



ROADWAY AND TRAFFIC DESIGN STANDARDS

FOR DESIGN, CONSTRUCTION, MAINTENANCE AND UTILITY
OPERATIONS ON THE STATE HIGHWAY SYSTEM

JANUARY 2000

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ENGLISH UNITS

Approved For Use On Federal Aid Projects

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INTRODUCTION

ROADWAY AND TRAFFIC DESIGN STANDARDS, JANUARY 2000

The 2000 English Roadway And Traffic Design Standards booklet was developed in concert with the development of the Department's roadway "Plans Preparation Manual", current as of January 2000; the 2000 "FDOT Standard Specifications For Road And Bridge Construction"; the current edition of the FDOT "Basis Of Estimate Handbook, English And Metric Combined Edition"; the AASHTO metric "A Policy On Geometric Design Of Highways And Streets", 1994; the AASHTO "Roadside Design Guide", 1996; the USDOT (FHWA) "Manual On Uniform Traffic Control Devices", 1988 and revisions; the USDOT rules implementing the Americans With Disabilities Act (ADA) and its proposed amendments to the rules, June 20, 1994; the "Florida Accessibility Code For Building Construction" (10/97 Edition); ASTM and AASHTO specifications; and, obtainable industry established interim and proposed specifications and trade indentifications.

Users of these standards are encouraged to suggest improvements to the standards. Suggestions should be submitted only after thorough study has been made and supporting background data can be furnished with the suggestion. Suggestions should be submitted to the State Roadway Design Engineer, Florida Department Of Transportation, 605 Suwannee St. MS 32, Tallahassee, FL. 32399-0450. The Department will make changes to the standards by special provisions, or where necessary by interim standards, until the next publication of standards is implemented.

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A Area or Amperes
AAA American Automobile Association
AASHTO American Association Of State Highway Officials
AASHTO American Association Of State Highway And Transportation Officials
ABC Asphalt Base Course
Abd. Abandoned
ABS Acrylonitrile-Butadiene-Styrene Pipe
AC, Ac. Acre
AC or Asph. Canc. Asphaltic Concrete
Accel. Acceleration
Act. Actuated
ADA The Americans With Disabilities Act
Adh. Adhesive
Adj. Adjust
ADT Average Daily Traffic
AADT Annual Average Daily Traffic
Agg. Aggregate
Ah. Ahead
AISC American Institute Of Steel Construction
Alt. Alternate
Al. Aluminum
AM 12:00 Midnight Until 11:59 Noon
ANSI American National Standards Institute
AOS Apparent Opening Size
App. Applied, Application
Apprh. Approach
Approx. Approximate
ARTBA American Road & Transportation Builders Association
Artf. Artificial
Asph. Asphalt
Assem. Assembly
Assn. Association
Assoc. Associate, Association
ASTM American Society For Testing Materials
Attn. Attention
Attenuat. Attenuator
Aux. or Auxil. Auxiliary
Ave. Avenue
AWG American Wire Gauge
AWS American Welding Society
Az. Azimuth

B to B Back to Back
Basc. Bascule
Bbl. Barrel
Bd. or Bnd. Bond or Bonded
BC Bottle Cap or Bolt Circle
B/C, B.C. Back Of Curb
BCCMP Bituminous Coated Corrugated Metal Pipe Culvert
BCPA Bituminous Coated Pipe Arch Culvert
BCCPCMP Bituminous Coated And Paved Corrugated Metal Pipe Culvert
BCPPA Bituminous Coated And Paved Pipe Arch Culvert
BCT Breakaway Cable Terminal
BE Buried Electric
Beg. Begin
Bif. Bituminous
Bk. Back
BL, BLC Base Line, Base Line Control
Bldg. Building
Blkhd. Bulkhead
Blvd. Boulevard
BM Bench Mark
Bndry. Boundary
Bdr. Border
Bot. Bottom
BP Borrow Pit
Bq. Becquerel
Br. Bridge
Brg. Bearing
Brkwy. Breakaway
BT Buried Telephone Cable or Duct
Btfly. Butterfly
BW Barbed Wire, Bottom Width or Both Ways
BO Basin Outlet

C Cantilever Length, Cut, Colorless, Coulomb or Cycle Length
°C Degree Celsius
C & G Curb And Gutter
CA Coarse Aggregate
Cap. Capacity
CAP Corrugated Aluminum Pipe
Caps. Capital Letters
CASP Corrugated Aluminized Steel Pipe
CATV Cable Television
CB Catch Basin
CBC Concrete Box Culvert
CBS Concrete Box Structure
CC, C/C, or C to C Center to Center
CCEW Center to Center Each Way
CD Cross Drain
cd Candela
Cem. Cement or Cemetery
Cem'd. Cemented
CFS Cubic Feet Per Second
Ch. Channel
Chchg. Channel Change
Chg. Changeable
CI Cast Iron
CIP Cast Iron Pipe
CIPL Cast In Place
cir. or circ. Circle or Circular
circ. Circumference

Ckt. Circuit
Cl. or Clear Clearance
CL, C/L or C Center Line
CM Concrete Monument
CMB Concrete Median Barrier
CMP Corrugated Metal Pipe
CMPA Corrugated Metal Pipe Arch
Co. County or Company
Col. Column
Com. Commercial or Common
COMM Committee or By Committee
Comp. Composite
Con. Connect or Connection
Conc. Concrete
Const. Construct or Construction
Contrl. Controller
Cont. Continuation
Contr. Contractor
Coord. Coordinate
Cor. Corner
Corr. Corrugated
CP Concrete Pipe
CPE Corrugated Polyethylene Pipe
CR Control Radius or County Road
CRA Clear Recovery Area
Crs. or Cse. Course
CS Curve To Spiral
CSP Corrugated Steel Pipe
CT Clear Trunk
Clvr. Cantilever
Ctr. Center
CU or Cu Copper
Culv. Culvert
Cwt. Hundredweight
CY Cubic Yard
Cyl. Cylindrical
CZ Clear Zone

D Degree Of Curvature, Depth, Density, Distance, Diameter or Directional Distribution
DA Drainage Area or Deflection Angle
DBH Diameter At Breast Height
DBI Ditch Bottom Inlet
Dbl. Double
DCS Degree Of Curvature (Spiral)
DD Dry Density
DDHV Directional Design Hour Traffic
Decel. Deceleration
Deg. Degree
Delin. Delineators
Demobl. Demobilization
Dept. Department
Det. Detour, Detection, Detectable
DGN or Dgn. Design
DHV Design Hourly Volume
DHW Design High Water
DT Ditch
DI Drop Inlet
Dia. or D Diameter
Dim. Dimension
Dist. Distance
Disp. Disposal
DLS District Location Surveyor
DMM Domestic Mail Manual
DOT Department Of Transportation
DPI Ditch Point Intersection
Dr. or DR. Drain, Drive or Design Review
DR Design Review
Driv. Driven
Drwy. Driveway
DS Design Speed
DSL Design Service Life
Dwg. Drawing

E East or External Distance
e Rate Of Super-elevation
E to E End to End
EA or Ea. Each
EB Eastbound
El. or Elev. Elevation
Elast. Elastomeric
Elec. Electric
Ellip. Elliptical
Embk. Embankment
Emul. Emulsified
Encl. Enclosure
Engr. Engineer
EOS End Of Survey or Equivalent Opening Size
Eq. Equation or Equal
Equip. Equipment
Esmt. Easement
Est. or Estm. Estimate
Est. Establish or Established
Etc. or etc. Et Cetera (And So Forth)
EW Endwall
Ex. Except
Exc. or Excav. Excavation
Exist. Existing
Exp. Expansion
Ext. Extension
Exwy. Expressway

F Fill, Farad
F or Final Final Quantity
F & I Furnish & Install
F to F Face to Face
FA Federal Aid or Fine Aggregate
FAC Florida Administrative Code
FAP Federal Aid Project
FC Friction Course
FD French Drain
Fdn. Foundation
FDOT Florida Department Of Transportation
FE Floor Elevation
Fed. Federal
Fert. Fertilizer
FES Flared End Section
FETS Flared End Terminal Section
FH Fire Hydrant
FHWA Federal Highway Administration
Fig. Figure
Fin. Finish
FL Flow Line
Florida Florida
Flex. Flexible
FNQ Fuse (Type Slow Burn)
FOC Fiber Optics Cable
FPM or fpm Feet Per Minute
FPS or fps Feet Per Second
FR or Fr. Frame
Frang. Frangible
Freq. Frequency
FS Far Side
Fl. Foot or Feet
FTB Floating Turbidity Barrier
FTBA Florida Transportation Builder Association
Furn. Furnish
Fut. Future

G Giga or Gauss
g Gram or Gravity
Galv. Galvanized
Ga. Gauge or Gage
Ga. or Gal. Gallon
Gar. Garage
GD Gutter Drain
GIP Galvanized Iron Pipe
GM Gas Main
GP Grade Point
Gr. Grade, Guardrail or Grate
Gr. or Gro. Gross
GRC Galvanized Rigid Steel Conduit
Grd. Ground
gross km Gross Kilometer
Gr. Wt. or gr. wt. Gross Weight
Gttr. Gutter
Gy Gray

H Henry
h Hour or Hecto
ha Hectare
HB Hay Bales
HC Horizontal Clearance
HD High Density or Heavy Duty
HD or Hd. Head
Hdwl. Headwall
HH Heavy Hex
Hndrl. Handrail
HOA Hand/Off/Automatic
Horiz. or Hor. Horizontal
HP High Pressure or Horsepower
Hr. Hour
HS High Strength
Hse. House
Ht. Height
HW High Water or Hot Water
Hwy. Highway
Hyd. Hydrant or Hydraulic
Hz Hertz

I Intchg. or Ichg. External Angle (Delta), Interstate Interchange
IES Illuminating Engineering Society
ID Inside Diameter or Identification
IMC Intermediate Metal Conduit
In. Inch
Inc. Incorporated or Including
Incl. or Inc. Included
Ind. Industry or Industrial
IP Iron Pipe
Install. Installed
Isect. Intersection
Isl. Island
ITE Institute Of Transportation Engineers

J Joule
JB Junction Box
Jct. Junction
Jt. Joint

K Design Hour Factor or Kelvin
k Kilo (prefix)
kg Kilogram
kg/m Kilogram Per Meter
kg/m² Kilogram Per Square Meter
kg/m³ Kilogram Per Cubic Meter
Kilo One Thousand
Kip 1000 Pounds
km Kilometer
km/h Kilometer Per Hour
kn Knot
kPa Kilopascal
ksi Kips Per Square Inch
kV Kilovolt
kVA Kilovolt Ampere
kWh Kilowatt-hour

L Length, Length Of Curve, Liter, Left
2-L Two-Lane
2LIW Two-Lane One-Way
2L2W Two-Lane Two-Way
LA or L/A Limited Access
lane km Lane Kilometer
Lat. Lateral or Latitude
Lb. Pound
LBR Limerock Bearing Ratio
LC Long Chord
Lgh. Length
Lin. Linear
lm Lumen
Lmrk. Limerock
Loc., LO Location
LS Length Of Spiral
LT Left Turn
Lt. Left
Ltd. Lighted or Limited
Lum. Luminaire
L/W Lightweight
lx Lux

M Mass, Middle Ordinate Length or Mega
m Meter or Milli
m² Square Meter or Meter Square
m³ Cubic Meter or Meter Cubed
m³/m Cubic Meter Per Meter
m/s Meters Per Second
Mach. Machine
Maint. Maintenance
Matl. Material
Max. Maximum
MB Median Barrier
MBM Thousand (Feet) Board Measure
Med. Median
Mega One Million
Mem. Member
MES Mitered End Section
Mess. Message
Mfg. Manufactured or Manufacturer
MG 1000 Gallons
MH Manhole
MHW Mean High Water
μ Micro
Mi. Mile
Micro One-Millionth
Mid. Middle
Mil One-Thousandth Of An Inch
Mil. Military
Milli One-Thousandth
Min. Minimum or Minute
Misc. Miscellaneous
mL Milliliter
MLW Mean Low Water
mm Millimeter
Mobl. Mobilization
Mod. Modify or Modified
Mol Mole
Mon. Monument
MOT Maintenance Of Traffic
MP Mile Post
MPa Megapascal
MPH or mph Miles Per Hour
MSL Mean Sea Level
Mtd. Mounted
MUTCD Manual On Uniform Traffic Control Device
MUTS Manual On Uniform Traffic Studies

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

STANDARD ABBREVIATIONS

Names	Dates	Approved By		
Designed By			State Roadway Design Engineer	
Drawn By		Revision	Sheet No.	Index No.
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UNITS OF MEASURE

N	North or Newton
N/m	Newtons Per Meter
N/m ²	Newtons Per Square Meter
N/m ³	Newtons Per Cubic Meter
N/mm ²	Newtons Per Square Millimeter
NA or N/A	Not Available or Not Applicable
N & C	Nail & Cap
NB	Northbound
NC	National Coarse
NDGBU	Neighborhood Delivery And Collection Box Unit
NE	Northeast
net km	Net Kilometer
NEMA	National Electrical Manufacturers Association
NGVD	National Geodetic Vertical Datum of 1929
NGS	National Geodetic Survey
NHW	Normal High Water
NIC	Not In Contract
NJ	New Jersey
N+m	Newton Meter
No.	Number
Nom.	Nominal
Norm.	Normal
NS	Non Stress, Not Suitable or Near Side
NT, N&T	Non Traffic, Nail & Tin
NTS	Not To Scale
NW	Northwest
Opass	Overpass
O to O or o to a	Out to Out
OA	Overall
O.B.G.	Optional Base Group
OC	On Center
OD	Outside Diameter
OE	Overhead Electric
OH, OHD or Ohd.	Overhead
Opt.	Option, Optional or Optically
OT	Overhead Telephone
Oz.	Ounce
Ω	Ohm
P	Passenger Car & Light Delivery Truck
P or Plan	Plan Quantity
Pa	Pascal
Par.	Parallel
Pa-s	Pascal Second
Part.	Participation or Partition
Pavt.	Pavement
PC	Point Of Curvature
PCBC	Precast Concrete Box Culvert
PCC	Point Of Compound Curvature or Plain Cement Concrete
PCE	Permanent Construction Easement
PE	Professional Engineer
Ped	Pedestrian or Pedestal
Pen.	Penetration
PG	Profile Grade
PGL	Profile Grade Line
Ph.	Phase
pH	Measure Of Acidity or Alkalinity
PI	Point Of Intersection
Pkg.	Parking
Pkwy.	Parkway
PL or \overline{P}	Property Line or Plate
PM	12:00 Noon Until 11:59 Midnight
POC	Point On Curve
POST	Point On Semi-Tangent
POT	Point On Tangent
PP	Power Pole
Pr.	Pair
PRC	Point Of Reverse Curvature
Prcst.	Precast
Prest.	Prestressed
Prob.	Probability
Prod.	Product, Production, Producer or Produced
Prog.	Program or Progression
Proj.	Project or Projection
PRM	Permanent Reference Monument
Prov.	Provisions
PS & E	Plans, Specifications And Estimates
PSF or psf	Pounds Per Square Foot
PSI or psi	Pounds Per Square Inch
PT	Point Of Tangency
PVC	Polyvinyl Chloride
PW	Pressure Water
Q	Peak Discharge or Flow Volume

R or Rad.	Radius
R or Rng.	Range
rad	Radian
rad/s	Radian Per Second
RBAC	Rock Base Asphaltic Concrete
RBST	Rock Base Surface Treatment
RCP	Reinforced Concrete Pipe
RCPA	Reinforced Concrete Pipe Arch
Rd.	Road or Round
Rdsd.	Roadside
Rdwy.	Roadway
Rec.	Recovery
Rect.	Reticuline or Rectangular
Ref.	Reference
Refl.	Reflective
Reg.	Region, Regular, Registered or Regulation
Reinf.	Reinforced or Reinforcing
Rejuv.	Rejuvenation
Reloc.	Relocated
Rem.	Removal
Repl.	Replace
Req. or Reqd.	Required
Res.	Residence or Residential
RHW	Insulation (Moisture & Heat Resistant Rubber)
RM	Reference Monument
r/min	Revolution Per Minute
RP	Reference Point
rpm	Revolution Per Minute
RPM	Raised Reflective Pavement Markers
r/s	Revolution Per Second
RR	Railroad
Rsf.	Resurface
Rt.	Right
R/W, ROW	Right Of Way
S or s	Speed, South, Seimens, Or Second
SAHM	Sand-Asphalt Hot Mix
SAN or San.	Sanitary
SB	Southbound
SBAC	Shell Base Asphaltic Concrete
SBRM	Sand Bituminous Road Mix
SBST	Shell Base Surface Treatment
SC	Seal Coat or Spiral To Curve
Sch.	Schedule
SCST	Sand-Clay Surface Treatment
SD	Side Drain, Storm Drain
SE	Southeast
Sec.	Second
Sect.	Section
Sed.	Sediment
Sep.	Separator
Seq.	Sequential
Serv.	Service
SF	Adjustment Factor In Percent, Silt Fence
SG	Subgrade
SG or Sp.Gr.	Specific Gravity
Sh. or Sht.	Sheet
Shldr.	Shoulder
SHW	Seasonal High Water
Spa.	Space
Spag. or Sp.	Spacing
Spec.	Specification
Sq. Ft. or SF	Square Foot
Sq. In.	Square Inch
Sq. Yd. or SY	Square Yard
SR or S.R.	State Road
SRAP	Spiral Rib Aluminum Pipe
SRASP	Spiral Rib Aluminumized Steel Pipe
SRSP	Spiral Rib Steel Pipe
SS	Sanitary Sewer
SSMD	Solid State Modular Design
ST	Surface Treatment or Spiral To Tangent
St. or ST.	Street
Sta.	Station
Stab.	Stability or Stabilization
STB	Staked Turbidity Barrier
Std.	Standard
Stg.	Strong
Stge.	Storage
Stl.	Steel
Str.	Structure
Sty.	Story
SU	Single Unit Trucks
Sub. or Subs.	Subsoil
Sub. or Subst.	Substitute
Subgr.	Subgrade
Suppl.	Supports
SUR or Sur.	Survey
Surf.	Surface
SW	Southwest
SW or Swk.	Sidewalk
Sys. or Syst.	System
Sv	Sievert

T	Tangent, Length Of Curve, Percent Trucks, Tesla,
T, TWP or Twp.	Township
t	Metric Ton
tan.	Tangent
TBM	Temporary Bench Mark
TC	Tangent To Curve
TCB	Temporary Concrete Barrier
TCE	Temporary Construction Easement
TCP	Terra Cotta Pipe
TCZ	Traffic Control Zone
Tel.	Telephone
Temp.	Temperature or Temporary
Traf.	Traffic
Theo.	Theoretical
THRMPSTC	Thermoplastic
THW or THWN	Insulation (Flame Retardant, Moisture And Heat Resistant Thermoplastic)
Thick.	Thickness
Tk	Thick, Thickness or Truck
Tn.	Ton
Trans.	Transition, Transverse, Translate or Transportation
Treat.	Treatment
TS	Tangent To Spiral
TSC	Length Of Tangent (Spiral Curve)
Typ.	Typical
Upass.	Underpass
UG	Underground
UL	Underwriters Laboratories
Ult.	Ultimate
Ultd.	Unlimited
Unddr.	Underdrains
Undrwy.	Underroadway
UNL or Undl.	Unloaded
Untr.	Untreated
USC & GS	US Coast and Geodetic Survey (now National Geodetic Survey)
USGS	US Geological Survey
USPS	United States Postal Service
Util.	Utilities
V	Volt, Velocity, Volume or Hourly Volume
Var.	Varies, Variable or Variance
VC	Vertical Curve
VCP	Vitrified Clay Pipe
VECP	Value Engineering Change Proposal
Veh.	Vehicle
Vert.	Vertical
VF	Vertical Foot
Vh	Verified Horizontal Location
VMS	Variable Message Sign
Vol.	Volume
VP	Vertical Panel
VPD or Vpd.	Vehicles Per Day
VPH or Vph.	Vehicles Per Hour
VPHPL or Vphpl.	Vehicles Per Hour Per Lane
VRMS	Volts Root Mean Square
Vv	Verified Vertical Elevation
Vvh	Verified Vertical Elevation And Horizontal Location
VW	Variable Width
W	Width, Wide, West or Watt
W/C	Water-Cement Ratio
WB	Westbound
Wb.	Weber
WB40	Intermediate Semi Trailer
WB50	Large Semi Trailer
WB60	Tandem Semi Trailer
WM	Water Main
W.P.I.	Work Program Item
WT	Water Table Or Weight
WWF	Welded Wire Fabric
X	Coordinate Value (East-West Direction) or Extra
X Rd.	Cross Road
Xing.	Crossing
Xsec.	Cross Section
Y	Coordinate Value (North-South Direction)
Yr.	Year

US MEASUREMENT

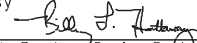
AC	Acre
AS	Assembly
BU	Bushel
CF	Cubic Foot
CO	Cleanout
CY	Cubic Yard
EA	Each
ED	Each Day
GA	Gallon
GM	Gross Mile
LB	Pound
LF	Linear Foot
LM	Lane Mile
LO	Per Location
LS	Lump Sum
LU	Luminaire
MB	Thousand Board Measure
MG	Thousand Gallons
MH	Man Hour
NM	Net Mile
PA	Per Analysis
PB	Per Building
PE	Pile
PI	Per Intersection
PL	Plant
PM	Per Mile
PS	Per Set
PW	Per Well
SF	Square Foot
SY	Square Yard
TN	Ton

METRIC MEASUREMENT

AS	Assembly
CO	Cleanout
DA	Day
EA	Each
ED	Each Day
GK	Gross Kilometer
HA	Hectare
HR	Hour
KG	Kilogram
KL	Kiloliter
KM	Kilometer
LI	Liter
LK	Lane Kilometer
LO	Per Location
LS	Lump Sum
LS/AS	Lump Sum Per Assembly
LS/DA	Lump Sum Per Day
LS/EA	Lump Sum Per Each
LS/HA	Lump Sum Per Hectare
LS/KG	Lump Sum Per Kilogram
LS/LS	Lump Sum Per Lump Sum
LS/MT	Lump Sum Per Metric Ton
LS/MI	Lump Sum Per Linear Meter
LS/M2	Lump Sum Per Square Meter
LU	Luminaire
MH	Man Hour
MO	Month
MT	Metric Ton
MI	Meter
M2	Square Meter
M3	Cubic Meter
NK	Net Kilometer
PA	Per Analysis
PB	Per Building
PI	Per Intersection
PL	Plant
PW	Per Well

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

STANDARD ABBREVIATIONS

Names	Dates	Approved By		
Designed By				
Drawn By		State Roadway Design Engineer	Revision	Sheet No.
Checked By			00	2 of 2
				001

STANDARD SYMBOLS FOR KEY MAP

	Highway With Full Control of Access
	Highway With Frontage Roads
	Highway Interchange
	Proposed Controlled Access Highway
	Divided Highway
	Hard Surfaced Road
	Soil, Gravel Or Shell Surfaced Road
	Graded And Drained Road
	Unimproved Road
	Primitive Road
	Private Road
	Streets In Inset Or Delimited Areas
	Extension Of Local Roads Within Cities
	Federal Aid Interstate Highway
	Federal Aid Urban Highway
	Federal Aid Primary Highway
	Federal Aid Secondary Highway
	National Forest Road
	State Forest Road
	State Park Road
	Interstate Highway
	US Numbered Highway
	State Highway
	County Road
	Railroad
	Double Track Railroad
	Abandoned Railroad
	Railroad Station
	Grade Crossing
	Railroad Above
	Railroad Below
	Military Field
	Commercial Or Municipal Airport
	Landing Area Or Strip
	Runways

	Free Ferry
	Toll Ferry
	Canal Or Drainage Ditch
	Intracoastal Waterway
	Narrow Stream
	Wide Stream
	Dam
	Dam Or Spillway With Lock
	Dam With Road
	Flood Control Structure
	Lake, Reservoir Or Pond
	Intermittent Pond
	Marsh Or Swamp
	Mangroves
	Levee Or Dike
	Levee Or Dike With Road
	Highway Bridge
	Small Bridges Closely Spaced
	Drawbridge
	Highway Grade Separation
	Tunnel
	State Boundary Line
	County Boundary Line
	Civil Township Boundary
	Extended Township Line
	Land Grant Line
	Land Section Line
	State Survey Section Line
	Survey By Others
	Location Of Inset Boundary Within Map
	Military Reservation Boundary
	College Or University Boundary
	Corporate Limits
	Delimited Area, Population Est.
	Reservation, Forest Or Park Boundary
	Wildlife Refuge Boundary

	Residential Area Under Development
	Lighthouse
	State Capital
	County Seat
	Other City Or Village
	Seminole Indian Village
	Welcome Station
	Wayside Park Or Small Park
	Park With Boat Ramp
	Boat Ramp
	Museum
	Recreational Area Or Historic Site
	Scenic Site
	Post Office
	School
	Church
	Cemetery
	Church And Cemetery
	Hospital, Health Center Or Rest Home
	Toll House, Port Of Entry Or Weight Station
	Fair Grounds, Race Course Or Rodeo Arena
	Mine Or Strip Mine
	Governmental Research Station

	Agricultural Inspection Station
	Farmers Market
	Game Preserve
	Game Checking Station
	Bird Sanctuary
	Fire Control Headquarters
	Lookout Tower
	Fire Station
	Patrol Or Police Station
	Correctional Institution Or Road Camp
	Department of Transportation Facility
	Coast Guard Station
	Armory
	Junkyard
	Sanitary Fill
	Sewage Disposal Plant
	Incinerator
	Power Plant
	Power Substation
	Communications Facility
	Locked Gate Or Fence
	Triangulation Station

GENERAL NOTE
 1. Symbols on this Index are intended for use on all Roadway, Signing And Marking, Signalization, and Lighting projects. For work zone traffic control symbols refer to Index 600. When additional or similar symbols are used, legends or notations may be required for clarity.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
STANDARD SYMBOLS				
Names	Dates	Approved By		
Designed By		State Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 3	002

STANDARD SYMBOLS FOR PLAN SHEETS

GENERAL SYMBOLS

	State Line
	County Line
	Township Line
	Section Line
	City Line
	Base Or Survey Line
	Right-Of-Way
	Easement Line
	Limited Access Line
	Fence Line
	National Or State Park Or Forest
	Grant Line
	Railroad (Drainage Maps)
	Railroad (Detail Plans)
	Fence (Limited Access)
	Box Culvert
	Bridge
	Pipe Culvert-Mitered End Section
	Pipe Culvert-Straight Endwall
	Pipe Culvert-U-Type Endwall
	Pipe Culvert-Median Drain
	Pipe Culvert-Other End Treatments
	Storm Drain
	Storm Drain
	Inlet
	Manhole
	Tied Longitudinal Joint
	Keyed Longitudinal Joint
	Doweled Transverse Expansion Joint
	Doweled Transverse Contraction Joint
	Transverse Contraction Joint Without Dowels
	Survey Reference Point
	ALACHUA Triangulation Station
	Bench Mark
	Point Of Intersection
	North Arrow
	Edges Of Existing Pavement And Sidewalk
	Guardrail
	Crash Cushion (Attenuator)
	Piling Pier Column
	Concrete Monument
	Base Line
	Centerline
	Property Line
	Delta Angle
	Approximate
	Round Or Diameter

	Curb
	Curb And Gutter
	Water Well, Spring
	Levee
	Railroad Mile Post
	Railroad Signal With Gate
	Railroad Switch
	Gate
	Pump Island
	Storage Tank (Surface)
	Storage Tank (Underground)
	Mine Or Quarry
	Borrow Pit
	Church
	Store
	Residence
	Barn
	School
	Hay Bales
	Silt Fence
	Floating Turbidity Barrier
	Staked Turbidity Barrier
	Stream
	Shore Line
	Marsh
	Wetland Boundary
	Hedge
	Trees
	Edge Of Wooded Area
	Shrubbery
	Grove Or Orchard
	Definition Of Skew For Cross Drains And Barrels Of Concrete Box Culverts
	Concrete
	Wood
	Rate Of Superelevation

UTILITY ADJUSTMENT SYMBOLS

		EXISTING	PROPOSED		EXISTING	PROPOSED	
	Manhole						Power Pole
	Fire Hydrant						Telephone Pole
	Meter (Type)						Combination Pole
	Valve (Type)						Guy Wire And Anchor Pin
	Valve Box (Type)						Guy Pole Deadman
	Valve Cover (Type)						Tower
	Vent (Type)						Light Pole
	Pump Station						Transformer
	Sewage Pump Station						
	Cleanout						
	Cable TV Service Box						
	Gas						Overhead Electric
	Water Main						Overhead Telephone
	Sanitary Sewer						Overhead Cable Television
	Buried Electric						Overhead Fiber Optic
	Buried Telephone						
	Buried Cable Television						
	Buried Fiber Optic						
	Casing						
	Duct						
	Non Potable Water						
	Petroleum						
	Roof Drain						
	Steam						

See General Note Sheet 1 Of 3.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
STANDARD SYMBOLS					
Designed By	Names	Dates	Approved By		
Drawn By	CUP	08/72	State Roadway Design Engineer		
Checked By	COR	08/72	Revision	Sheet No.	Index No.
			00	2 of 3	002

STANDARD SYMBOLS FOR PLAN SHEETS

TRAFFIC SIGNALS SYMBOLS

EXISTING	PROPOSED	
		Traffic Signal Head (Span Wire Mounted)
		Traffic Signal Head (Pedestal Mounted)
		Traffic Signal Head (Mast Arm Mounted)
		Traffic Signal Pole (Concrete, Wood, Metal)
		Vehicle Detector (Loop)
		Signal Cable (On Messenger Wire)
		Conduit
		Vehicle Detector (Points)
		Pedestrian Detector
		Pedestrian Signal Head (Pole Or Pedestal Mounted)
		Controller Cabinet (Base Mounted)
		Controller Cabinet (Pole Mounted)
		Walk - Dont Walk
		Flashing Dont Walk
		Signal Face Number
		Signal Lens
		Programmed Signal Head
		Messenger Wire
		Pole Tabulation Cross Reference
		Pole Tabulation Cross Reference (Joint Use Pole)
		Signal Phase

LIGHTING SYMBOLS

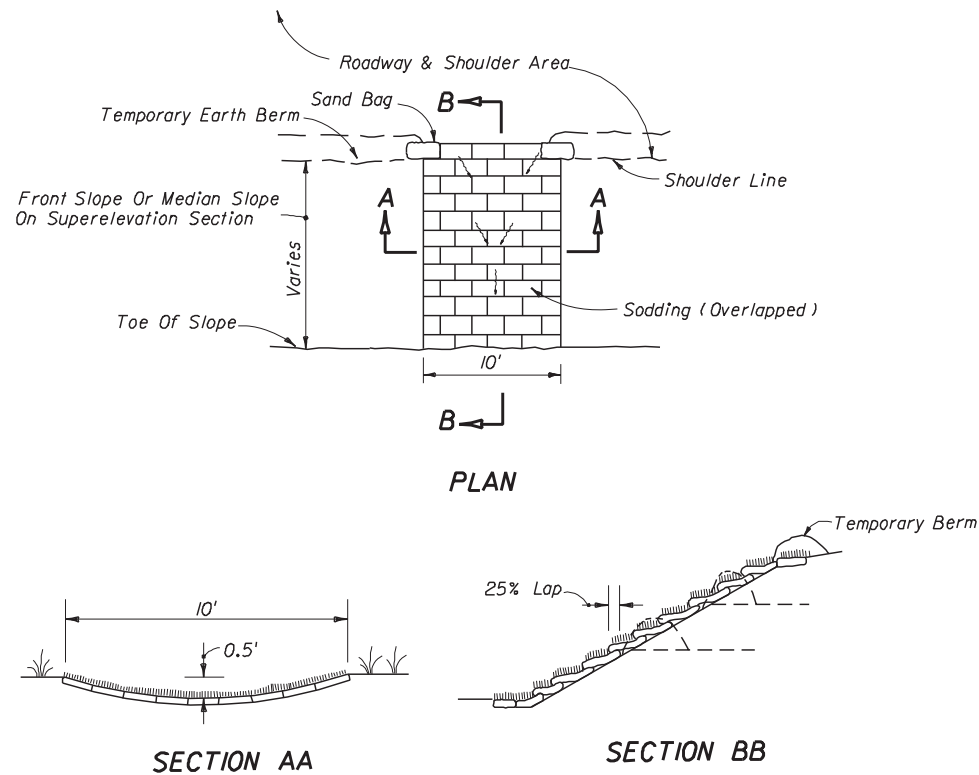
EXISTING	PROPOSED	
		Pole & Luminaire
		Existing Pole & Luminaire To Be Removed
		Final Position Of Relocated Or Adjusted Pole & Luminaire
		High Mast Lighting Tower
		City Or Utility Owned Luminaire & Pole
		PVC (Polyvinyl Chloride) Lighting Conduit And Conductors
		Rigid Galvanized Lighting Conduit And Conductors
		Lighting Pull-Box
		Light Distribution Point
		Joint Use Pole
		Pier Cap Underdeck Luminaire
		Pendant Hung Underdeck Luminaire

SIGNING AND PAVEMENT MARKING SYMBOLS

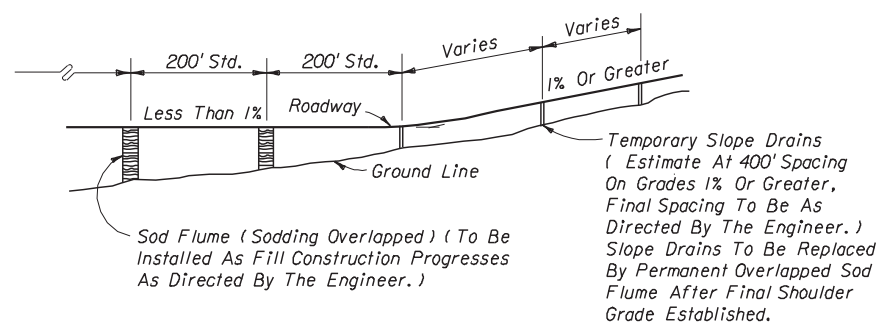
	Pavement Arrow
	Single Solid Line
	Double Solid Line
	Skip Line
	Stop Bar
	Traffic Sign (Post Mounted)
	Traffic Sign (Overhead)
	Sign Number
	Sign Item Number
	Traffic Flow Arrow

See General Notes, Sheet 1 of 3

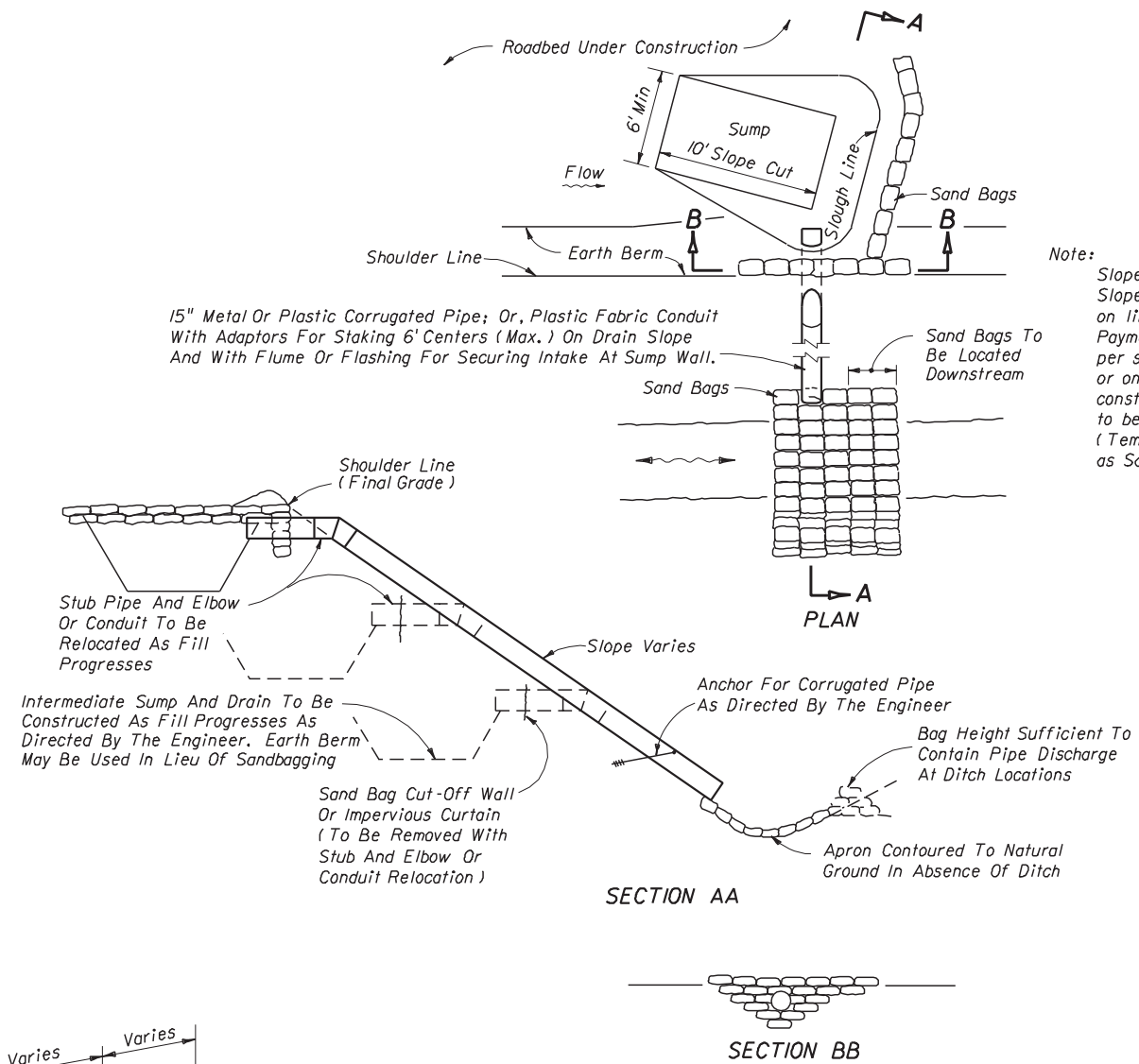
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STANDARD SYMBOLS				
	Names	Dates	Approved By	
Designed By			State Roadway Design Engineer	
Drawn By	CDP	08/72	Revision	Sheet No.
Checked By	COR	08/72	00	3 of 3
				Index No. 002



SOD FLUME (SODDING OVERLAPPED)



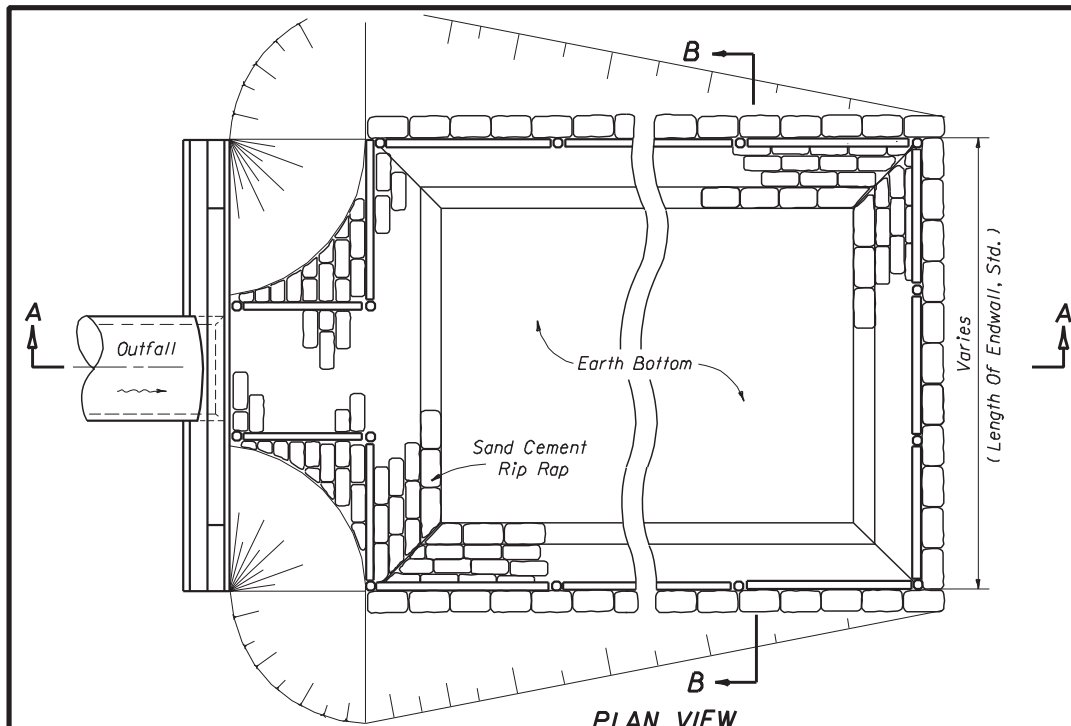
SLOPE DRAIN APPLICATION



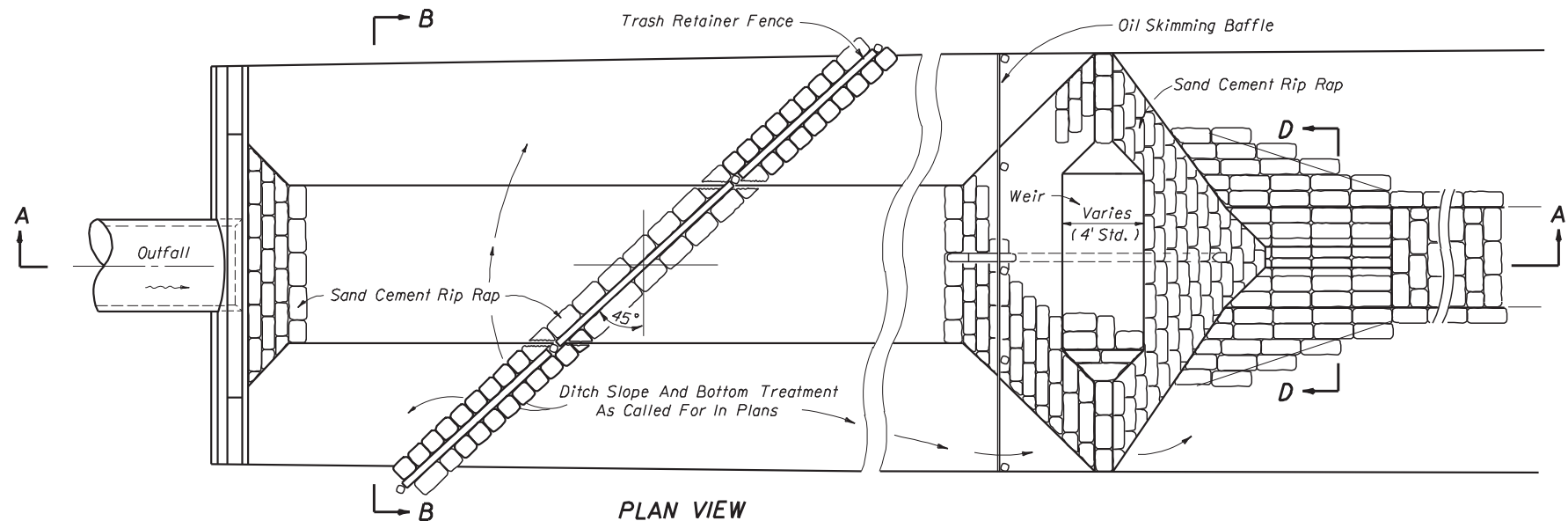
TEMPORARY SLOPE DRAIN

Note:
 Slope drain pipe to be paid for as Slope Drains (Temporary) LF, based on linear feet of pipe or conduit installed. Payment to be made for one installation per site, including one stub and elbow or one intake flume or flashing. Sump construction and maintenance and curtains to be included in cost for Slope Drains (Temporary). Sand bags to be paid for as Sandbagging CY.

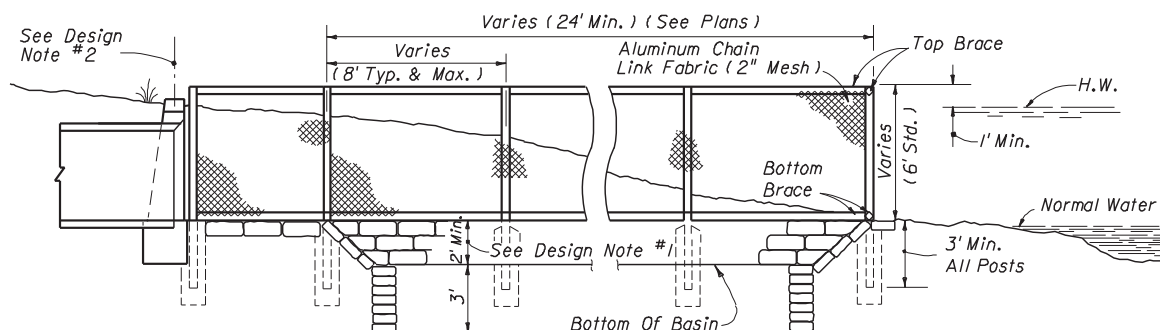
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TEMPORARY SLOPE DRAIN AND SOD FLUME				
DESIGNED BY	NAMES	DATES	APPROVED BY <i>S. A. McHenry</i> STATE DRAINAGE ENGINEER	
DRAWN BY			REVISION	SHEET NO. 1 of 1
CHECKED BY		10/07/80	00	INDEX NO. 100



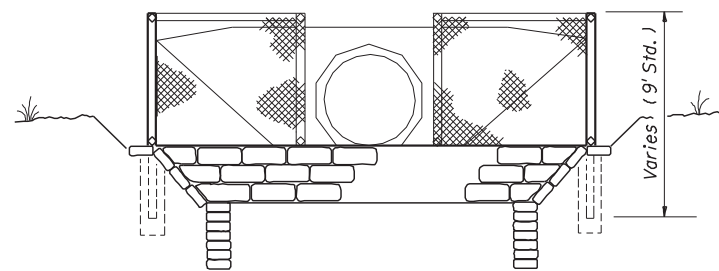
PLAN VIEW



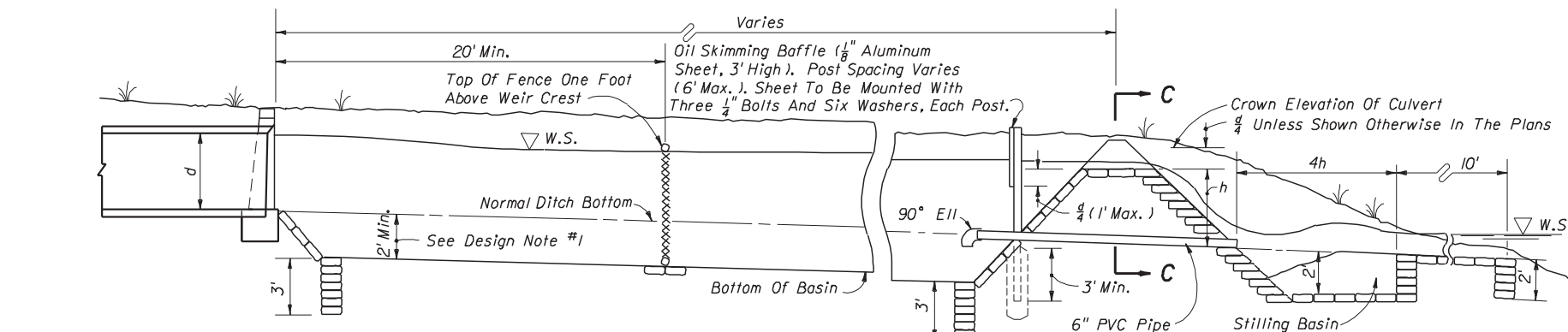
PLAN VIEW



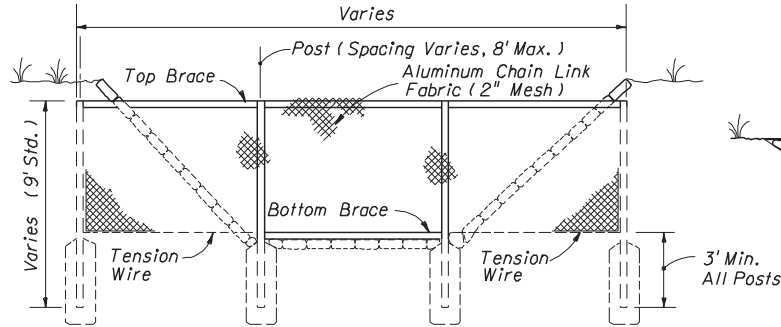
SECTION AA



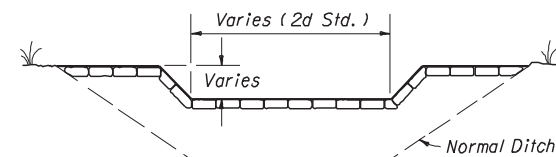
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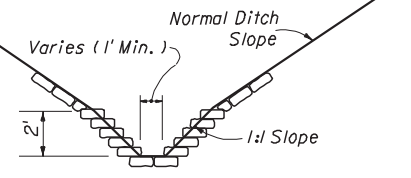
SECTION AA



SECTION BB



SECTION CC



SECTION DD

INTENDED FOR USE WHEN THE STORM SEWER OUTFALLS ADJACENT TO A SHORE LINE

TYPE A

INTENDED FOR USE WHEN THE STORM SEWER OUTFALLS IN AN OPEN DITCH

TYPE B

DESIGN NOTES

1. Basins should be as deep as practical with a minimum depth of 2.0 feet.
2. In Type A, when the top of endwall is below high water, fence also will be required along the top of the endwall.
3. In Type B, the weir shall be located as far from the endwall as practical. On steep ditch grades two or more weirs may be required. Intermediate weirs shall be constructed without stilling basins.
4. In Type B, the 6" PVC pipe shall be constructed unless shown otherwise in the plans.

GENERAL CONSTRUCTION NOTES

1. Fence materials shall be aluminum or concrete only.
2. Aluminum posts shall be 3" diameter minimum. Aluminum rail braces shall be in accordance with Index 452. Concrete posts and rail braces shall be in accordance with Index 451. All posts to be set in concrete.
3. Fabric shall be installed to inside of posts and rail braces, and tied to posts and braces at 6" centers.
4. For additional details on fencing, see Index Nos. 451 and 452.
5. All basin slopes to be 1:1 unless detailed otherwise in the plans.
6. Sediment basins to be constructed prior to commencement of upland construction. Maintenance and clean out to be by the Contractor until acceptance of project by the Engineer.

GENERAL NOTES

1. The cost for Type A and Type B trash retainer and sediment basins shall include the cost for riprap, fencing, baffles, piping and for sump and weir earthwork over and above ditch excavation called for in the plans. Payment for both Type A Type B shall be under the contract unit price for Sediment Basins, Each. Cleanouts as called for in the plans shall be paid for under the contract unit price for Sediment Basin Cleanouts, CO.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**TRASH RETAINER AND
SEDIMENT BASIN**

Names	Dates	Approved By <i>S. A. McHenry</i> State Drainage Engineer		
Designed By WJR	05/74	Revision	Sheet No.	Index No.
Drawn By		00	1 of 1	101
Checked By HLB	06/74			

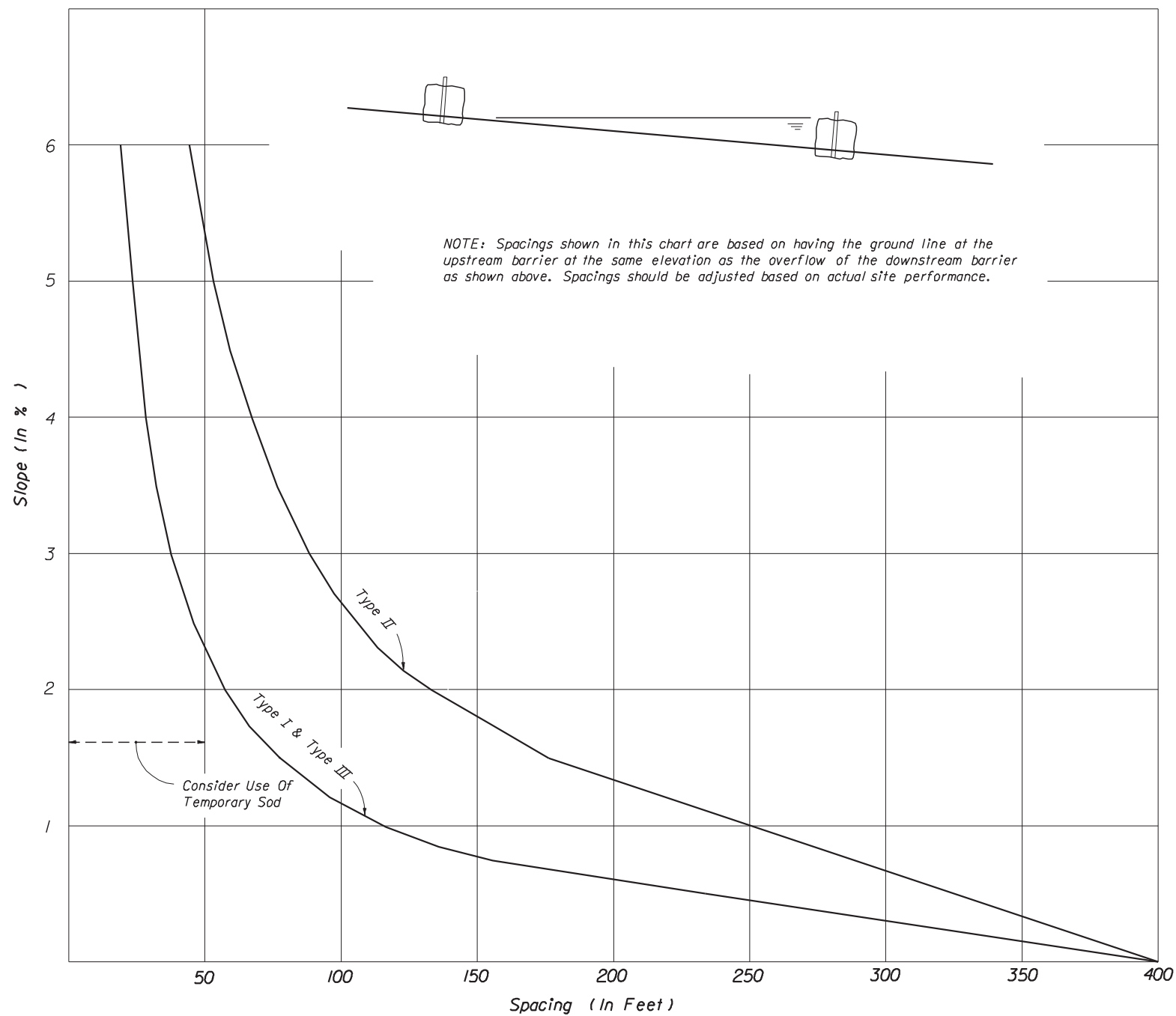
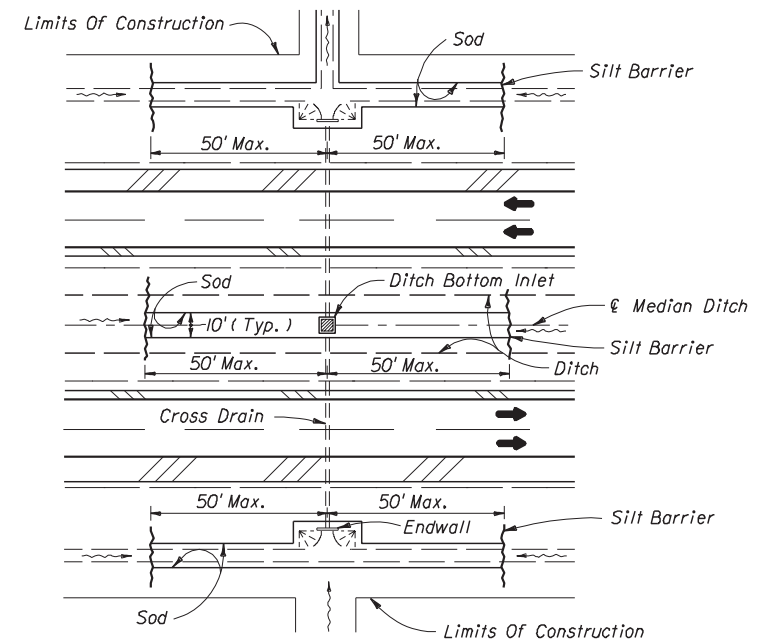
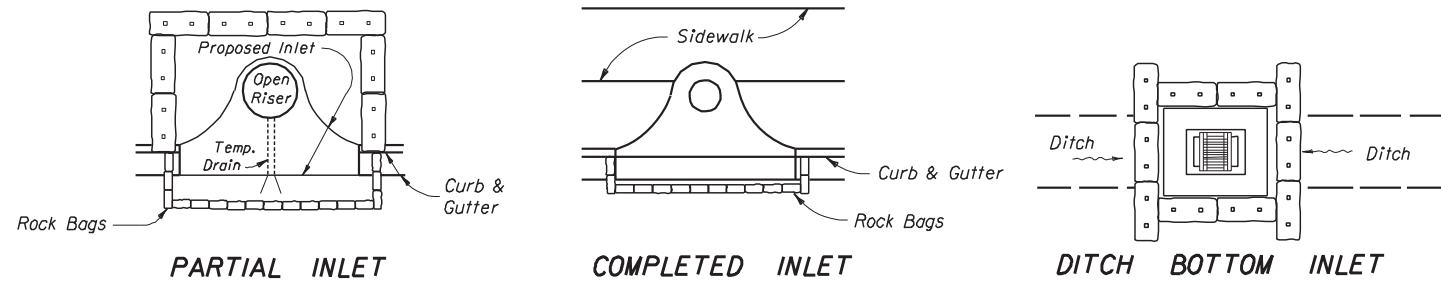


CHART I
RECOMMENDED SPACING FOR BALED HAY BARRIERS AND TYPE III SILT FENCE

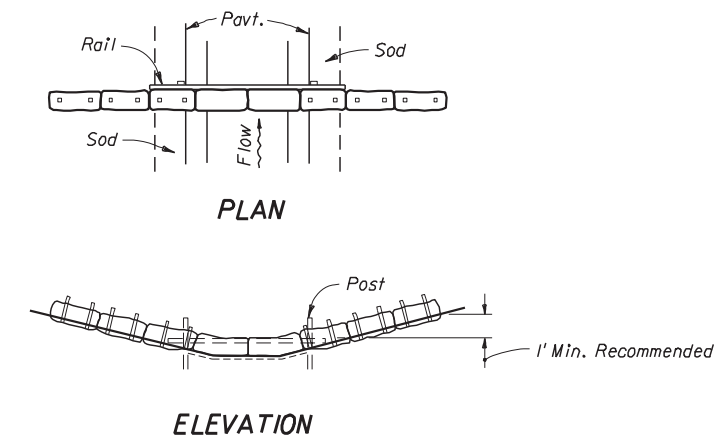


DITCH INSTALLATIONS AT DRAINAGE STRUCTURES

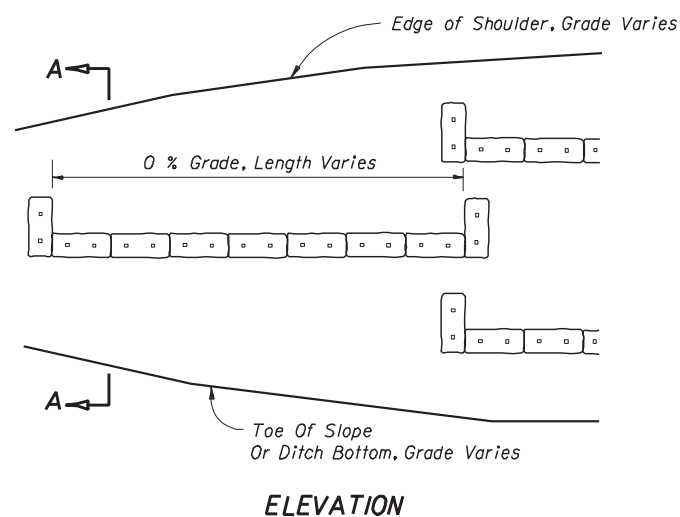
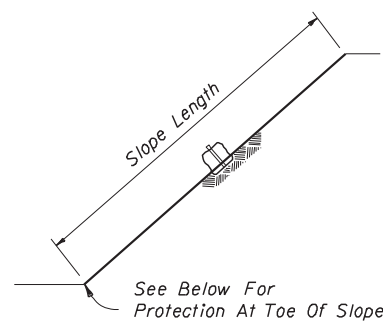
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
ROCK BAG, BALED HAY, BALED STRAW AND SILT FENCE BARRIERS				
Designed By	EGR	02/80	Approved By <i>S. A. McHenry</i> State Drainage Engineer	
Drawn By	HSD	09/82	Revision	Sheet No.
Checked By	JVG	09/82	00	1 of 3
				Index No. 102



PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

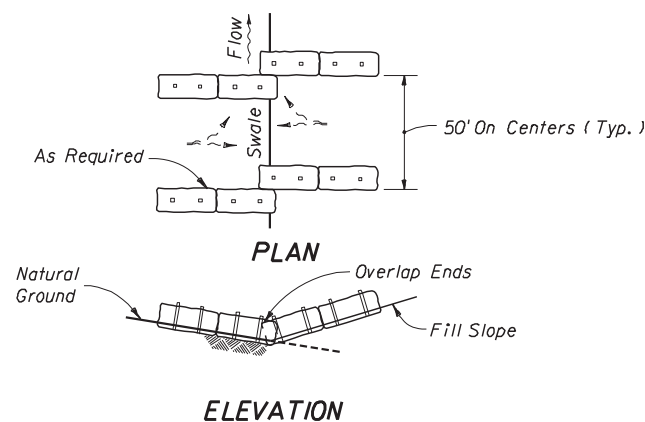


BARRIER FOR PAVED DITCH

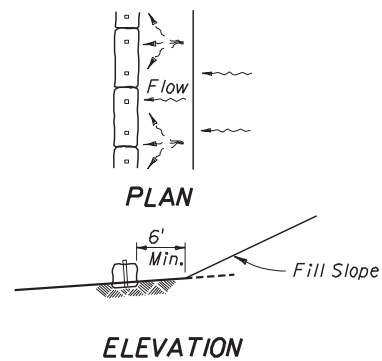


ALONG FILL SLOPE

Note:
Where the slope length exceeds 25 feet, construct one row of bale barriers at 0% longitudinal grade midway up the slope. Construct two rows of bale barriers where the slope length exceeds 50 feet.



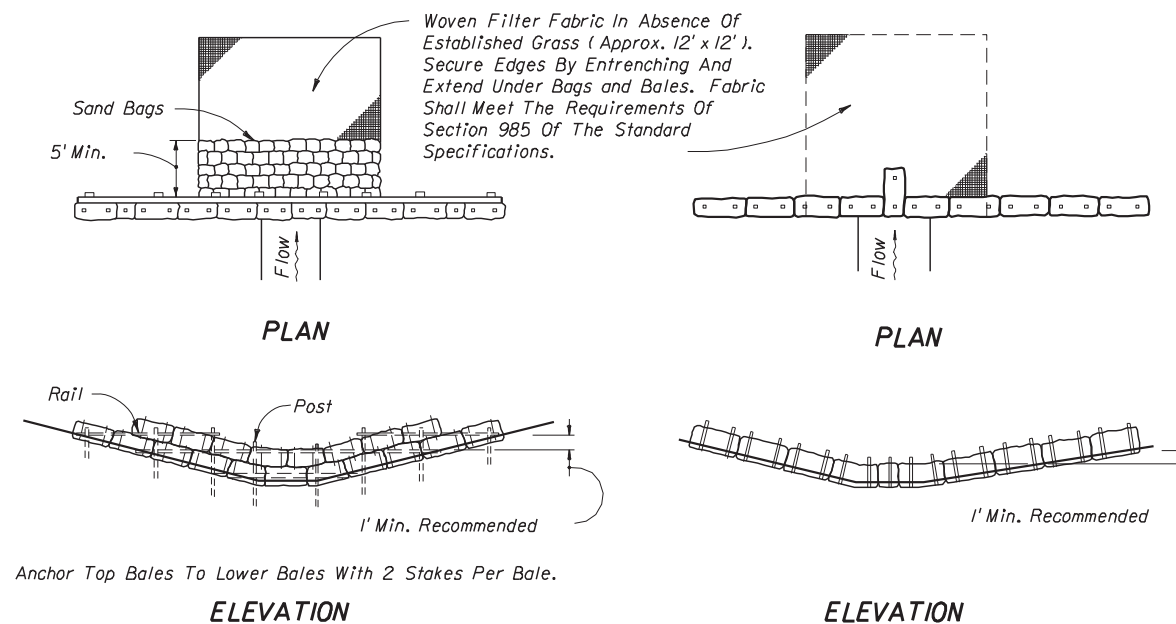
TO BE USED WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF SLOPE



TO BE USED WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF SLOPE

AT TOE OF SLOPE

BARRIERS FOR FILL SLOPES



Anchor Top Bales To Lower Bales With 2 Stakes Per Bale.

ELEVATION

ELEVATION

TYPE II

TYPE I

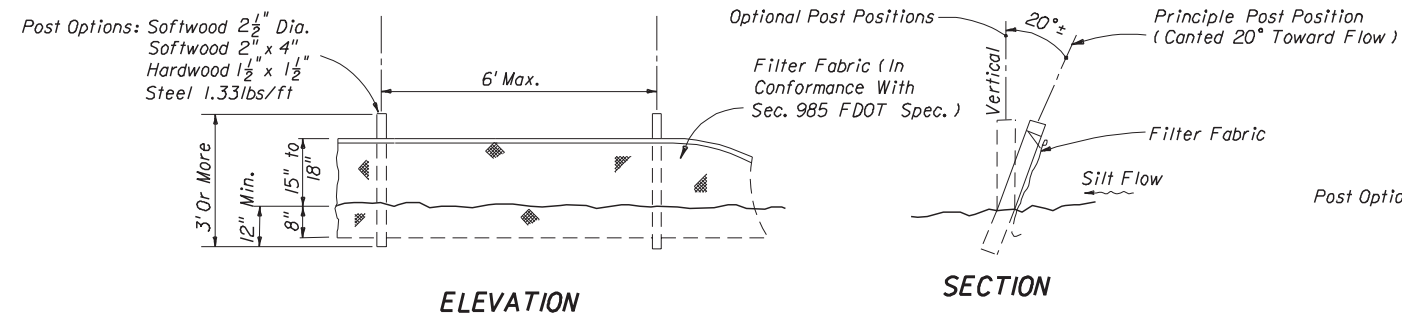
BARRIERS FOR UNPAVED DITCHES

NOTES FOR BAILED HAY OR STRAW BARRIERS

- Type I and II Barriers should be spaced in accordance with Chart I, Sheet I.
- Hay bales shall be trenched 3" to 4" and anchored with 2 - 1" x 2" (or 1" dia.) x 4' wood stakes. Stakes of other material or shape providing equivalent strength may be used if approved by the Engineer. Stakes other than wood shall be removed upon completion of the project.
- Rails and posts shall be 2" x 4" wood. Other materials providing equivalent strength may be used if approved by the engineer.
- Adjacent bales shall be butted firmly together. Unavoidable gaps shall be plugged with hay or straw to prevent silt from passing.
- Where used in conjunction with silt fence, hay bales shall be placed on the upstream side of the fence.
- Bales to be paid for under the contract unit price for Baled Hay or Straw, EA. The unit price shall include the cost of filter fabric for Type I and II Barriers. Sand bags shall be paid for under the unit price for Sandbagging, CY. Rock bags to be paid for under the contract unit price for Rock Bags, EA.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
ROCK BAG, BAILED HAY, BAILED STRAW AND SILT FENCE BARRIERS				
Designed By	Names	Dates	Approved By	
Drawn By	WJR	5/74	S. A. McHenry State Drainage Engineer	
Checked By	HLB	6/74	Revision	Sheet No. Index No.
			00	2 of 3 102

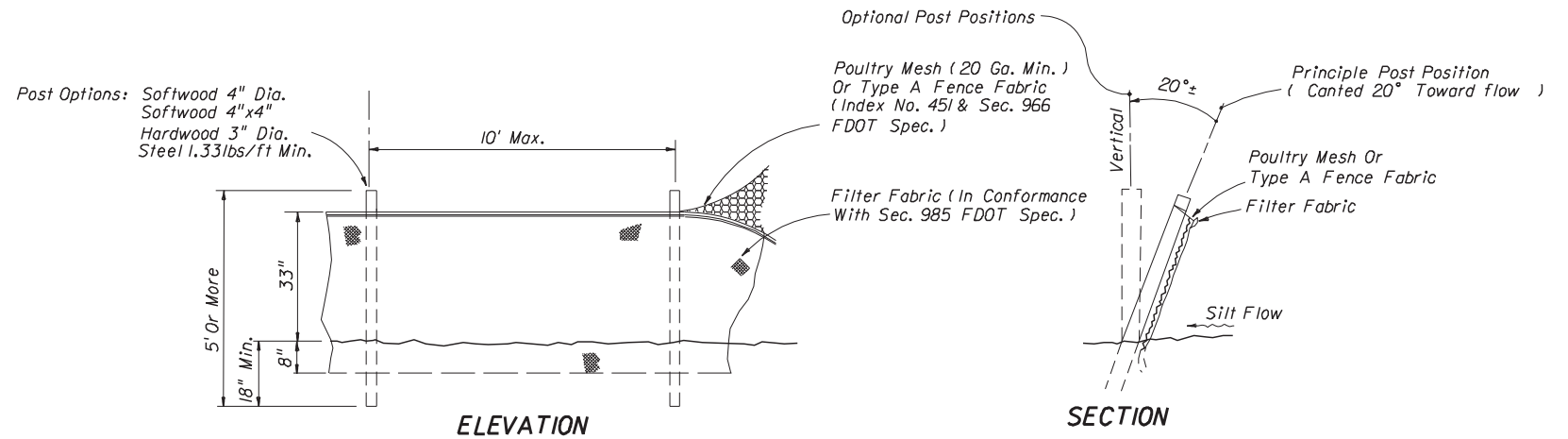
X 3/4"



ELEVATION

SECTION

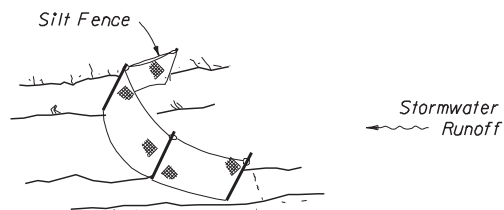
TYPE III SILT FENCE



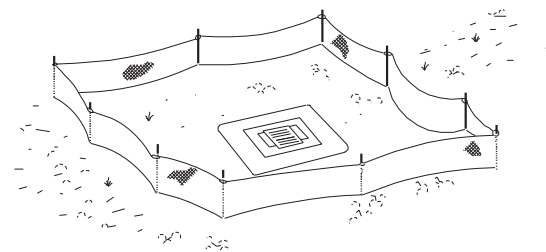
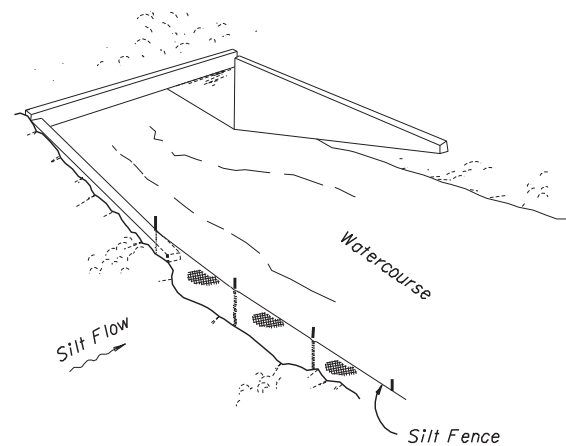
ELEVATION

SECTION

TYPE IV SILT FENCE



Silt Fence Protection in Ditches with Intermittent Flow



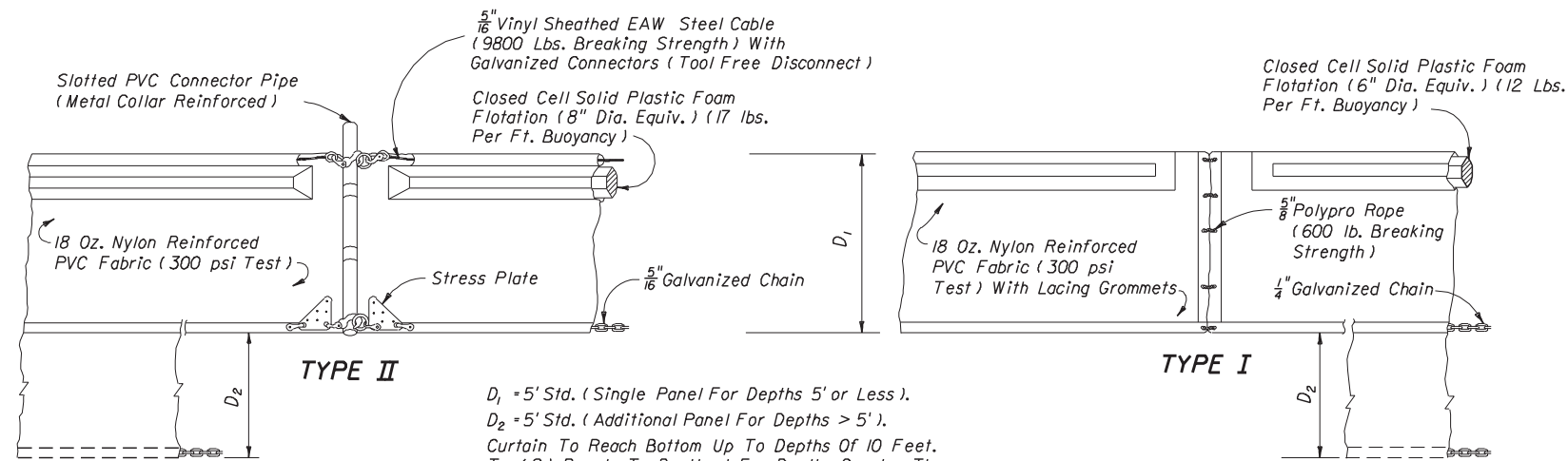
Silt Fence Protection Around Ditch Bottom Inlets.

SILT FENCE APPLICATIONS

NOTES FOR SILT FENCES

1. Type III Silt Fence to be used at most locations. Where used in ditches, the spacing for Type III Silt fence shall be in accordance with Chart I, Sheet I.
2. Type IV Silt Fence to be used where large sediment loads are anticipated. Suggested use is where fill slope is 1:2 or steeper and length of slope exceeds 25 feet. Avoid use where the detained water may back into travel lanes or off the right of way.
3. Do not construct silt fences across permanent flowing watercourses. Silt fences are to be at upland locations and turbidity barriers used at permanent bodies of water.
4. Where used as slope protection, Silt Fence is to be constructed on 0% longitudinal grade to avoid channelizing runoff along the length of the fence.
5. Silt Fence to be paid for under the contract unit price for Staked Silt Fence, (LF).

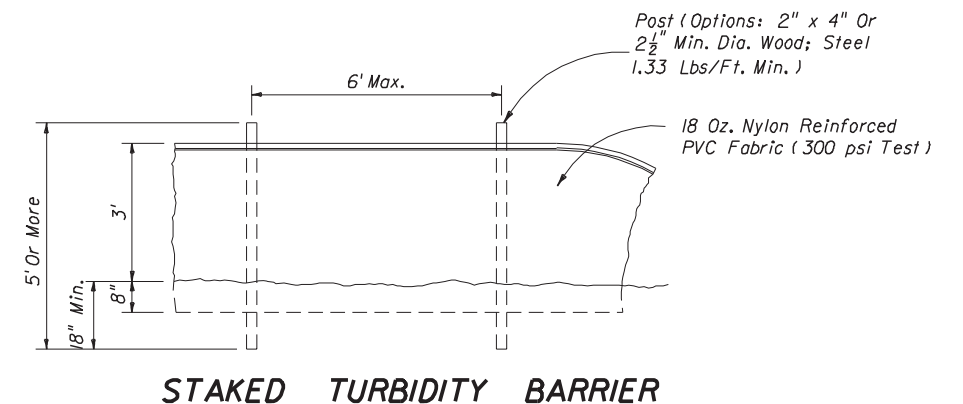
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
ROCK BAG, BALED HAY, BALED STRAW AND SILT FENCE BARRIERS				
Names	Dates	Approved By		
Designed By	RAA/CJA	09/85	<i>S. A. McHenry</i> State Drainage Engineer	
Drawn By	LRE	09/85	Revision	Sheet No.
Checked By	RAA	10/85	00	3 of 3
				102



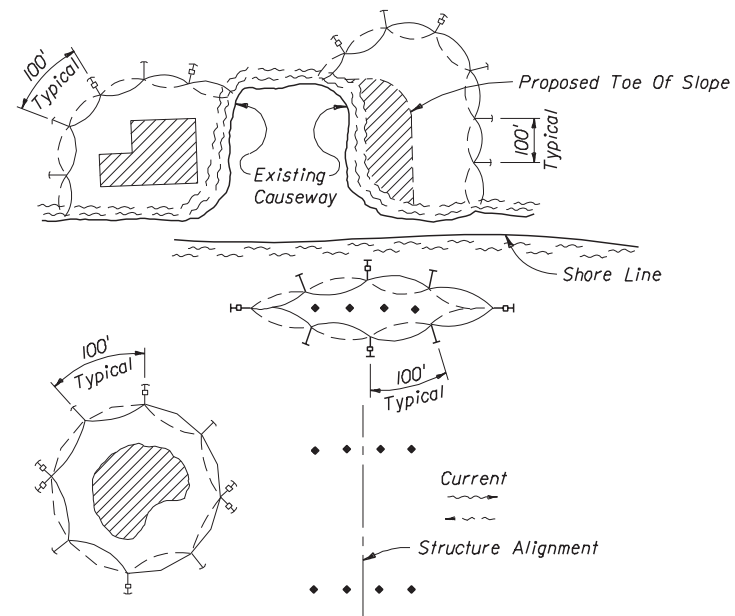
D_1 = 5' Std. (Single Panel For Depths 5' or Less).
 D_2 = 5' Std. (Additional Panel For Depths > 5').
 Curtain To Reach Bottom Up To Depths Of 10 Feet.
 Two (2) Panels To Be Used For Depths Greater Than 10 Feet Unless Special Depth Curtains Specifically Called For In The Plans Or As Determined By The Engineer.

NOTICE: COMPONENTS OF TYPES I AND II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.

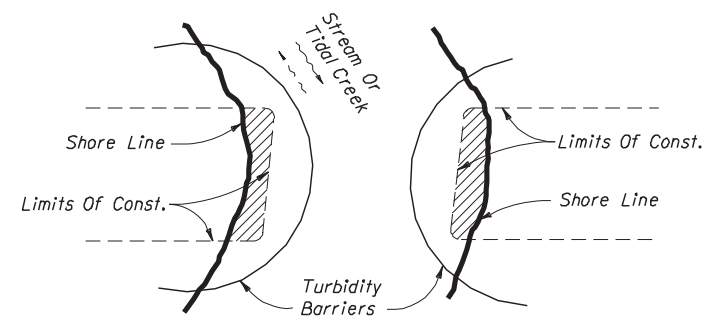
FLOATING TURBIDITY BARRIERS



STAKED TURBIDITY BARRIER



- LEGEND**
- Pile Locations
 - ▨ Dredge Or Fill Area
 - Mooring Buoy w/Anchor
 - Anchor
 - Barrier Movement Due To Current Action



Note:
 Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the pay item(s) established in the plans for Floating Turbidity Barrier and/or Staked Turbidity Barrier. Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

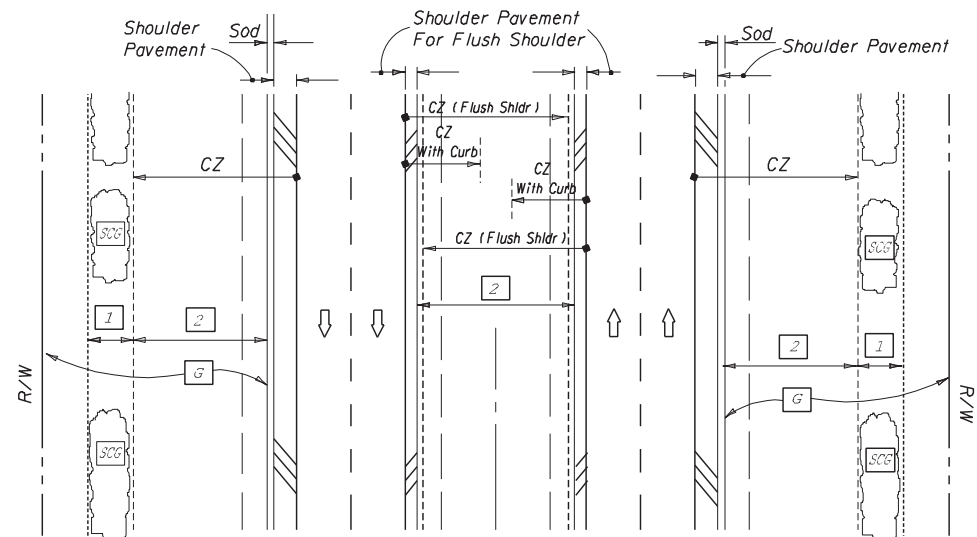
- NOTES:**
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
 2. Number and spacing of anchors dependent on current velocities.
 3. Deployment of barrier around pile locations may vary to accommodate construction operations.
 4. Navigation may require segmenting barrier during construction operations.
 5. For additional information see Section 104 of the Standard Specifications.

GENERAL NOTES

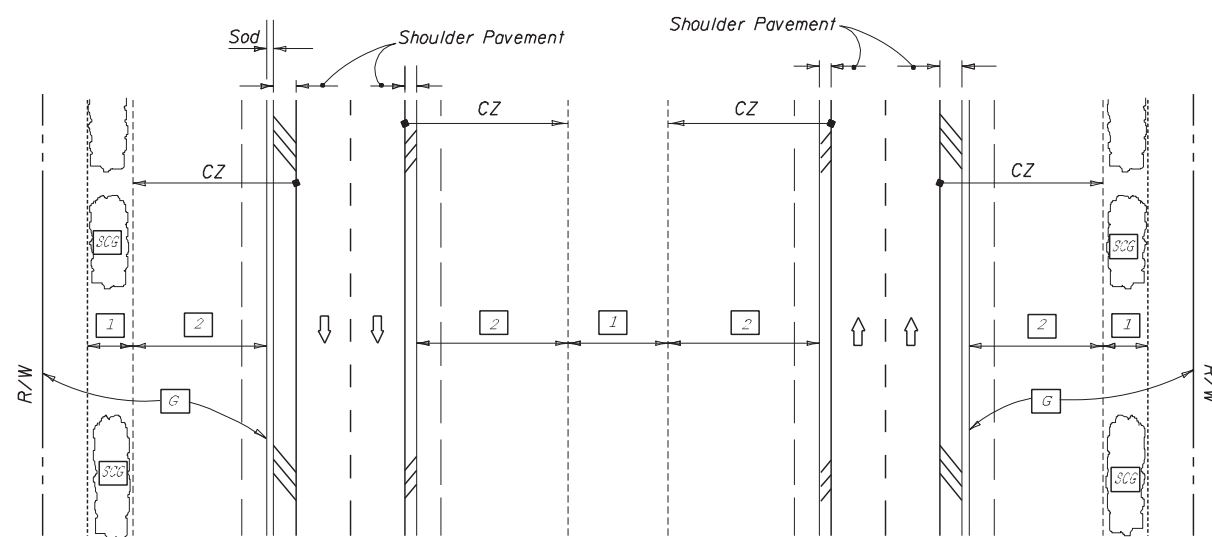
1. Floating turbidity barriers are to be paid for under the contract unit price for Floating Turbidity Barrier, LF.
2. Staked turbidity barriers are to be paid for under the contract unit price for Staked Turbidity Barrier, LF.

TURBIDITY BARRIER APPLICATIONS

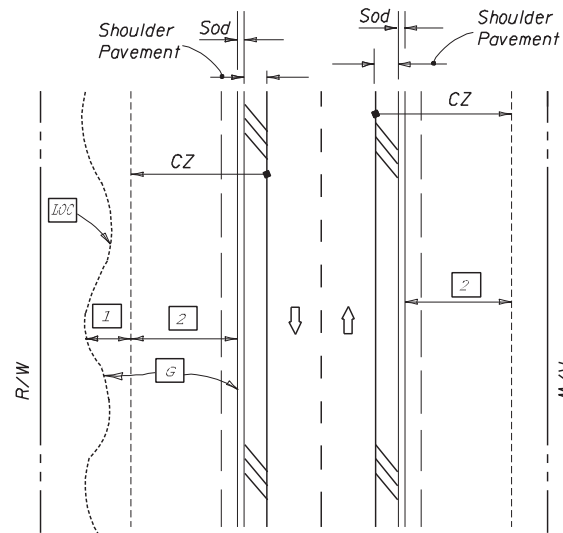
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TURBIDITY BARRIERS				
Names	Dates	Approved By		
Designed By RAA/CJA	9/85	S. A. McHenry State Drainage Engineer		
Drawn By LRE	9/85	Revision	Sheet No.	Index No.
Checked By RAA	10/85	00	1 of 1	103



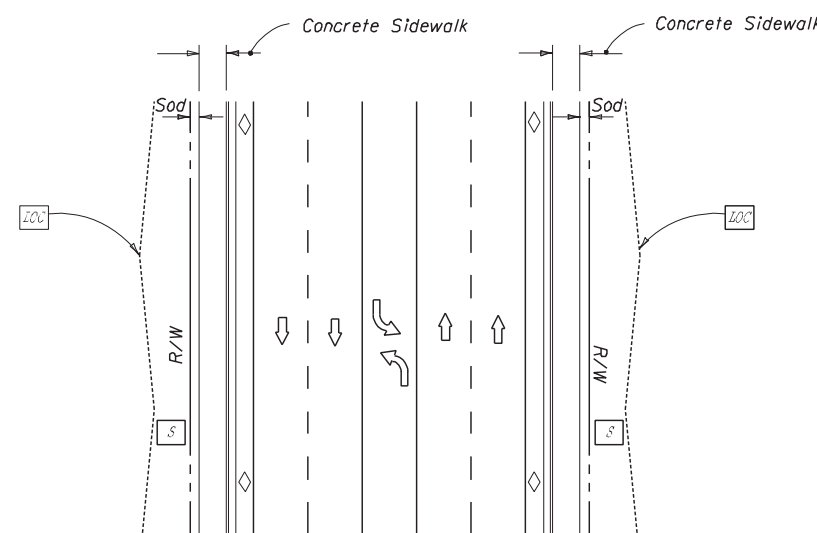
DIVIDED NARROW MEDIAN WITH OR WITHOUT CURBED MEDIAN



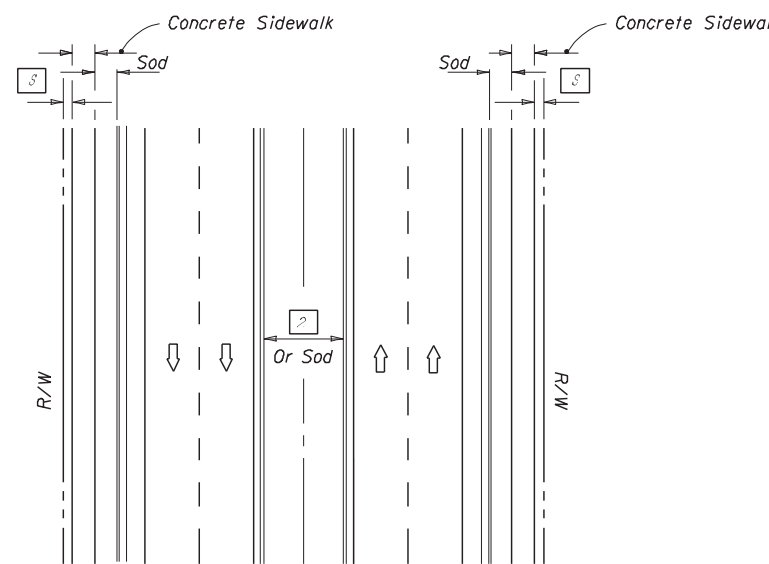
DIVIDED WIDE MEDIAN WITH OR WITHOUT CURBED MEDIAN



UNDIVIDED FLUSH SHOULDER



UNDIVIDED CURBED



DIVIDED CURBED

LEGEND

- 1 Wildflower Group #1
- 2 Wildflower Group #2
- G Grass-Seed/Seed & Mulch (To Limit of Construction)
- SCG Selective Clearing And Grubbing
- L0C Limits Of Construction
- 3 Seed, Seed And Mulch, Sod Or Seed, Sod

WILDFLOWERS SEEDING RATE	
Common Name (Botanical Name)	lbs/ac
#1 Group	
Black-Eyed Susan (<i>Rudbeckia hirta</i>)	2
Tickseed (<i>Coreopsis tinctoria</i>)	
Lance-Leaf Tickseed (<i>Coreopsis lanceolata</i>)	10
Indian Blanket (<i>Gaillardia pulchella</i>)	10
#2 Group	
Annual Phlox (<i>Phlox drummondii</i>)	10
Moss Verbena (<i>Berberis tenuisecta</i>)	6

SEEDING RATES (Lbs/Ac) FOR NEW SHOULDERS AND SLOPES*

TYPE OF SEED	ZONE I				ZONE II			
	COASTAL		INLAND		COASTAL		INLAND	
	Mar. To Nov.	Nov. To Mar.	Mar. To Oct.	Oct. To Mar.	Feb. To Dec.	Dec. To Feb.	Feb. To Dec.	Dec. To Feb.
PERMANENT GRASSES								
Unhulled Bermuda	20	20	20	20	20	20	20	20
Bahia Argentina Or Pensacola Bahia			80	80			80	80
QUICK GROWING GRASS								
Annual Rye		20		20		20		20
TOTAL Lbs/ PER ACRE	20	40	100	120	20	40	100	120

Note: The seeding rates shown in this table apply only when seed is spread by an approved mechanical spreader meeting the requirements of Section 570 and 577 of the Standard Specifications.

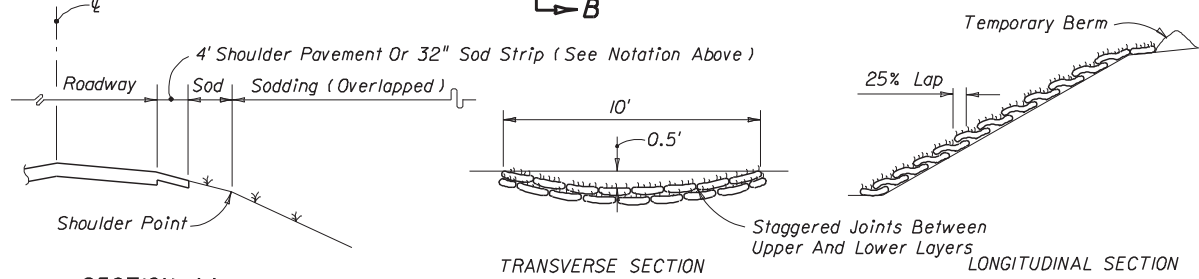
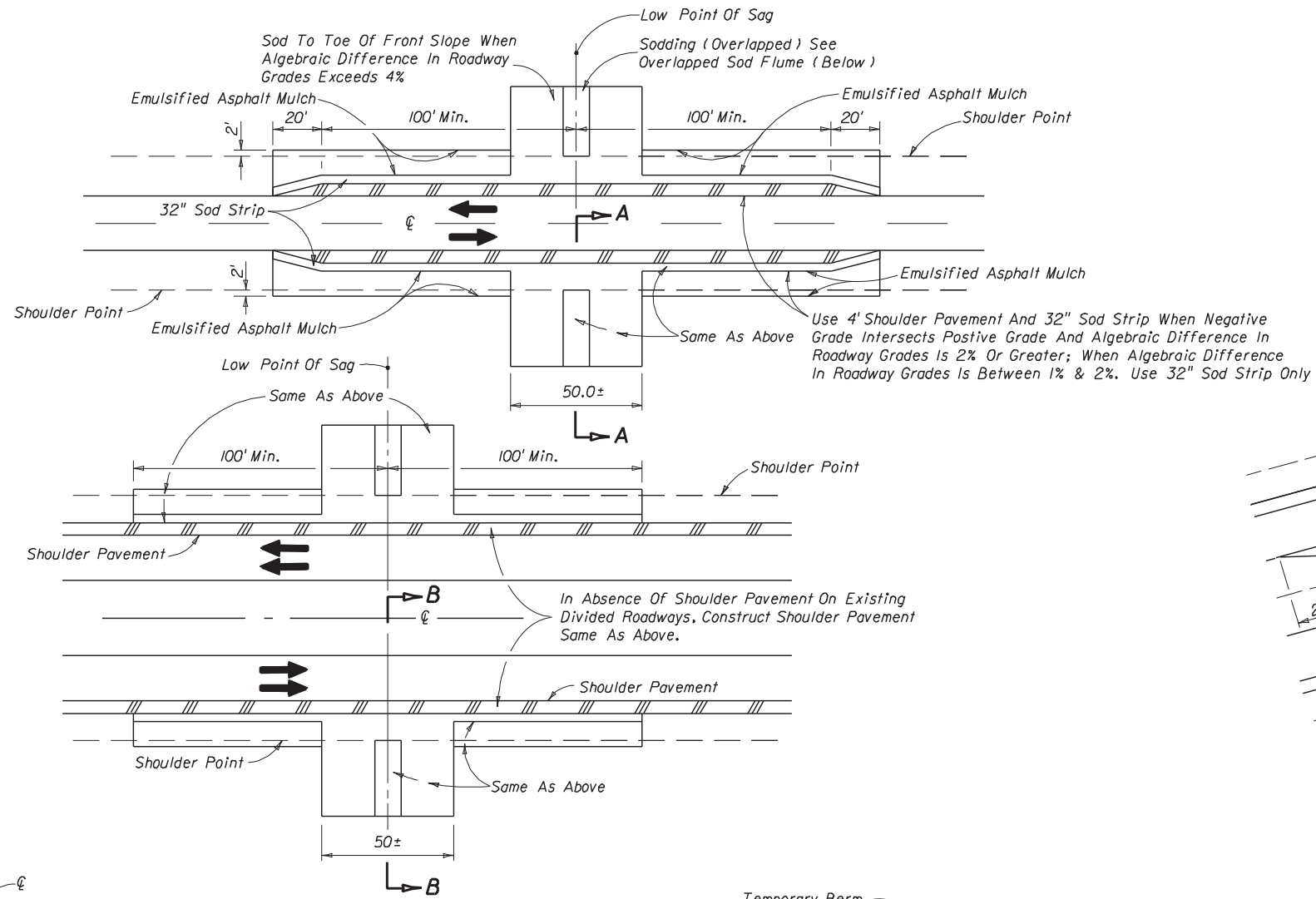
*See Index No. 105 for zone boundaries and seeding rates for shoulder reworking.

SEEDING FOR PERMANENT GRASSING AND WILDFLOWERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

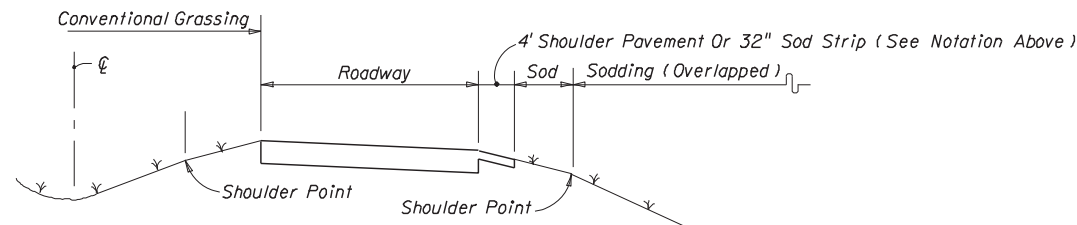
EROSION CONTROL

Names	Dates	Approved By	
Designed By	STE 01/00	 State Drainage Engineer	
Drawn By	HSD 01/00		
Checked By	GLE 01/00		
Revision	00	Sheet No.	Index No.
		1 of 2	104



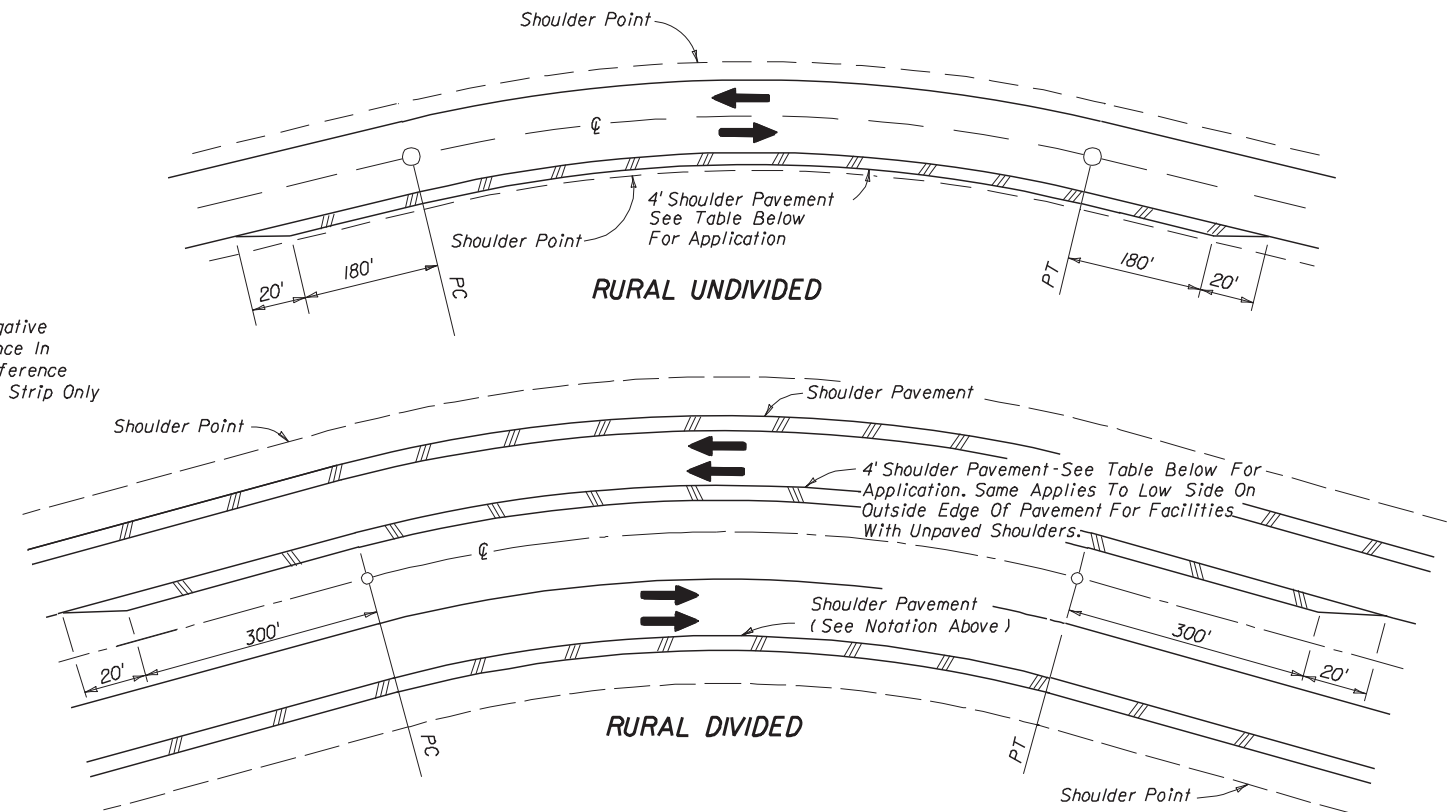
SECTION AA
(Symmetrical About C)

OVERLAPPED SOD FLUME



SECTION BB
(Symmetrical About C)

SHOULDER AND SLOPE TREATMENT IN SAG VERTICAL CURVES



CRITERIA FOR PAVING SHOULDER ON DIVIDED AND UNDIVIDED FACILITIES		
Design Speed (Lbs/Ac)	Radius Of Curve	Notes:
30	7° Or Greater	(1) Shoulder Pavement is required on all curves meeting the criteria tabulated. For curves not meeting the criteria, shoulders are to be paved where erosion of the shoulder is evident or anticipated. (2) If outside shoulder is paved as designated bike lane, the paved width within curves shall match the bike lane width.
40	5° Or Greater	
50	4° Or Greater	
60	3° Or Greater	
65	3° Or Greater	
70	2° Or Greater	

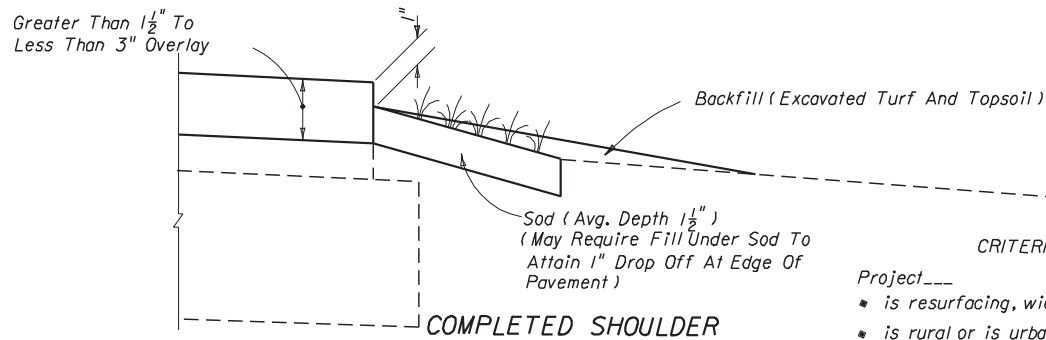
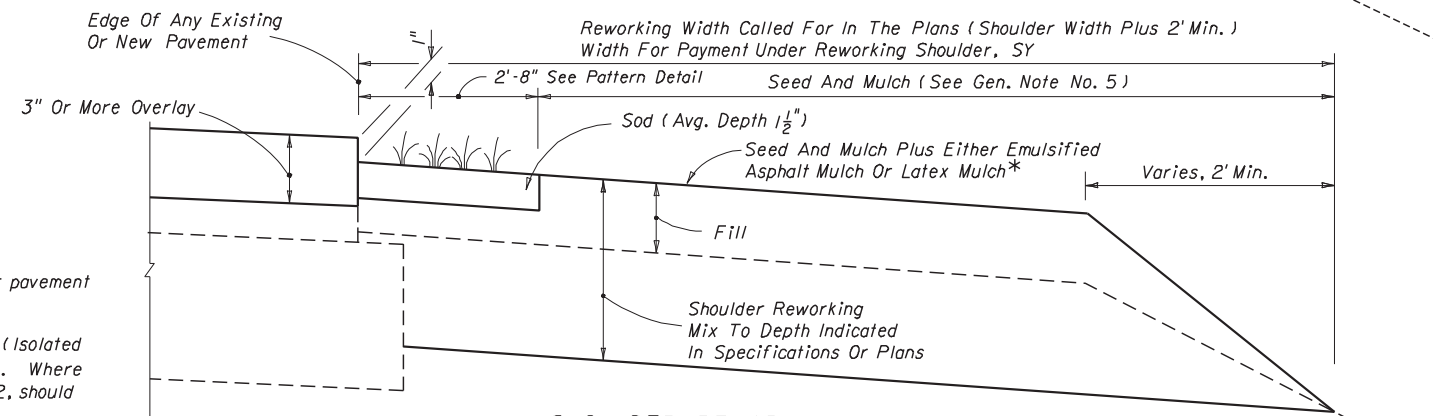
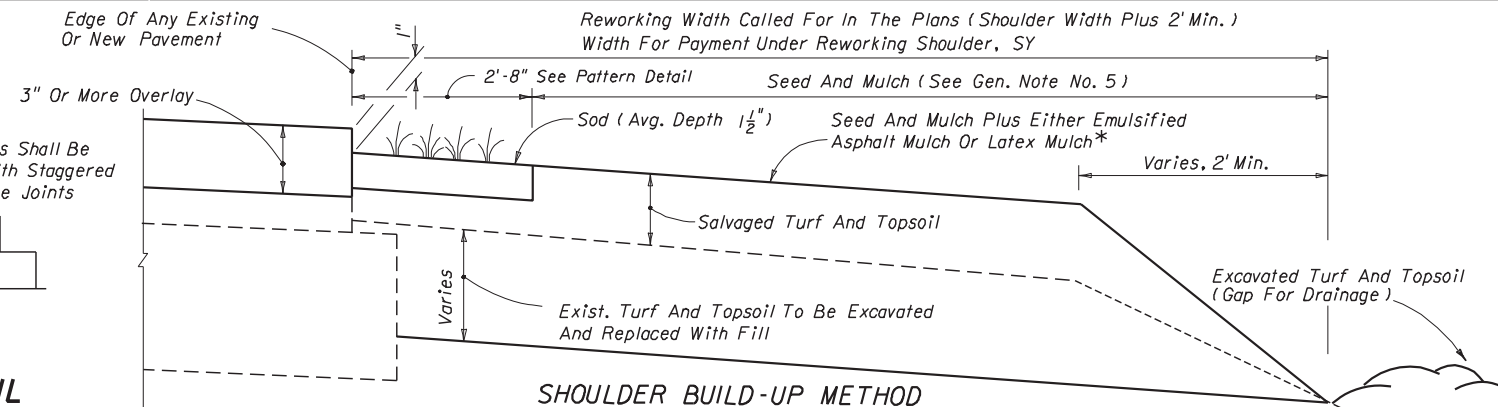
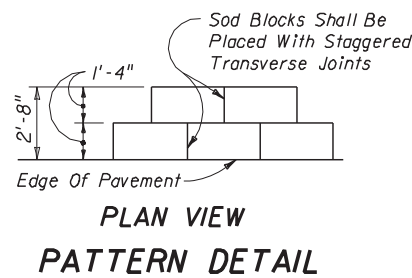
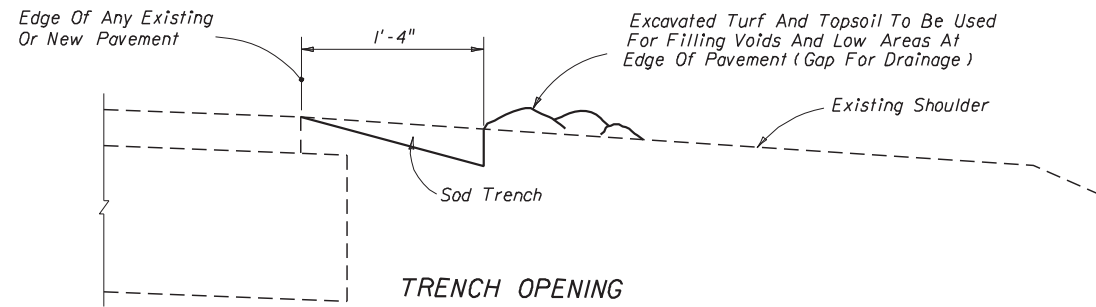
SHOULDER AND SLOPE TREATMENT FOR SUPERELEVATED ROADWAYS

NOTES

1. These treatments are applicable to new construction, reconstruction and RRR projects. Project requirements for shoulder pavement and sodding that exceed the limits of this standard take precedence.
2. For sodding adjacent to ditches and at headwalls, see Index No. 281.
3. All front slopes steeper than 1:3 are to be sodded.

TREATMENTS FOR PROTECTION FROM CONCENTRATED ROADWAY RUNOFF EROSION AND SHOULDER RAVELING

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
EROSION CONTROL				
Names	Dates	Approved By		
Designed By	HLG	04/75	S. A. McHenry State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By	DCB	04/75	00	2 of 2
				104



CRITERIA FOR USING TREATMENT TYPE R-1

- Project---
- is resurfacing, widening and resurfacing or construction of shoulder pavement
 - is rural or is urban without curb and gutter
 - has good existing soil and turf with no significant shoulder erosion (isolated areas of significant erosion will require additional special treatment. Where poor soil and/or turf conditions exist shoulder reworking, Type R-2, should be applied.)
 - resurfacing build-up is greater than 1 1/2" to less than 3"

CRITERIA FOR USING TREATMENT TYPE R-2

- Project---
- is resurfacing or construction of shoulder pavement
 - is rural or is urban without curb and gutter
 - has good existing soil and turf
 - resurfacing build-up is 3" or more

*Emulsified Asphalt Mulch Or Latex Mulch May Be Deleted For Low Volume Roadways (ADT Less Than 1600) Or Where Shoulder Pavement Is Constructed.

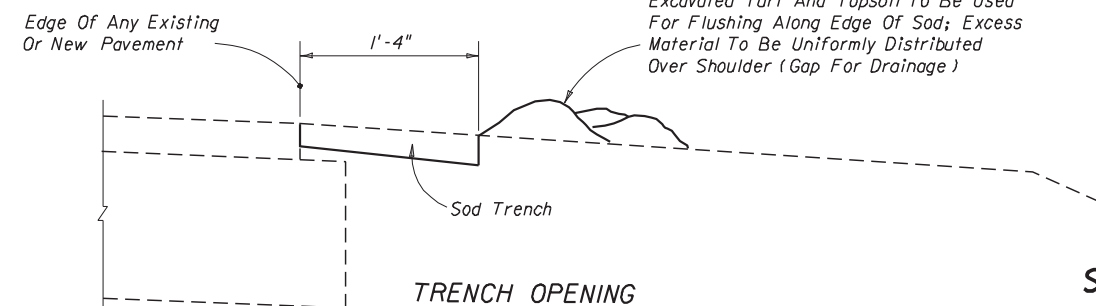
A SIMILAR TREATMENT MAY BE USED FOR PROJECTS THAT REQUIRE SHOULDER WIDENING. DETAILS ARE TO BE SHOWN IN THE PLANS.

TYPE R-1

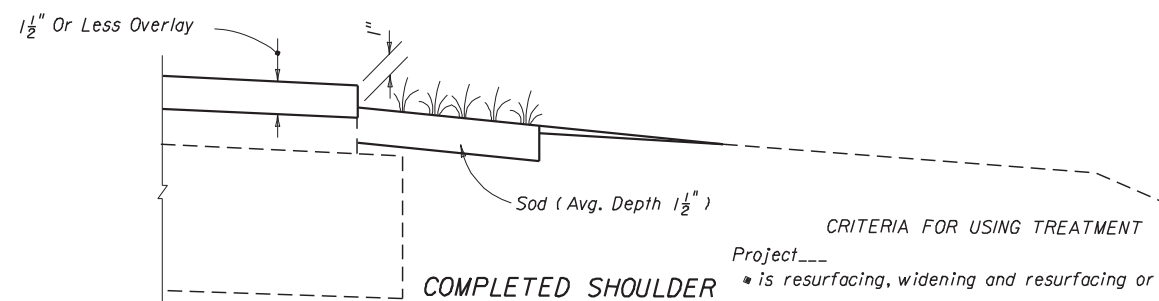
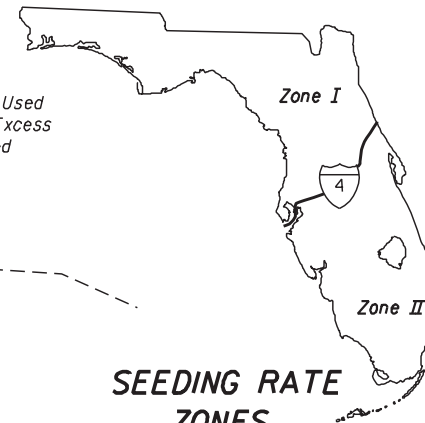
TYPE R-2

GENERAL NOTES

1. Special attention is to be directed to the construction of the required 1" drop-off at edge of pavement.
2. Fertilize entire unpaved shoulder and front slope to toe of slope or bottom of ditch.
3. Topsoil obtained from borrow pits or other sources may be used in lieu of excavated turf and topsoil when economically feasible. No additional payment will be made for substituting topsoil for excavated turf or topsoil.
4. Payment for excavation of turf and topsoil and for backfill of this material under Types R-1 and R-3, is to be included in the contract unit price for Sodding, SY.
5. Payment for reworking shoulders, shall include the cost for those seeding and mulching operations within the limits for reworking shoulders. Materials (Seed, Mulch, Fertilizer and Water) and Sodding shall be paid for as separate items. Reworking shoulders shall be paid for under the contract unit price for Reworking Shoulders, SY.



SEEDING RATE ZONES



CRITERIA FOR USING TREATMENT TYPE R-3

- Project---
- is resurfacing, widening and resurfacing or construction of shldr. pavt.
 - is rural or is urban without curb and gutter
 - has good existing soil and turf with no significant shoulder erosion (isolated areas of significant erosion will require additional special treatment. Where poor soil and/or turf conditions exist shoulder reworking, Type R-2, should be applied.)
 - resurfacing build-up is 1 1/2" or less

TYPE R-3

SEEDING RATES (Lbs/Ac)

TYPE OF SEED	ZONE I				ZONE II			
	COASTAL		INLAND		COASTAL		INLAND	
	Mar. to Nov.	Nov. to Mar.	Mar. to Oct.	Oct. to Mar.	Feb. to Dec.	Dec. to Feb.	Feb. to Dec.	Dec. to Feb.
PERMANENT GRASSES								
Unhulled Bermuda	20	20	20	20	20	20	20	20
Bahia Argentina Or Pensacola Bahia			80	80			80	80
QUICK GROWING GRASS								
Annual Rye Grass		20		20		20		20
TOTAL POUNDS PER ACRE	20	40	100	120	20	40	100	120

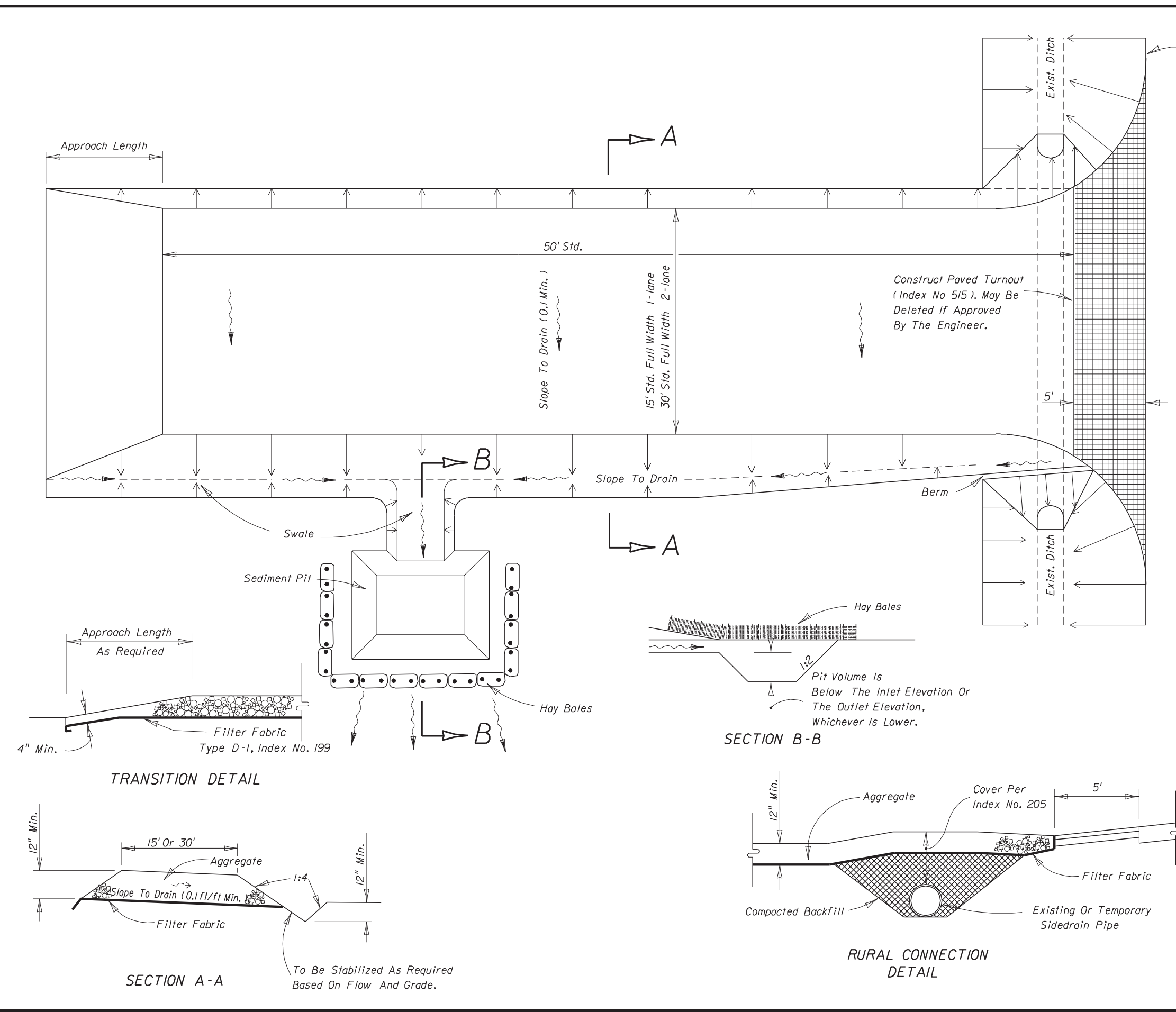
Note: The seeding rates shown in this table apply only when seed is spread by an approved mechanical spreader meeting the requirements of Section 570 and 577 of the Standard Specifications.

Wildflowers destroyed by shoulder reworking are to be reestablished under the seeding rates prescribed for permanent wildflower #2 Group shown by table on Index No. 104.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SHOULDER SODDING AND REWORKING ON EXISTING FACILITIES

Names	Dates	Approved By			
Designed By	EGR 09/07/84	A. A. McHenry State Drainage Engineer	Revision	Sheet No.	Index No.
Drawn By	HSD 09/07/84		00	1 of 1	105
Checked By	EGR 09/07/84				

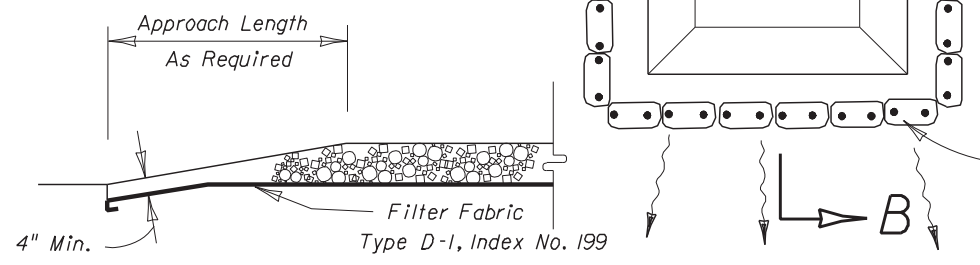


Existing Roadway
Edge Of Pavement

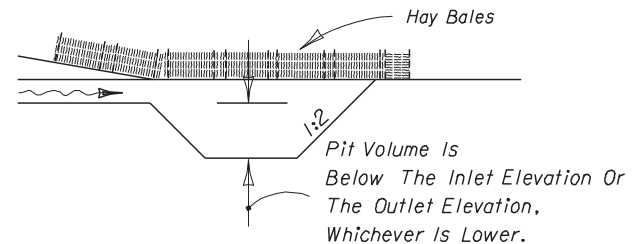
GENERAL NOTES

1. A Soil Tracking Prevention Device (STPD) shall be constructed at locations designated by the engineer for points of egress from unstabilized areas of the project to public roads where offsite tracking of mud could occur. Traffic from unstabilized areas of the construction project shall be directed thru a STPD. Barriers, flagging, or other positive means shall be used as required to limit and direct vehicular egress across the STPD.
2. The Contractor may propose an alternative technique to minimize offsite tracking of sediment. The alternative must be reviewed and approved by the Engineer prior to its use.
3. All materials spilled, dropped, or tracked onto public roads (including the STPD aggregate and construction mud) shall be removed daily, or more frequently if so directed by the Engineer.
4. Aggregates shall be as described in Section 901 excluding 901-2.3. Aggregates shall be FDOT size #1. If this size is not available, the next available smaller size aggregate may be substituted with the approval of the Engineer. Sizes containing excessive small aggregate will track off the project and are unsuitable.
5. The sediment pit should provide a retention volume of 3600 cubic feet/acre of surface area draining to the pit. When the STPD is isolated from other drainage areas, the following pit volumes will satisfy this requirement:
 $15' \times 50' = 100 \text{ ft}^3$ $30' \times 50' = 200 \text{ ft}^3$
 As an option to the sediment pit, the width of the swale bottom can be increased to obtain the volume. When the sediment pit or swale volume has been reduced to one half, it shall be cleaned. When a swale is used, hay bales or silt fence shall be placed along the entire length.
6. The swale ditch draining the STPD shall have a 0.2% minimum and a 1.0% maximum grade along the STPD and to the sediment pit.
7. Mitered end sections are not required when the sidedrain pipe satisfies the clear zone requirements.
8. The STPD shall be maintained in a condition that will allow it to perform its function. To prevent offsite tracking, the STPD shall be rinsed (daily when in use) to move accumulated mud downward thru the stone. Additional stabilization of the vehicular route leading to the STPD may be required to limit the mud tracked.
9. A STPD shall be paid for under the contract unit price for Soil Tracking Prevention Device, EA. The unit price shall constitute full compensation for construction, maintenance, replacement of materials, removal, and restoration of the area utilized for the STPD; including but not limited to excavation, grading, temporary pipe (including MES when required), filter fabric, aggregate, paved turnout (including asphalt and base construction), ditch stabilization, approach route stabilization, sediment removal and disposal, water, rinsing and cleaning of the STPD and cleaning of public roads, grassing and sod. Hay bales shall be paid for under the contract unit price for Hay or Straw Baled, EA. Silt fence shall be paid for under the contract unit price for Staked Silt Fence, LF.
10. The nominal size of a standard STPD is 15' x 50' unless otherwise shown in the plans. If the volume of entering and exiting vehicles warrant, a 30' width STPD may be used if approved by the Engineer. When a double width (30') STPD is used, the pay quantity shall be 2 for each location.

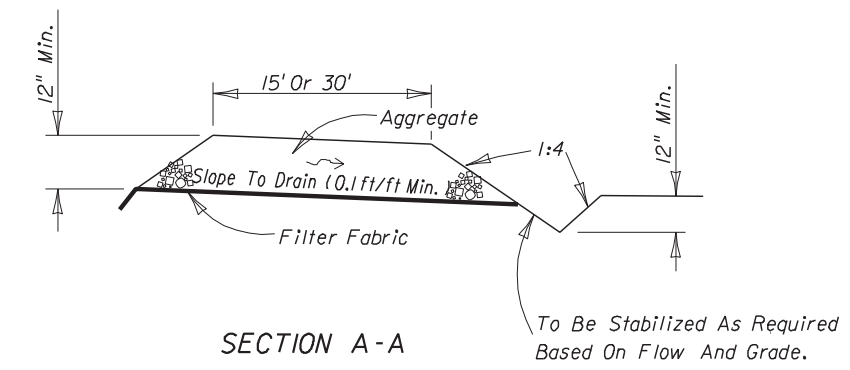
TRANSITION DETAIL



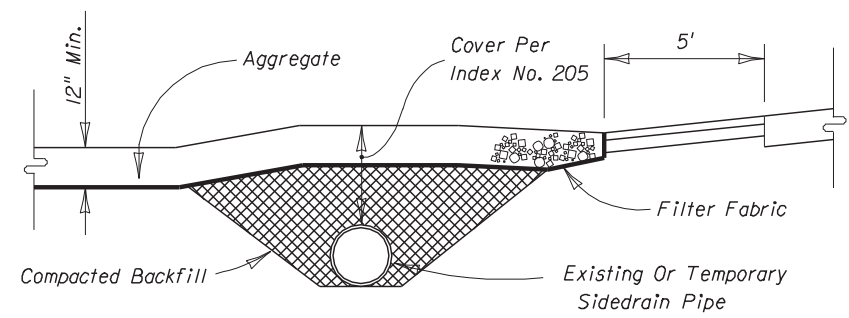
SECTION B-B



SECTION A-A



RURAL CONNECTION DETAIL



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SOIL TRACKING PREVENTION DEVICE TYPE A				
Designed By	COMM	Dates	11/94	Approved By
Drawn By	JDT	1/96		<i>S. A. McHenry</i> State Drainage Engineer
Checked By	CRH	1/96	00	Revision
			1 of 1	Sheet No.
				Index No.
				106

STANDARD CRITERIA

CLASS	TYPE (1)	APPLICATION DESCRIPTION	STANDARD INDEX NO.	PERMITTIVITY SEC ⁻¹	A. O. S. SIEVE #	GRAB TENSILE STRENGTH N	SEWN STRENGTH N	PUNCTURE N	TRAPEZOIDAL TEAR N	WIDE WIDTH TENSILE STRENGTH KN/M	U V RESISTANCE (Min. Allowed)		COMMENTS	
											%	Time (Hrs.)		
DRAINAGE (D)	D-1	Revetment (Special)		(See D-2)	(See D-2)	1400	1260	500	500		50	500	Woven Monofilament Geotextiles only (Elongation < 50%) Provide 6" thick aggregate bedding layer.	
	D-2	Revetment (Standard)		% SOIL PASSING No. 200 SIEVE	% SOIL PASSING No. 200 SIEVE	Woven Monofilament	Woven Monofilament	Woven Monofilament	Woven Monofilament					Woven Geotextiles only. No Slit Film Geotextiles allowed. Provide 150 mm thick aggregate bedding layer for revetment (standard). The bedding layer may be omitted if a D-1 fabric is used with revetment (standard). * For cohesive soils with a plasticity index > 7, maximum average role value for AOS is number 50 sieve.
		Articulating Block		< 15% 0.7	< 15% 40	1100	990	400	250					
		Gabions		15% to 50% 0.2	15% to 50% 60	Other Geotextiles: Elongation < 50% 1400 > 50% 900	Other Geotextiles: Elongation < 50% 1200 > 50% 810	Other Geotextiles: Elongation < 50% 500 > 50% 350	Other Geotextiles: Elongation < 50% 500 > 50% 350					
	D-3	Underdrain * * *	286	% SOIL PASSING No. 2000 SIEVE	% SOIL PASSING No. 2000 SIEVE	Elongation	Elongation	Elongation	Elongation					No woven slit film fabrics allowed. * For cohesive soils with a plasticity index > 7, maximum average role value for AOS is number 50 sieve. ** Required Trapezoidal tear for woven monofilament is 250. *** See Index No. 286 for the permittivity and AOS values of the internal filter fabric of type V underdrain.
		French Drain	285	< 15% 0.5	< 15% 40	< 50% 1100	< 50% 990	< 50% 400	< 50% 400 **					
		Sheet Piling Filter		15% to 50% 0.2	15% to 50% 60	> 50% 700	> 50% 630	> 50% 250	> 50% 250					
		Filter Fabric Jacket (Culvert)	280	> 50% 0.1	> 50% 70 *									
	D-4	Slope Pavement (Sand-Cement)					800	720	220	155		50	500	Nonwoven only. Min. Thickness 90 Mils Elongation ≥ 50%
		Ditch Pavement (Sand-Cement)	281		0.5	40								
	D-5	Mechanical Stabilized Retaining Wall					400	360	220	175		50	500	
		Cast-In-Place Retaining Wall			0.5	40								
D-6	Slope Pavement (Concrete)					800	720	220	155		50	500	Nonwoven only. Min. Thickness 120 Mils Elongation ≥ 50%	
	Ditch Pavement (Concrete)	281		0.5	40									
EROSION (E)	E-1	Staked Silt Fence	102	0.5	NA	400	360	NA	155		80	500	Minimum Filtration Efficiency of 75% and minimum flow rate of 0.3 gal.	
	E-2	Wind Screen		0.5	NA	400	360	NA	NA		80	150		
	E-3	Plastic Erosion Mat (Turf Reinforcement Mat) (Type 1)	NA	NA	NA	NA	NA	NA	NA	15 x 11	80	2,000	Maximum Permissible design velocity 3.0 M/Sec	
	E-4	Plastic Erosion Mat (Turf Reinforcement Mat) (Type 2)	NA	NA	NA	NA	NA	NA	NA	29 x 21	80	2,000	Maximum Permissible design velocity 4.3 M/Sec	
	E-5	Plastic Erosion Mat (Turf Reinforcement Mat) (Type 3)	NA	NA	NA	NA	NA	NA	NA	44 x 32	80	2,000	Maximum Permissible design velocity 5.5 M/Sec	
STABILIZATION (R)	R-1	Reinforcement		0.05	30	880	800	400	400		80	150		
	R-2	Separation		0.05	30	800	720	355	220		—	—		

(1) Type refers to FDOT class and application.

GENERAL NOTES

- Specifications for geotextiles are in Section 985. Physical criteria for each application is provided by this standard, in conjunction with those sections.
- All values except AOS are MINIMUM AVERAGE ROLL values in the weakest principal direction. Values for AOS are MAXIMUM AVERAGE ROLL values.
- Test soil or fill material adjacent to the geotextile for gradation to select values for permittivity and AOS.
- Unless specifically restricted in COMMENTS column, any type of material may be used.

DESIGN NOTES

- The Designer shall review this criteria and adjust the values as necessary to satisfy project requirements. These adjustments shall be called for in the plans or contained in the project special provisions.
- U V Resistance: The value represents the percent of minimum textile strength retained (ASTM-D-4632) after weathering per ASTM-D-4355 for the test period (hours).
- Maximum design velocity for plastic erosion mats shall be determined by tests performed by Utah State University, Texas Transportation Institute or an independent testing laboratory approved by the State Drainage Engineer.

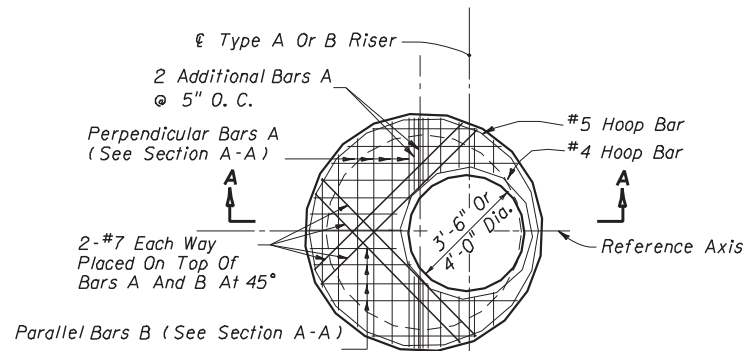
TABLE 1

Test	Unit	Test Method
Permittivity	sec ⁻¹	ASTM-D-4491
AOS	mm	ASTM-D-4751
Elongation	%	ASTM-D-4632
Grab Tensile Strength	N	ASTM-D-4632
Wide With Tensile Strength	KN/M	ASTM-D-4595
Maximum Design Velocity	M/sec	See Design Note 3
Sewn Strength	N	ASTM-D-4884
Puncture	N	ASTM-D-4833
Trapezoidal Tear	N	ASTM-D-4533
Ultra Violet Resistance	% Retained In Strength	ASTM-D-4355
Filtration Efficiency	%	ASTM-D-5141
Flow Rate	L ³ /min.	ASTM-D-5141

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

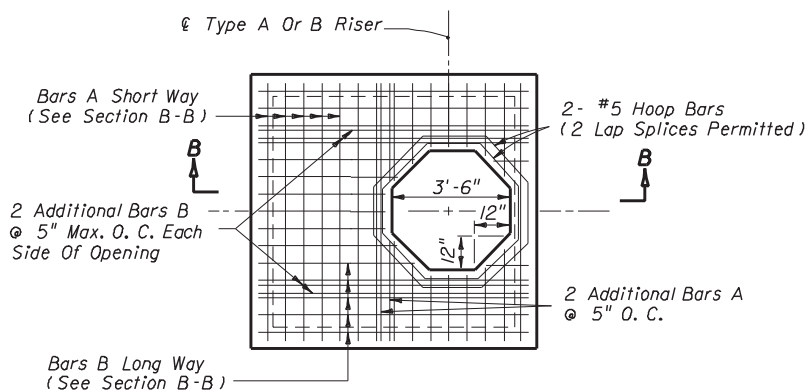
GEOTEXTILE CRITERIA

Names	Dates	Approved By		
Designed By	COMM 8/91	<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	DLG 8/91	Revision	Sheet No.	Index No.
Checked By	KHH 8/91	00	1 of 1	199

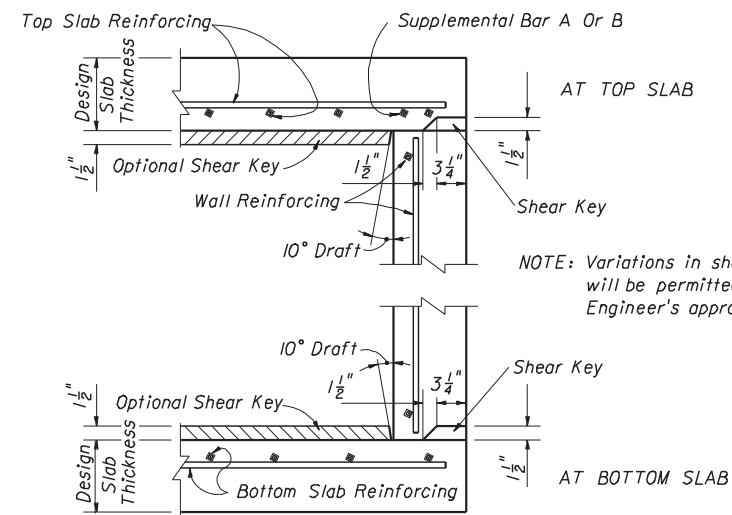


Note: Not Applicable For Type C, D & E
Ditch Bottom Inlets. See Index No. 232.

TOP SLAB REINFORCING STEEL DIAGRAM

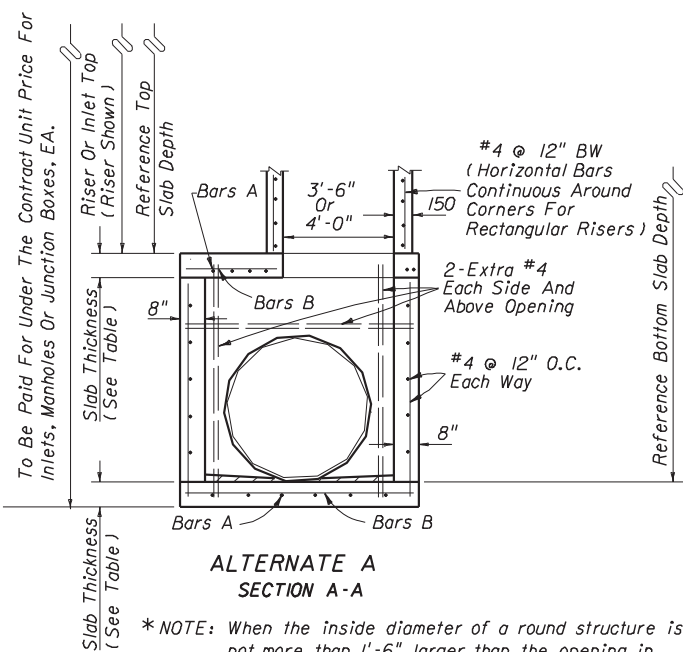


TOP SLAB REINFORCING STEEL DIAGRAM



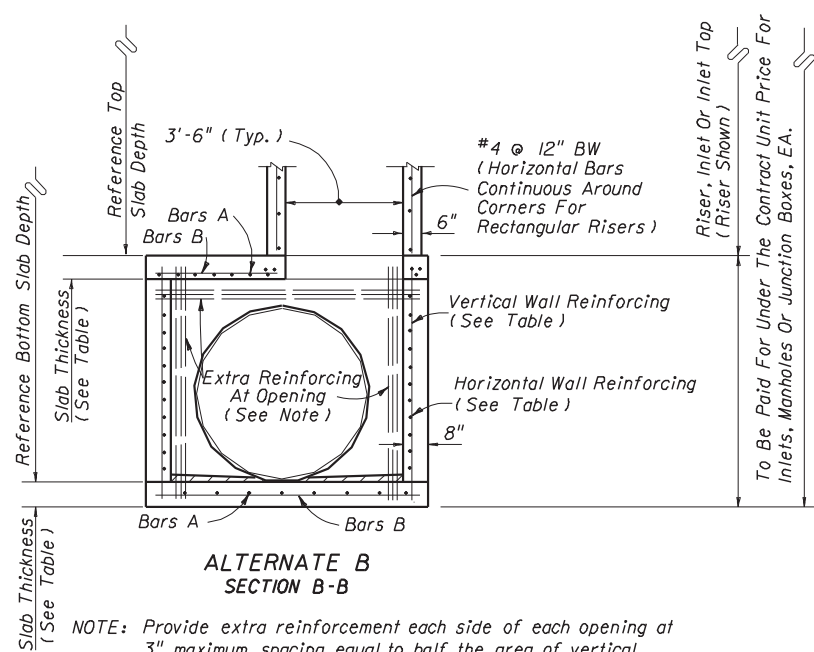
NOTE: Variations in shear key dimensions will be permitted subject to the Engineer's approval.

SLAB TO WALL DETAILS FOR PRECAST ALTERNATE WITH 8" WALLS



ALTERNATE A SECTION A-A

*NOTE: When the inside diameter of a round structure is not more than 1'-6" larger than the opening in the riser or top slab, the top of the structure or riser shall be constructed according to the "Special Top Slab" details on this sheet.

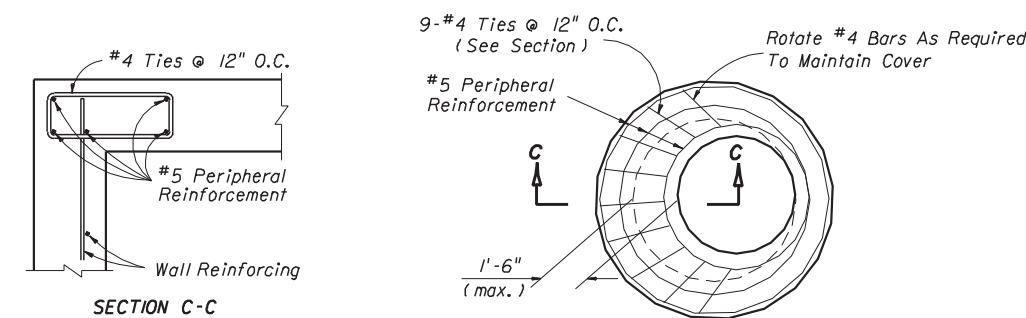


ALTERNATE B SECTION B-B

NOTE: Provide extra reinforcement each side of each opening at 3" maximum spacing equal to half the area of vertical reinforcement removed by the opening and provide the same area of reinforcement above each opening at 3" maximum spacing as removed by the opening.

GENERAL NOTES

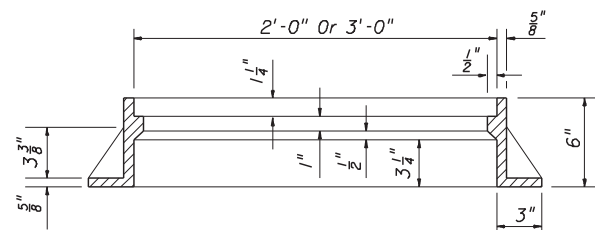
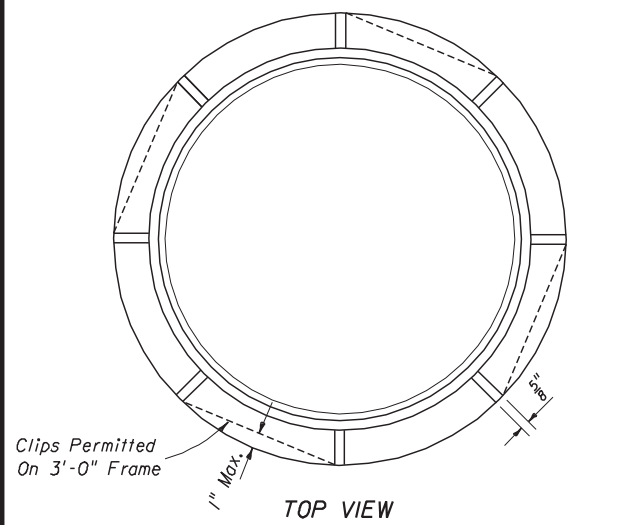
- Standard structure bottoms 4'-0" diameter and smaller (Alt. A) and 3'-6" square (Alt. B) are designated Type P. Larger standard structure bottoms are designated Type J. Risers are permitted for all structures.
- Walls of circular structures (Alternate A) constructed in place may be of non-reinforced concrete or brick or reinforced concrete. Precast and rectangular structures (Alternate B) shall be constructed of reinforced concrete only.
- Wall thickness and reinforcement are for either reinforced cast-in-place or precast concrete units except that precast circular units may be furnished with walls in accordance with either A.S.T.M. C478 (up to 96" diameter) or A.S.T.M. C76, Class III, B Wall, modified where the elliptical steel cage area is placed in the center one-third of the wall.
- Top and floor slab thickness and reinforcement are for precast and cast in place construction. Top and floor slabs shall be of Class II concrete. Concrete as specified in A.S.T.M. C478 (4000 psi) may be used in lieu of Class I and Class II concrete in precast items manufactured in plants which are under the 'Standard Operating Procedures' for the inspection of precast drainage products.
- All reinforcement shown is A.S.T.M. A615/A615M Grade 60 steel, either smooth or deformed. Equivalent area Grade 40 steel or Grade 65KSI welded wire fabric may be substituted according to index No. 201.
- Structure bottoms may be used in conjunction with curb inlet tops Types 1, 2, 3, 4, 5, 6, 9, and 10, and any manhole or junction box unless otherwise shown in the plans or other standard drawings. Alt. B structure bottoms may be used in conjunction with curb inlet Types 7 & 8, or any ditch bottom inlet unless otherwise shown in the plans or other standard drawings.
- Rectangular structures may be rotated as directed by the Engineer in order to facilitate connections between the structure walls and storm sewer pipes.
- Except when ACI hooks are specifically required, reinforcement top and slab shall be straight embedment.
- All steel bars shall have 1 1/2" minimum cover unless otherwise shown except for precast circular units manufactured under ASTM C76 or ASTM C478. Horizontal steel in rectangular structures shall be lapped a minimum of 24 bar diameters at corners.
- The corner fillets shown are necessary for rectangular structures used with circular risers and inlet throats and used on skew with rectangular risers, inlet and inlet throats. Fillets will be required in lieu of the bottom slab of the Alt. B riser when used with the Alt. A box. Each fillet shall be reinforced with 2-#5 bars.
- Inlet throats, riser or manhole tops shall be secured to structures as shown on Index No. 201.
- Structures with depths over 14' are to be checked for floatation by designer of project drainage.
- Units larger than specified standard may be substituted at the contractor's option when these units will not cause or increase the severity of utility conflicts. Such larger units shall be furnished at no additional cost to the Department. Larger Alternate A units cannot replace Alternate B units without approval of the Engineer. This note applies to this Index only.
- For manhole and junction box tops, for frames and covers, and, for supplementary details see Index No. 201.



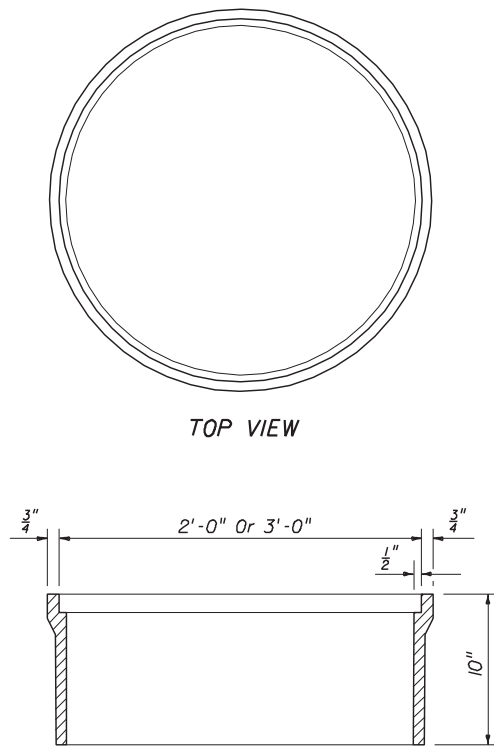
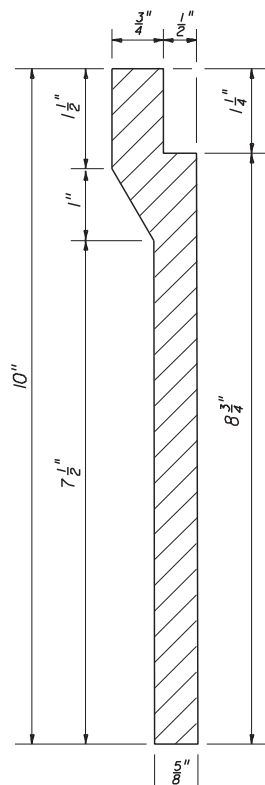
SECTION C-C

SPECIAL TOP SLAB *

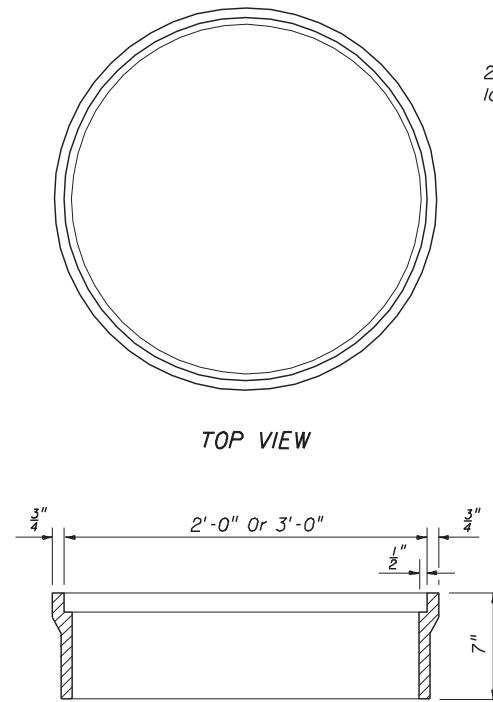
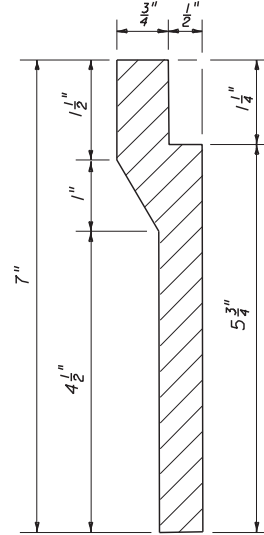
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
STRUCTURE BOTTOMS TYPE J AND P				
Names	Dates	Approved By <i>S. A. McHenry</i>		
Designed By		State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	200



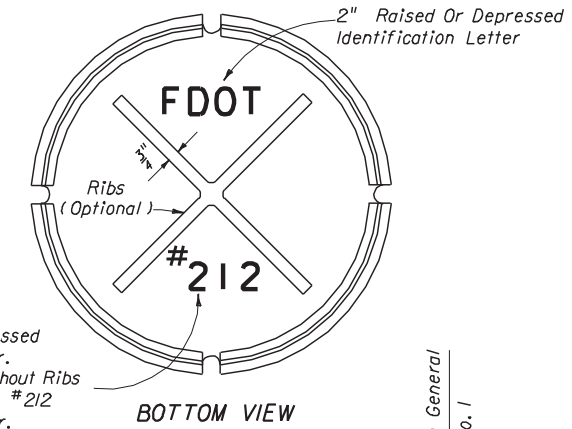
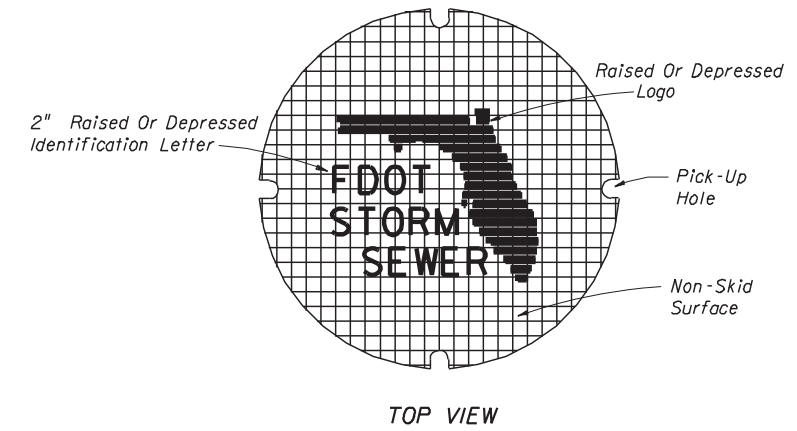
**SECTION
TYPE I**
For Manholes



**WALL SECTION
TYPE II**
For Curb Inlets Types 1, 2, 3, & 4

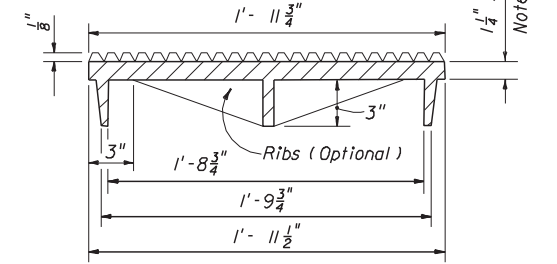


**WALL SECTION
TYPE III**
For Curb Inlets Types 7 & 8

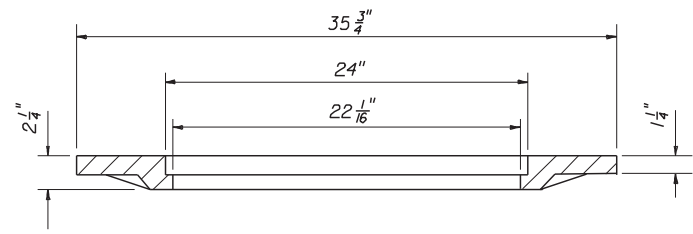


2" Raised Or Depressed Identification Number. Covers With And Without Ribs Shall Bear The Same #212 Identification Number.

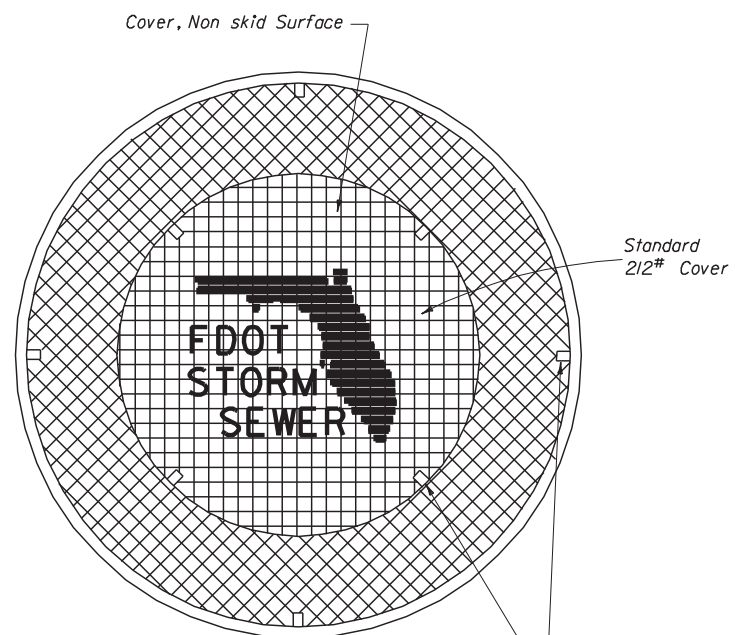
1/4" See General Note No. 1



COVER FOR ALL FRAMES



2-PIECE COVER



Pickholes
For Use With Types I, II And III Frames With 3'-0" Opening

2-PIECE COVER

CAST IRON FRAMES

Frame Type	WEIGHT OF CASTINGS					
	2' OPENING		3' OPENING			
	Frame	Cover (Std.)	Frame	2-Piece Cover		
			Inside	Outside	Total	
I	155 Lbs.	190 Lbs.	220 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.
II	145 Lbs.	190 Lbs.	255 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.
III	90 Lbs.	190 Lbs.	180 Lbs.	190 Lbs.	220 Lbs.	410 Lbs.

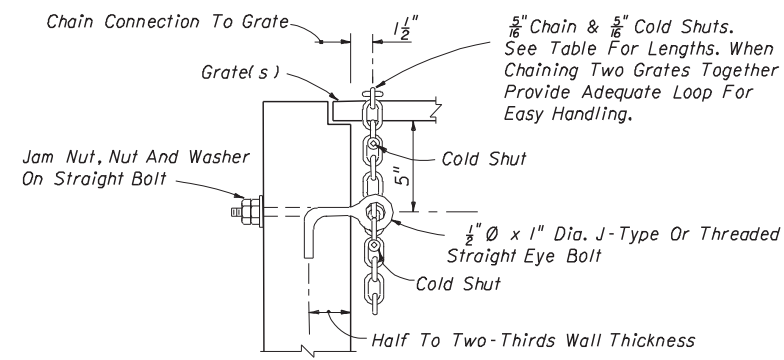
NOTES (FRAMES, AND COVER)

- The #212 cover is to be used for all frames Types I, II, III and the 2-Piece Cover, and is the replacement cover for all previous frames with 1 1/2" deep seats (traffic type). The 185 lb. cover (non-traffic type), 1984 Roadway and Traffic Design Standards Index No. 201, is the replacement cover for existing frames with 1/2" deep seats. Installation of frames with 1/2" deep seats is not permitted. The 185 lb. covers are to be placed in existing 1/2" deep seated frames only when specifically called for in the plans or as specifically directed by the Engineer.
- Use the 2'-0" cover, unless the 2-piece cover is called for in the plans.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

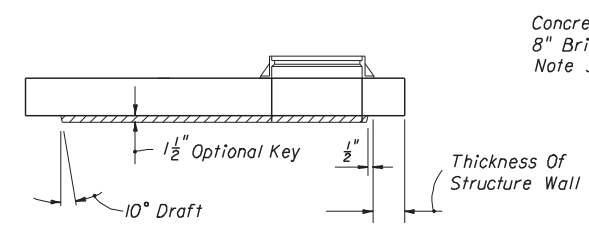
**SUPPLEMENTARY DETAILS FOR
MANHOLES AND INLETS**

Names	Dates	Approved By		
Designed By		S. A. McHenry State Drainage Engineer		
Drawn By	HSD 06/82	Revision	Sheet No.	Index No.
Checked By	JBW 06/82	00	1 of 6	201

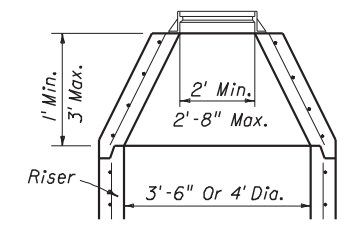
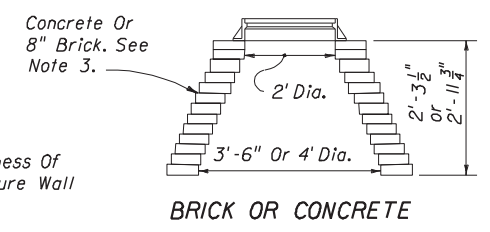


Note: When Alternate G grate is specified, the chain, bolt, nuts, washer and cold shuts shall be galvanized in accordance with the specifications for the grate.

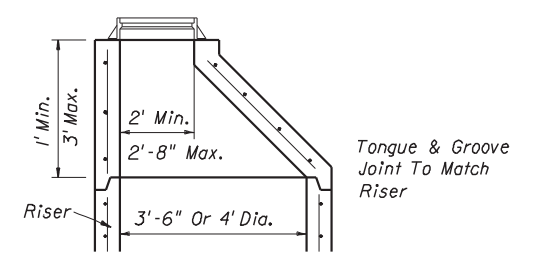
Cost of eye bolt and chain to be included in the contract unit price for inlets.



SECTION
Note: See Slab Designs Index 200.
TYPE 7



PRECAST CONCENTRIC CONE
TYPE 8



PRECAST ECCENTRIC CONE

MANHOLE TOPS

NOTES (TOPS)

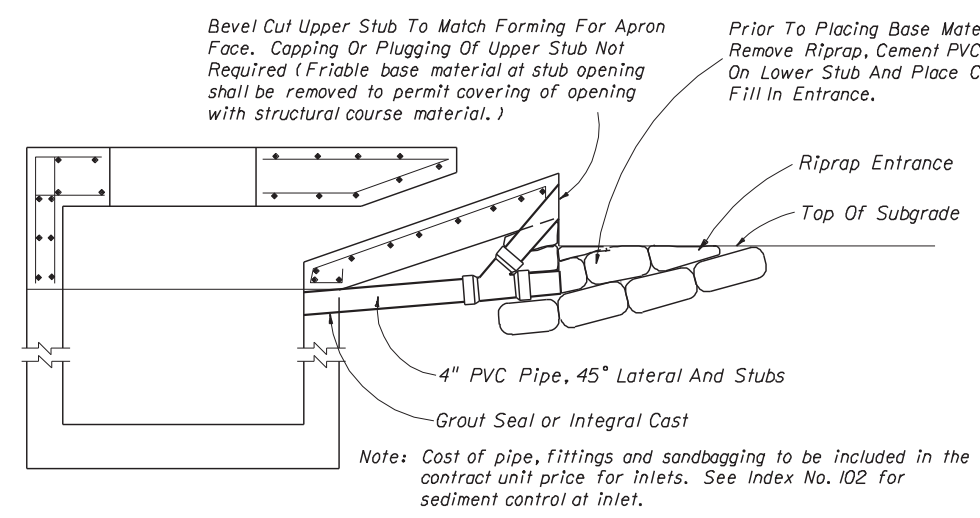
- Manhole top Type 7 slabs shall be of Class II concrete. Concrete as specified in ASTM C478 may be used for precast units; see General Note No. 3.
- Manhole top Type 7 slabs may be of cast-in-place or precast construction. The optional key is for precast tops and in lieu of dowels. Frame and slab openings are to be omitted when top is used over a junction box. Frames can be adjusted with from one to six courses of brick.
- Manhole top Type 8 may be of cast-in-place or precast concrete construction or brick construction. For concrete construction, the concrete and steel reinforcement shall be the same as the supporting wall unit. An eccentric cone may be used.
- Manhole tops shall be secured to structures by optional construction joints as shown on Sheet 3 of 6.
- Substitution of manhole top Type 8 for manhole top Type 7 is allowed provided that minimum dimensions shown above are not reduced.

DESIGN NOTES

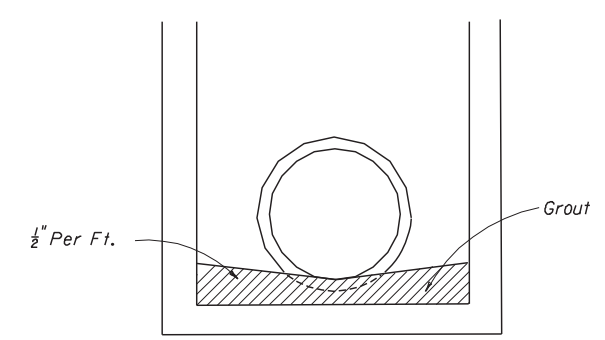
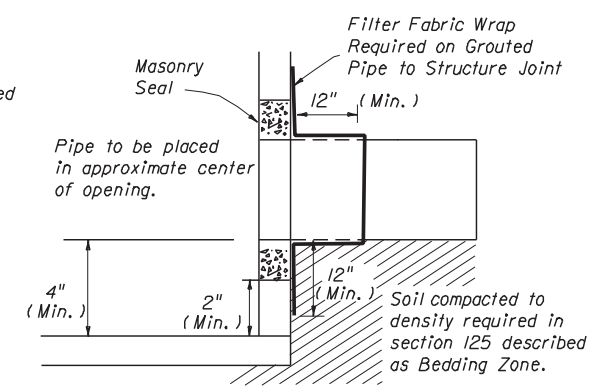
- Manhole top Type 8 should be specified in the plans when depths shown above can be maintained.

EYE BOLT AND CHAIN REQUIREMENTS				
Index Number	Inlet Type	Eye Bolts	Length Of Chain	Handling & Remarks
217	(MB) 1	1	4'-0"	Slide & Spin
	(MB) 2	1	4'-0"	Slide & Spin
	(MB) 3	2	2 @ 4'-0"	Slide & Spin
	(MB) 4	2	2 @ 4'-0"	Slide & Spin
	(MB) 5	2	2 @ 4'-0"	Slide & Spin
218	(BW)	1	3'-8"	Slide Or Slide & Spin
219	(BW, RGD)	1	4'-0"	Slide & Spin
220	S	1	4'-0"	Slide & Spin
221	V	1	4'-0"	Slide & Spin
230	A	1	3'-0"	Slide
231	B	1	5'-0"	Slide & Spin
232	C	1	2'-6"	Slide & Spin
	D	1	2'-6"	Slide & Spin
	E	2	2 @ 2'-6"	Slide & Spin
	H	2	2 @ 2'-6"	Flip Ctr. Grate and Slide & Spin Single Free Grate
233	F	1	3'-6"	Flip Or Slide & Spin
	G	1	6'-0"	Slide
			2'-0"	Lifting Loop
234	J	1	4'-0"	Slide & Spin

EYE BOLT AND CHAIN FOR LOCKING GRATES TO INLETS

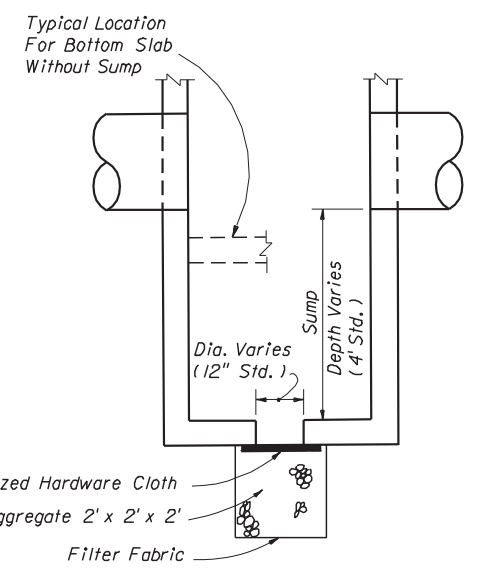


TEMPORARY DRAINS FOR SUBGRADE AND BASE



FOR ALL STRUCTURES UNLESS EXCLUDED BY SPECIAL DETAIL

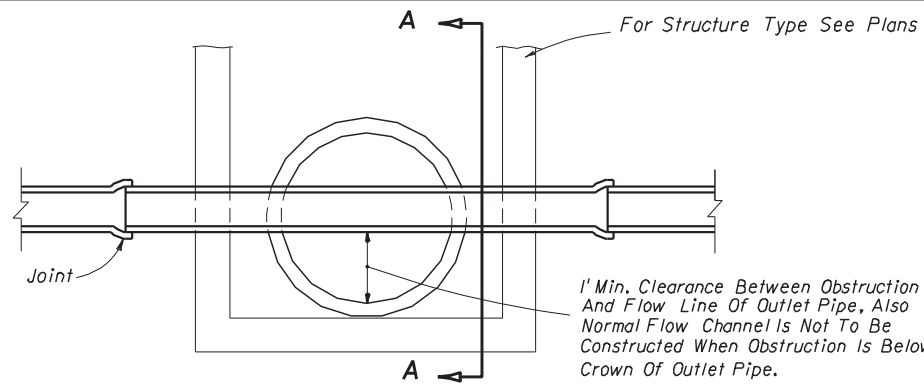
ALL PIPE TYPES DRAINAGE STRUCTURE INVERT



NOTE: Sump bottom appropriate for all manhole and inlet types. Cost for sump bottom to be included in the contract unit price for inlet or manhole.

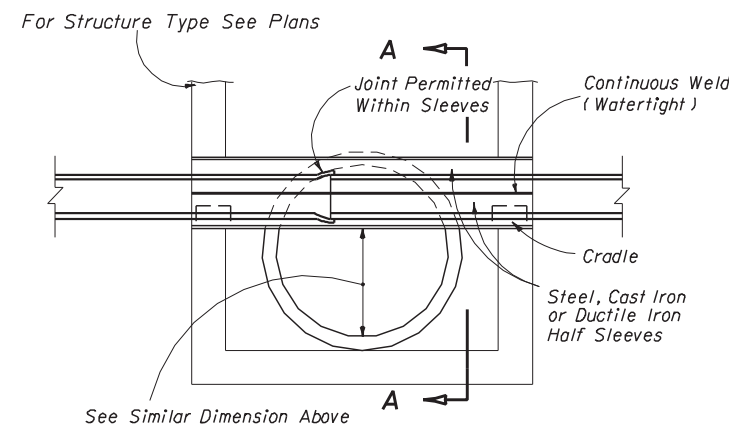
SUMP BOTTOM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS				
Designed By	HLB	04/75	Approved By <i>A. A. McHenry</i> State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By	LMF	04/75	00	2 of 6
				Index No. 201



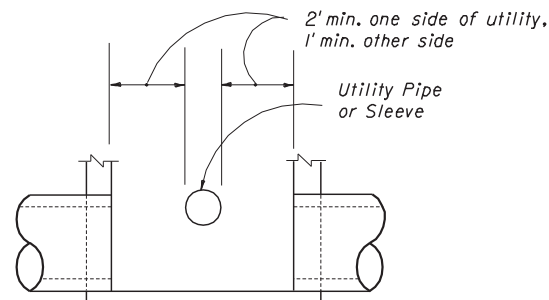
NOTE: No joints allowed inside the Condition I structure.

CONDITION I



NOTE: Only water mains will be allowed to pass through a Condition II structure.

CONDITION II

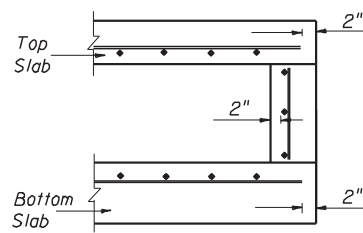


SECTION AA

DESIGNERS NOTE

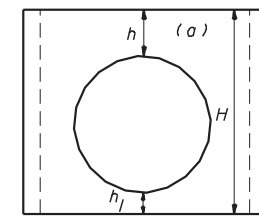
"Sumped" conflict manholes shall not be used unless the system is hydraulically designed to take in account the headloss generated if the sump is completely blocked.

UTILITY PIPES THRU STORM SEWER STRUCTURES



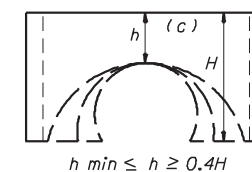
(NOTE: NOT APPLICABLE AROUND MANHOLE AND RISER OPENINGS)

REBAR STRAIGHT END EMBEDMENT FOR TOP AND BOTTOM SLABS

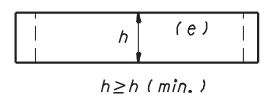


When
 $h_j < 0.75h$ (min.)
 $h_j \geq 0.75h$ (min.)

Then (Reg'd)
 $h \geq 0.4H$
 $h \geq h$ (min.)

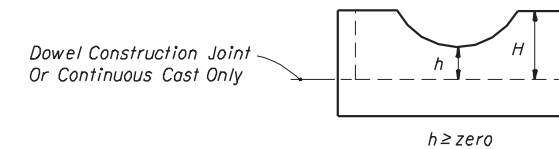


Segments may be inverted. Maximum opening for pipe shall be the pipe O.D. plus 6". If h can not be attained, then a top or bottom slab must be attached to the segment as shown below.



Minimum Value For h	
h (min.)	Box Or Riser Diameter
1'-0"	1'-0" & 4'-0"
1'-6"	5'-0" & 6'-0"
2'-0"	>6'-0"

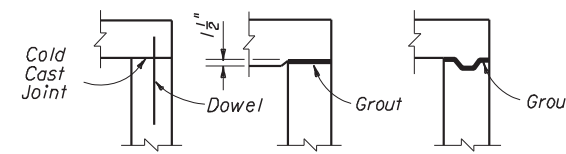
SEPARATE RISER SEGMENTS WITH CONSTRUCTION JOINTS OTHER THAN DOWEL OPTION



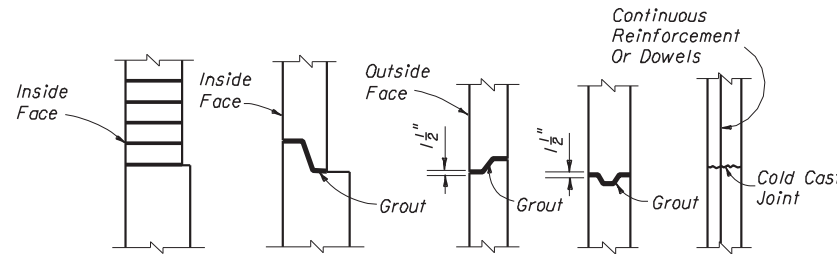
$h \geq \text{zero}$
 (h min Tabulated Above Do Not Apply)

TOP OR BOTTOM SEGMENT FOR DOWEL CONSTRUCTION JOINTS OR CONTINUOUS CAST SEGMENTS

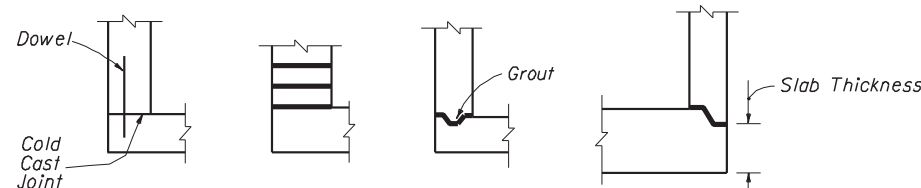
COMPARATIVE SIDE VIEWS MINIMUM DIMENSIONS FOR BOX AND RISER SEGMENTS



TOP SLABS TO WALLS



WALL JOINTS



BOTTOM SLABS TO WALLS

- One or more types of joints may be used in a single structure, except brick wall structure. Brick wall construction is permitted on circular units only.
- All grouted joints are to have a maximum thickness of 1".
- Keyways are to be a minimum of 1 1/2" deep.
- Joint dowels are to be #4 bars, 12" long with a minimum of 6 bars per joint approximately evenly spaced for circular structures or 2 bars per side at approximate quarter points for rectangular. Bars are to be placed approximately 6" into fresh concrete leaving the remainder to extend into the secondary cast. Welded wire fabric may be substituted for the dowels bar in accordance with the equivalent steel area table on Index 201, Sheet 4.
- Minimum cover on reinforcing bars is 1 1/2".
- Joints between wall segments and between wall segments and top or bottom slabs may be sealed either by preformed plastic gasket material using the procedures given in Section 430-7.3 or by grout.
- Approved product inserts may be used in lieu of dowel embedment.

OPTIONAL CONSTRUCTION JOINTS

GENERAL NOTES

- For square or rectangular precast drainage structures, either deformed or smooth welded wire fabric may be used provided:
 - The smooth welded wire fabric shall comply with ASTM A185, and deformed welded wire fabric shall comply with ASTM A497.
 - Width and length of the unit is four times the spacing of the cross wires.
 - Wire fabric shall be continuous around the box, spliced at quarter point(s) with overlap of not less than the spacing of the cross wires plus 2".
- For equivalent steel areas for precast drainage structures, see Sheet 4.
- Horizontal steel in the walls of rectangular structures shall be lapped a minimum of 24 bar diameter at corners.
- Welding of splices and laps is permitted. The requirements and restrictions placed on welding in AASHTO M259 shall apply.
- Rebar straight end embedment or peripheral reinforcement may be used in lieu of ACI standard hooks for top and bottom slabs except when hooks are specifically called for in plans or standard drawings.
- Concrete as specified in ASTM C478, (4000 psi) may be used in lieu of Class I and Class II concrete in precast items manufactured in plants which are under the 'Standard Operating Procedures For The Inspection Of Precast Drainage Products'.
- Maximum opening for pipe shall be the pipe o.d. plus 6". Mortar used to seal the pipe into the opening will be of such a mix that shrinkage will not cause leakage into or out of the structure.
- For pay item purposes, the height used to determine if a drainage structure is less than or greater than 10 feet shall be computed using (a) the elevation of the top of the manhole lid, (b) the grate elevation or the theoretical gutter grade elevation of an inlet, or (c) the outside top elevation of a junction box less the flow line elevation of the lowest pipe or to top of sump floor.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS

Names	Dates	Approved By		
Designed By	HLB 04/75	S. A. McHenry State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	LMF 04/75	00	3 of 6	201

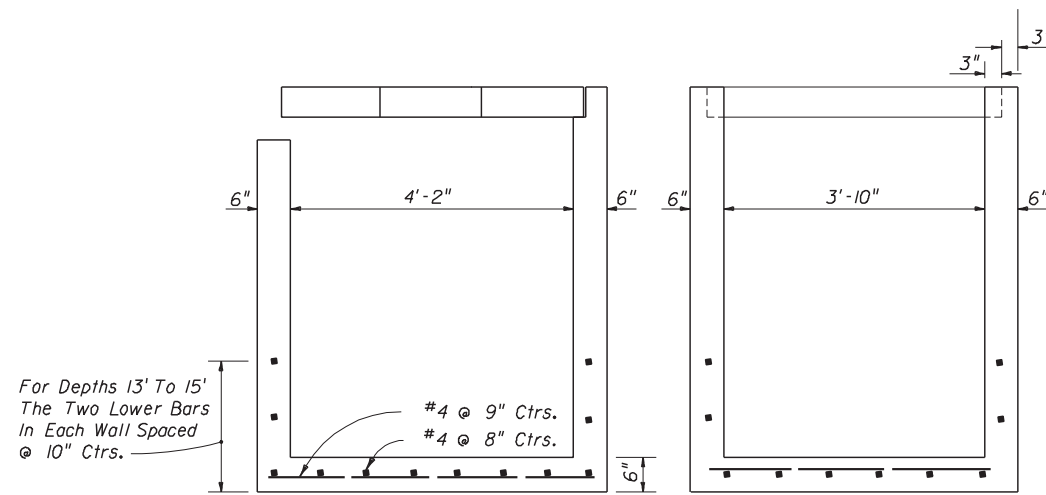
NOTES FOR THIN-WALL PRECAST OPTIONS

- The details on Sheets 4, 5 & 6 are optional for precast inlet construction up to depths of 15'. These inlets can be used with Alt. "B" Bottoms, Index 200. Cast-in-place construction must adhere to the details contained on the referenced indexes.
- Only the dimensions and reinforcement changes or other modifications are indicated. For all other dimensions and details, the referenced index drawings apply. When these precast units are used in conjunction with Alt "B" Structure Bottoms, Index 200, the interior dimensions of an Alt. "B" Bottom can be adjusted to reflect these inlet interior dimensions.
- Concrete which meets the requirements of ASTM C478 shall be used for structures constructed to these details.
- Reinforcement can be either deformed bar reinforcement or welded wire fabric. Bar reinforcement other than 40 ksi may be used, however only two grades are recognized; Grade 40 and Grade 60. Welded wire fabric, including deformed welded wire fabric, will be recognized as having a design strength of 65 ksi. The area of reinforcement required may be reduced in accordance with the Equivalent Steel Area Table provided. For bars and spacings not given, the steel area required can be determined by the following equations:

$$\text{Grade 60 Steel Area} = A_s 60 = \frac{40}{60} \times A_s 40$$

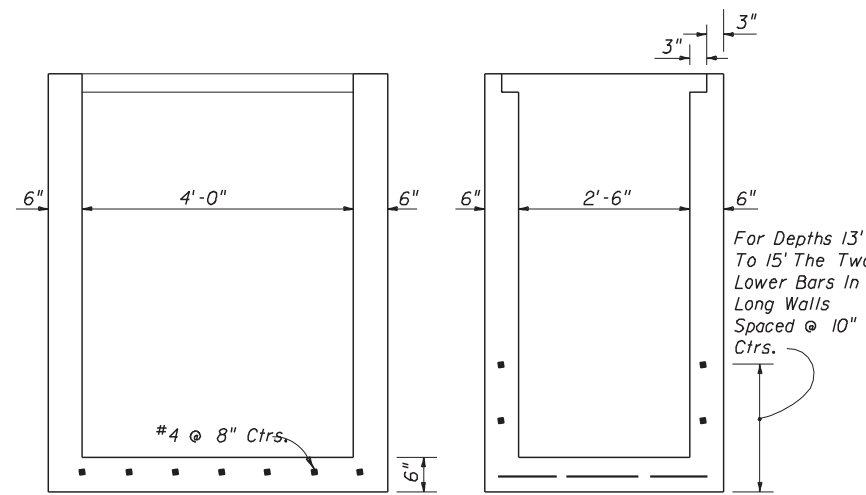
$$\text{Welded Wire Fabric Steel Area} = A_s 65 = \frac{40}{65} \times A_s 40$$

In no case will fabric with wires smaller than W3.1 or spacings greater than 8" be permitted. Bar reinforcement shall show the minimum yield designation grade mark of either the number 60 or one (1) grade mark line to be acceptable at the higher value. Maximum bar spacing shall not be greater than two (2) times the slab thickness with a maximum spacing of 12" or three (3) times the wall thickness, with a maximum spacing of 18".



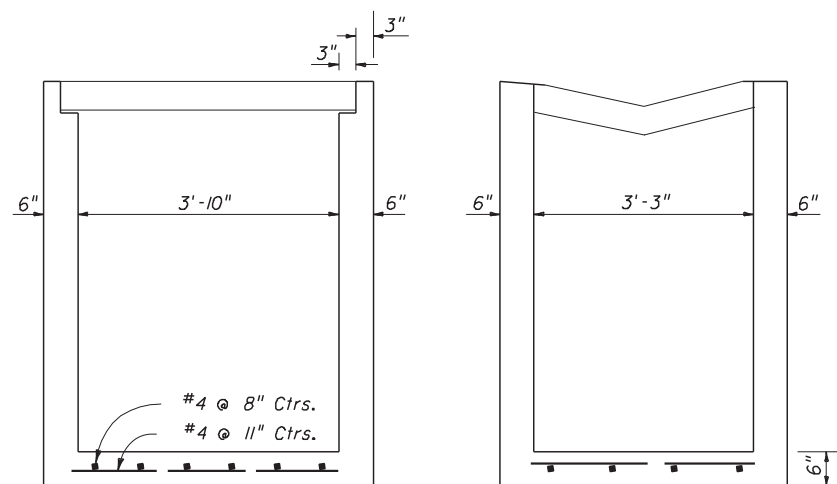
PARTIAL SECTION AA PARTIAL SECTION BB

**DITCH BOTTOM INLET TYPE B
INDEX 231**



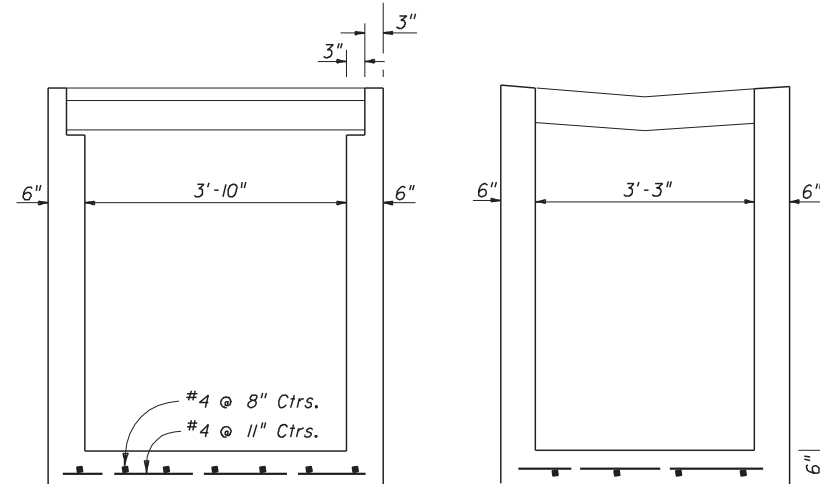
PARTIAL SECTION AA PARTIAL SECTION BB

**DITCH BOTTOM INLET TYPE F
INDEX 233**



PARTIAL SECTION AA PARTIAL SECTION BB

**GUTTER INLET TYPE S
INDEX 220**



PARTIAL SECTION AA PARTIAL SECTION BB

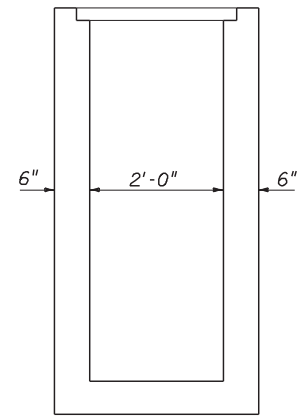
**GUTTER INLET TYPE V
AND DITCH BOTTOM INLET TYPE J
INDEX 221 & 234**

EQUIVALENT STEEL AREA TABLE					
GRADE 40 REINFORCING BAR		EQUIVALENT GRADE 60 REINFORCING BAR		EQUIVALENT 65 KSI WELDED WIRE FABRIC	
Bar Size & Spacing	Steel Area	Bar Size & Spacing	Min. Steel Area	Style Designation	Min. Steel Area
#4 @ 12" CCEW	0.20	#3 @ 9 1/2" CCEW	.1333	3" x 3" - W3.1 x W3.1 or 4" x 4" - W4.5 x W4.5 or 6" x 6" - W6.5 x W6.5	.1230
#4 @ 9" CCEW	0.267	#4 @ 13 1/2" CCEW or #3 @ 7" CCEW	.1778	3" x 3" - W4.5 x W4.5 or 4" x 4" - W5.5 x W5.5 or 6" x 6" - W8.5 x W8.5	.1641
#6 @ 6" CCEW	0.88	#5 @ 6" CCEW or #6 @ 9" CCEW	.5867	4" x 4" - W20 x W20 or 6" x 6" - W30 x W30	.5415
#7 @ 6" CCEW	1.20	#6 @ 6 1/2" CCEW or #7 @ 9" CCEW	.80	4" x 4" - W26 x W26	.7385

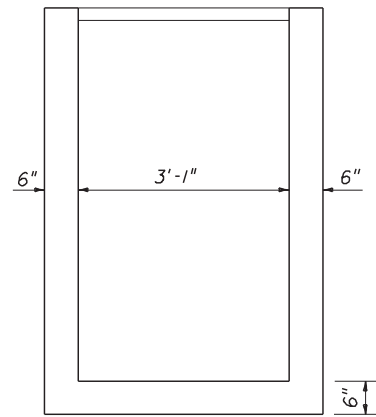
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**SUPPLEMENTARY DETAILS FOR
MANHOLES AND INLETS**

Names	Dates	Approved By		
Designed By	EGR/JGW 09/86	S. A. McHenry State Drainage Engineer		
Drawn By	WPH/dss 09/86	Revision	Sheet No.	Index No.
Checked By	EGR 09/86	00	4 of 6	201

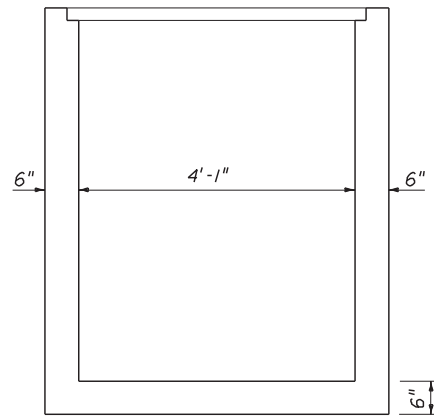


PARTIAL SECTION BB

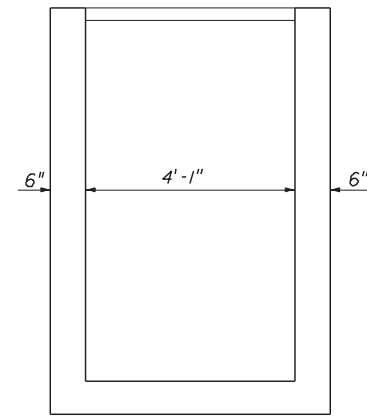


PARTIAL SECTION CC

DITCH BOTTOM INLET C
INDEX 232

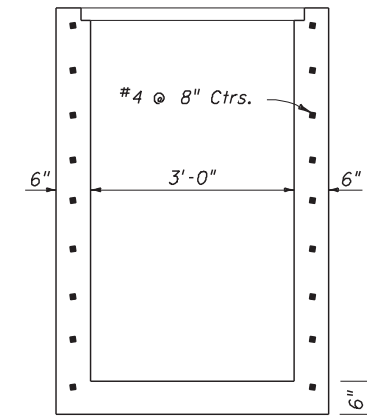


PARTIAL SECTION BB

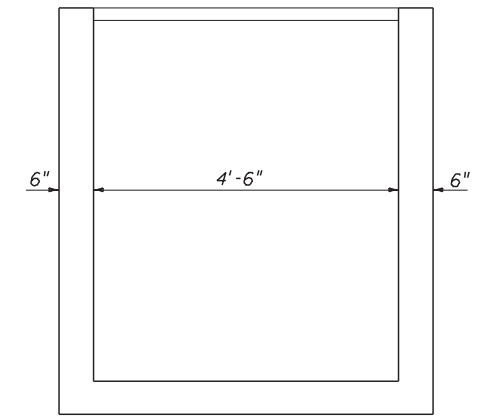


PARTIAL SECTION CC

DITCH BOTTOM INLET D
INDEX 232

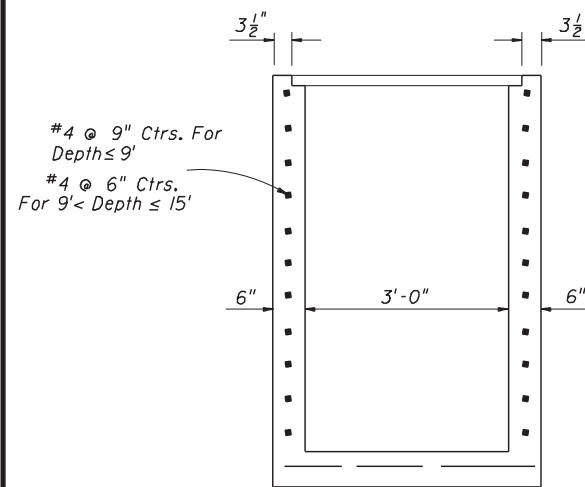


PARTIAL SECTION BB

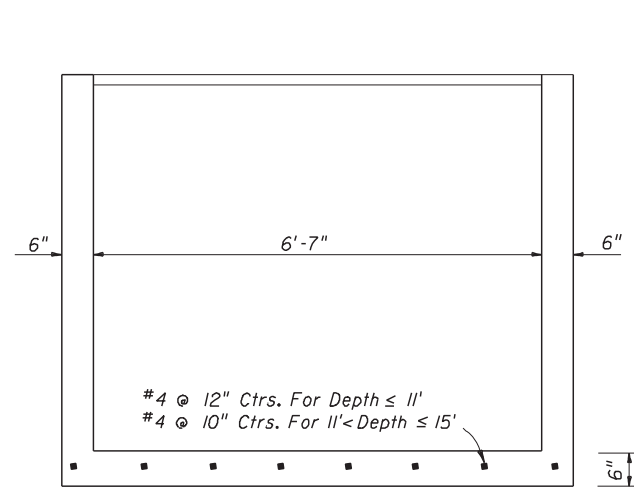


PARTIAL SECTION CC

DITCH BOTTOM INLET E
INDEX 232

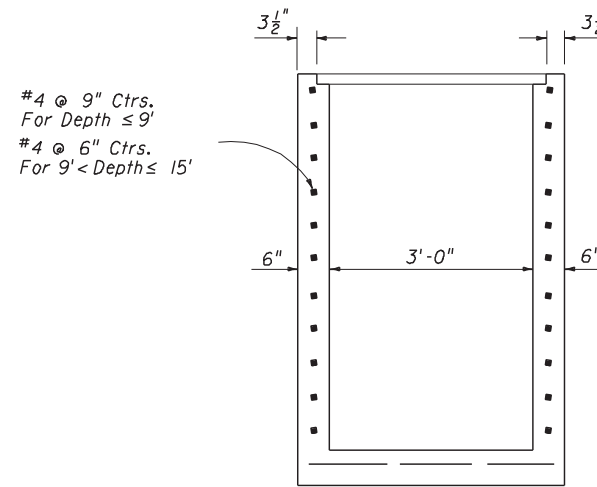


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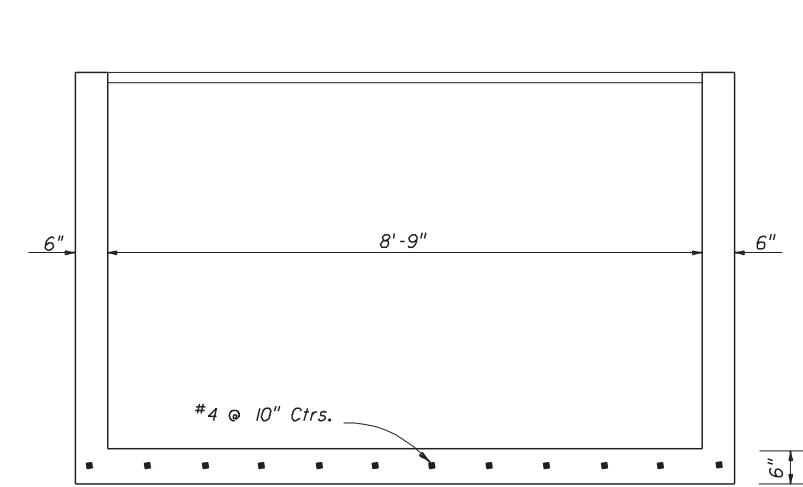


PARTIAL SECTION CC

DITCH BOTTOM INLET H (3-GRATE)
INDEX 232



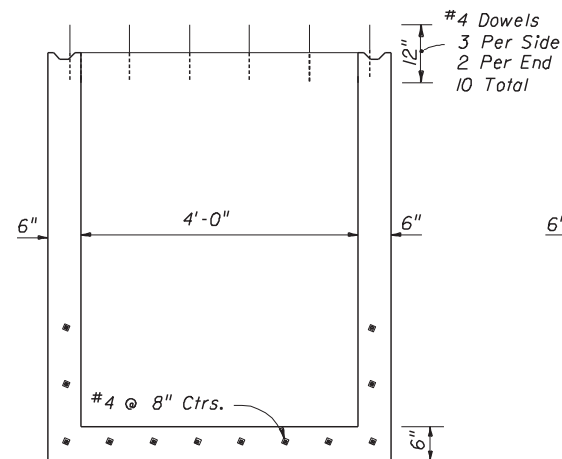
PARTIAL SECTION BB



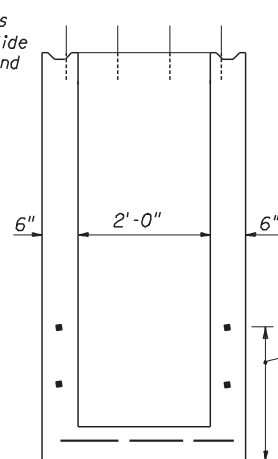
PARTIAL SECTION CC

DITCH BOTTOM INLET H (4-GRATE)
INDEX 232

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS				
Names	Dates	Approved By		
Designed By	EGR/JGW 09/06	S. A. McHenry State Drainage Engineer		
Drawn By	WPH/ddc 09/06	Revision	Sheet No.	Index No.
Checked By	EGR 09/06	00	5 of 6	201

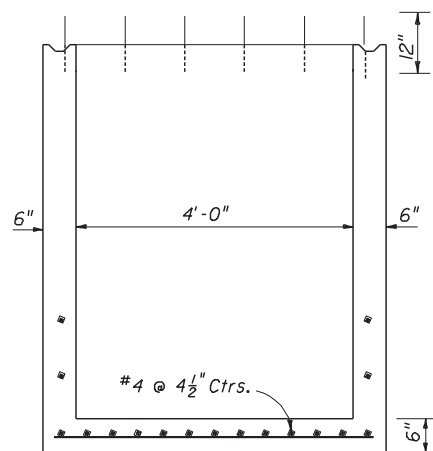


PARTIAL SECTION AA

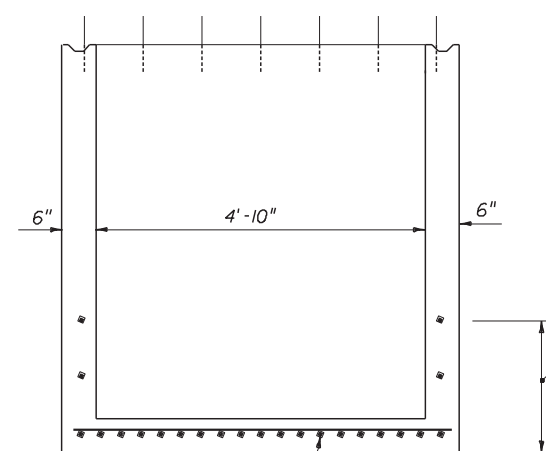


PARTIAL SECTION BB

MEDIAN BARRIER INLET TYPES 1 & 2



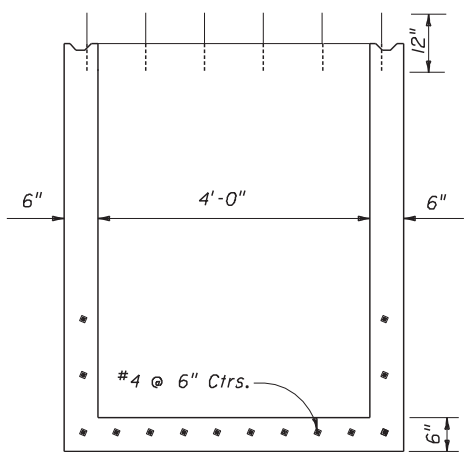
PARTIAL SECTION AA



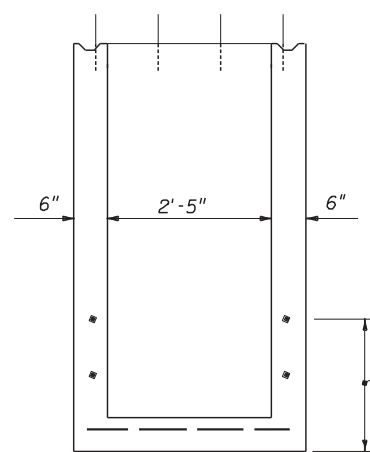
PARTIAL SECTION BB

MEDIAN BARRIER INLET TYPES 3, 4, & 5

INDEX 217



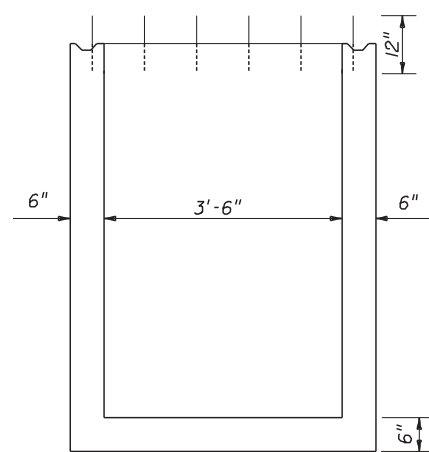
PARTIAL SECTION AA



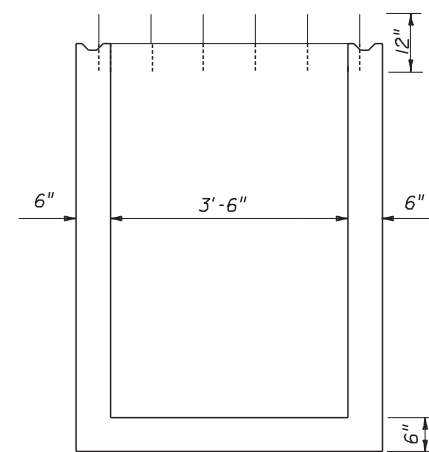
PARTIAL SECTION BB

BARRIER WALL (RIGID) (C & G)

INDEX 219



PARTIAL SECTION AA

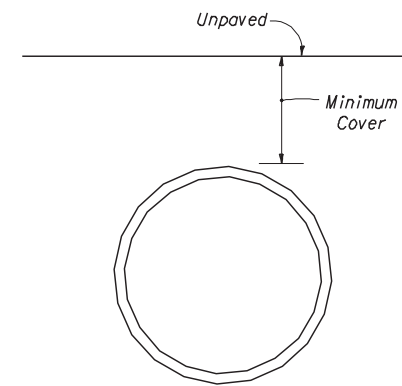
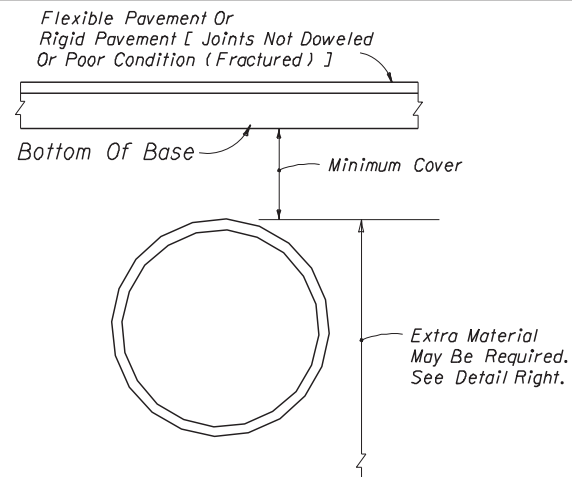
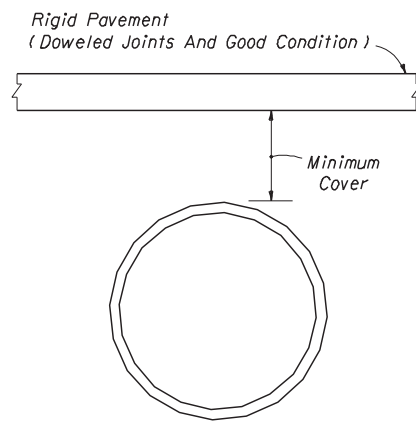


PARTIAL SECTION BB

STRUCTURE BOTTOM TYPE P

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS				
Designed By	Names	Dates	Approved By <i>S. A. McHenry</i> State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By			00	6 of 6
				Index No. 201



RIGID PAVEMENT

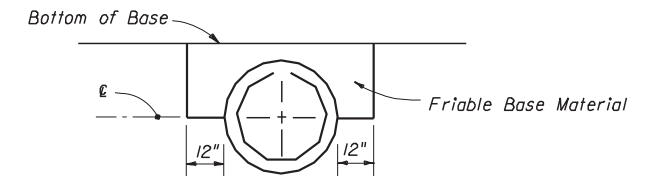
PIPE TYPE/SIZE & SHAPE	MINIMUM COVER
CONCRETE (See Note 6)	
Round & Elliptical	6"
CORRUGATED STEEL	
15"-72" Round & Arch Equiv.	9"
78" & Larger Round & Arch Eq.	15"
CORRUGATED ALUMINUM	
15"-72" Round & Arch Equiv.	9"
78"-102" Round & Arch Equiv.	15"
108" & Larger Round	18"
CORRUGATED POLYETHYLENE	
15"-48" Round	9"
POLYVINYL CHLORIDE	
15"-48" Round	9"

FLEXIBLE PAVEMENT

PIPE TYPE/SIZE & SHAPE	MINIMUM COVER
CONCRETE (See Note 6)	
Round & Elliptical	6"
CORRUGATED STEEL	
12"-30" Round	12" [12"]
36"-48" Round	18" (12") [15"]
54"-72" Round	21" (15") [18"]
78"-96" Round	(18") [27"]
102" & Larger Round	(24") [33"]
15"-30" Arch Equivalent	18" [18"]
36"-48" Arch Equivalent	24" (12") [18"]
54"-72" Arch Equivalent	27" (15") [24"]
78"-96" Arch Equivalent	(18") [30"]
102" & Larger Arch Equivalent	(24")
CORRUGATED ALUMINUM	
12"-24" Round	15" [12"]
30"-48" Round	18" (12") [18"]
54"-72" Round	24" (18") [24"]
78"-102" Round	(24") [30"]
108" & Larger	(30")
15"-24" Arch Equivalent	24" [21"]
30"-48" Arch Equivalent	27" (15") [24"]
54"-72" Arch Equivalent	30" (18") [27"]
78"-90" Arch Equivalent	(24") [30"]
96"-102" Arch Equivalent	(30")
CORRUGATED POLYETHYLENE	
15"-48" Round	15"
POLYVINYL CHLORIDE	
15"-48" Round	15"

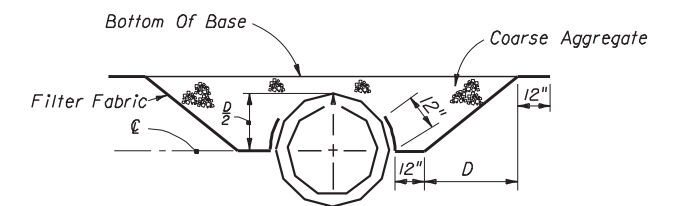
UNPAVED

PIPE TYPE/SIZE & SHAPE	MINIMUM COVER	
	COMMERCIAL	NON-COMMERCIAL
CONCRETE (See Note 6)		
Round & Elliptical	9"	3"
CORRUGATED STEEL		
12"-30" Round	18" [15"]	12" [12"]
36"-48" Round	18" (12") [15"]	12" (12") [12"]
54"-72" Round	18" (12") [15"]	15" (12") [12"]
78"-96" Round	(18") [27"]	(12") [12"]
102" & Larger Round	24" [33"]	18" [21"]
15"-30" Arch Equivalent	18" [18"]	12" [12"]
36"-48" Arch Equivalent	24" (12") [21"]	18" (12") [15"]
54"-72" Arch Equivalent	30" (18") [24"]	24" (12") [18"]
78"-96" Arch Equivalent	(24") [27"]	(18") [21"]
102" & Larger Arch Equivalent	(30")	(24")
CORRUGATED ALUMINUM		
12"-24" Round	21" [21"]	15" [15"]
30"-48" Round	24" (18") [21"]	18" (12") [15"]
54"-72" Round	30" (24") [27"]	24" (18") [21"]
78"-102" Round	(30") [33"]	(24") [27"]
108" & Larger	36"	30"
15"-24" Arch Equivalent	27" [24"]	24" [21"]
30"-48" Arch Equivalent	33" (21") [27"]	27" (15") [21"]
54"-72" Arch Equivalent	36" (24") [30"]	30" (18") [24"]
78"-90" Arch Equivalent	(30") [36"]	(24") [30"]
96"-102" Arch Equivalent	(36")	(30")
CORRUGATED POLYETHYLENE		
15"-48" Round	21"	15"
POLYVINYL CHLORIDE		
15"-48" Round	21"	15"



The cost of furnishing and installing the extra base material shall be included in the cost of the culvert.

FRIABLE BASE



The coarse aggregate shall be placed in 6 inch lifts and compacted sufficiently as to be firm and unyielding. The coarse aggregate shall be gravel or stone meeting the requirements of Section 901-2 or 901-3 respectively. The gradation shall meet Section 901-6, Grades 4, 467, 5, 56, or 57 unless restricted in the plans. The filter fabric shall be Type D-3 (See Index 199). The cost of furnishing and installing the coarse aggregate and filter fabric shall be included in the cost of the culvert.

ASPHALTIC CONCRETE BASE

Note: Extra material is required when cross culverts are located on facilities subject to high speed traffic (≥ 55 mph) or high traffic volumes (> 1600 ADT) and the cover is less than 12 inches for Concrete Pipe, 15 inches for Corrugated Steel Pipe And 18 inches for Corrugated Aluminum Pipe, Corrugated Polyethylene And Corrugated Polyvinyl Chloride Pipe.

GENERAL NOTES

- The tabulated values are recommended minimum dimensions to withstand anticipated highway traffic loads. Additional cover may be required to support construction equipment loads or highway traffic loads before pavement is completed. Some size thickness combinations may require minimum cover greater than those listed above. See Sheets 2, 3, & 4.
- Less than the tabulated minimum cover may be used provided suitable method (s) are detailed in the plans.
- Values shown in parentheses () are for 3" x 1" corrugations which must be specified to utilize the lesser cover.
- The tabulated values in the brackets [] apply to Type I-R (Spiral Rib) pipe which must be specified to utilize the lesser cover.
- Commercial and noncommercial refers to typical vehicular utilization of unpaved roads and drives where rutting and cover displacement may occur.
- For Pipe Class S with diameters of 12" to 30", the minimum height of fill measured from top of finished grade to outside top of pipe is 3 feet.

MINIMUM COVER FOR CONCRETE, STEEL, ALUMINUM, POLYETHYLENE AND POLYVINYL CHLORIDE PIPE

EXTRA MATERIAL FOR CROSS CULVERTS UNDER FLEXIBLE PAVEMENTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
COVER HEIGHT				
Names	Dates	Approved By		
Designed By	RGR	03/04	 State Drainage Engineer	
Drawn By	DLL	09/04		
Checked By	ECR	09/04	Revision	Sheet No.
			00	1 of 5
				205

ROUND PIPE DIMENSIONS				
Equiv. Dia. (In.)	Area (Sq. Ft.)	Wall Thickness (In.)* Classes II, III, IV, V		
		A WALL	B WALL	C WALL
12	0.8	1 3/4	2	NA
15	1.2	1 7/8	2 1/4	NA
18	1.8	2	2 1/2	NA
24	3.1	2 1/2	3	3 3/4
30	4.9	2 3/4	3 1/2	4 1/4
36	7.1	3	4	4 3/4
42	9.6	3 1/2	4 1/2	5 1/4
48	12.6	4	5	5 3/4
54	15.9	4 1/2	5 1/2	6 1/4
60	19.6	5	6	6 3/4
66	23.8	5 1/2	6 1/2	7 1/4
72	28.3	6	7	7 3/4
78	33.2	6 1/2	7 1/2	8 1/4
84	38.5	7	8	8 3/4
90	44.4	7 1/2	8 1/2	9 1/4
96	50.3	8	9	9 3/4
102	56.7	8 1/2	9 1/2	10 1/4
108	63.7	9	10	10 3/4
114	70.9	9 1/2	—	—
120	78.5	10	—	—

* For Informational Purposes Only
Do Not Specify Wall Thickness
Option B Wall Is Industry Standard

ELLIPTICAL PIPE DIMENSIONS						
Nominal Dimensions				Equiv. Dia. (In.)	Area (Sq. Ft.)	Wall Thickness (In.) Classes HE II, III, IV VE II, III, IV
Horiz.		Vert.				
Rise (In.)	Span (In.)	Rise (In.)	Span (In.)			
NA	NA	NA	NA	12	NA	NA
12	18	18	12	15	1.3	2 1/2
14	23	23	14	18	1.8	2 3/4
19	30	30	19	24	3.3	3 1/4
24	38	38	24	30	5.1	3 3/4
29	45	45	29	36	7.4	4 1/2
34	53	53	34	42	10.2	5
38	60	60	38	48	12.9	5 1/2
43	68	68	43	54	16.6	6
48	76	76	48	60	20.5	6 1/2
53	83	83	53	66	24.8	7
58	91	91	58	72	29.5	7 1/2
63	98	98	63	78	34.6	8
68	106	106	68	84	40.1	8 1/2
72	113	113	72	90	46.1	9
77	121	121	77	96	52.4	9 1/2
82	128	128	82	102	59.2	10
87	136	136	87	108	66.4	10 1/2
92	143	143	92	114	74.0	11
97	151	151	97	120	82.0	11 1/2

For Informational Purposes Only

ROUND PIPE INSTALLATIONS						
PIPE DIAMETER	Maximum Height of Fill (ft)					
	Class S	Class I	Class II	Class III	Class IV	Class V
12" - 30"	9	13	17	24	36	55
36" - 54"	8	12	16	22	34	52
60" - 78"	7	11	15	21	33	51
84" - 96"	6	10	14	20	32	49

Pipe Class S D-Load = 650 Lbs/Ft/Ft (.01" Crack)
D-Load = 950 Lbs/Ft/Ft (Ultimate)

Pipe Class I D-Load = 850 Lbs/Ft/Ft (.01" Crack)
D-Load = 1250 Lbs/Ft/Ft (Ultimate)

Pipe Class II D-Load = 1050 Lbs/Ft/Ft (.01" Crack)
D-Load = 1550 Lbs/Ft/Ft (Ultimate)

Pipe Class III D-Load = 1350 Lbs/Ft/Ft (.01" Crack)
D-Load = 2100 Lbs/Ft/Ft (Ultimate)

Pipe Class IV D-Load = 2100 Lbs/Ft/Ft (.01" Crack)
D-Load = 3150 Lbs/Ft/Ft (Ultimate)

Pipe Class V D-Load = 3150 Lbs/Ft/Ft (.01" Crack)
D-Load = 3650 Lbs/Ft/Ft (Ultimate)

Note: At the option of the pipe supplier or the contractor, a Pipe Class with greater strength may be substituted for the Pipe Class designated in the plans.

ELLIPTICAL PIPE INSTALLATIONS (All Sizes)			
Installation	Maximum Height Of Fill (Ft.)	Pipe Class	Bedding Class
Horizontal	1-6*	HE II*	C
	7-10	HE III	C
	11-16	HE IV	C
	17+	Special Design	Modified
Vertical	1-6*	VE II*	C
	7-10	VE III	C
	11-16	VE IV	C
	17+	Special Design	Modified

Pipe Class HE II D-Load = 1000 Lbs/Ft/Ft (.01" Crack)
And VE II D-Load = 1500 Lbs/Ft/Ft (Ultimate)

Pipe Class HE III D-Load = 1350 Lbs/Ft/Ft (.01" Crack)
And VE III D-Load = 2000 Lbs/Ft/Ft (Ultimate)

Pipe Class HE IV D-Load = 2000 Lbs/Ft/Ft (.01" Crack)
And VE IV D-Load = 3000 Lbs/Ft/Ft (Ultimate)

*Note: HE III and VE III pipe required for depths of cover less than 2' for 15", 18" and 24" equivalent.

PIPE DIMENSIONS

MAXIMUM COVER HEIGHTS

POLYETHYLENE PIPE	
DIAMETER	HEIGHT OF MAXIMUM FILL (Ft)
12" - 48"	16'

POLYVINYL CHLORIDE PIPE	
DIAMETER	HEIGHT OF MAXIMUM FILL (Ft)
12" - 48"	16'

MAXIMUM COVER FOR PLASTIC PIPE

Note: Height of fill (maximum cover) is measured from top of finished grade to outside top of pipe.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
COVER HEIGHT				
Names	Dates	Approved By		
Designed By	EGR 09/85	S a Mchemo		
Drawn By	HSD 09/85	State Drainage Engineer		
Checked By	EGR 09/85	Revision	Sheet No.	Index No.
		00	2 of 5	205

ROUND PIPE - 2 3/4" x 1/2" CORRUGATION							
D (In)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.064 (16)	0.079 (14)	0.109 (12)	0.138 (10)	0.168 (8)	
12	.79	100+	100+	NA	NA	NA	See Sheet 1 of 5
15	1.23	100+	100+	NA	NA	NA	
18	1.77	100+	100+	100+	NA	NA	
21	2.40	100+	100+	100+	NA	NA	
24	3.14	100+	100+	100+	NA	NA	
30	4.91	85	100+	100+	NA	NA	
36	7.1	71+	88	100+	100+	NA	
42	9.6	60+	76	100+	100+	NA	
48	12.6	53	66	93	100+	100+*	
54	16.0	NS	59	82	100+	100+*	
60	19.6	NS	NS	74	95	100+*	
66	23.8	NS	NS	NS	87	100+*	
72	28.3	NS	NS	NS	79	97*	
78	33.2	NS	NS	NS	NS	90*	
84	38.5	NS	NS	NS	NS	83*	

ROUND PIPE - 3" x 1" CORRUGATION							
D (In)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.064 (16)	0.079 (14)	0.109 (12)	0.138 (10)	0.168 (8)	
36	7.1	81	100+	100+	NA	NA	See Sheet 1 of 5
42	9.6	70	87	100+	NA	NA	
48	12.6	61	76	100+	100+	NA	
54	16.0	54	68	95	100+	NA	
60	19.6	48	61	85	100+	NA	
66	23.8	44	55	78	100	100+*	
72	28.3	40	51	71	91	100+*	
78	33.2	37	47	66	84	100+*	
84	38.5	35	43	61	78	100+*	
90	44.2	32	40	57	73	90*	
96	50.3	NS	38	53	68	84*	
102	56.7	NS	36	50	64	79*	
108	63.6	NS	NS	47	61	75*	
114	70.9	NS	NS	45	58	71*	
120	78.5	NS	NS	42	55	67*	
132	95.0	NS	NS	NS	50	61*	

ROUND PIPE - 5" x 1" CORRUGATION (3)							
D (In)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.064 (16)	0.079 (14)	0.109 (12)	0.138 (10)	0.168 (8)	
36	7.1	72	90	100+	NA	NA	See Sheet 1 of 5
42	9.6	62	77	100+	NA	NA	
48	12.6	54	68	95	100+	NA	
54	16.0	48	60	84	100+	NA	
60	19.6	43	54	76	98	NA	
66	23.8	39	49	69	89	100+*	
72	28.3	36	45	63	81	100+*	
78	33.2	33	41	58	75	92*	
84	38.5	31	38	54	70	85*	
90	44.2	29	36	50	65	80*	
96	50.3	NS	34	47	61	75*	
102	56.7	NS	32	44	57	70*	
108	63.6	NS	NS	42	54	66*	
114	70.9	NS	NS	40	51	63*	
120	78.5	NS	NS	38	49	60*	
132	95.0	NS	NS	NS	44	54*	

Notes:
Increase the minimum cover values shown on Sheet 1 of 5 by 6" for gage and size combinations below the heavy lines.

Height of fill (maximum cover) is measured from top of finished grade to outside top of pipe.

*Recorrugated end not available. May be considered for cross drain and side drain applications only.

NA - Not Available
NS - Not Suitable (For Highway H-20 Loadings)

(1) Limited availability of this product. Check availability before specifying (generally limited to 3" x 1" corrugation pipe arch fabricated from 60" and smaller diameter round pipe in 12 ga. and thicker material).

(2) 360° perforated pipe arch (french drain pipe) is not recommended. Do not specify without checking suitability and availability.

(3) 5" x 1" corrugated pipe is currently not manufactured for the Florida market. Check availability before specifying.

(4) .109 in. (12 gage) for spiral rib, 8' maximum cover, 3/4" x 1" x 1 1/2" rib spacing (2 rib) only.

PIPE ARCH: SPIRAL RIB: 3/4" x 3/4" x 7 1/2" RIB SPACING PIPE ARCH: SPIRAL RIB: 3/4" x 1" x 11 1/2" RIB SPACING PIPE ARCH - 2 3/4" x 1/2" CORRUGATION							
Span (In)	Rise (In)	Equiv. Round Pipe (In)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In) (Ga)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					4000	6000	
17	13	15	1.1	.064 (16)	12	14	See Sheet 1 of 5
21	15	18	1.6	.064 (16)	10	14	
24	18	21	2.2	.064 (16)	7	13	
28	20	24	2.9	.064 (16)	5	11	
35	24	30	4.5	.064 (16)	NS	7	
42	29	36	6.5	.064 (16)	NS	7	
49	33	42	8.9	.079 (14)	NS	6	
57	38	48	11.6	.109 (12)	NS	8	
64	43	54	14.7	.109 (12)	NS	9	
71	47	60	18.1	.138 (10) (4)	NS	10 (4)	
77	52	66	21.9	.168 (8) (4)	5	10 (4)	
83	57	72	26.0	.168 (8) (4)	5	10 (4)	

PIPE ARCH - 3" x 1" (1)(2)(3) and 5" x 1" (2)(3) CORR.							
Span (In)	Rise (In)	Equiv. Round Pipe (In)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In) (Ga)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					4000	6000	
40	31	36	7.0	.079 (14)	8	12	See Sheet 1 of 5
46	36	42	9.4	.079 (14)	8	13	
53	41	48	12.3	.079 (14)	8	13	
60	46	54	15.6	.079 (14)	8	13	
66	51	60	19.3	.079 (14)	9	13	
73	55	66	23.2	.079 (14)	11	16	
81	59	72	27.4	.079 (14)	11	17	
87	63	78	32.1	.079 (14)	10	16	
95	67	84	37.0	.079 (14)	11	17	
103	71	90	42.4	.109 (12)	10	15	
112	75	96	48.0	.109 (12)	10	16	
117	79	102	54.2	.109 (12)	10	15	
128	83	108	60.5	.138 (10)	9	14	
137	87	114	67.4	.138 (10)	8	13	
142	91	120	74.5	.168 (8)	7	12	

ROUND PIPE - SPIRAL RIB RIB SPACING (3/4" x 3/4" x 7 1/2") or (3/4" x 1" x 11 1/2")							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.064 (16)	0.079 (14)	0.109 (12)	0.138 (10)	0.168 (8)	
12	0.79	NA	NA	NA	NA	NA	See Sheet 1 of 5
15	1.23	NA	NA	NA	NA	NA	
18	1.77	68	72	NA	NA	NA	
21	2.40	58	62	100+	NA	NA	
24	3.14	51	72	100+	NA	NA	
30	4.91	41	58	97	NA	NA	
36	7.1	34	48	81	NA	NA	
42	9.6	29	41	69	NA	NA	
48	12.6	26	36	61	NA	NA	
54	16.0	23	32	54	NA	NA	
60	19.6	NS	29	49	NA	NA	
66	23.8	NS	26	44	NA	NA	
72	28.3	NS	24	40	NA	NA	
78	33.2	NS	NS	37	NA	NA	
84	38.5	NS	NS	35	NA	NA	
90	44.2	NS	NS	32	NA	NA	
96	50.3	NS	NS	30	NA	NA	
102	56.7	NS	NS	29	NA	NA	
108	63.6	NS	NS	27 (4)	NA	NA	

(A) = 3/4" x 1" x 1 1/2" Only.


MAXIMUM COVER FOR CORRUGATED STEEL PIPE ROUND AND PIPE ARCH

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
COVER HEIGHT				
Names	Dates	Approved By		
Designed By	EGR 09/85	<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	HSD 09/85	Revision	Sheet No.	Index No.
Checked By	EGR 09/85	00	3 of 5	205

ROUND PIPE - 2 3/4" x 1/2" CORRUGATION							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.060 (16)	0.075 (14)	0.105 (12)	0.135 (10)	0.164 (8)	
12	0.8	90	100+	NA	NA	NA	See Sheet 1 of 5
15	1.2	72	90	NA	NA	NA	
18	1.8	59	75	100+	NA	NA	
21	2.4	52	65	92	NA	NA	
24	3.1	44	56	79	NA	NA	
30	4.9	35 DR	44	63	NA	NA	
36	7.1	NS	36 DR	52	68	NA	
42	9.6	NS	NS	44 DR	58	NA	
48	12.6	NS	NS	38 DR	50 DR	61	
54	15.9	NS	NS	34 DR	45 DR	54 DR	
60	19.6	NS	NS	NS	39 DR	49 DR	
66	23.8	NS	NS	NS	NS	44 DR	
72	28.3	NS	NS	NS	NS	40 DR	

ROUND PIPE - 3" x 1" CORRUGATION							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.060 (16)	0.075 (14)	0.105 (12)	0.135 (10)	0.164 (8)	
36	7.1	33	42	60	NA	NA	See Sheet 1 of 5
42	9.6	28	36	51	NA	NA	
48	12.6	24	31	45	58	NA	
54	15.9	21	28	39	51	NA	
60	19.6	19	24	35	46	NA	
66	23.8	15 DR	22	32	42	51	
72	28.3	NS	20 DR	29	38	47	
78	33.2	NS	15 DR	27	35	43	
84	38.5	NS	NS	24 DR	32	40	
90	44.2	NS	NS	23 DR	30	37	
96	50.3	NS	NS	21 DR	28 DR	34	
102	56.7	NS	NS	NS	26 DR	32	
108	63.6	NS	NS	NS	24 DR	30 DR	
114	70.9	NS	NS	NS	NS	28 DR	
120	78.5	NS	NS	NS	NS	27 DR	

ROUND PIPE - SPIRAL RIB RIB SPACING (3/4" x 3/4" x 7 1/2")							
D (In.)	Area (Sq. Ft.)	Maximum Height Of Fill (Ft.)					Min. Cover (Ft.)
		Sheet Thickness In Inches (Gage)					
		0.060 (16)	0.075 (14)	0.105 (12)	0.135 (10)	0.164 (8)	
12	0.79	NA	NA	NA	NA	NA	See Sheet 1 of 5
15	1.23	63 ①	87 ①	NA	NA	NA	
18	1.77	55	76	NA	NA	NA	
21	2.40	47	65	NA	NA	NA	
24	3.14	41	57	NA	NA	NA	
30	4.91	33 DR	45	73	NA	NA	
36	7.1	27 ④	38 DR	61	NA	NA	
42	9.6	NS	32 ④	52	NA	NA	
48	12.6	NS	NS	46	65	NA	
54	16.0	NS	NS	40 DR	57	NA	
60	19.6	NS	NS	36 ④	52	NA	
66	23.8	NS	NS	NS	47 DR	NA	
72	28.3	NS	NS	NS	43 ④	NA	
78	33.2	NS	NS	NS	39 ④	NA	
84	38.5	NS	NS	NS	34 ④	NA	
90	44.2	NS	NS	NS	30 ①③④	NA	
96	50.3	NS	NS	NS	27 ①③④	NA	

 - NOTE
Special installation required.
Refer to AASHTO Standard Specifications
for Highway Bridges or ASTM B788-88
and manufacturer's recommendations.

PIPE ARCH - 2 3/4" x 1/2" CORRUGATION ②							
Span (In.)	Rise (In.)	Equiv. Round Pipe (In.)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In.) (Gage)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					Maximum Corner Pressure - Lbs/Sq.Ft.		
					4000	6000	
17	13	15	1.1	.060 (16)	12	15	See Sheet 1 of 5
21	15	18	1.6	.060 (16)	10	14	
24	18	21	2.2	.060 (16)	7	13	
28	20	24	2.9	.075 (14)	5	11	
35	24	30	4.5	.075 (14)	NS	7	
42	29	36	6.5	.105 (12)	NS	7	
49	33	42	8.9	.105 (12)	NS	6	
57	38	48	11.6	.135 (10)	NS	8	
64	43	54	14.7	.135 (10)	NS	9	
71	47	60	18.1	.164 (8)	NS	10	
77	52	66	21.9	.164 (8)	NS	10	
83	57	72	26.0	.164 (8)	NS	10	

PIPE ARCH - 3" x 1" CORRUGATION ① ②							
Span (In.)	Rise (In.)	Equiv. Round Pipe (In.)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In.) (Gage)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					Maximum Corner Pressure - Lbs/Sq.Ft.		
					4000	6000	
40	31	36	7.0	.060 (16)	8	12	See Sheet 1 of 5
46	36	42	9.4	.060 (16)	8	13	
53	41	48	12.3	.060 (16)	8	13	
60	46	54	15.6	.075 (14)	8	13	
66	51	60	19.3	.075 (14)	8	13	
73	55	66	23.2	.105 (12)	11	16	
81	59	72	27.4	.105 (12)	11	17	
87	63	78	32.1	.105 (12)	10	16	
95	67	84	37.0	.105 (12)	11	17	
103	71	90	42.4	.135 (10)	10	15	
112	75	96	48.0	.135 (10)	10	16	
117	79	102	54.2	.164 (8)	10	15	

PIPE ARCH - SPIRAL RIB RIB SPACING (3/4" x 3/4" x 7 1/2")							
Span (In.)	Rise (In.)	Equiv. Round Pipe (In.)	Area (Sq. Ft.)	Minimum Sheet Thickness Required (In.) (Gage)	Maximum Height Of Fill (Ft.)		Min. Cover (Ft.)
					Maximum Corner Pressure - Lbs/Sq.Ft.		
					4000	6000	
16	14	15	1.2	.060 (16)	12	13	See Sheet 1 of 5
20	16	18	1.7	.060 (16)	10	12	
23	19	21	2.3	.060 (16)	7	11	
27	21	24	3.0	.060 (16)	5	10	
33	26	30	4.7	.075 (14)	NS	9	
40	31	36	7.0	.075 (14)	NS	8	
46	36	42	9.4	.105 (12)	NS	8	
53	41	48	12.3	.105 (12)	NS	8	
60	46	54	15.6	.105 (10)	NS	8	
66	51	60	19.3	.135 (10)	NS	8	
73	55	66	23.2	.135 (10) ④	NS	8	
81	59	72	27.4	.135 (10) ④	NS	8	

MAXIMUM COVER FOR CORRUGATED ALUMINUM ALLOY ROUND PIPE AND PIPE ARCH

Notes:

Increase the minimum cover values shown on Sheet 1 of 5 by 6" for gage and size combinations below the heavy lines.

Height of fill (maximum cover) is measured from top of finished grade to outside top of pipe.

NA - Not Available

NS - Not Suitable (For Highway H-20 Loadings)

DR - Design Review is recommended for each specific application. The review should identify any special handling, installation, backfill procedures, and construction load restrictions which may be required. (The review performed by the designer does not relieve the contractor from analyzing and taking any necessary precautions required to protect partially or completely constructed pipe from the equipment used during construction.)

(NOTE: The DESIGNER may use a thicker gage in lieu of the Design Review.)

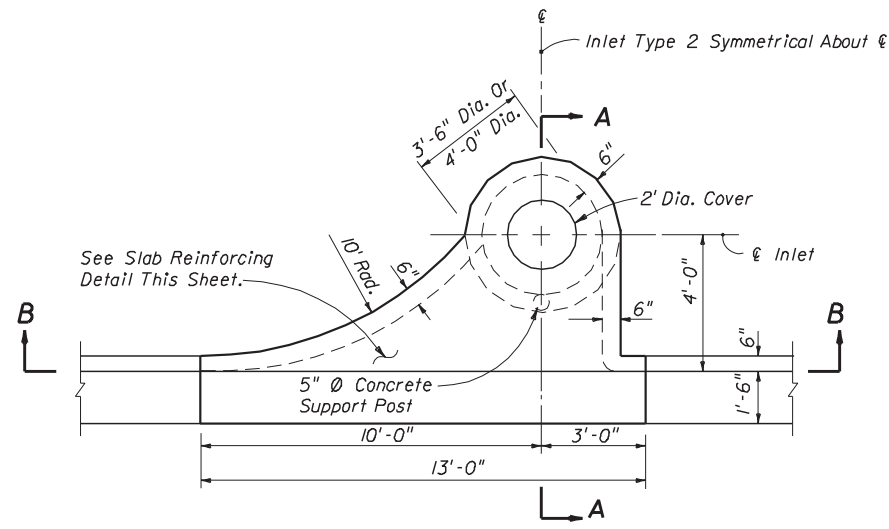
① Limited availability of this product. Check availability before specifying.

② 360° perforated pipe (french drain pipe) is not recommended in the pipe arch shape. Do not specify without checking both for suitability and availability.

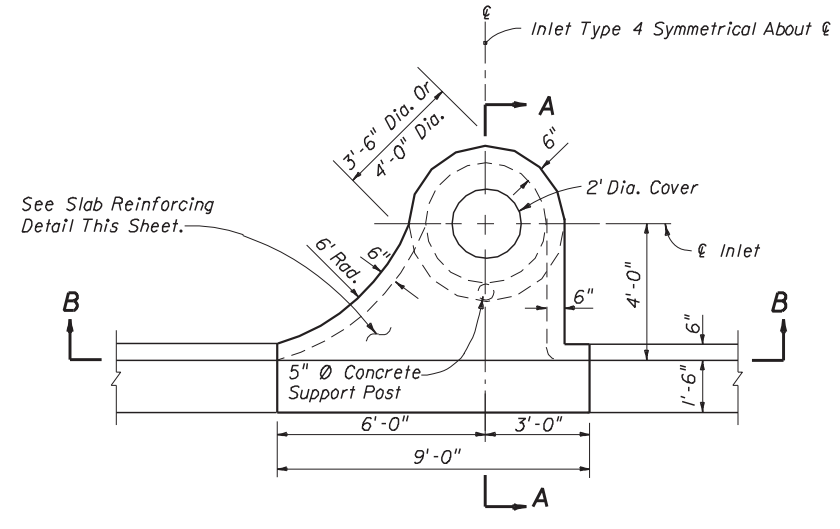
③ This size and gage combination must be strutted during installation per manufacturer's recommendations. Extra care will be required during handling and installation.

④ Use of this size and gage combination must be approved by the State Drainage Engineer.

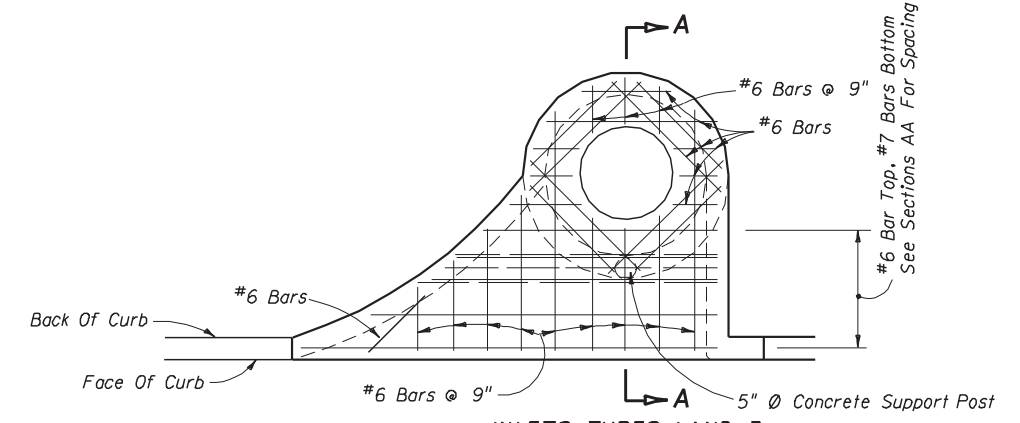
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
COVER HEIGHT					
Designed By	EGR	Dates	09/85	Approved By	<i>S. A. McHenry</i>
Drawn By	HSD	Revision	09/85	Sheet No.	4 of 5
Checked By	EGR	Index No.	09/85	00	205



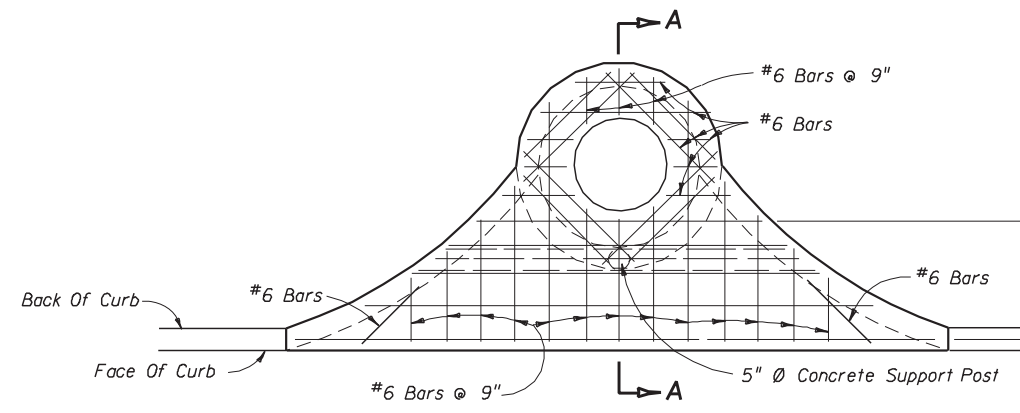
PLAN (INLET TYPE 2 SYMMETRICAL ABOUT €)



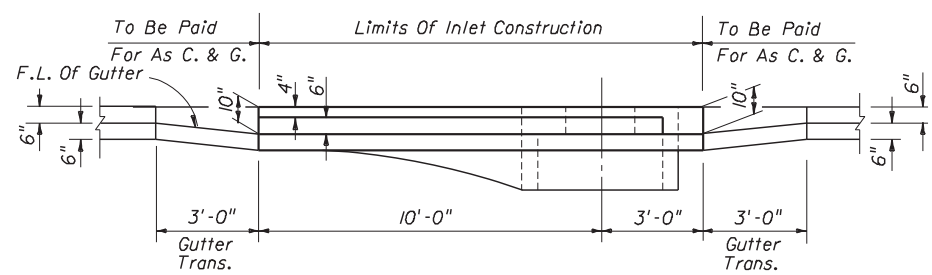
PLAN (INLET TYPE 4 SYMMETRICAL ABOUT €)



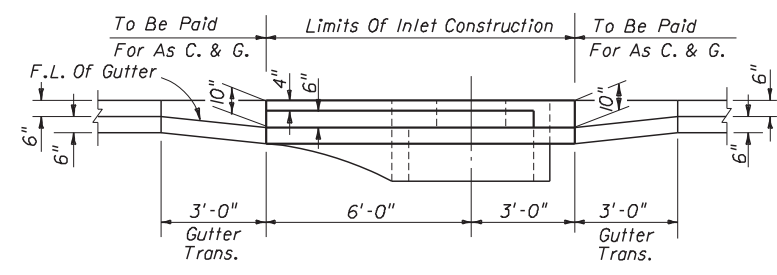
INLETS TYPES 1 AND 3



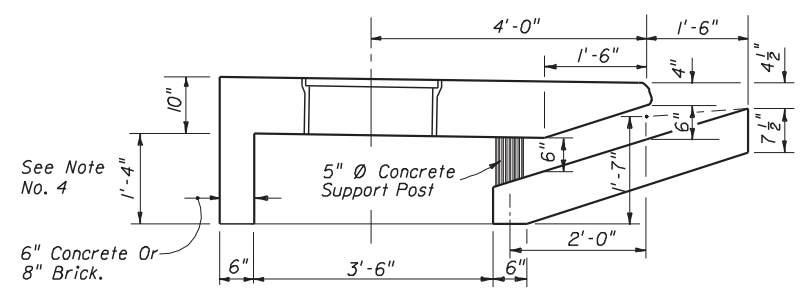
INLETS TYPES 2 AND 4
SLAB REINFORCING



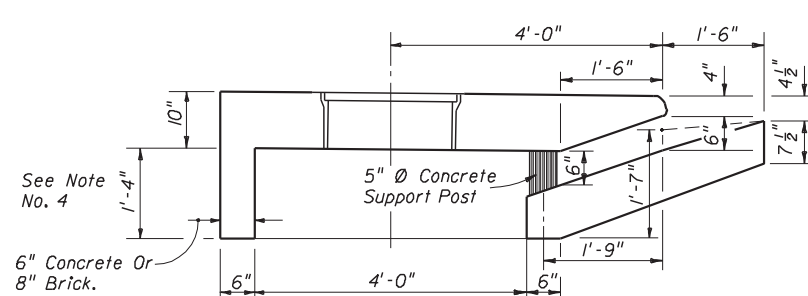
SECTION BB (INLET TYPE 2 SYMMETRICAL ABOUT €)



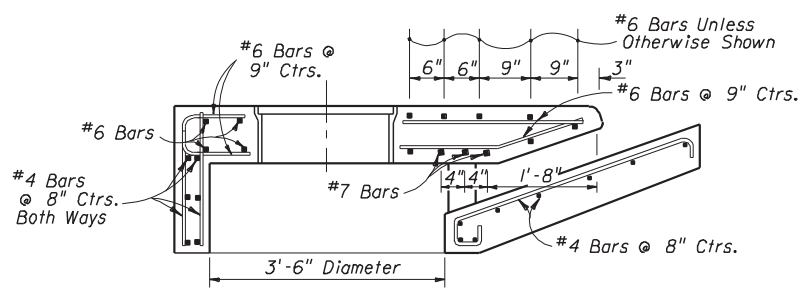
SECTION BB (INLET TYPE 4 SYMMETRICAL ABOUT €)



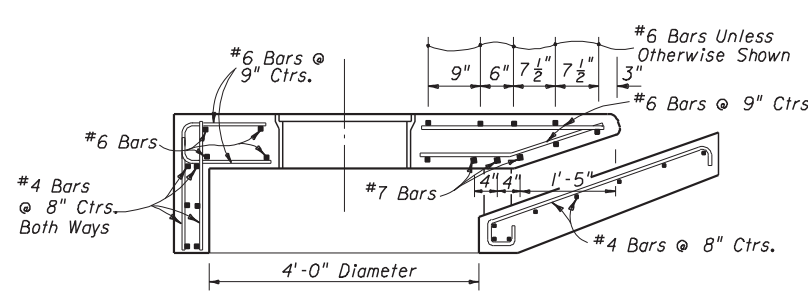
DIMENSIONAL SECTION
INLETS TYPES 1 AND 2



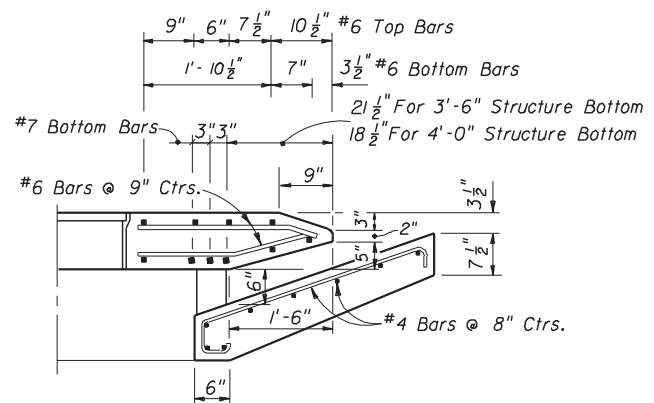
DIMENSIONAL SECTION
INLETS TYPES 3 AND 4



REINFORCING SECTION
3'-6" DIA. STRUCTURE BOTTOM (SECTION AA)



REINFORCING SECTION
4'-0" DIA. STRUCTURE BOTTOM (SECTION AA)

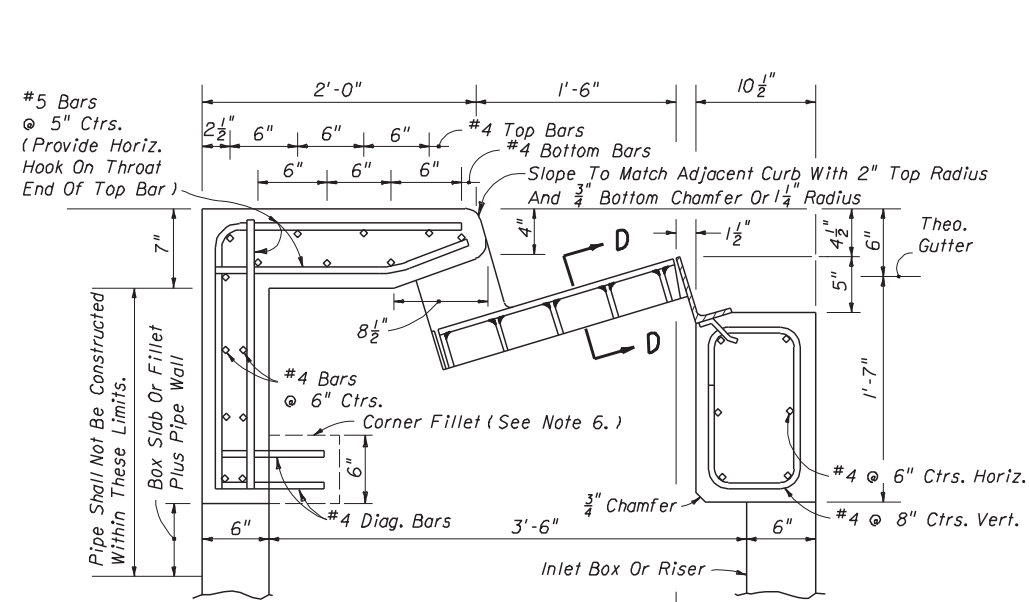


DIMENSION & REINFORCING HALF SECTION
TYPES A & E CURB (HALF SECTION AA)
(TYPE E GUTTER SHOWN)

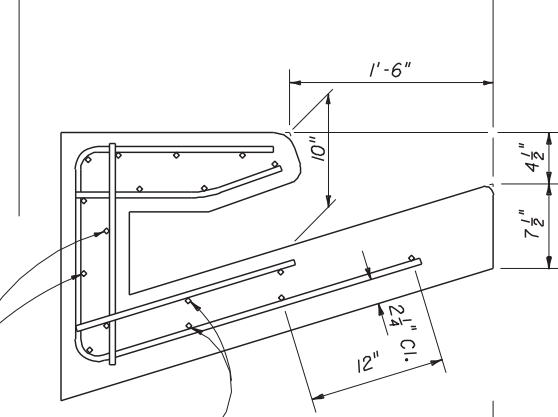
GENERAL NOTES

1. The finished grade and slope of the inlet tops are to conform with the finished cross slope and grade of the proposed sidewalk and/or border.
2. When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly. Bend steel when necessary.
3. All steel in inlet top shall have 1/4" minimum cover unless otherwise shown. Inlet tops shall be either cast-in-place or precast concrete.
4. The rear wall portion of inlet tops Types 1, 2, 3 & 4 may be constructed with brick. Dowels to top slab required.
5. Only round concrete support post will be acceptable.
6. For supplemental details see Index No. 201.
7. These inlets are to be used with Curb and Gutter Types E and F. Locate outside of pedestrian crosswalk where practical.
8. For structure bottoms see Index No. 200.
9. Inlet to be paid for under the contract unit price for Inlets (Curb) (Type —), Each.

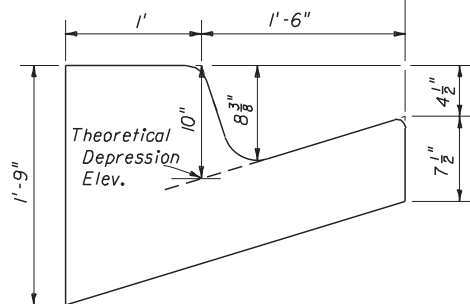
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN			
CURB INLET TOPS TYPES 1, 2, 3, & 4			
DESIGNED BY	NAMES	DATES	APPROVED BY
DRAWN BY			<i>S. A. McHenry</i>
CHECKED BY			STATE DRAINAGE ENGINEER
F. H. W. A.	APPROVED: 05/01/75	REVISION NO.	SHEET NO.
		00	1 of 1
			210



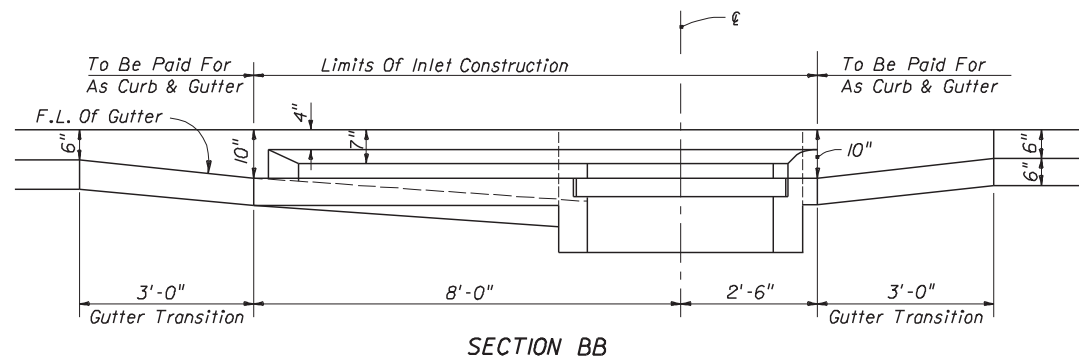
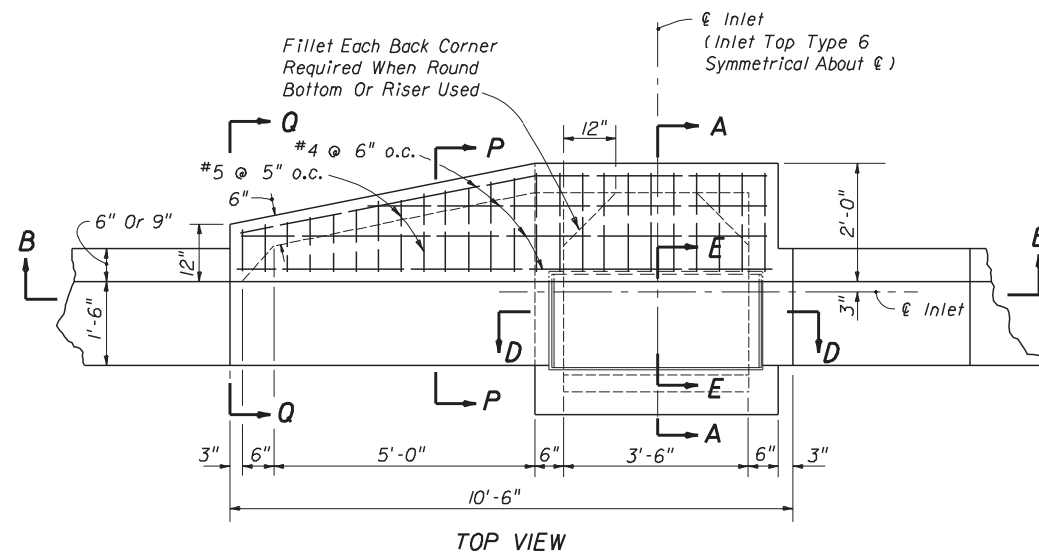
(Steel Cover Shown)
SECTION AA



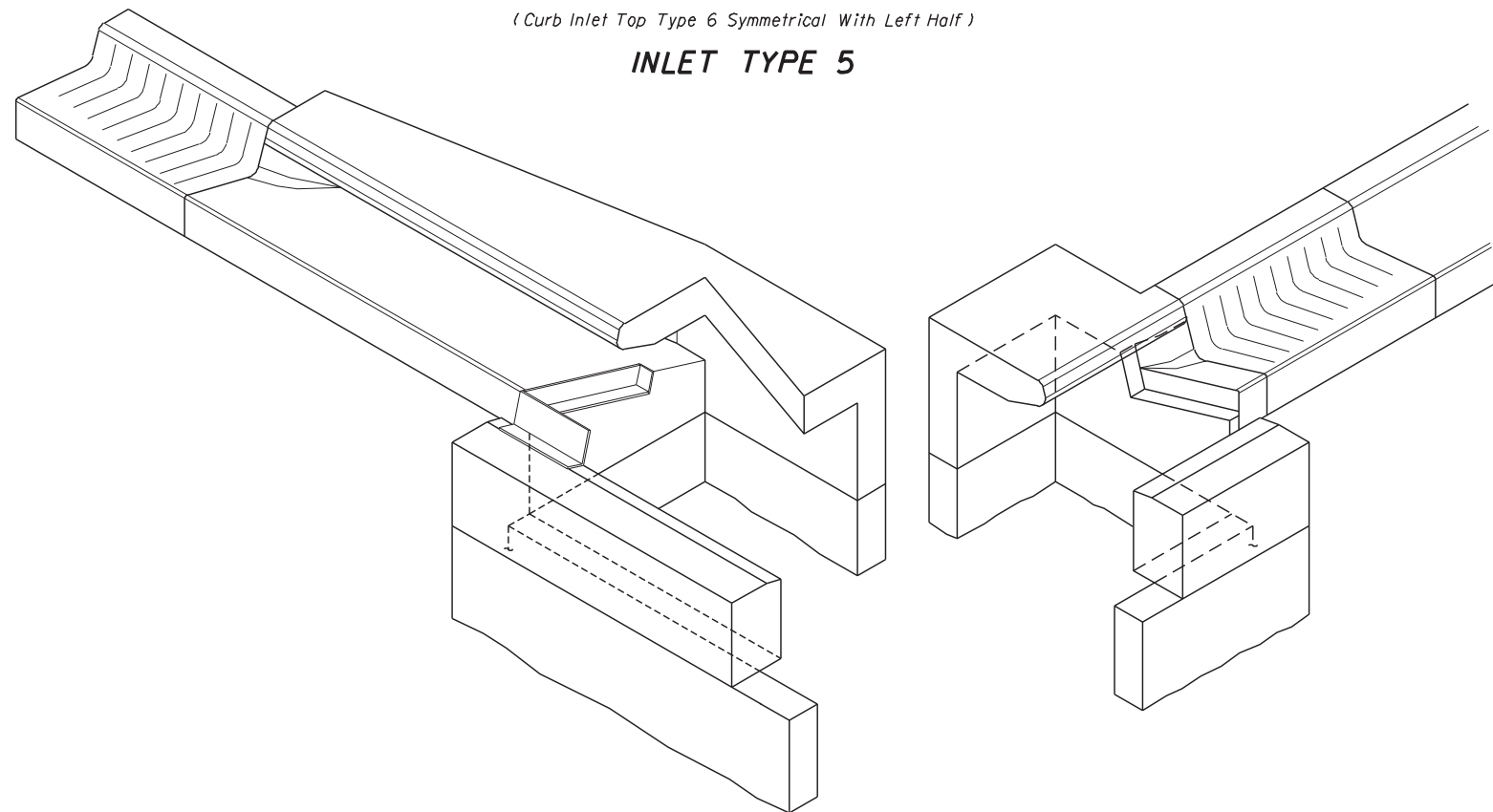
SECTION PP



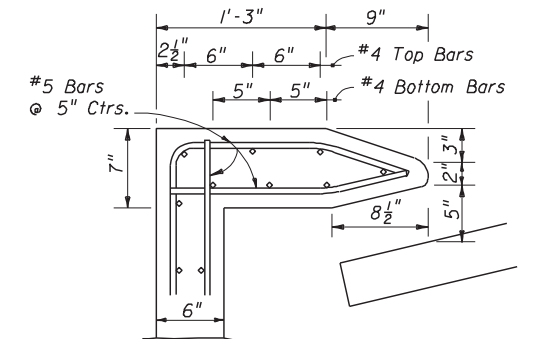
SECTION QQ



INLET TYPE 5



SKETCH SHOWING FRAME SEAT AND THROAT RECESS

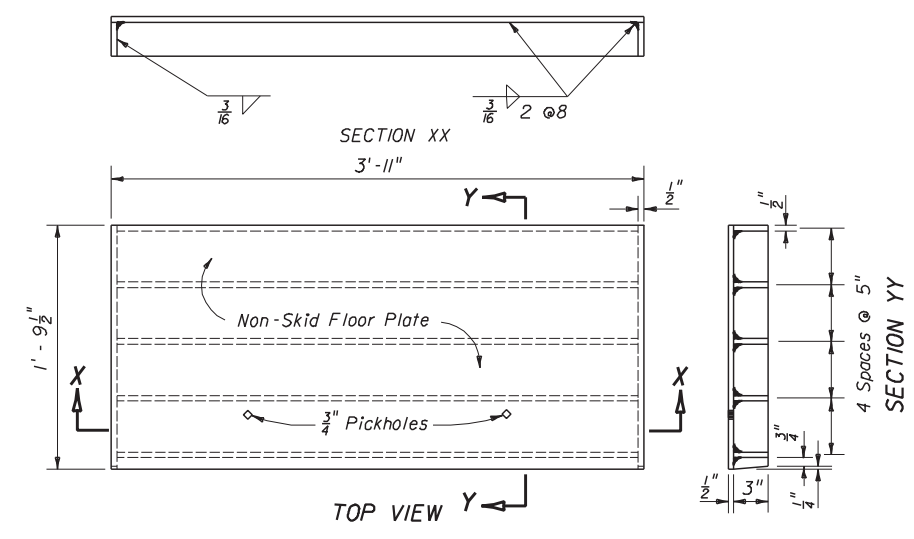
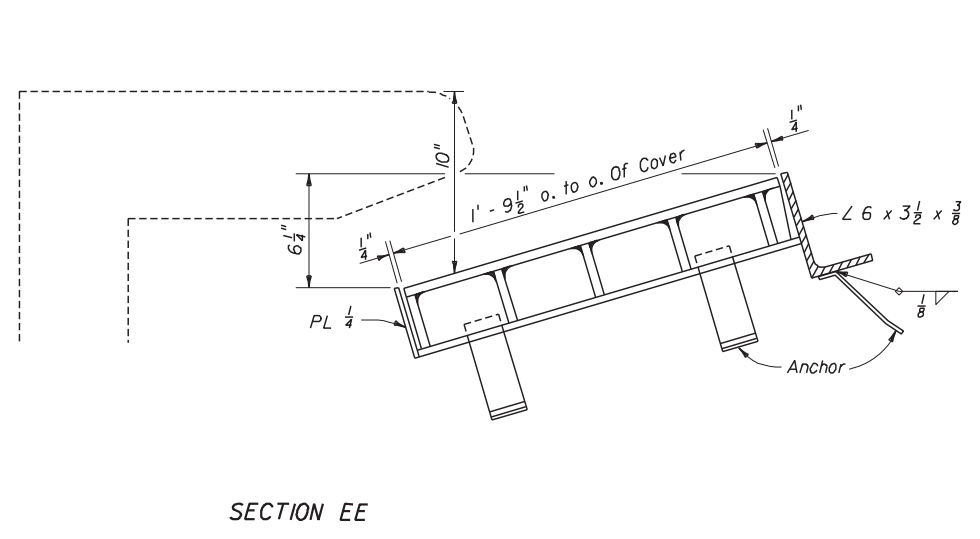
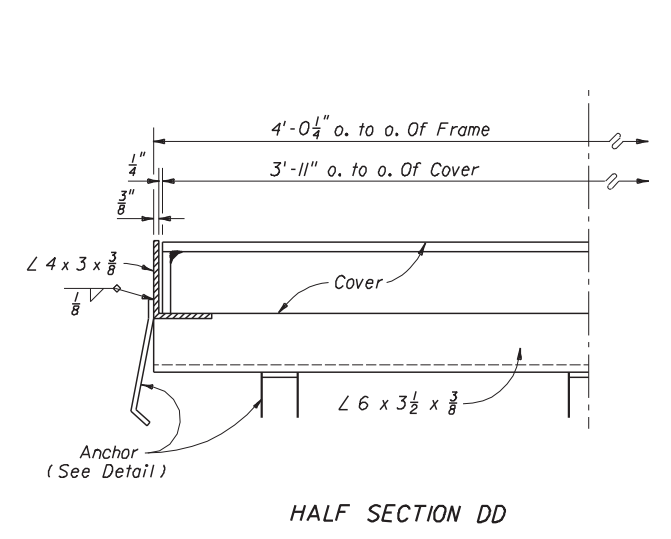
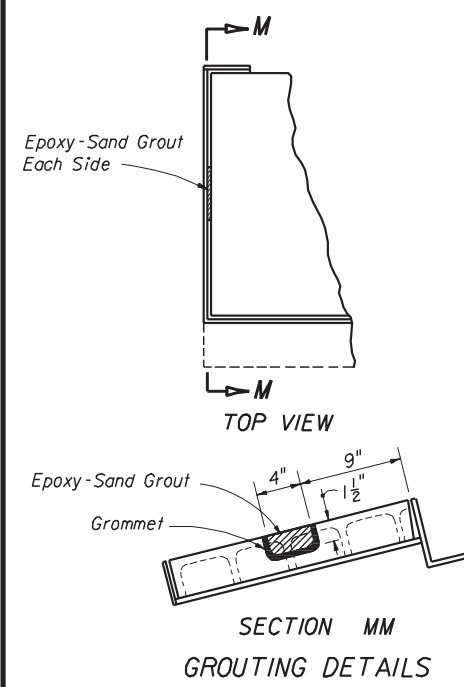
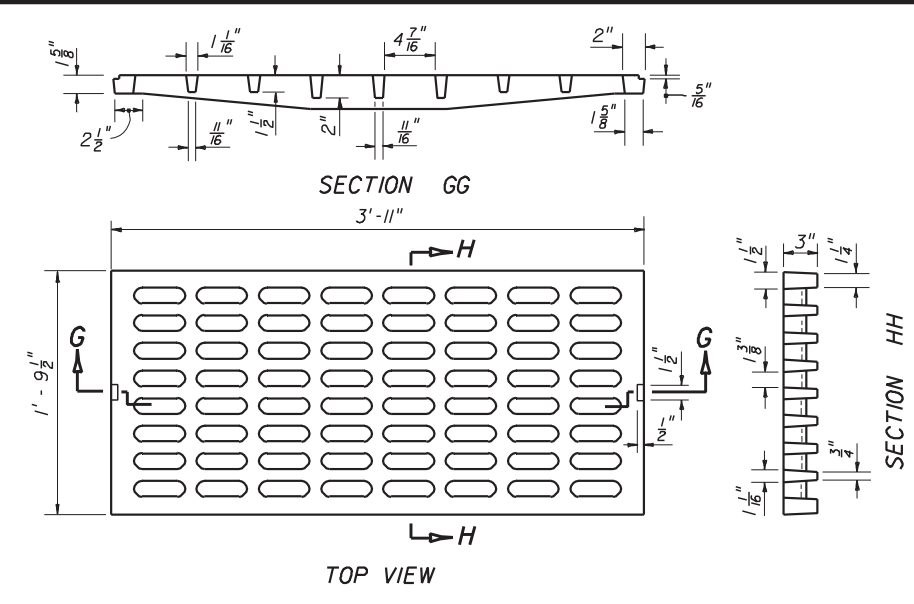
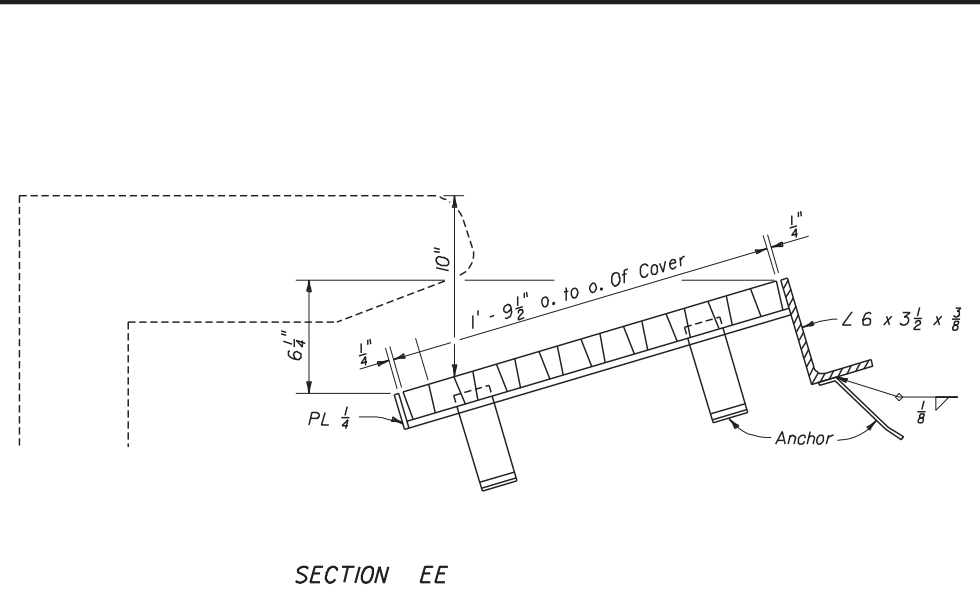
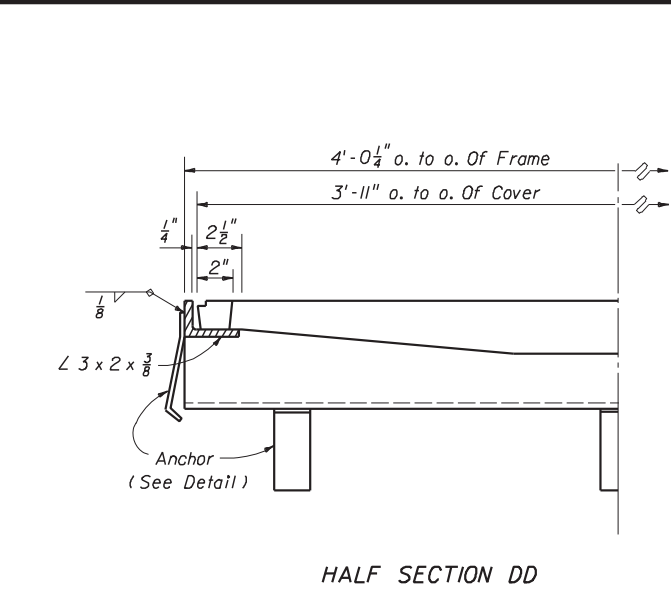
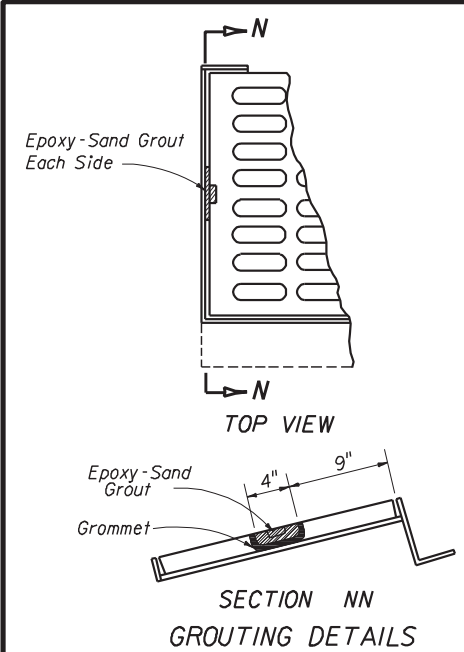


TOP MODIFICATION FOR TYPE E CURB

GENERAL NOTES

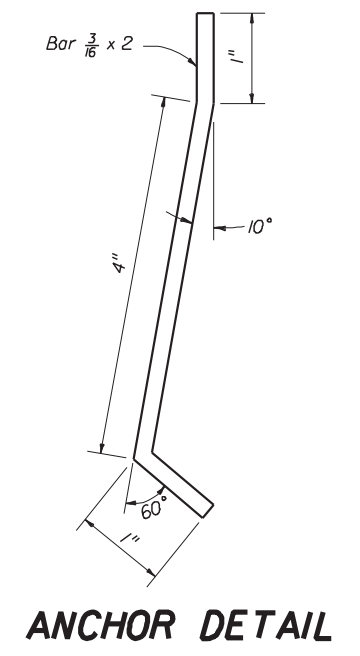
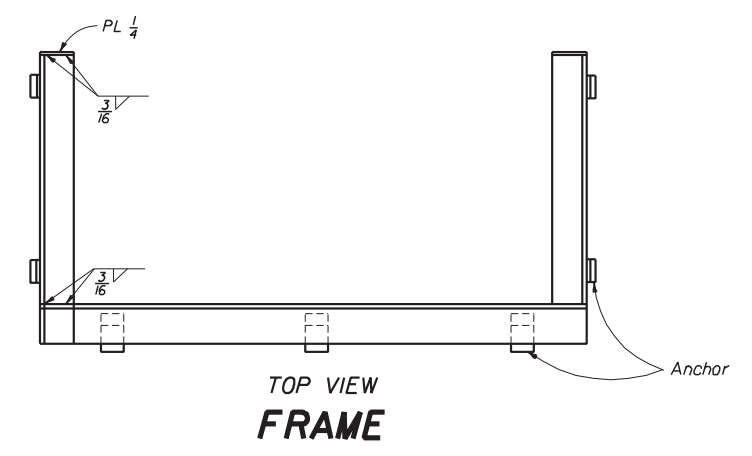
1. The finished grade and slope of the inlet tops are to conform with the finished cross slope and grade of the proposed sidewalk and/or parkway.
2. When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly. Bend steel when necessary.
3. All reinforcing steel shall have 1 1/4" minimum cover unless otherwise shown. Inlet tops shall be either cast-in-place or precast concrete.
4. Precasting of this inlet top will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer.
5. Concrete meeting the requirements of A.S.T.M. C478 (4,000 P.S.I.) may be used in lieu of Class I concrete for precast units, manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
6. The corner fillets shown for rectangular throats are necessary only when throats are to be used in conjunction with circular inlet bottoms or when used on skew with rectangular inlet boxes.
7. For inlet bottoms see Index No. 200.
8. These inlet tops are designed for use with standard curb and gutter Type E and Type F. Locate outside of pedestrian crosswalk where practical.
9. See Index 201 for supplemental details.
10. All steel used for frame and cover shall meet the requirements of ASTM A36/A36M.
11. Either cast iron covers or steel covers may be used. Iron covers shall be Class No. 30 castings in accordance with ASTM A48.
12. When Alternate "G" Cover is specified in plans either the cast iron cover and galvanized steel frame or the the galvanized steel cover and frame must be used. Covers are to be grouted in accordance with the grouting detail shown on sheet 2 of 2, in lieu of tack welding.
13. Inlet to be paid for under the contract unit price for Inlets (Curb) (Type—), Each.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CURB INLET TOPS TYPES 5 & 6				
Names	Dates	Approved By		
Designed By		S. A. Mcherson State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	211

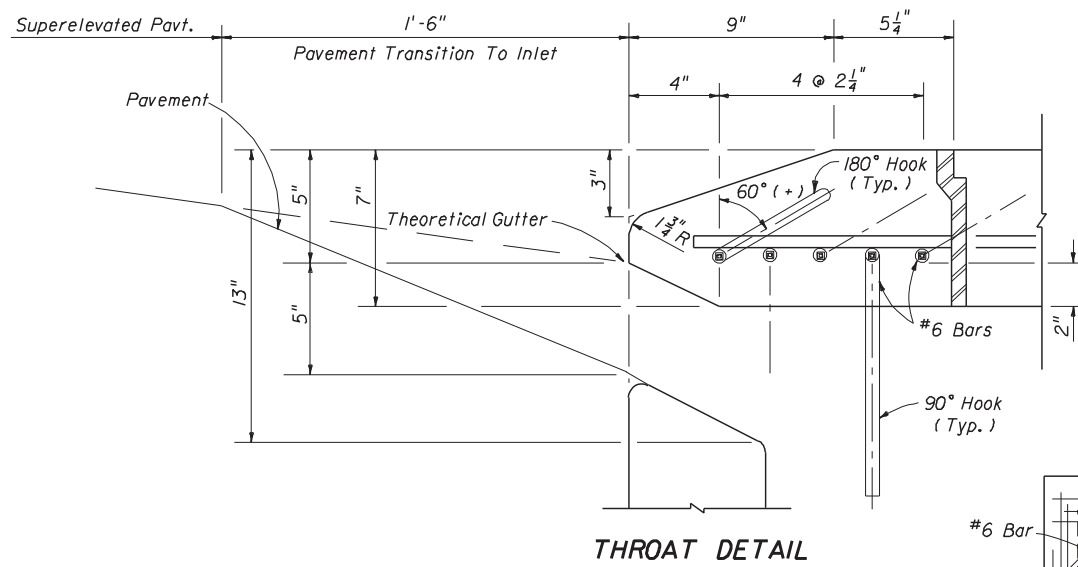
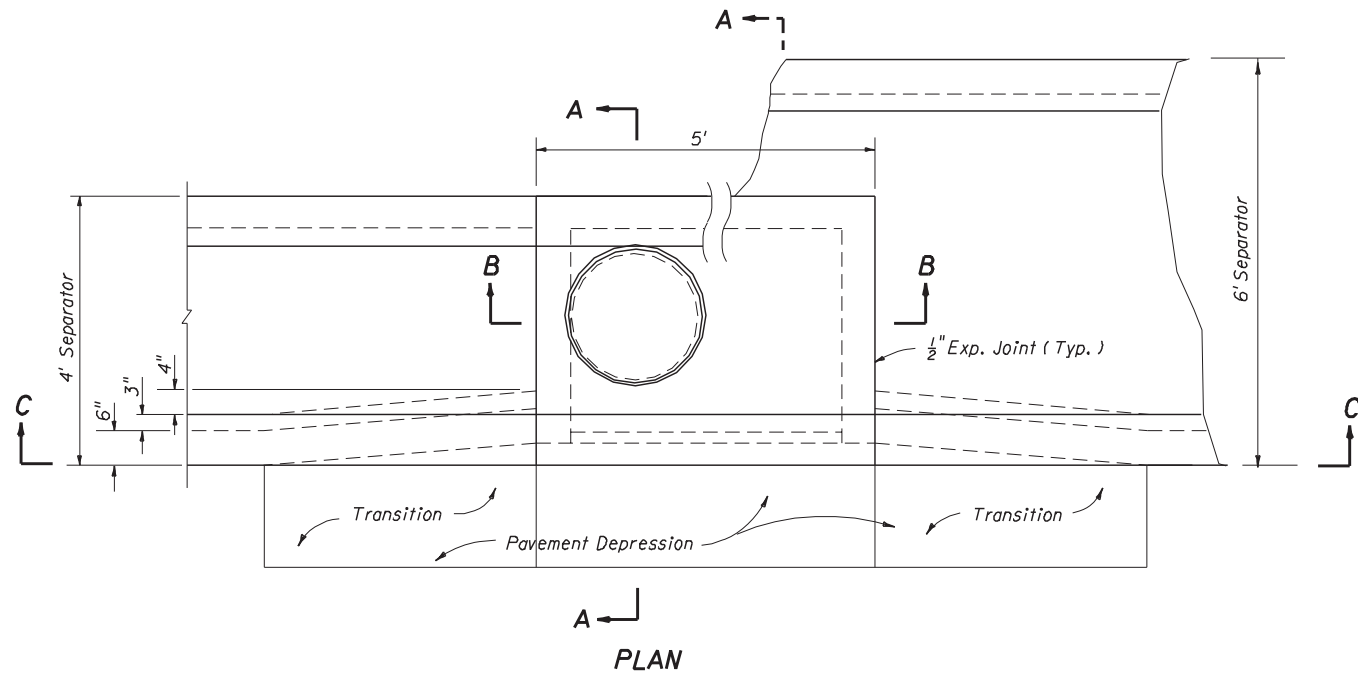


CAST IRON COVER

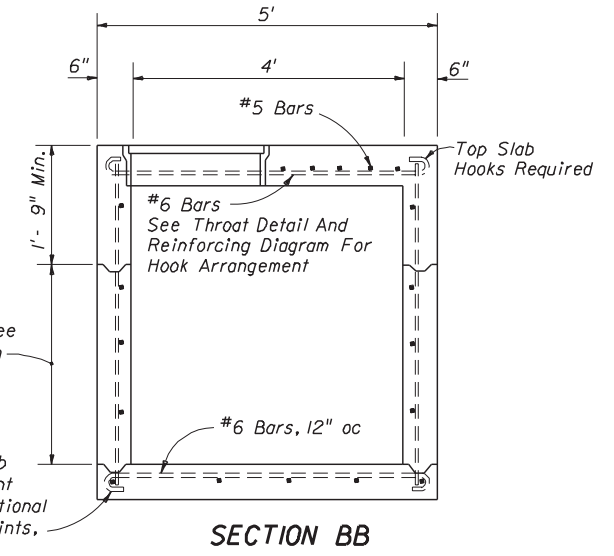
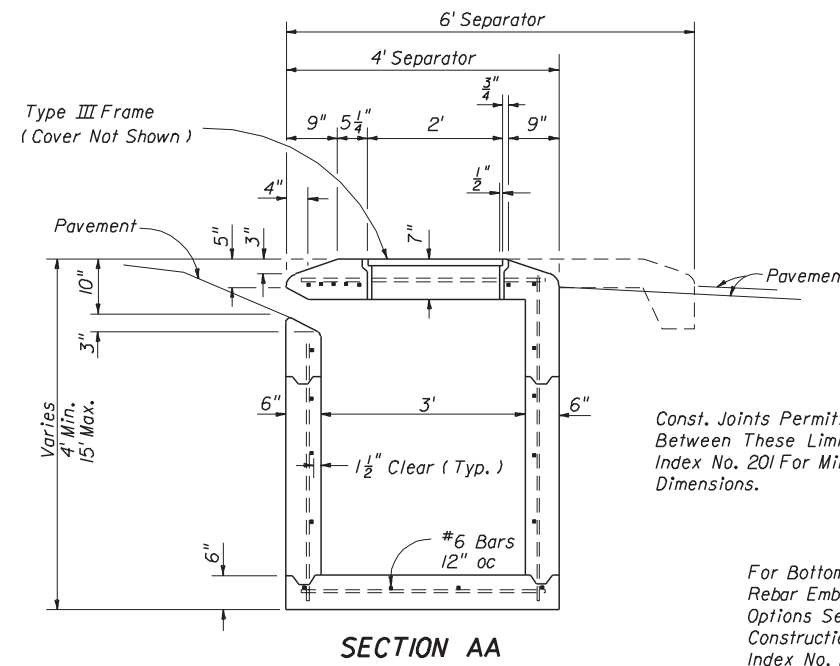
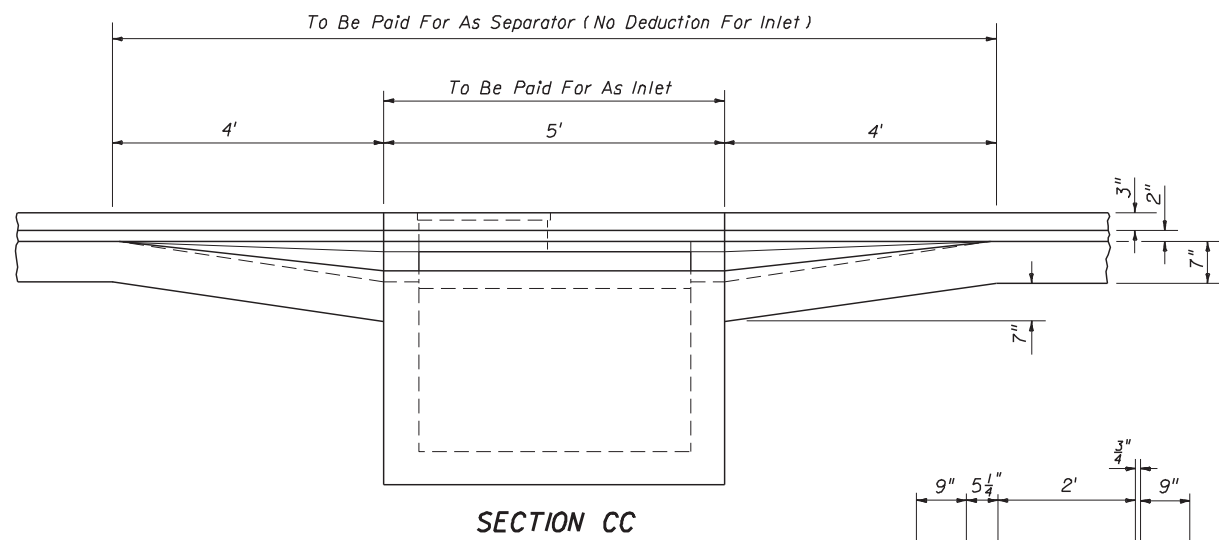
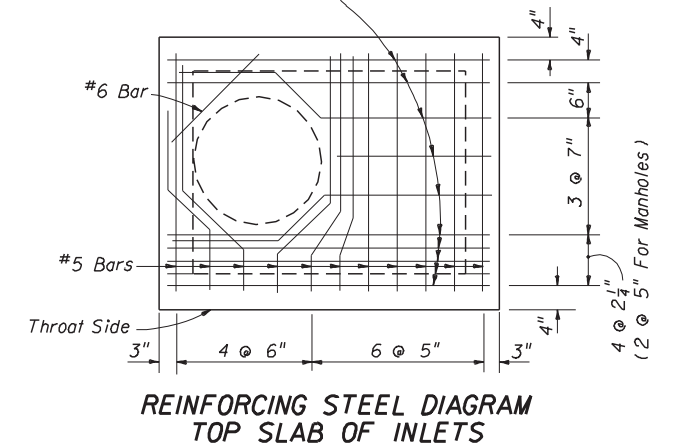
STEEL COVER



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
CURB INLET TOPS TYPES 5 & 6					
Designed By	Names	Dates	Approved By		
Drawn By			<i>S. A. Mchenroe</i> State Drainage Engineer		
Checked By			Revision	Sheet No.	Index No.
			00	2 of 2	211



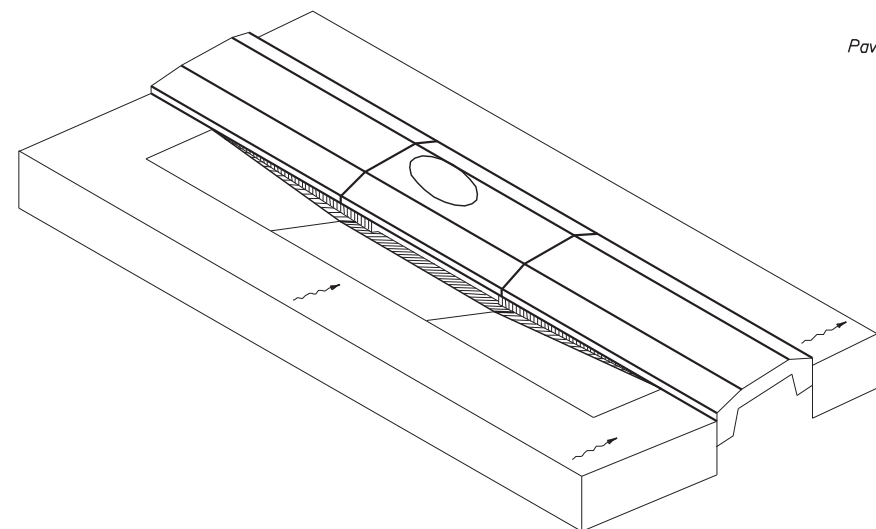
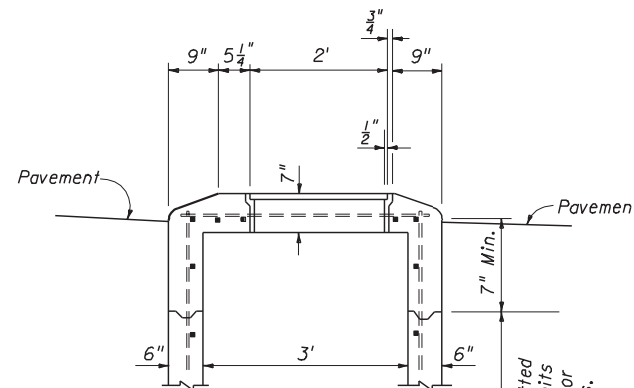
#6 Bars
 ACI Std. Hooks Required Each End Of
 Straight Bars And Right End Of Bent
 Bars: 180° Hooks, Canted 60° (+), On
 Odd Bars; 90° Hooks, Down, On Even
 Bars Numbered From Throat Side.



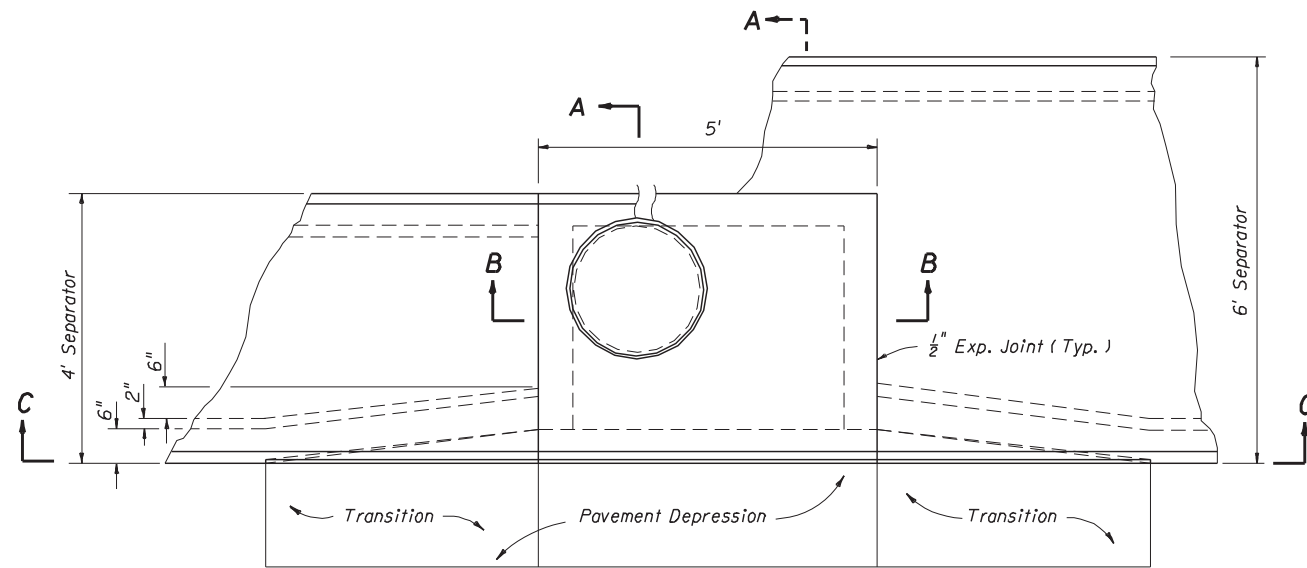
GENERAL NOTES

1. This inlet is used in Traffic Separators Types I and II; or, in separators constructed with Curbs Types A, B and E and sidewalk paving, which cannot accommodate Inlets Types 1, 2, 3, 4, 5, or 6. Use of this Inlet on through traffic side of the separator is not permitted in medians with Curb Types A and B. Locate inlet outside of pedestrian cross traffic.
2. Reinforcing-#4 bars @ 12" centers unless otherwise noted. Cut or bend bars out of way of pipe when necessary. Bars to clear pipe by 1/2".
3. Recommended maximum pipe sizes are 24" longitudinal and 30" transverse. For larger pipe, inlets with Alt. B bottoms, Index No. 200 are recommended.
4. For supplementary details see Index No. 201.
5. Inlet to be paid for under the contract unit price for Inlets (Curb) (Type 7), Each.

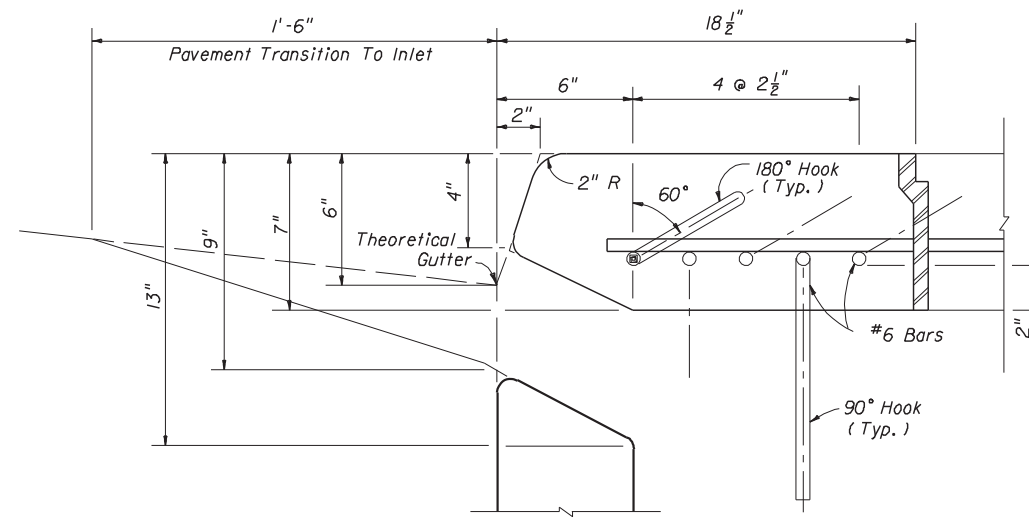
MODIFICATION WHEN USED AS A MANHOLE



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CURB INLET TYPE 7				
Names	Dates	Approved By		
Designed By	EGR 08/81	S. A. McHenry State Drainage Engineer		
Drawn By	HSD 08/81	Revision	Sheet No.	Index No.
Checked By	JG 08/81	00	1 of 1	212

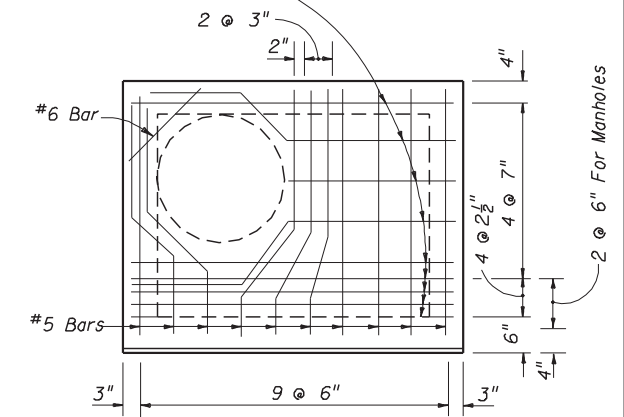


PLAN

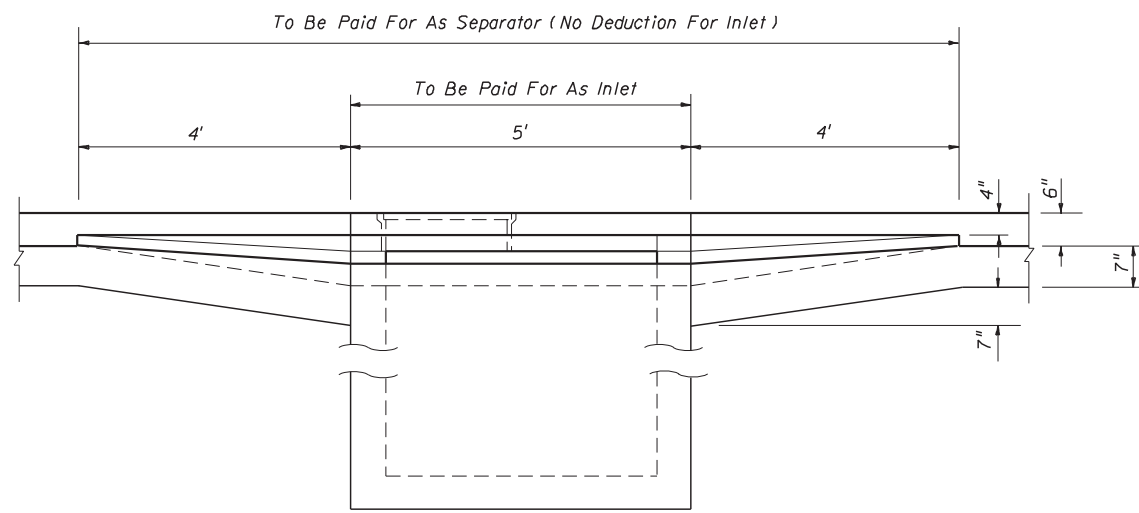


THROAT DETAIL (SECTION AA)

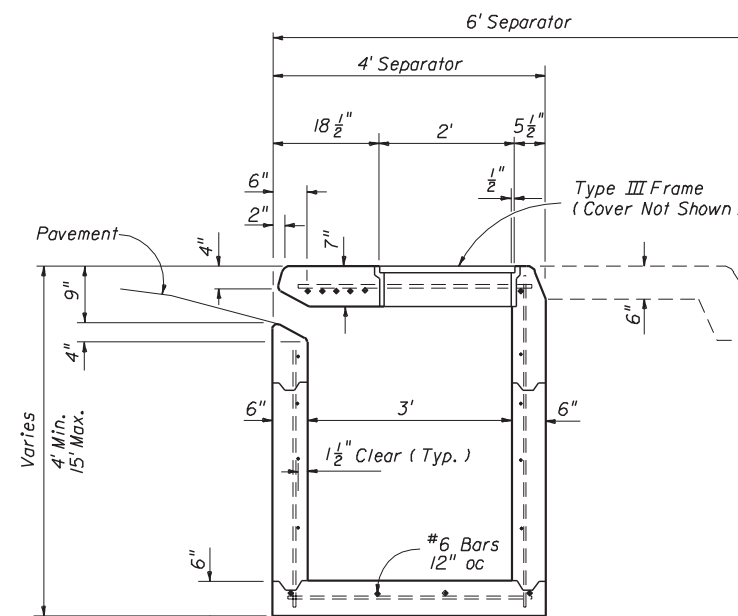
#6 Bars
 ACI Std. Hooks Required Each End Of
 Straight Bars And Right End Of Bent
 Bars. 180° Hooks, Canted 60° (+), On Odd
 Bars; 90° Hooks, Down, On Even Bars
 Numbered From Throat Side.



REINFORCING STEEL DIAGRAM
 TOP SLAB OF INLET

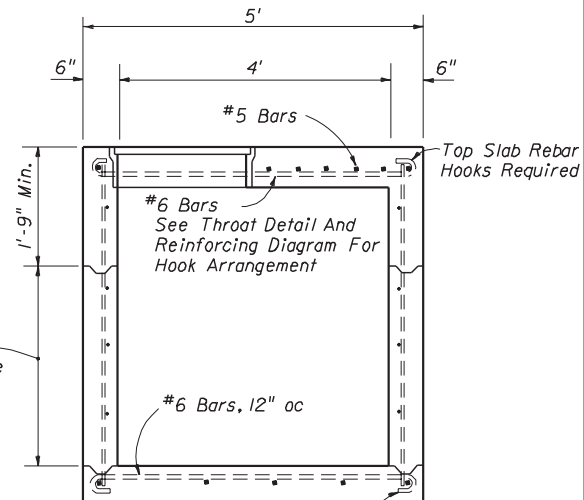


SECTION CC



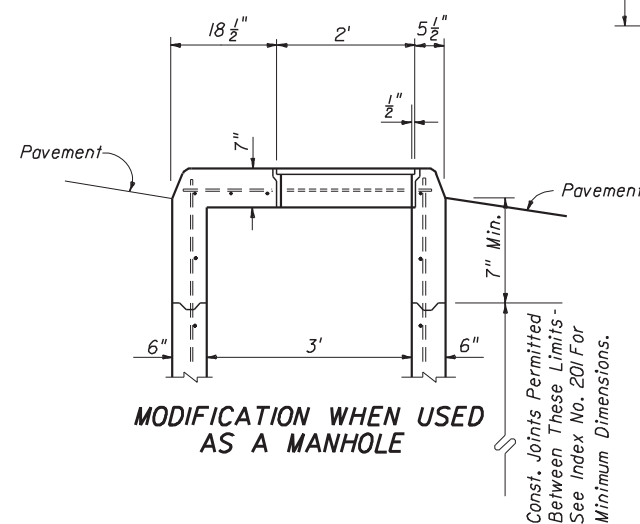
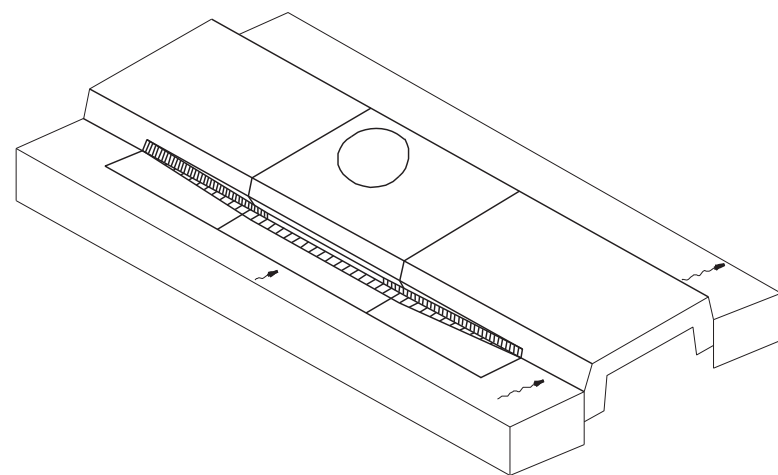
SECTION AA

Const. Joints Permitted
 Between These Limits - See
 Index No. 201 For Minimum
 Dimensions.



SECTION BB

For Bottom Slab
 Rebar Embedment
 Options See Optional
 Construction Joints,
 Index No. 201.



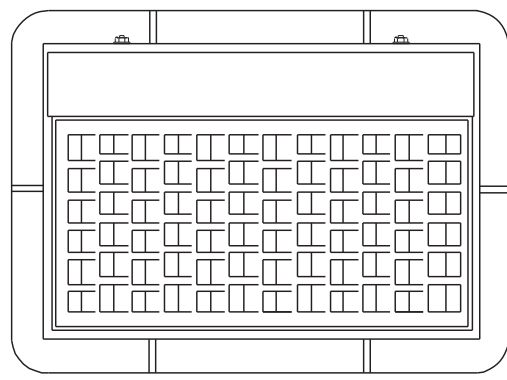
MODIFICATION WHEN USED
 AS A MANHOLE

Const. Joints Permitted
 Between These Limits -
 See Index No. 201 For
 Minimum Dimensions.

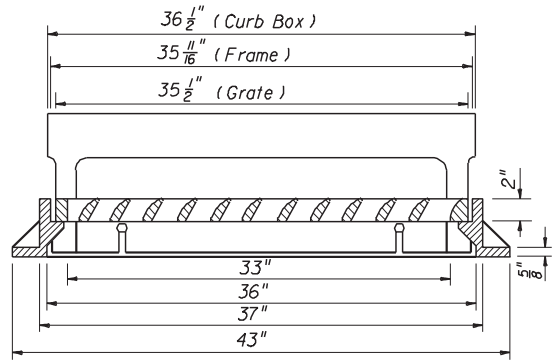
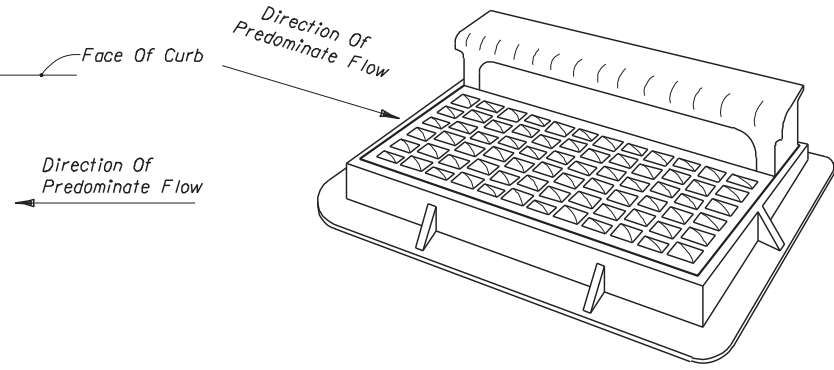
GENERAL NOTES

1. This inlet is to be used only in Traffic Separators Types III and IV; or, in separators constructed with Curbs Types D and F and sidewalk paving, which cannot accommodate Inlets Types 1, 2, 3, 4, 5 or 6. Use of this inlet on the through traffic side of the separator should be avoided in medians constructed with Curb Type D (Curb inlets Types 9 or 10 are recommended). Locate inlet outside of pedestrian cross traffic.
2. Reinforcing - #4 bars at 12" centers unless otherwise noted. Cut or bend bars out of way of pipe when necessary. Bars to clear pipe by 1 1/2".
3. Recommended maximum pipe sizes are 24" longitudinal and 30" transverse. For larger pipe, inlets with Alt. B bottoms, Index No. 200 are recommended.
4. For supplemental details see Index No. 201.
5. Inlet to be paid for under the contract unit price for Inlets (Curb) (Type 8), Each.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CURB INLET TYPE 8				
Names	Dates	Approved By		
Designed By	EGR 07/81	S. A. McHenry State Drainage Engineer		
Drawn By	HSD 07/81	Revision	Sheet No.	Index No.
Checked By	JG 07/81	00	1 of 1	213

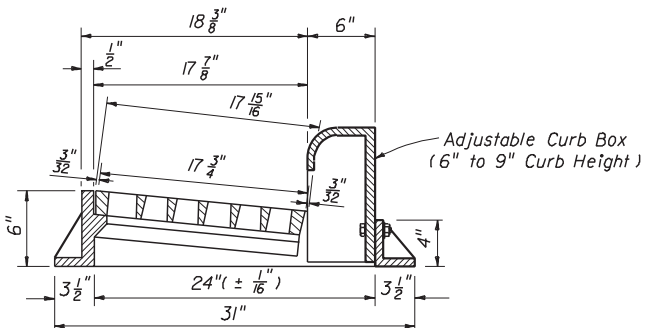


TOP VIEW

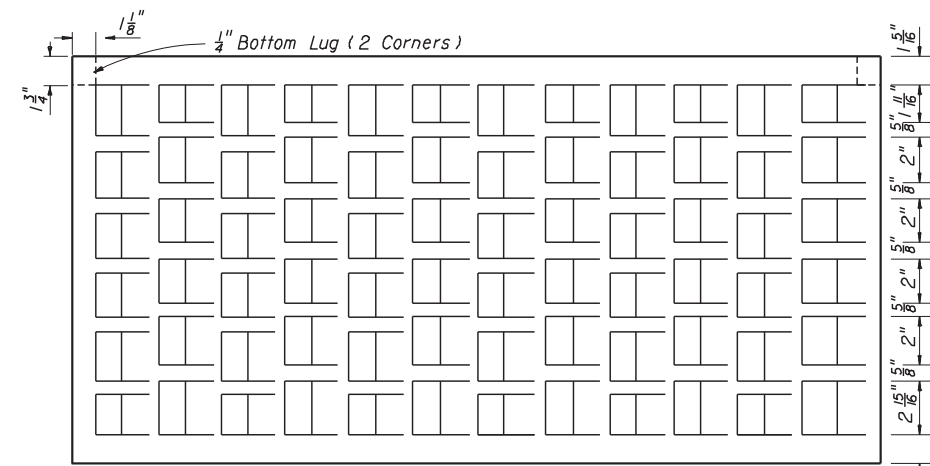


LONGITUDINAL SECTION

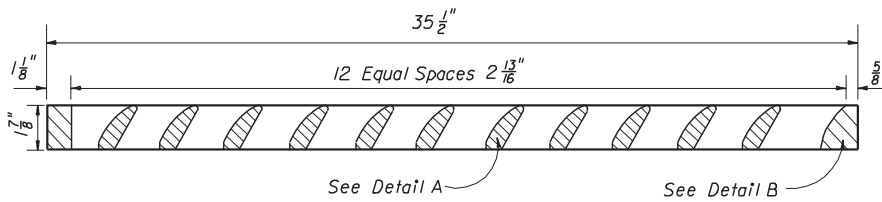
FRAME AND GRATE



TRANSVERSE SECTION

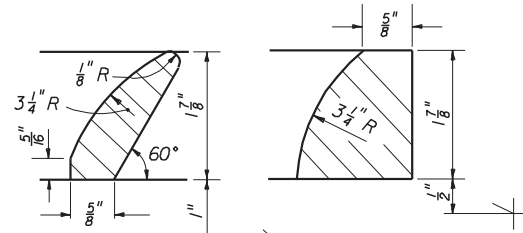


TOP VIEW



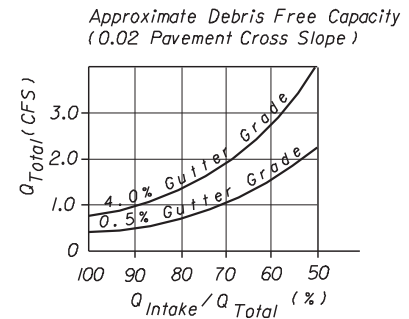
SECTION

GRATE DETAIL

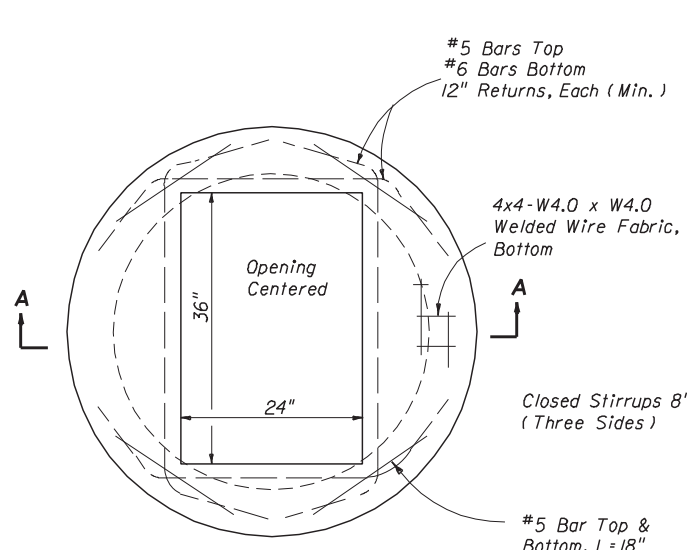


DETAIL A

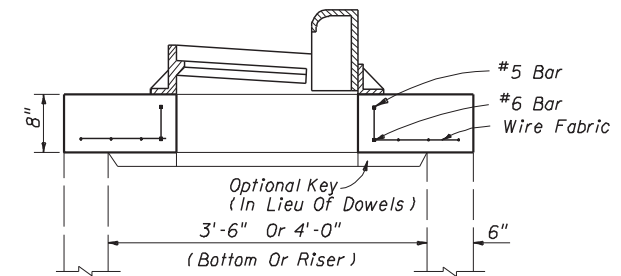
DETAIL B



EFFICIENCY CURVE

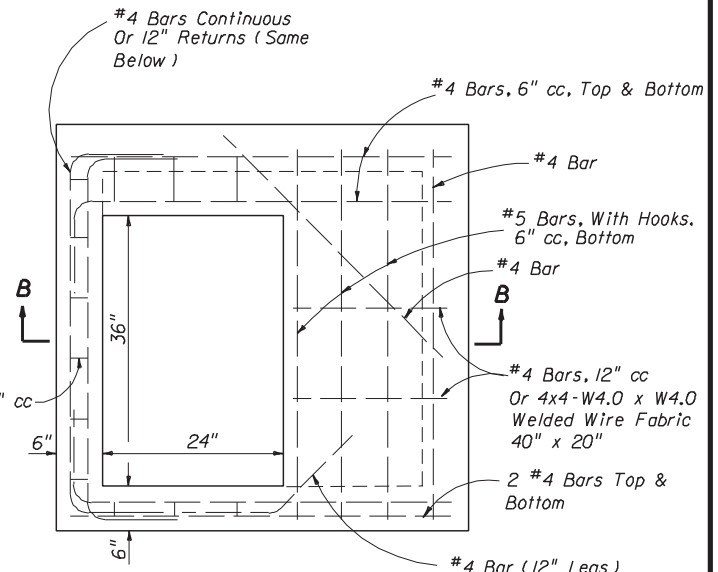


TOP VIEW

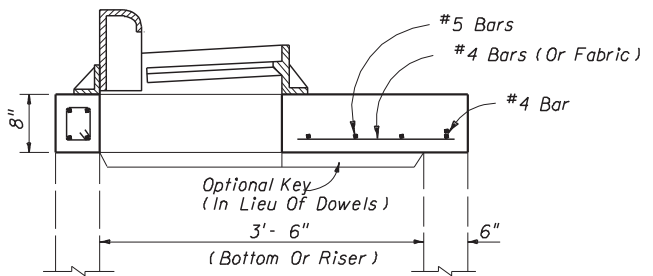


SECTION AA

(SEE NOTE 6 BELOW)



TOP VIEW



SECTION BB

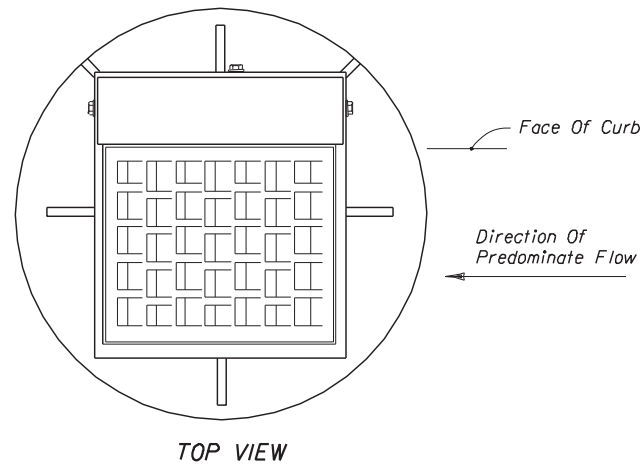
(SEE NOTE 6 BELOW)

TOP SLABS

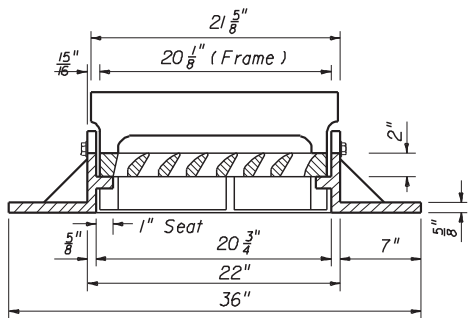
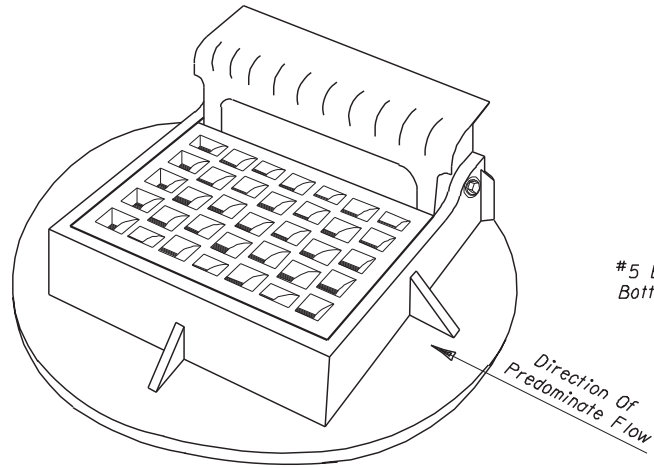
GENERAL NOTES

1. This inlet is primarily intended for locations with light to moderate flows where right of way does not permit the use of throat Curb Inlets Types 1 through 6. The typical application is on curb returns to city streets. The inlet grate is suitable for pedestrian and bicycle traffic.
2. This inlet to be located in vertical faced curbs such as Curb and Gutter Type F. Grate shall be oriented with vanes directed toward predominate flow. Inlet to be located outside pedestrian crosswalk where practical.
3. For structure bottoms see Index No. 200. For supplemental details see Index No. 201.
4. All steel in slab tops shall have 1/4" minimum cover unless otherwise shown. Tops shall be either cast-in-place or precast concrete.
5. For Alternate B applications, top slab openings shall be placed such that 2 edges of inlet frame will be located directly above bottom wall or riser wall.
6. When used on a structure with dimensions larger than those detailed above and risers are not applied, the top slab shall be constructed using Index 200 with the slab opening adjusted to 24" x 36". The "Special Top Slab" on Index 200 is not permitted.
7. Frame may be adjusted with one to six courses of brick.
8. Inlet and grate detail shown is Neenah R-3067-L. Vaned grates with approximately equal openings will be permitted that satisfy AASHTO H-20 loading. Inlet and grate shall be Class 30 castings in accordance with ASTM A48M. Grates shall be reversible, right or left.

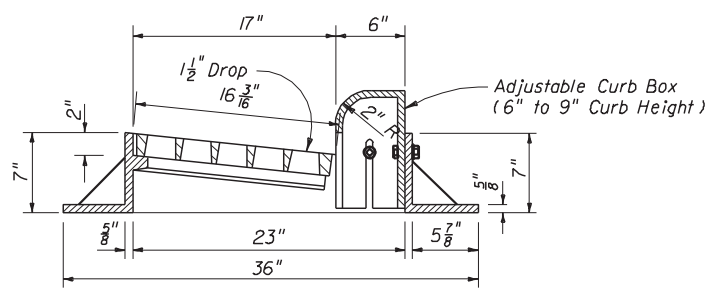
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CURB INLET TOP TYPE 9				
Names	Dates	Approved By		
Designed By	EGR	<i>A. A. McHenry</i> State Drainage Engineer		
Drawn By	HSD	01/81	Revision	Sheet No.
Checked By	JVG	01/81	00	1 of 1
				Index No. 214



TOP VIEW

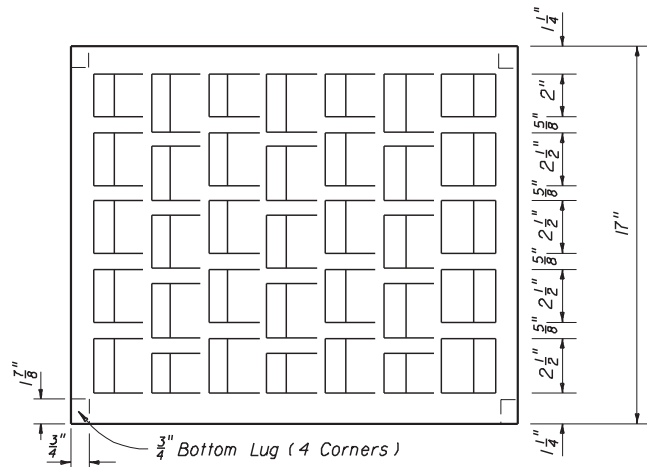


LONGITUDINAL SECTION

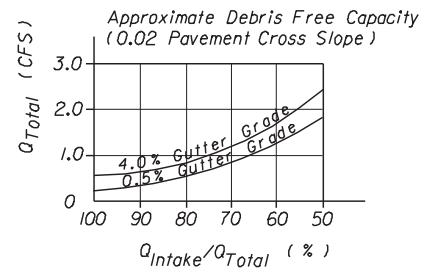


TRANSVERSE SECTION

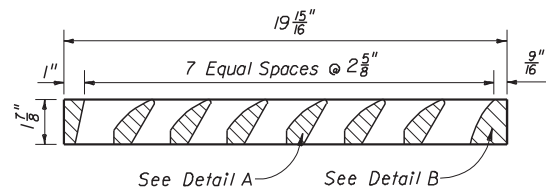
FRAME AND GRATE



PLAN

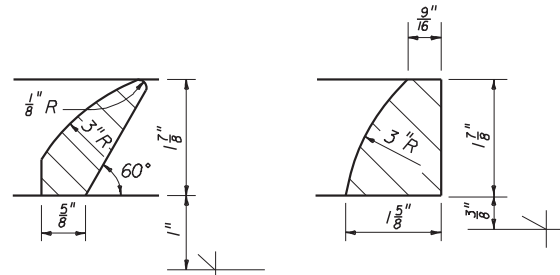


EFFICIENCY CURVE



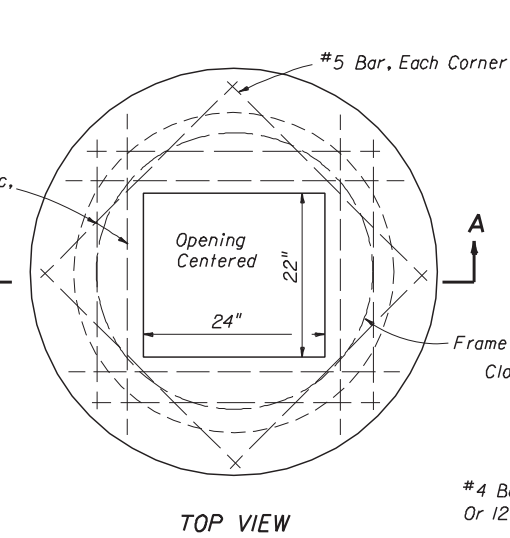
SECTION

GRATE DETAIL

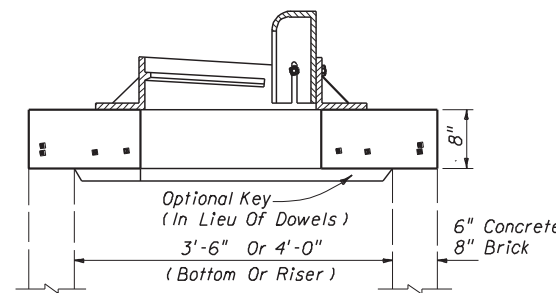


DETAIL A

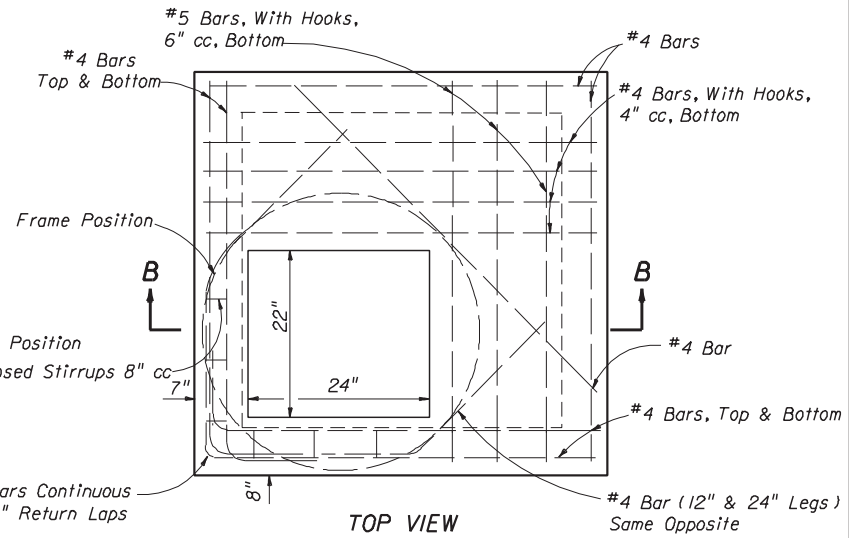
DETAIL B



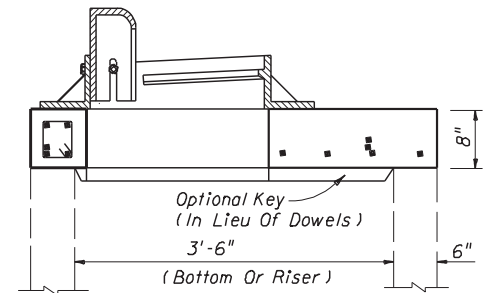
TOP VIEW



SECTION AA
(SEE NOTE 6 BELOW)



TOP VIEW



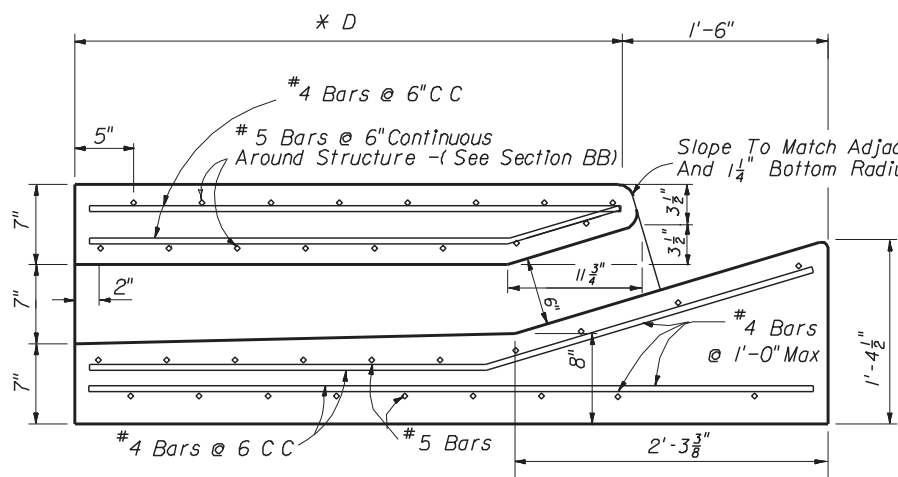
SECTION BB
(SEE NOTE 6 BELOW)

TOP SLABS

GENERAL NOTES

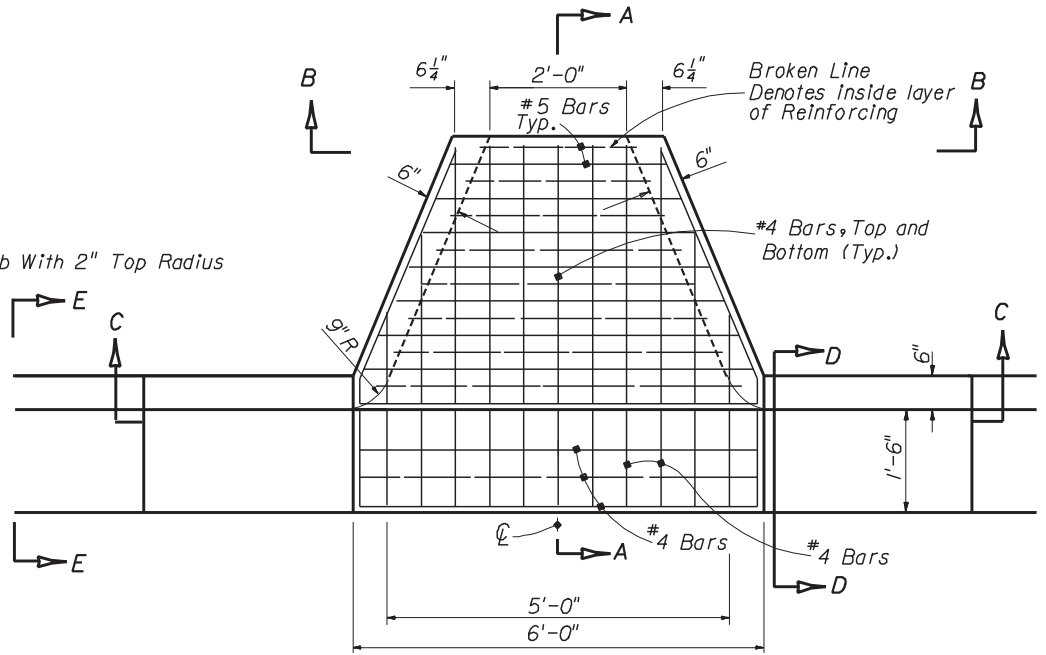
1. This inlet is primarily intended for locations with light flows where right of way does not permit the use of throated Curb Inlets Types I through 6. The typical application is on curb returns to city streets. The inlet grate is suitable for pedestrian and bicycle traffic.
2. This inlet to be located in vertical faced curbs such as Curb and Gutter Type F. Grate shall be oriented with vanes directed toward predominate flow. Inlet to be located outside pedestrian crosswalk where practical.
3. For structure bottoms see Index No. 200. For supplemental details see Index No. 201.
4. All steel in slab tops shall have 1 1/4" minimum cover unless otherwise shown. Tops shall be either cast-in-place or precast concrete.
5. For Alternate B applications, top slab openings shall be placed such that 2 edges of inlet frame will be located directly above bottom or riser walls.
6. When used on a structure with dimensions larger than those detail above and risers are not applied, the top slab shall be constructed using Index 200 with the slab opening adjusted to 24" x 36". The "Special Top Slab" on Index 200 is not permitted.
7. Frame may be adjusted with one to six courses of brick.
8. Inlet and grate detail shown is Neenah R-3065-L. Vaned grates with approximately equal openings will be permitted that satisfy AASHTO H-20 loading. Inlet and grate shall be Class 30 castings in accordance with ASTM A48M. Grates shall be reversible, left or right.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
CURB INLET TOP TYPE 10					
Names	Dates	Approved By			
Designed By	EGR	<i>S. A. McHenry</i> State Drainage Engineer			
Drawn By	HSD	1/81	Revision	Sheet No.	Index No.
Checked By	JVG	1/81	00	1 of 1	215

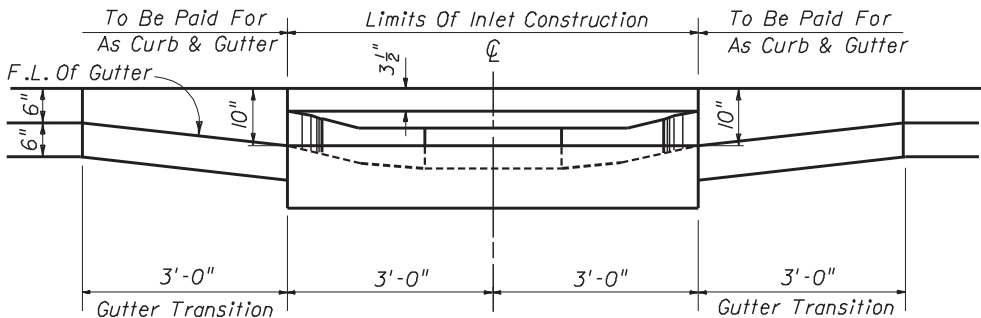


* See dimension and location in the plans (4'-0"-7'-6" Typ.)

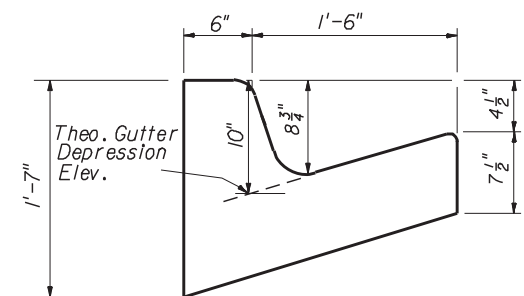
SECTION AA



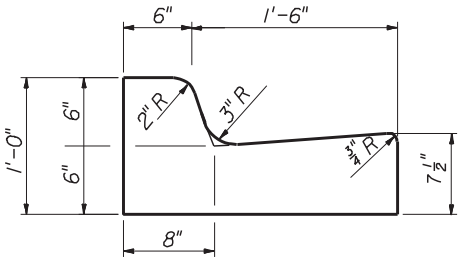
TOP VIEW



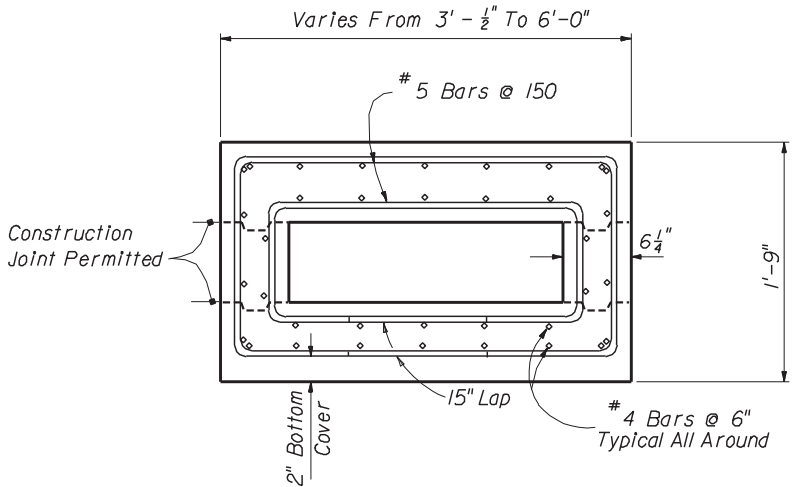
SECTION CC



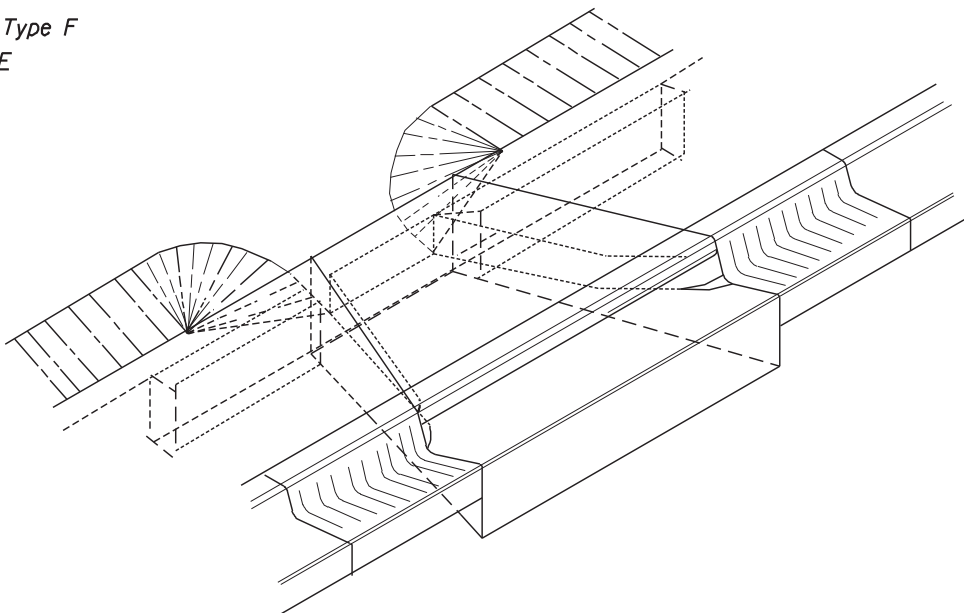
SECTION DD



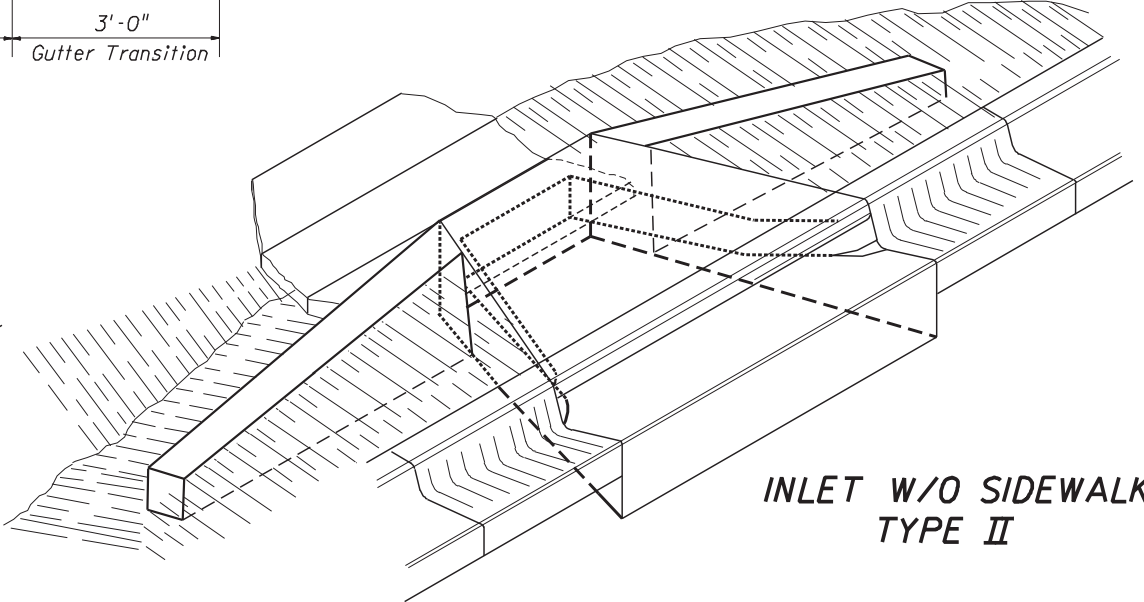
Curb And Gutter Type F
SECTION EE



SECTION BB



INLET W/SIDEWALK
TYPE I



INLET W/O SIDEWALK
TYPE II

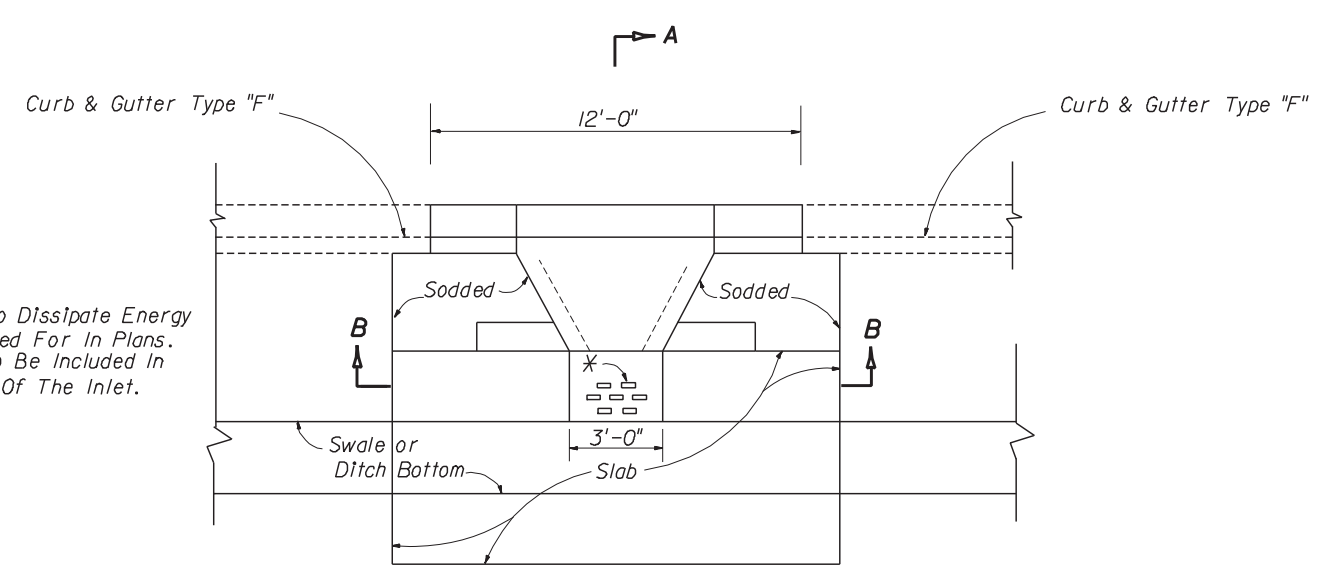
GENERAL NOTES

1. The finished grade and slope of the inlet top are to conform with the finished cross slope and grade of the proposed sidewalk and/or border.
2. When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly. Bend steel when necessary.
3. All steel shall have 1 1/4" minimum cover unless otherwise shown. Inlets can be either cast-in-place or precast concrete.
4. All reinforcement is ASTM A615/A615M Grade 60 steel, either smooth or deformed. Equivalent area grade 40 steel or 65 ksi welded wire fabric maybe substituted.
5. Precasting of this inlet will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer.
6. Inlets to be paid for under the contract unit price for Inlets (Closed Flume) EA.

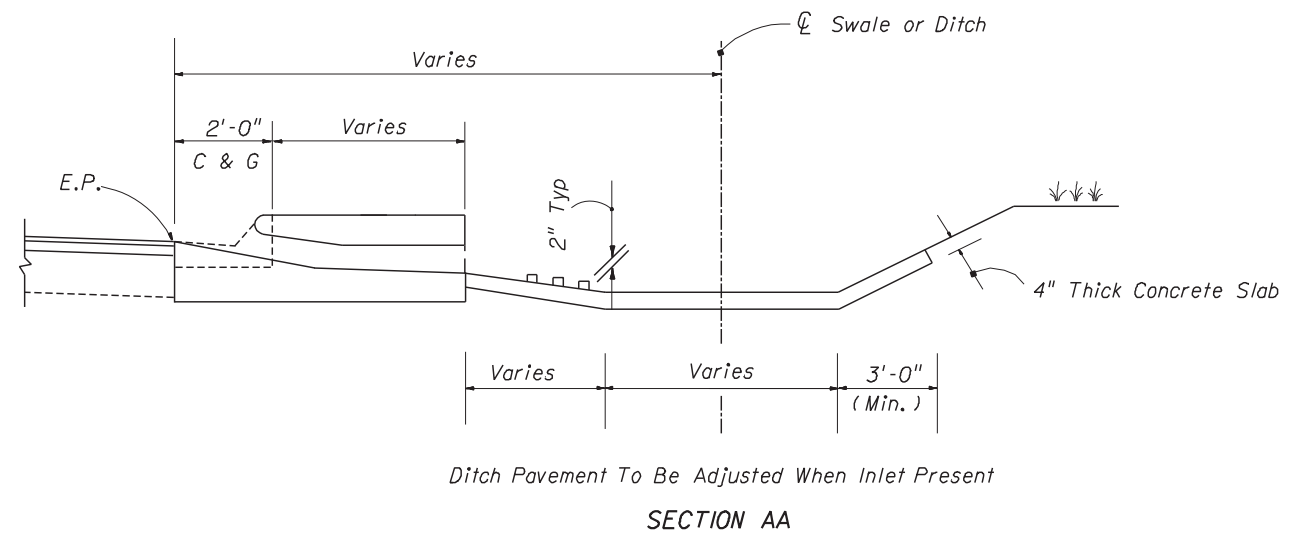
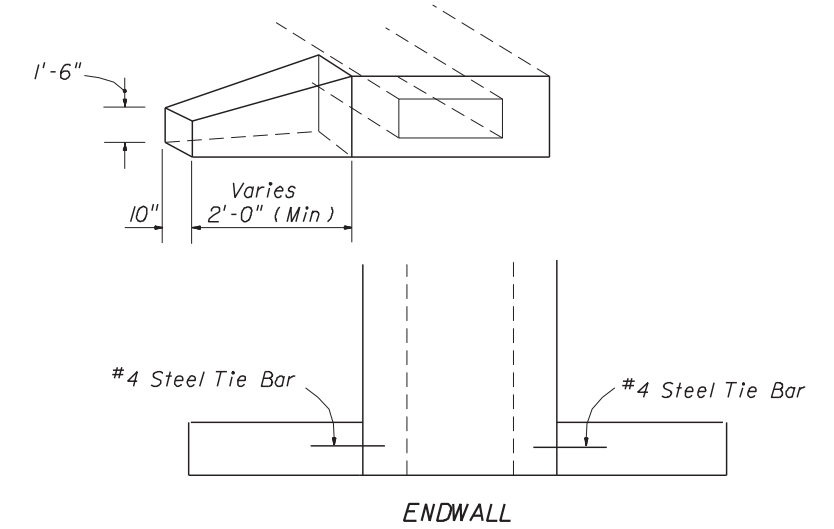
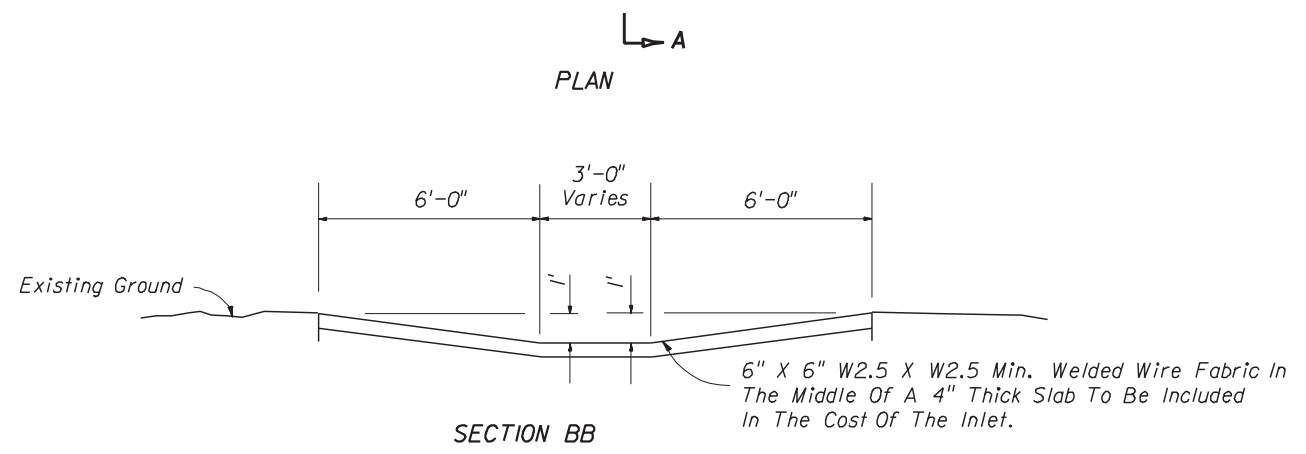
DESIGN NOTES

1. These inlets are designed for use with Type F curb and gutter only. This inlet is intended for locations with light to moderate flows.
2. Designer must specify "D" dimension in plans.
3. Designer must specify where energy dissipating bricks are required.

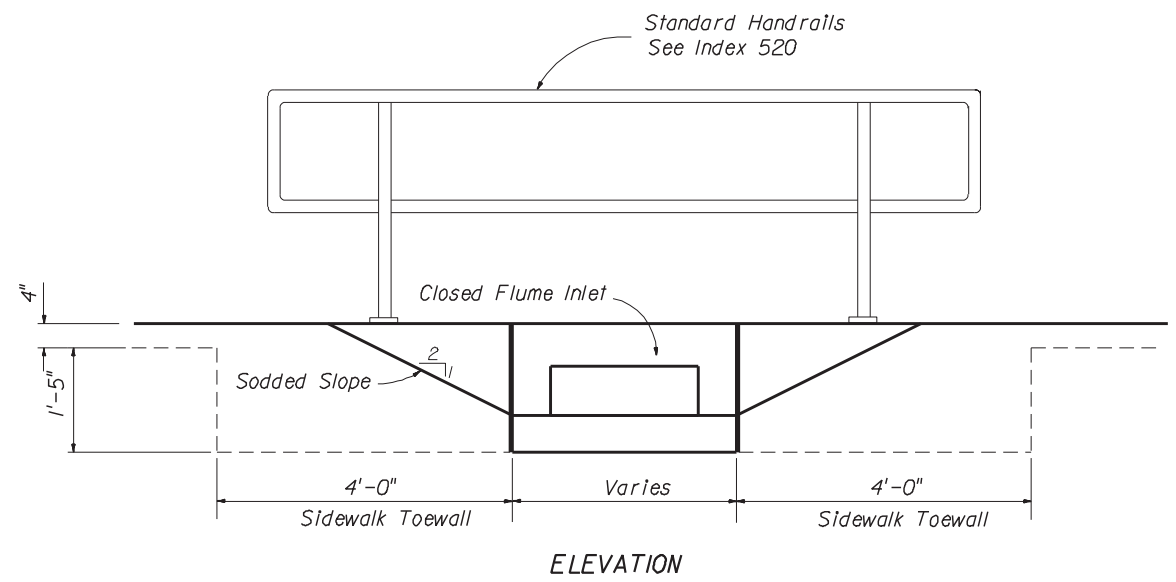
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CLOSED FLUME INLET				
Designed By	J. J. L.	Dates	03/96	Approved By
Drawn By		Revision	00	State Drainage Engineer
Checked By	W. P. H.	Sheet No.	1 of 2	Index No.
				216



* Bricks To Dissipate Energy When Called For In Plans. Bricks To Be Included In The Cost Of The Inlet.



INLET • NO SIDEWALK BACK OF CURB

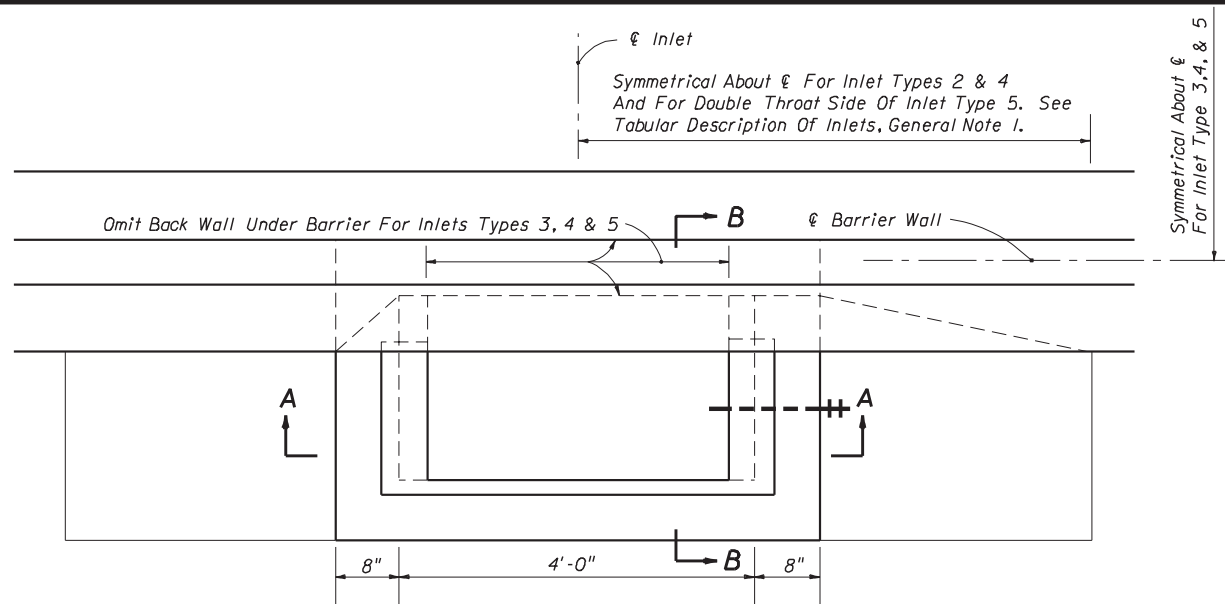


INLET • WITH SIDEWALK BACK OF CURB

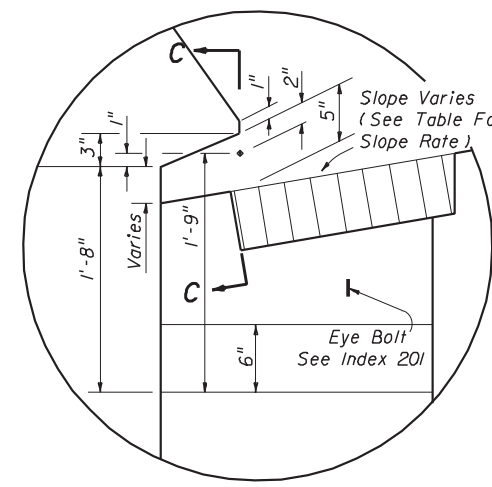
GENERAL NOTES

- 1. Chamfer all exposed edges $\frac{3}{4}$ "

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CLOSED FLUME INLET				
Names	Dates	Approved By		
Designed By	J.D.T. 03/99	<i>A. A. McHenry</i> State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	W.P.H. 03/99	00	2 of 2	216

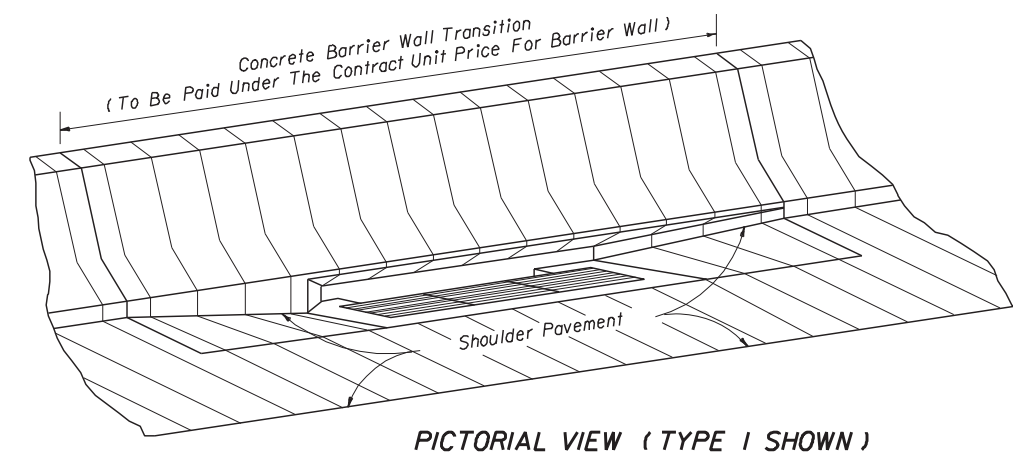


PLAN (INLETS TYPES 1 THRU 5)

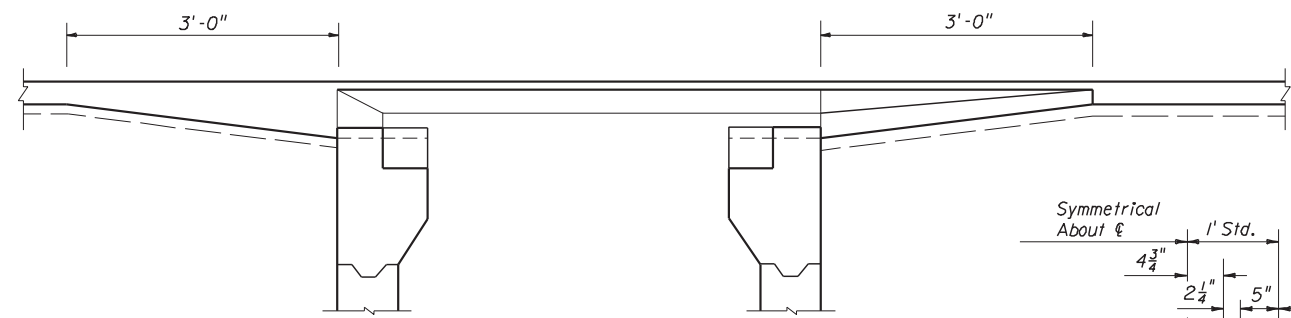


INSET A

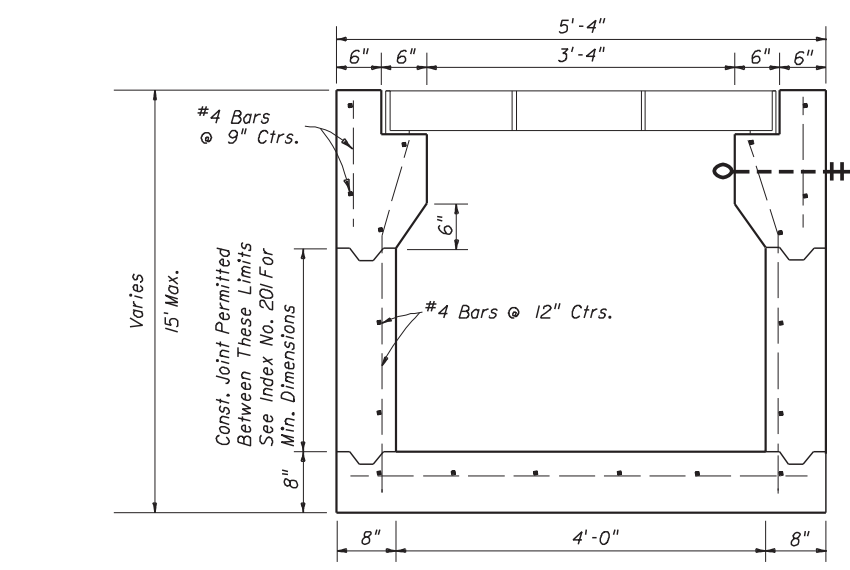
GRATE SLOPE		
Shoulder Slope	Grate Slope Rate	Remarks
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0.05	1:6	Std. Med. Flex. Shldr.
0.06	1:5.6	
0.07	1:5.2	
0.08	1:5	
0.09	1:4.5	
0.10	1:4.5	e (max)



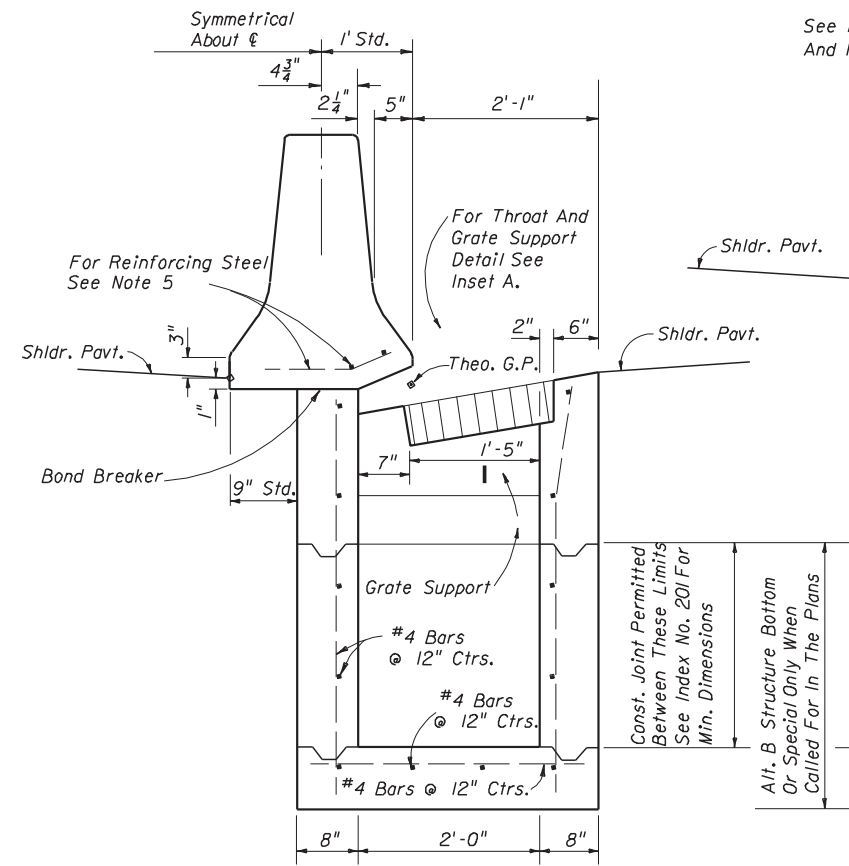
PICTORIAL VIEW (TYPE 1 SHOWN)



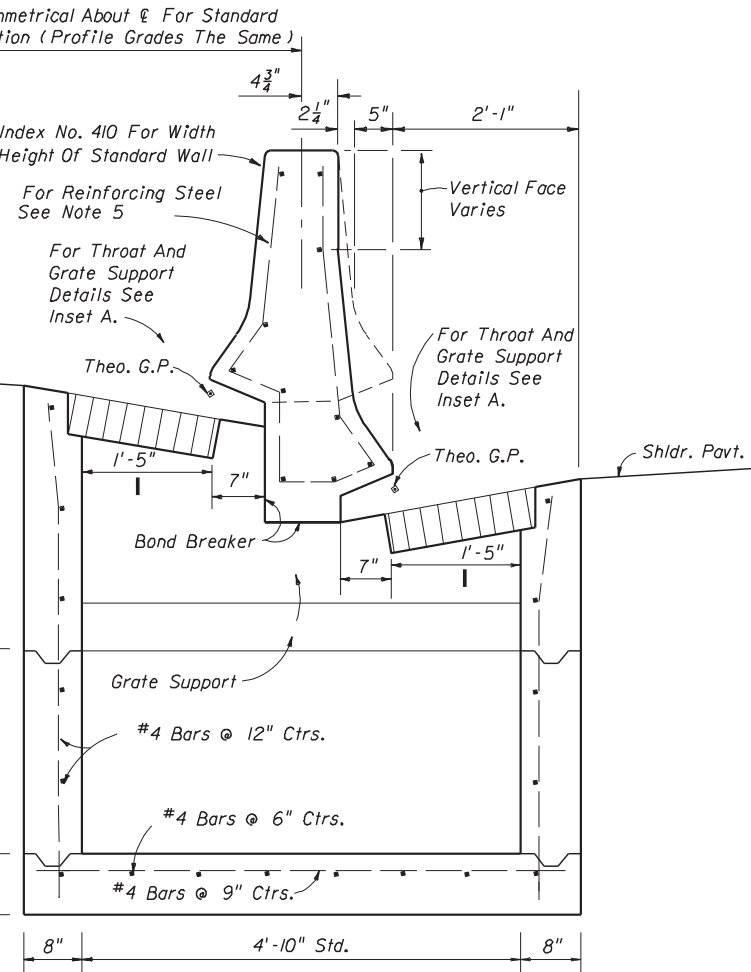
SECTION CC



SECTION AA



SECTION (INLETS TYPES 1 & 2)



SECTION BB

SECTION (INLETS TYPES 3, 4 & 5) (NON-SYMMETRICAL SECTION SHOWN)

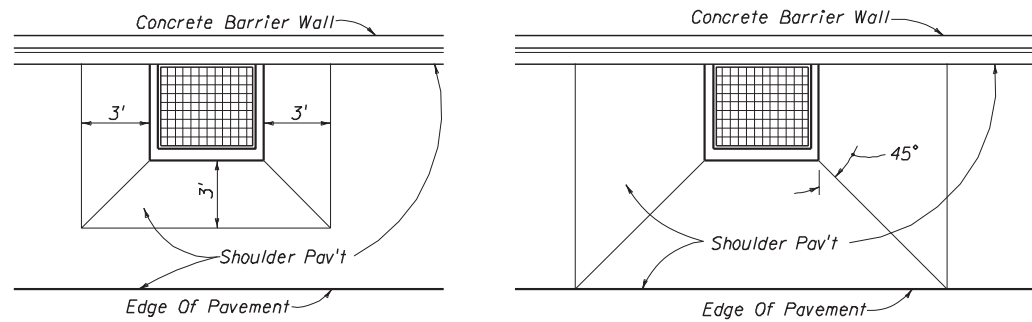
GENERAL NOTES

- Inlet Descriptions:
 Type 1 Single throat, one side of barrier wall.
 Type 2 Double throats, one side of barrier wall.
 Type 3 Two single throats, opposite sides of barrier wall.
 Type 4 Two double throats, opposite sides of barrier wall.
 Type 5 Double throats, one side of barrier wall, and single throat other side of barrier wall.
- For grate details see Index No. 220. The parallel bar grate shall be used unless the reticuline grate is called for in the plans. The reticuline grate shall be specified where bicycle traffic is anticipated.
- For standard concrete barrier wall dimensions, and for dimensions of concrete barrier wall incorporating light standards within the wall, see Index No. 410.
- Reinforcing steel shall have 2" minimum cover.
- All reinforcing steel #4 bars. Longitudinal steel bars extend over full length of concrete barrier wall transition. Tie bars @ 12" ctrs. Reinforcing to be paid for under the contract unit price for Concrete Barrier Wall, LF.
- For supplemental details see Index No. 201.
- Inlets to be paid for under the contract unit price for Inlets (Median Barrier Type-), EA. Barrier wall to be paid for under the contract unit price for Concrete Barrier Wall, LF.

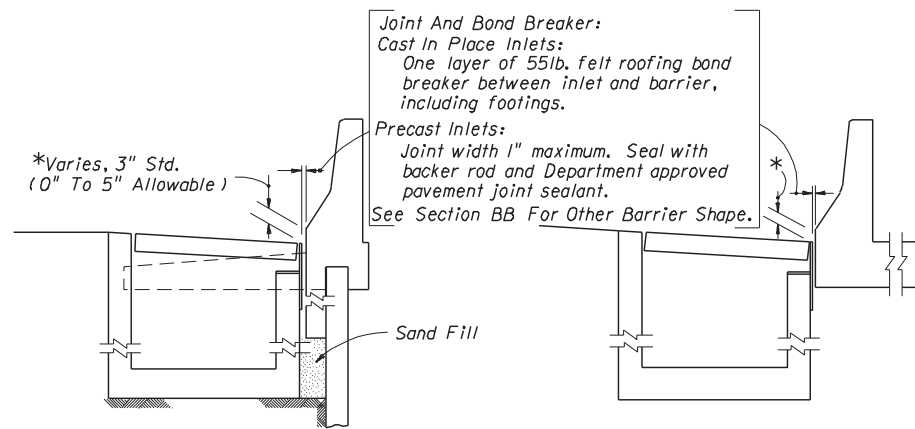
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

MEDIAN BARRIER INLETS
TYPES 1, 2, 3, 4 & 5

Names	Dates	Approved By		
Designed By		S. A. McHenry State Drainage Engineer		
Drawn By	HSD 06/83			
Checked By	JVG/JBW 07/83	Revision	Sheet No.	Index No.
		00	1 of 1	217

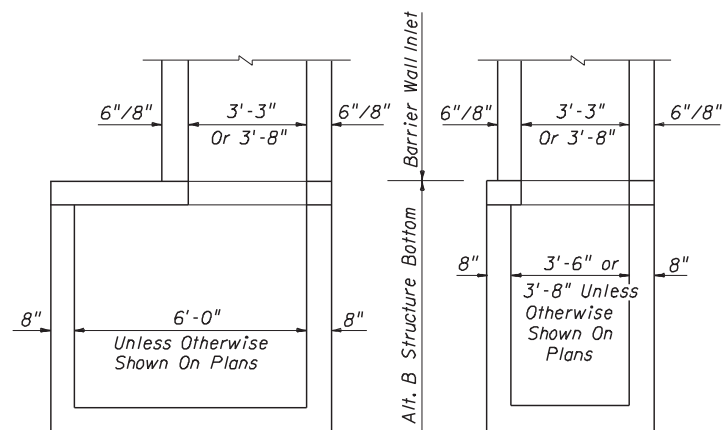


LOW SIDE SUPERELEVATION PAVEMENT WARP FOR SHOULDERS IN SUPERELEVATION
HIGH SIDE TRANSITION PAVEMENT WARP FOR SHOULDERS IN SUPERELEVATION



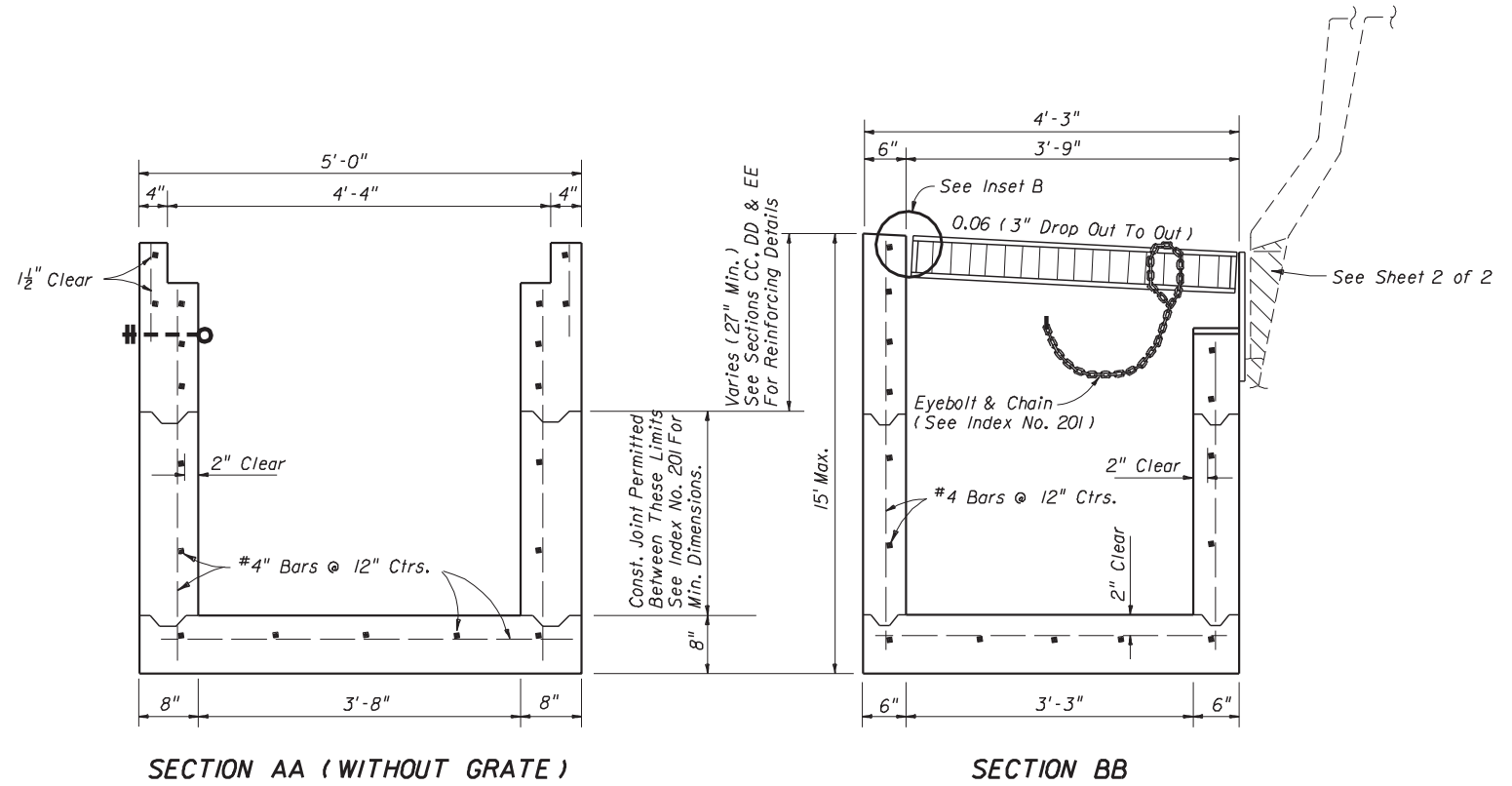
BARRIER WALL / RETAINING WALL SINGLE FACE ROADWAY BARRIER

INLET SECTION AT WALLS



Note: Alt. B Structure Bottom Only. See Index No. 200.

INLET WITH STRUCTURE BOTTOM

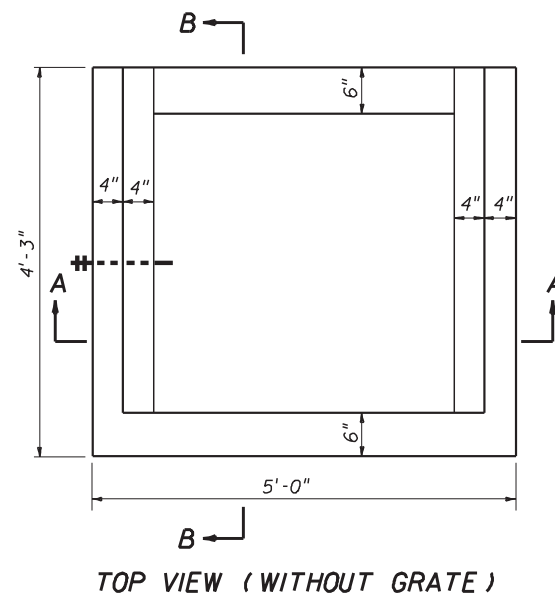


SECTION AA (WITHOUT GRATE)

SECTION BB

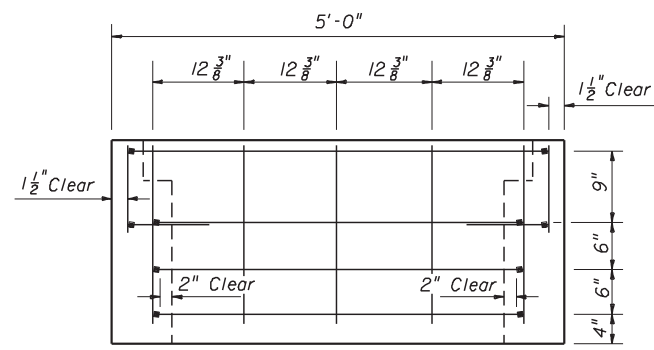
GENERAL NOTES

1. This inlet is primarily intended for use adjacent to concrete barrier walls on paved shoulders. Use of the inlet adjacent to other wall types shall be approved by the Drainage Engineer. The inlet is suitable for bicycle and occasional pedestrian traffic. It is not intended for use in curb and gutter or other areas where throated inlets are required, nor areas subject to high debris.
2. Inlets located in embankments constructed with earth anchored retaining wall shall be designed with minimum depths to reduce adverse impact on the anchorage system. Runs of pipe parallel to and near anchored wall shall be avoided wherever practical. Special coordination must be exercised during the design and construction of storm water systems within anchored wall systems.
3. Inlet bottoms and/or tops may be either precast or cast-in-place. Whether cast as a single unit or as multiple segments, and whether precast or cast-in-place, the upper 2'-3" of the inlet shall be reinforced in accordance with sections CC, DD and EE.
4. Exposed edges shall be chamfered $\frac{3}{4}$ ".
5. When Alternate G grate is specified in the plans, the grate is to be hot dipped galvanized after fabrication. Field installation of the filler bar called for in Inset B will not be permitted, thereby requiring tolerance adjustment during fabrication and/or casting, or, matching grate to structure prior to galvanizing.
6. For supplemental details see Index Nos. 200 and 201.
7. Inlets to be paid for under the contract unit for Inlets (Barrier Wall), Each.

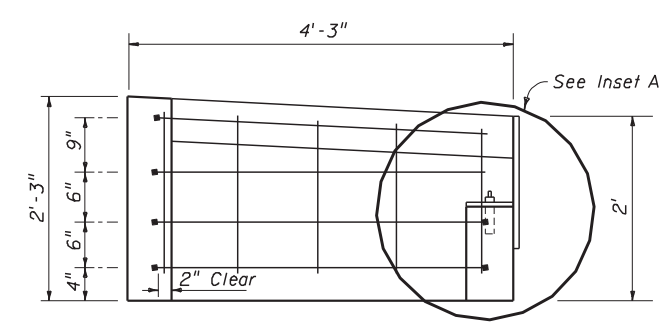


TOP VIEW (WITHOUT GRATE)

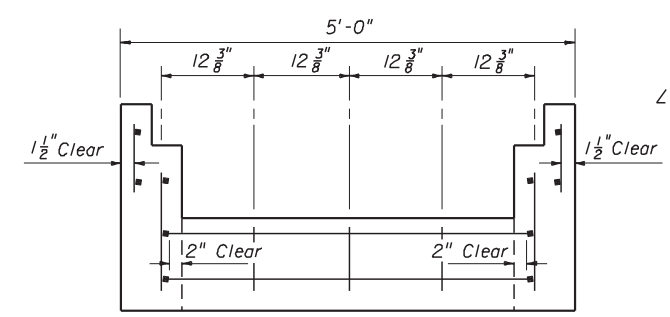
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
BARRIER WALL INLET				
Names	Dates	Approved By		
Designed By	JVG/EGR	09/86	 State Drainage Engineer	
Drawn By	HSD	09/86		
Checked By	JVG	09/86		
Revision		00	Sheet No.	Index No.
			1 of 2	218



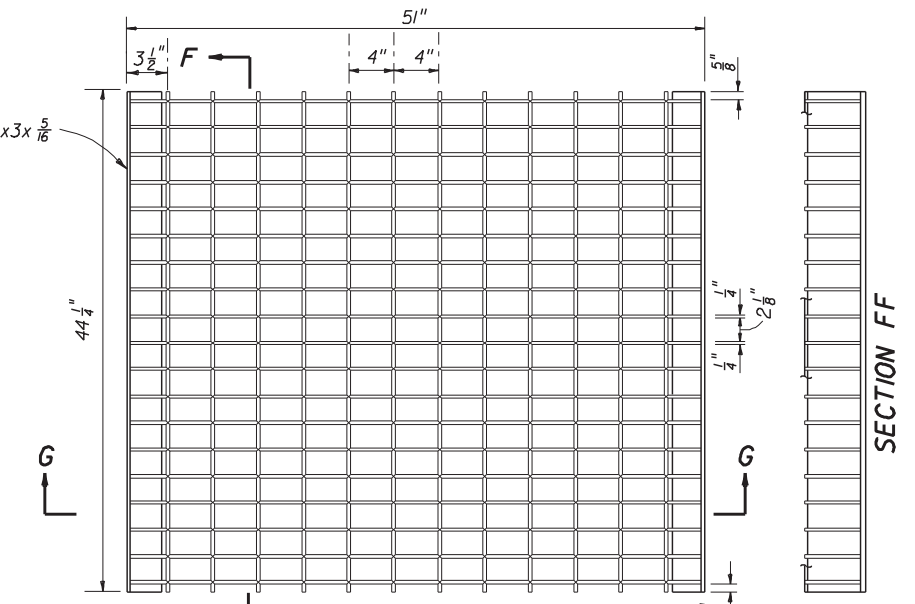
SECTION CC



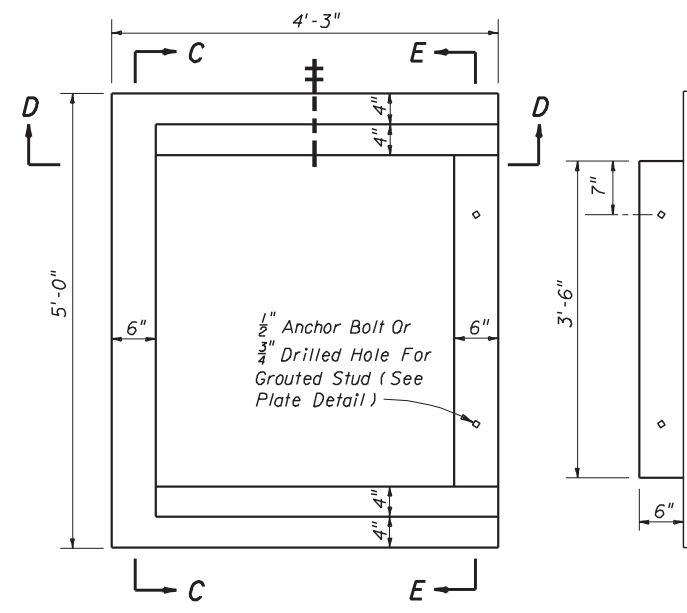
SECTION DD



SECTION EE

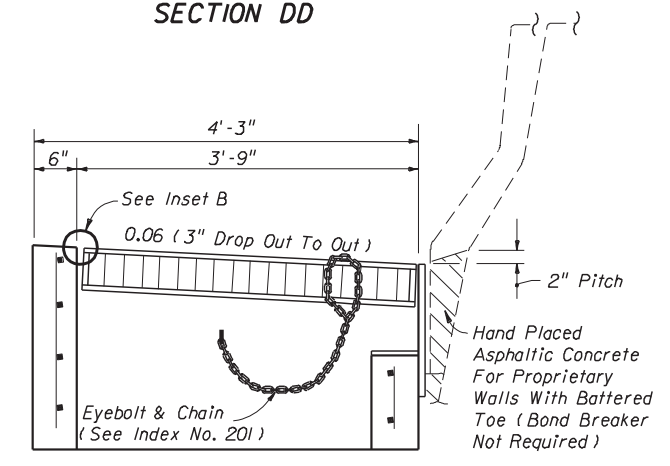


TOP VIEW
Main Bars 5" x 1/4"
Cross Bars: Either 3/8" Ø Electroforged Or 1/2" Ø Welded

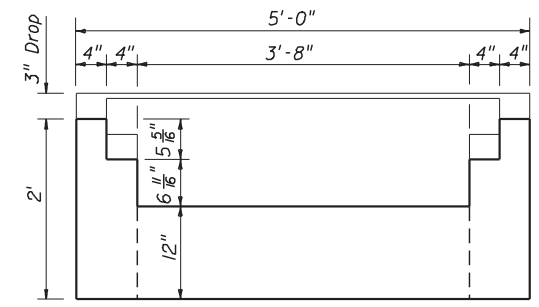


TOP VIEW OF INLET WITHOUT GRATE

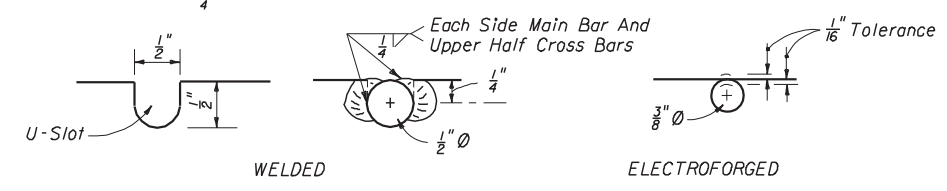
TOP VIEW OF METAL PLATE



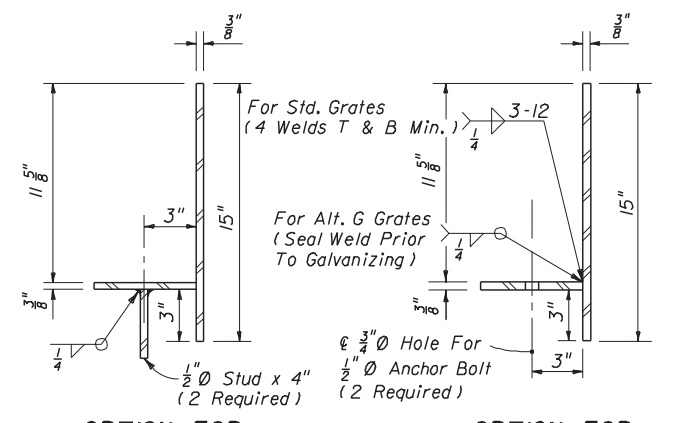
TRANSVERSE SECTION WITH GRATE & PLATE



BACK VIEW WITHOUT BACK PLATE



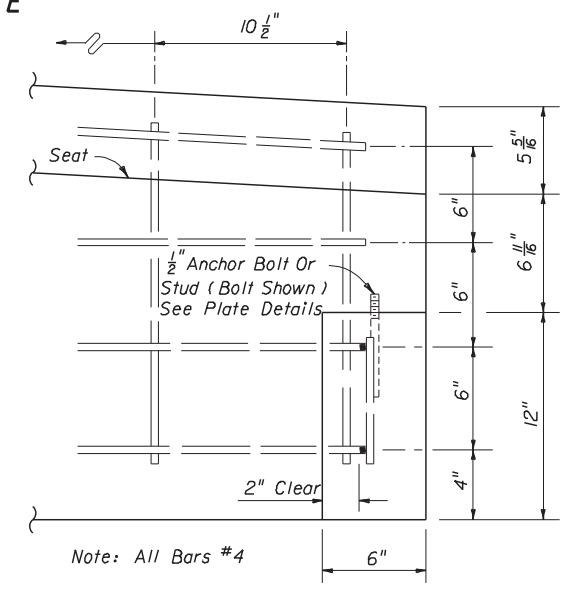
CROSS BAR OPTIONS
STEEL GRATE



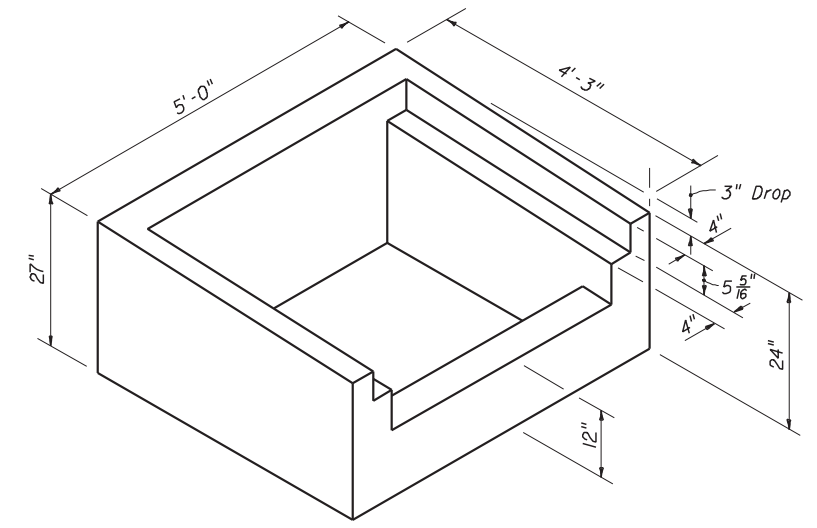
OPTION FOR GROUT STUD

OPTION FOR IMBEDDED ANCHOR

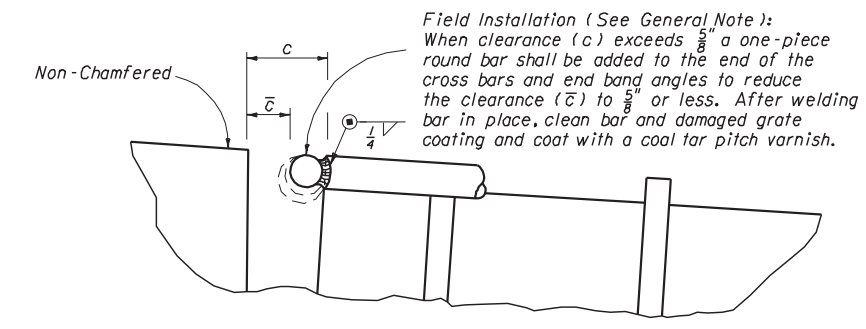
TRANSVERSE SECTIONS THRU BACKWALL PLATE



INSET A



PICTORIAL VIEW

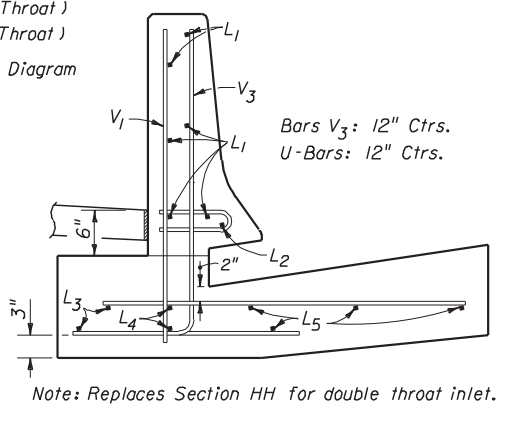
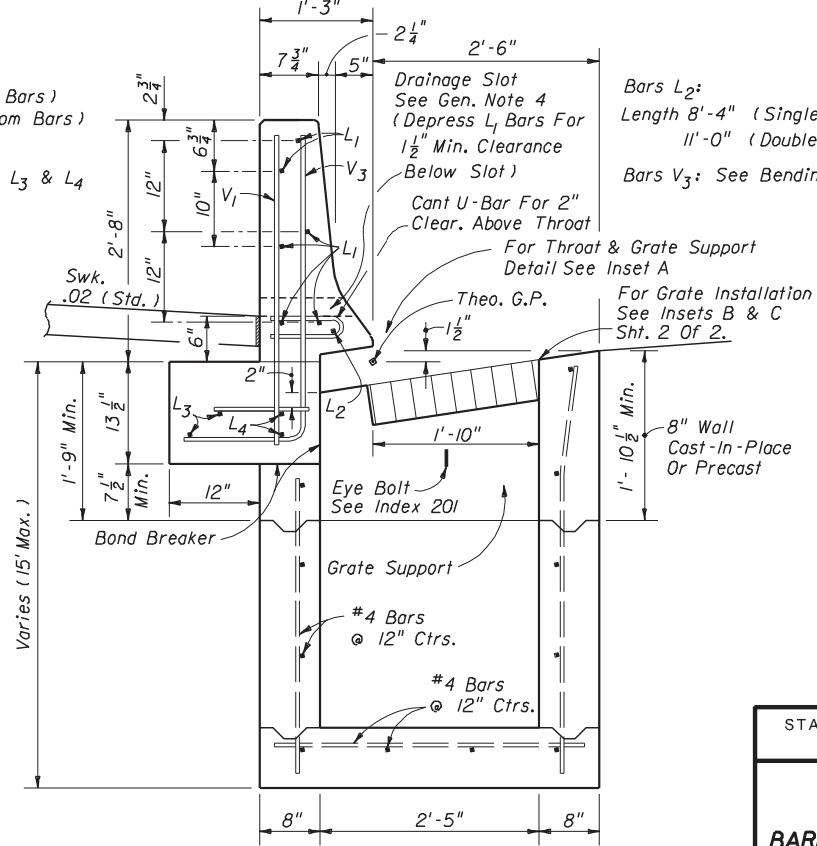
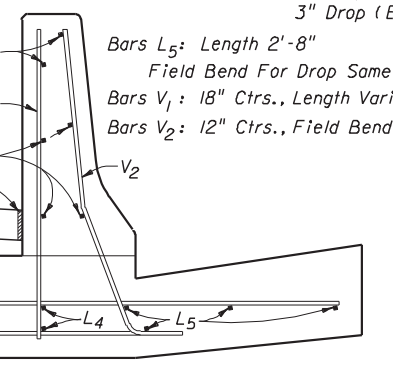
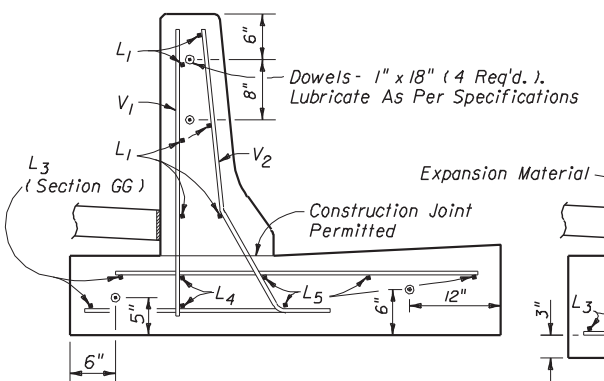
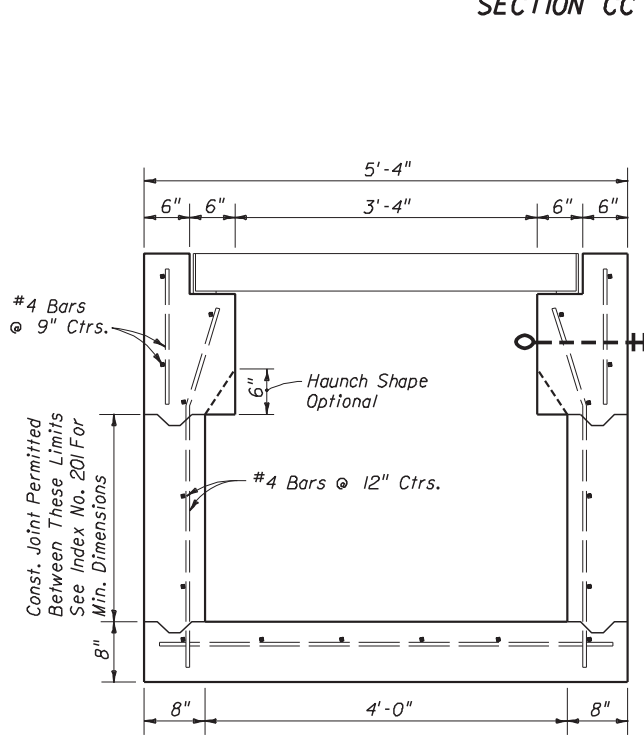
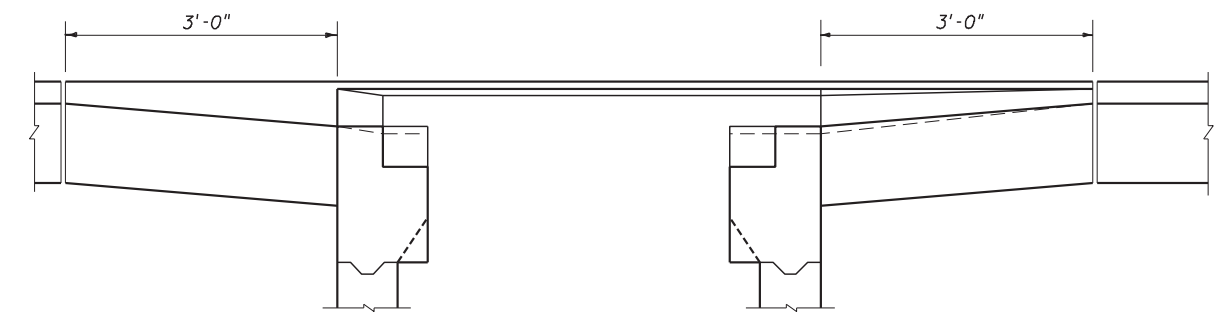
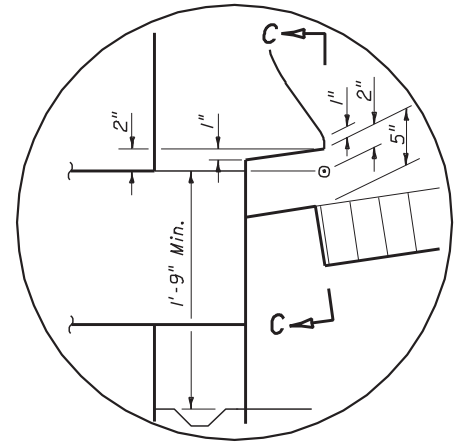
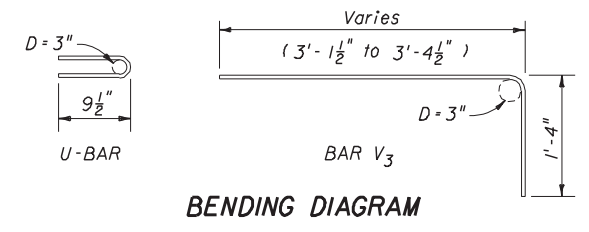
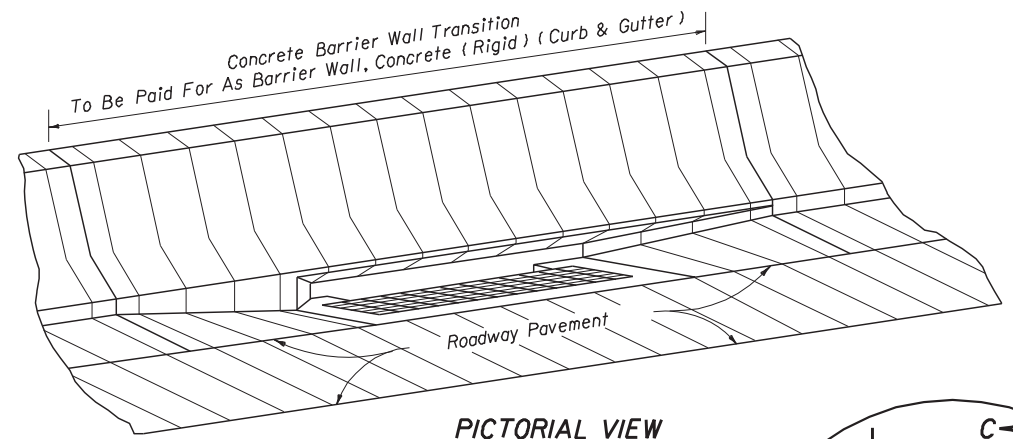
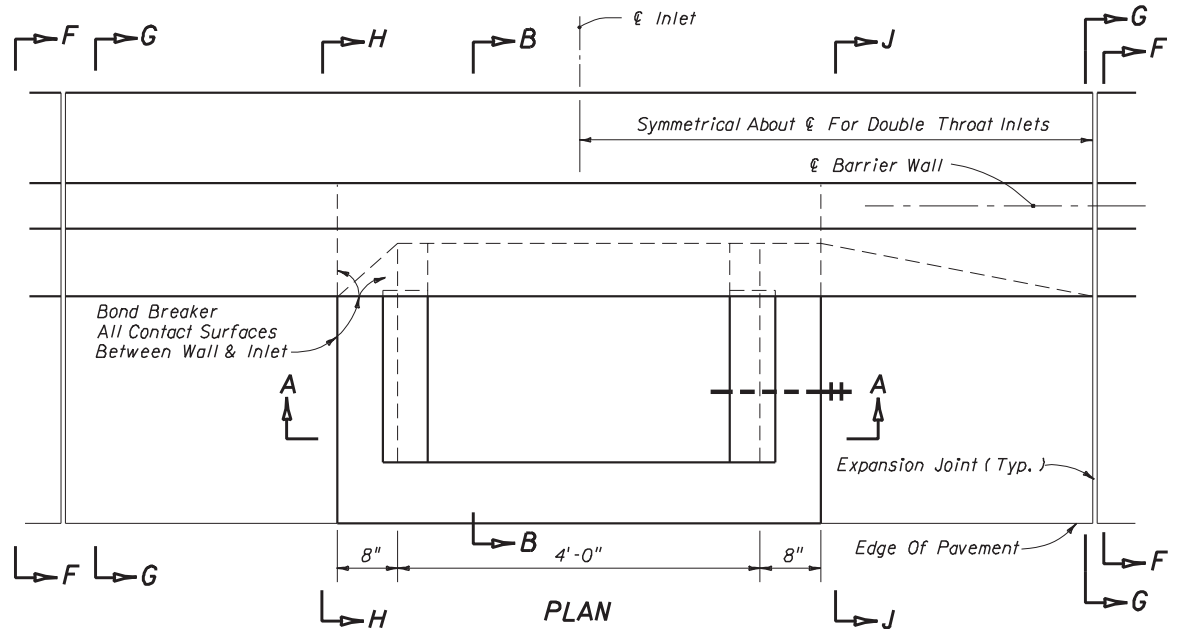


INSET B

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

BARRIER WALL INLET

Names		Dates	Approved By					
Designed By	JVG/EGR	09/86	 State Drainage Engineer					
Drawn By	HSD	09/86						
Checked By	JVG	09/86	Revision	00	Sheet No.	2 of 2	Index No.	218



GENERAL NOTES

1. This inlet to be used in conjunction with Barrier Wall, Concrete (Rigid) (Curb & Gutter), Index No. 410.
2. All reinforcing steel #4 bars. Reinforcing shall have 2" min. cover unless otherwise shown. Cost to be included in cost for concrete barrier wall.
3. Barrier wall shall be Class II concrete, finished in accordance with Index No. 410.
4. A flat 18" x 2 1/2" drainage slot shall be constructed at the inlet centerline when the inlet is located in a curb sag. No more than one V₃ bar, one V₂ bar and one U-bar are to be deleted for construction of the drainage slot.
5. For supplemental details see Index Nos. 201, 209 and 410.
6. Recommended maximum pipe sizes are 18" longitudinal and 30" transverse. For larger pipe, use Alt. B bottoms, Index No. 200.
7. Grates can be fabricated with reticuline bars or with either 3/8" ϕ electroformed or 1/2" ϕ welded cross bars and full depth bars as detailed.
8. When Alternate G grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
9. For pay item purposes the height of the structure shall be computed using the theoretical gutter elevation, less the flow line elevation of the lowest pipe or to top of sump floor.
10. Inlets to be paid for under the contract unit price for Inlets (Barrier Wall) (Rigid) (Curb & Gutter), Each.

Barrier wall to be paid for under the contract unit price for Barrier Wall, Concrete (Rigid-Curb & Gutter) LF.

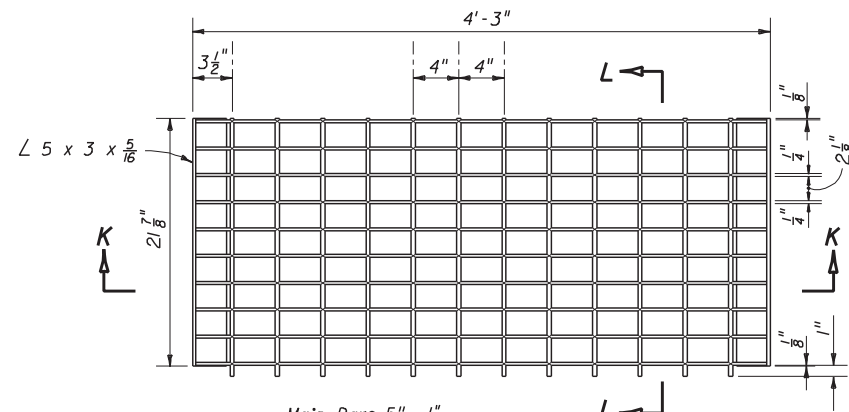
- Bars L₁: Length 11'-1", Straight
- Bars L₃ & L₄: Length 11'-1"
Field Bend For 4" Drop (Top Bars)
3" Drop (Bottom Bars)
- Bars L₅: Length 2'-8"
Field Bend For Drop Same As L₃ & L₄
- Bars V₁: 18" Ctrs., Length Varies
- Bars V₂: 12" Ctrs., Field Bend

Note: For SECTION FF and additional details see Index No. 410, 'CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)'

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

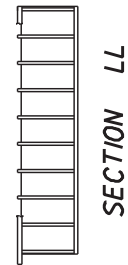
BARRIER WALL INLET
BARRIER WALL, CONCRETE (RIGID) (C & G)

Names	Dates	Approved By		
Designed By	EGR/JVG 9/89	S. A. McHenry		
Drawn By	JBW 9/89	Revision	Sheet No.	Index No.
Checked By	EGR/JVG 9/89	00	1 of 2	219

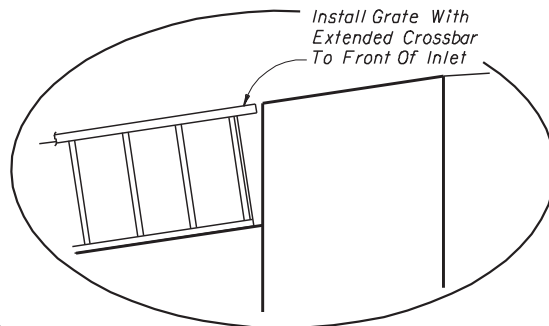


Main Bars 5" x 1/4"
 Cross Bars : Either 3/8" Ø Electroforged Or 1/2" Ø Welded

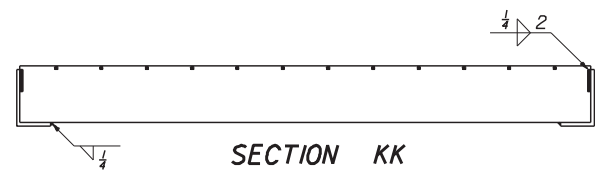
PLAN



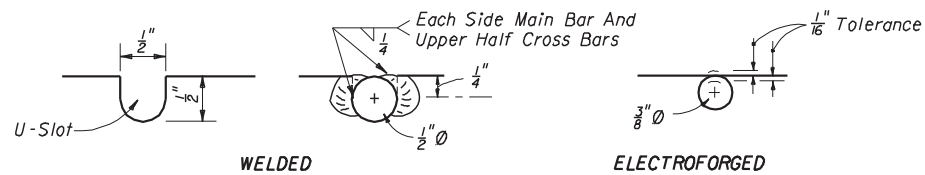
SECTION LL



INSET B

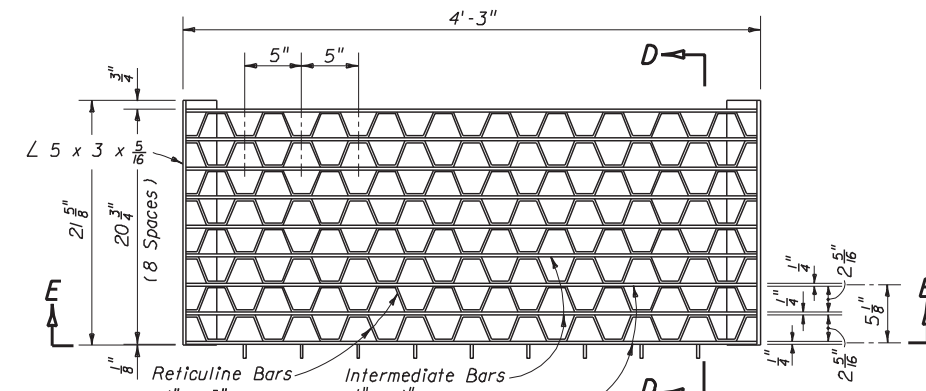


SECTION KK

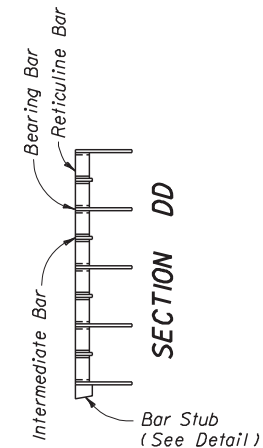


CROSS BAR OPTIONS

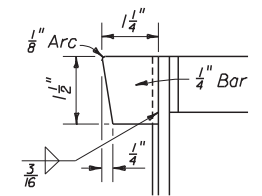
CROSS BAR



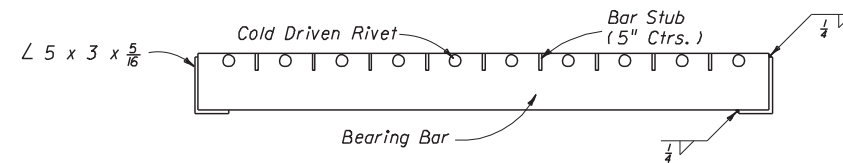
PLAN



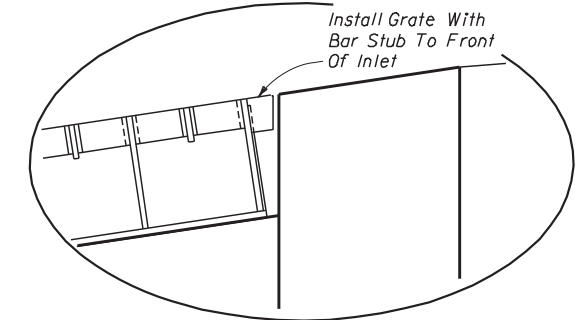
SECTION DD



BAR STUB



SECTION EE

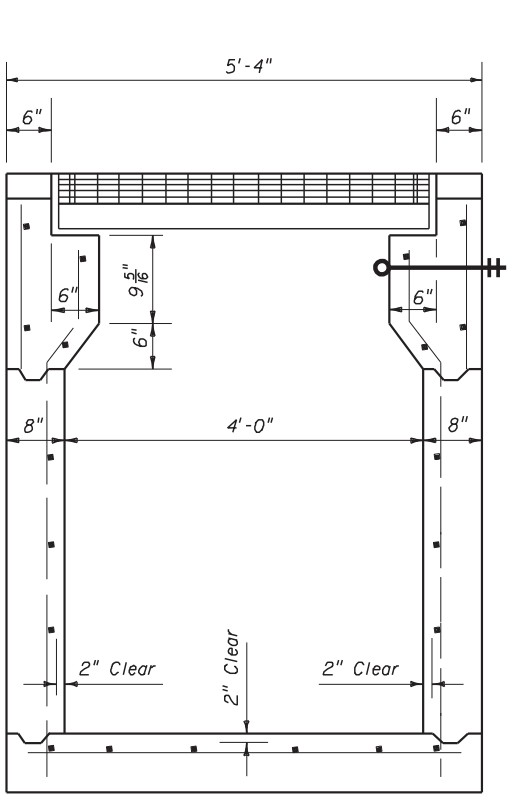
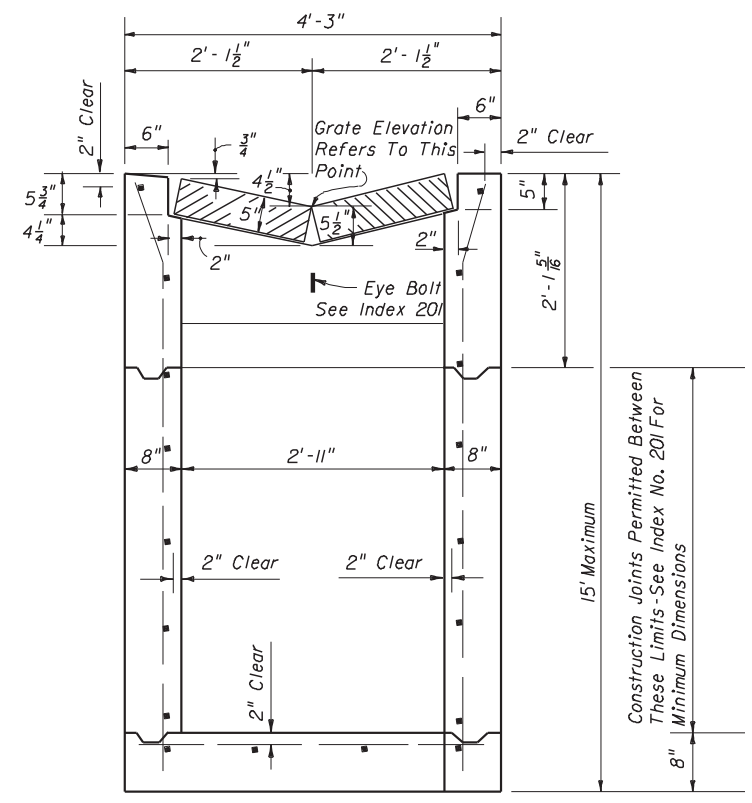
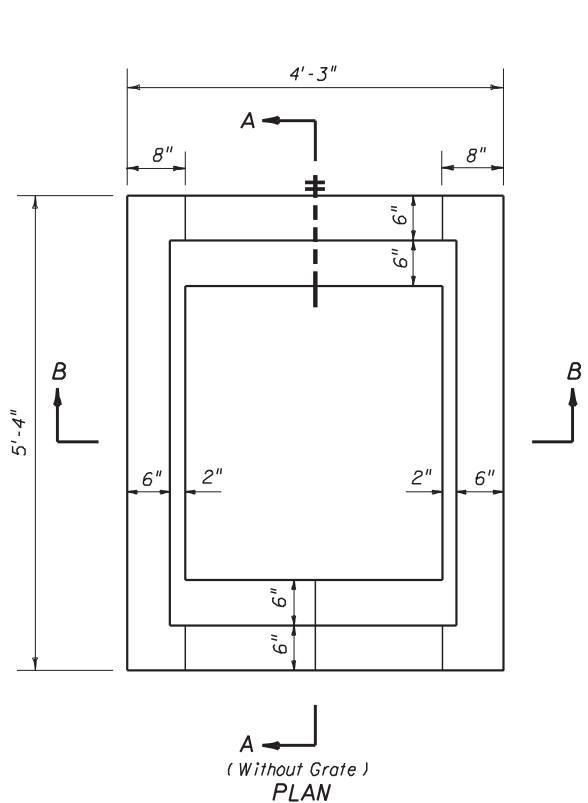


INSET C

RETICULINE

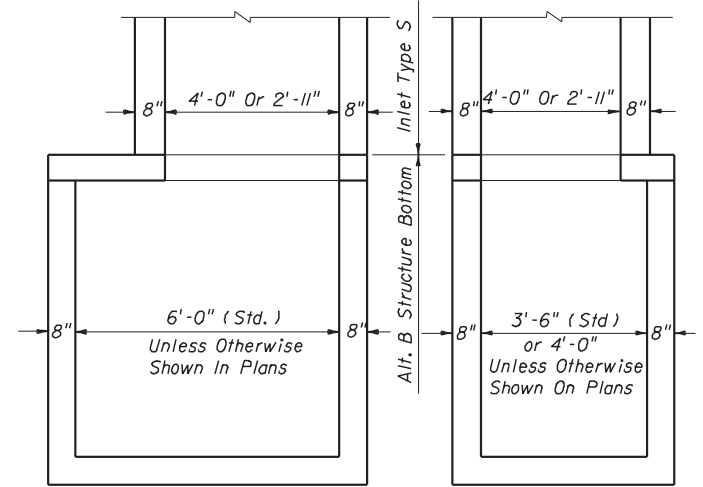
OPTIONAL STEEL GRATES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
BARRIER WALL INLET BARRIER WALL, CONCRETE (RIGID) (C & G)				
Names	Dates	Approved By		
Designed By	EGR/JVG	9/89	<i>S. A. Mchenroe</i> State Drainage Engineer	
Drawn By	JBW	9/89	Revision	Sheet No.
Checked By	EGR/JVG	9/89	00	2 of 2
				Index No. 219



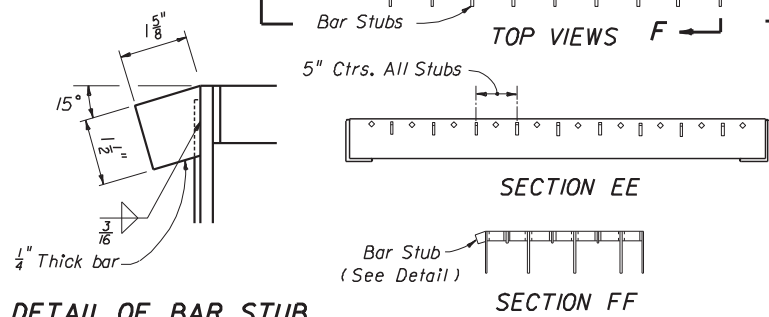
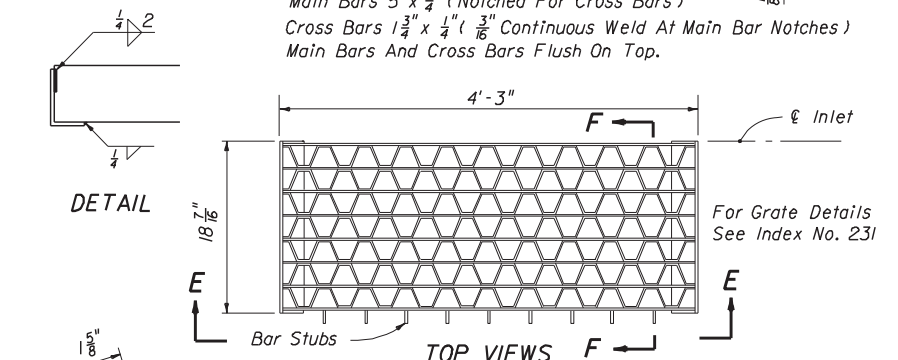
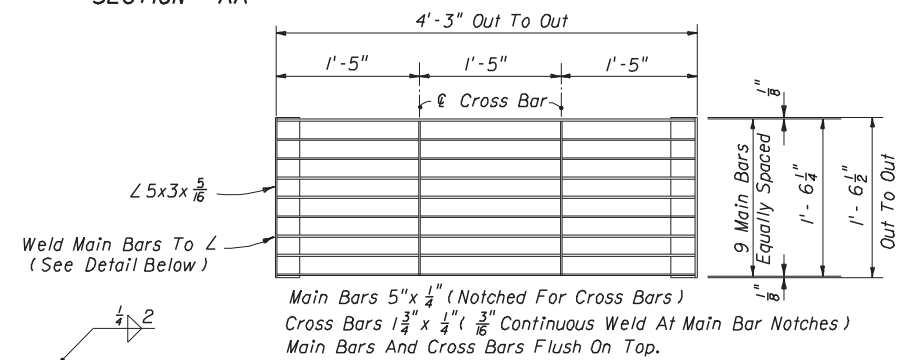
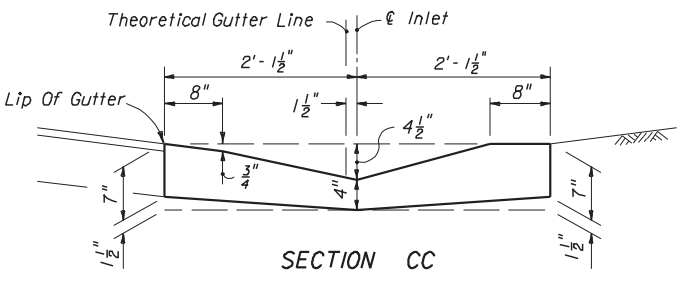
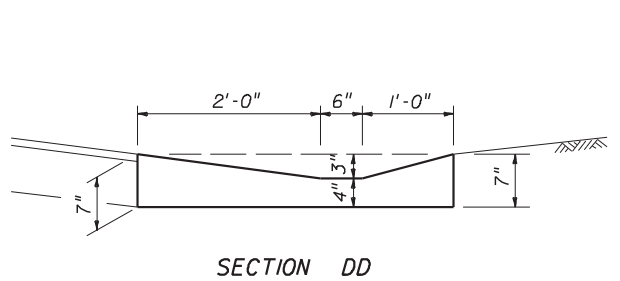
RECOMMENDED MAXIMUM PIPE SIZES	
INLET INSIDE WIDTH	PIPE SIZE
2'-11"	24"
4'-0"	36"

Note: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 201. For larger pipe see bottom detail right and Index No. 200.



NOTE: Alt. B Structure Bottom Only. See Index No. 200 for structure bottom details and hole reinforcement.

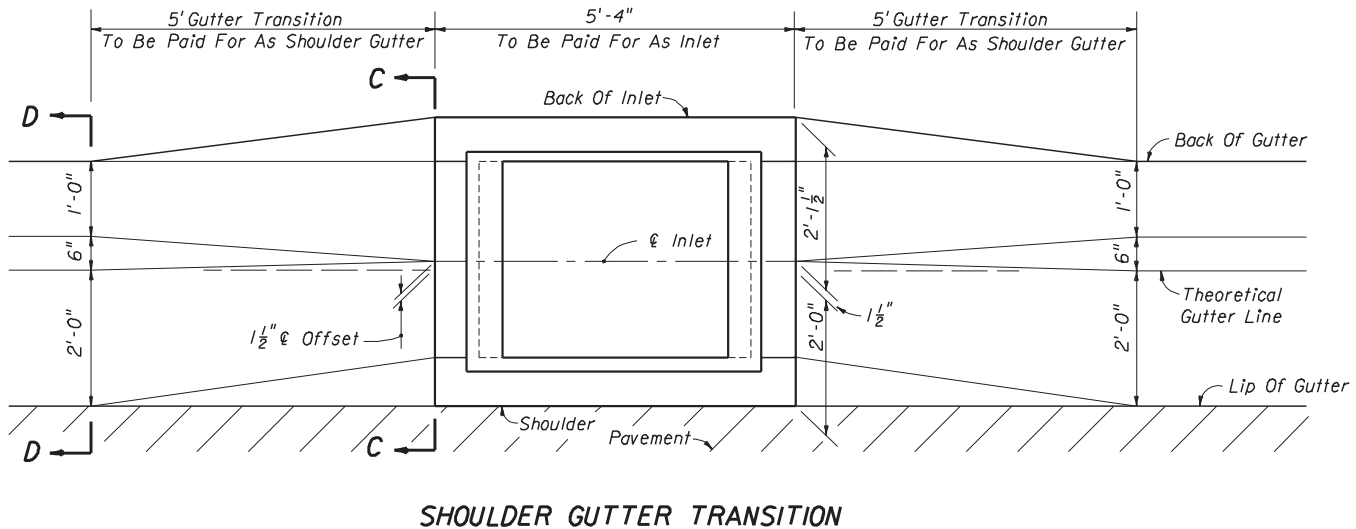
INLET WITH STRUCTURE BOTTOM



STEEL GRATE

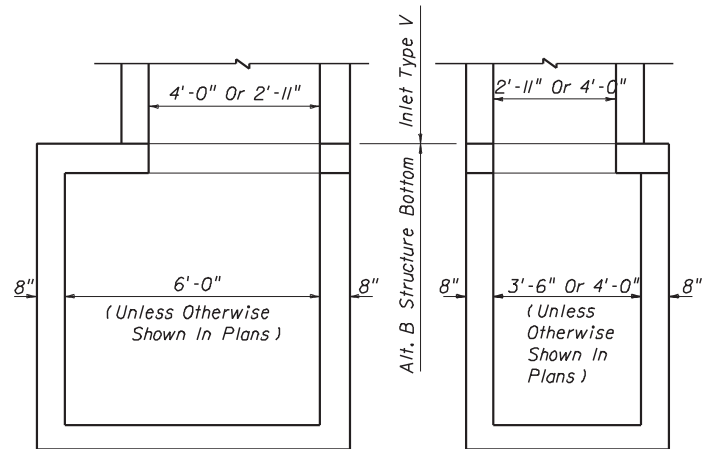
GENERAL NOTES

1. This inlet with parallel bar grate shall be used for limited access facilities and other bicycle restricted facilities subject to heavy loads; and, may be used in locations where inlets Type A and B, with wide grate opening, are unacceptable. On limited access facilities with designated bicycle access and on all other facilities, including roads overpassing limited access highways, the reticulate grate shall be used.
2. Reinforcing steel all No. 4 bars at 12" centers both ways with 2" clearance to inside of walls and bottom. Bars to be cut or bent for 1/2" minimum clearance around pipe.
3. All exposed edges and corners shall be tool to 3/4" radius.
4. When Alternate G grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
5. For supplementary details see Index Nos. 200 and 201.



SHOULDER GUTTER TRANSITION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUTTER INLET TYPE S				
Names	Dates	Approved By <i>A. M. Chennu</i> State Drainage Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	1 of 1	220
Checked By				

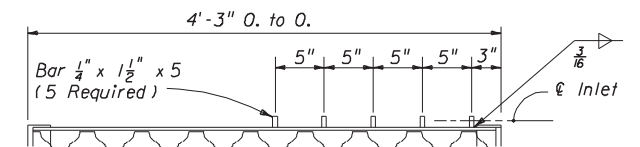


NOTE: Alt. B Structure Bottom Only. See Index No. 200 for structure bottom details and hole reinforcement. (For Pipes 30" Dia. And Larger)

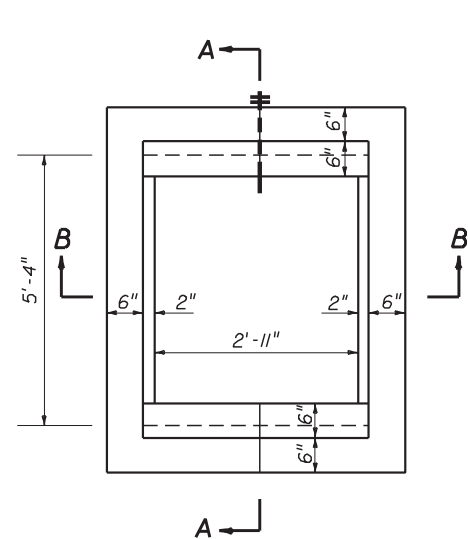
INLET WITH STRUCTURE BOTTOM

GENERAL NOTES

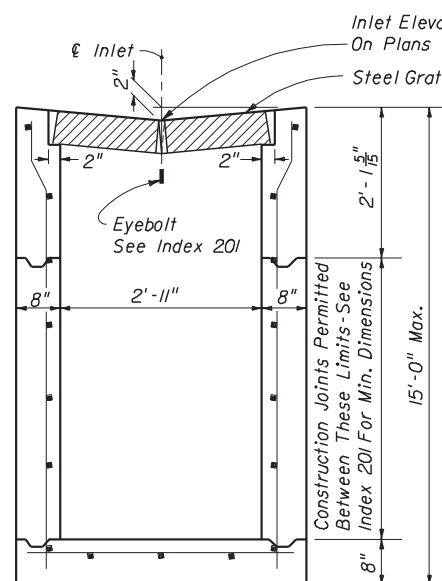
1. This inlet is designed for village swales, ditches, or other areas subject to heavy wheel loads, minimum debris and subject to pedestrian and/or bicycle traffic.
2. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
3. Reinforcing - #4 bars at 12" ctrs. both ways. Cut or bend bars out of way of pipe to clear pipe 1/2".
4. All exposed edges and corners shall be tooled to 1/4" radius.
5. Recommended maximum pipe sizes shown are for concrete pipe.
6. For supplementary details see Index No. 201.



OPTIONAL BAR SPACING

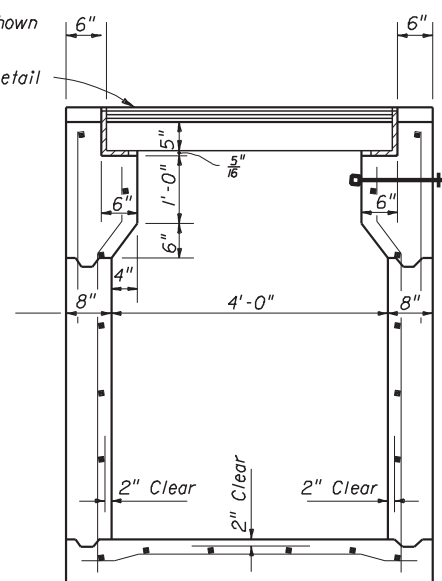


PLAN

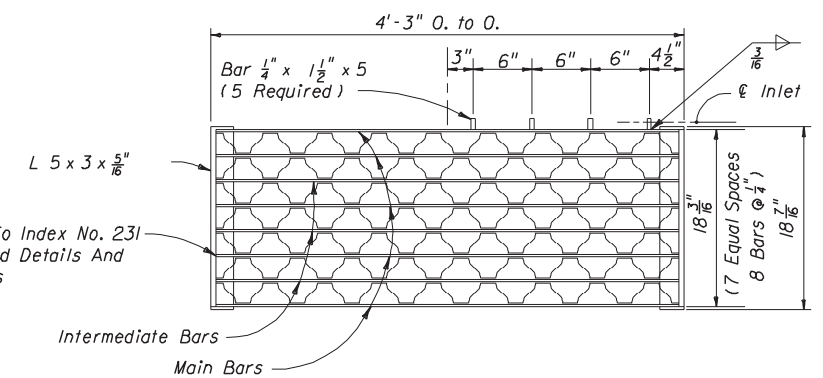


SECTION BB

Recommended Maximum Pipe Size:
 2'-11" Wall - 24" Size
 4'-0" Wall - 36" Size



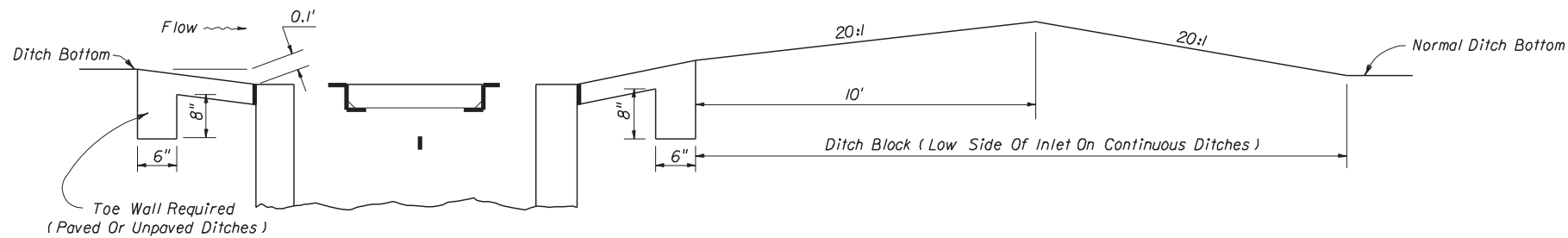
SECTION AA



STEEL GRATE

TWO REQUIRED PER INLET
 5" Steel Grate Main Bars 5" x 1/4"
 Intermediate Bars 1 1/2" x 1/4" Reticuline Bars 1 1/4" x 3/16"
 Steel Grate : Manufactured By Borden, Florida Steel, U.S. Foundry Irving, Reliance, Greulich (Or Equal).

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUTTER INLET TYPE V				
Names	Dates	Approved By		
Designed By		<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	WHW 4/57	Revision	Sheet No.	Index No.
Checked By	RMM 4/57	00	1 of 1	221

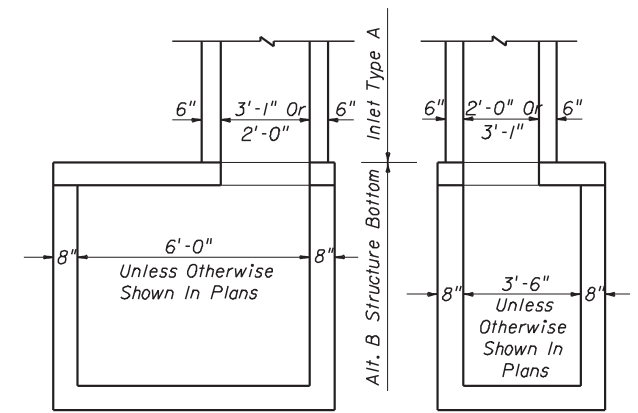


SECTION DD

D

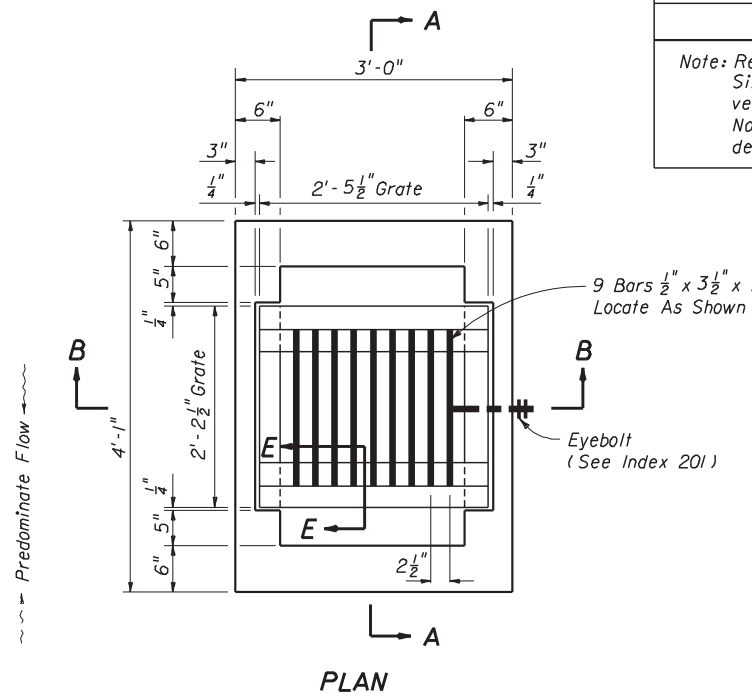
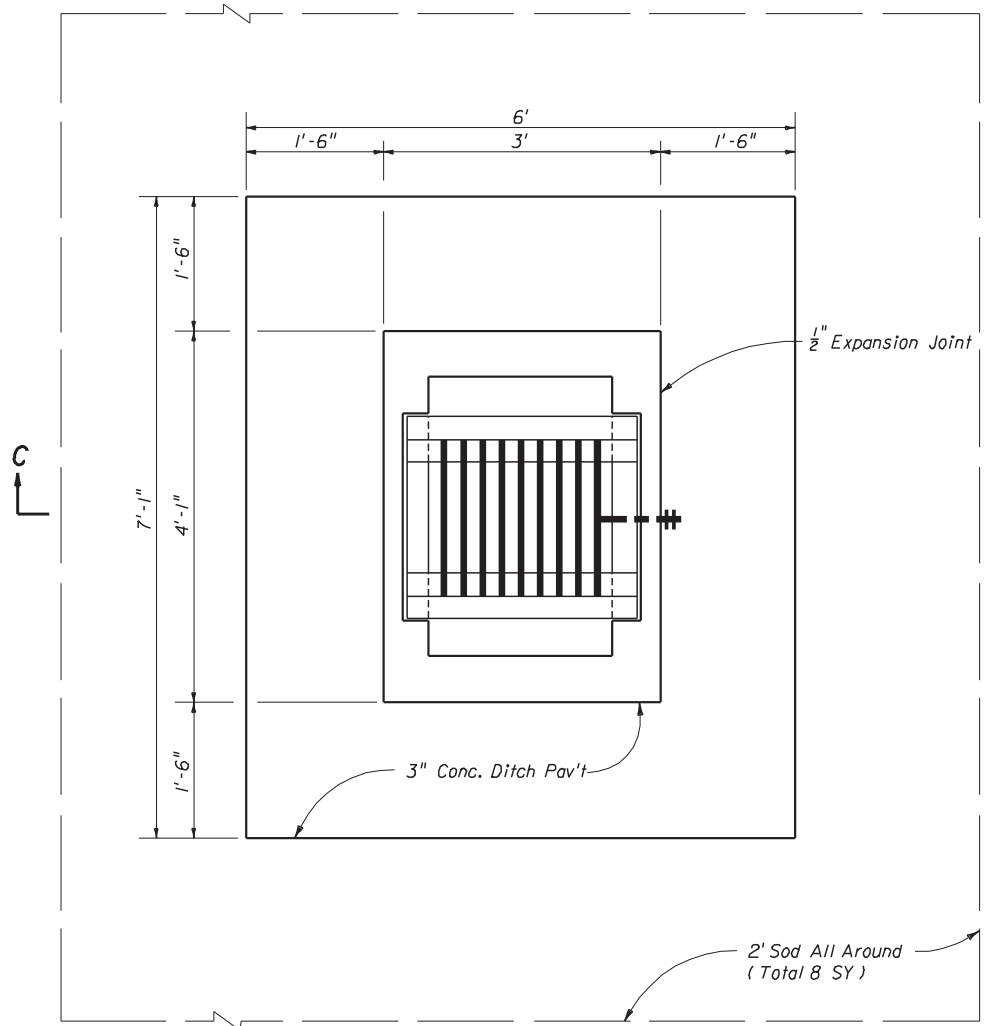
RECOMMENDED MAXIMUM PIPE SIZES	
INLET INSIDE WIDTH	PIPE SIZE
2'-0"	18"
3'-1"	24"

Note: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 201. For larger pipe see bottom detail right and Index No. 200.

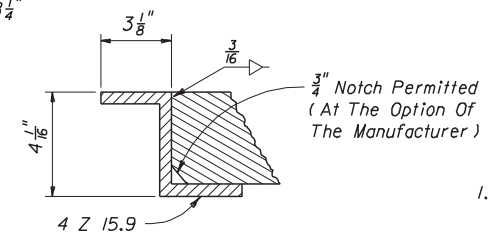


NOTE: Alt. B Structure Bottom Only. See Index No. 200 for Structure Bottom Details And Hole Reinforcement.

INLET WITH STRUCTURE BOTTOM

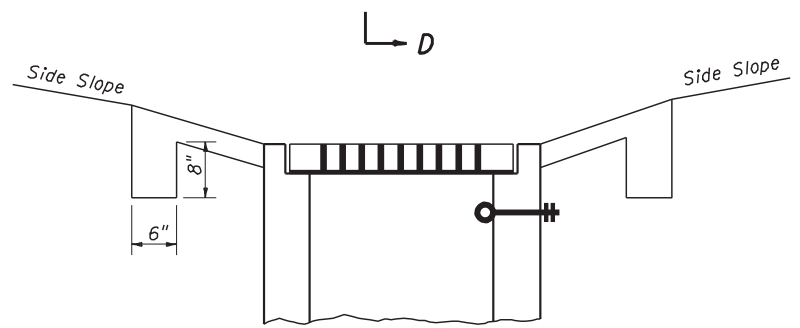


PLAN

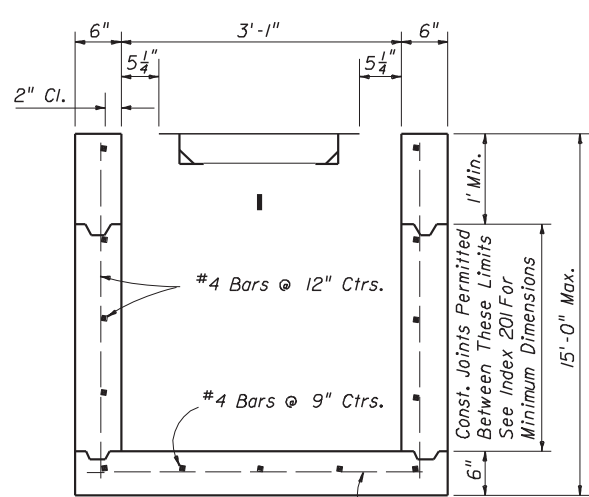


SECTION EE

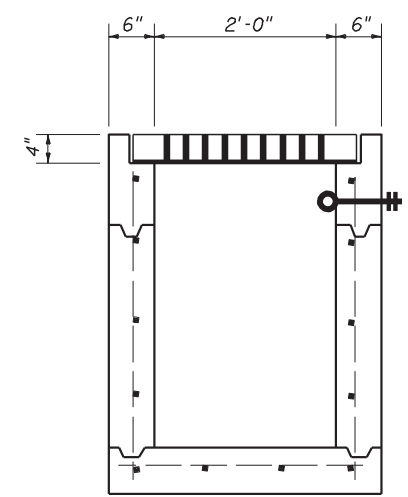
- GENERAL NOTES**
- This inlet is designed for ditches, medians, or other areas subject to heavy wheel loads on limited access facilities where debris may be a problem. NOTICE: This inlet is not for use in areas subject to pedestrian and/or bicycle traffic.
 - Reinforcing - 2" clearance to inside face. Cut or bend bars out of way of pipe to clear pipe by 1 1/2".
 - Chamfer exposed edges (3/4" Chamfer).
 - When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
 - Cost of ditch paving to be included in the cost of Inlet. Sodding to be paid for under contract unit price for Sodding, SY.
 - For supplemental details see Index No. 201.



SECTION CC

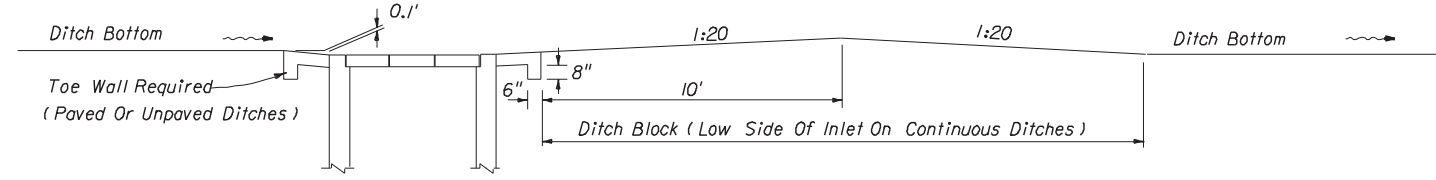


SECTION AA



SECTION BB

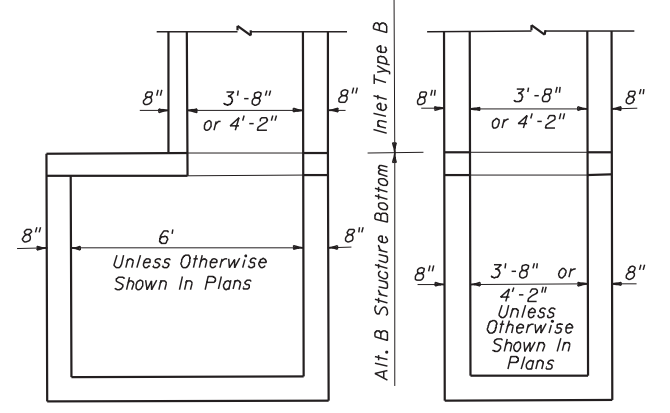
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DITCH BOTTOM INLET TYPE A				
Names	Dates	Approved By <i>S. A. McHenry</i> State Drainage Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	1 of 1	230
Checked By				



**SECTION EE
DITCH BLOCK**

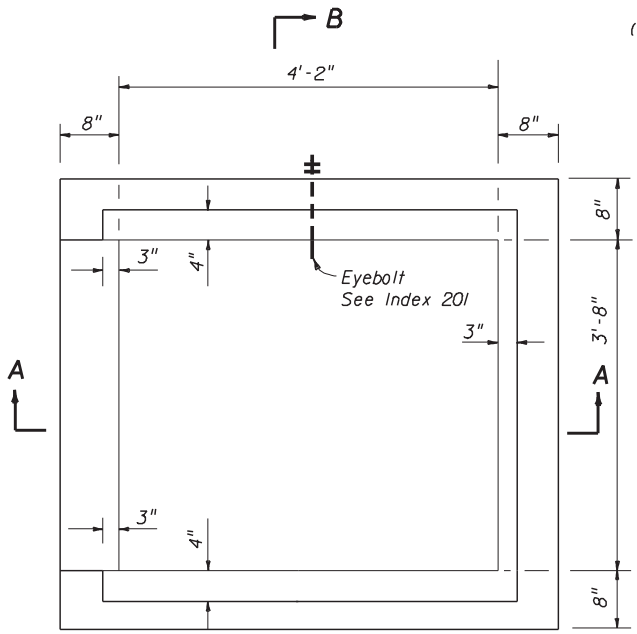
RECOMMENDED MAXIMUM PIPE SIZES	
INLET INSIDE WIDTH	PIPE SIZE
3'-8"	30"
4'-2"	36"

Note: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 201. For larger pipe see bottom detail above and Index No. 200.



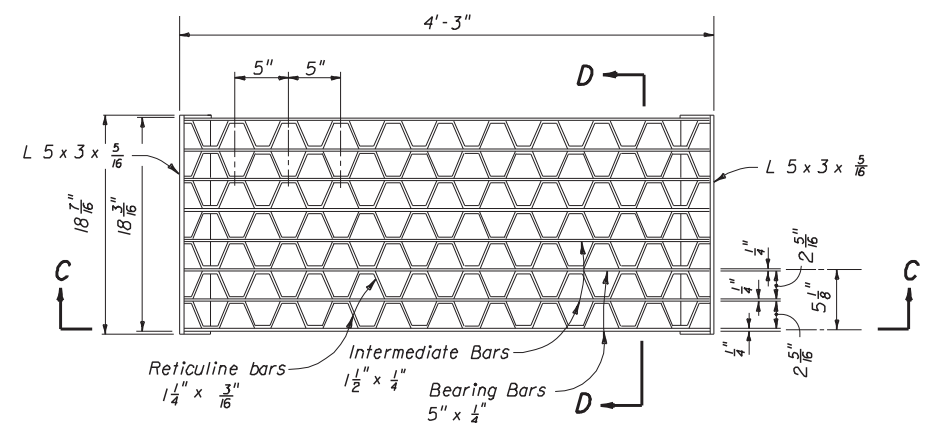
NOTE: Alt. B Structure Bottom Only. See Index No. 200 for structure bottom details and hole reinforcement.

INLET WITH STRUCTURE BOTTOM



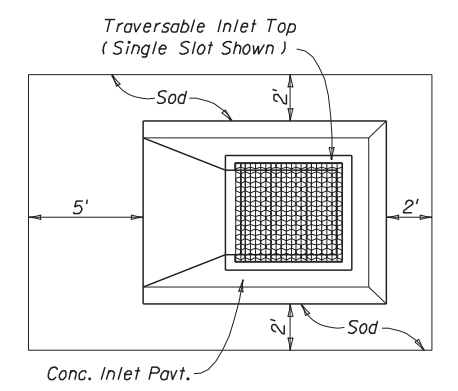
PLAN

Predominate Flow (s)
(Grate, Apron And Slot Not Shown)

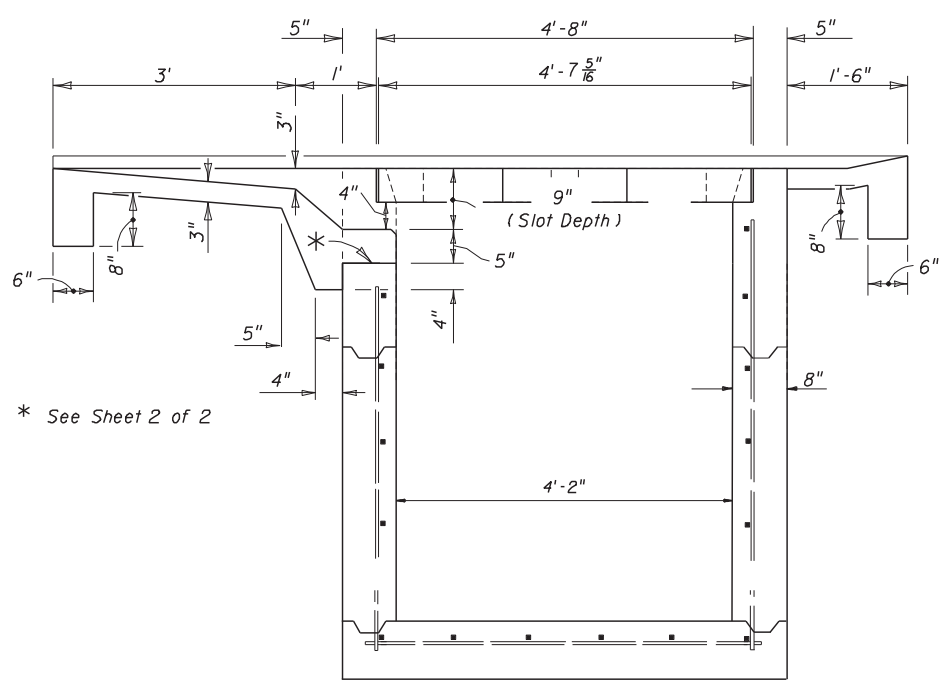


PLAN

ESTIMATED QUANTITIES For Informational Purposes Only			
SLOT TYPE	PAVEMENT		SOD
	SY	CY	SY
Single Slot	6.2	0.9	14
Double Slot	8.1	1.1	19

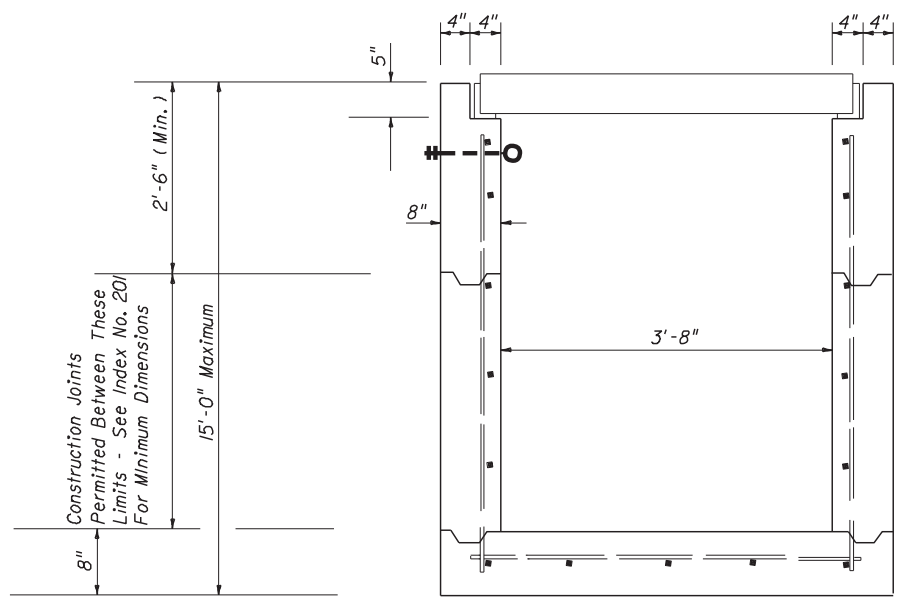


CONCRETE INLET PAVEMENT AND SODDING

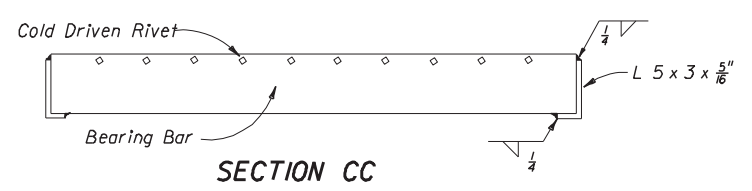


SECTION AA

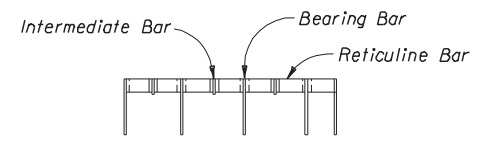
* See Sheet 2 of 2



SECTION BB



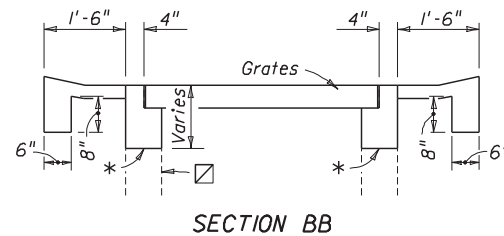
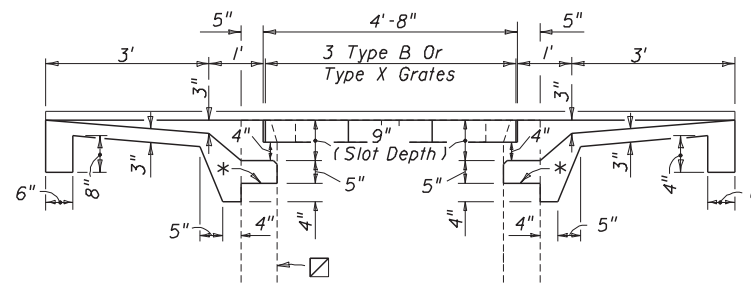
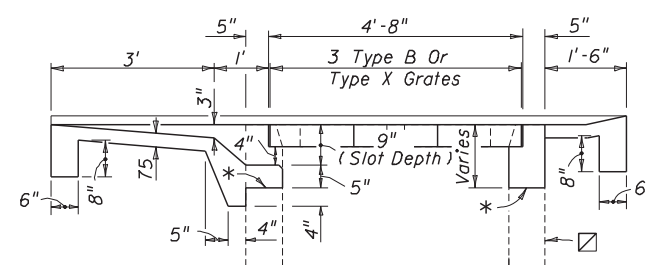
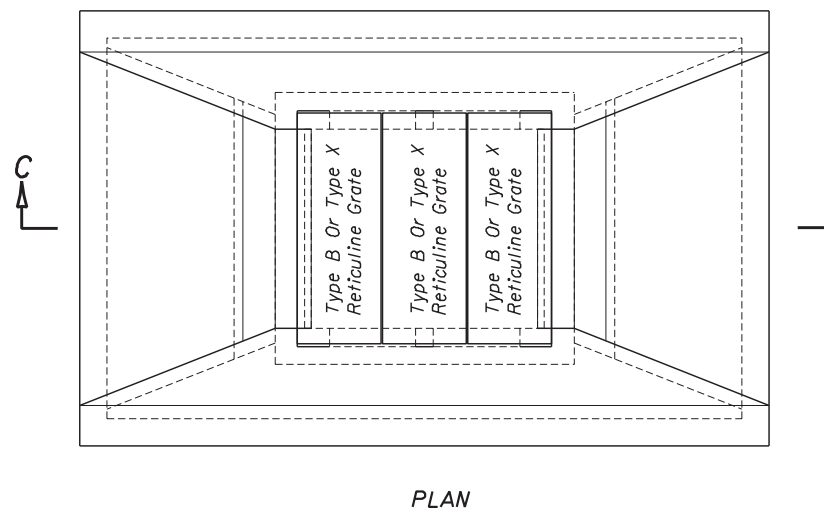
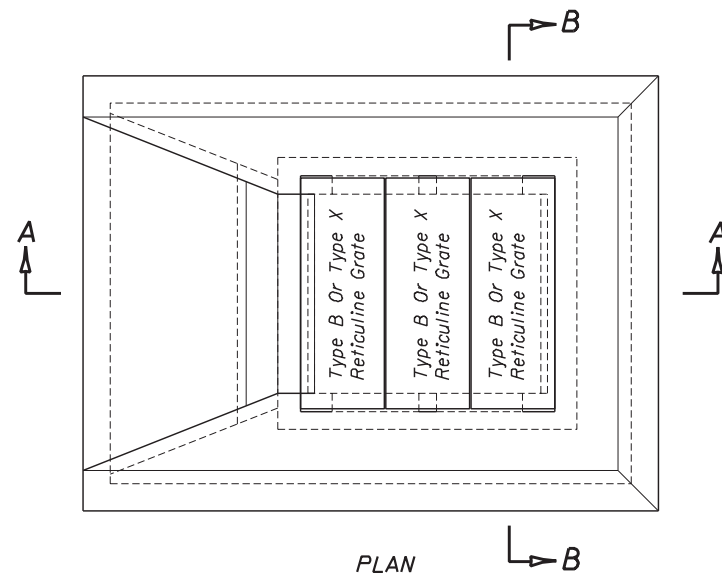
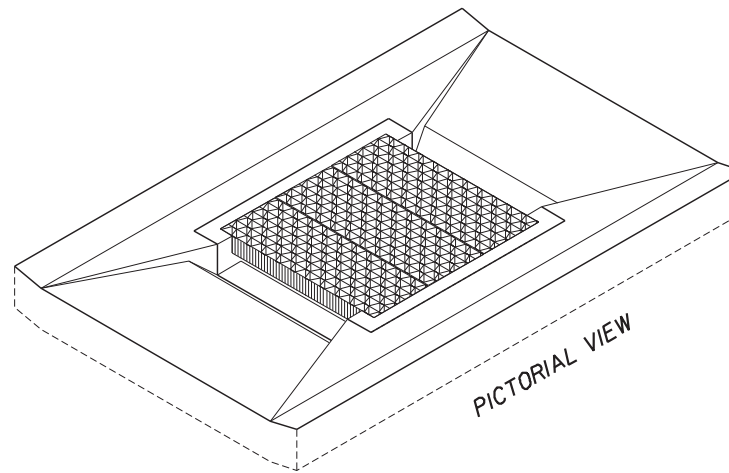
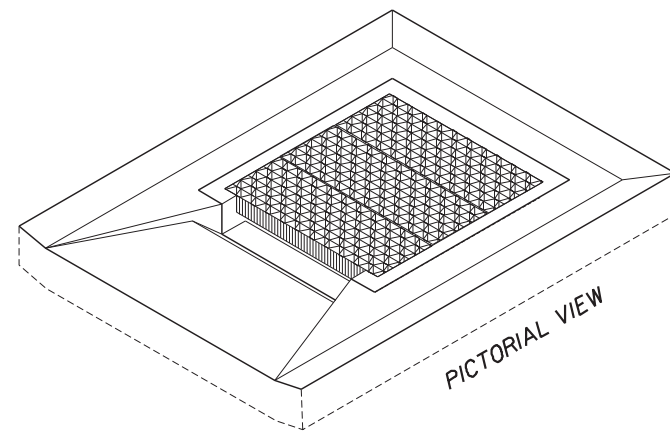
SECTION CC



SECTION DD

STEEL GRATE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DITCH BOTTOM INLET TYPE B				
Names	Dates	Approved By		
Designed By	HAB 04/67	<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	RWR 05/82	Revision	Sheet No.	Index No.
Checked By	JVG 05/82	00	1 of 2	231



☐ Inlet Box (Line Type Indicates Existing Box To Facilitate Depiction Of Partial Construction On Existing Inlets)

* On new boxes the traversable top may be cast as a monolithic unit or cast in segments, and the location of this line may be lower to facilitate handling and placement; however, the slot depth is to remain at 9 inches. See Index No. 201 for top to wall connection. For converting to traversable tops on existing inlets remove concrete to this line and expose the existing reinforcement. Reshape or splice in reinforcement to penetrate the rim and returns of the grate seat, and bend the reinforcement into the slot shelf to extend into the abutting throat pavement.

GENERAL NOTES

1. The general purpose of the inlet top designs are:
 - a. For ditches, medians or other areas subject to heavy wheel loads accommodating minimal debris locations and debris imposed locations.
 - b. Provide full grate and horizontal slot designs for new construction.
 - c. Provide full grate and horizontal slot designs for replacing the verticle slot tops on existing Inlets Type B and Type X that are in locations which have become pedestrian active.
2. Box, walls and bottoms reinforcing steel all #4 bars at 1' centers both ways with 2" clearance to inside of walls and bottom. Bars to be cut or bent for 1 1/2" minimum clearance around pipe.
3. When Alternate G grates are specified in the plans, the grates are to be hot-dipped galvanized after fabrication.
4. Cost for constructing traversable tops on new inlet boxes shall be included in the contract unit price for Inlets (DT BOT) (Type B), EA., and shall include the cost for surrounding pavement. Existing Inlets Type B and Inlets Type X that are converted to traversable inlet tops shall be paid for under the contract unit price for Inlets (DT BOT) (Type B) (Partial), EA. Unit price and payment shall be full compensation for inlet conversion and shall include the removal and disposal of any existing inlet pavement; the removal and stockpiling or disposal of sufficient material from the existing inlet box to facilitate construction of the required inlet top; construction of the required inlet conversion; backfill construction; construction of inlet pavement; reusing, supplementing, transferring or replacing grates as required by plans or as directed by the Engineer; any required earthwork for ditch restoration within 30' of the inlet; and, seeding and mulching disturbed grasses.
5. Ditch pavement shall be paid for, separate from the inlet, by pavement types and units as called for in the plans.
6. Sod will be paid for under the contract unit price for Sodding, SY.
7. For supplementary details see Index No. 201.

DESIGN NOTES

1. The type of top (single or double slots) depends on the approach ditch configuration and the hydraulic requirements of the site. The designer will stipulate in the plans the type of top to be constructed at each individual inlet location.

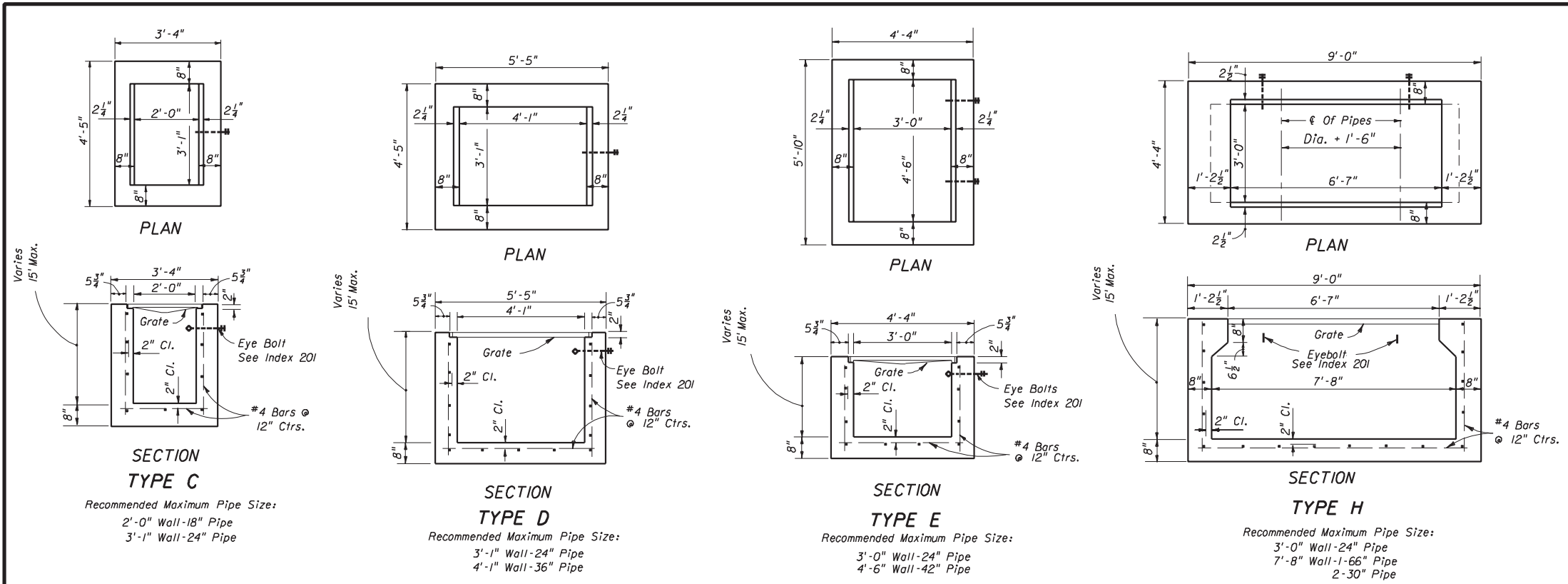
On existing inlets conversion grates shall be constructed at the original grate elevations unless other elevations are called for in the plans. When plans call for the inlet top to be constructed to support storm water detention, details for ditch modifications and underdrains shall be shown in the plans.

MAINTENANCE NOTES

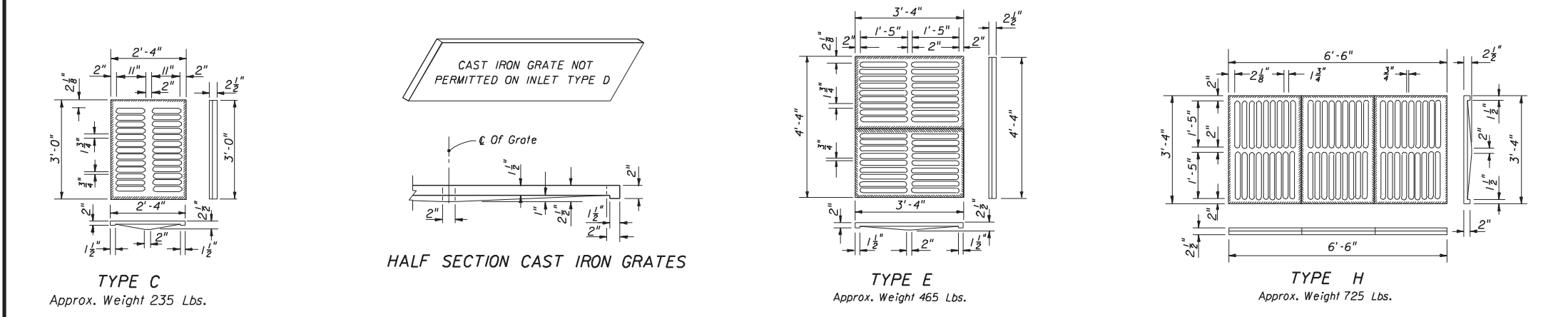
1. Traversable inlet tops that are constructed by maintenance contract or by maintenance forces may reuse the existing grates that are determined by the Maintenance Engineer to be functionally sound, and their reuse is so directed by the Maintenance Engineer. Existing grates approved for reuse and new grates may be mixed, matched or replaced as directed by the Maintenance Engineer.

TRAVERSABLE TOPS FOR INLETS TYPE B AND FOR CONVERSIONS OF EXISTING INLETS TYPE B AND TYPE X

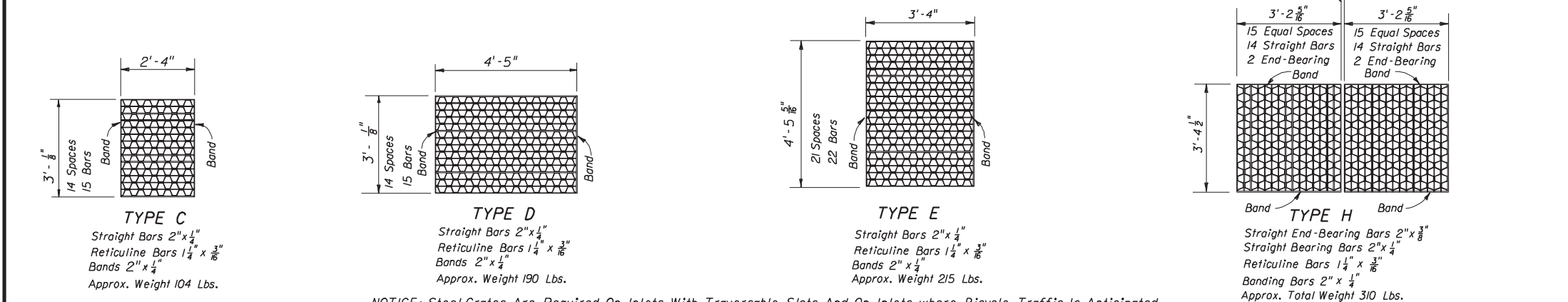
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DITCH BOTTOM INLETS TYPE B				
Names	Dates	Approved By		
Designed By	NPH 02/98	S. A. Mchenry State Drainage Engineer		
Drawn By	JDT 02/98	Revision	Sheet No.	Index No.
Checked By		00	2 Of 2	231



INLETS



CAST IRON GRATES



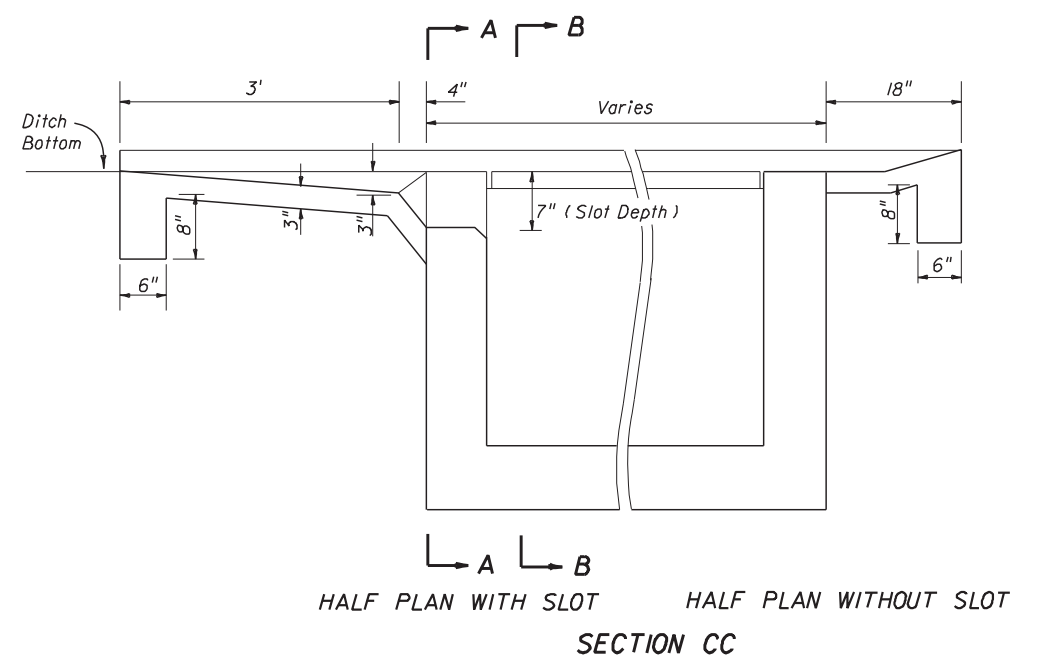
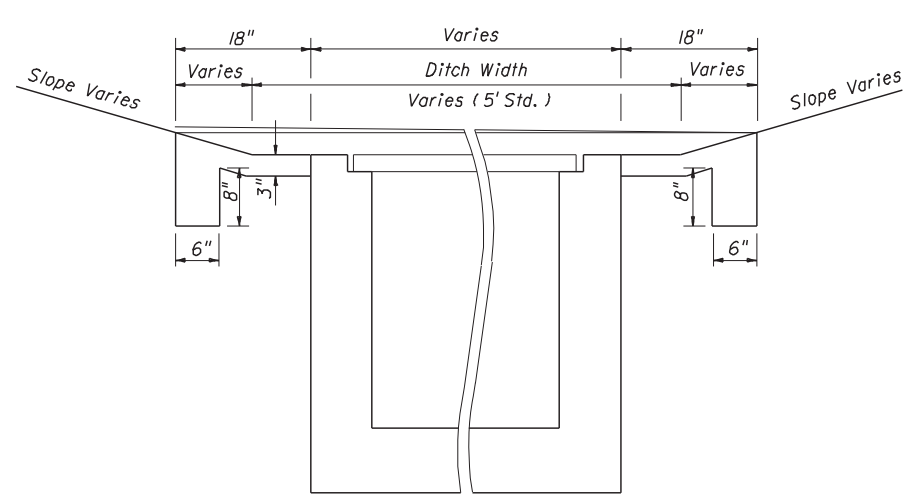
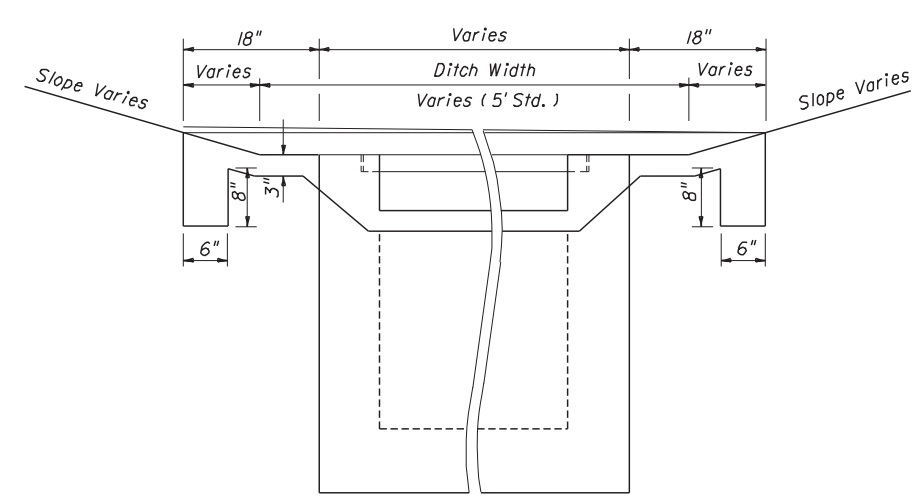
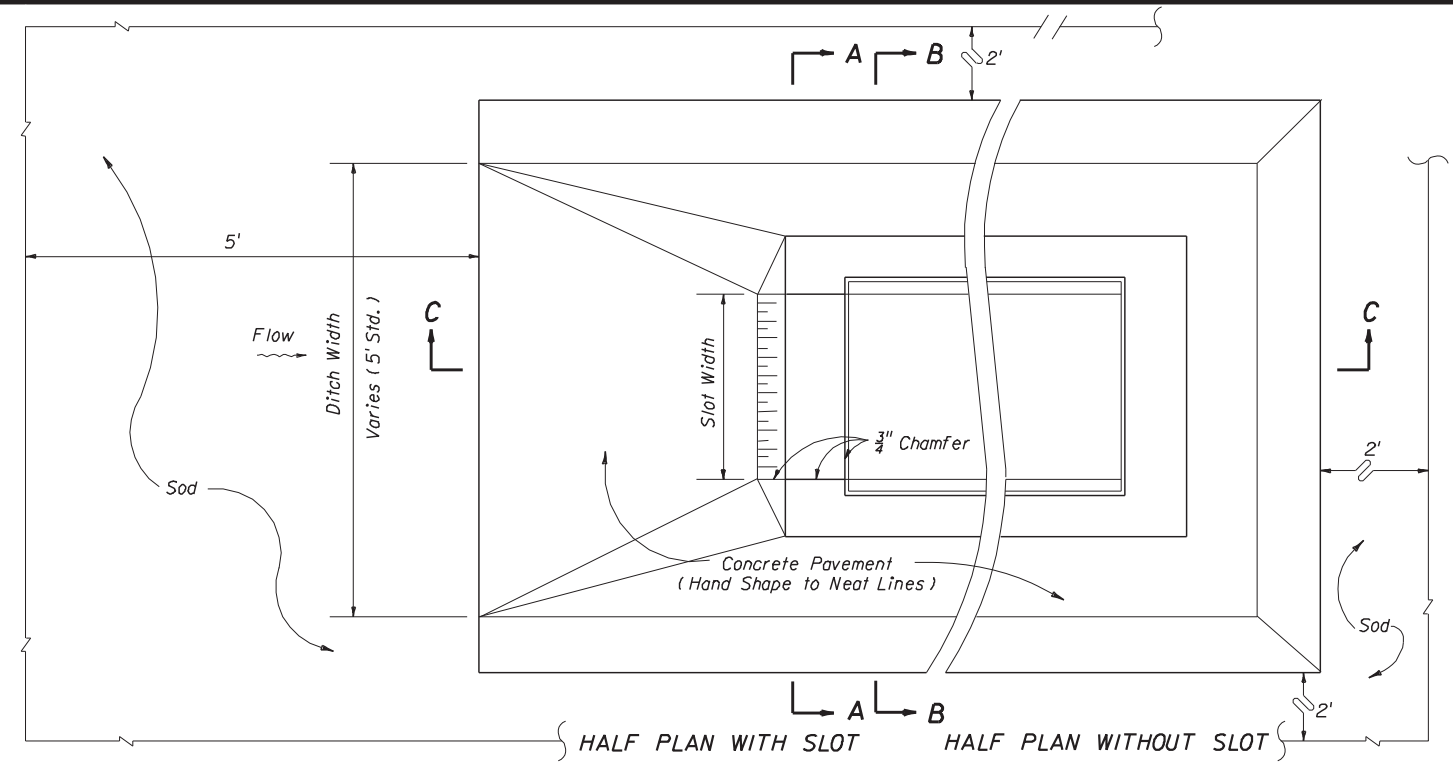
NOTICE: Steel Grates Are Required On Inlets With Traversable Slots And On Inlets where Bicycle Traffic Is Anticipated.

STEEL GRATES

GENERAL NOTES

1. These inlets are suitable for bicycle and pedestrian areas and are to be used in ditches, medians and other areas subject to infrequent traffic loadings but are not to be placed in areas subject to any heavy wheel loads.
2. Inlets subject to minimal debris should be constructed without slots. Where debris is a problem inlets should be constructed with slots. Slotted inlets located within roadway clear zones and in areas accessible to pedestrians shall have traversable slots. The traversable slot modification is not adaptable to inlet Type H. Slots may be constructed at either or both ends as shown on plans.
3. Steel grates are to be used on all inlets where bicycle traffic is anticipated. Steel grates are to be used on all inlets with traversable slots. Either cast iron or steel grates may be used on inlets without slots where bicycle traffic is not anticipated. Either cast iron or steel grates may be used on all inlets with non-traversable slots. Subject to the selection described above, when Alternate G grate is specified in the plans, either the steel grate, hot dipped galvanized after fabrication, or the cast iron grate may be used, unless the plans stipulate the particular type.
4. Recommended maximum pipe sizes shown are for concrete pipe. Pipe sizes larger than those recommended must be checked for fit.
5. All exposed corners and edges of concrete are to be chamfered 3/4".
6. Pavement to be used on inlets without slots and inlets with non-traversable slots only when called for in the plans; but required on all traversable slot inlets. Cost to be included in contract unit price for inlets. Quantities shown are for information only.
7. Traversable slots constructed in existing inlets shall be paid for as inlets partial, and shall include the cost for slot openings, paving and any required replacement grates.
8. Sodding to be used on all inlets not located in paved areas and paid for under contract unit price for Sodding, SY.
9. For supplementary details see Index No. 201.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DITCH BOTTOM INLETS TYPES C, D, E & H				
Designed By	Names	Dates	Approved By <i>S. A. McHenry</i> State Drainage Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By	EGR/JG	07/81	00	1 of 5 232



PAVEMENT AND SODDING QUANTITIES FOR TRAVERSABLE SLOTS

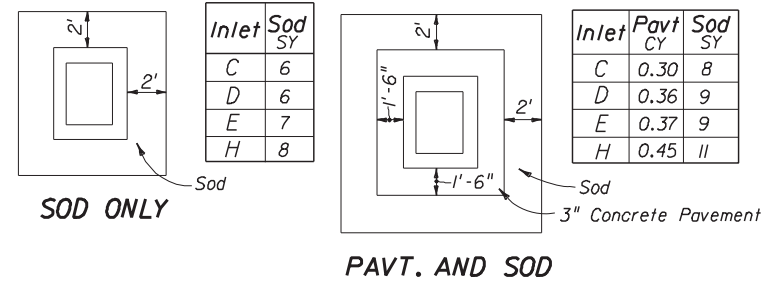
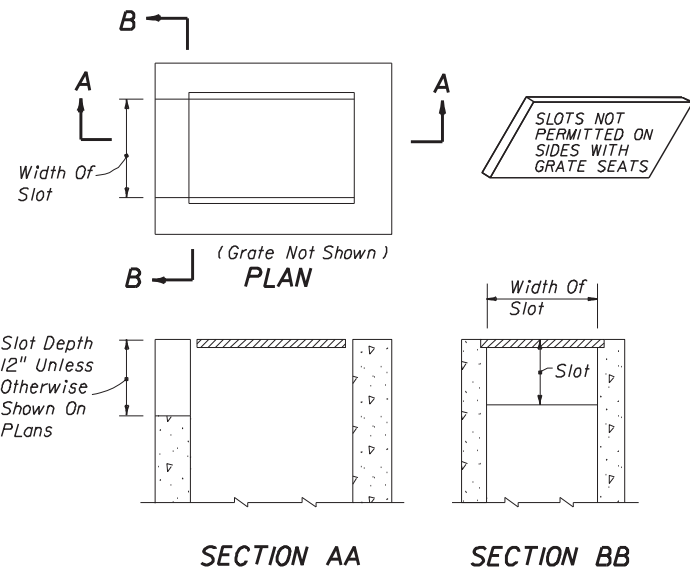
Inlet	Pavement		Sod			
	Single Slot	Double Slot	Single Slot	Double Slot		
	SY	CY	SY	CY	SY	SY
C	4.87	0.77	6.16	0.93	12	16
D	5.99	0.91	7.70	1.10	14	19
E	5.88	0.91	7.37	1.08	14	18

TRAVERSABLE SLOTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**DITCH BOTTOM INLETS
TYPES C, D, E, & H**

Names	Dates	Approved By	
Designed By	EGR 02/80	S. A. McHenry State Drainage Engineer	
Drawn By	JM 02/80	Revision	Sheet No.
Checked By	JVG 02/80	00	2 of 5
		Index No.	232

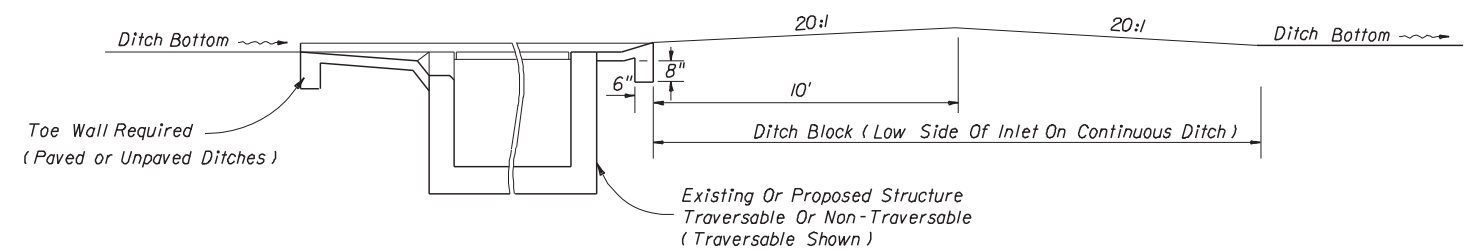


NOTE: See General Notes Nos. 6 and 7

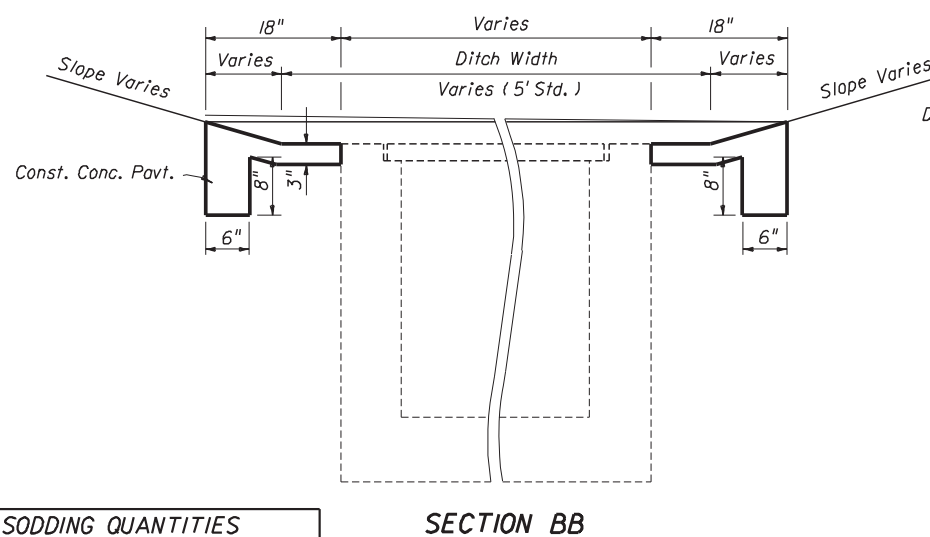
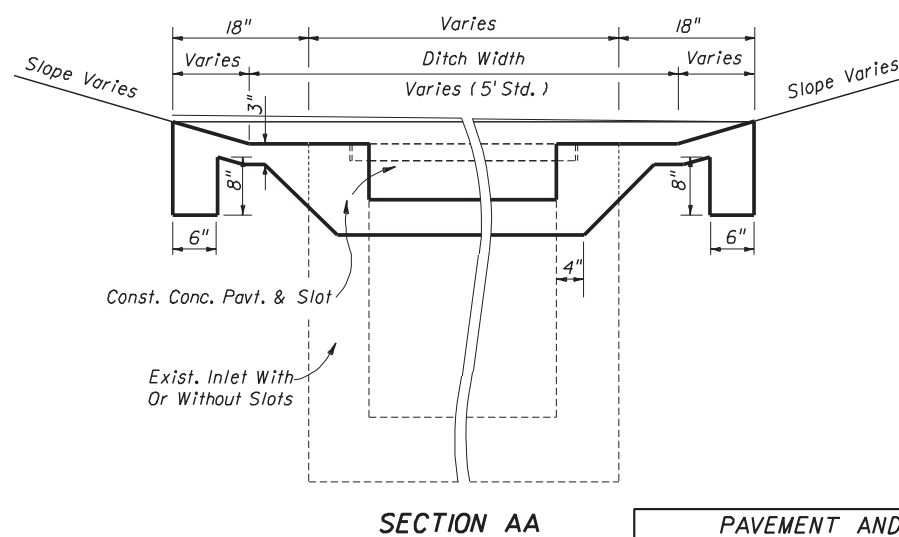
SODDING AND PAVEMENT FOR INLETS WITHOUT SLOTS AND INLETS WITH NON-TRAVERSABLE SLOTS

NOTE: See Index No. 229 For Application Guidelines

NON-TRAVERSABLE SLOTS

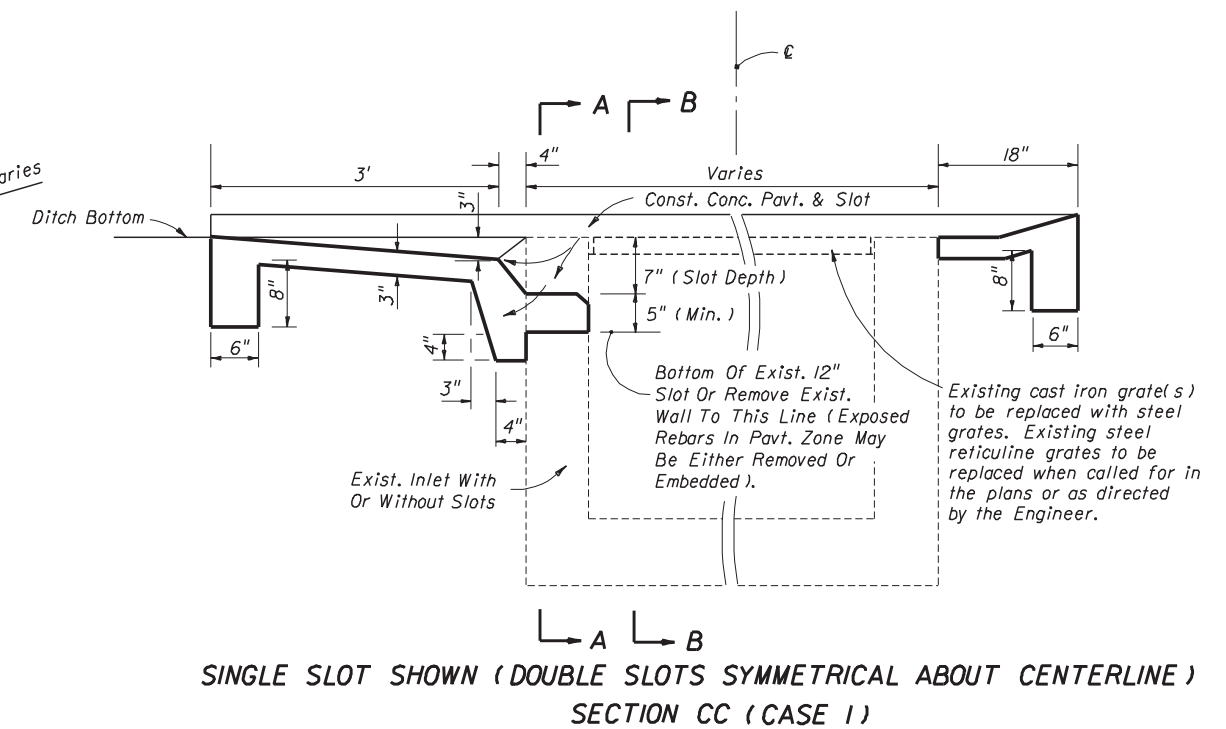


DITCH BLOCK FOR INLETS WITH OR WITHOUT SLOTS



PAVEMENT AND SODDING QUANTITIES FOR TRAVERSABLE SLOTS

Inlet	Pavement		Sod	
	Single Slot SY	Double Slot CY	Single Slot SY	Double Slot SY
C	4.87	0.83	6.16	1.05
D	5.99	1.01	7.70	1.30
E	5.88	0.99	7.37	1.24



NOTE: For plan view and additional details see sheet 2 of 4.
For payment see General Notes Nos. 6 and 7.

TRAVERSABLE SLOTS FOR EXISTING INLETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**DITCH BOTTOM INLETS
TYPES C,D,E & H**

Names	Dates	Approved By		
Designed By	EGR 07/84	S. A. McHenry State Drainage Engineer		
Drawn By	DAE 07/84			
Checked By	JBW/JVG 07/84	Revision	Sheet No.	Index No.
		00	3 of 5	232

DESIGN NOTES FOR TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS

1. The general purpose of these conversions is to remove the hazard of the protruding inlet top, while not creating a hazard by depressing the top too deeply.
2. The corrective procedure depends on the approach ditch grade and hydraulic requirements of the site. The selection of the appropriate case depends on the relationship between inlet top and ditch elevation, and, on the vertical clearance between the top of the uppermost pipe(s) and the grate. The purpose for the Case 1 conversion is to add the traversable slot to an existing inlet where top removal, change in grate elevation and ditch transitions are not required. Case 2 will normally be applicable to ditches with flatter grades adjoining the inlet. Case 3 will normally be applicable to ditches with steeper grades adjoining the inlet where buildup of the existing ditch is acceptable.
3. The designer shall stipulate in the plans which case is to be constructed at each individual inlet location.

Where the existing inlet top is above the existing ditch (Case 2) but borrow material will be required to adjust the ditch (Case 3), and vertical clearance or other conditions do not prevent removal of the inlet top, the designer should call for Case 2. The designer shall determine if ditch reconstruction is required more than 35 feet beyond any traversable slot side and shall include separate pay items in the plans to cover the cost for that portion of required ditch reconstruction exceeding the 35 foot limit. The designer shall also determine whether ditch pavement is required for ditch restoration within the 35 foot limit and include that pavement under a pay item separate from the inlets partial.

When the detention ditch concept is to be used with Case 3, the designer shall stipulate 'Case 3 (Detention)' in the plans.

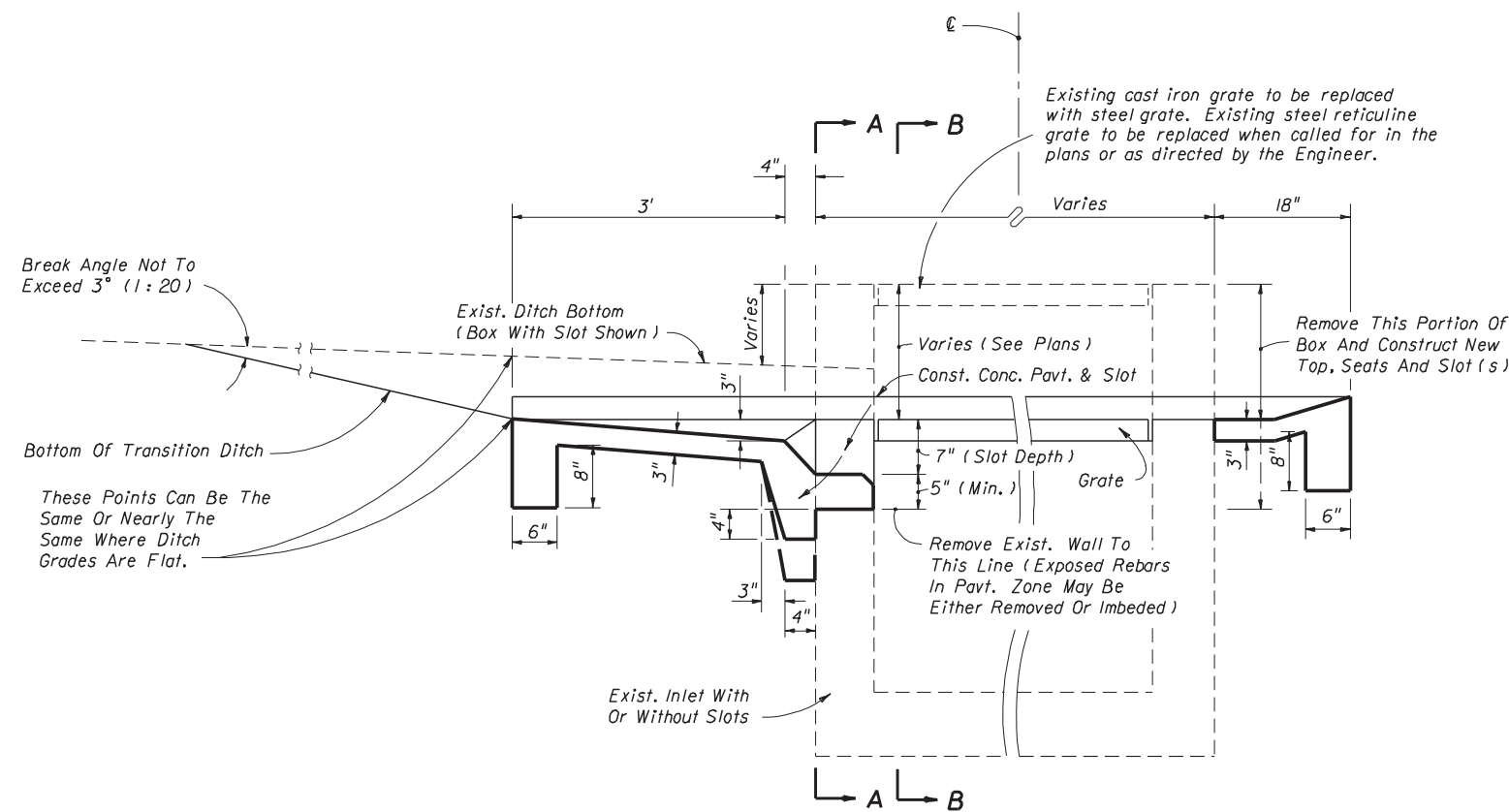
The designer shall determine whether tight soil or other conditions at each individual inlet indicates the need for underdrain in Case 3 conversions and shall call for Underdrain, Type I in the plans.

METHOD OF PAYMENT FOR TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS

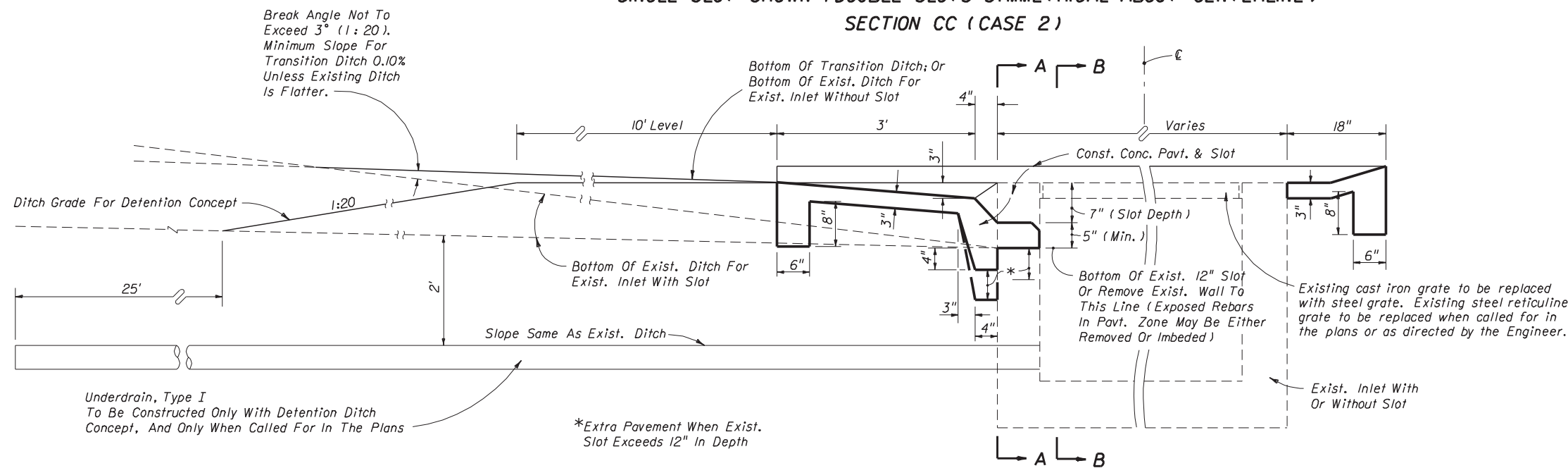
1. Existing inlets converted to traversable slot tops under Cases 1, 2 and 3 shall be paid for as inlets partial, each. Case shall not be included in the pay item description.
2. All ditch reconstruction work within 35 feet of each traversable slot conversion, whether required by these details or as a direct result of the conversion, shall be included as a part of the partial cost. Reconstruction work shall include excavation and removal of surplus materials or borrow materials in place, grading, compaction, shaping and seeding and mulching. Sodding, ditch pavement and underdrain are not included as part of the inlet partial cost and are to be paid for separately.
3. Inlet pavement and sodding shall be in accordance with the sections on this detail and with the Plan on Sheet 2 and Sections AA, BB and CC (as Case 1) and tabular quantities on Sheet 3.
4. Unit price and payment shall constitute full compensation for inlet conversion, replacement grate(s) ditch reconstruction, seeding and mulching, and shall be paid for under the contract unit price for Inlets (DT Bot) (Type ___) (Partial), each.

Sodding shall be paid for under the contract unit price for Sodding, SY.

Ditch pavement shall be paid for separate from the inlet by pavement type(s) and unit(s) as called for in the plans.



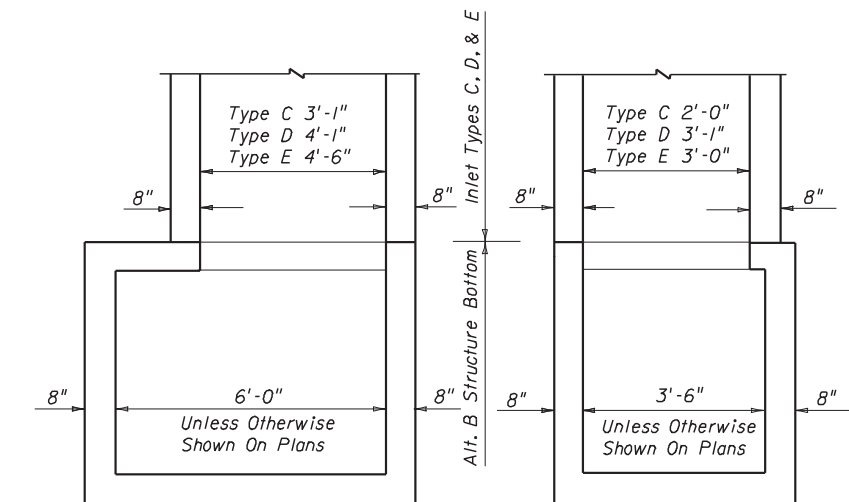
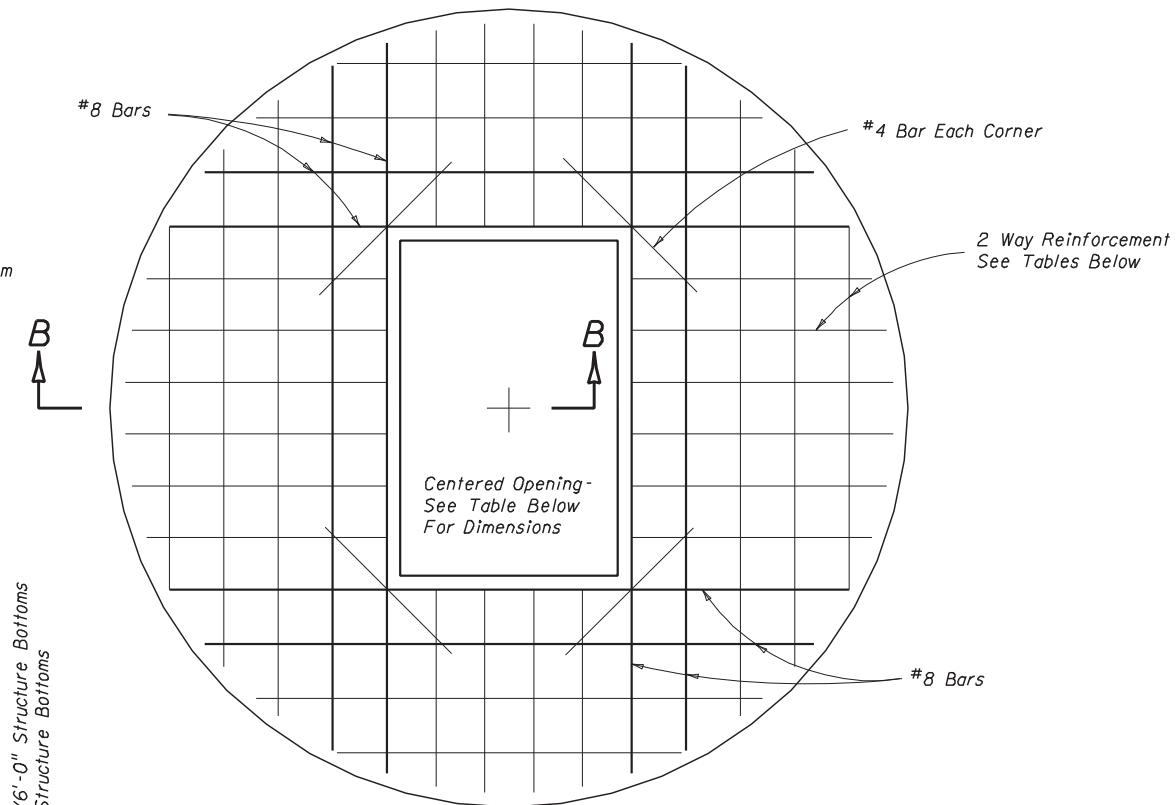
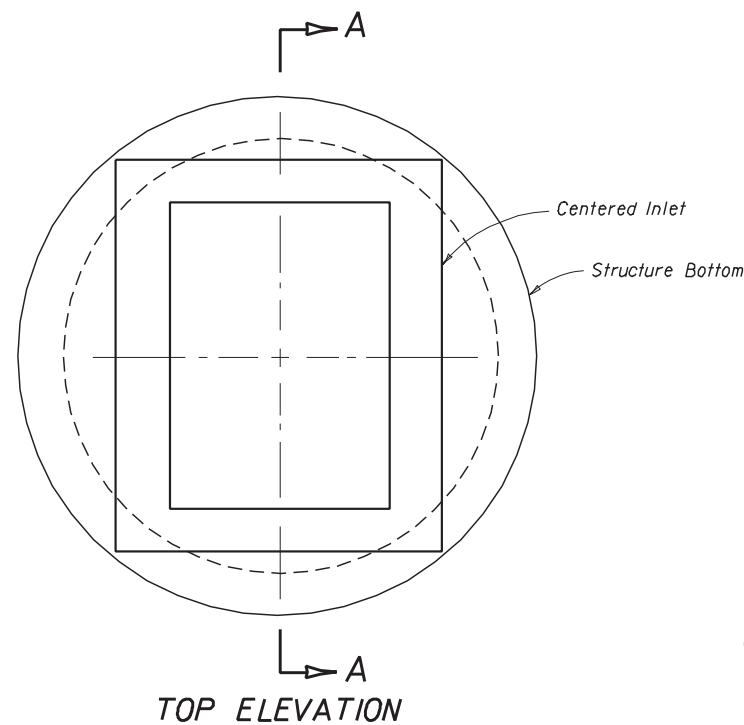
SINGLE SLOT SHOWN (DOUBLE SLOTS SYMMETRICAL ABOUT CENTERLINE) SECTION CC (CASE 2)



SINGLE SLOT SHOWN (DOUBLE SLOTS SYMMETRICAL ABOUT CENTERLINE) SECTION CC (CASE 3)

TRAVERSABLE SLOT INLETS (PARTIAL) FOR EXISTING INLETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DITCH BOTTOM INLETS TYPES C, D, E & H				
Names	Dates	Approved By		
Designed By	JVG/EGR	3/10/86	<i>S. A. McHenry</i> State Drainage Engineer	
Drawn By	HSD/dds	5/20/86	Revision	Sheet No.
Checked By	JVG/EGR	5/22/86	00	4 of 5
				232

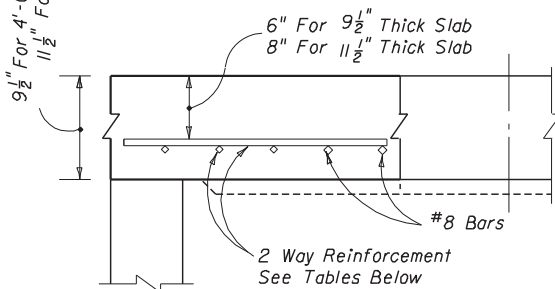


See Index No. 200 for structure bottom details and hole reinforcement.

ALT. B STRUCTURE BOTTOM FOR INLETS TYPE C, D & E

TOP SLAB OPENINGS		
DIAMETER	OPENING SIZE	
	MIN.	MAX.
4'-0"	2'-0" x 3'-1"	2'-0" x 3'-1"
5'-0"	2'-0" x 3'-1"	3'-1" x 4'-1"
6'-0"	2'-0" x 3'-1"	3'-0" x 4'-4"
8'-0"	2'-0" x 3'-1"	3'-0" x 4'-4"

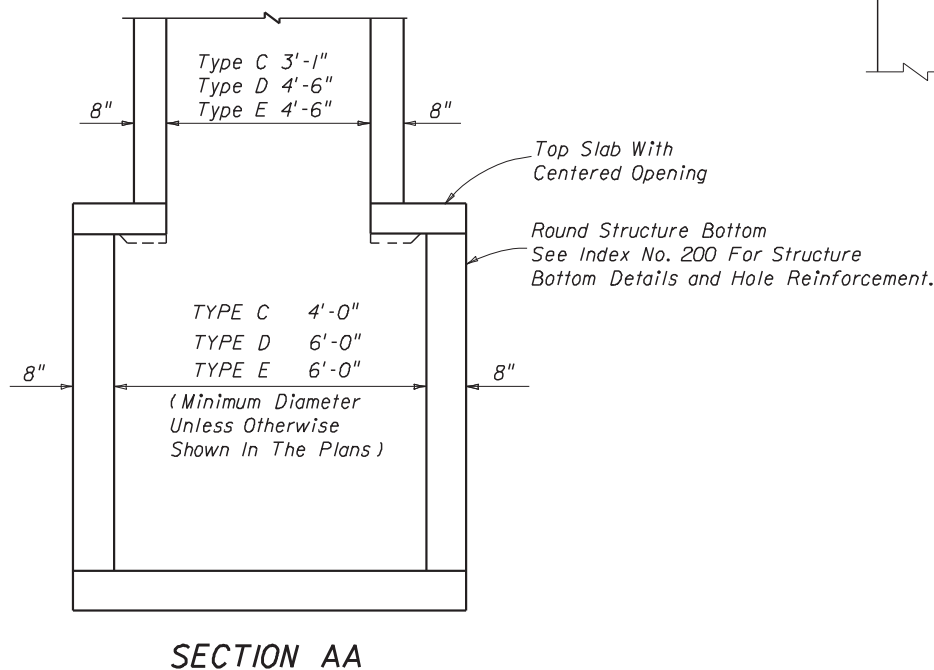
9 1/2" For 4'-0"/5'-0"/6'-0" Structure Bottoms
11 1/2" For 8'-0" Structure Bottoms



SECTION BB

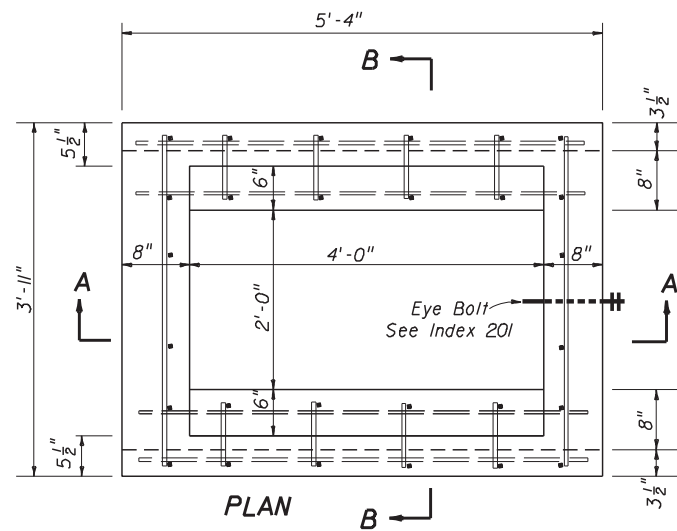
TOP SLAB WITH CENTERED OPENING		
SLAB DEPTH	SLAB THICKNESS	REINFORCING (2 WAYS) SCHEDULE
SIZE: 4'-0"		
≥ 0.5'-40'	9 1/2"	C
SIZE: 5'-0"		
≥ 0.5' < 30'	9 1/2"	C
30'-40'	9 1/2"	D
SIZE: 6'-0"		
0.5' < 8'	9 1/2"	B
8' < 18'	9 1/2"	C
18' < 30'	9 1/2"	D
30' < 37'	9 1/2"	E
37'-40'	9 1/2"	G
SIZE: 8'-0"		
≥ 0.5' < 9'	11 1/2"	C
9' < 15'	11 1/2"	D
15' < 23'	11 1/2"	E
23' < 33'	11 1/2"	E
33'-40'	11 1/2"	G

TOP SLAB REINFORCING SCHEDULE	
SCHEDULE	GRADE 60 OR 65KSI OR (WIRE FABRIC) In ² /ft
A	0.20
B	0.24
C	0.37
D	0.53
E	0.73
F	1.06
G	1.45

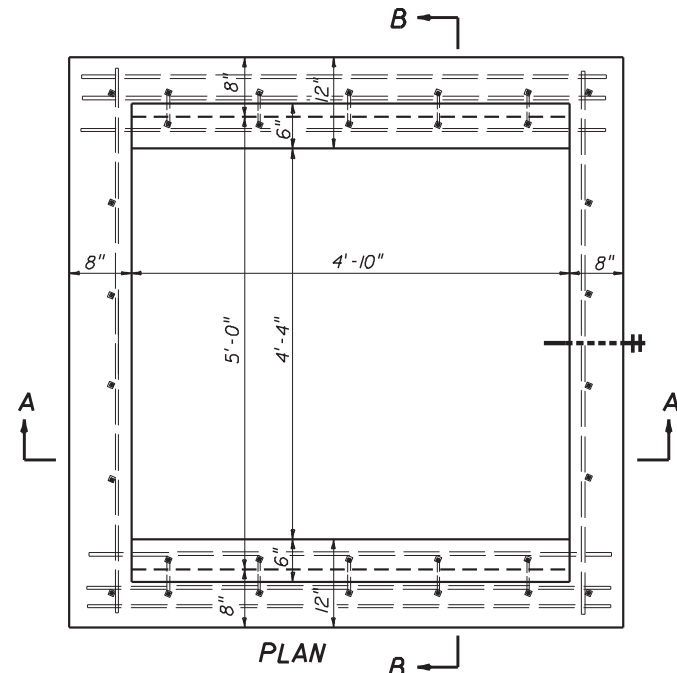


ALT. A STRUCTURE BOTTOM FOR INLETS TYPE C, D AND E

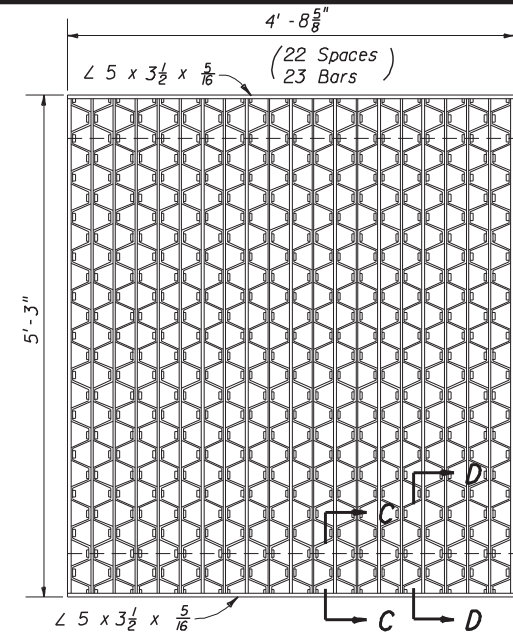
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
DITCH BOTTOM INLETS TYPES C, D, E & H					
Names	Dates	Approved By			
Designed By		<i>A. M. Memon</i> State Drainage Engineer			
Drawn By	JDT 02/99	Revision	Sheet No.	Index No.	
Checked By		00	5 of 5	232	



PLAN

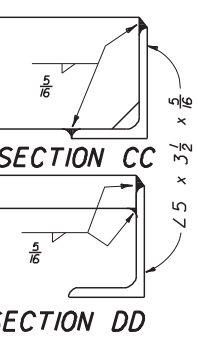


PLAN



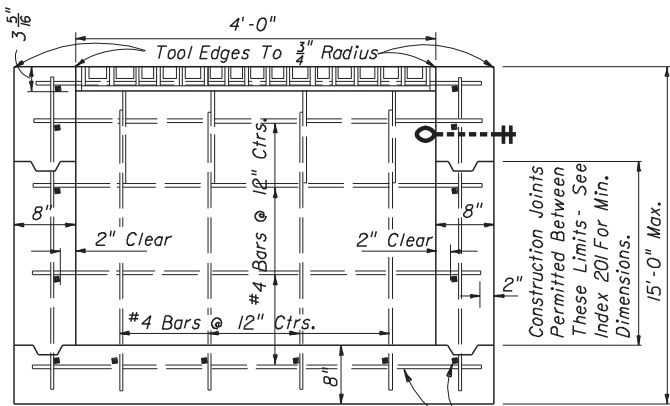
STEEL GRATE

5" Steel Decking, Weight 630 Lbs. Main Bars 5" x 1/4" Intermediate Bars 1 1/2" x 1/4", Reticuline Bars 1 1/4" x 3/16"



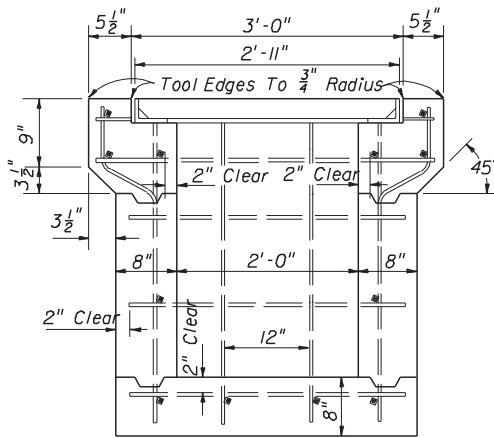
SECTION CC

SECTION DD

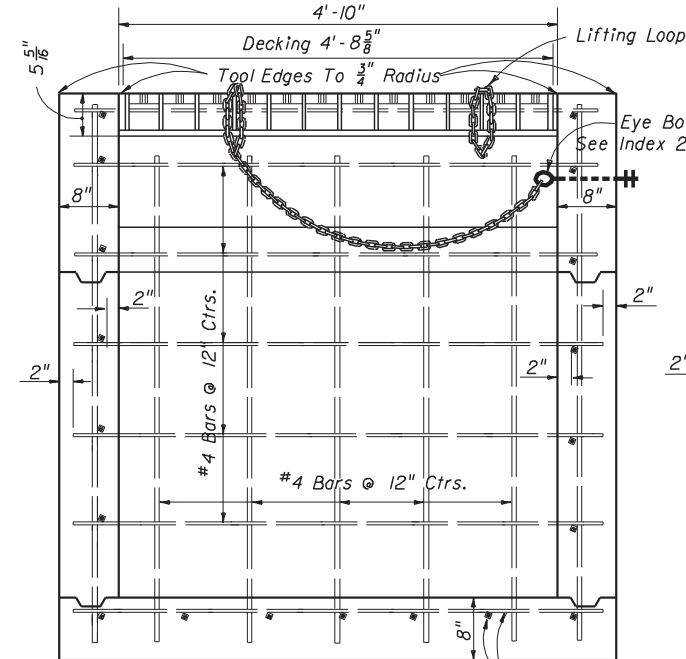


SECTION AA

#4 Bars @ 12" Ctrs.

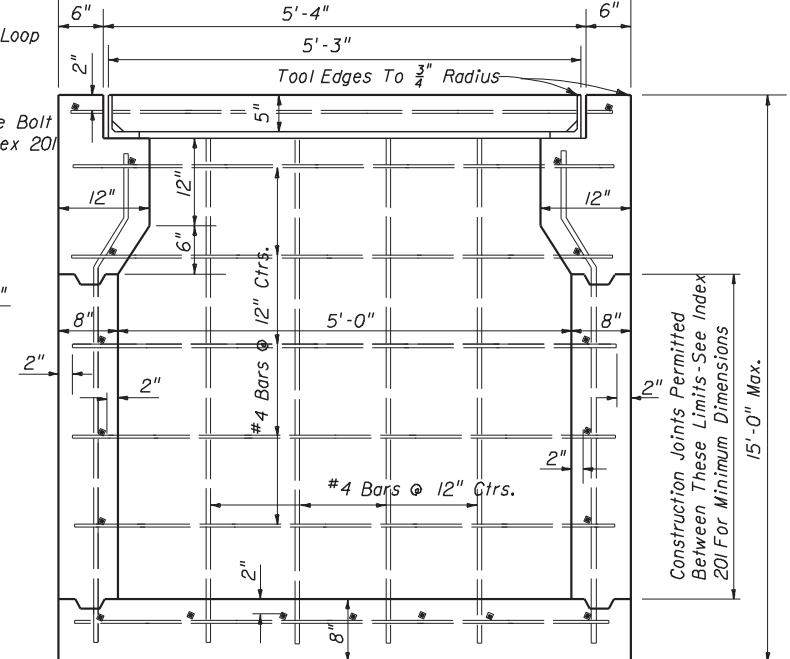


SECTION BB



SECTION AA

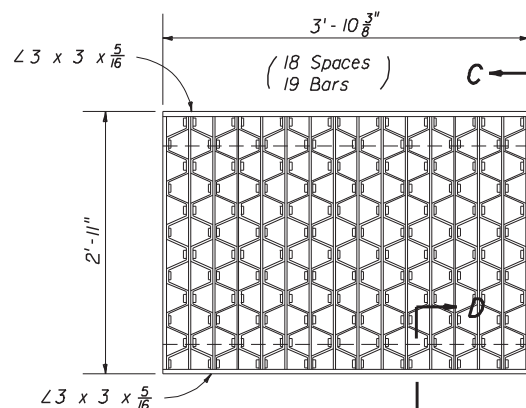
#4 Bars @ 12" Ctrs.



SECTION BB

Construction Joints Permitted Between These Limits - See Index 201 For Minimum Dimensions 15'-0" Max.

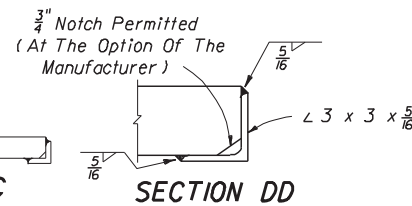
TYPE G



STEEL GRATE

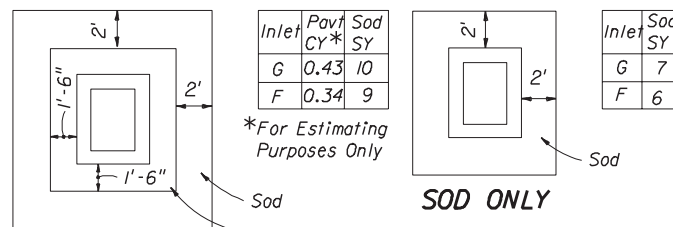
Steel Grating, Straight Bars 3" x 1/4" Reticuline Bars 2" x 3/16"

TYPE F



SECTION CC

SECTION DD



PAVT. AND SOD

SOD ONLY

Inlet	Pavt CY*	Sod SY
G	0.43	10
F	0.34	9

*For Estimating Purposes Only

Notes: 1. Pavement and/or sod to be used only where called for in the plans.
2. Cost of paving to be included in cost of inlet.

PAVEMENT AND SODDING

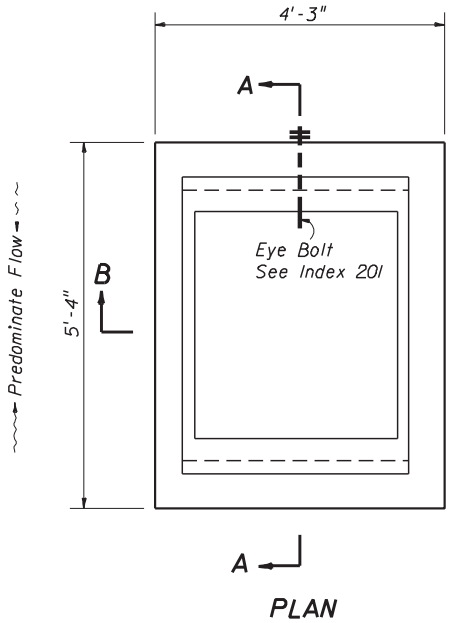
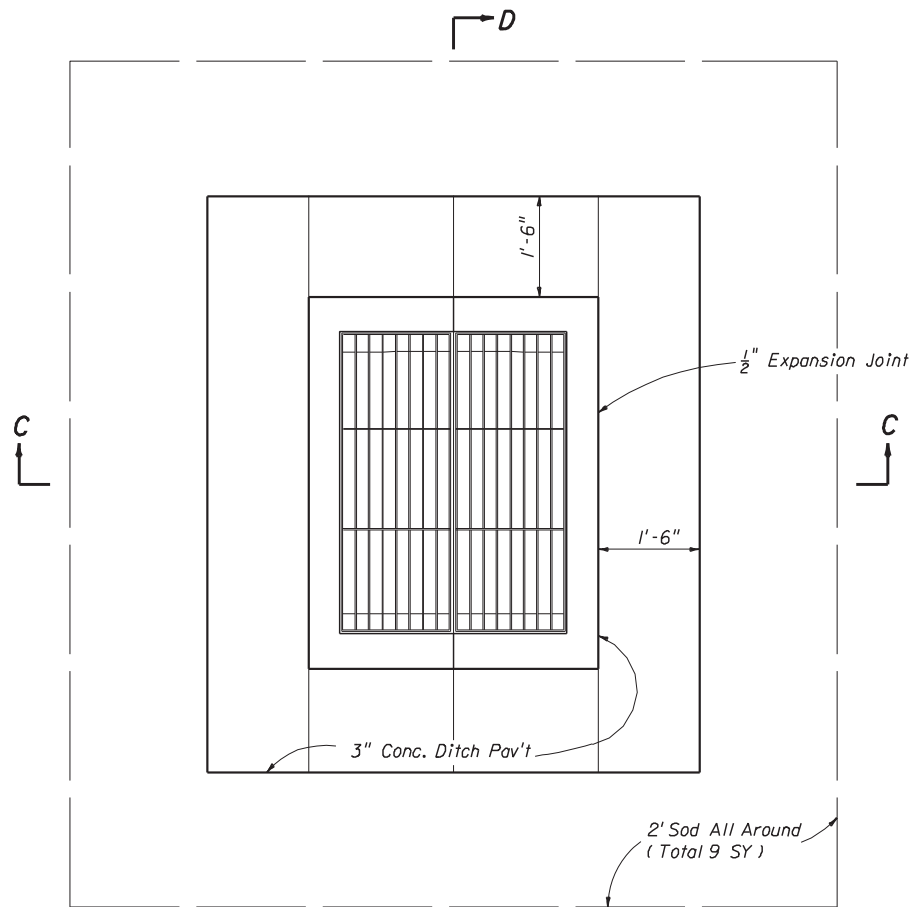
GENERAL NOTES

- These inlets are designed for use in ditches, medians, pavement areas, or other areas subject to heavy wheel loads where debris is minimal and is subject to pedestrian and/or bicycle traffic.
- When alternate G grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.
- These inlets may be used with Alt. B structure bottoms, Index 200. The inlet and bottom combinations are to be paid for under the contract unit price for Inlets (DT Bot) (Type F (or G)) (J Bot, Depth), Ea.
- For supplemental details (Type F only), see index 201.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

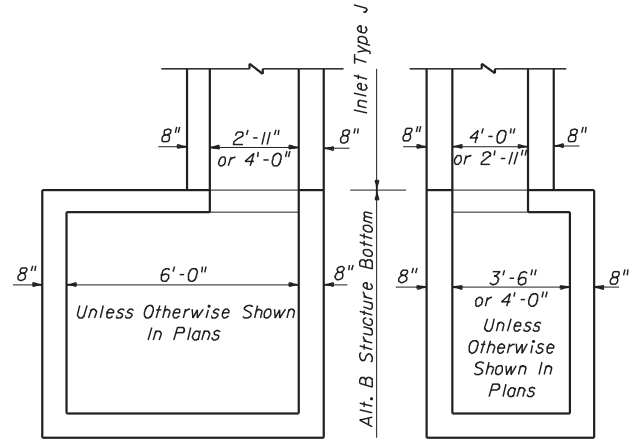
DITCH BOTTOM INLETS TYPES F & G

Names	Dates	Approved By	
Designed By	TWJ 01/50	S. A. McHenry State Drainage Engineer	
Drawn By	MEF 01/50		
Checked By	WHM 01/50		
Revision	00	Sheet No.	Index No.
		1 of 1	233



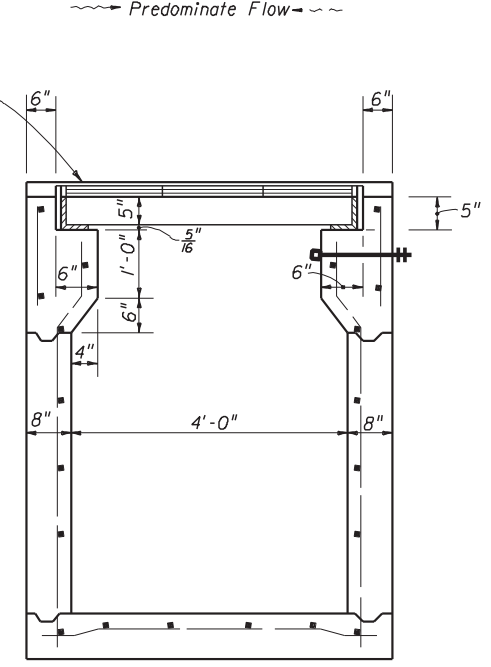
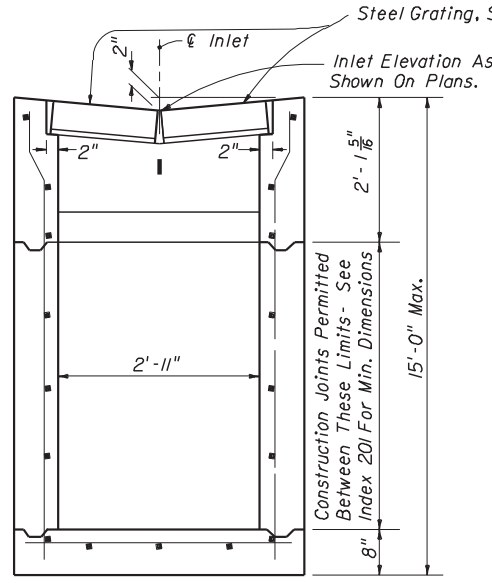
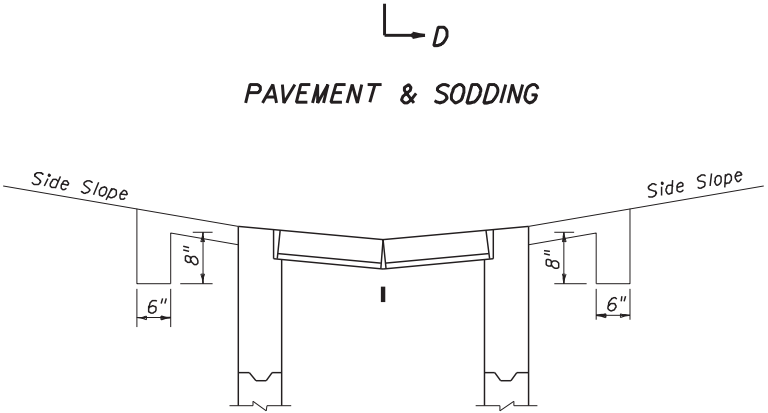
RECOMMENDED MAXIMUM PIPE SIZES	
INLET INSIDE WIDTH	PIPE SIZE
2'-11"	24"
4'-0"	36"

Note: Recommended sizes are for concrete pipe. Sizes for other types of pipe must be verified for fit in accordance with Index No. 201. For larger pipe see bottom detail right and Index No. 200.



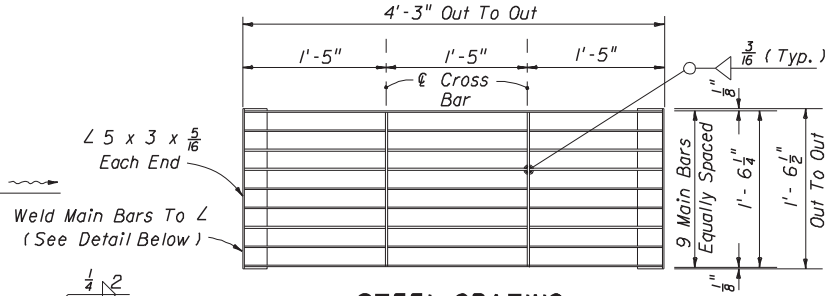
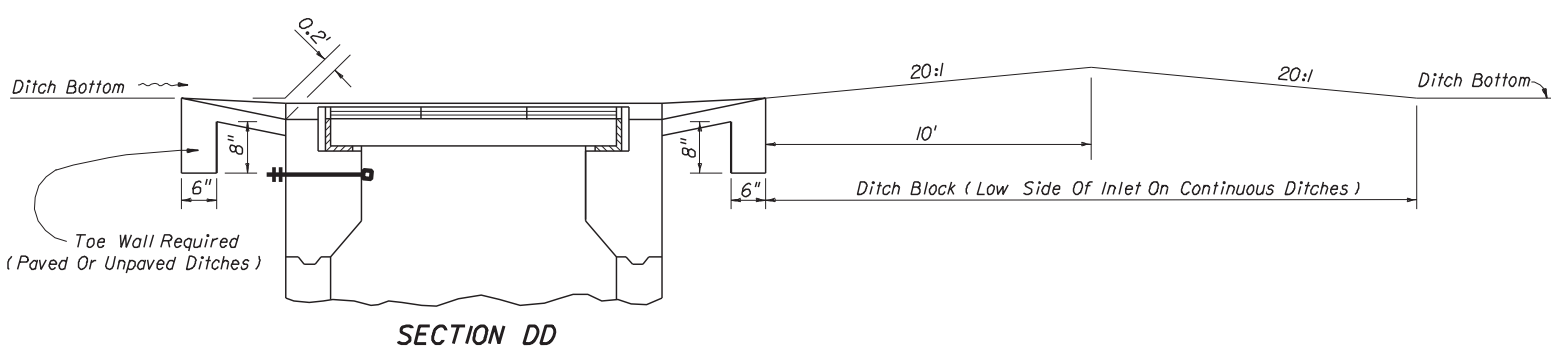
NOTE: Alt. B Structure Bottom Only. See Index 200 for structure bottom details and hole reinforcement.

INLET WITH STRUCTURE BOTTOM



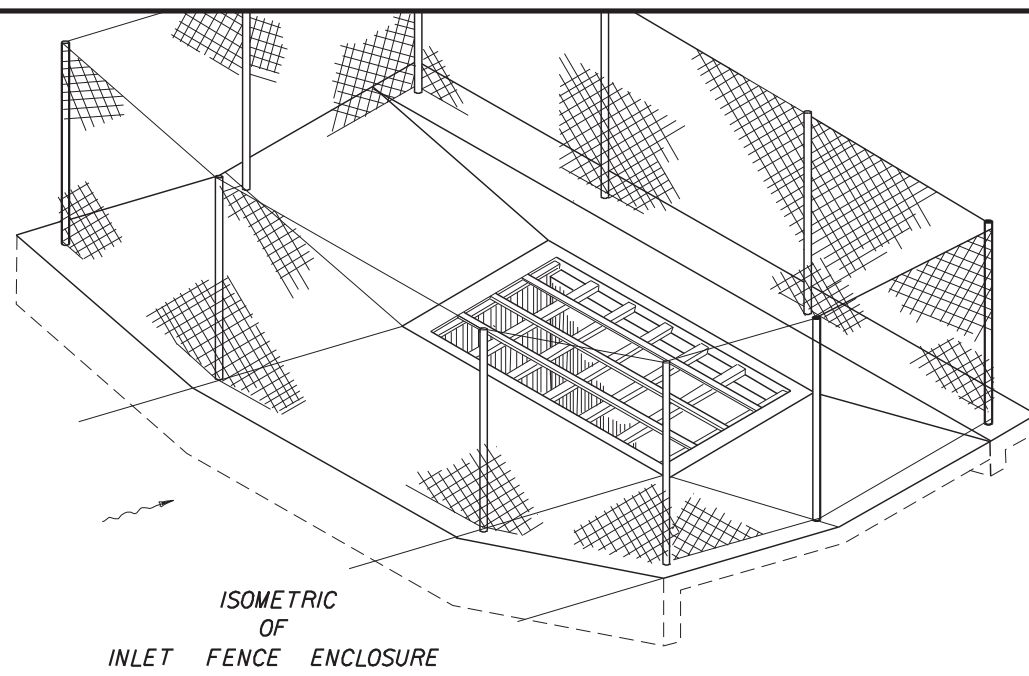
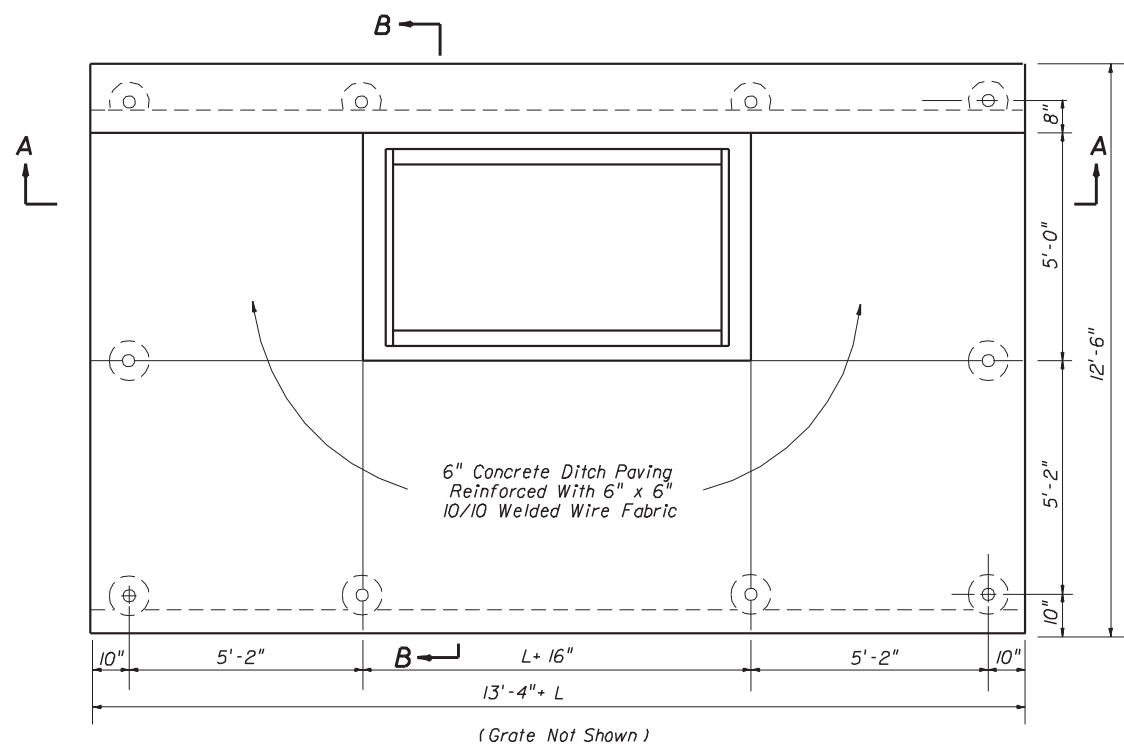
GENERAL NOTES

- This inlet is designed for ditches, medians or other areas subject to heavy wheel loads, where only light debris is expected and pedestrian traffic is anticipated. NOTICE: Inlet not for use in areas subject to bicycle traffic.
- Reinforcing - #4 bars at 12" centers both ways with 2" clearance to inside face. Cut or bend bars out of way of pipe when necessary; bars to clear pipe by 1/2".
- When alternate G grate is specified in plans the grate is to be hot dipped galvanized after fabrication.
- For supplemental details, see Index 201.
- Cost of ditch paving to be included in cost of inlet. Sodding to be paid for under contract unit price for Sodding, SY.

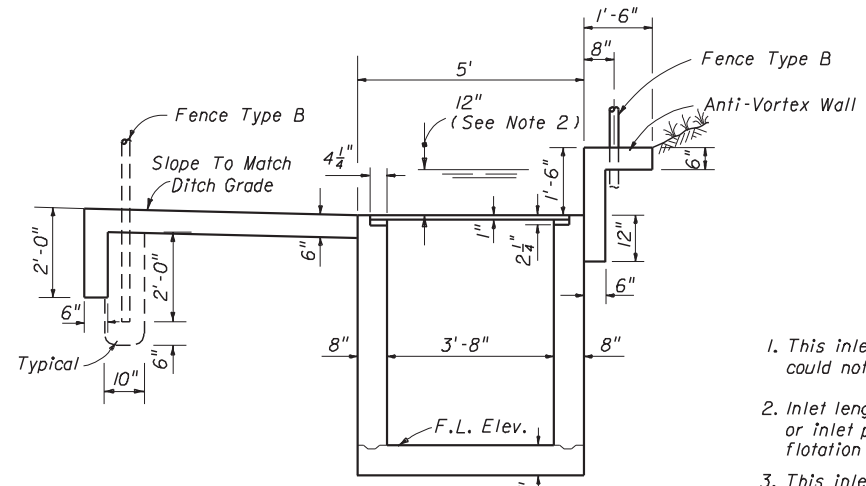
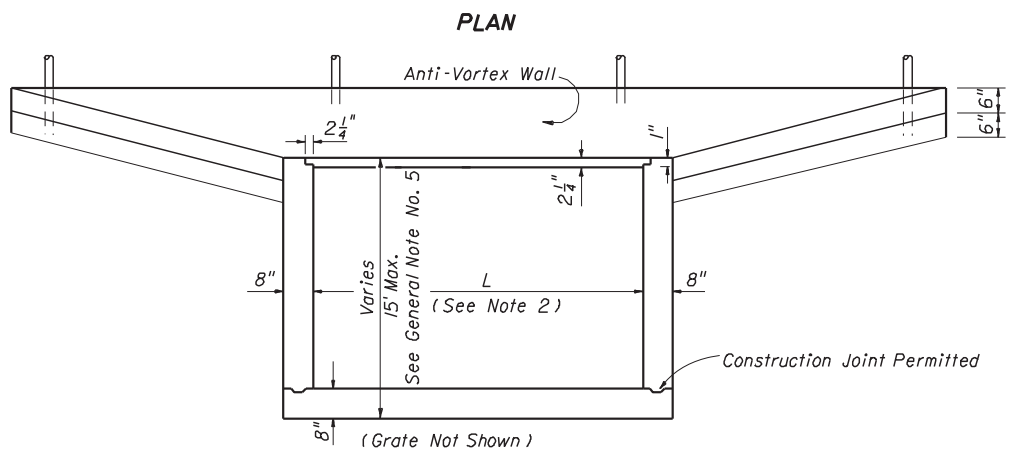


Note: Two Required Per Inlet
 Main Bars 5" x 1/4" (Notched For Cross Bars).
 Cross Bars 1 3/4" x 1/4" (Continuously Welded At Main Bar Notches).
 Main Bars And Cross Bars Flush On Top.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DITCH BOTTOM INLET TYPE J				
Names	Dates	Approved By		
Designed By	LMF	08/76	S. A. McHenry State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By	SRL	08/76	00	1 of 1
				Index No. 234

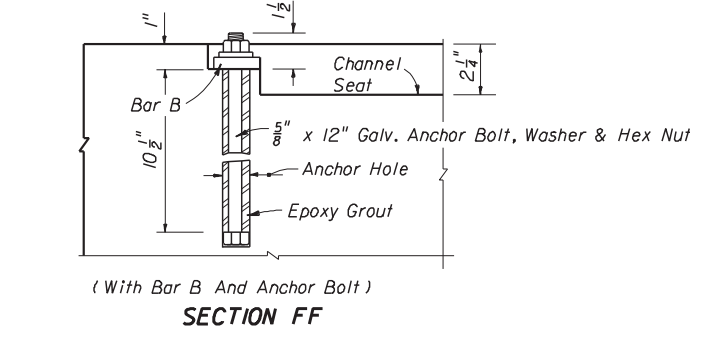
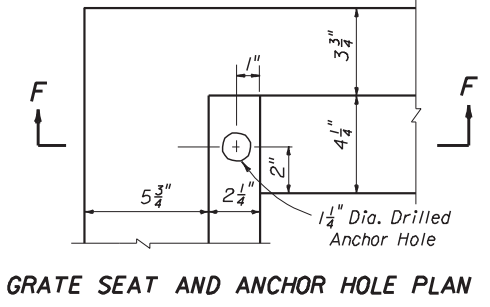
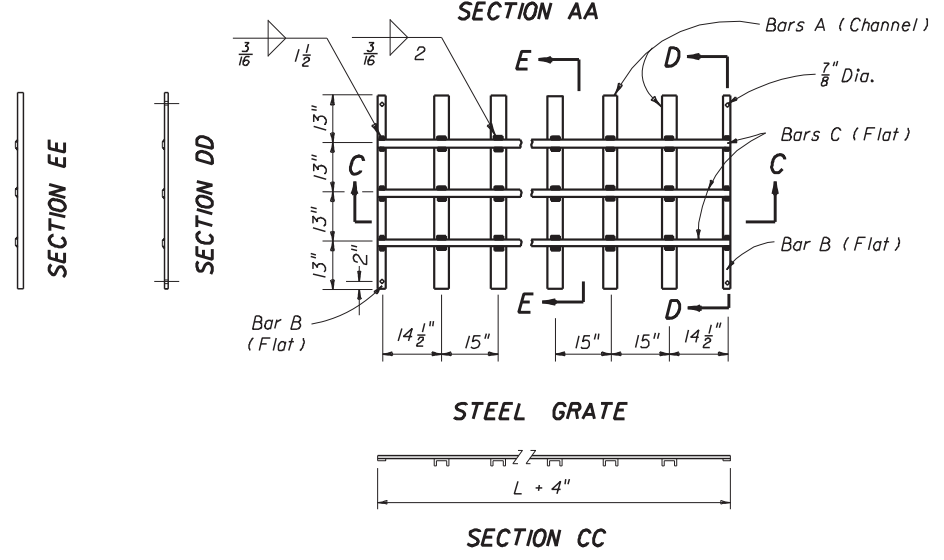


GRATE QUANTITIES						
PIPE SIZE	L	BILL OF STEEL			STEEL WEIGHT	
		BAR	No. REQ'D.	LENGTH	CHANNEL 4"x 5.4"#	FLAT 2"x 1/2" (3.4)#
30" & 36"	4'-9"	A	3	4'-4"	70	30
		B	2	4'-4"		
		C	3	5'-1"		
42" & 48"	6'-0"	A	4	4'-4"	94	30
		B	2	4'-4"		
		C	3	6'-4"		
54" & 60"	7'-3"	A	5	4'-4"	117	30
		B	2	4'-4"		
		C	3	7'-7"		
66" & 72"	8'-6"	A	6	4'-4"	140	30
		B	2	4'-4"		
		C	3	8'-10"		
SPECIAL	9'-9"	A	7	4'-4"	164	30
		B	2	4'-4"		
		C	3	10'-1"		
SPECIAL	11'-0"	A	8	4'-4"	187	30
		B	2	4'-4"		
		C	3	11'-4"		
SPECIAL	12'-3"	A	9	4'-4"	211	30
		B	2	4'-4"		
		C	3	12'-7"		
SPECIAL	13'-6"	A	10	4'-4"	234	30
		B	2	4'-4"		
		C	3	13'-10"		
SPECIAL	14'-9"	A	11	4'-4"	257	30
		B	2	4'-4"		
		C	3	15'-1"		
SPECIAL	16'-0"	A	12	4'-4"	281	30
		B	2	4'-4"		
		C	3	16'-4"		
SPECIAL	17'-3"	A	13	4'-4"	304	30
		B	2	4'-4"		
		C	3	17'-7"		
SPECIAL	18'-6"	A	14	4'-4"	328	30
		B	2	4'-4"		
		C	3	18'-10"		



GENERAL NOTES

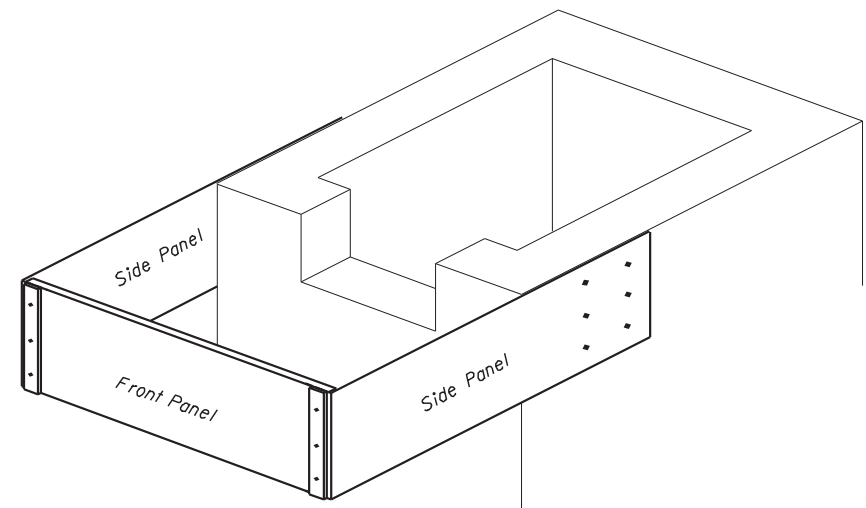
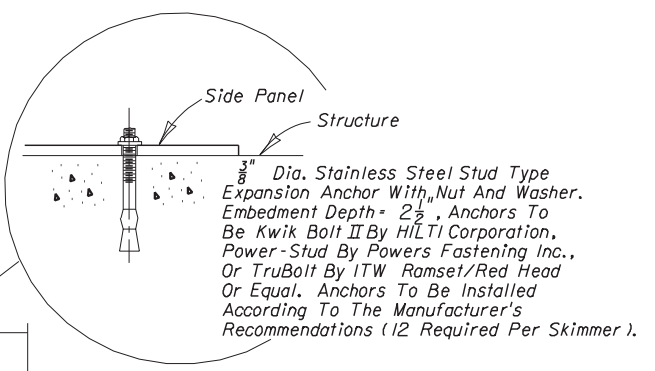
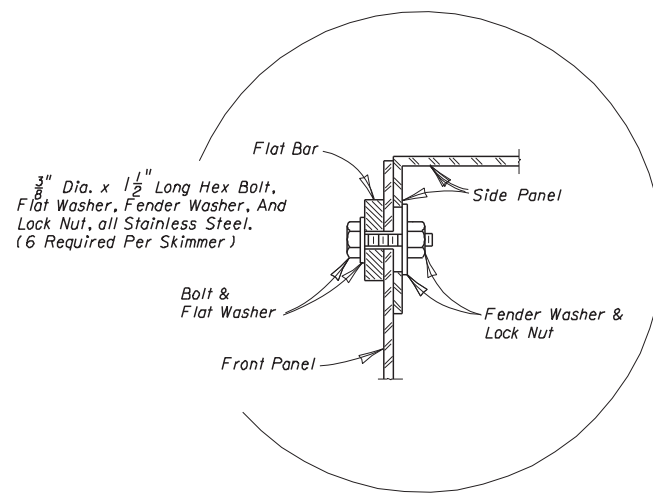
1. This inlet is to be used at locations having high flow rates, usually where an endwall could not be utilized without hazardous intake.
2. Inlet length (L) shall be set by the designer for the greater of either culvert requirement or inlet pool not to exceed 12" depth. Structures over 6' in depth are to be checked for flotation by the designer of project drainage.
3. This inlet is not intended for use with Alternate B structure bottoms.
4. Inlet and anti-vortex wall to be Class I Concrete.
5. Reinforcing - #4 bars at 12" centers both ways for pipe sizes up to 72" diameter; 1 1/2" clearance to inside face and bottom of Inlet. See Index No. 201, Sh. 4 & 5 for reinf. steel modification for depths 13' to 15'. Inlets for special size pipe require special reinforcement design and design approval by the project design engineer.
6. Channel section C 3x6 may be used as an alternate for the C 4x5.4 channel.
7. Channels and bars shall be ASTM A242/A242M, A572/A572M or A588/A588M, Grade 50 steel, and galvanized in accordance with Section 962-7 of the Standard Specifications.
8. Fence enclosure shall be Fence Type B (Index No. 452). All posts to be set in concrete. A minimum of 10 posts required. Corner and approach side posts to be 3" nominal diameter.
9. Cost of ditch paving, anti-vortex wall, grate, concrete, reinforcing steel and fence enclosure to be included in the cost of inlet. Inlet to be paid for under the contract unit price for inlets (DT Bot) (Type K), Each.



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

DITCH BOTTOM INLET TYPE K

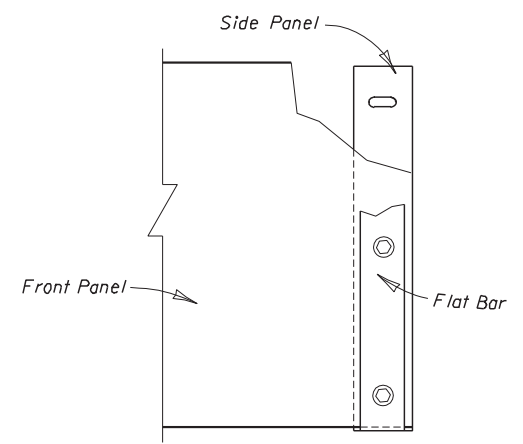
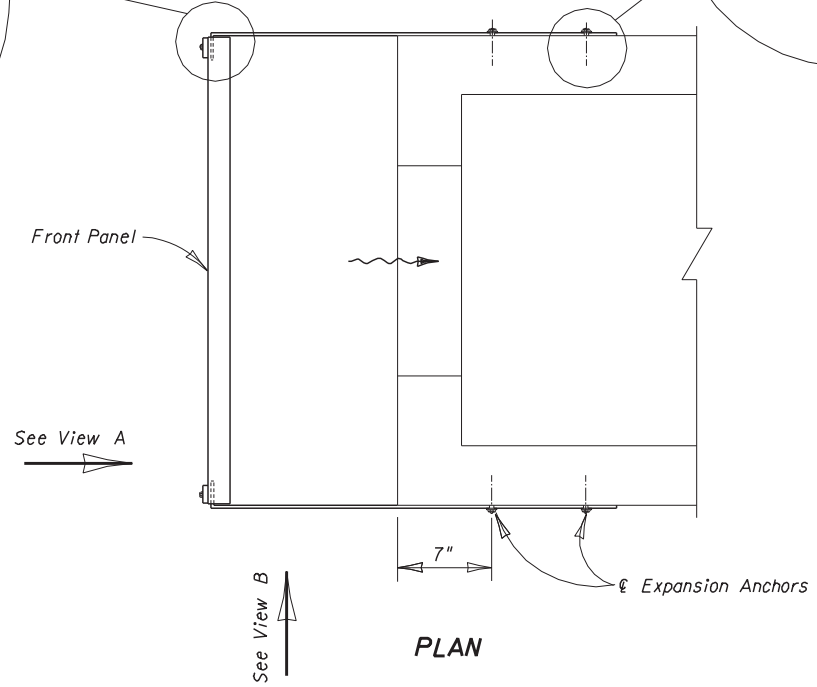
Designed By	FHWA	Dates	6/79	Approved By	S. A. McHenry
Drawn By	SM	6/79		State Drainage Engineer	
Checked By	JG	6/79		Revision	00
				Sheet No.	1 of 1
				Index No.	235



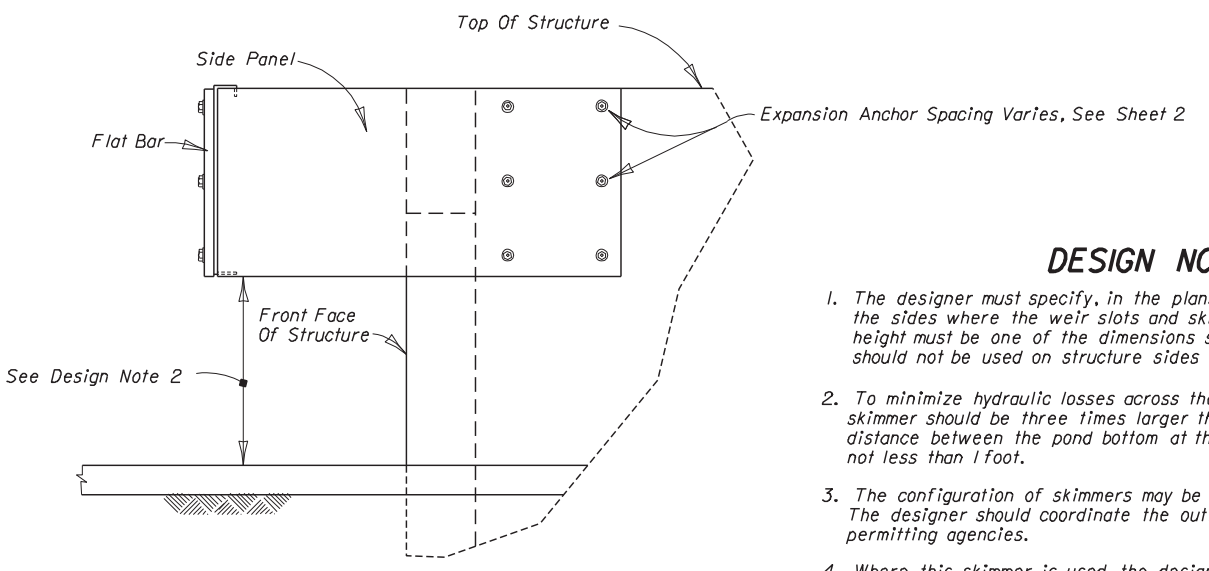
PICTORIAL VIEW

GENERAL NOTES

1. This skimmer is intended for use on Type C, D, or E Ditch Bottom Inlets that are used as outlet control structures of stormwater management facilities.
2. The side panels are dimensionally symmetric, therefore they may be used on either side of the structure.
3. Two (2) skimmers may be constructed on one structure provided they are on opposite ends.
4. The width of the front panel (dimension W) shall be the same as the outside dimension across the front of the structure.
5. The front panel, side panels, and flat bars are to be hot dipped galvanized after fabrication.
6. The location of the reinforcing steel in these structures must conform to the applicable standards to avoid conflict with the expansion anchors used to attach the skimmer.
7. Grates to be used on the inlets unless otherwise specified in the plans.
8. A skimmer consists of two (2) side panels, one front panel, two (2) flat bars, and accessory hardware. The cost of skimmers is to be included in the cost of the inlet.

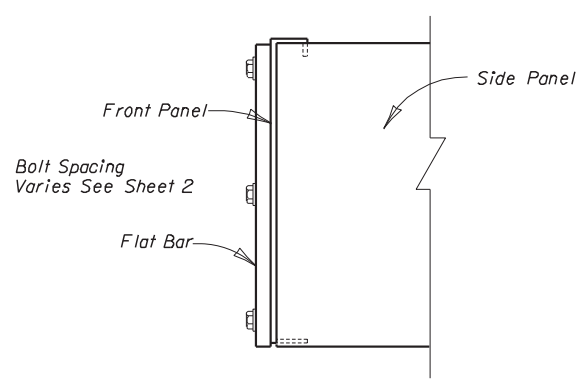


VIEW A



DESIGN NOTES

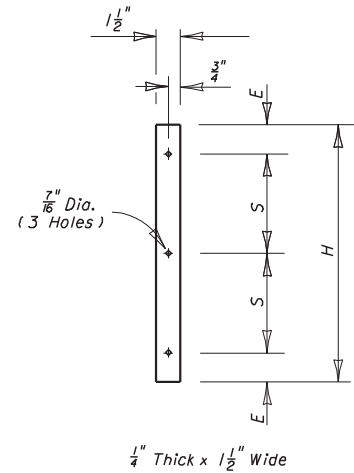
1. The designer must specify, in the plans, the skimmer height (dimension H) and the sides where the weir slots and skimmers are located. The skimmer height must be one of the dimensions shown in the table on Sheet 2. The skimmer should not be used on structure sides with outside dimensions greater than 6'-4".
2. To minimize hydraulic losses across the skimmer, the flow area under the skimmer should be three times larger than the flow area of the weir slot. The distance between the pond bottom at the structure and the skimmer shall be not less than 1 foot.
3. The configuration of skimmers may be subject to regulatory requirements. The designer should coordinate the outlet control structure details with the permitting agencies.
4. Where this skimmer is used, the designer should reference this index with the outlet control structure details. Where a different skimmer design is needed, the designer should provide skimmer details in the plans.
5. The designer shall evaluate if a grate is needed for safety reasons. Where a grate is not needed for safety reasons and is not desirable for hydraulic or other reasons, the designer may omit the grate by stating so in the outlet control structure details.
6. The designer must show the configuration of the weir slots in the outlet control structure detail.



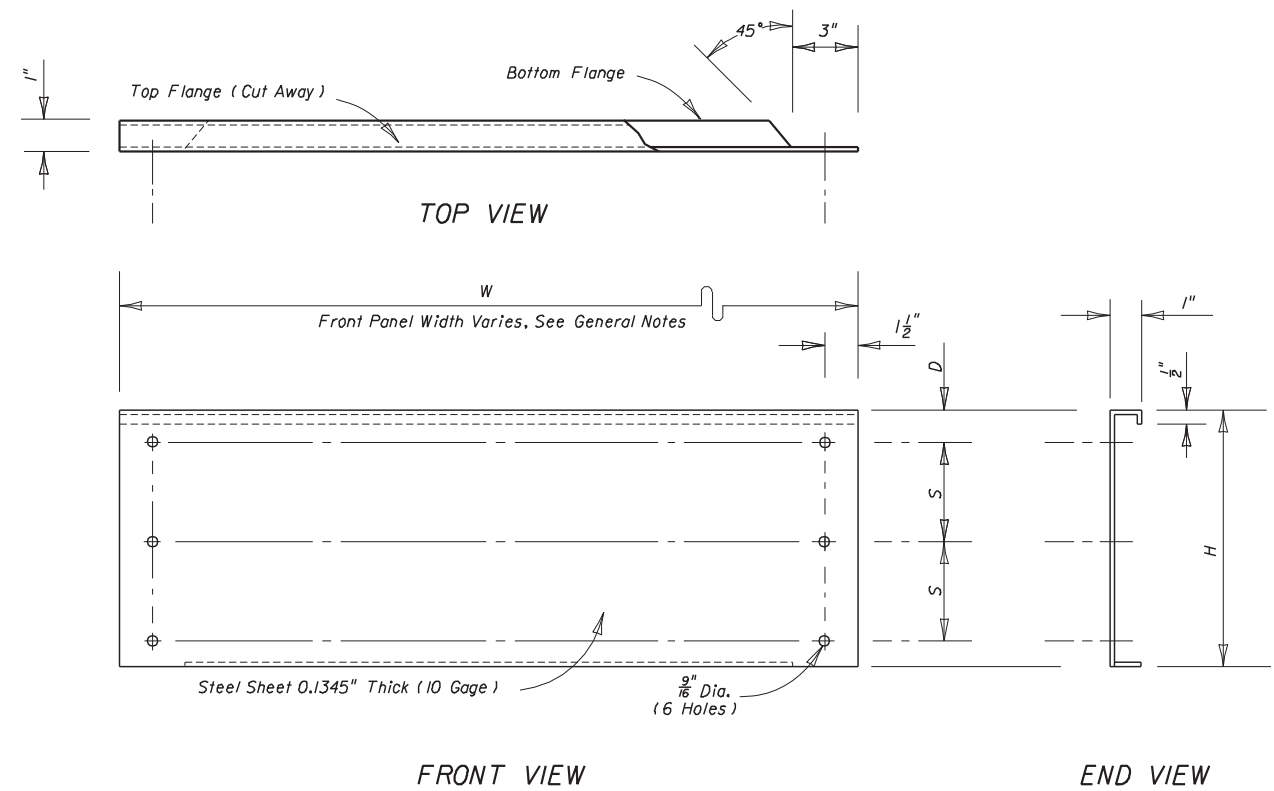
VIEW B

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
SKIMMER FOR OUTLET CONTROL STRUCTURES					
Designed By	CRH	02/99	Approved By <i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	JT	02/99	Revision	Sheet No.	Index No.
Checked By	WPH	02/99	00	1 of 2	240

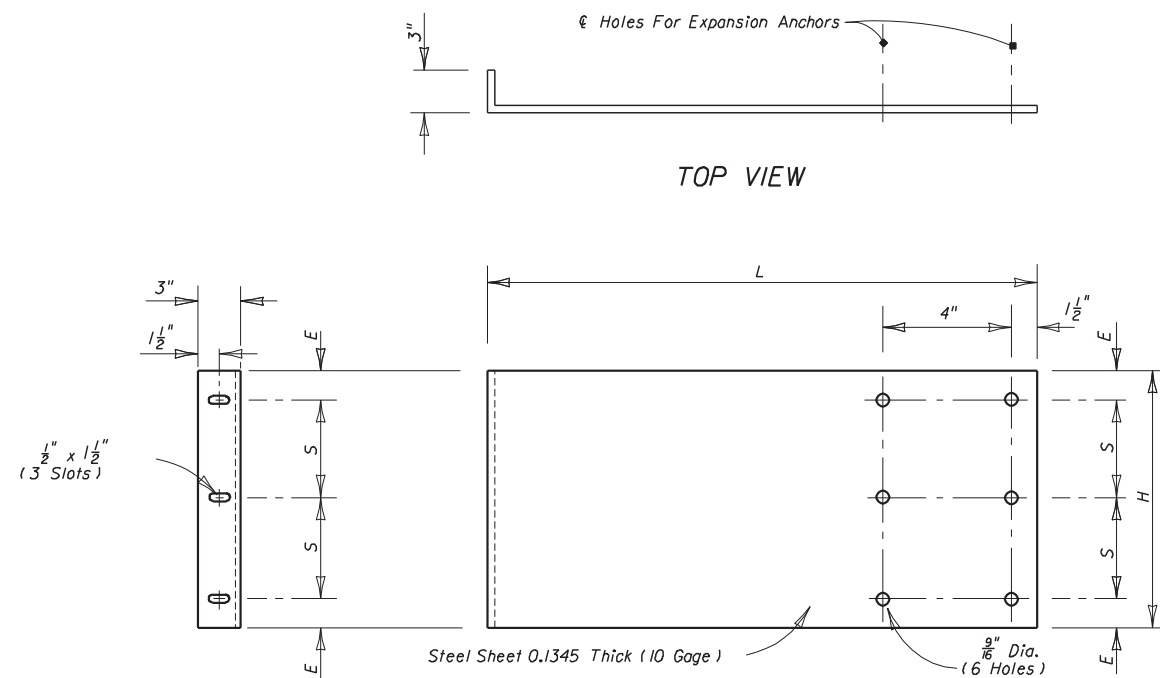
DIMENSIONS				
Skimmer Height as specified in the plans				Bolt Spacing
H	D	E	L	S
Inches				
12	3 ³ / ₁₆ "	3	28	3
14	3 ³ / ₁₆ "	3	28	4
16	3 ³ / ₁₆ "	3	28	5
18	3 ³ / ₁₆ "	3	28	6
20	4 ³ / ₁₆ "	4	31	6
22	4 ³ / ₁₆ "	4	31	7
24	4 ³ / ₁₆ "	4	31	8
26	4 ³ / ₁₆ "	4	31	9
28	4 ³ / ₁₆ "	4	31	10
30	5 ³ / ₁₆ "	5	31	10
32	5 ³ / ₁₆ "	5	31	11
34	5 ³ / ₁₆ "	5	31	12
36	6 ³ / ₁₆ "	6	31	12
38	6 ³ / ₁₆ "	6	31	13
40	6 ³ / ₁₆ "	6	31	14



FLAT BAR

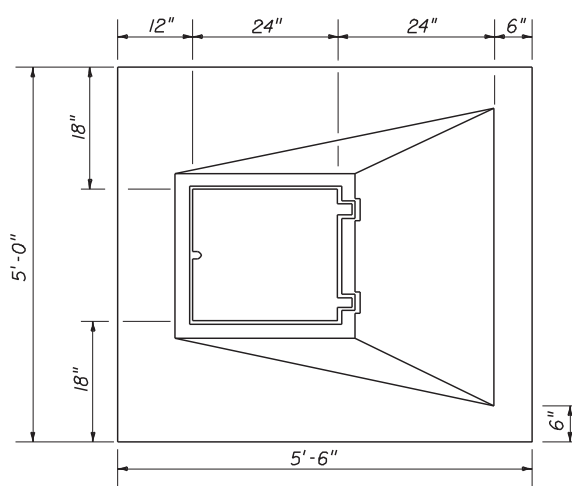
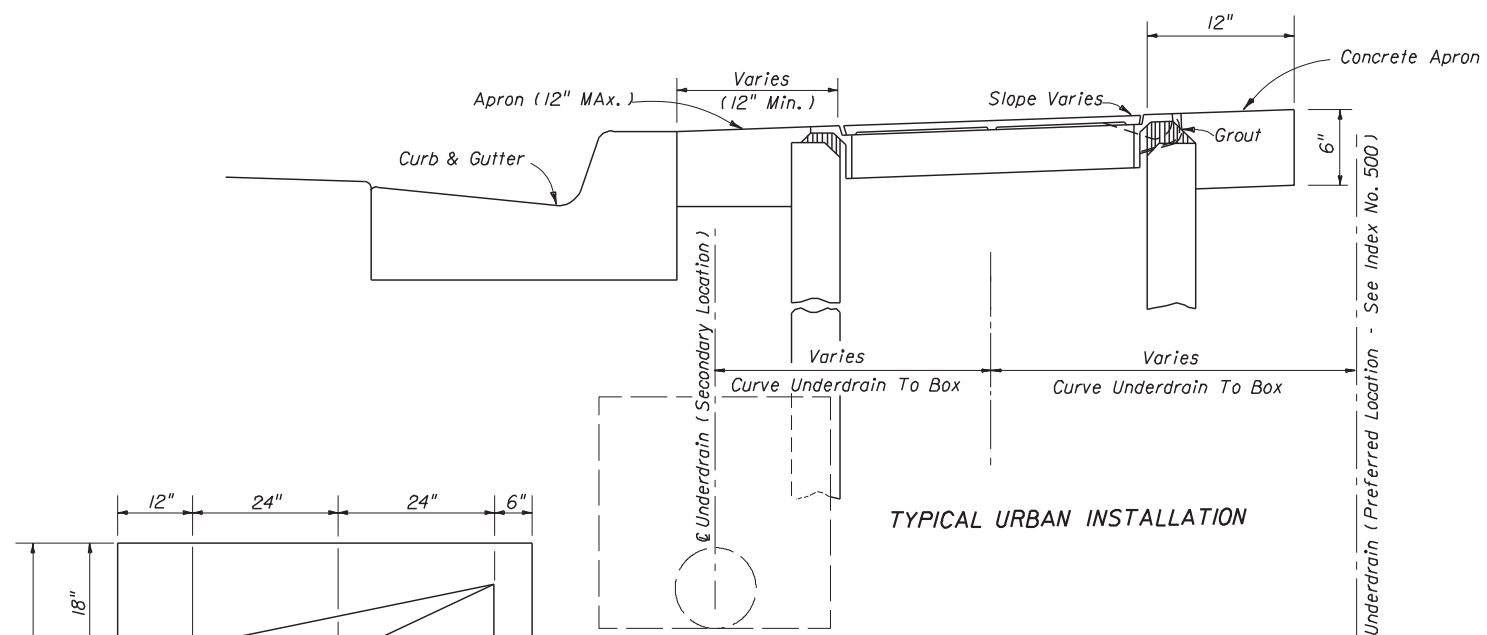


FRONT PANEL

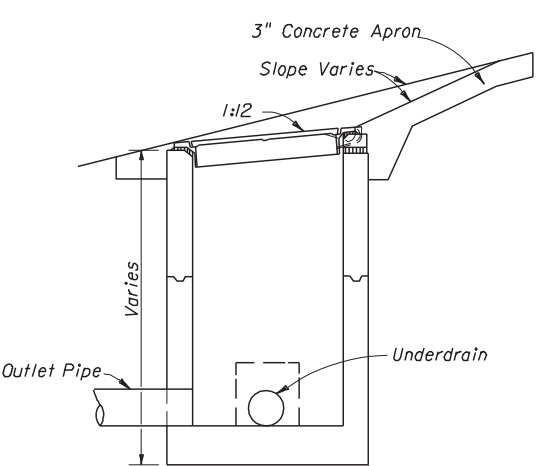


SIDE PANEL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SKIMMER FOR OUTLET CONTROL STRUCTURES				
Names	Dates	Approved By		
Designed By	CRH 02/99	<i>S. A. McHenry</i> State Roadway Design Engineer		
Drawn By	JT 02/99	Revision	Sheet No.	Index No.
Checked By	WPH 02/99	00	2 of 2	240

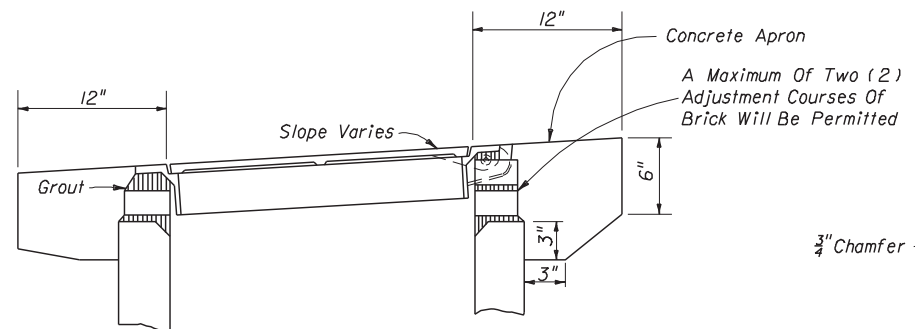


TYPICAL URBAN INSTALLATION

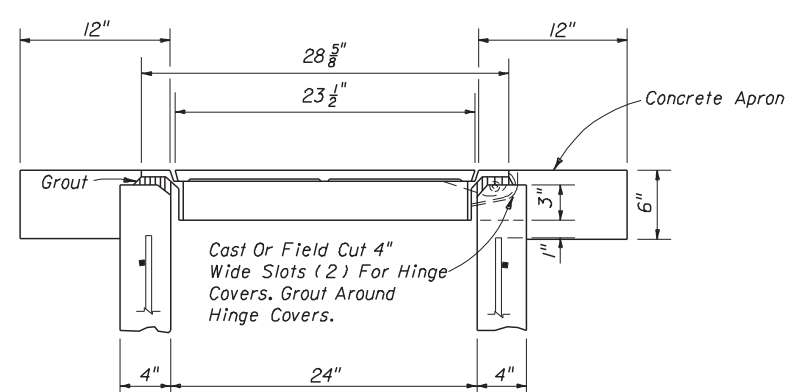


SECTION

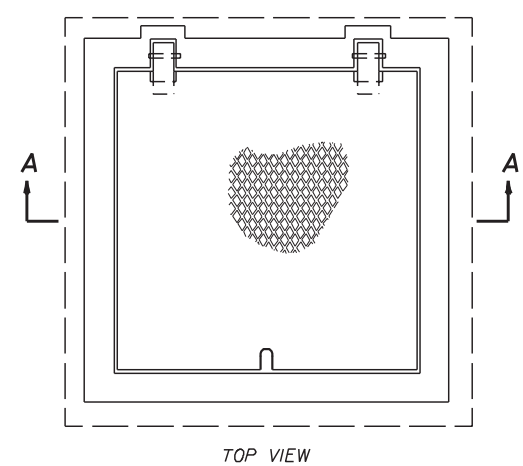
TYPICAL INSTALLATION ON SLOPES



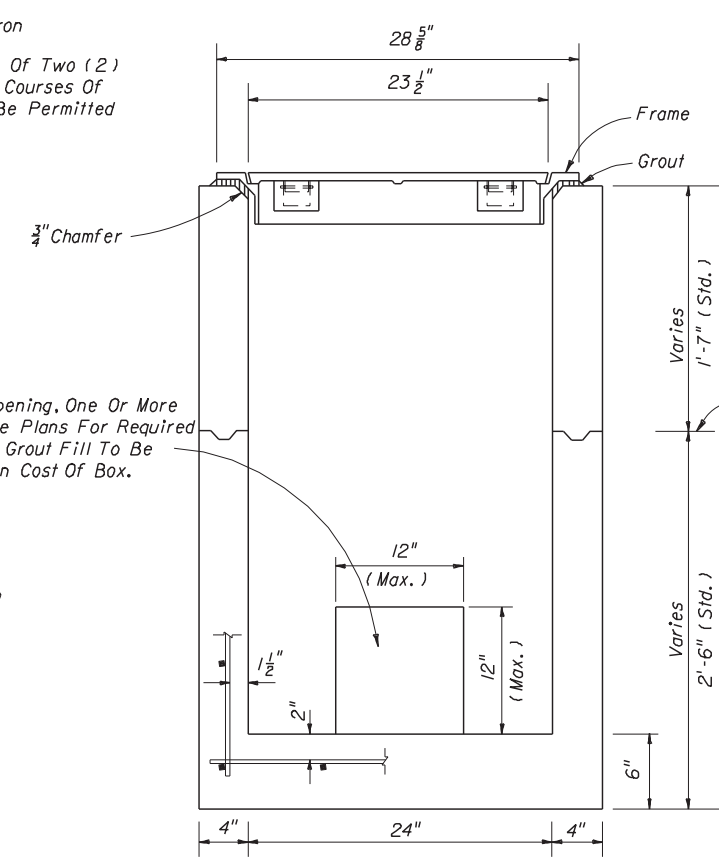
PERMISSIBLE TOP ADJUSTMENT



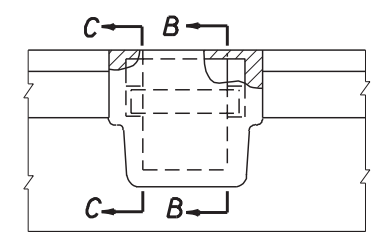
TYPICAL TOP AND APRON



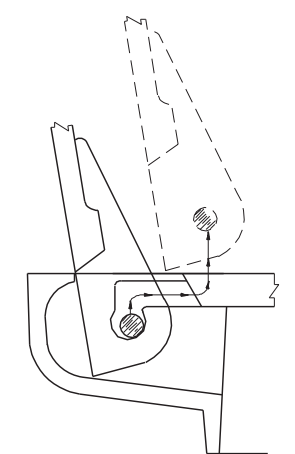
TOP VIEW



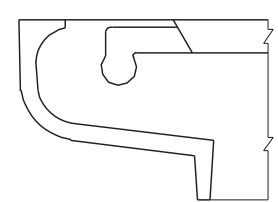
BOX AND TOP



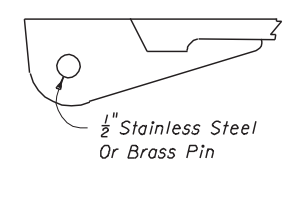
BACK VIEW



COVER REMOVAL



SECTION CC



SECTION BB

HINGE DETAIL

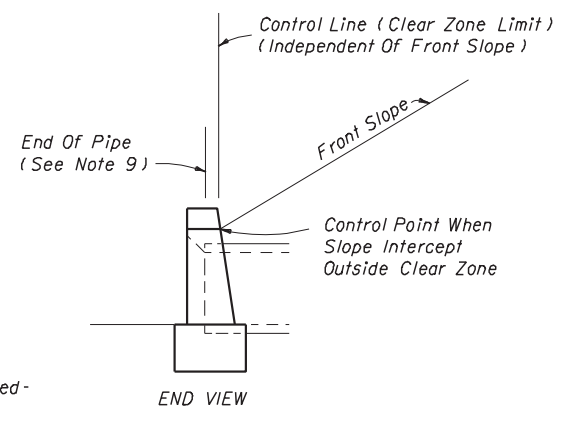
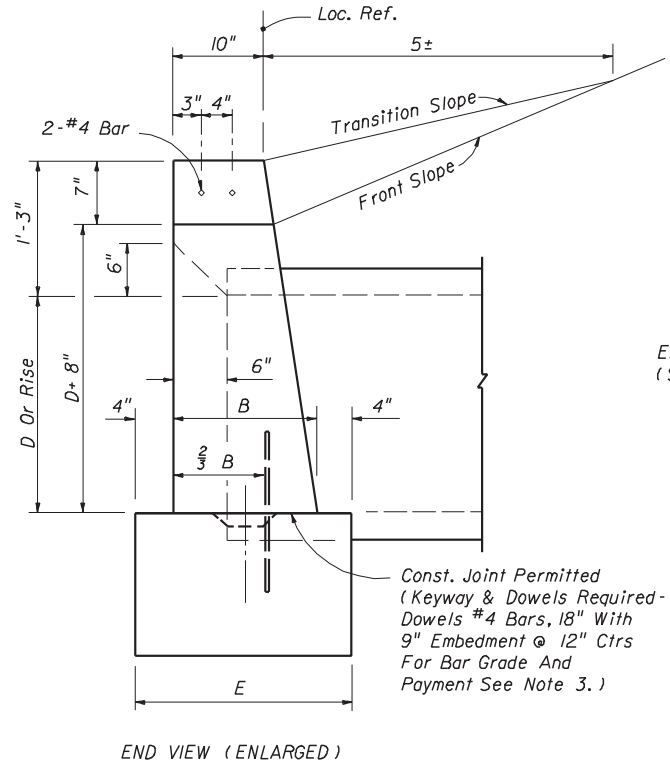
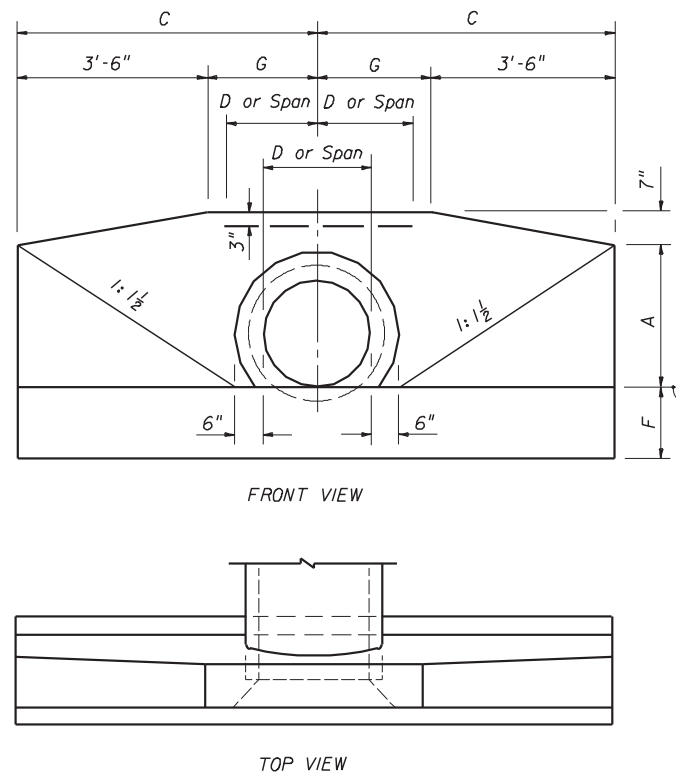
GENERAL NOTES

1. Cast iron cover and frame to be Neenah Foundry Company R-6660-JH, U.S. Foundry Manufacturing Corporation No. A-632 or equal. Neenah R-6660-JH detailed this index.
2. Box to be Class I Concrete, reinforced with No. 3 bars on 8" centers both ways, sides and bottom.
3. Concrete apron to be included in the contract unit price for Underdrain Inspection Box.
4. All covers shall be furnished with pick holes. Fitted lifts or handles are not permitted.
5. Manhole Type P Alternate A, Index 200, with Type I Frame and Cover, Index 201, may be used in lieu of the box detailed on this sheet, and is recommended when high ADT increases chance of the repeated vehicle loadings.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

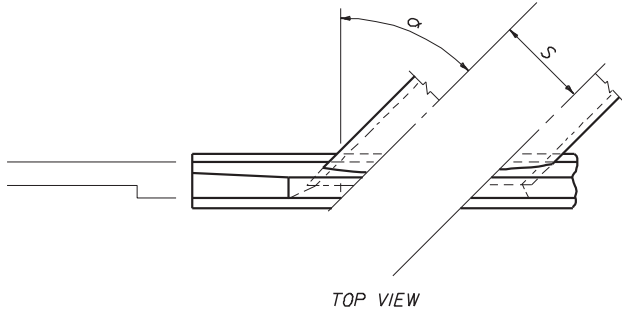
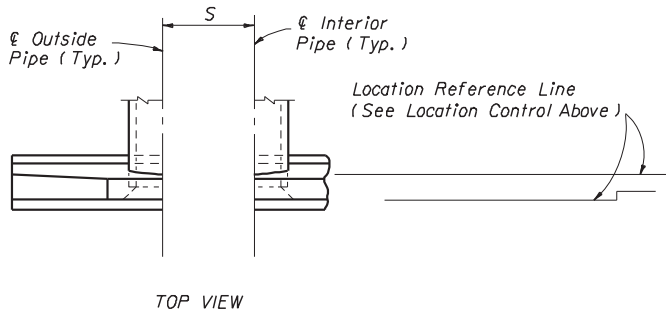
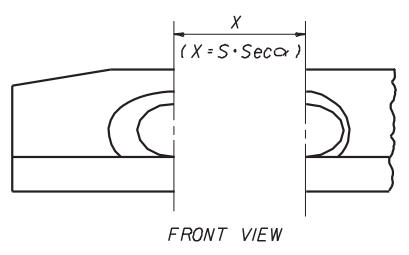
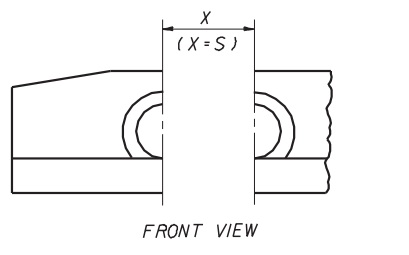
UNDERDRAIN
INSPECTION BOX

Names		Dates		Approved By				
Designed By	WS	05/81		 State Drainage Engineer				
Drawn By	JM	05/81	Revision				Sheet No.	Index No.
Checked By	JVG	05/81	00				1 of 1	245



STANDARD LOCATION CONTROL

ENDWALL DIMENSIONS (EXCLUSIVE OF MULTIPLE PIPE SPACING)



NORMAL PIPE

SKEWED PIPE

LEGEND

- α Pipe Skew
- S Center To Center Pipe Spacing
- X Centerline To Centerline Dimension At Face Of Headwall

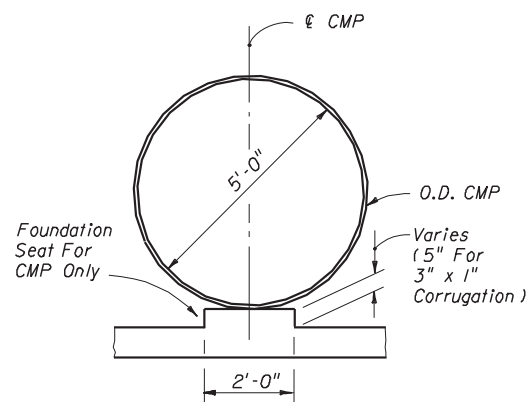
GENERAL NOTES

1. Endwall dimensions, locations and positions are for round and elliptical concrete pipe and for round and pipe-arch corrugated metal pipe. Round concrete pipe shown.
2. Front slope and ditch transitions shall be in accordance with Index No. 280.
3. Endwalls may be cast in place or precast concrete. Reinforcing steel shall be Grades 40 or 60. Additional reinforcement necessary for handling precast units shall be determined by the Contractor or the supplier. Cost of reinforcement shall be included in the contract unit price for concrete, (endwalls).
4. All exposed corners and edges of concrete are to be chamfered $\frac{3}{4}$ ".
5. Concrete meeting the requirements of ASTM C478 (4000 psi) may be used in lieu of Class I concrete in precast items manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
6. On outfall ditches with side slopes flatter than 1:1 1/2 provide 20' transitions from the endwall to the flatter side slopes, right of way permitting.
7. For sodding around endwalls see Index No. 281.
8. Payment for concrete quantities for endwalls skewed to the pipe shall be made on the following basis:

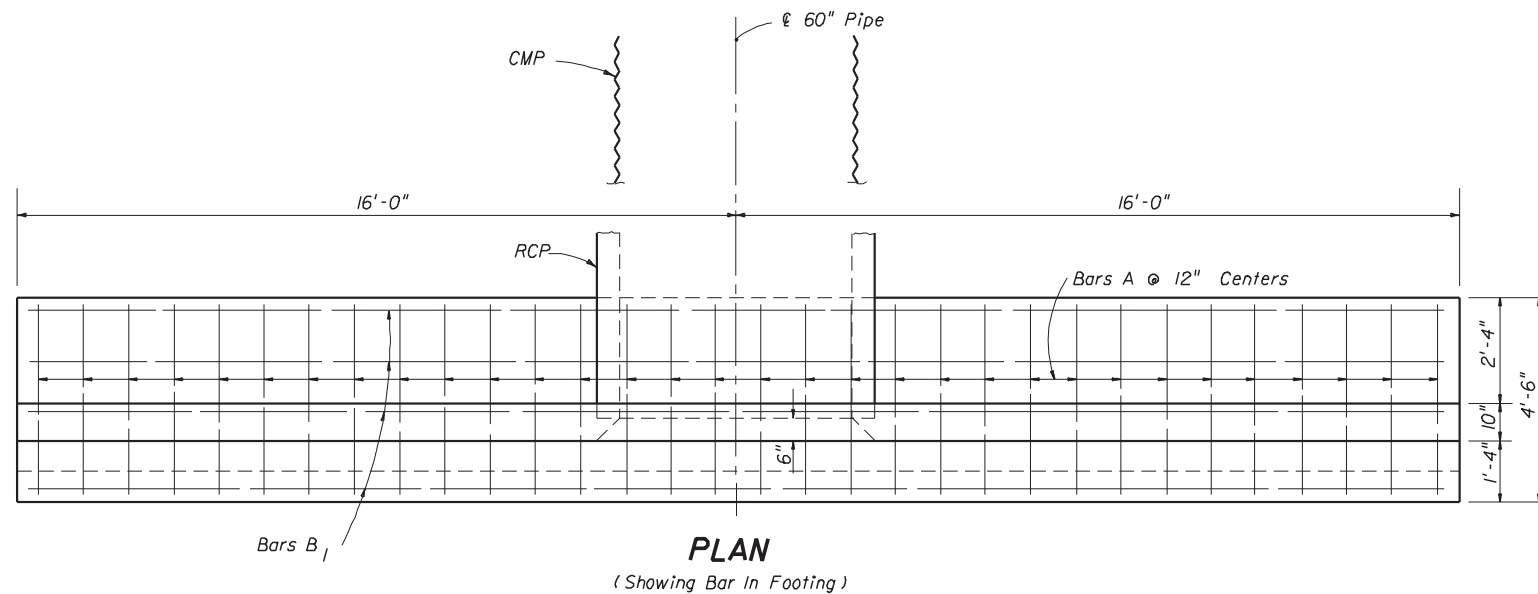
Endwall Skew To Pipe	Use Tabulated Value
0° to 5°	0°
6° to 15°	15°
16° to 30°	30°
31° or over	45°
9. Pipe length plan quantities shall be based on the pipe end locations shown in the standard location control end view, or lengths based on special endwall locations called for in the plans.
10. Payment for pipe in pipe culverts shall be based on plan quantities, adjusted for endwall locations subsequently established by the Engineer.
11. Endwalls to be paid for under the contract unit price for Concrete Class I (Endwalls), CY.

ENDWALL POSITIONS FOR SINGLE AND MULTIPLE PIPE AND SPACING FOR MULTIPLE PIPE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
STRAIGHT CONCRETE ENDWALLS SINGLE AND MULTIPLE PIPE				
Designed By	HAB/EGR	Dates	73/83	Approved By
Drawn By	RWR/HSD	Revision	83	<i>S. A. McHenry</i> State Drainage Engineer
Checked By	JBW/JVG	Revision	83	
			00	Sheet No.
			1 of 2	Index No.
				250



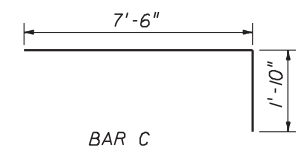
SECTION BB



PLAN
(Showing Bar In Footing)

BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	#4	32	4'-2"	Footing	Straight
B ₁	#4	13	31'-8"	Footing And Wall	Straight
B ₂	#4	4	12'-4"	Wall	Straight
B ₃	#4	4	13'-9"	Wall	Straight
C	#4	26	9'-4"	Wall	Bend
D	#4	18	7'-6"	Wall	Straight
E	#4	8	1'-8"	Footing And Wall	Straight

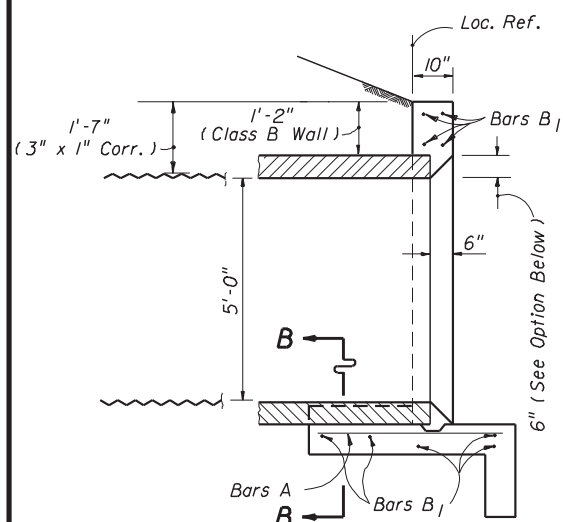
BENDING DIAGRAM



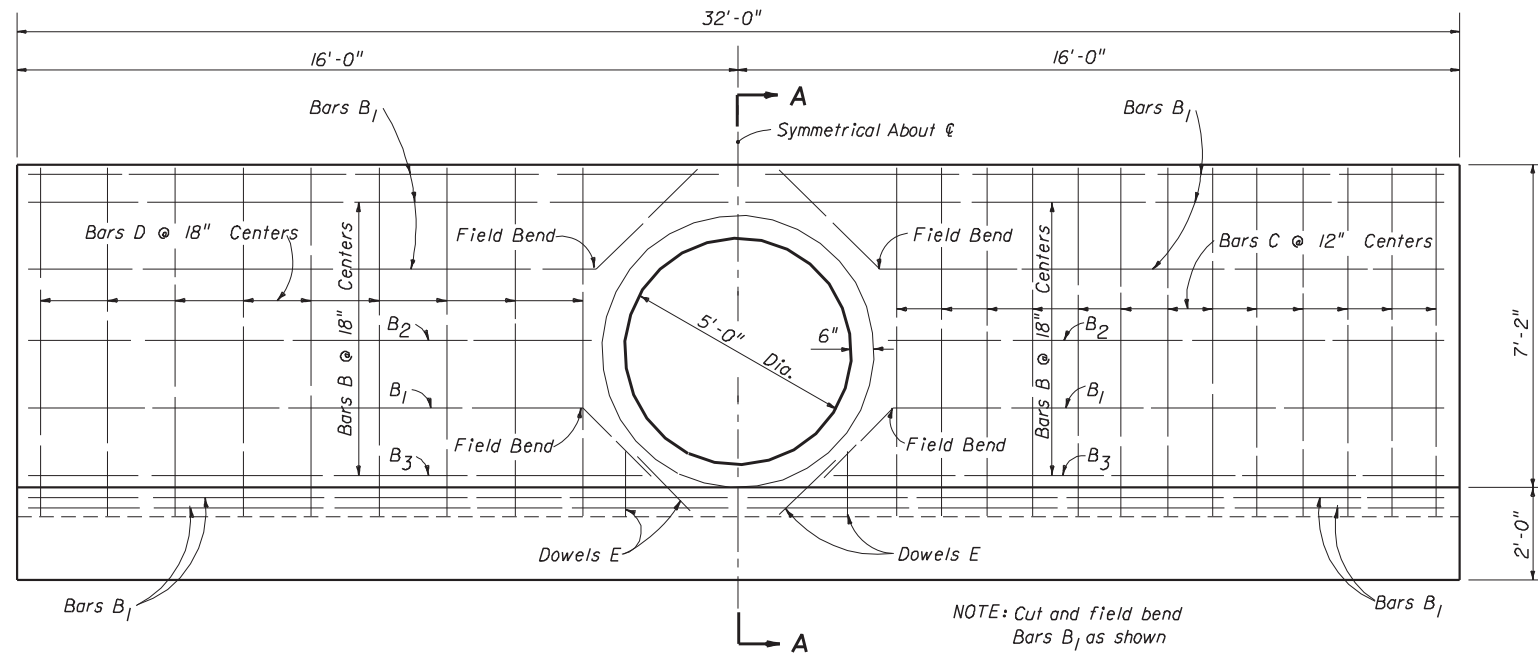
NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

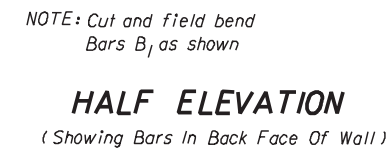
ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	11.3	11.4
Reinforcing Steel	Lb.	695	695



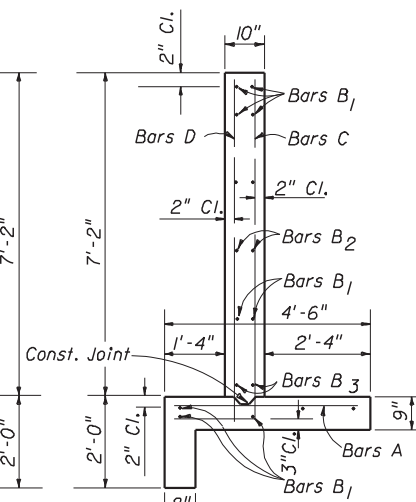
SECTION AA



HALF ELEVATION
(Showing Bars In Front Face Of Wall)



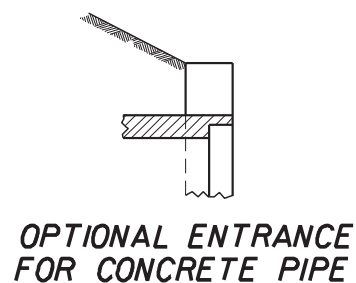
HALF ELEVATION
(Showing Bars In Back Face Of Wall)



TYPICAL SECTION THRU ENDWALL

GENERAL NOTES

- Straight concrete endwalls are intended for use outside the clear zone.
- Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this index, design specifications AASHTO 1989. Precast construction which adheres to this Index, including any additional reinforcement required for handling which shall be determined by the Contractor or supplier, does not require additional approvals. Deviations from this Index, for precast units, shall require the approval of the State Drainage Engineer prior to construction. For precast construction, see Index No. 20I for opening and grouting details.
- Reinforcing steel shall be either Grade 40 or 60.
- Concrete shall be Class II except concrete meeting the requirements of ASTM C 478 (4000 PSI) may be used in lieu of Class II concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
- Chamfer: All exposed edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown.
- Metal pipe shall be bituminous coated on all surfaces in contact with concrete and 12" beyond the boundary of contact. Any suitable bituminous material may be field applied.
- Sodding shall be in accordance with Index No. 28I and paid for under the contract unit price for Sodding, SY.
- Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated on the Index. Concrete and reinforcing steel shall be paid for under the contract unit prices for Concrete, Class II (Endwalls), CY and Reinforcing Steel (Roadway), LB.

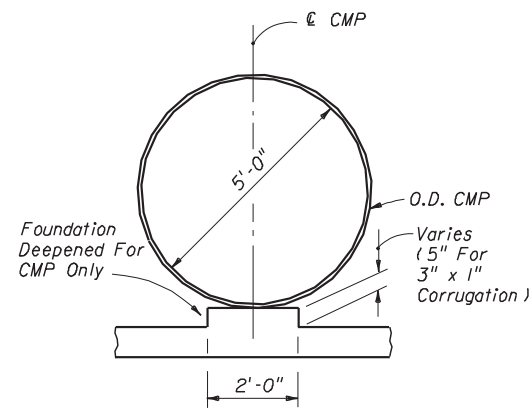


OPTIONAL ENTRANCE FOR CONCRETE PIPE

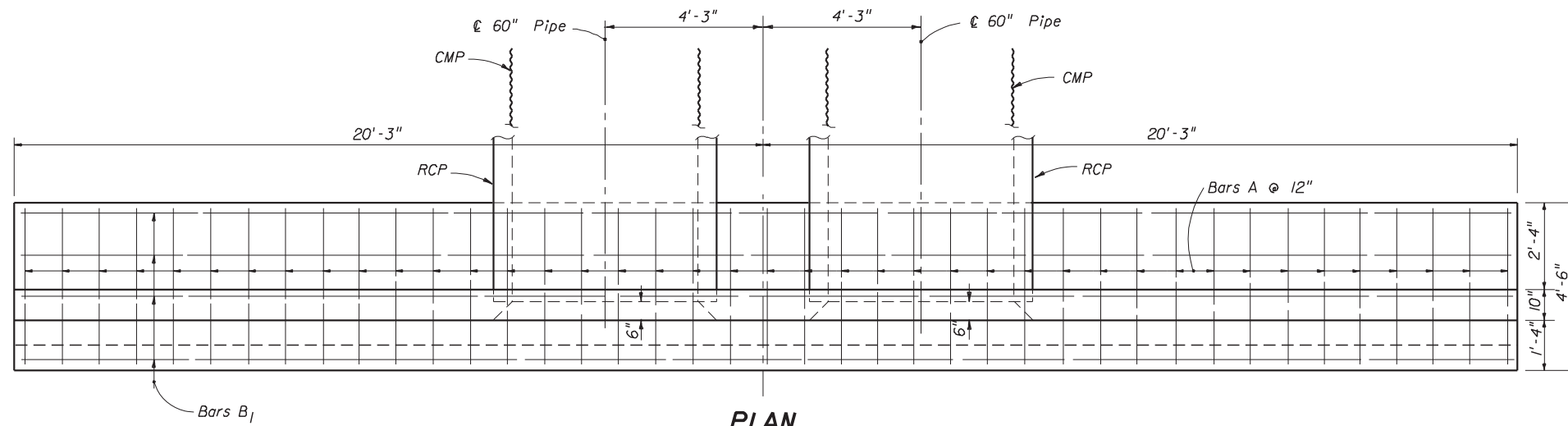
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 60" PIPE

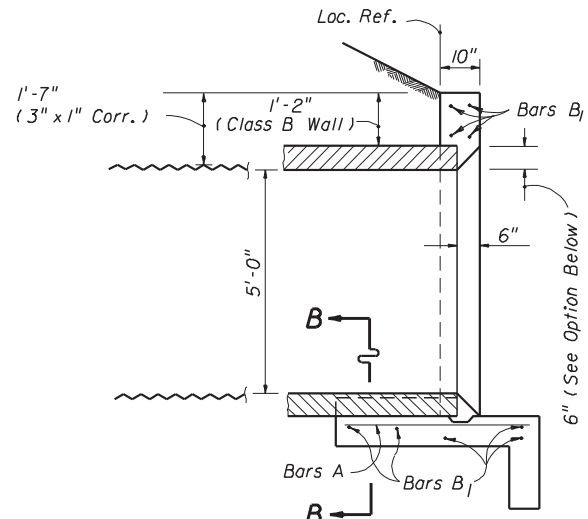
Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By	TWJ 11/49			
Checked By	WHM 11/49			
Revision	00			
		Index No.	251	



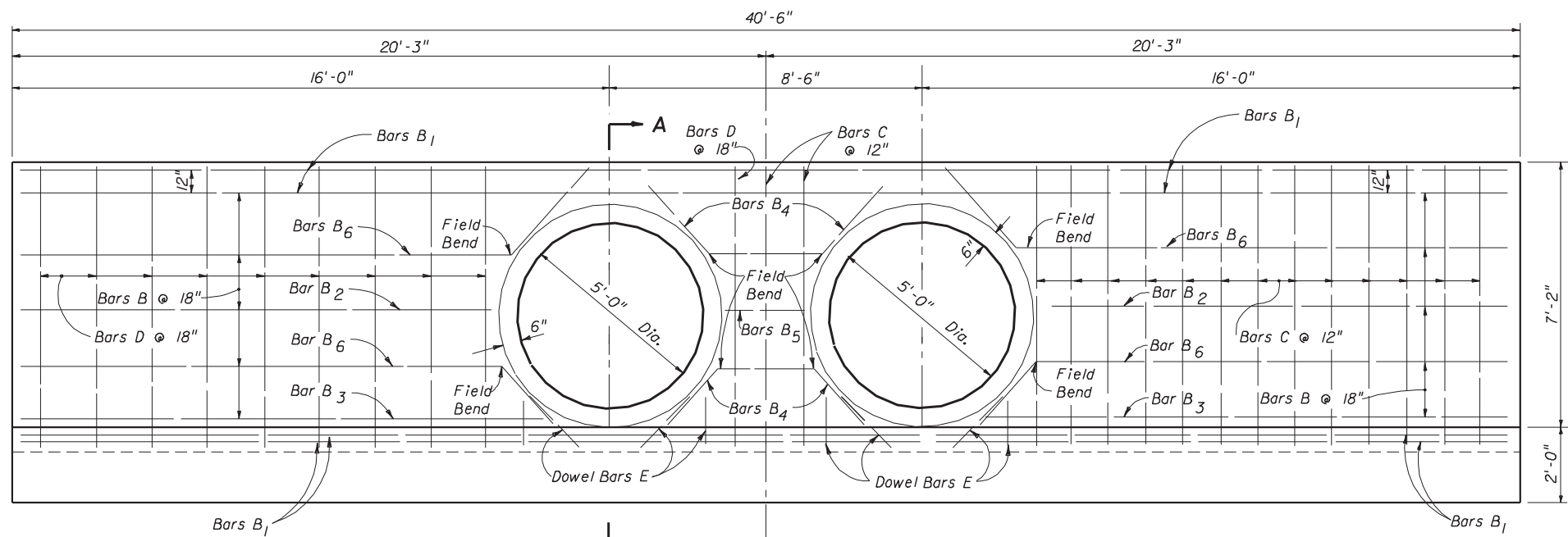
SECTION BB



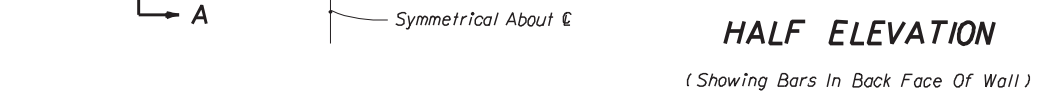
PLAN
(Showing Bar In Footing)



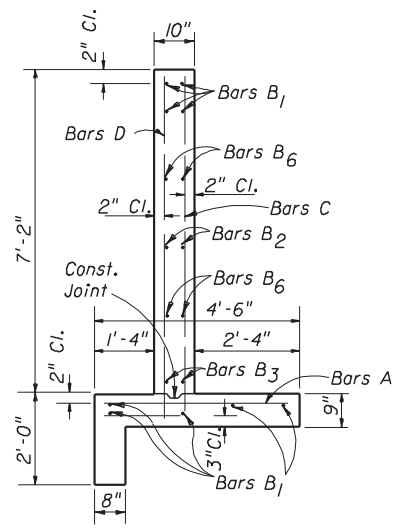
SECTION AA



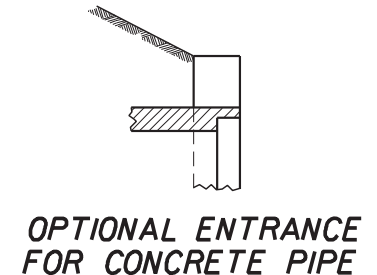
HALF ELEVATION
(Showing Bars In Front Face Of Wall)



HALF ELEVATION
(Showing Bars In Back Face Of Wall)

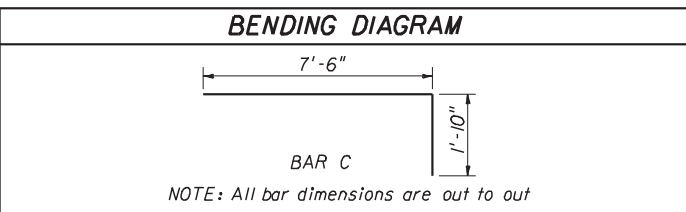


TYPICAL SECTION THRU ENDWALL



OPTIONAL ENTRANCE FOR CONCRETE PIPE

BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	#4	4	4'-2"	Footing	Straight
B ₁	#4	9	40'-2"	Footing & Wall	Straight
B ₂	#4	4	12'-6"	Wall	Straight
B ₃	#4	4	13'-9"	Wall	Straight
B ₄	#4	4	6'-0"	Wall	Field Bend
B ₅	#4	2	2'-2"	Wall	Straight
B ₆	#4	8	15'-0"	Wall	Field Bend
C	#4	29	9'-4"	Footing & Wall	Bend
D	#4	20	7'-6"	Footing & Wall	Straight
E	#4	16	1'-8"	Footing & Wall	Straight



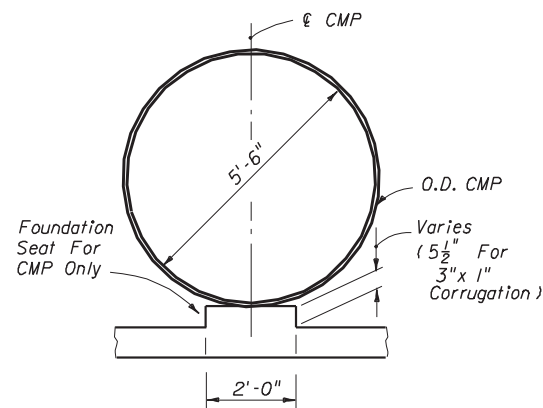
ESTIMATED QUANTITIES			
ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	13.7	13.8
Reinforcing Steel	Lb.	824	824

NOTE: See Sheet 1 of 2 For General Notes.

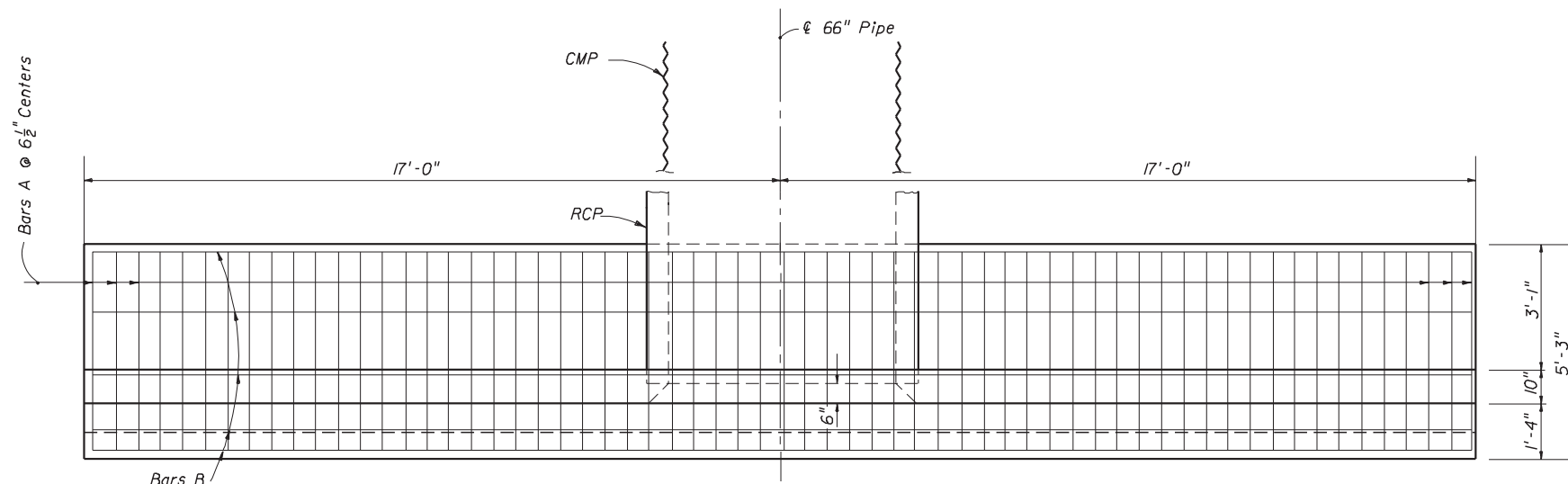
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 60" PIPE

Designed By	Names	Dates	Approved By	
Drawn By	TWJ	11/49	A. A. McHenry State Drainage Engineer	
Checked By	WHM	11/49	Revision	Sheet No.
			00	2 of 2
				251



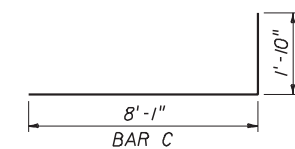
SECTION BB



PLAN
(Showing Bars In Footing)

BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	5	63	4'-11"	Footing	Straight
B	4	17	33'-8"	Footing & Wall	Straight
C	5	34	9'-11"	Wall	Bend
D	4	20	8'-1"	Wall	Straight
E	4	4	1'-8"	Wall	Straight

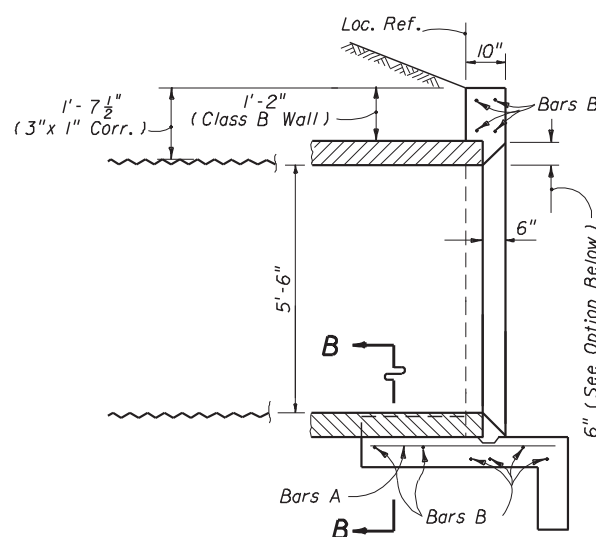
BENDING DIAGRAM



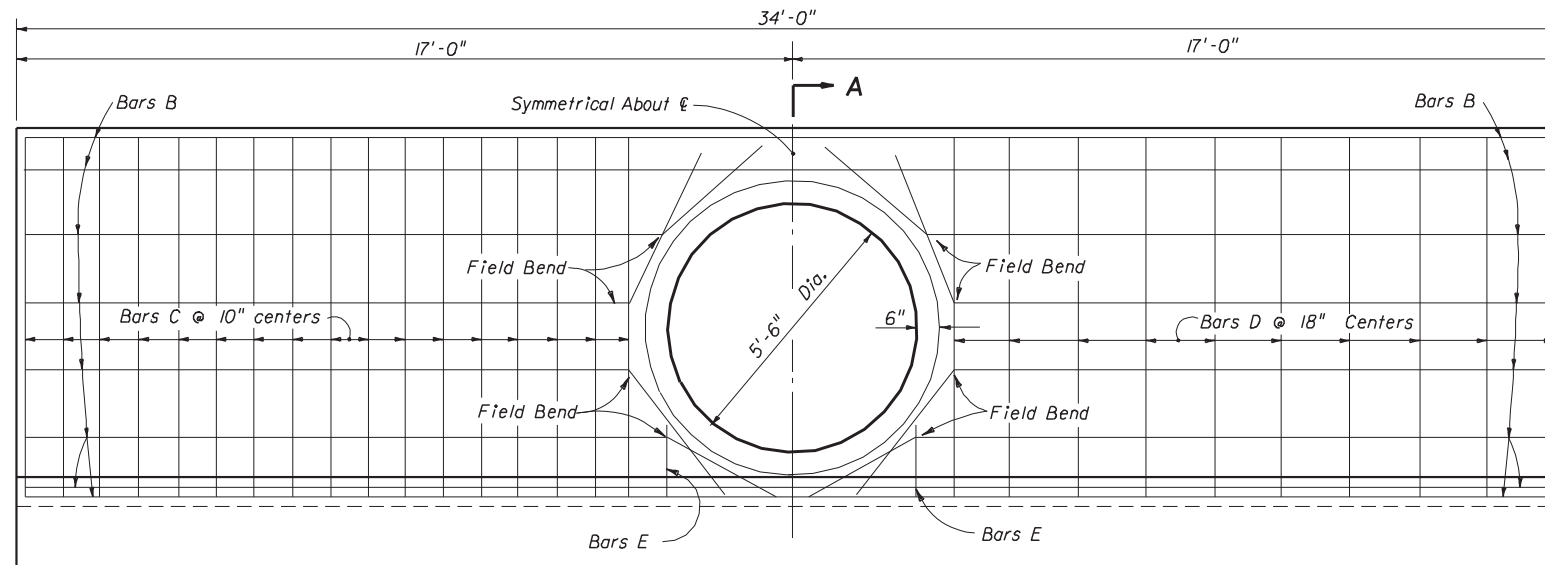
NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	13.2	13.3
Reinforcing Steel	Lb.	1170	1170

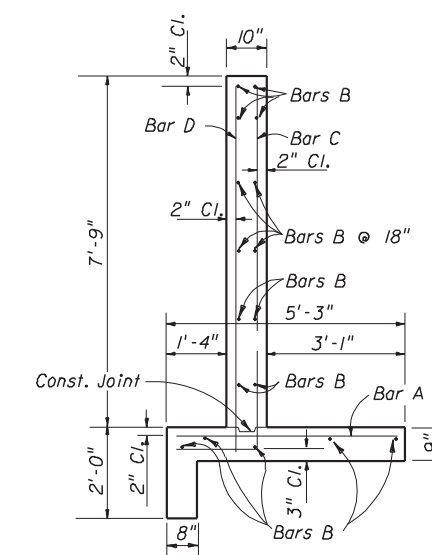


SECTION AA



HALF ELEVATION
(Showing Bars In Back Face Of Wall)

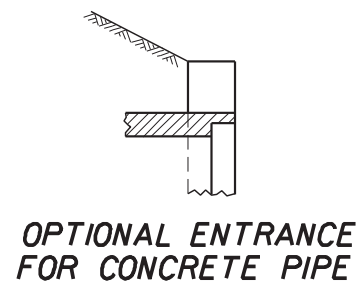
NOTE: Cut and field bend Bars B as shown



TYPICAL SECTION THRU ENDWALL

GENERAL NOTES

1. Straight concrete endwalls are intended for use outside the clear zone.
2. Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this index, design specifications AASHTO 1989. Precast construction which adheres to this Index, including any additional reinforcement required for handling which shall be determined by the Contractor or supplier, does not require additional approvals. Deviations from this Index, for precast units, shall require the approval of the State Drainage Engineer prior to construction. For precast construction, see Index No. 201 for opening and grouting details.
3. Reinforcing steel shall be either Grade 40 or 60.
4. Concrete shall be Class II except concrete meeting the requirements of ASTM C 478 (4000 psi) may be used in lieu of Class II concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
5. Chamfer: All exposed edges and corners to be chamfered 3/4" unless otherwise shown.
6. Metal pipe shall be bituminous coated on all surfaces in contact with concrete and 12" beyond the boundary of contact. Any suitable bituminous material may be field applied.
7. Sodding shall be in accordance with Index No. 281 and paid for under the contract unit price for Sodding, SY.
8. Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated on the Index. Concrete and reinforcing steel shall be paid for under the contract unit prices for Concrete Class II (Endwalls), CY and Reinforcing Steel (Roadway), LB.

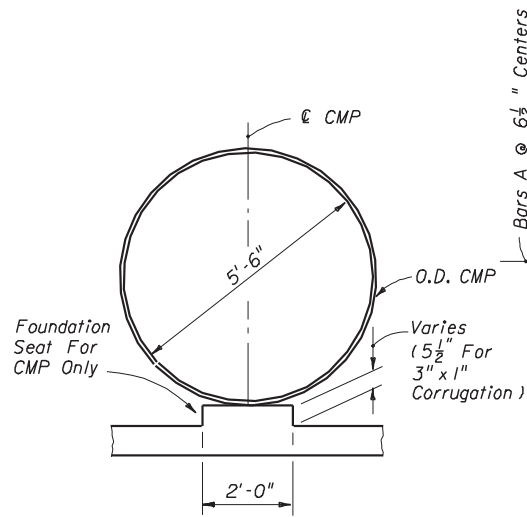


OPTIONAL ENTRANCE FOR CONCRETE PIPE

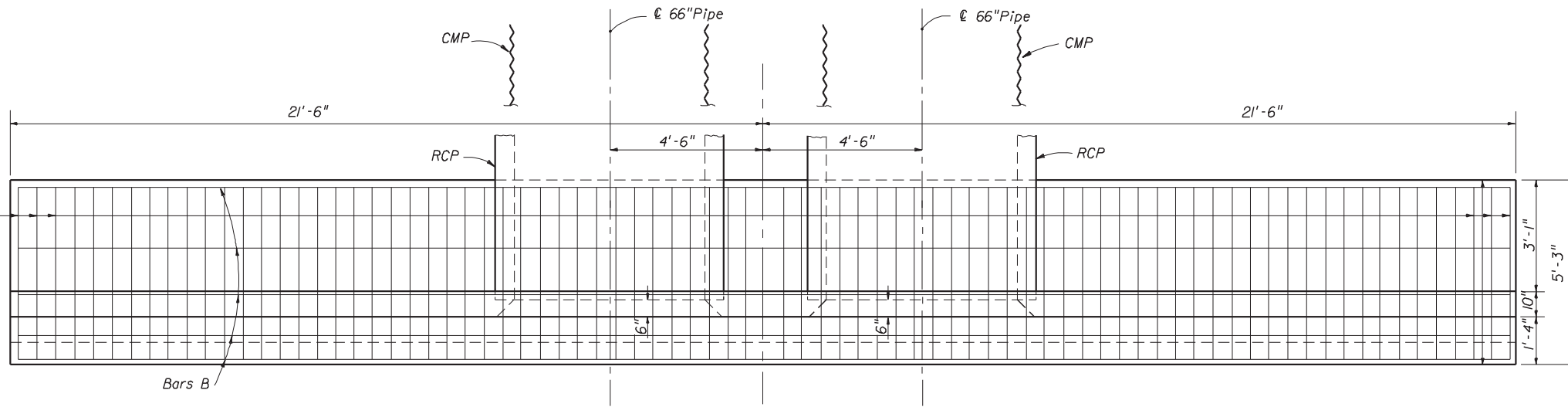
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 66" PIPE

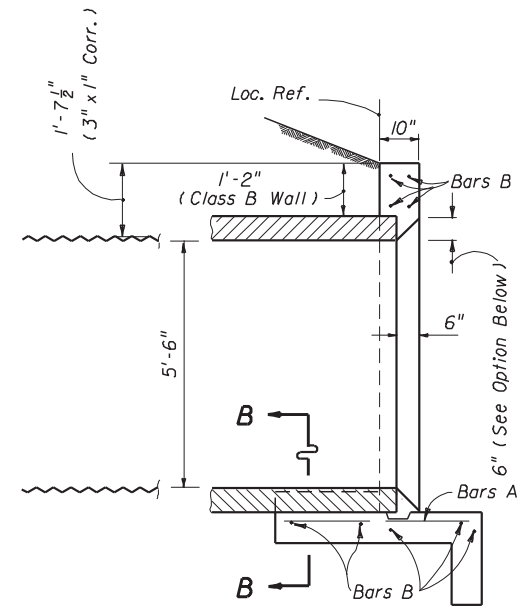
Designed By	JLW	Dates	03/54	Approved By	<i>S. A. McHenry</i>
Drawn By		Revision		State Drainage Engineer	
Checked By	RCB	03/54	00	Sheet No.	1 of 2
				Index No.	252



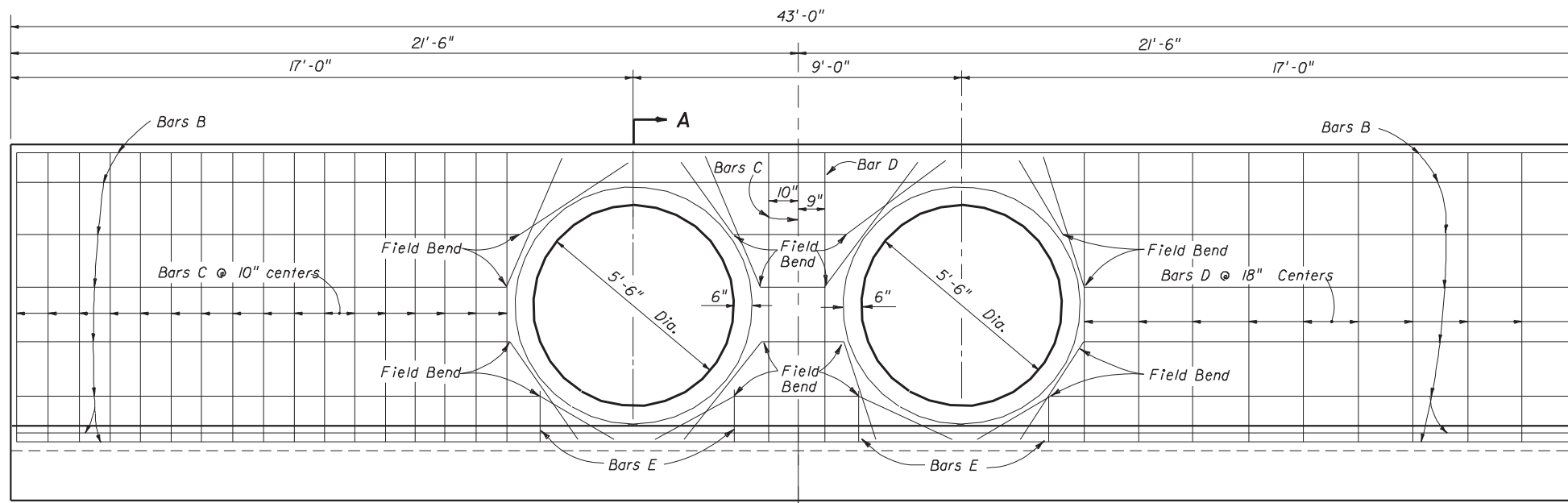
SECTION BB



PLAN
(Showing Bars In Footing)

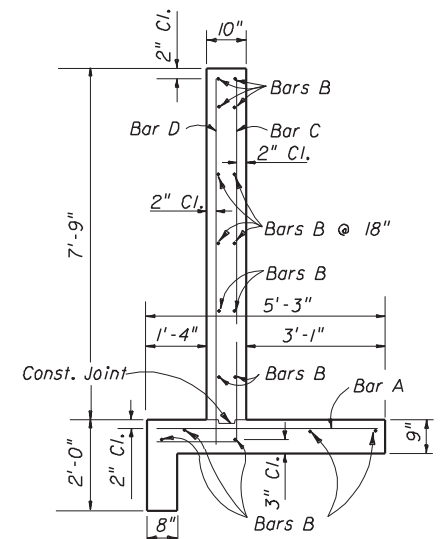


SECTION AA

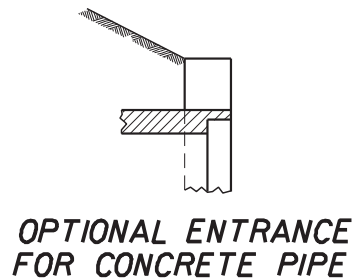


HALF ELEVATION
(Showing Bars In Back Face Of Wall)

HALF ELEVATION
(Showing Bars In Front Face Of Wall)

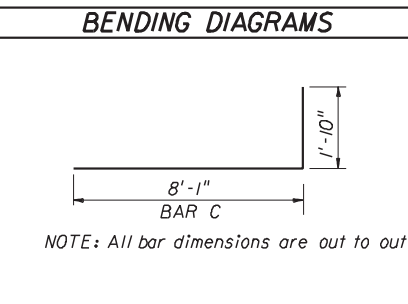


TYPICAL SECTION THRU ENDWALL



OPTIONAL ENTRANCE FOR CONCRETE PIPE

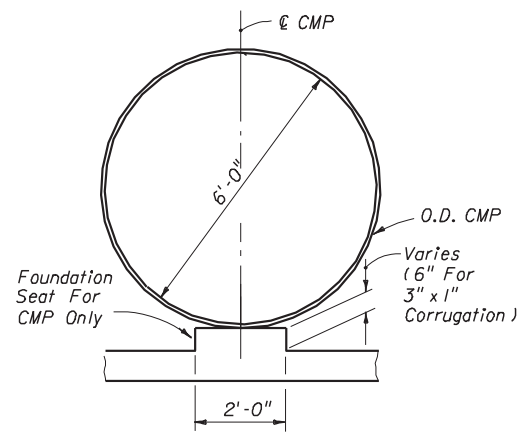
BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	5	80	4'-11"	Footing	Straight
B	4	17	42'-8"	Footing & Wall	Straight
C	5	37	9'-11"	Wall	Bend
D	4	22	8'-1"	Wall	Straight
E	4	8	1'-8"	Wall	Straight



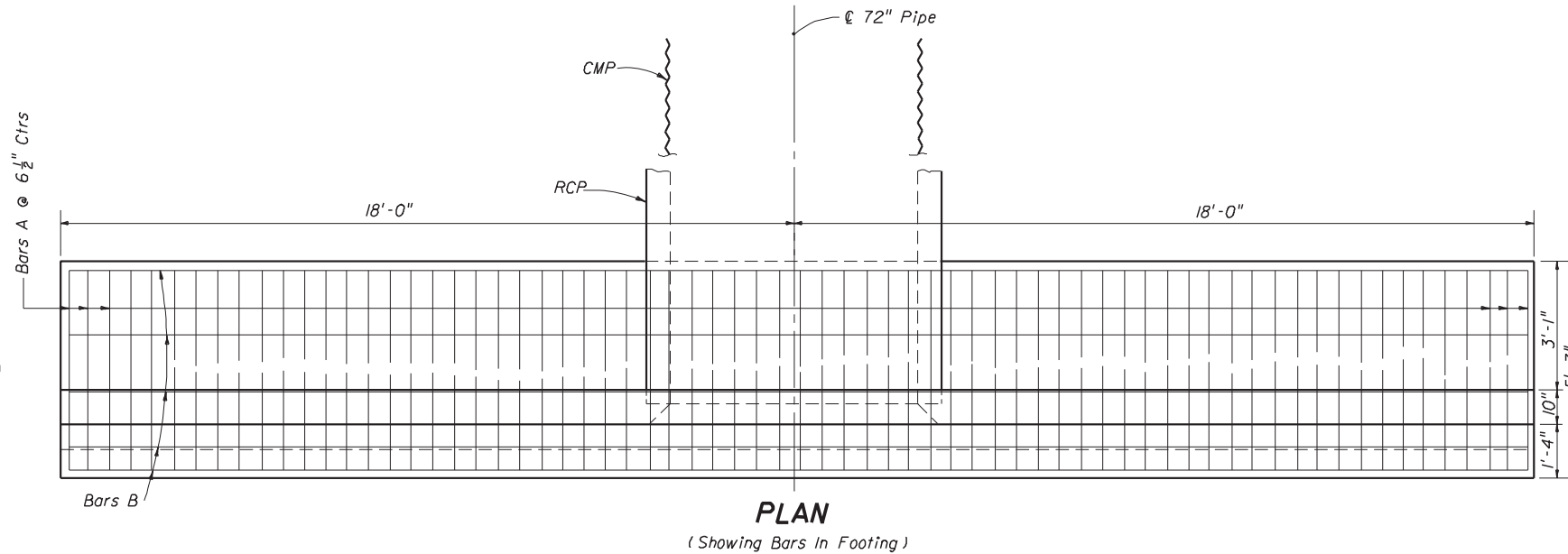
ESTIMATED QUANTITIES				
ITEM	UNIT	RCP	CMP	
Concrete Class II	Cu. Yd.	16.0	16.2	
Reinforcing Steel	Lb.	1,406	1,406	

NOTE: See Sheet 1 of 2 for General Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
STRAIGHT CONCRETE ENDWALLS SINGLE AND DOUBLE 66" PIPE				
Designed By	JSP	Dates	11/79	Approved By
Drawn By	FWT		11/79	<i>S. A. McHenry</i> State Drainage Engineer
Checked By		Revision	00	Sheet No. 2 of 2
				Index No. 252



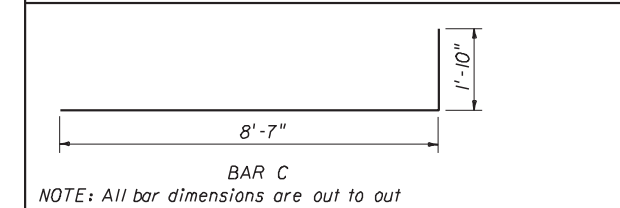
SECTION BB



PLAN
(Showing Bars In Footing)

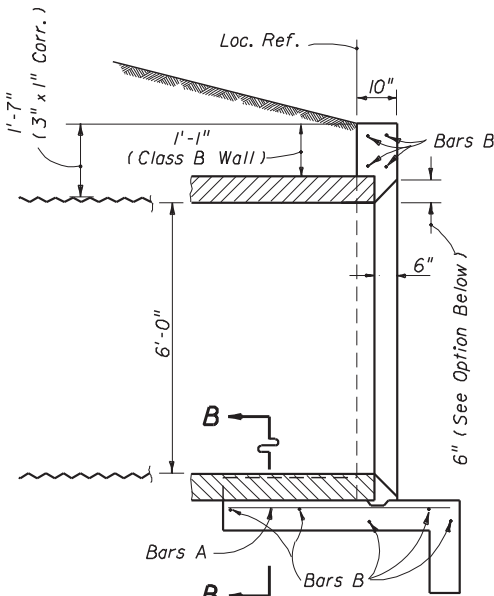
BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	5	68	4'-11"	Footing	Straight
B	4	17	35'-8"	Footing & Wall	Straight
C	5	34	10'-5"	Wall	Bend
D	4	20	8'-7"	Wall	Straight
E	4	4	2'-6"	Wall	Straight
F	4	4	1'-6"	Wall	Straight

BENDING DIAGRAM

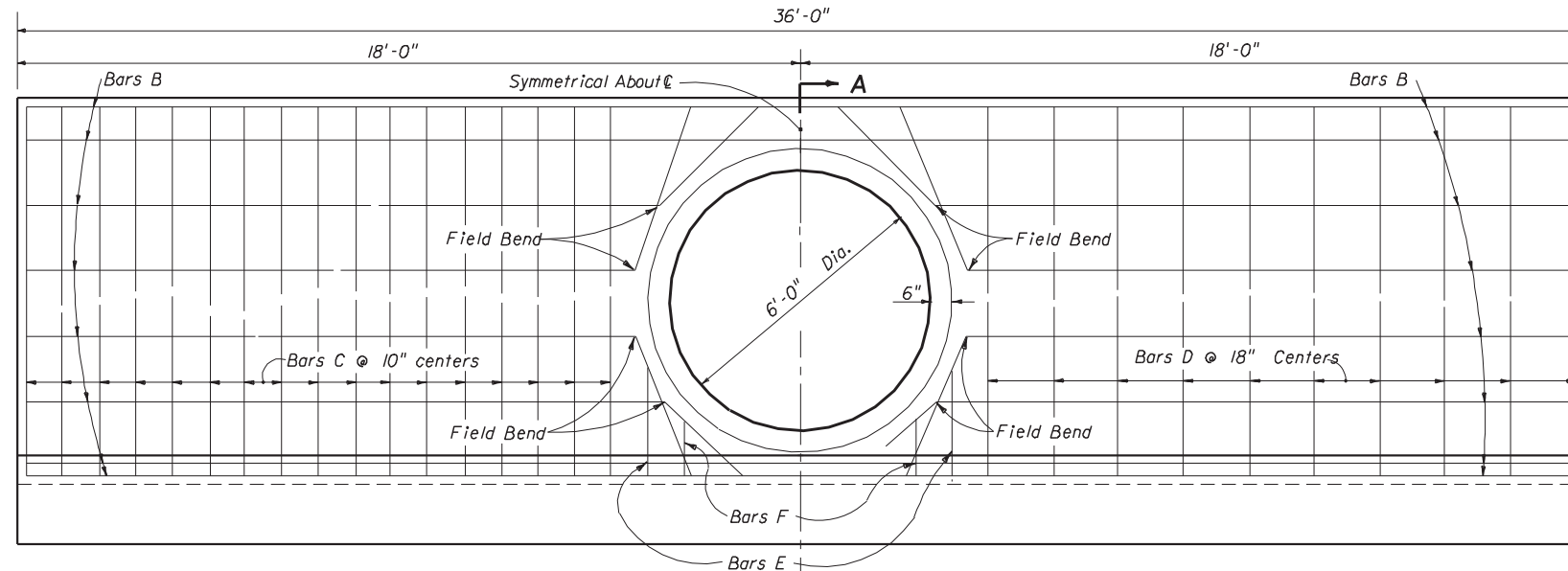


ESTIMATED QUANTITIES

ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	14.4	14.5
Reinforcing Steel	Lb.	1249	1249



SECTION AA



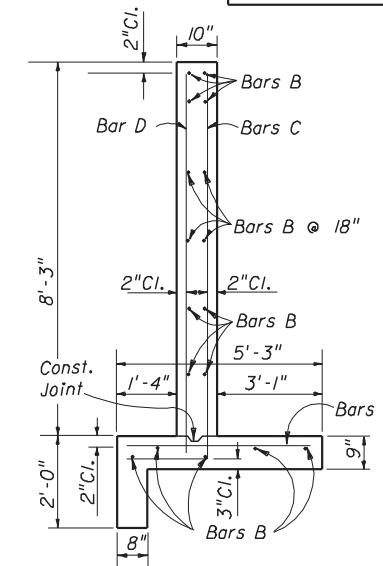
HALF ELEVATION
(Showing Bars In Back Face Of Wall)

NOTE: Cut and field bend Bars B as shown

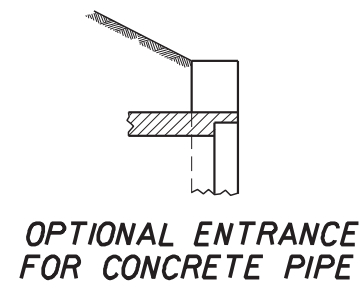
HALF ELEVATION
(Showing Bars In Front Face Of Wall)

GENERAL NOTES

1. Straight concrete endwalls are intended for use outside the clear zone.
2. Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this index, design specifications AASHTO 1989. Precast construction which adheres to this index, including any additional reinforcement required for handling which shall be determined by the Contractor or supplier, does not require additional approvals. Deviations from this index, for precast units, shall require the approval of the State Drainage Engineer prior to construction. For precast construction, see Index No. 201 for opening and grouting details.
3. Reinforcing steel shall be either Grade 40 or 60.
4. Concrete shall be Class II except concrete meeting the requirements of ASTM C 478 (4000 PSI) may be used in lieu of Class II concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
5. Chamfer: All exposed edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown.
6. Metal pipe shall be bituminous coated on all surfaces in contact with concrete and 12" beyond the boundary of contact. Any suitable bituminous material may be field applied.
7. Sodding shall be in accordance with Index No. 281 and paid for under the contract unit price for Sodding, SY.
8. Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated on the index. Concrete and reinforcing steel shall be paid for under the contract unit prices for Concrete, Class II (Endwalls), CY and Reinforcing Steel (Roadway), LB.



TYPICAL SECTION THRU ENDWALL

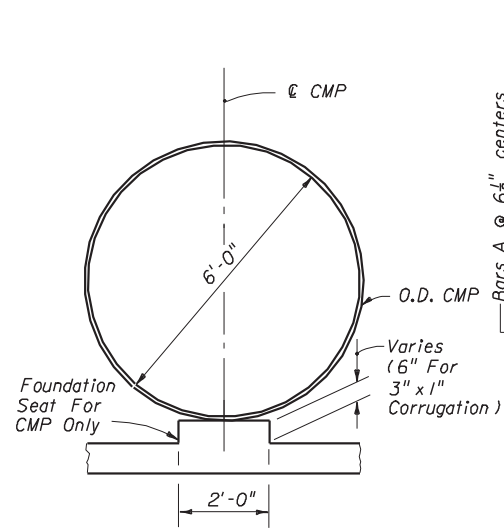


OPTIONAL ENTRANCE FOR CONCRETE PIPE

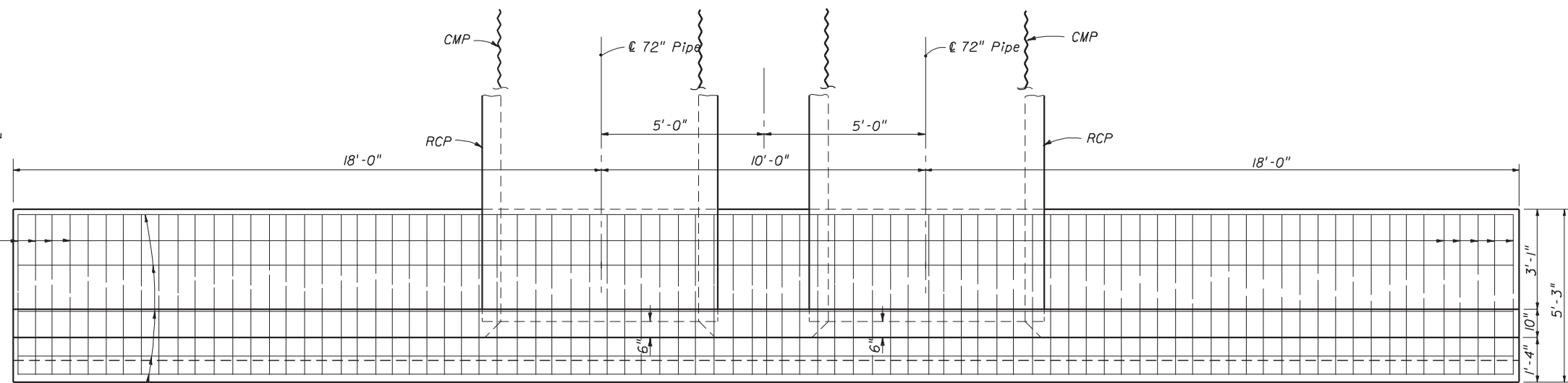
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 72" PIPE

Names	Dates	Approved By		
Designed By	EVC	10/55	S. A. McHenry	
Drawn By	WHW		Revision	Sheet No.
Checked By	WHW	10/55	00	1 of 2
				Index No.
				253

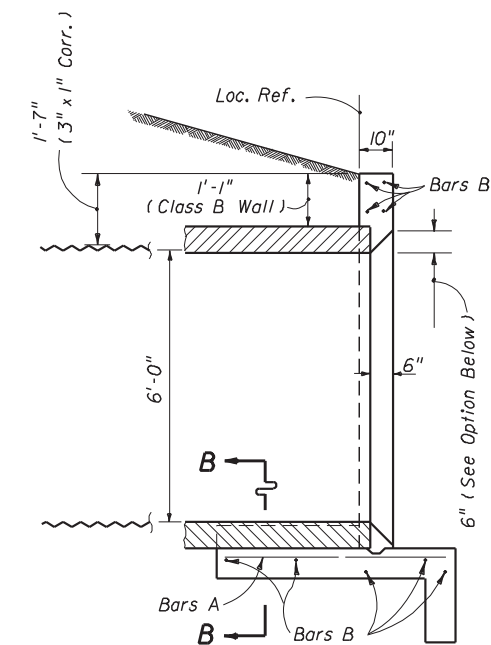


SECTION BB

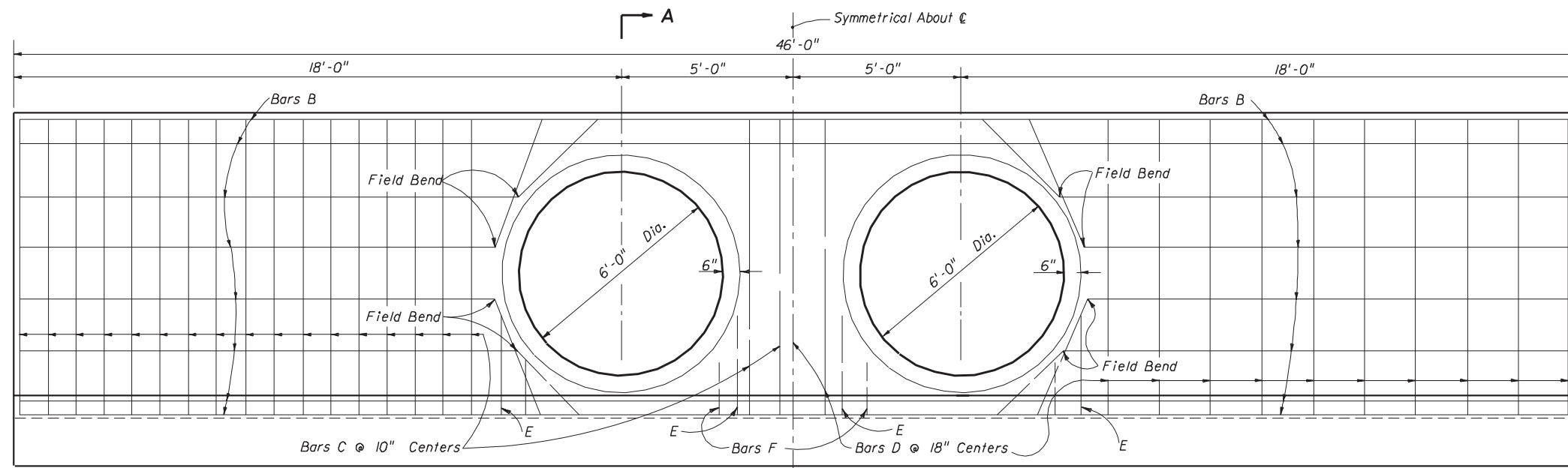


PLAN

(Showing Bars In Footing)



SECTION AA



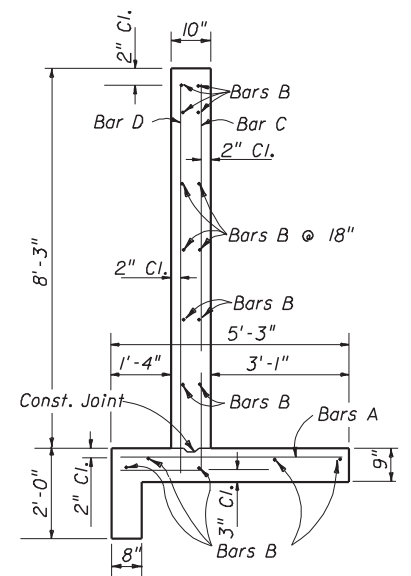
HALF ELEVATION

(Showing Bars In Back Face Of Wall)

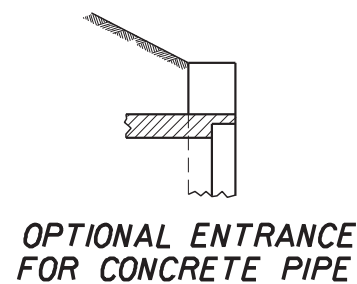
NOTE: Cut and Field Bend Bars B as shown

HALF ELEVATION

(Showing Bars In Front Face Of Wall)

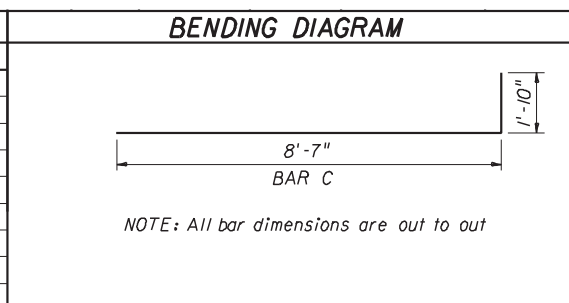


TYPICAL SECTION THRU ENDWALL



OPTIONAL ENTRANCE FOR CONCRETE PIPE

BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING
A	5	85	4'-11"	Footing	Straight
B	4	17	45'-8"	Footing & Wall	Straight
C	5	38	10'-5"	Wall	Bend
D	4	23	8'-7"	Wall	Straight
E	4	8	2'-6"	Wall	Straight
F	4	8	1'-6"	Wall	Straight



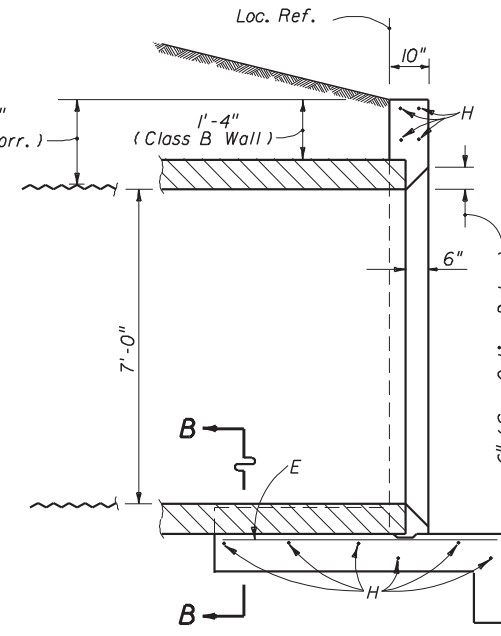
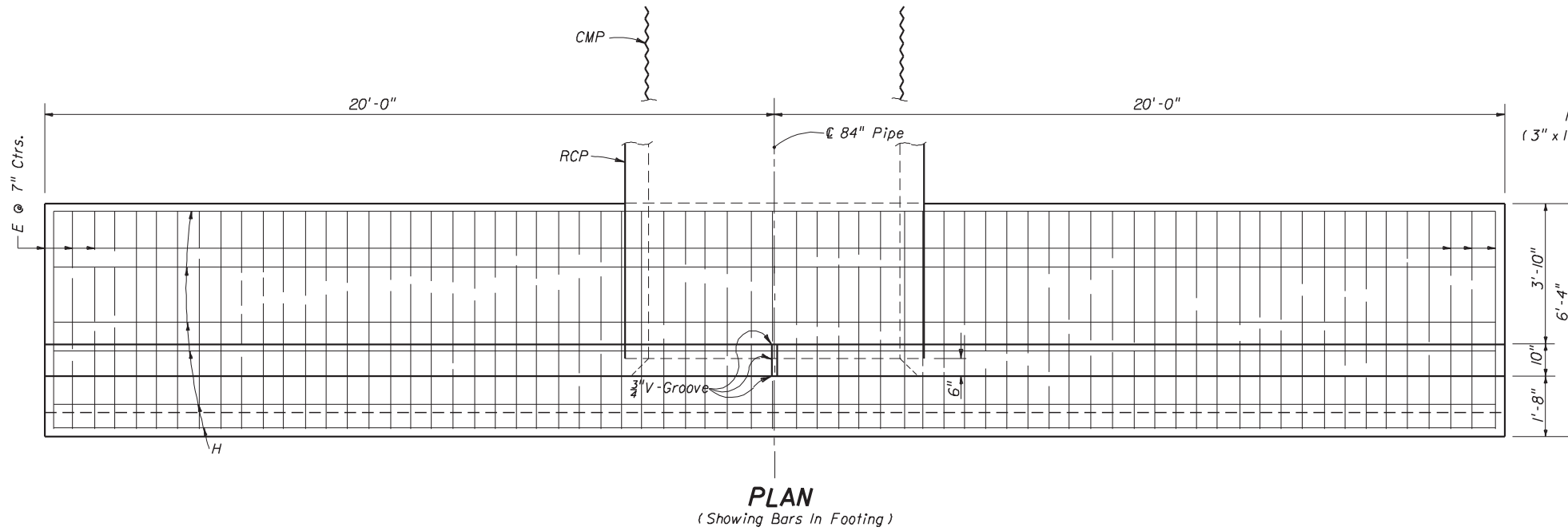
ESTIMATED QUANTITIES			
ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	17.5	17.8
Reinforcing Steel	Lb.	1519	1519

NOTE: See Sheet 1 of 2 for General Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

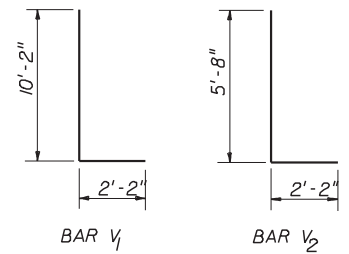
STRAIGHT CONCRETE ENDWALLS
SINGLE AND DOUBLE 72" PIPE

Designed By	EVC	Dates	10/55	Approved By	<i>S. A. Mchemore</i>
Drawn By		Revision		State Drainage Engineer	
Checked By	WHW	10/55	00	Sheet No.	2 of 2
				Index No.	253



MARK	SIZE	NO. REQ'D	LENGTH
E	6	69	6'-0"
H	4	20	39'-8"
V ₁	6	26	12'-4"
V ₂	6	26	7'-10"
V ₃	4	22	10'-2"
V ₄	4	4	2'-0"

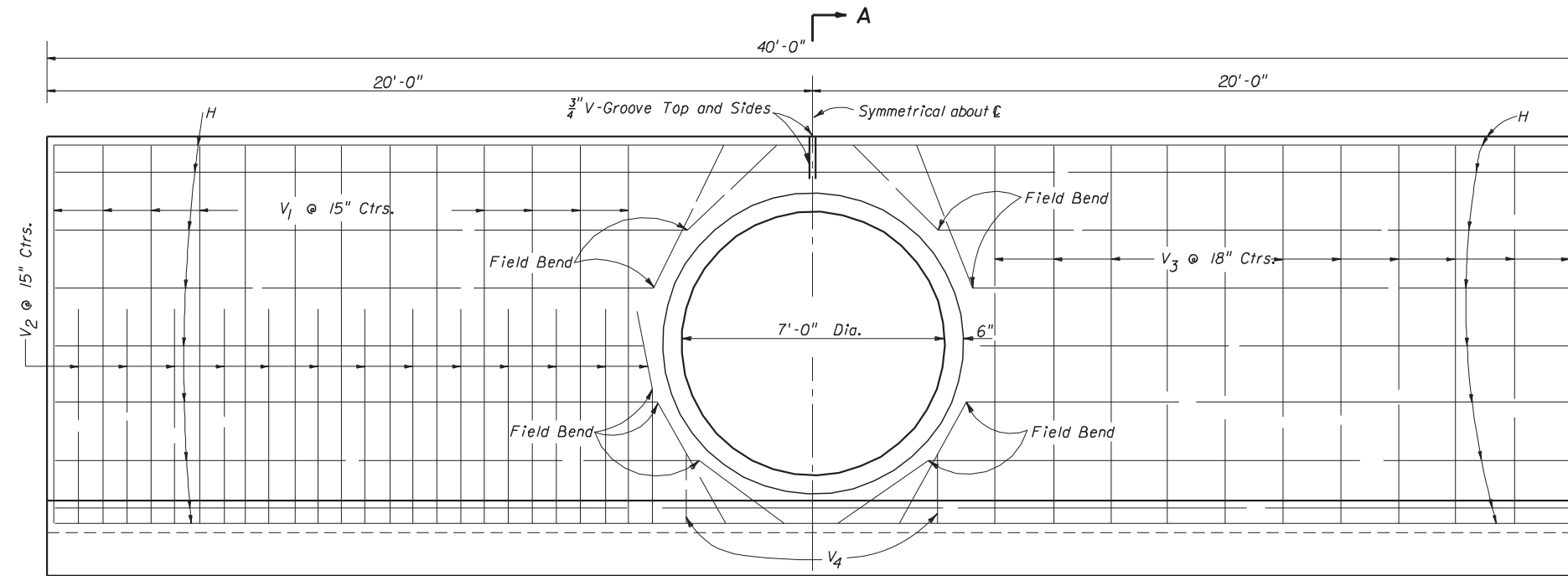
BENDING DIAGRAM



NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

ITEM	UNIT	RCP	CMP
Concrete Class II	Cu. Yd.	20.0	20.2
Reinforcing Steel	Lb.	2,095	2,095



NOTE: Cut and field bend Bars H as shown

HALF ELEVATION

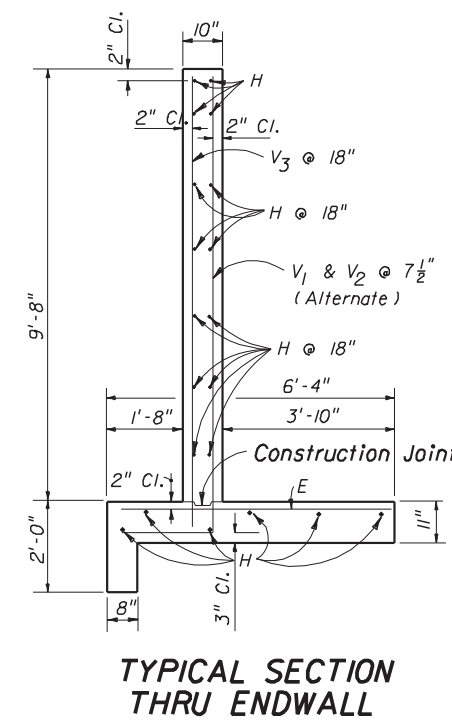
(Showing Bars In Back Face Of Wall)

HALF ELEVATION

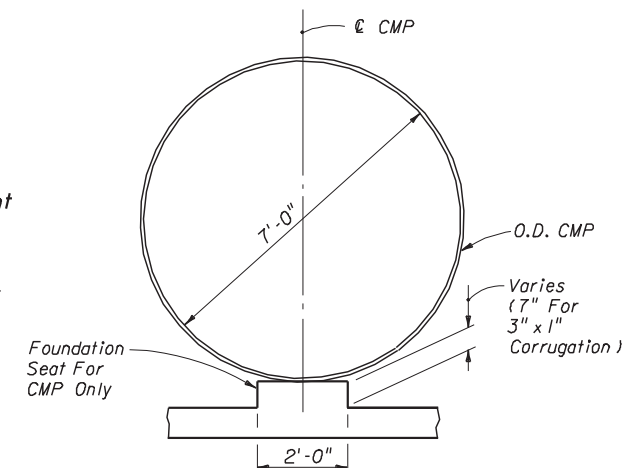
(Showing Bars In Front Face Of Wall)

GENERAL NOTES

- Straight concrete endwalls are intended for use outside the clear zone.
- Endwalls may be cast-in-place or precast construction. Cast-in-place endwalls shall conform to the details on this index, design specifications AASHTO 1989. Precast construction which adheres to this index, including any additional reinforcement required for handling which shall be determined by the Contractor or supplier, does not require additional approvals. Deviations from this index, for precast units, shall require the approval of the State Drainage Engineer prior to construction. For precast construction, see Index No. 201 for opening and grouting details.
- Reinforcing steel shall be either Grade 40 or 60.
- Concrete shall be Class II except concrete meeting the requirements of ASTM C 478 (4000 PSI) may be used in lieu of Class II concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
- Chamfer: All exposed edges and corners to be chamfered $\frac{3}{8}$ " unless otherwise shown.
- Metal pipe shall be bituminous coated on all surfaces in contact with concrete and 12" beyond the boundary of contact. Any suitable bituminous material may be field applied.
- Sodding shall be in accordance with Index No. 281 and paid for under the contract unit price for Sodding, SY.
- Basis of payment for either cast-in-place or precast construction shall be the estimated quantities tabulated on the index. Concrete and reinforcing steel shall be paid for under the contract unit prices for Concrete, Class II (Endwalls), CY and Reinforcing Steel (Roadway), LB.



TYPICAL SECTION THRU ENDWALL



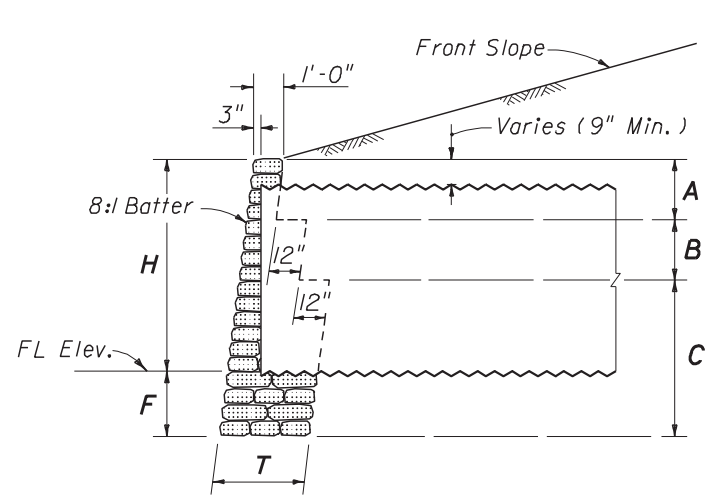
SECTION BB

OPTIONAL ENTRANCE FOR CONCRETE PIPE

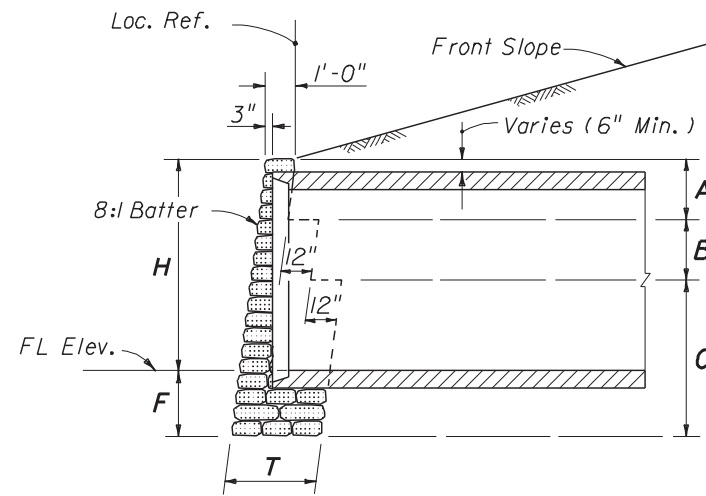
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**STRAIGHT CONCRETE ENDWALL
SINGLE 84" PIPE**

Names	Dates	Approved By	
Designed By		S. A. McHenry State Drainage Engineer	
Drawn By	WHW 07/58		
Checked By	HCG 07/58		
Revision	00	Sheet No.	Index No.
		1 of 1	255

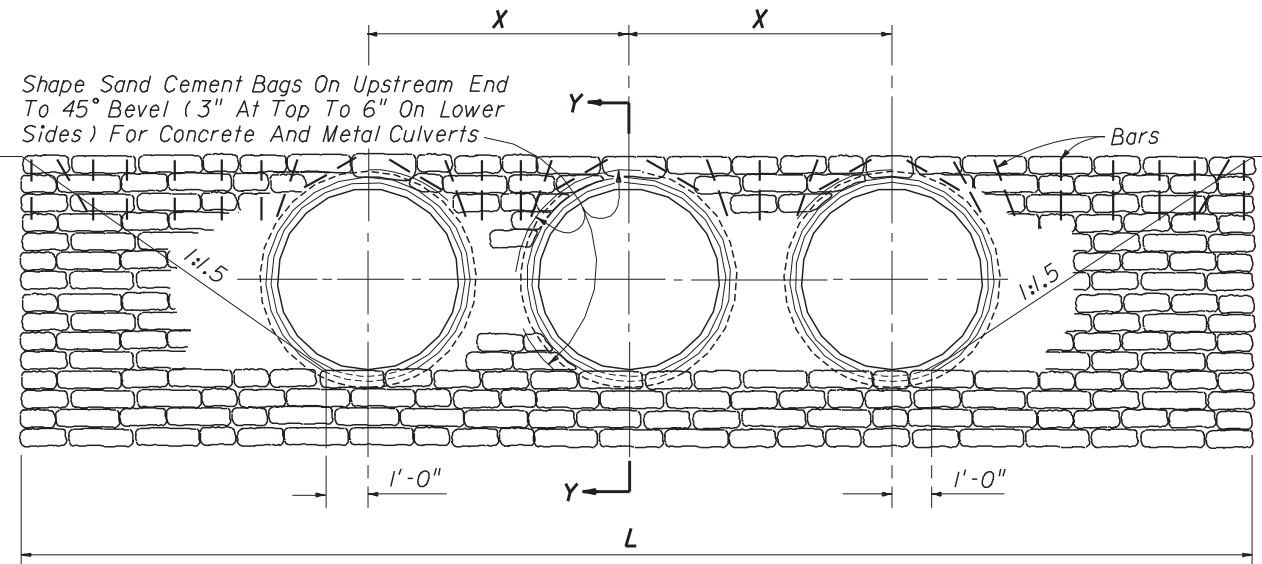


CORRUGATED METAL PIPE



CONCRETE PIPE

SECTION YY



Note: (1) For concrete and corrugated metal pipes. Concrete pipe shown.
 (2) The top row of riprap bags shall be secured by pinning, using #4 reinforcing bars 18 inches in length, as follows:
 (a) The end bags shall be secured using two bars per bag, one vertical and one diagonal as shown.
 (b) The next to last bag on each end shall be secured with two bars vertically.
 (c) Bags located over the pipe shall be secured by a bar which is driven diagonally except that for concrete pipe two bars shall be used for single bags above the pipe.
 (d) Intermediate bags shall be secured with a single bar.
 Bars shall be driven to one inch below the surface of the bag.
 The cost of furnishing and installing the bars shall be included in the cost of the riprap.

FRONT ELEVATION

TABLE OF DIMENSIONS AND QUANTITIES FOR ONE ENDWALL

SIZE OF PIPE	H	T	A	B	C	F	X	ONE PIPE CULVERTS		TWO PIPE CULVERTS		THREE PIPE CULVERTS		FOUR PIPE CULVERTS					
								L	RIPRAP CY		L	RIPRAP CY		L	RIPRAP CY		L	RIPRAP CY	
									CP	CMP		CP	CMP		CP	CMP		CP	CMP
18"	2'-3"	1'-0"	4'-0"	0'-0"	0'-0"	1'-9"	2'-10"	8'-9"	1.2	1.2	11'-7"	1.5	1.6	14'-5"	1.8	1.9	17'-3"	2.1	2.3
24"	2'-9"	2'-0"	2'-0"	2'-6"	0'-0"	1'-9"	3'-5"	10'-3"	2.4	2.5	13'-8"	3.0	3.2	17'-1"	3.7	4.0	20'-6"	4.3	4.7
30"	3'-4"	2'-0"	2'-0"	3'-2"	0'-0"	1'-10"	4'-3"	12'-0"	3.3	3.4	16'-3"	4.2	4.5	20'-6"	5.1	5.5	24'-9"	6.0	6.5
36"	3'-10"	2'-0"	2'-0"	3'-8"	0'-0"	1'-10"	5'-1"	13'-6"	4.0	4.2	18'-7"	5.2	5.7	23'-8"	6.3	6.9	28'-9"	7.4	8.2
42"	4'-5"	3'-0"	2'-0"	2'-0"	2'-4"	1'-11"	6'-0"	15'-3"	6.4	6.7	21'-3"	8.3	8.9	27'-3"	10.2	11.2	33'-3"	12.3	13.4
48"	4'-11"	3'-0"	2'-0"	2'-0"	2'-10"	1'-11"	6'-9"	16'-9"	7.7	8.1	23'-6"	10.0	10.8	30'-3"	12.3	13.5	37'-0"	14.5	16.2
54"	5'-6"	3'-0"	2'-0"	2'-0"	3'-6"	2'-0"	7'-8"	18'-6"	9.5	10.1	26'-2"	12.4	13.5	33'-10"	15.3	17.0	41'-6"	18.2	20.4
60"	6'-0"	3'-0"	2'-0"	2'-0"	4'-0"	2'-0"	8'-6"	20'-0"	11.0	11.7	28'-6"	14.4	15.8	37'-0"	17.8	19.8	45'-6"	21.1	23.8
66"	6'-7"	3'-0"	2'-0"	2'-0"	4'-8"	2'-1"	9'-3"	21'-9"	13.2	14.1	31'-0"	17.2	18.9	40'-3"	21.2	23.7	49'-6"	25.1	28.5
72"	7'-1"	3'-0"	2'-0"	2'-0"	5'-2"	2'-1"	10'-0"	23'-3"	15.0	16.0	33'-3"	19.4	21.4	43'-3"	23.9	26.8	53'-3"	28.3	32.3
78"	7'-8"	3'-0"	2'-0"	2'-0"	5'-10"	2'-2"	10'-9"	25'-0"	17.5	18.7	35'-9"	22.6	25.0	46'-6"	27.8	31.3	57'-3"	32.9	37.6
84"	8'-2"	3'-0"	2'-0"	2'-0"	6'-4"	2'-2"	11'-8"	26'-6"	19.5	20.9	38'-2"	25.3	28.1	49'-10"	31.1	35.2	61'-6"	36.9	42.4

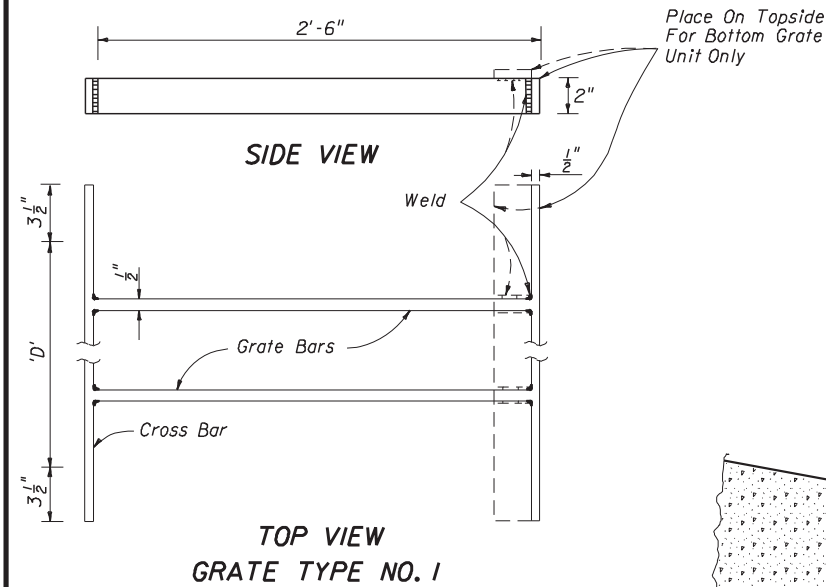
GENERAL NOTES

1. Straight sand-cement endwalls are intended for use outside the clear zone.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

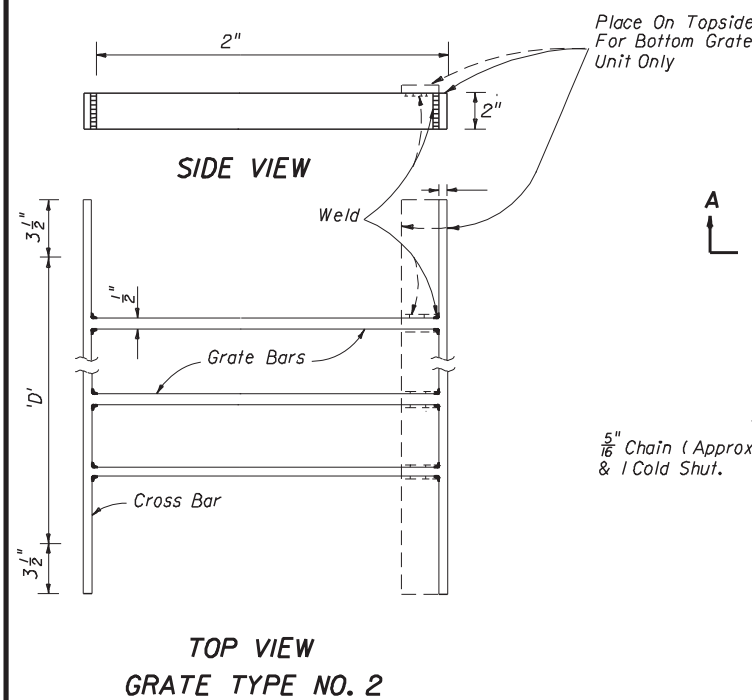
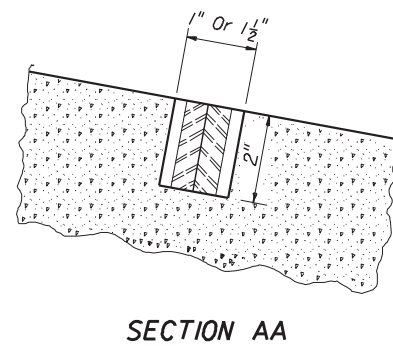
STRAIGHT SAND-CEMENT ENDWALLS

Designed By	Names	Dates	Approved By	<i>S. A. McHenry</i>		
Drawn By	JBW	07/88	State Drainage Engineer	Revision	Sheet No.	Index No.
Checked By	JVG/EGR	08/88	00	1 of 1	258	



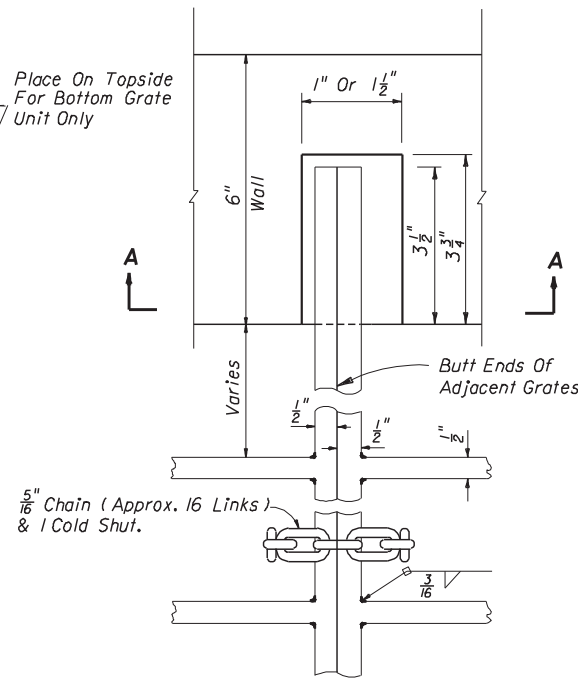
Pipe Size	Grate Bars Req'd.	Grate LB.
15"	2	28.93

Bars to be evenly spaced across dimension 'D'.
All bars 1/2" x 2".

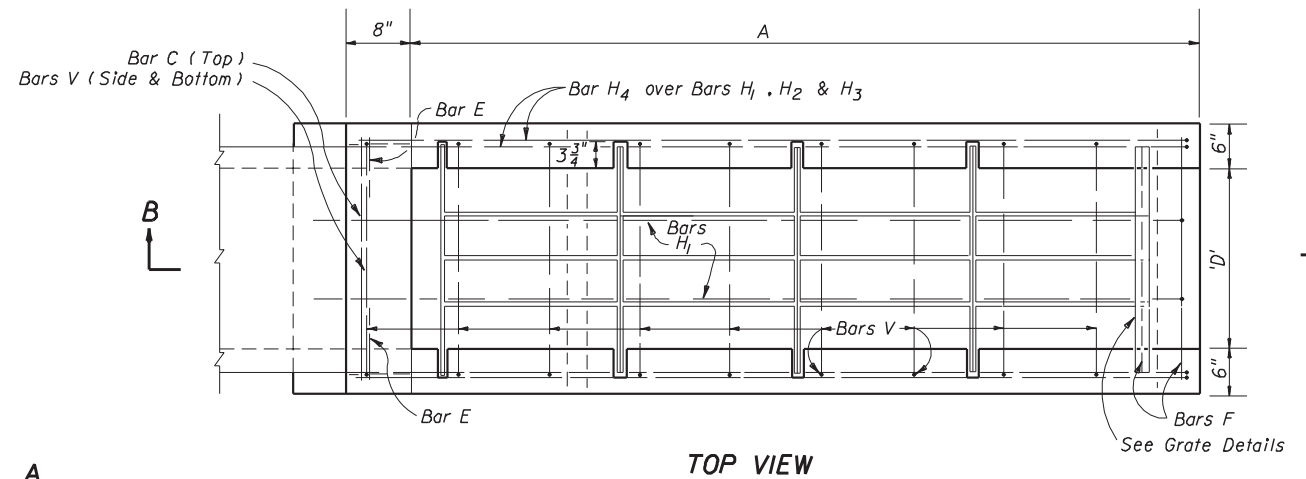
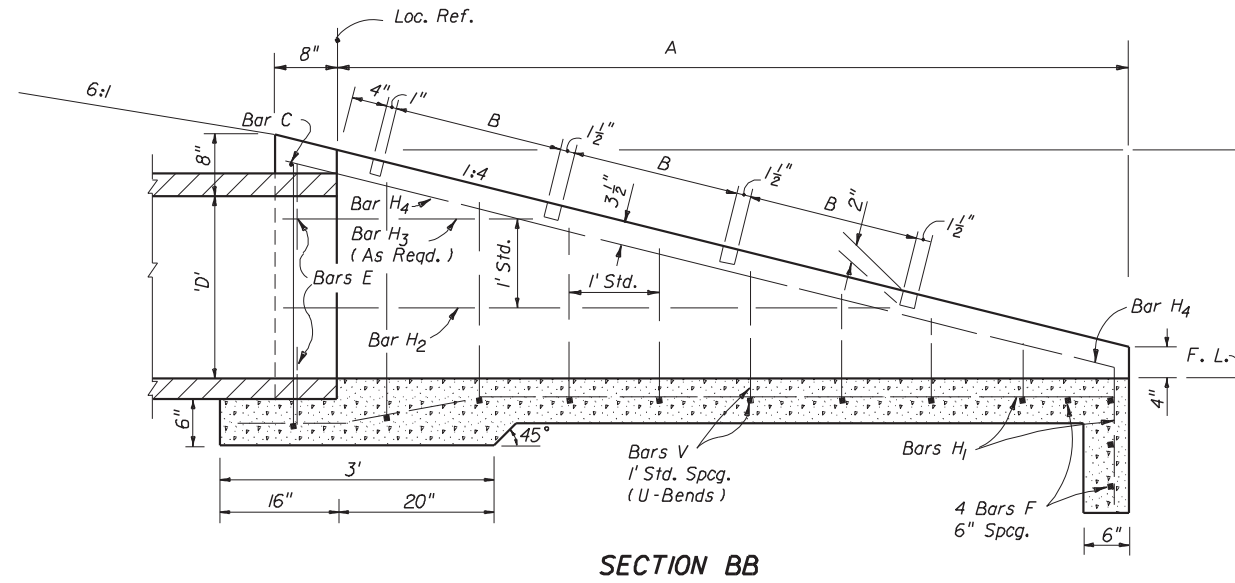


Pipe Size	Grate Bars Req'd.	Grate LB.
18"	3	33.69
24"	4	43.63
30"	5	53.55

Bars to be evenly spaced across dimension 'D'.
All bars 1/2" x 2".



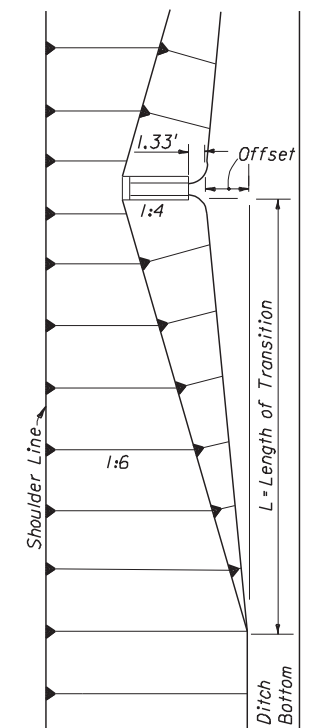
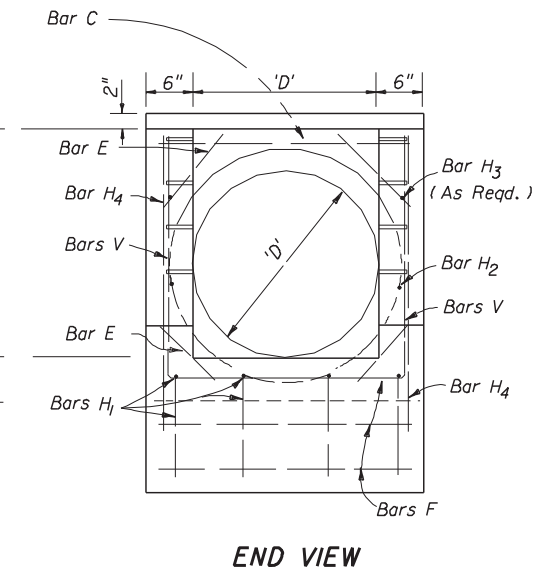
GRATE, SEAT, WELD & CHAIN DETAIL



Slope	Pipe Size D	A	B	Conc. Class I (CY)	Reinf. Steel (Lbs.)	Number Of Grates Req'd		Total Grate Wt. (Lbs.)	Sodding (SY)	Slope Transition	
						Type No. 1	Type No. 2			Offset	L
4:1	15"	5.67'	2.38'	0.85	56	2	0	57.86	15	4.2'	42'
	18"	6.67'	1.875'	1.01	73	0	3	101.08	16	4.8'	48'
	24"	8.67'	1.875'	1.65	97	0	4	174.52	19	5.8'	58'
	30"	10.67'	1.875'	2.33	129	0	5	267.75	21	6.9'	69'

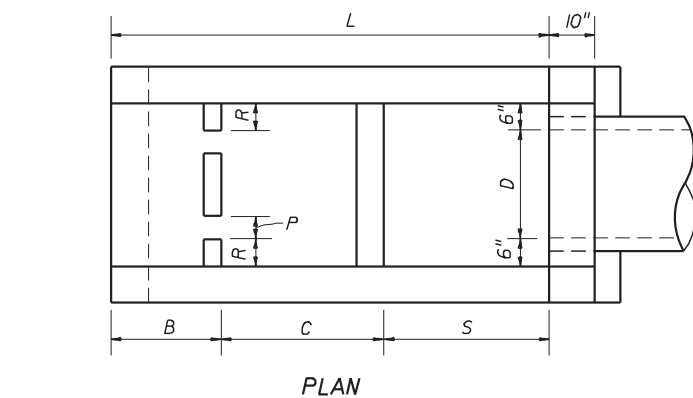
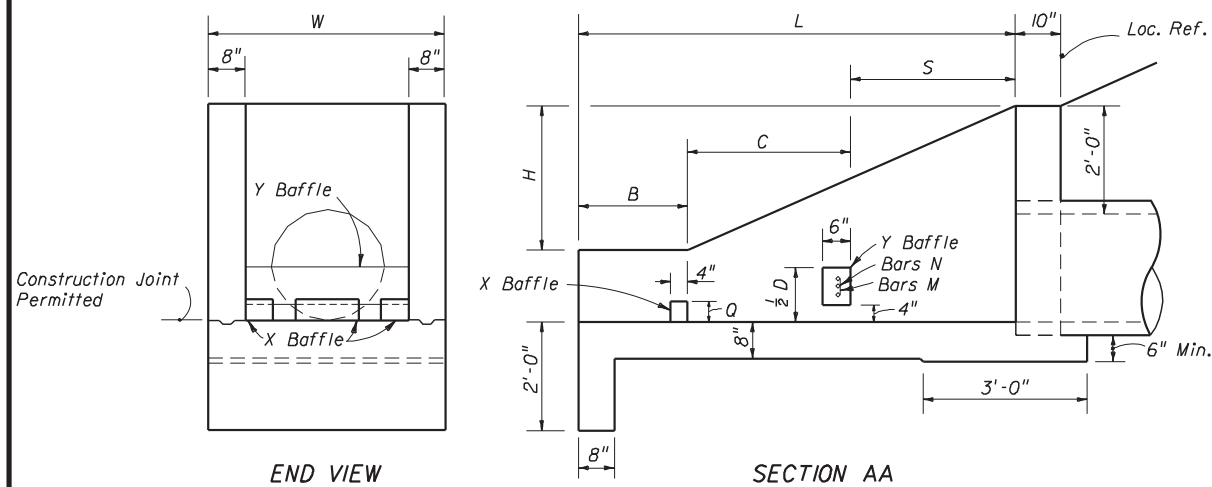
GENERAL NOTES

- This endwall is to be used only in the clear zone for the drainage of medians and other areas having low design velocities and negligible debris. Grates exposed to salt water shall be designated in the plan as Alternate G.
- Reinforcing steel: All bars are size #4. Spacings shown are center to center. Laps to be 12" minimum. Clearance is 2" except as noted.
Square welded wire fabric (two cages max.) having an equivalent cross sectional area (0.20 sq. in.) may be substituted for bar reinforcement.
- Grates shall be ASTM A242/A242M, A572/A572M or ASTM A588/A588M, Grade 50 steel, and galvanized in accordance with Section 962-7 of the Standard Specifications.
- Endwall to be paid for under the contract unit price for U-Endwall With Grate, Each. Payment shall include cost of concrete, reinforcing steel, grate, and accessories. Quantities shown are for estimating purposes only.
- Sod slopes 5' each side and above endwall. Sodding to be paid for under contract unit price for sodding.
- Precasting of this endwall will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer. Use Index No. 201 for opening and grouting details.
- Concrete meeting the requirements of A.S.T.M. C 478 (4,000 P.S.I.) may be used in lieu of Class I concrete for precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.

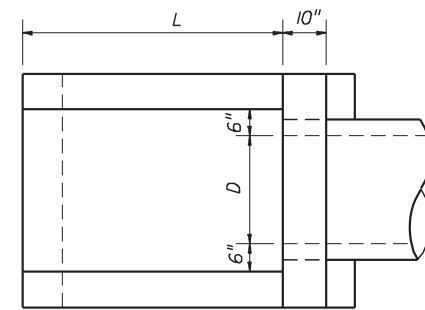
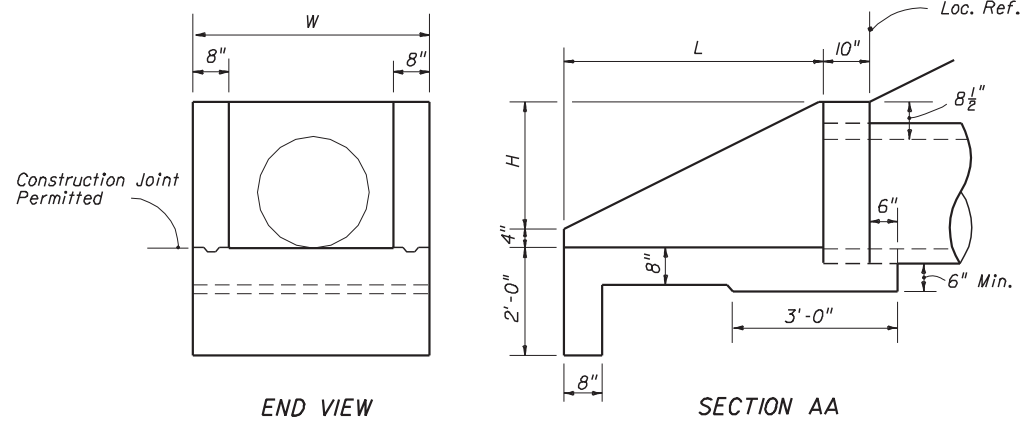


FRONT SLOPE TRANSITION AT ENDWALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
U-TYPE CONCRETE ENDWALLS WITH GRATES				
15" TO 30" PIPE				
Designed By	EGR	Dates	06/77	Approved By
Drawn By	HKH	06/77	00	<i>S. A. McHenry</i> State Drainage Engineer
Checked By	JVG	06/77	00	Revision
			Sheet No.	Index No.
			1 of 1	260



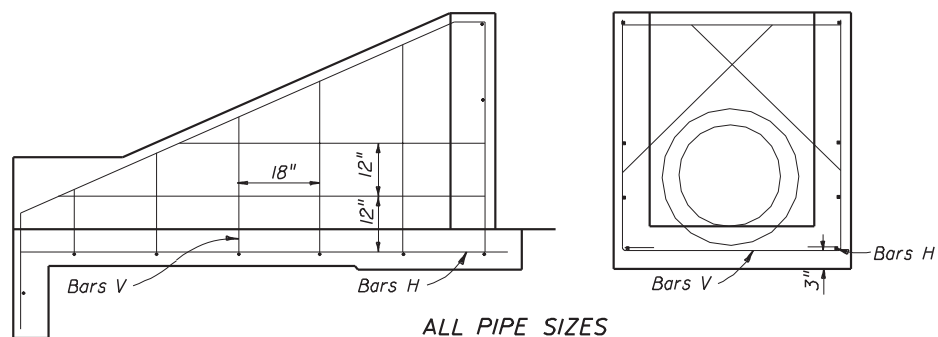
DIMENSIONAL DETAILS



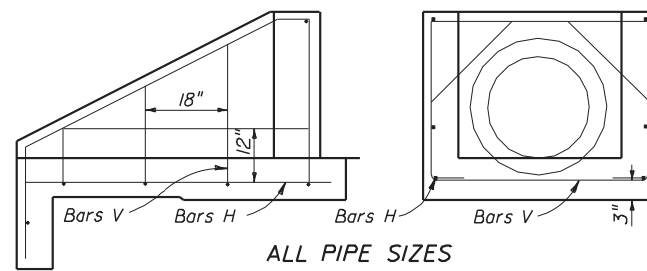
DIMENSIONAL DETAILS

GENERAL NOTES

1. Baffles to be constructed only when called for in plans.
2. When steel grating is required on endwall see Sheet 3 of 3 for details.
3. All reinforcing No. 4 bars with 2" clearance except as noted.
4. All angles, channels and bars shall be ASTM A242/A242M, A572/A572M or A588/A588M Grade 50 steel, when designated Alternate G in the plans galvanized in accordance with Section 962-7 of the Standard Specifications.
5. Channel section C 3 x 6 may be substituted for C 4 x 5.4 channel.
6. Precasting of this endwall will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the State Drainage Engineer. Use Index No. 201 for opening and grouting details.
7. Concrete meeting the requirements of ASTM C-478 (4000 psi) may be used in lieu of Class I concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
8. Sodding shall be in accordance with Index No. 281, and paid for under the contract unit price for Sodding, SY.
9. Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY and Reinforcing Steel (Roadway), LB. Cost of grates to be paid for under the contract unit price for Endwall Grate, LB, plan quantity. Cost of galvanized bolts and nuts to be included in the bid price for the grate.



ALL PIPE SIZES
SIDE VIEW AND BACKWALL SECTION
REINFORCING DETAIL



ALL PIPE SIZES
SIDE VIEW AND BACKWALL SECTION
REINFORCING DETAIL

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL														
Pipe Size		L	H	W	S	B	C	X Baffle			Y Baffle Reinf. Steel		Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
D	Area Sq. Ft.							P	Q	R	Bar M	Bar N		
15"	1.23	5'-9"	2'-3 1/2"	3'-7"	2'-3"	1'-3"	2'-3"	4"	4"	4"	2 #4	1 #4	1.61	72
18"	1.77	6'-6"	2'-5"	3'-10"	2'-6"	1'-6"	2'-6"	4"	4"	5"	3 #4	2 #4	1.89	86
24"	3.14	8'-0"	2'-8"	4'-4"	3'-0"	2'-0"	3'-0"	5"	5"	6"	4 #4	3 #4	2.52	108
30"	4.91	9'-6"	2'-11"	4'-10"	3'-6"	2'-6"	3'-6"	5"	5"	7"	4 #4	4 #4	3.34	131

WITH BAFFLES

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL						
Pipe Size		L	H	W	Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
D	Area Sq. Ft.					
15"	1.23	3'-3"	1'-7 1/2"	3'-7"	0.89	39
18"	1.77	3'-9"	1'-10 1/2"	3'-10"	1.05	43
24"	3.14	4'-9"	2'-4 1/2"	4'-4"	1.40	55
30"	4.91	5'-9"	2'-10 1/2"	4'-10"	1.88	64

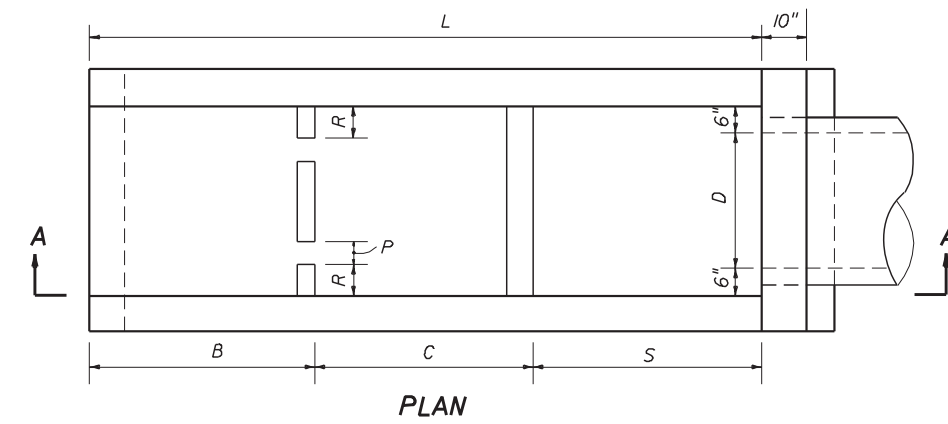
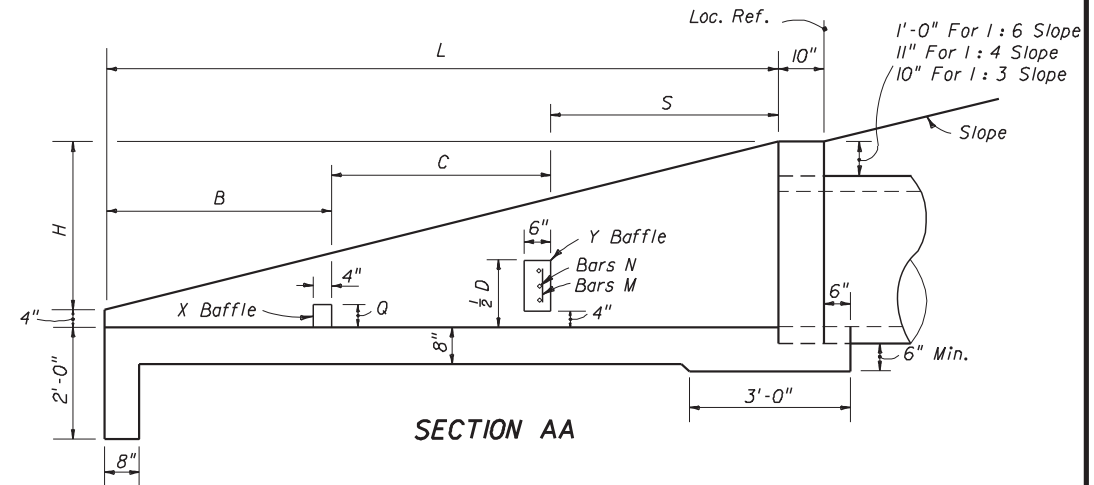
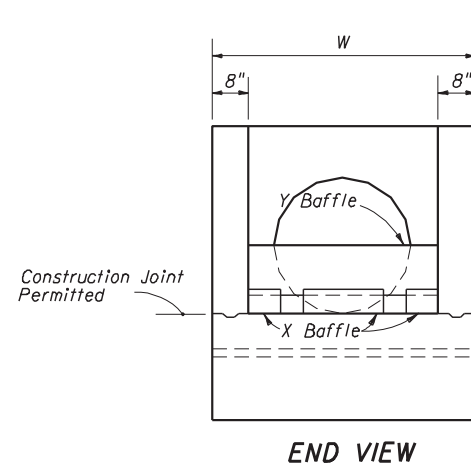
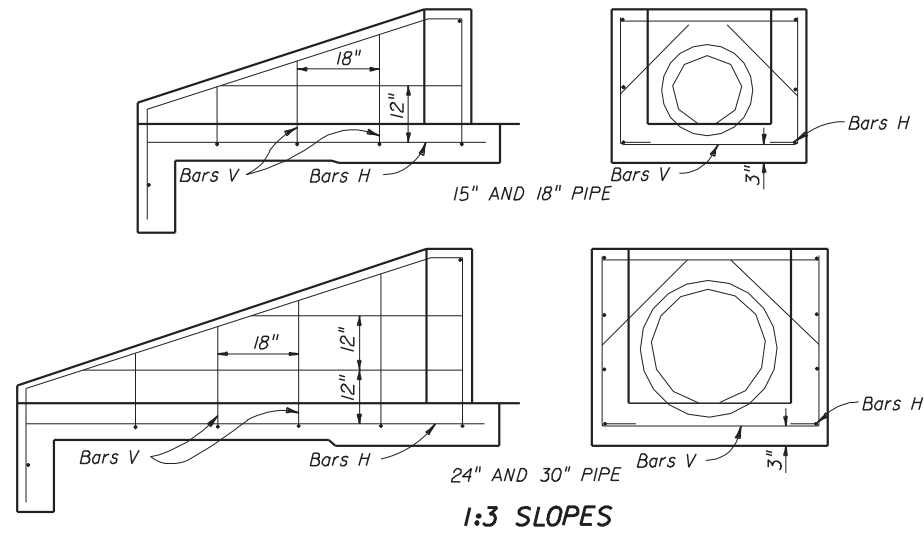
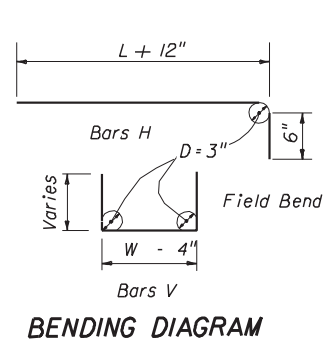
WITHOUT BAFFLES

ENDWALLS FOR 2:1 SLOPES

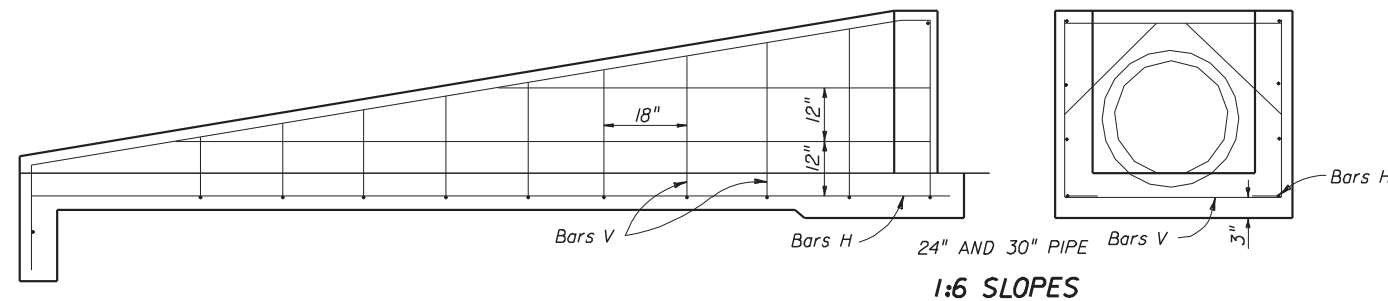
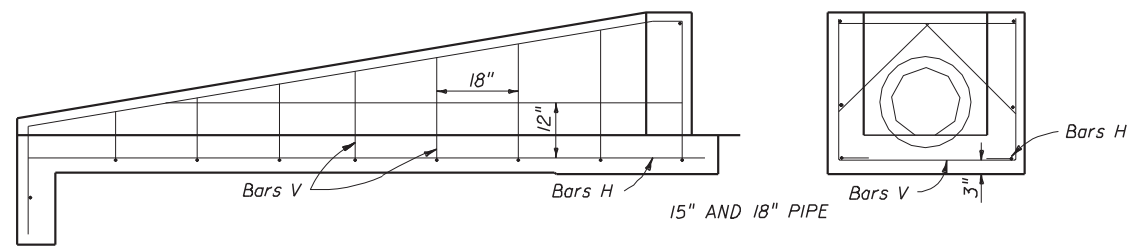
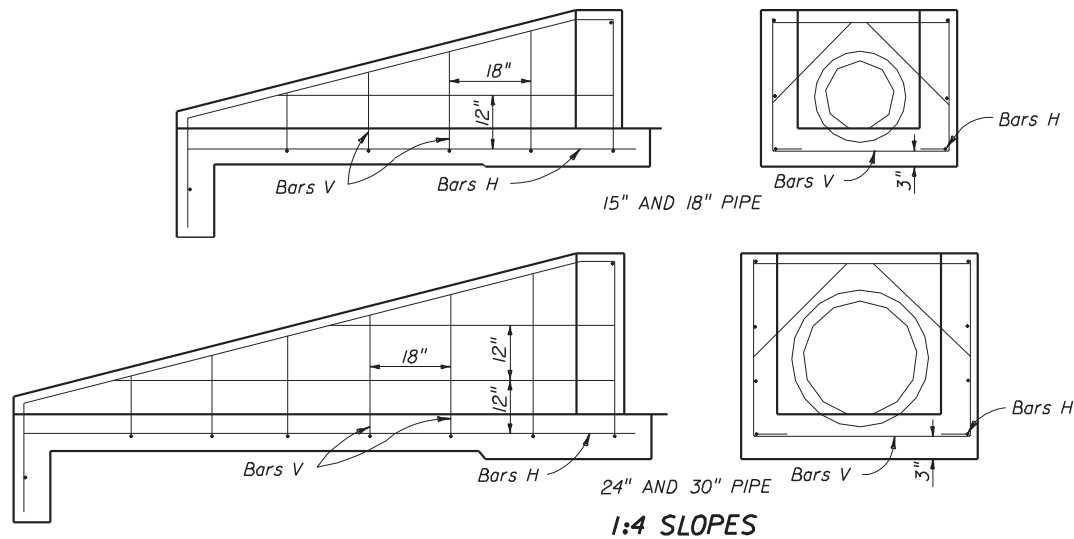
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRATE OPTIONAL
15" TO 30" PIPE**

Names	Dates	Approved By
Designed By		<i>S. A. McHenry</i> State Drainage Engineer
Drawn By	dds 09/85	Revision
Checked By		00
		Sheet No. 1 of 3
		Index No. 261



DIMENSIONAL DETAILS



SIDE VIEWS AND BACKWALL SECTIONS REINFORCING DETAILS

ENDWALLS WITH AND WITHOUT BAFFLES FOR 1:3, 1:4 AND 1:6 SLOPES

DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL

Rate Of Slope	Pipe Size		L	H	W	Baffle Locations (When Required)			Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
	D	Area Sq. Ft.				S	B	C		
1 : 3	15"	1.23	5'-3"	1'-9"	3'-7"	1'-9"	1'-9"	1'-9"	1.19	51
	18"	1.77	6'-0"	2'-0"	3'-10"	2'-0"	2'-0"	2'-0"	1.42	56
	24"	3.14	7'-6"	2'-6"	4'-4"	2'-6"	2'-6"	2'-6"	1.94	77
	30"	4.91	9'-0"	3'-0"	4'-10"	3'-0"	3'-0"	3'-0"	2.54	96
1 : 4	15"	1.23	7'-4"	1'-10"	3'-7"	2'-6"	2'-6"	2'-4"	1.54	64
	18"	1.77	8'-4"	2'-1"	3'-10"	2'-10"	2'-10"	2'-8"	1.84	71
	24"	3.14	10'-4"	2'-7"	4'-4"	3'-6"	3'-6"	3'-4"	2.53	92
	30"	4.91	12'-4"	3'-1"	4'-10"	4'-2"	4'-2"	4'-0"	3.34	124
1 : 6	15"	1.23	11'-6"	1'-11"	3'-7"	3'-10"	3'-10"	3'-10"	2.19	89
	18"	1.77	13'-0"	2'-2"	3'-10"	4'-4"	4'-4"	4'-4"	2.63	103
	24"	3.14	16'-0"	2'-8"	4'-4"	5'-4"	5'-4"	5'-4"	3.59	143
	30"	4.91	19'-0"	3'-2"	4'-10"	6'-4"	6'-4"	6'-4"	4.81	180

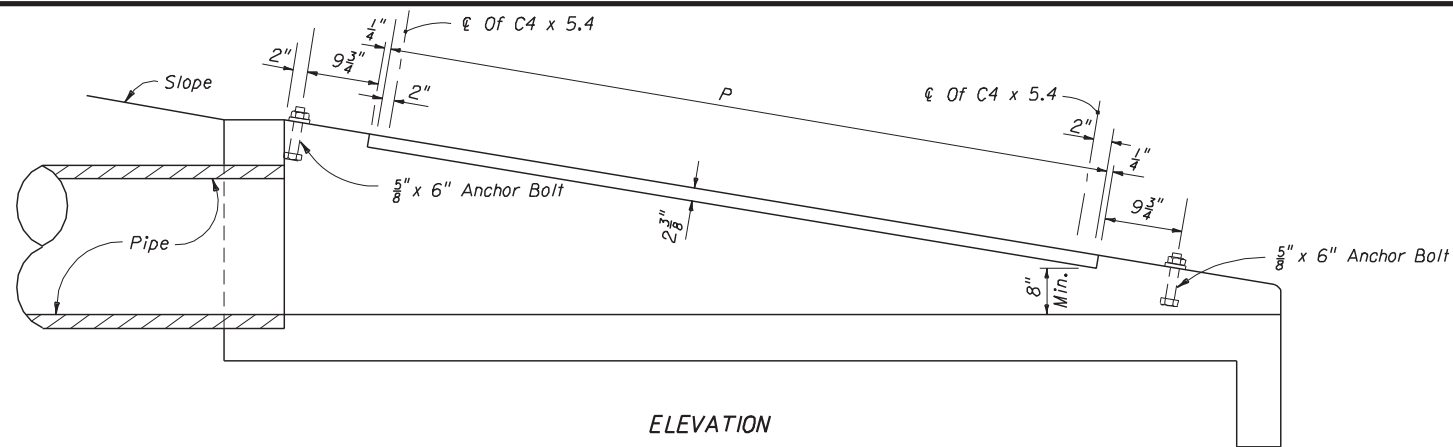
DIMENSIONS AND QUANTITIES FOR BAFFLES

Pipe Size D	X Baffle			Y Baffle Reinf. Steel		Concrete Class I Cu. Yd.	Reinf. Steel Lbs.
	P Width	Q Height	R Length	Bar M	Bar N		
15"	4"	4"	4"	2-# 4	1-# 4	0.10	4
18"	4"	4"	5"	3-# 4	2-# 4		8
24"	5"	5"	6"	4-# 4	3-# 4		12
30"	5"	5"	7"	4-# 4	4-# 4		16

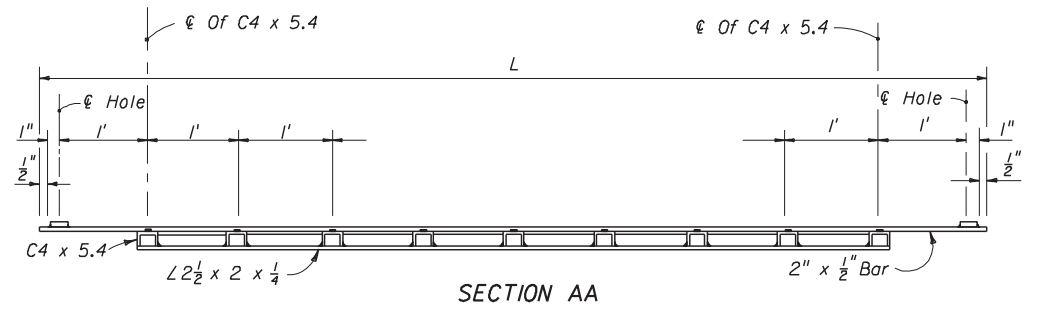
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRATE OPTIONAL
15" TO 30" PIPE**

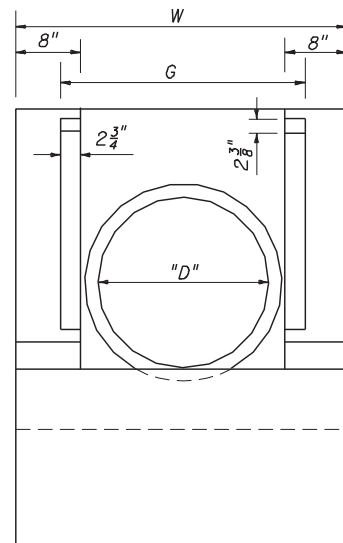
Names	Dates	Approved By	State Drainage Engineer	
Designed By		S. A. McHenry		
Drawn By	dds 9/85	Revision	Sheet No.	Index No.
Checked By		00	2 of 3	261



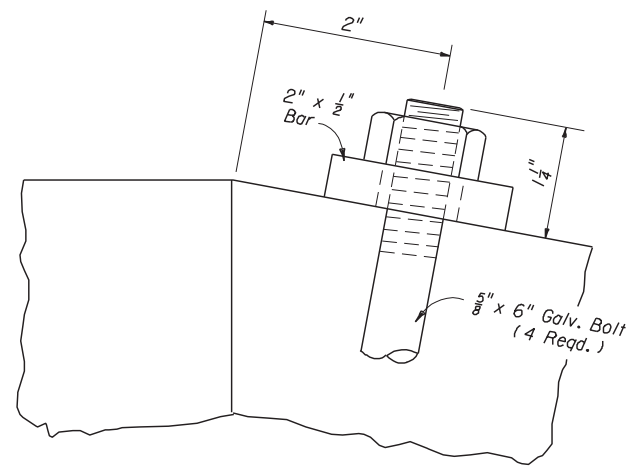
ELEVATION



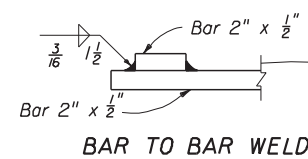
SECTION AA



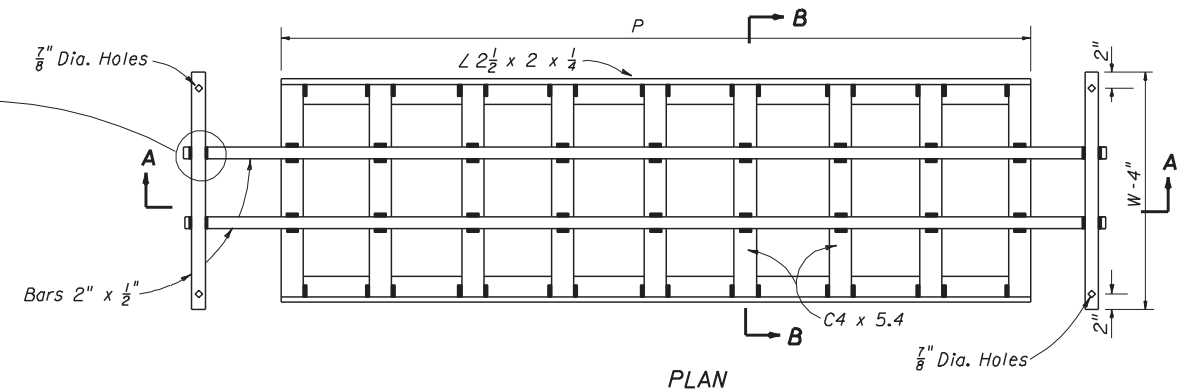
END VIEW



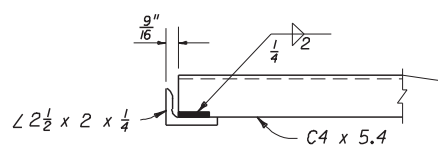
ANCHOR BOLT DETAIL



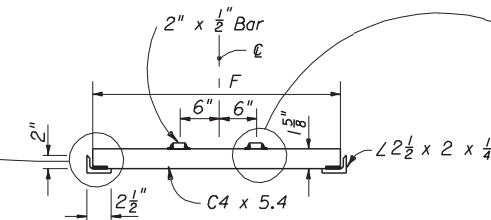
BAR TO BAR WELD



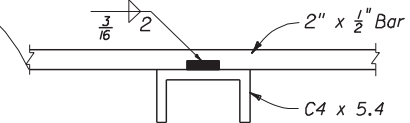
PLAN



CHANNEL TO ANGLE WELD



SECTION BB



BAR TO CHANNEL WELD

STEEL GRATE

MOUNTING FOR STEEL GRATE

STEEL GRATING USE CRITERIA

1. Grates to be used on pipe culvert endwalls located within the designated clear zone. Positive debris control shall be provided at all upgradient openings. Grates shall not be used unless one or more of the following conditions exist :

- A. Drainage area to culvert consists of median or infield areas or areas where debris and/or drift is negligible.
- B. Runoff to culvert is by sheet flow or in such ill defined channels that debris transport is not considered a major problem.
- C. Runoff to culvert is minor except on an infrequent basis (10 to 15 year frequency); for example a drainage basin in flat sandy terrain with normally low ground water table.
- D. Areas where culvert blockage with resultant backwater would not seriously affect roadway embankment, traffic operation or upland property.

2. Steel grating to be used only where called for in plans.

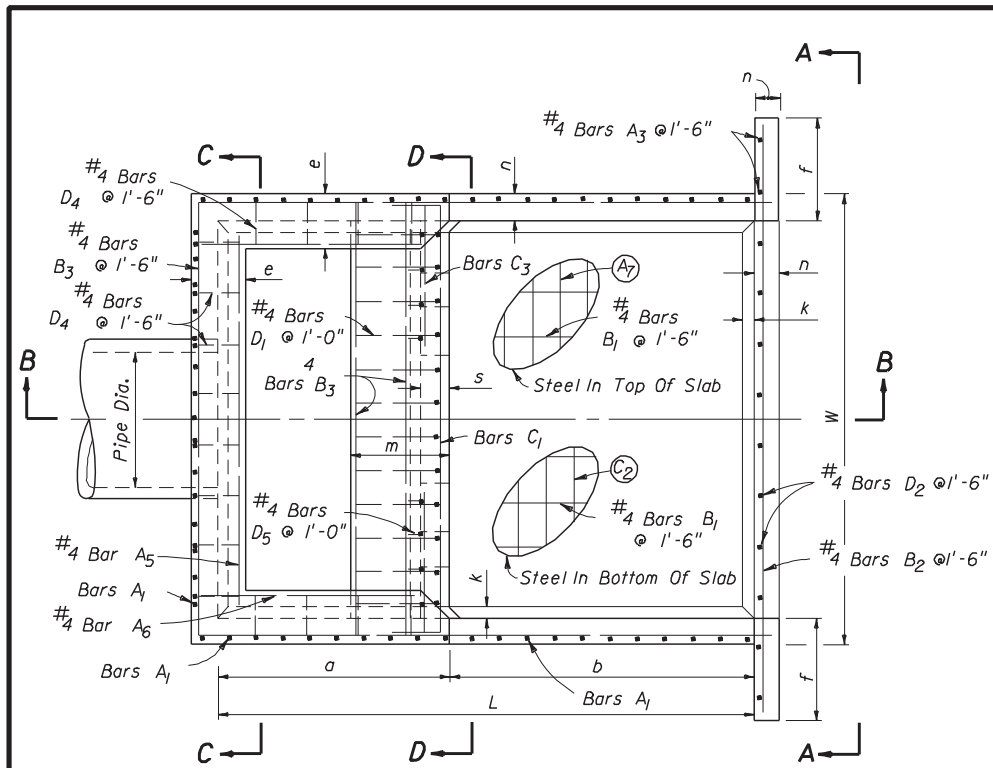
TABLE OF DIMENSIONS AND QUANTITIES FOR ONE GRATE

Rate Of Slope	Size Pipe " D "	G	2 Each Bars @ 3.4 Lbs./L.F.			(X) Channels @ 5.4 Lbs./L.F.			2 Angles @ 3.62 Lbs./L.F.		Total Weight Lbs.
			L	W-4"	Lbs.	(X)	F	Lbs.	P	Lbs.	
1:6	15"	2' - 8 1/2"	9' - 3"	3' - 3"	85	8	2' - 6 7/8"	111	7' - 4"	53	249
	18"	2' - 11 1/2"	10' - 3"	3' - 6"	94	9	2' - 9 7/8"	137	8' - 4"	62	292
	24"	3' - 5 1/2"	13' - 3"	4' - 0"	117	12	3' - 3 7/8"	215	11' - 4"	82	414
	30"	3' - 11 1/2"	16' - 3"	4' - 6"	141	15	3' - 9 7/8"	310	14' - 4"	104	555
1:4	15"	2' - 8 1/2"	6' - 3"	3' - 3"	65	5	2' - 6 7/8"	70	4' - 4"	32	167
	18"	2' - 11 1/2"	7' - 3"	3' - 6"	73	6	2' - 9 7/8"	92	5' - 4"	39	204
	24"	3' - 5 1/2"	9' - 3"	4' - 0"	90	8	3' - 3 7/8"	144	7' - 4"	53	287
	30"	3' - 11 1/2"	11' - 3"	4' - 6"	107	10	3' - 9 7/8"	206	9' - 4"	68	381
1:3	15"	2' - 8 1/2"	4' - 3"	3' - 3"	51	3	2' - 6 7/8"	42	2' - 4"	17	110
	18"	2' - 11 1/2"	5' - 3"	3' - 6"	60	4	2' - 9 7/8"	61	3' - 4"	24	145
	24"	3' - 5 1/2"	6' - 3"	4' - 0"	70	5	3' - 3 7/8"	90	4' - 4"	31	191
	30"	3' - 11 1/2"	8' - 3"	4' - 6"	87	7	3' - 9 7/8"	145	6' - 4"	46	278

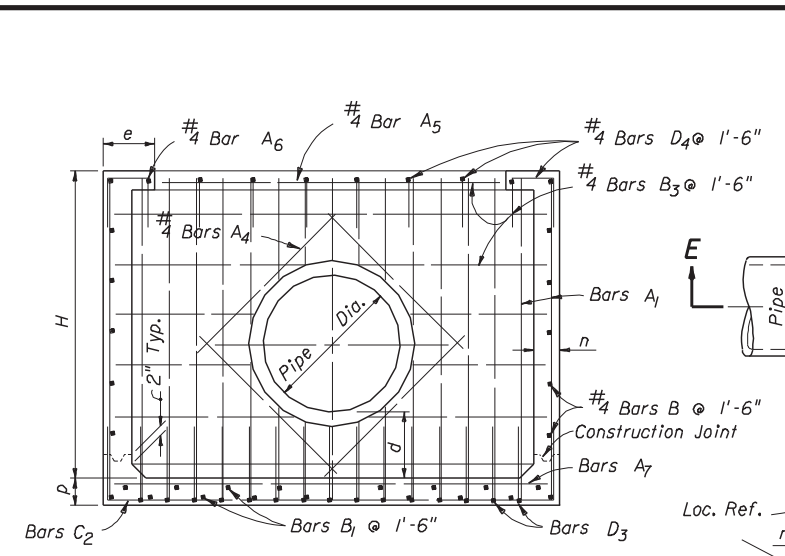
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**U-TYPE CONCRETE ENDWALLS
BAFFLES AND GRATE OPTIONAL
15" TO 30" PIPE**

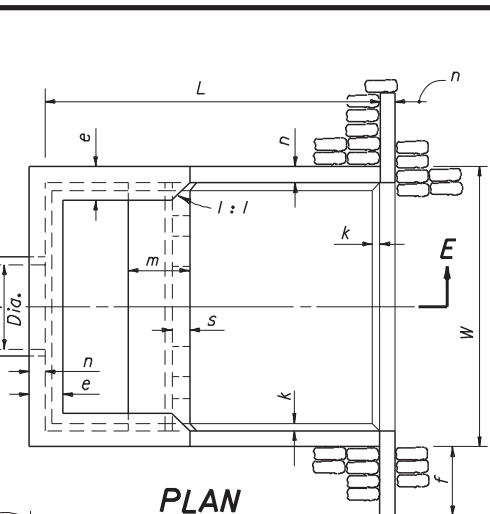
Names	Dates	Approved By
Designed By		<i>S. A. McHenry</i>
Drawn By	CDP 07/71	State Drainage Engineer
Checked By		Revision
		00
		Sheet No.
		3 of 3
		Index No.
		261



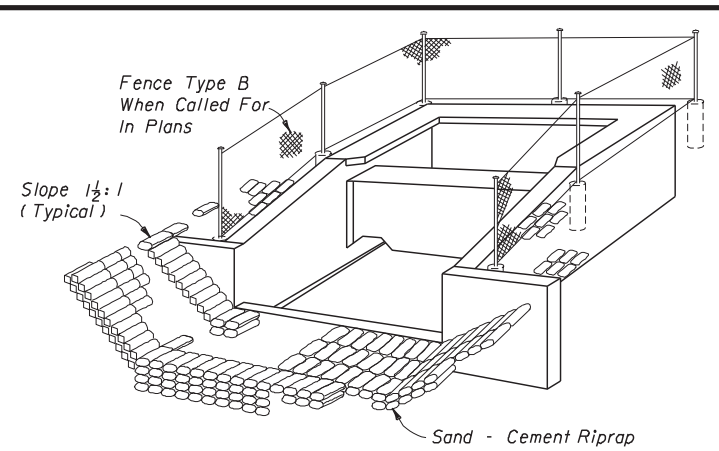
PLAN



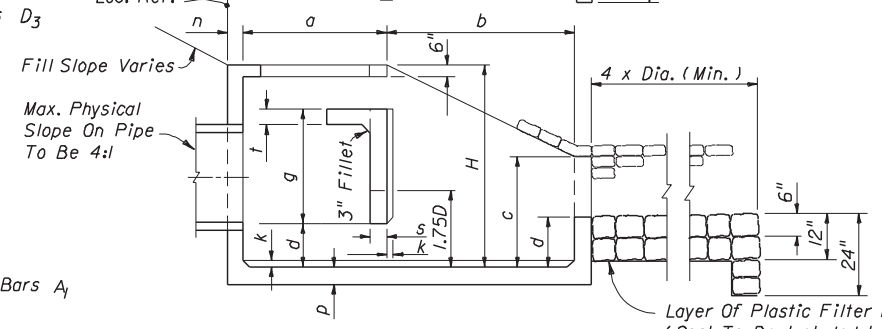
SECTION CC



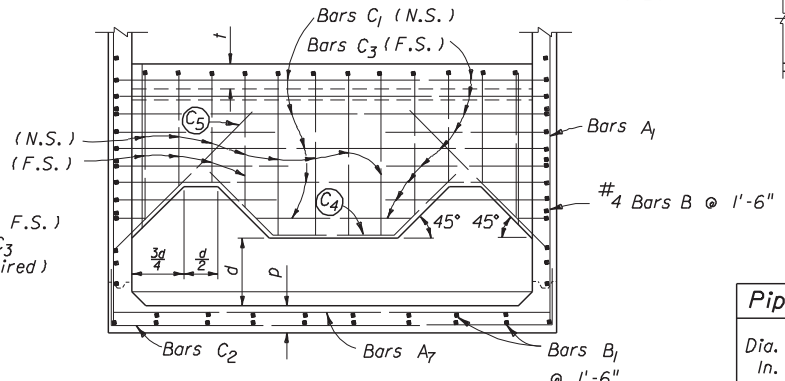
PLAN



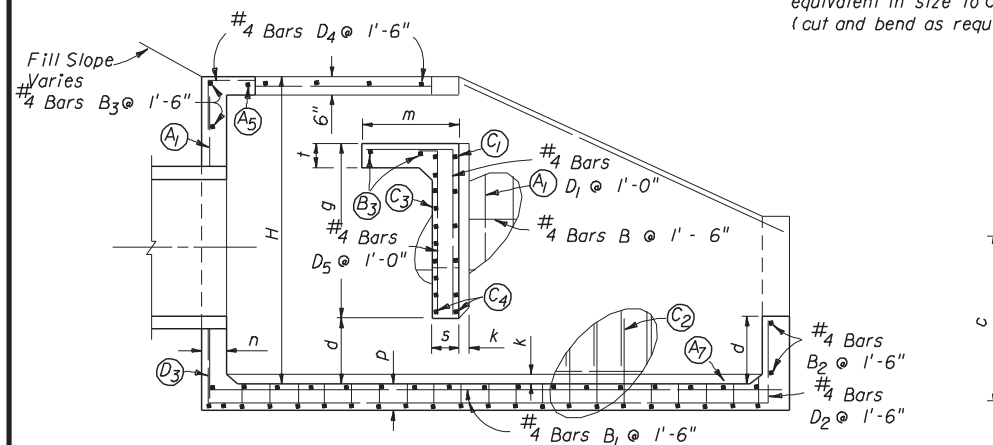
PERSPECTIVE



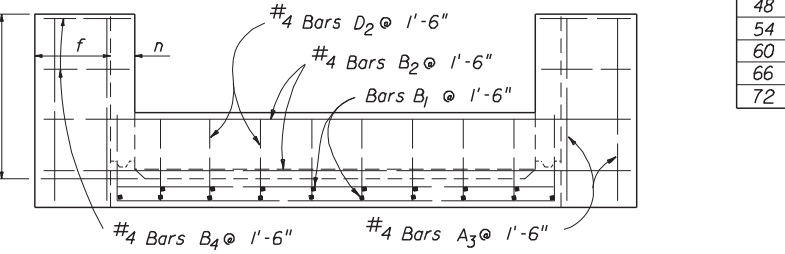
SECTION EE



SECTION DD



SECTION BB



VIEW AA

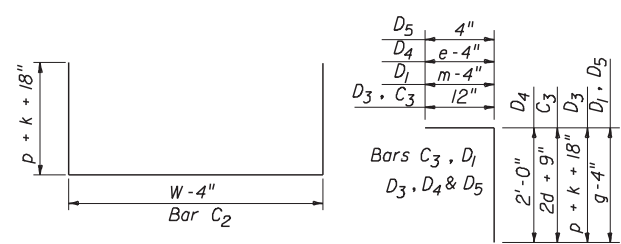
Note: Bars C₄ & C₅ (N.S. & F.S.) equivalent in size to C₃ (cut and bend as required)

Pipe Size Dia. In.	Area S.F.	Q (Max.) (cfs)	Dimensions													Concrete Class I C.Y.	Reinf. Steel Lbs.	Sand Cement Riprap C.Y. (Nom.)			
			Ft. - In.						Inches												
			W	H	L	a	b	c	d	e	f	g	m	n	p	s	t	k			
30	4.91	59	9-0	6-3	10-8	4-7	6-1	3-4	1-4	1-2	2-6	3-0	1-11	6	6 1/2	7	7	3	6.72	736	10.6
36	7.07	85	10-5	7-3	12-4	5-3	7-1	3-10	1-7	1-3	3-0	3-6	2-3	7	7 1/2	8	8	3	10.34	1,072	13.6
42	9.62	115	11-10	8-0	14-0	6-0	8-0	4-5	1-9	1-6	3-0	3-11	2-6	8	8 1/2	9	8	4	14.82	1,429	17.5
48	12.57	151	13-3	9-0	15-8	6-9	8-11	4-11	2-0	1-7	3-0	4-5	2-10	9	9 1/2	10	8	4	20.36	2,000	22.1
54	15.90	191	14-8	9-9	17-4	7-4	10-0	5-5	2-2	1-10	3-0	4-11	3-0	10	10 1/2	10	8	4	27.19	2,659	27.2
60	23.76	285	16-1	10-9	19-0	8-0	11-0	5-11	2-5	1-11	3-0	5-4	3-4	11	11 1/2	11	8	6	34.49	3,552	32.5
66	23.76	285	17-3	11-6	20-6	8-8	11-10	6-5	2-7	2-1	3-0	5-9	3-7	12	12 1/2	12	8	6	42.82	4,472	38.3
72	28.27	339	18-6	12-3	22-0	9-3	12-9	6-11	2-9	2-3	3-0	6-2	3-9	12	12 1/2	12	8	6	50.68	5,426	44.5

GENERAL NOTES

- U-type concrete endwall energy dissipators are intended for use outside the clear zone.
- Chamfer all exposed edges 3/4"
- Concrete meeting the requirements of ASTM C478 (4000 psi) may be used in lieu of Class I Concrete in precast items manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
- Reinforcing steel shall have 2" min. cover.
- Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY and Reinforcing Steel (Roadway), LB. Riprap to be paid for under the contract unit price for Riprap (Sand-Cement) (Roadway), CY. Cost of plastic filter fabric to be included in the contract unit price for riprap.
- Fencing, when called for in the plans, to be paid for under the contract unit price for Fencing, Type B, LF. Corner posts and end posts to be paid for under the contract unit price for Corner Post Assembly (Type B Fence), EA, and End Post Assembly (Type B Fence), EA, respectively. See Index No. 452 for details of Type B fencing.

BARS												
Pipe Size	A ₁		A ₇		C ₁		C ₂		C ₃		D ₃	
	Size (No.)	Spacing (Ft. - In.)	Size (No.)	Spacing (Ft. - In.)	Size (No.)	Spacing (Ft. - In.)	Size (No.)	Spacing (Ft. - In.)	Size (No.)	Spacing (Ft. - In.)	Size (No.)	Spacing (Ft. - In.)
30"	4	0-9 1/2	4	1-6	5	0-11	4	0-9 1/2	5	0-5 1/2	4	0-9 1/2
36"	5	1-0	4	1-6	5	0-10	5	1-0	5	0-5	5	1-0
42"	5	0-11	4	1-6	6	1-1	5	0-11	6	0-6 1/2	5	0-11
48"	5	0-9 1/2	4	1-0	6	1-0	5	0-9 1/2	6	0-6	5	0-9 1/2
54"	5	0-8 1/2	4	0-10	7	1-1	5	0-8 1/2	7	0-6 1/2	5	0-8 1/2
60"	6	0-10	5	1-1	7	1-0	6	0-10	7	0-6	6	0-10
66"	6	0-8 1/2	5	0-11 1/2	7	0-11	6	0-8 1/2	7	0-5 1/2	6	0-8 1/2
72"	6	0-7 1/2	5	0-10	7	0-10	6	0-7 1/2	7	0-5	6	0-7 1/2



Note: All bar dimensions are out to out.

BENDING DIAGRAM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

U-TYPE CONCRETE ENDWALL ENERGY DISSIPATOR
30" TO 72" PIPE

Names	Dates	Approved By
Designed By	HAB 10/69	S. A. McHenry
Drawn By	RWR 02/84	State Drainage Engineer
Checked By	JVG 02/84	Revision
	00	Sheet No.
		Index No.
		1 of 1
		264

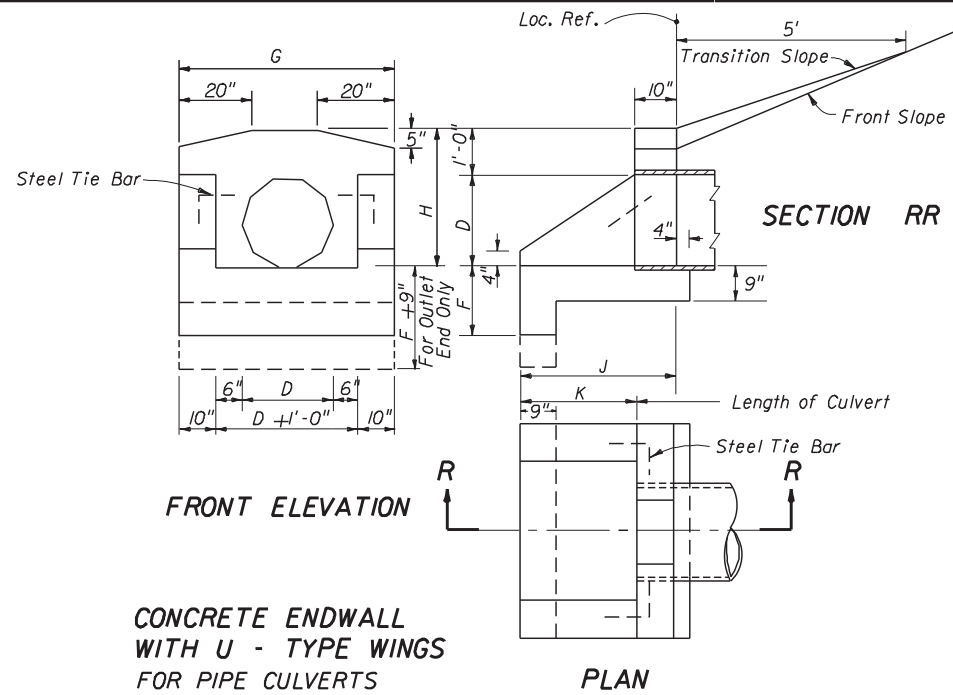


TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES
PIPE CULVERT ENDWALLS WITH U - TYPE WINGS

DIMENSIONS			QUANTITIES IN ONE ENDWALL											
Opening D	Area Sq.Ft.	Wall			Footing		Total Cu. Yds. Concrete, Class I						Steel Tie Bars	
		G	H	K	F	J	Conc. Pipe		C.M. Pipe		C.I. Pipe			
							Inlet	Outlet	Inlet	Outlet	Inlet	Outlet		
12"	0.8	3'-8"	2'-0"	1'-0"	1'-3"	2'-2"	0.48	0.55	0.49	0.57	0.49	0.57	none	
15"	1.2	3'-11"	2'-3"	1'-5"	1'-3"	2'-7"	0.59	0.67	0.62	0.70	0.61	0.70	none	
18"	1.8	4'-2"	2'-6"	1'-9"	1'-3"	2'-11"	0.70	0.79	0.74	0.82	0.74	0.82	none	
24"	3.1	4'-8"	3'-0"	2'-6"	1'-6"	3'-8"	1.01	1.11	1.06	1.16	1.06	1.16	2 - 3/4" x 2'-0"	
30"	4.9	5'-2"	3'-6"	3'-3"	1'-6"	4'-5"	1.33	1.44	1.41	1.51	1.40	1.51	2 - 3/4" x 2'-0"	
36"	7.1	5'-8"	4'-0"	4'-0"	1'-9"	5'-2"	1.73	1.85	1.84	1.96	1.82	1.94	2 - 3/4" x 2'-6"	
42"	9.6	6'-2"	4'-6"	4'-9"	2'-0"	5'-11"	2.19	2.32	2.32	2.45			2 - 3/4" x 2'-6"	
48"	12.6	6'-8"	5'-0"	5'-6"	2'-0"	6'-8"	2.64	2.78	2.81	2.95			2 - 3/4" x 3'-0"	

GENERAL NOTES

1. Winged concrete endwalls are intended for use outside the clear zone.
2. Chamfer all exposed edges 3/4"
3. Concrete meeting the requirements of ASTM C-478 (4000 psi) may be used in lieu of Class I concrete in precast units manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
4. Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY. Cost of steel tie bars to be included in the contract unit price for Class I Concrete.
5. Sadding to be in accordance with Index No. 281, and paid for under the contract unit price for Sodding, Sy.

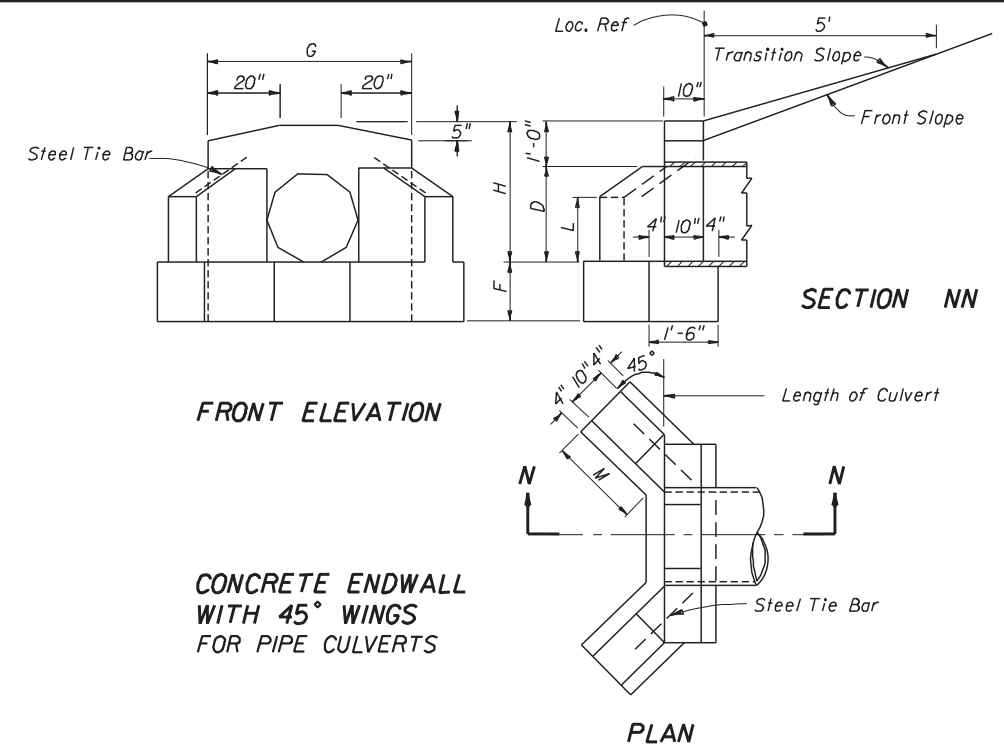
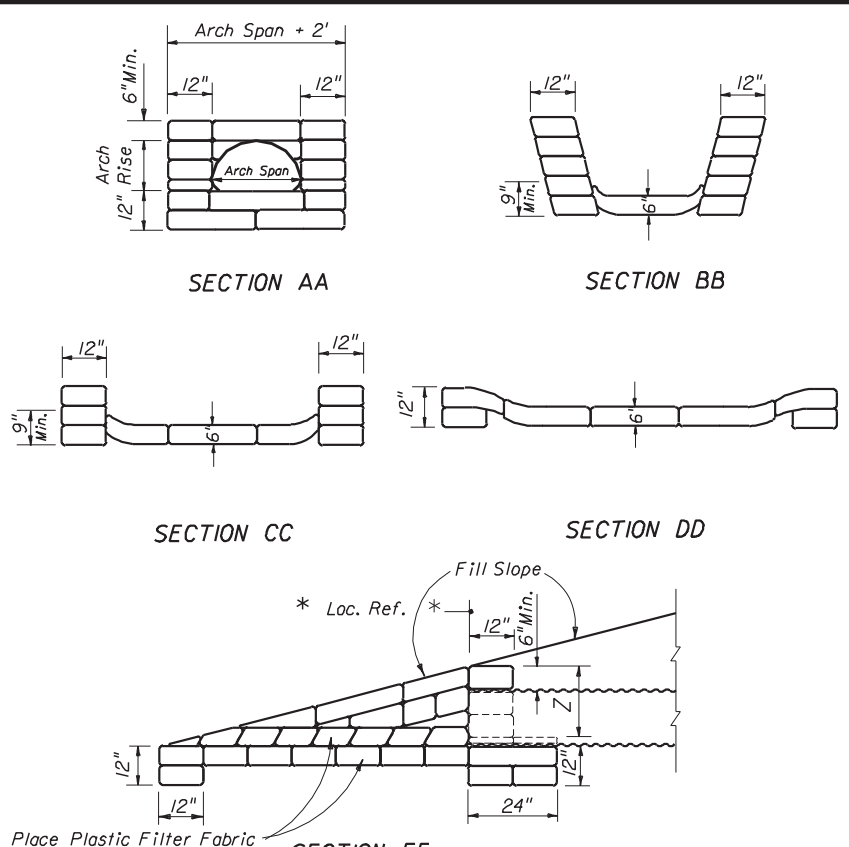
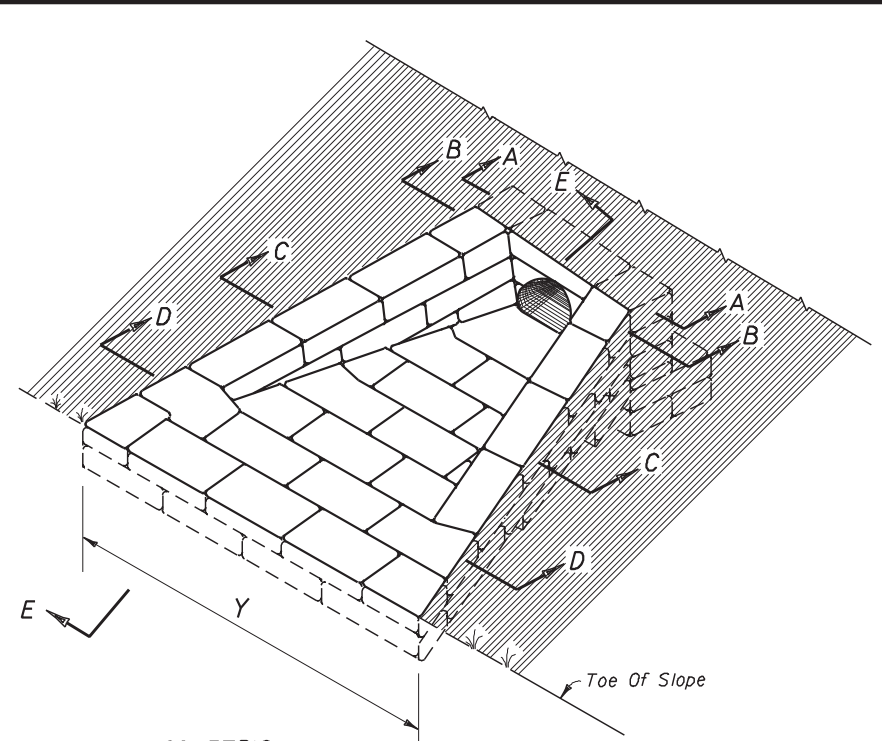
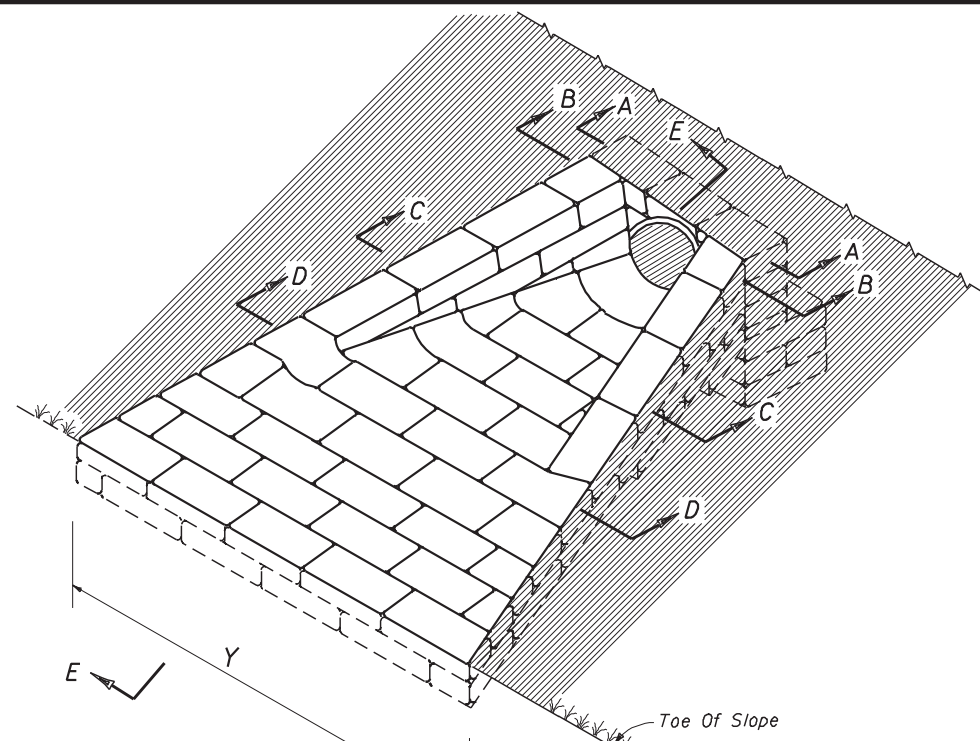


TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES
PIPE CULVERT ENDWALLS WITH 45° WINGS

DIMENSIONS			QUANTITIES IN ONE ENDWALL										
Opening D	Area Sq.Ft.	Wall			Footing		Concrete, Class I						Steel Tie Bars
		H	G	L	M	F	Total Cu. Yds.						
							Conc. Pipe	C.M. Pipe	C.I. Pipe				
18"	1.8	2'-6"	3'-10"	1'-2"	1'-7"	1'-3"	0.74	0.77	0.77				none
24"	3.1	3'-0"	4'-4"	1'-5"	2'-1"	1'-4"	1.01	1.06	1.06	2 - 3/4" x 2'-0"			
30"	4.9	3'-6"	4'-10"	1'-9"	2'-5"	1'-6"	1.32	1.40	1.39	2 - 3/4" x 2'-0"			
36"	7.1	4'-0"	5'-4"	2'-0"	2'-11"	1'-8"	1.72	1.83	1.82	2 - 3/4" x 3'-0"			
42"	9.6	4'-6"	5'-10"	2'-3"	3'-6"	2'-0"	2.34	2.47		2 - 3/4" x 3'-0"			
48"	12.6	5'-0"	6'-4"	2'-6"	4'-0"	2'-0"	2.74	2.90		2 - 3/4" x 3'-0"			
15"	1.2	2'-3"	3'-7"	1'-0"	1'-3"	1'-3"	0.56	0.59	0.59				none

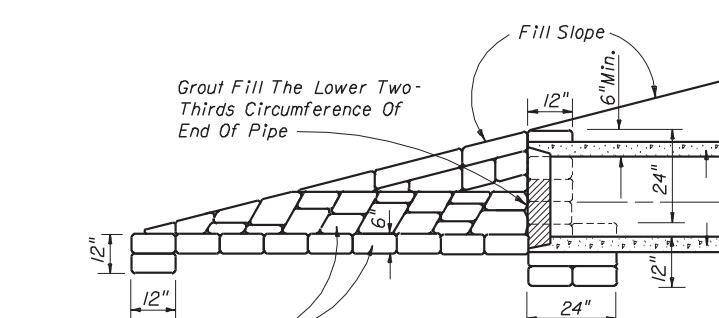
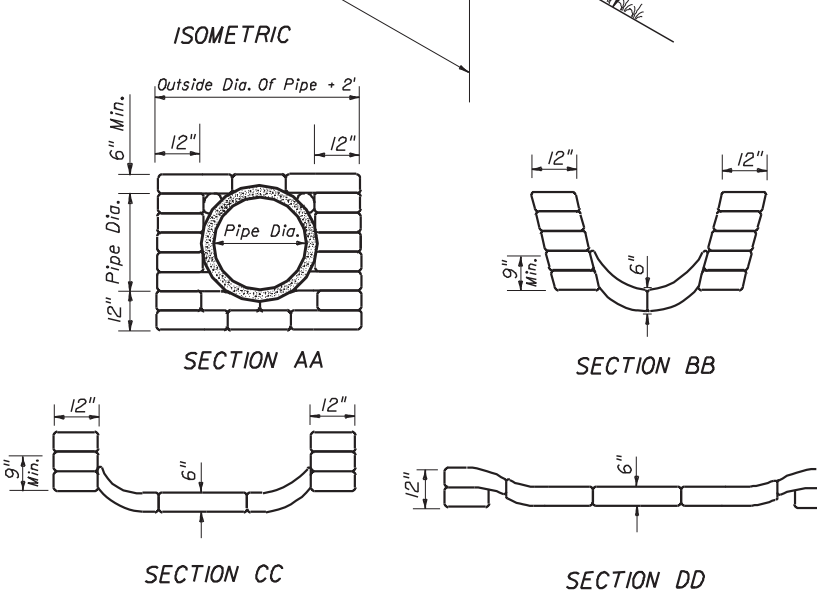
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
WINGED CONCRETE ENDWALLS SINGLE ROUND PIPE				
Names	Dates	Approved By		
Designed By		<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	TJK 12/31	Revision	Sheet No.	Index No.
Checked By	GEF 03/32	00	1 of 1	266



Place Plastic Filter Fabric Type D-4 (See Index 199) Around And Below Sand Cement Riprap. Cost Of Fabric To Be Included In Cost Of Sand Cement Riprap

DETAILS FOR SINGLE METAL PIPE ARCH CULVERTS

NOTE: For multiple metal pipe arch culvert spacing between arch centers = X



Place Plastic Filter Fabric Type D-4 (See Index 199) Around And Below Sand Cement Riprap. Cost Of Fabric To Be Included In Cost Of Sand Cement Riprap

DETAIL FOR SINGLE PIPE CULVERT

Note: For multiple pipe culvert spacing between pipe centers = X

DIMENSIONS AND QUANTITIES FOR METAL PIPE ARCH CULVERTS																			
Span	Rise	Dimensions								Quantity of Sand-Cement Riprap in Cu. Yds. for One Endwall									
		X	Y				Z	For 1:2 Slopes				For 1:4 Slopes		For 1:6 Slopes					
			1-Arch	2-Arch	3-Arch	4-Arch		1-Arch	2-Arch	3-Arch	4-Arch	1-Arch	2-Arch	3-Arch	4-Arch				
17"	13"	2'-6"	6'-6"	9'-0"	11'-6"	14'-0"	1'-7"	1.0	1.5	2.0	2.5	1.5	2.2	2.9	3.6				
21"	15"	2'-10"	7'-6"	10'-4"	13'-2"	16'-0"	1'-9"	1.2	1.8	2.4	3.0	1.9	2.7	3.5	4.3				
28"	20"	3'-5"	9'-3"	12'-8"	16'-1"	19'-6"	2'-0"	1.7	2.5	3.3	4.1	2.6	3.7	4.8	5.9				
35"	24"	4'-0"	11'-0"	15'-0"	19'-0"	23'-0"	2'-0"	2.2	3.1	4.0	4.9	3.4	4.7	6.0	7.3				
42"	29"	4'-9"	12'-9"	17'-6"	22'-3"	27'-0"	2'-0"	2.9	4.1	5.3	6.5	4.5	6.1	7.7	9.3				
49"	33"	5'-6"	14'-6"	20'-0"	25'-6"	31'-0"	2'-0"	3.5	4.9	6.3	7.7	5.5	7.4	9.3	11.2				
57"	38"	6'-4"	16'-6"	22'-10"	29'-2"	35'-6"	2'-0"	4.4	6.1	7.8	9.5	6.9	9.2	11.5	13.8				
64"	43"	7'-1"	18'-3"	25'-4"	32'-5"	39'-6"	2'-0"	5.1	7.0	8.9	10.8	8.1	10.7	13.3	15.9				
71"	47"	7'-10"	20'-0"	27'-10"	35'-8"	43'-6"	2'-0"	5.9	8.1	10.3	12.5	9.5	12.4	15.3	18.2				

GENERAL NOTES

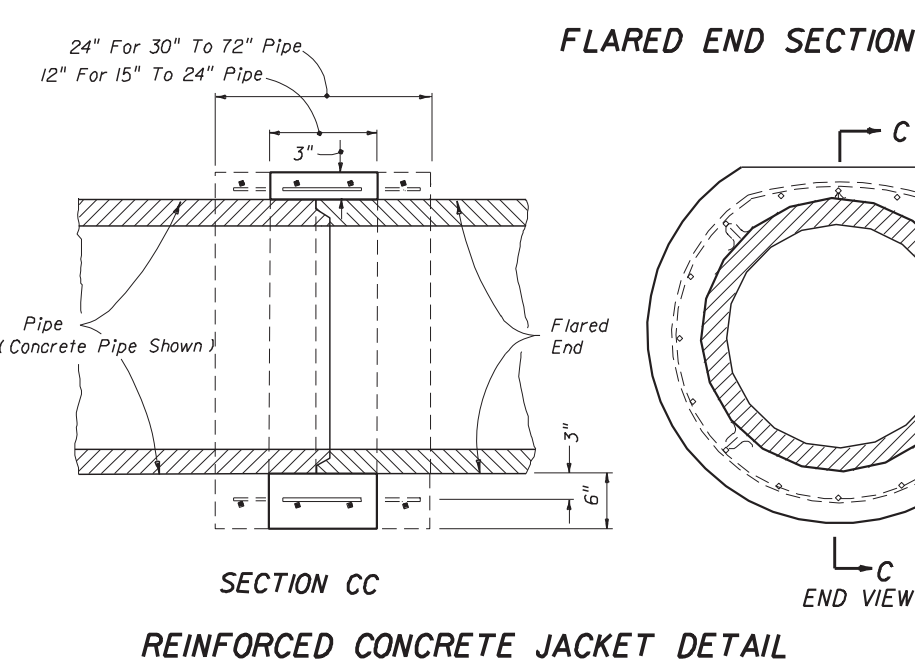
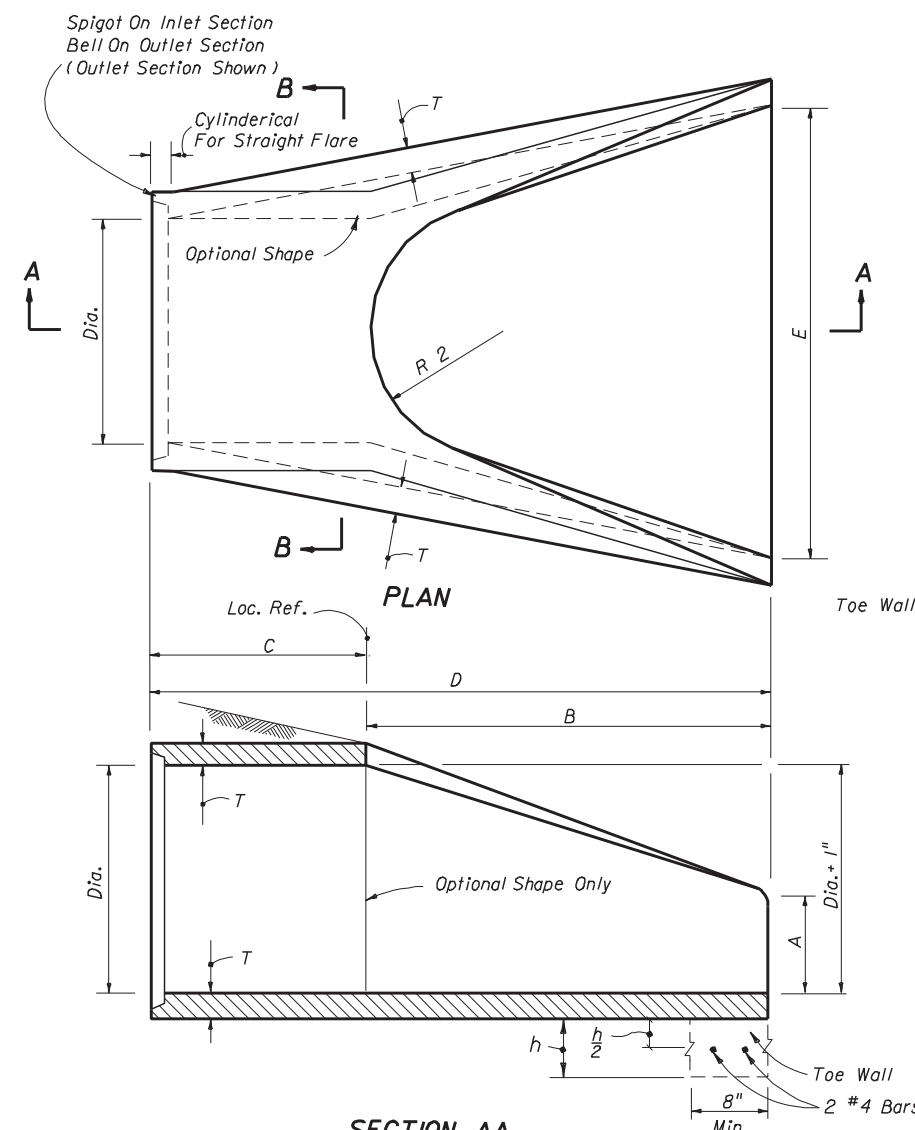
1. U-Type Sand-Cement Endwalls Are Intended For Use Outside The Clear Zone.

DIMENSIONS AND QUANTITIES FOR ROUND PIPE CULVERTS																			
Pipe Dia.	X	Dimensions				Quantity of Sand-Cement Riprap in Cu. Yds. for One Endwall													
		Y				For 1:2 Slopes			For 1:4 Slopes			For 1:6 Slopes							
		1-Pipe	2-Pipes	3-Pipes	4-Pipes	1-Pipe	2-Pipes	3-Pipes	4-Pipes	1-Pipe	2-Pipes	3-Pipes	4-Pipes	1-Pipe	2-Pipes	3-Pipes	4-Pipes		
15"	2'-7"	7'-0"	9'-7"	12'-2"	14'-9"	1.2	1.6	2.1	2.6	1.7	2.4	3.0	3.6						
18"	2'-10"	8'-0"	10'-10"	13'-8"	16'-6"	1.4	2.0	2.6	3.1	2.1	2.9	3.7	4.4						
24"	3'-5"	10'-0"	13'-5"	16'-10"	20'-3"	1.9	2.7	3.5	4.3	2.9	4.0	5.1	6.3						
30"	4'-3"	12'-0"	16'-3"	20'-6"	24'-9"	2.5	3.6	4.8	5.9	3.8	5.4	7.0	8.6						
36"	5'-1"	14'-0"	19'-1"	24'-2"	29'-3"	3.1	4.6	6.2	7.7	4.8	7.0	9.2	11.4						
42"	6'-0"	16'-0"	22'-0"	28'-0"	34'-0"	3.8	5.8	7.7	9.7	6.0	8.8	11.7	14.5						
48"	6'-9"	18'-0"	24'-9"	31'-6"	38'-3"	4.5	7.0	9.4	11.8	7.2	10.8	14.3	17.9						
54"	7'-8"	20'-0"	27'-8"	35'-4"	43'-0"	5.3	8.3	11.3	14.2	8.5	12.9	17.3	21.7						
60"	8'-6"	22'-0"	30'-6"	39'-0"	47'-6"	6.2	9.7	13.3	16.9	10.0	15.3	20.6	25.9						

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

U-TYPE SAND-CEMENT ENDWALLS

Names	Dates	Approved By		
Designed By	JEP 12/48	 State Drainage Engineer		
Drawn By	HW 03/54	Revision	Sheet No.	Index No.
Checked By	CDD 03/54	00	1 of 1	268



DIA.	T	REINF. REINF. SQ IN/LF	BELL Or SPIGOT	A	B	C	D	E	P	R 1	R 2	FLAT	WEIGHT (LBS.)	h	TOE WALL CLASS I CONC (Misc.) CY
12"	2"	0.07	1 1/2"	4"	2'-0"	4'-0 7/8"	6'-0 7/8"	2'-0"	19 15/16"	10 5/8"	9"	3 1/2"	530	12"	.06
15"	2 1/4"	0.07	2"	6"	2'-3"	3'-10"	6'-1"	2'-6"	24 5/16"	12 1/2"	11"	3 1/2"	740	12"	.07
18"	2 1/2"	0.07	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	29"	15 1/2"	12"	4"	990	15"	.11
21"	2 3/4"	0.07	2 3/4"	9"	2'-11"	3'-2"	6'-1"	3'-6"	31 5/8"	16 7/8"	13"	4"	1280	15"	.12
24"	3"	0.07	2 1/2"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	33 3/8"	16 13/16"	14"	4 1/2"	1520	18"	.17
27"	3 1/4"	0.148	2 1/2"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	4'-6"	36"	18 5/8"	14 1/2"	4 1/2"	1930	18"	.19
30"	3 1/2"	0.148	3"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	37"	18 1/2"	15"	5"	2190	21"	.24
36"	4"	0.148	3 1/2"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	47 13/16"	24 5/16"	20"	5 1/2"	4100	21"	.29
42"	4 1/2"	0.148	3 3/4"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	53 7/8"	27 1/2"	22"	5 1/2"	5380	24"	.36
48"	5"	0.148	4 1/4"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	56 1/2"	28 1/2"	22"	5 3/4"	6550	24"	.39
54"	5 1/2"	0.174	4 3/4"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"	65 1/2"	33 1/8"	24"	6 1/4"	8040	24"	.42
60"	6"	0.174	5"	2'-6"	5'-0"	3'-3"	8'-3"	8'-0"	72 1/2"	36 11/16"	24"	6 3/4"	8750	24"	.44
66"	6 1/2"	0.174	5 1/2"	2'-0"	6'-6"	1'-9"	8'-3"	8'-6"	72"	36 7/8"	24"	7 1/4"	10630	24"	.47
72"	7"	0.174	6"	2'-0"	6'-6"	1'-9"	8'-3"	9'-0"	77 13/16"	38 15/16"	24"	7 3/4"	12520	24"	.50

GENERAL NOTES

- Flared end sections shall conform to the requirements of ASTM C76 with the exception that dimensions and reinforcement shall be as prescribed in the table above. Circumferential reinforcement may consist of either one cage or two cages of steel. Compressive strength of concrete shall be 4000 psi. Shop drawings for flared end sections having dimensions other than above must be submitted for approval to the State Drainage Engineer.
- Connections between the flared end section and the pipe culvert may be any of the following types unless otherwise shown on the plans.
 - Joints meeting the requirements of Section 941-1.5 of the Standard Specifications (O-Ring Gasket). Flared end section joint dimensions and tolerances shall be identical or compatible to those used in the pipe culvert joint. When pipe culvert and flared end section manufacturers are different, the compatibility of joint designs shall be certified by the manufacturer of the flared end sections.
 - Joints sealed with preformed plastic gaskets. The gaskets shall meet the requirements of Section 942-2 of the Standard Specifications and the minimum sizes for gaskets shall be as that specified for equivalent sizes of elliptical pipe.
 - Reinforced concrete jackets, as detailed on this drawing. Cost of the reinforced concrete jacket to be included in the contract unit price for the flared end section. When non-coated corrugated metal pipe is called for in the plans, the pipe shall be bituminous coated in the jacketed area as specified on Index No. 280. Bituminous coating to be included in the contract unit price for the pipe culvert. Concrete jacket shall be as specified on index No. 280. Cost of concrete and reinforcement shall be included in the contract unit price for the pipe culvert.
- Toe walls shall be constructed when shown on the plans or at locations designated by the Engineer. Toe walls are to be cast-in-place with Class I Concrete and paid for under the contract unit price for Class I Concrete (Miscellaneous), CY. Reinforcing steel to be included in cost of toe wall.
- On skewed pipe culverts the flared end sections shall be placed in line with the pipe culvert. Side slopes shall be warped as required to fit the flared end sections.
- Flared End Section to be paid for under the contract unit price for Flared End Section (Concrete), Each. Sodding shall be in accordance with Index No. 281, and paid for under the contract unit price for Sodding, SY.

DESIGN NOTES

- Flared end sections are intended for use outside the clear zone on median drain and cross drain installation, except that flared end sections for pipe sizes 12" and 15" are permitted within the clear zone. When the slope intersection permits, 12" and 15" flared end sections may be located with the culvert opening as close as 8' beyond the outside edge of the shoulder. Flared end sections are not intended for side drain installations.
- Reinforced concrete jackets shall be used at all locations where high velocities and/or highly erosive soils may cause disjuncting. These locations are to be shown on the plans.
- Toe walls shall be used whenever the anticipated velocity of discharge and soil type are such that erosive action would occur. Toe walls are not required where ditch pavement is provided, except when disjuncting would occur if the ditch pavement should fail.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

FLARED END SECTION

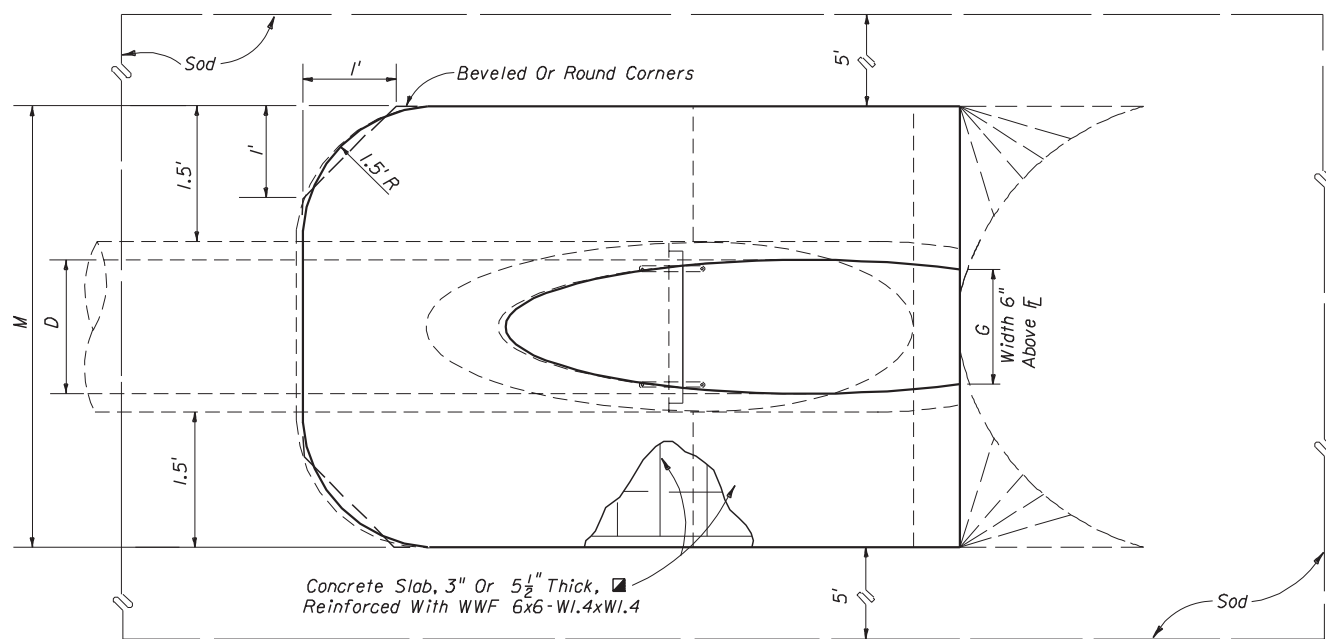
Names	Dates	Approved By
Designed By	EGR 09/77	<i>S. A. McHenry</i>
Drawn By	HKH 09/77	State Drainage Engineer
Checked By	JVG 09/77	Revision
		Sheet No.
		Index No.
	00	1 of 1
		270

DIMENSIONS AND QUANTITIES

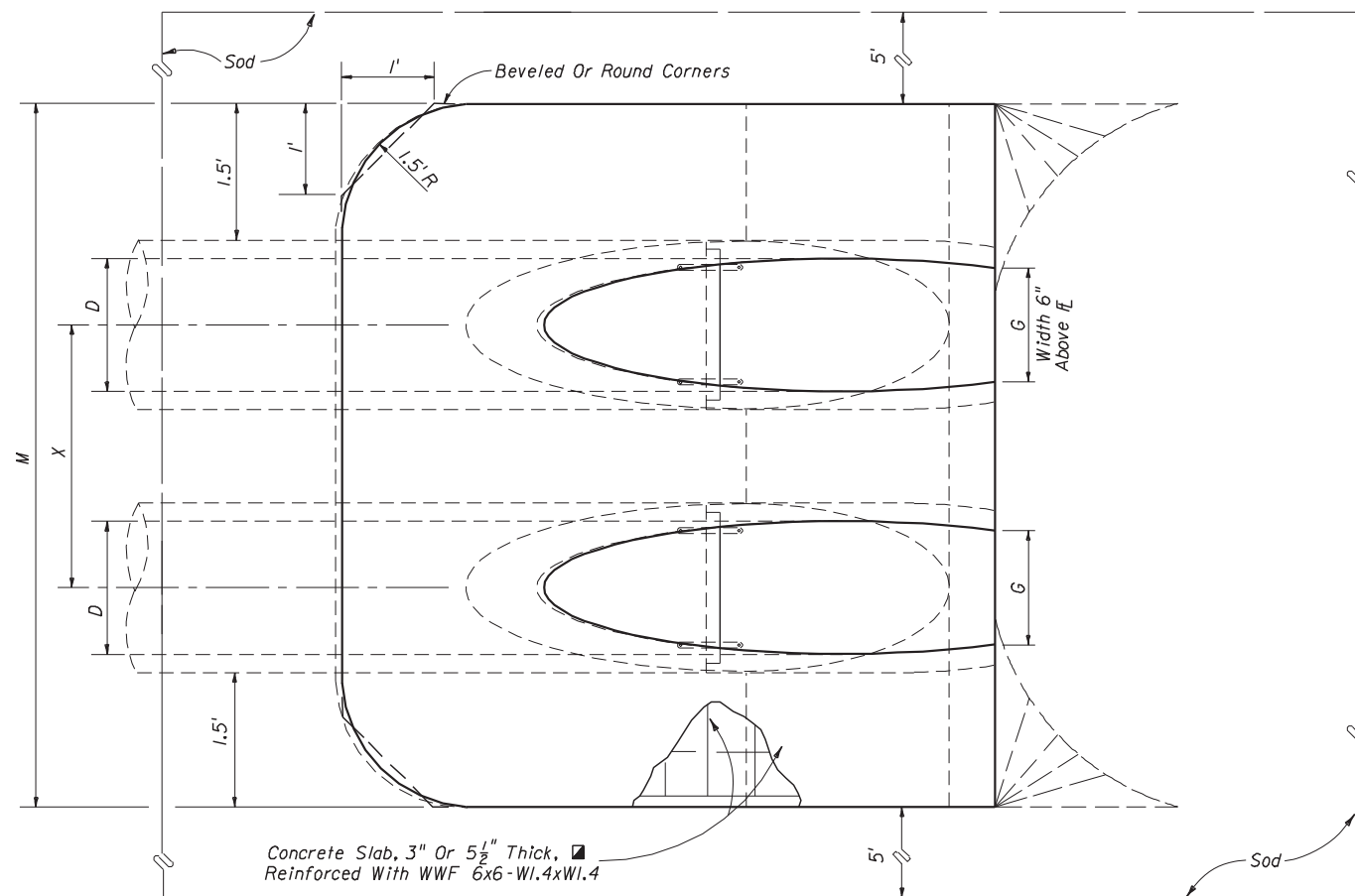
	D	X	A	B	C	E	F	G	M				N	5 1/2" CONCRETE SLAB (CY) ■				SODDING (SQ. YDS.)			
									Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	2'-7"	1.92'	2.18'	4.10'	2.06'	5'	1.22'	4.63'	7.21'	9.79'	12.37'	1.19'	0.38	0.58	0.77	0.96	21	24	27	30
	18"	2'-10"	1.97'	2.74'	4.71'	2.56'	6'	1.41'	4.92'	7.75'	10.58'	13.42'	1.21'	0.44	0.65	0.87	1.09	22	25	28	31
	24"	3'-5"	2.06'	3.85'	5.91'	3.56'	7'	1.73'	5.50'	8.92'	12.33'	15.75'	1.25'	0.54	0.83	1.12	1.42	24	28	32	35
	30"	4'-3"	2.15'	4.95'	7.10'	4.56'	8'	2.00'	6.08'	10.33'	14.58'	18.83'	1.29'	0.66	1.09	1.50	1.91	26	31	35	40
	36"	5'-1"	2.25'	6.08'	8.33'	5.56'	9'	2.24'	6.67'	11.75'	16.83'	21.92'	1.33'	0.81	1.38	1.95	2.51	28	34	39	45
	42"	6'-0"	2.34'	7.21'	9.55'	6.56'	10'	2.45'	7.25'	13.25'	19.25'	25.25'	1.38'	0.97	1.70	2.45	3.19	30	37	43	50
	48"	6'-9"	2.43'	8.33'	10.76'	7.56'	11'	2.65'	7.83'	14.58'	21.33'	28.08'	1.42'	1.13	2.04	2.93	3.84	32	39	47	54
	54"	7'-8"	2.52'	9.44'	11.96'	8.56'	12'	2.83'	8.42'	16.08'	23.75'	31.42'	1.46'	1.31	2.44	3.58	4.72	34	42	51	59
	60"	8'-6"	2.62'	10.56'	13.18'	9.56'	14'	3.00'	9.00'	17.50'	26.00'	34.50'	1.50'	1.51	2.89	4.28	5.68	36	45	55	64
	66"	9'-2"	2.71'	11.68'	14.39'	10.56'	15'	3.18'	9.58'	18.75'	27.92'	37.08'	1.54'	1.68	3.25	4.84	6.43	38	48	58	68
72"	10'-0"	2.80'	12.80'	15.60'	11.56'	16'	3.30'	10.16'	20.16'	30.16'	40.16'	1.58'	1.89	3.74	5.59	7.45	40	51	62	73	
1:4 Slope	15"	2'-7"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.63'	7.21'	9.79'	12.37'	1.19'	0.57	0.87	1.15	1.44	23	26	29	32
	18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.92'	7.75'	10.58'	13.42'	1.21'	0.66	0.99	1.31	1.65	25	28	31	35
	24"	3'-5"	2.53'	7.18' Δ	9.71'	7.03' Δ	11'	1.73'	5.50'	8.92'	12.33'	15.75'	1.25'	0.85	1.30	1.75	2.20	28	32	36	40
	30"	4'-3"	2.70'	9.25'	11.95'	9.03'	13'	2.00'	6.08'	10.33'	14.58'	18.83'	1.29'	1.10	1.74	2.39	3.05	31	36	41	46
	36"	5'-1"	2.87'	11.31' ◇	14.18'	11.03' ◇	15'	2.24'	6.67'	11.75'	16.83'	21.92'	1.33'	1.32	2.21	3.08	3.96	34	40	46	52
	42"	6'-0"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	7.25'	13.25'	19.25'	25.25'	1.38'	1.58	2.76	3.91	5.09	38	44	51	58
	48"	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	7.83'	14.58'	21.33'	28.08'	1.42'	1.85	3.30	4.73	6.17	41	48	56	63
	54"	7'-8"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	8.42'	16.08'	23.75'	31.42'	1.46'	2.14	3.95	5.77	7.58	44	52	61	69
	60"	8'-6"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	9.00'	17.50'	26.00'	34.50'	1.50'	2.45	4.66	6.87	9.07	47	56	66	75
	66"	9'-2"	3.73'	21.62'	25.35'	21.03'	25'	3.18'	9.58'	18.75'	27.92'	37.08'	1.54'	2.88	5.54	8.18	10.84	49	59	69	80
72"	10'-0"	3.91'	23.68'	27.59'	23.03'	27'	3.30'	10.16'	20.16'	30.16'	40.16'	1.58'	3.54	6.61	9.87	13.13	52	63	74	85	

■ See General Note No. 3.
See Sheet 5 Of 6 For 3" Slab Quantities

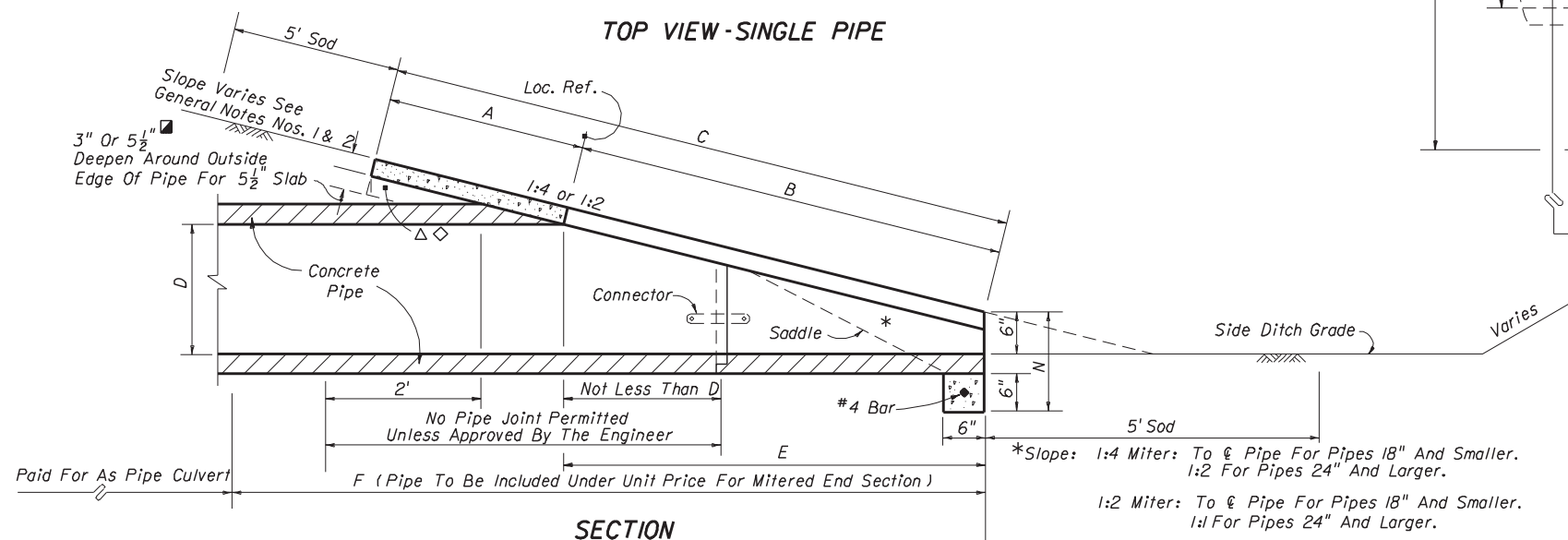
B **E**
 Δ 6.42' Δ 6.25' Dimensions permitted to allow use of 8' standard pipe lengths.
 ◇ 10.40' ◇ 10.10' Dimensions permitted to allow use of 12' standard pipe lengths.
 Δ ◇ Concrete slab shall be deepened to form bridge across crown of pipe. See section below.



TOP VIEW - SINGLE PIPE



TOP VIEW - MULTIPLE PIPE



SECTION

NOTE: See sheet 6 for details and notes.

*Slope: 1:4 Miter: To & Pipe For Pipes 18" And Smaller.
1:2 For Pipes 24" And Larger.
1:2 Miter: To & Pipe For Pipes 18" And Smaller.
1:1 For Pipes 24" And Larger.

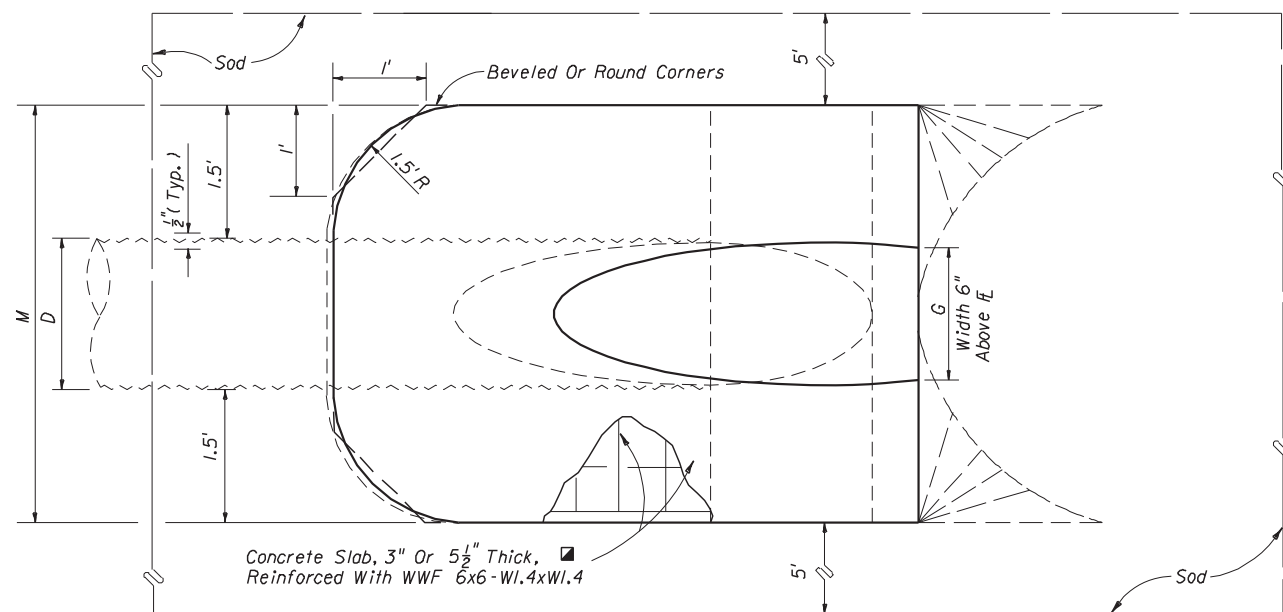
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**CROSS DRAIN
MITERED END SECTION
SINGLE AND MULTIPLE ROUND CONCRETE PIPE**

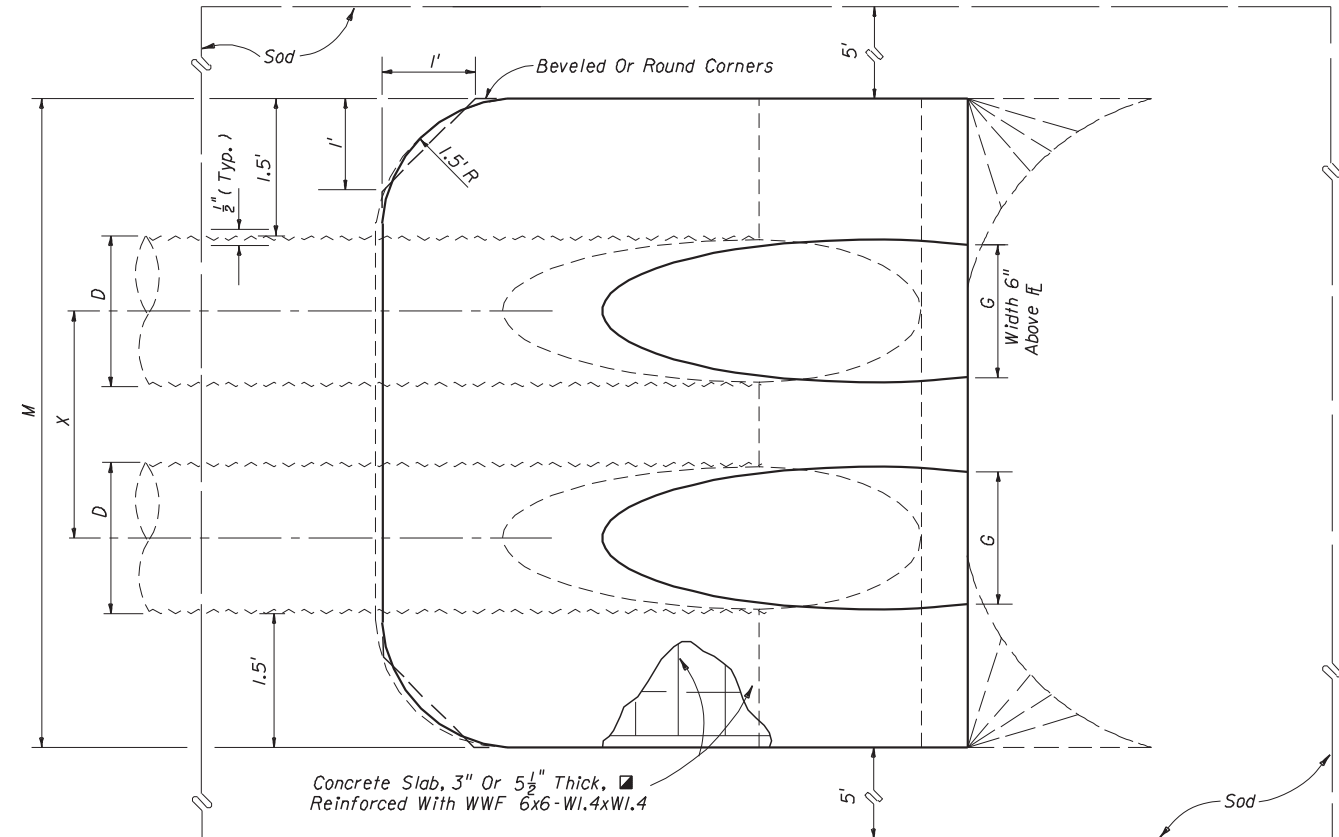
Names	Dates	Approved By		
Designed By	DCB 06/78	S. A. McHenry State Drainage Engineer	Revision	Sheet No.
Drawn By			00	1 of 6
Checked By	KNM 06/78		Index No.	272

		DIMENSIONS AND QUANTITIES																			
	D	X	A	B	C	E	F	G	M				N	5 1/2" CONCRETE SLAB (CY) ■				SODDING (SQ. YDS.)			
									Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	2'-7"	2.5'	1.68'	4.18'	1.50'	5'	1.23'	4.33'	6.92'	9.50'	12.08'	1.04'	0.35	0.54	0.74	0.94	21	24	27	29
	18"	2'-10"	2.5'	2.24'	4.74'	2.00'	6'	1.41'	4.58'	7.42'	10.25'	13.08'	1.04'	0.38	0.62	0.87	1.12	22	25	28	31
	24"	3'-5"	2.5'	3.35'	5.85'	3.00'	7'	1.73'	5.08'	8.50'	11.92'	15.33'	1.04'	0.47	0.76	1.05	1.34	23	27	31	35
	30"	4'-3"	2.5'	4.47'	6.97'	4.00'	8'	2.00'	5.58'	9.83'	14.08'	18.33'	1.04'	0.57	0.96	1.37	1.77	25	30	35	39
	36"	5'-1"	2.5'	5.59'	8.09'	5.00'	9'	2.24'	6.08'	11.17'	16.25'	21.33'	1.04'	0.67	1.19	1.72	2.26	27	33	38	44
	42"	6'-0"	2.5'	6.71'	9.21'	6.00'	10'	2.45'	6.58'	12.58'	18.58'	24.58'	1.04'	0.78	1.48	2.17	2.87	29	36	42	49
	48"	6'-9"	2.5'	7.83'	10.33'	7.00'	11'	2.65'	7.08'	13.83'	20.58'	27.33'	1.04'	0.89	1.71	2.54	3.36	31	38	46	53
	54"	7'-8"	2.5'	8.94'	11.44'	8.00'	12'	2.83'	7.58'	15.25'	22.92'	30.58'	1.04'	1.02	2.06	3.10	4.14	33	41	50	58
60"	8'-6"	2.5'	10.06'	12.56'	9.00'	13'	3.00'	8.08'	16.58'	25.08'	33.58'	1.04'	1.14	2.38	3.63	4.89	34	44	53	63	
4:1 Slope	15"	2'-7"	2.5'	3.09'	5.59'	3.0'	7.0'	1.23'	4.33'	6.92'	9.50'	12.08'	1.04'	0.44	0.68	0.91	1.15	22	25	28	31
	18"	2'-10"	2.5'	4.12'	6.62'	4.0'	8.0'	1.41'	4.58'	7.42'	10.25'	13.08'	1.04'	0.49	0.77	1.03	1.31	24	27	30	33
	24"	3'-5"	2.5'	6.18'	8.68'	6.0'	10.0'	1.73'	5.08'	8.50'	11.92'	15.33'	1.04'	0.65	1.09	1.38	1.77	27	30	34	38
	30"	4'-3"	2.5'	8.25'	10.75'	8.0'	12.0'	2.00'	5.58'	9.83'	14.08'	18.33'	1.04'	0.81	1.34	1.90	2.44	29	34	39	44
	36"	5'-1"	2.5'	10.31'	12.81'	10.0'	14.0'	2.24'	6.08'	11.17'	16.25'	21.33'	1.04'	0.97	1.68	2.41	3.14	32	38	44	49
	42"	6'-0"	2.5'	12.37'	14.87'	12.0'	16.0'	2.45'	6.58'	12.58'	18.58'	24.58'	1.04'	1.13	2.08	3.06	4.02	35	42	48	55
	48"	6'-9"	2.5'	14.43'	16.93'	14.0'	18.0'	2.65'	7.08'	13.83'	20.58'	27.33'	1.04'	1.29	2.49	3.69	4.88	38	46	53	60
	54"	7'-8"	2.5'	16.49'	18.99'	16.0'	20.0'	2.83'	7.58'	15.25'	22.92'	30.58'	1.04'	1.48	2.98	4.47	5.98	41	49	58	66
60"	8'-6"	2.5'	18.55'	21.05'	18.0'	22.0'	3.00'	8.08'	16.58'	25.08'	33.58'	1.04'	1.66	3.49	5.31	7.13	44	53	63	72	

■ See General Note No. 3.
See Sheet 5 Of 6 For 3" Slab Quantities

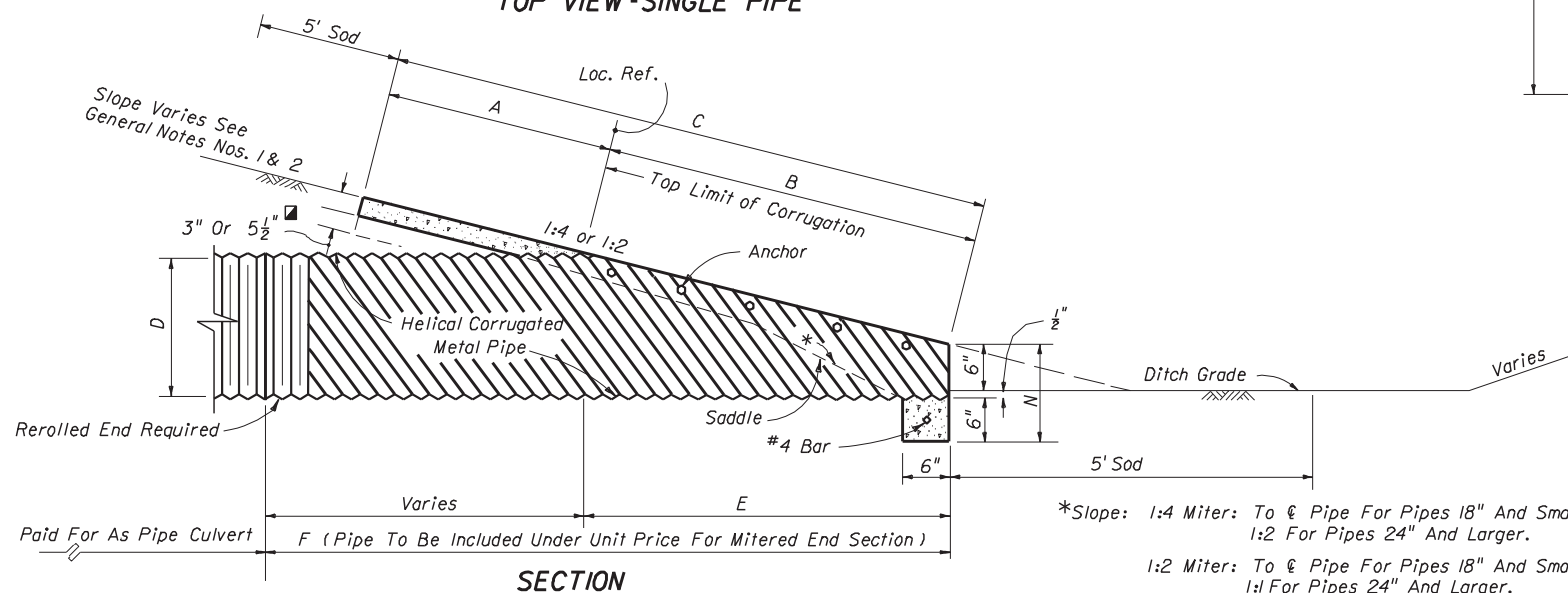


TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE

NOTE: See Sheet 6 For Details And Notes.

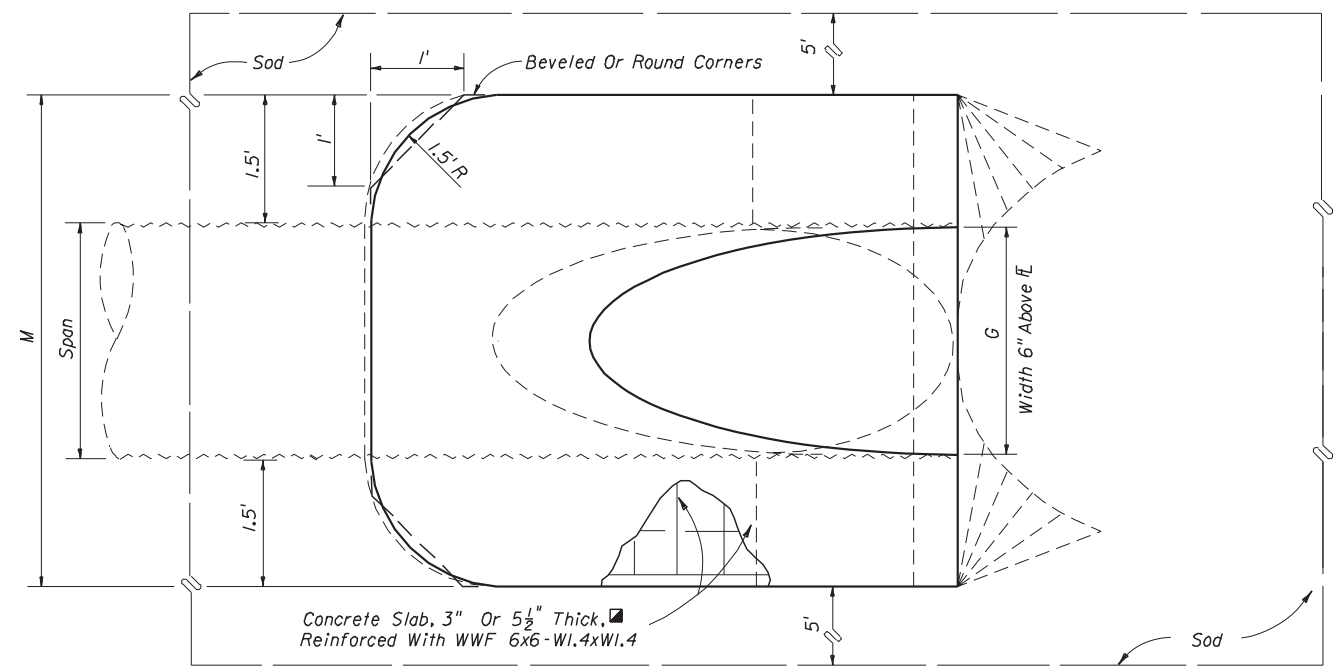


SECTION

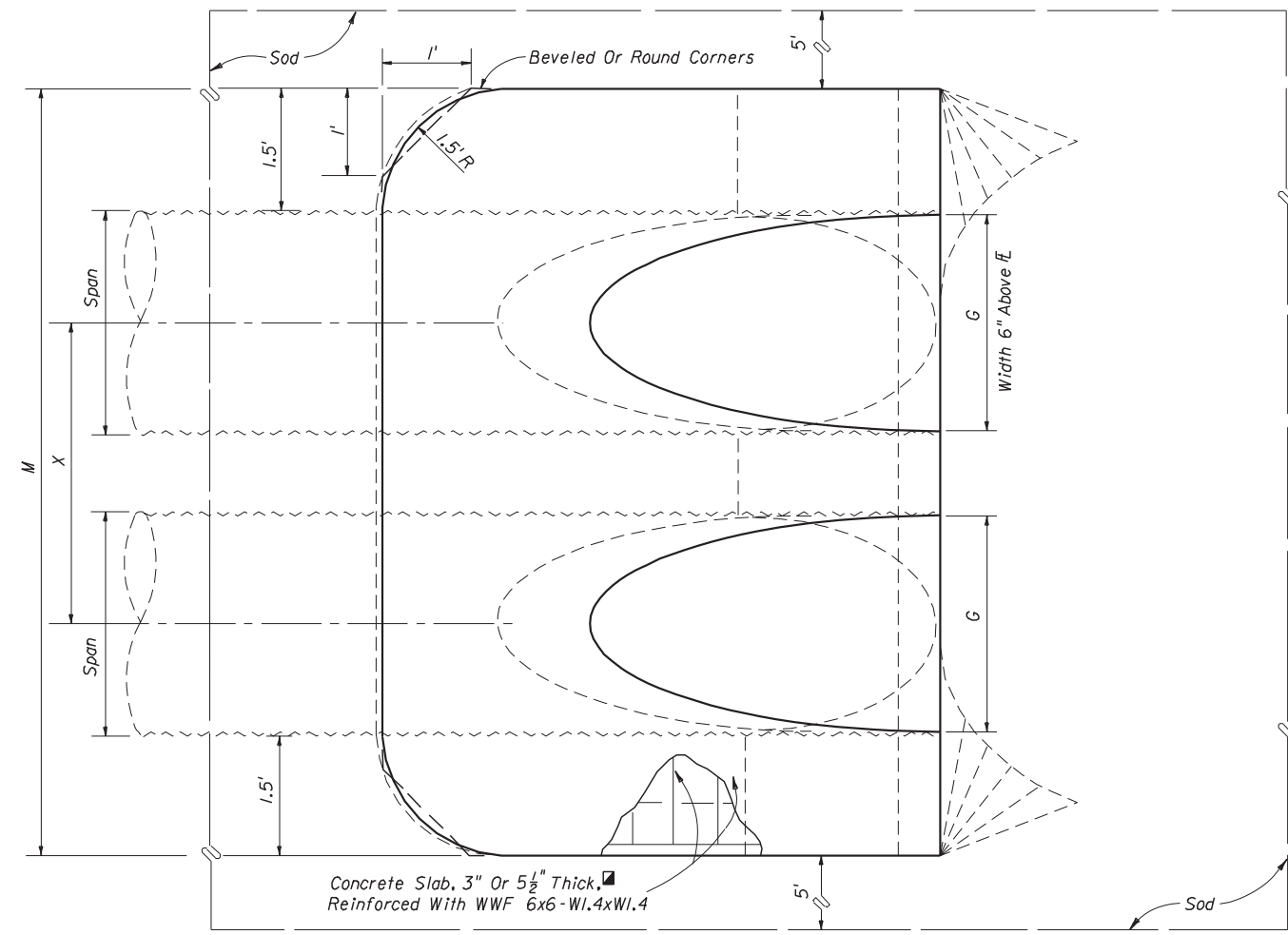
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CROSS DRAIN MITERED END SECTION				
SINGLE AND MULTIPLE ROUND CORRUGATED METAL PIPE				
Names	Dates	Approved By		
Designed By	DCB 06/78	<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	KNM 06/78	00	2 of 6	272

1974 AASHTO		DIMENSIONS AND QUANTITIES																				
SPAN	RISE	X	A	B	C	E	F	G	M				N	5 1/2" CONCRETE SLAB (CY) ■				SODDING (SQ. YDS.)				
									Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	
1:2 Slope	17"	13"	2'-6"	2.5'	1.30'	3.80'	1.17'	4'	1.39'	4.50'	7.00'	9.50'	12.00'	1.04'	0.41	0.61	0.81	1.02	21	23	26	29
	21"	15"	2'-10"	2.5'	1.68'	4.17'	1.50'	5'	1.76'	4.83'	7.67'	10.50'	13.33'	1.04'	0.43	0.66	0.88	1.10	22	25	28	31
	28"	20"	3'-5"	2.5'	2.61'	5.11'	2.33'	6'	2.22'	5.42'	8.83'	12.25'	15.67'	1.04'	0.51	0.78	1.06	1.33	23	27	30	34
	35"	24"	4'-0"	2.5'	3.35'	5.85'	3.00'	7'	2.55'	6.00'	10.00'	14.00'	18.00'	1.04'	0.57	0.90	1.22	1.55	24	29	33	38
	42"	29"	4'-9"	2.5'	4.29'	6.79'	3.83'	8'	2.97'	6.58'	11.33'	16.08'	20.83'	1.04'	0.64	1.04	1.46	1.87	26	31	37	42
	49"	33"	5'-6"	2.5'	5.03'	7.53'	4.50'	9'	3.34'	7.17'	12.67'	18.17'	23.67'	1.04'	0.73	1.23	1.72	2.22	28	34	40	46
	57"	38"	6'-4"	2.5'	5.96'	8.46'	5.33'	10'	3.65'	7.83'	14.17'	20.50'	26.83'	1.04'	0.83	1.44	2.04	2.64	29	36	44	51
	71"	47"	7'-10"	2.5'	6.89'	9.39'	6.17'	11'	3.89'	8.42'	15.50'	22.58'	29.67'	1.04'	0.95	1.67	2.39	3.11	31	39	47	55
1:4 Slope	17"	13"	2'-6"	2.5'	2.41'	4.91'	2.33'	7'	1.39'	4.50'	7.00'	9.50'	12.00'	1.04'	0.48	0.71	0.95	1.18	22	25	27	30
	21"	15"	2'-10"	2.5'	3.09'	5.59'	3.00'	8'	1.76	4.83'	7.67'	10.50'	13.33'	1.04'	0.52	0.80	1.09	1.31	23	26	29	32
	28"	20"	3'-5"	2.5'	4.81'	7.31'	4.67'	9'	2.22'	5.42'	8.83'	12.25'	15.67'	1.04'	0.61	0.92	1.27	1.59	25	29	33	37
	35"	24"	4'-0"	2.5'	6.18'	8.68'	6.00'	11'	2.55'	6.00'	10.00'	14.00'	18.00'	1.04'	0.73	1.14	1.55	1.97	28	32	37	41
	42"	29"	4'-9"	2.5'	7.90'	10.40'	7.67'	12'	2.97'	6.58'	11.33'	16.08'	20.83'	1.04'	0.87	1.39	1.92	2.45	30	35	41	46
	49"	33"	5'-6"	2.5'	9.28'	11.78'	9.00'	14'	3.34'	7.17'	12.67'	18.17'	23.67'	1.04'	1.00	1.66	2.30	2.96	32	38	45	51
	57"	38"	6'-4"	2.5'	11.00'	13.50'	10.67'	16'	3.65'	7.83'	14.17'	20.50'	26.83'	1.04'	1.18	2.00	2.82	3.64	35	42	49	56
	71"	47"	7'-10"	2.5'	12.71'	15.21'	12.33'	17'	3.89'	8.42'	15.50'	22.58'	29.67'	1.04'	1.36	2.39	3.38	4.38	38	45	53	61

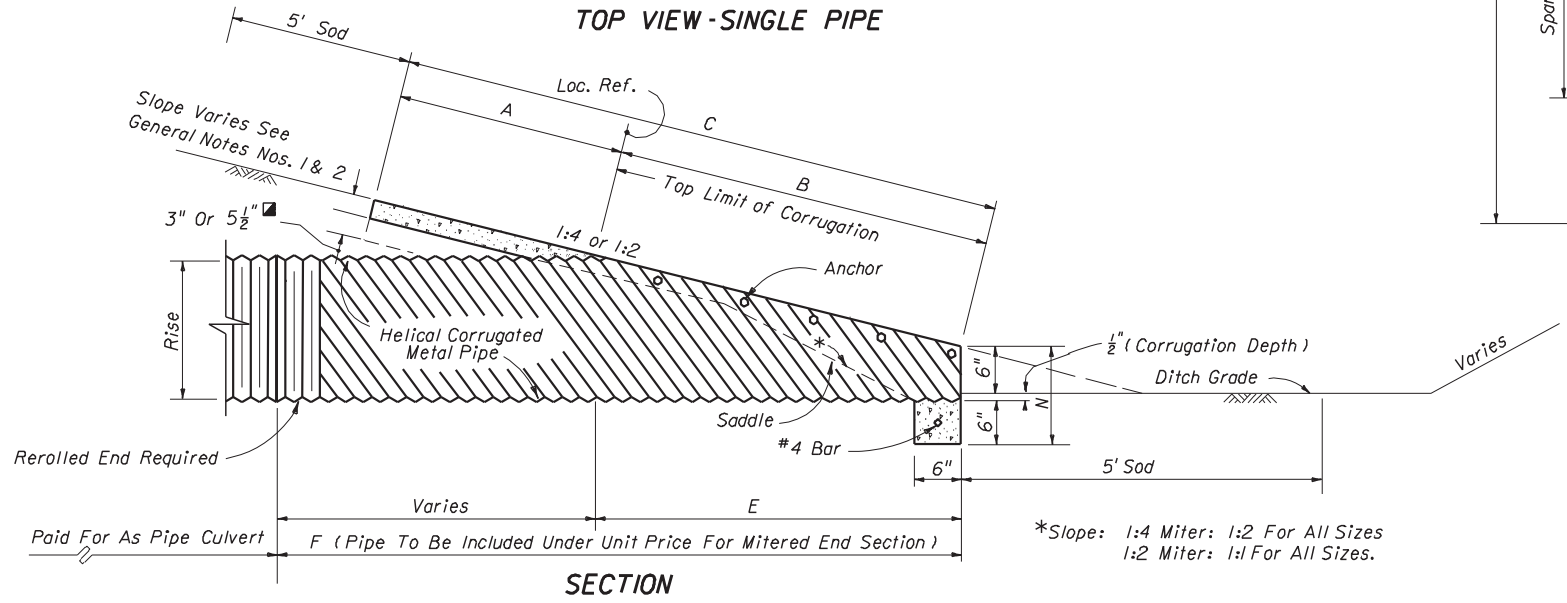
■ See General Note No. 3.
See Sheet 5 Of 6 For 3" Slab Quantities



TOP VIEW - SINGLE PIPE



TOP VIEW - MULTIPLE PIPE



SECTION

NOTE: See Sheet 6 For Details And Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

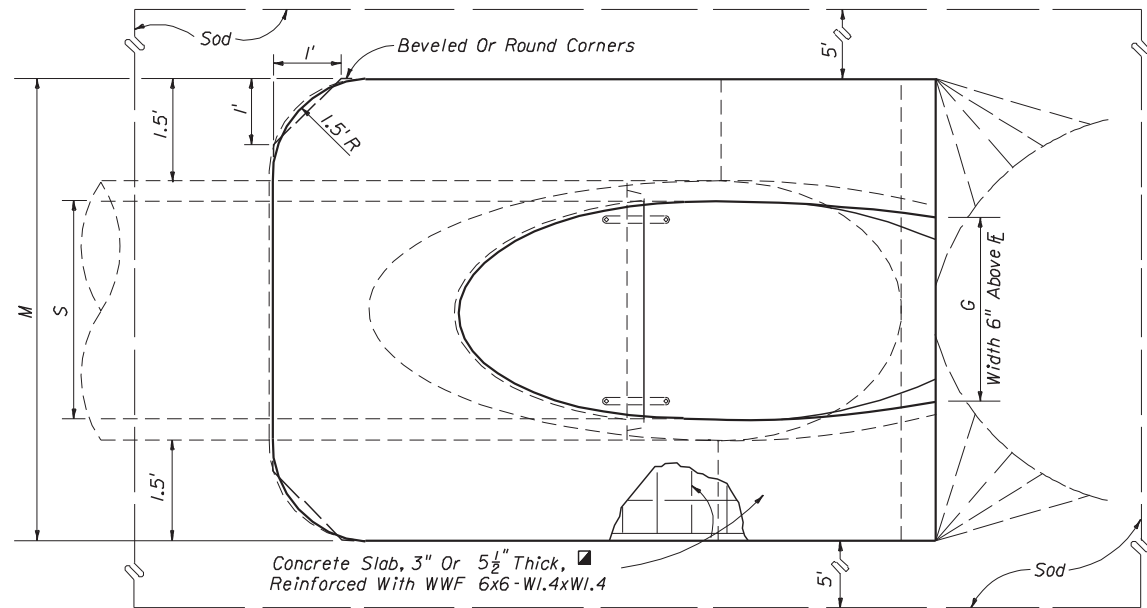
CROSS DRAIN MITERED END SECTION

SINGLE AND MULTIPLE CORRUGATED METAL PIPE - ARCH

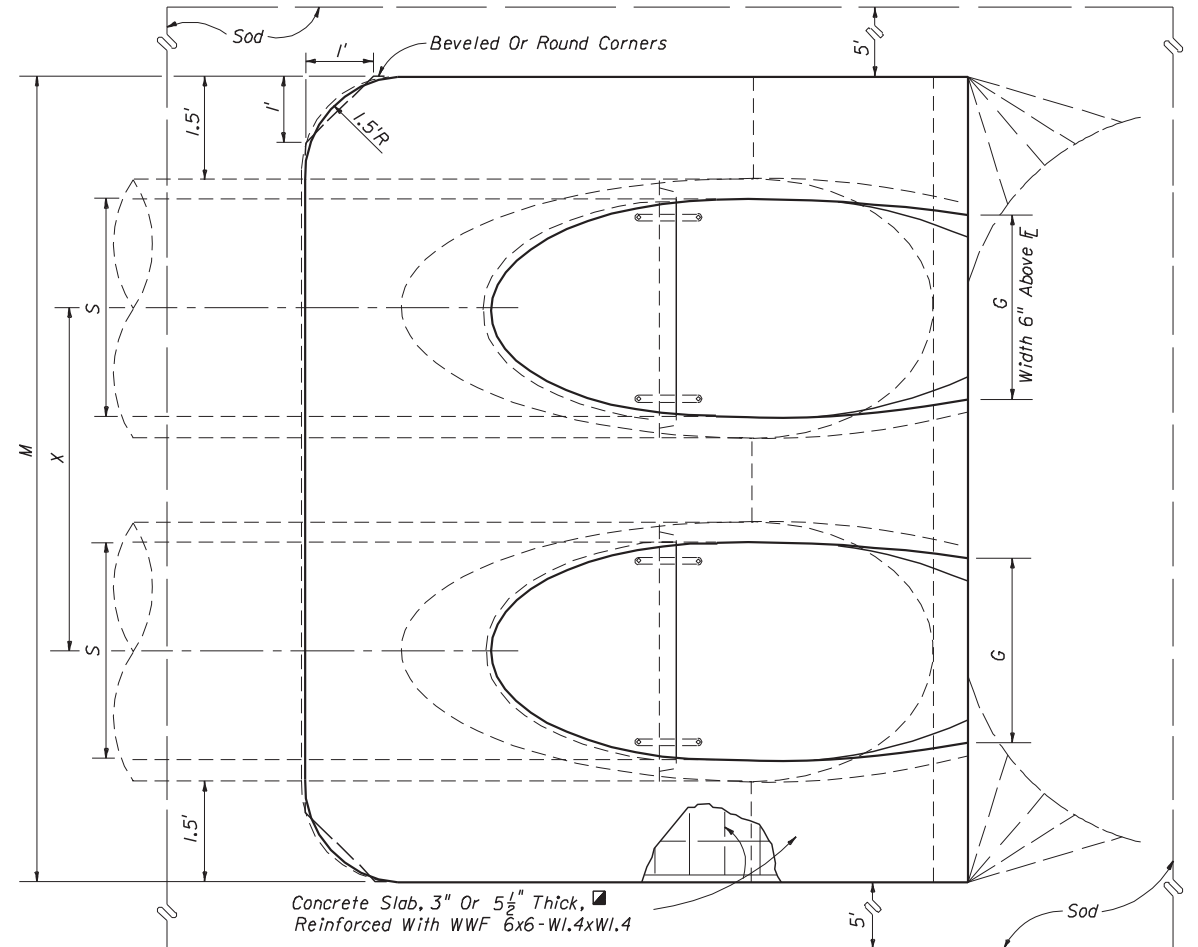
Names	Dates	Approved By	
Designed By	DCB 06/78	S. A. McHenry State Drainage Engineer	
Drawn By	KNM 06/78	Revision	Sheet No.
Checked By		00	3 of 6
		Index No.	
		272	

DIMENSIONS & QUANTITIES																						
	Rise R	Span S	X	A	B	C	E	F	G	M				N	5 1/2" CONC. SLAB (CY) ■				SODDING (SQ. YDS.)			
										Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	12"	18"	2'-10"	1.97'	1.62'	3.59'	1.56'	4'	1.50'	4.92'	7.75'	10.58'	13.42'	1.21'	0.30	0.49	0.67	0.85	21	24	27	30
	14"	23"	3'-4"	2.01'	1.99'	4.00'	1.89'	5'	1.90'	5.38'	8.71'	12.04'	15.38'	1.23'	0.37	0.59	0.81	1.02	22	26	29	33
	19"	30"	4'-0"	2.11'	2.92'	5.03'	2.73'	6'	2.37'	6.04'	10.04'	14.04'	18.04'	1.27'	0.50	0.80	1.09	1.39	24	28	33	37
	24"	36"	5'-0"	2.20'	3.85'	6.05'	3.56'	7'	2.85'	6.79'	11.79'	16.79'	21.79'	1.31'	0.62	1.03	1.45	1.86	26	31	37	42
	29"	45"	5'-11"	2.34'	4.79'	7.13'	4.39'	8'	3.19'	7.50'	13.42'	19.33'	25.25'	1.38'	0.75	1.30	1.84	2.39	28	34	41	47
	34"	53"	7'-0"	2.43'	5.72'	8.15'	5.23'	9'	3.57'	8.25'	15.25'	22.25'	29.25'	1.42'	0.90	1.61	2.32	3.03	30	37	45	53
	38"	60"	7'-10"	2.52'	6.46'	8.98'	5.89'	9'	3.95'	8.92'	16.75'	24.58'	32.42'	1.46'	1.03	1.89	2.74	3.60	31	40	49	57
	43"	68"	8'-11"	2.62'	7.39'	10.01'	6.73'	10'	4.28'	9.67'	18.58'	27.50'	36.42'	1.50'	1.19	2.26	3.33	4.40	33	43	53	63
	48"	76"	9'-11"	2.71'	8.33'	11.04'	7.56'	11'	4.59'	10.42'	20.33'	30.25'	40.17'	1.54'	1.38	2.65	3.93	5.21	35	46	57	68
	53"	83"	10'-8"	2.80'	9.26'	12.06'	8.39'	12'	4.77'	11.08'	21.75'	32.42'	43.08'	1.58'	1.55	3.03	4.50	5.96	37	49	61	73
58"	91"	11'-8"	2.90'	10.19'	13.09'	9.23'	13'	5.01'	11.83'	23.50'	35.17'	46.83'	1.63'	1.75	3.47	5.20	6.93	39	52	65	78	
1:4 Slope	12"	18"	2'-10"	2.36'	3.06'	5.42'	3.03'	5'	1.50'	4.92'	7.75'	10.58'	13.42'	1.21'	0.45	0.68	0.92	1.14	23	26	29	32
	14"	23"	3'-4"	2.44'	3.75'	6.19'	3.70'	6'	1.90'	5.38'	8.71'	12.04'	15.38'	1.23'	0.53	0.83	1.13	1.42	24	28	32	35
	19"	30"	4'-0"	2.62'	5.47'	8.09'	5.36'	8'	2.37'	6.04'	10.04'	14.04'	18.04'	1.27'	0.74	1.15	1.57	1.98	27	32	36	40
	24"	36"	5'-0"	2.79'	7.18'	9.97'	7.03'	10'	2.85'	6.79'	11.79'	16.79'	21.79'	1.31'	0.97	1.57	2.19	2.81	30	36	41	47
	29"	45"	5'-11"	3.05'	8.90'	11.95'	8.70'	12'	3.19'	7.50'	13.42'	19.33'	25.25'	1.38'	1.22	2.07	2.92	3.77	33	40	46	53
	34"	53"	7'-0"	3.22'	10.62'	13.84'	10.36'	13'	3.57'	8.25'	15.25'	22.25'	29.25'	1.42'	1.48	2.62	3.77	4.92	36	44	52	59
	38"	60"	7'-10"	3.39'	11.99'	15.38'	11.70'	15'	3.95'	8.92'	16.75'	24.58'	32.42'	1.46'	1.72	3.12	4.53	5.92	38	47	56	65
	43"	68"	8'-11"	3.56'	13.71'	17.27'	13.36'	17'	4.28'	9.67'	18.58'	27.50'	36.42'	1.50'	2.02	3.78	5.56	7.32	41	51	61	71
	48"	76"	9'-11"	3.73'	15.43'	19.16'	15.03'	19'	4.59'	10.42'	20.33'	30.25'	40.17'	1.54'	2.34	4.49	6.64	8.79	44	55	66	77
	53"	83"	10'-8"	3.91'	17.15'	21.06'	16.70'	20'	4.77'	11.08'	21.75'	32.42'	43.08'	1.58'	2.66	5.17	7.66	10.16	47	59	71	83
58"	91"	11'-8"	4.08'	18.87'	22.95'	18.36'	22'	5.01'	11.83'	23.50'	35.17'	46.83'	1.63'	3.02	5.98	8.95	11.90	50	63	76	89	

■ See General Note No. 3.
See Sheet 5 of 6 For 3" Slab Quantities

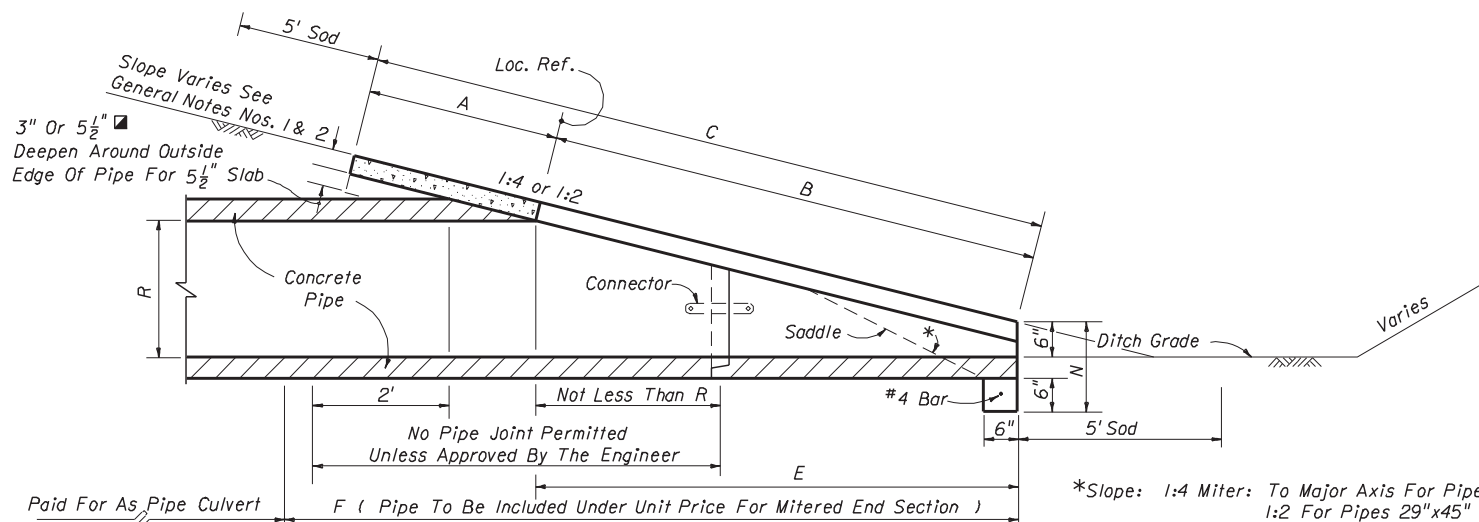


TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE

NOTE: See Sheet 6 For Details And Notes.



SECTION

*Slope: 1:4 Miter: To Major Axis For Pipes 24"x38" And Smaller.
1:2 For Pipes 29"x45" And Larger.

1:1 Miter: To Major Axis For Pipes 29"x45" And Smaller.
1:1 For Pipes 34"x53" And Larger.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**CROSS DRAIN
MITERED END SECTION**
SINGLE AND MULTIPLE ELLIPTICAL CONCRETE PIPE

Names	Dates	Approved By	
Designed By	EGR 06/81	S. A. Mchenry State Drainage Engineer	
Drawn By	HSD 06/81	Revision	Sheet No.
Checked By	JVG/JBW 06/81	00	4 of 6
			Index No. 272


QUANTITIES FOR 3" THICK CONCRETE SLABS (CY)

	D	ROUND - CONCRETE			
		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	0.27	0.41	0.54	0.67
	18"	0.31	0.45	0.60	0.75
	24"	0.39	0.59	0.79	1.00
	30"	0.46	0.76	1.04	1.32
	36"	0.55	0.94	1.33	1.71
	42"	0.66	1.15	1.66	2.15
	48"	0.76	1.37	1.96	2.57
	54"	0.87	1.62	2.38	3.14
	60"	0.99	1.90	2.81	3.73
	66"	1.11	2.15	3.21	4.27
72"	1.24	2.46	3.68	4.90	
1:4 Slope	15"	0.40	0.61	0.80	1.00
	18"	0.47	0.69	0.91	1.14
	24"	0.60	0.90	1.21	1.52
	30"	0.76	1.19	1.63	2.07
	36"	0.89	1.48	2.05	2.63
	42"	1.05	1.82	2.57	3.34
	48"	1.21	2.15	3.07	4.00
	54"	1.39	2.55	3.72	4.88
	60"	1.59	3.02	4.44	5.86
	66"	1.91	3.66	5.40	7.15
72"	2.12	4.18	6.24	8.30	

	D	ROUND - CMP			
		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	0.24	0.37	0.51	0.64
	18"	0.26	0.43	0.61	0.78
	24"	0.32	0.52	0.72	0.91
	30"	0.38	0.64	0.91	1.18
	36"	0.44	0.78	1.13	1.48
	42"	0.51	0.96	1.41	1.87
	48"	0.57	1.09	1.63	2.15
	54"	0.65	1.32	1.99	2.66
	60"	0.71	1.49	2.28	3.07
	72"				
1:4 Slope	15"	0.31	0.47	0.63	0.79
	18"	0.34	0.53	0.71	0.90
	24"	0.44	0.69	0.92	1.18
	30"	0.53	0.88	1.25	1.60
	36"	0.62	1.07	1.53	2.00
	42"	0.71	1.30	1.92	2.52
	48"	0.80	1.54	2.29	3.02
	54"	0.91	1.83	2.74	3.67
	60"	1.02	2.15	3.27	4.39
	72"				

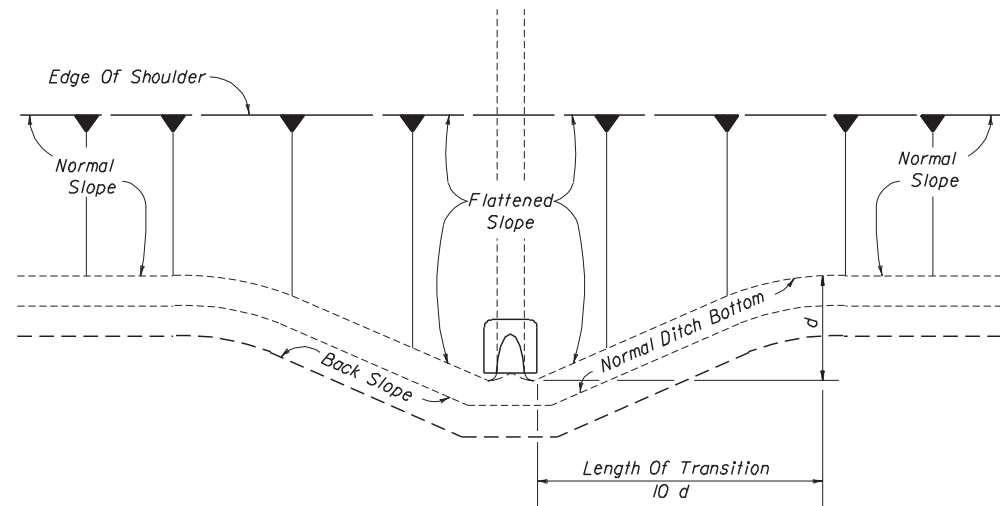
	Span	Rise	CMP - ARCH			
			Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	17"	13"	0.33	0.49	0.65	0.81
	21"	15"	0.33	0.50	0.67	0.83
	28"	20"	0.37	0.56	0.76	0.95
	35"	24"	0.40	0.62	0.84	1.07
	42"	29"	0.43	0.70	0.98	1.25
	49"	33"	0.49	0.82	1.15	1.48
	57"	38"	0.55	0.95	1.35	1.75
	64"	43"	0.62	1.10	1.57	2.05
	71"	47"	0.69	1.24	1.80	2.35
	72"					
1:4 Slope	17"	13"	0.38	0.56	0.74	0.92
	21"	15"	0.39	0.59	0.80	0.95
	28"	20"	0.43	0.64	0.88	1.10
	35"	24"	0.49	0.77	1.05	1.33
	42"	29"	0.57	0.92	1.27	1.62
	49"	33"	0.65	1.08	1.50	1.93
	57"	38"	0.76	1.30	1.83	2.37
	64"	43"	0.87	1.55	2.18	2.83
	71"	47"	0.95	1.68	2.43	3.17
	72"					

	Rise	Span	ELLIPTICAL - CONCRETE			
			Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	12"	18"	0.19	0.33	0.45	0.57
	14"	23"	0.25	0.40	0.55	0.69
	19"	30"	0.34	0.55	0.75	0.95
	24"	38"	0.43	0.71	1.00	1.28
	29"	45"	0.52	0.90	1.27	1.65
	34"	53"	0.62	1.11	1.60	2.09
	38"	60"	0.70	1.29	1.87	2.46
	43"	68"	0.81	1.54	2.26	2.99
	48"	76"	0.93	1.79	2.66	3.53
	53"	83"	1.04	2.04	3.03	4.02
58"	91"	1.17	2.33	3.49	4.66	
1:4 Slope	12"	18"	0.30	0.45	0.61	0.76
	14"	23"	0.36	0.56	0.76	0.95
	19"	30"	0.51	0.79	1.08	1.36
	24"	38"	0.68	1.10	1.53	1.96
	29"	45"	0.86	1.45	2.04	2.63
	34"	53"	1.02	1.81	2.60	3.39
	38"	60"	1.18	2.14	3.10	4.05
	43"	68"	1.38	2.58	3.79	4.99
	48"	76"	1.59	3.05	4.51	5.97
	53"	83"	1.80	3.50	5.19	6.88
58"	91"	2.04	4.04	6.05	8.05	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
CROSS DRAIN MITERED END SECTION					
Names	Dates	Approved By			
Designed By		 State Drainage Engineer			
Drawn By	dts	05/86	Revision	Sheet No.	Index No.
Checked By	JBW	05/86	00	5 of 6	272

GENERAL NOTES

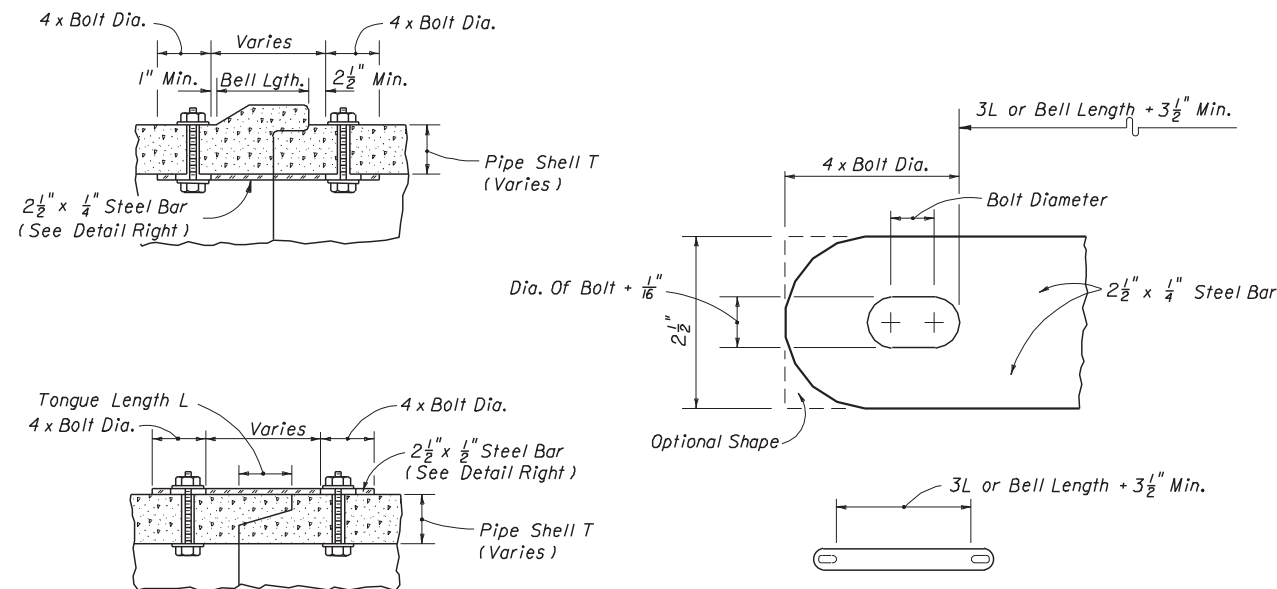
- Mitered end sections for pipe sizes 15", 18" and 24" round or equivalent pipe arch or elliptical pipe are permitted within the clear zone. When the slope intersection permits, the mitered end section may be located with the culvert opening as close as 8' beyond the outside edge of the shoulder.
- Slope and ditch transitions shall be used when the normal roadway slope must be flattened to place end section outside clear zone. See detail left.
- The reinforced concrete slab shall be constructed for all sizes of cross drain pipe and cast in place with Class I concrete. Slabs shall be 5½" thick unless 3" thickness called for in plans.
- Concrete pipe used in the assembly of mitered end sections shall be selective lengths to avoid excessive connections.
- Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered end section shall be repaired.
- That portion of corrugated metal pipe in direct contact with the concrete slab shall be bituminous coated prior to placing of the concrete.
- Unless otherwise designated in the plans, concrete pipe mitered end sections may be used with any type of cross drain pipe; corrugated steel pipe mitered end sections may be used with any type of cross drain pipe except aluminum pipe; and, corrugated aluminum mitered end sections may be used with any type of cross drain pipe except steel pipe. When bituminous coated metal pipe is specified for cross drain pipe, mitered end sections shall be constructed with like pipe or concrete pipe.
- When the mitered end section pipe is dissimilar to the cross drain pipe, a concrete jacket shall be constructed in accordance with Standard Index 280.
- When existing multiple cross drain pipes are spaced other than the dimensions shown in this detail, or have non-parallel axes, or have non-uniform sections, the mitered end sections will be constructed either separately as single pipe mitered end sections or collectively as multiple pipe end sections as directed by the Engineer; however, mitered end sections will be paid for each based on each independent pipe end.
- The cost of all pipe(s), fasteners, reinforcing, connectors, anchors, concrete, sealants, jackets, and coupling bands shall be included in the cost for the mitered end section. Sodding shall be paid for separately under the contract unit price of Sodding, SY.
- Mitered end sections shall be paid for under the contract unit price for Mitered End Section (CD), Each, based on each independent pipe end.



PLAN

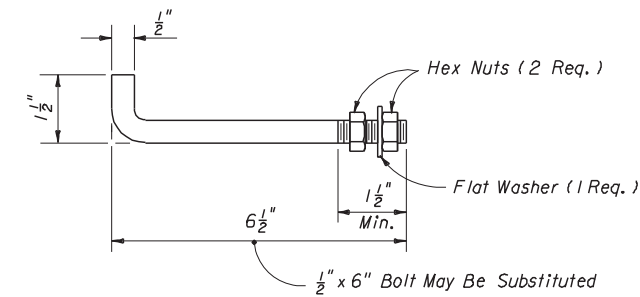
NOTE: See General Note 2

SLOPE AND DITCH TRANSITIONS



All bars, bolts, nuts and washers are to be galvanized steel.
Bolts diameters shall be 3/8" for 15" to 36" pipe and 5/8" for 42" to 72" pipe.
Two connectors required per joint, located 60° right and left of bottom center of pipe.
Bolt holes in pipe shell are to be drilled.

CONCRETE PIPE CONNECTOR



Anchors required for CMP only.

Anchor, washer and nuts to be galvanized steel.

Bend anchor where required to center in concrete slab. Damaged surfaces to be repaired after bending. Anchors are to be spaced a distance equal to four (4) corrugations. Place the anchors in the outside crest of corrugation.

Flat washers to be placed on inside wall of pipe.

Holes in the mitered end pipe are to be drilled or punched; burning not permitted.

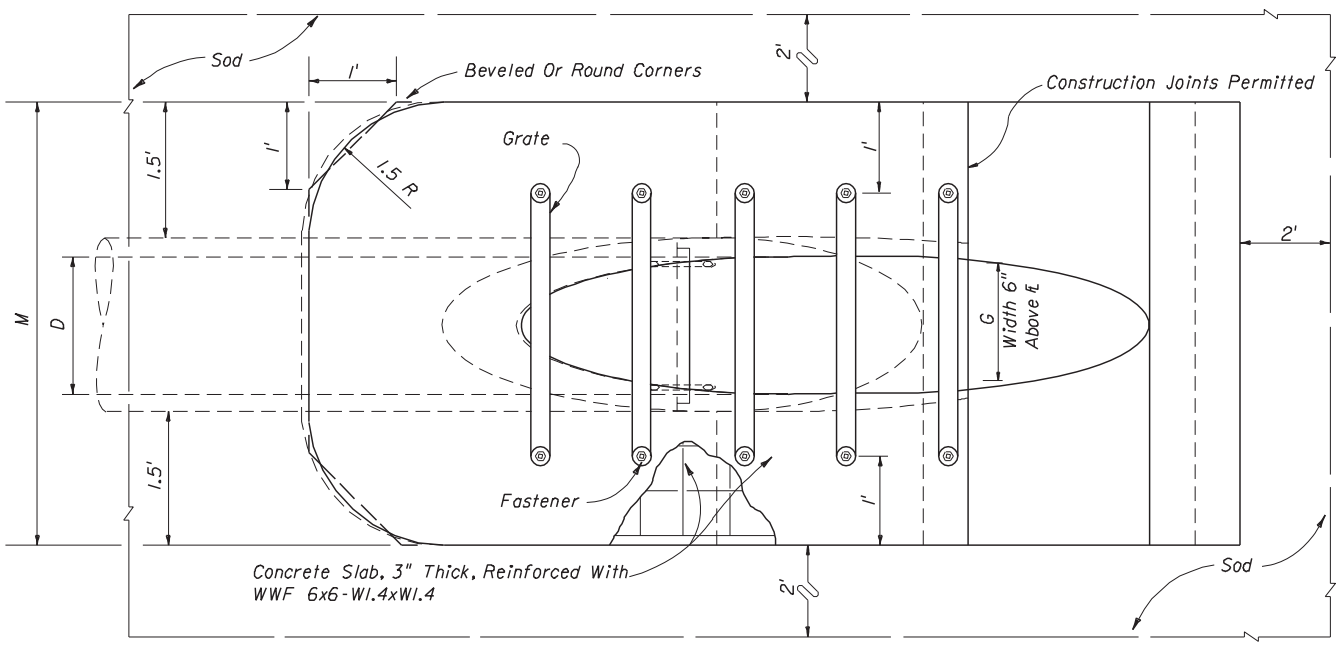
ANCHOR DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CROSS DRAIN MITERED END SECTION				
SPECIAL DETAILS AND NOTES				
Names	Dates	Approved By		
Designed By	DCB	06/78	S. A. McHenry State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By	KNM	06/78	00	6 of 6
				272

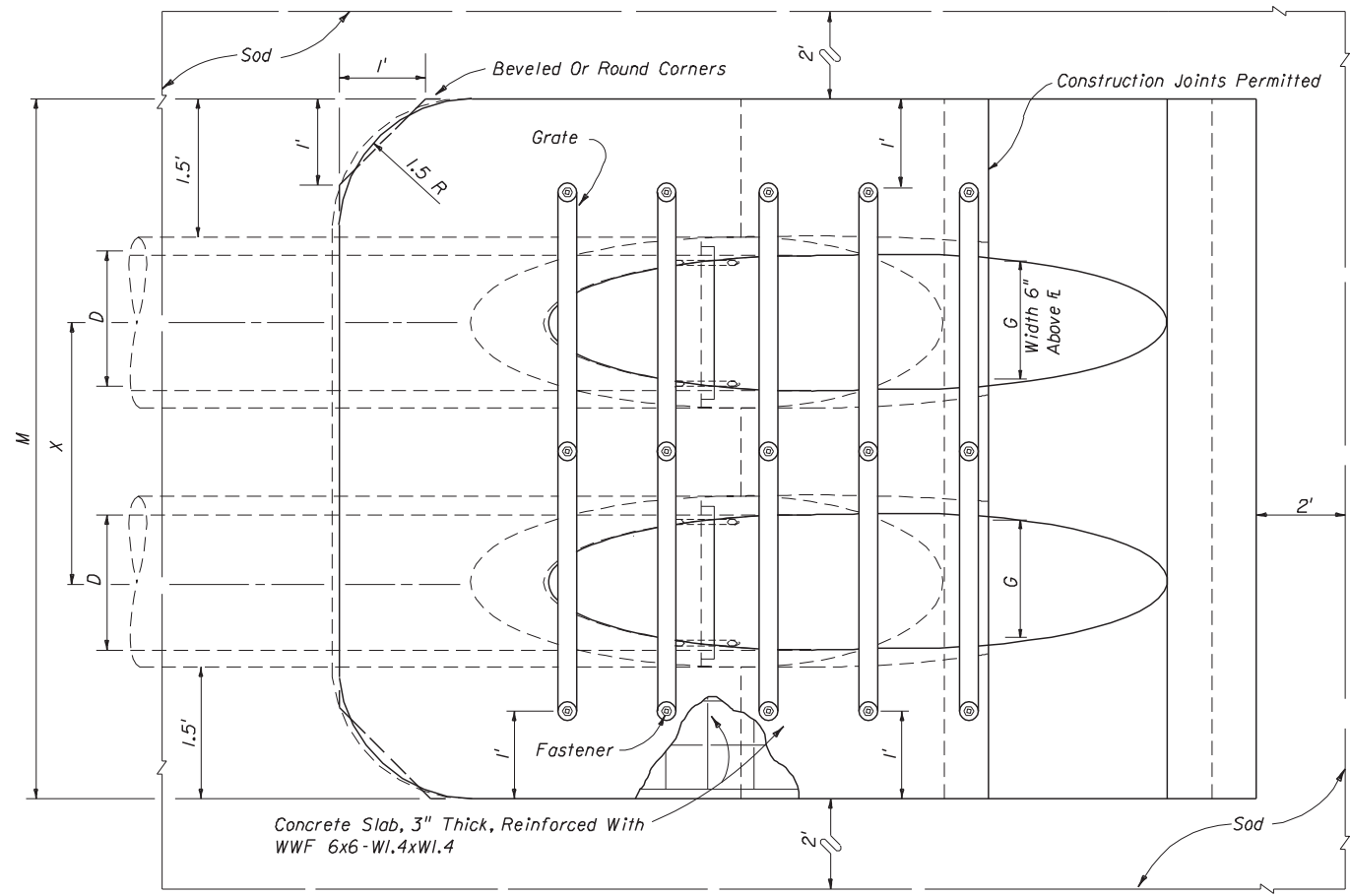
DIMENSIONS & QUANTITIES

D	X	A	B	C	E	F	G	M				N	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)			
								Single Pipe	Double Pipe	Triple Pipe	Quad Pipe		Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad Pipe
15"	2'-7"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.63'	7.21'	9.79'	12.37'	1.19'			0.76	1.16	1.54	1.94	8	10	11	12
18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.92'	7.75'	10.58'	13.42'	1.21'			0.85	1.28	1.71	2.17	9	10	12	13
24"	3'-5"	2.53'	7.18' Δ	9.71'	7.03' Δ	11'	1.73'	5.50'	8.92'	12.33'	15.75'	1.25'			1.02	1.58	2.15	2.75	10	12	13	15
30"	4'-3"	2.70'	9.25'	11.95'	9.03'	13'	2.00'	6.08'	10.33'	14.58'	18.83'	1.29'	2 1/2"	3"	1.23	1.98	2.74	3.50	12	14	15	17
36"	5'-1"	2.87'	11.31' ◇	14.18'	11.03' ◇	15'	2.24'	6.67'	11.75'	16.83'	21.92'	1.33'	2 1/2"	3"	1.40	2.38	3.33	4.24	13	15	17	20
42"	6'-0"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	7.25'	13.25'	19.25'	25.25'	1.38'	2 1/2"	3 1/2"	1.60	2.83	4.04	5.26	14	17	19	22
48"	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	7.83'	14.58'	21.33'	28.08'	1.42'	2 1/2"	3 1/2"	1.81	3.26	4.70	6.14	15	18	21	24
54"	7'-8"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	8.42'	16.08'	23.75'	31.42'	1.46'	3"	4"	2.03	3.78	5.54	7.28	17	20	23	27
60"	8'-6"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	9.00'	17.50'	26.00'	34.50'	1.50'	3"	4"	2.28	4.36	6.43	8.50	18	22	25	29

Δ 6.42' Δ 6.25' Dimensions permitted to allow use of 8' standard pipe lengths.
 ◇ 10.40' ◇ 10.10' Dimensions permitted to allow use of 12' standard pipe lengths.
 Δ ◇ Concrete slab shall be deepened to form bridge across crown of pipe. See section below.

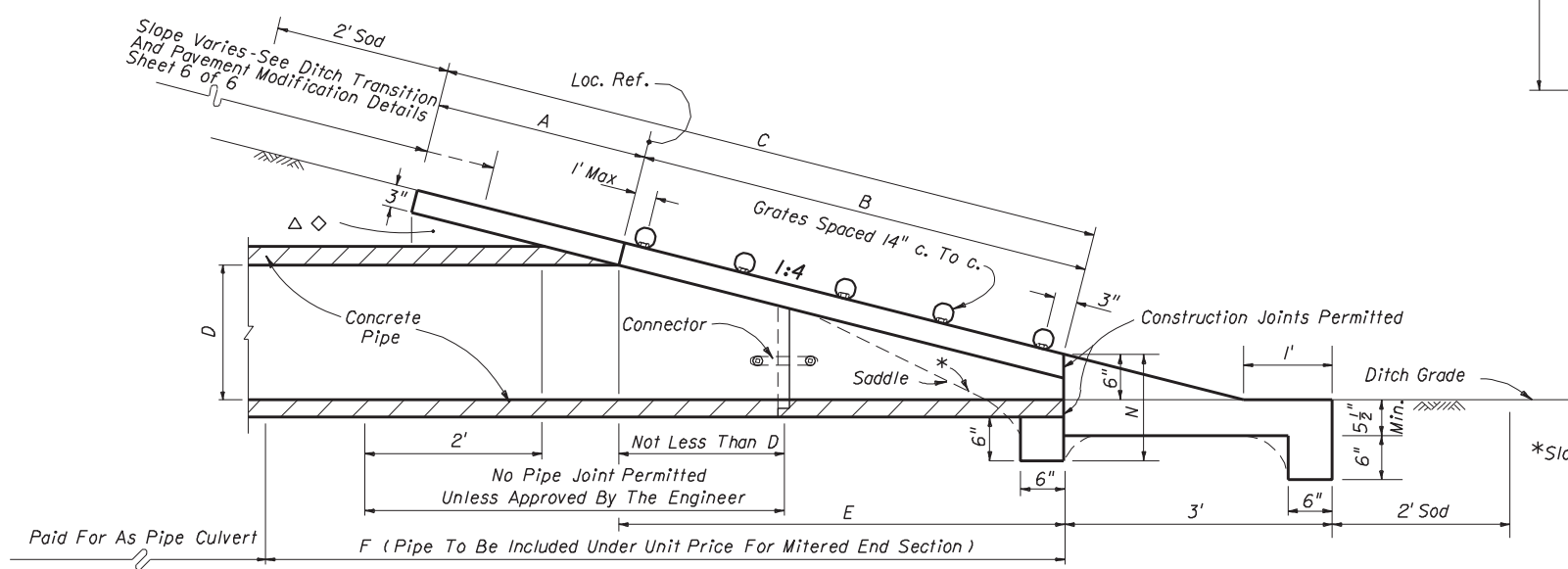


TOP VIEW - SINGLE PIPE



TOP VIEW - MULTIPLE PIPE

Note: See Sheets 5 and 6 for details and general notes.



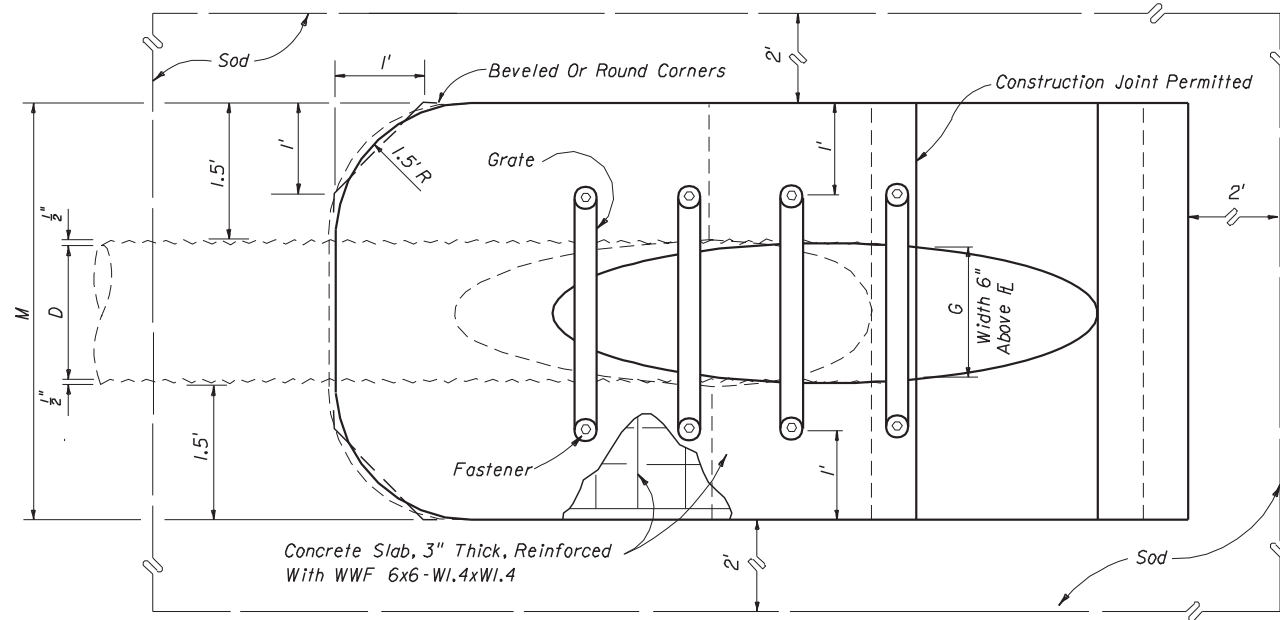
SECTION

*Slope:
 To 6" Pipe For Pipes 18" And Smaller
 1:2 For Pipes 24" And Larger.

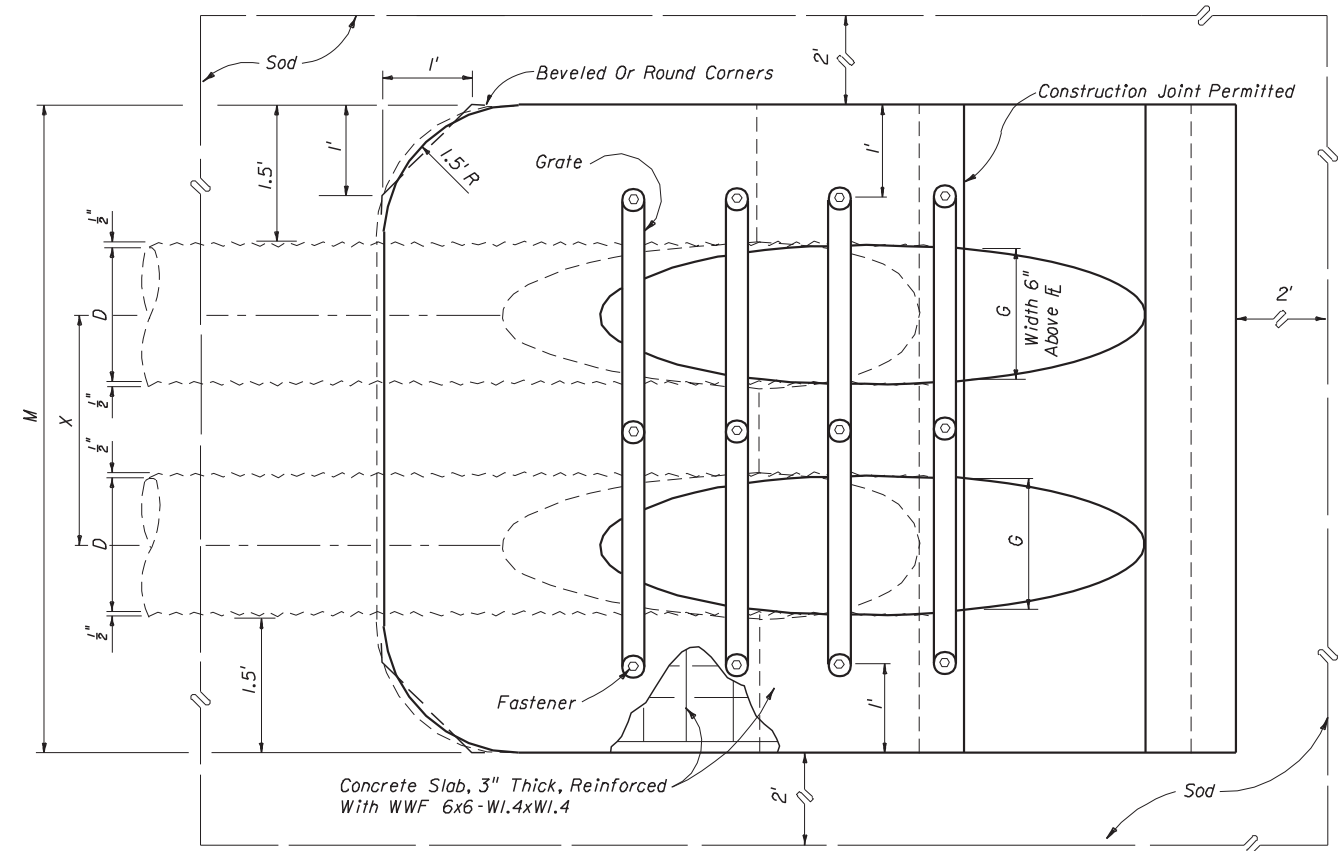
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SIDE DRAIN MITERED END SECTION SINGLE AND MULTIPLE ROUND CONCRETE PIPE				
Designed By	EGR	06/78	Approved By <i>S. A. McHenry</i> State Drainage Engineer	
Drawn By	HKH	06/78	Revision	Sheet No. Index No.
Checked By	JVG	06/78	00	1 of 6 273

DIMENSIONS & QUANTITIES

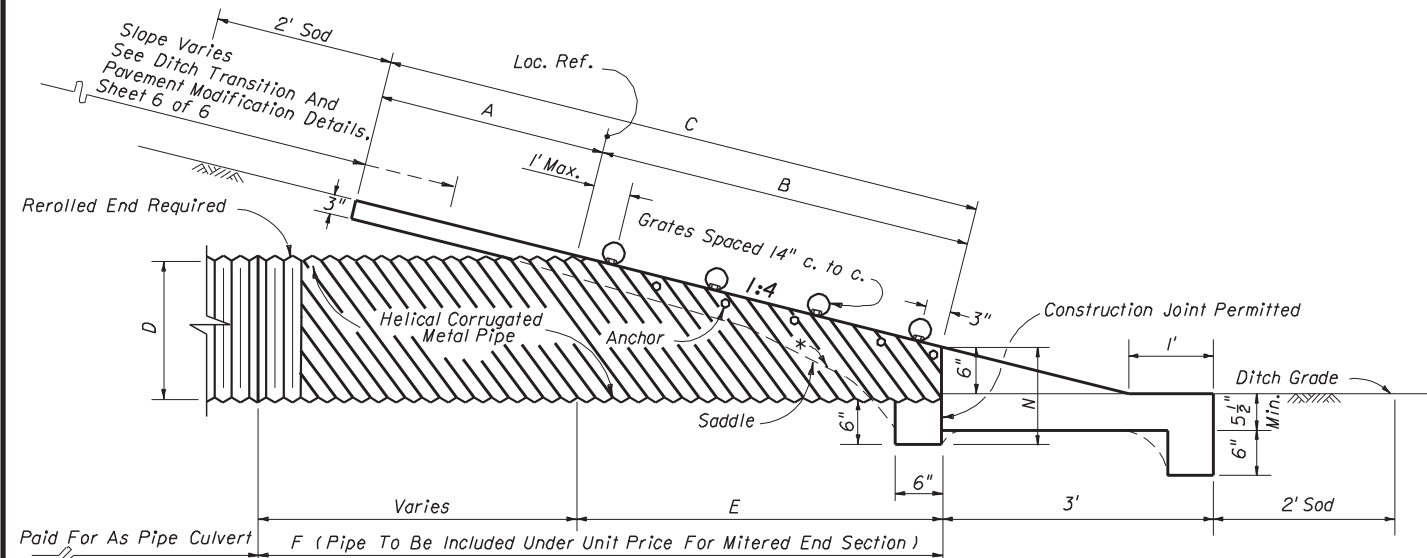
D	X	A	B	C	E	F	G	M				N	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)				REMARKS
								Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	
8"	2'-0"	2.5'	0.72'	3.22'	0.7'	4.0'	0.58'	3.75'	5.75'	7.75'	9.75'	1.04'			0.52	0.90	1.22	1.54	7	8	8	9	These sizes are restricted to inlet and outlet treatment for water management systems or similar applications.
10"	2'-2"	2.5'	1.34'	3.84'	1.3'	5.0'	0.81'	3.92'	6.08'	8.25'	10.41'	1.04'			0.64	0.99	1.34	1.70	7	8	9	10	
12"	2'-4"	2.5'	2.06'	4.56'	2.0'	6.0'	1.00'	4.08'	6.42'	8.75'	11.08'	1.04'			0.68	1.09	1.48	1.88	7	8	10	11	
15"	2'-7"	2.5'	3.09'	5.59'	3.0'	7.0'	1.23'	4.33'	6.92'	9.50'	12.08'	1.04'			0.64	1.00	1.35	1.71	8	9	10	11	
18"	2'-10"	2.5'	4.12'	6.62'	4.0'	8.0'	1.41'	4.58'	7.42'	10.25'	13.08'	1.04'			0.69	1.09	1.49	1.89	9	10	11	12	
24"	3'-5"	2.5'	6.18'	8.68'	6.0'	10.0'	1.73'	5.08'	8.50'	11.92'	15.33'	1.04'			0.83	1.34	1.82	2.34	10	11	13	14	
30"	4'-3"	2.5'	8.25'	10.75'	8.0'	12.0'	2.00'	5.58'	9.83'	14.08'	18.33'	1.04'	2 1/2"	3"	0.96	1.63	2.32	2.99	11	13	15	17	
36"	5'-1"	2.5'	10.31'	12.81'	10.0'	14.0'	2.24'	6.08'	11.17'	16.25'	21.33'	1.04'	2 1/2"	3"	1.08	1.92	2.77	3.62	12	14	17	19	
42"	6'-0"	2.5'	12.37'	14.87'	12.0'	16.0'	2.45'	6.58'	12.58'	18.58'	24.58'	1.04'	2 1/2"	3 1/2"	1.20	2.26	3.34	4.61	13	16	18	21	
48"	6'-9"	2.5'	14.43'	16.93'	14.0'	18.0'	2.65'	7.08'	13.83'	20.58'	27.33'	1.04'	2 1/2"	3 1/2"	1.60	3.11	4.62	6.12	14	17	20	23	
54"	7'-8"	2.5'	16.49'	18.99'	16.0'	20.0'	2.83'	7.58'	15.25'	22.92'	30.58'	1.04'	3"	4"	1.76	3.56	5.34	7.14	15	19	22	26	
60"	8'-6"	2.5'	18.55'	21.05'	18.0'	22.0'	3.00'	8.08'	16.58'	25.08'	33.58'	1.04'	3"	4"	1.94	4.03	6.12	8.20	17	20	24	28	



TOP VIEW - SINGLE PIPE



TOP VIEW - MULTIPLE PIPE



SECTION

NOTE: See Sheets 5 and 6 for details and general notes.

*Slope:
To 1/2 Pipe For Pipe 18" And Smaller
1:2 For Pipe 24" And Larger

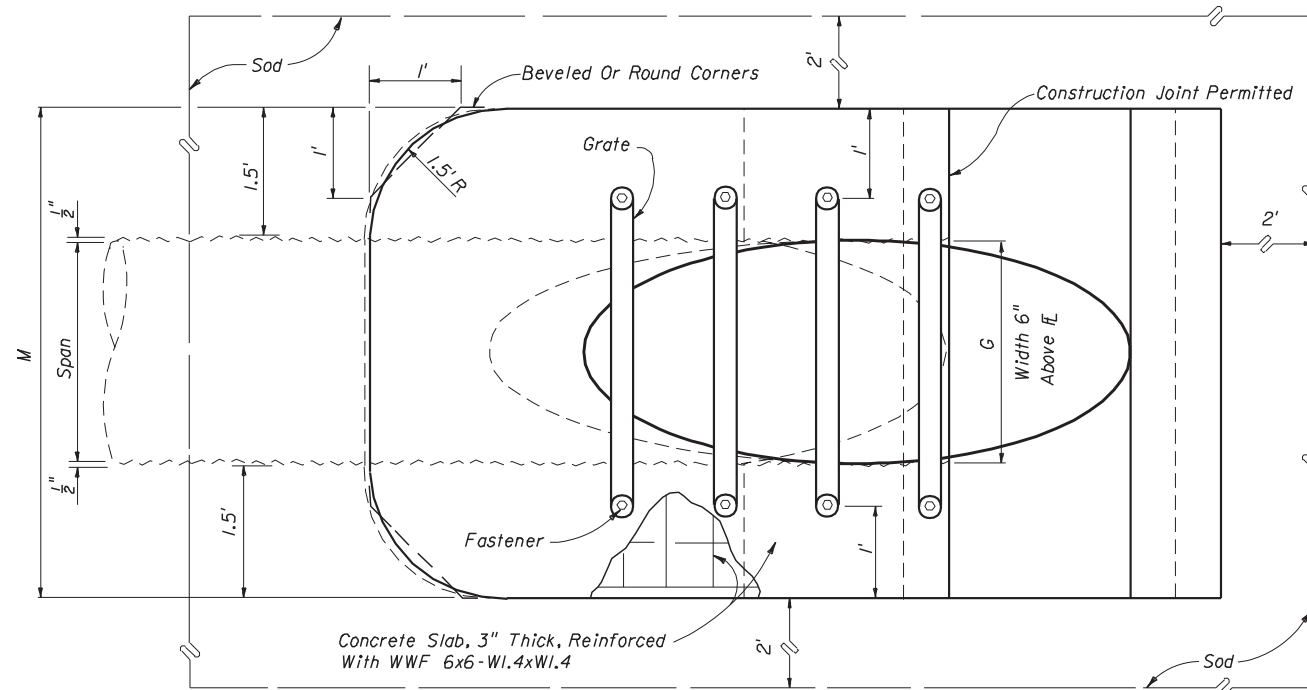
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SIDE DRAIN MITERED END SECTION SINGLE AND MULTIPLE ROUND CORRUGATED METAL PIPE

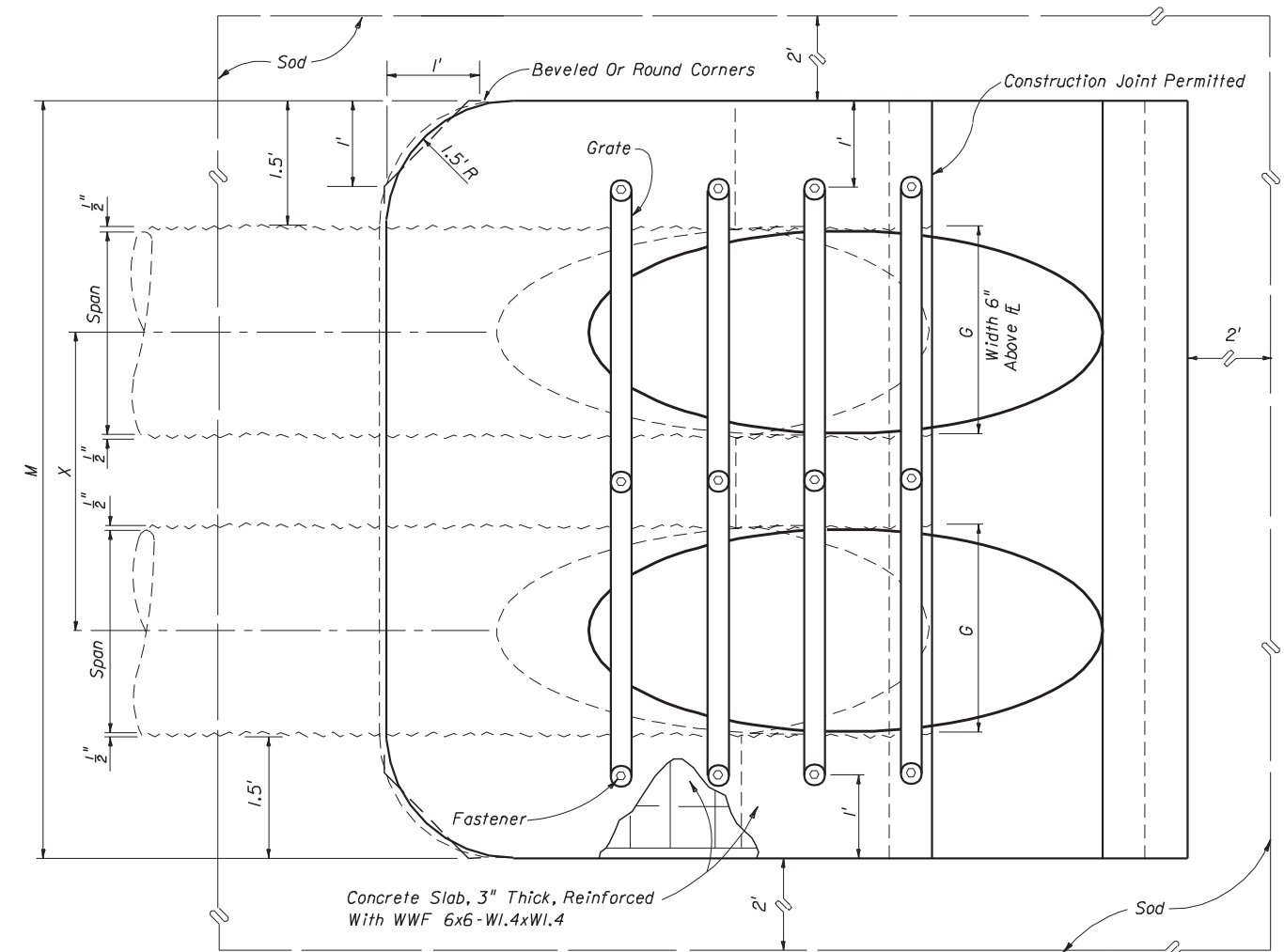
Names	Dates	Approved By		
Designed By	EGR 08/77	<i>A. McHenry</i> State Roadway Design Engineer		
Drawn By	HKH 08/77	Revision	Sheet No.	Index No.
Checked By	JVG 08/77	00	2 of 6	273

DIMENSIONS & QUANTITIES

1974 AASHTO		X	A	B	C	E	F	G	M				N	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)			
Span	Rise								Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
17"	13"	2'-6"	2.5'	2.4'	4.9'	2.33'	7'	1.39'	4.50'	7.00'	9.50'	12.00'	1.04'			0.62	0.95	1.27	1.60	8	9	10	11
21"	15"	2'-10"	2.5'	3.09'	5.59'	3.00'	8'	1.76'	4.83'	7.67'	10.50'	13.33'	1.04'			0.69	1.06	1.44	1.77	8	9	11	12
28"	20"	3'-5"	2.5'	4.8'	7.31'	4.67'	9'	2.22'	5.42'	8.83'	12.25'	15.67'	1.04'			0.81	1.26	1.73	2.19	9	11	12	14
35"	24"	4'-0"	2.5'	6.18'	8.68'	6.00'	11'	2.55'	6.00'	10.00'	14.00'	18.00'	1.04'		2 1/2"	0.94	1.51	2.09	2.66	10	12	14	15
42"	29"	4'-9"	2.5'	7.90'	10.40'	7.67'	12'	2.97'	6.58'	11.33'	16.08'	20.83'	1.04'		2 1/2"	1.06	1.76	2.46	3.16	11	13	15	17
49"	33"	5'-6"	2.5'	9.28'	11.78'	9.00'	14'	3.34'	7.17'	12.67'	18.17'	23.67'	1.04'		2 1/2"	1.19	2.02	2.84	3.68	12	14	17	19
57"	38"	6'-4"	2.5'	11.00'	13.50'	10.67'	16'	3.65'	7.83'	14.17'	20.50'	26.83'	1.04'		3"	1.35	2.35	3.35	4.36	13	16	19	22
64"	43"	7'-1"	2.5'	12.71'	15.21'	12.33'	17'	3.89'	8.42'	15.50'	22.58'	29.67'	1.04'		3"	1.50	2.70	3.86	5.03	14	17	20	24
71"	47"	7'-10"	2.5'	14.09'	16.59'	13.67'	19'	4.14'	9.00'	16.83'	24.67'	32.50'	1.04'		3"	1.62	2.94	4.27	5.59	15	18	22	25

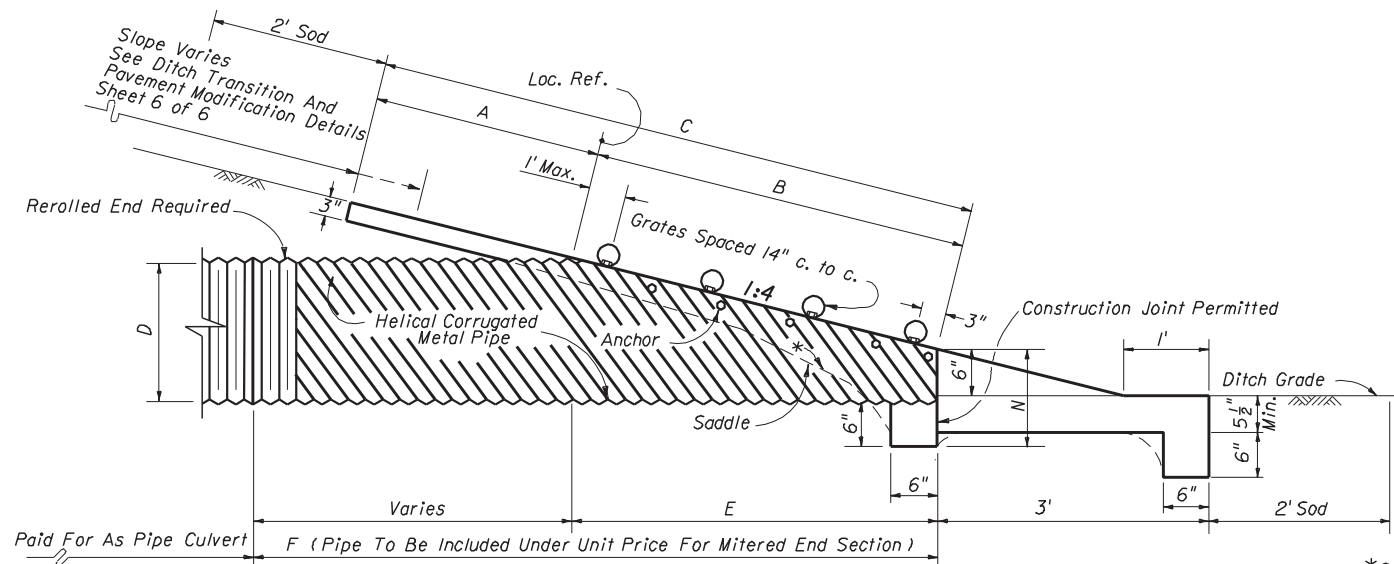


TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE

NOTE: See Sheets 5 and 6 for details and general notes.



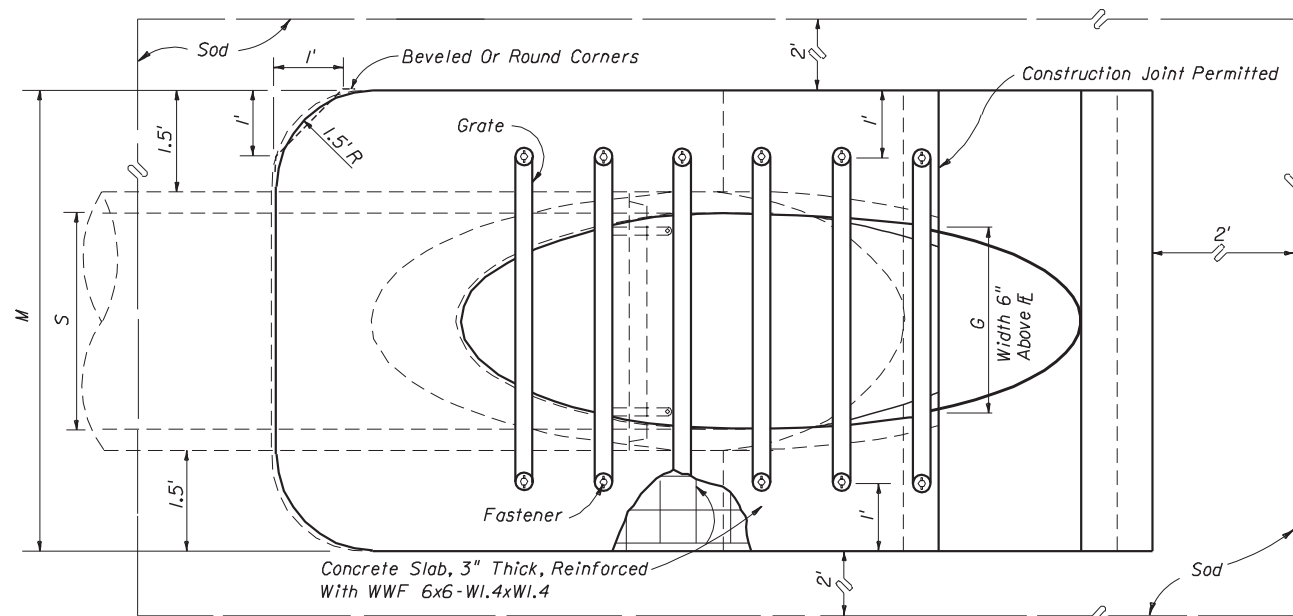
SECTION

*Slope:
To Span Line For Pipe Arch 28" x 20" And Smaller
1:2 For Pipe Arch 35" x 24" And Larger

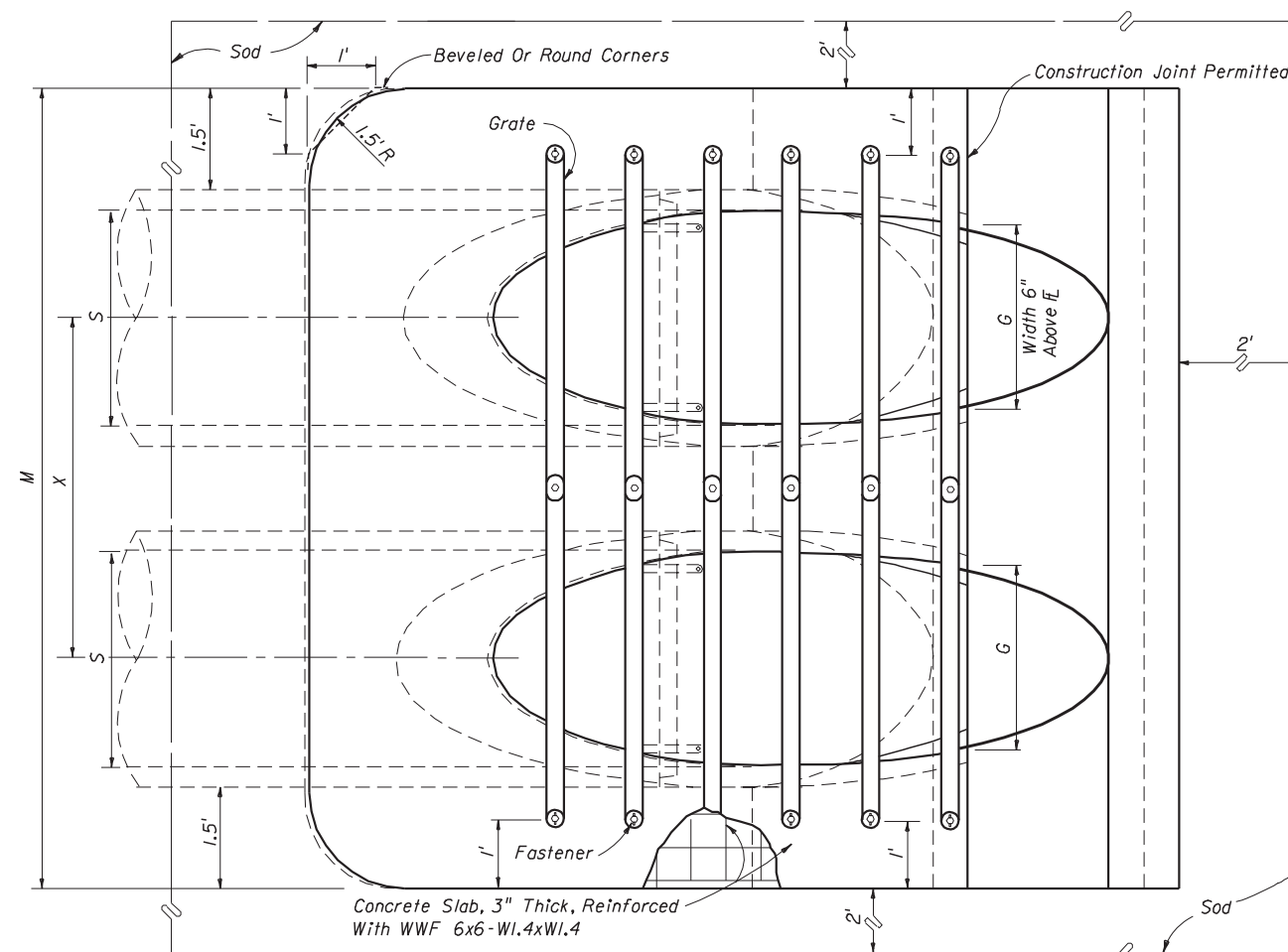
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SIDE DRAIN MITERED END SECTION				
SINGLE AND MULTIPLE CORRUGATED METAL PIPE-ARCH				
Names	Dates	Approved By		
Designed By	EGR 08/77	<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	HKH 08/77	Revision	Sheet No.	Index No.
Checked By	JVG 08/77	00	3 of 6	273

DIMENSIONS & QUANTITIES

Rise R	Span S	X	A	B	C	E	F	G	M				N	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)			
									Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
12"	18"	2'-10"	2.36'	3.06'	5.42'	3.03'	5'	1.50'	4.92'	7.75'	10.58'	13.42'	1.21'			0.68	1.04	1.41	1.77	8	9	11	12
14"	23"	3'-4"	2.44'	3.75'	6.19'	3.70'	6'	1.90'	5.38'	8.71'	12.04'	15.38'	1.23'			0.76	1.19	1.63	2.05	9	10	12	13
19"	30"	4'-0"	2.62'	5.47'	8.09'	5.36'	8'	2.37'	6.04'	10.04'	14.04'	18.04'	1.27'	2 1/2"	3"	0.95	1.52	2.09	2.65	10	12	13	15
24"	38"	5'-0"	2.79'	7.18'	9.97'	7.03'	10'	2.85'	6.79'	11.79'	16.79'	21.79'	1.31'	2 1/2"	3"	1.18	1.95	2.74	3.53	11	13	15	18
29"	45"	5'-11"	3.05'	8.90'	11.95'	8.70'	12'	3.19'	7.50'	13.42'	19.33'	25.25'	1.38'	2 1/2"	3 1/2"	1.41	2.42	3.44	4.45	12	15	18	20
34"	53"	7'-0"	3.22'	10.62'	13.84'	10.36'	13'	3.57'	8.25'	15.25'	22.25'	29.25'	1.42'	3"	3 1/2"	1.63	2.92	4.22	5.52	13	17	20	23
38"	60"	7'-10"	3.39'	11.99'	15.38'	11.70'	15'	3.95'	8.92'	16.75'	24.58'	32.42'	1.46'	3"	4"	1.83	3.36	4.89	6.41	14	18	21	25
43"	68"	8'-11"	3.56'	13.71'	17.27'	13.36'	17'	4.28'	9.67'	18.58'	27.50'	36.42'	1.50'	3"	4"	2.09	3.95	5.80	7.65	16	20	23	27
48"	76"	9'-11"	3.73'	15.43'	19.16'	15.03'	19'	4.59'	10.42'	20.33'	30.25'	40.17'	1.54'	Special	Special	2.37	4.54	6.73	8.92	17	21	26	30
53"	83"	10'-8"	3.91'	17.15'	21.06'	16.70'	20'	4.77'	11.08'	21.75'	32.42'	43.08'	1.58'	Special	Special	2.61	5.09	7.56	10.03	18	23	27	32
58"	91"	11'-8"	4.08'	18.87'	22.95'	18.36'	22'	5.01'	11.83'	23.50'	35.17'	46.83'	1.63'	Special	Special	2.91	5.77	8.64	11.50	19	24	29	35

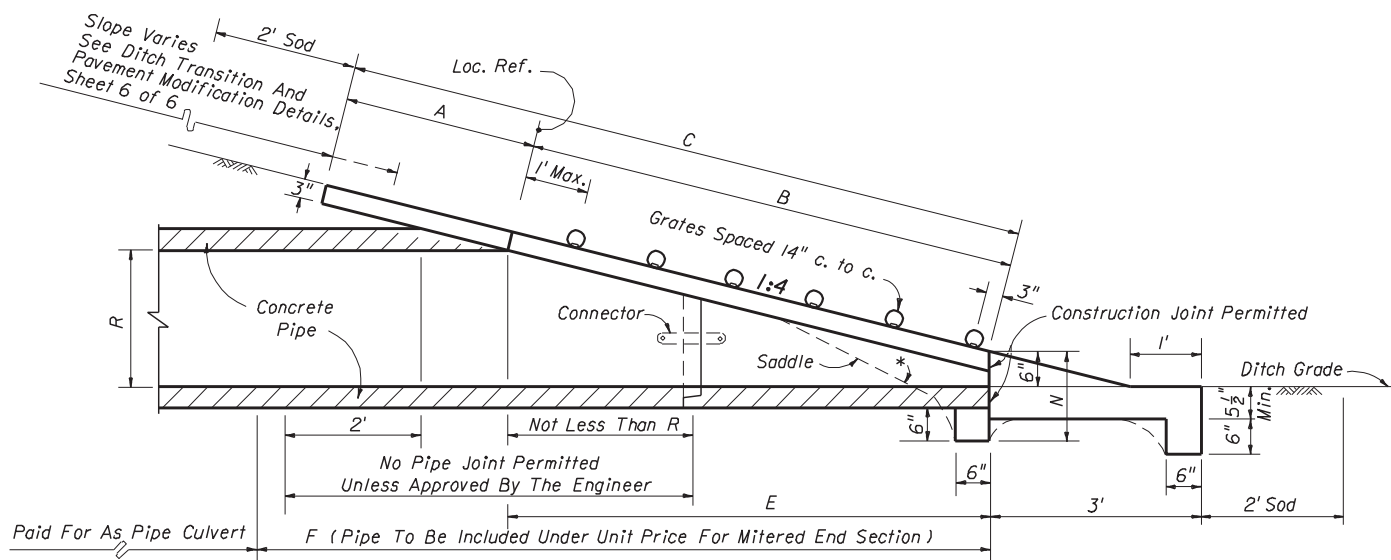


TOP VIEW-SINGLE PIPE



TOP VIEW-MULTIPLE PIPE

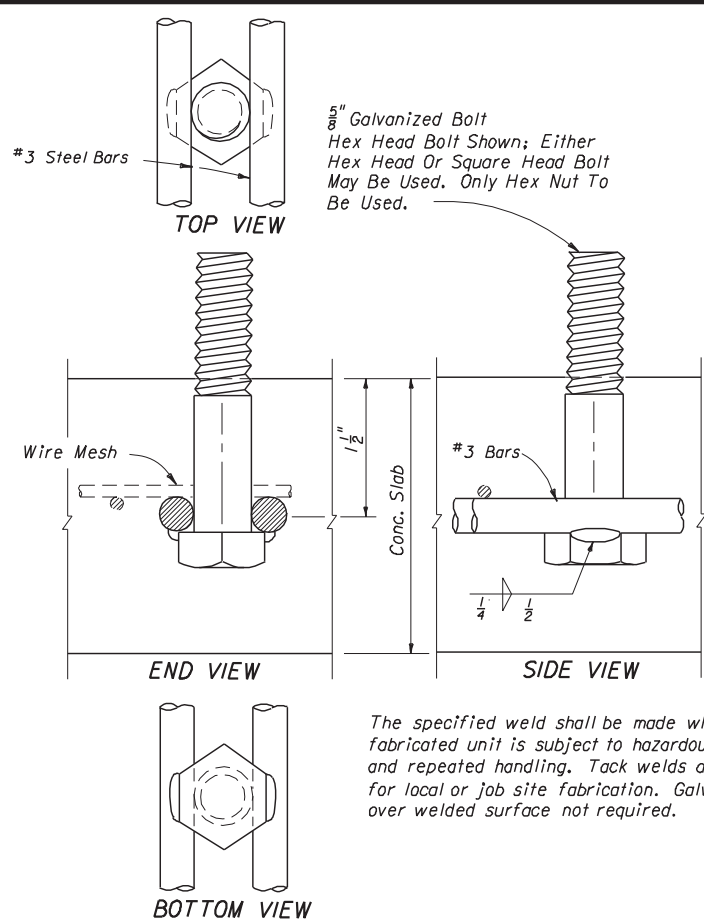
NOTE: See Sheets 5 and 6 for details and general notes.



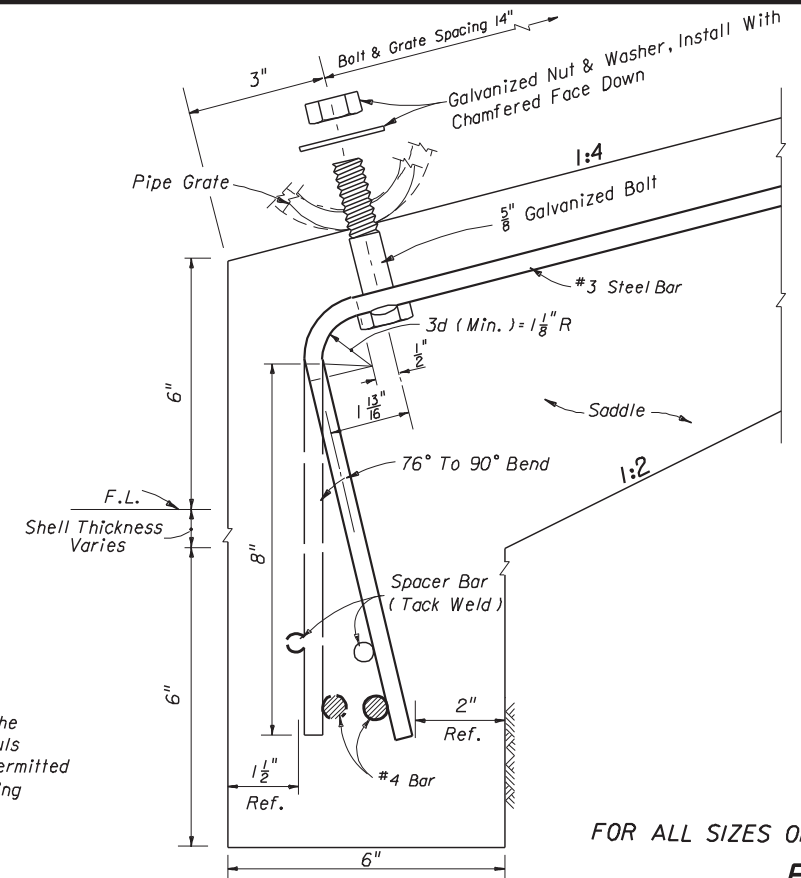
SECTION

*Slope:
To Major Axis For Pipes 24" x 38" And Smaller.
1:2 For Pipes 29" x 45" And Larger.

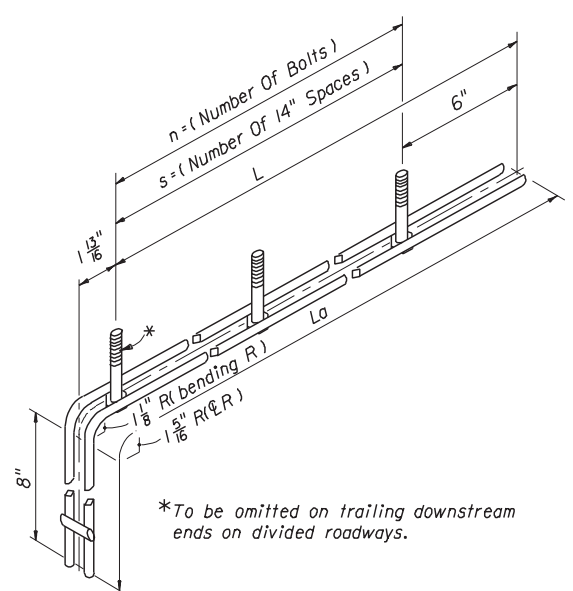
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SIDE DRAIN MITERED END SECTION				
SINGLE AND MULTIPLE ELLIPTICAL CONCRETE PIPE				
Names	Dates	Approved By		
Designed By	EGR 06/81	<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	HSD 06/81	Revision	Sheet No.	Index No.
Checked By	JVG/JBW 06/81	00	4 of 6	273



The specified weld shall be made when the fabricated unit is subject to hazardous hauls and repeated handling. Tack welds are permitted for local or job site fabrication. Galvanizing over welded surface not required.



FOR ALL SIZES OF SINGLE AND MULTIPLE DRAIN PIPE FASTENER UNIT



Drain Size	s	n	L	La
CONCRETE PIPE (ROUND)				
15"	3	4	4'-0"	4'-11"
18"	4	5	5'-2"	6'-1"
24"	6	7	7'-6"	8'-5"
30"	7	8	8'-8"	9'-7"
36"	9	10	11'-0"	11'-11"
42"	11	12	13'-4"	14'-3"
48"	13	14	15'-8"	16'-7"
54"	14	15	16'-10"	17'-9"
60"	16	17	19'-2"	20'-1"

Drain Size	s	n	L	La
ELLIPTICAL CONCRETE PIPE				
12" x 18"	2	3	2'-10"	3'-9"
14" x 23"	3	4	4'-0"	4'-11"
19" x 30"	4	5	5'-2"	6'-1"
24" x 38"	5	6	6'-4"	7'-3"
29" x 45"	7	8	8'-8"	9'-7"
34" x 53"	8	9	9'-10"	10'-9"
38" x 60"	10	11	12'-2"	13'-1"
43" x 68"	11	12	13'-4"	14'-3"
48" x 76"	13	14	15'-8"	16'-7"
53" x 83"	14	15	16'-10"	17'-9"
58" x 91"	15	16	18'-0"	18'-11"

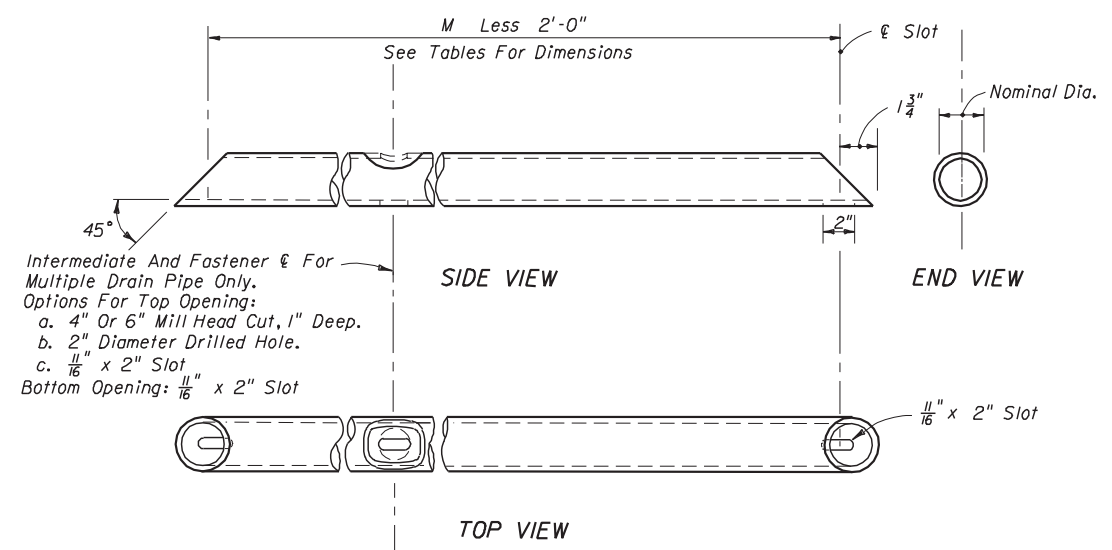
Drain Size	s	n	L	La
CORRUGATED METAL PIPE (ROUND)				
15"	2	3	2'-10"	3'-9"
18"	3	4	4'-0"	4'-11"
24"	5	6	6'-4"	7'-3"
30"	7	8	8'-8"	9'-7"
36"	8	9	9'-10"	10'-9"
42"	10	11	12'-2"	13'-1"
48"	12	13	14'-6"	15'-5"
54"	14	15	16'-10"	17'-9"
60"	15	16	18'-0"	18'-11"

Drain Size	s	n	L	La
CORRUGATED METAL PIPE (ARCH)				
17" x 13"	1	2	1'-8"	2'-7"
21" x 15"	2	3	2'-10"	3'-9"
28" x 20"	4	5	5'-2"	6'-1"
35" x 24"	5	6	6'-4"	7'-3"
42" x 29"	6	7	7'-6"	8'-5"
49" x 33"	7	8	8'-8"	9'-7"
57" x 38"	9	10	11'-0"	11'-11"
64" x 43"	10	11	12'-2"	13'-1"
71" x 47"	12	13	14'-6"	15'-5"

Note: 5/8" x 3" bolts are standard for all grate fasteners, except when the contractor elects to use the slotted upper holes for the intermediate fasteners on multiple drain pipe, which will require the following bolt lengths:

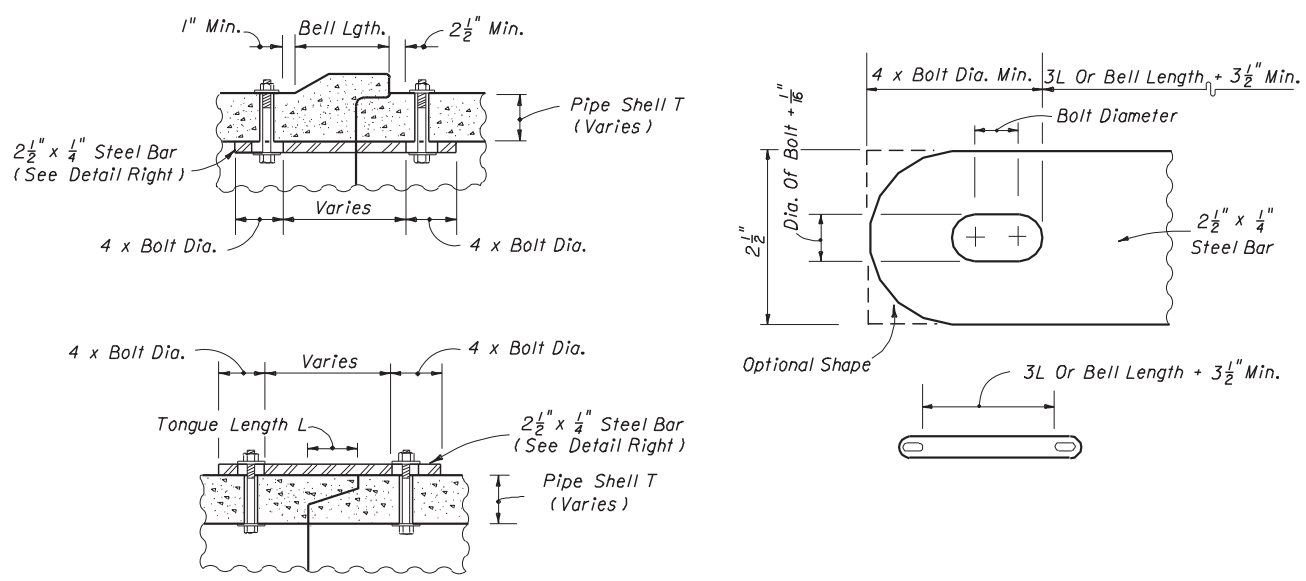
Grate Size (Std. & X-Stg.)	Bolt Length
2 1/2"	5 1/2"
3"	6"
3 1/2"	6 1/2"
4"	7"

**To be used only when grates are called for in the plans.
***1974 AASHTO Pipe Arch Sizes.



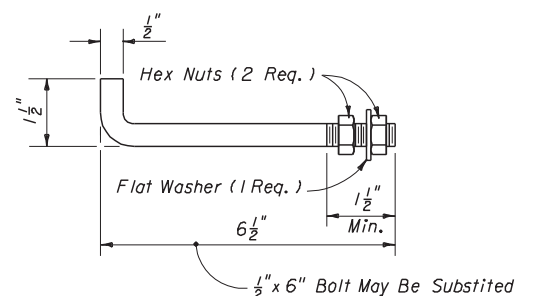
GRATE DETAIL FOR SINGLE & MULTIPLE DRAIN PIPE

See General Notes, Sheet 6.



All bars, bolts, nuts and washers are to be galvanized steel. Bolt diameters shall be 3/8" for 15" to 36" pipe and 5/8" for 42" to 60" pipe. Two connectors required per joint, located 60° right and left of bottom center of pipe. Bolt holes in pipe shell are to be drilled.

CONCRETE PIPE CONNECTOR DETAIL



Anchors required for CMP only. Anchor, washer and nuts to be galvanized steel. Bend anchor where required to center in concrete slab. Damaged surfaces to be repaired after bending. Anchors are to be spaced a distance equal to four (4) corrugations. Place the anchors in the outside crest of corrugation. Flat washer to be placed on inside wall of pipe. Holes in the mitered end pipe are to be drilled or punched; burning not permitted.

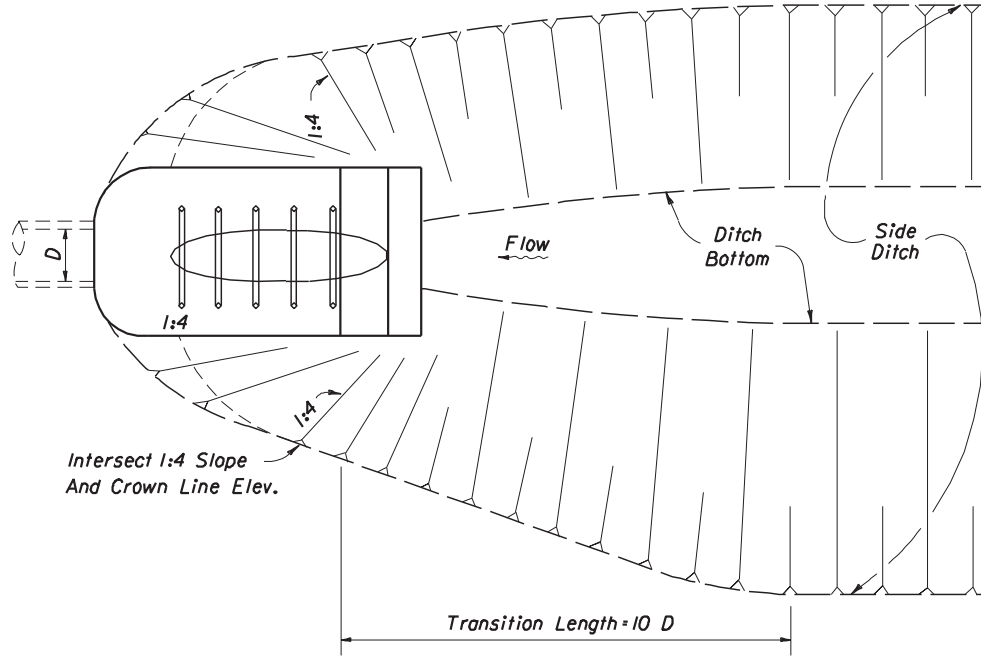
ANCHOR DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

SIDE DRAIN MITERED END SECTION
DETAILS FOR CONCRETE & CORRUGATED METAL PIPE

Names	Dates	Approved By		
Designed By	EGR 08/77	 State Drainage Engineer		
Drawn By	HKH 08/77			
Checked By	JVG 08/77			
Revision	00			
		5 of 6	273	

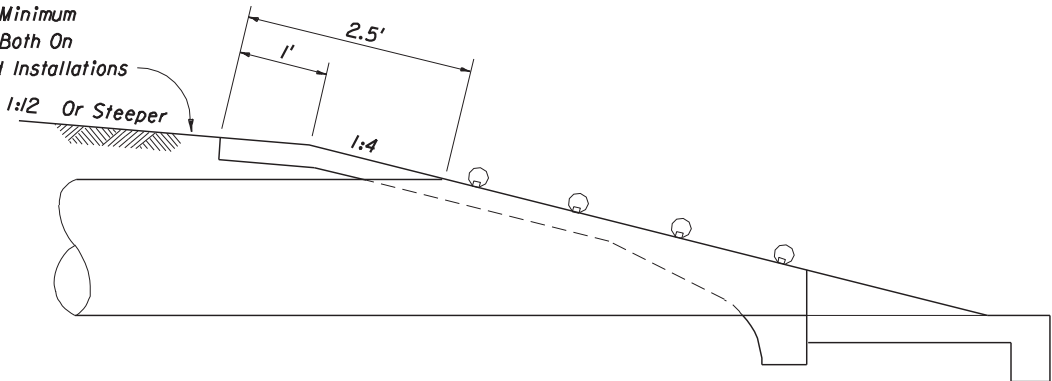
GENERAL NOTES



PLAN
DITCH TRANSITION

1. Unless otherwise designated in the plans, concrete pipe mitered end sections may be used with any type of side drain pipe; corrugated steel pipe mitered end sections may be used with any type of side drain pipe except aluminum pipe; and, corrugated aluminum mitered end sections may be used with any type of side drain pipe except steel pipe. When bituminous coated metal pipe is specified for side drain pipe, mitered end sections shall be constructed with like pipe or concrete pipe. When the mitered end section pipe is dissimilar to the side drain pipe, a concrete jacket shall be constructed in accordance with Index No. 280.
2. Concrete pipe used in the assembly of mitered end sections shall be of selective lengths to avoid excessive connections.
3. Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered end section shall be repaired.
4. That portion of corrugated metal pipe in direct contact with the concrete slab shall be bituminous coated prior to placing of the concrete.
5. Corrugated polyethylene pipe (CPE) for side drain application of 15", 18" or 24" diameter shall utilize either corrugated metal or concrete mitered end sections. When used in conjunction with corrugated metal mitered end sections, connection shall be by either a formed metal band specifically designated to join CPE pipe and metal pipe or other coupler approved by the State Drainage Engineer. When used in conjunction with a concrete mitered end section, connection shall be by concrete jacket constructed in accordance with Index No. 280.
6. When existing multiple side drain pipes are spaced other than the dimensions shown in this detail, or have non-parallel axes, or have non-uniform sections, the mitered end sections will be constructed either separately as single pipe mitered end sections or collectively as multiple pipe end sections as directed by the Engineer; however, mitered end sections will be paid for each, based on each independent pipe end.
7. In addition to the requirements of Section 430-4, side drain culverts shall comply with the cover requirements shown on Index No. 205.
8. The reinforced concrete slab shall be constructed for all sizes of side drain pipe and cast in place with Class I concrete.
9. Round pipe size 30" or greater, pipe-arch size 35" x 24" or greater and elliptical pipe 19" x 30" or greater shall be grated unless excepted in the plans. Smaller sizes of pipe shall be grated only when called for in plans. The lower grate on trailing downstream ends on divided highways shall be omitted.
10. Grates are to be fabricated from steel ASTM A53, Grade B, pipe. The lower grate on all traffic approach ends shall be Schedule 80 and all remaining grates shall be Schedule 40. Grates subject to salt free and corrosive free environment may be fabricated from galvanized pipe, with base metal exposed during fabrication repaired as specified in Section 562, Standard Specifications; or, fabricated from black pipe and hot dipped galvanized after fabrication in accordance with ASTM A123. Grates subject to salt water or highly corrosive environment shall be hot dipped galvanized after fabrication in accordance with ASTM A123.
11. Ditch transitions shall be used on all grades in excess of 3% as directed by the Engineer.
12. The project engineer shall contact the District Drainage Engineer for possible alternate treatment prior to constructing side drain mitered end sections where a minimum spacing of 30' will not result between the toe points of the mitered end sections.
13. The cost of all pipe (s), grates, fasteners, reinforcing, connectors, anchors, concrete, sealants, jackets and coupling bands shall be included in the cost for the mitered end section. Sodding shall be paid for separately under the contract unit price for Sodding, SY.
14. Mitered end sections shall be paid for under the contract unit price for Mitered End Section (SD), Ea., based on each independent pipe end.

Modified Slope When Minimum Cover Or Less Occurs Both On Existing And Proposed Installations



PERMISSIBLE PAVEMENT MODIFICATION

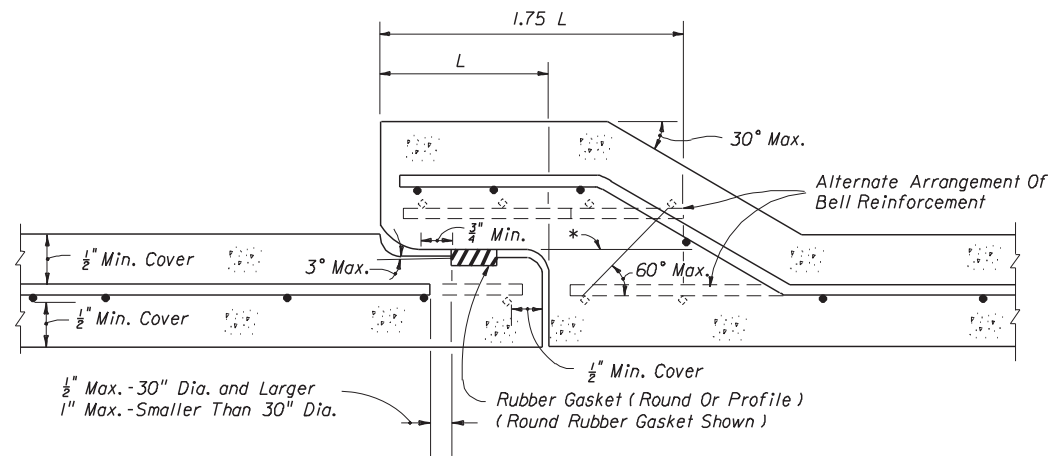
DESIGN NOTES

1. In critical hydraulic locations, grates shall not be used until potential debris transport has been evaluated by the drainage engineer and appropriate adjustments made. Ditch grades in excess of 3% or pipe with less than 1.5' of cover and grades in excess of 1% will require such an evaluation (General Note 9).
2. The design engineer shall determine highly corrosive locations and specify in the plans when the grates shall be hot-dipped galvanized after fabrication (General Note 10).
3. The design engineer shall determine and designate in the plans which alternate types of mitered end section will not be permitted. The restriction shall be based on corrosive or structural requirements.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
SIDE DRAIN MITERED END SECTION					
NOTES & INFORMATION					
Names	Dates	Approved By			
Designed By	EGR	08/77	 State Drainage Engineer		
Drawn By	HKH	08/77	Revision	Sheet No.	Index No.
Checked By	JVK	08/77	00	6 of 6	273

SCHEDULE OF BELL REINFORCEMENT
Classes II, III, IV, V; Wall A, B, C

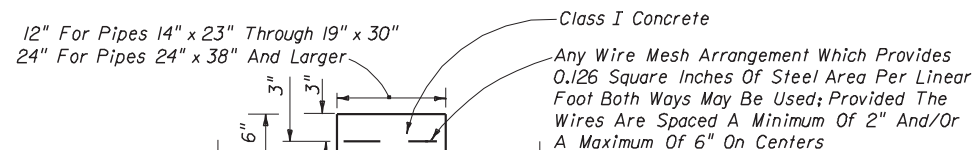
Nominal Pipe Diameter	Design Bell Reinforcement SQ. IN. PER FOOT	Maximum Reinforcement Under Tolerance SQ. IN. PER FOOT
15"	0.07	0.010
18"	0.07	0.010
24"	0.09	0.010
30"	0.12	0.010
36"	0.14	0.010
42"	0.16	0.010
48"	0.19	0.011
54"	0.21	0.012
60"	0.23	0.0135
66"	0.26	0.015
72"	0.28	0.0165
78"	0.30	0.018
84"	0.33	0.0195
90"	0.35	0.021
96"	0.37	0.0225
102"	0.40	0.024
108"	0.42	0.0255



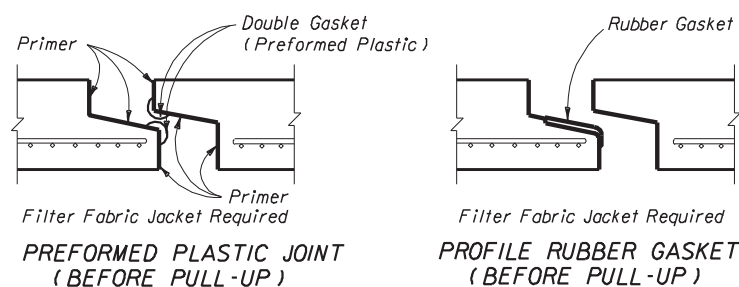
*All circumferential steel located above this line within 1.75 L is defined as bell reinforcement.

ROUND RUBBER GASKET SHOWN

DETAIL OF BELL & SPIGOT CONCRETE PIPE JOINT USING ROUND OR PROFILE RUBBER GASKET

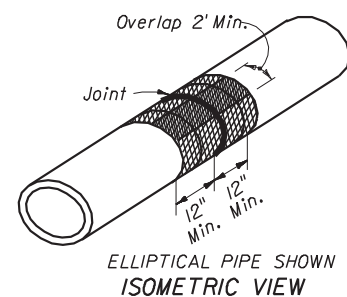


CONCRETE JACKET

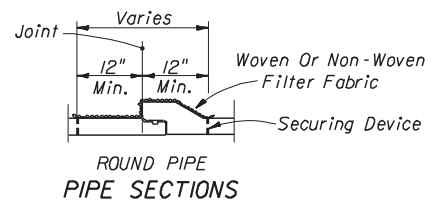
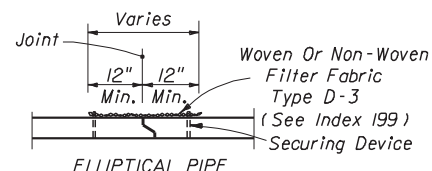


Cost of concrete jacket or filter fabric jacket to be included in cost of elliptical concrete pipe culverts.

ELLIPTICAL CONCRETE PIPE JOINTS

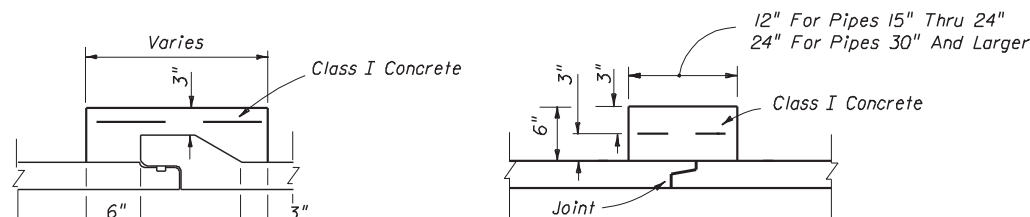


ELLIPTICAL PIPE SHOWN ISOMETRIC VIEW



Cost of filter fabric jacket to be included in cost of pipe culverts.

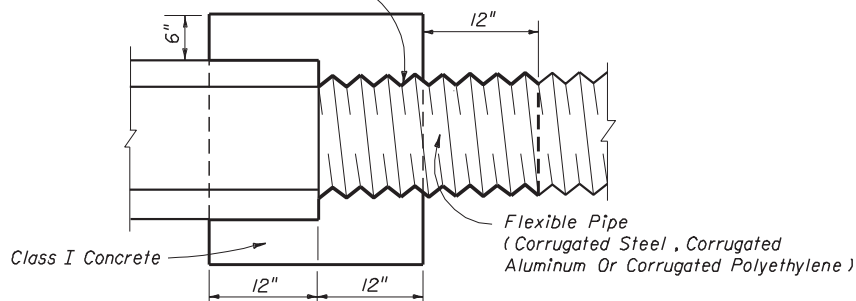
FOR ALL PIPE TYPES - CONCRETE PIPE SHOWN
FILTER FABRIC JACKET



Note: For reinforcement see elliptical pipe concrete jacket.

BELL AND SPIGOT TONGUE & GROOVE DISSIMILAR JOINTS

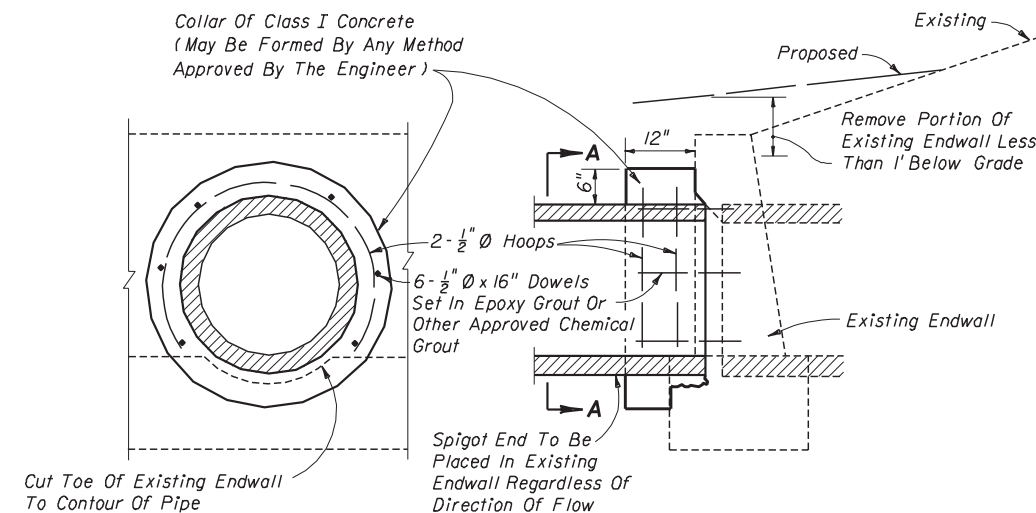
Bituminous Coating Required For CMP (Any Suitable Bituminous Material May Be Field Applied)



Note: Cost of concrete and bituminous coating to be included in contract unit price for either new pipe or Mitered End Section. A concrete jacket shall not be used to join:
(a) metal pipe of dissimilar materials
(b) flexible pipe when the minimum cover required in accordance with Index No. 205 cannot be obtained.

DISSIMILAR TYPES

CONCRETE JACKET FOR CONNECTING DISSIMILAR TYPES OF PIPE AND CONCRETE PIPES WITH DISSIMILAR JOINTS

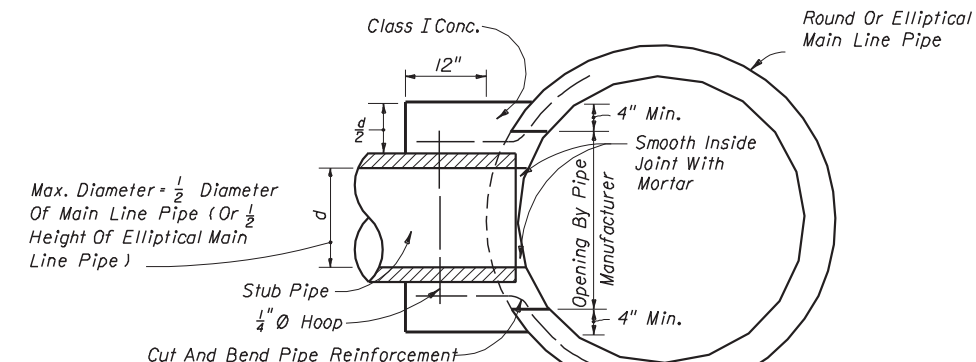


SECTION AA

LONGITUDINAL SECTION

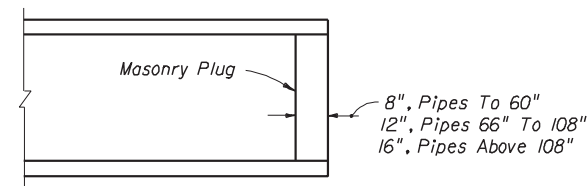
Note: Cost for removal and disposal of portions of top and toe of existing endwall and cost of concrete, reinforcing steel and construction of collar to be included in the contract unit price for pipe culvert.

CONCRETE COLLAR FOR EXTENSION OF EXISTING PIPE CULVERTS



Cost of concrete and steel to be included in contract unit price for pipe culvert.

CONCRETE COLLAR FOR JOINING MAINLINE PIPE AND STUB PIPE



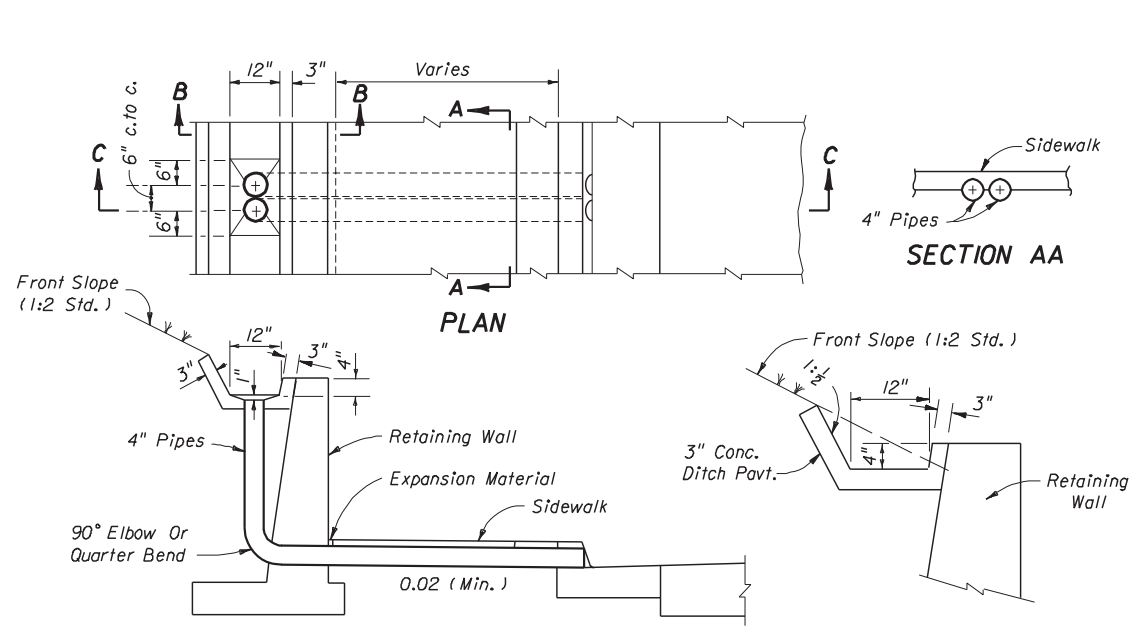
Note: Unless otherwise called for in the plans, the cost of plugging pipes to be included in contract unit price for new pipe.

PIPE PLUG

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

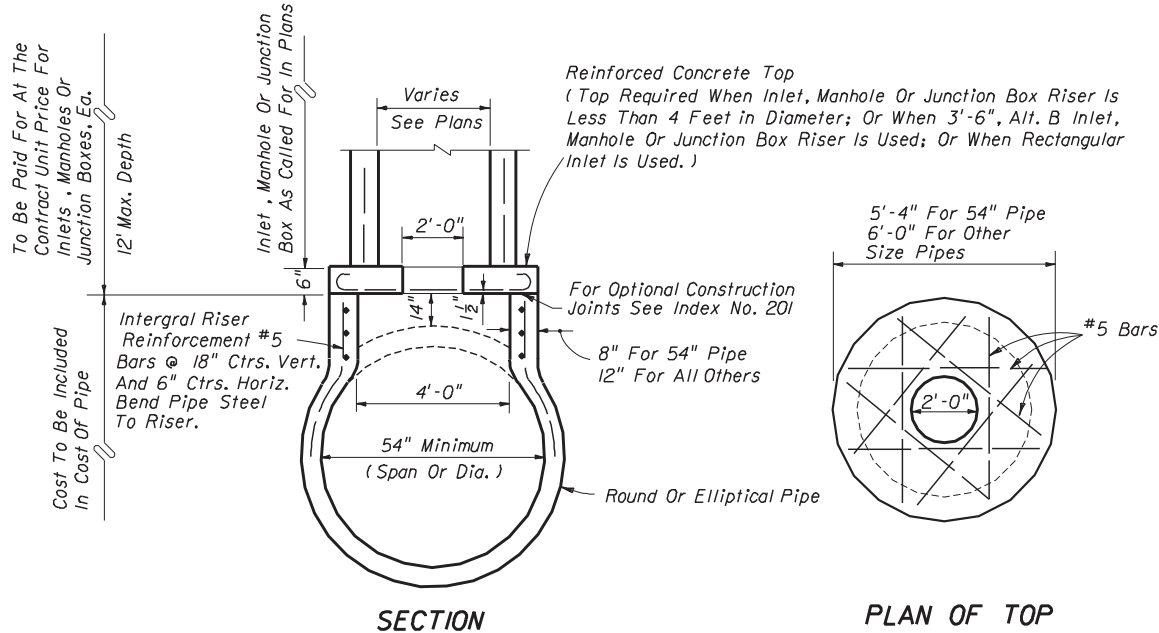
MISCELLANEOUS DRAINAGE DETAILS

Names	Dates	Approved By		
Designed By		 State Drainage Engineer		
Drawn By	HSD 01/85			
Checked By	JBW/JVG 09/85	00	1 of 4	280

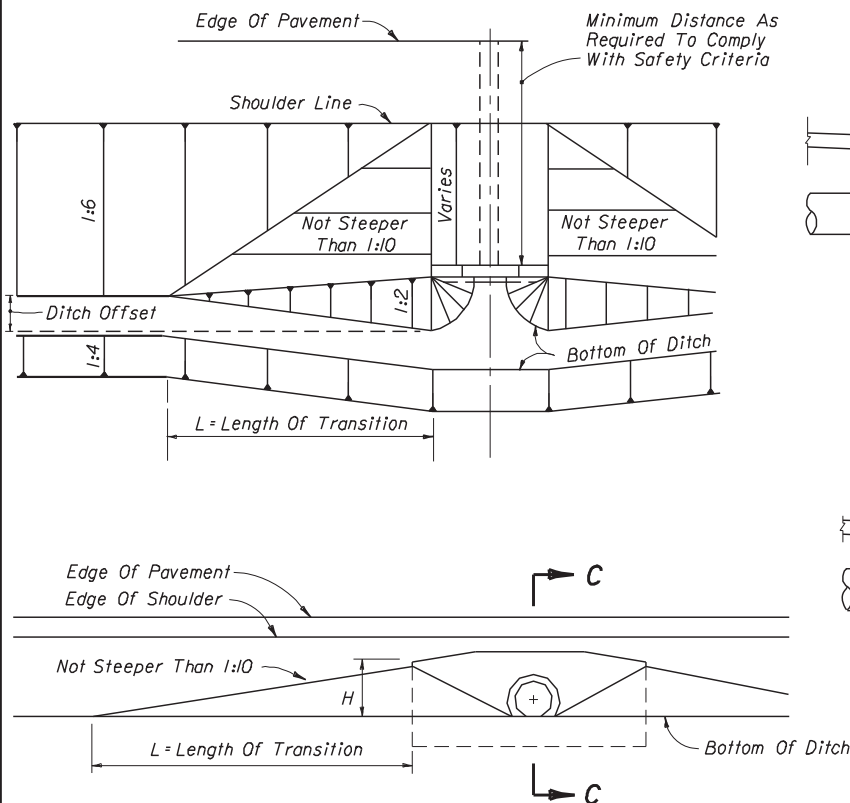
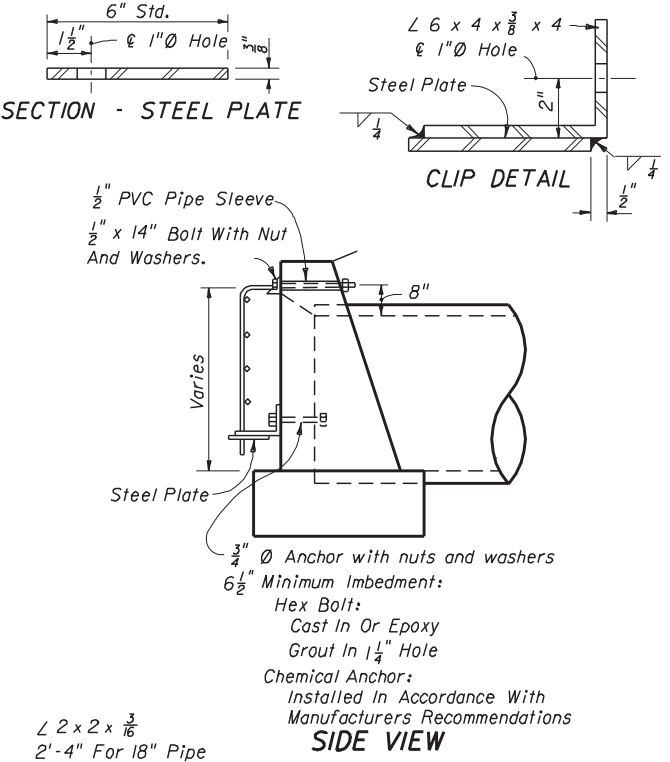


CONCRETE GUTTER AND DRAINS AT RETAINING WALLS

Note: Either cast iron pipe or PVC pipe, Schedule 40, may be used. Pipe to be paid for under the contract unit price for either Cast Iron Pipe For Roof Drains (4"), LF, or Polyvinyl Chloride Pipe Culvert (4"), LF.

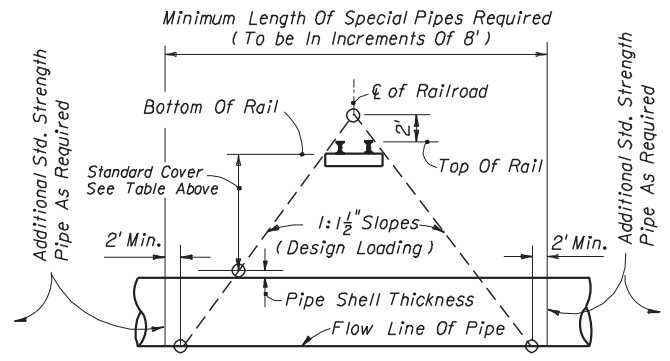
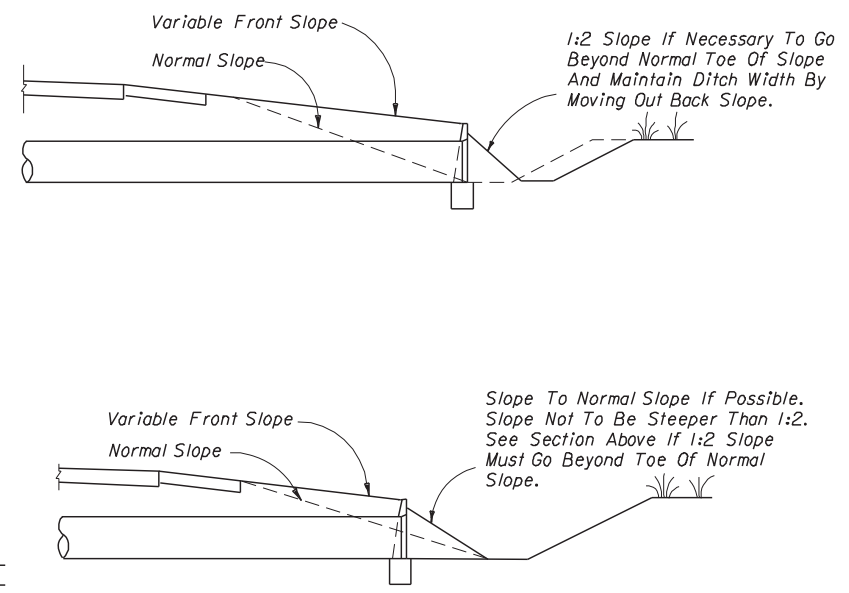


INLETS, MANHOLES OR JUNCTION BOXES ON INTEGRAL PRECAST CONCRETE RISER FOR CONCRETE PIPE



Use Larger Value Of Either:
 1. $L = 10 \times H$ (No Maximum)
 2. $L = 10 \times \text{Ditch Offset}$ (Maximum $L = 100'$)

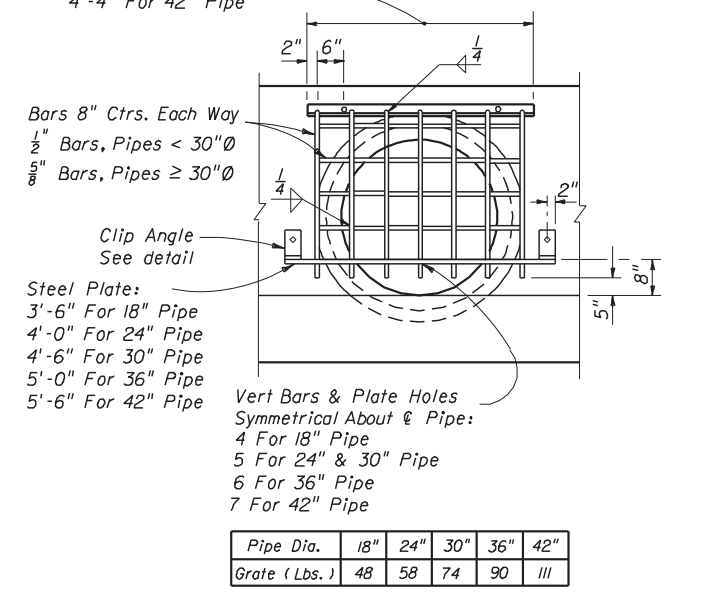
METHOD FOR SETTING LIMITS OF VARIABLE FRONT SLOPES AT DRAINAGE STRUCTURES



METHOD FOR DETERMINING THE LENGTH OF SPECIAL PIPE REQUIRED UNDER RAILROADS

RAILROAD COMPANY	CLEARANCE BELOW BOTTOM OF RAIL (FEET)	STRENGTH ASTM (C76) CLASS
Apalachicola Northern	4.0	IV
Atlanta And St. Andrews Bay	4.0	IV
Florida East Coast	5.5*	IV
Burlington Northern Railroad	S-TRK M/L	IV
	4.5 5.5	
CSX Transportation, Inc.	5.5	IV
Southern Railway System		
Georgia Southern And Florida	5.5	V
Live Oak Perry And South Georgia	5.5	V
St. Johns River Terminal	5.5	V

*Clearance is for casing pipe. All subgrade carrier pipelines and wirelines will be installed within a casing pipe which will extend from Right-of-Way line to Right-of-Way line.



GUARD AT PIPE ENDS

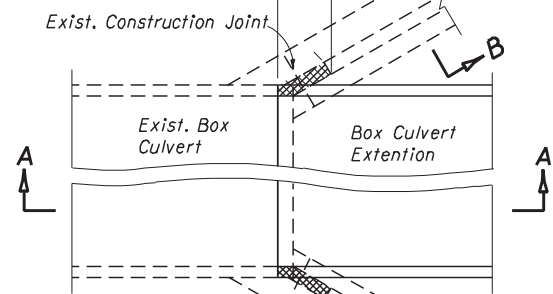
Note: Guards to be constructed only at locations specifically called for in plans. Guard, plate & clips, bolts, nuts and sleeves to be included in the contract unit price for Endwall Grate, LB.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

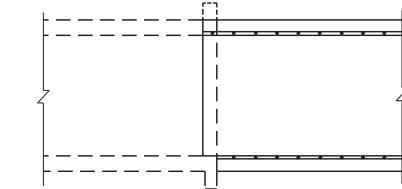
MISCELLANEOUS DRAINAGE DETAILS

Names	Dates	Approved By
Designed By		<i>A. A. McHenry</i> State Drainage Engineer
Drawn By		Revision
Checked By		Sheet No. 2 of 4
		Index No. 280

Remove Headwall, Outside Wall And Wingwall From Inside Face Of Headwall Sufficient To Construct Culvert Extension. Longitudinal Reinforcing Steel To Be Cleaned, Straightened And Extended Into Culvert Extension.

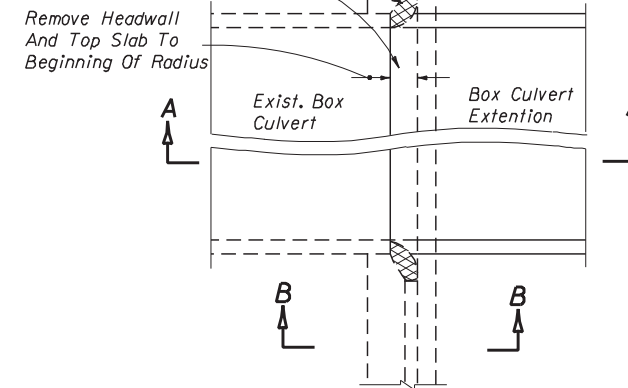


Tie-In Length
Length For Manually Estimated Or Computerized Quantities (Coding And Printout Lengths)
Culvert Extension (Length Tabulated On Drainage Structures And Summary Sheet For Standard Box Section Extension)



SECTION AA

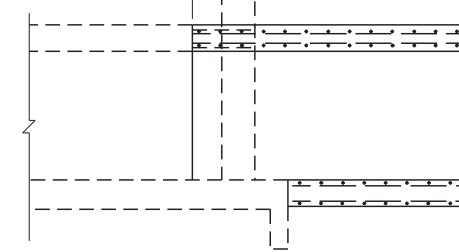
Longitudinal Reinforcing Steel In Top Slab And Wall Return To Be Cleaned, Straightened And Extended Into Culvert Extension.
Remove Wall And Headwall To Construction Joint



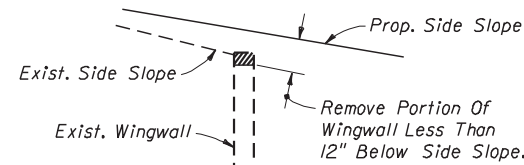
OUTSIDE WALLS-SINGLE, DOUBLE, TRIPLES, & QUADRUPLE BOXES

Length For Manually Estimated Or Computerized Quantities (Coding And Printout Lengths)

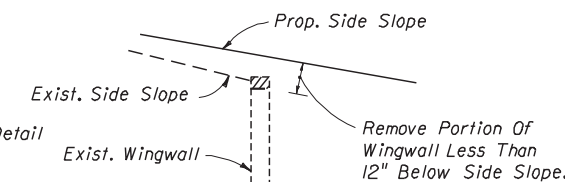
Tie-In Length
Culvert Extension (Length Tabulated On Drainage Structures And Summary Sheet For Standard Box Section Extension)



SECTION AA

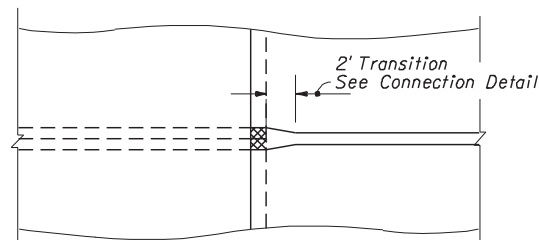


SECTION BB

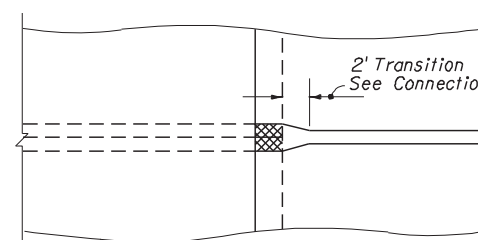


SECTION BB

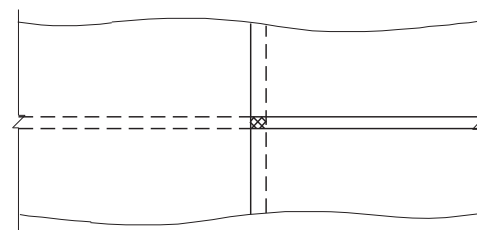
OUTSIDE WALLS-SINGLE, DOUBLE, TRIPLES, & QUADRUPLE BOXES



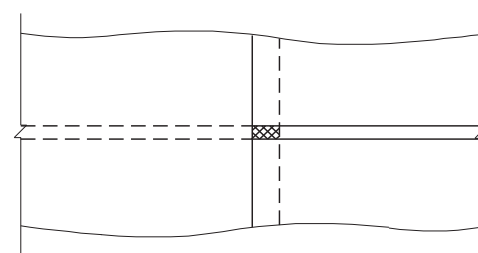
CENTER WALL-QUADRUPLE BOXES



CENTER WALL-QUADRUPLE BOXES



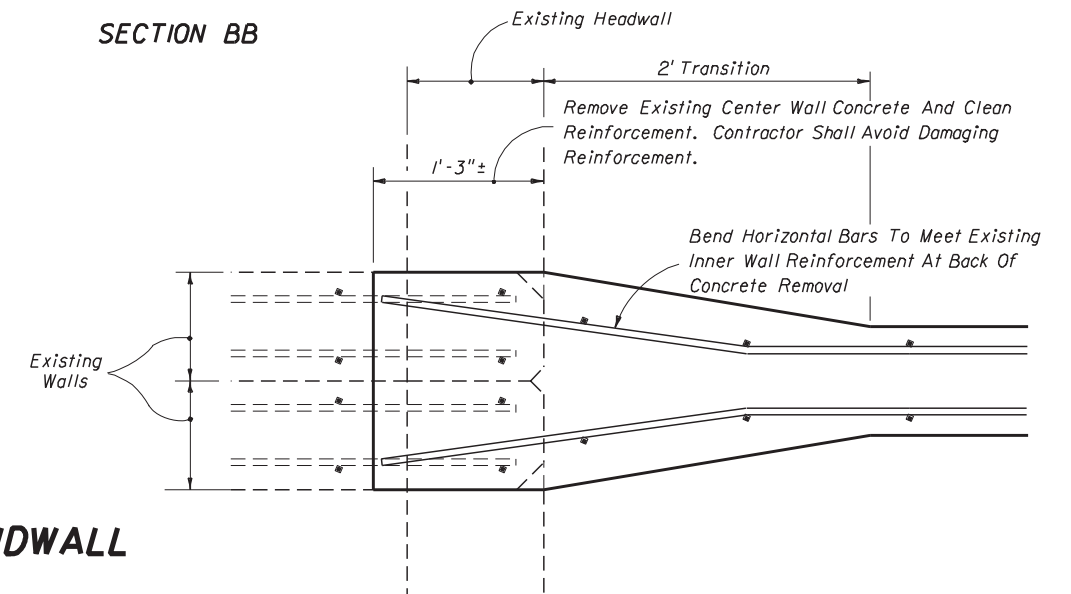
INTERIOR WALLS-DOUBLE & TRIPLE BOXES
INTERMEDIATE WALLS-QUADRUPLE BOXES



INTERIOR WALLS-DOUBLE & TRIPLE BOXES
INTERMEDIATE WALLS-QUADRUPLE BOXES

PLAN VIEWS

STRAIGHT ENDWALL



CONNECTION AT CENTER WALL OF QUADRUPLE CULVERTS

PLAN VIEWS

FLARED ENDWALL

NOTE: The computerized printout for reinforcing steel does not include the additional lengths needed for extension and overlaps or connections to the horizontal reinforcement in the interior walls of double, triple and quadruple existing concrete box culverts; the cost for additional reinforcement and the thickened concrete wall in the transitional area shall be included in the costs for constructing the tie-in.

Cost for removal and disposal of material from existing headwalls, wingwalls and the top slab, and cost of cleaning, straightening and extending longitudinal reinforcing steel shall be included in the cost for concrete and steel of the culvert extension.

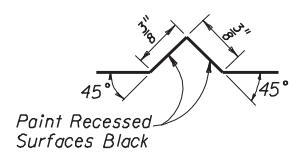
For concrete box culvert details, see Index No. 290.

CONNECTION DETAILS FOR CONCRETE BOX CULVERT EXTENSIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

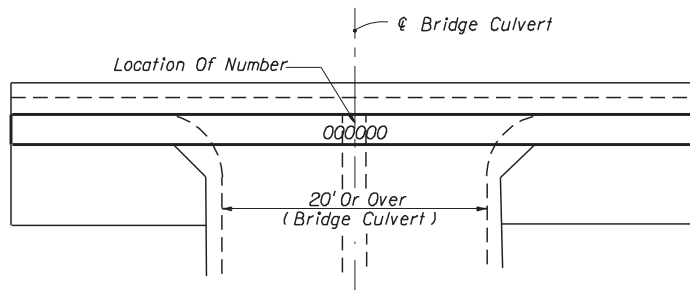
MISCELLANEOUS DRAINAGE DETAILS

Names	Dates	Approved By		
Designed By		S. A. McHenry State Drainage Engineer	Revision	Sheet No.
Drawn By			00	3 of 4
Checked By				Index No. 280



Black Plastic Figures 3" in height as approved by the Engineer may be used in lieu of numbers formed by $\frac{3}{8}$ " V Grooves. "V" Grooves shall be formed by preformed figures.

SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED FIGURES

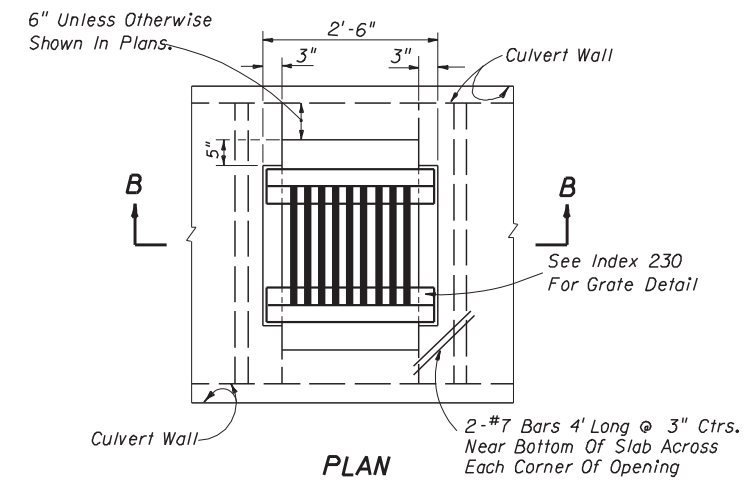
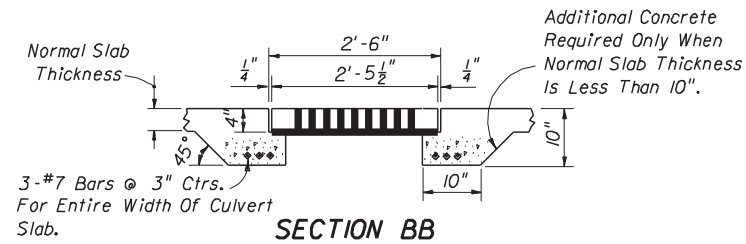


The number is to be placed in the center of the top surface of all bridge culvert headwalls.

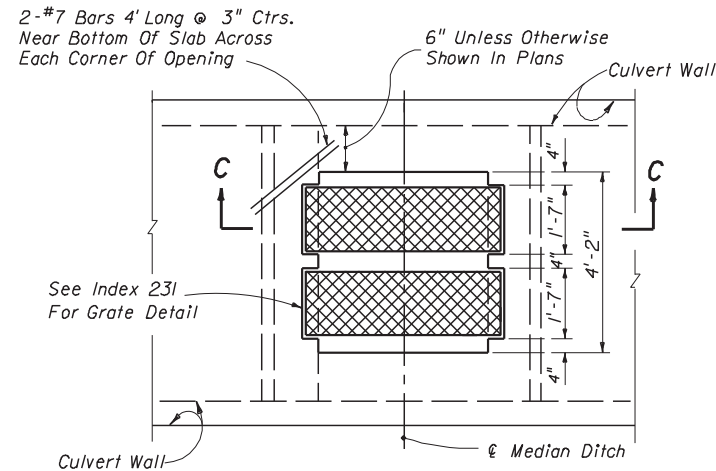
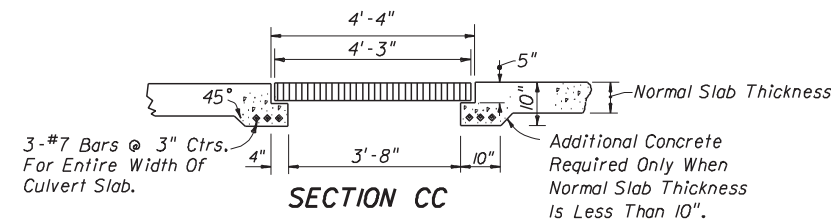
For Bridge Number See Plan-Profile Sheet(s).

TOP VIEW OF HEADWALL

BRIDGE CULVERT NUMBER LOCATION



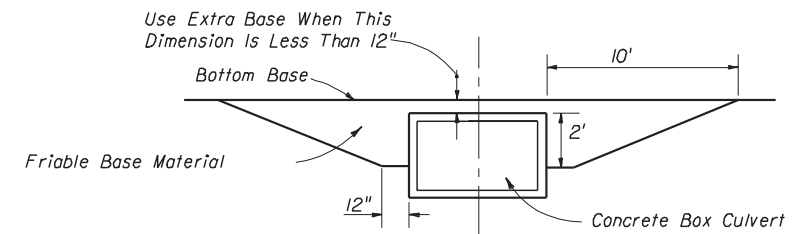
INLET TYPE A GRATE



INLET TYPE B GRATE

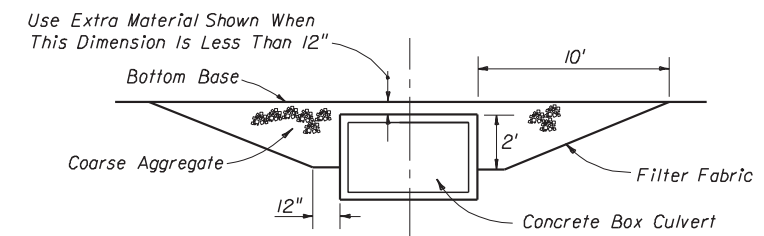
NOTE: 1. Cost of Steel Grating to be included in cost of Box Culvert.
2. All steel shall be 1 1/4" clear.

INLET IN TOP OF BOX CULVERT



The cost of furnishing and installing extra friable base material shall be included in the cost of the Box Culvert.

FRIABLE BASE



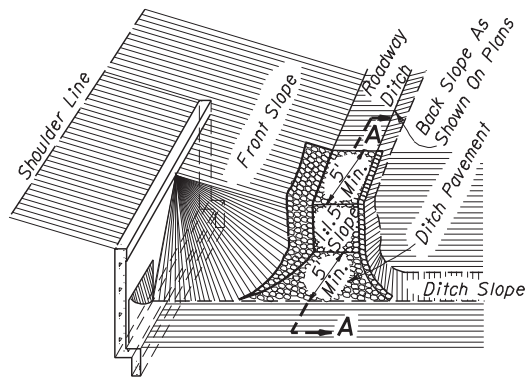
The coarse aggregate shall be placed in 6 inch lifts and compacted sufficiently as to be firm and unyielding. The coarse aggregate shall be gravel or stone meeting the requirements of Section 901-2 or 901-3 respectively. The gradation shall meet Section 901-6, Grades 4, 467, 5, 56, or 57 unless restricted in the plans. The filter fabric shall be Type D-3 (See Index 199). The cost of furnishing and installing the coarse aggregate and filter fabric shall be included in the cost of the Box Culvert.

ASPHALTIC CONCRETE BASE

NOTE: Extra base is required when cross box culverts are located on facilities subject to high speed traffic (> 45 mph) or high traffic volumes (> 1600 ADT) and the cover is within the range specified in the notation above.

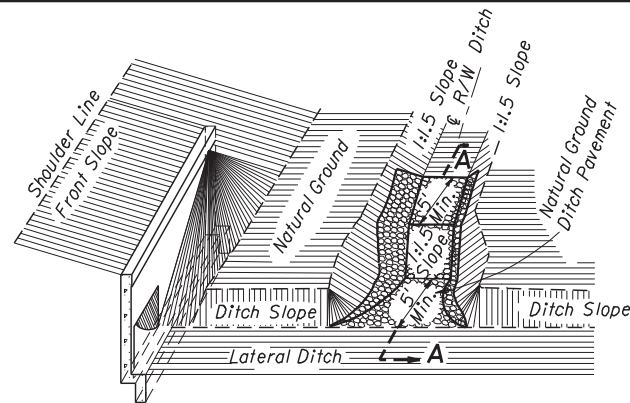
EXTRA BASE FOR CROSS BOX CULVERTS UNDER FLEXIBLE PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
MISCELLANEOUS DRAINAGE DETAILS				
Names	Dates	Approved By		
Designed By		S. A. McHenry State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	4 of 4	280

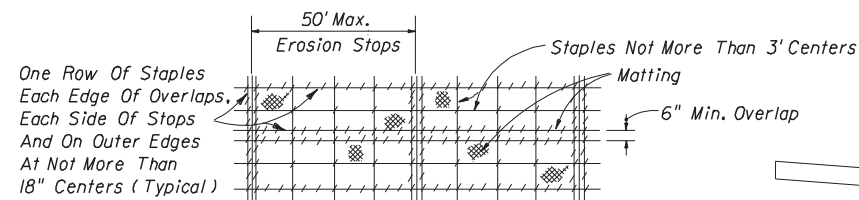


JUNCTION OF ROADWAY DITCH* AND LATERAL DITCH

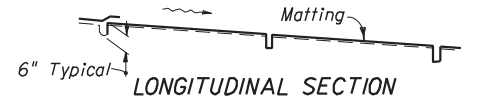
* Soil cement or misc. asphalt will not be permitted for this type of construction



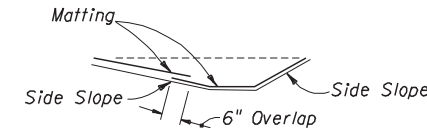
JUNCTION OF R/W DITCH* AND LATERAL DITCH



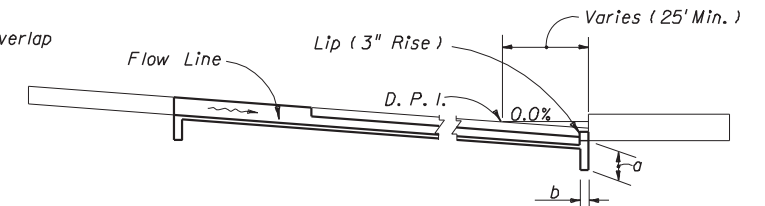
PLAN



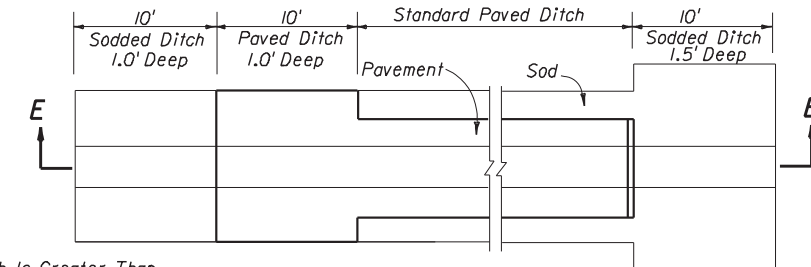
LONGITUDINAL SECTION



SECTION MATTING FOR DITCH



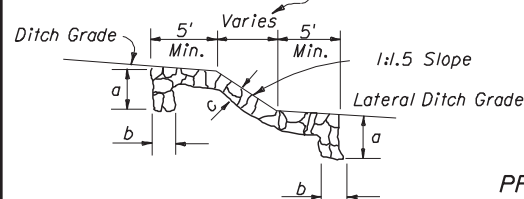
SECTION EE



PLAN

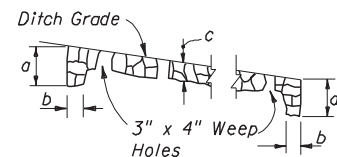
PAVED DITCH END TREATMENT

Do Not Construct Weep Holes In This Area Or 5' Upstream

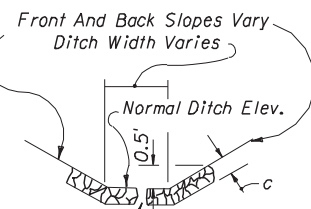


SECTION AA

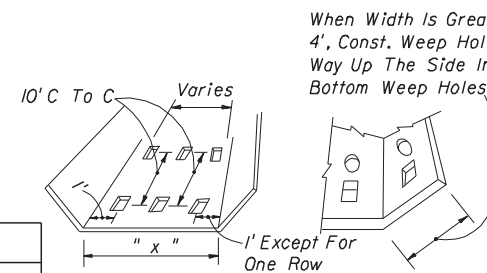
PROFILE OF DITCH PAV'T AT LOCATIONS OTHER THAN JUNCTION WITH LATERAL DITCH



TYPICAL SECTION



DITCH PAVEMENT								
Pavement Type	Dimensions			Payment Unit	Basis Of Estimate	Filter Fabric Type	Velocity Range	References & Remarks
	a	b	c					
Concrete	24"	6"	3"	SY	SY	D-6	Low-High	Section 524 of the Standard Specifications.
Miscellaneous Asphalt	24"	12"	4"	TN	0.2 TN/SY	None	Low-Moderate	Section 339.
Soil-Cement	24"	12"	4"	SY	SY	None	Low	Section 170.
Riprap (Sand-Cement)	24"	12"	4"	CY	0.11 CY/SY	D-4	Low-Moderate	Section 530. Grouting of joints required.
Riprap (Ditch Lining)				TN	TN	D-2	Moderate-High	Section 530



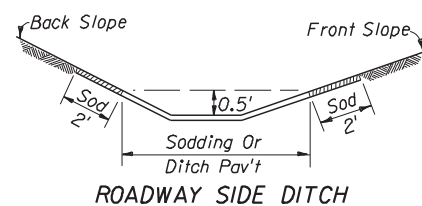
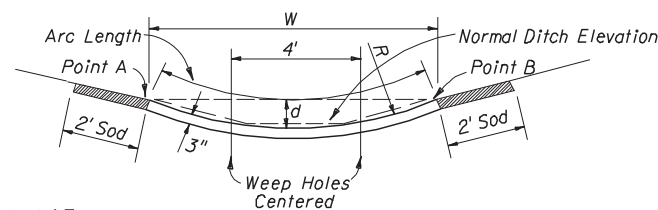
When "x" = 1' To 4' Const. 1 Row (Centered)
 "x" = 5' To 7' Const. 2 Rows
 "x" = 8' To 12' Const. 3 Rows
 "x" = 13' To 17' Const. 4 Rows
 "x" = 18' To 22' Const. 5 Rows

GENERAL NOTES

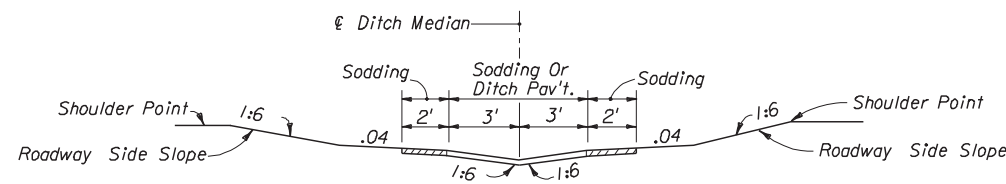
- Type of ditch pavement shall be as shown on plans.
- In concrete ditch pavement, contraction joints are to be spaced at 25' maximum intervals, or as directed by the Engineer. Contraction joints may be either formed (construction joint) or toled. No open joints will be permitted.
- Lip at end of ditch pavement shall normally be located downstream of D.P.I. or on flatter grades where there is a decrease in ditch velocity.
- Toewalls are to be used with all ditch paving. A toewall is not required adjacent to drainage structures.
- When directed by the Engineer, weep hole spacing may be reduced to 5' minimum.
- For junction of R/W ditch spillway and lateral ditch, sides of paving to be 1' high minimum.
- For ditch pavements requiring filter fabric the fabric shall be placed directly beneath the pavement for the entire length and width of the pavement. When weep holes with aggregate are used the filter fabric shall be placed below the aggregate to form a mat continuous with or underlapping the pavement fabric. (See Index 199 for fabric type and application).
- Ditch pavement requiring reinforcement shall be detailed in the plan.
- Cost of plastic filter fabric to be included in the contract unit price for ditch pavement.

Notes: All weep holes to be 3" x 4" rectangle or 4" or 5" dia. circular hole. 1/2 cu. ft. (12" x 12" x 6") of No. 6 aggregate to be placed under each hole. 1 sq. ft. of galvanized wire mesh (1/4" openings) shall be placed between the aggregate and the concrete. Cost of holes, aggregate and wire mesh to be included in the cost of ditch pavement.

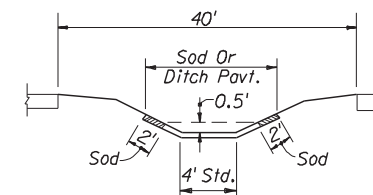
WEEP HOLE ARRANGEMENT



ROADWAY SIDE DITCH



SWALED MEDIAN (No Weep Holes)



40' MEDIAN

TO REPLACE:

	W	d	No. Of Rows Of Weep Holes	Arc Length
6' Median Swale 1:6 Front Slopes; 1:4 Back Slope	6'	.24'	19'	6.0
5' B.W. Ditch	10'	.67'	19'	10.1
4' B.W. Ditch	9'	.54'	19'	9.1
1:4 Front Slopes & Back Slope				
5' B.W. Ditch	9'	.74'	14'	9.2
4' B.W. Ditch	8'	.58'	14' (1 in center)	8.1

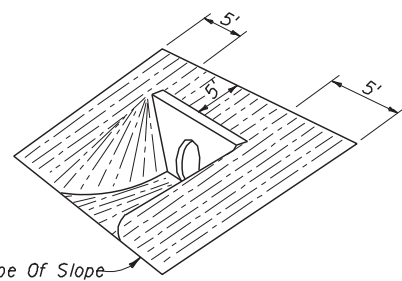
ALTERNATE DITCH PAVEMENT

For use only where side slopes are 1:4 or flatter. Point "A" and "B" are to be the same elevation and should be used to locate the paved section.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

DITCH PAVEMENT & SODDING

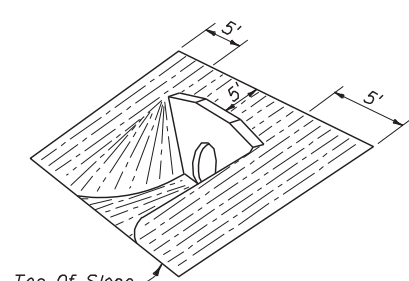
Names	Dates	Approved By		
Designed By		S. A. McHenry State Drainage Engineer	Revision	Sheet No.
Drawn By			00	1 of 2
Checked By				281



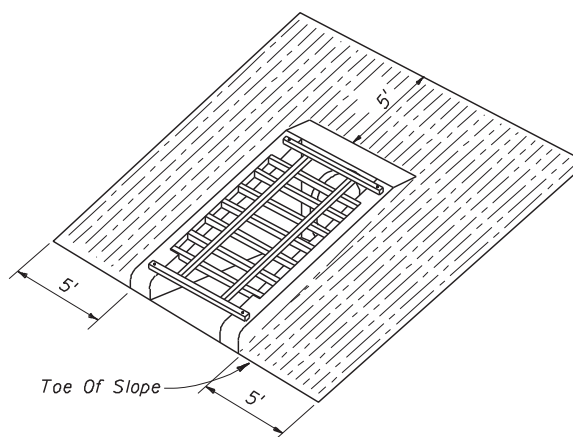
Toe Of Slope

Note: Sodding quantities for each endwall to be determined by the designer from this detail.

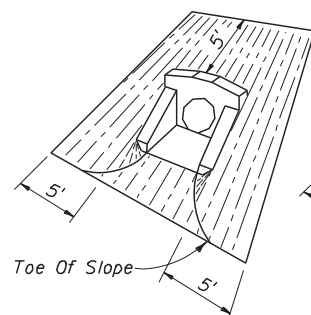
(EXCEPT INDEX 250)
STRAIGHT ENDWALL



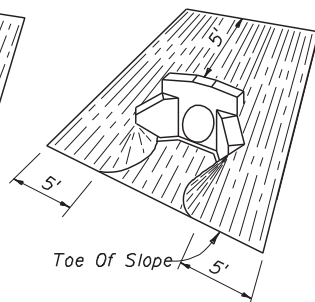
**STRAIGHT ENDWALL
INDEX 250**



**U - TYPE ENDWALL
INDEX 261**

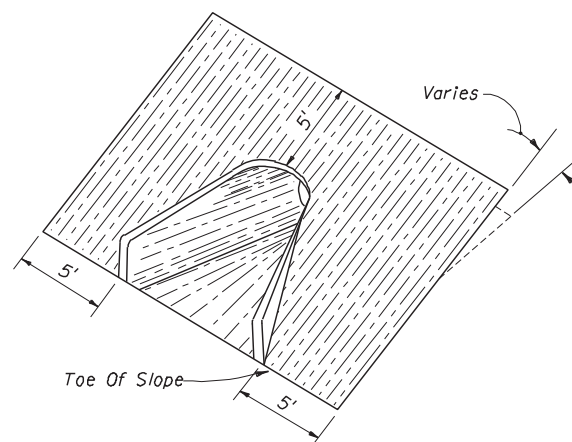


U - TYPE WINGS

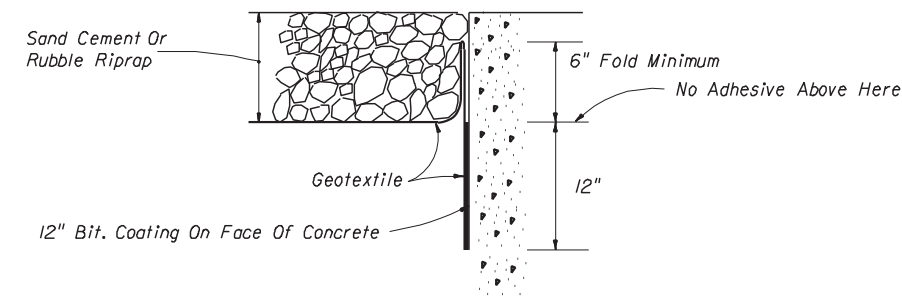


45° WINGS

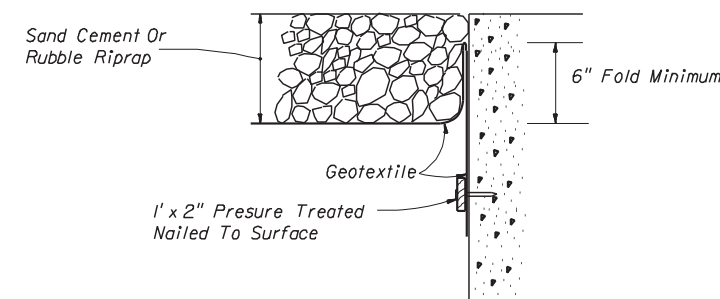
**WINGED ENDWALLS
INDEX 266**



**FLARED END SECTION
INDEX 270**



BONDED OPTION



NAILED OPTION

Note: Either option maybe used unless otherwise called for in the plans.

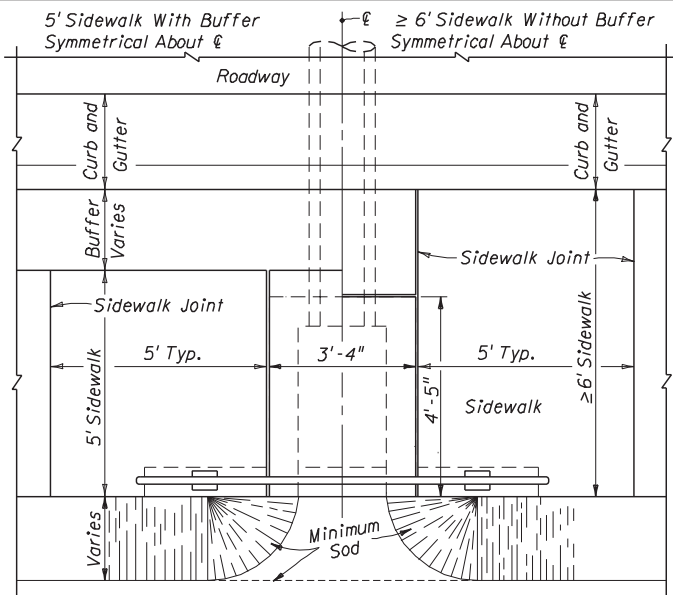
GEOTEXTILE PLACEMENT AT CONCRETE STRUCTURE

SODDING QUANTITIES (S. Y.)																						
PIPE SIZE	INDEX 250												INDEX 261				INDEX 266				INDEX 270	
	SLOPE												SLOPE				SLOPE					ALL SLOPES
	1: 2			1: 3			1: 4			1: 6			1: 2	1: 3	1: 4	1: 6	1: 2	1: 3	1: 4	1: 6		
	PIPES												PIPES				PIPES					
	1	2	3	1	2	3	1	2	3	1	2	3	1	1	1	1	1	1	1	1	1	
12"													13 (15)	16	17	23	14	15	18	22	10	
15"	19	21	24	22	26	29	26	30	33	34	38	43	15	17	20	25	15	17	20	25	11	
18"	21	24	27	25	29	33	30	34	38	39	44	50	14 (16)	17	19	25	16	18	22	28	11	
21"																					12	
24"	26	30	34	32	37	42	38	44	50	50	58	66	15 (17)	19	21	28	19	22	26	34	14	
27"																					15	
30"	31	37	42	39	46	53	46	55	63	62	74	85	17 (18)	21	24	32	21	25	30	40	16	
36"	37	44	52	46	56	65	56	67	79	76	91	107					24	29	35	47	18	
42"	43	53	62	55	67	79	67	82	96	91	111	132					27	32	39	54	19	
48"	50	62	73	64	79	93	78	97	115	108	133	158					30	36	44	61	21	
54"	57	71	85	74	92	110	91	113	136	126	157	188									21	
60"																					22	
66"																					25	
72"																					26	

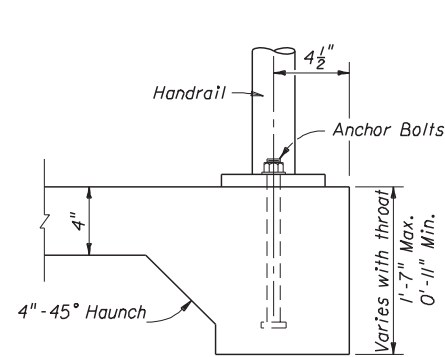
() Endwall With Baffles

SODDING

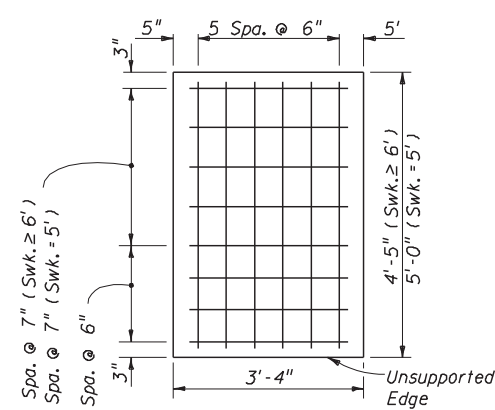
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DITCH PAVEMENT & SODDING				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	08/85	S. A. McHenry State Drainage Engineer	
Checked By	JBW/JVG	09/85	Revision	00
			Sheet No.	2 of 2
			Index No.	281



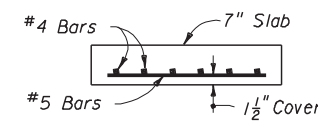
PLAN



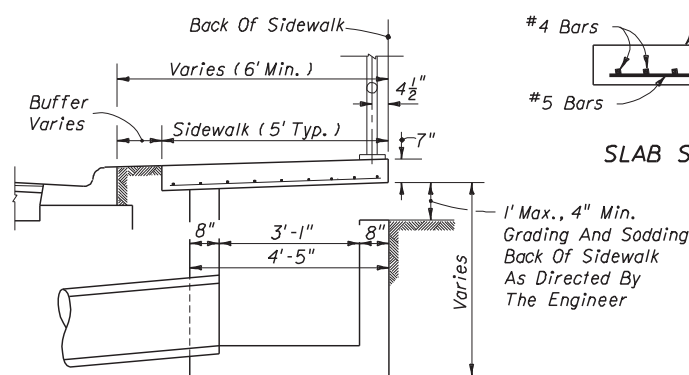
SECTION BB



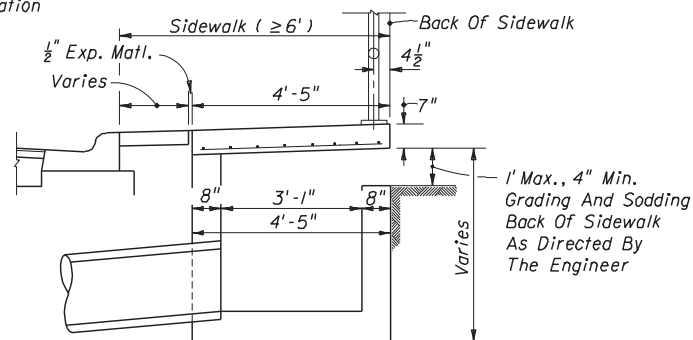
SLAB REINFORCEMENT



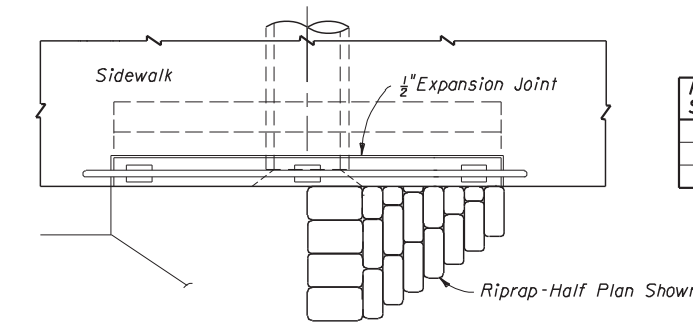
SLAB SECTION



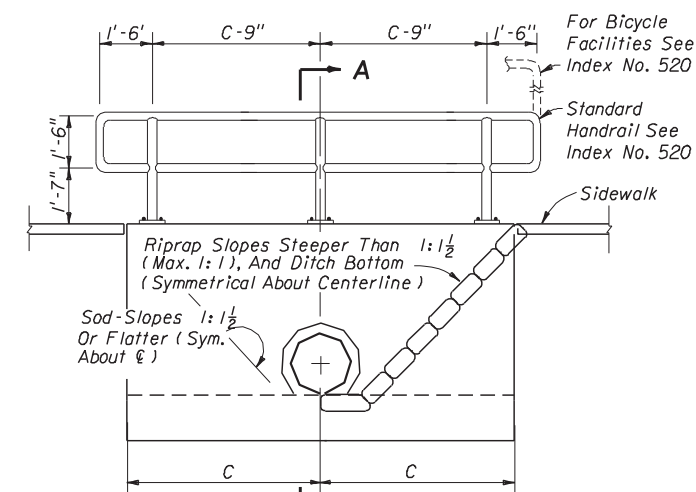
5' SIDEWALK SECTION AA



>= 6' SIDEWALK SECTION AA

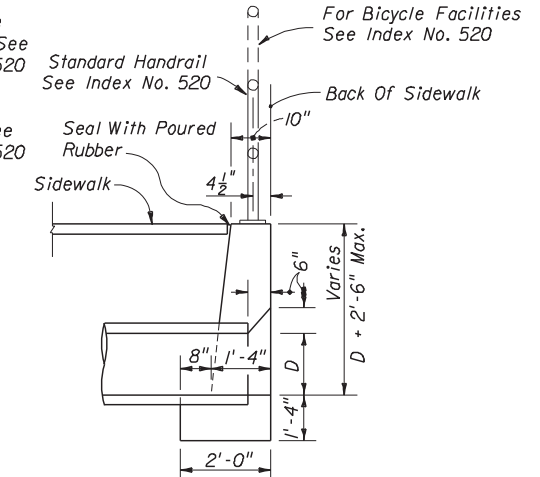


PLAN



FRONT ELEVATION

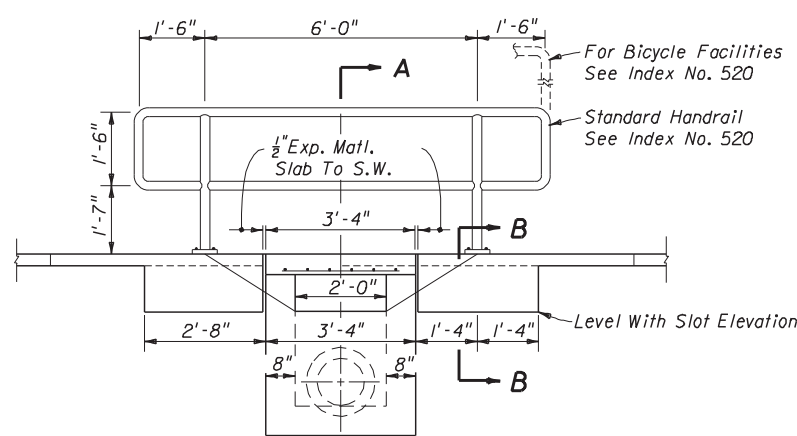
Pipe Size	C	Conc. - CY	Riprap - CY (Sand - Cement)
15"	4'-9"	2.27	1.1
18"	5'-3"	2.59	1.3
24"	6'-3"	3.26	1.8



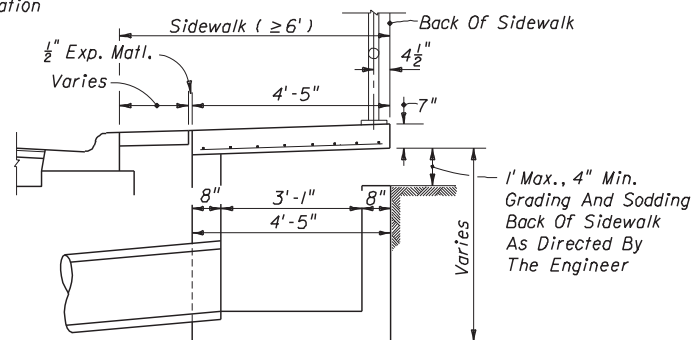
SECTION AA

- Notes:
1. Maximum pipe size shall be 24" diameter.
 2. Grading back of sidewalk varies and shall be done as directed by the Engineer.
 3. Concrete quantities shown are for maximum wall heights, and shall be basis for estimate and payment.
 4. Riprap quantities shown are for estimate purposes only. Cost of riprap to be included in cost of the endwall.
 5. Endwalls to be paid for under the contract unit price for Conc. Class I (Endwalls), CY. Handrail to be paid for under the contract unit price for Pipe Handrail, (Material), LF.

SPECIAL CONCRETE ENDWALL



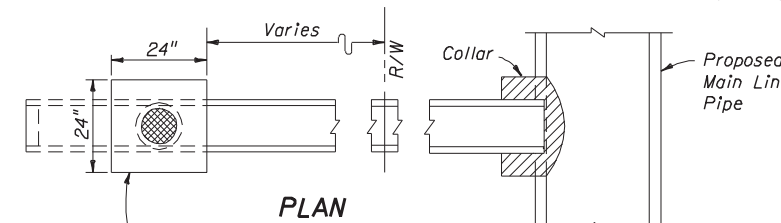
FRONT ELEVATION



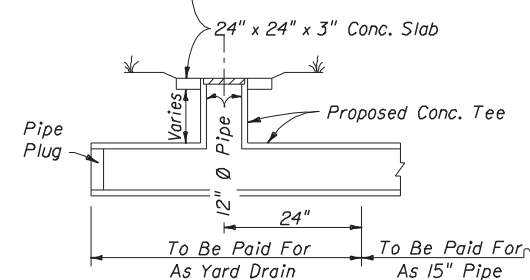
>= 6' SIDEWALK SECTION AA

INLET TYPE C (MODIFIED)

- Notes:
1. For additional details see Index No. 232.
 2. Inlet to be paid for under the contract unit price for Inlets (Ditch Bottom Type C Modified), EA. Handrail to be paid for under the contract unit price for Pipe Handrail, (Material), LF.



PLAN



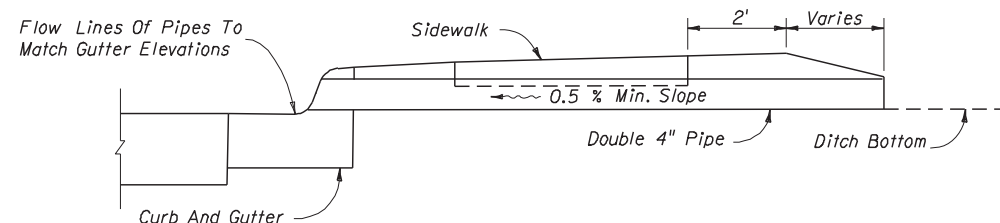
ELEVATION

YARD DRAIN ITEM INCLUDES :

1. 15" x 15" x 12" Conc. Tee 4' long.
2. One (1) Grate-Neenah No. R-4030, Phoenix No. P-1058, U.S. Foundry No. 5605 or equivalent.
3. 12" Conc. pipe as necessary.
4. 0.04 Cu. yds. conc. for slab.

- Notes:
1. Yard drains to be located outside the R/W. Drainage area should not exceed 750 S.F. (grate flow 0.1 Cfs).
 2. Yard drains may be constructed at the option of the property owner as shown on the plans.
 3. Cost of plugs and collars to be included in the cost for 15" concrete pipe. For collar and plug details see Index No. 280.
 4. Yard drains to be paid for under the contract unit price for Yard Drains, EA.

YARD DRAINS



SHALLOW DITCHES

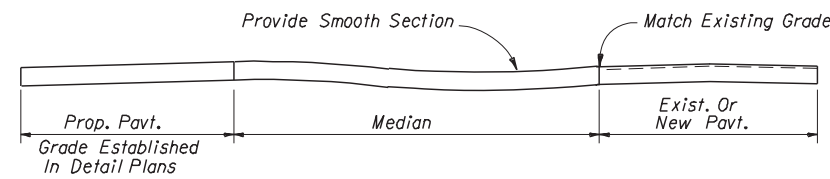
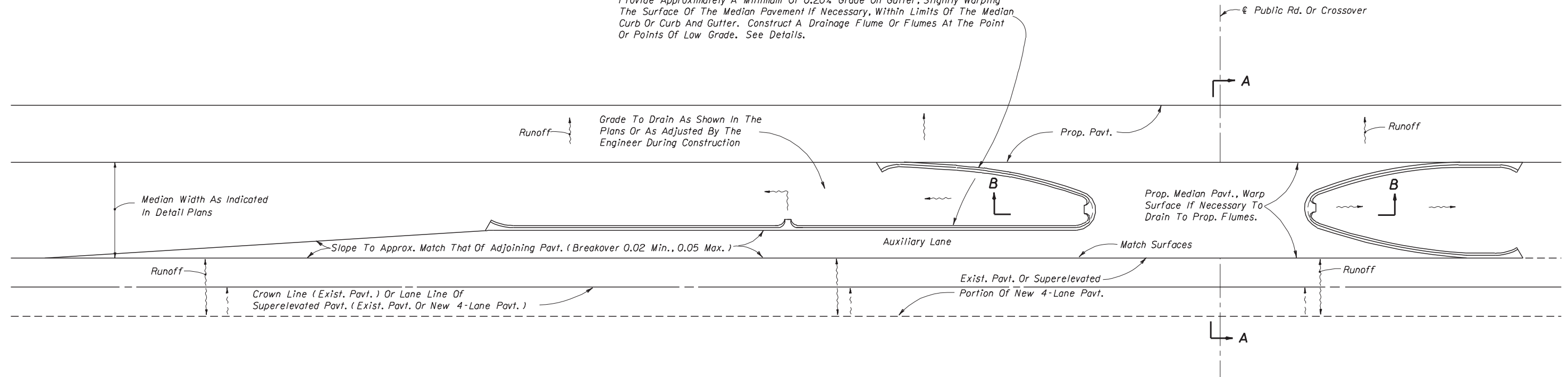
- Notes:
1. To be constructed at locations as directed by the Engineer.
 2. Either cast iron pipe or PVC rigid conduit, U.L. listed for direct sunlight exposure, Schedule 40, may be used.
 3. Pipe to be paid for under the contract unit price for either Cast Iron Soil Pipe (Standard) (4"), LF or Polyvinyl Chloride Pipe Culvert (4"), LF.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

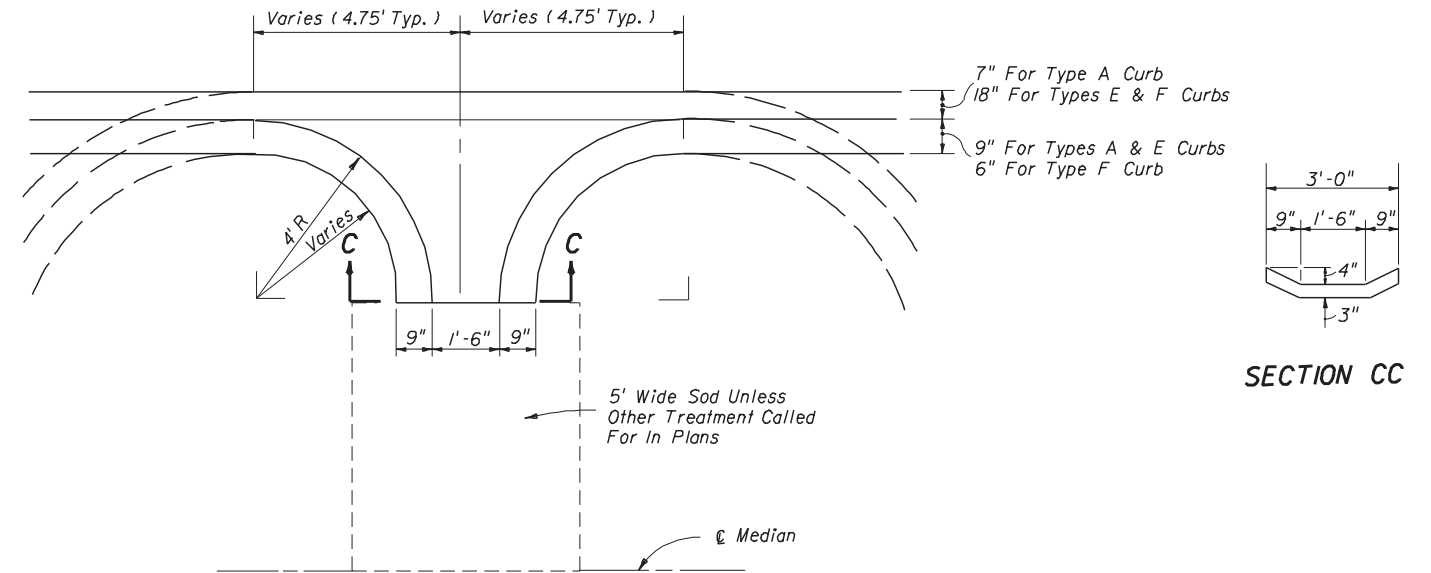
BACK OF SIDEWALK DRAINAGE

Names	Dates	Approved By
Designed By		S. A. McHenry State Drainage Engineer
Drawn By		
Checked By		
Revision	00	Sheet No. 1 of 1
		Index No. 282

Provide Approximately A Minimum Of 0.20% Grade On Gutter, Slightly Warping The Surface Of The Median Pavement If Necessary, Within Limits Of The Median Curb Or Curb And Gutter. Construct A Drainage Flume Or Flumes At The Point Or Points Of Low Grade. See Details.



SECTION AA



FLUME DETAIL



SECTION BB

(May Drain From Any Point Designated In The Plans Or As Adjusted By The Engineer During Construction)

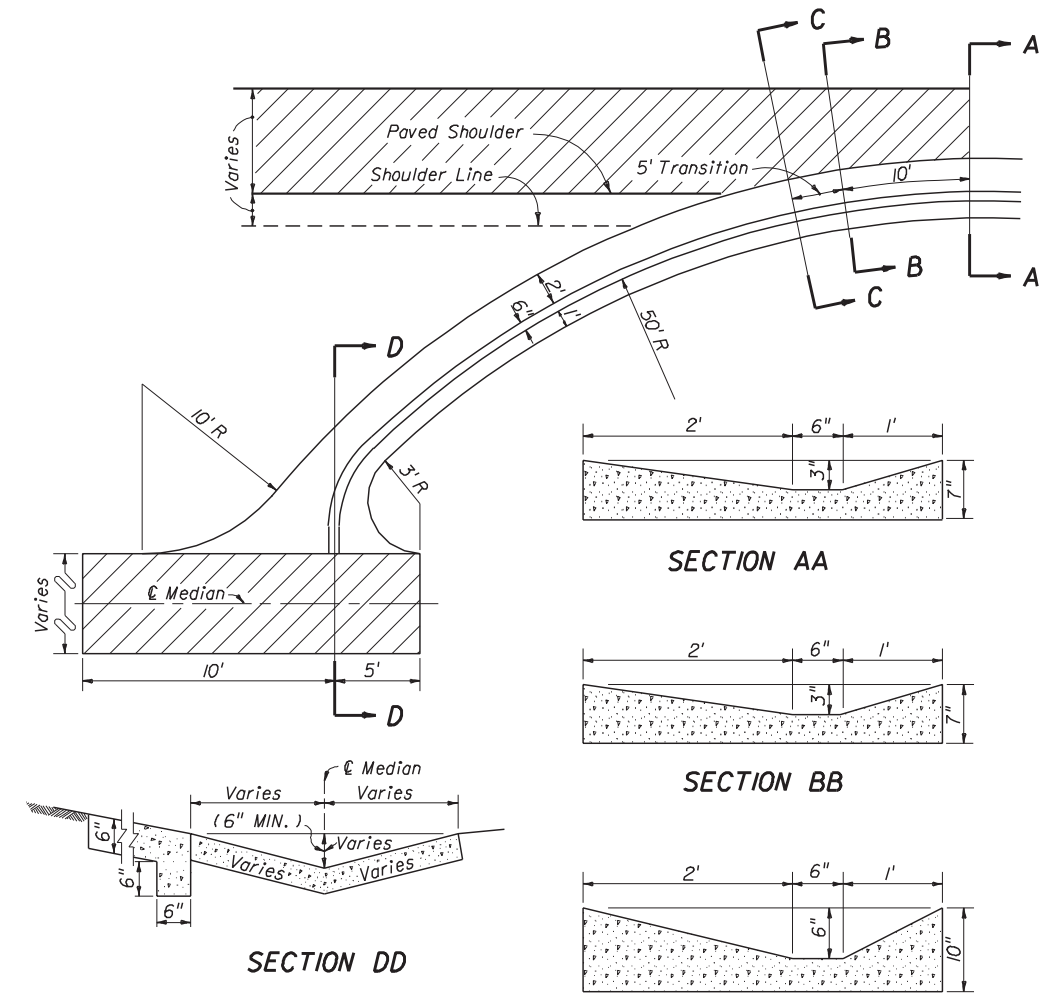
GENERAL NOTES

1. These details are to apply to projects which provide for the conversion of 2-lane sections to 4-lane divided highway sections and for superelevated sections of new 4-lane divided highways. Layout above is illustration only. Cost of flumes to be included in the contract price for Curb or Curb and Gutter. Sod to be paid for under the contract unit price for Sodding, SY.
2. Flumes to be located in low point of noses and at other points as designated in the plans. The locations may be adjusted by the Engineer during construction.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

MEDIAN OPENING FLUME

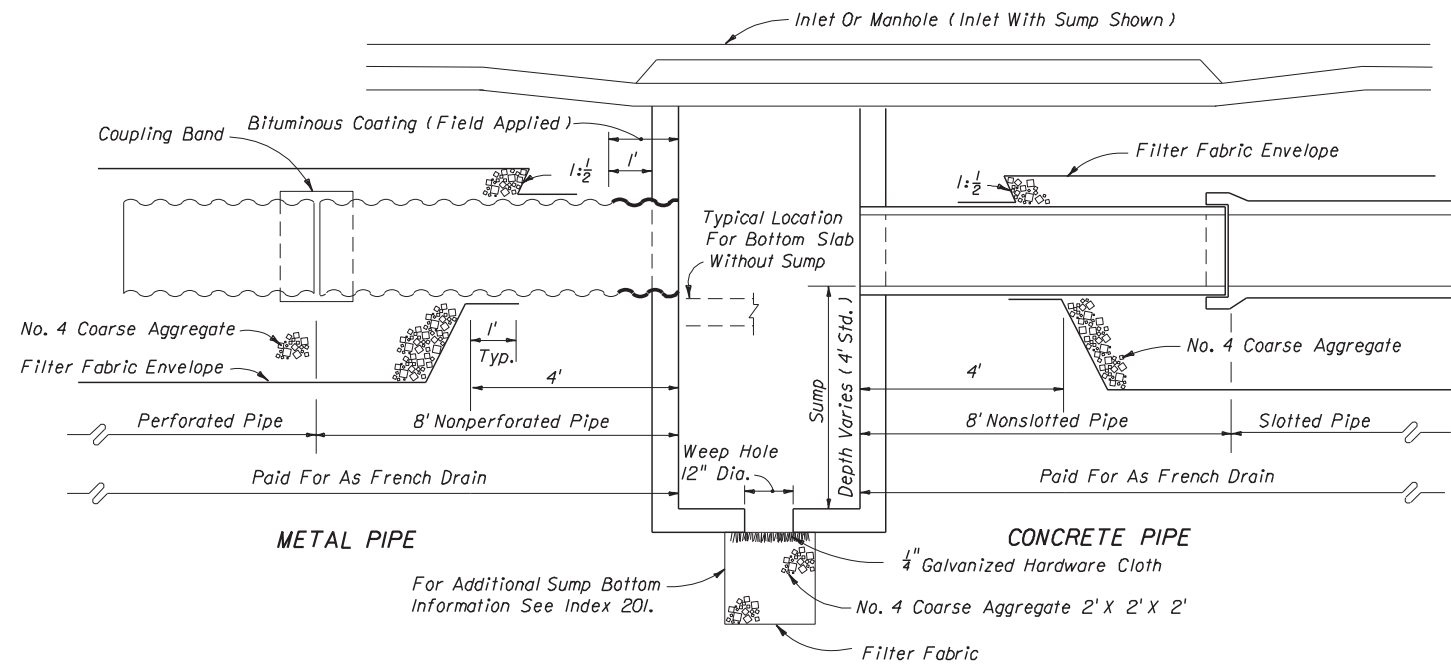
Names	Dates	Approved By		
Designed By	CHR	03/59	A. A. McHenry State Drainage Engineer	
Drawn By			Revision	Sheet No.
Checked By	CDD	03/59	00	1 of 1
				283



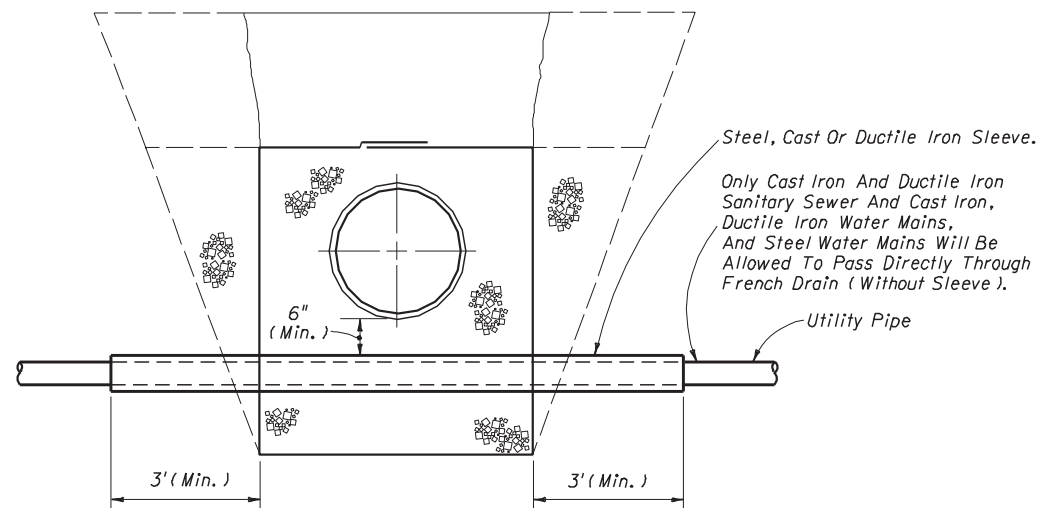
1. Spillway to be paid for as shoulder gutter.
2. If spillway empties into a shallow or median ditch, the detail should be modified as necessary.

DETAIL OF CONC. SPILLWAY AT END OF SHOULDER GUTTER
 (TO BE USED WHERE INLETS, PIPES & ENDWALLS ARE IMPRACTICAL)

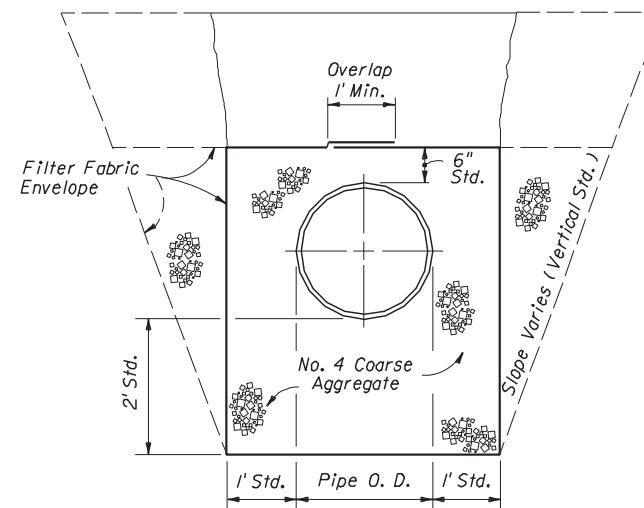
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE SPILLWAYS SHOULDER GUTTER SPILLWAY				
Names	Dates	Approved By		
Designed By		<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	284



LONGITUDINAL SECTION



ROUND PIPE SHOWN
UTILITY PIPES THRU FRENCH DRAIN



ROUND PIPE SHOWN
STANDARD CROSS SECTION (ENLARGED)

FRENCH DRAIN SYSTEM

GENERAL NOTES

1. Pipe shall be any of the optional types permitted in Section 443 of the Specifications unless otherwise restricted in the plans. Dissimilar types of pipe will not be permitted in a continuous run of pipe.
2. Concrete pipe shall be placed with the slots positioned on sides.
3. Alignment joints are standard (gaskets not required). Recorrugation of metal pipe ends not required.
4. The contractor may submit other methods of providing slots having equal or greater area of opening, for approval by the Engineer.
5. Filter fabric shall be Subsurface Drainage type meeting the requirements of Section 985. All filter fabric joints shall lap a minimum of one (1) foot.
6. The standard cross section shall be constructed unless other section(s) described or detailed in the plans.
7. For supplemental details see Index No. 280.
8. The contractor shall take the necessary precautions to prevent contamination of the trench with sand, silt and foreign materials.
9. The 12" diameter weep hole shall be eliminated, when the bottom of the inlet is below the normal water table, unless otherwise shown in the plans.
10. French drains following the typical cross section shall be paid for under the contract unit price for French Drains, LF. The unit price shall include the cost of pipe, pipe plugs, pipe fittings, coarse aggregate and filter fabric in place, and the cost for trench excavation, backfill and compaction. The unit price shall also include the cost for disposal of surplus excavated materials and cost for restoration of pavement removed or damaged by french drain construction, but shall not include payments for items paid for elsewhere.

French drains with a significantly different cross section shall be paid for under the contract unit prices for separate items as follows:

- (a) Slotted or Perforated Pipe Culvert, LF. Unit price shall include cost for pipe, pipe plugs and fittings in place.
- (b) Ballast Rock (French Drain Aggregate), CY. Unit price shall include cost for coarse aggregate in place, and cost for trench excavation, backfill and compaction. The unit price shall also include the cost for disposal of surplus excavated materials and cost for restoration of pavement removed or damaged by french drain construction, but shall not include payment for items paid for elsewhere.
- (c) Plastic Filter Fabric (Subsurface), SY. Unit price shall be for cost of fabric in place. Quantity shall be determined by plan neat dimensions of the fabric envelope.

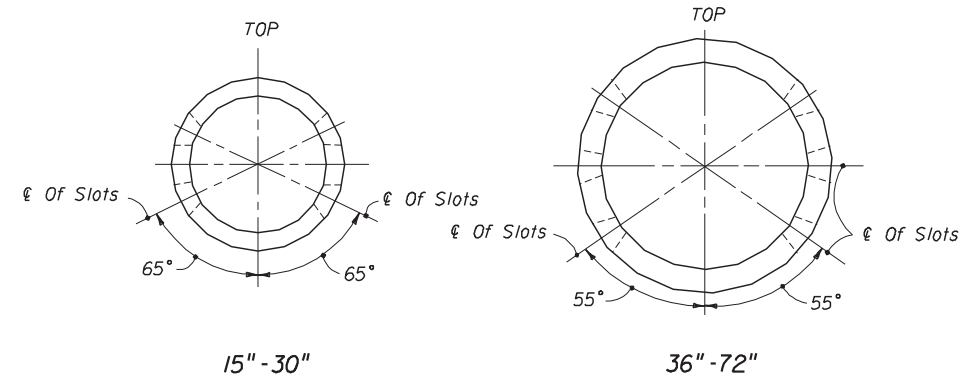
DESIGN NOTES

1. Pipe invert should be at or above the water table whenever possible.
2. French drains with minor dimensional changes or otherwise different from the standard cross-section shall be either described or detailed in the plans.
French drains with significantly different cross-sections shall be detailed in the plans.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

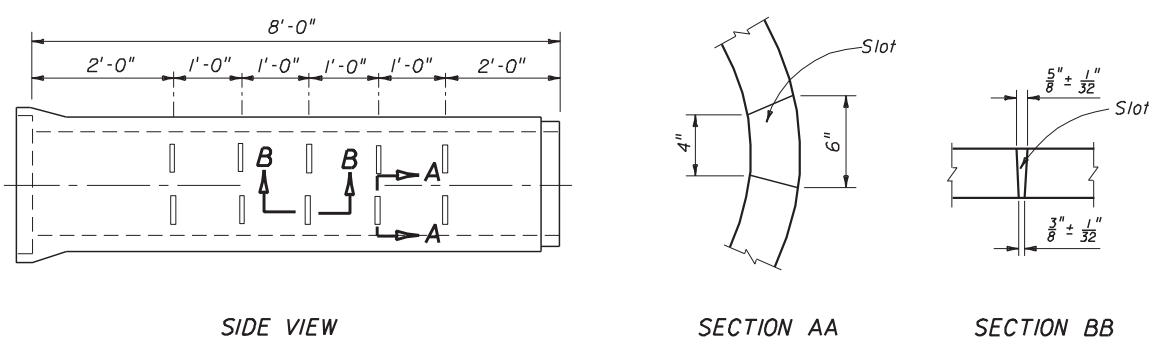
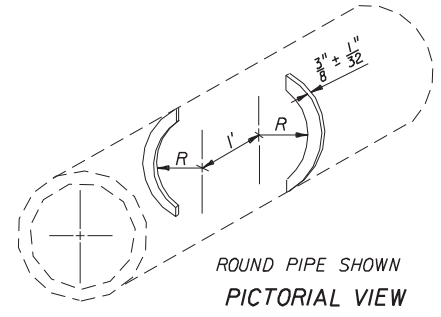
FRENCH DRAIN

Names	Dates	Approved By		
Designed By	MPS 09/83	S. A. McHenry State Drainage Engineer		
Drawn By	RWR 09/83	Revision	Sheet No.	Index No.
Checked By	EGR 09/83	00	1 of 2	285

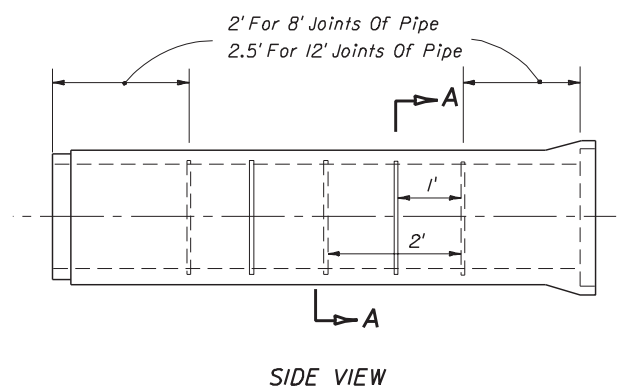
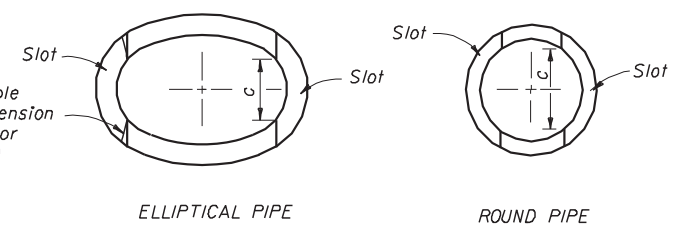


ELLIPTICAL PIPE		
Pipe Size	Slot Cut	
	Opening c	
	Min.	Max.
14"x23"	10"	12"
19"x30"	14"	16"
24"x38"	14"	16"
29"x45"	20"	22"
34"x53"	20"	22"
38"x60"	20"	22"

ROUND PIPE		
Pipe Size	Slot Cut	
	Opening c	
	Min.	Max.
15"	12"	14"
18"	12"	14"
24"	16"	18"
30"	16"	18"
36"	22"	24"
42"	22"	24"
48"	22"	24"
54"	24"	26"
60"	24"	26"
66"	24"	26"
72"	24"	26"



A curved cut is acceptable provided the control dimension is maintained (Typical For Elliptical & Round Pipe)



SIDE VIEW
SECTION AA
SECTION BB
OPTION A - ROUND PIPE

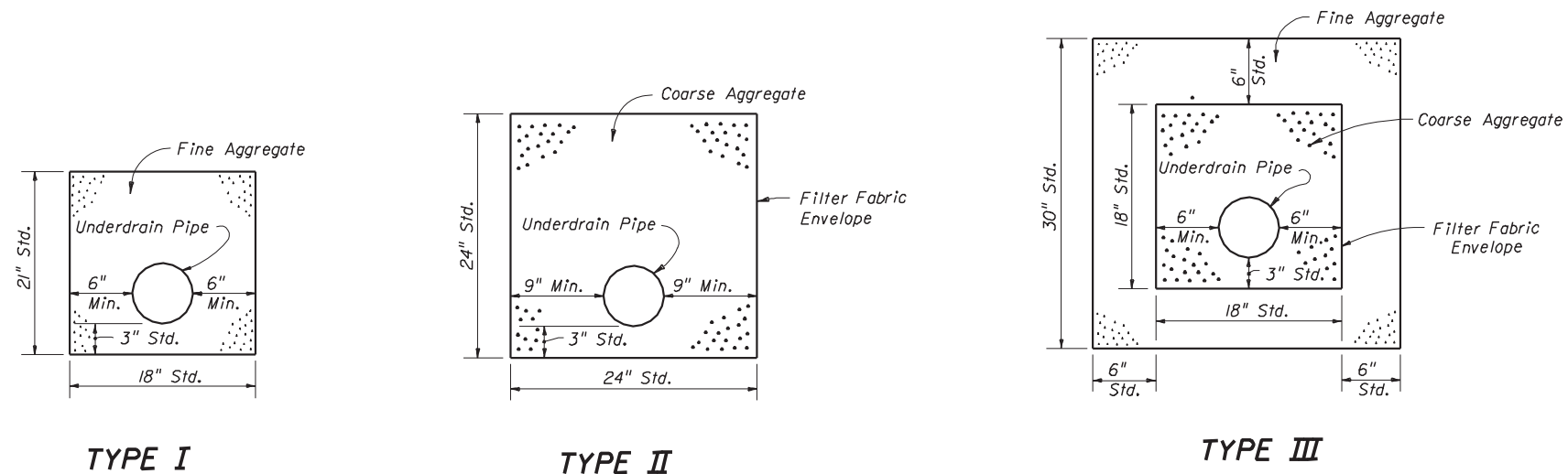
ELLIPTICAL PIPE
ROUND PIPE
SECTION AA
SECTION BB
OPTION B - ROUND OR ELLIPTICAL PIPE

SLOTTED PIPE OPTIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
FRENCH DRAIN				
Designed By	Names	Dates	Approved By <i>S. A. McHenry</i> State Drainage Engineer	
Drawn By			Revision 00	Sheet No. 2 of 2
Checked By				Index No. 285

GENERAL NOTES

- The underdrain pipe shall be either 4" smooth or 5" corrugated tubing unless otherwise shown in the plans. The size to be furnished will be based on the nominal internal diameter of a pipe with a smooth interior wall. Except when prohibited by the plans, the special provisions or this standard, pipe with a corrugated interior wall may be provided based on the following size equivalency.
 - 4" smooth interior equivalent to 5" corrugated interior
 - 5" smooth interior equivalent to 6" corrugated interior
 - 6" smooth interior equivalent to 8" corrugated interior
 - 8" smooth interior equivalent to 10" corrugated interior
- Fine aggregate shall be quartz sand meeting the requirements of Sections 902-4 of the Standard Specifications.
- Coarse aggregate shall be gravel or stone meeting the requirements of Sections 901-2 or 901-3. The gradation shall meet Section 901, Grades 4, 467, 5, 56 or 57 stone unless otherwise shown restricted in the plans.
- Underdrain Type I, II, III and V shall be in accordance with Section 440.
- Filter fabric shall be Type D-3 (See Index No. 199). The internal filter fabric of Type V underdrain shall have a permittivity of 0.7 /sec and an AOS of # 40 sieve.
- When corrugated polyethylene tubing with slots or 360° perforations is used in conjunction with fine aggregate, a filter fabric sock meeting Section 948 is required.
- See Index no. 500 for the standard location of Type I, II, and III underdrain. The location of Type V underdrain and non standard locations of Type I, II, and III underdrain will be as detailed in the plans.
- All Filter fabric joints shall overlap a minimum of 1'. The internal filter fabric of Type V underdrain shall overlap into the coarse aggregate or the fine aggregate a minimum of 1'.
- Underdrain outlet pipes shall be non-perforated and all bends shall be made using 1/8 (45 deg.) elbows. 90 deg. bends shall be constructed with two 1/8 elbows separated by at least 1' of straight pipe. Outlet pipes stubbed into inlets or other drainage structures shall be not less than 6" above the structure flow line. Outlet pipes discharging to grassed areas shall have concrete aprons, hardware cloth, and bordering sod as shown in Index no. 287 for Edgedrain outlets.
- Pay Item shall be based on the size of the smooth interior products. The contract unit price for Underdrain, LF, shall include the cost of pipe, fittings, aggregate, sock, filter fabric, underdrain cleanouts, and concrete aprons.
The contract unit price for Underdrain Outlet Pipe, LF, shall be full compensation for trench excavation, pipe and fittings, concrete aprons, hardware cloth for concrete aprons, stubbing into drainage structures, backfill in place, and disposal of excess materials.
The contract unit price for Underdrain Inspection Box, EA, shall be for the number completed and accepted.



TYPE I

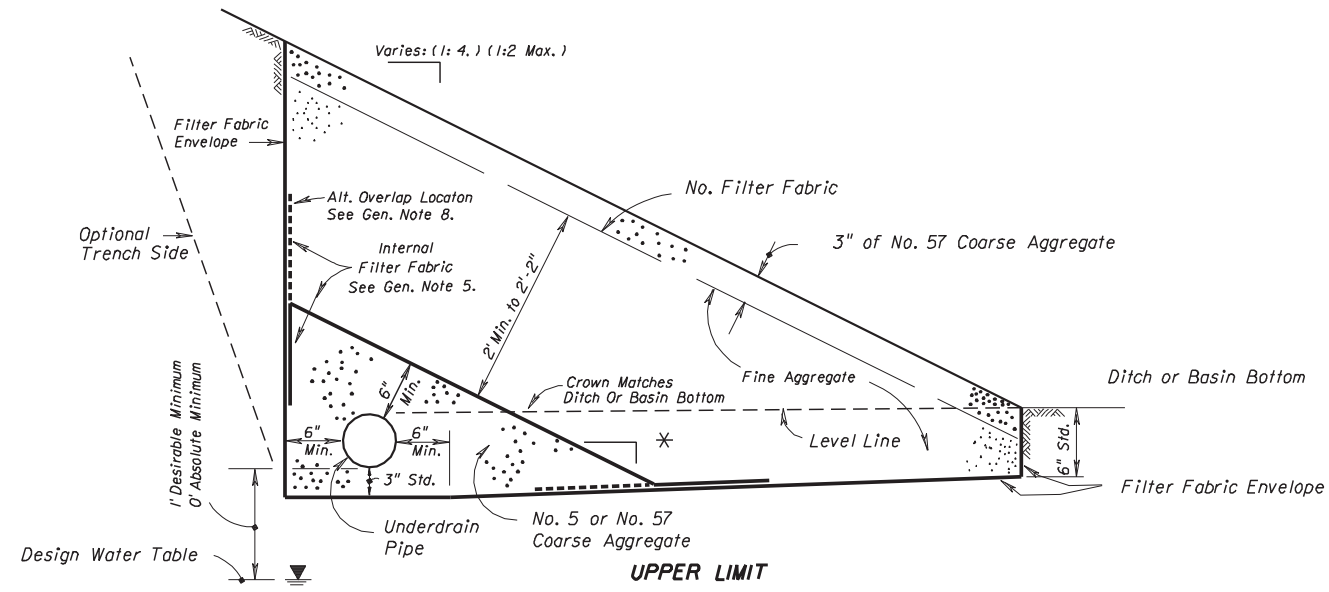
TYPE II

TYPE III

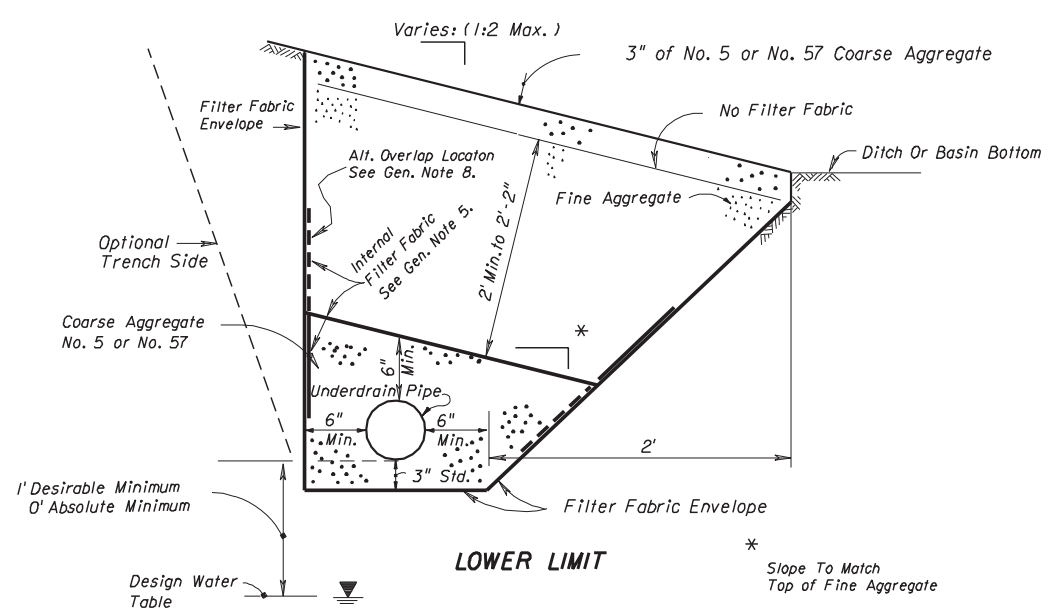
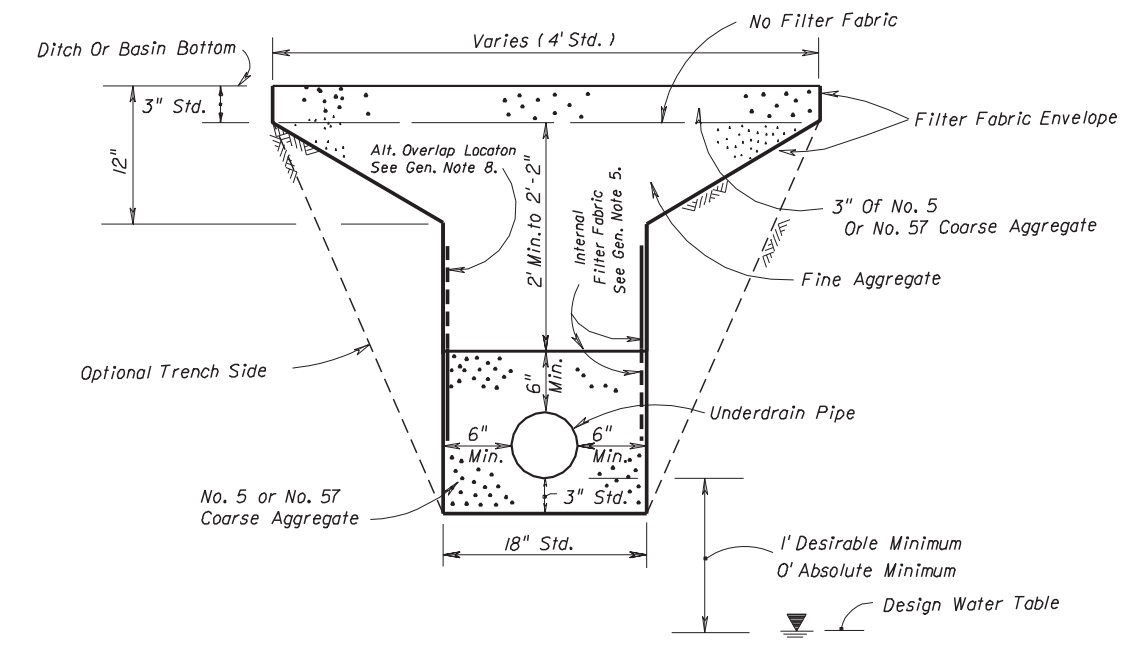
DESIGN NOTES

- The type of underdrain should be selected to meet design water removal rate and soil conditions. Caution is prescribed in the use of these typical sections since special designs may be required to satisfy project conditions.
- Type I underdrain is intended for minimum water removal conditions.
- Type II underdrain is intended for moderate water removal conditions. Where reactive conditions may create chemical clogging, the use of an inert material and/or elimination of the filter fabric may be necessary.
- Type III underdrain is intended for maximum water removal conditions. Filter fabric is required between the coarse aggregate or fine aggregate including those described in general notes 2 and 3. Design note 3 applies for reactive conditions.
- Type V underdrain is intended for use in detention basins and other locations which require a filtration system. The standard fine aggregate specified for Type V underdrain conforms to filtration gradation requirements of Chapter 62-25 F.A.C..
- The designer should detail in the plans, the location of: (a) Type V underdrain, (b) non-standard locations of Type I, II, and III underdrain, (c) underdrain inspection boxes, (d) cleanouts for Type V underdrain, and (e) underdrain outlet pipes.
- The designer should specify the flow line elevations at the beginning, bends, junctions and ends of underdrain pipes and outlet pipes.
- The designer should evaluate whether an external filter fabric envelope is required around underdrain Types I and III. When required, fabric shall be specified in the plans.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
UNDERDRAIN				
		Names	Dates	Approved By
Designed By	EGR	10/85		<i>S. A. McHenry</i> State Drainage Engineer
Drawn By	HSD	10/85	Revision	Sheet No.
Checked By	EGR	10/85	00	1 of 2
				286

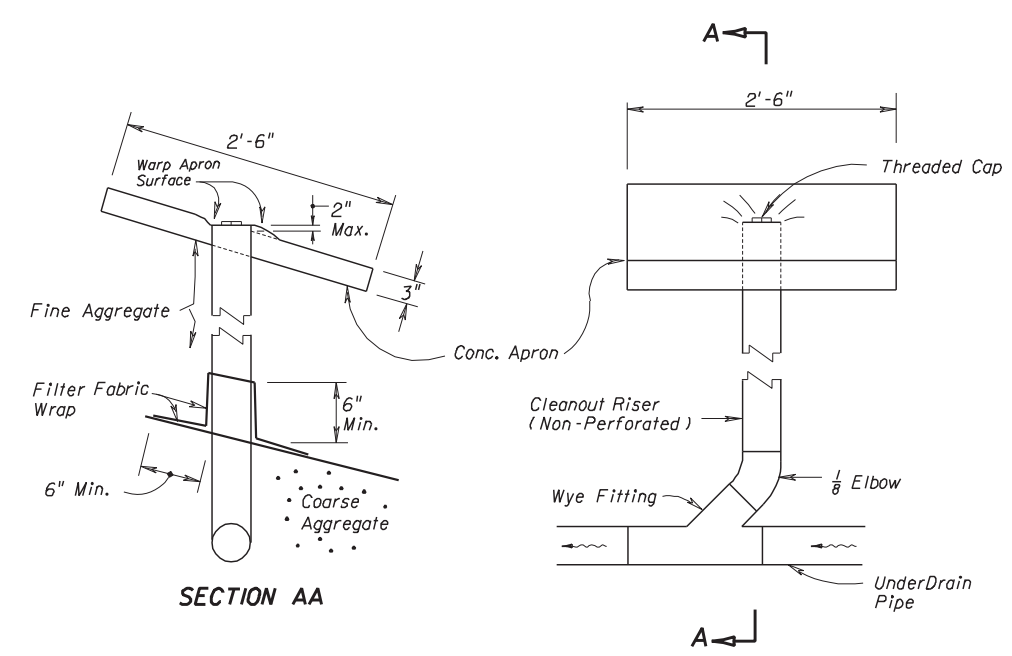


* Slope To Match Top of Fine Aggregate



* Slope To Match Top of Fine Aggregate

TYPE V a

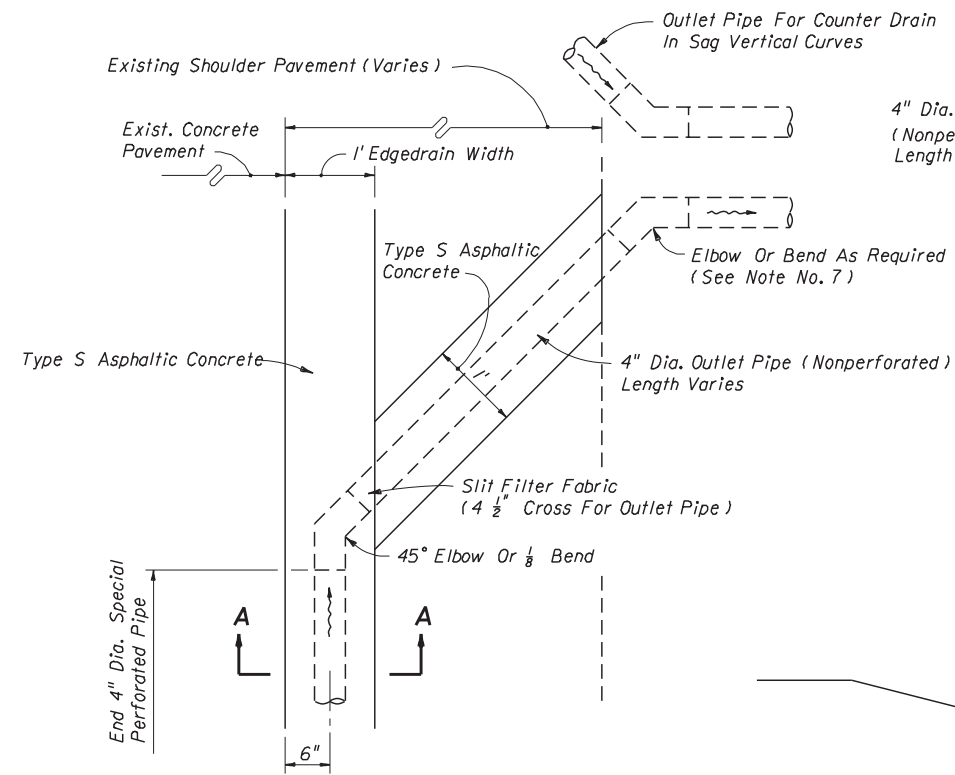


CLEANOUT FOR TYPE V UNDERDRAIN

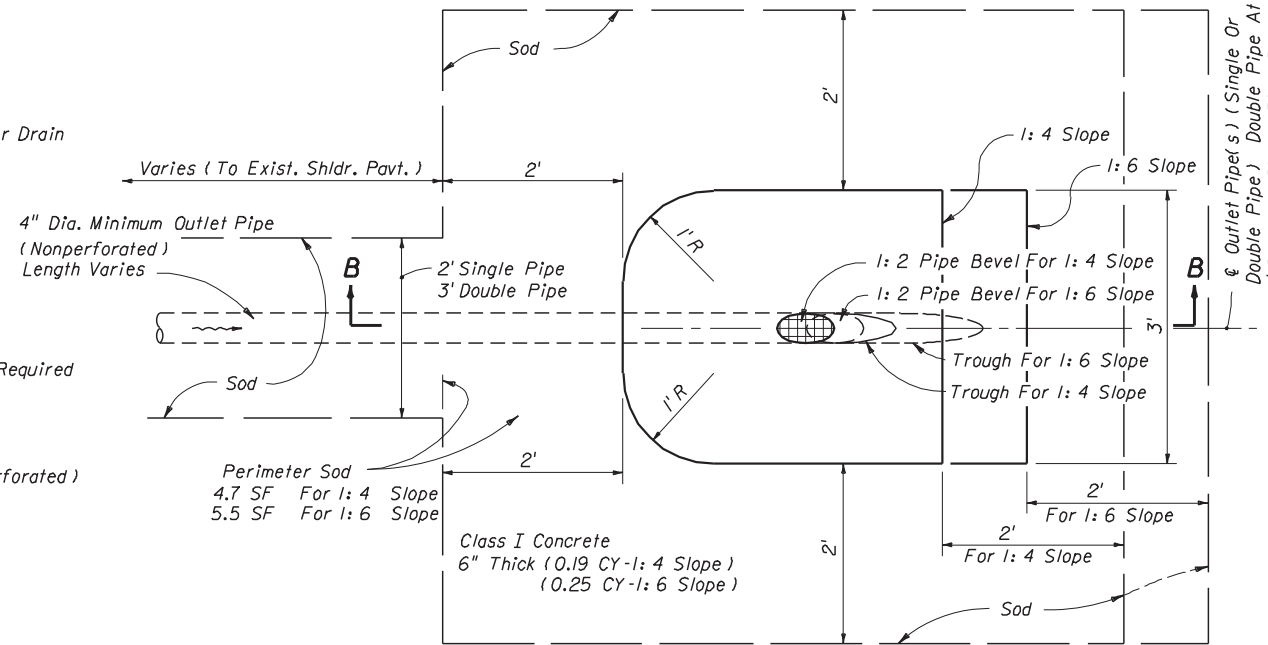
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
UNDERDRAIN				
Names	Dates	Approved By		
Designed By		<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	JDT	Revision	Sheet No.	Index No.
Checked By		00	2 of 2	286

**GENERAL NOTES FOR
CONCRETE PAVEMENT SUBDRAINAGE**

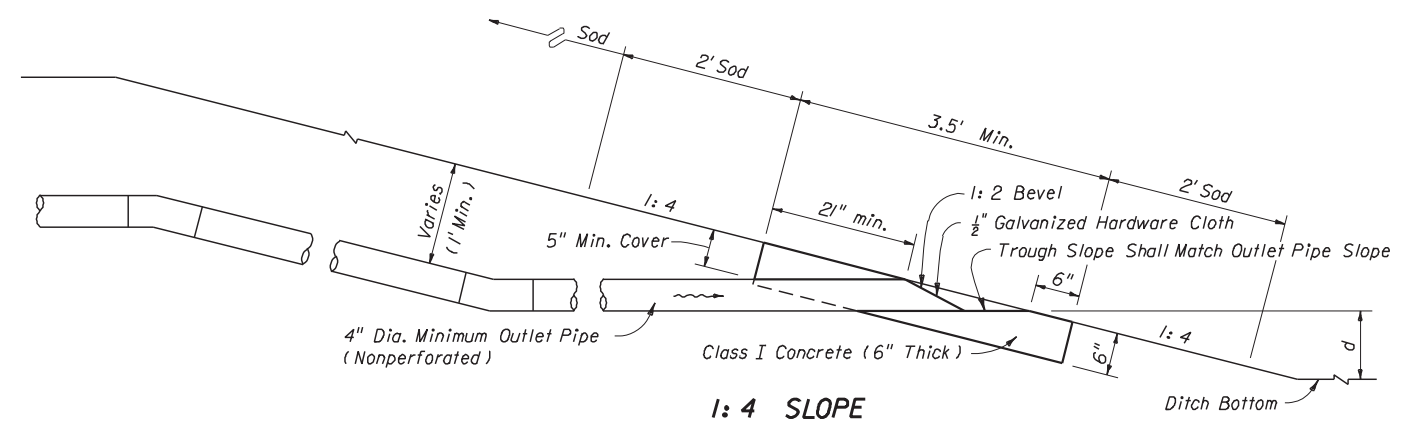
- No trench greater than 2' in depth will be allowed overnight. Trenches shall be barricaded at all times.
- Concrete pavement subdrainage shall be constructed adjacent to the low edge of the roadway pavement and under travel lanes, auxiliary pavement and shoulders, as called for in the plans. When the low edge shifts between outside and inside edges of pavement the concrete pavement subdrainage shall extend 50' beyond and begin 50' before the flat point (100' overlap).
Concrete pavement subdrainage shall be placed on the low side of ramps of crossroad terminals.
- Concrete pavement subdrainage shall be constructed on a grade parallel with the edge of pavement profile, except on profiles flatter than one-tenth percent (0.10%) the concrete pavement subdrainage shall be constructed on a grade of one-tenth percent (0.10%).
- Immediately prior to placing the filter fabric the entire vertical face of the concrete pavement shall be cleaned to remove adhering base material and soil.
- The Contractor shall devise a procedure for holding the filter fabric in position on the vertical face of the trench. The procedure must be approved by the Engineer prior to placement of the draincrete.
- The upper end of each separate run of the concrete pavement subdrainage pipe shall be capped.
- Outlet pipes shall be constructed at a maximum of 500' intervals. Elbows or $\frac{1}{8}$ bends shall be used to connect the outlet pipe to the concrete pavement subdrain pipe. The elbows or bends shall be of the same material as the outlet pipe but compatible with the pipe.
When directed by the Engineer, outlet pipes shall be stubbed into existing inlets or into existing ditch pavements at an elevation 6" above the inlet flowline or ditch bottom. Concrete apron and bordering sod are not required for stubbed outlets, but replacement sodding will be required at trenches for pipes stubbed into paved ditches.
In sag vertical curves separate outlet pipes for concrete pavement subdrains from opposite directions shall use a single apron unless otherwise shown in the plans or otherwise directed by the Engineer.
Backfill around outlet pipes shall be of cohesive soils, draincrete will not be permitted.
- Existing paved shoulder that is removed for the construction of outlet pipes shall be replaced with Type S asphaltic concrete at the rate of 500 LB per SY.
- The contract unit price for Edgedrain Outlet Pipe (4") LF, shall be full compensation for removal of existing shoulder pavement, trench excavation, pipe and fittings, concrete apron, hardware cloth, sod, stubbing into existing inlets and paved ditches, restoration of ditch pavement, backfill in place, and disposal of excess materials.



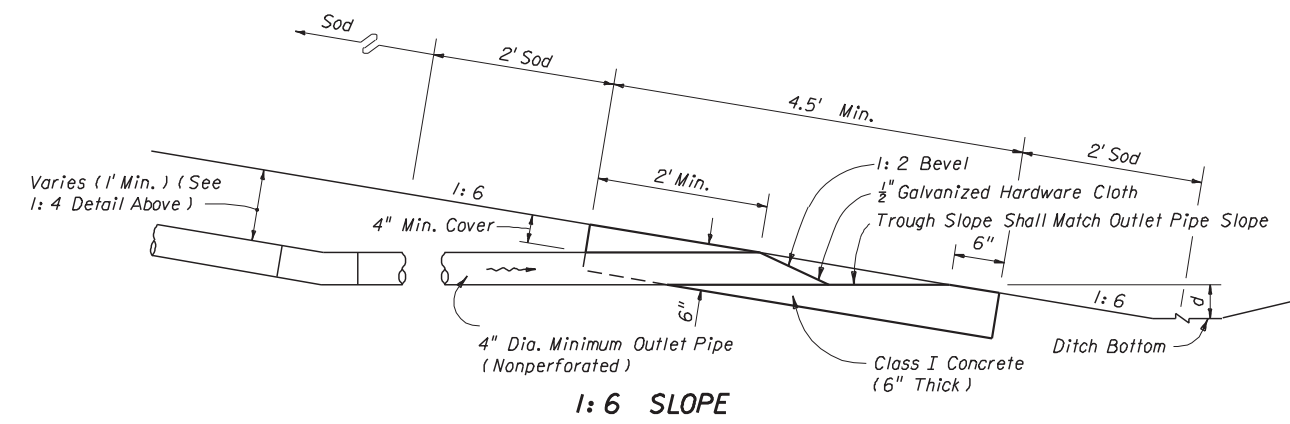
ALIGNMENT OF OUTLET PIPE



PLAN - OUTLET PIPE APRON



1:4 SLOPE

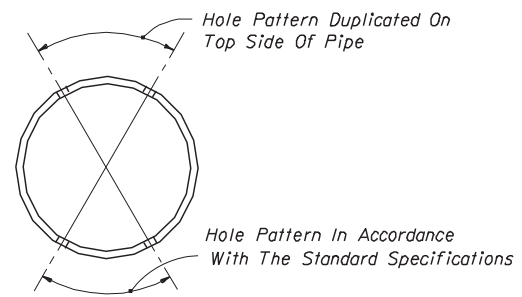


1:6 SLOPE

SECTIONS BB

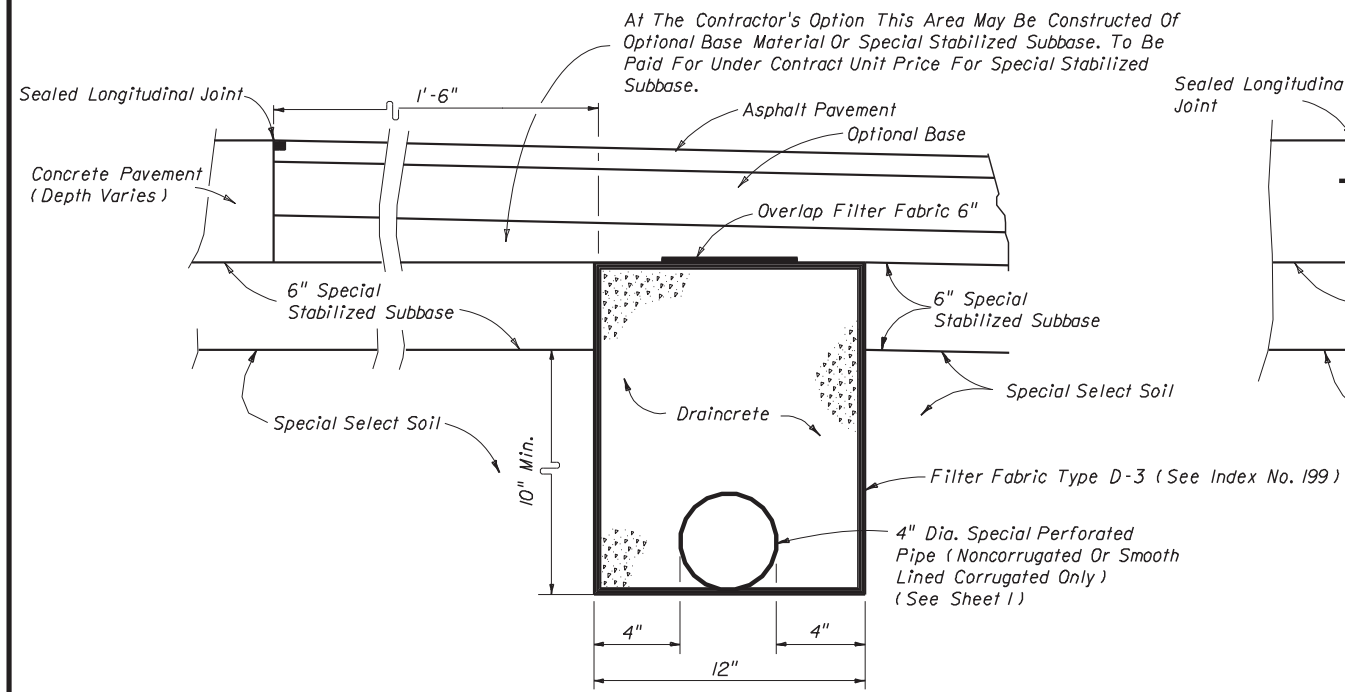
^d 1.75' std. for grassed ditches
0.5' std. for paved ditches [less is acceptable to provide minimum 0.1% outlet pipe slope]

**4" EDGEDRAIN
EDGEDRAIN OUTLET**

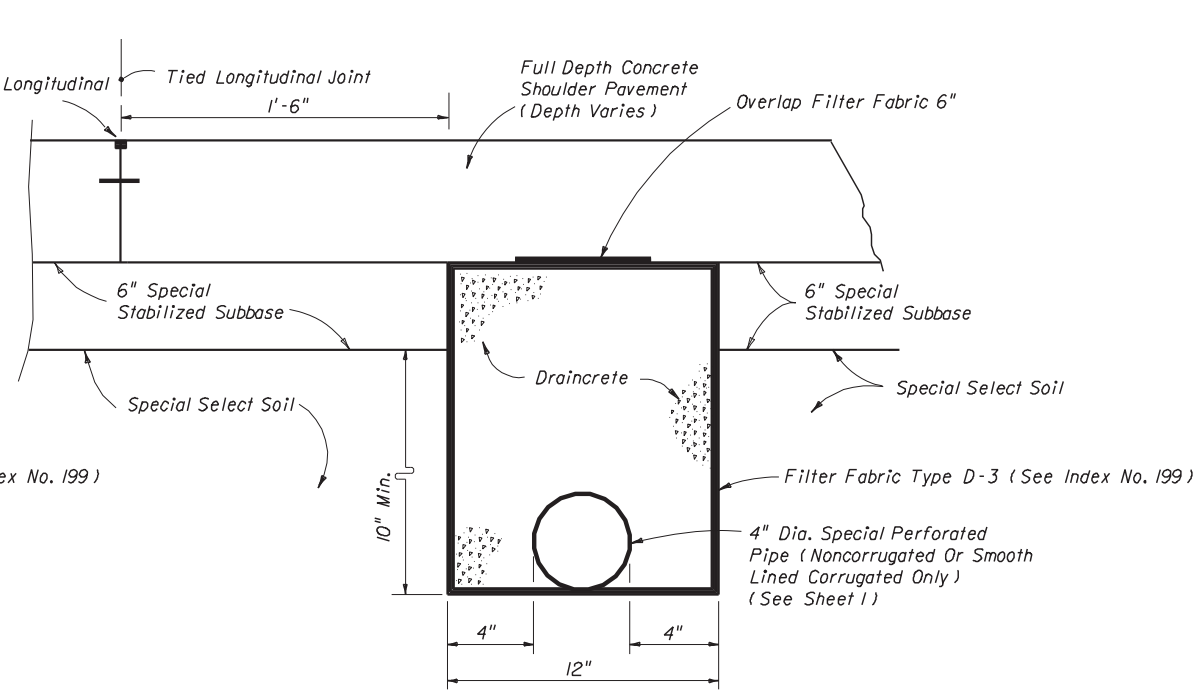


**HOLE PATTERN
SUBDRAINAGE PIPE**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE PAVEMENT SUBDRAINAGE				
Names	Dates	Approved By		
Designed By	HMD 10/94	S. A. McHenry State Drainage Engineer		
Drawn By	DLG 10/94	Revision	Sheet No.	Index No.
Checked By	HMD/WPH 10/94	00	1 of 3	287



ASPHALT SHOULDERS



CONCRETE TRAVEL LANES,
SHOULDERS, AND AUXILIARY PAVEMENT

NEW CONSTRUCTION

NOTES FOR DRAINCRETE
PAVEMENT SUBDRAINAGE

1. The edgedrain sections for DRAINCRETE SUBDRAINAGE are applicable to pavement construction identified as RIGID PAVEMENT Alteration #1 on Index No. 505 (sheet 2 of 3)
2. The contractor shall confine the construction of draincrete edgedrain to an area in which the entire operation can be carried out in five (5) work days, unless another construction period is called for in the plans, with sufficient time allowed for the draincrete to set before placement of pavement.

METHOD OF PAYMENT

NEW CONSTRUCTION:

1. The contract unit price for Edgedrain (Draincrete) LF shall be full compensation for trench excavation disposal of excess material, filter fabric, draincrete edgedrain pipe and fittings and draincrete.

Payment for outlet pipe shall be in accordance with General Note 9, Sheet 1 of 3.

FOR REHABILITATION:

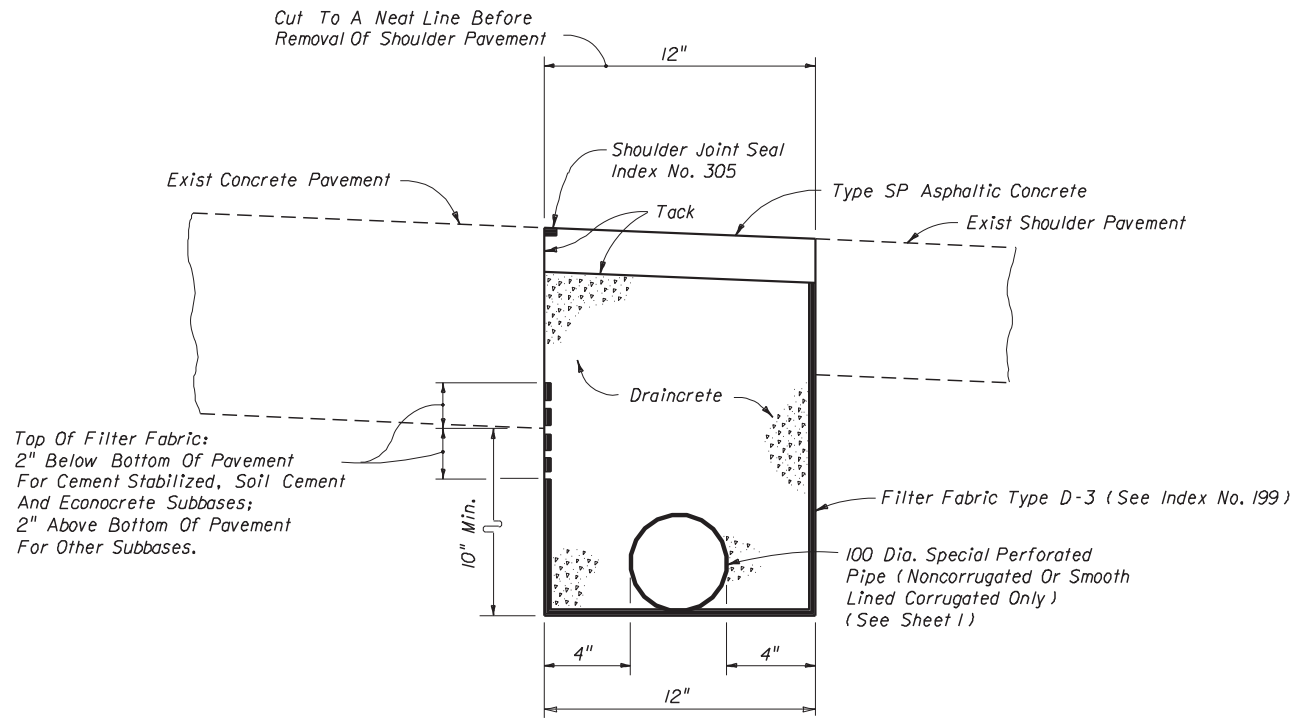
1. The contract unit price for Edgedrain (Draincrete) LF, shall be full compensation for removal of existing shoulder pavement, trench excavation, disposal of excess materials, filter fabric, draincrete edgedrain pipe and fittings, draincrete, and barricades necessary for edgedrain construction.

Payment for outlet pipe shall be in accordance with General Note 9, Sheet 1 of 3.

Shoulder pavement shall be paid for under the contract unit price for Type SP, Asphaltic concrete.

Tack coat shall be paid for under the contract unit price for Bit Mat (Tack Coat), GA.

Shoulder joint seal shall be paid for under the contract unit price for Pavement joint or, LF.

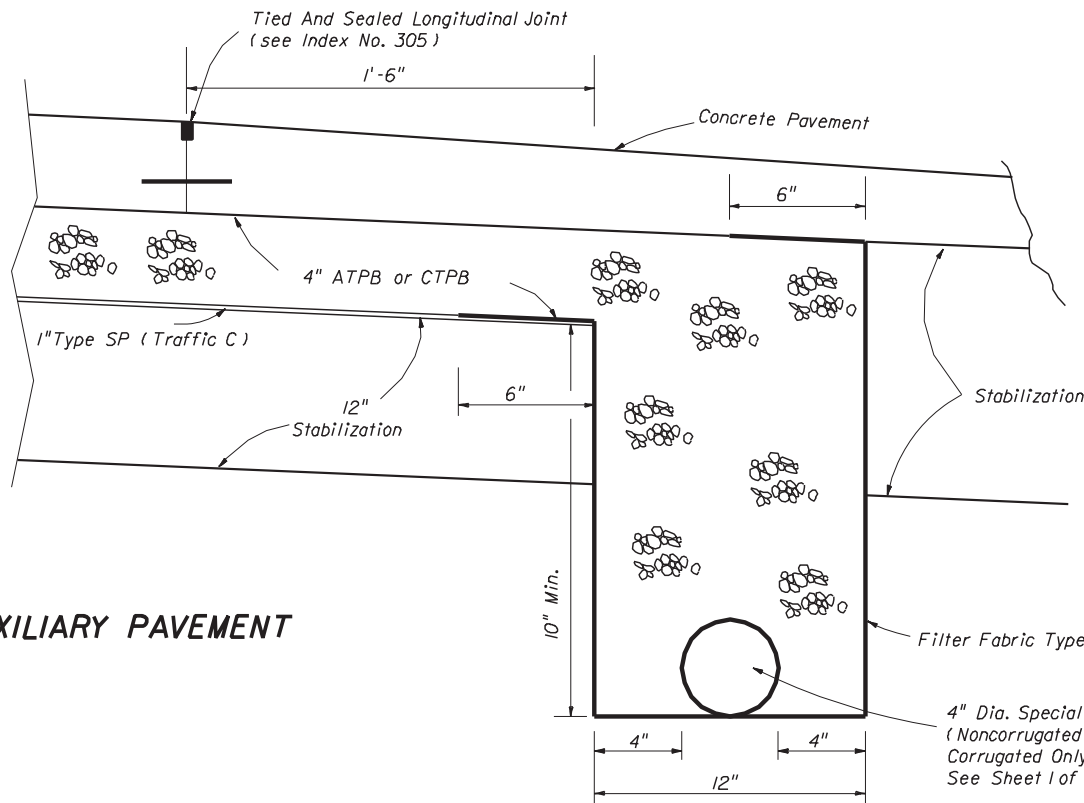
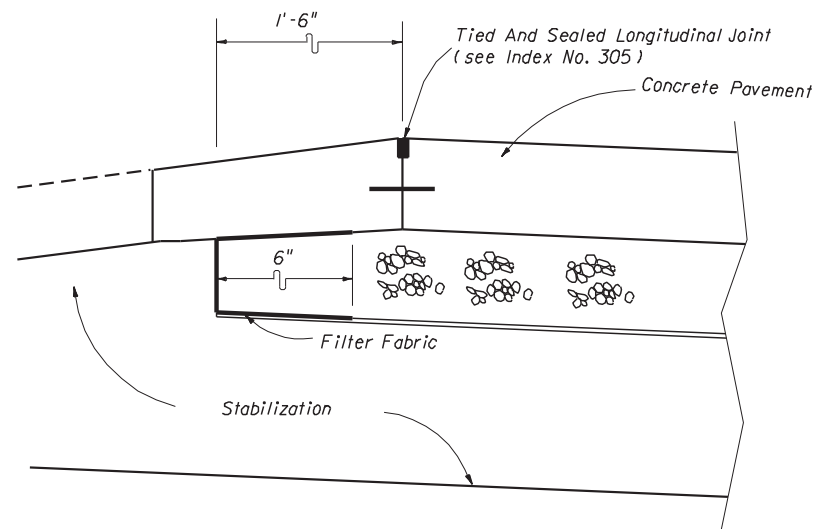


REHABILITATION

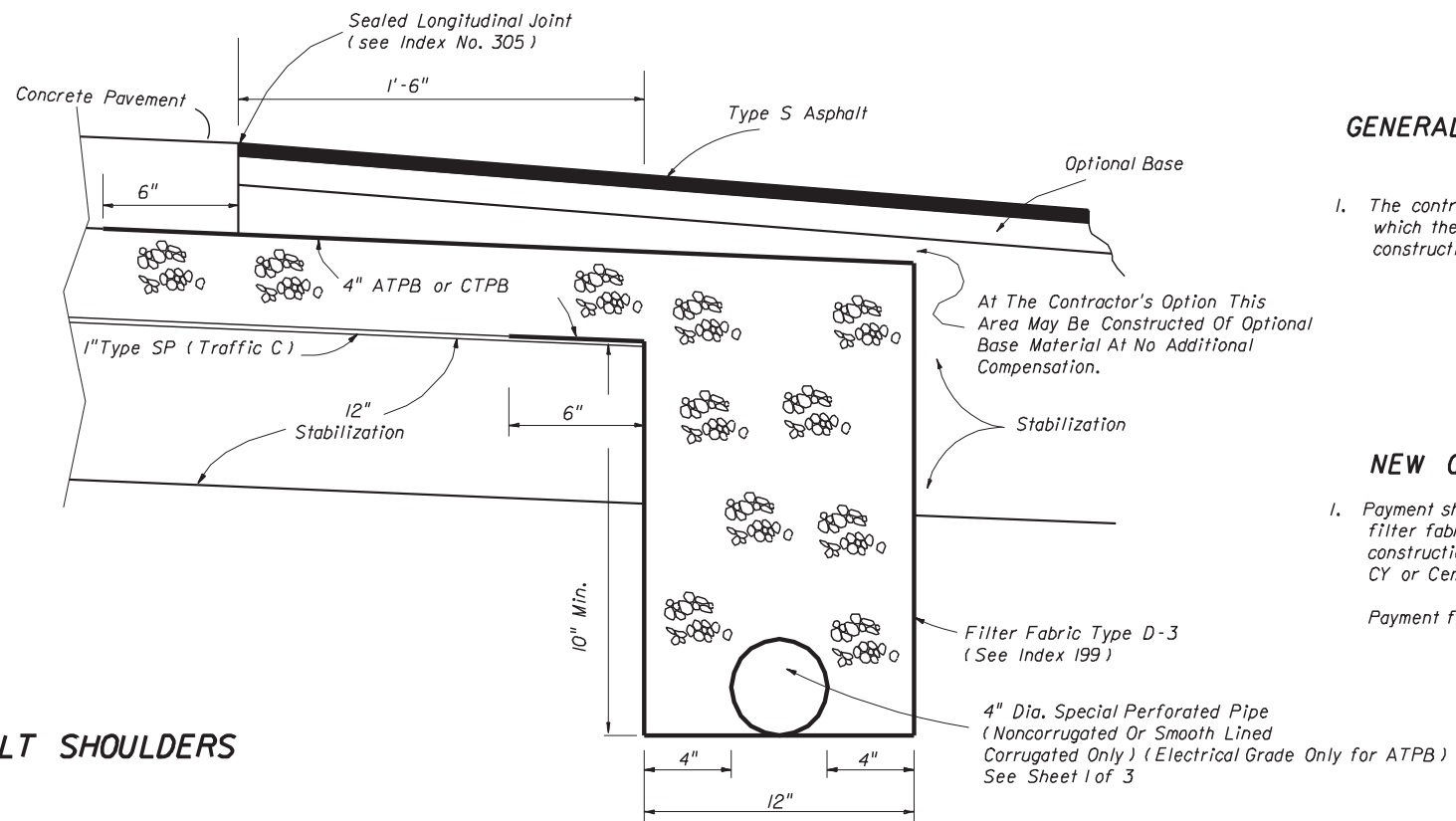
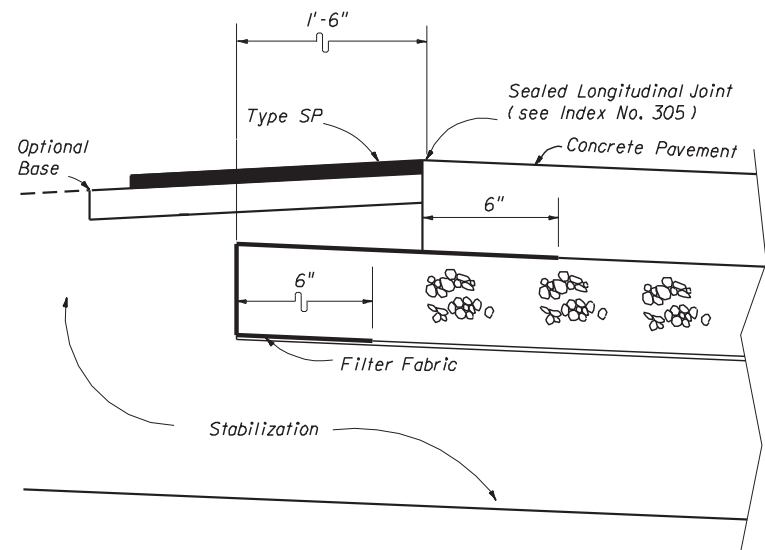
DRAINCRETE SUBDRAINAGE

Not to scale

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE PAVEMENT SUBDRAINAGE				
Names	Dates	Approved By		
Designed By	HMD 10/94	<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	DLG 10/94	Revision	Sheet No.	Index No.
Checked By	HMD/WPH 10/94	00	2 of 3	287



CONCRETE TRAVEL LANE, SHOULDERS, AND AUXILIARY PAVEMENT



ASPHALT SHOULDERS

TREATED PERMEABLE BASE SUBDRAINAGE

GENERAL NOTES FOR TREATED PERMEABLE BASE EDGEDRAIN (NEW CONSTRUCTION)

- 1. The contractor shall confine the construction of monolithic edgedrain to an area in which the entire operation can be carried out in (5) work days, unless another construction period is called for the plans.

METHOD OF PAYMENT

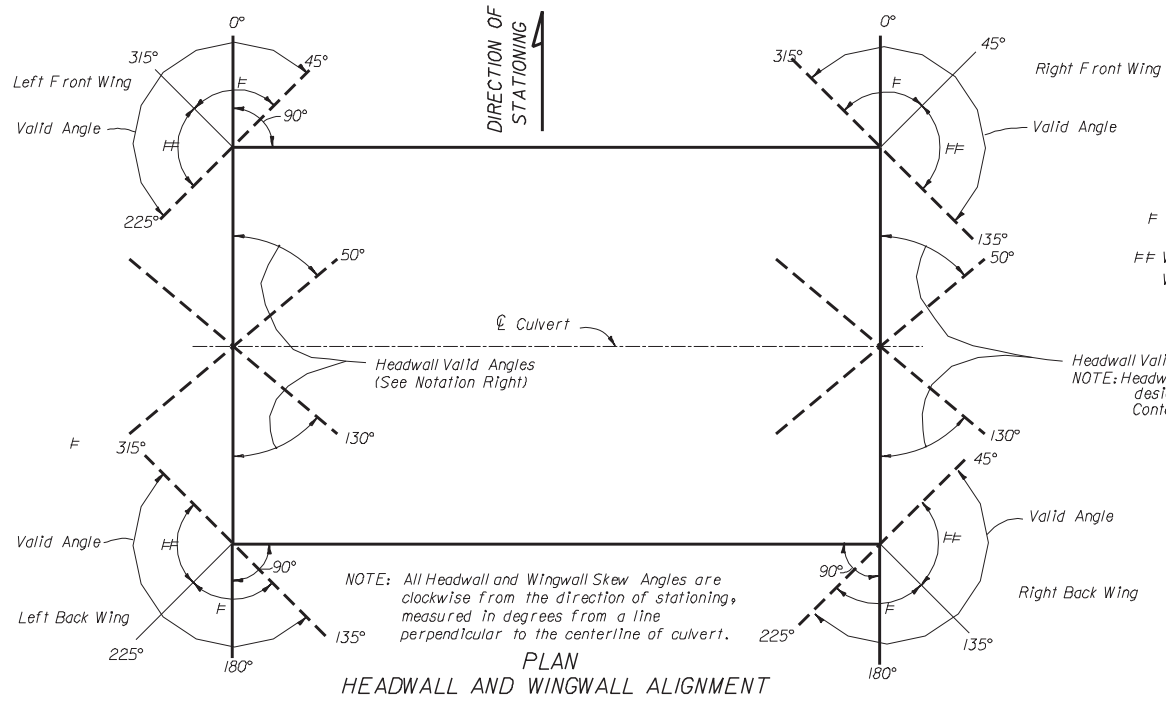
NEW CONSTRUCTION

- 1. Payment shall be full compensation for trench excavation, disposal of excess materials, filter fabric, pipe and fittings, and barricades necessary for concrete pavement subdrainage construction. Payment shall be included in the cost for Asphalt Treated Permeable base, CY or Cement Treated Permeable Base CY.

Payment for outlet pipe shall be in accordance with General Note 9, Sheet 1 of 3.

Not To Scale

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE PAVEMENT SUBDRAINAGE				
Names	Dates	Approved By		
Designed By	HMD 10/94	 State Drainage Engineer		
Drawn By	DLD 10/94	Revision	Sheet No.	Index No.
Checked By	HMD/WPH 10/94	00	3 of 3	287



NOTE: Designs for box culverts under this index are to be produced only by computer analysis, utilizing the program named PSTDN55. Designs under this Index are to be limited to the live loads and dimensional restraints shown in the General Notes of this Index and to the fill on the barrels as shown in the roadway plans. It is the construction Contractors responsibility to provide for supporting construction loads that exceed the above loadings.

GENERAL NOTES

DESIGN SPECIFICATIONS: A.A.S.H.T.O. 1996.

LOADING: HS20-44, Modified for Military Loading as Required or HS25, see Structures Design Guidelines.

SURFACE FINISH: The Class Surface finish for all concrete surfaces shall be a general surface finish.

SKewed CONSTRUCTION JOINTS: Construction joints in barrels of culverts with skewed wingwalls may be placed parallel to the headwalls and the reinforcing steel, in the slabs may be cut provided that the cut reinforcing steel extends beyond the construction joint enough for splices to be made in accordance with the table (lower right) this sheet. The cost of construction joints shall be at the expense of the contractor.

CULVERT EXTENSIONS: For cut backs and ties into existing concrete box culverts see Index No. 280

- * REINFORCING BAR SCHEDULE:
- A. When the depth is less than or equal to 2.0 feet, Bars C2 are utilized in the bottom of the top slab. In all other cases, Bars C2 are replaced with Bars C1 spaced at 18 inches on centers.
 - B. When the skew angle for a headwall equals 0 degrees plus or minus 11 degrees the respective S Bars (S2 or S3) will not be utilized.
 - C. When the barrel height is less than 6 feet, Bars B2 will be eliminated as shown in Detail J.
 - D. If the span is less than five feet, Bars A1 and A2 will be Type II Bars.
 - E. The portions of Bars "N" that extend thru Construction joints into wingwalls above footings shall be given one coat of approved zinc rich paint and shall be encased in approved capped plastic (PVC) pipes filled with approved durable lubricant or cut back asphalt. The length and inside diameter of the plastic pipe shall be approximately 1/4" larger than those of the bar.
 - F. For culvert extensions Bar C1 is redesignated Bar C3 in the bottom slab.

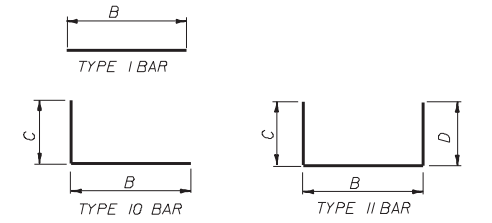
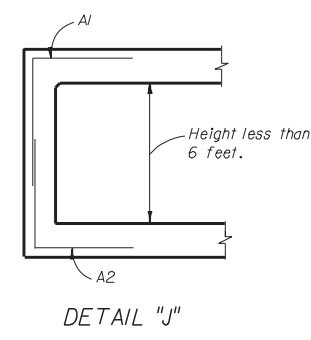
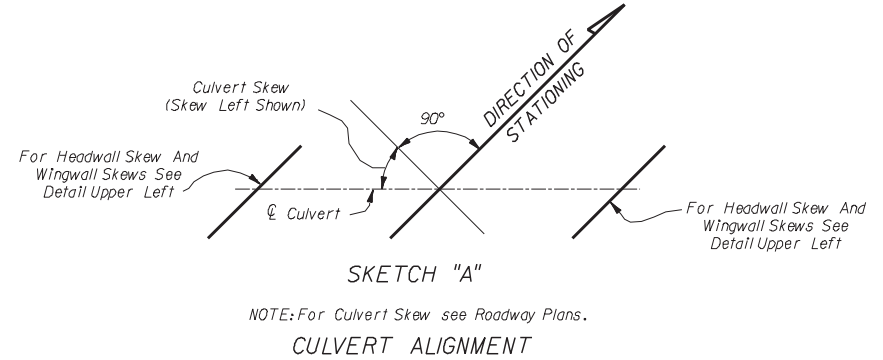
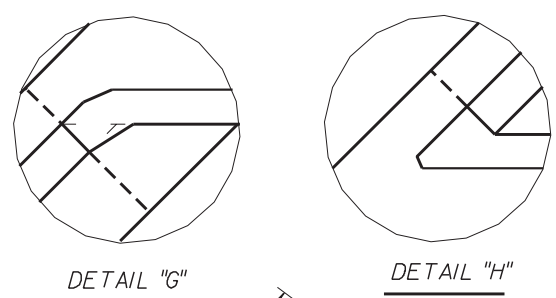
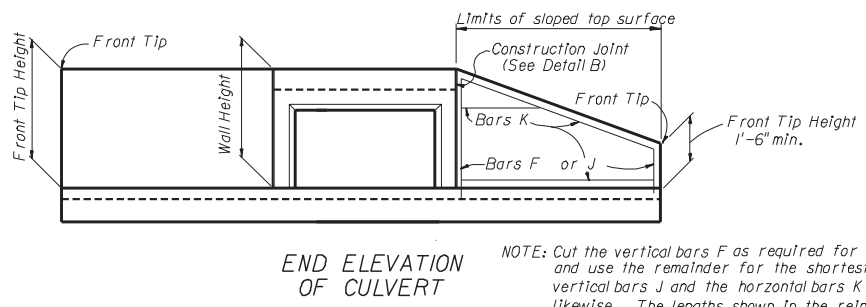
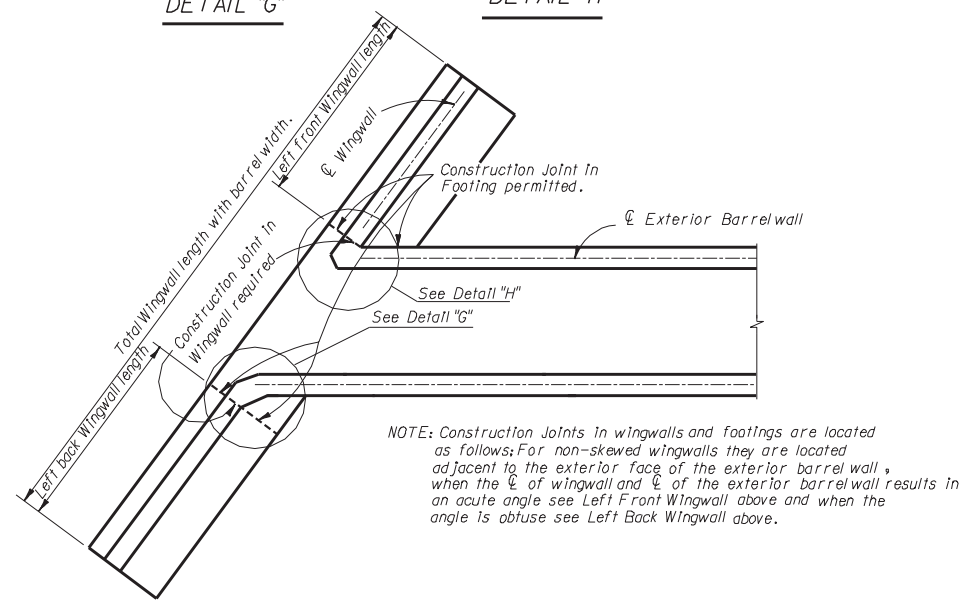


TABLE OF MINIMUM BAR SPLICE LENGTHS

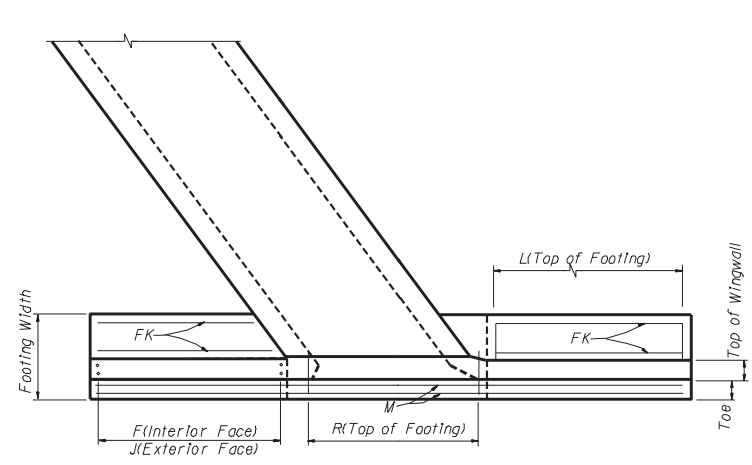
BAR SIZE	SPLICE	BAR SIZE	SPLICE
#4	1'-10"	#8	4'-8"
#5	2'-4"	#9	5'-3"
#6	2'-9"	#10	5'-10"
#7	4'-0"	#11	6'-6"



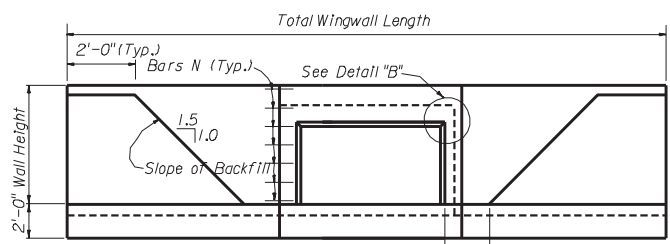
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**CONCRETE BOX CULVERT
CULVERT DETAILS**

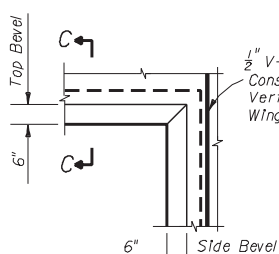
Names	Dates	Approved By		
Designed By		S. A. McHenry State Drainage Engineer		
Drawn By	GFG 1-86	Revision	Sheet No.	Index No.
Checked By	RCB 1-86	00	1 of 5	290



PART PLAN AT END OF CULVERT



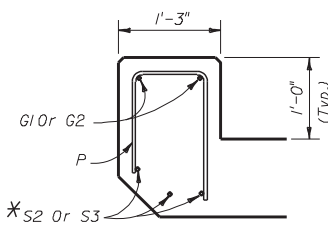
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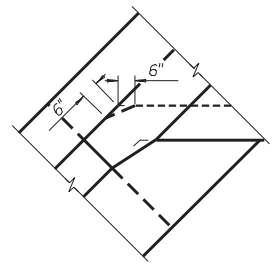
DETAIL "B"



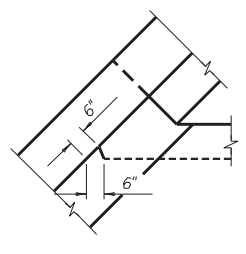
SECTION C-C



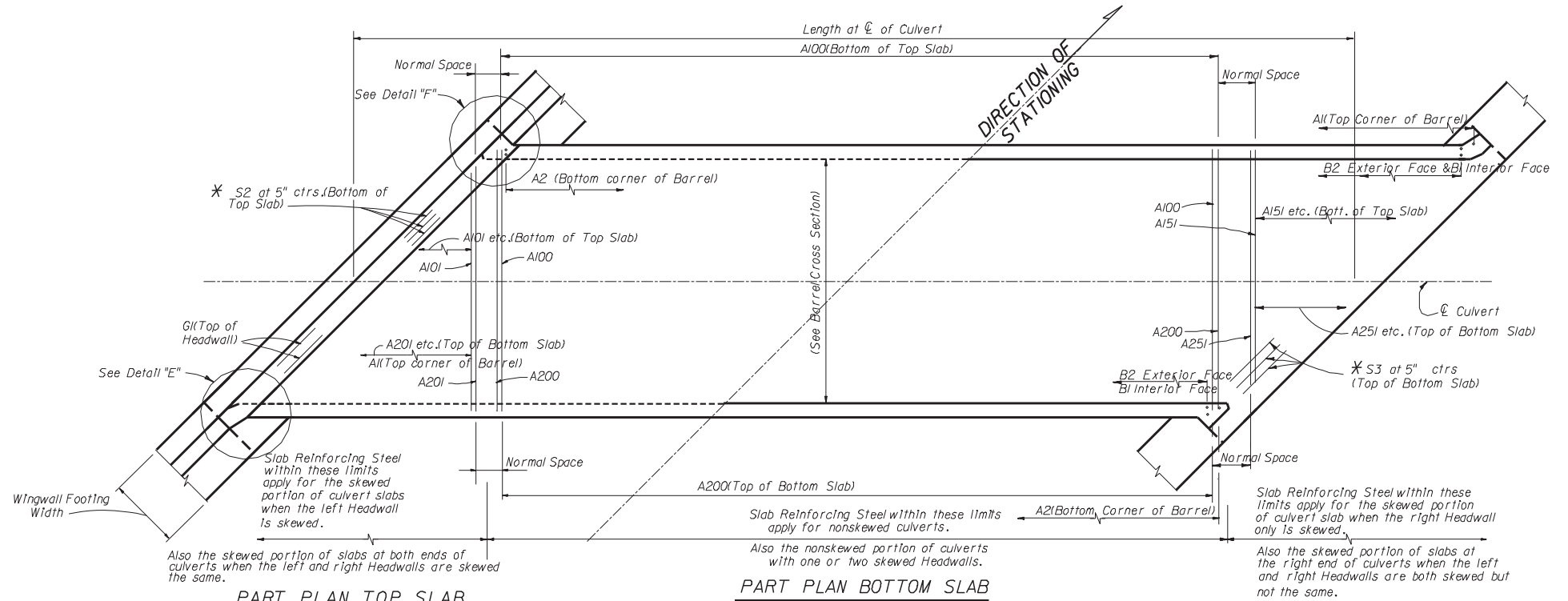
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DETAIL "E"

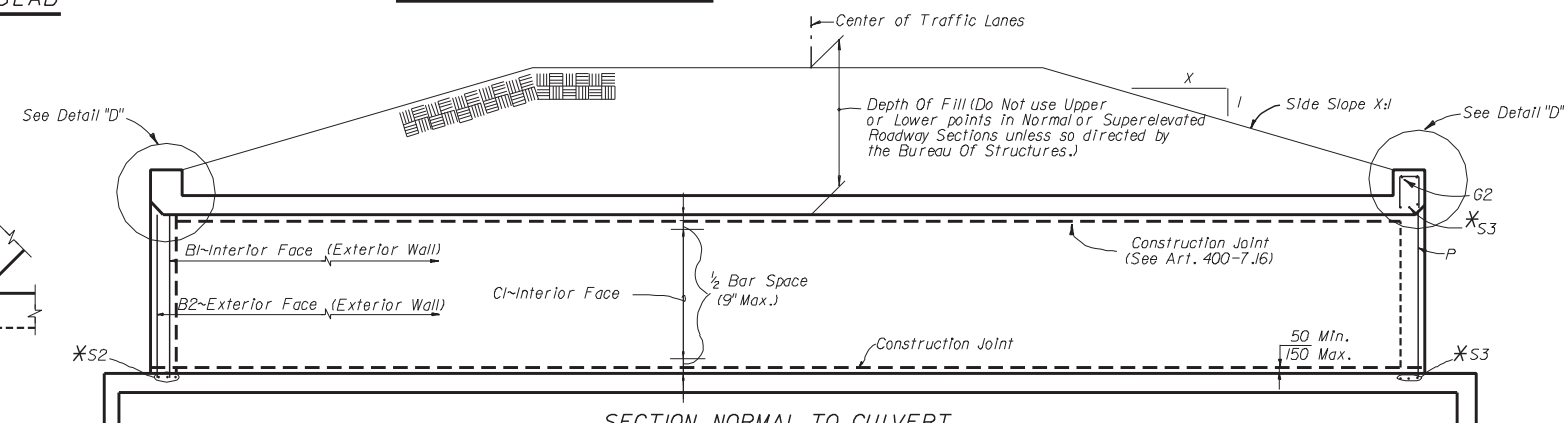


DETAIL "F"

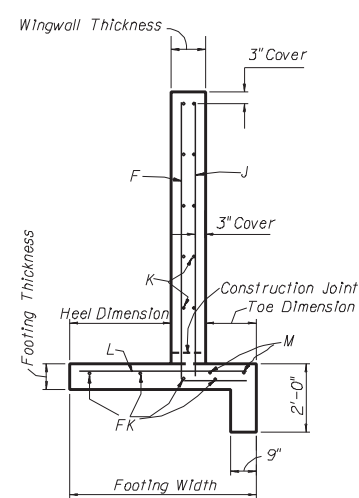


PART PLAN TOP SLAB

PART PLAN BOTTOM SLAB

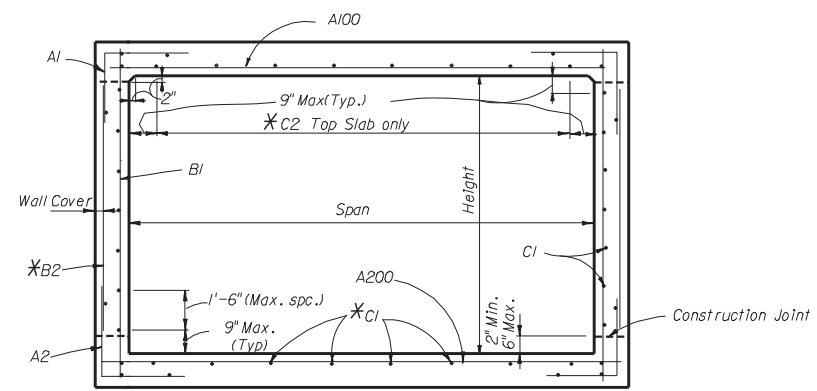


SECTION NORMAL TO CULVERT



SECTION THRU WINGWALL

NOTE: For Bars F, J, K, L and FK in the Wingwalls, the subscripts 1 thru 4 apply as follows:
 1-Left Front
 2-Left Back
 3-Right Front
 4-Right Back

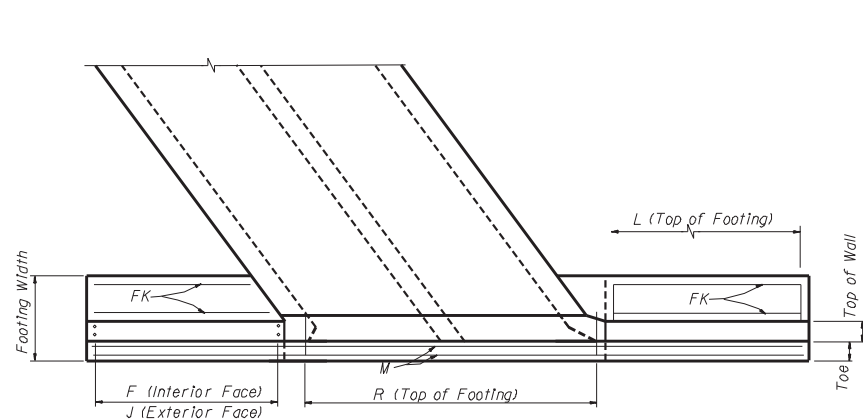


SECTION THRU BARREL

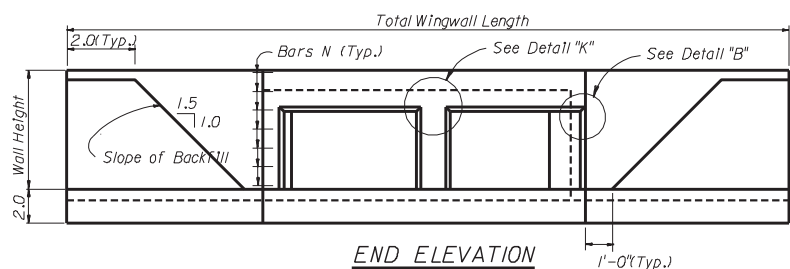
NOTE: The location of the first bar from the ends of the culvert shall not be less than 3", but not greater than one half the bar spacing.

* See Culvert Details and Reinforcing Bar Schedule, Sheet 1 of 5

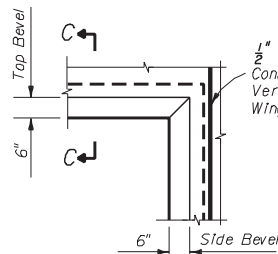
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BOX CULVERT SINGLE BARREL				
Designed By	Names	Dates	Approved By <i>S. A. McHenry</i> State Drainage Engineer	
Drawn By	GFG	1-86	Revision	Sheet No. 2 of 5
Checked By	RCB	1-86	00	Index No. 290



PART PLAN AT END OF CULVERT



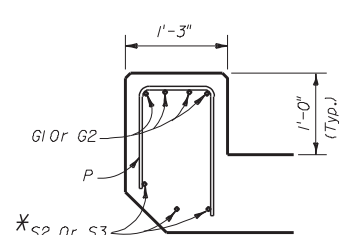
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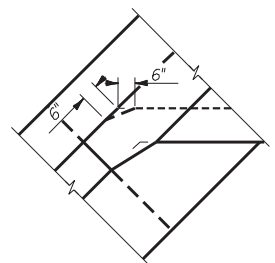
DETAIL "B"



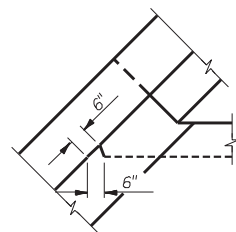
SECTION C-C



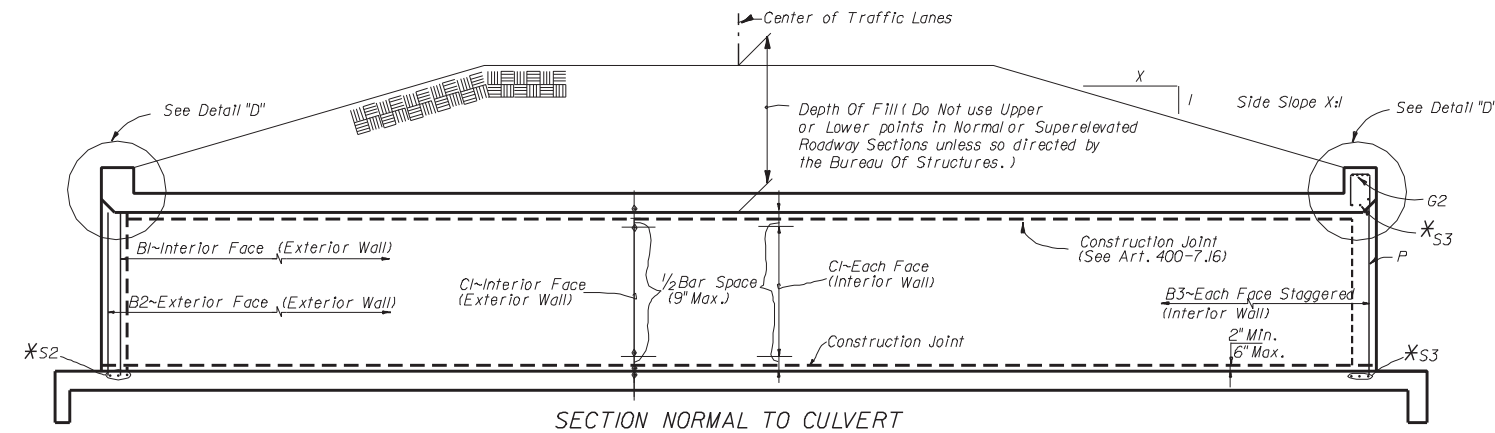
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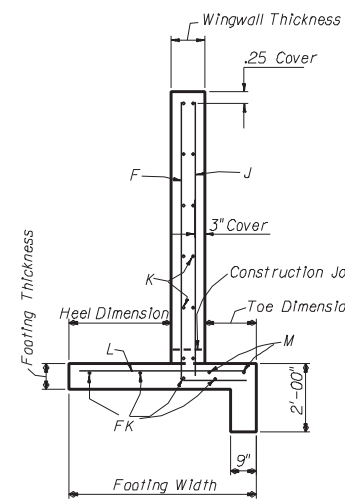
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DETAIL "F"

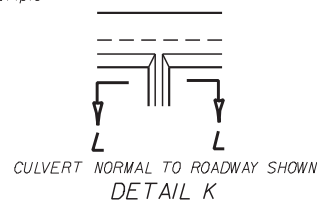


SECTION NORMAL TO CULVERT

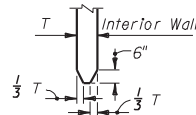


SECTION THRU WINGWALL

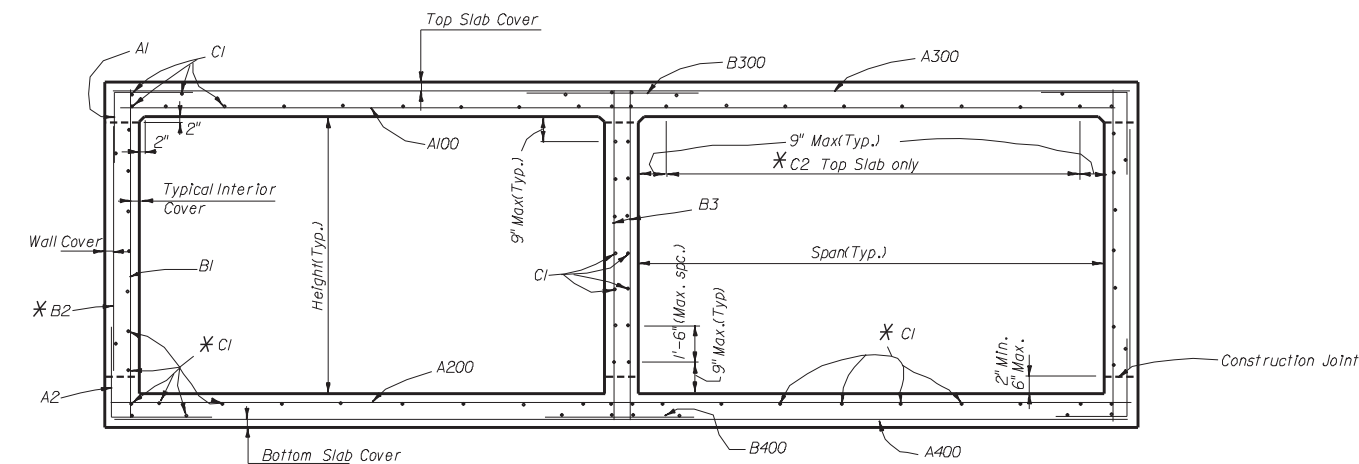
NOTE: For Bars F, J, K, L and/or FK in the Wingwalls, the subscripts 1 thru 4 apply as follows:
 1-Left Front
 2-Left Back
 3-Right Front
 4-Right Back



CULVERT NORMAL TO ROADWAY SHOWN
DETAIL K

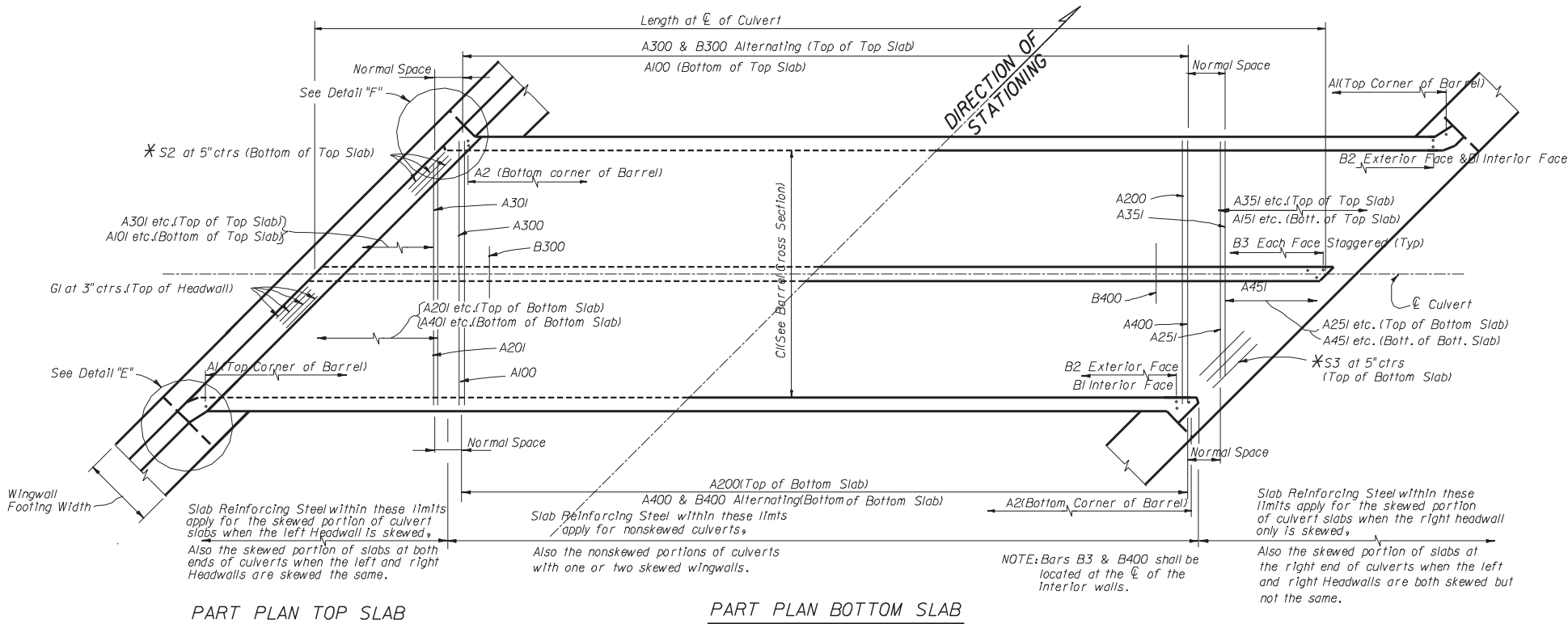


SECTION LL



SECTION THRU BARREL

NOTE: The location of the first bar from the ends of the culvert shall not be less than .25, but not greater than one half the bar spacing.



PART PLAN TOP SLAB

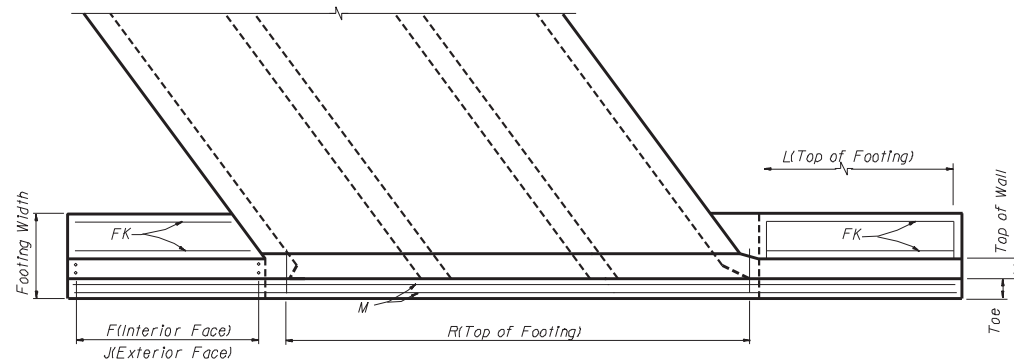
PART PLAN BOTTOM SLAB

* See Culvert Details and Reinforcing Bar Schedule, Sheet 1 of 5

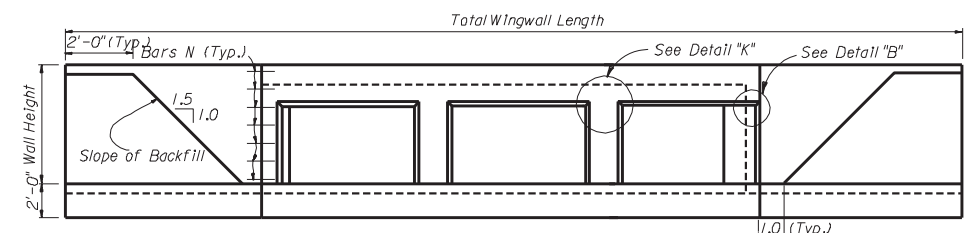
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**CONCRETE BOX CULVERT
DOUBLE BARREL**

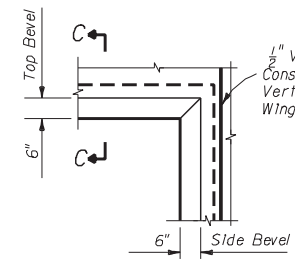
Names	Dates	Approved By				
Designed By		 State Drainage Engineer				
Drawn By	GFG 1-86				Revision	Sheet No.
Checked By	RCB 1-86				00	3 of 5
		Index No.	290			



PART PLAN AT END OF CULVERT



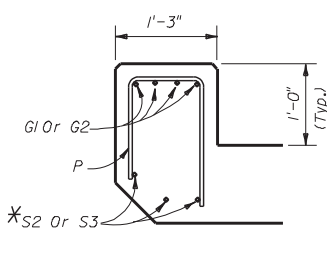
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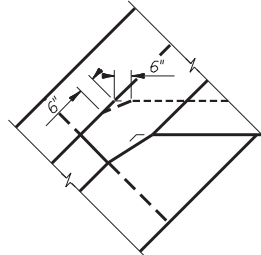
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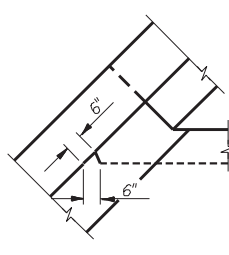
SECTION C-C



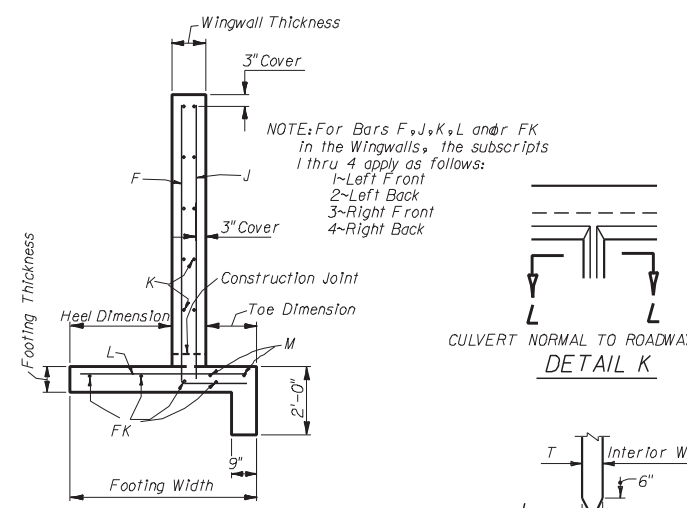
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DETAIL "E"

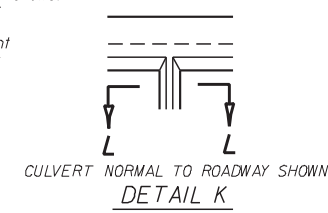


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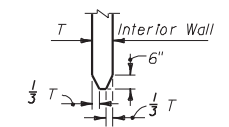


SECTION THRU WINGWALL

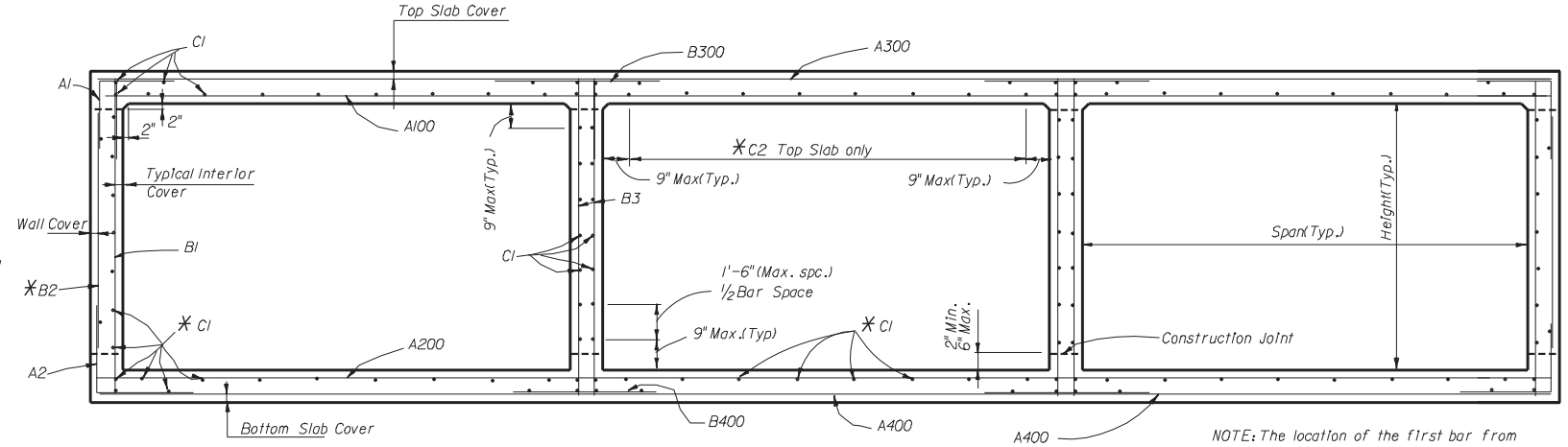
NOTE: For Bars F, J, K, L and FK in the Wingwalls, the subscripts 1 thru 4 apply as follows:
 1-Left Front
 2-Left Back
 3-Right Front
 4-Right Back



CULVERT NORMAL TO ROADWAY SHOWN DETAIL K

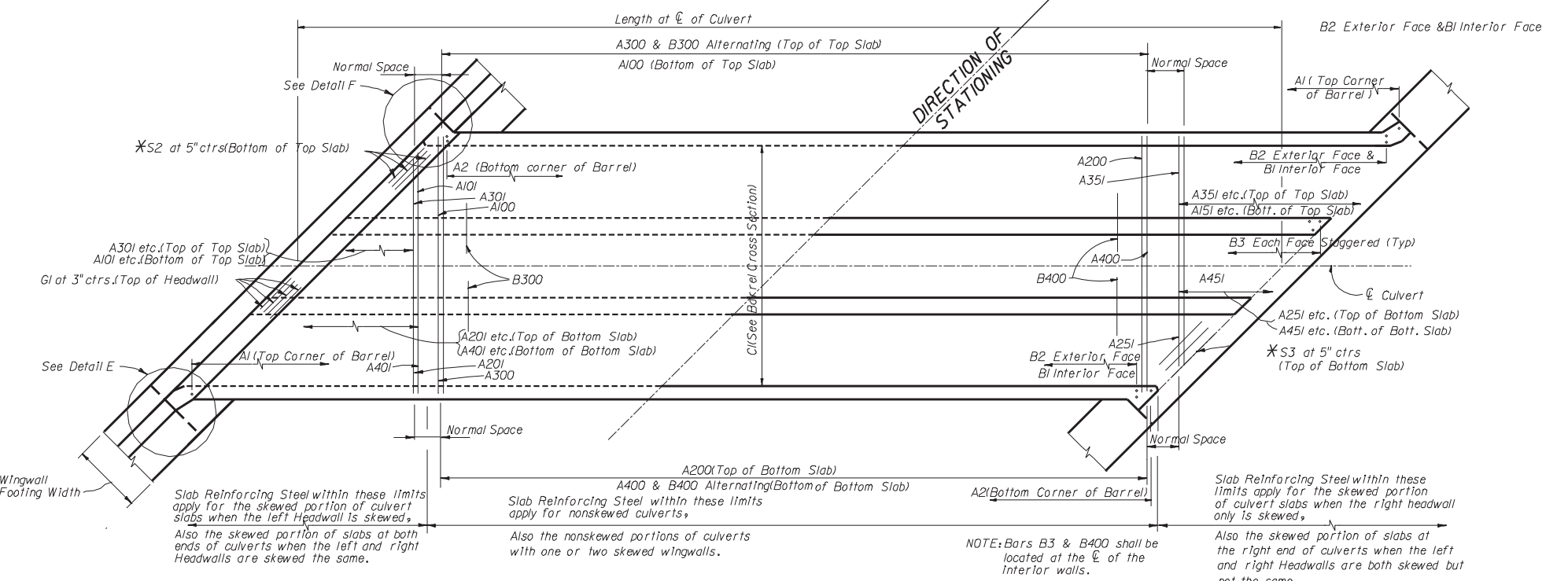


SECTION LL



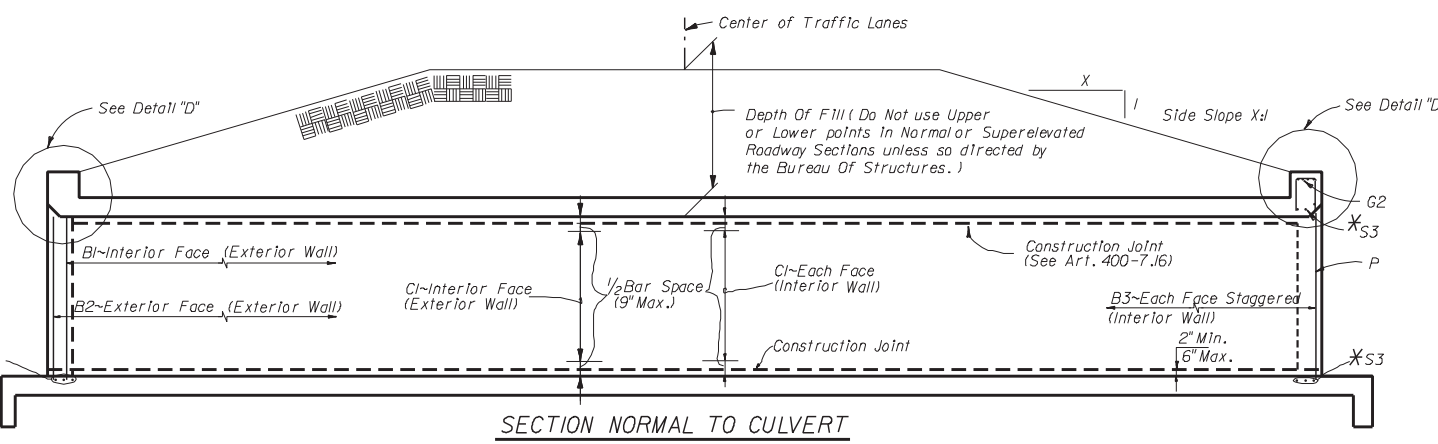
SECTION THRU BARREL

NOTE: The location of the first bar from the ends of the culvert shall not be less than 3", but not greater than one half the bar spacing.



PART PLAN TOP SLAB

PART PLAN BOTTOM SLAB



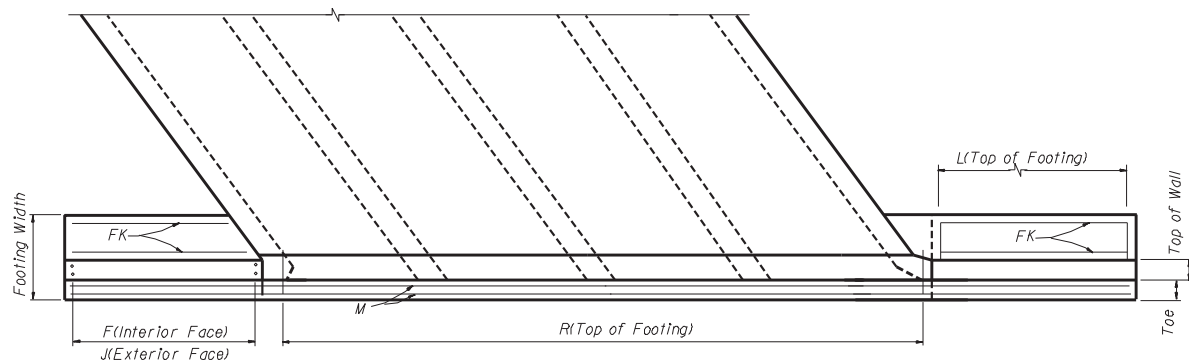
SECTION NORMAL TO CULVERT

* See Culvert Details and Reinforcing Bar Schedule, Sheet 1 of 5

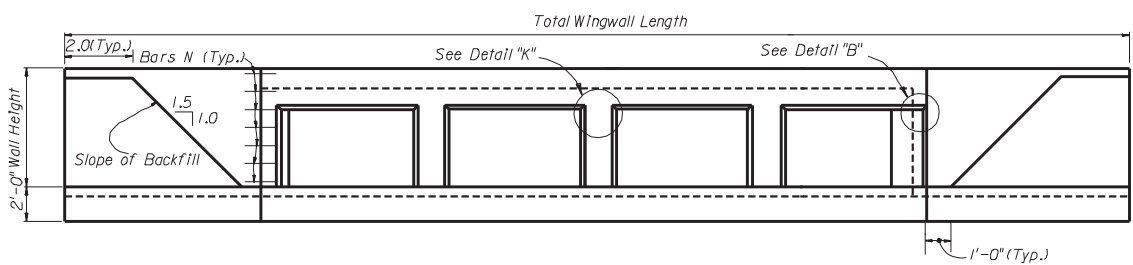
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**CONCRETE BOX CULVERT
TRIPLE BARREL**

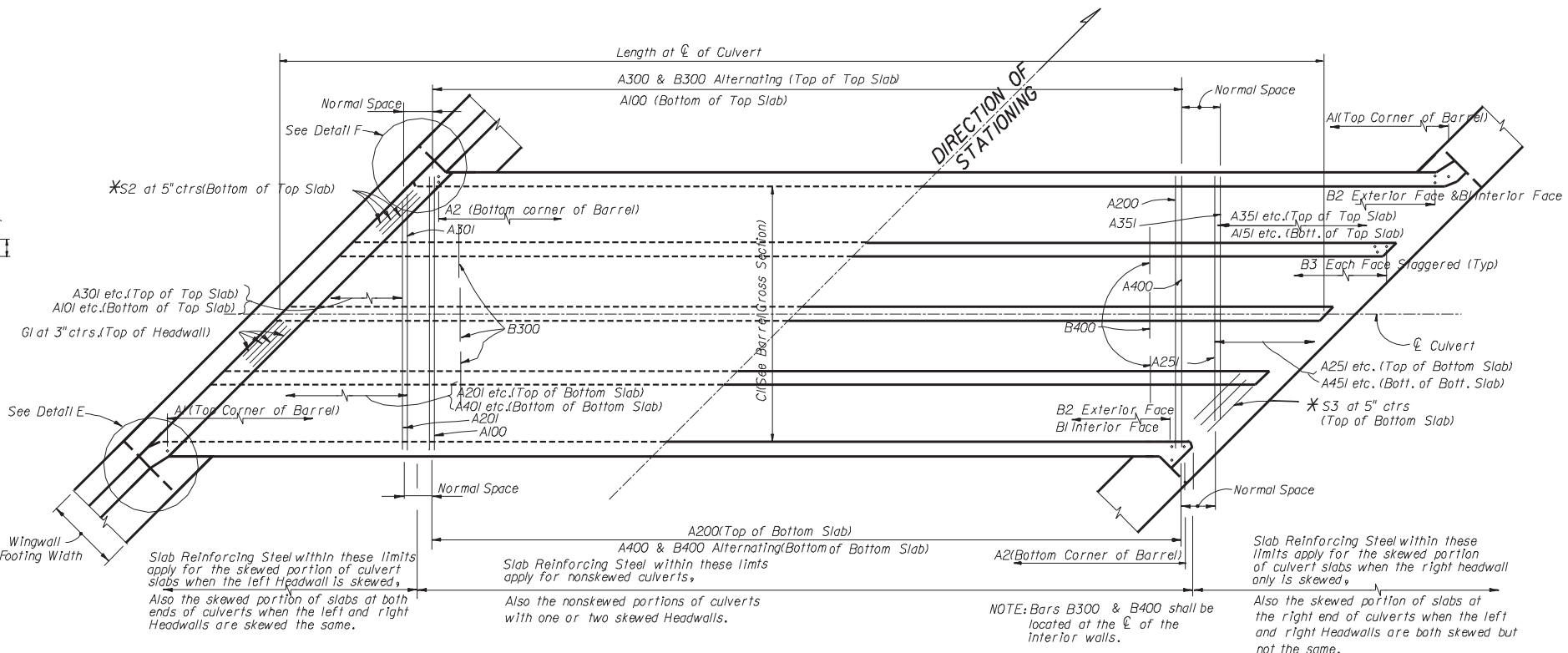
Names	Dates	Approved By		
Designed By		S. A. McHenry State Drainage Engineer		
Drawn By	GFG 1-86			
Checked By	RCB 1-86	Revision	Sheet No.	Index No.
		00	4 of 5	290



PART PLAN AT END OF CULVERT

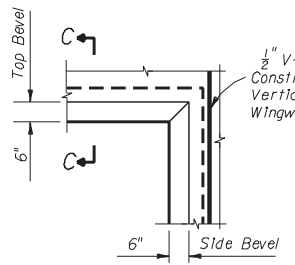


END ELEVATION



PART PLAN TOP SLAB

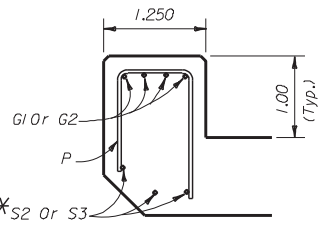
PART PLAN BOTTOM SLAB



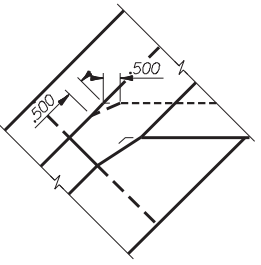
DETAIL "B"



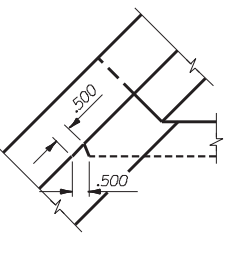
SECTION C-C



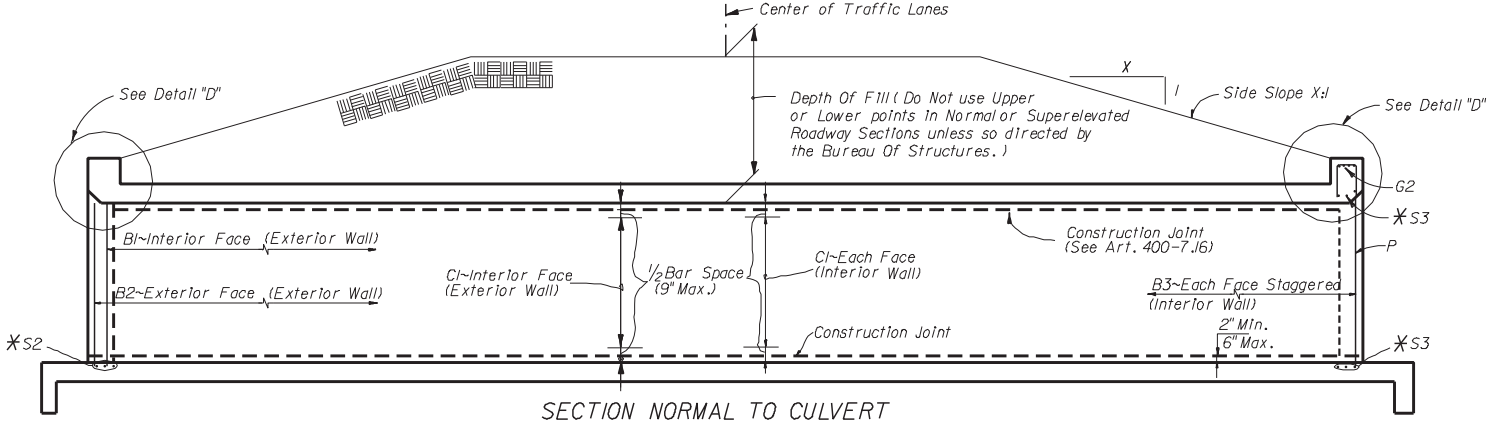
DETAIL "D"



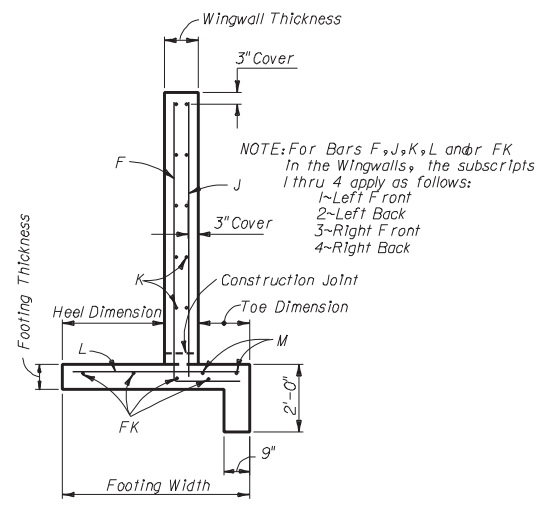
DETAIL "E"



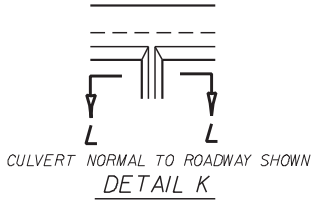
DETAIL "F"



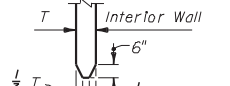
SECTION NORMAL TO CULVERT



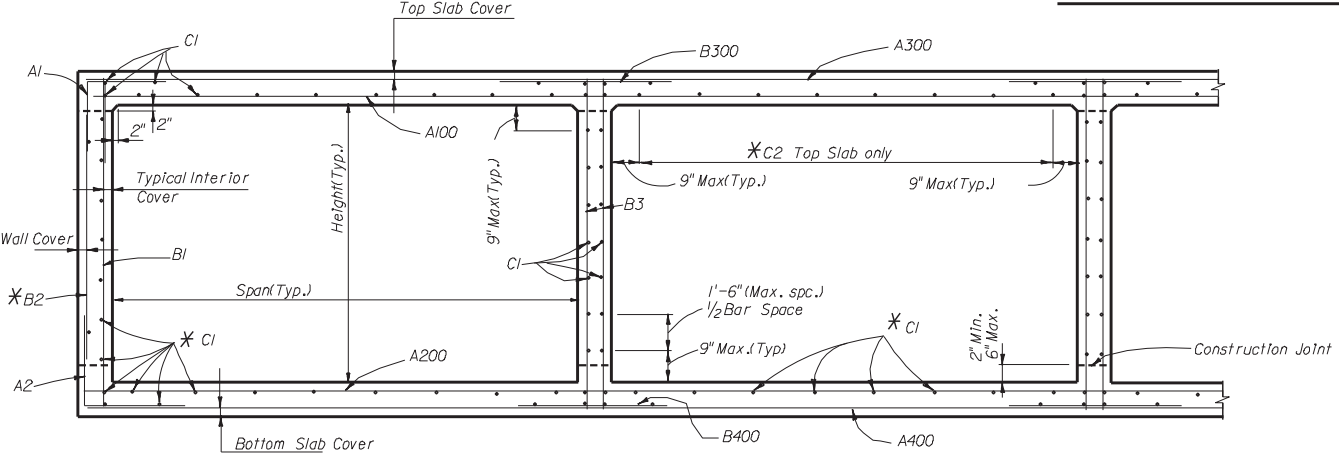
SECTION THRU WINGWALL



DETAIL K



SECTION LL



SECTION THRU BARREL

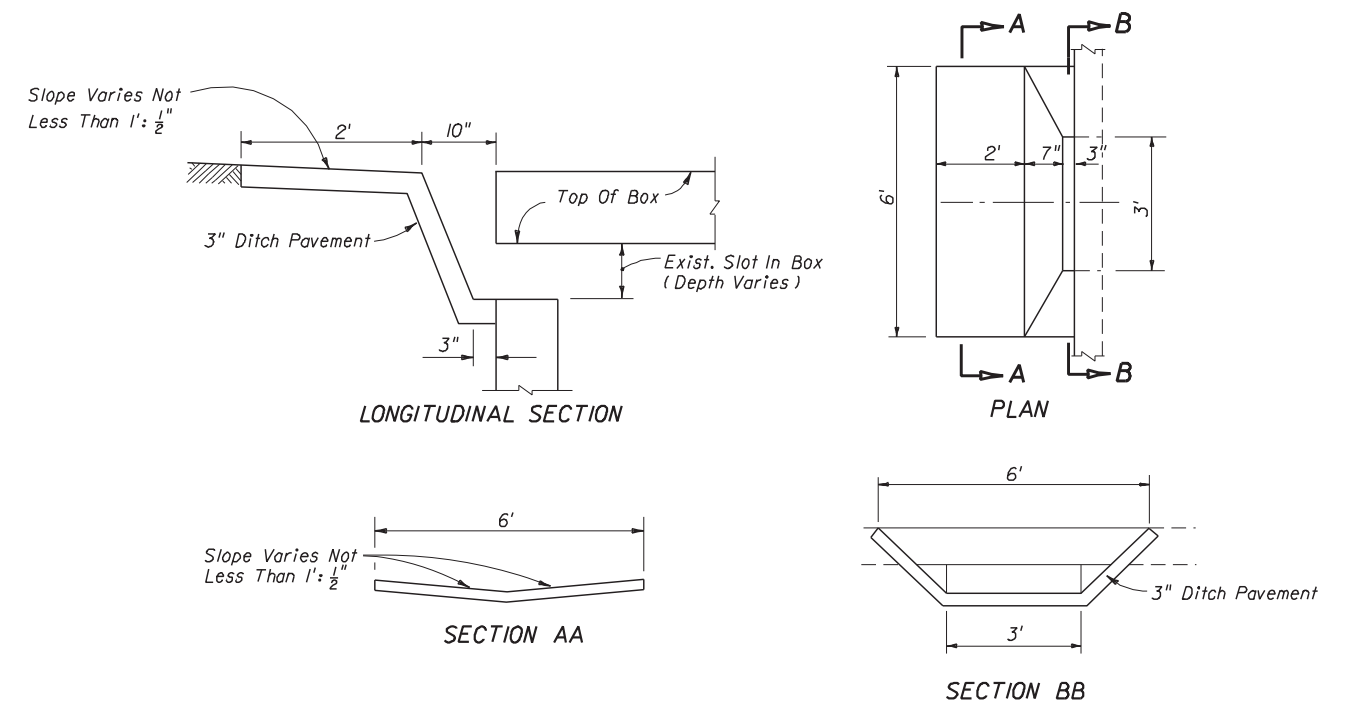
NOTE: The location of the first bar from the ends of the culvert shall not be less than 3", but not greater than one half the bar spacing.

* See Culvert Details and Reinforcing Bar Schedule, Sheet 1 of 5

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

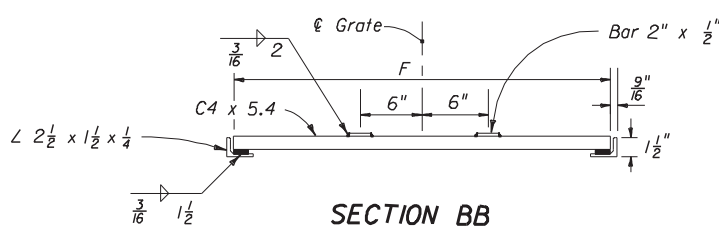
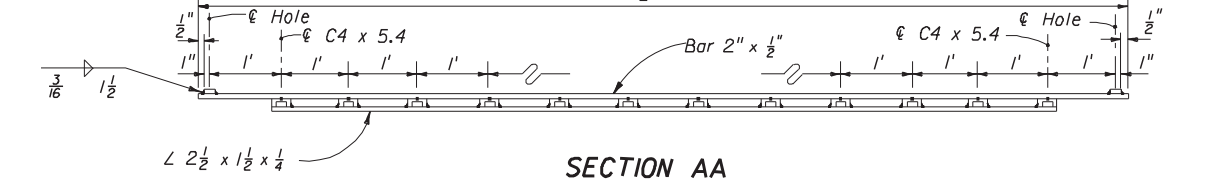
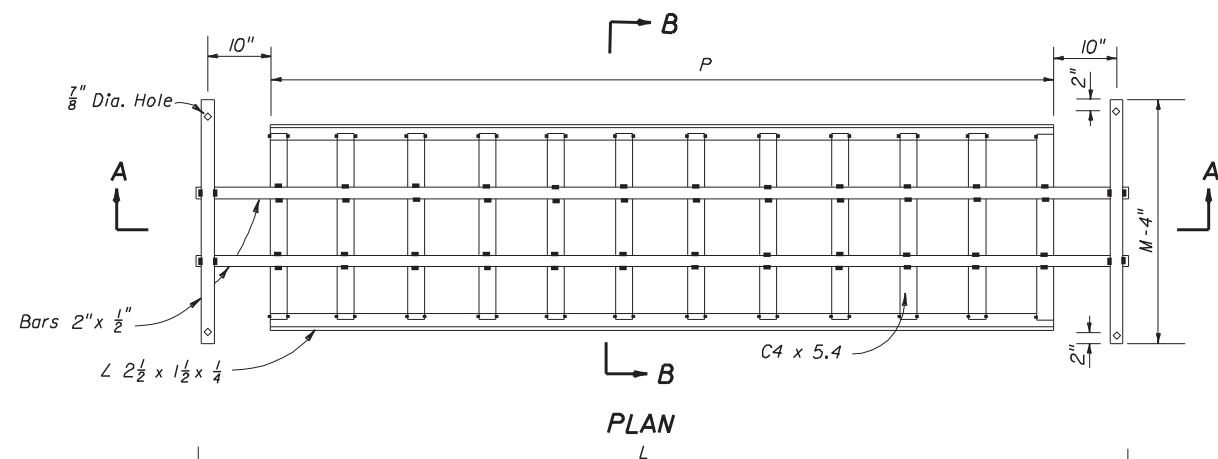
**CONCRETE BOX CULVERT
QUADRUPLE BARREL**

Names	Dates	Approved By				
Designed By		 State Drainage Engineer				
Drawn By	GFG 1-86				Revision	Sheet No.
Checked By	RCB 1-86				00	5 of 5
				Index No.		
				290		

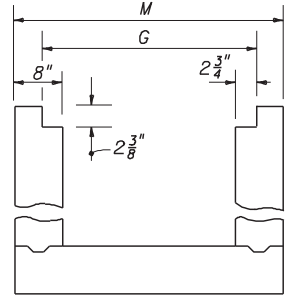


SAFETY MODIFICATION FOR INLETS IN BOX CULVERTS

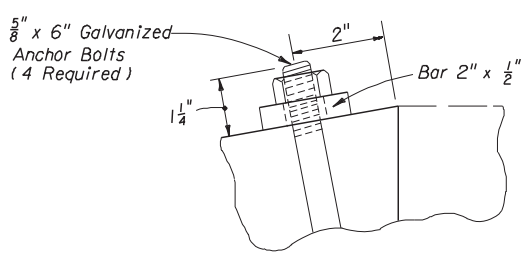
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
SAFETY MODIFICATIONS FOR INLETS IN BOX CULVERTS					
	Names	Dates	Approved By		
Designed By	HAB	07/67	<i>S. A. McHenry</i> State Drainage Engineer		
Drawn By	MJT	07/67	Revision	Sheet No.	Index No.
Checked By	DWS	07/67	00	1 of 1	293



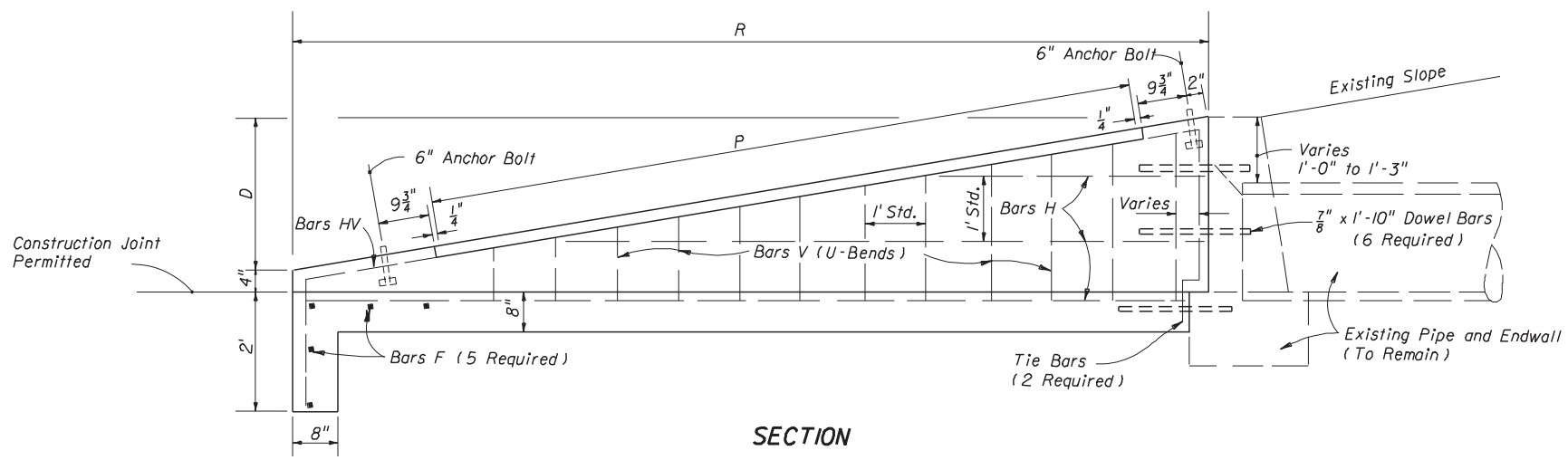
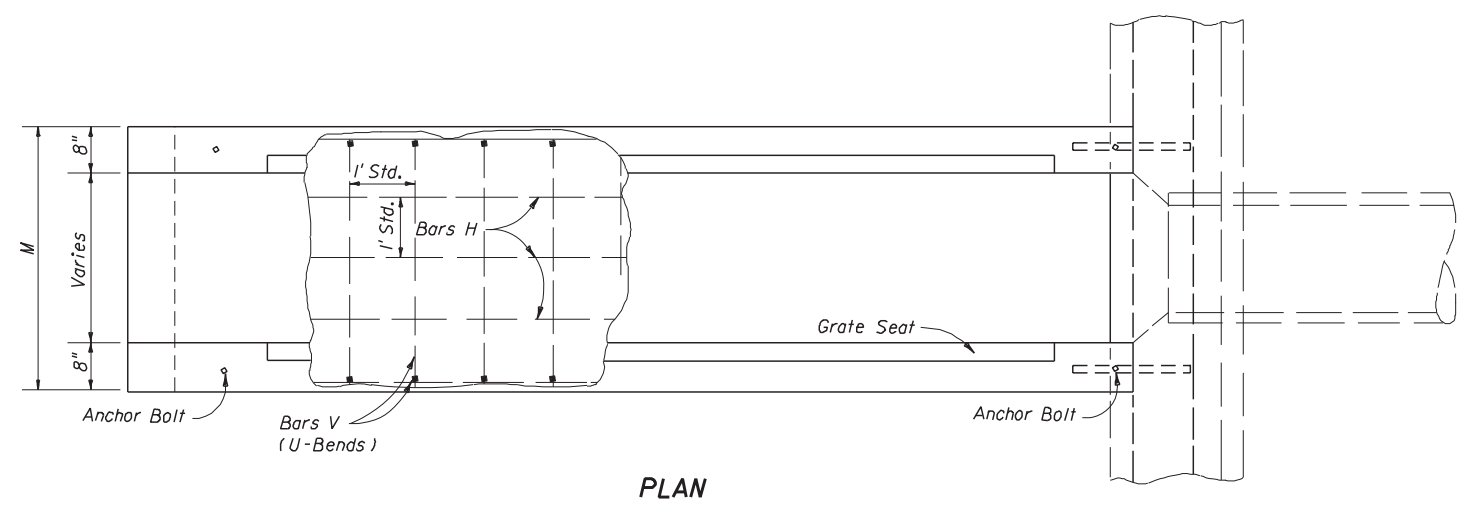
GRATE DETAIL



GRATE SEAT DETAIL



ANCHOR BOLT DETAIL



GENERAL NOTES

1. For use criteria see " Steel Grating Use Criteria " Index No. 261.
2. Grates shall be ASTM A242/A242M, A572/A572M or A588/A588M, Grade 50 steel, and galvanized in accordance with Section 962-7 of the Standard Specifications.
3. Channel section C3 x 6.0 may be substituted for the C4 x 5.4 channel.
4. All reinforcing No. 4 bars with 2" clearance except as noted. Spacings shown are center to center. Laps to be 12" minimum. Welded wire fabric (two cages max.) having an equivalent cross section area (0.20 sq. in.) may be substituted for bar reinforcement.
5. Drill 1 3/4" holes 8" deep with a rotary drill in existing endwall for dowel bars. Holes shall be thoroughly cleaned prior to placing dowel bars and epoxy.
6. Endwall to be paid for under the contract unit price for Class I Concrete (Endwalls), CY and Reinforcing Steel (Roadway), LB. Cost of dowel bars and epoxy mortar to be included in the contract unit price for reinforcing steel. Cost of grates to be paid for under the contract unit price for Endwall Grate, LB., plan quantity. Cost of galvanized bolts and nuts to be included in the contract unit price for the grate.
7. Sod slopes 5' each side and above endwall. Sodding to be paid for under the contract unit price for Sodding, SY.

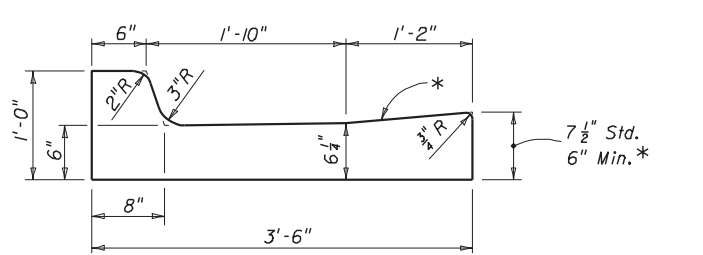
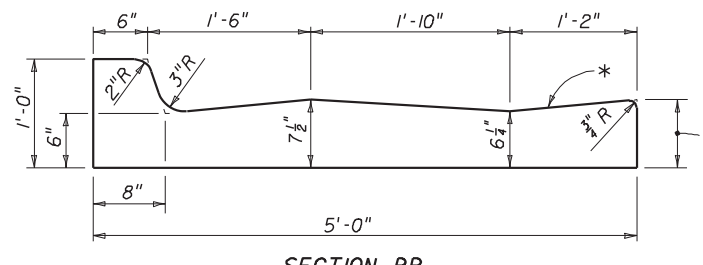
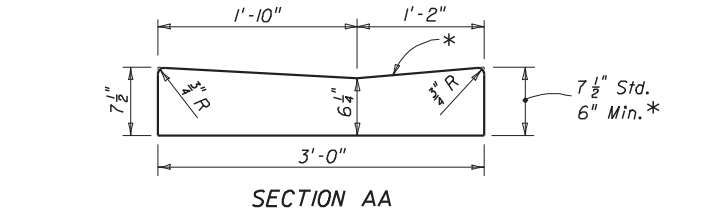
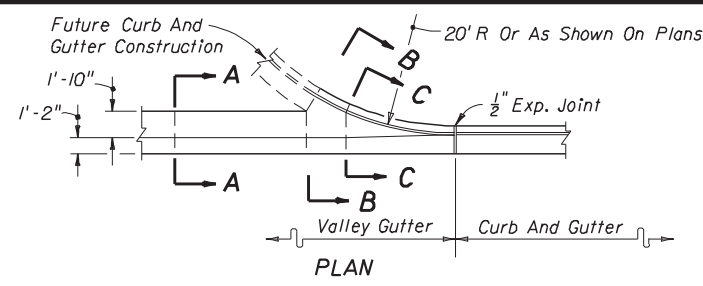
DIMENSIONS AND QUANTITIES PER GRATE										
Slope	Pipe Size	Channels @ 5.4 Lbs./L.F.		Bars @ 3.4 lbs./L.F. (2 ea.)			Angles @ 3.2 Lbs./L.F. (2)		Total Weight-Lbs.	
		Quantity	F	Lbs.	L	M-4"	Lbs.	P		Lbs.
1:6	15"	10	2'-6 3/8"	139	11'-3"	3'-3"	99	9'-4"	60	298
	18"	12	2'-9 3/8"	183	13'-3"	3'-6"	114	11'-4"	73	370
	24"	15	3'-3 3/8"	269	16'-3"	4'-0"	138	14'-4"	92	499
	30"	18	3'-9 3/8"	372	19'-3"	4'-6"	162	17'-4"	111	645
1:4	15"	6	2'-6 3/8"	83	7'-3"	3'-3"	71	5'-4"	34	188
	18"	7	2'-9 3/8"	107	8'-3"	3'-6"	80	6'-4"	41	228
	24"	9	3'-3 3/8"	161	10'-3"	4'-0"	97	8'-4"	53	311
	30"	11	3'-9 3/8"	227	12'-3"	4'-6"	114	10'-4"	66	407

DIMENSIONS AND QUANTITIES PER U-ENDWALL								
Pipe Size	G	M	D	R	P	Class I Concrete-C.Y.	Reinforcing Steel-Lbs.	Sodding S Y
15"	2'-8 1/2"	3'-7"	2'-2"	13'-0"	9'-4"	2.12	167	23
18"	2'-11 1/2"	3'-10"	2'-5"	14'-6"	11'-4"	2.53	173	25
24"	3'-5 1/2"	4'-4"	2'-11"	17'-6"	14'-4"	3.48	238	29
30"	3'-11 1/2"	4'-10"	3'-5"	20'-6"	17'-4"	4.57	315	32
15"	2'-8 1/2"	3'-7"	2'-2"	8'-8"	5'-4"	1.44	120	19
18"	2'-11 1/2"	3'-10"	2'-5"	9'-8"	6'-4"	1.72	130	20
24"	3'-5 1/2"	4'-4"	2'-11"	11'-8"	8'-4"	2.36	167	22
30"	3'-11 1/2"	4'-10"	3'-5"	13'-8"	10'-4"	3.09	225	25

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**SAFETY MODIFICATIONS
FOR ENDWALLS**

Designed By	Names	Dates	Approved By	S. A. McHenry State Drainage Engineer	
Drawn By			Revision	Sheet No.	Index No.
Checked By			00	1 of 1	295

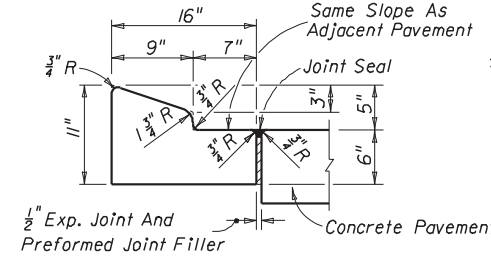


* When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement. The thickness of the lip shall be 6", unless otherwise shown on plans.

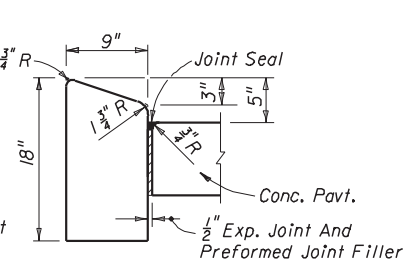
☑ Rotate entire section so that gutter cross slope matches slope of adjacent circulating roadway pavement.

Note: For use adjacent to concrete or flexible pavement. For details depicting usage adjacent to flexible pavement, see diagram right. Expansion joint, preformed joint filler and joint seal are required between curb & gutter and concrete pavement only, see diagram right.

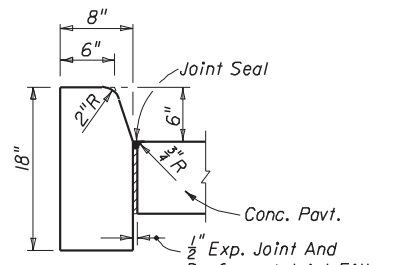
CONCRETE CURB AND GUTTER



TYPE A



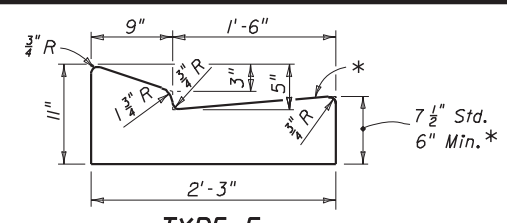
TYPE B



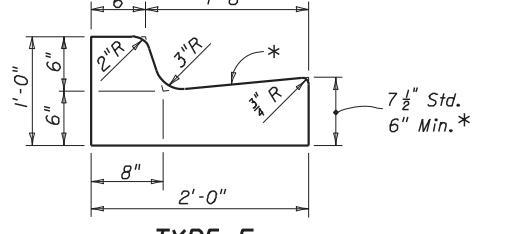
TYPE D

Note: For use adjacent to concrete or flexible pavement, concrete shown. Expansion joint, preformed joint filler and joint seal are required between curbs and concrete pavement only, see diagram right.

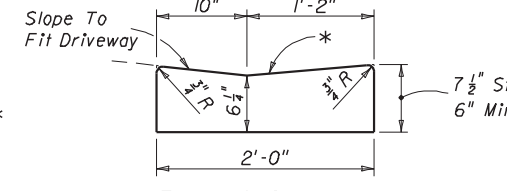
CONCRETE CURB



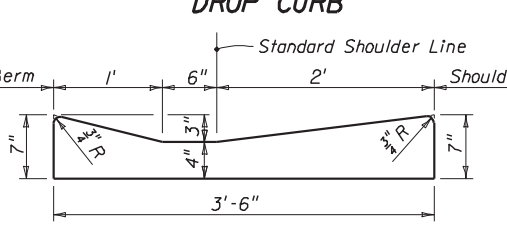
TYPE E



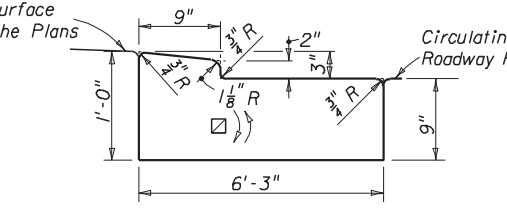
TYPE F



DROP CURB



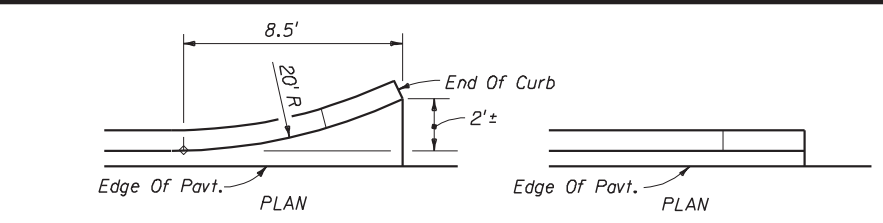
SHOULDER GUTTER



SHOULDER GUTTER

TYPE RA

TRAFFIC BEARING SECTION FOR USE IN ROUNDABOUT CENTRAL ISLAND CONSTRUCTION



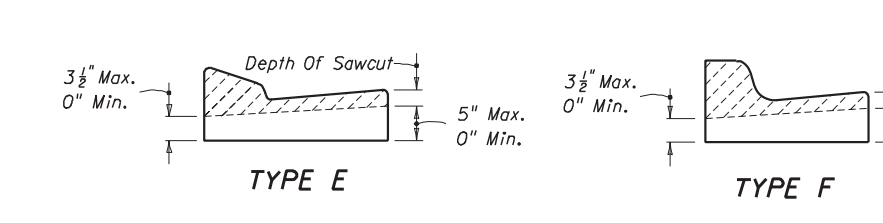
FLARED END



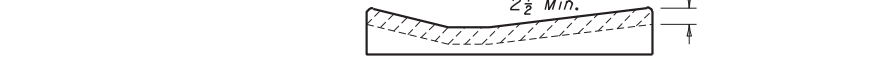
STRAIGHT END

CURB TYPE A

CURB AND GUTTER ENDINGS



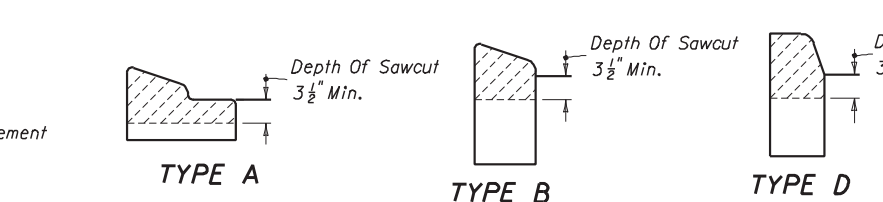
SHOULDER GUTTER



SHOULDER GUTTER

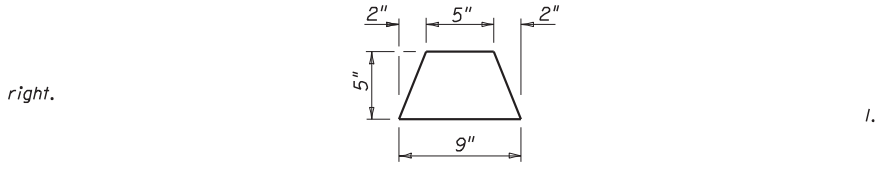
Sawcuts should be avoided within valley gutter and within curb and gutter endings.

CONTRACTION JOINT IN CURB AND GUTTER

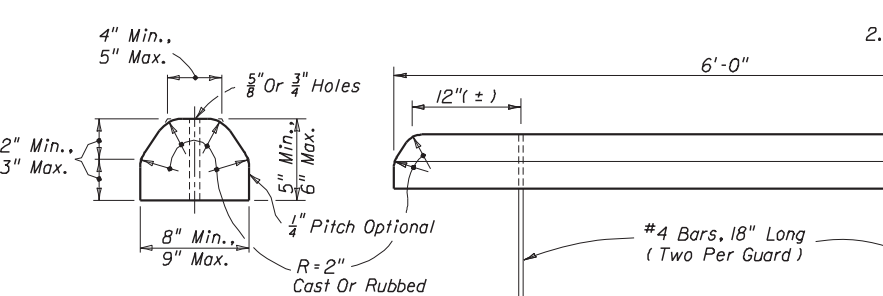


CONTRACTION JOINT IN CURB

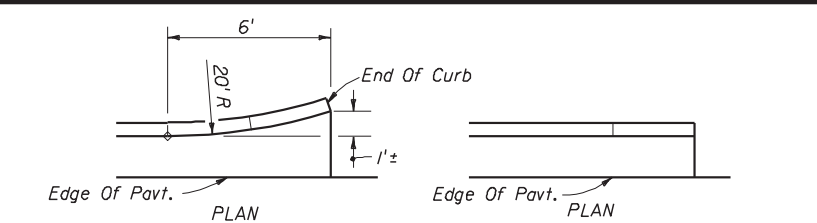
ASPHALTIC CONCRETE CURB



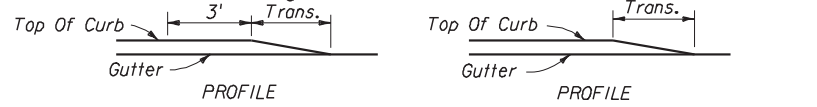
CONCRETE BUMPER GUARD



CONCRETE BUMPER GUARD



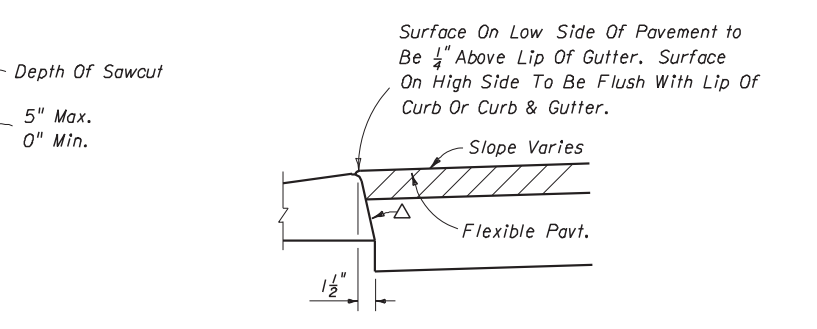
FLARED END



STRAIGHT END

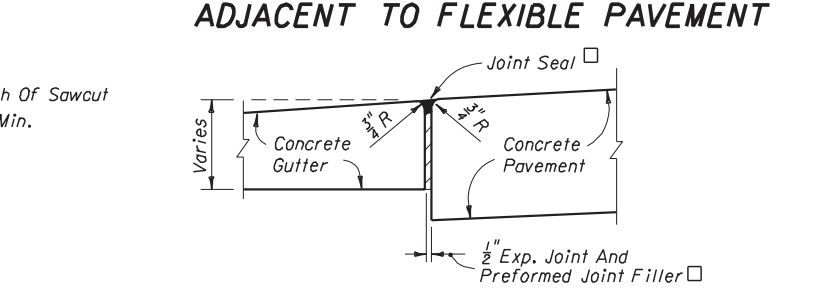
CURB AND GUTTER TYPES E & F

CURB AND GUTTER AND TYPE A CURB ADJACENT TO FLEXIBLE PAVEMENT



△ Applies to both high and low sides of pavement, low side shown. Applies to shoulder gutter only where adjoining traffic lanes.

CURB AND GUTTER AND TYPE A CURB ADJACENT TO FLEXIBLE PAVEMENT



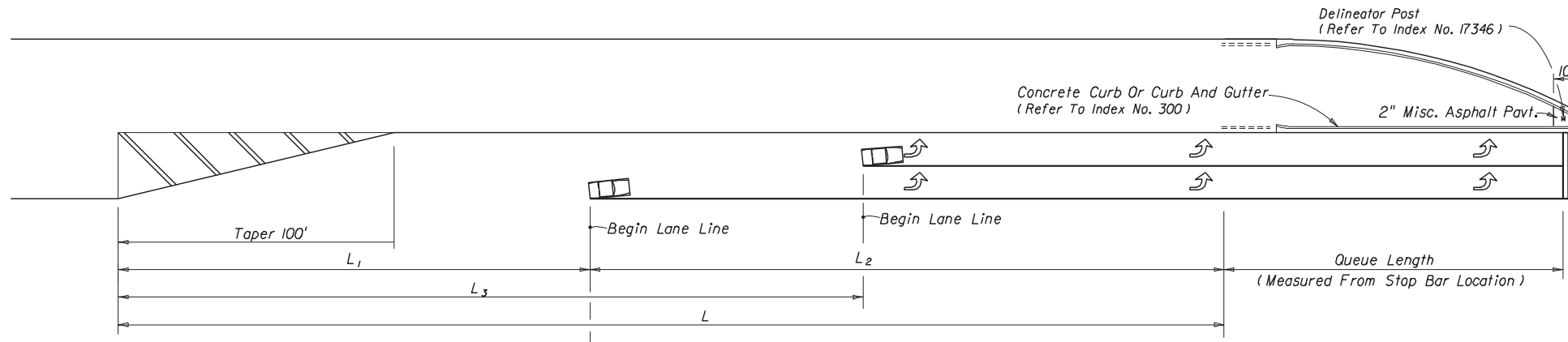
☐ Applies to both high and low sides of pavement, low side shown.

EXPANSION JOINT BETWEEN GUTTER AND CONCRETE PAVEMENT

GENERAL NOTES

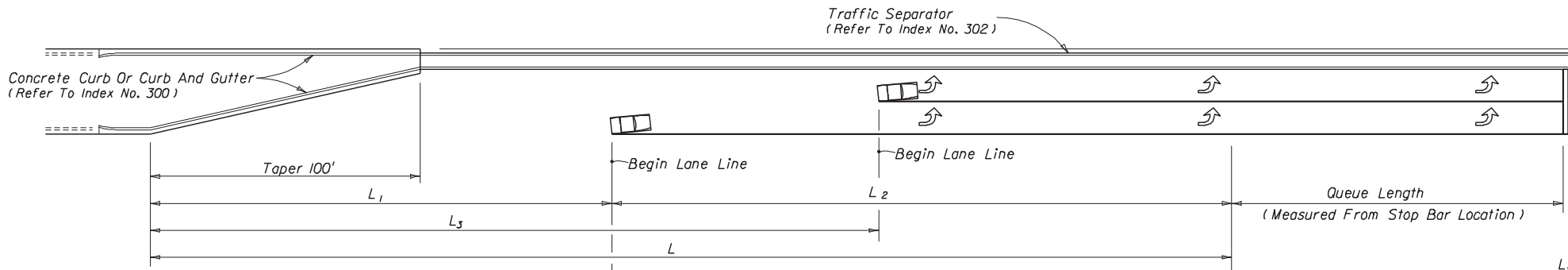
1. For curb, gutter and curb & gutter provide 1/8" - 1/4" contraction joints at 10' centers (max.). Contraction joints adjacent to concrete pavement on tangents and flat curves are to match the pavement joints, with intermediate joints not to exceed 10' centers. Curb, gutter and curb & gutter expansion joints shall be located in accordance with Section 520 of the standard specifications.
2. Ends of Curbs Types B and D shall transition from full to zero heights in 3'.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CURB & CURB AND GUTTER				
Designed By	Names	Dates	Approved By	
Drawn By			State Roadway Design Engineer	
Checked By			Revision	Sheet No.
			00	1 of 1
				300



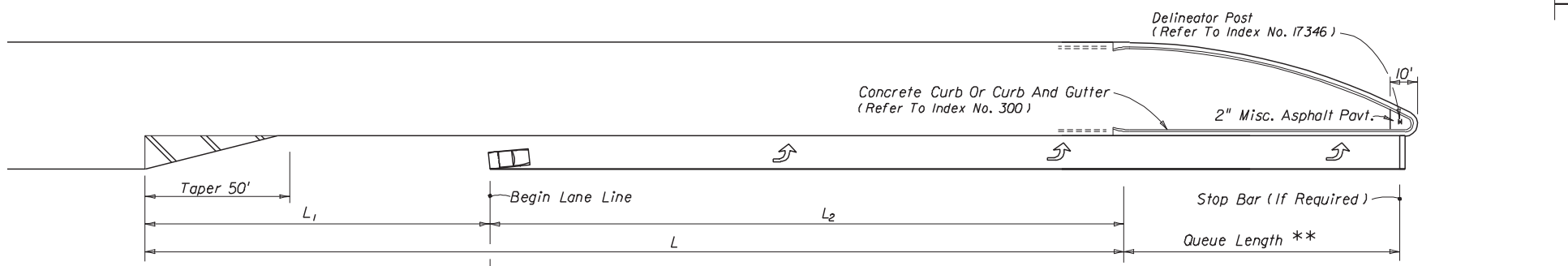
Brakes Applied After Turning Vehicle Clears Through Lane;
Entry Speed: 10 mph Below Design Speed For Urban Condition
Average Running Speed For Rural Condition

FLUSH AND/OR CURBED SEPARATION



Brakes Applied After Turning Vehicle Clears Through Lane;
Entry Speed: 10 mph Below Design Speed For Urban Condition
Average Running Speed For Rural Condition

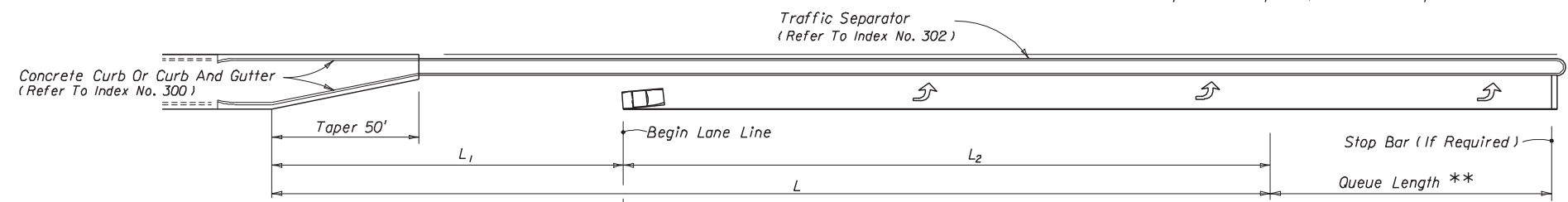
**RAISED SEPARATION
DOUBLE LEFT TURNS**



Brakes Applied After Turning Vehicle Clears Through Lane;
Entry Speed: 10 mph Below Design Speed For Urban Condition
Average Running Speed For Rural Condition

FLUSH AND/OR CURBED SEPARATION

** Queue Length Is Measured From The Median Nose Radial Point Or,
When A Stop Bar Is Required, From The Stop Bar.

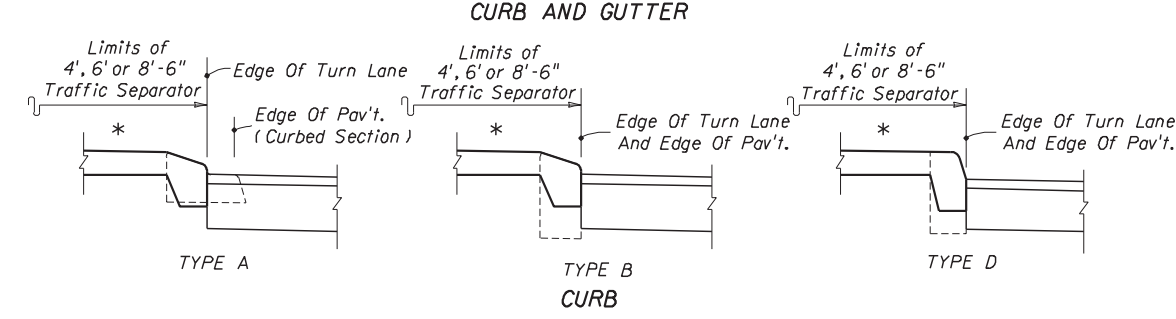
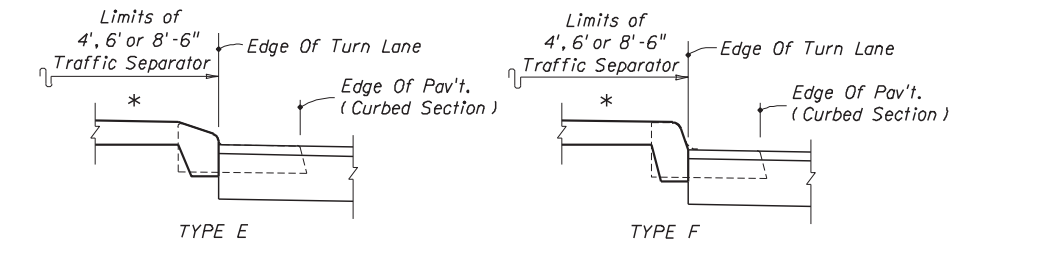


Brakes Applied After Turning Vehicle Clears Through Lane;
Entry Speed: 10 mph Below Design Speed For Urban Condition
Average Running Speed For Rural Condition

**RAISED SEPARATION
SINGLE LEFT TURNS**

TURN LANES

TURN LANES ○ CURBED AND UNCURBED MEDIANS								
Design Speed (mph)	Entry Speed (mph)	Clearance Distance L ₁	URBAN CONDITONS			RURAL CONDITONS		
			Brake To Stop Distance L ₂	Total Decel. Distance L	Clearance Distance L ₃	Brake To Stop Distance L ₂	Total Decel. Distance L	Clearance Distance L ₃
35	25	70'	75'	145'	110'	---	---	---
40	30	80'	75'	155'	120'	---	---	---
45	35	85'	100'	185'	135'	---	---	---
50	40/44	105'	135'	240'	160'	215'	320'	160'
55	48	125'	---	---	---	260'	385'	195'
60	52	145'	---	---	---	310'	455'	230'
65	55	170'	---	---	---	350'	520'	270'



For Curb And Curb & Gutter Types, See Index No. 300
* Option I Separators Shown (Refer To Index No. 302)

**MEDIAN CURB AND TRAFFIC SEPARATOR
JUNCTURE DETAILS**

- GENERAL NOTES**
- The plan views shown are for turn lane taper shapes and dimensional purposes only, they do not prescribe the use of curb, curb and gutter, shoulders nor separators specifically to either rural or urban conditions.
 - Total deceleration distances must not be reduced except where lesser values are imposed by unrelocatable control points.
 - Right turn lane tapers and distances identical to left turn lanes under stop control conditions. Right turn lane tapers and/or distances are site specific under free flow or yield conditions.
 - These left turn configurations apply to continuous left turn lanes only where specifically called for in the plans.
 - For pavement markings see Index No. 17346.

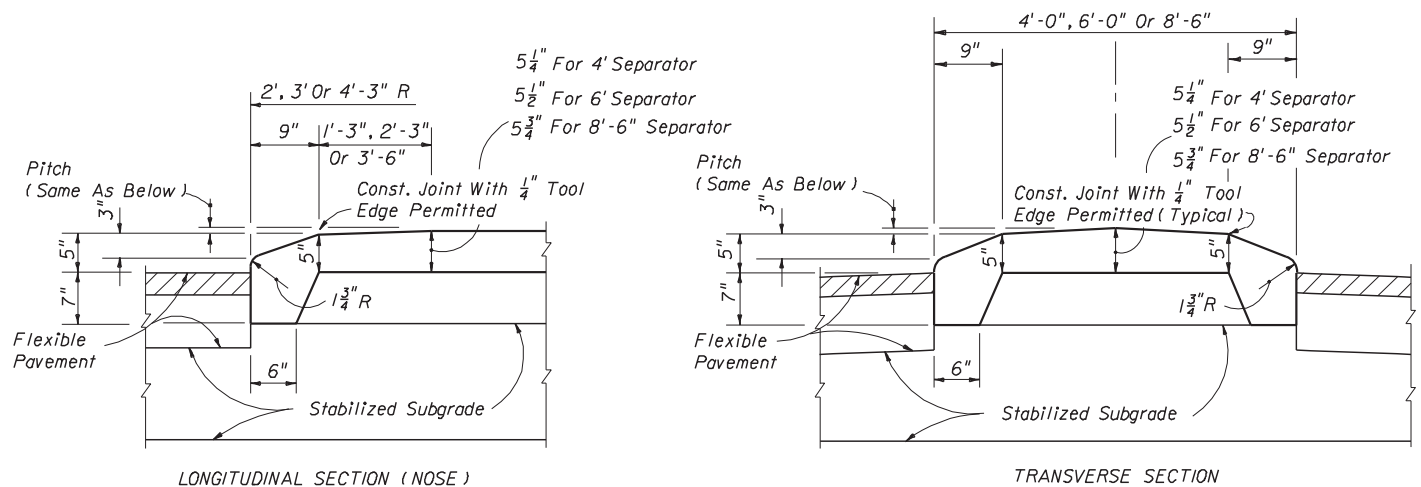
DESIGN NOTES

- Basis for turn lane configurations:
 - Informed Driver.
 - Stop condition (With Or Without Stop Control).
 - Wet Pavement.
 - Reaction preceding entry point.
 - Maximum safe deceleration rates for urban conditions.
 - Comfortable deceleration rates for rural conditions.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TURN LANES

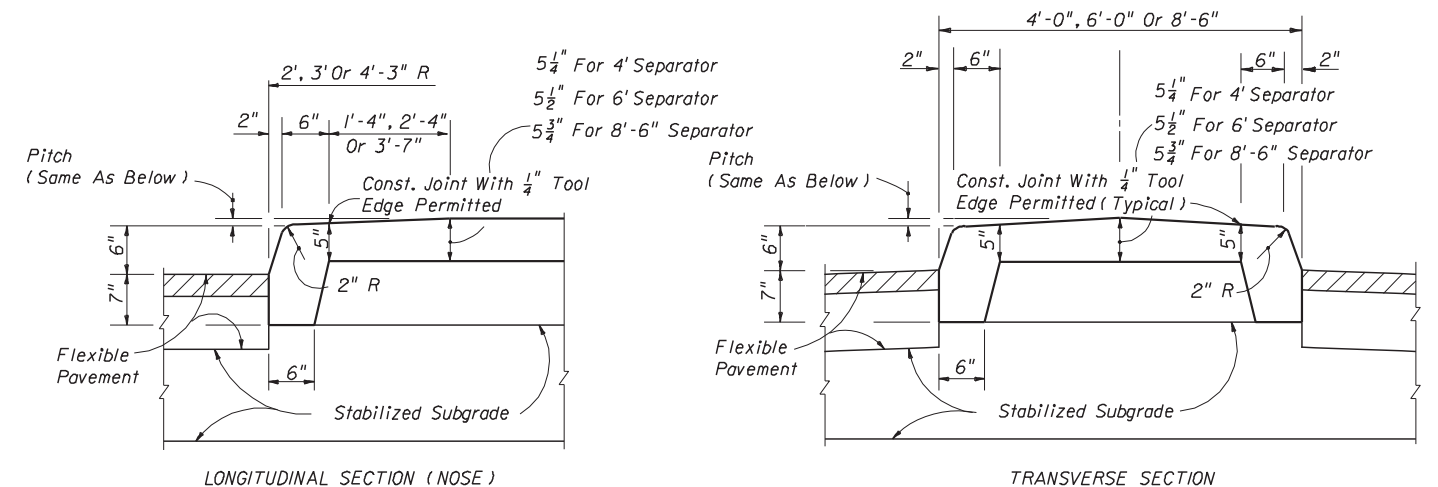
Designed By	RRR	05/91	Approved By		<i>[Signature]</i>
Drawn By	HSD/HKH	05/91	Revision	Sheet No.	Index No.
Checked By	JTC/REA	05/91	00	1 of 1	301



LONGITUDINAL SECTION (NOSE)

TRANSVERSE SECTION

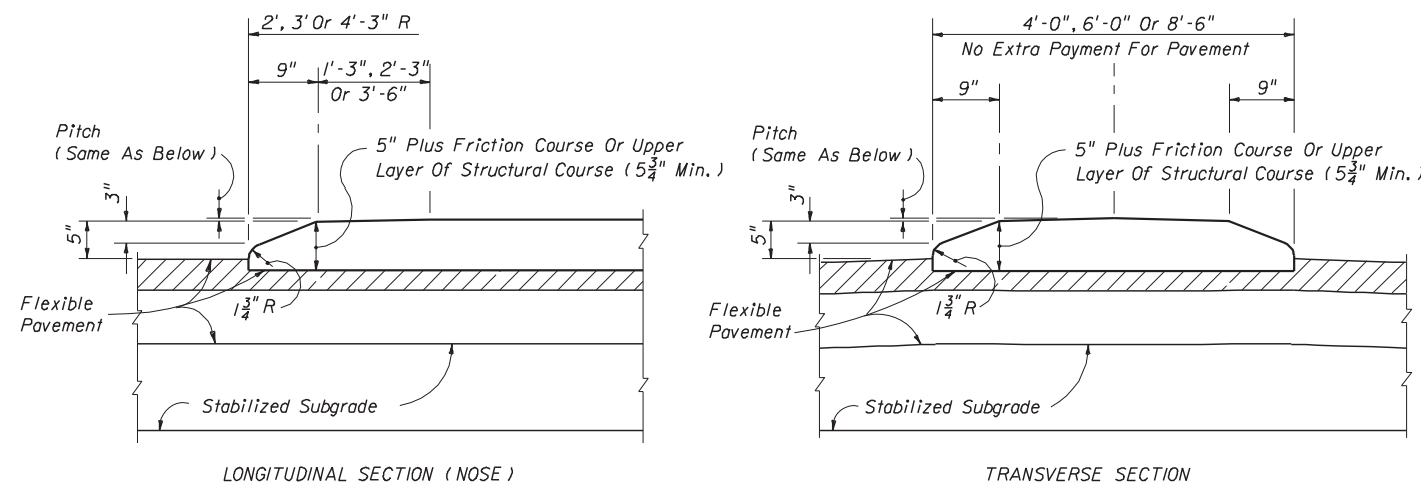
OPTION I



LONGITUDINAL SECTION (NOSE)

TRANSVERSE SECTION

OPTION I

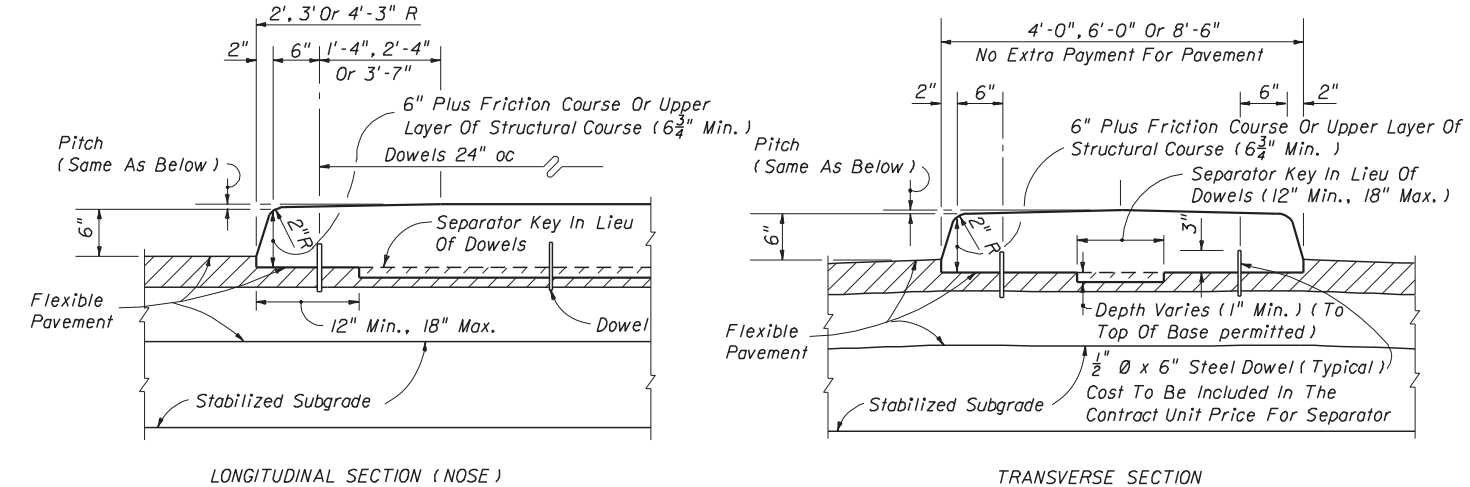


LONGITUDINAL SECTION (NOSE)

TRANSVERSE SECTION

OPTION II

TYPE I CONCRETE TRAFFIC SEPARATOR

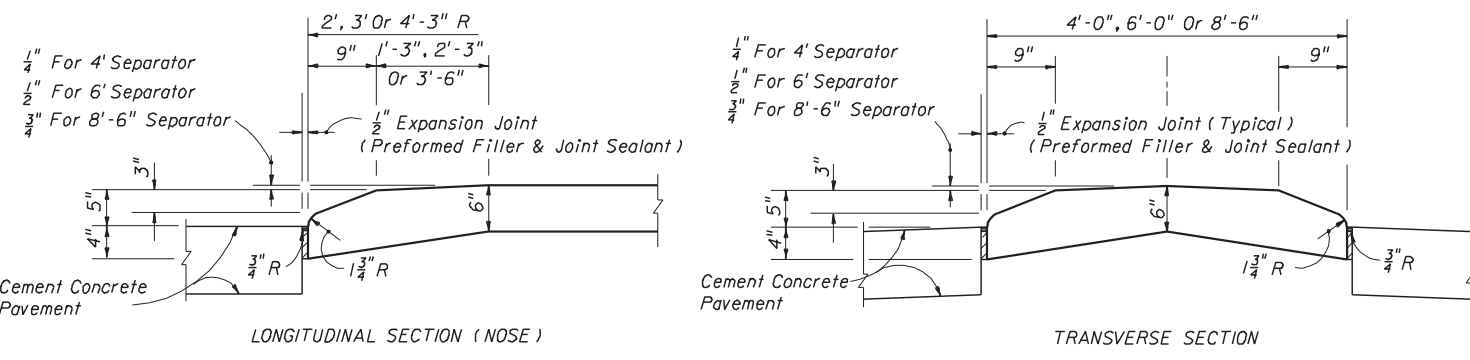


LONGITUDINAL SECTION (NOSE)

TRANSVERSE SECTION

OPTION II

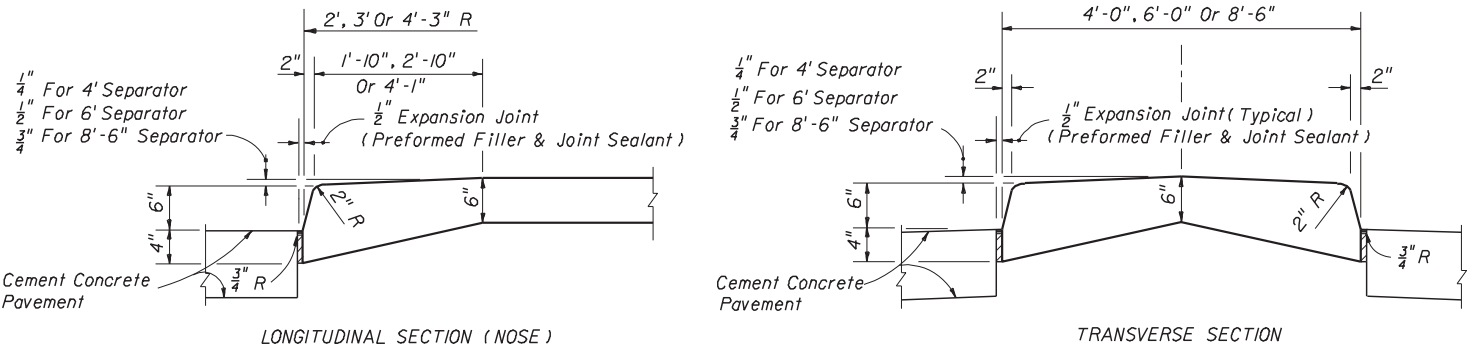
TYPE IV CONCRETE TRAFFIC SEPARATOR



LONGITUDINAL SECTION (NOSE)

TRANSVERSE SECTION

TYPE II CONCRETE TRAFFIC SEPARATOR



LONGITUDINAL SECTION (NOSE)

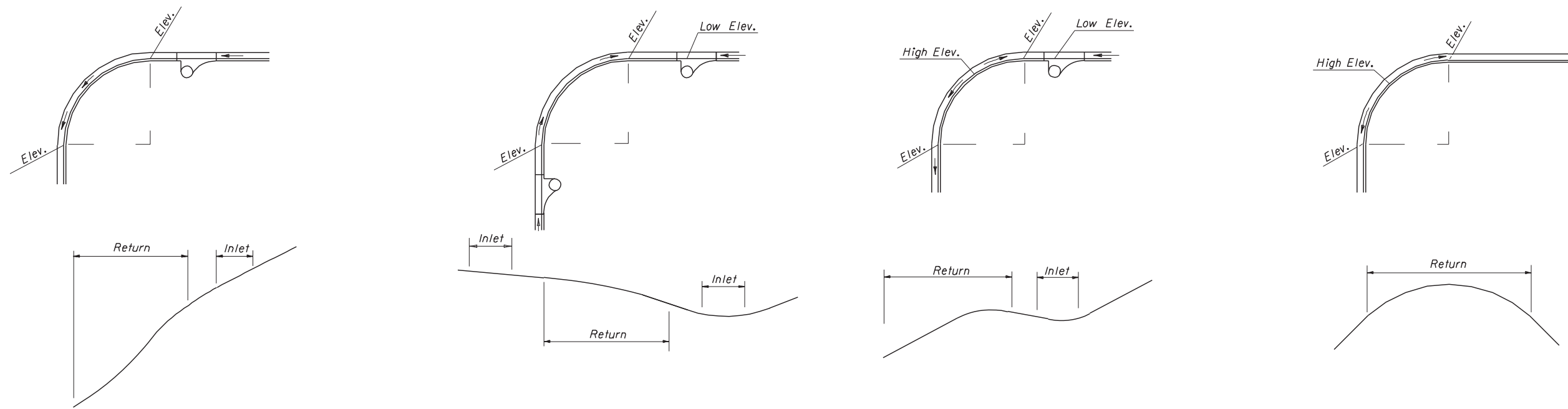
TRANSVERSE SECTION

TYPE V CONCRETE TRAFFIC SEPARATOR

NOTES

- Separators Type I and IV are to be used with flexible pavement. Separators Types II and V are to be used with rigid pavement.
- Either Option I or Option II may be used for Types I and IV separators except when a specific option is called for in the plans.
- For all separators provide 1/8" - 1/4" contraction joints at 10' centers (max.). Contraction joints adjacent to concrete pavement on tangents and flat curves are to match the pavement joints, with intermediate joints not to exceed 10' centers.
- Separators having widths of 4', 6' or 8'-6" shall be paid for under the contract unit price for Concrete Traffic Separator (Type __) (__' Wide) LF. Separators having widths other than 4', 6' or 8'-6" shall be detailed in the plans as special separators and paid for under the contract unit price for Concrete Traffic Separator (Special) SY.

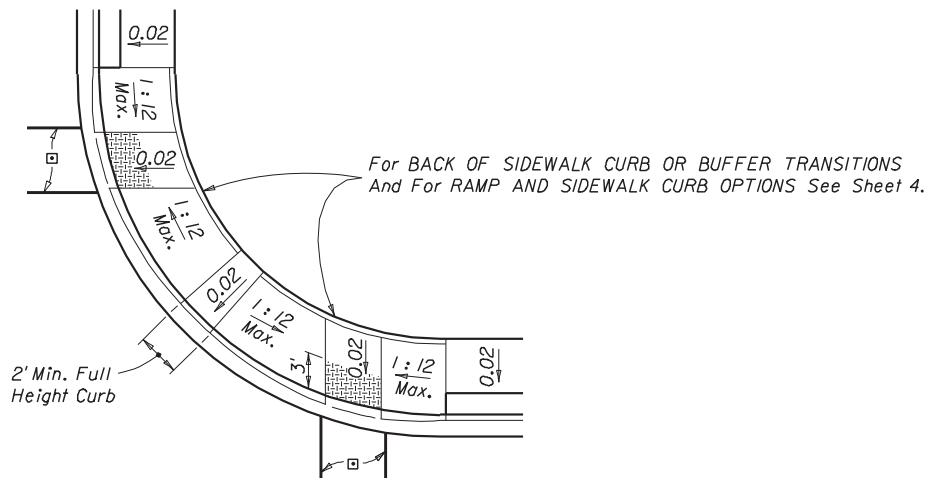
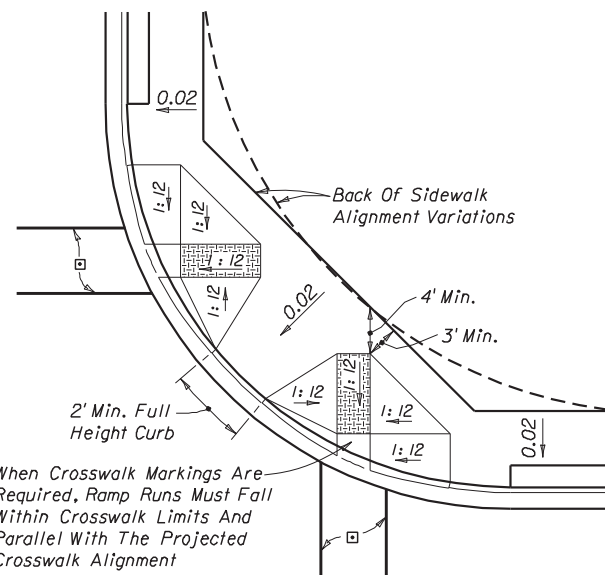
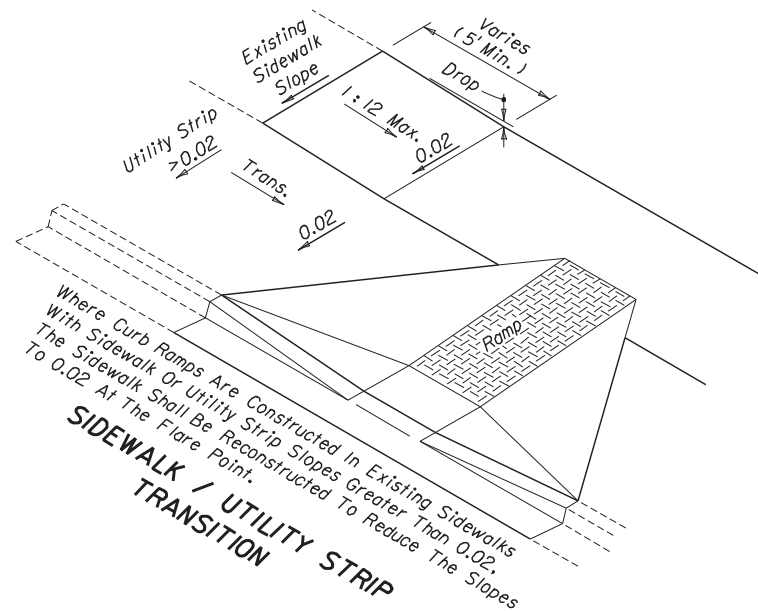
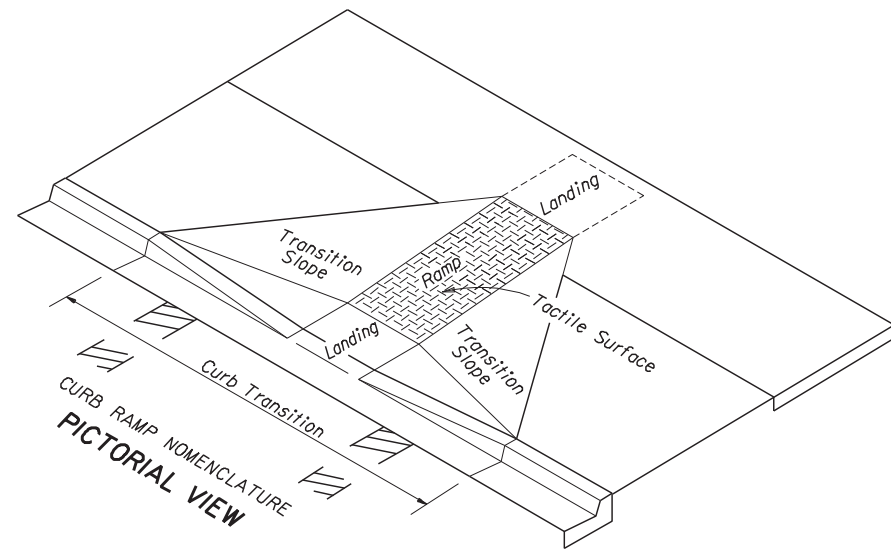
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC SEPARATORS				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	HSD	09/81	Revision	Sheet No. 1 of 1
Checked By	JVG	09/81	00	Index No. 302



Note:
 Profile grades should be established that will allow inlets to be located outside the return whenever practical. Inlets should be located to avoid conflict with pedestrian movement. Special care must be exercised to prevent conflict with public sidewalk curbed ramps for the disabled. For information on public sidewalk curbed ramps refer to Index No. 304.

**SHOWING LOCATION OF INLETS ON RETURN
 TYPICAL RETURN PROFILES**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CURB RETURN PROFILES				
	Names	Dates	Approved By <i>[Signature]</i>	
Designed By			State Roadway Design Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			00	1 of 1 303



Note: A portion of one or both ramps may extend outside the return.

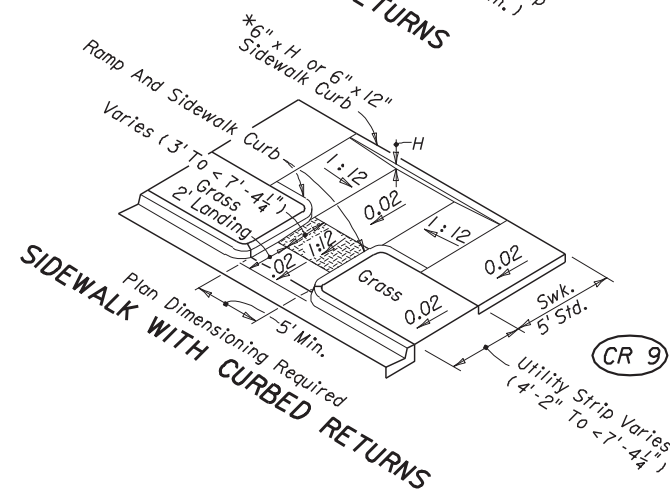
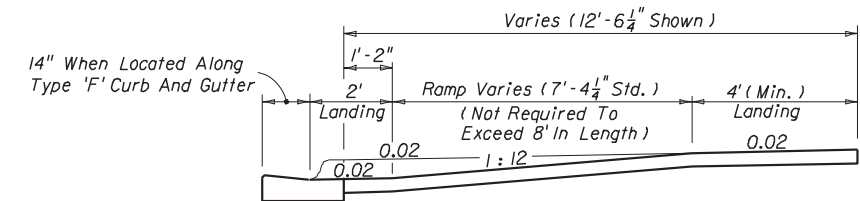
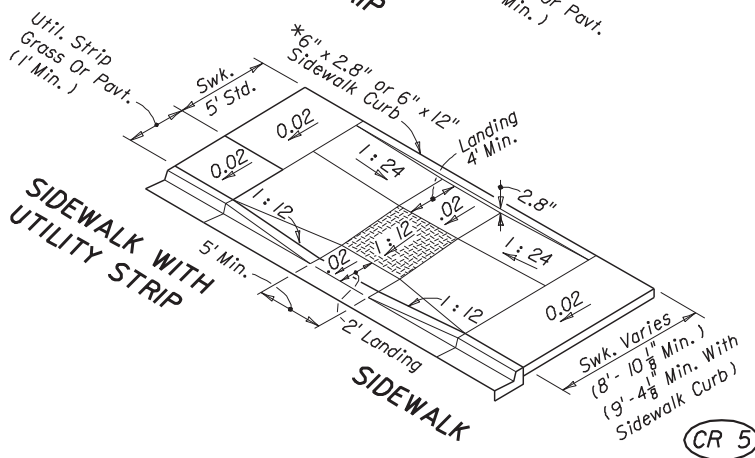
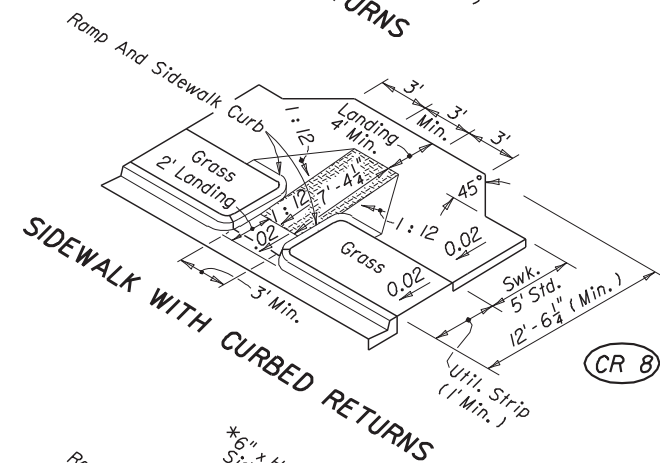
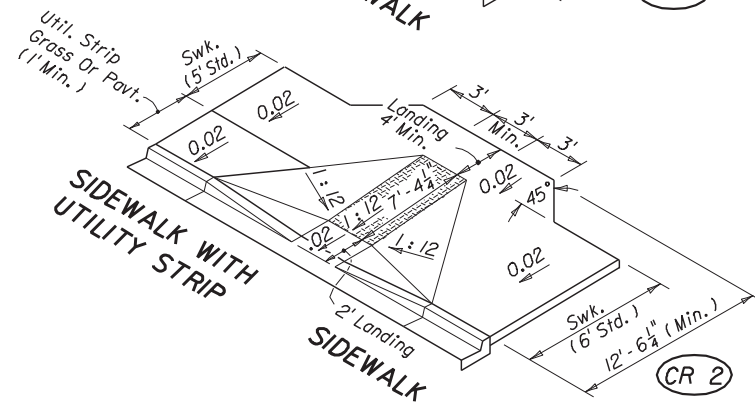
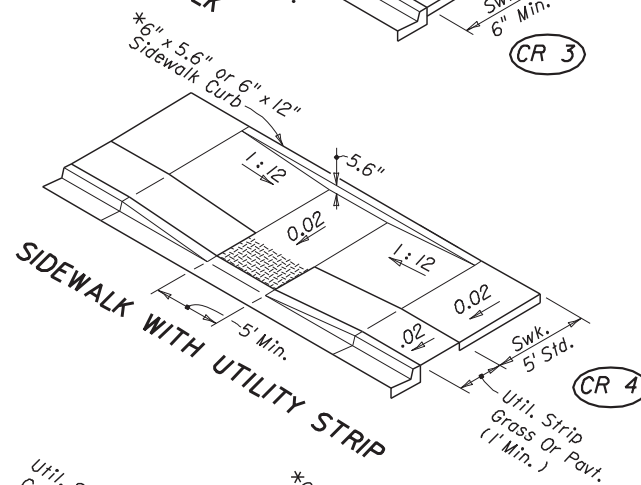
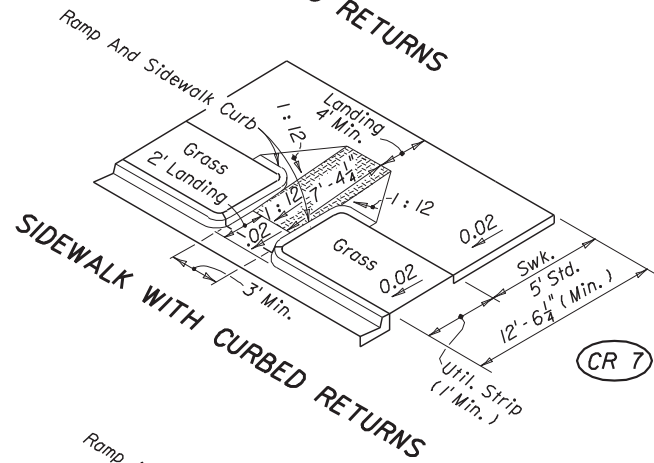
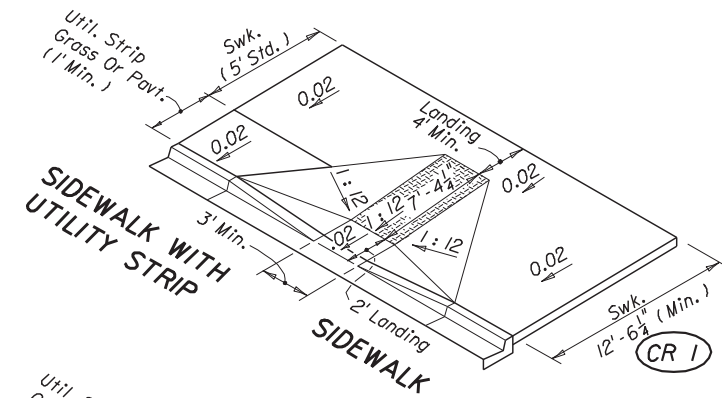
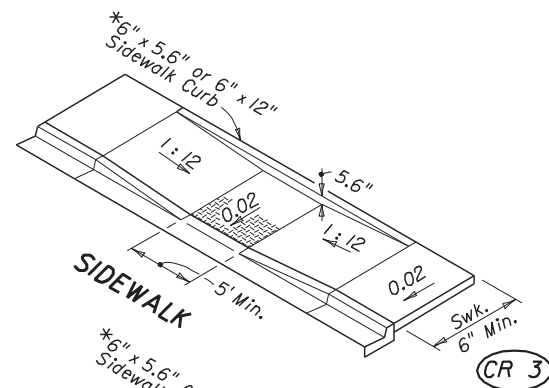
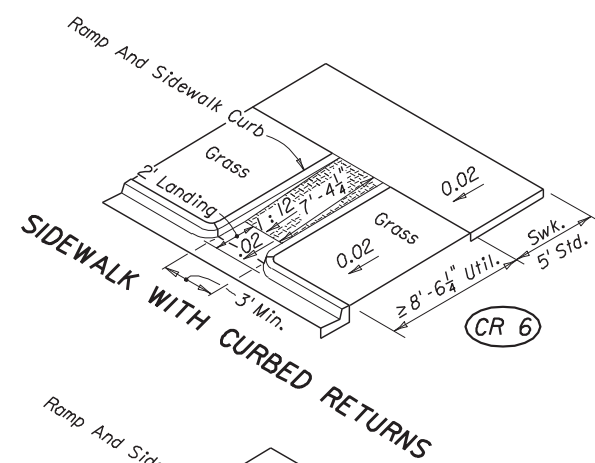
□ Crosswalk widths and configuration vary; must conform to Traffic Design Standards.

TYPICAL PLACEMENT OF PUBLIC SIDEWALK CURB RAMPS AT CURBED RETURNS

GENERAL NOTES

- Public sidewalk curb ramps shall be constructed in the public right of way at locations that will provide continuous unobstructed pedestrian circulation paths to pedestrian areas, elements and facilities in the public right of way and to accessible pedestrian routes on adjacent sites. Curbed facilities with sidewalks and those without sidewalks are to have curb ramps constructed at all street intersections and at turnouts that have curbed returns. Partial curb returns shall extend to the limit prescribed by Index No. 515 to accommodate curb ramps. Ramps constructed at locations without sidewalks shall have a landing constructed at the top of each ramp, see Sheet 5.
- The location and orientation of curb ramps shall be as shown in the plans.
- Curb ramp running slopes at unrestrained sites shall not be steeper than $1:12$ and cross slope shall be 0.02 or flatter.
When altering existing pedestrian facilities where existing site development precludes the accommodation of a ramp slope of $1:12$, a running slope between $1:12$ and $1:10$ is permitted for a rise of 6" maximum and a running slope of between $1:10$ and $1:8$ is permitted for a rise of 3" maximum. Where compliance with the requirements for cross slope cannot be fully met, the minimum feasible cross slope shall be provided.
Ramp running slope is not required to exceed 8' in length, except at sites where the plans specify a greater length.
- If a curb ramp is located where pedestrians must walk across the ramp, then the walk shall have transition slopes to the ramp; the maximum slope of the transitions shall be $1:12$. Ramps with curb returns may be used at locations where other improvements provide guidance away from that portion of curb perpendicular to the sidewalk; improvements for guidance are not required at curb ramps for linear pedestrian traffic.
- When perpendicular curb ramps abut the back of curb a tactile surface shall be applied to the full width and length of the ramp. When landings of parallel curb ramps abut the back of curb the tactile surface shall extend full width and 3' back of the curb. The tactile surfaces on curb ramps for linear pedestrian traffic and for corner ramps under conditions of infeasibility are to conform with the details in this Index for those specific ramp types. Tactile surfaces shall be constructed by texturing to a depth not exceeding $\frac{1}{8}$ " by use of a tamp or roller fabricated with an imprinting surface of either 1" mesh $\frac{1}{4}$ " wire cloth (plain weave, conventional crimp) #6 expanded metal (standard) or 3 lb. expanded metal grating. Transition slopes are not to have tactile surfaces. Detectable surface requirements have been suspended; if reinstated the detectable surface requirements will replace the tactile surface requirements and notice will be by special provision.
- Where a curb ramp is constructed within existing curb, curb and gutter and/or sidewalk, the existing curb or curb and gutter shall be removed to the nearest joint beyond the curb transitions or to the extent that no remaining section of curb or curb and gutter is less than 5' long. The existing sidewalk shall be removed to the nearest joint beyond the transition slope or walk around or to the extent that no remaining section of sidewalk is less than 5' long.
- Alpha-numeric identifications are for reference (plans, permits, etc.).
- Public sidewalk curb ramps are to be paid for as follows:
Ramps, reconstructed sidewalks, walk around sidewalks, sidewalk landings and sidewalk curbs are to be paid for under the contract unit price for Sidewalk Concrete, (___" Thick), SY. Curb transitions and reconstructed curbs are to be paid for under the contract unit price for the parent curb, i.e., Curb Conc., (Type __), LF or Curb and Gutter Conc., (Type __), LF.
When a separate pay item for the removal and disposal of existing curb, curb and gutter, and/or sidewalk is not provided in the plans, the cost of removal and disposal of these features shall be included in the contract unit price for new curb, curb and gutter and/or sidewalk respectively.

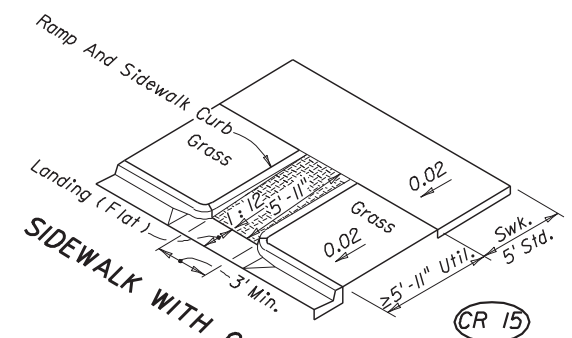
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
PUBLIC SIDEWALK CURB RAMPS					
Names	Dates	Approved By			
Designed By STAFF	10/94	State Roadway Design Engineer			
Drawn By HKH	10/94	Revision	Sheet No.	Index No.	
Checked By JVC	10/94	00	1 of 5	304	



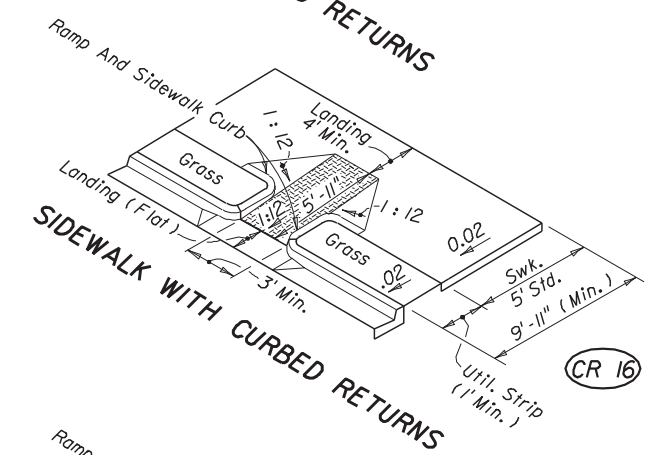
* For BACK OF SIDEWALK CURB OR BUFFER TRANSITION And For RAMP AND SIDEWALK CURB OPTIONS See Sheet 4.

DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE NOT RESTRICTED BY RIGHT OF WAY

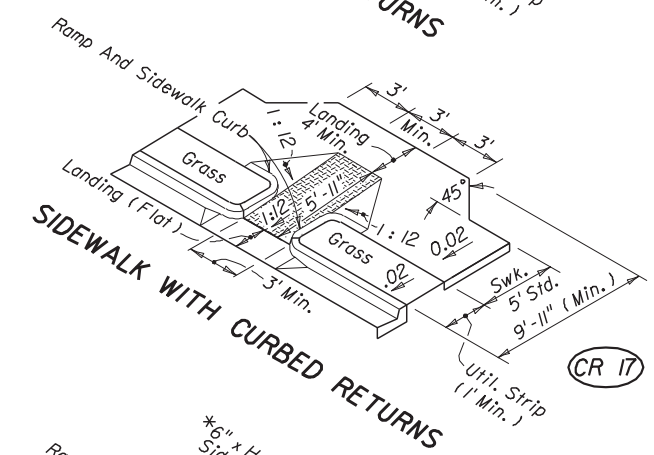
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
PUBLIC SIDEWALK CURB RAMPS				
Names	Dates	Approved By		
Designed By	STAFF	10/94	State Roadway Design Engineer	
Drawn By	HKH	10/94	Revision	Sheet No.
Checked By	JVC	10/94	00	2 of 5
				304



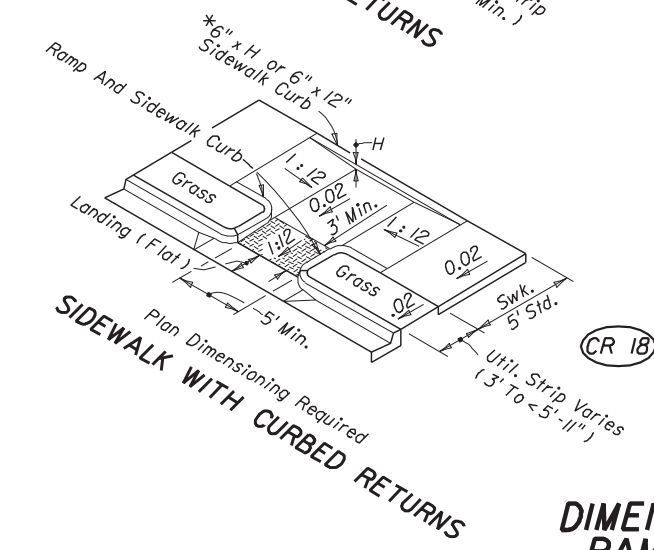
CR 15



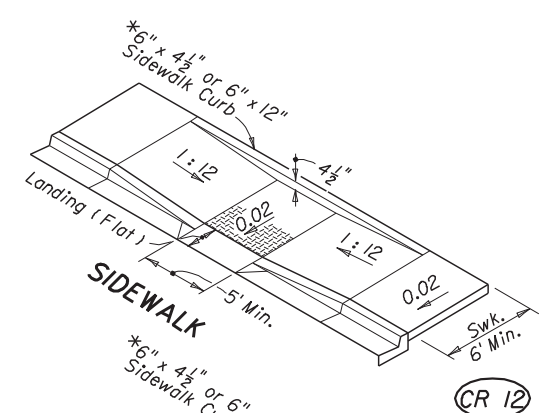
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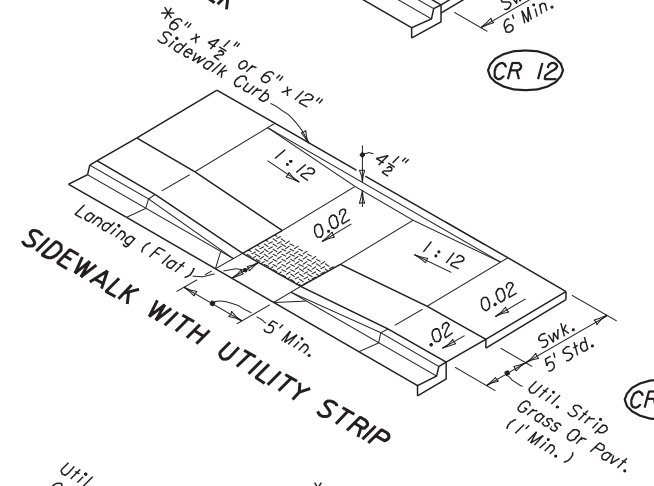
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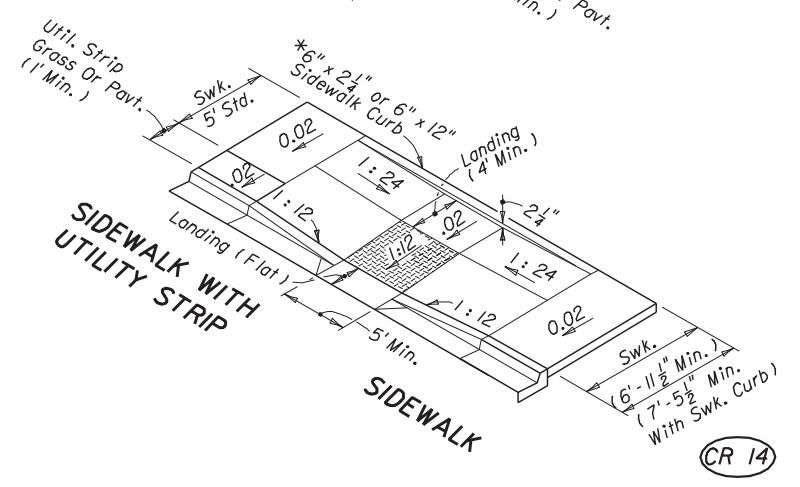
CR 18



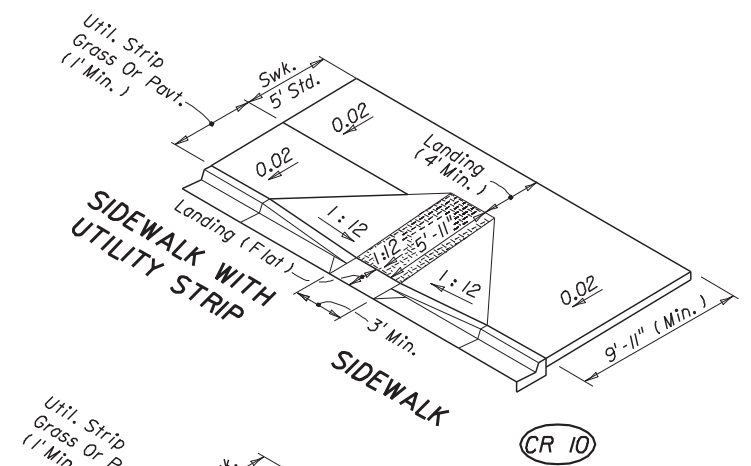
CR 12



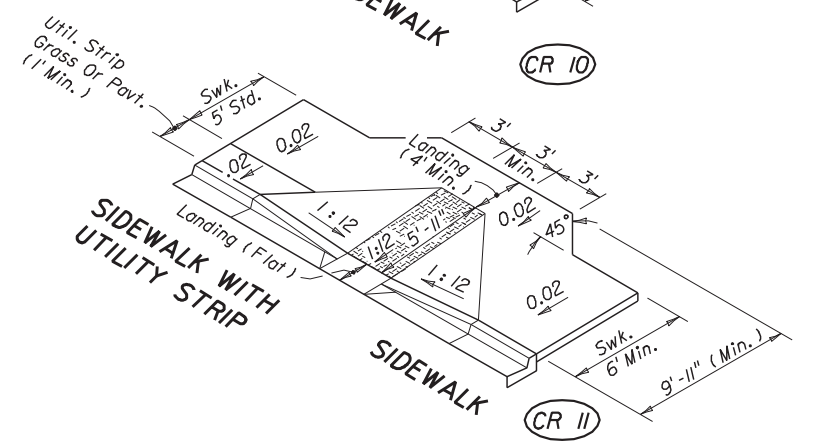
CR 13



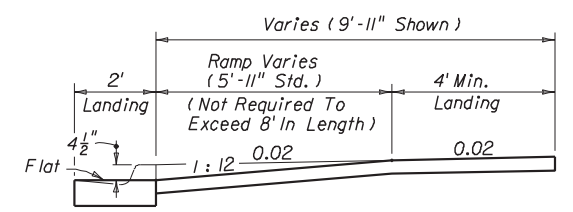
CR 14



CR 10



CR 11

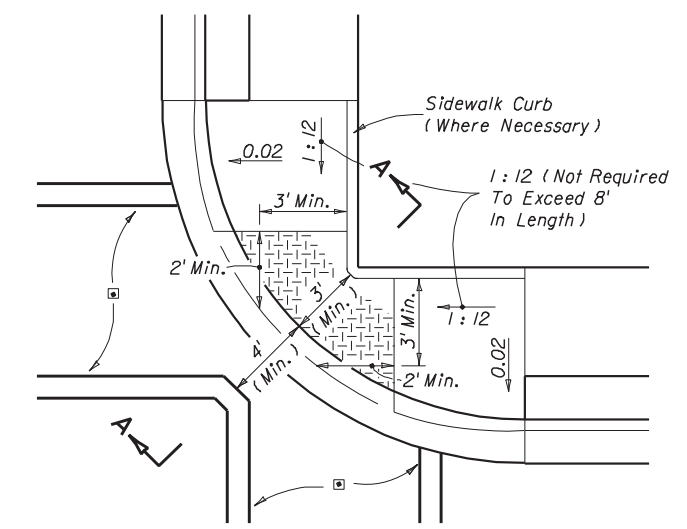
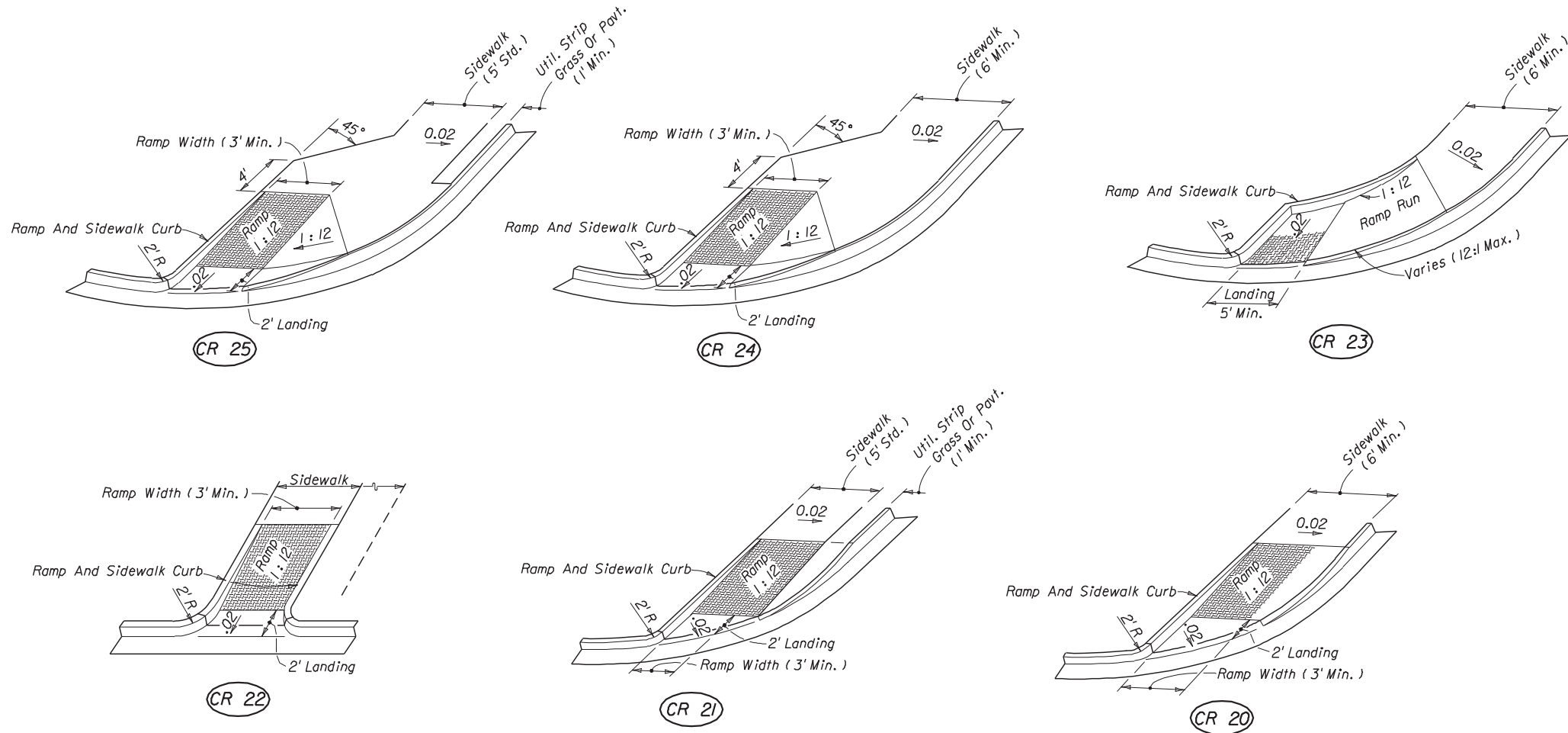


SECTION THROUGH RAMP RUN AND LANDINGS WITH UPPER LANDING AT NORMAL SIDEWALK ELEVATION

* For BACK OF SIDEWALK CURB OR BUFFER TRANSITION And For RAMP AND SIDEWALK CURB OPTIONS See Sheet 4.

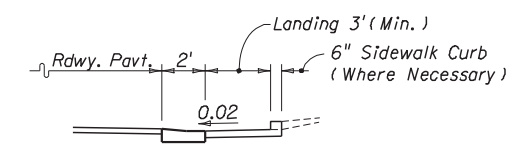
DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE RESTRICTED BY RIGHT OF WAY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
PUBLIC SIDEWALK CURB RAMPS				
Designed By	STAFF	Dates	10/94	Approved By
Drawn By	HKH	10/94		State Roadway Design Engineer
Checked By	JVC	10/94		
Revision	00	Sheet No.	3 of 5	Index No.
				304



□ Crosswalk width and configuration vary; must conform to Traffic Design Standards.

PLAN

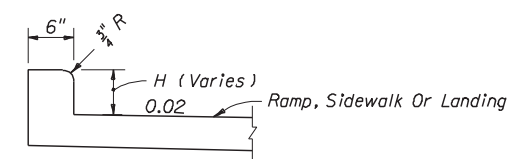


SECTION AA

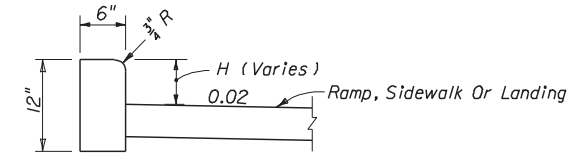
CR 26

DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS FOR LINEAR PEDESTRIAN TRAFFIC

DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CORNER RAMPS UNDER CONDITIONS OF INFEASIBILITY

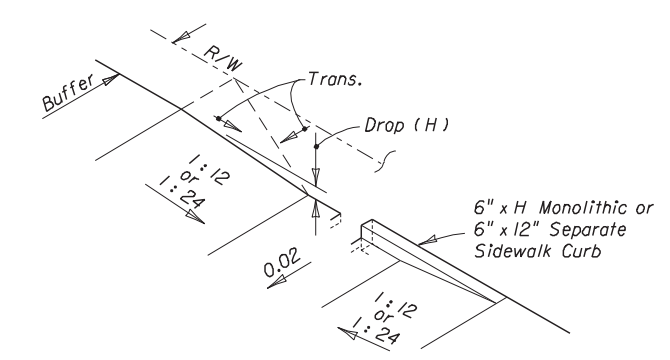


MONOLITHIC CAST CURB



SEPARATELY CAST CURB

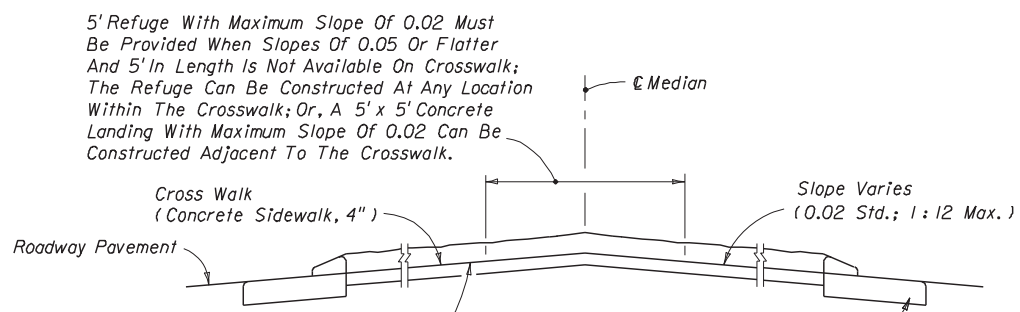
RAMP AND SIDEWALK CURB OPTIONS



Construct Sidewalk Curb In Absence Of Adequate Buffer, Maintainable Surface Contour, Abutting Structure, Or When Called For In The Plans Or Standards

BACK OF SIDEWALK CURB OR BUFFER TRANSITION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
PUBLIC SIDEWALK CURB RAMPS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By STAFF	10/94	State Roadway Design Engineer		
Drawn By HKH	10/94	Revision	Sheet No.	Index No.
Checked By JVC	10/94	00	4 of 5	304



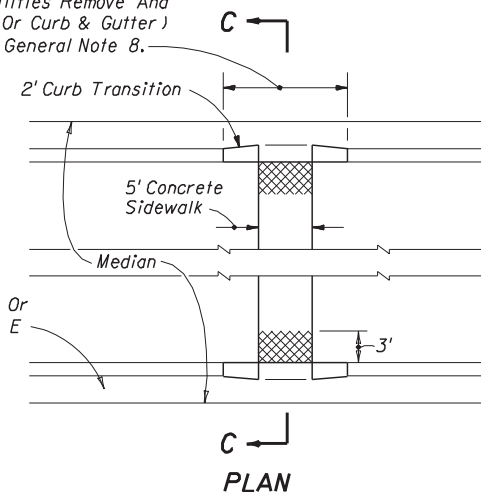
5' Refuge With Maximum Slope Of 0.02 Must Be Provided When Slopes Of 0.05 Or Flatter And 5' In Length Is Not Available On Crosswalk; The Refuge Can Be Constructed At Any Location Within The Crosswalk; Or, A 5' x 5' Concrete Landing With Maximum Slope Of 0.02 Can Be Constructed Adjacent To The Crosswalk.

Slopes Shall Intersect At Centerline Of Median On The 0.02 Rate When The Edge Of Pavement Elevations Are Equal. The Slopes May Intersect Off The Centerline For Variable Edge Of Pavement Elevations Or To Accommodate Other Construction In The Median; However, Slopes Shall Not Be Steeper Than 1 : 12.

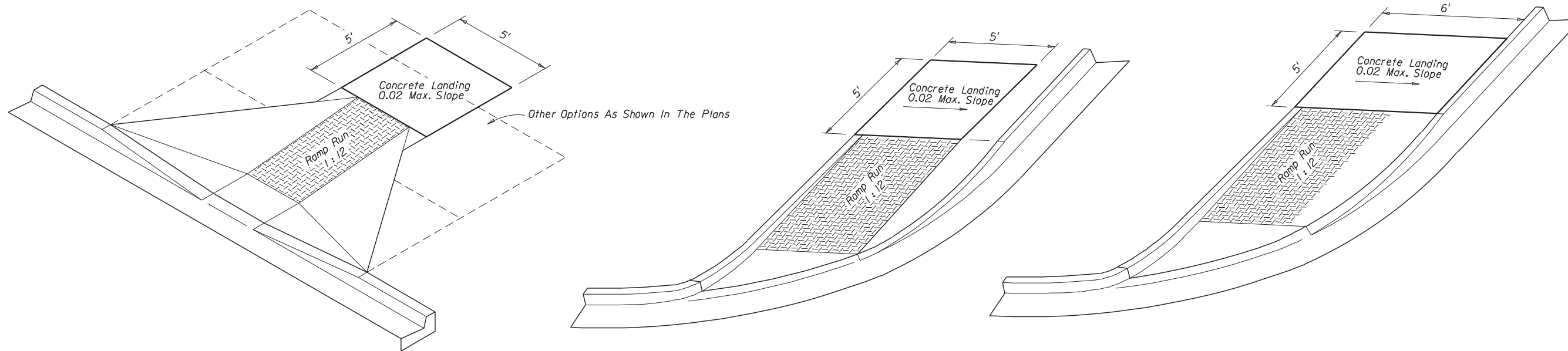
SECTION CC

MEDIAN CROSSWALKS

Curb Transition (On Existing Facilities Remove And Reconstruct Curb Or Curb & Gutter) For Payment See General Note 8.

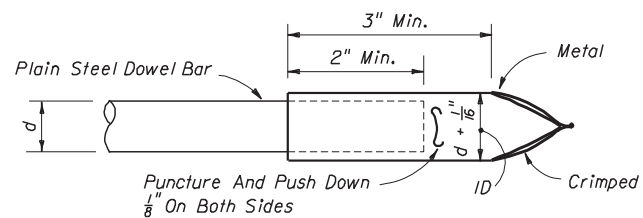


Curb Types A Or B Or Curb & Gutter Type E (Curb & Gutter Type E Shown)

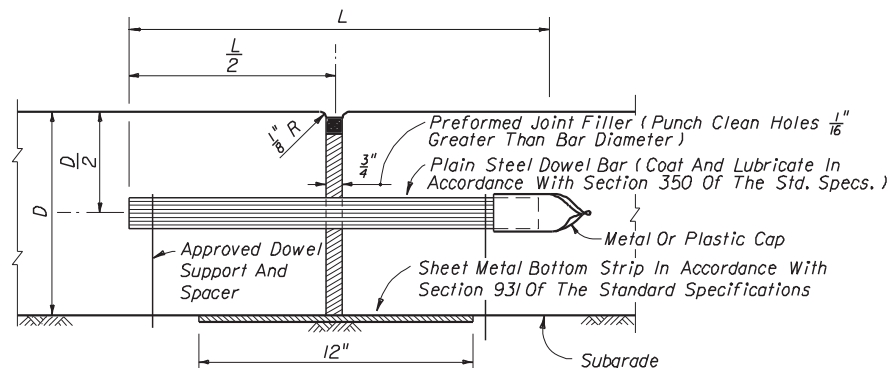
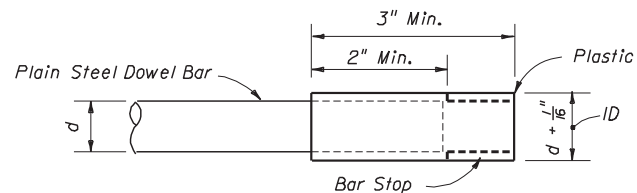


LANDINGS FOR RAMPS WITHIN PUBLIC RIGHT OF WAY CONSTRUCTED AT LOCATIONS WHERE FUTURE SIDEWALKS ARE PROPOSED, WHERE STABLE SURFACES OTHER THAN SIDEWALKS ARE PART OF A CONTINUOUS PASSAGE OR WHERE A CURB FALLS ALONG THE CIRCULATION PATH TO PEDESTRIAN ROUTES ON ADJACENT SITES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
PUBLIC SIDEWALK CURB RAMPS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By STAFF	10/94	State Roadway Design Engineer		
Drawn By HKH	10/94	Revision	Sheet No.	Index No.
Checked By JVC	10/94	00	5 of 5	304

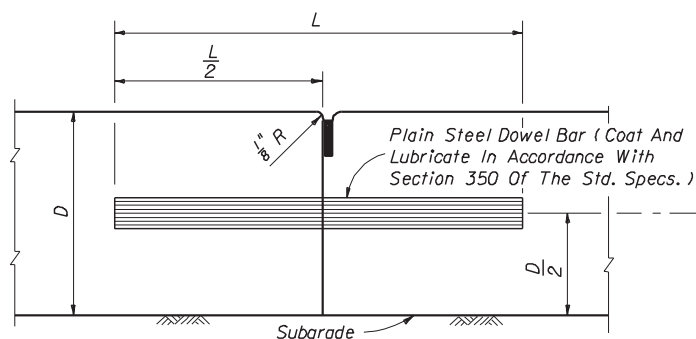


METAL OR PLASTIC CAPS FOR DOWEL BARS

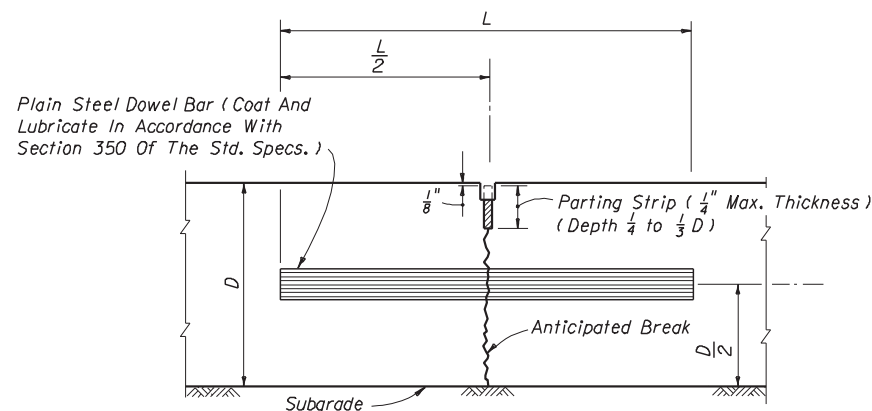


Note: Expansion joints to be placed on approaches to bridges, at street intersections and other locations indicated in detail plans.

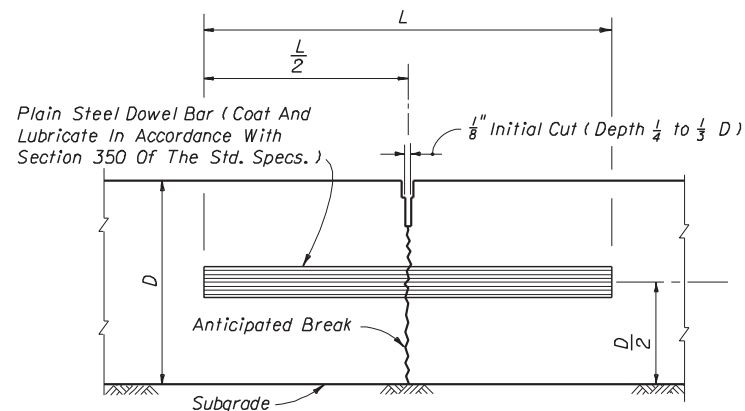
TRANSVERSE EXPANSION JOINT



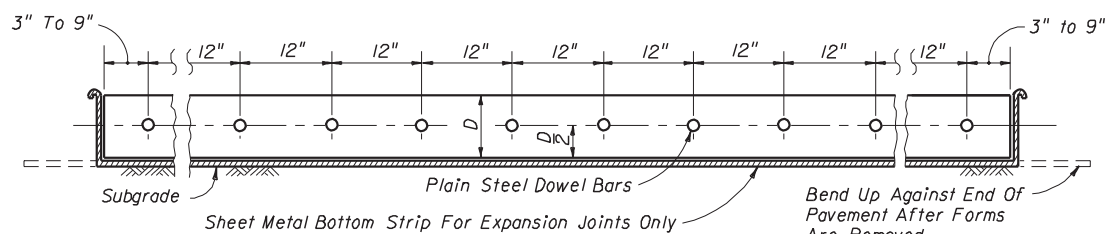
BUTT CONSTRUCTION JOINT TO BE USED AT DISCONTINUANCES OF WORK



TRANSVERSE CONTRACTION JOINT, VIBRO CAST METHOD



TRANSVERSE CONTRACTION JOINT, SAWED METHOD



DOWEL BAR LAYOUT

DOWELS (LENGTH 18")	
Pavement Thickness "D"	Diameter
6"	3/4"
7"	1"
8"	1"
9"	1 1/4"
10"	1 1/4"
≥ 11"	1 1/2"

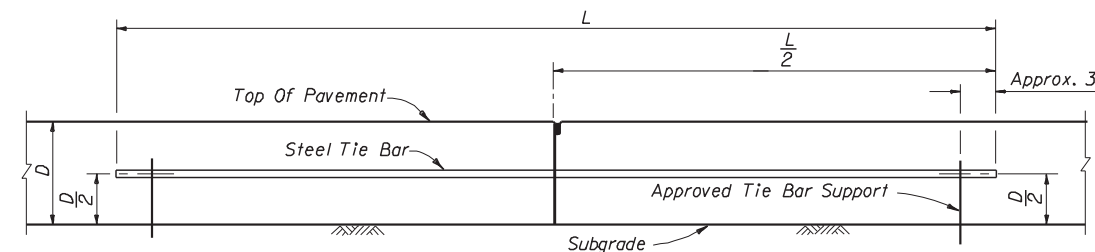
TRANSVERSE JOINTS ARE TO BE SPACED AT A MAXIMUM OF 15'. DOWELS ARE REQUIRED AT ALL TRANSVERSE JOINTS UNLESS OTHERWISE NOTED IN PLANS.

TRANSVERSE JOINTS

Pavement Thickness "D"	MAXIMUM TIE BAR SPACING			
	Distance To Closest Free Edge			
	12'		24'	
	#4 Bars Length 25"	#5 Bars Length 30"	#4 Bars Length 25"	#5 Bars Length 30"
6"	48"	48"	26"	41"
7"	45"	48"	22"	35"
8"	39"	48"	19"	31"
9"	35"	48"	17"	27"
10"	31"	48"	15"	24"
11"	29"	45"	14"	22"
12"	26"	41"	13"	20"
13"	24"	38"	12"	19"
14"	22"	35"	11"	17"
15"	21"	33"	10"	16"

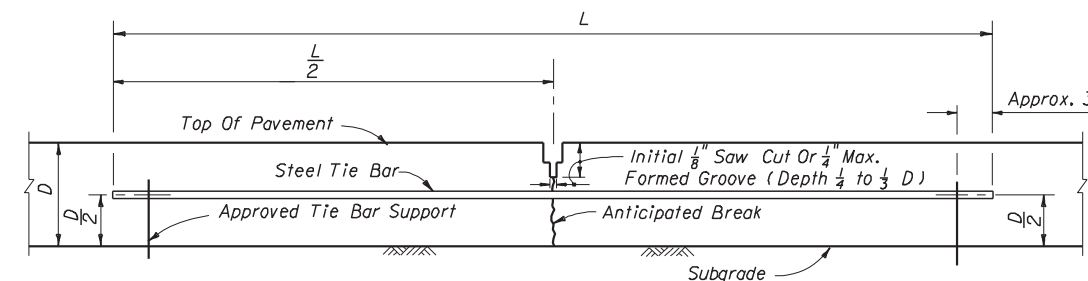
Tie bars are deformed #4 or #5 reinforcing steel bars meeting the requirements of Section 931 of the Standard Specifications.

When the distance to the closest free edge exceeds 24', provide a standard load transfer tied joint with #4 bars at 24" spacing. This joint can then be considered a free edge for determination of tie bar spacing on other joints.



Note: Tie bar spacing shall not exceed 24" at these joints.

LONGITUDINAL BUTT CONSTRUCTION JOINT



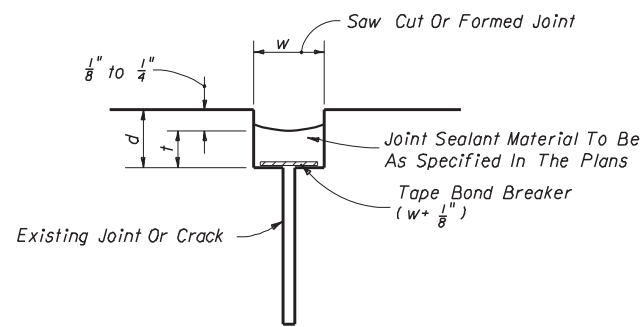
Note: Slabs poured simultaneously. Tie bars may be inserted in the plastic concrete by means approved by the Engineer.

LONGITUDINAL LANE-TIE JOINT

LONGITUDINAL JOINTS

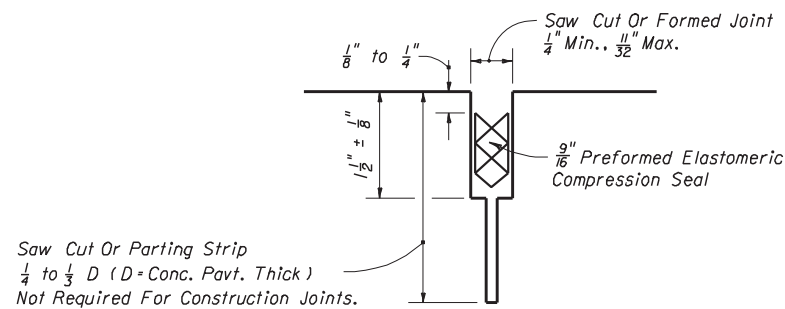
Note: For joint seal dimensions see Sheet 2.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE PAVEMENT JOINTS				
Designed By	Names	Dates	Approved By	
Drawn By	HW	08/57	Bryan Dittel State Pavement Design Engineer	
Checked By	SEC	08/57	Revision	Sheet No.
			00	1 of 4
				305



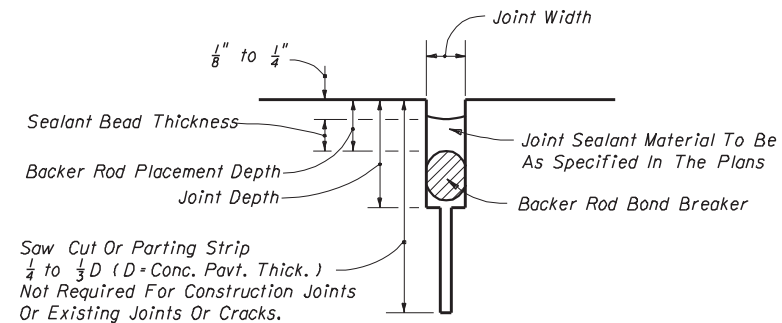
Note: Dimension w will be shown in the plans or established by the Engineer based on field conditions. Dimension d will be constructed so that the shape factor $\frac{d}{w}$ has a maximum value of 2.0 and a minimum value of 1.0.

FOR REHABILITATION PROJECTS
TAPE BOND BREAKER



Saw Cut Or Parting Strip
 $\frac{1}{4}$ to $\frac{1}{2}$ D (D = Conc. Pavt. Thick)
Not Required For Construction Joints.

FOR NEW PROJECTS
PREFORMED ELASTOMERIC COMPRESSION SEAL



Saw Cut Or Parting Strip
 $\frac{1}{4}$ to $\frac{1}{2}$ D (D = Conc. Pavt. Thick.)
Not Required For Construction Joints
Or Existing Joints Or Cracks.

FOR NEW AND REHABILITATION PROJECTS
BACKER ROD BOND BREAKER

**BACKER ROD BOND BREAKER
(CONCRETE-CONCRETE JOINTS)**

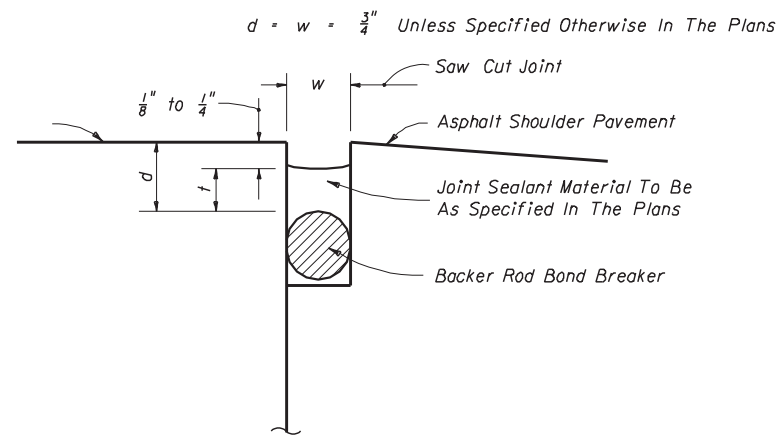
JOINT DIMENSIONS (INCHES)

JOINT WIDTH	SEALANT BEAD THICKNESS	BACKER ROD DIAMETER	MINIMUM JOINT DEPTH	BACKER ROD PLACEMENT DEPTH
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	1	$\frac{1}{2}$
$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$1\frac{1}{4}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{5}{8}$	$1\frac{1}{4}$	$\frac{1}{2}$
$\frac{5}{8}$	$\frac{5}{16}$	$\frac{3}{4}$	$1\frac{1}{2}$	$\frac{9}{16}$
$\frac{3}{4}$	$\frac{3}{8}$	1	$1\frac{3}{4}$	$\frac{5}{8}$
$\frac{7}{8}$	$\frac{7}{16}$	$1\frac{1}{8}$	$1\frac{3}{4}$	$\frac{11}{16}$
1	$\frac{1}{2}$	$1\frac{1}{4}$	2	$\frac{3}{4}$
> 1	$\frac{1}{2}$	$1\frac{1}{4}$ +	2 +	$\frac{3}{4}$

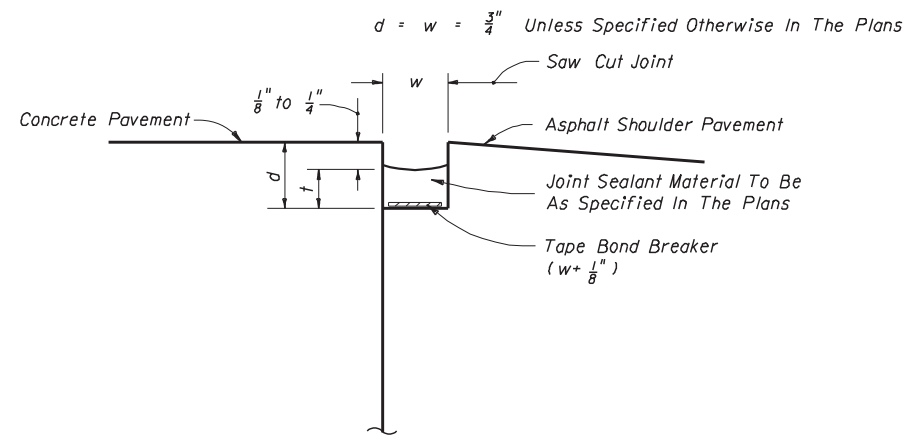
Unless otherwise indicated on the plans the joint width for new construction will be $\frac{1}{4}$ " for construction joints, $\frac{3}{8}$ " for all other joints.

For rehabilitation projects the joint width will be shown on the plans or established by the Engineer based on field conditions.

CONCRETE-CONCRETE JOINTS



BACKER ROD BOND BREAKER



TAPE BOND BREAKER

FOR NEW AND REHABILITATION PROJECTS;
EITHER TAPE OR BACKER ROD BOND BREAKER REQUIRED;
SHOULDER MUST BE REPAIRED IF PROPER JOINT SHAPE
CAN NOT BE ATTAINED

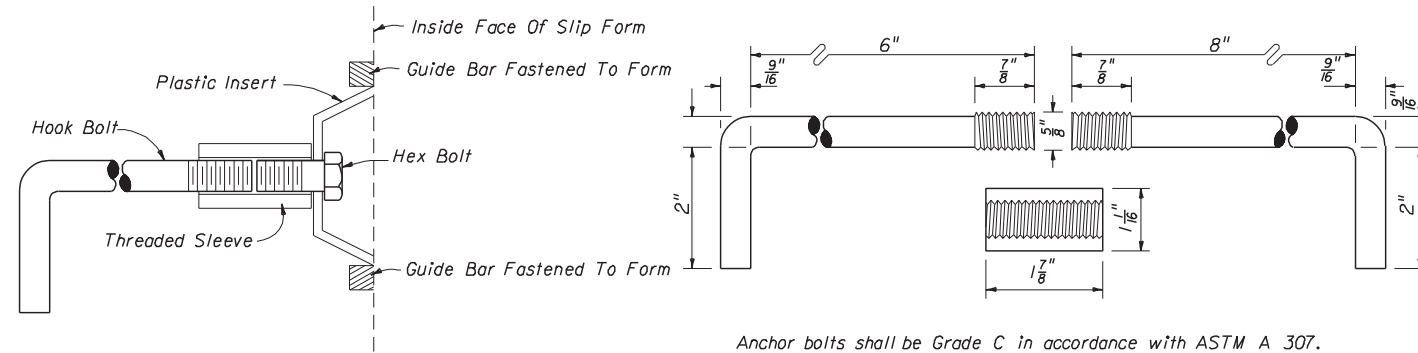
CONCRETE-ASPHALT SHOULDER JOINTS

JOINT SEAL DIMENSIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CONCRETE PAVEMENT JOINTS

Designed By	NMT	05/98	Approved By	<i>Bruce Dittus</i>	
Drawn By	HSD	05/85	Revision	Sheet No.	Index No.
Checked By	JVC	05/85	00	2 of 4	305

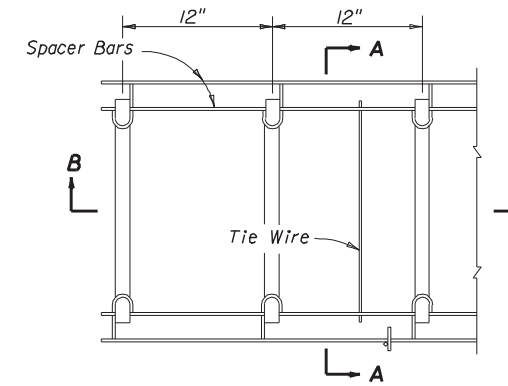


NOTE: After the concrete has set to the extent that the keyway will retain its shape, the hex bolt and plastic insert shall be removed. The remaining portion of the hook bolt assembly shall be installed immediately prior to placing of concrete in the adjacent lane.

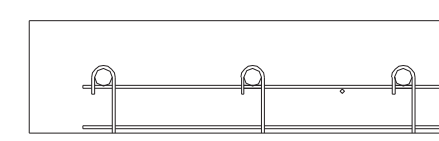
ALTERNATE KEYWAY AND HOOK BOLT

STEEL HOOK BOLT ASSEMBLY

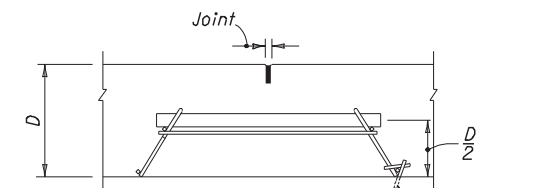
Anchor bolts shall be Grade C in accordance with ASTM A 307.
Threaded sleeves shall develop the full strength of the bolt and meet the material and thread requirements of ASTM A 563.



TOP VIEW

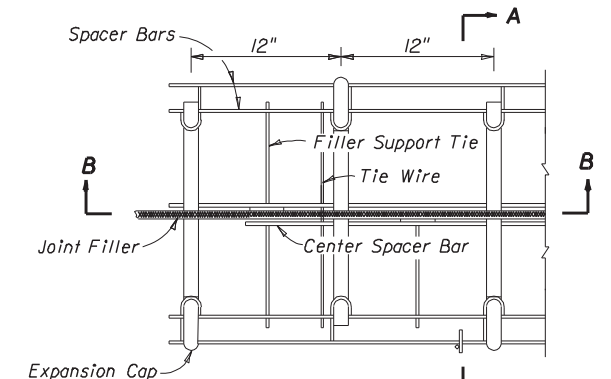


SECTION BB

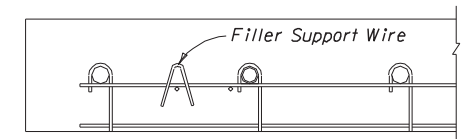


SECTION AA

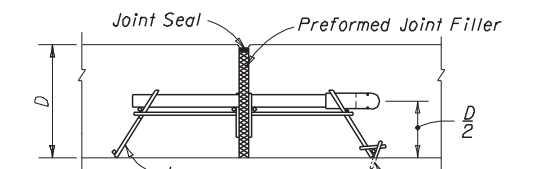
CONTRACTION ASSEMBLY



TOP VIEW



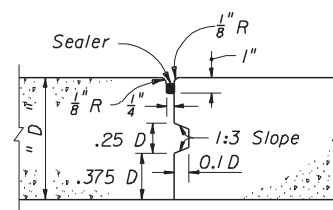
SECTION BB



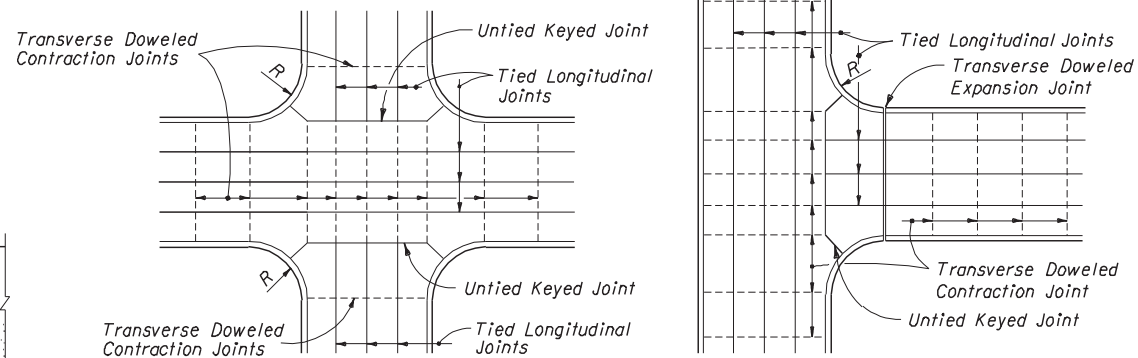
SECTION AA

EXPANSION ASSEMBLY

Note:
Proprietary contraction and expansion assemblies may be used.
Products shall be introduced to the State Construction Office in accordance with section (C) of the Product Evaluation Procedure.



KEYED JOINT



JOINT LAYOUT AT THRU INTERSECTION JOINT LAYOUT AT 'T' INTERSECTIONS

NOTES

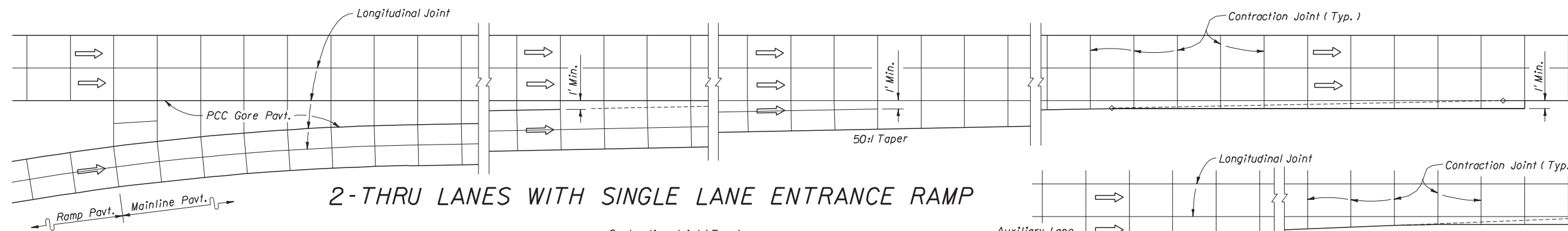
1. Longitudinal joints will not be required for single lane pavement 14' or less in width. For entrance and exit ramp joint details, see Sheet 4 of 4.
2. Arrangement of longitudinal joints are to be as directed by the Engineer.
3. All manholes, meter boxes and other projections into the pavement shall be boxed-in with 1/2" preformed expansion joint material.

JOINT ARRANGEMENT

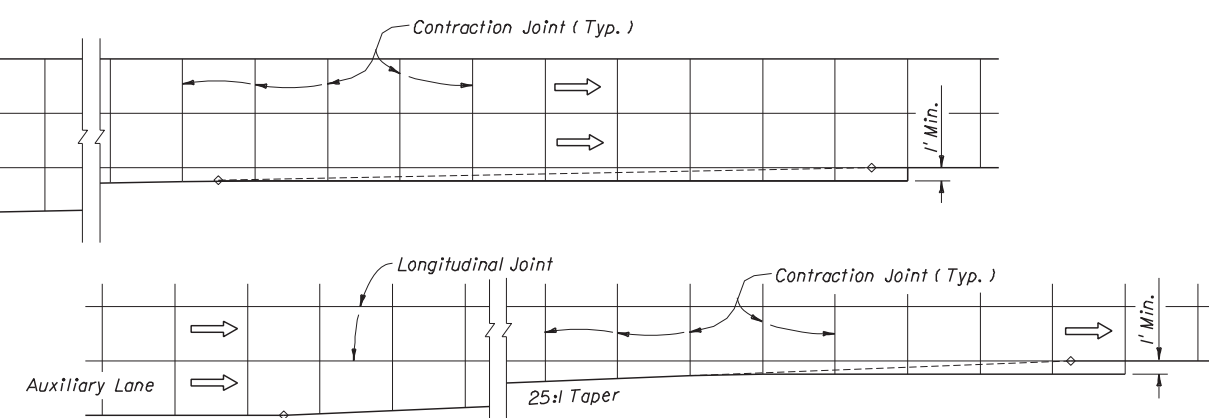
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CONCRETE PAVEMENT JOINTS

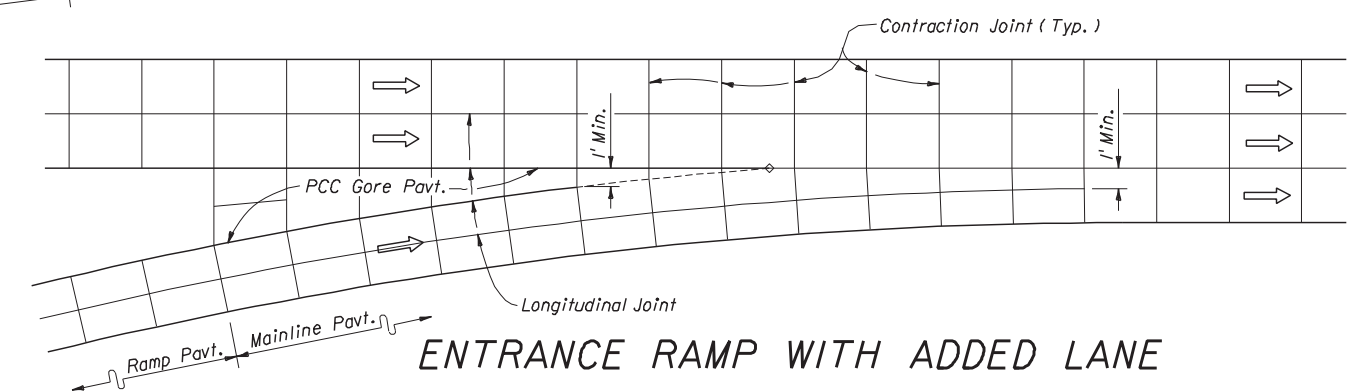
Names	Dates	Approved By		
Designed By	FMD 07/97	 State Pavement Design Engineer		
Drawn By	HSD 07/94			
Checked By	FMD 07/97	Revision	Sheet No.	Index No.
		00	3 of 4	305



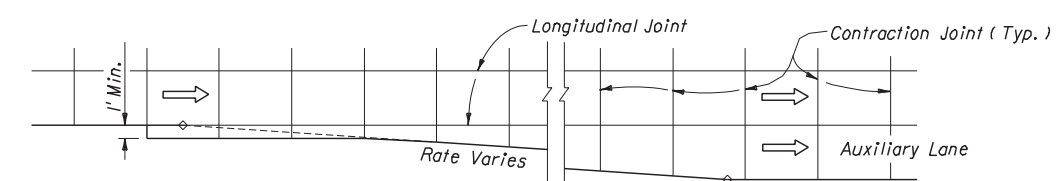
2-THRU LANES WITH SINGLE LANE ENTRANCE RAMP



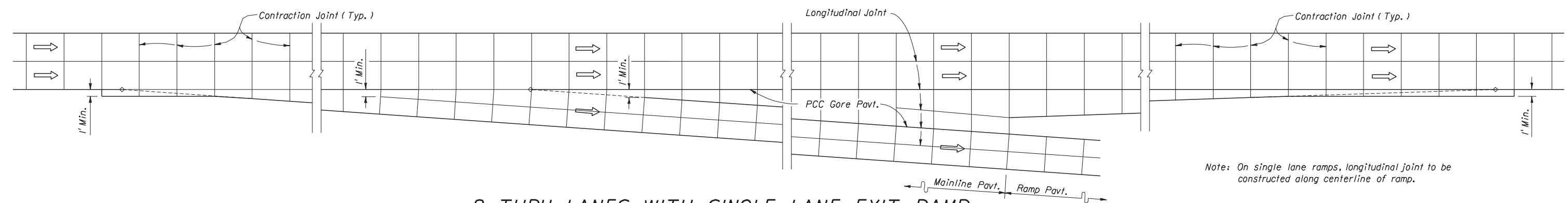
ENTRANCE TAPER WITH AUXILIARY LANE



ENTRANCE RAMP WITH ADDED LANE

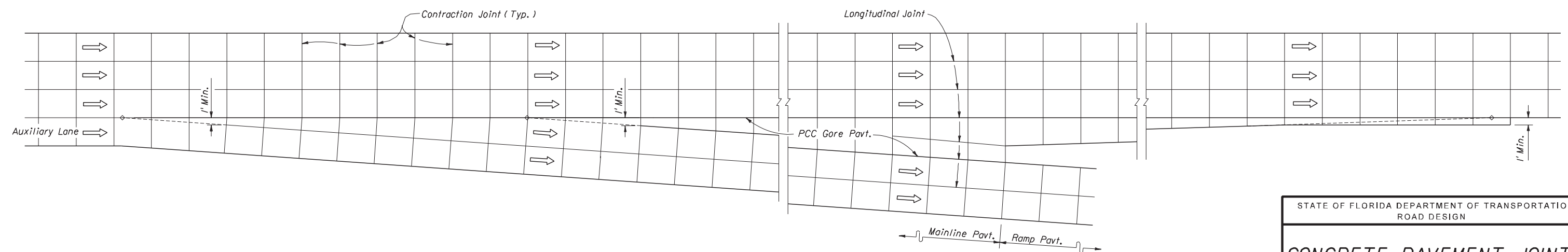


EXIT TAPER WITH AUXILIARY LANE



2-THRU LANES WITH SINGLE LANE EXIT RAMP

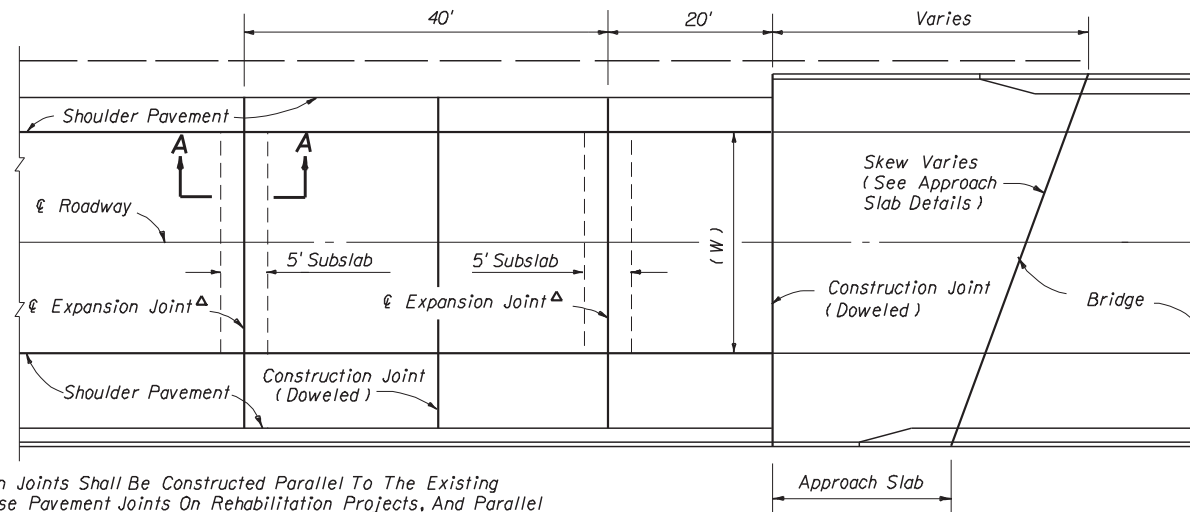
Note: On single lane ramps, longitudinal joint to be constructed along centerline of ramp.



3-THRU LANES WITH AUXILIARY LANE AND 2-LANE EXIT RAMP

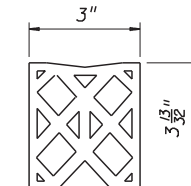
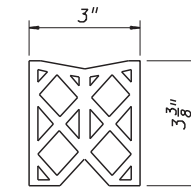
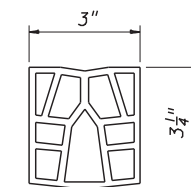
JOINT LAYOUT AT ENTRANCE AND EXIT RAMP TERMINALS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE PAVEMENT JOINTS				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	11/91	Bryan Distefano State Pavement Design Engineer	
Checked By	MLZ	11/91	Revision	Sheet No.
			00	4 of 4
				Index No. 305

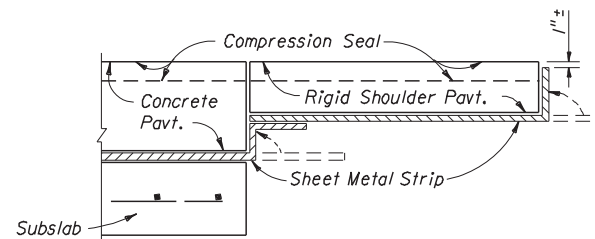


△ Expansion Joints Shall Be Constructed Parallel To The Existing Transverse Pavement Joints On Rehabilitation Projects, And Parallel To The Standard Transverse Pavement Joints Shown In The Plans For New Construction.

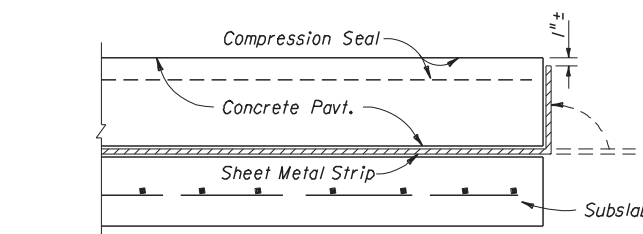
PLAN



OPTIONAL SEALS



WITH RIGID SHOULDER PAVEMENT



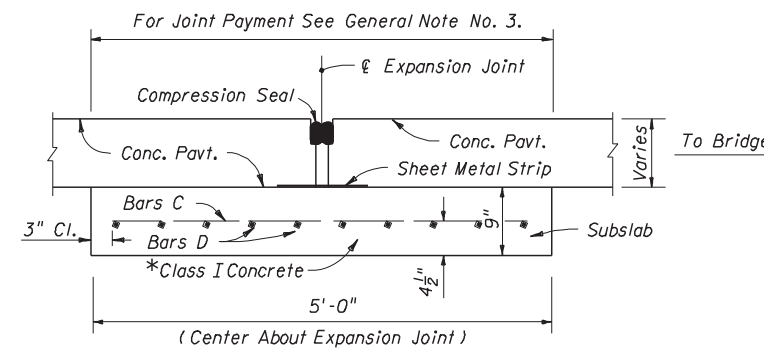
WITH GRASSED SHOULDER OR FLEXIBLE SHOULDER PAVEMENT

Note: Immediately prior to placing the seal, the joint shall be thoroughly cleaned of all foreign material. Immediately after the seal is placed, sheet metal strip shall be bent up against the pavement edge.

The sheet metal strip shall be a minimum 16 gage steel, 0.3 m wide and shall be galvanized in accordance with ASTM A-526, Coating Designation G90.

Rigid shoulder pavement shall be concrete or econcrete as called for in the plans.

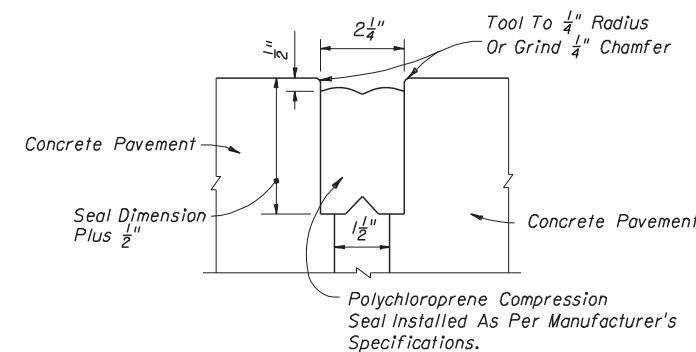
DETAIL SHOWING SHEET METAL STRIP



REINFORCING STEEL				
Mark	Size	Spac.	No. Req.	Lgth.
C	5	6"	Varies	4'-6"
D	5	6"	10	W Minus 6"

*Finish surface smooth. Cure with heavy coating of wax base white pigmented curing compound. Apply second application immediately prior to placing pavement.

SECTION AA EXPANSION JOINT



Note: All contacting surfaces between the compression seal and concrete shall be thoroughly coated with a lubricant-adhesive.

JOINT DIMENSIONS COMPRESSION SEAL DETAIL

DESIGN NOTES

1. For rehabilitation projects, the designer must indicate in the plans the number of slabs to be removed, the number of sub slabs to be constructed/reconstructed, and the location of expansion joints.
2. Pay quantity of expansion joint to be calculated across pavement at right angles to the centerline of the roadway pavement. Shoulder pavement joint included.

GENERAL NOTES

1. The centerline of roadway and the centerline of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the centerline of the roadway pavement shall be determined.
2. For information on other types of concrete pavement joints see Index No. 305.
3. Pay quantity for expansion joint is the length of joint to be constructed across the roadway and shoulder pavements, measured at right angles to the centerline of the roadway.

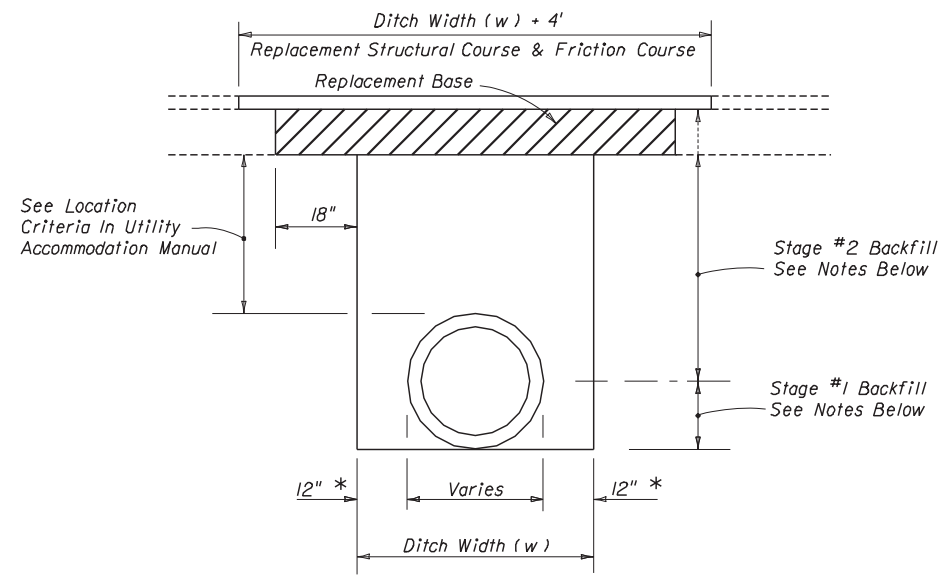
Payment for expansion joint shall be full compensation for joint construction, including reinforced concrete subslab, sheet metal strip and compression seal, but, not including roadway pavement reconstruction associated with joint replacement or reconstruction.

Expansion joint to be paid for under the contract unit price for Bridge Approach Expansion Joint, LF.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

BRIDGE APPROACH EXPANSION JOINT - CONCRETE PAVEMENT

Designed By	Names	Dates	Approved By <i>Bruce Dittus</i>		
Drawn By	JMK	6/75	State Pavement Design Engineer		
Checked By	SEA	6/75	Revision	Sheet No.	Index No.
			00	1 of 1	306



FLEXIBLE PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

Pavement shall be mechanically sawed.

The replacement friction course shall match the existing friction course, except Structural course may be used in lieu of dense graded friction course. The thickness of the replacement asphalt pavement shall match the thickness of the existing asphalt pavement.

The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 514).

BACKFILL

COMPACTED AND STABILIZED FILL OPTION

Backfill material shall be placed in accordance with Section 125 of the Standard Specifications.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct compacted fill along the sides of the pipe and up to the bottom of the base, with the upper 12" receiving Type B Stabilization. In lieu of Type B Stabilization, the Contractor may construct using Optional Base Group 3.

*** FLOWABLE FILL OPTION**

If mechanical compaction is difficult to achieve, then flowable fill may be used. When flowable fill is used, this dimension may be reduced to 4".

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

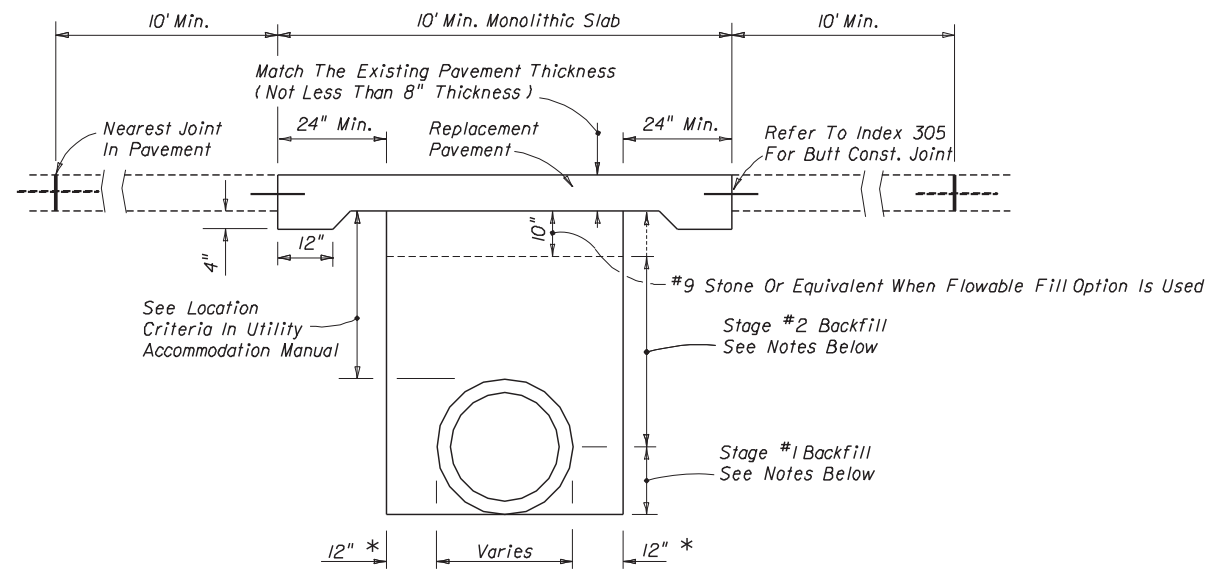
If forms are used to temporarily contain flowable fill, the forms shall be in accordance with the Standard Specifications.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the existing base course. Do not allow the utility being installed to float. If a method is provided to prevent floatation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

FLEXIBLE PAVEMENT CUT

TRENCH CUT AND RESTORATION WITHIN ROADWAY LIMITS



RIGID PAVEMENT NOTES

PAVEMENT REMOVAL AND REPLACEMENT

High early strength cement concrete (3000 psi) meeting the requirements of Standard Specification 346 shall be used for rigid pavement replacement.

Pavement shall be mechanically sawed and restored to conform with existing pavement joints within 12 hours. (See Index No. 305)

GRANULAR BACKFILL

Any edg drain system that is removed shall be replaced with the same type materials. Any edg drain system that is damaged shall be repaired with methods approved by the Engineer.

Fill material shall be placed in accordance with the Standard Specifications. Fill material shall be special select soil in accordance with Index No. 505.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct fill along the sides of the pipe and up to the bottom of replacement pavement.

*** FLOWABLE FILL OPTION**

If mechanical compaction is difficult to achieve, then flowable fill may be used. When flowable fill is used, this dimension may be reduced to 4".

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

If forms are used to temporarily contain flowable fill, the forms shall be in accordance with the Standard Specifications.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the stone layer. Do not allow the utility being installed to float. If a method is provided to prevent floatation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

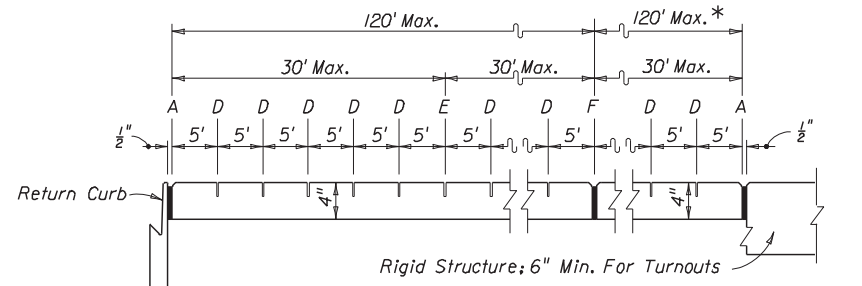
RIGID PAVEMENT CUT

GENERAL NOTES

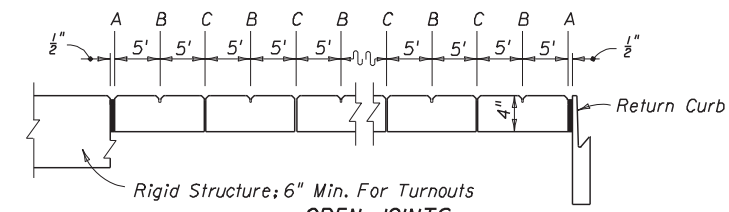
- The details provided in this standard index apply to cases in which jack and bore or directional boring methods are not feasible.
- Flowable fill shall not be placed directly over loose, or High Plastic, or Muck material (see Index 505) which will cause settlement due to fill weight. Where highly compressible material exists, the amount, shape and depth of flowable fill must be engineered to prevent pavement settlement.
- These details should not apply to utility cuts longitudinal to the centerline of the roadway which may require the additional use of geotextiles, special bedding and backfill, or other special requirements.
- Method of construction must be approved by the Engineer.
- Some pipe may require special granular backfill up to 6" above top of pipe. Geotextiles may be required to encapsulate the special granular material.
- Where asphalt concrete overlays exist over full slab concrete pavement, the replacement pavement shall have an overlay constructed over the replacement slab. The overlay shall match the existing asphalt pavement thickness. The replacement friction course shall match the existing friction course, except Structural course may be used in lieu of dense graded friction course.

Existing broken and seated pavements shall be treated as flexible pavements.
- All shoulder pavement, curb and curb and gutter and their substructure disturbed by utility trench cut construction shall be restored in kind.
- Approved permanent patch materials may be used in lieu of structural courses.
- Where long sections of flowable fill are installed, caution must be applied so local ground water flow will not be interrupted.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
UTILITY CUT				
Names	Dates	Approved By		
Designed By	JGW/RKJ	12/95	State Utilities Engineer	
Drawn By	HSD	12/95	Revision	Sheet No.
Checked By	HMD/JVC	12/95	00	1 of 1
			307	



*"E" Joint(s) Required When Length Exceeds 30'
SAWED JOINTS



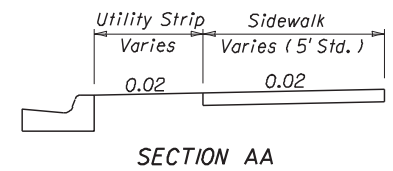
EXAGGERATED SCALE
LONGITUDINAL SECTION
SIDEWALK JOINTS

JOINT LEGEND

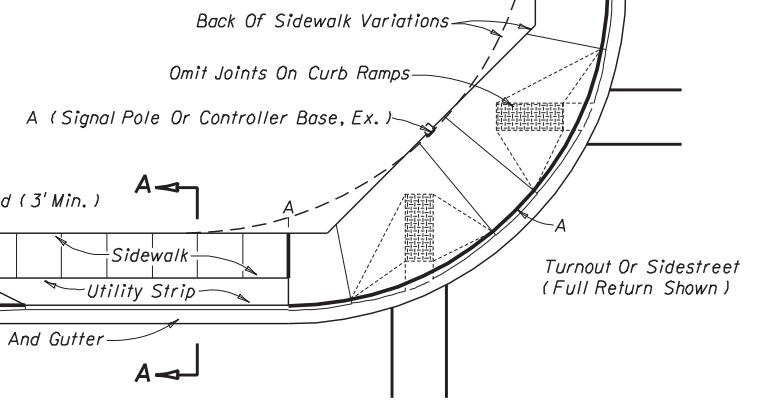
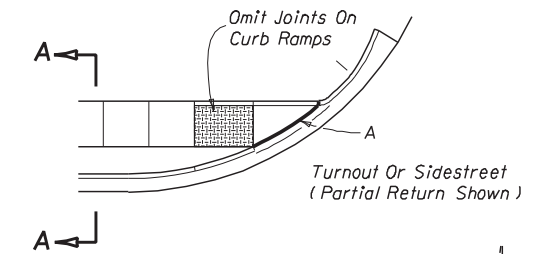
- A - 1/2" Expansion Joints (Preformed Joint Filler)
- B - 1/8" Dummy Joints, Tooled
- C - 1/8" Formed Open Joints
- D - 3/16" Saw Cut Joints, 1/2" Deep (96 Hour) Max. 5' Centers
- E - 3/16" Saw Cut Joints, 1/2" Deep (12 Hour) Max. 30' Centers
- F - 1/2" Expansion Joint When Run Of Sidewalk Exceeds 120'
- G - Cold Joint With Bond Breaker, Tooled

NOTES FOR CONCRETE SIDEWALK ON CURBED ROADWAYS

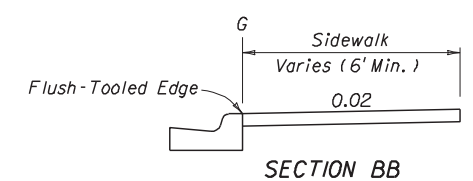
1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications except for public sidewalk curb ramp runs which shall be finished in accordance with Index No. 304.
2. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils nor more than 1/2".
3. For public sidewalk curb ramps see Index No. 304.
4. For turnouts see Index No. 515.
5. Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (___ Thick), S.Y.



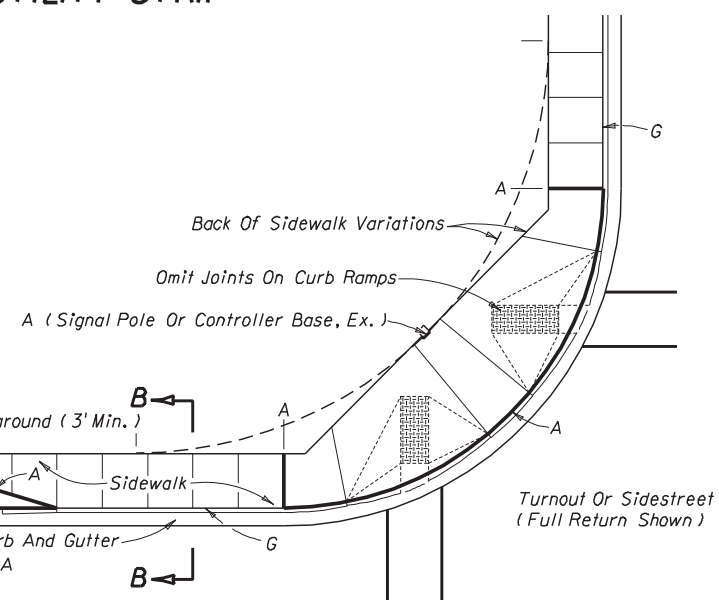
SECTION AA



SIDEWALK WITH UTILITY STRIP



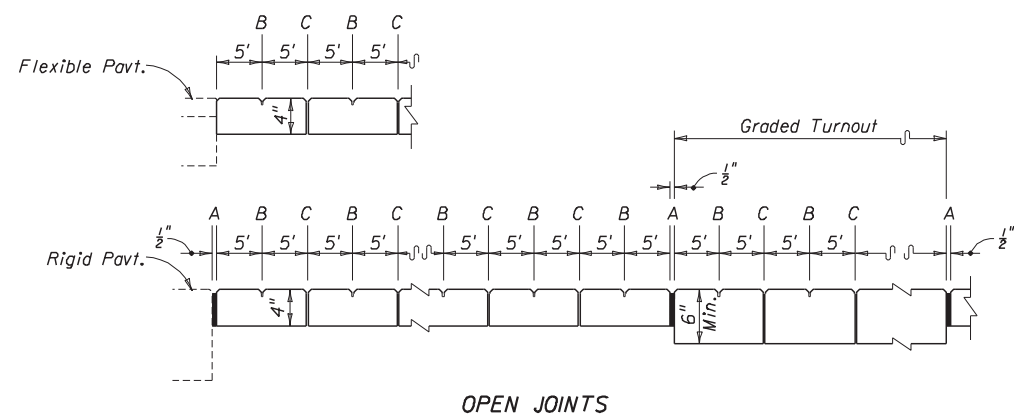
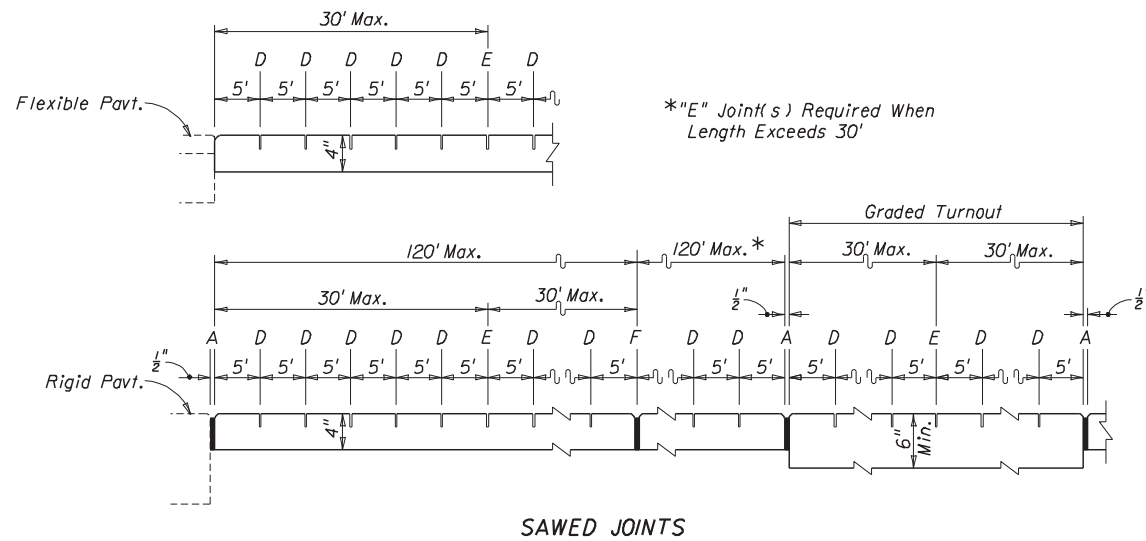
SECTION BB



SIDEWALK WITHOUT UTILITY STRIP

CONCRETE SIDEWALK FOR CURBED ROADWAYS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE SIDEWALK				
Designed By	SPRCS	Dates	Approved By <i>[Signature]</i>	
Drawn By	HKH	11/93	Revision	Sheet No. 1 of 2
Checked By	JVC	11/93	00	Index No. 310



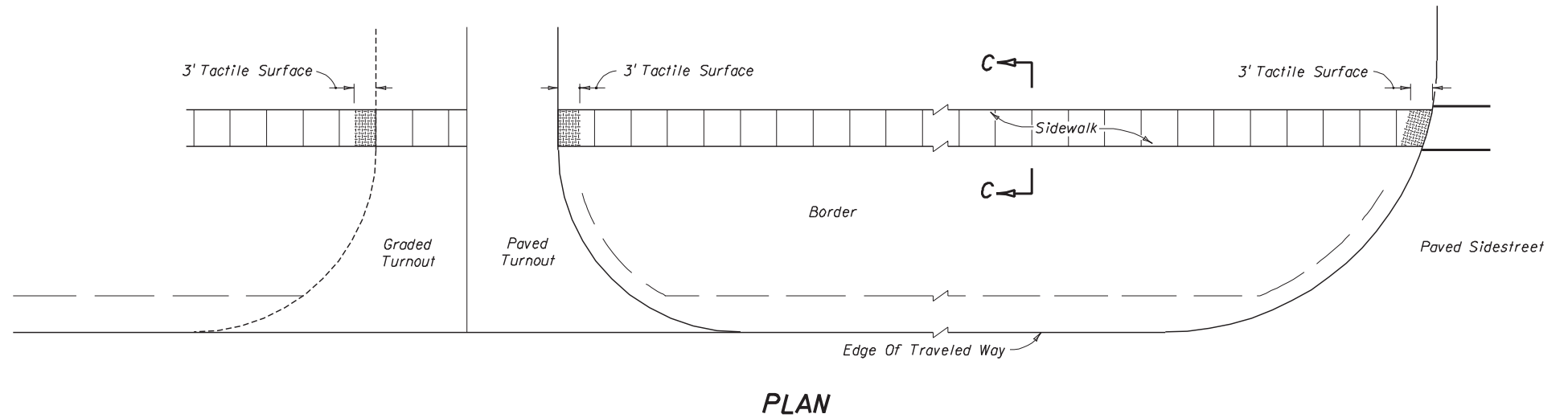
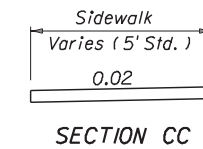
EXAGGERATED SCALE
**LONGITUDINAL SECTIONS
SIDEWALK JOINTS**

JOINT LEGEND

- A - $\frac{1}{2}$ " Expansion Joints (Preformed Joint Filler)
- B - $\frac{1}{8}$ " Dummy Joints, Tooled
- C - $\frac{1}{8}$ " Formed Open Joints
- D - $\frac{3}{16}$ " Saw Cut Joints, $1\frac{1}{2}$ " Deep (96 Hour) Max. 5' Centers
- E - $\frac{3}{16}$ " Saw Cut Joints, $1\frac{1}{2}$ " Deep (12 Hour) Max. 30' Centers
- F - $\frac{1}{2}$ " Expansion Joint When Run Of Sidewalk Exceeds 120'

NOTES FOR CONCRETE SIDEWALKS ON UNCURBED ROADWAYS

1. Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications.
2. Sidewalks crossing streets and driveways shall have a tactile surface for a minimum of 3' adjacent to each crossing. Tactile surfaces shall conform to the requirements described in the General Notes on Index No. 304.
3. For turnouts see Index No. 515.
4. Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (___ Thick), SY.



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
CONCRETE SIDEWALK					
	Names	Dates	Approved By		
Designed By	SPPCS		State Roadway Design Engineer		
Drawn By	HKH	4/99	Revision	Sheet No.	Index No.
Checked By	JVC	4/99	00	2 of 2	310

CONCRETE SIDEWALKS FOR UNCURBED ROADWAYS

GENERAL NOTES

1. The illustrations for guardrail applications are standard configurations; adjustments are to be made as required by site specific condition to attain optimum design for function, economy and serviceability.
2. The beginning of guardrail need shall be at the greatest of the upstream distances from the hazard, as determined from Figure 1, and other application details of this index.
3. One Panel equals 12'-6". Guardrail shall be constructed with rail elements 12'-6" in length except where 25'-0" elements are called for by this and other standards (indexes) or specifically called for in the plans.

Post spacings shall be 6'-3" except that reduced spacings shall be used for (a) transitions to anchorages at rigid structures such as bridges (See Details E and J) and transitions to redirective crash cushions, (b) the conditions in note no. 7 below, (c) special post applications, (d) the specific posts spacing shown in Index No. 401, (e) reduced post spacing required for specific end anchorage assemblies, and, (f) specific spacings called for in the plans.
4. Guardrail mounting height for the W-beam without rubrail and for thrie-beam is 1'-9" to the center of beam, and for W-beam with rubrail 2'-0" to center of beam. Modified thrie-beam shall be mounted at a height of 2'-0" to center of beam. The height is critical and shall be attained in all cases; a tolerance of 3" above and 1" below the standard mounting heights is permissible over necessary surface irregularities (e.g., across shoulder gutters, inlets and roadway surface break lines).
5. All guardrail panels, end sections and special end shoes shall be lapped in the direction of adjacent traffic.
6. Flared end anchorage assemblies providing 4' offset are the standard end treatments for single face free standing guardrail approach ends. Parallel end anchorage assemblies for guardrail approach end treatments will be constructed only when restraints prevent construction of flared end anchorages.
7. At above ground rigid hazards where the face of guardrail is offset from the hazard less than the 4' minimum for standard W-beam, other guardrail configurations may be applicable; see General Note No. 10 and the minimum offset table on Sheet 18. For guardrail with post spacing less than 6'-3" the reduced spacing should extend a minimum of one panel in advance of the hazard. When minimum offset cannot be attained safety shape concrete barrier shall be used unless other shielding is approved by the Engineer of record. See Index No. 410 for safety shape concrete barriers and typical applications, and the plans for special barrier shapes and applications.
8. In addition to use at conventional roadside hazards, guardrail will be required on flush shoulder sections where fill slopes are steeper than 1:3 within the clear zone, and on curbed sections where fill slopes are steeper than 1:3 within 4' of the face of curb. However, when fill heights are less than 6' the guardrail may be omitted, unless in the opinion the Engineer its use is deemed necessary due to other roadside features.
9. The guardrail to bridge connections contained in this index are for bridges with Test Level 4 safety shaped traffic rails. For guardrail to bridge connections on existing bridges with less than Test Level 4 rails see Index No. 401. For guardrail to concrete barrier wall connections see Index No. 410.
10. Thrie-beam guardrail panels shall be used in guardrail transitions to bridge traffic rail barriers, to concrete and certain water filled safety shaped barriers, certain crash cushion and as a continuous barrier when called for in the plans. For additional information on rail attachment, post spacings, nested rails, location of thrie-beam transition panels and offset block configurations see details elsewhere in this Index, and Index Nos. 410, 416 and 435. The use of thrie-beam guardrail with standard offset blocks may be considered where one or more of the conditions listed below or similar conditions are anticipated or exist:
 - a. W-beam deflection is marginal,
 - b. W-beam with rubrail considered functionally deficient,
 - c. Overriding W-beam is probable,
 - d. Drainage will be impeded or blocked by the use of concrete barrier wall,
 - e. High frequency of repairs to W-beam,
 - f. Spandrel beam with low deflection needed around unrelocatable structure, and,
 - g. Accommodating passenger vehicles heavier or larger than the standard passenger car (e.g. passenger vans and small buses)

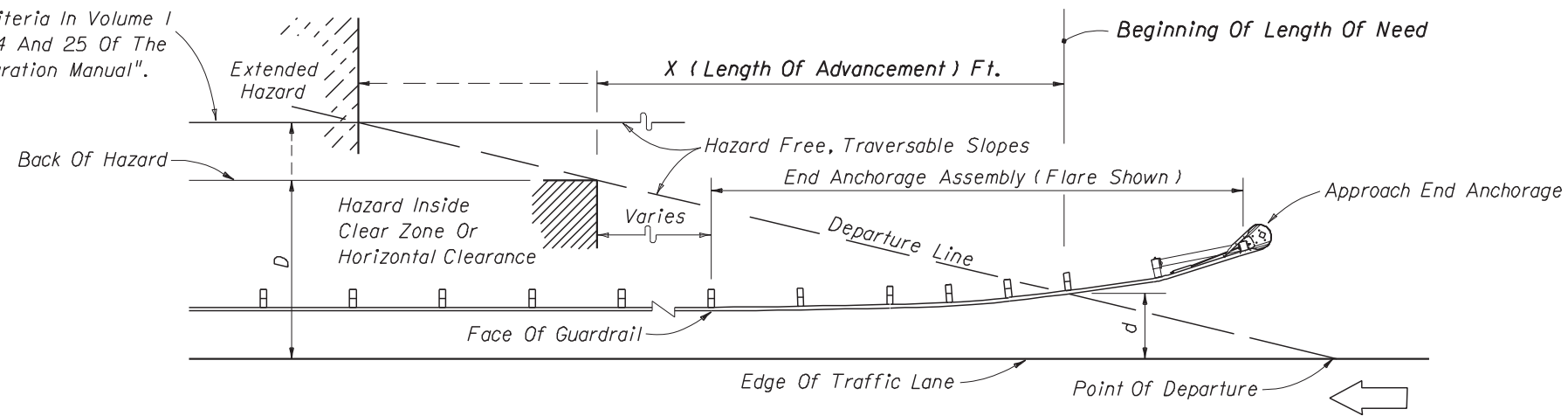
The modified thrie-beam guardrail may have application to accommodate large buses.

11. Single face median guardrail for bridges located on divided roadways shall be constructed the same as outer roadway guardrail under the following conditions:
 - (a) Wide medians where approach end anchor is located outside of opposing roadway clear zone.
 - (b) Medians of uniform width that are occupied by other transportation and joint use facilities.
 - (c) Medians of uniform or variable widths with independent vertical alignments not suited to normal median guardrail installations.
 - (d) Medians of bifurcated roadways.
12. Straight rail sections may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shop-bent) to fit.
13. Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in lieu of Type II assemblies located in the approach clear zones.
14. Corrugated sheet steel beams, end shoes, end sections and back-up plates shall conform to the current requirements of AASHTO M180, Class A, Type II (zinc) coating. Aluminum guardrail elements will not be permitted unless specifically called for in the plans. All other metallic components, hardware and accessories shall be in conformance with the appropriate current AASHTO requirements.

Recycled beams: Used Class A guardrail beams that have been refurbished to condition new (AASHTO M180) may be used for both construction of new guardrail and maintenance of existing guardrail. Refurbishing shall include stripping of the existing galvanizing, restoration of the base metal in section and straightness free of warp and deformation, and, regalvanizing to AASHTO Type II specifications. Refurbished beams that retain ruptured holes, gashes or tears will not be accepted.
15. Steel offset blocks other than modified thrie-beam offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. Permissible post and offset block combinations are tabulated on Sheet 16.
16. Where necessary to enlarge or add holes to galvanized guardrail, the work will be done by drilling or reaming. Damaged galvanized guardrail will be metalized in accordance with Sections 562 and 971 of the Standard Specifications. No burning of holes will be permitted.
17. Guardrail reflector color (white or yellow) shall conform to the color of the near lane edgeline.
18. Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using timber or steel posts. Repair within a run of guardrail with existing concrete posts can be made with either steel, timber, sound salvaged concrete posts; replacement in kind of damaged posts is to be made when like posts are on hand at time of repair.
19. Substitutions between thrie-beam guardrail and concrete barrier wall are not eligible for V.E.C.P. consideration.

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GUARDRAIL					
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Clear Zone Limit Or Horizontal Clearance Limit In Accordance With The Criteria In Volume I Chapters 2, 4 And 25 Of The "Plans Preparation Manual".



Design Speed mph	X (Length Of Advancement) Ft. [■]
≤ 45	= 16 (D-d)
≥ 50	= 13 (D-d)

■ Length of advancement determined from the diagram and equations above establishes the location of the upstream beginning length of need for guardrail, however, the length of advancement can be no less than that required by other details of this index.

The flared end anchorage with 4' nose offset is shown in the diagram above, however, the diagram applies to other configurations that may occur at the beginning of length of need, such as, other flare designs; upstream returns; and, other upstream deflected, tangent and curvilinear conditions.

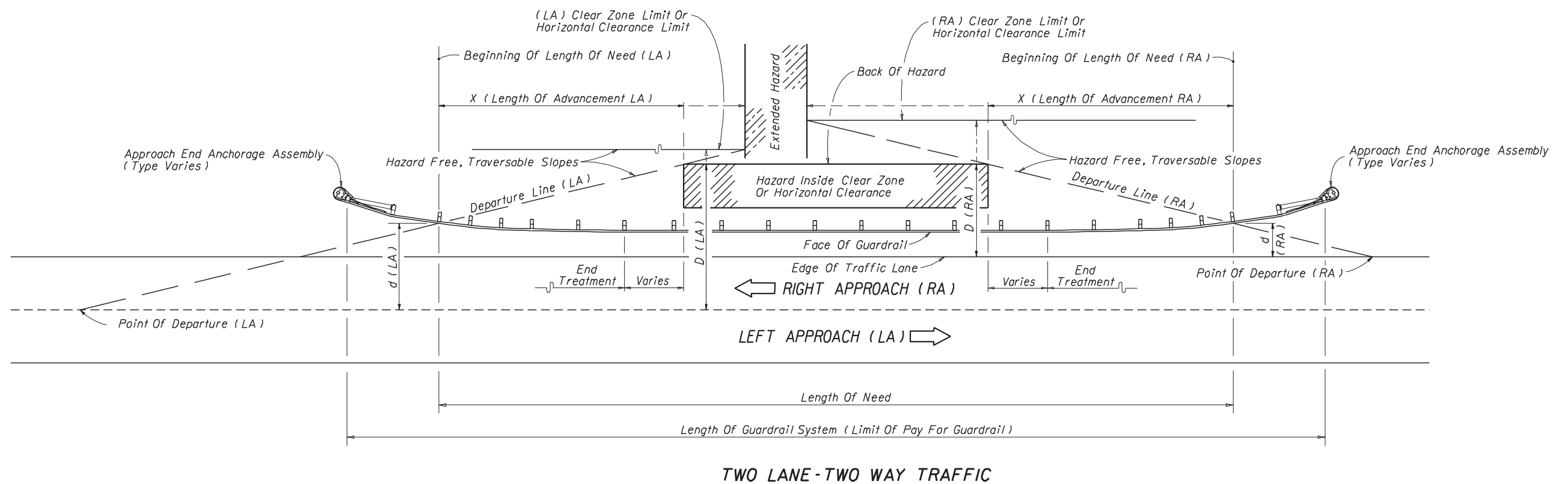
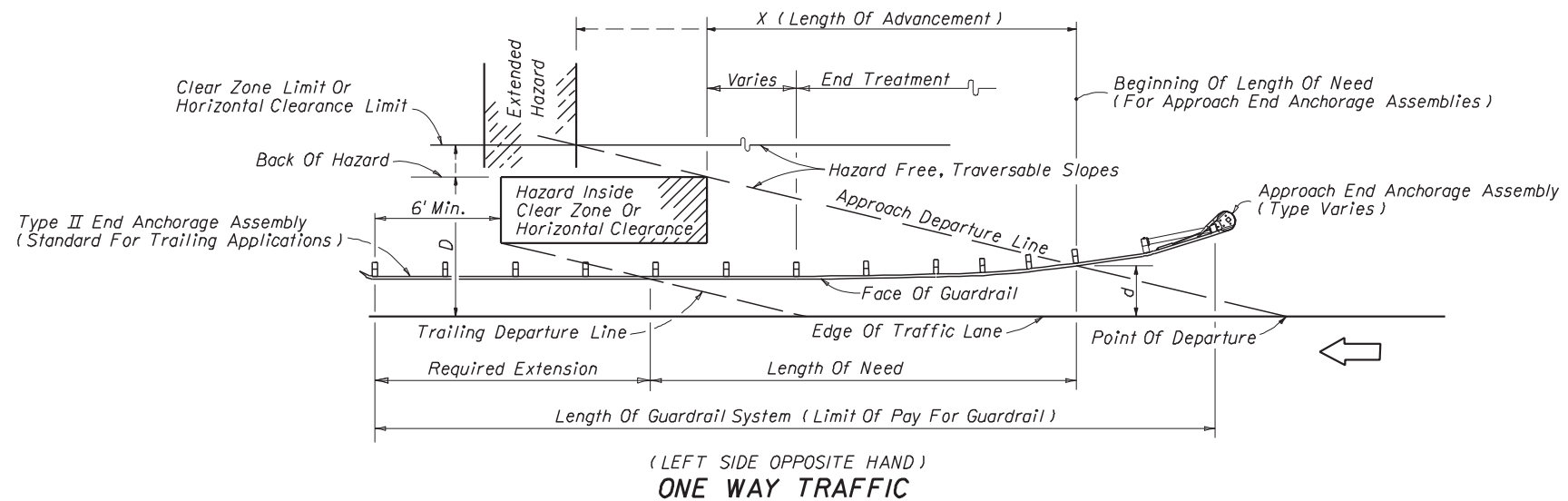
Equation Variables:

D=Distance in feet from near edge of the near approach traffic lane to either (a) the back of hazard, when the hazard is located inside the clear zone or horizontal clearance or (b) the clear zone or horizontal clearance outer limit, when the hazard extends to or goes beyond the clear zone or horizontal clearance limit. For left side hazards on two-way undivided facilities, D is measured from the inside edge of the near approach traffic lane (see Figure 2).

d=Distance in feet from the near edge of the near approach traffic lane to the face of guardrail at its intersection with the departure line. For left side hazards on two-way undivided facilities, d is measured from the inside edge of the near approach traffic lane (see Figure 2).

LENGTH OF ADVANCEMENT - FIGURE 1

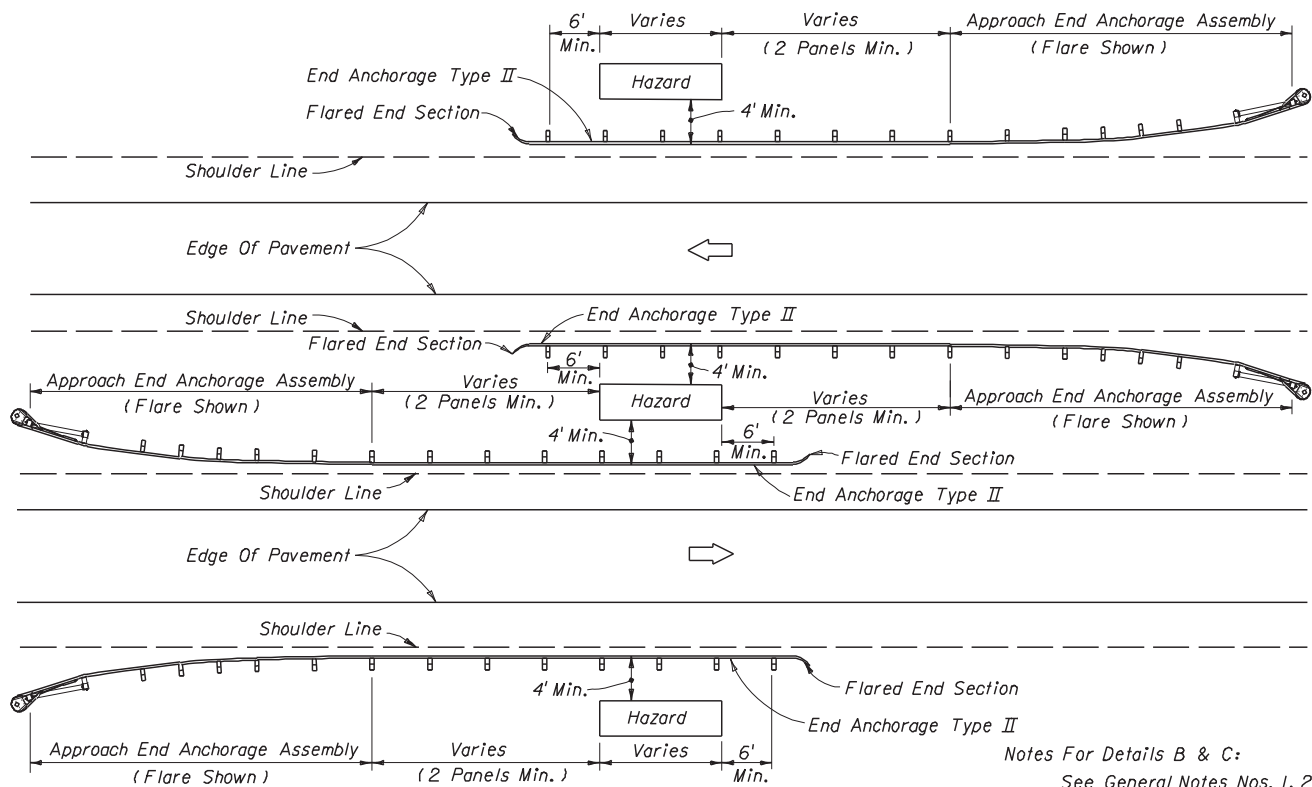
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GUARDRAIL					
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For description of the dimensions D , d and X , see Length of Advancement - Figure 1.
For additional shoulder guardrail information, see Details B and C.

LOCATING TERMINALS ON SHOULDER GUARDRAILS - FIGURE 2

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GUARDRAIL				
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Median Guardrail Applications Shown Are For Locations Where Approach End Anchorage Assemblies Are Outside Of The Opposing Roadway Clear Zone.

DIVIDED ROADWAY- DETAIL B

Notes For Details B & C:

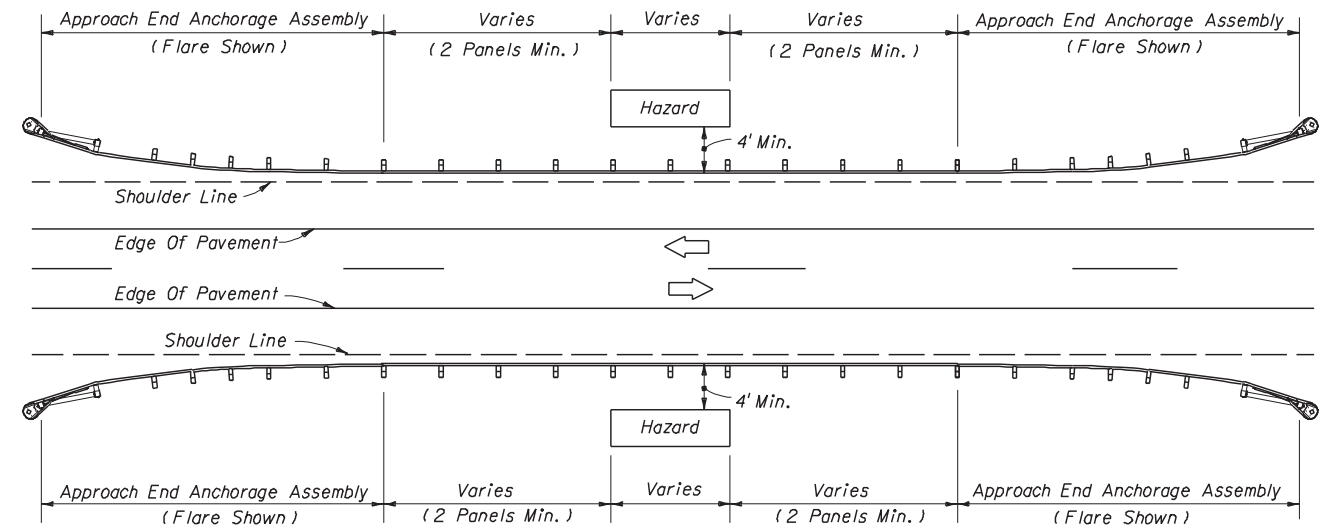
See General Notes Nos. 1, 2, 3, 4, 5, 6, 7 and 8.

See Details K and L for guardrail offsets.

For end anchorage assemblies see sheets elsewhere in this Index and the plans.

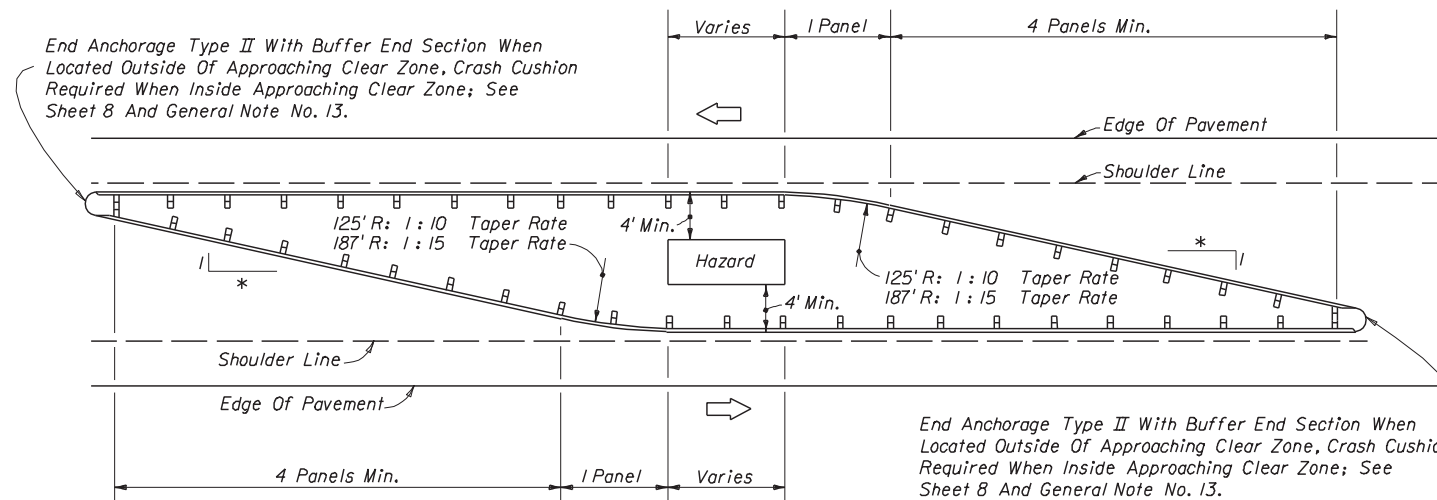
For hazards that require shielding and are located back of curb see other sheets of this index, and where rigid barrier is required see Index No. 410.

When divided roadways are designated evacuation routes, approach end anchorage assemblies should be used for trailing end anchorage.



UNDIVIDED ROADWAY- DETAIL C

GUARDRAIL APPLICATION FOR ROADSIDE HAZARDS



This Guardrail Configuration Applies Where Approach End Anchorage Assemblies Cannot be Located Outside Of The Opposing Roadway Clear Zone.

OPPOSING TRAFFIC- DETAIL D

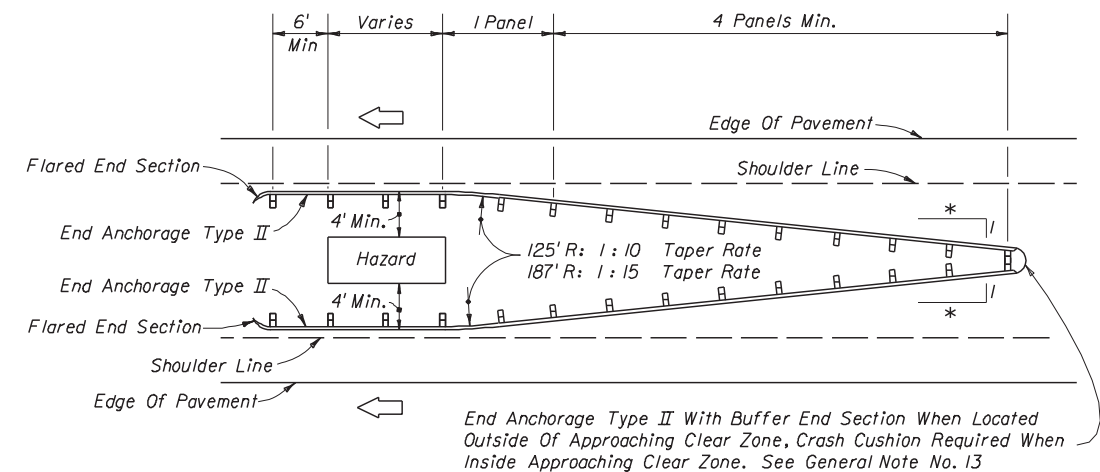
Notes For Details D & G:

See General Notes Nos. 1, 2, 3, 4, 5, 7, and 12.

See Details K and L for guardrail offsets.

For hazards that require shielding and are located back of curb see other sheets of this index, and where rigid barrier is required see Index No. 410.

GUARDRAIL APPLICATION FOR NARROW MEDIAN AND GORE HAZARDS



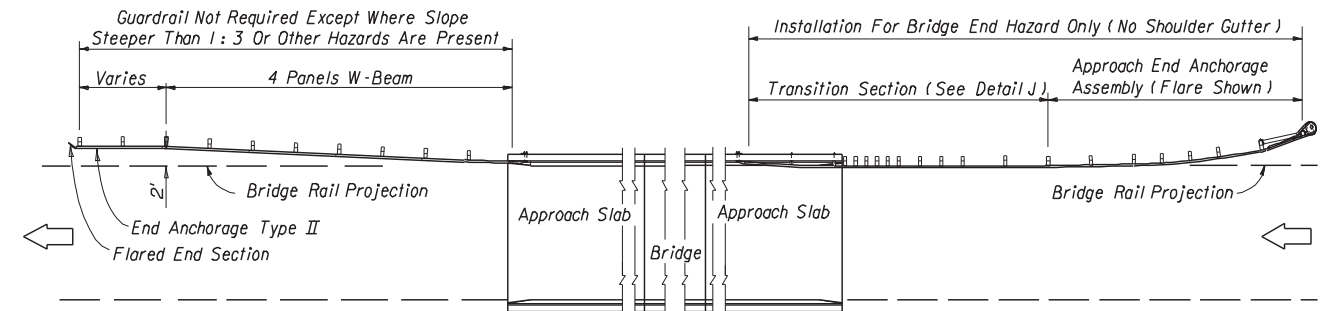
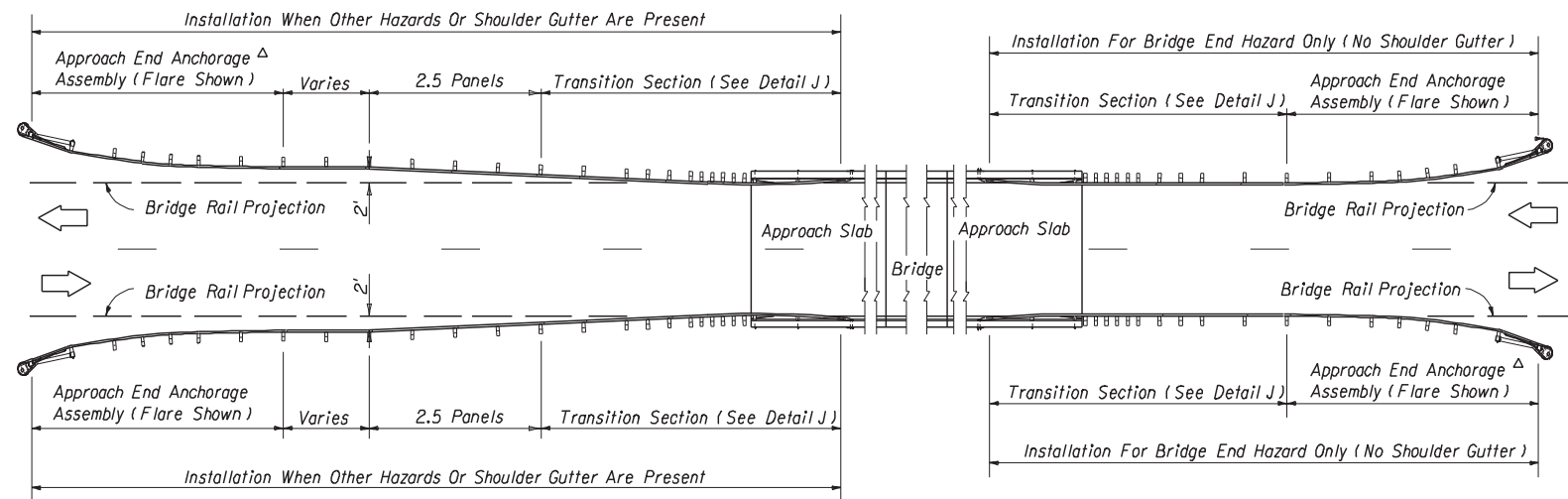
ONE-WAY TRAFFIC- DETAIL G

*1:10 Taper Rate For Design Speeds ≤45 mph
 1:15 Taper Rate For Design Speeds ≥50 mph

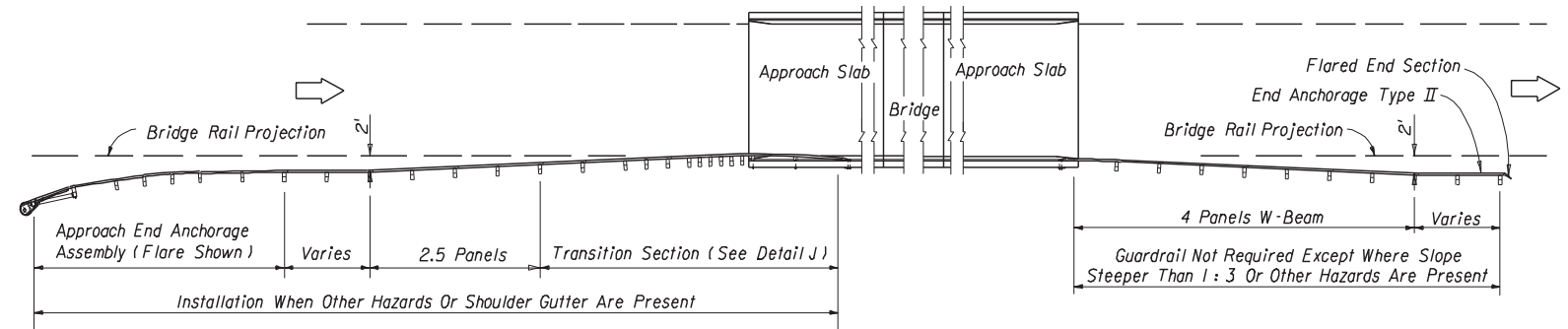
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For Median Guardrail See Sheets 7 & 8 And General Note II.



^ΔWith Four Or More Lanes Trailing Guardrail Anchorages May Be As Shown In Detail P Unless Other Anchorage Called Out In The Plans
UNDIVIDED ROADWAY - DETAIL O

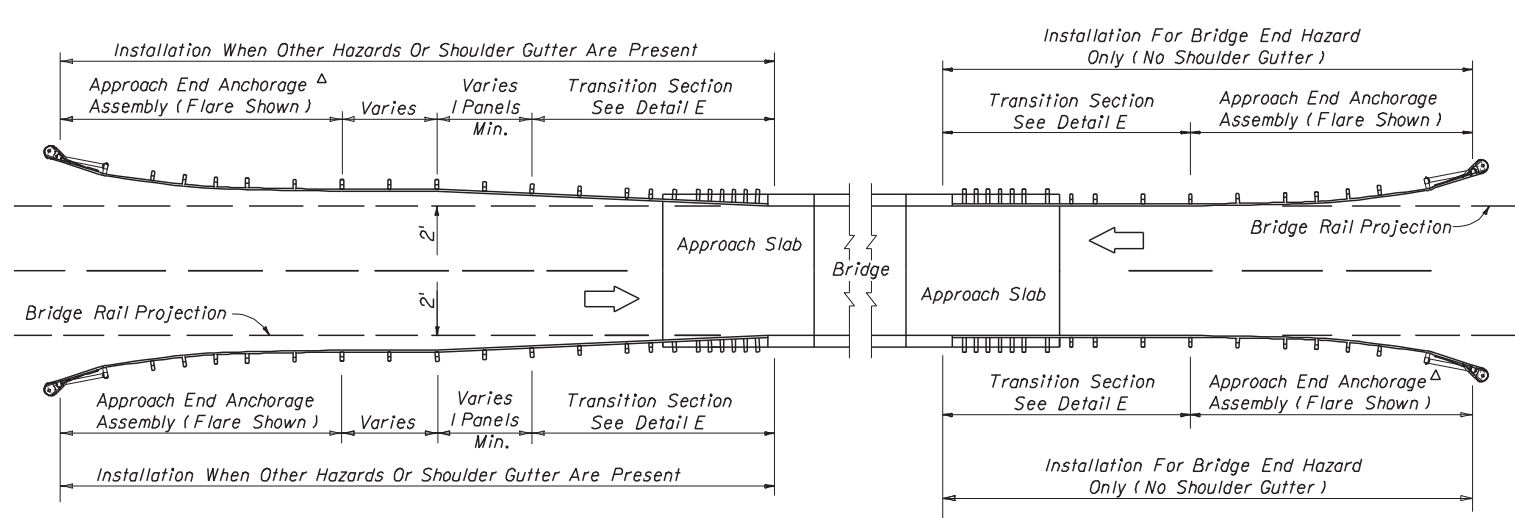
DIVIDED ROADWAY - DETAIL P

Notes For Details O & P:

- See General Notes Nos. 1, 2, 3, 4, 5, 6, 8 and 9. See Detail J for connections to bridges.
- For end anchorage assemblies see sheets elsewhere in this Index and the plans.
- When divided roadways are designated evacuation routes, approach end anchorage assemblies should be used for trailing end anchorage.
- Shoulder gutter in itself does not require the installation of guardrail.

GUARDRAIL APPLICATIONS FOR BRIDGES WITH FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING FULL LENGTH OF APPROACH SLAB

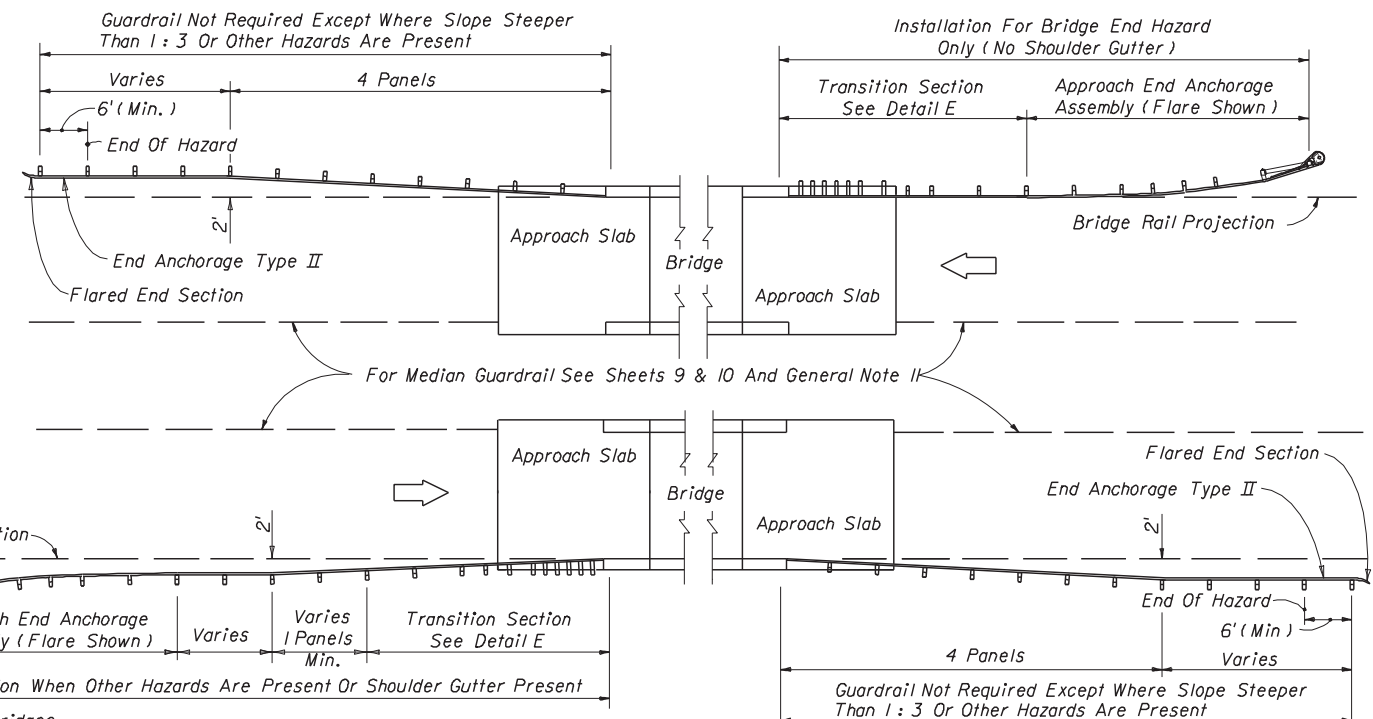
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GUARDRAIL				
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△With Four Or More Lanes Trailing Guardrail Anchorages May Be As Shown In Detail I Unless Other Anchorage Called Out In The Plans

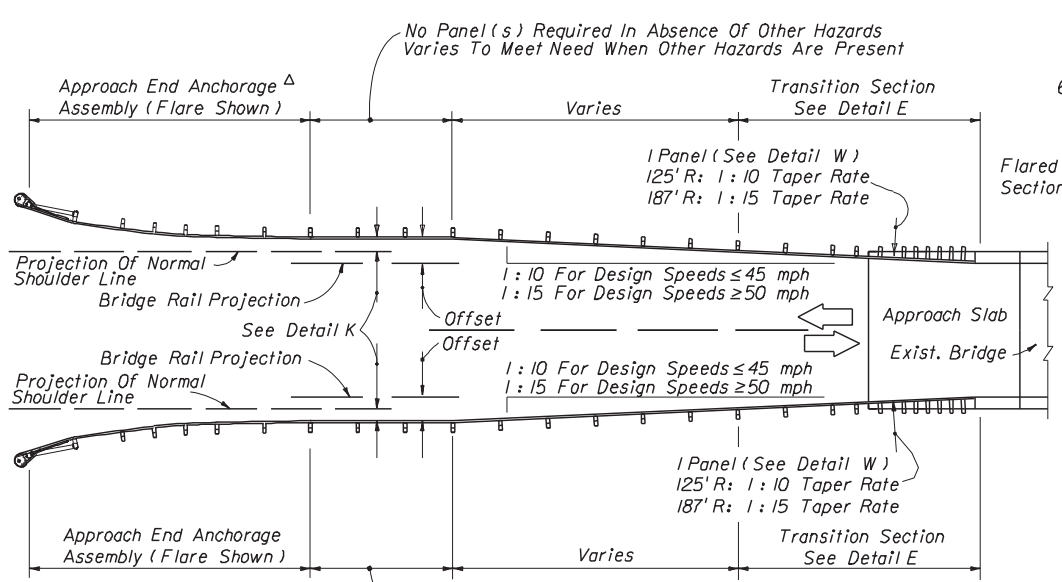
UNDIVIDED ROADWAY - DETAIL H

Notes For Details H & I:
 See General Notes Nos. 1, 2, 3, 4, 5, 6, 8, and 9. See Details E and N for approach connections to bridges.
 For end anchorage assemblies see sheets elsewhere in this Index and in the plans.
 When divided roadways are designated evacuation routes, approach end anchorage assemblies should be used for trailing end anchorage.
 Shoulder gutter in itself does not require the installation of guardrail.



DIVIDED ROADWAY - DETAIL I

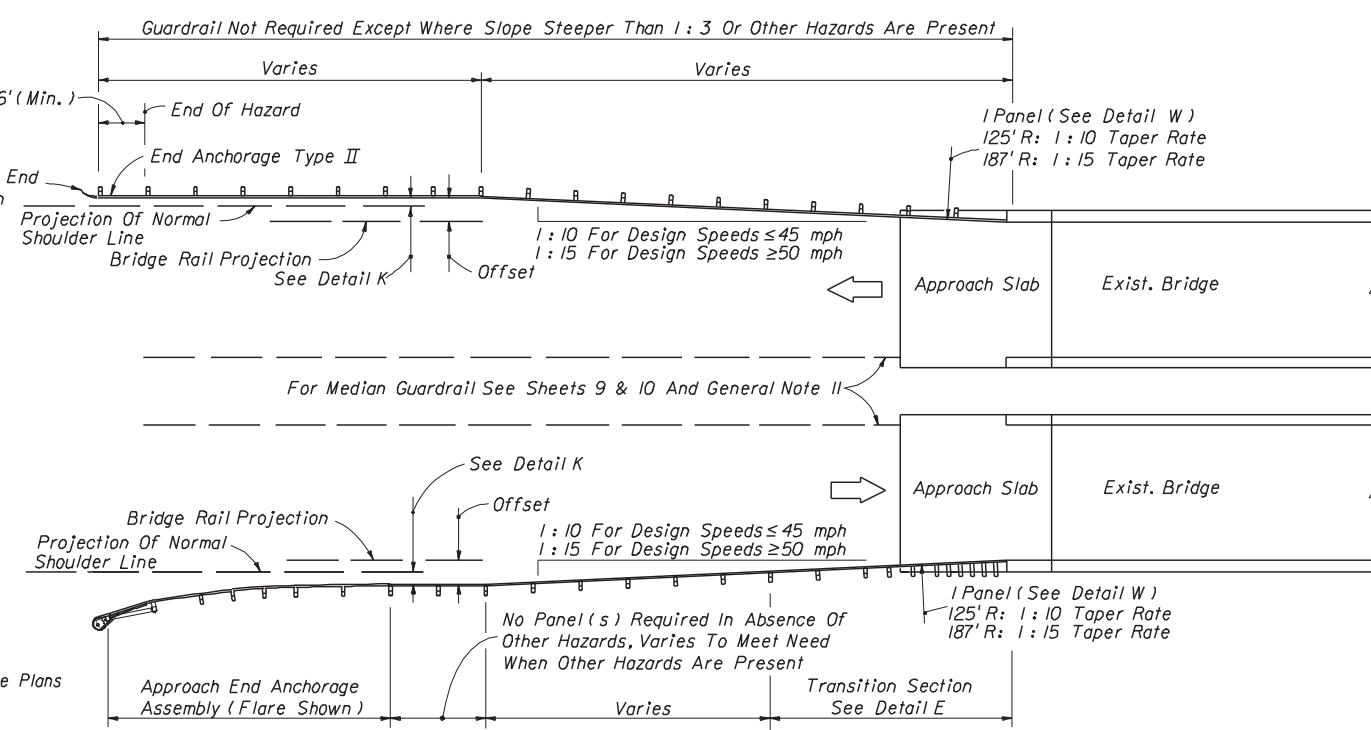
GUARDRAIL APPLICATIONS FOR BRIDGES WITH FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH



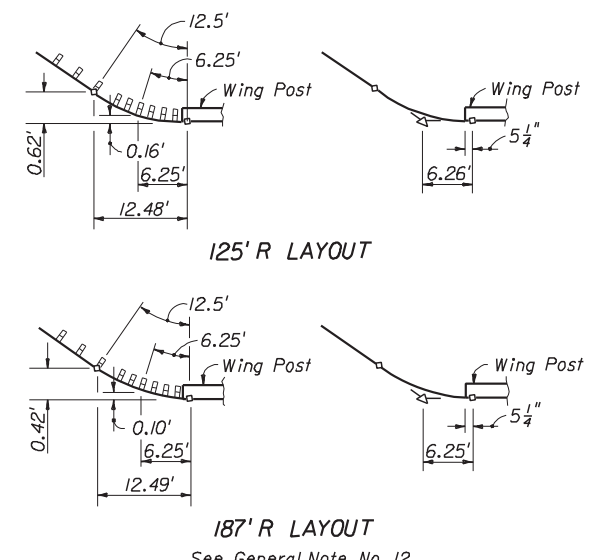
UNDIVIDED ROADWAY - DETAIL S

Notes for Details S & T:
 See General Notes Nos. 1, 2, 3, 4, 5, 6, 8 and 9. See Details E and N for approach connections to bridges.
 For end anchorage assemblies see sheets elsewhere in this Index and the plans.
 When divided roadways are designated evacuation routes, approach end anchorage assemblies should be used for trailing end anchorage.

GUARDRAIL APPLICATIONS FOR BRIDGES WITH LESS THAN FULL WIDTH SHOULDERS AND SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH

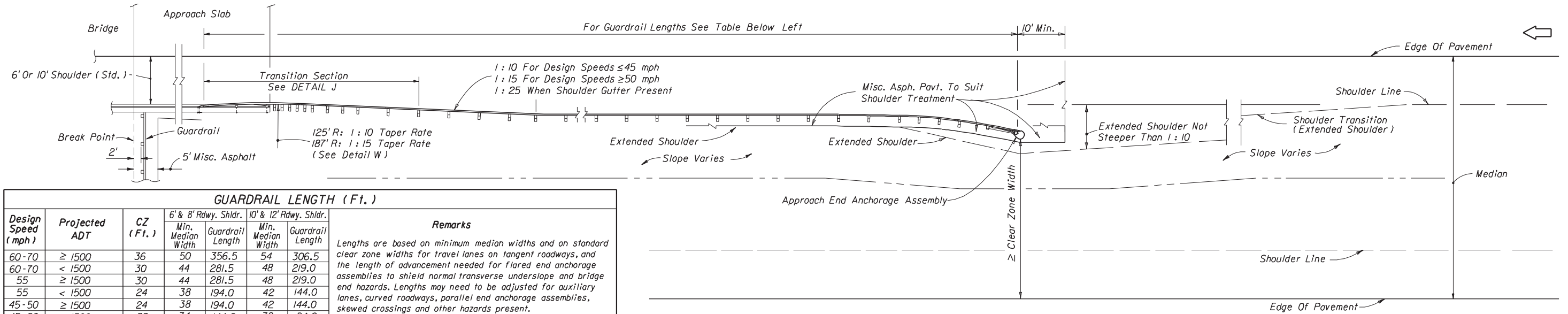


DIVIDED ROADWAY - DETAIL T



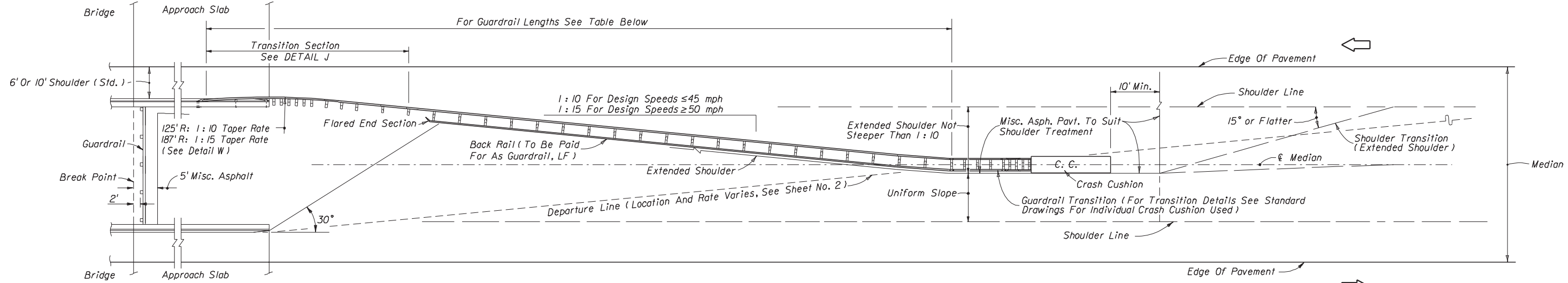
STANDARD PANELS SET TO RADIALS ADJOINING BRIDGES DETAIL W

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GUARDRAIL				
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GUARDRAIL LENGTH (Ft.)							Remarks
Design Speed (mph)	Projected ADT	CZ (Ft.)	6' & 8' Rdwy. Shldr.		10' & 12' Rdwy. Shldr.		
			Min. Median Width	Guardrail Length	Min. Median Width	Guardrail Length	
60-70	≥ 1500	36	50	356.5	54	306.5	Lengths are based on minimum median widths and on standard clear zone widths for travel lanes on tangent roadways, and the length of advancement needed for flared end anchorage assemblies to shield normal transverse underslope and bridge end hazards. Lengths may need to be adjusted for auxiliary lanes, curved roadways, parallel end anchorage assemblies, skewed crossings and other hazards present.
60-70	< 1500	30	44	281.5	48	219.0	
55	≥ 1500	30	44	281.5	48	219.0	
55	< 1500	24	38	194.0	42	144.0	
45-50	≥ 1500	24	38	194.0	42	144.0	
45-50	< 1500	20	34	144.0	38	94.0	
45-50	Urban % Curb	24	38	194.0	42	144.0	
35-40	Urban % Curb	18	32	144.0	36	81.5	

Note: For approach end anchorage assemblies see sheets elsewhere in this Index and the plans.
WHEN END TERMINAL IS OUTSIDE OF OPPOSING ROADWAY CLEAR ZONE



Median Width (Ft.)	GUARDRAIL LENGTHS															
	1:10 TAPER RATE								1:15 TAPER RATE							
	6' Bridge Shoulder				10' Bridge Shoulder				6' Bridge Shoulder				10' Bridge Shoulder			
	Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)	
Front	Back	Total	Total	Front	Back	Total	Total	Front	Back	Total	Total	Front	Back	Total	Total	
32	9.5	6	15.5	193.75	6.5	4	10.5	131.25	13.5	10	23.5	293.75	8.5	6	14.5	181.25
34	10.5	7	17.5	218.75	7.5	5	12.5	156.25	14.5	11	25.5	318.75	9.5	7	16.5	206.25
36	10.5	7	17.5	218.75	7.5	5	12.5	156.25	15.5	12	27.5	343.75	10.5	8	18.5	231.25
38	11.5	8	19.5	243.75	8.5	6	14.5	181.25	16.5	13	29.5	368.75	11.5	9	20.5	256.25
40	12.5	9	21.5	268.75	9.5	6	15.5	193.75	17.5	13	30.5	381.25	13.5	11	24.5	306.25
42	13.5	9	22.5	281.25	10.5	7	17.5	218.75	19.5	15	34.5	431.25	14.5	11	25.5	318.75
44	14.5	10	24.5	306.25	10.5	7	17.5	218.75	20.5	16	36.5	456.25	15.5	12	27.5	343.75
46	14.5	10	24.5	306.25	11.5	8	19.5	243.75	21.5	17	38.5	481.25	16.5	13	29.5	368.75
48	15.5	11	26.5	331.25	12.5	9	21.5	268.75	22.5	17	39.5	493.75	17.5	13	30.5	381.25

The lengths shown on this table are typical for roadways with standard width shoulders. Length requirements shall be determined on a site specific basis for both standard width and narrow bridge shoulders and end anchorage or end shielding use.

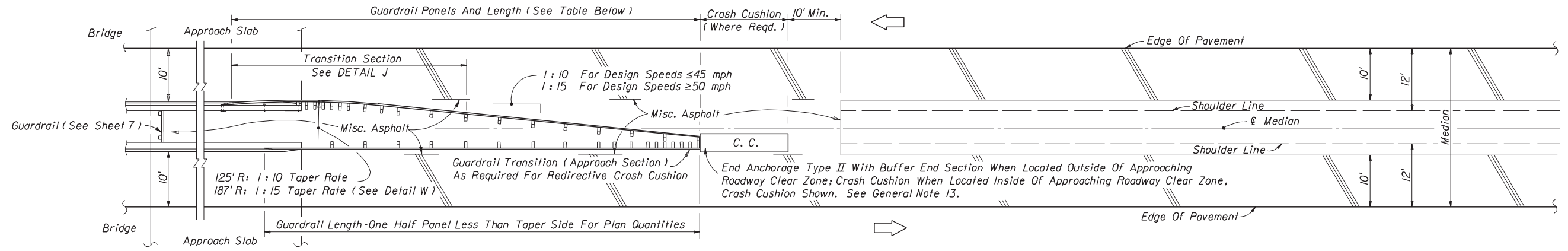
WHEN END TERMINAL CANNOT BE LOCATED OUTSIDE OF OPPOSING ROADWAY CLEAR ZONE

**APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING
 EXTENDING FULL APPROACH SLAB LENGTH IN WIDE MEDIANS WITH FLUSH SHOULDERS**

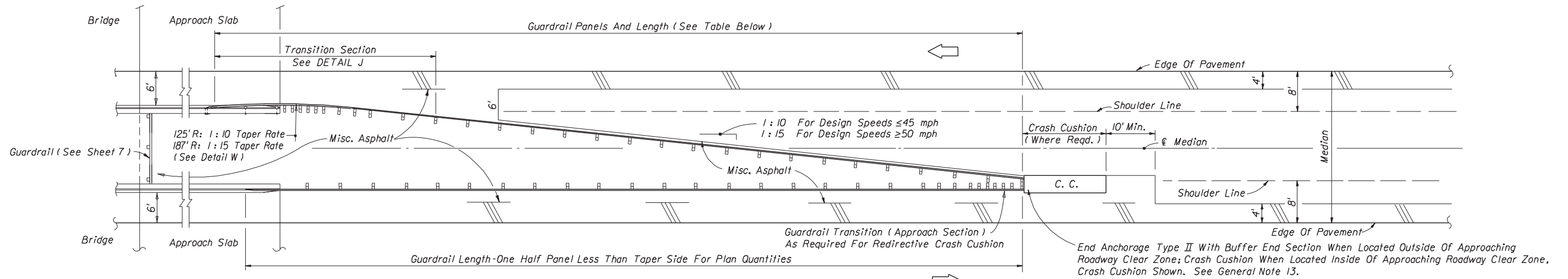
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
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GUARDRAIL

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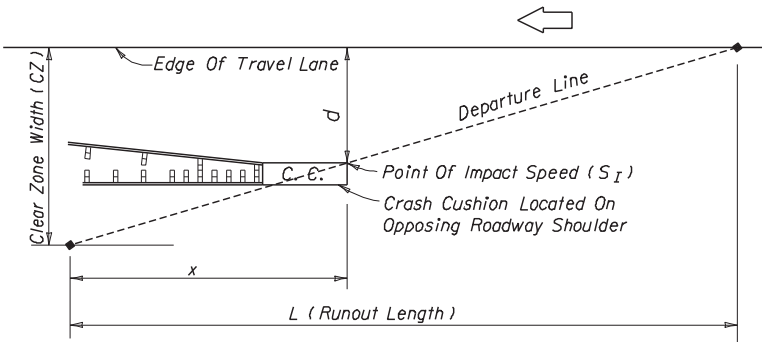
MEDIANS WITH 10' BRIDGE SHOULDERS



MEDIANS WITH 6' BRIDGE SHOULDERS

Note: The guardrail configurations shown apply only to parallel or near parallel bridges with open medians.

Design Speed (mph)	CZ (Ft.)
<45	18
45	24
50	24
55	30
>55	36



Speed (S_I) For Determining Crash Cushion Size:

$$S_I = \frac{x}{L} (\text{Design Speed}) + \frac{(CZ-d)}{CZ} [\text{Design Speed}]$$

SIZING CRASH CUSHIONS LOCATED ON OPPOSING ROADWAY SHOULDERS

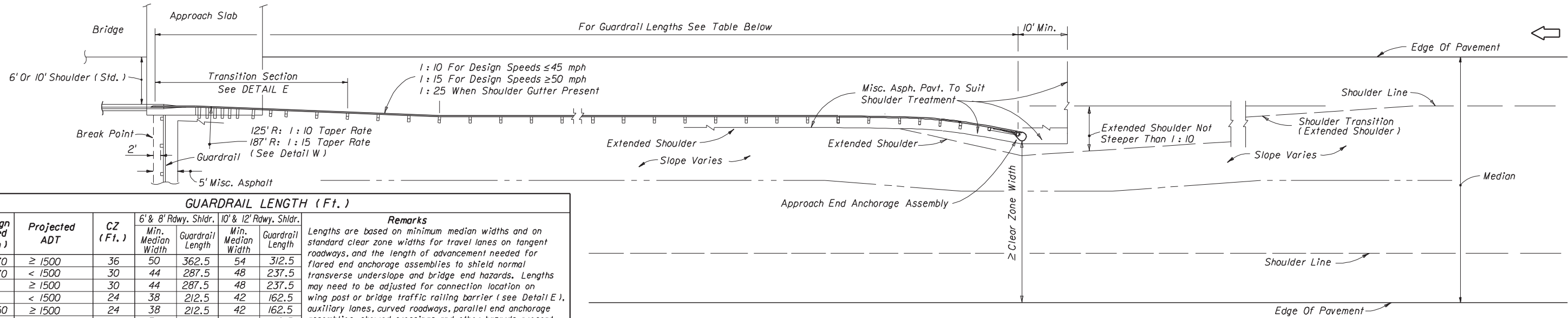
GUARDRAIL LENGTHS								
MEDIAN WIDTH (Ft.)	6' BRIDGE SHOULDERS				10' BRIDGE SHOULDERS			
	1:10 TAPER RATE		1:15 TAPER RATE		1:10 TAPER RATE		1:15 TAPER RATE	
	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)
30	14.5	181.25	20.5	256.25	7.5	93.75	10.5	131.25
28	12.5	156.25	18.5	231.25	6.5	81.25	8.5	106.25
26	11.5	143.75	15.5	193.75	5.5*	68.75	6.5	81.25
24	9.5	118.75	13.5	168.75	5.5*	68.75	5.5*	68.75

The lengths shown in this table are based on standard widths for roadway and bridge median shoulders. Length requirements for both standard width and narrow bridge shoulders and end anchorage or end shielding requirements shall be determined on a site specific basis. When crash cushions are required on opposing roadway shoulders, their sizes may be determined by the residual speeds (S_I 's) along the runouts from the approach roadways; however, when calculated speeds (S_I 's) are less than 30 mph; crash cushions shall be no less in size than for 30 mph, see speed diagram left. The number of panels may be reduced when installing a crash cushion more than 2.5' in width, see * below.

* Number shown is the minimum number of panels plus a W-Three beam transition panel; single faced guardrail must have a length of five (5) or more panels.

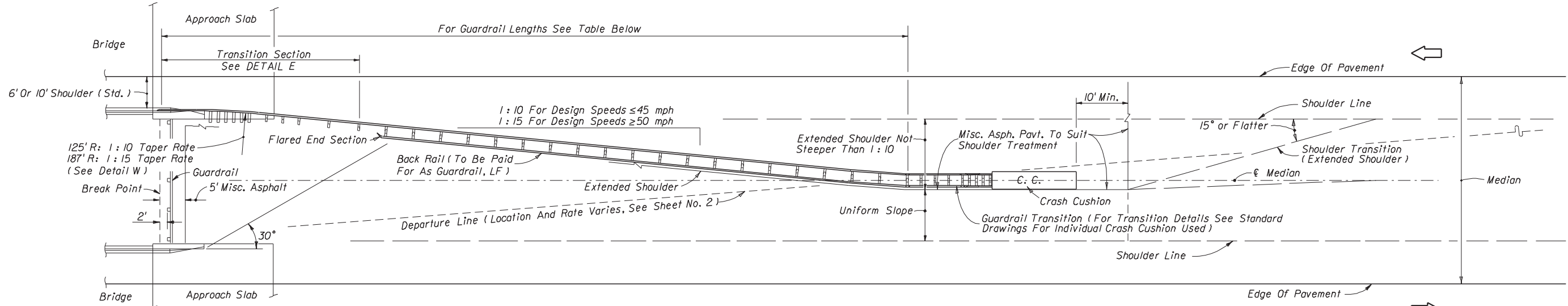
APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING EXTENDING FULL APPROACH SLAB LENGTH IN NARROW MEDIANS WITH FLUSH SHOULDERS

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Checked By				



GUARDRAIL LENGTH (Ft.)							Remarks
Design Speed (mph)	Projected ADT	CZ (Ft.)	6' & 8' Rdwy. Shldr. Min. Median Width	10' & 12' Rdwy. Shldr. Guardrail Length	10' & 12' Rdwy. Shldr. Min. Median Width	Guardrail Length	
60-70	≥ 1500	36	50	362.5	54	312.5	Lengths are based on minimum median widths and on standard clear zone widths for travel lanes on tangent roadways, and the length of advancement needed for flared end anchorage assemblies to shield normal transverse underslope and bridge end hazards. Lengths may need to be adjusted for connection location on wing post or bridge traffic railing barrier (see Detail E), auxiliary lanes, curved roadways, parallel end anchorage assemblies, skewed crossings and other hazards present. When the wing post is replaced by bridge traffic railing barrier, see Detail E with reference to Detail J.
60-70	< 1500	30	44	287.5	48	237.5	
55	≥ 1500	30	44	287.5	48	237.5	
55	< 1500	24	38	212.5	42	162.5	
45-50	≥ 1500	24	38	212.5	42	162.5	
45-50	< 1500	20	34	162.5	38	112.5	
45-50	Urban % Curb	24	38	212.5	42	162.5	
30-40	Urban % Curb	18	32	162.5	36	100.0	

Note: For approach end anchorage assemblies see sheets elsewhere in this Index and the plans.
WHEN END TERMINAL IS OUTSIDE OF OPPOSING ROADWAY CLEAR ZONE



Median Width (Ft.)	GUARDRAIL LENGTHS															
	1:10 TAPER RATE								1:15 TAPER RATE							
	6' Bridge Shoulder				10' Bridge Shoulder				6' Bridge Shoulder				10' Bridge Shoulder			
	Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)		Panels (No.)		Length (Ft.)	
Front	Back	Total	Total	Front	Back	Total	Total	Front	Back	Total	Total	Front	Back	Total	Total	
32	7.5	6	13.5	168.75	4.5	3	7.5	93.75	11.5	9	20.5	256.25	7.5	6	13.5	168.75
34	8.5	6	14.5	181.25	5.5	4	9.5	118.75	12.5	10	22.5	281.25	7.5	6	13.5	168.75
36	9.5	7	16.5	206.25	6.5	5	11.5	143.75	13.5	11	24.5	306.25	8.5	7	15.5	193.75
38	10.5	8	18.5	231.25	7.5	6	13.5	168.75	14.5	12	26.5	331.25	10.5	9	19.5	243.75
40	10.5	8	18.5	231.25	7.5	6	13.5	168.75	16.5	13	29.5	368.75	11.5	9	20.5	256.25
42	11.5	8	19.5	243.75	8.5	6	14.5	181.25	17.5	14	31.5	393.75	12.5	10	22.5	281.25
44	12.5	9	21.5	268.75	9.5	7	16.5	206.25	18.5	15	33.5	418.75	13.5	11	24.5	306.25
46	12.5	9	21.5	268.75	10.5	8	18.5	231.25	19.5	16	35.5	443.75	14.5	12	26.5	331.25
48	14.5	11	25.5	318.75	11.5	9	20.5	256.25	20.5	16	36.5	456.25	16.5	13	29.5	368.75

The lengths shown on this table are typical for roadways with standard width shoulders and a relocated connection to the existing wing post. When the wing post is replaced by bridge traffic railing barrier, see Detail E with reference to Detail J. Length requirements shall be determined on a site specific basis for both standard width and narrow bridge shoulders and for end anchorage or end shielding use.

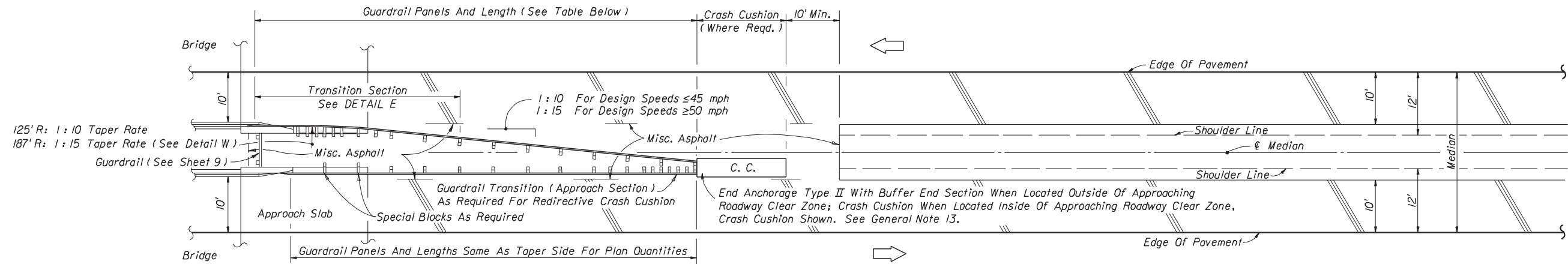
WHEN END TERMINAL CANNOT BE LOCATED OUTSIDE OF OPPOSING ROADWAY CLEAR ZONE

**APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING
 EXTENDING LESS THAN FULL APPROACH SLAB LENGTH IN WIDE MEDIANS WITH FLUSH SHOULDERS**

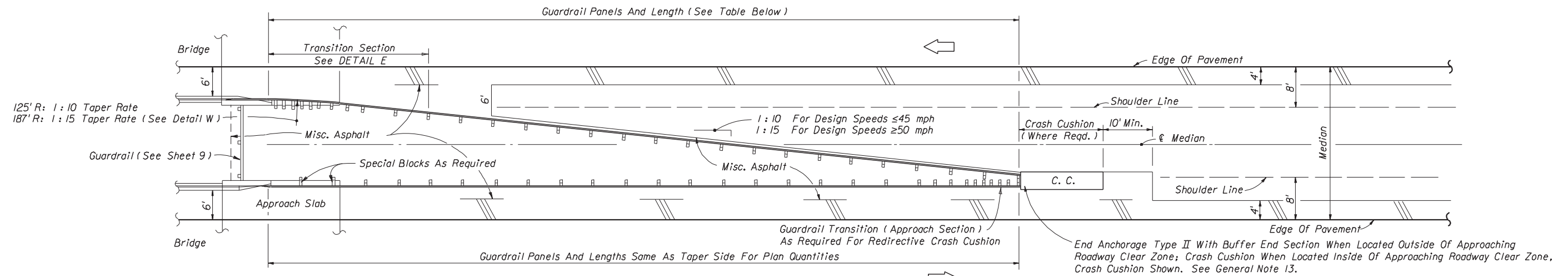
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

GUARDRAIL

Names	Dates	Approved By		
Designed By			Revision	Sheet No.
Drawn By	HSD 09/81		00	9 of 31
Checked By	JBN JVC 09/81			400



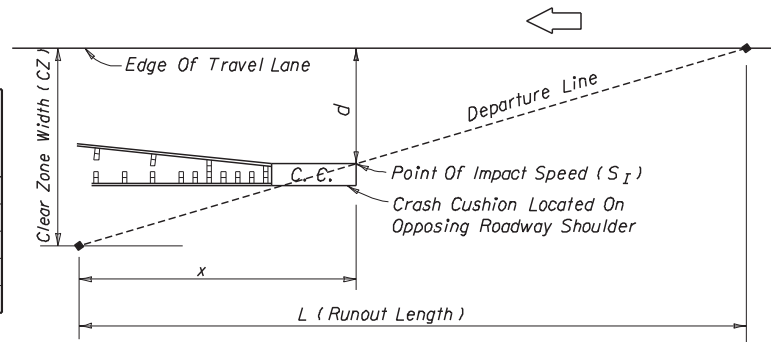
MEDIANS WITH 10' BRIDGE SHOULDERS



MEDIANS WITH 6' BRIDGE SHOULDERS

Note: The guardrail configurations shown apply only to parallel or near parallel bridges with open medians.

Design Speed (mph)	CZ (Ft.)
< 45	18
45	24
50	24
55	30
> 55	36



Speed (S_I) For Determining Crash Cushion Size:

$$S_I = \frac{x}{L} (\text{Design Speed}) = \frac{(CZ-d)}{CZ} [\text{Design Speed}]$$

SIZING CRASH CUSHIONS LOCATED ON OPPOSING ROADWAY SHOULDERS

GUARDRAIL LENGTHS

MEDIAN WIDTH (Ft.)	6' BRIDGE SHOULDERS				10' BRIDGE SHOULDERS			
	1:10 TAPER RATE		1:15 TAPER RATE		1:10 TAPER RATE		1:15 TAPER RATE	
	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)	PANELS (No.)	LENGTH (Ft.)
30	12.5	156.25	18.5	231.25	6.5	81.25	9.5	118.75
28	11.5	143.75	16.5	206.25	5.5	68.75	7.5	93.75
26	9.5	118.75	14.5	181.25	5.5*	68.75	5.5*	68.75
24	8.5	106.25	11.5	143.75	5.5*	68.75	5.5*	68.75

The lengths shown in this table are based on standard widths for roadway and bridge median shoulders. Length requirements for both standard width and narrow bridge shoulders and end anchorage or end shielding requirements shall be determined on a site specific basis. When crash cushions are required on opposing roadway shoulders, their sizes may be determined by the residual speeds (S_I 's) along the runouts from the approach roadways; however, when calculated speeds (S_I 's) are less than 30 mph crash cushions shall be no less in size than for 30 mph; see speed diagram left. The number of panels may be reduced when installing a crash cushion more than 2.5' in width; see * below.

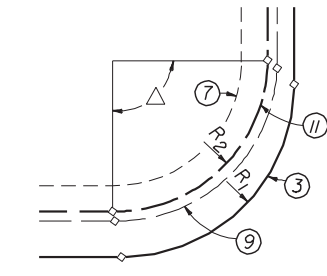
*Number shown is the minimum number of panels plus a W-Three beam transition panel; single faced guardrail must have a length of five (5) or more panels.

**APPROACH GUARDRAIL TREATMENTS FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING
EXTENDING LESS THAN FULL APPROACH SLAB LENGTH IN NARROW MEDIANS WITH FLUSH SHOULDERS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Designed By	Names	Dates	Approved By	
Drawn By	RWR	08/02	 State Roadway Design Engineer	
Checked By	JTC/JBW	08/02	Revision	Sheet No.
			00	10 of 31
				400

RADIAL GUARDRAIL						
Normal Turnouts						
		Taper		Simple Curve		
R_1	R_2	Panels Required	Δ	R_2	Panels Required	Δ
15'	25'	3	85° 56'	25'	3	85° 56'
20'	25'	3	85° 56'	25'	3	85° 56'
25'	25'	3	85° 56'	25'	3	85° 56'
30'	25'	3	85° 56'	25'	3	85° 56'
35'	25'	3	85° 56'	25'	3	85° 56'
40'	40'	5	89° 31'	40'	5	89° 31'
45'	40'	5	89° 31'	40'	5	89° 31'
50'	40'	5	89° 31'	40'	5	89° 31'

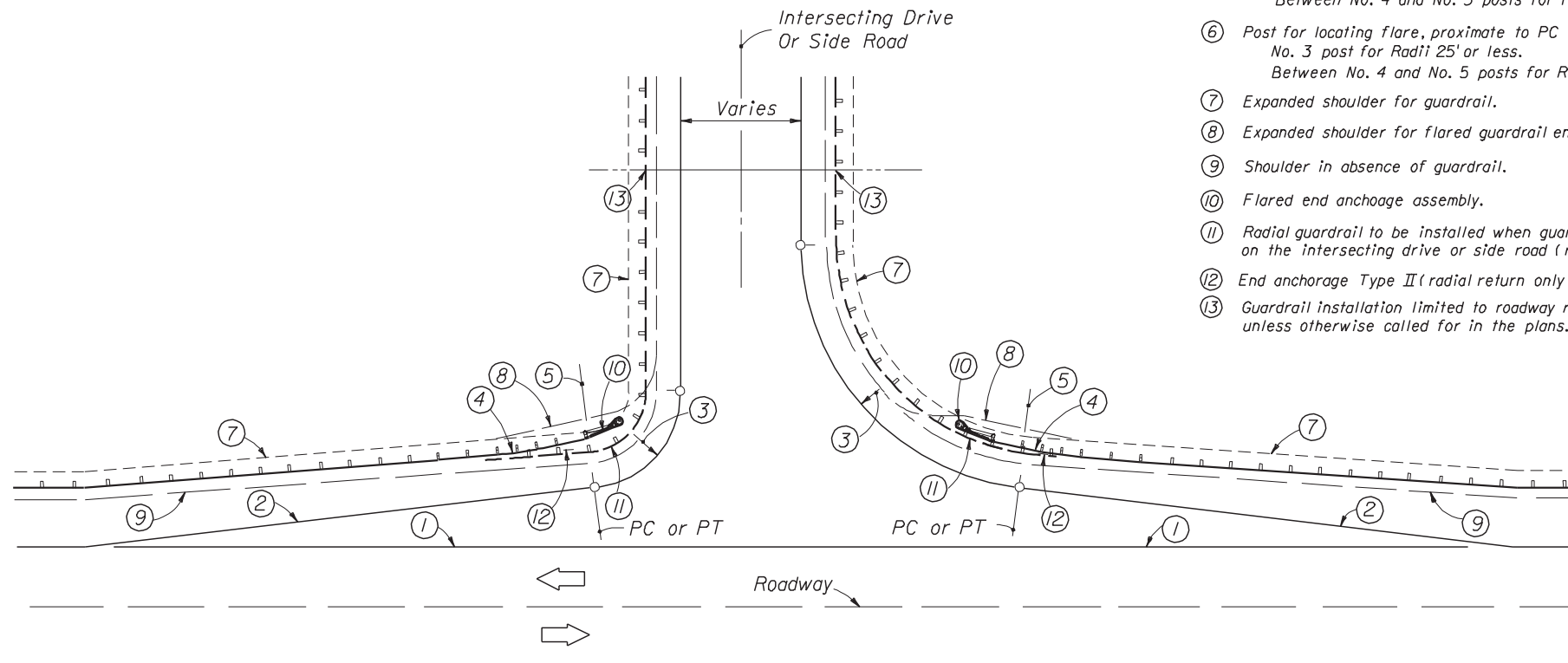
Note: Only 25' and 40' radius panels are to be used for return guardrail on normal turnouts. On skewed turnouts the number of panels used and their arrangement with straight panels will be as shown in the plans or as directed by the Engineer.



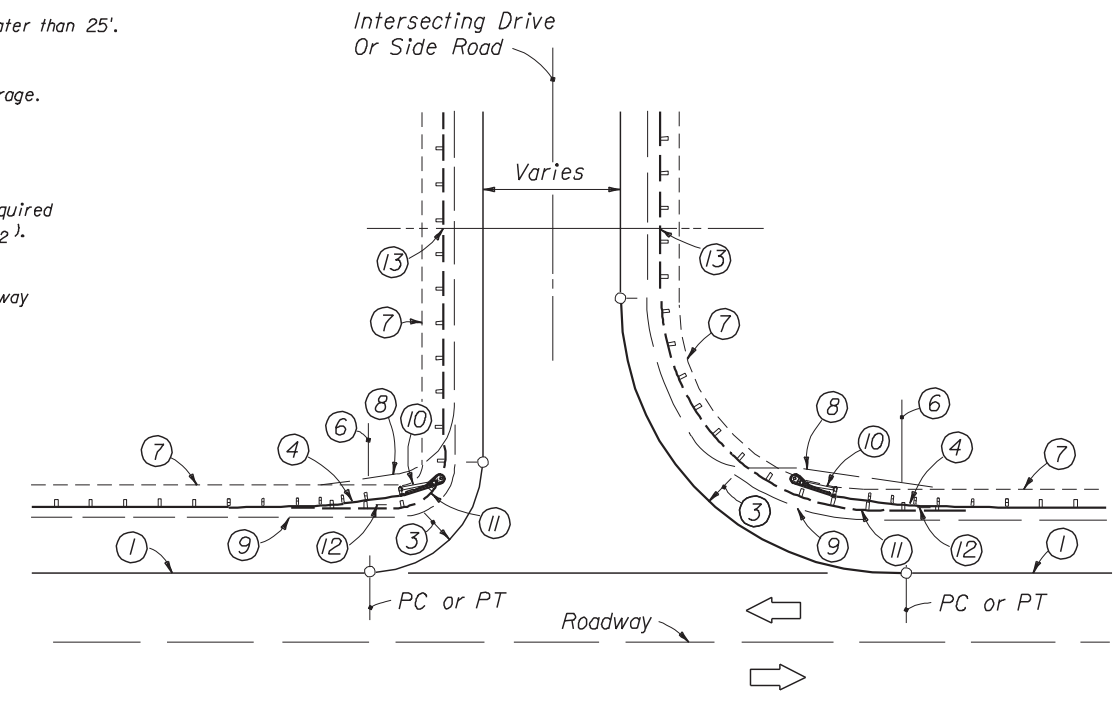
RADIAL GUARDRAIL

LEGEND

- ① Edge of roadway pavement.
- ② Taper.
- ③ Pavement return (radius R_1).
- ④ Flared end anchorage to be installed except when existing guardrail on intersecting drive or side road adjoins the project.
- ⑤ Post for locating flare, proximate to PC or PT:
No. 2 post for Radii 25' or less.
No. 3 post for Radii >25' and <50'.
Between No. 4 and No. 5 posts for Radii 50' or greater.
- ⑥ Post for locating flare, proximate to PC or PT:
No. 3 post for Radii 25' or less.
Between No. 4 and No. 5 posts for Radii greater than 25'.
- ⑦ Expanded shoulder for guardrail.
- ⑧ Expanded shoulder for flared guardrail end anchorage.
- ⑨ Shoulder in absence of guardrail.
- ⑩ Flared end anchorage assembly.
- ⑪ Radial guardrail to be installed when guardrail required on the intersecting drive or side road (radius R_2).
- ⑫ End anchorage Type II (radial return only).
- ⑬ Guardrail installation limited to roadway right of way unless otherwise called for in the plans.



TAPER TURNOUTS



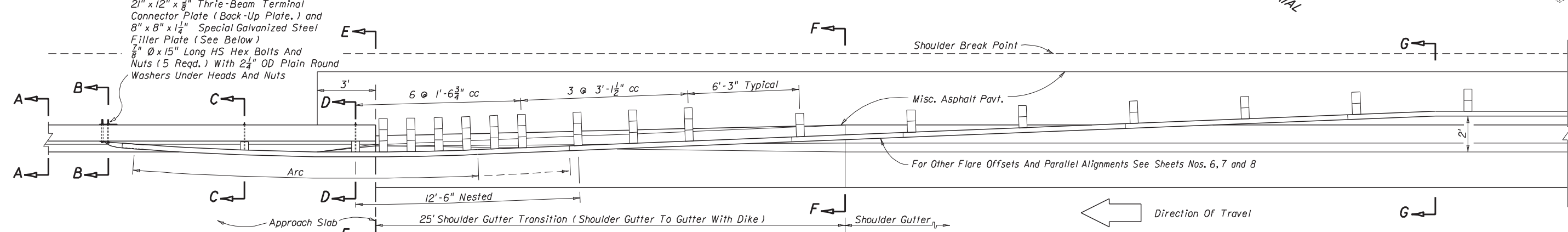
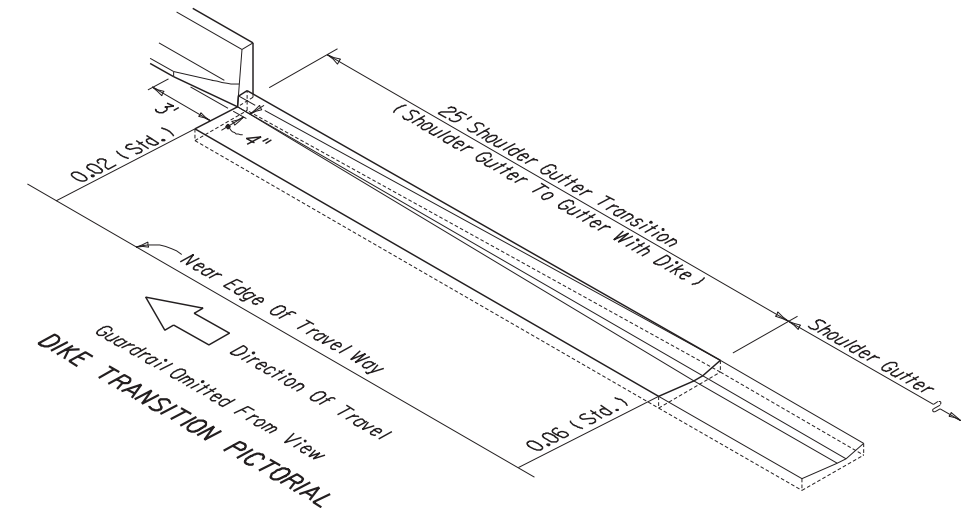
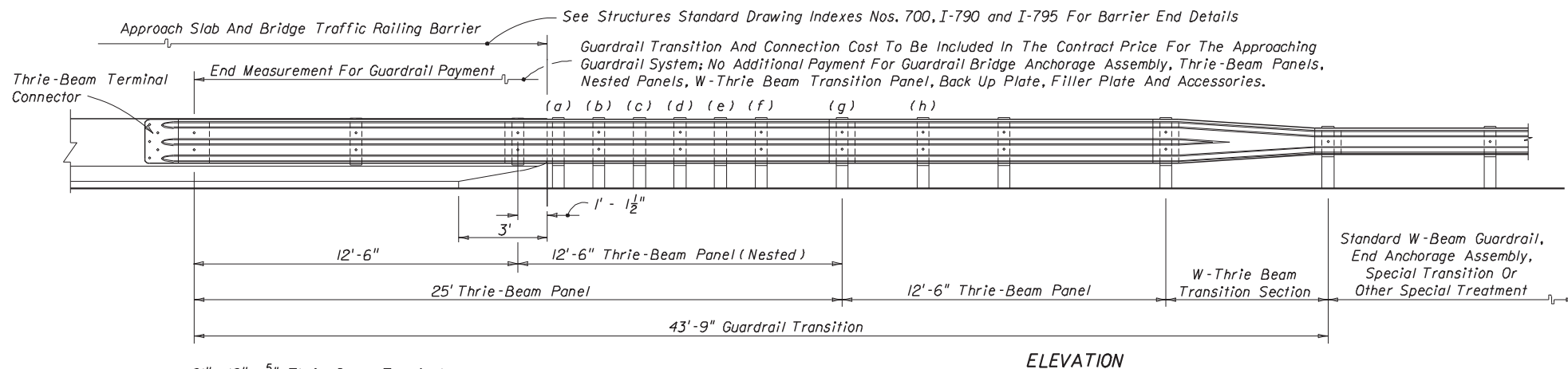
SIMPLE CURVE TURNOUTS

Note: The guardrail application shown on this sheet are for highways with flush shoulders and no restraints for constructing flared end anchorages and minimum lengths of guardrail. For highways with flush shoulders and restraints to constructing flared anchorages, see General Note No. 6.

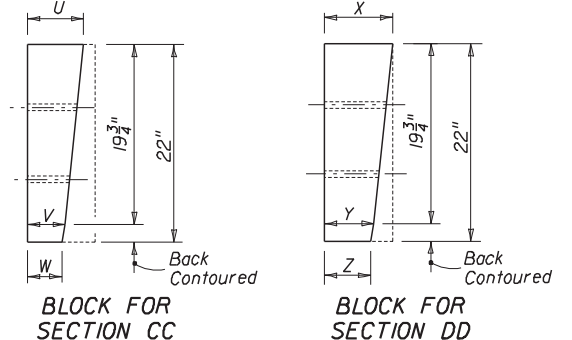
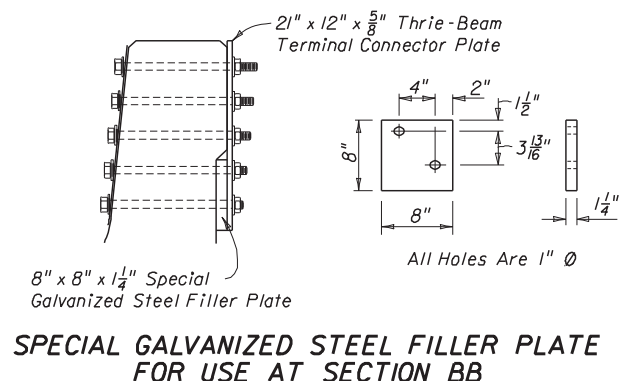
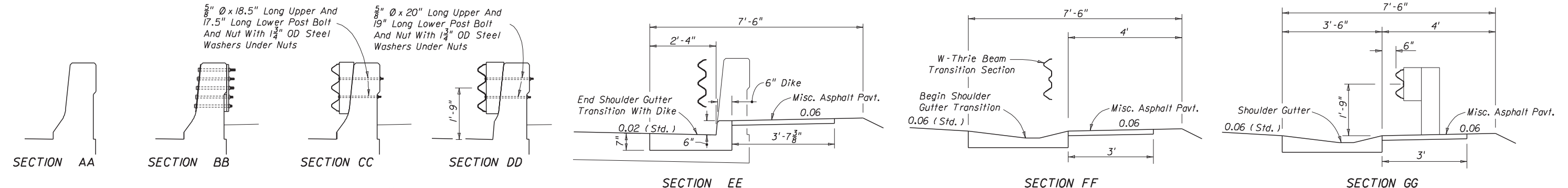
Where openings in guardrail are required in close proximity to bridge traffic rails or ends of concrete barrier walls, and minimum length guardrail with flared end anchorages can not be applied, either controlled release returns or energy absorbing terminals are to be applied.

GUARDRAIL APPLICATIONS FOR INTERSECTING DRIVES AND SIDE ROADS ON RURAL FACILITIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
GUARDRAIL					
Designed By	Names	Dates	Approved By		
Drawn By	HSD	03/83	Revision	Sheet No.	Index No.
Checked By	JVG	03/83	00	11 of 31	400



PLAN - GUARDRAIL, SHOULDER GUTTER AND SHOULDER TRANSITIONS



APPLICATIONS	SECTION CC			SECTION DD		
	U	V	W	X	Y	Z
Single Face Guardrail	6 1/8"	4 1/8"	3 5/8"	7 1/2" nom.	5 1/2" nom.	5" nom.
Double Face Guardrail With Timber Posts	5 1/8"	3 1/8"	2 5/8"	6 1/2" nom.	4 1/2" nom.	4" nom.
Double Face Guardrail With Steel Posts	4 3/8"	2 3/8"	1 7/8"	5 3/4"	3 3/4"	3 1/4"

For Double Face Guardrail Connections To Median Bridge Traffic Railing Barrier, See Index No. 410 'Guardrail Connection To Concrete Barrier Wall Approach Ends'.

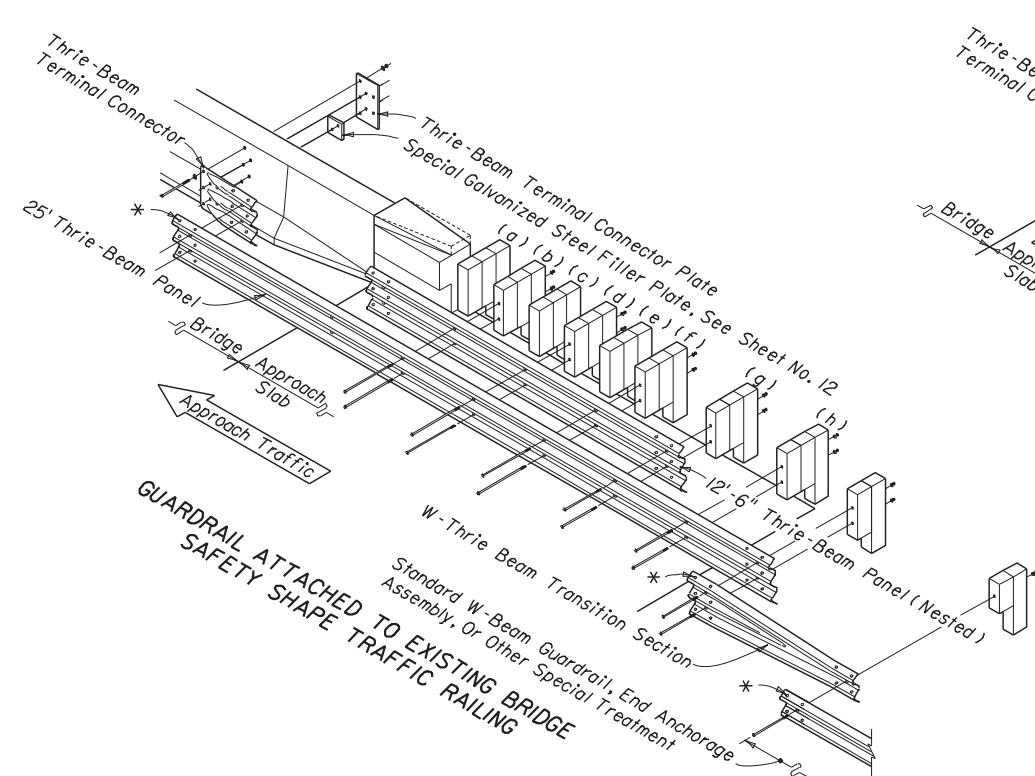
GUARDRAIL TRANSITION NOTE
 When shoulder gutter is required, the 25' long dike transition, shown in the 'PLAN' and 'PICTORIAL' above, is required. Double offset blocks are shown for guardrail installations adjacent to shoulder gutter/dike transitions; single offset blocks shall be installed in absence of shoulder gutter. Nested rails shall not be bolted to the blocks and posts at posts (a), (c), and (e). One 16d galvanized nail shall be driven between each post and block, and between double blocks, in order to prevent block rotation, see '16d NAIL FOR PREVENTION OF OFFSET BLOCK ROTATION', this Index.

THRIE-BEAM OFFSET BLOCKS FIELD TRIMMED FOR USE AT SECTIONS CC & DD
GUARDRAIL APPROACH TRANSITION AND CONNECTION FOR BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIERS EXTENDING FULL LENGTH OF APPROACH SLAB
DETAIL J

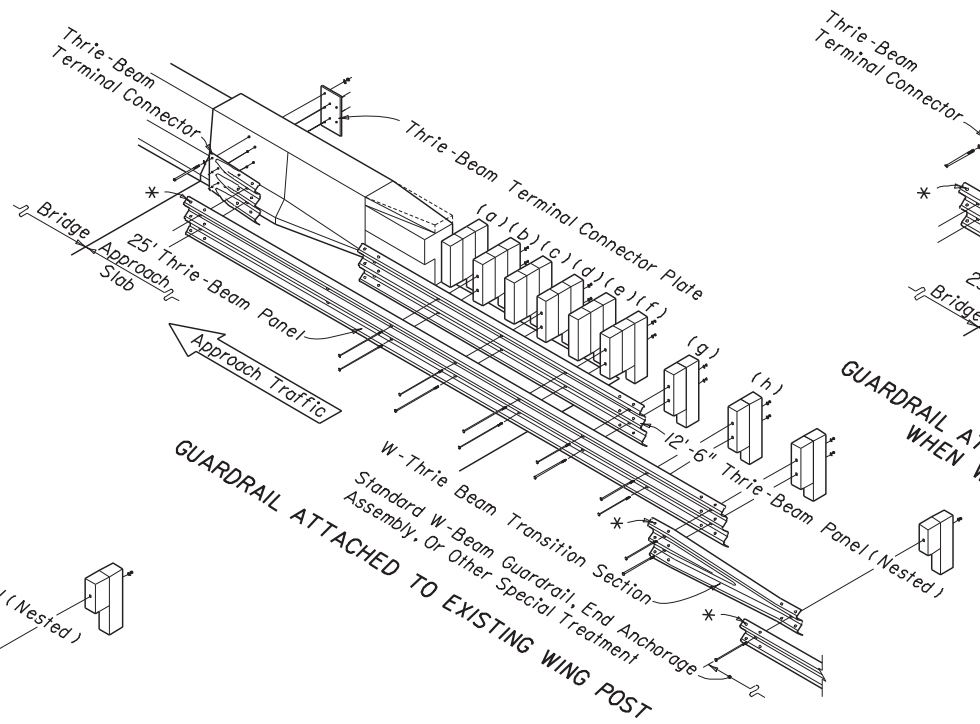
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

GUARDRAIL

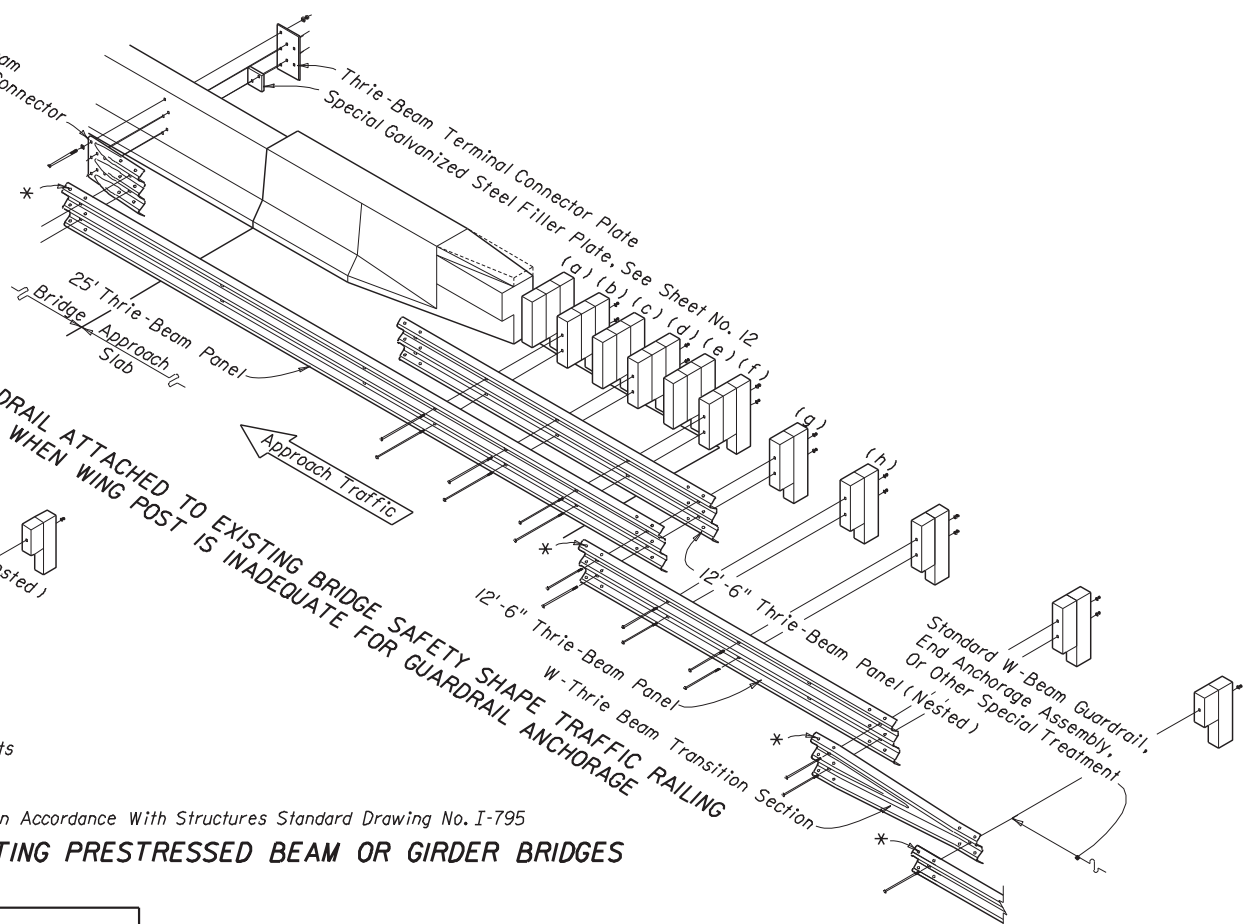
Names	Dates	Approved By		
Designed By		 State Roadway Design Engineer	Revision	Sheet No.
Drawn By	HKH 9-98		00	12 of 31
Checked By	JVC 9-98			400



Guardrail Attachment Location Shall Be In Accordance With Structures Standard Drawing No. I-790
GUARDRAIL TRANSITION TO EXISTING FLAT SLAB BRIDGES

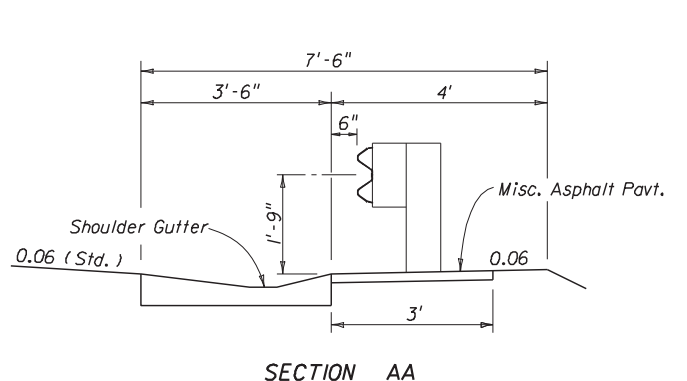
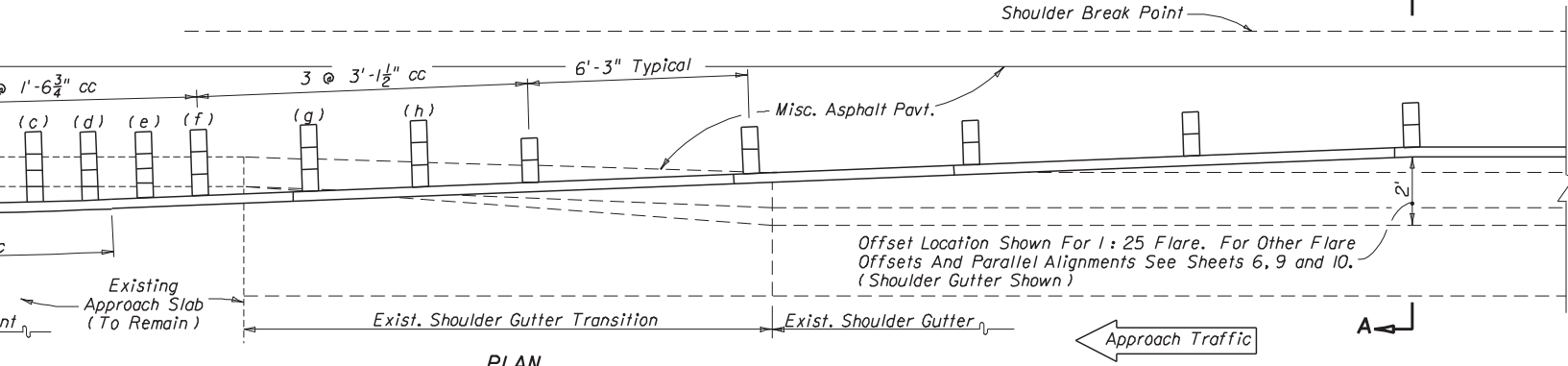
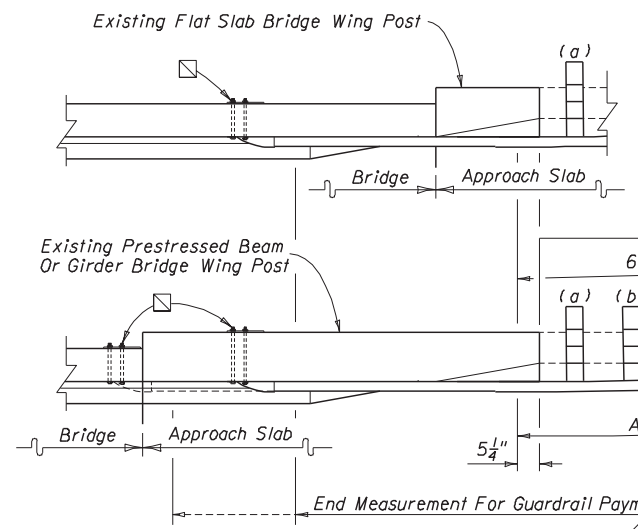


Guardrail Attachment Location Shall Be In Accordance With Structures Standard Drawing No. I-795
GUARDRAIL TRANSITIONS TO EXISTING PRESTRESSED BEAM OR GIRDER BRIDGES



* Splice Locations: Thrie-Beam - 12 Guardrail Splice Bolts And Recessed Nuts
 W-Beam - 8 Guardrail Splice Bolts And Recessed Nuts

APPROACH POSTS AND SPECIAL OFFSET BLOCKS
 Block assemblies for special offsets can be made up of one special block plus one standard size block or of three standard size blocks field dressed to approximately equal size, with the pieces secured for relative position by 16d galvanized nails, 'see 16d NAIL FOR PREVENTION OF OFFSET BLOCK ROTATION'. The nested rails shall not be bolted to the blocks and posts at posts (a), (c) and (e). The details shown are for approach slabs with internal edge dike extending beyond parapet type traffic railing termini.



Guardrail Transition Cost To Be Included In The Contract Unit Price For The Approaching Guardrail System; No Additional Payment For Thrie-Beam Panels, Nested Panels, W-Thrie Beam Transition Panel, and Accessories.

PLAN

NOTES

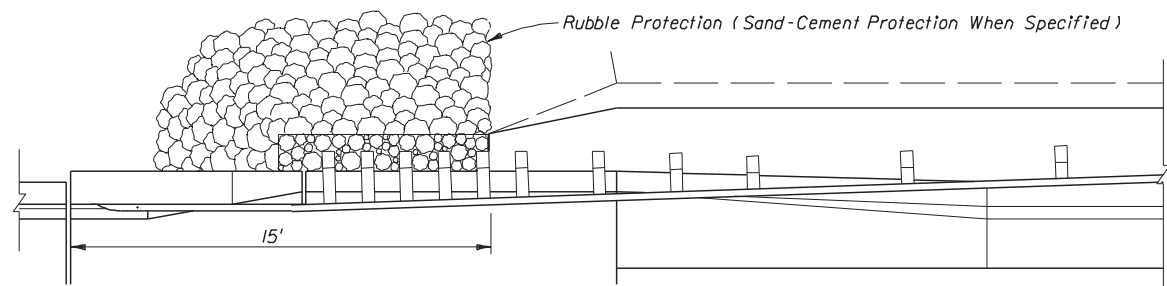
1. When the existing wing post is to be replaced with a bridge traffic railing barrier in accordance with Structure Standard Drawings No. I-790 or No. I-795, the thrie-beam guardrail connection shall be in accordance with Detail J.
2. When retrofitting thrie-beam guardrail to existing wing posts or existing bridge safety shape traffic railing, attachment construction to be paid for under the contract unit price for Bridge Anchorage Assembly, EA., and shall be full compensation for bolt hole construction, terminal connector, terminal connector plate(s) and bolts, nuts and washers.

□ 21" x 12" x 5/8" Thrie-Beam Terminal Connector Plate (Back-Up Plate), And 7/8" x 18" Long (15" Long For Bridge Safety Shape Railing) HS Hex Bolts And Nuts (5 Reqd.) With 2 1/4" OD Plain Round Washers Under Heads And Nuts. (When Attaching Guardrail To Existing Wing Posts Or Bridge Rails, Care Should Be Exercised To Avoid Damaging Conduits And Their Utilities That May Be Routed Through Wing Posts Or Bridge Rails. When Conduits And Their Utilities Are Encountered, At Least Five 7/8" HS Hex Bolts Shall Be Installed In Any Of The Seven Holes Provided In The Thrie-Beam Terminal Connector.)

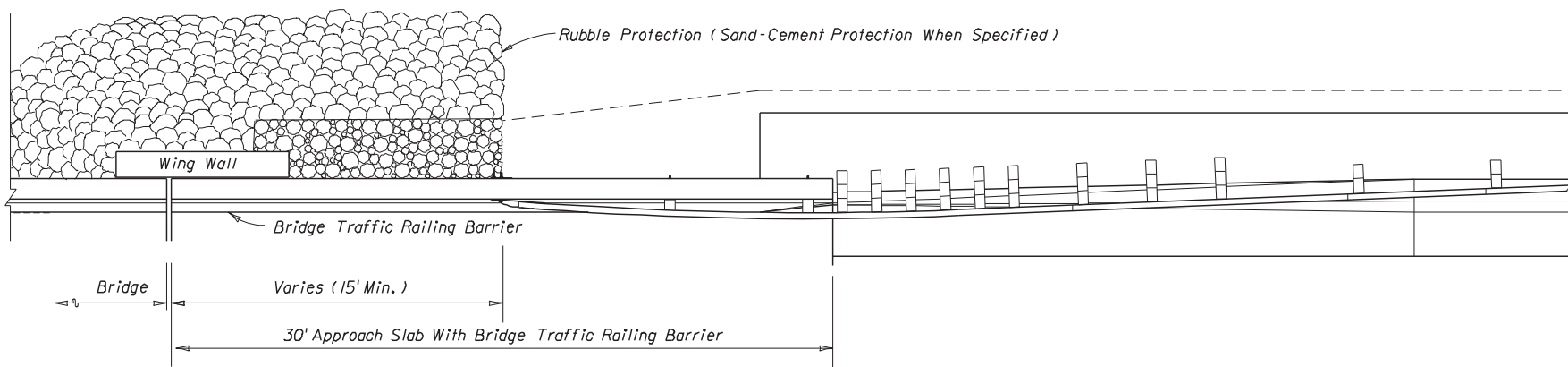
GUARDRAIL APPROACH TRANSITIONS AND CONNECTIONS FOR EXISTING FLAT SLAB, PRESTRESSED BEAM AND GIRDER BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH

DETAIL E

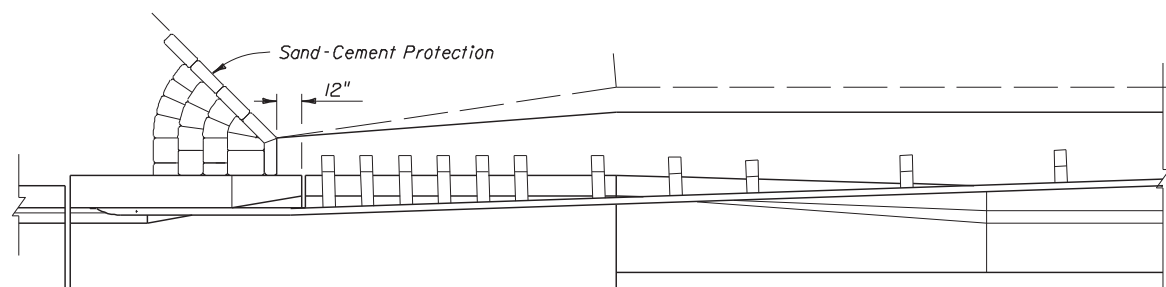
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By	HKH 9-98	Revision	Sheet No.	Index No.
Checked By	JVC 9-98	00	13 of 31	400



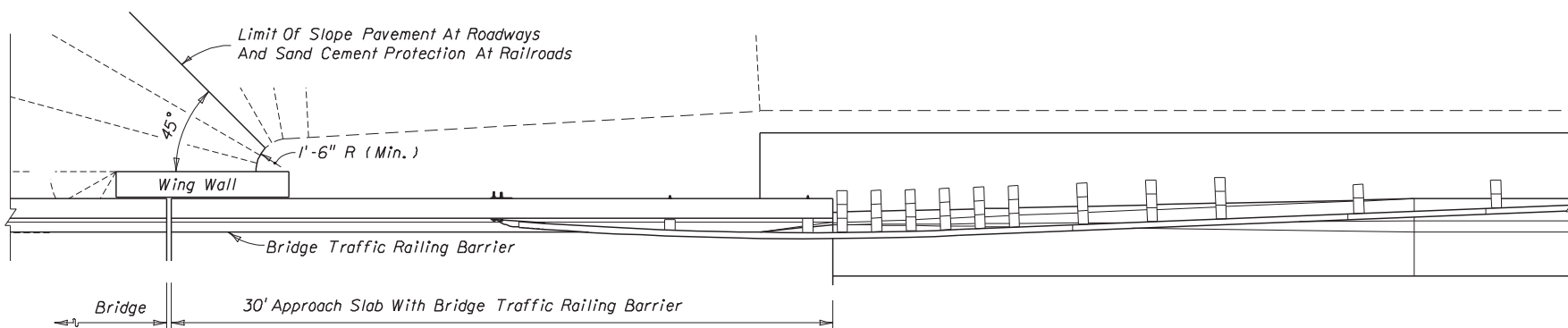
BRIDGES OVER STREAMS



BRIDGES OVER STREAMS



BRIDGES OVER RAILROADS



BRIDGES OVER ROADWAYS OR RAILROADS

For Additional Information See Sheet 13

SKETCHES - BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING LESS THAN FULL APPROACH SLAB LENGTH

For Additional Guardrail Information See Sheet 12

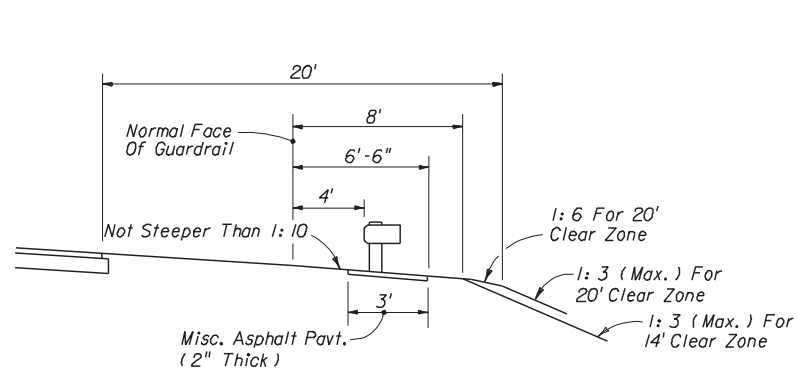
SKETCHES - BRIDGES WITH SAFETY SHAPE TRAFFIC RAILING BARRIER EXTENDING FULL APPROACH SLAB LENGTH

SKETCH NOTES

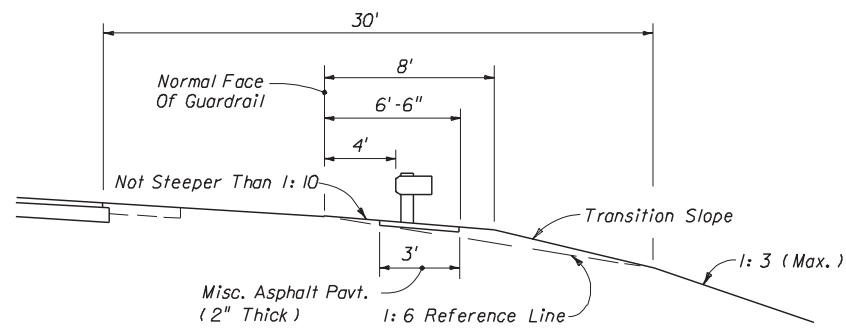
1. These sketches are for showing shoulder interface between roadways and bridges where crossings are normal to other roadways, railroads and streams. For site specific applications and details see the plans and the FDOT Structures Design Office "Detailing Manual" and "Design Guidelines".
2. Shoulder treatments shown in these sketches are for locations with shoulder gutter; shoulder hinge location will vary for facilities without shoulder gutter.

SHOULDER INTERFACE BETWEEN ROADWAYS AND BRIDGES

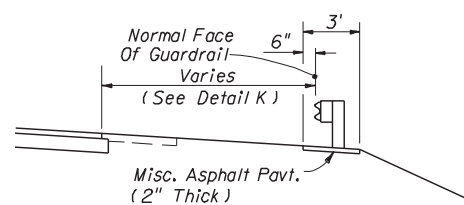
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By <i>Bob J. Johnson</i>		
Designed By		State Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	14 of 31	400



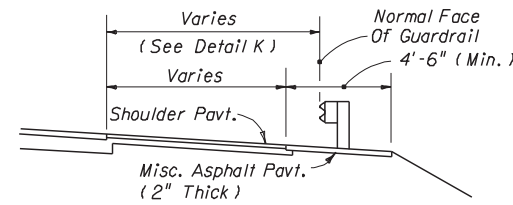
SECTION AA (EXAMPLE FOR 20' CLEAR ZONE)



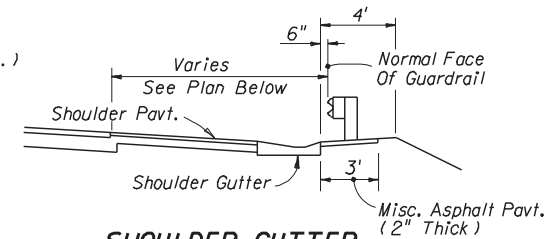
SECTION AA (EXAMPLE FOR 30' CLEAR ZONE)



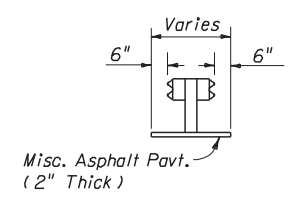
SHOULDER WITH OR WITHOUT 5' PAVEMENT



PAVED SHOULDERS

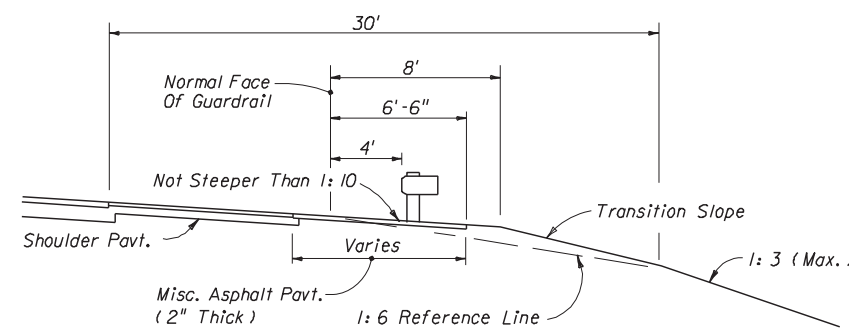


SHOULDER GUTTER

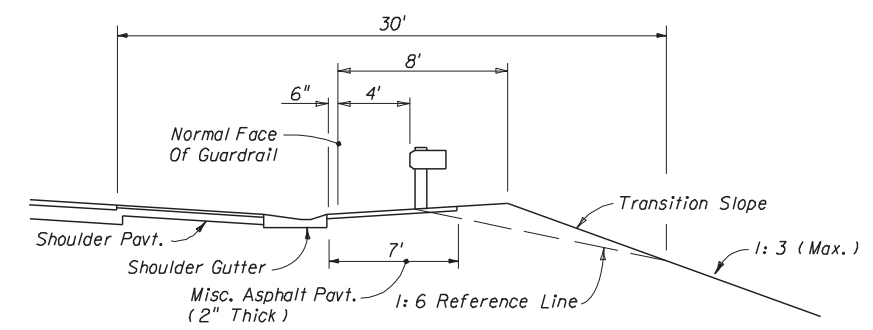


DOUBLE FACE RAIL

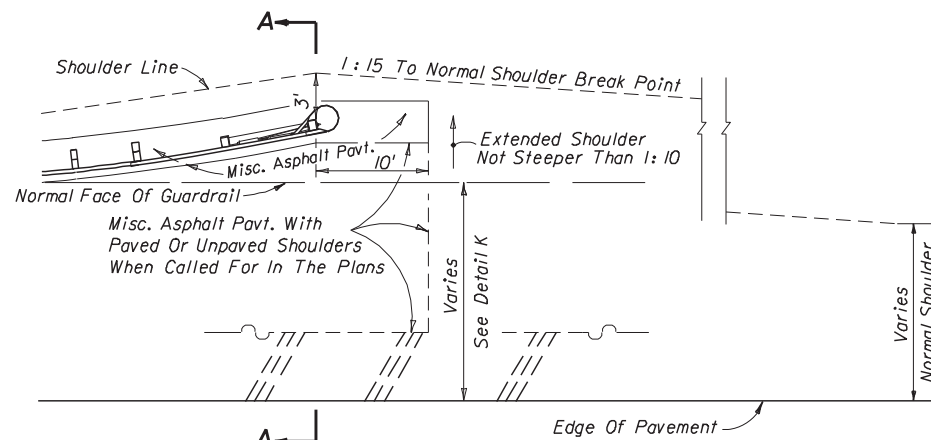
MISCELLANEOUS PAVING FOR STANDARD GUARDRAIL SECTIONS



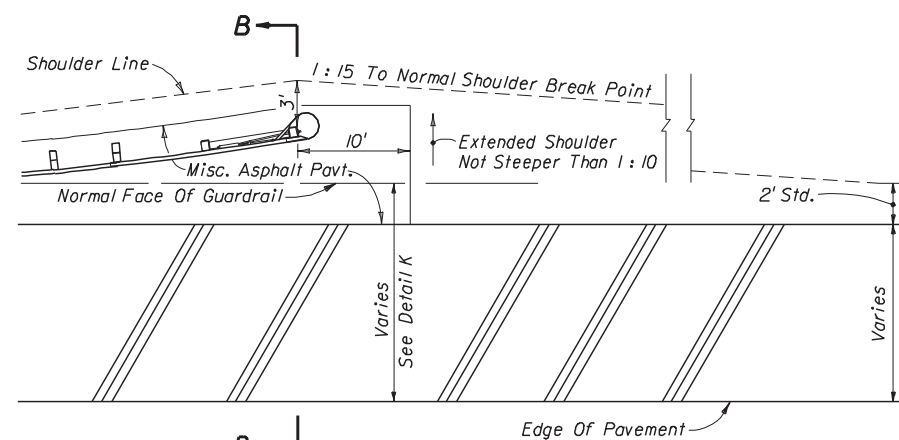
SECTION BB (EXAMPLE FOR 30' CLEAR ZONE)



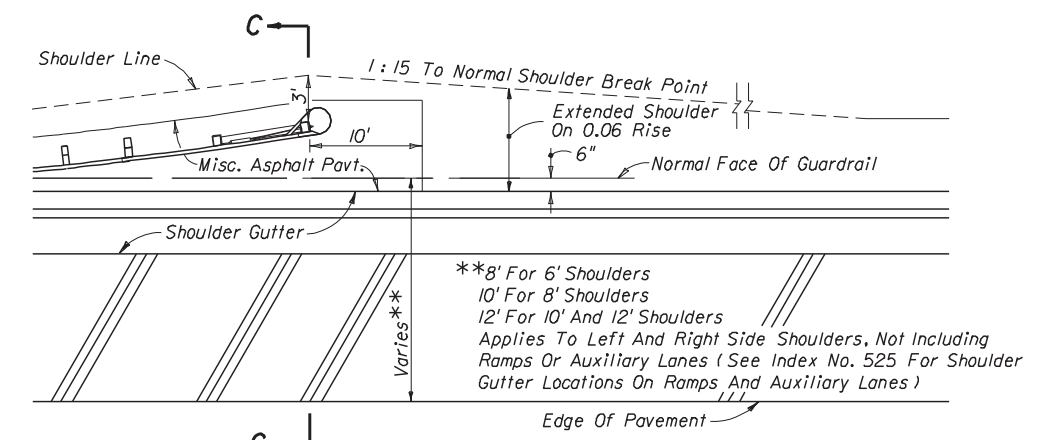
SECTION CC (EXAMPLE FOR 30' CLEAR ZONE)



SHOULDER WITH OR WITHOUT 5' PAVEMENT

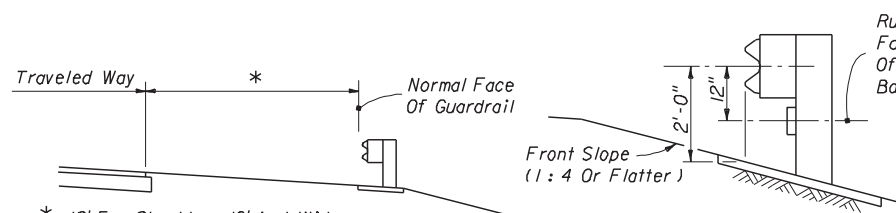


PAVED SHOULDERS



SHOULDER GUTTER

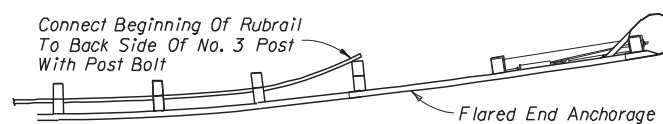
SHOULDERS, SLOPES AND MISCELLANEOUS PAVING FOR FLARED END ANCHORAGE ASSEMBLIES



* 12' For Shoulders 10' And Wider;
8' For Median Shoulders 8' Or Less In Width; and,
Shoulder Width Plus 2' For All Others Shoulders.

STANDARD LOCATIONS

Rubrail (C6 x 8.2, Plates And Fastners or Bent Plate And Fastners In Accordance With Standards RLRO1 And RERO1 Of AASHTO-AGC-ARTBA "A Guide To Standardized Highway Barrier Hardware")



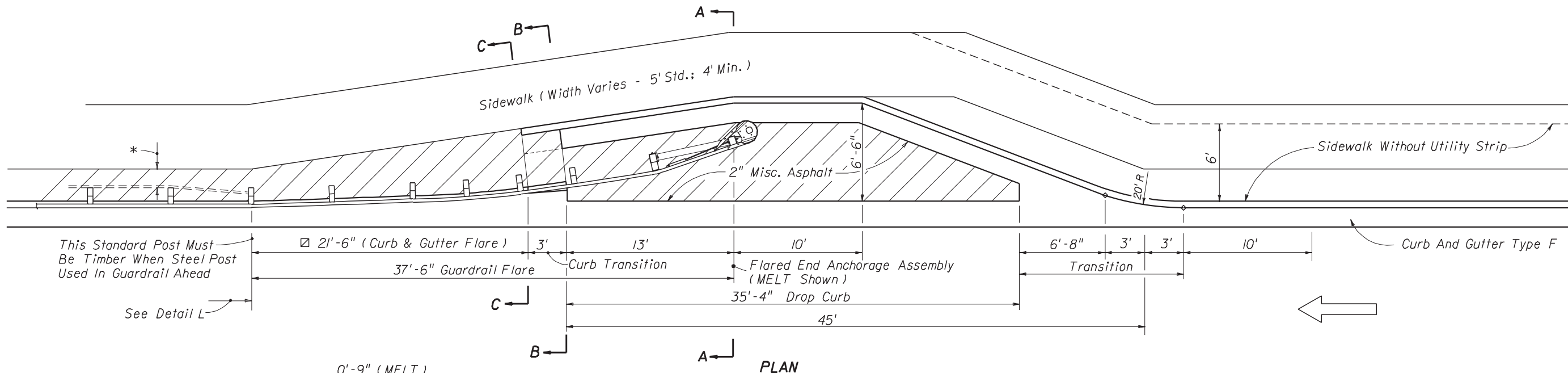
LOCATIONS ON FRONT SLOPES

GUARDRAIL LOCATION-DETAIL K

LATERAL PLACEMENT ON FRONTSLOPES (FROM EDGE OF TRAVELED WAY)		
SLOPE	NOT RECOMMENDED	ACCEPTABLE WITH RUBRAIL
4:1	14' to 27'	28' to 45'
5:1	15' to 25'	26' to 45'
6:1	17' to 22'	23' to 45'
7:1	21' to 24'	25' to 45'
8:1	Acceptable to 25'	26' to 45'
9:1	Acceptable to 26'	27' to 45'
10:1	Acceptable to 27'	28' to 45'

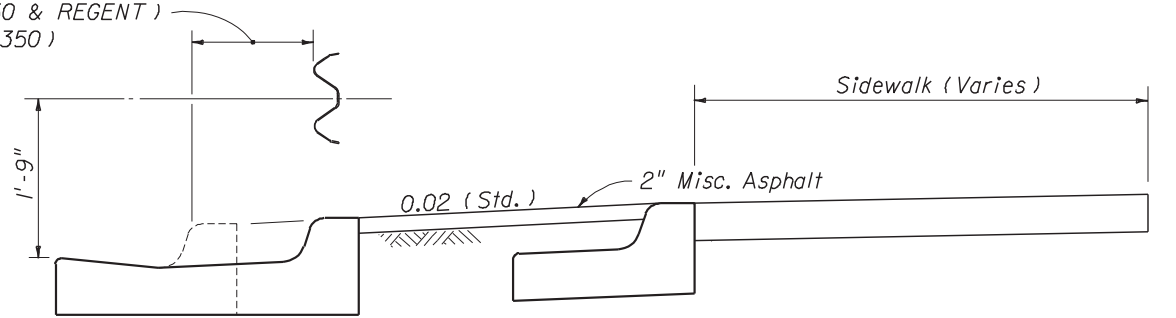
Notes:
For shoulders less than 12' in width the tabulated values will be reduced by the difference between 12' and the shoulder width.
Placement of guardrail on front slopes steeper than 4:1 not recommended.
Cost of rubrail to be included in the contract unit price for guardrail.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By <i>Bob J. [Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By	JM 07/81	Revision	Sheet No.	Index No.
Checked By	JBW/JVG 07/81	00	15 of 31	400



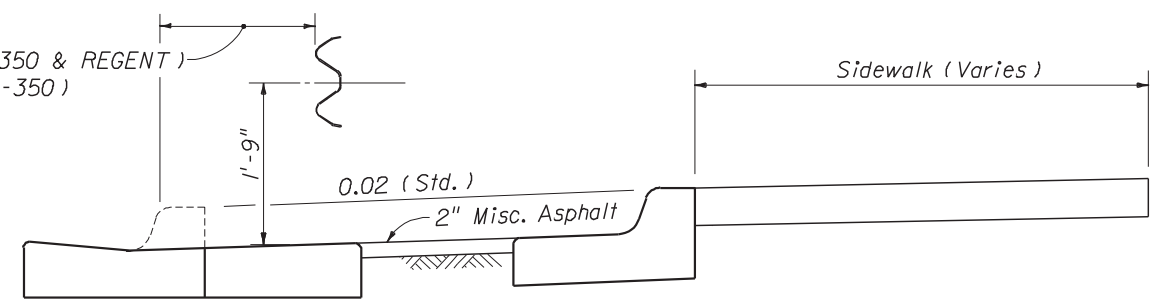
This Standard Post Must Be Timber When Steel Post Used In Guardrail Ahead
See Detail L

0'-9" (MELT)
1'-3 1/2" (SRT-350 & REGENT)
2'-3 1/2" (FLEAT-350)

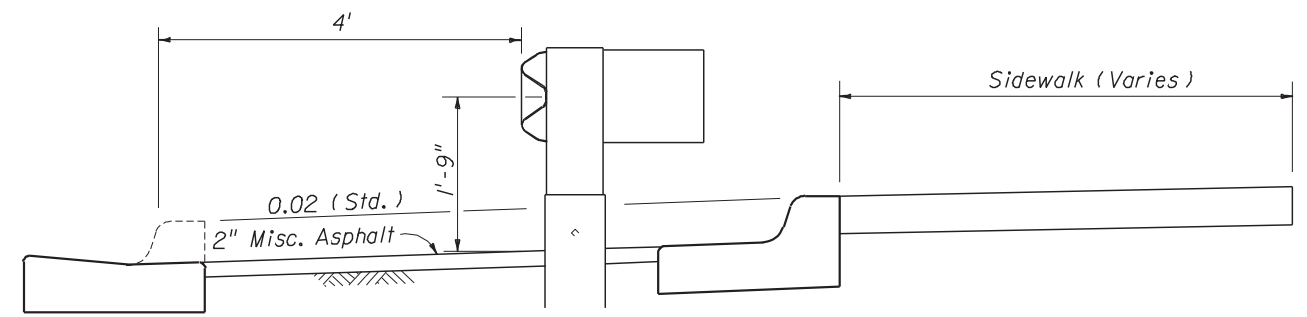


SECTION CC

1'-1" (MELT)
1'-8 1/2" (SRT-350 & REGENT)
1'-7" (FLEAT-350)



SECTION BB



SECTION AA

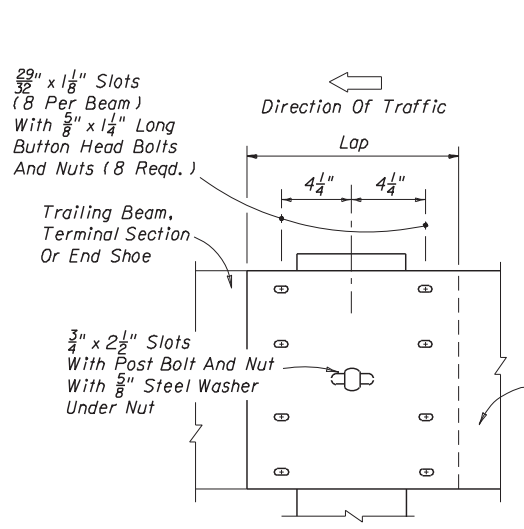
APPROACH TREATMENT FOR CURB AND GUTTER

DETAIL Q

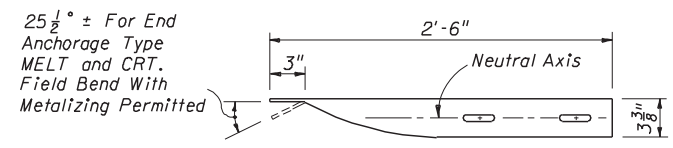
*Safety pipe rail is required when the back of steel guardrail posts are 4' or less from the near edge of a pedestrian way or bikeway and post bolt treatment is required when the back of timber posts are 4' or less from the near edge of a pedestrian way or bikeway; see 'SPECIAL SAFETY PIPE RAIL'

☐ Curb flare shall follow guardrail flare, see elsewhere in this Index for additional guardrail flare information.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By JVG/JBW	10/87	State Roadway Design Engineer		
Drawn By JBW	10/87	Revision	Sheet No.	Index No.
Checked By JVG	10/87	00	17 of 31	400

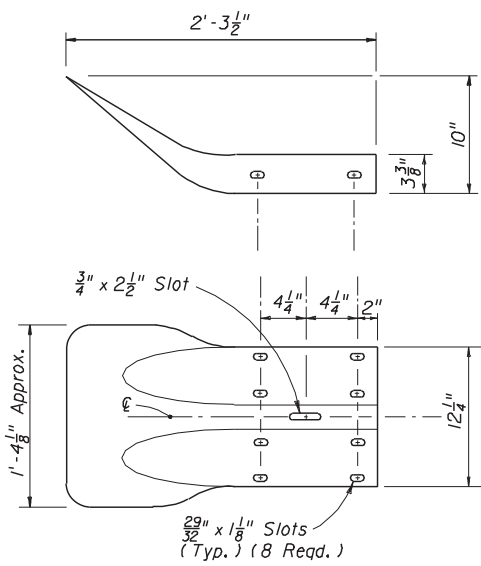


W-BEAM RAIL SPLICE

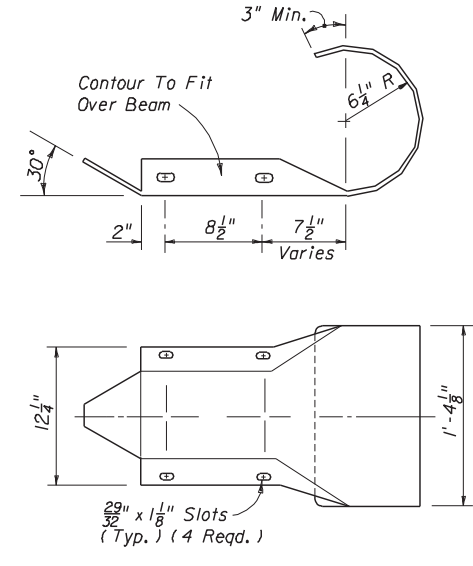


Note: 5/8" Steel washer required with splice bolts

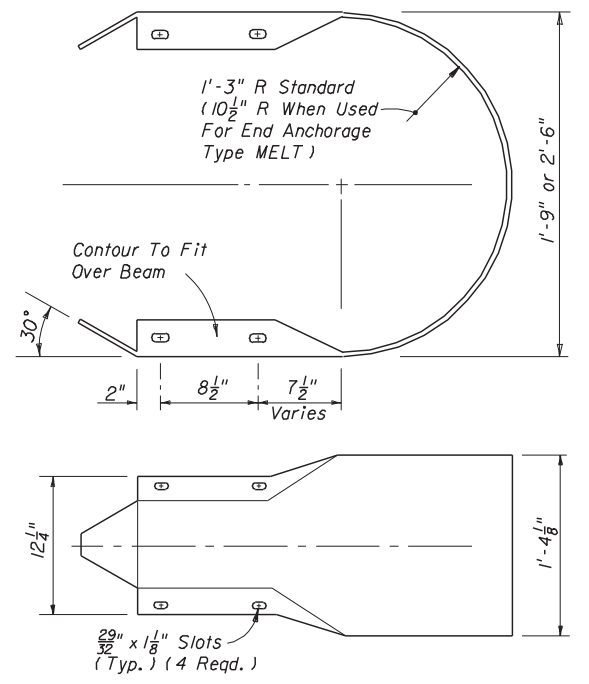
SPECIAL END SHOE



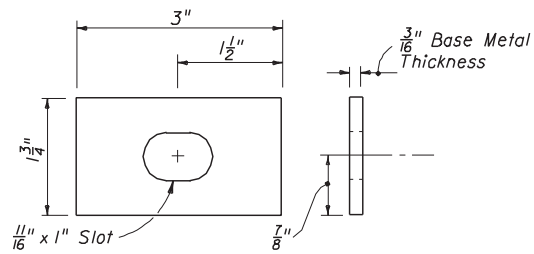
FLARED END SECTION



ROUNDED END SECTION

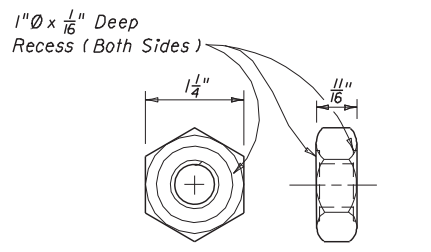


BUFFER END SECTION

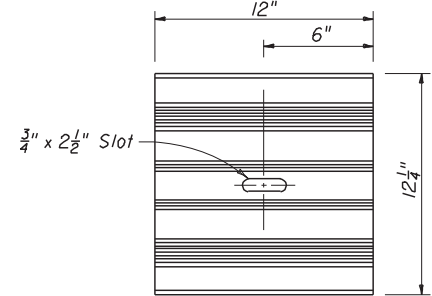


(RECTANGULAR PLATE WASHER) BEAM WASHER

Note: For beam washer requirements on end terminals, see individual end anchorage assembly details. Washers are to be used where necessary to accomplish alignment or where the posts bolt head shows tendency to pull through the rail slot. Washers installed on guardrail, between end anchorages, prior to July 1, 1990 may remain in place until the guardrail is relocated or until repairs require removal and reinstallation of a post bolt.



5/8" MODIFIED HEAVY HEX NUT (RECESSED NUT)

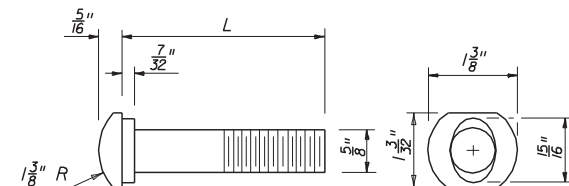


Note: For application information see individual end anchorage assembly details.

W-BEAM BACK-UP PLATE

Hex bolts shall conform to the requirements of ASTM F568M and hex nuts to the requirements of ASTM A563M. Heavy hex nuts may be used in lieu of hex nuts and hex nuts used for jam nuts.

HEX BOLTS AND NUTS



5/8" OVAL SHOULDER BUTTON HEAD BOLT

L (In.)	THREAD LENGTH (Min.) (In.)	APPLICATION
1 1/4"	Full Length	Rail Splice Bolt
10"	4"	Single Or Double Faced Guardrail Post Bolt - Timber Or Recycled Plastic Offset Block(s) On Steel Post
18"	4"	Post Bolt - Single Faced Guardrail Timber Posts
25"*	4"	Post Bolt - Double Faced Guardrail Timber Posts

Special bolts having lengths of 10" or greater shall have a thread length of not less than 4".

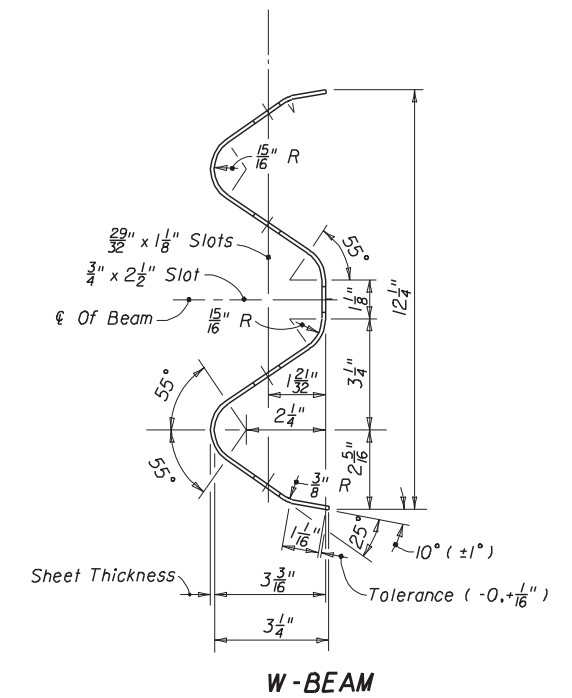
* Use of the 25" AASHTO-AGC-ARTBA standard length post bolt on double faced guardrail that results in the bolt projecting more than 3/4" beyond the face of the nut after pull-up shall be trimmed to 3/4" reveal and metalized with organic zinc-rich coating.

Note: Specifications same as for hex bolts.

POST SPACING (Ft.)	OFFSETS (Ft.) Measured From Face Of Guardrail To Front Of Above Ground Rigid Hazard			
	SINGLE BEAM W-Beam	THREE-BEAM Thrie-Beam	NESTED BEAMS W-Beam	THREE-BEAM Thrie-Beam
6'-3"	4'	3'-3"	N/A	N/A
3'-1 1/2"	3'	2'-8"	2'-8"	2'-4"
1'-6 3/4"	N/A	N/A	2'-4"	2'

Note: The values shown should be utilized unless changes are supported by empirical validation. Those desiring to develop offset values from the simulated deflection values shown in Table 5.3 of the AASHTO Roadside Design Guide are cautioned to proceed only if back-ground in the table development is understood.

MINIMUM OFFSET FOR SINGLE FACED GUARDRAIL (Ft.)

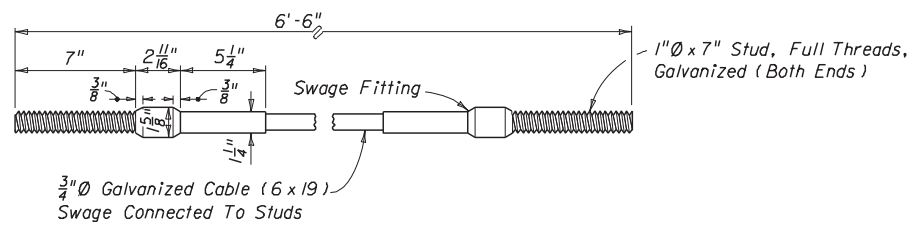


W-BEAM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

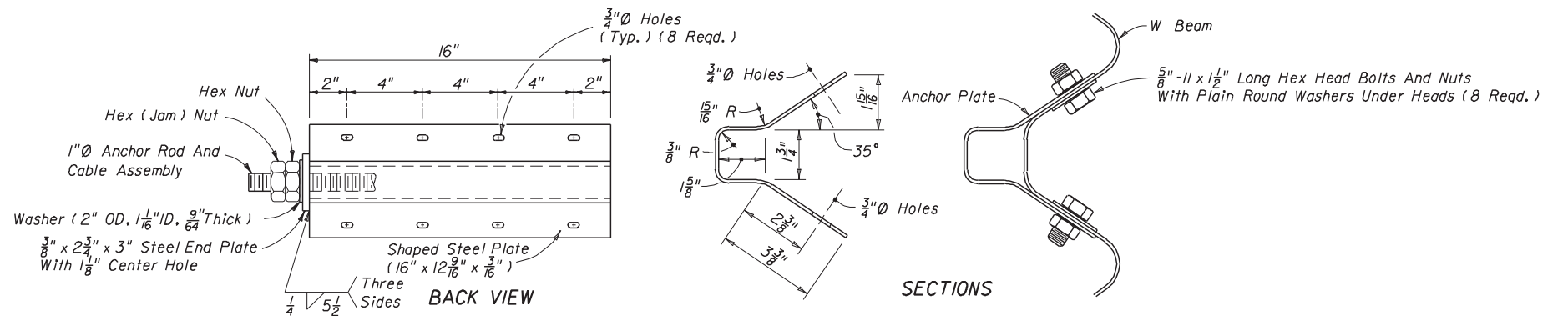
GUARDRAIL

Names	Dates	Approved By
Designed By		<i>Bob J. Thomas</i> State Roadway Design Engineer
Drawn By	HSD 8/81	Revision
Checked By	JBW/JVG 8/81	Sheet No.
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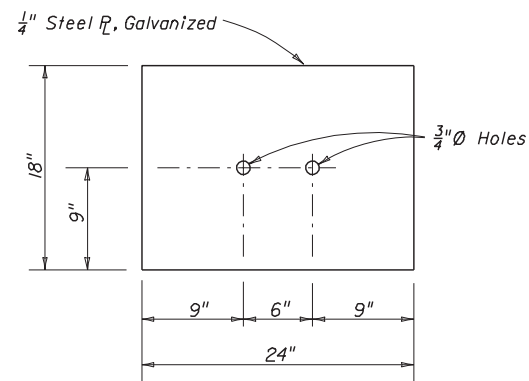
Note: Cable assemblies shall be in accordance with the specifications of AASHTO-AGC-ARTBA 'A Guide To Standardized Highway Barrier Hardware' Cable Anchor Assembly FCA01. Cable assemblies as detailed above are required as a part of end anchorage assemblies Type II (Cable Option), MELT, SRT-350, CRT, ET-2000, BEST, LET, SKT-350, FLEAT-350 and REGENT. An additional cable assembly 9' in length with a swaged fitting on one (1) end is required for each end anchorage assembly Type CRT.

CABLE ASSEMBLY

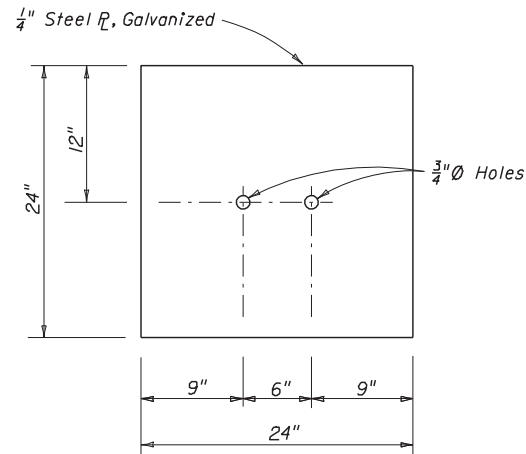


Note: Beam anchor plates are required for use as a part of end anchorage assemblies Type II, MELT, SRT-350, CRT and REGENT.

BEAM ANCHOR PLATE

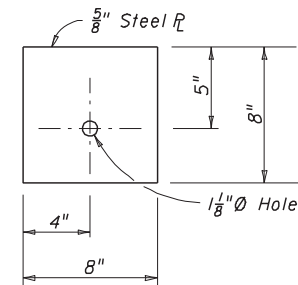


Note: This soil plate is required for use as a part of end anchorage assemblies Type II (Cable Option), CRT, SRT-350, ET-2000 and REGENT.



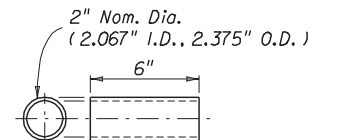
Either soil plate is approved for use as a part of end anchorage assembly Type MELT.

SOIL PLATES



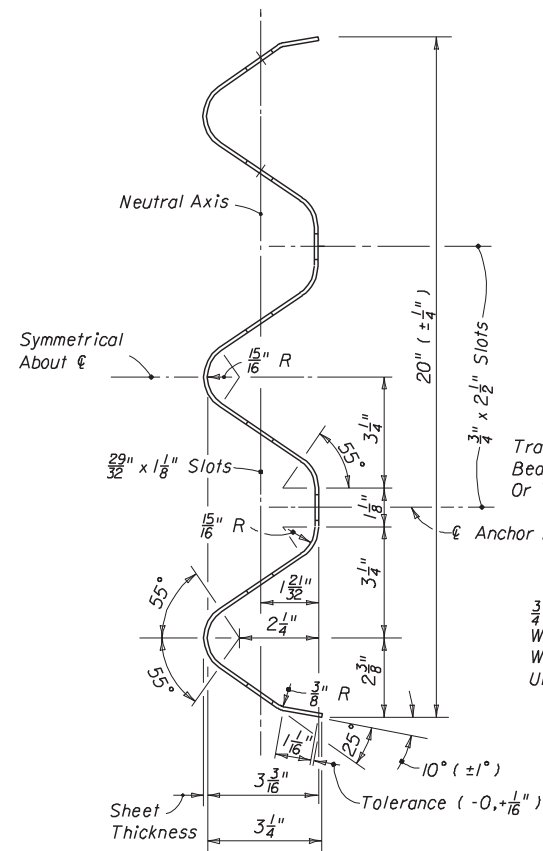
Note: This bearing plate is required for use as a part of end anchorage assemblies Type II (Cable Option), MELT, CRT, ET-2000, BEST, LET, SKT-350 and FLEAT-350.

BEARING PLATE

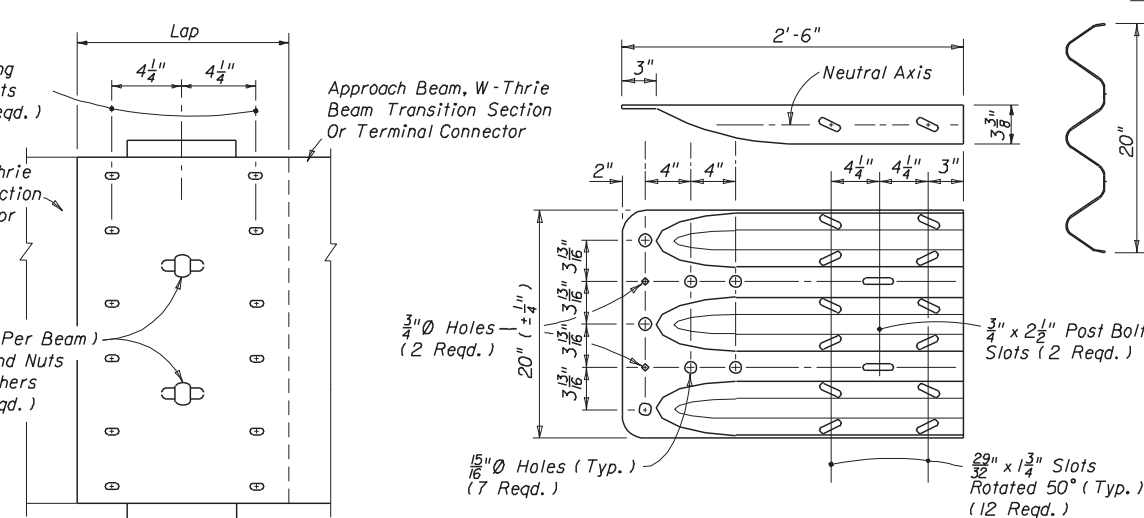


Note: This breakaway terminal post sleeve is required for use as a part of end anchorage assemblies Type II (Cable Option), MELT, CRT, SRT-350, ET-2000, BEST, LET, SKT-350 and FLEAT-350.

BREAKAWAY TERMINAL POST SLEEVE

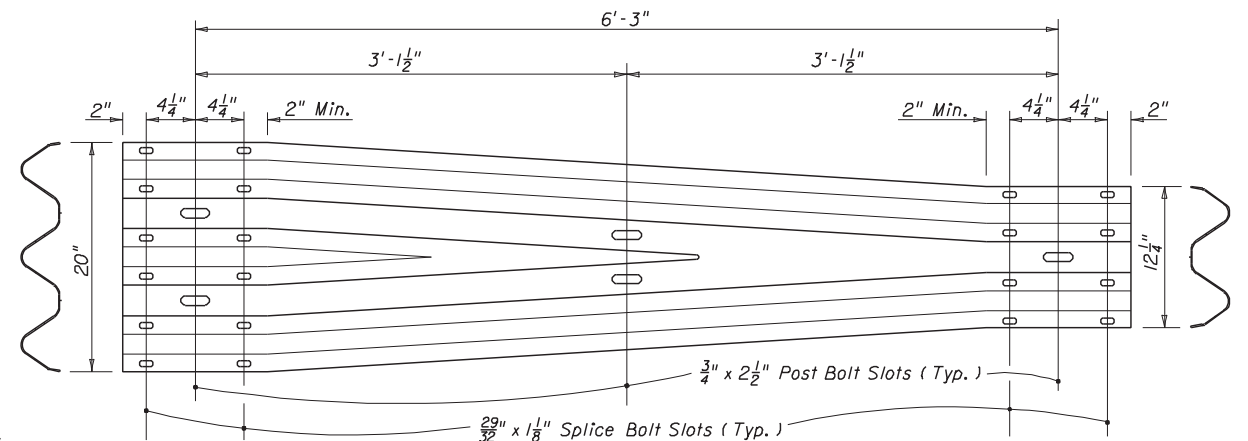


THRIE-BEAM



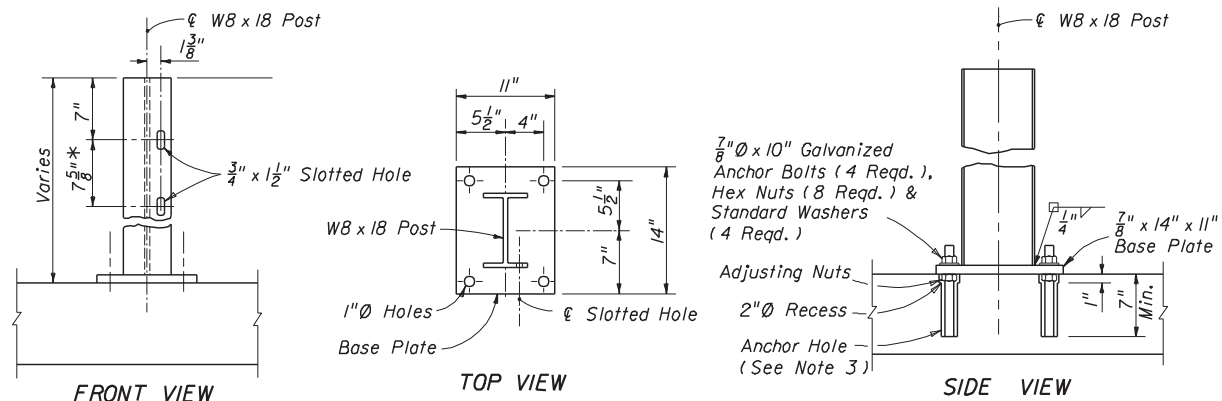
Note: 5/8" steel washer required with splice bolts

THRIE-BEAM RAIL SPLICE



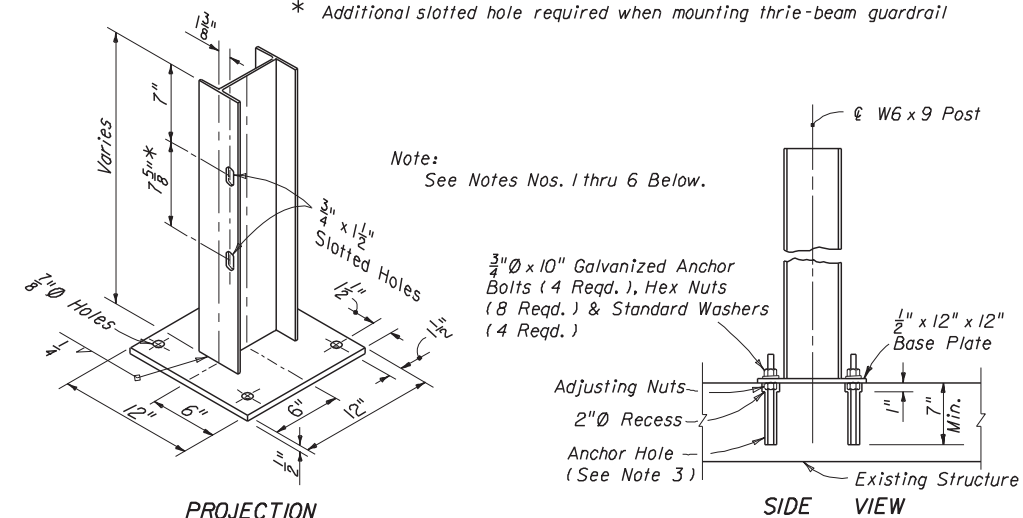
W-THRIE BEAM TRANSITION SECTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By <i>Bob J. Johnson</i>		
Designed By		State Roadway Design Engineer		
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FOR MOUNTING GUARDRAIL ON EXISTING APPROACH SLABS AND BRIDGE SIDEWALKS

* Additional slotted hole required when mounting thrie-beam guardrail

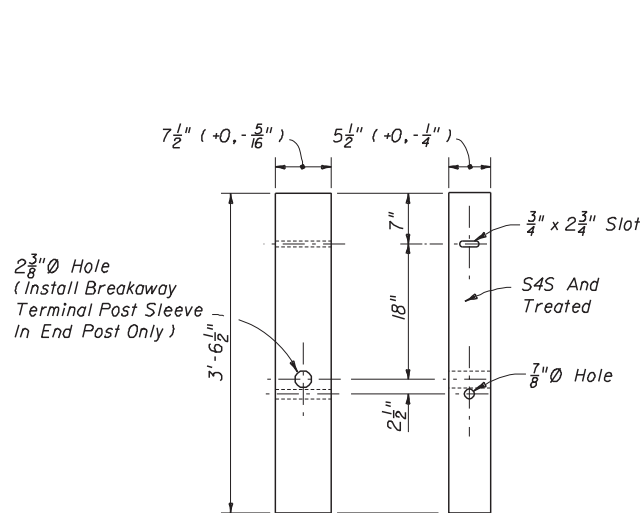


FOR CONSTRUCTION OF GUARDRAIL WHERE CULVERT, PIER FOOTING OR OTHER STRUCTURE PRECLUDES NORMAL POST INSTALLATION

NOTES: (SPECIAL STEEL POST)

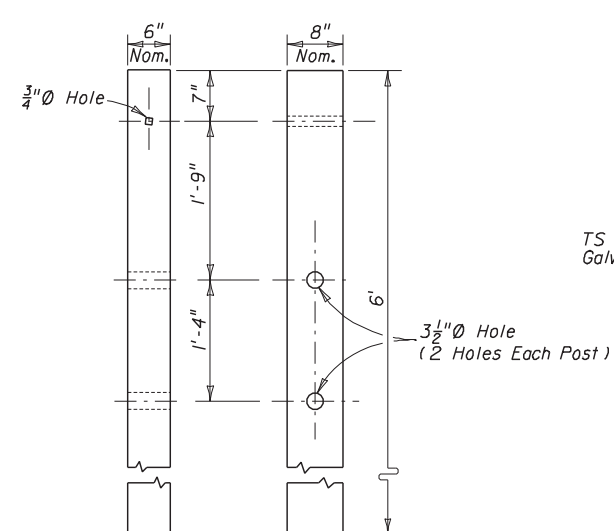
1. Either anchor bolts, concrete wedge anchors or approved Adhesive-Bonded Anchors for Structural Applications may be used.
Anchor bolts, wedge anchors and adhesive anchors shall have a minimum tensile strength of 60,000 psi and galvanized in accordance with ASTM A153 (stainless steel components may be substituted but components plated in accordance with ASTM B-633 are not acceptable). Adhesive anchor rods shall be equal in diameter to that detailed for anchor bolts. Wedge anchors are to be installed in accordance with the manufacturers recommendations, assuming 3,000 psi compressive strength for concrete. Wedge anchors shall also meet the following requirements: (a) tensile load each anchor: approach slabs 14,000 lbs.; other structures 8,000 lbs. (b) shear load each anchor: approach slabs 15,000 lbs.; other structures 7,800 lbs.
2. Posts are to be plumbed by adjusting nuts or mortar seating. Posts installed using anchor bolts and adhesive anchors are to be set with adjusting nuts as detailed, unless the Engineer approves the use of mortar seating in lieu of adjusting nuts. Posts installed using wedge anchors are to be set with mortar seating. Base plates shall be grouted with neat finish.
3. Adhesive-Bonded Anchors for Structural Applications shall comply with Section 937 and be installed in accordance with Section 416. Drilled hole diameter shall be in accordance with the manufacturer's instructions.
4. Anchor holes and recesses shall be drilled; wedge anchor holes are to be drilled in accordance with the manufacturers specifications. Encountered reinforcing steel shall be drilled through. Holes shall be thoroughly cleaned when setting bolts and anchors and dry when setting wedge anchors.
6. Steel post and base units shall be galvanized in accordance with ASTM A123. Any damaged galvanized areas are to be metalized in accordance with Section 562 of the Standard Specifications.

SPECIAL STEEL GUARDRAIL POSTS

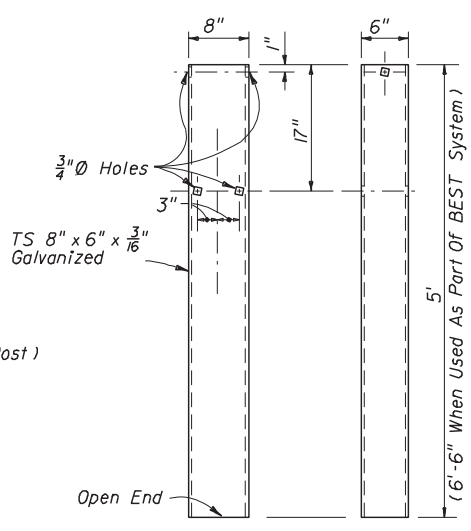


**SHORT TIMBER BREAKAWAY POST
CRT TIMBER POST**

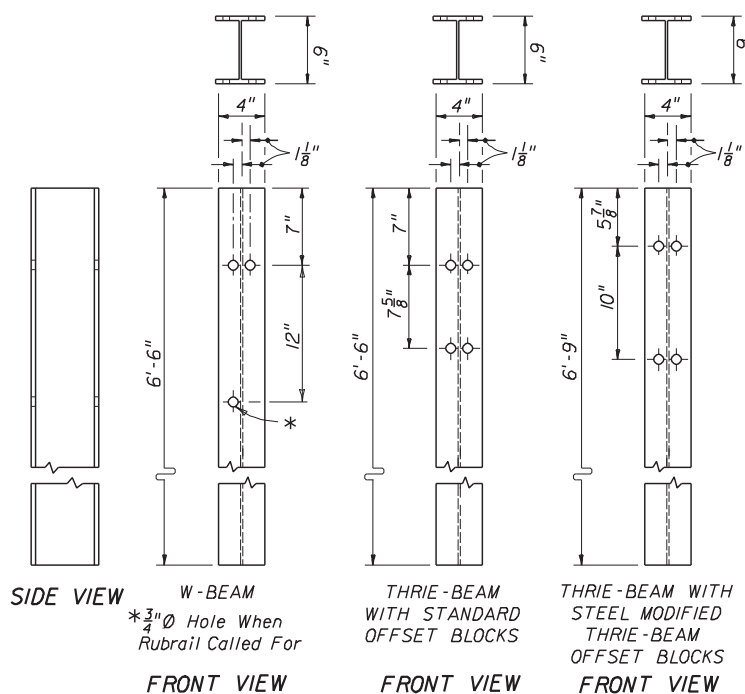
SPECIAL TIMBER GUARDRAIL POSTS



STEEL TUBE



TIMBER POST



**W-BEAM
THRIE-BEAM WITH STANDARD OFFSET BLOCKS
THRIE-BEAM WITH STEEL MODIFIED THRIE-BEAM OFFSET BLOCKS**

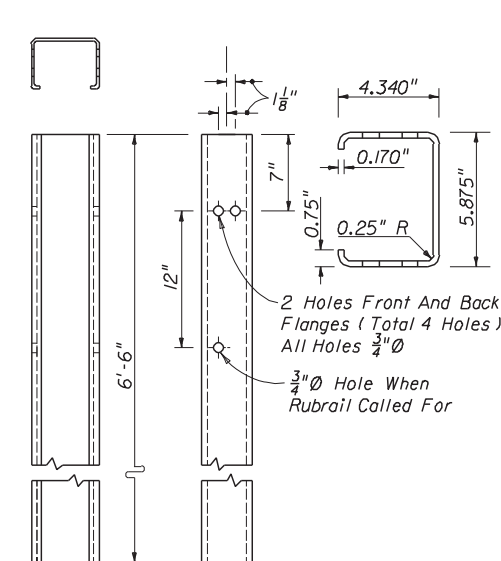
All Holes Shall Be 3/4 inch Diameter Identical Front And Back Flanges

Note: W6 x 8.5 or W6 x 9 steel posts may be either rolled or welded structural shapes conforming to or exceeding the design properties of ASTM A6/A6M. Welding shall be in accordance with the requirements of ASTM A769/A769M. Posts shall be cut to length and the ends seal welded between web and flange before galvanizing. Posts to be galvanized in accordance with ASTM A123.

W6 x 8.5 OR W6 x 9 STEEL POST

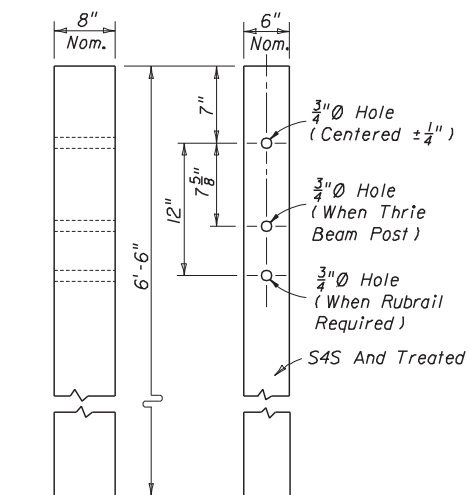
STANDARD TIMBER AND STEEL GUARDRAIL POSTS

GUARDRAIL POSTS



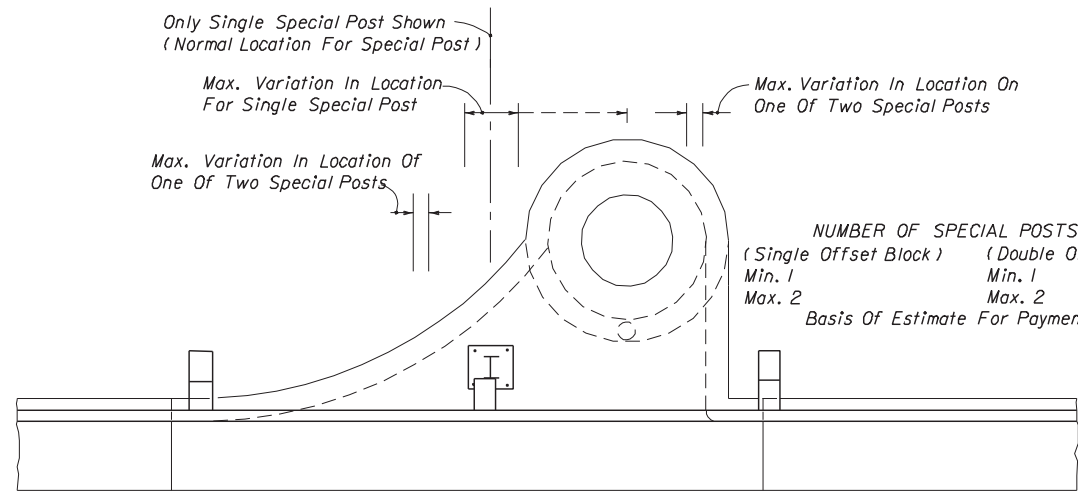
6'-C STEEL POST

Note: 6'-C steel posts are to face the same direction in any continuous run of guardrail. Posts to be galvanized in accordance with ASTM A123.



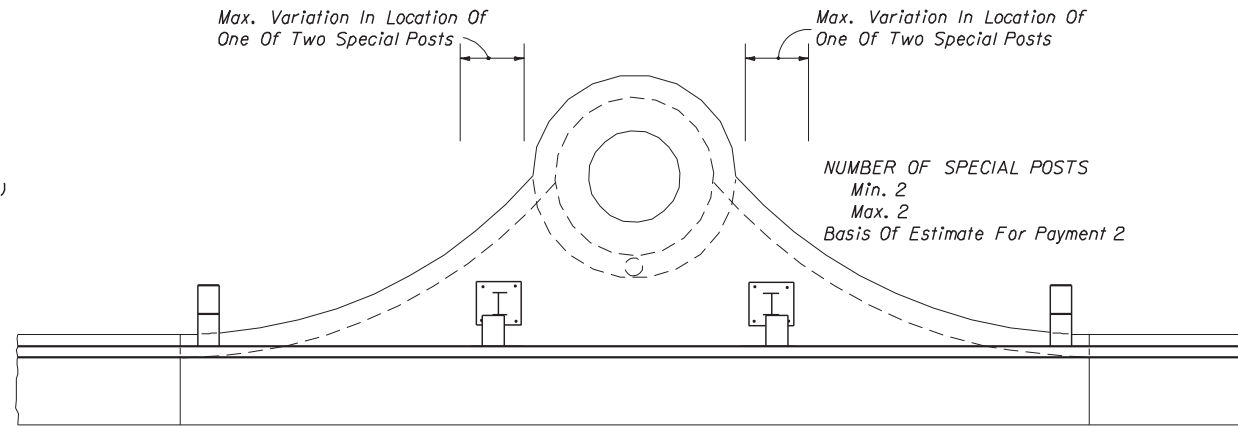
TIMBER POST

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By		
Designed By		State Roadway Design Engineer		
Drawn By	JM 08/81	Revision	Sheet No.	Index No.
Checked By	JVG/JBW 08/81	00	20 of 31	400



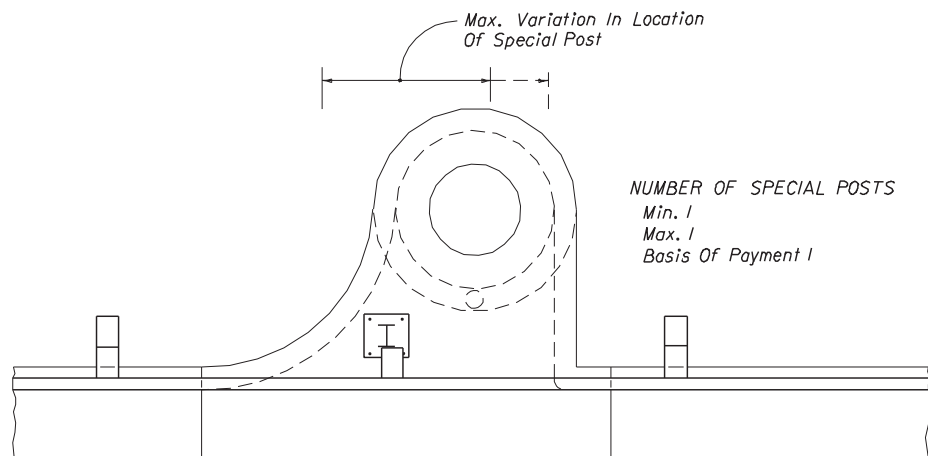
CURB INLET TYPE 1

NUMBER OF SPECIAL POSTS
(Single Offset Block) (Double Offset Block)
Min. 1 Min. 1
Max. 2 Max. 2
Basis Of Estimate For Payment 1



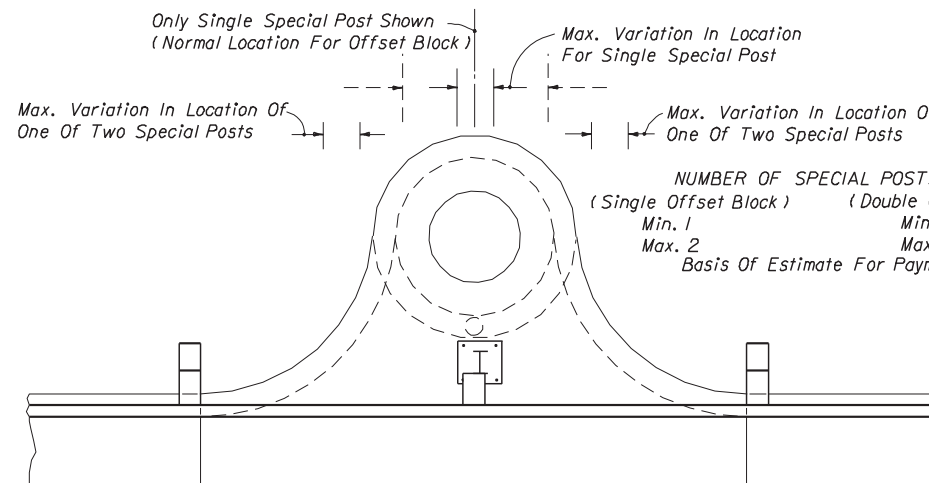
CURB INLET TYPE 2

NUMBER OF SPECIAL POSTS
Min. 2
Max. 2
Basis Of Estimate For Payment 2



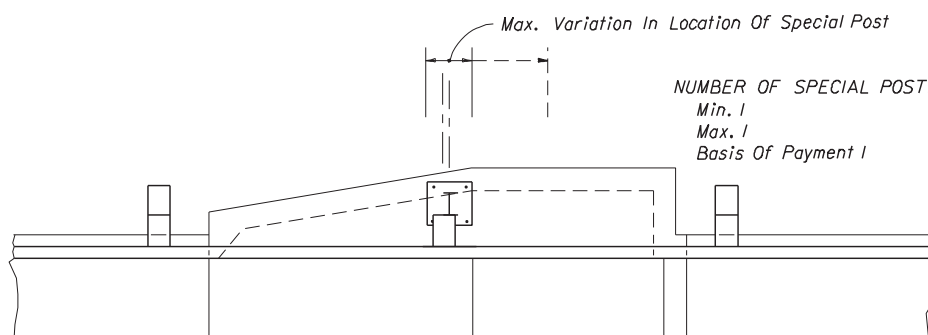
CURB INLET TYPE 3

NUMBER OF SPECIAL POSTS
Min. 1
Max. 1
Basis Of Payment 1



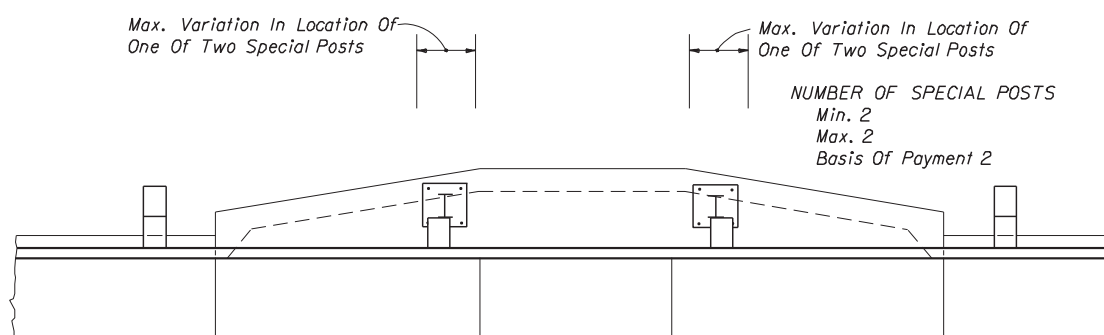
CURB INLET TYPE 4

NUMBER OF SPECIAL POSTS
(Single Offset Block) (Double Offset Block)
Min. 1 Min. 1
Max. 2 Max. 1
Basis Of Estimate For Payment 1



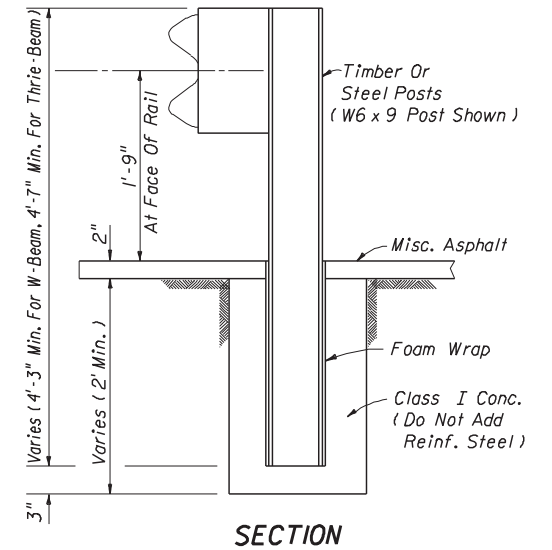
CURB INLET TYPE 5

NUMBER OF SPECIAL POSTS
Min. 1
Max. 1
Basis Of Payment 1



CURB INLET TYPE 6

NUMBER OF SPECIAL POSTS
Min. 2
Max. 2
Basis Of Payment 2



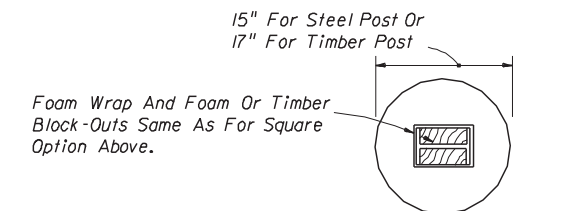
SECTION

15" For Steel Post Or 17" For Timber Post

To Facilitate Post Replacement Install With $\frac{3}{16}$ " Plastic Foam Sheet On All Sides, Below The Surface Of The Miscellaneous Asphalt.

Foam Or Timber Block-Out For W6 x 9 Or 6" C Posts

PLAN (SQUARE OPTION)



PLAN (ROUND OPTION)

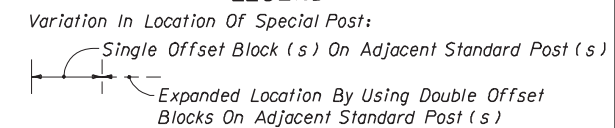
Note: For line post applications only, i.e. not to be used with breakaway post applications nor be used to modify End Anchorage Assemblies Type II

**TO BE USED PRINCIPALLY OVER SHALLOW UTILITIES
ENCASED GUARDRAIL POST**

Notes:

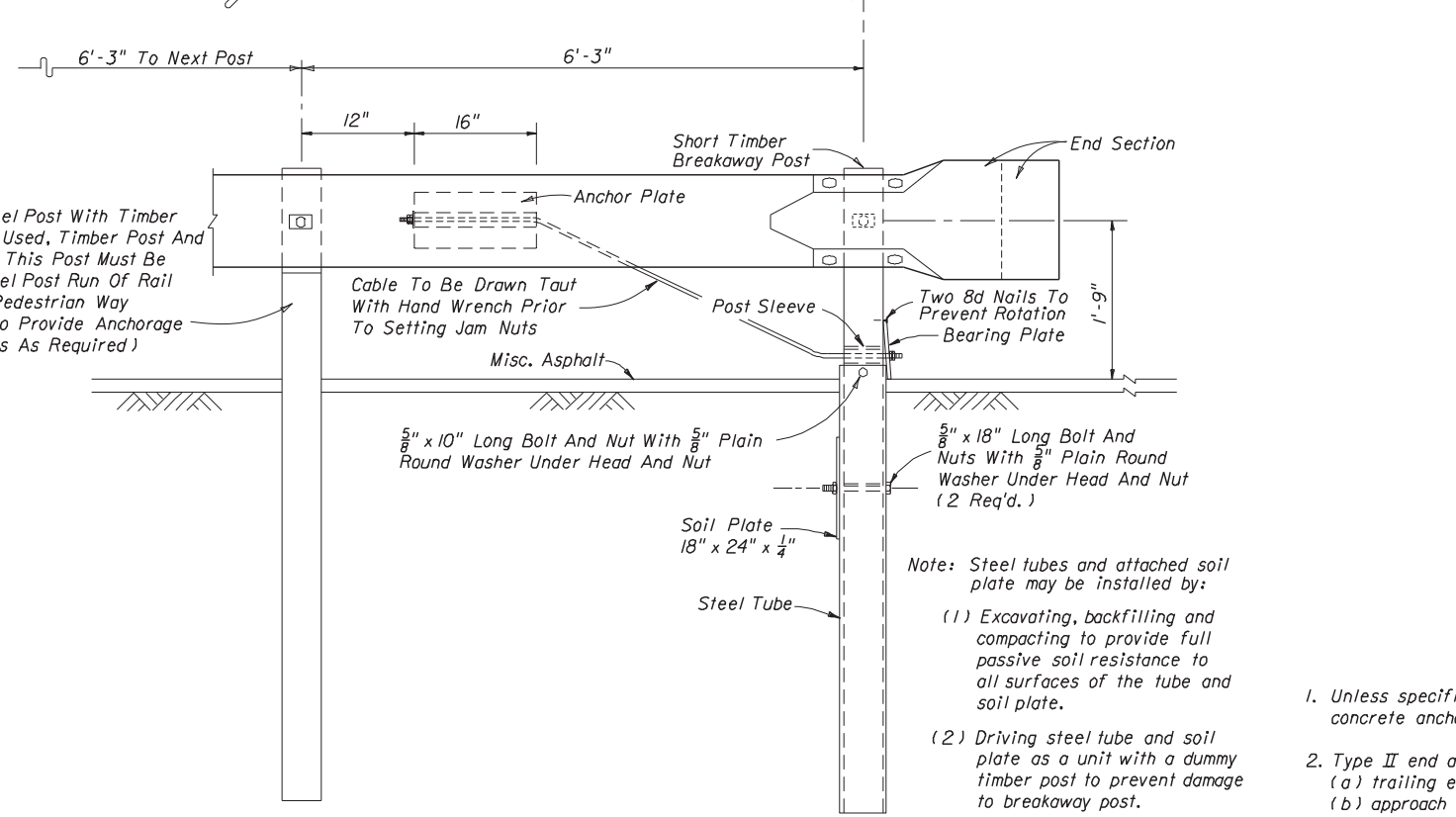
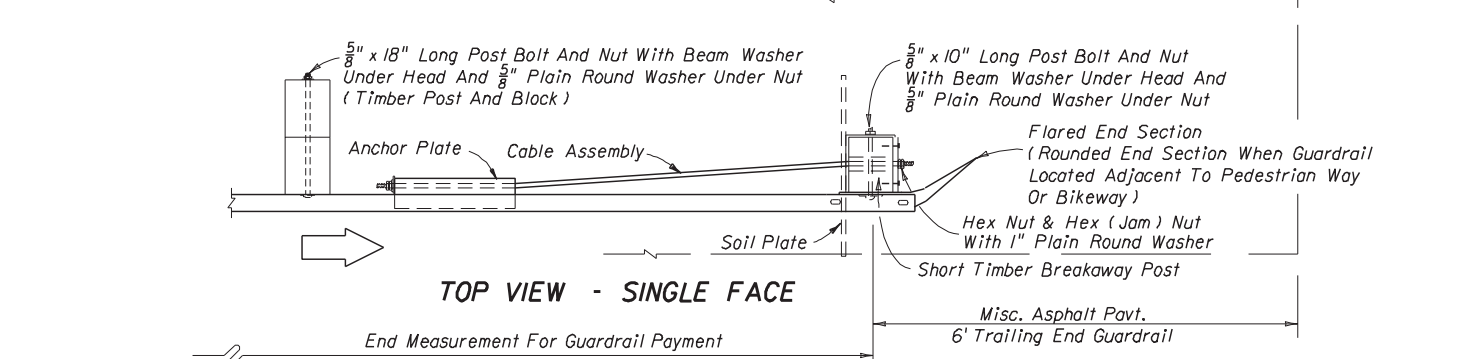
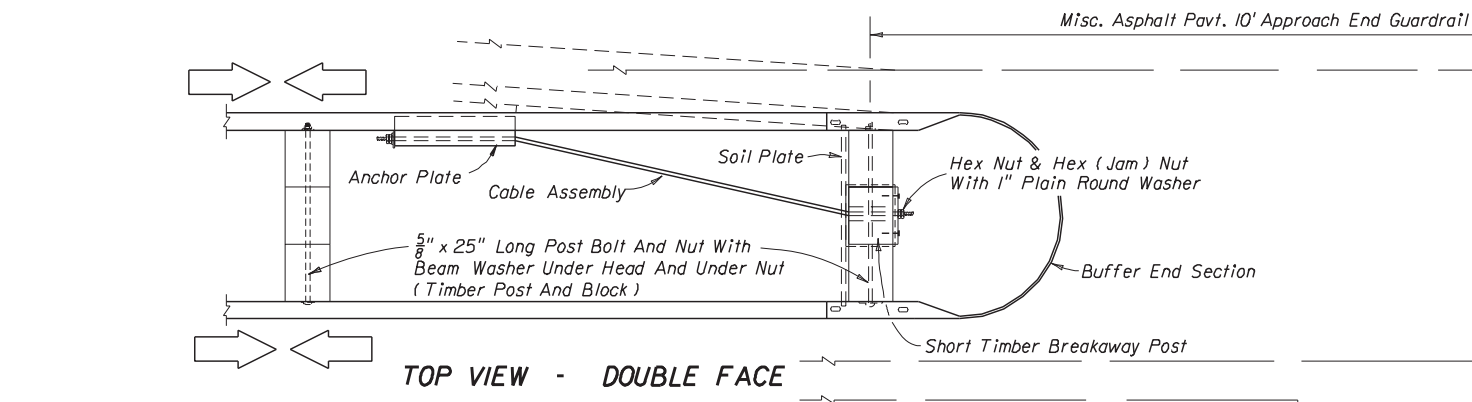
- The locations shown for special posts mounted on inlets are to be used as guidelines for positioning the posts and for estimating the number of required posts.
- Special posts and their anchorages mounted on curb inlets shall be in accordance with special steel guardrail posts Sheet 20, and paid for under the contract unit price for Special Guardrail Post, EA.
- Variations shown for the locations of special posts mounted on inlets are established from standard post spacing (6'-3"); clearance of standard posts from inlets (4" min.); use of single and double offset blocks on standard posts adjacent to the inlets; optional flange mountings; and, concrete anchor edge distances (2" for grouted and 3 $\frac{3}{4}$ " for expansion anchors). The number of posts and their locations may vary by reducing post spacing and adjusting the length of rail panel (s).
- Encased guardrail posts shall conform in section to standard timber and steel posts, and be paid for under the contract unit price for Special Guardrail Post, EA. Payment shall include cost of foam wrap and concrete encasement.

LEGEND



SPECIAL POST LOCATIONS ON CURB INLETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By	HSD 08/83	Revision	Sheet No.	Index No.
Checked By	JVG 08/83	00	21 of 31	400



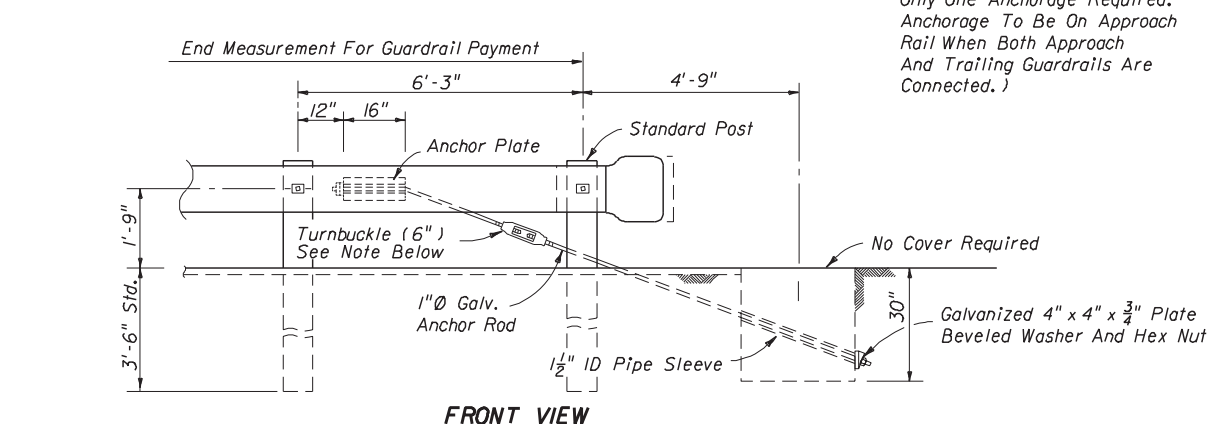
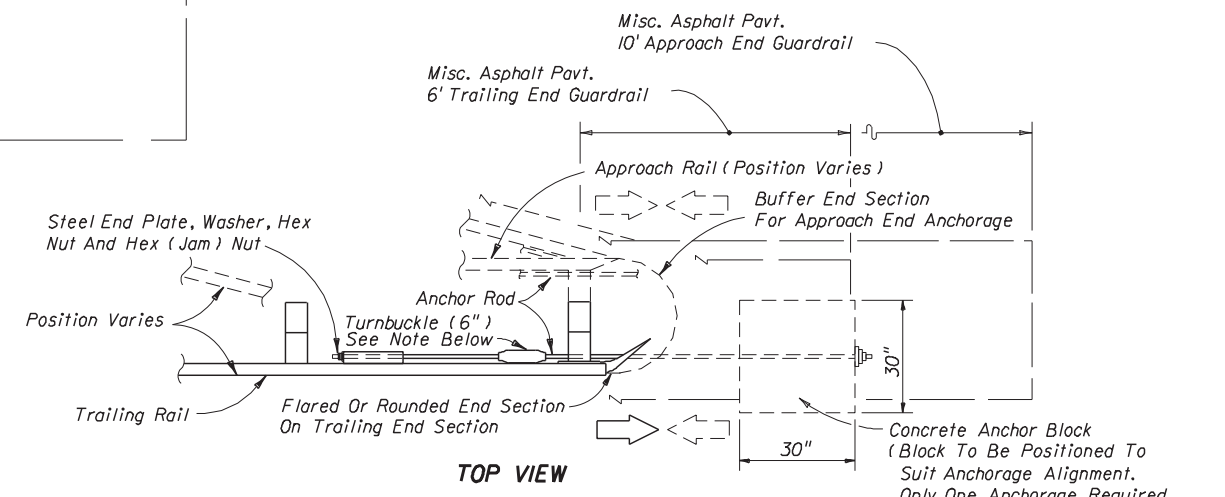
FRONT VIEW

The payment for the items of End Anchorage Assembly Type II (Cable Option) shall be full compensation for furnishing and installing either the Round or the Buffer End Section, the Beam Anchor Plate, Cable Assembly, Pipe Sleeve, Soil Plate, Steel Tube, Bearing Plate, Short Timber Breakaway Post, Offset Blocks and the necessary hardware.

CABLE ANCHOR OPTION

Note: Steel tubes and attached soil plate may be installed by:

- (1) Excavating, backfilling and compacting to provide full passive soil resistance to all surfaces of the tube and soil plate.
- (2) Driving steel tube and soil plate as a unit with a dummy timber post to prevent damage to breakaway post.



Turnbuckle to be used only for guardrail that is reset vertically. The existing anchor rod (1" or 1 1/4" Dia.) shall be field cut, threaded 4" on each end, and metalized in accordance with Sections 562 and 971 of the Standard Specifications. The cost for cutting, threading, metalizing and the turnbuckle shall be included in the contract unit price for Reset Guardrail, LF.

The payment for the items of End Anchorage Assembly Type II (Concrete Anchor Block Option) shall be full compensation for furnishing and installing the Beam Anchor Plate, Anchor Rod, Pipe Sleeve, Anchor Block, either Flared, Rounded or Buffer End Section, and the necessary hardware.

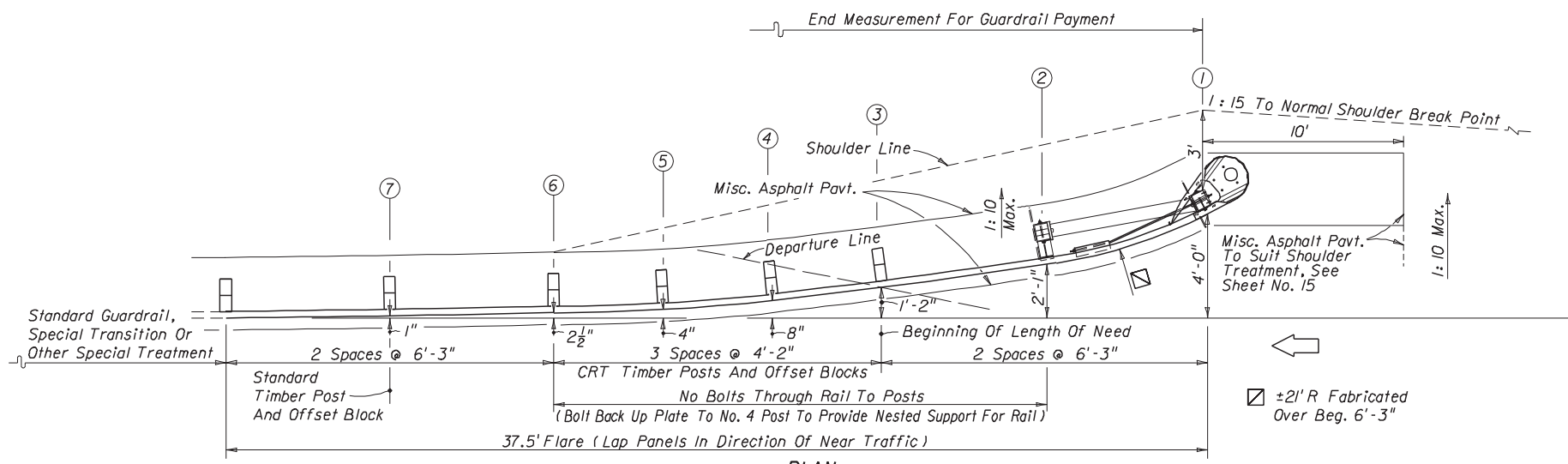
CONCRETE ANCHOR BLOCK OPTION

TYPE II NOTES

1. Unless specified in the plans, the contractor can supply either the cable anchor option or the concrete anchor block option.
2. Type II end anchorage assemblies are approved for all speeds and are intended for use as:
 - (a) trailing end anchorages for single face free standing guardrail systems;
 - (b) approach end anchorages for single face free standing guardrail systems when end anchorage is located outside of the clear zone; and,
 - (c) both approach and trailing ends of double face guardrail systems.
 Crash cushions shall be constructed at or in lieu of approach Type II end anchorages located inside the clear zone.
3. These end anchors are to be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Type II) EA as called for in the plans or by permit.

END ANCHORAGE ASSEMBLY TYPE II

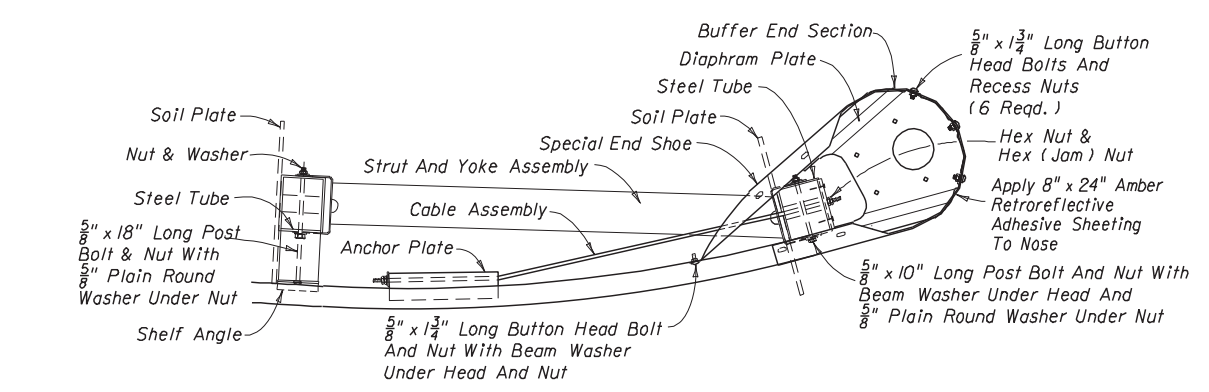
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By	JM	01/81	Revision	Sheet No.
Checked By	JGV	01/81	00	22 of 31
				Index No. 400



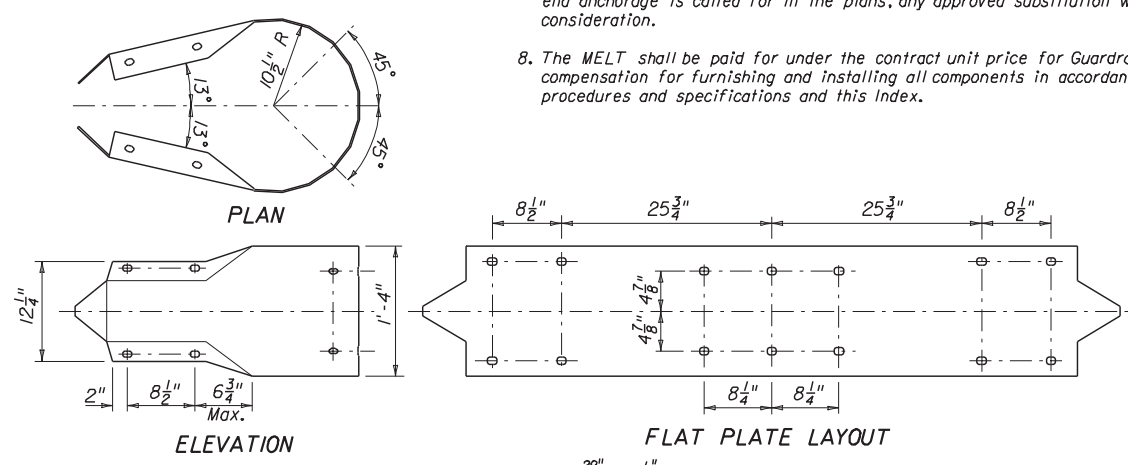
MODIFIED ECCENTRIC LOADER TERMINAL (MELT)

MODIFIED ECCENTRIC LOADER TERMINAL NOTES

1. The MELT is applicable for design speeds up to 45 mph. The MELT is intended for use as an approach end guardrail anchorage for shoulder guardrail. Its alignment is a flare from the normal guardrail alignment with an effective length of 37.5' including three standard W-beam panel outside of any standard guardrail, guardrail transitions or other special treatments.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the MELT and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the MELT when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The MELT shall be assembled in accordance with the distributor's detailed drawings, procedures and specifications.
4. The first two post must be short timber breakaway posts with steel foundation tubes and soil plates, post Nos. 3 thru 6 must be CRT timber posts and post No. 7 must be a standard timber post.
5. The MELT can not be used in medians where horizontal clearance requires the use of a backrail.
6. See the General Notes for galvanizing requirements of metallic components.
7. If the plans call for the MELT at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'Flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly that meet the applications for that location. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
8. The MELT shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the distributor's detailed drawings, procedures and specifications and this Index.



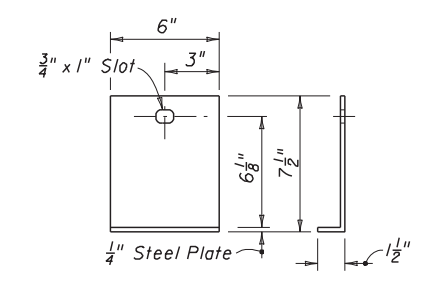
TOP VIEW



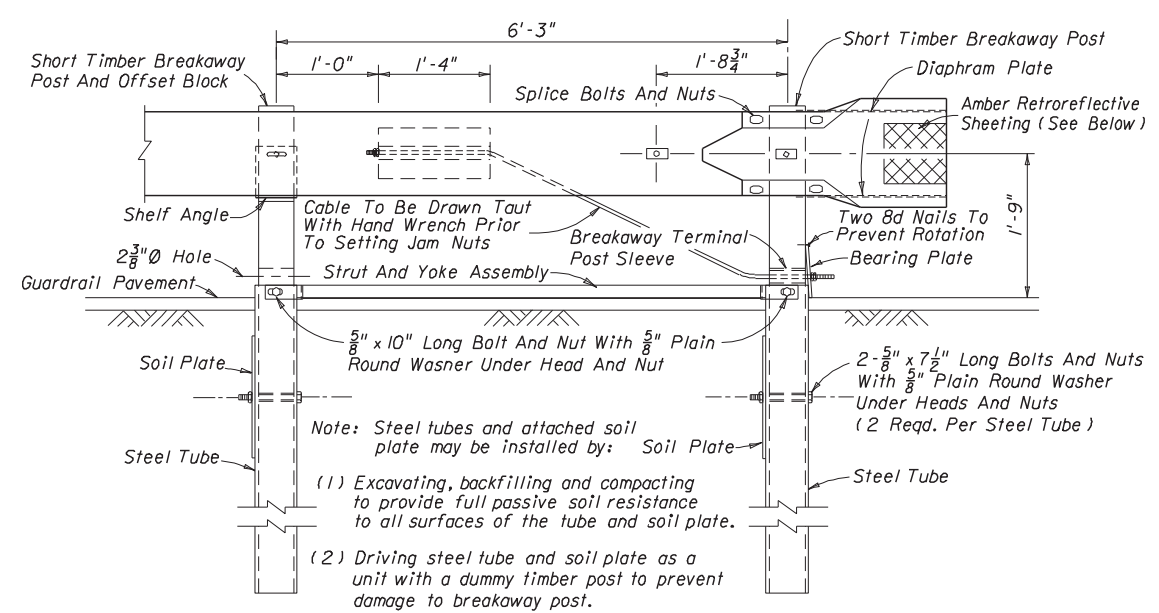
ELEVATION

FLAT PLATE LAYOUT

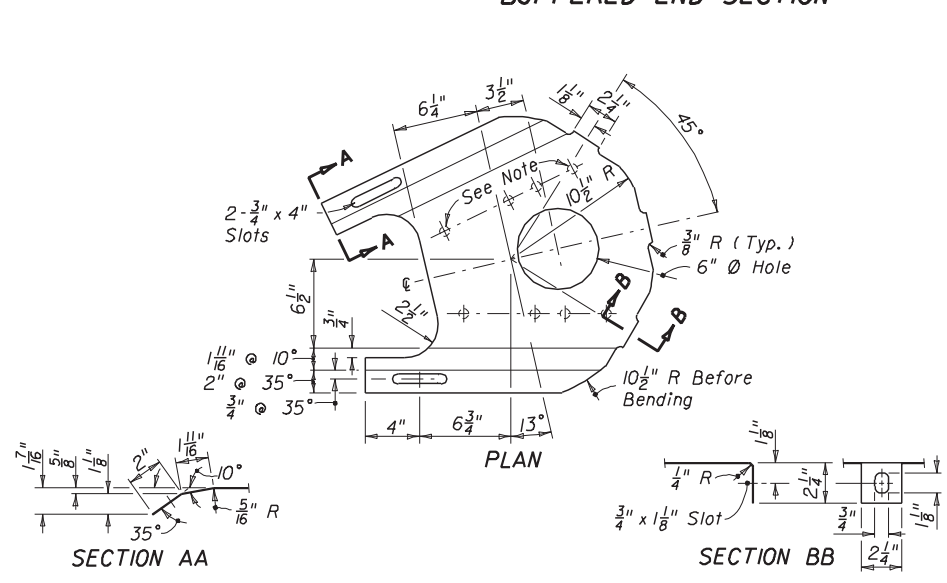
BUFFERED END SECTION



SHELF ANGLE



FRONT VIEW

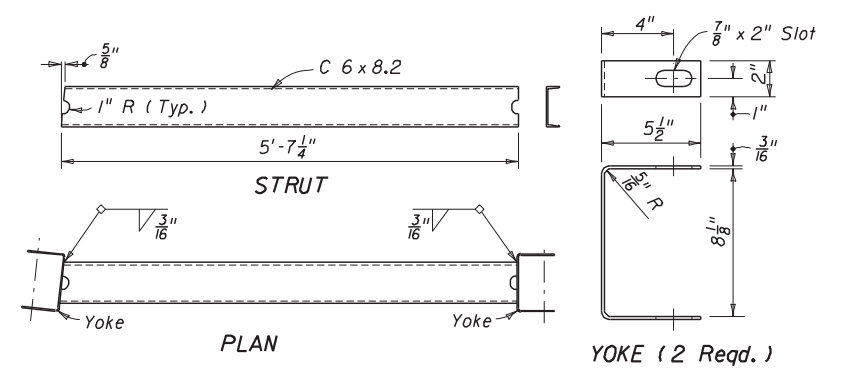


SECTION AA

SECTION BB

Note: Bolt holes are not required, but, diaphragms with either manufacturer produced two or three hole in line patterns are acceptable.

DIAPHRAGM PLATE (2 Reqd.)



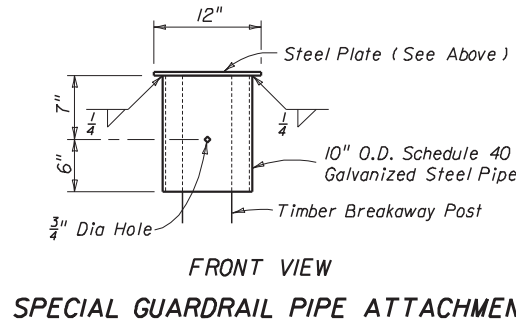
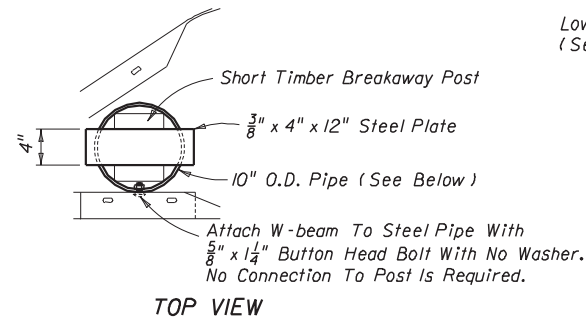
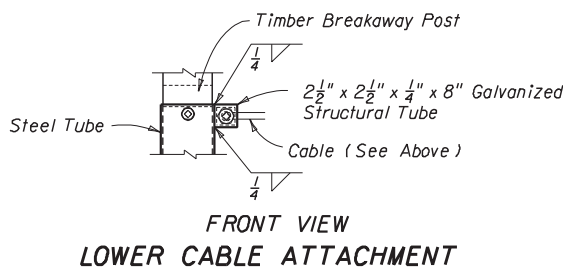
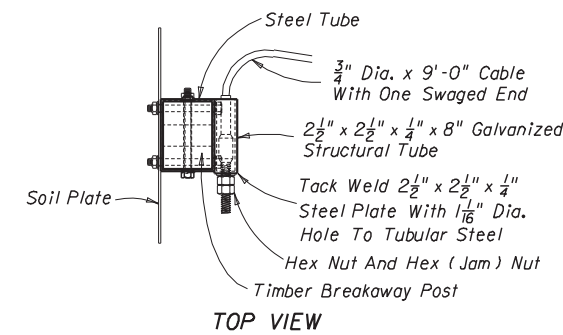
PLAN

YOKE (2 Reqd.)

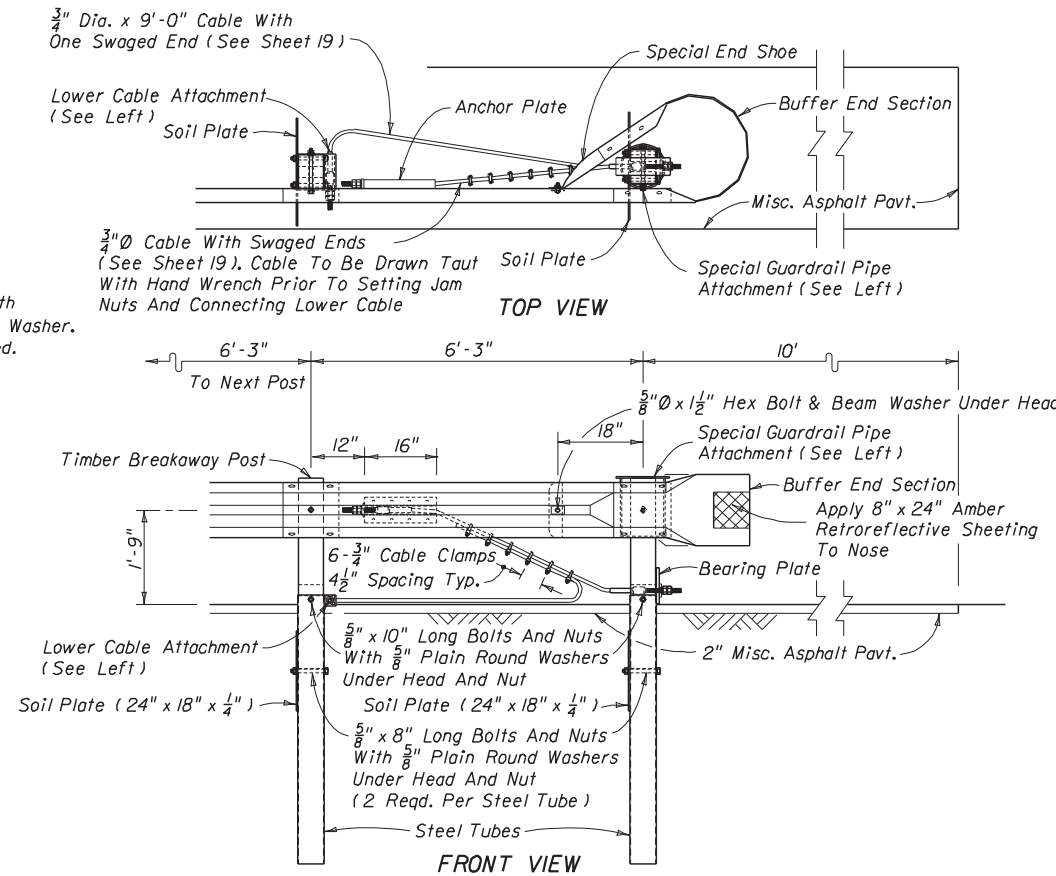
Note: Assembly installed with channel turned down for right side guardrail and turned up for left side guardrail.

STEEL STRUT AND YOKE ASSEMBLY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Designed By	FHWA	3/95	Approved By <i>[Signature]</i>	
Drawn By	HKH	3/95	Revision	Sheet No.
Checked By	JVG	3/95	00	23 of 31
				Index No. 400



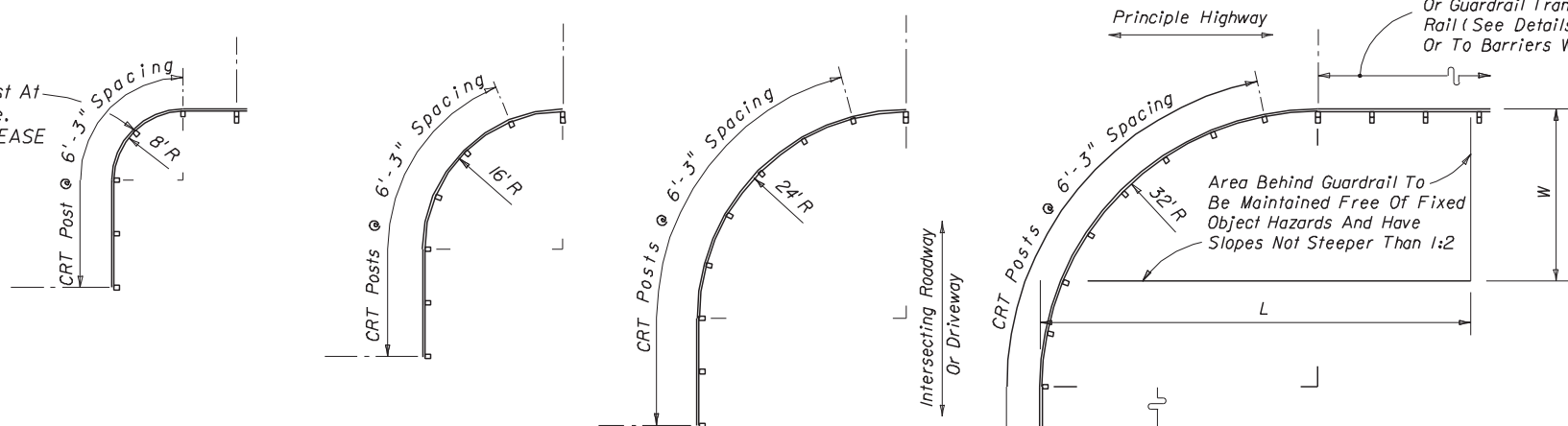
GUARDRAIL END ANCHORAGE ASSEMBLY TYPE CRT



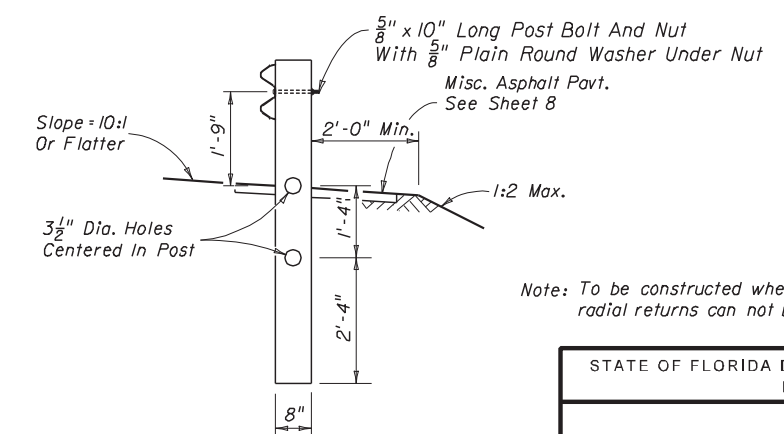
CONTROLLED RELEASE RETURN NOTES

- Controlled release returns are intended for use (a) in openings in continuous guardrail for driveway and side road access when flares and transitions or standard radial returns can not be applied (Sheet 11); and, (b) for shielding the ends of bridge traffic rails and barrier walls where the driveway and side road access is in close proximity to the structure and space does not permit the proper use of Guardrail End Anchorage Assemblies Type II, MELT, SRT-350, ET-2000, BEST, LET, SKT-350, FLEAT-350 or REGENT.
- Controlled release returns are not intended as a substitute or replacement for the appropriate use of approved vehicle impact attenuators.
- Controlled release returns with either 8', 16' or 24' radii are designed for highway speeds of 60 mph or less; the 32' radius return is to be used only for highway speeds of 45 mph or less.
- The controlled release returns shown are designed as full returns based on an intersection angle of 90°. The return can be terminated with the Guardrail End Anchorage Assembly Type CRT or connected to standard guardrail as shown or as otherwise detailed in the plans.
- The Guardrail End Anchorage Assembly Type CRT is to be used only for the controlled release returns with 8', 16', 24' and 32' radii as shown; the assembly is not to be used in any tangent rail or flared rail applications. Other types of end anchorage assemblies are not to be used in the controlled release returns.
- The area immediately behind the control release return shall have slopes not steeper than 1:2 and be maintained free of fixed objects in accordance with the area limits tabulated in the plan below.
- The surface approaching the controlled release return shall have a transverse slope not exceeding 1:10. The effective width of the transverse surface is to be based on standard vehicle departure, return radii and preceding shielding; the width (beyond shoulder) shall be not greater than the corresponding 15' and 20' 'W' values tabulated below.
- The curved guardrail portion of the controlled release return shall be full section shop bent panels (12.5' or 25' panels).
- Washers are not to be used between the guardrail beam and the head of the button head post bolts at any controlled release terminal (CRT) post or at any Guardrail End Anchorage Assembly Type CRT breakaway timber post.
- The guardrail beam of the B' radius return is not bolted to the center control release post.
- See the General Notes for galvanizing requirements of metallic components.
- Controlled release return systems shall be paid for under the contract unit prices for Guardrail (Roadway), LF, Guardrail (Shop-bent Panels), LF, and Guardrail, End Anchorage Assembly (Type CRT), EA as called for in the plans or by permit and shall be full compensation for furnishing and installing all components in accordance with the plans and with this index. CRT posts are included in the cost for guardrail.

Do NOT Bolt Rail To Post At The Center Of The Nose. (See 'CONTROLLED RELEASE RETURN NOTES' No. 10)



Return Nom. R	Length Of Shop Bent Panels	No. Of CRT Posts	Required Area Free Of Hazards	
			L	W
8'	12.5'	5	25' x 15'	
16'	25'	6	30' x 15'	
24'	37.5'	8	40' x 20'	
32'	50'	11	50' x 20'	

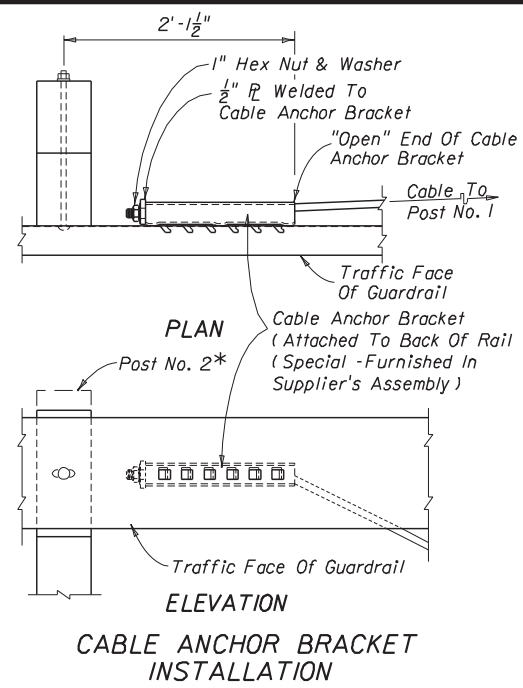
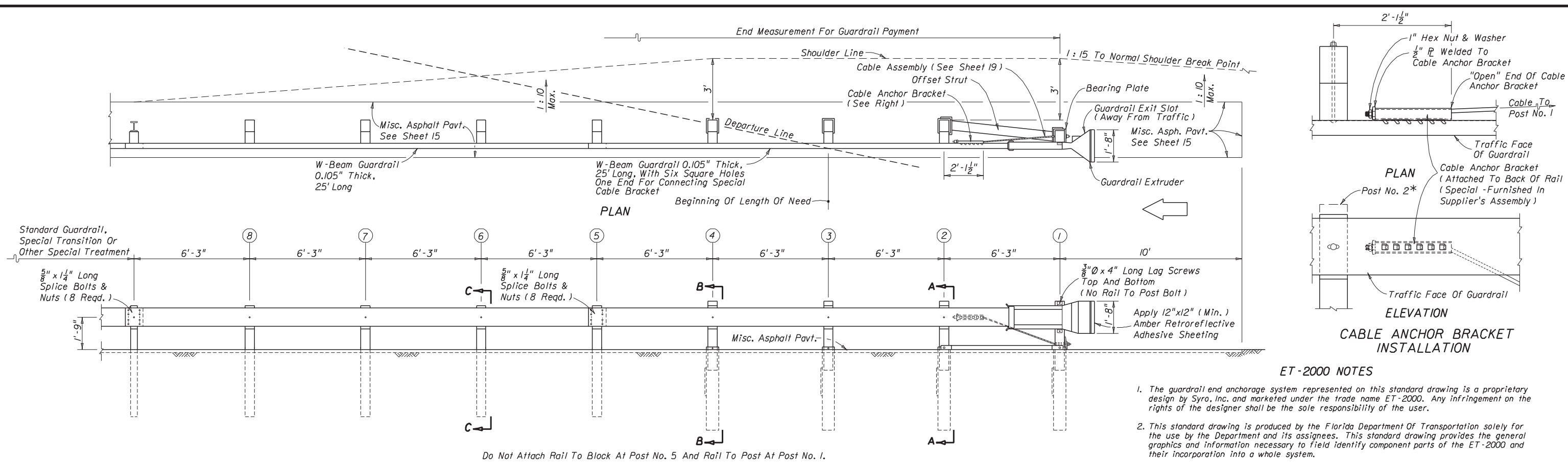


Note: To be constructed when flares and transitions or standard radial returns can not be applied. See Sheet 11.

CRT TIMBER POST

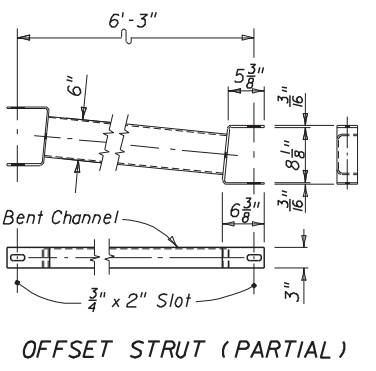
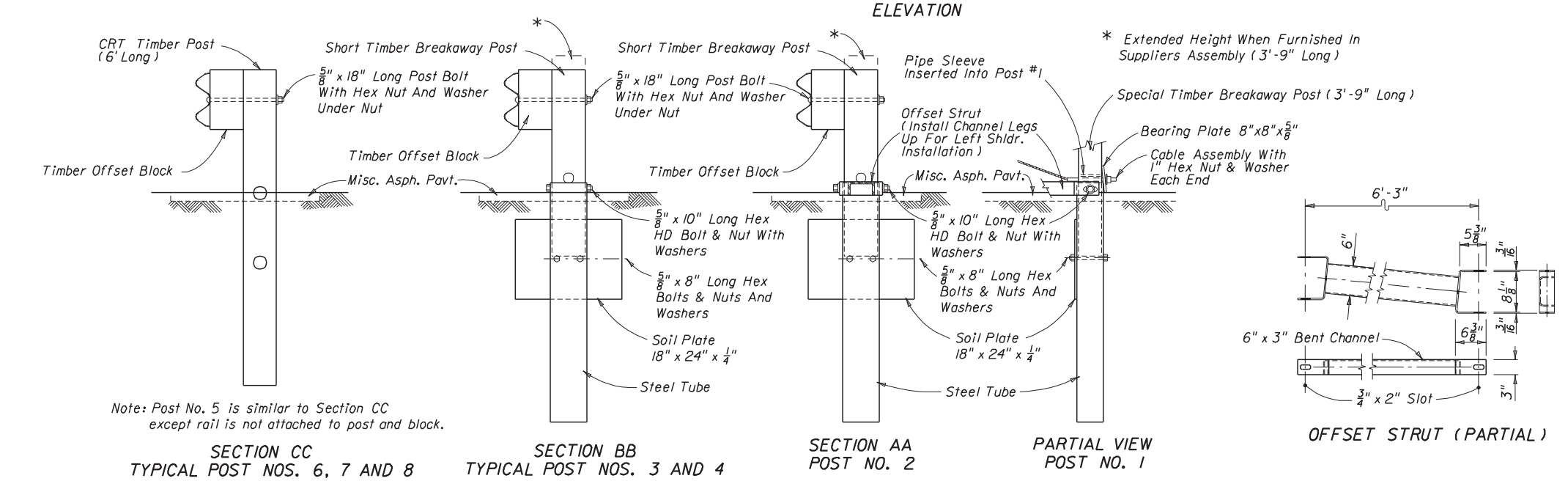
CONTROLLED RELEASE RETURN FOR SIDE ROAD AND DRIVEWAY ACCESS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	FHWA	State Roadway Design Engineer		
Drawn By	HSD	Revision	Sheet No.	Index No.
Checked By	JVG	00	24 of 31	400



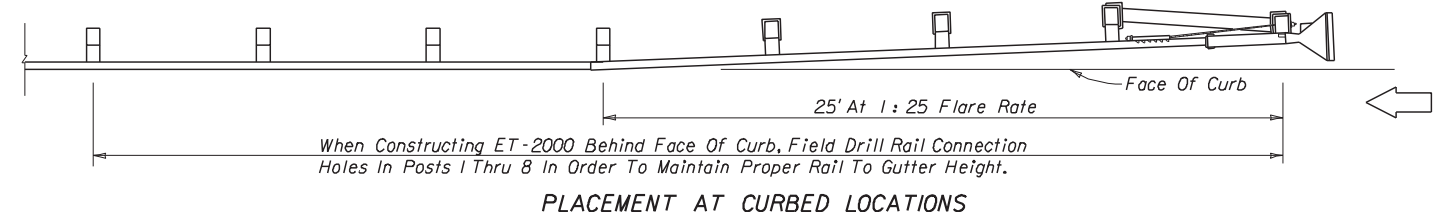
ET-2000 NOTES

- The guardrail end anchorage system represented on this standard drawing is a proprietary design by Syro, Inc. and marketed under the trade name ET-2000. Any infringement on the rights of the designer shall be the sole responsibility of the user.
- This standard drawing is produced by the Florida Department Of Transportation solely for the use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the ET-2000 and their incorporation into a whole system.
- This standard drawing is sufficient for plan details for the ET-2000 when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The ET-2000 shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
- The ET-2000 is intended for use as an approach end guardrail anchorage for shoulder guardrail located parallel to travel or auxiliary lanes. The effective length of the ET-2000 is 50' including two 25' W-Beam panels of guardrail. The effective length is outside of any standard guardrail, guardrail transitions or other special treatments. The ET-2000 alignment is an extension of the normal guardrail alignment, except when constructed with curb the alignment of the ET-2000 will be flared over the first 25' at a rate of 1:25.
- The ET-2000 can not be used in medians where horizontal clearance requires the use of a backrail.
- Posts at location Nos. 1, 2, 3 and 4 must be timber breakaway posts with steel foundation tubes. The breakaway posts at location Nos. 5, 6, 7 and 8 may be constructed as shown in Section CC or may utilize timber breakaway posts with steel foundation tubes as shown in Section BB.
- See the General Notes for galvanizing requirements of metallic component.
- If the plans call for the ET-2000 at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'parallel' at a specific location the contractor has the option to construct any FDOT approved parallel assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
- The ET-2000 shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.



DESIGN NOTES

- A special site evaluation should be considered prior to using the ET-2000 where there is less than 25' clear area on the extrusion side (back side) of the ET-2000.
- The ET-2000 is suitable for all design speeds.



END ANCHORAGE ASSEMBLY TYPE ET-2000

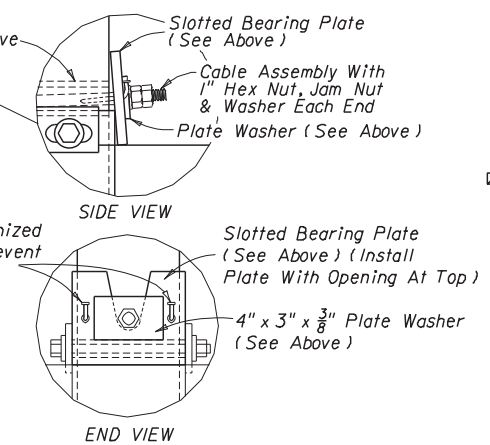
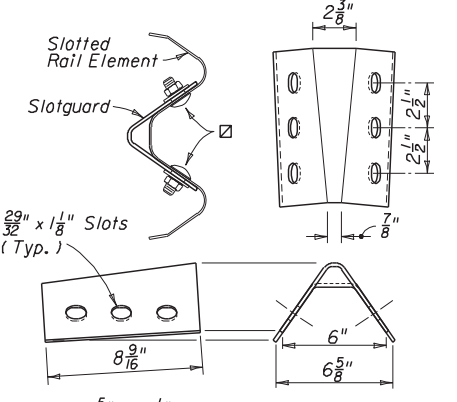
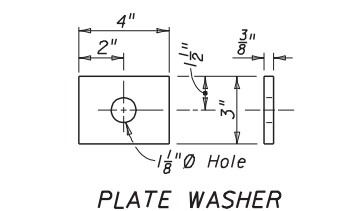
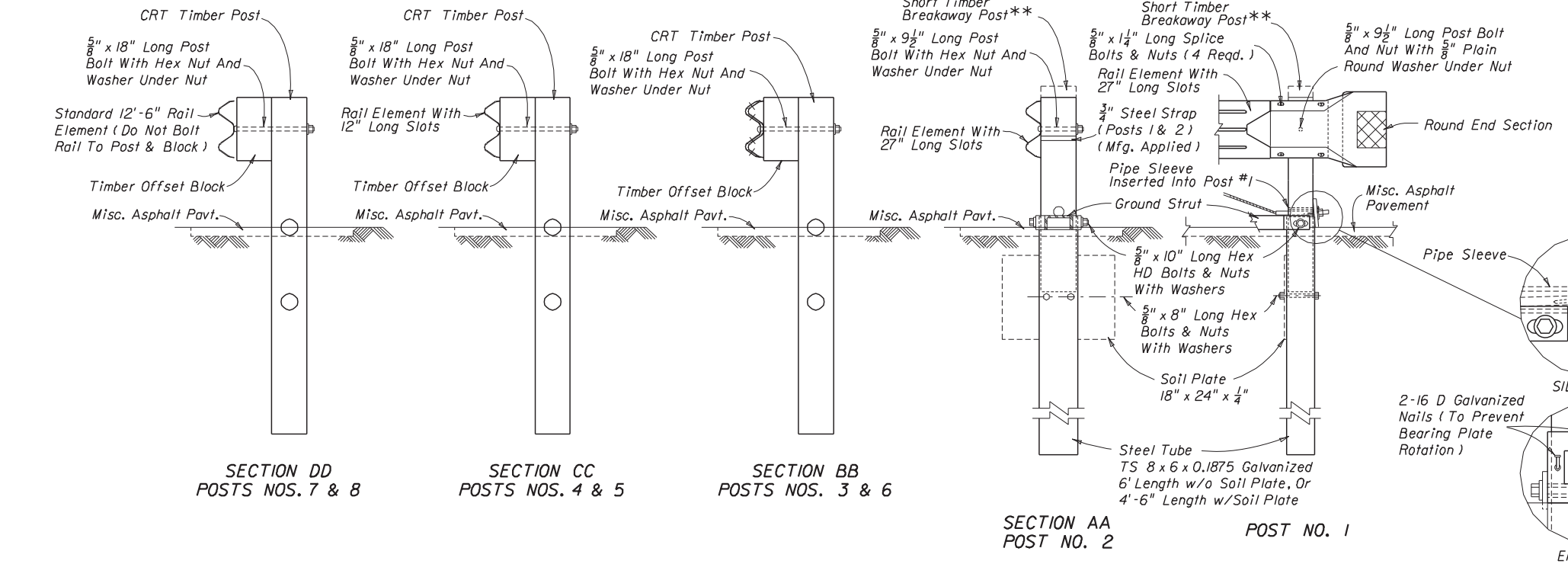
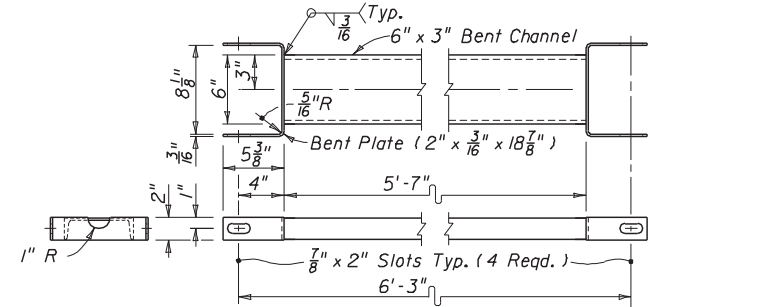
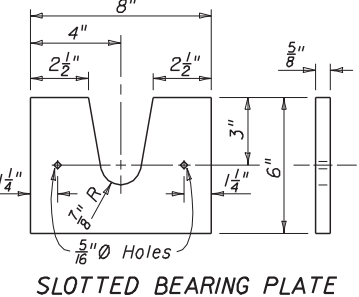
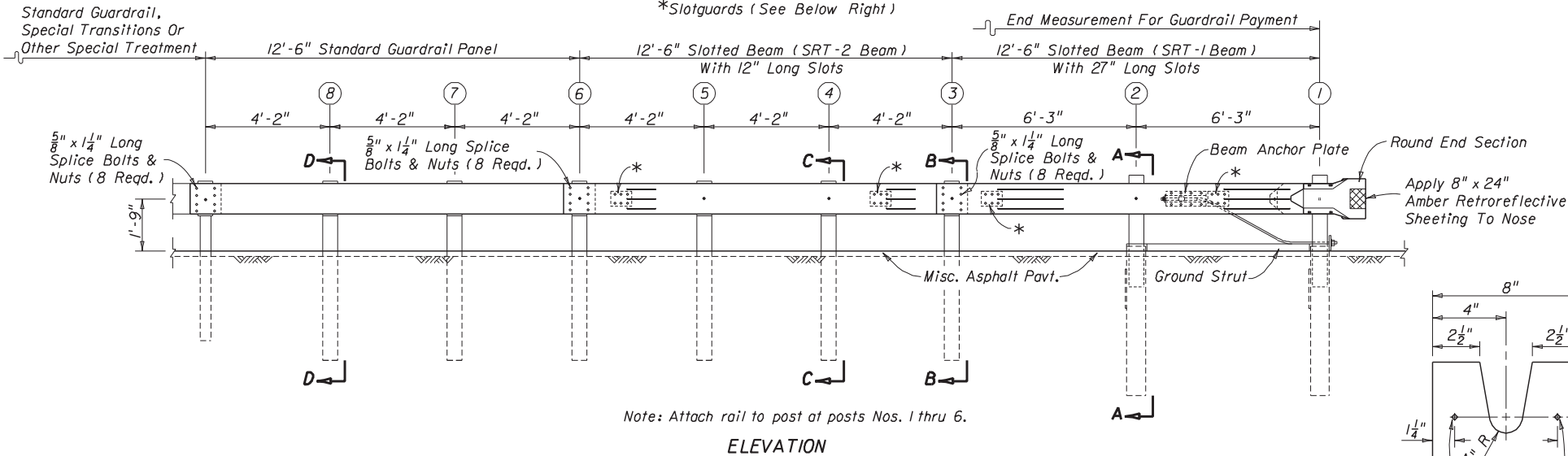
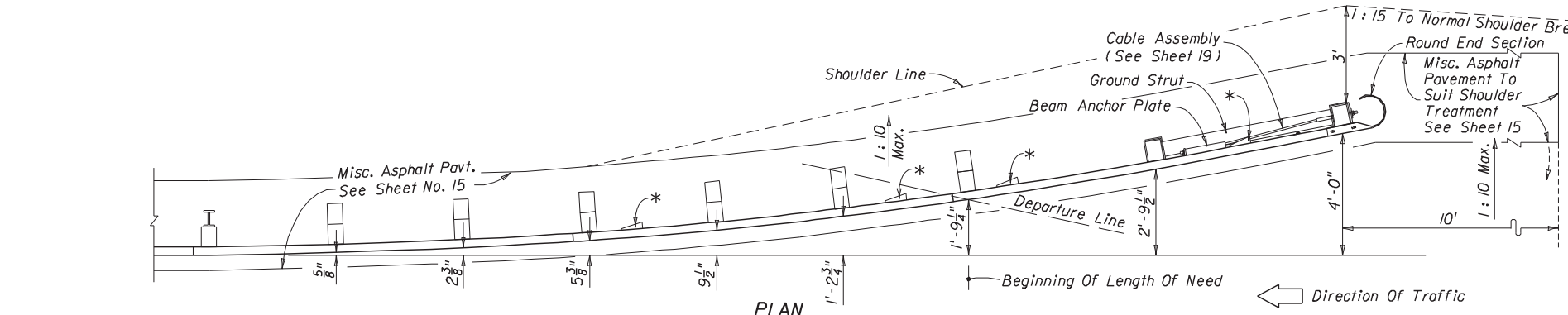
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Designed By	MFG	8/95	Approved By <i>[Signature]</i>	
Drawn By	HKH	8/95	Revision	Sheet No.
Checked By	JVG	8/95	00	25 of 31
				Index No. 400

SRT-350 NOTES

1. The guardrail end anchorage system represented on this drawing is a proprietary eight (8) post design by Trinity Industries, Inc. and marketed by Syro, Inc. under the trade name SRT-350, short for Slotted Rail Terminal. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the SRT-350 and their incorporation into a whole system.
3. This drawing is sufficient for plan details for the SRT-350 when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless called for elsewhere in the plans. The SRT-350 shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The SRT-350 can not be used in medians where horizontal clearance requires the use of a backrail.
5. The SRT-350 is suitable for all design speeds. The SRT-350 is intended for use as an approach end anchorage for shoulder guardrail. Its alignment is a parabolic flare from the normal guardrail alignment with an effective length of 37.5' including two special slotted W-Beam panels and one standard W-Beam panel outside of any standard guardrail, guardrail transitions or other special treatments.
6. Posts 1 and 2 must be timber breakaway posts each with a 3/4" steel strap located approximately 1" below the post bolt and a steel foundation tube. CRT breakaway posts shall be used at all other locations within the system.
7. See the General Notes for galvanizing requirements of metallic component.
8. If the plans call for the SRT-350 at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'Flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
9. The SRT-350 shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this index.

SLOTTED BEAM NOTES

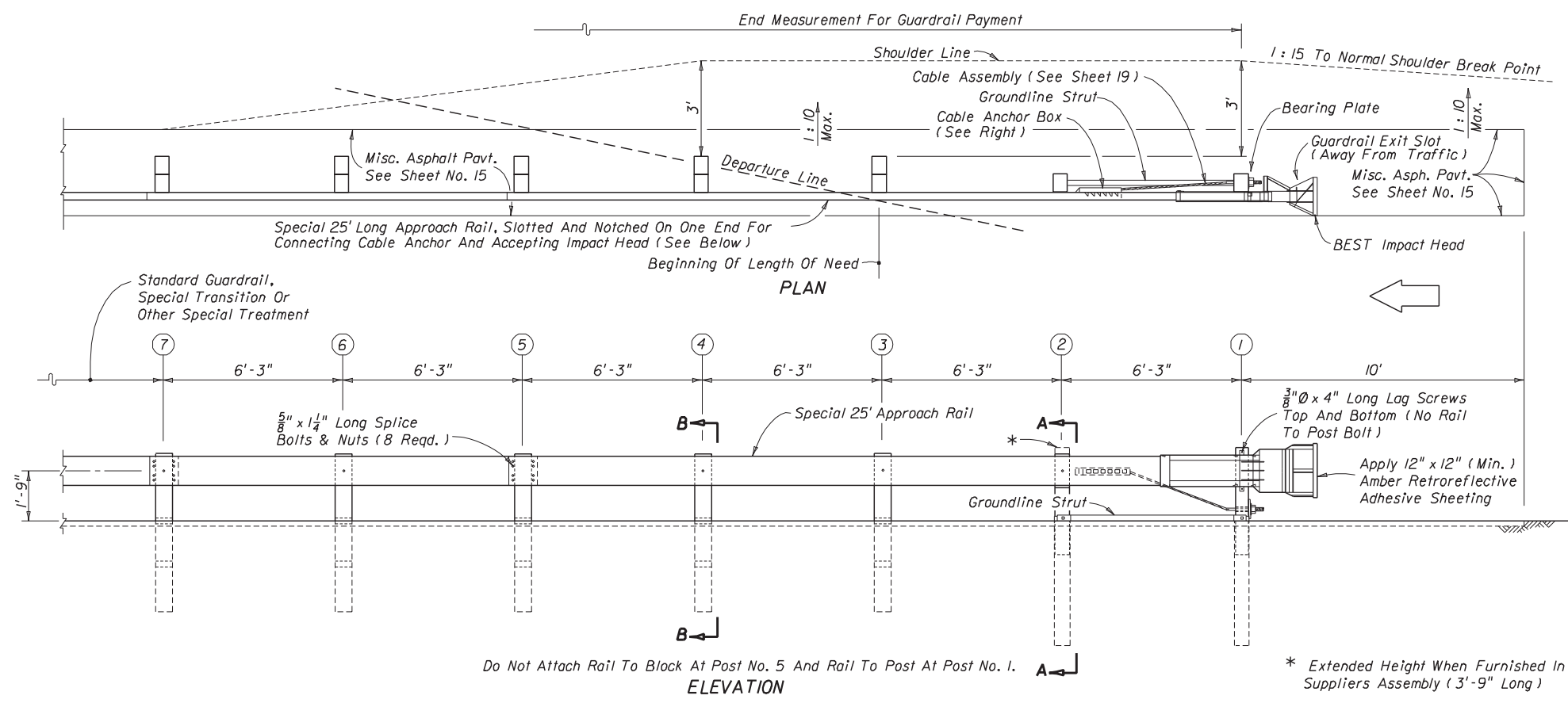
The 12'-6" SRT-1 and SRT-2 beams can be used for the repair or replacement of slotted rails in existing 9 or 10 post SRT-350 systems.



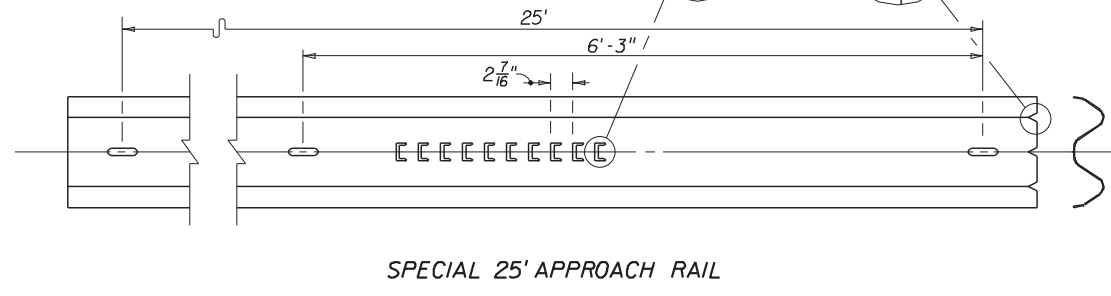
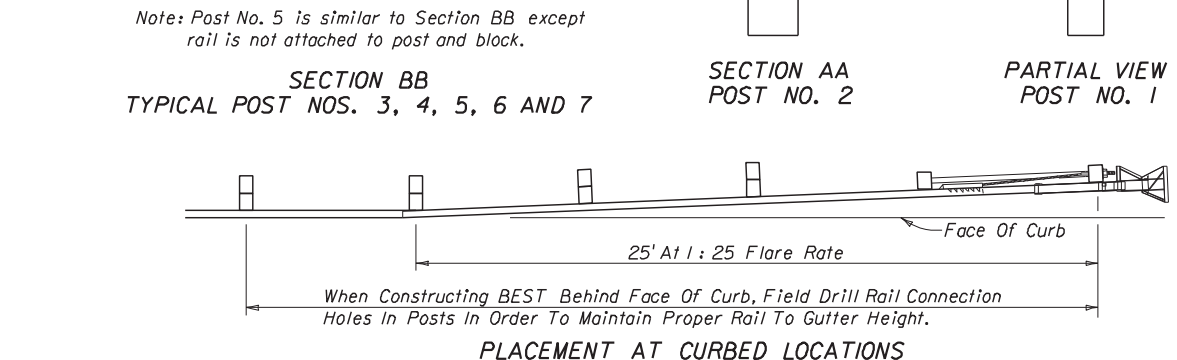
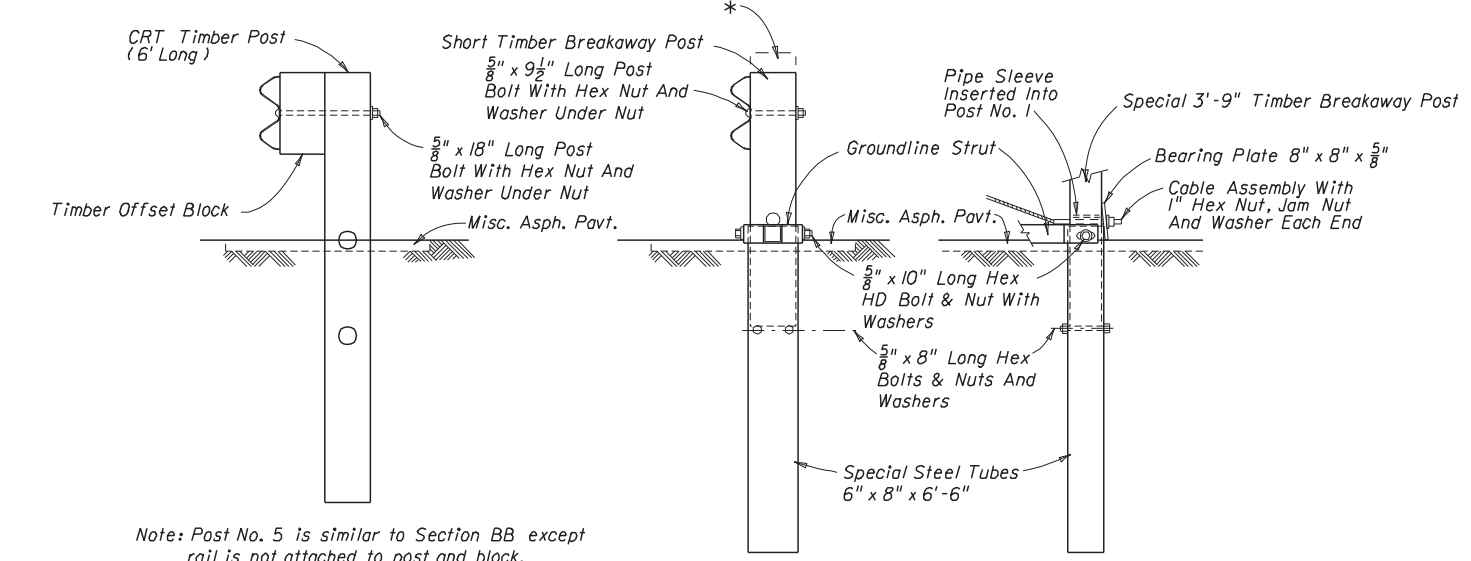
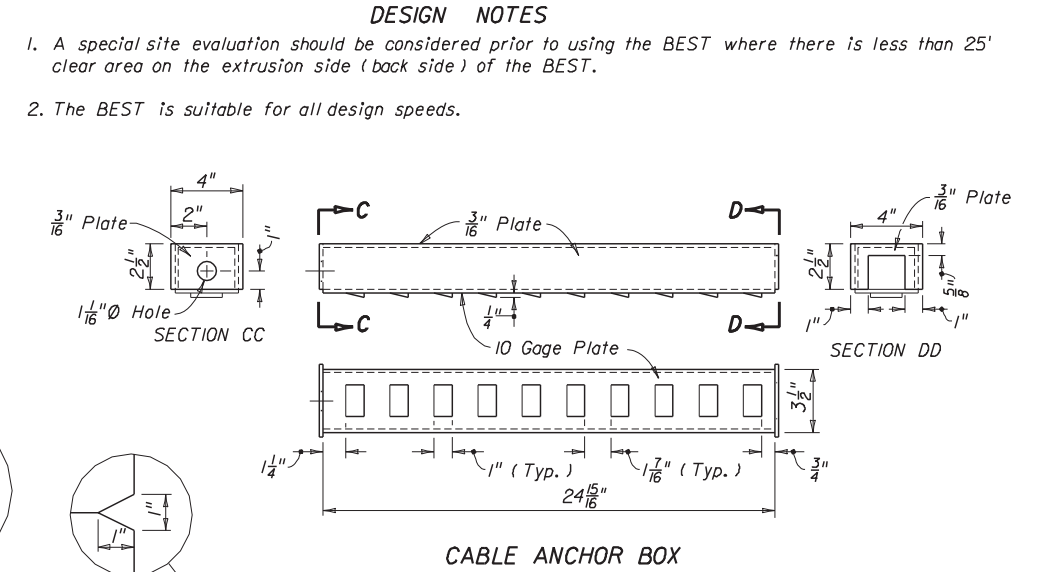
Assemble With 5/8" Dia x 1/4" Long Oval Shoulder Button Head Bolts And Nuts With Plain Round Washers Under Nuts (6 Req'd.).

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By		
Designed By	MFG	2/96	State Roadway Design Engineer	
Drawn By	HKH	2/96		
Checked By	JVG	2/96		
Revision		00	Sheet No.	Index No.
			26 of 31	400

END ANCHORAGE ASSEMBLY TYPE SRT-350 (8 POST SYSTEM)

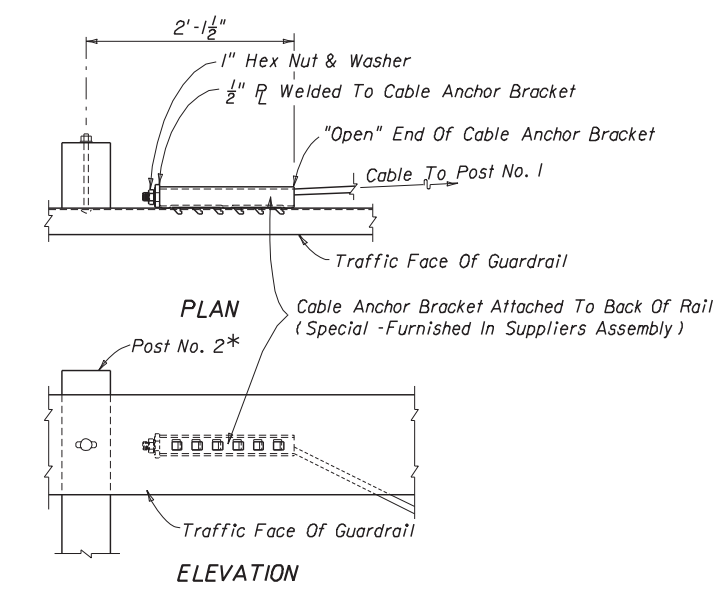
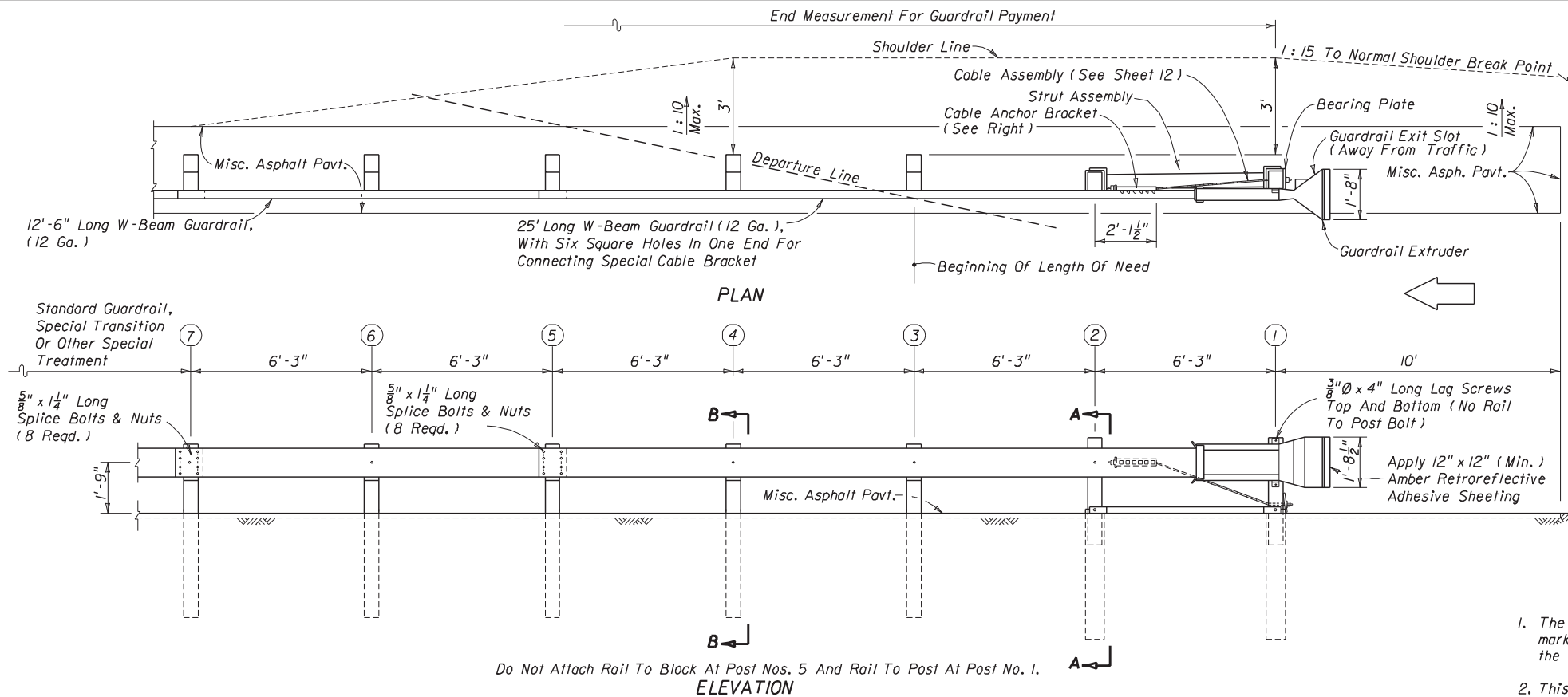


- 'BEST' NOTES**
1. The guardrail end anchorage system represented on this standard drawing is a proprietary design by Interstate Steel Corporation and marketed under the trade name BEST. Any infringement on the rights of the designer shall be the sole responsibility of the user.
 2. This standard drawing is produced by the Florida Department Of Transportation solely for the use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the BEST and their incorporation into a whole system.
 3. This standard drawing is sufficient for plan details for the BEST when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The BEST shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
 4. The BEST is intended for use as an approach end guardrail anchorage for shoulder guardrail located parallel to travel or auxiliary lanes. The effective length of the BEST is 37.5' including a 25' special W-Beam panel plus one 12.5' standard W-Beam panel outside of any other standard guardrail, guardrail transitions or other special treatments. The alignment of the BEST is an extension of the normal guardrail alignment, except when constructed with curb the alignment of the BEST will be flared over the first 25' at a rate of 1 : 25.
 5. The BEST can not be used in medians where horizontal clearance requires the use of a backrail.
 6. Posts at location Nos. 1 and 2 must be timber breakaway posts with special length steel foundation tubes without soil plates. The posts at location Nos. 3, 4, 5, 6 and 7 shall be CRT timber posts.
 7. See the General Notes for galvanizing requirements of metallic components.
 8. If the plans call for the 'BEST' at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'parallel' at a specific location, the contractor has the option to construct any FDOT approved parallel assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchor will not be eligible for VECP consideration.
 9. The BEST shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.



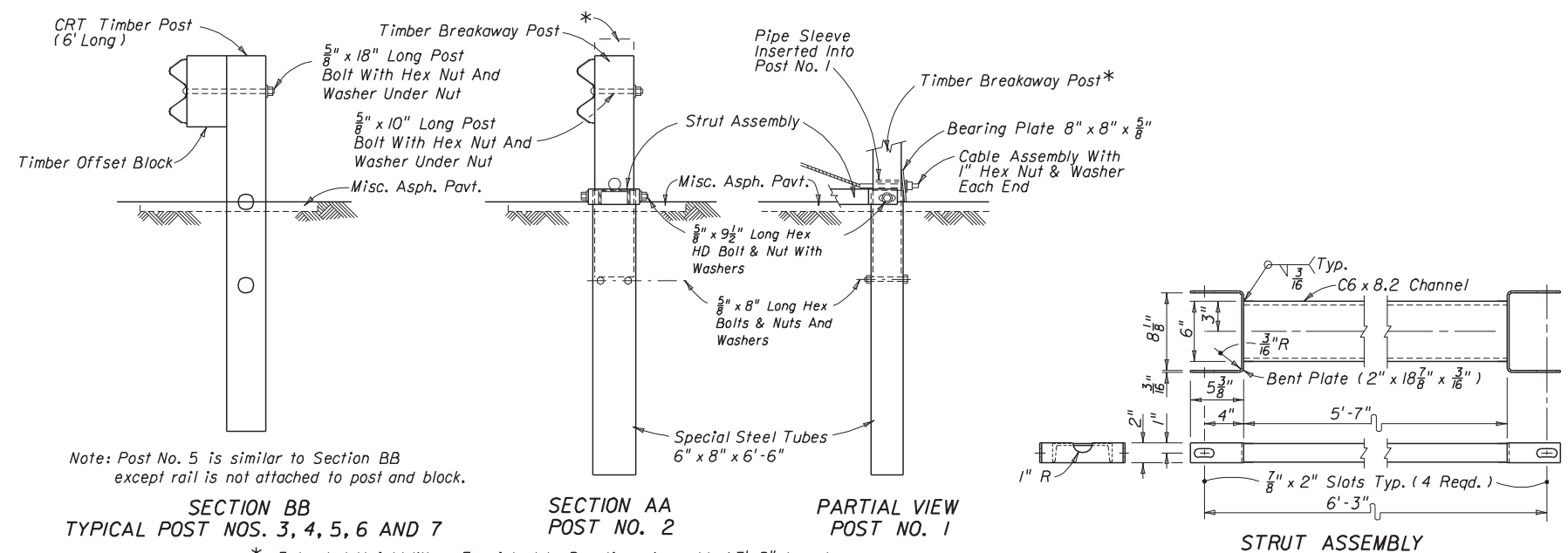
END ANCHORAGE ASSEMBLY TYPE BEST

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Designed By	MFG	8/95	Approved By <i>[Signature]</i>	
Drawn By	HKH	8/95	Revision	Sheet No.
Checked By	JVG	8/95	00	27 of 31
				Index No. 400



CABLE ANCHOR BRACKET INSTALLATION
LET NOTES

1. The guardrail end anchorage system represented on this standard drawing is a proprietary design by Syro, Inc. and marketed under the trade name ET-2000 LET hereafter referred to and identified as LET. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the LET and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the LET when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The LET shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The LET is intended for use as an approach end guardrail anchorage for shoulder guardrail located parallel to travel or auxiliary lanes. The effective length of the LET is 37.5' including one 25' special W-Beam panel and one 12.5' standard W-Beam panel. The effective length is outside of any other standard guardrail, guardrail transitions or other special treatments. The LET alignment is an extension of the normal guardrail alignment, except when constructed with curb the alignment of the LET will be flared over the first 25' at a rate of 1:25.
5. The LET can not be used in medians where horizontal clearance requires the use of a backrail.
6. Posts at location Nos. 1 and 2 must be timber breakaway posts with special length steel foundation tubes without soil plates. Posts at location Nos. 3, 4, 5, 6 and 7 must be CRT timber posts.
7. See the General Notes for galvanizing requirements of metallic component.
8. If the plans call for the 'LET' at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'parallel' at a specific location, the contractor has the option to construct any FDOT approved parallel assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchor will not be eligible for VECP consideration.
9. The LET shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturers detailed drawings, procedures and specifications and this Index.



Note: Post No. 5 is similar to Section BB except rail is not attached to post and block.

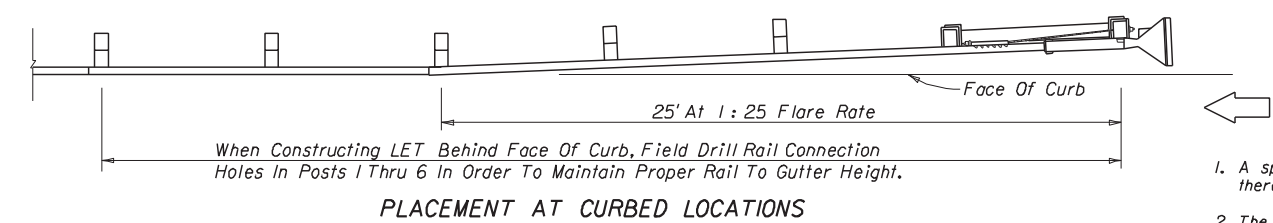
SECTION BB TYPICAL POST NOS. 3, 4, 5, 6 AND 7

SECTION AA POST NO. 2

PARTIAL VIEW POST NO. 1

STRUT ASSEMBLY

* Extended Height When Furnished In Suppliers Assembly (3'-9" Long)



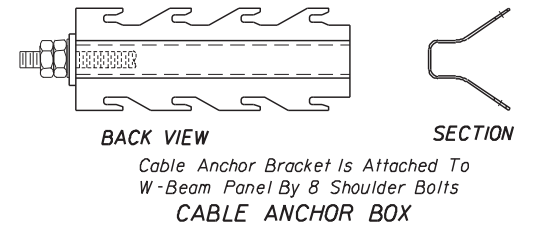
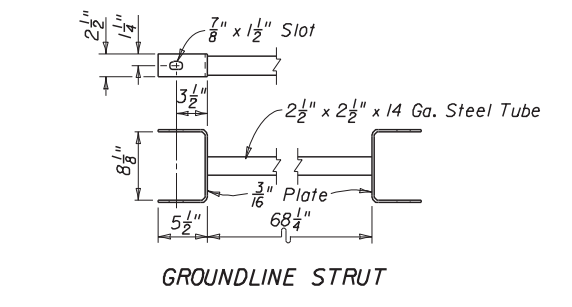
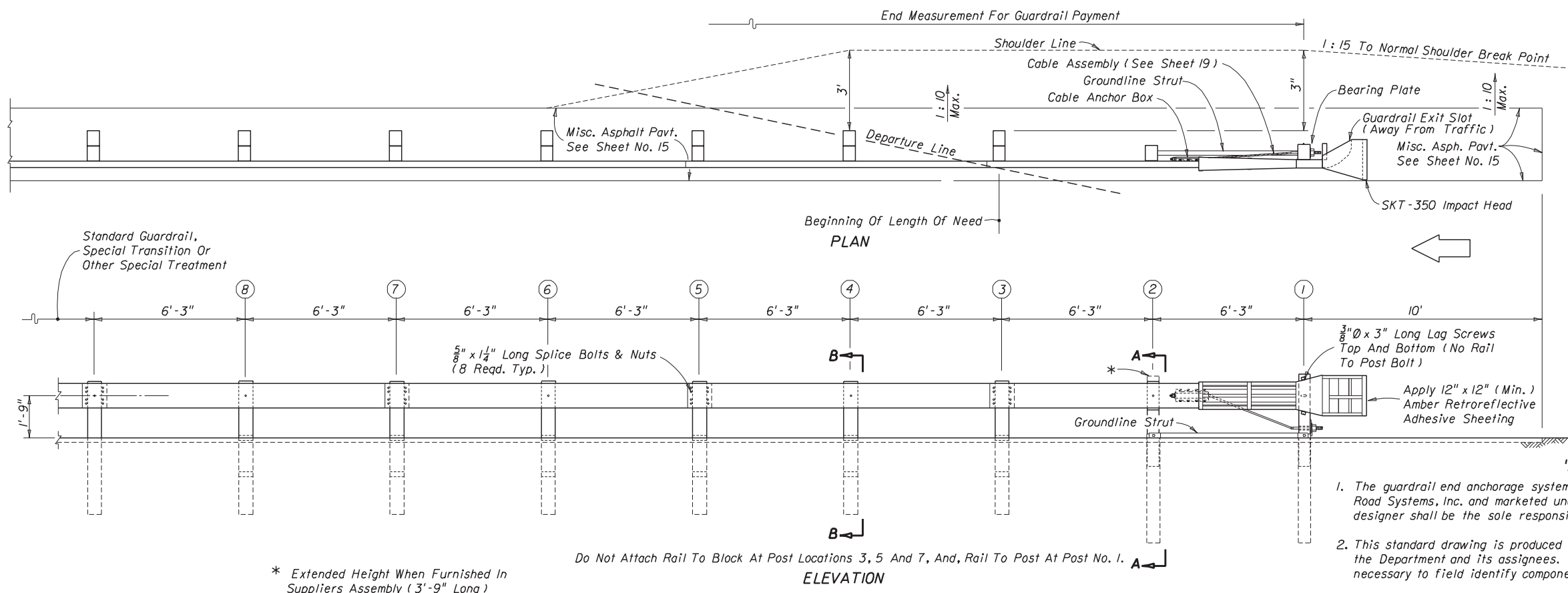
PLACEMENT AT CURBED LOCATIONS

DESIGN NOTES

1. A special site evaluation should be considered prior to using the LET where there is less than 25' clear area on the extrusion side (back side) of the LET.
2. The LET is suitable for all design speeds.

END ANCHORAGE ASSEMBLY TYPE LET

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Designed By	STAFF	Dates	10/97	Approved By
Drawn By	HKH	10/97		State Roadway Design Engineer
Checked By	JVG	10/97	00	Revision
			28 of 31	Sheet No.
				Index No.
				400

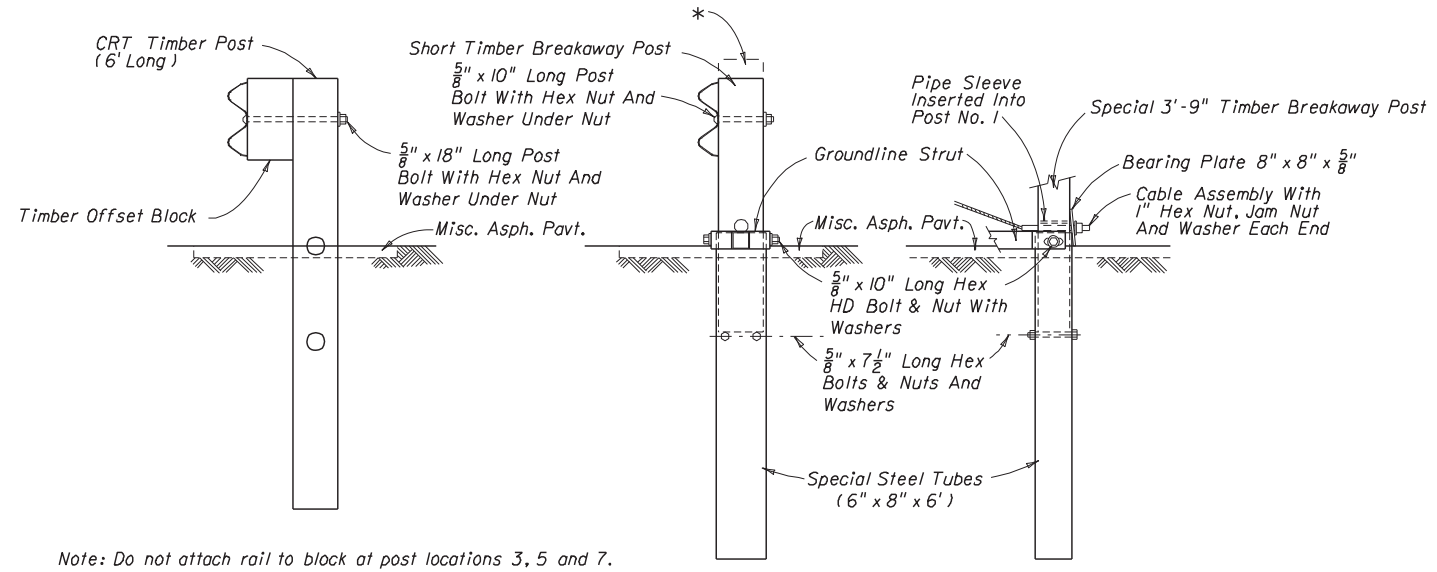


'SKT-350' NOTES

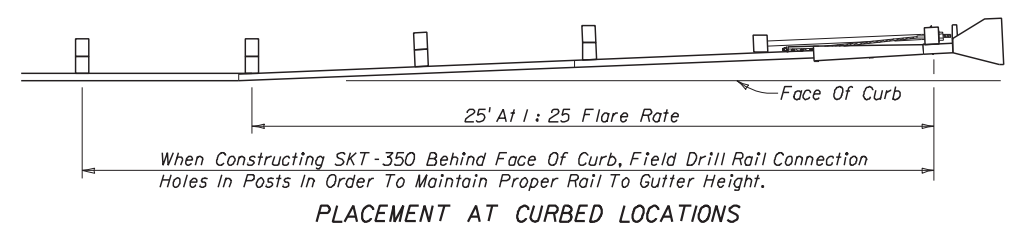
1. The guardrail end anchorage system represented on this standard drawing is a proprietary design by Road Systems, Inc. and marketed under the trade name SKT-350. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for the use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the SKT-350 and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the SKT-350 when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The SKT-350 shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The SKT-350 is intended for use as an approach end guardrail anchorage for shoulder guardrail located parallel to travel or auxiliary lanes. The effective length of the SKT-350 is 50'. The alignment of the SKT-350 is an extension of the normal guardrail alignment, except when constructed with curb the alignment of the SKT-350 will be flared over the first 25' at a rate of 1 : 25.
5. The SKT-350 can not be used in medians where horizontal clearance requires the use of a backrail.
6. Posts at location Nos. 1 and 2 must be timber breakaway posts with special length steel foundation tubes without soil plates. The posts at location Nos. 3, 4, 5, 6, 7 and 8 shall be CRT timber posts.
7. See the General Notes for galvanizing requirements of metallic components.
8. If the plans call for the 'SKT-350' at a specific location, substitution with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'parallel' at a specific location, the contractor has the option to construct any FDOT approved parallel assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchor will not be eligible for VECP consideration.
9. The SKT-350 shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.

* Extended Height When Furnished In Suppliers Assembly (3'-9" Long)

Do Not Attach Rail To Block At Post Locations 3, 5 And 7, And, Rail To Post At Post No. 1.



Note: Do not attach rail to block at post locations 3, 5 and 7.



- DESIGN NOTES**
1. A special site evaluation should be considered prior to using the SKT-350 where there is less than 25' clear area on the extrusion side (back side) of the SKT-350.
 2. The SKT-350 is suitable for all design speeds.

END ANCHORAGE ASSEMBLY TYPE SKT-350

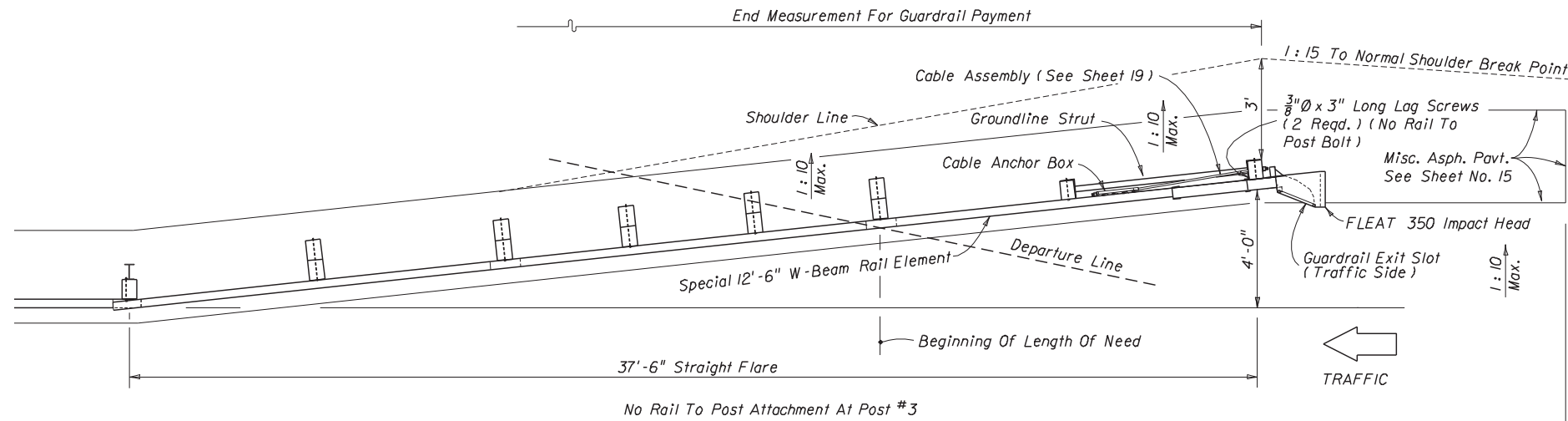
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN						
GUARDRAIL						
Names	Dates	Approved By				
Designed By	MFG	8/95	 State Roadway Design Engineer			
Drawn By	HKH	8/95			Revision	Sheet No.
Checked By	JVG	8/95			00	29 of 31
				Index No. 400		

'FLEAT-350' NOTES

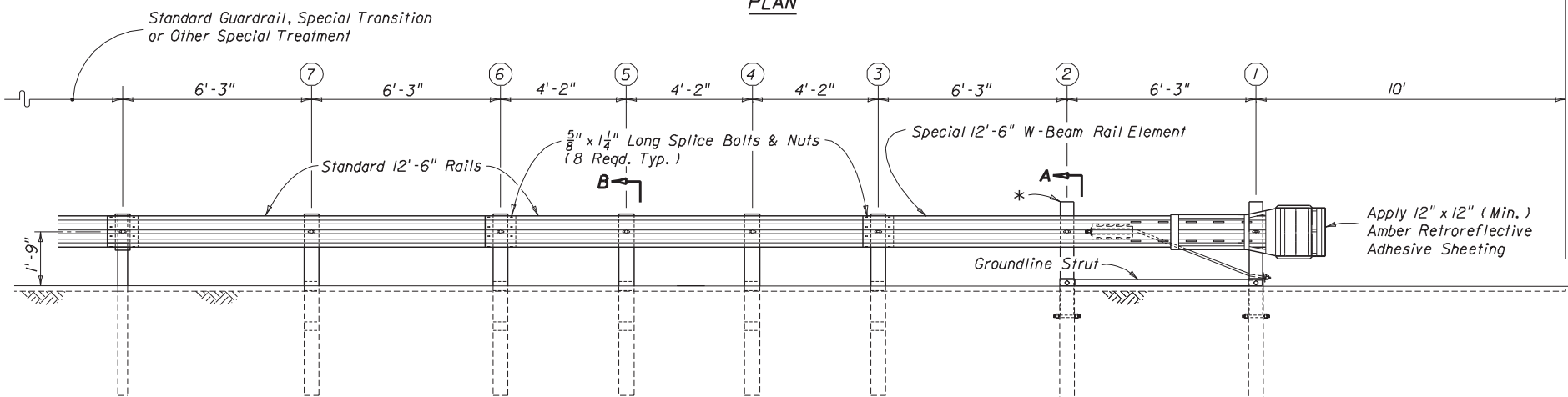
1. The guardrail end anchorage system represented on this standard drawing is a proprietary design by Road Systems, Inc. and marketed under the trade name FLEAT-350. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for the use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the FLEAT-350 and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the FLEAT-350 when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The FLEAT-350 shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The FLEAT-350 is intended for use as an approach end guardrail anchorage for shoulder guardrail on one-way facilities and divided multilane facilities. The effective length of the FLEAT-350 is 37.5' including one 12.5' special W-Beam panel plus two 12.5' standard W-Beam panels outside of any other standard guardrail, guardrail transitions or other special treatments. The alignment of the FLEAT-350 is a straight flare with end offset of 4' from the normal guardrail alignment.
5. The FLEAT-350 can not be used in medians where horizontal clearance requires the use of a backrail.
6. Posts at location Nos. 1 and 2 must be timber breakaway posts with special length steel foundation tubes without soil plates. The posts at location Nos. 3, 4, 5, 6, and 7 shall be CRT timber posts.
7. See the General Notes for galvanizing requirements of metallic components.
8. If the plans call for the 'FLEAT-350' at a specific location, substitution with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
9. The FLEAT-350 shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the manufacturer's detail drawings, procedures and specifications and this Index.

DESIGN NOTES

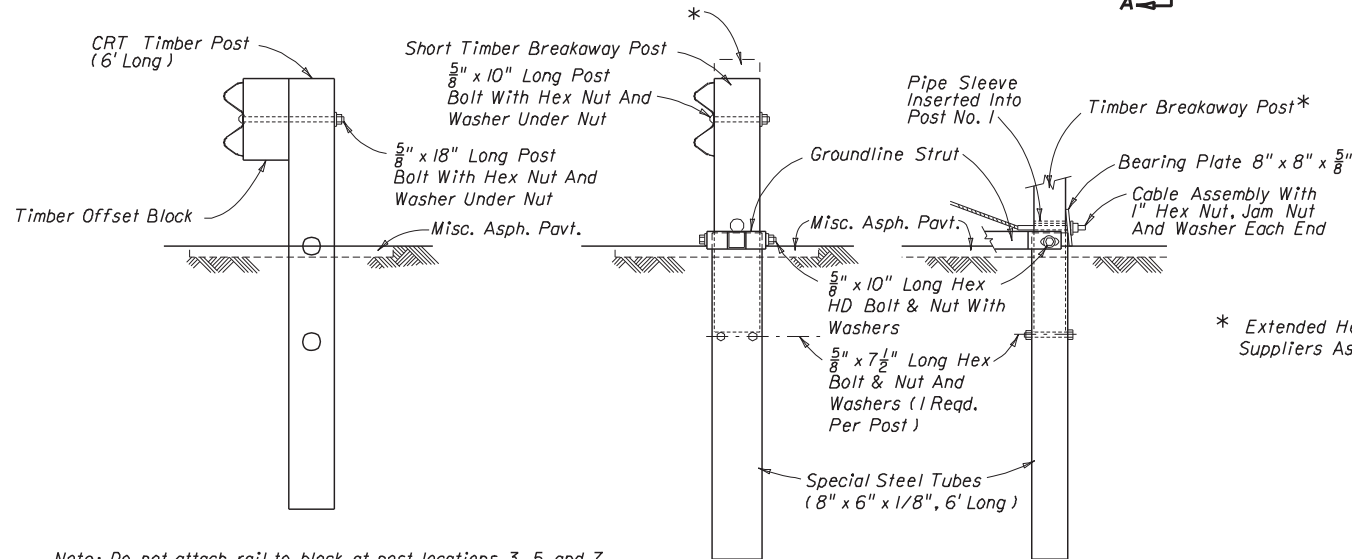
1. The FLEAT-350 is suitable for all design speeds.



PLAN



ELEVATION

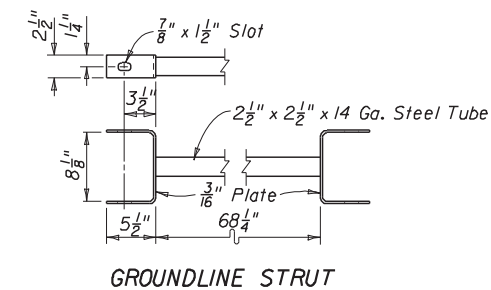


Note: Do not attach rail to block at post locations 3, 5 and 7.

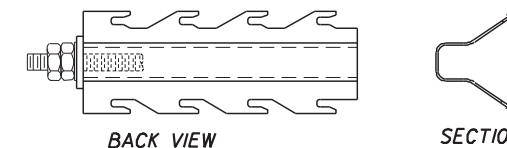
SECTION BB
TYPICAL POST NOS. 3, 4, 5, 6 AND 7

SECTION AA
POST NO. 2

PARTIAL VIEW
POST NO. 1



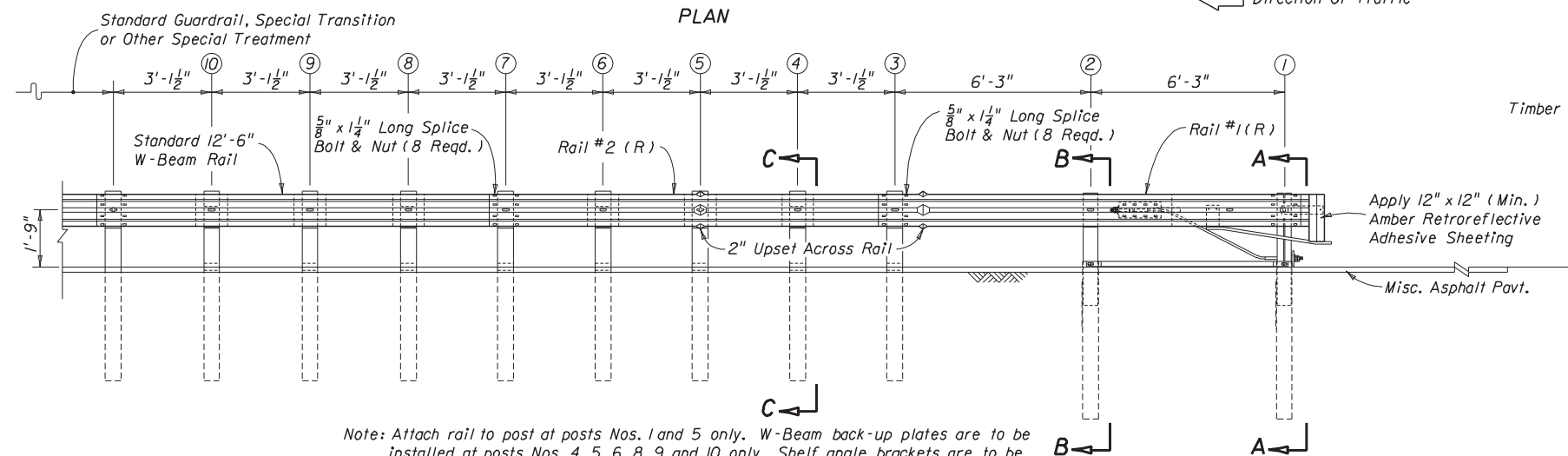
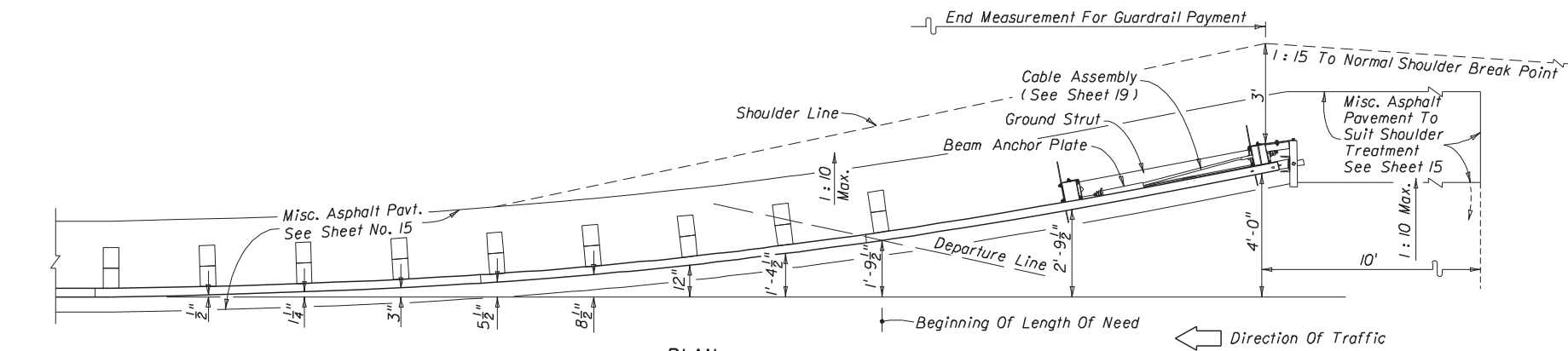
GROUNDLINE STRUT



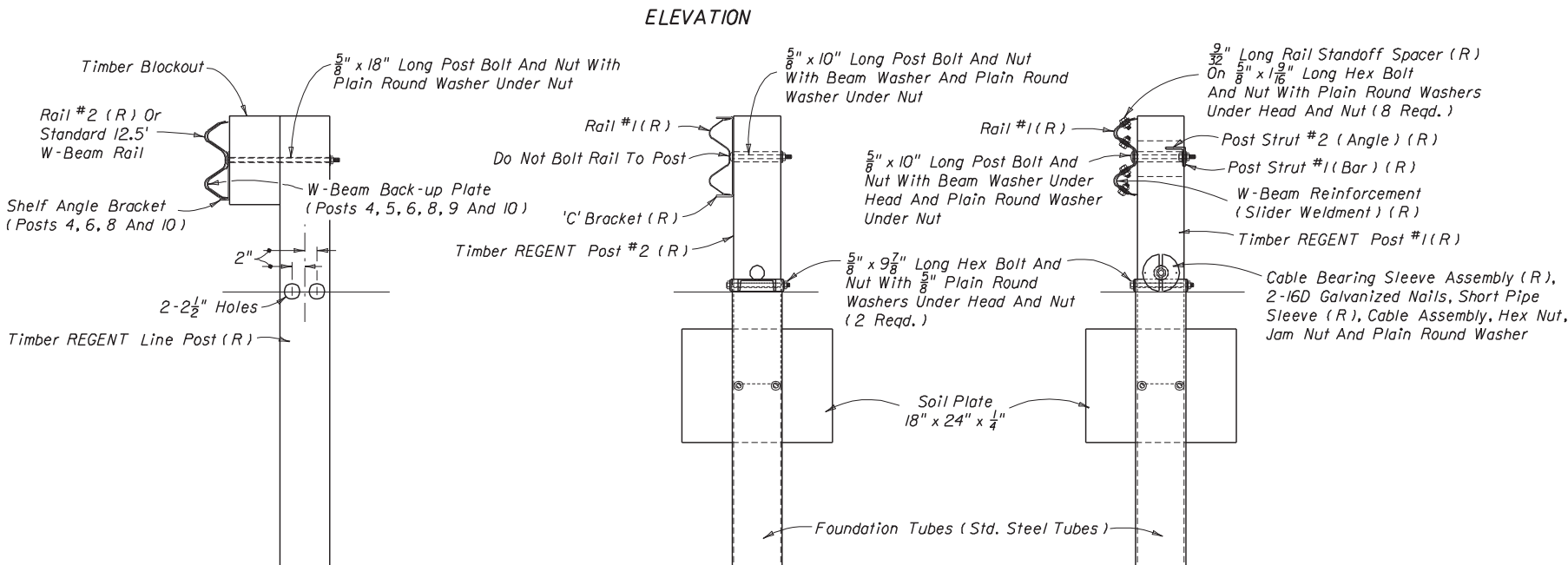
BACK VIEW
SECTION
Cable Anchor Bracket Is Attached To
W-Beam Panel By 8 Shoulder Bolts
CABLE ANCHOR BOX

END ANCHORAGE ASSEMBLY TYPE FLEAT-350

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By		
Designed By	MFG	07/98	 State Roadway Design Engineer	
Drawn By	HKH	07/98		
Checked By	JVG	07/98		
Revision		00	Sheet No.	Index No.
			30 of 31	400



Note: Attach rail to post at posts Nos. 1 and 5 only. W-Beam back-up plates are to be installed at posts Nos. 4, 5, 6, 8, 9 and 10 only. Shelf angle brackets are to be installed at posts Nos. 4, 6, 8 and 10 only.



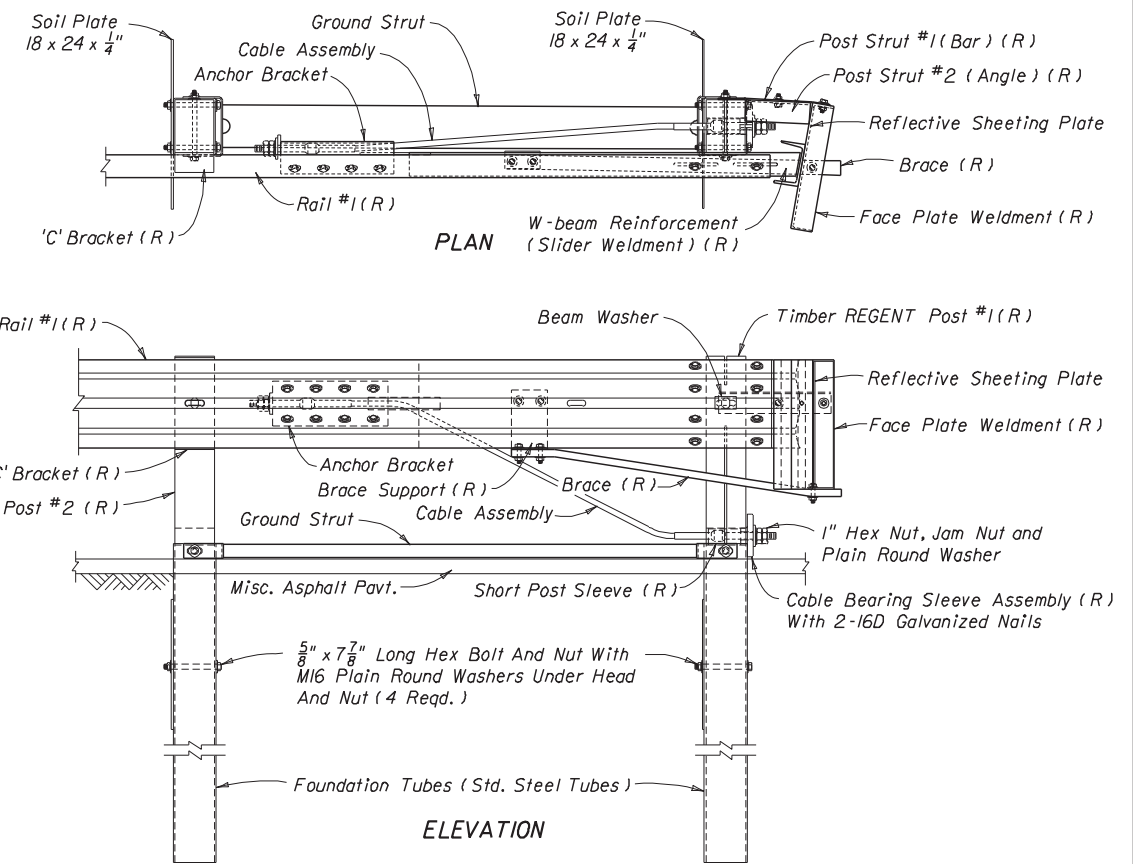
Note: Attach Rail To Post At Post No. 5 Only

SECTION CC
TYPICAL POST NOS. 3 THRU 10

SECTION BB
POST NO. 2

SECTION AA
POST NO. 1

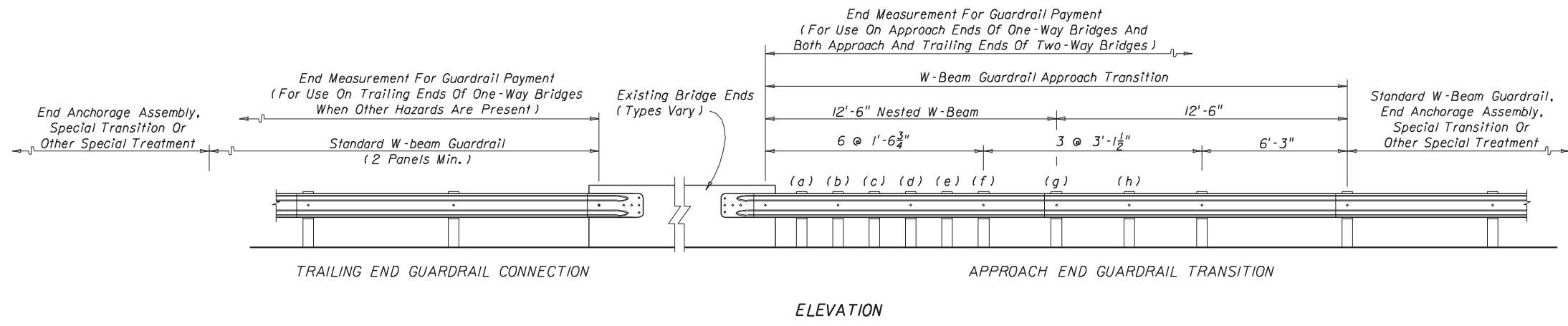
END ANCHORAGE ASSEMBLY TYPE REGENT



'REGENT' NOTES

- The REGENT is suitable for all design speeds. The REGENT is intended for use as an approach end guardrail anchorage for shoulder guardrail. Its alignment is a parabolic flare from the normal guardrail alignment with an effective length of 37.5' including two special W-Beam panels and one standard W-Beam panel outside of any standard guardrail, guardrail transitions or other special treatments.
- This standard drawing is produced by the Florida Department of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the REGENT and their incorporation into a whole system.
- This standard drawing is sufficient for plan details for the REGENT when installed in connection with shoulder guardrail and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. The REGENT shall be assembled in accordance with the distributor's detailed drawings, procedures and specifications.
- The first post must be a timber REGENT Post #1 with a steel foundation tube and soil plate; the second post must be a timber REGENT Post #2 with a steel foundation tube and soil plate; and, posts Nos. 3 thru 10 must be timber REGENT line posts.
- The suffix (R) indicates components unique to the REGENT System, these components along with bolts, nuts and washers not labeled are to be furnished in the distributor's package.
- The REGENT can not be used in medians where horizontal clearance requires the use of a backrail.
- See the General Notes for galvanizing requirements of metallic components.
- If the plans call for the 'REGENT' at a specific location, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. If the plans call for end anchorage assembly 'flared' at a specific location, the contractor has the option to construct any FDOT approved flared assembly. Where a flared end anchorage is called for in the plans, any approved substitution with a parallel end anchorage will not be eligible for VECP consideration.
- The REGENT shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA and shall be full compensation for furnishing and installing all components in accordance with the plans; the distributor's detailed drawings, procedures and specifications and this Index.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL				
Names	Dates	Approved By		
Designed By	MFG 07/98	 State Roadway Design Engineer		
Drawn By	HKH 07/98			
Checked By	JVG 07/98			
		Revision	Sheet No.	Index No.
		00	31 of 31	400



GENERAL NOTES

- Whether an existing bridge handrail is to remain in place, be retrofitted or be replaced, is a determination that must be made independent of any information contained on this Index.
Only after it has been established that an existing bridge handrail is to remain in place is this Index to be used to analyze guardrail to bridge connections.
- The schemes on this index are not to be used for new bridge construction, bridge widening, bridge barrier wall or handrail replacement, or, for existing bridges that have safety shape traffic barrier.
- The schemes on this index are divided into two general categories, representing curbed and uncurbed roadway approaches. A scheme selection guide is provided below for curbed and uncurbed roadway approaches. Approach slabs with curbs or wing walls with radial safety curbs will be treated as curbed roadway approaches.
- Existing bridge features shown in these schemes are example configurations only. The principle key to scheme selection is bridge curb or sidewalk width. Location control is keyed to bridge face of curb, except for certain trailing conditions.
- Details that are repetitive on the schemes and features that are detailed on Index No. 400 have been purposely deleted to produce clarity and simplification in the schemes, and to emphasize proper location and positioning of the anchorage and connecting guardrail.
- All schemes are right side or right hand details for traffic flow right to left. Left side applications are opposite hand.
- For undivided two-way bridges 'trailing end', as used in this index, is in relation to the direction of travel of near lane traffic, but it is always considered as an approach for opposing lane traffic.
- All connections of guardrail special end shoes to concrete anchorage posts, panels and walls shall have a 12" x 12" x 5/8" galvanized steel back-up plate for gang tightening of hex nuts on 7/8" diameter galvanized hex bolts; hex bolts shall have a nominal length equal to the thickness of the concrete anchorage plus 1 1/2".

When thru bolts would penetrate existing bridge rails, 7/8" diameter bolt clusters and chemical anchor bolts meeting the manufacturers recommendation may be substituted as approved by the Engineer.

- Unless otherwise called for in the plans exposed concrete surfaces shall have a Class 3 surface finish and Class 5 Applied Finish Coating in accordance with Section 521 and 400 respectively of the Standard Specifications.
- The guardrail end anchorage schemes on this index do not include cost for payment of guardrail. See above for limit of guardrail measurement.

Each independent anchorage described in these schemes shall be paid for as a bridge end anchorage assembly under the contract unit price for Bridge Anchorage Assembly, EA. The unit price shall be full compensation for the following:
(a) Each concrete anchor post, panel or transition wall including reinforcing steel, existing rail or rail and post removal, socket filling, bond breaker, post beveling, drilling, dowels, grouting, excavation, backfill, special end shoe and accessory items.
(b) Each guardrail steel terminal post, including flared end section, anchorage and accessory items (optional use not included).
(c) Each special end shoe anchored directly to an existing bridge end post or wing post, including back-up plate and accessory items.

Continuous concrete safety barrier (Schemes 1 & 19) shall be paid for as a roadway item under the contract unit price for Concrete Handrail (Retrofit Barrier) (Vert. Face), LF.

Continuous guardrail across bridges shall be paid for as a roadway item under the contract unit price for Guardrail (Bridge) LF, and Special Guardrail Post, EA. The unit price for guardrail shall include the cost for all accessories prescribed under Index No. 400 and the unit price for special posts shall include the cost for all accessories and anchorage prescribed in Index 400 and in Scheme 16 of this Index.

GUARDRAIL NOTE

Approach end guardrail transitions shall be constructed on the approach ends of one-way bridges, and both the approach and trailing ends of undivided two-way bridges. Nested rails shall not be bolted to the blocks and posts at posts (a), (c), and (e). Trailing end guardrail connections shall be constructed on the trailing ends of one way bridges when other hazards are present. One 16d galvanized nail shall be driven between each timber post and block, and between double blocks, in order to prevent block rotation, see Index No. 400 '16d NAIL FOR PREVENTION OF OFFSET BLOCK ROTATION'. All posts are standard guardrail posts except where special circumstances require the use of guardrail steel terminal posts, special steel guardrail posts or encased guardrail posts. Refer to Index No. 400 for additional guardrail details.


DESIGN NOTES

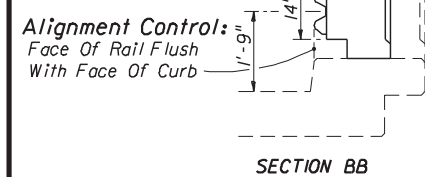
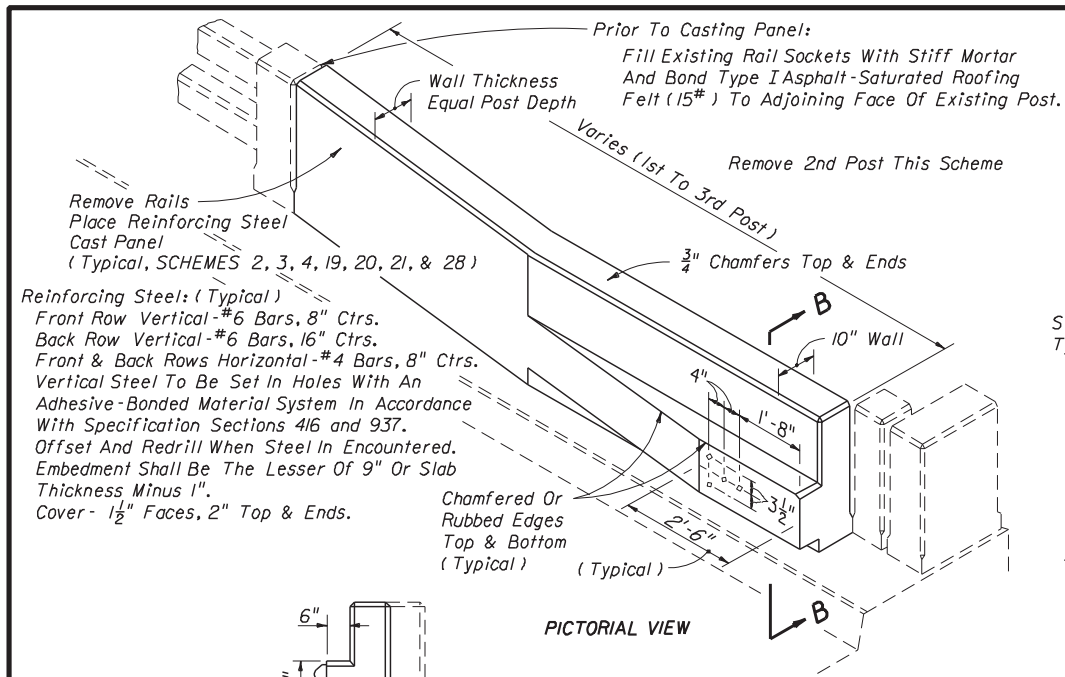
- The details in this index are intended to be used for existing bridges that have end and approach slab configurations constructed under former Department standards; and, are not intended to preclude special design details more suited to bridges with unusual handrail or wingpost configurations, or, when there is conflict with drainage structures or other features that can not be adjusted.
- The schemes provide the designer with a convenient method of providing standardized information on the plans. In the selection and assignment of schemes the designer must predetermine existing bridge handrail, curb, sidewalk and approach slab conditions, particularly the location of embedded conduit. Special attention must be directed to the presence or absence of curbed approaches on each independent corner of the bridge.
- Each corner of the bridge that requires a guardrail connection should be labeled independently by scheme number, and, where continuous barrier is required across a bridge the scheme number should be labeled independently on the side(s) of the bridge. When continuous guardrail is called for, bridge end anchorage assemblies will be omitted, but, when continuous concrete safety barrier is called for, one or more bridge end anchorage assemblies will be labeled on the plans.
- The scheme selection guide below is to be used as a quick reference for determining anchorages and continuous barriers that are applicable to specific conditions for existing bridges. When appropriate, special details are to be used in lieu of schemes or to supplement or complement the scheme details. In selecting schemes the width of curb, safety curb and sidewalk is the distance from the face of curb to the nearest face of post, rail or parapet.

SCHEME SELECTION GUIDE (NUMBERS)				
ONE-WAY BRIDGES	WITH ROADWAY CURBS APPROACHING BRIDGES Sheets 2 thru 6		WITHOUT ROADWAY CURBS APPROACHING BRIDGES Sheets 7 thru 9	
	APPROACH END	TRAILING END	APPROACH END	TRAILING END
Handrail Curb	3, 4, 18	3, 4, 18	21, 22, 27, 30	23, 27, 30
Narrow Curb	2, 3, 8, 9, 10, 11, 12, 13, 14	2, 3, 8, 15	20, 21, 27, 29	23, 27, 29
Wide Safety Curb	1, 2, 8, 11, 12, 13, 14, 15, 16, 17	1, 2, 8, 11, 12, 13, 14, 15, 16	19, 20, 28, 29	19, 23, 29
Sidewalks	1, 16	1, 16	19	19
TWO-WAY BRIDGES	APPROACH AND TRAILING ENDS		APPROACH AND TRAILING ENDS	
Handrail Curb	3, 4, 9, 10, 18		21, 22, 26, 30	
Narrow Curb	2, 3, 6, 7, 9, 10, 11, 12, 13, 14		20, 21, 25, 29	
Wide Safety Curb	1, 2, 5, 6, 9, 10, 11, 12, 13, 14, 16		19, 20, 24, 25, 29	
Sidewalks	1, 16		19	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

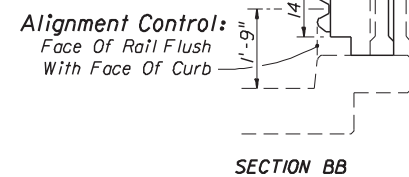
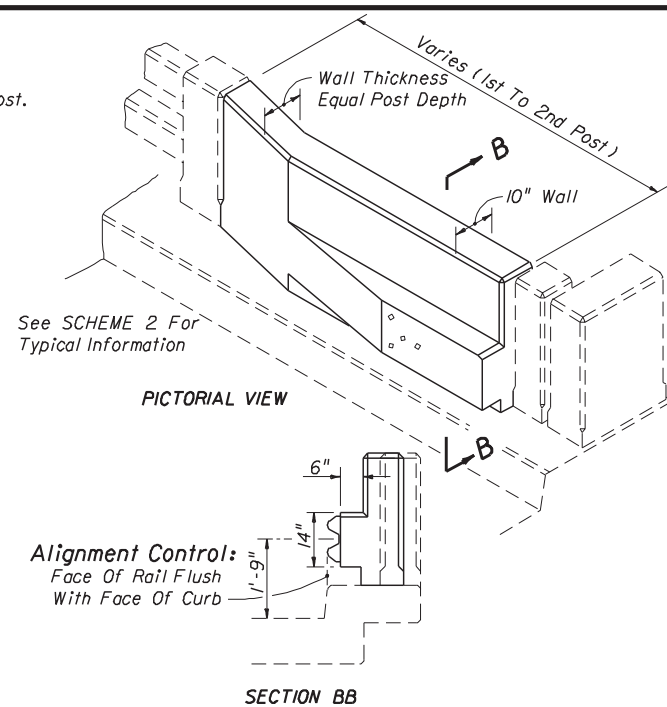
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES

Names	Dates	Approved By		
Designed By	JVG 09/86	 State Roadway Design Engineer		
Drawn By	HSD 09/86			
Checked By	JVG 09/86			
Revision	00	Sheet No.	Index No.	
		1 of 9	401	



APPLICATIONS
 SAFETY CURB 1'-1" TO 2'-0" WIDE
 POST AND DISCONTINUOUS BEAM RAILING
 APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
 APPROACH END OF ONE-WAY BRIDGES
 TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 2

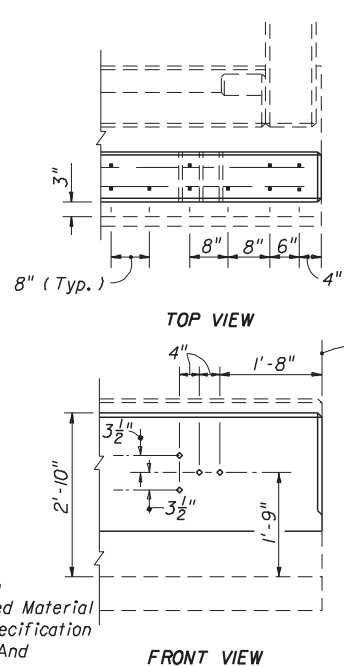
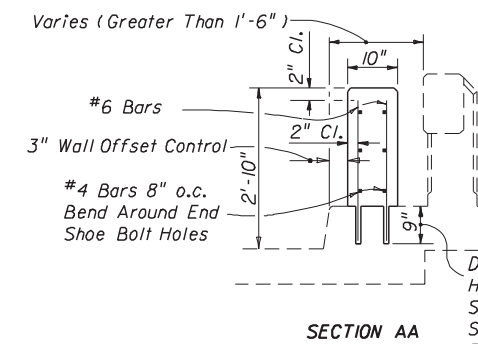
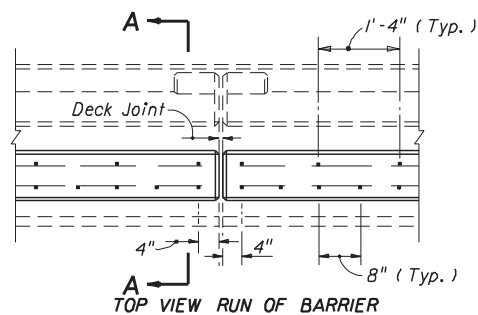


APPLICATIONS
 SAFETY CURB 1'-0" OR LESS IN WIDTH
 POST AND DISCONTINUOUS BEAM RAILING
 APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
 APPROACH END OF ONE-WAY BRIDGES
 TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 3

CAST IN PLACE PANELS

Estimated Quantities (Per L.F.)
 Class II Concrete - 0.06 C.Y.
 Reinforcing Steel - 16 Lbs.

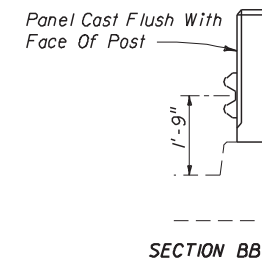
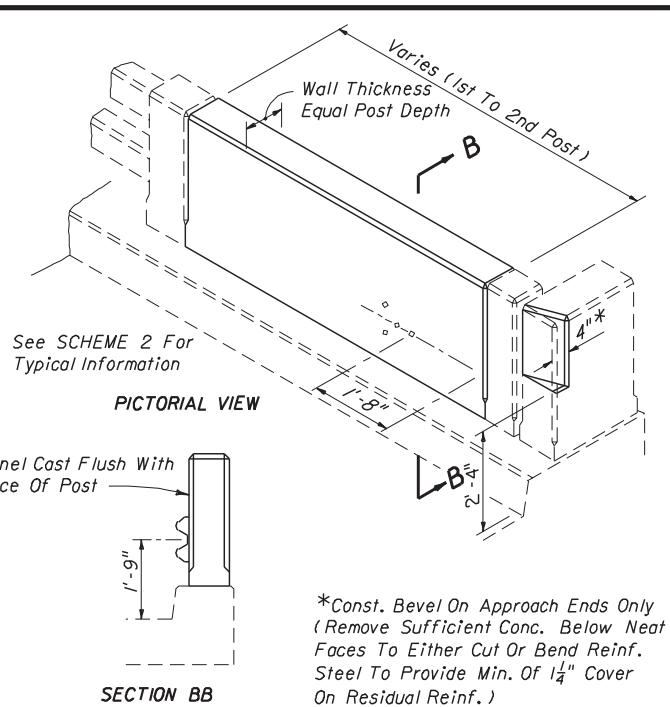


Beginning Or End Of Bridge
 Note: Holes For Special End Shoe Required:
 One-Way Bridges:
 Approach Ends
 Trailing Ends When Other Hazards Present
 Two-Way Bridges:
 Approach And Trailing Ends

APPLICATIONS
 SAFETY CURB WIDER THAN 1'-6" AND
 SIDEWALKS CONTINUOUS BARRIER ACROSS BRIDGE

SCHEME 1
CONCRETE SAFETY BARRIER

BRIDGES WITH APPROACHING ROADWAY CURB

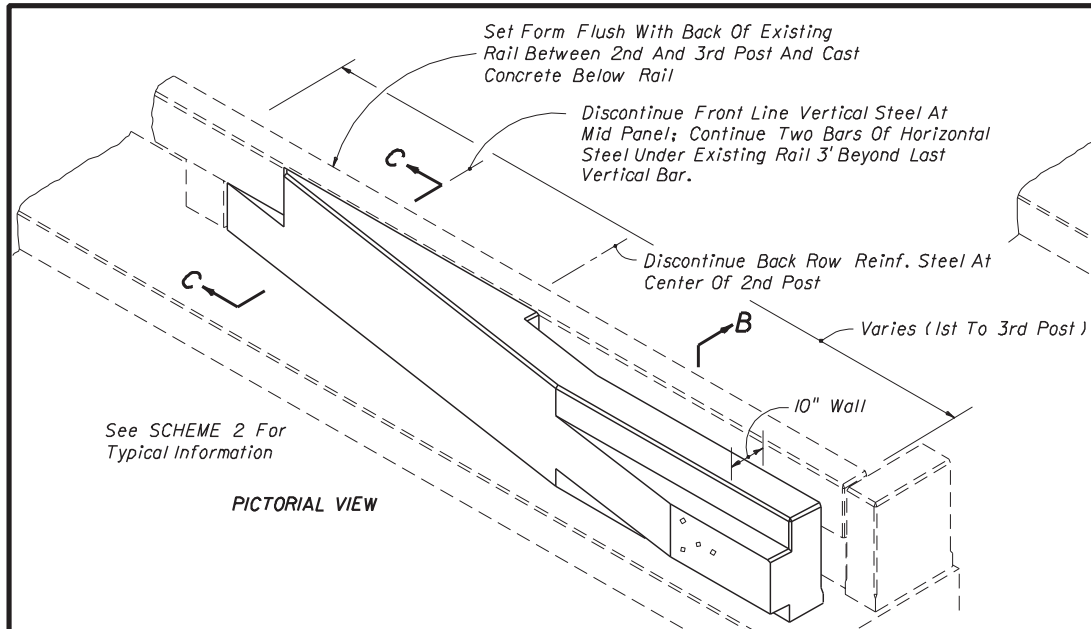


*Const. Bevel On Approach Ends Only
 (Remove Sufficient Conc. Below Neat
 Faces To Either Cut Or Bend Reinf.
 Steel To Provide Min. Of 1/4" Cover
 On Residual Reinf.)

APPLICATIONS
 HANDRAIL CURB
 POST AND DISCONTINUOUS BEAM RAILING
 APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
 APPROACH END OF ONE-WAY BRIDGES
 TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

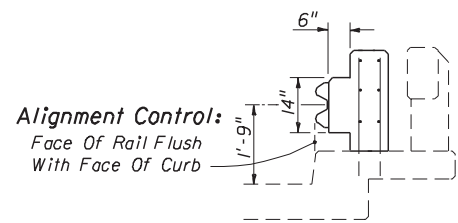
SCHEME 4

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES				
Names	Dates	Approved By		
Designed By	JVG	9/86	 State Roadway Design Engineer	
Drawn By	HSD	9/86		
Checked By	JVC	9/86		
Revision		00	Sheet No.	Index No.
			2 of 9	401



See SCHEME 2 For Typical Information

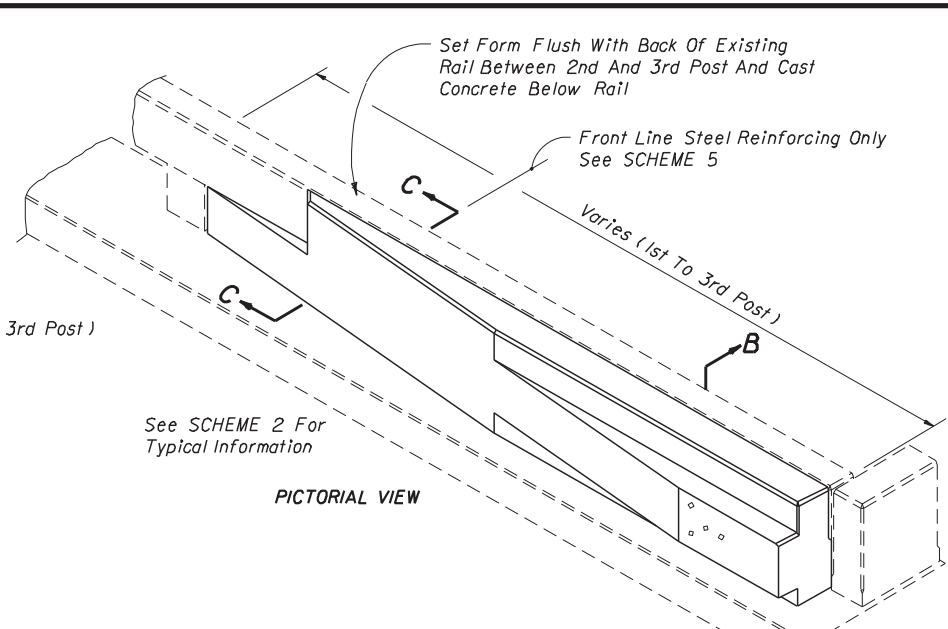
PICTORIAL VIEW



SECTION BB

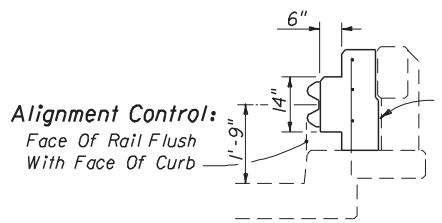
APPLICATIONS
 SAFETY CURB 2'-0" WIDE
 CONCRETE CONTINUOUS BEAM RAILING
 APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
 TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 5



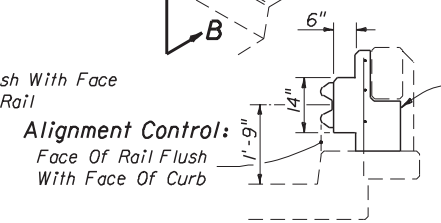
See SCHEME 2 For Typical Information

PICTORIAL VIEW



SECTION BB

CURBS 18" TO 23" WIDE (18" SHOWN)



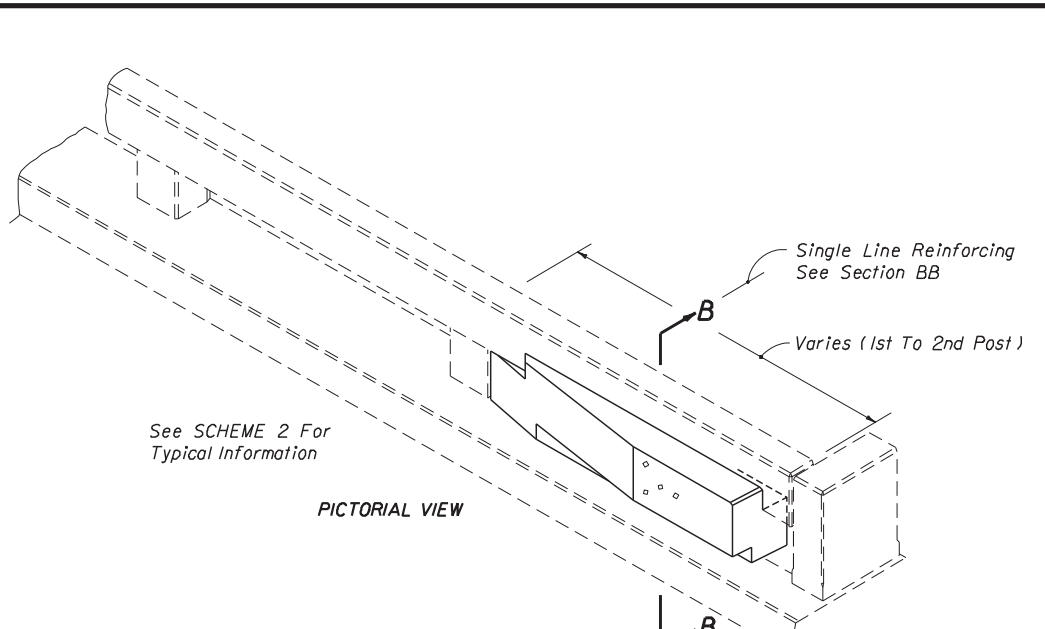
SECTION BB

CURBS 13" TO 17" WIDE (13" SHOWN)

APPLICATIONS
 SAFETY CURB 1'-1" TO 1'-11" WIDE
 CONCRETE CONTINUOUS BEAM RAILING
 APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES (CURBS 1'-1" TO 1'-11" WIDE)
 TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT (CURBS 1'-8" TO 1'-11" WIDE)

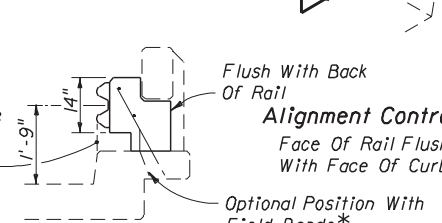
SCHEME 6

CAST IN PLACE PANELS



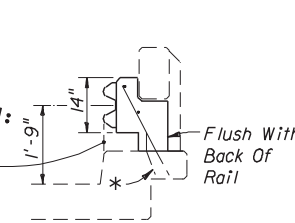
See SCHEME 2 For Typical Information

PICTORIAL VIEW



SECTION BB

(12" CURBS SHOWN)

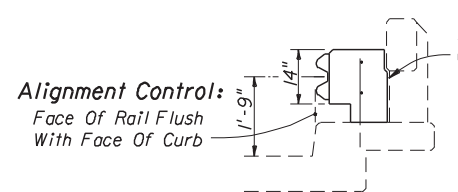


SECTION BB

(9" CURBS SHOWN)

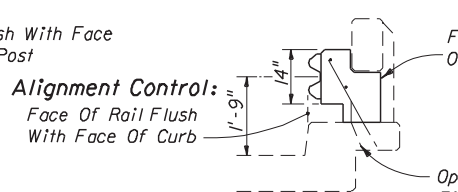
APPLICATIONS
 SAFETY CURB 9" TO 1'-0" WIDE
 CONCRETE CONTINUOUS BEAM RAILING
 APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES

SCHEME 7



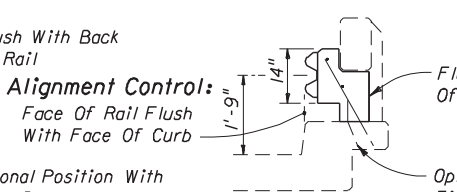
SECTION BB

CURBS 17" TO 19" WIDE (19" SHOWN)



SECTION BB

CURBS 9" TO 16" WIDE (12" SHOWN)



SECTION BB

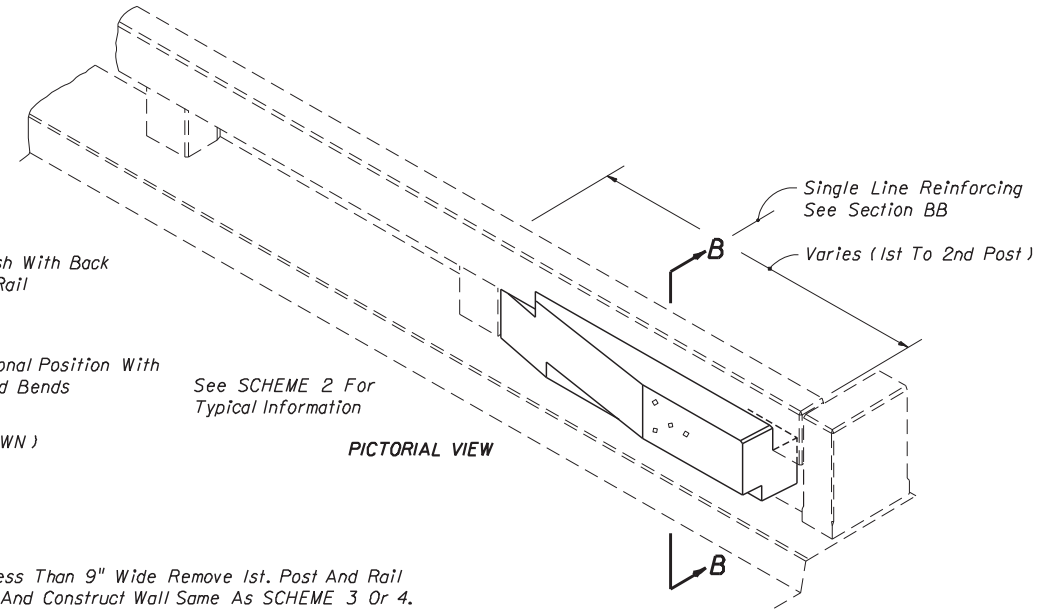
CURBS 9" TO 16" WIDE (9" SHOWN)

APPLICATIONS
 SAFETY CURB 9" TO 1'-7" WIDE
 CONCRETE CONTINUOUS BEAM RAILING
 APPROACH END OF ONE-WAY BRIDGES
 TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 8

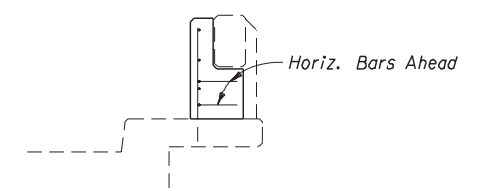
CAST IN PLACE PANELS

BRIDGES WITH APPROACHING ROADWAY CURB



See SCHEME 2 For Typical Information

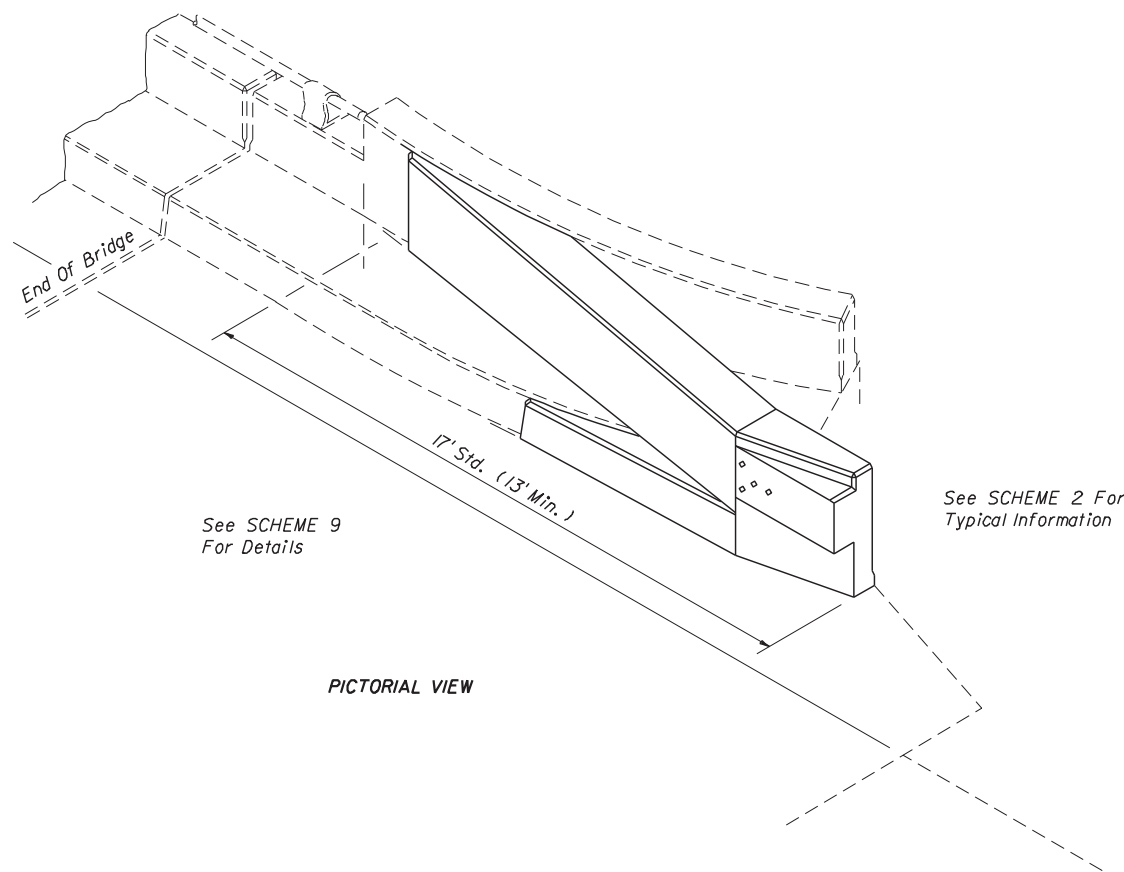
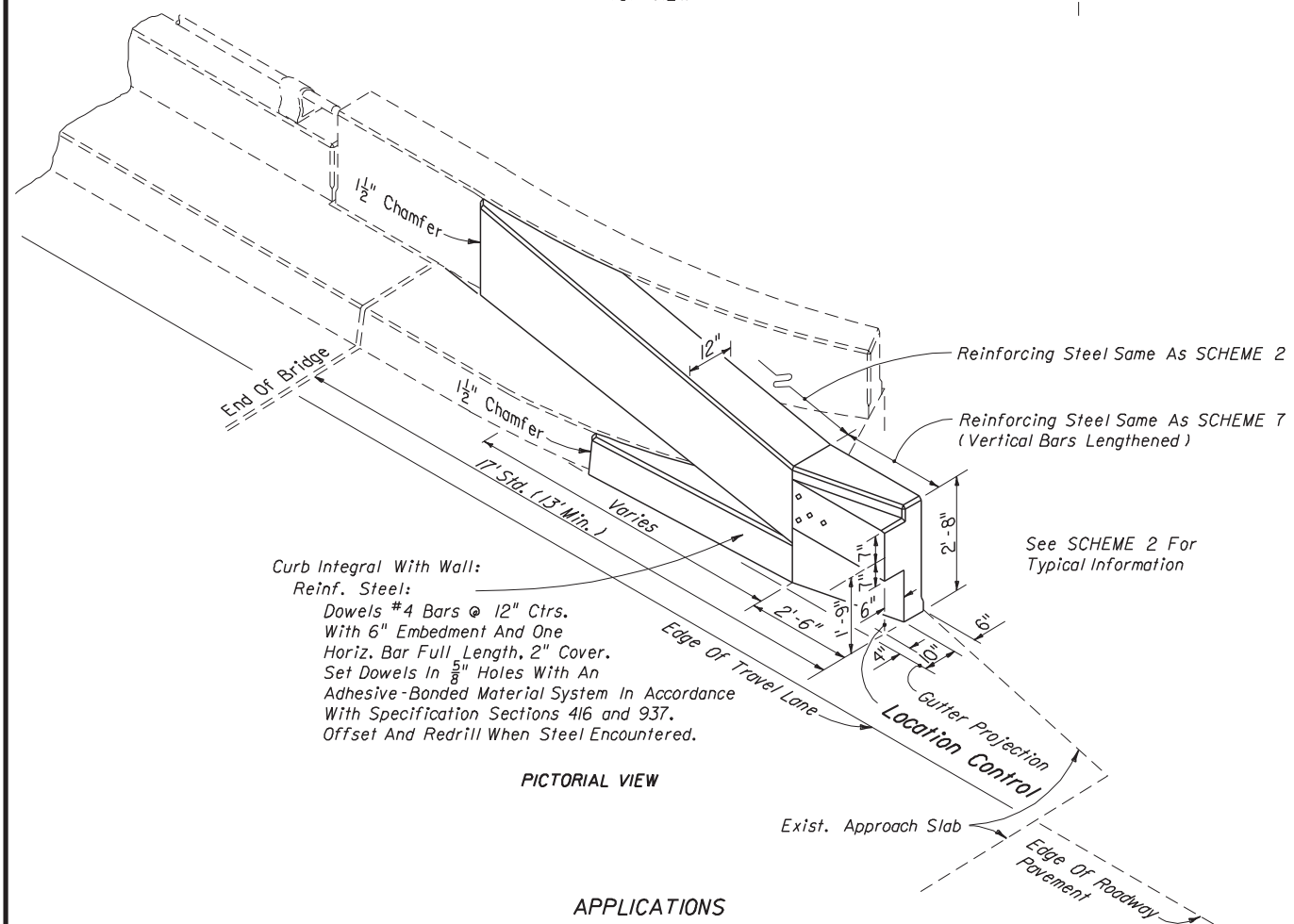
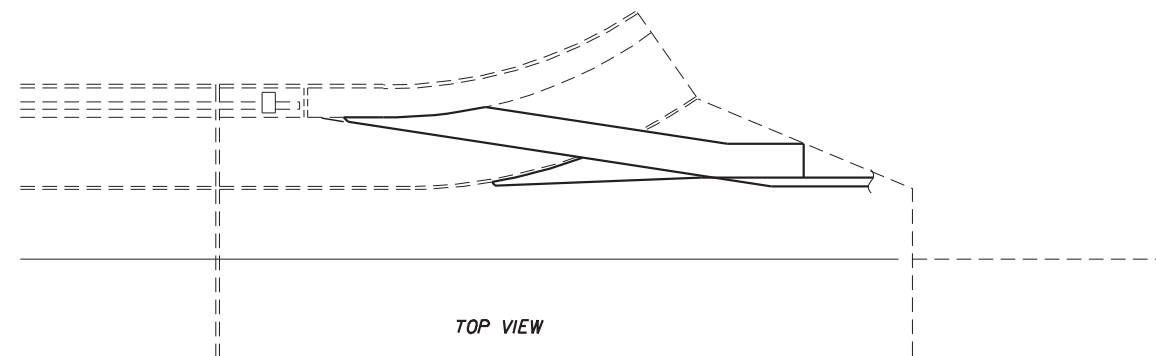
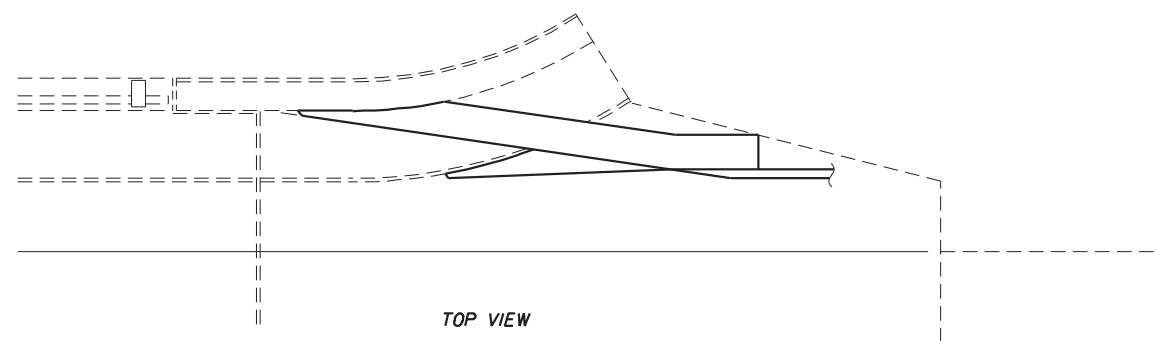
PICTORIAL VIEW



SECTION CC (SCHEMES 5, 6 & 8)

Note: For Curbs Less Than 9" Wide Remove 1st. Post And Rail To 2nd Post And Construct Wall Same As SCHEME 3 Or 4.
 For Safety Curbs Wider Than 19" See SCHEME 5, 6 & 9.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	JVG	09/86	State Roadway Design Engineer	
Drawn By	HSD	09/86	Revision	Sheet No.
Checked By	JVG	09/86	00	3 of 9
				Index No. 401



APPLICATIONS
 SAFETY CURBS 2'-0" WIDE OR LESS
 CONCRETE PARAPET WITH METAL PIPE RAILING
 APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
 APPROACH END OF ONE-WAY BRIDGES
 APPROACH SLAB FOUNDATION

SCHEME 9

APPLICATIONS
 SAFETY CURBS 2'-0" WIDE OR LESS
 CONCRETE PARAPET WITH METAL PIPE RAILING
 APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
 APPROACH END OF ONE-WAY BRIDGES
 APPROACH SLAB FOUNDATION

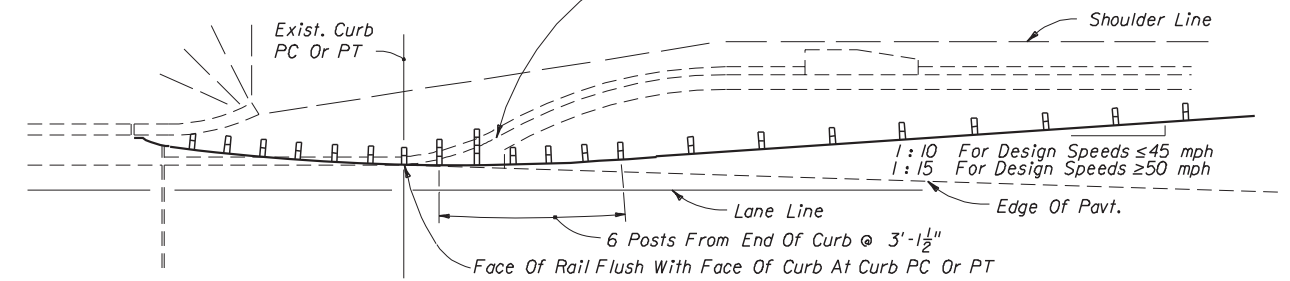
SCHEME 10

CAST IN PLACE TRANSITION WALL

BRIDGE WITH APPROACHING ROADWAY CURB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES				
Names	Dates	Approved By		
Designed By	JVG 09/86	State Roadway Design Engineer		
Drawn By	HSD 09/86	Revision	Sheet No.	Index No.
Checked By	JVG 09/86	00	4 of 9	401

Portions Of Curb And Gutter May Be Removed And Reconstructed As Necessary To Locate Posts In This Zone. Post May Be Located Within The Curb Or Within The Lip Of The Gutter, But Not Closer Than 12" From Face Of Curb.

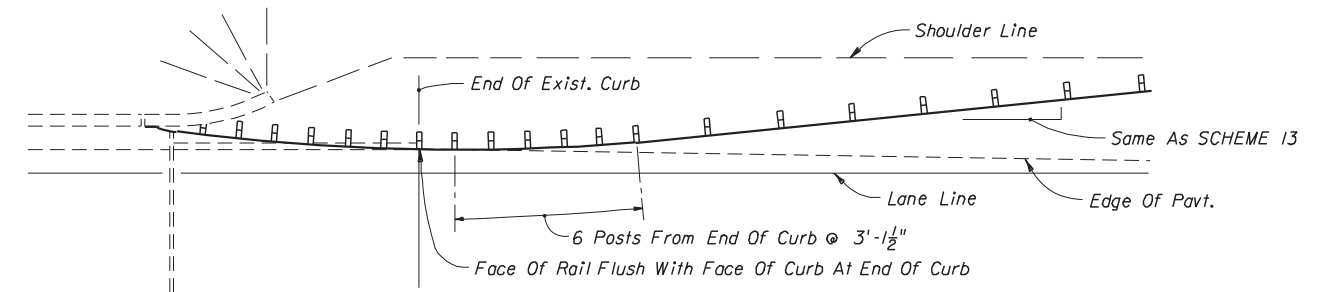


See SCHEMES 11 & 12 For Additional Information

APPLICATIONS

SAFETY CURB 2'-0" WIDE OR LESS
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 13

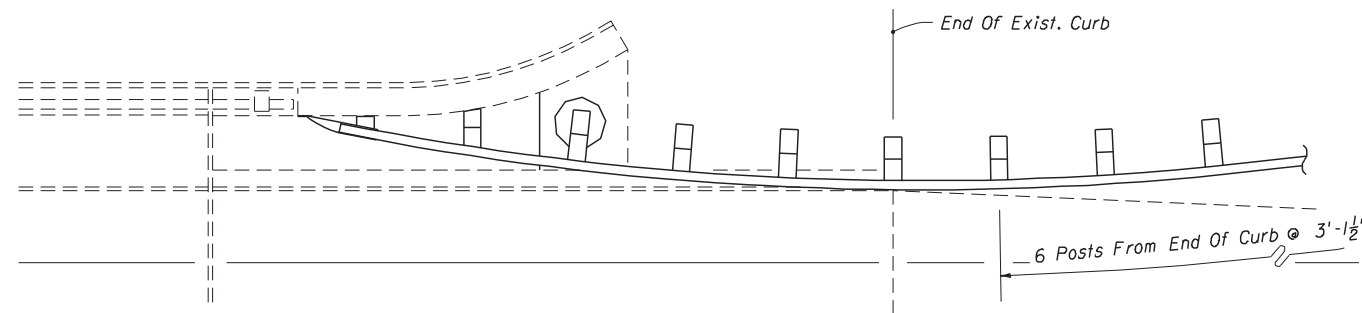


See SCHEMES 11 & 12 For Additional Information

APPLICATIONS

SAFETY CURB 2'-0" WIDE OR LESS
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 14

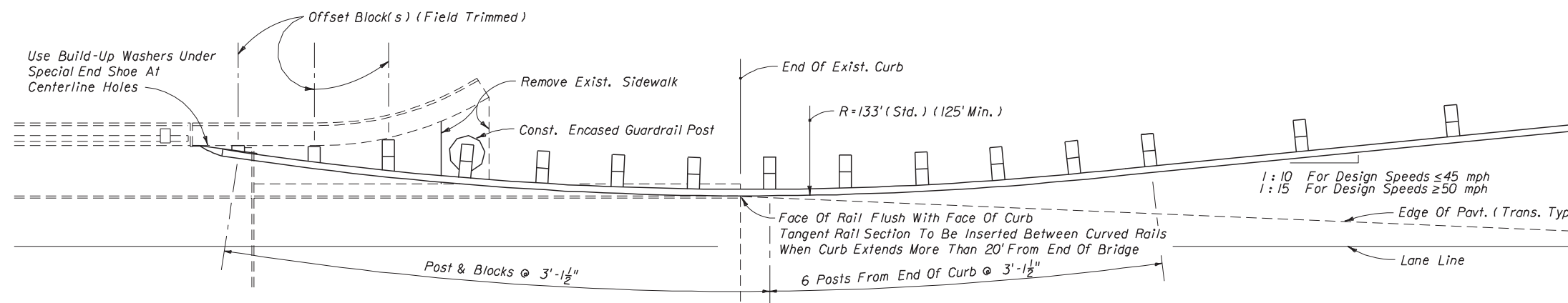


See SCHEME 11 For Additional Information

APPLICATIONS

SAFETY CURB 2'-0" WIDE OR LESS
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

SCHEME 12



APPLICATIONS

SAFETY CURB 2'-0" WIDE OR LESS
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

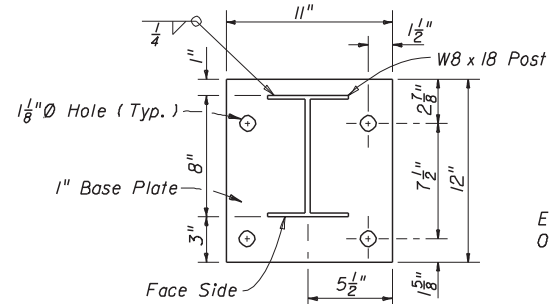
SCHEME 11

CURVILINEAR GUARDRAIL

BRIDGES WITH APPROACHING ROADWAY CURB

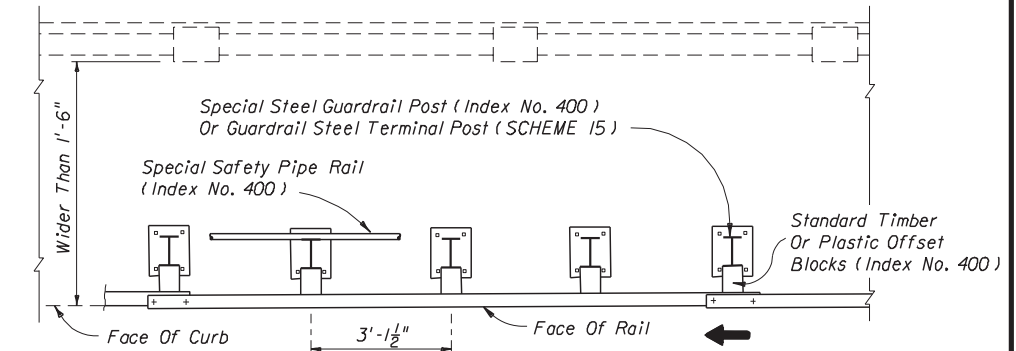
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES				
Names	Dates	Approved By <i>Bo J. [Signature]</i>		
Designed By	JVG 09/86	State Roadway Design Engineer		
Drawn By	HSD 09/86	Revision	Sheet No.	Index No.
Checked By	JVG 09/86	00	5 of 9	401

Approach Slab Boundary Varies; Standard Or Special Steel Guardrail Posts To Suit Approach Slab Configuration; Posts And Offset Block In Accordance With Index No. 400.



Either Special Steel Guardrail Post (Index No. 400) Or Guardrail Steel Terminal Post As Detailed

Steel Terminal Post See Detail Above



Alignment Control: Face Of Rail Flush With Face Of Curb

Note: Post Of Uniform Type And Blocks Of Uniform Material And Size To Be Used Throughout Run Of Bridge. 7/8" Or 1" Anchor Bolt To Match Post Selected.

TRAILING END: SAFETY CURB 2'-0" OR LESS IN WIDTH

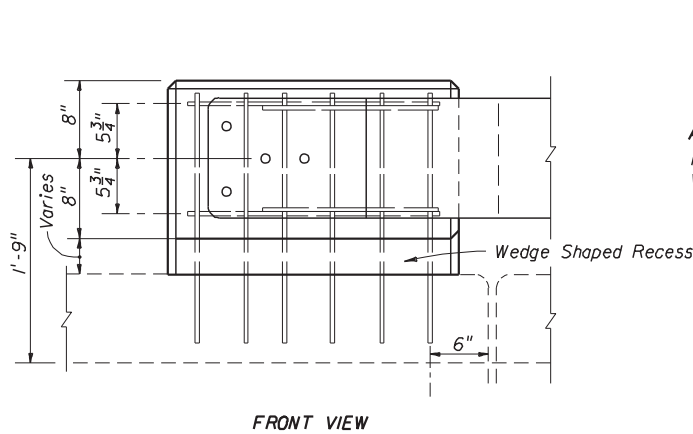
APPROACH END: SAFETY CURBS 1'-6" TO 2'-0" WIDE

APPLICATIONS
SAFETY CURB 2'-0" OR LESS IN WIDTH
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

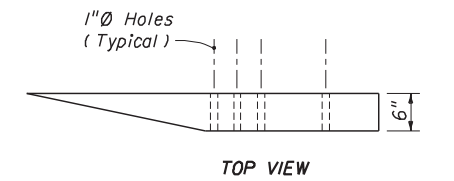
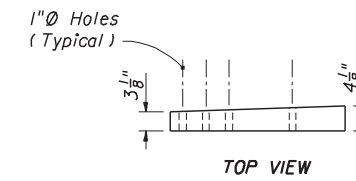
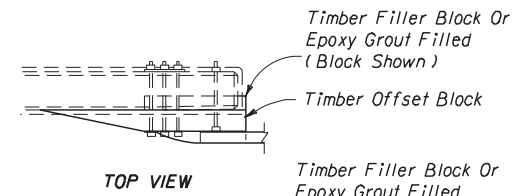
APPLICATION
SAFETY CURB WIDER THAN 1'-6" AND SIDEWALK
SCHEME 16

GUARDRAIL CONTINUOUS ACROSS BRIDGE

STEEL ANCHOR POST AT RADIAL WING WALL



Alignment Control: Face Of Rail Flush With Face Of Curb



When $h \geq 2'-0"$ Install Rubrail Back To Post (g). Flare Rubrail From Front Of Post (f) To Back Of Post (g). See Index No. 400, Detail K For Rubrail Materials.

Reinforcing Steel: All #4 Bars (#3 Bars Permitted For Hoops). Vertical Bars Shall Be Set In 3/8" Diameter Holes With An Adhesive-Bonded Material System In Accordance With Specification Sections 416 and 937. Embed 6". Offset And Redrill When Steel Encountered.

Note: Scheme comparatively enlarged to facilitate reinforcement detailing.


APPLICATIONS
SAFETY CURB 1'-6" TO 2'-0" WIDE
APPROACH END OF ONE-WAY BRIDGES ONLY

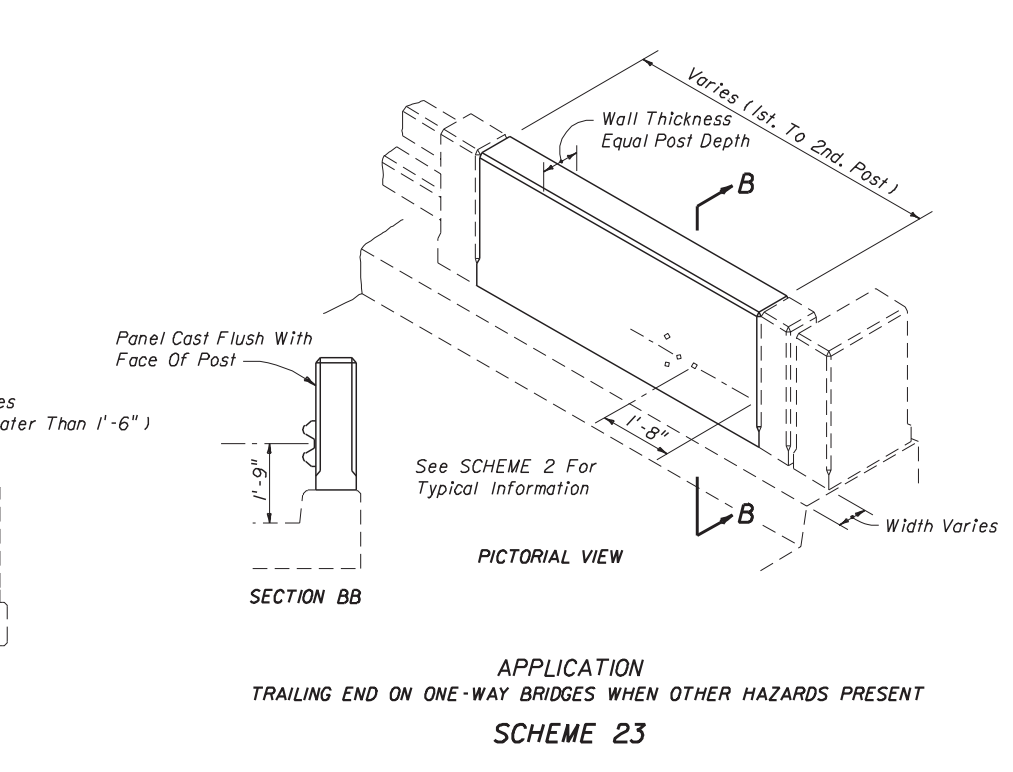
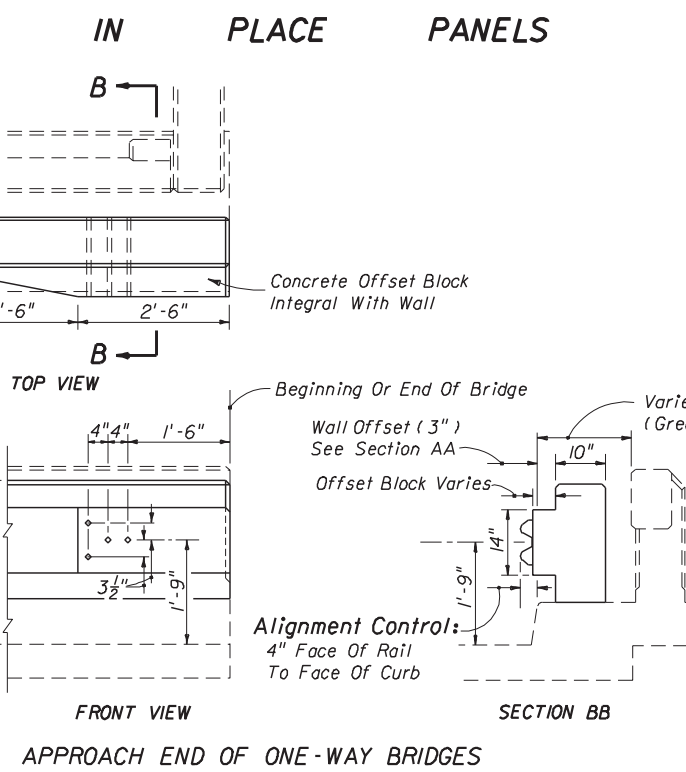
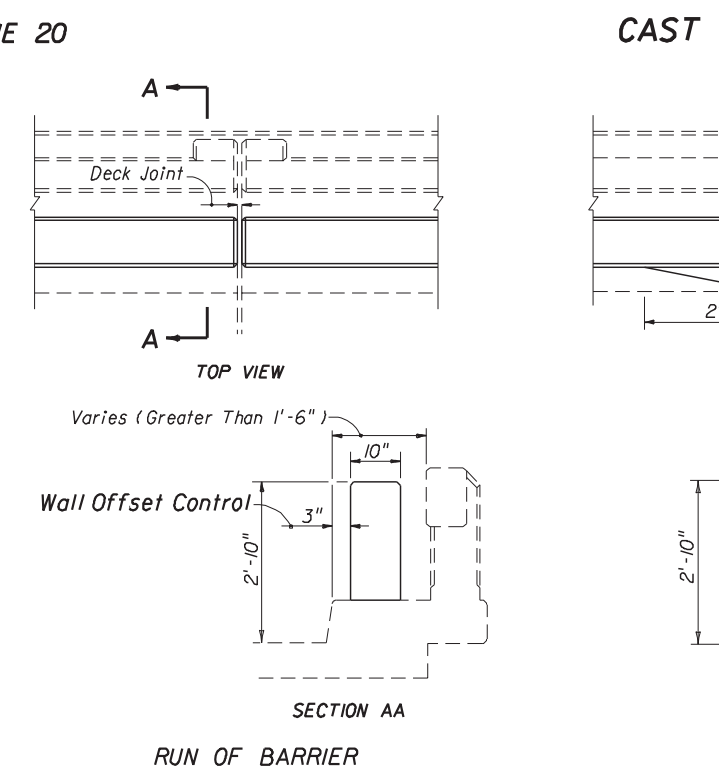
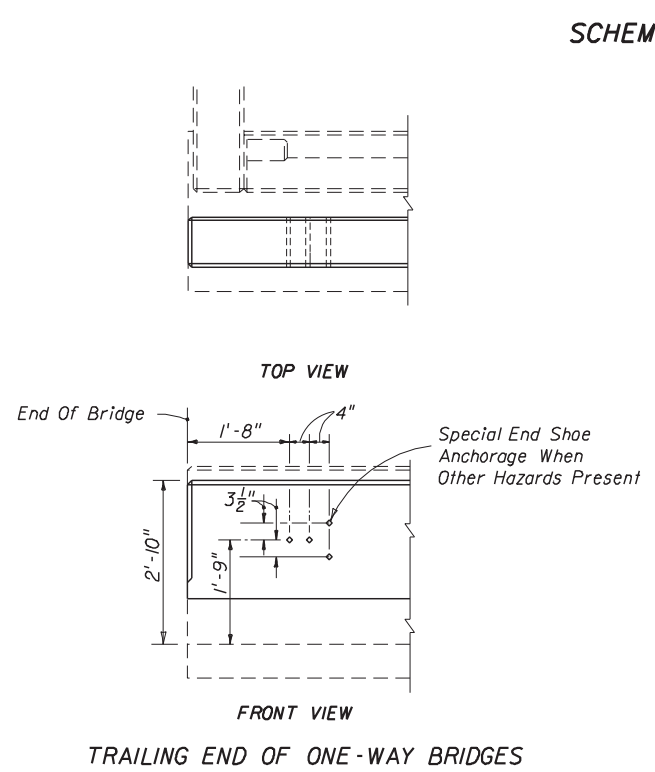
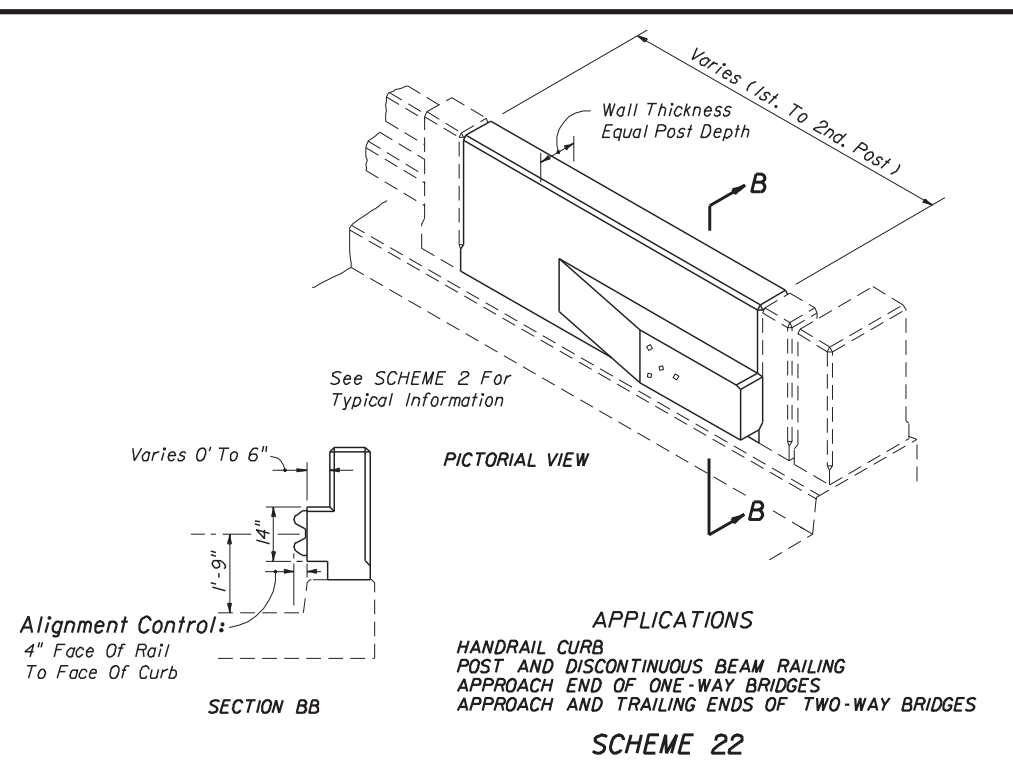
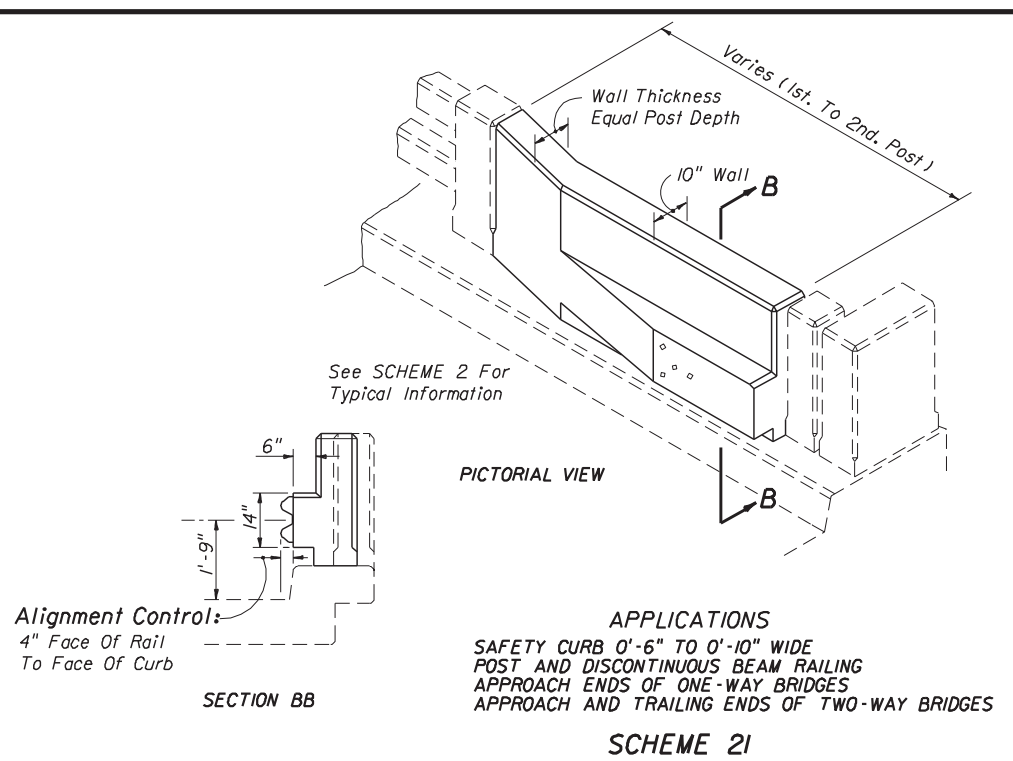
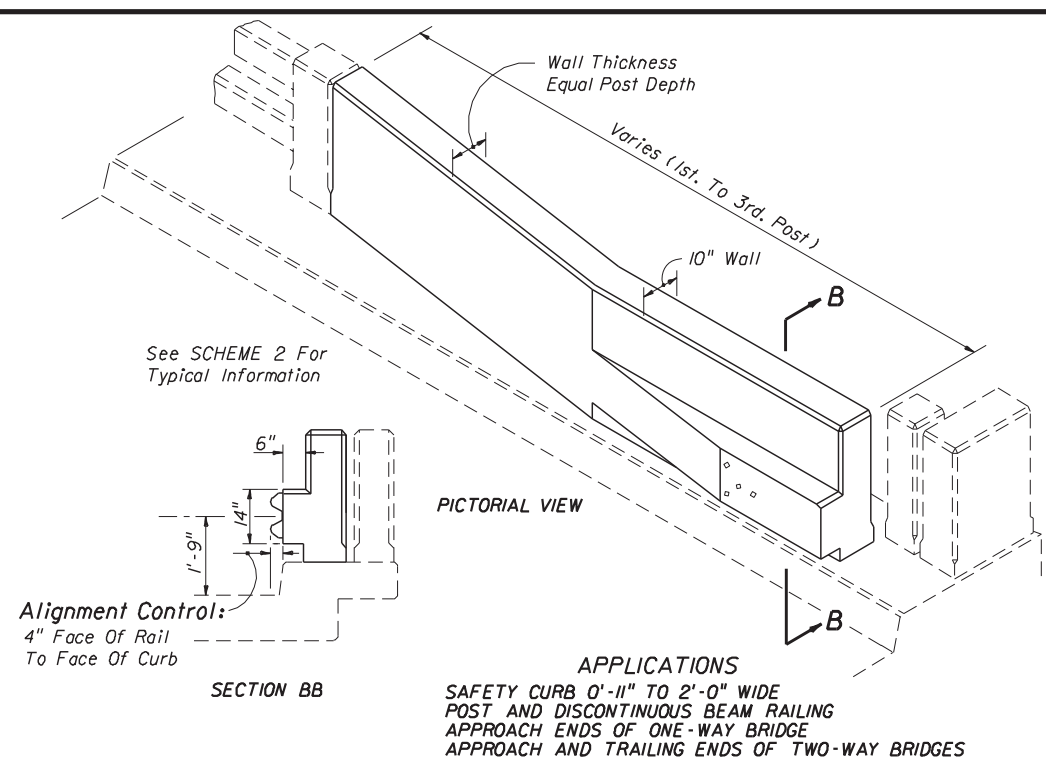
SCHEME 17
CONCRETE ANCHOR POST

BRIDGES WITH APPROACHING ROADWAY CURB

APPLICATIONS
HANDRAIL CURB
SPECIAL END SHOE RECESS (EXISTING)
APPROACH AND TRAILING END OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES (NOTES: SPECIAL END SHOE TO REMAIN IN THE RECESS ON TRAILING END)

SCHEME 18
END POST WITH SPECIAL END SHOE RECESS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN						
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES						
Names	Dates	Approved By				
Designed By	JVG 09/86	 State Roadway Design Engineer				
Drawn By	HSD 09/86				Revision	Sheet No.
Checked By	JVG 09/86				00	6 of 9
		Index No.	401			



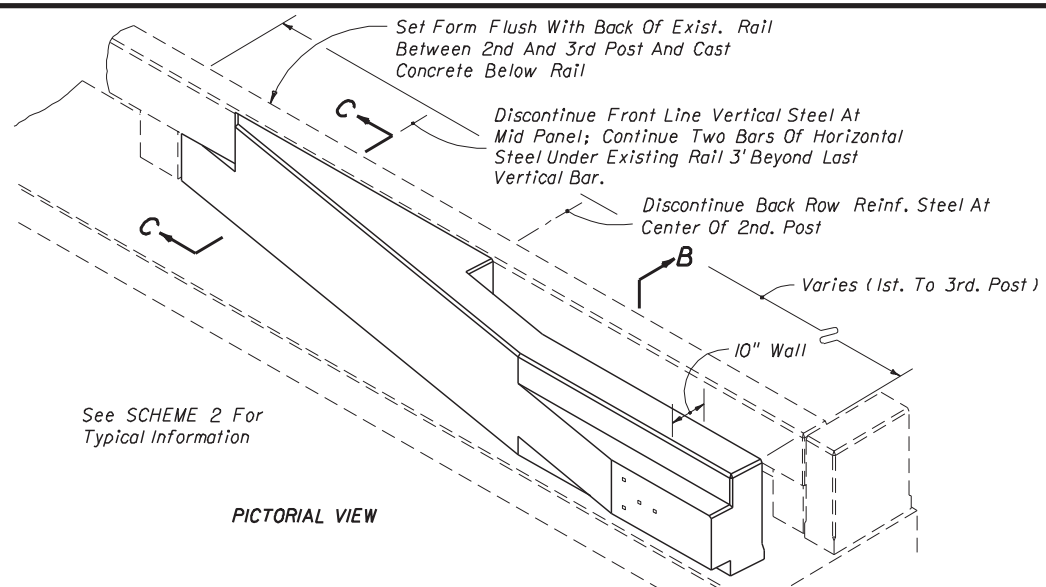
See SCHEME 1 For Reinforcing Details And Estimated Quantities

APPLICATIONS
SAFETY CURB WIDER THAN 1'-6", AND
SIDEWALKS CONTINUOUS BARRIER ACROSS BRIDGE

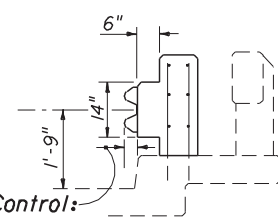
SCHEME 19
CONCRETE SAFETY BARRIER

BRIDGE WITHOUT APPROACHING ROADWAY CURB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By JVG	09/86	State Roadway Design Engineer		
Drawn By HSD	09/86	Revision	Sheet No.	Index No.
Checked By JVG	09/86	00	7 of 9	401



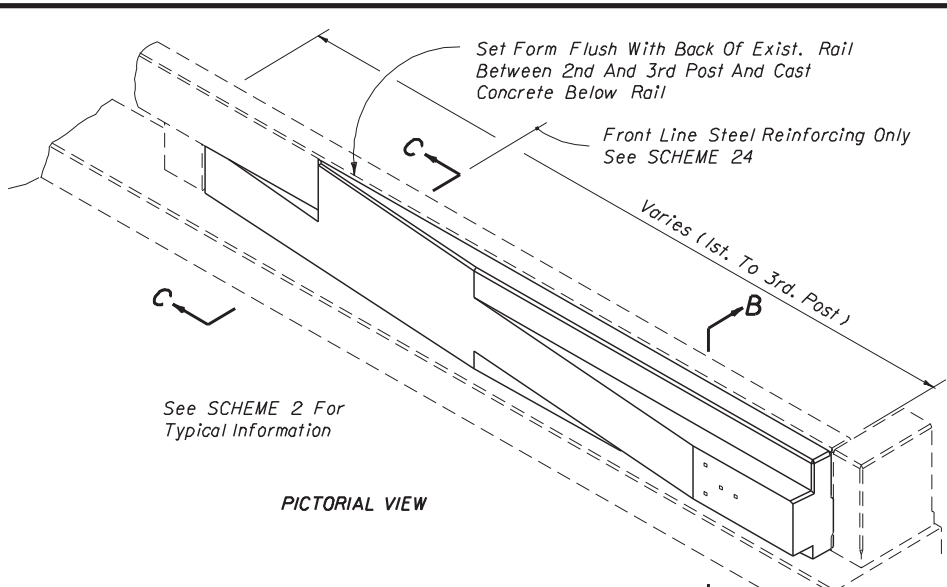
PICTORIAL VIEW



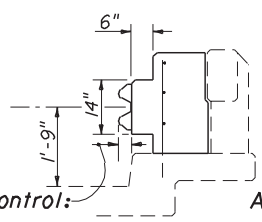
SECTION BB
(24" Shown)

APPLICATIONS
SAFETY CURBS 1'-8" TO 2'-0" WIDE
CONCRETE CONTINUOUS BEAM RAILING
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES

SCHEME 24

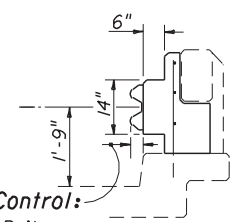


PICTORIAL VIEW



Alignment Control:
4" Face Of Rail To Face Of Curb

SECTION BB
Curbs 14" To 19" (19" Shown)



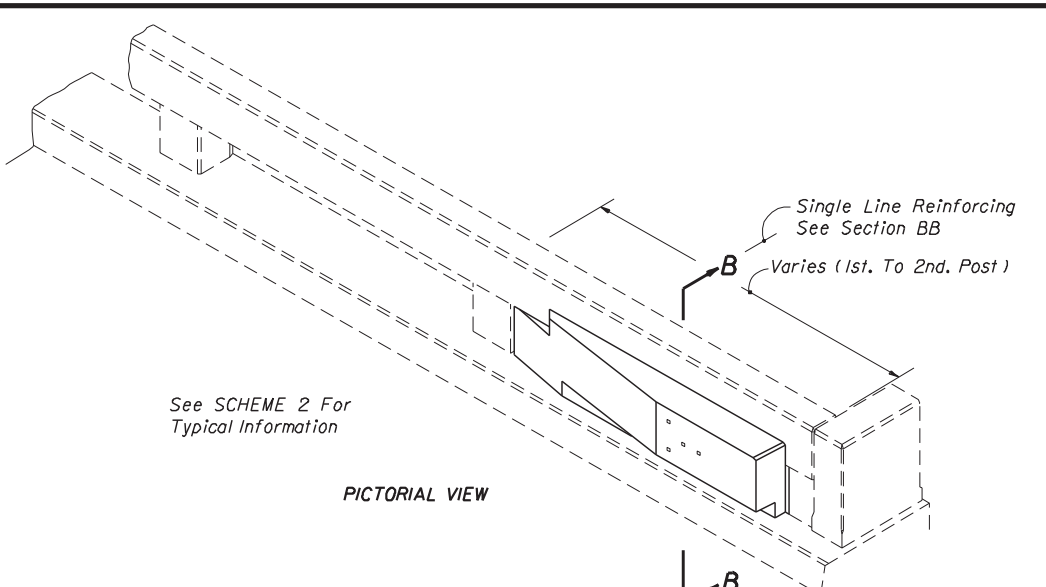
Alignment Control:
4" Face Of Rail To Face Of Curb

SECTION BB
Curbs 9" To 13" (9" Shown)

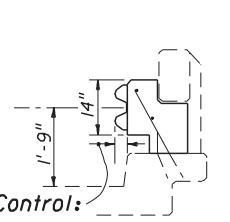
APPLICATIONS
SAFETY CURBS 9" TO 1'-7" WIDE
CONCRETE CONTINUOUS BEAM RAILING
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES

SCHEME 25

CAST IN PLACE PANELS



PICTORIAL VIEW



Alignment Control:
4" Face Of Rail To Face Of Curb

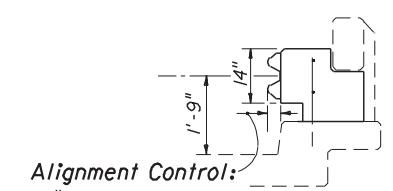
SECTION BB
(8" Shown)

Alignment Control:
4" Face Of Rail To Face Of Curb

SECTION BB
(5" Shown)

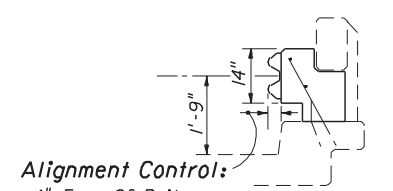
APPLICATIONS
SAFETY CURBS 5" TO 8" WIDE
CONCRETE CONTINUOUS BEAM RAILING
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES

SCHEME 26



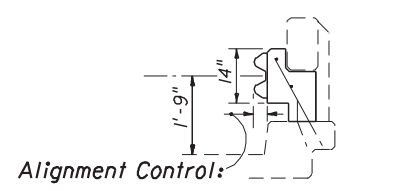
Alignment Control:
4" Face Of Rail To Face Of Curb

SECTION BB
CURBS 9" TO 15" WIDE (13" SHOWN)
APPROACH ENDS



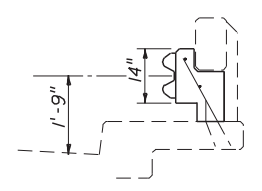
Alignment Control:
4" Face Of Rail To Face Of Curb

SECTION BB
CURBS 5" TO 8" WIDE (8" SHOWN)
APPROACH ENDS



Alignment Control:
4" Face Of Rail To Face Of Curb

SECTION BB
CURBS 5" TO 8" WIDE (5" SHOWN)
APPROACH ENDS



Alignment Control:
4" Face Of Rail To Face Of Curb

SECTION BB
CURB WIDTHS VARY
TRAILING END
WHEN OTHER HAZARDS PRESENT

Note: For Approach End Curb Less Than 5" Wide See SCHEME 22.

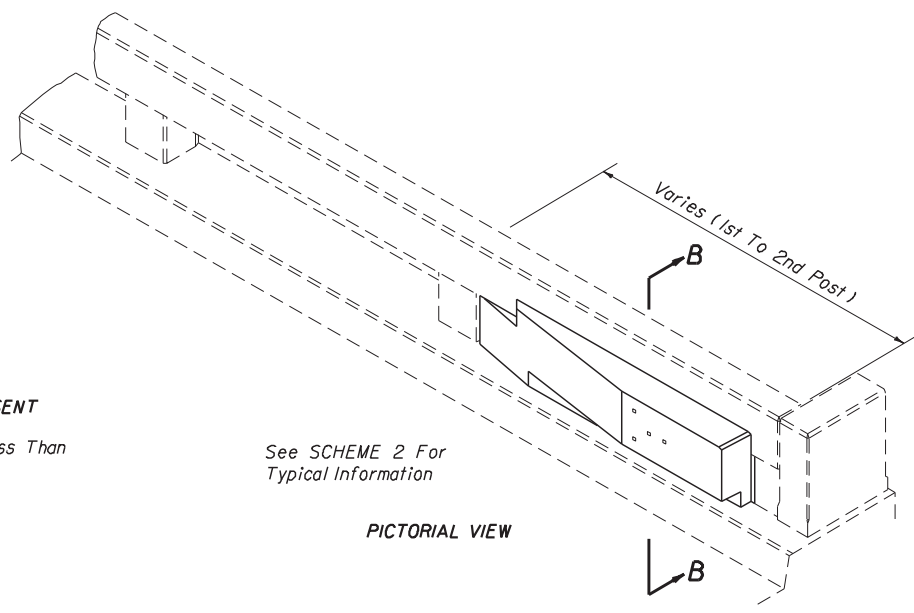
Note: For Trailing End Curb Less Than 5" Wide See SCHEME 23

APPLICATIONS
SAFETY CURB 5" TO 1'-3" WIDE
CONCRETE CONTINUOUS BEAM RAILING
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

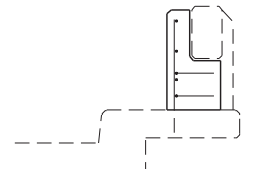
SCHEME 27

CAST IN PLACE PANELS

BRIDGES WITHOUT APPROACHING ROADWAY CURB



PICTORIAL VIEW

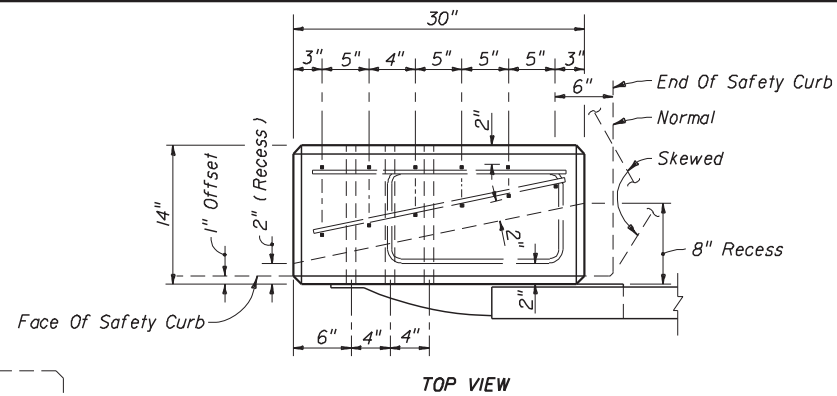


SECTION CC (SCHEMES 24 & 25)

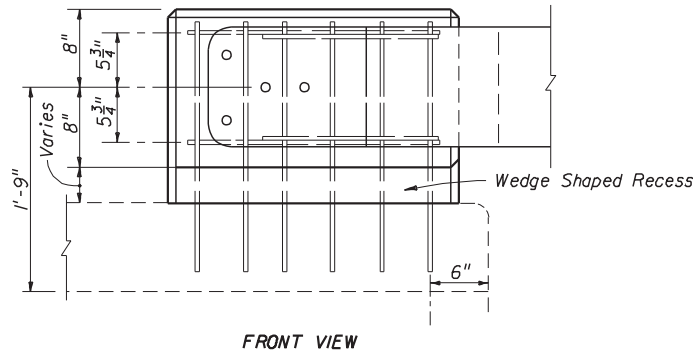
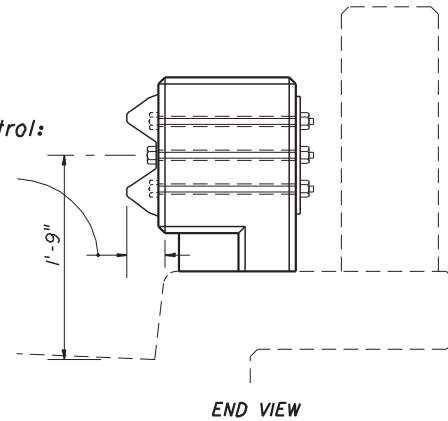
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES				
Names	Dates	Approved By		
Designed By	JVG 09/86	 State Roadway Design Engineer		
Drawn By	HSD 09/86			
Checked By	JVG 09/86			
Revision	00	Sheet No.	8 of 9	Index No.
				401

Reinforcing Steel: See SCHEME 17.

Note: Scheme comparatively enlarged to facilitate reinforcement detailing.

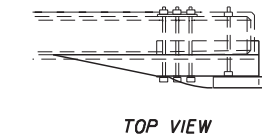


Alignment Control:
4" Face Of Rail
To Face Of Curb

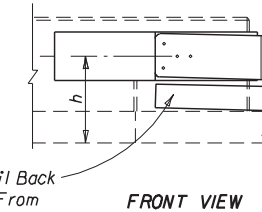


APPLICATIONS
SAFETY CURB WIDER THAN 1'-4" AND UP TO 2'-0"
APPROACH END OF ONE-WAY BRIDGES ONLY

**SCHEME 28
CONCRETE ANCHOR POST**



See SCHEME 18 For Complete Detailing



When $h \geq 2'-0"$ Install Rubrail Back To Post (g). Flare Rubrail From Front Of Post (f) To Back Of Post (g). See Index 400, Detail K For Rubrail Materials.

APPLICATIONS

HANDRAIL CURB
SPECIAL END SHOE RECESS (EXISTING)
APPROACH AND TRAILING END OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES (NOTE: SPECIAL END SHOE TO REMAIN IN THE RECESS ON TRAILING END)

**SCHEME 30
END POST WITH SPECIAL END SHOE RECESS**

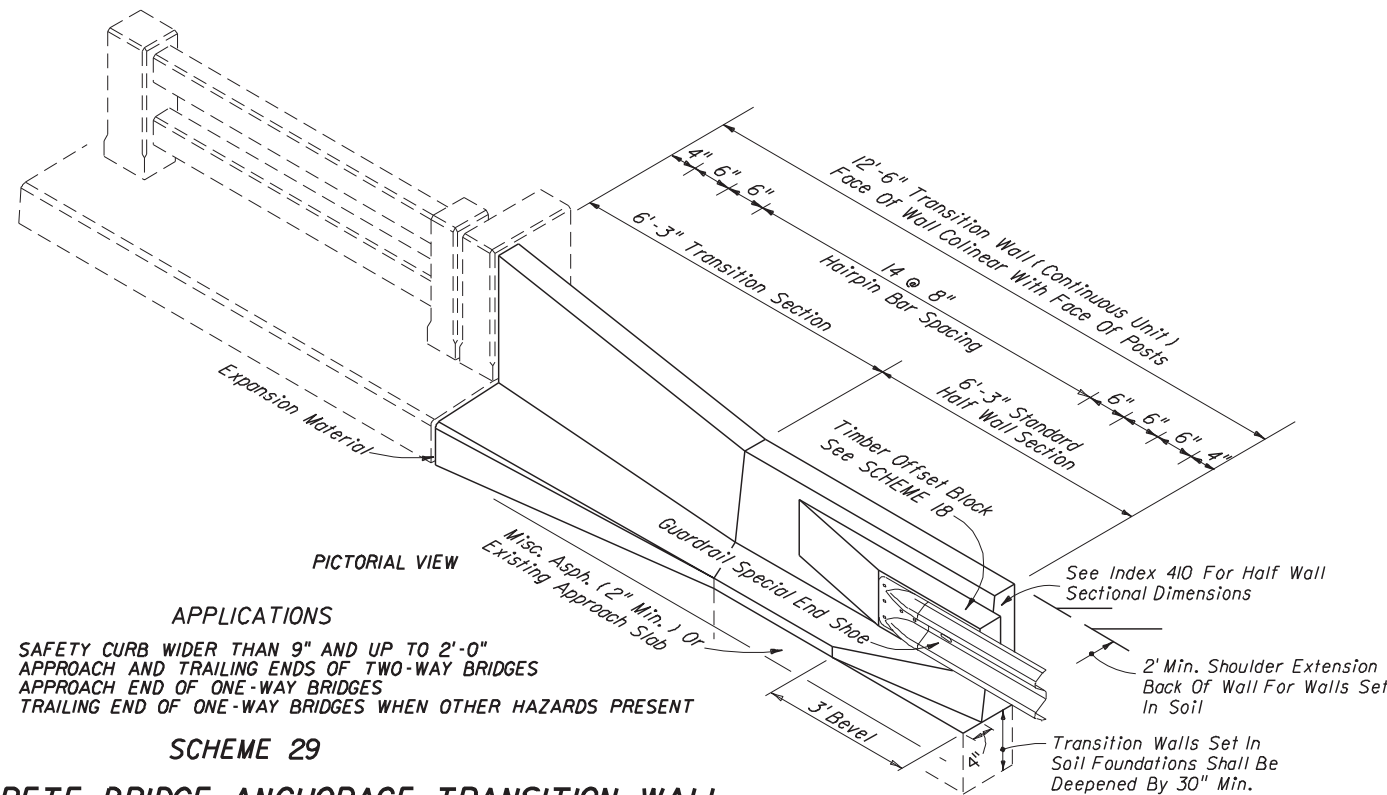
Note (Scheme 29):

Portions of existing approach slab curbing, wingwalls, shoulder gutter, flumes and etc. may have to be revamped or removed.

Transition walls shall be reinforced in accordance with the 'Free End Reinforcement' detail of Index No. 410 with the hairpin bars spaced as shown in this pictorial. Walls mounted on existing approach slabs shall be anchored into the slabs with the front line of the hairpin reinforcement embedded 6" in the slab with an Adhesive-Bonded Material System in accordance with Specification Section 416 and 937. Offset and redrill when steel encountered.

Transition walls mounted on soil foundation shall have footings deepened 30" and the walls doweled into the end of the existing bridge in the following manner:
Four 1 1/4" diameter holes 6" deep shall be drilled in the end post of the existing bridge and #6 bars 15" long set in epoxy mortar. The holes shall be located as near as practical to the vertical center of the end of the transition wall and equally spaced to provide cover of 3" minimum. The ends of the dowels extending into the transition wall shall be wrapped with one layer of Type I asphalt-saturated roofing felt (15#) with the ends crimped.

Approaching guardrail shall have approach post spacings, offset blocks and double W-beams in accordance with Details H, I, S & T, Index No. 400.

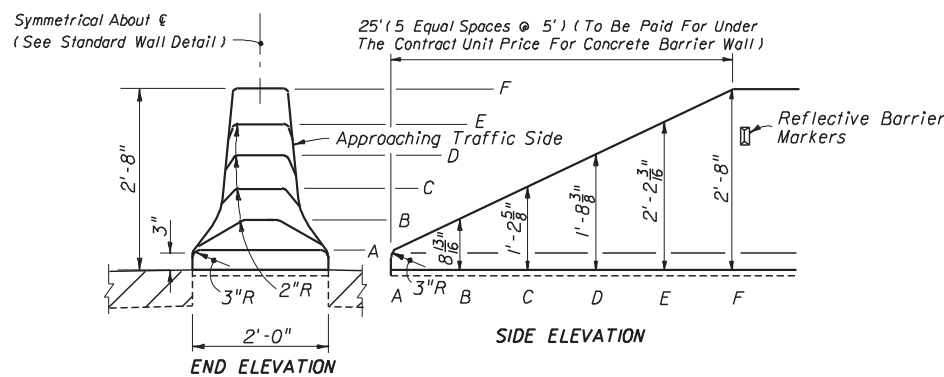


APPLICATIONS
SAFETY CURB WIDER THAN 9" AND UP TO 2'-0"
APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES
APPROACH END OF ONE-WAY BRIDGES
TRAILING END OF ONE-WAY BRIDGES WHEN OTHER HAZARDS PRESENT

**SCHEME 29
CONCRETE BRIDGE ANCHORAGE TRANSITION WALL**

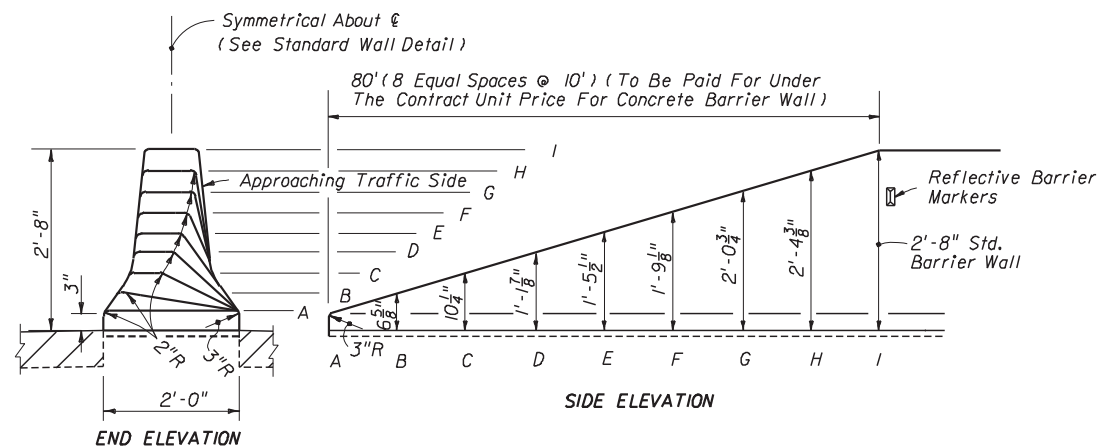
BRIDGES WITHOUT APPROACHING ROADWAY CURB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GUARDRAIL ANCHORAGE AND CONTINUOUS BARRIER FOR EXISTING BRIDGES				
Names	Dates	Approved By		
Designed By	JVG 09/86	State Roadway Design Engineer		
Drawn By	HSD 09/86	Revision	Sheet No.	Index No.
Checked By	JVG 09/86	00	9 of 9	401



TO BE USED ONLY WHERE TERMINAL LOCATED CLEAR ZONE WIDTH FROM EDGE OF THE NEAR APPROACH TRAFFIC LANE.

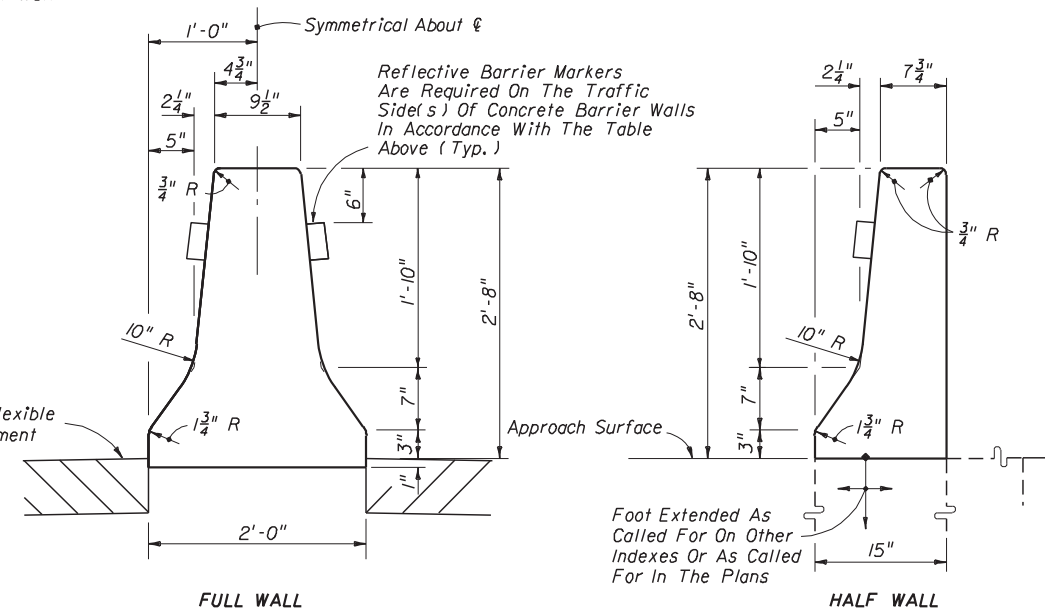
**CONCRETE BARRIER WALL TERMINAL
DETAIL II**



DESIGN SPEED 45 MPH OR LESS

**CONCRETE BARRIER WALL TERMINAL FOR NARROW MEDIAN
DETAIL III**

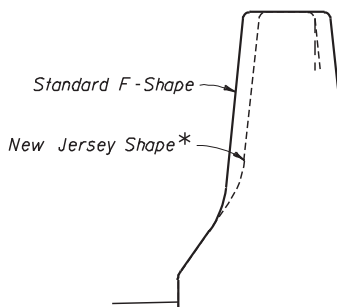
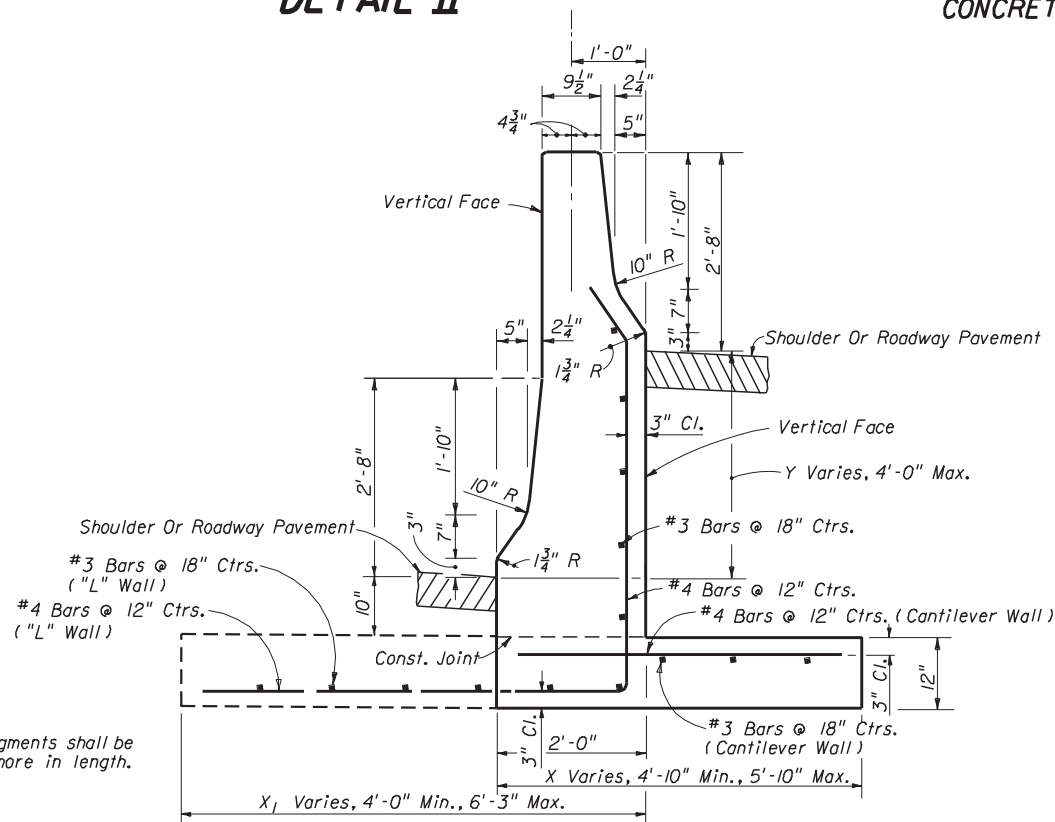
REFLECTIVE BARRIER MARKER SPACING ON WALL		
Distance - Edge of Travel Lane to Barrier Wall. (Ft.)	Spacing (Ft.)	REMARKS
< 4'	40'	1. Reflectors shall conform to Section 993-5 of the Standard Specifications. 2. Reflector color (white or yellow) shall conform to the color of the near edgeline.
4' to 8'	80'	
> than 8'	none required	



For concrete barrier wall details at piers, highway lighting and guardrail connections, see other sheets of this Index.

Standard barrier to be paid for under the contract unit price for Concrete Barrier Wall, LF.

STANDARD BARRIER WALL SECTIONS



*Existing New Jersey shaped walls that are to remain in place or be modified as called for in the plans; or, walls that are to be repaired, modified or constructed as directed by the Engineer. Wall dimensions shall be in accordance with Index No. 410 of the 1988 Roadway and Traffic Design Standards.

Where standard F-Shape walls abut existing NJ Shape walls, face transitions of not less than 5' in length shall be constructed at the end of the F-Shape wall.

WALL FACE SAFETY SHAPES

GENERAL NOTES

- Class II concrete shall be used for all reinforced and plain (nonreinforced) concrete barrier walls; except, in moderately and extremely aggressive environments, Class IV concrete shall be used. Exposed concrete surfaces shall have a Class 3 surface finish in accordance Section 521 of the Standard Specifications, unless other finish called for in the plans. The surfaces shall have a Class 5 Applied Finish Coating in accordance with Section 400 only when called for in the plans.
- Concrete barrier wall terminal notes for design speeds ≥ 50 mph.
 - Terminated outside clear zone of the approach traffic with 'DETAIL II' end treatment.
 - Terminated within a shielded location.
 - Terminal protection by the use of a crash cushion system.
 - Terminated in conjunction with a suitably designed transition to another barrier.
- Expansion joints in wall required only at bridge ends and/or at locations where wall is an integral part of existing or proposed concrete slab; wall joints are to match an existing or proposed expansion joint.
- When the barrier is installed adjacent to the pavement the top 12" of the subgrade shall be compacted to at least 100% of the density as defined in the AASHTO T-99 specifications.
- Cast-in-place barrier wall normally will be a continuous pour without transverse contraction joints. Cast-in-place segments with a length < 40' shall be joined to adjacent sections by doweling. See Detail B.
- Precast construction is allowed as an alternate to cast-in-place construction.
 - Wall segments < 40' in length shall be joined by a transverse joint in accordance with Details C & D. The minimum segment length is 20'.
 - Bedding of the precast sections shall be facilitated by the use of sand-cement grout or equal method to assure uniform bearing.
 - Reinforcement may be required for handling stresses.
- Cost of reinforcing steel and reflective barrier markers shall be included in the contract unit price for concrete barrier wall. See individual details for pay item information.
- For barrier wall inlet details see Index Nos. 217, 218 and 219.

Note: Wall segments shall be 20' or more in length.

Design Criteria:

Vehicle: 4000 lbs., 60 mph, 25°, Avg. Lat. Impact Deceleration Force - 7G's (28 kips)
Vehicle Force Applications: 1000 lbs. Vert. At Top of Toe; 28 kips Horiz. At 5 1/2' Above Pavt.

Unless the plans stipulate a specific wall type, either the cantilever wall or the "L" wall may be constructed at the Contractor's option.

Steel not required in walls of heights Y=0' To 0'-6" when footing and stem cast as one unit. When footing and stem cast separately by construction joint, the footing joint surface shall be roughened and #4 dowels 24" long installed at the centerline of the stem on 24" centers with 9" embedment in the footing.

Cost of the steel and concrete footing to be included in the contract unit price for Barrier Wall Concrete, LF.

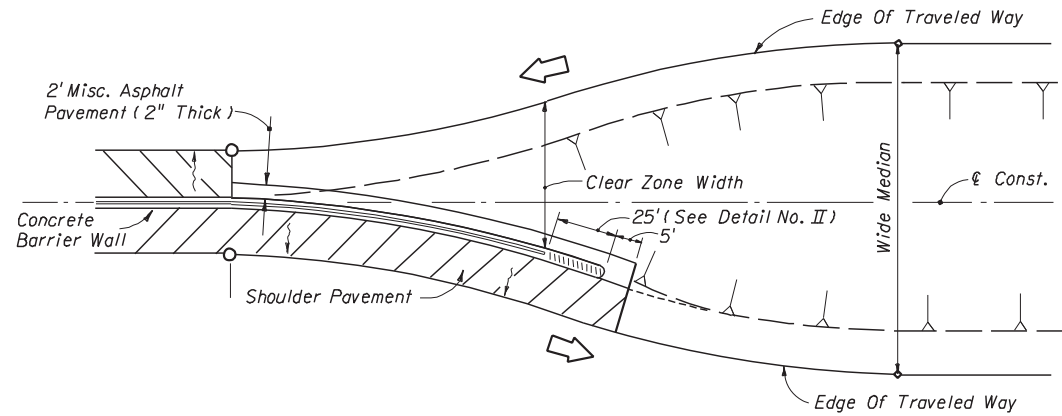
	Height Y	0'-0"	0'-6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"
Cantilever Wall	Width X	4'-10"	5'-0"	5'-2"	5'-3"	5'-5"	5'-6"	5'-7"	5'-9"	5'-10"
"L" Wall	Width X ₁	4'-0"	4'-4"	4'-8"	5'-0"	5'-3"	5'-6"	5'-9"	6'-0"	6'-3"

**MEDIAN BARRIER WALL FOR SUPERELEVATED SECTIONS
OR FOR VARIABLE ROADWAY PROFILE GRADES**

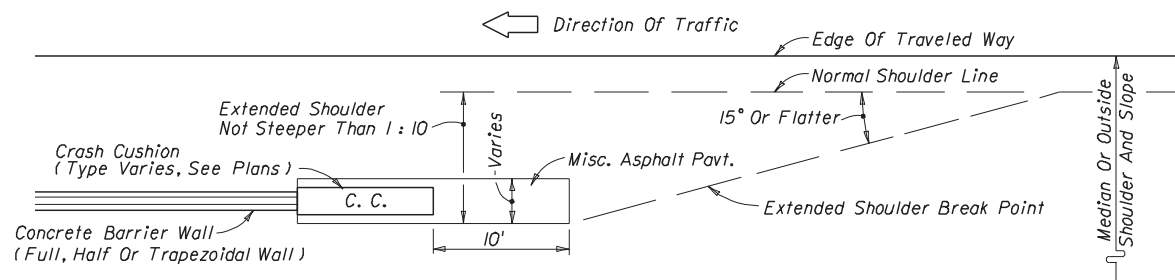
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CONCRETE BARRIER WALL

Names	Dates	Approved By	
Designed By		State Roadway Design Engineer	
Drawn By	AF/HSD 73/91		
Checked By	LMF/JG 73/91	00	1 of 22
		Index No. 410	

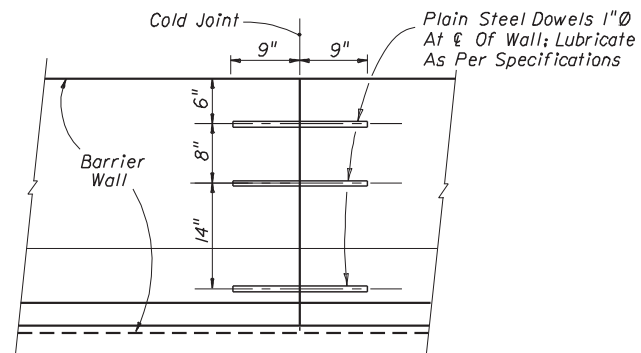


CONCRETE BARRIER WALL TRANSITION BETWEEN WIDE AND NARROW MEDIANS WHEN BARRIER WALL END LOCATED OUTSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE



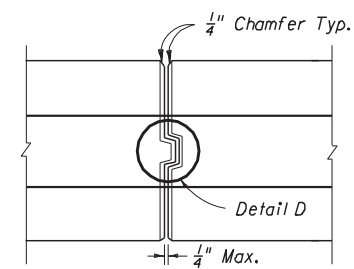
SHOULDER TREATMENT WHEN CRASH CUSHIONS SHIELDING CONCRETE BARRIER WALL END LOCATED INSIDE APPROACH CLEAR ZONE OR HORIZONTAL CLEARANCE

DETAIL A

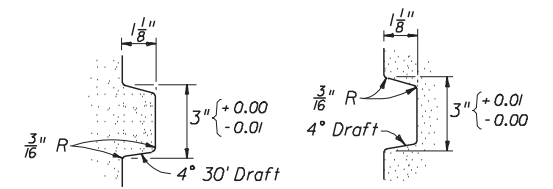


DOWELED TRANSVERSE CONSTRUCTION JOINT WHEN ABUTTING SEGMENT(S) LESS THAN 40' IN LENGTH

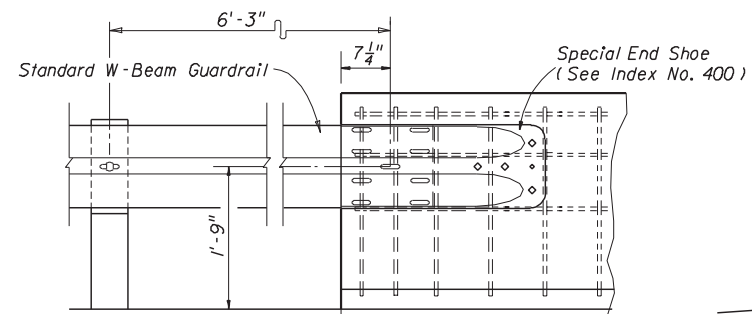
DETAIL B



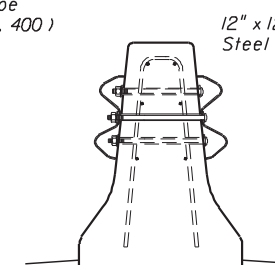
**TOP VIEW
PRECAST BARRIER TRANSVERSE JOINTS
DETAIL C**



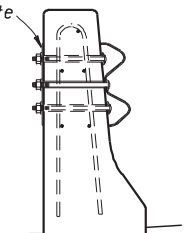
**TOP VIEW
STRAIGHT TONGUE AND GROOVE
DETAIL D**



FRONT VIEW



END VIEW

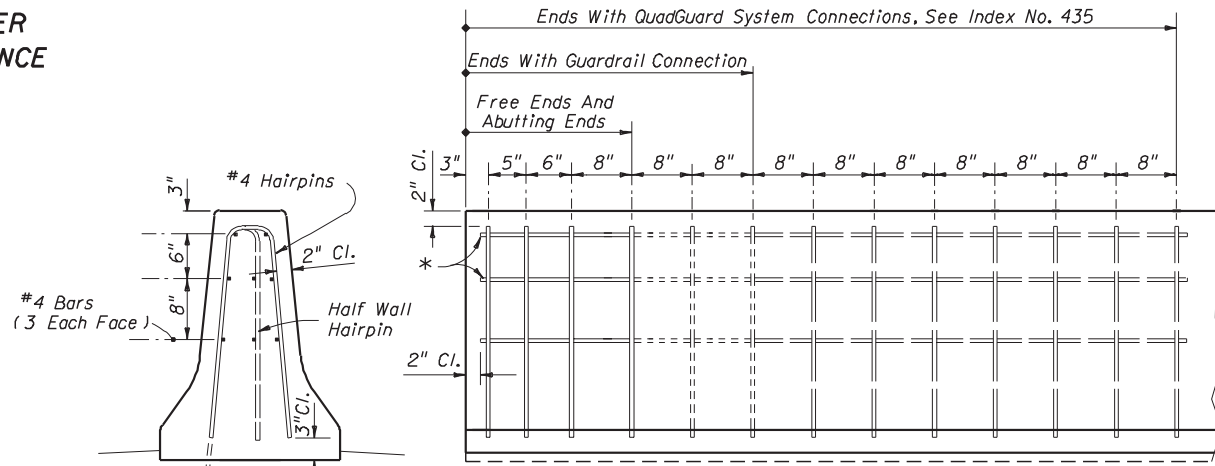


END VIEW

NOTES

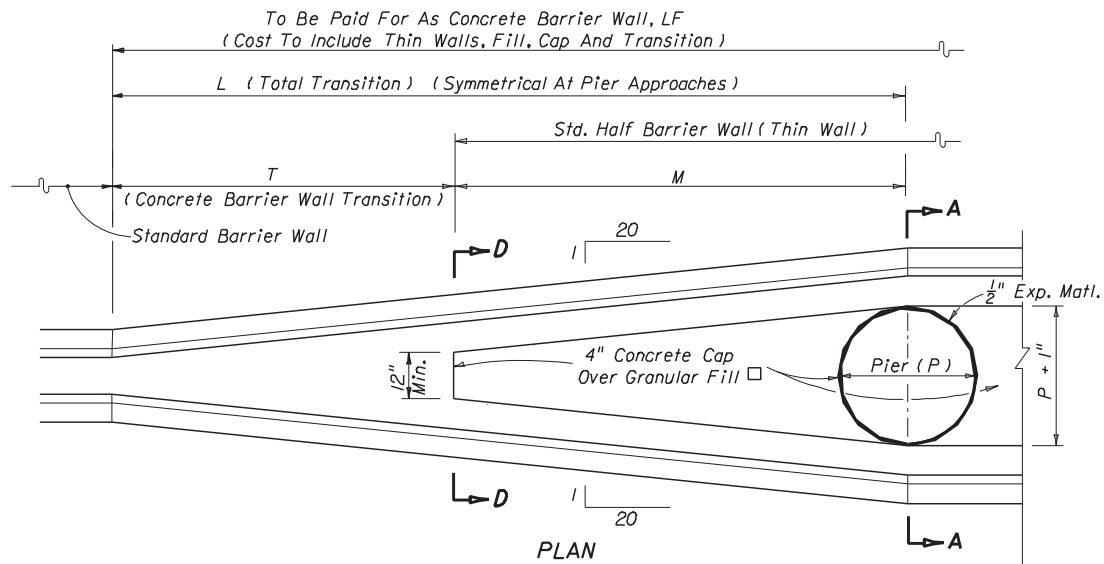
- End of wall flush mounted connections are not applicable to two-lane two-way facilities. See Sheets 18 and 20 for trailing end connections on two-lane two-way facilities and for approach guardrail connections.
- Trailing guardrail connections to double face safety shaped walls will be under one of the following traffic conditions and mounting methods:
 - One-way traffic trailing condition one side only - flush mount with flat steel back-up plate on back side.
 - One-way traffic trailing condition both sides - flush mount both sides.
 - For trailing condition one side and approach traffic condition opposite side - see "Median Barrier Wall" mounting, Sheet 20.

W-BEAM GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL TRAILING ENDS



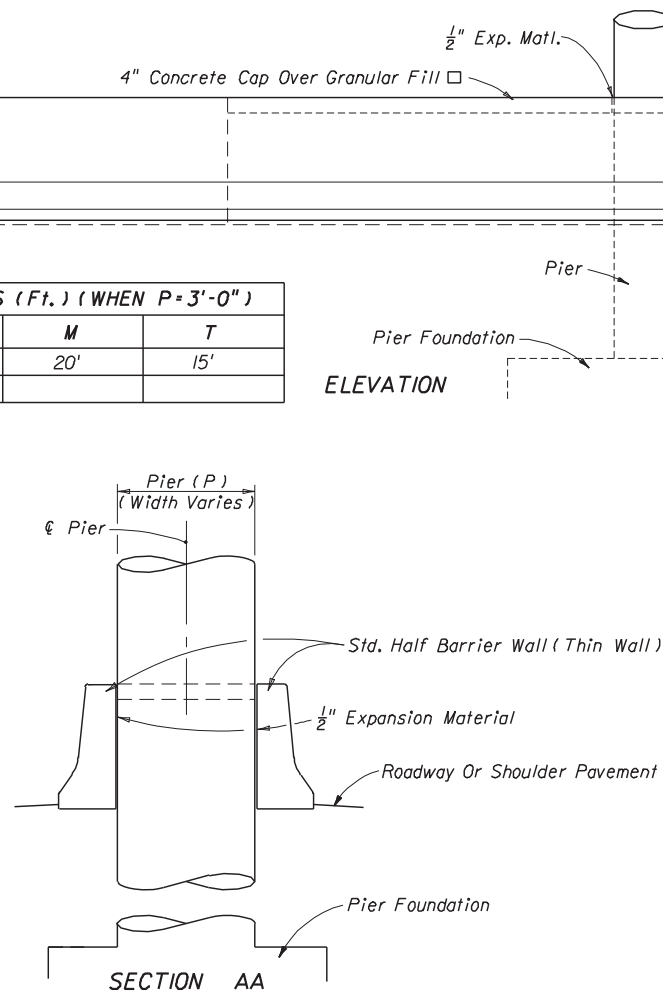
FREE END REINFORCEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	AF/HSD	73/91	Revision	Sheet No. Index No.
Checked By	LMF/JG	73/91	00	2 of 22 410

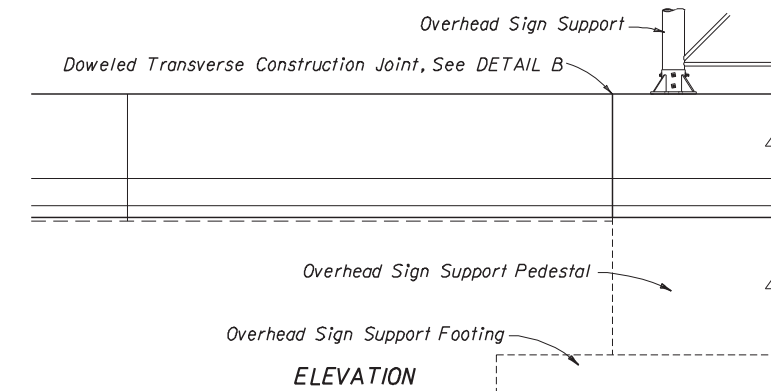
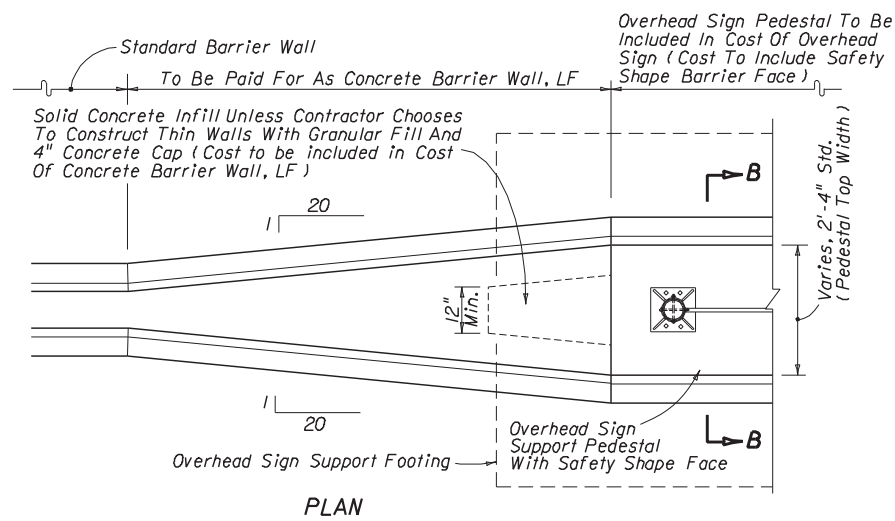


DIMENSIONS (Ft.) (WHEN P = 3'-0")

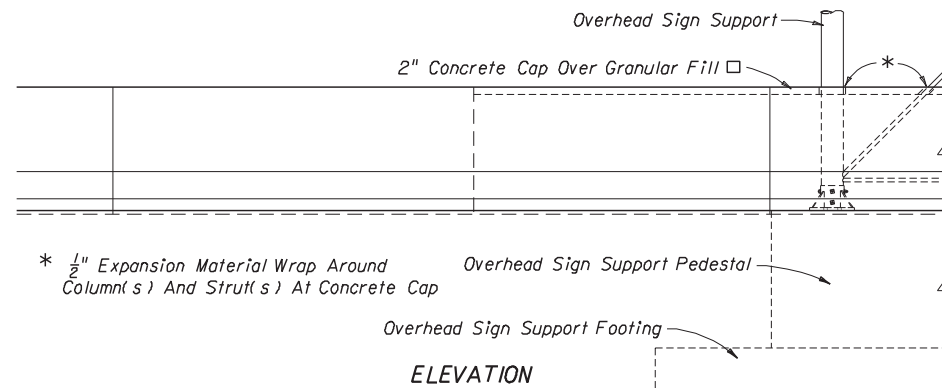
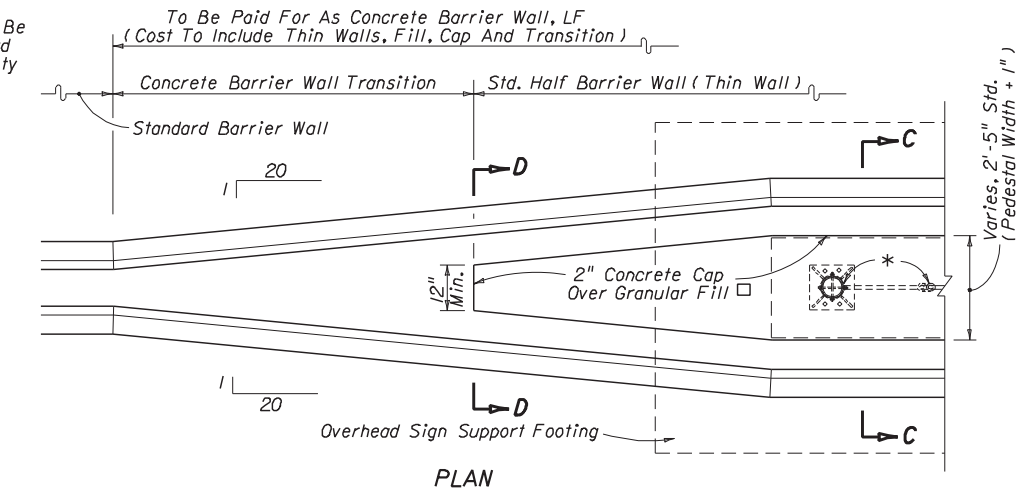
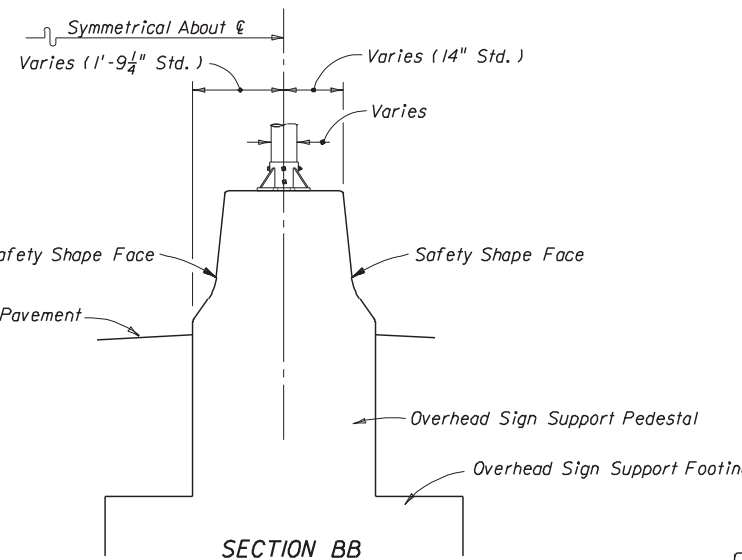
L	M	T
35'	20'	15'



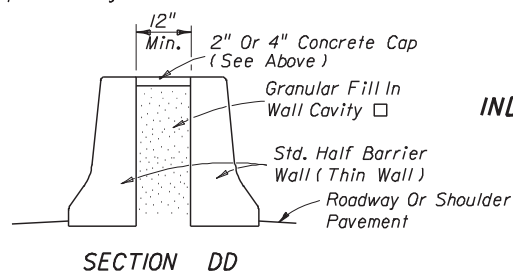
BRIDGE PIERS



COMBINATION BARRIER AND SIGN PEDESTAL



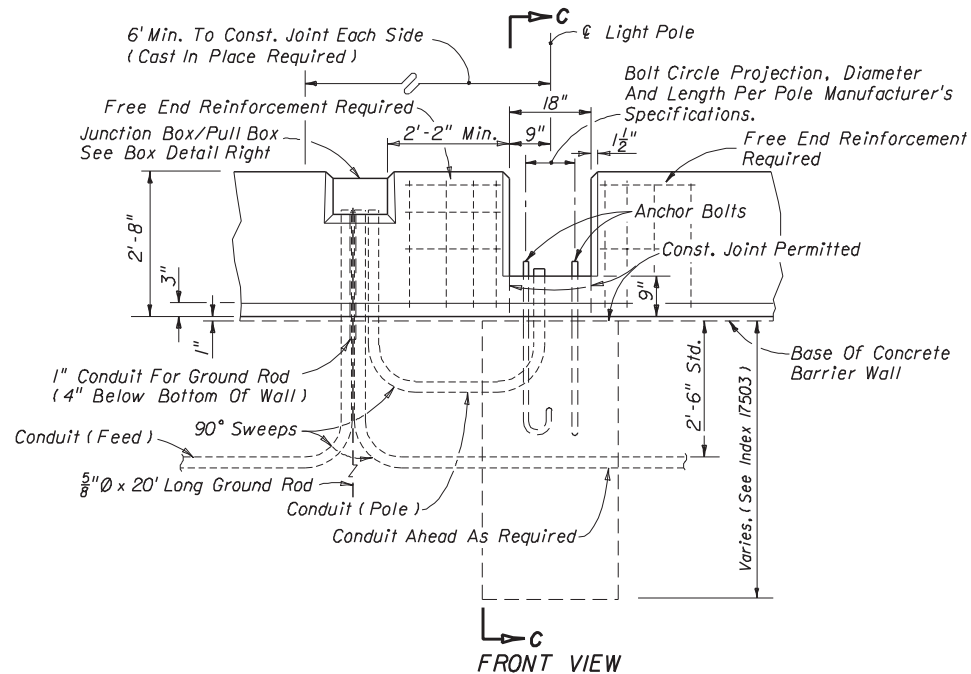
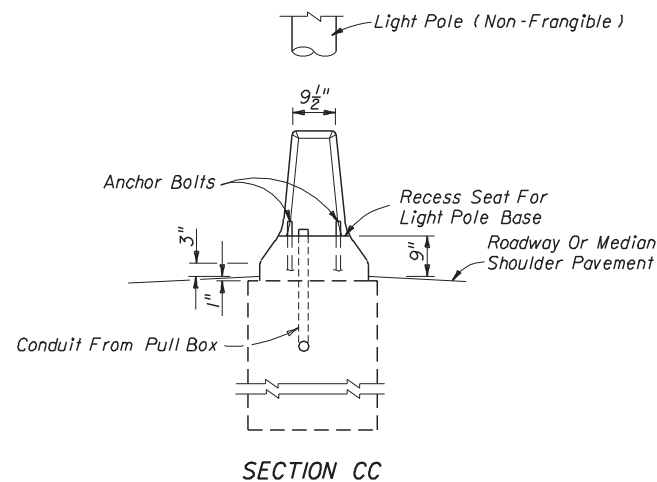
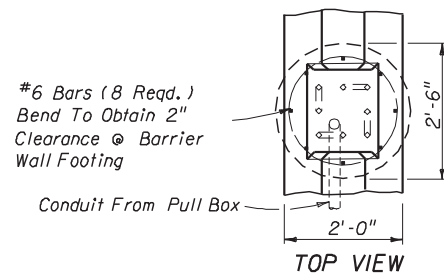
INDEPENDENT BARRIER AND SIGN PEDESTAL



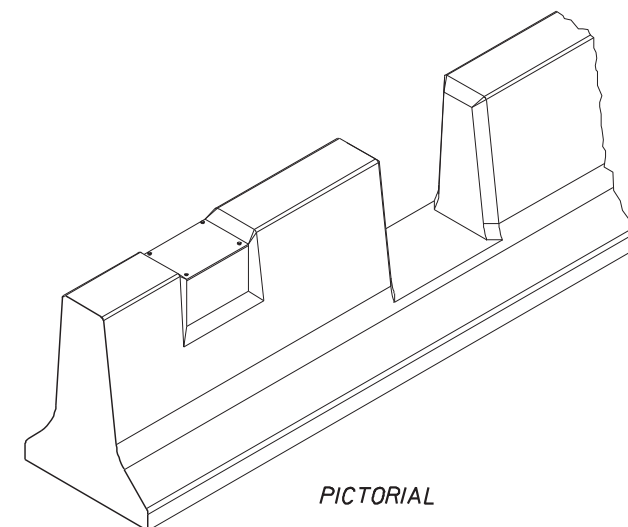
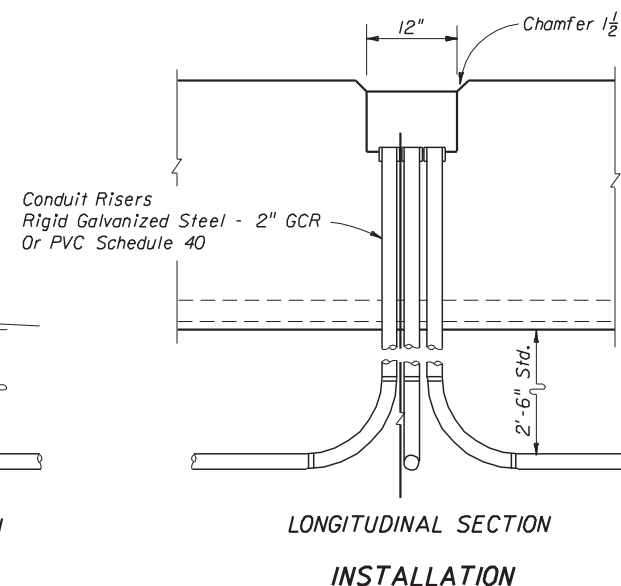
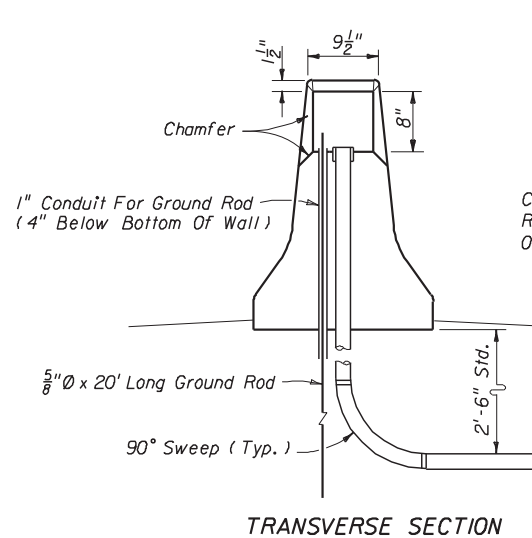
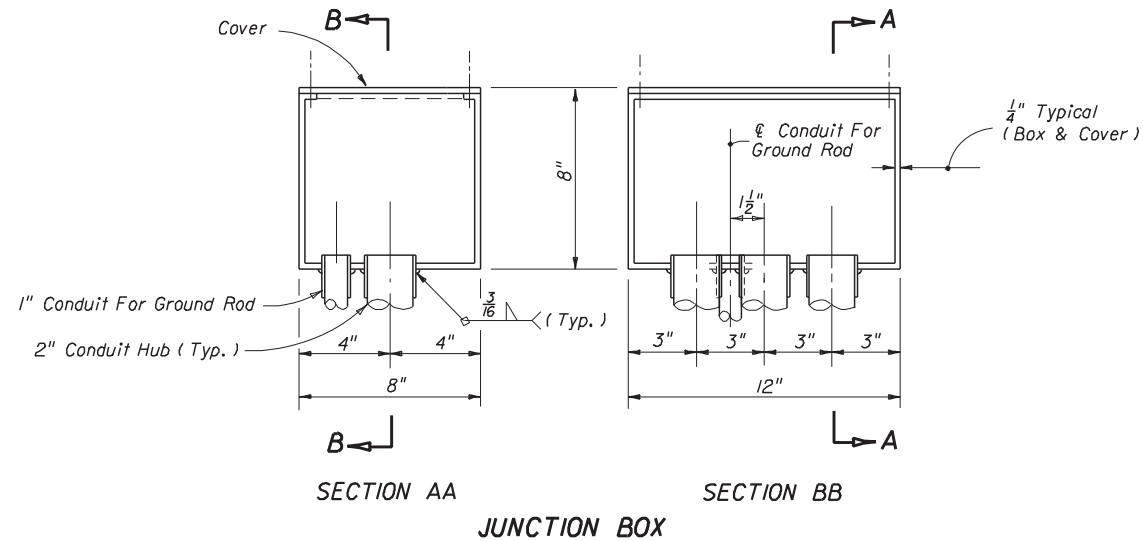
SECTION DD
 Free Of Deleterious And Cementsations Materials

CONCRETE MEDIAN BARRIER WALL TRANSITIONS AT BRIDGE PIERS AND OVERHEAD SIGN SUPPORTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	3 of 22	410



Note: For foundation design and details see Index No. I7503.
Refer to Highway Lighting Plans for size of conduit.
Payment for the 2'-6" concrete shaft including reinforcing steel, anchor bolts and accessories shall be included in the contract unit price for Light Pole Complete, EA.



- JUNCTION BOX NOTES
1. Junction boxes are to be fabricated from steel conforming to ASTM A36 and be hot dipped galvanized after fabrication. All seams shall be continuously welded and ground smooth. A neoprene gasket shall be attached to the box to provide a watertight cover. The cover screws shall be fully galvanized.
 2. Remove excess concrete while green and hand form chamfers.
 3. Junction box complete and conduit risers are incidental to the construction and cost of the barrier wall; there is to be no separate compensation for the box, risers or installation unless specifically called for in the plans.

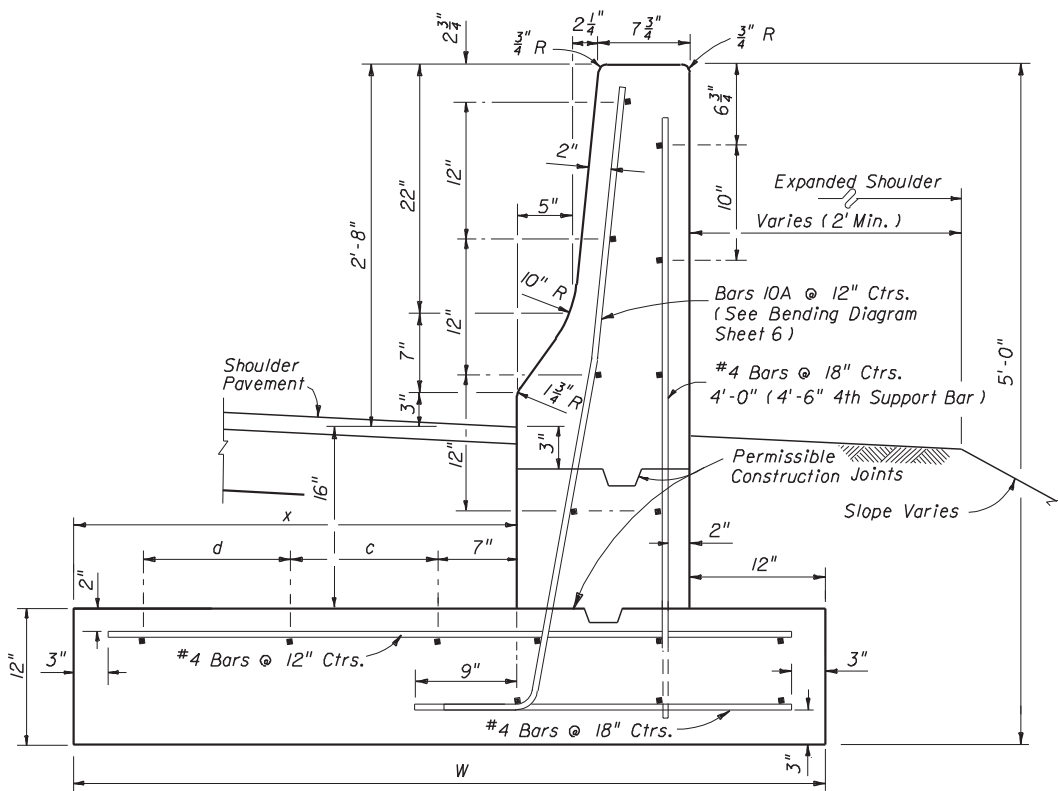
JUNCTION BOX - ELECTRICAL

LIGHT POLE MOUNTING IN MEDIAN BARRIER WALL

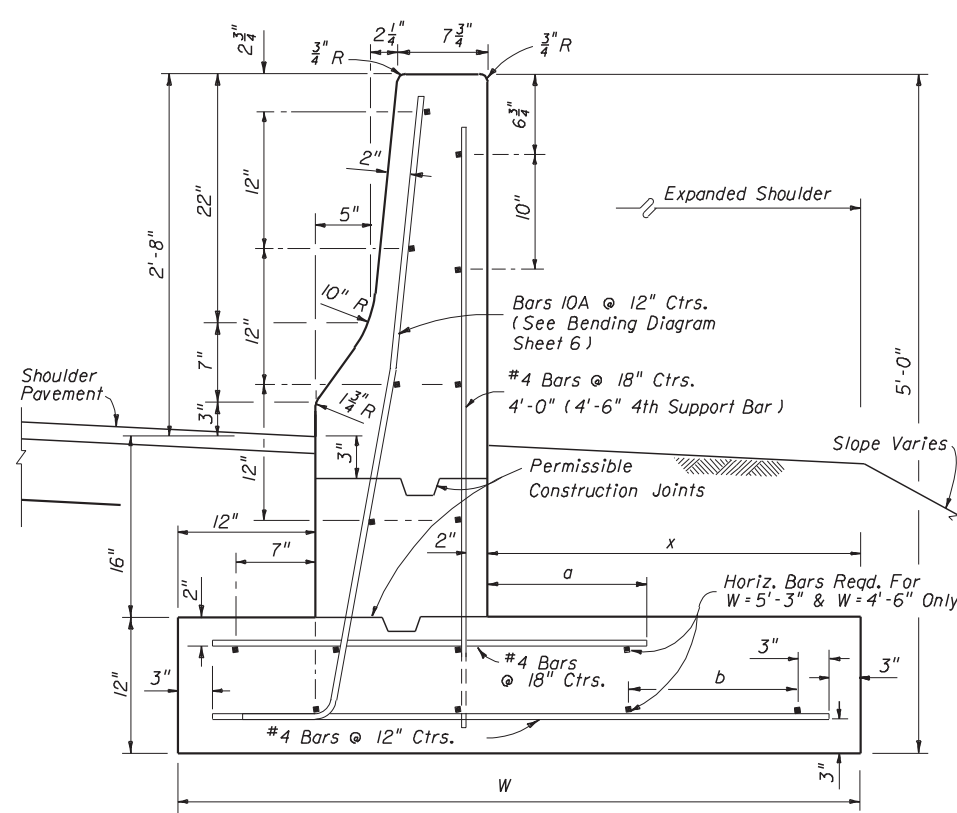
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CONCRETE BARRIER WALL

Names	Dates	Approved By
Designed By		<i>[Signature]</i> State Roadway Design Engineer
Drawn By	HSD 9/85	Revision Sheet No. Index No.
Checked By	JVG 9/85	00 4 of 22 410

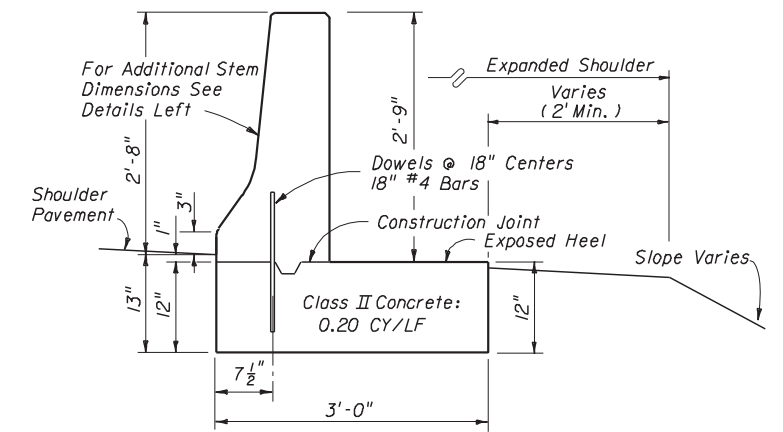
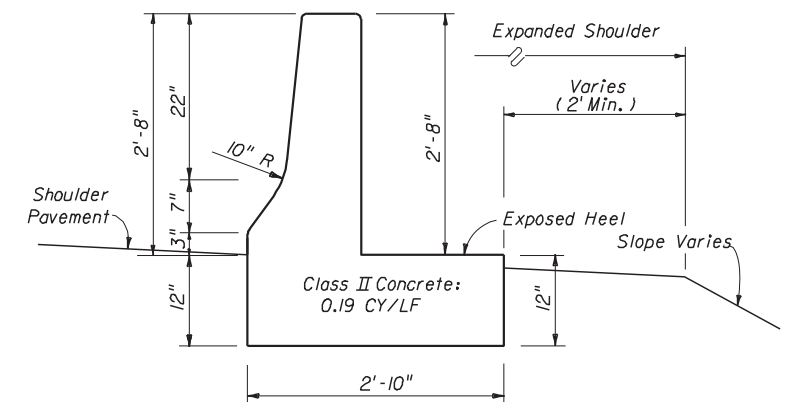


CANTILEVER WALL



L-WALL

NOTE: All longitudinal reinforcement #4 bars.

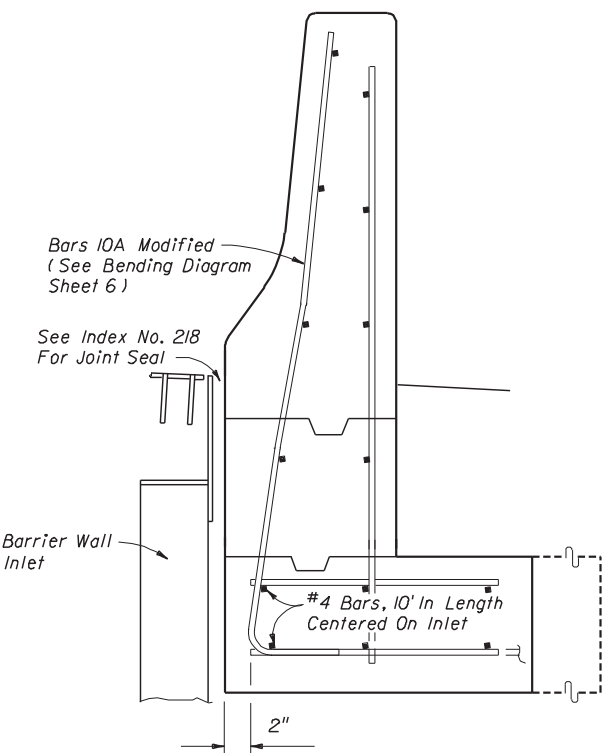


WALL OPTIONS

NOTE:
Wall to be paid for under the contract unit price for Concrete Barrier Wall (Plain-Shoulder), LF.

DESIGN NOTE:
Wall shall have a length of 40' or greater. Wall of 40' or more in length may be made up of segments of 20' or more in length provided the segments are joined by a transverse joint in accordance with Detail B, Sheet 2; segments shall have dimensions same as wall shown above.

PLAIN CONCRETE BARRIER WALL (SHOULDER)



REINFORCING STEEL MODIFICATIONS AT BARRIER WALL INLETS (INDEX NO. 218)

DIMENSIONS AND QUANTITIES													
CANTILEVER WALL						L-WALL							
Length* Of Barrier Wall	W	x	c	d	Class II Concrete CY Per Lin. Ft.	Reinforcing Steel LBS. Per Lin. Ft.	Length* Of Barrier Wall	W	x	a	b	Class II Concrete CY Per Lin. Ft.	Reinforcing Steel LBS. Per Lin. Ft.
≥ 40'	3'-3"	1'-0"	NA	NA	0.27	18	≥ 40'	3'-3"	1'-0"	6"	NA	0.27	18
35' to 39'	3'-6"	1'-3"	NA	NA	0.28	18	35' to 39'	3'-6"	1'-3"	6"	NA	0.28	18
30' to 34'	4'-0"	1'-9"	NA	NA	0.29	19	30' to 34'	3'-9"	1'-6"	6"	NA	0.29	18
25' to 29'	4'-6"	2'-3"	14"	NA	0.31	20	25' to 29'	4'-0"	1'-9"	9"	NA	0.30	19
21' to 24'	5'-0"	2'-9"	18"	NA	0.33	20	20' to 24'	4'-6"	2'-3"	12"	12"	0.31	20
19' & 20'	5'-6"	3'-3"	13"	13"	0.35	21	15' to 19'	5'-3"	3'-0"	16"	17"	0.34	21
17' & 18'	6'-0"	3'-9"	16"	16"	0.37	21							
15' & 16'	6'-6"	4'-3"	18"	18"	0.39	22							

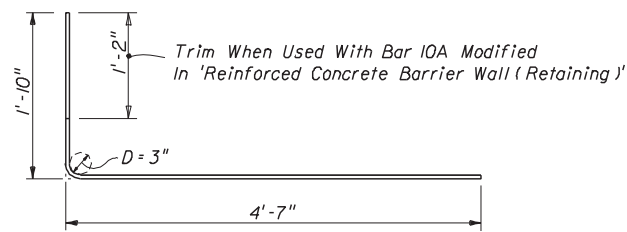
Quantities shown are for information only. For method of payment see payment note below.
Barrier wall inlets (Index 218) shall be isolated from the barrier wall stem and footing by 1" expansion material.
*Any length less than 40' must be a continuous (non-jointed) segment. Walls of 40' or more in length may be made up of segments of 20' or more in length provided the segments are joined by a transverse joint in accordance with Detail B, Sheet 2; segments shall have dimensions same as wall ≥ 40' above.

PAYMENT:
Wall to be paid for under the contract unit price for Concrete Barrier Wall (Rigid-Shoulder), LF.

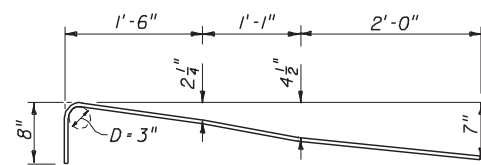
DESIGN NOTES:
Use of this barrier wall should be limited to special applications such as hazard encroachment into the clear zone where barrier wall deflection, rotation or translation cannot be tolerated; example hazards to consider are as follows:
(a) Structure supporting piers, bents and pylons (b) Pumping, metering, control or other similar critical stations (c) Quarries (d) Intolerable vertical drops (e) Historic structures or monuments (f) Rail transit travel way or passenger station (g) Other similar occupancies

REINFORCED CONCRETE BARRIER WALL (SHOULDER)

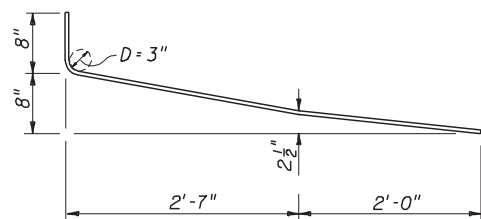
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Names	Dates	Approved By		
Designed By		State Roadway Design Engineer		
Drawn By	HSD 9/85	Revision	Sheet No.	Index No.
Checked By	JVG 9/85	00	5 of 22	410



BAR 10B

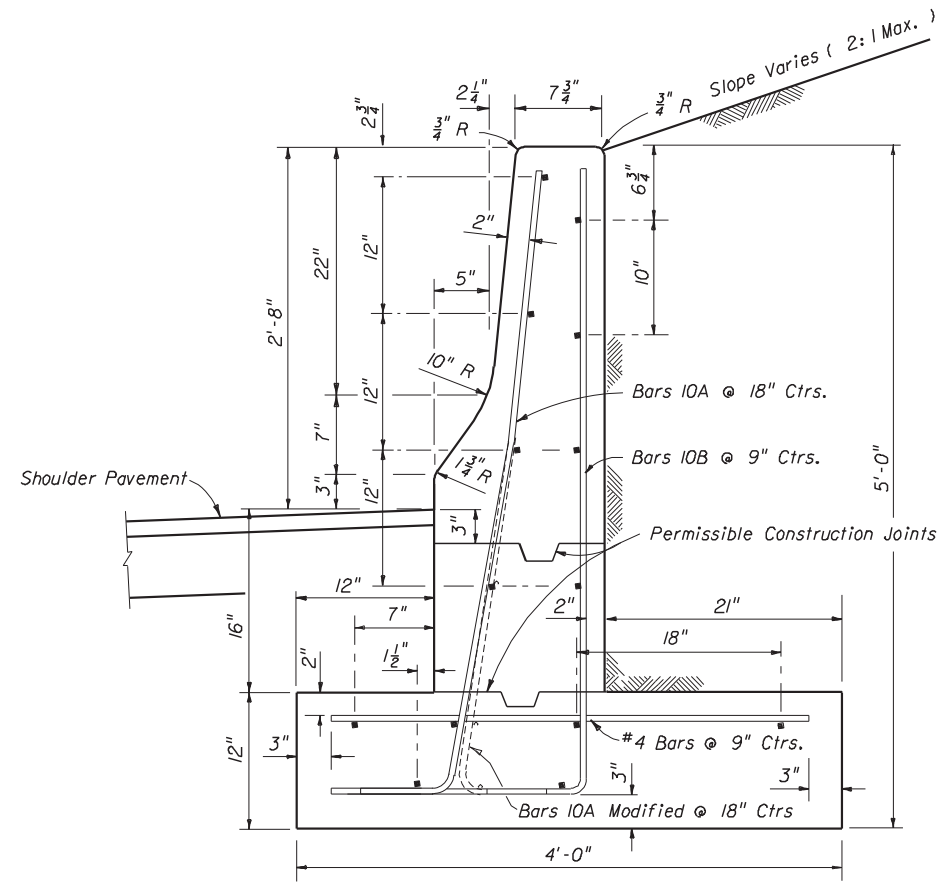


For Use In Areas Where Obstructions Require Localized Omission Of Toe
BAR 10A MODIFIED



BAR 10A

BENDING DIAGRAMS



NOTE: All longitudinal reinforcement #4 bars.
Minimum segment length for this wall is 20 feet.
Wall to be paid for under the contract unit price for Concrete Barrier Wall (Rigid-Retaining), LF.

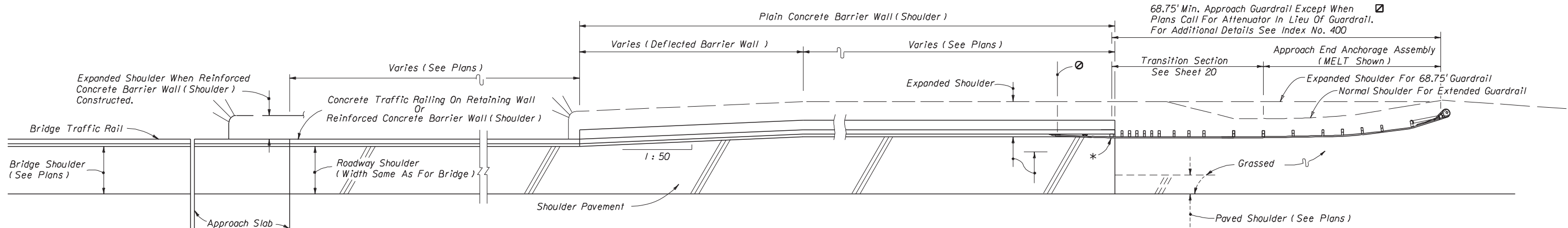
QUANTITIES: Class II Concrete 0.29 CY/LF
Reinforcing Steel 21 LBS/LF

REINFORCED CONCRETE BARRIER WALL (RETAINING)

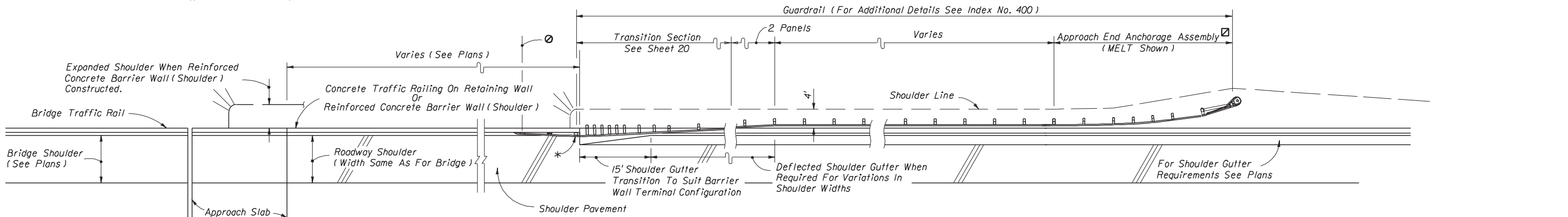
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CONCRETE BARRIER WALL

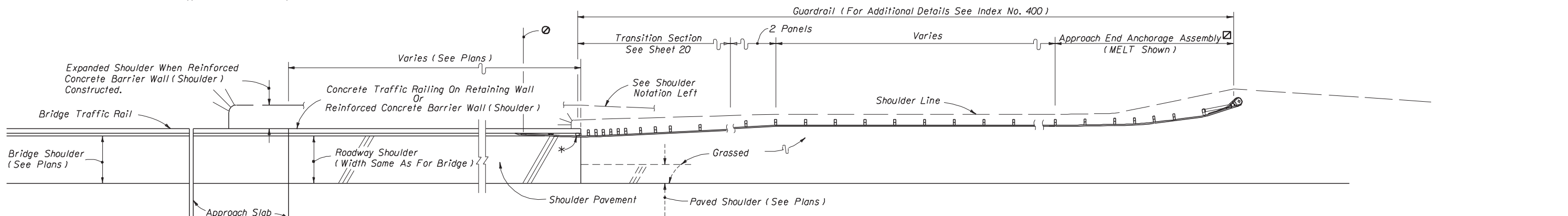
Names	Dates	Approved By		
Designed By		<i>Bob J. [Signature]</i> State Roadway Design Engineer	Revision	Sheet No.
Drawn By			00	6 of 22
Checked By				Index No. 410



WITH PLAIN CONCRETE BARRIER WALL (SHOULDER)



WITH SHOULDER GUTTER AND GUARDRAIL



WITH GRASSED OR PAVED SHOULDERS AND GUARDRAIL

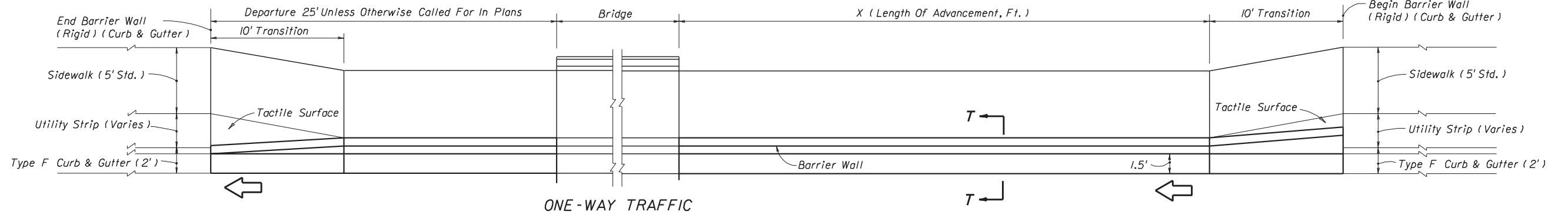
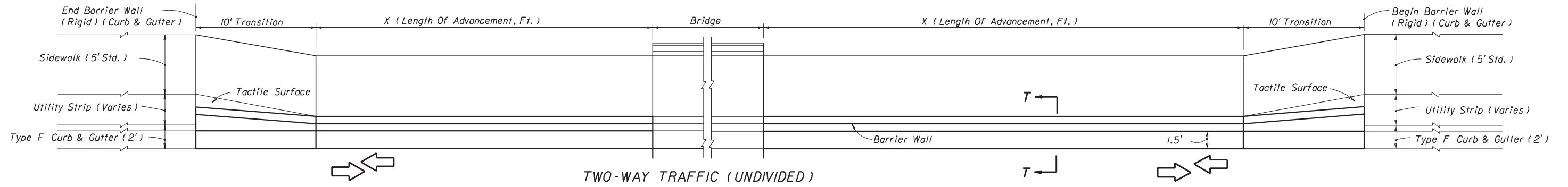
△ Views show approach roadside barriers when length of need exceeds the length of either retaining walls with concrete traffic railings* or Reinforced Concrete Barrier Wall (Shoulder) on shoulders. When either of these rigid barriers alone satisfies the approach length of need, the wall ends shall be shielded by crash cushions, or, by guardrail the same as for bridge traffic rails, as detailed in Index No. 400.
See other flagged notes for trailing end treatments.
Miscellaneous asphalt paving under guardrail not shown.

* Guardrail connection to concrete traffic railings on retaining walls shall be in accordance with the Structures Design Office Standard Drawings and the plans. Approach guardrail connections to shoulder concrete barrier walls shall be in accordance with the details shown on Sheets 2 and 20 of this Index and Index No. 400, Detail J.
⊙ End measurement for guardrail payment when guardrail connected to shoulder barrier walls. See Index No. 400, Detail J for end measurement when guardrail connected to concrete traffic rails constructed with approach slab or on retaining walls.

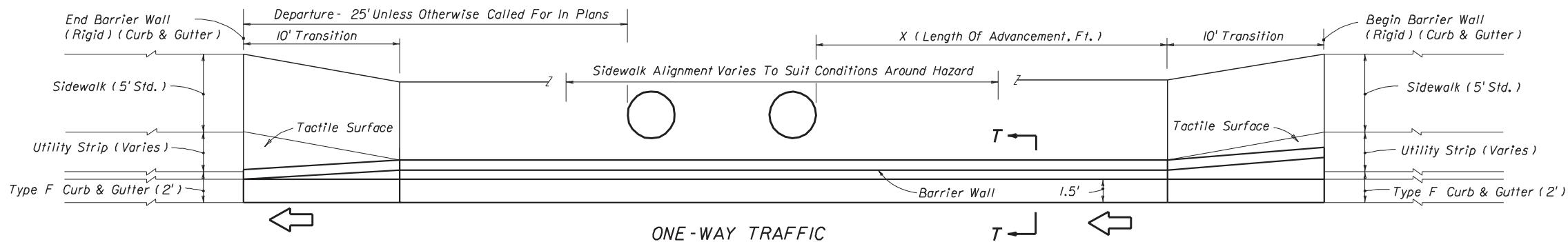
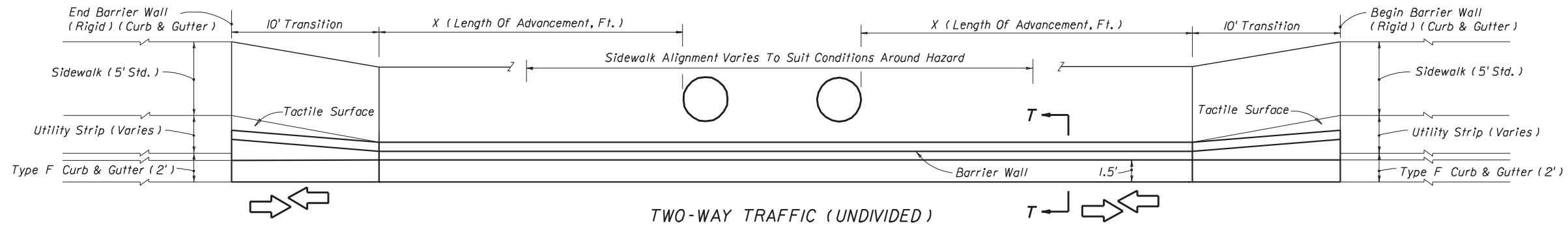
☑ To be deleted on trailing ends except for 2-lane 2-way facilities. The tangent guardrail shall be anchored by End Anchorage Type II, Index No. 400.
☑ To be deleted on trailing ends except for 2-lane 2-way facilities.

EITHER REINFORCED CONCRETE BARRIER WALL (SHOULDER) OR RETAINING WALL WITH CONCRETE TRAFFIC RAILING
CONCRETE BARRIER WALLS ON APPROACHES TO BRIDGES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	8/89	<i>Bo J. Johnson</i> State Roadway Design Engineer	
Checked By	KNM/JVG	8/89	Revision	Sheet No.
			00	7 of 22
				410



BRIDGE END HAZARD

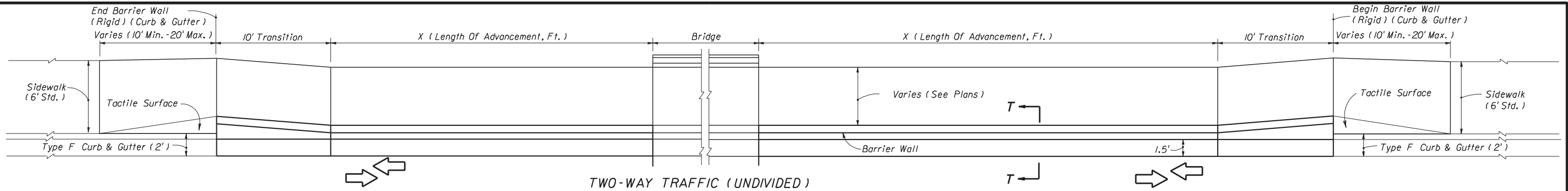


HAZARD 4' OR LESS FROM FACE OF CURB

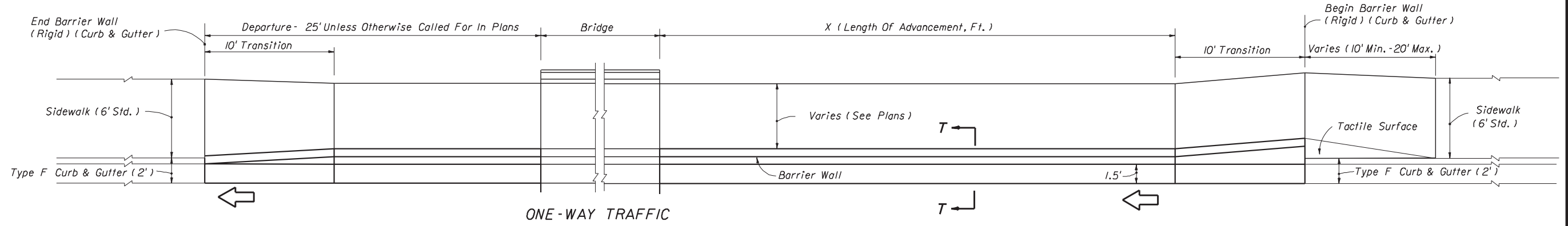
**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
CURB AND GUTTER WITH UTILITY STRIP AND WITH ADJACENT BICYCLE LANE**

NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 12.
 For locations without utility strips see Sheet 9.
 For transition, sidewalk and sectional details see Sheets 10 & 11.
 The 1.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheet 19.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Designed By	STAFF	Dates	10/97	Approved By
Drawn By	HKH	10/97		<i>[Signature]</i> State Roadway Design Engineer
Checked By	JVG	10/97	00	Revision
			8 of 22	Sheet No.
				Index No.
				410

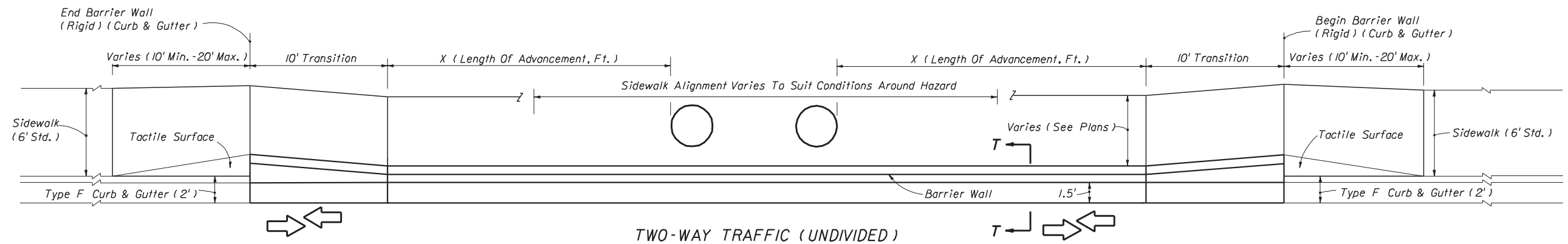


TWO-WAY TRAFFIC (UNDIVIDED)

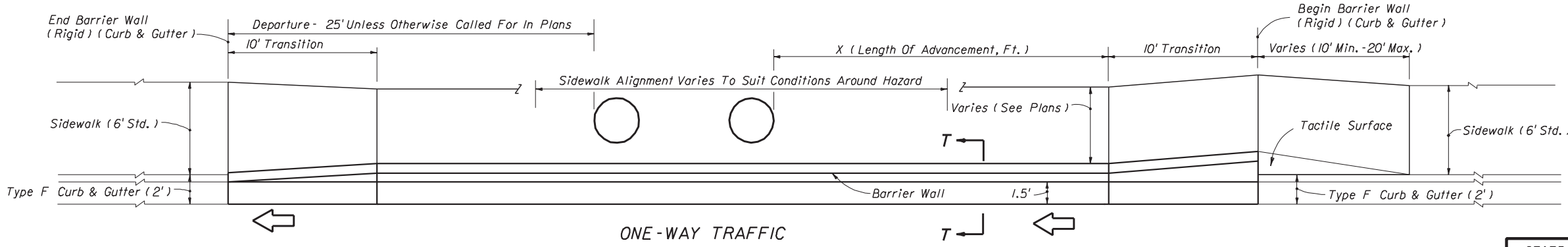


ONE-WAY TRAFFIC

BRIDGE END HAZARD



TWO-WAY TRAFFIC (UNDIVIDED)



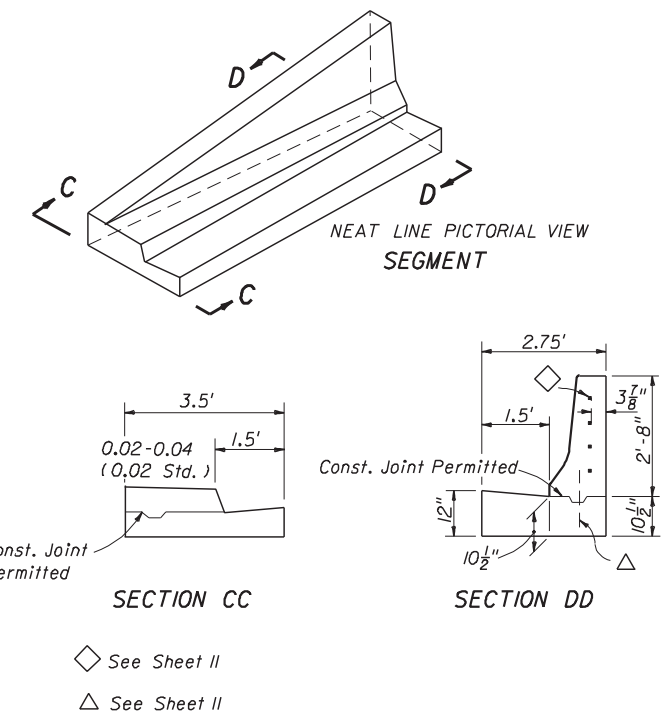
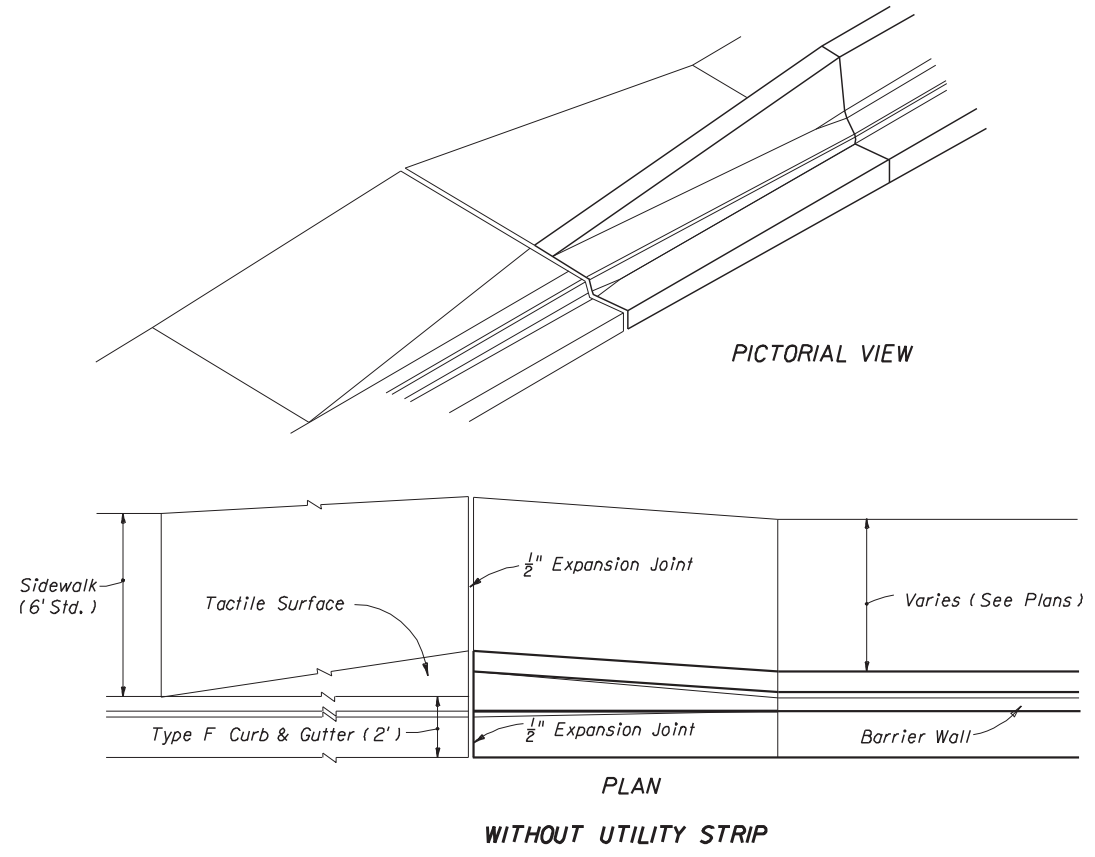
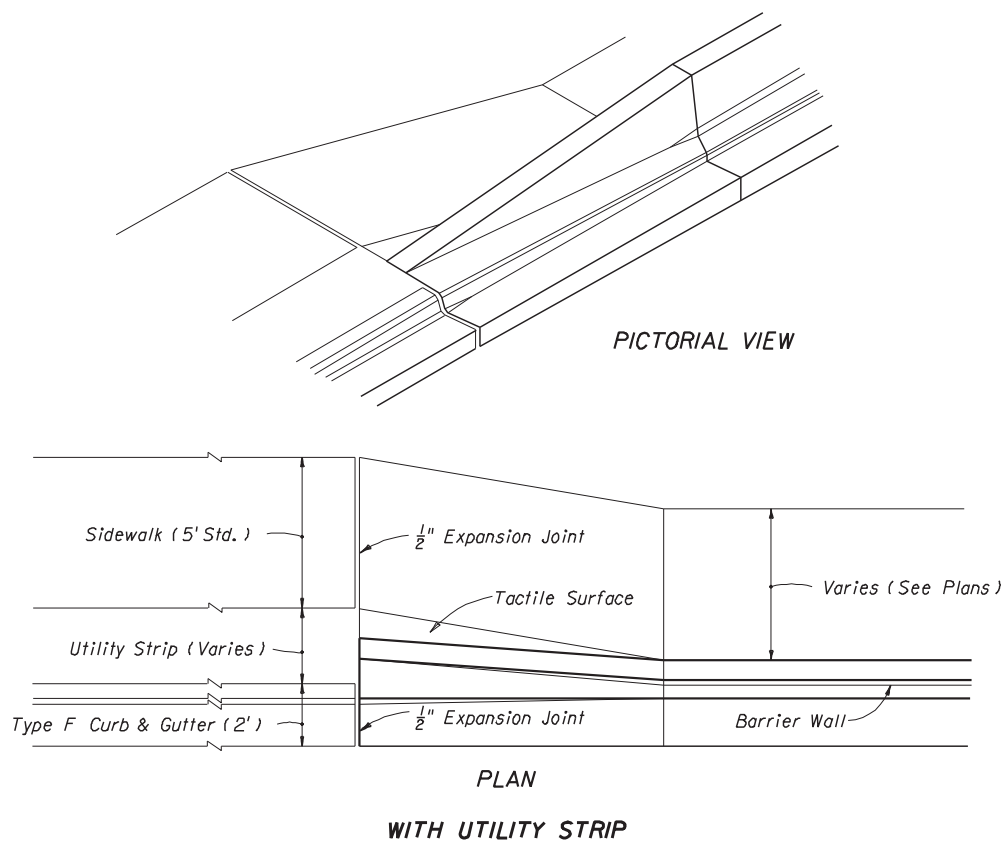
ONE-WAY TRAFFIC

HAZARD 4' OR LESS FROM FACE OF CURB

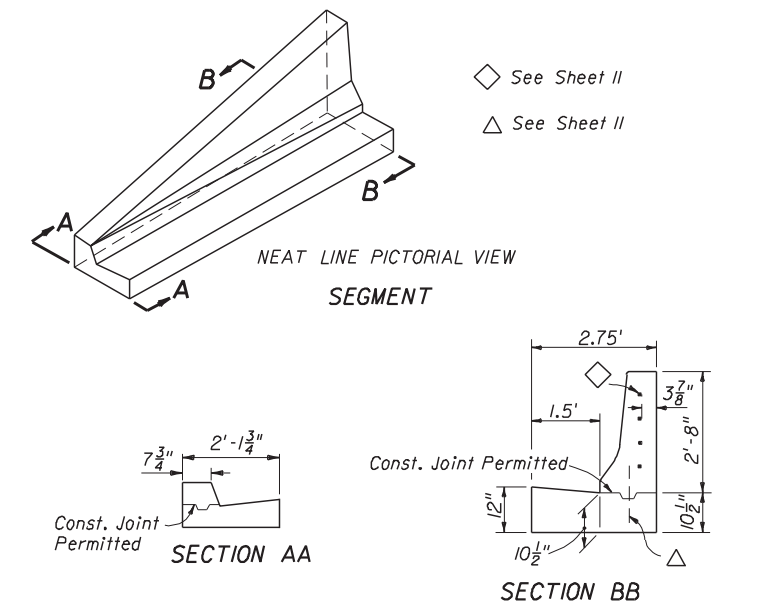
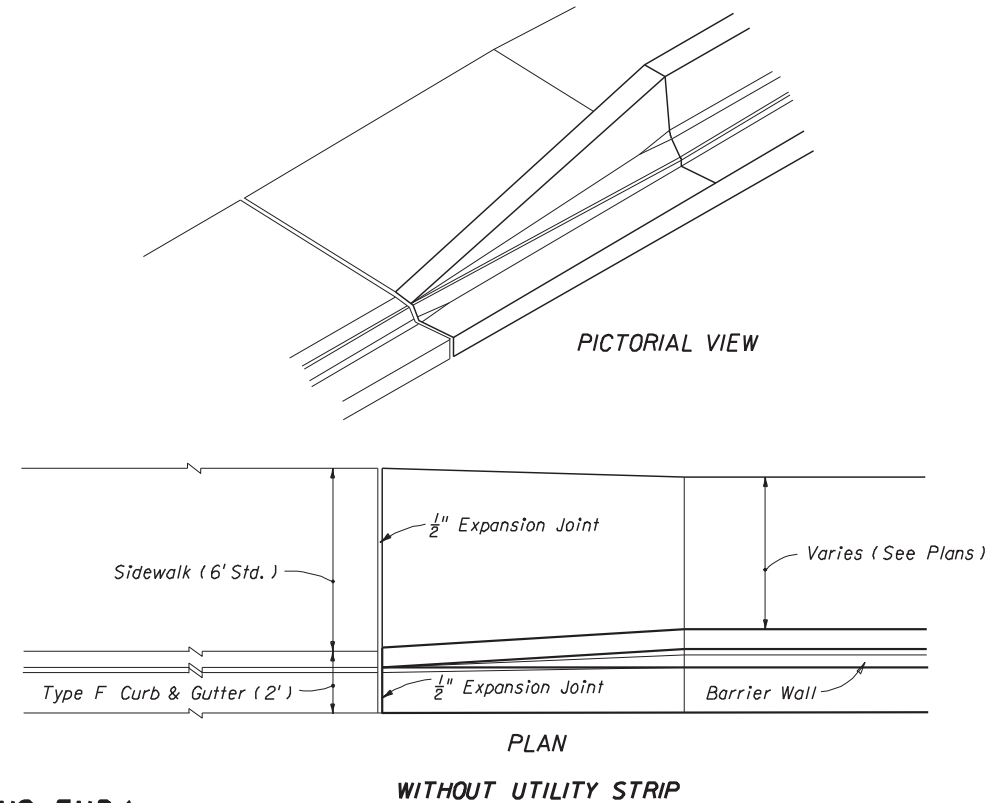
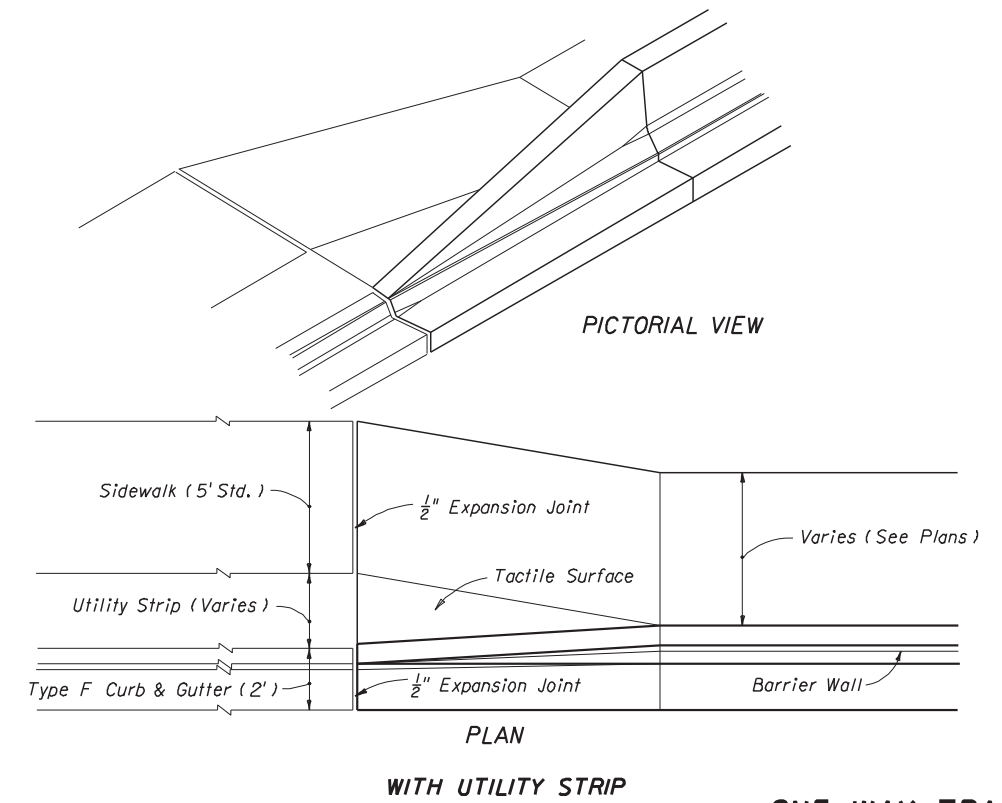
NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 12.
 For locations with utility strips see Sheet 8.
 For transition, sidewalk and sectional details see Sheet 10 & 11.
 The 1.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheet 19.

**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
 CURB AND GUTTER WITHOUT UTILITY STRIP AND WITH ADJACENT BICYCLE LANE**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Designed By	STAFF	Dates	10/97	Approved By
Drawn By	HKH	10/97	00	State Roadway Design Engineer
Checked By	JVG	10/97	00	Revision
			9 of 22	Sheet No.
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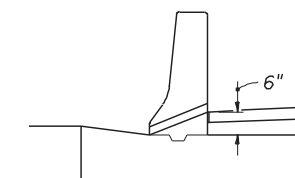
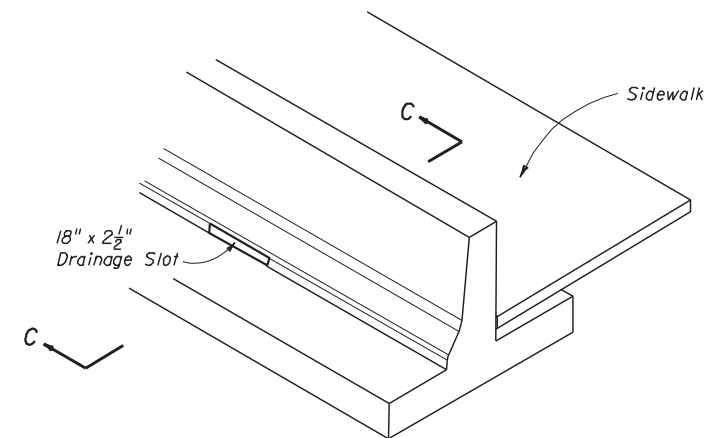
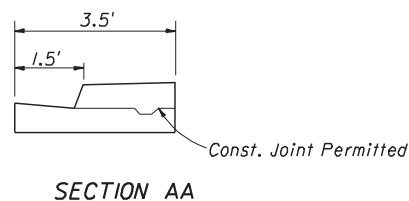
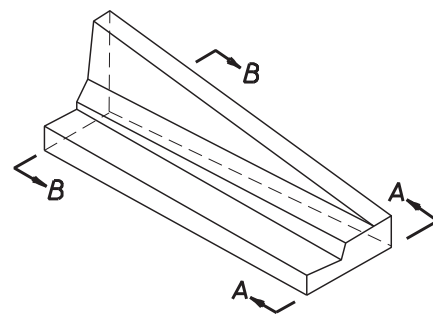
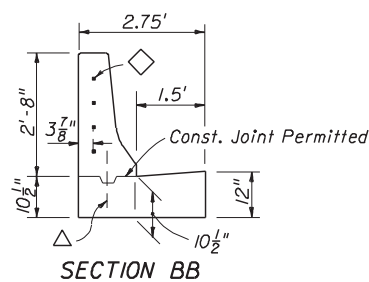
TWO-WAY TRAFFIC (OPPOSING LANE APPROACH)



ONE-WAY TRAFFIC (TRAILING END)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENTS • WITH ADJACENT BICYCLE LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	STAFF	10/97	State Roadway Design Engineer	
Drawn By	HKH	10/97	Revision	Sheet No.
Checked By	JVG	10/97	00	10 of 22
				Index No. 410



- ◇ See Notes This Sheet
- △ See Notes This Sheet

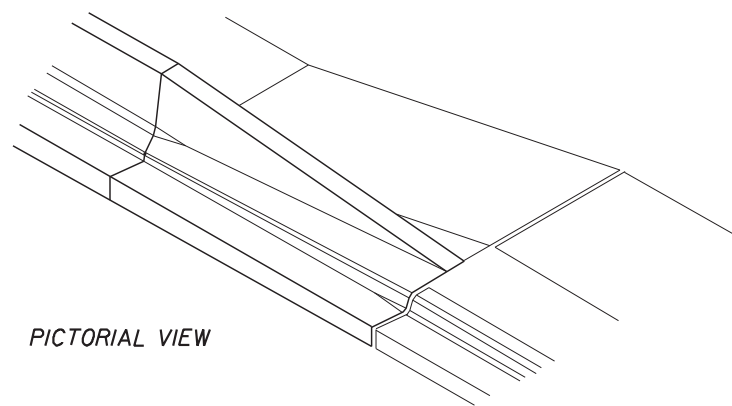
WITH OR WITHOUT UTILITY STRIP
NEAT LINE PICTORIAL VIEW

NEAT LINE PICTORIAL VIEW

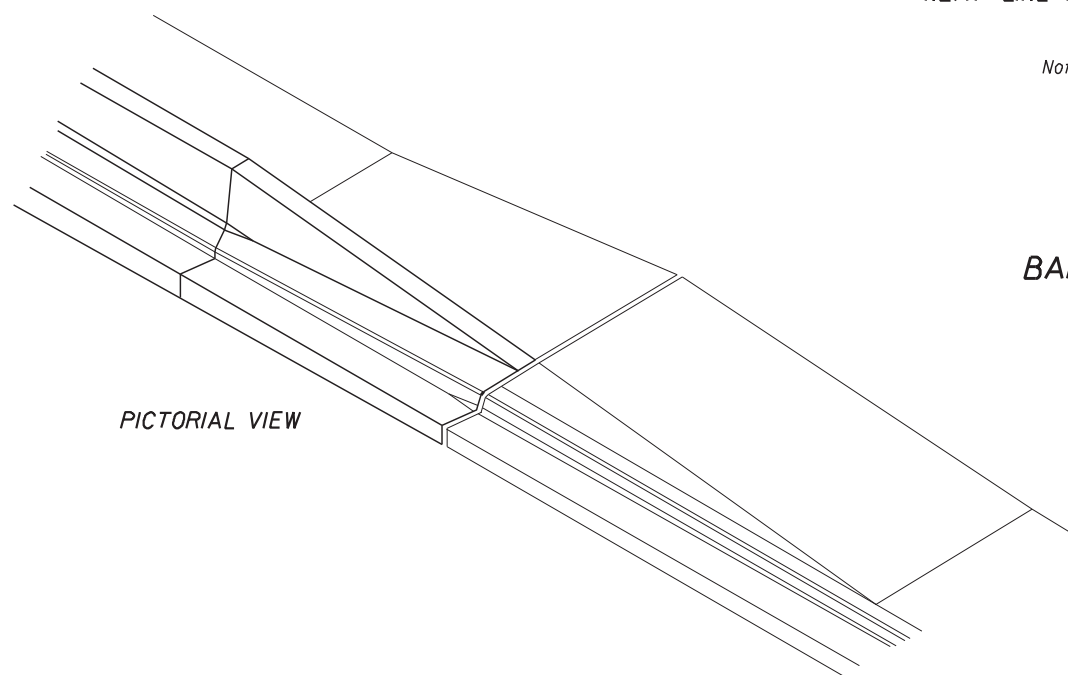
SECTION CC

Note: Drainage slots shall be located at all low points along the sidewalk, and, unless otherwise shown in the plans, slots shall be spaced at intervals not exceeding 50' in fill sections and 20' in cut sections. Slots shall be located such that only one bar is cut away or deleted in front and back lines of vertical reinforcement.

SIDEWALK DRAINAGE SLOT FOR BARRIER WALL (RIGID) (CURB & GUTTER)



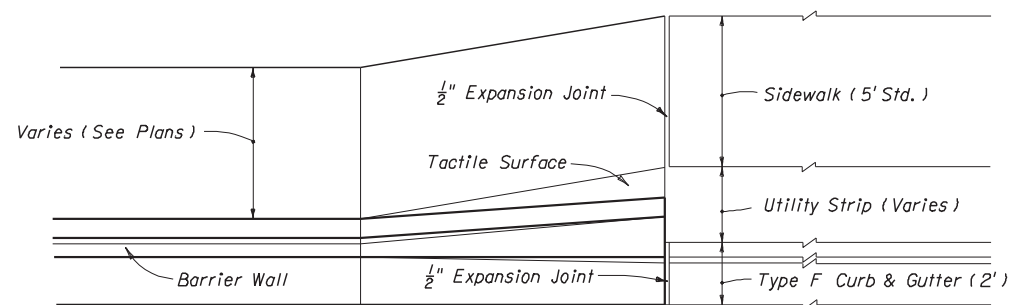
PICTORIAL VIEW



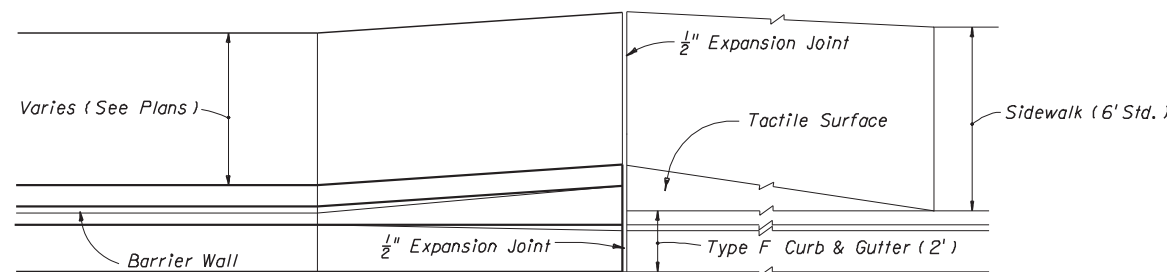
PICTORIAL VIEW

NOTE:

- ◇ Transition Segments Shall Be Doweled Into The End Of The Barrier Wall In The Following Manner:
Four 1 1/4" diameter holes 6" deep on 6" centers shall be drilled in the end of the barrier and #6 bars 15" long set in epoxy mortar. The ends of the dowels extending into the transition segment shall be wrapped with one layer of 15 lb. Type I asphalt-saturated roofing felt with the ends crimped.
- △ When Construction Joints Are Utilized For Transition Segment Construction The Stem Shall Be Doweled To The Footing In The Following Manner:
Five #5 bars 15" long shall be embedded 7" into the footing. The dowels shall be spaced 15" on centers with the first dowel located 12" from the barrier wall. Dowels may be placed within or adjacent to the keyway.



PLAN
WITH UTILITY STRIP



PLAN
WITHOUT UTILITY STRIP

RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE HAND

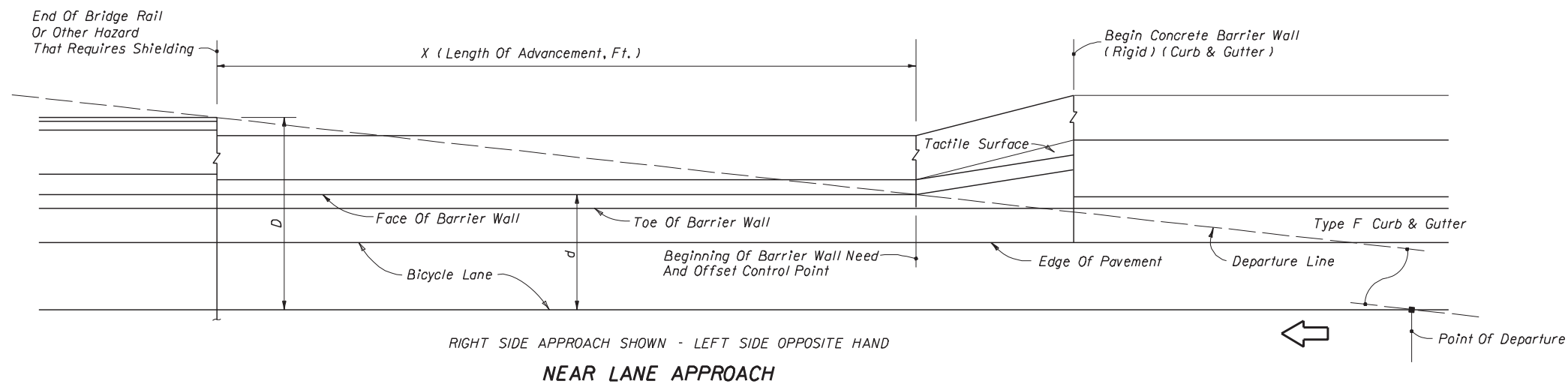
ONE-WAY AND TWO-WAY TRAFFIC (NEAR LANE APPROACH)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENT • WITH ADJACENT BICYCLE LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

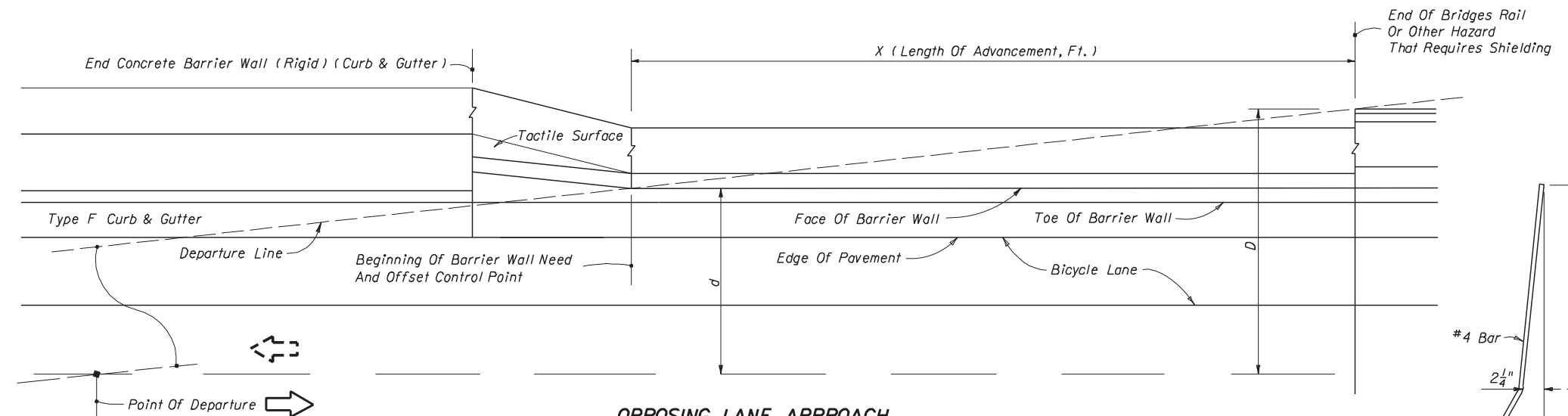
CONCRETE BARRIER WALL

Names	Dates	Approved By <i>Bob J. [Signature]</i>		
Designed By	STAFF	10/97	State Roadway Design Engineer	
Drawn By	HKH	10/97	Revision	Sheet No.
Checked By	JVG	10/97	00	11 of 22
				410



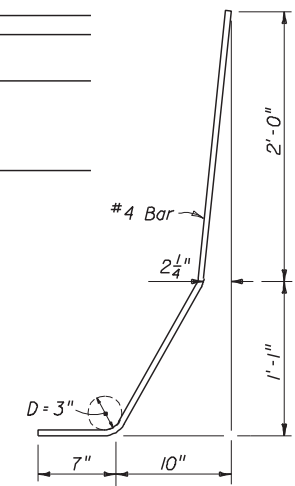
RIGHT SIDE APPROACH SHOWN - LEFT SIDE OPPOSITE HAND

NEAR LANE APPROACH

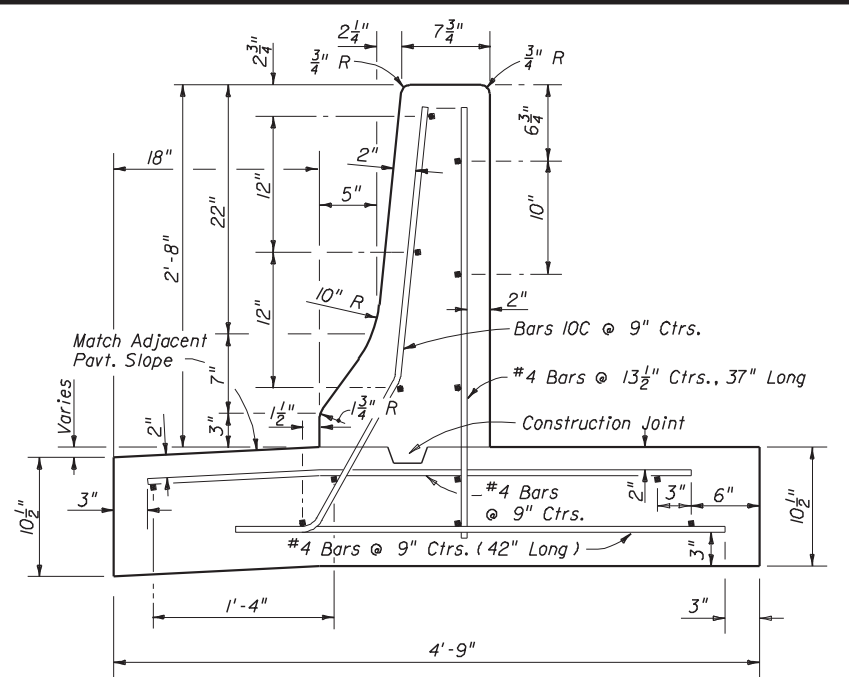


OPPOSING LANE APPROACH

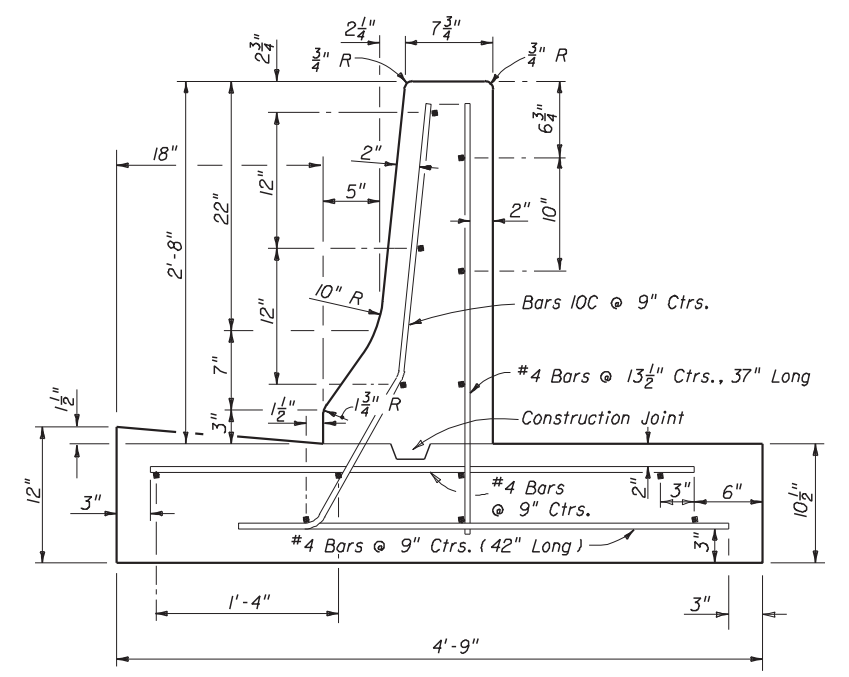
WITH OR WITHOUT UTILITY STRIP - UTILITY STRIP SHOWN - SEE SHEET 8 & 9 FOR APPLICATIONS



BAR 10C BENDING DIAGRAM



FOR HIGH SIDE



FOR LOW SIDE

Design Speed mph	Length Of Advancement, Ft. (X)
≤ 45	= 16 (D - d)

Note: The minimum length of advancement for both near and opposing lane approaches is 40'.

Equation Variables:
 D = Distance in feet from near edge of the near approach traffic lane to back of hazard or clear zone width whichever is lesser. For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the near approach traffic lane.
 d = Distance in feet from near edge of the near approach traffic lane to the face of barrier (at offset control point). For left side hazards on two-way undivided facilities d is measured from the inside edge of the nearest opposing traffic lane.

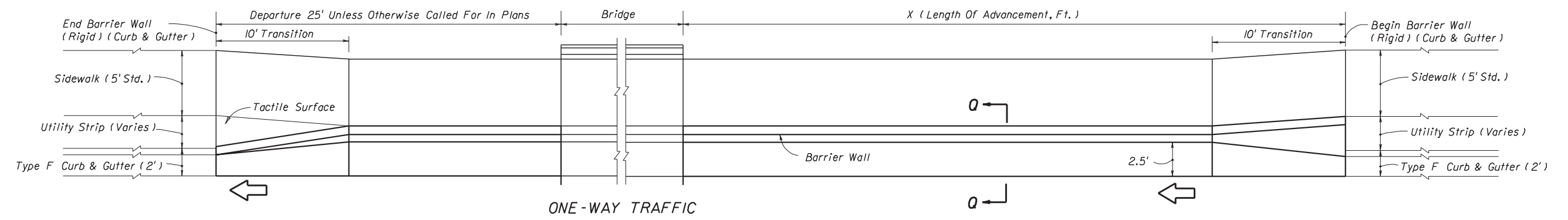
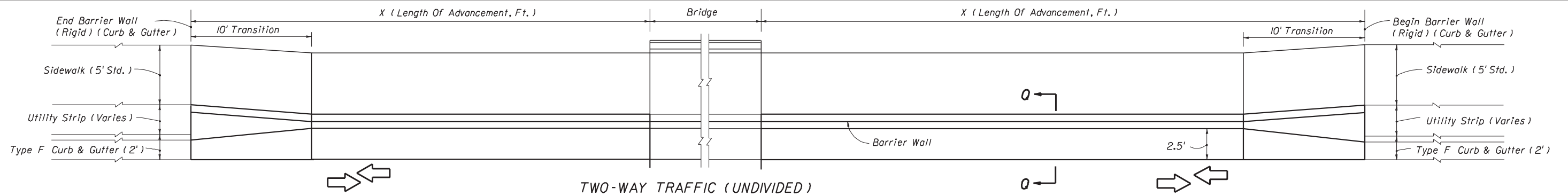
LENGTH OF ADVANCEMENT

Note: All longitudinal reinforcement #4 bars. Minimum segment length for this wall is 40'. Shorter segments due to construction or expansion joint shall be doweled in the manner described for 'Transition Segments' on Sheet 11. Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at intervals so that spacing will not exceed 100'. For barrier wall inlet details see Index No. 219. Inlet extends into bicycle lane 12". Wall to be paid for under the contract unit Price for Concrete Barrier Wall (Rigid-Curb & Gutter), LF.
 Estimated Quantities Per Linear Foot Of Wall:
 Class II Concrete: 0.23 C.Y.
 Reinforcing Steel: 20.7 Lbs.

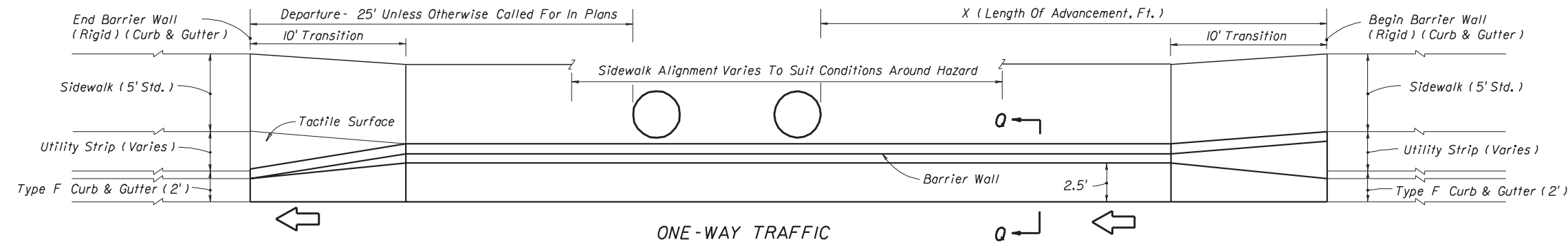
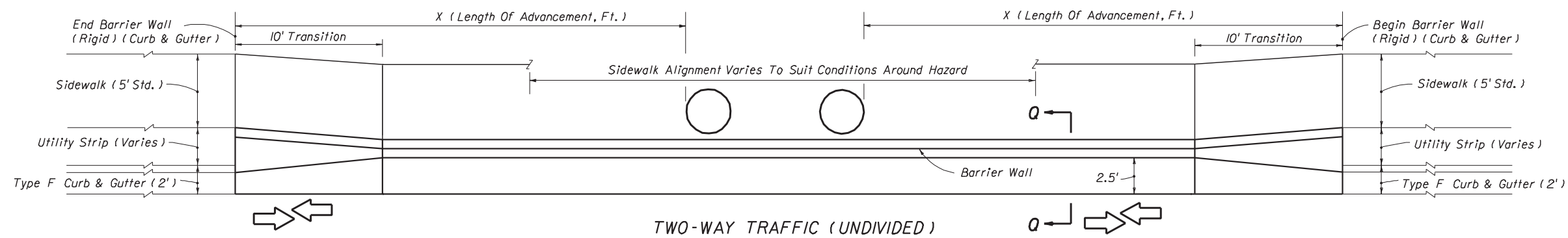
SECTION TT

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • WITH ADJACENT BICYCLE LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Names	Dates	Approved By		
Designed By	STAFF	10/97	 State Roadway Design Engineer	
Drawn By	HKH	10/97		
Checked By	JVG	10/97		
Revision	00	Sheet No.	12 of 22	Index No.
				410



BRIDGE END HAZARD

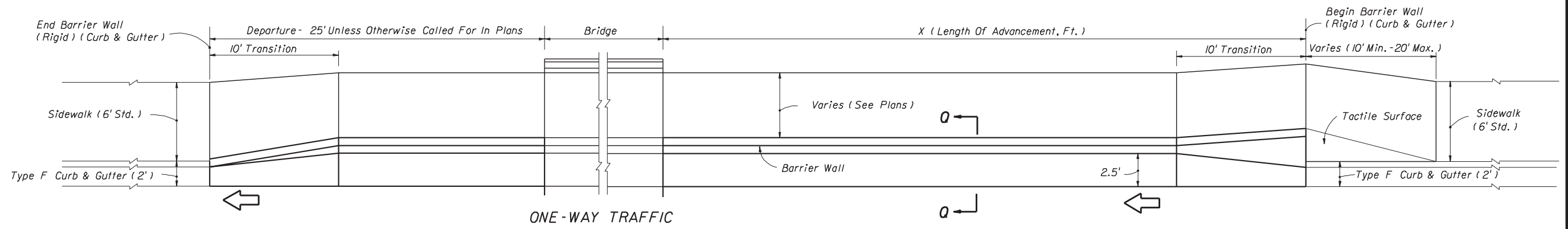
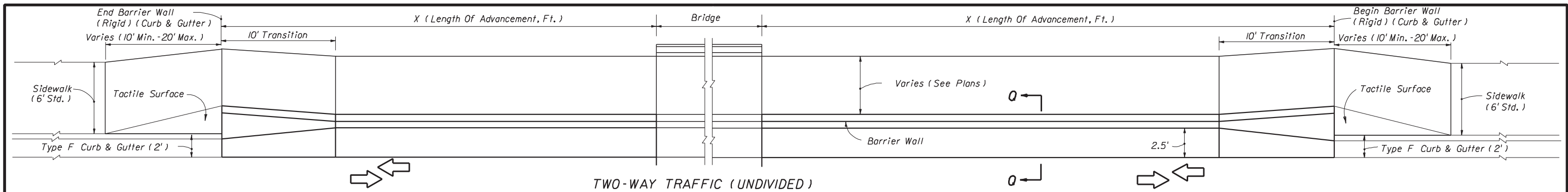


HAZARD 4' OR LESS FROM FACE OF CURB

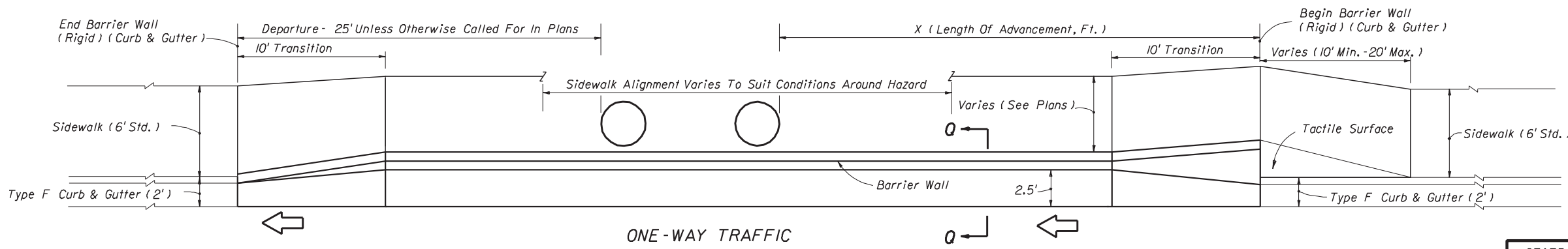
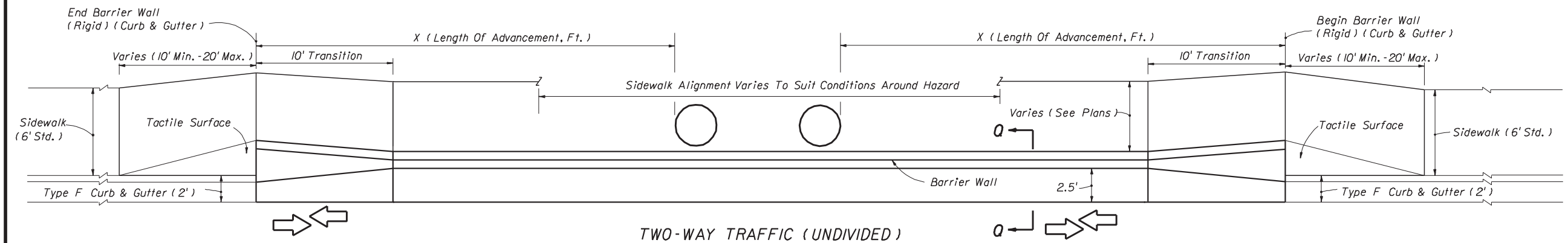
NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 17.
 For locations without utility strips see Sheet 14.
 For transition, sidewalk and sectional details see Sheets 15 & 16.
 The 2.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheet 19.

**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
 CURB AND GUTTER WITH UTILITY STRIP AND WITHOUT ADJACENT BICYCLE LANE**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Names	Dates	Approved By		
Designed By		State Roadway Design Engineer		
Drawn By	HSD 10/85	Revision	Sheet No.	Index No.
Checked By	JBW/JVG 10/85	00	13 of 22	410



BRIDGE END HAZARD

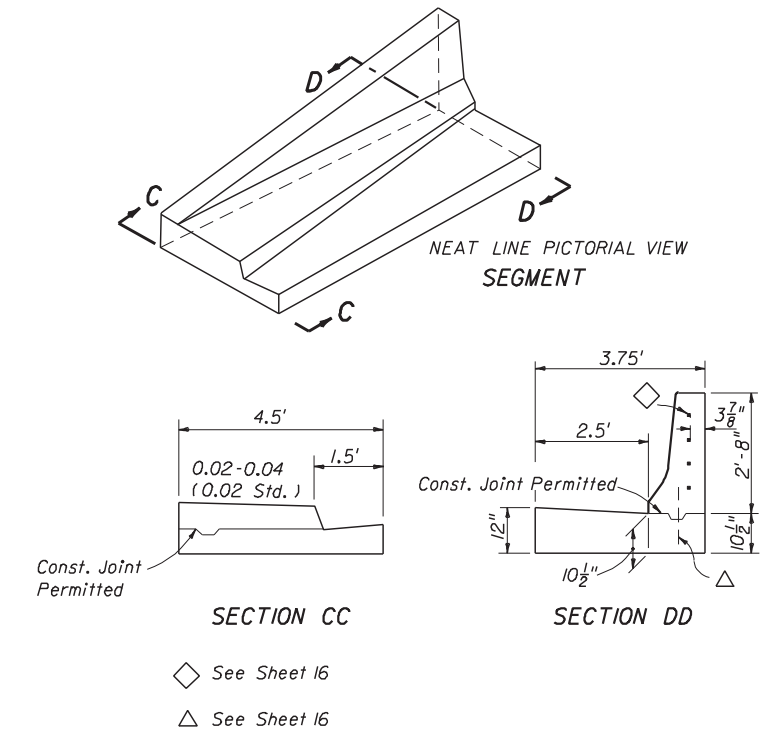
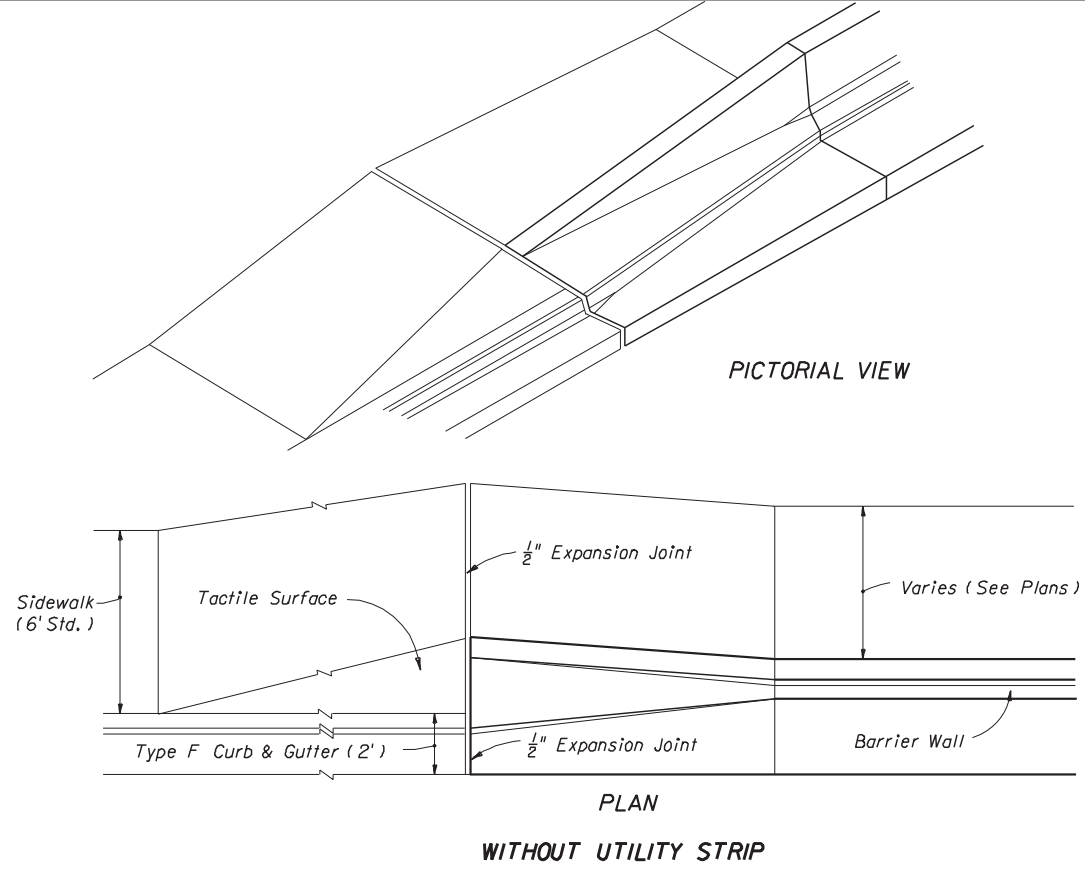
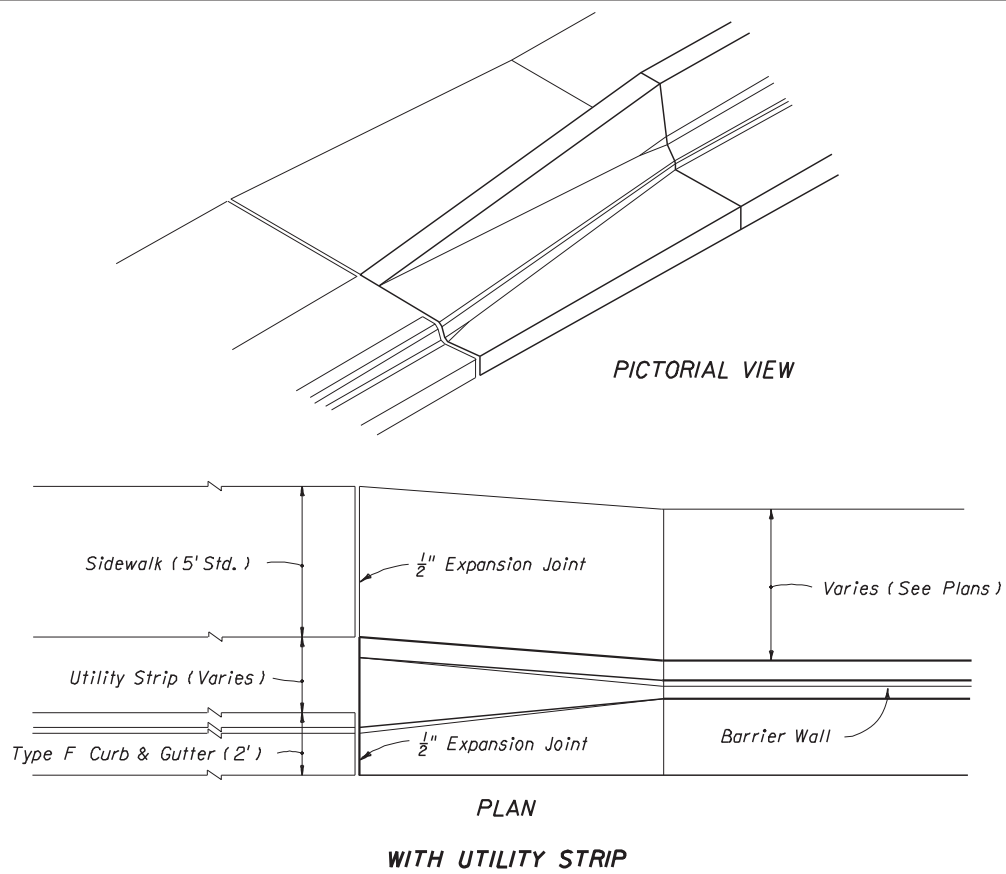


HAZARD 4' OR LESS FROM FACE OF CURB

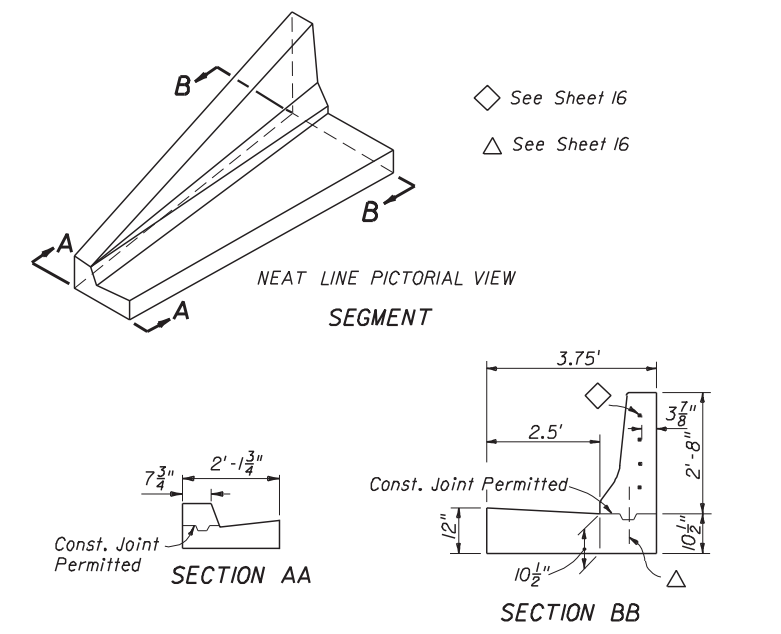
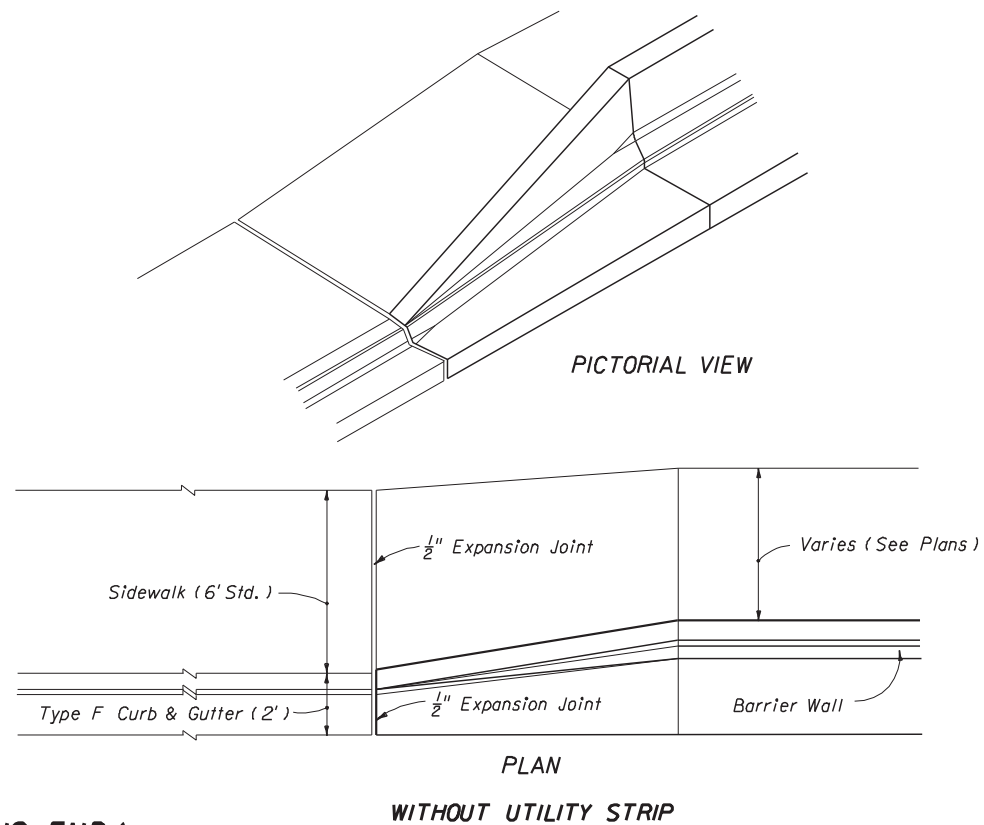
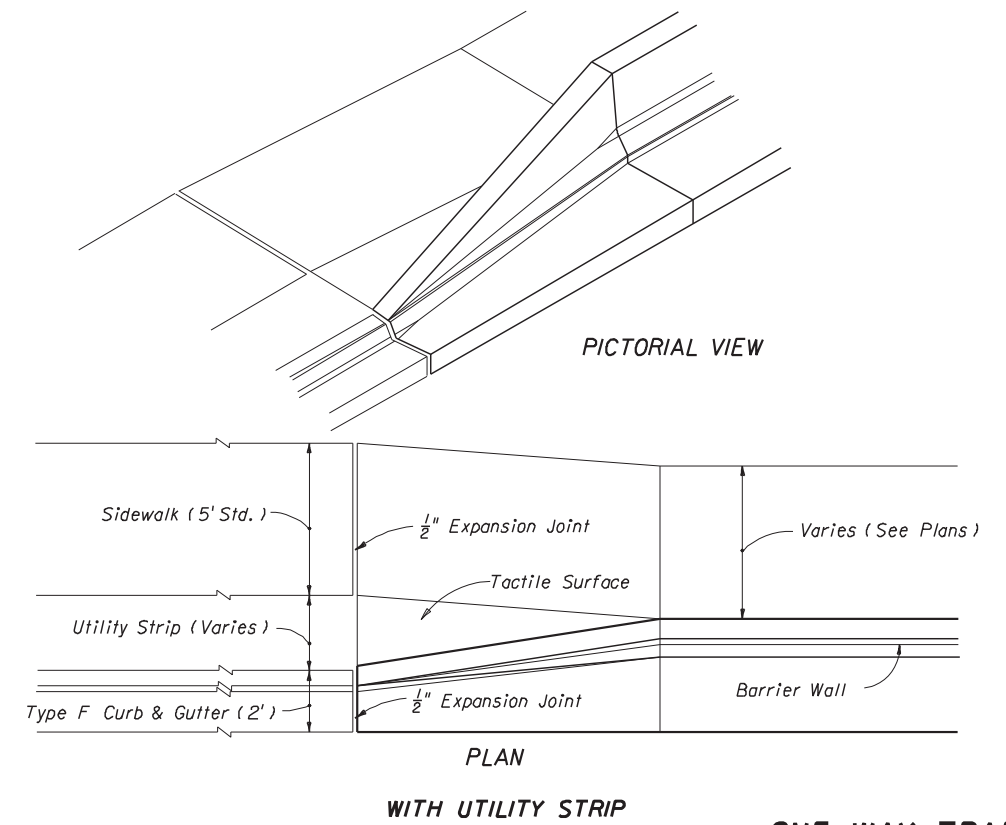
**CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER)
CURB AND GUTTER WITHOUT UTILITY STRIP AND WITHOUT ADJACENT BICYCLE LANE**

NOTE:
 X = Length of advancement in feet for near and opposing approach lanes. See Sheet 17.
 For locations with utility strips see Sheet 13.
 For transition, sidewalk and sectional details see Sheet 15 & 16.
 The 2.5' offsets to toe of barrier wall cannot be reduced to accommodate hazards; however, hazards located in the stem of the wall may be accommodated by the detail on Sheet 19.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	10/85	 State Roadway Design Engineer	
Checked By	JBW/JVG	10/85	Revision	Sheet No.
			00	14 of 22
				410



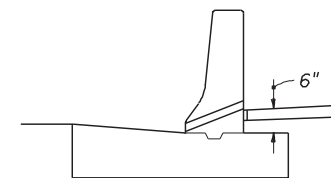
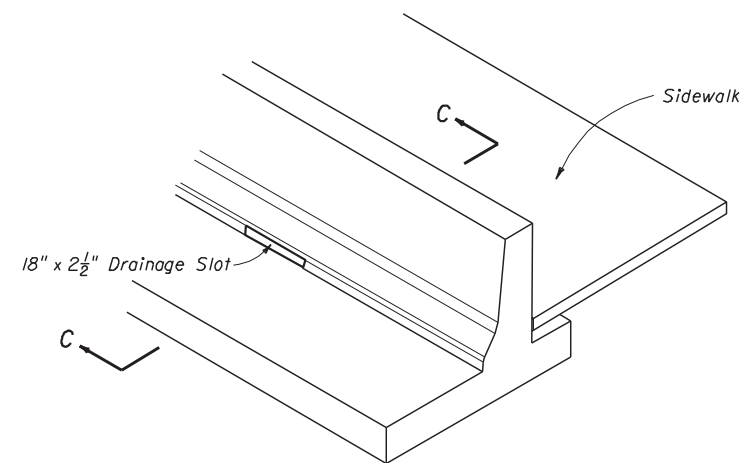
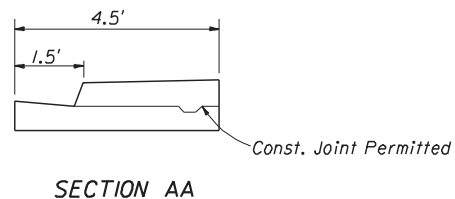
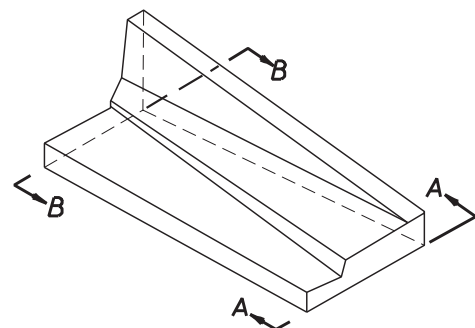
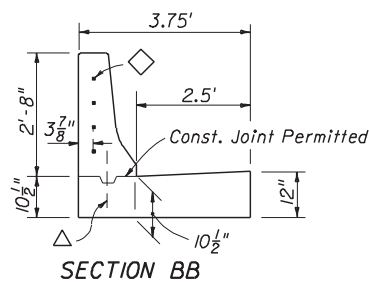
TWO-WAY TRAFFIC (OPPOSING LANE APPROACH)



ONE-WAY TRAFFIC (TRAILING END)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENTS • WITHOUT ADJACENT BICYCLE LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Names	Dates	Approved By		
Designed By		State Roadway Design Engineer		
Drawn By	HSD 10/85	Revision	Sheet No.	Index No.
Checked By	JBW/JVG 10/85	00	15 of 22	410



◇ See Notes This Sheet
 △ See Notes This Sheet

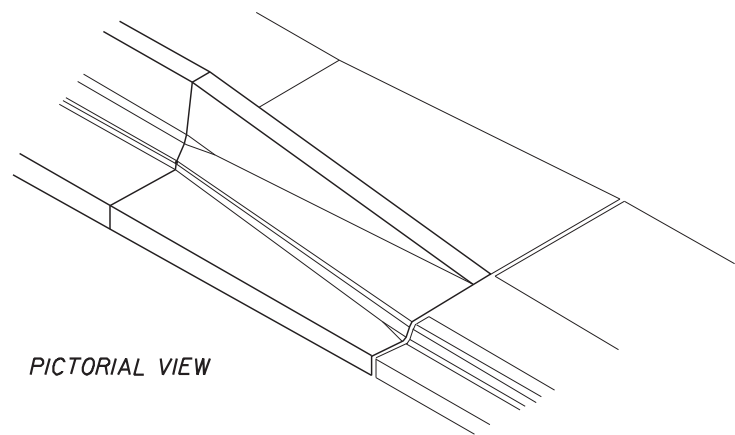
WITH OR WITHOUT UTILITY STRIP
 NEAT LINE PICTORIAL VIEW

NEAT LINE PICTORIAL VIEW

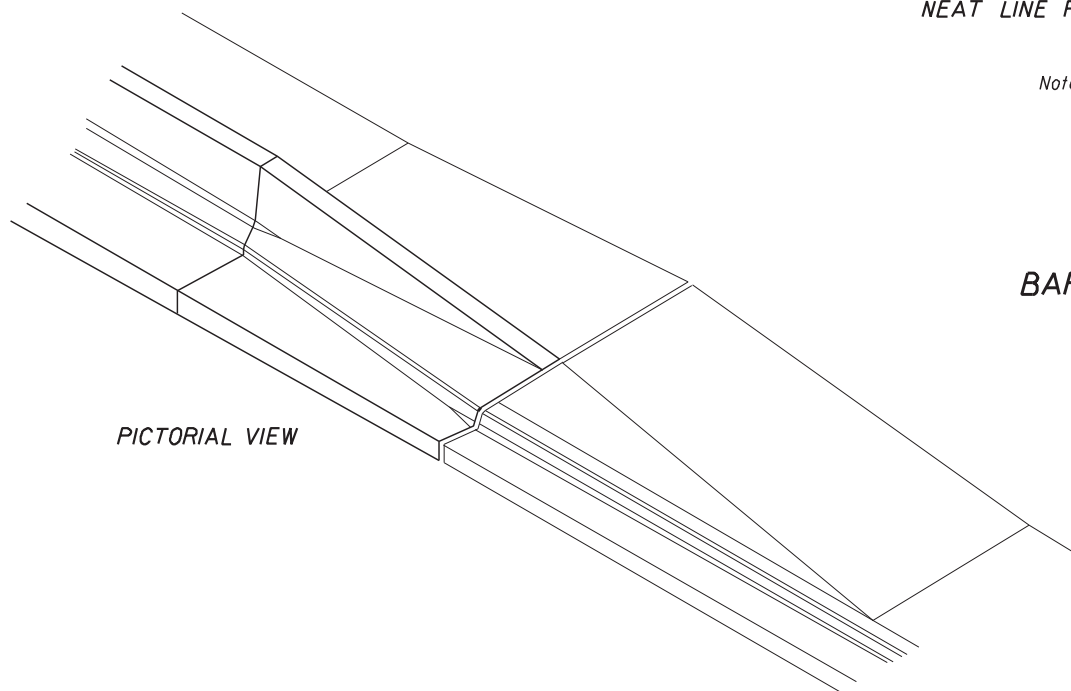
SECTION CC

Note: Drainage slots shall be located at all low points along the sidewalk, and, unless otherwise shown in the plans, slots shall be spaced at intervals not exceeding 50' in fill sections and 20' in cut sections. Slots shall be located such that only one bar is cut away or deleted in front and back lines of vertical reinforcement.

SIDEWALK DRAINAGE SLOT FOR BARRIER WALL (RIGID) (CURB & GUTTER)



PICTORIAL VIEW

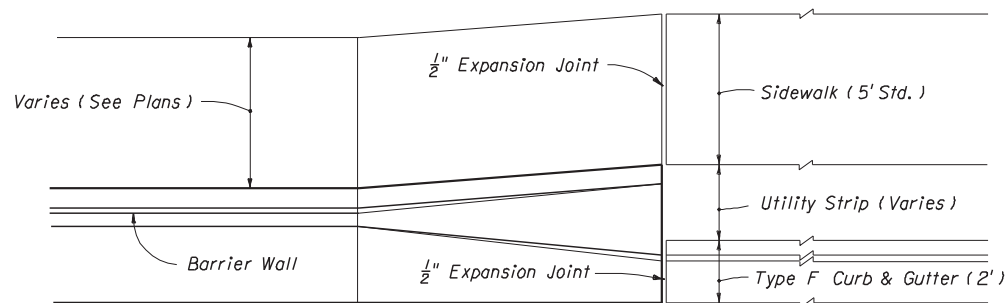


PICTORIAL VIEW

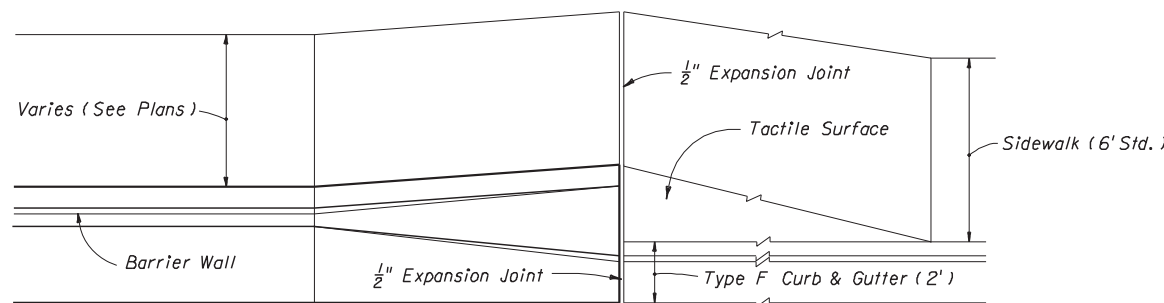
NOTE:

◇ Transition Segments Shall Be Doweled Into The End Of The Barrier Wall In The Following Manner:
 Four 1 1/4" diameter holes 6" deep on 6" centers shall be drilled in the end of the barrier and #6 bars 15" long set in epoxy mortar. The ends of the dowels extending into the transition segment shall be wrapped with one layer of 15 lb. Type I asphalt-saturated roofing felt with the ends crimped.

△ When Construction Joints Are Utilized For Transition Segment Construction The Stem Shall Be Doweled To The Footing In The Following Manner:
 Five #5 bars 15" long shall be embedded 7" into the footing. The dowels shall be spaced 15" on centers with the first dowel located 12" from the barrier wall. Dowels may be placed within or adjacent to the keyway.



PLAN
 WITH UTILITY STRIP



PLAN
 WITHOUT UTILITY STRIP

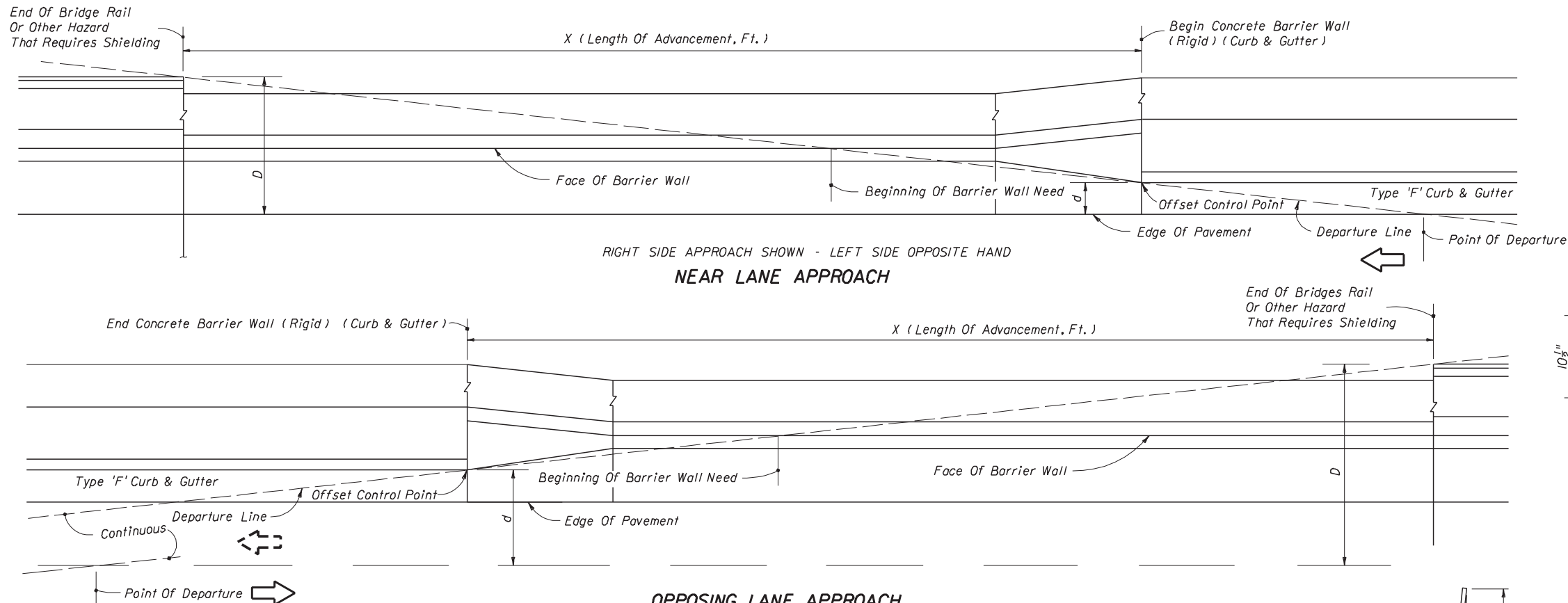
RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE HAND
 ONE-WAY AND TWO-WAY TRAFFIC (NEAR LANE APPROACH)

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • TRANSITION SEGMENT • WITHOUT ADJACENT BICYCLE LANE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

CONCRETE BARRIER WALL

Names	Dates	Approved By		
Designed By		 State Roadway Design Engineer	Revision	Sheet No.
Drawn By	HSD 10/85		00	16 of 22
Checked By	JBW/JMG 10/85			410



RIGHT SIDE APPROACH SHOWN - LEFT SIDE OPPOSITE HAND
NEAR LANE APPROACH

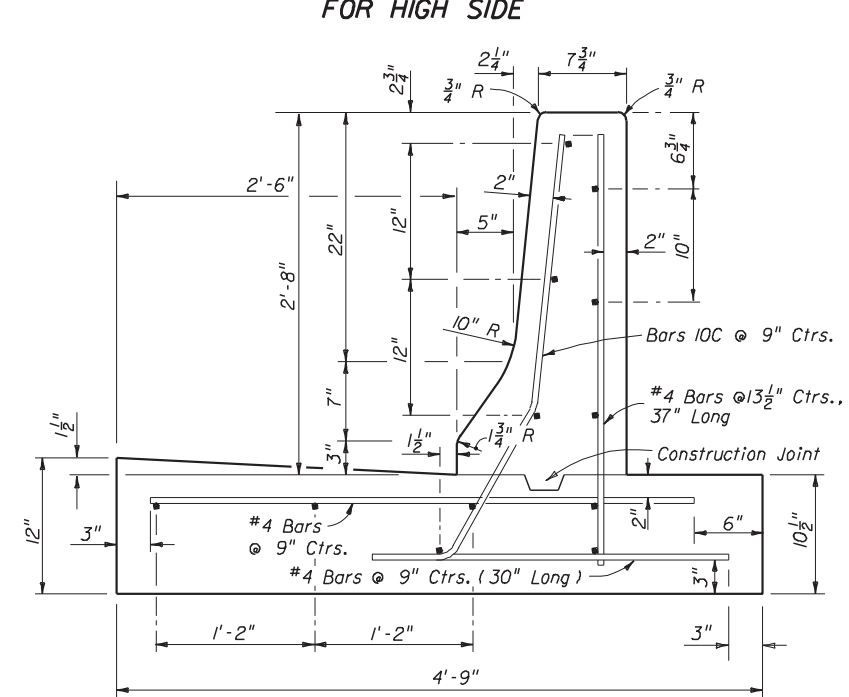
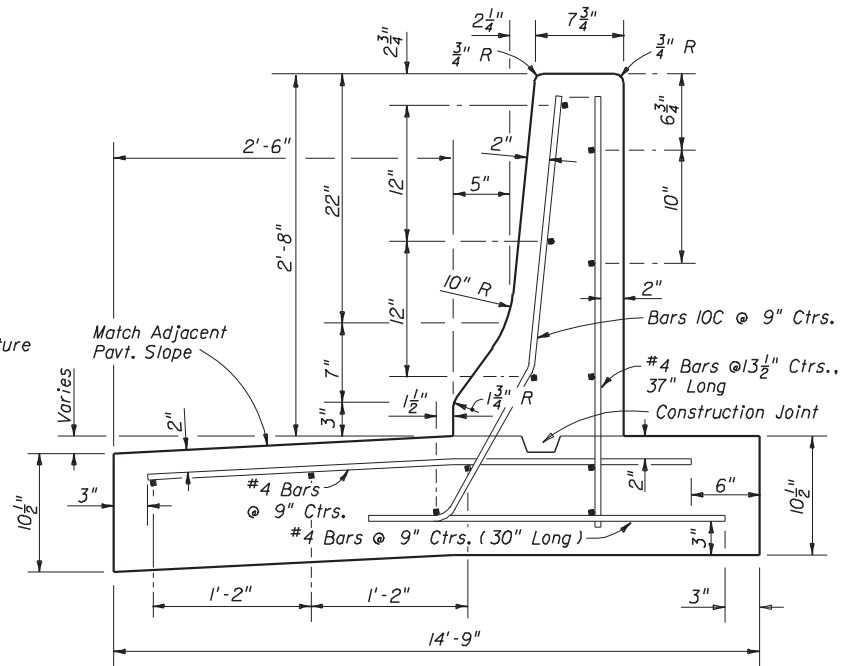
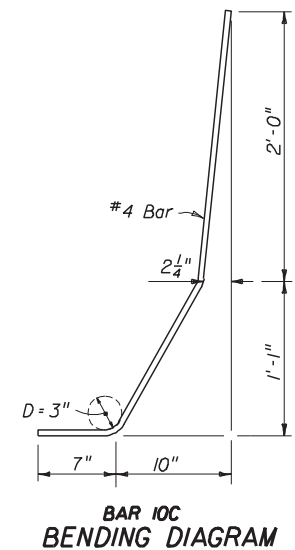
OPPOSING LANE APPROACH
 WITH OR WITHOUT UTILITY STRIP - UTILITY STRIP SHOWN - SEE SHEET 13 & 14 FOR APPLICATIONS

Design Speed mph	Length Of Advancement, Ft. (X)
≤ 45	16 (D - d)

Note: The minimum length of advancement for both near and opposing lane approaches is 40'.

Equation Variables:
 D = Distance in feet from near edge of the near approach traffic lane to back of hazard or clear zone width whichever is lesser. For left side hazards and clear zones on two-way undivided facilities D is measured from the inside edge of the near approach traffic lane.
 d = Distance in feet from near edge of the near approach traffic lane to the face of curb (at offset control point). For left side hazards on two-way undivided facilities d is measured from the inside edge of the nearest opposing traffic lane.

LENGTH OF ADVANCEMENT

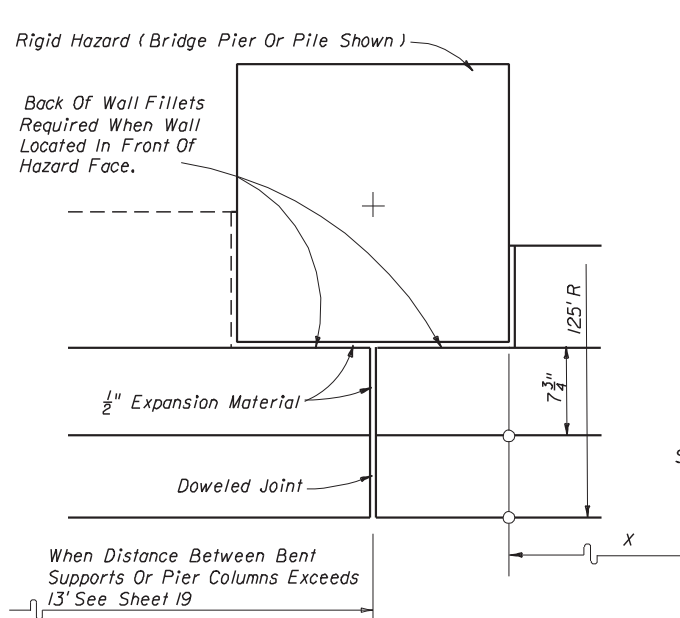


Note: All longitudinal reinforcement #4 bars. Minimum segment length for this wall is 40'. Shorter segments due to construction or expansion joint shall be dowled in the manner described for 'Transition Segments' on Sheet 16. Transverse expansion joints are to be constructed at the juncture of wall transitions and curb and gutter, and at intervals so that spacing will not exceed 100'. For barrier wall inlet details see Index No. 219. Wall to be paid for under the contract unit Price for Concrete Barrier Wall (Rigid-Curb & Gutter), LF.
 Estimated Quantities Per Linear Foot Of Wall:
 Class II Concrete: 0.23 C.Y.
 Reinforcing Steel: 19.7 Lbs.

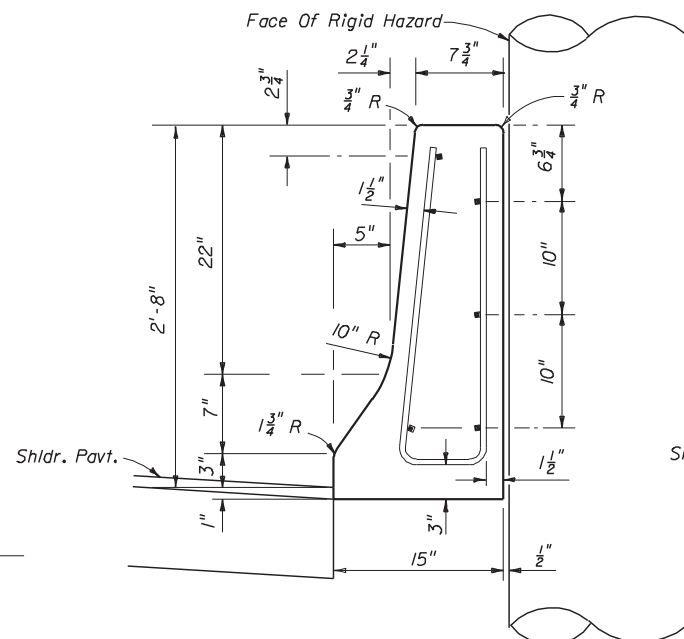
SECTION QQ

CONCRETE BARRIER WALL (RIGID) (CURB & GUTTER) • WITHOUT ADJACENT BICYCLE LANE

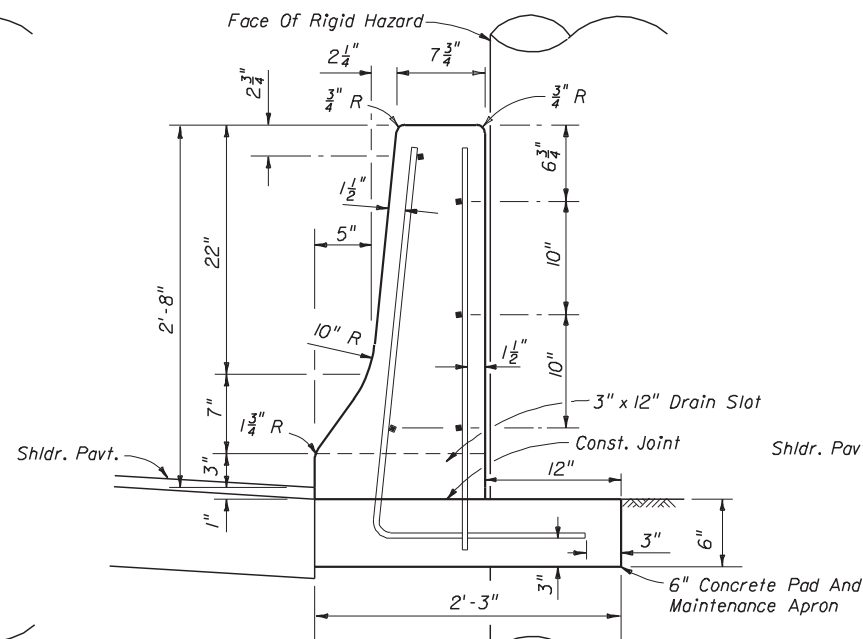
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By	HSD 10/85	Revision	Sheet No.	Index No.
Checked By	JBW/JVG 10/85	00	17 of 22	410



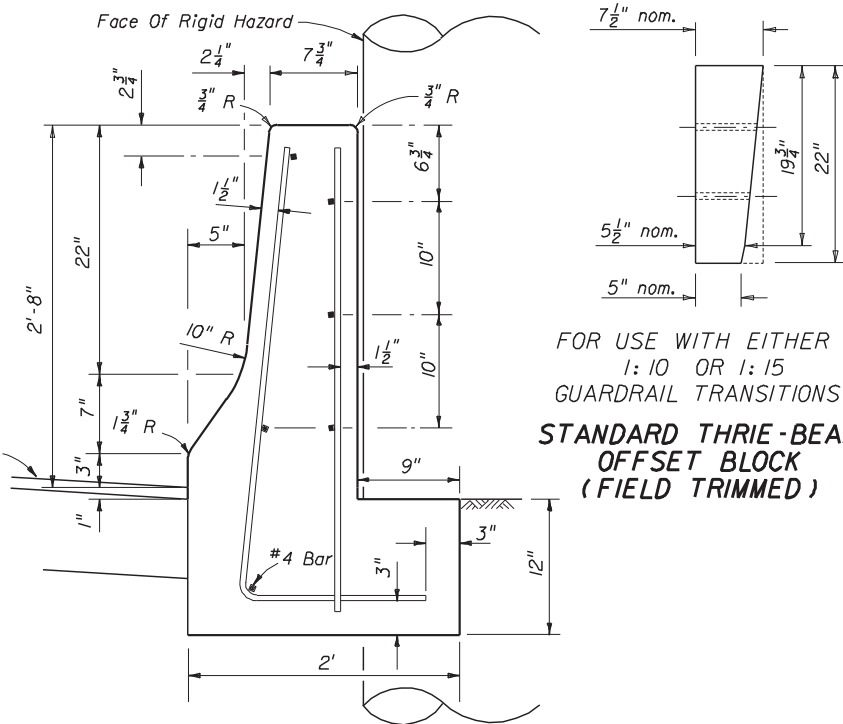
BARRIER WALL AT SQUARE OR RECTANGULAR SHAPED HAZARD
PARTIAL PLAN



SECTION AA

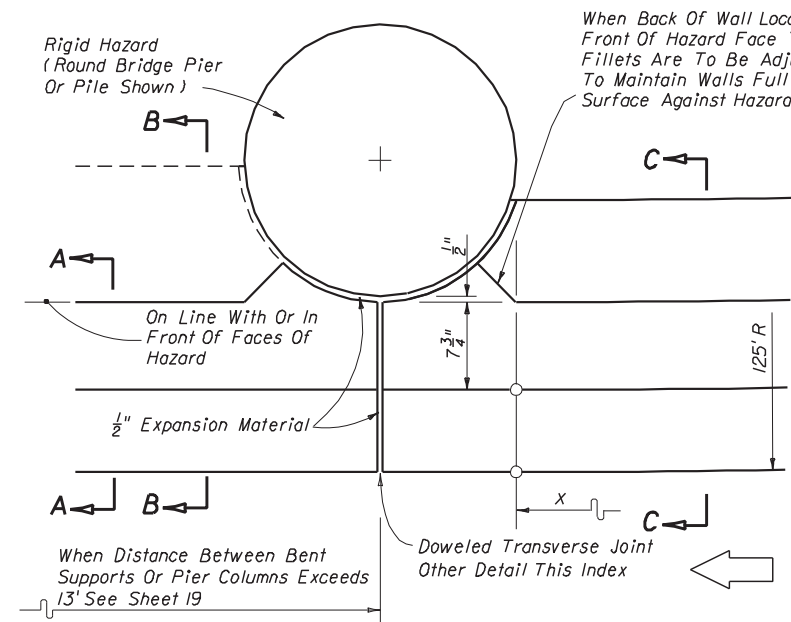


TO BE CONST. IN LIEU OF SECTION AA WHEN THRU DRAINAGE REQUIRED
SECTION BB



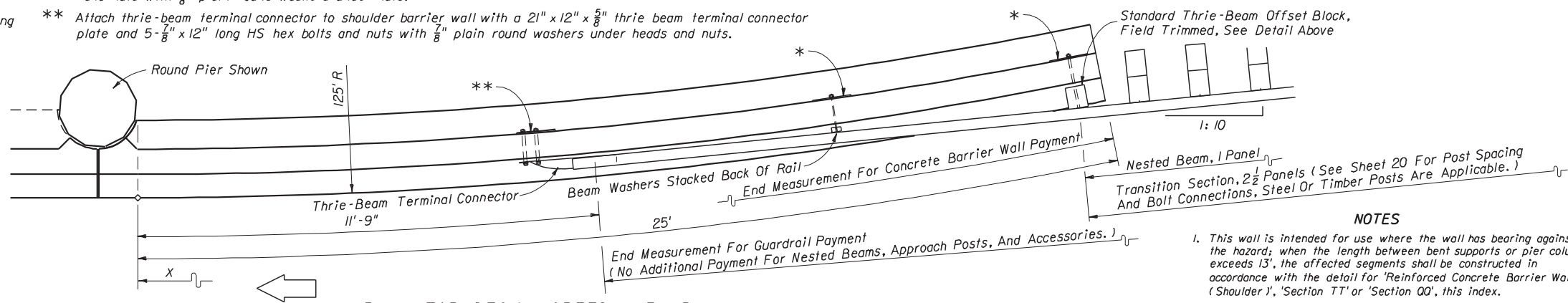
SECTION CC

FOR USE WITH EITHER
1:10 OR 1:15
GUARDRAIL TRANSITIONS
STANDARD THRIE-BEAM
OFFSET BLOCK
(FIELD TRIMMED)

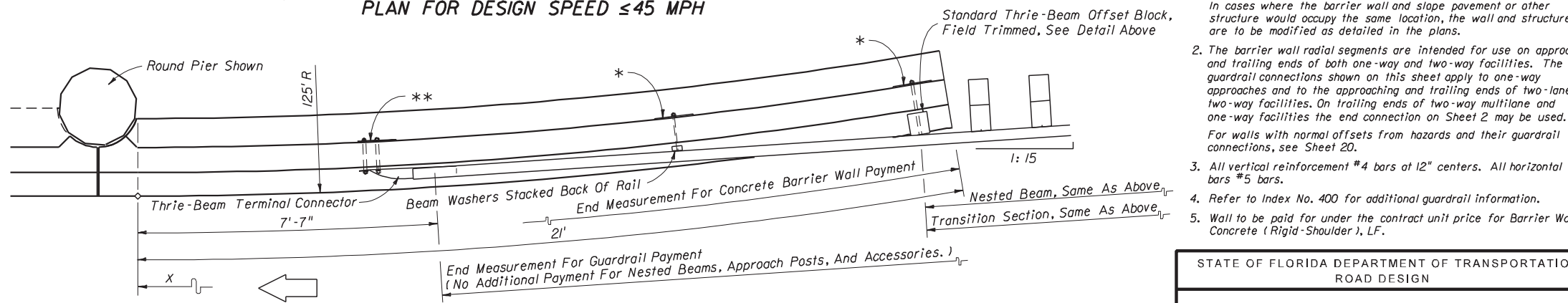


BARRIER WALL AT ROUND HAZARD
PARTIAL PLAN

- * 12" x 12" x 1/4" galvanized steel back-up plate with 5/8" post bolts (either 14" or 18" long) and nuts with 3/8" plain round washers under nuts.
- ** Attach thrie-beam terminal connector to shoulder barrier wall with a 2 1/2" x 12" x 5/8" thrie beam terminal connector plate and 5-7/8" x 12" long HS hex bolts and nuts with 3/8" plain round washers under heads and nuts.



PLAN FOR DESIGN SPEED ≤ 45 MPH



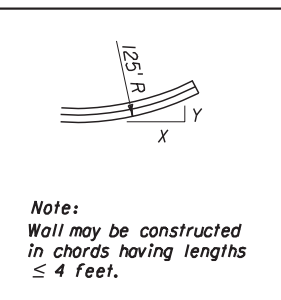
PLAN FOR DESIGN SPEED ≥ 50 MPH

Note: For continuous barrier between independent bents or single pier columns see Sheet 19.

SHOULDER BARRIER WALL AT ABOVE GROUND RIGID HAZARDS
WHEN GUARDRAIL OFFSET FROM HAZARD LESS THAN 3'

- NOTES
1. This wall is intended for use where the wall has bearing against the hazard; when the length between bent supports or pier columns exceeds 13', the affected segments shall be constructed in accordance with the detail for 'Reinforced Concrete Barrier Wall (Shoulder)', 'Section TT' or 'Section QQ', this index. In cases where the barrier wall and slope pavement or other structure would occupy the same location, the wall and structure are to be modified as detailed in the plans.
 2. The barrier wall radial segments are intended for use on approach and trailing ends of both one-way and two-way facilities. The guardrail connections shown on this sheet apply to one-way approaches and to the approaching and trailing ends of two-lane two-way facilities. On trailing ends of two-way multilane and one-way facilities the end connection on Sheet 2 may be used. For walls with normal offsets from hazards and their guardrail connections, see Sheet 20.
 3. All vertical reinforcement #4 bars at 12" centers. All horizontal bars #5 bars.
 4. Refer to Index No. 400 for additional guardrail information.
 5. Wall to be paid for under the contract unit price for Barrier Wall Concrete (Rigid-Shoulder), LF.

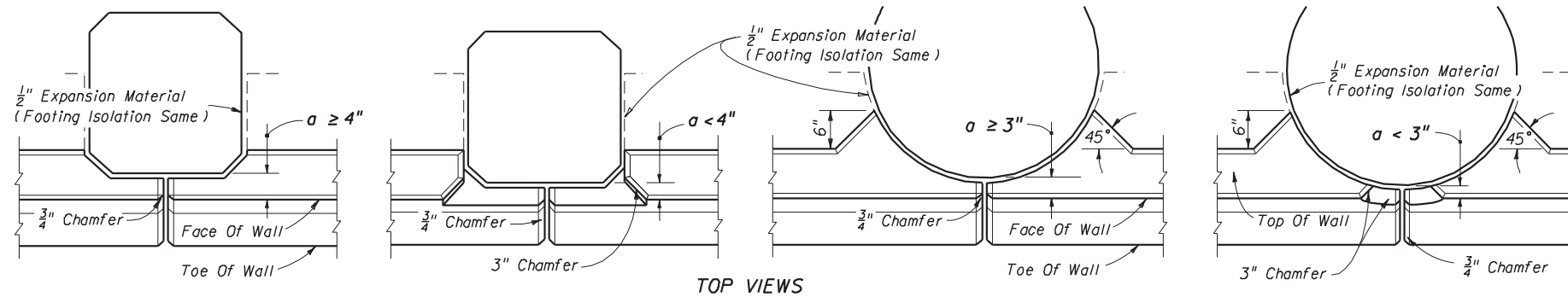
ARC LENGTH (FT)	DISTANCE "x" (FT)	OFFSETS "y" "y" (FT)
4	4.00	0.06
8	7.99	0.26
12	11.98	0.58
16	15.96	1.02
20	19.91	1.60
24	23.85	2.30
25	24.83	2.49



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

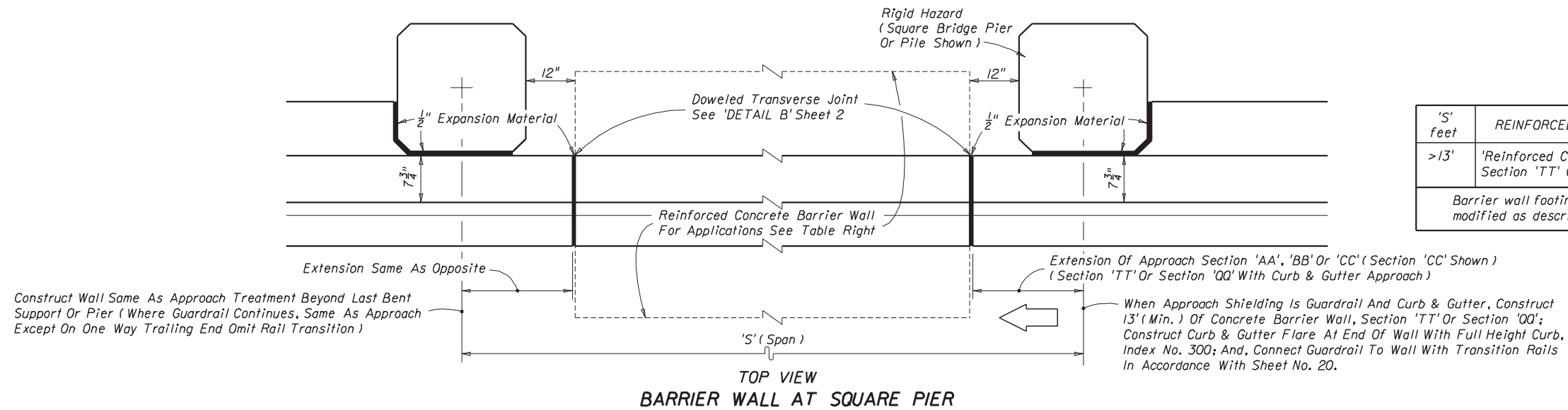
CONCRETE BARRIER WALL

Designed By	HSD	11/89	Approved By	[Signature]
Drawn By	JVG/KNM	11/89	Revision	00
Checked By			Sheet No.	18 of 22
			Index No.	410



'a' Varies (Circular Or Octagonal Hazard Not More Than 2" In Front Of Face Of Wall)
 Applicable To Sections 'AA' And 'BB' With Spans Of $\leq 13'$, And To Section 'CC', Sheet No. 18.
 Applicable To Other Rigid Walls Of This Index For Spans $> 13'$ Unless Otherwise Shown In The Plans.

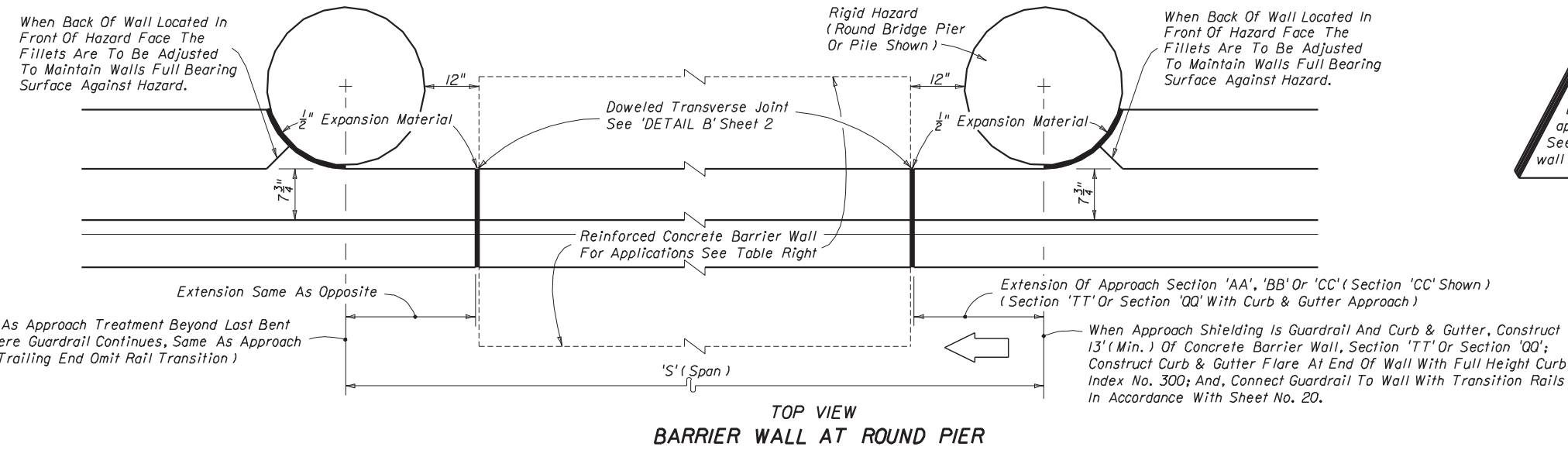
HAZARD PENETRATING STEM OF RIGID CONCRETE BARRIER WALLS



'S' feet	REINFORCED CONCRETE BARRIER WALL APPLICATIONS
$> 13'$	'Reinforced Concrete Barrier Wall (Shoulder)' With Flush Shoulders; Or, Section 'TT' Or Section 'QQ' With Curb & Gutter
Barrier wall footings that conflict with bent or pier foundations shall be modified as described in the plans.	

Construct Wall Same As Approach Treatment Beyond Last Bent Support Or Pier (Where Guardrail Continues, Same As Approach Except On One Way Trailing End Omit Rail Transition)

When Approach Shielding Is Guardrail And Curb & Gutter, Construct 13' (Min.) Of Concrete Barrier Wall, Section 'TT' Or Section 'QQ'; Construct Curb & Gutter Flare At End Of Wall With Full Height Curb, Index No. 300; And, Connect Guardrail To Wall With Transition Rails In Accordance With Sheet No. 20.



The details on this sheet are treatments to the F-shape concrete barrier walls depicted on Sheet Nos. 8 through 18, where site conditions impose reduced clearances between above ground hazards and the walls. Bridge bent supports and piers are shown. These treatments are not applicable to hazards that cannot provide lateral support for the walls. See the plans for limits of wall sections applied and other associated wall treatments.

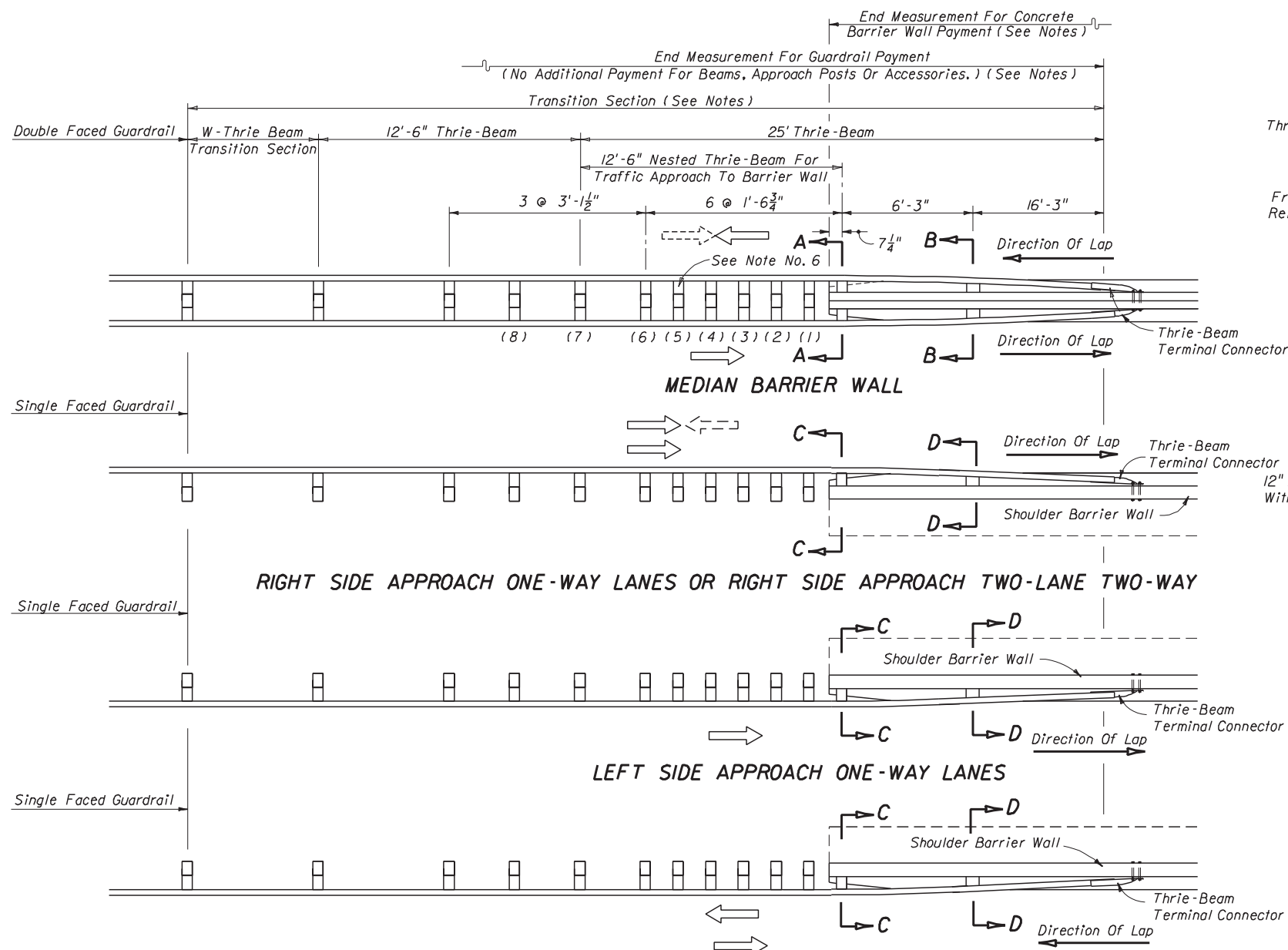
Construct Wall Same As Approach Treatment Beyond Last Bent Support Or Pier (Where Guardrail Continues, Same As Approach Except On One Way Trailing End Omit Rail Transition)

When Approach Shielding Is Guardrail And Curb & Gutter, Construct 13' (Min.) Of Concrete Barrier Wall, Section 'TT' Or Section 'QQ'; Construct Curb & Gutter Flare At End Of Wall With Full Height Curb, Index No. 300; And, Connect Guardrail To Wall With Transition Rails In Accordance With Sheet No. 20.

CONCRETE BARRIER WALL WHEN SPAN BETWEEN BENT SUPPORTS OR PIER COLUMNS EXCEEDS 13'

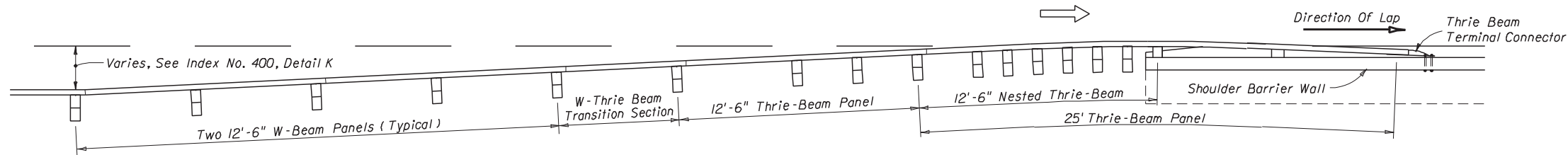
CONCRETE BARRIER WALL WHEN GUARDRAIL OFFSET FROM BENT OR PIER LESS THAN 3 FEET OR WHERE WALL STEM ABUTTS SUPPORTS OR PIER COLUMN

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Designed By	STAFF	Dates	10/97	Approved By
Drawn By	HKH	10/97		State Roadway Design Engineer
Checked By	JVG	10/97	00	Revision
			19 of 22	Sheet No.
				Index No.
				410



Attach thrie-beam terminal connector to median barrier wall with 5-7/8" x 15" long HS hex bolts and nuts with 7/8" plain round washers under heads and nuts. Attach to shoulder barrier wall with a 21" x 12" x 5/8" thrie-beam terminal connector plate and 5-7/8" x 12" long HS hex bolts and nuts with 7/8" plain round washers under heads and nuts.

LEFT SIDE OF TWO-LANE TWO-WAY (APPROACH FOR FAR LANE)

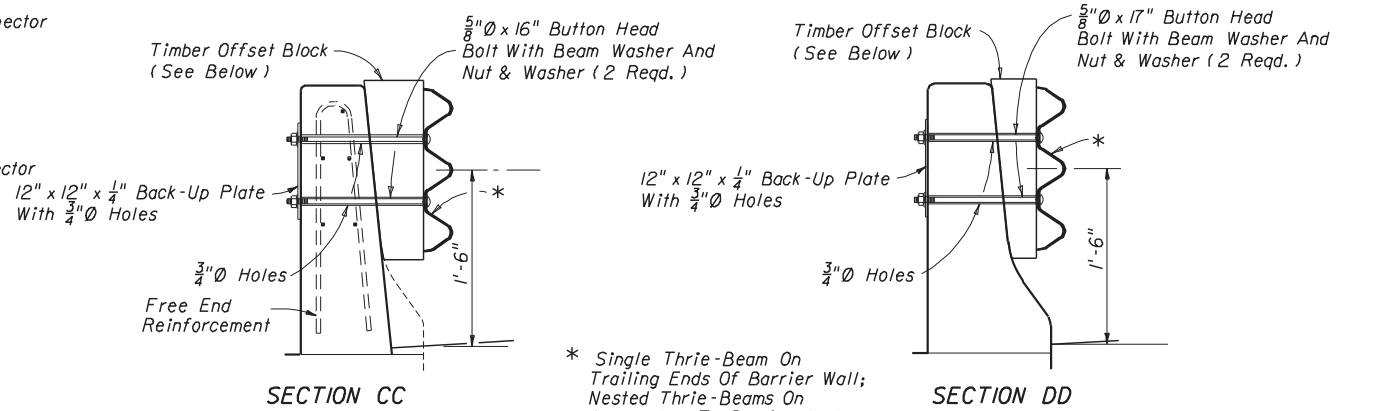
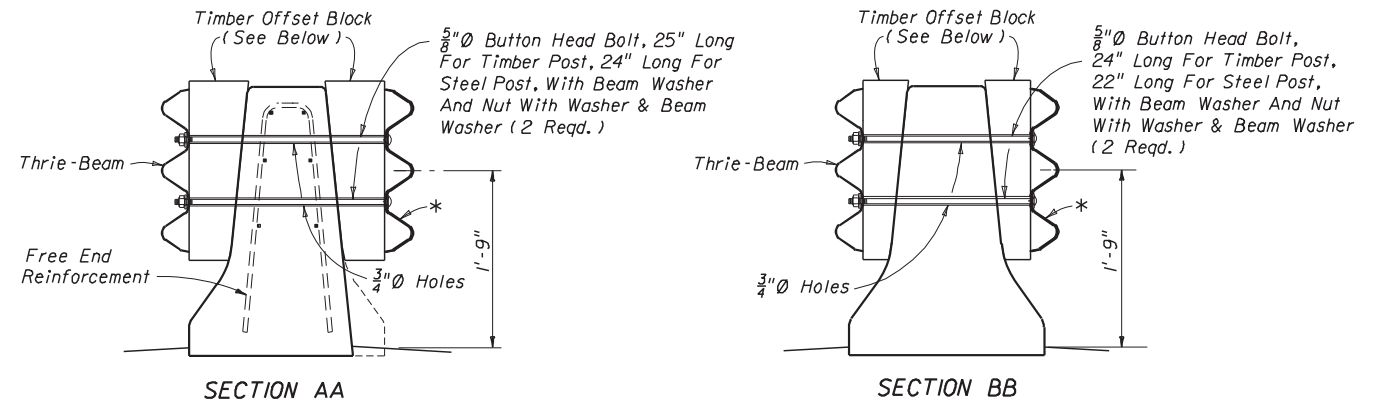


STANDARD GUARDRAIL APPROACH TO SHOULDER BARRIER

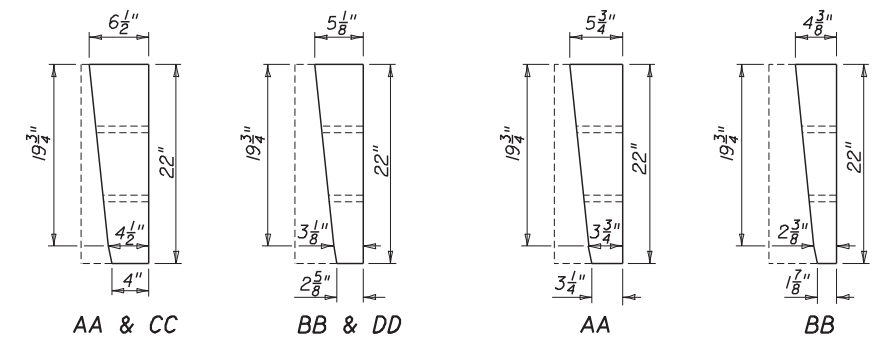
NOTES

- The longitudinal dimensions and payment limits shown for median concrete barrier wall also apply to shoulder concrete barrier walls.
- W-beam elements do not apply to these transition schemes. For barrier wall trailing end guardrail connections for one-way lanes, see Sheet 2.
- Where reaming is necessary to fit nested beams the reamed surfaces shall be metalized in accordance with Index No. 400.
- Either steel or timber guardrail post may be used, timber posts shown.
- The nested beams shall not be bolted to blocks and posts at posts numbers (1), (3) and (5).
- On the trailing side of MEDIAN BARRIER WALL, offset blocks may be omitted at posts numbers 1, 2, 3, 5, 6 and 8.
- For additional guardrail information refer to Index No. 400.

GUARDRAIL CONNECTION TO CONCRETE BARRIER WALL APPROACH ENDS



* Single Thrie-Beam On Trailing Ends Of Barrier Wall; Nested Thrie-Beams On Approaches To Barrier Wall.



FOR DOUBLE FACED GUARDRAIL USING TIMBER POSTS AND FOR SINGLE FACED GUARDRAIL USING EITHER TIMBER OR STEEL POSTS

STANDARD TIMBER OR PLASTIC OFFSET BLOCKS o FIELD TRIMMED FOR USE AT SECTIONS AA, BB, CC & DD

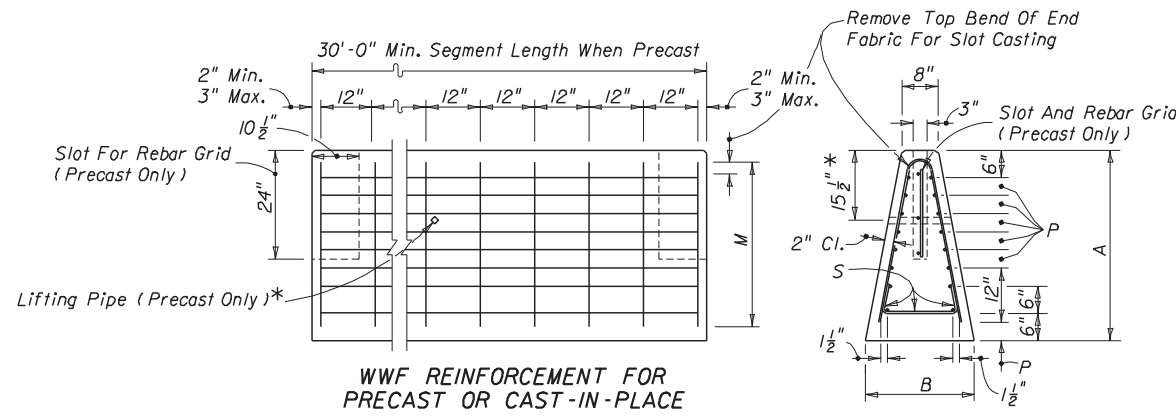
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CONCRETE BARRIER WALL

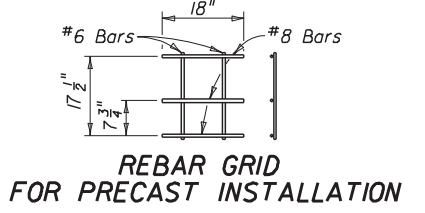
Names	Dates	Approved By			
Designed By	JVG 05/91	 State Roadway Design Engineer			
Drawn By	HSD 05/91				
Checked By	JVG 05/91				
Revision	00	Sheet No.	20 of 22	Index No.	410

GENERAL NOTES FOR TRAPEZOIDAL BARRIER WALL

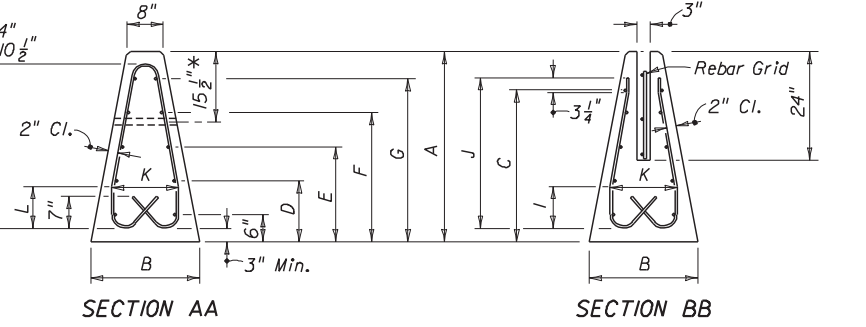
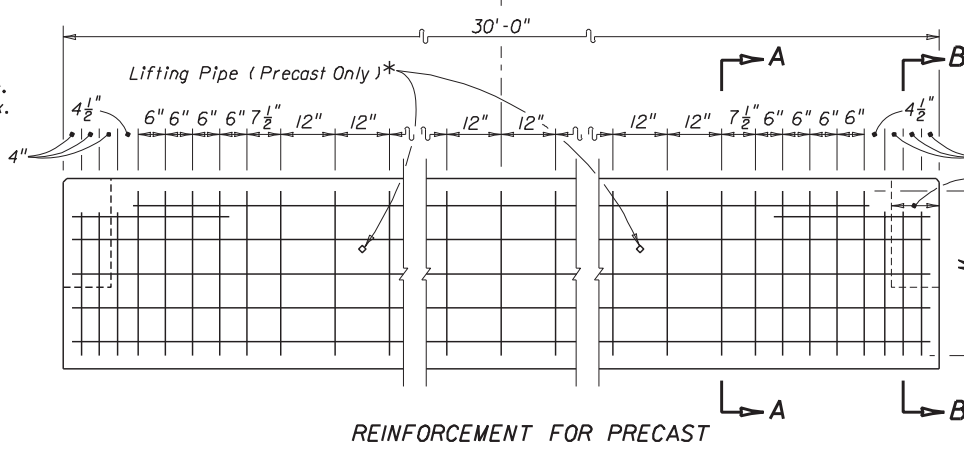
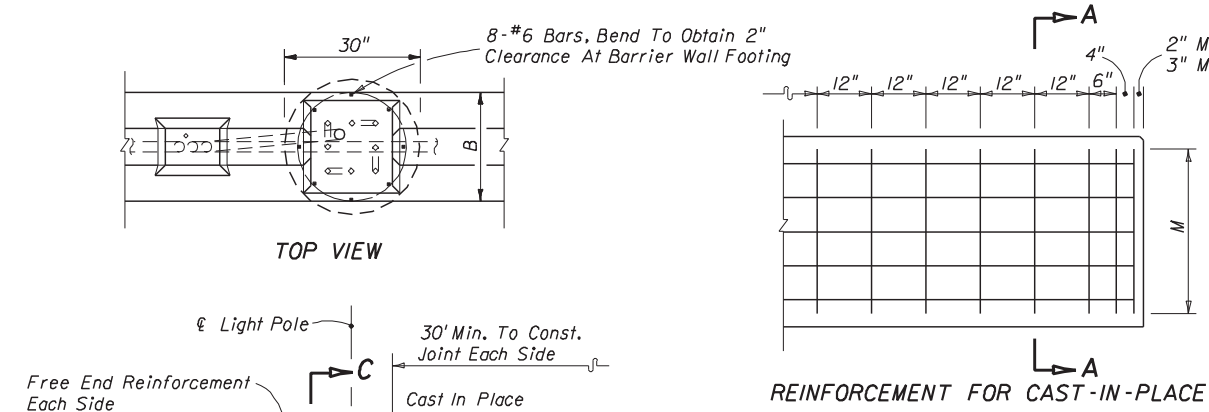
- Concrete trapezoidal barrier wall can be either precast or cast in place. The wall is designed for zero deflection and shall have a minimum system length of 120'.
- Where concrete trapezoidal barrier wall height changes from 42" to 48" or from 48" to 54", height change will be uniform for each 6" of height change per 90' of wall. Steel placement shall meet the dimensional positioning requirements of 42", 48" and 54" high barriers at the respective points along the vertical transition, with the vertical steel uniformly lengthened and the horizontal steel uniformly splayed throughout.
- Welded wire fabric (WWF) made in accordance with ASTM A497 may be used as an option to the conventional reinforcement for precast or cast in place barrier wall, with the exception that only conventional reinforcement shall be used for horizontal transition and half wall sections. These sections shall be cast in place with length, shape and reinforcement as shown in this Index.
- To attain system length, precast segments shall be interconnected with rebar grids placed in the preformed slots and grouted into place. Segment length shall be not less than 30' unless otherwise specified in the plans.
- The centerline axis of the barrier shall be vertical except where the roadway is superelevated in which case it shall be normal to the cross slope unless otherwise shown in the plans or directed by the Engineer.
- For reflective barrier marker requirements see 'STANDARD BARRIER WALL SECTIONS' and the GENERAL NOTES, Sheet 1.
- The concrete trapezoidal barrier wall is considered by the Federal Highway Administration to be innovative and may be used as such on Federal-Aid projects.
- The concrete trapezoidal barrier wall is to be paid for under the contract unit price for Barrier Wall Concrete (Trapezoidal), LF. This price will include full payment for transitions, half walls, fill and concrete caps.



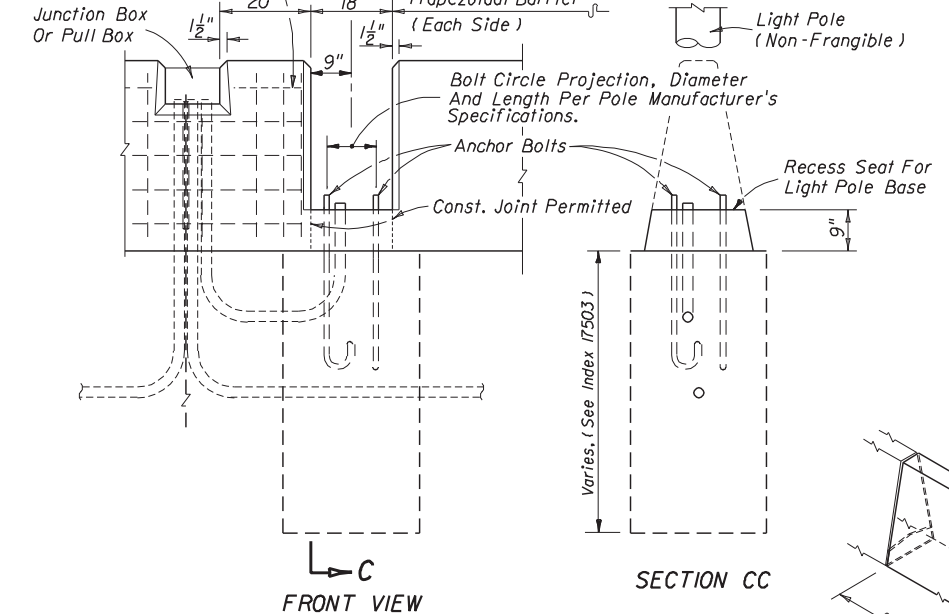
WWF REINFORCEMENT FOR PRECAST OR CAST-IN-PLACE
 All Transverse Reinforcing Wire Size D14
 All Longitudinal Reinforcing Wire Size D20
WELDED WIRE FABRIC REINFORCING



REBAR GRID FOR PRECAST INSTALLATION
 * 1 1/2" Nominal Dia. Galvanized Steel Lifting Pipe For Precast Sections (7.5' From Either End)

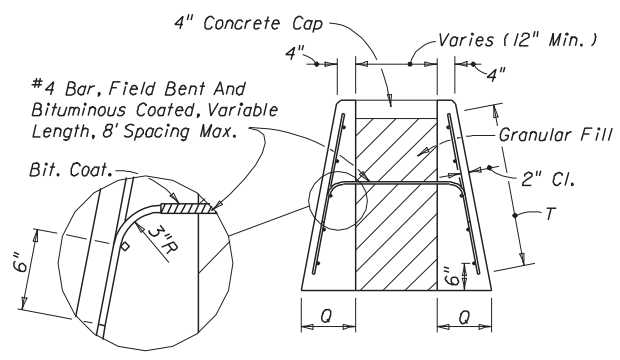


All Vertical Reinforcing #4 Bars
 All Horizontal Reinforcing #5 Bars
CONVENTIONAL REINFORCING

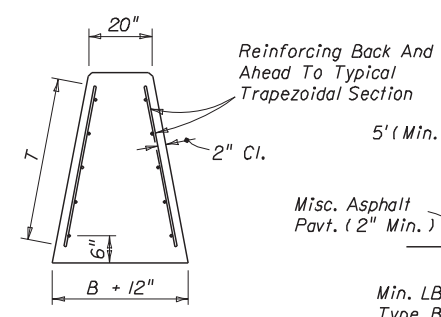


Note: For Additional Details See Sheet 4

LIGHT POLE MOUNTING IN TRAPEZOIDAL SECTIONS

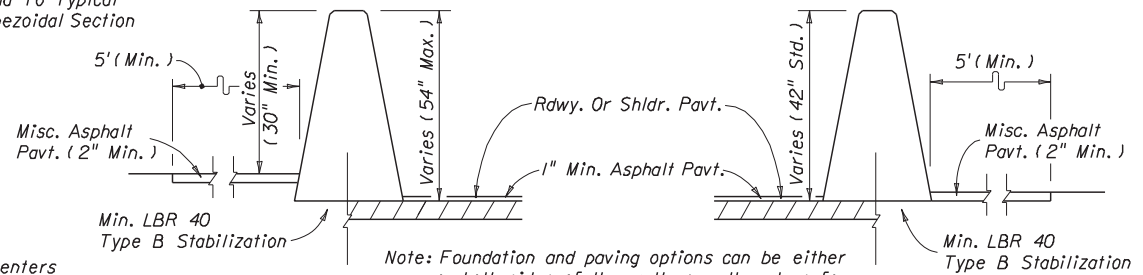


All Vertical Reinforcing #4 Bars On 12" Centers
 All Horizontal Reinforcing #5 Bars Spaced As Tabulated
TYPICAL HALF WALLS AROUND OBSTRUCTION

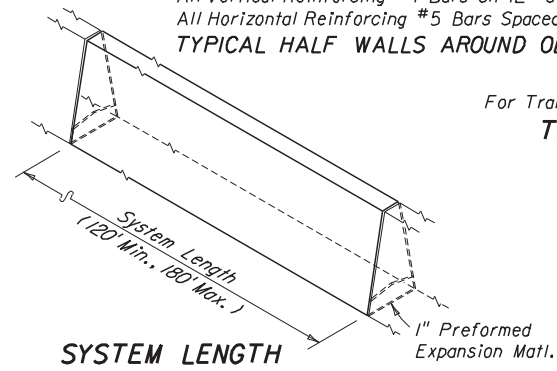


All Vertical Reinforcing #4 Bars On 12" Centers
 All Horizontal Reinforcing #5 Bars Spaced As Tabulated
SECTION AT BEGIN AND END OF HALF WALLS

For Transition Wall Plan See DETAIL I 'PLAN'
TRANSITION SECTIONS



INDEPENDENT ROADWAY PROFILES
MATCHING ROADWAY PROFILES
 Note: Foundation and paving options can be either or both sides of the wall; see the plans for the options applied.



SYSTEM LENGTH
 1" Preformed Expansion Mat.

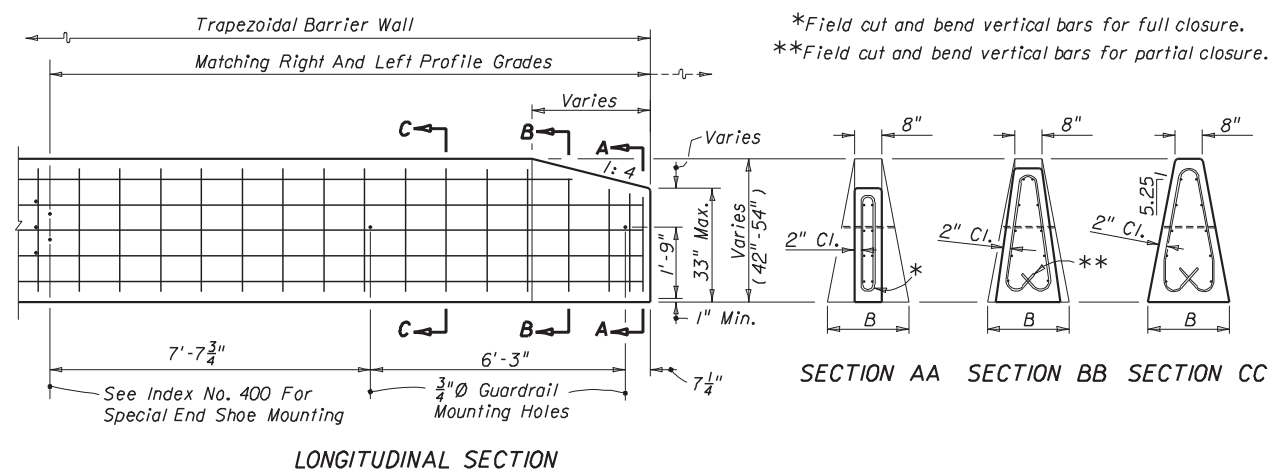
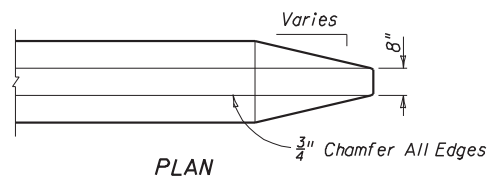
TRAPEZOIDAL BARRIER WALL

Barrier Height (in.)	DIMENSIONS (Inches)																	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	S	T
42	42	24	33 1/2	13 1/2	21	28 1/2	36	15	9 1/2	33 1/4	15	9 1/4	36	72	4	12	28	36
48	48	26 9/32	39 1/2	15	24	33	42	17 1/4	10 3/4	39 1/4	17 1/4	10 3/4	42	84	5	13 9/64	31 1/2	42
54	54	28 9/16	45 1/2	16 1/2	27	37 1/2	48	19 1/2	12 1/4	45 1/4	19 1/2	12 1/4	48	96	6	14 9/32	34 3/4	48

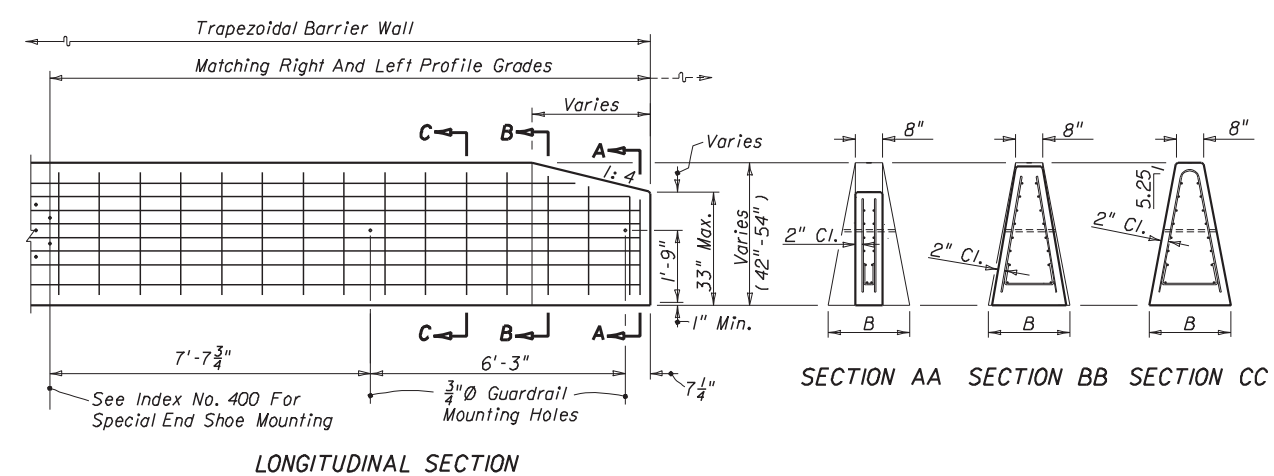
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

CONCRETE BARRIER WALL

Names	Dates	Approved By
Designed By	FHWA 11/93	<i>[Signature]</i> State Roadway Design Engineer
Drawn By	HKH 11/93	
Checked By	JVG 11/93	
Revision	00	Sheet No.
		Index No.
	21 of 22	410

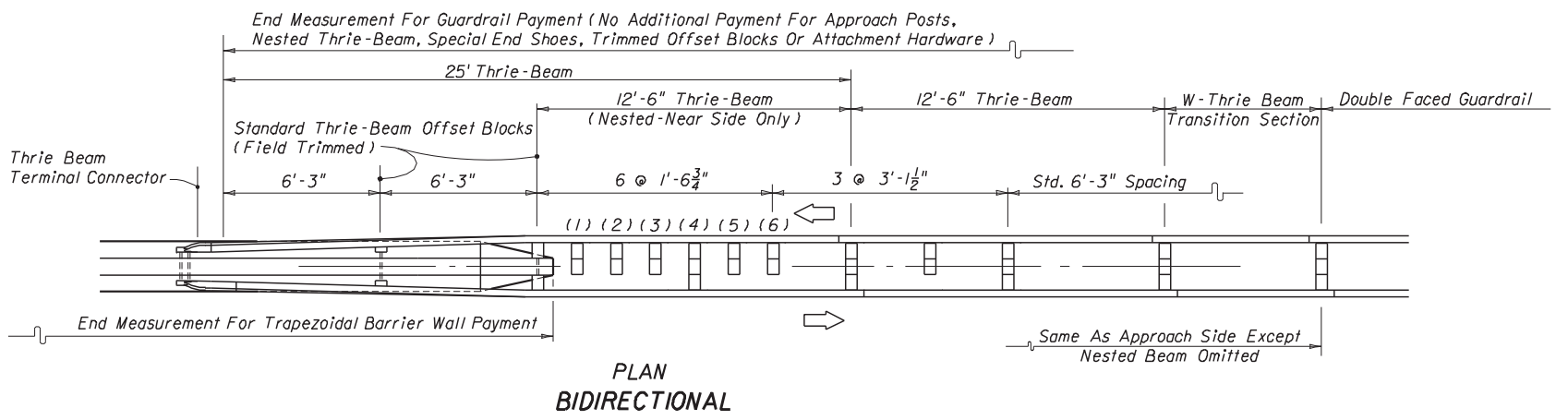
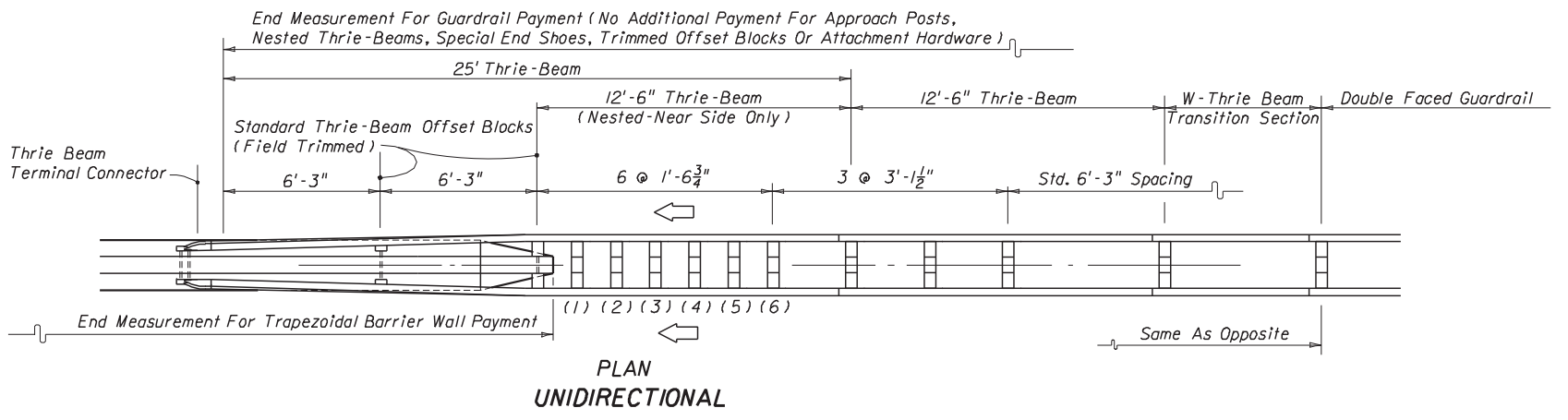
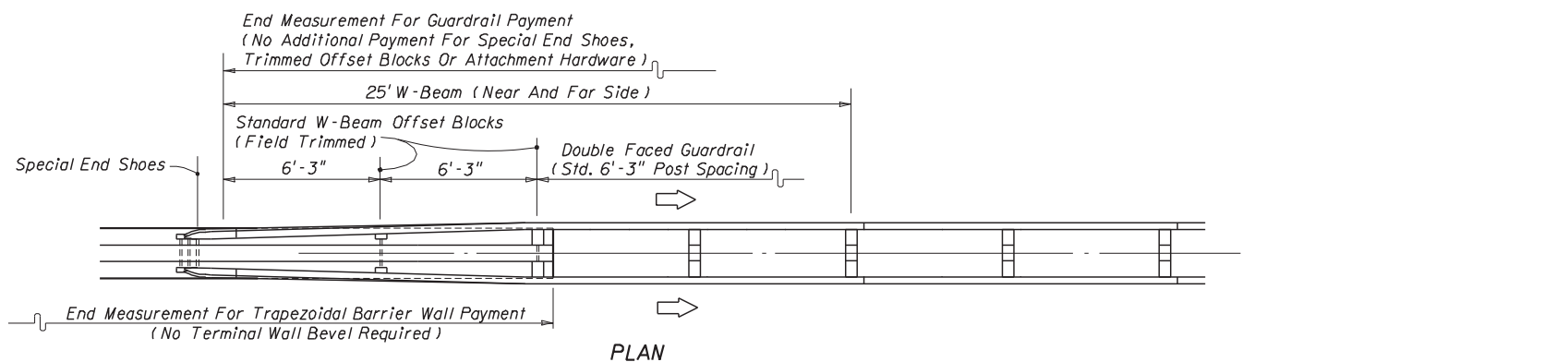


CONVENTIONAL REINFORCEMENT



WELDED WIRE FABRIC REINFORCEMENT

END TREATMENT FOR PRECAST OR CAST-IN-PLACE WALLS



Note: Timber or steel posts may be used, timber posts shown.

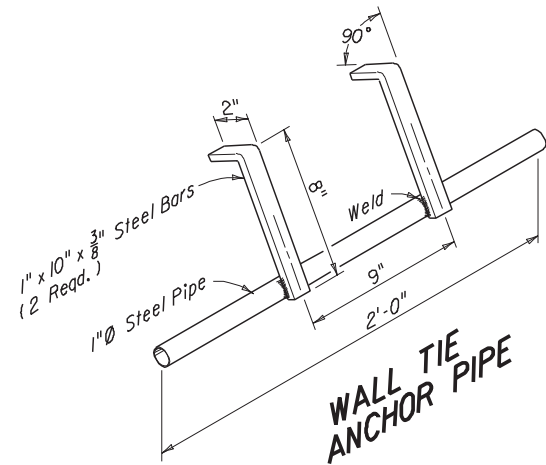
GUARDRAIL TRANSITIONS AND CONNECTIONS

NOTES

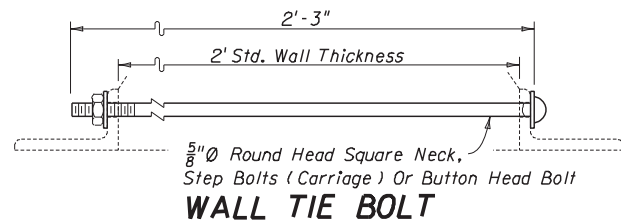
1. Where reaming is necessary to fit nested beams the reamed surface shall be metalized in accordance with Index No. 400.
2. The nested beams shall not be bolted to the posts and blocks at post numbers (1), (3) and (5).
3. For additional wall details, see Sheet 21.
4. For additional guardrail information refer to Index No. 400.

GUARDRAIL CONNECTION TO TRAPEZOIDAL BARRIER WALL

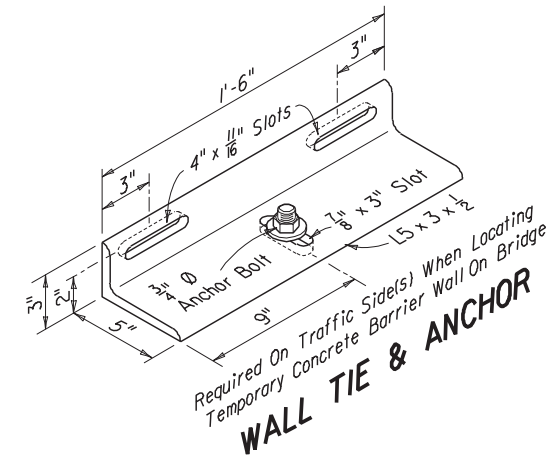
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
CONCRETE BARRIER WALL				
Designed By	JVG/HKH	7/96	Approved By <i>Bo J. [Signature]</i> State Roadway Design Engineer	
Drawn By	HKH	7/96	Revision	Sheet No.
Checked By	JVG	7/96	00	22 of 22
				Index No. 410



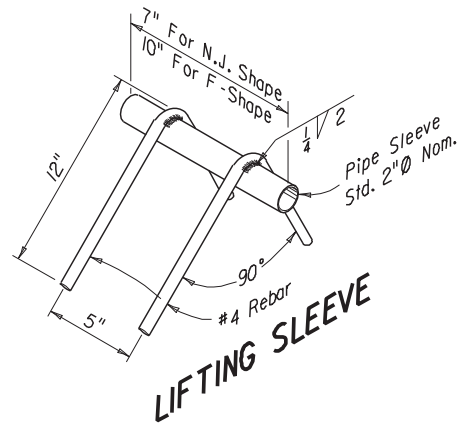
WALL TIE ANCHOR PIPE



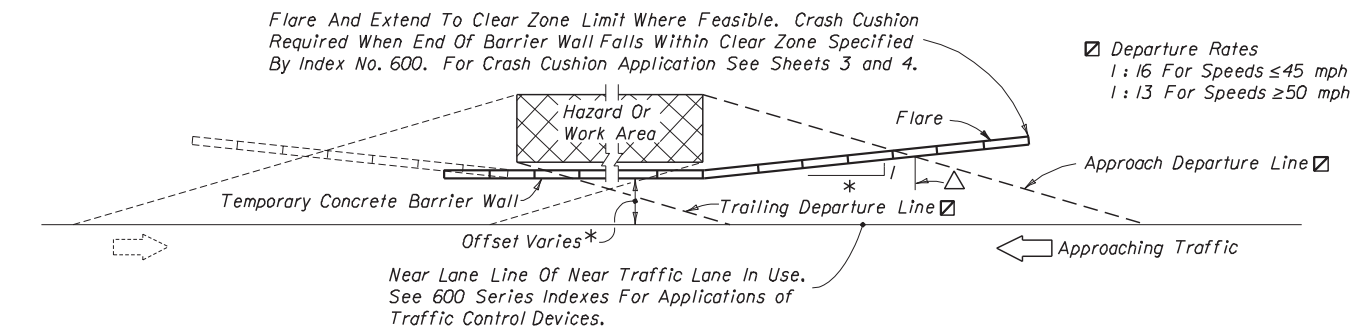
WALL TIE BOLT



WALL TIE & ANCHOR



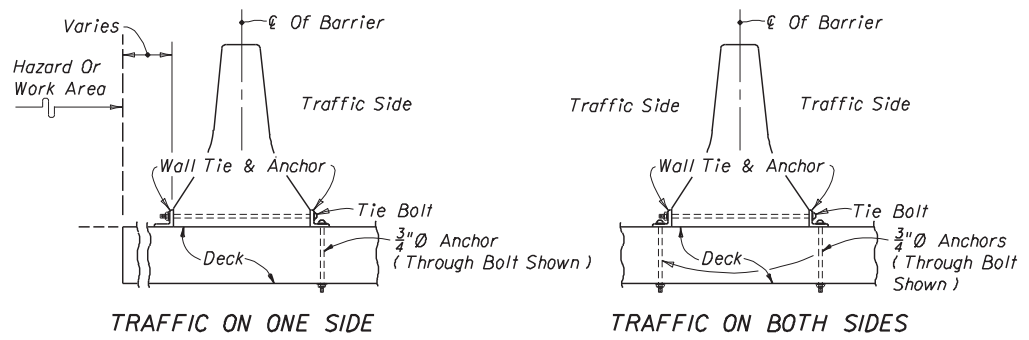
LIFTING SLEEVE



**PLAN
TEMPORARY CONCRETE BARRIER WALL ALIGNMENT**

△ The length of temporary concrete barrier wall is determined by the intersect point between the departure lines and the traffic side toe of wall. The approach departure line location is determined by the line intersect with the back of the hazard, and the trailing departure line location is determined by the line intersect with the front side of the trailing end of the hazard. For unanchored approach and trailing ends of temporary concrete barrier walls with standard length units, a minimum of two and one-half (2½) units is required outside the length of need to provide wall end anchorage. Where a redirective crash cushion is used to shield an approach end of a temporary concrete barrier wall, the crash cushion may be located by the departure line intersect point indicated on the standard drawing for the crash cushion used; the wall beginning unit will be positioned relative to the crash cushion position and the beginning unit anchored; and, interconnections between the end unit and crash cushion made as required for the specific crash cushion type.

* The wall offset from the near traffic lane, wall flare rate and wall flare length are to be in accordance with the alignment called for in the plans and the alignments called for by other department Roadway And Traffic Design Standards specified in the plans; in absence of either plan requirement, the offset shall be as determined by the Engineer, and, unless other flare rates are approved by the Engineer the flare rates to be applied are 1:10 or flatter for speeds <= 45 mph and 1:15 or flatter for speeds >= 50 mph; see Index No. 600 for other flare rates on expressway facilities.

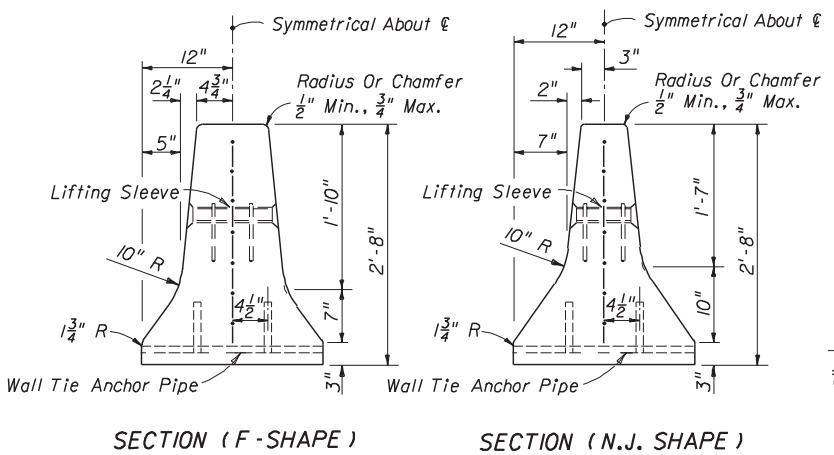


TRAFFIC ON ONE SIDE

TRAFFIC ON BOTH SIDES

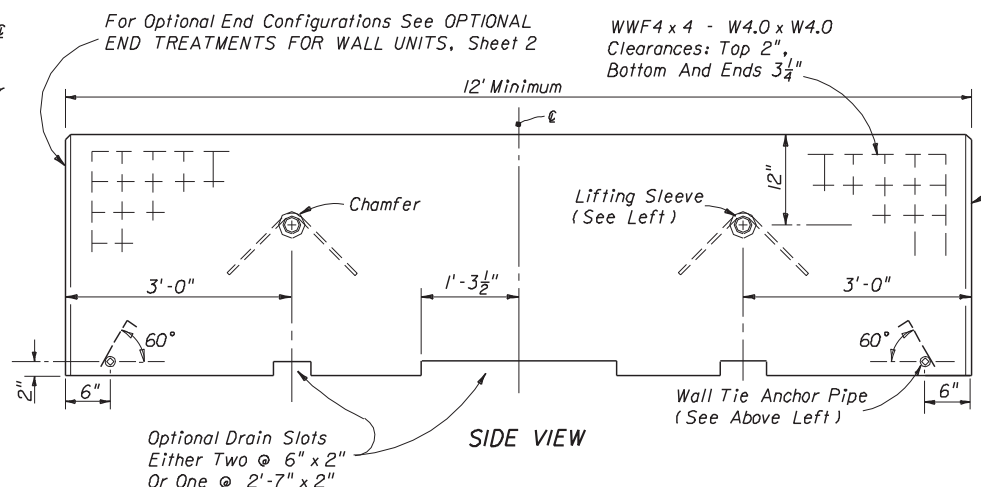
Anchor bolts shall have a pullout and shear capacity of 14,000 lbs. Expansion or chemical anchor bolts will be used to secure walls to approach slabs. Expansion or chemical anchor bolts or through bolts with washers and nuts will be used to secure walls to bridge decks. Core drills shall be used to construct through bolt holes, and, drills specified by the manufacturer shall be used to construct expansion and chemical anchor bolt holes. Chemical anchorage shall be an Adhesive Material System in accordance with Specification Sections 416 and 937. After removal of walls, anchors shall be removed to 1" min. below deck surface and holes filled with epoxy grout.

BRIDGE DECK AND APPROACH SLAB INSTALLATIONS



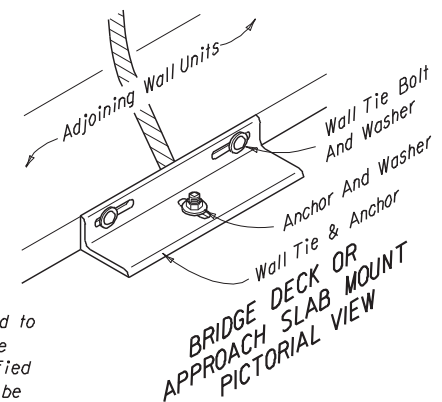
SECTION (F-SHAPE)

SECTION (N.J. SHAPE)

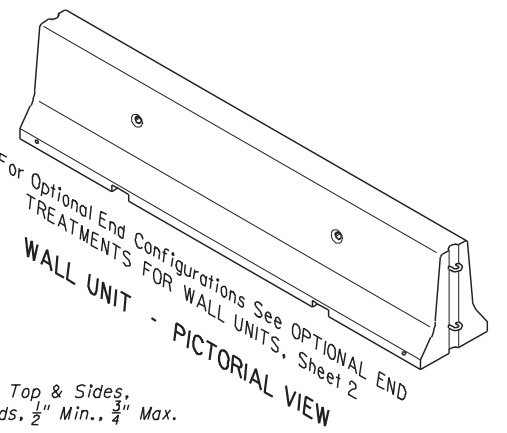


SIDE VIEW

WALL UNIT



BRIDGE DECK OR APPROACH SLAB MOUNT PICTORIAL VIEW



WALL UNIT - PICTORIAL VIEW

GENERAL NOTES

1. Temporary concrete barrier wall units may be either the New Jersey shape or the F-Shape configuration, unless the plans specify other types of temporary concrete barrier wall; however, intermixing of units with different shapes in a continuous run of barrier will not be permitted.
2. Material and workmanship for the wall shall meet the requirements of Sections 400 and 521 of the Standard Specifications, except the bottom of the unit can be finished to a dense uniform surface by floating in lieu of the Class 3 finish. Concrete shall be Class II.
3. Type C Steady-Burn Lights are to be mounted on top of temporary concrete barrier walls that are used as barriers along travel ways in work zones. The lights are to be spaced at 50' centers in transitions, 100' centers on curves and 200' centers on tangent roadways. For additional information refer to 'Warning Lights' on Index No. 600.
4. Wall units shall not be used for permanent barrier wall construction regardless of unit length, unless specifically permitted by the plans.
5. The temporary concrete barrier wall units with the optional end connections shown on this index are the standard optional units for Florida Department Of Transportation projects. Standard optional end units can be intermixed in a run of wall, and interconnected with other barrier systems as specified on other standard drawings or with appropriate transitions as detailed in the plans.

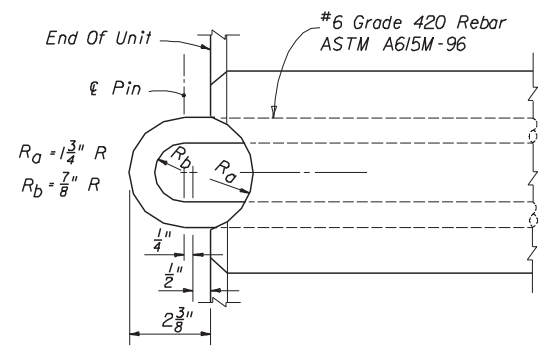
Temporary concrete barrier wall units with end configurations that are on the 'Qualified Products' listing may be substituted for the standard optional end units when approved by the Engineer; however, substitution units cannot be intermixed with dissimilar units in a run of wall. Substitution units shall have positive interconnections between each adjoining unit; wall units with plain ends will not be permitted regardless of ties or anchorages.

6. Wall units may be reused provided they have the structural integrity and surface qualities of new units.
7. Wall units shall be furnished by the Contractor except when the plans stipulate the availability of Department owned units. Regardless of unit source the Contractor shall furnish all hardware and shall be responsible for all handling including loading, transport, unloading, stockpiling, installation, removal and return.
8. If the plans specify Barrier (Temporary) Optional, the Contractor has the option to furnish either concrete or water filled barriers. If the plans specify Barrier (Temporary) Concrete, substitution with water filled barriers will not be permitted.
9. Wall units used for work zone traffic control and other temporary applications shall be paid for under the contract unit price for Barrier (Temporary) Concrete, LF, or Barrier (Temporary) Optional, LF. Type C Steady-Burn Lights shall be paid for under the contract unit price for Lights, Temp. Barrier Wall Mount (Type C, Steady-Burn), ED.

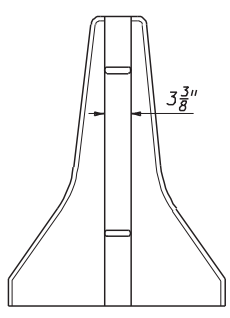
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**PRECAST CONCRETE
TEMPORARY BARRIER WALL**

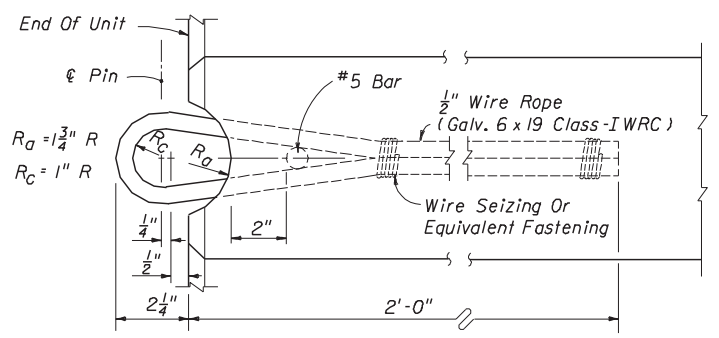
Names	Dates	Approved By				
Designed By		State Roadway Design Engineer				
Drawn By	HSD 04/82				Revision	Sheet No.
Checked By	JVG 04/82				00	1 of 4
				Index No. 415		



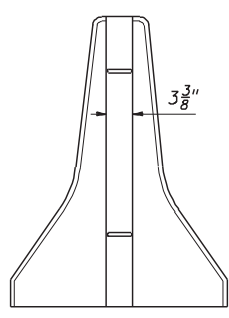
TOP VIEW



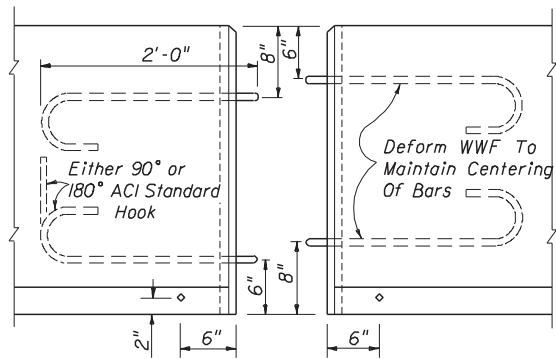
END VIEW



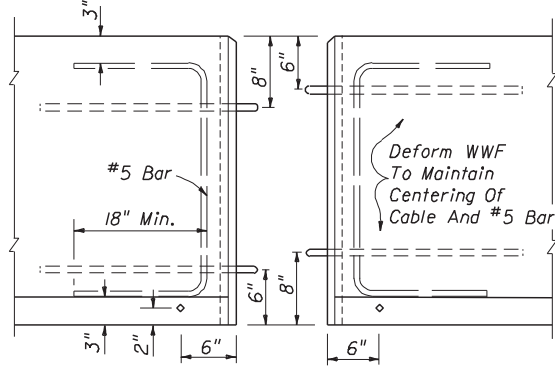
TOP VIEW



END VIEW

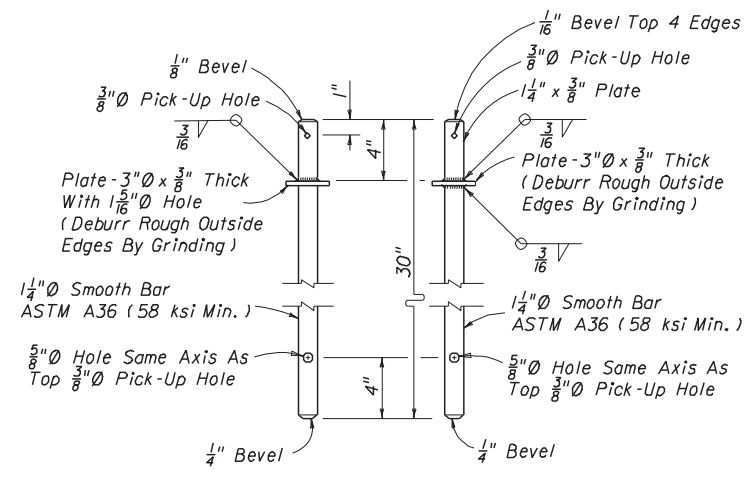


SIDE VIEW
ROUND BAR CONNECTOR

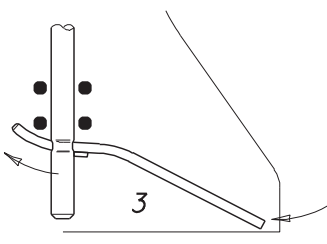
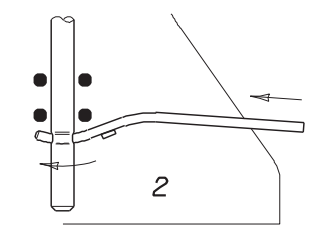
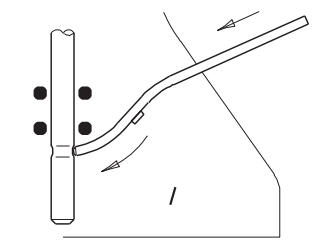


SIDE VIEW
WIRE ROPE CONNECTOR

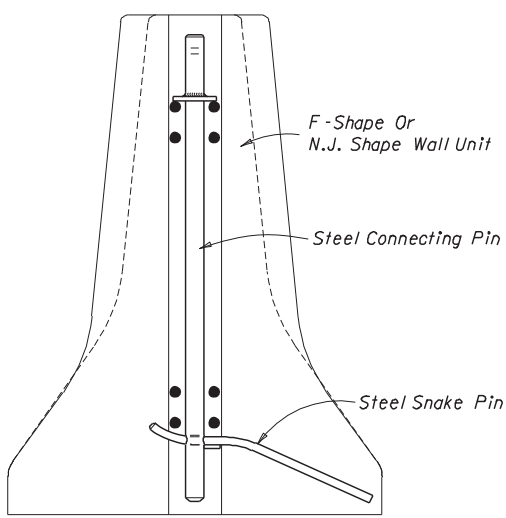
OPTIONAL END TREATMENTS FOR WALL UNITS



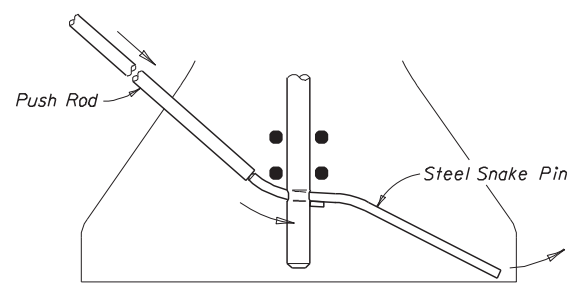
OPTIONAL PINS
STEEL CONNECTING PIN



INSERTING FDOT SNAKE PIN

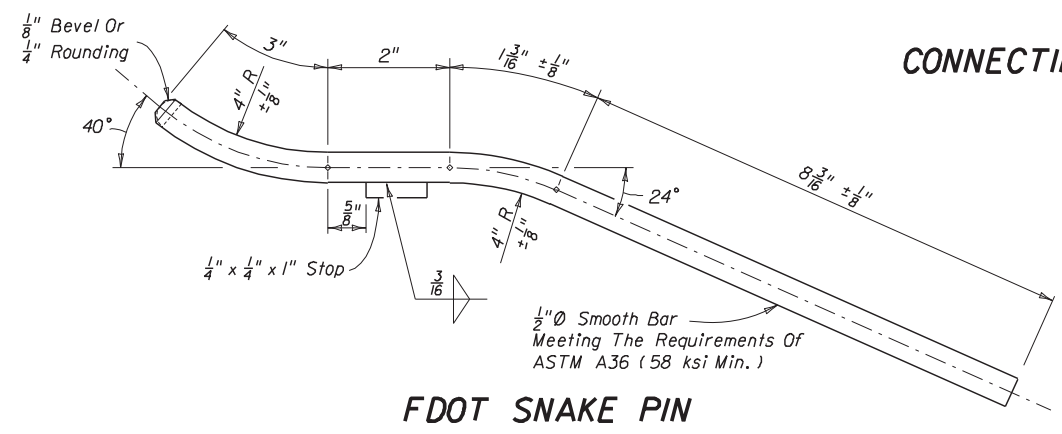


ASSEMBLED UNIT



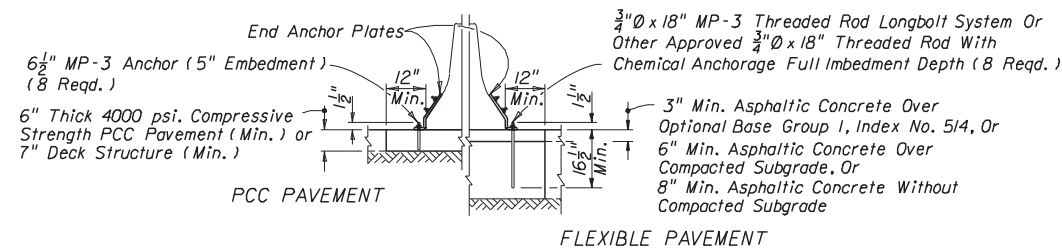
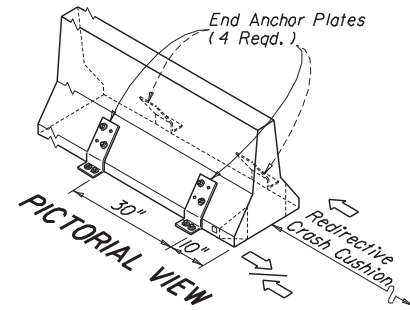
REMOVING FDOT SNAKE PIN

CONNECTING PIN ASSEMBLY



FDOT SNAKE PIN

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
PRECAST CONCRETE TEMPORARY BARRIER WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By	HSD 04/82	Revision	Sheet No.	Index No.
Checked By	JVG 04/82	00	2 of 4	415



SURFACE ANCHORAGE REQUIREMENTS

END ANCHORAGE NOTES

1. For temporary barrier wall end anchorage applications, see 'TEMPORARY CONCRETE BARRIER WALL ALIGNMENT' and 'NOTES FOR TEMPORARY CONCRETE BARRIER WALL END SHIELDING'.
2. The temporary concrete barrier wall anchor plate depicted above is a proprietary design by Energy Absorption Systems, Inc. Other temporary anchorage methods can be substituted when wall rigidity is assured by any of the following:
 - (a) proven by associated crash test of redirective crash cushions, or
 - (b) meet anchorage prescribed in 'A Guide To Standardized Highway Barrier Hardware', or
 - (c) crash cushion manufacturer's engineered design, or
 - (d) approved shop drawings on a case by case basis.
3. The cost for anchoring the wall segment will be included in the cost for the adjoining redirective crash cushion.

BARRIER WALL END ANCHORAGE

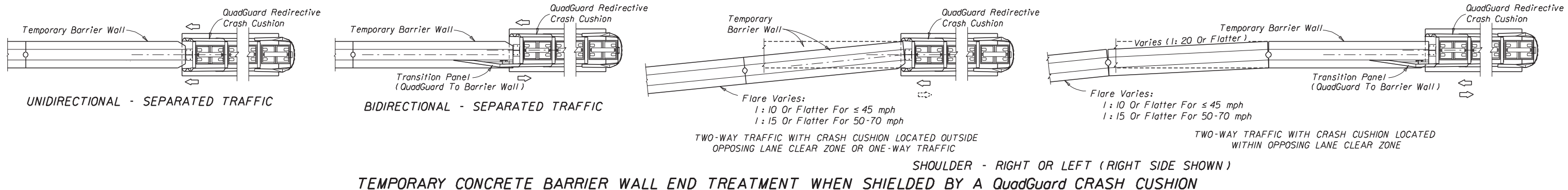
NOTES FOR TEMPORARY CONCRETE BARRIER WALL END SHIELDING

1. Redirective crash cushions are the principal (standard) device to be used for shielding approach ends of temporary concrete barrier walls. Except where the plans designate a particular type of redirective crash cushion for a specific location, the contractor has the option to construct either the REACT 350, QuadGuard, ADIEM 350 or TRACC crash cushions subject to the uses and limitations described on Index Nos. 434, 435, 436 and 440 respectively. The barrier wall end segment must be anchored to a paved surface in accordance with 'BARRIER WALL END ANCHORAGE'.
2. Temporary redirective crash cushions shall be installed in accordance with the manufacturer's specifications and recommendations. Temporary crash cushions can be either new or functionally sound used devices. Performance of intended function is the only condition for acceptance, whether the crash cushion is new, used, refurbished, purchased, leased, rented, on loan, shared between projects, or made up of mixed new and used components.
3. Inertial crash cushions are not optional systems for locations designated for redirective crash cushions by the plans; can not be substituted for redirective crash cushions without expressed approval by the Engineer; and, such substitutions are not eligible for VECP consideration.
4. A yellow post mounted Type I Object Marker shall be centered 3' in front of the nose of all temporary crash cushions. Mounting hardware shall be in accordance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the crash cushion.
5. Optional temporary redirective crash cushions are to be paid for per location under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

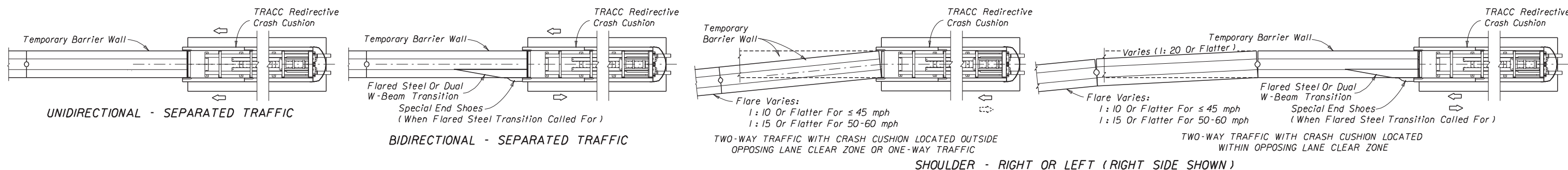
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**PRECAST CONCRETE
TEMPORARY BARRIER WALL**

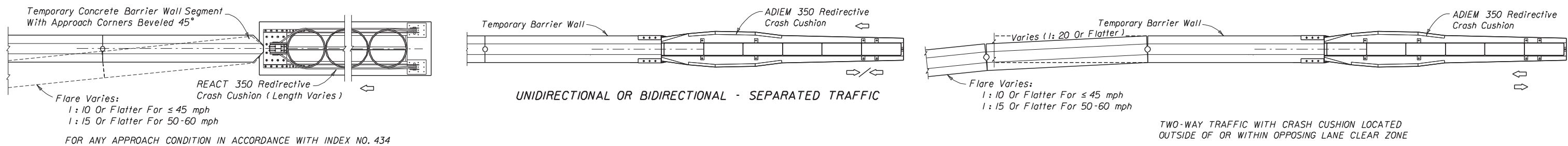
Designed By	Names	Dates	Approved By		
Drawn By	HKH	03/99	 State Roadway Design Engineer		
Checked By	JVG	03/99			
			00	3 of 4	415



TEMPORARY CONCRETE BARRIER WALL END TREATMENT WHEN SHIELDED BY A QuadGuard CRASH CUSHION



TEMPORARY CONCRETE BARRIER WALL END TREATMENT WHEN SHIELDED BY A TRACC CRASH CUSHION



TEMPORARY CONCRETE BARRIER WALL END TREATMENT WHEN SHIELDED BY A REACT 350 CRASH CUSHION

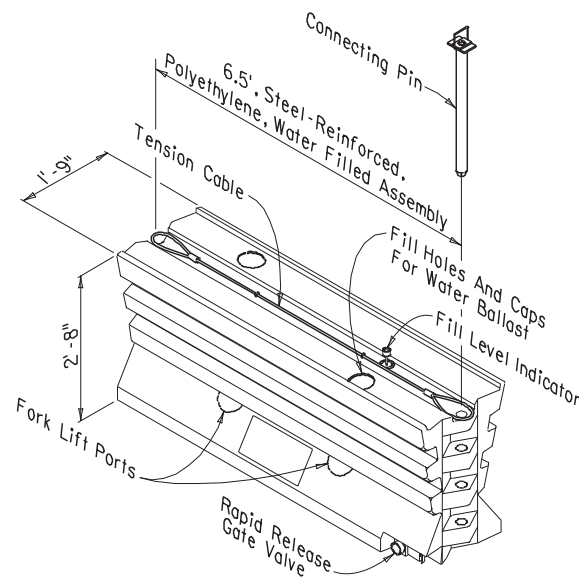
TEMPORARY CONCRETE BARRIER WALL END TREATMENT WHEN SHIELDED BY AN ADIEM 350 CRASH CUSHION

See 'TEMPORARY CONCRETE BARRIER WALL ALIGNMENT', 'BARRIER WALL END ANCHORAGE' and 'NOTES FOR TEMPORARY CONCRETE BARRIER WALL END SHIELDING' for additional information.

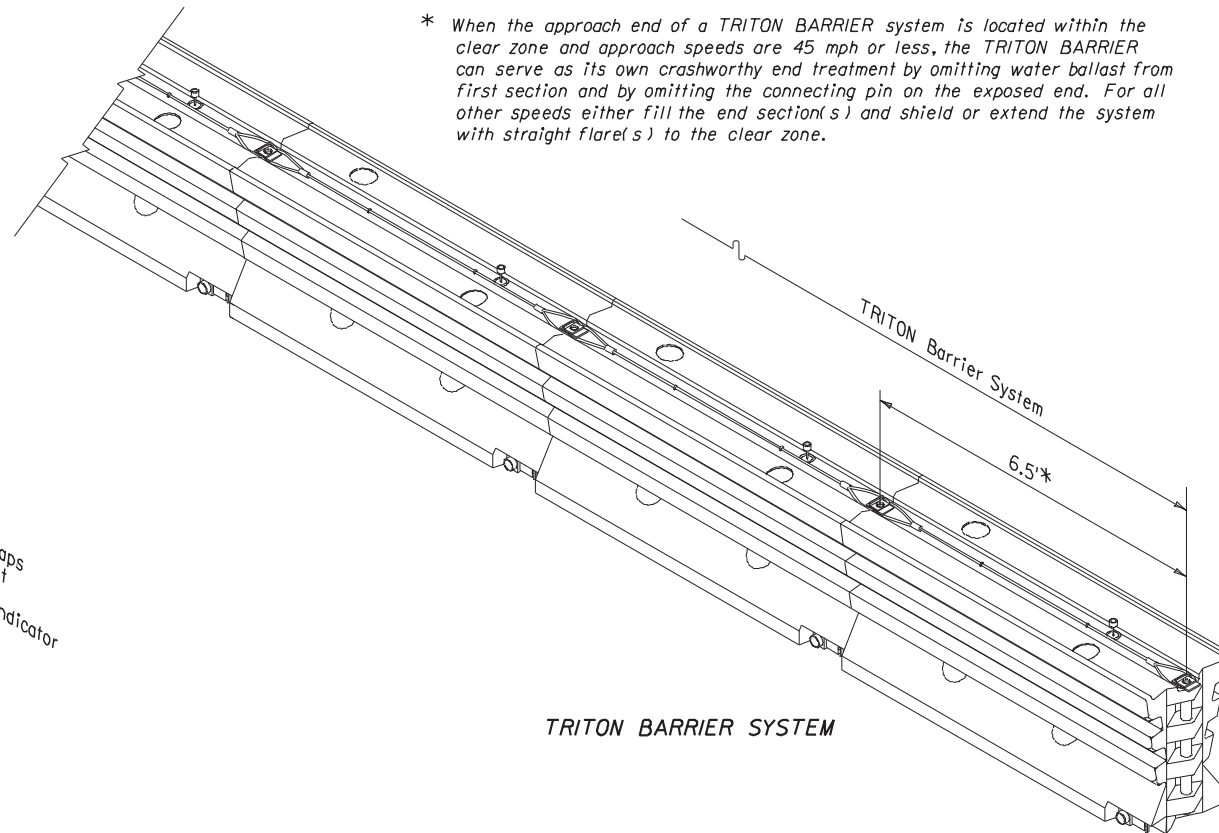
SHIELDING TEMPORARY CONCRETE BARRIER WALL ENDS WITH REDIRECTIVE CRASH CUSHIONS (REDIRECTIVE OPTION)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
PRECAST CONCRETE TEMPORARY BARRIER WALL				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	HKH	3/99	Revision	Sheet No. Index No.
Checked By	JVG	3/99	00	4 of 4 415

* When the approach end of a TRITON BARRIER system is located within the clear zone and approach speeds are 45 mph or less, the TRITON BARRIER can serve as its own crashworthy end treatment by omitting water ballast from first section and by omitting the connecting pin on the exposed end. For all other speeds either fill the end section(s) and shield or extend the system with straight flare(s) to the clear zone.



TRITON BARRIER SECTION



TRITON BARRIER SYSTEM

SUPPLEMENTAL GENERAL NOTES FOR THE TRITON BARRIER

1. The system presented on this standard drawing (index) under the label TRITON BARRIER is a proprietary design by Energy Absorption Systems, Inc. and is marketed under the trade name TRITON BARRIER.
2. This index provides the general graphics and information necessary to field identify component parts of the TRITON BARRIER and their incorporation as a whole system for Department standard applications.
3. The TRITON BARRIER system can be installed as a free standing system or in combination with other Department temporary and permanent barrier systems, exclusive of other proprietary water filled barrier systems.
4. Connections between the TRITON BARRIER and other barrier systems shall be as shown in the 'TRITON BARRIER TRANSITION HARDWARE ASSEMBLIES'. Variation from these connections shall be as detailed in the plans or as prescribed by the manufacturer.
5. The TRITON BARRIER section or sections are not to be used as perpendicular road closure blocks, whether connected, unconnected, filled or unfilled.
6. Sections shall be installed in alternating white and work zone safety orange colors.
7. The TRITON BARRIER systems shall be paid for under the contract unit price for Barrier (Temporary) (Water Filled), LF, or Barrier (Temporary) (Optional), LF and shall be full compensation for furnishing and installing TRITON BARRIER in accordance with this index, with the plans and with the manufacturers detailed drawings, procedures and specifications. The cost for transition hardware detailed in this index shall be included in the contract unit price for the barrier. TRITON modules considered a part of the systems crashworthy end treatment shall be included in the linear measure; other crashworthy end terminals, crash cushions or other shielding required for use of the TRITON barrier will not be included in the contract unit price for the barrier.

SUPPLEMENTAL DESIGN NOTES AND GUIDELINES FOR THE TRITON BARRIER

1. The longitudinal system can be used for work zone speeds of 60 mph or less. Transition hardware can be used in areas where speeds are limited to 45 mph or less.
2. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the TRITON BARRIER, and until such alternatives are available, the TRITON BARRIER need not be bid against other proprietary items.

TRITON BARRIER


GENERAL NOTES

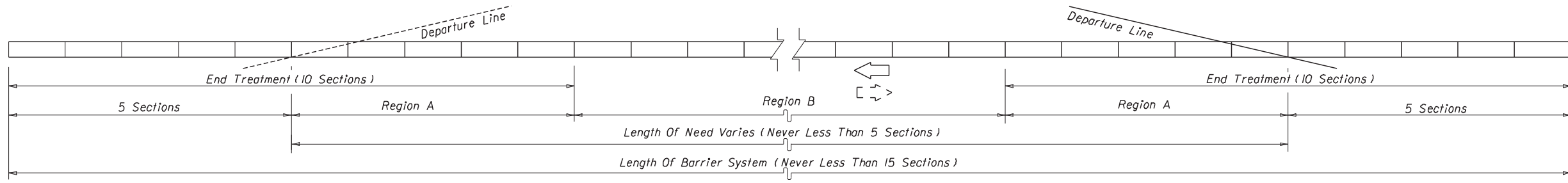
1. This standard drawing (index) presents proprietary temporary water filled barrier designs and is produced by the Florida Department Of Transportation solely for use by the Department and its assignees.
2. Any system presented on this index can be used as a temporary barrier in traffic control work zones and other Department permitted traffic control zones but cannot be constructed as a permanent barrier.
3. All systems shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications; however, installation will be limited to the applications shown on this index, except when otherwise detailed in the plans or approved by shop drawings or approved by the Engineer.
4. Water filled barrier systems are to be used only as longitudinal systems. A longitudinal system may include encapsulating work space barriers within low speed intersections only where the approach longitudinal system deflects the traffic alignment around the work space enclosure.
5. One type proprietary water filled barrier system is not to be used in conjunction with another type proprietary water filled barrier system, except when specifically called for and detailed in the plans.
6. All water filled barrier system sections shall be interconnected with manufacturer and Department approved crash tested connections, i.e., no individual sections or interconnected sections of substandard length are to stand alone, except when specifically called for and detailed in the plans, or for specific applications of interconnected sections around work spaces shown on this index.
7. Water filled barrier systems are not to be used on surfaces with cross slopes exceeding 0.05 (steeper than 1:20), including the surface within the design deflection space behind the barrier.
8. Water filled barrier systems are not to be used on grades steeper than 5%, nor placed over surface irregularities that cause vertical deflection exceeding 1:20 between connected sections.
9. Water filled barrier systems are not permitted on bridges or approach slabs; however, they can be placed over box culverts, including those of bridge length, where design deflection space is adequate. The system should be used on concrete pavements only where the Engineer determines that the dynamic loading of pavement slabs will not cause the system to crab out of alignment.
10. Temporary water filled barriers are to be paid for under the contract unit price for Barrier (Temporary) (Water Filled), LF, or Barrier (Temporary) (Optional), LF. If the plans specify Barrier (Temporary) (Optional), the Contractor has the option to furnish either concrete or water filled barriers. If the plans specify Barrier (Temporary) Water Filled, substitution with concrete barriers will not be permitted. For additional payment information see the supplemental general notes for the individual barrier systems.

Type C Steady-Burn lights are to be mounted on top of all water filled barriers used along travelways in work zones. The lights are to be spaced at 50' centers on transitions, 100' centers on curves and 200' centers on tangent roadways. Lights shall be paid for under the contract unit price for Lights (Temporary Barrier Wall Mount) (Type C Steady-Burn), ED.

DESIGN NOTES

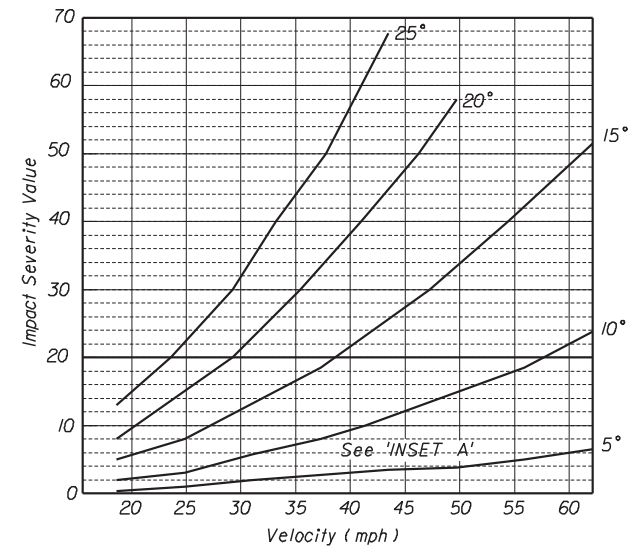
1. The TRITON and GUARDIAN water filled barriers are considered by the Federal Highway Administration to be innovative temporary barriers, and, may be used as such toward compliance with the percentage of innovative barrier required in the total median barrier on Federal Aid Projects.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TEMPORARY WATER FILLED BARRIERS				
Names	Dates	Approved By		
Designed By	MFG/HKH 6/95	 State Roadway Design Engineer		
Drawn By	HKH 6/95	Revision	Sheet No.	Index No.
Checked By	JVG 6/95	00	1 of 5	416



When TRITON BARRIER is used as its own end treatment fill all sections with water ballast except the approach end section(s). Do not use connecting pin on the exposed end of the end section(s).

SYSTEM LENGTHS FOR UNIDIRECTIONAL OR BIDIRECTIONAL TRAFFIC

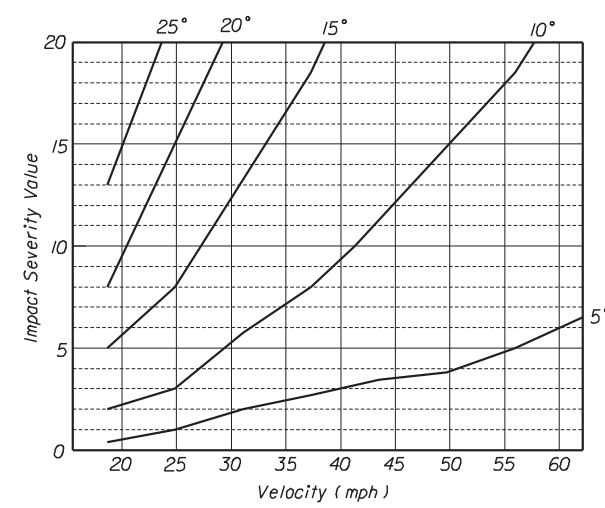
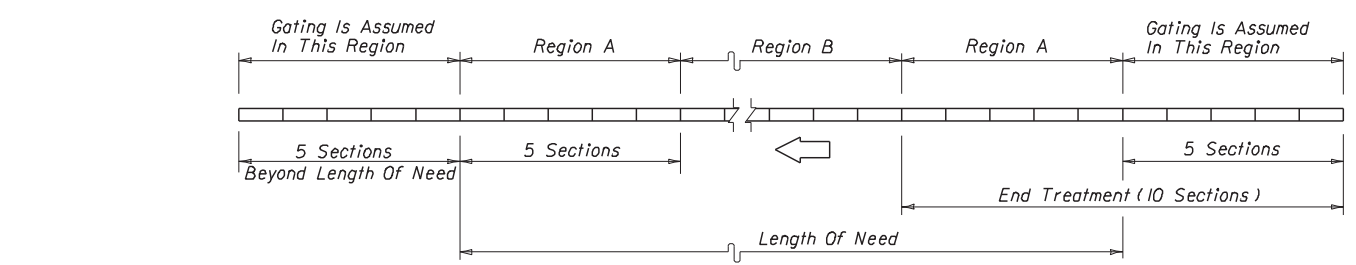


DETERMINING THE IMPACT ANGLE CURVE TO APPLY

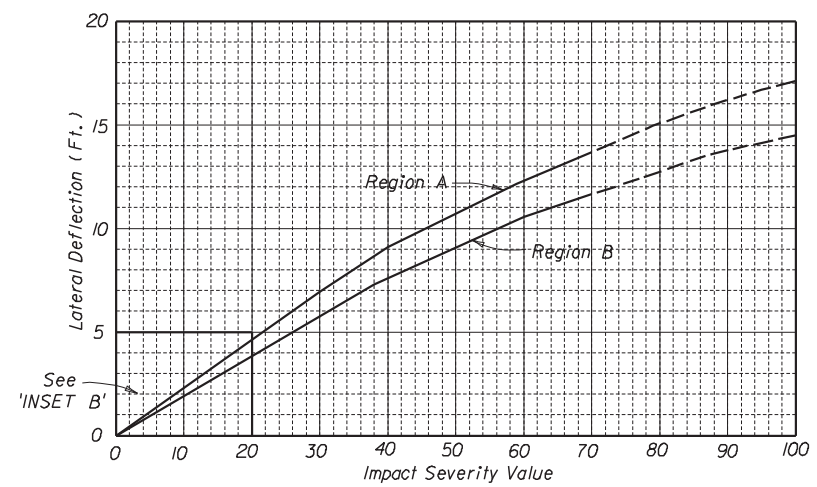
Except where the plans call for the use of a certain impact angle curve, or where a certain impact angle is anticipated by site specific conditions, the impact angle curve to be used in determining impact severity will be selected on the following basis:

Barrier Location	Graph Curve
Parallel to tangent roadway	5°
Parallel to and on the inside of roadway curve	5°
Standard lane shift or drop ($WS \leq \frac{WS^2}{60}$)	5°
Parallel to and on the outside of roadway curve	5° (10°) [15°]
Approach flared end section on inside of roadway curve	10°
Approach flared end section on approach tangent roadway	10°
Approach flared end section on outside of roadway curve	10° (15°) [25°]
() Max. Curvature (Min. Radius), High Speed Facilities	
[] Max. Curvature (Min. Radius), Low Speed Facilities	

IMPACT SEVERITY DETERMINATION FOR VEHICLES ≤4400 LB IMPACTING SINGLE ROW TRITON SYSTEM



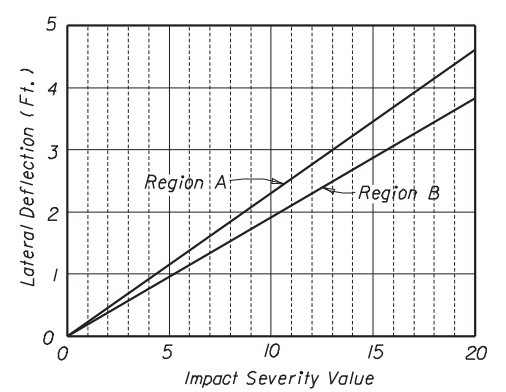
INSET A



Notes: Curves for Regions 'A' and 'B' apply to vehicles ≤ 4400 lbs.

--- Indicates impact severity levels created by higher impact angles not anticipated in work zone.

SINGLE ROW TRITON BARRIER INSTALLATION DEFLECTION CURVES

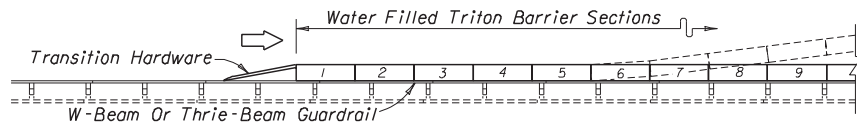
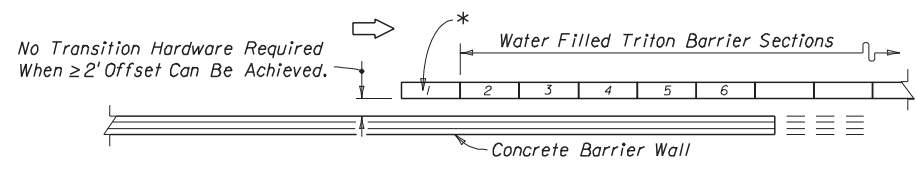
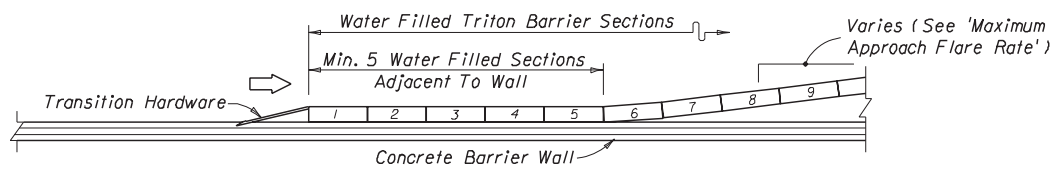
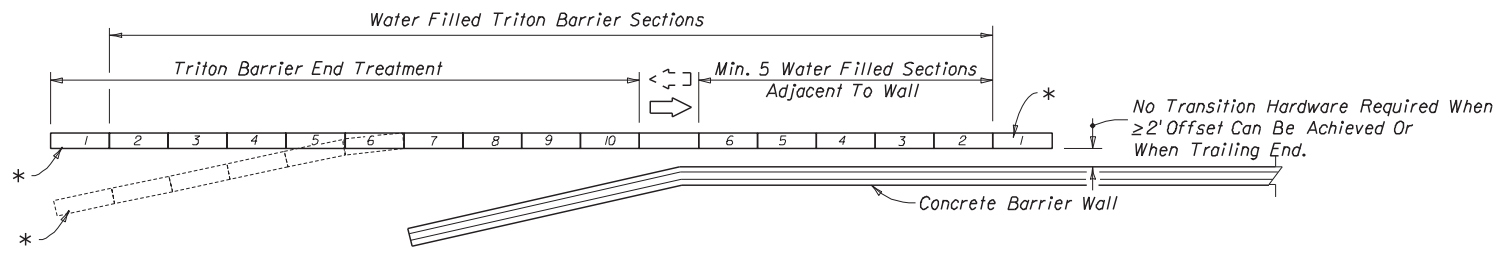
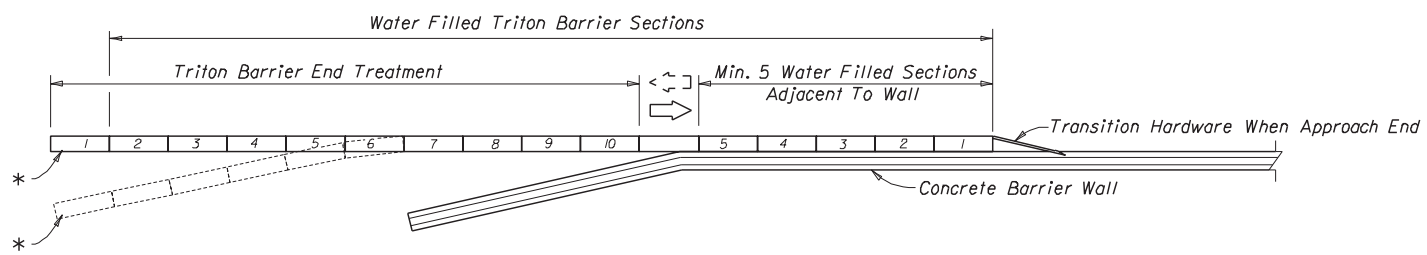


INSET B

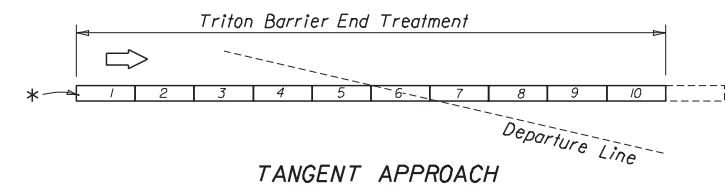
IMPACT SEVERITY AND LATERAL DEFLECTION DISTANCES

TRITON BARRIER SYSTEM LENGTHS AND DEFLECTIONS

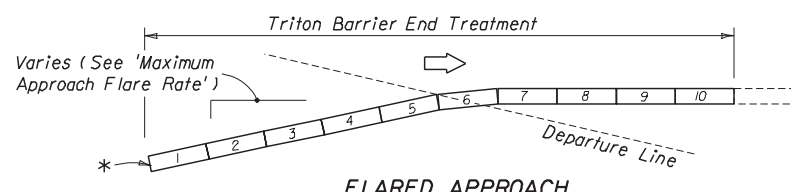
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TEMPORARY WATER FILLED BARRIERS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	MFG/HKH	6/95	State Roadway Design Engineer	
Drawn By	HKH	6/95	Revision	Sheet No.
Checked By	JVG	6/95	00	2 of 5
				Index No. 416



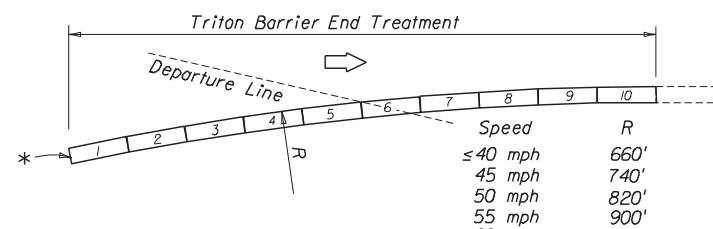
BARRIER SYSTEM IN COMBINATION WITH OTHER BARRIER SYSTEMS WHEN SPEEDS ARE ≤45 mph



TANGENT APPROACH



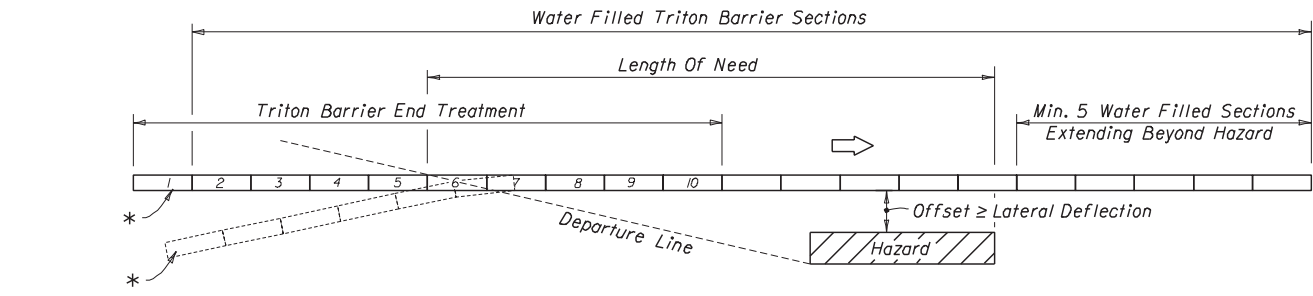
FLARED APPROACH



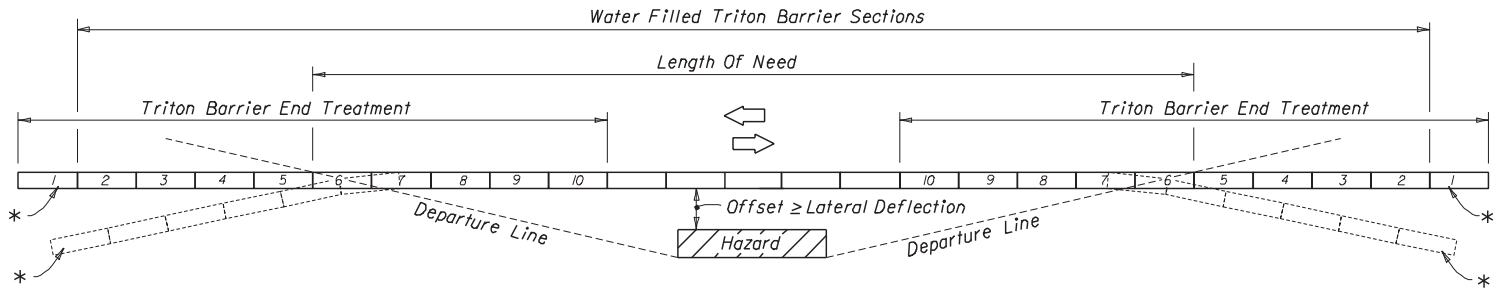
RADIAL APPROACH

END TREATMENT CONFIGURATIONS

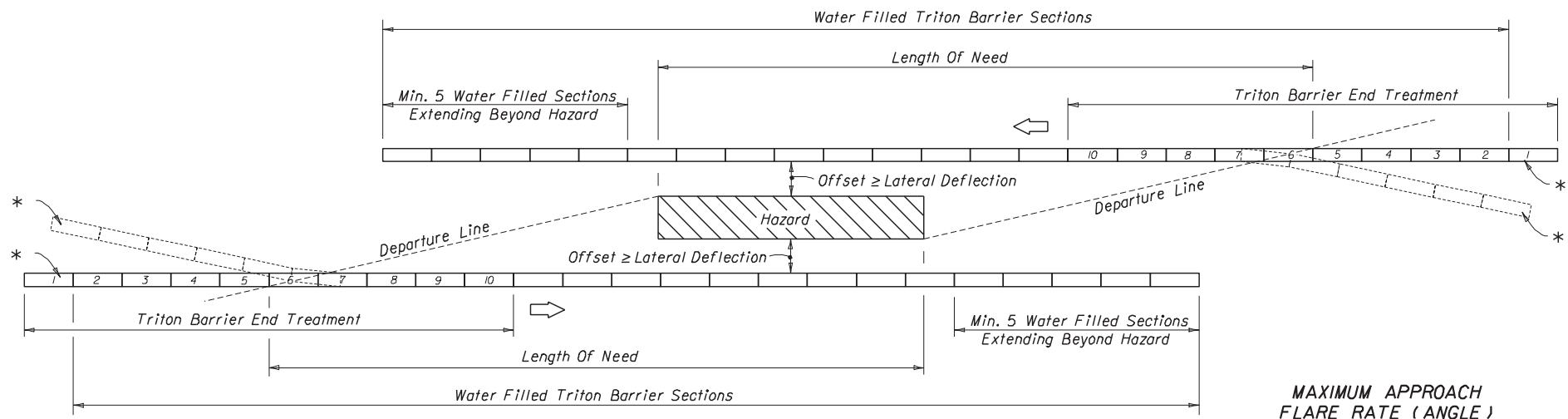
TRITON BARRIER - TYPICAL APPLICATIONS



TYPICAL UNIDIRECTIONAL SHOULDER LAYOUT



TYPICAL BIDIRECTIONAL SHOULDER LAYOUT



TYPICAL MEDIAN LAYOUT FREE STANDING BARRIER SYSTEMS

MAXIMUM APPROACH FLARE RATE (ANGLE)

- ≤40 mph - 1:9 (6°)
- 45 mph - 1:10 (5.5°)
- 50 mph - 1:11 (5°)
- 55 mph - 1:12 (4.5°)
- 60 mph - 1:13 (4°)

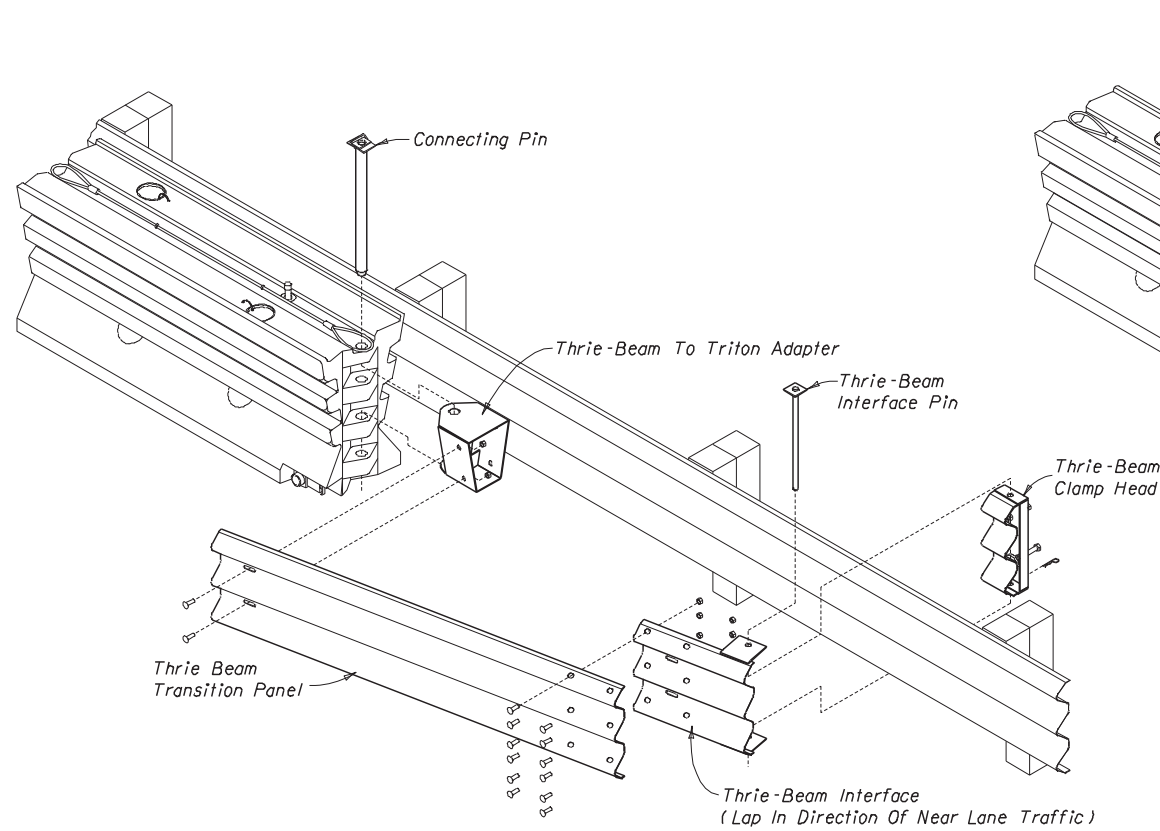
For Departure Line requirements see Index 400.

* When used as an approach end treatment for speeds ≤45 mph, omit water ballast from first section and omit connecting pin on exposed end. For speeds ≥50 mph fill and shield or extend with straight flare to C2.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

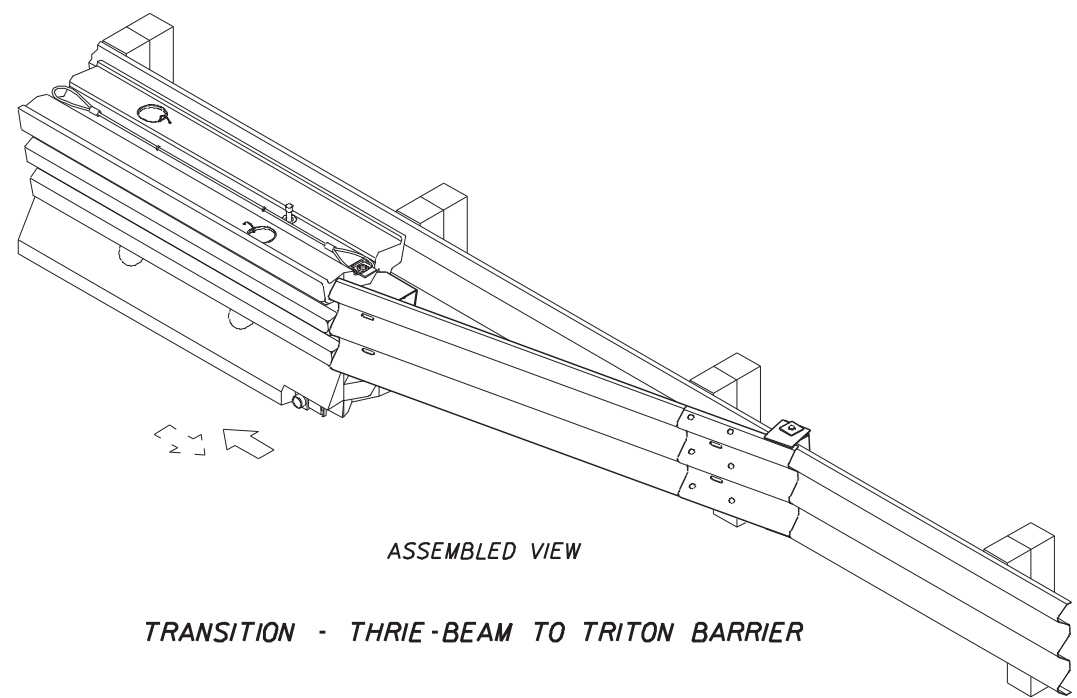
TEMPORARY WATER FILLED BARRIERS

Names	Dates	Approved By		
Designed By	MFG/HKH	6/95	[Signature]	
Drawn By	HKH	6/95	Revision	Sheet No.
Checked By	JVG	6/95	00	3 of 5
			Index No.	416

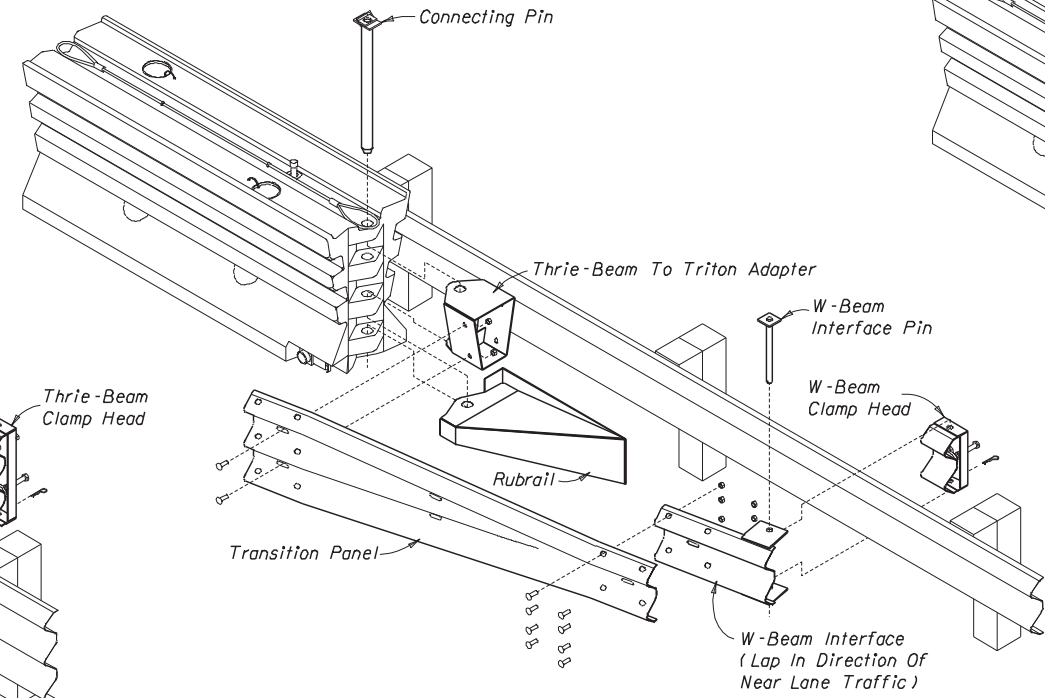


EXPLODED VIEW

TRANSITION - THRIE-BEAM TO TRITON BARRIER

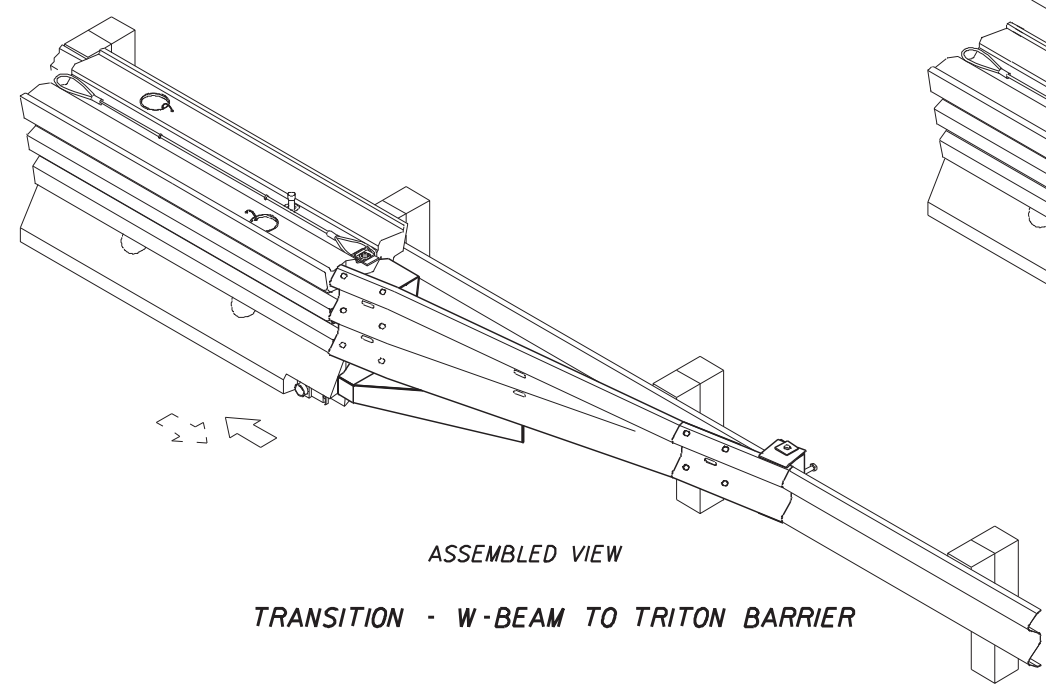


ASSEMBLED VIEW

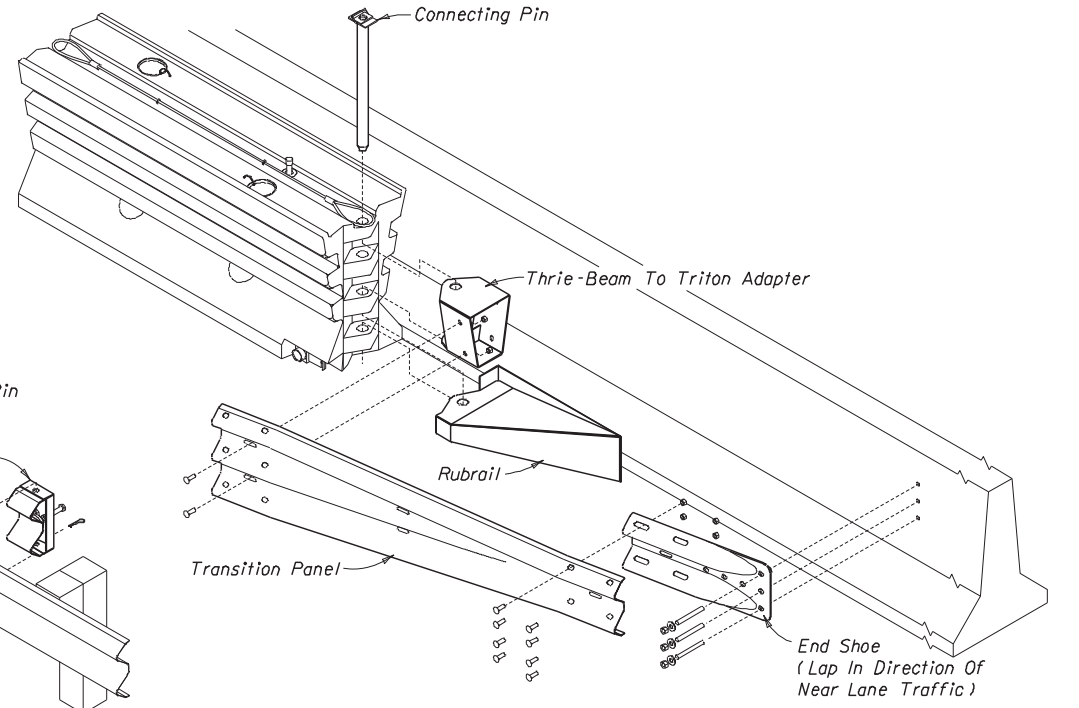


EXPLODED VIEW

TRANSITION - W-BEAM TO TRITON BARRIER

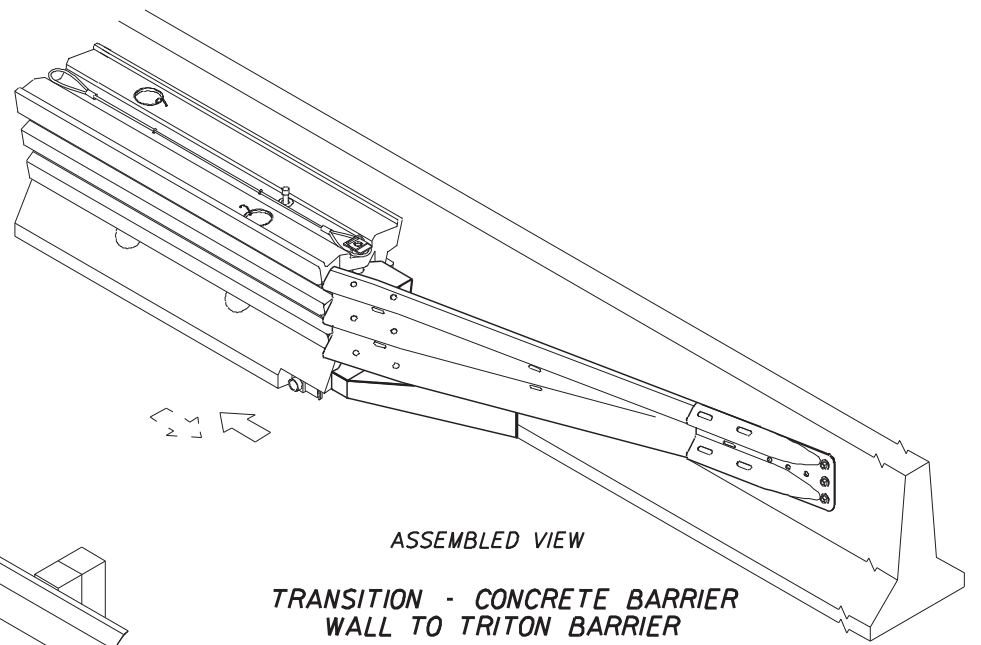


ASSEMBLED VIEW



EXPLODED VIEW

TRANSITION - CONCRETE BARRIER WALL TO TRITON BARRIER



ASSEMBLED VIEW

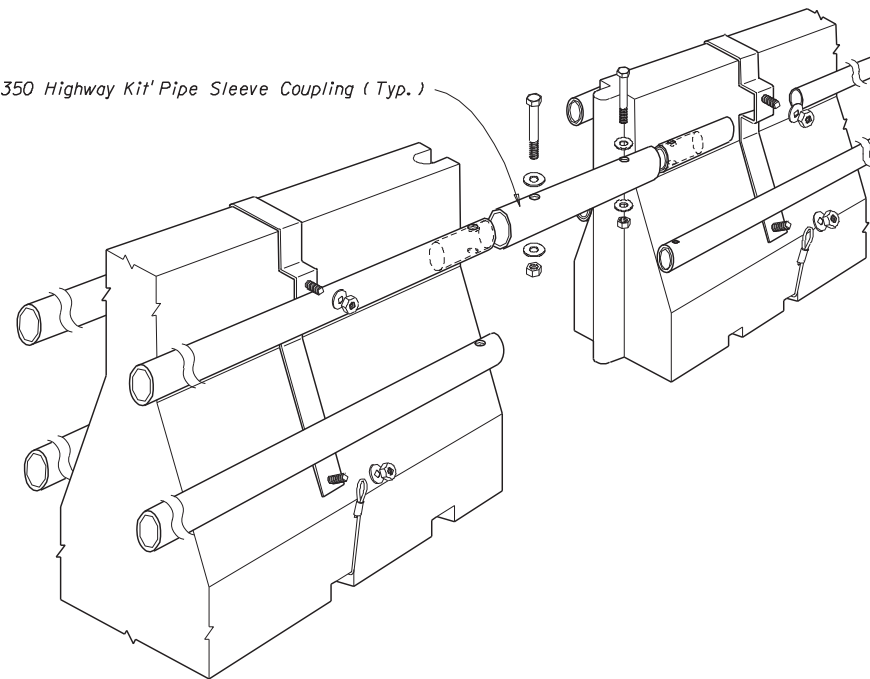
TRANSITION NOTES

1. Transitions shown on this sheet are limited to speeds of 45 mph or less.
2. Transition hardware can be placed on either end of TRITON section.
3. Transition hardware can be located on left or right side of roadway, right side shown.
4. TRITON Barrier end sections must be filled with water when using transition hardware assemblies.
5. Install transition hardware in accordance with the manufacturer's recommendations and specifications.

TRITON BARRIER TRANSITION HARDWARE ASSEMBLIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TEMPORARY WATER FILLED BARRIERS				
Designed By	MFG/HKH	6/95	Approved By <i>[Signature]</i>	
Drawn By	HKH	6/95	Revision	Sheet No.
Checked By	JVG	6/95	00	4 of 5
				Index No. 416

'GUARDIAN 350 Highway Kit' Pipe Sleeve Coupling (Typ.)



SUPPLEMENTAL GENERAL NOTES FOR THE GUARDIAN BARRIER

1. The barrier units presented on this standard drawing (index) and the label GUARDIAN are proprietary designs by Safety Barrier Systems and are marketed under the trade name GUARDIAN Safety Barrier.
2. This index provides general schematics and information necessary to field identify the water filled polyethylene segmental barrier module and the module frame and basic connections, but does not identify the incorporation of the modules and frame connections into a whole system. Any use of the GUARDIAN must be in accordance with the details on the plans, or by shop drawing approval or by the Engineer in absence of plan detail.
3. The GUARDIAN modules are approved for use on highways with all design speeds and only when the "GUARDIAN 350 Highway Kit" is incorporated throughout the system in use.
4. The GUARDIAN modules can be used only in a stand alone system. i.e., not connected to other types of barrier systems.
5. The GUARDIAN can be used only as a longitudinal barrier on the State maintained highway system. Any longitudinal system must have a minimum of eleven (11) longitudinally connected modules in advance of and following the length of need; in no case can the longitudinal run of barrier be less than 33 modules.

The approach end of the GUARDIAN must either extend to the outer limit of the clear zone; be shielded by a crash cushion; or, begin behind but not connected to another barrier or shielding feature.

6. The GUARDIAN system must be placed on a cross slope not exceeding 1:10, and located to provide a deflection distance between the system and hazards in accordance with the table below.

GUARDIAN BARRIER WITH 350 HIGHWAY KIT ESTIMATED BARRIER DEFLECTION (FEET)					
Vehicle Speed (mph)	Vehicle Impact Angle (Degrees)				
	25°	20°	15°	10°	5°
≤ 45	6.5	5.3	4.0	2.7	1.3
50	8.0	6.4	4.9	3.3	1.6
55	9.5	7.7	5.8	4.0	2.0
60	11.2*	9.0	6.9	4.6	2.3


* Observed Value (Crash Test Result)
Other Values Manufacturers Calculated Estimates

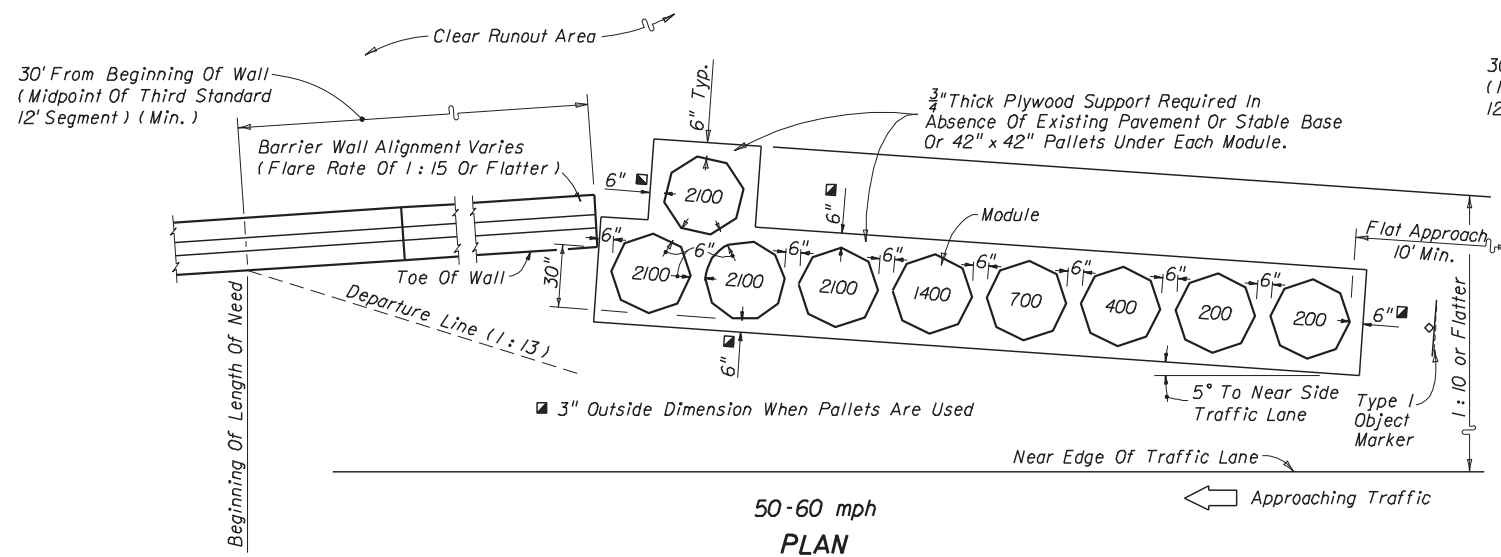
7. The GUARDIAN barrier system shall be paid for under the contract unit price for Barrier (Temporary) (Water Filled), LF, or Barrier (Temporary) (Optional), LF, and shall be full compensation for furnishing and installing GUARDIAN barrier in accordance with this index, with the plans and with the manufacturer's detailed drawings, procedures and specifications. Any crashworthy end terminal, crash cushion or other shielding required for use of the GUARDIAN barrier will not be included in the contract unit price for the barrier.

SUPPLEMENTAL DESIGN NOTES FOR THE GUARDIAN BARRIER

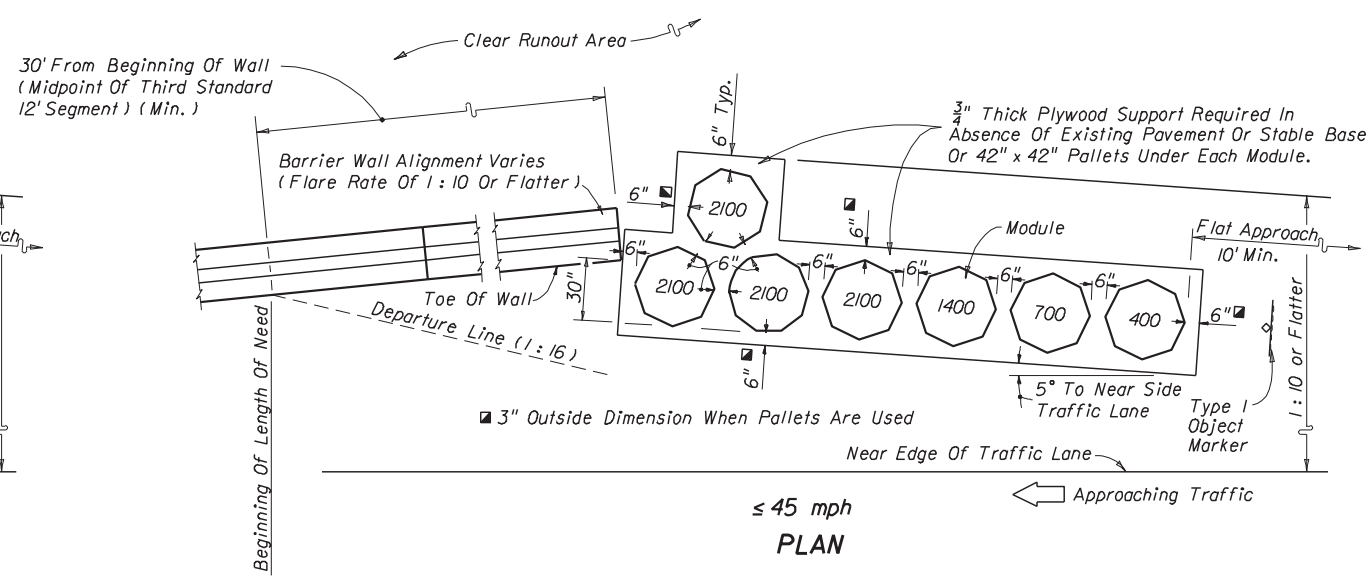
1. At time of publication of this standard no crash test data was available to provide a crashworthy end terminal design using the barrier modules; only the requirement for eleven (11) interconnected modules preceding and following the length of need, based on available crash test data.
2. Systems included in any maintenance of traffic plan will require detailed location and placement information.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the GUARDIAN barrier, and until such alternatives are available, the GUARDIAN barrier need not be bid against other proprietary items.

GUARDIAN BARRIER WITH 350 HIGHWAY KIT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
TEMPORARY WATER FILLED BARRIERS					
Names	Dates	Approved By			
Designed By	MFG/HKH	6/95	 State Roadway Design Engineer		
Drawn By	HKH	6/95	Revision	Sheet No.	Index No.
Checked By	JVG	6/95	00	5 of 5	416



50-60 mph
PLAN



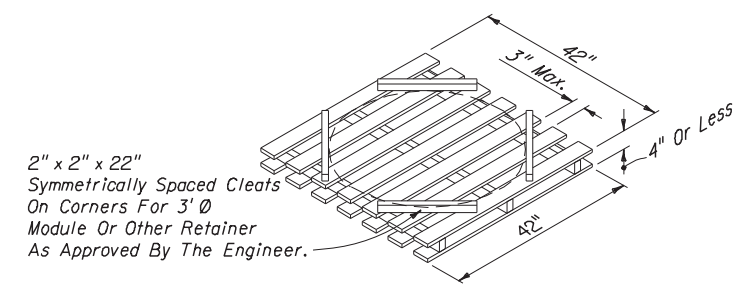
<= 45 mph
PLAN

Note: Numbers shown inside modules indicate mass in pounds of sand. All modules are approximately 3' in diameter with heights ranging from 3' to 3'-9".

INERTIAL CRASH CUSHION ARRAYS

NOTES FOR TEMPORARY INERTIAL CRASH CUSHIONS

1. The crash cushion arrays shown on this index can be used on the State highway system only for shielding temporary concrete barrier wall approach ends (a) where called for by the plans, or (b) where the use of redirective crash cushions is declared infeasible by the Engineer. Any permanent use of inertial modules will require site specific design. These arrays can not be substituted for redirective crash cushions called for in the plans without expressed approval by the Engineer; and, such approved substitutions are not eligible for VECP considerations.
2. Inertial crash cushions are gating type crash cushions, and a clear runout area back of the array must be provided. The arrays shown can be used for outer roadway applications, exclusive of gore areas, and for median applications where the median width is sufficient to provide clear zone width between the back side module and the near lane of the opposing traffic.
3. Inertial crash cushion modules shall be installed in accordance with the manufacturer's specifications and recommendations, and can be constructed of either new or functionally sound used modules.
4. Anchorage of barrier wall end segment is not required.
5. A yellow post mounted Type I Object Marker shall be centered 3' in front of the nose of all crash cushion arrays. Mounting hardware shall be in accordance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the modules.
6. Temporary inertial crash cushions are to be paid for per module under the contract unit price for Impact Attenuator Modules (Inertial) (Temporary), EA.

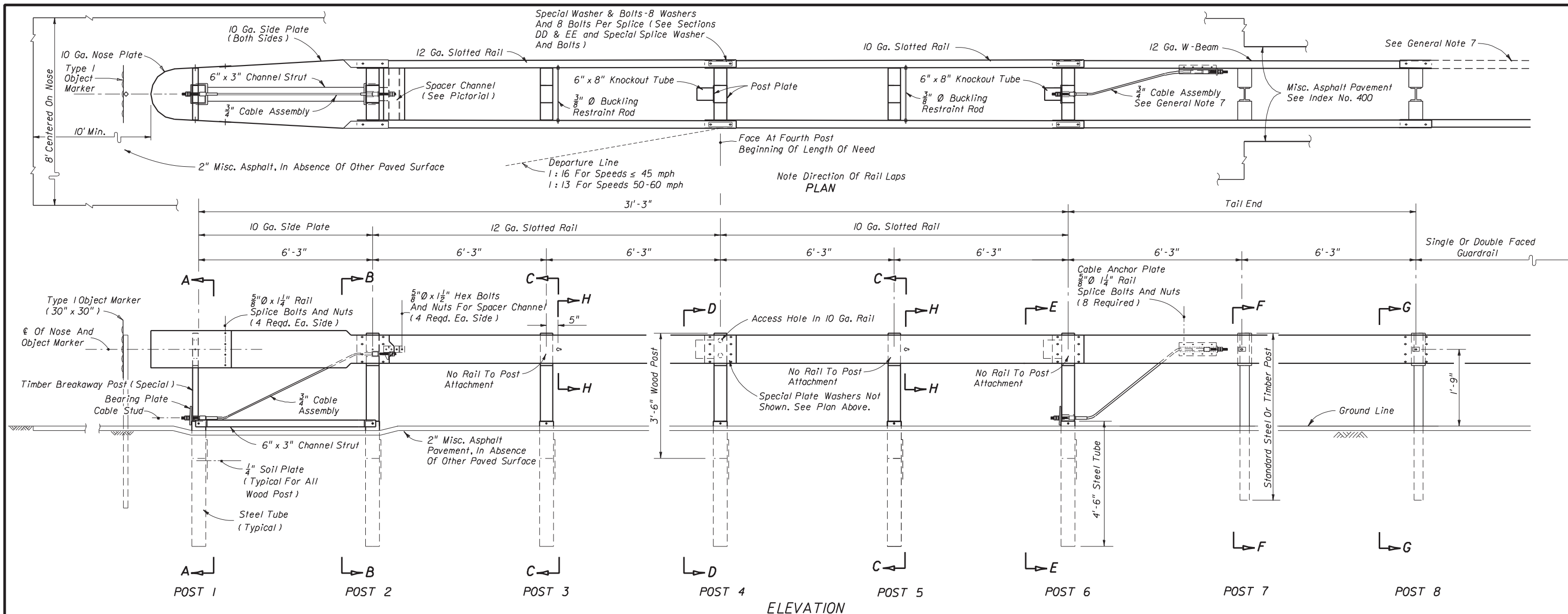


Pallet Shall Be Constructed Of Wood Or Other Frangible Or Resilient Materials Other Than Metals, And, Shall Be Sufficiently Durable To Support Modules For Their Expected Period Of Use; Wood Pallet Detail Shown.

INERTIAL MODULE PALLET

TEMPORARY INERTIAL CRASH CUSHIONS FOR SHIELDING ENDS OF TEMPORARY CONCRETE BARRIER WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
INERTIAL CRASH CUSHION				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	3/99	 State Roadway Design Engineer	
Checked By	JVC	3/99	Revision	Sheet No.
			00	1 of 1
				417



GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by SYRO Inc. and marketed under the trade name C-A-T 350, short for Crash Cushion/Attenuating Terminal. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the C-A-T 350 system and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the C-A-T 350 system installed in connection with standard single and double faced W-beam guardrail systems, and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.
4. The C-A-T 350 system shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
5. The C-A-T 350 system is suitable for speeds ≤ 60 mph.
6. The C-A-T 350 system shall be located on slopes of 1:10 or flatter and not closer than 11' to any traffic lane.
7. The 'tail end' section represented on this drawing applies to connections with single and double faced guardrail. The cable anchorage at Post No. 6 is to be used with single faced guardrail connections only.

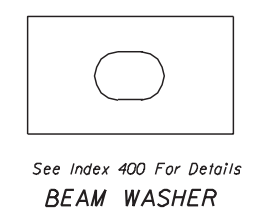
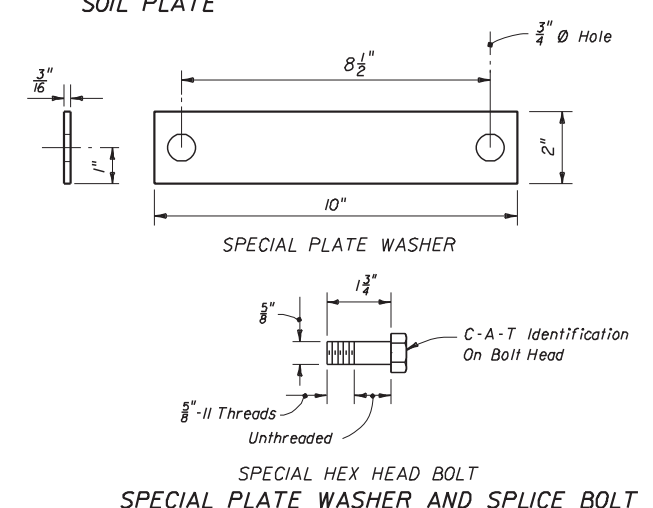
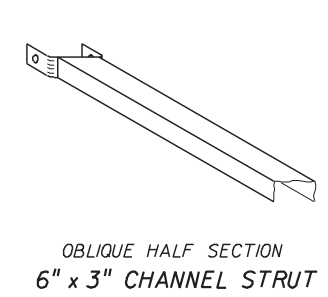
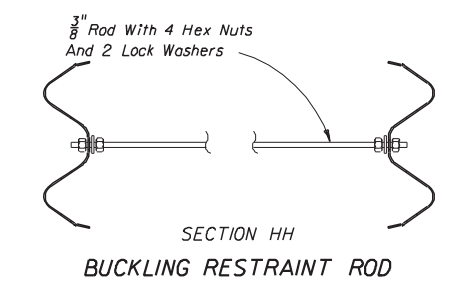
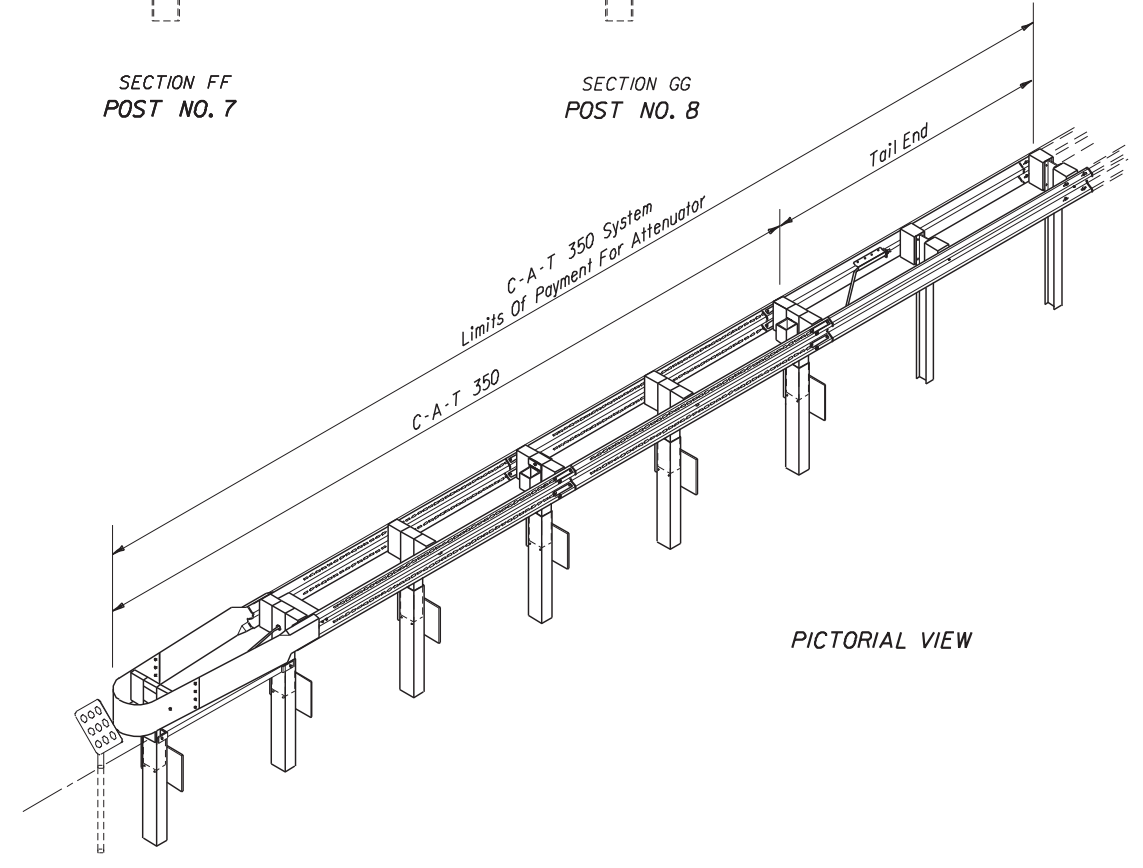
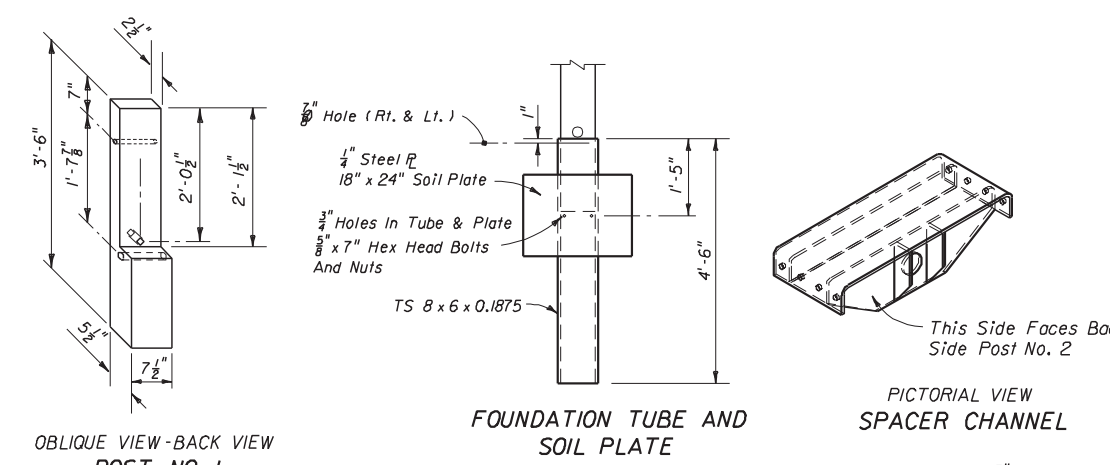
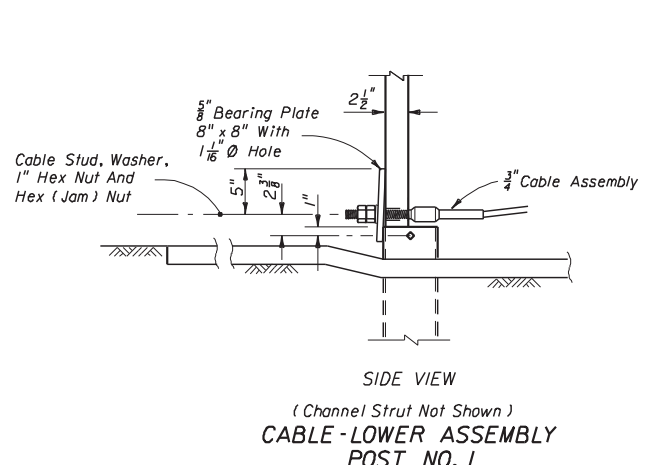
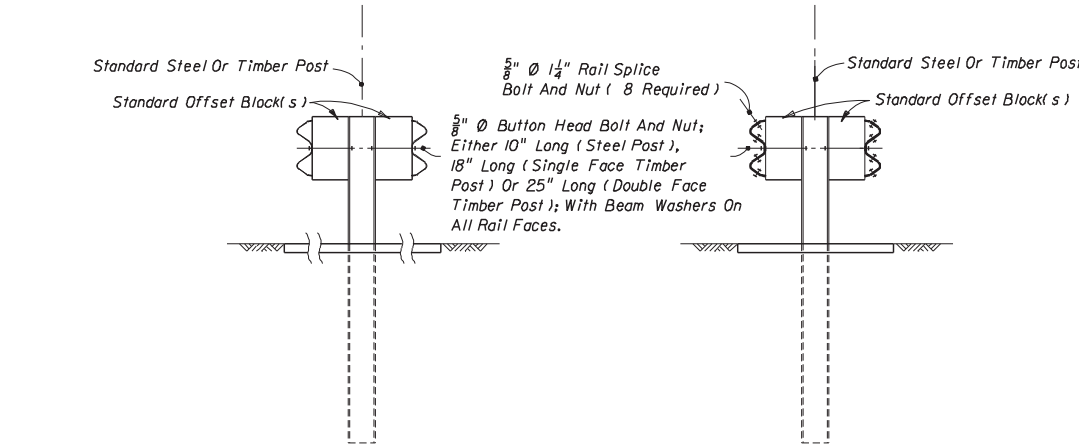
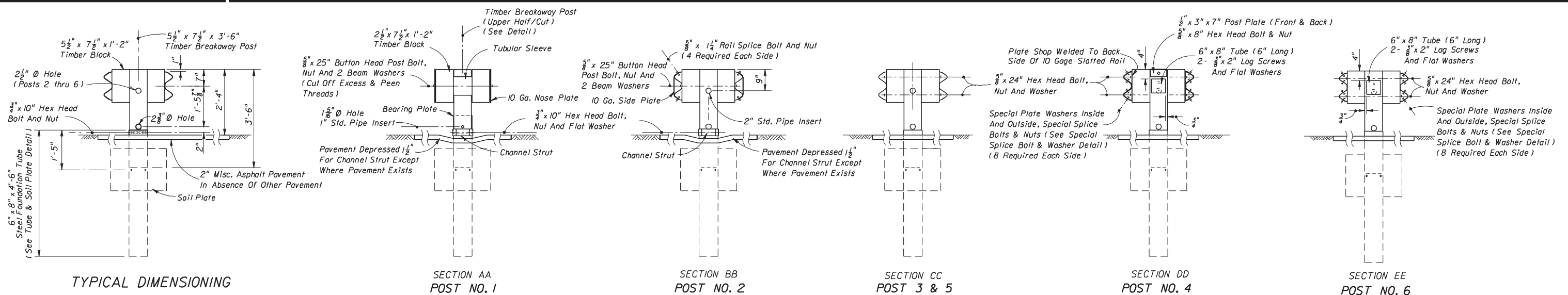
Where the C-A-T 350 system is installed in conjunction with a rigid structure, a guardrail transition section shall be constructed between the C-A-T 350 system and the structure connection. The transition sections shown on Indexes 400 and 410 shall be constructed for connected to bridge concrete traffic rails and roadway concrete barrier walls; transition sections for connections to other rigid structures shall be as detailed in the plans and/or as approved by shop drawings.

8. Metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
9. A yellow Type I Object Marker shall be centered 3' in front of the nose of the C-A-T 350 system. Mounting hardware shall be in conformance with Index No. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the C-A-T 350.
10. The C-A-T 350 system for single and double faced guardrail applications will be paid for the under the contract unit price for Impact Attenuator Vehicular (CAT), EA.

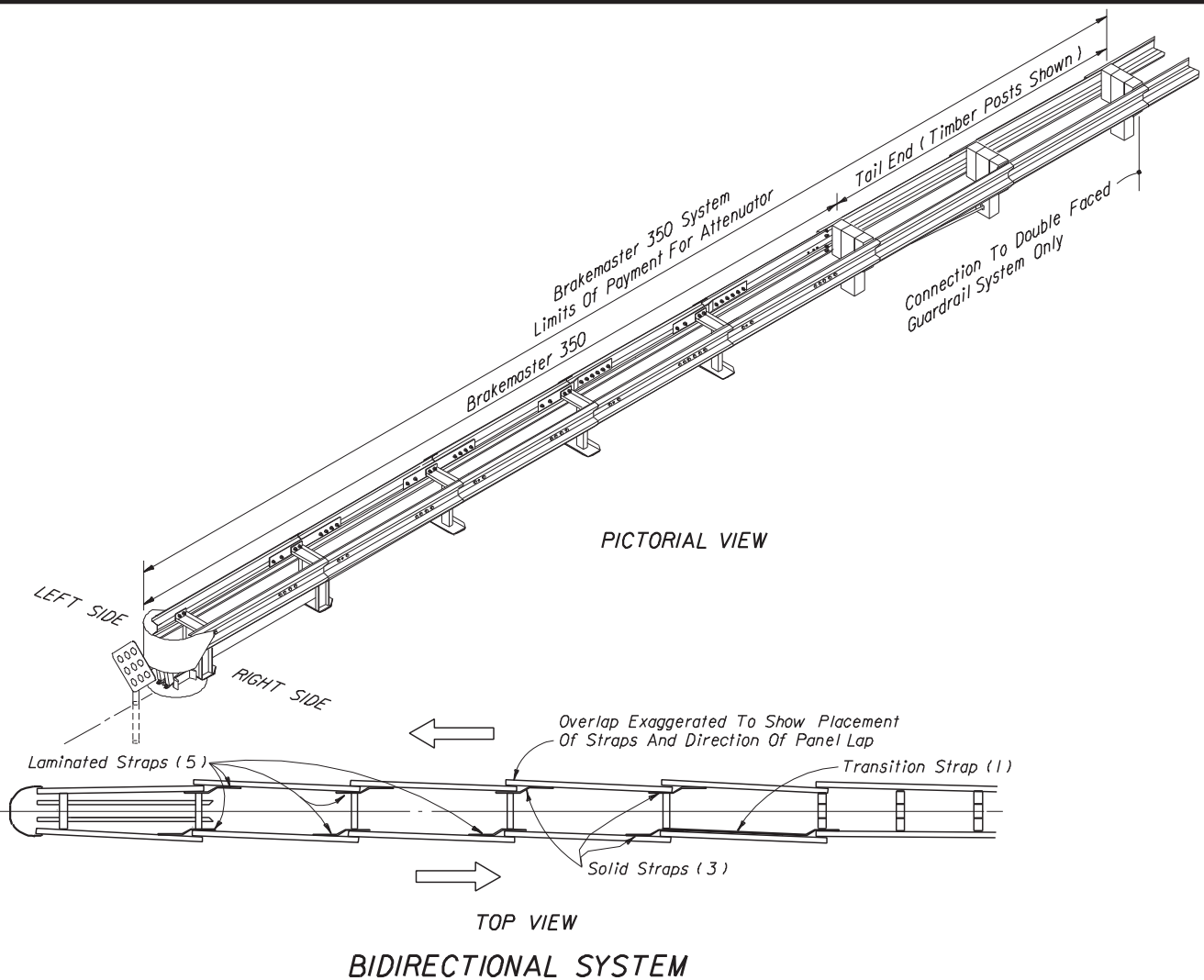
DESIGN NOTES AND GUIDELINES

1. The C-A-T 350 system is designed to cushion automobile end-on hits and to redirect automobiles from side hits when impacting at speeds up to and including 60 mph. The C-A-T 350 system has a singular design for all speeds of 60 mph or less, and any adjustment to its design will not be permitted except as authorized by the manufacturer.
2. The C-A-T 350 system is not intended for use in gores of freeway and expressway mainline ramp terminals; gores of roadway forks; or other gore locations where there is a history of high frequency vehicle departure from the roadway or the potential exists for such departures. The C-A-T 350 system is not a restorable design and therefore requires complete replacement after having sustained either an end-on or a side vehicular impact. Deformed side rail elements that will inhibit the shearing of lands between the rail slots will be subfunctional and are to be replaced immediately; deformed elements are not to be refurbished for reuse.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the C-A-T 350, and until such alternatives are available, the C-A-T 350 need not be bid against other proprietary items.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
C-A-T 350				
Designed By	NFG/JVG	7/91	Approved By <i>[Signature]</i> State Roadway Design Engineer	
Drawn By	HSD	7/91	Revision	Sheet No.
Checked By	JVG/REB	7/91	00	1 of 2
				Index No. 432



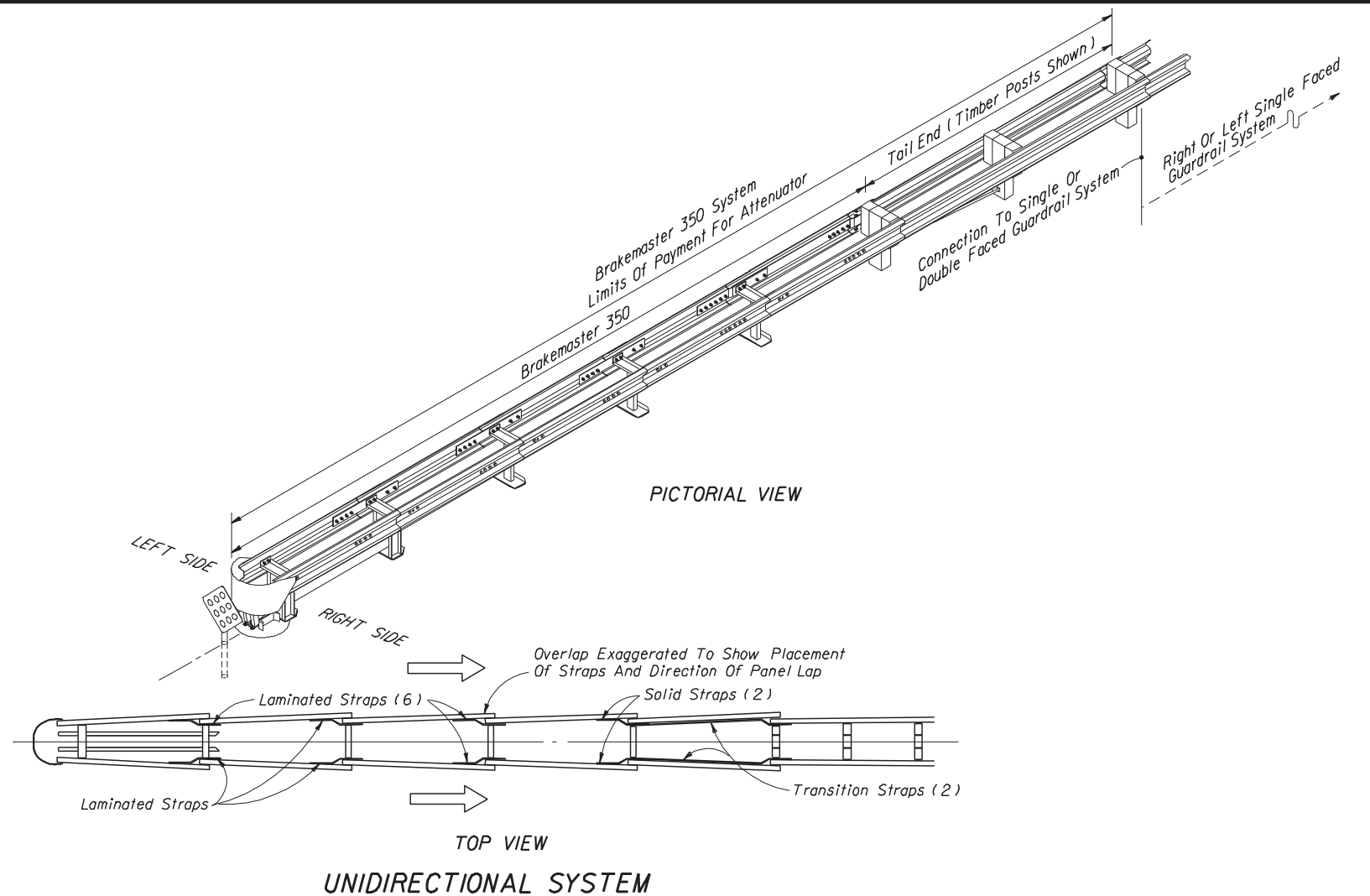
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
C-A-T SYSTEM				
DESIGNED BY	NAMES	DATES	APPROVED BY	
MFG/JVG	MFG/JVG	7/91		
DRAWN BY	HSD	7/91		
CHECKED BY	JVG/RER	7/91	REVISION NO.	SHEET NO.
F.H.W.A. APPROVED:			00	2 of 2
				432



BIDIRECTIONAL SYSTEM

GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name Brakemaster 350. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general information and graphics necessary to field identify component parts of the Brakemaster 350 system and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the Brakemaster 350 system installed in connection with standard single and double faced W-beam guardrail systems, and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.
4. The Brakemaster 350 system shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
5. The Brakemaster 350 system is suitable for speeds ≤ 60 mph.
6. The Brakemaster 350 system shall be located on slopes of 1:10 or flatter and not closer than 11' to any traffic lane.
7. The 'tail end' section represented on this drawing applies to connections with single and double faced guardrail. Where the Brakemaster 350 system is installed in conjunction with safety shaped or vertical faced barrier walls or other rigid structures, a special transitional guardrail section between the Brakemaster 350 and wall or structure shall be as detailed on Index No. 410 or as approved by shop drawings.
8. Metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
9. A yellow Type 1 Object Marker shall be centered 3' in front of the nose of the Brakemaster 350 system. Mounting hardware shall be in conformance with Index No. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the BRAKEMASTER 350.
10. The Brakemaster 350 system will be paid for under the contract unit price for Impact Attenuator Vehicular (Brakemaster), EA.



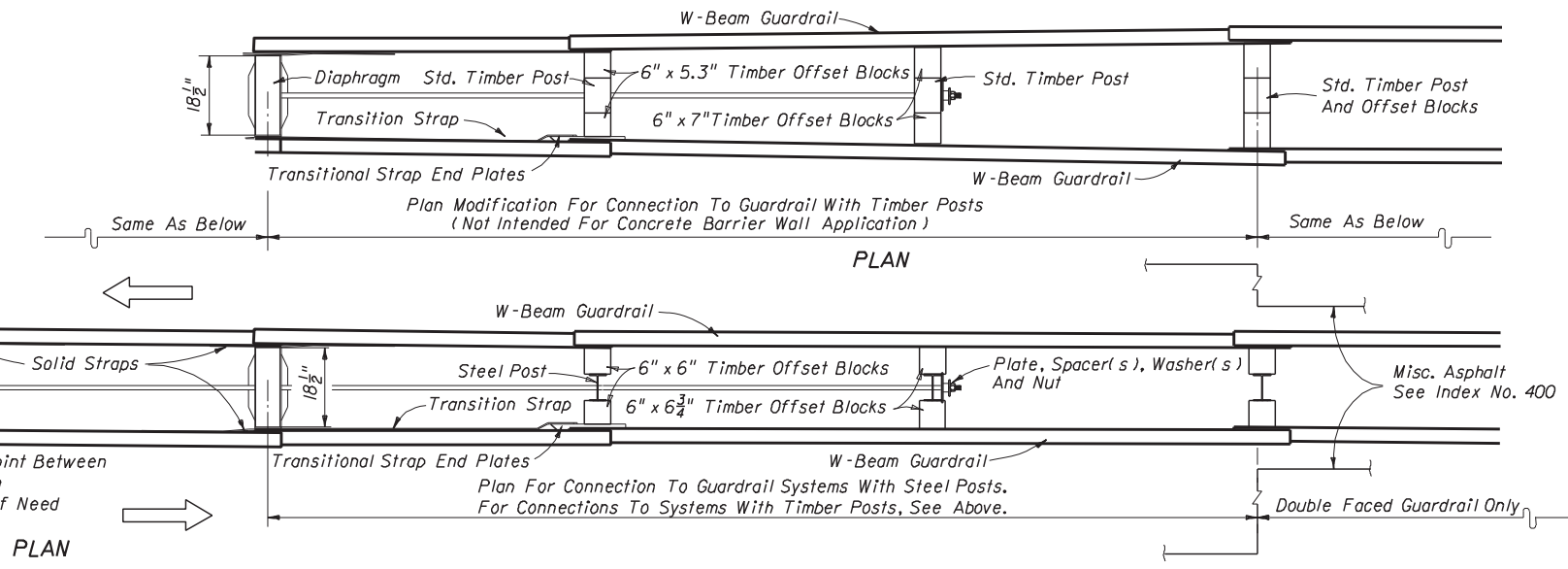
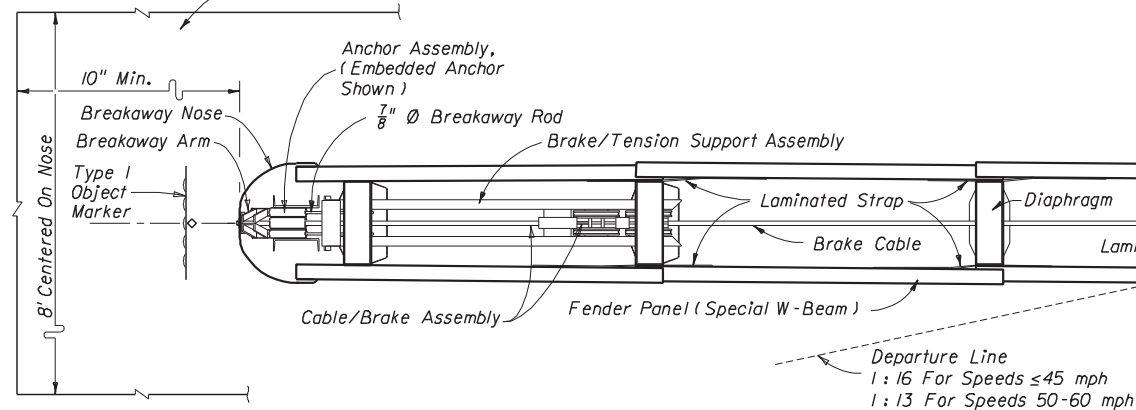
UNIDIRECTIONAL SYSTEM

DESIGN NOTES AND GUIDELINES

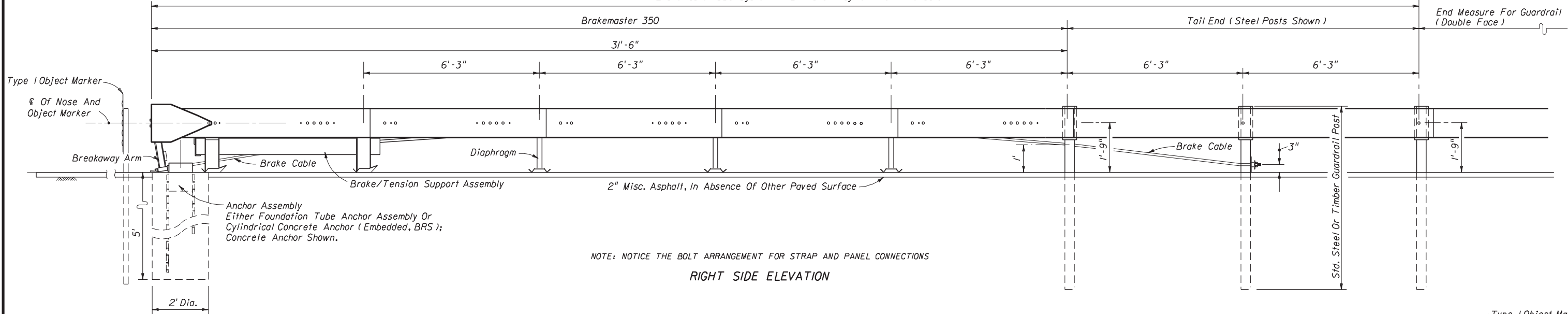
1. The Brakemaster 350 system is designed to cushion automobile end-on hits and to redirect automobiles from side hits when impacting at speeds up to and including 60 mph. The Brakemaster 350 system has a singular design for all speeds of 60 mph or less, and any adjustment to its design will not be permitted except as authorized by the manufacturer.
2. The Brakemaster 350 system is specially designed to shield both narrow hazards and the ends of other fixed barriers located in low frequency impact areas. The Brakemaster 350 system is not intended for use in gores of freeways and expressway mainline ramp terminals; gores of roadway forks; and, other gore locations where there is a history of high frequency vehicle departures from the roadway or the potential exists for such departures. The Brakemaster 350 system is not a restorable design and therefore requires complete replacement after having sustained either an end-on or a side vehicular impact. Deformed side rail elements of the Brakemaster 350 will be subfunctional and are to be replaced immediately; deformed elements are not to be refurbished for reuse. When replacing an impacted Brakemaster 350 system the cable/brake assembly is not to be reused, if the cable sleeve is exposed. After vehicle impact on the Brakemaster 350 system the cable/brake assembly can be returned to the manufacturer for credit toward replacement of the cable.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the Brakemaster 350, and until such alternatives are available, the Brakemaster 350 need not be bid against other proprietary items.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
BRAKEMASTER 350				
Designed By	MFG/JVG	7/91	Approved By	<i>[Signature]</i>
Drawn By	HSD	7/91	Revision	00
Checked By	JVG	7/91	Sheet No.	1 of 4
			Index No.	433

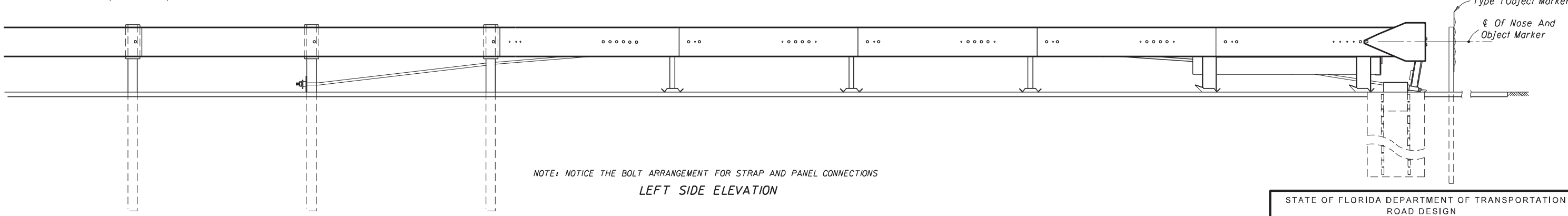
2" Misc. Asphalt, In Absence Of Other Paved Surface



Brakemaster 350 System - Limits Of Payment For Attenuator



RIGHT SIDE ELEVATION



LEFT SIDE ELEVATION

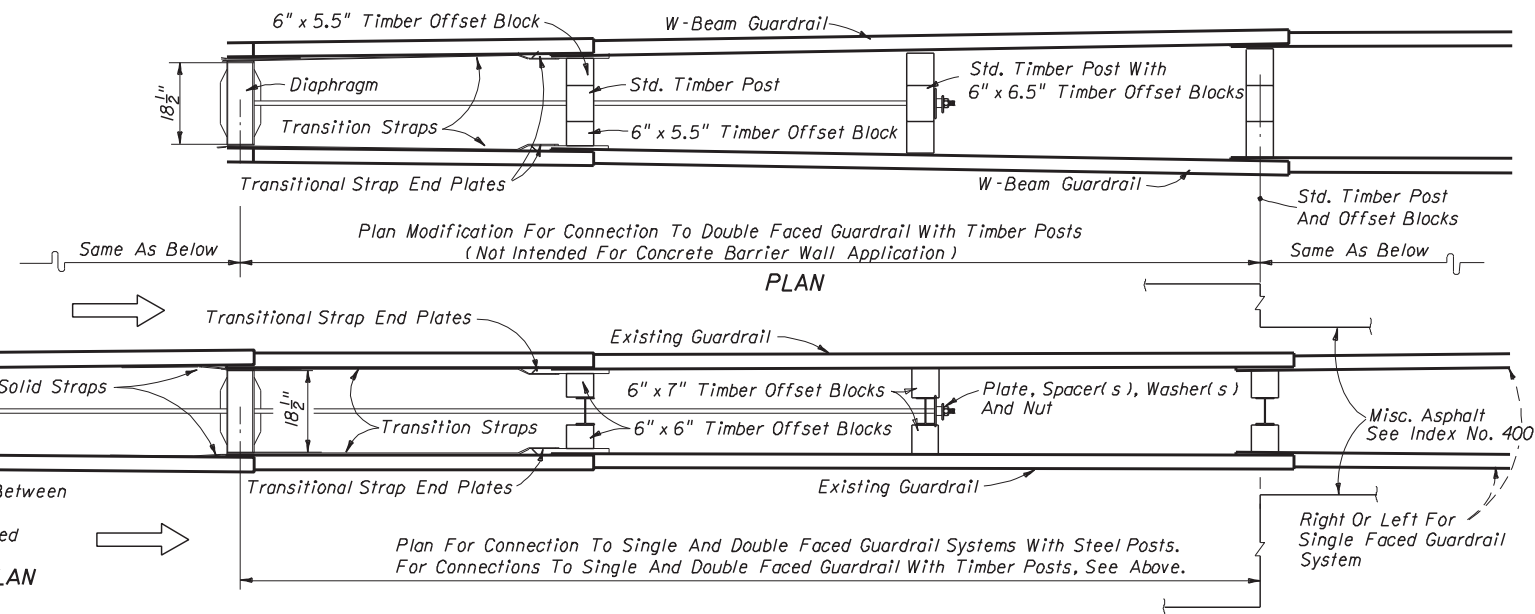
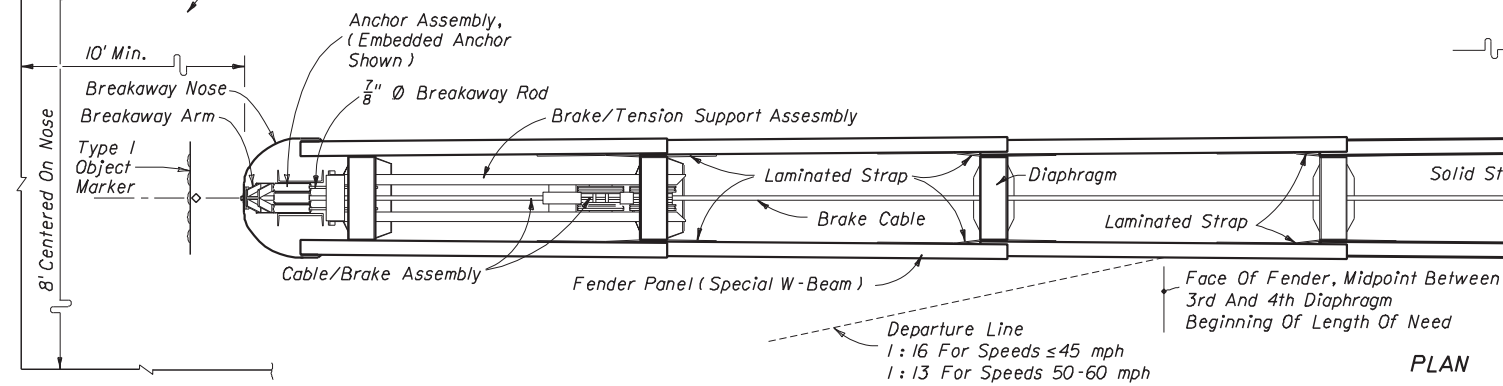
BIDIRECTIONAL SYSTEM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

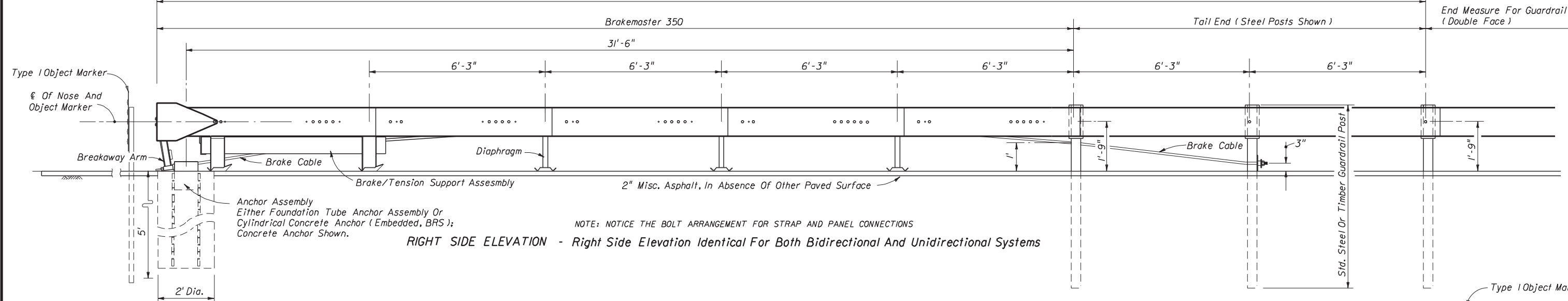
BRAKEMASTER 350

Names		Dates		Approved By		
Designed By	MFG/JVG	7/91		 State Roadway Design Engineer		
Drawn By	HSD	7/91	Revision			Sheet No.
Checked By	JVG	7/91	00			2 of 4
				Index No.	433	

2" Misc. Asphalt, In Absence Of Other Paved Surface



Brakemaster 350 System - Limits Of Payment For Attenuator



NOTE: NOTICE THE BOLT ARRANGEMENT FOR STRAP AND PANEL CONNECTIONS

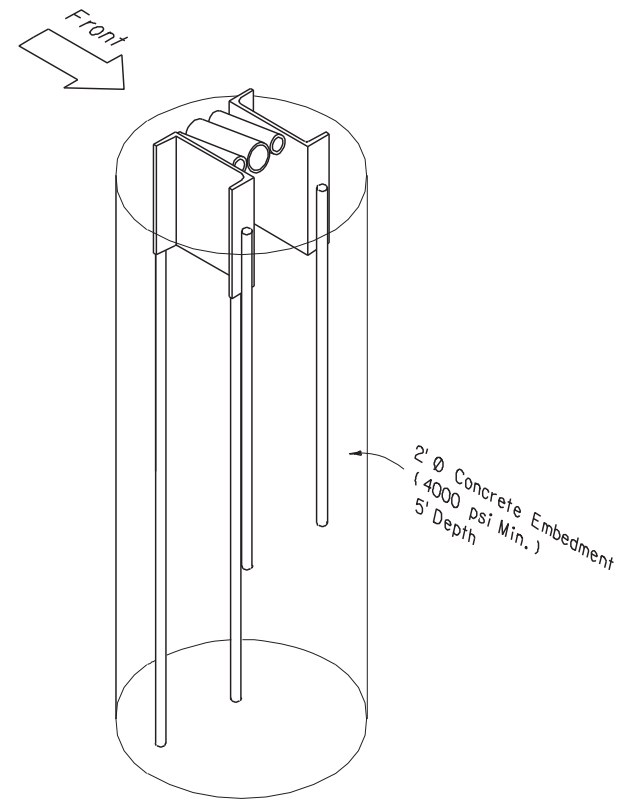
LEFT SIDE ELEVATION

UNIDIRECTIONAL SYSTEM

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

BRAKEMASTER 350

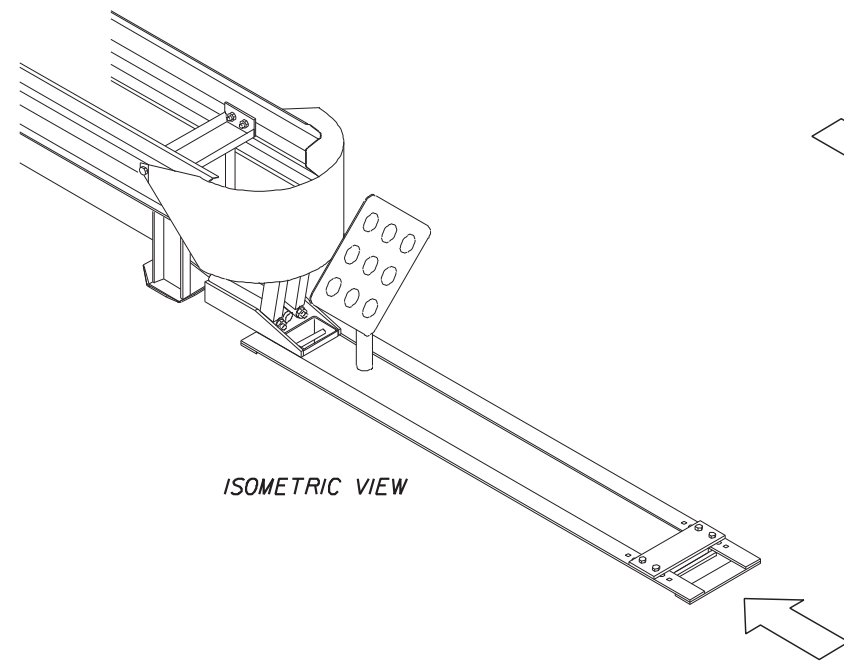
Names	Dates	Approved By	
Designed By MFG/JVG	7/91	 State Roadway Design Engineer	
Drawn By HSD	7/91		
Checked By JVG	7/91		
Revision	00	Sheet No. 3 of 4	Index No. 433



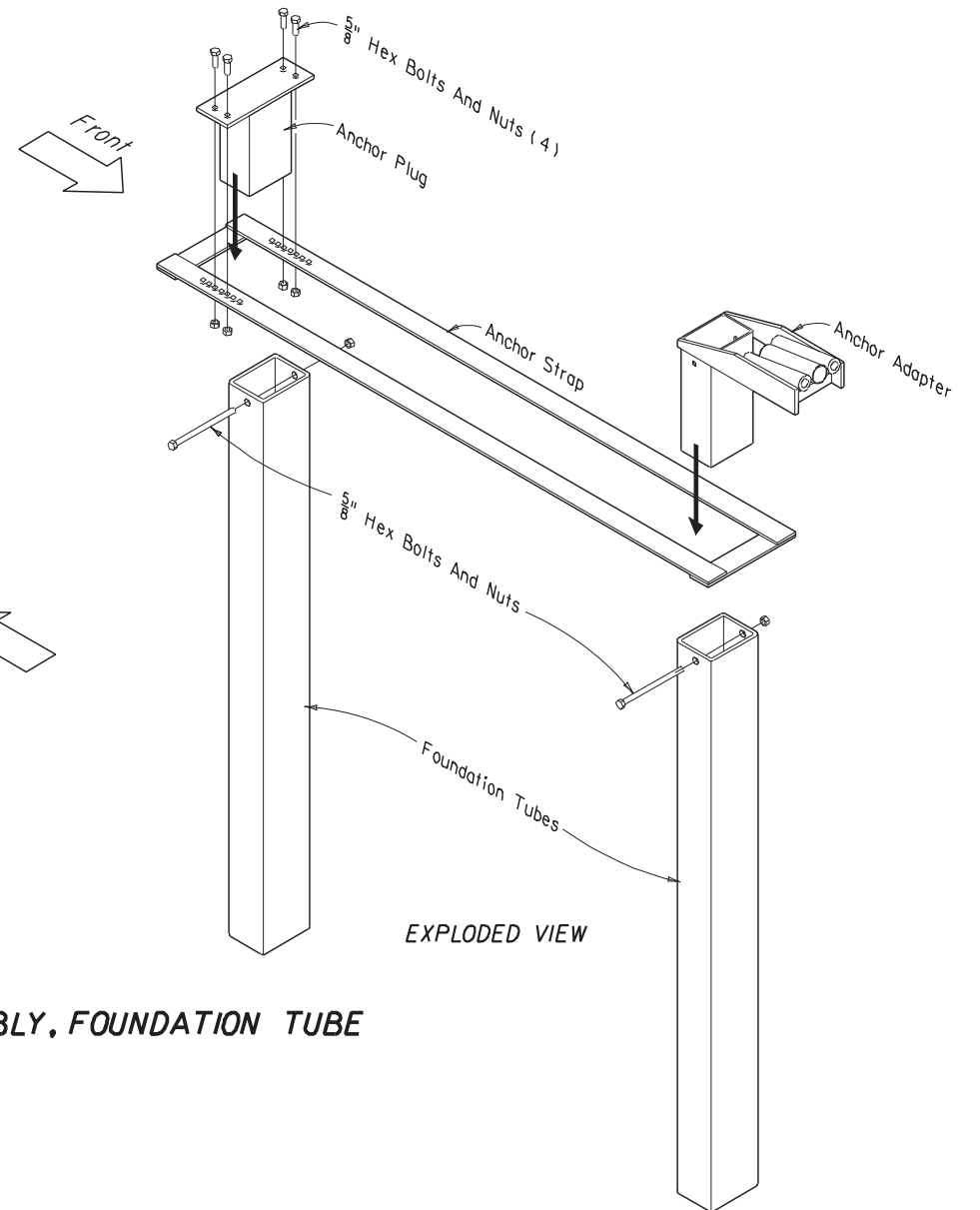
ISOMETRIC VIEW

ANCHOR ASSEMBLY, EMBEDDED BRS

2' Ø Concrete Embedment
(4000 psi Min.)
5' Depth

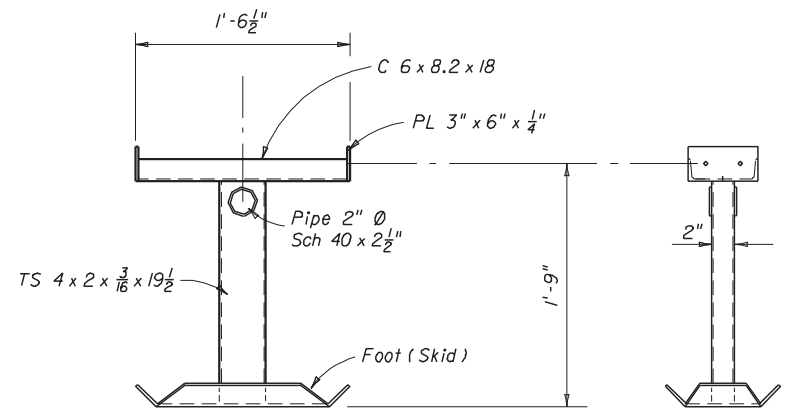


ISOMETRIC VIEW



EXPLODED VIEW

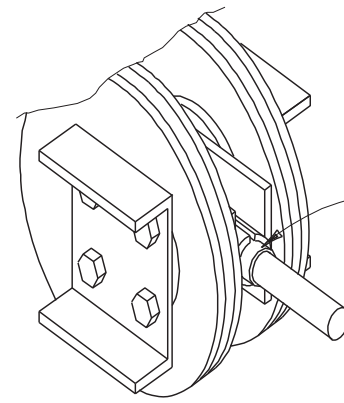
ANCHOR ASSEMBLY, FOUNDATION TUBE



FRONT VIEW

SIDE VIEW

DIAPHRAGM, BRS

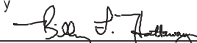


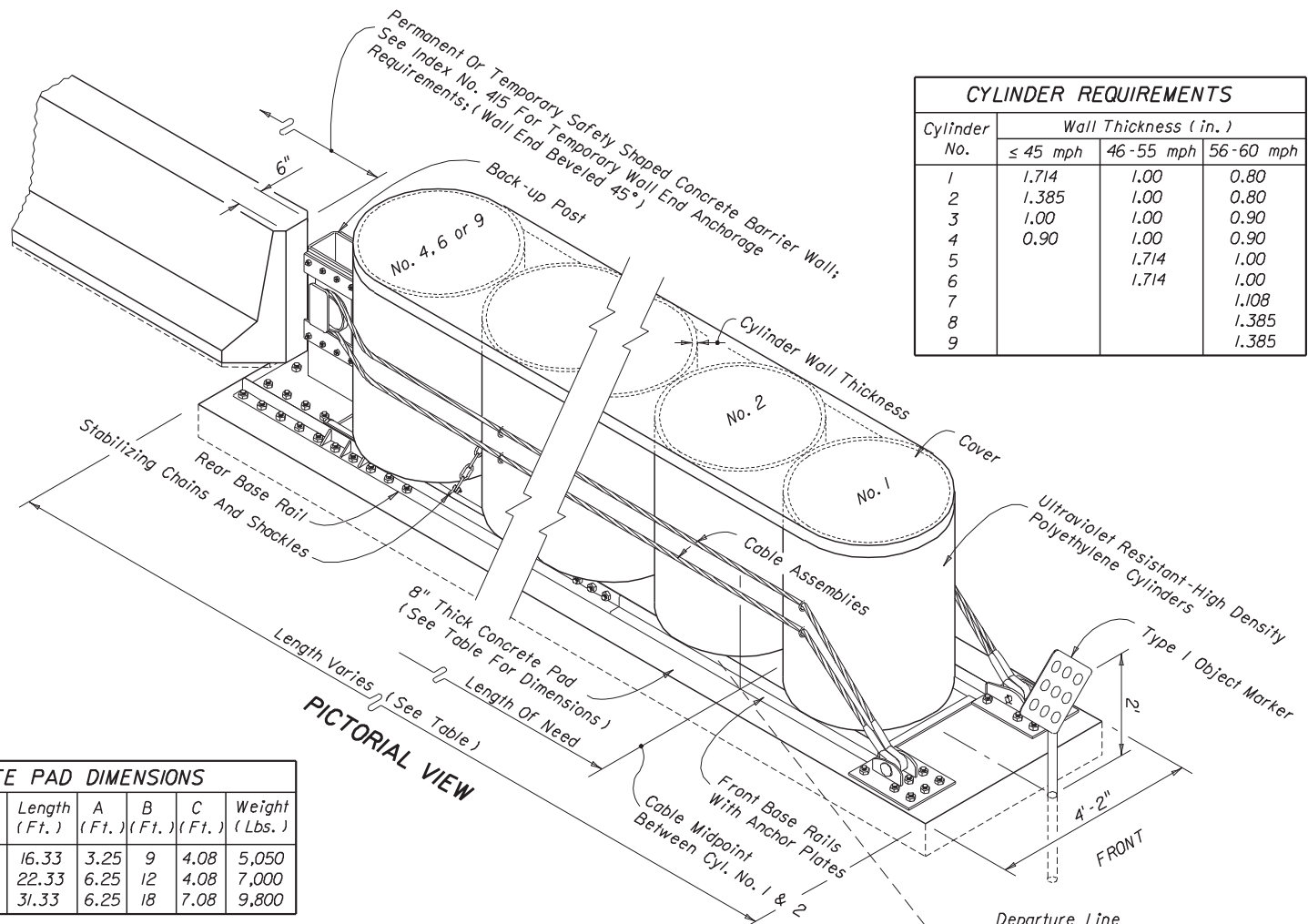
Cable Replacement Required When Cable Sleeve Exposed. See "Design Notes And Guidelines", Note No. 2, For Additional Information.

BRAKE/CABLE REPLACEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

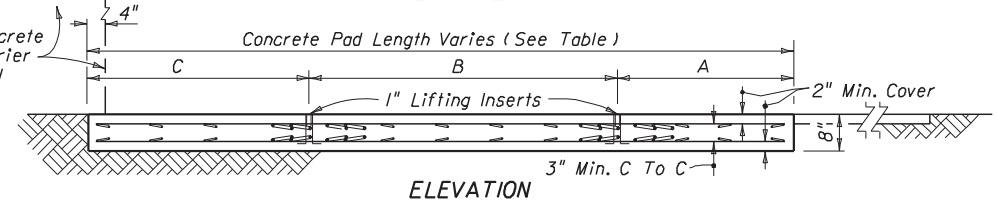
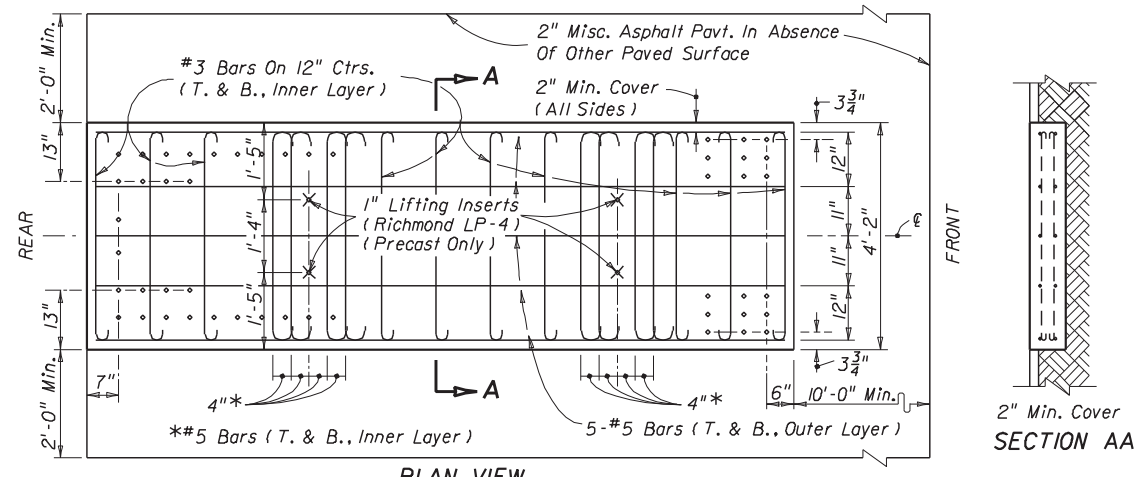
BRAKEMASTER 350

Names	Dates	Approved By		
Designed By	MFG/JVG 7/91	 State Roadway Design Engineer		
Drawn By	HSD 7/91			
Checked By	JVG 7/91	00	4 of 4	433



Cylinder No.	Wall Thickness (in.)		
	≤ 45 mph	46-55 mph	56-60 mph
1	1.714	1.00	0.80
2	1.385	1.00	0.80
3	1.00	1.00	0.90
4	0.90	1.00	0.90
5		1.714	1.00
6		1.714	1.00
7			1.108
8			1.385
9			1.385

CONCRETE PAD DIMENSIONS						
Number of Cylinders	Width (Ft.)	Length (Ft.)	A (Ft.)	B (Ft.)	C (Ft.)	Weight (Lbs.)
4	4	16.33	3.25	9	4.08	5,050
6	4	22.33	6.25	12	4.08	7,000
9	4	31.33	6.25	18	7.08	9,800



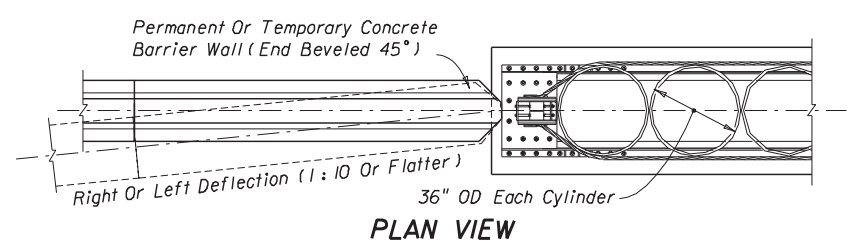
Departure Line
 1:16 For Speeds ≤ 45 mph
 1:13 For Speeds 50-60 mph

GENERAL NOTES

- The energy absorbing unit represented on this standard drawing is a proprietary design by Roadway Safety Service, Inc. and marketed under the trade name REACT 350, short for Reusable Energy Absorbing Crash Terminal. Any infringement on the rights of the designer shall be the sole responsibility of the user.
- This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the REACT 350 and their incorporation into a whole unit.
- This standard drawing is sufficient for plan details for the REACT 350 installed as a free standing unit shielding safety shaped concrete barrier wall ends and for that use precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals. Use of the REACT 350 for shielding other hazards will require plan details, shop drawings, or both where called for in the plans.
- The REACT 350 shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
- Concrete foundations shall be constructed with 4000 psi min. compressive strength concrete.
- The REACT 350 is suitable for speeds ≤ 60 mph.
- The REACT 350 shall be constructed on cross slopes 1:10 or flatter.
- On facilities with speeds of ≤ 45 mph, the REACT 350 can be used in any location specified by the plans or by Department permit. On facilities with speeds of 50-60 mph, units shall not be used in narrow medians where post impact trajectory from end on crashes (rebound) will result in the crash vehicle rebounding into opposing traffic lanes, nor used in gore locations where the crash vehicle is likely to rebound into either the continuing or departing traffic lanes; units can be used in medians and gores where other features such as profile differentials, berms, ditches or other barriers will prevent adverse rebounding encroachment into traffic lanes.
- Due to the overall unit height of 4'-0", which exceeds the drivers height of eye, caution is to be exercised in locating the REACT 350 to avoid blockage of required sight distance.
- All metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
- A yellow Type 1 Object Marker shall be centered 3' in front of the nose of the REACT 350. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the REACT 350.
- For REACT 350 units that have been impacted by vehicle crashes and are to remain in service, close inspection must be made on the anchorages of the front cable anchor plates and the rear pylon; the anchorages must be in design condition when restoration is complete.
- Quantity for payment of both permanently and temporarily installed REACT 350 units will be based on each independent installation as called for in the plans or as directed by the Engineer. Payment for the permanently installed REACT 350 is for an assembled and installed system including the foundation, and will be paid for under the contract unit price for Impact Attenuator Vehicular (REACT 350), EA. Payment for the temporary REACT 350 is for an assembled and installed unit with components as described for the permanent installation with the addition of miscellaneous asphalt pavement and will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (REACT 350), LO, or when the REACT 350 is used as an option in accordance with Index No. 415 it will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

DESIGN NOTES

- The REACT 350 is designed to cushion automobile end-on hits and to redirect automobiles from side hits. The number of cylinders to be used in a specific unit will be determined by the design speed, except where the Engineer determines that another speed is more applicable.
- The REACT 350 is a restorable system that is particularly suited to shielding hazards in areas with a history of frequent errant vehicle departures from the roadway or the potential exists for such departures. Until further development is completed in the application of the REACT 350 to shielding other hazards, this Index is limited to use with safety shaped concrete barrier walls. The REACT 350 alone is not suited to shielding a wide hazard.
- The REACT 350 crash data accepted by the Federal Highway Administration (FHWA) covers vehicular impacts at speeds of 60 mph with 9 cylinder units and 45 mph with 4 cylinder units. The 6 cylinder unit has been developed by analytical deduction based on relative energy imparted by an impacting vehicle at various speeds. Until crash test data, accident data or other in service data is available to indicate change in application, the Department will support appropriate use of the six 6 cylinder units at locations where speeds are 55 mph or less. See 'CYLINDER REQUIREMENTS' table above.
- The REACT 350 is a proprietary device with distinct performance, vehicular response and restoration characteristics, unlike other redirective crash cushions. Currently the Department recognizes the devices selective features and does not recognize other proprietary devices as equal alternatives, and until such alternatives are available the REACT 350 need not be bid against other proprietary items.



REACT 350

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
REACT 350				
Names	Dates	Approved By		
Designed By	MFG 8-95	 State Roadway Design Engineer		
Drawn By	HKH 8-95			
Checked By	JVG 8-95			
Revision	00	Sheet No.	Index No.	
		1 of 1	434	

GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by Energy Absorption Systems, Inc. and marketed under the trade name QuadGuard. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the QuadGuard System and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the QuadGuard installed as a free standing system or installed in connection with concrete barrier walls and other fixed barrier systems, and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.

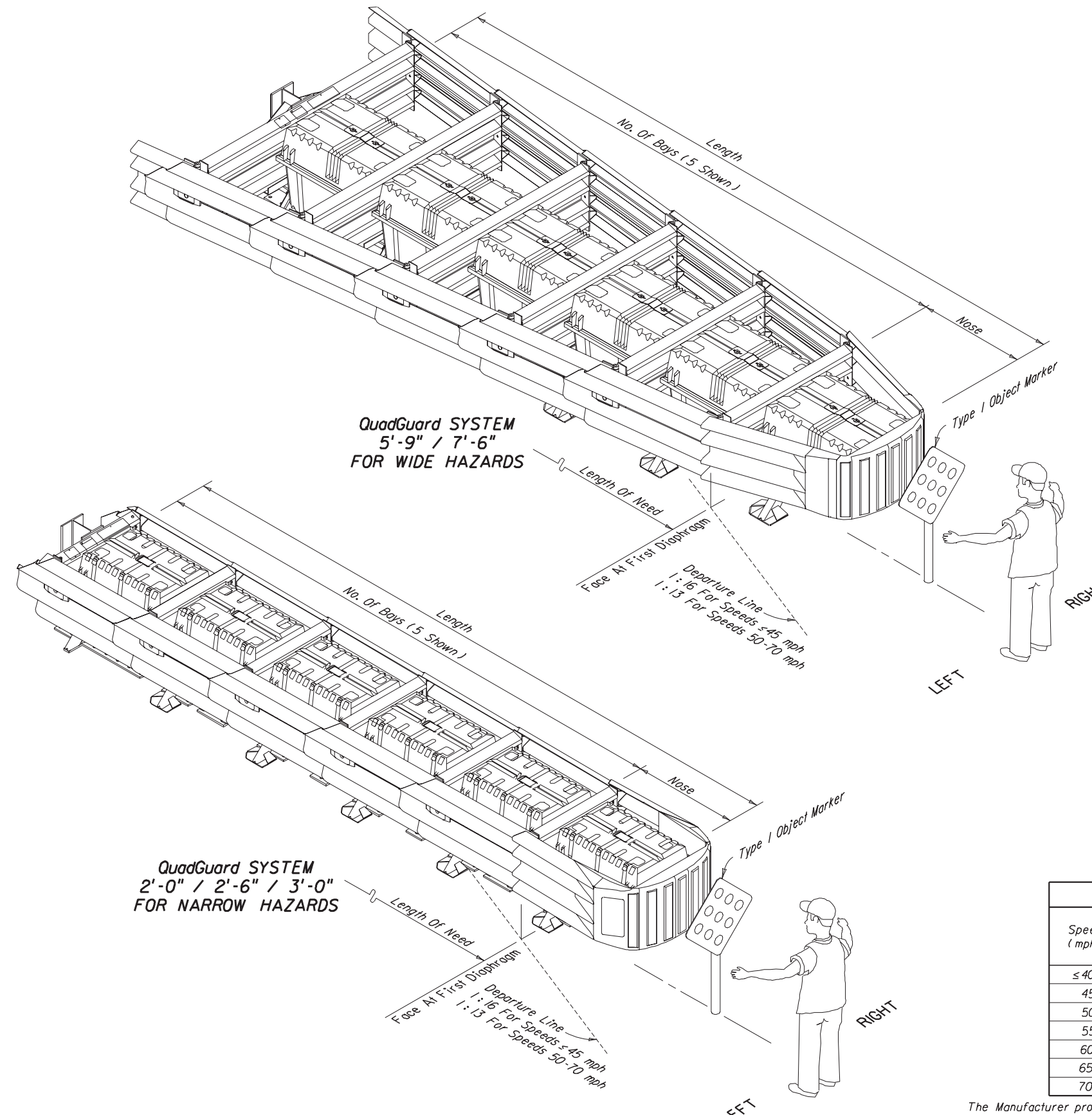
The QuadGuard tension strut backup is the primary backup to be used on Florida Department Of Transportation projects. Use of concrete backups will be permitted, but will require call out and detailing in the plans for site specific construction; concrete backups must meet manufacturers specifications, installation guidelines and transition hardware requirements.
4. The QuadGuard shall be assembled and installed in accordance with the manufacturers detailed drawings, procedures and specifications.
5. The QuadGuard is available in 24", 30", and 36" nominal widths for narrow hazards and 69" and 90" nominal widths for wide hazards. The system width will be as called out in the plans, permit or other contract document for each location.
6. Only the QuadGuard Type I and Type II cartridges shall be used in bay and nose locations as described in the 'BAY SELECTION GUIDELINES' table.
7. Cement concrete foundations and cement concrete backup assemblies shall be constructed with 4000 psi min. compressive strength concrete.
8. The QuadGuard shall be constructed on cross slopes 1 : 10 or flatter.
9. All metallic components shall meet the galvanizing requirements for guardrail, Index No. 400.
10. A yellow Type I Object Marker shall be centered 3' in front of the nose of the QuadGuard. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the QuadGuard.
11. Quantity for payment is based on each independent location as called for in the plans or as directed by the Engineer. The cost for foundations, subgrade preparation and miscellaneous asphalt shown on this index will be included in the cost for the QuadGuard system. The permanent QuadGuard System will be paid for under the contract unit price for Impact Attenuator Vehicular (QuadGuard), EA; temporary units will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (QuadGuard), LO, or when the QuadGuard system is used as an option in accordance with Index No. 415, it will be paid for under contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

DESIGN NOTES AND GUIDELINES

1. The QuadGuard System is designed to cushion automobile end-on hits and to redirect automobiles from side hits. The QuadGuard is designed to shield fixed hazards or the ends of other temporary and permanent barrier systems. The number of bays to be used in a specific unit will be determined by the design speed, except where the Engineer determines that another speed is more applicable. The unit width will be determined by the width of the object to be shielded or by the connecting barrier system. The backup assembly for a specific unit will be determined by either (a) the unit standing free of the object to be shielded or (b) the barrier system(s) to which it is connected.
2. The QuadGuard is a restorable system that is particularly suited to shielding hazards subject to high speed traffic, high volume traffic, and/or traffic with a history of frequent errant vehicle departures from the roadway or the potential exists for such departures. The QuadGuard is particularly suited to shielding hazards where the approach space is limited; and, is particularly suited to conditions where the terminal must be located close to the traffic lane.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the QuadGuard, and until such alternatives are available, the QuadGuard need not be bid against other proprietary items. However, for temporary use where the QuadGuard and other approved redirective crash cushions meet or exceed the minimum requirements for a specific location, the approved crash cushions will be considered optional systems and paid for as described in General Note 11 above.

BAY SELECTION GUIDELINES				
Speed (mph)	No. Of Bays	Number Of Cartridges		Length
		Type I (Front)	Type II (Rear)	
≤40	2	2	1	8'-8"
45	3	3	1	11'-8"
50	4	3	2	14'-8"
55	5	4	2	17'-8"
60	6	4	3	20'-8"
65	7	4	4	23'-8"
70	9	4	6	29'-8"

The Manufacturer provides QuadGuard units with up to 12 bays designed for use with speeds up to 75 mph. These larger units may be utilized when called for in the plans or as directed by the Engineer.

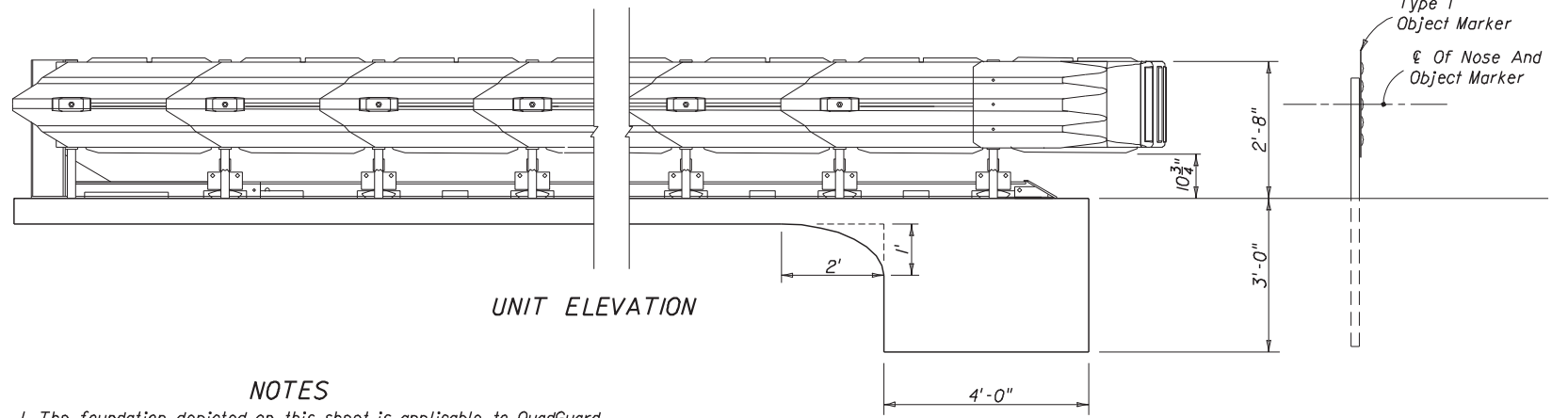
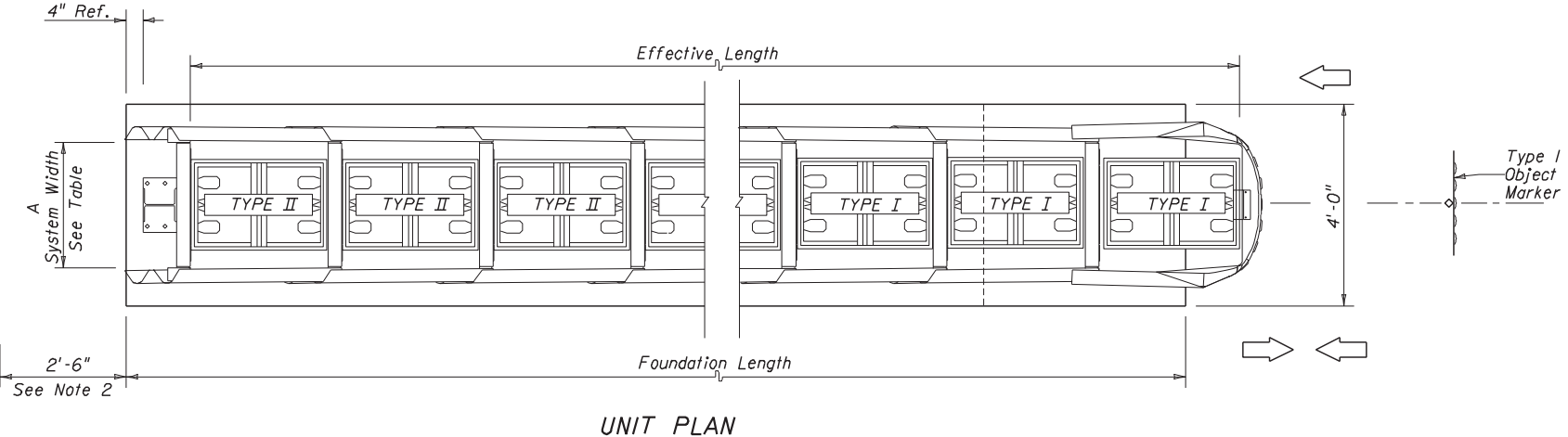
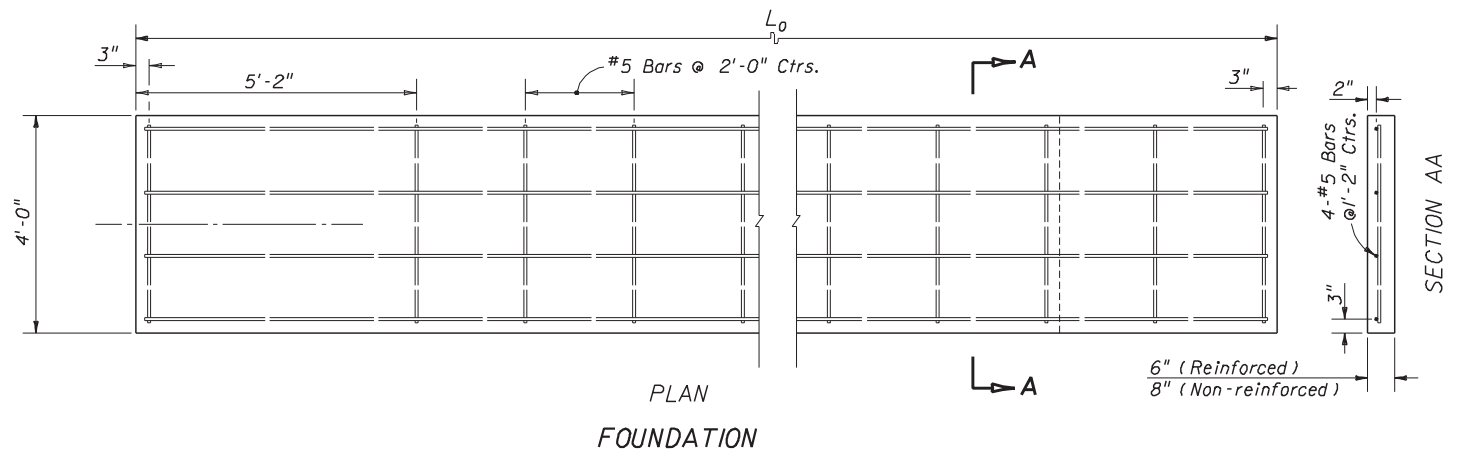


**QuadGuard SYSTEM
5'-9" / 7'-6"
FOR WIDE HAZARDS**

**QuadGuard SYSTEM
2'-0" / 2'-6" / 3'-0"
FOR NARROW HAZARDS**

GENERAL SYSTEM FEATURES AND BAY SELECTION GUIDELINES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
QuadGuard				
Names	Dates	Approved By		
Designed By	MFG/STD	State Roadway Design Engineer		
Drawn By	HKH	Revision	Sheet No.	Index No.
Checked By	JVG	00	1 of 6	435



Nominal System Width	A (Backup Width)
2'-0"	2'-0"
2'-6"	2'-6"
3'-0"	3'-0"
5'-9"	5'-3 3/4"
7'-6"	6'-10 5/8"

ESTIMATED FOUNDATION QUANTITIES For Informational Purposes Only				
No. Of Bays	L ₀	REINFORCED		NON-REINFORCED
		Rebar Required	Concrete Required (CY)	Concrete Required (CY)
2	9'-0"	48'-8"	2.1	2.3
3	12'-0"	68'-0"	2.4	2.7
4	15'-0"	83'-8"	2.6	3.0
5	18'-0"	103'-0"	2.8	3.3
6	21'-0"	118'-8"	3.1	3.6
7	24'-0"	138'-0"	3.3	3.9
9	30'-0"	173'-0"	3.7	4.5

Note: Monorail anchorage bolt spacing to be in accordance with the manufacturer's installation drawings and specifications.

NOTES

1. The foundation depicted on this sheet is applicable to QuadGuard systems for both narrow and wide hazards, 2'-6" system shown.
2. For the number of bays required see table, Sheet 1.
3. Provision shall be made for rear fender panels to slide rearward upon impact 2'-6" min.
4. For barrier connections see 'TRANSITIONS', Sheet Nos. 4 and 5.

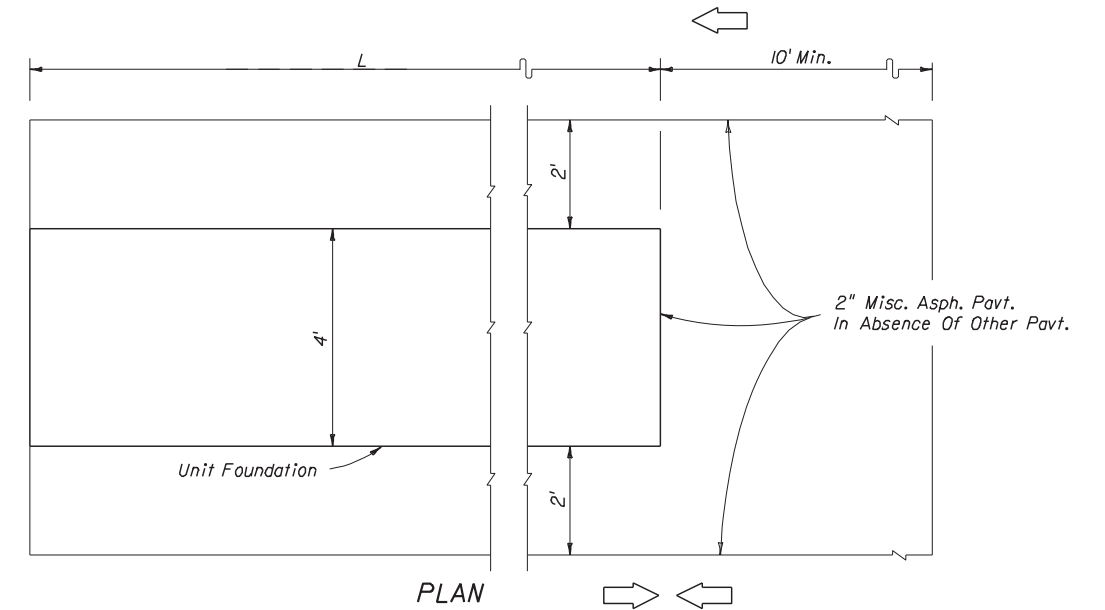
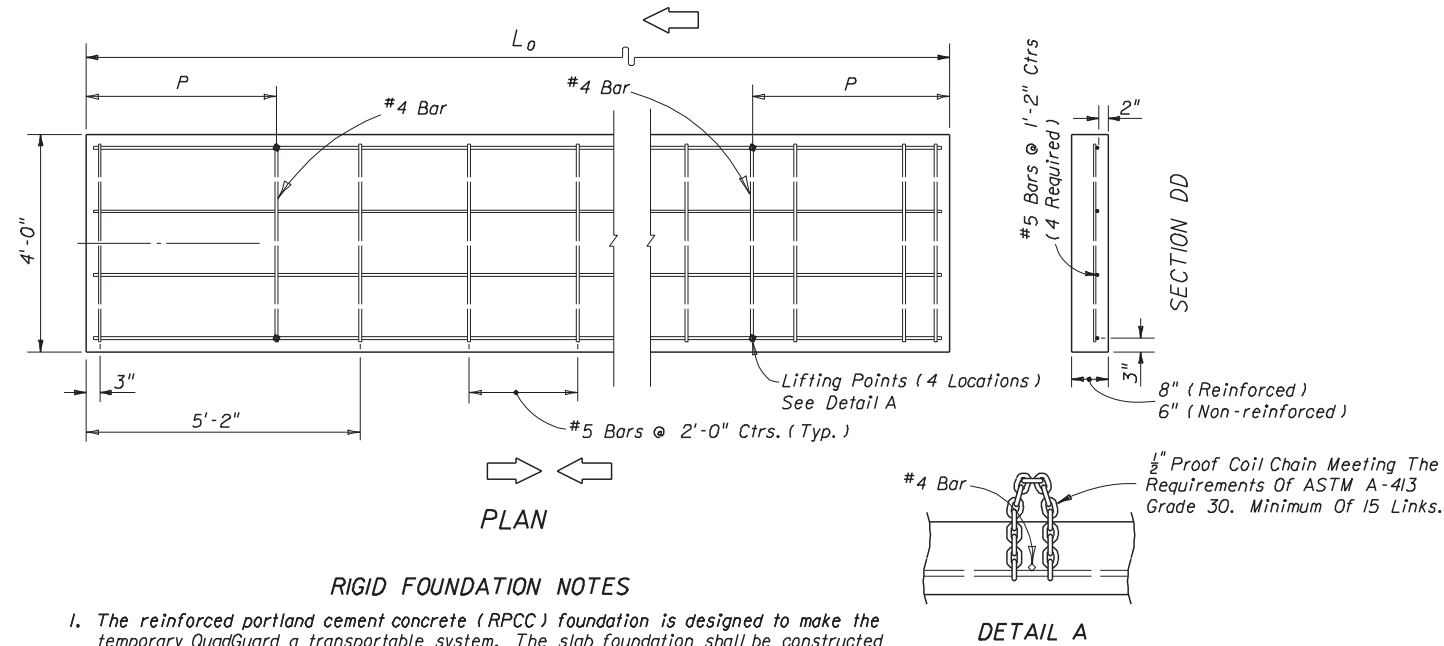
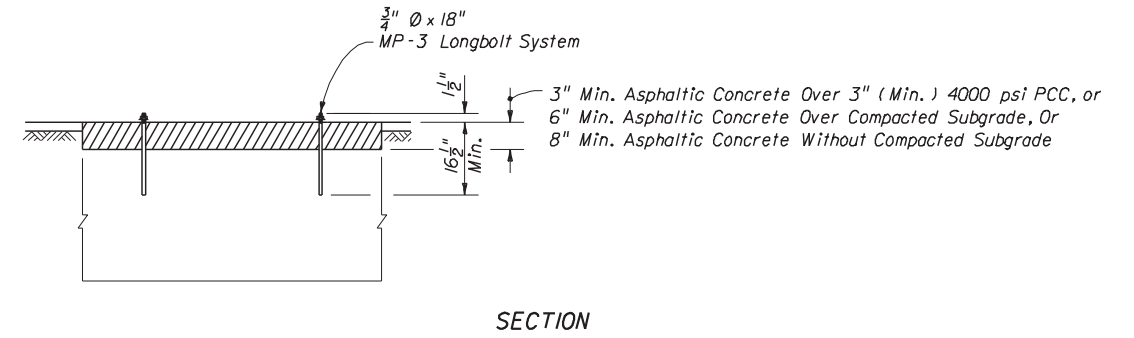
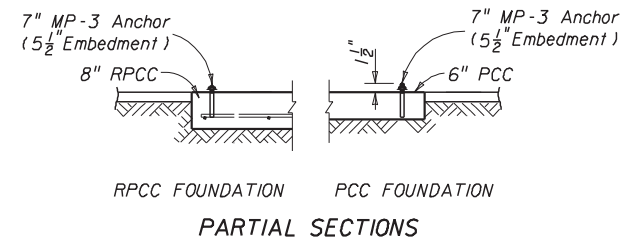
PERMANENT FOUNDATION FOR TENSION STRUT BACKUP ASSEMBLY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

QuadGuard

Names	Dates	Approved By
Designed By	MFG/STD	<i>[Signature]</i> State Roadway Design Engineer
Drawn By	HKH	Revision
Checked By	JVG	Sheet No. 2 of 6
		Index No. 435

ESTIMATED FOUNDATION QUANTITIES For Informational Purposes Only					
No. Of Bays	L ₀	P	REINFORCED		NON-REINFORCED
			Rebar Required	Concrete Required (CY)	Concrete Required (CY)
3	12'	3'-0"	68'-0"	1.2	0.9
4	15'	3'-9"	83'-8"	1.5	1.1
5	18'	4'-6"	103'-0"	1.8	1.3
6	21'	5'-3"	118'-8"	2.1	1.6
7	24'	6'-0"	138'-0"	2.4	1.8
9	30'	7'-6"	173'-0"	3.0	2.2



MP-3 LONGBOLT ANCHOR SYSTEM
ASPHALTIC CONCRETE FOUNDATIONS

RIGID FOUNDATION NOTES

- The reinforced portland cement concrete (RPCC) foundation is designed to make the temporary QuadGuard a transportable system. The slab foundation shall be constructed with 4000 psi min. compressive strength concrete. The slab shall be seated so the top of the slab is flush with the surface intended for approaching vehicles. In absence of other pavement the surrounding surface shall be paved with 2" of miscellaneous asphalt pavement as depicted in 'ASPHALTIC CONCRETE FOUNDATIONS'. The QuadGuard shall be anchored exclusively with the 7" MP-3 anchor system supplied with the QuadGuard unit, unless another anchor is supplied or approved by the QuadGuard manufacturer.
- The nonreinforced portland cement concrete (PCC) foundation shall be Class I concrete, having depth equal to or greater than 6". The PCC foundation utilization options are as follows: (a) Poured in place as an expendable slab, having a thickness of not less than 6"; disposal of the slab will be as approved by the Engineer, (b) Project constructed roadway PCC pavement, or, (c) Existing 9" PCC roadway pavement.

The utilization option applied shall be as approved by the Engineer on a site specific basis. The top of the foundation shall be flush with the surface intended for approaching vehicles. In absence of surrounding pavement the surrounding surface shall be paved as shown on this sheet in 'ASPHALTIC CONCRETE FOUNDATIONS'.

The QuadGuard installed on PCC pavement shall be anchored only with the MP-3 anchor system supplied with the QuadGuard unit. Holes for the 7" anchors shall be drilled in both existing and new pavements. When the QuadGuard is removed from the project pavement or from existing pavement that is to remain in place, the anchor shall be cut off flush with the top of the pavement, unless the plans call for other treatment.
- For additional information see the General Notes.

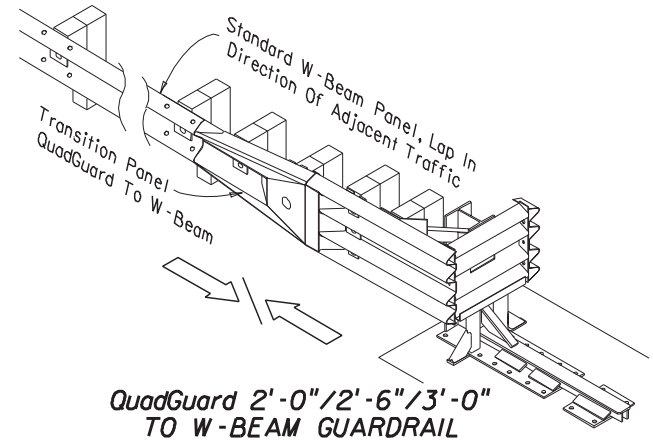
REINFORCED AND NONREINFORCED CONCRETE PAD SYSTEMS
CEMENT CONCRETE FOUNDATIONS

NOTES

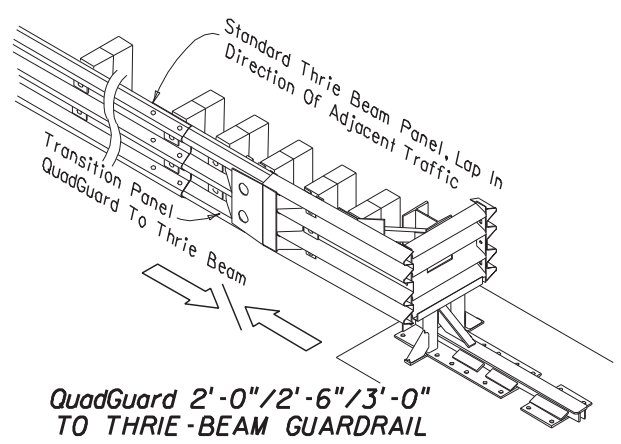
- For the number of bays required see table, Sheet 1.
- For barrier connections see 'TRANSITIONS', Sheet Nos. 4 and 5.

TEMPORARY FOUNDATIONS

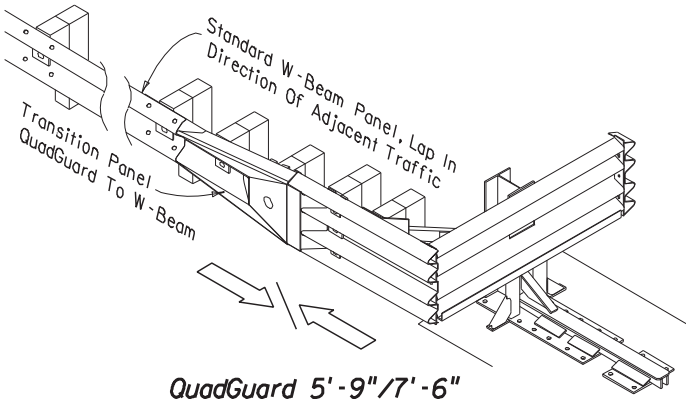
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
QuadGuard				
Names	Dates	Approved By		
Designed By	MFG	State Roadway Design Engineer		
Drawn By	HKH	8/97	Revision	Sheet No.
Checked By	JVG	8/97	00	3 of 6
				Index No. 435



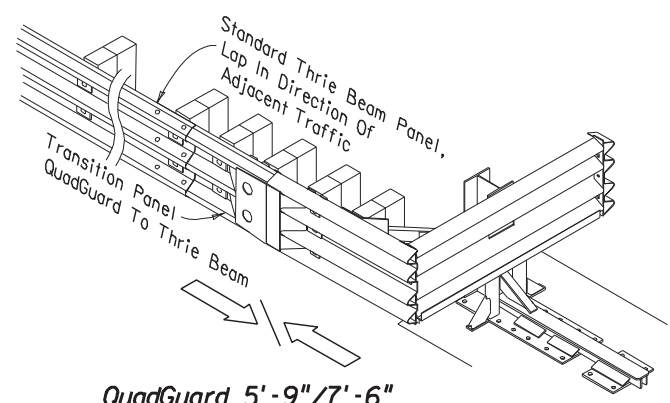
QuadGuard 2'-0"/2'-6"/3'-0" TO W-BEAM GUARDRAIL



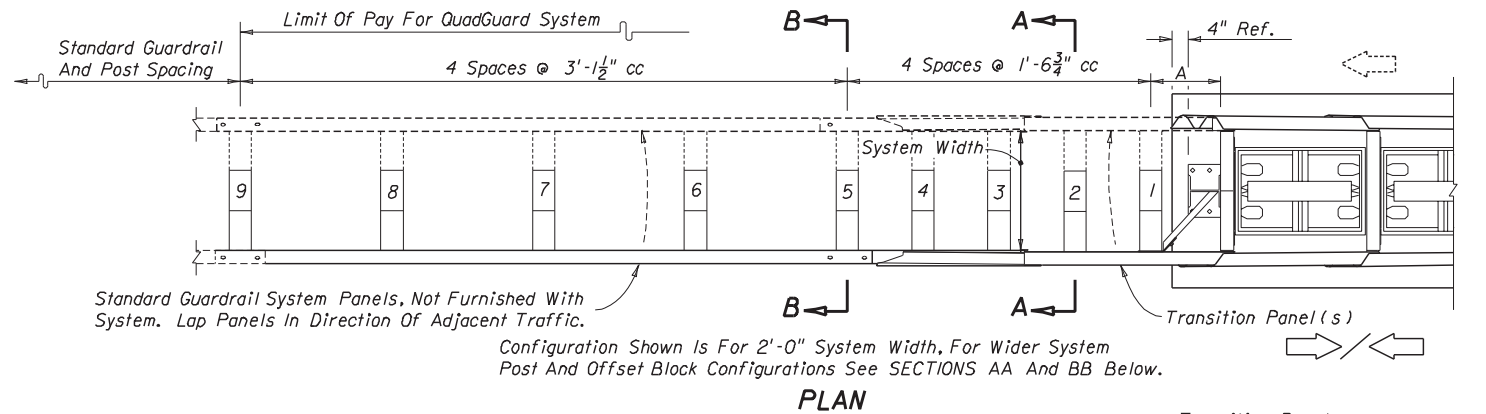
QuadGuard 2'-0"/2'-6"/3'-0" TO THRIE-BEAM GUARDRAIL



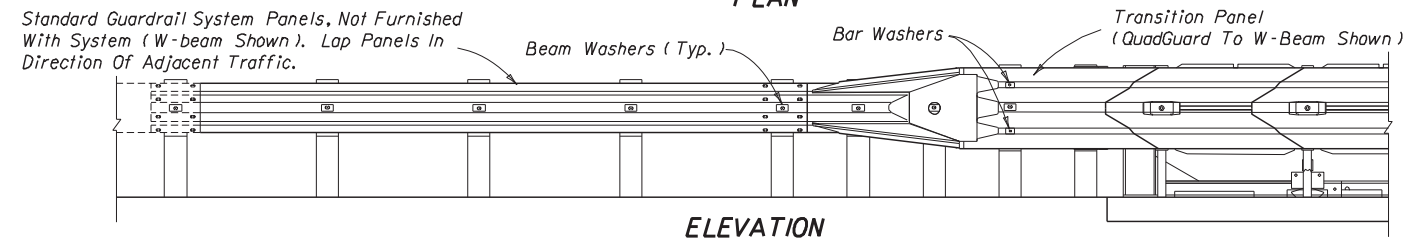
QuadGuard 5'-9"/7'-6" TO W-BEAM GUARDRAIL



QuadGuard 5'-9"/7'-6" TO THRIE-BEAM GUARDRAIL



Standard Guardrail System Panels, Not Furnished With System. Lap Panels In Direction Of Adjacent Traffic.
Configuration Shown Is For 2'-0" System Width, For Wider System Post And Offset Block Configurations See SECTIONS AA And BB Below.

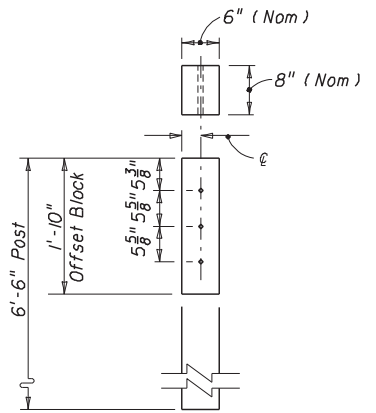


ELEVATION

NOTES

1. Transitions are required when connecting the QuadGuard to any guardrail system.
2. Post spacing identical for W-beam or thrie-beam, W-beam shown.
3. Post #1 is not bolted directly to transition panel(s).
4. Install beam washers on post bolts on posts #2 thru #9, with supplementary bar washers at post #2.
5. W-Beam Transition:
Posts #1 and #2 - Posts and offset blocks as shown below.
Posts #3 thru #9 - Standard W-beam posts and offset blocks, see Index No. 400.
Thrie Beam Transition:
Posts #1 and #2 - Posts and offset blocks as shown below.
Posts #3 thru #9 - Standard thrie beam posts and offset blocks, see Index No. 400.
Transitions using steel posts: Use limited to rigid surface mounting (decks and slabs). See Index No. 400 for special steel guardrail posts. See section below. Δ

System Width	A
2'-0"/2'-6"/3'-0"	18.7"
5'-9"/7'-6"	21.93"

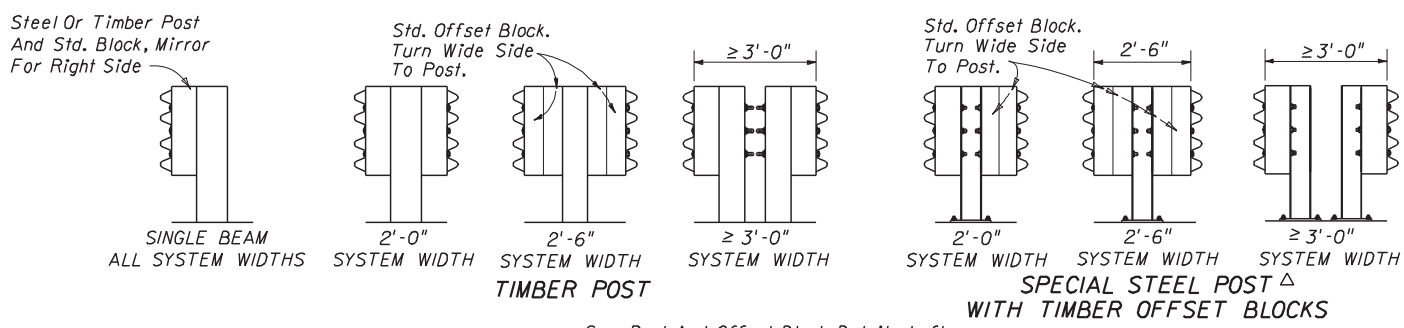


TIMBER

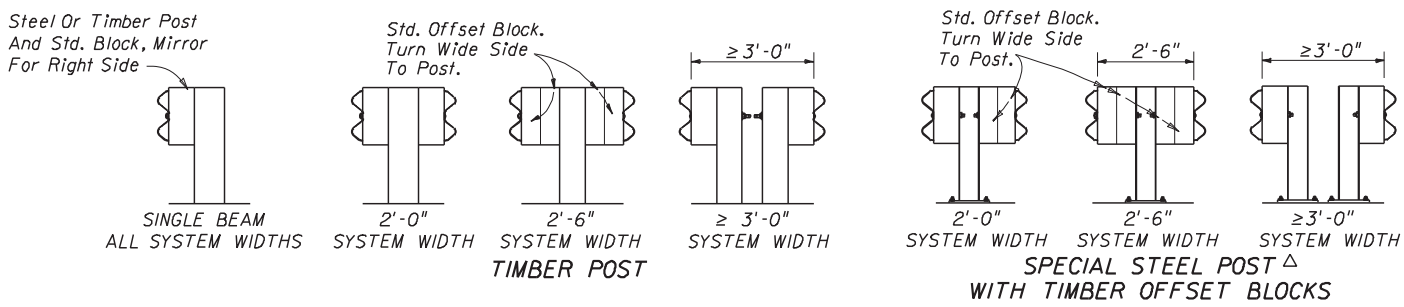
NOTES

1. All Holes 3/4" Ø.
2. When using a special steel post with a timber offset block at location #2, field drill matching attachment holes in block and in post flange. When drilling special steel posts metalize holes in accordance with Index No. 400.
3. For double face guardrail applications with special steel posts and 2'-0" or 2'-6" system widths, and, with timber posts and 2'-6" system widths, turning wide side of standard offset block to post or field trimming will be required, see Sections right.

POSTS AND OFFSET BLOCKS FOR LOCATIONS #1 AND #2



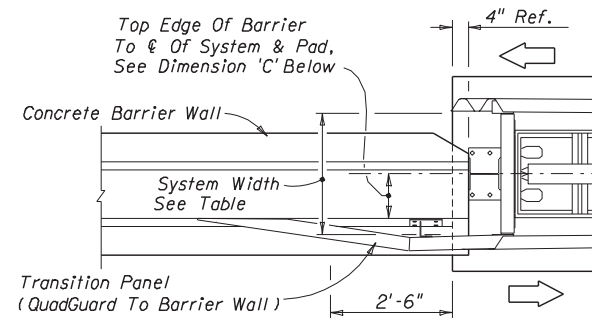
SECTION AA (POSTS #1 AND #2)



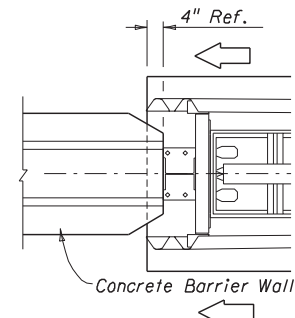
SECTION BB (POSTS #3 THRU #9)

QuadGuard TO GUARDRAIL TRANSITIONS

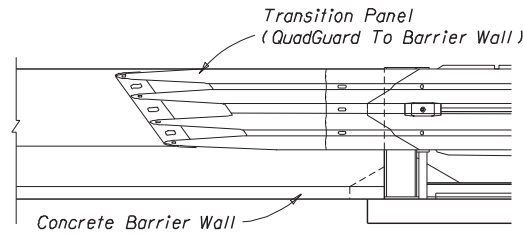
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
QuadGuard				
Names	Dates	Approved By		
Designed By	MPS, JWG	09/97	 State Roadway Design Engineer	
Drawn By	HKH	09/97		
Checked By	JVC	09/97		
Revision		00	Sheet No.	Index No.
			4 of 6	435



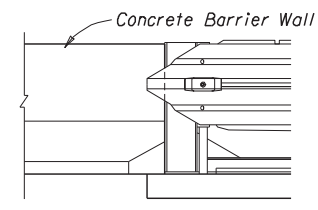
BIDIRECTIONAL PLAN



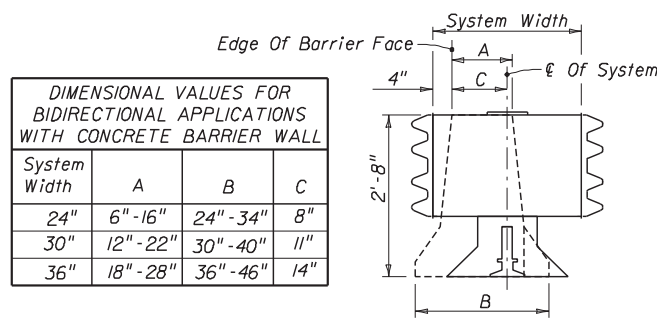
UNIDIRECTIONAL PLAN



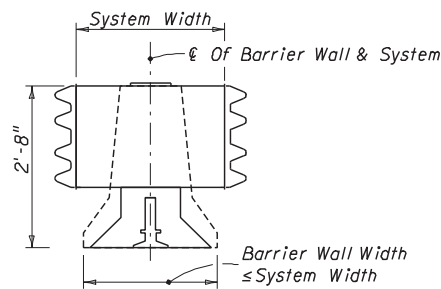
BIDIRECTIONAL ELEVATION



UNIDIRECTIONAL ELEVATION



BIDIRECTIONAL SECTION



UNIDIRECTIONAL SECTION

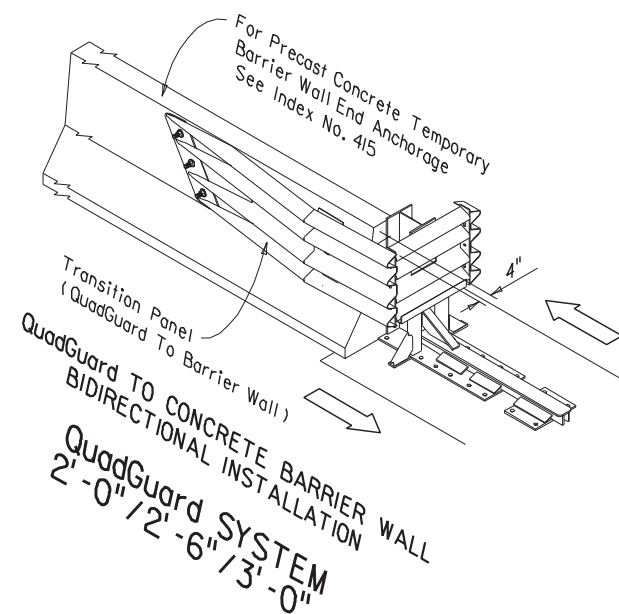
DIMENSIONAL VALUES FOR BIDIRECTIONAL APPLICATIONS WITH CONCRETE BARRIER WALL			
System Width	A	B	C
24"	6" - 16"	24" - 34"	8"
30"	12" - 22"	30" - 40"	11"
36"	18" - 28"	36" - 46"	14"

ALIGNMENT DETAIL

BIDIRECTIONAL PLAN

The axis of the QuadGuard relative to concrete barriers will be established on site specific basis. The QuadGuard supplier shall furnish dimensional data for setback between the barrier wall end and the system foundation, and for the alignment between the face of the barrier wall and the rear diaphragm where dimensions other than those above apply.

QuadGuard SYSTEM
5'-9" / 7'-6"

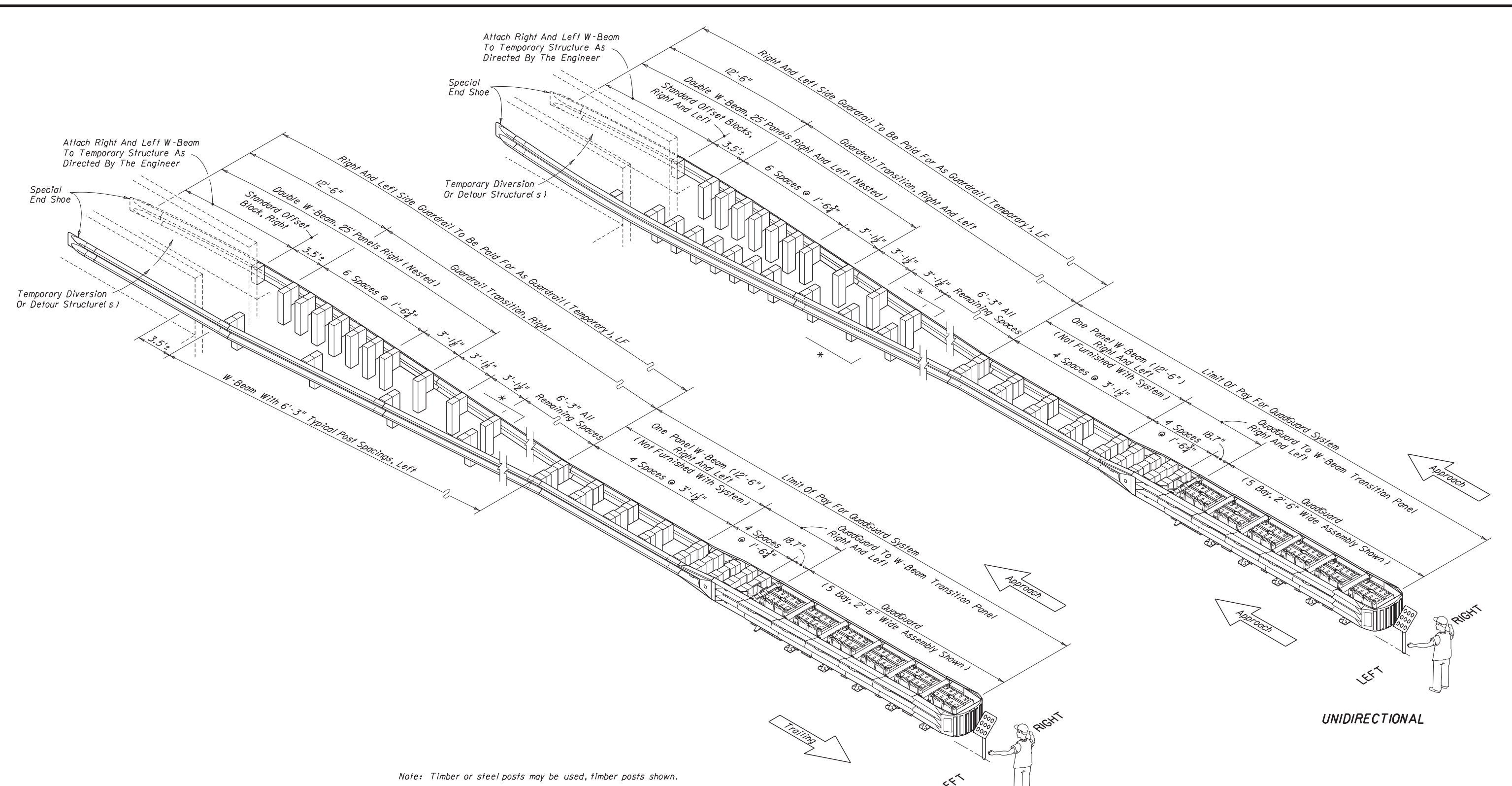


BARRIER WALL TRANSITION NOTE

Barrier wall free end must be reinforced in accordance with Index No. 410 and temporary walls must be adequately anchored for proper impact performance in accordance with Index No. 415.

QuadGuard TO CONCRETE BARRIER WALL TRANSITIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
QuadGuard				
Names	Dates	Approved By		
Designed By	MPS, JVG	09/97	 State Roadway Design Engineer	
Drawn By	HKH	09/97		
Checked By	JVC	09/97		
		Revision	Sheet No.	Index No.
		00	5 of 6	435



Note: Timber or steel posts may be used, timber posts shown.

* Transition Flare Rates:
 1:10 Or Flatter For ≤45 mph
 1:15 Or Flatter For 50-70 mph

GUARDRAIL TRANSITION TO TEMPORARY DIVERSION OR DETOUR STRUCTURES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
QuadGuard				
Names	Dates	Approved By		
Designed By	MFG, STJ	 State Roadway Design Engineer		
Drawn By	HKH	Revision	Sheet No.	Index No.
Checked By	JVC	00	6 of 6	435

GENERAL NOTES

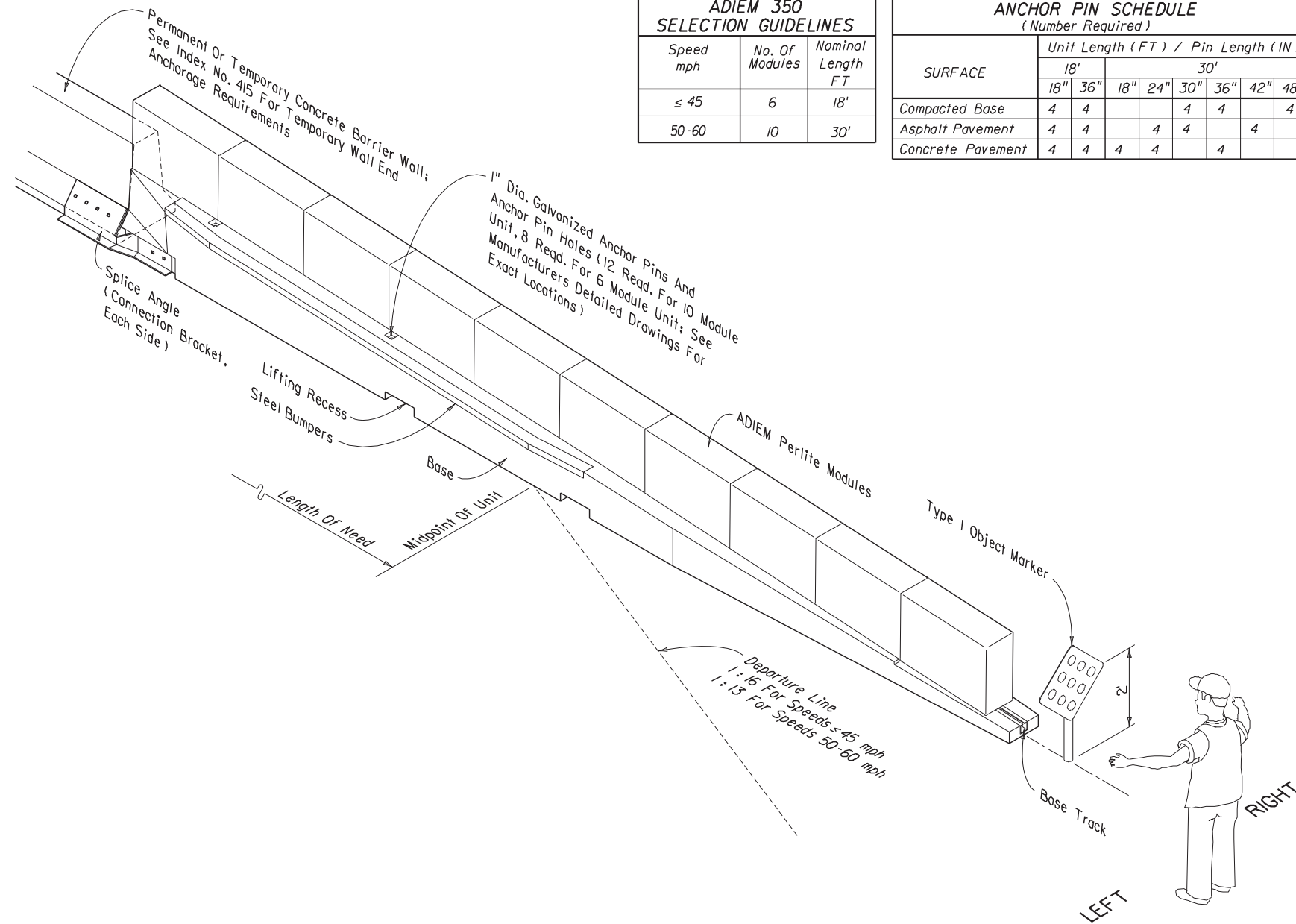
- The energy absorbing system represented on this standard drawing is a proprietary design by SYRO Inc. and marketed under the trade name ADIEM 350. Any infringement on the rights of the designer shall be the sole responsibility of the user.
- This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the ADIEM 350 and their incorporation into a whole system.
- This standard drawing is sufficient for plan details for the ADIEM 350 installed in connection with permanent or temporary concrete barrier walls, and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.
- The ADIEM 350 shall be assembled and installed in accordance with the manufacturers detailed drawings, procedures and specifications.
- The ADIEM 350 can be located on compacted base, asphalt or concrete. Driving of anchor pins into compacted base or soft asphalt will be permitted while drilling will be necessary for hard asphalt or concrete pavements. See schedule left for anchor pin requirements.
- The ADIEM 350 is suitable for speeds ≤ 60 mph.
- The ADIEM 350 shall be located parallel to the approach travel lanes, on 1:10 or flatter cross slopes. Until there is further development in the application of the ADIEM 350, the system is not to be located in narrow medians, gores or locations where frequent side impacts can be expected.
- All modules are alike in size and mass (interchangeable).
- Due to the overall unit height of 4', which exceeds the drivers height of eye, caution is to be exercised in locating the ADIEM 350 to avoid blockage of required sight distance.
- Attach splice angle (connection bracket) to ADIEM 350 base with 2- $\frac{1}{8}$ " dia. x 25" long HD hex bolts. Attach splice angle to barrier wall with 8 field drilled $\frac{7}{8}$ " dia. x 6" long chemical anchors.
- A yellow Type I Object Marker shall be centered 3' in front of the nose of the ADIEM 350. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the ADIEM 350.
- Temporary ADIEM 350 systems can be reused provided the bases have the structural integrity and surface qualities of new systems, and the modules are condition new. Refurbished systems can be made up of mixed new and used components. New and used systems can be purchased, leased, rented, on loan or shared between projects.
- The permanent ADIEM 350 will be paid for under the contract unit price for Impact Attenuator Vehicular (ADIEM), EA; temporary units will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (ADIEM), LO, or when the ADIEM 350 is used as an option in accordance with Index No. 415, it will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

DESIGN AND MAINTENANCE NOTES AND GUIDELINES

- The ADIEM 350 is designed to cushion automobile end-on hits and to redirect automobiles from side hits within the length of need while shielding the ends of permanent or temporary concrete barrier walls.
- The ADIEM 350 is a restorable system that is particularly suited to shielding concrete barrier wall ends. The 18' unit is applicable for speeds of 45 mph or less, the 30' unit is applicable for speeds of 50-60 mph.
- The upstream half of the system (3 or 5 modules) is a gating design. Each module (cartridge) has a mass of 180 lbs. Care must be exercised in locating the system where debris scatter may pose a hazard. Upstream modules or their residual components must be removed to replace damaged downstream modules.
- The ADIEM 350 will require close monitoring for damage that will open module encasement; immediate repair is essential to prevent moisture absorption into module core.
- Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the ADIEM 350, and until such alternatives are available, the ADIEM 350 need not be bid against other proprietary items. However, where the ADIEM 350 and other approved temporary redirective crash cushions meet or exceed the minimum requirements for a specific location, the approved crash cushions will be considered optional systems and paid for as described in General Note 13 above.

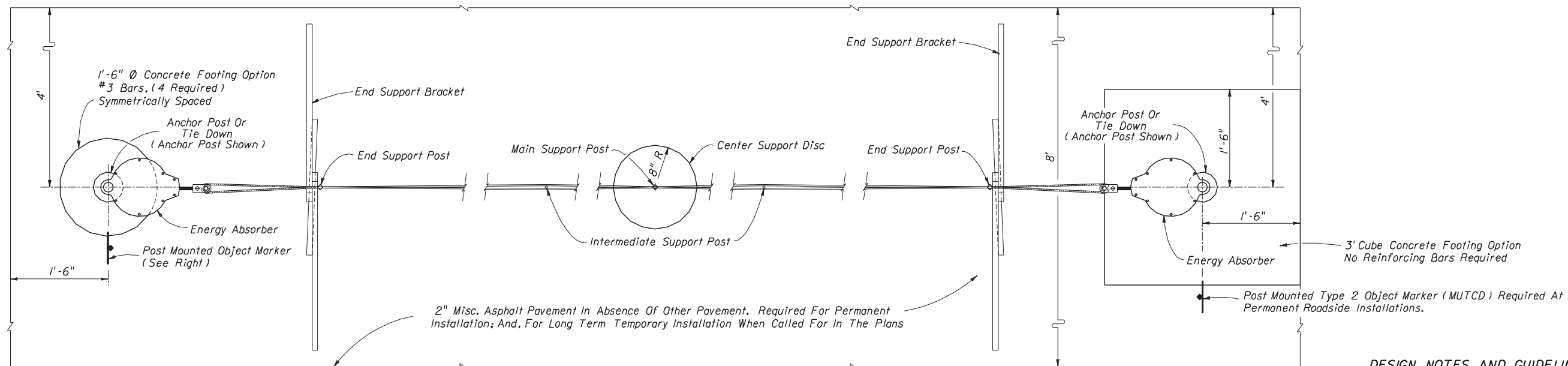
Speed mph	No. Of Modules	Nominal Length FT
≤ 45	6	18'
50-60	10	30'

SURFACE	Unit Length (FT) / Pin Length (IN)							
	18'		30'					
	18"	36"	18"	24"	30"	36"	42"	48"
Compacted Base	4	4			4	4		4
Asphalt Pavement	4	4		4	4		4	
Concrete Pavement	4	4	4	4		4		



GENERAL SYSTEM FEATURES AND GUIDELINES

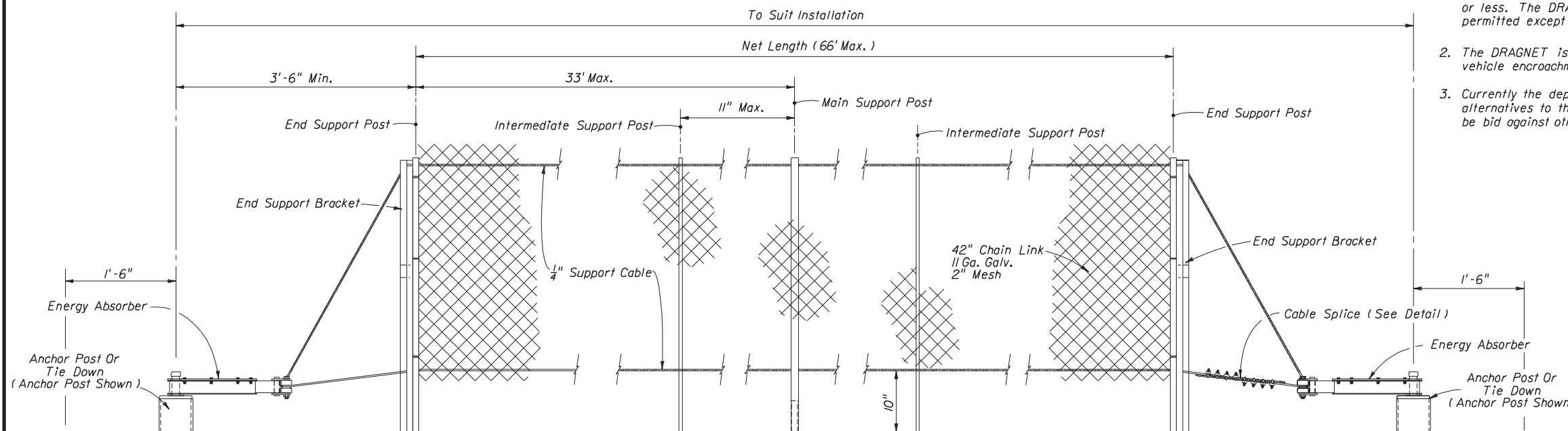
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
ADIEM 350				
Names	Dates	Approved By		
Designed By	MFG	State Roadway Design Engineer		
Drawn By	HKH	7/97	Revision	Sheet No.
Checked By	JVC	7/97	00	1 of 1
				Index No. 436



PLAN

DESIGN NOTES AND GUIDELINES

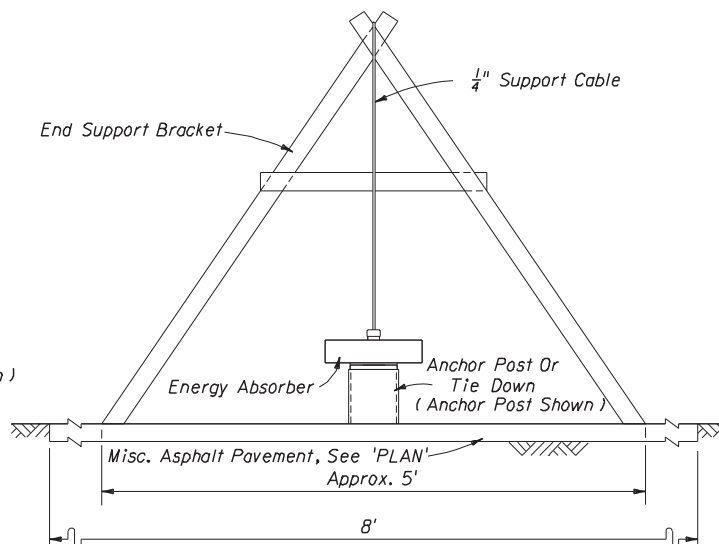
1. The DRAGNET is designed to safely stop automobiles when impacted at speeds of 60 mph or less. The DRAGNET has a singular design and any adjustment to its design will not be permitted except as authorized by the manufacturer.
2. The DRAGNET is a restorable system that is particularly suited to the prevention of head-on vehicle encroachment into hazardous areas.
3. Currently the department does not recognize other proprietary items as being equally suitable alternatives to the DRAGNET and until such alternatives are available, the DRAGNET need not be bid against other proprietary items.



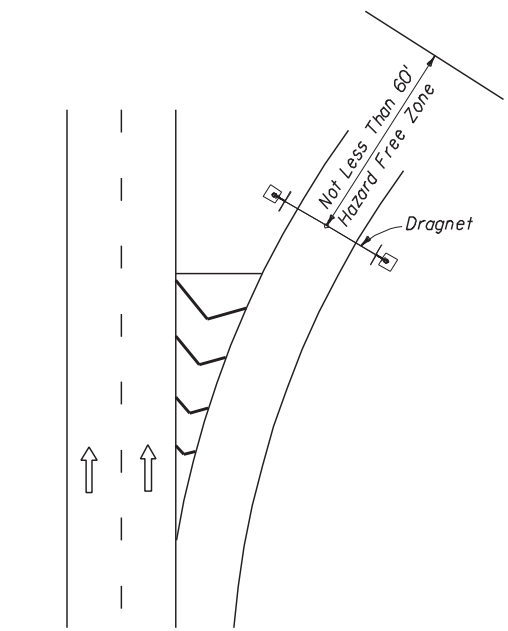
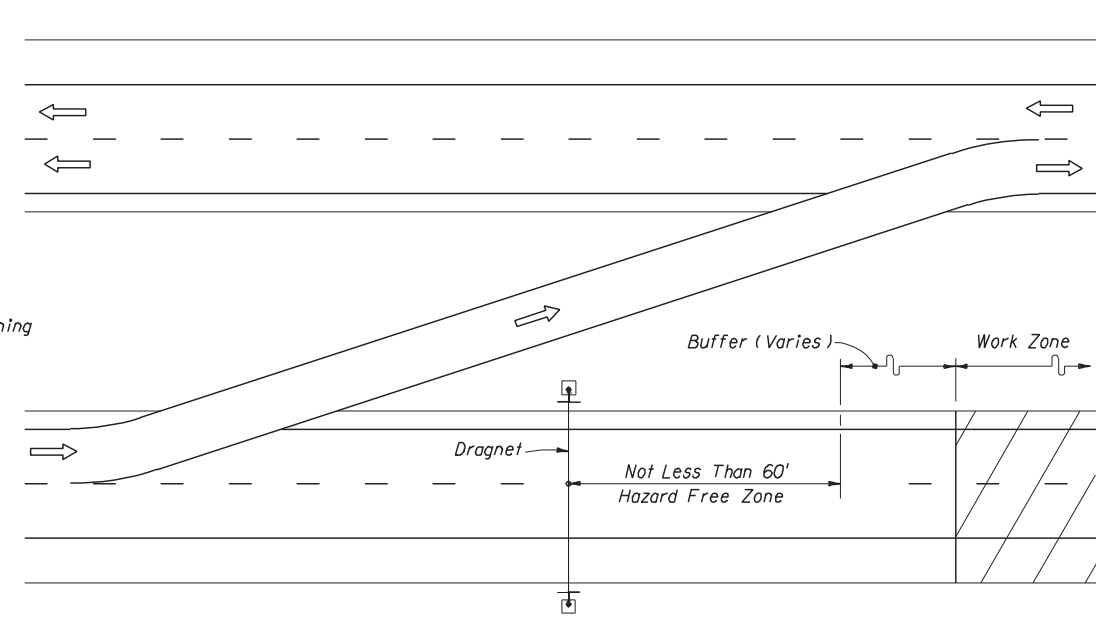
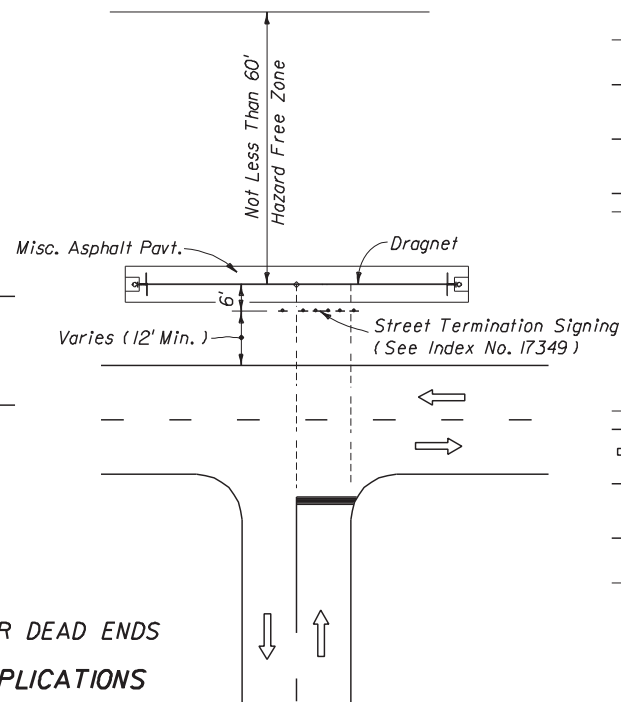
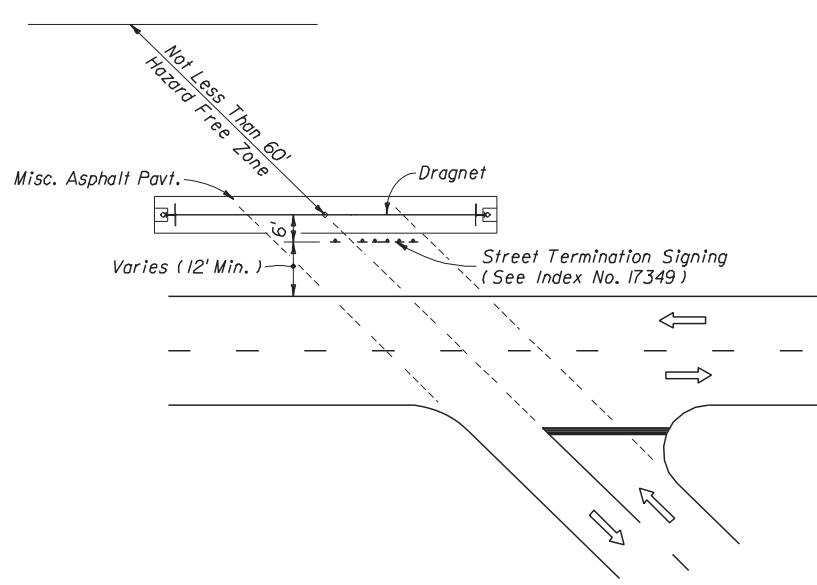
ELEVATION

GENERAL NOTES

1. The vehicle arresting barrier represented on this standard is a proprietary product of Highway Safety Systems, Inc. and marketed under the trade name DRAGNET. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the DRAGNET system and their incorporation into a whole system.
3. This standard drawing is sufficient for plan details for the DRAGNET installed as a free standing system and precludes the requirement for shop drawing submittals unless the plans otherwise call for such submittals.
4. The DRAGNET shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications.
5. Concrete footings shall be constructed with Class I concrete.
6. Each temporary DRAGNET assembly shall include a spare parts package consisting of two extra arresting tapes and a set of end support brackets. The spare parts package shall be stored on site at locations approved by the Engineer. Damaged attenuators shall be restored within 24 hours. The cost of furnishing and maintaining spare parts packages for each attenuator shall be included in the cost of the attenuator.
7. The cost of the DRAGNET shall include furnishing and installing all components and materials necessary for a complete installation and will be paid for under the contract unit price for Impact Attenuator Vehicular (Dragnet), EA., for permanent installations or Vehicle Arresting Barrier (Net Type), EA., for temporary installations.



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DRAGNET				
Designed By	MPS/HKP	10/91	Approved By	
Drawn By	HKK	10/91	Revision	Sheet No.
Checked By	JVC	10/91	00	1 of 2
				Index No. 438



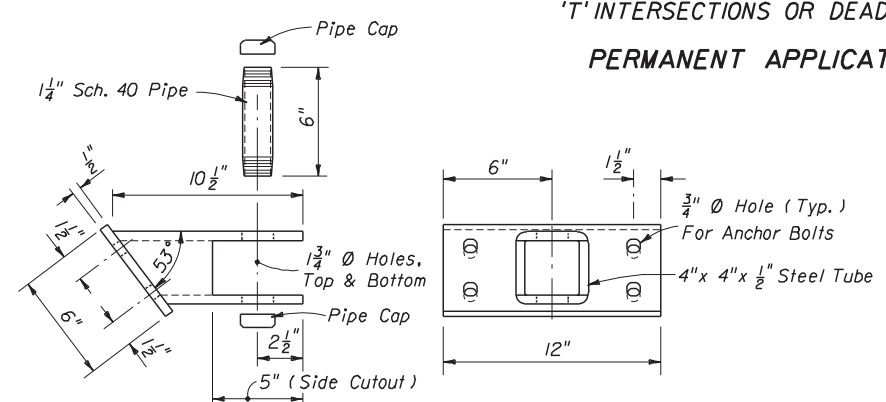
'T' INTERSECTIONS OR DEAD ENDS
PERMANENT APPLICATIONS

TEMPORARY ROADWAY CLOSURES

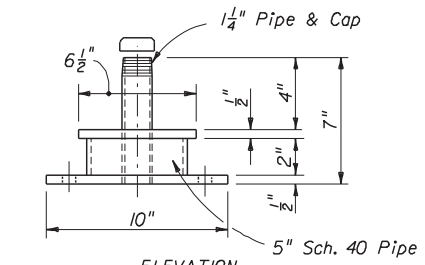
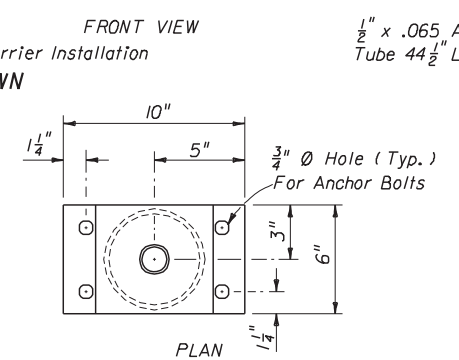
TEMPORARY RAMP CLOSURES

See Index No. 600 For Traffic Control Through Work Zones
TEMPORARY APPLICATIONS

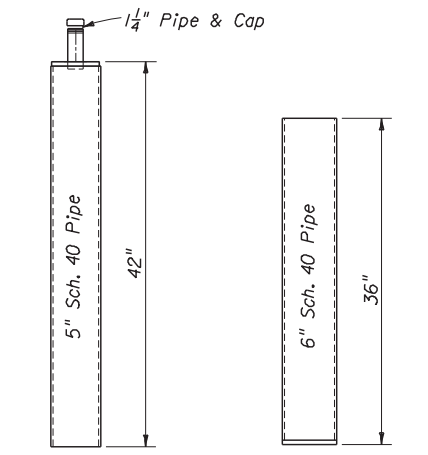
TYPICAL APPLICATIONS



SIDE VIEW
FRONT VIEW
For Use On Concrete Barrier Installation
TIE DOWN



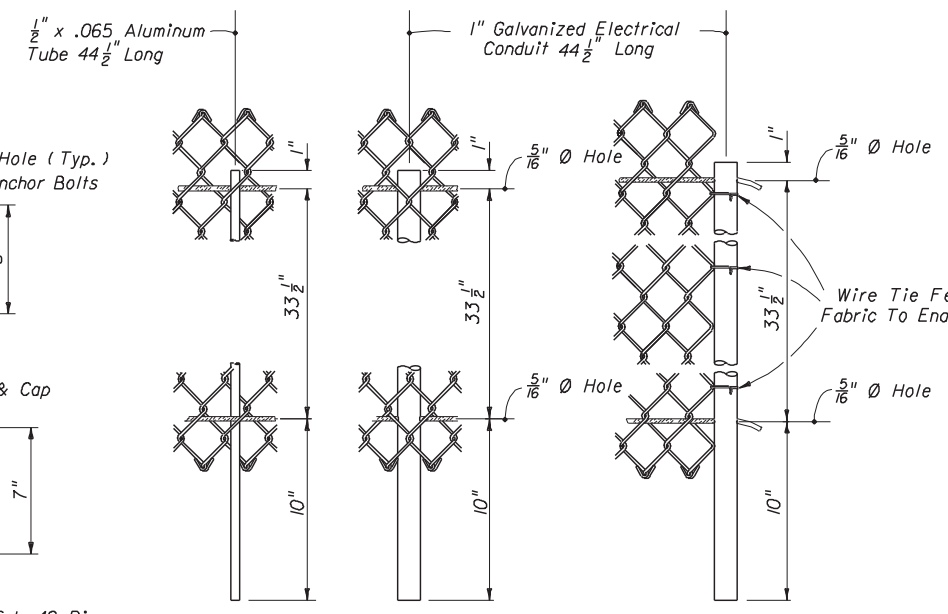
ELEVATION
For Use Inside Clear Zone. Can Be Used With Either Concrete Footing Option Or On Existing Concrete Slab.



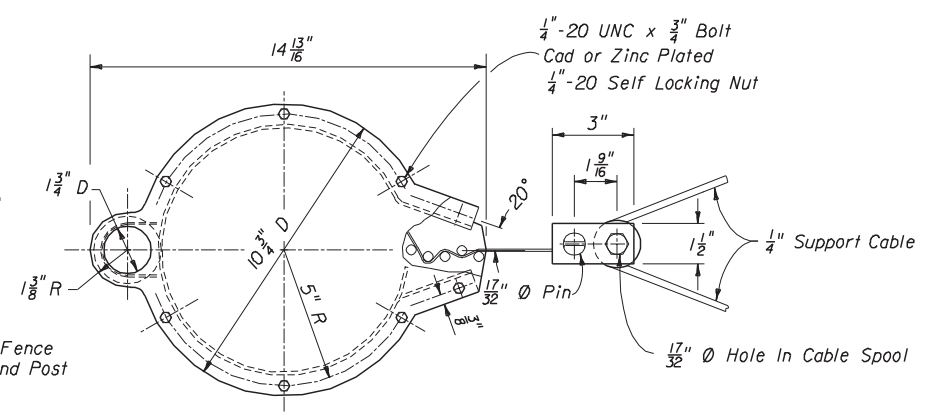
ANCHOR POST ASSEMBLY
ANCHOR POST SOCKET

Note: Tie down anchor bolts shall be 1/2" dia. adhesive anchors with 4 1/2" min. embedment, installed to manufacturers specifications; 4 required per tie down.

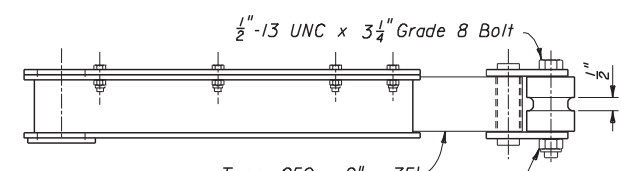
ANCHOR DETAILS



INTERMEDIATE SUPPORT POST
MAIN SUPPORT POST
END SUPPORT POST
SUPPORT POST DETAILS

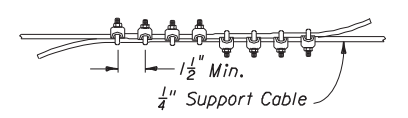


PLAN



ELEVATION

ENERGY ABSORBER ASSEMBLY



'U' Bolt Presses Against Dead End Of Cable. Torque Nuts To 130 In. Lbs. (8 Required)

CABLE SPLICE DETAIL

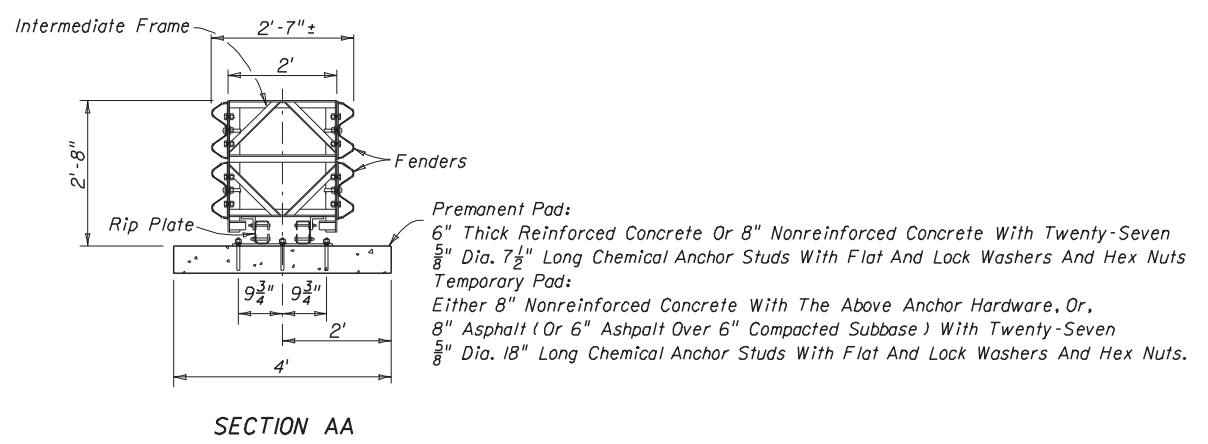
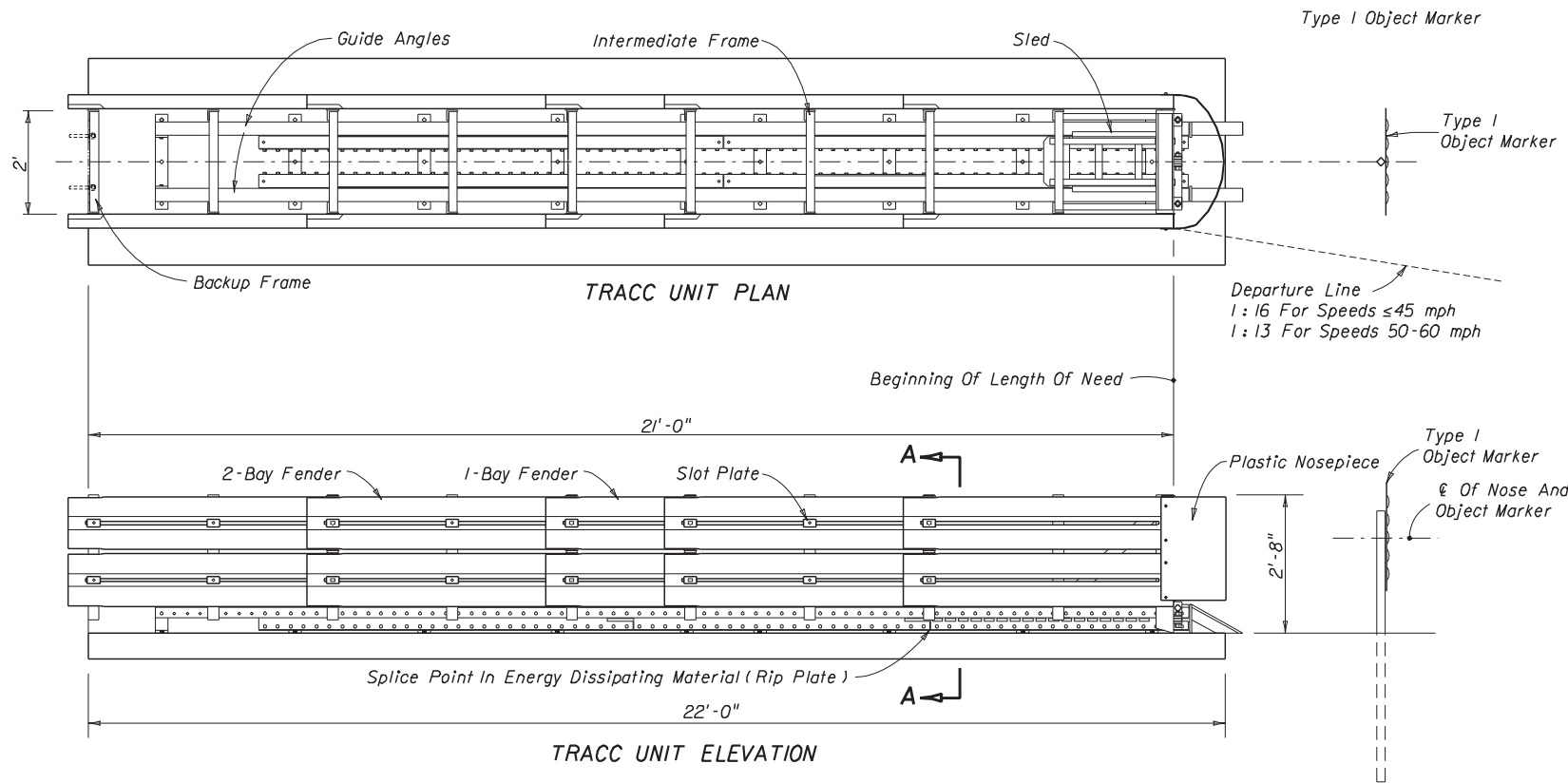
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
DRAGNET				
Names	Dates	Approved By		
Designed By	MSH/HKP	10/91	 State Roadway Design Engineer	
Drawn By	HKK	10/91		
Checked By	JVC	10/91		
Revision		00	Sheet No.	Index No.
			2 of 2	438

GENERAL NOTES

1. The energy absorbing system represented on this standard drawing is a proprietary design by Trinity Industries, Inc. and marketed under the trade name TRACC. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This standard drawing is produced by the Florida Department Of Transportation solely for use by the Department and its assignees. This standard drawing provides the general graphics and information necessary to field identify component parts of the TRACC and their incorporation into a whole system.
3. At time of publishing this standard the TRACC system is limited to installations on bulb-out ends of concrete barrier walls. Under this application the standard drawing is sufficient for plan details, and precludes the requirement for shop drawing submittals unless the plans call for such submittals. See DESIGN NOTES for additional information.
4. The TRACC shall be assembled and installed in accordance with the manufacturers detailed drawings, procedures and specifications, except that transition section posts will be set to connect to guardrail at standard W-beam center bolt height (1'-9").
5. The TRACC system is suitable for speeds of ≤60 mph.
6. When the TRACC is installed at permanent locations it shall be anchored to either a reinforced 6" thick concrete pad or a nonreinforced 8" thick concrete pad with twenty-seven 7 1/2" long 5/8" dia. chemical anchor studs, flat and lock washers, and, hex nuts. When the TRACC is installed at temporary locations it shall be anchored to a nonreinforced 8" thick concrete pad with the above mentioned anchor hardware, or a 8" thick asphalt pad (or a 6" thick asphalt over 6" of compacted subbase) using twenty-seven 18" long 5/8" dia. Grade 5 threaded chemical anchor studs, flat and lock washers, and, hex nuts.
7. The TRACC shall be located parallel to the approach travel lane(s), on 1:10 or flatter cross slopes.
8. In-place repairs on the TRACC crash cushion are limited to (a) end-on impacts which cause the sled to stroke 54" or less, and (b) side impacts where permanent distortion is limited to a unit's fender panels and where distortion of the intermediate frame(s) can be restored manually. Unit replacement is required when damage exceeds these conditions. Temporary construction units and units under Maintenance responsibility may be shop repaired units utilizing new or salvaged parts which will produce condition new units. All permanent units shall be factory new at completion of construction.
9. A yellow Type I Object Marker shall be centered 3' in front of the nose of the TRACC. Mounting hardware shall be in conformance with Index Nos. 11860 and 11865. The cost of the Object Marker shall be included in the cost of the TRACC.
10. The permanent TRACC will be paid for under the contract unit price for Impact Attenuator Vehicular (TRACC), EA; temporary units will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (TRACC), LO, or when the TRACC is used as an option in accordance with Index No. 415, it will be paid for under the contract unit price for Vehicular Impact Attenuator (Temporary) (Redirective Option), LO.

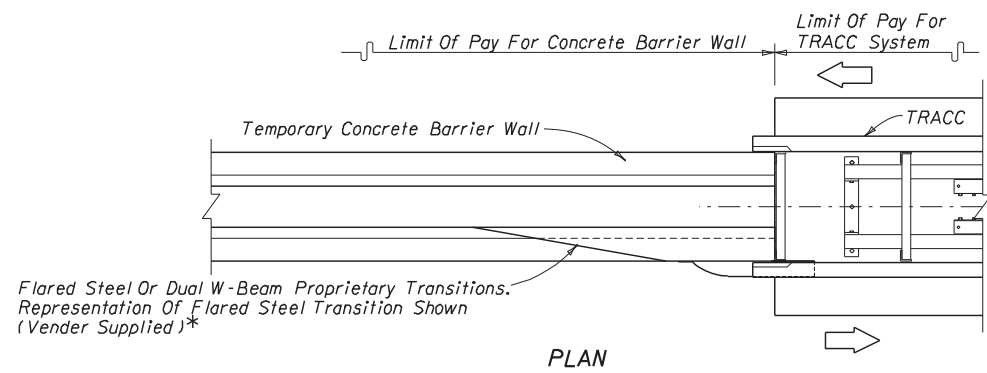
DESIGN AND NOTES AND GUIDELINES

1. The TRACC is designed to cushion automobile end-on hits and to redirect automobiles from side hits within the length of need while shielding the ends of permanent or temporary concrete barrier walls, or, double faced guardrails. At time of publishing this standard the manufacturer's designs for bidirectional hardware was complete for applications indicated on Sheet 2, but final acceptance and department approval had not been attained. For current status of development and acceptance contact the central Office of Roadway Design.
2. The TRACC system is not intended for use in gores of freeway and expressway mainline ramp terminals; gores of roadway forks; or other gore locations where there is a history of high frequency vehicle departure from the roadway or the potential exists for such departures. The TRACC system is not a restorable design, and repairs or replacement will be in accordance with GENERAL NOTES note No. 8.
3. Currently the Department does not recognize other proprietary items as being equally suitable alternatives to the TRACC, and until such alternatives are available, the TRACC need not be bid against other proprietary items. However, where the TRACC and other approved temporary redirective crash cushions meet or exceed the minimum requirements for a specific location, the approved crash cushions will be considered optional systems and paid for as described in General Note 10 above.

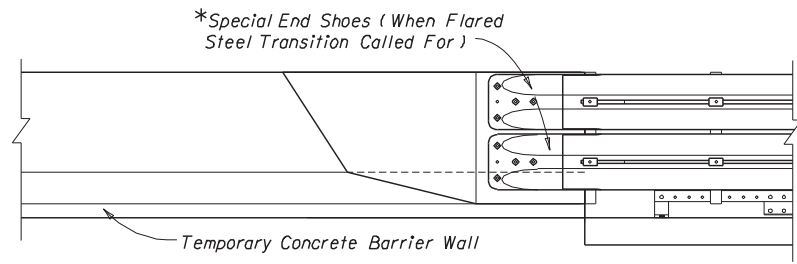


GENERAL SYSTEM FEATURES AND GUIDELINES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRACC				
Names	Dates	Approved By		
Designed By	MFG	State Roadway Design Engineer		
Drawn By	HKH	7/97	Revision	Sheet No.
Checked By	JVC	7/97	00	1 of 2
				Index No. 440

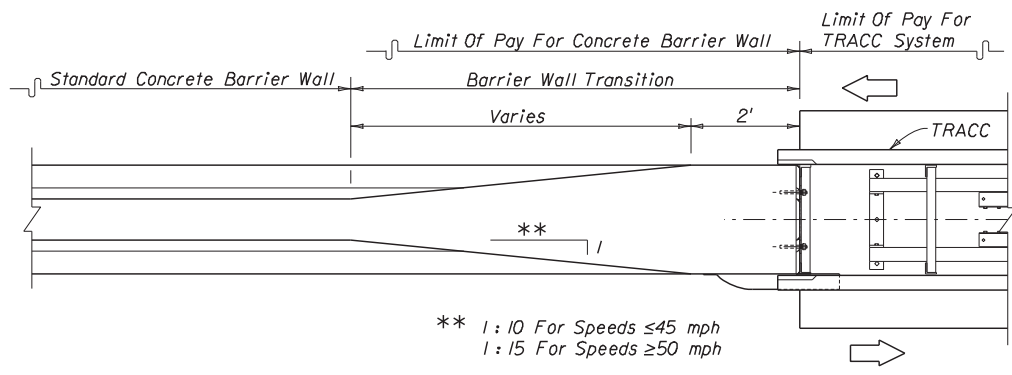


PLAN

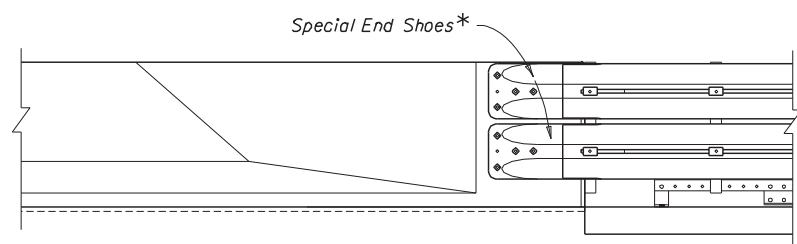


ELEVATION

* To Be Included In Cost Of TRACC
MANUFACTURED STEEL TRANSITION

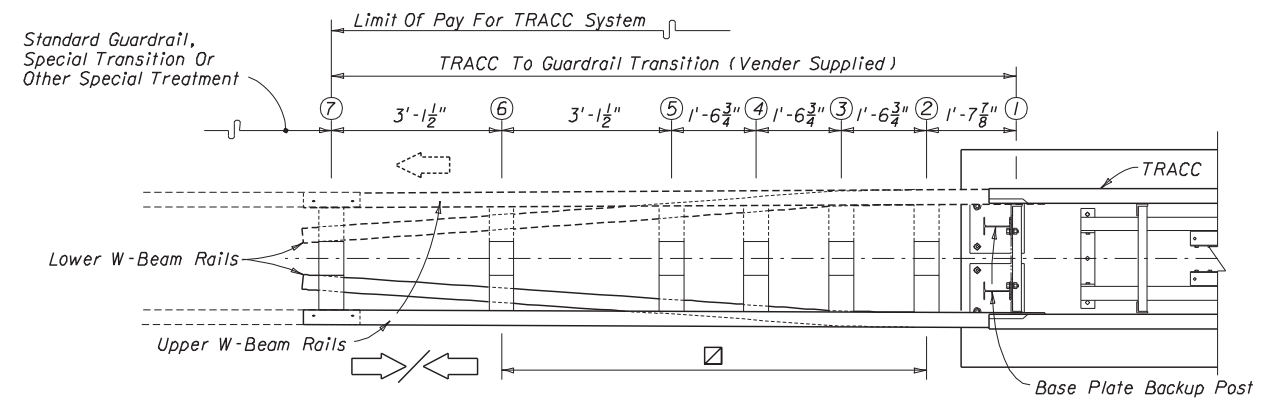


PLAN

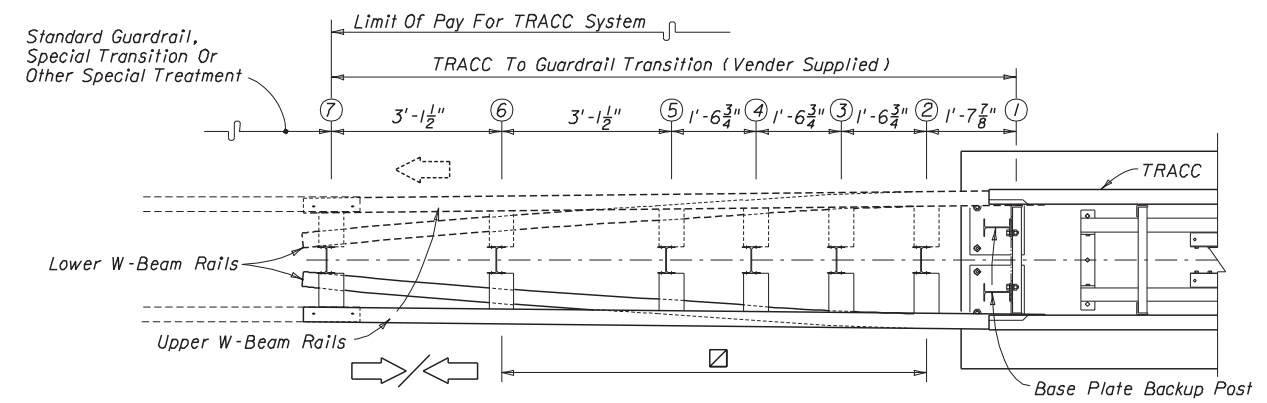


ELEVATION

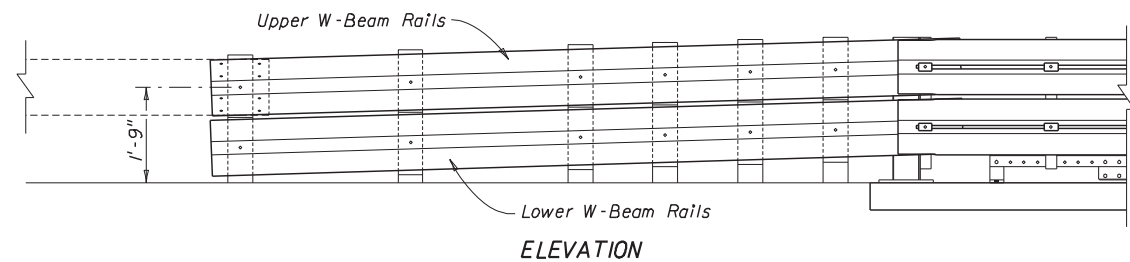
* To Be Included In Cost Of TRACC
INTEGRAL WALL TRANSITION
TRACC TO CONCRETE BARRIER WALL



PLAN - TIMBER POSTS



PLAN - STEEL POSTS



ELEVATION

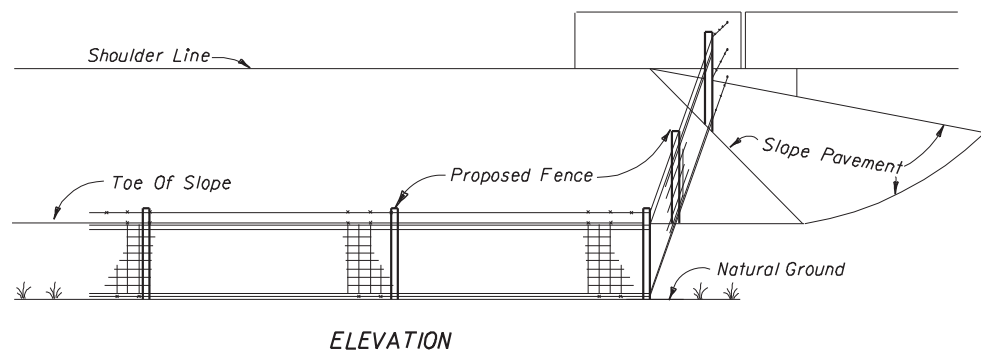
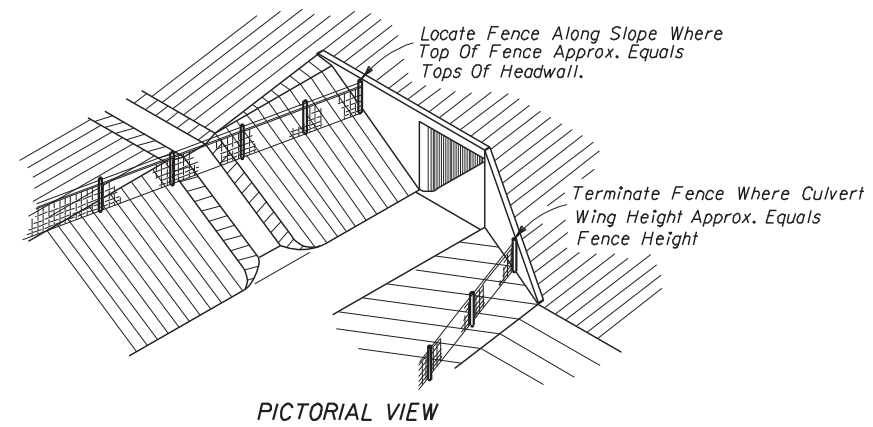
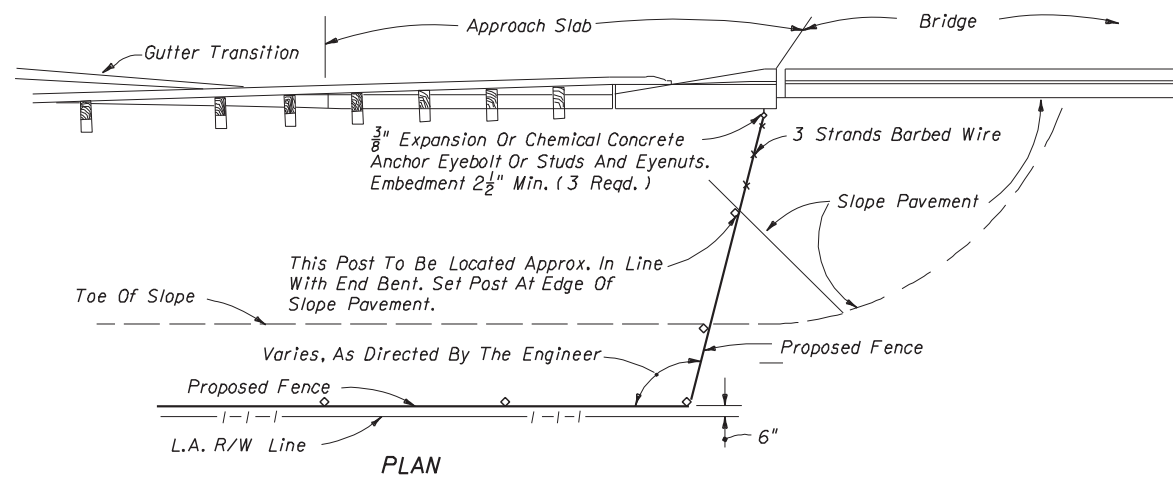
☑ Offset blocks that exceed standard block depth can be made up of blocks of special size or multiple standard blocks field trimmed to approximately equal size to achieve full transition width. Offset blocks for lower W-beam that are less in depth than standard blocks may be field trimmed standard blocks. All blocks are to be secured to plan position by 16d galvanized nails.

Transitions are required when connecting the TRACC to any guardrail system.

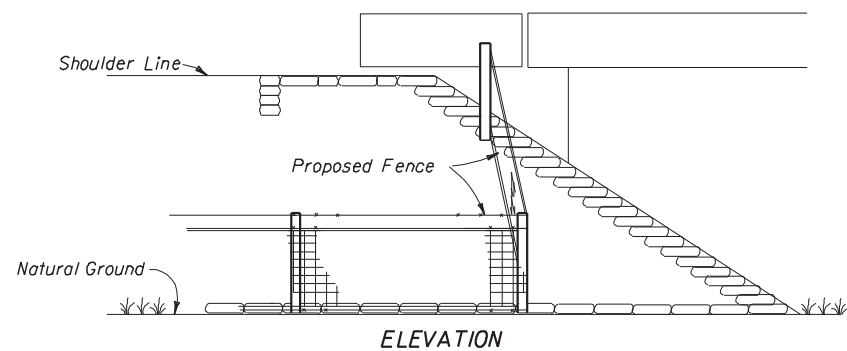
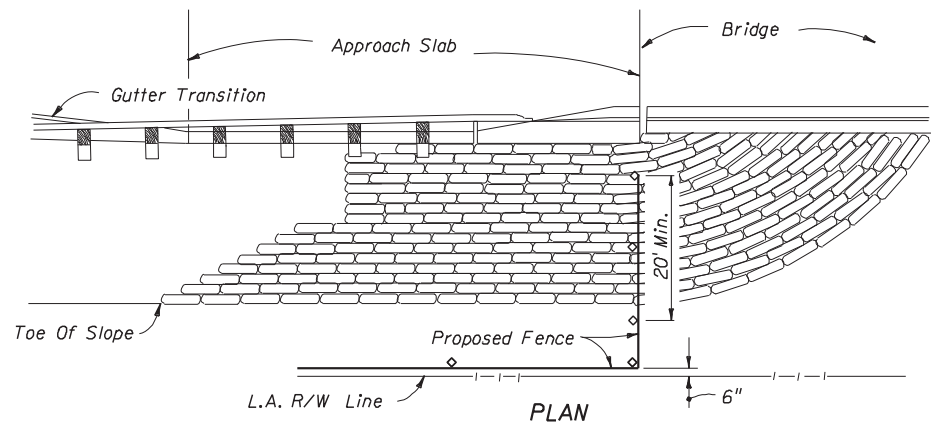
TRACC TO GUARDRAIL

TRACC TRANSITIONS

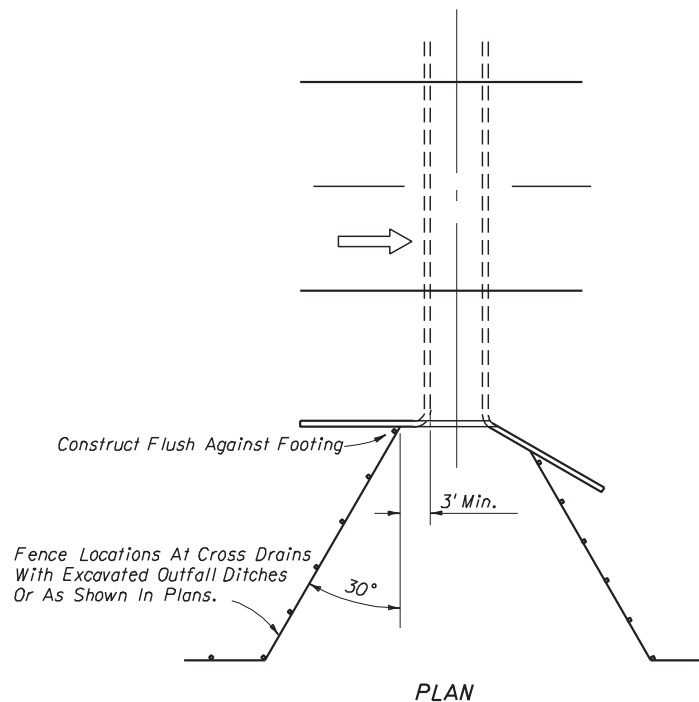
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRACC				
Names	Dates	Approved By <i>Bob J. [Signature]</i>		
Designed By	MFG	State Roadway Design Engineer		
Drawn By	HKH	7/97	Revision	Sheet No.
Checked By	JVC	7/97	00	2 of 2
				Index No. 440



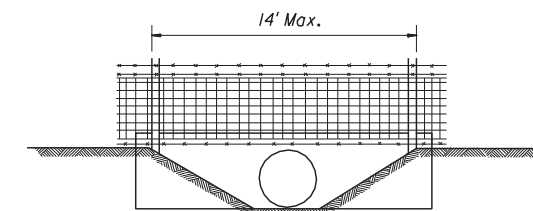
FENCING TERMINALS AT BRIDGE ENDS (ROADWAY)



FENCING TERMINALS AT BRIDGE ENDS (STREAM CROSSING)



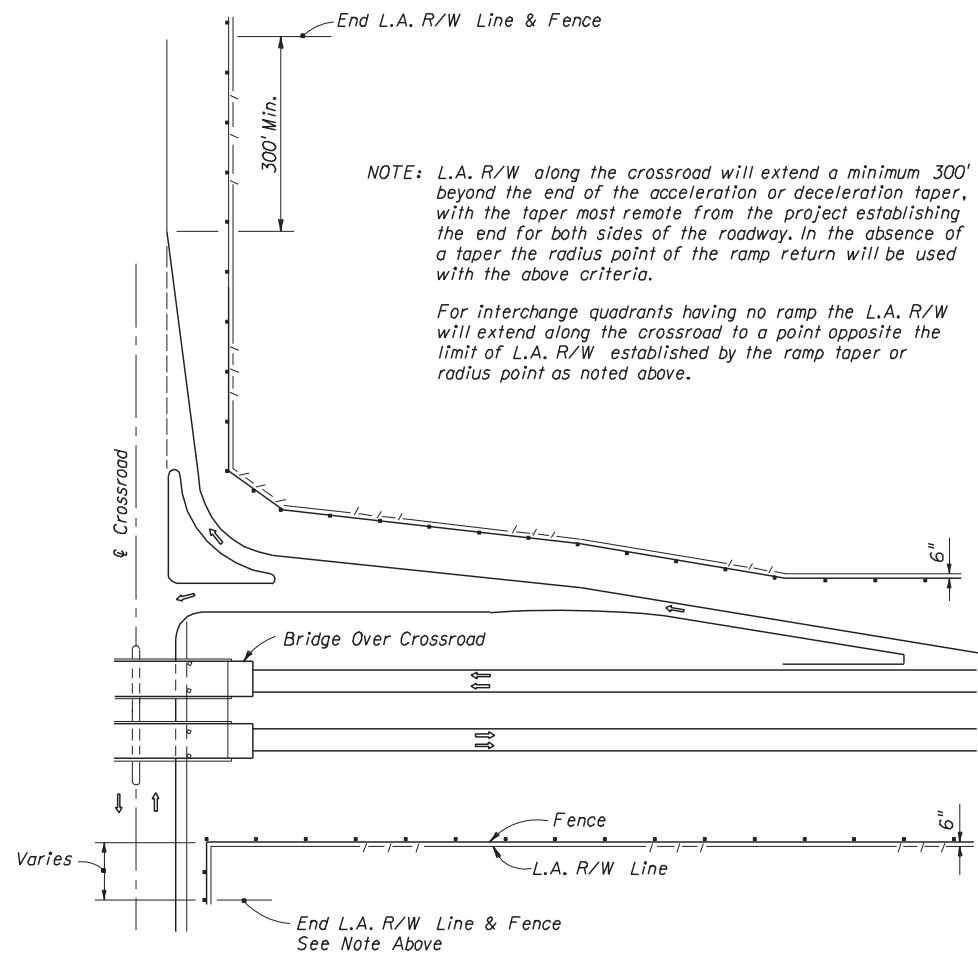
(For Heights Of Headwall Greater Than 4') FENCING TERMINALS AT BOX CULVERTS



FENCING DETAIL AT CULVERT (For Heights Of Headwalls 4' Or Less.)

Note: When height of headwall is 4' or less (drainage pipe 36" or less) the fence shall not be tied to the headwall, but shall span the lateral ditch.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
FENCE LOCATION				
Names	Dates	Approved By		
Designed By	HFV 02/65	 State Roadway Design Engineer		
Drawn By	HFV 02/65			
Checked By	RLO 02/65			
		Revision	Sheet No.	Index No.
		00	1 of 2	450

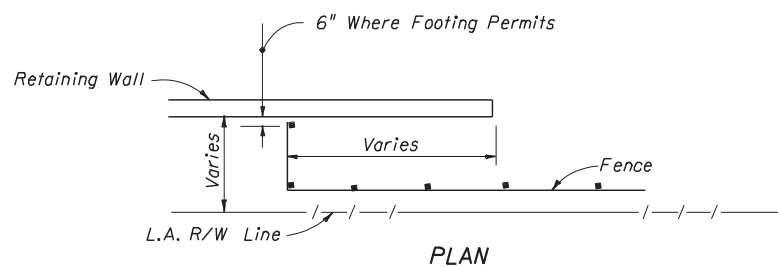


NOTE: L.A. R/W along the crossroad will extend a minimum 300' beyond the end of the acceleration or deceleration taper, with the taper most remote from the project establishing the end for both sides of the roadway. In the absence of a taper the radius point of the ramp return will be used with the above criteria.

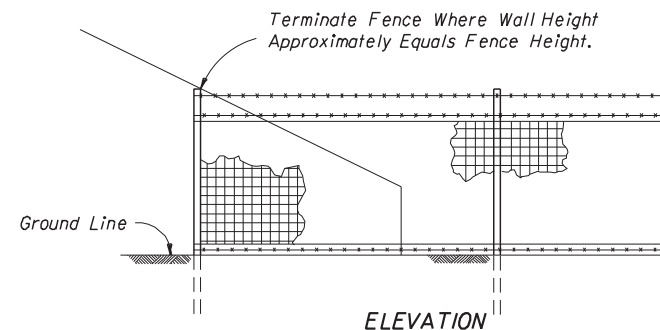
For interchange quadrants having no ramp the L.A. R/W will extend along the crossroad to a point opposite the limit of L.A. R/W established by the ramp taper or radius point as noted above.

APPLIES TO BRIDGE OVER CROSSROAD AND CROSSROAD OVER FREEWAY (BRIDGE OVER CROSSROAD SHOWN)

FENCING TERMINALS AT RURAL INTERCHANGES

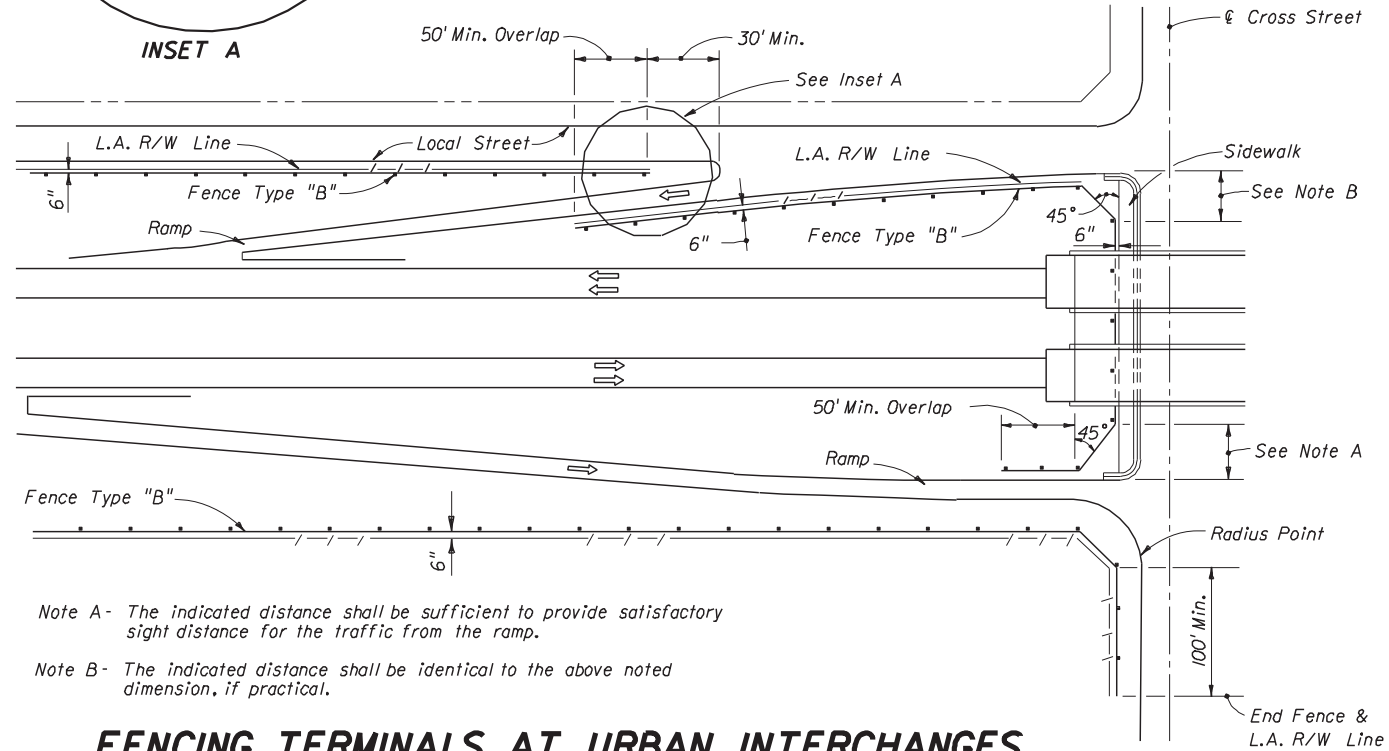
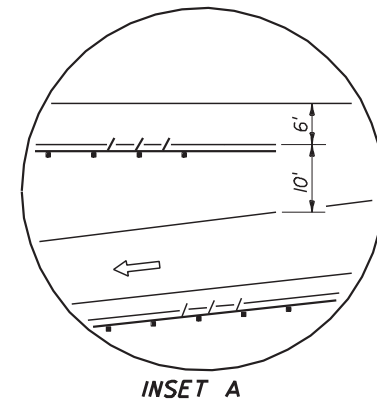


PLAN



ELEVATION

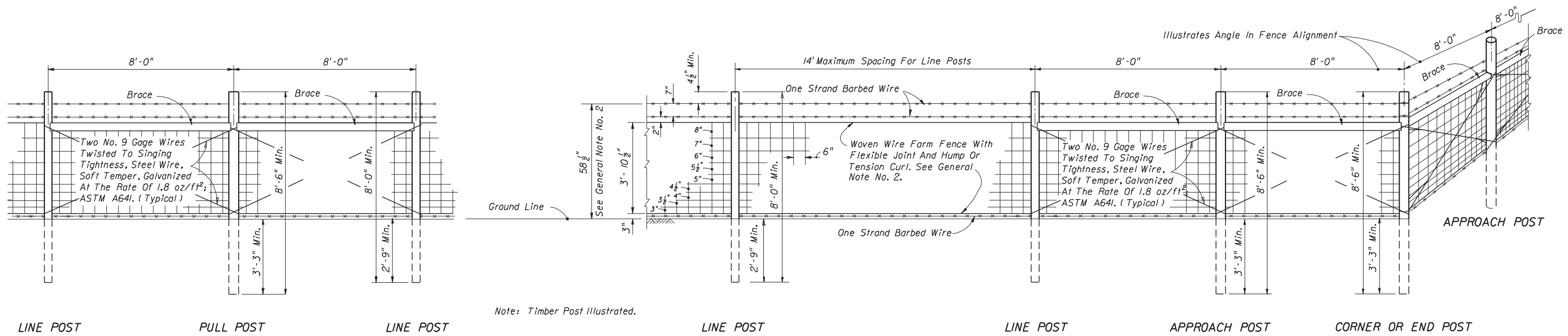
FENCING TERMINALS AT RETAINING WALLS



Note A - The indicated distance shall be sufficient to provide satisfactory sight distance for the traffic from the ramp.
 Note B - The indicated distance shall be identical to the above noted dimension, if practical.

FENCING TERMINALS AT URBAN INTERCHANGES

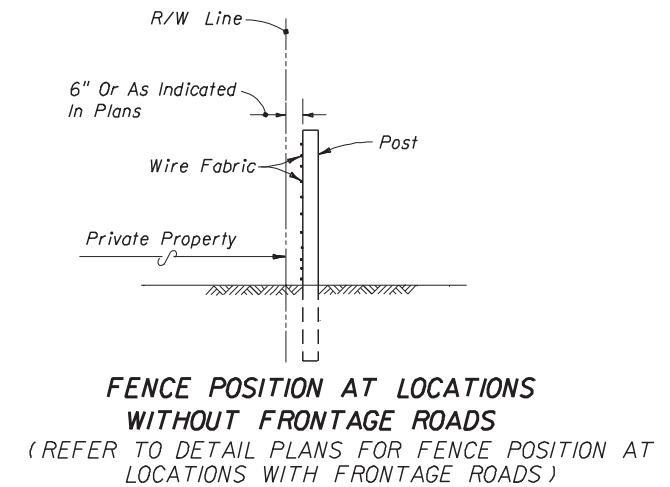
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
FENCE LOCATION				
Designed By	HEW	02/65	Approved By <i>[Signature]</i>	
Drawn By	HEW	02/65	Revision	Sheet No. 2 of 2
Checked By	RLO	02/65	00	Index No. 450



Note: Timber Post Illustrated.

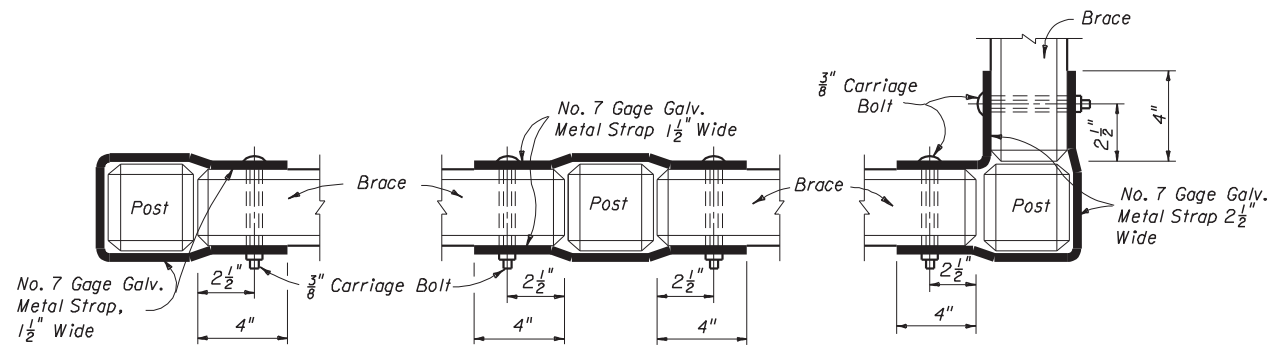
GENERAL NOTES

- This fence to be provided generally in rural areas. For supplemental information see Section 550 of the FDOT Specifications.
- Fabric shall be woven wire, either galvanized steel, meeting the requirements of ASTM A116, No. 9 Farm, Design Number 1047-6-9, with Class 3 zinc coating, or aluminum coated steel, meeting the requirements of ASTM A584, No. 9 Farm, Design Number 1047-6-9, with a minimum coating weight of 0.40 oz./ft². For additional information see payment note below.
- Fence shall be installed with wire side to private property except on horizontal curves greater than 3° the fence shall be installed so as to pull against all posts.
- Posts may be either timber, steel, recycled plastic or concrete. Unless a specific post material is called for in the plans, the Contractor may elect to use either a single material or a combination of timber, steel, recycled plastic or concrete materials. Line posts of one material may be used with corner, pull and end post assemblies of a different material. Line posts of only one optional material and pull post assemblies of only one optional material will be permitted between corner and end post assemblies. Within individual corner and end post assemblies only one optional material will be permitted.
- Timber line posts are to be minimum 4" diameter. Timber corner, pull, approach and end posts are to be minimum 5" diameter. Timber braces are to be minimum 4" diameter.
 - Staples for line posts to be 1 1/4" minimum length; for approach, corner and pull posts 1 1/2" minimum length. At approach, corner and pull posts, staple every line wire. At line posts, staple every line wire in top half and alternate line wires in bottom half. Staples shall be driven diagonally across the line wire with the points in separate grains.
 - Connections between timber posts and braces to be provided by dowels as shown in fastener details.
 - Wire to be wrapped and tied, as shown in the splice details, at the following locations:
 - All end posts
 - Corner post, including the assemblies at vertical breaks of 15° or more.
 - Pull posts where the wire is not spliced and pulled through the assembly; see General Note 16.
- Steel posts and braces shall be standard steel posts, galvanized at the rate of 2 oz/ft², together with necessary hardware and wire clamps and meeting the following requirements:
 - Line posts: 8' long; 1.33 lbs./ft.; roll formed studding; anchor plate attached (23 in²).
 - Approach posts: 2 1/2" x 2 1/2" x 2 1/2" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - Pull, end and corner posts: 2 1/2" x 2 1/2" x 2 1/2" angles, 8' long; fabricated for attaching brace; with necessary hardware, clamps, etc.
 - Braces: 2" x 2" x 1/4" angles with necessary hardware and fabricated for attaching to post.
 - The pull, corner, approach and end posts are to be set in concrete as per detail. (Also see Note No. 13)
- Recycled plastic posts shall meet the material requirements of specification Section 972 and be one of the products included on the Qualified Products List current at the time of installation. Line posts shall have a minimum section of 4" round or 4" square. Plastic posts shall not be used as corner, pull, end or approach posts unless such use specifically detailed in the plans. Plastic posts can be set by either digging and tamped backfill or by driving into full depth preformed holes 1/4" to 1/2" smaller than cross section of post. Staples for fabric and barbed wire connection to plastic line posts shall be the same size, count and location as that for timber posts.
- The Contractor, at his option, may use any suitable precast or prestressed concrete posts; however, approval by the Engineer, of posts not shown on this index, will be required prior to construction of the fence. Precast posts shall be Class I concrete. Prestressed posts shall be Class III concrete. Lengths of concrete post to be as indicated for timber posts.
- Aluminum post, braces and accessory framing hardware shall not be used unless the plans specifically detail their application or the Engineer specifically approves their incorporation in fence construction or repair. Aluminum framed gates are permitted as described in General Note 19.
- The woven wire shall be attached to steel and concrete posts by a minimum of five tie wires. The single wire ties shall be applied to the top, bottom and three intermittent line wires. The ends of each tie wire shall have a minimum of two tight turns around the line wire. Tie wires shall be steel wire not less than 0.120" diameter, zinc coating Class 3, soft temper, in accordance with ASTM A641.
- Steel Barbed Wire can be either of the following types:
 - Type I: This type shall conform to the requirements of ASTM A121, with two strands of 12 1/2 gage wire; four point barbs, wire size 14 gage, twisted around both line wires; and, Class 3 coating.
 - Type II: This type same as Type I except the two strand wires are twisted in alternating directions between consecutive barbs.
 Aluminum Barbed Wire shall be fabricated of two strands of 0.110-inch wire with 0.08-inch diameter four-point barbs spaced at approximately 5 1/2", and at a maximum spacing of 6". The wire for the strands and for the barbs shall be of ASTM B211M Alloy 5052-H38 or equal.
- The woven wire shall be stretched only until one-half the tension curl has been pulled out of the line wires.
- Posts to be set by driving or digging. If by digging, the posts shall be set at the center of the hole and the soil tamped securely on all sides.
- Longer posts than those indicated above may be required by the plans or for deeper installations.
- Concrete bases for angular steel posts (pull, corner, end and approach) shall be Class I as specified in Section 347 except that the requirements of 347-7 shall not apply. Materials for Class I concrete may be proportioned by volume and/or by weight.
- Pull post assemblies shall be installed at approximately 330' centers except that this maximum interval may be reduced by the Engineer on curves where the radius is less than 3°.
- Corner post assemblies are to be installed at all horizontal and vertical breaks in fence of 15° or more.
- A maximum length of 1320' of wire may be installed as a unit. For pulls through a pull post assembly the fabric shall be spliced by crimping sleeves only. Pulls through a corner post assembly will not be permitted.
- Unless otherwise called for in the plans gates shall be commercially available metal swing gates assembled and installed in accordance with the manufacturer's specifications as approved by the Engineer. Chain link swing gates in accordance with Index No. 452 may be substituted for metal swing gates as approved by the Engineer. Gate size is full opening width whether single leaf or double leaves. Payment for gates shall include the gate, single or double, all necessary hardware for installation and any additional length and/or size for posts at the opening. Gates shall be paid for under the contract unit price for Fence Gates, Type A, EA.
- For construction and pay purposes assemblies are defined as follows: End post assemblies shall consist of: one end post, one approach post, two braces, four diagonal tension wires and all necessary fittings and hardware. Pull post assemblies shall consist of: one pull post, two braces, four diagonal tension wires and necessary fittings and hardware. Corner post assemblies shall consist of: one corner post, two approach posts, four braces, eight diagonal tension wires and all necessary fittings and hardware.
- This index details fencing that is constructed with farm fabric 46 1/2" (47" nominal) in height and with specific ground clearance and specific barbed wire spacings, and, is to be paid for under the contract unit price for Fencing, Type A, LF. When the plans detail other combinations of materials or variation in dimensions, the fence shall be paid for under the contract unit price for Fencing, Type A, (x' Height), LF. Fencing Type A, LF, shall be inclusive of the lengths of pull, end and corner post assemblies but exclusive of gate widths. Assemblies shall be paid for as follows:
 - Corner Post Assemblies, EA.
 - Pull and End Post Assemblies, EA.

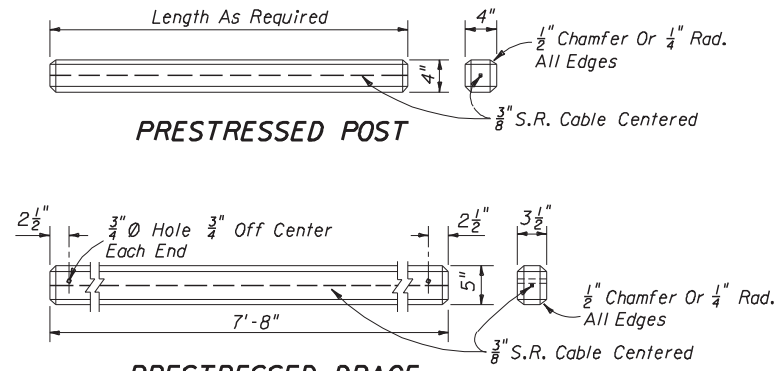


FENCE POSITION AT LOCATIONS WITHOUT FRONTAGE ROADS (REFER TO DETAIL PLANS FOR FENCE POSITION AT LOCATIONS WITH FRONTAGE ROADS)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
FENCE TYPE A				
Names	Dates	Approved By		
Designed By		State Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	451

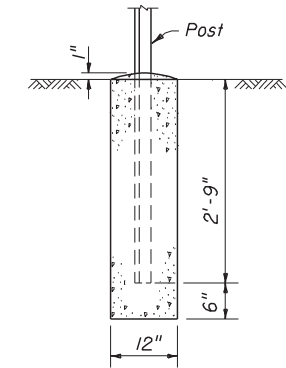


BRACE AND POST BRACE TO BRACE ON LINE BRACE TO BRACE AT CORNER
FASTENER FOR CONCRETE POST AND BRACES

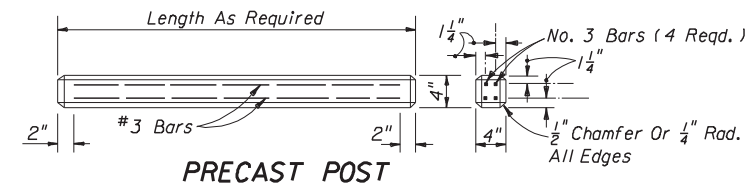


PRESTRESSED POST

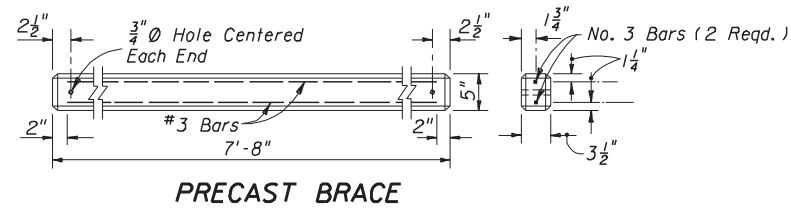
PRESTRESSED BRACE



(Pull, Corner, End And Approach Posts)
CONCRETE BASE FOR ANGULAR STEEL POST

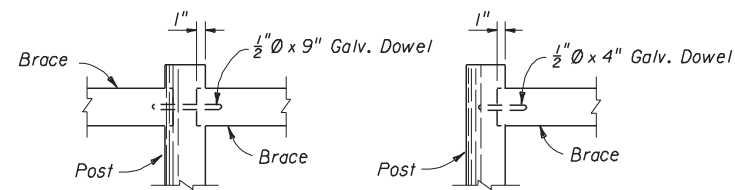


PRECAST POST

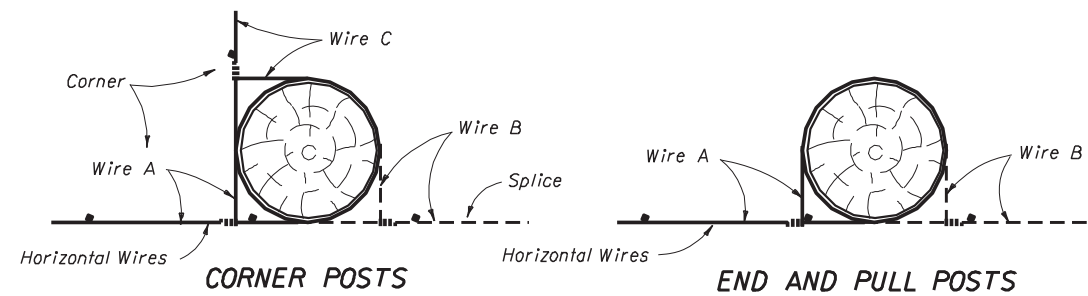


PRECAST BRACE

ALTERNATE CONCRETE POSTS AND BRACES



FASTENER FOR TIMBER POST AND BRACE



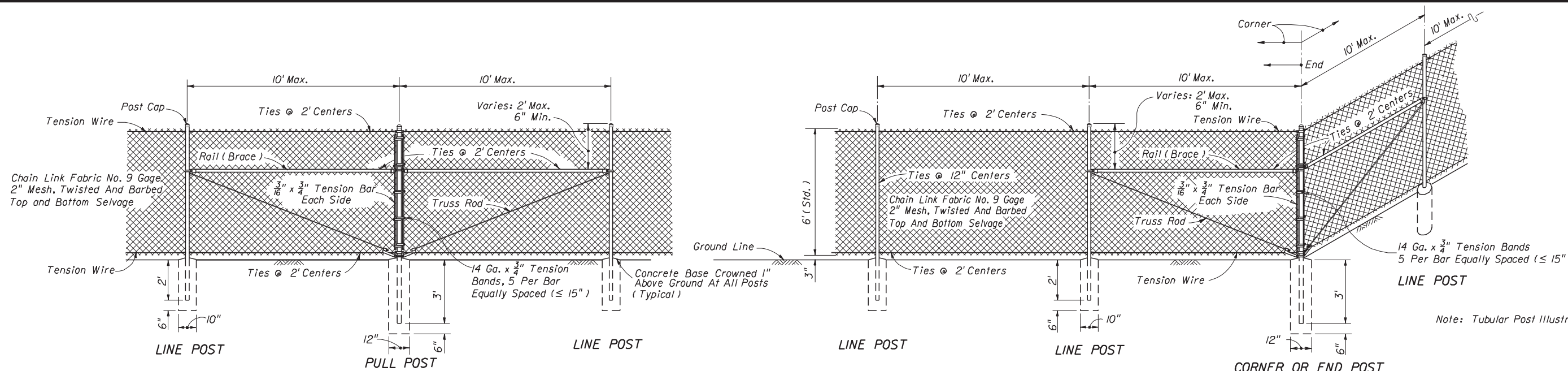
CORNER POSTS

END AND PULL POSTS

Each horizontal wire to be wrapped around corner, end and pull posts and tied to same wire. See General Notes 5 and 17. Timber post illustrated. These methods also apply to steel and concrete post illustrations.

SPLICES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
FENCE TYPE A				
Designed By	Names	Dates	Approved By	
Drawn By			State Roadway Design Engineer	
Checked By			Revision	Sheet No. / Index No.
			00	2 of 2 / 451



GENERAL NOTES

- This fence to be used generally in urban areas.
- For supplemental information refer to Sections 550 of FDOT Standard Specifications.
- Chain link fabric, posts, rails, truss rods, tension wires, tie wires, stretcher bars, gates and all miscellaneous fittings and hardware shall meet the requirements of AASHTO M181 unless otherwise specified by this index. Stipulated AASHTO and ASTM signify current reference.
- Fence Component Options:
 - Line post options:
 - Galvanized steel pipe, Schedule 40 - 1 1/2" nominal dia. zinc galvanized at the rate of 1.8 oz/sf; ASTM A53 Table X 2, ASTM F1083, and AASHTO M181.
 - Aluminum coated steel pipe; ASTM A53, X 2 Tables Schedule 40; 1 1/2" nominal dia., 1.90" O.D.; coated at the rate 0.40 oz/sf; AASHTO M181.
 - Aluminum alloy pipe - 2" nominal dia.: ASTM B241 or B221, Alloy 6063, T6.
 - Steel H-Beam - 1 1/2" x 1 1/2": Zinc Galv. 1.8 oz/sf; AASHTO M181 and Detail.
 - Aluminum alloy H-Beam - 1 1/2" x 1 1/2": Detail.
 - Steel C - 1 1/8" x 1 1/8": Galv.: 1.8 oz/sf zinc; AASHTO M181; or, 0.9 oz/sf zinc - 5% aluminum-mischmetal; ASTM F1043 and Detail.
 - Resistance welded steel pipe; 50,000 psi min. yield strength ASTM A569/A569M, A653/A653M or undepleted stock of discontinued A446/A446M base materials; ASTM F669 Group IV (Alternative Design); fence industry 2" O.D., 1 1/2" NPS, 1.900" dec. equiv., 0.120" min. wall thick. and min. wt. 2.28 lb/ft; with ASTM F1043 metric equivalent internal coating Types A, B, C or D and external coating Types A, B, or C; the chromate conversion coating of external Type B shall have a thickness of 15 μg/in² min. and the polymer film topcoat shall have a thickness of 0.0003" min.; internal and external coatings are not restricted to the combinations of Table 2, ASTM F1043.
 - Corner, end, and pull post options:
 - Galvanized steel pipe, Schedule 40 - 2" nominal dia. zinc galvanized at the rate of 1.8 oz/sf; ASTM A53 Table X 2, ASTM F1083, and AASHTO M181.
 - Aluminum coated steel pipe; ASTM A53 steel, X 2 Tables Schedule 40; 2" nominal dia., 2.375" O.D.; coated at the rate 0.40 oz/sf; AASHTO M181.
 - Aluminum alloy pipe - 2 1/2" nominal dia.: ASTM B241 or B221, Alloy 6063, T6.
 - Resistance welded steel pipe; 50,000 psi min. yield strength ASTM A569/A569M, A653/A653M or undepleted stock of discontinued A446/A446M base materials; ASTM F669 Group IV (Alternative Design); fence industry 2 1/2" O.D., 2" NPS, 2.375" dec. equiv., 0.130" min. wall thick. and min. wt. 3.117 lb/ft; with ASTM F1043 metric equivalent internal coating Types A, B, C or D and external coating Types A, B, or C; the chromate conversion coating of external Type B shall have a thickness of 15 μg/in² min. and the polymer film topcoat shall have a thickness of 0.0003" min.; internal and external coatings are not restricted to the combinations of Table 2, ASTM F1043.
 - Rail options:
 - Galvanized steel pipe, Schedule 40 - 1 1/2" nominal dia. zinc galvanized at the rate of 1.8 oz/sf; ASTM A53 Table X 2, ASTM F1083, and AASHTO M181.
 - Aluminum coated steel pipe; ASTM A53 steel, X 2 Tables Schedule 40; 1 1/2" nominal dia., 1.660" O.D.; coated at the rate 0.40 oz/sf; AASHTO M181.
 - Aluminum alloy pipe - 1 1/2" nominal dia.: ASTM B241 or B221, Alloy 6063, T6.
 - Resistance welded steel pipe; 50,000 psi min. yield strength ASTM A569/A569M, A653/A653M or undepleted stock of discontinued A446/A446M base materials; ASTM F669 Group IV (Alternative Design); fence industry 1 1/2" O.D., 1 1/2" NPS, 1.660" dec. equiv., 0.111" min. wall thick. and min. wt. 1.836 lb/ft; with ASTM F1043 metric equivalent internal coating Types A, B, C or D and external coating Types A, B, or C; the chromate conversion coating of external Type B shall have a thickness of 15 μg/in² min. and the polymer film topcoat shall have a thickness of 0.0003" min.; internal and external coatings are not restricted to the combinations of Table 2, ASTM F1043.
- Chain link fabric options (2" mesh with twisted and barbed selvsage top and bottom for all options except as described in Note No. 10):
 - AASHTO M181 Type I - Zinc Coated Steel, No. 9 gage (coated wire diameter), coated at the rate of 1.8 oz/sf (M181 Class D 2.0 oz/sf modified to 1.8 oz/sf).
 - AASHTO M181 Type II - Aluminum Coated Steel, No. 9 gage (coated wire diameter), coated at the rate of 0.40 oz/sf.
 - AASHTO M181 Type IV - Polyvinyl Chloride (PVC) Coated Steel, No. 9 gage (coated core wire diameter), core wire-zinc coated steel. PVC coating: M181 Class A (either extruded or extruded and bonded) or Class B (bonded). See table right.
- Tension wire options:
 - Steel wire No. 7 gage zinc galvanized at the rate of 1.2 oz/sf; AASHTO M181.
 - Aluminum alloy wire with a diameter of 0.1875" or larger conforming to the requirements of ASTM B211, Alloy 5056 Temper H38, or, Alclad Alloy 5056 Temper H192.
 - Aluminum coated steel wire No. 7 gage coated at the rate of 0.40 oz/sf; AASHTO M181.
- Tie wire and hog ring options:
 - Steel wire No. 9 gage zinc galvanized at the rate of 1.2 oz/sf.
 - Aluminum alloy wire with a diameter of 0.1443" or larger conforming to the requirements of ASTM B211, Alloy 5056 Temper H38, or, Alclad Alloy 5056 Temper H192.
 - Aluminum coated steel wire No. 7 gage coated at the rate of 0.40 oz/sf.
- Unless a specific material is called for in the plans the Contractor may elect to use either a single type of material or a combination of material types from the component options listed above. Combinations of optional materials are restricted as follows: (a) Only one fabric optional material will be permitted between corner and/or end post assemblies. (b) Only one line post optional material will be permitted between corner and/or end post assemblies. (c) Pull post assemblies shall be optional materials identical to either the line post optional material or the corner and end post assembly optional material; but, pull post assemblies shall be the same optional material between any set of corner and/or end post assemblies.
- Concrete for bases shall be either Class I concrete or 'Sackcrete' premix. Class I concrete shall be as specified in Section 347 of the Standard Specifications except the requirements contained in 347-7 shall not apply. Materials for Class I concrete may be proportioned by volume and/or by weight.
- Line posts are to be set in concrete as detailed above or by the following methods:
 - In accordance with special details and/or as specifically described in the contract plans and specifications.
 - In accordance with ASTM F567 Subsections 4.4 through 4.7 and 4.9 and 4.10 as approved by the Engineer.
 - In soils that are firm, well drained and suitable for full stable embedment any of the optional steel posts may be driven in locations approved by the Engineer. Driving will not be permitted in sandy soils. Driven posts shall be set to a minimum depth of 3' for fences up through 6' in height, and, for each 1' of fence height above 6' the posts shall be set an additional 6" in depth. Posts shall be protected to prevent damage from driving. Damaged posts shall be repaired or removed and replaced as directed by the Engineer without additional cost to the Department.
 - Posts mounted on concrete structure or solid rock shall be mounted in accordance with the base plate detail "Fence Mounting On Concrete Endwalls And Retaining Wall", Sheet 2; or, by embedment in accordance with ASTM F567 Subsection 4.5.
 End, pull and corner post assemblies shall be set in concrete as detailed above for all soil conditions other than solid rock. Posts within assemblies that are located on concrete structures or solid rock shall be set by base plate or by embedment as prescribed under (b) above for line posts. Line and assembly posts set in concrete bases shall be set an additional 3" in depth for each 1' of fence height greater than 6'.
- Pull posts shall be used at breaks in vertical grades of 15° or more, or at approximately 350' centers except that this maximum interval may be reduced by the Engineer on curves where the curve is greater than 3°.
- Corner posts are to be installed at all horizontal breaks in fence at 15° or more and as required at vertical breaks over 15° as determined by the Engineer.
- When fence has an installed top of fabric height less than 6', knuckled top and bottom selvages shall be used unless the plans specifically identify locations for twisted selvage fabrics.
- Unless sliding gates or special gates are called for in the plans, all gates shall be chain link swing gates meeting the material requirements described above as approved by the Engineer. Payment shall include the gates, single or double, all necessary hardware for installation and any additional length and/or size for posts at the opening. Gates shall be paid for under the contract unit price for Fence Gates, Type B, EA.
- Line posts, tension wires, chain link fabric, tie wires, Class I concrete, and all miscellaneous fittings and hardware to be included in the cost for Fencing Type B, LF. Fence having other height, line components and/or barbed wire attachments shall be paid for under the contract unit price for Fencing Type B (), LF. Corner post assemblies shall consist of one corner post, two braces, two truss rods, and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for Corner Post Assembly (Type B Fence), EA. End post assemblies shall consist of one end post, one brace, one truss rod and all necessary fittings and hardware as detailed above and shall be paid for under the contract unit price for End Post Assembly (Type B Fence), EA.

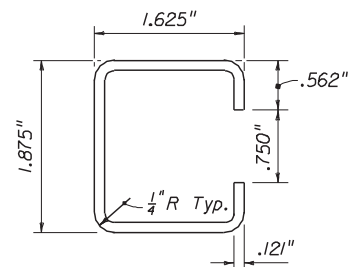
TYPE IV VINYL COATED FABRIC								
Specification Section 966 And AASHTO M181 Table 4 Redefined As Follows								
Specified Diameter Of Metallic Coated Core Wire		Minimum Weight Of Zinc Coating		PVC Thickness Range				
				M181 Class A (Extruded Or Extruded And Bonded Coating)		M181 Class B (Bonded Coating)		
in.	mm	gage	oz/sf	g/m ²	in.	mm	mm	
0.148	3.77	9	0.30	92	0.015 to 0.025	0.38 to 0.64	0.006 to 0.010	0.15 to 0.25

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

FENCE TYPE B

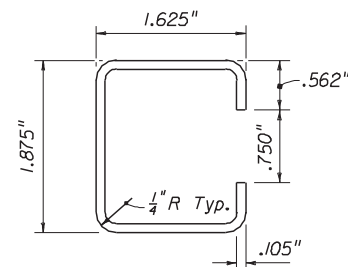
Names	Dates	Approved By
Designed By		[Signature]
Drawn By		State Roadway Design Engineer
Checked By		Revision
		Sheet No.
		Index No.
	00	1 of 2
		452

conf.



Galv. Wt. Per. Ft. = 2.34# ±5%
Yield p.s.i. (Min.) 45,000

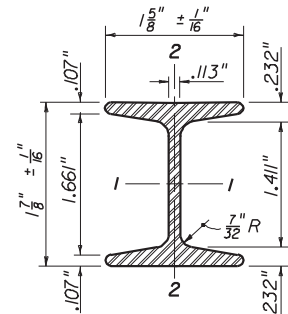
STANDARD WALL



Galv. Wt. Per. Ft. = 1.85# ±5%
Yield p.s.i. (Min.) 45,000

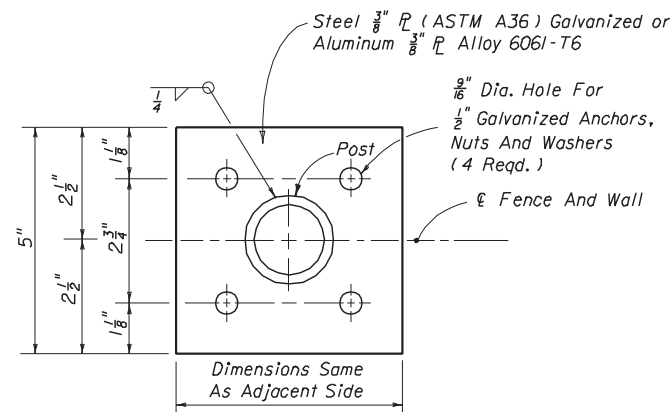
THINWALL

OPTIONAL "C" LINE POST

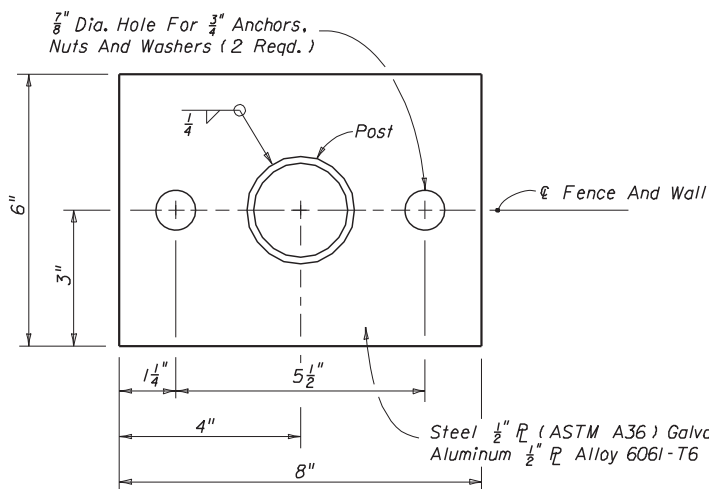


	STEEL	ALUMINUM
Area (Sq. In.)	724	724
Weight (Lb./Ft.)	2.72 ±5% (Galv.)	0.91 ±5%
Surface Area (SF/Ft.)	.776	.776
Tensile Strength (psi Min.)	80,000	30,000
Yielding Point (psi Min.)	48,000	25,000
Axes	Axes	
	1-1 2-2	1-1 2-2
Moment Of Inertia	.428 .101	.428 .101
Section Modulus	.456 .124	.456 .124
Rad. Of Gyration	.779 .373	.779 .373

OPTIONAL 1 7/8" x 1 5/8" H-BEAM LINE POST

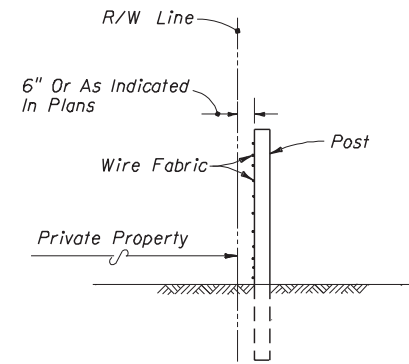


TOP VIEW
FOUR ANCHOR OPTION

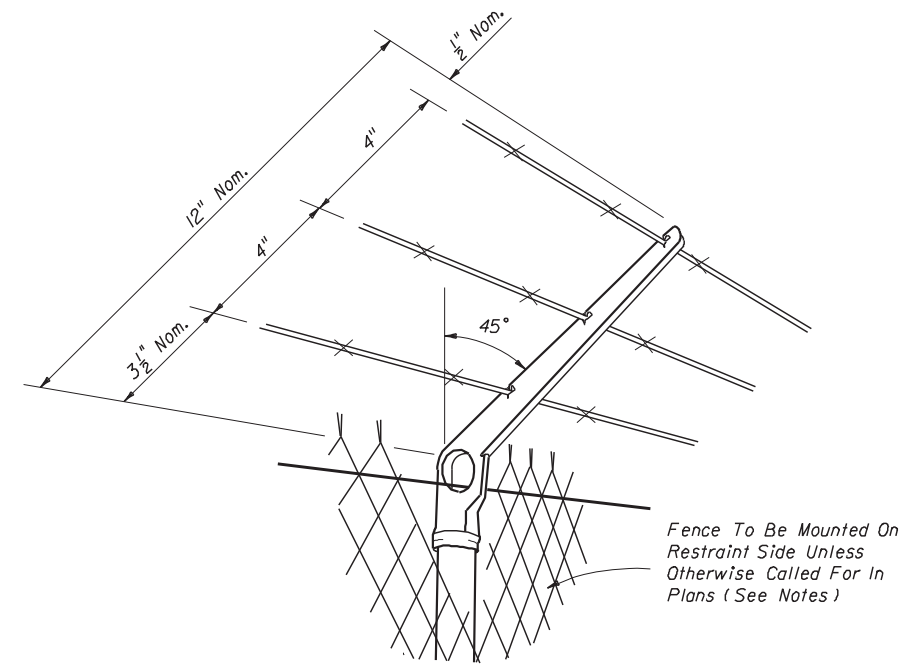


TOP VIEW
TWO ANCHOR OPTION

FENCE MOUNTING ON CONCRETE ENDWALL AND RETAINING WALLS



FENCE POSITION AT LOCATIONS WITHOUT FRONTAGE ROADS
(REFER TO DETAIL PLANS FOR FENCE POSITION AT LOCATIONS WITH FRONTAGE ROADS)



NOTES

Attachments to be used only when called for in the plans.
Attachments to extend in direction of restraint. Unless otherwise called for in plans, direction of restraint will be as follows:

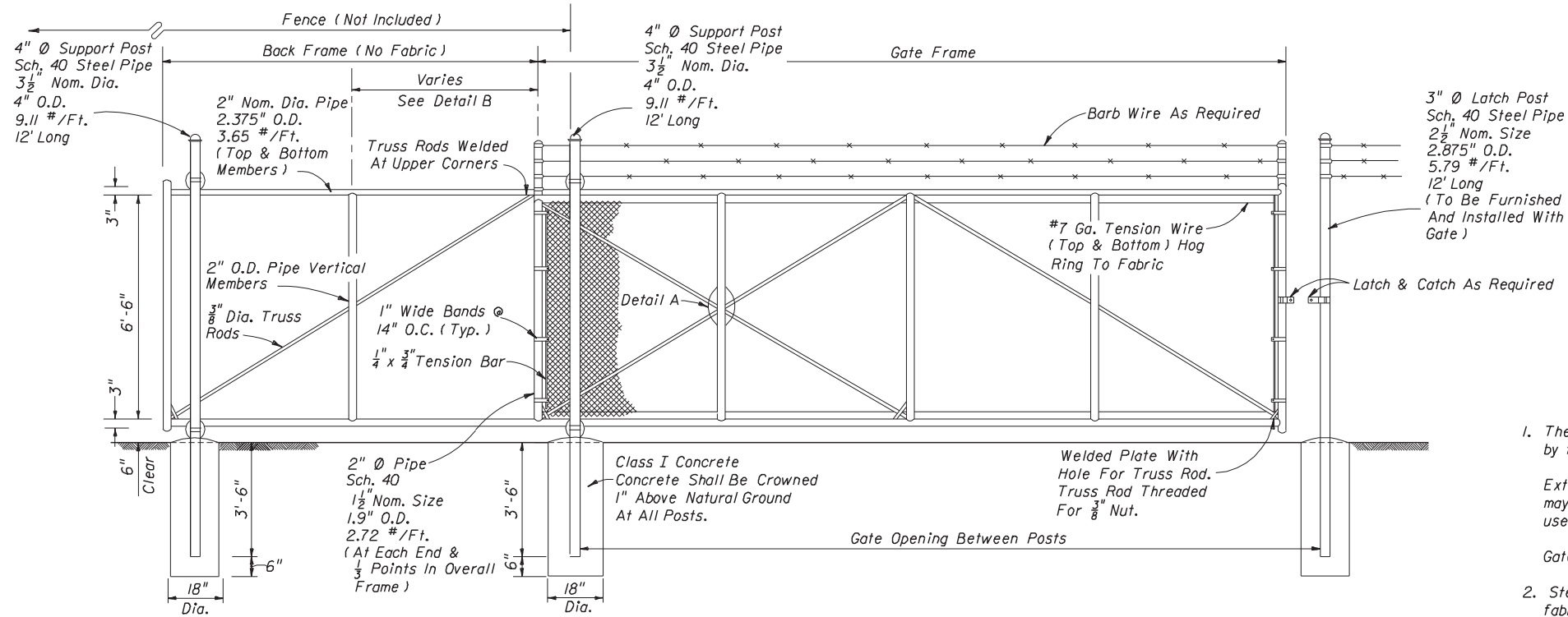
- Outward on limited access right of way line.
- Outward on controlled access right of way line.
- Outward from utilities and hazardous facilities located within highway right of way.
- Outward from lateral ditches, outfalls, retention basins, canals, borrow areas and similar support facilities.
- Inward on pedestrian ways.

The cap-arm shall be designed to provide a drive fit over the top of posts and to exclude moisture in posts with tubular sections.
Attachments to be paid for under the contract unit price for Fencing, Type B (With Barb Wire Attachment) LF.

BARB WIRE ATTACHMENT

- BASE PLATE AND ANCHOR NOTES:**
- Base plate identical for line, pull, end and corner posts and shall be considered an integral part of the respective posts for basis of payment.
 - Post to be plumbed by grout shim under base plate.
 3. Anchors (Galvanized Steel):
12" Cast In Place, 10 1/2" Embedment:
Headed Bolts, U-Bolts or Cluster Plates.
8" Adhesive Anchors, 6" Min. Embedment.*
*Adhesive anchors shall be headless anchor bolts set in drilled holes with an Adhesive Material System in accordance with Specification Sections 416 and 937; drilled holes shall be 1/8" larger in diameter than the anchor bolt.
Expansion Bolts Not Permitted.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
FENCE TYPE B				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 2	452



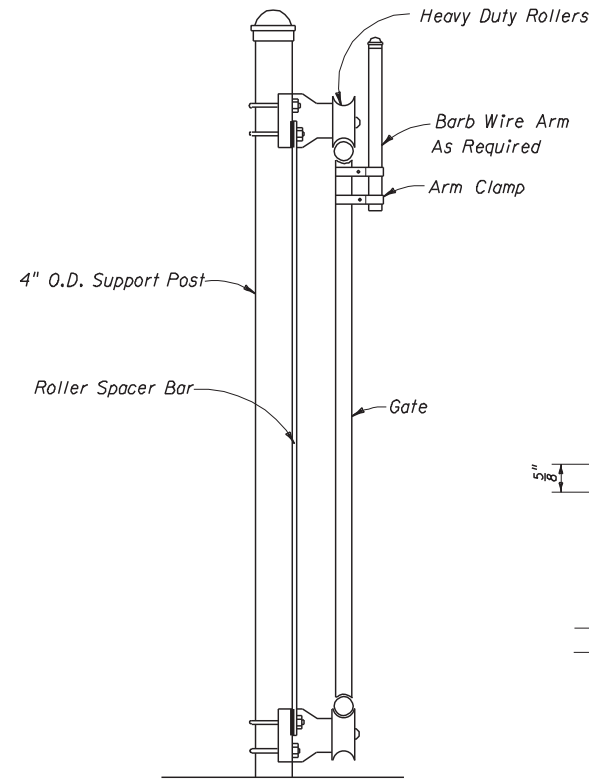
FRONT ELEVATION

GENERAL NOTES

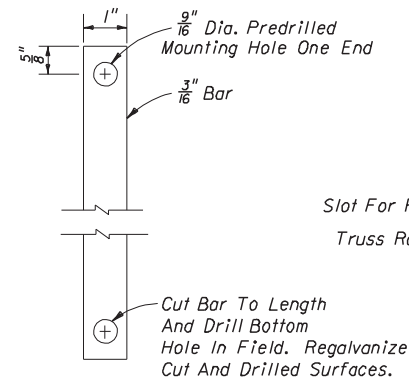
- The Contractor may substitute any equivalent cantilever slide gate approved by the Engineer.

Extruded, rolled or formed components that provide equal strength and stability may be used in lieu of the pipe components shown; and, internal rollers may be used in lieu of the external roller units shown.

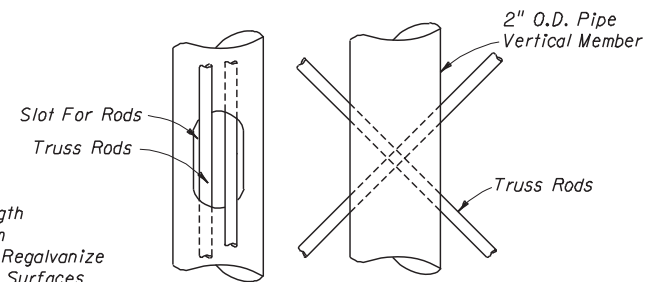
Gate components shall meet or exceed the protective coatings specified on Index No. 452.
- Steel gate frame shall be fabricated prior to galvanizing, except that truss rods may be galvanized following frame galvanizing provided surfaces damaged during welding are galvanized in accordance with Section 24 of AASHTO M36; or, fabricated from pipe components with protective coating meeting the requirements of Index No. 452 that are tolerant of welding (low burn back), and a protective coating applied to the weld and damaged pipe surfaces that is equivalent to the protective coating of the fabricated pipe stock.
- All fabric shall be knuckled top and bottom selvages.
- Cost of all gate components shall be included in the contract unit price for Sliding Fence Gate (Cantilever), EA.



SUPPORT POST DETAIL

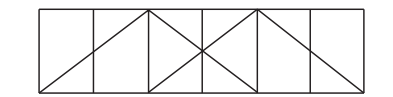


ROLLER SPACER BAR

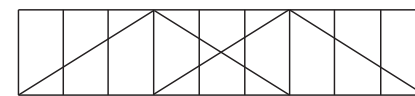


DETAIL A

GATE OPENING	GATE FRAME	BACK FRAME
12'	12'-3"	6'
16'	16'-3"	8'
20'	20'-3"	10'
24'	24'-3"	12'



TYPICAL FRAME - 12', 16' & 20' Opening



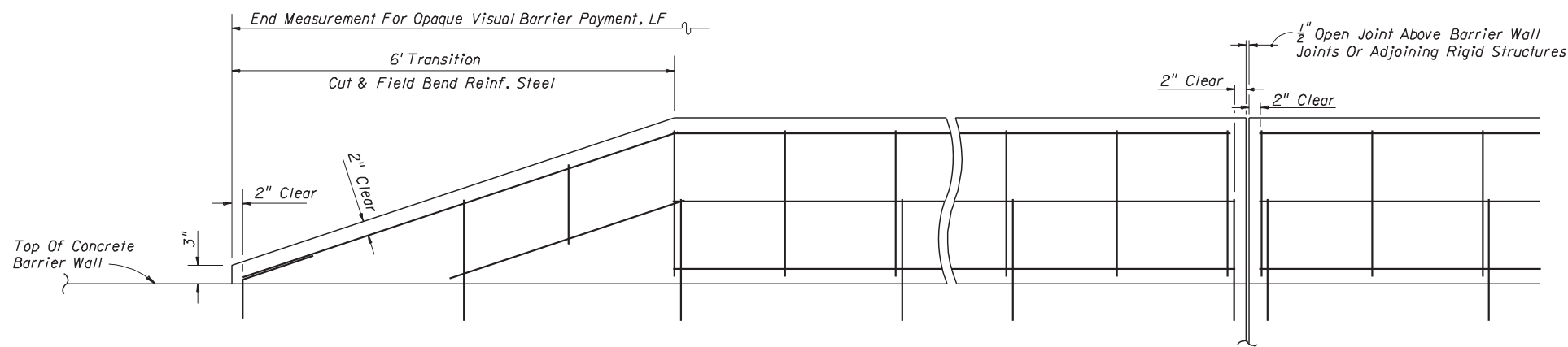
TYPICAL FRAME - 24' Opening

DETAIL B

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

CANTILEVER SLIDE GATE
TYPE B FENCE

Names	Dates	Approved By <i>Bob J. [Signature]</i>		
Designed By		State Roadway Design Engineer		
Drawn By	HDD 9/78	Revision	Sheet No.	Index No.
Checked By	LMF 9/78	00	1 of 1	453



ELEVATION OF REINFORCEMENT AND DOWELING

GENERAL NOTES

1. The opaque visual barrier is intended to function as a visual screen, and is not intended to resist vehicle impact loads nor to restrain, contain or restrict vehicles or cargo. The barrier is designed to withstand zone wind loading and strikes by light debris; and, designed to yield to exceptional strikes by vehicles or cargo, and to contain ruptured segments of the screen when yielding to such strikes.
2. When the opaque visual barrier is constructed on an existing barrier wall, dowels shall be 1'-8" in length, embedded 6" into the barrier wall and set with an approved chemical grout. Embedment holes shall be 5/8" diameter, drilled to a depth 1/4" below the tip of the dowel unless greater depth is required to accept manufactured grout capsules.

When the opaque visual barrier is constructed in conjunction with project concrete barrier walls, dowels may be set as described above, in either the drilled or preformed the drilled or preformed holes; or, placed when the barrier wall is cast. For dowels that are placed when the wall is cast, the dowel shall be 2'-2" in length and embedded to a depth of 12".

3. For both double and single faced concrete barrier walls the opaque visual barrier is to be located in the center of the top of the wall.

For single faced barrier walls that are constructed around other vertical structure, the opaque visual barrier shall follow the alignments of only one of the walls and be centered atop that wall.

For dual median barrier walls that follow differential profiles, the opaque visual barrier shall be constructed atop the wall with the higher elevation, unless conditions dictate otherwise. Lateral transitions or end overlaps for opaque visual barriers that alternate between dual walls shall be detailed in the plans.

For median barrier walls that are divided when connecting to separated bridges, the opaque visual barrier shall be constructed atop the approach side barrier wall, unless differential profiles dictate locating the opaque visual barrier on the departure side barrier wall.

Opaque visual barriers to be located on capped fills between dual barrier walls shall be detailed in the plans.

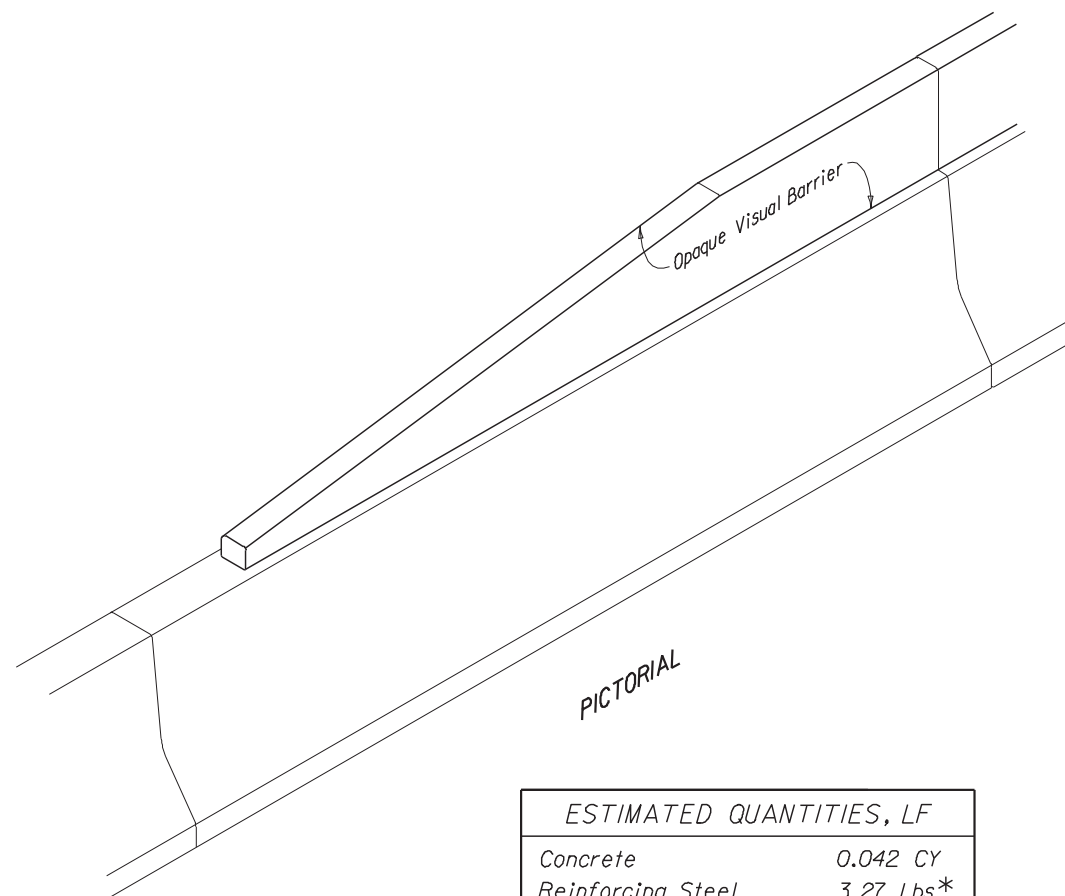
4. In lieu of the reinforcement shown the Contractor may substitute welded wire fabric equal to or better than that shown, when approved by the Engineer. Details shall be submitted with requests for substitution.

5. The Contractor may construct contiguous precast concrete panels in lieu of the cast-in-place opaque screen when approved by the Engineer. Panel design and method for anchorage to the barrier wall shall be detailed by shop drawings when requesting the Engineers approval.

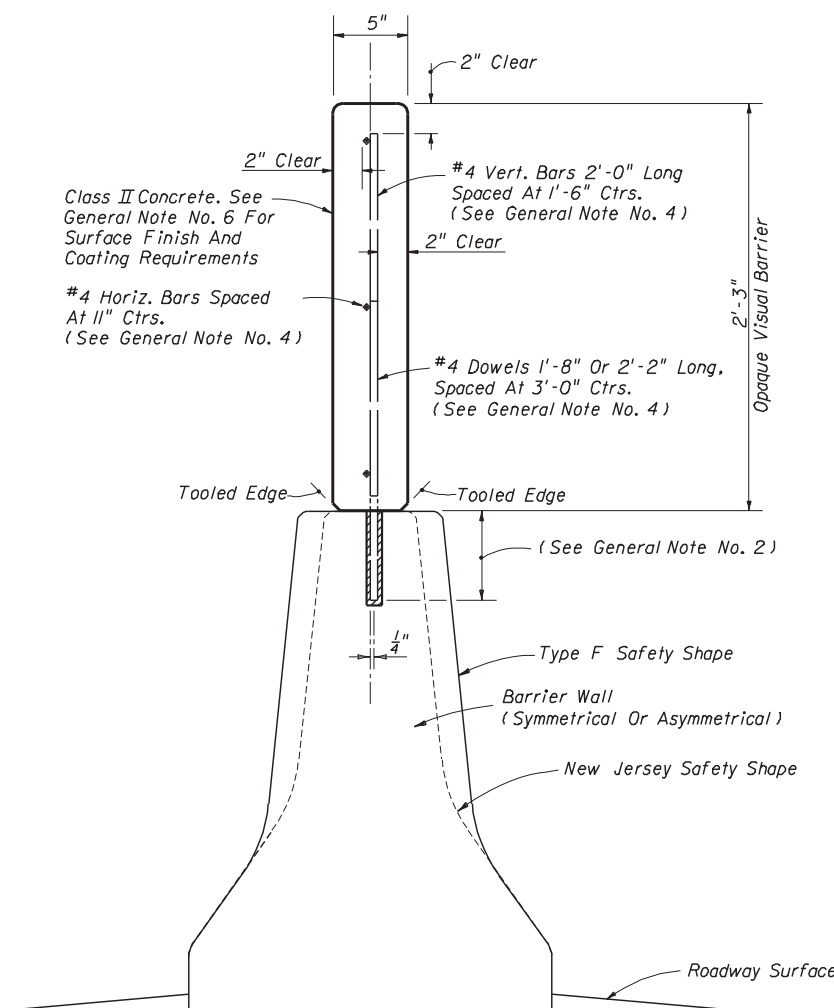
The Contractor may construct the opaque screen monolithically with the barrier wall, however, the screen design shall not be modified so as to cause the wall to be dynamically active from strikes on the screen; see design considerations in Note No. 1 above.

6. Exposed concrete surfaces shall have a Class 3 surface finish in accordance with Section 521 of the Standard Specification, unless other finish called for in the plans. The surfaces shall have a Class 5 Applied Finish Coating in accordance with Section 400 only when called for in the plans.

7. Payment for opaque visual barrier shall be full compensation for concrete, reinforcement, dowels, casting, placement, drilling, grouting, tooling, finishing and work incidental thereto, and shall be paid for under the contract unit price for Opaque Visual Barrier (Concrete) (2'-3" Height), LF.



ESTIMATED QUANTITIES, LF	
Concrete	0.042 CY
Reinforcing Steel	3.27 Lbs*
*3.38 Lbs. With 2'-2" Dowels	



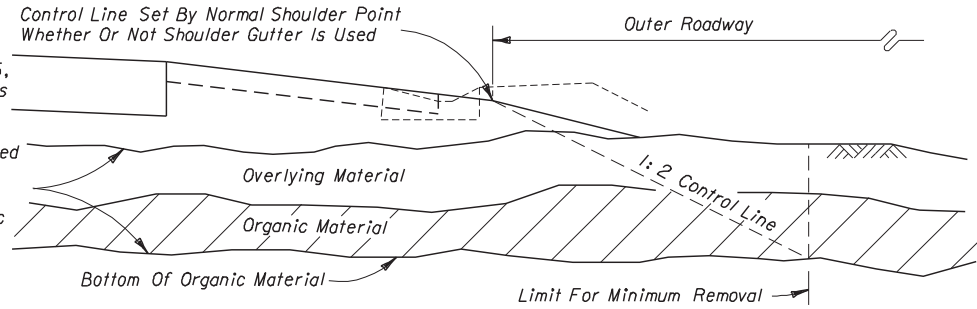
END VIEW

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

OPAQUE VISUAL BARRIER

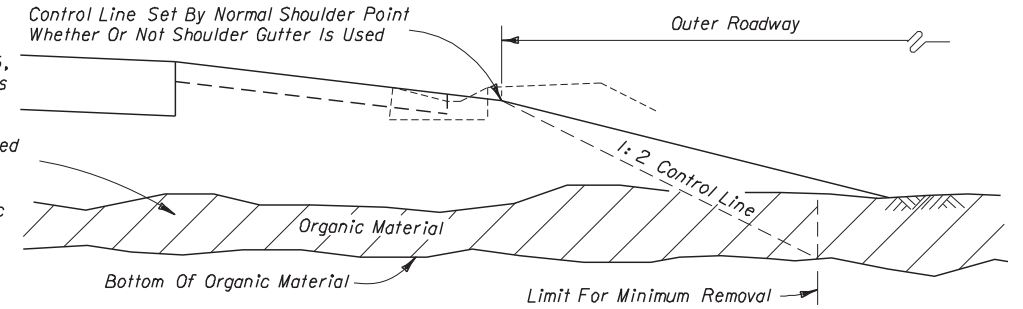
Names	Dates	Approved By		
Designed By	DCR, JWG	9/87	 State Roadway Design Engineer	
Drawn By	JBW	9/87		
Checked By	DCB JVC	9/87		
Revision	00	Sheet No.	1 of 1	Index No.
				461

Remove Overlying Material And Organic Material Within The Limits Shown And Backfill In Accordance With Index No. 505, Unless Otherwise Called For In The Plans Or Directed Otherwise By The District Geotechnical Engineer; The Limits Include Full Median Width When Applied To Divided Facilities With Median Widths Up To 64'; When Median Width Is Greater Than 64' And For Bifurcated Roadways The Organic Material Removal Limits Will Be Set By A 1:2 Control Line Complimentary To The Outer Roadway That Will Accomodate One Future Median Lane On Each Roadway Unless Specified Otherwise By The Plans.



WITH OVERBURDEN - HALF SECTION

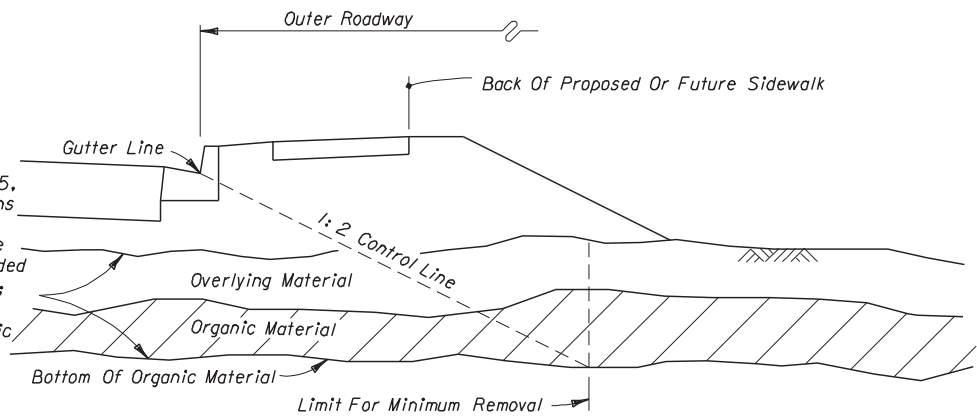
Remove Overlying Material And Organic Material Within The Limits Shown And Backfill In Accordance With Index No. 505, Unless Otherwise Called For In The Plans Or Directed Otherwise By The District Geotechnical Engineer; The Limits Include Full Median Width When Applied To Divided Facilities With Median Widths Up To 64'; When Median Width Is Greater Than 64' And For Bifurcated Roadways The Organic Material Removal Limits Will Be Set By A 1:2 Control Line Complimentary To The Outer Roadway That Will Accomodate One Future Median Lane On Each Roadway Unless Specified Otherwise By The Plans.



WITHOUT OVERBURDEN - HALF SECTION

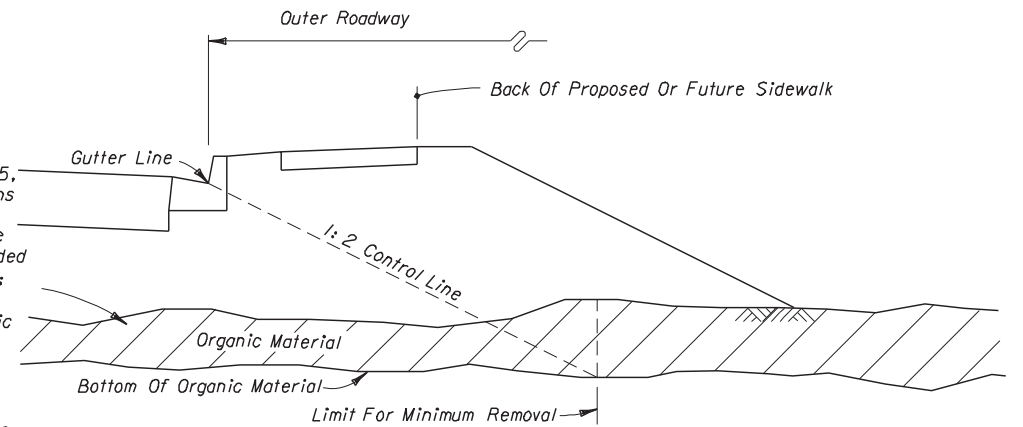
IN RURAL CONSTRUCTION

Remove Overlying Material And Organic Material Within The Limits Shown And Backfill In Accordance With Index No. 505, Unless Otherwise Called For In The Plans Or Directed Otherwise By The District Geotechnical Engineer; The Limits Include Full Median Width When Applied To Divided Facilities With Median Widths Up To 64'; When Median Width Is Greater Than 64' And For Bifurcated Roadways The Organic Material Removal Limits Will Be Set By A 1:2 Control Line Complimentary To The Outer Roadway That Will Accomodate One Future Median Lane On Each Roadway Unless Specified Otherwise By The Plans.



WITH OVERBURDEN - HALF SECTION

Remove Overlying Material And Organic Material Within The Limits Shown And Backfill In Accordance With Index No. 505, Unless Otherwise Called For In The Plans Or Directed Otherwise By The District Geotechnical Engineer; The Limits Include Full Median Width When Applied To Divided Facilities With Median Widths Up To 64'; When Median Width Is Greater Than 64' And For Bifurcated Roadways The Organic Material Removal Limits Will Be Set By A 1:2 Control Line Complimentary To The Outer Roadway That Will Accomodate One Future Median Lane On Each Roadway Unless Specified Otherwise By The Plans.



WITHOUT OVERBURDEN - HALF SECTION

IN URBAN CONSTRUCTION

REMOVAL OF ORGANIC MATERIAL

GENERAL NOTES

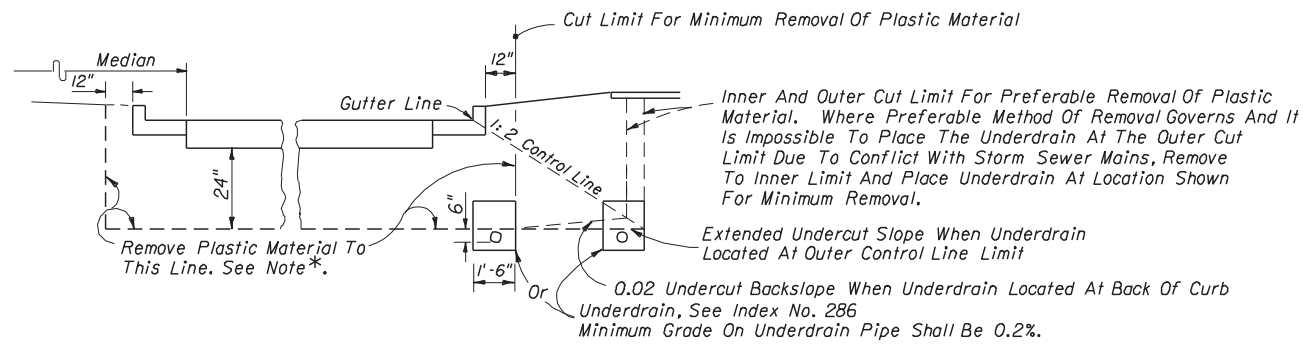
- All details shown on this index for removal of organic and plastic materials apply unless otherwise shown on the plans.
- Utilization of excavated materials shall be in accordance with Index No. 505.
- Where organic or plastic material is undercut, backfill shall be made of suitable material in accordance with Index No. 505, unless otherwise shown on the plans.
- The term "Plastic Material" used in this index in conjunction with removal of plastic soil is as defined under soil classifications for Plastic (P) and High Plastic (H) on Index No. 505.
- The term "Organic Material" as used on this index is defined as any soil which has an average organic content greater than five (5.0) percent, or an individual organic content test result which exceeds seven (7.0) percent. Organic material shall be removed as shown on this index and the plans unless directed otherwise by the District Geotechnical Engineer.
- The normal depth of side ditches shall be 3.5' below the shoulder point except in special cases.
- In municipal areas, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain filter material will not extend above the bottom of the stabilized section of the subgrade. Gradation of the filter material shall conform to FDOT specifications. Minimum grade on underdrain pipe shall be 0.2%.
- See Index No. 506 for miscellaneous earthwork details.

DESIGN NOTES

- At locations where organic material or other soft soil deposits persists to such depth that removal is impractical, the construction of a geosynthetic foundation over those soils should be considered. The Engineer of Record should request guidance from the District Geotechnical Engineer and make a geosynthetic foundation design in accordance with Index No. 501 when pursuing geosynthetic alternates.
- The designer shall take into consideration the expectancy of roadway widening to the outside, and where widening is anticipated specify in the plans the limits of removal of organic and plastic materials necessary to accommodate anticipated widening.

Average organic content shall be determined from the test results from a minimum of three randomly selected samples from each stratum. Tests shall be performed in accordance with FM 1-T267 on the portion of a sample passing the No. 4 sieve.

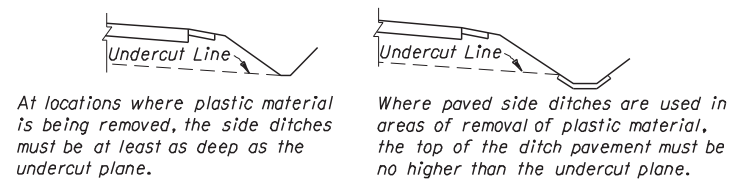
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
REMOVAL OF ORGANIC AND PLASTIC MATERIAL				
Designed By	GEOTECH	9/93	Approved By <i>[Signature]</i>	
Drawn By	HKH	9/93	State Geotechnical Engineer	
Checked By	BTD/FLS	9/93	Revision	00
			Sheet No.	1 of 2
			Index No.	500



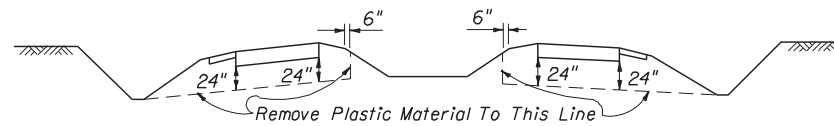
HALF SECTION

NOTES: Refer to roadway cross sections to determine whether minimum or preferable removal is used.
 *Where frequency of median breaks indicates that it is impractical to leave plastic material in the median, the designer may elect to indicate total removal of this material.
 If during construction it becomes apparent, due to normal required construction procedures, that it is impractical to leave the plastic material in the median, total removal of this material shall be approved by the Engineer.

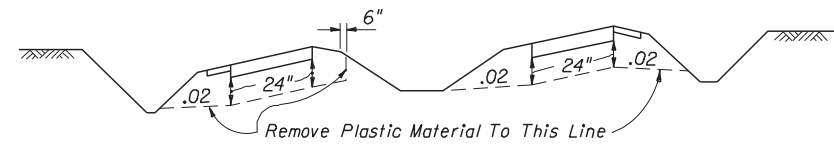
REMOVAL OF PLASTIC MATERIAL AND LOCATION OF UNDERDRAIN IN URBAN CONSTRUCTION



MISCELLANEOUS DETAILS

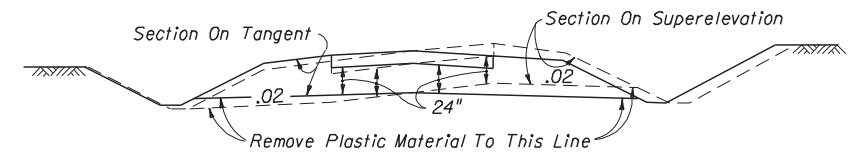


TYPICAL CUT SECTION ON TANGENT



TYPICAL CUT SECTION ON SUPERELEVATION

REMOVAL OF PLASTIC MATERIAL ON INTERSTATE FACILITIES, FREEWAYS, DIVIDED ARTERIALS AND MAJOR COLLECTORS HAVING DEPRESSED MEDIANS



TYPICAL CUT SECTION

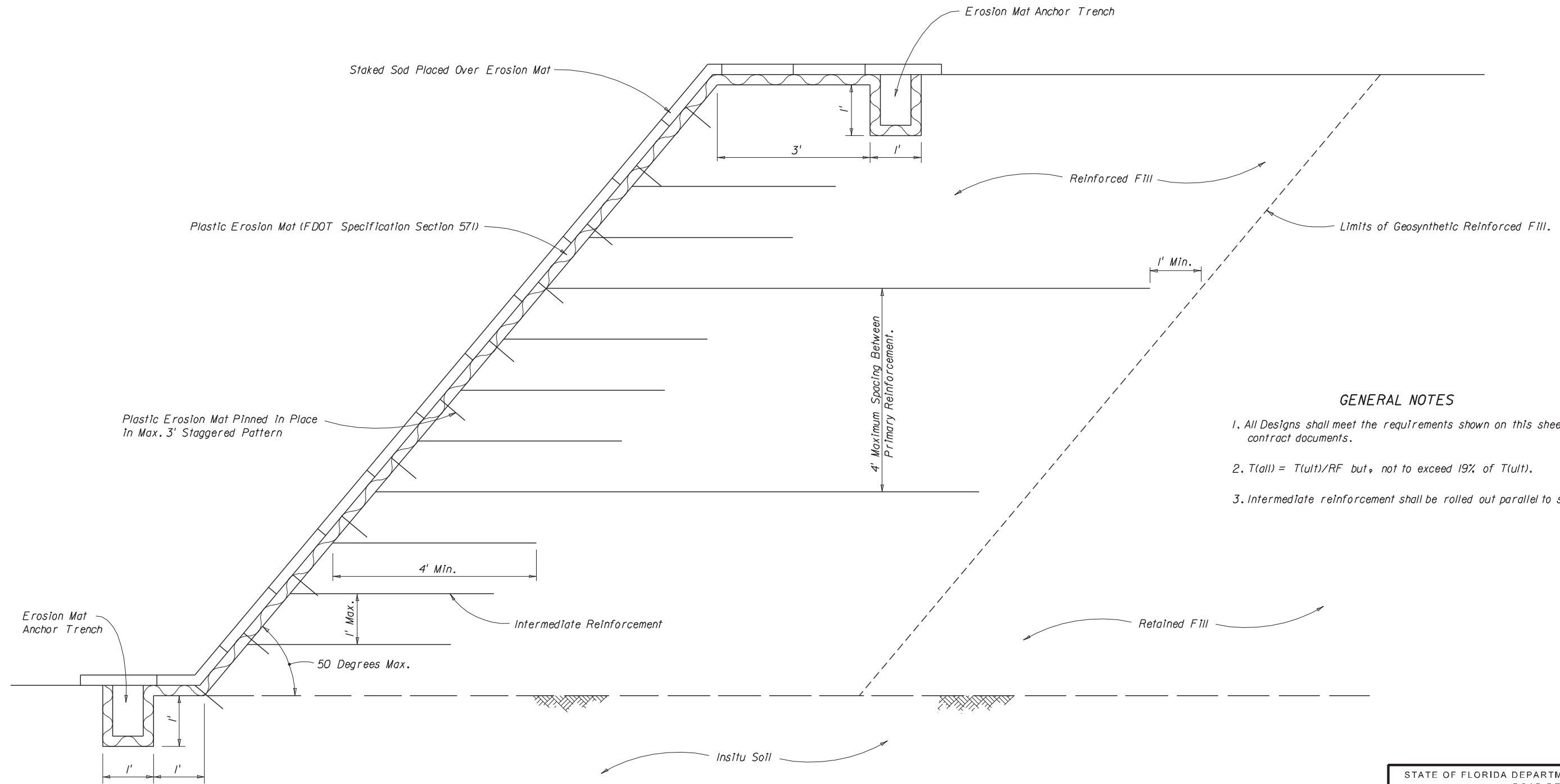
Note: When this detail is applied to minor collectors and local facilities, the undercut may be reduced to 18".

REMOVAL OF PLASTIC MATERIAL ON DIVIDED FREEWAYS, ARTERIALS AND MAJOR COLLECTORS HAVING FLUSH MEDIANS, AND, ON UNDIVIDED ARTERIALS AND MAJOR COLLECTORS

REMOVAL OF PLASTIC MATERIAL

Note: For GENERAL NOTES see Sheet 1.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
REMOVAL OF ORGANIC AND PLASTIC MATERIAL				
Names	Dates	Approved By		
Designed By	ZGH/WNL	05/91	State Geotechnical Engineer	
Drawn By	HKH	05/91	Revision	Sheet No.
Checked By	JVC/WNL	05/91	00	2 of 2
				Index No. 500

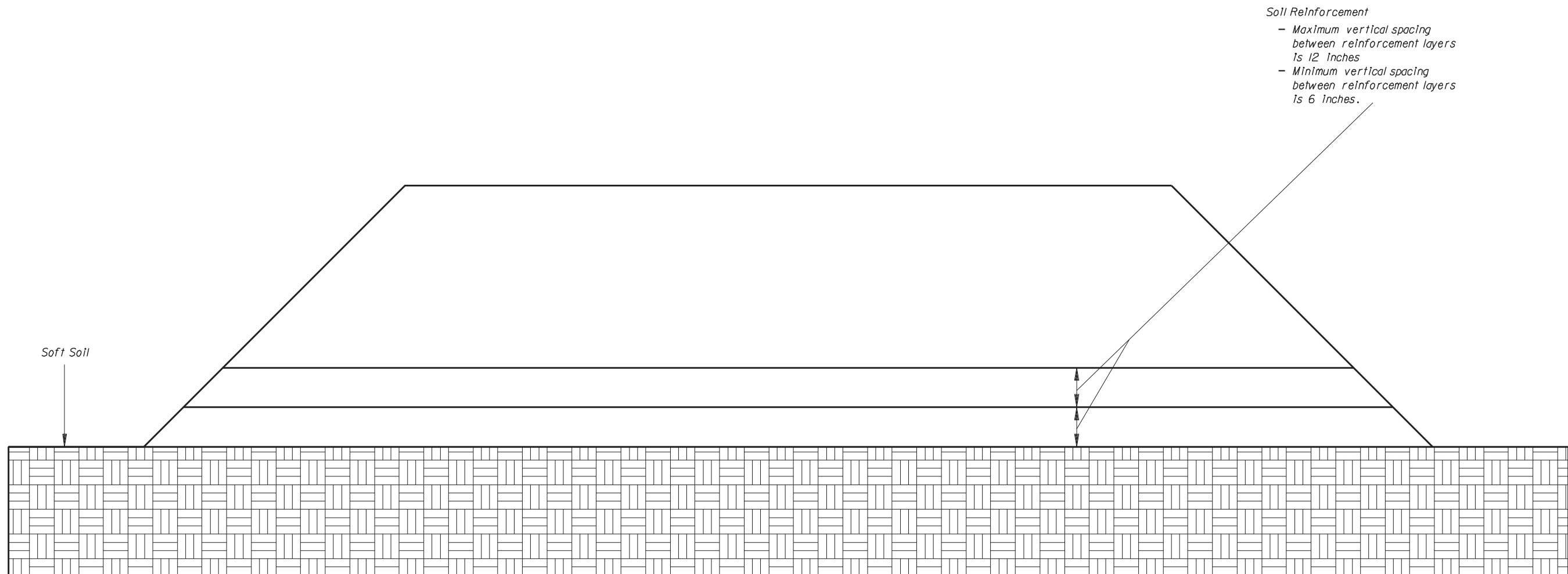


GENERAL NOTES

1. All Designs shall meet the requirements shown on this sheet and the contract documents.
2. $T(alt) = T(ult)/RF$ but, not to exceed 19% of $T(ult)$.
3. Intermediate reinforcement shall be rolled out parallel to slope face.

GEOSYNTHETIC REINFORCED SOIL SLOPES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By		
Designed By	PDP 07/99	State Geotechnical Engineer		
Drawn By	SM 07/99	Revision	Sheet No.	Index No.
Checked By	PWL 08/99	00	1 of 8	501



Soil Reinforcement

- Maximum vertical spacing between reinforcement layers is 12 inches
- Minimum vertical spacing between reinforcement layers is 6 inches.

Soft Soil

GEOSYNTHETIC REINFORCED FOUNDATIONS CONSTRUCTED ON SOFT SOILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GEOSYNTHETIC REINFORCED SOILS				
	Names	Dates	Approved By	
Designed By	PDP	07/99	<i>[Signature]</i> State Geotechnical Engineer	
Drawn By	SM	07/99	Revision	Sheet No. Index No.
Checked By	PDP	08/99	00	2 of 8 501

TABLE OF WOVEN GEOTEXTILE VALUES

PROPERTY	REQUIRED TEST METHOD	MIRAFI HP 370	MIRAFI HP 470	MIRAFI HP 570	MIRAFI HP 670	MIRAFI HP 770	MIRAFI HS 400	MIRAFI HS 600	MIRAFI HS 800	MIRAFI HS 1150	
Permittivity (0.05 sec ⁻¹ Min.)	ASTM D 4491	0.52	0.20	0.40	0.50	0.23	0.026	0.32	0.20	0.32	
UV Stability (Retained 50% Strength Min. @ 500 hr.)	ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%	
Burst Strength (psi)	GRI: GSI	800	1,200	1,200	1,200	1,200	—	—	—	—	
Grab Strength (lb)	ASTM D 4632	400 x 250	380 x 350	475 x 440	650 x 450	600 x 550	—	—	—	—	
A.O.S. (in)	ASTM D 4751	0.0236	0.0335	0.0236	0.0335	0.0236	0.0118	0.0335	0.0335	0.0236	
Tensile Strength (lb/ft)	ASTM D 4595										
Machine Direction		Ultimate	3,240	3,600	4,800	6,420	7,200	4,800	7,200	9,600	13,800
		2% Ultimate	540	900	960	1,080	1,080	—	—	—	—
		5% Ultimate	1,356	1,800	2,400	2,700	3,000	1,080	2,040	3,600	4,800
Cross Direction		Ultimate	2,700	3,600	4,800	4,800	4,800	4,800	3,600	3,600	3,600
		2% Ultimate	540	1,200	1,320	1,200	1,320	—	—	—	—
		5% Ultimate	1,356	1,800	2,400	2,700	2,400	2,400	—	—	—
Strain @ Ultimate Tensile Strength (lb/ft)		ASTM D 4595	14%	10%	10%	14%	12%	15%	15%	10%	12%
Secant Modulus @			2% strain	27,000	45,000	48,000	54,000	54,000	—	—	—
	5% strain		27,120	36,000	48,000	54,000	60,000	21,600	40,800	72,000	96,000
	10% strain	24,000	36,000	48,000	54,000	66,000	33,600	57,600	96,000	120,000	
Seam Breaking Strength (lb/ft)	ASTM D 4884	1,440	1,800	3,000	3,600	1,200	2,400	2,400	2,400	2,400	
Puncture Resistance (lb)	ASTM D 4833	180	170	190	200	220	—	—	—	—	
Tear Strength (lb)	Machine Direction	180	130	180	250	250	—	—	—	—	
	Cross Direction	110	200	180	200	400	—	—	—	—	
Soil- Geosynthetic Friction	GRI: GG5, GT7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	
Creep Resistance-T _{creep} (lb/ft)	ASTM D 5262	—	—	—	—	—	2,880	4,320	5,760	8,280	
Creep Reduction Factor (T _{ult} /T _{creep})	GRI: GG3 & GT5	5.0	5.0	5.0	5.0	5.0	1.67	1.67	1.67	1.67	
Installation Damage (RF _c)	Sand	1.25	1.25	1.15	1.15	1.15	1.3	1.25	1.2	1.15	
	Limestone	1.5	1.5	1.35	1.35	1.35	5	3.5	1.85	1.7	
Durability (RF _d)	Chemical	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	Biological	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Joint Strength (RF _j)	Mechanical	—	—	—	—	—	—	—	—	—	
	Overlap	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Approved Application Usage		3	3	3	3	3	3	3	3	3	

Approved Application Usage: 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils

**APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEOTEXTILES)
 APPLICATION AND PROPERTIES**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

GEOSYNTHETIC REINFORCED SOILS

Names	Dates	Approved By
Designed By	PDP 07/99	
Drawn By	PDP 08/99	Revision
Checked By	PWL 08/99	00
		Sheet No. 3 of 8
		Index No. 501

TABLE OF WOVEN GEOTEXTILE VALUES

PROPERTY	REQUIRED TEST METHOD	MIRIFI HS 1400	MIRIFI HS 1715	MIRIFI HS 2400	MIRIFI HS 3000	MIRIFI HS 3600	AMOCO 2006	AMOCO 2016	AMOCO 2044	COMTRAC 70/70	
Permittivity (0.05 sec ⁻¹ Min.)	ASTM D 4491	0.20	0.32	0.02	0.02	0.02	0.05	0.70	0.15	0.20	
UV Stability (Retained 50% Strength Min. @ 500 hr.)	ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%	
Burst Strength (psi)	GRI: GSI	—	—	—	—	—	1,000	1,100	1,500	—	
Grab Strength (lb)	ASTM D 4632	—	—	—	—	—	315	315	600/500	—	
A.O.S. (in)	ASTM D 4751	0.0335	0.0335	0.0118	0.0118	0.0118	0.0167	0.0167	0.0236	0.0335	
Tensile Strength (lb/ft)	ASTM D 4595	—	—	—	—	—	—	—	—	—	
Machine Direction		Ultimate	16,800	20,580	28,800	36,000	43,200	2,100	2,400	4,800	16,800
		2% Ultimate	—	—	—	—	—	156	276	456	—
		5% Ultimate	6,000	8,400	14,400	18,000	21,600	564	744	1,452	6,000
Cross Direction		Ultimate	3,600	3,600	3,600	3,600	3,600	2,100	2,400	4,800	3,600
		2% Ultimate	—	—	—	—	—	576	660	1,380	—
	5% Ultimate	—	—	—	—	—	1,104	1,404	2,604	—	
Strain @ Ultimate Tensile Strength	ASTM D 4595	14%	14%	10%	10%	10%	8%	8%	8%	14%	
Modulus @ (lb/ft)		2% strain	—	—	—	—	—	7,800	13,800	22,800	—
		5% strain	120,000	168,000	288,000	360,000	432,000	11,280	14,880	29,040	120,000
	10% strain	120,000	162,000	288,000	360,000	432,000	10,440	12,480	31,200	120,000	
Seam Breaking Strength (lb/ft)	ASTM D 4884	2,400	2,400	3,600	3,600	3,600	—	—	—	2,400	
Puncture Resistance (lb)	ASTM D 4833	—	—	—	—	—	120	120	170	—	
Stitch Strength (lb)	Machine Direction	—	—	—	—	—	120	120	250	—	
	Cross Direction	—	—	—	—	—	120	120	250	—	
Soil- Geosynthetic Friction	GRI: GG5, GT7	0.9	0.9	0.9	0.9	0.9	0.65	0.65	0.65	0.9	
Creep Resistance - T _{creep} (lb/ft)	ASTM D 5262	10,080	12,348	17,280	21,600	21,600	600	685	1,371	—	
Creep Reduction Factor (T _{ult} / T _{creep})	GRI: GG3 & GT5	1.67	1.67	1.67	1.67	1.67	3.5	3.5	3.5	1.67	
Installation Damage (RF _C)	Sand	1.15	1.15	1.1	1.1	1.1	1.10	1.05	1.05	1.15	
	Limestone	1.5	1.35	1.25	1.25	1.25	1.20	1.20	1.10	1.5	
Durability (RF _D)	Chemical	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	Biological	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Joint Strength (RF _J)	Mechanical	—	—	—	—	—	—	—	—	—	
	Overlap	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.0	
Approved Application Usage		3	3	3	3	3	3	3	3	3	

Approved Application Usage: 1 = Steepened Slopes
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 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils

APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEOTEXTILES)
 APPLICATION AND PROPERTIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	PDP 07/99	State Geotechnical Engineer		
Drawn By	PDP 08/99	Revision	Sheet No.	Index No.
Checked By	PWL 08/99	00	4 of 8	501

TABLE OF WOVEN GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	MIRIFI MG 2XT	MIRIFI MG 3XT	MIRIFI MG 5XT (Matrex 30)	MIRIFI MG 7XT	MIRIFI MG 8XT	MIRIFI MG 10XT (Matrex 60)	MIRIFI MG 18XT (Matrex 90)	MIRIFI MG 20XT (Matrex 120)	MIRIFI MG 22XT (Matrex 180)	MIRIFI MG 24XT (Matrex 240)
UV Stability (Retained 50% Strength Min. @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Tensile Strength (lb/ft)		ASTM D 4595										
Machine Direction	Ultimate		2,000	2,800	3,590	4,350	6,230	8,300	9,360	12,420	17,760	25,380
	2% Ultimate		—	—	—	—	—	—	—	—	—	—
	5% Ultimate		1,200	1,056	1,740	2,160	2,520	3,120	4,400	5,340	7,140	10,020
Cross Direction	Ultimate		2,000	—	—	—	—	—	—	—	—	—
	2% Ultimate		—	—	—	—	—	—	—	—	—	—
	5% Ultimate	—	—	—	—	—	—	—	—	—	—	
Strain @ Ultimate Tensile Strength		ASTM D 4595	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Secant Modulus @ (lb/ft)	2% strain		—	—	—	—	—	—	—	—	—	—
	5% strain		—	21,120	34,800	43,200	50,400	62,400	88,800	106,800	142,800	200,400
	10% strain		—	—	—	—	—	—	—	—	—	—
Junction Strength (lb/ft)		GRI: GG2	—	—	—	—	—	—	—	—	—	—
Soil- Geosynthetic Friction		GRI: GG5, GT7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Creep Resistance- T_{creep} (lb/ft)		ASTM D 5262	1,200	1,680	2,154	2,610	3,738	4,980	5,616	7,221	10,326	14,756
Creep Reduction Factor (T_{ult} / T_{creep})		GRI: GG3 & GT5	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67
Installation Damage (RF_c)	Sand	GRI: GG4 & GT7	1.25	1.20	1.15	1.15	1.15	1.1	1.1	1.1	1.1	1.1
	Limestone		Not Recommended	1.75	1.3	1.3	1.3	1.25	1.25	1.25	1.25	1.25
Durability (RF_d)	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Joint Strength (RF_j)	Mechanical	ASTM D 4595, GRI: GG4 & GT7	—	—	—	—	—	—	—	—	—	—
	Overlap	GRI: GG5 & GT6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Approved Application Usage			3	3	3	3	3	3	3	3	3	3

Approved Application Usage: 1 = Steepened Slopes
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APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEOGRIDS)
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Designed By	PDP 07/99			
Drawn By	PDP 08/99	Revision	Sheet No.	Index No.
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TABLE OF WOVEN GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	SYNTEEN SF 20	SYNTEEN SF 35	SYNTEEN SF 40	SYNTEEN SF 50	SYNTEEN SF 55	SYNTEEN SF 80	SYNTEEN SF 110				
UV Stability (Retained 50% Strength Min. @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%				
Tensile Strength (lb/ft)													
Machine Direction	Ultimate	ASTM D 4595	1,809	2,627	3,051	3,731	3,774	5,583	8,126				
	2% Ultimate		370	462	488	791	736	1,016	1,186				
	5% Ultimate		670	725	970	922	1,159	1,273	1,684				
Cross Direction	Ultimate		1,809	2,556	3,051	3,933	2,499	2,206	2,176				
	2% Ultimate		370	399	488	791	604	882	1,274				
	5% Ultimate		670	583	970	922	796	1,563	1,581				
Strain @ Ultimate Tensile Strength				9.4%	14.1%	9.9%	14.2%	11.5%	14.2%	18.8%			
Secant Modulus @ (lb/ft)	2% strain		ASTM D 4595	18,494	23,114	24,408	39,551	36,799	50,807	59,298			
	5% strain			13,397	14,499	19,404	18,432	23,174	25,459	33,676			
	10% strain	15,206		15,234	22,089	18,432	27,137	37,910	27,380				
Junction Strength (lb/ft)		GRI: GG2	—	—	—	—	—	—	—				
Soil- Geosynthetic Friction		GRI: GG5, GT7	0.8	0.8	0.8	0.8	0.8	0.8	0.8				
Creep Resistance- T_{creep} (lb/ft)		ASTM D 5262	1,005	1,523	1,525	2,201	2,265	3,182	4,026				
Creep Reduction Factor (T_{ult} / T_{creep})		GRI: GG3 & GT5	1.80	1.72	2.00	1.70	1.67	1.75	2.02				
Installation Damage (RF_c)	Sand	GRI: GG4 & GT7	1.05	1.15	1.15	1.08	1.08	1.08	1.08				
	Limestone		1.75	1.70	1.60	1.55	1.55	1.55	1.35				
Durability (RF_d)	Chemical	ASTM D 5322	1.10	1.10	1.10	1.10	1.10	1.10	1.10				
	Biological	ASTM D1987, D3083, G21 & G22	1.10	1.10	1.10	1.10	1.10	1.10	1.10				
Joint Strength (RF_j)	Mechanical	ASTM D 4595, GRI: GG4 & GT7	—	—	—	—	—	—	—				
	Overlap	GRI: GG5 & GT6	1.10	1.10	1.10	1.10	1.10	1.10	1.10				
Approved Application Usage			3	3	3	3	3	3	3				

Approved Application Usage: 1 = Steepened Slopes
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APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEOGRID)
 APPLICATION AND PROPERTIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	PDP 07/99	State Geotechnical Engineer		
Drawn By	PDP 08/99	Revision	Sheet No.	Index No.
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TABLE OF EXTRUDED GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	TENSAR BX 4100	TENSAR BX 4120	TENSAR BX 4200	TENSAR BX 4220	TENSAR UX 900 HS	TENSAR UX 1100 HS	TENSAR UX 1400 HS	TENSAR UX 1500 HS	TENSAR UX 1600 HS	TENSAR UX 1700 HS	
UV Stability (Retained 50% Strength Min. @ 500 hr.)		ASTM D 4355	—	90%	90%	90%	90%	90%	90%	90%	90%	90%	
Tensile Strength (lb/ft)		ASTM D 4595											
Machine Direction	Ultimate		860	860	1,270	1,270	3,700	3,700	4,400	6,900	9,000	10,800	
	2% Ultimate		240	240	370	370	840	840	1,000	1,800	2,330	2,740	
	5% Ultimate		480	480	705	705	1,440	1,440	2,000	3,700	4,450	5,400	
Cross Direction	Ultimate		875	875	1,370	1,370	—	—	—	—	—	—	—
	2% Ultimate		300	300	500	500	—	—	—	—	—	—	—
	5% Ultimate	635	635	960	960	—	—	—	—	—	—	—	
Strain @ Ultimate Tensile Strength		ASTM D 4595	—	—	—	—	10%	10%	10%	10%	10%	10%	
Secant Modulus @ (lb/ft)	2% strain		11,995	11,995	18,506	18,506	42,015	42,015	50,000	89,993	116,518	137,012	
	5% strain		9,596	9,596	14,092	14,092	28,800	28,800	40,000	73,996	89,006	108,005	
	10% strain		—	—	—	—	—	—	—	—	—	—	—
Junction Strength (lb/ft)		GRI: GG2	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	
Soil- Geosynthetic Friction		GRI: GG5, GT7	—	0.90	0.95	0.95	0.462	0.462	0.462	0.462	0.462	0.462	
Creep Resistance- T_{creep} (lb/ft)		ASTM D 5262	250	250	420	420	900	1,350	1,850	2,800	3,700	4,650	
Creep Reduction Factor (T_{ult} / T_{creep})		GRI: GG3 & GT5	3.5	3.5	3.27	3.27	4.12	3.65	2.381	2.46	2.43	2.33	
Installation Damage (R _{IC})	Sand	GRI: GG4 & GT7	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	
	Limestone		1.43	1.43	1.35	1.35	1.25	1.25	1.20	1.20	1.20	1.20	
Durability (R _{FD})	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Joint Strength (R _{FJ})	Mechanical	ASTM D 4595, GRI: GG4 & GT7	—	—	—	—	1.0	1.0	1.0	1.0	1.0	1.0	
	Overlap	GRI: GG5 & GT6	1.0	1.0	1.0	1.0	—	1.0	1.0	1.0	1.0	1.0	
Approved Application Usage			3	3	3	3	3	3	3	3	3	3	

Approved Application Usage: 1 = Steepened Slopes
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APPROVED GEOSYNTHETIC PRODUCTS
 (EXTRUDED GEOGRID)
 APPLICATION AND PROPERTIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	PDP 07/99	State Geotechnical Engineer		
Drawn By	PDP 08/99	Revision	Sheet No.	Index No.
Checked By	PWL 08/99	00	7 of 8	501

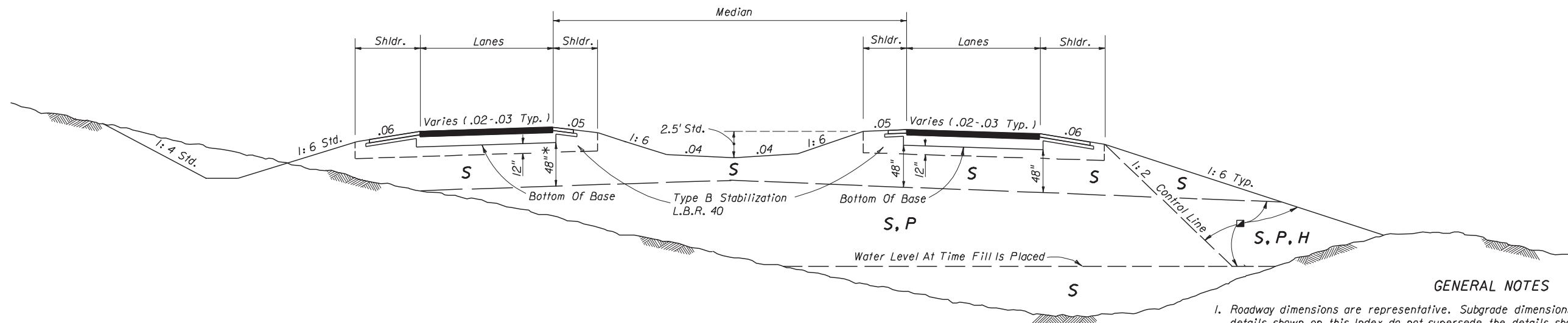
TABLE OF EXTRUDED GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	TENAX MS 220	TENAX MS 330							
UV Stability (Retained 50% Strength Min. @ 500 hr.)		ASTM D 4355	85%	85%							
Tensile Strength (lb/ft)		ASTM D 4595									
Machine Direction	Ultimate		925	1,370							
	2% Ultimate		300	418							
	5% Ultimate		615	925							
Cross Direction	Ultimate		1,400	2,100							
	2% Ultimate		445	616							
	5% Ultimate	890	1,340								
Strain @ Ultimate Tensile Strength		ASTM D 4595	12%	12%							
Secant Modulus @ (lb/ft)	2% strain		15,000	20,900							
	5% strain		12,330	18,500							
	10% strain		—	—							
Junction Strength (lb/ft)		GRI: GG2	835	1,230							
Soil- Geosynthetic Friction		GRI: GG5, GT7	—	—							
Creep Resistance- T_{creep} (lb/ft)		ASTM D 5262	—	—							
Creep Reduction Factor (T_{ult} / T_{creep})		GRI: GG3 & GT5	5.0	5.0							
Installation Damage (RF _C)	Sand	GRI: GG4 & GT7	3.0	3.0							
	Limestone		3.0	3.0							
Durability (RF _D)	Chemical	ASTM D 5322	2.0	2.0							
	Biological	ASTM D1987, D3083, G21 & G22									
Joint Strength (RF _J)	Mechanical	ASTM D 4595, GRI: GG4 & GT7	—	—							
	Overlap	GRI: GG5 & GT6	—	—							
Approved Application Usage			2	2							

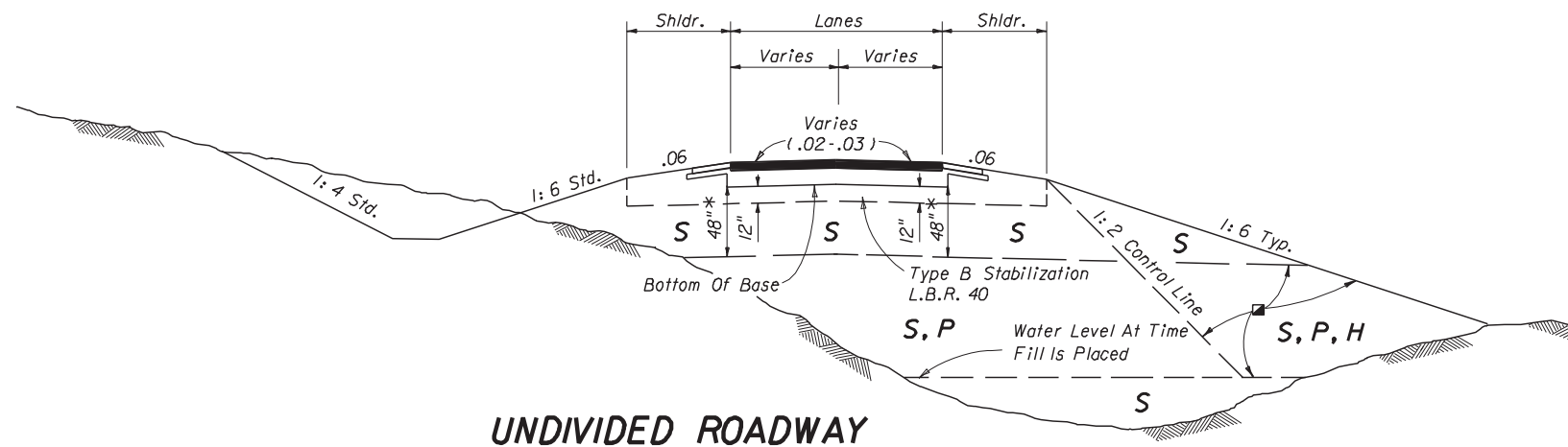
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APPROVED GEOSYNTHETIC PRODUCTS
 (EXTRUDED GEOGRID)
 APPLICATION AND PROPERTIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
GEOSYNTHETIC REINFORCED SOILS				
Names	Dates	Approved By		
Designed By	PDP 07/99	<i>Paul J. ...</i> State Geotechnical Engineer		
Drawn By	PDP 08/99	Revision	Sheet No.	Index No.
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DIVIDED ROADWAYS



UNDIVIDED ROADWAY

SYMBOL	SOIL	CLASSIFICATION (AASHTO M-145)
S	Select	A-1, A-3, A-2-4 **
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

Classification listed left to right in order of preference.

See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.

** Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the roadbed when approved by the District Geotechnical Engineer.

* For cut sections this dimension may be reduced to 24"; see Index No. 500. For minor collectors and local facilities this dimension may be reduced to 18".

FLEXIBLE PAVEMENT

GENERAL NOTES

- Roadway dimensions are representative. Subgrade dimensions and control lines are standard. The details shown on this Index do not supersede the details shown in the plans or on Index Nos. 500 or 506.
- Plastic (P) soils may be placed above the existing water level (at the time of construction) to within 4 feet of the proposed base. It should be placed uniformly in the lower portion of the embankment for some distance along the project rather than full depth for short distances.
- High Plastic (H) soils excavated within the project limits may be used in embankment construction as indicated on this index. High Plastic soils are not to be used for embankment construction when obtained from outside the project limits.
- Select (S) soils having an average organic content of more than two and one-half (2.5) percent, or having an individual test value which exceeds four (4) percent, shall not be used in the subgrade portion of the roadbed.

Select (S), Plastic (P), or High Plastic (H) soils having an average organic content of more than five (5) percent, or an organic content individual test result which exceeds seven (7) percent, shall not be used in the portion of embankment inside the control line, unless written authorization is provided by the District Geotechnical Engineer; these soils may be used for embankment construction outside the control line, unless restricted by the plans or otherwise specified in the plans, provided they can be compacted sufficiently to sustain a drivable surface for operational vehicles as approved by the Engineer.

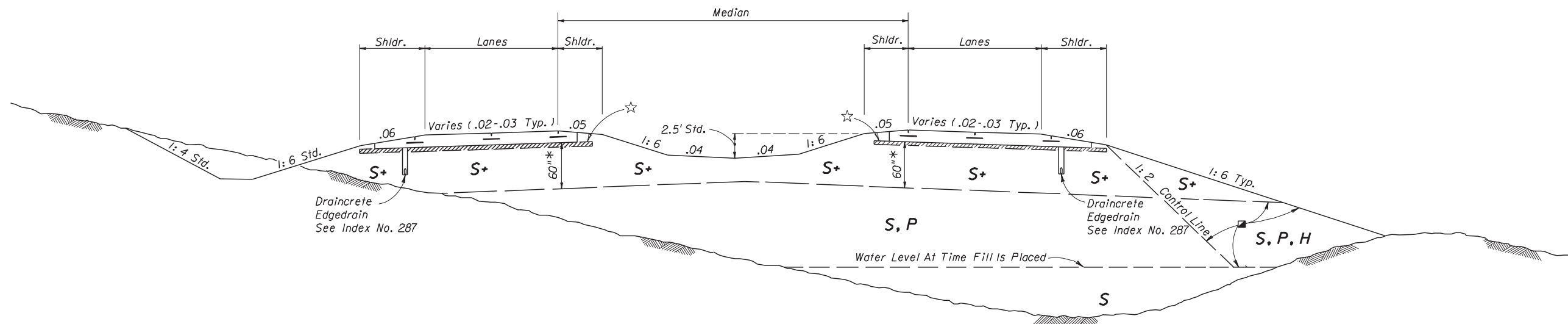
Average organic content shall be determined from the test results from a minimum of three randomly selected samples from each stratum or stockpile of a particular material. Tests shall be performed in accordance with FM 1-T267 on the portion of a sample passing the No. 4 sieve.
- Highly organic soils, composed primarily of partially decayed organic matter, often dark brown or black in color with an odor of decay, and sometimes fibrous, shall be designated as muck. Further, any stratum or stockpile of soil which contains pockets of highly organic material may be designated as Muck (M).

Highly organic soils shall not be used within the subgrade or embankment portion of the roadbed, with the exception of muck used as a supplement to construct a finish soil layer as described in Section 162 of the FDOT Standard Specifications.

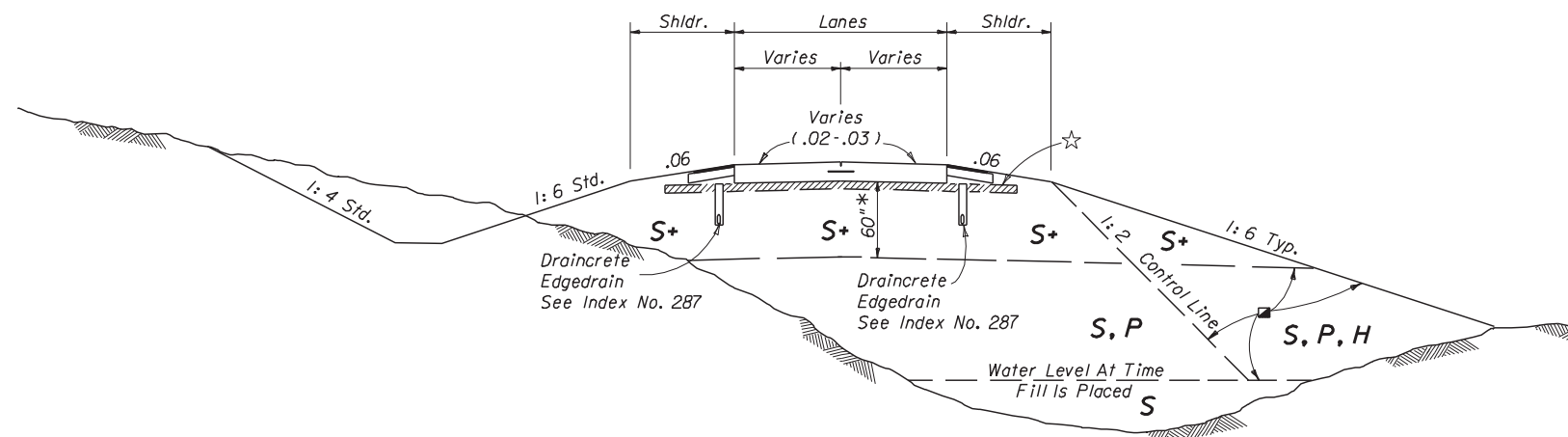
DESIGN NOTES

- The designer shall take into consideration the expectancy of roadway widening to the outside, and where widening is anticipated, specify in the plans the utilization of Select (S), Plastic (P) and/or High Plastic (H) soils classified as organic material, in the embankment outside the control line.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
EMBANKMENT UTILIZATION					
Names	Dates	Approved By <i>[Signature]</i>			
Designed By	GPO7RCP	09/93	State Geotechnical Engineer		
Drawn By	HSD	03/93	Revision	Sheet No.	Index No.
Checked By	BID	02/93	00	1 of 3	505



DIVIDED ROADWAYS



UNDIVIDED ROADWAY

SYMBOL	SOIL	CLASSIFICATION (AASHTO M-145)
S	Select	A-1, A-3, A-2-4 **
S+	Special Select	A-3 *** With Minimum Average Lab Permeability of 5×10^{-5} cm/sec (0.14 ft./day) as per FM 1-T215
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

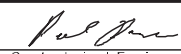
Classification listed left to right in order of preference.

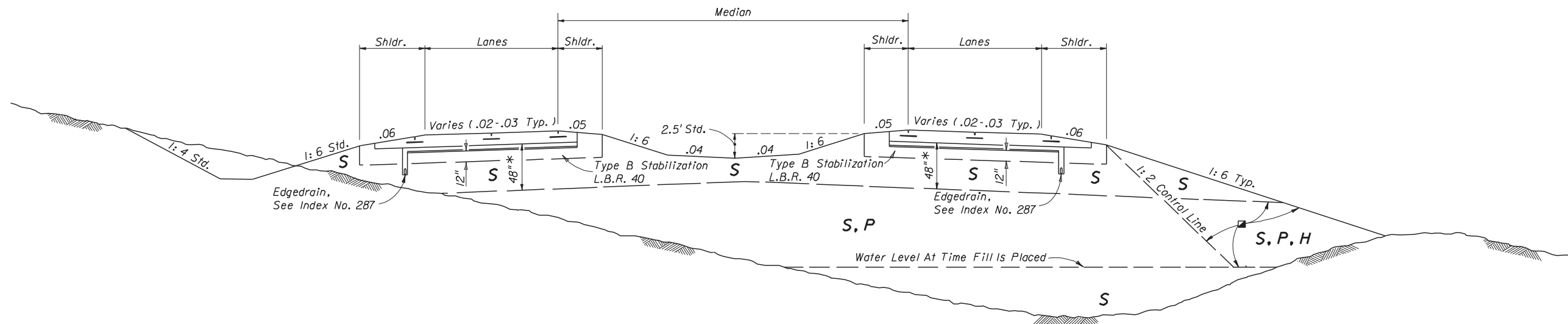
- See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.
- ***When allowed by the plans, some types of A-2-4 material may be approved in writing by the District Materials Engineer. This material must meet the minimum lab permeability requirement, be non-plastic, and not exceed 12% passing the No. 200 sieve.
- ** Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction.
- * For cut sections this dimension may be reduced to 24"; see Index No. 500. For minor collectors and local facilities this dimension may be reduced to 18".
- ☆ 3" of #57 Coarse Aggregate Mixed Into Top 6".

RIGID PAVEMENT - SPECIAL SELECT SOIL

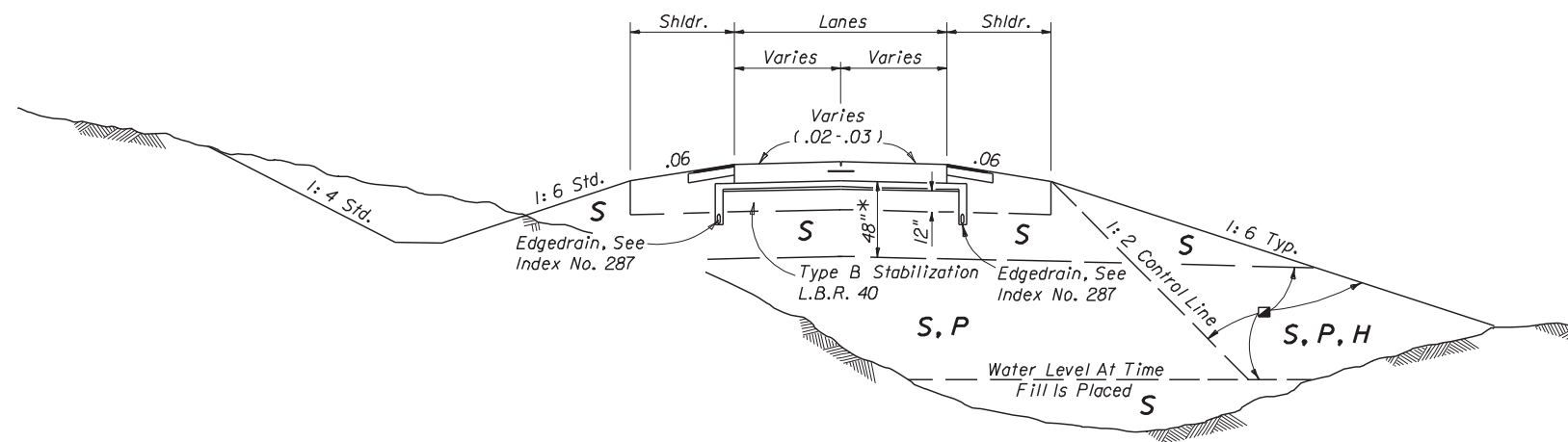
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

EMBANKMENT UTILIZATION

Names	Dates	Approved By		
Designed By	FMD 09/93	 State Geotechnical Engineer	Revision	Sheet No.
Drawn By	HSD 03/93		96	2 of 3
Checked By	BTD 02/93			505



DIVIDED ROADWAYS



UNDIVIDED ROADWAY

DESIGN NOTE
 1. Concrete pavement is to be placed over 4" of Asphalt Treated Permeable Base (ATPB) or Cement Treated Permeable Base (CTPB) as identified in the plans. This will be placed on an aggregate separator layer using 1" Type SP (Traffic C). This will be placed on a working platform using 12" of Type B Stabilization.

SYMBOL	SOIL	CLASSIFICATION (AASHTO M-145)
S	Select	A-1, A-3, A-2-4 **
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

Classification listed left to right in order of preference.

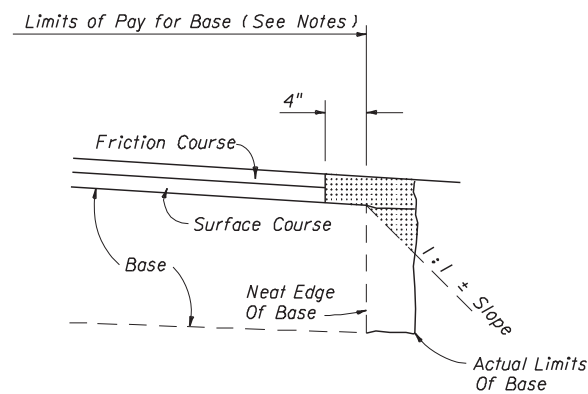
- ☑ See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.
- ** Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the roadbed when approved by the District Geotechnical Engineer.
- * For cut sections this dimension may be reduced to 24"; see Index No. 500. For minor collectors and local facilities this dimension may be reduced to 18".

RIGID PAVEMENT - TREATED PERMEABLE BASE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

EMBANKMENT UTILIZATION

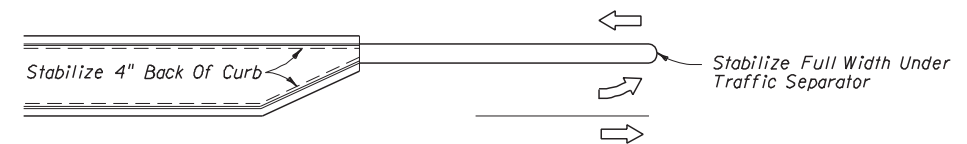
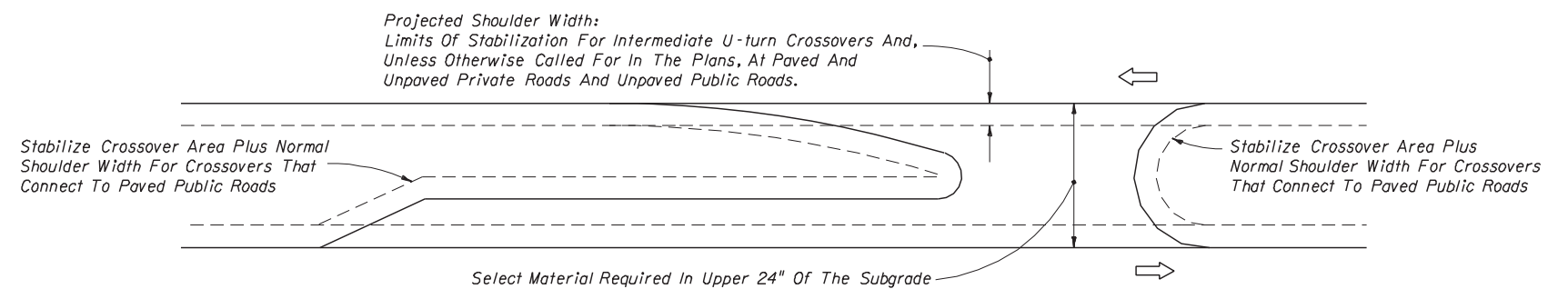
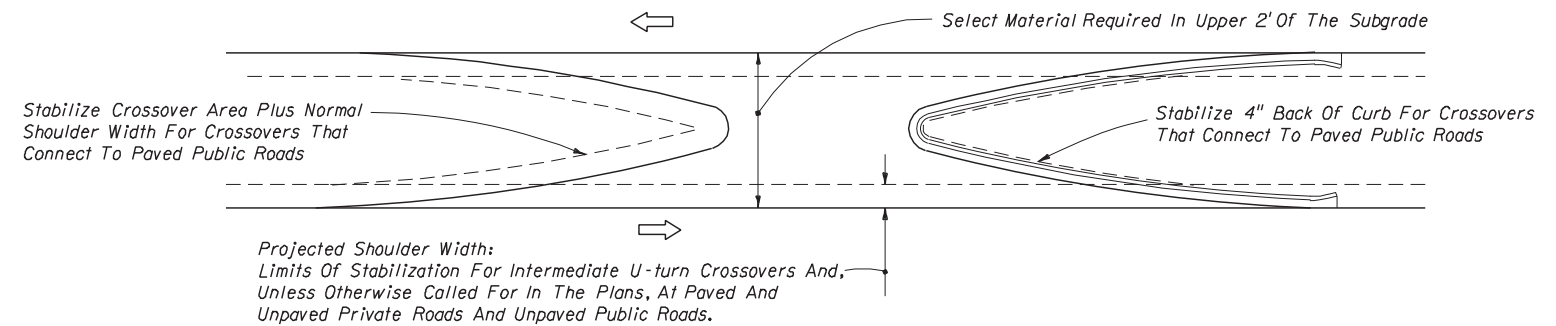
Names	Dates	Approved By		
Designed By	FMD	09/93	 State Geotechnical Engineer	
Drawn By	HSD	03/93		
Checked By	BTD	02/93		
Revision		00	Sheet No.	Index No.
			3 of 3	505



NOTES

1. All material in the shaded area is excess base to be removed.
2. The cost for removal of excess base material shall be included in the contract unit price for base.
3. Payment for base shall be calculated using normal width.

REMOVAL OF EXCESS BASE MATERIAL

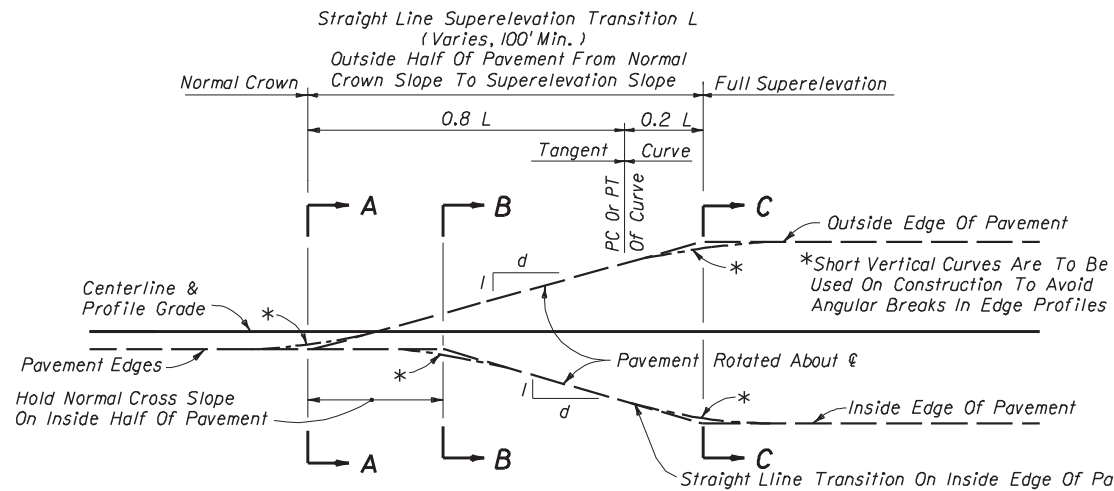


NOTES

1. When the median has curb or curb and gutter, stabilize 4" back of curb.
2. When the median has shoulder with no curb or curb and gutter, stabilize to normal shoulder width.
3. See the details above for stabilizing requirements at crossroads.
4. Stabilize entire area under all paved traffic islands.
5. Stabilize full width under all traffic separators.
6. Select material as defined on Index No. 505. For minor collectors and local facilities the depth of select material thickness may be reduced from 24" to 18".

MEDIAN STABILIZING DETAILS

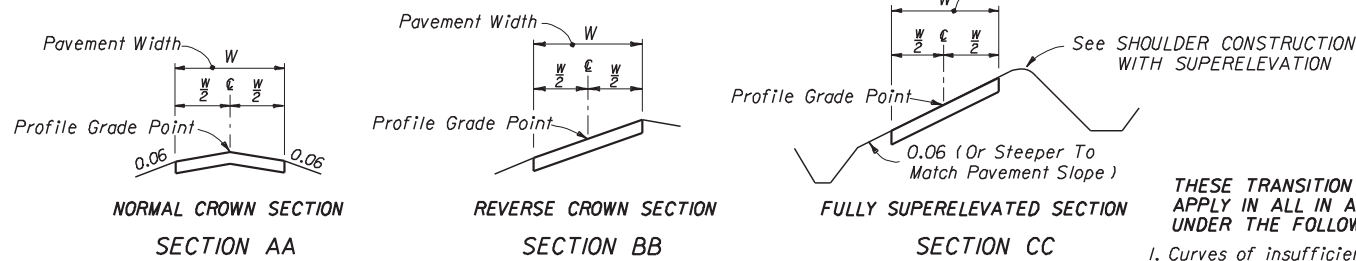
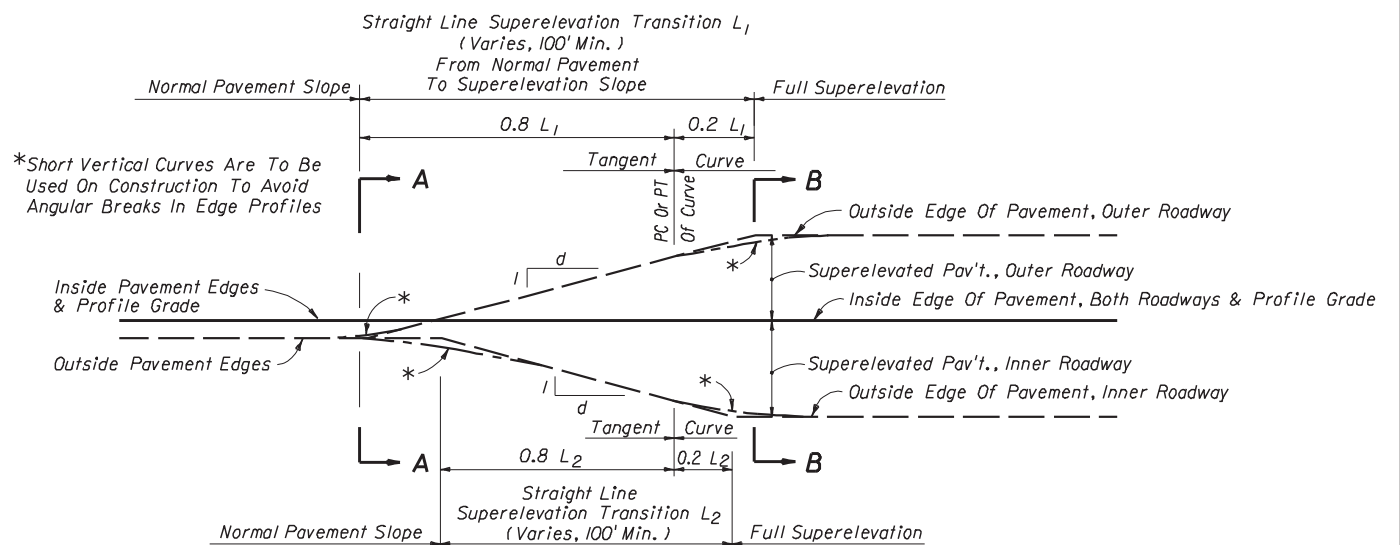
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
MISCELLANEOUS EARTHWORK DETAILS					
Designed By	Names	Dates	Approved By		
Drawn By	RE/WNL	05/91	 State Roadway Design Engineer		
Checked By	HKH	05/91			
	JVC/WNL	05/91	Revision	Sheet No.	Index No.
			00	1 of 1	506



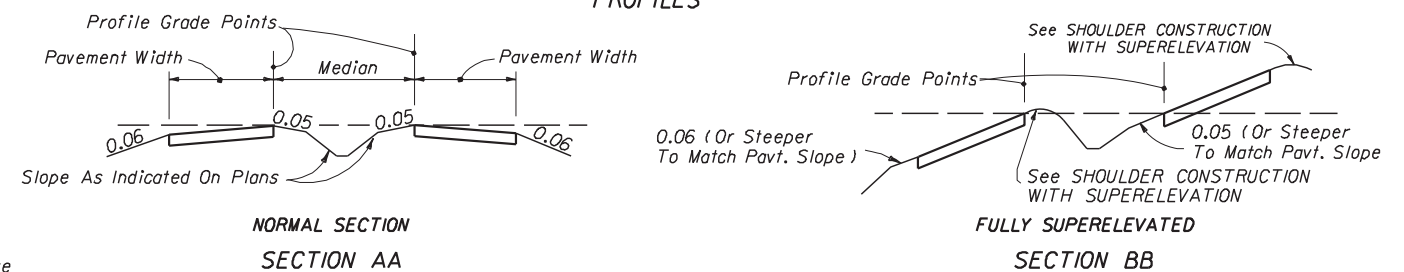
SLOPE RATIOS FOR SUPERELEVATION TRANSITIONS

SECTION	DESIGN SPEED, MPH		
	45-50	55-60	65-70
2 Lane & 4 Lane	1: 200	1: 225	1: 250
6 Lane	1: 160	1: 180	1: 200
8 Lane	1: 150	1: 170	1: 190

The length of superelevation transition is to be determined by the relative slope between the travel way edge of pavement and the profile grade, except that the minimum length of transition shall be 100 ft.



2-LANE, 4-LANE OR 6-LANE PAVEMENT, NO MEDIAN



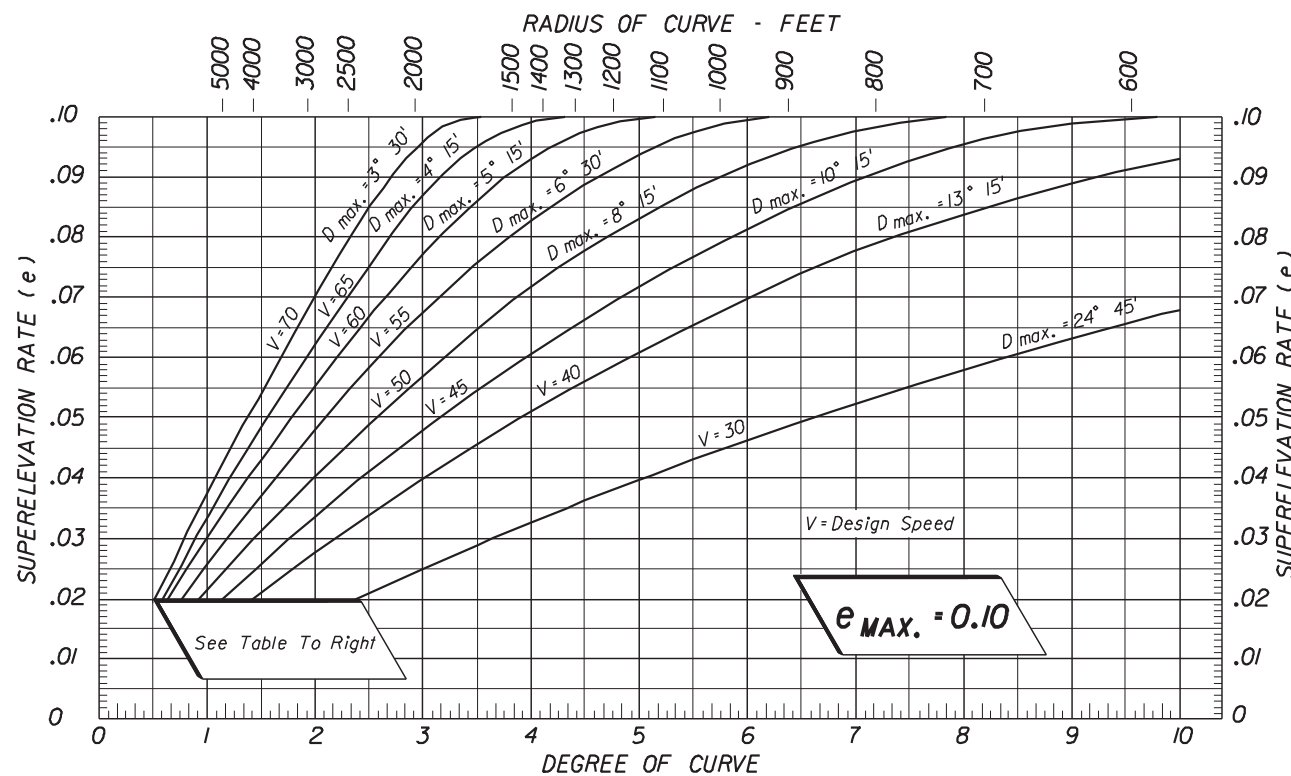
4-LANE OR 6-LANE PAVEMENT WITH MEDIAN

THESE TRANSITION DETAILS ARE TO APPLY IN ALL IN ALL CASES, EXCEPT UNDER THE FOLLOWING CONDITIONS:

1. Curves of insufficient length.
2. Insufficient tangent length between curves.
3. Deficient transition distance between a curve and other control points.
4. At PCC's or PRC's (Runoff rates are applicable).

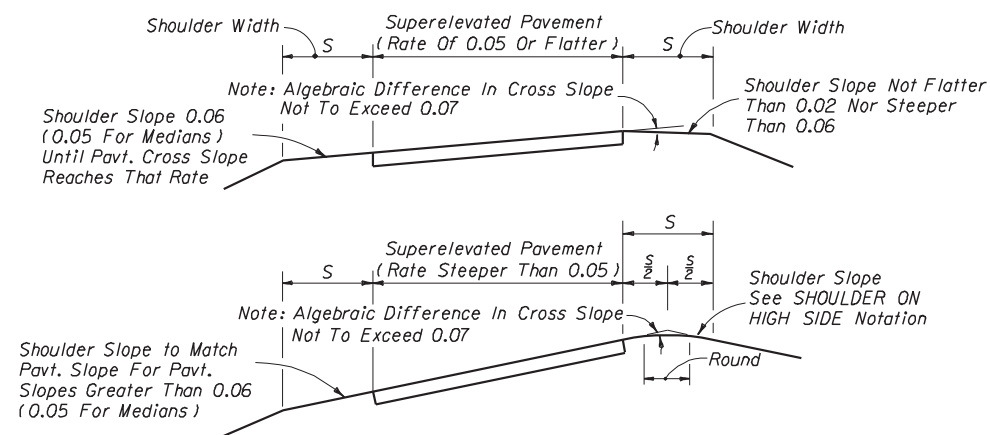
Transitions for these exceptions are to be as detailed in the plans.

SUPERELEVATION TRANSITIONS



DESIGN SUPERELEVATION RATES FOR RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS

DEGREE OF CURVE (D)	DESIGN SPEED, V MPH						
	30	40	45/50	55	60	65	70
0° 15'	NC	NC	NC	NC	NC	NC	NC
0° 30'	NC	NC	NC	NC	RC	RC	RC
0° 45'	NC	NC	RC	RC	0.023	0.025	0.028
1° 00'	NC	NC	0.021	0.025			
1° 30'	NC	0.021	SEE DESIGN SUPERELEVATION RATE TO LEFT				
2° 00'	RC						



SHOULDER CONSTRUCTION WITH SUPERELEVATION

SHOULDER ON HIGH SIDE: A shoulder slope of 0.06 downward from the edge of pavement will be maintained until a 0.07 break in slope at the pavement edge is reached due to superelevation of the pavement. As the pavement superelevation increases, the 0.07 break in slope will be maintained and the shoulder flattened until the shoulder slope reaches the minimum of 0.02 downward from the edge of pavement. Any further increase in pavement superelevation will necessitate sloping the inside half of the shoulder toward the pavement and the outer half outward, both at 0.02 for superelevations 0.06-0.09 and both at 0.03 for superelevation 0.10.

SHOULDER ON LOW SIDE: Maintain 0.06 drop across inside shoulder until pavement cross slope reaches 0.06. For pavement cross slopes greater than 0.06, shoulder to have same slope as pavement.

These slopes are the same as those shown pictorially on sheet 2.

NOTE: These details apply to both paved and grassed shoulders. For median shoulders use 0.05 in lieu of 0.06.

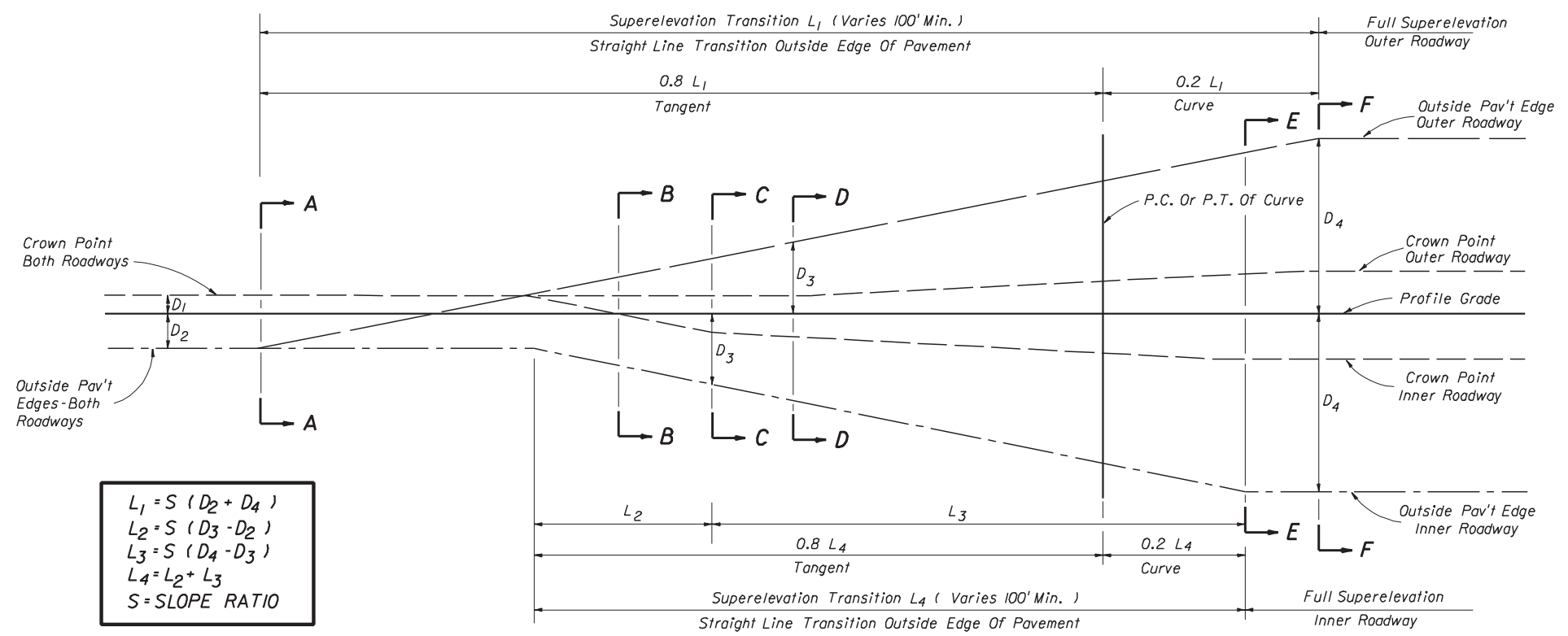
GENERAL NOTES

1. For curves in urban highways and high speed urban streets, see Index No. 511.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SUPERELEVATION
RURAL HIGHWAYS, URBAN FREEWAYS
AND HIGH SPEED URBAN HIGHWAYS

Designed By	HFV	Date	5/65	Approved By	<i>[Signature]</i>
Drawn By	LMF	Date	10/74	Revision	State Roadway Design Engineer
Checked By				Sheet No.	1 of 2
				Index No.	510



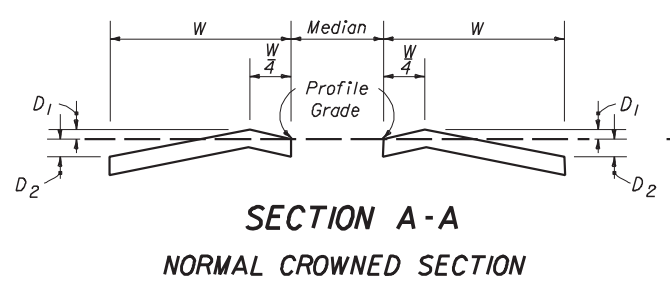
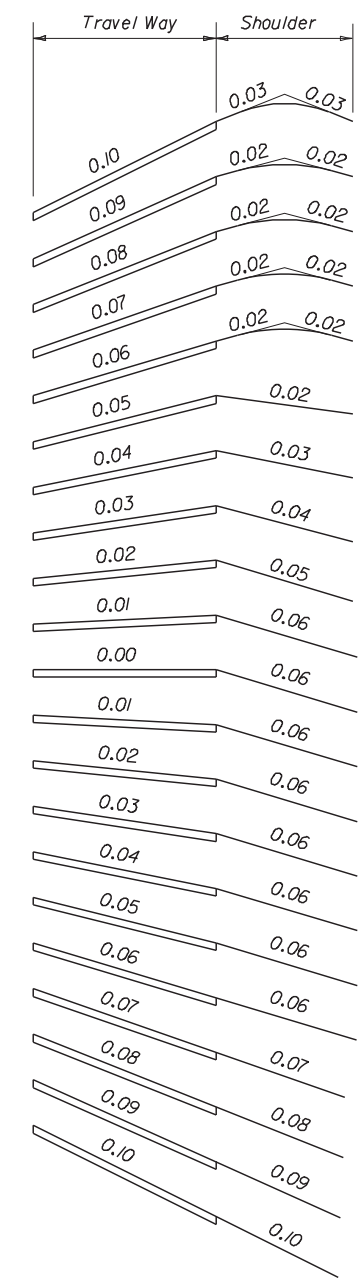
$$L_1 = S (D_2 + D_4)$$

$$L_2 = S (D_3 - D_2)$$

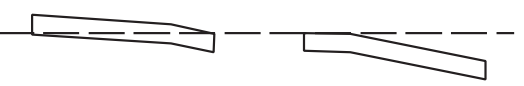
$$L_3 = S (D_4 - D_3)$$

$$L_4 = L_2 + L_3$$

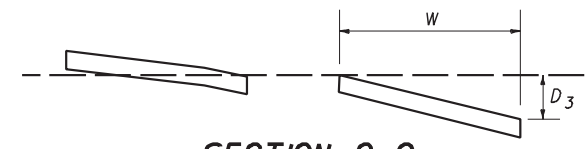
$$S = \text{SLOPE RATIO}$$



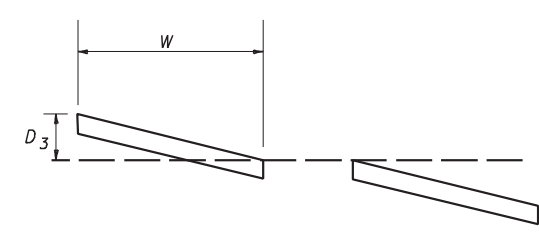
SECTION A-A
NORMAL CROWNED SECTION



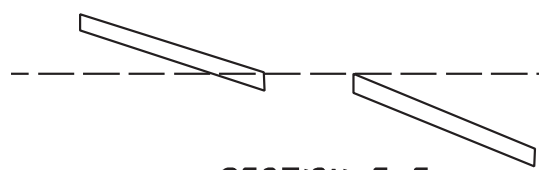
SECTION B-B
SUPERELEVATION SECTION LT. & RT.



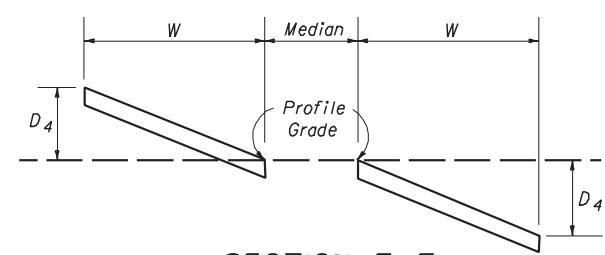
SECTION C-C
SUPERELEVATION SECTION LT.
PLANE INCLINED SECTION RT.



SECTION D-D
PLANE INCLINED SECTION LT.
SUPERELEVATION TRANSITION RT.



SECTION E-E
SUPERELEVATION TRANSITION LT.
FULL SUPERELEVATION RT.



SECTION F-F
FULL SUPERELEVATION LT. & RT.

8-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN

SLOPES OF TRAVELED WAY
AND ABUTTING SHOULDERS
**SHOULDER SLOPES ON
SUPERELEVATION SECTIONS**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SUPERELEVATION RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS				
Names	Dates	Approved By		
Designed By	WAL 8/77	State Roadway Design Engineer		
Drawn By	LMP 8/77	Revision	Sheet No.	Index No.
Checked By	WAL 8/77	00	2 of 2	510

SUPERELEVATION RATES (e) FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

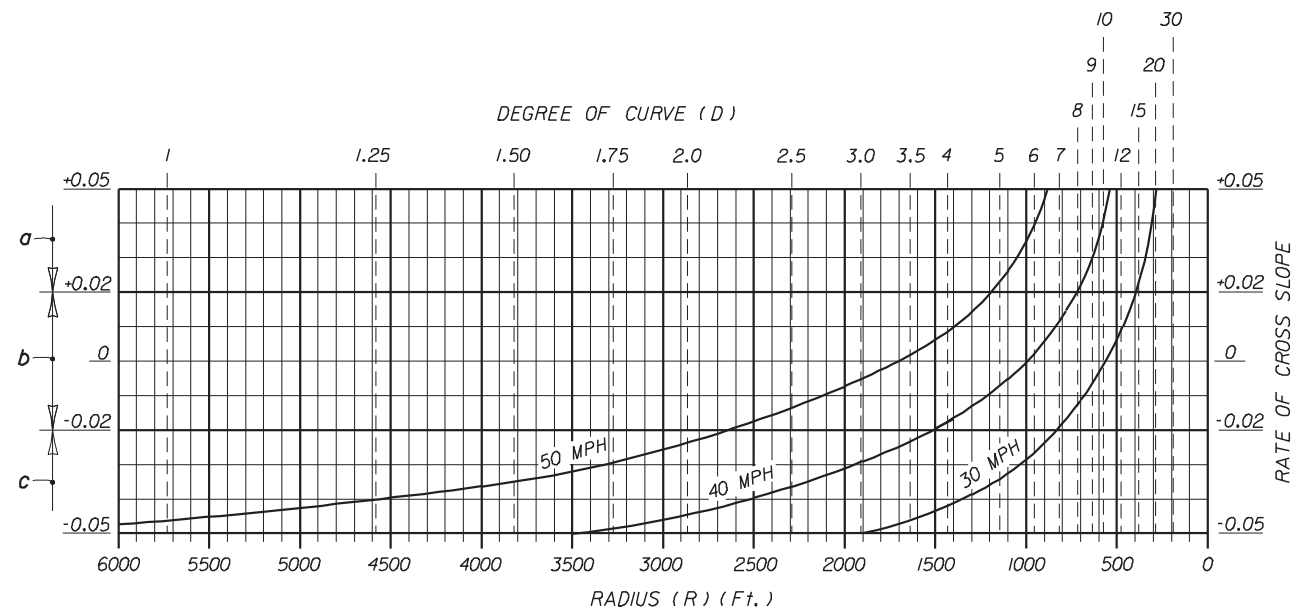
$e_{max} = 0.05$

TABULATED VALUES

Degree Of Curve (D)	Radius (R) (Ft.)	Design Speed (mph)				
		30	35	40	45	50
2° 00'	2,865	NC	NC	NC	NC	NC
2° 15'	2,546					RC
2° 45'	2,083				NC	
3° 00'	1,910				RC	
3° 45'	1,528			NC		
4° 00'	1,432			RC		
4° 45'	1,206					RC
5° 00'	1,146		NC			0.023
5° 15'	1,091		RC			0.027
5° 30'	1,042					0.030
5° 45'	996					0.035
6° 00'	955				RC	0.040
6° 15'	917				0.022	0.045
6° 30'	881				0.024	0.050
6° 45'	849				0.027	$D_{max.} = 6° 30'$
7° 00'	819	NC			0.030	
7° 15'	790	RC			0.033	
7° 30'	764				0.037	
7° 45'	739				0.041	
8° 00'	716			RC	0.045	
8° 15'	694			0.022	0.050	
8° 30'	674			0.025	$D_{max.} = 8° 15'$	
8° 45'	655			0.027		
9° 00'	637			0.030		
9° 30'	603			0.034		
10° 00'	573			0.040		
10° 30'	546		RC	0.047		
11° 00'	521		0.023	$D_{max.} = 10° 45'$		
11° 30'	498		0.026			
12° 00'	477		0.030			
13° 00'	441		0.036			
14° 00'	409	RC	0.045			
15° 00'	382	0.023	$D_{max.} = 14° 15'$			
16° 00'	358	0.027				
17° 00'	337	0.032				
18° 00'	318	0.038				
19° 00'	302	0.043				
20° 00'	286	0.050				
		$D_{max.} = 20° 00'$				

NC = Normal Crown
RC = Reverse Crown (+.02 Superelevation)

CHARTED VALUES



- a: When the speed curves and the degree of curve or radius lines intersect above this line, the pavement is to be superelevated (positive slope) at the rates indicated at the lines intersecting points.
- b: When the speed curves and the degree of curve or radius lines intersect between these limits, the pavement is to be superelevated at the rate of 0.02 (positive slope).
- c: When the speed curves and the degree of curve or radius lines intersect below this line, the pavement is to have normal crown (typically 0.02 and 0.03 downward slopes).

GENERAL NOTES

1. Maximum rate of superelevation for urban highways and high speed urban streets shall be 0.05.
2. Superelevation shall be obtained by rotating the plane successively about the break points of the section until the plane has attained a slope equal to that required by the chart. Should the rotation traverse the entire section and further superelevation be required, the remaining rotation of the plane shall be about the low edge of the inside travel lane.

Crown is to be removed in the auxiliary lane to the outside of the curve only when the adjoining travel lanes require positive superelevation.
3. When positive superelevation is required, the slope of the gutter on the high side shall be a continuation of the slope of the superelevated pavement.
4. In construction, short vertical curves shall be placed at all angular profile breaks within the limits of the superelevation transition.
5. The variable superelevation transition length "L" shall have a minimum value of 50 feet for design speeds under 40 MPH and 75 feet for design speeds of 40 MPH or greater.
6. Roadway sections having lane arrangements different from those shown, but composed of a series of planes, shall be superelevated in a similar manner.
7. For superelevation of lower speed urban streets, see the FDOT 'Manual Of Uniform Minimum Standards For Design, Construction And Maintenance For Streets And Highways'. For superelevation of curves on rural highways, urban freeways and high speed urban highways, see Index No. 510.

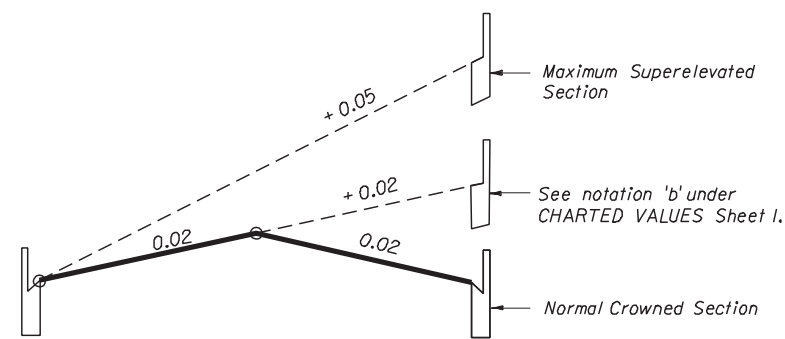
$e_{max} = 0.05$

SUPERELEVATION FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

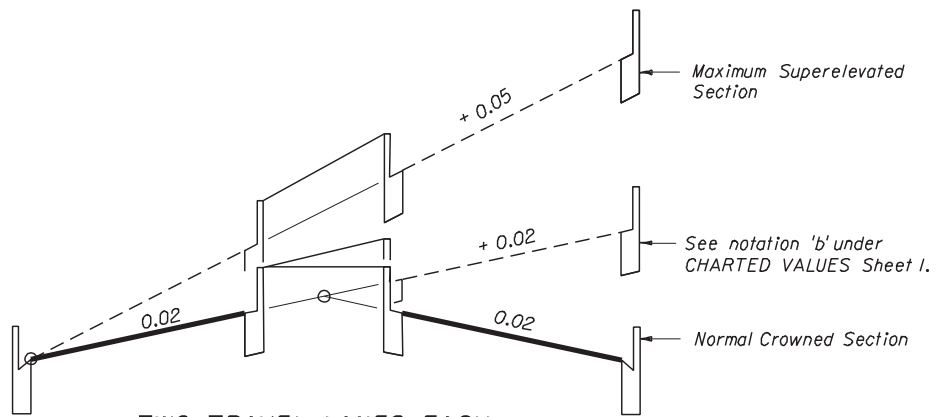
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**SUPERELEVATION
URBAN HIGHWAYS AND STREETS**

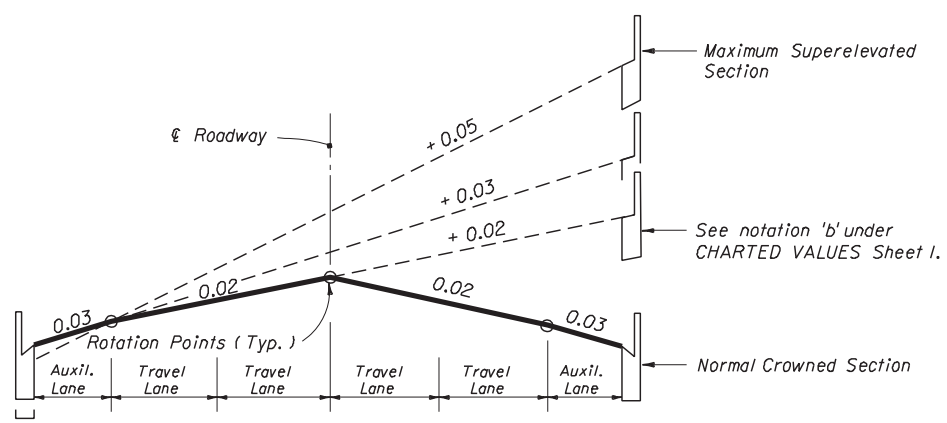
Names	Dates	Approved By		
Designed By	WLB/JMG 66 & 90		Revision	Sheet No.
Drawn By	CDR/HSD 67 & 90		00	1 of 3
Checked By	RLO/JMG 67 & 90			511



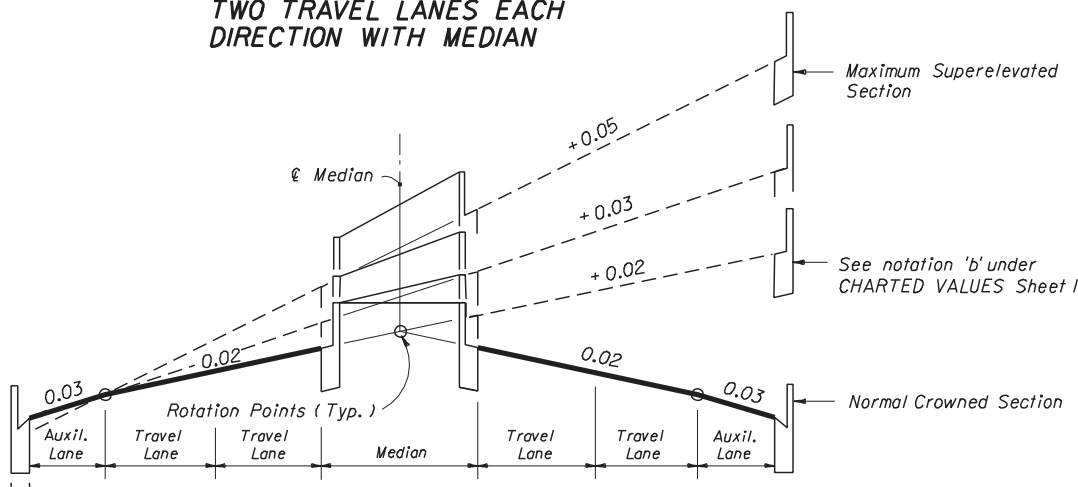
TWO TRAVEL LANES EACH DIRECTION



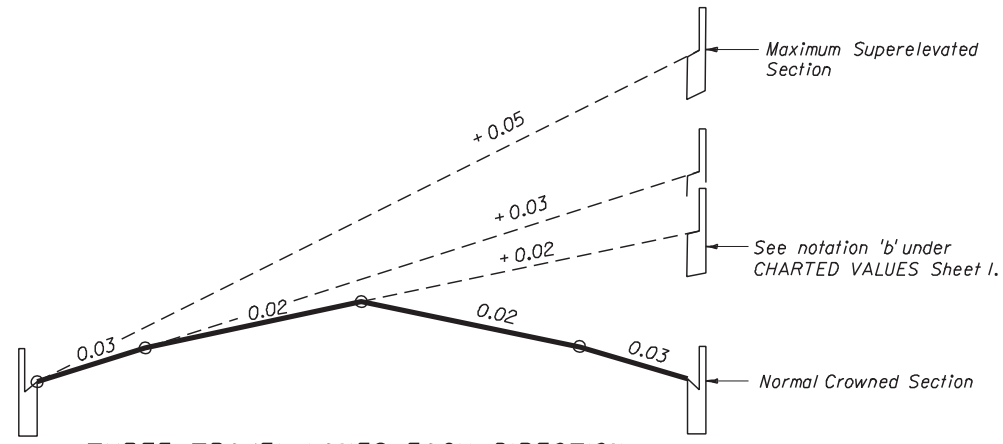
TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN



TWO TRAVEL LANES EACH DIRECTION WITH AUXILIARY LANES

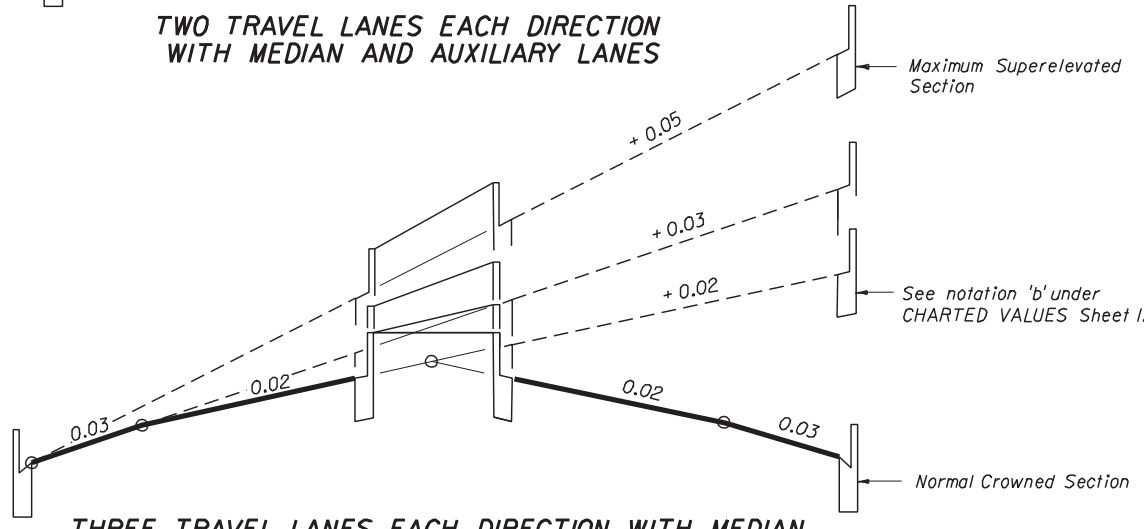


TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANES



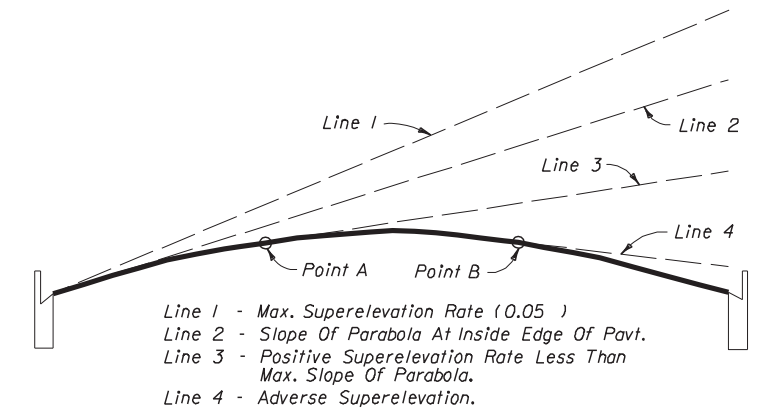
THREE TRAVEL LANES EACH DIRECTION

UNDIVIDED FACILITIES



THREE TRAVEL LANES EACH DIRECTION WITH MEDIAN

DIVIDED FACILITIES

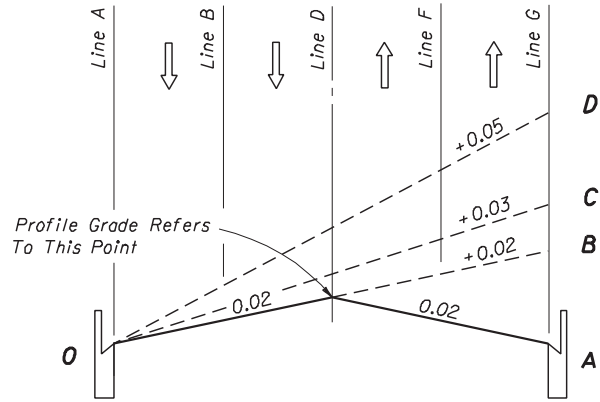


Superelevation rates obtained from the chart or table on Sheet I are also applicable to a parabolic crown section. When this section is used, superelevation is established by rotating a tangent about the arc of the parabolic crown until the desired slope is attained (points A & B on sketch). The normal parabolic crown will be maintained outside the limits of the plane thus formed.

PARABOLIC SECTION

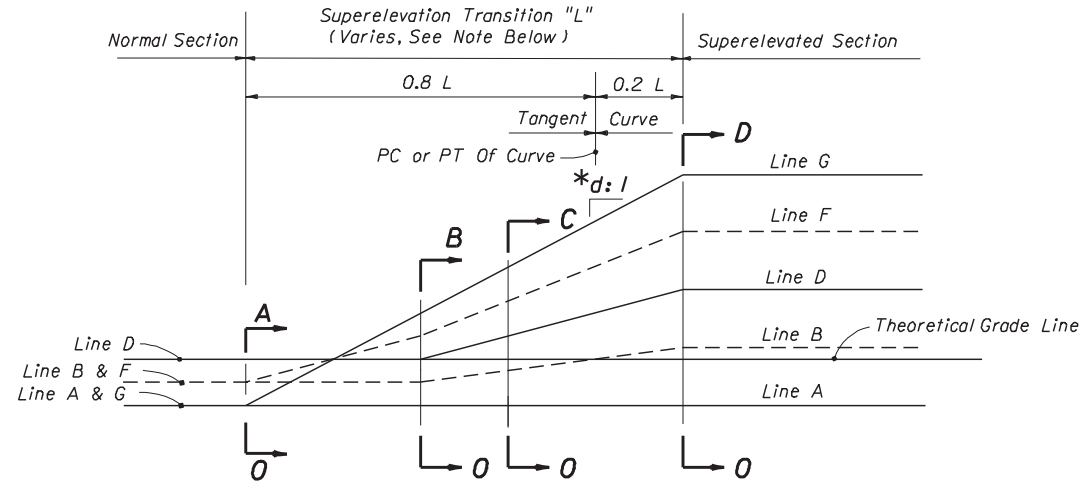
SUPERELEVATION TRANSITION SECTIONS FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SUPERELEVATION URBAN HIGHWAYS AND STREETS				
Designed By	WLR, JVG	EE/98	Approved By	
Drawn By	CDR, HSD	67/98	Revision	Sheet No.
Checked By	RLO, JVG	67/98	00	2 of 3
			Index No.	511



SECTION O-A to O-D

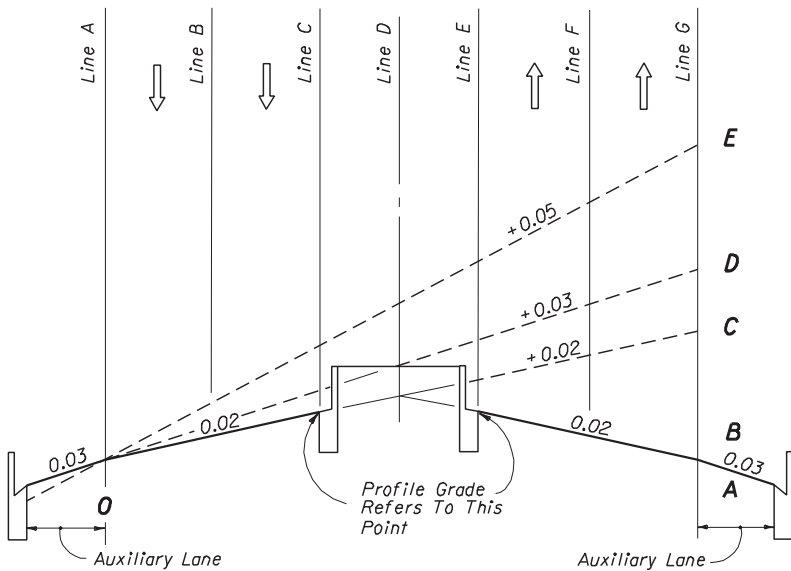
TWO LANES EACH DIRECTION



PROFILE

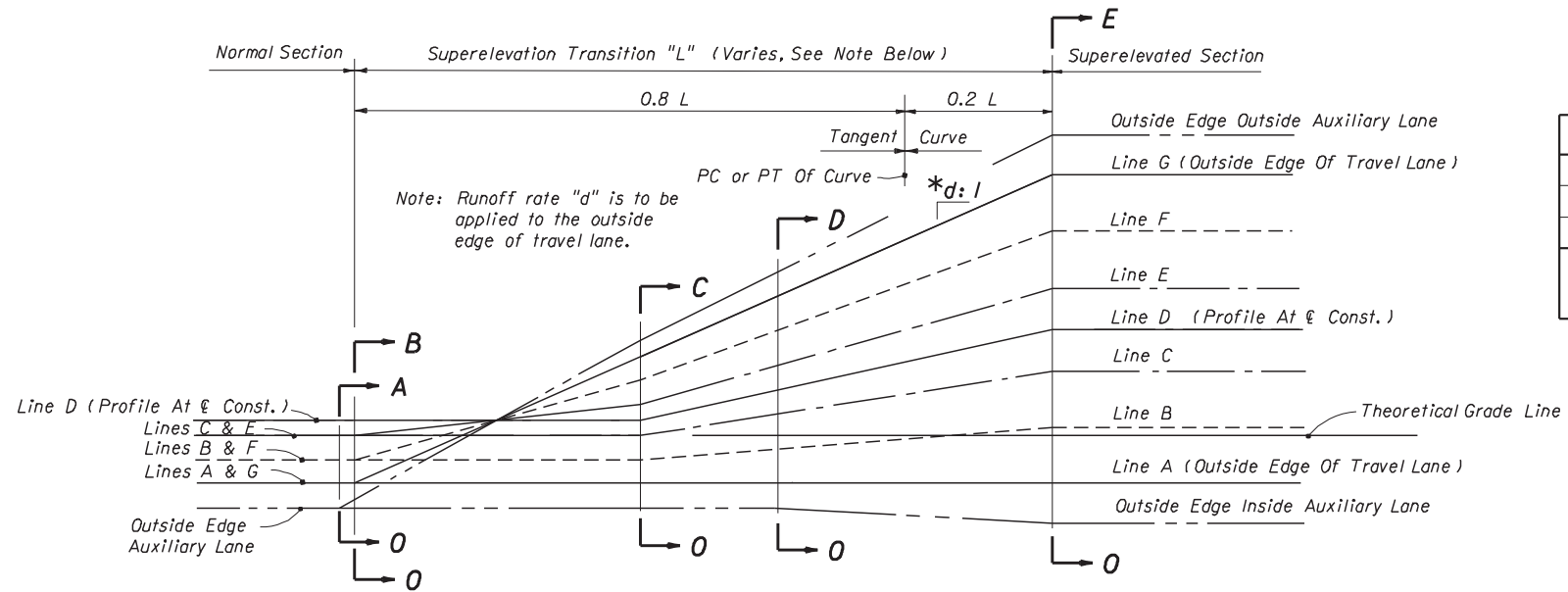
LINE	DESCRIPTION
A	Inside Travel Lane
B	Inside Lane Line
C	Inside Median Edge Pavement
D	℄ Construction
E	Outside Median Edge Pavement
F	Outside Lane Line
G	Outside Travel Lane

Inside And Outside Are Relative To Curve Center



SECTION O-A to O-E

TWO LANES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANE



PROFILE

*d (Slope Ratio)	
30 MPH	1: 100
40 MPH	1: 125
45-50 MPH Δ	1: 150

Δ 1: 125 May Be Used For 45 MPH Under Restricted Conditions.

Note: The sections and profiles shown are examples of superelevation transitions. Similar schemes should be used for roadways having other sections.

EXAMPLE SUPERELEVATION SECTIONS AND PROFILES FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SUPERELEVATION URBAN HIGHWAYS AND STREETS				
Designed By	WTR, JWG	EE/98	Approved By	
Drawn By	CDR, HSD	67/98	Revision	Sheet No.
Checked By	RLO, JVC	67/98	00	3 of 3
				Index No. 511

BASE THICKNESS AND OPTION CODES										
Base Group	Structural Range	Base Group Pay Item Number	Base Options							RAP Base
			Limerock LBR 100	Cemented Coquina LBR 100	Shell Rock LBR 100	Bank Run Shell LBR 100	Graded Aggregate Base LBR 100	Type B-12.5	B-12.5 And 4" Granular Subbase, LBR 100 *	
			Structural Number (Per. in.)							
			(.18)	(.18)	(.18)	(.18)	(.15)	(.30)	(.30&.15)	(NA)
1	.65-.75	701	4"	4"	4"	4"	4 1/2"	Δ 4"		□ 5"
2	.80-.90	702	5"	5"	5"	5"	5 1/2"	Δ 4"		
3	.95-1.05	703	5 1/2"	5 1/2"	5 1/2"	5 1/2"	6 1/2"	Δ 4"		
4	1.05-1.15	704	6"	6"	6"	6"	7 1/2"	Δ 4"		
5	1.25-1.35	705	7"	7"	7"	7"	8 1/2"	4 1/2"		
6	1.35-1.50	706	8"	8"	8"	8"	9"	5"		
7	1.50-1.65	707	8 1/2"	8 1/2"	8 1/2"	8 1/2"	10"	5 1/2"		
8	1.65-1.75	708	9 1/2"	9 1/2"	9 1/2"	9 1/2"	11"	5 1/2"		
9	1.75-1.85	709	10"	10"	10"	10"	12"	6"	4"	
10	1.90-2.00	710	11"	11"	11"	11"	∅ 13"	6 1/2"	4 1/2"	
11	2.05-2.15	711	12"	12"	12"	12"	∅ 14"	7"	5"	
12	2.20-2.30	712	12 1/2"	12 1/2"	12 1/2"	12 1/2"		7 1/2"	5 1/2"	
13	2.35-2.45	713	∅ 13 1/2"	∅ 13 1/2"	∅ 13 1/2"	∅ 13 1/2"		8"	6"	
14	2.45-2.55	714	∅ 14"	∅ 14"	∅ 14"	∅ 14"		8 1/2"	6 1/2"	
15	2.60-2.70	715						9"	7"	

GENERAL NOTES

1. On new construction and complete reconstruction projects where an entirely new base is to be built, the design engineer may specify just the Base Group and any of the unrestricted General Use Optional Bases shown in that base group may be used. Note, however, that some thick granular bases are limited to widening which prevents their general use.
2. Where base options are specified in the plans, only those options may be bid and used.
3. The designer may require the use of a single base option, for instance Type B-12.5 in a high water condition. This will still be bid as Optional Base.

* For granular subbase, the construction of both the subbase and Type B-12.5 will be paid for under the contract unit price for Optional Base. Granular subbases include Limerock, Cemented Coquina, Shell Rock, Bank Run Shell and Graded Aggregate Base at LBR 100. The base thickness shown is Type B-12.5. All subbase thicknesses are 4".

∅ To be used for widening only, three feet or less.

Δ Based on minimum practical thicknesses.

□ Restricted to non-limited access shoulder base construction.

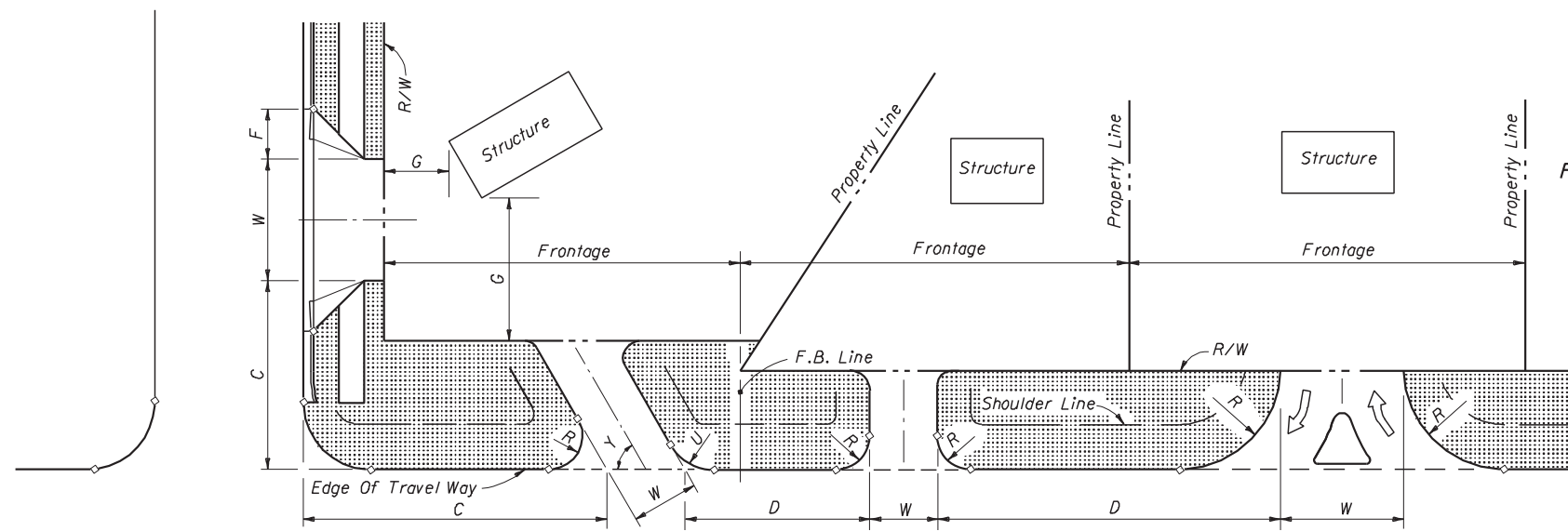
GENERAL USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
OPTIONAL BASE GROUP AND STRUCTURAL NUMBERS				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	12/93	<i>Bruce Dittus</i> State Pavement Design Engineer	
Checked By	BTD	12/93	Revision	Sheet No. Index No.
			00	1 of 2 514

BASE THICKNESS AND OPTION CODES									
Base Group	Structural Range	Base Group Pay Item Number	Base Options						
			Limerock Stabilized LBR 70	Shell LBR 70	Shell Stabilized LBR 70	Sand-Clay LBR 75	Soil Cement (300 psi) (Plant Mixed)	Soil Cement (300 psi) (Road Mixed)	Soil Cement (500 psi) (Plant Mixed)
			Structural Number (Per. in.)						
			(.12)	(.12)	(.10)	(.12)	(.15)	(.15)	(.20)
1	.60-.75	701	5"	5"	7"	5"	5"	5"	4"*
2	.75-.90	702	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	4"
3	.95-1.05	703	8"	8"	9 $\frac{1}{2}$ "	8"	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	5"
4	1.05-1.15	704	9"	9"	10 $\frac{1}{2}$ "	9"	7 $\frac{1}{2}$ "	7 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "
5	1.20-1.35	705	10"	10"	12"	10"	8 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	6"
6	1.30-1.45	706	11"	11"		11"	9"		7"
7	1.45-1.60	707	12 $\frac{1}{2}$ "	12 $\frac{1}{2}$ "		12 $\frac{1}{2}$ "	10"		7 $\frac{1}{2}$ "
8	1.65-1.75	708					11"		8 $\frac{1}{2}$ "
<p>Not Recommended For 20 Year Design Accumulated 18 kip Equivalent Single Axle (ESAL) Loads Greater Than 1,000,000</p>									
<p>Note: These base materials may be used on FDOT projects when approved in writing by the District Materials Engineer and shown in the plans. * Based On Minimum Practical Thickness</p>									

LIMITED USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
OPTIONAL BASE GROUP AND STRUCTURAL NUMBERS				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	12/93	<i>Bruce Dietel</i> State Pavement Design Engineer	
Checked By	BTD	12/93	Revision	Sheet No. / Index No.
			00	2 of 2 / 514



For Additional Information Refer To FDOT Rules Chapters 14-96 And 14-97.

SKETCH ILLUSTRATING DEFINITIONS

LEGEND

- Return Radius Point Or Flare Point
- ▨ Buffer Areas
- F.B. Line** Frontage Boundary Line
- W** Driveway Width
- Y** Driveway Angle
- C** Corner Clearance
- G** Setback
- R** Outside Radius
- U** Inside Radius
- D** Distance Between Connections
- F** Flare

GENERAL NOTES

- For definitions and descriptions of access connection "Categories" and access "Classifications" of highway segments, and for other detailed information on access to the State Highway System, refer to FDOT Rule Chapter 14-96, "State Highway Connection Permits Administrative Process" and Rule Chapter 14-97, "State Highway System Access Management Classification System And Standards"
- For this index the term 'turnout' applies to that portion of driveways, roads or streets adjoining the outer roadway. For this index the term 'connection' encompasses a driveway, street or road and their appurtenant islands, separators, transition tapers, auxiliary lanes, travelway flares, drainage pipes and structures, crossovers, sidewalks, curb cut ramps, signing, pavement marking, required signalization, maintenance of traffic or other means of access to or from controlled access facilities. The turnout requirements set forth in this index do not provide complete intersection design, construction or maintenance requirements.
- The location, positioning, orientation, spacing and number of connections and median openings shall be in conformance with FDOT Rule Chapter 14-97.
- On Department construction projects all driveways not shown on the plans are to be reconstructed at their existing location in conformance to these standards, or, in conformance to permits issued during the construction project.
- Driveways shall have sufficient length and size for all vehicular queueing, stacking, maneuvering, standing and parking to be carried out completely beyond the right of way line. Except for vehicles stopping to enter the highway, the turnout areas and drives within the right of way shall be used only for moving vehicles entering or leaving the highway.
- Connections with expected daily traffic over 4000 vpd are to be constructed as intersecting streets or roads. The design requirement of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.

For connections with expected daily traffic less than 4000 vpd, the Department will determine if drop curbs or radius returns are required in accordance with existing or planned connections. Where radius returns apply, the design requirements of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.

For connections that are intended to daily accommodate either multi-unit vehicles or single unit vehicles exceeding 30' in length, returns with 50' radii are to be used, unless otherwise called for in the plans or otherwise stipulated by permit. Where large numbers of multi-unit vehicles will use the connection, the connection width and radii are to be increased and auxiliary lanes, tapers, lane flares, separators and/or islands constructed, as determined by the Department to be necessary for safe turning movements.

- Any connection on a highway having a posted or operating speed over 45 mph shall have radial returns. Any connection requiring or having a specified median opening with left turn storage and served directly by that opening shall have radial returns.
- Where a connection is intended to align with a connection across the highway, the through lanes are to align directly with the corresponding through lanes.
- For new connections and for connections on all new construction and reconstruction projects, pavement materials and thicknesses shall meet the requirements applicable to either that detailed for "Urban Flared Turnouts", or, that described in "Table 515-1" for connections with radial returns and/or auxiliary lanes.
- The responsibility for the cost of construction or alteration to an access connection shall be in accordance with FDOT Rule Chapter 14-96.

DESIGN NOTES

- Prior to the adoption of FDOT Rules Chapters 14-96 and 14-97, connections to the State Highway System were defined and permitted by Classes. Connections have been redefined by Categories under Rule 14-96; and, the term "Class" has been applied to highway segments of the State Highway System as defined under Rule 14-97.

ELEMENT DESCRIPTION	URBAN (CURB & GUTTER)			RURAL		
	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day [■] or 61-400 Trips/Hour	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day [■] or 61-400 Trips/Hour
		2-Way □	2-Way □		2-Way □	2-Way □
CONNECTION WIDTH W	12' Min. 24' Max.	24' Min. 36' Max.	24' Min. 36' Max.	12' Min. 24' Max.	24' Min. 36' Max.	24' Min. 36' Max.
FLARE (Drop Curb) F	10' Min.	10' Min.	N/A	N/A	N/A	N/A
RETURNS (Radius) R & U	N/A	△	25' Min. 50' Std. 75' Max.	15' Min. 25' Std. 50' Max.	25' Min. 50' Std. 75' Max.	25' Min. 50' Std. (Or 3-Centered Curves)
ANGLE OF DRIVE Y		60°-90°	60°-90°		60°-90°	60°-90°
DIVISIONAL ISLAND (Throat Median)		4'-22' Wide	4'-22' Wide		4'-22' Wide	4'-22' Wide
SETBACK G	12' Min., All categories. See General Note No. 5.					

■ Street or road intersection design, with possible auxiliary lanes and channelization, may be necessary. Intersection design, with possible auxiliary lanes and channelization, should be considered for connections with more than 4000 trips/days.

□ "2-Way" refers to one "in" movement and one "out" movement i.e. not exclusive left or right turn lanes on the connection.

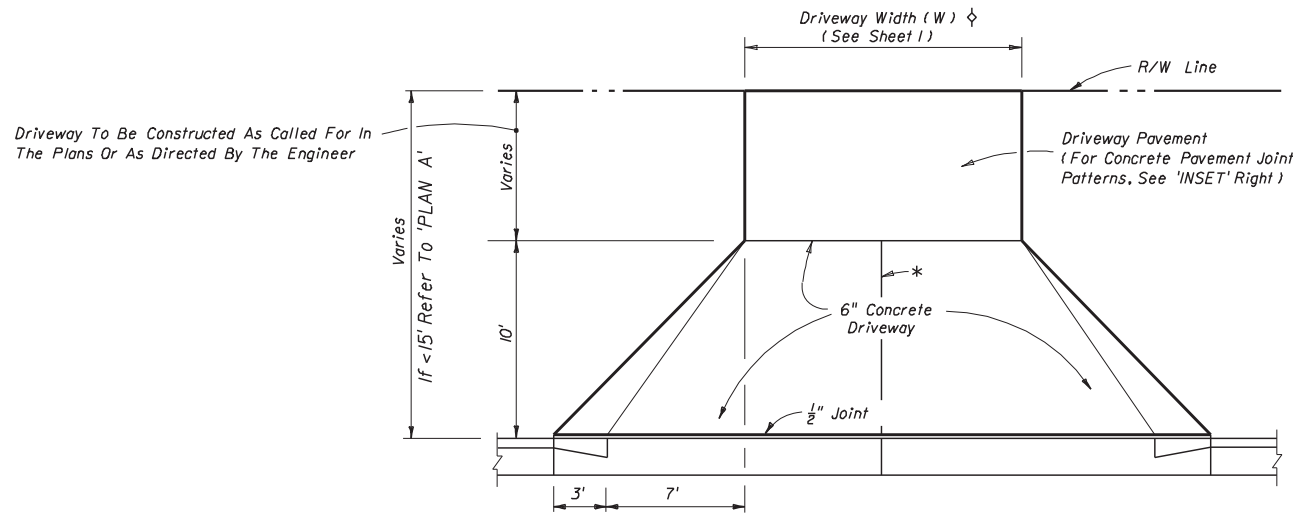
△ Small radii may be used in lieu of flares as approved by the Department.

DESIGN NOTE: 1-Way connections will be designed to effectively eliminate unpermitted movements.

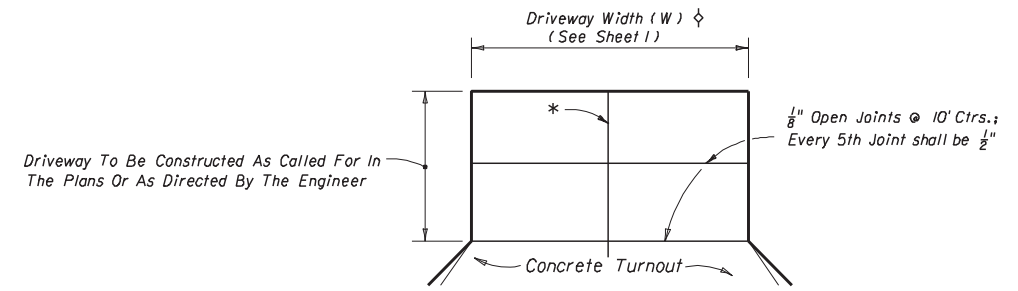
SUMMARY OF GEOMETRIC REQUIREMENTS FOR TURNOUTS

NOT INTENDED FOR FULL INTERSECTION DESIGN

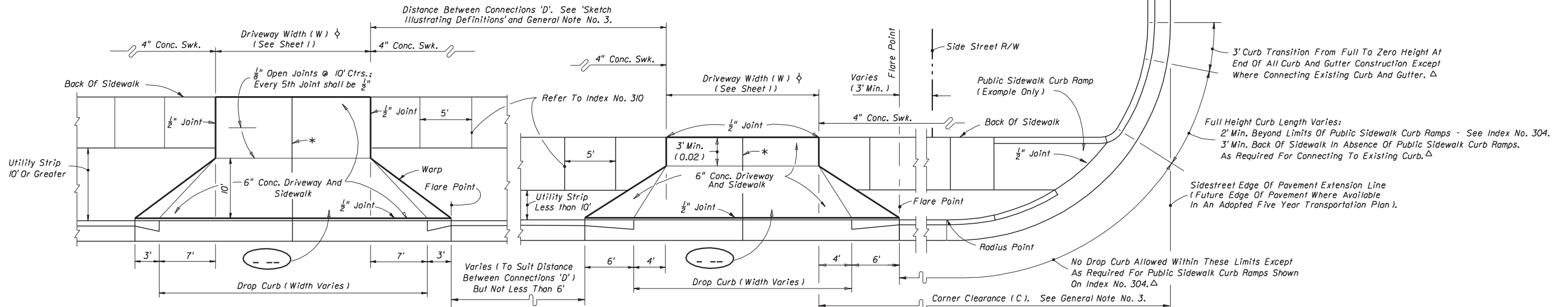
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
TURNOUTS					
Names	Dates	Approved By			
Designed By COM/DT	9/91	 State Roadway Design Engineer			
Drawn By RSD	03/91	Revision	Sheet No.	Index No.	
Checked By JVC	03/91	00	1 of 6	515	



PLAN C
TURNOUT WITHOUT SIDEWALK



JOINT PATTERN WHEN CONCRETE DRIVE CONSTRUCTED
INSET



PLAN B
TURNOUT WITH SIDEWALK AND
UTILITY STRIP (10' OR GREATER)

PLAN A
TURNOUT WITH SIDEWALK AND
UTILITY STRIP (LESS THAN 10')

Footnotes:

- All 1/2" joints shall be constructed with preformed joint filler.
- * 1/8" Open joints placed at equal (20' max.) intervals for driveways over 20' wide. Joints in curb and gutter to match joints in driveways.
- △ When connecting to sidestreet curb and gutter sections, the no drop curb limits should extend back to the sidestreet radius point. With or without curb and gutter, no driveway should encroach on the corner radius.
- ◇ Driveways (6" concrete) shall be of a uniform width (W) to the right of way line.
- Alpha-numeric identification of a flared driveway type specifically called for in the plans, see sheets 3 and 4.

SPECIAL NOTES FOR URBAN FLARED TURNOUTS

1. Driveway 6" concrete pavement and drop curb shall meet the material and construction requirements of Sections 522 and 520 respectively of the FDOT Standard Specifications. The driveway foundation shall meet the requirement of Subarticle 522-4.
2. For details of drop curb and public sidewalk curb ramps refer to Indexes Nos. 300 and 304 respectively.
3. Where turnouts are constructed within existing curb and gutter, the existing curb and gutter shall be removed either to the nearest joint beyond the flare point or to the extent that no remaining section is less than 5' long; and, drop curb constructed in accordance with Notes Nos. 1 and 2.
4. Cost for preformed joint filler shall be included in the cost for the concrete pavement (concrete sidewalk, 6" thick).
5. For turnouts with radial returns see the requirements under the "Summary Of Geometric Requirements For Turnouts", the "General Notes", the details of "Rural Turnout Construction" and the detail of "Limits Of Clearing & Grubbing, Stabilization And Base At Intersections".
6. Department maintenance of pavement shall extend out to the right of way or 2' back of sidewalk, whichever distance is less.
7. The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.
8. All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.
9. All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.
10. Turnouts will be paid for under the contract unit price for Concrete Sidewalk (6" Thick), SY.

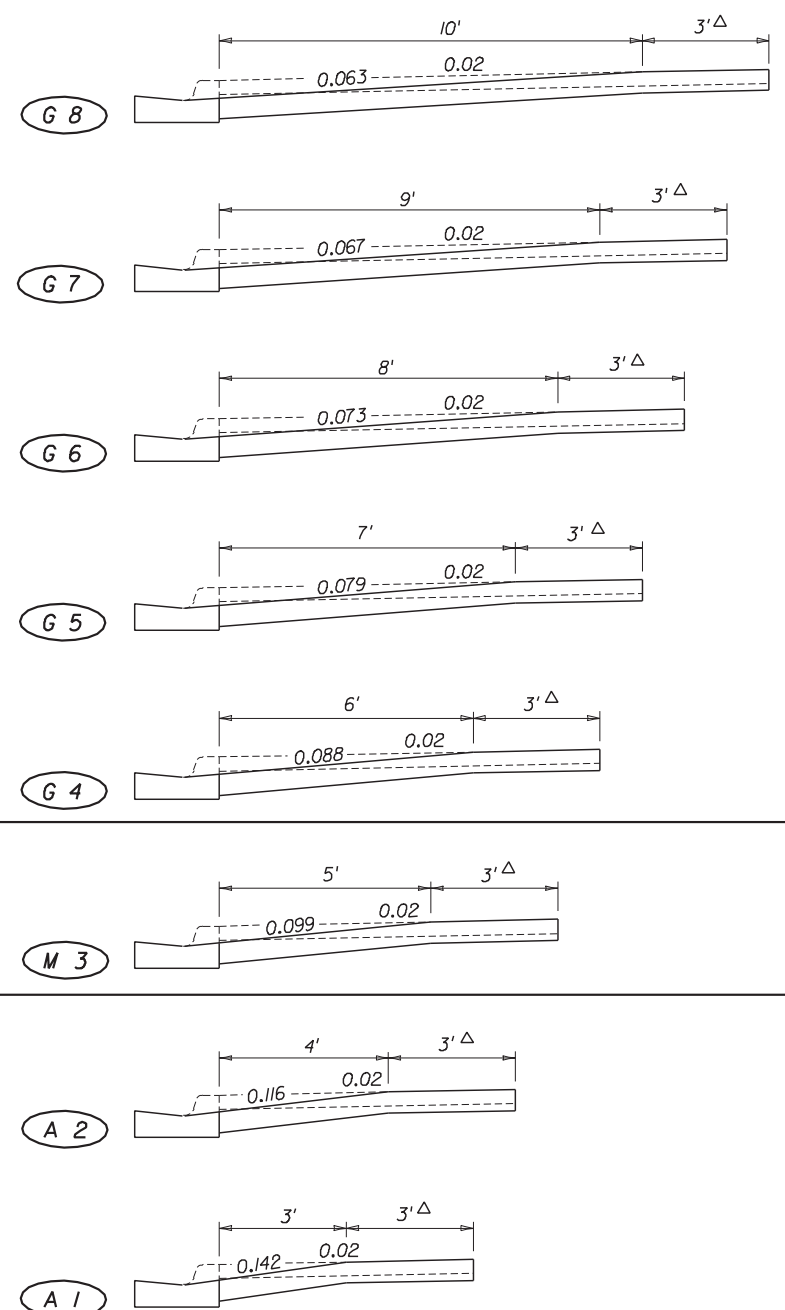
DESIGN NOTES FOR URBAN FLARED TURNOUTS

1. Driveways indicated as 'Adverse Applications' are those with slopes that can cause overhang drag for representative standard passenger vehicles under fully loaded conditions; or, those with slopes that can cause drivers who are leaving the roadway to slow or pause to the extent that traffic demand volumes will be impeded.
 2. The standard flared driveways on this index may not accommodate vehicles with low beds, low undercarriage or low appendage features. Where such vehicles are design vehicles driveways are to have site specific flare designs or Category III designs.
 3. When specific flare type driveways are to be constructed, the type shall be designated in the plans using the assigned alpha-numeric designation.
- Driveways indicated as 'Marginal Applications' are those with slopes that can cause overhang drag for representative standard passenger vehicles under fully loaded conditions when the driveway is located on the low side of fully super-elevated roadways.
- Driveways indicated as 'General Applications' are those with slopes that can readily accommodate representative standard passenger vehicles and those that can accommodate representative standard trucks, vans, buses and recreational vehicles operating under normal crown and super-elevation conditions.

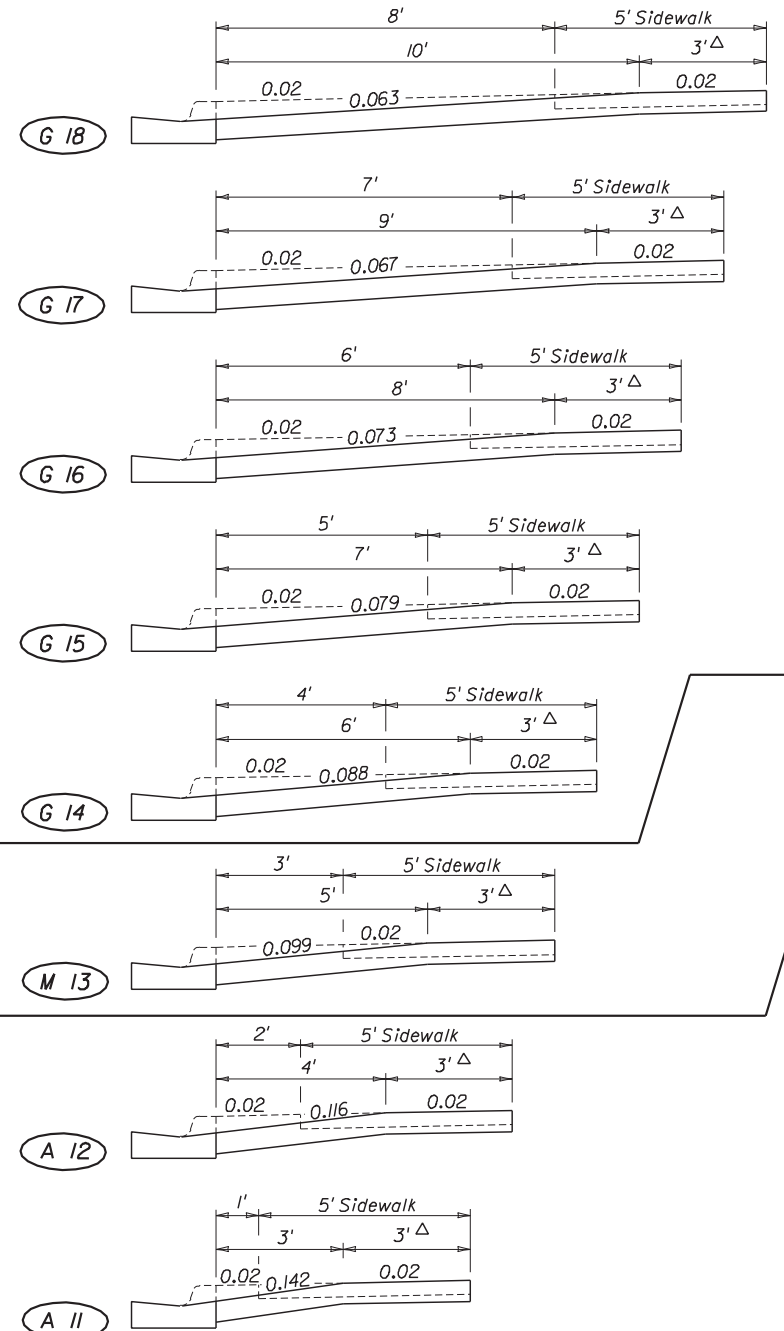
URBAN FLARED TURNOUTS

Note: See sheet 1 for 'GENERAL NOTES'

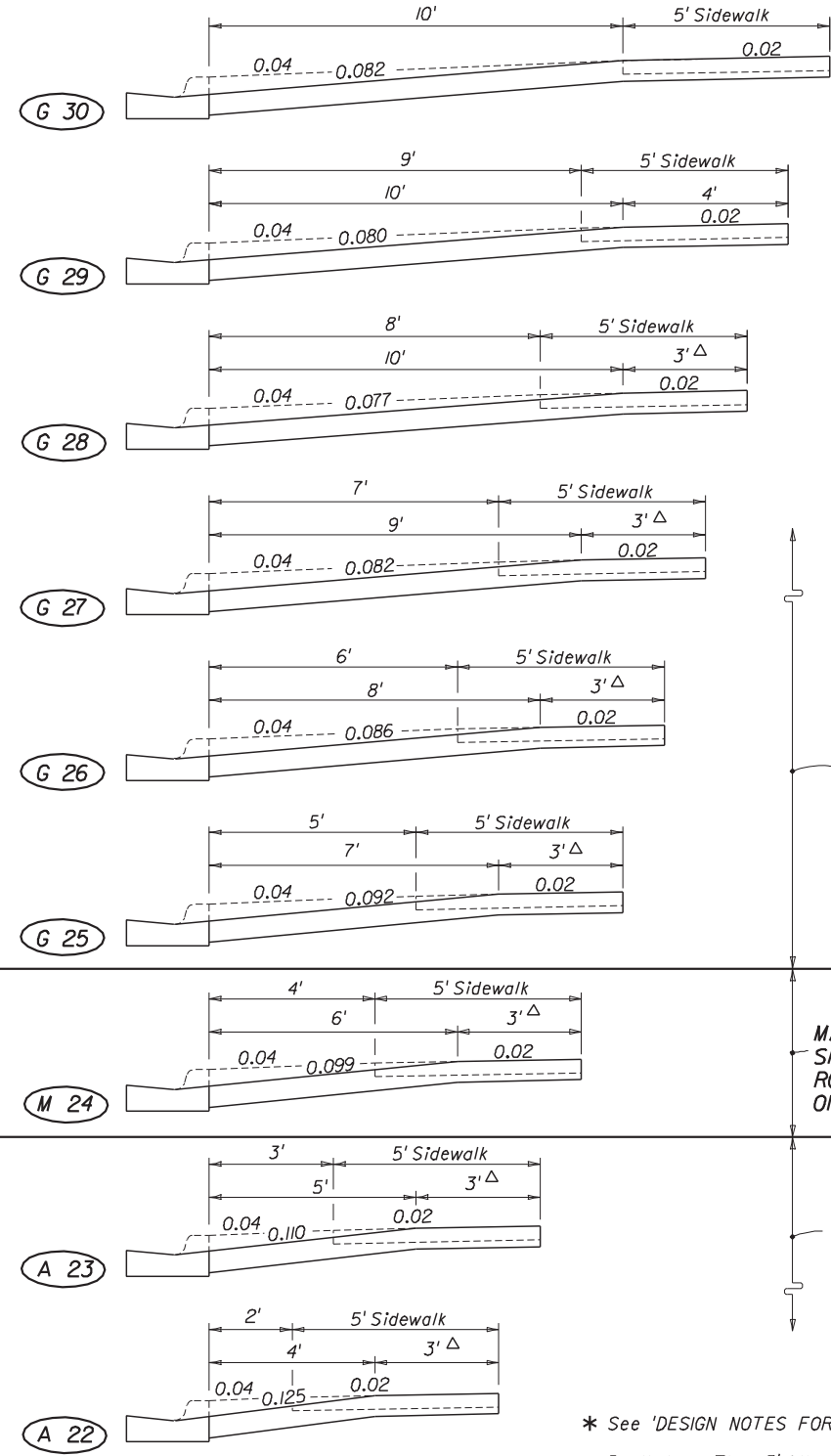
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TURNOUTS				
Names	Dates	Approved By		
Designed By	JVS/JRH 09/93	State Roadway Design Engineer		
Drawn By	HKH 09/93	Revision	Sheet No.	Index No.
Checked By	JVS 09/93	00	2 of 6	515



SIDEWALK ADJACENT TO CURB



SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE



SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE

GENERAL* APPLICATIONS

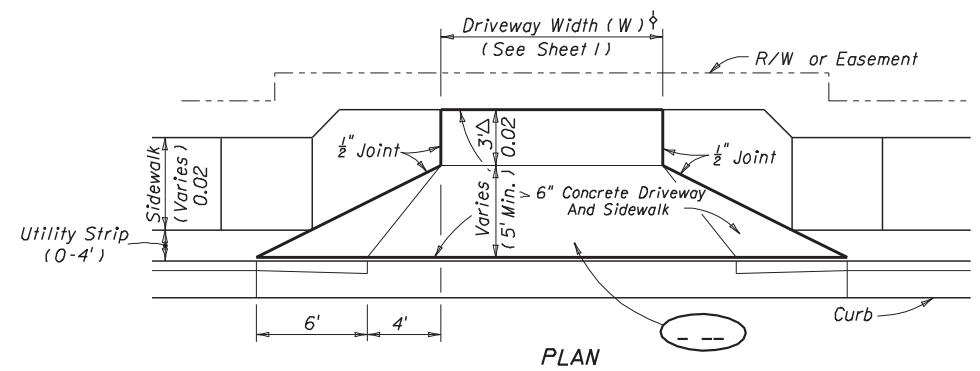
MARGINAL* APPLICATIONS ON LOW SIDE OF FULLY SUPERELEVATED ROADWAY (REFER TO MODIFICATIONS ON SHEET 4)

ADVERSE* APPLICATIONS (REFER TO MODIFICATIONS ON SHEET 4)

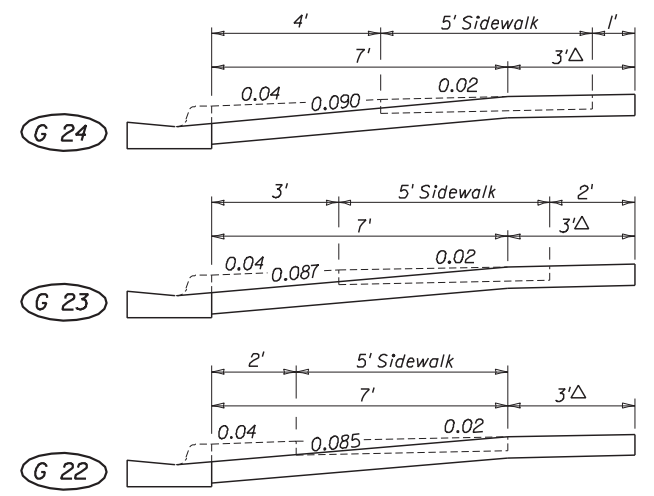
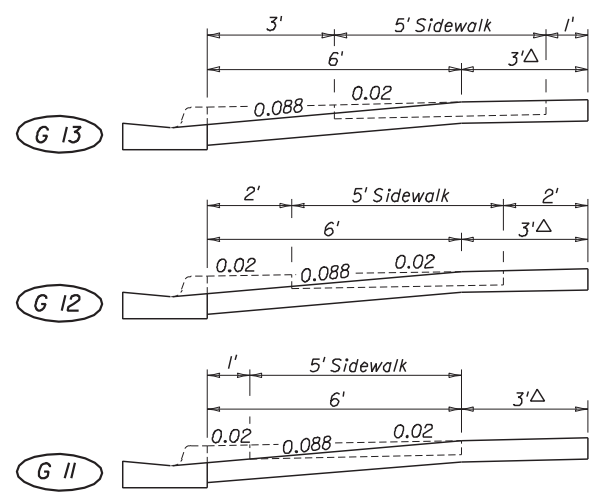
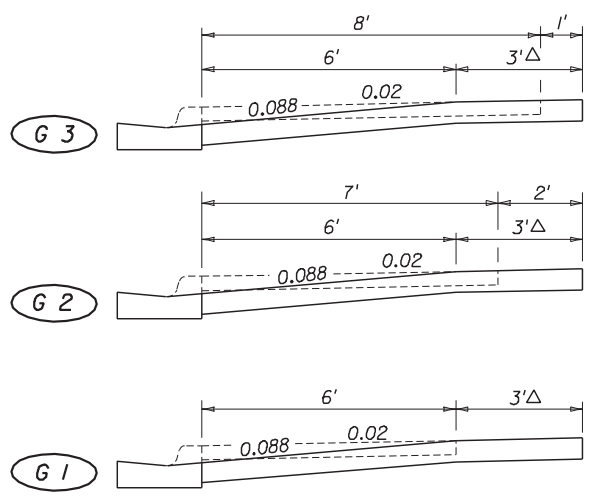
* See 'DESIGN NOTES FOR URBAN FLARED TURNOUTS' On Sheet 2.
 Δ Depth Less Than 3' Allowable Only Under Findings Of Infeasibility.

DRIVEWAY SECTIONS ON CURBED FACILITIES WITH SIDEWALKS

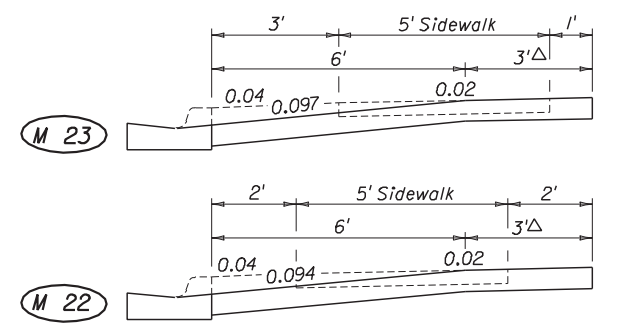
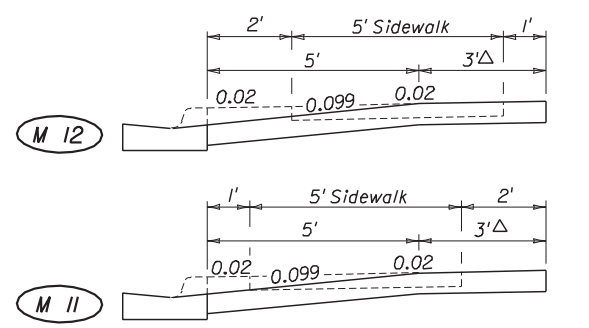
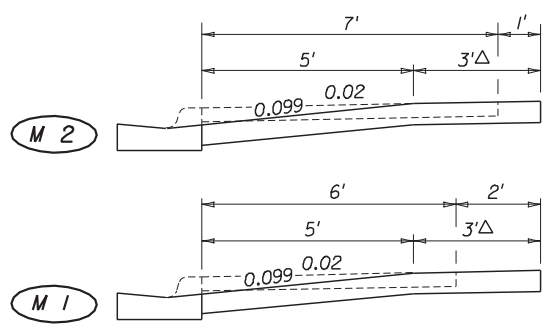
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TURNOUTS				
Designed By	JWS/HKP	9/93	Approved By <i>[Signature]</i>	
Drawn By	HKH	9/93	Revision	Sheet No.
Checked By	JWC/FLS	9/93	00	3 of 6
			Index No.	515



MODIFICATIONS OF 'ADVERSE' AND 'MARGINAL' APPLICATIONS



ADVERSE* AND MARGINAL* SECTIONS MODIFIED TO ACHIEVE GENERAL* APPLICATION



ADVERSE* SECTIONS MODIFIED TO ACHIEVE MARGINAL* APPLICATION

* See 'DESIGN NOTES FOR URBAN FLARED TURNOUTS' On Sheet 2.
 Δ Depth Less Than 3' Allowable Only Under Findings Of Infeasibility.

SIDEWALK ADJACENT TO CURB

SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE

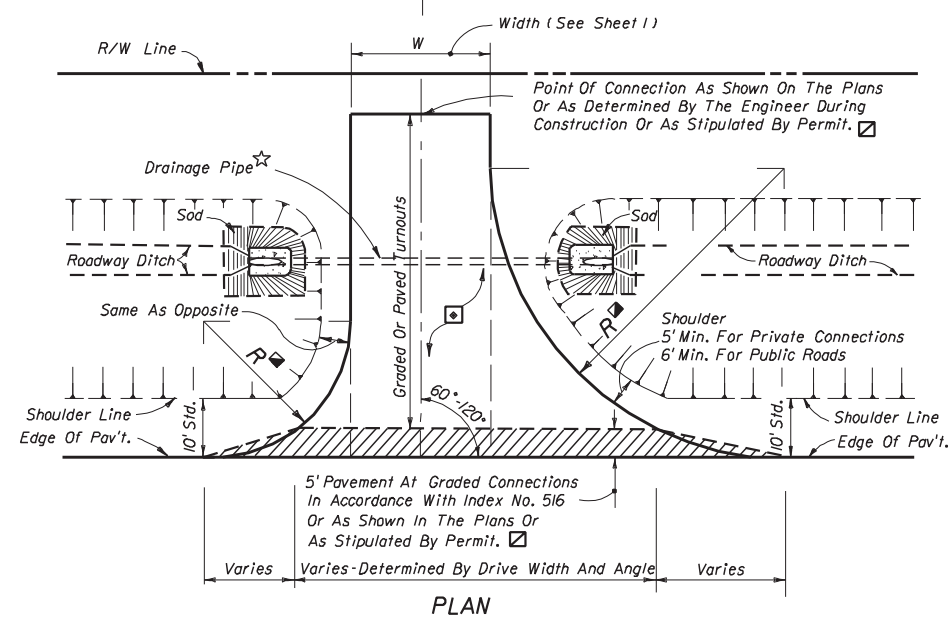
SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE

MODIFICATIONS TO ADVERSE AND MARGINAL SECTIONS

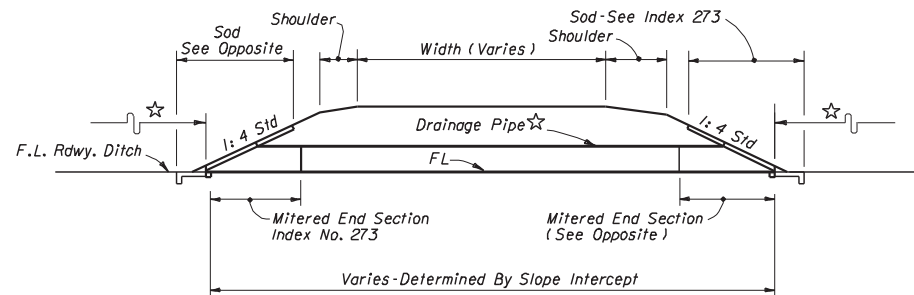
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TURNOUTS				
Names	Dates	Approved By		
Designed By JVG/HKP	9/93	 State Roadway Design Engineer		
Drawn By HKH	9/93			
Checked By JVG/FLS	9/93	Revision	Sheet No.	Index No.
		00	4 of 6	515

Typical Half Section For Low Volume/Residential Connections

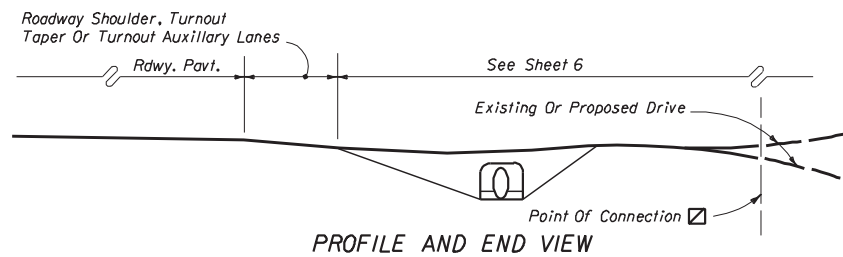
Typical Half Section For Higher Volume Connections



PLAN



LONGITUDINAL SECTION



PROFILE AND END VIEW

★ Drainage pipe size and length shall be that shown on the plans, or as stipulated by permit, or, as determined by the Engineer during construction. The size shall be at least that established by the FDOT District, but not less than 15" diameter or equivalent. For minimum cover over drainage pipe see Index No. 205. Pipe arch or elliptical pipe may be required to obtain necessary cover. At minimal cover applications a modified pavement apron is permitted. See 'PERMISSIBLE PAVEMENT MODIFICATION' Index No. 273. For spacing between adjacent pipe end treatments see Index No. 273.

☐ Stable material may be required for graded turnouts to private property as directed by the Engineer in accordance with Section 102-6 of the Standard Specifications.

☑ The 5' pavement at graded connections is not required where there is paved shoulder 4' or more in width. The 5' pavement requirement may be waived for connections serving one or two homes or field entrances with less than 20 trips per day, or 5 trips per hour as approved by permit or by the Engineer, or when not itemized in the plans.

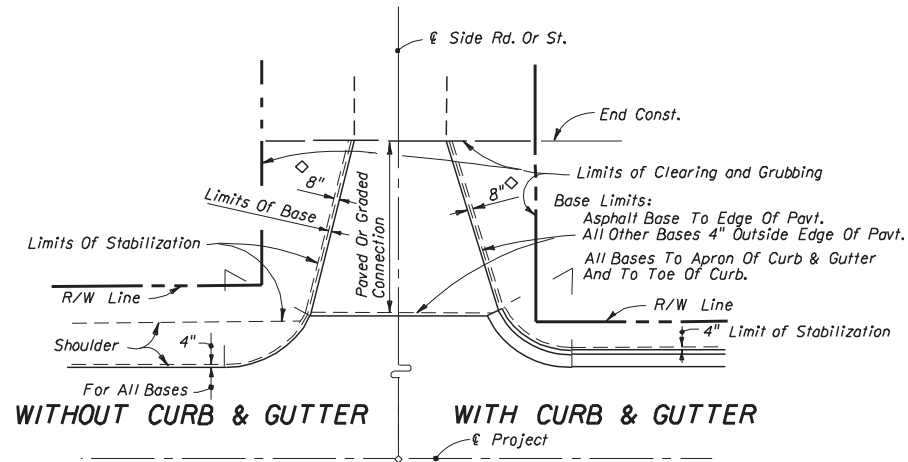
Paved turnouts are to be constructed for all paved connecting facilities. The connecting point will be determined by the Engineer.

Paved turnouts are to be constructed for all business, commercial, industrial or high volume residential graded connecting facilities. The connecting point shall be 30' from edge of roadway pavement or at R/W line, whichever is less.

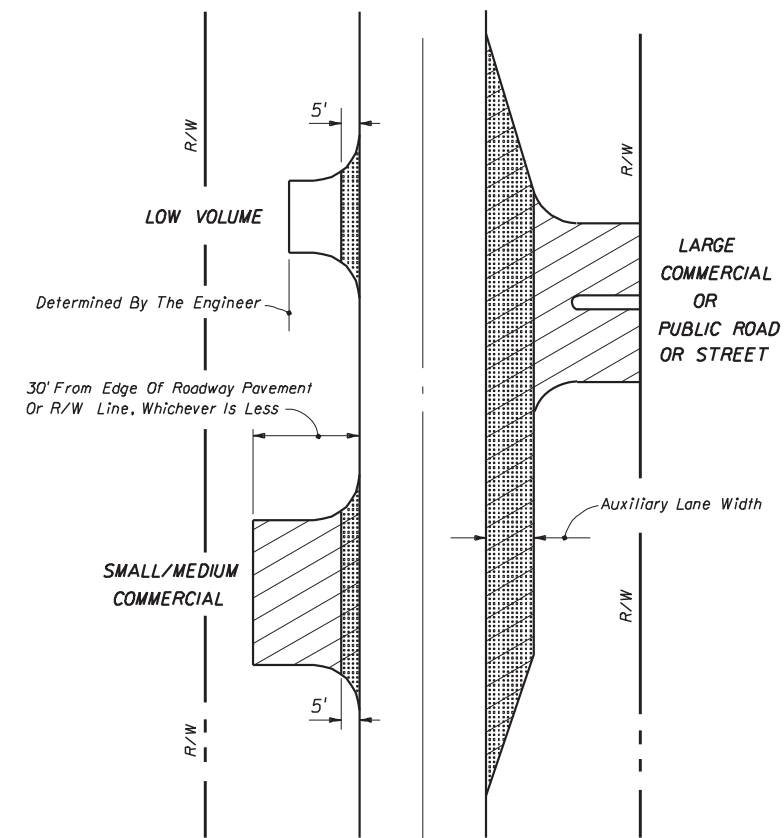
Paved turnouts are to be constructed for all connecting facilities over 4000 vehicles per day. The connecting point shall be at the R/W line.

☑ See "Summary Of Geometric Requirements For Turnouts" chart for return radii lengths and supplemental information.

RURAL TURNOUT CONSTRUCTION



LIMITS OF CLEARING & GRUBBING, STABILIZING AND BASE AT INTERSECTIONS



LEGEND
 □ Graded Or Paved
 ▨ Required Paving
 ▩ Limits Of Department Maintenance

NOTES

1. Auxiliary lane pavements and crossover pavements shall be maintained by the Department.
2. Department maintenance of turnout pavement shall extend out to 5' from edge of the travel way or limits of paved shoulders, and, extend to include auxiliary lanes. The remainder of any turnout paved area on the right of way shall be maintained by the owner or his authorized agent. As a function of routinely reworking shoulders, the Department may grade and shape existing material on non-paved areas beyond the maintained pavement.
3. Control and maintenance of drainage facilities within the right of way shall be solely the responsibility of the Department, unless specified differently by Department permit.
4. The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.
5. All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.
6. All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.

LIMITS OF CONSTRUCTION AND MAINTENANCE FOR RURAL CONNECTIONS

MATERIAL TYPES AND THICKNESSES IN DRIVING AREAS FOR RURAL AND URBAN CONNECTIONS			
Course	Materials ^②	Thickness (in.) ^①	
		Connections ^③	Roadway ^④
Structural	Asphaltic Concrete	1"	1 1/2"
Bases	Optional Base (See Index No. 514)	O.B.G. 1	O.B.G. 3

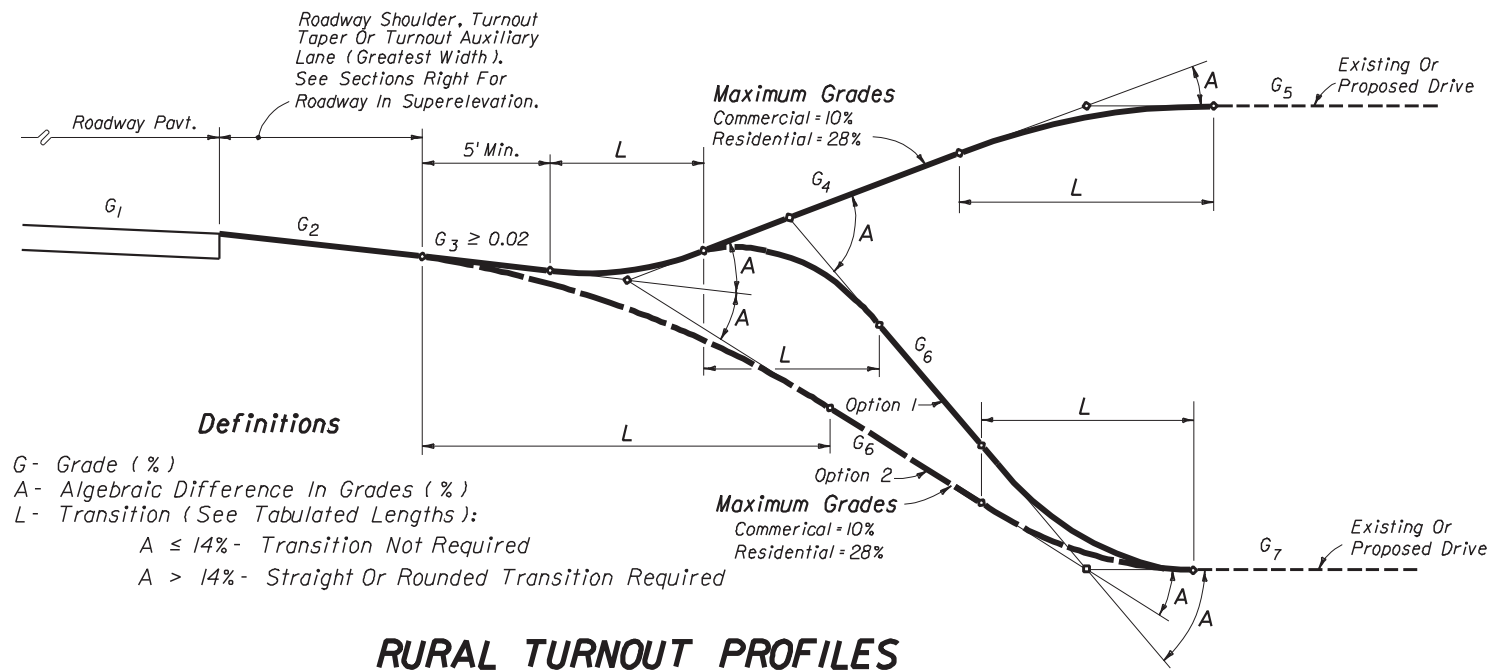
① Minimum thickness.
 ② All materials shall be approved by the Department prior to being placed.
 ③ Connection structure other than traffic lanes. See Notes 1 and 2 below.
 ④ Travel way flares (bypass lanes), auxiliary lanes serving more than a single connection, and all median crossovers including their auxiliary lanes and/or transition tapers. See Notes 1 and 2 below.

NOTES

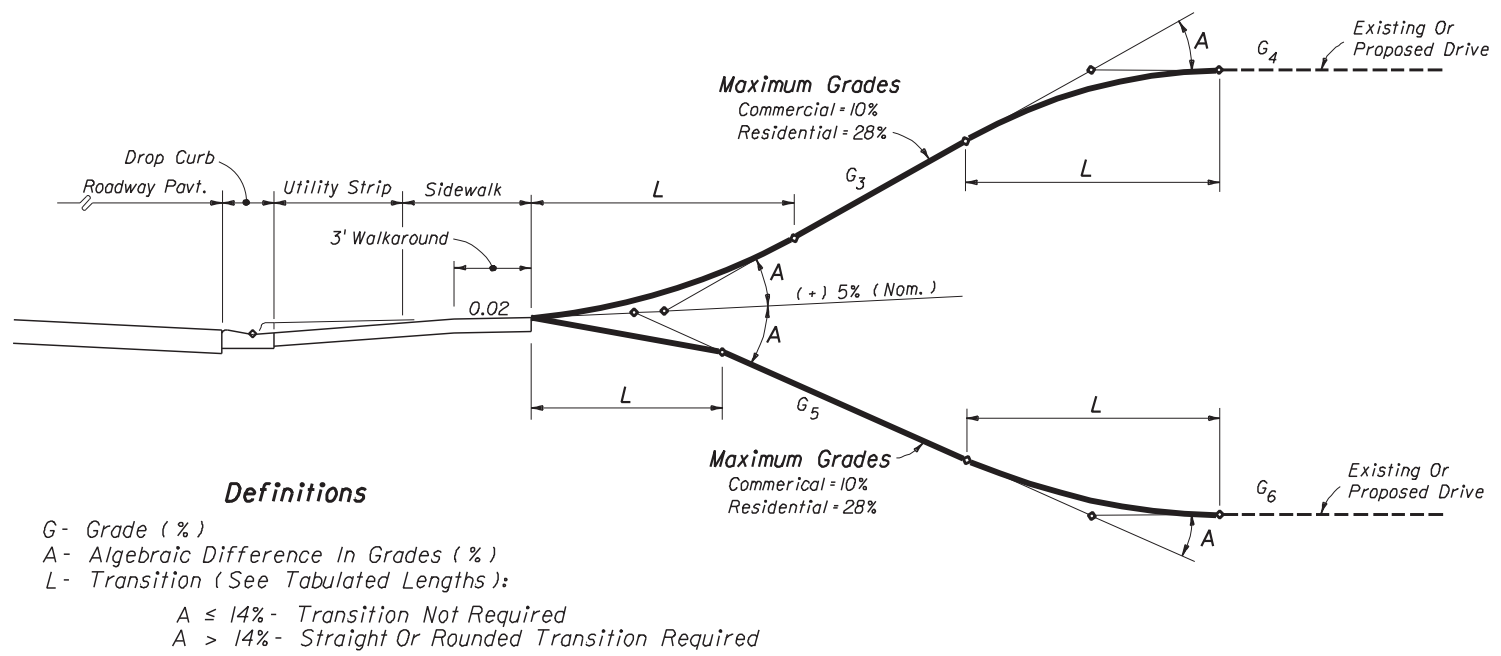
1. The pavement should be structurally adequate to meet the expected traffic loads and should not be less than that shown above, except as approved by the Department for graded connections. Other Department approved pavement equivalences may be used at the discretion of the Engineer. For additional information see Index No. 514.
2. Auxiliary lanes and their transition tapers shall be the same structure as the abutting roadway pavement or any of the roadway structures tabulated above, whichever is thicker.
3. If an asphalt base course is used for a turnout, its thickness may be increased to match the edge of roadway pavement in lieu of a separate structural course. 6" of Portland cement concrete will be acceptable in lieu of the asphalt base and structural courses. See Notes 4 and 5 below.
4. A structural course is required for flexible pavements when they are used for auxiliary lanes serving more than a single connection.
5. Connections paved with Portland cement concrete shall be Class I concrete at least 6" thick. The Department may require greater thickness when called for in the plans or stipulated by permit. Materials and construction are to conform with FDOT Standard Specifications Sections 346, 350 and 522.
6. The Department may require other pavement criteria where local conditions warrant.

PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILIARY LANES TABLE 515-1

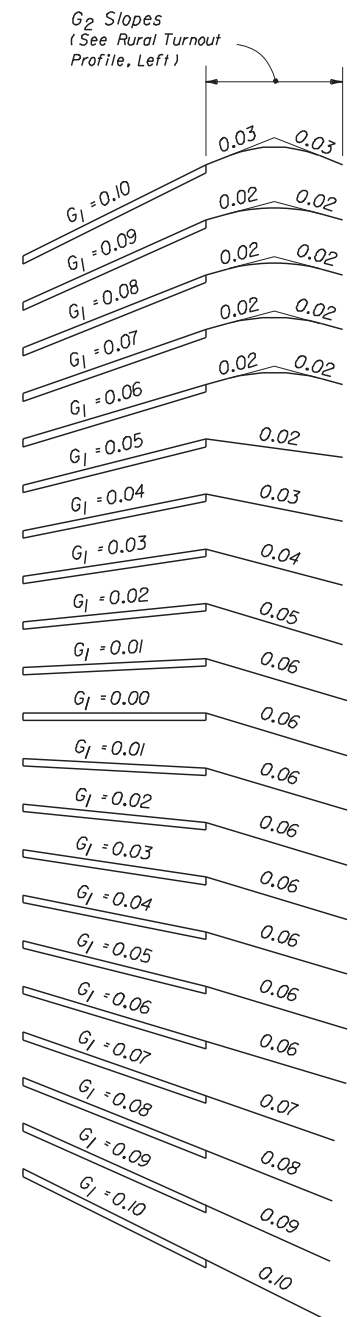
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
TURNOUTS					
Names	Dates	Approved By			
Designed By	COM/JIT	95/91	[Signature]		
Drawn By	RSD	3/91	Revision	Sheet No.	Index No.
Checked By	JVC	03/91	00	5 of 6	515



RURAL TURNOUT PROFILES



URBAN TURNOUT PROFILES



ROADWAY PAVEMENT SLOPES AND SLOPES OF ABUTTING RURAL TURNOUT SURFACES (G₂) SUPERELEVATION SECTIONS

LENGTHS (L) (FT.)								
A	CRESTS				SAGS			
	STRAIGHT		ROUNDED		STRAIGHT		ROUNDED	
	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum
6-13%	3	0	5	0	3	0	5	0
14%	3	0	10	0	3	0	10	0
15%	3	2.5	10	3	5	3	10	5
16%	5	3	10	4	6	4	10	6
17%	6	3.5	10	5	8	5	10	7
18%	6	4	10	6	9	6	10	8
19%	7	4.5	10	7	11	7	12	9
20%	8	5	11	8	12	8	13	10
21%	9	5.5	12	9	13	8.5	14	11
22%	10	6	13	10	14	9	16	12
23%	10	6.5	14	10.5	14	9.5	16	12.5
24%	11	7	15	11	15	10	17	13
25%	12	7.5	15	11.5	16	10.5	18	13.5
26%	12	8	16	12	17	11	18	14
27%	13	8.5	17	12.5	17	11.5	19	14.5
28%	14	9	17	13	18	12	20	15
29%	NA	NA	22	14	NA	NA	21	17
30-31%	NA	NA	23	15	NA	NA	22	18
32-33%	NA	NA	24	16	NA	NA	23	20
34-36%	NA	NA	26	17	NA	NA	25	21
37-38%	NA	NA	27	18	NA	NA	26	22
39-41%	NA	NA	29	19	NA	NA	28	24
42-43%	NA	NA	30	20	NA	NA	29	25
44-46%	NA	NA	32	21	NA	NA	31	26
47-48%	NA	NA	33	22	NA	NA	32	27
49-51%	NA	NA	34	23	NA	NA	34	28
52-54%	NA	NA	36	24	NA	NA	35	30
55-56%	NA	NA	37	25	NA	NA	36	31

Rounded: Either circular, parabolic or spline curvature. The plans or the Engineer may specify a particular type of curvature.
Desirable: Desirable minimum lengths. } Greater lengths than minimum and desirable are recommended where practical for flatter and smoother profile.
Minimum: Absolute minimum lengths. }

RECOMMENDED TURNOUT PROFILE TRANSITION LENGTHS (L) (FT)

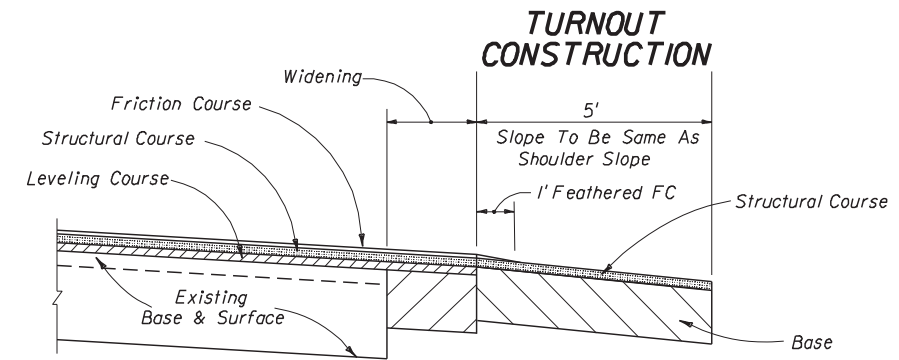
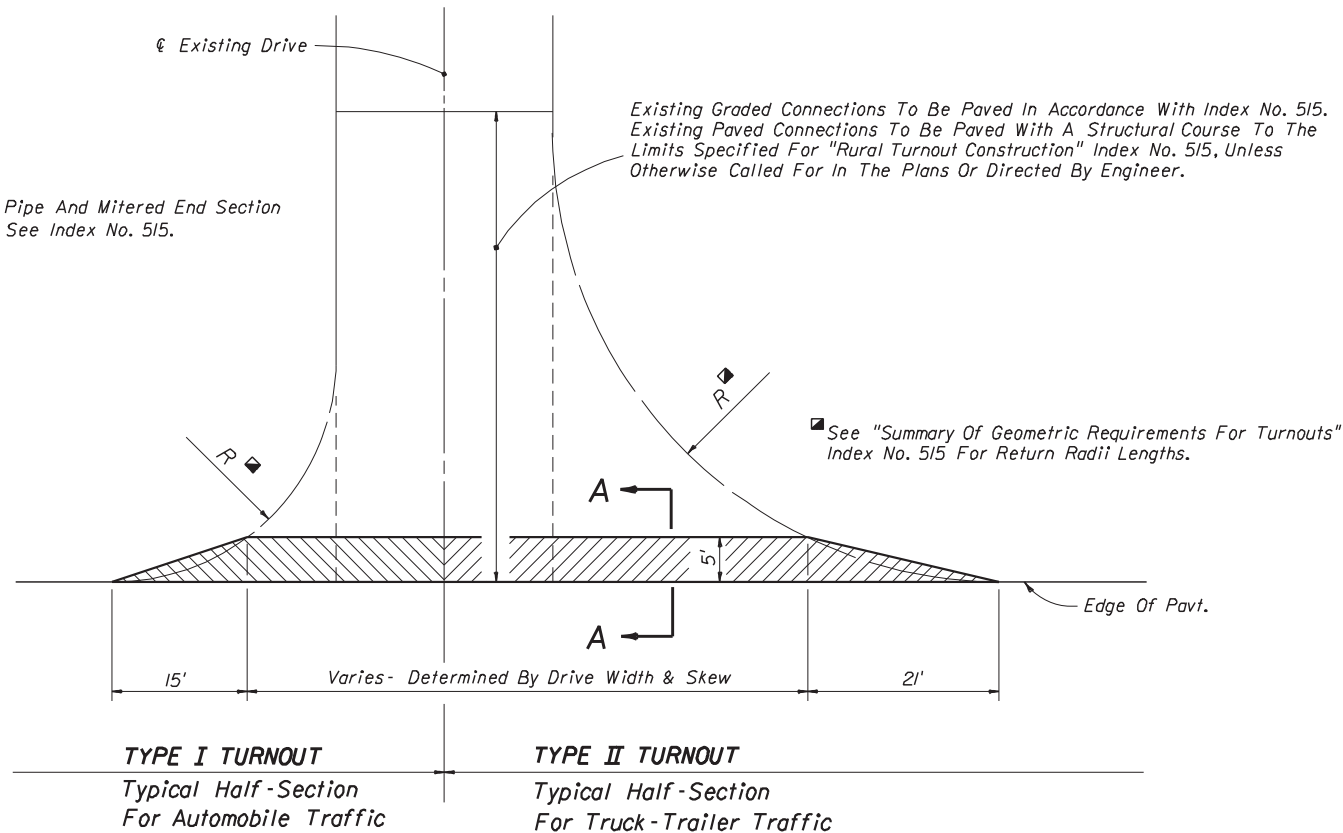
PROFILE AND STORMWATER RUNOFF NOTES

1. Turnouts shall neither cause water to flow on or across the roadway pavement, nor cause water ponding or erosion within the State right of way. On all rural turnouts the transition (L) nearest the roadway shall be sloped or crowned to direct stormwater runoff to the roadside ditch. Inlets, flumes or other appropriate runoff control devices shall be constructed when runoff volumes are sufficient to cause erosion of the shoulder. Similar runoff control devices shall be constructed as necessary to properly direct and control the stormwater runoff on urban turnouts.
2. The Option 1 profile is intended for locations where roadway, turnout taper and auxiliary lane stormwater runoff volumes are relatively large. The Option 2 profile is intended for locations where runoff volumes are relatively small and/or where there is no roadside ditch.

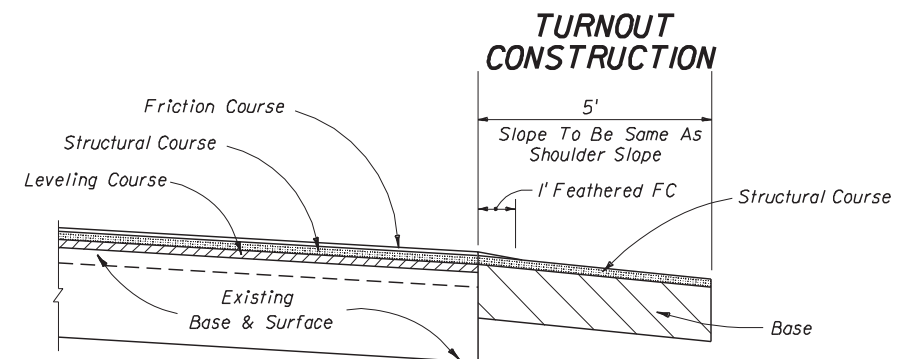
TURNOUT PROFILES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
TURNOUTS					
Designed By	Names	Dates	Approved By		
Drawn By	HSD	08/02	 State Roadway Design Engineer		
Checked By	JVC	08/02			
			Revision	Sheet No.	Index No.
			00	6 of 6	515

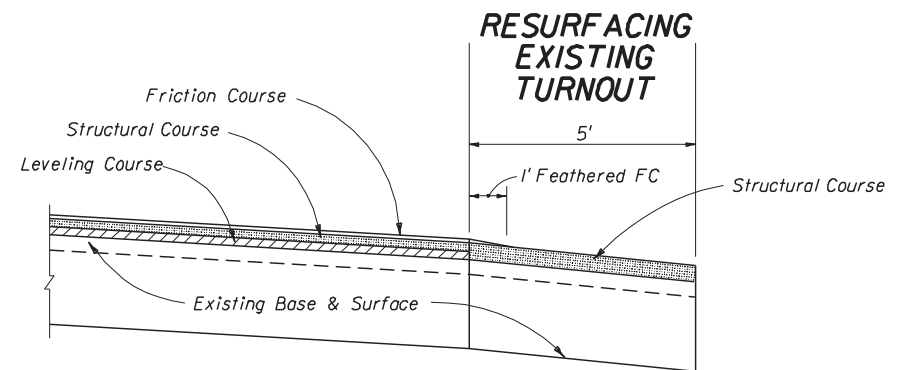
For Drainage Pipe And Mitered End Section Requirements See Index No. 515.



SECTION AA WITH WIDENING



SECTION AA



SECTION AA

Drive Width (Ft.)	AREAS FOR ONE 5' DEEP TURNOUT (SY)			
	Intersection			
	Normal		Skewed	
	Type I	Type II	Type I	Type II
12	26	51	31	60
14	27	52	33	61
16	28	53	34	63
18	29	54	35	64
20	31	55	37	65
22	32	56	38	67
24	33	57	39	68
26	34	58	40	69
28	35	59	42	70
30	36	61	43	72
32	37	62	44	73
34	38	63	46	74
36	39	64	47	76
38	41	65	48	77
40	42	66	49	78
42	43	67	51	79
44	44	68	52	81
46	45	69	53	82
48	46	71	55	83
50	47	72	56	85
52	48	73	57	86
54	49	74	58	87
56	51	75	60	88
58	52	76	61	90
60	53	77	62	91

PAVEMENT STRUCTURE FOR 5' DEEP TURNOUTS		
Course	Material	Minimum Thickness
Structural	Asphaltic Concrete	1"
Base	Optional Base (See Index No. 514)	O.B.G. 1

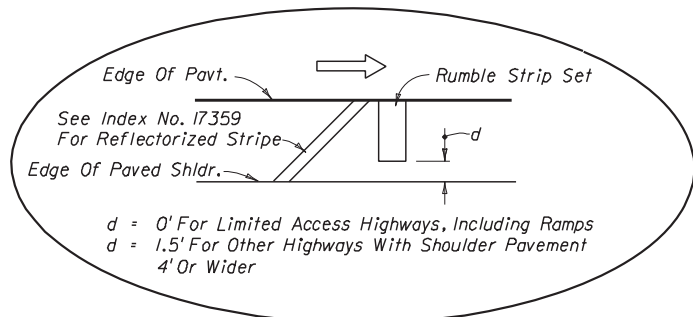
Notes:

- Turnout structural course to be the same material as roadway leveling or structure course. Structural course not required if asphalt base course and its thickness increased to match edge of roadway pavement.
- Any Department approved pavement structure equivalence may be used at the discretion of the Engineer.
- Additional structural strength may be required if heavy truck loads are anticipated.

GENERAL NOTES

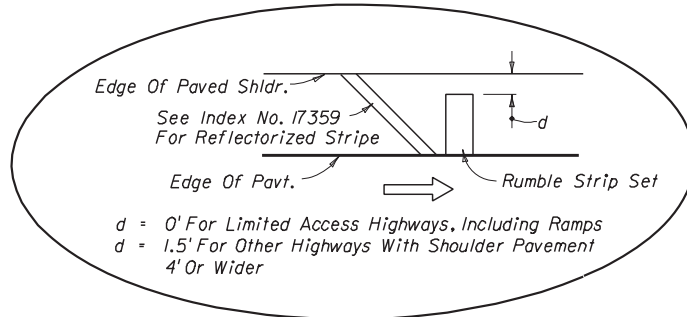
- Turnouts are to be constructed or resurfaced for low volume (single family, duplex, farm, etc.) residential connections as directed by the Engineer.
- Turnout construction not required for low volume residential connections where roadway shoulders are paved.
- Connections outside the 5' limit are to be constructed as directed by the Engineer.
- The contract unit price for Turnout Construction includes the cost for excavation and base.
- Payment for structural course to be included in roadway resurfacing pay item.
- Payment for feathering friction course to be included in the unit price for Asphaltic Concrete Friction Course placed on the roadway. Feathered areas will not be included in measured quantities. Feathering not required for FC-5 friction course.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TURNOUTS RESURFACING PROJECTS				
Names	Dates	Approved By		
Designed By	DCB	11/77	Revision	Sheet No.
Drawn By	HKH	11/77	00	1 of 1
Checked By	JVC	11/77		516



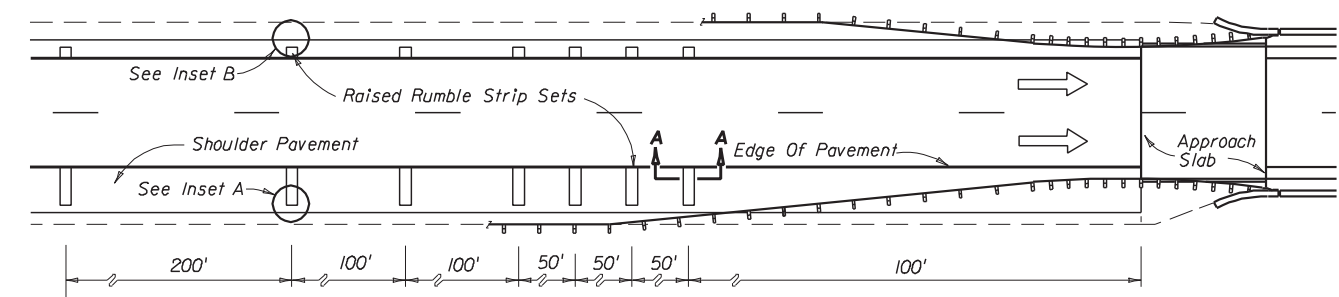
$d = 0'$ For Limited Access Highways, Including Ramps
 $d = 1.5'$ For Other Highways With Shoulder Pavement 4' Or Wider

INSET A

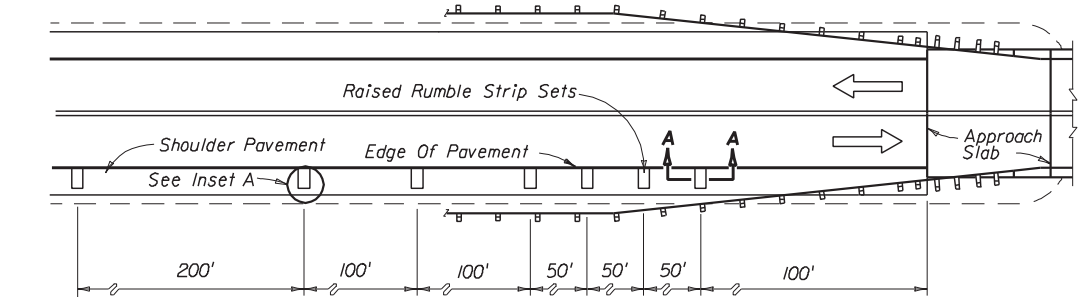


$d = 0'$ For Limited Access Highways, Including Ramps
 $d = 1.5'$ For Other Highways With Shoulder Pavement 4' Or Wider

INSET B

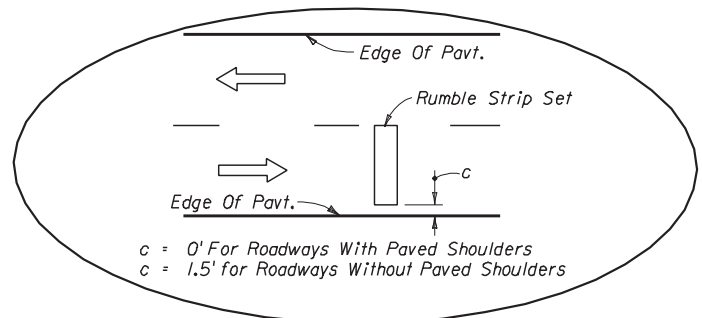


PLAN ○ ONE-WAY



PLAN ○ TWO-WAY

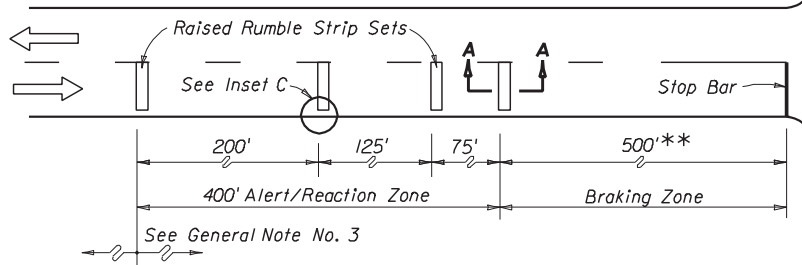
STRUCTURES WITH LESS THAN FULL WIDTH SHOULDERS



$c = 0'$ For Roadways With Paved Shoulders
 $c = 1.5'$ For Roadways Without Paved Shoulders

INSET C

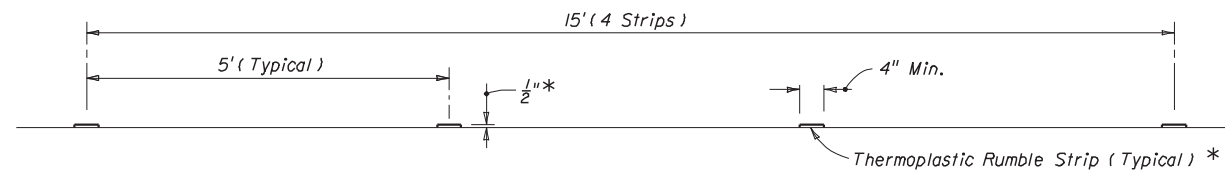
Note: Rumble strips may be required for one or more legs of the intersection (one leg shown for spacing information). Rumble strips shall be constructed only on the legs identified in the plans. See General Note No. 1.



** May be decreased in urban areas with low operating speeds.

PLAN

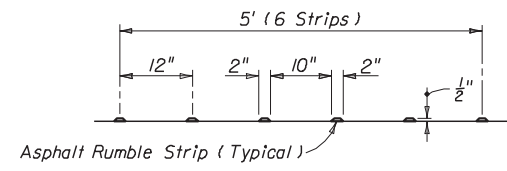
INTERSECTIONS



* Use multiple applications to achieve desired 1/2" thickness

Note: Shoulder thermoplastic rumble strip sets shall match edgeline color. Intersection thermoplastic rumble strip sets shall be white.

THERMOPLASTIC SET



ASPHALT SET

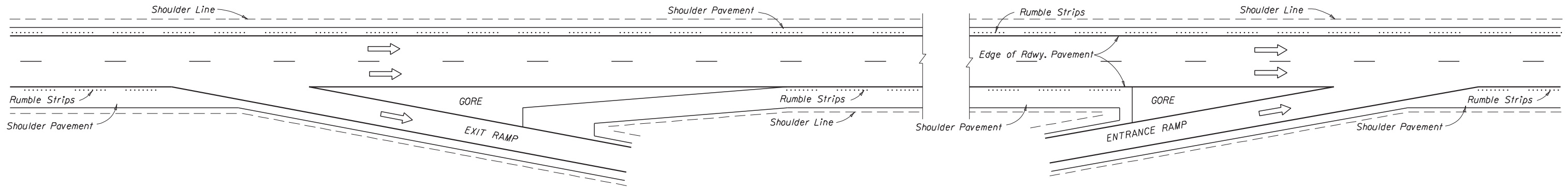
SECTION AA ○ FOR THERMOPLASTIC AND ASPHALT RUMBLE STRIP SETS

RAISED RUMBLE STRIPS

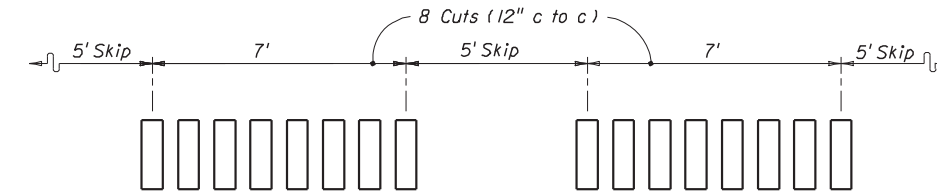
GENERAL NOTES FOR RAISED RUMBLE STRIPS

1. Raised rumble strips shall be constructed on all paved shoulders approaching structures, where the structure shoulder width is less than the usable shoulder width of the approach roadway. Raised rumble strips at intersections shall be constructed only when specified in the plans.
2. Raised rumble strips are to be constructed in accordance with Section 546 of the Specifications.
3. When any portion of a curve falls within the limit of rumble strips shown in these details, additional rumble strip sets spaced at 200' centers shall be constructed throughout the remainder of the approaching curve.
4. Raised rumble strips shall be paid for per set under the contract unit price for Rumble Strips Sets, PS. Such price and payment shall be full compensation for all work and materials required without adjustment due to width of pavement receiving the strips or length of strips.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RUMBLE STRIPS				
Names	Dates	Approved By		
Designed By	2017/2/28	10/87	 State Roadway Design Engineer	
Drawn By	JRW	10/87		
Checked By	KAM JVC	10/87		
Revision	00	1 of 2	Index No.	518



LIMITED ACCESS FACILITIES
SHOULDER GROUND-IN RUMBLE STRIP PLACEMENT



SKIP ARRAY

Continuous Cuts (12" c to c)

CONTINUOUS ARRAY

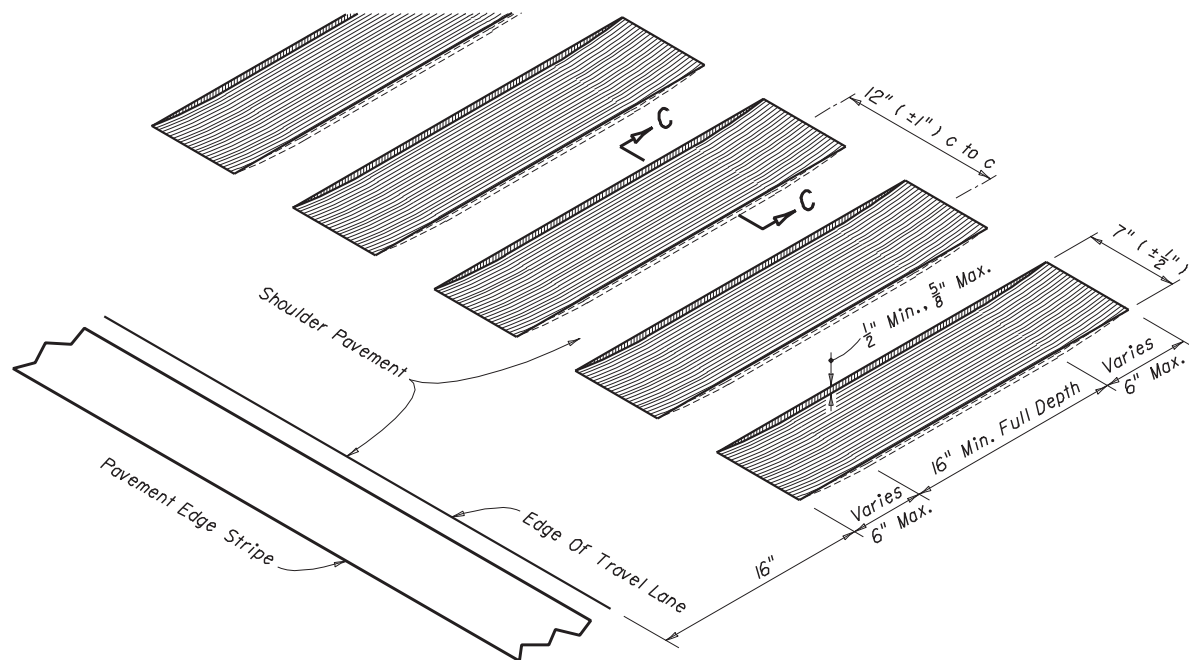
ARRAYS

GENERAL NOTES FOR SHOULDER GROUND-IN RUMBLE STRIPS

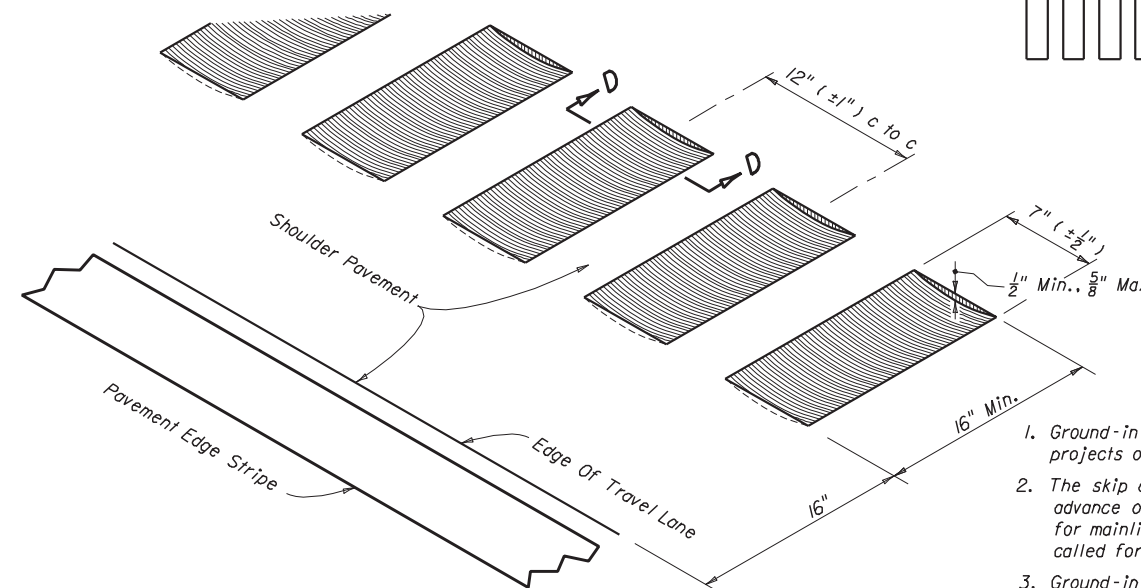
1. Ground-in rumble strips shall be constructed on freeway and other limited access projects only, and only when called for in the plans.
2. The skip array is the standard array. The continuous array shall be constructed in advance of bridge ends for a distance of 1000', or back to the gore recovery area for mainline interchange bridges; and constructed at other specific locations as called for in the plans.
3. Ground-in rumble strips are to be constructed in accordance with Section 546 of the Specifications.
4. When friction course extends more than 12" beyond the edge of the outer traffic lane, the extended friction course shall be bladed off back to the 12" line, prior to rumble strip grinding.
5. Both arrays shall be paid for under the contract unit price for Rumble Strips (Ground-In), PM. Such price and payment shall be full compensation for all work and materials required.

DESIGN NOTE

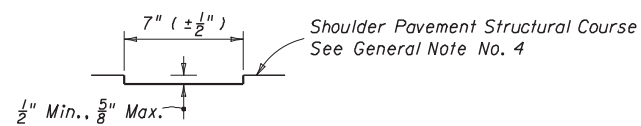
1. The rumble strips described on this sheet are intended for use on flexible pavement shoulders. When constructing ground-in rumble strips on existing rigid (concrete) shoulders, no rumble strips shall be located closer than 6" from any pavement joint. When specifying ground-in rumble strips on existing rigid shoulders their location and array shall be detailed in the plans.
2. Other methods and types of applications shall not be used unless approved in writing by the State Roadway Design Engineer. Approval will be considered only with sufficient documented justification for variance from this standard.



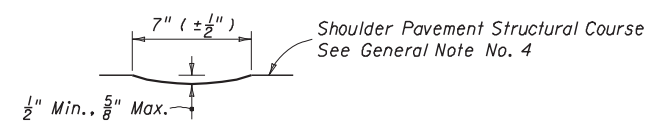
ISOMETRIC - TRANSVERSE CUT



ISOMETRIC - LONGITUDINAL CUT



SECTION CC
 TRANSVERSE CUT



SECTION DD
 LONGITUDINAL CUT

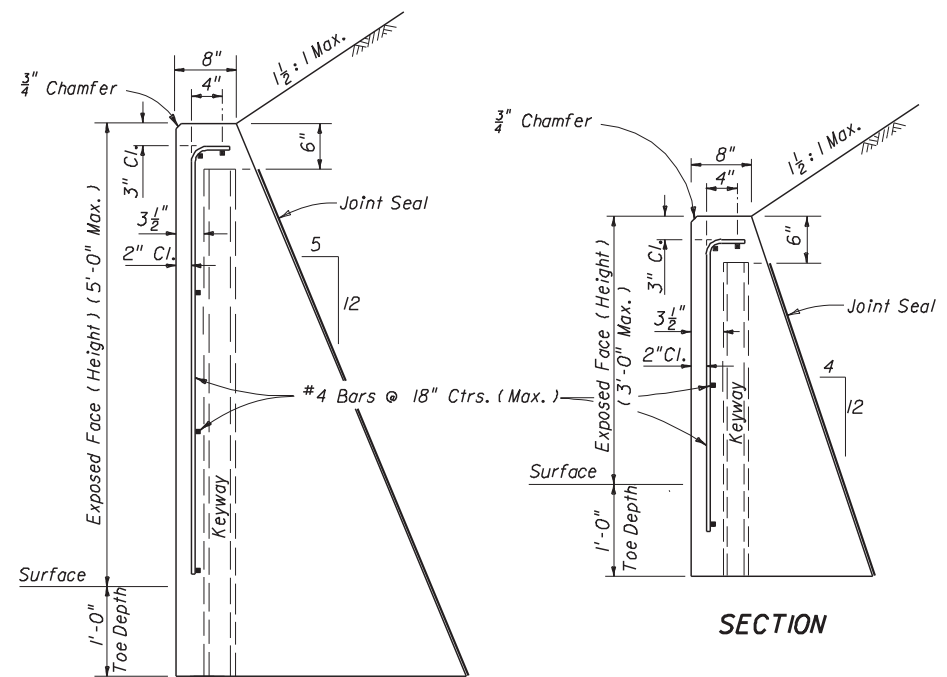
LOCATION ALONG SHOULDER (FLEXIBLE PAVEMENT)

SHOULDER GROUND-IN RUMBLE STRIPS

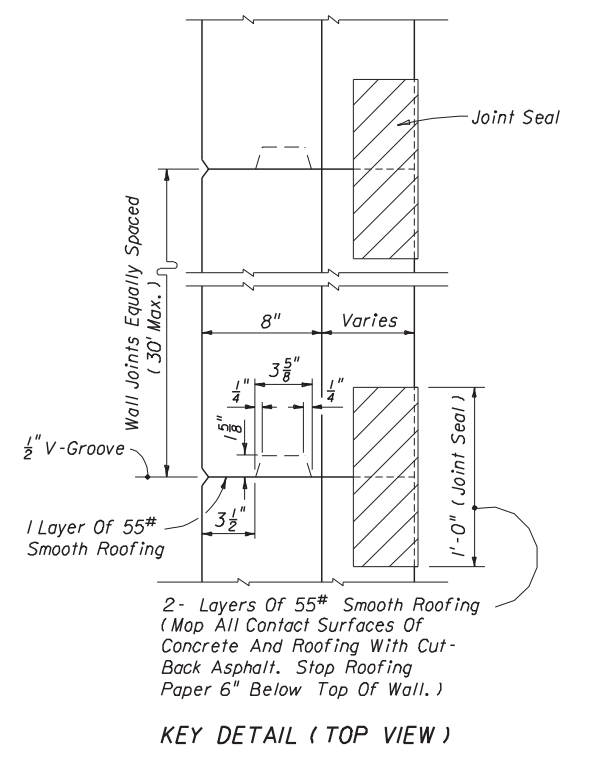
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

RUMBLE STRIPS

Designed By	COM	11/93	Approved By			
Drawn By	HKH	11/93	Revision	Sheet No.	Index No.	
Checked By	FLS JVC	11/93	00	2 of 2	518	



SECTION



KEY DETAIL (TOP VIEW)

ESTIMATED QUANTITIES FOR WALL

HEIGHT (EXPOSED FACED)	PER LINEAR FOOT OF WALL	
	CLASS I CONCRETE (CY)	STEEL (LB)
1'	0.07	3
2'	0.13	4
3'	0.20	5
4'	0.32	6
5'	0.43	7

GRAVITY WALL NOTES

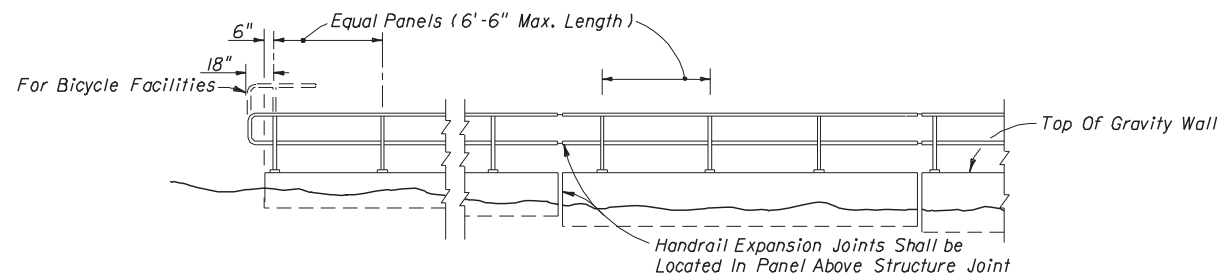
- Gravity walls constructed as extensions of reinforced concrete retaining walls, except walls of proprietary designs, shall have the same face texture and finish as the reinforced concrete retaining wall.
- Cost of reinforcing steel, face texture, finish and joint seal to be included in the contract unit price for Class I Concrete (Retaining Walls) CY.

GRAVITY WALL

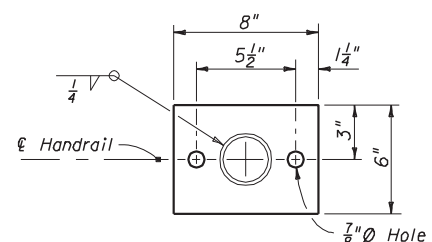
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**ALUMINUM PIPE HANDRAILS,
GRAVITY WALLS AND STEPS**

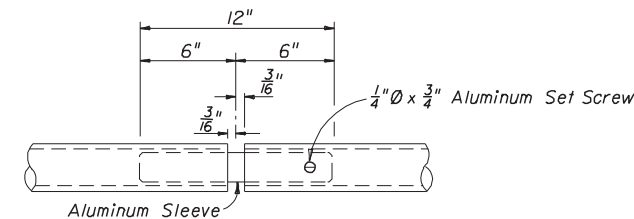
Designed By	Names	Dates	Approved By		
Drawn By	CDK	6/2/68	 State Roadway Design Engineer		
Checked By	REC	6/7/68			
			Revision	Sheet No.	Index No.
			00	1 of 2	520



ELEVATION



BASE PLATE



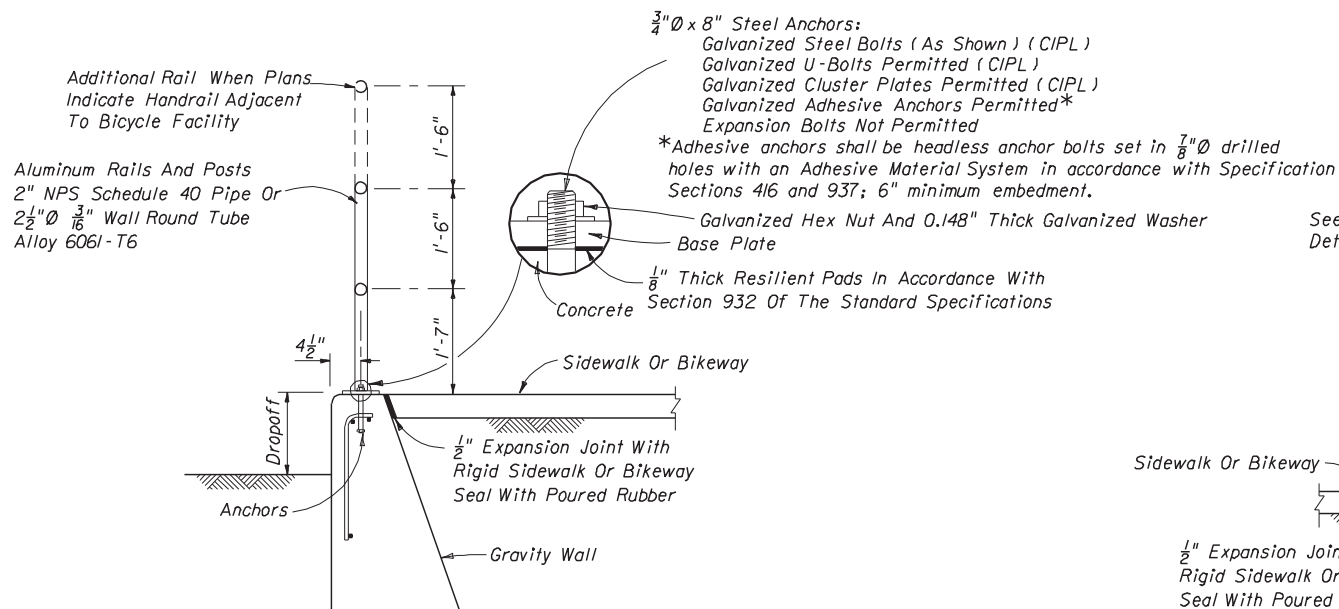
EXPANSION JOINT

ALUMINUM PIPE HANDRAIL NOTES

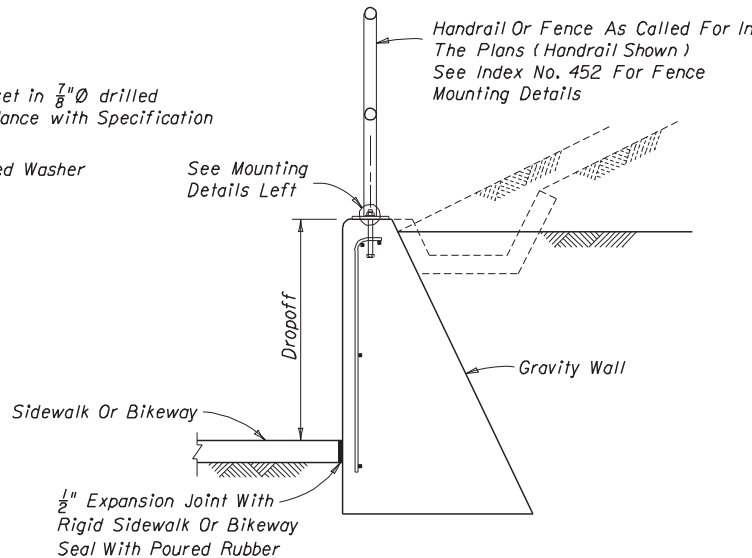
1. This handrail is applicable to mountings on walls and other roadway structures subject to pedestrian use where dropoffs do not exceed thirty inches (30"); and, applicable to select uses on sidewalk, within service areas and similar locations where foundation support and anchorage are adequate or can be provided.
2. All fixed joints to be either welded all around and ground smooth; or, commercially designed fixed joint systems (soldered, brazed, fused, bonded or shrink fitted) specified on the plans or approved by the Engineer. Mechanical joints other than expansion joints are not permitted unless specified on the plans or approved in writing by the Engineer. Posts shall be connected to base by weld only. Weld filler to be alloy ER5356, ER5556 or ER5183.
3. Anchor bolts shall be in accordance with ASTM A36 or A307. Nuts, washers, and bolts to be hot dip galvanized in conformance with ASTM A153. After the nuts have been tightened, the anchor bolt thread at the top of the nut shall be punch distorted and coated with zinc compound.
4. Aluminum handrail shall be constructed in accordance with Section 515 of the Standard Specifications. Payment shall be full compensation for furnishing and installing handrail, including mounting hardware, and shall be paid for under the contract unit price for Pipe Handrail (Aluminum), LF.

DESIGN NOTES

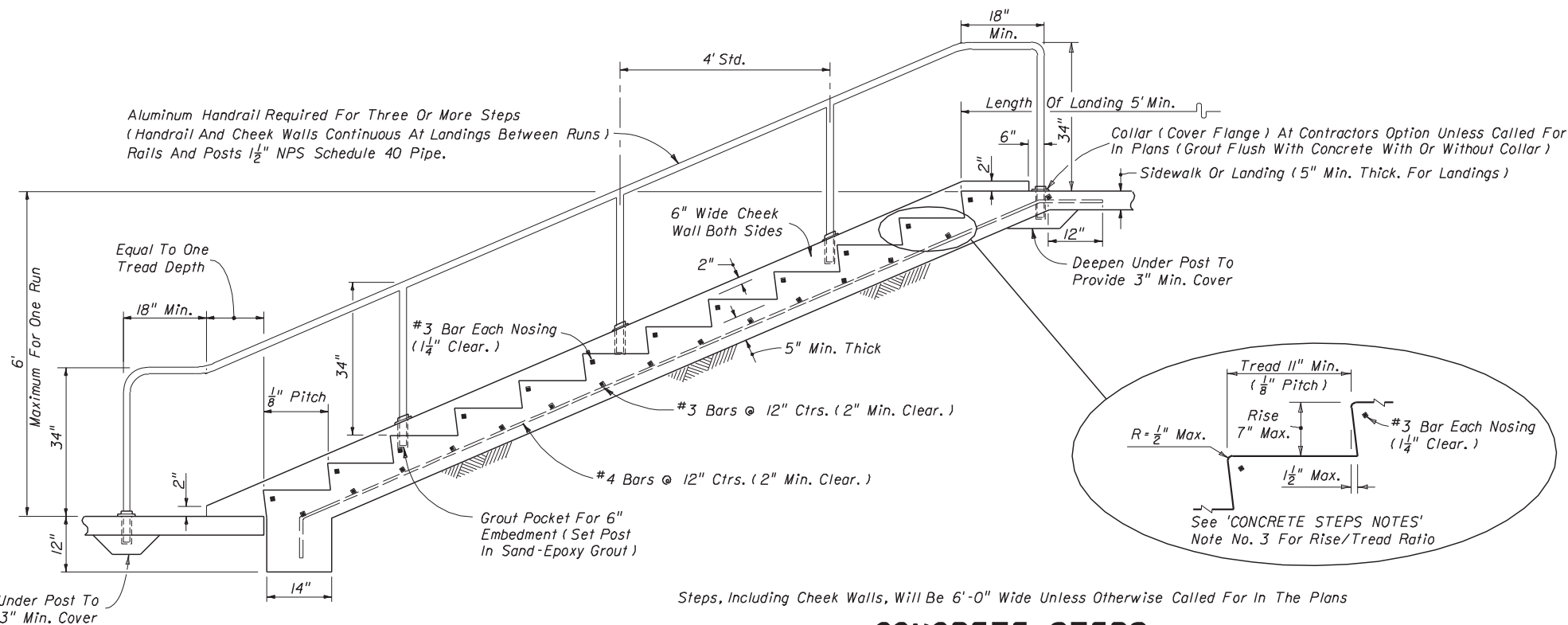
1. For dropoffs that exceed thirty inches (30"), handrails for customary applications are provided in Structures Standard Index No. 850. For unusual site conditions where handrails are needed, the handrail is to be designed site specific by the responsible engineer.



TYPICAL SECTIONS AT POST



ALUMINUM PIPE HANDRAIL ON GRAVITY WALLS FOR DROPOFFS >10" AND ≤2'-6"



Steps, Including Cheek Walls, Will Be 6'-0" Wide Unless Otherwise Called For In The Plans

CONCRETE STEPS

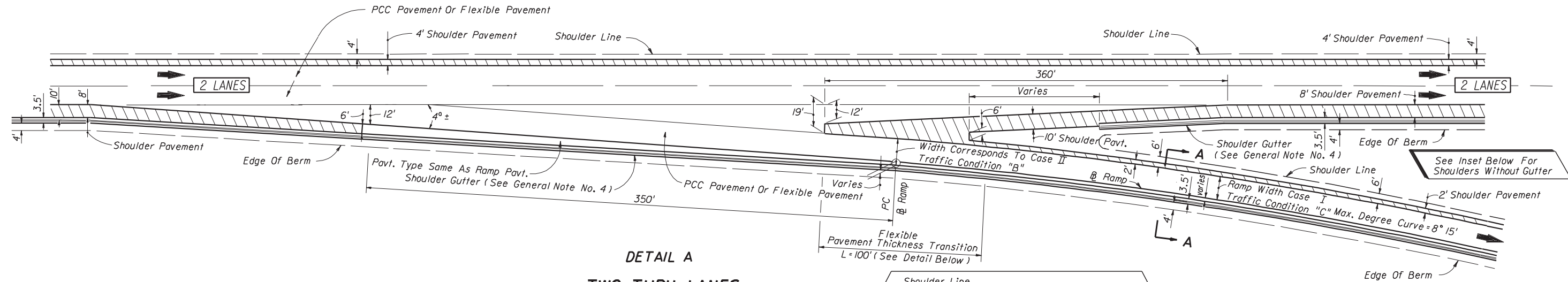
CONCRETE STEPS NOTES

1. Step and handrail design shown is for soil supported steps without adjacent dropoffs; do not use for suspended (structural) steps or stairway.
2. 12 risers maximum between landings.
3. Ratio of riser height to tread depth: 2R" + T" = 26".
4. For steps parallel to and adjoining walls, delete adjoining cheek wall and mount handrail to wall at height and length shown.
5. Aluminum handrail shall be constructed in accordance with Section 515 of the Standard Specifications. Payment shall be full compensation for furnishing and installing handrail, including mounting hardware, and shall be paid for under the contract unit price for Pipe Handrail (Aluminum), LF.
6. Cost of concrete steps, landings and cheek walls shall be paid for under the contract unit price for Class I Concrete (Miscellaneous), CY. Cost of reinforcing steel shall be paid for under the contract unit price for Reinforcing Steel (Miscellaneous), LB.

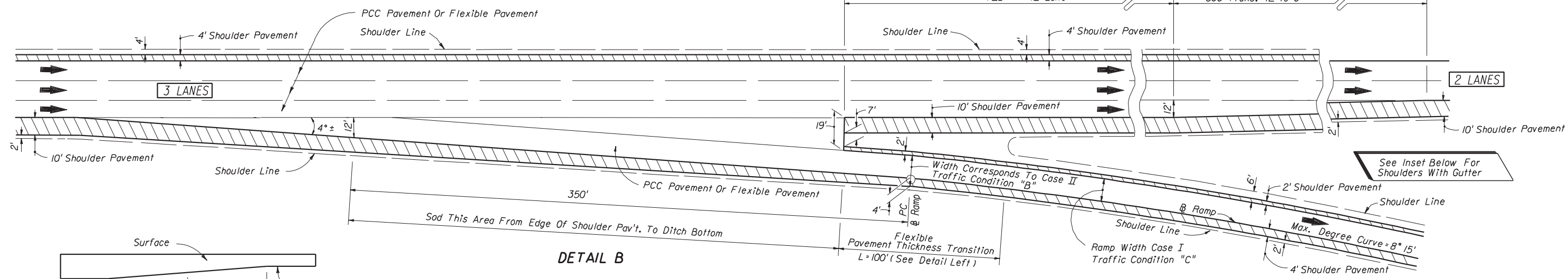
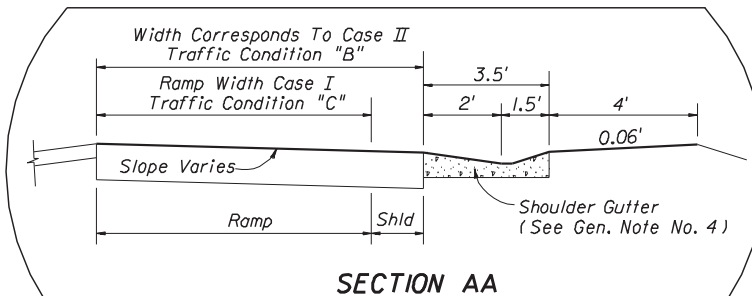
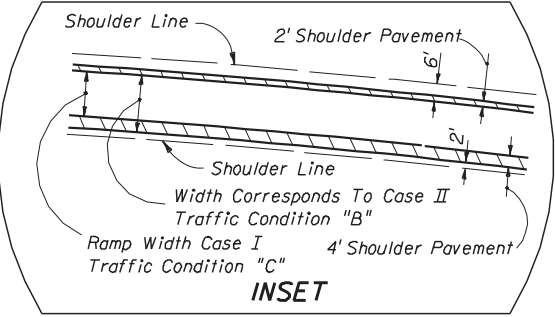
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

ALUMINUM PIPE HANDRAILS,
 GRAVITY WALLS AND STEPS

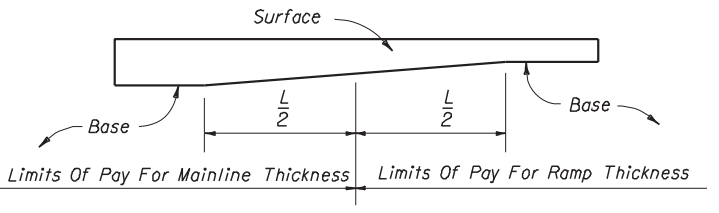
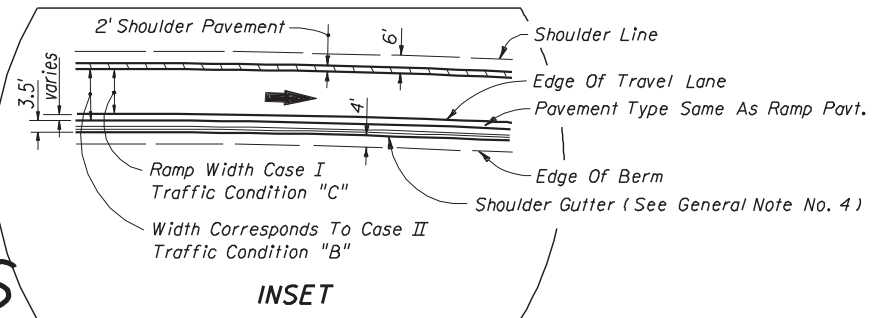
Designed By	Names	Dates	Approved By		
Drawn By	CDK	6/2/68	[Signature]	Revision	Sheet No.
Checked By	REC	6/7/68		00	2 of 2



DETAIL A
TWO THRU LANES



DETAIL B
THREE APPROACH LANES - TWO THRU LANES

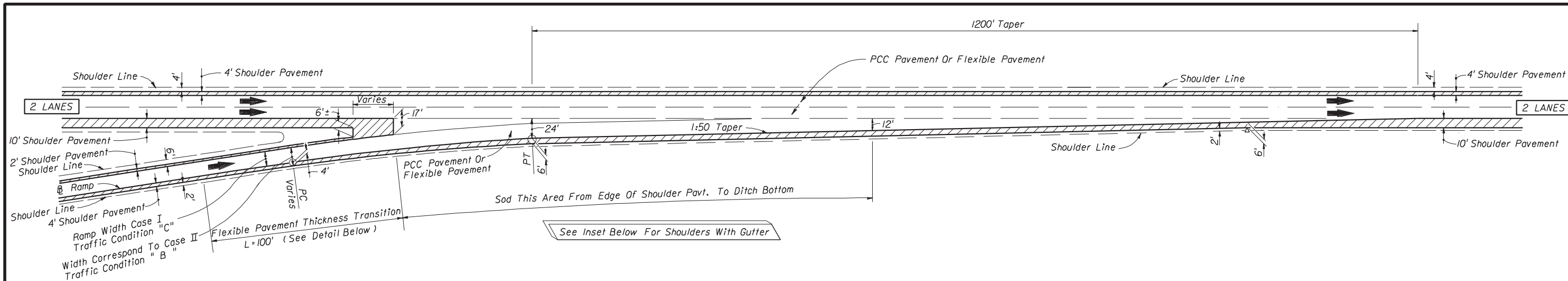


FLEXIBLE PAVEMENT THICKNESS TRANSITION

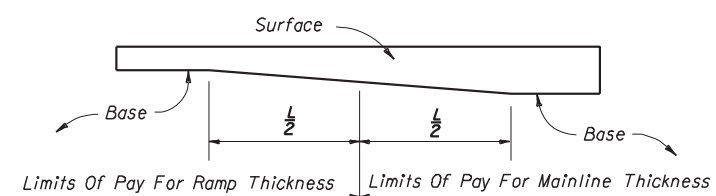
EXIT TERMINALS
SINGLE - LANE RAMPS

NOTE: For General Notes See Sheet No. 2

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RAMP TERMINALS				
Designed By	RWE	01/65	Approved By	
Drawn By	BSW	02/65	State Roadway Design Engineer	
Checked By	RLO	06/67	Revision	00
			Sheet No.	1 of 5
			Index No.	525



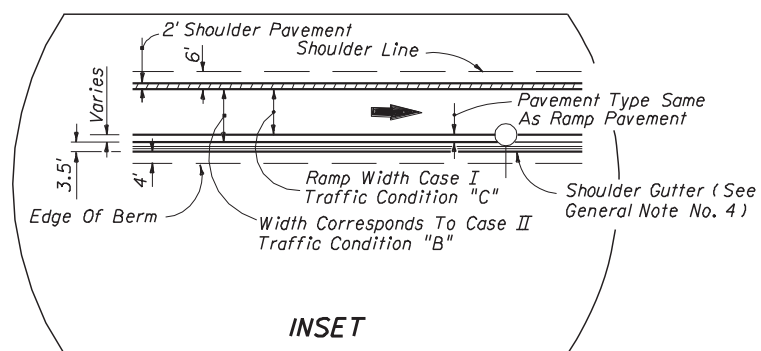
DETAIL C
TWO THRU LANES



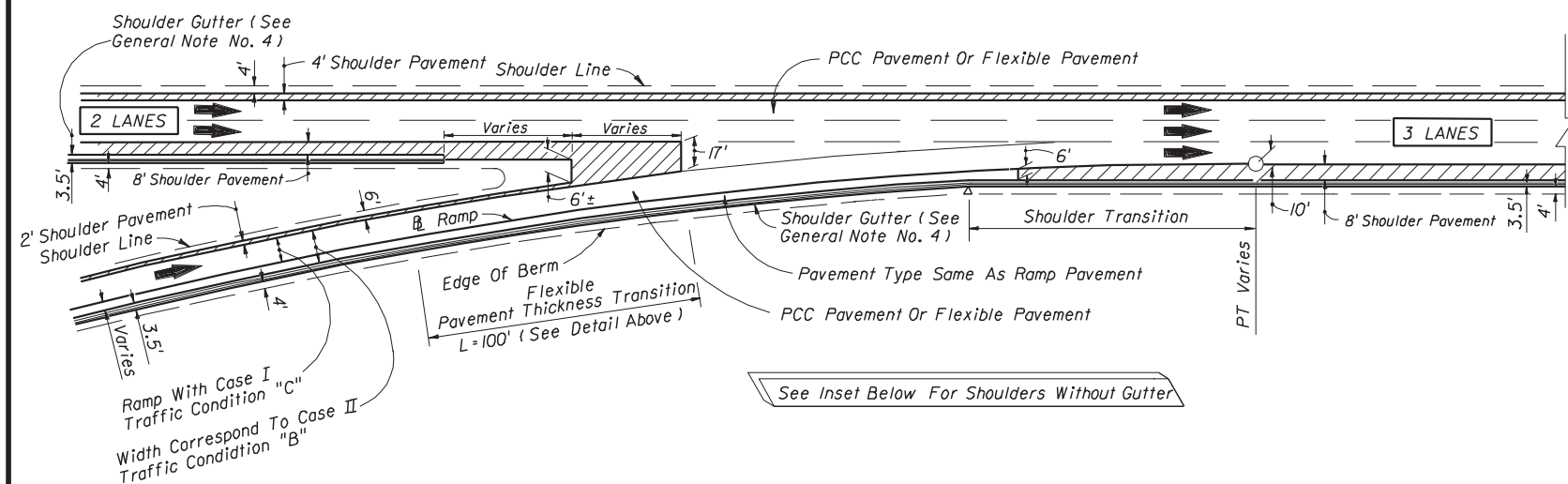
FLEXIBLE PAVEMENT THICKNESS TRANSITION

GENERAL NOTES

- Exit and entrance terminals as detailed shall not be used on ramps for which a speed of 50 MPH or greater cannot be maintained. For such ramps, parallel deceleration and acceleration lanes shall be used in place of tapers with lengths set according to AASHTO.
- (a.) PCC Pavement Projects:
Where shoulder pavement adjacent to shoulder gutter is less than 6' wide, it shall be identical to the adjacent roadway pavement beginning with the transverse joint nearest the point of 6' width.
- (b.) Flexible Pavement Projects:
Where shoulder pavement used in conjunction with shoulder gutter is less than 6' uniform width, it shall be identical to the adjacent roadway pavement.
- For concrete pavement joint details and layouts at entrance and exit ramp terminals see Index No. 305.
- Shoulder gutter applications will be determined by drainage design.

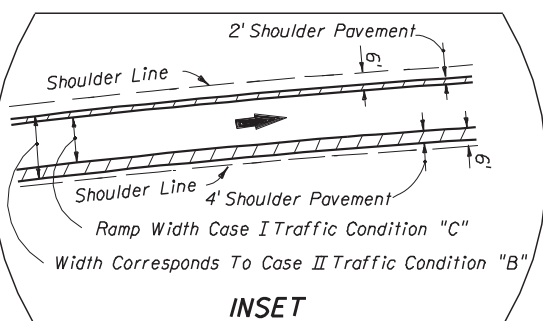


INSET



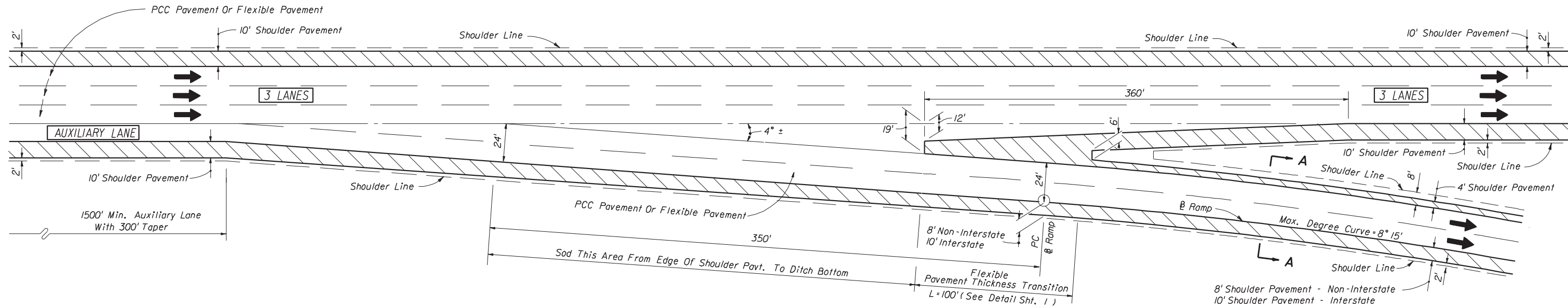
DETAIL D
WITH ADDED LANE

ENTRANCE TERMINALS
SINGLE-LANE RAMPS

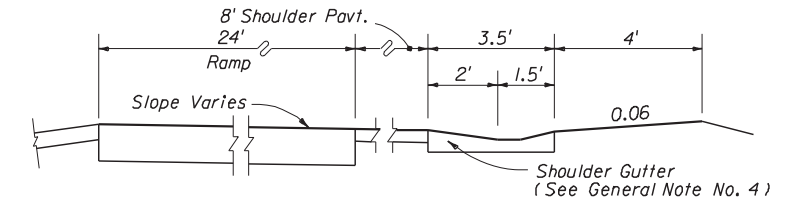


INSET

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN						
RAMP TERMINALS						
Names	Dates	Approved By				
Designed By	PWE 01/65	 State Roadway Design Engineer				
Drawn By	HEW 02/65				Revision	Sheet No.
Checked By	RLO 06/67				00	2 of 5
				Index No. 525		



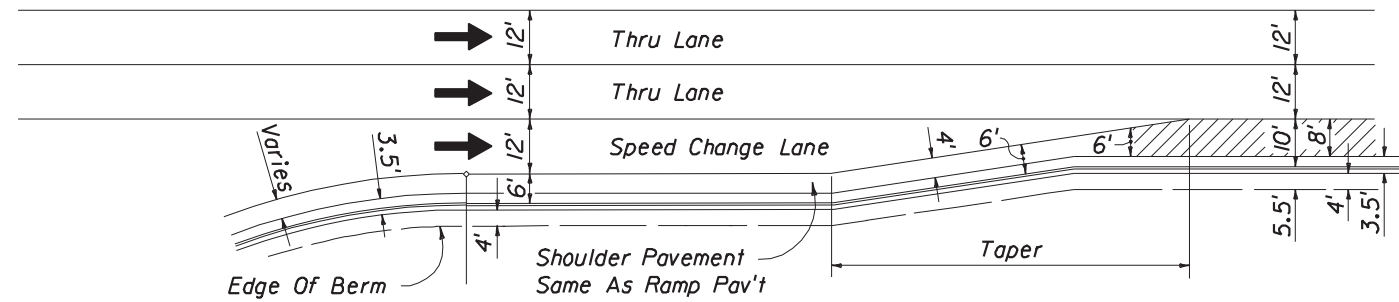
THREE THRU LANES - APPROACH AUXILIARY LANE



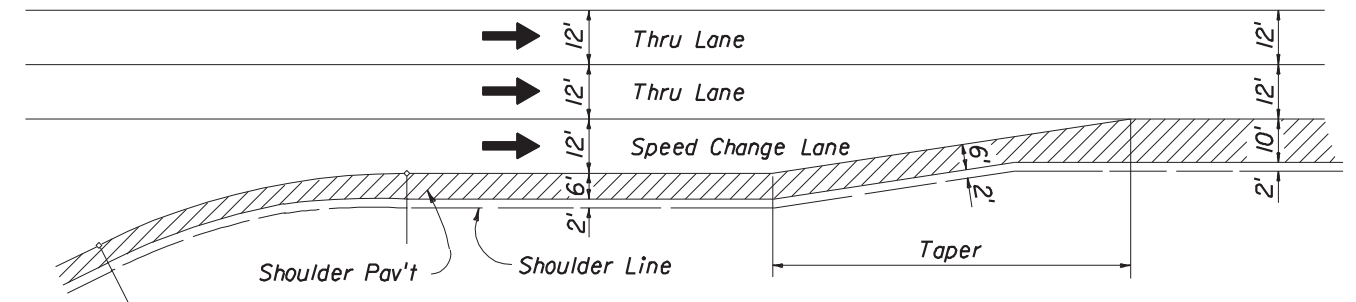
SECTION WHEN SHOULDER GUTTER USED
SECTION AA

EXIT TERMINALS
TWO-LANE RAMPS

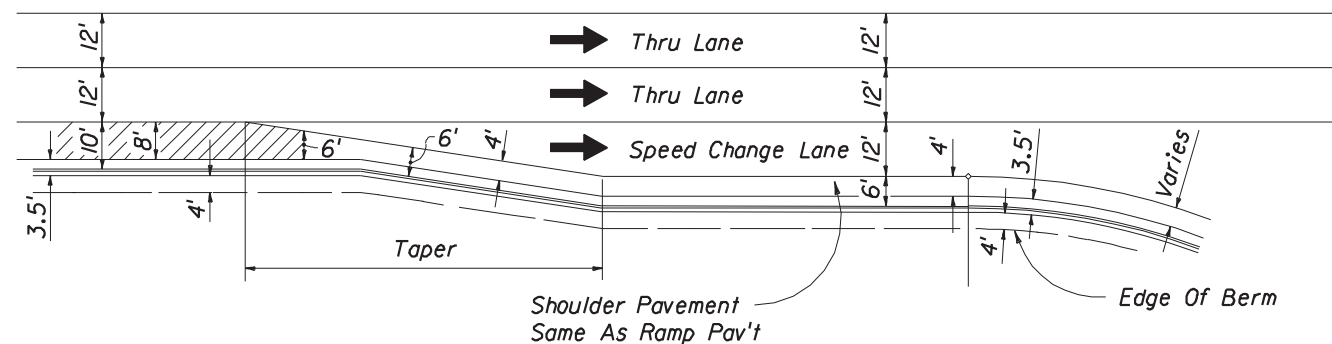
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RAMP TERMINALS				
Names	Dates	Approved By		
Designed By	DCB	07/86	State Roadway Design Engineer	
Drawn By	DUS	07/85	Revision	Sheet No.
Checked By	DCB	07/85	00	3 of 5
				Index No. 525



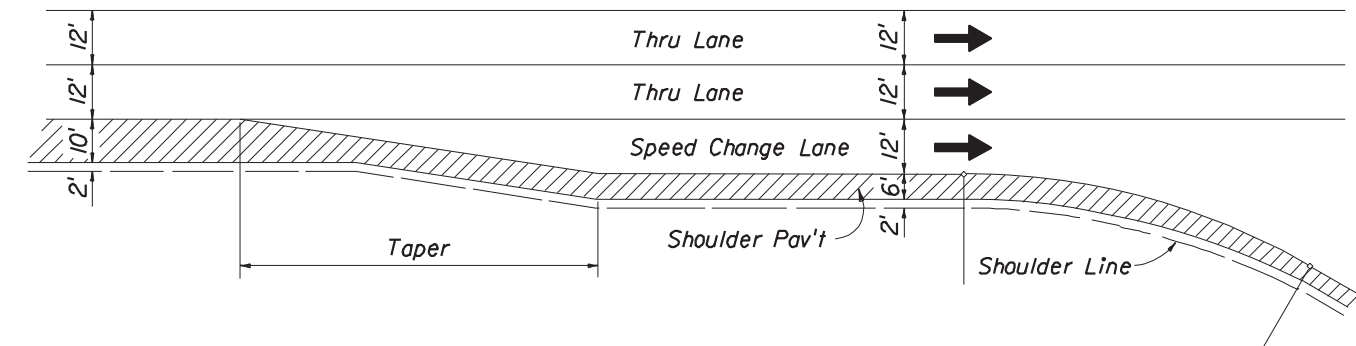
ACCELERATION LANE WITH SHOULDER GUTTER



ACCELERATION LANE WITHOUT SHOULDER GUTTER



DECELERATION LANE WITH SHOULDER GUTTER

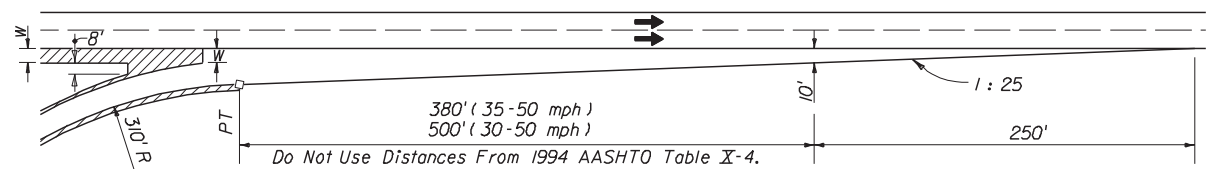


DECELERATION LANE WITHOUT SHOULDER GUTTER

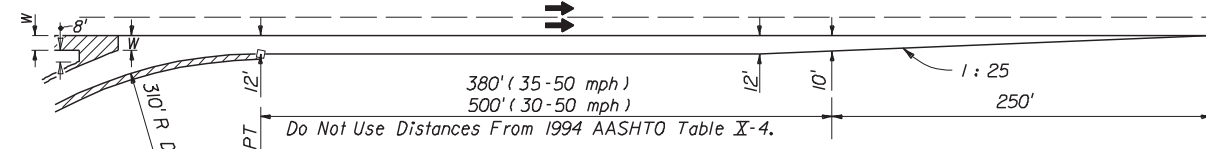
SHOULDER TREATMENT
AT SPEED CHANGE LANES AT EXPRESSWAY RAMP TERMINALS

EXPRESSWAY RAMP TERMINALS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RAMP TERMINALS				
Designed By	RME	01/65	Approved By <i>[Signature]</i>	
Drawn By	BSW	02/65	Revision	Sheet No.
Checked By	RLO	06/67	00	4 of 5
			Index No.	525

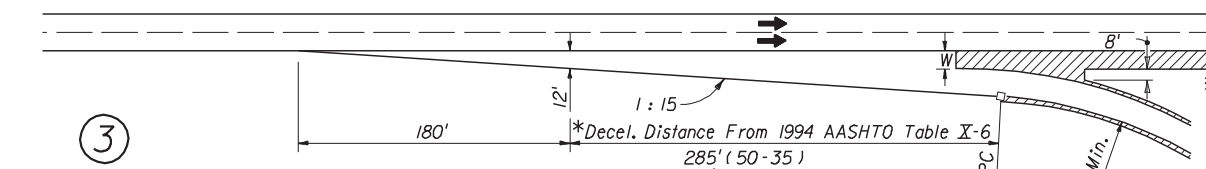


Standard cross road entrance terminals. To be used when roadway alignment is tangent and no bridges are located within the merging lane.

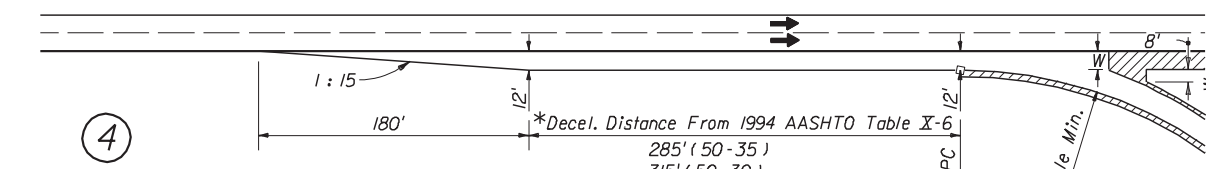


Parallel cross road entrance terminals. Recommended when a bridge is located within the merging lane, turning roadway speed is less than 60% of thru roadway speed or for the combinations of horizontal alignment shown elsewhere on this sheet.

UNSIGNALIZED ENTRANCES



Standard cross road exit terminal. To be used when roadway alignment is tangent.



Parallel cross road exit terminals. Recommended when exit is partially hidden over the crest of vertical curve or when turning roadway speed is less than 60% of the thru roadway speed, or for the combinations of horizontal alignment shown elsewhere on this sheet.

UNSIGNALIZED EXITS

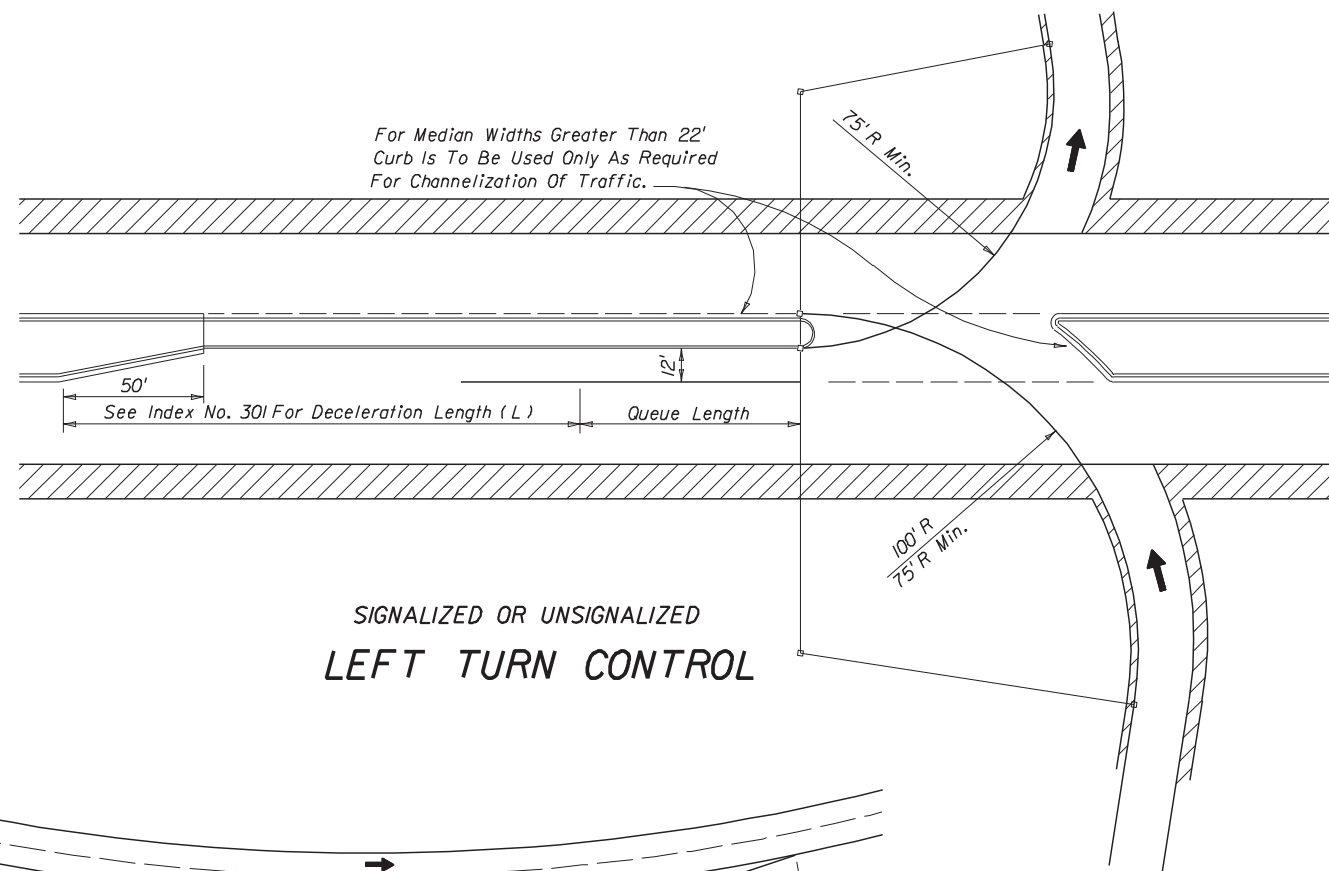
FOOTNOTES:

W Normal shoulder pavement width.

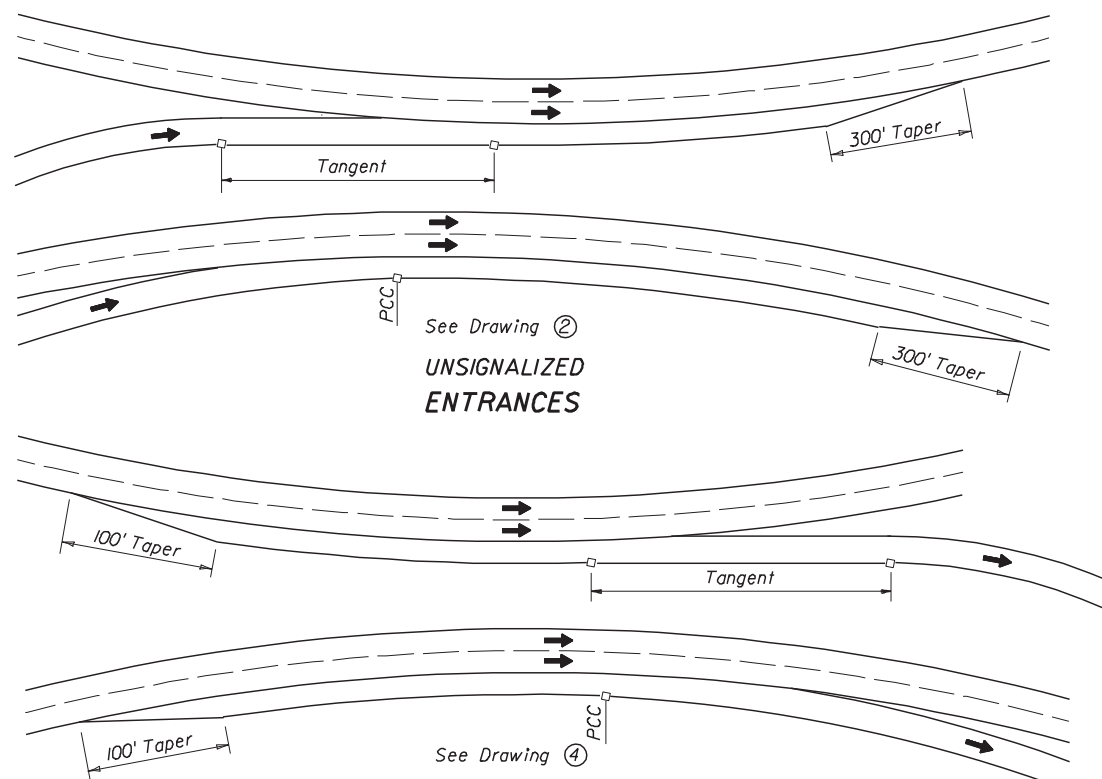
* Adjust for grades if greater than 2% (See Table X-5, AASHTO).

RAMP TERMINALS

CROSSROAD TERMINALS



SIGNALIZED OR UNSIGNALIZED LEFT TURN CONTROL



UNSIGNALIZED ENTRANCES


UNSIGNALIZED EXITS

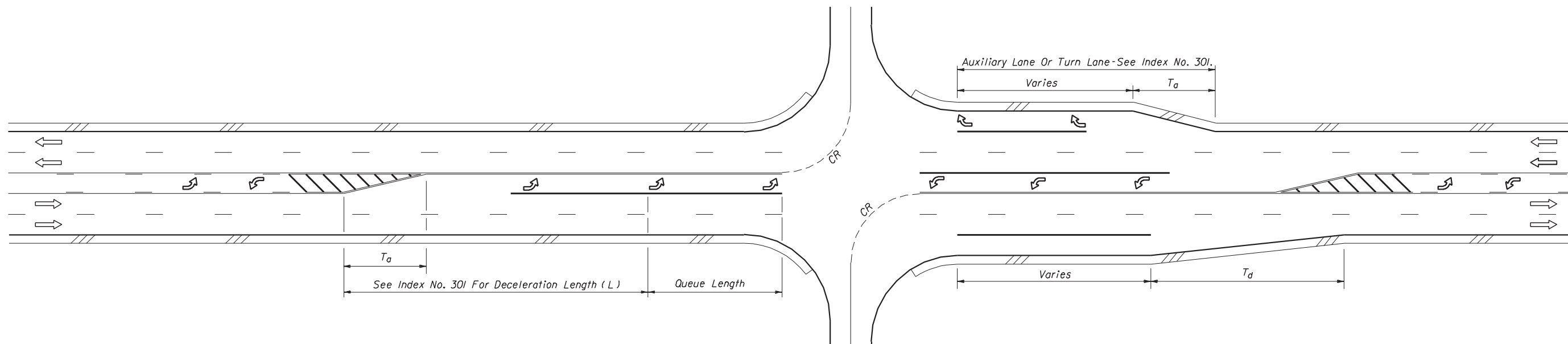
NOTE: Ramp terminals on curves should be avoided when possible.

RAMP TERMINALS ON CURVES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RAMP TERMINALS

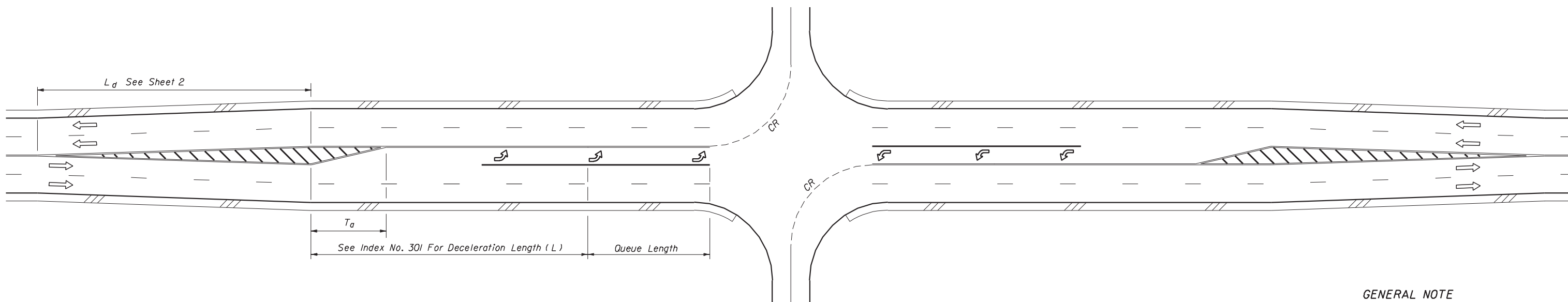
Names	Dates	Approved By		
Designed By	RWE	1/65	 State Roadway Design Engineer	
Drawn By	HEW	1/65		
Checked By	RLO	6/67		
Revision	00	5 of 5	Index No.	525



4-LANE UNDIVIDED WITH OPTIONAL LANE

DESIGN SPEED (mph)	T_d (METERS)	T_d
	ADD LANE	LANE DROP
< 30		1 : 25
30 - 45	50' ± 1 : 4	1 : 30
> 45		1 : 40

Note: For locations with unrelocatable control points minimum taper rates for lane drop (T_d) will be 1 : 20.



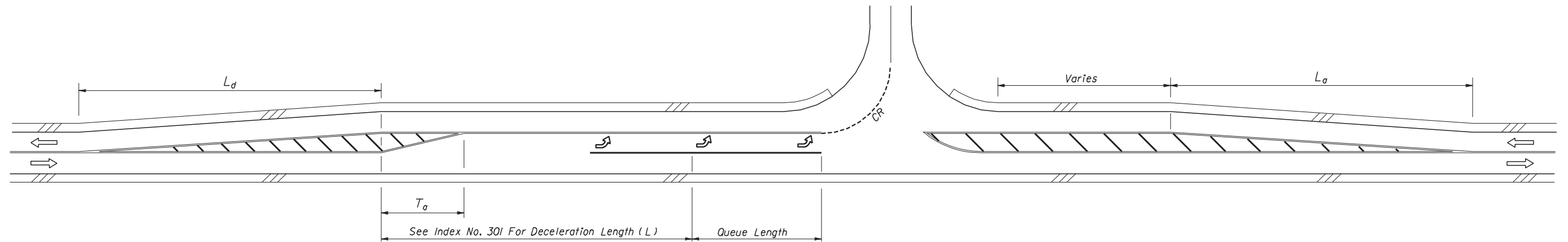
4-LANE UNDIVIDED FLARED - SYMMETRICAL

INTERSECTION TURNS AND STORAGE

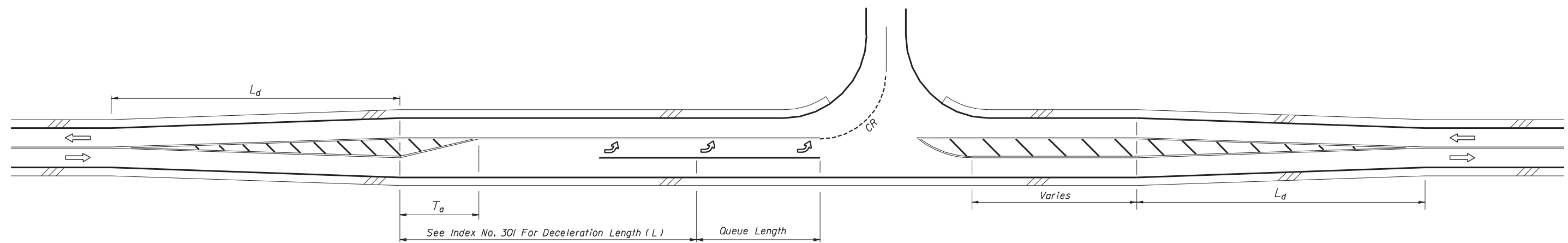
GENERAL NOTE

1. For pavement markings refer to Index No. 17346.

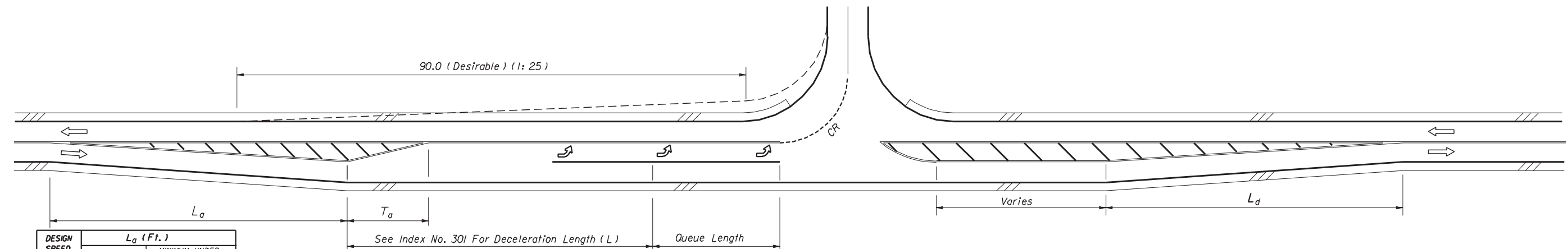
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
ROADWAY TRANSITIONS				
Designed By	Names	Dates	Approved By	
Drawn By	JRW	9/89	 State Roadway Design Engineer	
Checked By	KGM JVC			
			Revision	Sheet No.
			00	1 of 8
				Index No.
				526



LEFT SIDE WIDENING



CENTERED WIDENING



RIGHT SIDE WIDENING

DESIGN SPEED (mph)	L _d (Ft.)	
	STANDARD	MINIMUM UNDER RESTRAINTS
30	180	120
40	320	150
50	500	180
60	720	240

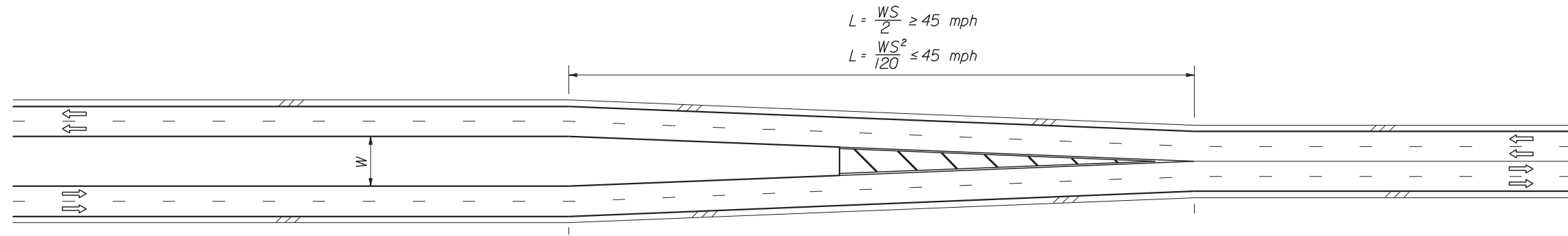
(mph)	L _d (Ft.)	
30	180	120
40	240	150
50	360	180
60	480	240

FLARED & PAINTED LEFT TURNS FOR 2-LANE 2-WAY ROADWAYS

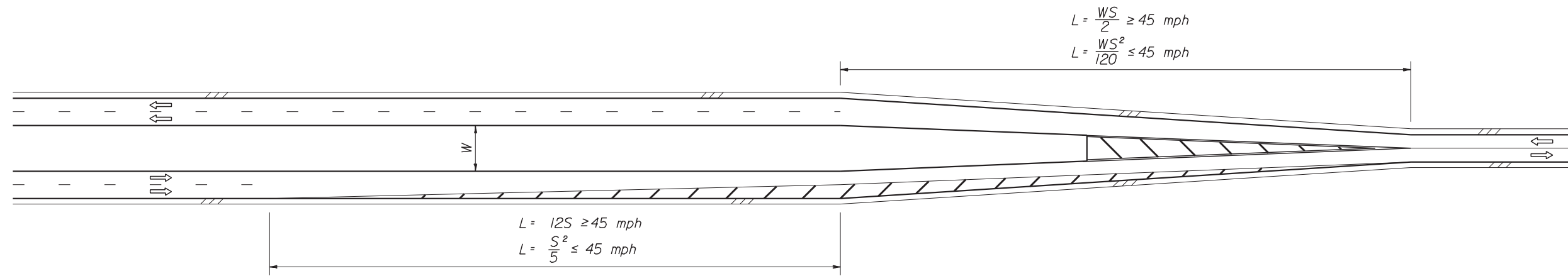
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

ROADWAY TRANSITIONS

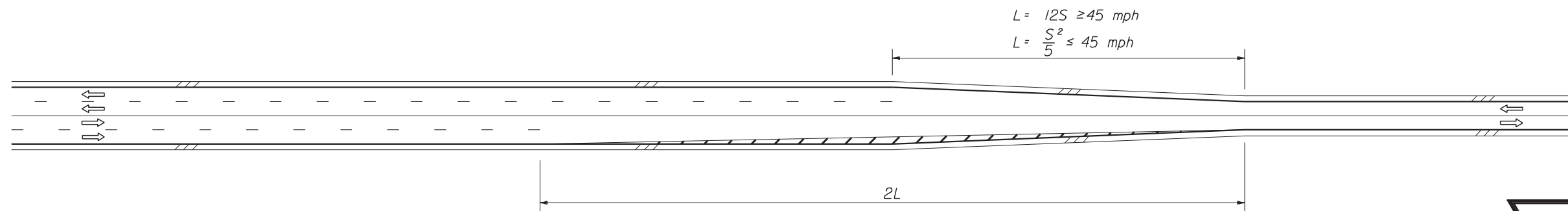
Designed By	RRR, JVG	9/98	Approved By	<i>[Signature]</i>
Drawn By	JRW	9/98	Revision	00
Checked By	RRR, JVG	9/98	Sheet No.	2 of 8
				Index No.
				526



4-LANE DIVIDED TO 4-LANE UNDIVIDED



4-LANE DIVIDED TO 2-LANE UNDIVIDED




4-LANE UNDIVIDED TO 2-LANE UNDIVIDED

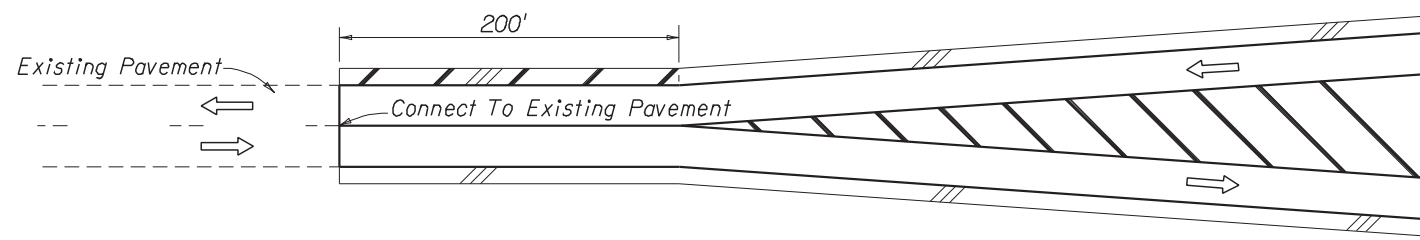
LANE DIVERGENCE AND CONVERGENCE FOR CENTERED ROADWAYS

S = Design speed (mph).

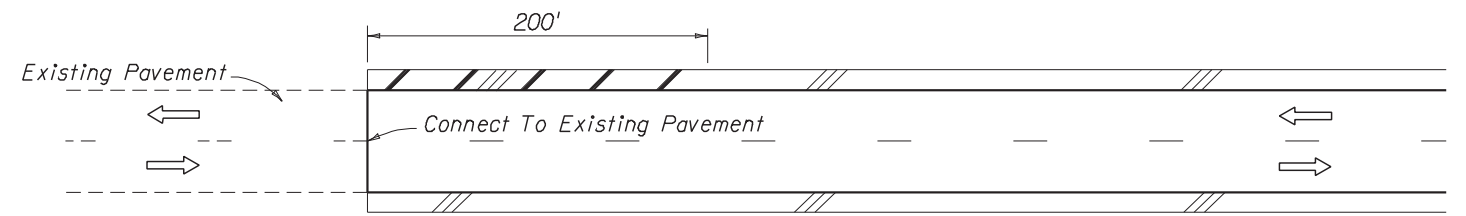
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

ROADWAY TRANSITIONS

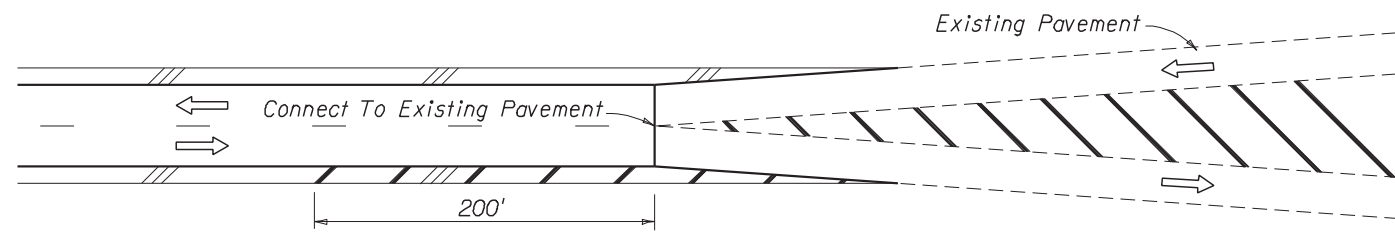
Names	Dates	Approved By			
Designed By	KRM	9/89	 State Roadway Design Engineer		
Drawn By	JRW	9/89			
Checked By	KRM JVC	9/89	Revision	Sheet No.	Index No.
			00	3 of 8	526



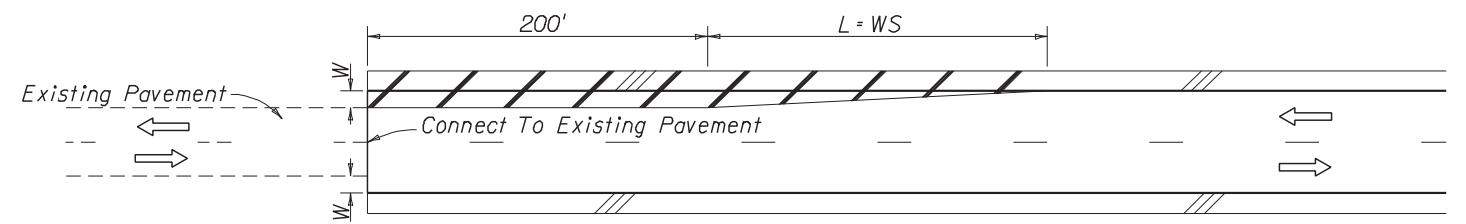
CONNECTING FLARE WITH PAVED SHOULDERS TO EXISTING ROADWAY WITHOUT PAVED SHOULDERS



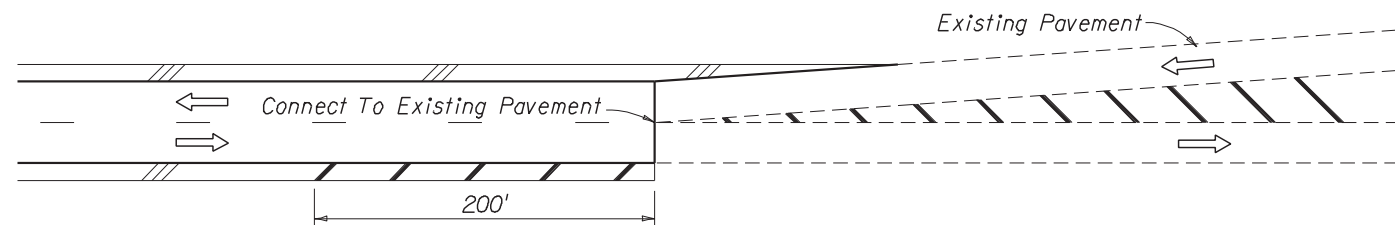
CONNECTING SIMILAR WIDTH PAVEMENTS



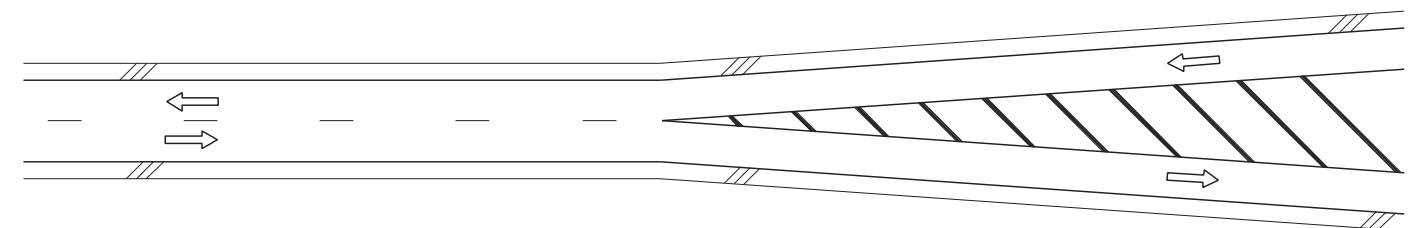
CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING SYMMETRICAL FLARE WITHOUT PAVED SHOULDERS



CONNECTING DIFFERENT WIDTH PAVEMENTS



CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING ASYMMETRICAL FLARE WITHOUT PAVED SHOULDERS

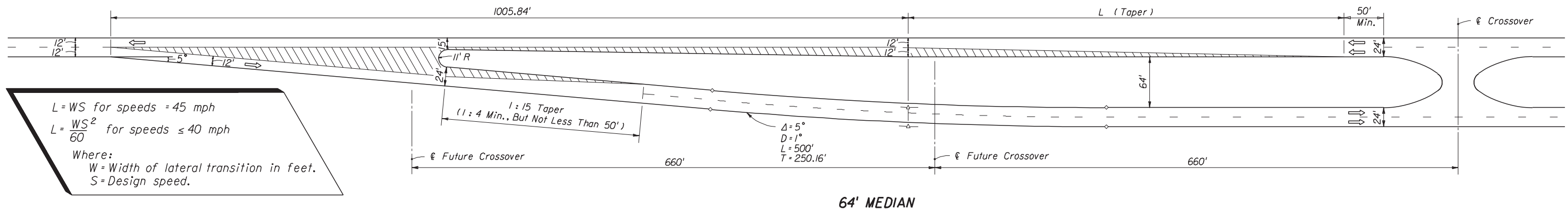
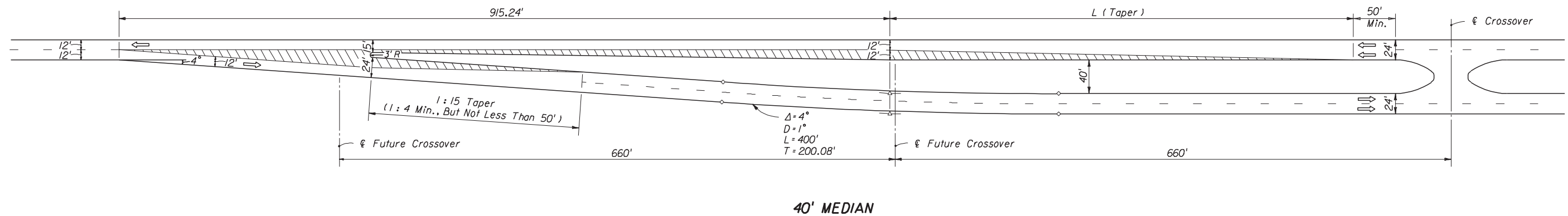
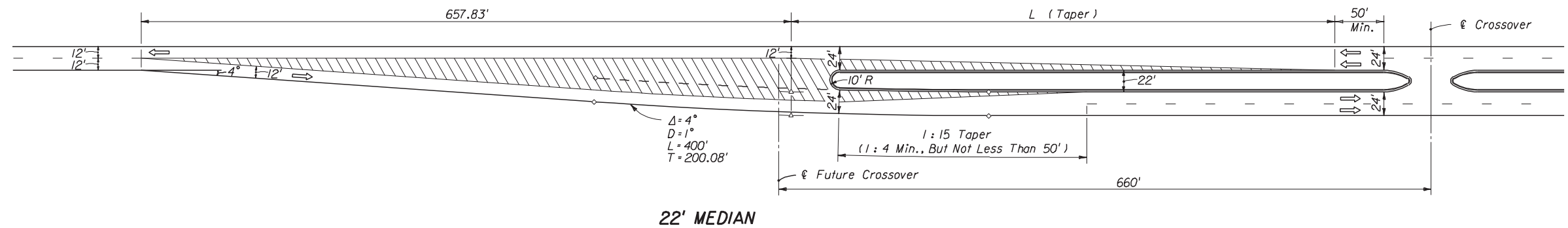


FLARED - PAVED SHOULDERS

S = Design speed (mph).

PAVED SHOULDER TREATMENT AT TRANSITIONS AND CONNECTIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
ROADWAY TRANSITIONS				
Designed By	KRM	3/83	Approved By <i>[Signature]</i> State Roadway Design Engineer	
Drawn By	JRW	9/89	Revision	Sheet No.
Checked By	KRM JVC	9/98	00	4 of 8
				Index No. 526



$L = WS$ for speeds = 45 mph
 $L = \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Design speed.


NOTES FOR SHEETS 5 THRU 8

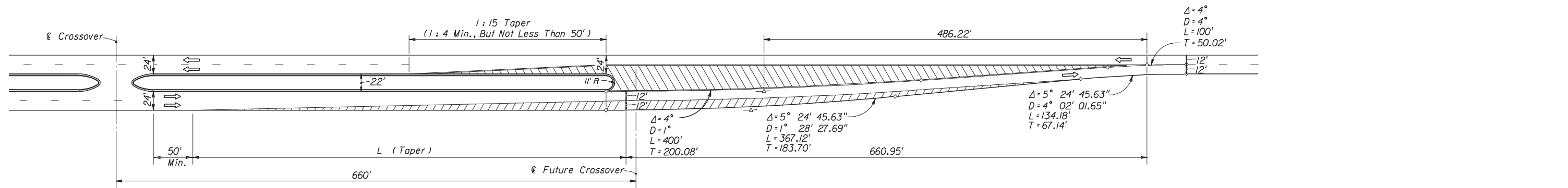
- The transition details as represented on sheets 5 thru 8 are intended as guidelines only. The transition lengths, curve data, nose radii and offsets are valid only for tangent alignment, design speeds ≤ 45 mph, the median widths and lane widths shown.
- Approach lane departures ($\Delta = 5^\circ$) are suitable for design speeds up to 60 mph. Interior curves ($D = 1^\circ$) are suitable for normal crown for design speeds up to 50 mph. Merging curves ($D \geq 5^\circ$) will require superelevation.
- The geometrics of these schemes are associated with the standard subsectional spacing for sideroads, but in any case will require modification to accommodate sideroad location, multilane and/or divided sideroads, oblique sideroads, crossover widths, storage and speed change lane requirements, and, other related features.

**LEFT ROADWAY CENTERED ON APPROACH ROADWAY
 TWO LANE TO FOUR LANE TRANSITION**

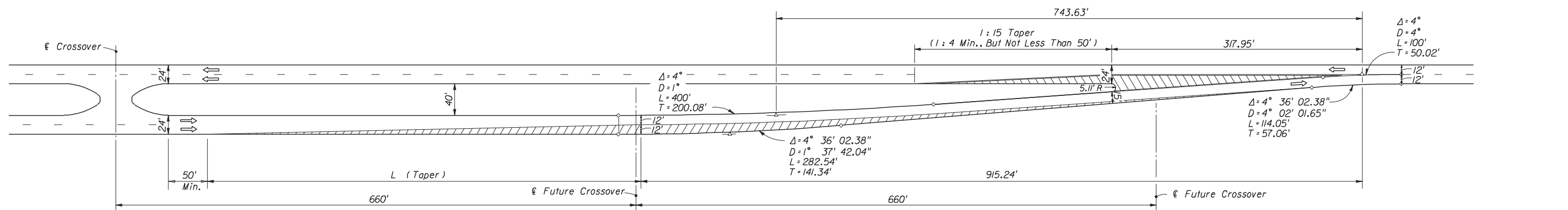
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

ROADWAY TRANSITIONS

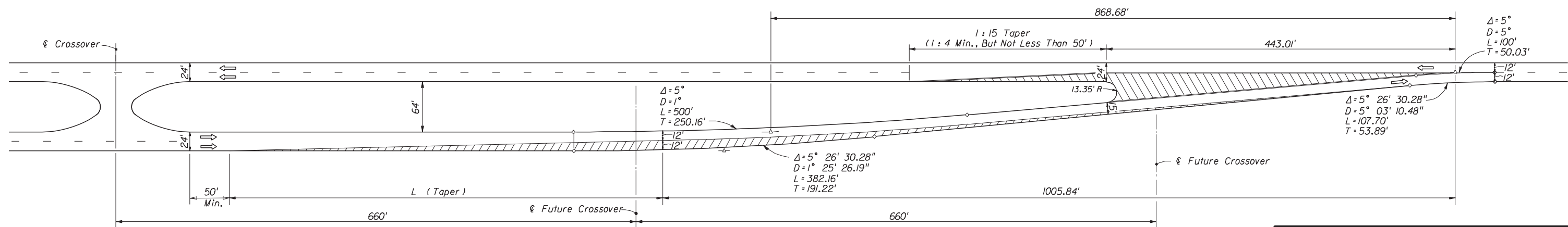
Names	Dates	Approved By		
Designed By	KRM	3/83	 State Roadway Design Engineer	
Drawn By	HKH	2/94		
Checked By	JVC	2/94		
Revision	00	5 of 8	Index No.	526



22' MEDIAN



40' MEDIAN



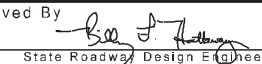
64' MEDIAN

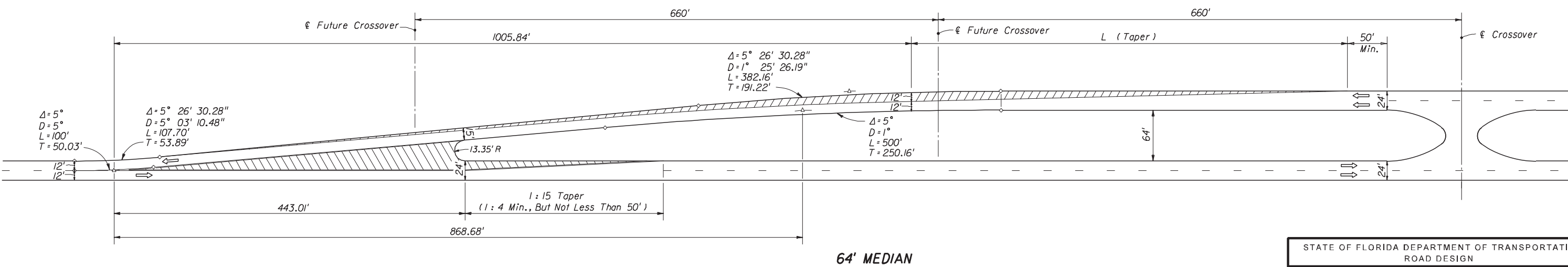
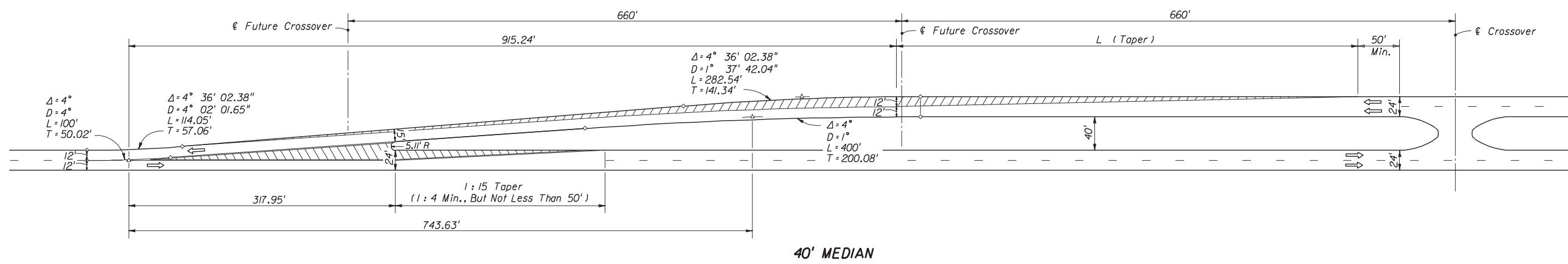
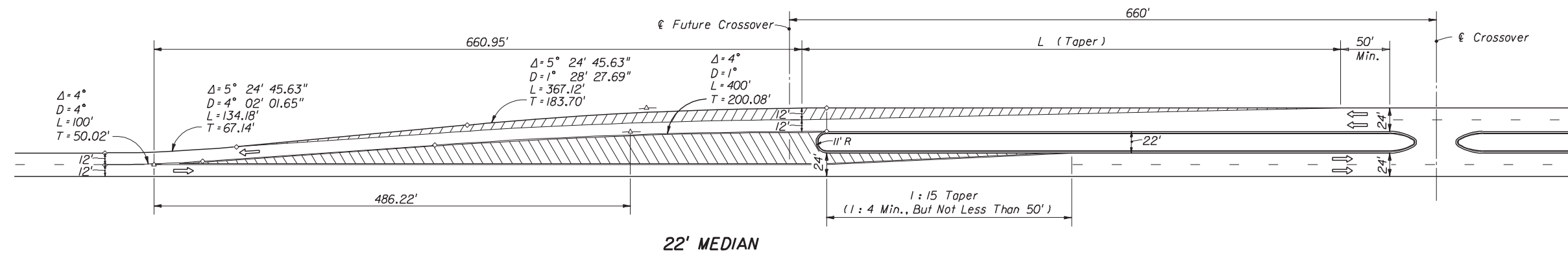
$L = WS$ for speeds = 45 mph
 $L = \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Design speed.

LEFT ROADWAY CENTERED ON THRU ROADWAY
FOUR LANE TO TWO LANE TRANSITION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

ROADWAY TRANSITIONS

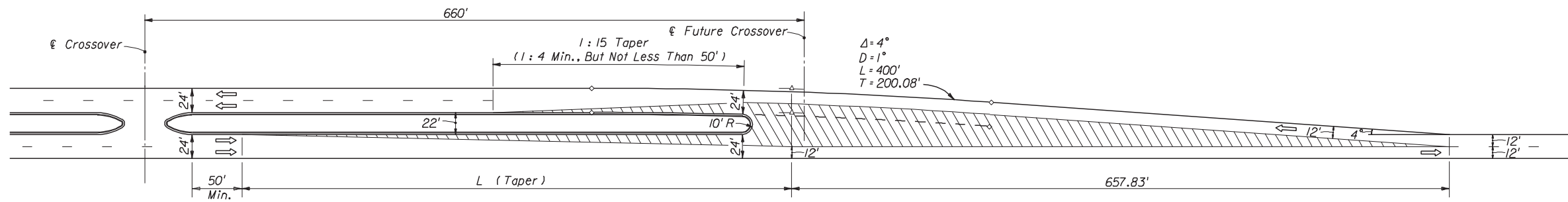
Names	Dates	Approved By
Designed By: KRM	3/83	 State Roadway Design Engineer
Drawn By: HKH	2/94	
Checked By: JVC	2/94	
Revision	00	Sheet No. 6 of 8
		Index No. 526



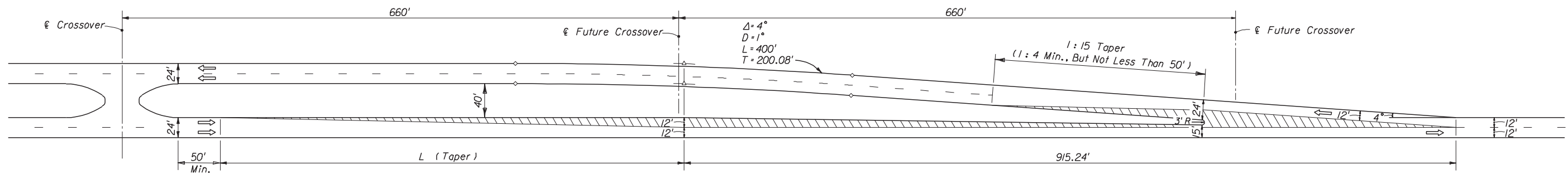
$L = WS$ for speeds = 45 mph
 $L = \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Design speed.

RIGHT ROADWAY CENTERED ON APPROACH ROADWAY
TWO LANE TO FOUR LANE TRANSITION

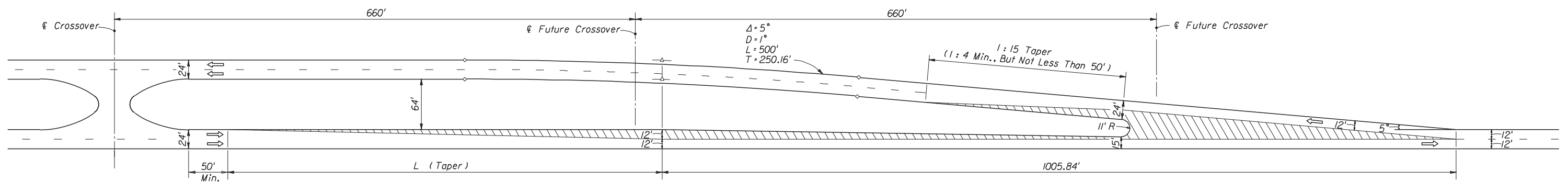
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
ROADWAY TRANSITIONS				
Designed By	Names	Dates	Approved By	
Drawn By	HKH	3/83	 State Roadway Design Engineer	
Checked By	JVC	2/94		
	Revision	Sheet No.	Index No.	
	00	7 of 8	526	



22' MEDIAN



40' MEDIAN




64' MEDIAN

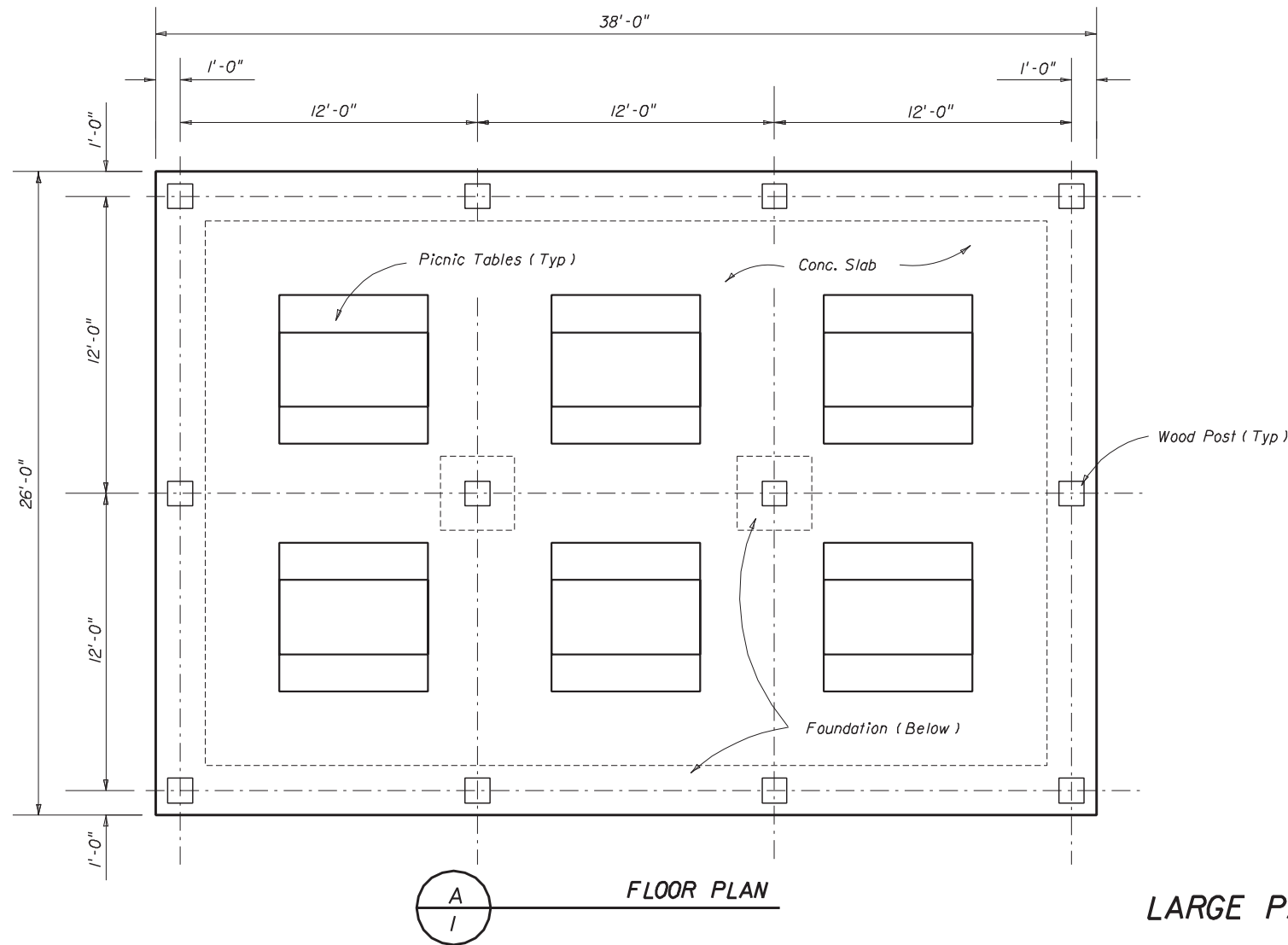
$L = WS$ for speeds = 45 mph
 $L = \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Design speed.

RIGHT ROADWAY CENTERED ON THRU ROADWAY
FOUR LANE TO TWO LANE TRANSITION

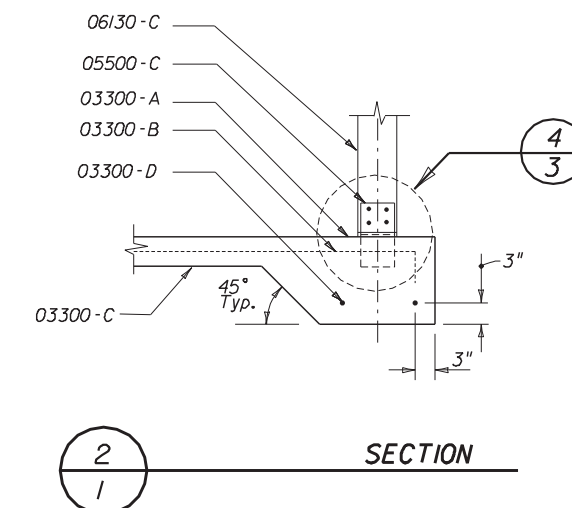
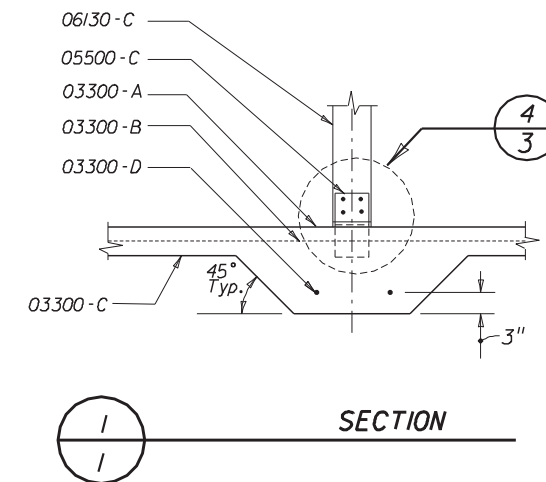
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

ROADWAY TRANSITIONS

Names	Dates	Approved By		
Designed By	KRM	3/83	 State Roadway Design Engineer	
Drawn By	HKH	2/94		
Checked By	JVC	2/94		
Revision	00	Sheet No.	8 of 8	Index No.
				526



LARGE PAVILION



NOTES

Keynotes On Sheet 2.

FLOOR

6" Reinf. Concrete Slab w/WWF6 x 6-WI.4 x WI.4

1'-6" x 1'-6" Drop Footing At Slab Perimeter & Interior Posts.

Harden & Broom Finish Slab Surface.

STRUCTURE

Posts: 8 x 8 PT

Beams: 4 x 6 PT

Framing: 4x PT As Described.

Misc Members: 1x and 2x As Described.

ROOF

3" x 6" T&G Wood Decking.

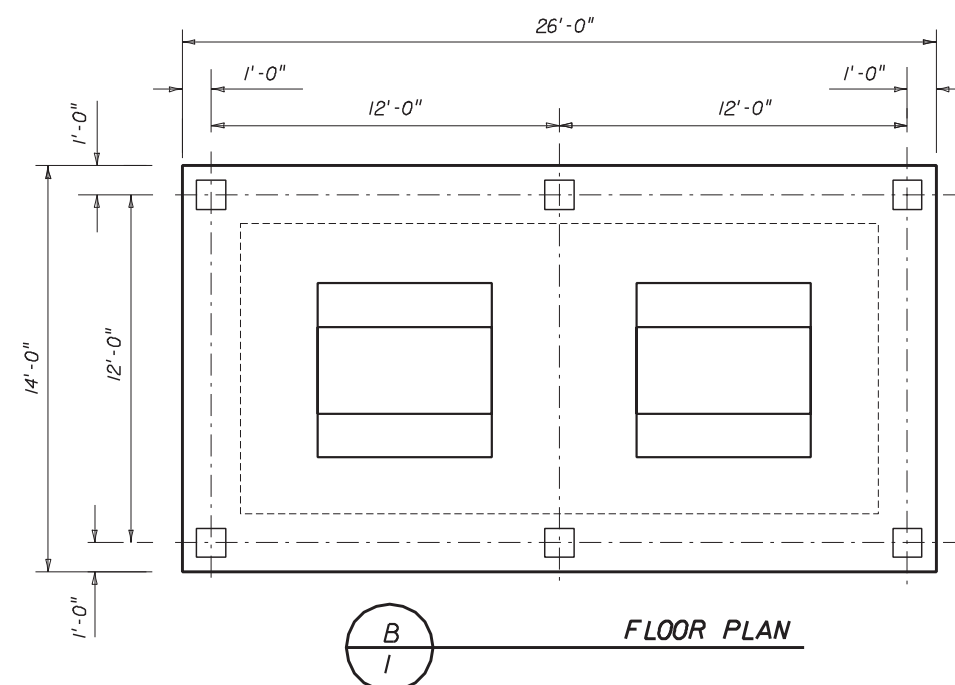
30# Asphalt Impregnated Fiberglass Felt Underlayment.

Standing Seam Metal Roof (24 GA Steel Or .032 Alum.) w/ Kynar 500 Finish.

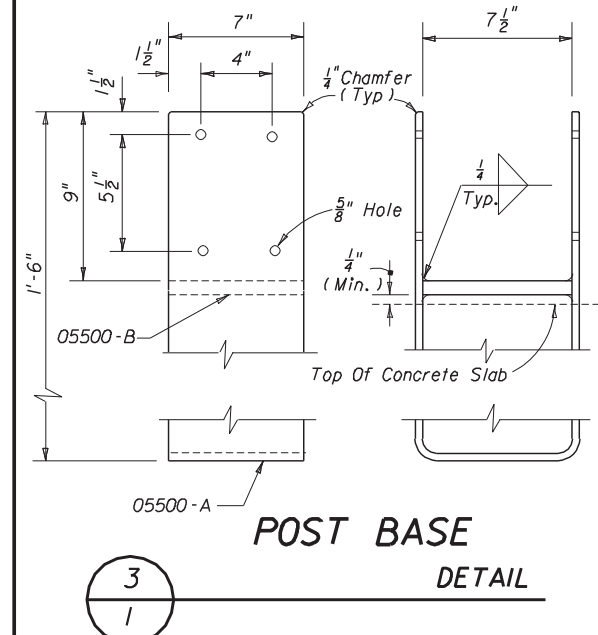
Structure, Decking And Roofing Shall Be Designed To Withstand 130 mph Wind Load.

BUILDING CODE

Picnic Pavilions Shall Be Constructed According To The Requirements Of The Appropriate Sections Of Applicable "Standard Building Code" or "South Florida Building Code", Current, Adopted Edition.



SMALL PAVILION

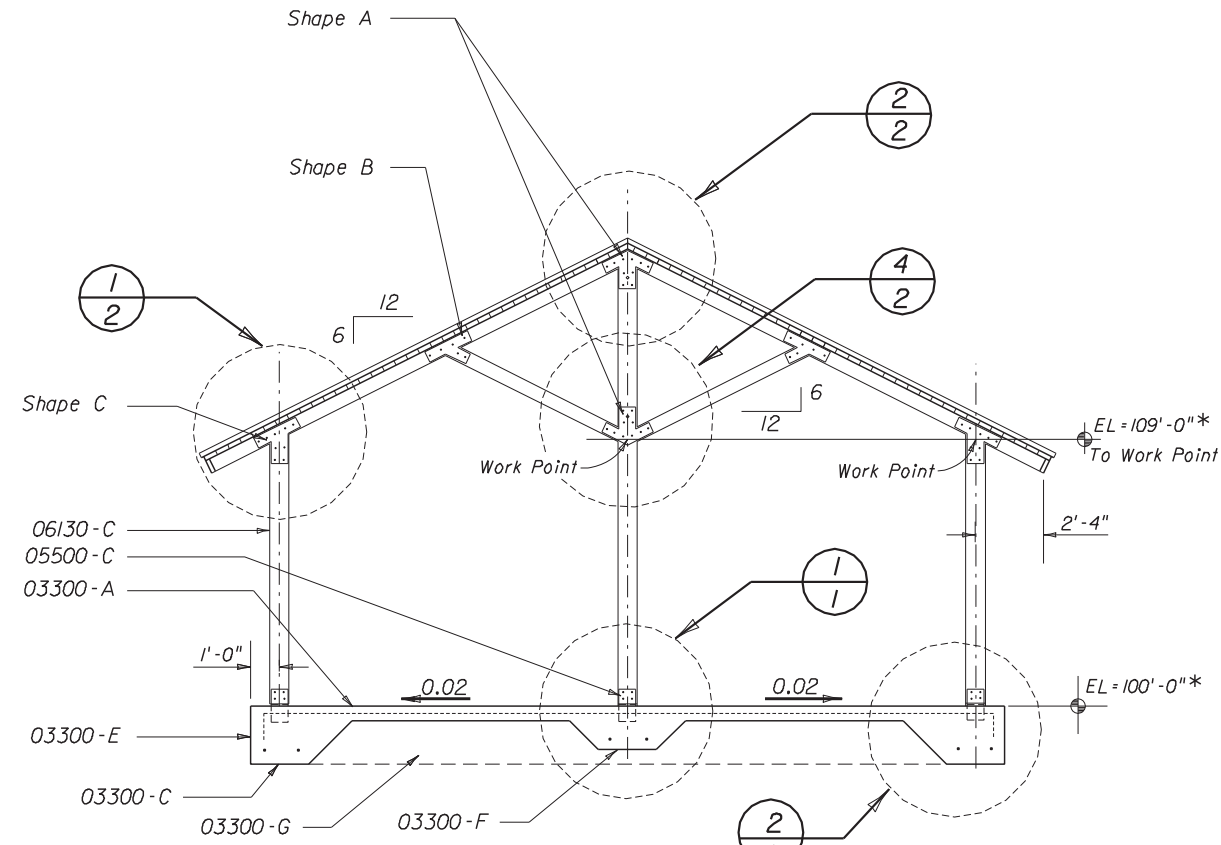


PICNIC PAVILIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

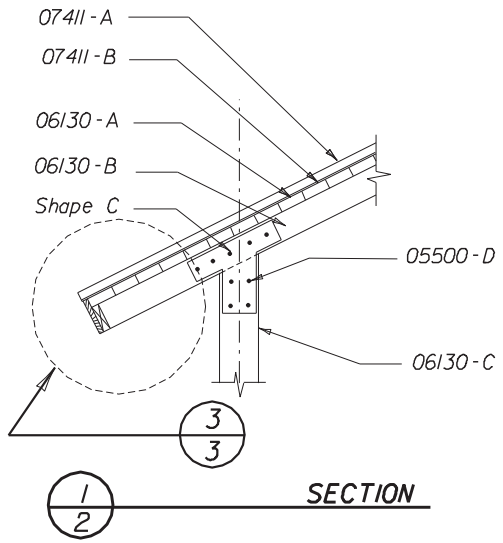
REST AREA EQUIPMENT

Names	Dates	Approved By		
Designed By	HDP	6/93	 State Roadway Design Engineer	
Drawn By	HDP	6/93		
Checked By	ABK	9/93		
Revision		00	Sheet No.	Index No.
			1 of 3	530

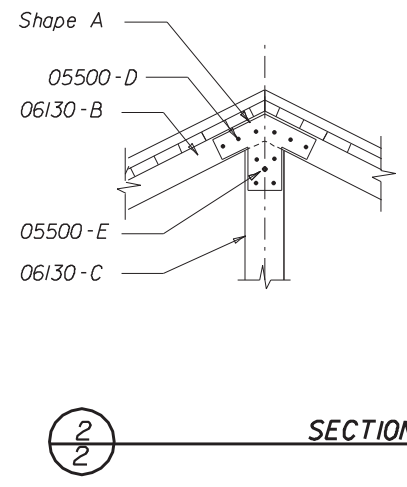


* REFERENCE ELEVATION ONLY

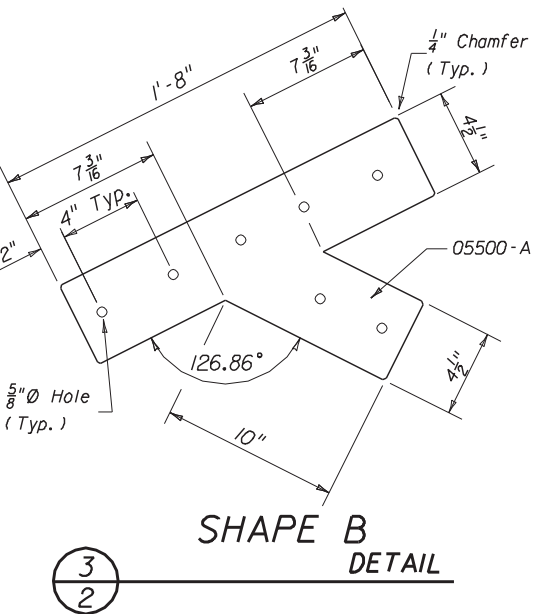
SECTION A



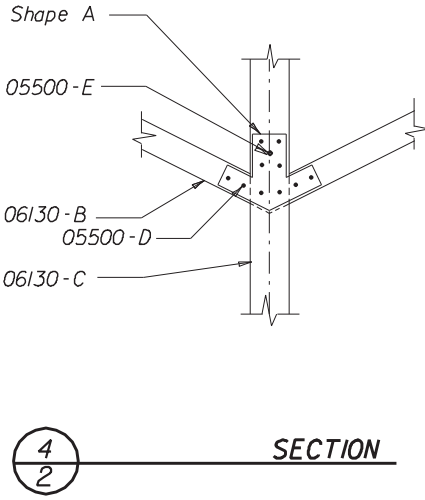
SECTION 3



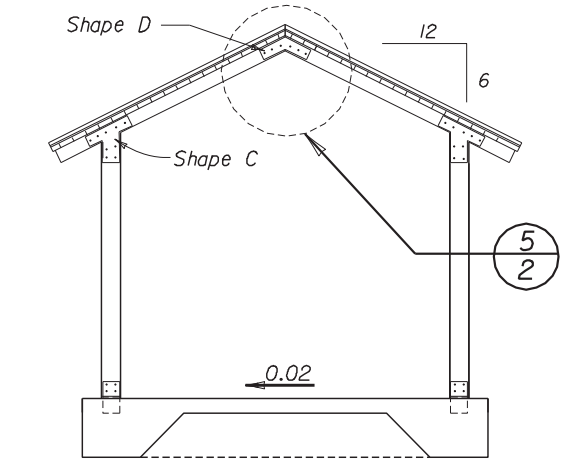
SECTION 2



SHAPE B DETAIL

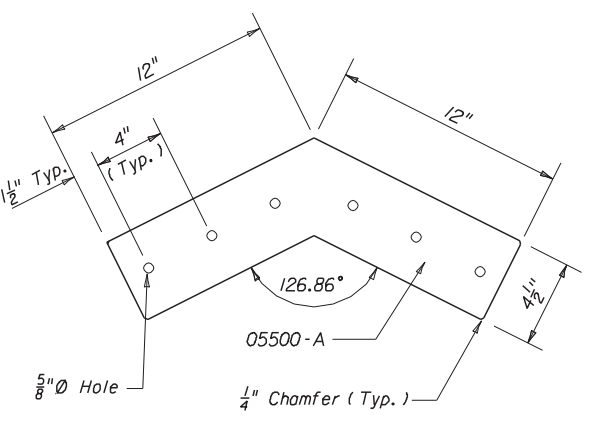


SECTION 4

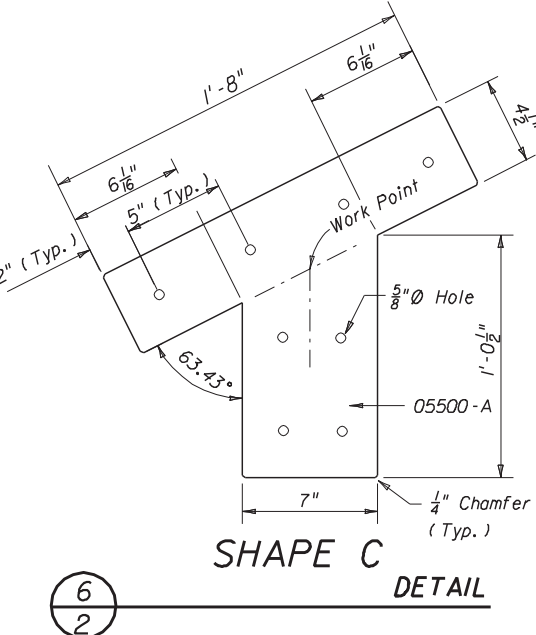


NOTE: DETAILS TO MATCH THOSE OF LARGE PICNIC PAVILION

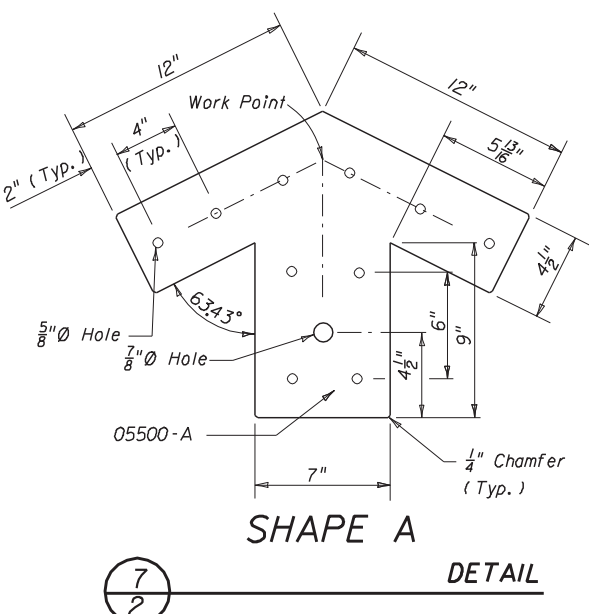
SECTION B



SHAPE D DETAIL



SHAPE C DETAIL



SHAPE A DETAIL

KEYNOTES

- 03300-A Class II Conc Slab
- 03300-B 6" x 6"-WI.4 x WI.4 @ 6" Of Slab
- 03300-C 6 Mil Vapor Barrier
- 03300-D #5 Rebar Cont. (2 Required)
- 03300-E 24" x 24" Drop Footing
- 03300-F 18" x 18" Drop Footing
- 03300-G 6" Min Comp Sand Fill
- 03300-H #5 x 18" Rebar (4 Required)

- 05500-A 3/8" Galv. Steel Plate
- 05500-B 1/2" Galv. Steel Plate
- 05500-C Post Base
- 05500-D 1/2"Ø Bolt, Washer & Nut (Typ)
- 05500-E 3/4"Ø Eyebolt, Washer & Nut For Cross Brace Bars
- 05500-F 1/2"Ø Steel Rod w/Turnbuckle

- 06130-A 3" x 6" T&G Wood Decking
- 06130-B 4" x 6" PT Wood Frame
- 06130-C 8" x 8" PT Wood Post
- 06130-D 2" x 6" PT Wood Fascia
- 06130-E 1" x 10" PT Wood Fascia
- 06130-F 3/4"± Wood Shim

- 07411-A Standing Seam Metal Roof
- 07411-B Felt Underlayment

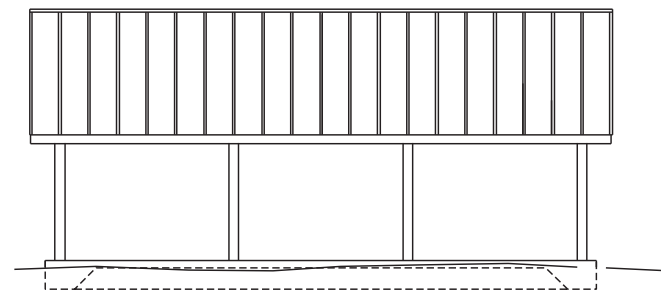
Alternate Material Note:
 These structures are shown with timber frames and decking. Alternate materials (ie. aluminum, steel, etc.) may be used when submittals are signed and sealed by a specialty engineer as per Section 5.1 of the Standard Specifications and when approved by the Engineer.

PICNIC PAVILIONS

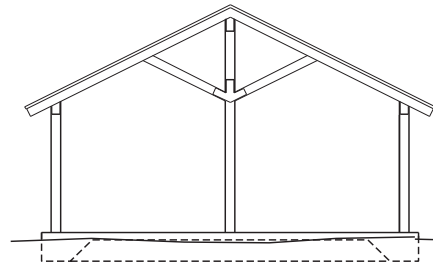
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

REST AREA EQUIPMENT

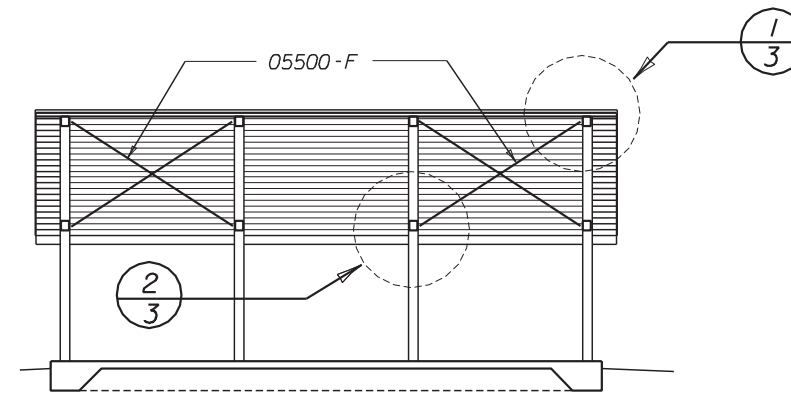
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Designed By HDP	6/93	State Roadway Design Engineer		
Drawn By HDP	9/95	Revision	Sheet No.	Index No.
Checked By ABK	9/95	00	2 of 3	530



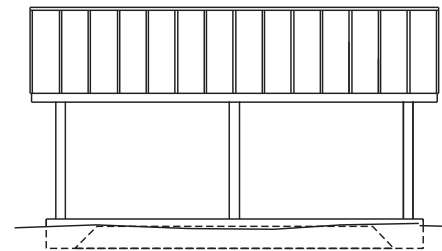
A
3 SIDE ELEVATION



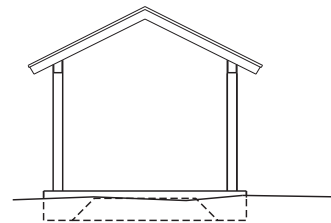
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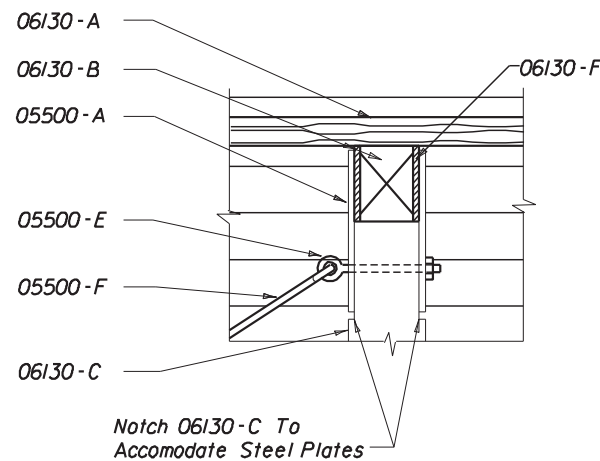
C
3 SECTION



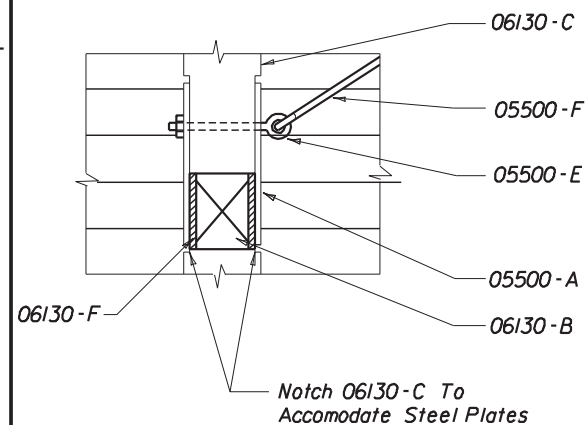
D
3 SIDE ELEVATION



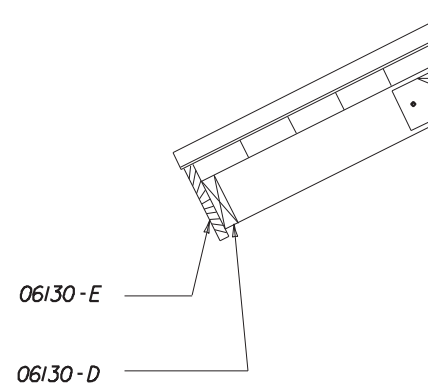
E
3 END ELEVATION



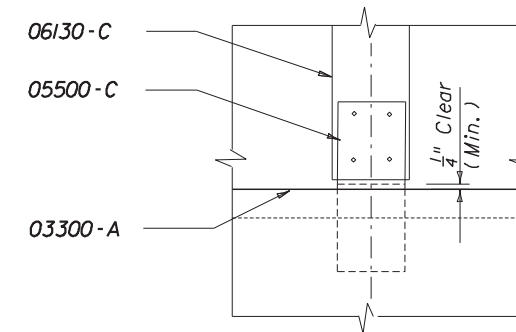
1
3 DETAIL



2
3 DETAIL



3
3 DETAIL
Similar At Roof Rake



4
3 DETAIL

SPECIFICATIONS

Keynotes On Sheet 2.

CONCRETE

Concrete: FDOT Class II.

Reinforcing Bars: ASTM A615/A615M, Grade 400.

Welded Wire Fabric: ASTM A-185.

Vapor Barrier: Black 6-Mil Polyethylene.

STEEL

Galvanized Steel Plate: Steel Plate ASTM A446 With G90 Zinc Coating.

Galvanized Fasteners: High-Strength Bolts And Nuts, ASTM A325 With G90 Zinc Coating.

Galvanize Shapes After Fabrication, Make Field Repairs To Galvanizing With High Zinc Dust Content Paint, Complying With SSPC-Paint-20.

WOOD

Comply With American Institute For Timber Construction AITC 108, "Standard For Heavy Timber Construction."

For Solid Wood Decking, Comply With AITC 112, Standard For Tongue And Groove Heavy Timber Standard."

Species: Douglas Fir, Hem-fir, Or Southern Pine, At Fabricator's Option.

Preservative Treatment: Pressure Treat Fabricated Members With Waterborne Solution For Above Ground Use, Complying With AWPAC2.

Wood Decking: Predrill Decking At 30" Centers For Lateral Spiking To Adjacent Units. Spikes To Be 20d Galvanized Common.

PICNIC TABLES

Picnic Tables And Benches Shall Be 6' x 6' w/Heavy Galvanized Pipe Frames And Recycled Plastic Wood Seats And Table Tops. All Tables Shall Be Of Walk Thru Design Suitable For Exterior Locations. Tables At Accessible Pavilions Shall Meet The Requirements Of The Americans With Disabilities Act (ADA) Accessibility Guidelines.

PICNIC PAVILIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

REST AREA EQUIPMENT

Names	Dates	Approved By		
Designed By	HDP	6/95	 State Roadway Design Engineer	
Drawn By	EDP	9/95		
Checked By	ABK	9/95		
Revision		00	Sheet No.	Index No.
			3 of 3	530

GENERAL NOTES

1. The location and construction of mailboxes shall conform to the rules and regulations of the United States Postal Service as modified by this design standard.

2. Mailboxes will not be permitted on Interstate highways, freeways, or other highways where prohibited by law or regulation.

3. The contractor shall give the Postmaster of the delivery route(s) written notice of project construction 7 days prior to the beginning of work, with Saturdays, Sundays and Holidays excluded.

The Contractor shall furnish and install one mailbox in accordance with this design standard at each mail patron delivery location and maintain the box throughout the contract period. The Contractor shall apply box numbers to each patron box in accordance with identification specifications of the Domestic Mail Manual of the U. S. Postal Service; where local street names and house numbers are authorized by the Postmaster as a postal address, the Contractor shall inscribe the house number on the box; if the box is located on a different street from the patrons residence, the Contractor shall inscribe the street name and house number on the box.

The Contractor shall coordinate removal of the patrons existing mailboxes. Immediately after installing the new mailboxes the Contractor must notify each "Mail Delivery Patron" by Certified Mail that removal of the existing mailboxes must be accomplished in 21 days after receipt of notices. Patrons shall have the option of removing their existing mailboxes or leaving the mailboxes in place for removal by the Contractor; removal by the Contractor shall be included in the contract unit price for Mailbox, Each. The Contractor shall dispose of mailboxes and supports in areas provided by him.

Reuse of existing mailboxes by the Contractor will not be a requirement under any construction project; however where an existing mailbox meets the design requirements of this standard and is structurally and functionally sound, the Contractor at his option may elect to reuse the existing mailbox in lieu of constructing a new mailbox. Any use of existing mailboxes must be approved by the Engineer.

4. Mailboxes shall be metal construction only, in traditional style only, and only in Size 1 as prescribed by the Domestic Mail Manual of the U. S. Postal Service (DMM).

Mailbox production standards, lists of approved manufacturers and suppliers of mailboxes, design approval and guidance may be obtained by writing to the Rural Delivery Division, Delivery Service Department, Operations Group, USPS Headquarters, Washington, DC 20260.

5. Mailboxes shall be located on the right-hand side of the roadway in the direction of the delivery route, except on one-way roads and streets where they may be placed on the left-hand side.

Mailboxes on rural highways shall be set with the roadside face of the box offset from the edge of the traveled way a minimum distance of the greater of the following:

- (a) Shoulder width plus 8" to 12".
- (b) 10' for ADT over 10,000 vpd.
8' for ADT 100 to 10,000 vpd.
6' for ADT under 100 vpd
2'-6" for low speed and ADT under 100 vpd.

When a mailbox is installed within the limits of guardrail it should be placed behind the guardrail whenever practical.

Mailboxes on curbed highways, roads and streets shall be set with the face of the box between 6" and 12" back of the face of curb. If the sidewalk abuts the curb or if an unusual condition exists which makes it difficult or impractical to install or serve boxes at the curb, the Contractor with concurrence of the local postal authority may be permitted to install all mailboxes at the back edge of the sidewalk, where they can be served by the carrier from the sidewalk.

6. Mailboxes shall be set with the bottom of the box between 42" and 48" above the mail stop surface, unless the U.S. Postal Service establishes other height restrictions.

7. No more than two mailboxes may be mounted on a support structure unless the support structure and mailbox arrangements have been shown to be safe by crash testing and approved by the State Design Engineer, Roadways.

Neighborhood Delivery and Collection Box Units (NDCBU) are a specialized multiple mailbox installation that must be located outside the highway and street clear zones. The location of NDCBUs is the sole responsibility of the Postmaster for the delivery route under consideration.

8. Lightweight newspaper receptacles may be mounted below the mailbox on the side of the support post in conformance with the USPS Domestic Mail Manual. The mail patron shall be responsible for newspaper receptacle installation and maintenance.

9. Wood and steel support posts for both single and double mailbox mountings shall be embedded no more than 24" into the ground.

Concrete, block, brick, stone or other rigid foundation structure or encasement, either above or below the shoulder groundline, will not be permitted for mailboxes on rural highways. On urban roads and streets where mailbox support posts are set within rigid pavement back of curb, the support posts shall be separated from the pavement by a minimum of 1" of expansion material.

Support posts shall not be fitted nor installed with surface mount base plates.

10. At driveway entrances mailboxes shall be placed on the far side of the driveway in the direction of the delivery route.

At intersecting roads mailboxes shall be located 100' or more from the centerline of the intersecting road on the far side in the direction of the delivery route, with the distance increased to 200' when the route volume exceeds 400 vehicles per day.

11. Wood support posts shall be in conformance with the material and dimensional requirements of Section 952 and the treatment requirements of Section 955 of the Standard Specifications.

Steel support posts shall have an external finish equal to or better than two coats of weather resistant, air dried or baked, paint or enamel. Surfaces(s) shall be cleaned of all loose scale prior to finishing. The Postal Service prefers that posts be painted white, but other colors may be used when approved by the Engineer. When galvanized posts are used painting is not required.

Mounting brackets, plates, platforms, shelves and accessory hardware surface finishes are to be suited to support post finish.

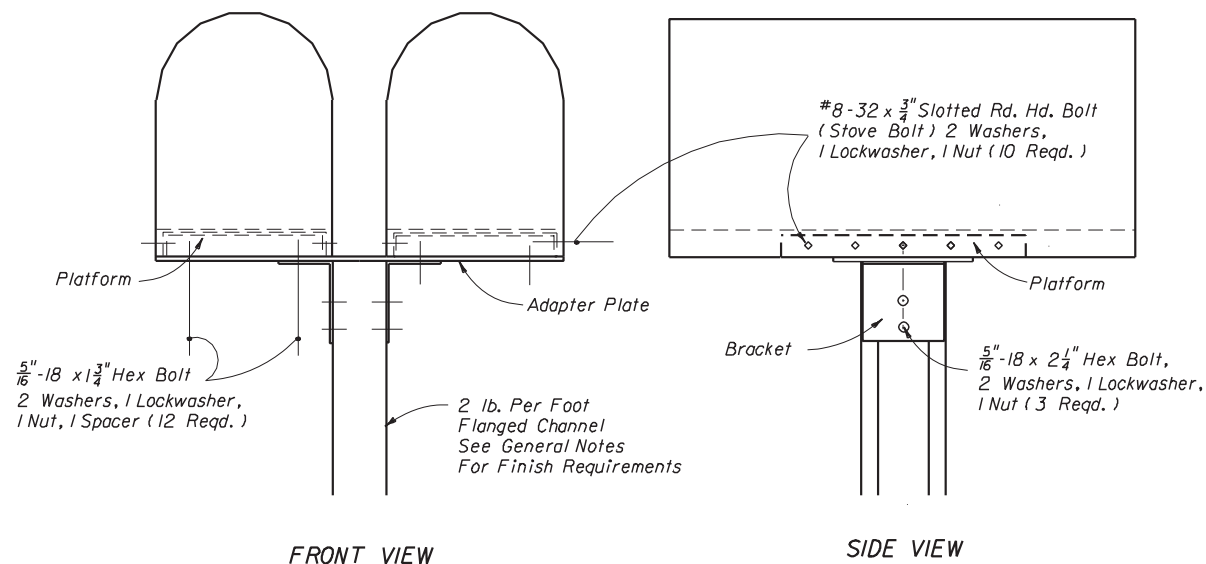
12. Mailboxes shall be paid for under the contract unit price for Mailboxes, Each. Payment shall be full compensation for boxes, posts and accessory items essential for installation in accordance with this standard; erection; adjustments to suit construction needs; and, for identification letters and numbers.

Payment shall be limited to one mailbox per patron address whether the mailbox is new, reused, salvaged, reset or relocated. Payment shall be per mailbox regardless of the number of mailboxes per support or grouping arrangement.

The above compensation shall include any work and cost incurred by the contractor for removal and disposal of existing mailboxes.

There shall be no payment participation for NDCBU furnishing, assembly, installation, resetting or relocation.

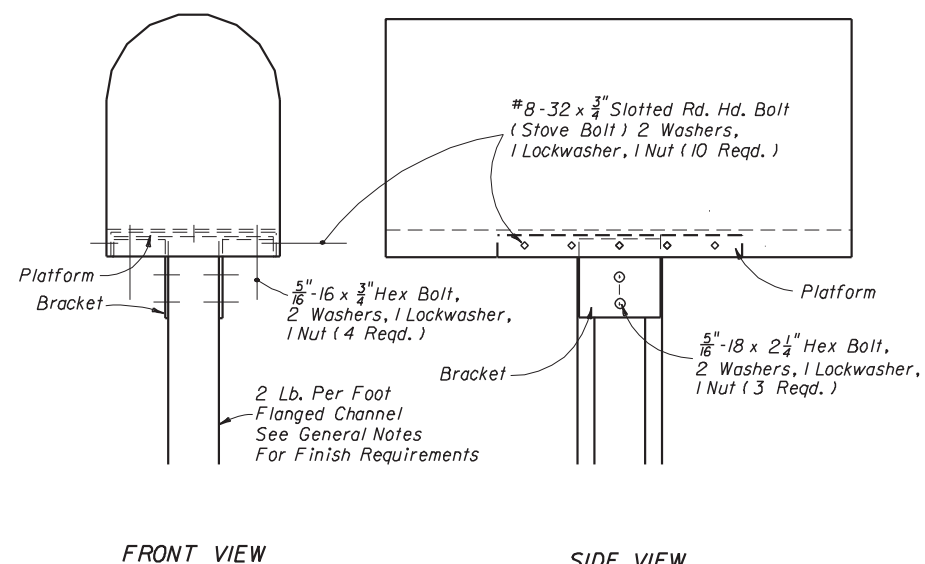
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
MAILBOXES					
	Names	Dates	Approved By		
Designed By					
Drawn By	HSD		State Roadway Design Engineer		
Checked By	JVS/JSK		Revision	Sheet No.	Index No.
			00	1 of 3	532



FRONT VIEW

SIDE VIEW

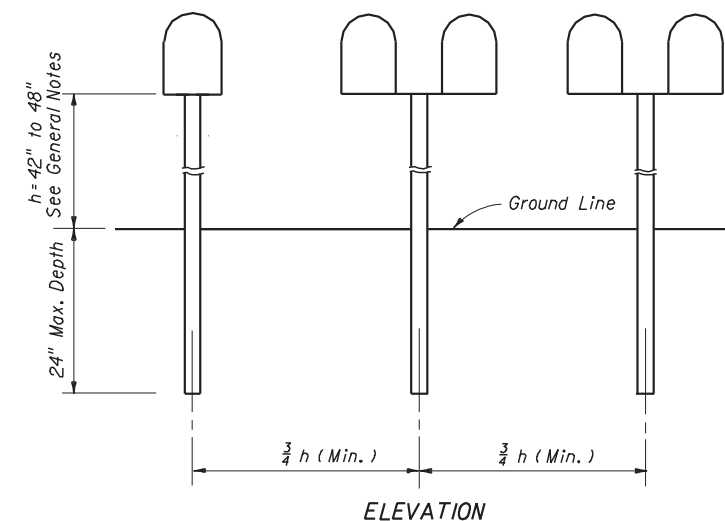
FLANGED CHANNEL



FRONT VIEW

SIDE VIEW

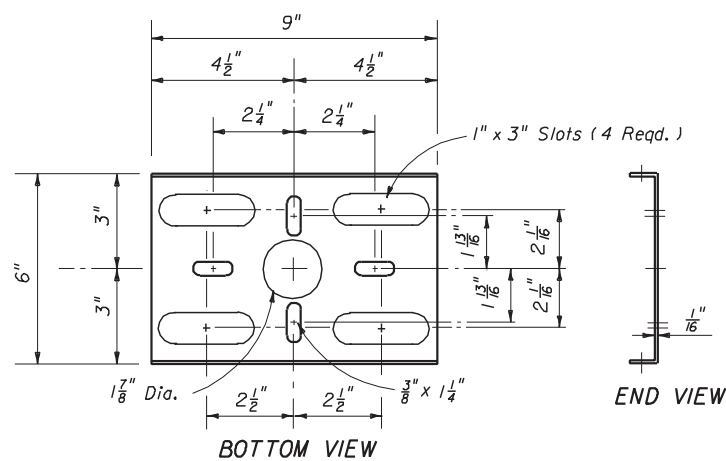
FLANGED CHANNEL



ELEVATION

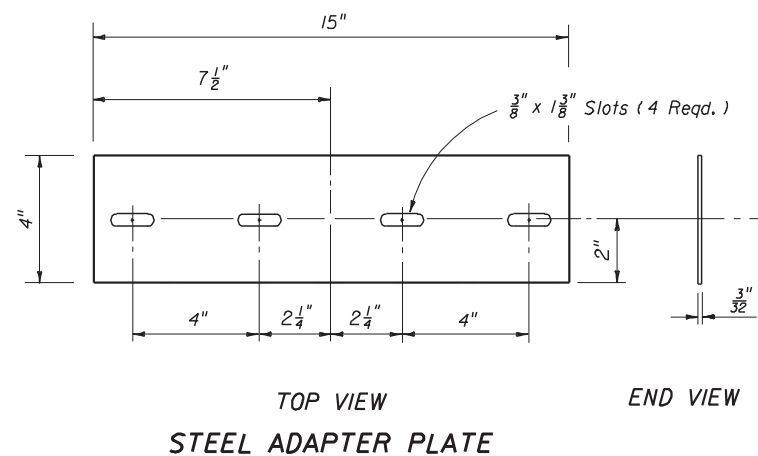
SINGLE OR COMBINED WOOD, FLANGED CHANNEL OR PIPE POST TYPES SHOWN ON THIS INDEX

POST SPACING



BOTTOM VIEW

END VIEW

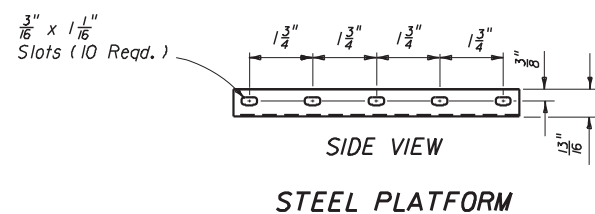


TOP VIEW

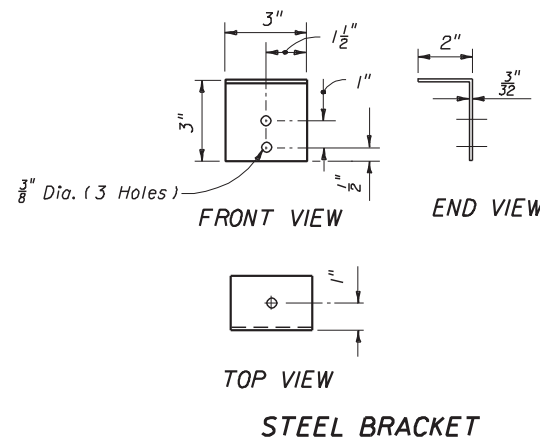
END VIEW

STEEL ADAPTER PLATE

Note: See General Notes for finish requirements.



STEEL PLATFORM

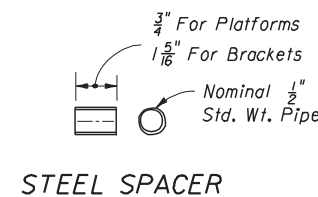


FRONT VIEW

END VIEW

TOP VIEW

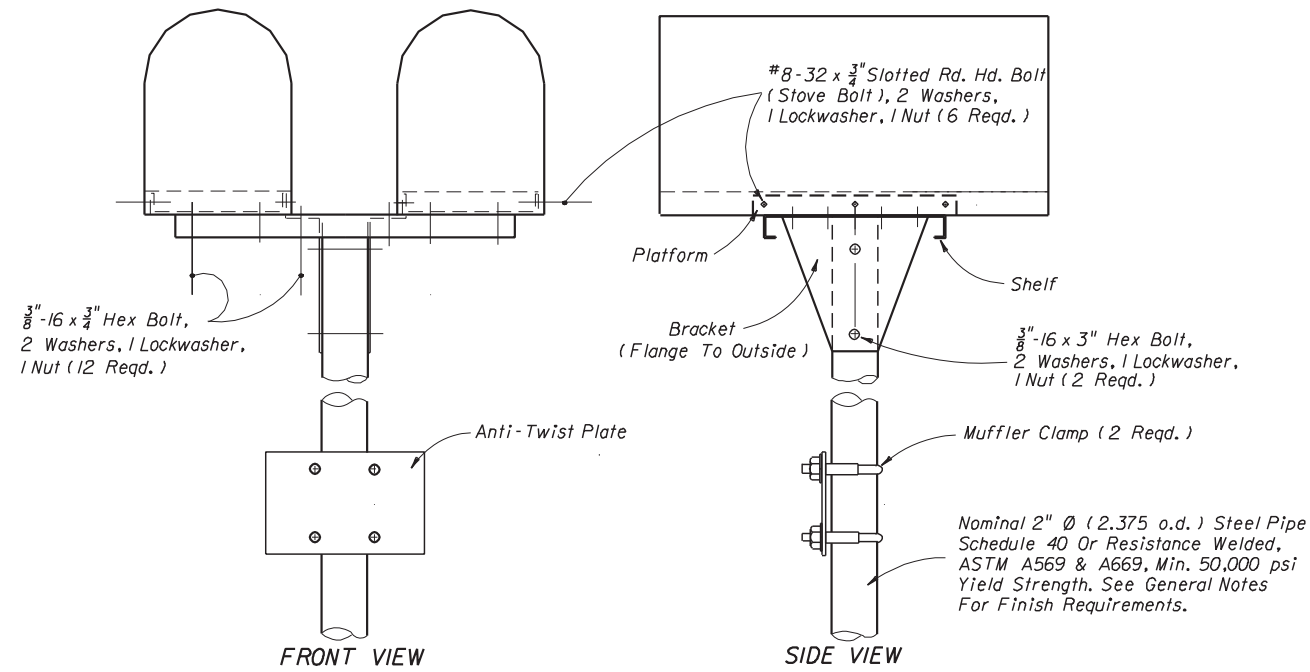
STEEL BRACKET



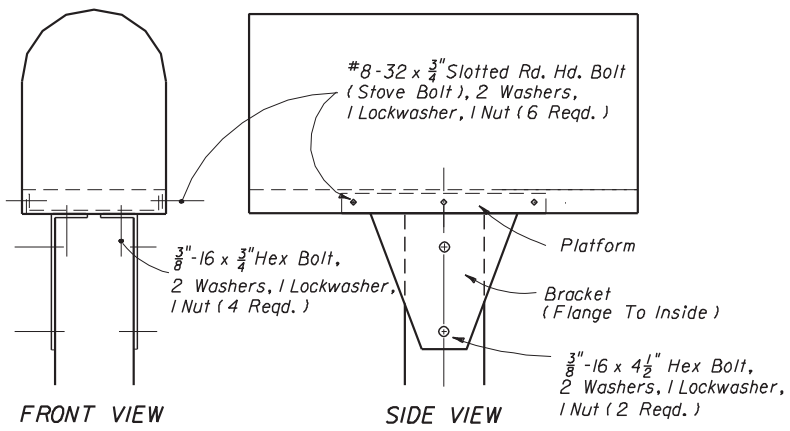
STEEL SPACER

STEEL FLANGED CHANNEL SUPPORT POSTS

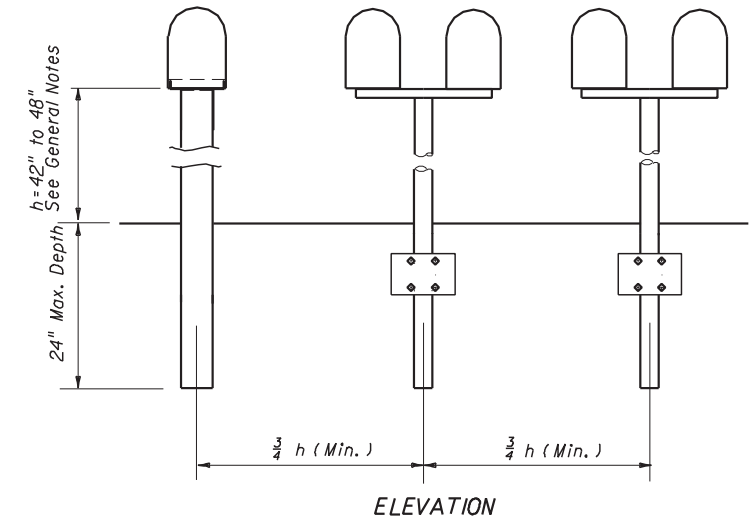
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MAILBOXES				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	HSD	7/87	Revision	Sheet No. 2 of 3
Checked By	JTC/JBW	7/87	00	Index No. 532



2" Ø PIPE POST

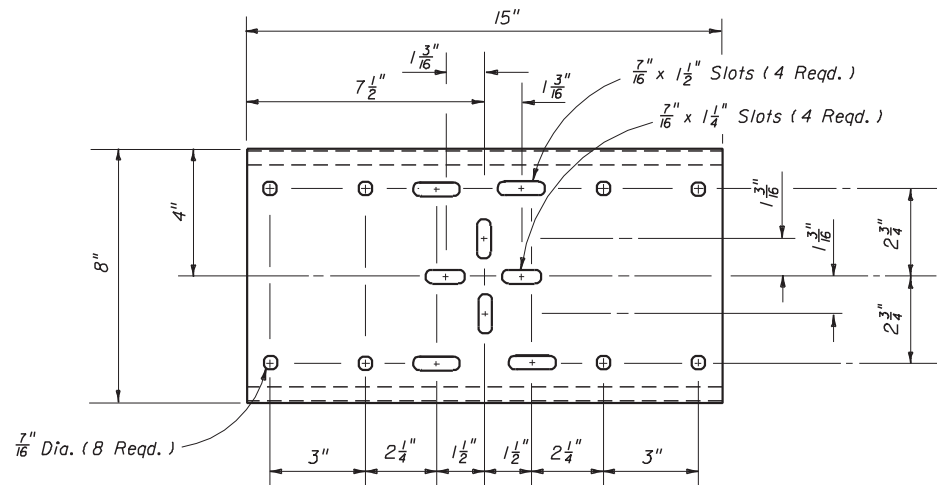


4" X 4" WOOD POST

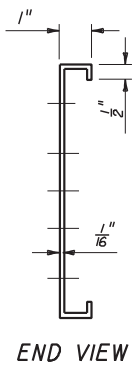


ELEVATION

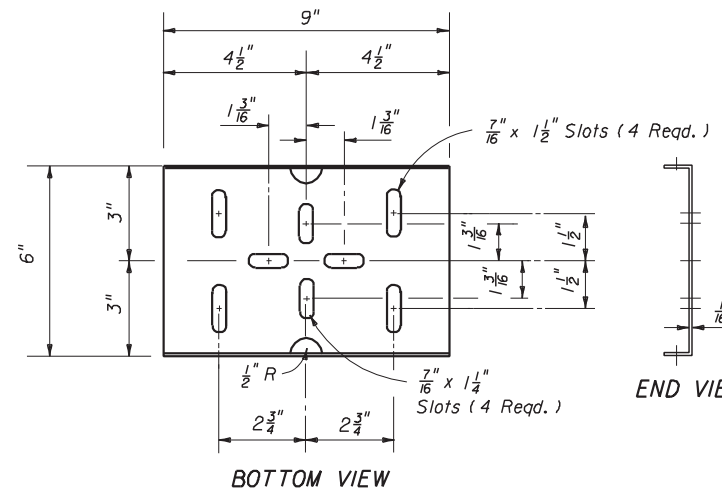
SINGLE OR COMBINED WOOD, FLANGED CHANNEL OR PIPE POST TYPES SHOWN ON THIS INDEX
POST SPACING



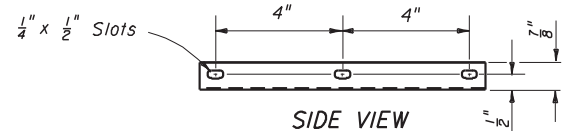
TOP VIEW
STEEL SHELF



END VIEW



BOTTOM VIEW

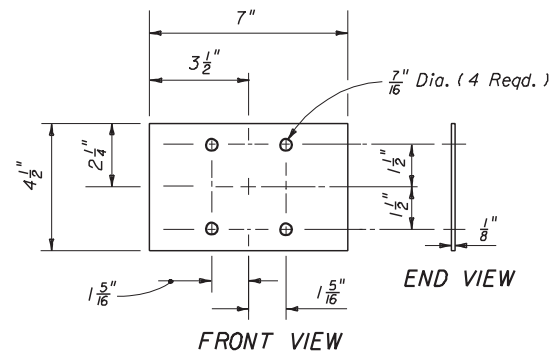


SIDE VIEW

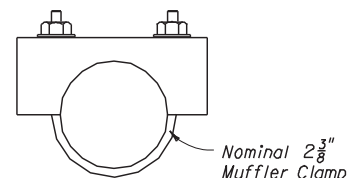
STEEL PLATFORM

END VIEW

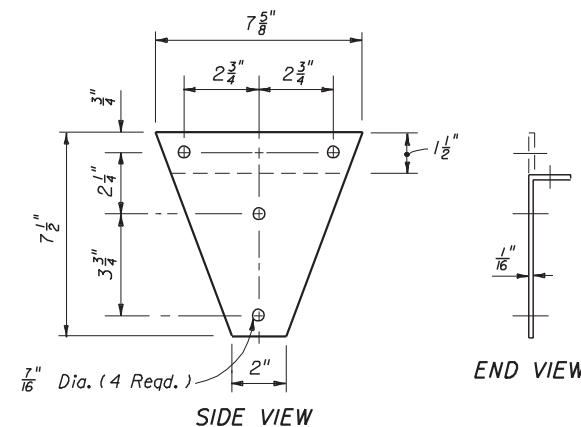
Note: See General Notes for finish requirements



STEEL ANTI-TWIST PLATE



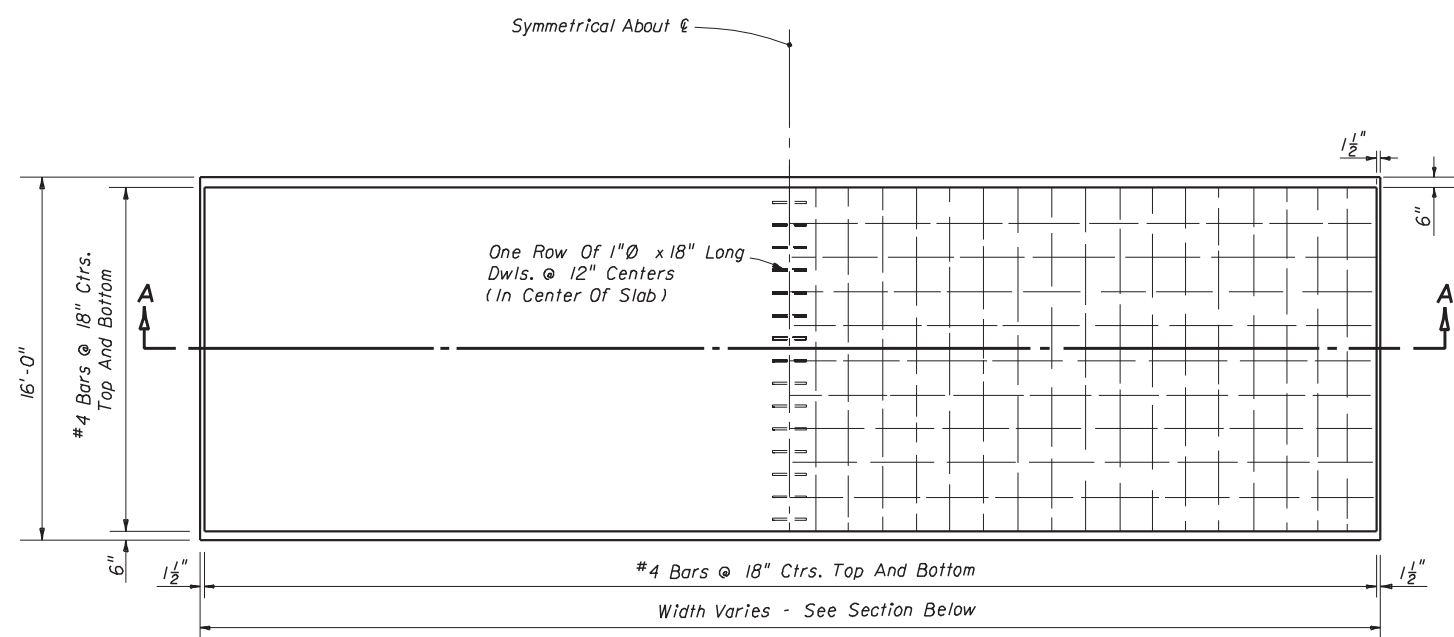
STEEL CLAMP



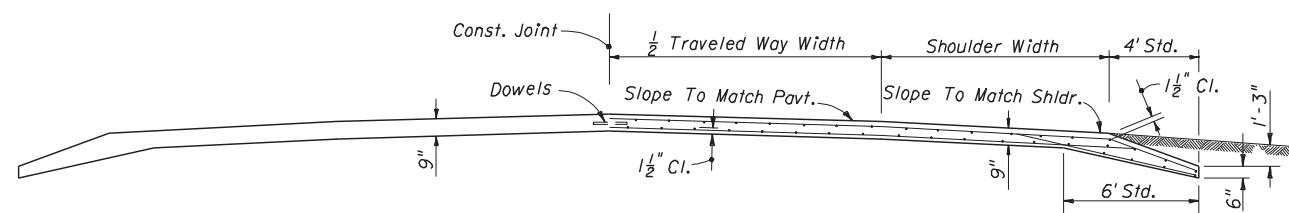
STEEL BRACKET

STEEL PIPE AND WOOD SUPPORT POSTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
MAILBOXES				
Designed By	Names	Dates	Approved By	
Drawn By	HSD	7/87	State Roadway Design Engineer	
Checked By	JTC/JBW	7/87	Revision	Sheet No.
			00	3 of 3
				532



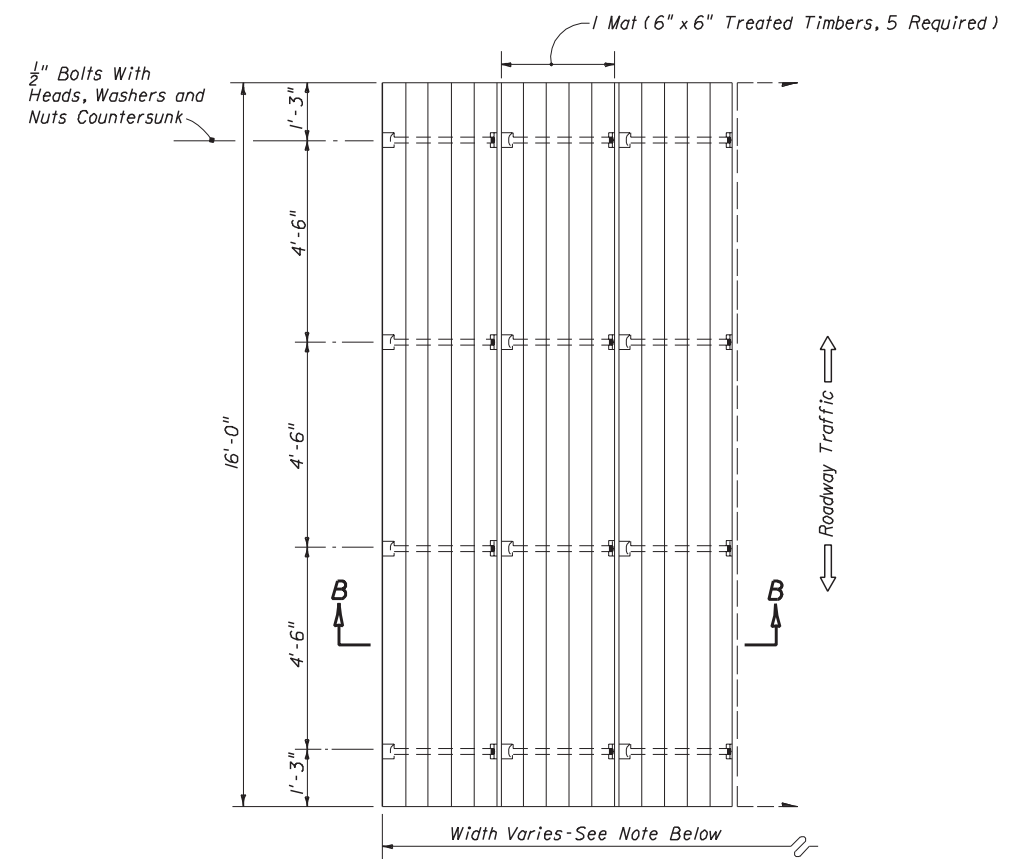
PLAN



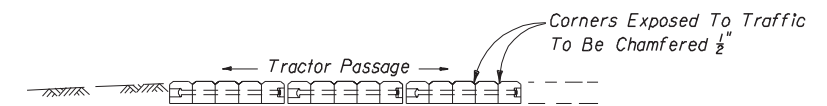
SECTION AA

Note: Class I concrete is to be used unless otherwise noted in plans or special provisions.

**REINFORCED CONCRETE
TYPE A**



PLAN



SECTION BB

Note: Tractor crossing to be constructed to match pavement cross slope.

The number of mats required will vary with the pavement width. A sufficient number of mats will be used so that the tractor crossing will extend a minimum of four feet (4') beyond roadway shoulders.

**TREATED TIMBER
TYPE B**


GENERAL NOTES

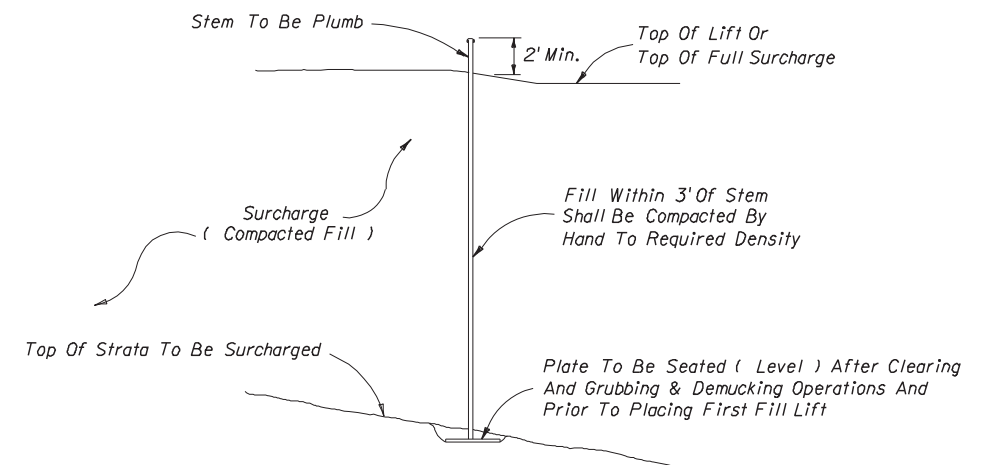
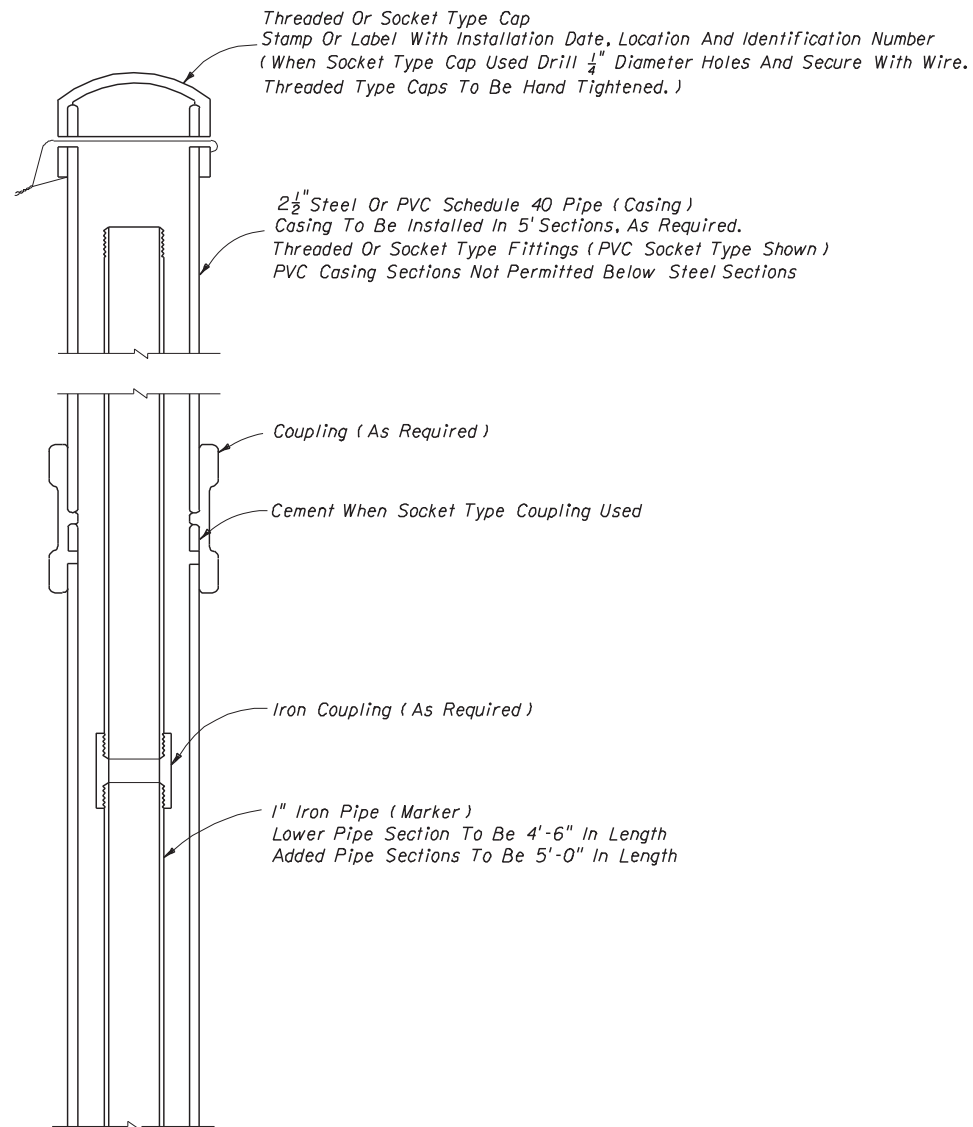
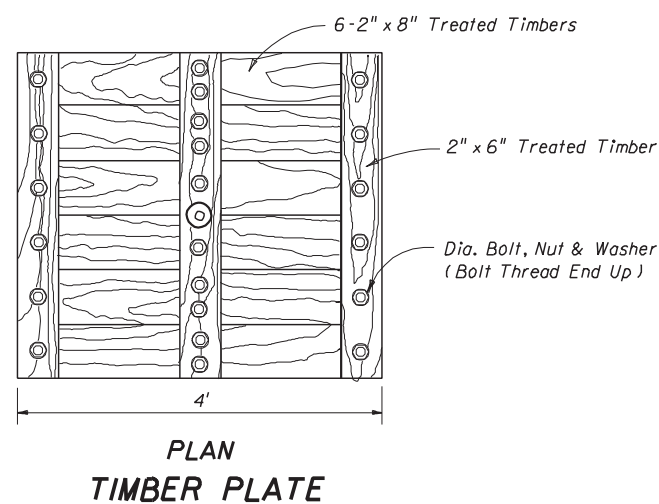
1. Tractor crossing shall be paid for under the contract unit price for Tractor Crossing, EA.

TRACTOR CROSSINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TRACTOR CROSSINGS

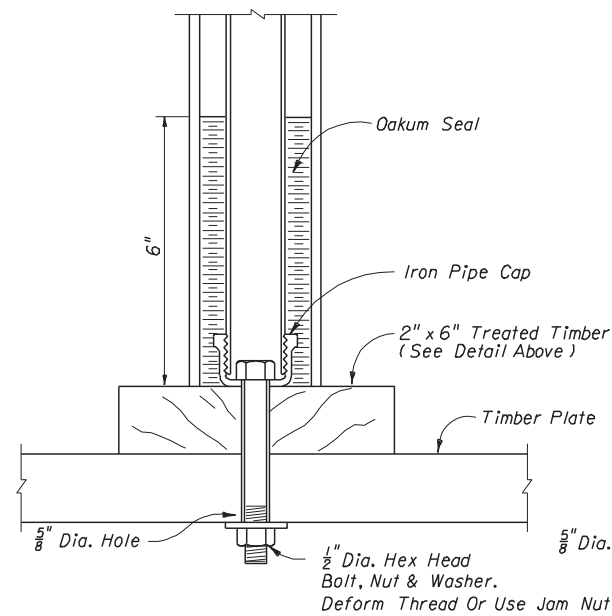
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Designed By		 State Roadway Design Engineer				
Drawn By	LH 01/51				Revision	Sheet No.
Checked By	CD 01/51				00	1 of 1
		Index No.	535			



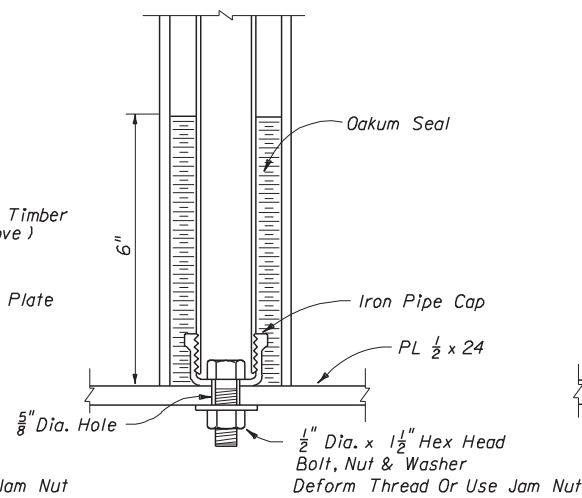
INSTALLATION

NOTES

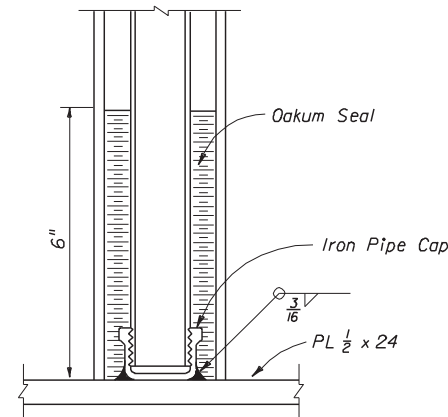
1. Elevation of the top of each length of marker pipe shall be determined as soon as it is installed and also immediately before the next length of marker pipe is added.
2. Settlement plate locations shall be flagged and protected from construction vehicles and equipment. If settlement plates are disturbed, they shall be replaced in kind.
3. Oakum used to construct seal should not have a mesh covering (plastic or other synthetic material).
4. The settlement plates shall be paid for under the contract unit price for Settlement Plate Assembly, AS.



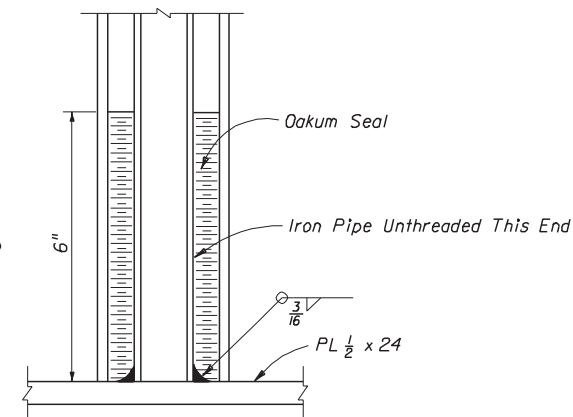
TIMBER PLATE



**STEEL PLATE
STEM AND PLATE OPTIONS**

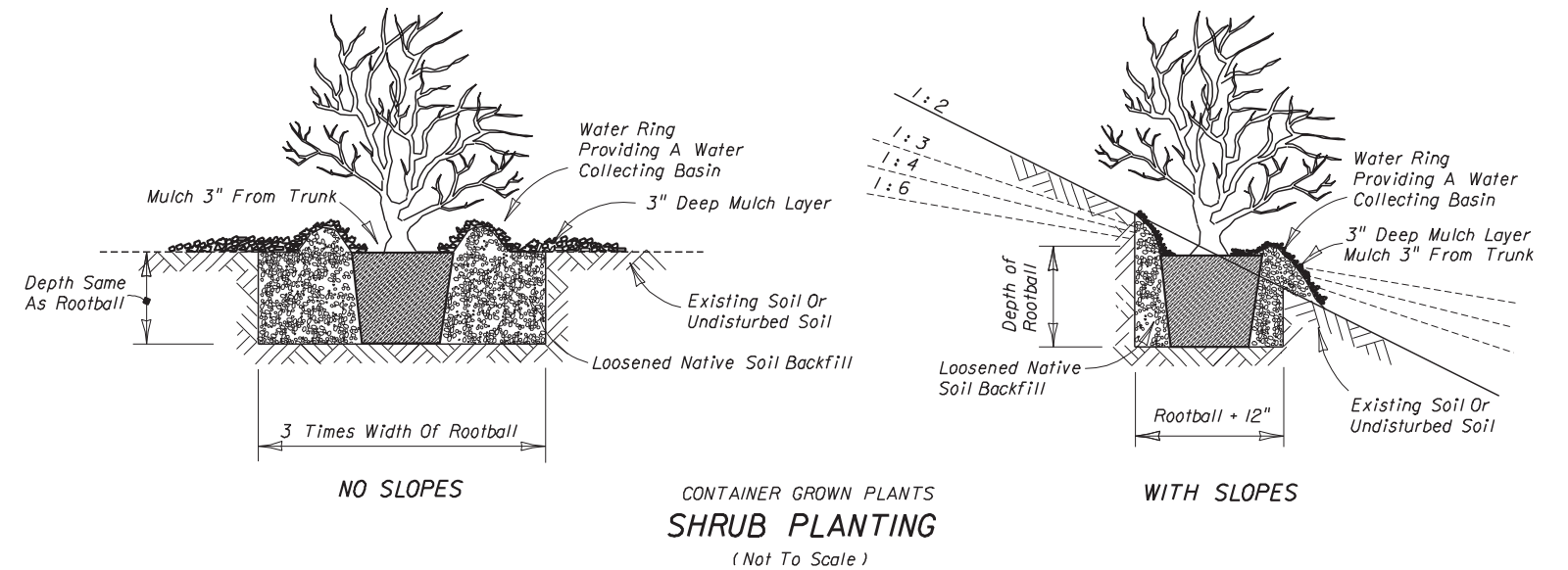
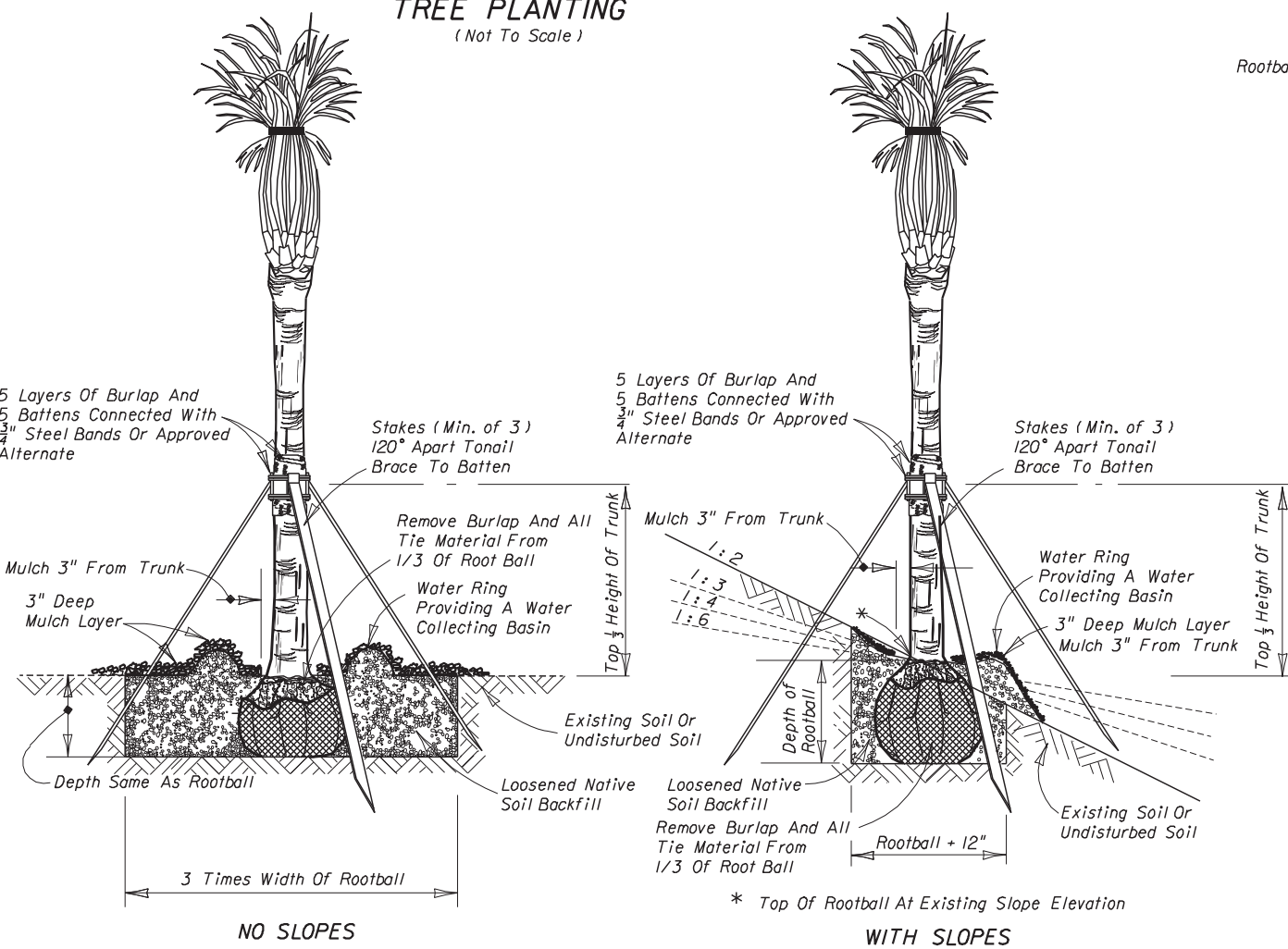
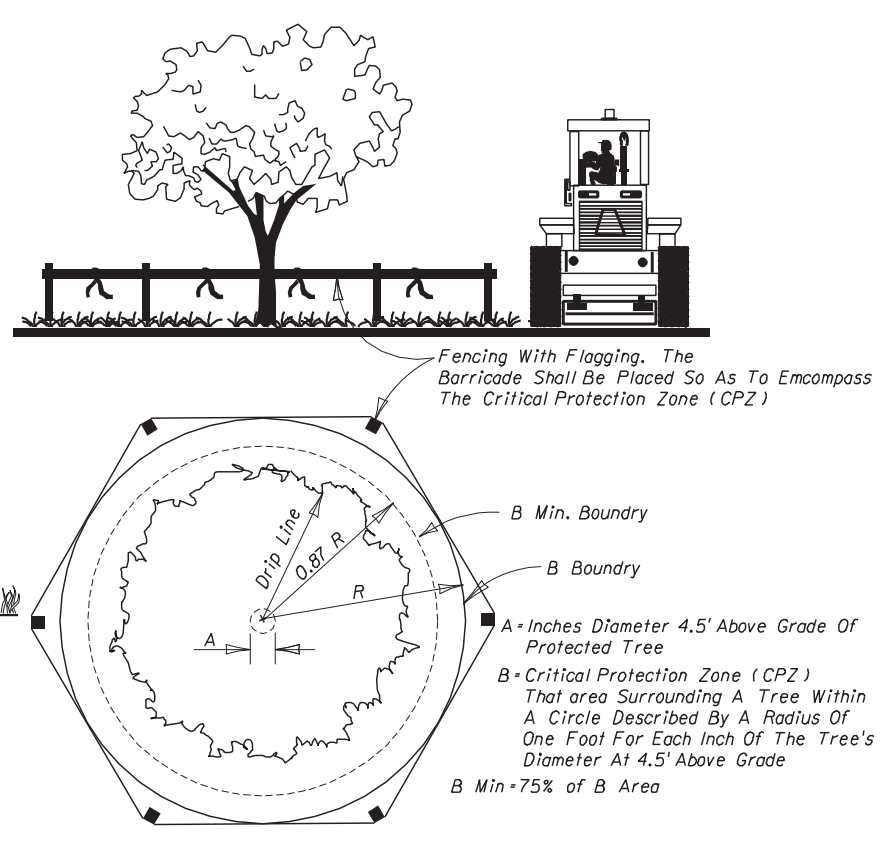
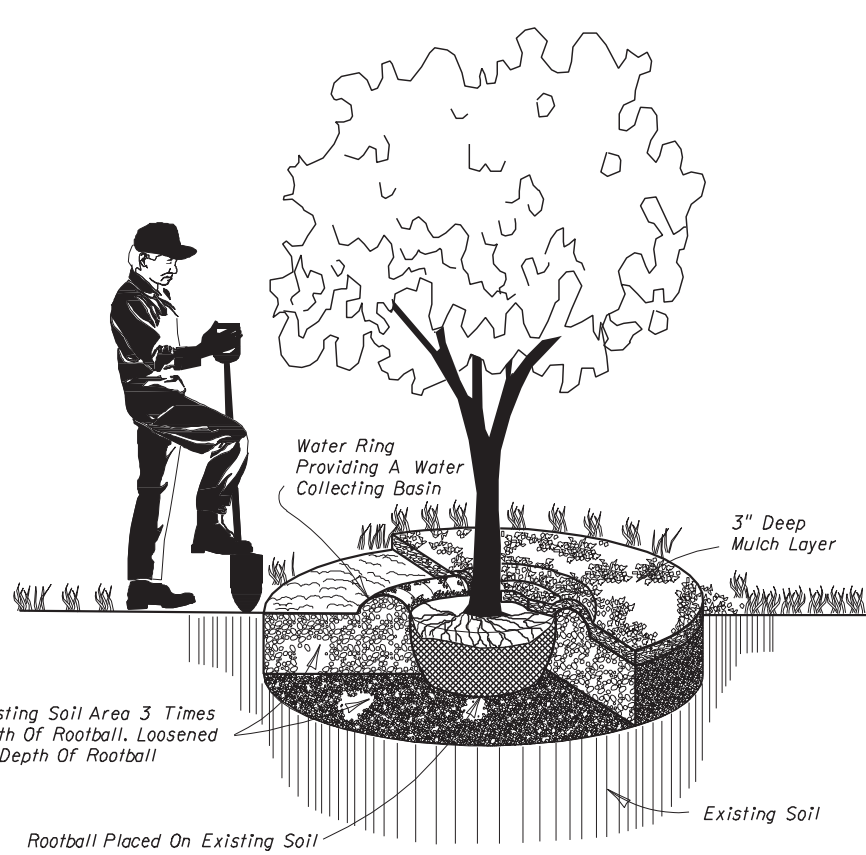
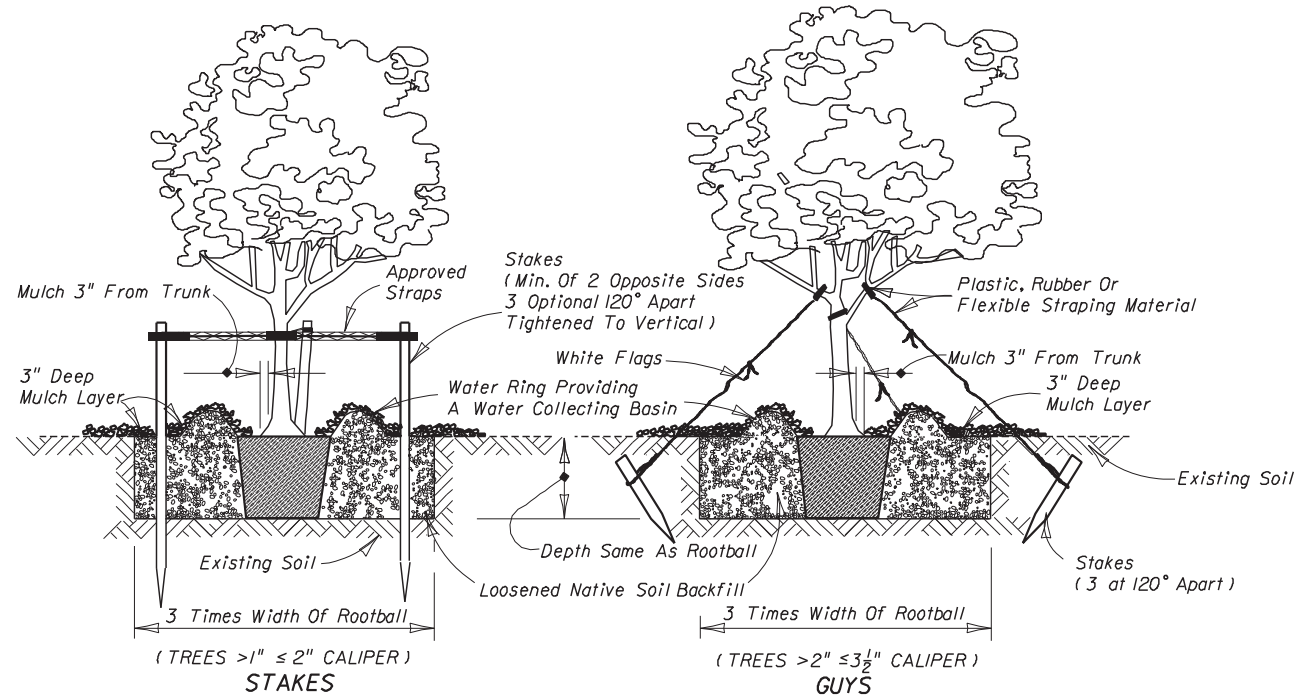


STEEL PLATE



STEEL PLATE

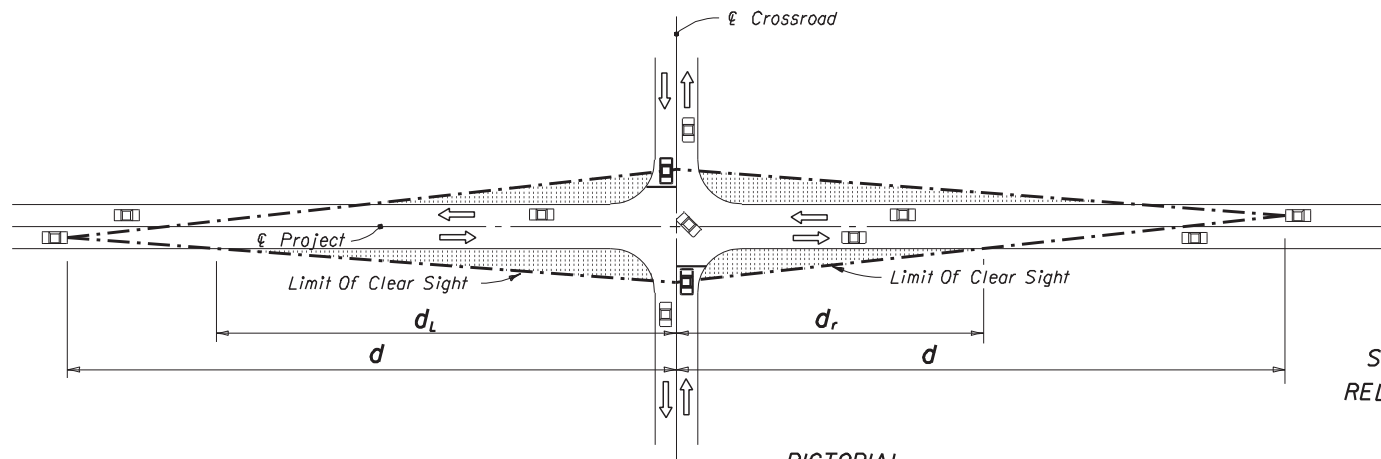
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SETTLEMENT PLATE				
Names	Dates	Approved By		
Designed By	JVG	10/79	 State Roadway Design Engineer	
Drawn By	HSD	10/79		
Checked By	JEW	10/79		
Revision	00	Sheet No.	1 of 1	Index No.
				540



NOTES:

1. All trees and shrubs are to be positioned vertically regardless of the slope of the ground in which they are planted. Water rings are to be constructed which will most effectively serve the purpose of retaining water at the base of the plant.
2. Tree, palm and shrub planting shall be carried out in accordance with Section 580 of the Standard Specifications.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
LANDSCAPE INSTALLATION				
Designed By	Names	Dates	Approved By	
Drawn By	SHJ/JHC	01/00	State Landscape Architect	
Checked By	RSD	01/00	Revision	Sheet No.
	GLR/JHC	01/00	00	1 of 1
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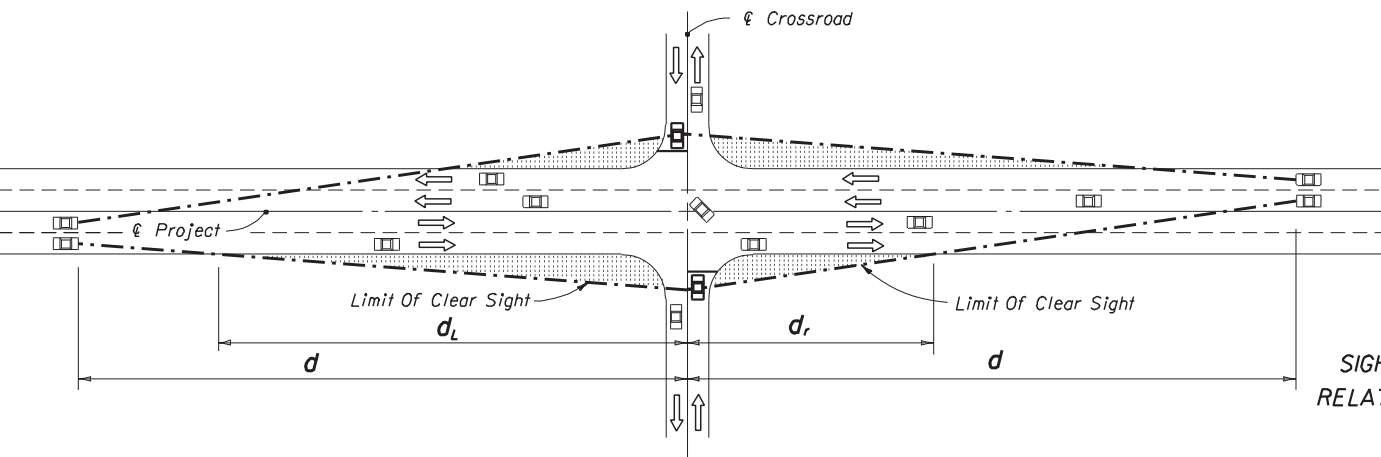


PICTORIAL
2 LANE UNDIVIDED

Design Speed	d	d _L	d _R
30	380	290	200
35	470	370	250
40	580	450	310
45	710	550	380
50	840	650	450
55	990	760	520
60	1150	890	610
65	1350	1040	710

See General Note 2

SIGHT DISTANCE (d) AND
RELATED DISTANCES (d_L, d_R)
(FEET)

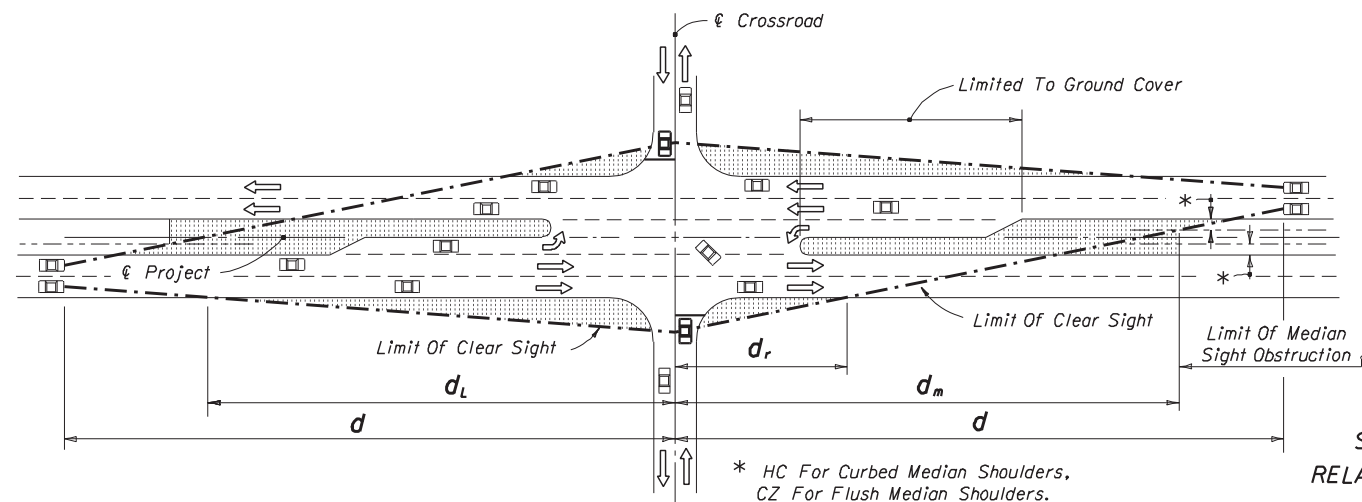


PICTORIAL
MULTILANE UNDIVIDED

Design Speed	d	d _L	d _R
30	380	290	160
35	470	370	190
40	580	450	240
45	710	550	290
50	840	650	340
55	990	760	400
60	1150	890	460
65	1350	1040	540

See General Note 2

SIGHT DISTANCE (d) AND
RELATED DISTANCES (d_L, d_R)
(FEET)



PICTORIAL
MULTILANE DIVIDED

Design Speed	d	d _L	d _R	d _M
30	380	290	120	300
35	470	370	150	370
40	580	450	180	460
45	710	550	220	560
50	840	650	260	670
55	990	760	300	780
60	1150	890	360	910
65	1350	1040	420	1070

See General Note 2

SIGHT DISTANCE (d) AND
RELATED DISTANCES (d_L, d_R, d_M)
(FEET)

* HC For Curbed Median Shoulders,
CZ For Flush Median Shoulders.

LEGEND

Areas Free Of Sight Obstructions

NOTE: See Sheet 2 for intersecting roadway origin
of clear sight and quadrant corner clips.

GENERAL NOTES

- Details apply to both rural and urban intersections under stop sign control or flashing beacon control. For full signal controlled intersections see Design Note No. 4 below.
- Sight distance (d) applies to normal and skewed intersections (intersecting angles between 60° and 120°), and where vertical and/or horizontal curves are present. Sight distance (d) is measured along the major roadway from the center of the intersecting roadway. Distances d_L and d_R are measured from the centerline of the intersecting roadway to a point on the edge of the near side outer traffic lane on the major roadway. Distance d_M is measured from the centerline of the intersecting roadway to a point on the median clear zone limit or horizontal clearance limit for the far side roadway of the major roadway.
 - The limits of clear sight define a corridor throughout which a clear sight window must be preserved. See WINDOW DETAIL, Sheet 2.
 - Clear sight must be provided between vehicles at intersection stop locations, and vehicles on the major roadway within dimension 'd'.
 - Since observations are made in both directions along the line of sight, the reference datum between roadways is 3'-6" above respective pavements.
- Barrier systems within intersection sight corridors, where penetration into the sight window might occur, shall be located to provide the least adverse affect practical.
- The corridor defined by the limits of clear sight is a restricted planting area. Drivers of vehicles on the intersecting roadway and vehicles on the major roadway must be able to see each other clearly throughout the limits of 'd'. If, in the Engineers judgement landscaping interferes with the line of sight corridor prescribed by these standards the Engineer may rearrange, relocate or eliminate plantings. Plants within the restricted areas are limited to selections as follows:
 - Ground Cover & Trunked Plants (Separate or Combined):
 - Ground Covers- Plant selection of low growing vegetation which at maturity does not attain a height greater than 18" below the sight line datum.
 - For ground cover in combination with trees and palms; the following heights below the sight line datum will apply: 24" for trees and palms ≤ 11" dia.; and, 18" for sabal palms > 11" ≤ 18" dia. (dia. within Sight Window).
 - Trunked Plants- Plant selection of a mature trunk diameter 4" or less measured at 6" above the ground. Canopy or high borne foliage shall never be lower than 5' above the sight line datum. These selections shall be spaced no closer than 20'.
 - Trees:
 - Trees can be used with lawn; pavers; pavement; gravel; bark or wood chip beds; ground covers or other Department approved material.
 - The clear sight window must be in conformance with the 'WINDOW DETAIL' modified to attain the height requirements listed in 'Ground Covers' above. Tree size and spacing shall conform to the following tabular values:

Description	Speed (mph)													
	30		35		40		45		50		55		60	
	(Inches)													
Diameter (Within Limits Of Sight Window)	>4 ≤ 11	>11 ≤ 18	>4 ≤ 11	>11 ≤ 18	>4 ≤ 11	>11 ≤ 18	>4 ≤ 11	>11 ≤ 18	>4 ≤ 11	>11 ≤ 18	>4 ≤ 11	>11 ≤ 18	>4 ≤ 11	>11 ≤ 18
	(Feet)													
Minimum Spacing (c. to c. Of Trunk)	22	91	27	108	33	126	40	146	45	165	52	173	60	193

Sizes and spacings are based on the following conditions:
 (a) A single line of trees in the median parallel to but not necessarily colinear with the centerline.
 (b) A straight approaching mainline, within skew limits as described in No. 2 above.
 (c) 1. Trees and palms ≤ 11" in diameter casting a vertical 6' wide shadow band on a vehicle entering at stop bar location when viewed by mainline driver beginning at distance 'd'; see SHADOW DIAGRAM, Sheet 2.
 2. Sabal palms with diameters > 11" to ≤ 18" spaced at intervals providing a 2 second full view of entering vehicle at stop bar location when viewed by mainline driver beginning at distance 'd'; see PERCEPTION DIAGRAM, Sheet 2.
 For any other conditions the tree sizes, spacings and locations shall be detailed in the plans; see Design Note No. 5.

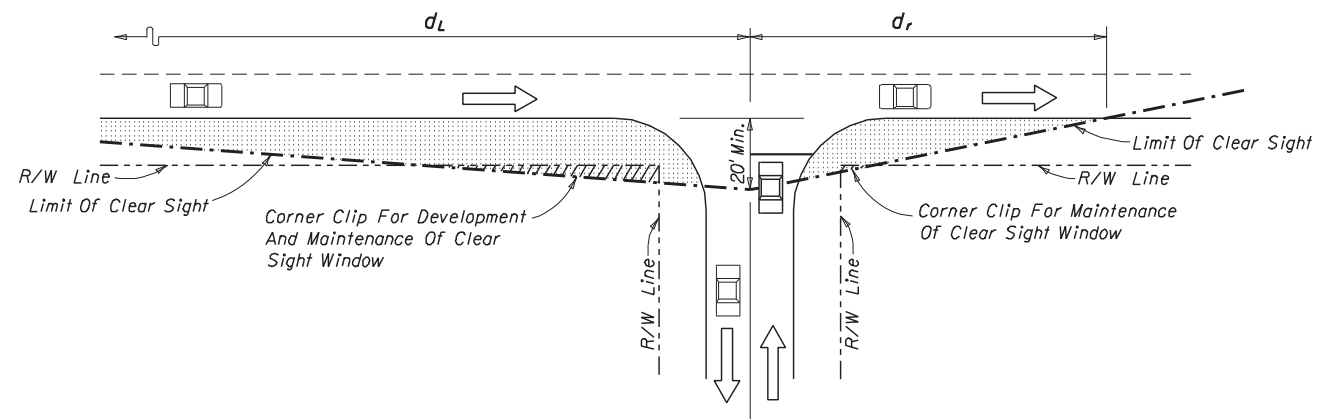
DESIGN NOTES

- The information shown on this index is intended solely for the purpose of clear sight development and maintenance at intersecting highways, roads and streets, and is not intended to be used to establish geometric design, speed control, signing, marking, lighting or signalization, or to establish roadway and roadside safety except as related to clear sight corridors. An analysis of sight distance shall be documented for all intersections.
- Details are based on the AASHTO 'A Policy On Geometric Design Of Highways And Streets', Chapter IX, Cases III and IV, and Department practices for channelized median openings (left turns from major roadways).
- The minimum driver eye setback of 20' from the edge of the traffic lane may be adjusted on any intersection leg only when justified by a documented, site specific field study of vehicle stopping position and driver eye position.
- For SIGNALIZED INTERSECTIONS: Due to a variety of standard operational characteristics associated with signal controlled intersections, the sight distances based on Case III procedures should be available to the driver. Unanticipated vehicle conflicts at signalized intersections, such as violation of the signal, turns on red, malfunction of the signal, or use of the flashing red/yellow mode further substantiate the need for incorporation of Case III sight distances. If the proper sight distances can not be attained, other design features such as 'no right-on-red' may be necessary. Where landscaping is incorporated with construction or superimposed on existing facilities, the planting restrictions listed under the General Notes above are to be considered in the sight distance analysis.
- Where curvature, superelevation, adverse split profiles or other conditions preclude the use of standard tree sizes and spacing, proof of view and shadowing restraints must be documented and the size and location of trees in medians detailed in the plans.

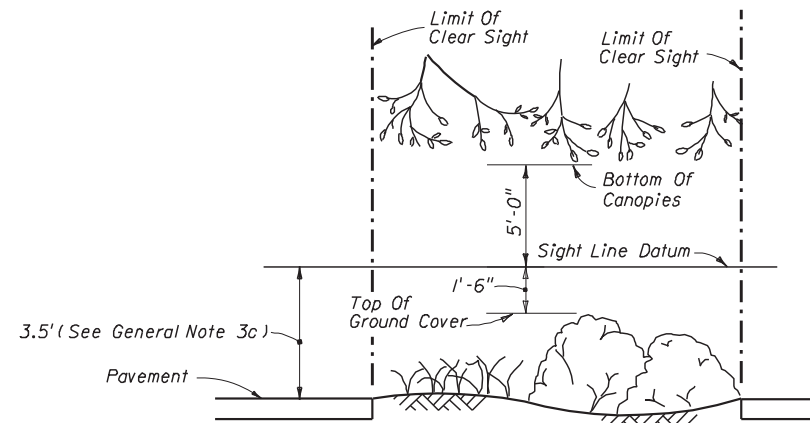
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SIGHT DISTANCE
AT INTERSECTIONS

Names		Dates		Approved By			
Designed By	KAM, JWS	10/89	 State Roadway Design Engineer				
Drawn By	RSD	10/89					
Checked By	JTC/KAM	10/89					
Revision	00	Sheet No.		Index No.			
				1 of 2		546	

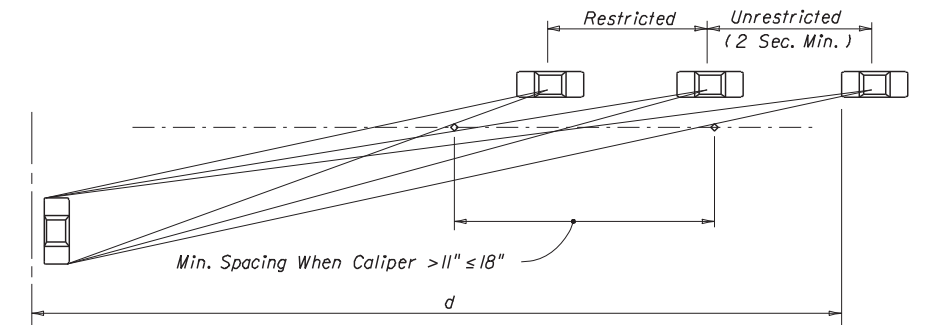


PICTORIAL
ORIGIN OF CLEAR SIGHT LINE
AND PROPERTY CORNER CLIPS

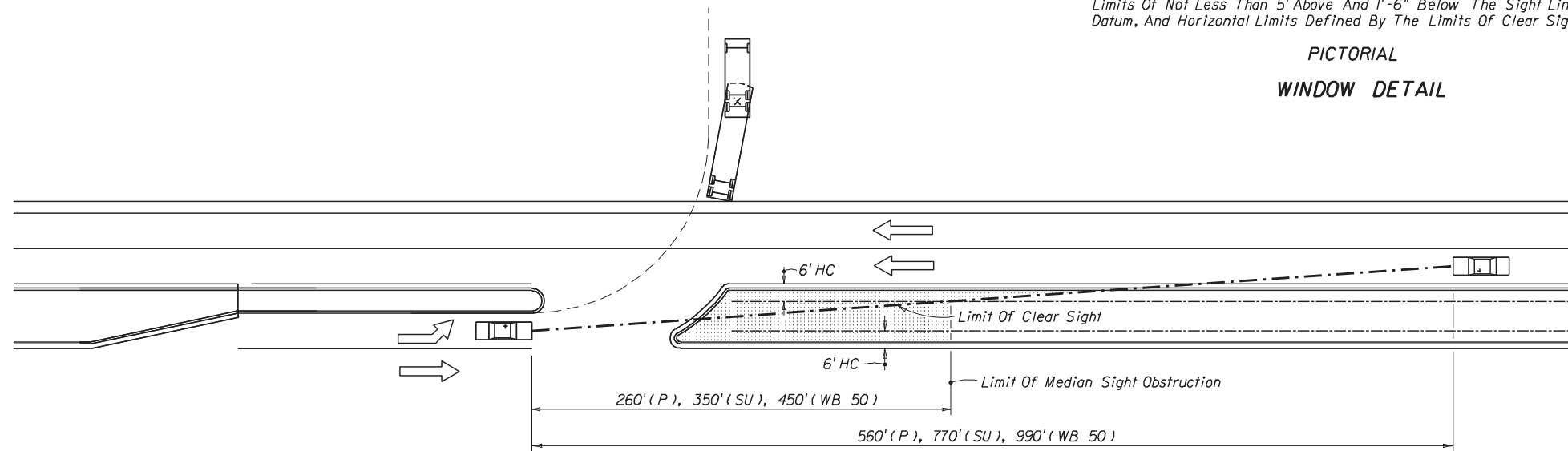


The Intent Of This Standard Is To Provide A Window With Vertical Limits Of Not Less Than 5' Above And 1'-6" Below The Sight Line Datum, And Horizontal Limits Defined By The Limits Of Clear Sight.

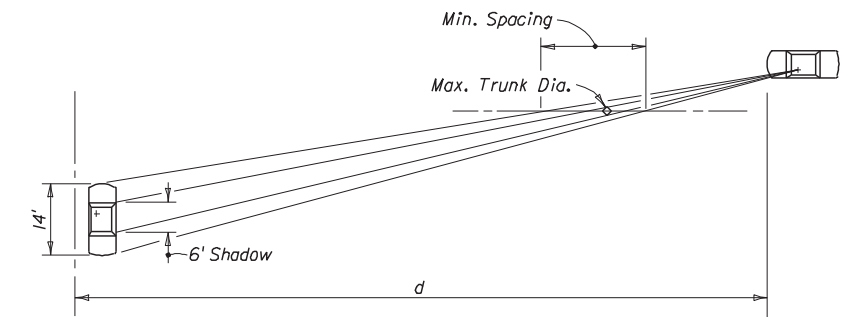
PICTORIAL
WINDOW DETAIL



PERCEPTION DIAGRAM
SETTING SABAL PALM (STATE TREE) SPACING



PICTORIAL
CHANNELIZED DIRECTIONAL MEDIAN OPENINGS



SHADOW DIAGRAM

LEGEND

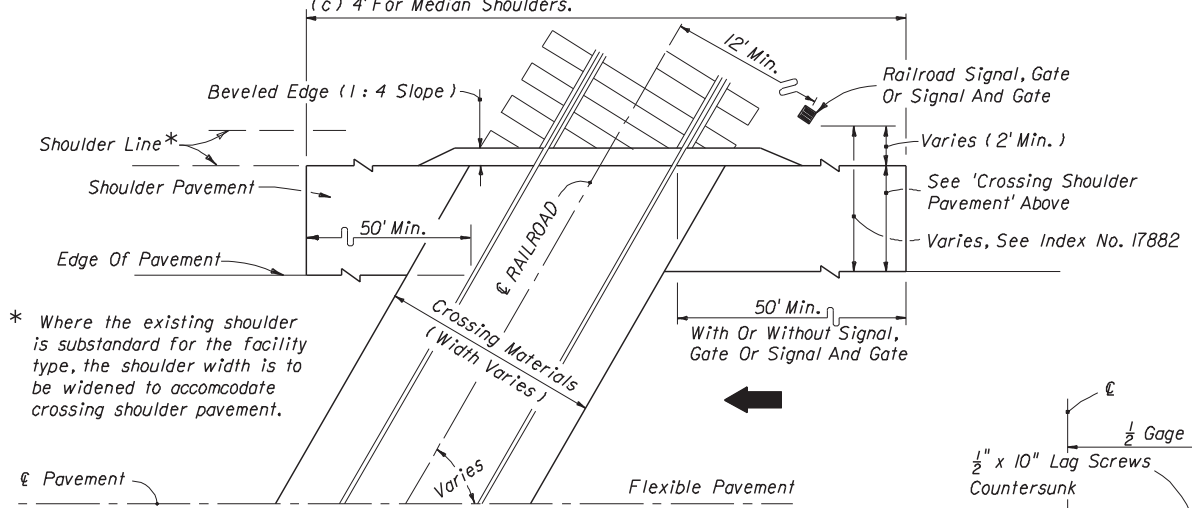
Areas Free Of Sight Obstructions

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

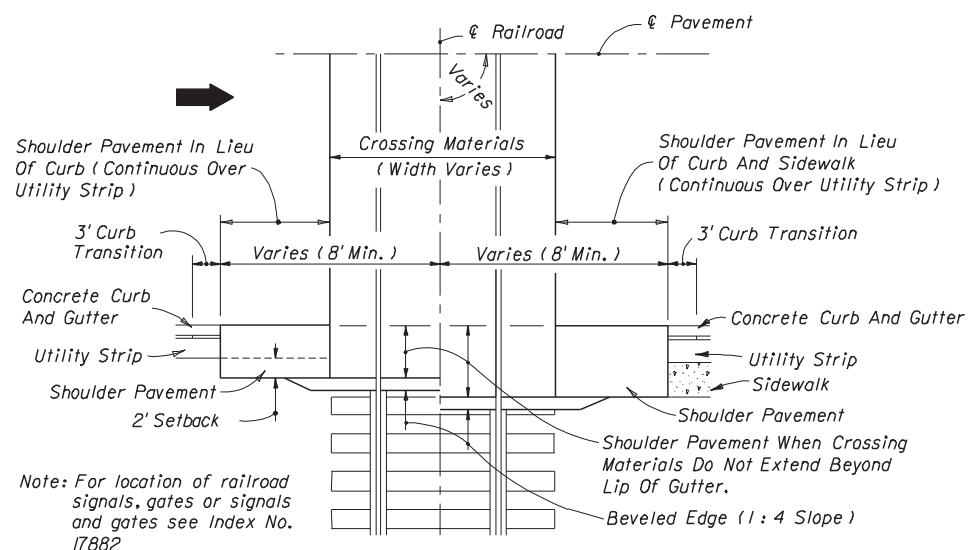
SIGHT DISTANCE
AT INTERSECTIONS

Names	Dates	Approved By		
Designed By	KAM, JWS	10/89	 State Roadway Design Engineer	
Drawn By	HSD	10/89		
Checked By	JWC/KAM	10/89		
Revision	00	Sheet No.	2 of 2	Index No.
				546

Crossing Shoulder Pavement (Except Area Occupied By Crossing Surfacing Material):
 (a) To Shoulder Line For Outside Shoulders Less Than 8' Wide.
 (b) To 8' Maximum Width For Outside Shoulders 8' Or Wider
 (Regardless Of Approach Shoulder Pavement Width).
 (c) 4' For Median Shoulders.

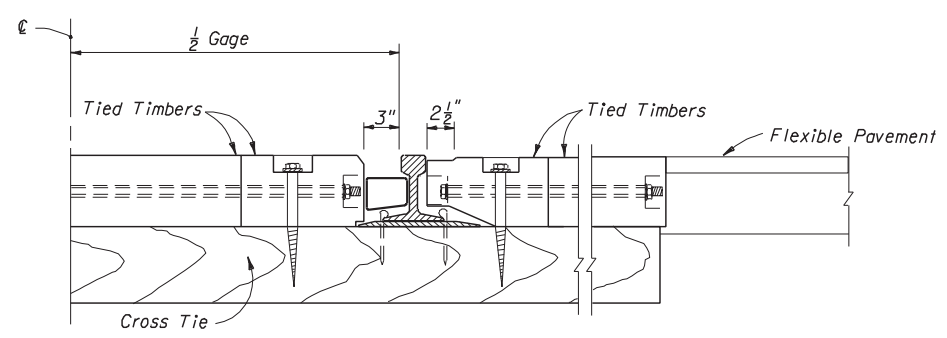


ROADWAYS WITH FLUSH SHOULDERS

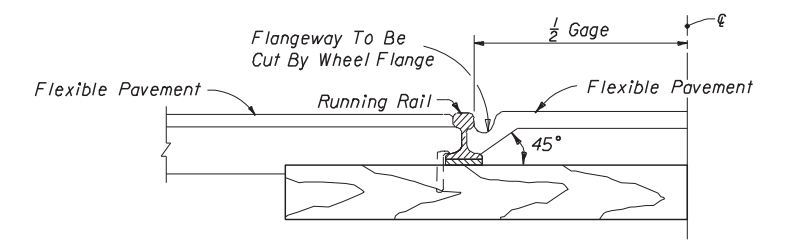


CURBED ROADWAYS

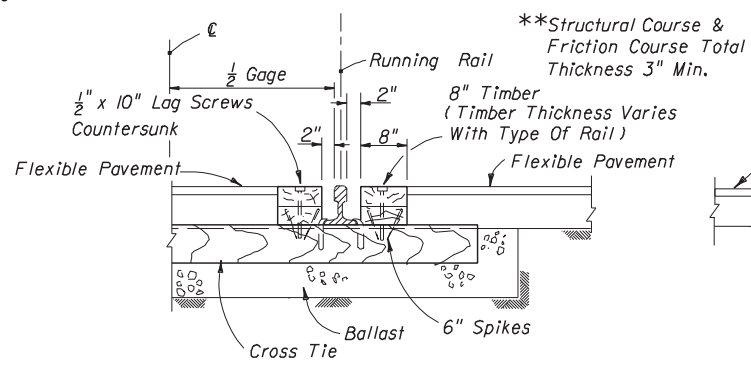
Note: For location of railroad signals, gates or signals and gates see Index No. 17882



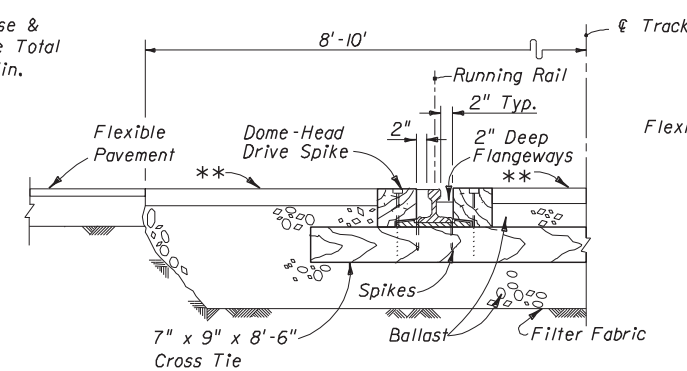
HALF SECTION TYPE D



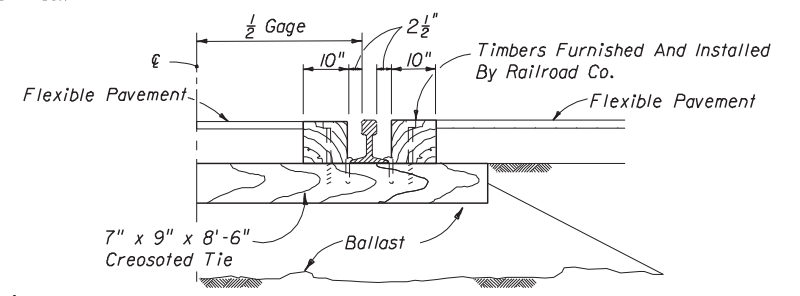
HALF SECTION TYPE E



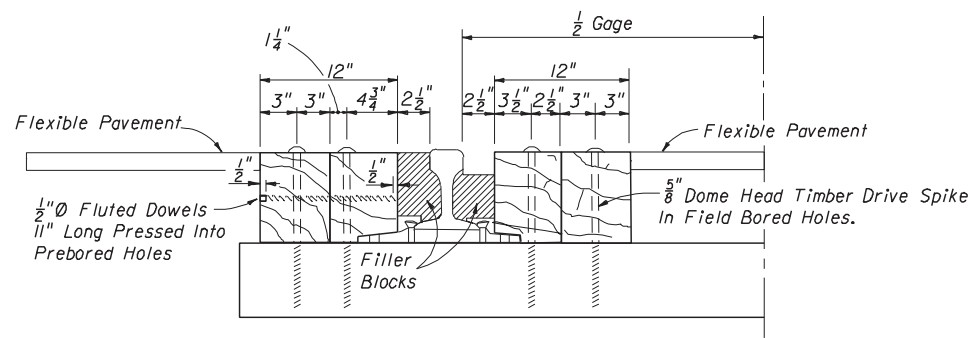
HALF SECTION TYPE G



HALF SECTION TYPE G MODIFIED



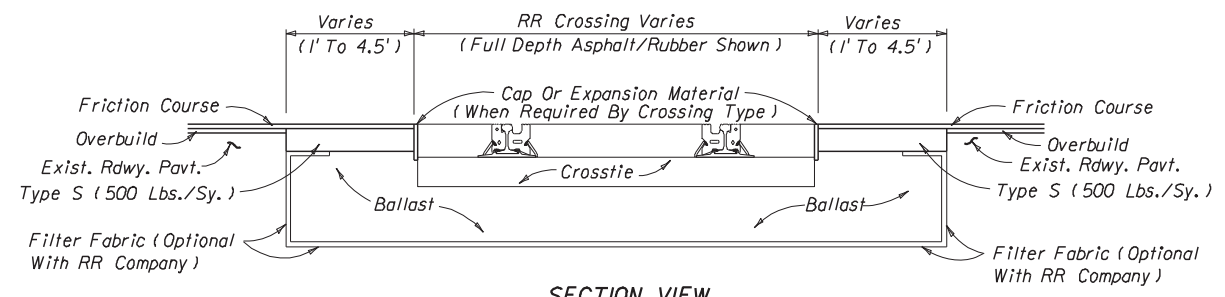
HALF SECTION TYPE H



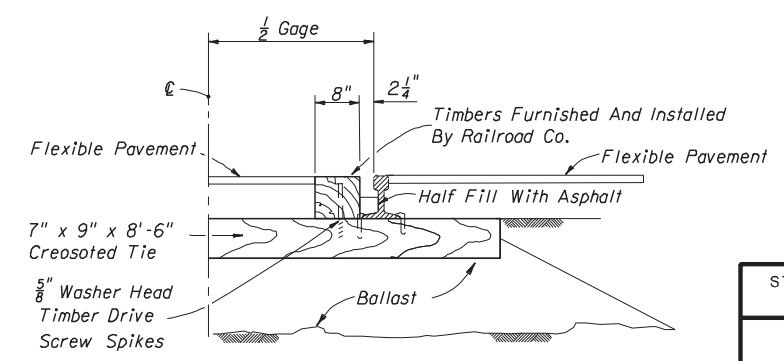
HALF SECTION TYPE L

NOTES

- The Railroad Company will furnish and install all track bed (ballast), crossties, rails, crossing surface panels and accessory components. All pavement material, including that through the crossing, will be furnished and installed by the Department or its Contractor, unless negotiated otherwise.
- Gage is standard A.R.E.A. track gage of 4'-8 1/2" (56 1/2").



TYPICAL FLEXIBLE PAVEMENT REPLACEMENT AT RR CROSSINGS



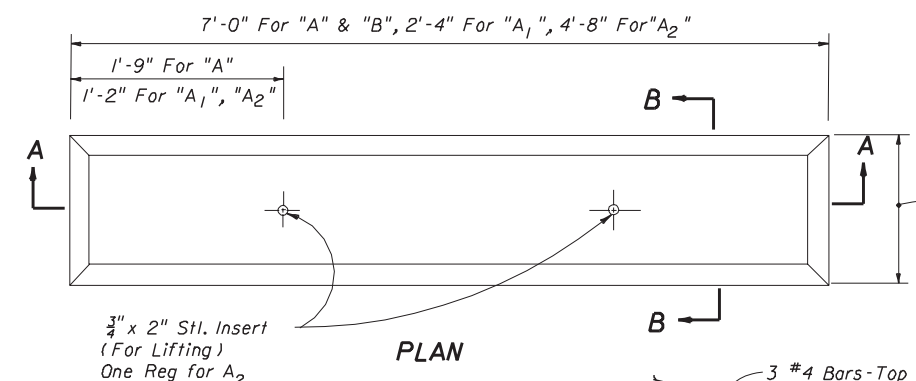
HALF SECTION TYPE S

TYPES D, E, G, G-MOD., H, L AND S

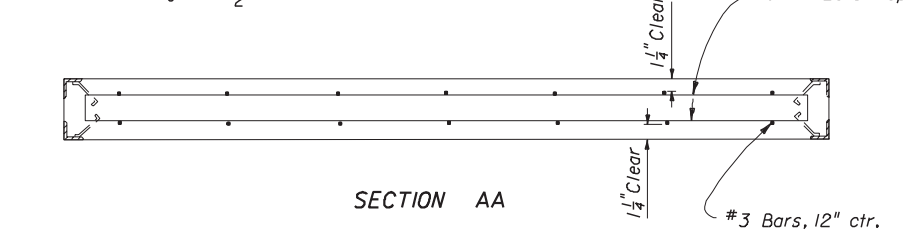
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RAILROAD CROSSINGS

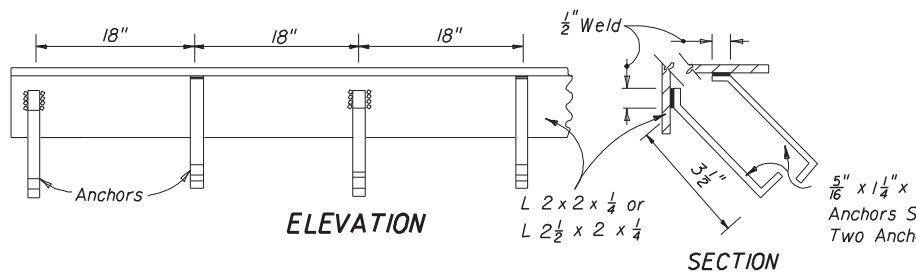
Names	Dates	Approved By				
Designed By		 State Roadway Design Engineer				
Drawn By	HW 02/69				Revision	Sheet No.
Checked By	JRC 02/69				00	1 of 5
				Index No.		
				560		



PLAN

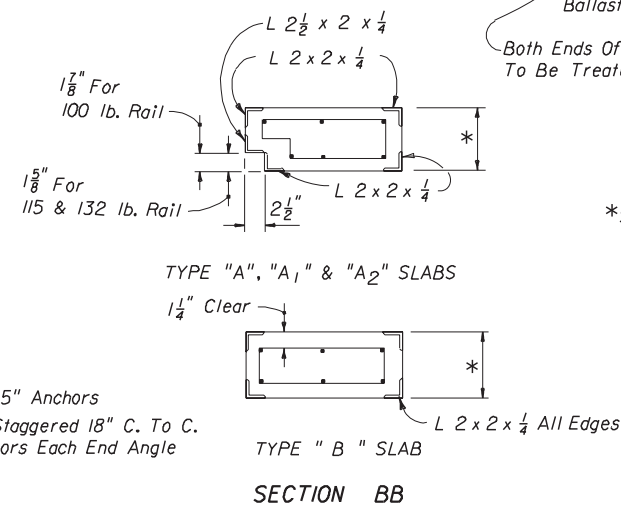


SECTION AA



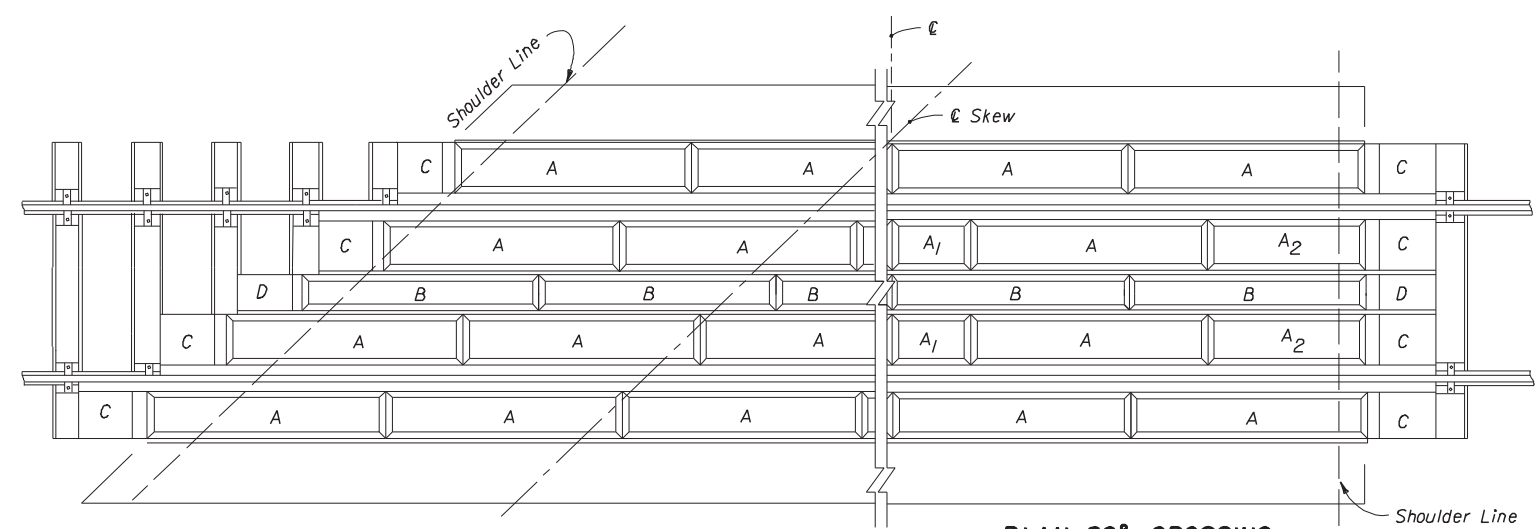
ELEVATION

SECTION



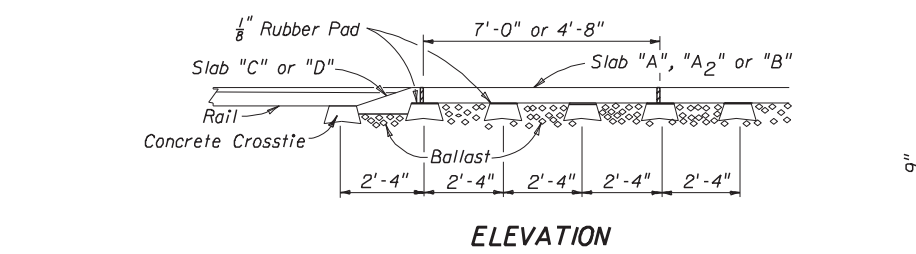
TYPE "A", "A1" & "A2" SLABS

TYPE "B" SLAB

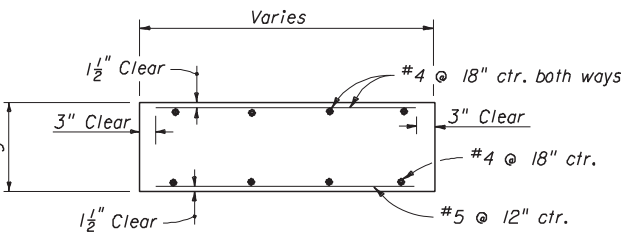


PLAN OF SKEWED CROSSING

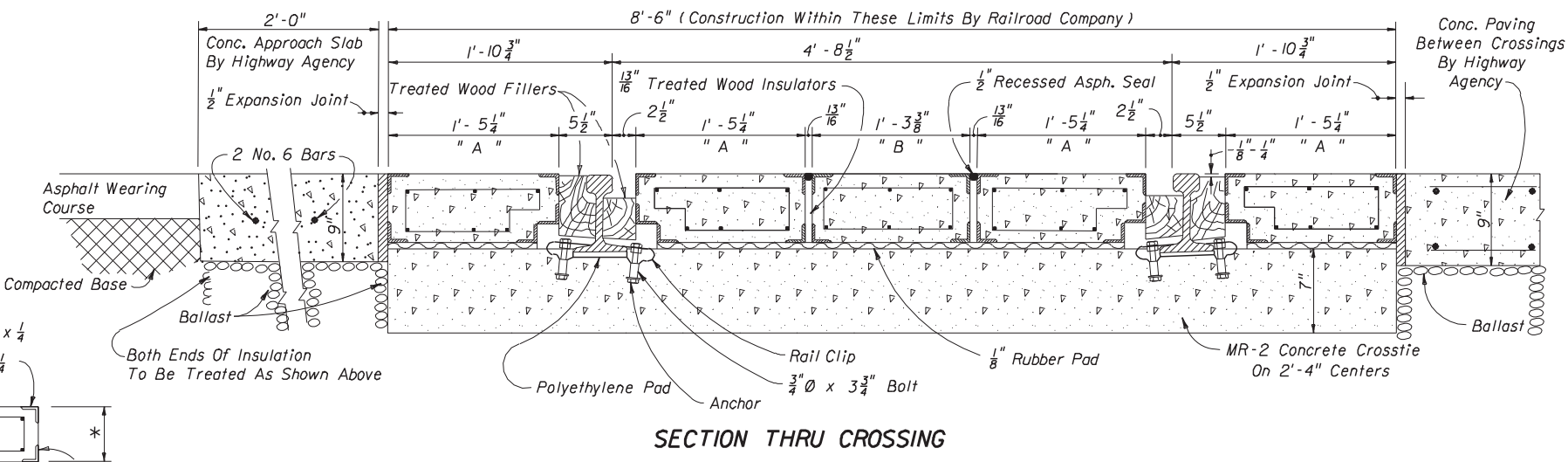
PLAN -90° CROSSING



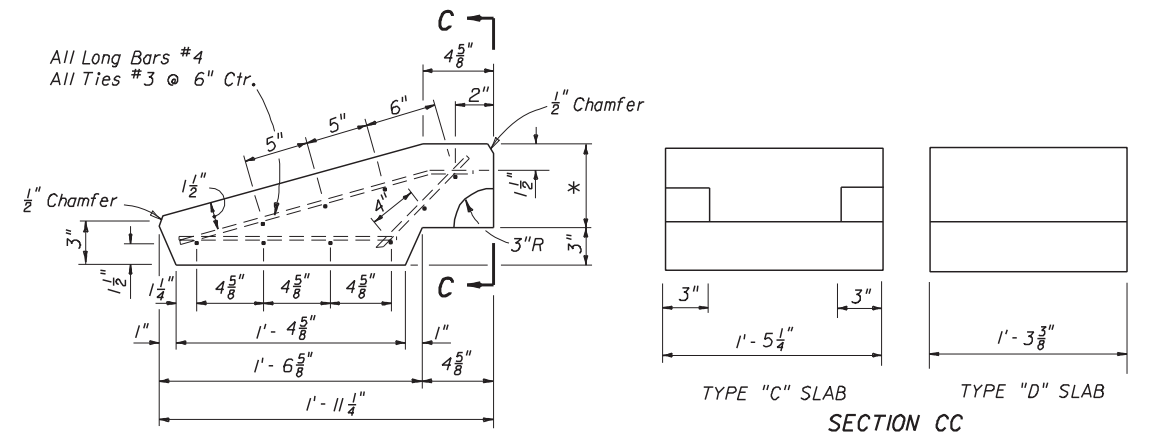
ELEVATION



CONCRETE PAVING BETWEEN MULTIPLE CROSSINGS
(Cost Of Reinforcing To Be Included In The Cost Of Concrete, See Note No. 6)



SECTION THRU CROSSING



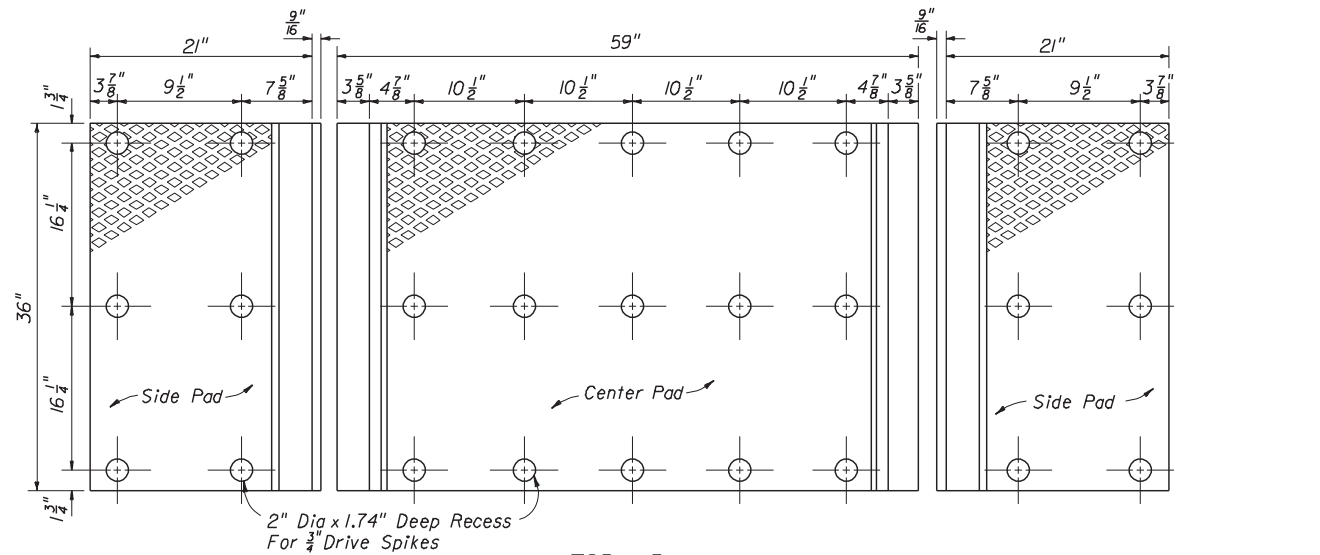
TYPE "C" & "D" SLAB DETAILS

NOTES

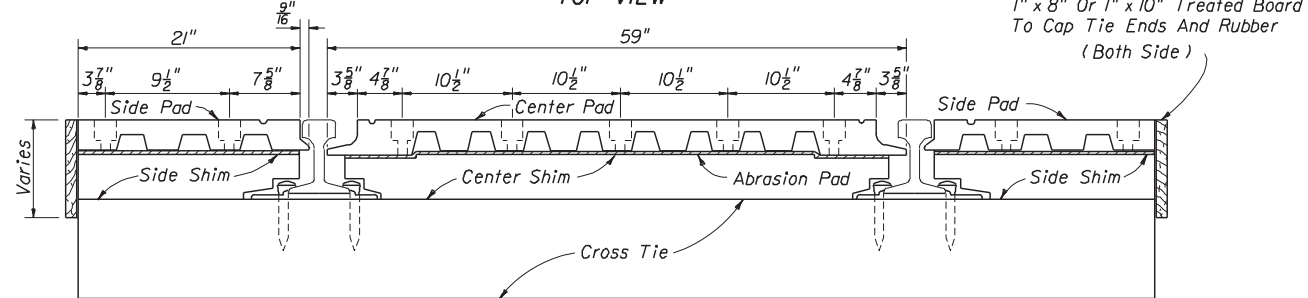
1. The furnishing and installing of concrete crossties together with any necessary reballasting, grade adjustment and track alignment shall be done by the Railroad Company without cost to the Contractor or to the Highway Agency.
2. All concrete slabs, rubber pads for tops of ties and wood filler blocks shall be furnished and installed by the Railroad Company.
3. Concrete crossties shall be spaced on 28" centers.
4. Rubber pads shall be installed on concrete ties in field using contact cement.
5. Filler blocks shall be pressure treated pine or clear heart redwood and shall be shaped prior to treatment.
6. Cost of concrete and reinforcing steel necessary for approach slabs and paving between multiple crossings shall be paid for by the Highway Agency under the contract unit price for Cement Concrete Pavement Reinforced, (9"), SY.

TYPE K

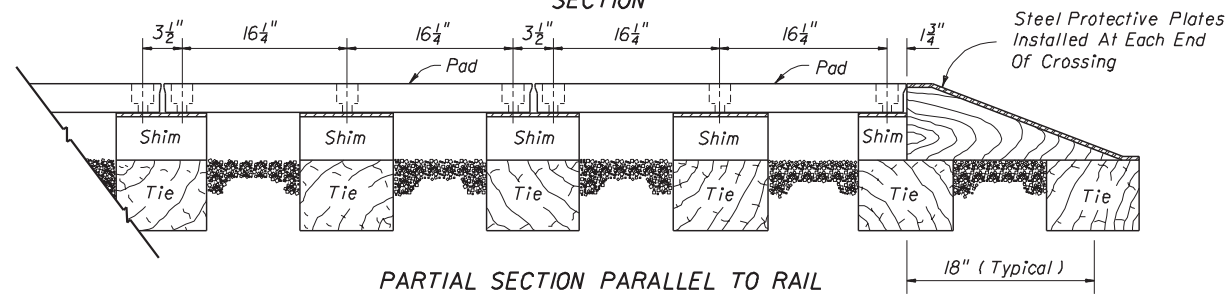
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RAILROAD CROSSINGS				
Designed By	Names	Dates	Approved By	
Drawn By	HW	08/69	 State Roadway Design Engineer	
Checked By	JRC	08/69	Revision	Sheet No.
			00	2 of 5
				560



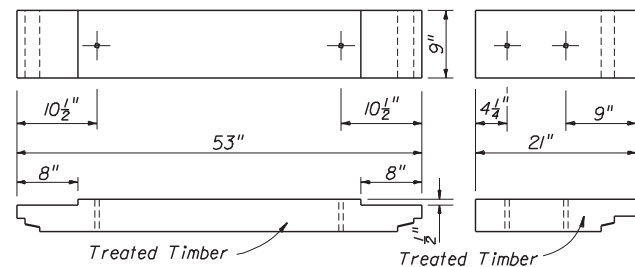
TOP VIEW



SECTION



PARTIAL SECTION PARALLEL TO RAIL



Shim Thickness Varies With Height Of Rail.

CENTER SHIM

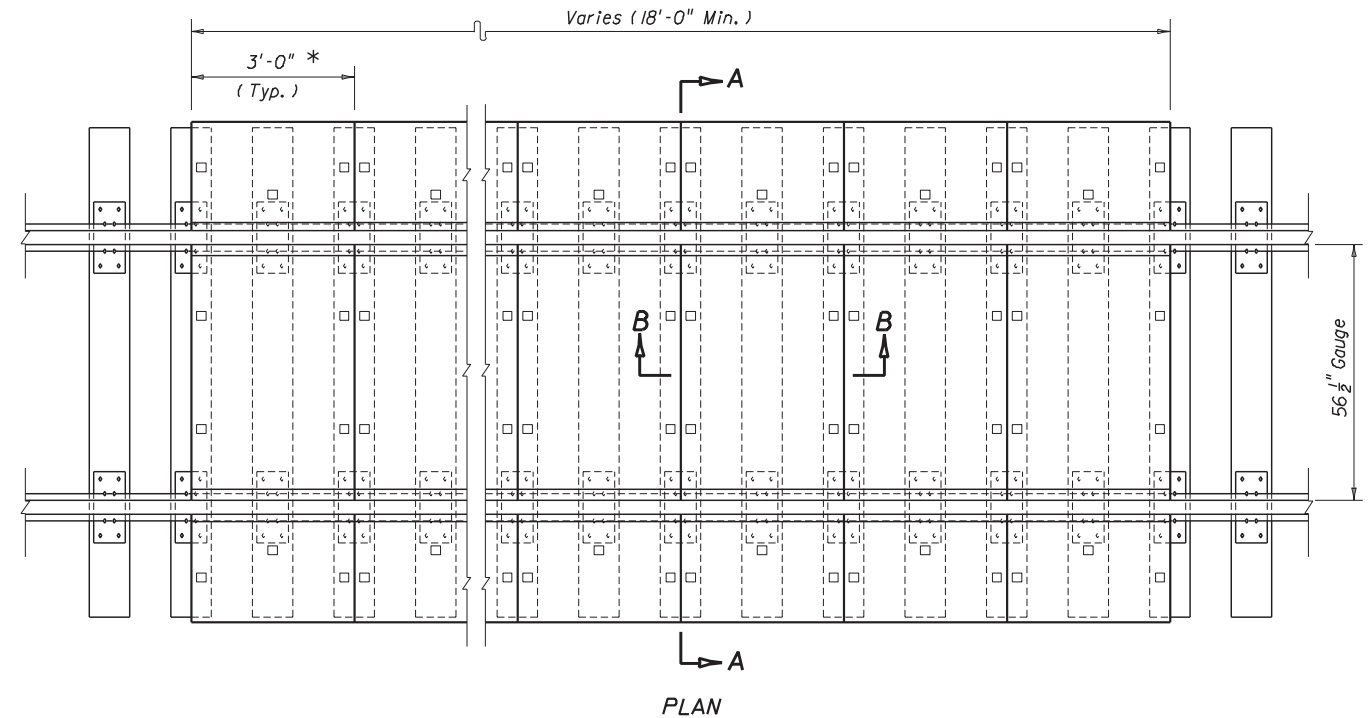
SIDE SHIM

TYPE R

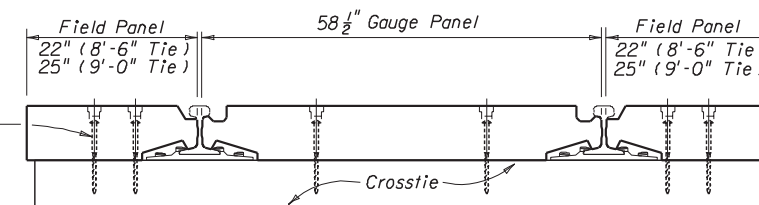
STOP ZONE	
Design Speed (mph)	Zone Length (Distance From Stop)
45 Or Less	250'
50 - 55	350'
60 - 65	500'
70	600'

NOTES

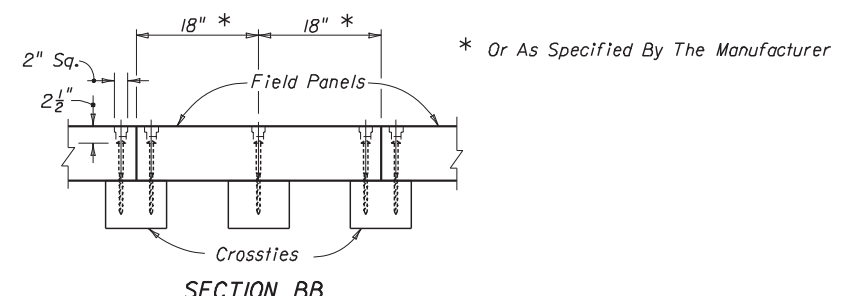
- The crossings shown on this sheet are NOT to be used for multiple track crossings within zones for an existing or scheduled future vehicular stop. Zone lengths are charted above.
- Crossings on this sheet may be used for single track crossings within the zones on the chart unless engineering or safety considerations dictate otherwise.
- Tie spacing is critical, ties shall be spaced in accordance with the manufacturers specifications.
- Details shown are for straight track installations. Materials are also available for curved track installations.
- For additional details, materials required and installation procedures refer to the manufacturers specifications.



PLAN



SECTION AA

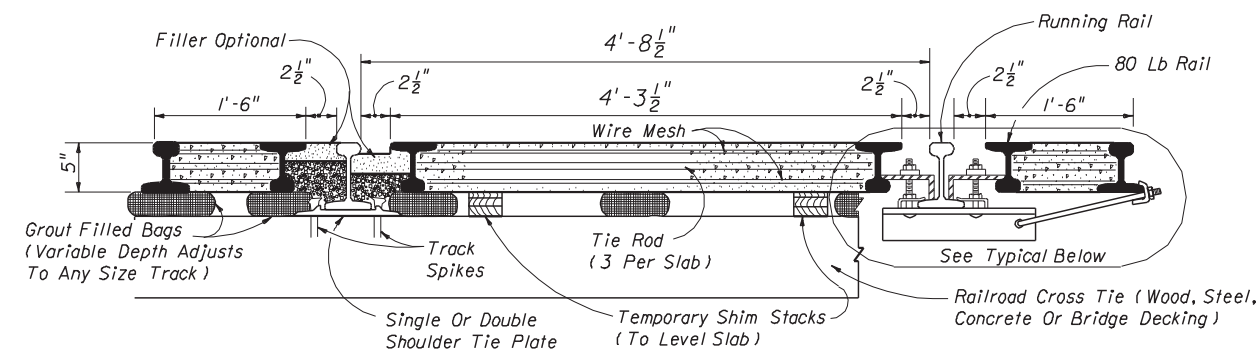
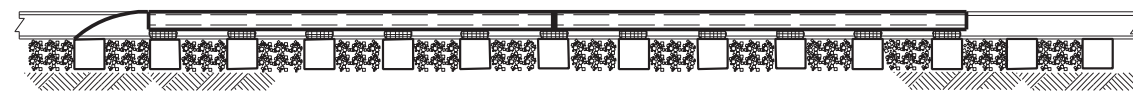
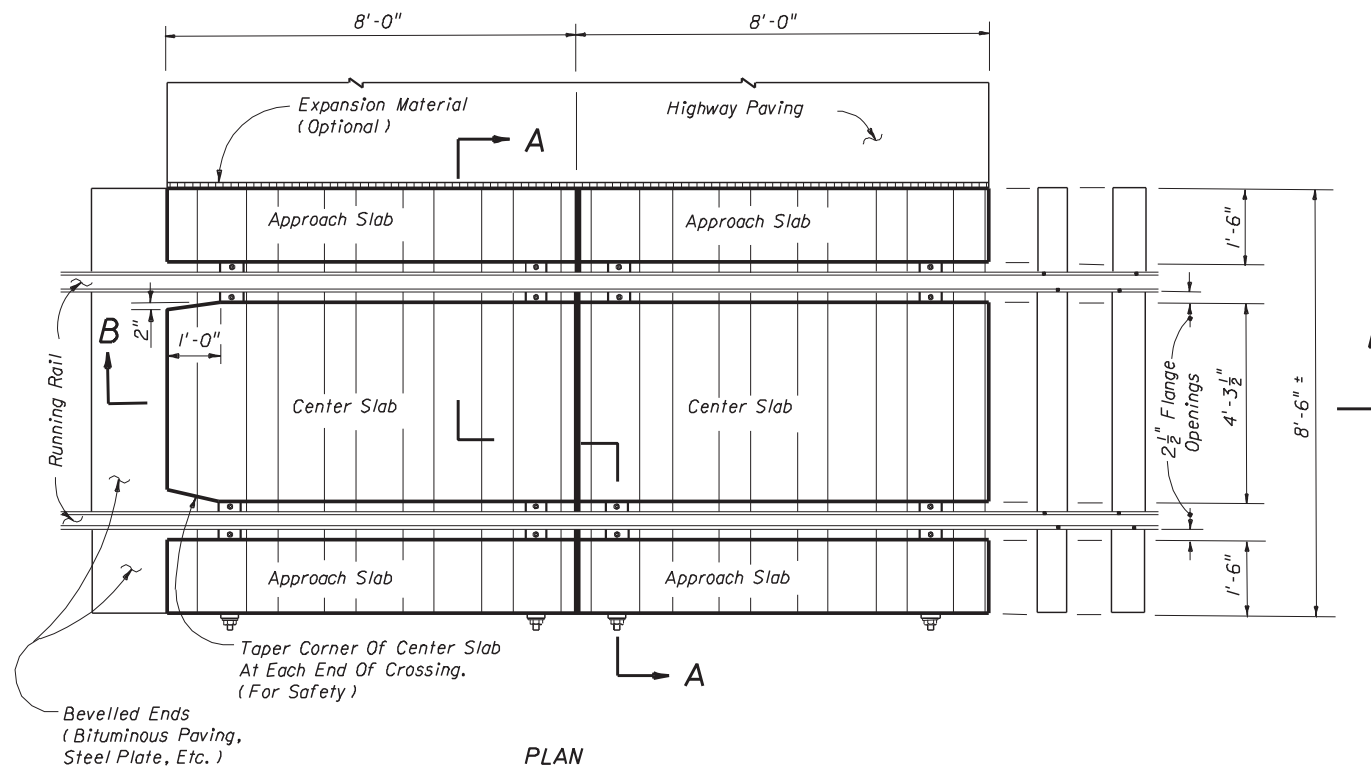


SECTION BB

HEAVY DUTY - FULL DEPTH RUBBER CROSSING
TYPE R FULL DEPTH

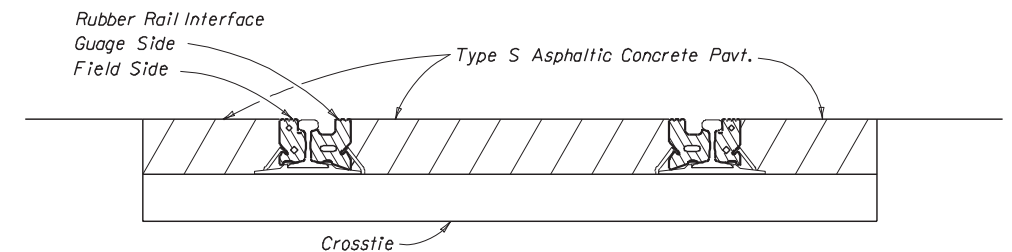
TYPES R RUBBER & R FULL DEPTH RUBBER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RAILROAD CROSSINGS				
Designed By	Names	Dates	Approved By	
Drawn By	JMY	11/75	State Roadway Design Engineer	
Checked By	GSB	11/75	Revision	Sheet No.
			00	3 of 5
				560

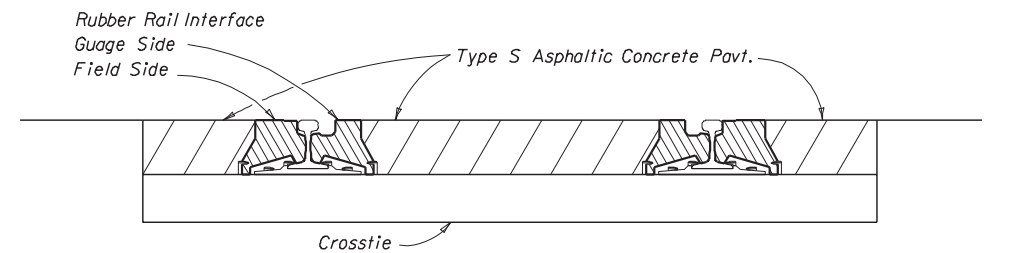


NOTES

1. The reinforced concrete slabs are manufactured in 8'-0" sections, 5" in depth to fit all rail sections 5 1/4" in height or heavier. Slabs are interchangeable and relocateable.
2. Center slabs are one piece construction allowing for 2 1/2" flange opening, 80 lb. rail is used to encase, armor and reinforce slabs and is held to gage with 3 tie rods per slabs.
3. Slabs are installed by a "flotation" process, supported on non-shrinkable, non-metallic grout positioned on the ties. Slabs can be placed on wood ties, concrete ties, steel ties, bridge decks or any other type of track support. No re-spacing of ties is necessary.
4. Slabs are secured to "running rails" with specially designed hardware. Insulation is to be provided for crossing in signal territory.
5. Curved slabs are fabricated to fit curved track to 22 degrees (262.04' radius). Special slabs are available for diamond crossings, turnouts, multiple tracks, bridge decks and rapid transit systems.
6. For additional details, materials required and installation procedures refer to the manufacturers specifications.
7. All asphalt will be installed in accordance with Index No. 513 and Section 300 of the Standard Specifications.



ALTERNATE INTERFACE SECTION VIEW

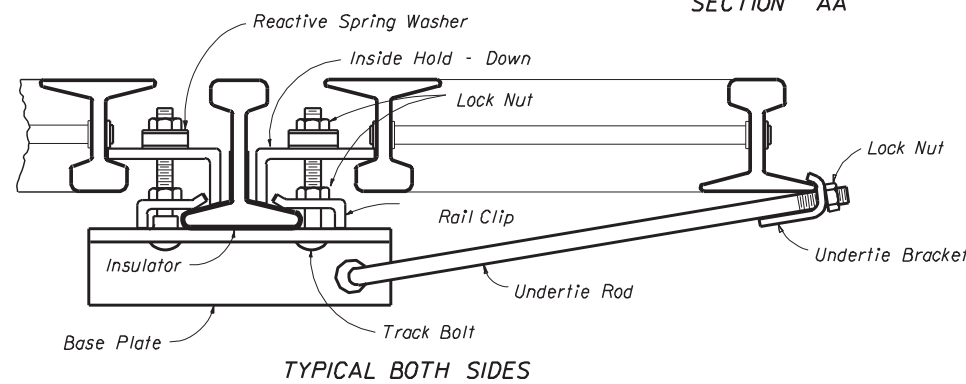


ALTERNATE INTERFACE SECTION VIEW

NOTES

1. Rubber rail interface systems are manufactured to fit various rails from 115# to 136#.
2. The Railroad Company will furnish and install all crossing material except as specified in the agreement.
3. For additional details, methods required and installation procedures refer to the manufacturers specifications.

FULL DEPTH ASPHALT/RUBBER CROSSING
TYPE RS




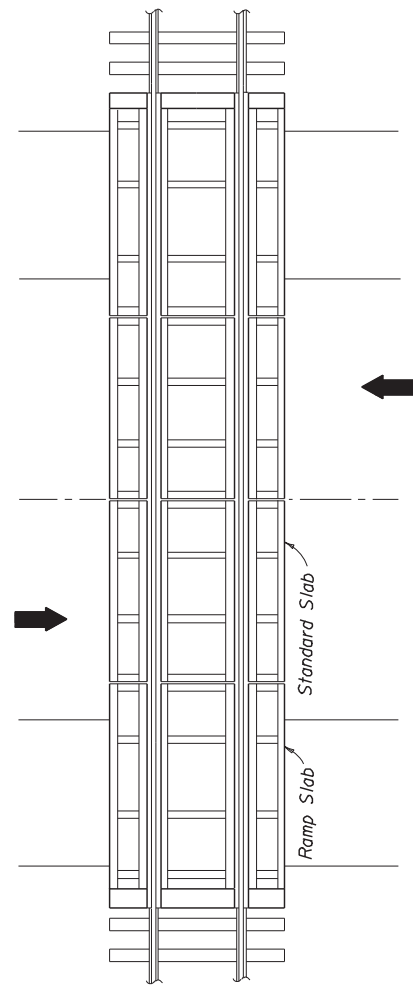
TYPE T

TYPES T & RS

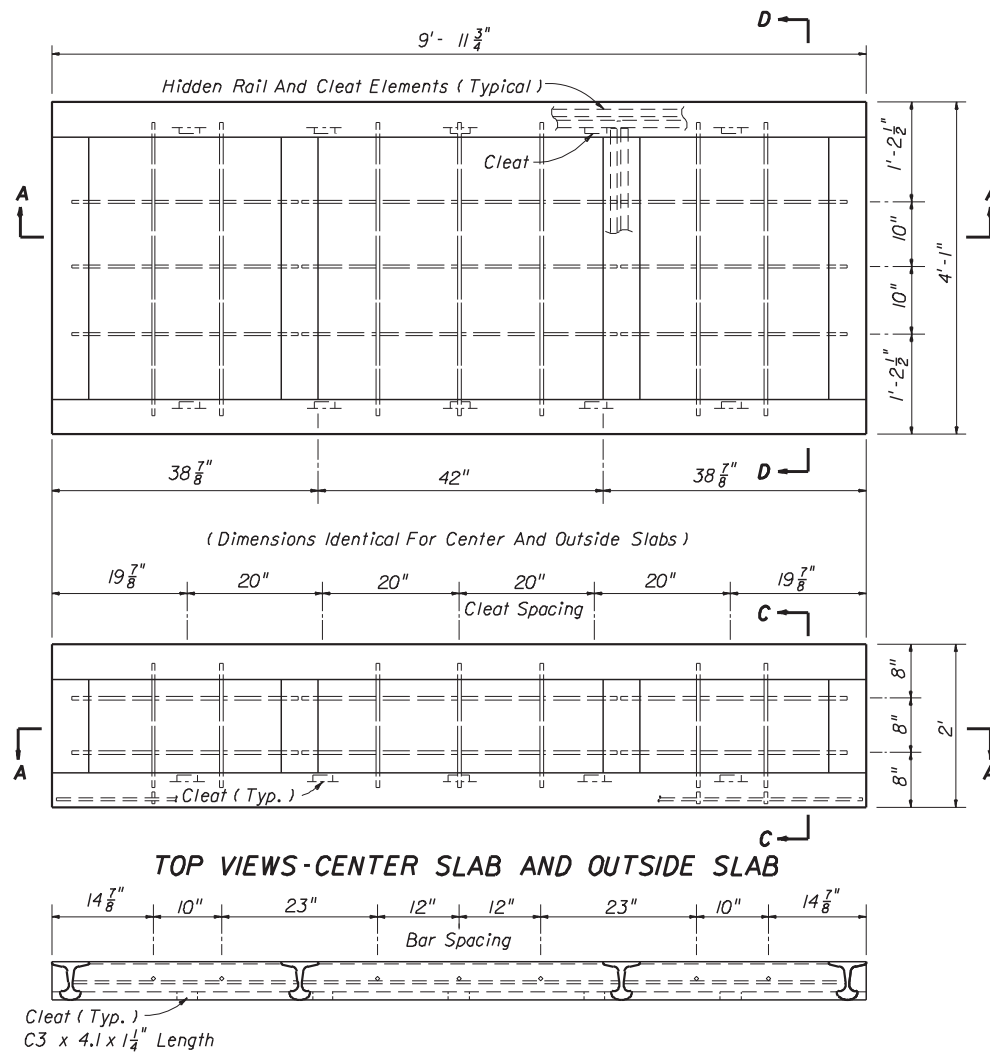
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RAILROAD CROSSINGS

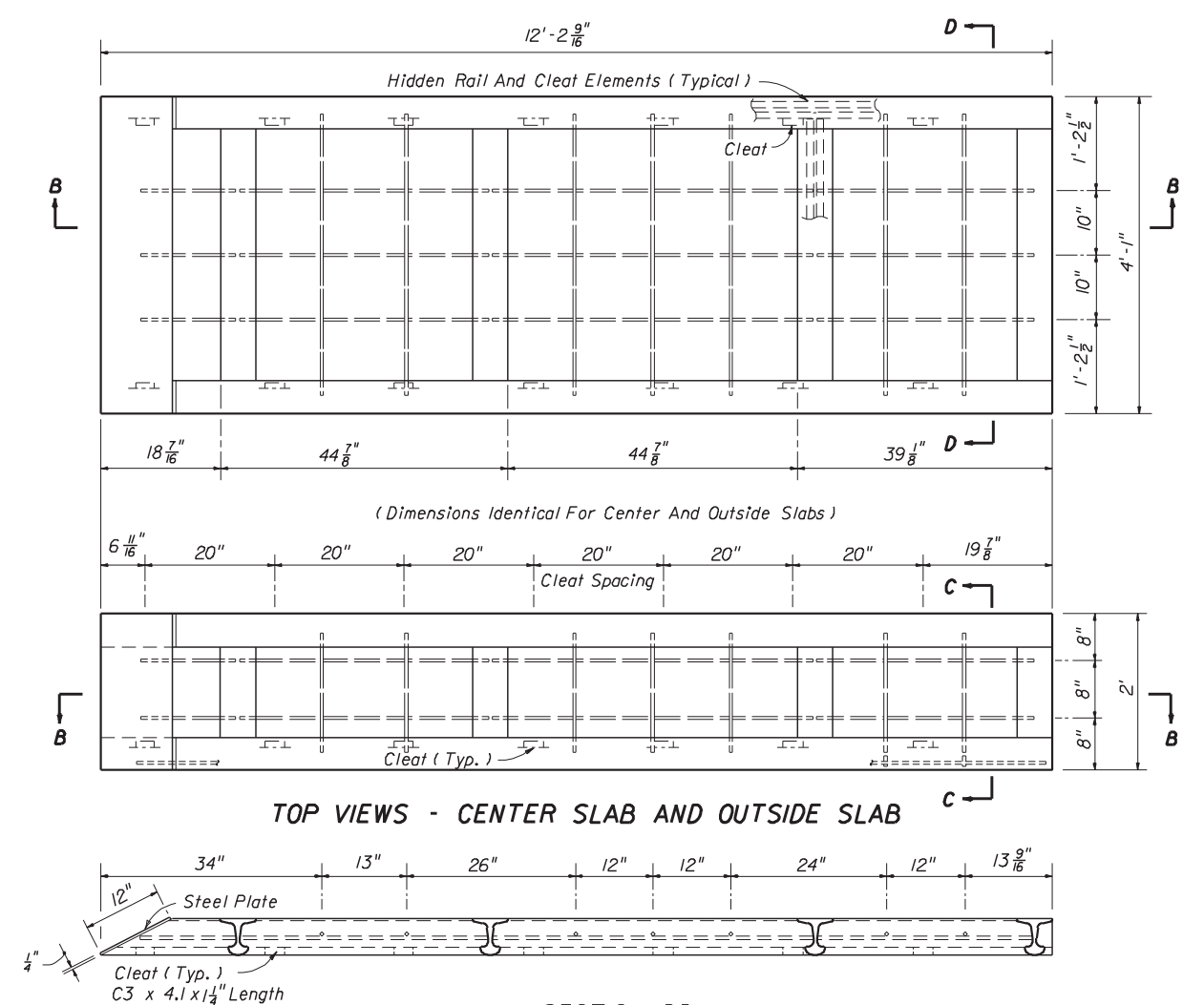
Names	Dates	Approved By		
Designed By		 State Roadway Design Engineer		
Drawn By	JMK 02/77			
Checked By	GSB 02/77	Revision	Sheet No.	Index No.
		00	4 of 5	560



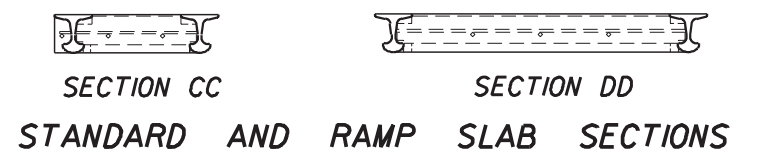
PLAN VIEW
TYPICAL 44' CROSSING



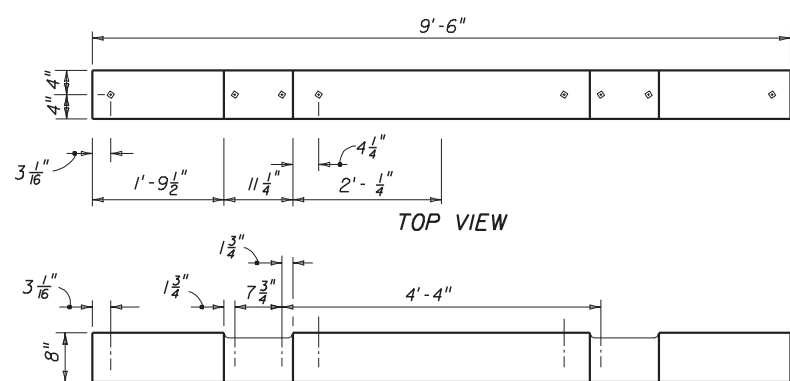
SECTION AA
STANDARD SLABS (PRECAST CONCRETE)



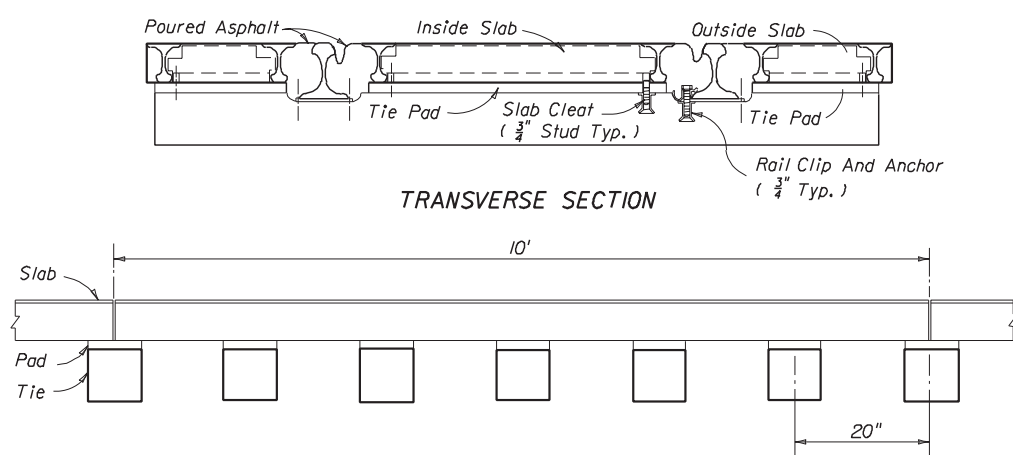
SECTION BB
RAMP SLABS (PRECAST CONCRETE)



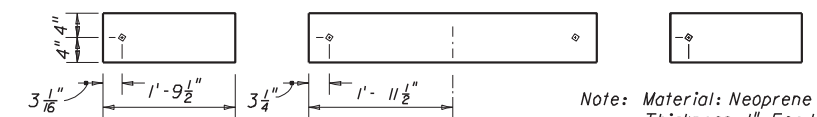
SECTION CC
SECTION DD
STANDARD AND RAMP SLAB SECTIONS



SIDE VIEW
PRECAST CONCRETE (CROSSING TIE)



TRANSVERSE SECTION
ELEVATION TIE SPACING



TOP VIEW
TIE PAD

- NOTES
- Slab frames are welded 90 lb. rails.
 - Slab reinforcement all #4 bars.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RAILROAD CROSSING

Names	Dates	Approved By		
Designed By				
Drawn By	RWR 9/82			
Checked By	JTC/JBW 9 82	Revision	Sheet No.	Index No.
		00	5 of 5	560

TYPE T MODIFIED

CONTENTS

- Preface
- Manual On Uniform Traffic Control Devices
- Abbreviations
- Symbols
- Definitions
- Extended Distance Advance Warning Signs
- Regulatory Speeds In Work Zones
- Adjoining And/Or Overlapping Work Zone Signing
- Intersecting Road Signing
- Signals
- Channelizing And Lighting Devices
- Dropoffs In Work Zones
- Warning Lights
- Sight Distance To Delineation Devices
- Channelizing And Lighting Device Consistency
- Flagging Operations
- Nighttime Flagging
- Removing Pavement Markings
- Superelevation
- End Road Work Signs
- Detours
- Variable Message Signs (VMS)
- Roadside Barriers
- Above Ground Hazards
- Work Zone Sign Supports
- Clear Zone Widths
- Sign Materials
- Survey Work Zones
- Pedestrians And Bicyclist
- Railroads
- Sign Covering And Intermittent Work Stoppage Signing
- Lane Widths
- Length Of Road Work Sign
- Manholes/Crosswalks
- Truck Mounted Attenuators
- Speeding Fines Doubled When Workers Present Sign
- Dropoffs In Work Zones
- Temporary Curb
- Identifications-Channelizing And Lighting Devices And Advance Warning Arrow Panel Modes
- Transitions For Temporary Concrete Barrier Wall On Freeway Facilities
- Commonly Used Warning And Regulatory Signs In Work Zones
- Reflective Pavement Markers

PREFACE

All projects and works on highways, roads and streets shall have a traffic control plan. All work shall be executed under the established plan and Department approved procedures. This index contains information specific to the Federal and State guidelines and standards for the preparation of traffic control plans and for the execution of traffic control in work zones, for construction and maintenance operations and utility work on highways, roads and streets.

Index 600 provides Department policy and standards. Changes are only to be made thru Department approved procedures. Indexes 601 thru 665 provide typical application for various situations. Modification can be made to these Indexes as long as the changes comply with the M.U.T.C.D. and Department standards.

The sign spacings shown on the Indexes are typical (recommended) distances. These distances may be increased or decreased based on field conditions, in order to avoid conflicts or to improve site specific traffic controls.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

The Florida Department of Transportation has adopted the "Manual On Uniform Traffic Control Devices For Streets And Highways" (MUTCD) and subsequent revisions and addendums, as published by the U.S. Department of Transportation, Federal Highway Administration, for mandatory use on the State Maintained Highway System whenever there exists the need for construction, maintenance operations or utility work.

ABBREVIATIONS


























Abbreviations assigned to the 600 series Roadway Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:


TCP	Traffic control plan(s)
MUTCD	'Manual On Uniform Traffic Control Devices For Streets And Highways'
TCZ	Traffic control through work zones
L	Taper length, buffer length or taper length plus buffer space
W	Width of taper transition in feet, i.e., lateral offset
S	Posted speed or off-peak 85 percentile speed (mph)
RPM	Raised reflectorized pavement marker
TMA	Truck mounted attenuator
COMM	Traffic Control Standards Committee
VMS	Variable Message Sign
MOT	Designates Maintenance Of Traffic Signs
FDOT	Florida Dept. Of Transportation
DTOE	District Traffic Operations Engineer
R	Radius

SYMBOLS

The symbols shown are found in the Traffic Control Zone Cell Library (TCZ.cel) on the CADD system.

Symbols assigned to the 600 series Roadway Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:

-  Work Area, Hazard Or Work Phase (Any pattern within a boundary)
-  Sign With 18" x 18" (Min.) Orange Flag And Type B Light
-  Type I Or Type II Barricade Or Vertical Panel Or Drum
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only)
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
-  Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
-  Cone Or Tubular Marker
-  Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
-  Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)
-  Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Steady Burning Light)
-  Type III Barricade
-  Type III Barricade (With Flashing Light)
-  Type III Barricade (With Steady Burning Light)
-  Work Zone Sign
-  Flagger
-  Traffic Signal
-  Advance Warning Arrow Panel
-  Portable Signal
-  Crash Cushion
-  Stop Bar
-  Work Vehicle With Flashing Beacon
-  Shadow (S) Or Advance Warning (AW) Vehicle With Advance Warning Arrow Panel And Warning Sign
-  Truck Mounted Attenuator (TMA)
-  Orange Flag For TCZ Signs
-  Type B Light For TCZ Signs

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DEFINITIONS

Regulatory Speed (In Work Zones)

The maximum permitted travel speed posted for the work zone as indicated by the regulatory speed limit signs. The work zone speed must be shown or noted in the plans. This speed should be used as the minimum design speed to determine runout lengths, departure rates, flare rates, lengths of need, clear widths, taper lengths, crash cushion requirements, marker spacings, superelevation and other similar features.

Advisory Speed

The maximum recommended travel speed through a curve or a hazardous area.

Travel Way

The intended path for vehicular traffic through or around obstructions in construction, maintenance, utility and other work zones on highways, roads and streets. For traffic control through work zones, travel way includes auxiliary lanes, shoulders and any other permanent or temporary surface intended for the path of vehicular traffic.

Detour

A detour is the redirection of traffic onto another roadway to bypass the temporary traffic control zone. A lane shift is the redirection of traffic onto a different section of the permanent pavement. A diversion is the redirection of traffic onto a temporary roadway, usually adjacent to the permanent roadway and within the limits of the right-of-way.

Above Ground Hazard

An above ground hazard is any object, material or equipment other than traffic control devices that encroaches upon the travel way or that is located within the clear zone which does not meet the Department's safety criteria, i.e., anything that is greater than 4" in height and is firm and unyielding or doesn't meet breakaway requirements.

EXTENDED DISTANCE ADVANCE WARNING SIGNS

Advance Warning Signs shall be used at extended distance of one-half mile or more when limited sight distance or the nature of the obstruction may require a motorist to bring their vehicle to a stop. Extended distance Advanced Warning Signs may be required on any type roadway, but particularly be considered on multi-lane divided highways where vehicle speed is generally in the higher range (45 M.P.H. or more).

REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCPs) for all projects must include specific regulatory speeds for each phase of work. This can either be the posted speed or a reduced speed. The speed shall be noted in the TCPs; this includes indicating the existing speed if no reduction is to be made. Regulatory speeds are to be uniformly established through each phase.

In general, the regulatory speed should be established to route vehicles safely through the work zone as close to normal highway speed as possible. The regulatory speed should not be reduced more than 10 mph below the posted speed and never below the minimum statutory speed for the class of facility. When a speed reduction greater than 10 mph is imposed, the reduction is to be done in 10 mph per 500' increments.

Temporary regulatory speed signs shall be removed as soon as the conditions requiring the reduced speed no longer exist. Once the work zone regulatory speeds are removed, the regulatory speed existing prior to construction will automatically go back into effect unless new speed limit signing is provided for in the plans.

On projects with interspaced work activities, speed reductions should be located in proximity to those activities which merit a reduced speed, and not "blanketed" for the entire project. At the departure of such activities, the normal highway speed should be posted to give the motorist notice that normal speed can be resumed.

If the existing regulatory speed is to be used, consideration should be given to supplementing the existing signs when the construction work zone is between existing regulatory speed signs. For projects where the reduced speed conditions exist for greater than 1 mile in rural areas (non-interstate) and on rural or urban interstate, additional regulatory speed signs are to be placed at no more than 1 mile intervals. Engineering judgement should be used in placement of the additional signs. Locating these signs beyond ramp entrances and beyond major intersections are examples of proper placement. For urban situations (non-interstate), additional speed signs are to be placed at a maximum of 1000' apart.

When field conditions warrant speed reductions different from those shown in the TCP the contractor may submit to the project engineer for approval by the Department, a signed and sealed study to justify the need for further reducing the posted speed, or, the engineer may request the District Traffic Operations Engineer (DTOE) to investigate the need. It will not be necessary for the DTOE to issue regulations for regulatory speeds in work zones due to the revised provisions of F.S. 316.0745(2) (b). Advisory Speed plates will be used at the option of the field engineer for temporary use while processing a request to change the regulatory speed specified in the plans when deemed necessary. Advisory speed plates cannot be used alone but must be placed below the construction warning sign for which the advisory speed is required.

For additional information refer to the FDOT Roadway Plans Preparation Manual, Volume I , Chapter 10.

ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING

Adjoining work zones may not have sufficient spacing for standard placement of signs and other traffic control devices in their advance warning areas or in some cases other areas within their traffic control zones. Where such restraints or conflicts occur or are likely to occur, one of the following methods will be employed to avoid conflicts and prevent conditions that could lead to misunderstanding on the part of the traveling public as to the intended travel way by the traffic control procedure applied:

- (a) For scheduled projects the engineer in responsible charge of project design will resolve anticipated work zone conflicts during the development of the project traffic control plan. This may entail revision of plans on preceding projects and coordination of plans on concurrent projects.
- (b) Unanticipated conflicts arising between adjoining in progress highway construction projects will be resolved by the Resident Engineer for projects under his residency, and, by the District Construction Engineer for in progress projects under adjoining residencies.
- (c) The District Maintenance Engineer will resolve anticipated and occurring conflicts under the following work zone conditions.
 1. Within scheduled maintenance operations.
 2. Between scheduled maintenance operations, maintenance construction, permitted works and/or in progress highway construction projects.
- (d) The Unit Maintenance Engineer will resolve conflicts that occur within routine maintenance works; between routine maintenance work, unscheduled work and/or permitted work; and, between unit controlled maintenance works and highway construction projects.

INTERSECTING ROAD SIGNING

Signing for the control of traffic entering and leaving work zones by way of intersecting highways, roads and streets shall be adequate to make drivers aware of work zone conditions. Under no condition will intersecting leg signing be less than a ROAD WORK AHEAD sign, including light and flag, for approaching vehicles.

SIGNALS

Existing traffic signal operations that require modification in order to carry out work zone traffic control shall be included in the TCP and be approved by the District Traffic Operations Engineer. The need for temporary signal loops or other methods of actuation shall be determined by the District Traffic Operations Engineer and the designer and included in the TCP.

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ROAD DESIGN				
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Designed By		12/87	<i>Lance D. Mill</i> Roadway Design Engineer	
Drawn By		12/87	Revision	Sheet No. Index No.
Checked By		12/87	00	2 of 11 600

CHANNELIZING AND LIGHTING DEVICES

Channelizing and lighting devices for work zone traffic control shall be as prescribed in Part VI of the MUTCD, subject to supplemental revisions provided in the contract documents.

Primary work zone traffic control devices are shown on Sheet 8 for the purpose of ready identification. Approved devices are listed on the Departments Qualified Product List.

DROPOFFS IN WORK ZONES

Acceptable warning and barrier devices for traffic control at dropoffs in work areas are detailed on Sheet 6. Unless otherwise specified in the plans, the contractor may use any of the barrier types shown in note 3 on sheet 6.

WARNING LIGHTS

Warning lights shall be in accordance with Section 6E-5 of the MUTCD except for the application limitations and methods of payment stipulated below:

Flashing

Type A Low Intensity Flashing Warning Lights are to be mounted on barricades, drums, vertical panels or advance warning signs (except as noted below) and are intended to continually warn drivers that they are approaching or proceeding in a hazardous area. Flashing lights shall not be used to delineate the intended path of travel, and not placed with spacings that will form a continuous line to the drivers eye. The Type A light will be used to mark obstructions that are located adjacent to or in the intended travel way. Type A lights shall not be used in conjunction with the first advance warning sign nor the second such sign when used.

Type B High Intensity Flashing Warning Lights shall be mounted on the first advanced warning sign and on the first and second advanced warning sign where two or more signs are used; this applies to all approaches to any work zone.

Steady-Burn

Type C Steady-Burn Lights are to be mounted on barricades, drums, concrete barrier walls or vertical panels and used in combination with those devices to delineate the travel way on lane closures, lane changes, detour curves and other similar conditions. Steady-burn lights are intended to be placed in a line to delineate the traveled way through and around obstructions in the transition, buffer, work and termination areas of the traffic control zone. Their intended purpose is not for warning drivers that they are approaching or proceeding through a hazardous area.

SIGHT DISTANCE TO DELINEATION DEVICES

Transition tapers should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve), the taper should begin well in advance of the view obstruction. The beginning of tapers should not be hidden behind curves.

CHANNELIZING AND LIGHTING DEVICE CONSISTENCY

Barricades, vertical panels, cones, tubular markers and drums shall not be intermixed within either the lateral transition or within the tangent alignment.

FLAGGING OPERATIONS

When operations are such that signs, signals and barricades do not provide adequate protection on or adjacent to a highway or street, flaggers and / or other appropriate traffic control shall be provided. Flagger station(s) shall be located far enough ahead of the work space so that approaching traffic has sufficient distance to stop before entering the work space.

Stop /Slow Paddles are the primary hand-signaling device. Flag use is limited to Immediate Emergencies, Intersections, and when working on centerline or shared left turn lanes where two (2) flagmen are required and there is opposing traffic in the adjacent traffic lanes. Where Flagmen are used, a FLAGMAN symbol or legend sign must replace the WORKERS symbol or legend sign.

NIGHTTIME FLAGGING

Nighttime flagging will require proper illumination of the flagger. A well lighted flagging station and/or a reflectorized paddle or reflectorized flag, plus a flashlight, lantern or other lighted signal that will display a red warning light shall be used. Lights, reflectorized paddles, reflectorized flags and reflectorized vests, shirts or jackets approved by the Department must be used to flag traffic at night. The STOP face of paddles shall be reflectorized red with white reflectorized letters and border, and the SLOW face shall be reflectorized orange with black letters and border. Flagger vests, shirts or jackets shall be reflectorized orange.

The flagger must be clearly visible to approaching traffic for a distance sufficient to permit proper response by the motorist to the flagging instructions, and to permit traffic to reduce speed or to stop as required before entering the work site. Flaggers shall be positioned to maintain maximum color contrast between the flaggers reflective garments and equipment and the work area background.

REMOVING PAVEMENT MARKINGS

Existing pavement markings that conflict with temporary work zone delineation shall be removed by any method approved by the Engineer, where operations exceed one daylight period; however, painting over existing pavement markings will not be permitted. Full pavement width overlays of either asphalt concrete SP 9.5 or FC-6 is a positive means to achieve obliteration.

SUPERELEVATION

Horizontal curves constructed in conjunction with work zone traffic control should have the required superelevation applied to the design radii. Under conditions where normal cross slope controls curvature, the minimum radii that can be applied are listed in the table below.

MINIMUM RADII FOR NORMAL CROSS SLOPES	
DETOUR DESIGN SPEED	MINIMUM RADIUS R
MPH	feet
65	3130
60	2400
55	1840
50	1390
45	1080
40	820
35	610
30	430
Superelevate When Smaller Radii Used	

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END ROAD WORK SIGNS

The END ROAD WORK sign (G20-2A) should be erected approximately 500 feet beyond the end of a construction or maintenance project, unless other distance called for in the plans. Where other Construction or Maintenance Operations occur within 1 mile this sign should be omitted and signing coordinated in accordance with Index No. 600, ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING.

DETOURS

Detours should be signed clearly over their entire length so that motorists can easily determine how to return to the original roadway. The W1-4R, MOT-2, and MOT-3 warning signs are to be used for the advanced warning for a lane shift. A diversion should be signed as a lane shift.

VARIABLE MESSAGE SIGNS (VMS)

The VMS can be used to:

- (1) Supplement standard signing in construction/maintenance work zones.
- (2) Reinforce static advance warning messages.
- (3) Provide motorists with updated guidance information.

The message should be visible and legible at a minimum distance of 900 feet. All messages should be cycled so that two message cycles are displayed to a driver while approaching the sign from 900 feet at 55 mph.

VMS should be placed approx. 500 to 800 feet in advance of the work zone conflicts or 1.5 to 2 miles in advance of complex traffic control schemes which require new and/or unusual traffic maneuvers.

If VMS are to be used at night, the intensity of the flashers shall be reduced during darkness when lower intensities are desirable.

For additional information refer to the FDOT Roadway Plans Preparation Manual, Volume I, Chapter 10.

ROADSIDE BARRIERS

When connecting temporary concrete barrier wall to guardrail the connection shall be made in accordance with Index No. 410. All guardrail end anchorages to be included in the cost of Temporary Guardrail.

ABOVE GROUND HAZARD

Above ground hazards (see definitions) are to be considered work areas during working hours and treated with appropriate work zone traffic control procedures. During non-working hours, all objects, materials and equipment that constitute an above ground hazard must be stored/placed outside the travel way and clear zone or be shielded by a barrier or crash cushion.

For above ground hazards within a work zone the clear zone required should be based on the regulatory speed posted during construction.

WORK ZONE SIGN SUPPORTS

All post mounted Work Zone signs shall be installed on either round aluminum or steel channel post as specified in the table below.

SUPPORTS FOR MAINTENANCE OF TRAFFIC SIGNS					
SIGN SIZE	SIGN BRACKET	ROUND ALUMINUM	DEPTH IN GROUND	STEEL CHANNEL	DEPTH IN GROUND
24" x 36"	2-I	NPS 2.0" x $\frac{1}{8}$ "	2'-0"	2.5 lb F/M*	3'-0"
48" x 48" DIAMOND	2-I & 1-II	NPS 3.5" x $\frac{3}{16}$ "	3'-4"	**	3'-0"
60" x 48"	3-I	NPS 3.5" x $\frac{3}{16}$ "	3'-4"	**	3'-0"
24" x 30"	2-I	NPS 2.0" x $\frac{1}{8}$ "	2'-0"	2.5 lb F/M*	3'-0"
48" x 48"	2-II	NPS 3.0" x $\frac{1}{8}$ "	2'-6"	**	3'-0"
60" x 24"	3-I	NPS 3.0" x $\frac{1}{8}$ "	2'-6"	3.0 lb F/M*	3'-0"
60" x 36"	3-I	NPS 3.5" x $\frac{3}{16}$ "	3'-4"	4.0 lb F/M*	3'-0"

* F/M Indicates Type F or Type M

** Requires two 3 lb/ft steel channel (F/M) at 2'-6" center to center. All sign brackets shall be Type I. The total number of brackets shall be per post as tabulated, except the "Diamond" sign which shall use two Type I brackets per post.

The 4 lb/ft steel channel shall be installed with approved breakaway bases.

Refer to Design Standard 11860, Sheet 3, for round aluminum sign bracket details, and 11865 Sheet 2 for steel channel breakaway bases, and notes.

CLEAR ZONE WIDTHS

The term 'clear zone' describes the unobstructed relatively flat area, impacted by construction, extending outward from the edge of the travel lane. The table below gives clear zone widths in work zones for medians and roadside conditions other than for roadside canals; where roadside canals are present, clear zone widths are to conform with the distances to canals as described in Volume I Ch. 4, Sec. 4.2 and Exhibit 4-A and 4-B of the Plans Preparation Manual.

CLEAR ZONE WIDTHS FOR WORK ZONES	
WORK ZONE SPEED (MPH)	WIDTHS (feet)
60-70	30
55	24
45-50	18
30-40	14
ALL SPEEDS CURB & GUTTER	4' BEHIND FACE OF CURB

SIGN MATERIALS

Mesh signs may be used only for Daylight Operations as noted in the standards. Type B Lights and Orange Flags are not required.

Vinyl signs may be used for Day or Night Operations not to exceed 12 hours except as noted in the standards. Type B Lights and Orange Flags are not required.

All signs shall be post mounted if operation exceeds 12 hours except as noted in the standards.

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SURVEY WORK ZONES

The SURVEY CREW AHEAD symbol or legend sign shall be the principal Advance Warning Sign used for Traffic Control Through Survey Work Zones and may replace the ROAD WORK AHEAD sign when lane closures occur, at the discretion of the Party Chief. Type B Light or dual orange flags shall be used at all times to enhance the SURVEY CREW AHEAD sign, even with mesh signs.

When Traffic Control Through Work Zones is being used for Survey purposes only, the END ROAD WORK sign as called for on certain 600 Series Indexes should be omitted.

Survey Between Active Traffic Lanes or Shared Left Turn Lanes

The following provisions apply to Main Roadway Traffic Control Work Zones. These provisions must be adjusted by the Party Chief to fit roadway and traffic conditions when the Survey Work Zone includes Intersections.

- (A) A STAY IN YOUR LANE (MOT-1) sign shall be added to the Advance Warning Sign sequence as the second most immediate sign from the work area.
- (B) Elevation Surveys-Cones may be used at the discretion of the Party Chief to protect prism holder and flagger(s). Cones, if used, may be placed at up to 50' intervals along the break line throughout the work zone.
- (C) Horizontal Control-With traffic flow in the same direction, cones shall be used to protect the backsight tripod and/or instrument. Cones shall be placed at the equipment, and up to 50' intervals for at least 200' towards the flow of traffic.
- (D) Horizontal Control-With traffic flow in opposite directions, cones shall be used to protect the backsight tripod and/or instrument. Cones shall be placed at the equipment, and up to 50' intervals for at least 200' in both directions towards the flow of traffic.

PEDESTRIANS AND BICYCLIST

When an existing pedestrian way or bicycle way is located within a traffic control work zone, accomodation must be maintained and include provision for the disabled.

RAILROADS

Railroad crossings affected by a construction project should be evaluated for traffic controls to reduce queuing on the tracks. The evaluation should include as a minimum: traffic volumes, distance from the tracks to the intersections, lane closure or taper locations, signal timing, etc.

SIGN COVERING AND INTERMITTENT WORK STOPPAGE SIGNING

Existing signs that conflict with temporary work zone signing shall be removed or covered as approved by the Engineer. Traffic control signs that require covers when no work is being performed in a work area shall be fully covered with a durable opaque sheet material.

Plastic film and woven fabrics including burlap will not be permitted.

Covering of only the legend or symbol will not be permitted.

Reflective coverings will not be permitted.

Hinged signs designed to cover when folded and sign blanks will be permitted.

Covers, blanks, hinged panels and intermittent work stoppage shields and plaques are incidental to work operation signs and are not to be paid for separately.

LANE WIDTHS

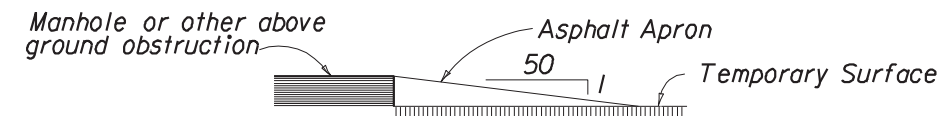
Lane widths of through roadways should be maintained through work zone travel ways wherever practical. The minimum widths for work zone travel lanes shall be as follows: 10' for Interstate with at least one 12'-0" lane provided in each direction, unless formally excepted by the Federal Highway Administration; 10' for freeways; and 9' for all other facilities.

LENGTH OF ROAD WORK SIGN

The length of road work sign (G20-1) bearing the legend ROAD WORK NEXT_____ MILES is required for all projects of more than 2 miles in length. The number of miles entered should be rounded up to the nearest mile. The sign shall be located at begin construction points.

MANHOLES/CROSSWALKS

Manholes extending 1" or more above the travel lane and crosswalks having an uneven surface greater than 1/2" shall have a temporary asphalt apron constructed as shown in the diagram below.



The apron is to be removed prior to constructing the next lift of asphalt. The cost of the temporary asphalt shall be included in the Contract Unit Price for Maintenance of Traffic, L.S.

TRUCK MOUNTED ATTENUATORS

Truck-mounted attenuators (TMA) can be used for moving operations and short-term stationary operations. For moving operations, see Index No. 627. For short term, stationary operations, see Part VI of the MUTCD.

SPEEDING FINES DOUBLED WHEN WORKERS PRESENT SIGN

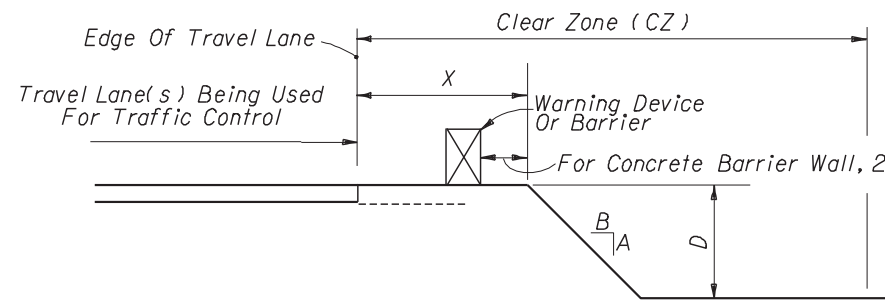
The SPEEDING FINES DOUBLED WHEN WORKERS PRESENT sign should be installed on all projects.

The placement should be 500 ft beyond the ROAD WORK AHEAD sign or midway to the next sign whichever is less.

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DROPOFF CONDITION

1. A dropoff is defined as a drop in elevation, parallel to the adjacent travel lanes, greater than 3" with slopes (A:B) steeper than 1:4. When dropoffs occur within the clear zone during construction or maintenance activities, protection devices will be required, see chart.
2. Distance X is to be the maximum practical under project conditions.
3. Distance from the travel lane to the barrier or warning device should be maximum practical for project conditions.
4. Any dropoff condition that is created and restored within the same work period will not be subject to the use of barriers; however, warning devices will be required.
5. When permanent curb heights are $\geq 6"$, no warning device will be required. For curb heights $< 6"$, see chart.



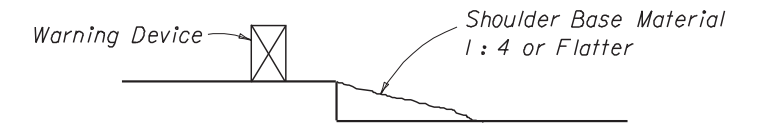
DROPOFF PROTECTION REQUIREMENTS ALL SPEEDS NO CURB AND GUTTER		
X (ft)	D (in)	Device Required
0-CZ	≤ 3	Sign W8-9AS
0-12	> 3	Barrier
12-CZ	> 3 to ≤ 5	Warning Device
0-CZ	> 5	Barrier

For Clear Zone widths, see Index No. 600 sheet 4.

DROPOFF NOTES

1. These conditions and treatments can be applied only in work areas that fall within a properly signed work zone.
2. The following are defined as acceptable warning devices:
 - a. Vertical Panel
 - b. Type I Or Type II Barricades
 - c. Drum
 - d. Cone (where allowed)
 - e. Tubular Marker (where allowed)
3. Where a barrier is specified any of the types below may be used as shown in the plans:
 - a. Concrete temporary barrier wall;
 - b. Temporary guardrail and end anchorages;
 - c. Temporary Curb;
 - d. Temporary water filled barriers.
4. Warning device spacing shall be as follows:
 - A. On Taper
Maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30 - 40 MPH; 50' for 45 MPH and greater.
 - B. On Alignments
Maximum spacing between cones or tubular markers shall be 25'. and for Type I or Type II barricades, vertical panels or drums is 50' on center for the first 250'; thereafter, cones or tubular markers at 50' on center and Type I or Type II barricades drums or vertical panels at 100' on center.

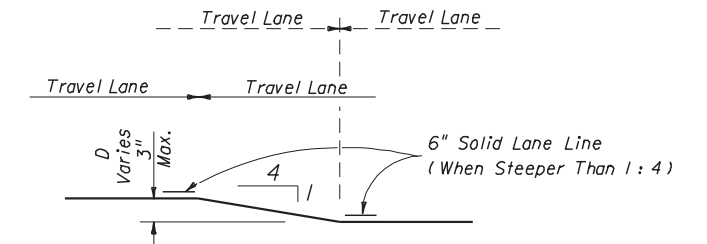
DROPOFFS IN WORK ZONES



NOTES

1. The contractor may use shoulder treatment in lieu of barrier. Warning devices are required.
2. Daily inspections shall be conducted to assure that no erosion, excessive slopes, rutting, or other adverse conditions exist. Any deficiencies shall be repaired immediately.
3. Compensation for the placement and removal of the material required for the shoulder treatment shall be included in the cost for Maintenance Of Traffic, LS. Use of shoulder treatment in lieu of a barrier is not eligible for VECP consideration.


SHOULDER TREATMENT

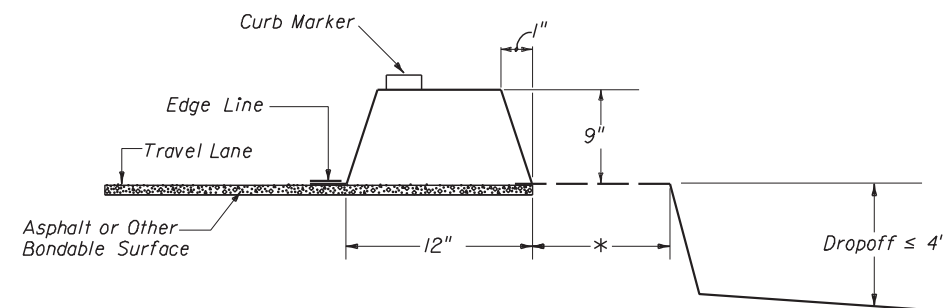


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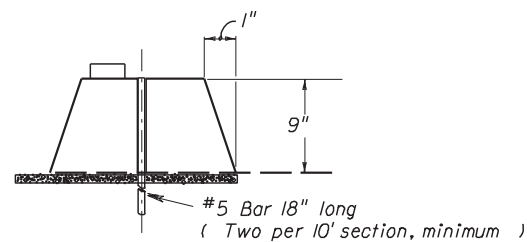
1. This treatment applies to resurfacing or milling operations between adjacent travel lanes.
2. Whenever there is a difference in elevation between adjacent travel lanes, the W8-9A sign with "UNEVEN PAVEMENT" plaque is required at intervals of $\frac{1}{2}$ mile maximum.
3. If D is $1\frac{1}{2}"$ or less, no treatment is required.
4. Treatment allowed only when D is 3" or less.
5. If the slope is steeper than 1:4 (not to be steeper than 1:1), the R4-1 and MOT-1 signs shall be used as a supplement to the W8-9A; this condition should never exceed 3 miles in length.

TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING

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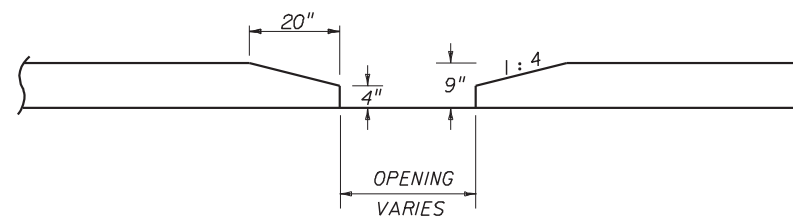


TEMPORARY CURB DETAIL

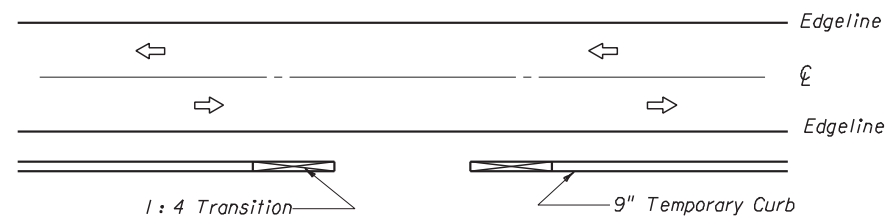


PINNING DETAIL

* 12" (or more) is desirable in order to enhance/improve stability. However, it is recognized that there may be cases where 12" (or more) is not feasible or obtainable. In these instances, engineering judgement must be used to balance this offset distance with the depth of dropoff, soil type, etc.



ELEVATION



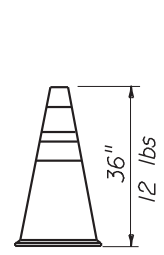
PLAN
TEMPORARY CURB OPENINGS

TEMPORARY CURB

1. Application: Temporary curb shall not be used on facilities with posted speeds greater than 45 mph or dropoffs greater than 4' deep. It shall not be used on Interstate or limited access facilities.
2. Edgelines shall be provided in accordance with the traffic striping specifications, including reflective beads. The face of the curb shall also be painted (white or yellow as appropriate). A Curb Marker shall be placed on the temporary curb every 10' (Colorless when curb is on the right side of the lane, and amber when the curb is on the left side of the lane).
3. The temporary asphalt curb is to be bonded to the surface by use of a tack coat. It is important that the curb adhere to the surface in order to provide the strength necessary to redirect errant vehicles. Concrete curb and curb of other approved materials shall be pinned to a paved surface as shown in detail.
4. When temporary curb is call for in the plans the contractor has the option to construct temporary curb of asphalt, Class I concrete, or other Department approved material.
5. When concrete is used to construct temporary curb, $\frac{1}{2}$ " open joints shall be constructed every 10' in order to control cracking.
6. Drainage needs must be addressed when using temporary curb. If driveways or other accesses are not frequent enough to allow for water runoff, the designer may need to specify the need for "drainage slots" at an appropriate spacing based on grades, number of lanes, etc. Typically, a drainage slot should be 12" wide (a break in the curb) at 50' spacings.
7. At openings such as driveways and business accesses, the temporary curb should be transitioned in height from 4" up to 9" at a 1:4 slope in order to eliminate a potential hazard at the end points.
8. Temporary curb shall be paid for under the contract unit price for Temporary Curb, LF, and will include all materials (including Curb Markers) and work necessary to construct, maintain and remove the temporary curb. Any damage to existing pavement caused by the removal of temporary curb shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of the temporary curb.

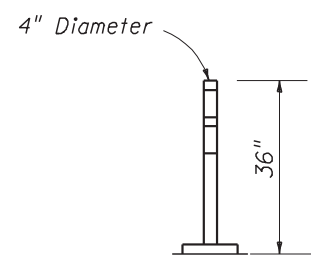
TEMPORARY CURB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES				
Designed By	Names	Dates	Approved By <i>Samuel D. Mill</i> Roadway Design Engineer	
Drawn By			Revision	Sheet No. 7 of 11
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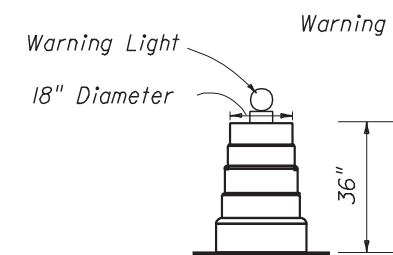
FOR NIGHT USE
SEE NOTE 9.

CONES



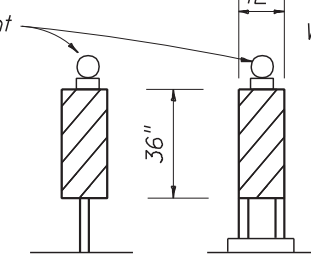
TUBULAR NON-FIXED MARKER TO BE USED
DURING DAYLIGHT ONLY.

TUBULAR MARKER



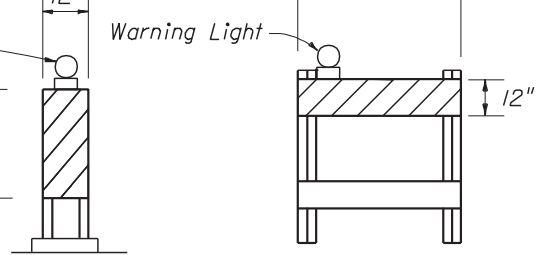
STEEL DRUMS
NOT PERMITTED

PLASTIC DRUMS



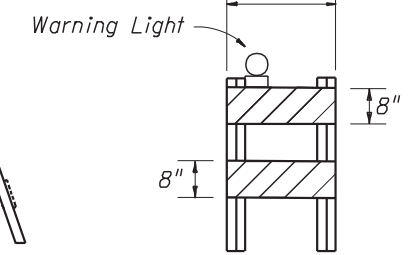
POST MOUNT

VERTICAL PANEL

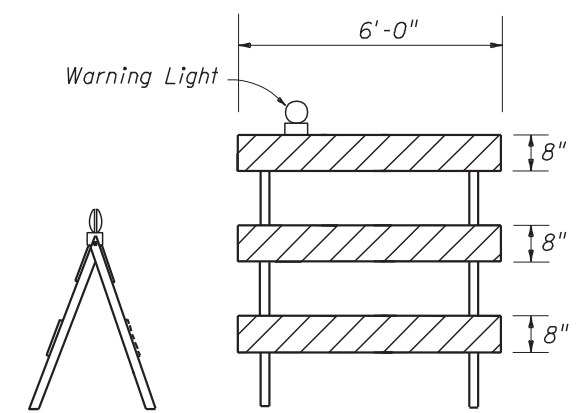


A-FRAME

TYPE I BARRICADE



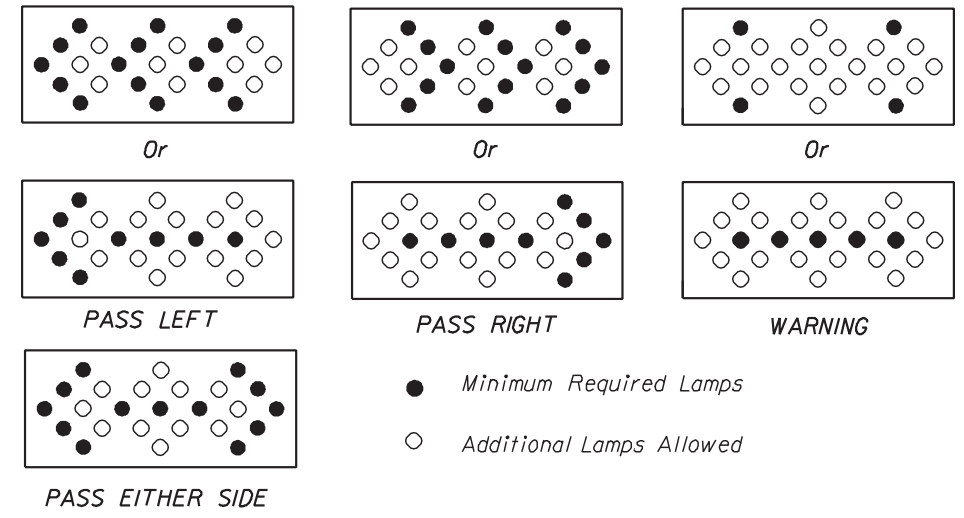
TYPE II BARRICADE



TYPE III BARRICADE

CHANNELIZING AND LIGHTING DEVICE NOTES

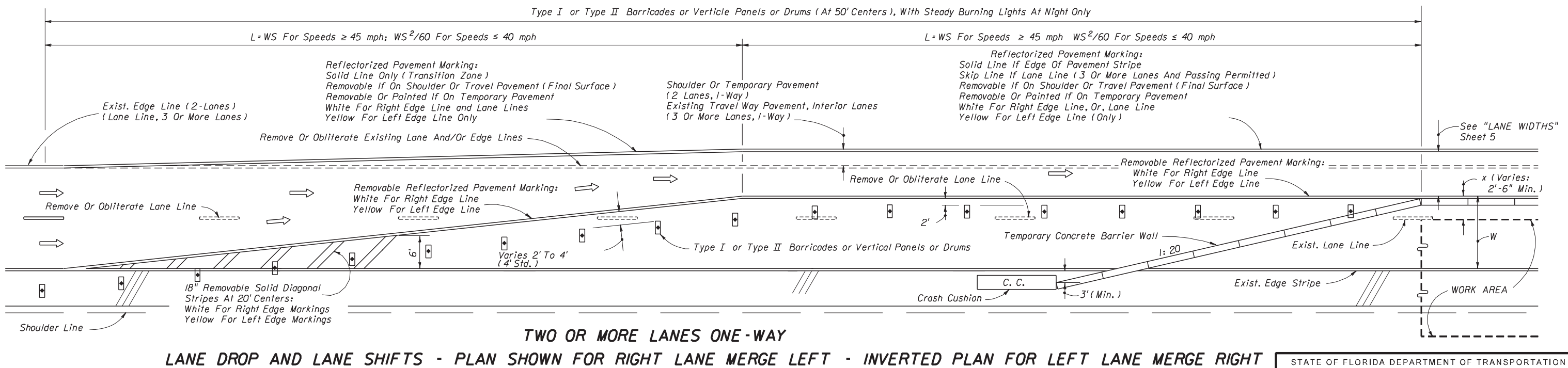
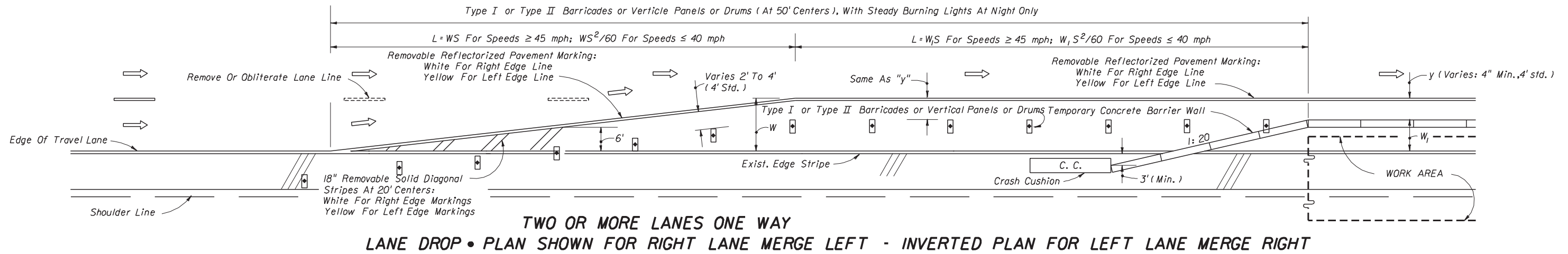
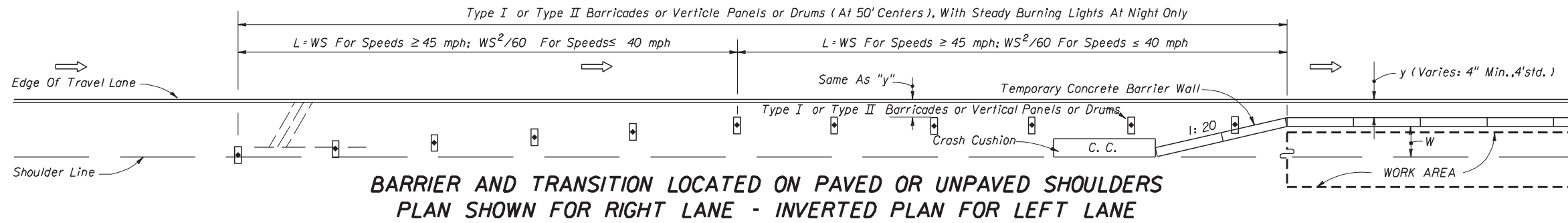
- Only approved traffic control devices may be used.
- The FDOT approval number shall be engraved on the device at a convenient and readily visible location. Where engraving is not practical a water-resistant type label may be used.
- The details shown on this sheet are for the following purposes: (a) For ease of identification and (b) To provide information that supplements or supercedes that provided by the MUTCD.
- The Type III Barricade shall have a unit length of 6'-0" only. When barricades of greater lengths are required those lengths shall be in multiples of the 6'-0" unit. Signs used in conjunction with Type III Barricades may be mounted on or above the Barricade. These Signs should not cover more than 50 percent of the top two rails or 33 percent of the total area of the three rails.
- During hours of darkness, warning lights shall be used on drums, vertical panels, Type I, Type II and Type III barricades in accordance with 'Warning Lights' Sheet 3.
- Ballast shall not be placed on top rails or any striped rails or higher than 13" above the driving surface.
- For rails less than 3'-0" long, 4" stripes shall be used.
- When Advance Warning Arrow Panels are used at night, the intensity of the flashers shall be reduced during darkness when lower intensities are desirable.
- Cones Shall:
 - Be used only in work zones where workers are present.
 - Not exceed 1 mile in length of use at any one time nor exceed a 12 hour work period.
 - Have as a minimum, one designated person for the purpose of continuous monitoring and maintenance of cones during lane closures.
 - Be reflectorized as per the MUTCD with Department approved reflective collars when used at night.
- The splicing of sheeting is not permitted on either channelizing devices or MOT signs.



MODES
ADVANCE WARNING ARROW PANELS

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES AND
ADVANCE WARNING ARROW PANEL MODES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES				
Names	Dates	Approved By		
Designed By	12/87	James D. Mill Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	8 of 11	600

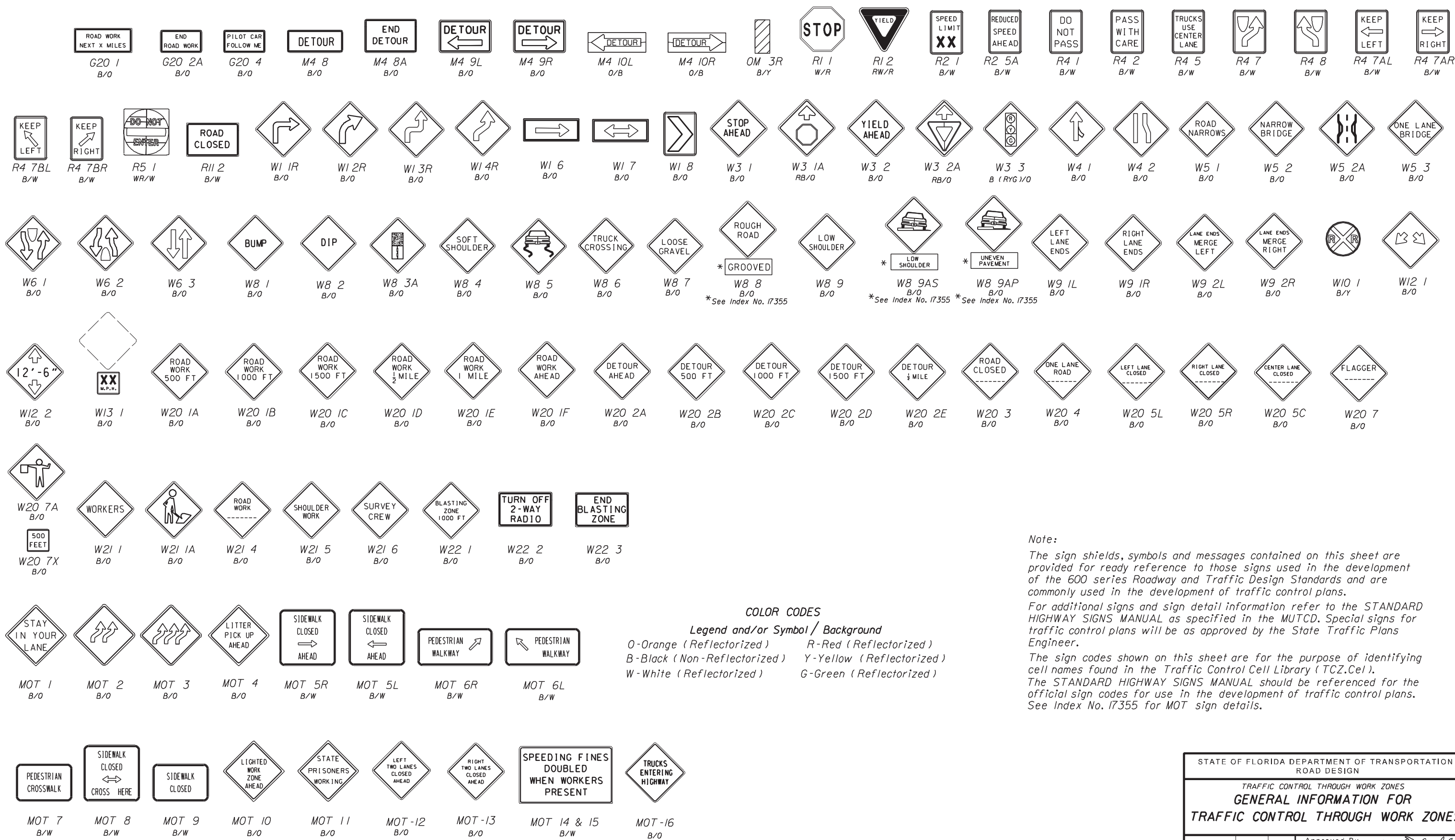


TRANSITION NOTES

1. Barrier wall within the transition areas shall have reflective markers mounted on the travel side of the wall, 6" below the top and on 12' centers.
2. Arrows denote direction of traffic only and do not reflect pavement markings.
3. For signing information see the Plans, Specifications, MUTCD and other TCZ Standards.

TRANSITIONS FOR TEMPORARY CONCRETE BARRIER WALL ON FREEWAY FACILITIES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES				
Names	Dates	Approved By		
Designed By	4/89			
Drawn By	4/89	Revision	Sheet No.	Index No.
Checked By	4/89	00	9 of 11	600



*See Index No. 17355 *See Index No. 17355 *See Index No. 17355

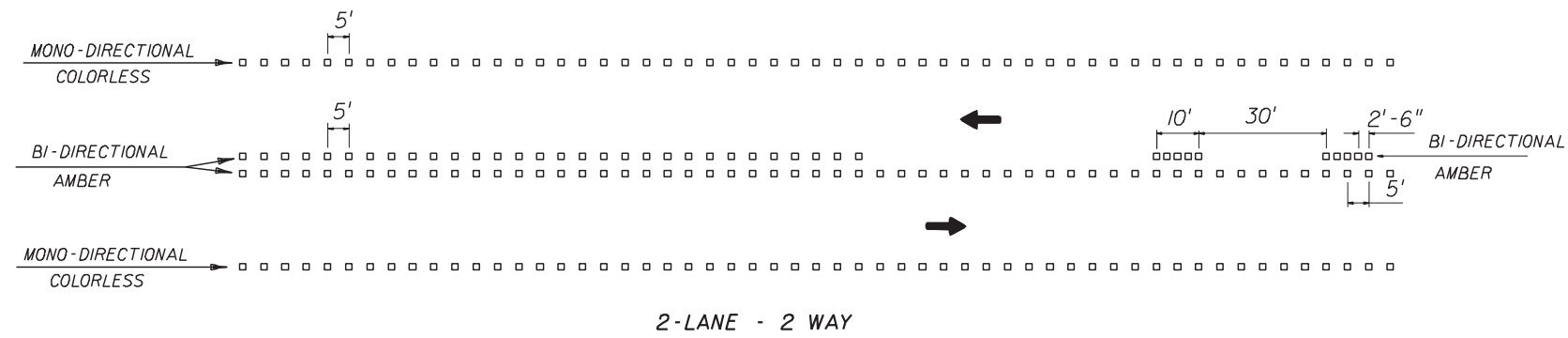
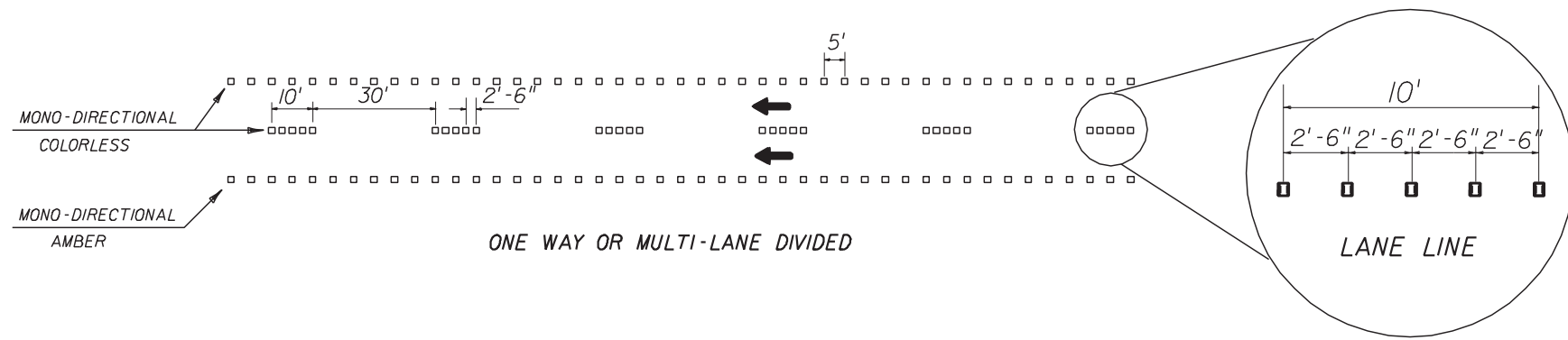
COLOR CODES

Legend and/or Symbol/ Background
 O-Orange (Reflectorized) R-Red (Reflectorized)
 B-Black (Non-Reflectorized) Y-Yellow (Reflectorized)
 W-White (Reflectorized) G-Green (Reflectorized)

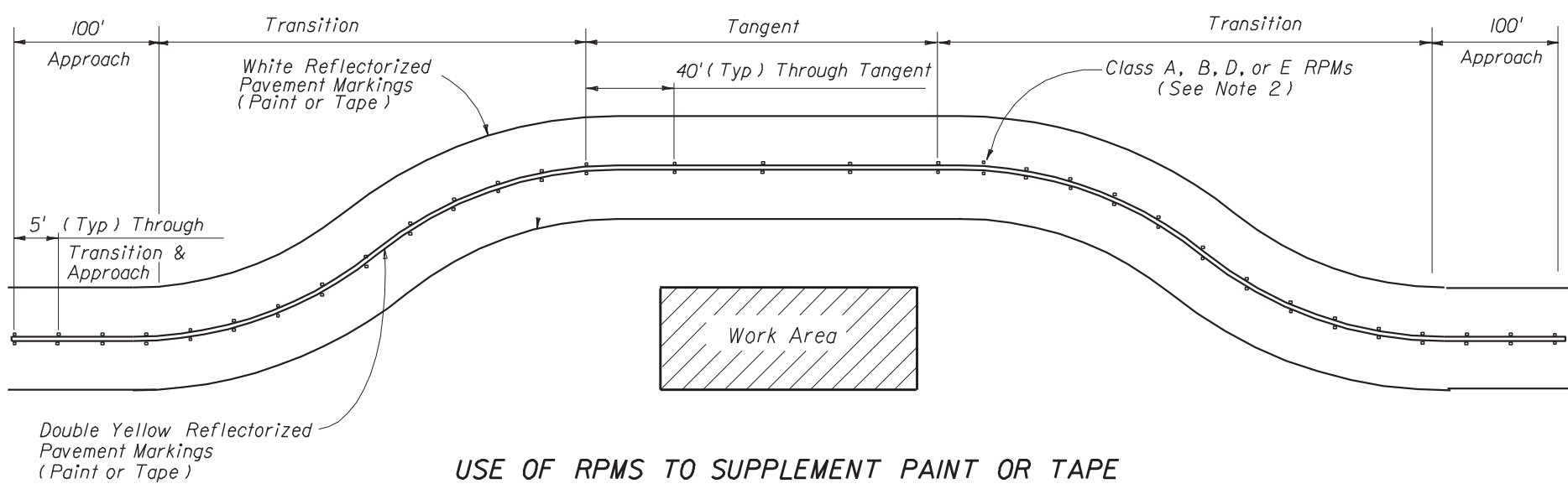
Note:
 The sign shields, symbols and messages contained on this sheet are provided for ready reference to those signs used in the development of the 600 series Roadway and Traffic Design Standards and are commonly used in the development of traffic control plans.
 For additional signs and sign detail information refer to the STANDARD HIGHWAY SIGNS MANUAL as specified in the MUTCD. Special signs for traffic control plans will be as approved by the State Traffic Plans Engineer.
 The sign codes shown on this sheet are for the purpose of identifying cell names found in the Traffic Control Cell Library (TCZ.Cel). The STANDARD HIGHWAY SIGNS MANUAL should be referenced for the official sign codes for use in the development of traffic control plans. See Index No. 17355 for MOT sign details.

COMMONLY USED WARNING AND REGULATORY SIGNS IN WORK ZONES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES				
Names	Dates	Approved By <i>James D. Mill</i>		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
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**TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS
IN LIEU OF TEMPORARY TAPE OR PAINT IN WORK ZONES**



USE OF RPMs TO SUPPLEMENT PAINT OR TAPE

REFLECTIVE PAVEMENT MARKERS

RPM CLASS

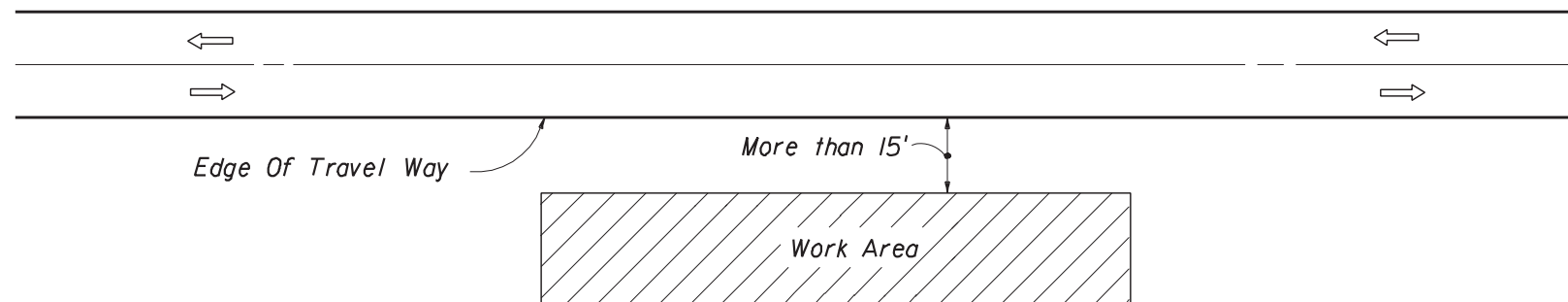
APPLICATION

- A Permanent Applications In Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
- B Permanent Application In Traffic And Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
- D Work Zone Application Only, For Traffic And Non-Traffic Areas.
- E Temporary Work Zone Application Only, Not Exceeding Five (5) Continuous Days, For Traffic And Non-Traffic Areas.

NOTES

1. RPMs shall be installed as a supplement to all lane lines and the edge lines of of gore areas during construction. Placement of RPMs should be as shown in Index 17352 with the exception that Class D markers be placed at a maximum spacing of 5' center to center.
2. In work zones, CLASS A, B, or D RPMs may be used to form lane lines, edge lines and temporary gore areas, in lieu of tape or paint; however, tape or paint must be used in all transition areas in addition to RPMs. In short term work zones, where the RPMs will be used for five (5) days or less, CLASS "E" RPMs may be used to form lane or edge lines.
3. Basic color rule: colorless reflectors supplement white lines and amber reflectors supplement yellow lines.
4. To provide contrast on concrete pavement, or light asphalt, the five (5) colorless RPMs shall be followed by five black RPMs. The spacing between RPMs shall be 2'-6". Black RPMs will not be required for contrast with amber RPMs.
5. It shall be the contractors responsibility to replace damaged or missing RPMs.
6. RPMs used to supplement lane lines are to be paid for as Reflective Pavement Marker (Temporary), EA. RPM's used in lieu of temporary tape or paint are to be paid for as Removable Pavement Marking L.F.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES				
Names	Dates	Approved By <i>Lance D. Mill</i>		
Designed By		Roadway Design Engineer		
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GENERAL NOTES

1. If the work operation requires that two or more work vehicles cross the 15' zone in any one hour, traffic control will be in conformance with Index No. 602.
2. No special signing is required.
3. Arrows denote direction of traffic only and do not reflect pavement markings.
4. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
5. For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS

Work Area

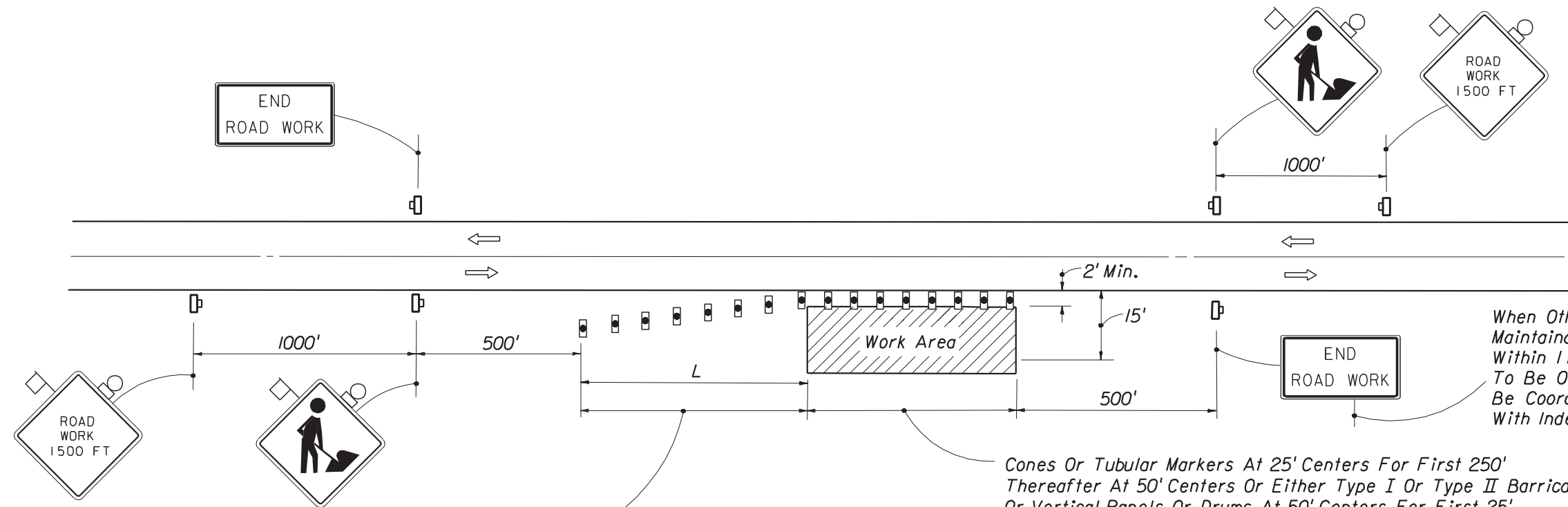
TYPICAL APPLICATIONS

- Landscaping Work
- Utility Work
- Fencing Work
- Cleaning Drainage Structures
- Reworking Ditches

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 15' FROM THE EDGE OF PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
TRAFFIC CONTROL THROUGH WORK ZONES					
TWO-LANE, TWO-WAY • RURAL DAY OR NIGHT OPERATIONS					
	Names	Dates	Approved By		
Designed By		12/87	 Roadway Design Engineer		
Drawn By		12/87	Revision	Sheet No.	Index No.
Checked By		12/87	00	1 of 1	601



Maximum spacing between cones and tubular markers shall be 25'
 Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows:
 15' up to 25 MPH; 30' for 30 - 40 MPH;
 50' for 45 MPH and greater.

Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50' Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers For First 25'
 Thereafter At 100' Centers.

GENERAL NOTES

- All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.
- If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
- When four or more work vehicles enter the through traffic lanes in a one hour period or less, the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs, see Index No. 603
- The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations
 Type B Lights and Orange Flags are not required.
- The WORKERS legend sign may be substituted for the symbol sign.
- All signs shall be post mounted if the work operation time exceeds 12 hours.
- $L (min) = \frac{WS}{2}$ for speeds ≥ 45 mph
 $= \frac{WS^2}{120}$ for speeds ≤ 40 mph
 Where:
 W = Width of shoulder in feet, 8' minimum.
 S = Posted speed limit (mph)
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- WORKERS sign to be removed or fully covered when no work is being performed.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
 (Tubular Markers May Be Used During Daylight Only.
 Cones May Be Used -See Index 600).
- Work Zone Sign

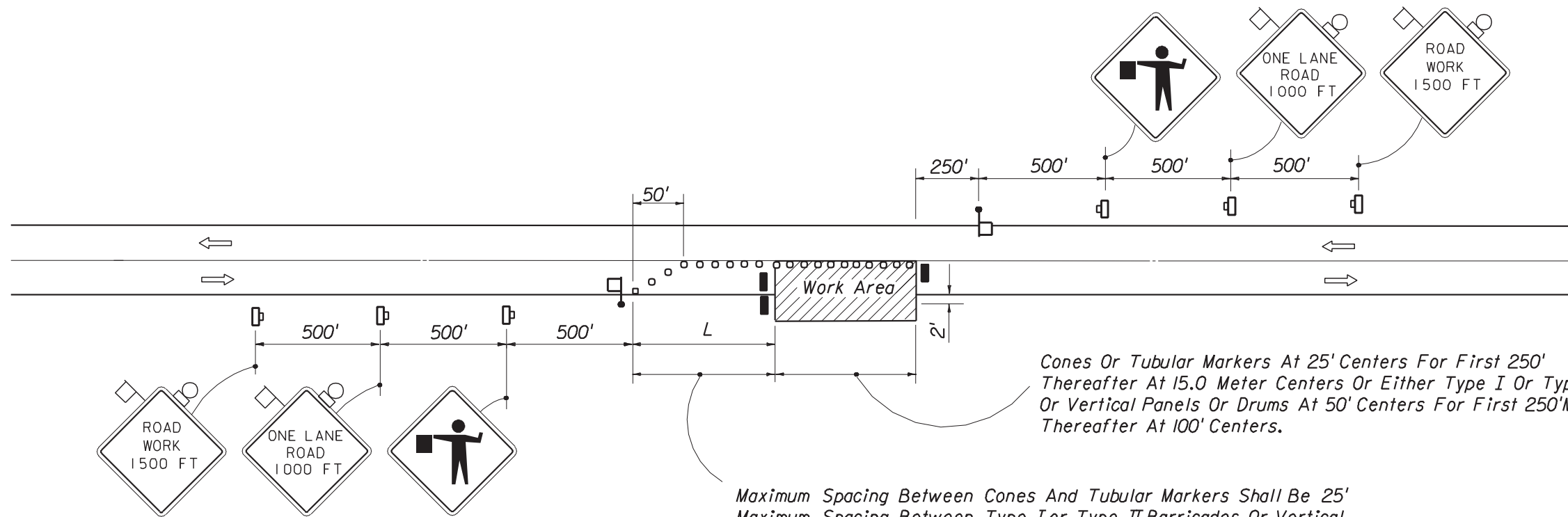
TYPICAL APPLICATIONS

- Utility Work
- Culvert Extensions
- Side Slope Work
- Guardrail Work
- Landscaping Work
- Cleaning Drainage Structures
- Reworking Ditches
- Sign Installation And Maintenance
- Shoulder Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
TRAFFIC CONTROL THROUGH WORK ZONES					
TWO-LANE, TWO-WAY • RURAL DAY OR NIGHT OPERATIONS					
Names	Dates	Approved By			
Designed By	12/87	James D. Mill Roadway Design Engineer			
Drawn By	12/87	Revision	Sheet No.	Index No.	
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Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 15.0 Meter Centers Or Either Type I Or Type II Barricades
 Or Vertical Panels Or Drums At 50' Centers For First 250' Meters
 Thereafter At 100' Centers.

Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I or Type II Barricades Or Vertical
 Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30 MPH - 40 MPH;
 50' For 45 MPH And Greater.

GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
2. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
3. If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
4. Additional one-way control may be effected by the following means:
 (1) Flag-carrying vehicle; (2) Official vehicle;
 (3) Pilot vehicles; (4) Traffic signals.
 When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
5. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
6. The FLAGGER legend sign may be substituted for the symbol sign.

7. $L (min) = \frac{WS}{2}$ for speeds ≥ 45 mph
 $= \frac{WS^2}{120}$ for speeds ≤ 40 mph

Where:
 W = Width of lateral transition in feet
 S = Posted speed limit (mph)

8. The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
12. For general TCZ requirements and additional information, refer to Index No. 600.

TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work

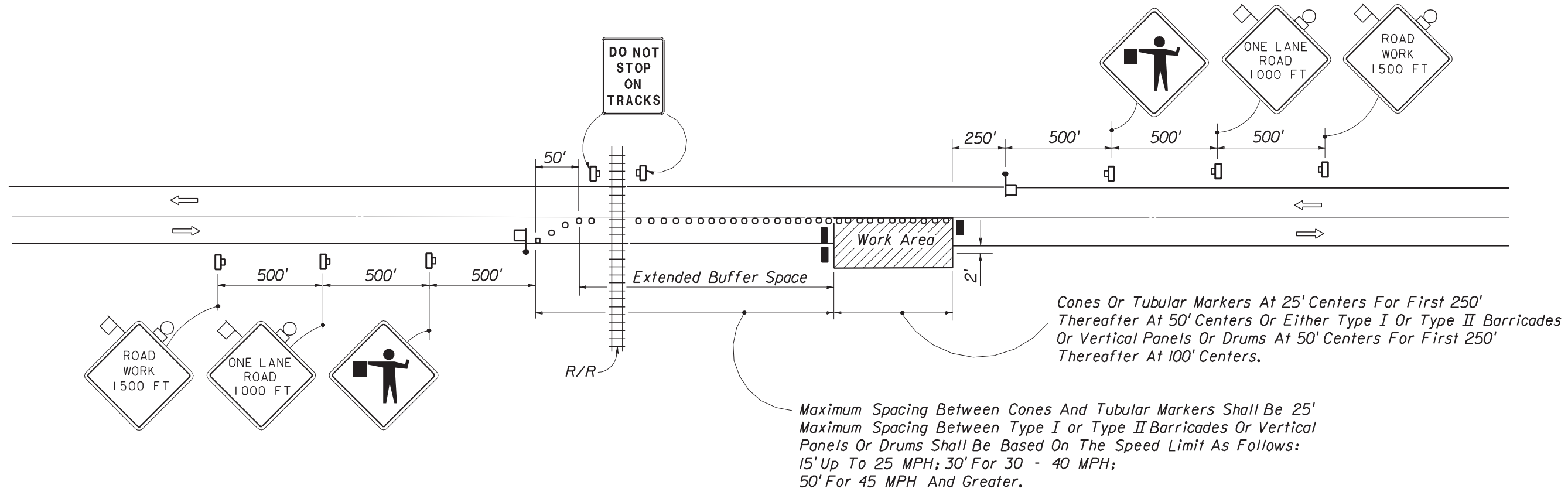
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF PAVEMENT

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL OPERATIONS ONE DAYLIGHT PERIOD OR LESS				
Names	Dates	Approved By		
Designed By	12/87			
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GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
2. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
3. When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
4. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
5. The FLAGGER legend sign may be substituted for the symbol sign.
6. The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
7. Arrows denote direction of traffic only and do not reflect pavement markings.
8. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
9. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
10. For general TCZ requirements and additional information, refer to Index No. 600.
11. Discontinuing of extended buffer space will not occur until the queue length plus 300' is reached.

TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work

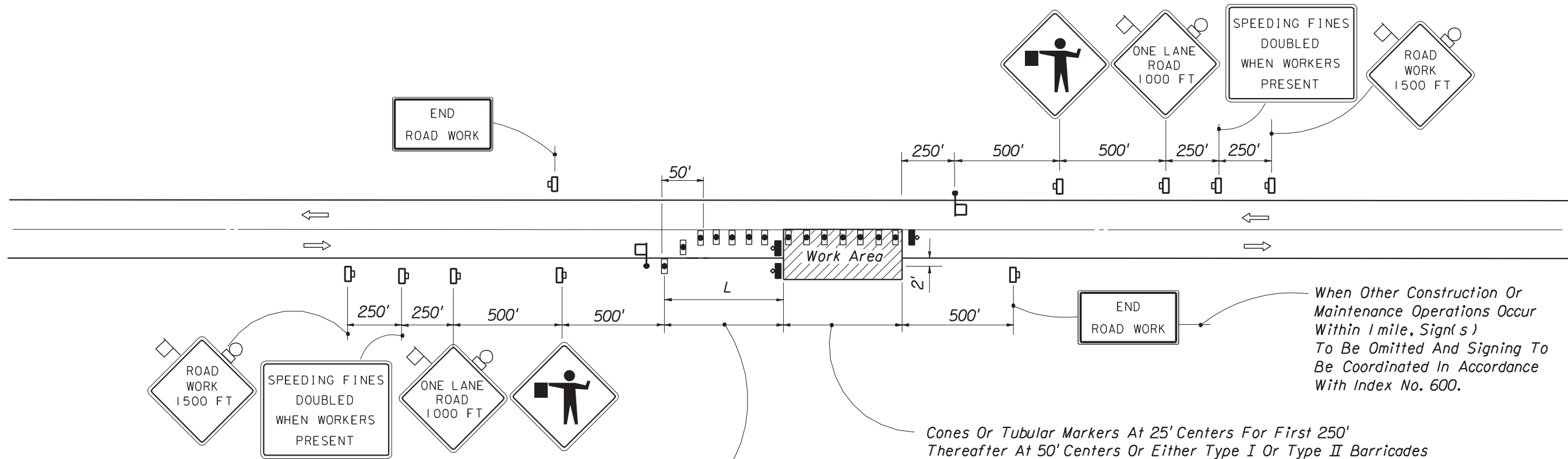
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF PAVEMENT THAT REQUIRES A LANE CLOSURE IN THE VICINITY OF A RAILROAD CROSSING.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL OPERATIONS ONE DAYLIGHT PERIOD OR LESS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	2 of 2	603



Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I or Type II Barricades Or Vertical
 Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30 - 40 MPH;
 50' For 45 MPH And Greater.

Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50' Centers Or Either Type I Or Type II Barricades
 Or Vertical Panels Or Drums At 50' Centers For First 250'
 Thereafter At 100' Centers.

GENERAL NOTES

TYPICAL APPLICATIONS

- Pavement Repair
- Culvert Construction
- Utility Work
- Bridge Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT
 WORKERS OR THEIR ACTIVITIES
 ENCROACH THE AREA BETWEEN
 THE CENTERLINE AND A LINE 2'
 OUTSIDE THE EDGE OF PAVEMENT

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.)
Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel
Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only.
Cones May Be Used -See Index 600).
- Type I, Type II Or Type III Barricade Or
Vertical Panel Or Drum (With Flashing Light)
- Work Zone Sign
- Flagger

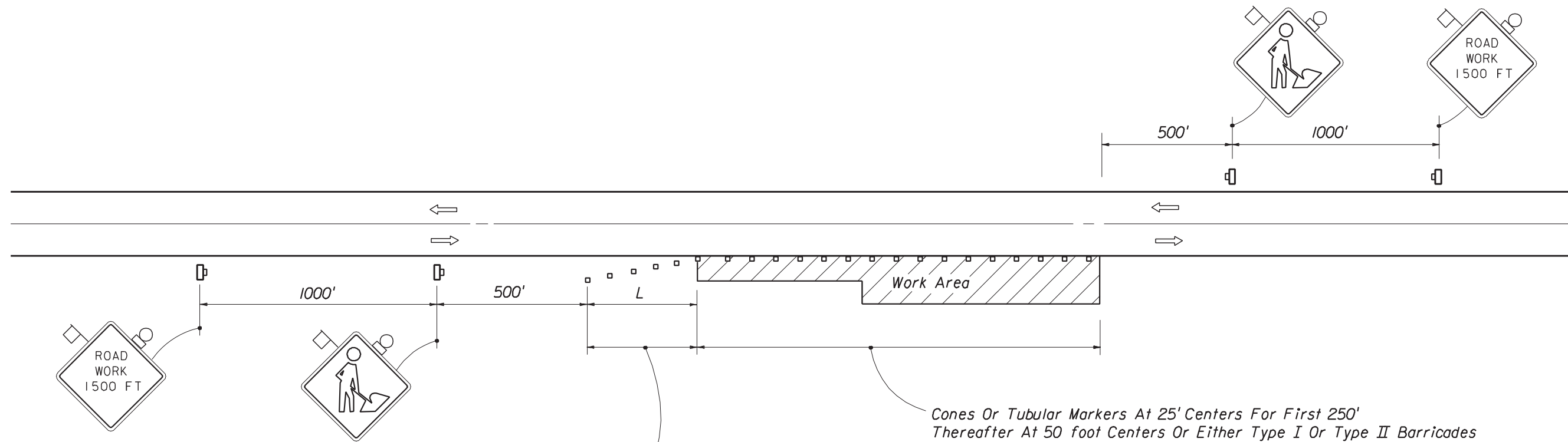
1. Construction operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
2. All vehicles, equipment, workers, (except flaggers) and their activities are restricted at all times to one side of the roadway.
3. Additional one-way control may be effected by the following means:
 (1) Flag-carrying vehicle; (2) Official vehicle;
 (3) Pilot vehicles; (4) Traffic signals.

 When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
4. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
5. The FLAGGER legend sign may be substituted for the symbol sign.
6. All signs shall be post mounted if the closure time exceeds 12 hours.

7. L (min) = $\frac{WS}{2}$ for speeds ≥ 45 mph
 = $\frac{WS^2}{120}$ for speeds ≤ 40 mph

 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph)
8. The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
12. For general TCZ requirements and additional information refer to Index No. 600.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL				
NIGHT OPERATIONS OR OPERATIONS				
EXCEEDING ONE DAYLIGHT PERIOD				
Names	Dates	Approved By		
Designed By	12/87	[Signature]		
Drawn By	12/87	Roadway Design Engineer		
Checked By	12/87	Revision	Sheet No.	Index No.
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Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30 MPH - 40 MPH;
 50' For 45 MPH And Greater.

Cones Or Tubular Markers At 25' Centers For First 250'
 Thereafter At 50 foot Centers Or Either Type I Or Type II Barricades
 Or Vertical Panels Or Drums At 50' Centers For First 250'
 Thereafter At 100' Centers.

GENERAL NOTES

1. All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
2. If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
3. If the work operation encroaches on the through traffic lanes or when four or more work vehicles enter the through traffic lanes in a one hour period flaggers shall be provided and the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs see Index No. 603.
4. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
5. The WORKERS legend sign may be substituted for the symbol sign.
- * 6. Where work activities within 2' of the edge of pavement are incidental (ie. Mowing, Litter Removal) the engineer may delete requirements for cones and signs provided a vehicle with flashing warning lights is present.

7. L (min.) = $\frac{WS}{2}$ for speeds ≥ 45 mph
 = $\frac{WS^2}{120}$ for speeds ≤ 40 mph

Where:
 W = Width of shoulder in feet, 8' minimum.
 S = Posted speed limit (mph)

8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
11. For general TCZ requirements and additional information, refer to Index No. 600.

TYPICAL APPLICATIONS

- Shoulder And Slope Work
- Utility Work
- Guardrail Work
- Landscape Work
- Delineator Installation And Maintenance
- * Mowing
- * Litter Removal

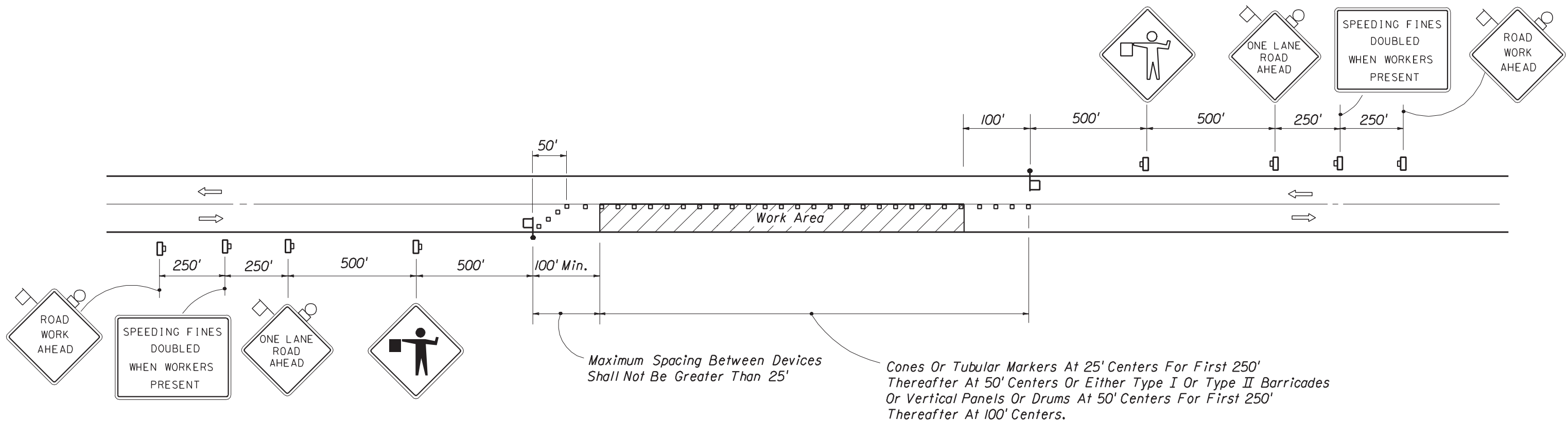
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE AN INTERMITTENT OR CONTINUOUS MOVING OPERATION ON THE SHOULDER OR SHOULDER AND SLOPES

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL MOVING OPERATIONS-DAYLIGHT ONLY				
Names	Dates	Approved By <i>Samuel D. Mill</i>		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	1 of 1	605



GENERAL NOTES

- All vehicles, equipment, workers (except flaggers), and their activities are restricted at all times to one side of the roadway.
- Minimum length of work area is 200'. Maximum length to be determined by the Engineer, but in no case to exceed the length of one-half ($\frac{1}{2}$) days operation or 2 miles whichever is less.
- If the work operation does not exceed 60 minutes, traffic control will be in conformance with Index No. 607.
- Additional one-way control may be effected by the following means:
(1) Flag-carrying vehicle; (2) Official vehicle;
(3) Pilot vehicles; (4) Traffic signals.

When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
- The first two warning signs shall have an 18" x 18" orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
- The FLAGGER legend sign may be substituted for the symbol sign.
- The ONE LANE ROAD AHEAD and FLAGGER signs are to be removed or fully covered when no work is being performed and the highway is open to two-way traffic.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information, refer to Index No. 600.

TYPICAL APPLICATIONS

- Pavement Repair
- Pavement Surfacing
- Utility Work
- Delineator Maintenance
- Crack Sealing
- Core Boring

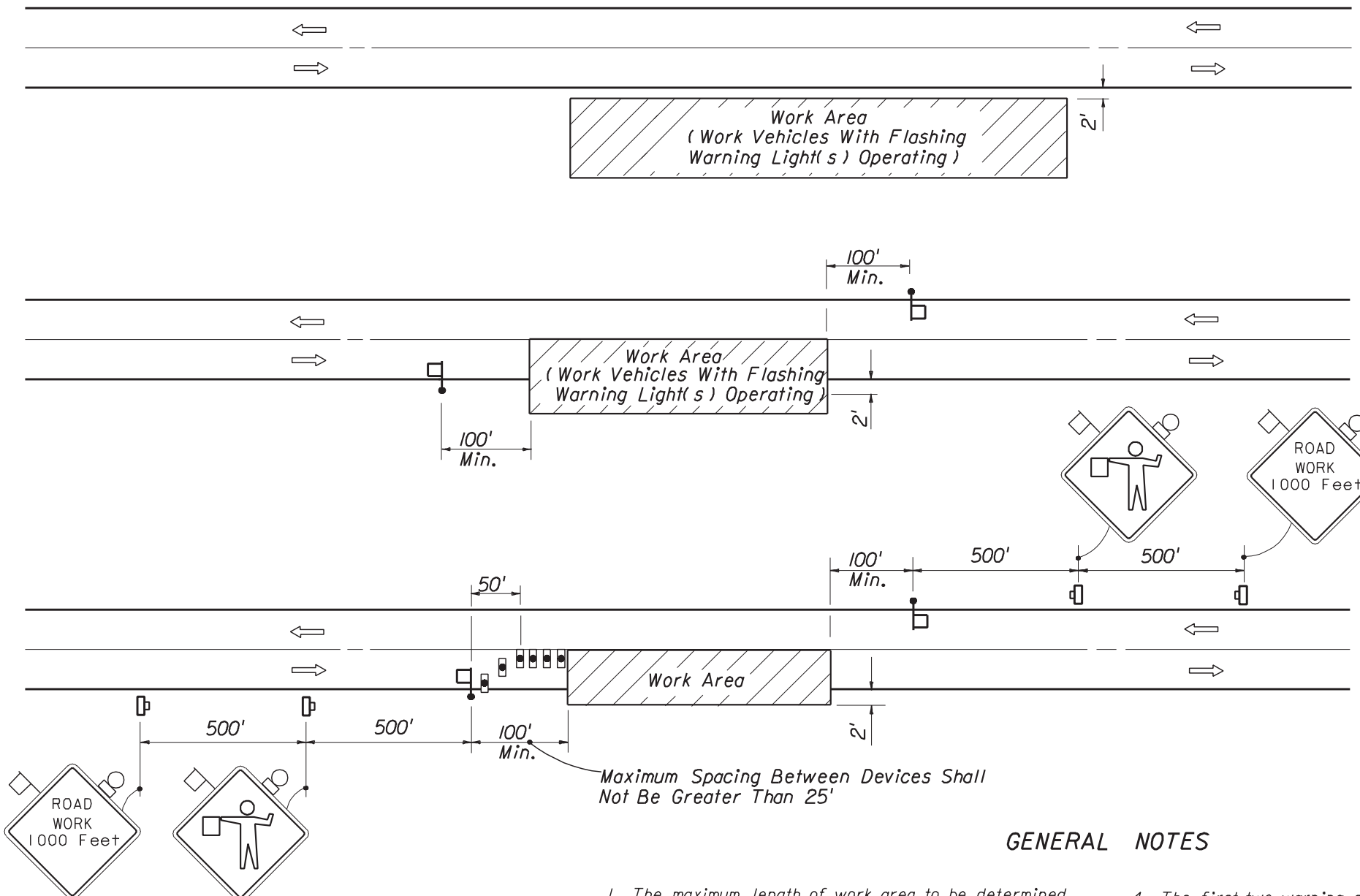
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE AN INTERMITTENT OR CONTINUOUS MOVING OPERATION ON THE PAVEMENT WHERE THE AVERAGE SPEED OF MOVEMENT IS LESS THAN 4 MILES PER HOUR

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL				
MOVING OPERATIONS-DAYLIGHT ONLY				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Roadway Design Engineer		
Checked By	12/87	Revision	Sheet No.	Index No.
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CONDITIONS
 FOR ANY OPERATION THAT IS 2' OR MORE
 OUTSIDE THE EDGE OF THE PAVEMENT FOR A
 PERIOD OF LESS THAN 60 MINUTES.

CONDITIONS
 FOR ANY OPERATION THAT ENCROACHES IN THE
 AREA BETWEEN THE CENTERLINE AND A LINE
 2' OUTSIDE THE EDGE OF THE PAVEMENT
 FOR A PERIOD OF 15 MINUTES OR LESS

CONDITIONS
 FOR ANY OPERATION THAT ENCROACHES IN THE
 AREA BETWEEN THE CENTERLINE AND A LINE
 2' OUTSIDE THE EDGE OF THE PAVEMENT
 FOR A PERIOD IN EXCESS OF 15 MINUTES BUT
 LESS THAN 60 MINUTES.

GENERAL NOTES

- The maximum length of work area to be determined by the Engineer, but in no case to exceed the length of one-half (1/2) days operation or 2 miles whichever is less.
- All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.
- Additional one-way control may be effected by the following means:
 (1) Flag-carrying vehicle; (2) Official vehicle;
 (3) Pilot vehicles; (4) Traffic signals.
 When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
- The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations
 Type B Lights and Orange Flags are not required.
- The FLAGGER legend sign may be substituted for the symbol sign.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

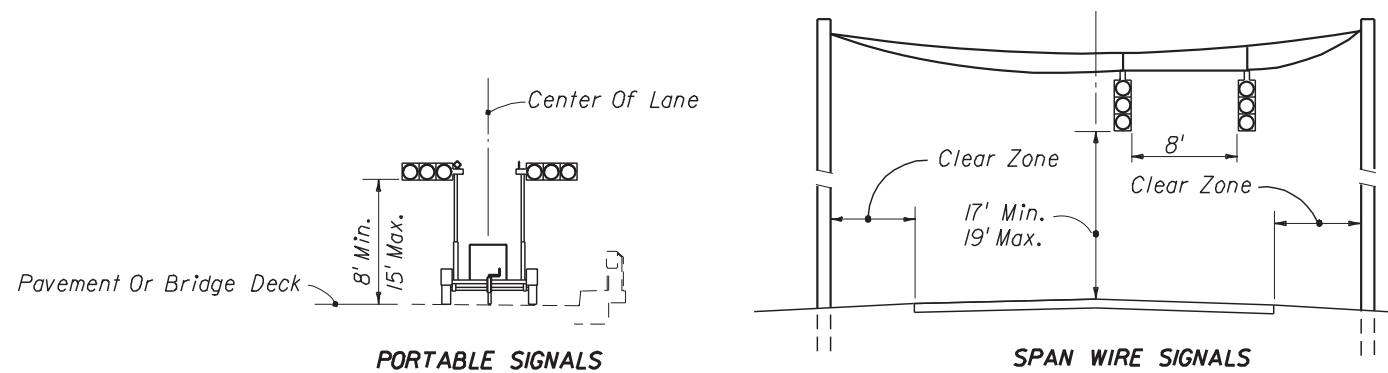
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Work Zone Sign
- Flagger

TYPICAL APPLICATIONS

- Marking Patches
- Field Patches
- String Line
- Utility Work
- Cleaning Up Debris On Pavement
- Pavement Coring And Straight Edging

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES TWO-LANE TWO-WAY • RURAL SHORTTIME DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	1 of 1	607



SIGNAL MOUNT DETAILS

GENERAL NOTES

1. Work operations shall be confined to one traffic lane, except for haul road crossings, leaving the opposite lane open to traffic.
2. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway, except for haul road crossings.
3. The installation and timing of signals shall be approved by the District Traffic Operations Engineer prior to signals being placed in operation.
Where sight distance to the signal is limited, the signals may be mounted on span wire at the discretion of the Engineer.
The maximum distance between portable traffic signals (receiver/controllers) shall be .25 mile, however, in no case shall the distance exceed the maximum distance at which the remote operator (transmitter) can positively and safely operate both portable signals.
4. Flaggers to supplement the signal operator/flagger shall be used when needed to assure safe movements between traffic and operating equipment, as determined by the Engineer.
5. The first two warning signs shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
6. When needed, an additional warning sign may be installed in advance of the ROAD WORK AHEAD sign. The distance between successive signs shall be 500'.
7. The SIGNAL AHEAD legend sign may be substituted for the symbol sign.
8. All signs shall be post mounted if the closure time exceeds 12 hours.
9. SIGNAL AHEAD and EQUIPMENT CROSSING AHEAD signs are to be removed or fully covered when no work is being performed and the highway is open to two-way traffic. Type III Barricades shall be in place to block haul road access when the haul road is not in operation and a flagger/signal operator is not on duty, except when the haul road is an existing properly marked road.
10. Arrows denote direction of traffic only and do not reflect pavement markings.
11. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
12. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
13. For general TCZ requirements and additional information refer to Index No. 600.
14. Span wire signals are to be used only in work zones with workers present, where the contractor can monitor signal operation and maintain traffic with flaggers in the event of a power failure.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Work Zone Sign
- Traffic Signal
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
- Type III Barricade
- Stop Bar
- Flagger
- Portable Signal

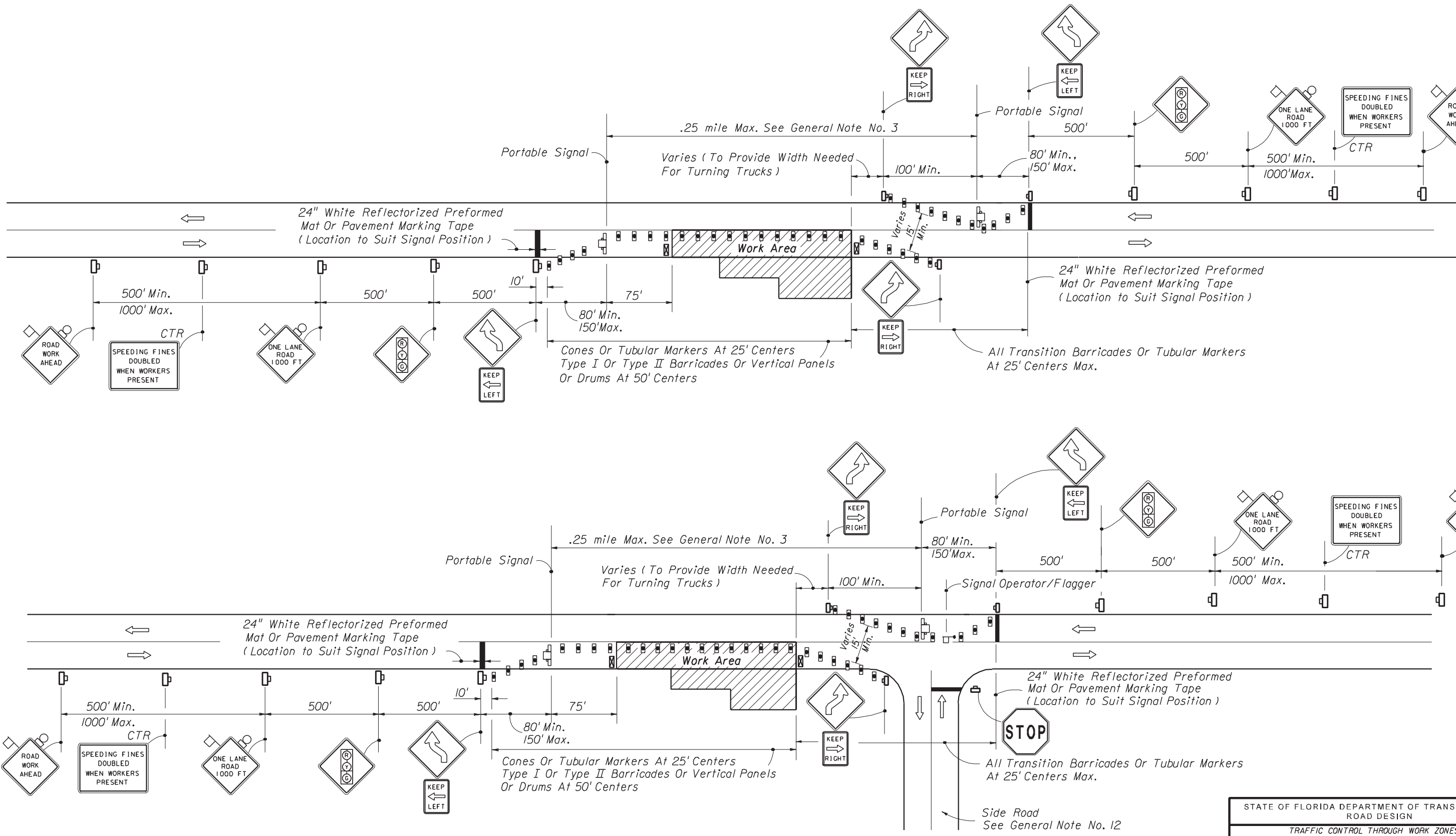
TYPICAL APPLICATION

- Pavement Repair
- Shoulder & Roadside Work
- Bridge Work
- Box Culvert Work
- Drainage Work
- Utility Work
- Haul Road Crossing

CONDITIONS

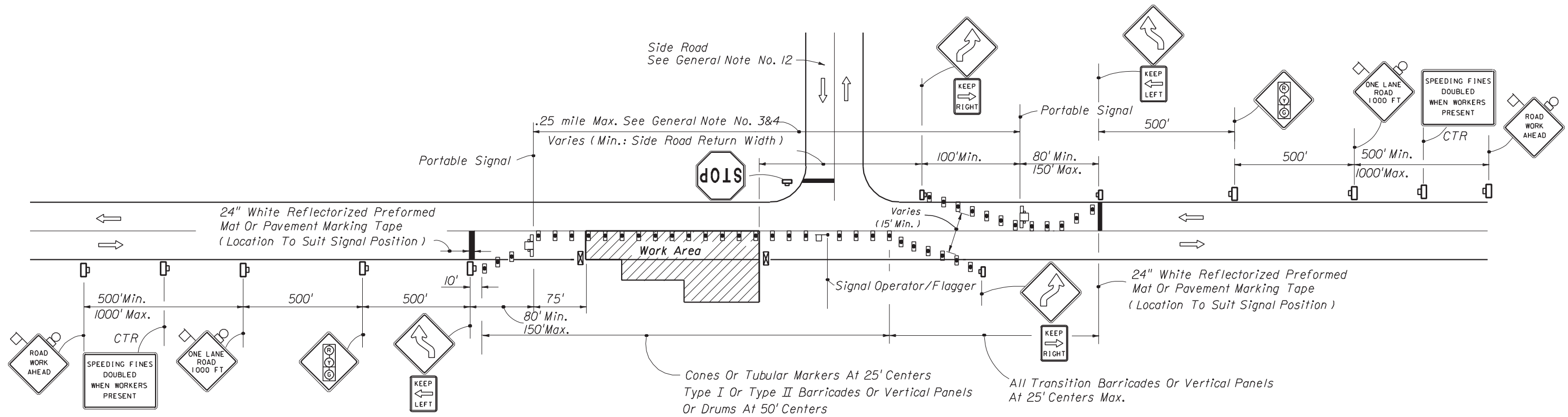
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON ONE LANE OR MOMENTARILY ENCROACH ON BOTH LANES OF A TWO-LANE TWO-WAY ROADWAY AND TRAFFIC SIGNALS ARE NEEDED.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES TWO-LANE, TWO-WAY LANE CLOSURE BY SIGNAL CONTROL DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	1 of 4	608

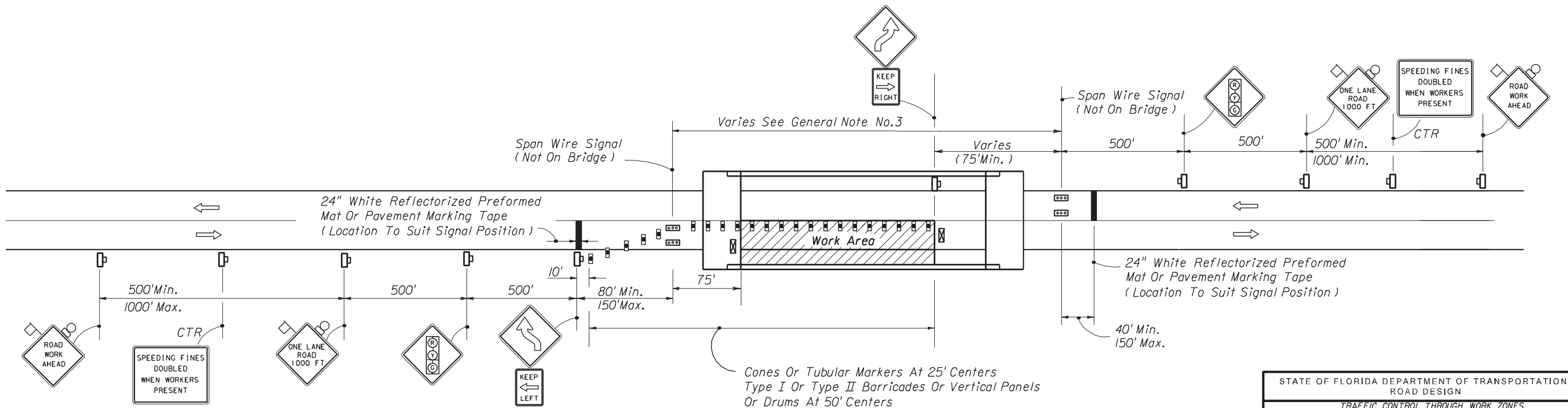


SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY				
LANE CLOSURE BY SIGNAL CONTROL				
DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	5/89	[Signature]		
Drawn By	5/89	Revision	Sheet No.	Index No.
Checked By	5/89	00	2 of 4	608

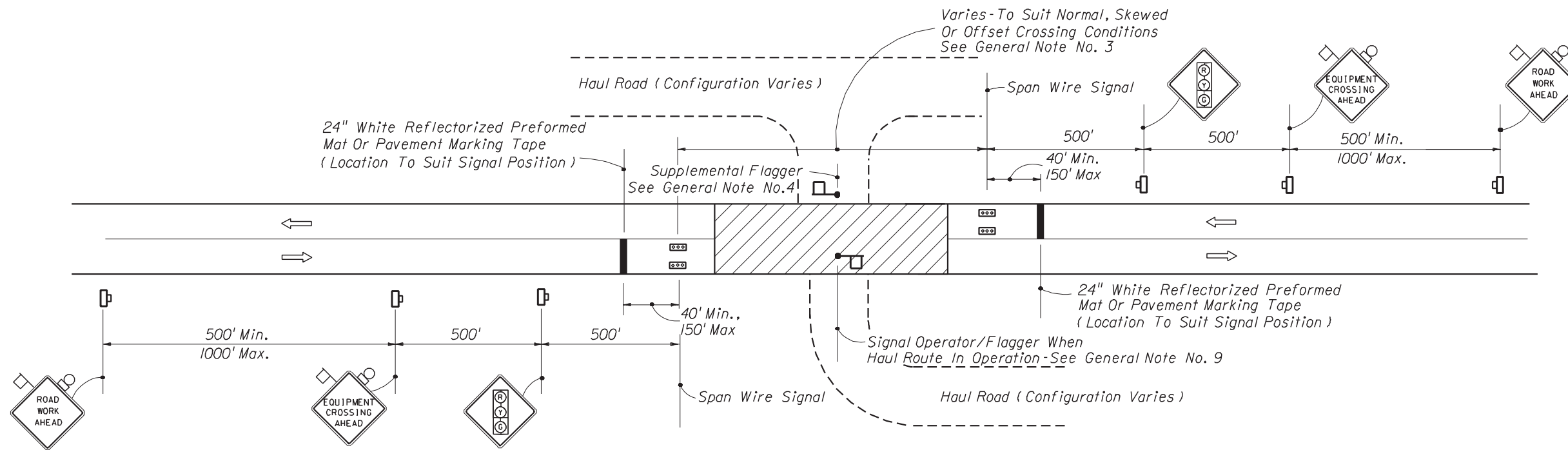


SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS



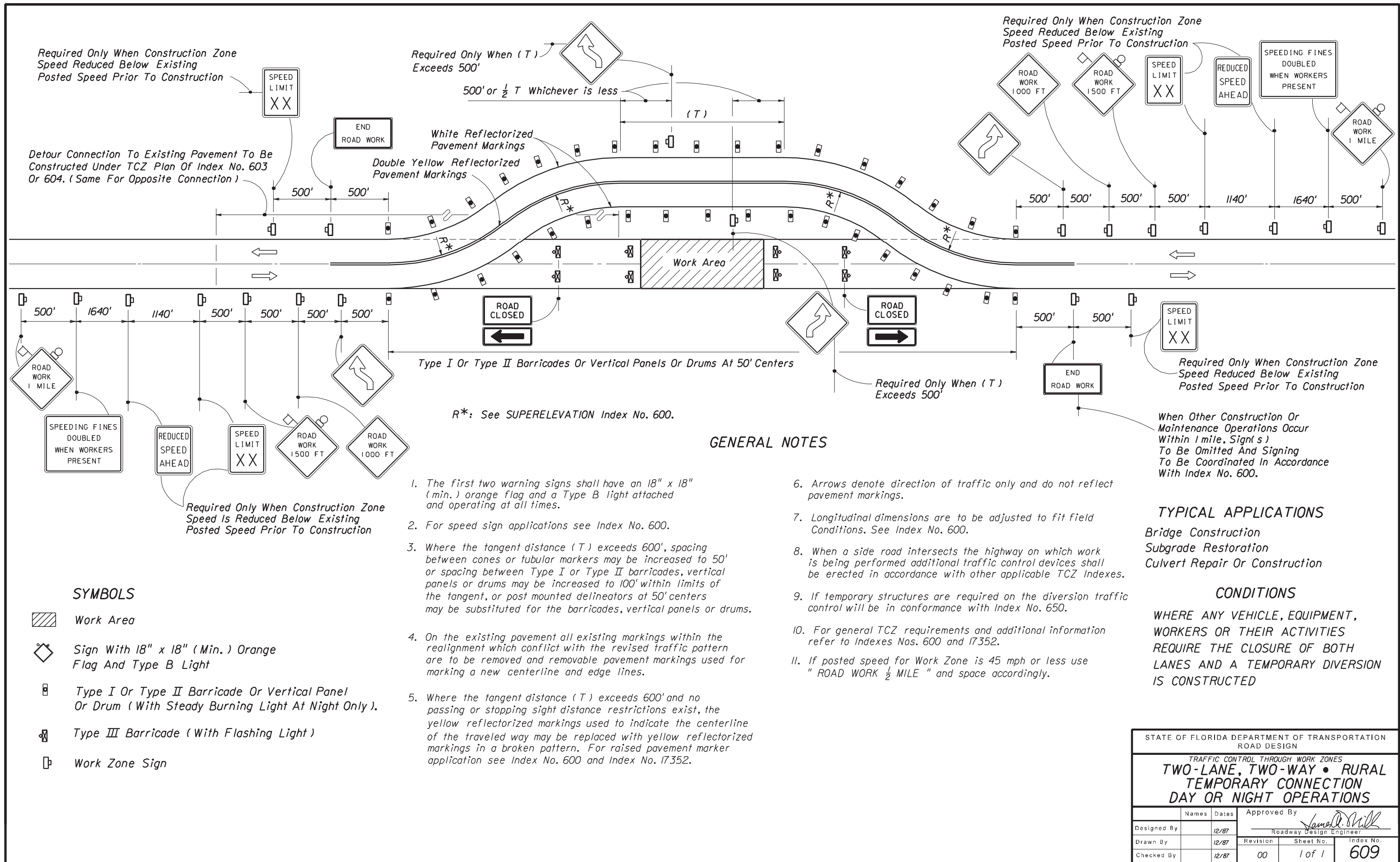
SINGLE LANE CLOSURE • SHORT BRIDGES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY				
LANE CLOSURE BY SIGNAL CONTROL				
DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		5/89	Roadway Design Engineer	
Checked By		5/89	Revision	Sheet No.
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MOMENTARY ROADWAY CLOSURE • HAUL ROUTE CROSSING

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES TWO-LANE, TWO-WAY LANE CLOSURE BY SIGNAL CONTROL DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	5/89	Roadway Design Engineer		
Drawn By	5/89	Revision	Sheet No.	Index No.
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GENERAL NOTES

1. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
2. For speed sign applications see Index No. 600.
3. Where the tangent distance (T) exceeds 600', spacing between cones or tubular markers may be increased to 50' or spacing between Type I or Type II barricades, vertical panels or drums may be increased to 100' within limits of the tangent, or post mounted delineators at 50' centers may be substituted for the barricades, vertical panels or drums.
4. On the existing pavement all existing markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for marking a new centerline and edge lines.
5. Where the tangent distance (T) exceeds 600' and no passing or stopping sight distance restrictions exist, the yellow reflectORIZED markings used to indicate the centerline of the traveled way may be replaced with yellow reflectORIZED markings in a broken pattern. For raised pavement marker application see Index No. 600 and Index No. 17352.
6. Arrows denote direction of traffic only and do not reflect pavement markings.
7. Longitudinal dimensions are to be adjusted to fit field Conditions. See Index No. 600.
8. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
9. If temporary structures are required on the diversion traffic control will be in conformance with Index No. 650.
10. For general TCZ requirements and additional information refer to Indexes Nos. 600 and 17352.
11. If posted speed for Work Zone is 45 mph or less use " ROAD WORK 1/2 MILE " and space accordingly.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
- Type III Barricade (With Flashing Light)
- Work Zone Sign

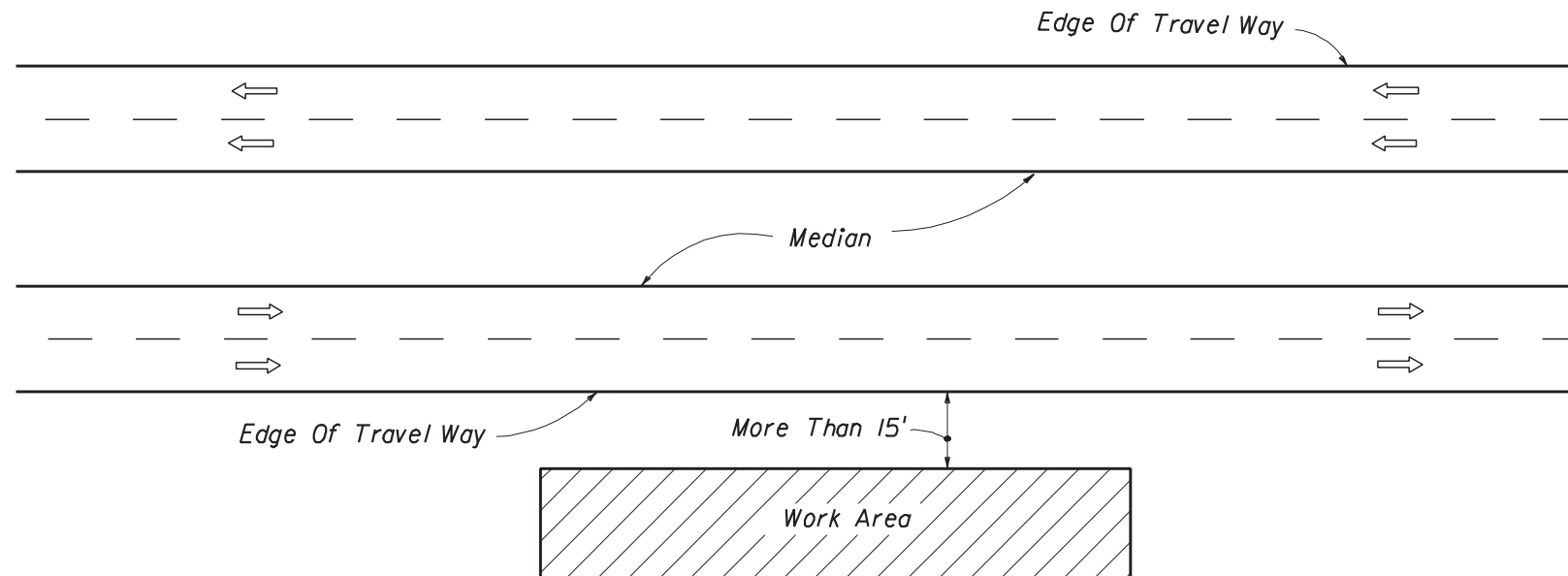
TYPICAL APPLICATIONS

- Bridge Construction
- Subgrade Restoration
- Culvert Repair Or Construction

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF BOTH LANES AND A TEMPORARY DIVERSION IS CONSTRUCTED

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL				
TEMPORARY CONNECTION				
DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	[Signature]		
Drawn By	12/87	Roadway Design Engineer		
Checked By	12/87	Revision	Sheet No.	Index No.
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GENERAL NOTES

1. If the work operation requires that two or more work vehicles cross the 15' zone in any one hour, traffic control will be in conformance with Index No. 602 undivided or Index No. 611 divided.
2. No special signing is required.
3. This index also applies when work is being performed on a multilane undivided highway.
4. This index also applies to work performed in the median more than 15' from edge of travel way, both roadways.
5. Arrows denote direction of traffic only and do not reflect pavement markings.
6. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
7. For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS

Work Area

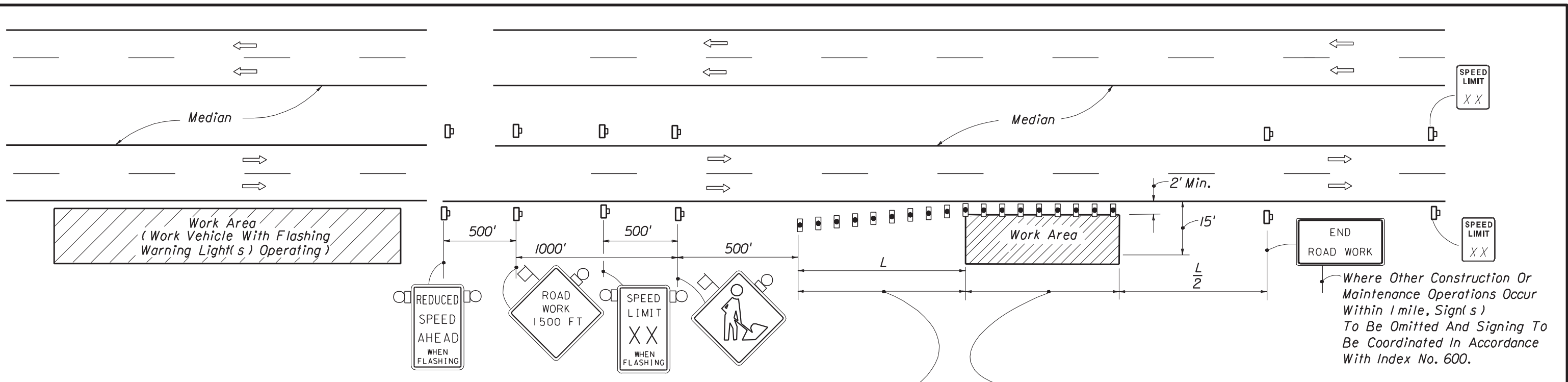
TYPICAL APPLICATIONS

- Landscaping Work
- Utility Work
- Fencing Work
- Cleaning Drainage Structures
- Reworking Ditches

CONDITIONS

WHERE ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE MORE THAN 15' FROM THE EDGE OF PAVEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED OR UNDIVIDED				
RURAL • DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
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CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF PAVEMENT FOR A PERIOD OF LESS THAN 60 MINUTES

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Work Zone Sign

Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30 - 40 MPH;
 50' For 45 MPH And Greater.

GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
2. If the work operation encroaches on the through traffic lanes or when four or more work vehicles enter the through traffic lanes in a one hour period a flagger shall be provided and a FLAGGER sign shall be substituted for the WORKERS sign. The flagger shall be positioned at the point of vehicle entry or departure from the work area.
3. This TCZ plan also applies to work performed in the median more than 2' but less than 15' from the edge of either pavement.
4. The first two warning signs, each side, shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations
 Type B Lights and Orange Flags are not required.
5. The WORKERS legend sign may be substituted for the symbol sign.
6. $L (min) = \frac{WS}{2}$ for speeds ≥ 45 mph
 $= \frac{WS^2}{120}$ for speeds ≤ 40 mph
7. Arrows denote direction of traffic only and do not reflect pavement markings.
8. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
9. When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
10. WORKERS signs to be removed or fully covered when no work is being performed.
11. END ROAD WORK signs required only when work exceeds one daylight period.
12. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
13. If the work operation does not exceed 15 minutes, signs, barricades, vertical panels, cones, tubular markers, or drums will not be required provided vehicles in the work area have warning light(s) operating.
14. For general TCZ requirements and additional information refer to Index No. 600.

Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit

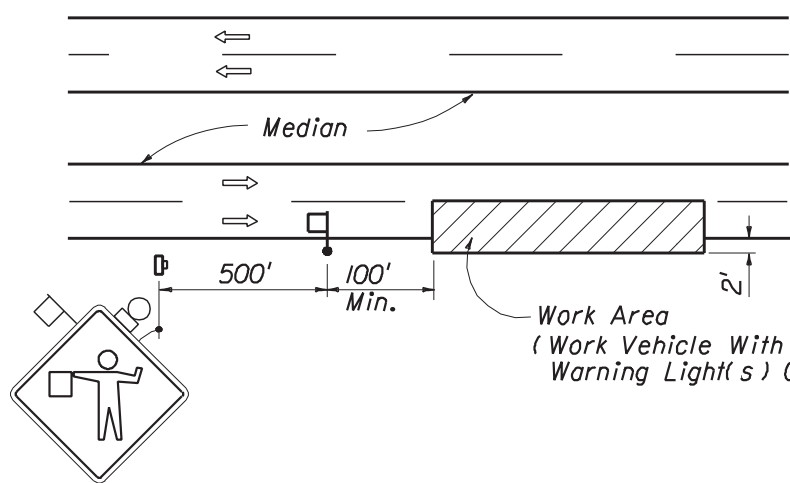
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF PAVEMENT FOR A PERIOD OF 60 MINUTES OR GREATER

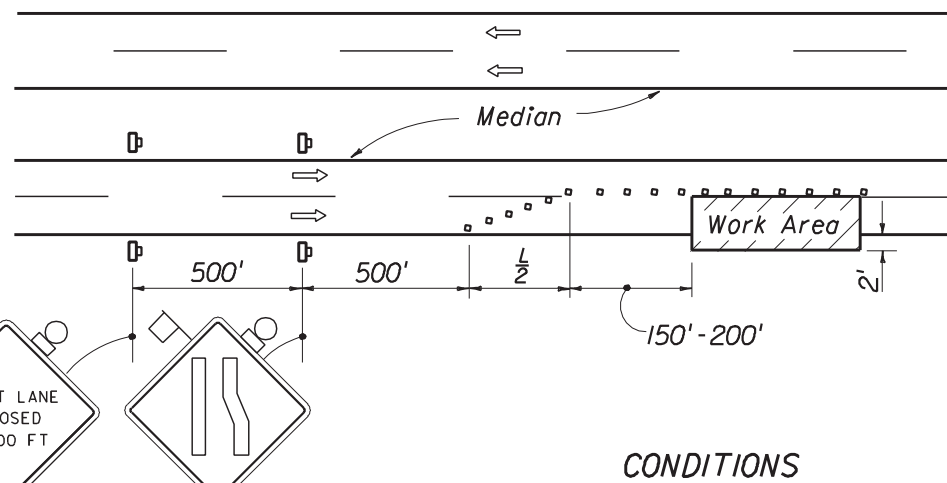
TYPICAL APPLICATIONS

- Utility Work
- Culvert Extensions
- Side Slope Work
- Guardrail Work
- Landscaping Work
- Cleaning Drainage Structures
- Reworking Ditches
- Sign Installation And Maintenance
- Shoulder Repair

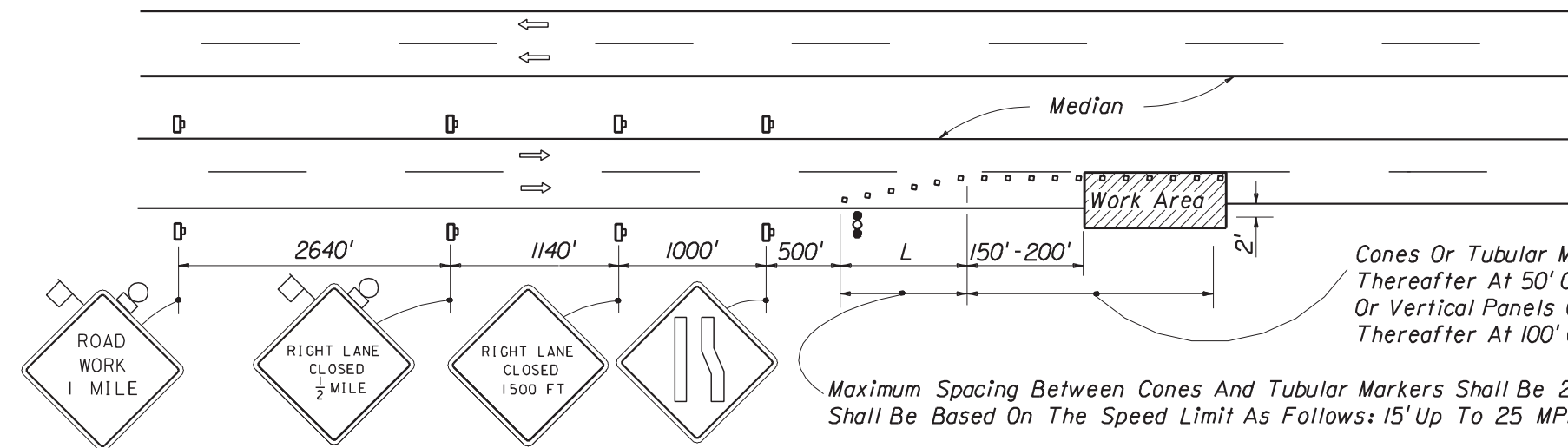
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED OR UNDIVIDED				
RURAL • DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Roadway Design Engineer		
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CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF PAVEMENT FOR A PERIOD OF 15 MINUTES OR LESS



CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF PAVEMENT FOR A PERIOD OF MORE THAN 15 MINUTES BUT LESS THAN 60 MINUTES



CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF PAVEMENT FOR A PERIOD OF 60 MINUTES OR GREATER

Cones Or Tubular Markers At 25' Centers For First 250' Thereafter At 50' Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers For First 250' Thereafter At 100' Centers.

Maximum Spacing Between Cones And Tubular Markers Shall Be 25'. Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows: 15' Up To 25 MPH; 30' For 30 - 40 MPH; 50' For 45 MPH And Greater.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Flagger
- Advance Warning Arrow Panel

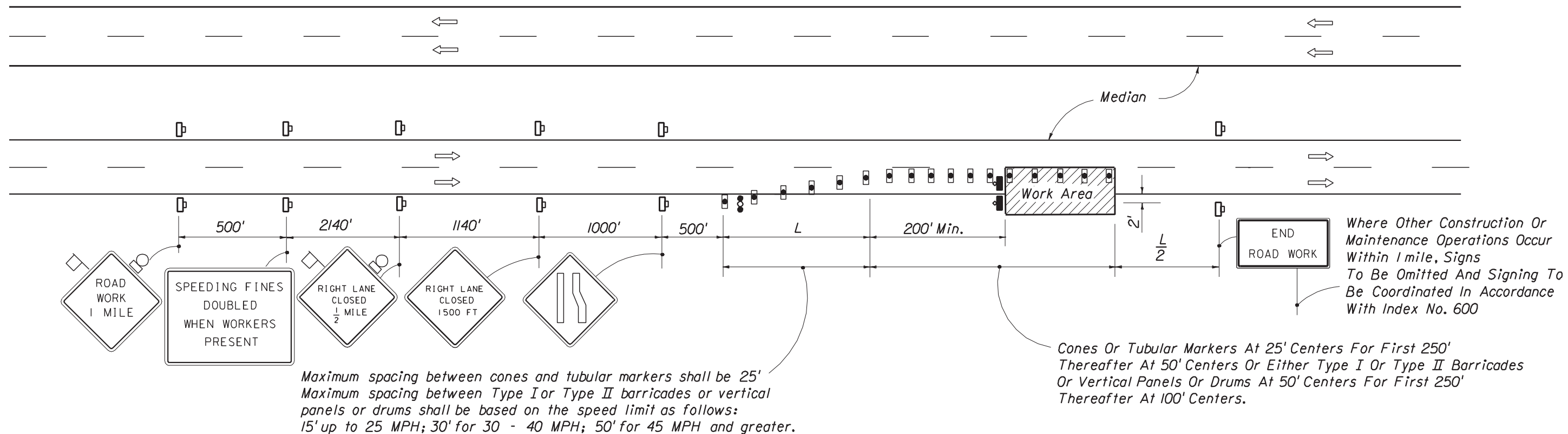
GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the adjacent lane open to traffic.
2. All vehicles, equipment, workers, and their activities are restricted at all times to one side of the roadway.
3. The first two warning signs, each side, shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
4. On undivided highways the median signs as shown are to be omitted.
5. When work is performed in the median lane on divided highways the barricading plan is inverted and left lane closed and lane reduction signs substituted for the right lane closed and lane reduction signs.
 The same applies to undivided highways with the following exceptions: (a) Work shall be confined within one median lane. (b) Additional barricades, cones, or drums shall be placed along the centerline abutting the work area and across the trailing end of the work area.
 When work on undivided highways occurs across the centerline so as to encroach on both median lanes, the inverted plan is applied to the approach of both roadways.
6. The RIGHT (LEFT) LANE CLOSED signs are to be removed or fully covered when no work is being performed and the highway is open to traffic.
7. L (min.) = Length of taper feet :
 = WS for speeds ≥ 45 mph
 = $\frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet
 S = Posted speed limit
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
11. This TCZ plan does not apply when work is being performed in the middle or inside lane(s) of a six or more lane highway. See Indexes Nos. 616 and 617.
12. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
13. For general TCZ requirements and additional information, refer to Index No. 600.

TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work
- Pavement Coring And Straight Edging

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, DIVIDED AND UNDIVIDED RURAL • OPERATIONS ONE DAYLIGHT PERIOD OR LESS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	1 of 1	612



GENERAL NOTES

1. Work operations shall be confined to one traffic lane, leaving the adjacent lane open to traffic.
2. All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
3. The first two warning signs, each side, shall have a 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
4. All signs shall be post mounted if the closure time exceeds 12 hours.
5. On undivided highways the median signs as shown are to be omitted.
6. When work is performed in the median lane on divided highways the barricading plan is inverted and left lane closed and lane reduction signs substituted for the right lane closed and lane reduction signs.
 The same applies to undivided highways with the following exceptions:
 (a) Work shall be confined within one median lane. (b) Additional barricades, cones, or drums shall be placed along the centerline abutting the work area and across the trailing end of the work area.
 When work on undivided highways occurs across the centerline so as to encroach on both median lanes, the inverted plan is applied to the approach of both roadways.
7. Signs and traffic control devices are to be modified in accordance with INTERMITTENT WORK STOPPAGE details (sheet 2 of 2) when no work is being performed and the highway is open to traffic.

8. L (min.) = Length of taper in feet:
 = WS for speeds ≥ 45 mph
 = $\frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet
 S = Posted speed limit (mph).
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
12. When a side road intersects the highway on which work is being performed, additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
13. For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Pavement Resurfacing
- Pavement Repair
- Utility Work
- Bridge Repair
- Guardrail Work

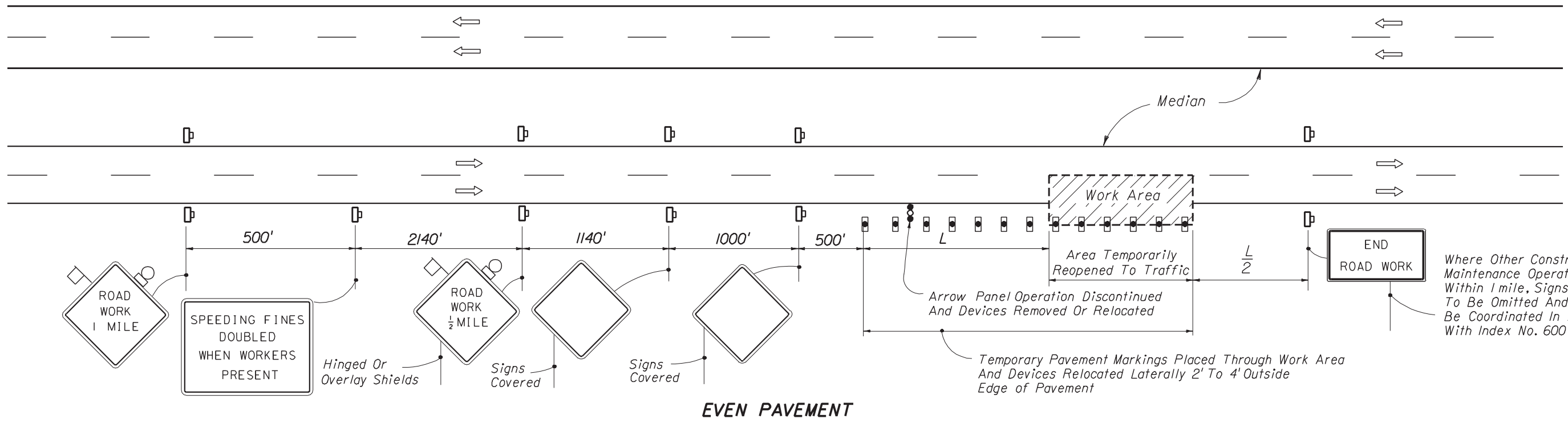
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF PAVEMENT

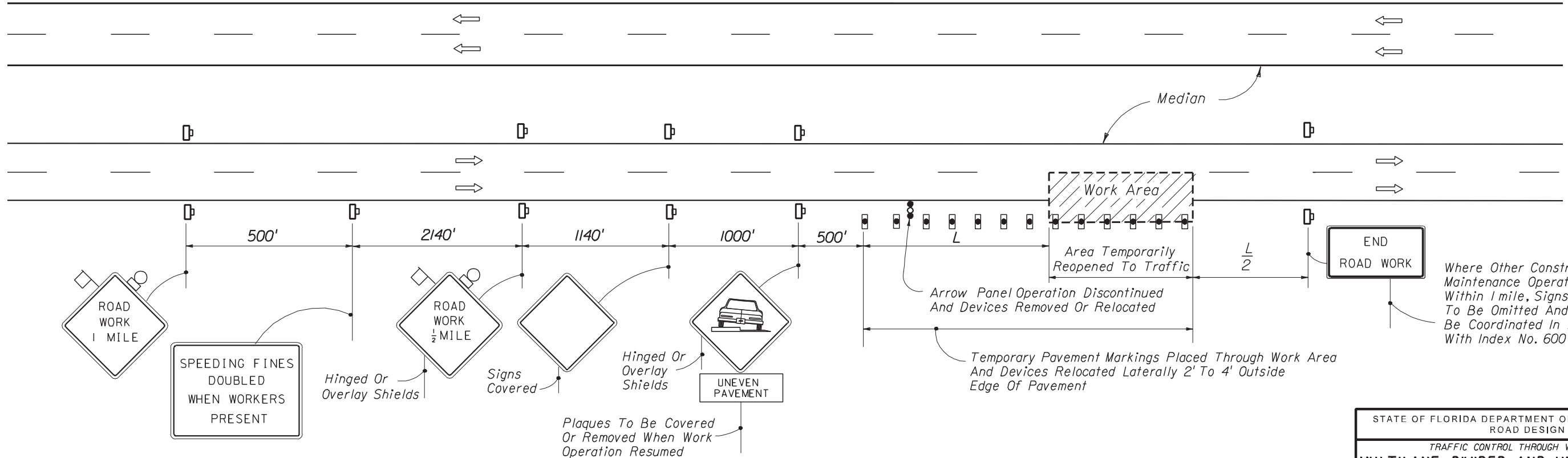
SYMBOLS

- Work Area
- Sign With 18"x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)
- Work Zone Sign
- Advance Warning Arrow Panel

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, DIVIDED AND UNDIVIDED • RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
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EVEN PAVEMENT



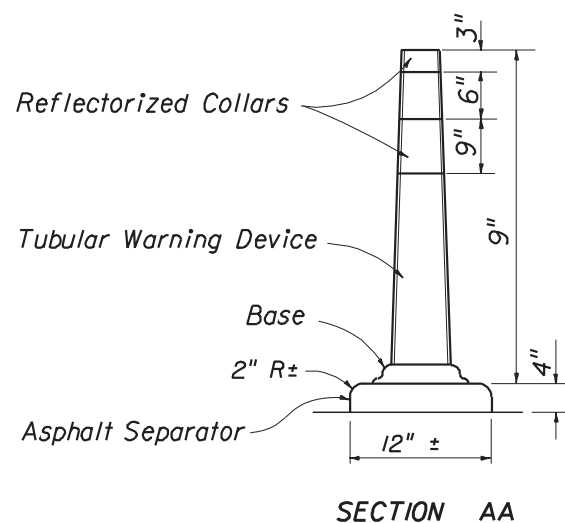
UNEVEN PAVEMENT

INTERMITTENT WORK STOPPAGE • RIGHT LANE REOPENED TO TRAFFIC • DAYTIME OR NIGHTTIME

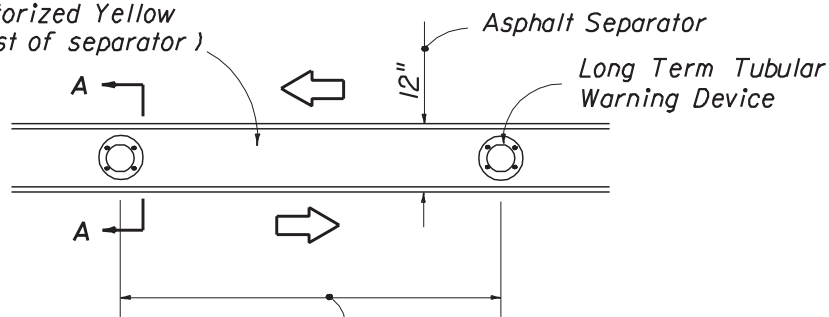
Where Other Construction Or Maintenance Operations Occur Within 1 mile, Signs To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600

Where Other Construction Or Maintenance Operations Occur Within 1 mile, Signs To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES MULTILANE, DIVIDED AND UNDIVIDED • RURAL NIGHT OPERATIONS OR OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
			00	2 of 2 613



Entire Separator Shall Be Painted Reflectorized Yellow (included in cost of separator)



Based On Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30 - 40 MPH;
 50' For 45 MPH And Greater.

- Notes: (a) The tubular device is to be made of a flexible material or have a flexible joint at the base such that it will not cause damage to vehicles upon impact and will return to its original shape after being struck by a 5000 lb. vehicle at a velocity of 75'/sec.
- (b) The tubular device shall be orange with two white reflectorized collars.
- (c) The tubular device may be attached by bituminous adhesive or other methods approved by the Engineer.
- (d) Reflectorized materials shall have a smooth sealed outer surface which will display the same approximate color day and night.
- (e) 12" openings for drainage will be constructed in the separator island every 25' in areas with grades of 1% or less or every 50' in areas with grades over 1% as directed by the Engineer.

DETAIL OF TEMPORARY ASPHALT TRAFFIC SEPARATOR

APPLICATIONS

- Scheme 1:** Restricted Construction Limits
- Scheme 2:** Unrestricted Construction Limits And Light To Moderate Traffic
- Scheme 3:** Unrestricted Construction Limits And Moderate To Heavy Traffic
- Where:** Construction Limits Are The Outward Beginning Or Ending Of Lane Reductions
- Where:** Unless A Specific Scheme Is Called For In The Plans, Scheme Selection Shall Be At The Contractors Option And As Approved By The Engineer

GENERAL NOTES

- All vehicles, equipment, workers and their activities are restricted at all times to one side of the highway.
- The first two warning signs, each side, shall have a 18" x 18" orange flag and a Type B light attached and operating at all times.
- All signs shall be post mounted.
- TWO-WAY TRAFFIC sign(s) shall be repeated every 1/4 mile in each direction, throughout the tangent distance (T).
- L (min.) = WS for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph).
- Where the tangent distance (T) exceeds 250', spacing between Type I or II barricades or vertical panels or drums may be increased to 100' within the limits of the tangent, or post mounted delineators at 50' centers may be substituted for barricades, vertical panels or drums.
- All existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for marking new edge lines.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When side roads, cross roads or interchanges are located within the limits for work zone traffic control additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.
- The contractor has the option of using temporary traffic separators and tubular type warning devices from the qualified products list in lieu of the temporary asphalt traffic separator and tubular warning device detailed above.

CONDITIONS

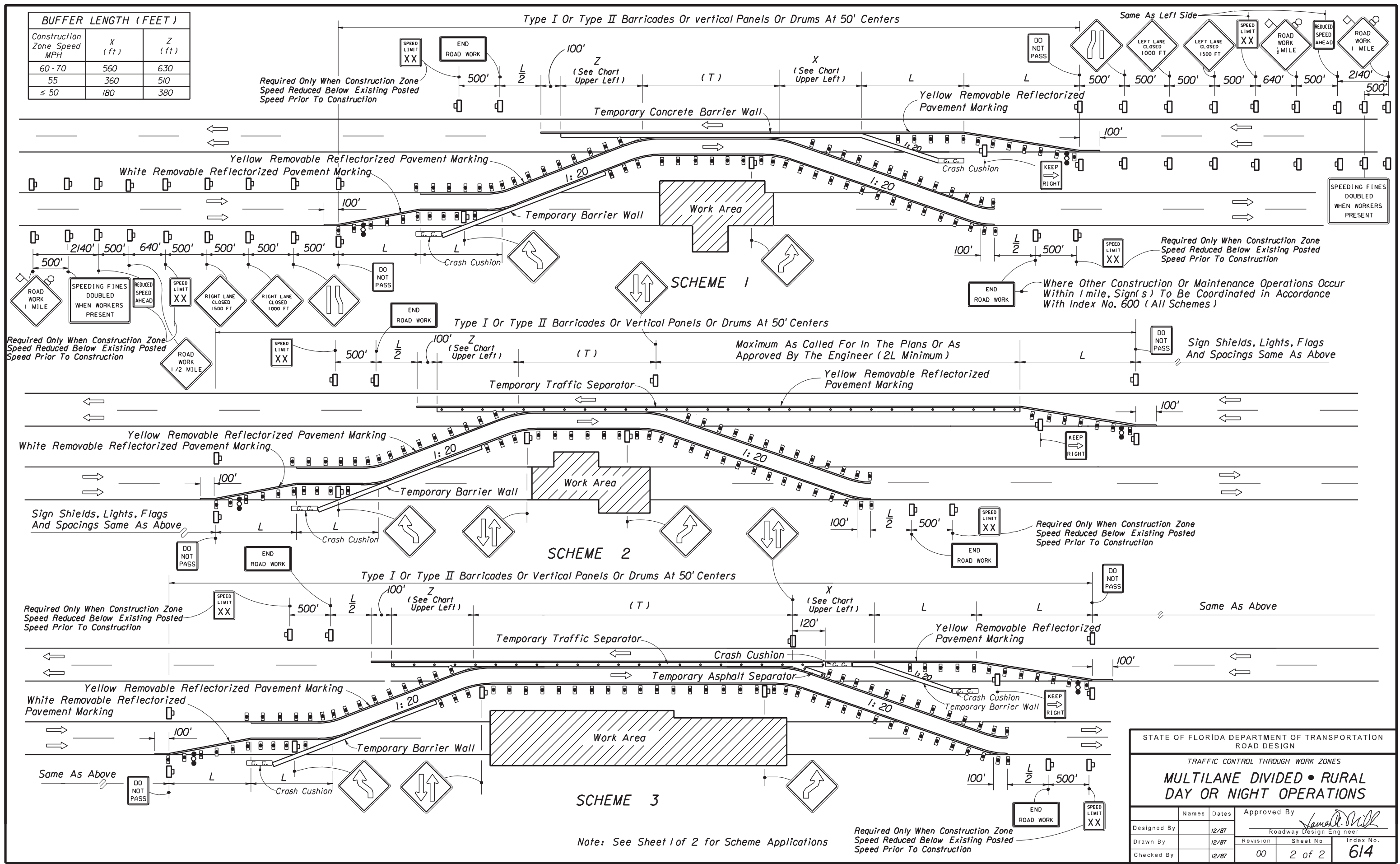
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF ONE ROADWAY AND THE OPPOSING ROADWAY IS CONVERTED TO TEMPORARY TWO-WAY TRAVEL BY WAY OF CROSSOVERS

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Work Zone Sign
- Advance Warning Arrow Panel

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED • RURAL DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
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BUFFER LENGTH (FEET)		
Construction Zone Speed MPH	X (ft)	Z (ft)
60 - 70	560	630
55	360	510
≤ 50	180	380



Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

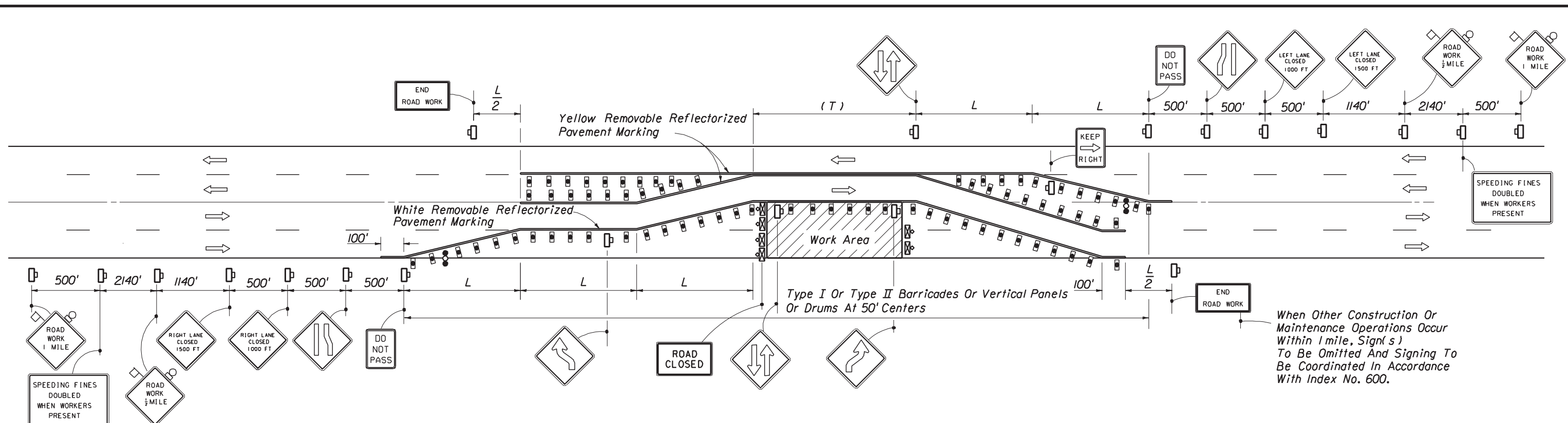
Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Where Other Construction Or Maintenance Operations Occur Within 1 mile, Sign(s) To Be Coordinated In Accordance With Index No. 600 (All Schemes)

Note: See Sheet 1 of 2 for Scheme Applications

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED • RURAL DAY OR NIGHT OPERATIONS				
Designed By		Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No.
			00	2 of 2
			Index No.	614



GENERAL NOTES

- All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
- The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
- All signs, except those required in paved areas, shall be post mounted if the closure time exceeds 12 hours.
- TWO-WAY TRAFFIC signs shall be repeated every 1/4 mile in each direction, through the tangent distance (T).
- L (min.) = WS for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph).
- Where the tangent distance (T) exceeds 250', spacing between cones or tubular markers may be increased to 50' or spacing between Type I or Type II barricades or vertical panels or drums may be increased to 100' within the limits of the tangent.
- This index does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special maintenance of traffic details will be required.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

When Other Construction Or Maintenance Operations Occur Within 1 mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

SYMBOLS

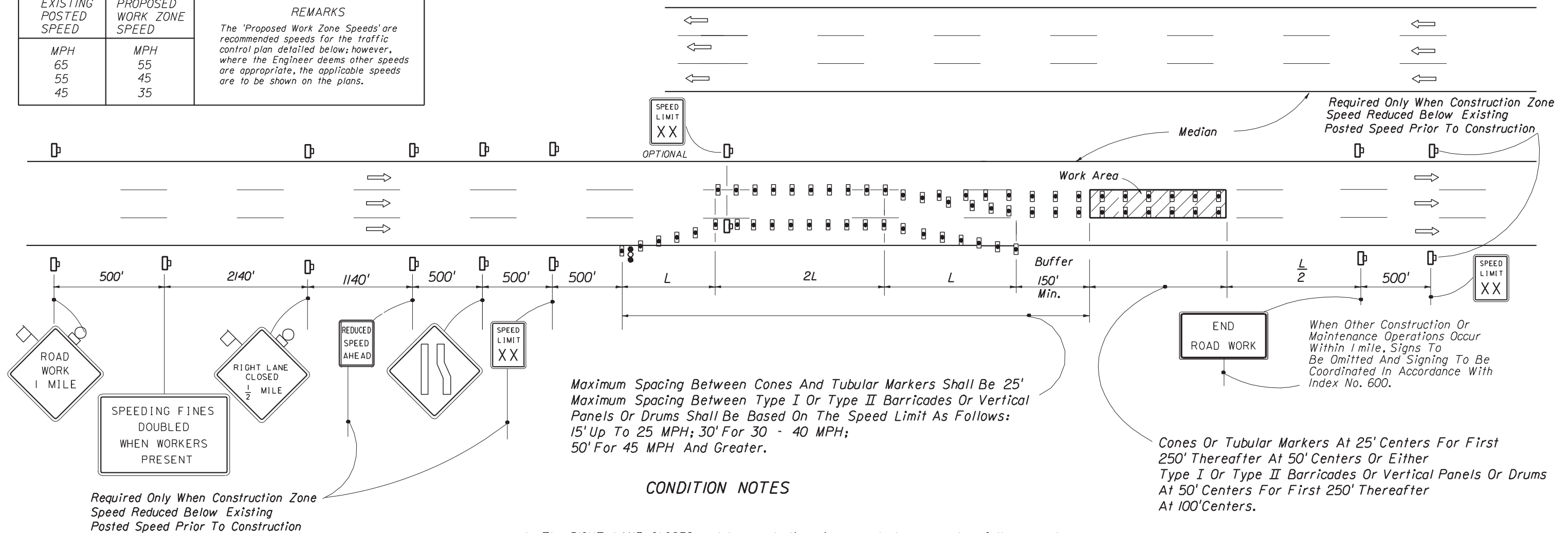
- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index 600)
- Type III Barricade (With Flashing Light)
- Work Zone Sign
- Advance Warning Arrow Panel

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF THE LANES IN ONE DIRECTION AND A DIVERSION IS PROVIDED BY UTILIZING ONE LANE OF THE OPPOSING TRAFFIC LANES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE UNDIVIDED • RURAL DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	1 of 1	615

EXISTING POSTED SPEED	PROPOSED WORK ZONE SPEED	REMARKS
MPH	MPH	The 'Proposed Work Zone Speeds' are recommended speeds for the traffic control plan detailed below; however, where the Engineer deems other speeds are appropriate, the applicable speeds are to be shown on the plans.
65	55	
55	45	
45	35	



Maximum Spacing Between Cones And Tubular Markers Shall Be 25'
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows:
 15' Up To 25 MPH; 30' For 30 - 40 MPH;
 50' For 45 MPH And Greater.

CONDITION NOTES

1. The RIGHT LANE CLOSED and lane reduction signs are to be removed or fully covered when no work is being performed and the center lane is opened to traffic.
2. For work performed in the outside lane refer to Indexes Nos. 612 and 613. For work performed in the inside lane refer to Indexes Nos. 617.
3. When the lane closure exceeds a continuous 24 hour period all existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement marking used for marking new edge lines and centerline.

GENERAL NOTES

1. All vehicles, equipment, workers, and their activities are restricted at all times to one side of the highway.
2. The first two warning signs each side shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.
3. All signs shall be post mounted if closure time exceeds 12 hours.
4. L (min.) = WS for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph).
5. Arrows denote direction of traffic only and do not reflect pavement markings.
6. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
7. END ROAD WORK signs required only when work exceeds one daylight period.
8. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
9. For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Work Zone Sign
- Advance Warning Arrow Panel

TYPICAL APPLICATIONS

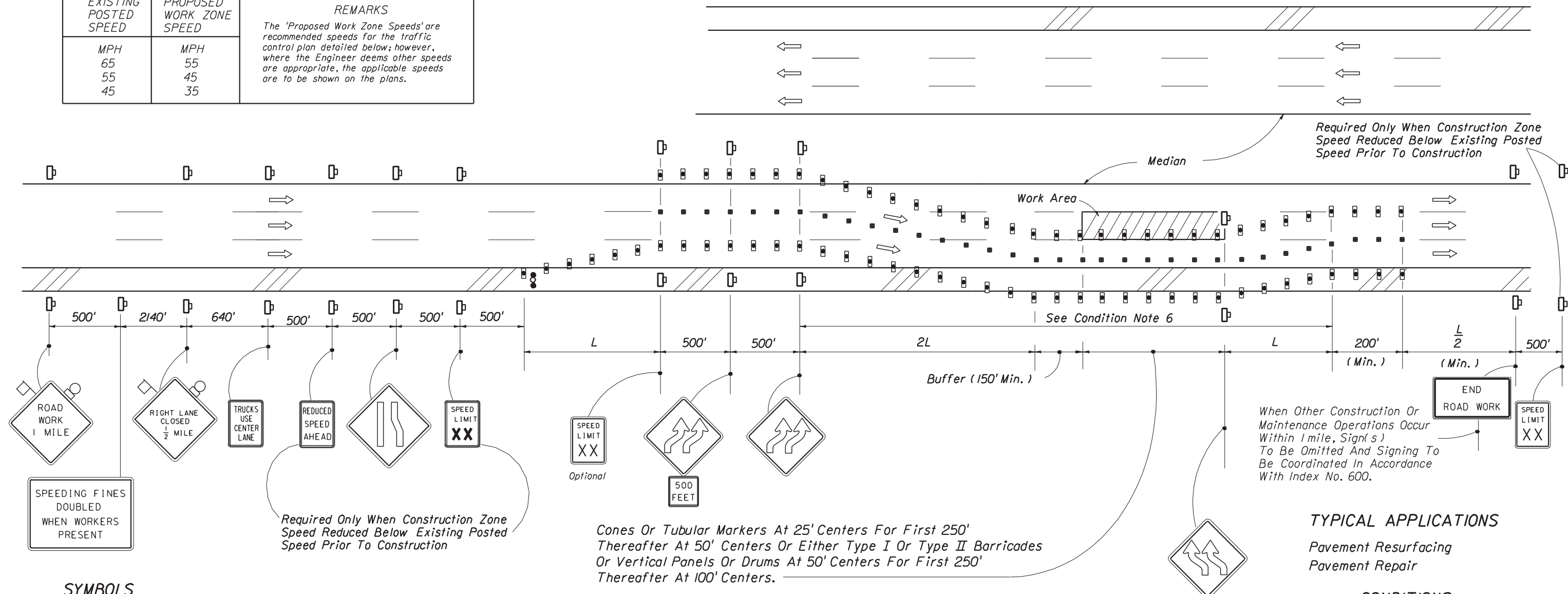
Pavement Resurfacing
 Pavement Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON ANY PORTION OF A CENTER LANE OF A MULTILANE HIGHWAY, AND TWO DRIVING LANES ARE MAINTAINED ON THE TRAVEL WAY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED • RURAL				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
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EXISTING POSTED SPEED	PROPOSED WORK ZONE SPEED	REMARKS
MPH	MPH	The 'Proposed Work Zone Speeds' are recommended speeds for the traffic control plan detailed below; however, where the Engineer deems other speeds are appropriate, the applicable speeds are to be shown on the plans.
65	55	
55	45	
45	35	



SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index 600).
- Work Zone Sign
- Advance Warning Arrow Panel
- Cone Or Tubular marker (Except At Night Use Vertical Panels)

CONDITION NOTES

1. See General Notes, Sheet 1 of 2.
2. Maximum spacing between devices (ft) to be equal to the speed limit (mph) but not greater than 25' for cones or tubular markers or 50' for Type I or Type II barricades or or vertical panels or drums.
Barricades, vertical panels or drums shall be used to delineate the edge lines of the transition areas (i.e. L and 2L). Beyond the transition area, any of the above noted devices may be used to delineate the edge lines.
Cones or tubular markers shall be used to delineate the center line. (Except at night use vertical panels)
3. Length of time that traffic is using shoulder should be minimized. For example, remove lane closure and lane shift at night (unless performing nightwork) if practical.
4. The RIGHT LANE CLOSED, lane reduction and reverse curve signs are to be removed or fully covered when no work is being performed and the travel way is open to traffic.
5. When the lane closure exceeds a continuous 24 hour period all existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for marking new edge lines and centerlines.
6. For general TCZ requirements and additional information refer to Index No. 600.

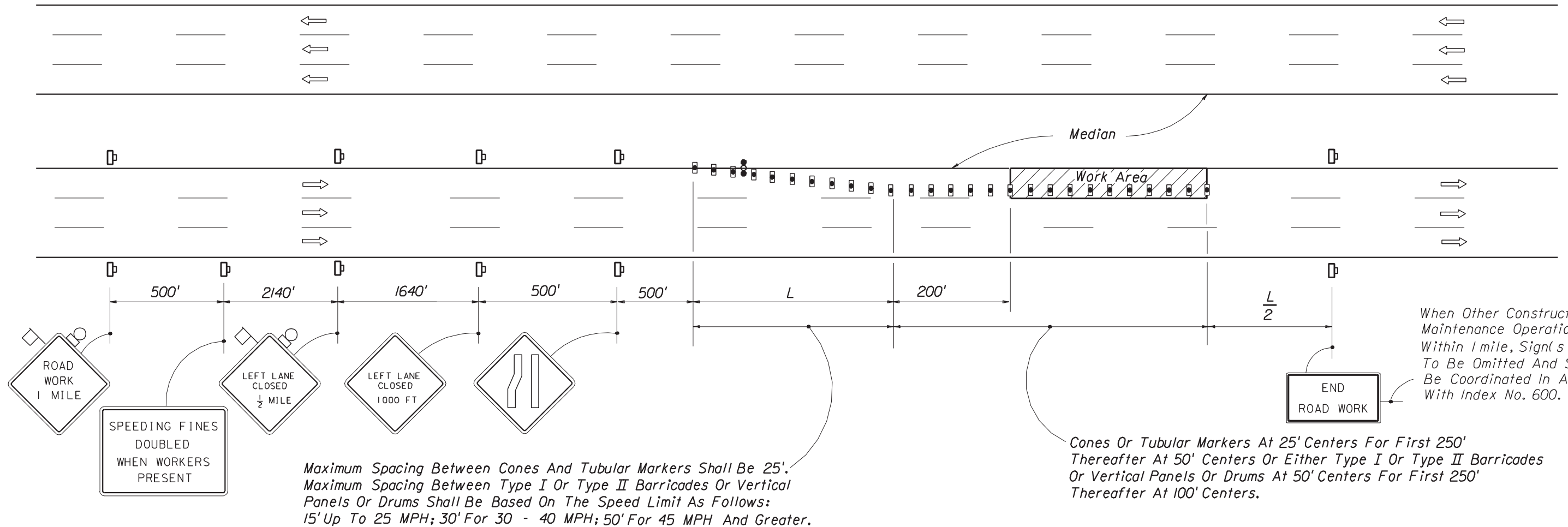
TYPICAL APPLICATIONS

Pavement Resurfacing
Pavement Repair

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON ANY PORTION OF A CENTER LANE OF A MULTILANE HIGHWAY, AND TWO DRIVING LANES ARE MAINTAINED, AND, THE OUTSIDE SHOULDER PAVEMENT IS TEMPORARILY USED AS A TRAVEL LANE.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED - RURAL				
Names	Dates	Approved By		
Designed By	6/89	Roadway Design Engineer		
Drawn By	6/89	Revision	Sheet No.	Index No.
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Cones Or Tubular Markers At 25' Centers For First 250' Thereafter At 50' Centers Or Either Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers For First 250' Thereafter At 100' Centers.

Maximum Spacing Between Cones And Tubular Markers Shall Be 25'. Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows: 15' Up To 25 MPH; 30' For 30 - 40 MPH; 50' For 45 MPH And Greater.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Work Zone Sign
- Advance Warning Arrow Panel

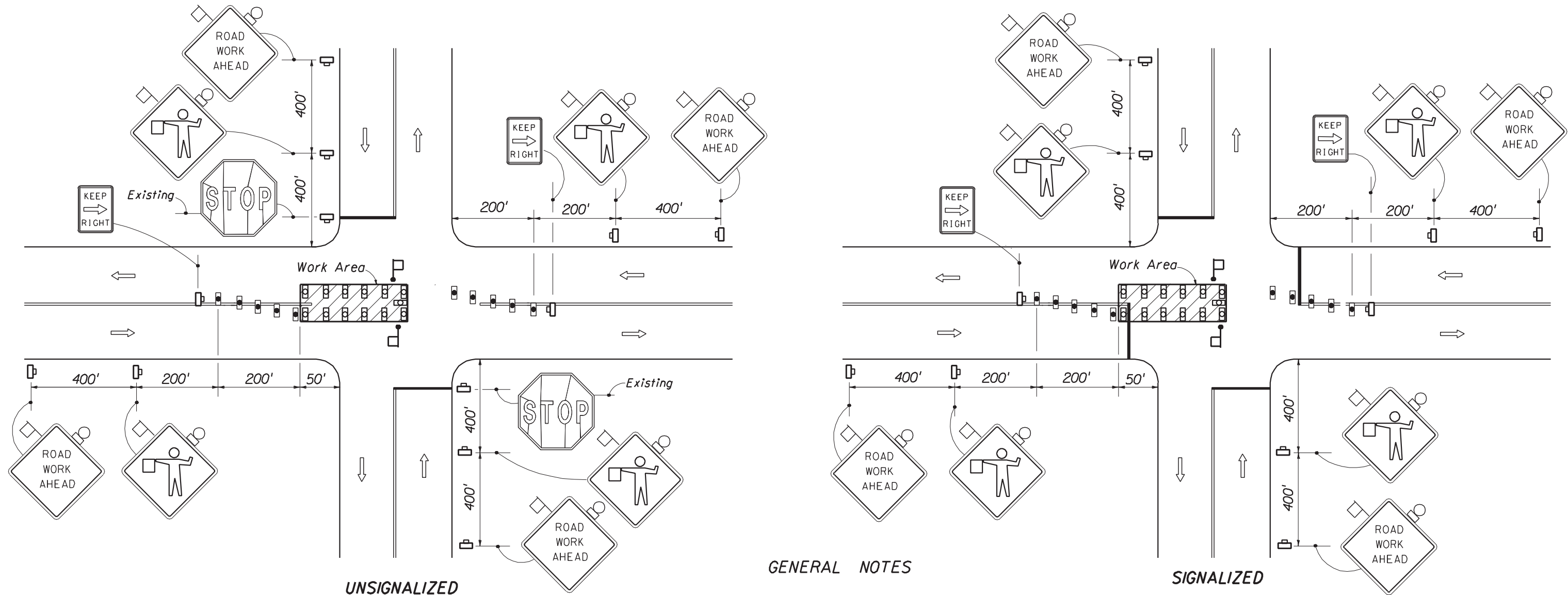
GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the highway.
2. The first two warning signs, each side, shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.
3. All signs shall be post mounted if closure time exceeds 12 hours.
4. L (min.) = WS for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet
 S = Posted speed limit (mph).
5. The LEFT LANE CLOSED and lane reduction signs are to be removed or fully covered when no work is being performed and the inside lane is open to traffic.
6. Advance warning arrow panels are required for both day and night operation. Either the right flashing arrow or the right sequential arrow modes may be used; the caution mode shall not be used.
7. Arrows denote direction of traffic only and do not reflect pavement marking.
8. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
9. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
10. For work performed in the outside lane refer to Indexes Nos. 612 and 613. For work performed in the center lane refer to Index No. 616.
11. For general TCZ requirements and additional information refer to Index No. 600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON ANY PORTION OF THE INSIDE LANE OF A MULTILANE HIGHWAY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED - RURAL				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No.
			00	1 of 1
				617



UNSIGNALIZED

GENERAL NOTES

SIGNALIZED

TYPICAL APPLICATIONS

Utility Work
Pavement Repair

CONDITIONS

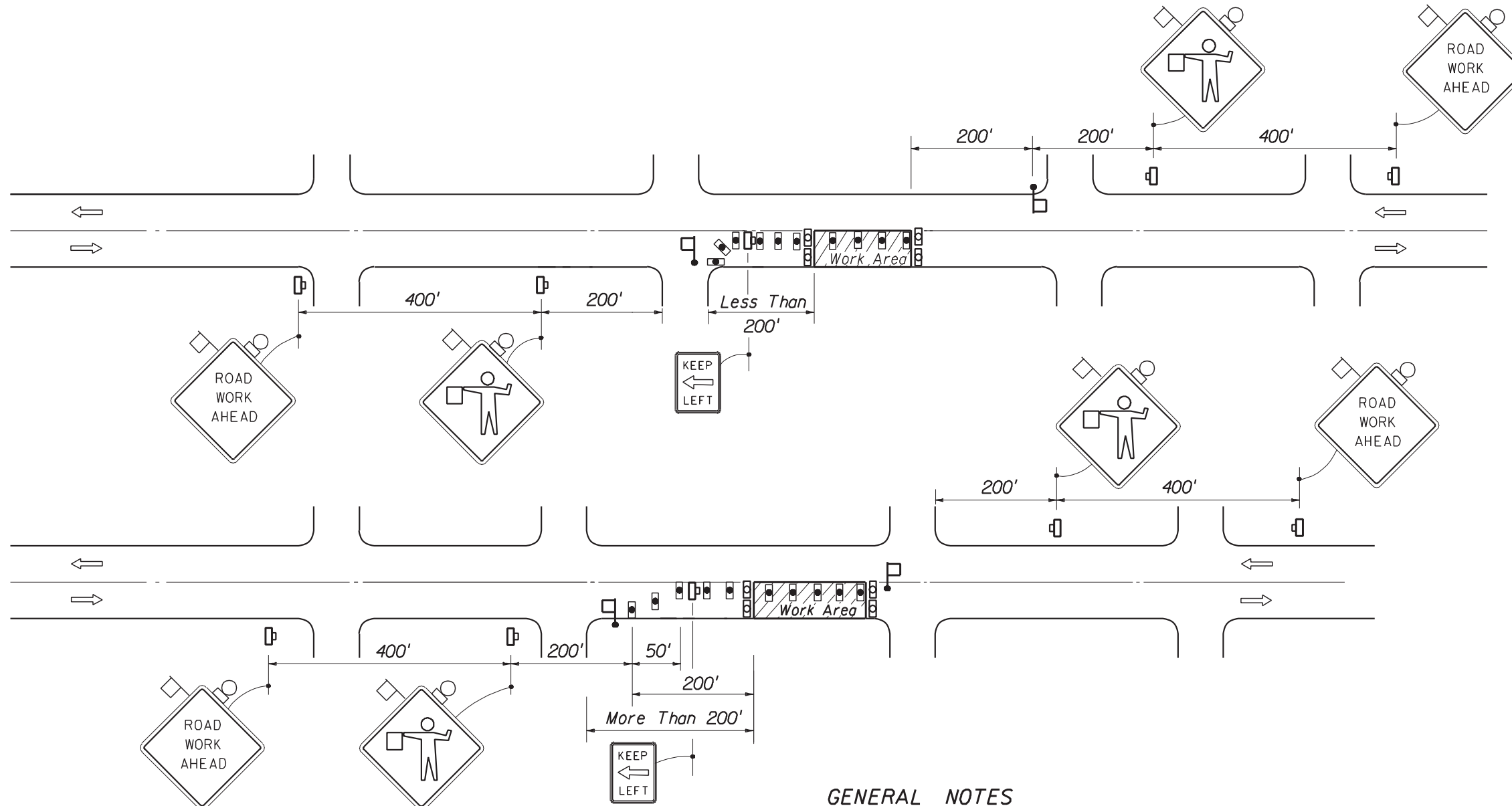
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF A PORTION OF ONE OR MORE TRAFFIC LANES IN AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Flagger
- Stop Bar

1. All vehicles, equipment, workers (except flaggers) and their activities are forbidden in lane and intersection areas reserved for traffic.
2. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
3. The FLAGGER legend sign may be substituted for the symbol sign.
4. All signs shall be post mounted if closure time exceeds 12 hours.
5. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
6. Flaggers shall be located where they can control more than one direction of traffic. Flaggers shall be in sight of each other or in direct communication at all times.
7. Maximum spacing between barricades, vertical panels, cones, tubular markers and drums shall be not greater than 25'.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. Temporary signal phasing modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.
11. Work performed for a period of 60 minutes or less is to be conducted in accordance with Index No. 607.
12. For general TCZ requirements and additional information refer to index No. 600.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • URBAN DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	James D. Hill Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
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CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF ONE TRAFFIC LANE, FOR WORK AREAS LESS THAN 200' DOWNSTREAM FROM AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF ONE TRAFFIC LANE, FOR WORK AREAS 200' OR MORE DOWNSTREAM FROM AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

GENERAL NOTES

1. Work operations shall be confined to one travel lane, leaving the opposing travel lane open to traffic.
2. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.
3. For work operations of 60 minutes or less see Index No. 607
4. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
5. If work area is confined to an outside auxiliary lane the work area shall be barricaded and the FLAGGER signs replaced by ROAD WORK AHEAD signs. Flaggers are not required.
6. Flaggers shall be in sight of each other or in direct communication at all times.
7. The ROAD CONSTRUCTION AHEAD and FLAGGER signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.
8. The FLAGGER legend sign may be substituted for the symbol sign.
9. All signs shall be post mounted if the closure time exceeds 12 hours.
10. The maximum spacing between devices shall be not greater than 25'.
11. Arrows denote direction of traffic only and do not reflect pavement markings.
12. Longitudinal dimensions are to be adjusted to fit field conditions See Index No. 600.
13. For general TCZ requirements and additional information refer to Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Flagger

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • URBAN DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Roadway Design Engineer		
Checked By	12/87	Revision	Sheet No.	Index No.
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GENERAL NOTES

1. All vehicles, equipment, workers (except flaggers) and their activities are forbidden in lane and intersection areas reserved for traffic.
2. For work operations of 60 minutes or less see Index No. 607.
3. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
4. All signs shall be post mounted if closure time exceeds 12 hours.
5. The WORKERS legend sign may be substituted for the symbol sign.
6. Dual signs are required for divided roadways.
7. Arrows denote direction of traffic only and do not reflect pavement markings.
8. Maximum spacing between barricades, vertical panels, cones, tubular markers and drums shall be not greater than 25'.
9. Temporary signal phasing modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCZ requirements and additional information refer to Index No. 600.








TYPICAL APPLICATIONS

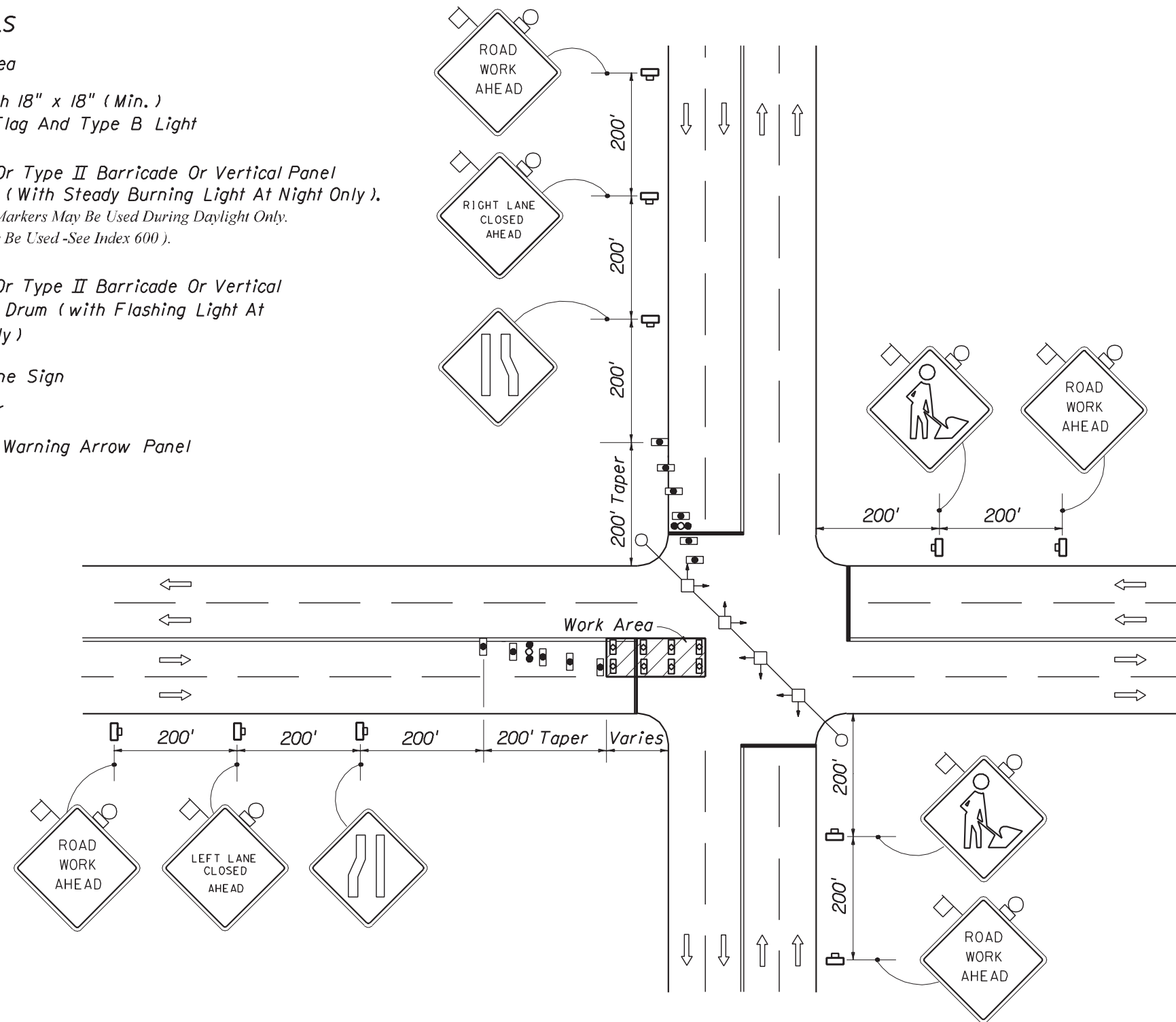
- Utility Work
- Pavement Repair
- Structure Adjustments

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF AT LEAST ONE MEDIAN TRAFFIC LANE FOR A PERIOD OF MORE THAN 60 MINUTES

SYMBOLS

-  Work Area
-  Sign With 18" x 18" (Min.) Orange Flag And Type B Light
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
-  Work Zone Sign
-  Stop Bar
-  Advance Warning Arrow Panel

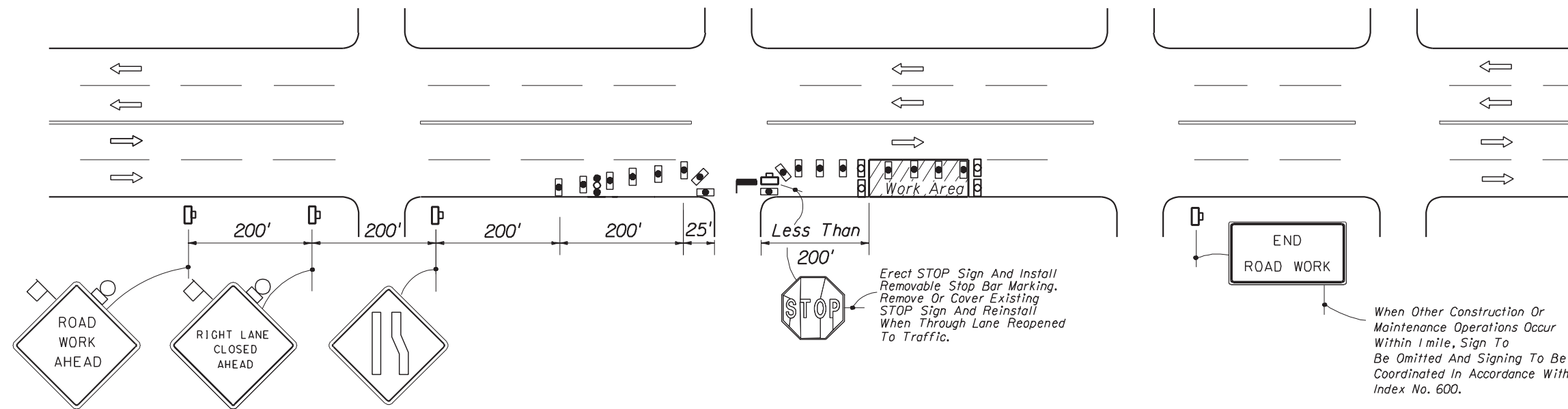


SIGNALIZED

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES MULTILANE, TWO-WAY • URBAN DIVIDED OR UNDIVIDED DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	1 of 1	622

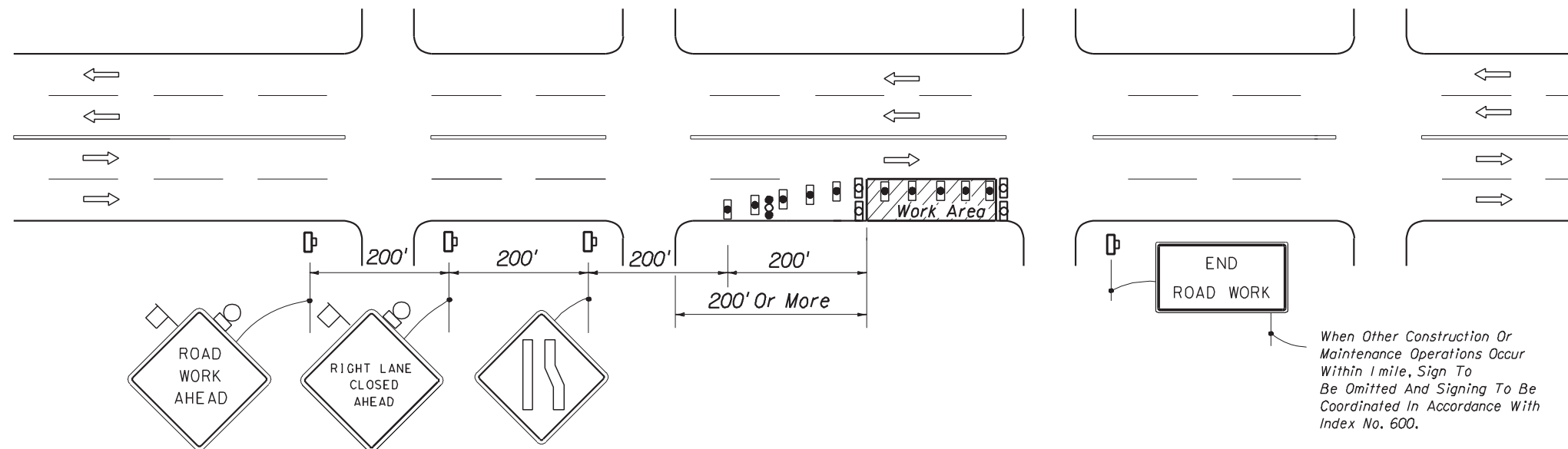
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE OUTSIDE TRAVEL LANE, AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.



CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE OUTSIDE TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.



SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index 600)
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel
- Stop Bar

GENERAL NOTES

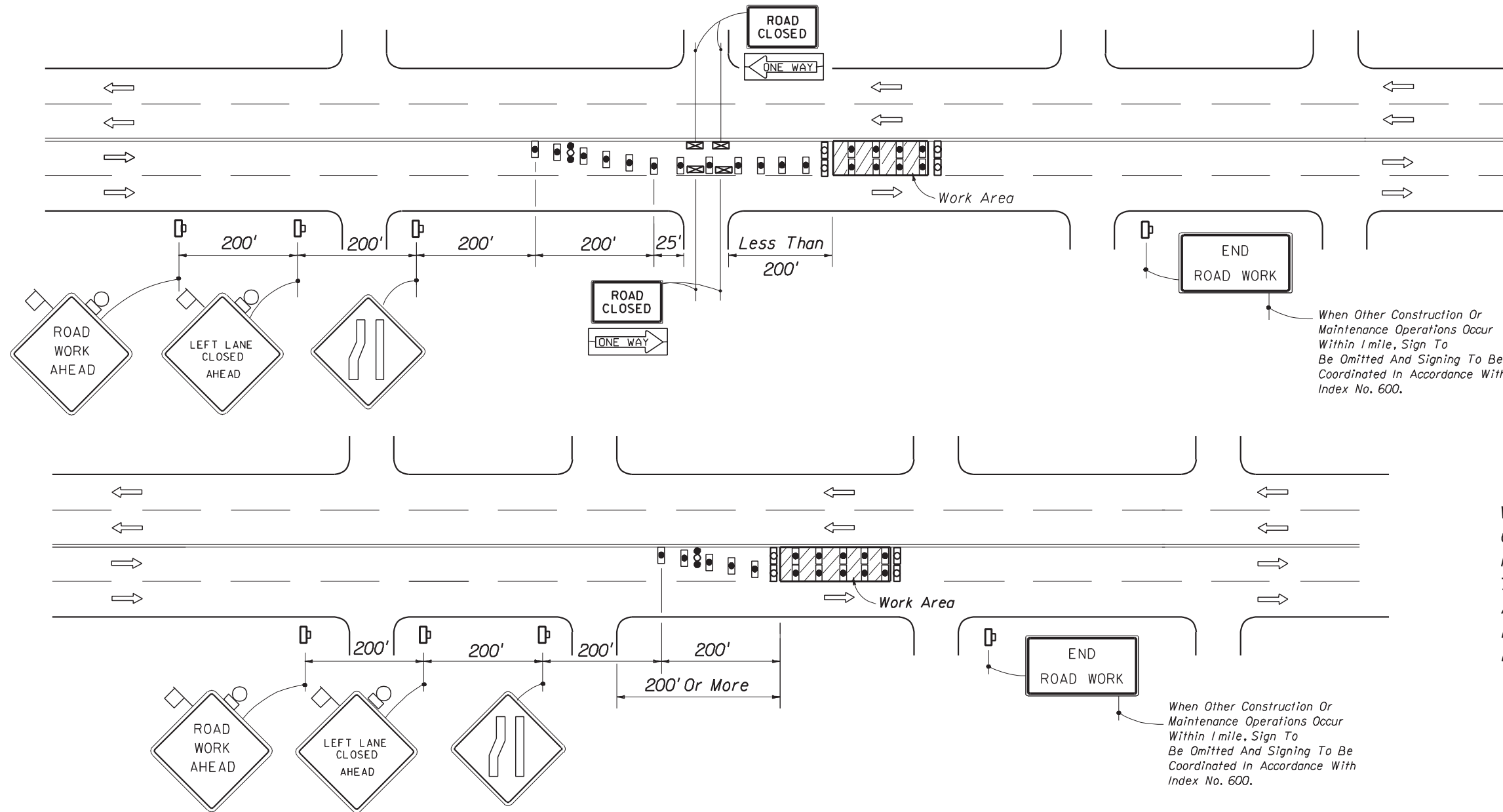
1. All vehicles, equipment, workers (except flaggers) and their activities are restricted at all times to one side of the roadway.
2. Work operations shall be confined to either one lane or lane combinations as follows:
 - (a) Outside travel lane; (b) Outside auxiliary lane;
 - (c) Outside travel lane and adjoining auxiliary lane;
 - (d) Inside travel lane^Δ; (e) Inside auxiliary lane^Δ;
 - (f) Inside travel lane and adjoining auxiliary lane^Δ;^Δ See Sheet 2 Of 2
3. For work operations of 60 minutes or less see Index No. 612.
4. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
5. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
6. All signs shall be post mounted if the closure times exceeds 12 hours.
7. Dual signs are required for divided roadways.

(Continued)

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repairs
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE, TWO-WAY • URBAN				
DIVIDED OR UNDIVIDED				
DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87			
Drawn By	12/87	Roadway Design Engineer		
Checked By	12/87	Revision	Sheet No.	Index No.
		00	1 of 2	623



CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE INSIDE TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

When Other Construction Or Maintenance Operations Occur Within 1 mile, Sign To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE INSIDE TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

When Other Construction Or Maintenance Operations Occur Within 1 mile, Sign To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Type III Barricade
- Work Zone Sign
- Advance Warning Arrow Panel

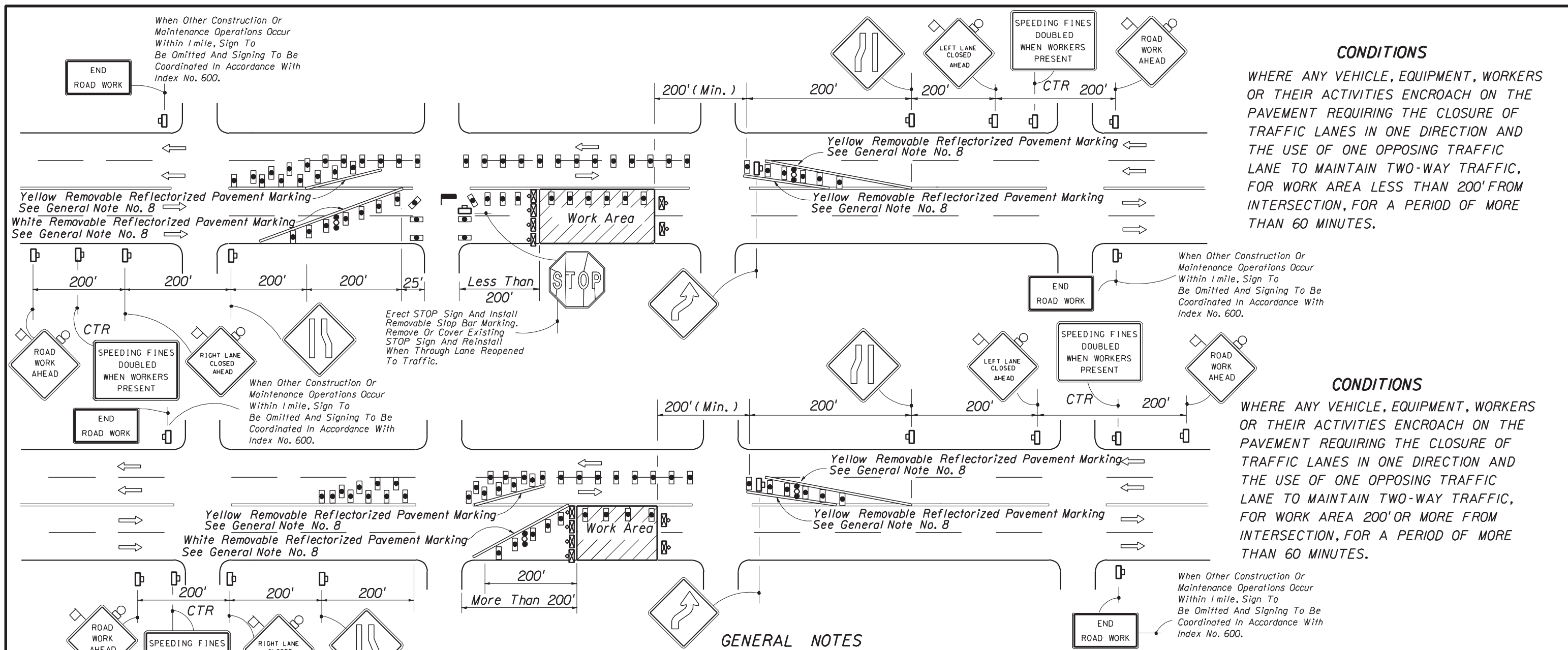
GENERAL NOTES (CONT.)

8. Within the lateral transitions, the maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater. Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' Centers for Type I or Type II barricades or vertical panels or drums for 250', thereafter cones or tubular markers at 50' centers and Type I or Type II barricades or vertical panels or drums at 100' centers.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repairs
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES MULTILANE, TWO-WAY • URBAN DIVIDED OR UNDIVIDED DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	 Raymond D. Mill Roadway Design Engineer	
Checked By		12/87		
	Revision	00	Sheet No.	Index No.
			2 of 2	623



CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF TRAFFIC LANES IN ONE DIRECTION AND THE USE OF ONE OPPOSING TRAFFIC LANE TO MAINTAIN TWO-WAY TRAFFIC, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF TRAFFIC LANES IN ONE DIRECTION AND THE USE OF ONE OPPOSING TRAFFIC LANE TO MAINTAIN TWO-WAY TRAFFIC, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the pavement.
2. For work operations of 60 minutes or less (daylight only) see Index No. 607.
3. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. I7302.
4. The first two warning signs shall have an 18" x 18" (min.) Orange flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations. Type B Lights and Orange Flags are not required.
5. All signs shall be post mounted if the closure time exceeds 12 hours.
6. Dual signs are required for divided roadways.
7. Channelizing devices are to be spaced with Type I or Type II barricades or vertical panels or drums at 50' centers, except in tangent work areas spacing may be increased to 100' after the first 250' when approved by the Engineer.
8. Removable reflectorized pavement markings shall be used when closure time exceeds one daylight period.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCZ requirements and additional information refer to Index No. 600.

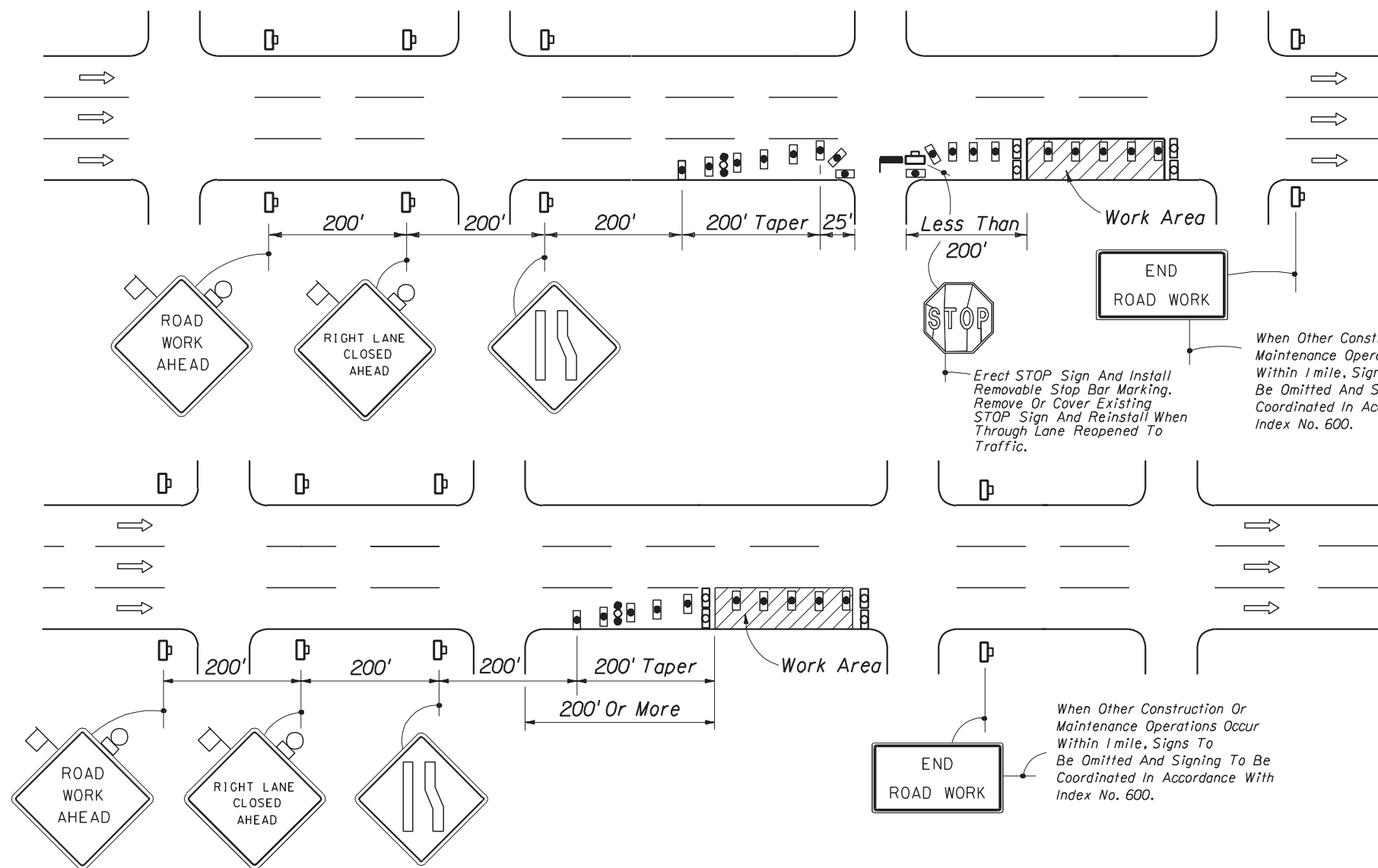
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
- Type III Barricade (With Flashing Light)
- Work Zone Sign
- Advance Warning Arrow Panel
- Stop Bar

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED WITH TRAVERSABLE MEDIAN OR UNDIVIDED URBAN DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87	Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No.
			00	1 of 1
				624



CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE OR THE MEDIAN TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE OR THE MEDIAN TRAVEL LANE AND/OR ADJOINING AUXILIARY LANE, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel
- Stop Bar

GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the roadway.
2. Work operations shall be confined to either one lane or a combination of lanes as follows:
 - (a) Outside travel lane; (b) Outside auxiliary lane;
 - (c) Outside travel lane and adjoining auxiliary lane;
 - (d) Outside travel lane and adjoining center lane;
 - (e) Outside travel lane and adjoining auxiliary and center lanes;
 - (f) Median travel lane^Δ; (g) Median auxiliary lane^Δ;
 - (h) Median travel lane and adjoining auxiliary lane^Δ;
 - (i) Median travel lane and adjoining center lane^Δ;
 - (j) Median travel lane and adjoining auxiliary and center lanes^Δ;^ΔSee Sheet 2.

If the work area is confined to an auxiliary lane the work area shall be barricaded and the RIGHT LANE CLOSED AHEAD signs replaced by ROAD WORK AHEAD signs and the merge left symbol signs eliminated.
3. For work operations, that require only a single lane closure of 60 minutes or less see Index No. 612.
4. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
5. When work is performed in the median lane or the median and adjoining center lanes the barricading plans are inverted and LEFT LANE CLOSED AHEAD and merge right symbol signs shall be substituted for the RIGHT LANE CLOSED AHEAD and merge left symbol signs.

If work is confined to the median auxiliary lane the work area shall be barricaded and the LEFT LANE CLOSED AHEAD signs replaced by ROAD WORK AHEAD signs and the merge right symbol signs eliminated.
6. The first two warning signs, each side, shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.

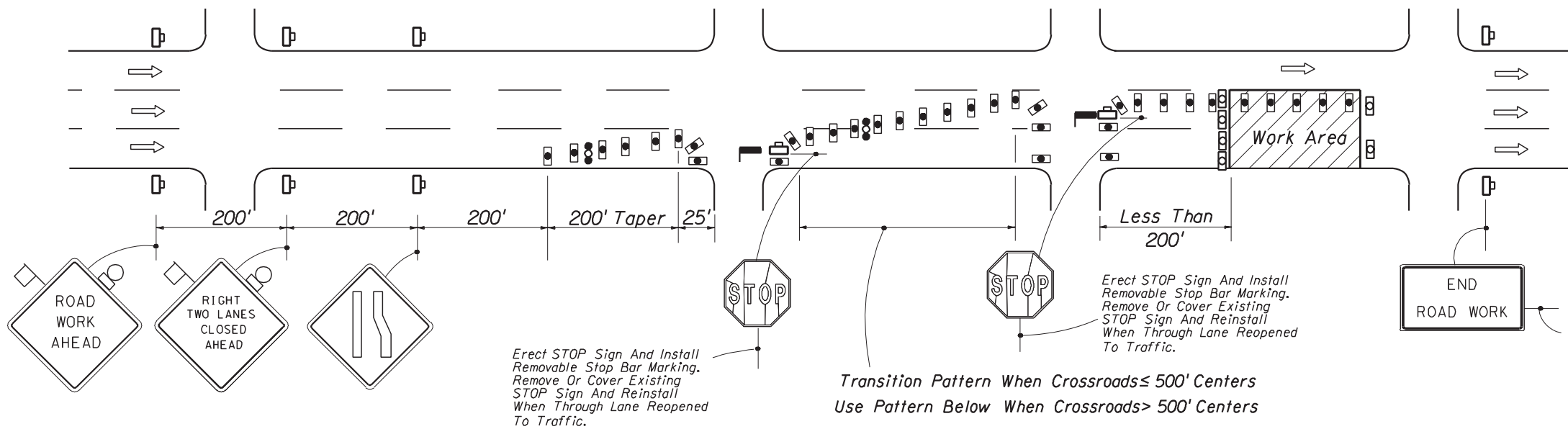
Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.

TYPICAL APPLICATIONS

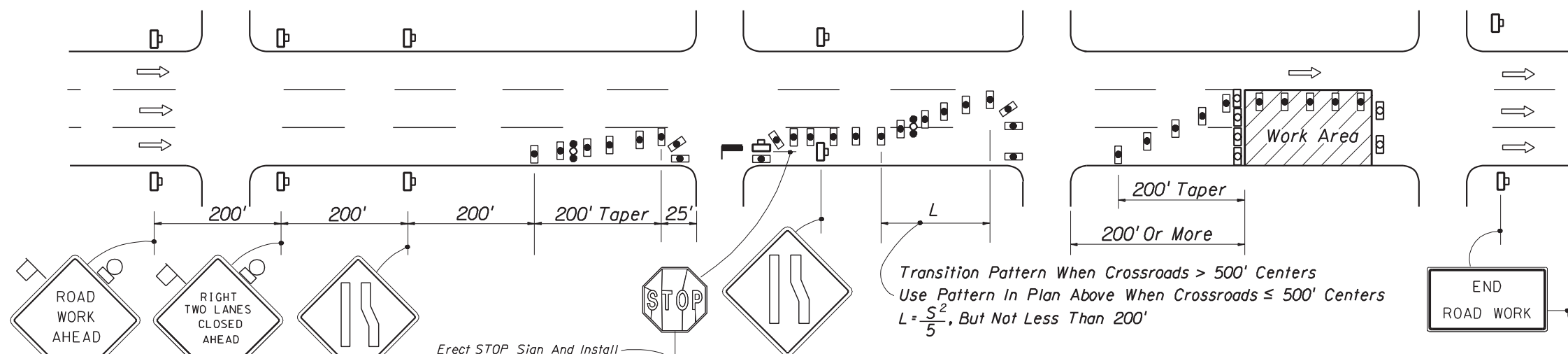
- Utility Work
- Pavement Repair
- Structure Adjustments

(Continued)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE ONE-WAY OR MULTILANE DIVIDED WITH NON-TRAVERSABLE MEDIAN • URBAN DAY OR NIGHT OPERATIONS				
Designed By		Dates	Approved By	
Drawn By		12/87		
Checked By		12/87	Revision	Sheet No.
			00	1 of 2
				625



CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE AND CENTER TRAVEL LANES OR THE MEDIAN AND CENTER TRAVEL LANES, WITH OR WITHOUT CLOSURE OF ADJOINING AUXILIARY LANES, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.



CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE AND CENTER TRAVEL LANES OR THE MEDIAN AND CENTER TRAVEL LANES, WITH OR WITHOUT CLOSURE OF ADJOINING AUXILIARY LANES, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

SYMBOLS

- Work Area
- Sign With 18"x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel
- Stop Bar

GENERAL NOTES (CONT.)

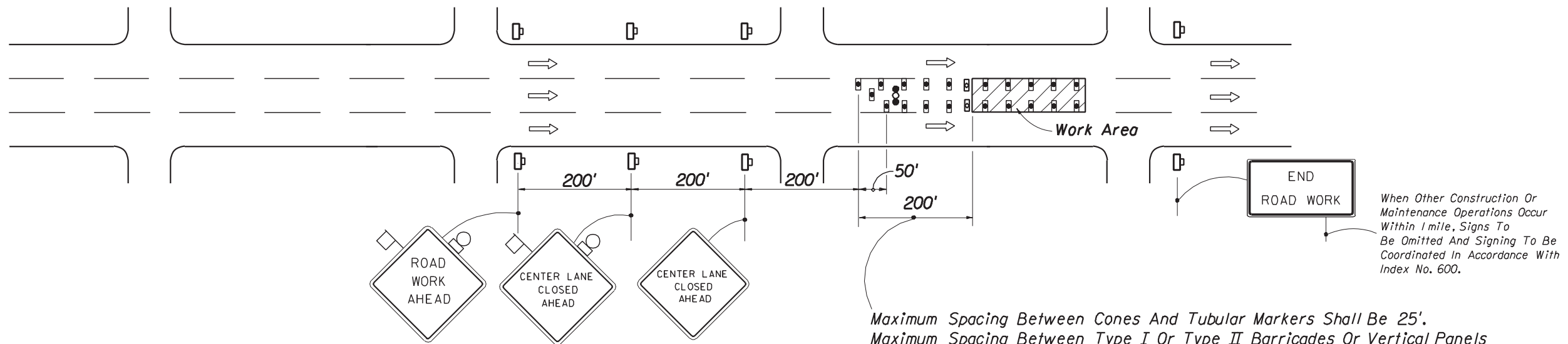
7. All signs shall be post mounted if closure time exceeds 12 hours.
8. Within the lateral transitions, the maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30 MPH-40 MPH; 50' for 45 MPH or greater.
Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' centers for Type I or Type II barricades or vertical panels or drums for 250', thereafter, cones or tubular markers at 50' centers and Type I or Type II barricades or vertical panels or drums at 100' centers.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. For general TCZ requirements and additional information refer to Index No. 600.

When Other Construction Or Maintenance Operations Occur Within 1 mile, Signs To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE ONE-WAY OR MULTILANE DIVIDED WITH NON-TRAVERSABLE MEDIAN • URBAN DAY OR NIGHT OPERATIONS				
Designed By	Names	Dates	Approved By	
Drawn By		12/87		
Checked By		12/87	Revision	Sheet No.
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Maximum Spacing Between Cones And Tubular Markers Shall Be 25'.
 Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows: 15' Up To 25 MPH; 30' For 30 MPH-40 MPH; 50' For 45 MPH Or Greater.

When Other Construction Or Maintenance Operations Occur Within 1 mile, Signs To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

GENERAL NOTES

- All vehicles, equipment, workers and their activities are prohibited at all times from the lane areas reserved for traffic.
- Work operations shall be confined to one center travel lane, leaving the adjacent travel lanes open to traffic.
- For work operations of 60 minutes or less, see Index No. 612.
- When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index No. 17302.
- The first two warning signs, each side, shall have an 18" x 18" orange flag and a Type B light attached and operating at all times.
 Mesh signs may be used for (Daylight Only) operations Type B Lights and Orange Flags are not required.
- All signs shall be post mounted if the closure time exceeds 12 hours.
- Advance warning arrow panel is required for both day and night operations.
- Channelizing devices are to be spaced with cones or tubular markers at 25' centers; Type I or Type II barricades or vertical panels or drums at 50' centers for the first 250'; thereafter, cones or tubular markers at 50' centers and Type I or Type II barricades or vertical panels or drums at 100' centers.
- Arrows denote direction of traffic only and do not reflect pavement markings.
- Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- For general TCZ requirements and additional information refer to Index No. 600.

TYPICAL APPLICATIONS

- Utility Work
- Pavement Repair
- Structure Adjustments

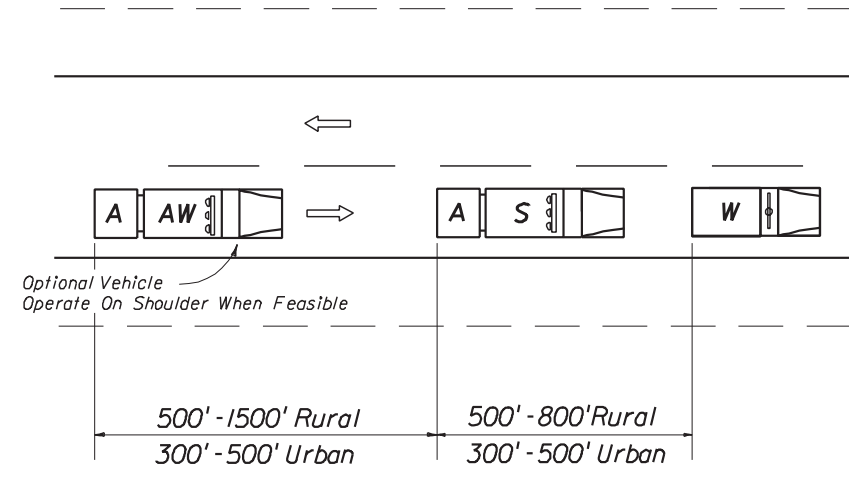
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE CENTER LANE.

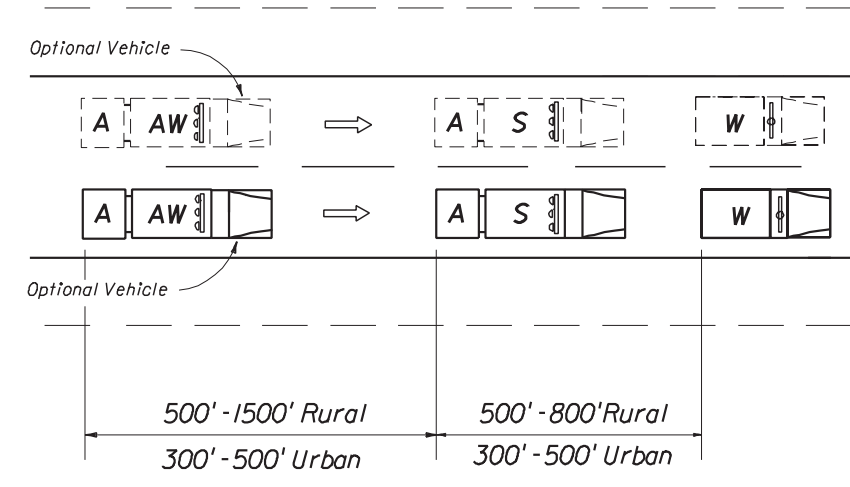
SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type I Or Type II Barricade Or Vertical Panel Or Drum (with Flashing Light At Night Only)
- Work Zone Sign
- Advance Warning Arrow Panel

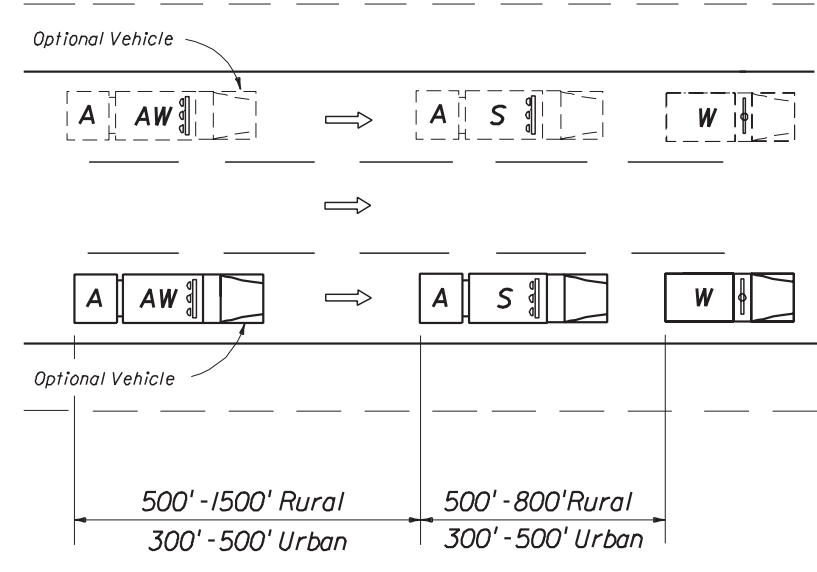
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE ONE-WAY OR MULTILANE DIVIDED WITH NON-TRAVERSABLE MEDIAN • URBAN DAY OR NIGHT OPERATIONS				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
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MODE • WARNING



MODE • PASS LEFT [RIGHT]
MOVING OPERATIONS



MODE • PASS LEFT [RIGHT]

SYMBOLS

- Work Vehicle With Flashing Beacon
- Shadow (S) Or Advance Warning (AW) Vehicle With Advance Warning Arrow Panel And Sign Message
- Truck Mounted Attenuator (TMA)
- Lane Identification And Direction Of Traffic

GENERAL NOTES

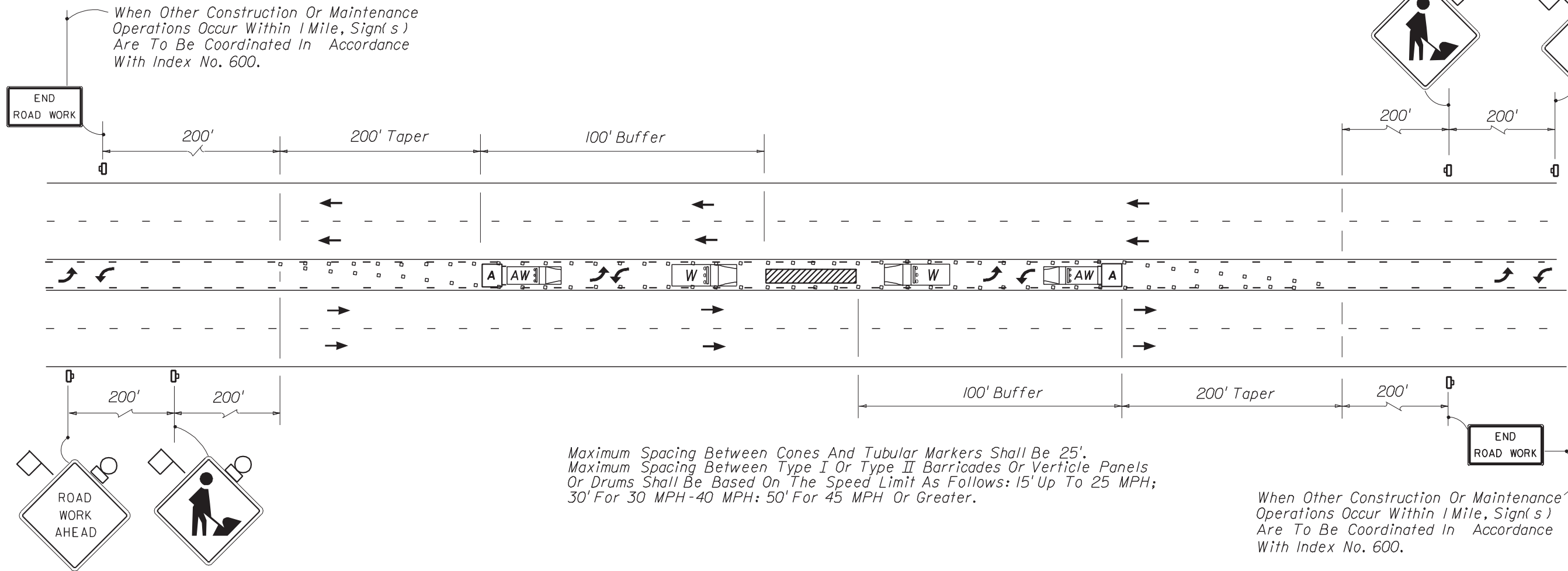
1. These illustrations are representative of general conditions.
2. The intensity of light and the position of panels shall be as specified in Index No. 600.
3. The Advance Warning Vehicle (Optional) may be used at the direction of the Engineer. If an Advance Warning Vehicle is operated within the travel way, an approved Truck Mounted Attenuator will be required on the Advance Warning Vehicle but not required on the Shadow Vehicle. The Advance Warning Arrow Panel and Warning Sign are required on both the Advance Warning and Shadow Vehicles.
4. For general TCZ requirements and additional information refer to Index No. 600.
5. If the work vehicle speed exceeds the minimum legal speed limit on limited access facilities and one half the posted speed limit on other facilities the engineer in charge may delete requirements for shadow vehicle and attenuators. The work vehicle will be required to have an advance warning arrow panel and sign message

TYPICAL APPLICATIONS

- Striping
- RPM Placement
- Vegetation Control

**CONDITIONS
MOVING OPERATION**

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MOVING OPERATIONS				
Designed By		Dates	Approved By	
Drawn By		12/87	<i>James D. Mill</i> Roadway Design Engineer	
Checked By		12/87	Revision	Sheet No. Index No.
			00	1 of 1 627



Maximum Spacing Between Cones And Tubular Markers Shall Be 25'.
 Maximum Spacing Between Type I Or Type II Barricades Or Verticle Panels Or Drums Shall Be Based On The Speed Limit As Follows: 15' Up To 25 MPH; 30' For 30 MPH-40 MPH; 50' For 45 MPH Or Greater.

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) Are To Be Coordinated In Accordance With Index No. 600.

GENERAL NOTES

1. Work operations shall be confined to two way left turn lane, leaving the adjacent lanes open to traffic.
2. The first two warning signs, each side, shall have an 18" x 18" (min.) Orange Flag and a Type B light attached and operating at all times. Mesh signs may be used for (Daylight Only) operations, Type B Lights and Orange Flags are not Required.
3. Advance Warning Vehicle will have an Advanced Warning Arrow Panel in the Warning Mode.
4. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
5. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
6. For general TCZ requirements and additional information, refer to Index No. 600.

TYPICAL APPLICATIONS

Pavement Repair
 Utility Work

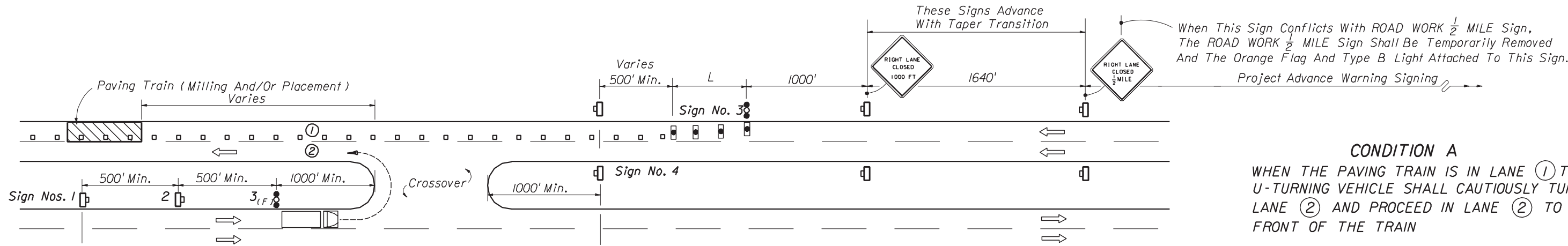
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ARE BEING CONDUCTED IN THE TWO WAY LEFT TURN LANE.

SYMBOLS

- Work Area
- ◆ Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burn Light At Night Only)
- Type I Or Type II Barricade Or Verticle Panel Or Cone Or Tubular Marker Or Drum
- Ⓜ Work Zone Sign
- Work Vehicle With Flashing Beacon (optional)
- Advance Warning Vehicle Equipped With Advance Warning Arrow Panel And Truck Mounted Attenuator

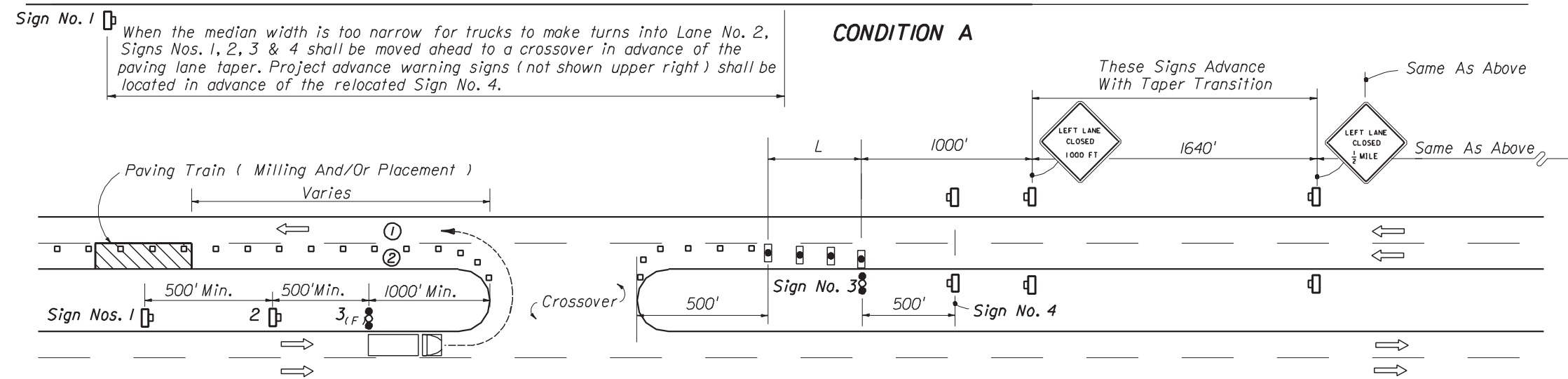
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO WAY LEFT TURN LANE CLOSURE				
Names	Dates	Approved By		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	628



CONDITION A
 WHEN THE PAVING TRAIN IS IN LANE ① THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ② AND PROCEED IN LANE ② TO THE FRONT OF THE TRAIN

CONDITION B
 WHEN THE PAVING TRAIN IS IN LANE ② THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ①, AND PROCEED IN LANE ① TO THE FRONT OF THE PAVING TRAIN

CONDITION A & B
 THE ADVANCE WARNING ARROW PANELS ARE REQUIRED. UNDER NO CIRCUMSTANCES WILL THE TRAFFIC TRANSITION BE LOCATED WITHIN THE LIMITS OF THE CROSSOVER



CONDITION A

CONDITION B

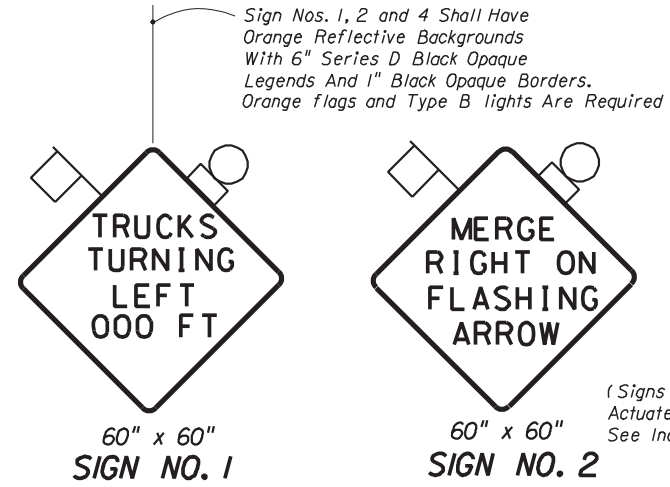
When the median width is too narrow for trucks to make turns into Lane No. 2, Signs Nos. 1, 2, 3 & 4 shall be moved ahead to a crossover in advance of the paving lane taper. Project advance warning signs (not shown upper right) shall be located in advance of the relocated Sign No. 4.

TRAFFIC TRANSITION AREA UPSTREAM FROM CROSSOVER

CASE I

GENERAL NOTES

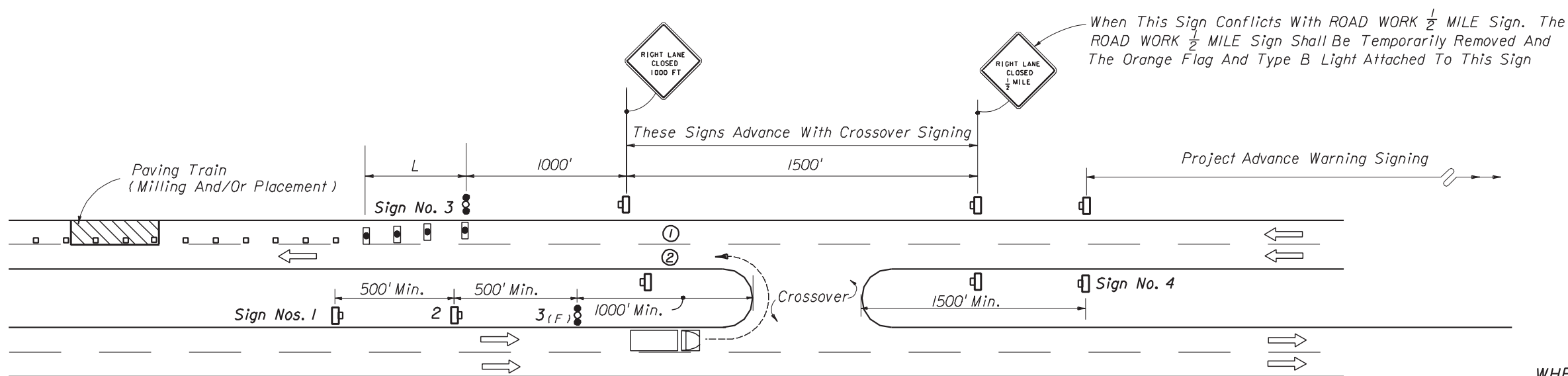
- When crossovers do not exist, the contractor will construct temporary crossovers in accordance with Index No. 631.
- $L =$ Length of taper in feet:
 $= WS$ for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 $W =$ Width of lateral transition in feet.
 $S =$ Posted speed limit (mph).
- Within the lateral transitions, the maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater. Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' for Type I or Type II barricades or vertical panels or drums.
- Arrows denote direction of traffic only and do not reflect pavement markings.



SYMBOLS

- Work Area
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum
- Work Zone Sign
- Advance Warning Arrow Panel
- Work Vehicle
- Lane Number

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
CROSSOVER FOR PAVING TRAIN OPERATIONS • RURAL				
Names	Dates	Approved By <i>Lamont D. Mill</i>		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	1 of 2	630



When This Sign Conflicts With ROAD WORK 1/2 MILE Sign. The ROAD WORK 1/2 MILE Sign Shall Be Temporarily Removed And The Orange Flag And Type B Light Attached To This Sign



These Signs Advance With Crossover Signing

Project Advance Warning Signing

Sign No. 3

Sign Nos. 1 2 3 (F)

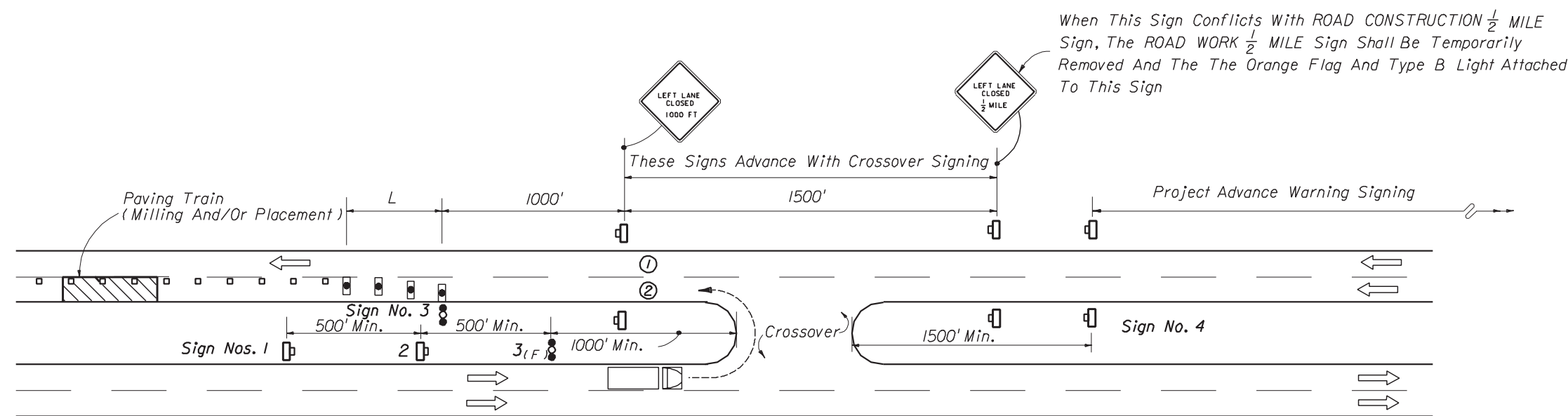
Sign No. 4

Sign No. 1

When the median width is too narrow for trucks to make turns into Lane No. 2, Signs Nos. 1, 2, 3 & 4 shall be moved ahead to a crossover in advance of the RIGHT LANE CLOSED 1/2 MILE sign. Project advance warning signs (not shown upper right) shall be located in advance of the relocated Sign No. 4.

CONDITION A

CONDITION A
WHEN THE PAVING TRAIN IS IN LANE ① THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ② AND PROCEED IN LANE ② TO THE FRONT OF THE TRAIN



When This Sign Conflicts With ROAD CONSTRUCTION 1/2 MILE Sign, The ROAD WORK 1/2 MILE Sign Shall Be Temporarily Removed And The The Orange Flag And Type B Light Attached To This Sign



These Signs Advance With Crossover Signing

Project Advance Warning Signing

Sign Nos. 1 2 3 (F)

Sign No. 4

Sign No. 1

When the median width is too narrow for trucks to make turns into Lane No. 2, Signs Nos. 1, 2, 3 & 4 shall be moved ahead to a crossover in advance of the LEFT LANE CLOSED 1/2 MILE sign. Project advance warning signs (not shown upper right) shall be located in advance of the relocated Sign No. 4.

CONDITION B

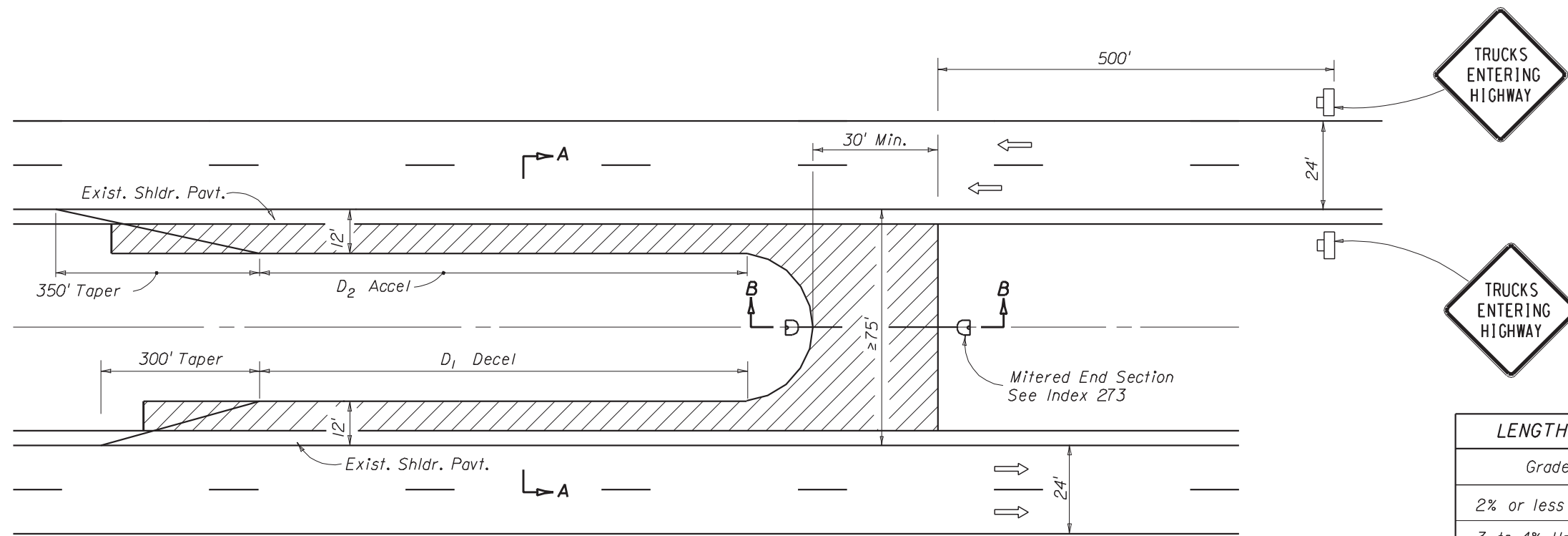
CONDITION B
WHEN THE PAVING TRAIN IS IN LANE ② THE U-TURNING VEHICLE SHALL TURN INTO LANE ①, CAUTIOUSLY MERGE INTO LANE ① AND PROCEED TO THE FRONT OF THE PAVING TRAIN

CONDITION A & B
THE ADVANCE WARNING ARROW PANEL IS REQUIRED. UNDER NO CIRCUMSTANCES WILL THE TRAFFIC TRANSITION BE LOCATED WITHIN THE LIMITS OF THE CROSSOVER

TRAFFIC TRANSITION AREA DOWNSTREAM FROM CROSSOVER
CASE II

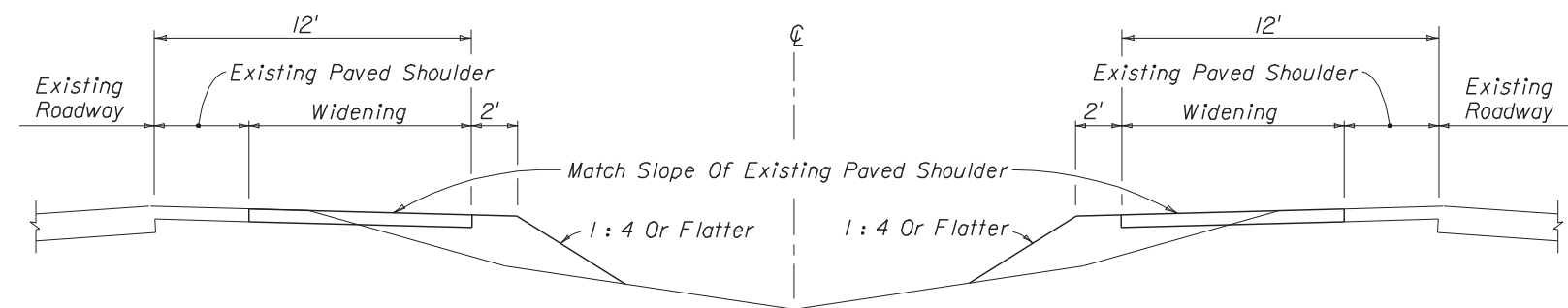
Note: See Sheet 1 of 2 For General Notes, Sign No. Details, And Conditions.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES CROSSOVER FOR PAVING TRAIN OPERATIONS • RURAL				
Names	Dates	Approved By		
Designed By	12/87	Roadway Design Engineer		
Drawn By	12/87	Revision	Sheet No.	Index No.
Checked By	12/87	00	2 of 2	630

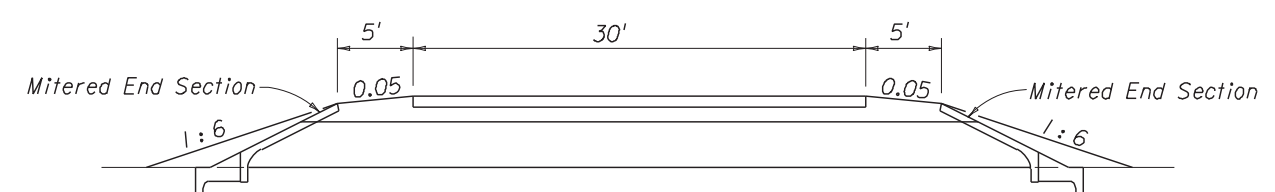


LENGTH OF ACCESS LANES (Ft.)		
Grade	D ₁	D ₂
2% or less	590'	1540'
3 to 4% Upgrade	530'	2310'
3 to 4% Downgrade	710'	925'

PLAN



SECTION AA



SECTION BB

SYMBOLS

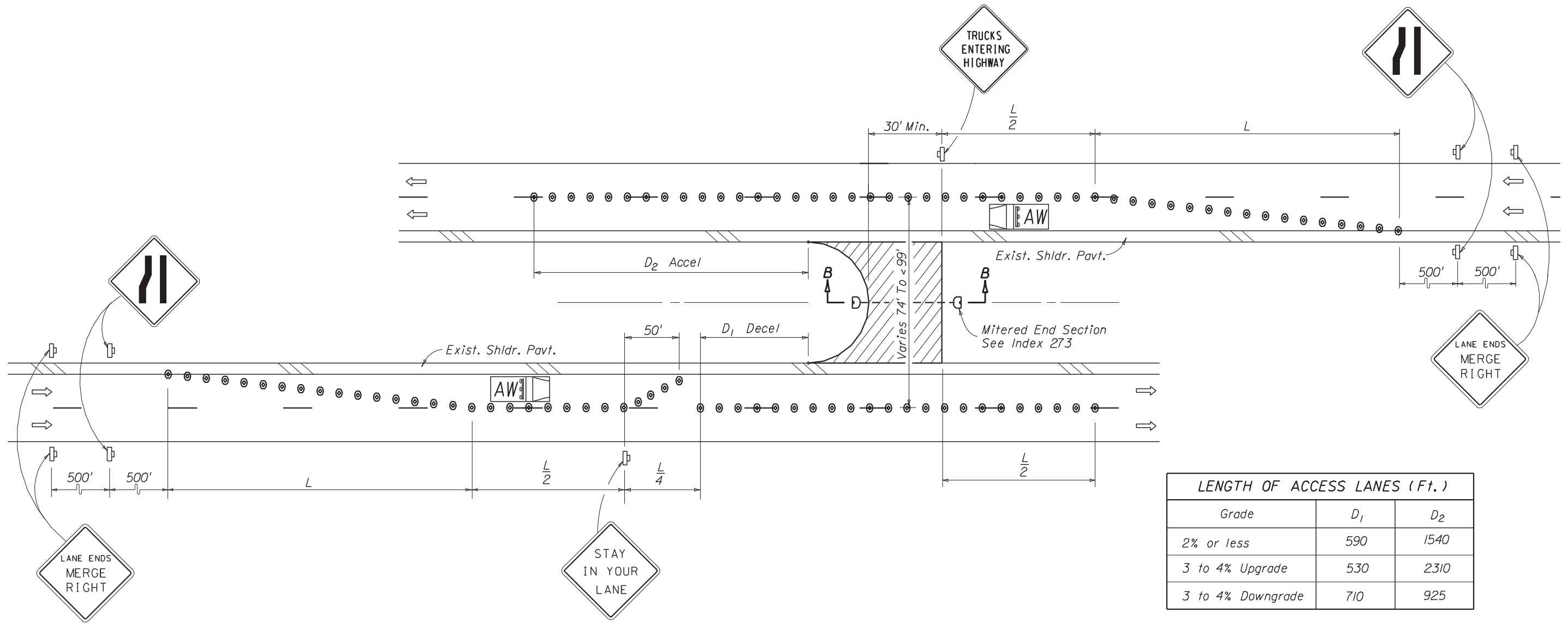
Work Zone Sign

GENERAL NOTES

1. Temporary median crossovers shall be within the project limits and shall not be used for transporting materials to or from any other project. The acceleration-deceleration surfaces shall be paved. RAP material is acceptable for crossing surfacing.
2. Temporary median crossovers shall be located only in areas having adequate sight distance. On limited access facilities temporary median crossovers shall not be located within 1.5 miles of interchanges nor within 2000 ft. of acceleration-deceleration lanes at rest areas, other access openings or other highway service areas.
3. For paving train operations at permanent crossovers, see Index 630.
4. All traffic control devices are to be removed when crossover will not be in use for one hour or longer.
5. Trailer mounted advance warning panel may be used in lieu of advance warning vehicle.
6. When a crossover is no longer needed, all temporary construction shall be immediately removed and the area restored to its original condition.
7. Cost of construction, maintenance, removal and restoration work related to temporary crossovers shall be included in the contract unit price for Maintenance of Traffic, LS.

TEMPORARY CROSSOVER FOR MEDIAN WIDTHS ≥ 75'

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TEMPORARY CROSSOVER				
Names	Dates	Approved By		
Designed By		 Raymond D. Mill Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	631



LENGTH OF ACCESS LANES (Ft.)		
Grade	D ₁	D ₂
2% or less	590	1540
3 to 4% Upgrade	530	2310
3 to 4% Downgrade	710	925

SYMBOLS

- Work Area
- Work Zone Sign
- Cone Or Tubular Marker
- Advance Warning Vehicle

Maximum Spacing Between Cones And Tubular Markers Shall Be 25'.

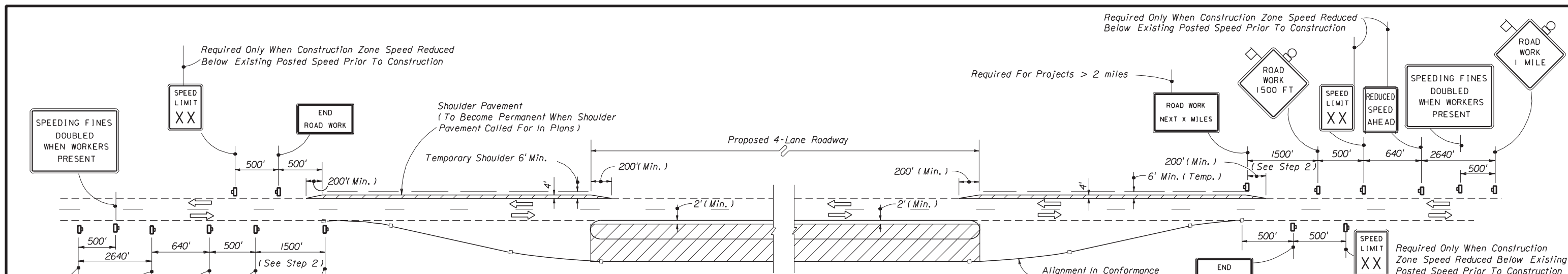
$L (Min.) = WS$
 $S = Existing Posted Speed$

NOTES

1. A lane closure analysis will be required to determine the times of day that this crossover can be in operation.
2. Arrows denote direction of traffic only and do not reflect pavement markings.

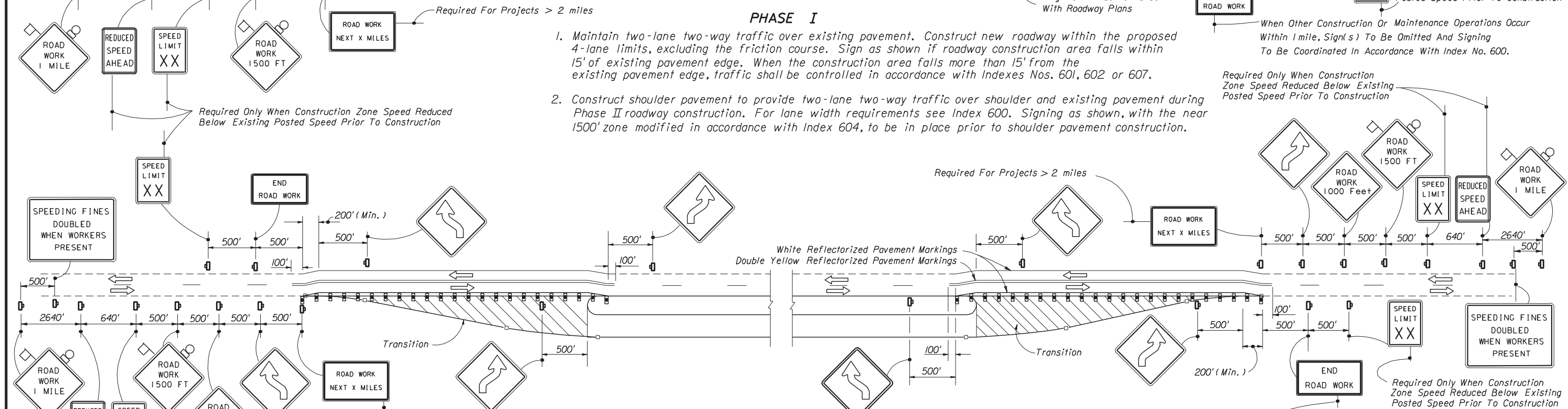
TEMPORARY CROSSOVER FOR MEDIAN WIDTHS FROM 50' TO < 75'

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TEMPORARY CROSSOVER				
Names	Dates	Approved By		
Designed By				
Drawn By		Roadway Design Engineer		
Checked By		Revision	Sheet No.	Index No.
		00	2 of 2	631



PHASE I

1. Maintain two-lane two-way traffic over existing pavement. Construct new roadway within the proposed 4-lane limits, excluding the friction course. Sign as shown if roadway construction area falls within 15' of existing pavement edge. When the construction area falls more than 15' from the existing pavement edge, traffic shall be controlled in accordance with Index Nos. 601, 602 or 607.
2. Construct shoulder pavement to provide two-lane two-way traffic over shoulder and existing pavement during Phase II roadway construction. For lane width requirements see Index 600. Signing as shown, with the near 1500' zone modified in accordance with Index 604, to be in place prior to shoulder pavement construction.



PHASE II

1. Remove existing pavement marking, in areas of diversion and re-mark as shown, install warning devices and re-sign as shown. Traffic to be controlled in accordance with Index No. 606. For lane width requirements see Index No. 600.
2. Route through traffic to temporary and existing pavement.
3. Construct transitions, excluding friction course.

SYMBOLS

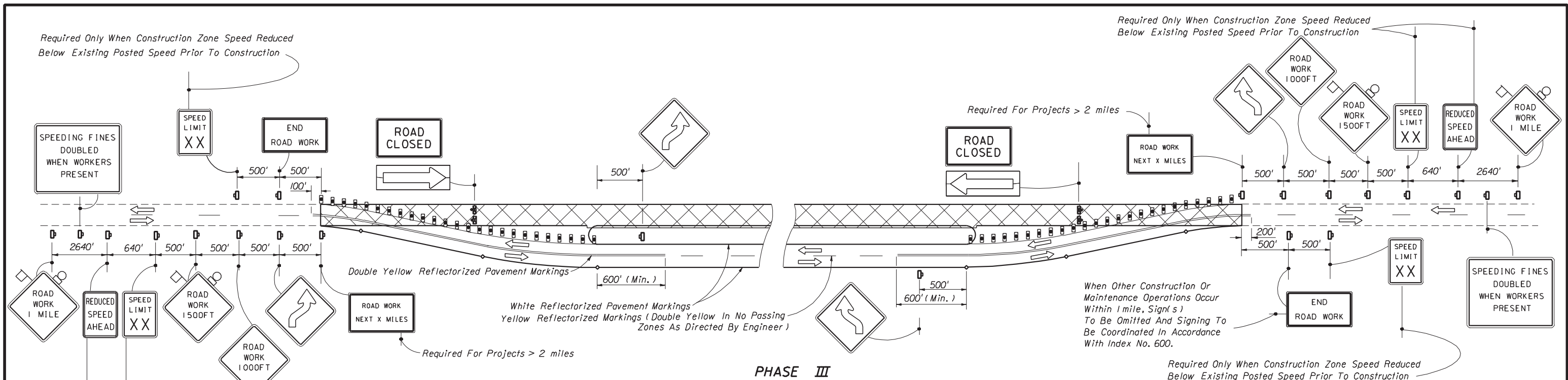
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
- Work Zone Sign

LEGEND

- Phase I Construction
- Phase II Construction
- Phase III Construction

Note: See Sheet 2 for General Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
CONVERTING TWO LANES TO FOUR LANES DIVIDED • RURAL				
Names	Dates	Approved By		
Designed By				
Drawn By		Roadway Design Engineer		
Checked By		Revision	Sheet No.	Index No.
		00	1 of 2	640



PHASE III

1. Remove temporary marking from the existing pavement and temporary shoulder pavement. Mark pavement, install warning devices and re-sign as shown. Traffic to be controlled in accordance with Index No. 606. For lane width requirements see Index No. 600.
2. Route through traffic to newly constructed roadway.
3. Resurface or reconstruct existing pavement including required shoulder pavement and friction course.

PHASE IV

1. Reroute through traffic as shown in Phase II. Signing to be as shown in Phase II.
2. Construct friction course over pavement constructed in Phases I and II.

GENERAL NOTES

1. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
2. Existing signs and pavement markings that conflict with construction signing and marking shall be obliterated or removed.
3. Lane widths for maintenance of two-way traffic should desirably be equal to lane widths of the existing facility, but lanes shall be not less than 10' in width. When one-lane one-way operations are necessary, a minimum width of 12' shall be maintained and traffic controlled in accordance with Indexes Nos. 603, 604, 606 and 607. Minimum width for the temporary shoulders is 6'.
4. Within the lateral transitions, the maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater.
The maximum spacing between warning devices used for delineation between the travel way and construction area to be 50' for Type I or Type II barricades or vertical panels or drums.
5. Warning Devices shall be in conformance with 'DropOffs In Work Zones', Index No. 600.
6. For speed sign applications, see 'Regulatory Speed In Work Zones' Index No. 600.
7. For reflectorized raised pavement marker applications, see Reflective Pavement Markers Index 600 and Index No 17352.
8. Additional barricades, signing, lighting or other traffic controls shall be provided for limited work areas in accordance with other applicable TCZ Indexes.
9. Arrows denote direction of traffic only and do not reflect pavement markings.
10. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
11. When a side road intersects the highway on which work is being performed additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
12. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
13. For general TCZ requirements and additional information refer to Index No. 600.

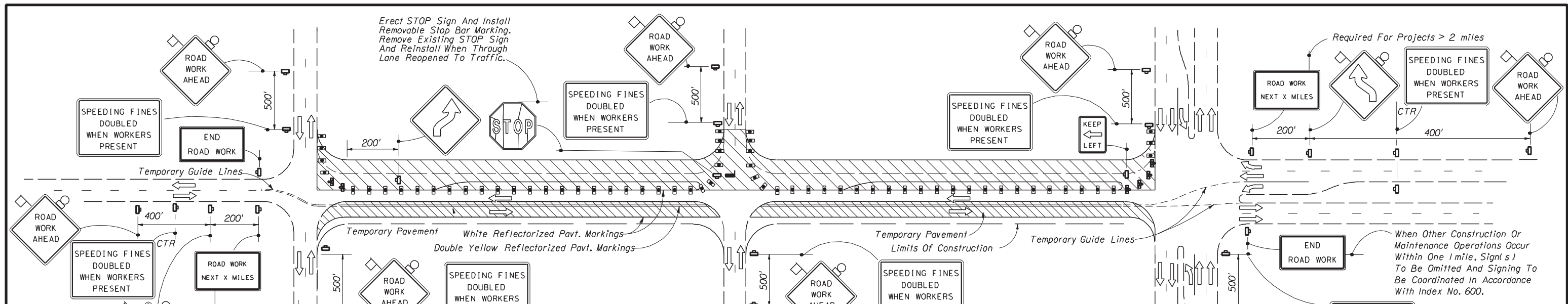
SYMBOLS

- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
- Type III Barricade (With Flashing Light)
- Work Zone Sign

LEGEND

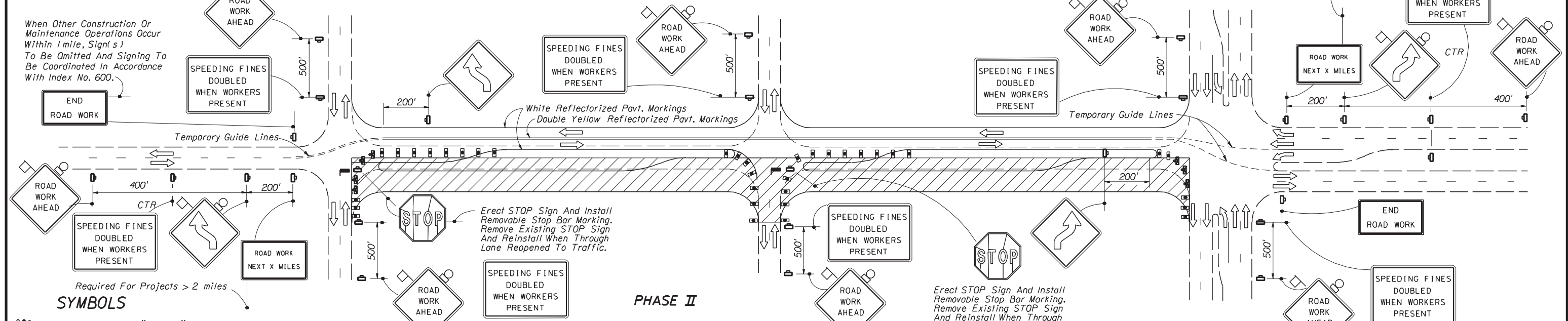
- Phase I Construction
- Phase II Construction
- Phase III Construction

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES CONVERTING TWO LANES TO FOUR LANES DIVIDED • RURAL				
Names	Dates	Approved By		
Designed By		Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 2	640



PHASE I

1. Maintain two-lane two-way traffic along existing facility. Install construction signing.
2. Remark existing pavement to facilitate temporary pavement construction. For lane width requirements see Index No. 600.
3. Construct temporary pavement of sufficient width to accommodate two-lane two-way traffic on the temporary pavement and a portion of the existing pavement during Phase I roadway construction. When two-lane two-way traffic can not be maintained during temporary pavement construction one-lane operations shall be maintained in accordance with Index No. 621. Channelizing devices shall be in conformance with 'Dropoffs in Work Zones' of Index No. 600.
4. Mark the pavement in accordance with the Phase I diagram. Reroute through traffic to the temporary pavement and a portion of the existing pavement. For lane width requirements see Index No. 600.
5. Construct two lanes of the proposed roadway, excluding the friction course. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Indexes Nos. 620, 621 and 622. Barricading shall be in conformance with 'Dropoffs in Work Zones', Index No. 600. When work extends through an intersection, temporarily reroute the cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane access (minimum) each direction for four-lane two-way cross streets, in accordance with Indexes Nos. 620, 621 and 622.



PHASE II

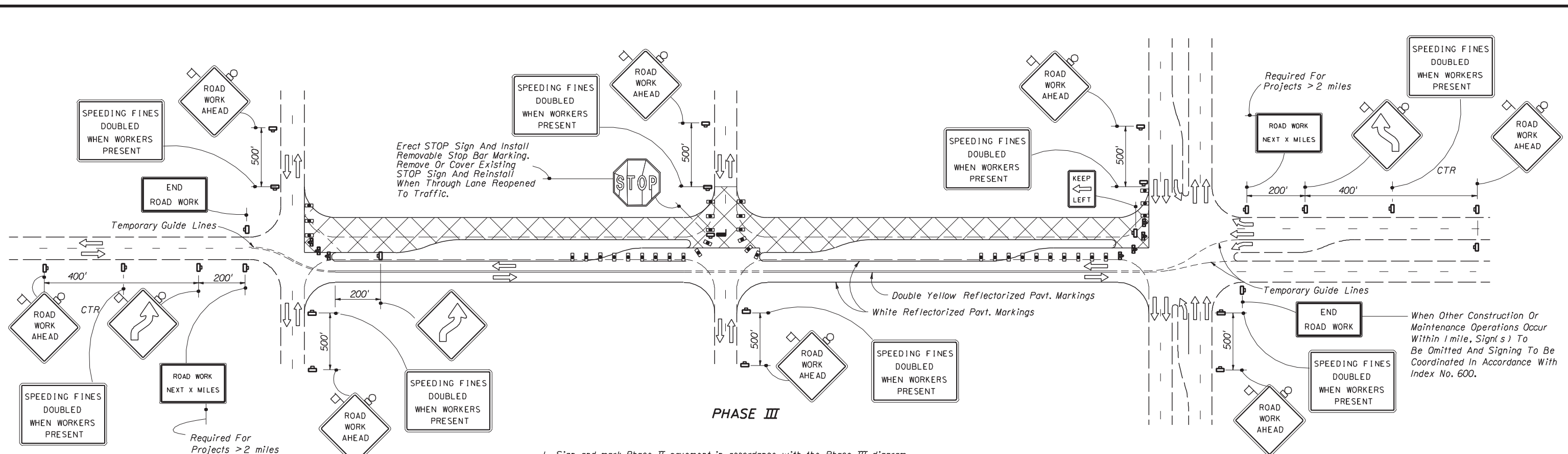
1. Sign and mark Phase I pavement in accordance with the Phase II diagram. For lane width requirements see Index No. 600.
2. Reroute through traffic to Phase I pavement.
3. Complete all Phase II construction, including the friction course. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Indexes Nos. 620, 621 and 622. Channelizing devices shall be in conformance with 'Dropoffs in Work Zones' of Index No. 600. When work extends through an intersection, temporarily reroute cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane access (minimum) each direction for four-lane two-way cross streets, in accordance with Indexes Nos. 620, 621 and 622.

- SYMBOLS**
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
 - Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
 - Type III Barricade (With Flashing Light)
 - Work Zone Sign
 - Stop Bar

- LEGEND**
- Phase I Construction
 - Phase II Construction
 - Phase III Construction

See Sheet 2 for General Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
CONVERTING TWO LANES TO FOUR LANES DIVIDED • URBAN				
Names	Dates	Approved By		
Designed By	08/79	Roadway Design Engineer		
Drawn By	08/79	Revision	Sheet No.	Index No.
Checked By	08/79	00	1 of 2	641



PHASE III

1. Sign and mark Phase II pavement in accordance with the Phase III diagram.
2. Reroute through traffic to Phase II pavement.
3. Construct friction course over Phase I pavement. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Indexes Nos. 620, 621 or 622. When work extends through an intersection, temporarily reroute cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane access (minimum) each direction for four-lane two-way cross streets.

GENERAL NOTES

1. All signing, pavement marking, barricades and warning lights necessary for maintenance of traffic shall conform to Index No. 600.
2. The first two warning signs shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
3. Lane widths for maintenance of two-way traffic should desirably be equal to lane widths of the existing facility, but lanes shall not be less than 10' in width. When one-lane one-way operations are necessary, a minimum width of 12' should be maintained and traffic controlled in accordance with Indexes Nos. 620, 621 or 622.
4. At signalized intersections, signals shall be directed or relocated as required to the center of relocated lanes.
5. For reflectorized raised pavement marker application see index No. 600 and index No. 17352.
6. Additional barricades, signing, lighting or other traffic controls for limited work areas shall be provided in accordance with other applicable TCZ Indexes as conditions warrant in each phase.
7. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. For general TCZ requirements and additional information refer to Index No. 600.

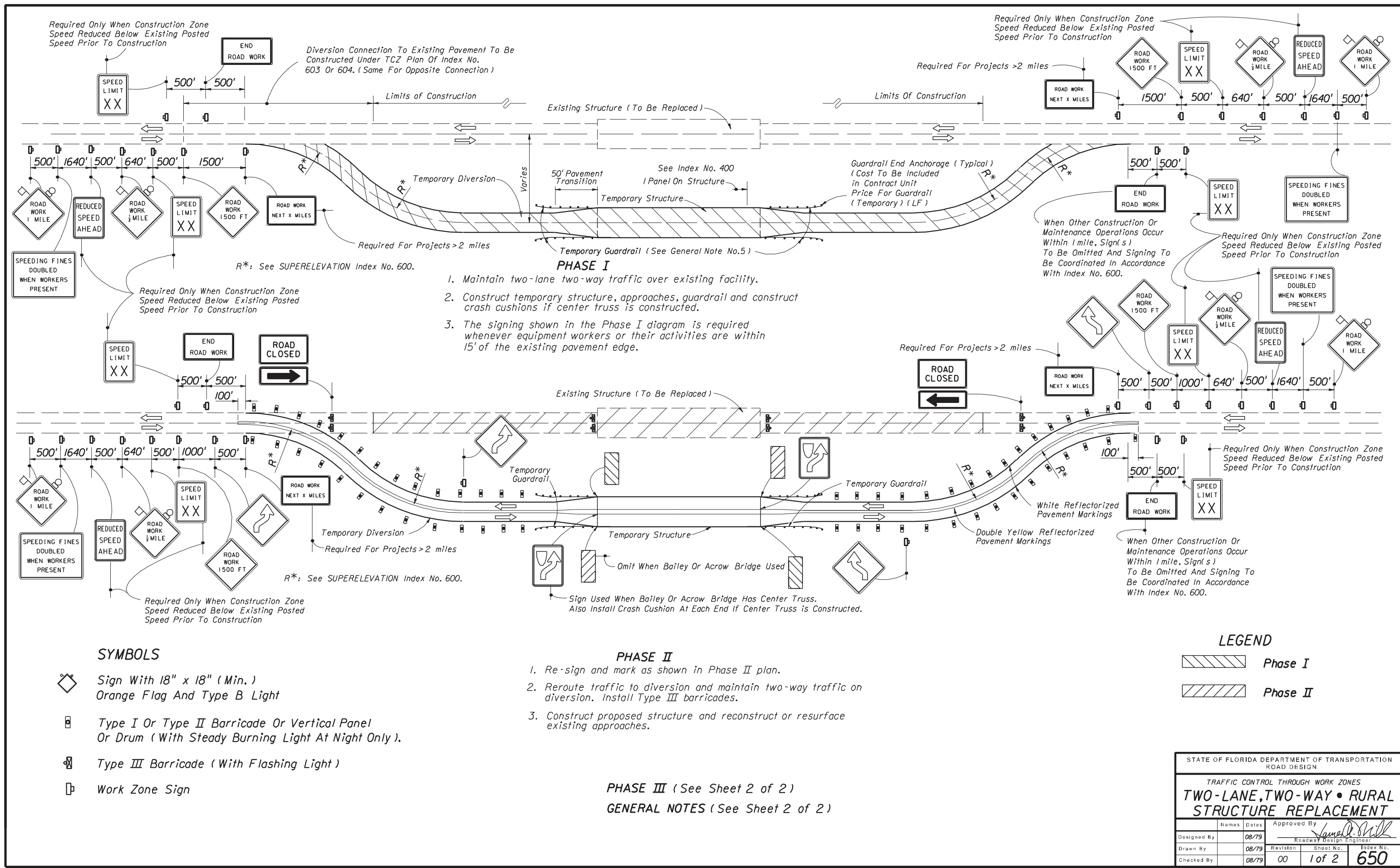
SYMBOLS

- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). Tubular Markers May Be Used During Daylight Only.
- Type III Barricade (With Flashing Light)
- Work Zone Sign
- Stop Bar

LEGEND

- Phase I Construction
- Phase II Construction
- Phase III Construction

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
CONVERTING TWO LANES TO FOUR LANES DIVIDED • URBAN				
Names	Dates	Approved By		
Designed By	08/79			
Drawn By	08/79	Revision	Sheet No.	Index No.
Checked By	08/79	00	2 of 2	641

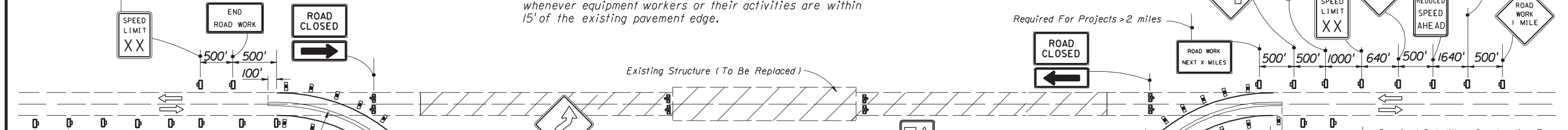
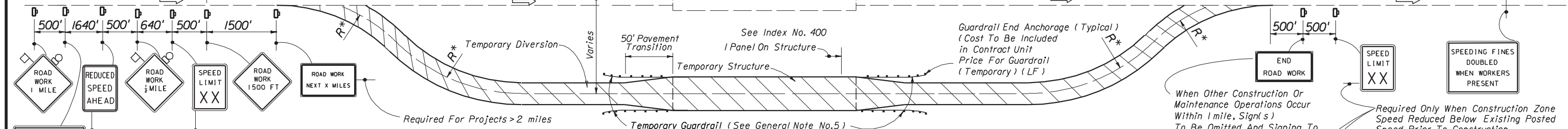
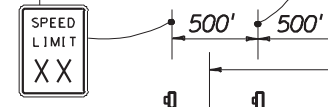


Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Diversion Connection To Existing Pavement To Be Constructed Under TCZ Plan Of Index No. 603 Or 604. (Same For Opposite Connection)

Required For Projects > 2 miles



- PHASE I**
1. Maintain two-lane two-way traffic over existing facility.
 2. Construct temporary structure, approaches, guardrail and construct crash cushions if center truss is constructed.
 3. The signing shown in the Phase I diagram is required whenever equipment workers or their activities are within 15' of the existing pavement edge.

- PHASE II**
1. Re-sign and mark as shown in Phase II plan.
 2. Reroute traffic to diversion and maintain two-way traffic on diversion. Install Type III barricades.
 3. Construct proposed structure and reconstruct or resurface existing approaches.

PHASE III (See Sheet 2 of 2)
GENERAL NOTES (See Sheet 2 of 2)

SYMBOLS

- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
- Type III Barricade (With Flashing Light)
- Work Zone Sign

LEGEND

- Phase I
- Phase II

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN			
TRAFFIC CONTROL THROUGH WORK ZONES TWO-LANE, TWO-WAY • RURAL STRUCTURE REPLACEMENT			
Designed By	Names	Dates	Approved By
Drawn By	Revision	Sheet No.	Index No.
Checked By	08/79	00	1 of 2 650

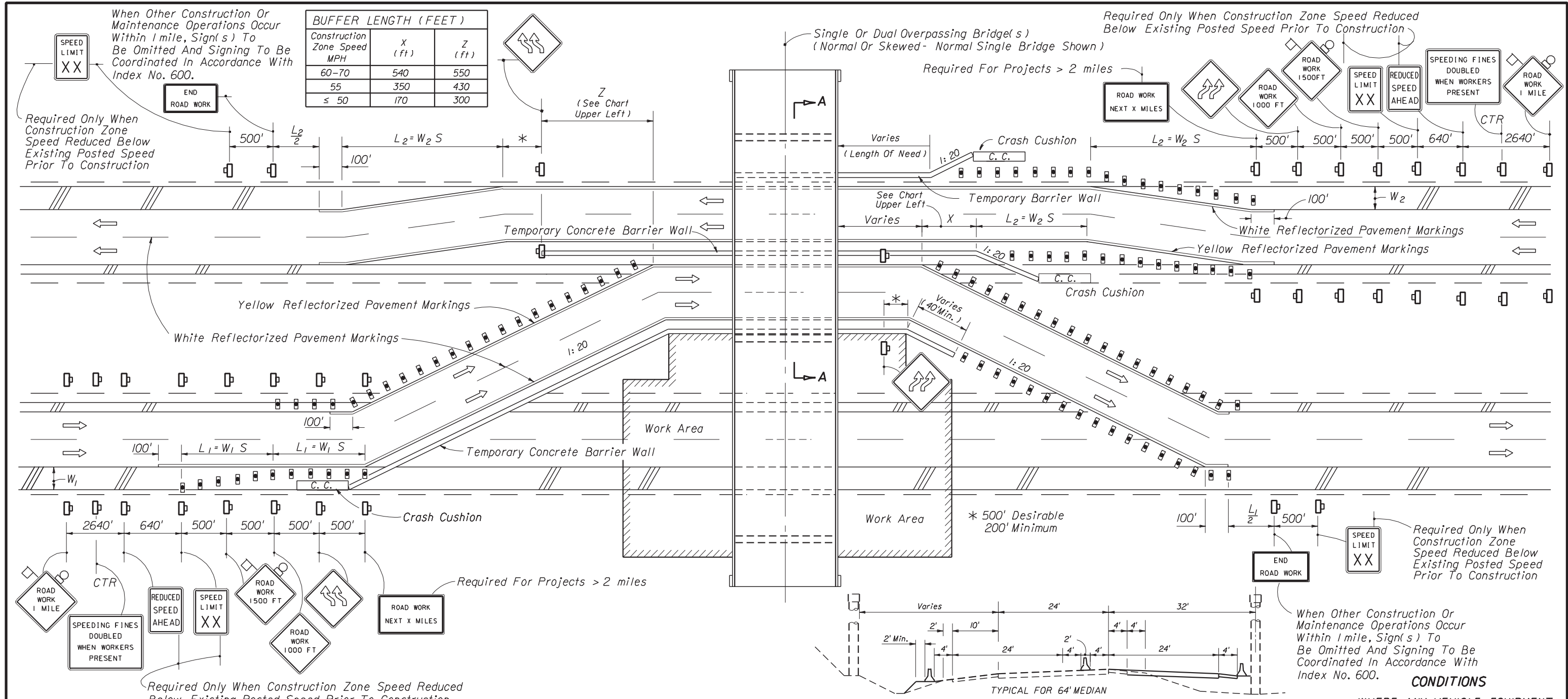
PHASE III

- 1. Reroute traffic to final alignment and maintain two-way traffic.
- 2. Remove all temporary construction items.

GENERAL NOTES

- 1. All signing, pavement marking, barricades and warning lights necessary for maintenance of traffic shall conform to Index No. 600.
- 2. The first two warning signs shall have an 18" x 18"(min.) orange flag and a Type B light attached and operating at all times.
- 3. For speed sign applications see Index No. 600.
- 4. For lane width requirements see Index No. 600. When one-way one-lane operations are necessary, a minimum width of 12' shall be maintained and traffic controlled in accordance with Indexes Nos. 603, 604, 606, 607 or 608. Minimum width for the detour shoulders is 6'.
- 5. Method of attaching temporary guardrail to the diversion structure to be approved by the Engineer. Cost of temporary guardrail systems, including end anchorage assemblies, transitions and attachment to temporary structures, are to be included in the contract unit price for guardrail (temporary) LF.
- 6. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
- 7. Temporary crash cushions shall be in accordance with Index No. 435 unless other device called for in the plans.
- 8. Arrows denote direction of traffic only and do not reflect pavement markings.
- 9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
- 10. Where the temporary structure is not required the diversion may be constructed in accordance with Index No. 609, unless otherwise stipulated in the plans.
- 11. For reflective raised pavement marker application see Index No. 600 and Index No. 17352.
- 12. For general TCZ requirements and additional information refer to Index No. 600.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
TWO-LANE, TWO-WAY • RURAL STRUCTURE REPLACEMENT				
	Names	Dates	Approved By	
Designed By		08/79	_____ Roadway Design Engineer	
Drawn By		08/87	Revision	Sheet No. Index No.
Checked By		08/79	00	2 of 2 650



BUFFER LENGTH (FEET)		
Construction Zone Speed MPH	X (ft)	Z (ft)
60-70	540	550
55	350	430
≤ 50	170	300

When Other Construction Or Maintenance Operations Occur Within 1 mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

Required For Projects > 2 miles

Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
- Work Zone Sign

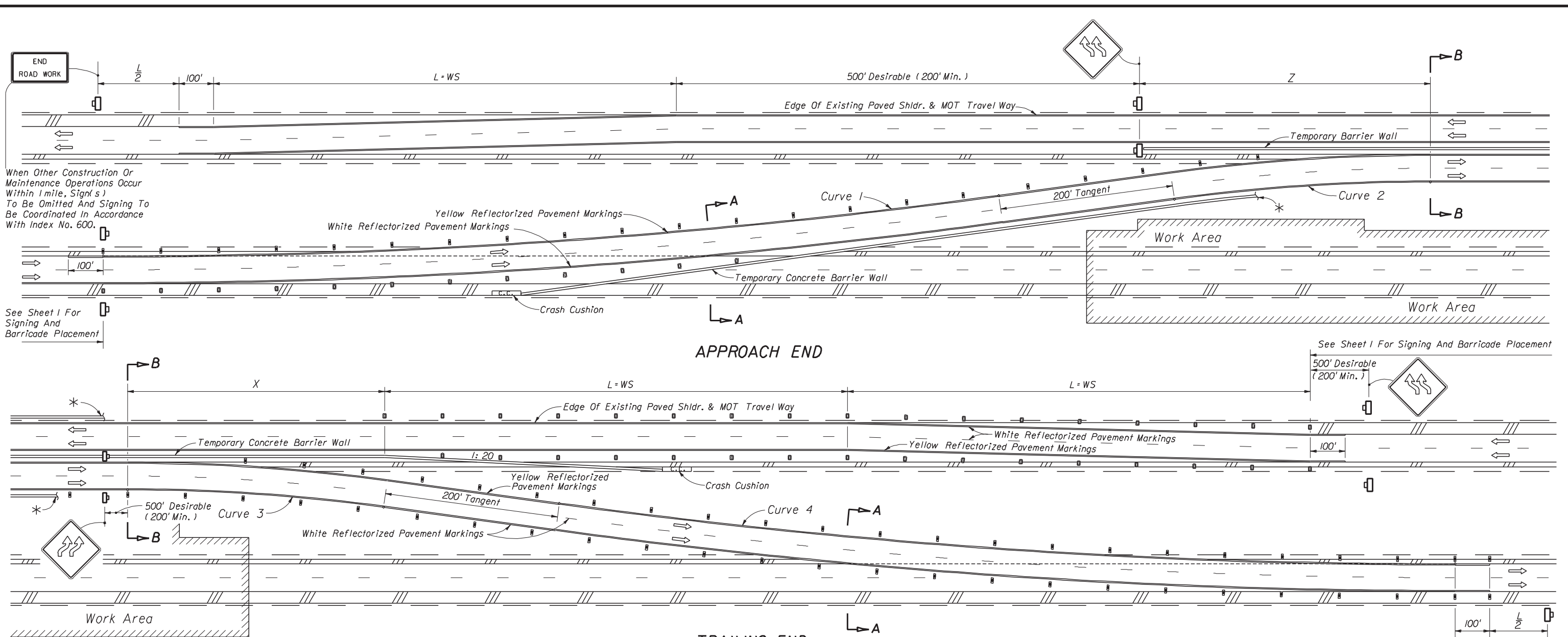
GENERAL NOTES

1. All vehicles, equipment, workers and their activities are restricted at all times to one side of the highway.
2. The first two warning signs, each side, shall have an 18" x 18" (min.) orange flag and a Type B light attached and operating at all times.
3. All signs shall be post mounted.
4. S = Posted speed limit (mph).
5. Within the lateral transitions, the maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater. Barricades, vertical panels, and drums shall not be intermixed in lateral transition.
6. For speed sign applications see 'Regulatory Speed In Work Zones' Index No. 600.
7. All existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and new pavement markings used for marking edge lines and lane lines.
8. Arrows denote direction of traffic only and do not reflect pavement markings.
9. Longitudinal dimensions are to be adjusted to fit field conditions. See Index No. 600.
10. When side roads, cross roads or interchanges are located within the limits for work zone traffic control additional traffic control devices shall be erected in accordance with other applicable TCZ Indexes.
11. For general TCZ requirements and additional information refer to Index No. 600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF ONE ROADWAY AND THE OPPOSING ROADWAY IS CONVERTED TO TEMPORARY TWO-WAY TRAVEL BY WAY OF CROSSOVERS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
MULTILANE DIVIDED MAINTENANCE AND CONSTRUCTION				
Designed By	Names	Dates	Approved By	
Drawn By		10/89	 Raymond D. Hill Roadway Design Engineer	
Checked By		10/89		
		10/89		
	Revision	00	Sheet No.	Index No.
			1 of 2	651



When Other Construction Or Maintenance Operations Occur Within 1 mile, Signs To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

See Sheet I For Signing And Barricade Placement

See Sheet I For Signing And Barricade Placement

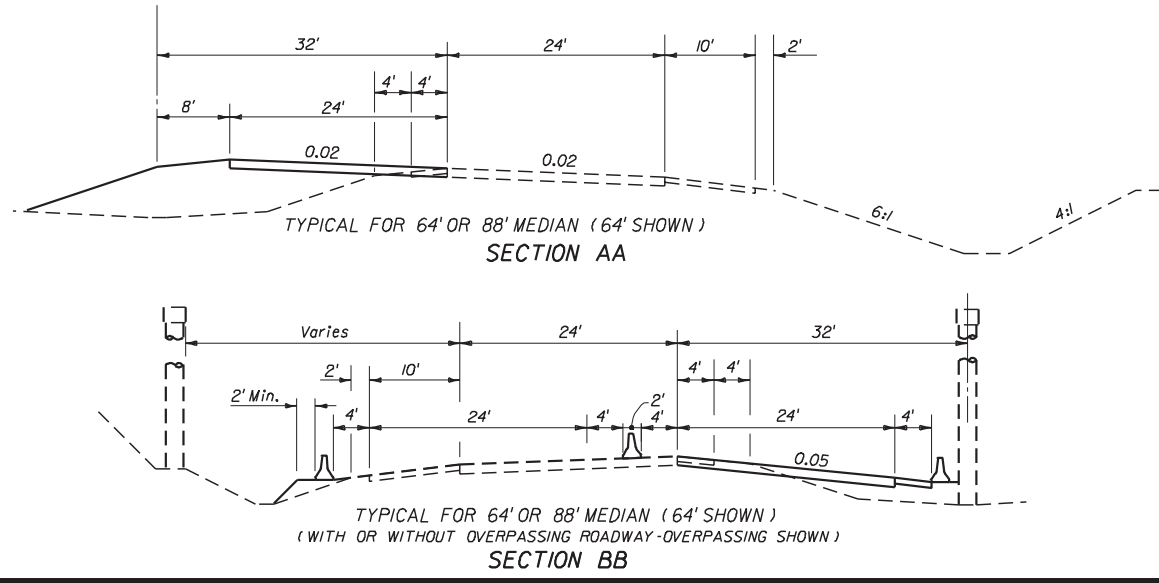
* Length of barrier wall needed for protection of work area and/or other hazards to be shown in the plans. For complimentary information on barrier walls and work area see Sheet I. See Index No. 600 for clear zone requirements.

When Other Construction Or Maintenance Operations Occur Within 1 mile, Signs To Be Omitted And Signing To Be Coordinated In Accordance With Index No. 600.

BUFFER LENGTH (ft)				
Construction Zone Speed MPH	64' Median		88' Median	
	X	Z	X	Z
70	607	588	582	545
65	581	562	552	514
60	562	543	531	492
55	337	369	330	350
50	201	286	200	276
45	115	164	115	163
40	104	149	104	148
35	91	134	91	132
30	78	118	78	115

MINIMUM RADII FOR NORMAL CROSS SLOPES			
Construction Zone Speed MPH	Minimum Radius (ft) R		
	Curves 1 & 4		Curves 2 & 3
70	22,918 (0° 15')	4,584 (1° 15')	
65	22,918 (0° 15')	3,820 (1° 30')	
60	22,918 (0° 15')	3,274 (1° 45')	
55	11,459 (0° 30')	2,546 (2° 15')	
50	11,459 (0° 30')	2,292 (2° 30')	
45	1,080 (5° 18')	700 (8° 11')	
40	830 (6° 54')	550 (10° 25')	
35	620 (9° 14')	410 (13° 58')	
30	450 (12° 44')	285 (20° 06')	

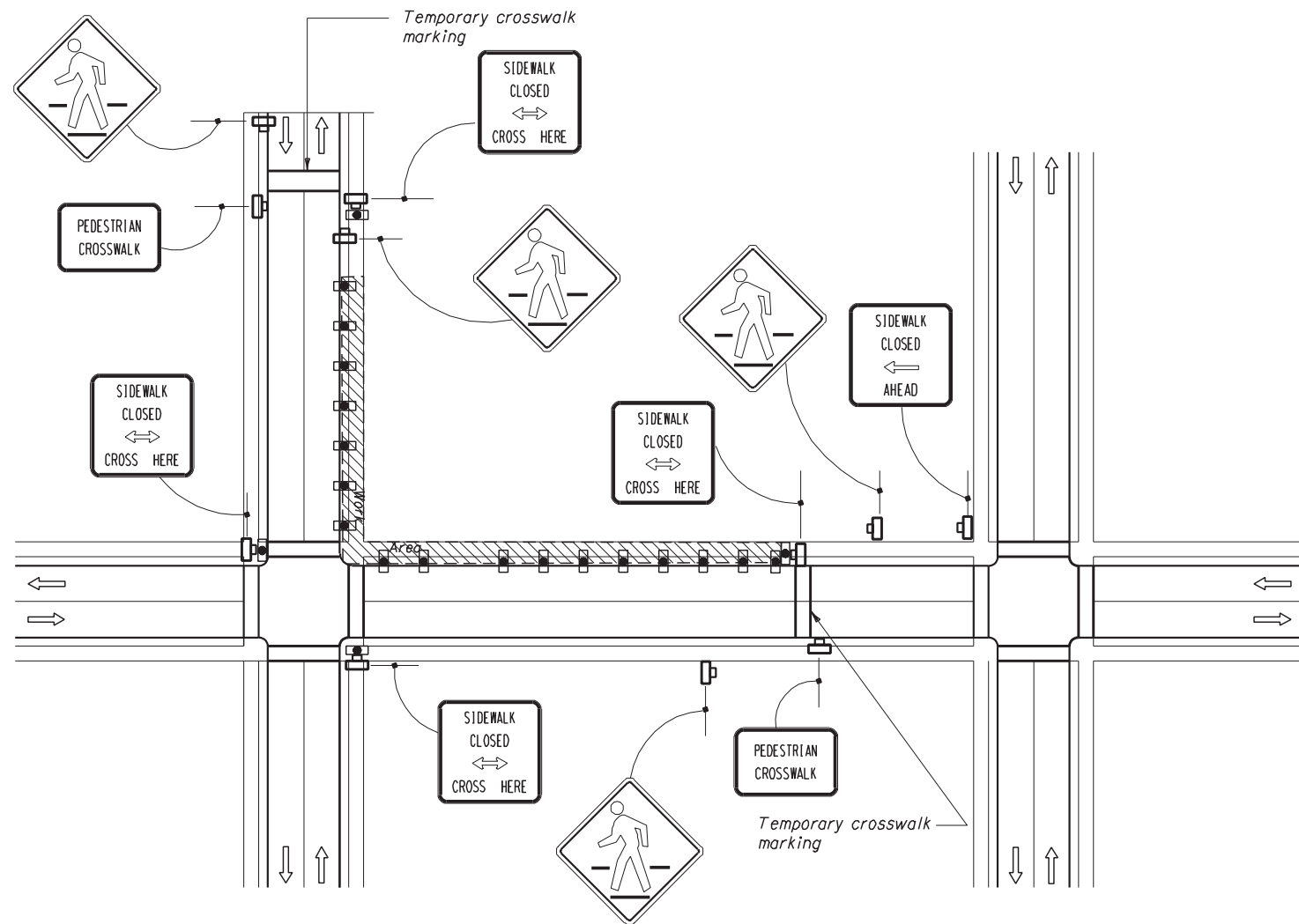
NOTE: Diversions with speeds of 50 mph or greater are considered high speed facilities; curvature and superelevation criteria for open highway conditions apply.



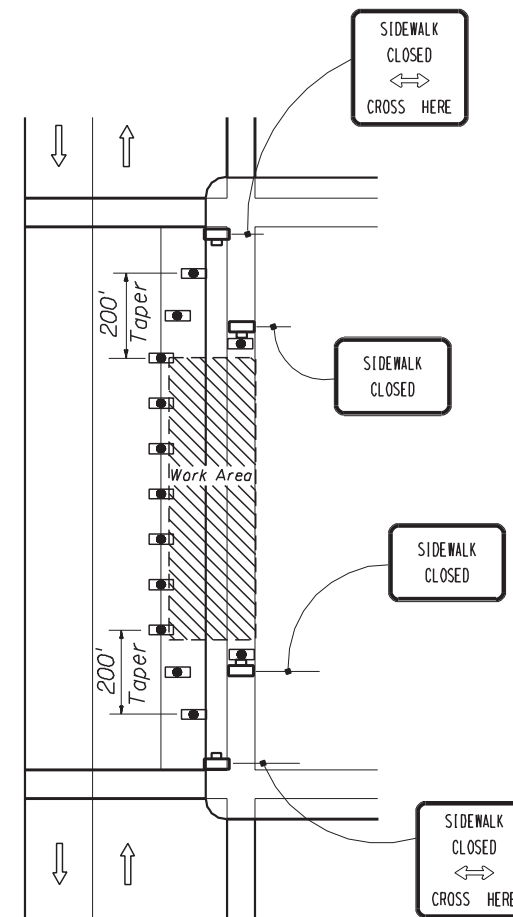
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TRAFFIC CONTROL THROUGH WORK ZONES
MULTILANE DIVIDED MAINTENANCE AND CONSTRUCTION

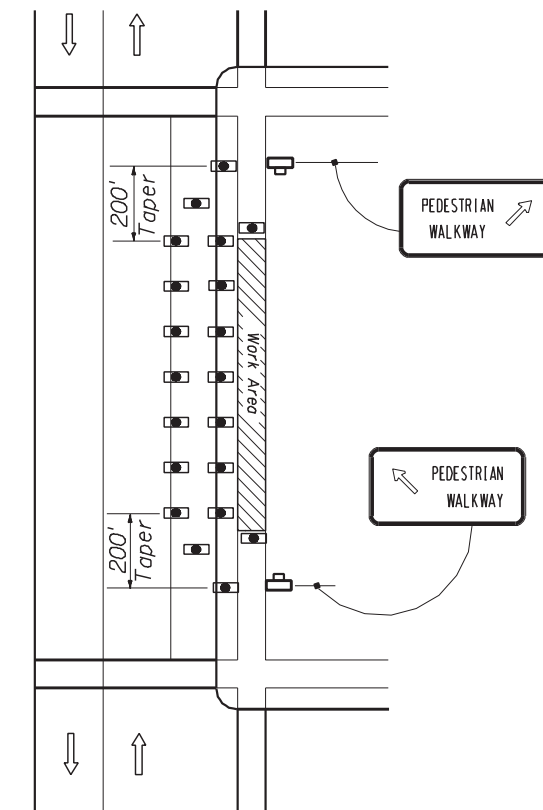
Names	Dates	Approved By	
Designed By		Roadway Design Engineer	
Drawn By		Revision	Sheet No.
Checked By		00	2 of 2
			651



CORNER SIDEWALK CLOSURE WITH TEMPORARY CROSSWALKS



MID-BLOCK SIDEWALK CLOSURE



MID-BLOCK SIDEWALK CLOSURE WITH TEMPORARY WALKWAY

GENERAL NOTES

1. Arrows denote direction of traffic only and do not reflect pavement markings.
2. Only the signs controlling pedestrian flows are shown. Other work zone signs will be needed to control traffic on the streets.
3. For spacing of traffic control devices and general TCZ requirements refer to Index No. 600. Maximum spacing between barricades, vertical panels, drums or tubular markers shall not be greater than 25'.
4. Street lighting should be considered.
5. For nighttime closures use Type A flashing warning lights on barricades supporting signs and closing sidewalks. Use Type C steady-burn lights on channelizing devices separating the work area from vehicular traffic.
6. Pedestrian traffic signal display controlling closed crosswalks shall be covered or deactivated.
7. Temporary walkways shall be a minimum of 4' wide and kept free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials and etc. (For details see Index 600)
8. Post Mounted Signs located near or adjacent to a sidewalk shall have a 7' minimum clearance from the bottom of sign to the sidewalk.
9. When construction activities involve sidewalks on both sides of the street, efforts should be made to stage the construction so that both sidewalks are not out of service at the same time.
10. In the event that sidewalks on both sides of the street are closed, then pedestrians shall be guided around the construction zone.




TYPICAL APPLICATIONS

Sidewalk Repair
Pavement Widening
Utility Work

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCROACH ON THE SIDEWALK FOR A PERIOD OF MORE THAN 60 MINUTES

SYMBOLS

-  Work Area
-  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used -See Index 600).
-  Work Zone Sign

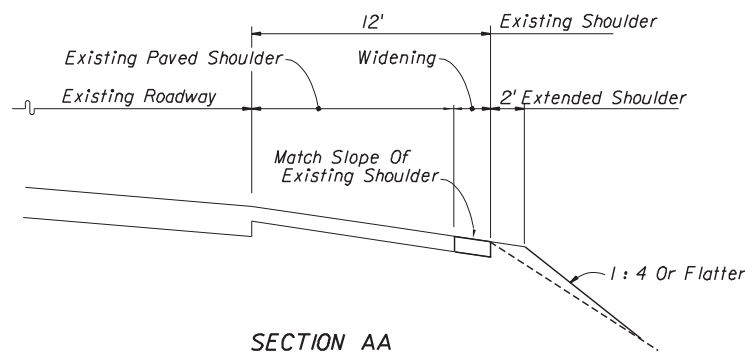
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES				
PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS				
Names	Dates	Approved By <i>Lamont D. Mill</i>		
Designed By	7/93	Roadway Design Engineer		
Drawn By	7/93	Revision	Sheet No.	Index No.
Checked By	7/93	00	1 of 1	660



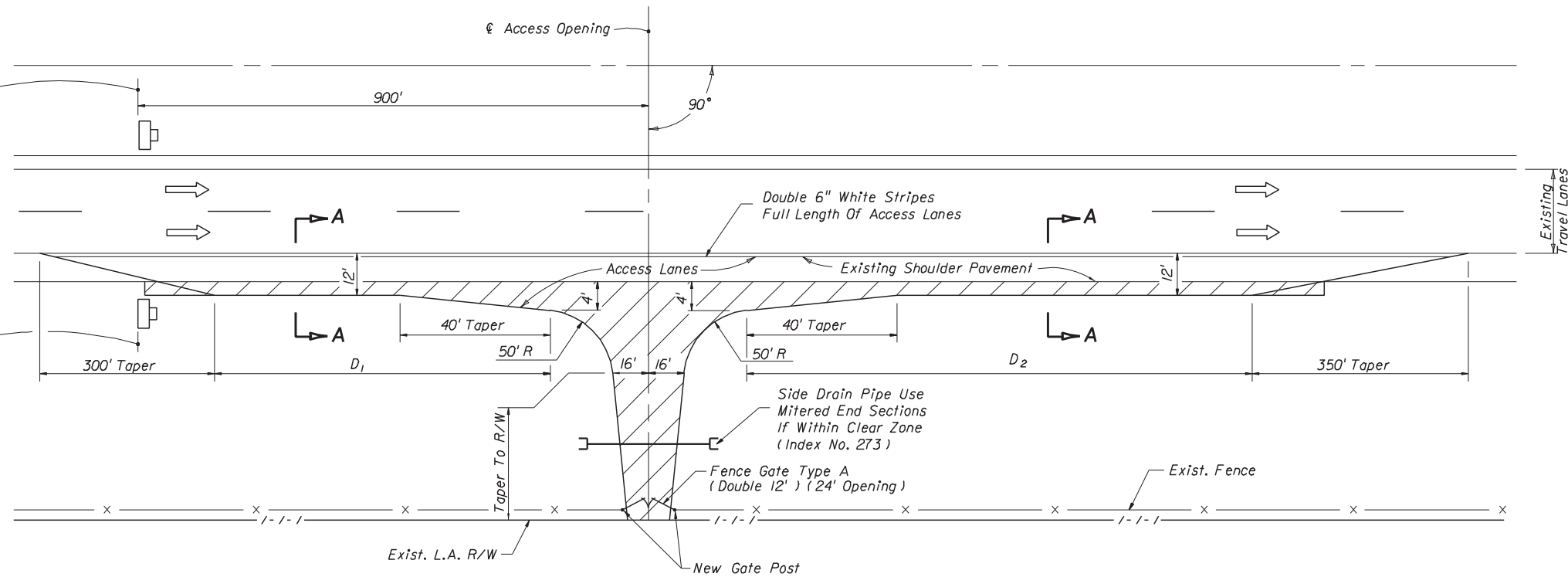
SYMBOLS

 Work Zone Sign

LENGTH OF ACCESS LANES (Ft)		
Grade	D ₁	D ₂
2% or less	590	1540
3 to 4% Upgrade	530	2310
3 to 4% Downgrade	710	925




SECTION AA



PLAN

GENERAL NOTES

- Access openings across limited access right of way and use of this Index are prohibited unless specifically permitted in the Contract Plans or Special Provisions. When permitted in the Contract Plans or Special Provisions and prior to construction of any opening, the Contractor must submit, in writing, a request identifying specific locations for approval by the Engineer.
- No more than two (2) access openings will be allowed on each project.
- Access openings shall be located only in areas having adequate sight distance and shall not be located within 1.5 miles of interchanges nor within 2000 ft. of acceleration-deceleration lanes at rest areas, other access openings or other highway service areas.
- Access openings shall not be constructed directly opposite temporary median crossovers nor within 2000 ft. of temporary median crossovers.
- Access openings shall be within the project limits and shall not be used for transporting materials to or from any other project. The acceleration-deceleration surfaces shall be paved. RAP material is acceptable for driveway surfacing.
- Any Motorist Aid Call Boxes affected by the temporary access openings shall be relocated outside the limits of access lanes and remain in use during construction. Upon removal of the access lanes, call boxes shall be returned to their previous location. Temporary relocation and restoration of call boxes shall be at the contractors expense.
- Access openings in the limited access fence shall have gates which are to be locked during non-work hours or periods when the access is not in active use.
- The contractor shall take all precautions necessary to insure against entrance by livestock or unauthorized persons or vehicles.
- The contractor shall not vary from the plan detail without approval of the Engineer.
- Gates shall be removed and access opening locations shall be restored to pre-construction condition immediately upon completion of activities utilizing the materials being transported through the openings whether or not the project is completed.
- Failure to comply with any provision of the access opening plan shall be cause for terminating use of all openings. Upon notification by the Engineer, the contractor shall cease hauling and begin restoration of affected areas. Under this condition expense of removal, restoration and of additional hauling distances shall be borne by the contractor.
- No guardrail or barrier wall will be removed for access openings.
- Construction and removal of the access and restoring the area to pre-construction condition shall be included in the cost of Maintenance Of Traffic, LS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC CONTROL THROUGH WORK ZONES LIMITED ACCESS RIGHT OF WAY TEMPORARY OPENING				
Names	Dates	Approved By		
Designed By		 Roadway Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	665

NOTES

1. Walls shall be constructed in accordance with Section 548 and the wall suppliers instructions.
2. Retaining Walls and all cast-in-place appurtenances, i.e., coping, traffic railing barriers, sidewalk parapets, light pilasters, integral sign foundations, etc., shall be paid for at the contract unit price per square feet of retaining wall under, Retaining Wall System (Permanent), Retaining Wall System (Temporary). Payment shall be based on plan quantities.

The related cost of installation of drainage structures (only structures affected by wall) shall be included in the unit cost for retaining wall, Pay Item Retaining Wall System (Permanent), or Retaining Wall System (Temporary).

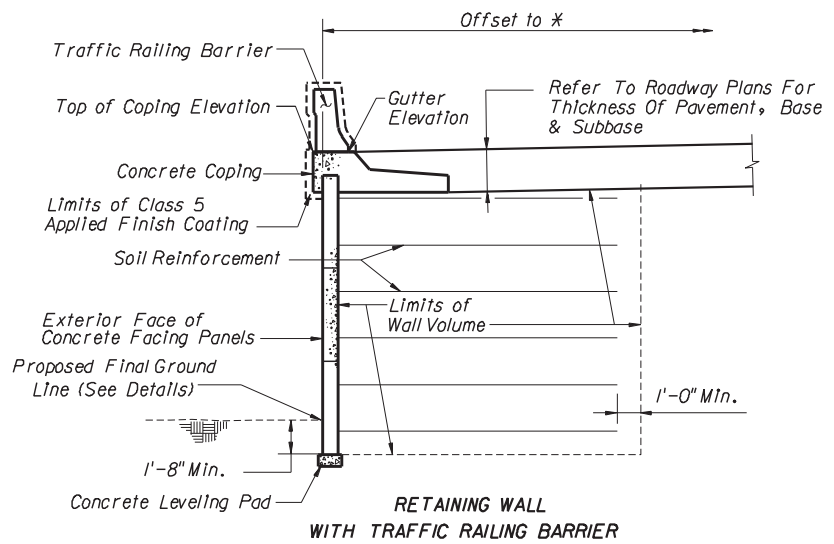
3. All exposed surfaces of cast-in-place concrete shall receive a Class 5 Applied Finish Coating in accordance with Construction Specifications Section 400. Refer to Typical Wall Sections and the following notes for limits of applied finish:
 - a. The inside, backside and top of Traffic Railing Barriers and Pedestrian/Bicycle Railing Barriers.
 - b. Exposed surfaces of coping on top of retaining wall.
4. Other coatings, colors or textures shall be applied as required by the Contract Documents.

5. Piles within the wall volume shall be driven prior to construction of the retaining wall. The portion of the pile within the wall volume shall be wrapped with polyethylene sheeting in accordance with Section 459.
6. A structural extension of the connection of the wall panel to the soil reinforcement shall be used whenever necessary to avoid the cutting or excessive skewing (greater than 15 degrees) of the soil reinforcements around obstructions (i.e. piles, pipes, etc.).
7. For wall systems utilizing footings, the top of footing elevation is the same elevation as top of leveling pad.
8. Steps in leveling pads shall occur at panel interfaces. Panels shall not cantilever past the end of the leveling pad.
9. No cutting of soil reinforcement grids allowed unless shown on shop drawings and approved by the Engineer.

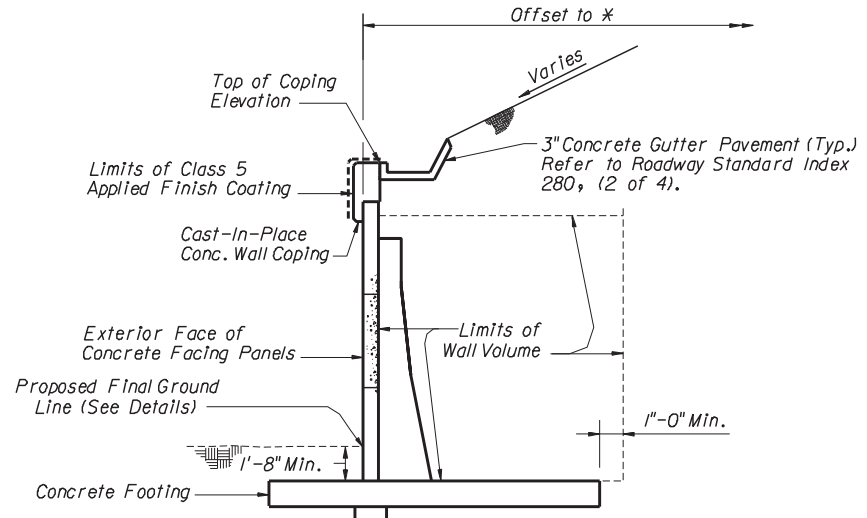
SHOP DRAWING REQUIREMENTS

The successful bidder shall submit the final design of the wall for review as shop drawings. The Shop Drawings shall include detailed design computations and all details, dimensions and quantities necessary to construct the wall. The design and fully detailed plans shall be prepared to Department standards current at time of bid and shall include, but not be limited to, presentation of required information as follows:

1. Provide an elevation view of the wall indicating elevations at top of wall at begin and end wall stations, at all breaks in vertical alignment and at whole stations and 30 foot increments. Show elevations at top of leveling pad, bottom of footings, locations of all steps in leveling pad, panel designations, and length, size and designation of soil reinforcement in elevation view. Indicate location of the proposed final ground line.
2. Provide a plan view detailing the horizontal alignment and offsets from the horizontal control line(s) to the exterior face of the Wall.
3. Show in the plan and elevation all utilities, sign supports, light pole pilasters, drainage structures, drainage pipes, etc. that affect the walls. Locate on the plan all piles within the wall volume including those for future widening as shown on Foundation Layout drawings.
4. Provide general notes and design parameters on the shop drawings, including design soil characteristics, minimum factors of safety, allowable material stresses and all other pertinent notes required for the construction of the walls. Provide the allowable and maximum actual bearing pressure for each wall height increment.
5. Show the limits of the wall volume.
6. Show all details of each concrete panel, slip joint and all other concrete elements incorporated in the wall, including reinforcing bar size and spacing, reinforcing bar bending details and details of all embedments.
7. Show all details of leveling pads and footings, including steps in leveling pads.
8. Show all details for construction of wall around obstructions. Show details for placement of soil reinforcement at acute corners and at interface with temporary walls.



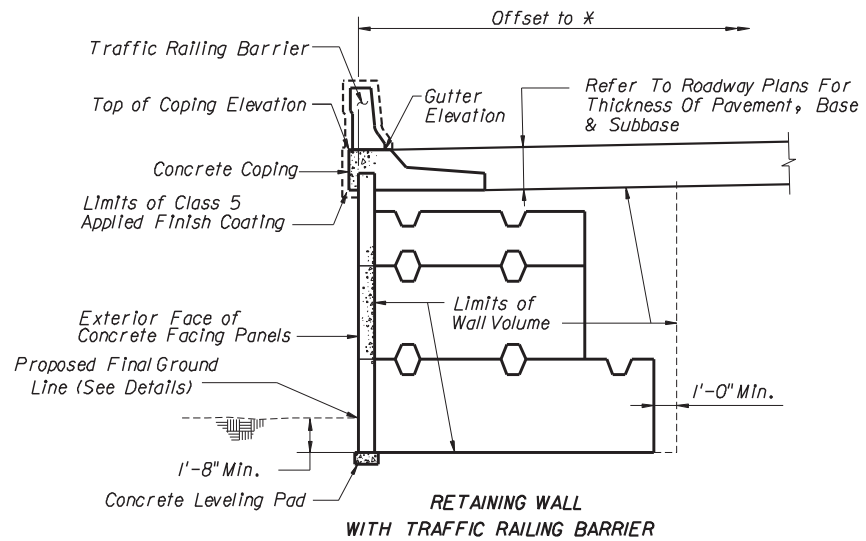
TYPICAL WALL SECTION - MSE SYSTEM (N.T.S.)



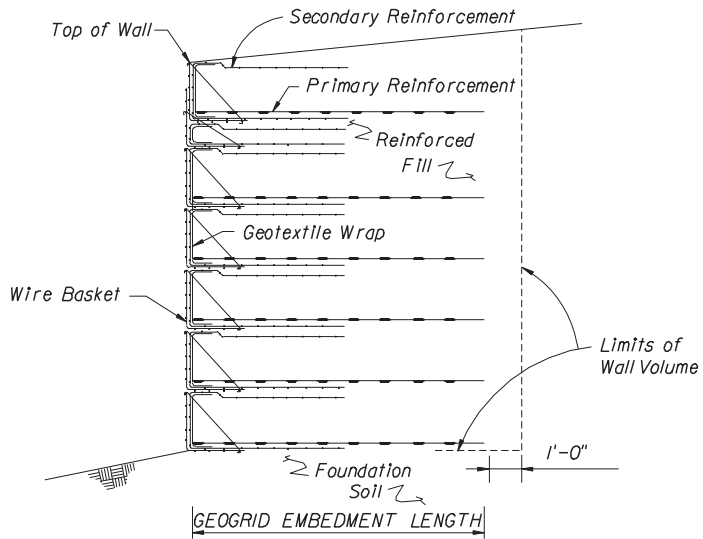
TYPICAL WALL SECTION - COUNTERFORT SYSTEM (N.T.S.)

* Insert control line designation i. e. C, B etc.

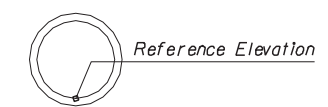
9. Show all details addressing conflicts between soil reinforcement, concrete facing panels and embedments in the wall volume. Provide full details of connections of barriers, coping, sign supports, light pole pilasters, acute corners, etc.
10. Show all details where walls of different types intersect/influence one another.
11. Provide fully detailed design calculations for each wall height increment utilized in the shop drawings. The submitted plans and design calculations shall be signed and sealed by a Professional Engineer registered in the State of Florida.



TYPICAL WALL SECTION - CONCRETE STEM SYSTEM (N.T.S.)



TEMPORARY WALL - TYPICAL CROSS-SECTION (N.T.S.)



NOTE: See Roadway plans for complete drainage details.

DRAINAGE PIPE DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
RETAINING WALL SYSTEM GENERAL NOTES					
Names	Dates	Approved By <i>[Signature]</i>			
Designed By	RVR	11-98	State Structures Design Engineer		
Drawn By	JSP	11-98	Revision	Sheet No.	Index No.
Checked By	DEK	11-98	00	1 of 1	5000

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A Division of L. B. Foster Company

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GENERAL NOTES

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE REINFORCED EARTH VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE CONTRACTING AGENCY'S TECHNICAL SPECIFICATIONS FOR RETAINED EARTH WALLS.

2. FACTORS OF SAFETY

OVERTURNING 2.0
 INTERNAL PULLOUT 1.5 (ALLOW DEFORMATION 3/4")
 OVERALL STABILITY 1.5
 SLIDING 1.5
 BEARING 2.5

SOIL REINFORCEMENT MESH 0.47 F_y AT END OF DESIGN LIFE

3. SOIL CHARACTERISTICS ASSUMED FOR DESIGN:

SOIL PARAMETERS:

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF φ, C AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS.

4. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF OTHERS TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.

5. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED EARTH VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.

REINFORCING ELEMENTS

6. REINFORCING MESH ELEMENTS SHALL BE SHOP FABRICATED FROM COLD DRAWN STEEL ROD CONFORMING TO THE MINIMUM REQUIREMENTS OF ASTM A-82 AND SHALL BE WELDED AT THE JUNCTIONS BETWEEN LONGITUDINAL AND TRANSVERSE WIRES IN ACCORDANCE WITH ASTM A-185. GALVANIZATION SHALL BE APPLIED AFTER MESH FABRICATION AND SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF ASTM A-123.

LOOP EMBEDS SHALL BE FABRICATED FROM COLD DRAWN STEEL ROD CONFORMING TO ASTM A-510 OR ASTM A-82. LOOP EMBEDS SHALL BE WELDED IN ACCORDANCE WITH ASTM A-185. LOOP EMBEDS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM B-633.

DESIGN:

7. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, THE WALL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

WALL CONSTRUCTION

8A. (SQUARE PANELS) RETAINED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 5.0' EACH TO MATCH DESIRED WALL ALIGNMENT.

8B. (HEX PANELS) RETAINED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 4.33' EACH TO MATCH DESIRED WALL ALIGNMENT.

9. FOR LOCATION AND ALIGNMENT OF RETAINED EARTH WALLS. SEE RETAINING WALL CONTROL PLANS.

10. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.

11. IF PILES ARE LOCATED WITHIN REINFORCED SOIL VOLUME. THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE REINFORCED EARTH WALL UNLESS A METHOD TO PROTECT THE STRUCTURE WHICH IS ACCEPTABLE TO THE ENGINEER AND FOSTER GEOTECHNICAL COMPANY AND IS PROPOSED AND APPROVED IN WRITING.

12. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 TO A LEVEL OF 2" (+/-) ABOVE THE TIE MESH EMBEDDED IN THE PANELS. INSTALLATION OF REINFORCING MESH SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.

13. WALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 548.

14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS BEHIND RETAINED EARTH PANELS. PRIOR TO PLACEMENT OF THE TOP LAYER OF REINFORCING MESH, INDIVIDUAL REINFORCING MESH MAY BE SKEWED TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER (NO CUTTING OF SOIL REINFORCEMENT GRIDS ALLOWED UNLESS SHOWN ON SHOP DRAWINGS AND APPROVED BY THE ENGINEER). ANY DAMAGE DONE TO THE REINFORCING MESH DUE TO THE INSTALLATION OF THE GUARDRAIL SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

15. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN REINFORCED SOIL VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING MESH AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN.

16. TOP PANELS BENEATH CAST-IN-PLACE COPING SHALL HAVE #4 BARS PROTRUDING FROM THEIR TOP EDGE.

17. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO FOSTER GEOTECHNICAL CONSTRUCTION MANUAL.

18. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING MESH DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPER ELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

19. NOMINAL MESH LENGTHS

THE REINFORCING MESH LENGTH SHOWN ON THE PLANS, MEASURED FROM BACK FACE OF PANEL ARE THE NOMINAL LENGTHS REQUIRED BY CALCULATION. THE ACTUAL FABRICATED MESH LENGTHS ARE OFTEN LONGER (UP TO 6") DUE TO MANUFACTURING TOLERANCES. THE REQUIRED HORIZONTAL LIMIT OF GRANULAR BACKFILL IS EQUAL TO THE NOMINAL MESH LENGTH. ADDITIONAL GRANULAR BACKFILL BEYOND THE NOMINAL MESH LENGTH IS NOT REQUIRED BY CALCULATION.

20. REINFORCED BACKFILL QUANTITY

THE REINFORCED BACKFILL QUANTITY INDICATED BY FOSTER GEOTECHNICAL IS CALCULATED BY MULTIPLYING THE NOMINAL MESH LENGTHS SHOWN ON THE PLANS BY THEIR TRIBUTARY WALL SURFACE AREA AND CONVERTING THE RESULT TO A NEATER CUBIC METER QUANTITY. THIS INFORMATION IS FURNISHED FOR THE CONTRACTOR'S INFORMATION ONLY AND IS NOT INTENDED TO PRESENT THE ACTUAL QUANTITIES REQUIRED TO COMPLETE THE WORK. THE CONTRACTOR MUST CALCULATE HIS OWN EXCAVATION AND BACKFILL QUANTITIES BASED UPON THE SPECIFIC CONDITIONS OF THE PROJECT.

21. PANEL FINISH

THE PRECAST PANELS FOR THIS PROJECT SHALL BE A PLAIN STEEL FORM FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINED EARTH CONTROL PLANS.

22. NOTE TO CONTRACTORS

ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY FOSTER GEOTECHNICAL

- PRECAST PANELS
- REINFORCING MESH
- LOOP EMBED
- HDPE BEARING PAD (NOMINAL 4.0 MELT / .950 DENSITY)
- NON-WOVEN FILTER CLOTH AND ADHESIVE (FOR PANEL JOINTS ONLY) (WEBTECH-TERRATEX NO. 4 OR EQUAL)

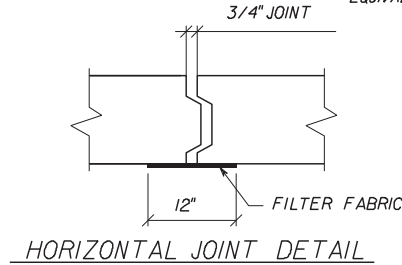
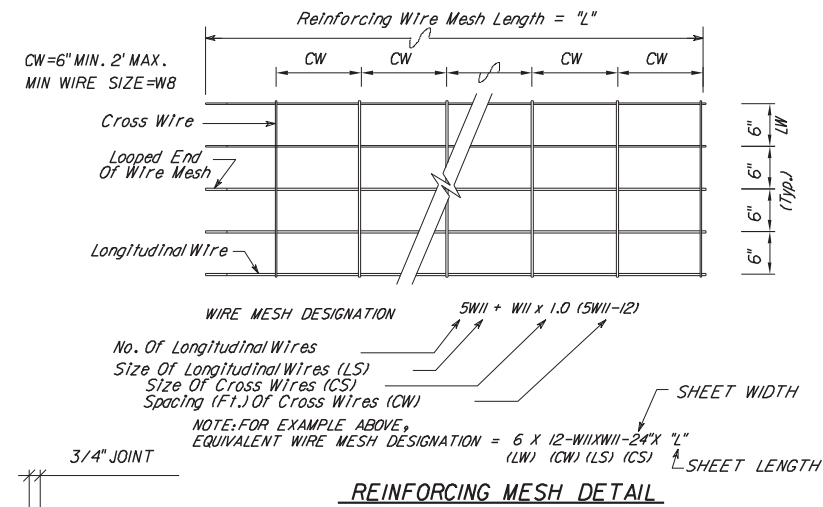
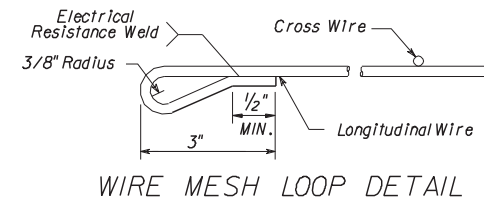
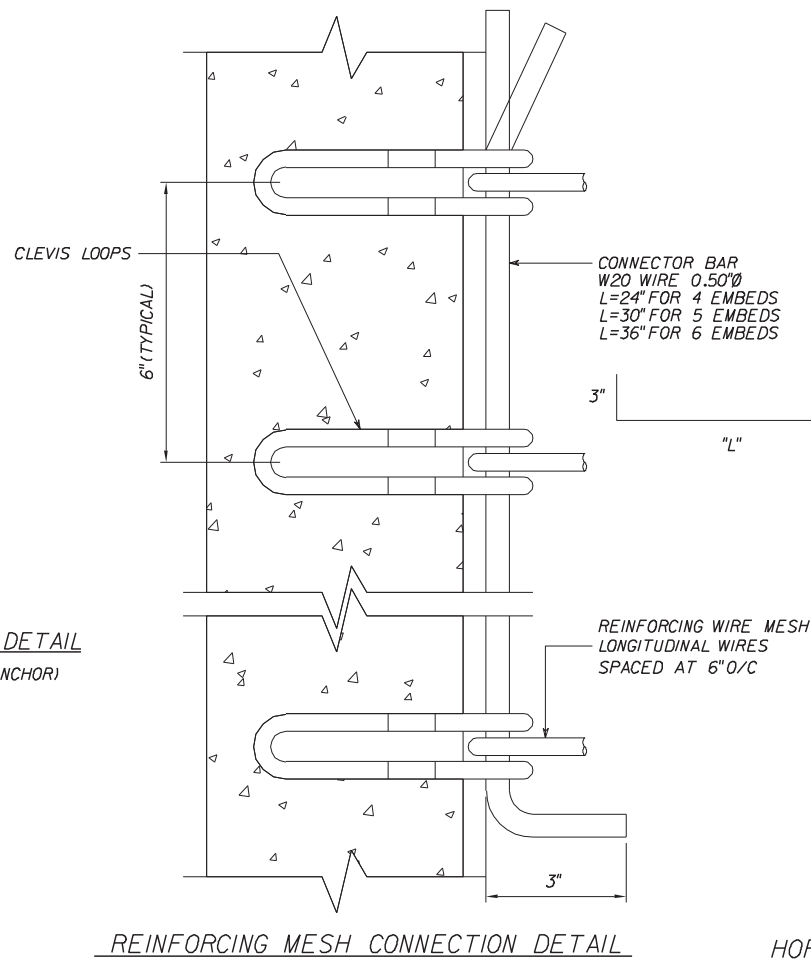
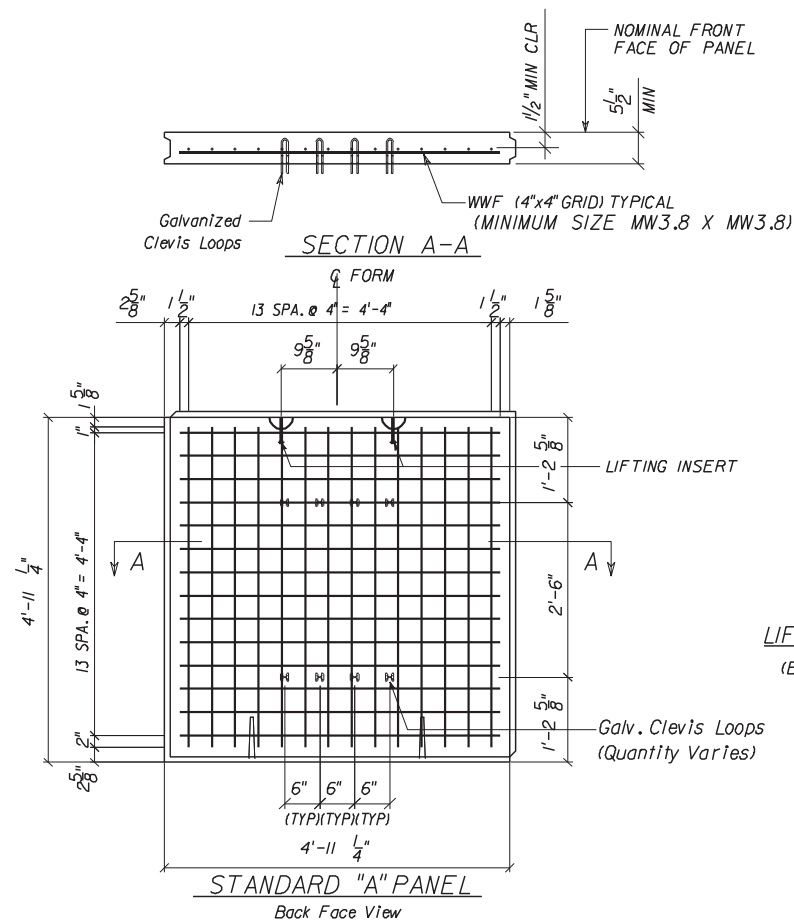
ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTION CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED / INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

23. FOSTER GEOTECHNICAL SUPPLIES PRECAST CONCRETE FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF RETAINED EARTH WALLS DETAILED HEREIN. THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY FOSTER GEOTECHNICAL IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE. PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.

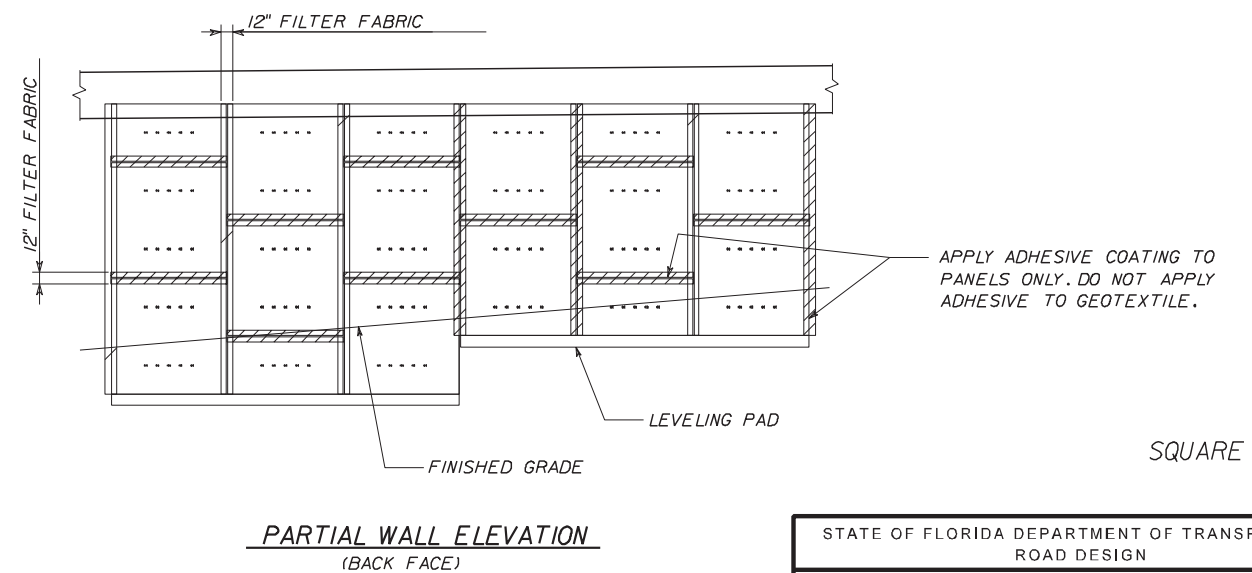
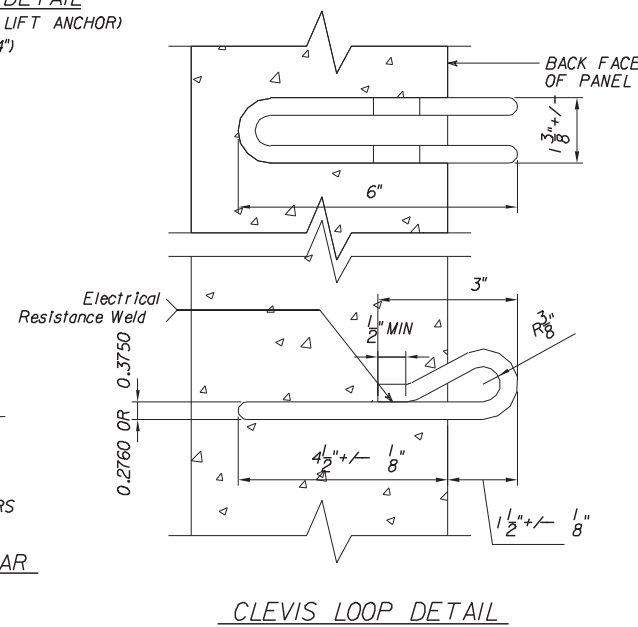
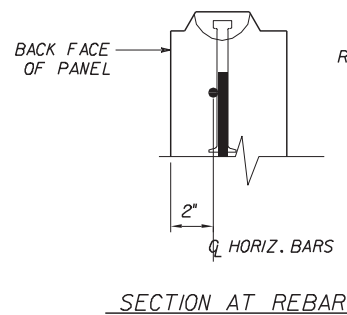
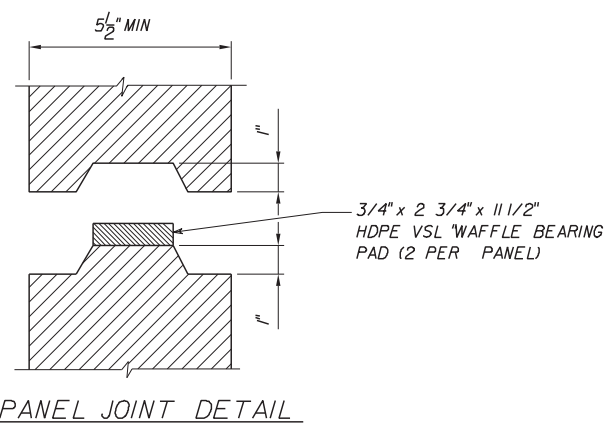
SQUARE / HEX PANELS

THIS SYSTEM SHALL BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS ONLY.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Names	Dates	Approved By <i>W. M. [Signature]</i>		
Designed By	TCNA	11/98	State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No. Index No.
Checked By	GEO	11/98	00	1 of 12 5005



NOTE: Steel Wire Material And Welding Of Cross Wires And Loops Shall Conform To ASTM A82 And ASTM A185, $F_y = 65$ KSI. Mesh Shall Be Galvanized To ASTM A123
 6×12 -W11X11-24\"/>

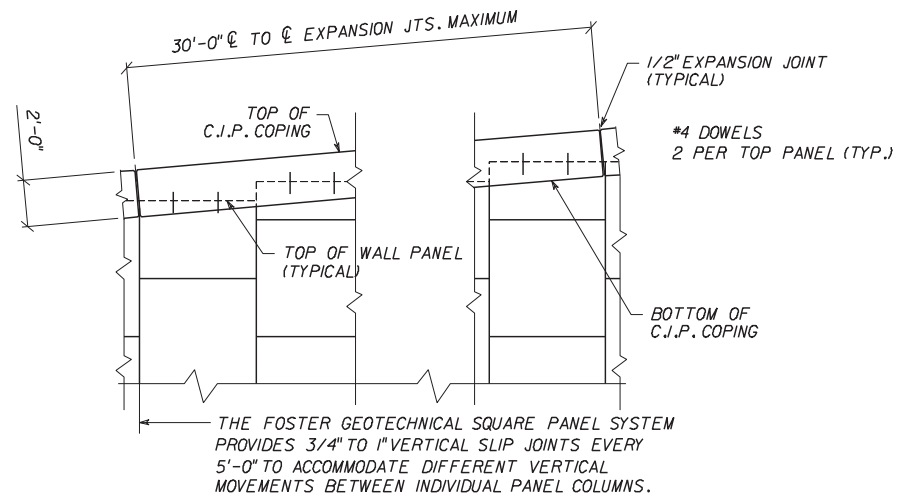


SQUARE PANELS

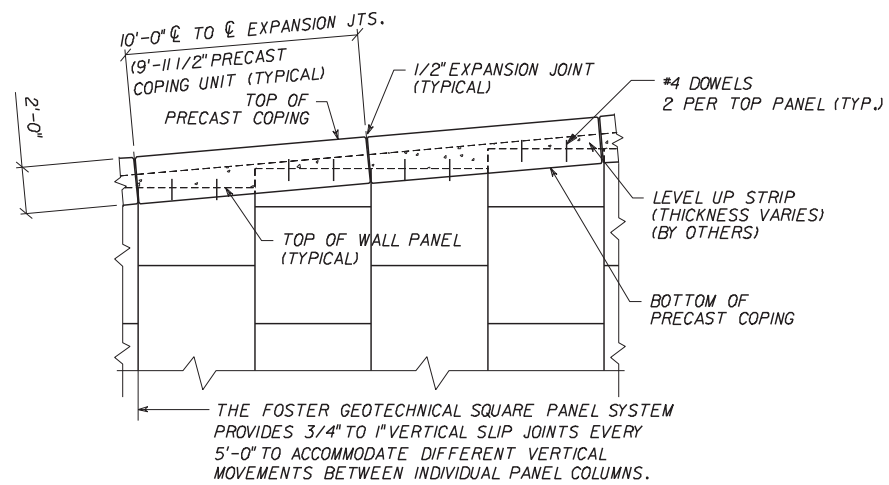
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	Dates	11/98	Approved By
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	2 of 12
				5005

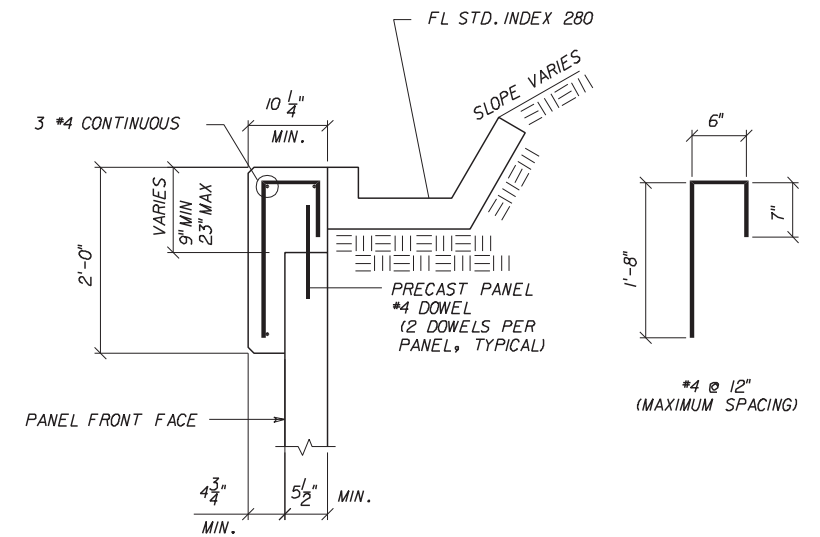
*****DGN SPECIFICATION*****
 *****SYTIME*****



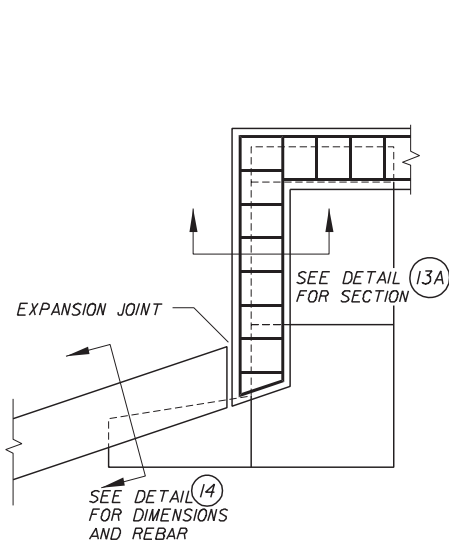
14A PARTIAL ELEVATION C.I.P. COPING
(SQUARE PANELS SHOWN, HEX PANELS SIMILAR)



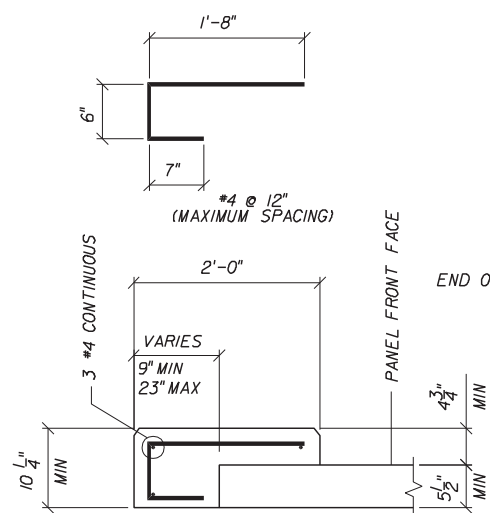
20A PARTIAL ELEVATION PRECAST COPING
(SQUARE PANELS SHOWN, HEX PANELS SIMILAR)



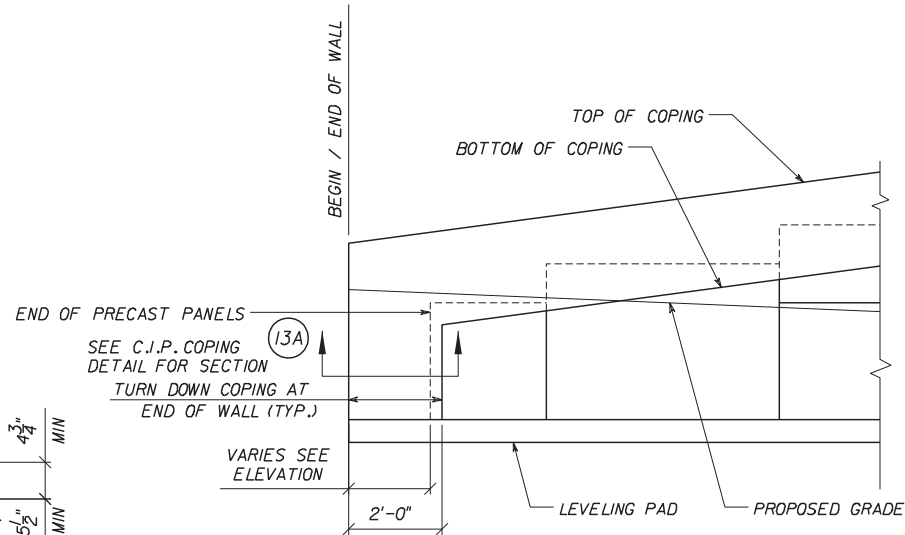
14 C.I.P. COPING W/ DITCH
(2" MIN. COVER TYP.)



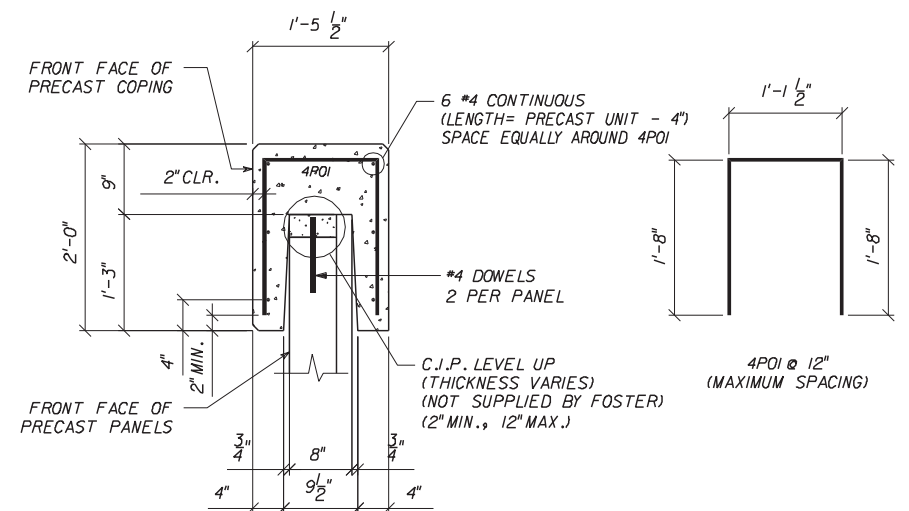
13 VERTICAL COPING (C.I.P.)
(SQUARE PANELS SHOWN, HEX PANELS SIMILAR)



13A VERTICAL COPING (C.I.P.) SECTION
(2" MIN. COVER TYP.)



15 COPING ENCLOSURE (C.I.P.)
(SQUARE PANELS SHOWN, HEX PANELS SIMILAR)



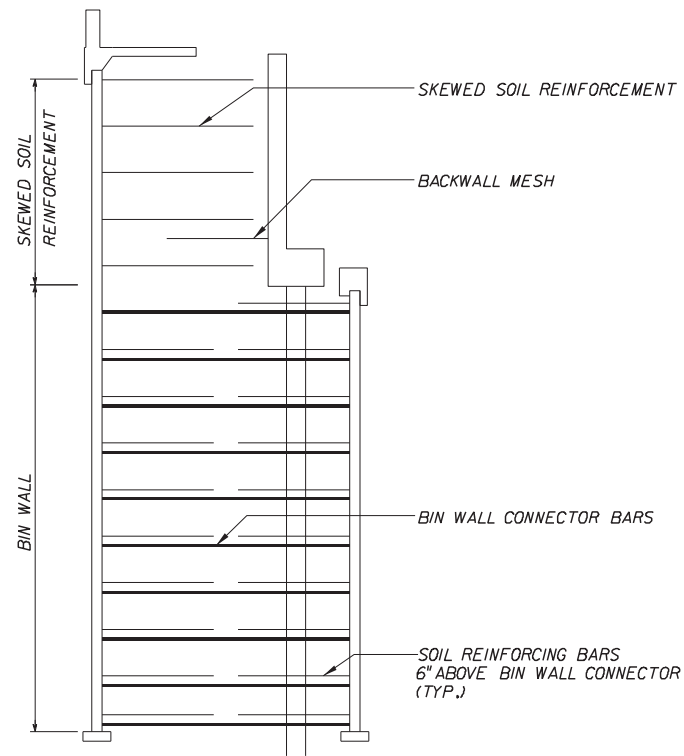
20 TYPE H_ PRECAST COPING
(STANDARD PRECAST COPING)

SQUARE / HEX PANELS

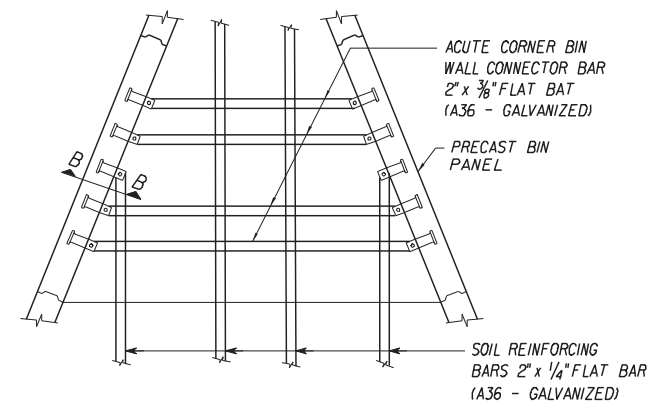
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	Dates	11/98	Approved By
Drawn By	CAD	11/98	00	3 of 12
Checked By	GEO	11/98	00	5005

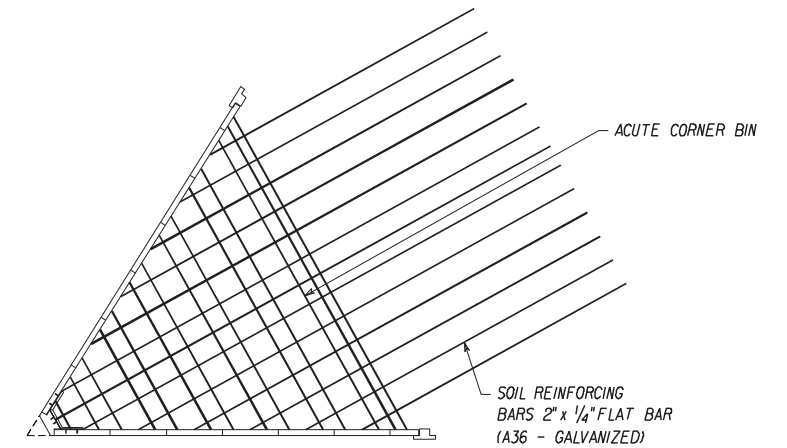
\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



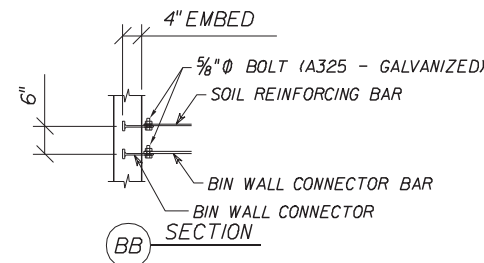
CC TYPICAL SECTION @ BIN WALL



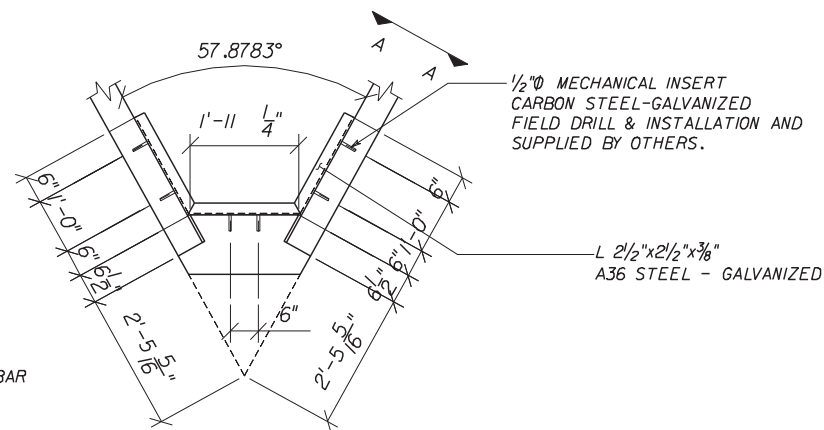
31 CORNER PLAN



BIN WALL CONNECTOR & SOIL REINF. BAR LAYOUT

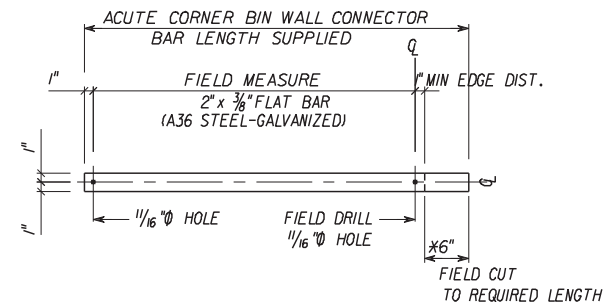


BB SECTION



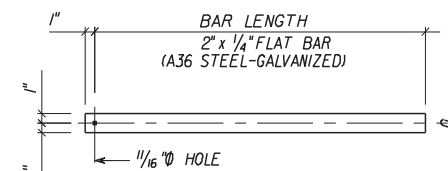
NOTES: BRACKETS TYPICALLY LOCATED IN THE CORNER BETWEEN BIN WALL CONNECTOR & SOIL REINFORCING BAR ELEVATION
BIN WALL CONNECTOR BARS & SOIL REINF. BARS NOT SHOWN

30 ANGLE BRACKET DETAIL

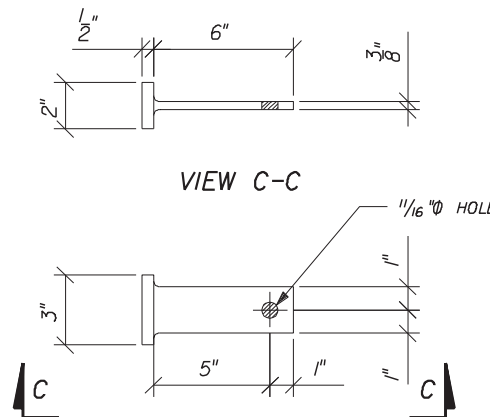


* EXPOSED STEEL ON FIELD MODIFIED END SHALL BE COATED WITH ZINC RICH PAINT

32 BIN WALL CONNECTOR BAR



33 SOIL REINFORCING BAR

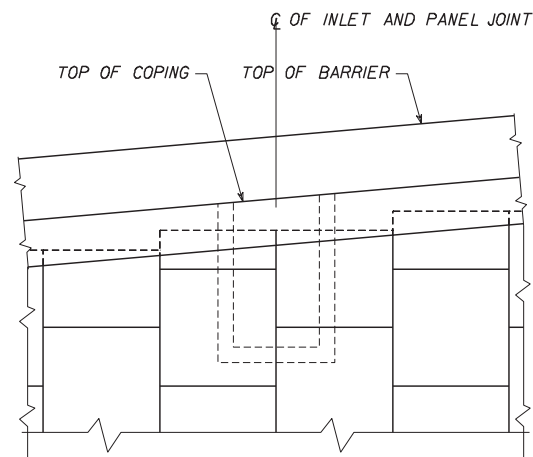


BIN WALL CONNECTOR (A36 GALVANIZED)

SQUARE / HEX PANELS

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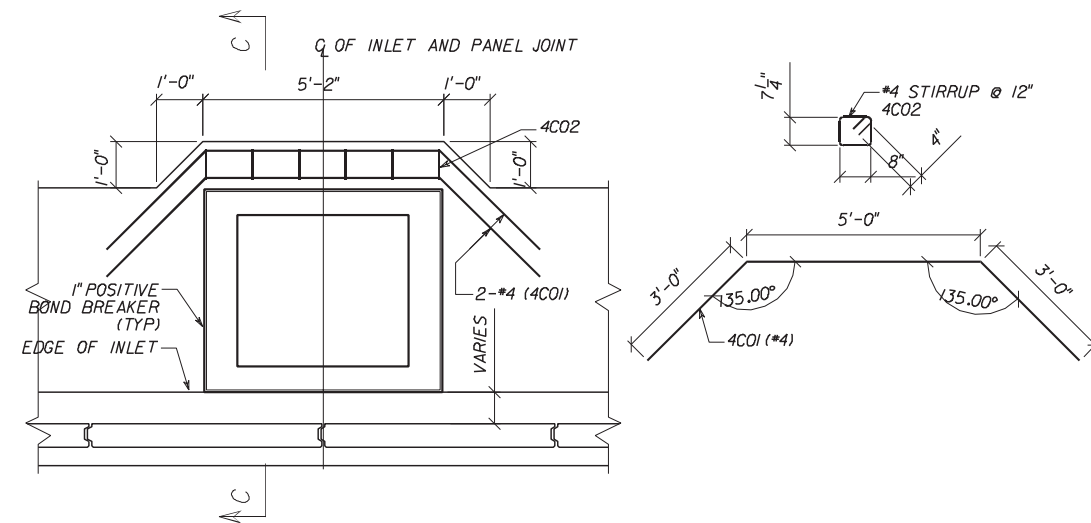
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	11/98	Approved By <i>W. J. [Signature]</i> State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No.
Checked By	GEO	11/98	00	4 of 12
				Index No. 5005



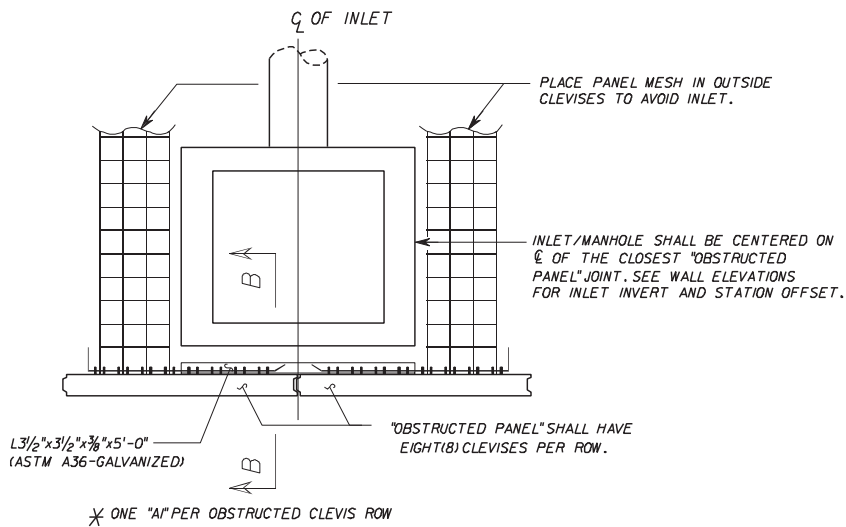
65 PARTIAL ELEVATION WALL @ DRAINAGE INLET

VERTICAL OBSTRUCTION NOTES

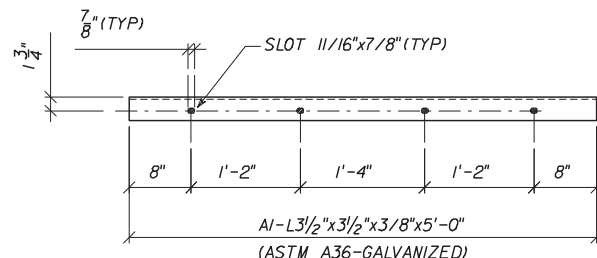
OBSTRUCTION SHALL BE CONSTRUCTED BEFORE WALL INSTALLATION.
FIELD CUT AND SKEW MESH AROUND OBSTRUCTION AS REQUIRED. THESE AREAS WILL BE CLEARLY INDICATED ON THE RETAINED EARTH SHOP DRAWINGS AND APPROVED BY THE ENGINEER OF RECORD.
CUT MESH/DAMAGED GALV. SHALL BE COATED WITH ZINC RICH PAINT.
NO CUTTING OF SOIL REINFORCEMENT GRIDS ALLOWED UNLESS SHOWN ON SHOP DRAWINGS AND APPROVED BY THE ENGINEER



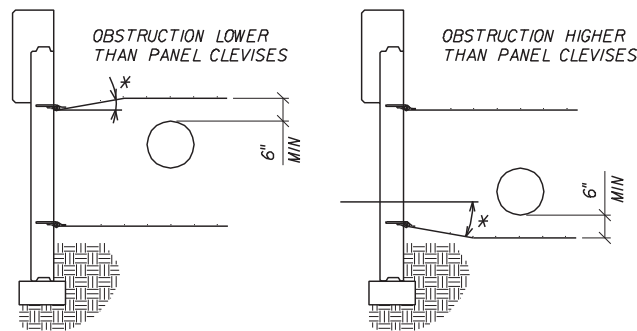
66 PARTIAL PLAN - JUNCTION SLAB AROUND INLET
(REBAR NOT SUPPLIED BY FOSTER GEOTECHNICAL)



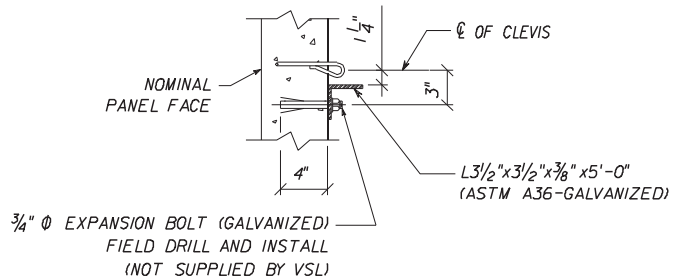
65A OBSTRUCTION DETAIL (VERTICAL)
INLETS ≤ 5'-0" (TYP.)



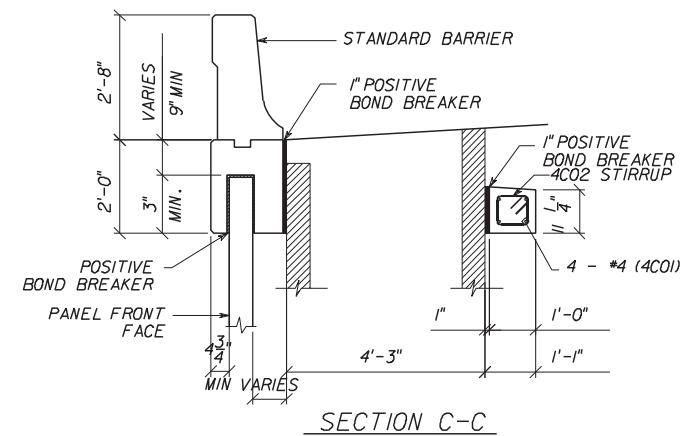
65B OBSTRUCTED PANEL CONNECTOR (AI)
(ASTM A36 ANGLE - GALVANIZED)



61 OBSTRUCTION (HORIZONTAL)
* 15 DEGREES MAX BEND



65C CONNECTOR INSTALLATION DETAIL
(SECTION B-B)

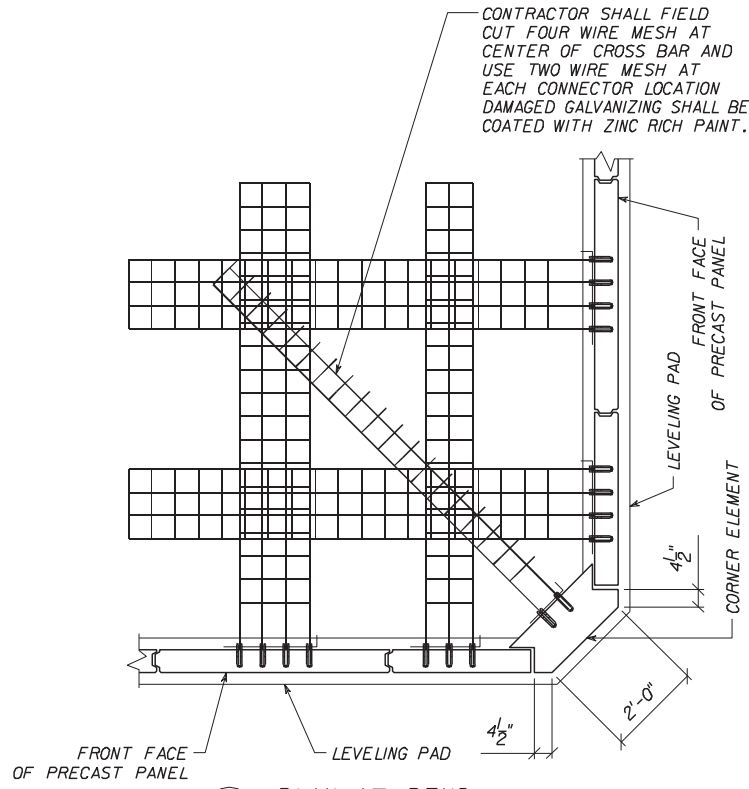


SECTION C-C

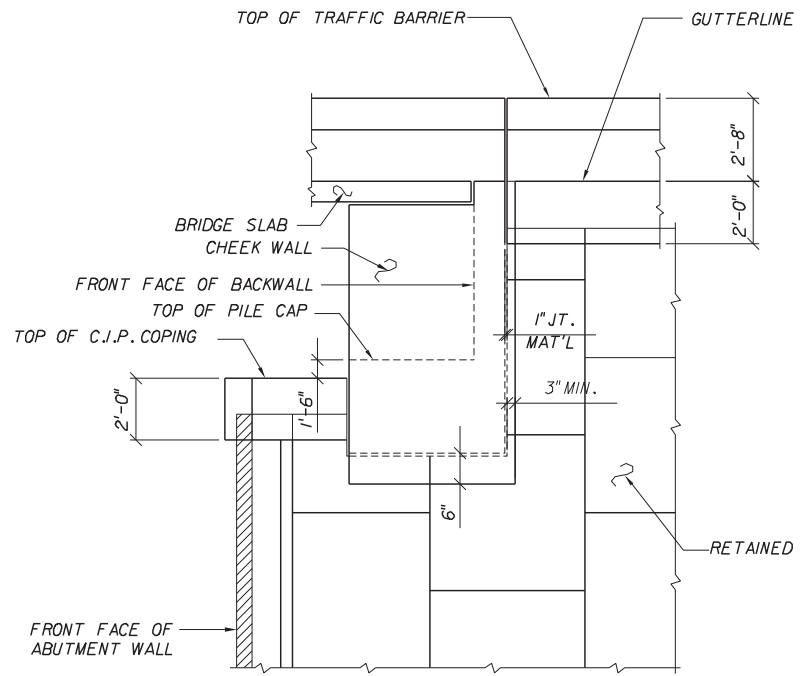
SQUARE / HEX PANELS

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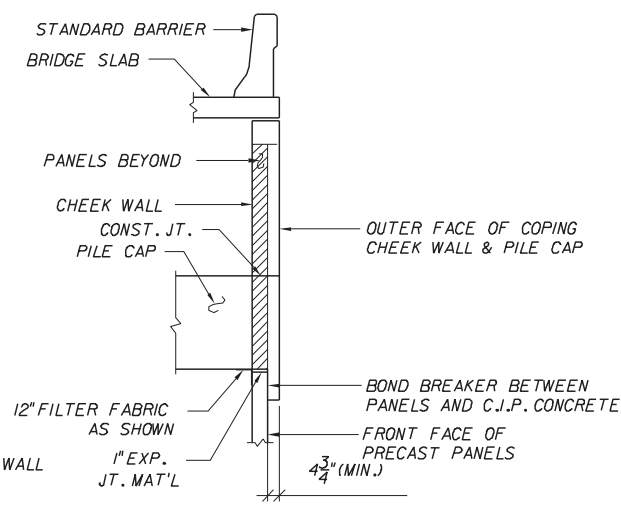
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	TCNA	11/98	State Structures Design Engineer	
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				Index No. 5005



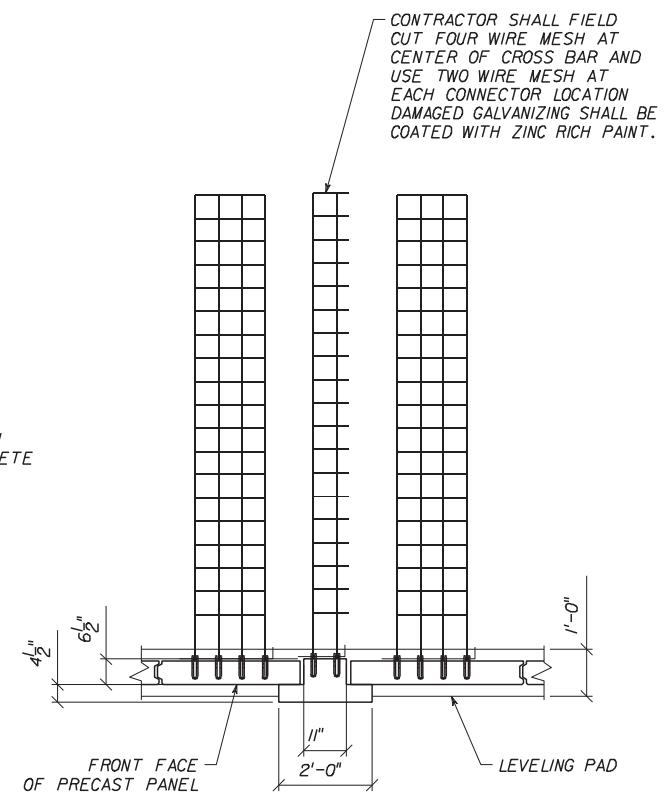
80 PLAN AT BEND



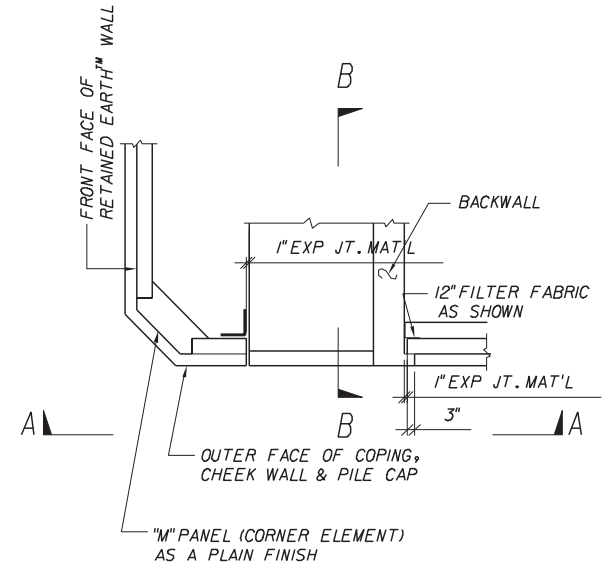
SECTION A-A



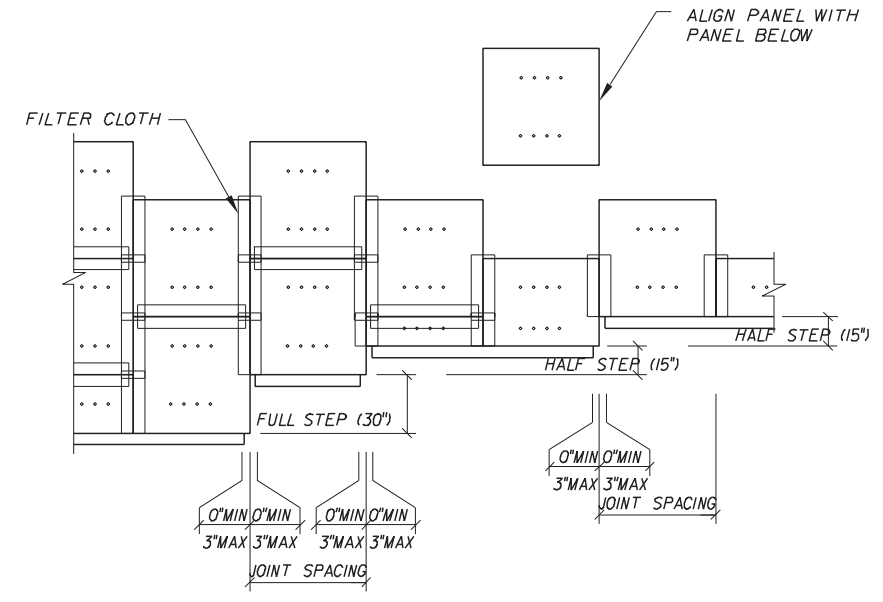
SECTION B-B



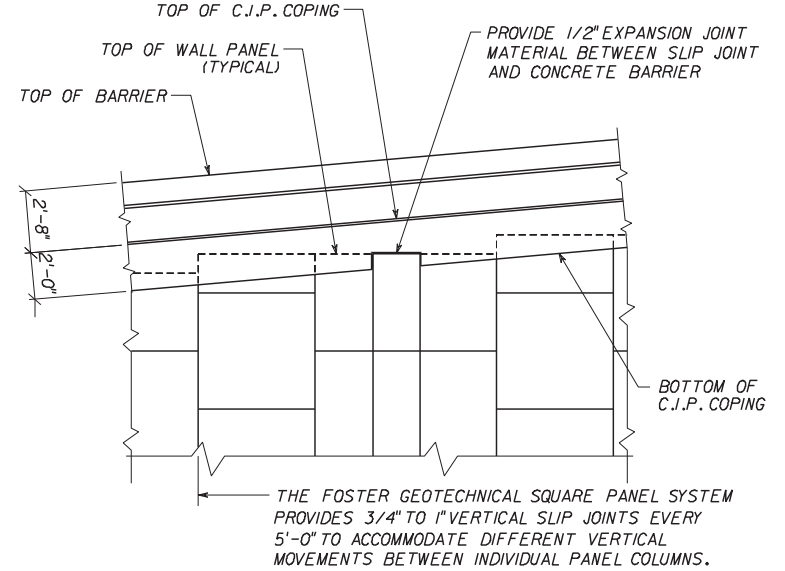
81 PLAN AT SLIP JOINT



PLAN VIEW AT END BENT



5 TYPICAL LEVELING PAD STEPS (BACK FACE SHOWN)

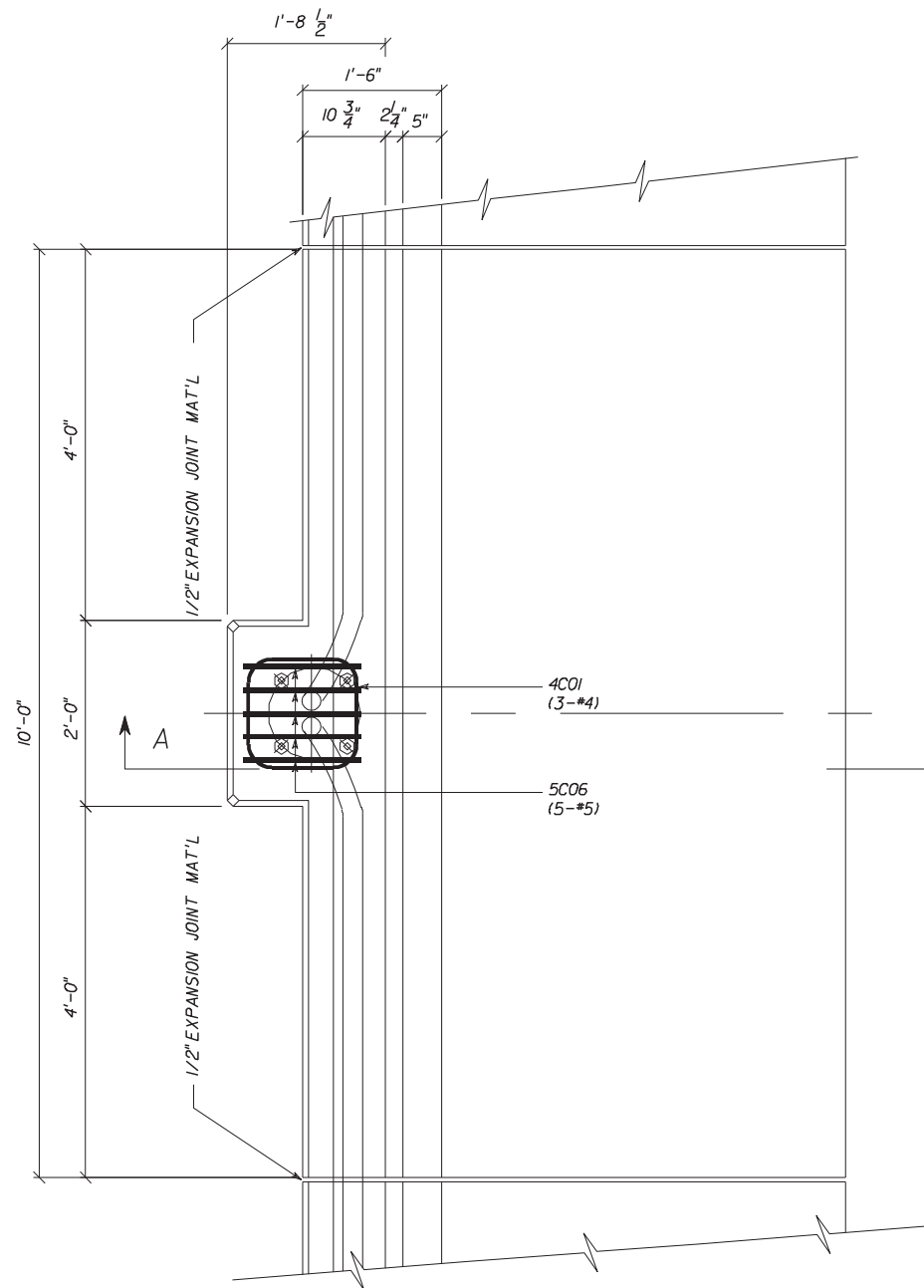


80A PARTIAL ELEVATION C.I.P. BARRIER OVER SLIP JOINT

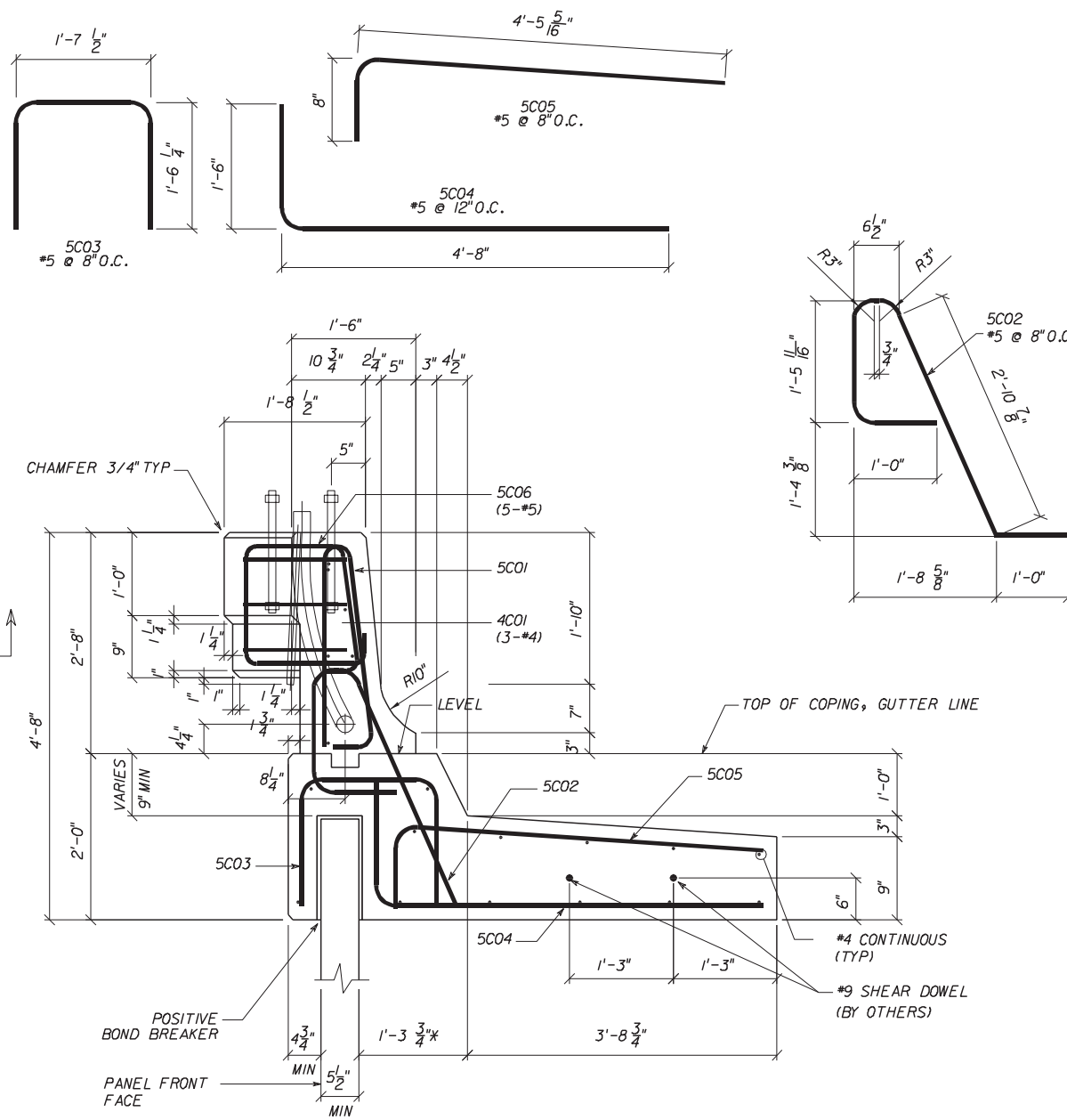
SQUARE PANELS

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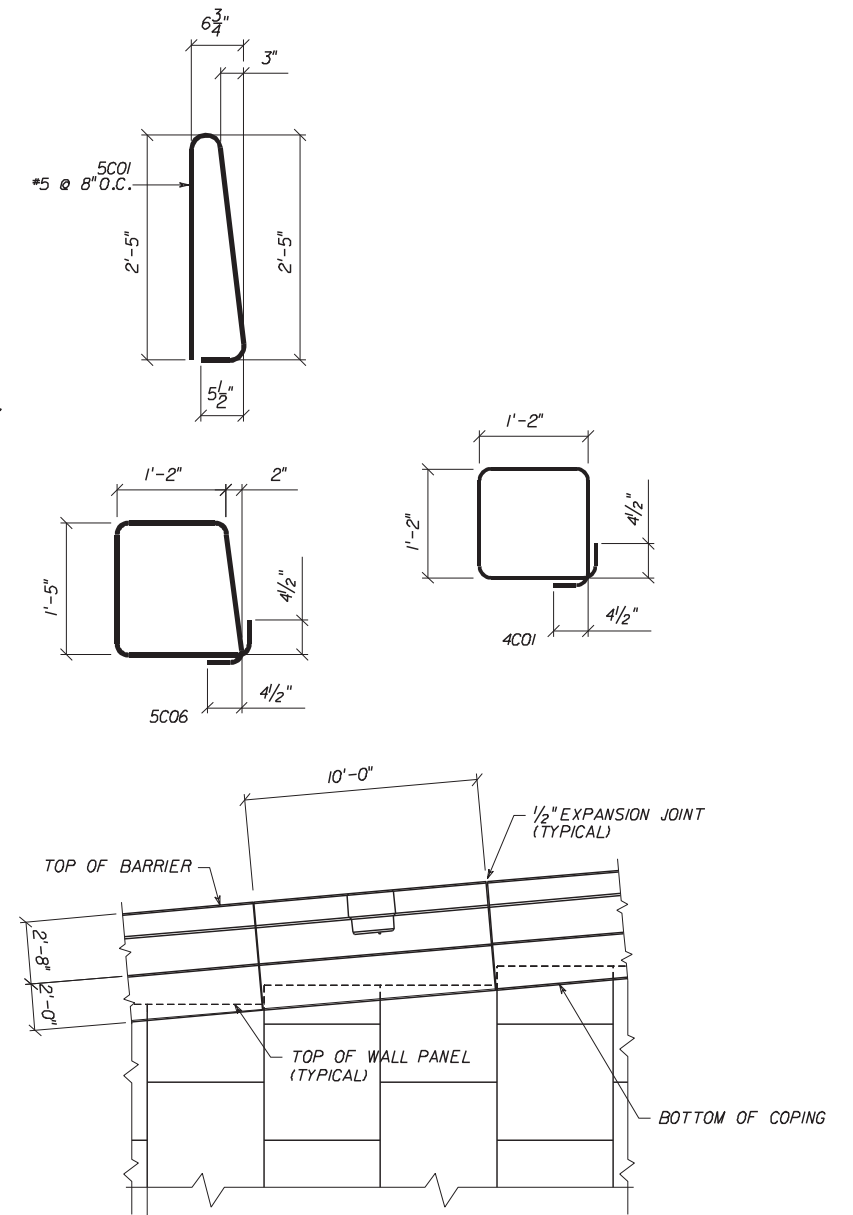
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL					
Names	Dates	Approved By			
Designed By	TCNA	11/98	Revision		Sheet No.
Drawn By	CAD	11/98	00	7 of 12	5005
Checked By	GEO	11/98			



29 CAST IN PLACE LIGHT POLE
 (ALL REBAR BY OTHERS)
 (LIGHT POLE/BARRIER COPING)



SECTION A-A
 (SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS)



29A PARTIAL ELEVATION AT LIGHT POLE

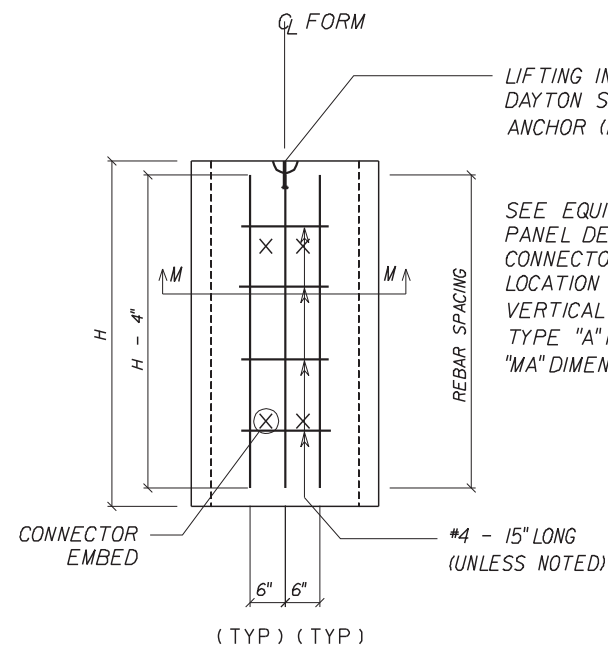
THE FOSTER GEOTECHNICAL SQUARE PANEL SYSTEM PROVIDES 3/4" TO 1" VERTICAL SLIP JOINTS EVERY 5'-0" TO ACCOMMODATE DIFFERENT VERTICAL MOVEMENTS BETWEEN INDIVIDUAL PANEL COLUMNS.

SQUARE / HEX PANELS

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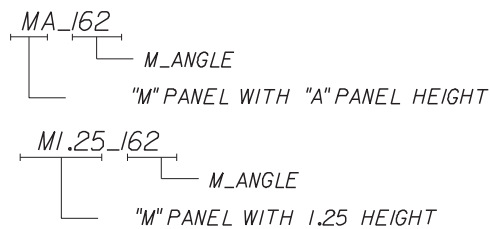
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	11/98	Approved By <i>W. J. [Signature]</i>	
Drawn By	CAD	11/98	State Structures Design Engineer	
Checked By	GEO	11/98	Revision	Sheet No.
			00	8 of 12
				5005

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
 \$\$\$SYTIME\$\$\$

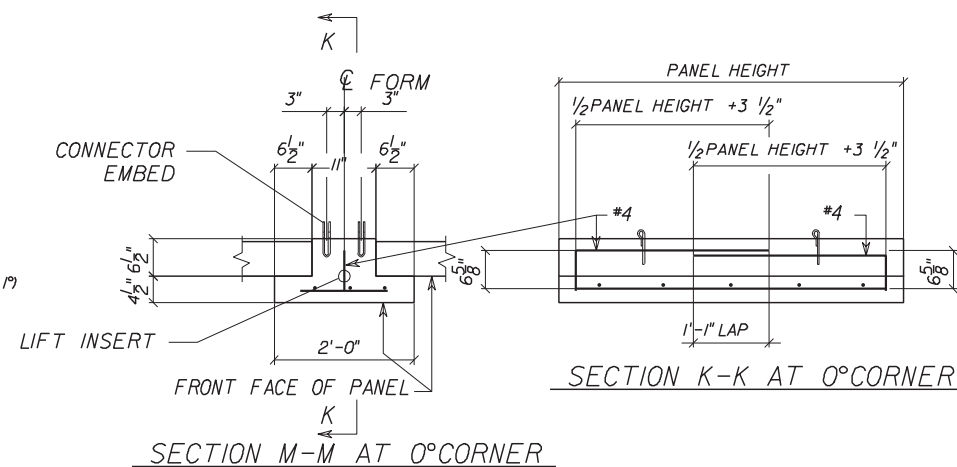
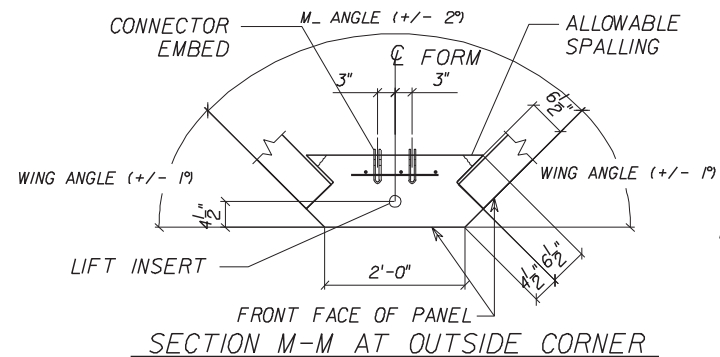
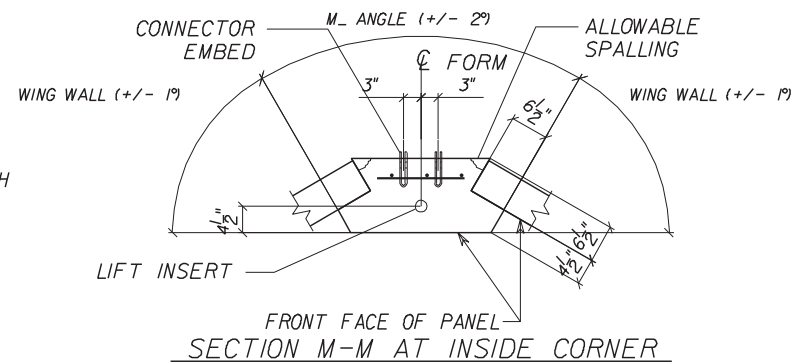


M- TYPE M REBAR
"M" PANELS SHALL HAVE AN PLAIN SURFACE FINISH

PANEL AREAS	
PANEL NAME	SQ. FT.
MA	13.75
MD	11.46
MD2	9.17
MC2	6.55
MD4	4.58
MB6	10.31
MB2	6.88
MB4	3.44



TYPICAL PANEL DESIGNATION

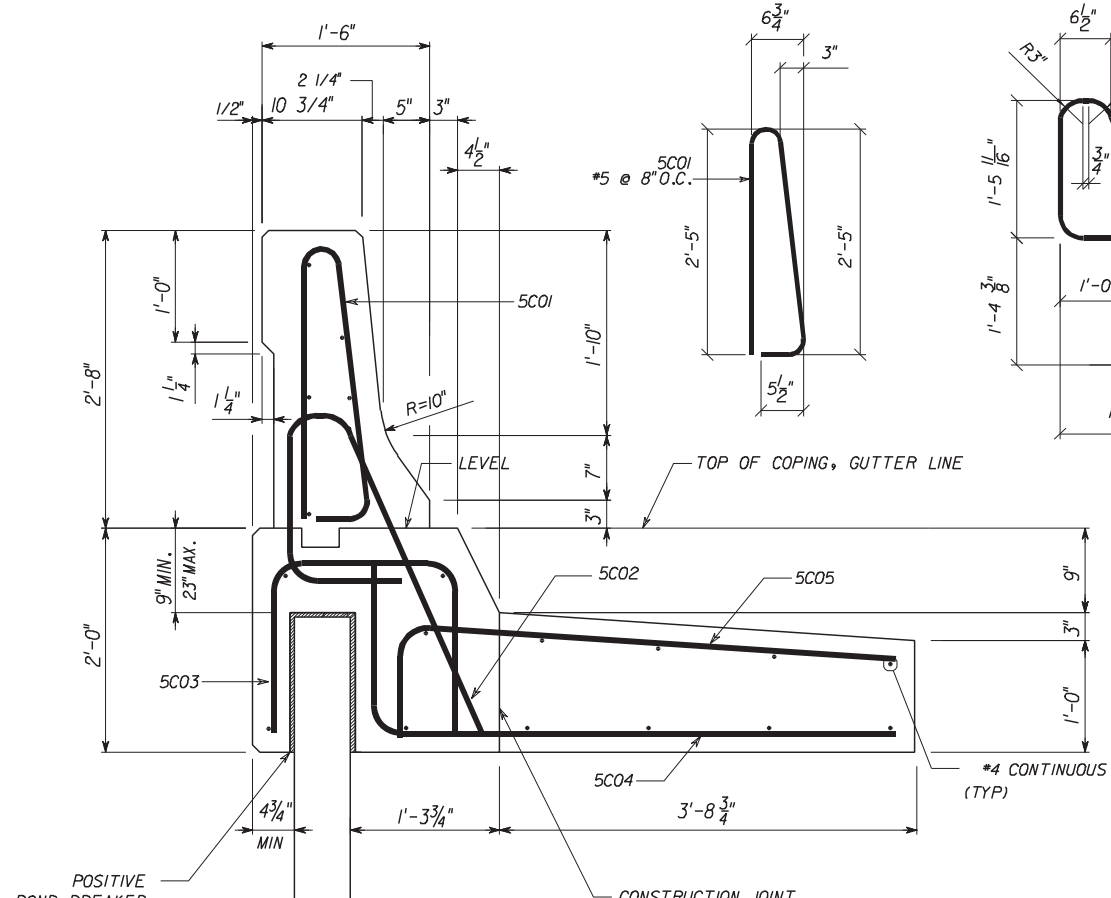


- PANEL REINFORCEMENT NOTES:
1. PANELS ARE SHOWN BACK FACE.
 2. RIGHT END PANELS ARE OPPOSITE TO LEFT END.
 3. DIMENSIONS ARE TO FORM INSIDE BACK FACE.
 4. VERTICAL REINFORCEMENT SHALL HAVE 2" MINIMUM COVER TO THE BACK FACE.
 5. HORIZONTAL REINFORCEMENT SHALL HAVE 1/2" MINIMUM COVER TO THE BACK FACE.
 6. ALL REINFORCEMENT SHALL HAVE 2" MINIMUM COVER TO THE SIDES.
 7. REINFORCEMENT LABELS INDICATE BAR SIZE AND LENGTH. EXAMPLE: 454 IS A #4 BAR 54" LONG.
 8. REINFORCEMENT SHALL BE GRADE 60.
 9. EQUIVALENT WELDED WIRE FABRIC MAY BE USED.
 10. SEE RETAINED EARTH™ PRECASTING SPECIFICATIONS FOR CONCRETE REQUIREMENTS.
 11. VSL RETAINED EARTH™ IS PROTECTED UNDER PATENT 4,725,170.
 12. ALL PANELS TO USE .276" Ø CLEVIS LOOPS, EXCEPT PANELS WITH A "Q" SUFFIX WHICH REQUIRE .374" Ø CLEVIS LOOPS.
 13. ALL "M" PANEL (CORNER ELEMENTS) SHALL HAVE A PLAIN FINISH.

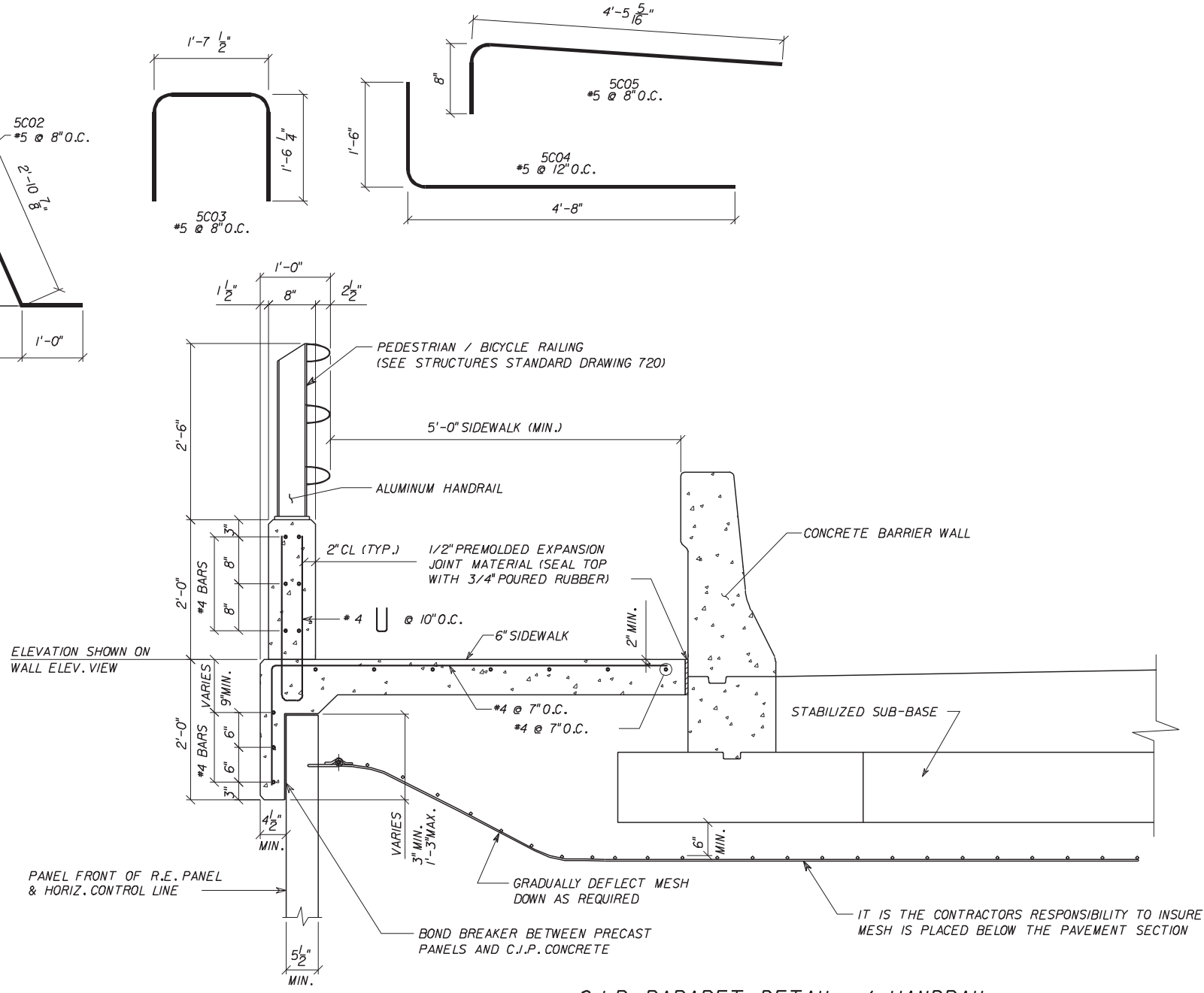
SQUARE / HEX PANELS

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Names	Dates	Approved By		
Designed By	TCNA 11/98	State Structures Design Engineer		
Drawn By	CAD 11/98	Revision	Sheet No.	Index No.
Checked By	GEO 11/98	00	9 of 12	5005



- NOTES:
1. PROVIDE A POSITIVE BOND BREAKER BETWEEN C.I.P. CONCRETE AND PRECAST PANELS.
 2. ONE HALF INCH (1/2") JOINT TO BE PLACED EVERY SIXTH PANEL JOINT.
 3. SEE STRUCTURES STANDARD DRAWING 700 FOR ADDITIONAL 700 AND DETAILS.



6B C.I.P. BARRIER W/ COPING & JUNCTION SLAB STEEL

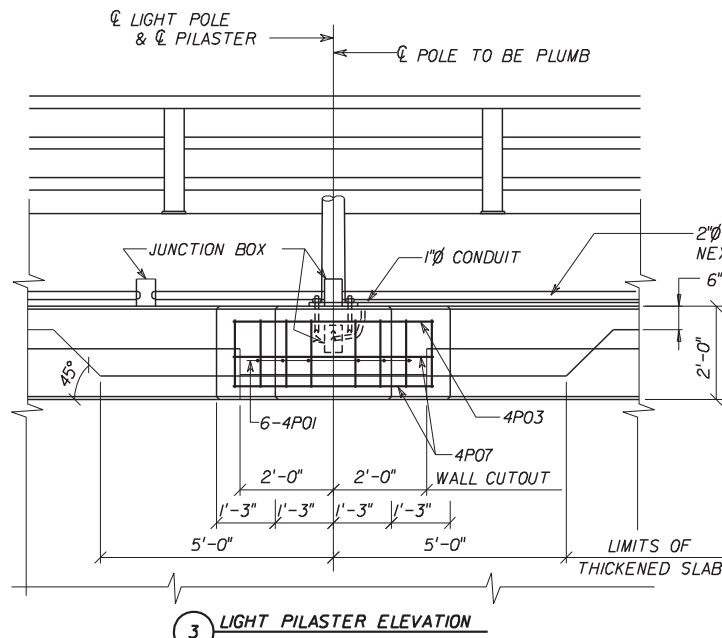
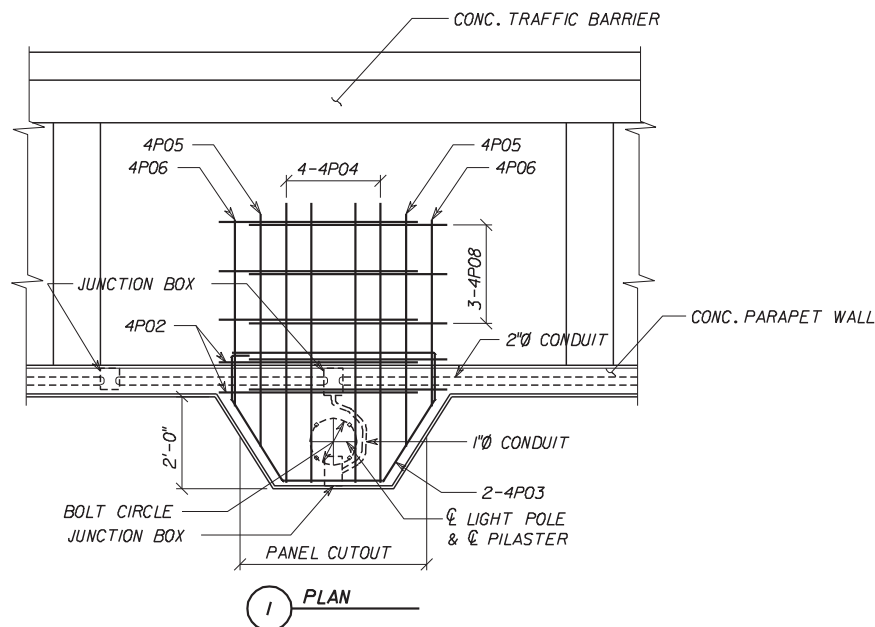
C.I.P. PARAPET DETAIL w/ HANDRAIL

SQUARE / HEX PANELS

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	11/98	Approved By <i>W. V. [Signature]</i>	
Drawn By	CAD	11/98	State Structures Design Engineer	
Checked By	GEO	11/98	Revision	Sheet No.
			00	10 of 12
				5005

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



NOTES:

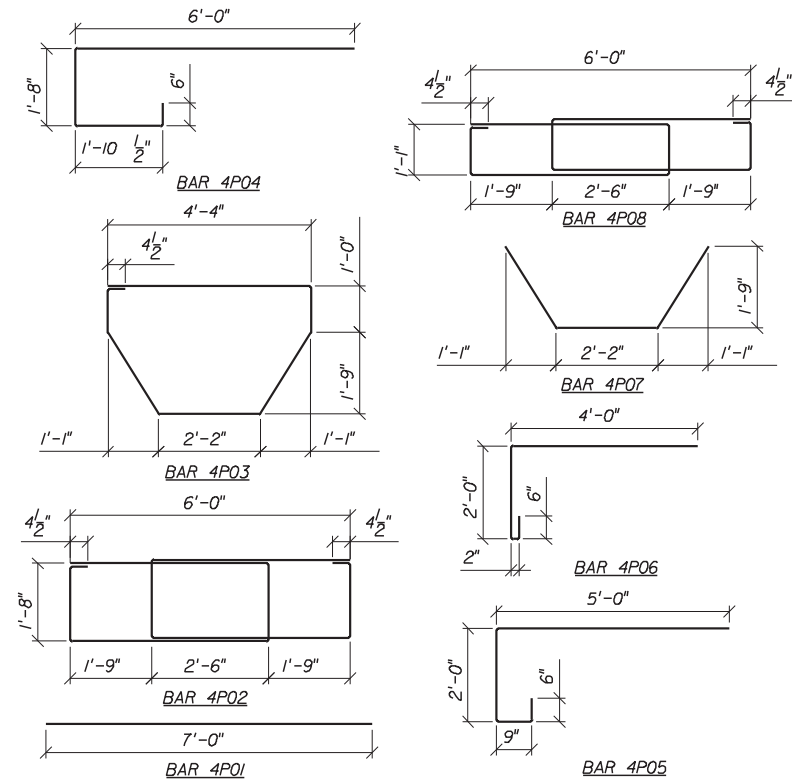
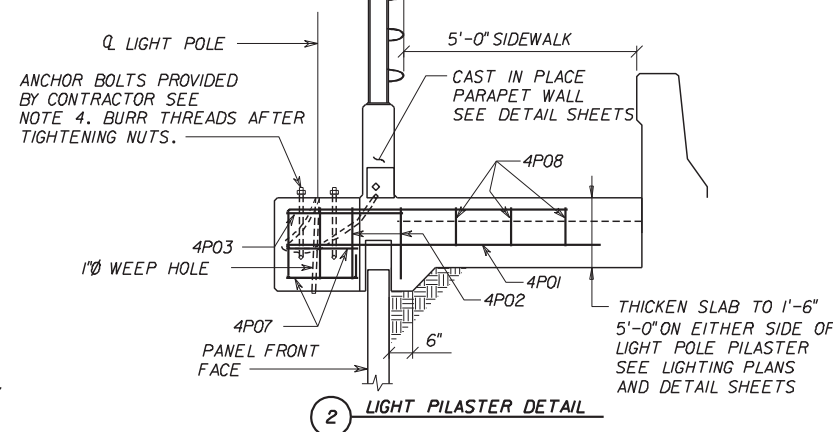
- ADDITIONAL CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTER SHALL MEET THE SAME REQUIREMENTS AS THAT OF THE PARAPET WALL.
- TOP OF PILASTER SHALL BE FINISHED TO A TRUE LEVEL AREA.
- LIGHT POLE PILASTER IS DESIGNED TO RESIST WORKING LOADS (IN ANY DIRECTION) FROM THE LIGHT POLE APPLIED AT THE TOP OF THE PILASTER AS FOLLOWS:

LONGITUDINAL MOMENT = 30,000 FT. POUNDS
 TRANSVERSE MOMENT = 6,000 FT. POUNDS
 LONGITUDINAL SHEAR = 1,000 POUNDS
 TRANSVERSE SHEAR = 200 POUNDS
 TORSION = 3,000 FT. POUNDS
 AXIAL = 400 POUNDS

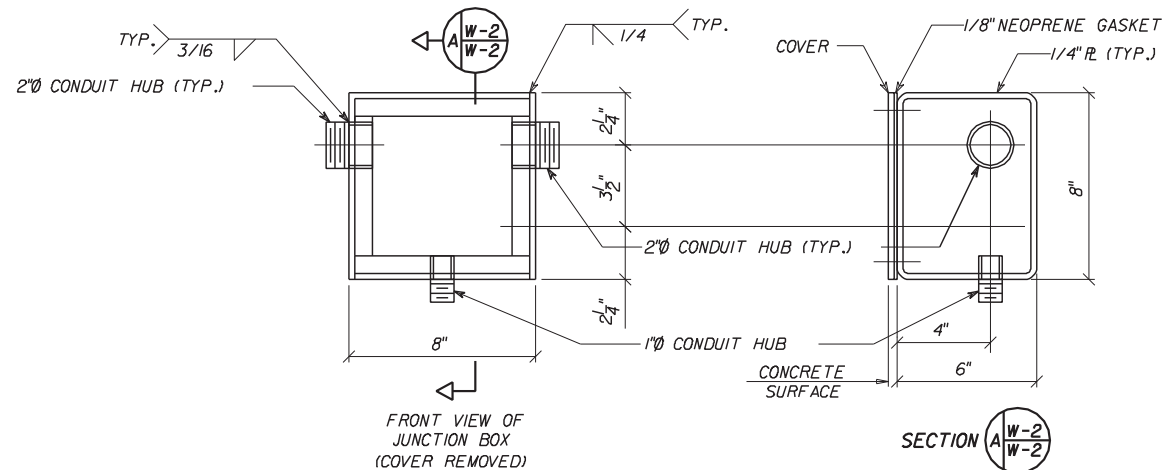
IF THE LIGHT POLE PROVIDED APPLIES LOADS THAT ARE IN EXCESS OF THOSE SHOWN ABOVE, THE CONTRACTOR SHALL REDESIGN THE PILASTER AND SUBMIT HIS DESIGN TO THE DEPARTMENT FOR REVIEW. THE CONTRACTOR'S REDESIGN SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA, AND QUALIFIED TO PERFORM THE WORK.

- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND THAT FIT THE REINFORCING CAGE. CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHALL BE SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT FOR REVIEW AND APPROVAL SHOWING THAT THESE REQUIREMENTS HAVE BEEN MET PRIOR TO CONSTRUCTION.

- STEEL FOR JUNCTION BOXES SHALL CONFORM WITH ASTM-A36. THE BOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. IN LIEU OF STEEL BOXES THE CONTRACTOR MAY SUBMIT FOR APPROVAL MOLDED P.V.C. BOXES (SCHEDULE 80).
- ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL OR SCHEDULE 80 P.V.C.
- THE COST OF ANCHOR BOLTS SHALL BE INCLUDED IN THE BID PRICE FOR LIGHT POLES.
- PAYMENT: THE COST OF ALL LABOR, CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTERS AND ALL CONDUITS, EXPANSION COUPLINGS, JUNCTION BOXES AND MISCELLANEOUS HARDWARE REQUIRED FOR COMPLETION OF THE ELECTRICAL INSTALLATION WITHIN THE LIMITS SHOWN ON THIS SHEET SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR THE MSE WALLS.



BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
4P01	#4	6	7'-0"
4P02	#4	2	24'-5"
4P03	#4	1	13'-1"
4P04	#4	4	10'-0 1/2"
4P05	#4	2	8'-3"
4P06	#4	2	6'-8"
4P07	#4	2	6'-4"
4P08	#4	3	22'-1"

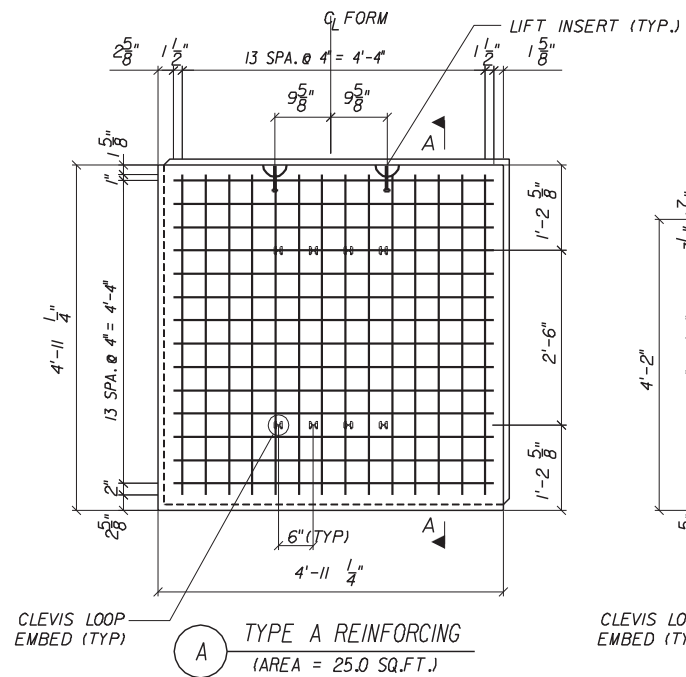


4 BAR BENDING DETAIL

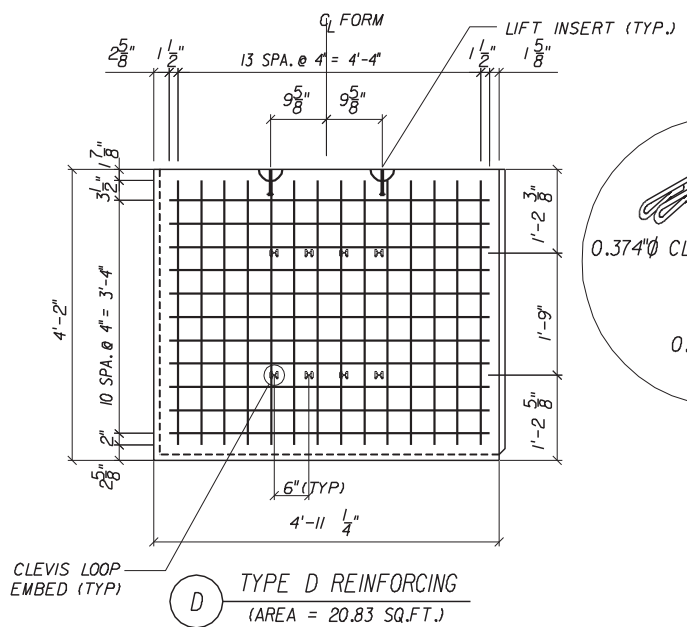
SQUARE / HEX PANELS

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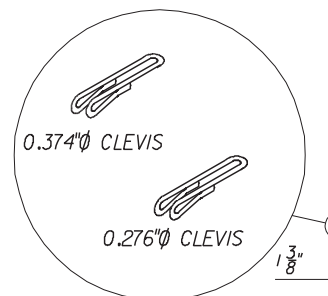
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
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Designed By	TCNA	Dates	11/98	Approved By
Drawn By	CAD	11/98		State Structures Design Engineer
Checked By	GEO	11/98	00	11 of 12
				5005



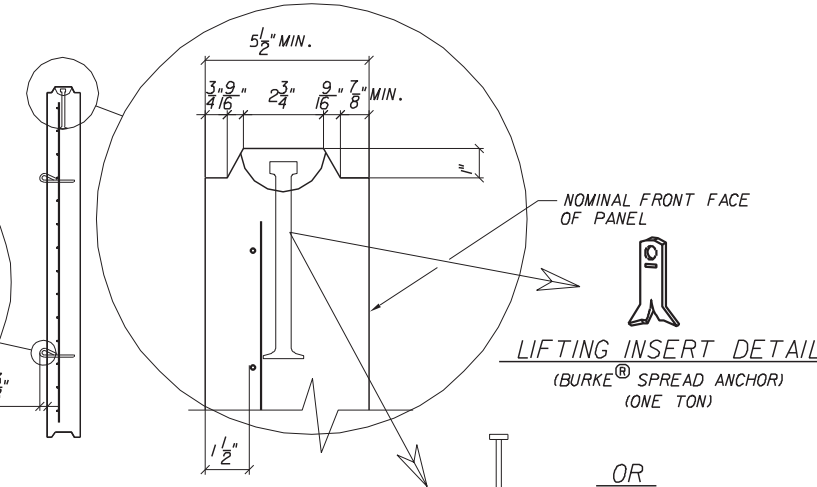
A TYPE A REINFORCING
(AREA = 25.0 SQ.FT.)



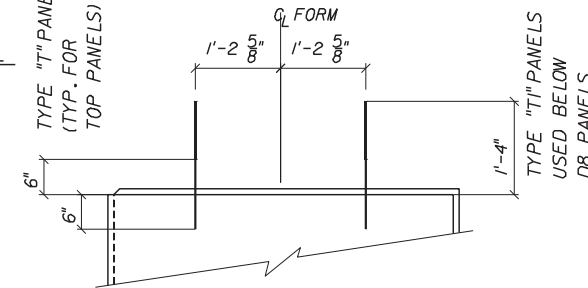
D TYPE D REINFORCING
(AREA = 20.83 SQ.FT.)



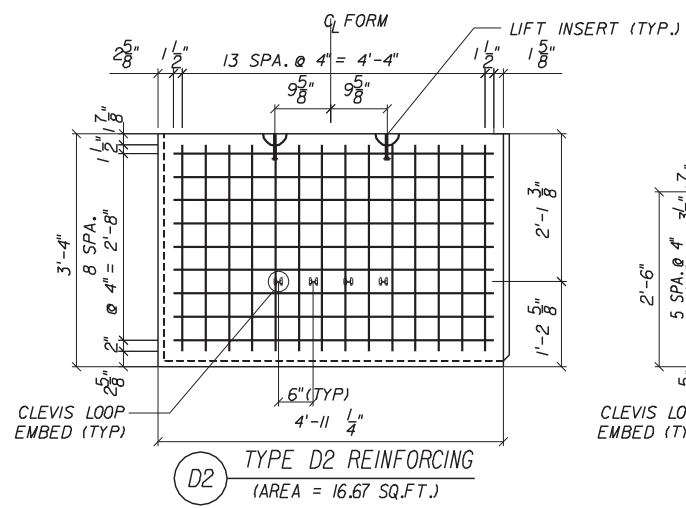
A-A SECTION A-A



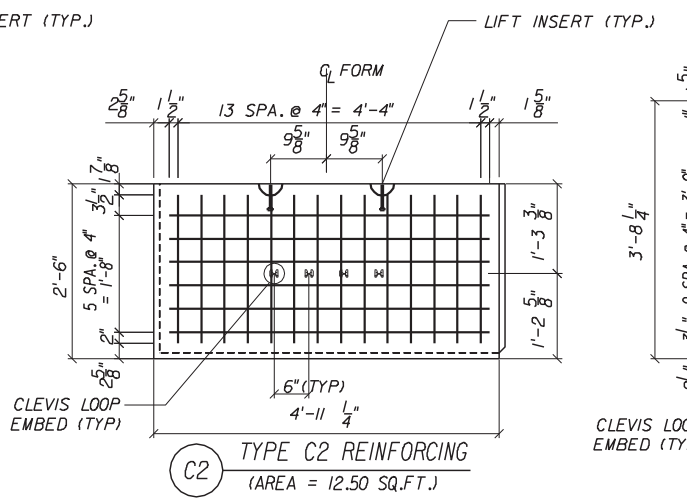
- PANEL REINFORCEMENT NOTES:**
1. PANELS ARE SHOWN BACK FACE.
 2. RIGHT END PANELS ARE OPPOSITE TO LEFT END.
 3. DIMENSIONS ARE TO FORM INSIDE BACK FACE.
 4. ALL REINFORCEMENT SHALL HAVE 1 1/2" MINIMUM COVER TO THE SIDES AND BACK OF PANEL.
 5. REINFORCEMENT SHALL BE WELDED WIRE FABRIC MINIMUM W.W.F. W3.8 x W3.8 x 4" x 4" GRID.
 6. SEE RETAINED EARTH™ PRECASTING SPECIFICATIONS FOR CONCRETE REQUIREMENTS.
 7. FOSTER RETAINED EARTH™ IS PROTECTED UNDER PATENT 4,725,170.
 8. ALL PANELS TO USE .276" Ø CLEVIS LOOPS, EXCEPT PANELS WITH A "Q" SUFFIX WHICH REQUIRE .374" Ø CLEVIS LOOPS.
 9. ALL "M" PANEL (CORNER ELEMENTS) SHALL HAVE A PLAIN FINISH.



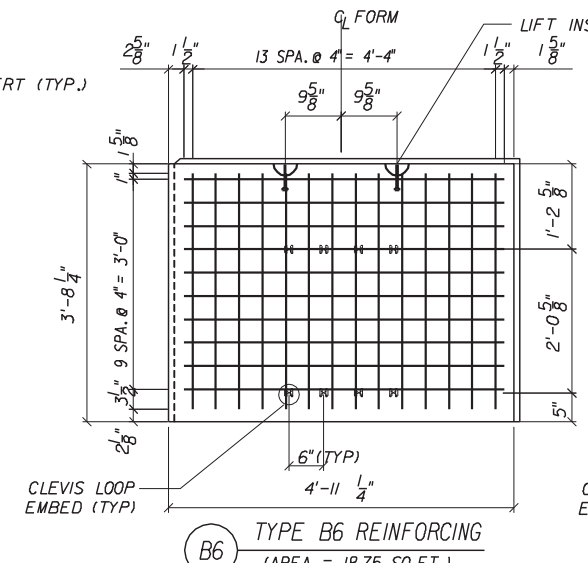
T TYPE T REINFORCING
TYPE T PANELS TO HAVE 2-#4x12" DOWELS
TYPE T1 PANELS TO HAVE 2-#4x22" DOWELS



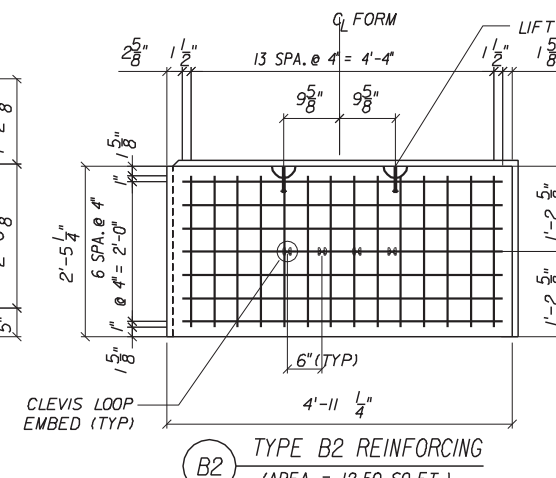
D2 TYPE D2 REINFORCING
(AREA = 16.67 SQ.FT.)



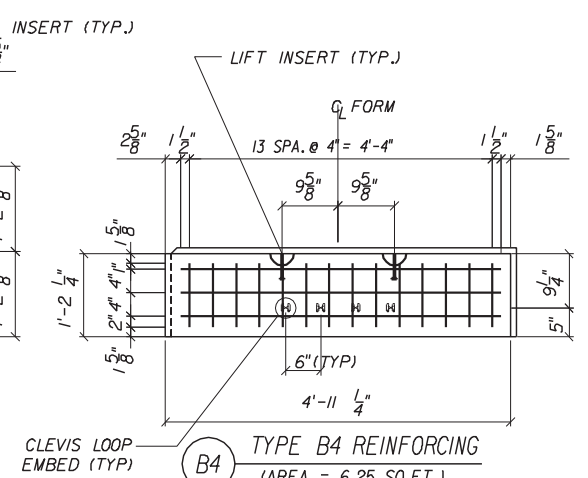
C2 TYPE C2 REINFORCING
(AREA = 12.50 SQ.FT.)



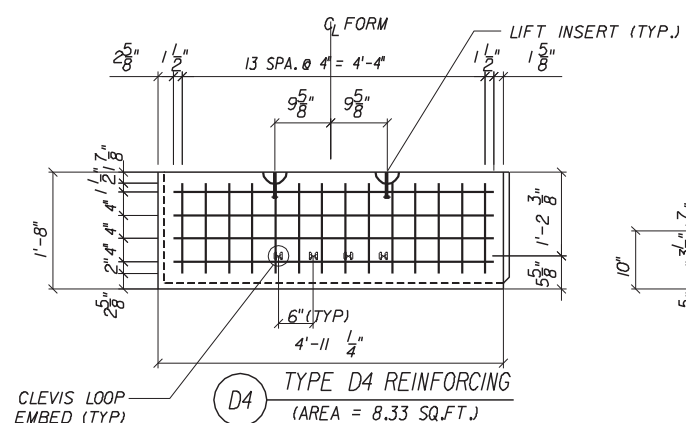
B6 TYPE B6 REINFORCING
(AREA = 18.75 SQ.FT.)



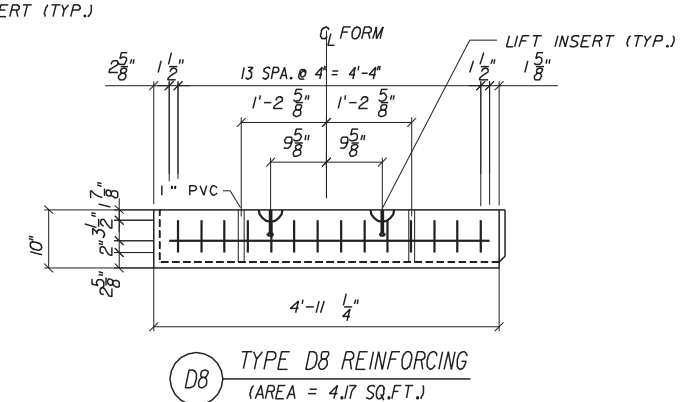
B2 TYPE B2 REINFORCING
(AREA = 12.50 SQ.FT.)



B4 TYPE B4 REINFORCING
(AREA = 6.25 SQ.FT.)



D4 TYPE D4 REINFORCING
(AREA = 8.33 SQ.FT.)



D8 TYPE D8 REINFORCING
(AREA = 4.17 SQ.FT.)

SQUARE PANELS

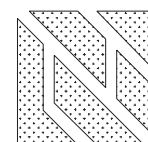
FOSTER Geotechnical claims a strict proprietary right in all drawings, specification and calculations ("information") set forth on this sheet. The use of such information in whole or in part, or any reproduction thereof, is restricted to the site for which it was prepared and to the material and/or service provided by FOSTER Geotechnical. Any other use is strictly prohibited, and FOSTER GEOTECHNICAL DISCLAIMS ANY LIABILITY THEREFOR.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL RETAINED EARTH WALL				
Designed By	TCNA	Dates	11/98	Approved By
Drawn By	CAD	11/98	00	12 of 12
Checked By	GEO	11/98	00	5005

STANDARD DETAILS FOR 3" CONCRETE COVER

T-WALL® RETAINING WALL SYSTEM

DESIGNER



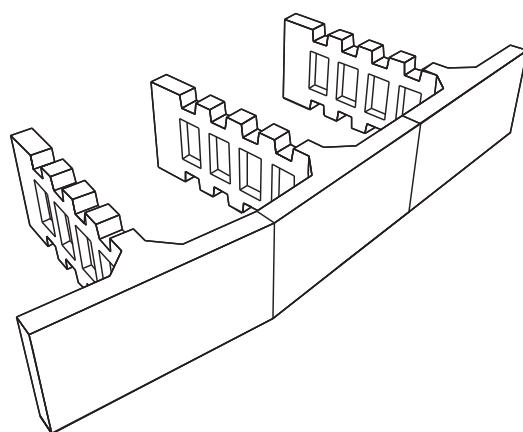
THE NEEL COMPANY

8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER

OLDCASTLE PRECAST, INC.

11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992



MISCELLANEOUS NOTES:

- DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VA 22152
PH: (703) 913-7858
FX: (703) 913-7859
- PRECASTER:
OLDCASTLE PRECAST INC.
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992
- MATERIALS SUPPLIED BY PRECASTER:
-PRECAST T-WALL UNITS
-PRECAST SHEAR KEYS
-HORIZONTAL JOINT MATERIAL
-VERTICAL JOINT MATERIAL AND ADHESIVE
-SHEAR KEY JOINT MATERIAL

DESIGN NOTES:

- DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE RETAINING WALL VOLUME, METHODS OF CONSTRUCTION, AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO SPEC SECTION 548 - RETAINING WALL SYSTEMS.
- SOIL PARAMETERS:
-SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUE OF ϕ , C AND GAMMA SHALL BE PROVIDED IN THE SHOP DRAWINGS
- FACTORS OF SAFETY:
-OVERTURNING - 2.0
-SLIDING - 1.5
-INTERNAL PULLOUT - 1.5
-BEARING CAPACITY - 2.5
-OVERALL STABILITY - 1.5
- THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE NEEL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN, INCLUDING FOUNDATION AND SLOPE STABILITY, IS THE RESPONSIBILITY OF OTHERS.
- PANELS WITH CANTILEVERED (EXTENDED) FACE SHALL ONLY BE USED TO AVOID OBSTRUCTIONS AS APPROVED ON THE SHOP DRAWINGS.

MATERIALS NOTES:

- PRECAST CONCRETE:
-PRECAST T-WALL UNITS - PER SPEC SECTION 548
-PRECAST SHEAR KEYS - PER SPEC SECTION 548
- C.I.P. CONCRETE:
-C.I.P. LEVELING PAD - PER SPEC SECTION 548
-OTHER C.I.P. CONCRETE - PER SPEC SECTION 548
- REINFORCING STEEL:
-PER SPEC SECTION 548
- JOINT MATERIAL:
-HORIZONTAL JOINT FILLER:
-1/2" x 4" x 5'-0"
-PREFORMED EPDM
-DUROMETER: 80 - 90
-VERTICAL JOINT COVER:
-TENSAR DC4205 OR EQUAL
-12" WIDE x HEIGHT OF JOINT
-GEOCOMPOSITE MEETING REQUIREMENTS OF SPEC SECTION 548
-SHEAR KEY WRAP:
-1/4" x 8" x 24"
-AVI ASTRO-FOAM AF-250
- BACKFILL:
-PER SPEC SECTION 548

CONSTRUCTION NOTES:

- ALL CONSTRUCTION PROCEDURES SHALL COMPLY WITH SPEC SECTION 548 AND THE "T-WALL CONSTRUCTION MANUAL" (PROVIDED BY THE NEEL COMPANY OR OLDCASTLE PRECAST, INC.). IN THE EVENT OF A DISCREPANCY BETWEEN THE SPEC AND THE "T-WALL CONSTRUCTION MANUAL", THE SPEC SHALL CONTROL.
- FOR LOCATION AND ALIGNMENT OF T-WALL STRUCTURE, SEE RETAINING WALL CONTROL PLANS.
- T-WALL STRUCTURES ON CURVES SHALL BE BUILT IN CHORDS AS SHOWN IN THE T-WALL DESIGN DRAWINGS.
- IF MANHOLES OR DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN IN THE T-WALL DESIGN DRAWINGS.
- IF PILES ARE LOCATED WITHIN THE RETAINING WALL VOLUME, THEY SHALL BE DRIVEN BEFORE CONSTRUCTION OF THE T-WALL STRUCTURE.
- T-WALL UNITS SHALL BE PLACED ONE ROW AT A TIME, AND BACKFILLED BEFORE PLACEMENT OF THE NEXT ROW.
- IF A STRUCTURE EXCEEDS 20' IN HEIGHT, THE FINISH GRADE AT THE FACE OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS 20' IN HEIGHT.
- THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING STORM WATER DRAINAGE IN THE VICINITY OF THE WALL DURING CONSTRUCTION. STORMWATER RUNOFF SHALL BE COLLECTED AND DISCHARGED AWAY FROM THE WALL AND THE RETAINING WALL VOLUME.

THIS SYSTEM SHALL NOT BE USED FOR WALLS WITH ACUTE INTERIOR CORNERS IN SALT WATER ENVIRONMENTS.

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

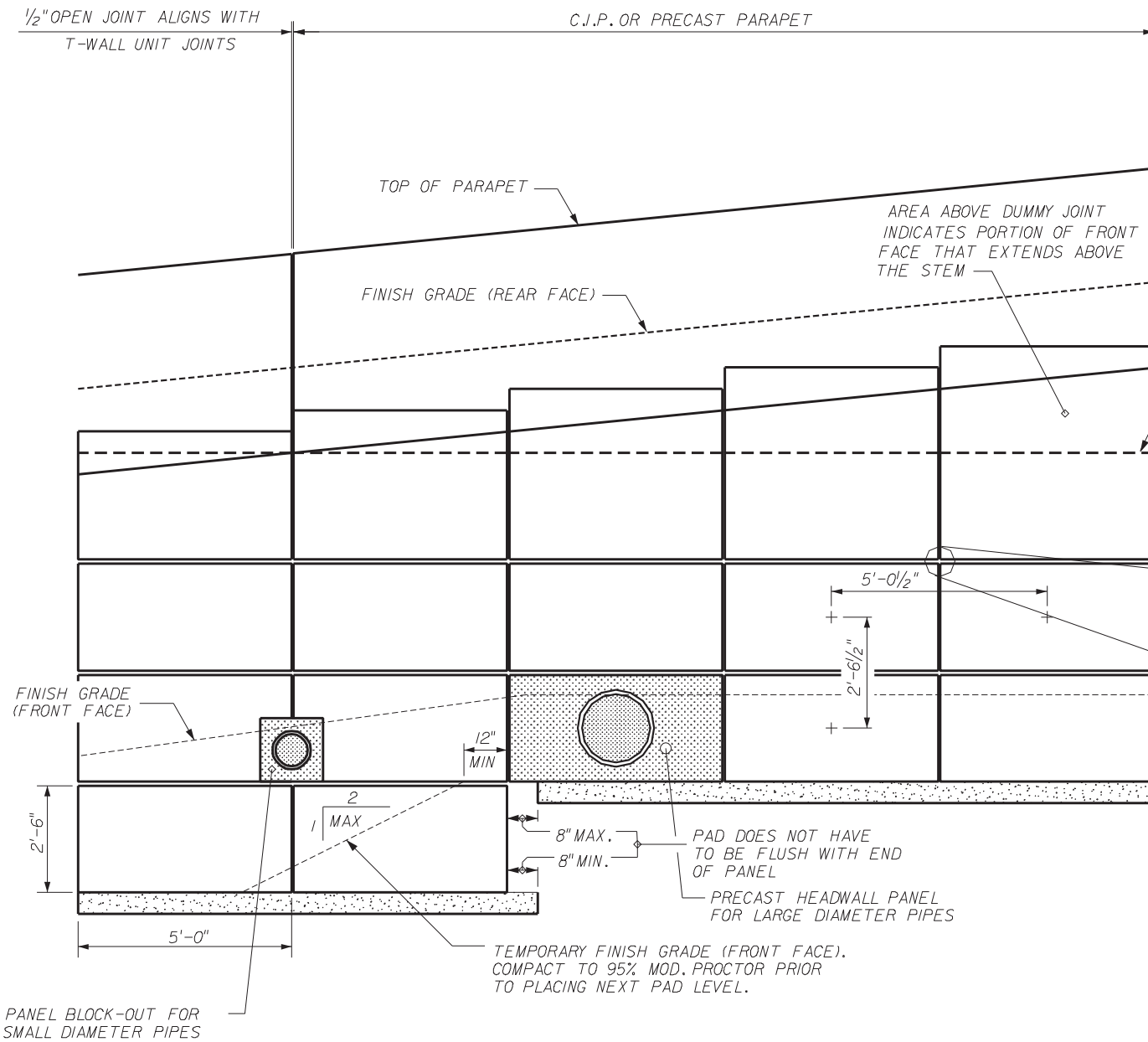
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)

Names		Dates		Approved By		
Designed By	JMC	10/01/98	State Structures Design Engineer			
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.	
Checked By	JMC	10/01/98	00	1 of 20	5010	

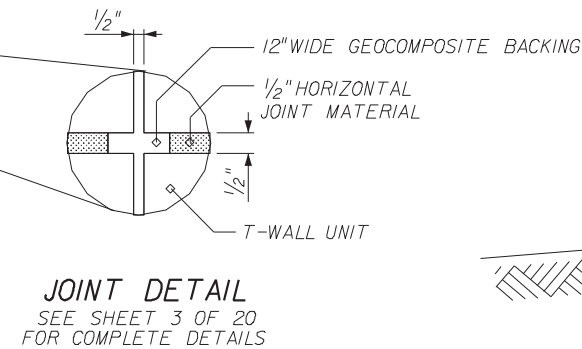


THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

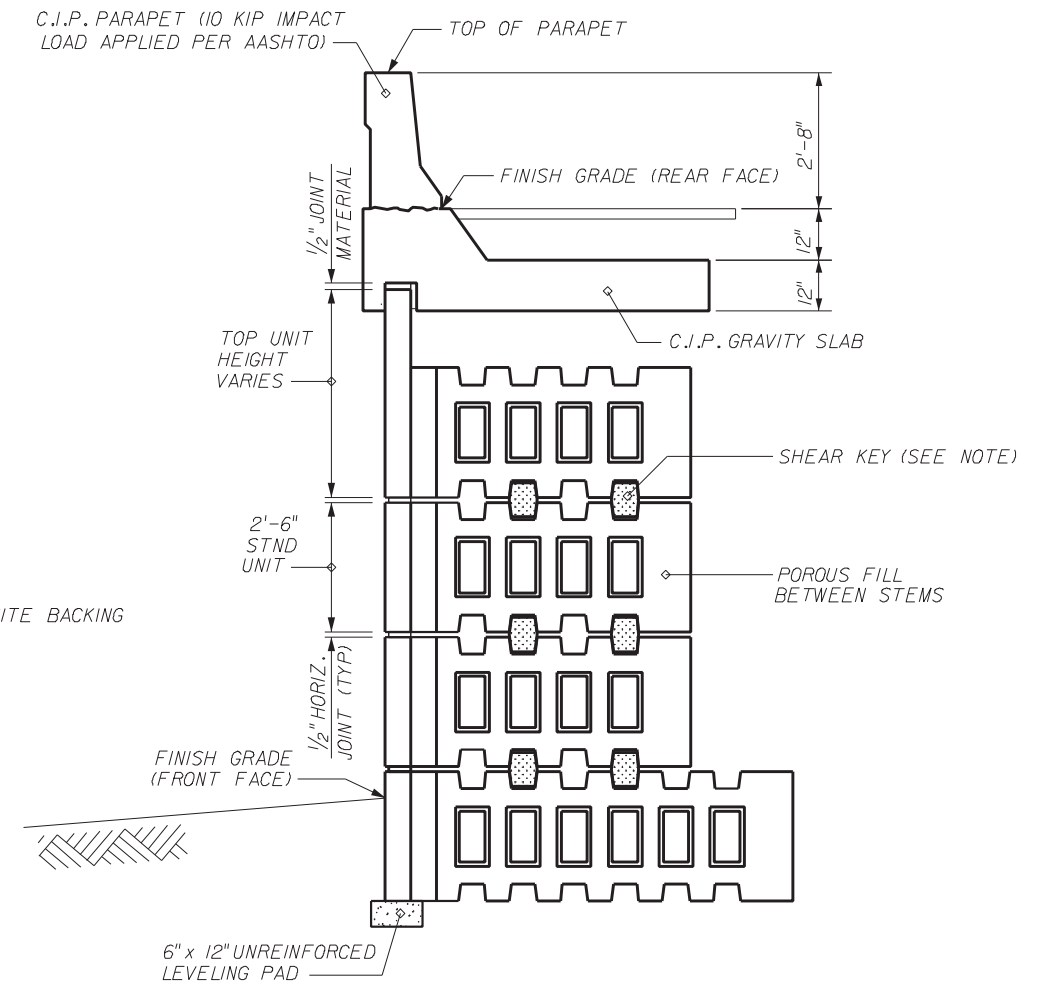
OLDCASTLE PRECAST, INC.
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992



PART ELEVATION SHOWING TYPICAL DETAILS
(NO SCALE)



JOINT DETAIL
SEE SHEET 3 OF 20
FOR COMPLETE DETAILS



SECTION SHOWING TYPICAL DETAILS
(NOT ALL DETAILS APPLY TO EACH WALL)

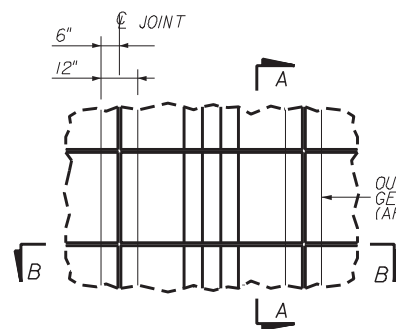
NOTE: ALL EXTENDED FACE TOP UNITS REQUIRE
A MINIMUM OF TWO SHEAR KEYS. ALL OTHER UNITS
ARE AS SHOWN BELOW:

- TOP UNITS - 2 SHEAR KEYS
- 6' STEM - 2 SHEAR KEYS
- 8' STEM - 2 SHEAR KEYS
- 10' STEM - 2 SHEAR KEYS
- 12' STEM - 2 SHEAR KEYS
- 14' STEM - 3 SHEAR KEYS
- 16' STEM - 3 SHEAR KEYS

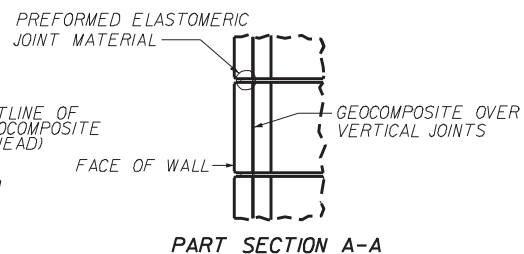
THE NEEL COMPANY
8328 B TERRY ROAD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

OLDCASTLE PRECAST, INC.
11843 102nd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2996
FX: (904) 778-2992

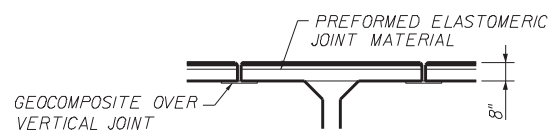
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Designed By	JMC	10/01/98	Approved By <i>W. V. [Signature]</i>	
Drawn By	CAA	10/01/98	State Structures Design Engineer	
Checked By	JMC	10/01/98	Revision	Sheet No.
			00	2 of 20
				5010



PART ELEVATION - REAR FACE



PART SECTION A-A



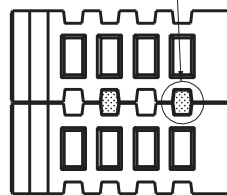
PART SECTION B-B

JOINT MATERIAL DETAILS

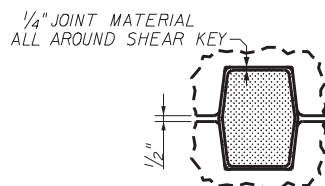
NOTES:

- HORIZONTAL JOINT:
1/2" x 4" x 5'-0" PREFORMED ELASTOMERIC JOINT MATERIAL
- VERTICAL JOINT:
1/2" SPACE
12" WIDE GEOCOMPOSITE BACKING, CENTERED ABOUT JOINT CENTERLINE.

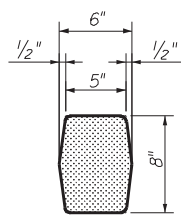
SHEAR KEY WRAPPED IN JOINT MATERIAL. SEE DETAILS THIS SHEET.



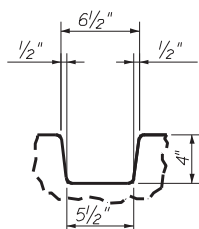
PART SECTION



SHEAR KEY / JOINT MATERIAL ARRANGEMENT



SHEAR KEY DIMENSIONS

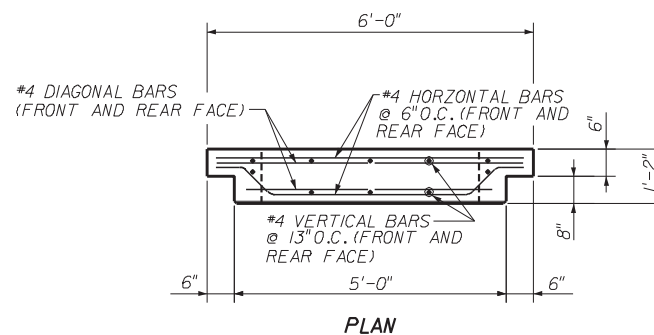
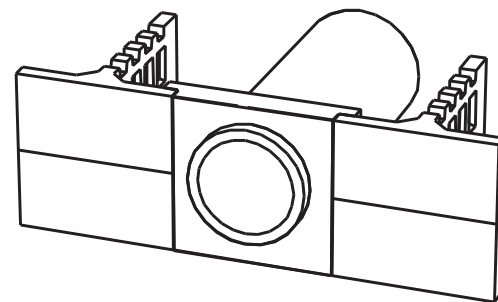


SHEAR KEY BLOCKOUT DIM'S

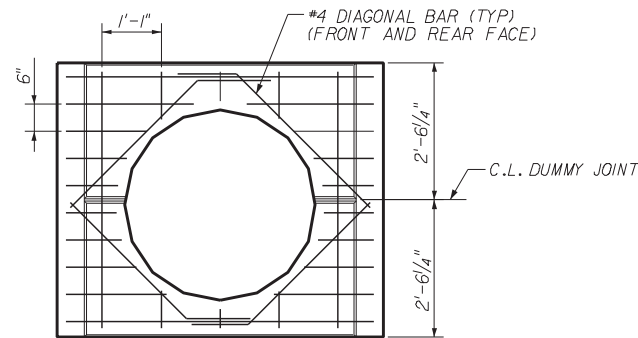
NOTES:

- SHEAR KEY JOINT MATERIAL: MINIMUM OF ONE 1/4" x 8" x 24" PIECE OF AVIASTRO-FOAM AF-250 PER SHEAR KEY.
- JOINT MATERIAL MAY BE ADDED OR REMOVED TO AID IN SHIMMING AND ALIGNING, HOWEVER SHEAR KEY MUST FIT SNUG IN THE SHEAR KEY BLOCKOUT WHEN UNIT IS IN ITS FINAL POSITION.
- MINIMUM OF 2 SHEAR KEYS REQUIRED PER UNIT. SEE NOTES ON SHEET 2 OF 20, 'TYPICAL DETAILS (1)'

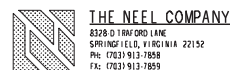
SHEAR KEY DETAILS



PLAN



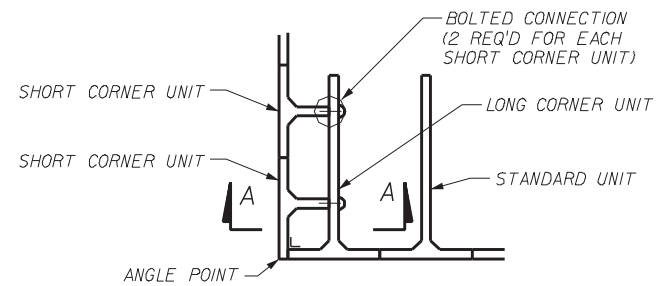
ELEVATION (FRONT FACE)
PRECAST HEADWALL PANEL
FOR LARGE DIAMETER PIPES



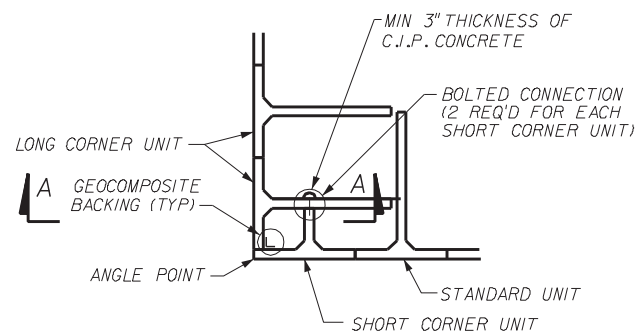
THE NEEL COMPANY
2028 S. 19th AVE. LANE
SPRINGFIELD, FL 32110
PH: (781) 913-7858
FX: (781) 913-7859

OLDCASTLE PRECAST, INC.
11643 13th STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992

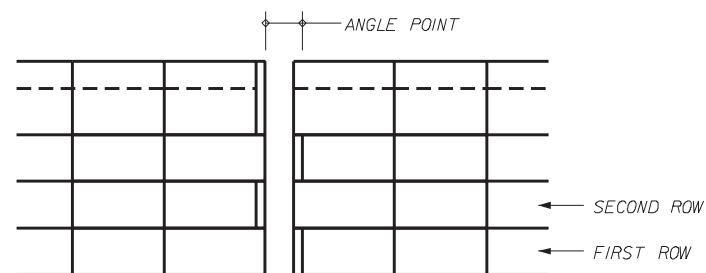
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	3 of 20
				Index No. 5010



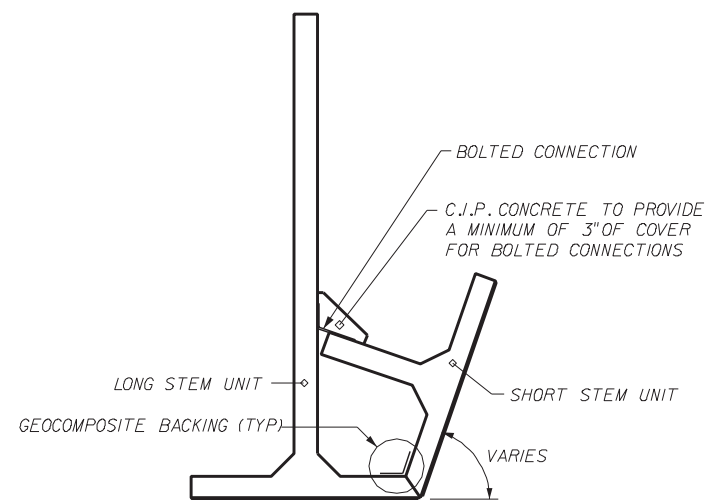
PART PLAN - FIRST ROW



PART PLAN - SECOND ROW

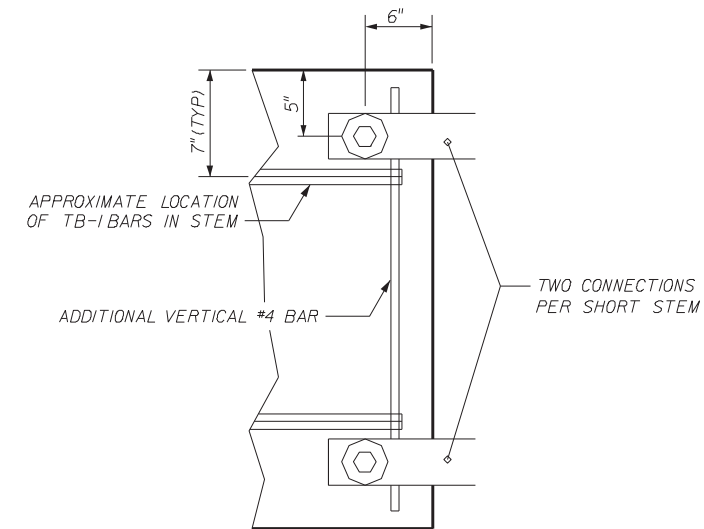


PART ELEVATION

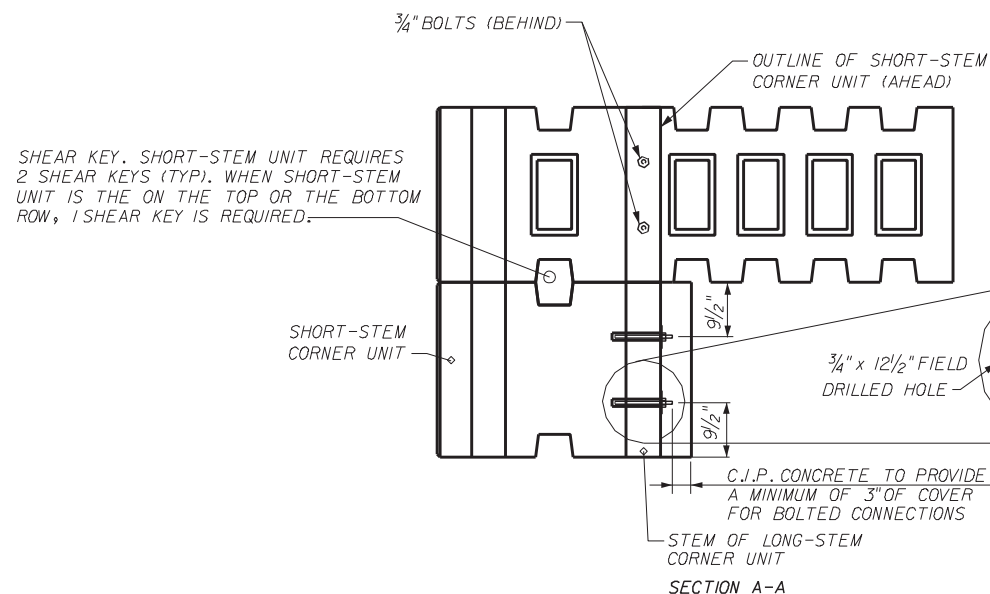


PART PLAN - ANGLE > 90°

SHORT AND LONG STEMS ALTERNATE PER 90° CORNER DETAIL

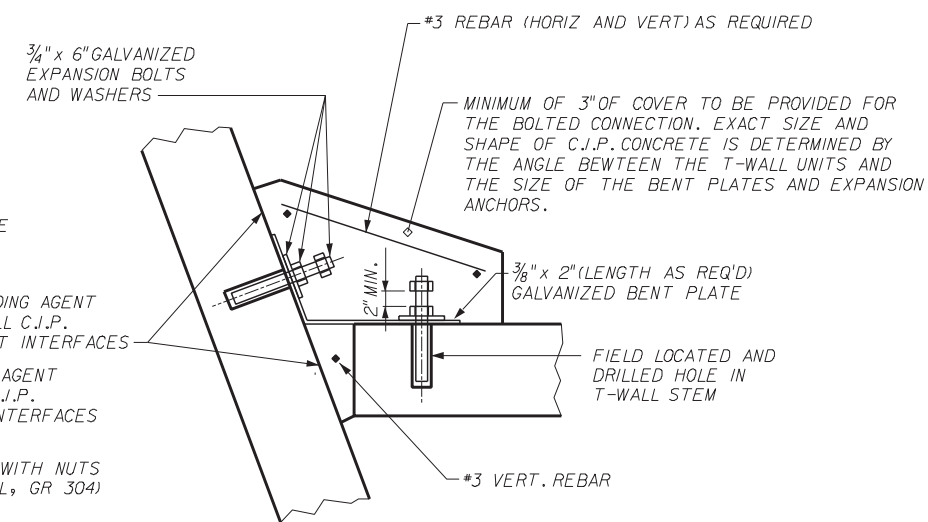


VIEW B-B



TYPICAL CORNER UNIT ARRANGEMENT

STEM LENGTHS VARY - SEE SPECIFIC ELEVATIONS FOR PROPER UNITS
NO SCALE



TYPICAL BOLTED CONNECTION FOR ANGLE POINTS

TYPICAL ANGLE POINT DETAIL

NO SCALE

NOTE: C.J.P. CONCRETE SHALL BE CLASS IV.

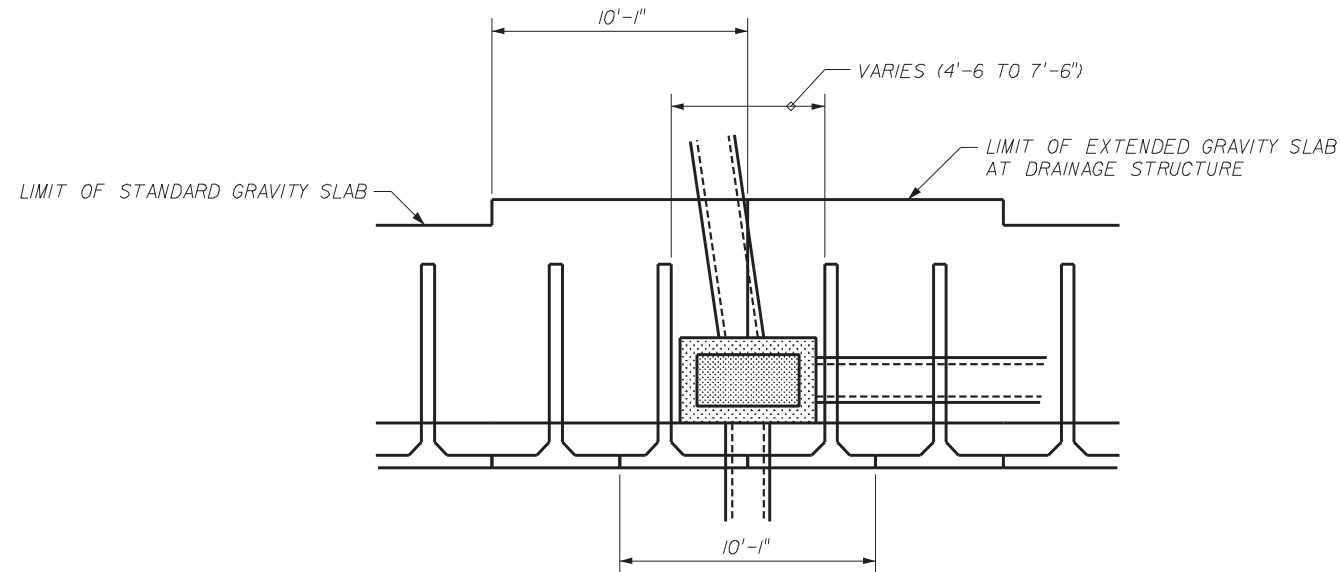
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: (703) 913-7858
Fx: (703) 913-7859

OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
Ph: 19041 778-2990
Fx: 19041 778-2992

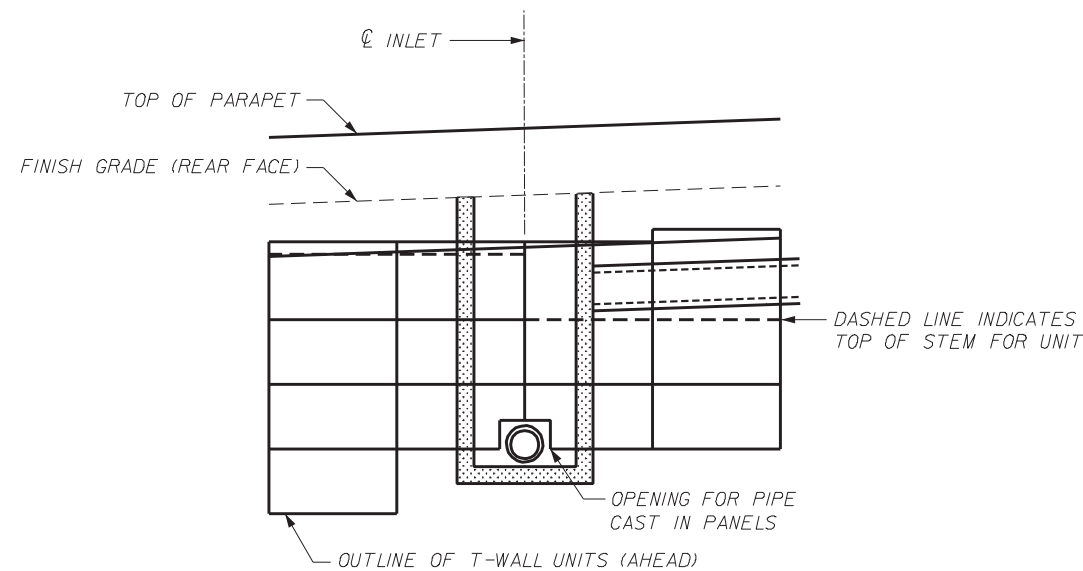
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)

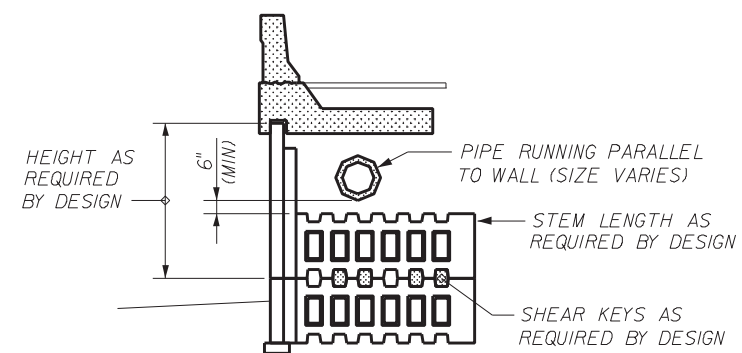
Names	Dates	Approved By		
Designed By	JMC 10/01/98	 State Structures Design Engineer		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	Revision	Sheet No.	Index No.
		00	4 of 20	5010



PART PLAN



PART ELEVATION (FRONT FACE)

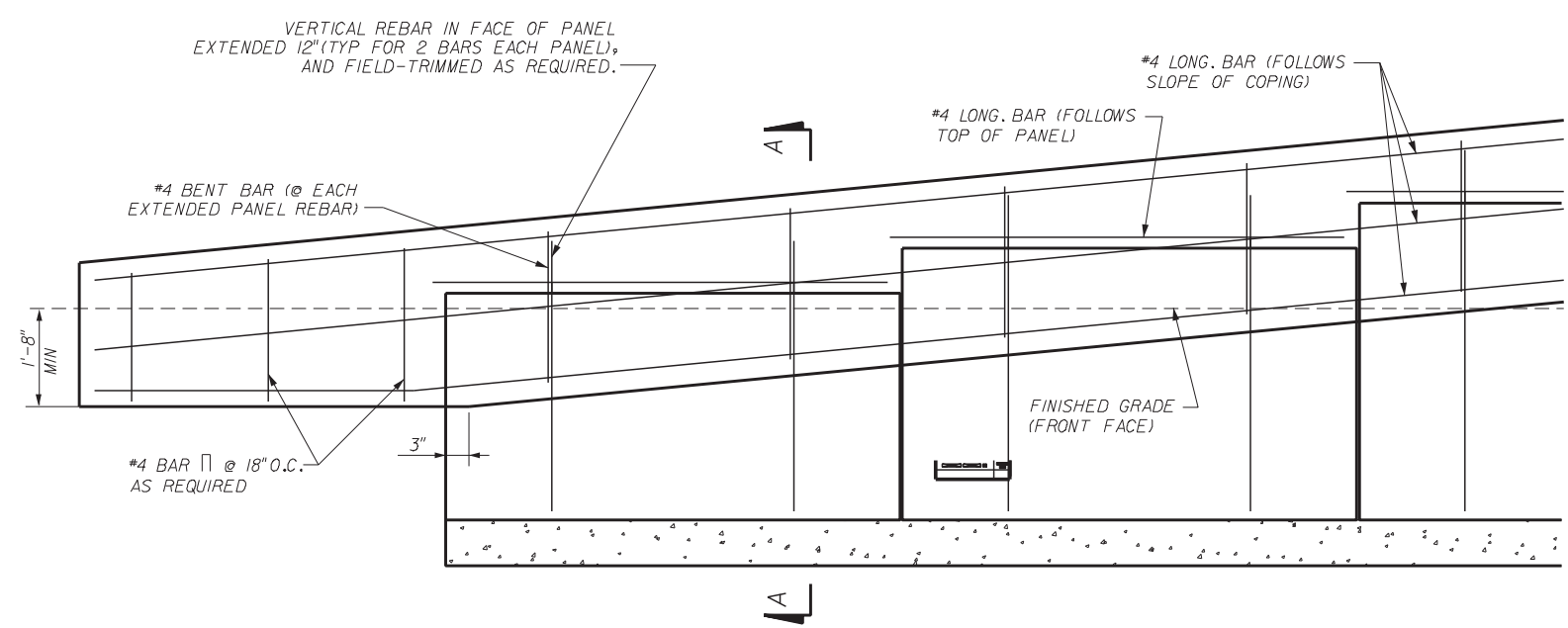


SECTION
(SHOWING PIPE PARALLEL TO WALL)

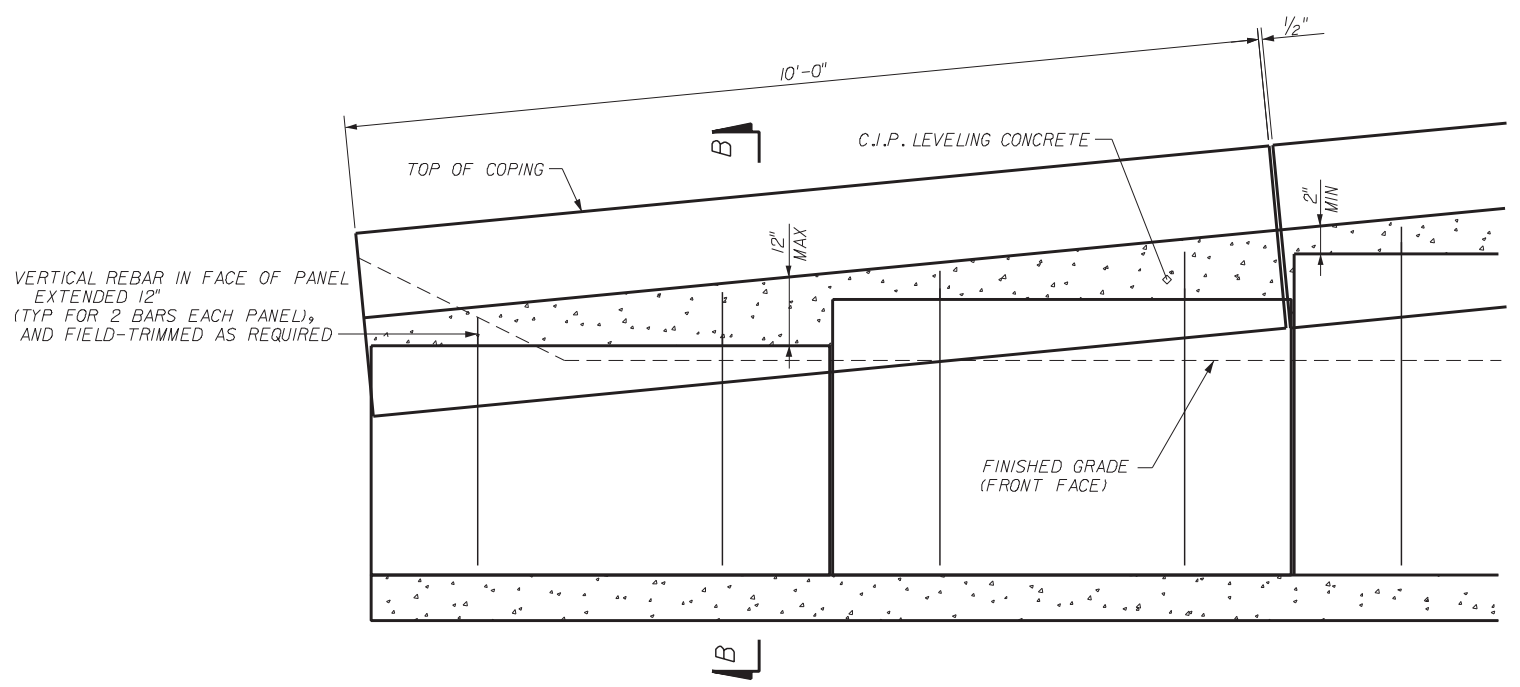
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: 17031 913-7858
Fx: 17031 913-7859

OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
Ph: 19041 778-2990
Fx: 19041 778-2992

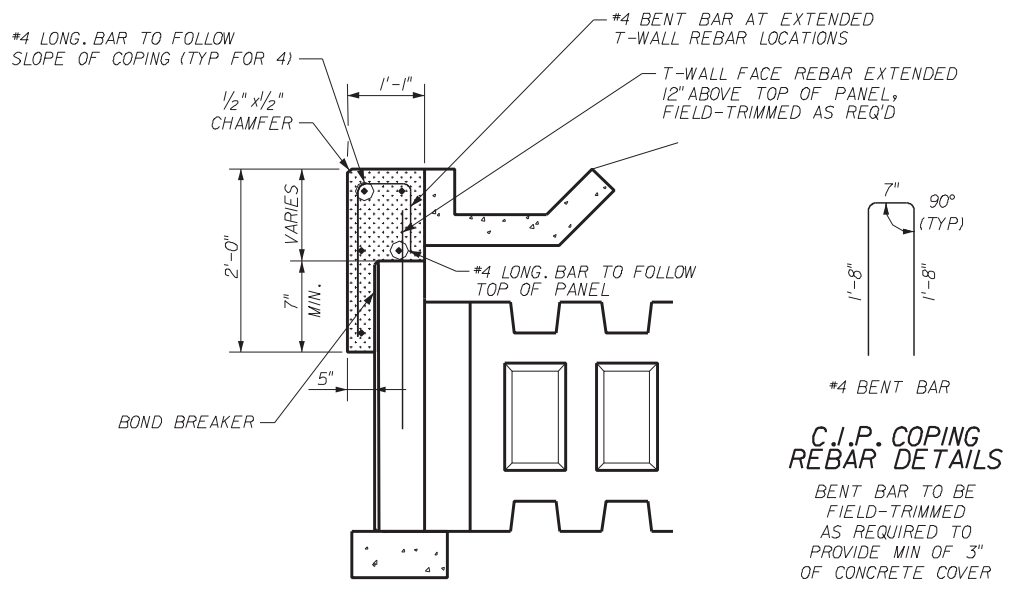
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	TCN	10/01/98	00	5 of 20
				Index No. 5010



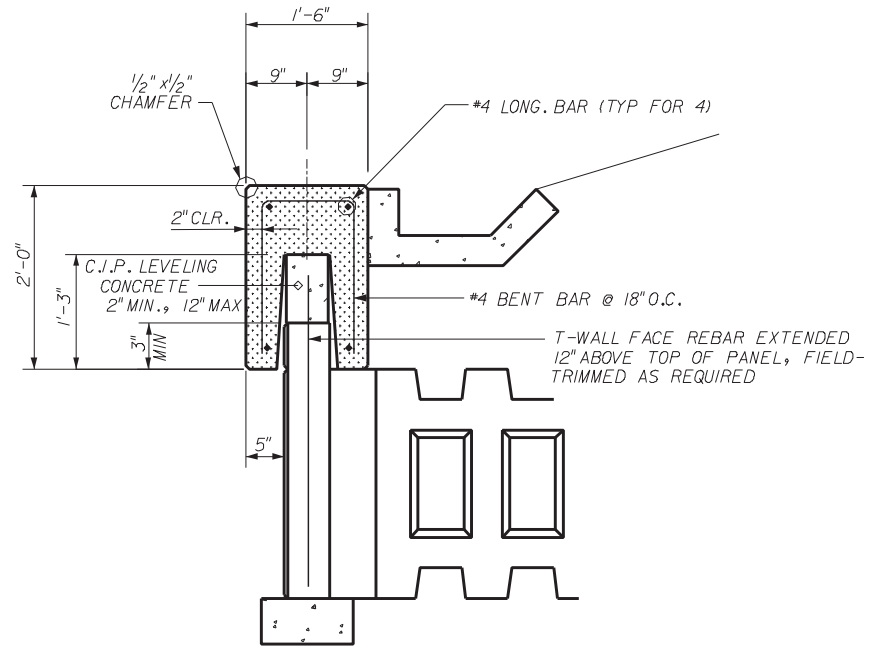
C.J.P. COPING TREATMENT AT BEGINNING/END OF WALLS



PRECAST COPING - PART ELEVATION

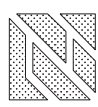


SECTION A-A
C.J.P. COPING



SECTION B-B
PRECAST COPING

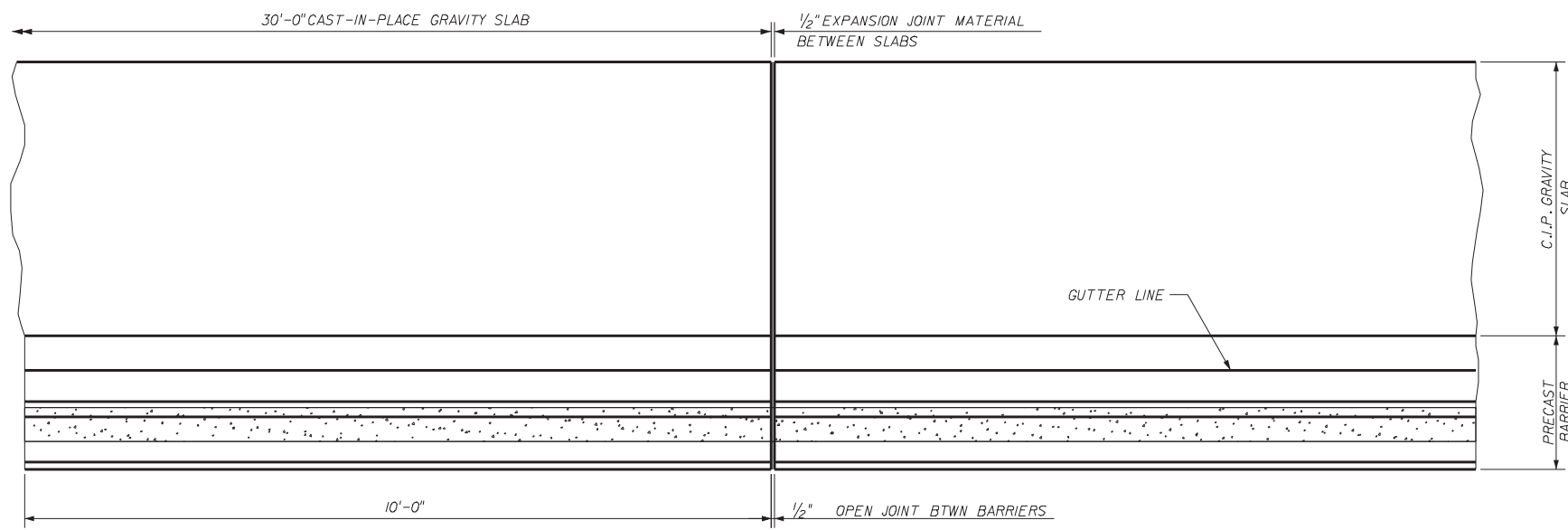
C.J.P. COPING REBAR DETAILS
BENT BAR TO BE FIELD-TRIMMED AS REQUIRED TO PROVIDE MIN OF 3" OF CONCRETE COVER



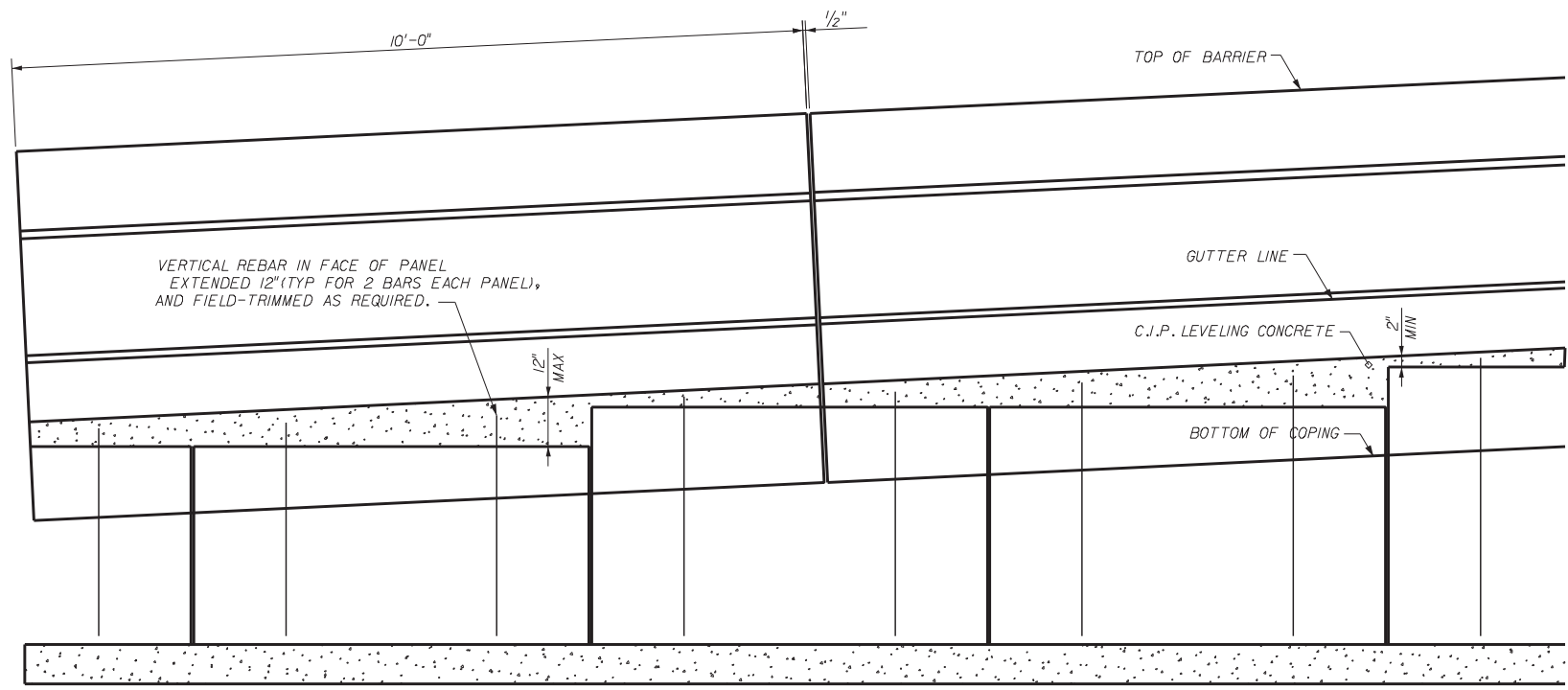
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 1703/913-7858
FX: 1703/913-7859

OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992

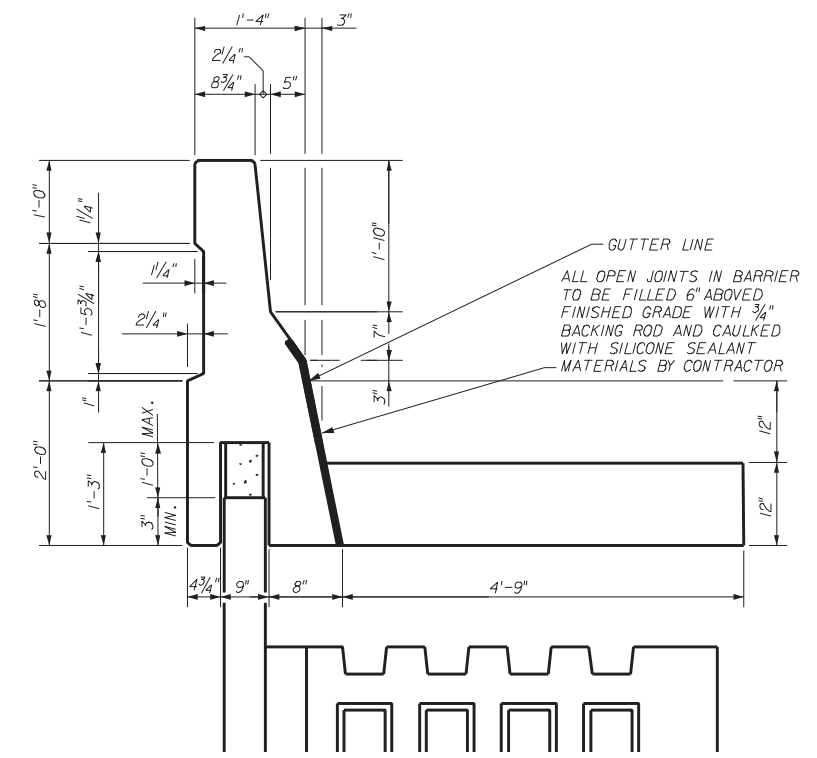
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
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Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
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Checked By	JMC	10/01/98	00	6 of 20
				5010



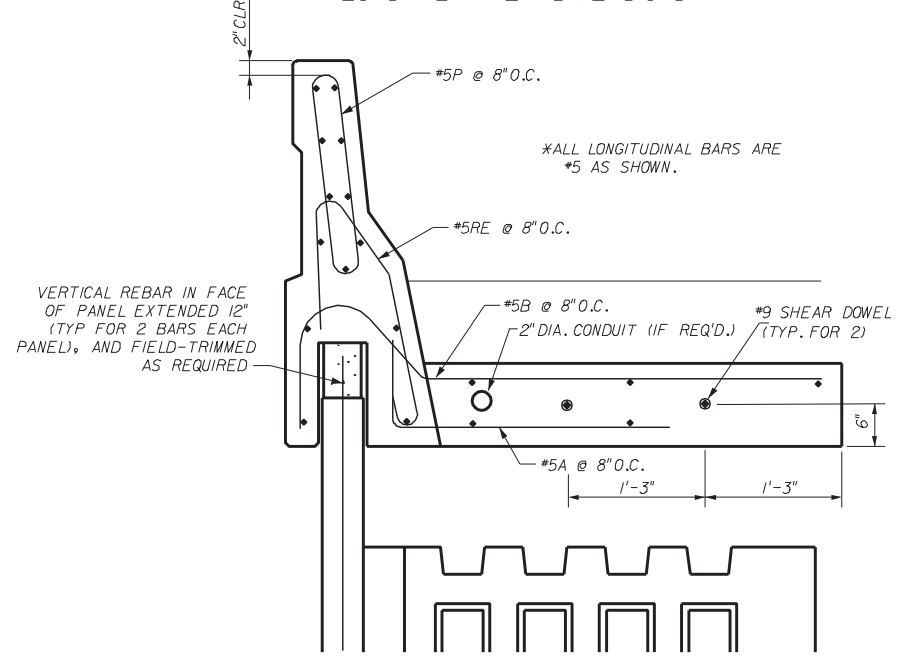
PART PLAN - PRECAST BARRIER



PART ELEVATION - PRECAST BARRIER



PRECAST BARRIER DIMENSIONS

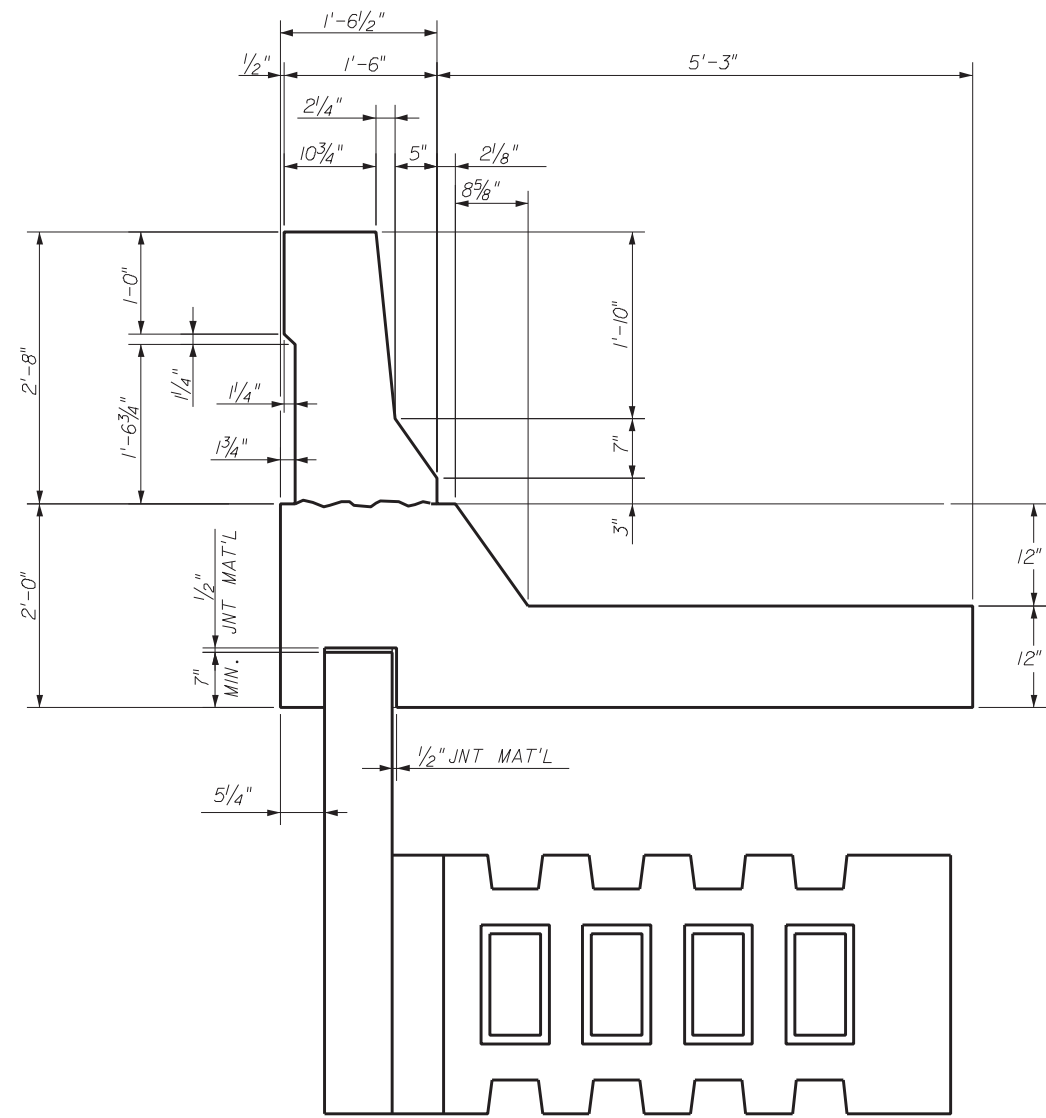


PRECAST BARRIER REBAR

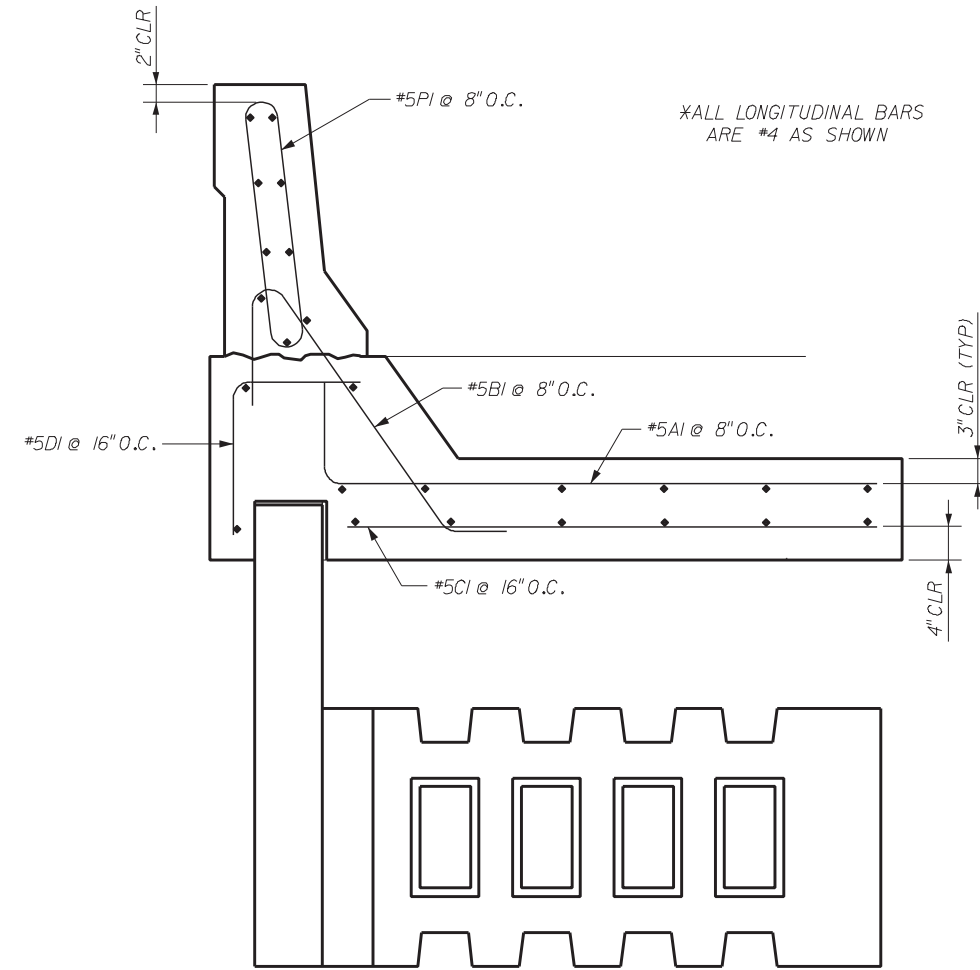
THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

OLDCASTLE PRECAST, INC.
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

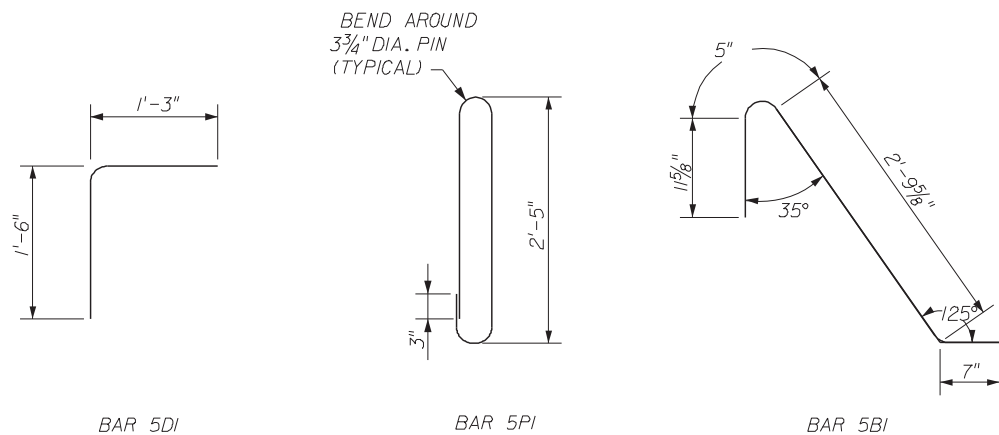
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	7 of 20
				Index No. 5010



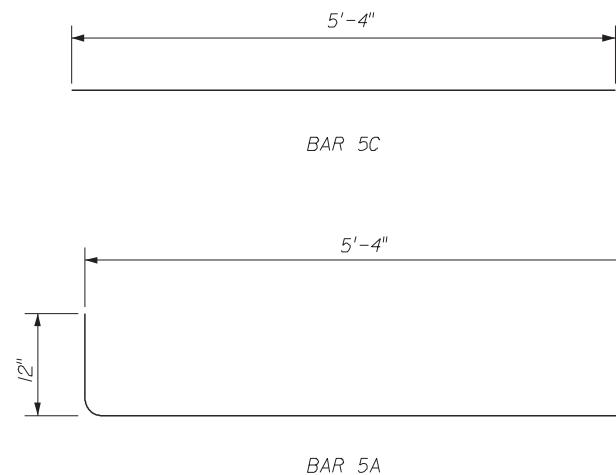
C.I.P. BARRIER AND C.I.P. JUNCTION SLAB DIMENSIONS



C.I.P. BARRIER AND C.I.P. JUNCTION SLAB REBAR



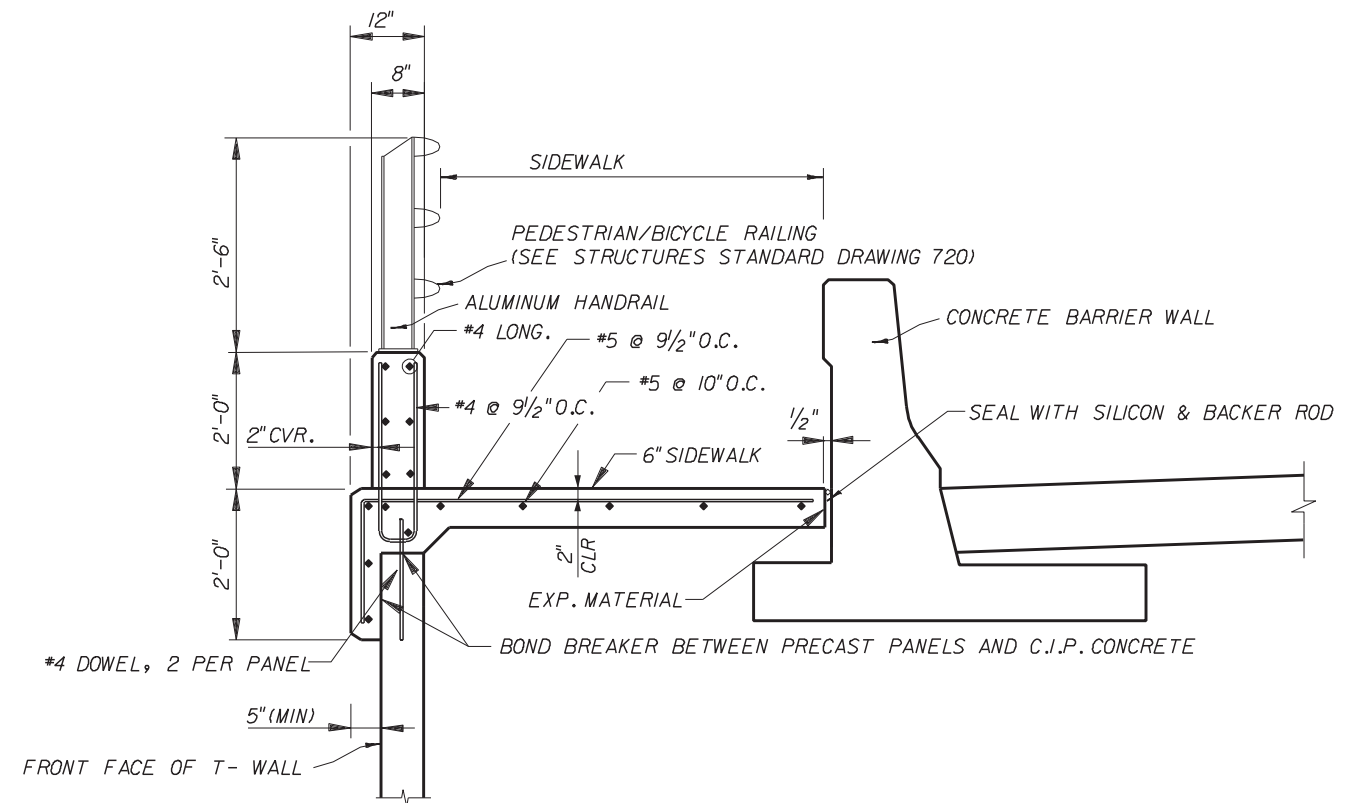
C.I.P. BARRIER REBAR DETAILS



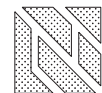
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
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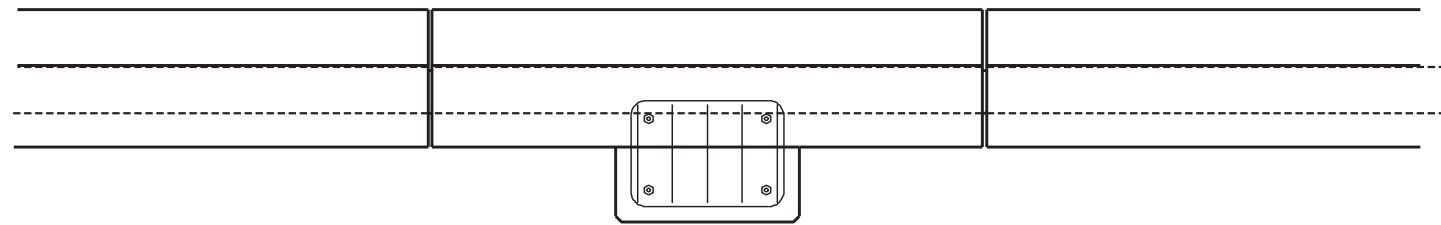
C.I.P. PARAPET DETAIL W/ HANDRAIL



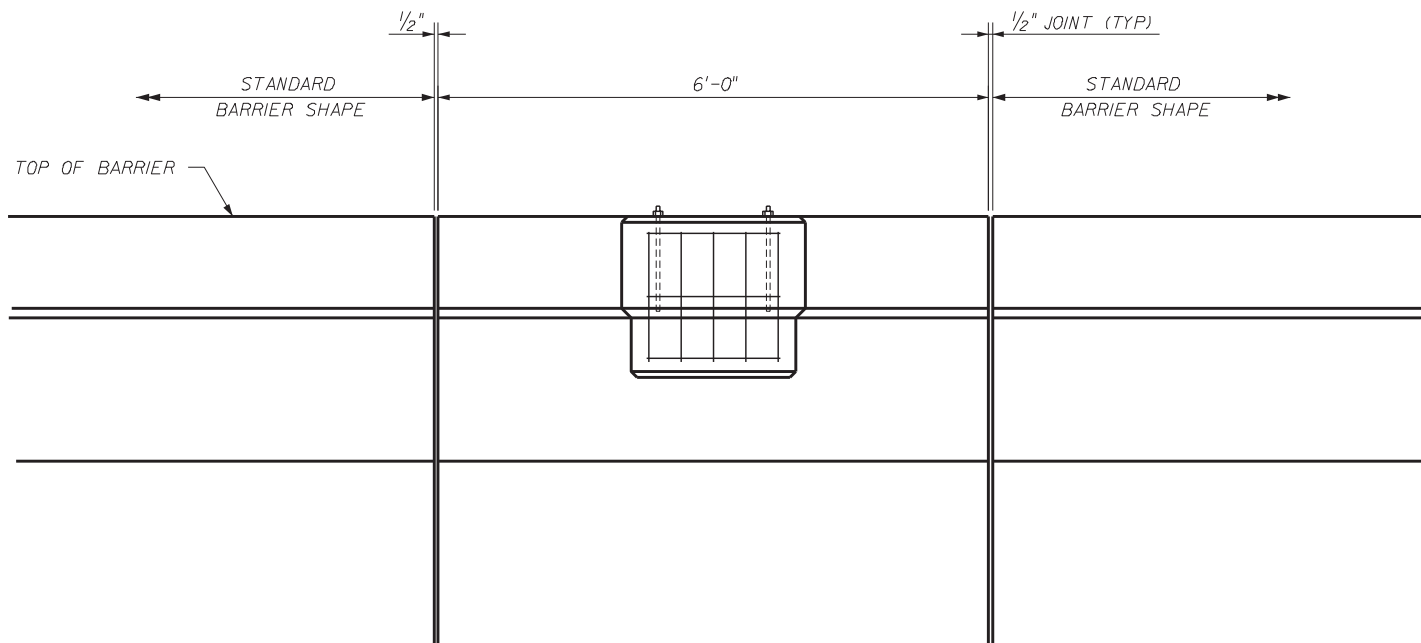
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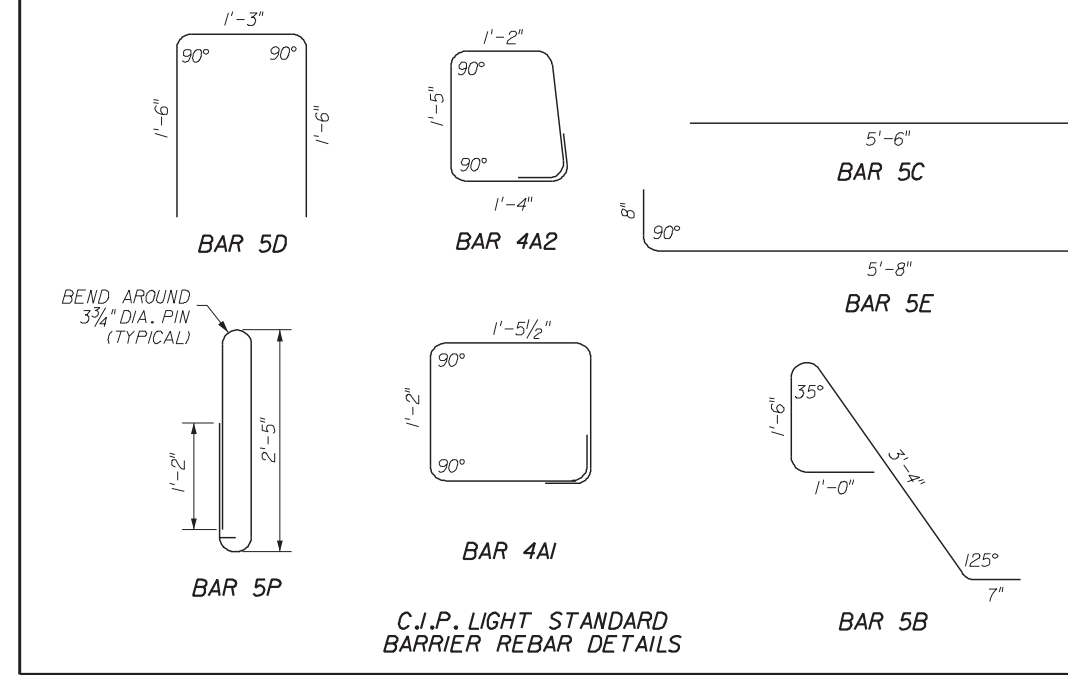
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Designed By	JMC	10/01/98	Approved By <i>W. V. [Signature]</i>	
Drawn By	CAA	10/01/98	State Structures Design Engineer	
Checked By	JMC	10/01/98	Revision	Sheet No. Index No.
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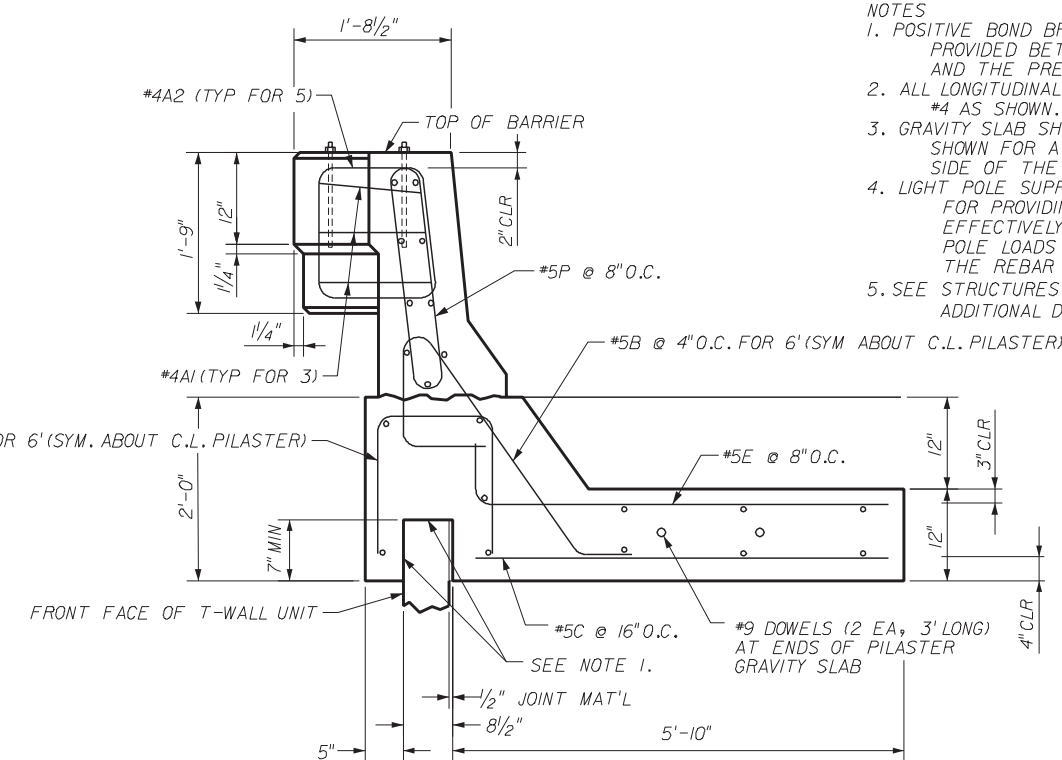
C.J.P. LIGHT STANDARD BARRIER - PART PLAN WITH REBAR
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)



C.J.P. LIGHT STANDARD BARRIER - PART ELEVATION
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)

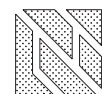


C.J.P. LIGHT STANDARD BARRIER REBAR DETAILS



C.J.P. LIGHT STANDARD BARRIER - PART SECTION WITH REBAR

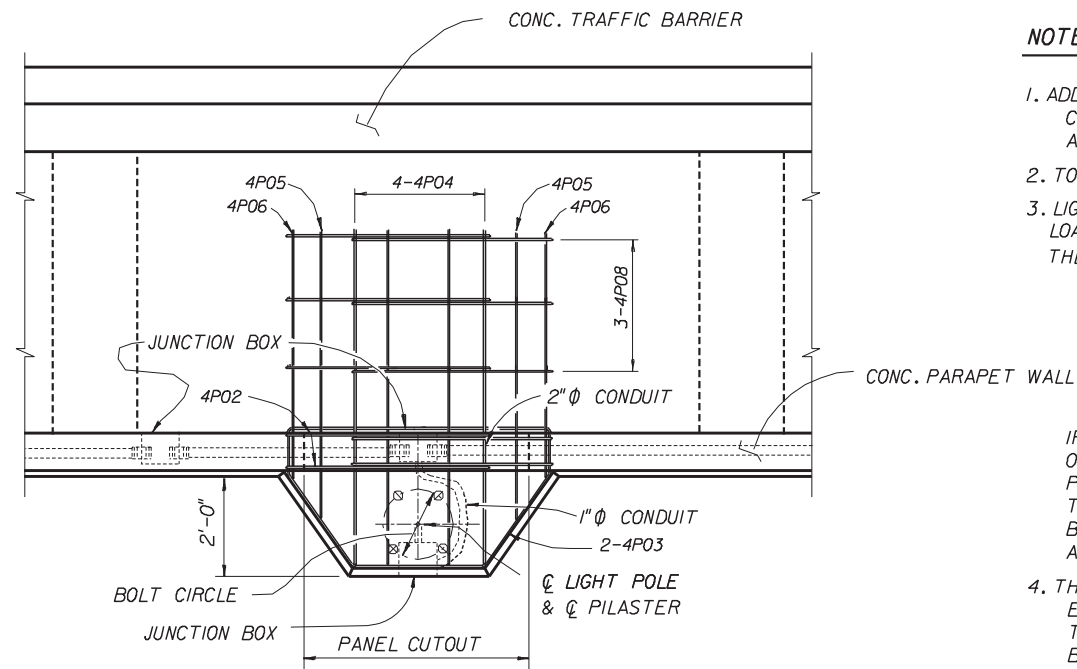
- NOTES
1. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN THE C.J.P. CONC. AND THE PRECAST PANEL.
 2. ALL LONGITUDINAL BARS ARE #4 AS SHOWN.
 3. GRAVITY SLAB SHALL HAVE DIMENSIONS SHOWN FOR A MIN. LENGTH OF 10'-0" EITHER SIDE OF THE LIGHT STANDARD BARRIER.
 4. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REBAR CAGE.
 5. SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS.



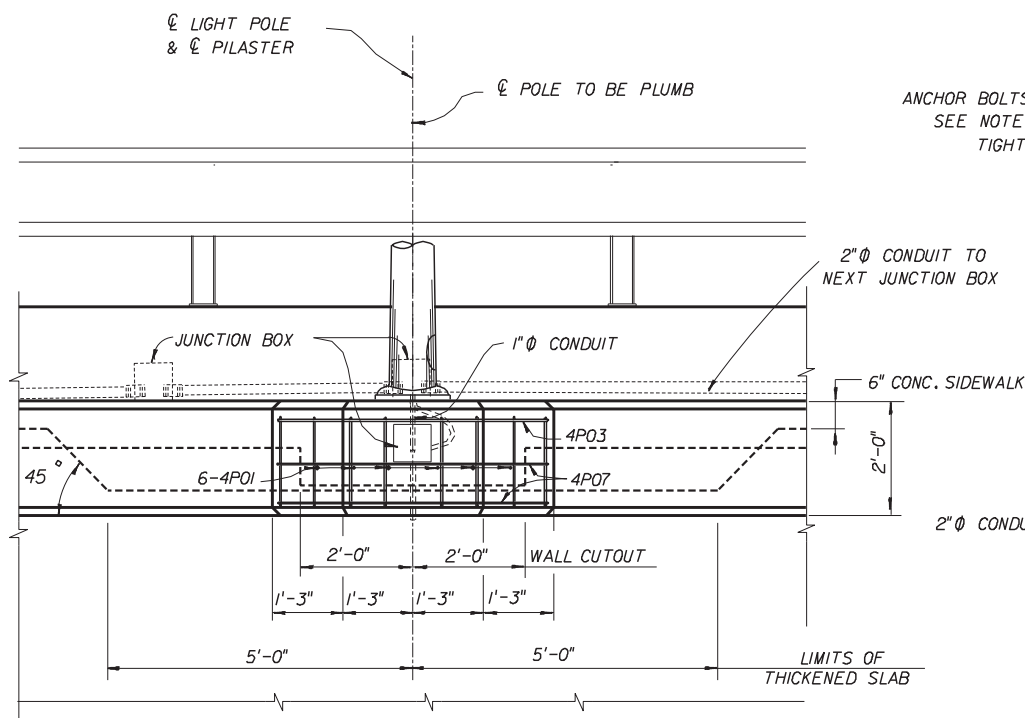
THE NEEL COMPANY
8328-D TRAFORD LANE
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
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PLAN

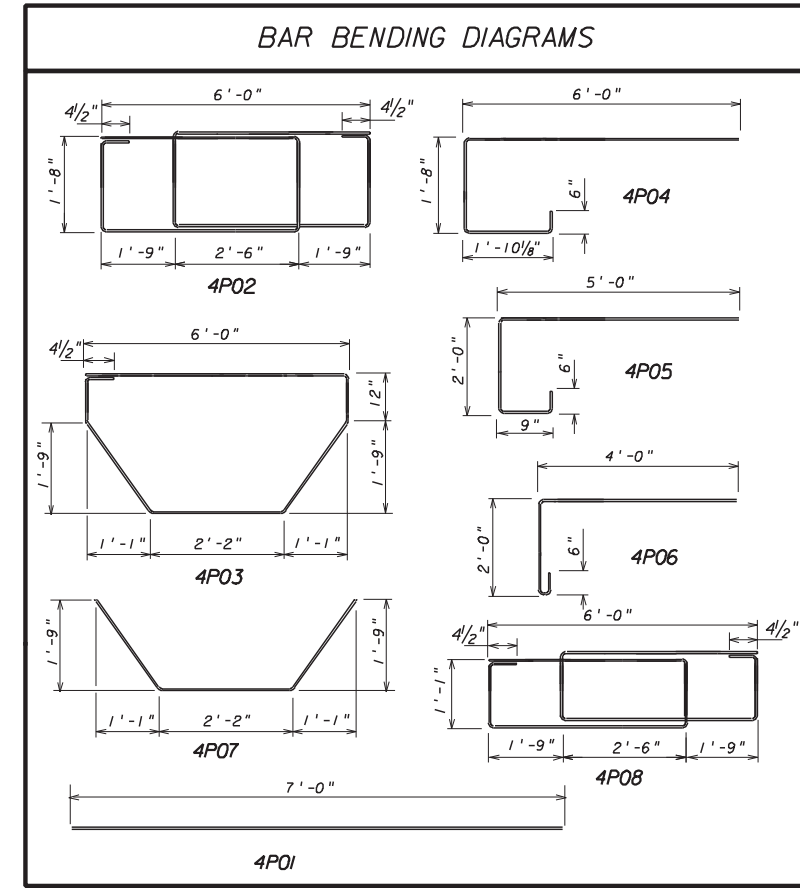
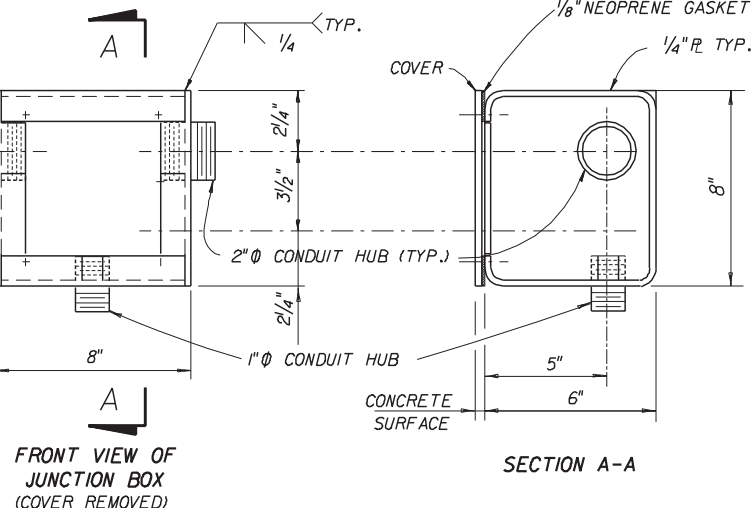
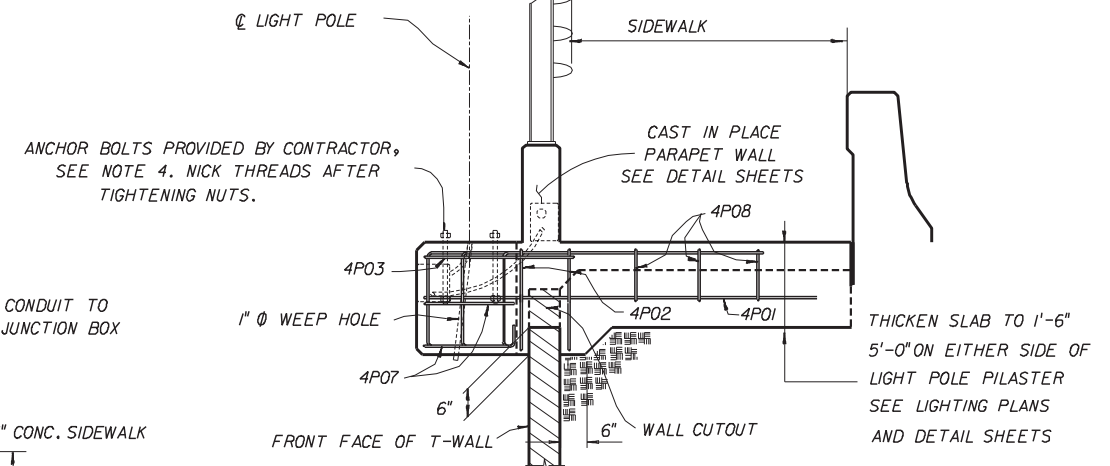


LIGHT PILASTER DETAIL

NOTES

- ADDITIONAL CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTER SHALL MEET THE SAME REQUIREMENTS AS THAT OF THE PARAPET WALL.
- TOP OF PILASTER SHALL BE FINISHED TO A TRULY LEVEL AREA.
- LIGHT POLE PILASTER IS DESIGNED TO RESIST WORKING LOADS (IN ANY DIRECTION) FROM THE LIGHT POLE APPLIED AT THE TOP OF THE PILASTER AS FOLLOWS:
 - LONGITUDINAL MOMENT = 30,000 FT. POUND
 - TRANSVERSE MOMENT = 6,000 FT. POUND
 - LONGITUDINAL SHEAR = 1,000 POUND
 - TRANSVERSE SHEAR = 200 POUND
 - TORSION = 3,000 FT. POUNDS
 - AXIAL = 400 POUNDS
- IF THE LIGHT POLE PROVIDED APPLIES LOADS THAT ARE IN EXCESS OF THOSE SHOWN ABOVE, THE CONTRACTOR SHALL REDESIGN THE PILASTER AND SUBMIT HIS DESIGN TO THE DEPARTMENT FOR REVIEW. THE CONTRACTOR'S REDESIGN SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA, AND QUALIFIED TO PERFORM THE WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND THAT FIT THE REINFORCING CAGE. CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHALL BE SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT FOR REVIEW AND APPROVAL SHOWING THAT THESE REQUIREMENTS HAVE BEEN MET PRIOR TO CONSTRUCTION.

- STEEL FOR JUNCTION BOXES SHALL CONFORM WITH ASTM-A36. THE BOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. IN LIEU OF STEEL BOXES THE CONTRACTOR MAY SUBMIT FOR APPROVAL MOLDED P.V.C. BOXES (SCHEDULE 80).
- ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL OR SCHEDULE 80 P.V.C.
- THE COST OF ANCHOR BOLTS SHALL BE INCLUDED IN THE BID PRICE FOR LIGHT POLES.
- PAYMENT: THE COST OF ALL LABOR, CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTERS AND ALL CONDUITS, EXPANSION COUPLINGS, JUNCTION BOXES AND MISCELLANEOUS HARDWARE REQUIRED FOR COMPLETION OF THE ELECTRICAL INSTALLATION WITHIN THE LIMITS SHOWN ON THIS SHEET, SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR THE MSE WALLS.



BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
4P01	4	6	7'-0"
4P02	4	2	24'-5"
4P03	4	1	14'-9"
4P04	4	4	9'-8"
4P05	4	2	7'-11"
4P06	4	2	6'-2"
4P07	4	2	6'-4"
4P08	4	3	22'-1"

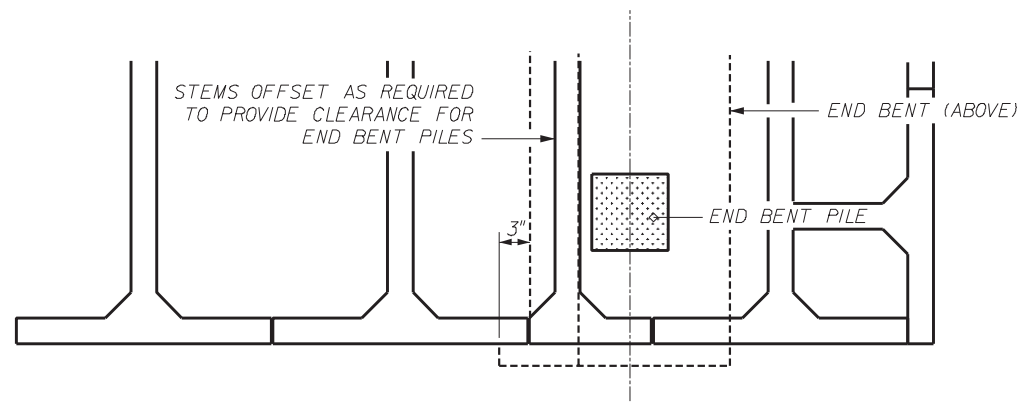
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)**

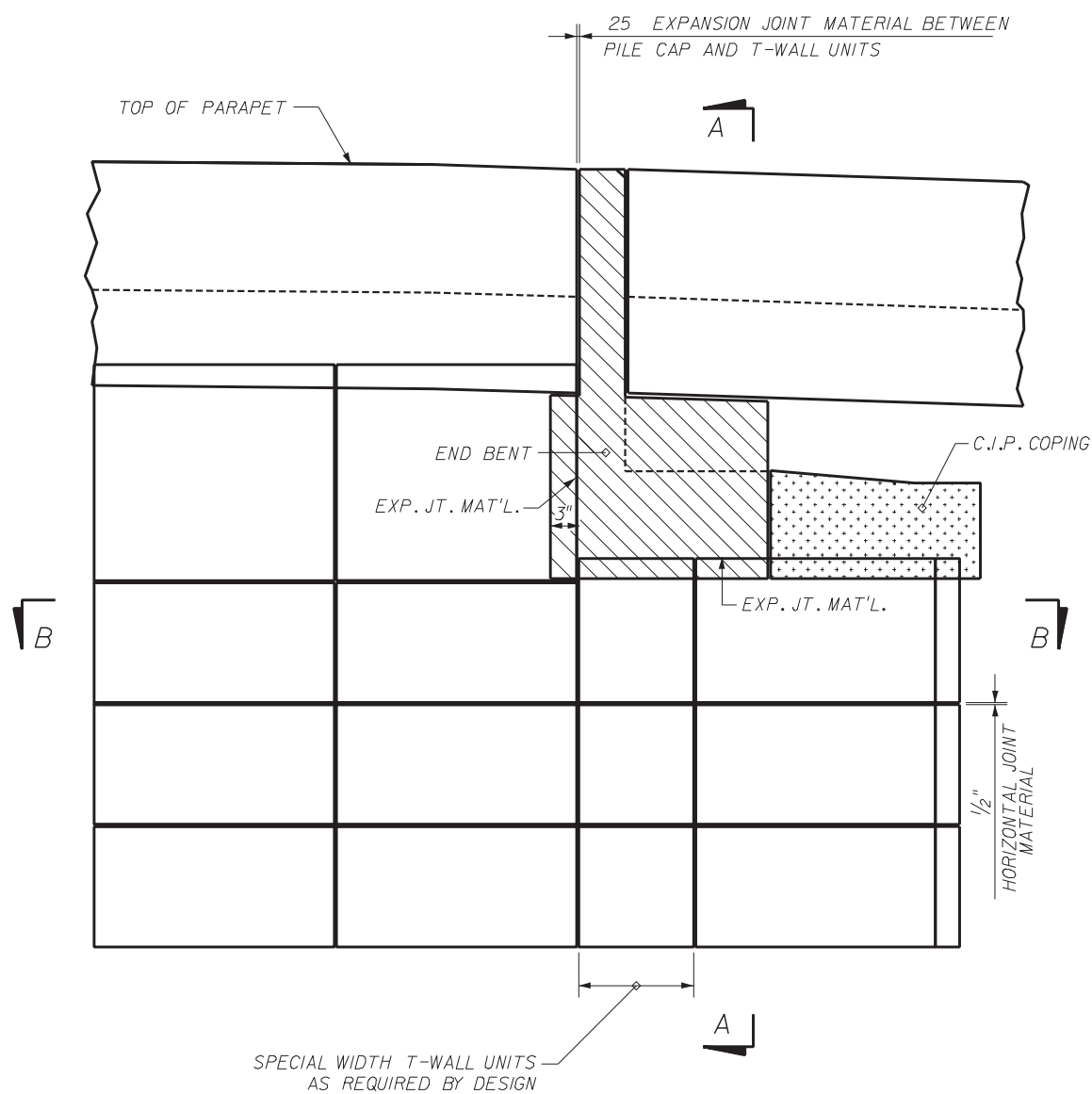
Names	Dates	Approved By		
Designed By	JMC 10/01/98	 State Structures Design Engineer	Revision	Sheet No.
Drawn By	CAA 10/01/98		00	11 of 20
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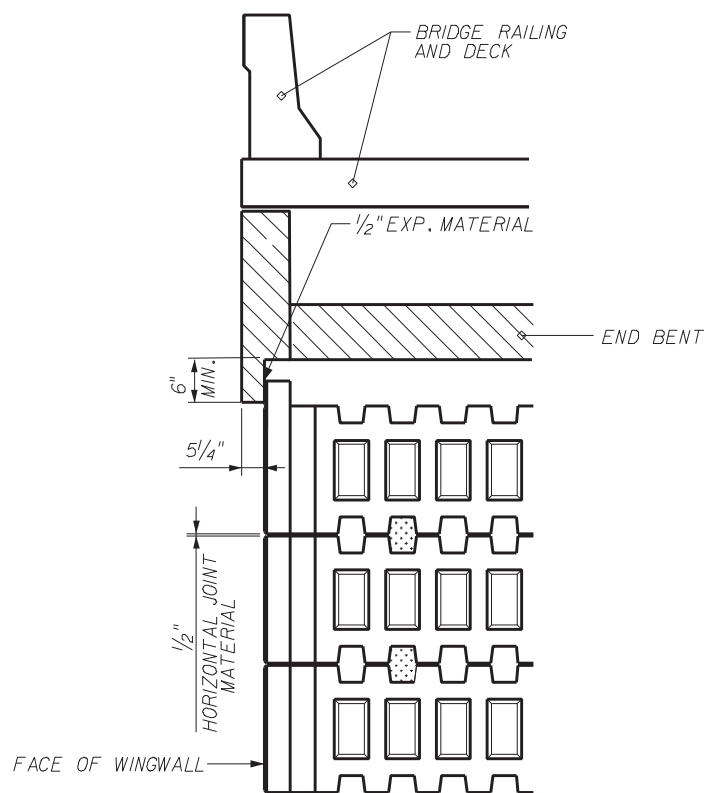
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11643 103rd STREET
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SECTION B-B
STEM / END BENT PILE INTERFACE



PART ELEVATION SHOWING
WINGWALL / END BENT INTERFACE

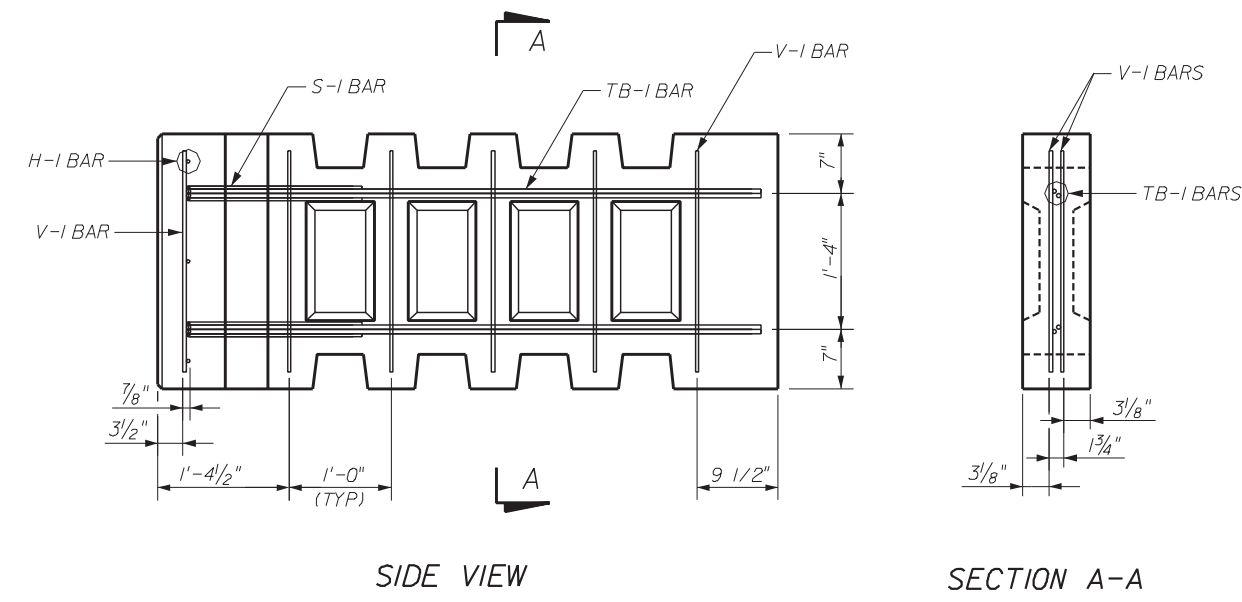
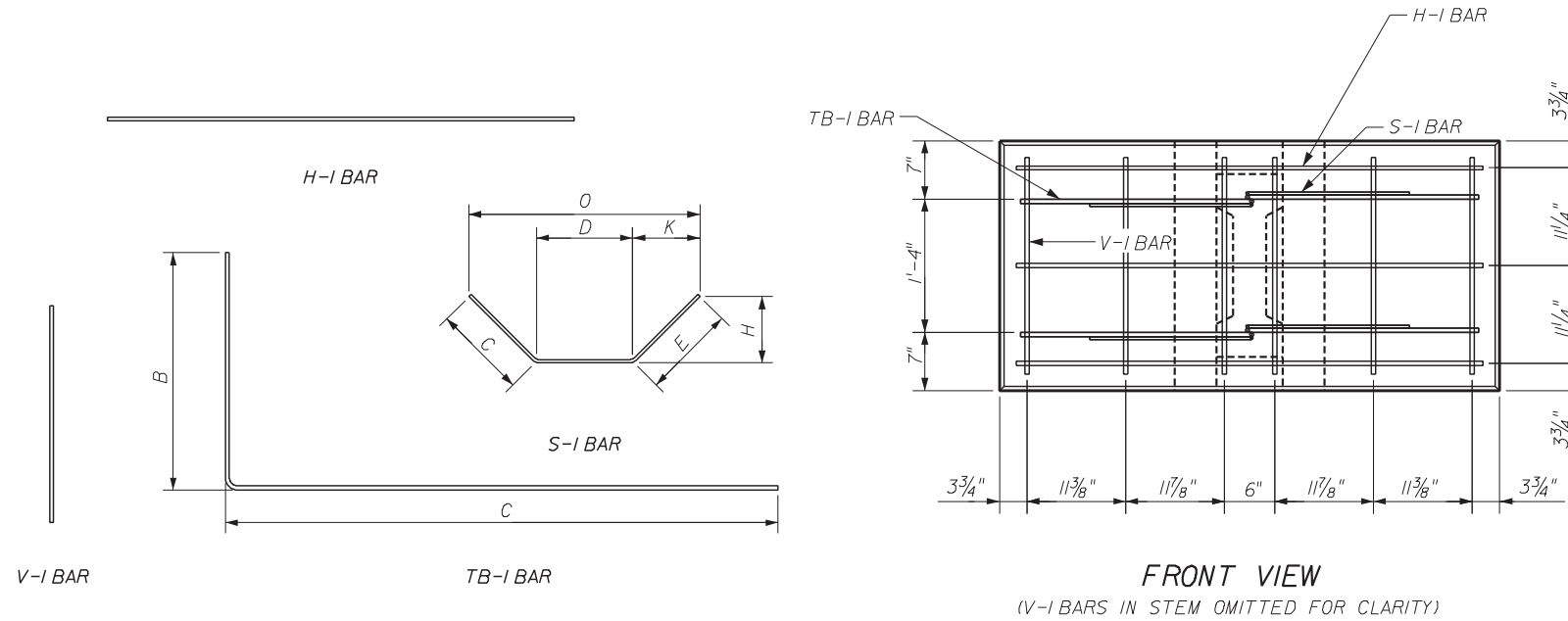


SECTION A-A
SECTION THRU PILE CAP

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
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REBAR SCHEDULE - 2.5 x 5.0 x 04 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	12	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 06 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	16	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 08 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	20	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 10 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	24	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	11'-8 1/2"	2'-3 1/2"	9'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 12 STD UNIT

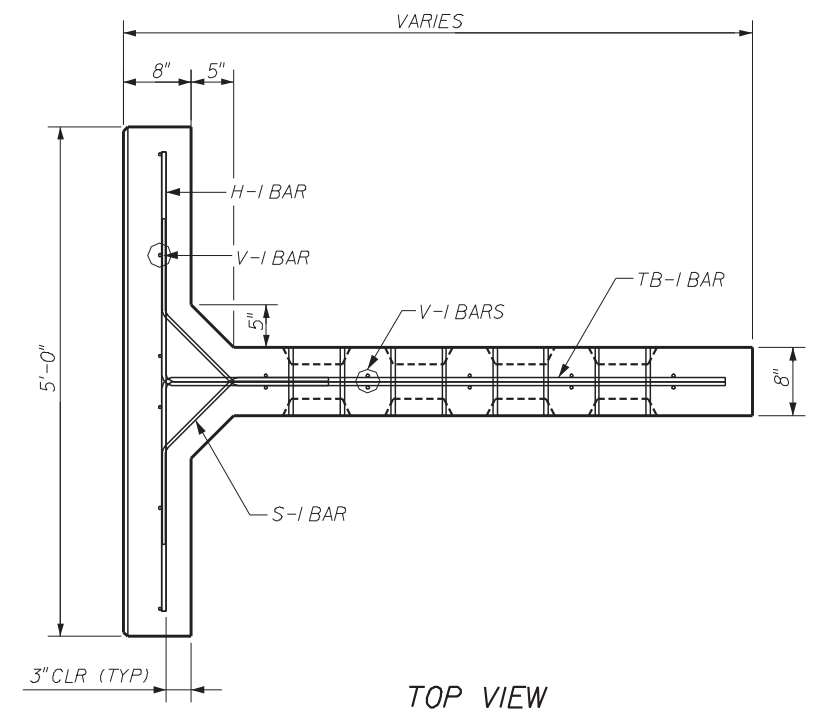
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	26	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	13'-8 1/2"	2'-3 1/2"	11'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 14 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	32	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	15'-8 1/2"	2'-3 1/2"	13'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 16 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	36	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	17'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	



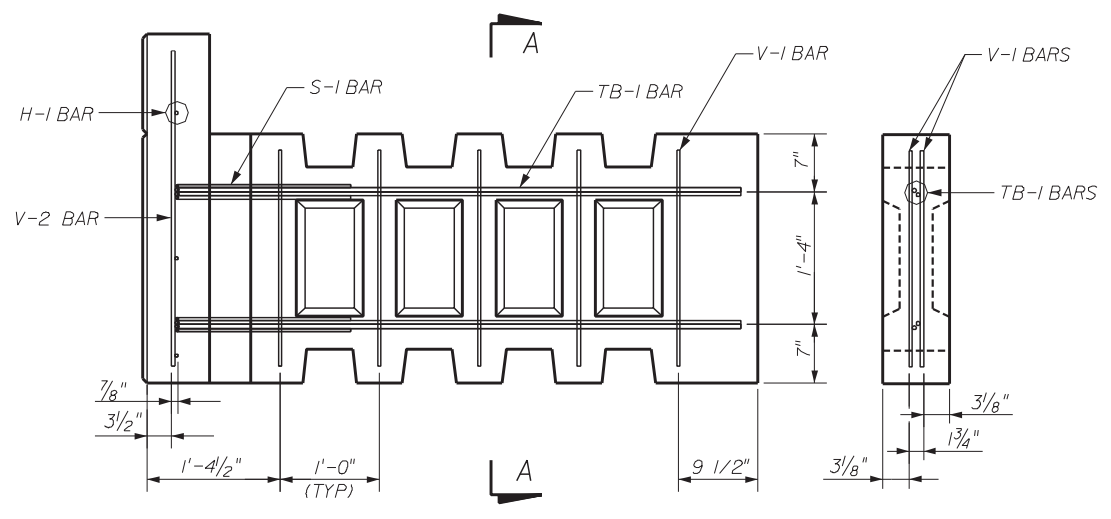
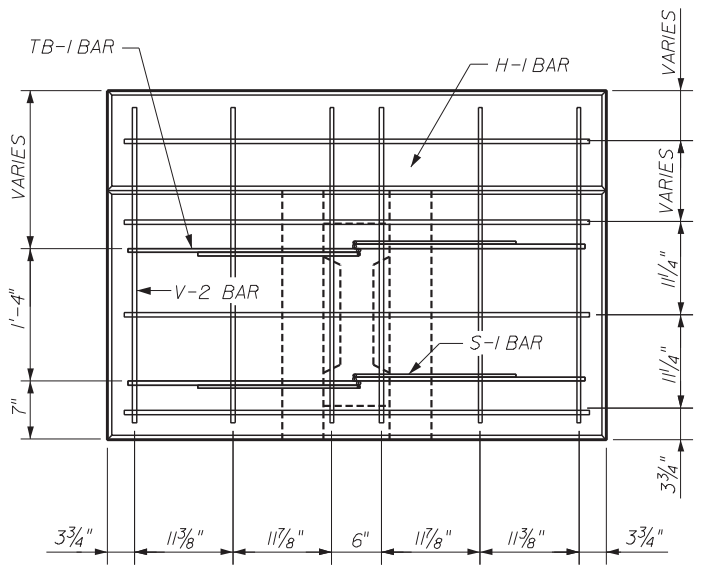
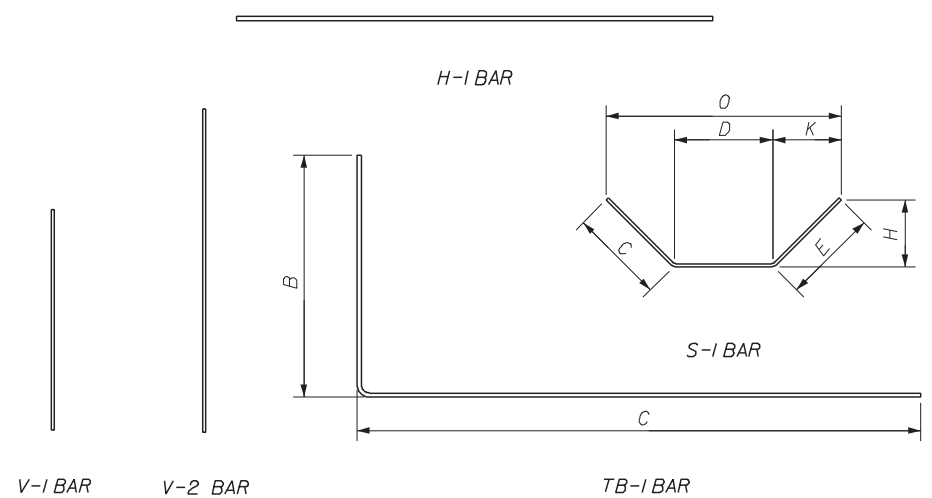
REINFORCING STEEL - STANDARD UNITS

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

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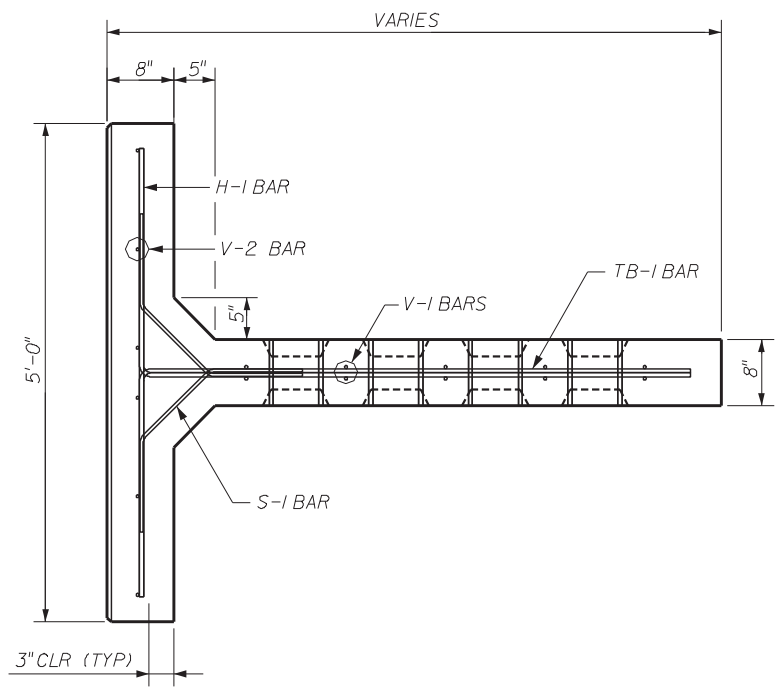
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN			
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)			
Names	Dates	Approved By	
Designed By JMC	10/01/98	State Structures Design Engineer	
Drawn By CAA	10/01/98	Revision	Sheet No. 13 of 20
Checked By JMC	10/01/98	00	5010



FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A



TOP VIEW

REINFORCING STEEL - TOP UNITS (I)

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

REBAR SCHEDULE - 3.0 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	4	4	-	4'-6"								-	
V-1	6	3	-	2'-0"								-	
V-2	6	5	-	2'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 3.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	4	4	-	4'-6"								-	
V-1	10	3	-	2'-0"								-	
V-2	6	5	-	2'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 3.5 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	
V-1	6	3	-	2'-0"								-	
V-2	6	5	-	3'-0"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 3.5 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	
V-1	10	3	-	2'-0"								-	
V-2	6	5	-	3'-0"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 4.0 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	
V-1	6	3	-	2'-0"								-	
V-2	6	5	-	3'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 4.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	
V-1	10	3	-	2'-0"								-	
V-2	6	5	-	3'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

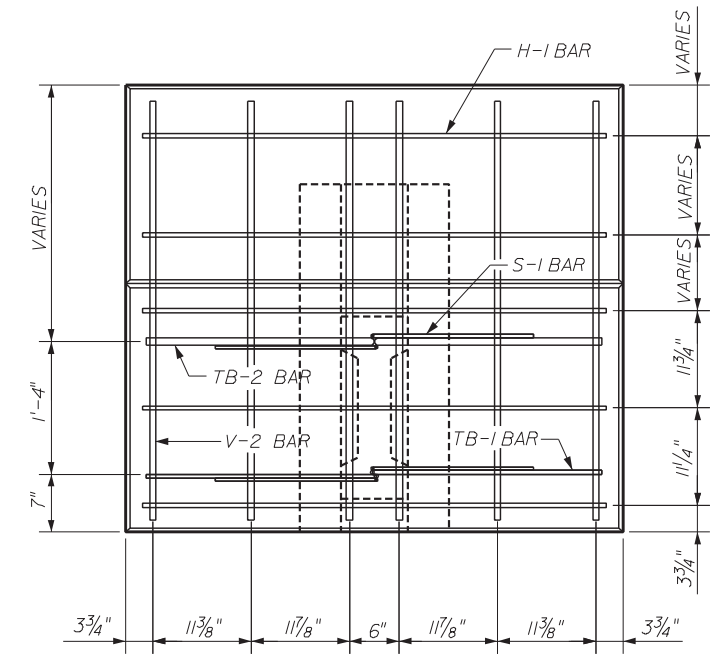
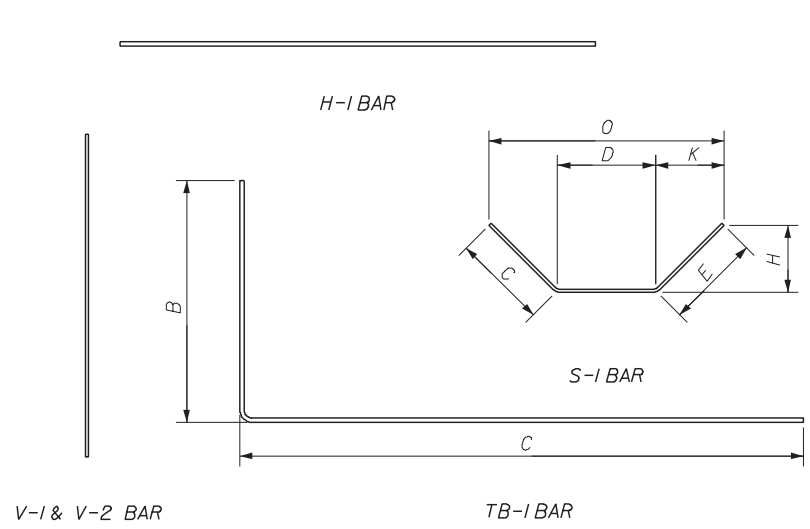
REBAR SCHEDULE - 4.5 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	6	3	-	2'-0"								-	
V-2	6	5	-	4'-0"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	10	3	-	2'-0"								-	
V-2	6	5	-	4'-6"								-	
S-1	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

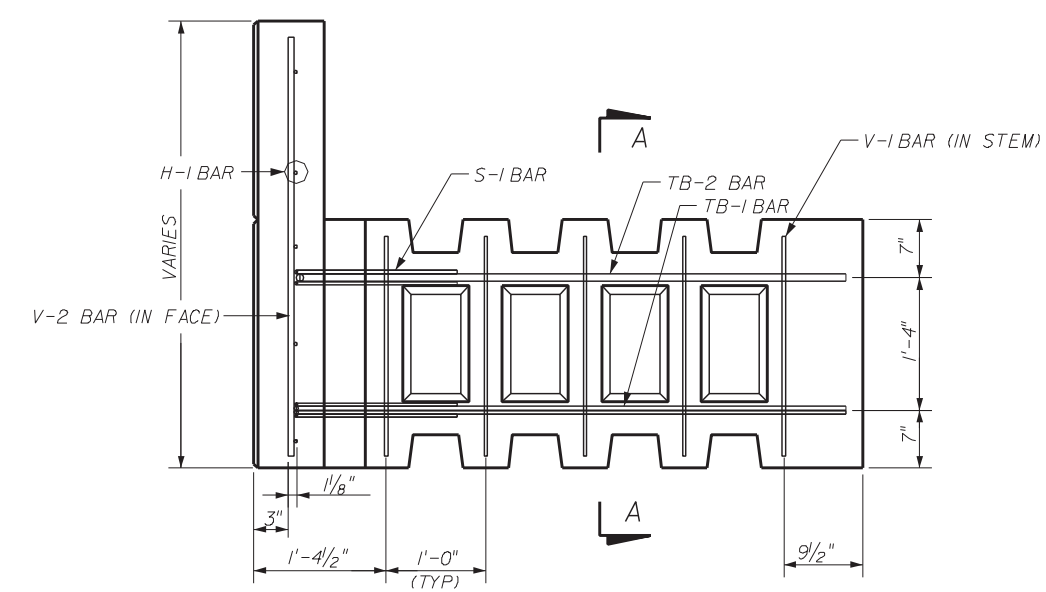
THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
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OLDCASTLE PRECAST, INC
 11643 103RD STREET
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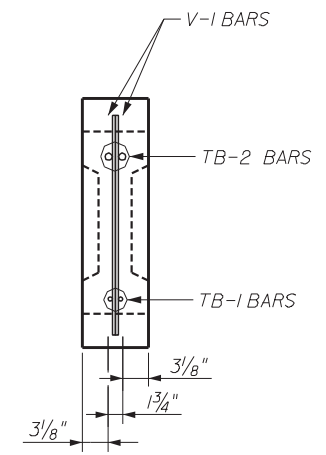
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN			
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)			
Designed By	JMC	10/01/98	Approved By <i>[Signature]</i> State Structures Design Engineer
Drawn By	CAA	10/01/98	Revision Sheet No. Index No.
Checked By	JMC	10/01/98	00 14 of 20 5010



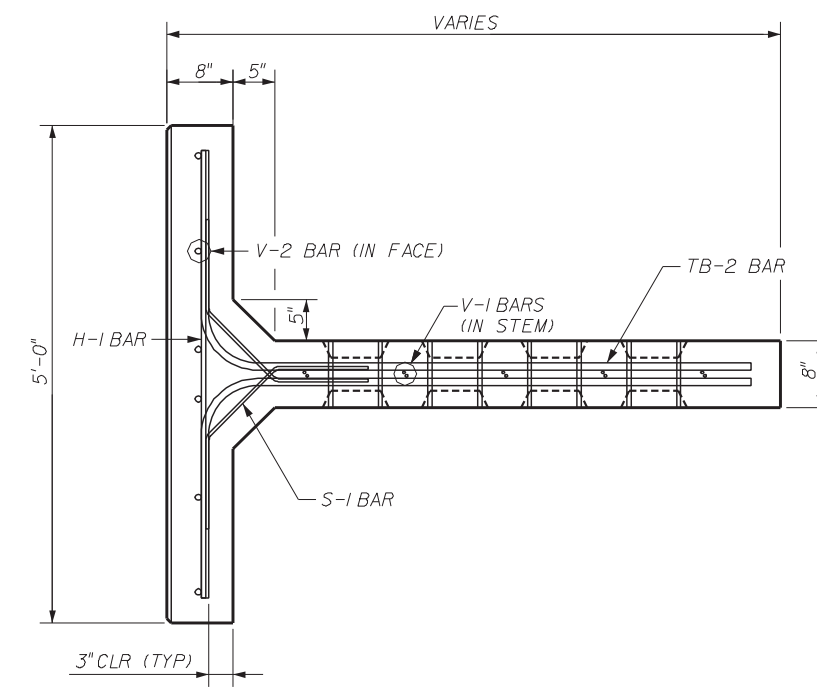
FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW
REINFORCING STEEL - TOP UNITS (II)

THESE UNITS WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

REBAR SCHEDULE - 5.5 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	5'-0"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 6.0 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	5'-6"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 6.5 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	6'-0"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

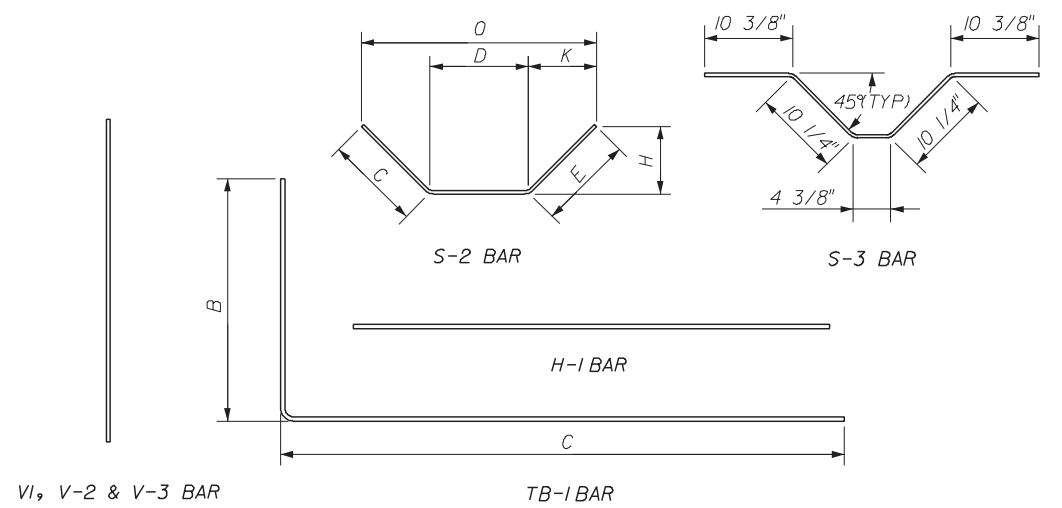
REBAR SCHEDULE - 7.0 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	6'-6"								-	
S-1	4	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

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FX: 19041 778-2992

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)				
Designed By	JMC	10/01/98	Approved By	<i>W. J. [Signature]</i>
Drawn By	CAA	10/01/98	State Structures Design Engineer	
Checked By	JMC	10/01/98	Revision	00
			Sheet No.	15 of 20
			Index No.	5010



VI, V-2 & V-3 BAR

TB-1 BAR

REBAR SCHEDULE - 7.5 x 5.0 x 10 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	18	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	6'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	8	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 8.0 x 5.0 x 10 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	18	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	6'-6"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	9	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

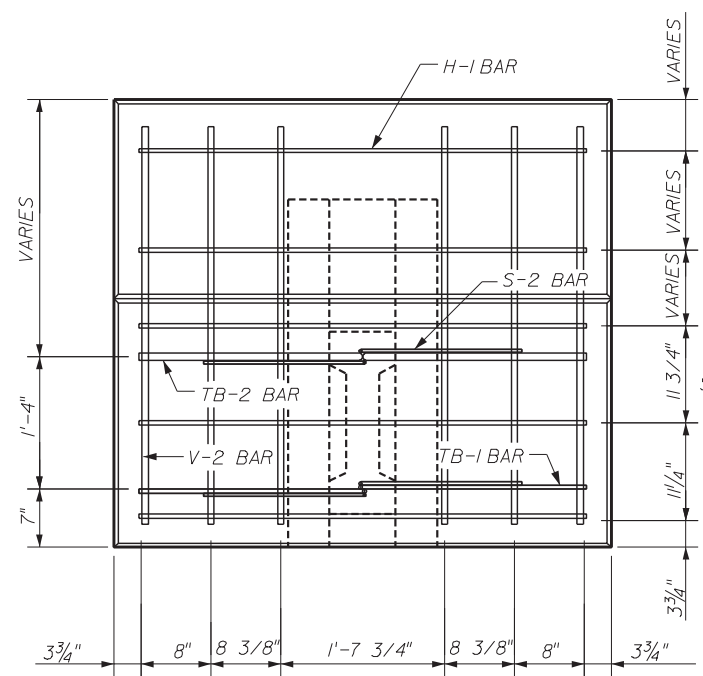
REBAR SCHEDULE - 8.5 x 5.0 x 10 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	18	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	7'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	10	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 9.0 x 5.0 x 12 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	22	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	7'-6"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	11	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

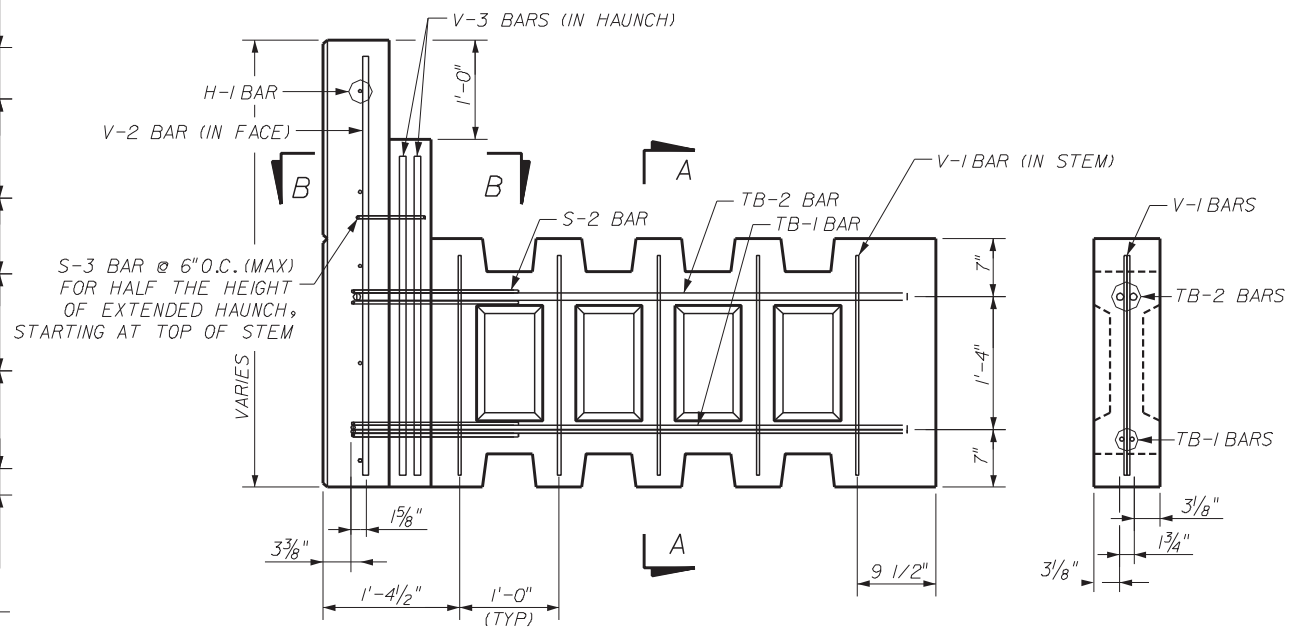
REBAR SCHEDULE - 9.5 x 5.0 x 12 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	22	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	8'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	12	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 10.0 x 5.0 x 12 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	22	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	8'-6"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	13	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 10.5 x 5.0 x 12 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"									
V-1	22	3	-	2'-0"									
V-2	6	6	-	7'-0"									
V-3	4	6	-	9'-0"									
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	14	3	3	3'-3 3/8"									SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

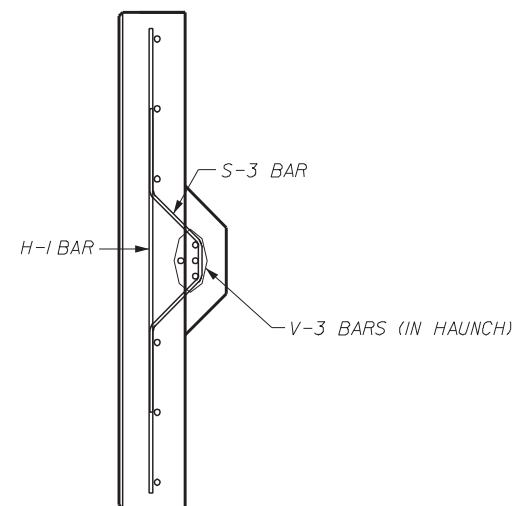


FRONT VIEW
(V-1 BARS IN STEM AND V-3 BARS IN HAUNCH OMITTED FOR CLARITY)

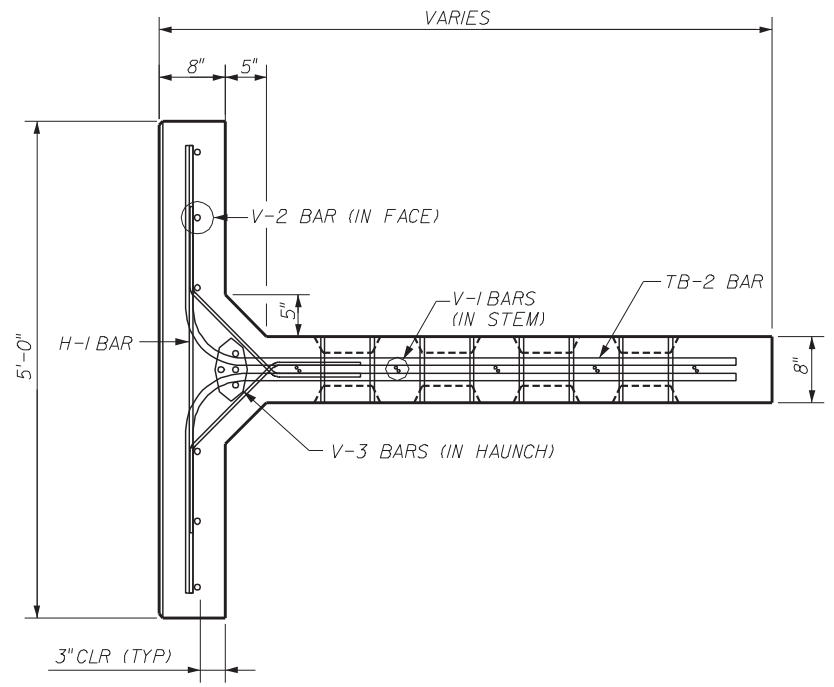


SIDE VIEW

SECTION A-A



SECTION B-B



TOP VIEW
S-3 BARS IN EXTENDED HAUNCH OMITTED FOR CLARITY

I. ALL UNITS ON THIS SHEET WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

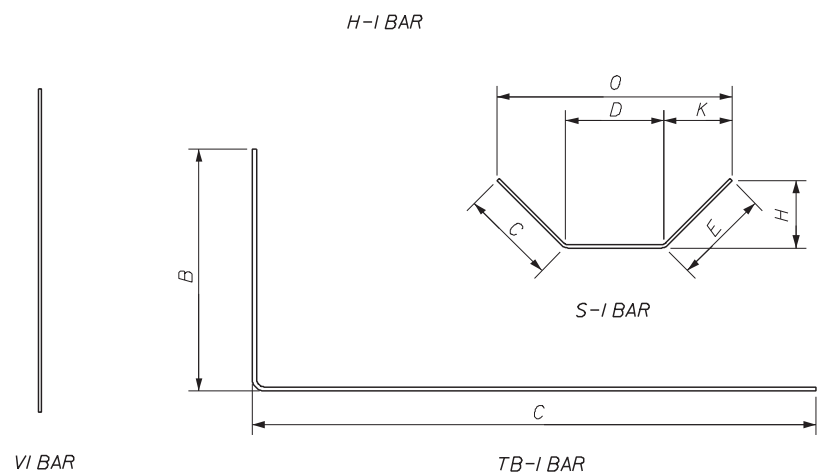
REINFORCING STEEL - TOP UNITS (III)

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NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN			
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)			
Names	Dates	Approved By	
Designed By	JMC 10/01/98	 State Structures Design Engineer	
Drawn By	CAA 10/01/98		
Checked By	JMC 10/01/98	Revision	00
		Sheet No.	16 of 20
		Index No.	5010



REBAR SCHEDULE - 5.0 x 5.0 x 04 DBL UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	12	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 06 DBL UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	16	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

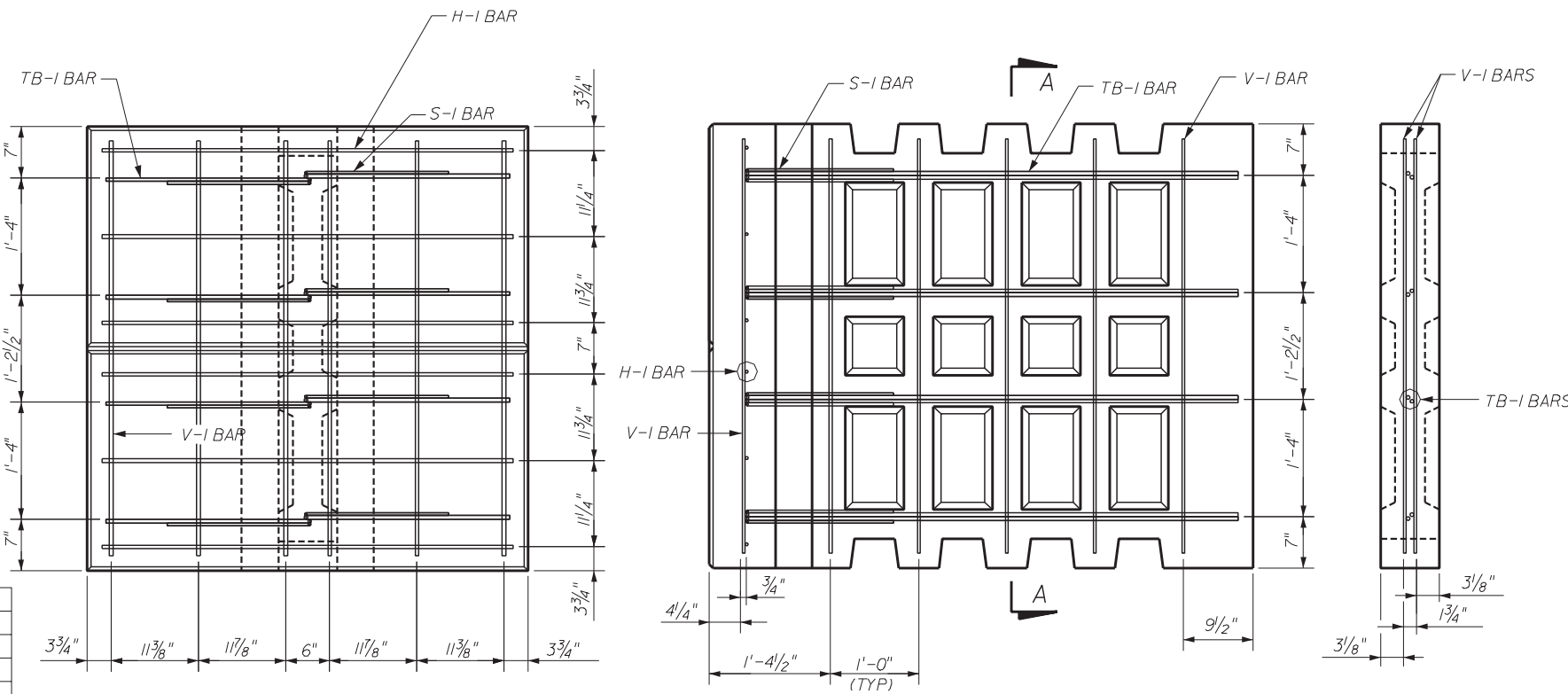
REBAR SCHEDULE - 5.0 x 5.0 x 08 DBL UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	20	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 10 DBL UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	24	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	11'-8 1/2"	2'-3 1/2"	9'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 12 DBL UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	26	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	13'-8 1/2"	2'-3 1/2"	11'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 14 DBL UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	32	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	15'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	

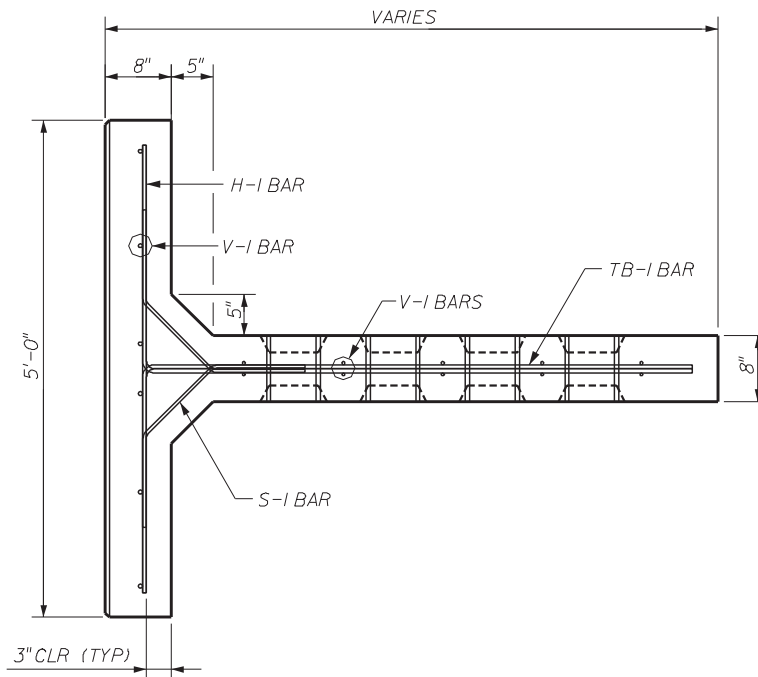
REBAR SCHEDULE - 5.0 x 5.0 x 16 DBL UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	36	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	17'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	



FRONT VIEW
(V-I BARS IN STEM OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A



TOP VIEW
REINFORCING STEEL - DOUBLE UNITS

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER



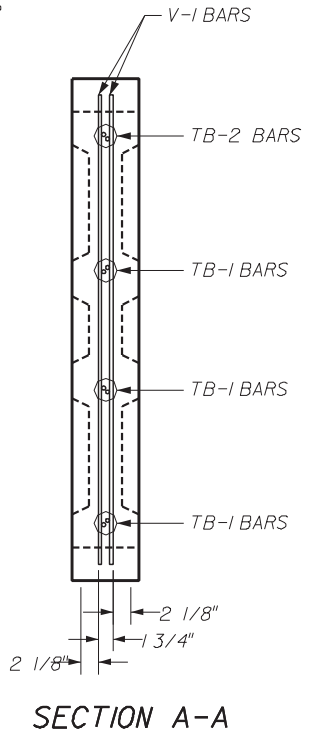
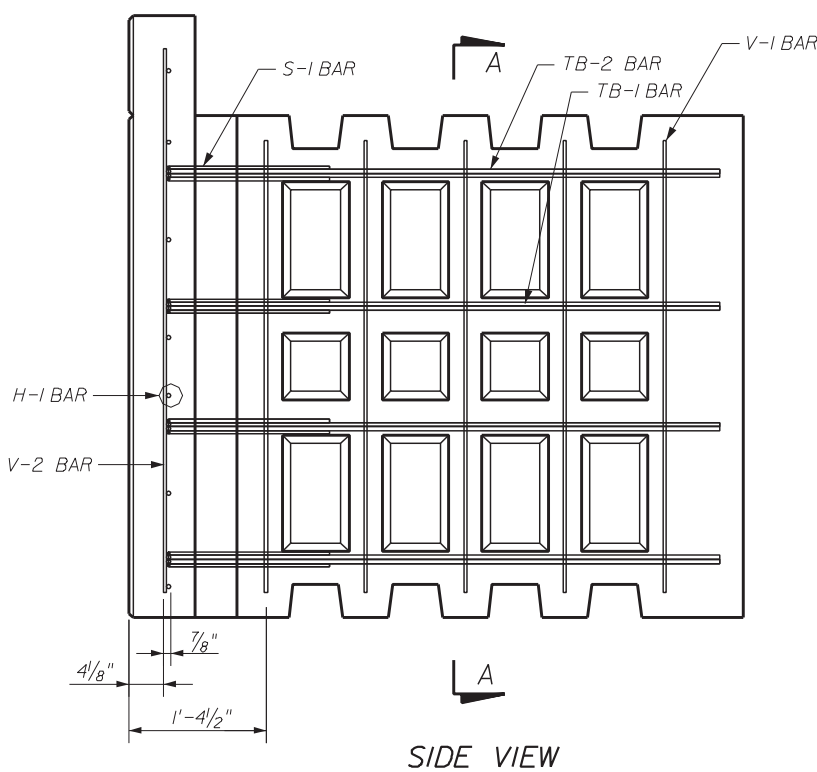
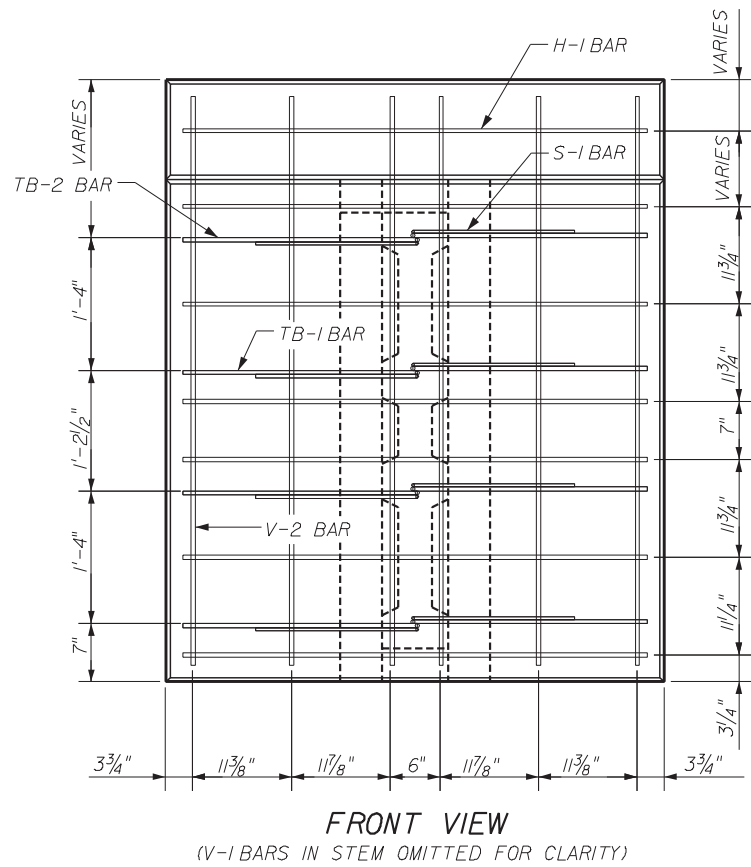
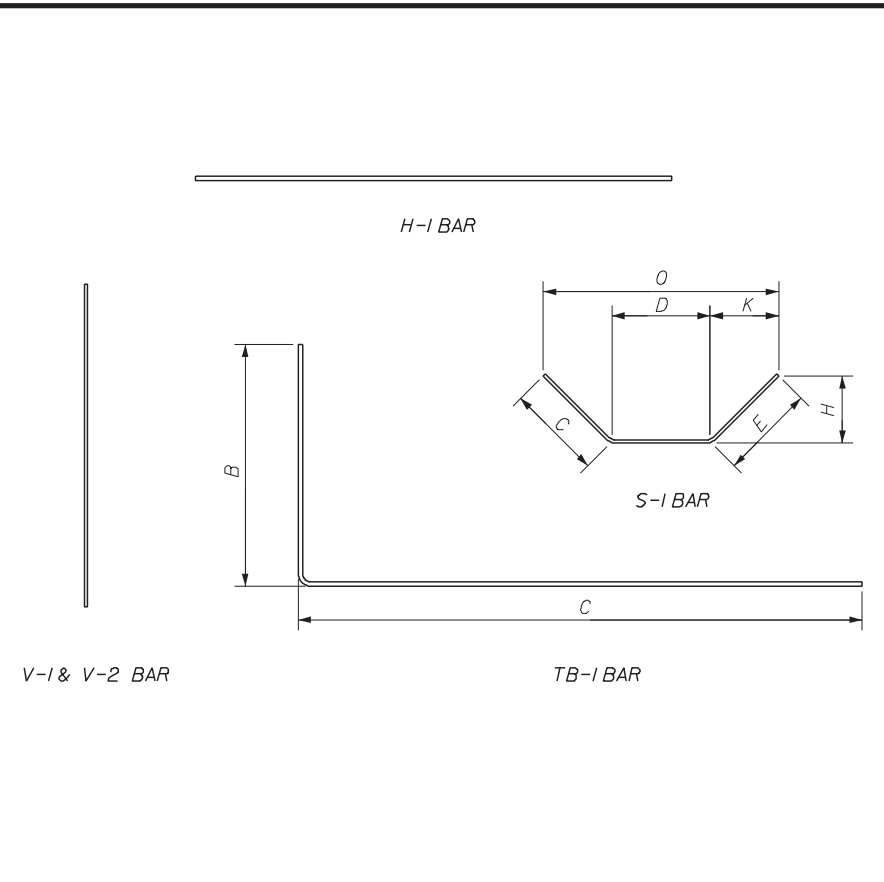
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)

Names		Dates		Approved By	
Designed By	JMC	10/01/98	W. V. [Signature]		State Structures Design Engineer
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By	JMC	10/01/98	00	17 of 20	5010



REBAR SCHEDULE - 5.5 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	5'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 6.0 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	5'-6"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 6.5 x 5.0 x 06 DBL TOP UNIT

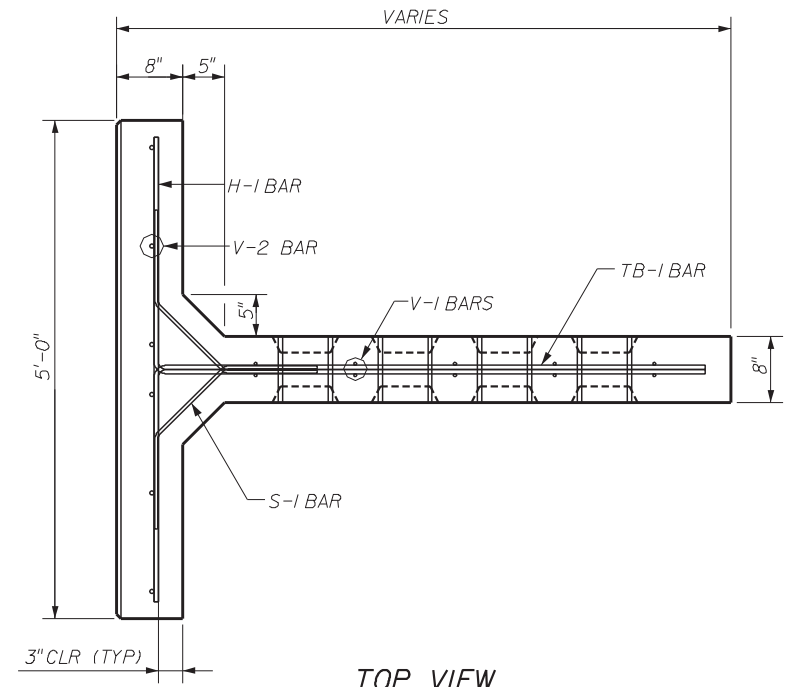
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	6'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 7.0 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	6'-6"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 7.5 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	7'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	



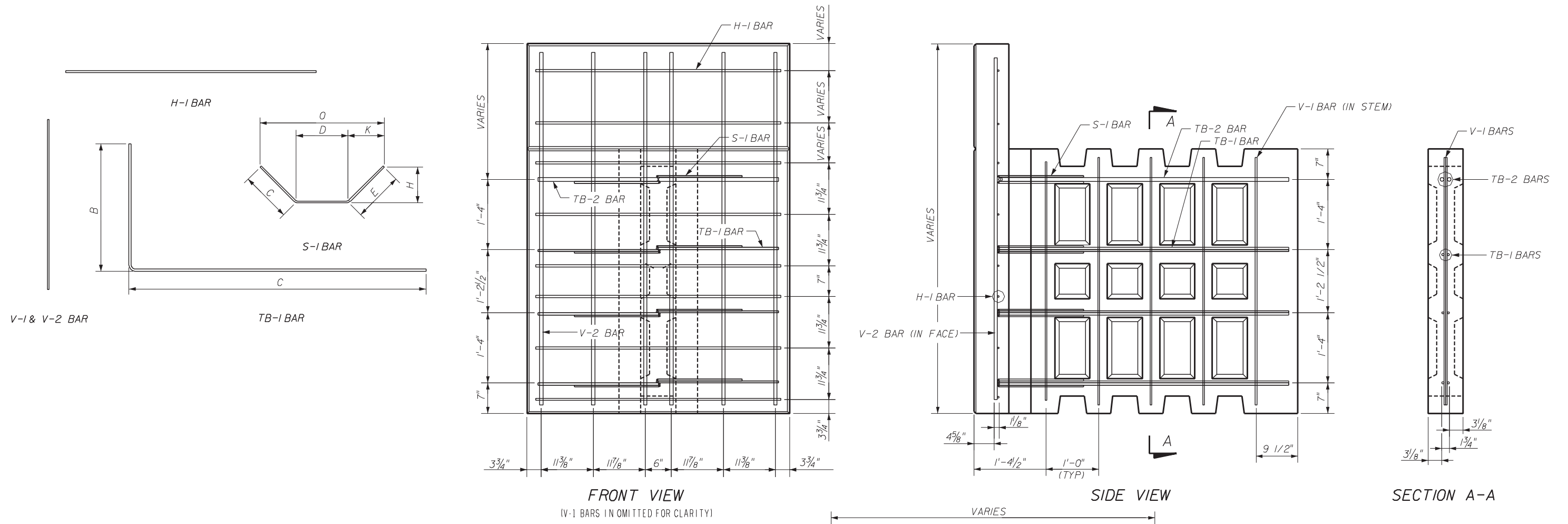
TOP VIEW
REINFORCING STEEL - DOUBLE TOP UNITS (I)

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 3" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN			
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (3" COVER)			
Designed By	JMC	10/01/98	Approved By <i>W. J. [Signature]</i>
Drawn By	CAA	10/01/98	State Structures Design Engineer
Checked By	JMC	10/01/98	Revision Sheet No. Index No.
		00	18 of 20 5010

THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

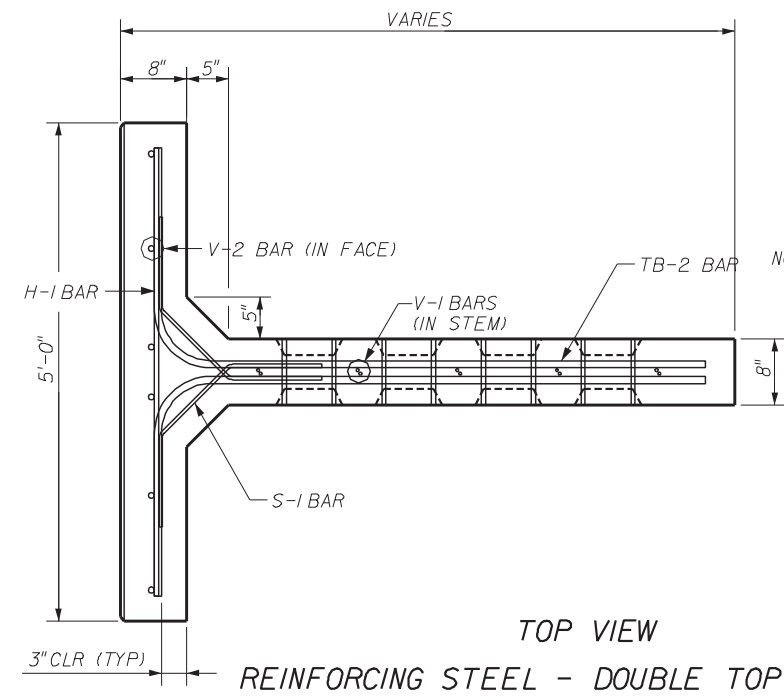
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992



FRONT VIEW
(V-1 BARS IN OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A



TOP VIEW
REINFORCING STEEL - DOUBLE TOP UNITS (II)

THESE TWO UNITS WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

REBAR SCHEDULE - 8.0 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	9	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	7'-6"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 8.5 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	9	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	8'-0"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 9.0 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	10	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	8'-6"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 9.5 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	10	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	9'-0"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 1703 913-7858
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OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

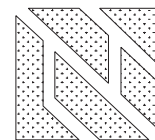
**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(3" COVER)**

Names	Dates	Approved By	Revision	Sheet No.	Index No.
Designed By	JMC 10/01/98	W. J. [Signature]			
Drawn By	CAA 10/01/98		State Structures Design Engineer		
Checked By	JMC 10/01/98		00	19 of 20	5010

STANDARD DETAILS FOR 2" CONCRETE COVER

T-WALL® RETAINING WALL SYSTEM

DESIGNER



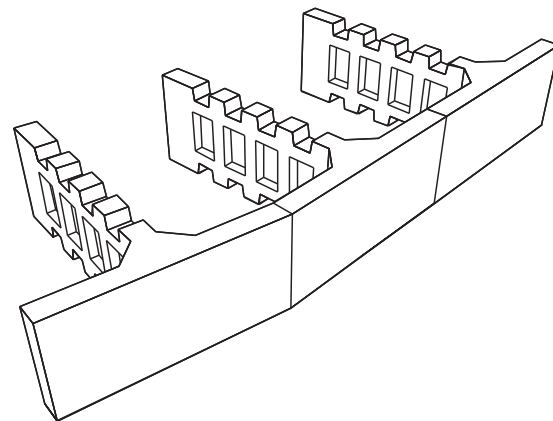
THE NEEL COMPANY

8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER

OLDCASTLE PRECAST, INC.

11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992



MISCELLANEOUS NOTES:

- DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VA 22152
PH: (703) 913-7858
FX: (703) 913-7859
- PRECASTER:
OLDCASTLE PRECAST INC.
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992
- MATERIALS SUPPLIED BY PRECASTER:
-PRECAST T-WALL UNITS
-PRECAST SHEAR KEYS
-HORIZONTAL JOINT MATERIAL
-VERTICAL JOINT MATERIAL AND ADHESIVE
-SHEAR KEY JOINT MATERIAL

DESIGN NOTES:

- DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE RETAINING WALL VOLUME, METHODS OF CONSTRUCTION, AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO SPEC SECTION 548 - RETAINING WALL SYSTEMS.
- SOIL PARAMETERS:
-SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUE OF ϕ , c AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS
- FACTORS OF SAFETY:
-OVERTURNING - 2.0
-SLIDING - 1.5
-INTERNAL PULLOUT - 1.5
-BEARING CAPACITY - 2.5
-OVERALL STABILITY - 1.5
- THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE NEEL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN, INCLUDING FOUNDATION AND SLOPE STABILITY, IS THE RESPONSIBILITY OF OTHERS.
- PANELS WITH CANTILEVERED (EXTENDED) FACE SHALL ONLY BE USED TO AVOID OBSTRUCTIONS AS APPROVED ON THE SHOP DRAWINGS.

MATERIALS NOTES:

- PRECAST CONCRETE:
-PRECAST T-WALL UNITS - PER SPEC SECTION 548
-PRECAST SHEAR KEYS - PER SPEC SECTION 548
- C.I.P. CONCRETE:
-C.I.P. LEVELING PAD - PER SPEC SECTION 548
-OTHER C.I.P. CONCRETE - PER SPEC SECTION 548
- REINFORCING STEEL:
-PER SPEC SECTION 548
- JOINT MATERIAL:
-HORIZONTAL JOINT FILLER:
-1/2" x 4" x 5'-0"
-PREFORMED EPDM
-DUROMETER: 80 - 90
-VERTICAL JOINT COVER:
-TENSAR DC4205 OR EQUAL
-12" WIDE x HEIGHT OF JOINT
-GEOCOMPOSITE MEETING REQUIREMENTS OF SPEC SECTION 548
-SHEAR KEY WRAP:
-1/4" x 8" x 24"
-AVI ASTRO-FOAM AF-250
- BACKFILL:
-PER SPEC SECTION 548

CONSTRUCTION NOTES:

- ALL CONSTRUCTION PROCEDURES SHALL COMPLY WITH SPEC SECTION 548 AND THE "T-WALL CONSTRUCTION MANUAL" (PROVIDED BY THE NEEL COMPANY OR OLDCASTLE PRECAST, INC.) IN THE EVENT OF A DISCREPANCY BETWEEN THE SPEC AND THE "T-WALL CONSTRUCTION MANUAL", THE SPEC SHALL CONTROL.
- FOR LOCATION AND ALIGNMENT OF T-WALL STRUCTURE, SEE RETAINING WALL CONTROL PLANS.
- T-WALL STRUCTURES ON CURVES SHALL BE BUILT IN CHORDS AS SHOWN IN THE T-WALL DESIGN DRAWINGS.
- IF MANHOLES OR DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN IN THE T-WALL DESIGN DRAWINGS.
- IF PILES ARE LOCATED WITHIN THE RETAINING WALL VOLUME, THEY SHALL BE DRIVEN BEFORE CONSTRUCTION OF THE T-WALL STRUCTURE.
- T-WALL UNITS SHALL BE PLACED ONE ROW AT A TIME, AND BACKFILLED BEFORE PLACEMENT OF THE NEXT ROW.
- IF A STRUCTURE EXCEEDS 20' IN HEIGHT, THE FINISH GRADE AT THE FACE OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS 20' IN HEIGHT.
- THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING STORM WATER DRAINAGE IN THE VICINITY OF THE WALL DURING CONSTRUCTION. STORMWATER RUNOFF SHALL BE COLLECTED AND DISCHARGED AWAY FROM THE WALL AND THE RETAINING WALL VOLUME.

DESIGNER:



THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
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FX: (703) 913-7859

PRECASTER:

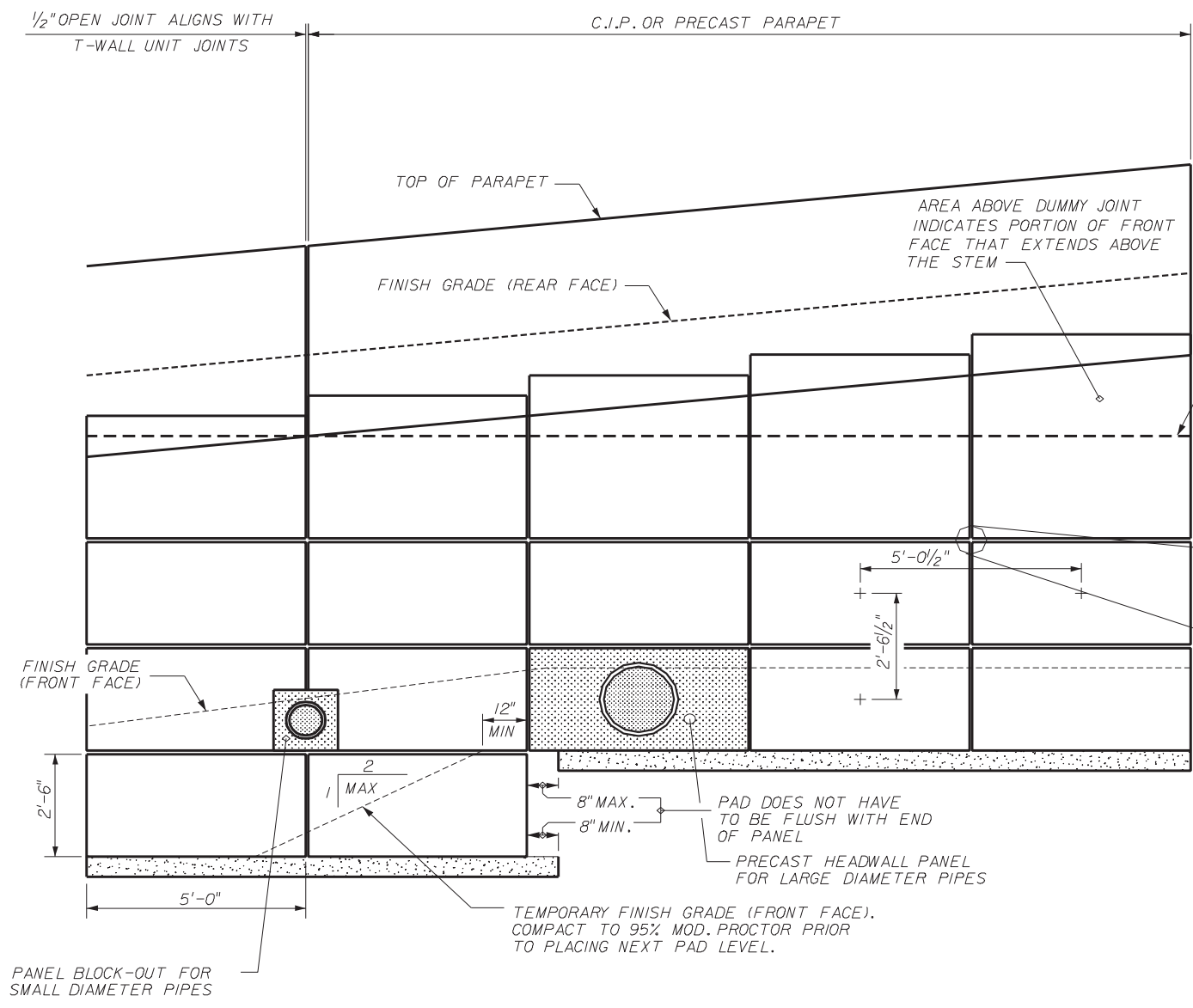
OLDCASTLE PRECAST, INC.
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992

THIS SYSTEM SHALL BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS.

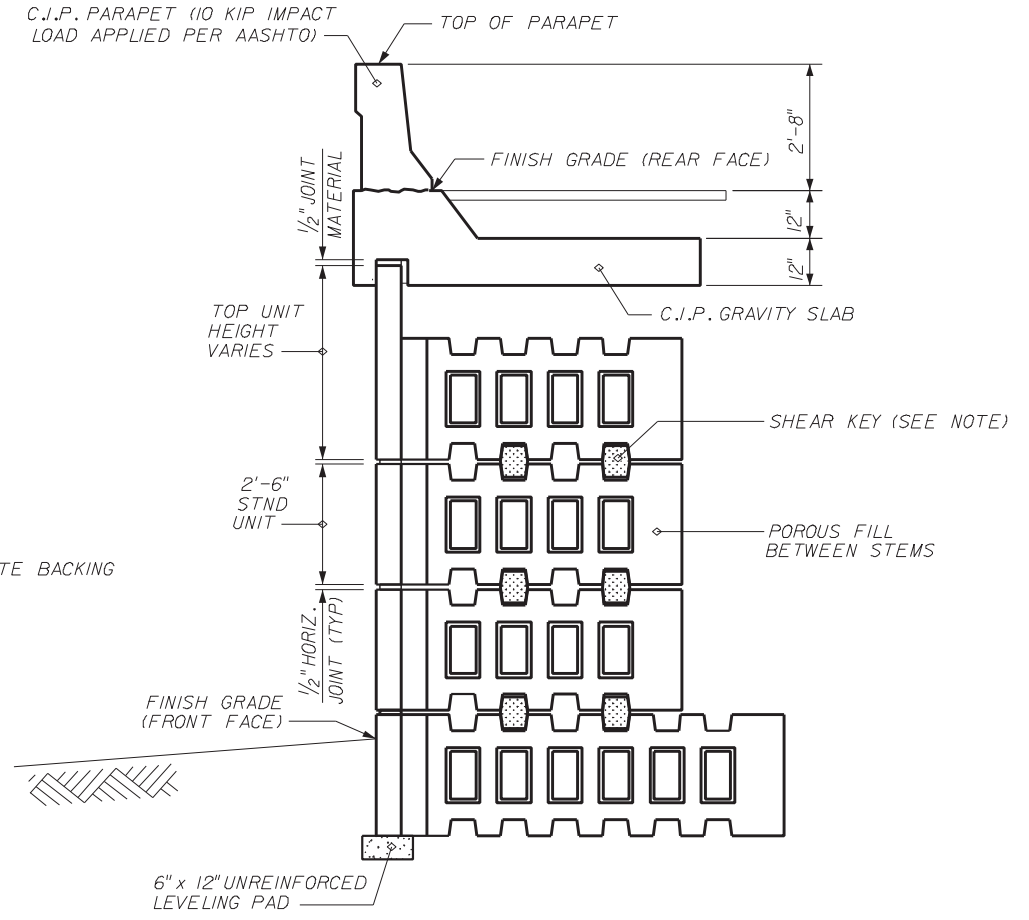
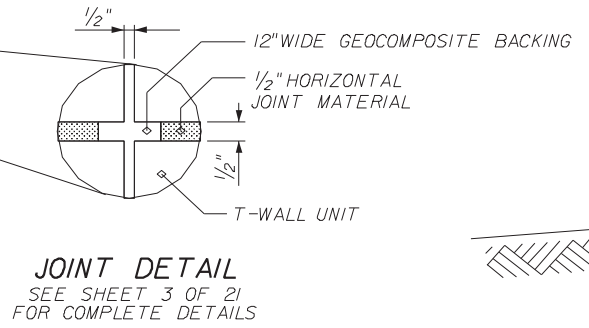
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)

Names		Dates		Approved By		
Designed By	JMC	10/01/98	[Signature]			
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.	
Checked By	JMC	10/01/98	00	1 of 21	5011	



PART ELEVATION SHOWING TYPICAL DETAILS
(NO SCALE)



SECTION SHOWING TYPICAL DETAILS
(NOT ALL DETAILS APPLY TO EACH WALL)

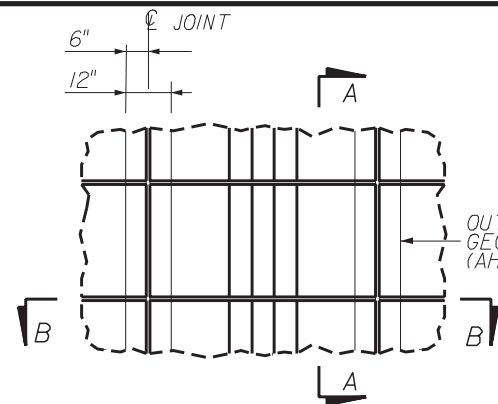
NOTE: ALL EXTENDED FACE TOP UNITS REQUIRE A MINIMUM OF TWO SHEAR KEYS. ALL OTHER UNITS ARE AS SHOWN BELOW:

- TOP UNITS - 2 SHEAR KEYS
- 6' STEM - 2 SHEAR KEYS
- 8' STEM - 2 SHEAR KEYS
- 10' STEM - 2 SHEAR KEYS
- 12' STEM - 2 SHEAR KEYS
- 14' STEM - 3 SHEAR KEYS
- 16' STEM - 3 SHEAR KEYS

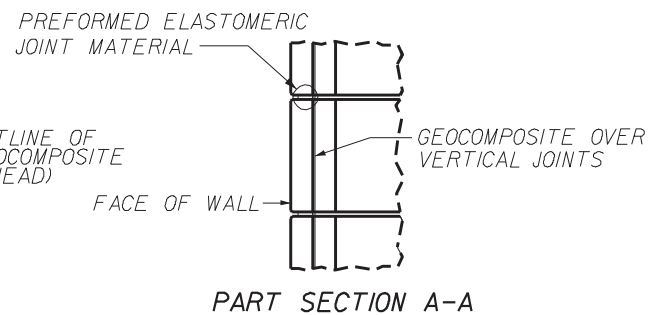
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: (703) 913-7858
Fx: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
Ph: 1904) 778-2990
Fx: 1904) 778-2992

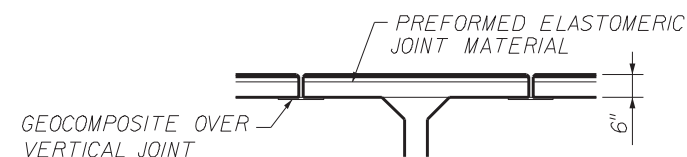
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	2 of 21
				Index No. 5011



PART ELEVATION - REAR FACE



PART SECTION A-A

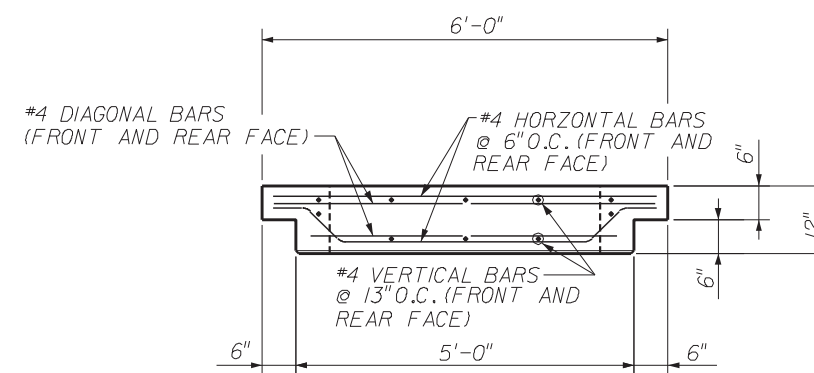
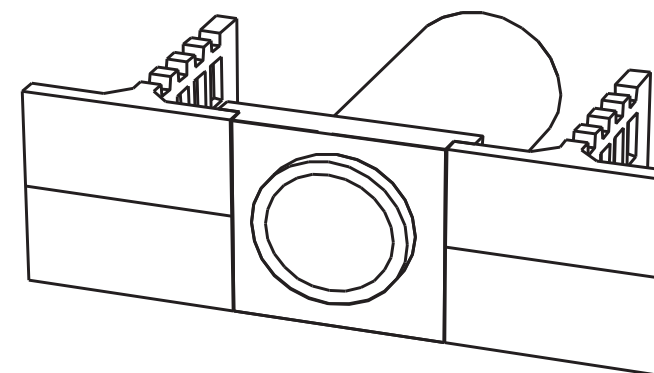


PART SECTION B-B

JOINT MATERIAL DETAILS

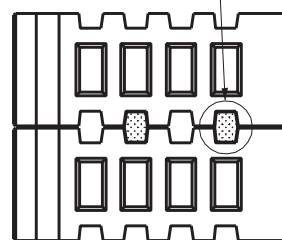
NOTES:

1. HORIZONTAL JOINT:
1/2" x 4" x 5'-0" PREFORMED ELASTOMERIC JOINT MATERIAL
2. VERTICAL JOINT:
1/2" SPACE
12" WIDE GEOCOMPOSITE BACKING, CENTERED ABOUT JOINT CENTERLINE.



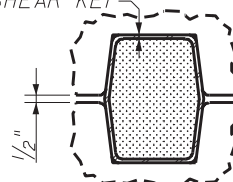
PLAN

SHEAR KEY WRAPPED IN JOINT MATERIAL. SEE DETAILS THIS SHEET.



PART SECTION

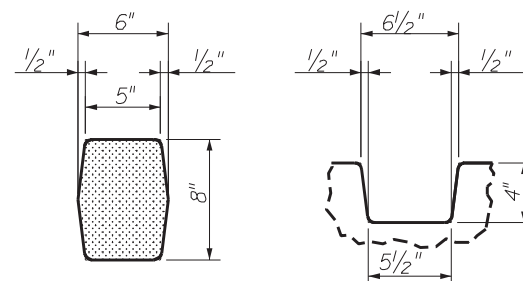
1/4" JOINT MATERIAL ALL AROUND SHEAR KEY



SHEAR KEY / JOINT MATERIAL ARRANGEMENT

NOTES:

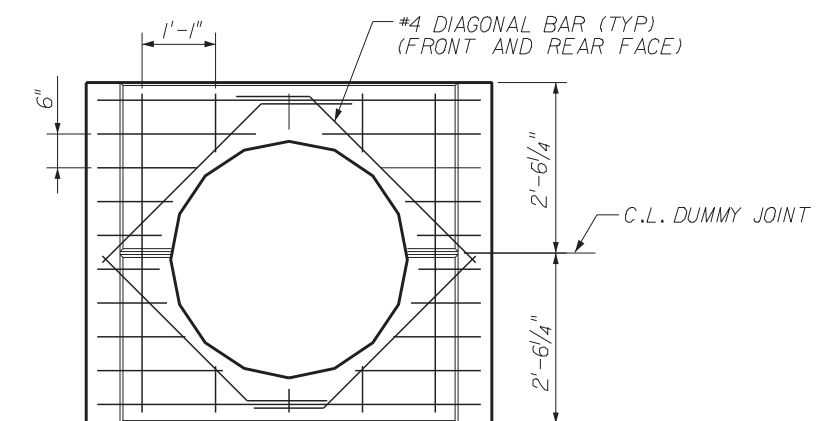
1. SHEAR KEY JOINT MATERIAL: MINIMUM OF ONE 1/4" x 8" x 24" PIECE OF AVI ASTRO-FOAM AF-250 PER SHEAR KEY.
2. JOINT MATERIAL MAY BE ADDED OR REMOVED TO AID IN SHIMMING AND ALIGNING, HOWEVER SHEAR KEY MUST FIT SNUG IN THE SHEAR KEY BLOCKOUT WHEN UNIT IS IN ITS FINAL POSITION.
3. MINIMUM OF 2 SHEAR KEYS REQUIRED PER UNIT. SEE NOTES ON SHEET 2 OF 21, 'TYPICAL DETAILS (I)'



SHEAR KEY DIMENSIONS

SHEAR KEY BLOCKOUT DIM'S

SHEAR KEY DETAILS



ELEVATION (FRONT FACE)
PRECAST HEADWALL PANEL
FOR LARGE DIAMETER PIPES

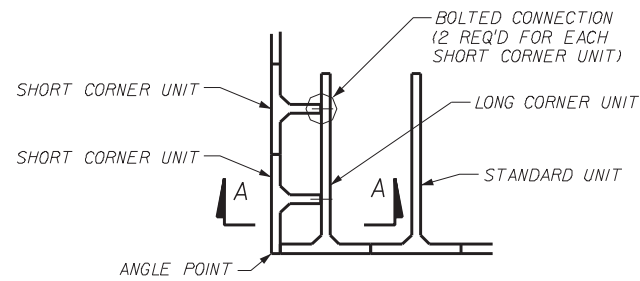
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 703/913-7858
FX: 703/913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: 904/778-2990
FX: 904/778-2992

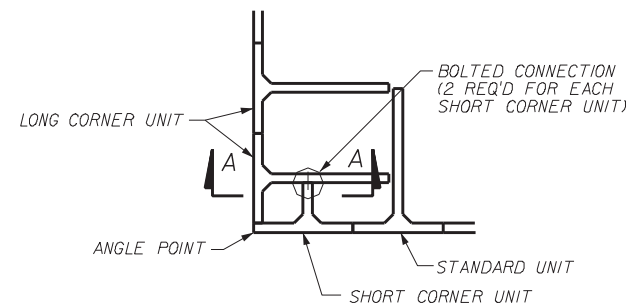
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)

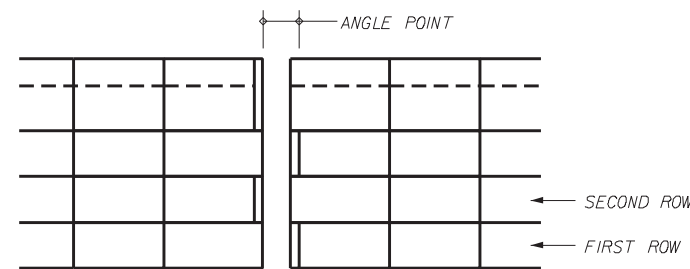
Names	Dates	Approved By		
Designed By	JMC 10/01/98	 State Structures Design Engineer		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	00	3 of 21	5011



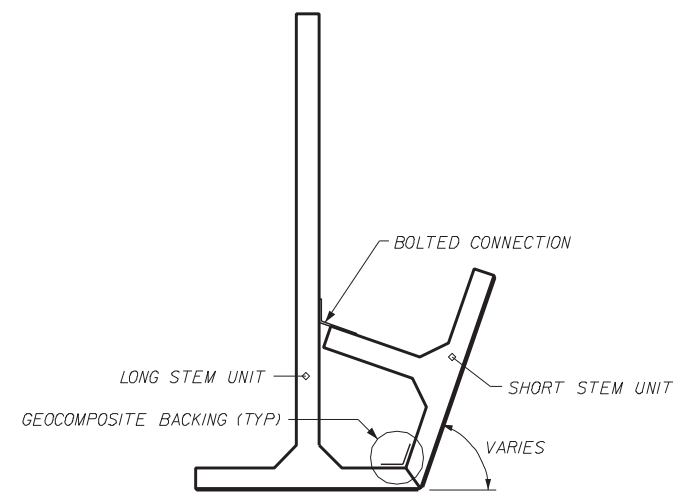
PART PLAN - FIRST ROW



PART PLAN - SECOND ROW

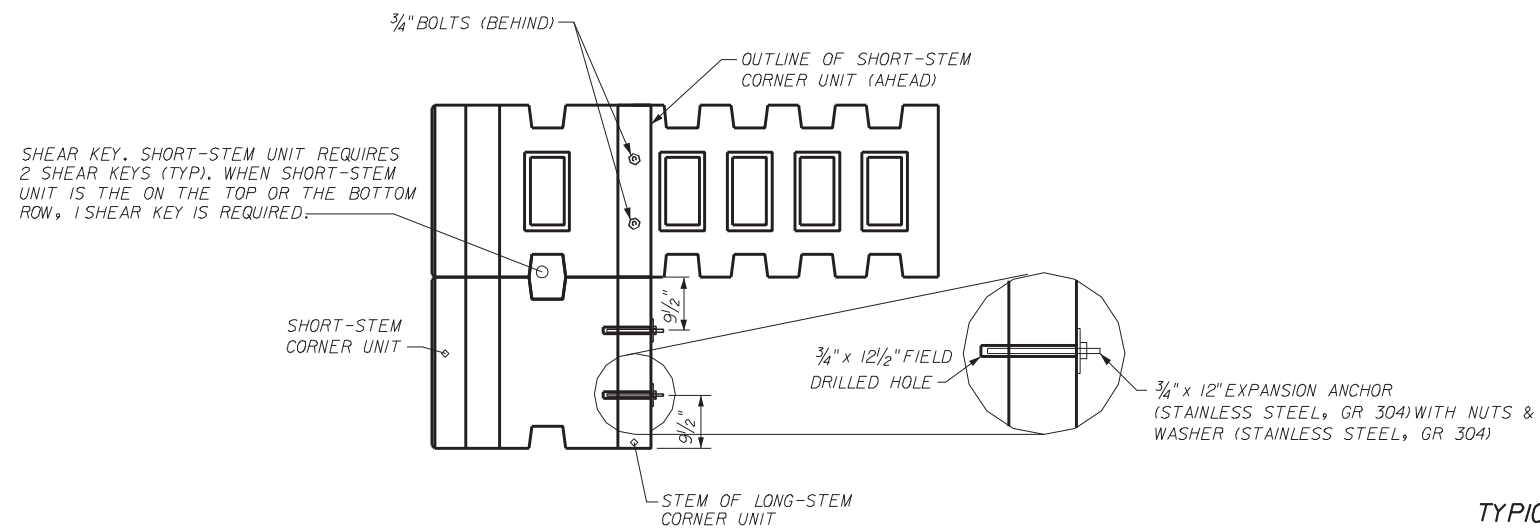


PART ELEVATION

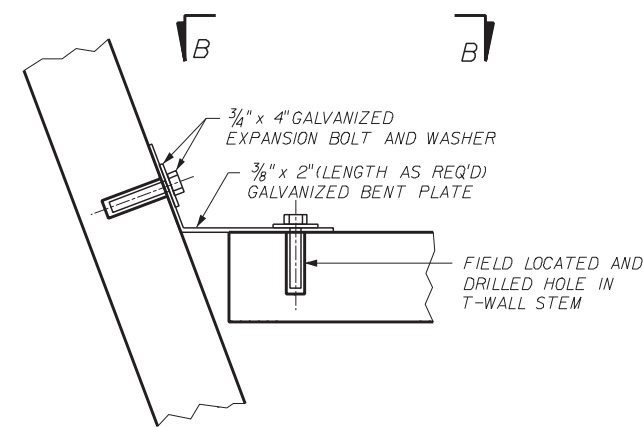


PART PLAN - ANGLE > 90°

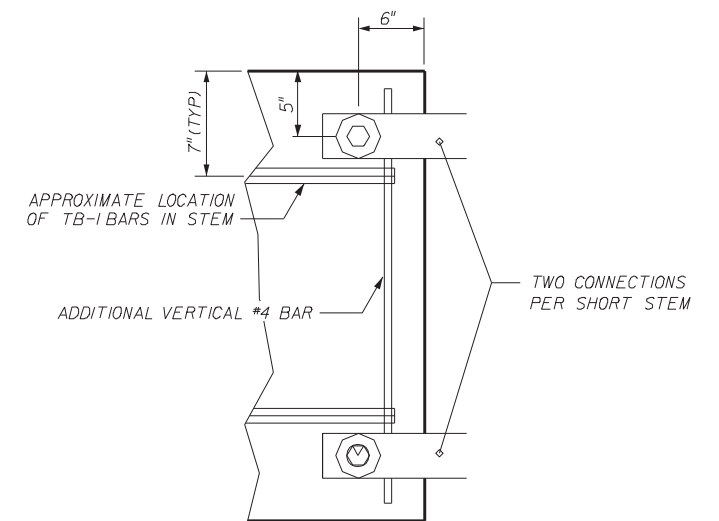
SHORT AND LONG STEMS ALTERNATE PER 90° CORNER DETAIL



TYPICAL CORNER UNIT ARRANGEMENT
STEM LENGTHS VARY - SEE SPECIFIC ELEVATIONS FOR PROPER UNITS
NO SCALE



TYPICAL BOLTED CONNECTION FOR ANGLE POINTS > 90°



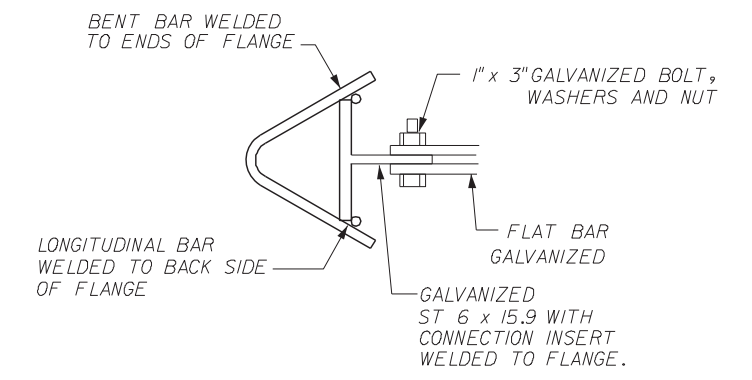
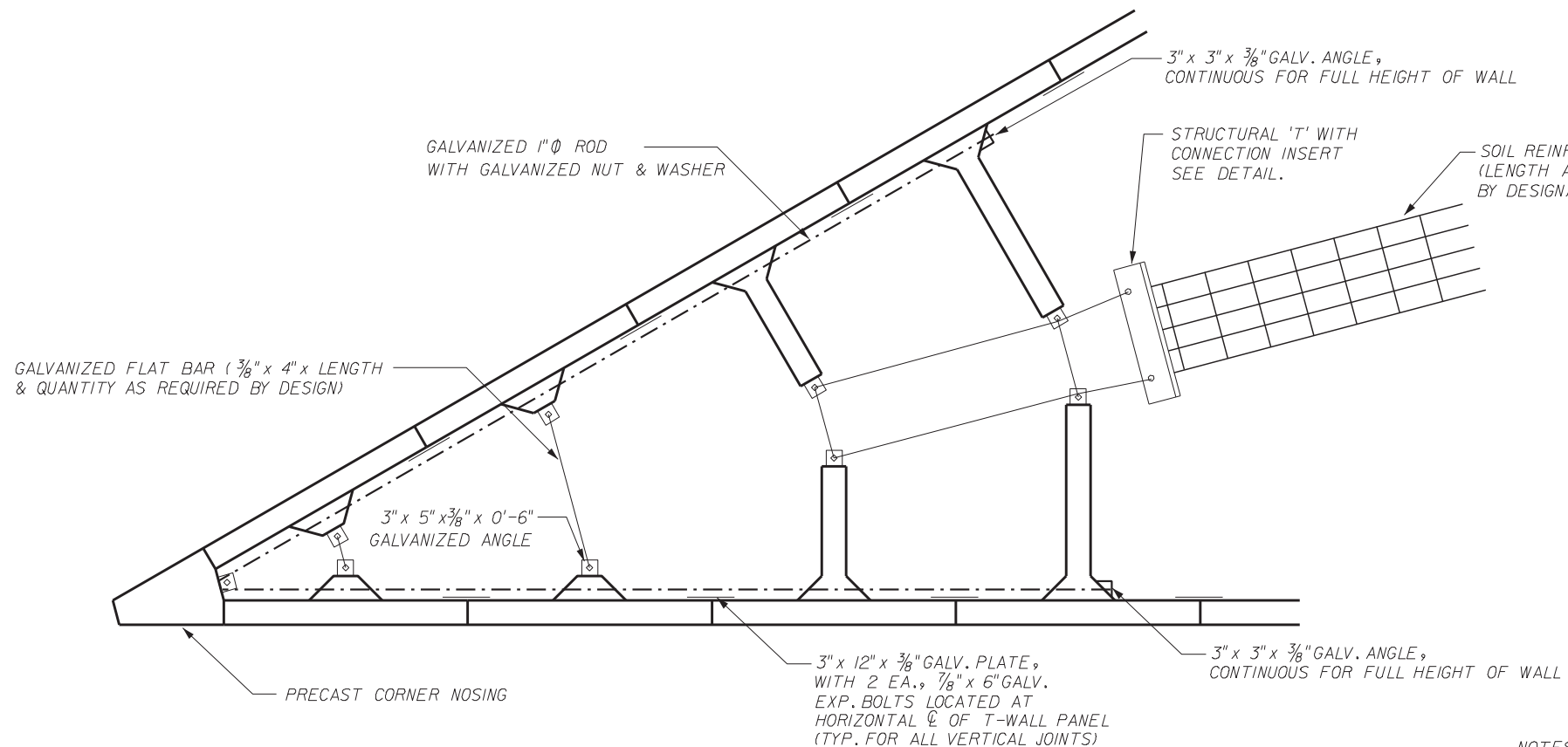
VIEW B-B

TYPICAL ANGLE POINT DETAIL
NO SCALE

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 17031 913-7858
FX: 17031 913-7859

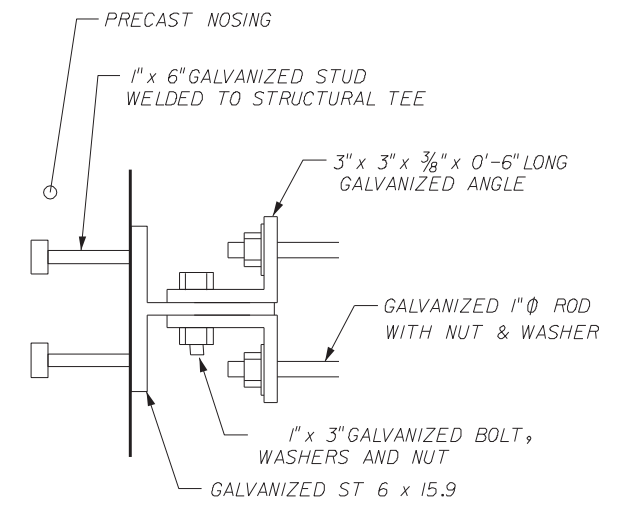
PRECASTER:
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: 19041 778-2990
FX: 19041 778-2992

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No. Index No.
Checked By	JMC	10/01/98	00	4 of 21 5011



SOIL GRID CONNECTION DETAIL
SEVERE ACUTE CORNERS

PART PLAN
SEVERE ACUTE ANGLE DETAIL
ANGLE 45° OR LESS



ROD/NOSING CONNECTION DETAIL

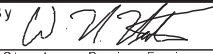
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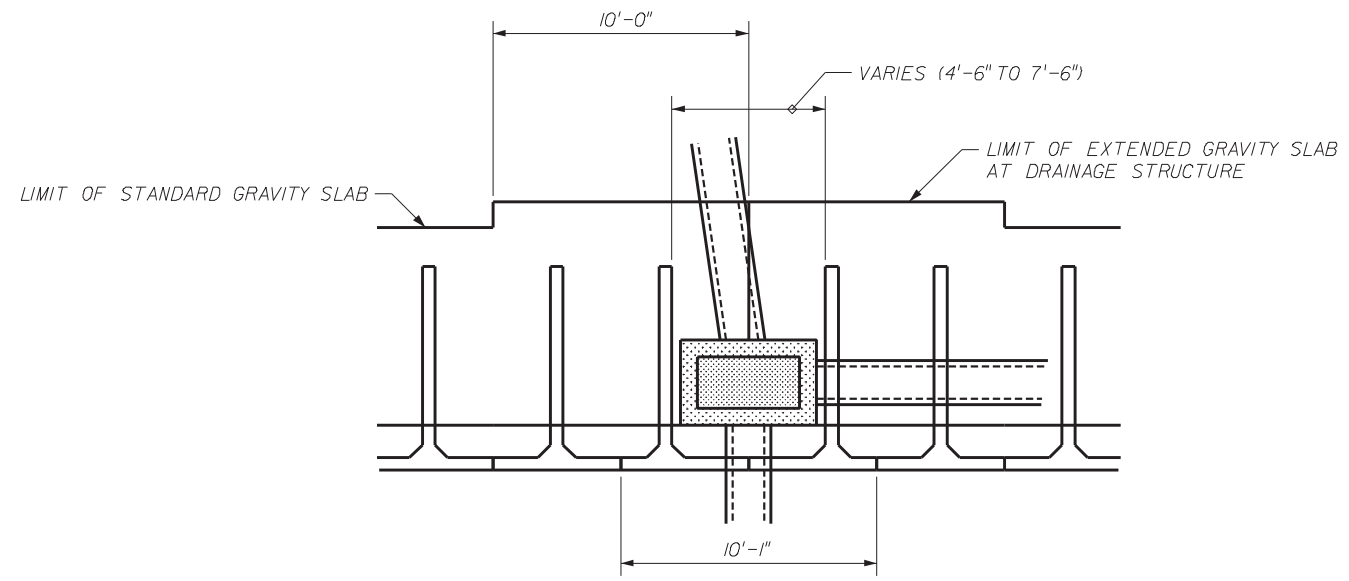
1. SOIL GRID TO BE DESIGNED FOR PULLOUT & TENSION. QUANTITY AND LENGTH OF GRIDS TO BE AS REQUIRED BY DESIGN.
2. CONNECTION INSERT:
 - PER SPEC SECTION 548
 - WII WIRE
 - WELDED PER ASTM A185 PRIOR TO GALVANIZATION
3. LOCKING BAR:
 - PER SPEC SECTION 548
4. SOIL REINFORCEMENT GRIDS:
 - PER SPEC SECTION 548
 - WII WELDED WIRE GRIDS:
 - 5 LONGITUDINAL WIRES @ 6" O.C., LENGTH AS REQUIRED BY DESIGN
 - 24" LONG TRANSVERSE BARS AT 6" OR 12" O.C., AS REQUIRED BY DESIGN
 - SOIL GRID LENGTHS SHOWN ON T-WALL DESIGN DRAWINGS ARE NOMINAL LENGTHS AS REQUIRED BY DESIGN CALCULATIONS. DUE TO MANUFACTURING TOLERANCES, ACTUAL GRID LENGTHS MAY BE LONGER.

DESIGNER:

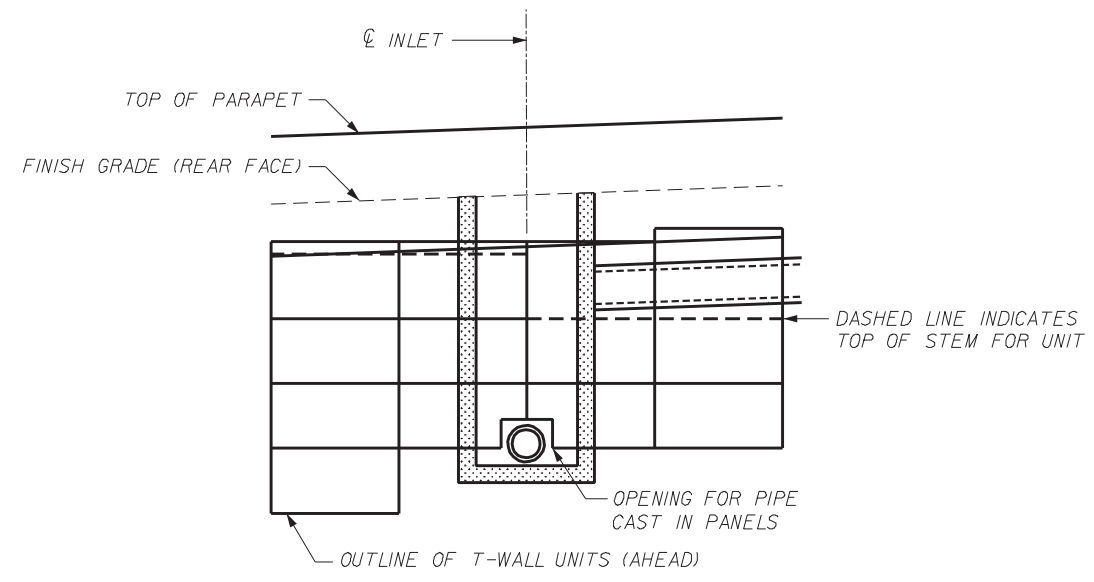
THE NEEL COMPANY
 8328-D TRAFORD LANE
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 PH: (703) 913-7859
 FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2996
 FX: (703) 913-7859

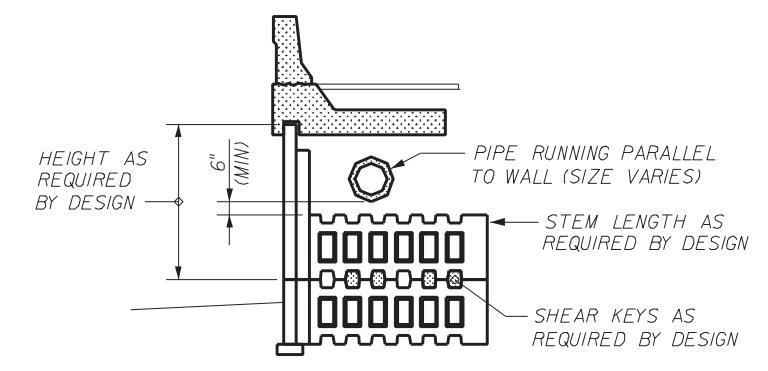
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	5 of 21
			Index No.	5011



PART PLAN



PART ELEVATION (FRONT FACE)

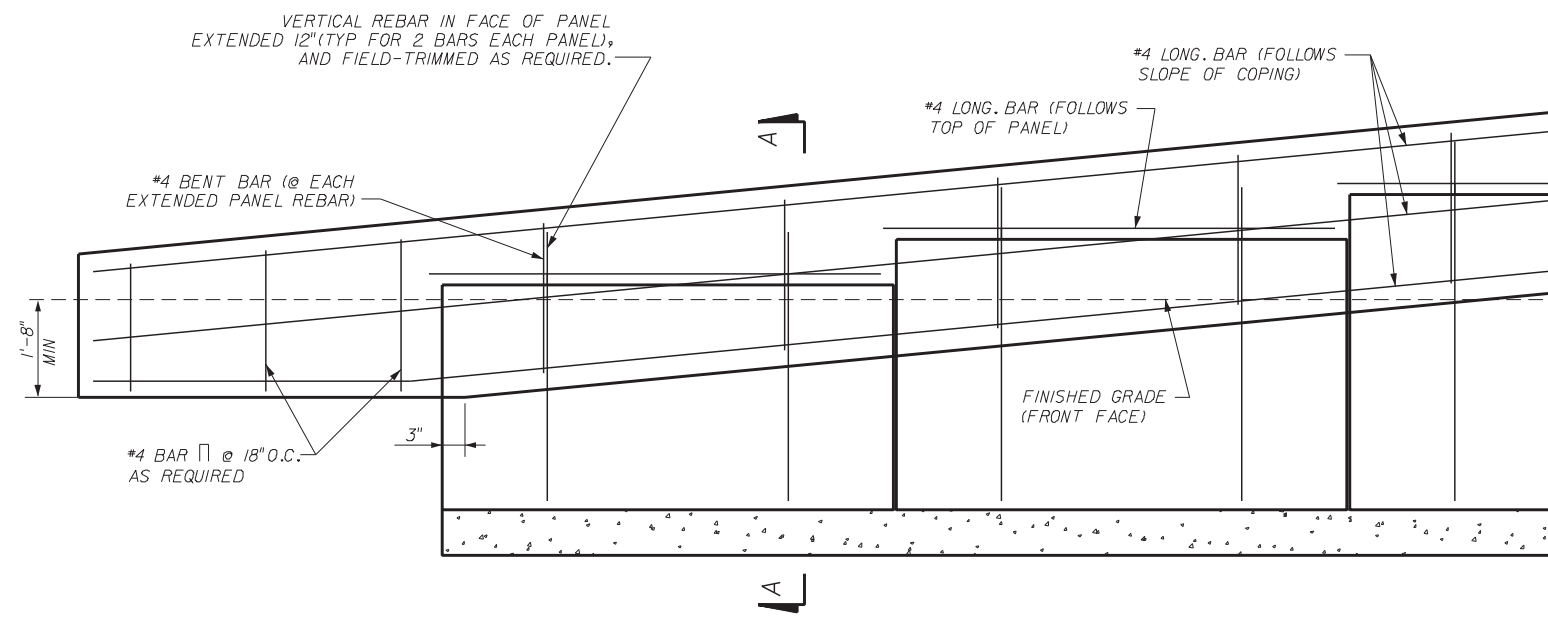


SECTION
(SHOWING PIPE PARALLEL TO WALL)

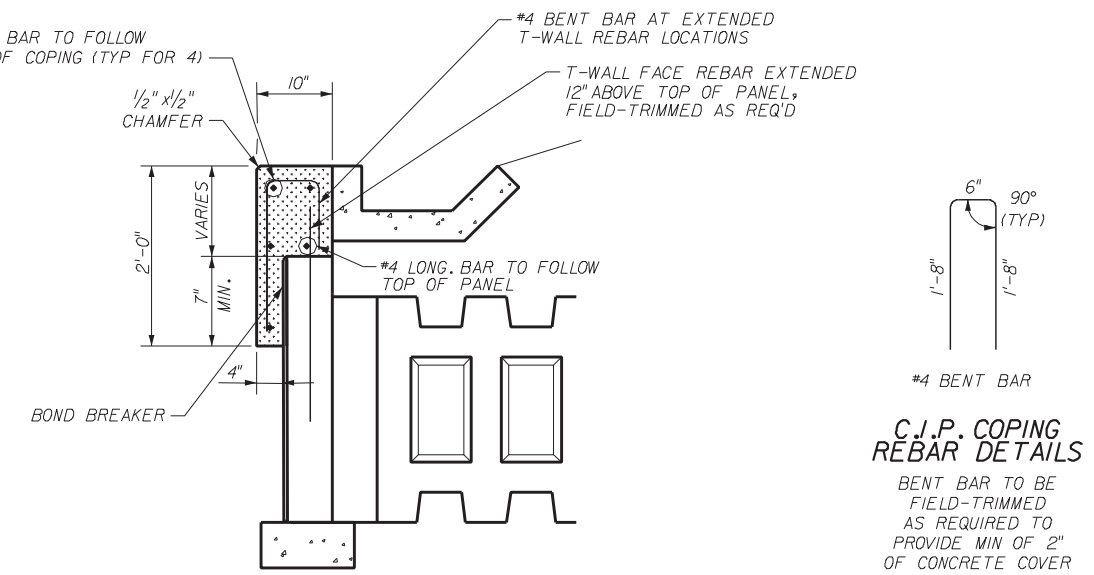
DESIGNER: **THE NEEL COMPANY**
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FAX: (703) 913-7859

PRECASTER: **OLDCASTLE PRECAST, INC.**
 11643 103RD STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

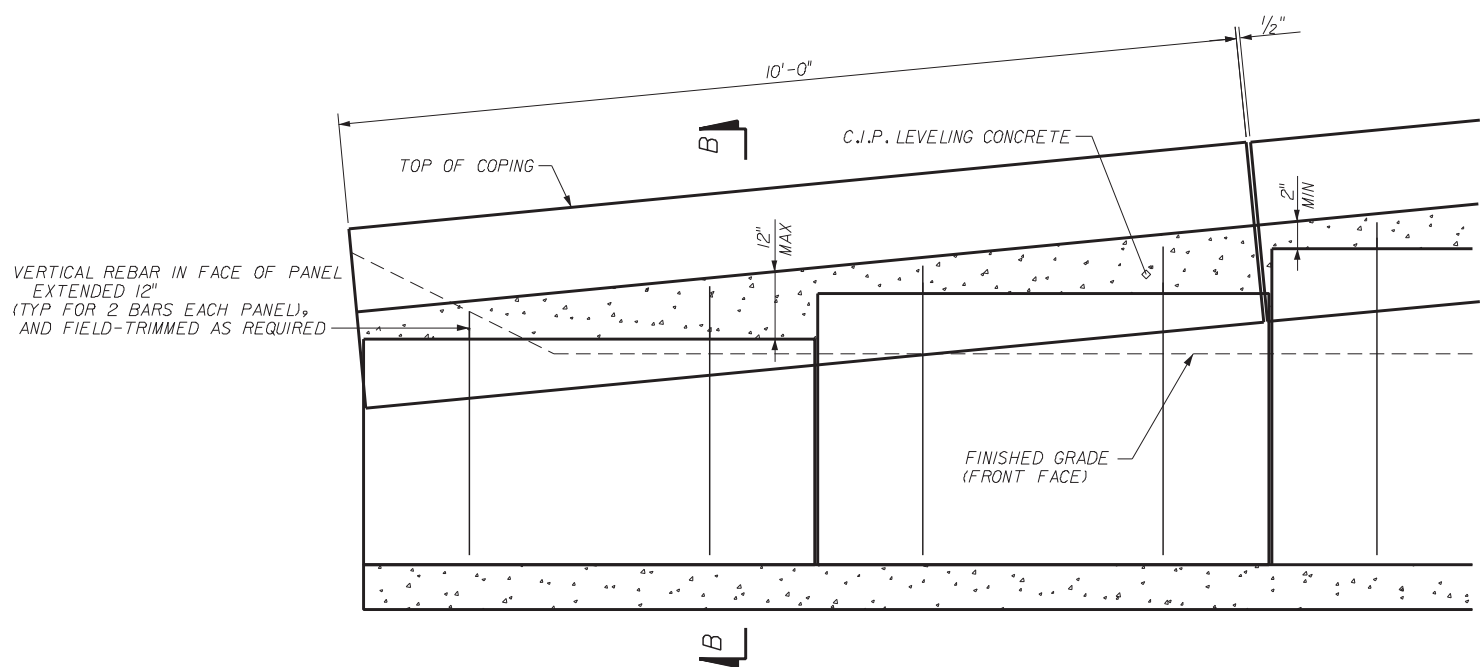
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No. Index No.
Checked By	JMC	10/01/98	00	6 of 21 5011



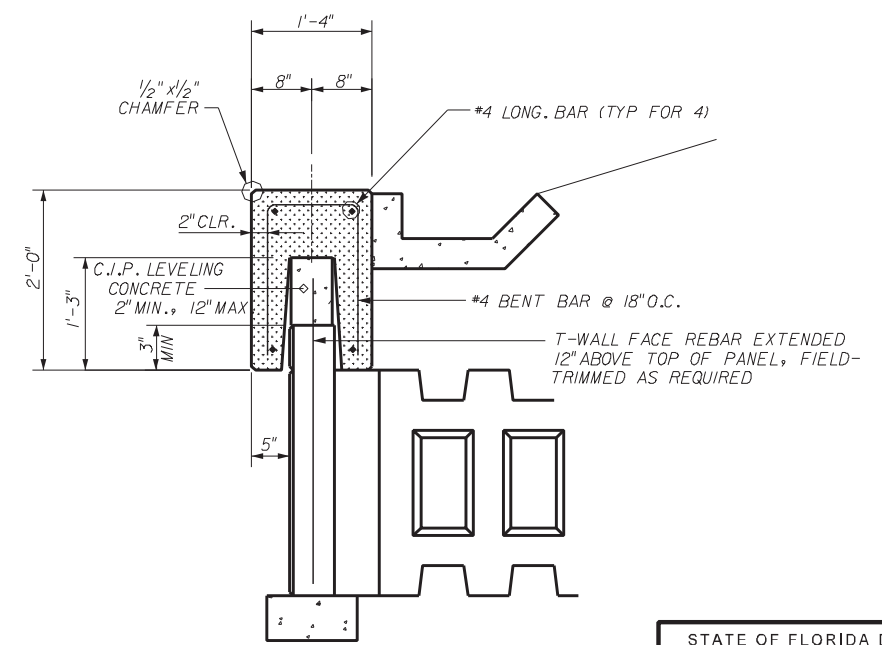
C.I.P. COPING TREATMENT AT BEGINNING/END OF WALLS



SECTION A-A
C.I.P. COPING

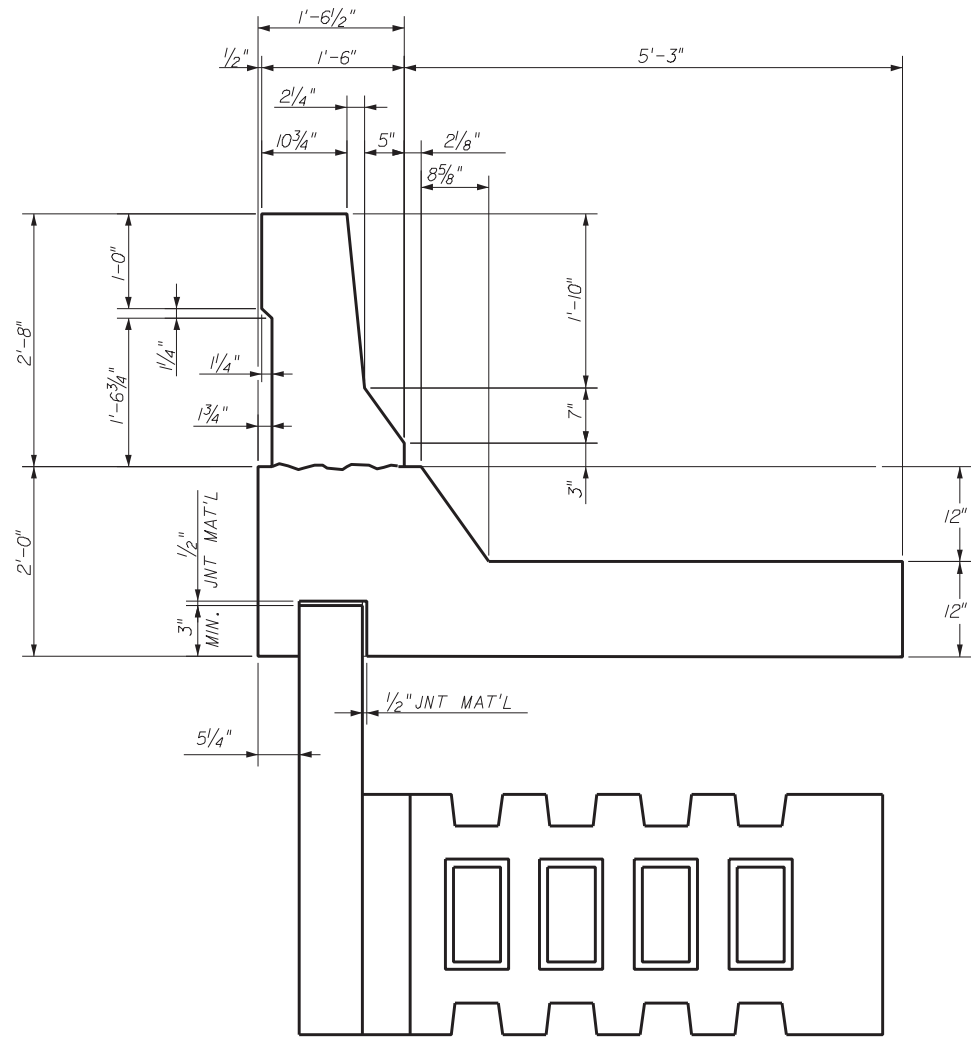


PRECAST COPING - PART ELEVATION

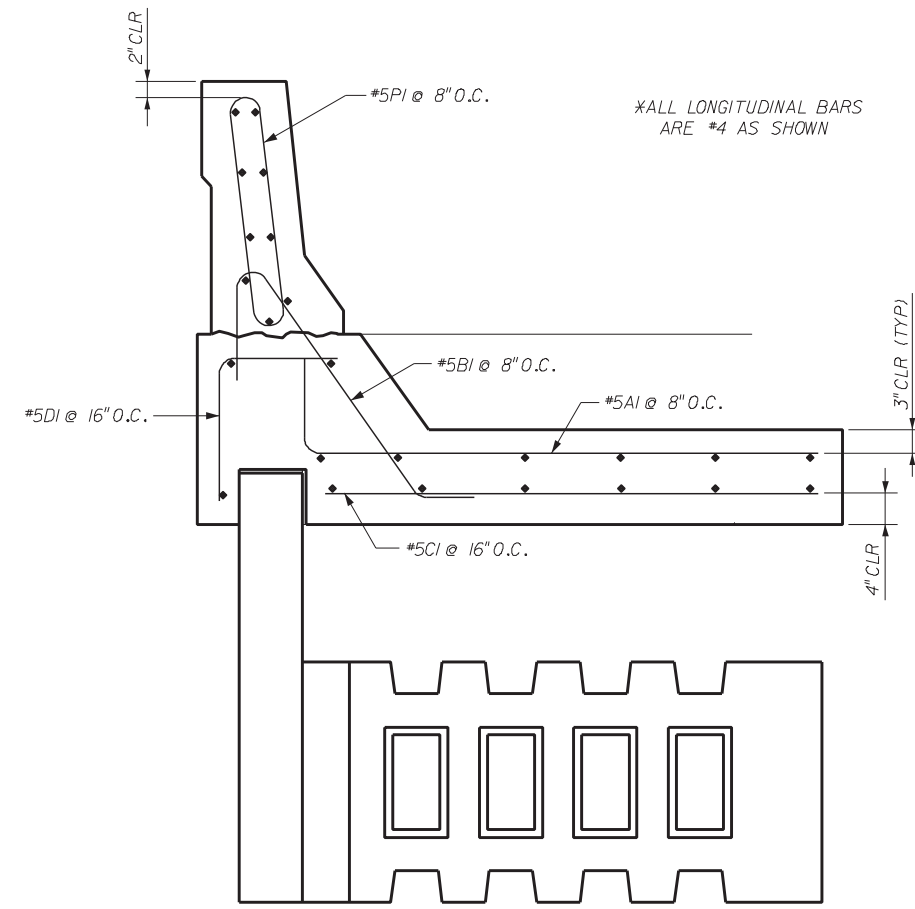


SECTION B-B
PRECAST COPING

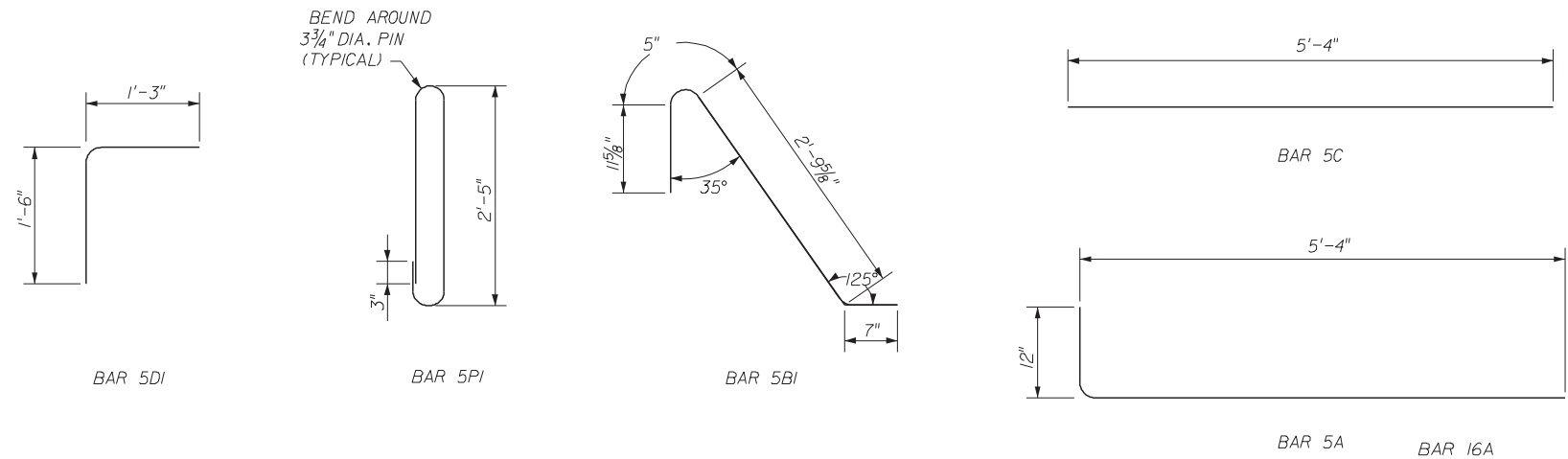
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	7 of 21
				Index No. 5011



C.I.P. BARRIER AND C.I.P. JUNCTION SLAB DIMENSIONS



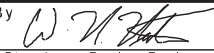
C.I.P. BARRIER AND C.I.P. JUNCTION SLAB REBAR

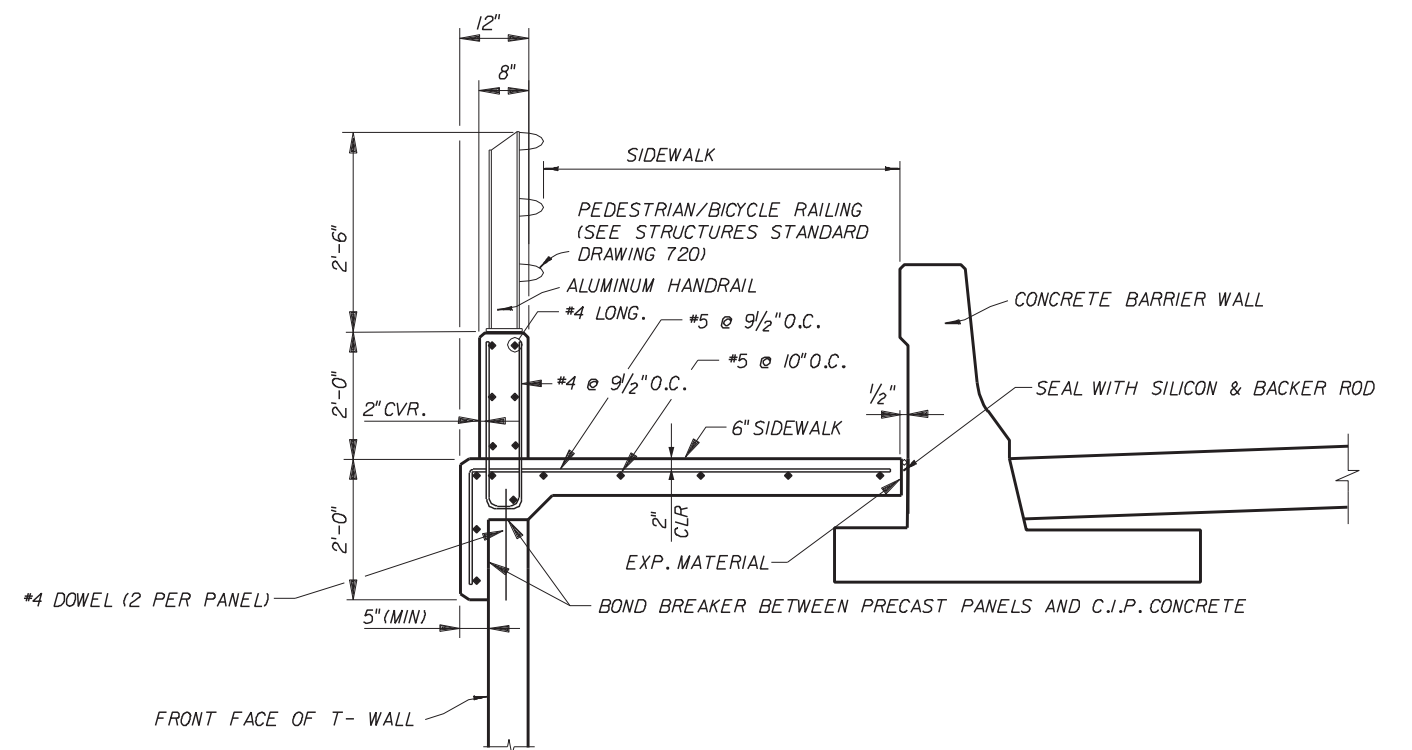


C.I.P. BARRIER REBAR DETAILS

DESIGNER:
 THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

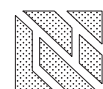
PRECASTER:
 OLDCASTLE PRECAST, INC.
 11643 103RD STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	9 of 21
				Index No. 5011



C.I.P. PARAPET DETAIL W/ HANDRAIL

DESIGNER:



THE NEEL COMPANY
 8328 D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

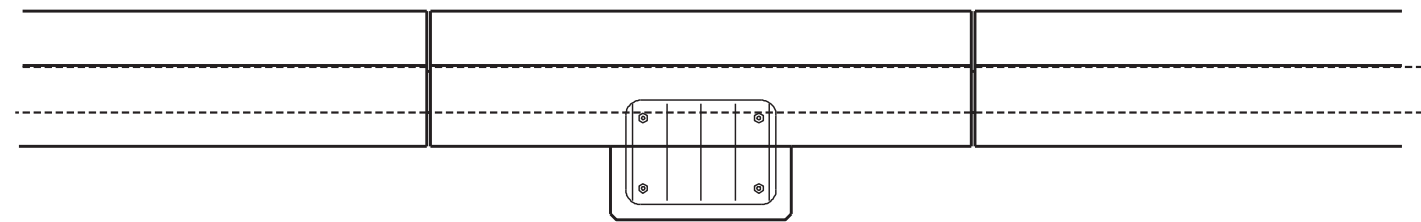
PRECASTER:

OLDCASTLE PRECAST, INC
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

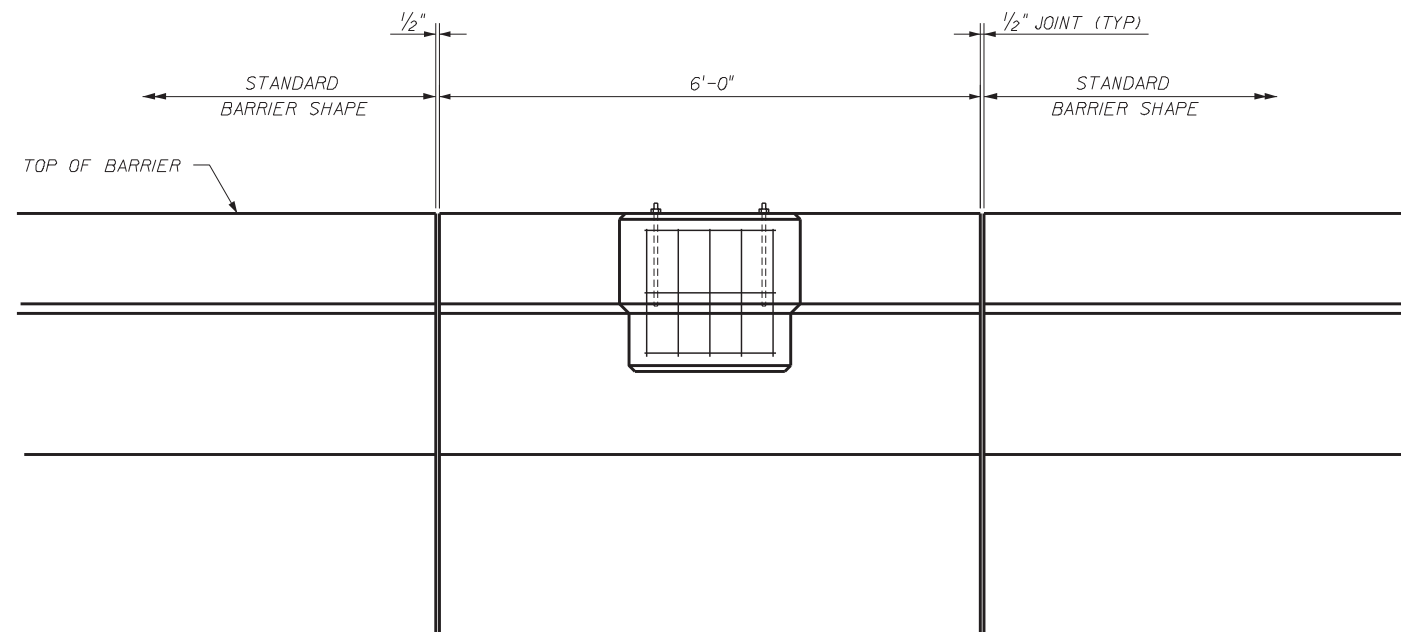
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

**RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (2" COVER)**

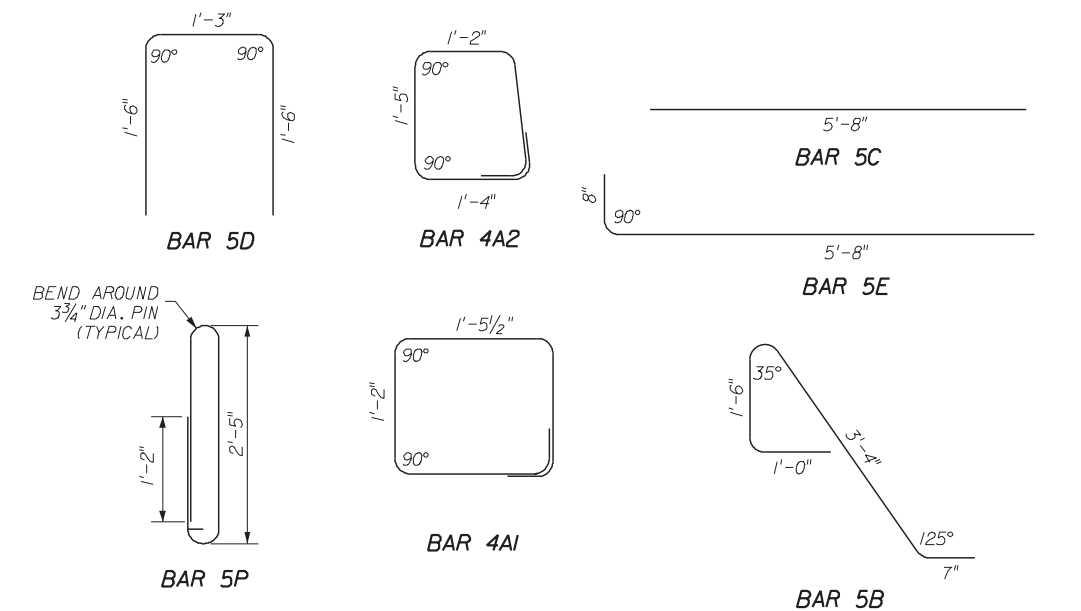
Names		Dates		Approved By	
Designed By	JMC	10/01/98	 State Structures Design Engineer		
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By	JMC	10/01/98	00	10 of 21	5011



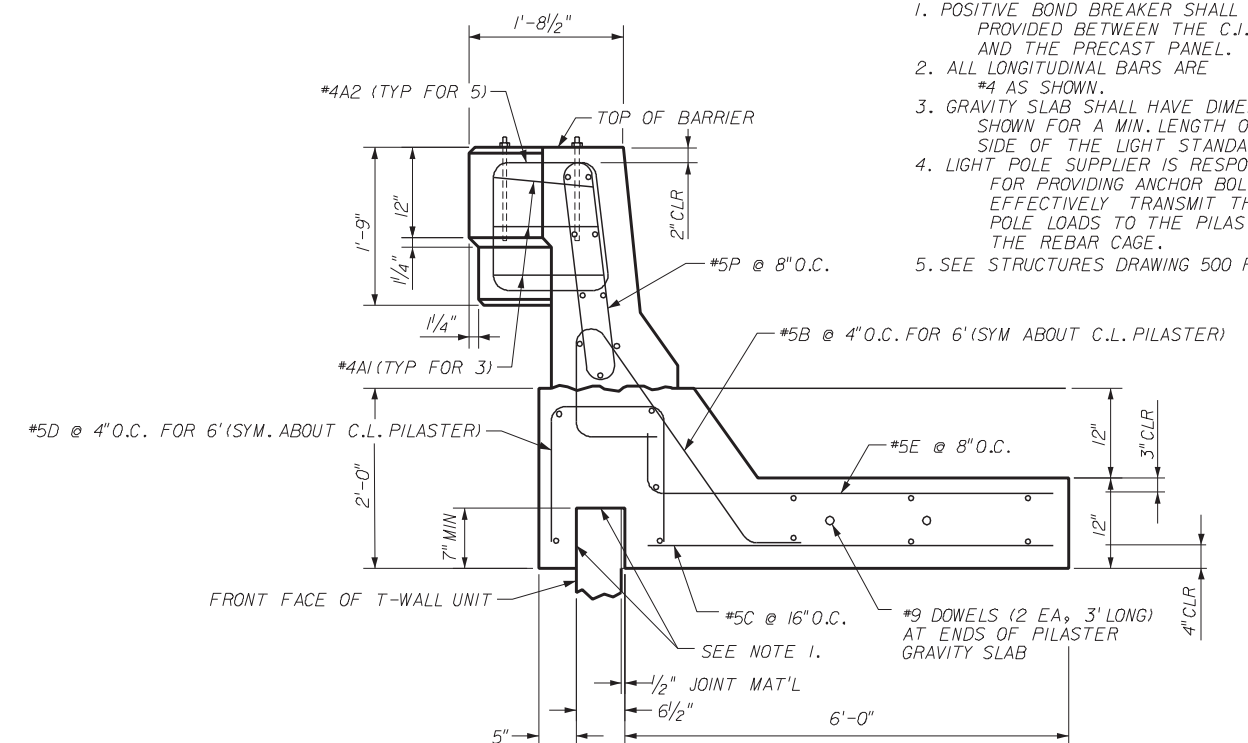
C.J.P. LIGHT STANDARD BARRIER - PART PLAN WITH REBAR
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)



C.J.P. LIGHT STANDARD BARRIER - PART ELEVATION
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)



C.J.P. LIGHT STANDARD BARRIER REBAR DETAILS



C.J.P. LIGHT STANDARD BARRIER - PART SECTION WITH REBAR

- NOTES
1. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN THE C.J.P. CONC. AND THE PRECAST PANEL.
 2. ALL LONGITUDINAL BARS ARE #4 AS SHOWN.
 3. GRAVITY SLAB SHALL HAVE DIMENSIONS SHOWN FOR A MIN. LENGTH OF 10'-0" EITHER SIDE OF THE LIGHT STANDARD BARRIER.
 4. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REBAR CAGE.
 5. SEE STRUCTURES DRAWING 500 FOR ADDITIONAL DETAILS.

DESIGNER:

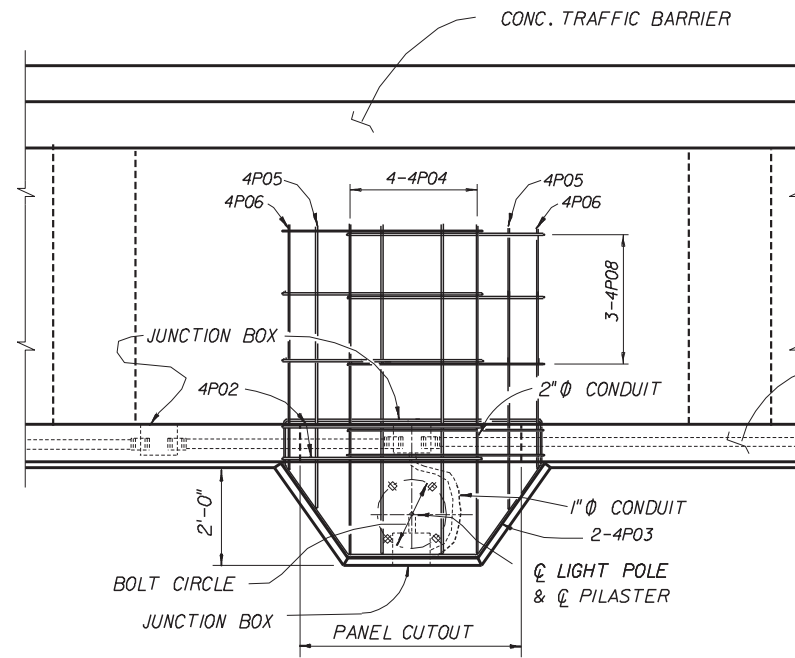
THE NEEL COMPANY
 8328 D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: 1703/913-7858
 FX: 1703/913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: 904/1778-2990
 FX: 904/1778-2992

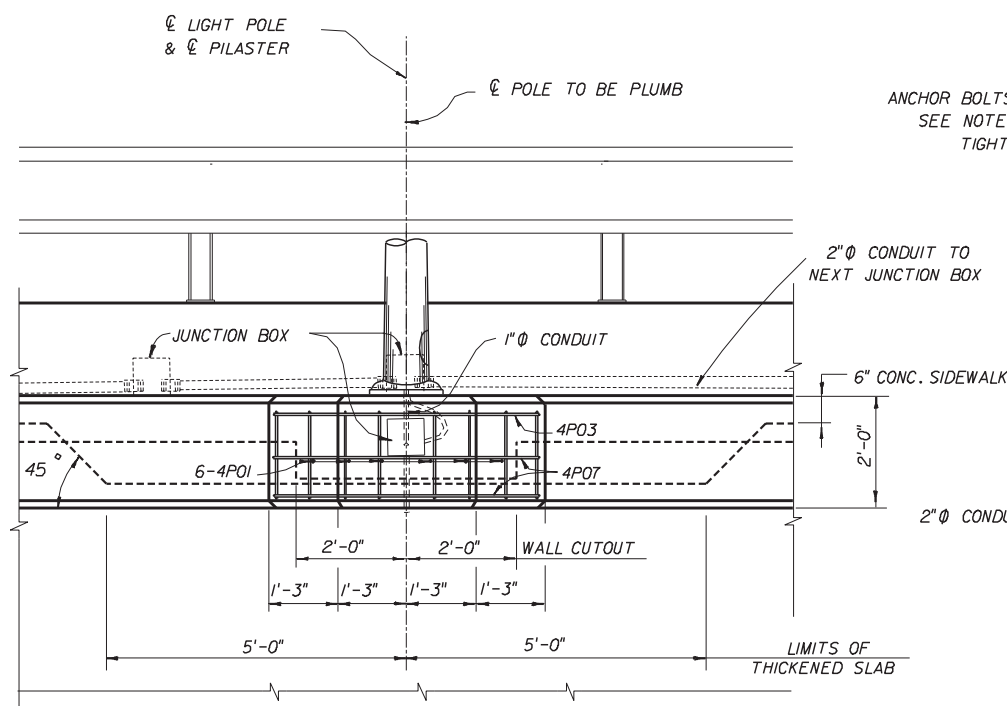
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

RETAINING WALL SYSTEM
 THE NEEL COMPANY T-WALL
 (2" COVER)

Names	Dates	Approved By		
Designed By	JMC	10/01/98	W. V. [Signature]	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	11 of 21
				5011



PLAN



LIGHT PILASTER DETAIL

NOTES

1. ADDITIONAL CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTER SHALL MEET THE SAME REQUIREMENTS AS THAT OF THE PARAPET WALL.

2. TOP OF PILASTER SHALL BE FINISHED TO A TRULY LEVEL AREA.

3. LIGHT POLE PILASTER IS DESIGNED TO RESIST WORKING LOADS (IN ANY DIRECTION) FROM THE LIGHT POLE APPLIED AT THE TOP OF THE PILASTER AS FOLLOWS:

LONGITUDINAL MOMENT	=	30,000 FT. POUND
TRANSVERSE MOMENT	=	6,000 FT. POUND
LONGITUDINAL SHEAR	=	1,000 POUND
TRANSVERSE SHEAR	=	200 POUND
TORSION	=	3,000 FT. POUNDS
AXIAL	=	400 POUNDS

IF THE LIGHT POLE PROVIDED APPLIES LOADS THAT ARE IN EXCESS OF THOSE SHOWN ABOVE, THE CONTRACTOR SHALL REDESIGN THE PILASTER AND SUBMIT HIS DESIGN TO THE DEPARTMENT FOR REVIEW. THE CONTRACTOR'S REDESIGN SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA, AND QUALIFIED TO PERFORM THE WORK.

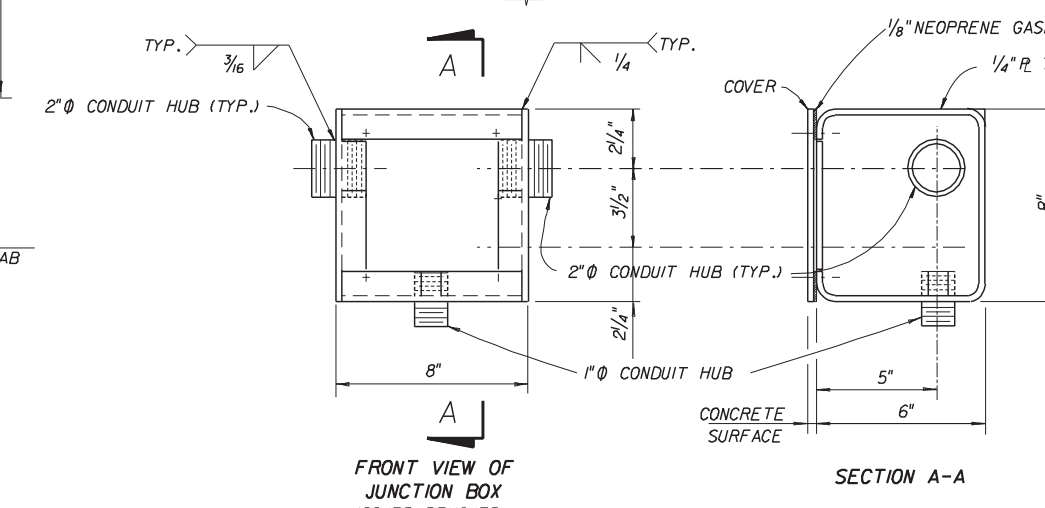
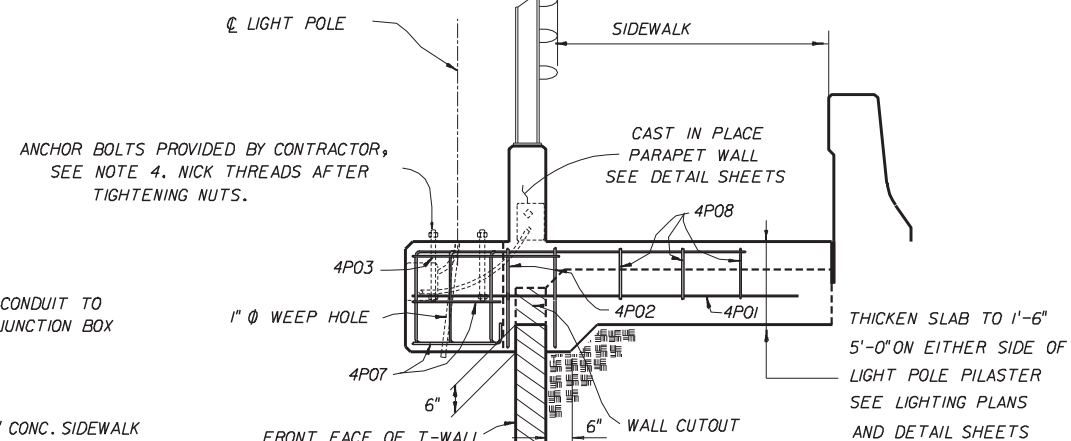
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND THAT FIT THE REINFORCING CAGE. CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHALL BE SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT FOR REVIEW AND APPROVAL SHOWING THAT THESE REQUIREMENTS HAVE BEEN MET PRIOR TO CONSTRUCTION.

5. STEEL FOR JUNCTION BOXES SHALL CONFORM WITH ASTM-A36. THE BOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. IN LIEU OF STEEL BOXES THE CONTRACTOR MAY SUBMIT FOR APPROVAL MOLDED P.V.C. BOXES (SCHEDULE 80).

6. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL OR SCHEDULE 80 P.V.C.

7. THE COST OF ANCHOR BOLTS SHALL BE INCLUDED IN THE BID PRICE FOR LIGHT POLES.

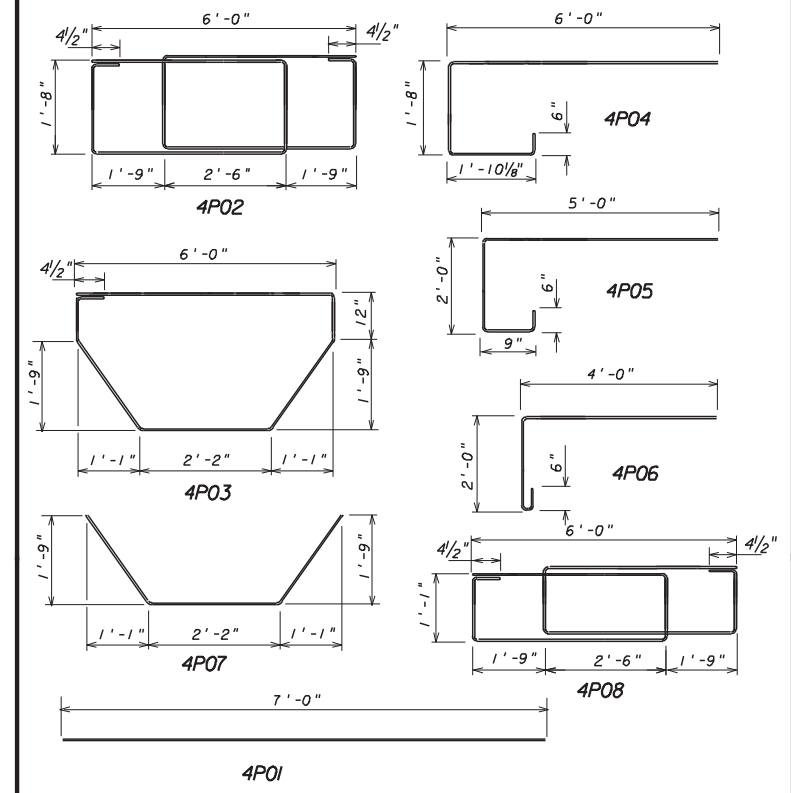
8. PAYMENT: THE COST OF ALL LABOR, CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTERS AND ALL CONDUITS, EXPANSION COUPLINGS, JUNCTION BOXES AND MISCELLANEOUS HARDWARE REQUIRED FOR COMPLETION OF THE ELECTRICAL INSTALLATION WITHIN THE LIMITS SHOWN ON THIS SHEET, SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR THE MSE WALLS.



FRONT VIEW OF JUNCTION BOX (COVER REMOVED)

SECTION A-A

BAR BENDING DIAGRAMS



BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
4P01	4	6	7'-0"
4P02	4	2	24'-5"
4P03	4	1	14'-9"
4P04	4	4	9'-8"
4P05	4	2	7'-11"
4P06	4	2	6'-2"
4P07	4	2	6'-4"
4P08	4	3	22'-1"

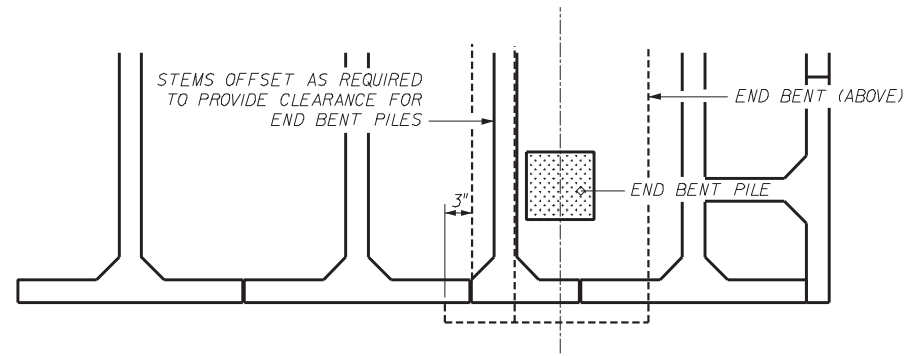
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)

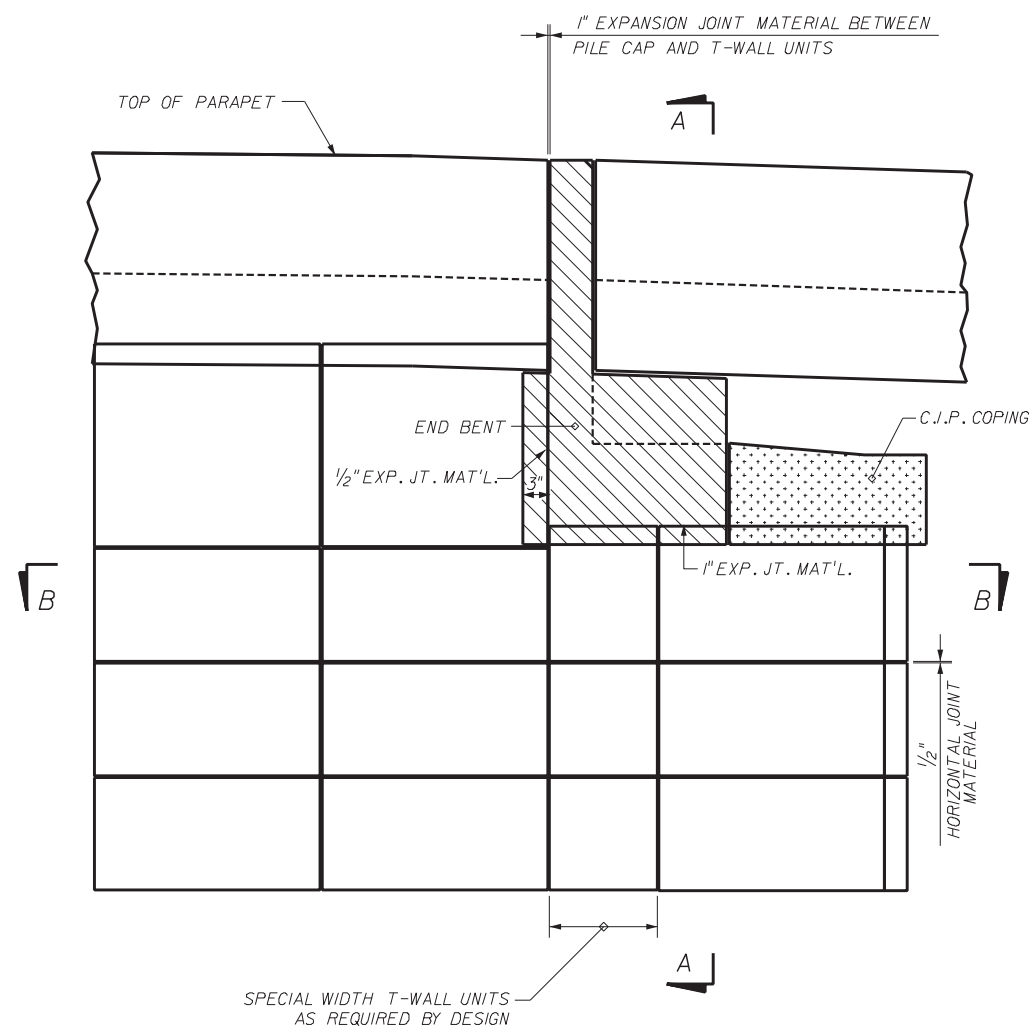
Designed By	JMC	10/01/98	Approved By	<i>W. J. [Signature]</i>	
Drawn By	CAA	10/01/98	State Structures Design Engineer	Revision	Sheet No.
Checked By	JMC	10/01/98	00	12 of 21	5011

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: (703) 913-7855
Fk: (703) 913-7859

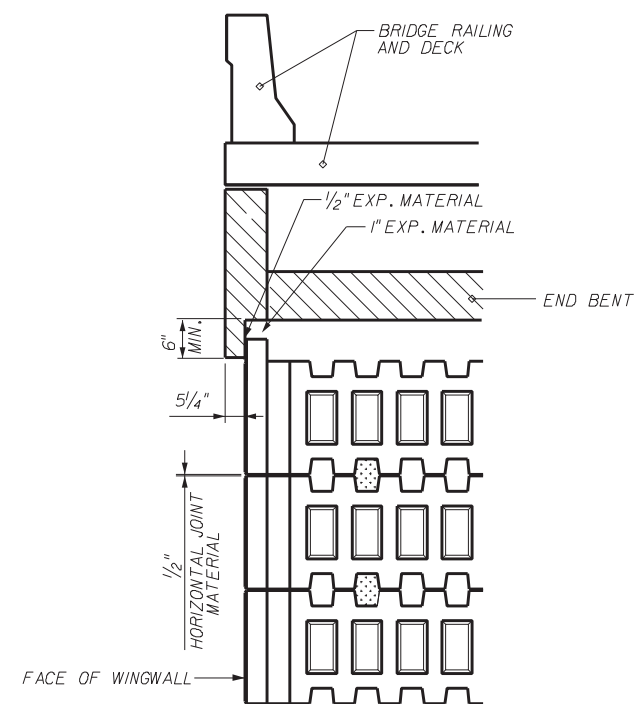
PRECASTER:
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
Ph: (904) 778-2990
Fk: (904) 778-2992



SECTION B-B
STEM / END BENT PILE INTERFACE

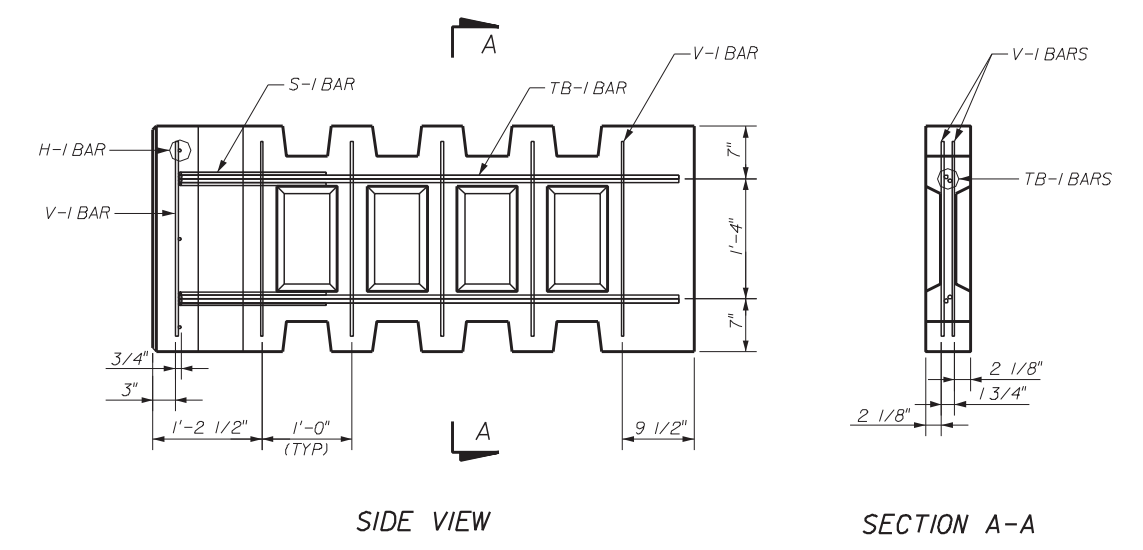
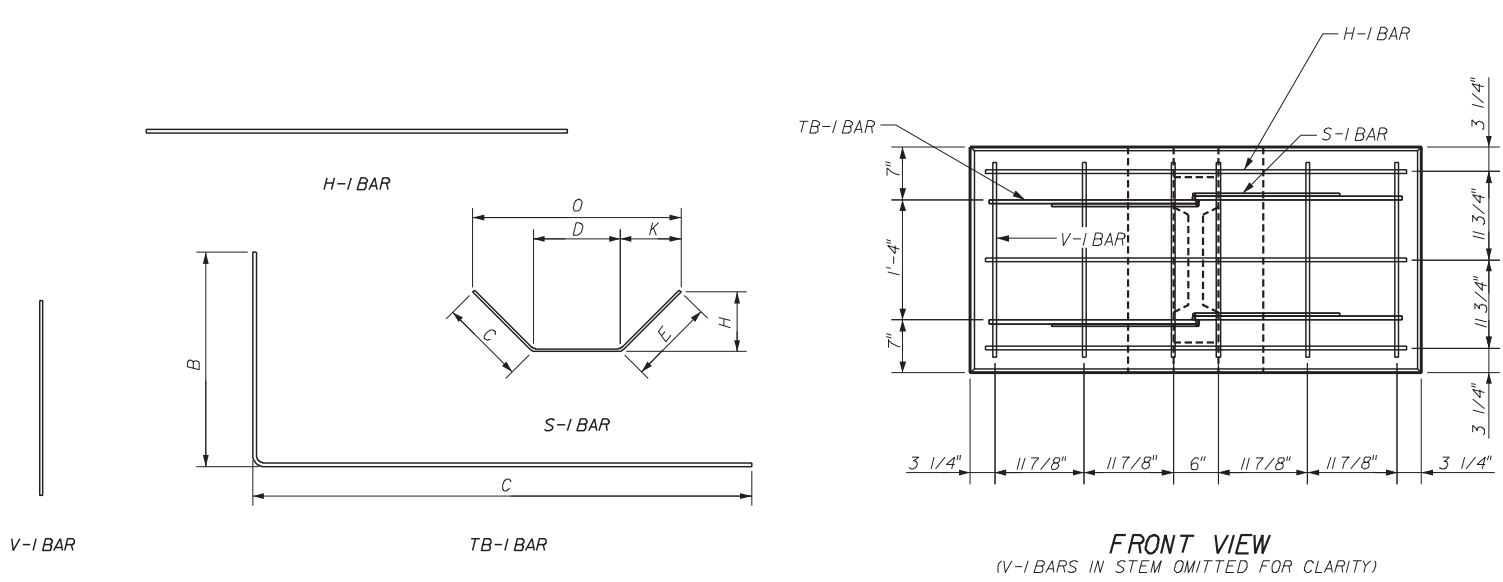


PART ELEVATION SHOWING
WINGWALL / END BENT INTERFACE



SECTION A-A
SECTION THRU PILE CAP

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	13 of 21
				Index No. 5011



FRONT VIEW
(V-I BARS IN STEM OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A

REBAR SCHEDULE - 2.5 x 5.0 x 04 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	12	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 06 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	16	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 08 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	20	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 10 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	24	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	11'-8 1/2"	2'-3 1/2"	9'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 12 STD UNIT

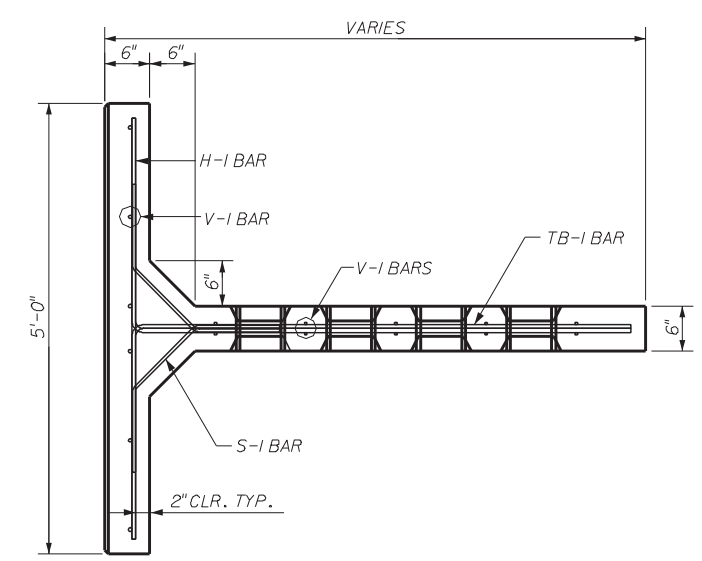
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H-I	3	4	-	4'-6"								-	
V-I	26	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	13'-8 1/2"	2'-3 1/2"	11'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 14 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	32	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	15'-8 1/2"	2'-3 1/2"	13'-6 1/2"						90	

REBAR SCHEDULE - 2.5 x 5.0 x 16 STD UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	3	4	-	4'-6"								-	
V-I	36	3	-	2'-0"								-	
S-I	4	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	4	4	17	17'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	



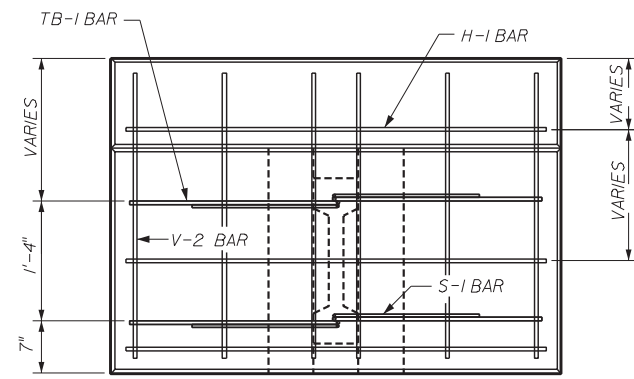
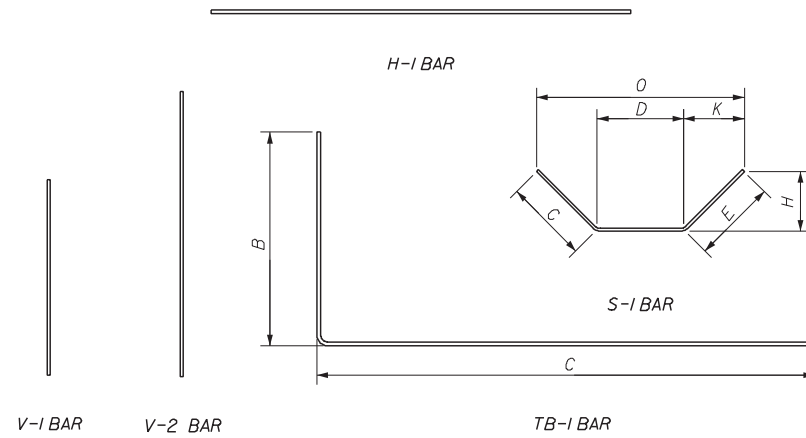
TOP VIEW
REINFORCING STEEL - STANDARD UNITS

DESIGNER: **THE NEEL COMPANY**
8328 D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 1703 913-7858
FX: 1703 913-7859

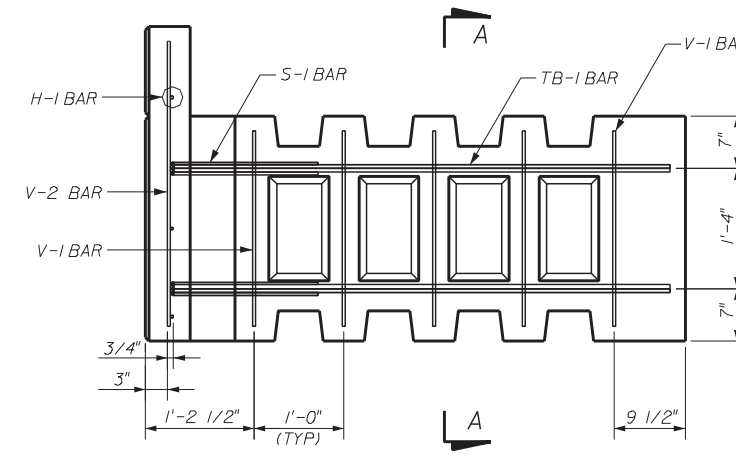
PRECASTER: **OLDCASTLE PRECAST, INC**
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: 1904 778-2990
FX: 1904 778-2992

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

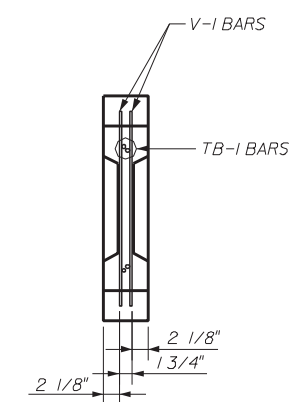
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	14 of 21
			Index No.	5011



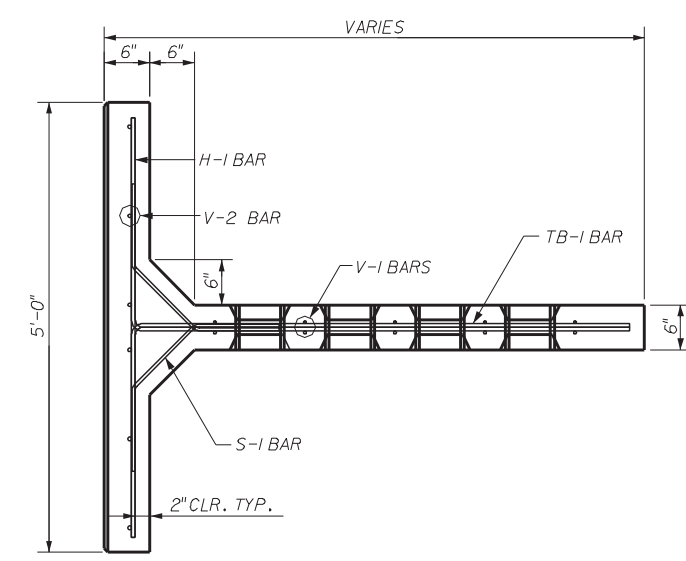
FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW

REINFORCING STEEL - TOP UNITS (1)

REBAR SCHEDULE - 3.0 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	4	4	-	4'-6"								-	-
V-1	6	3	-	2'-0"								-	-
V-2	6	5	-	2'-6"								-	-
S-1	4	3	3	2'-9 1/8"	11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"		45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 3.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	4	4	-	4'-6"								-	-
V-1	10	3	-	2'-0"								-	-
V-2	6	5	-	2'-6"								-	-
S-1	4	3	3	2'-9 1/8"	11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"		45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 3.5 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	-
V-1	6	3	-	2'-0"								-	-
V-2	6	5	-	3'-0"								-	-
S-1	4	3	3	2'-9 1/8"	11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"		45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 3.5 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	-
V-1	10	3	-	2'-0"								-	-
V-2	6	5	-	3'-0"								-	-
S-1	4	3	3	2'-9 1/8"	11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"		45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 4.0 x 5.0 x 04 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	-
V-1	6	3	-	2'-0"								-	-
V-2	6	5	-	3'-6"								-	-
S-1	4	3	3	2'-9 1/8"	11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"		45	
TB-1	4	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 4.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	5	4	-	4'-6"								-	-
V-1	10	3	-	2'-0"								-	-
V-2	6	5	-	3'-6"								-	-
S-1	4	3	3	2'-9 1/8"	11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"		45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 4.5 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	-
V-1	6	3	-	2'-0"								-	-
V-2	6	5	-	4'-0"								-	-
S-1	4	3	3	2'-9 1/8"	11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"		45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

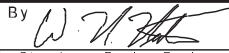
REBAR SCHEDULE - 5.0 x 5.0 x 06 TOP UNIT													
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	-
V-1	10	3	-	2'-0"								-	-
V-2	6	5	-	4'-6"								-	-
S-1	4	3	3	2'-9 1/8"	11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"		45	
TB-1	4	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

DESIGNER:

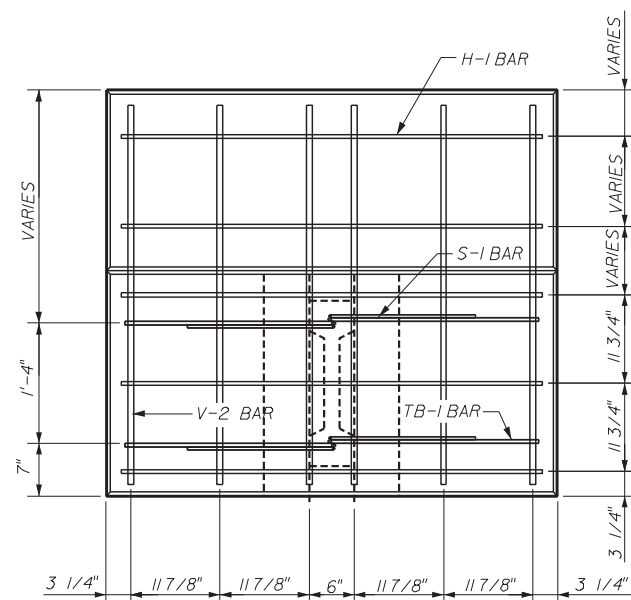
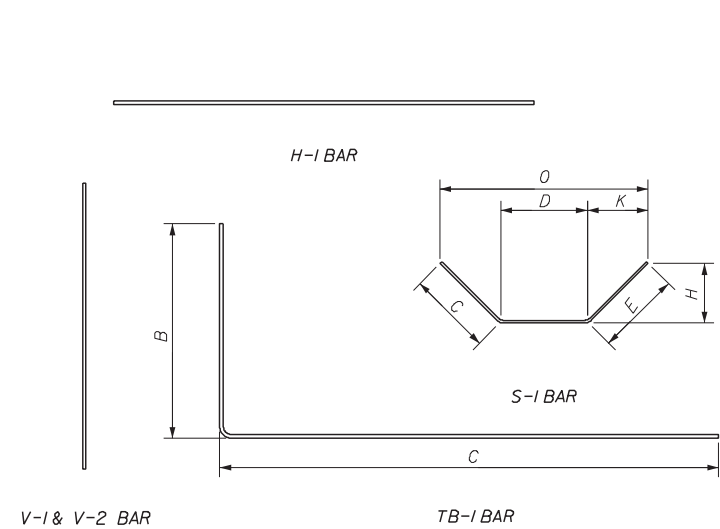
THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 Ph: 1703/913-7856
 Fax: 1703/913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 Ph: 1904/1778-2990
 Fax: 1904/1778-2992

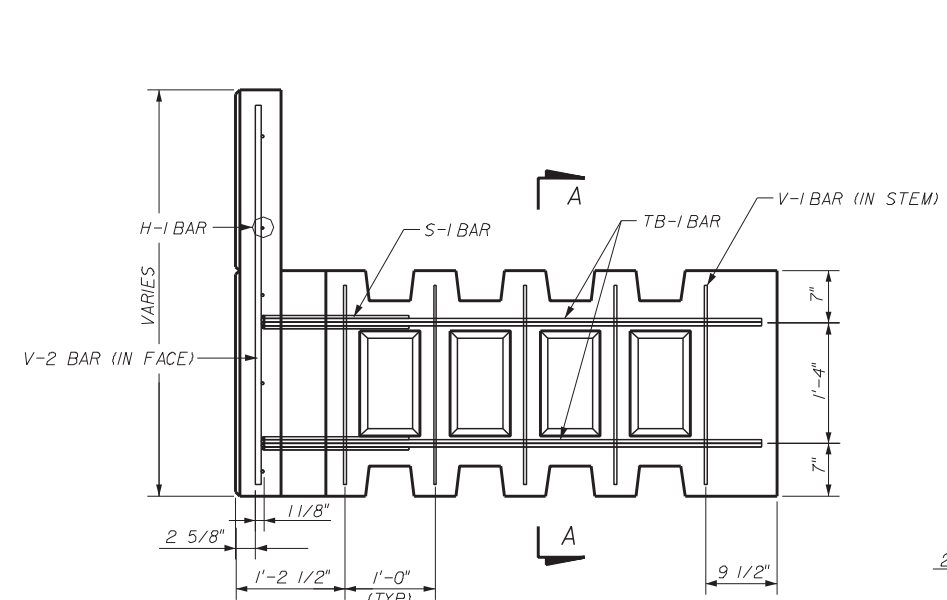
NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	15 of 21
				5011

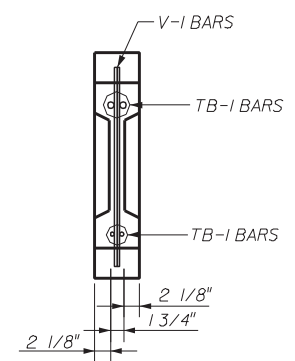
\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
 \$\$\$\$\$SYTIME\$\$\$\$\$



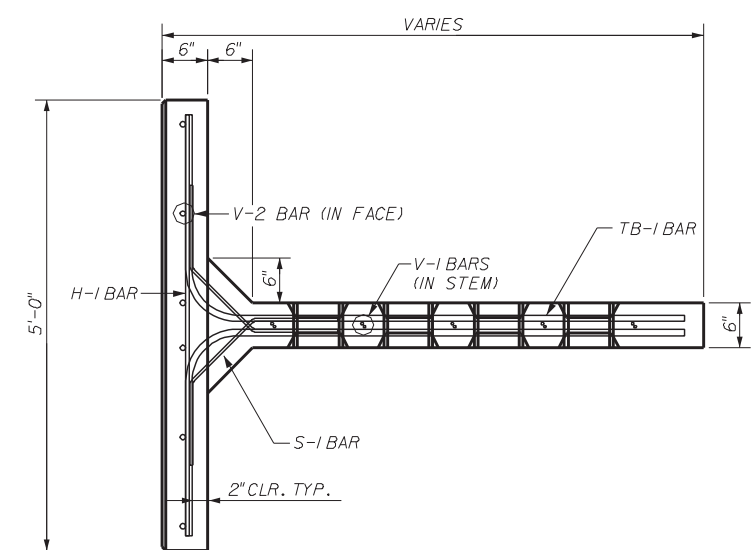
FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW

REINFORCING STEEL - TOP UNITS (II)

THESE UNITS WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

REBAR SCHEDULE - 5.5 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	5'-0"								-	
S-1	4	3	3	2'-9"	9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"		45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 6.0 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	5'-6"								-	
S-1	4	3	3	2'-9"	9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"		45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 6.5 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	6'-0"								-	
S-1	4	3	3	2'-9"	9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"		45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 7.0 x 5.0 x 08 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	14	3	-	2'-0"								-	
V-2	6	6	-	6'-6"								-	
S-1	4	3	3	2'-9"	9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"		45	
TB-1	4	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

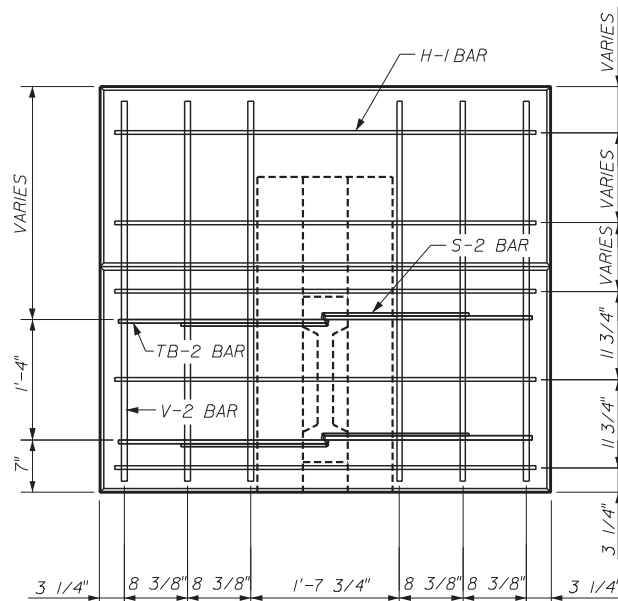
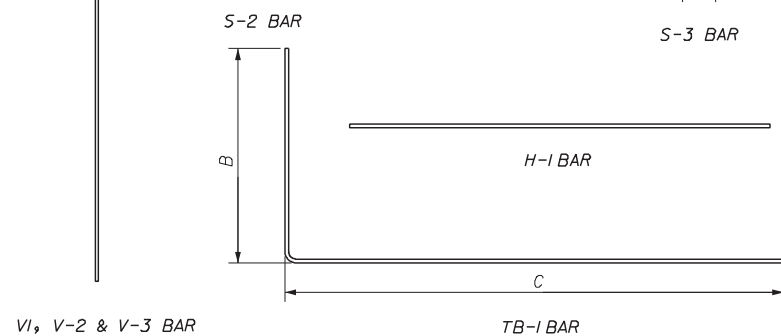
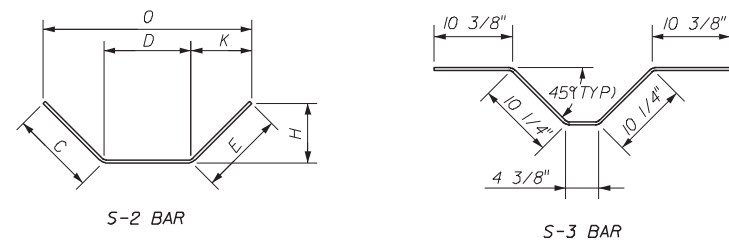
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: 17031 913-7858
Fx: 17031 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
11643 103RD STREET
JACKSONVILLE, FL 32210
Ph: 19041 778-2990
Fx: 19041 778-2992

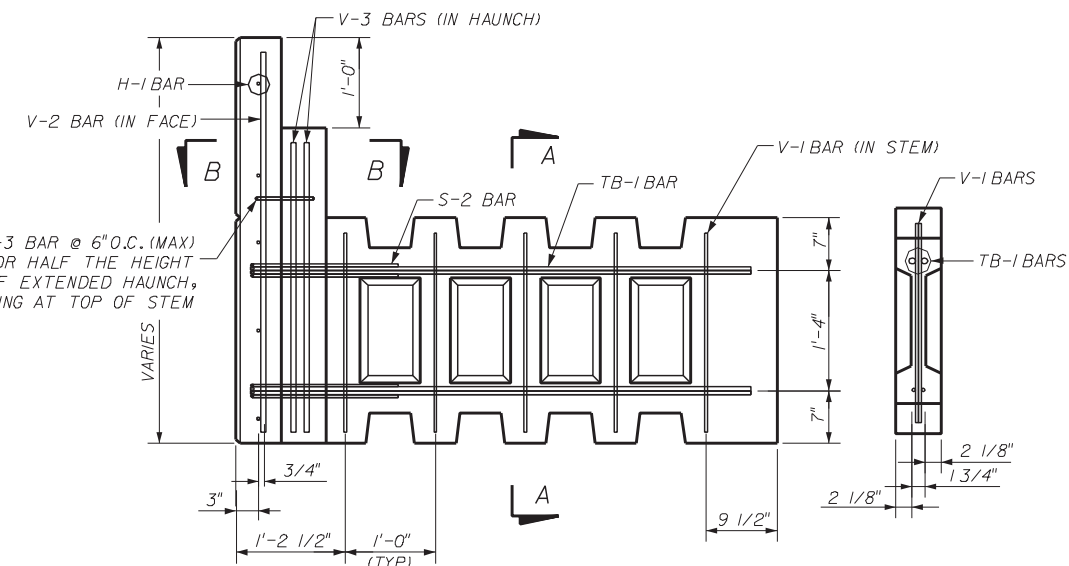
NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	16 of 21
				5011

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



FRONT VIEW
(V-1 BARS IN STEM AND V-3 BARS IN HAUNCH OMITTED FOR CLARITY)



SIDE VIEW

SECTION A-A

REBAR SCHEDULE - 7.5 x 5.0 x 10 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	18	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	6'-0"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	8	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 8.0 x 5.0 x 10 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	18	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	6'-6"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	9	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 8.5 x 5.0 x 10 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	18	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	7'-0"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	10	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 9.0 x 5.0 x 12 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	22	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	7'-6"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	11	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 9.5 x 5.0 x 12 TOP UNIT

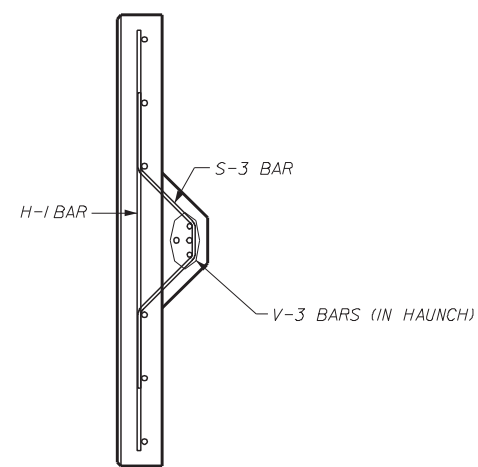
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	22	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	8'-0"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	12	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 10.0 x 5.0 x 12 TOP UNIT

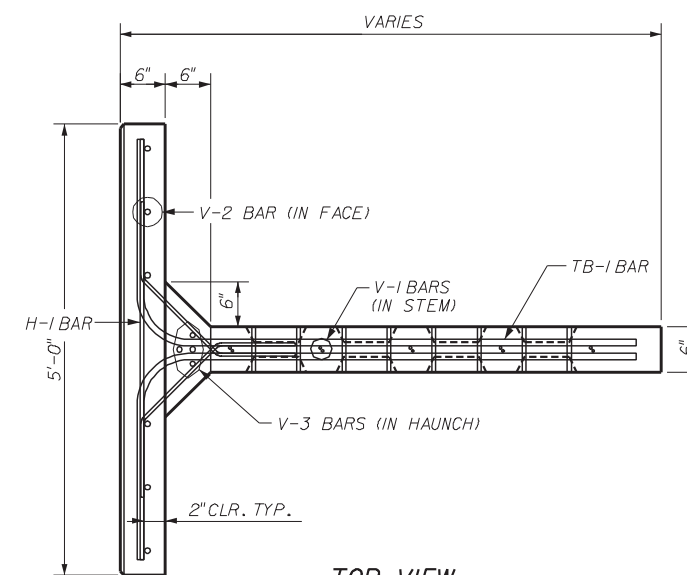
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	22	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	8'-6"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	13	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	

REBAR SCHEDULE - 10.5 x 5.0 x 12 TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	22	3	-	2'-0"								-	
V-2	6	6	-	7'-0"								-	
V-3	4	6	-	9'-0"								-	
S-2	4	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	14	3	3	3'-3 3/8"								-	SEE BENDING DTL
TB-1	4	7	17	13'-7 1/8"	2'-2 1/4"	11'-6 7/8"						90	



SECTION B-B



TOP VIEW

REINFORCING STEEL - TOP UNITS (III)

S-3 BARS IN EXTENDED HAUNCH 1. ALL UNITS ON THIS SHEET WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

DESIGNER:

THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 1703 913-7858
FX: 1703 913-7859

PRECASTER:

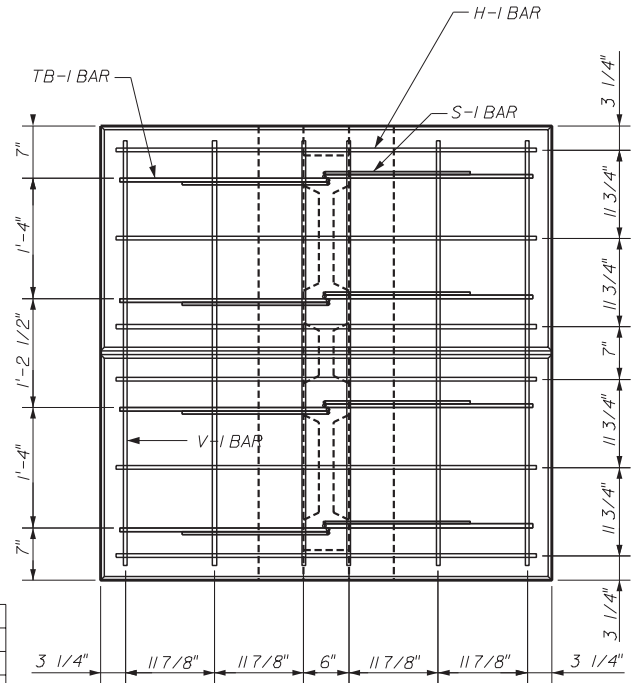
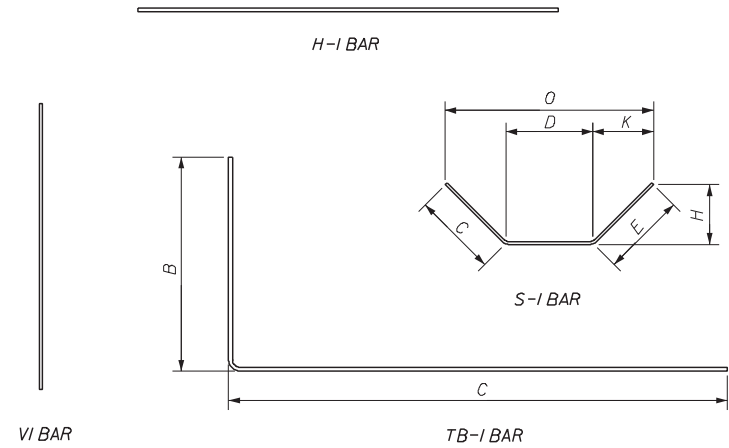
OLDCASTLE PRECAST, INC
11643 103RD STREET
JACKSONVILLE, FL 32210
PH: 904 178-2990
FX: 904 178-2992

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

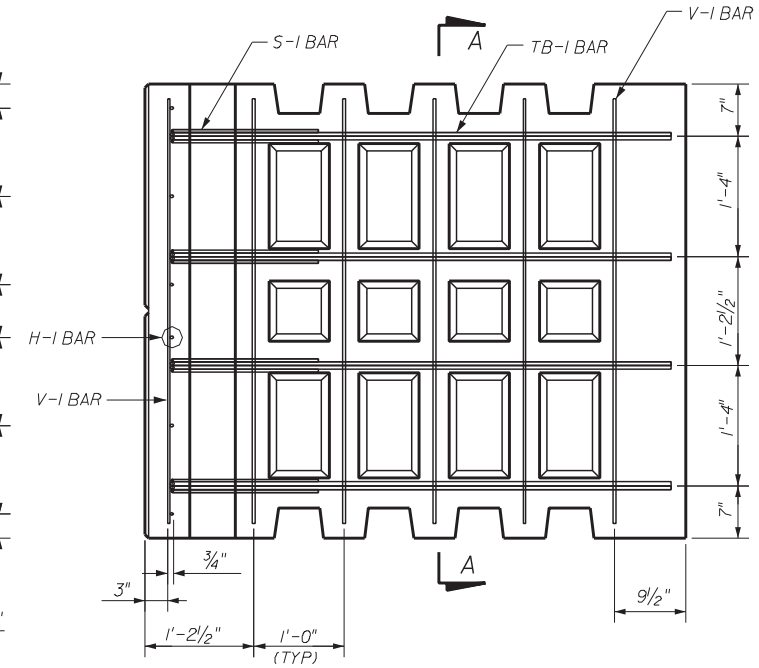
RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)

Names	Dates	Approved By		
Designed By	JMC	10/01/98	 State Structures Design Engineer	
Drawn By	CAA	10/01/98		
Checked By	JMC	10/01/98		
Revision	00	17 of 21		

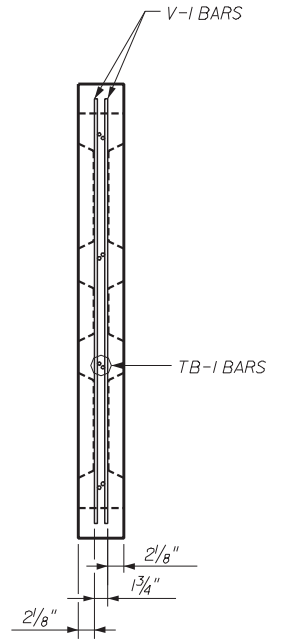


FRONT VIEW

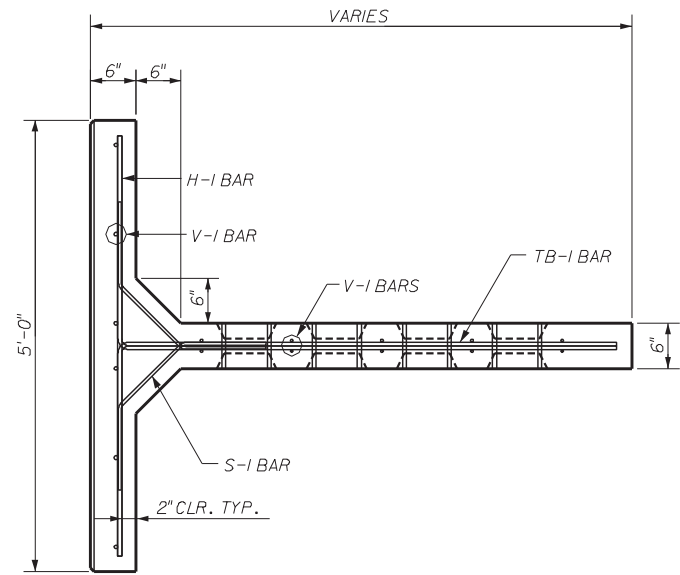
(V-I BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW
REINFORCING STEEL -DOUBLE UNITS

REBAR SCHEDULE - 5.0 x 5.0 x 04 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	12	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	5'-8 1/2"	2'-3 1/2"	3'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 06 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	16	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 08 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	20	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 10 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	24	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	11'-8 1/2"	2'-3 1/2"	9'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 12 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	26	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	13'-8 1/2"	2'-3 1/2"	11'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 14 DBL UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-I	6	4	-	4'-6"								-	
V-I	32	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	15'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	

REBAR SCHEDULE - 5.0 x 5.0 x 16 DBL UNIT

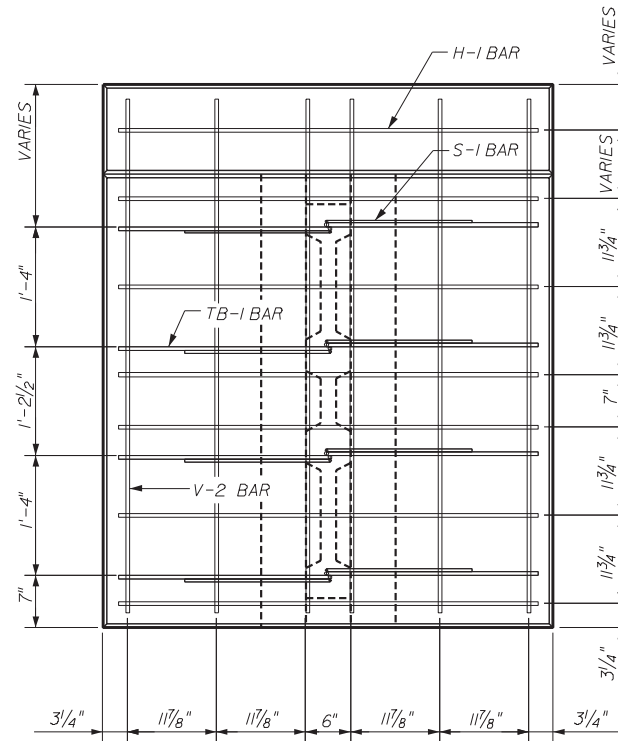
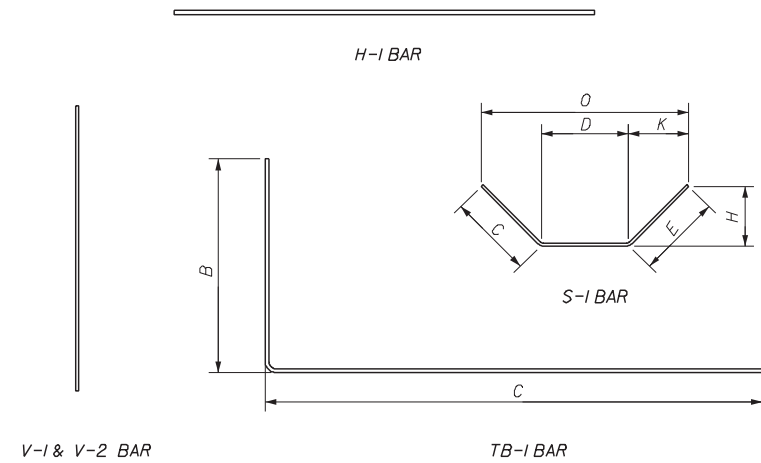
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V-I	36	3	-	4'-6"								-	
S-I	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-I	8	4	17	17'-8 1/2"	2'-3 1/2"	15'-6 1/2"						90	

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7859
FX: (703) 913-7859

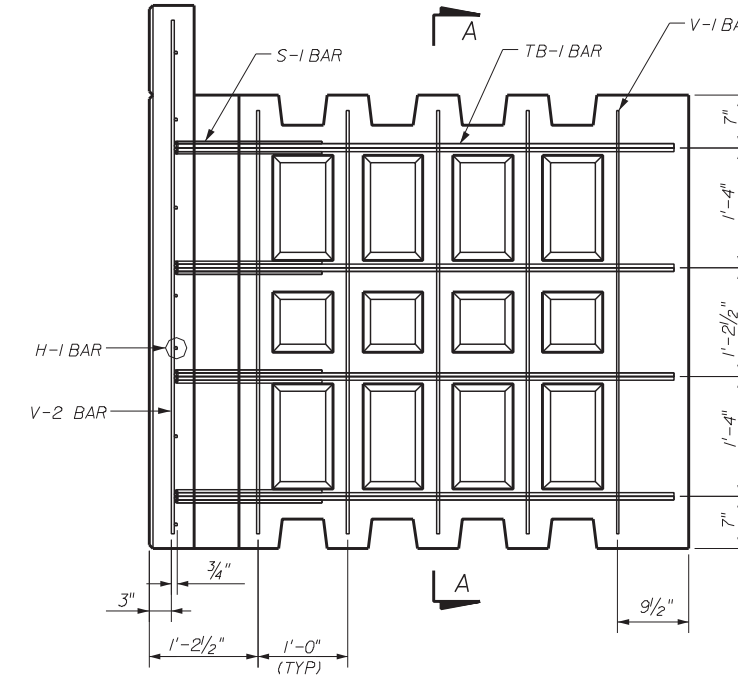
PRECASTER:
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

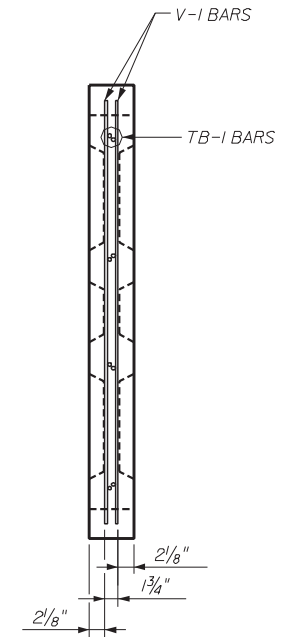
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	18 of 21
			Index No.	5011



FRONT VIEW
(V-1 BARS IN STEM OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A

REBAR SCHEDULE - 5.5 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	6	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	5'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 6.0 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	5'-6"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 6.5 x 5.0 x 06 DBL TOP UNIT

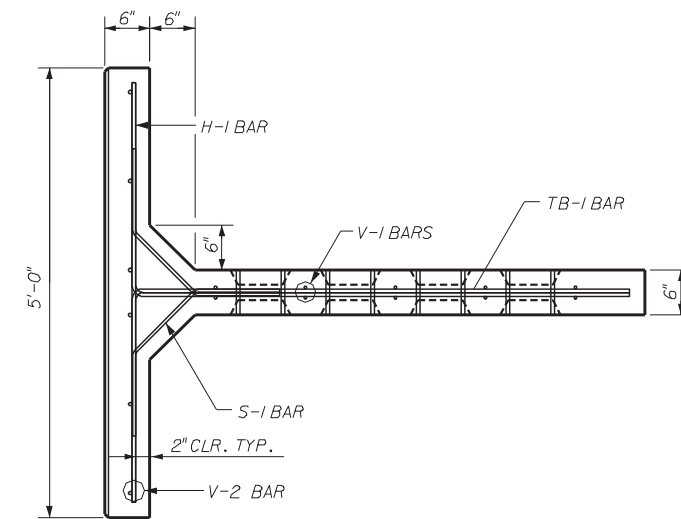
MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	7	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	6'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 7.0 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	6'-6"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	

REBAR SCHEDULE - 7.5 x 5.0 x 06 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	8	4	-	4'-6"								-	
V-1	10	3	-	4'-6"								-	
V-2	6	5	-	7'-0"								-	
S-1	8	3	3	2'-9 7/8"		11 1/4"	11 1/4"	11 1/4"	8"	8"	2'-3 3/4"	45	
TB-1	8	5	17	7'-8 1/2"	2'-3 1/2"	5'-6 1/2"						90	



TOP VIEW
REINFORCING STEEL - DOUBLE TOP UNITS (1)

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 1703 913-7858
FX: 1703 913-7859

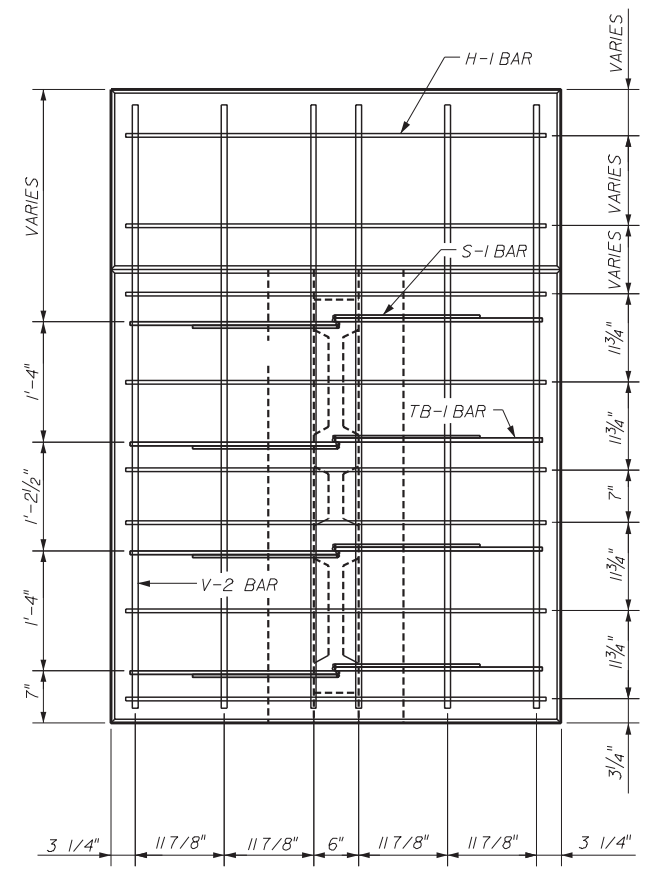
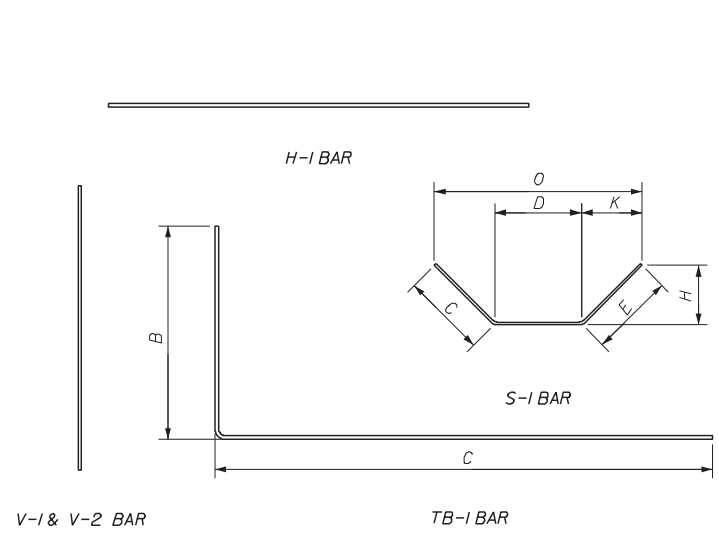
PRECASTER:
OLDCASTLE PRECAST, INC
11643 103RD STREET
JACKSONVILLE, FL 32210
PH: 1904 178-2990
FX: 1904 178-2992

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

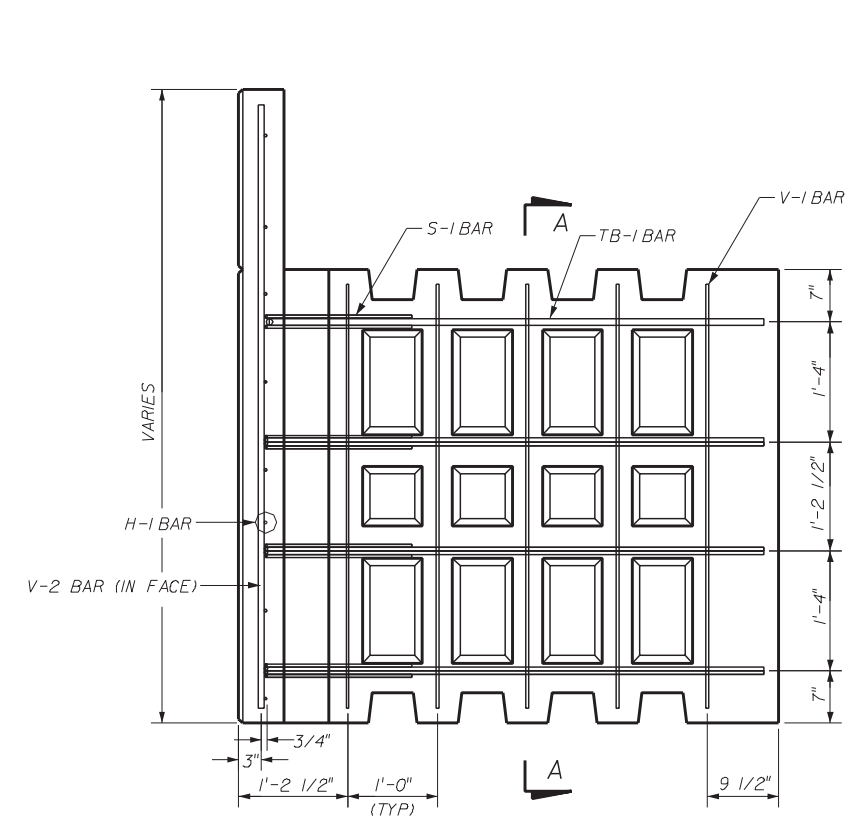
**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)**

Names	Dates	Approved By	Revision	Sheet No.	Index No.
Designed By	JMC	10/01/98			
Drawn By	CAA	10/01/98			
Checked By	JMC	10/01/98	00	19 of 21	5011

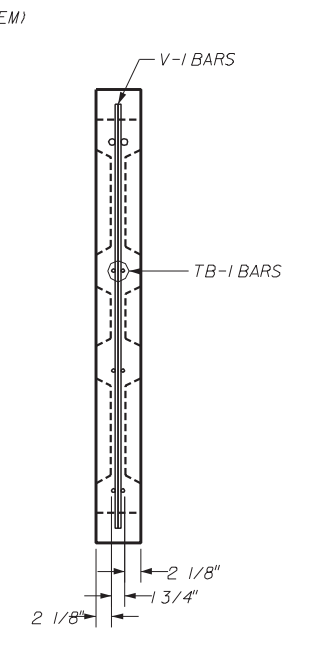
\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



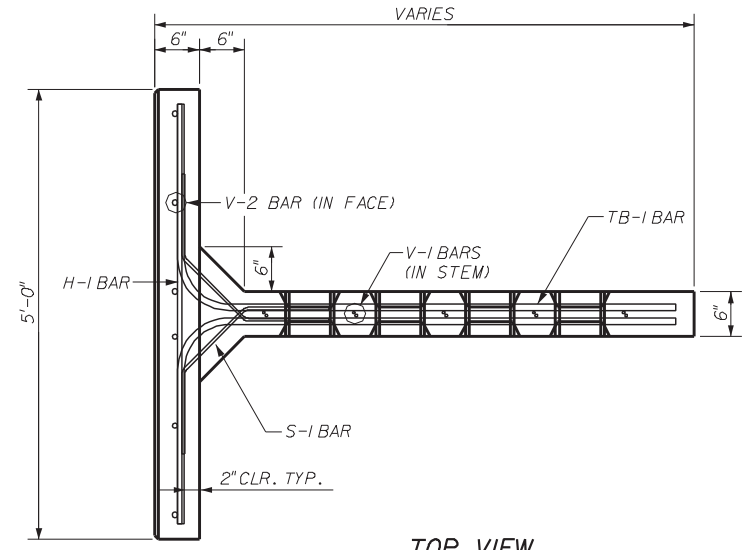
FRONT VIEW
(V-1 BARS IN OMITTED FOR CLARITY)



SIDE VIEW



SECTION A-A



TOP VIEW
REINFORCING STEEL - DOUBLE TOP UNITS (II)

REBAR SCHEDULE - 8.0 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	9	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	7'-6"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 8.5 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	9	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	8'-0"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 9.0 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	10	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	8'-6"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

REBAR SCHEDULE - 9.5 x 5.0 x 08 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	10	4	-	4'-6"								-	
V-1	14	3	-	4'-6"								-	
V-2	6	6	-	9'-0"								-	
S-1	8	3	3	2'-9"		9"	1'-3"	9"	5 3/8"	5 3/8"	2'-1 3/4"	45	
TB-1	8	6	17	9'-8 1/2"	2'-3 1/2"	7'-6 1/2"						90	

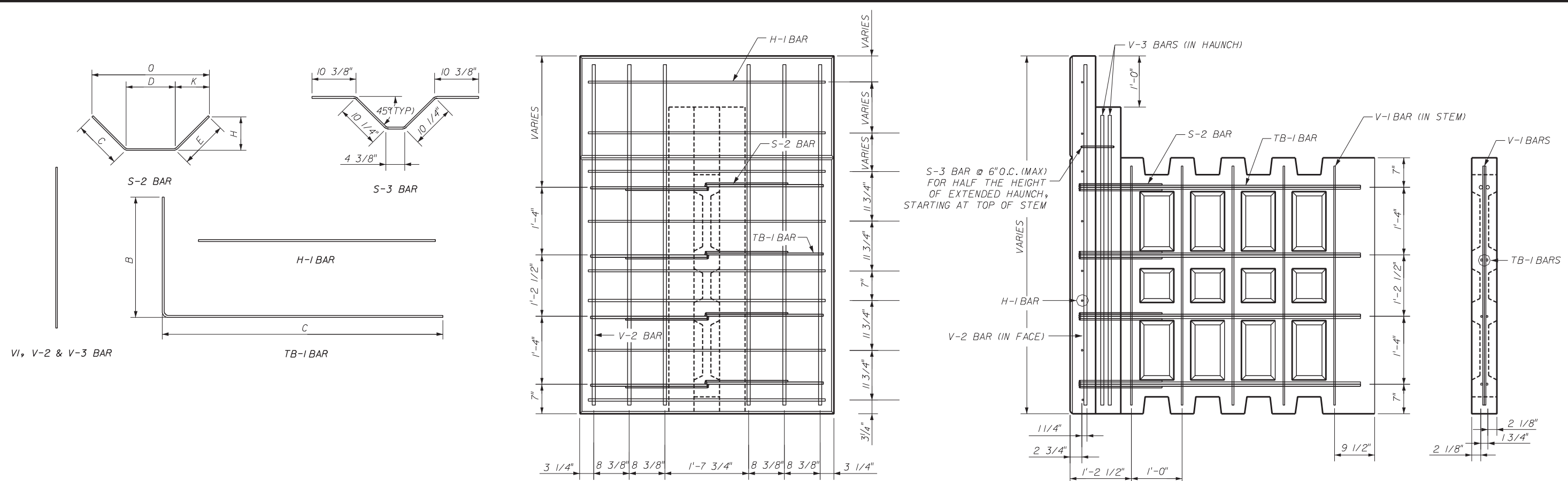
THESE TWO UNITS WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: 17031 913-7858
Fx: 17031 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
11643 103RD STREET
JACKSONVILLE, FL 32210
Ph: 19041 778-2990
Fx: 19041 778-2992

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY T-WALL (2" COVER)				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	JMC	10/10/98	State Structures Design Engineer	
Drawn By	CAA	10/10/98	Revision	Sheet No.
Checked By	JMC	10/10/98	00	20 of 21
				Index No. 5011



REBAR SCHEDULE - 10.0 x 5.0 x 10 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	11	4	-	4'-6"								-	
V-1	18	3	-	4'-6"								-	
V-2	6	6	-	9'-6"								-	
V-3	4	6	-	8'-6"								-	
S-2	8	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	8	3	3	3'-3 5/8"								-	SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 10.5 x 5.0 x 10 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	11	4	-	4'-6"								-	
V-1	18	3	-	4'-6"								-	
V-2	6	6	-	10'-0"								-	
V-3	4	6	-	9'-0"								-	
S-2	8	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	9	3	3	3'-3 5/8"								-	SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

REBAR SCHEDULE - 11.0 x 5.0 x 10 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	12	4	-	4'-6"								-	
V-1	18	3	-	4'-6"								-	
V-2	6	6	-	10'-6"								-	
V-3	4	6	-	9'-6"								-	
S-2	8	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	10	3	3	3'-3 5/8"								-	SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

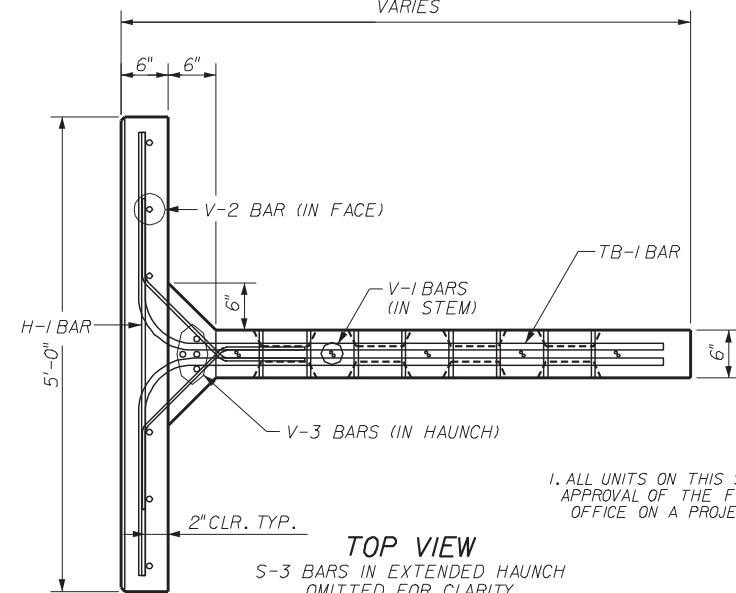
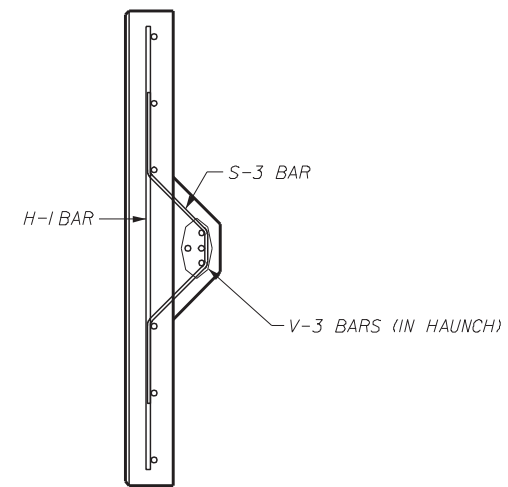
REBAR SCHEDULE - 11.5 x 5.0 x 10 DBL TOP UNIT

MARK	QNTY	SIZE	TYPE	LGTH	B	C	D	E	H	K	O	ANGLE	REMARKS
H-1	12	4	-	4'-6"								-	
V-1	18	3	-	4'-6"								-	
V-2	6	6	-	11'-0"								-	
V-3	4	6	-	10'-0"								-	
S-2	8	3	3	2'-10"		10 3/8"	1'-2 3/8"	10 3/8"	7 1/2"	7 1/2"	2'-5"	45	
S-3	11	3	3	3'-3 5/8"								-	SEE BENDING DTL
TB-1	8	7	17	11'-7 1/8"	2'-2 1/4"	9'-6 7/8"						90	

FRONT VIEW
(V-1 BARS IN STEM AND V-3 BARS IN HAUNCH OMITTED FOR CLARITY)

SIDE VIEW

SECTION A-A



REINFORCING STEEL - DOUBLE TOP UNITS (III)

1. ALL UNITS ON THIS SHEET WILL ONLY BE USED BY APPROVAL OF THE F.D.O.T. STRUCTURES DESIGN OFFICE ON A PROJECT BY PROJECT BASIS.

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: 1703-913-7858
Fx: 1703-913-7859

PRECASTER:
OLDCASTLE PRECAST, INC.
11643 103rd STREET
JACKSONVILLE, FL 32210
Ph: 904-778-2990
Fx: 904-778-2992

NOTE: ALL STEEL REINFORCING BARS SHALL HAVE 2" MIN. CONCRETE COVER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

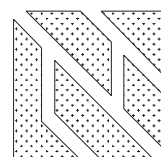
**RETAINING WALL SYSTEM
THE NEEL COMPANY T-WALL
(2" COVER)**

Names	Dates	Approved By		
Designed By	JMC 10/01/98	 State Structures Design Engineer		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	Revision	Sheet No.	Index No.
		00	21 of 21	5011

STANDARD DETAILS

ISOGRID® M.S.E. WALL SYSTEM

DESIGNER



THE NEEL COMPANY

8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER

OLDCASTLE PRECAST, INC.

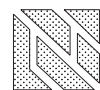
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992

LEGEND

	PANEL WITH ONE SOIL REINFORCEMENT GRID		HORIZONTAL HALF-PANEL WITH ONE SOIL REINFORCEMENT GRID	
	PANEL WITH TWO SOIL REINFORCEMENT GRIDS		VERTICAL HALF-PANEL WITH ONE SOIL REINFORCEMENT GRID	
	PANEL WITH THREE SOIL REINFORCEMENT GRIDS		TL/BR & TR/BL QUARTER PANELS WITH ONE SOIL REINFORCEMENT GRID	
	PANEL WITH FOUR SOIL REINFORCEMENT GRIDS		SPECIAL HEIGHT PANELS (X-1 THRU X-5) WITH ONE SOIL REINFORCEMENT GRID	

DENOTES LIMITS OF DIFFERENT LENGTHS OF SOIL REINF. GRIDS

DESIGNER:



THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

PRECASTER:

OLDCASTLE PRECAST, INC.
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (703) 913-7859

THIS SYSTEM SHALL BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS ONLY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID

	Names	Dates	Approved By		
Designed By	JMC	10/01/98	State Structures Design Engineer		
Drawn By	CAA	10/01/98	Revision	Sheet No.	Index No.
Checked By	JMC	10/01/98	00	1 of 20	5012

*****DGN SPECIFICATION*****
*****SYTIME*****

MISCELLANEOUS NOTES:

1. DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VA 22152
PH: (703) 913-7858
FX: (703) 913-7859
2. PRECASTER:
OLDCASTLE PRECAST INC.
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992
3. MATERIALS SUPPLIED BY PRECASTER:
-PRECAST ISOGRID PANELS
-GALVANIZED SOIL REINFORCEMENT GRID
-GALVANIZED GRID LOCKING BAR
-DIAGONAL JOINT MATERIAL AND ADHESIVE
-VERTICAL JOINT MATERIAL

DESIGN NOTES:

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE RETAINING WALL VOLUME, METHODS OF CONSTRUCTION, AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO SPEC SECTION 548 - RETAINING WALL SYSTEMS.
2. SOIL PARAMETERS:
-SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUE OF ϕ , c AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS
3. FACTORS OF SAFETY:
-OVERTURNING - 2.0
-SLIDING - 1.5
-INTERNAL PULLOUT - 1.5 (ALLOWABLE DEFORMATION 0.75")
-SOIL REINFORCEMENT GRID - 0.47 F_y AT END OF DESIGN LIFE
-BEARING CAPACITY - 2.5
-OVERALL STABILITY - 1.5
4. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL DESIGN DRAWINGS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE OWNER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
5. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE NEEL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY, IS THE RESPONSIBILITY OF OTHERS

MATERIALS NOTES:

1. PRECAST CONCRETE:
-PRECAST ISOGRID PANELS - PER SPEC SECTION 548
-ARCHITECTURAL FINISH SHALL BE PLAIN STEEL FORM FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINING WALL CONTROL PLANS.
2. C.I.P. CONCRETE:
-C.I.P. LEVELING PAD - PER SPEC SECTION 548
-OTHER C.I.P. CONCRETE - PER SPEC SECTION 548
3. REINFORCING STEEL:
-PER SPEC SECTION 548
-6" x 6" WELDED GRID, D8 x D8 WIRE
OR
-#3 REBAR @ 6" O.C. EACH WAY
-WELDED PER ASTM A497 PRIOR TO GALVANIZATION
4. CONNECTION INSERT:
-PER SPEC SECTION 548
-WII WIRE
-WELDED PER ASTM A185 PRIOR TO GALVANIZATION
5. LOCKING BAR:
-PER SPEC SECTION 548
6. SOIL REINFORCEMENT GRIDS:
-PER SPEC SECTION 548
-WII WELDED WIRE GRIDS:
-5 LONGITUDINAL WIRES @ 6" O.C., LENGTH AS REQUIRED BY DESIGN
-2' LONG TRANSVERSE BARS AT 6" OR 12" O.C., AS REQUIRED BY DESIGN
-SOIL GRID LENGTHS SHOWN ON ISOGRID DESIGN DRAWINGS ARE NOMINAL LENGTHS AS REQUIRED BY DESIGN CALCULATIONS. DUE TO MANUFACTURING TOLERANCES, ACTUAL GRID LENGTHS MAY BE LONGER.
7. JOINT MATERIAL:
-DIAGONAL JOINT FILLER:
-1/2" x 4" x 4'-2"
-PREFORMED EPDM
-DUROMETER: 80 - 90
-DIAGONAL JOINT BACKING:
-MIRAFILION OR EQUAL
-12" WIDE x LENGTH OF JOINT
-GEOTEXTILE MEETING REQUIREMENTS OF SPEC SECTION 548
-WEEPHOLE COVER:
-TENSAR DC4205 OR EQUAL
-6" x 6 1/2" (MIN)
-GEOCOMPOSITE MEETING REQUIREMENTS OF SPEC SECTION 548
8. BACKFILL:
-PER SPEC SECTION 548

CONSTRUCTION NOTES:

1. ALL CONSTRUCTION PROCEDURES SHALL COMPLY WITH SPEC SECTION 548-8 AND THE "ISOGRID CONSTRUCTION MANUAL" (PROVIDED BY THE NEEL COMPANY OR OLDCASTLE PRECAST, INC). IN THE EVENT OF A DISCREPANCY BETWEEN THE SPEC AND THE "ISOGRID CONSTRUCTION MANUAL", THE SPEC SHALL CONTROL.
2. FOR LOCATION AND ALIGNMENT OF ISOGRID STRUCTURE, SEE RETAINING WALL CONTROL PLANS.
3. ISOGRID STRUCTURES ON CURVES SHALL BE BUILT IN CHORDS AS SHOWN IN THE ISOGRID DESIGN DRAWINGS.
4. IF MANHOLES OR DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN IN THE ISOGRID DESIGN DRAWINGS.
5. IF PILES ARE LOCATED WITHIN THE RETAINING WALL VOLUME, THEY SHALL BE DRIVEN BEFORE CONSTRUCTION OF THE ISOGRID STRUCTURE UNLESS A METHOD TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE NEEL COMPANY, IS SUBMITTED AND APPROVED IN WRITING.
6. IF A STRUCTURE EXCEEDS 20' IN HEIGHT, THE FINISH GRADE AT THE FACE OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS 20' IN HEIGHT.
7. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN THE RETAINING WALL VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING GRIDS AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
8. TOP PANELS ON WALLS WITH CAST-IN -PLACE COPING SHALL HAVE #4 REBAR PROTRUDING FROM THEIR TOP EDGE.
9. BACKFILL MATERIAL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS FOR MSE WALLS TO A LEVEL OF APPROXIMATELY 2" ABOVE THE CONNECTION INSERT EMBEDDED IN THE PANELS. INSTALLATION OF THE SOIL REINFORCEMENT SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
10. COMPACTION AND OPERATION EQUIPMENT SHALL BE KEPT A MINIMUM DISTANCE OF 3' FROM THE BACK FACE OF THE ISOGRID PANELS. COMPACTION WITHIN 3' OF THE ISOGRID PANEL SHALL BE 90% OF AASHTO T-180.
11. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING GRIDS DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPERATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPERELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.
12. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING STORM WATER DRAINAGE IN THE VICINITY OF THE WALL DURING CONSTRUCTION. STORMWATER RUNOFF SHALL BE COLLECTED AND DISCHARGED AWAY FROM THE WALL AND THE RETAINING WALL VOLUME.

DESIGNER:



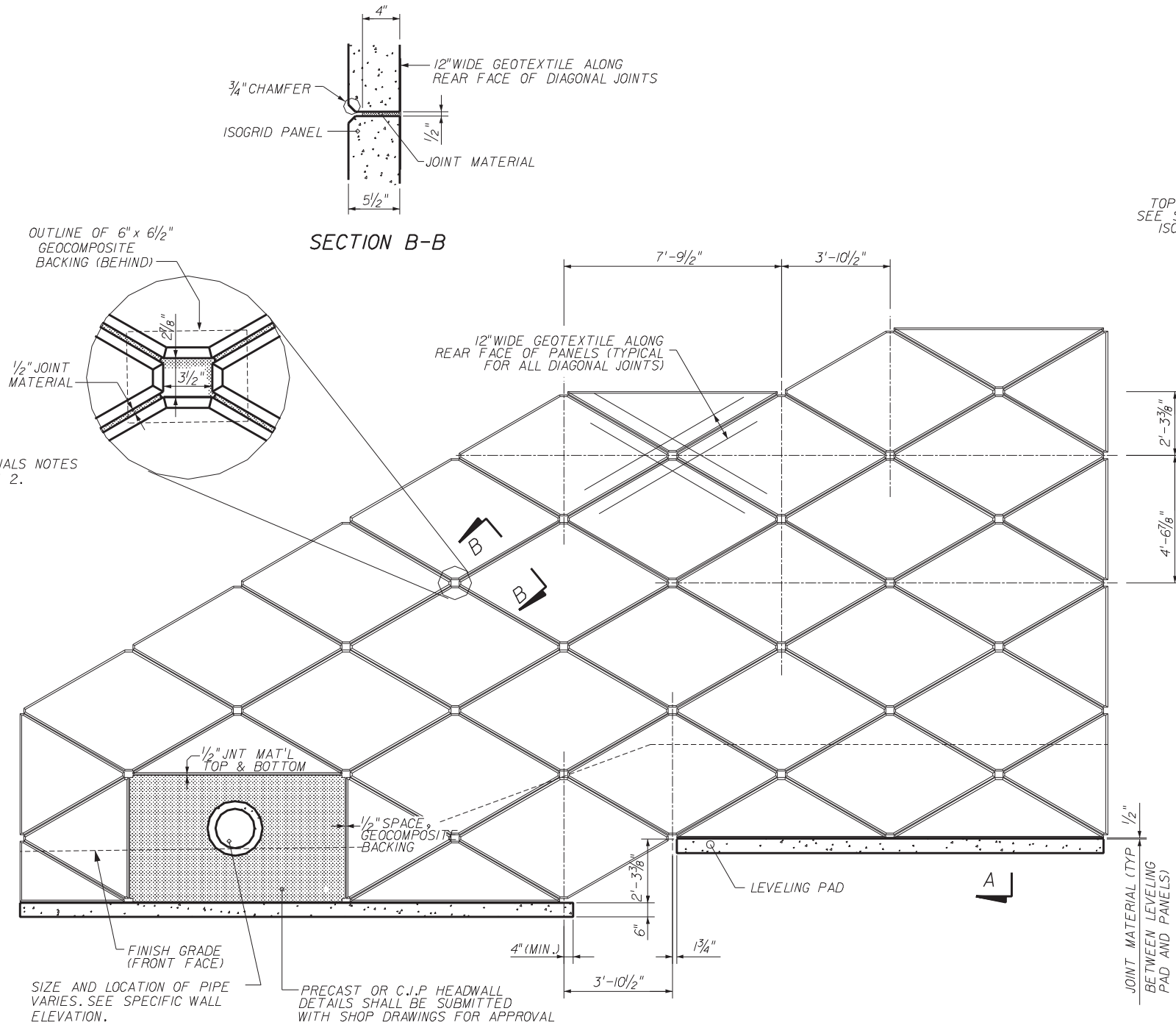
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 1703 913-7858
FX: 1703 913-7859

PRECASTER:

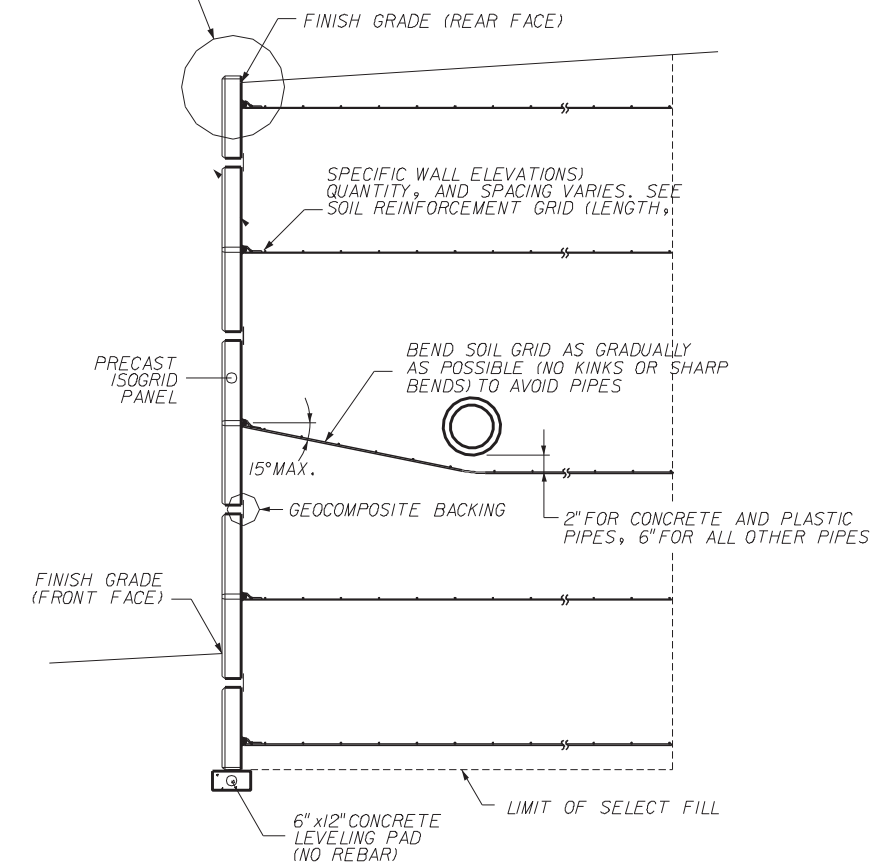
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (904) 778-2992

THIS SYSTEM MAY BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS ONLY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
	Names	Dates	Approved By	
Designed By	JMC	10/01/98	State Roadway Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No. Index No.
Checked By	JMC	10/01/98	00	2 of 20 5012



TOP OF WALL TREATMENT VARIES. SEE SPECIFIC WALL ELEVATIONS AND ISOGRID STANDARD DRAWINGS FOR DETAILS



SECTION A-A SHOWING TYPICAL DETAILS

ELEVATION (FRONT FACE) SHOWING TYPICAL DETAILS

NOTE: FOR MATERIALS NOTES SEE SHEET 2.

SIZE AND LOCATION OF PIPE VARIES. SEE SPECIFIC WALL ELEVATION.
 PRECAST OR C.J.P. HEADWALL DETAILS SHALL BE SUBMITTED WITH SHOP DRAWINGS FOR APPROVAL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

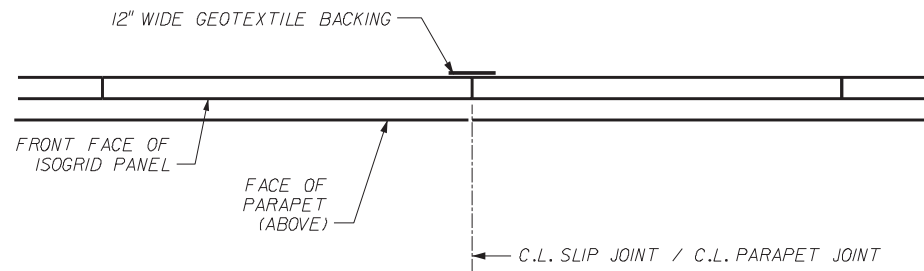
RETAINING WALL SYSTEM
 THE NEEL COMPANY ISOGRID

Names	Dates	Approved By		
Designed By	JMC 03/01/98	 State Structures Design Engineer		
Drawn By	CAA 03/01/98			
Checked By	JMC 03/01/98	00	3 of 20	5012

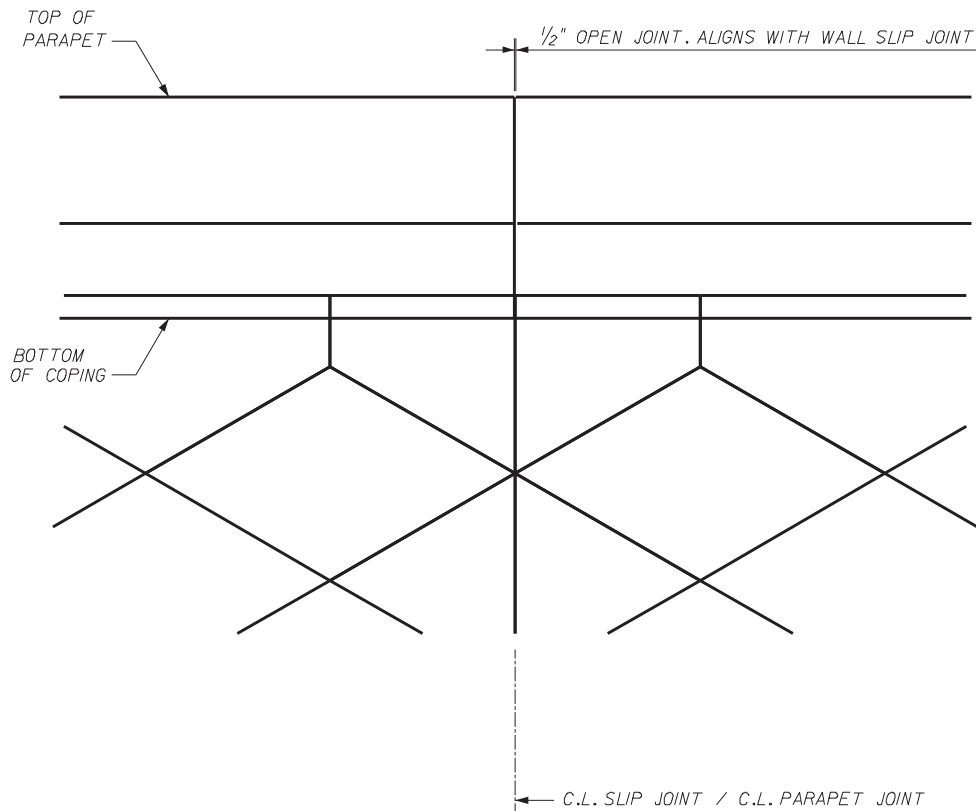
DESIGNER:

THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

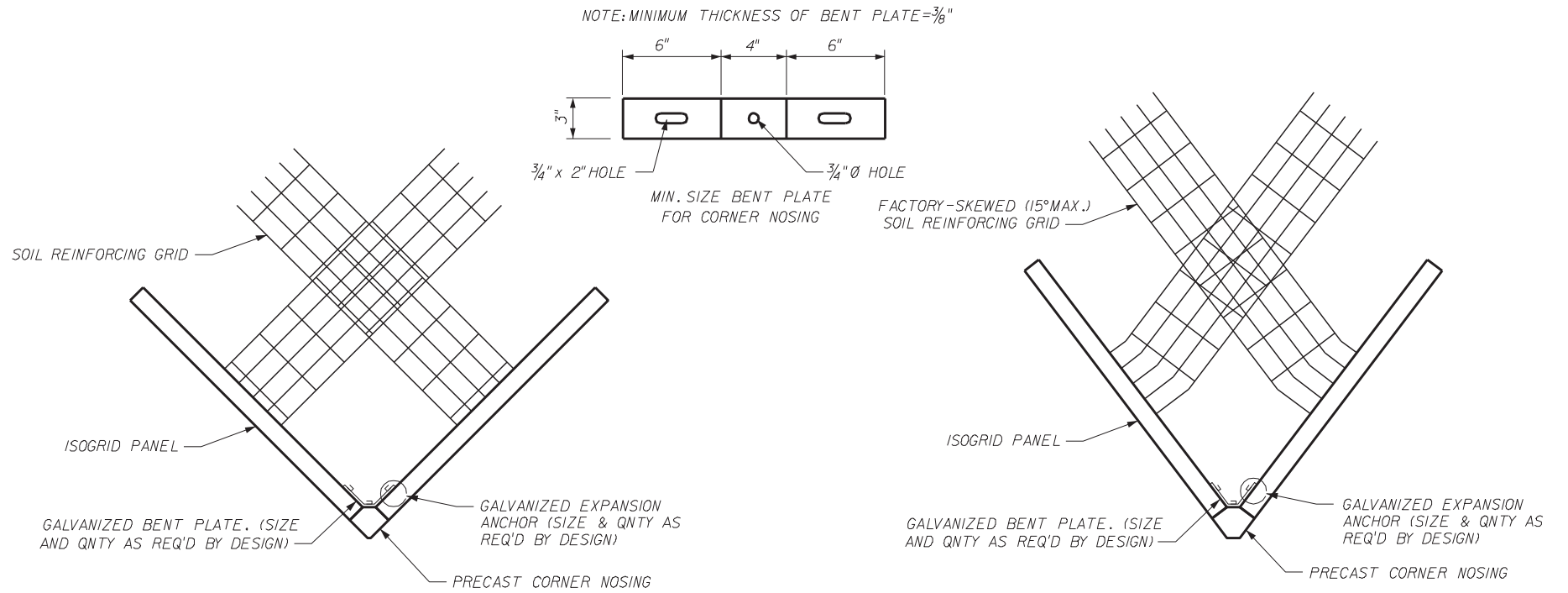
PRECASTER:
OLDCASTLE PRECAST, INC
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (703) 913-7859



PART PLAN
SLIP JOINT DETAIL



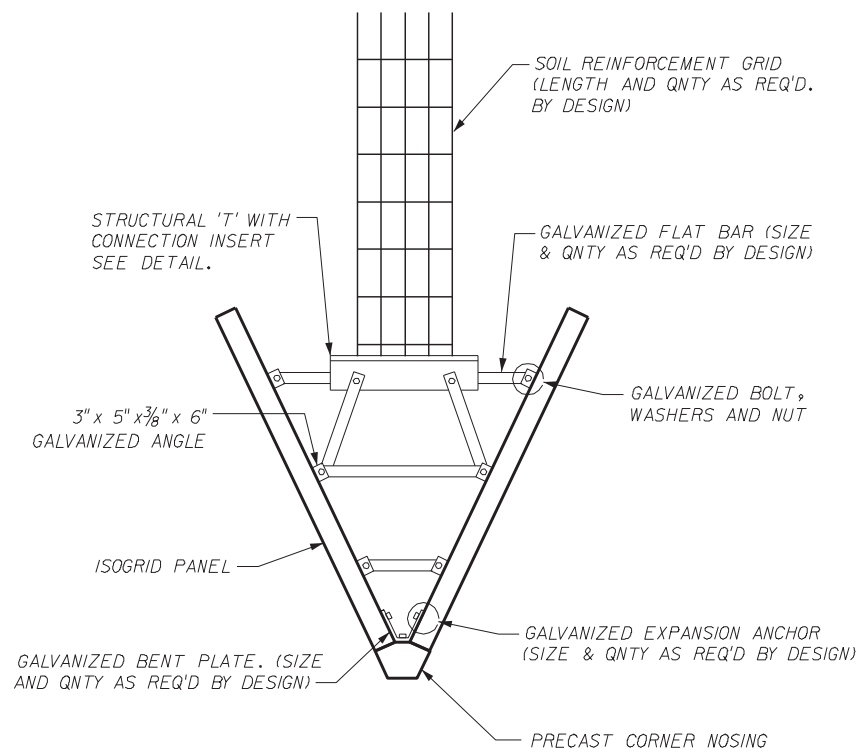
PART ELEVATION
SLIP JOINT DETAIL



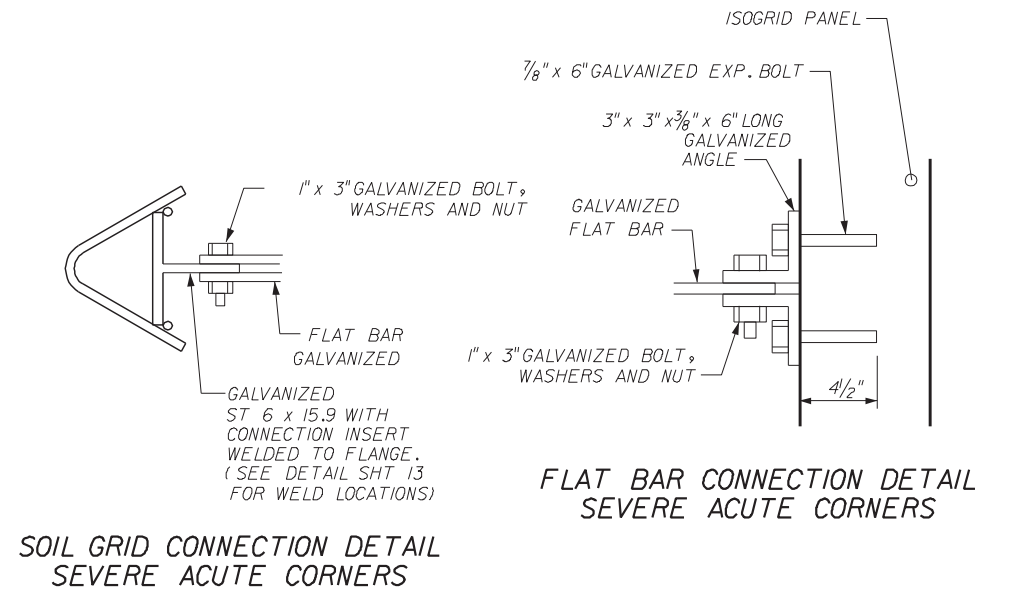
PART PLAN
STD CORNER DETAIL

PART PLAN
MILD (65° MIN.) ACUTE CORNER DETAIL

APPLIES UNTIL GRID CONFLICTS
WITH ADJACENT PANELS



PART PLAN
SEVERE ACUTE CORNER DETAIL



SOIL GRID CONNECTION DETAIL
SEVERE ACUTE CORNERS

FLAT BAR CONNECTION DETAIL
SEVERE ACUTE CORNERS

DESIGNER:



THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 17031 913-7858
FX: 17031 913-7859

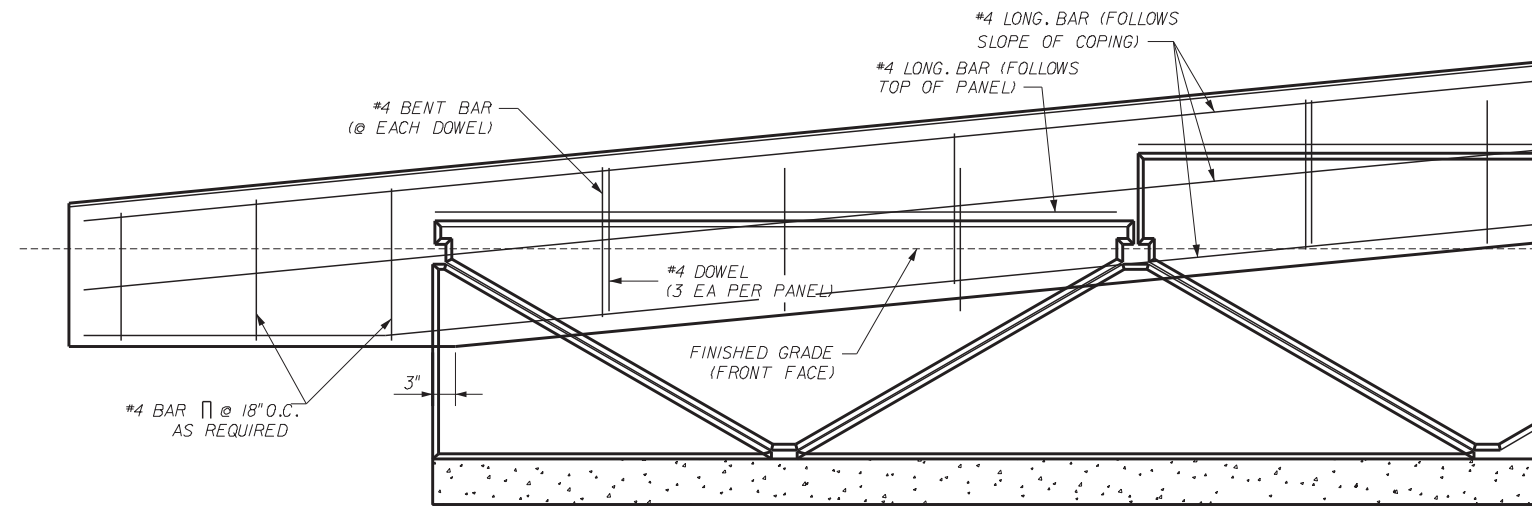
PRECASTER:

OLDCASTLE PRECAST, INC.
11643 103RD STREET
JACKSONVILLE, FL 32210
PH: 19041 778-2990
FX: 17031 913-7859

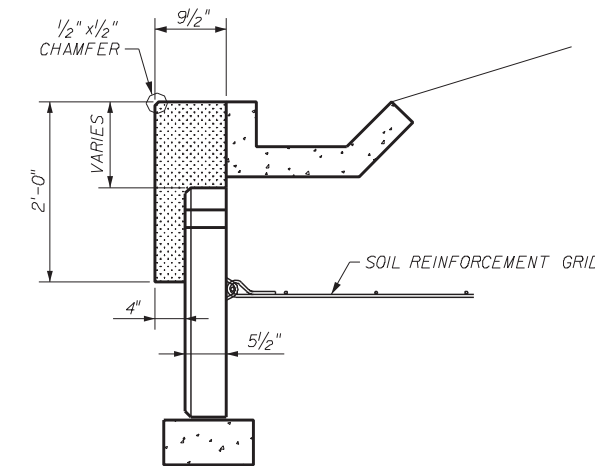
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID

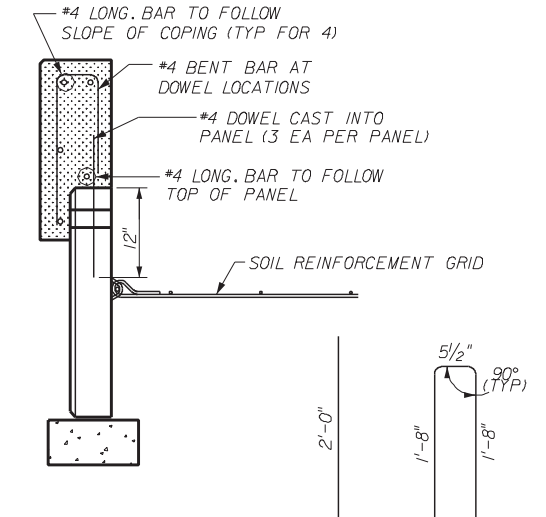
Names	Dates	Approved By		
Designed By	JMC	10/01/98	W. V. [Signature]	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	5 of 20
				5012



C.I.P. COPING TREATMENT AT BEGINNING/END OF WALLS



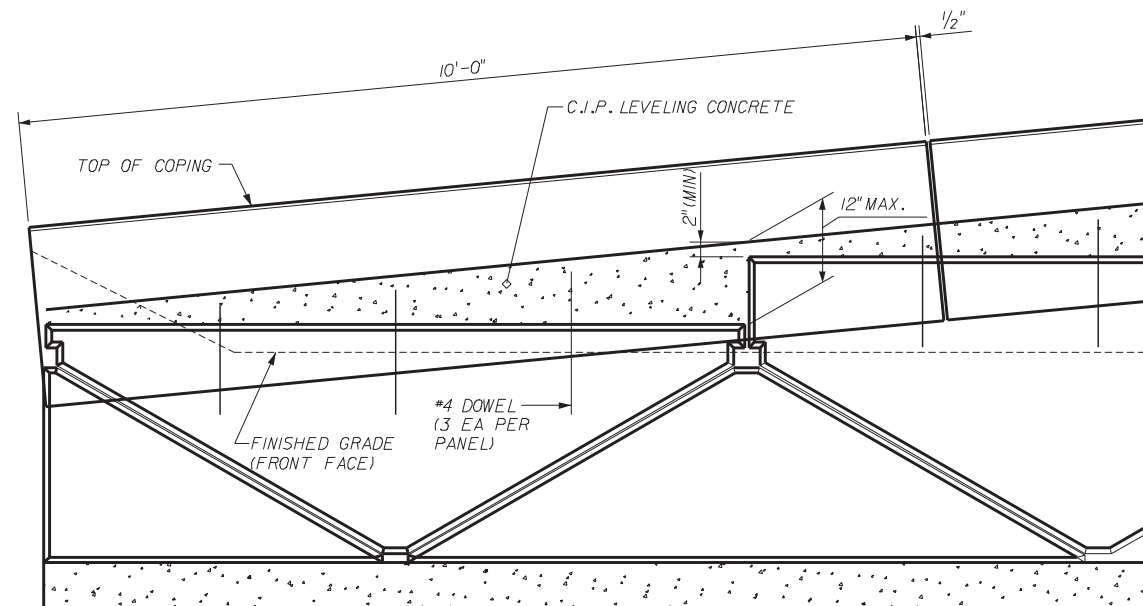
C.I.P. COPING DIMENSIONS



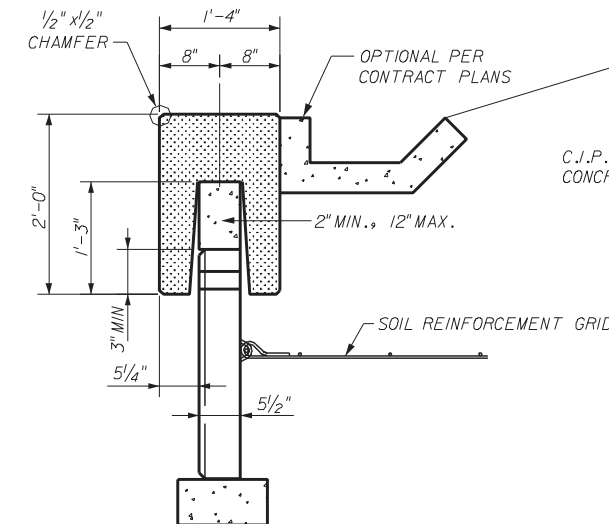
C.I.P. COPING REBAR

#4 DOWEL #4 BENT BAR

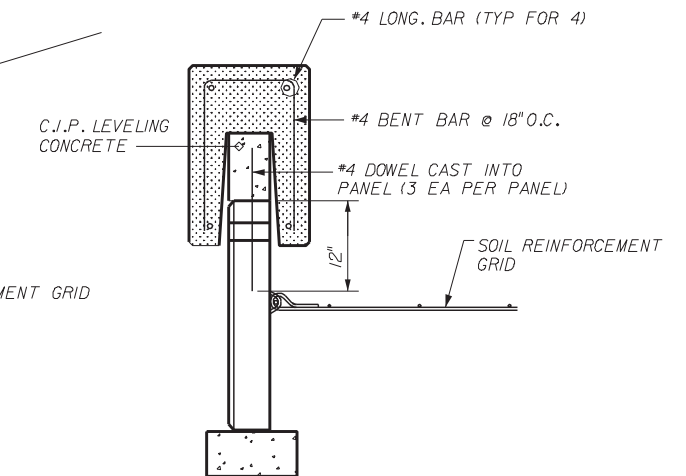
C.I.P. COPING REBAR DETAILS
BENT BAR AND DOWEL TO BE FIELD-TRIMMED AS REQUIRED TO PROVIDE MIN OF 2" OF CONCRETE COVER



PRECAST COPING - PART ELEVATION



PRECAST COPING DIMENSIONS



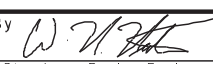
PRECAST COPING REBAR

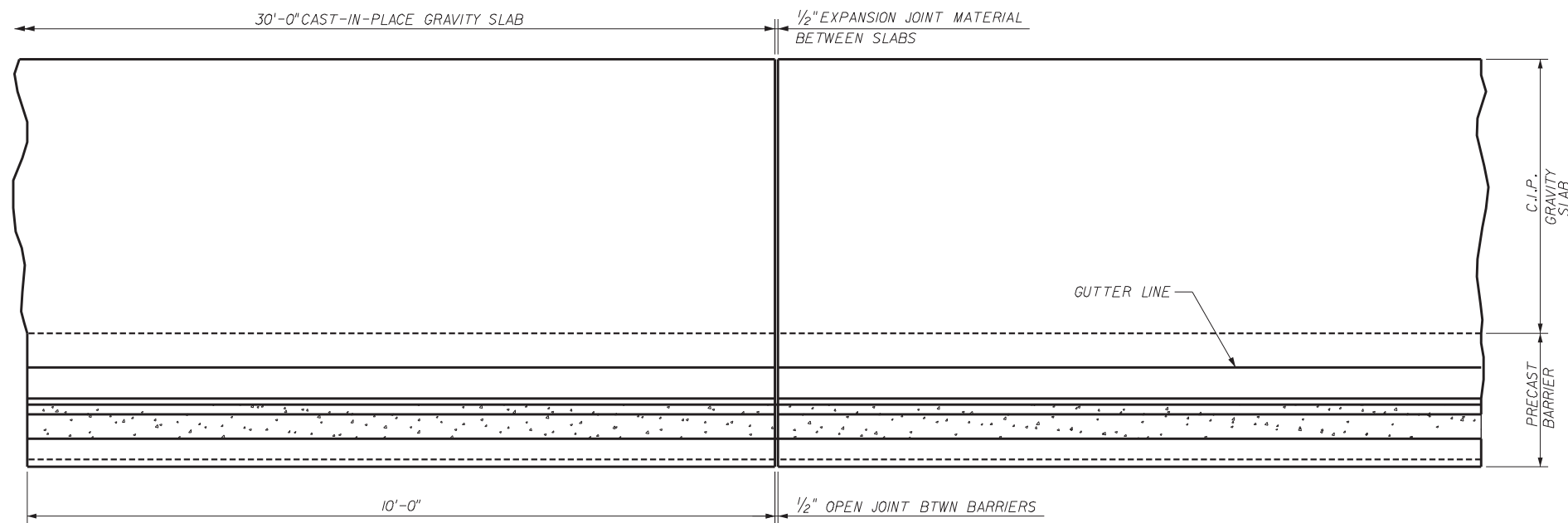
DESIGNER:
THE NEEL COMPANY
8328-D TRAY ORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: 1703 913-7858
FX: 1703 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: 1904 778-2990
FX: 1703 913-7859

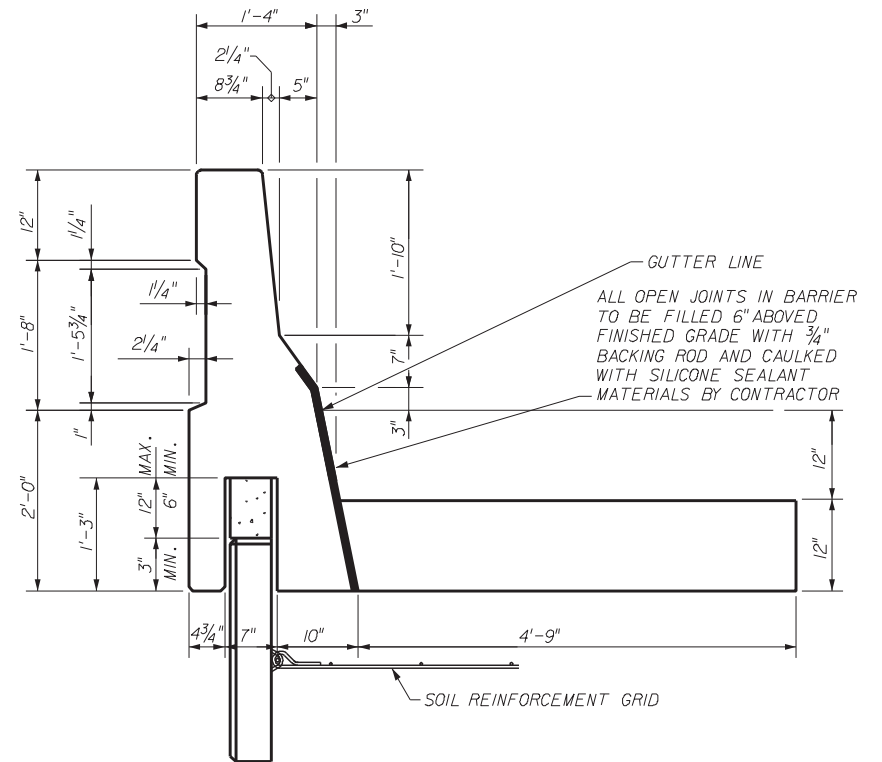
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID**

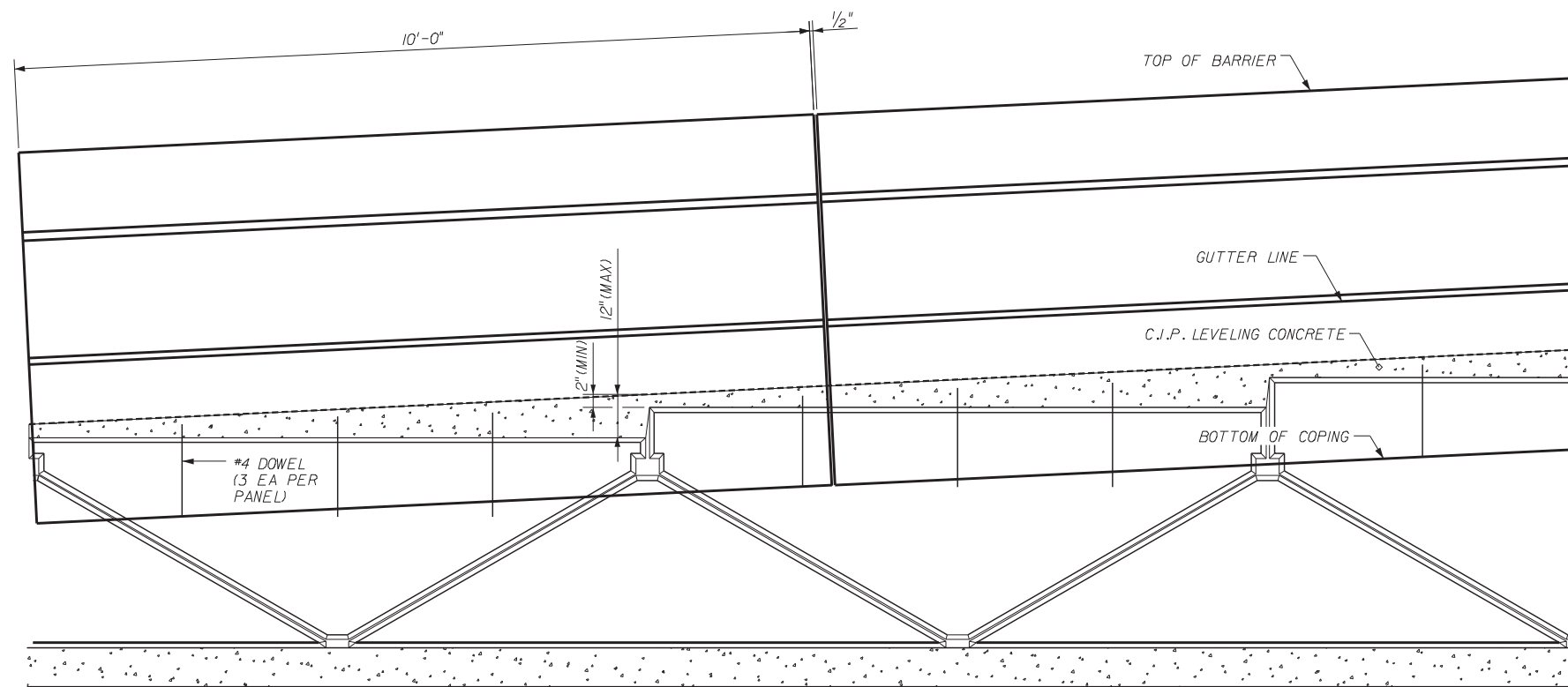
Names	Dates	Approved By		
Designed By	JMC 10/01/98	 State Structures Design Engineer		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	00	6 of 20	5012



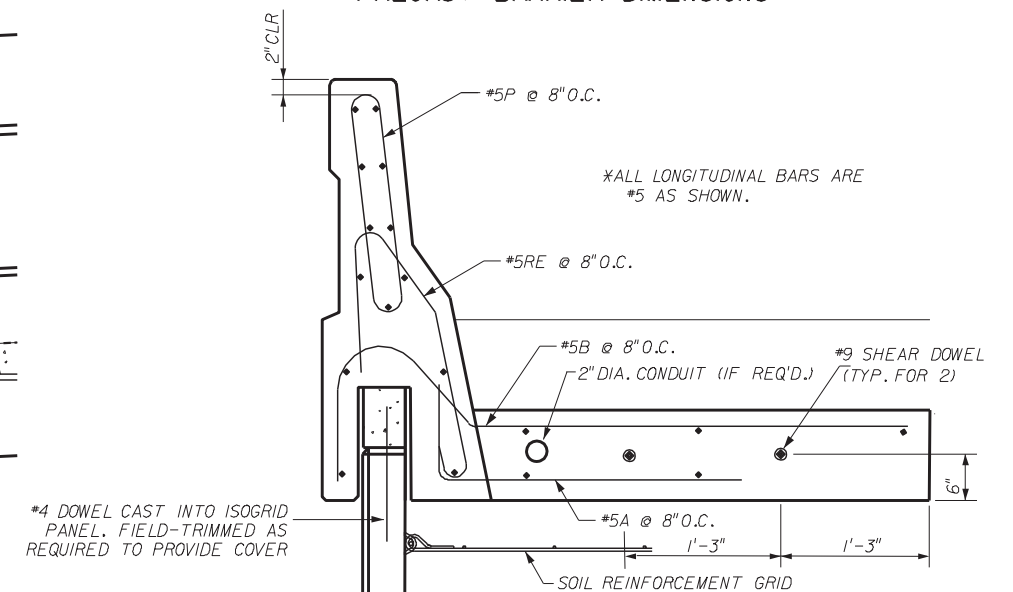
PART PLAN - PRECAST BARRIER



PRECAST BARRIER DIMENSIONS



PART ELEVATION - PRECAST BARRIER



PRECAST BARRIER REBAR

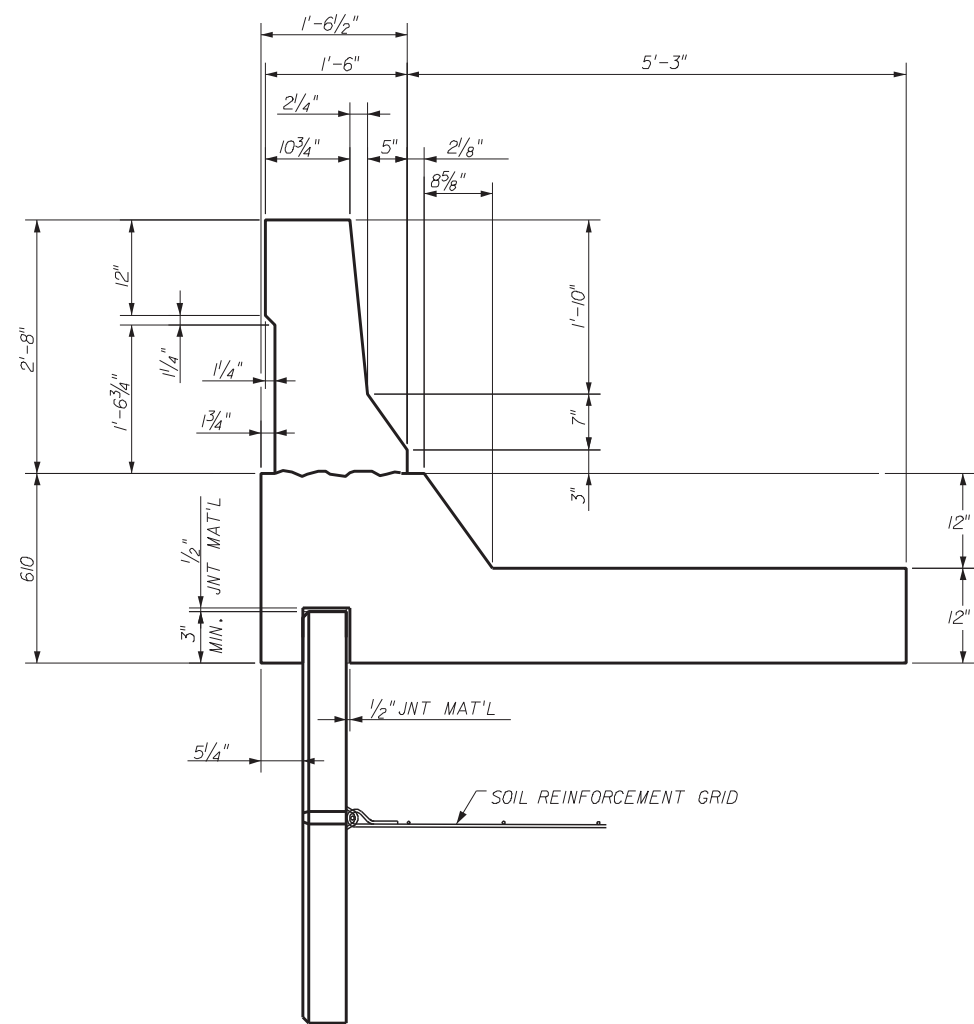
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID

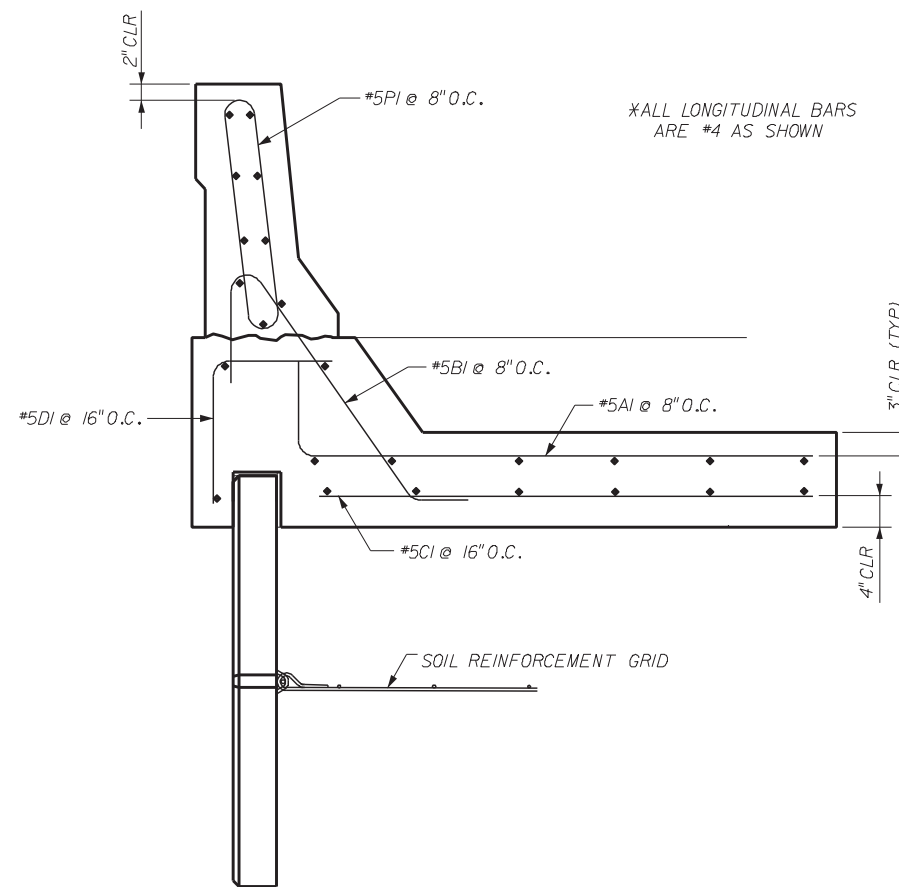
Names	Dates	Approved By	Revision	Sheet No.	Index No.
Designed By	JMC	10/01/98			
Drawn By	CAA	10/01/98			
Checked By	JMC	10/01/98	00	7 of 20	5012

DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
PH: (703) 913-7858
FX: (703) 913-7859

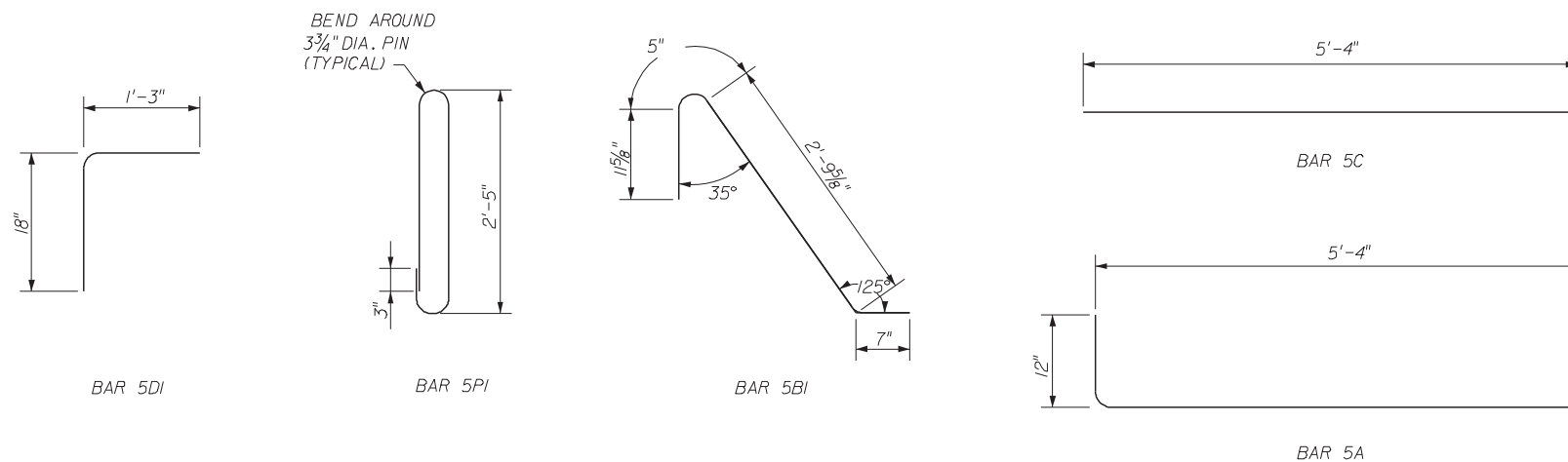
PRECASTER:
OLDCASTLE PRECAST, INC
11643 103RD STREET
JACKSONVILLE, FL 32210
PH: (904) 778-2990
FX: (703) 913-7859



C.I.P. BARRIER AND C.I.P. JUNCTION SLAB DIMENSIONS




C.I.P. BARRIER AND C.I.P. JUNCTION SLAB REBAR

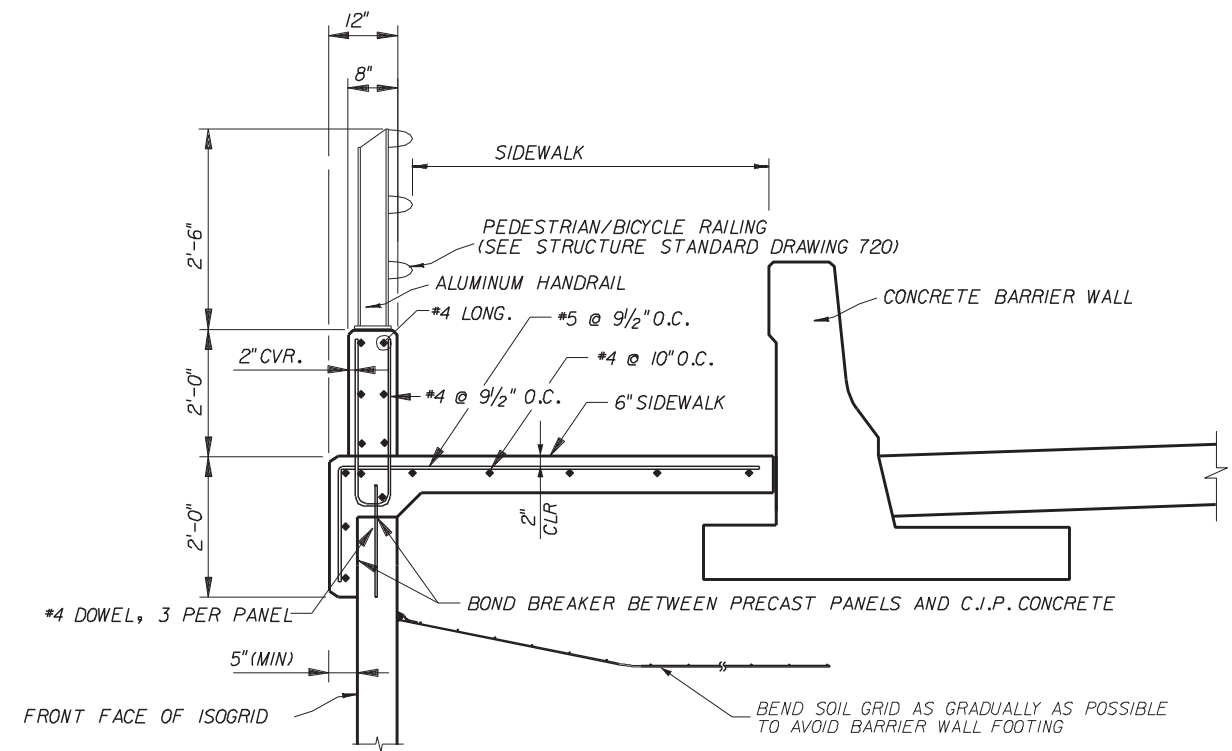


C.I.P. BARRIER REBAR DETAILS

DESIGNER:
 THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
 OLDCASTLE PRECAST, INC
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	8 of 20
				Index No. 5012



C.J.P. PARAPET DETAIL W/ HANDRAIL

DESIGNER:



THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7859
 FX: (703) 913-7859

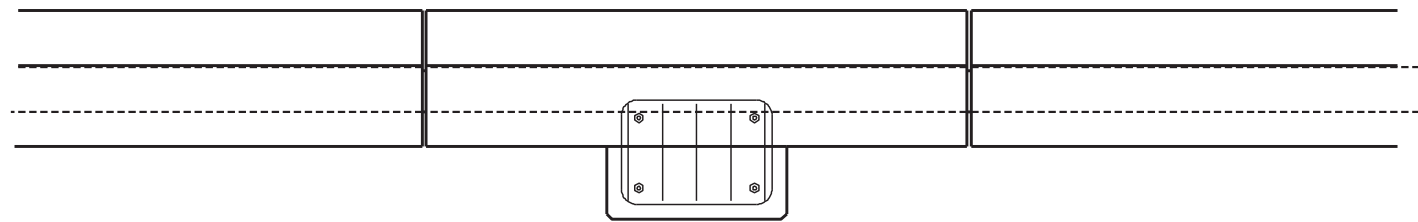
PRECASTER:

OLDCASTLE PRECAST, INC
 11643 103RD STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

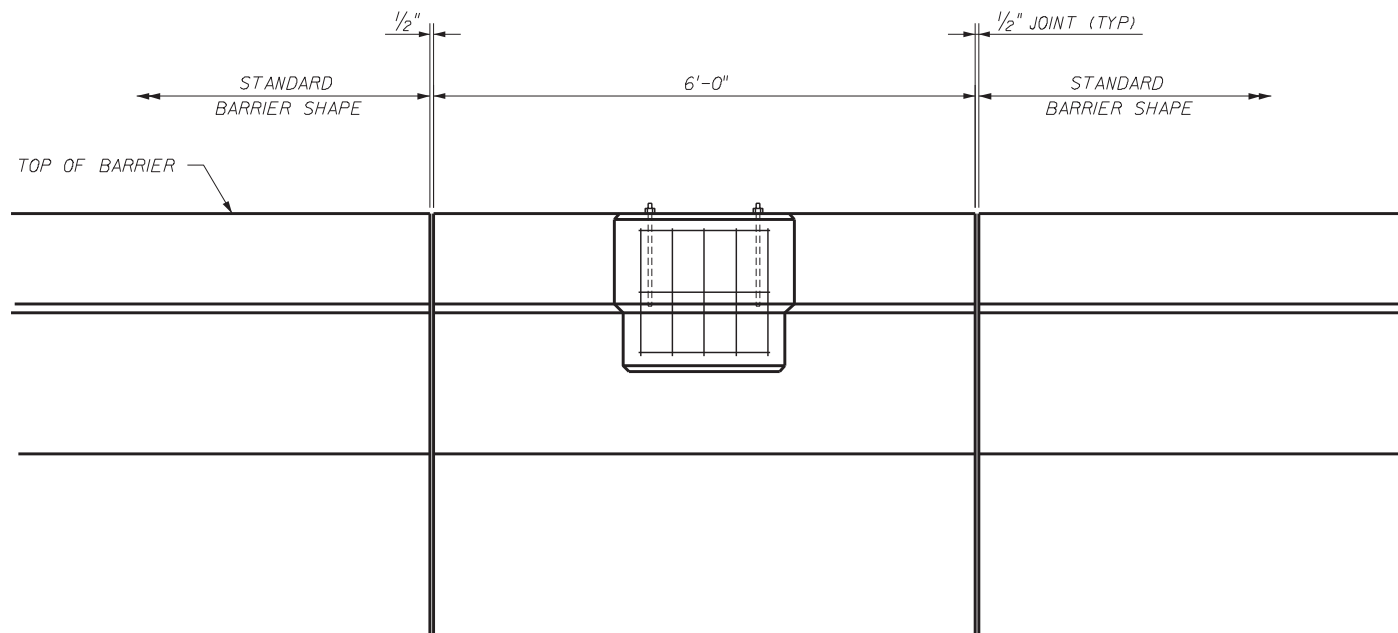
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

**RETAINING WALL SYSTEM
 THE NEEL COMPANY ISOGRID**

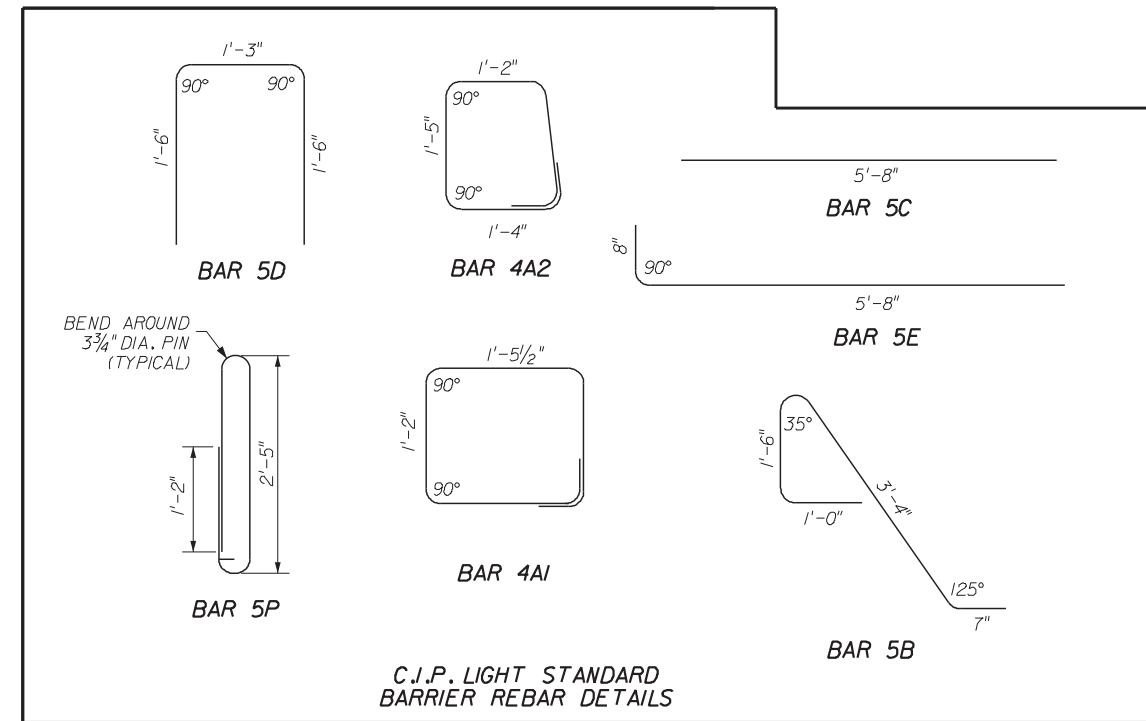
Names	Dates	Approved By <i>W. H. [Signature]</i>		
Designed By	JMC 10/01/98	State Structures Design Engineer		
Drawn By	CAA 10/01/98	Revision	Sheet No.	Index No.
Checked By	JMC 10/01/98	00	9 of 20	5012



C.J.P. LIGHT STANDARD BARRIER - PART PLAN WITH REBAR
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)

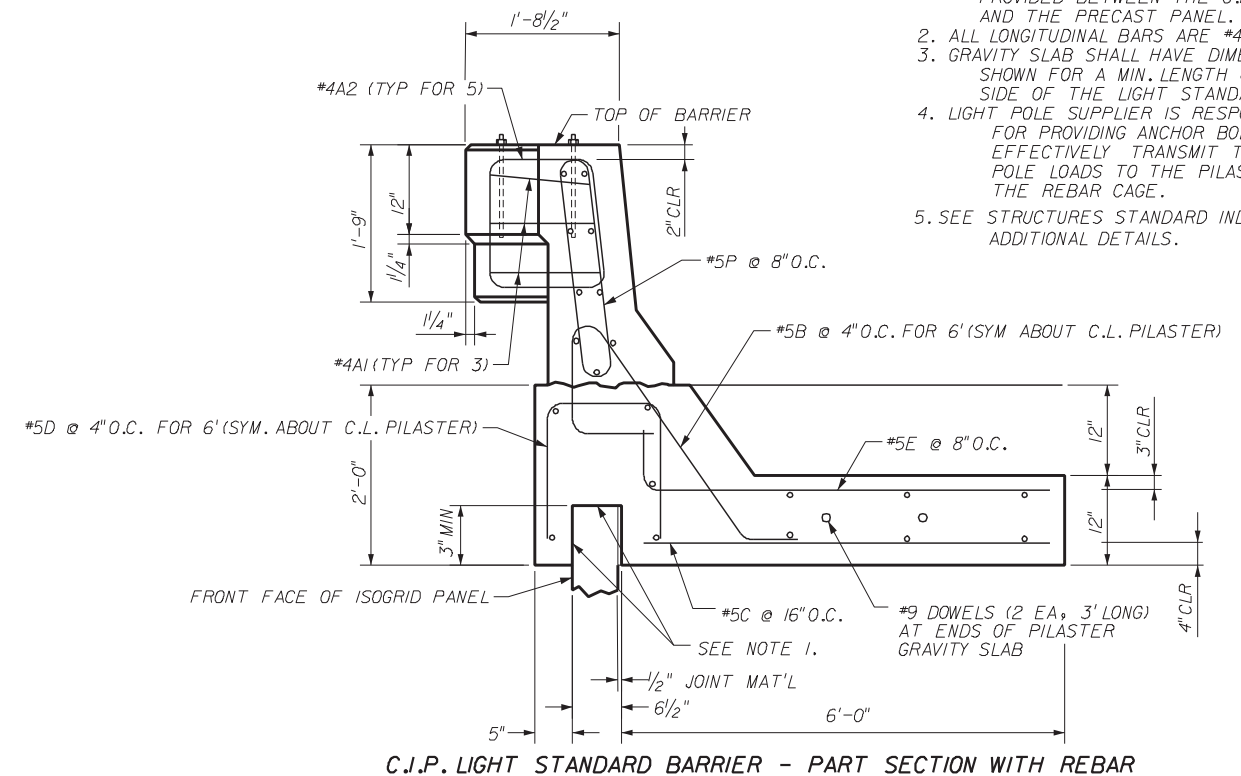


C.J.P. LIGHT STANDARD BARRIER - PART ELEVATION
(BARRIER AND GRAVITY SLAB REBAR OMITTED FOR CLARITY)




C.J.P. LIGHT STANDARD BARRIER REBAR DETAILS

- NOTES
1. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN THE C.J.P. CONC. AND THE PRECAST PANEL.
 2. ALL LONGITUDINAL BARS ARE #4 AS SHOWN.
 3. GRAVITY SLAB SHALL HAVE DIMENSIONS SHOWN FOR A MIN. LENGTH OF 10'-0" EITHER SIDE OF THE LIGHT STANDARD BARRIER.
 4. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REBAR CAGE.
 5. SEE STRUCTURES STANDARD INDEX 500 FOR ADDITIONAL DETAILS.



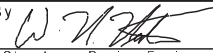
C.J.P. LIGHT STANDARD BARRIER - PART SECTION WITH REBAR

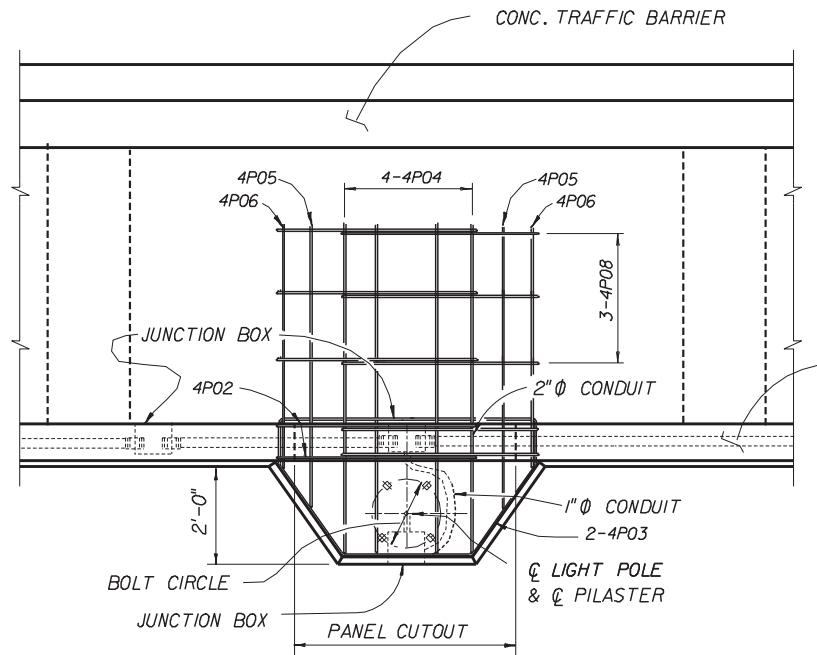
DESIGNER:

THE NEEL COMPANY
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC.
 11643 10314 STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

RETAINING WALL SYSTEM
 THE NEEL COMPANY ISOGRID

Names	Dates	Approved By		
Designed By	JMC 10/01/98	 State Structures Design Engineer		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	00	10 of 20	5012



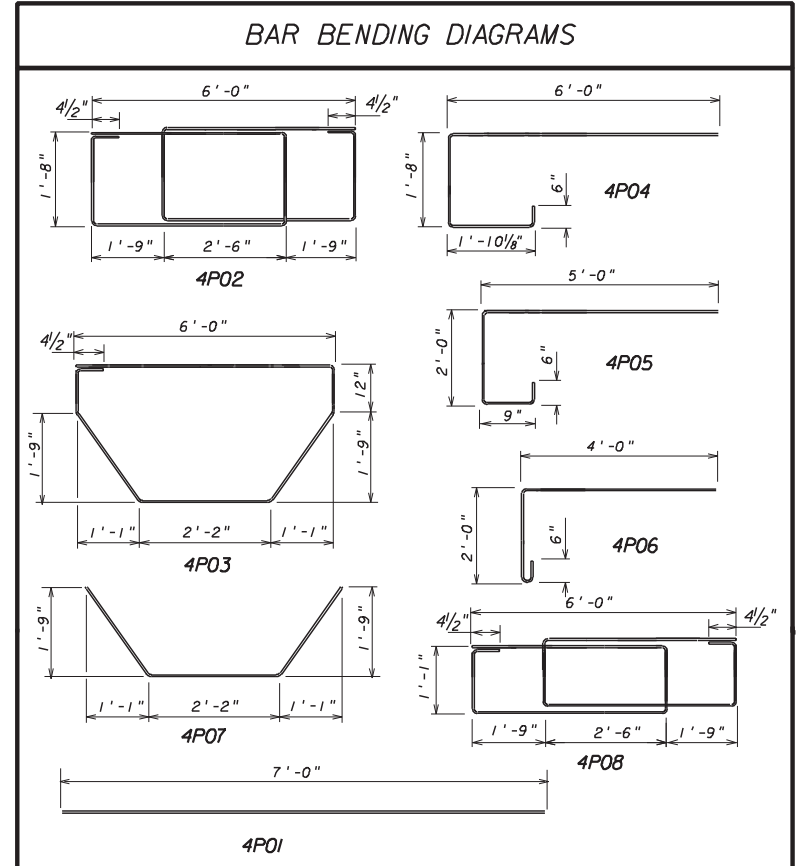
NOTES

- ADDITIONAL CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTER SHALL MEET THE SAME REQUIREMENTS AS THAT OF THE PARAPET WALL.
- TOP OF PILASTER SHALL BE FINISHED TO A TRULY LEVEL AREA.
- LIGHT POLE PILASTER IS DESIGNED TO RESIST WORKING LOADS (IN ANY DIRECTION) FROM THE LIGHT POLE APPLIED AT THE TOP OF THE PILASTER AS FOLLOWS:

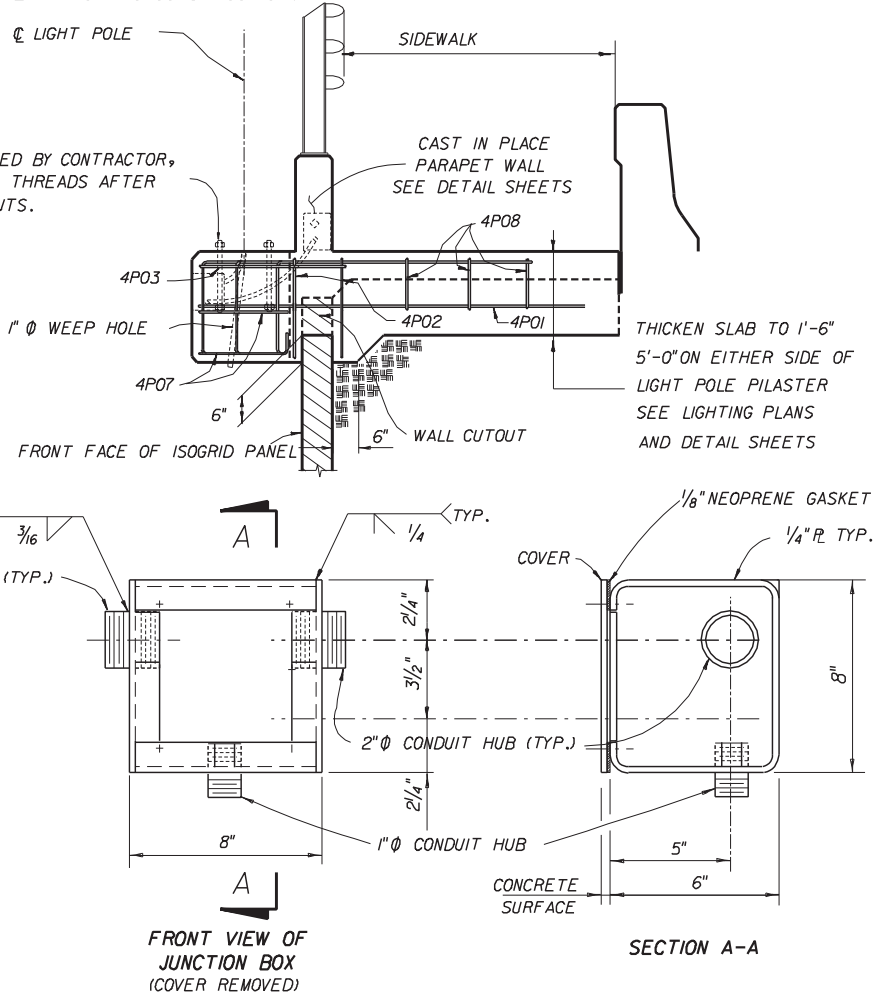
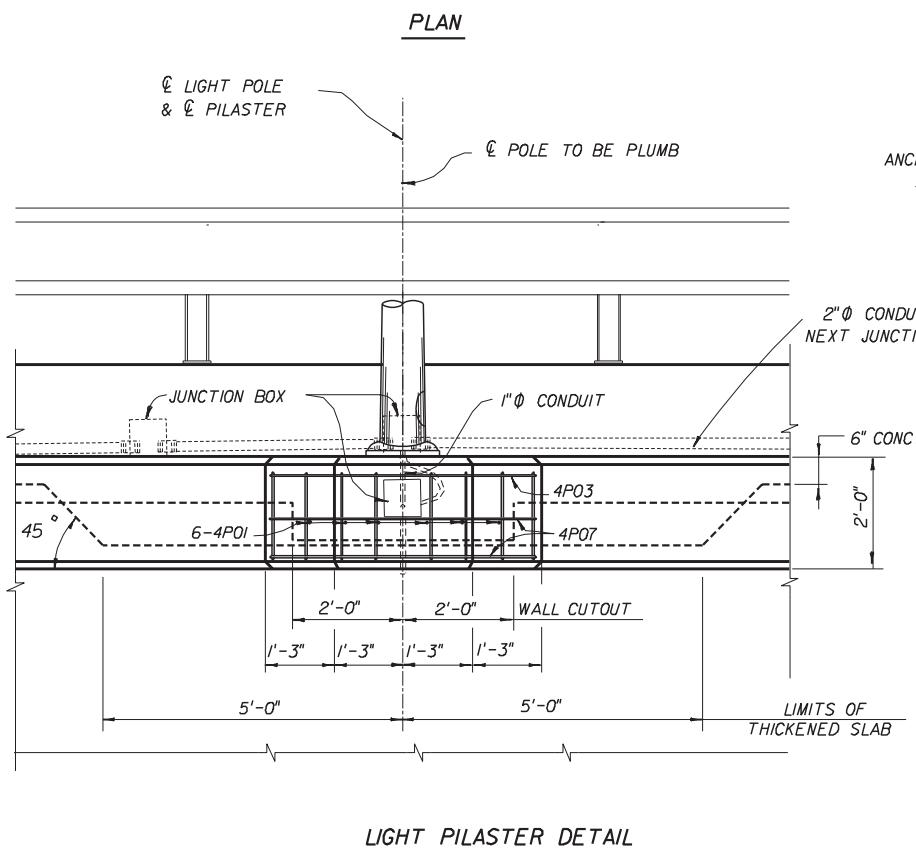
LONGITUDINAL MOMENT	=	30,000 FT. POUND
TRANSVERSE MOMENT	=	6,000 FT. POUND
LONGITUDINAL SHEAR	=	1,000 POUND
TRANSVERSE SHEAR	=	200 POUND
TORSION	=	3,000 FT. POUNDS
AXIAL	=	400 POUNDS

IF THE LIGHT POLE PROVIDED APPLIES LOADS THAT ARE IN EXCESS OF THOSE SHOWN ABOVE, THE CONTRACTOR SHALL REDESIGN THE PILASTER AND SUBMIT HIS DESIGN TO THE DEPARTMENT FOR REVIEW. THE CONTRACTOR'S REDESIGN SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA, AND QUALIFIED TO PERFORM THE WORK.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND THAT FIT THE REINFORCING CAGE. CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA SHALL BE SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT FOR REVIEW AND APPROVAL SHOWING THAT THESE REQUIREMENTS HAVE BEEN MET PRIOR TO CONSTRUCTION.

- STEEL FOR JUNCTION BOXES SHALL CONFORM WITH ASTM-A36. THE BOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. IN LIEU OF STEEL BOXES THE CONTRACTOR MAY SUBMIT FOR APPROVAL MOLDED P.V.C. BOXES (SCHEDULE 80).
- ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL OR SCHEDULE 80 P.V.C.
- THE COST OF ANCHOR BOLTS SHALL BE INCLUDED IN THE BID PRICE FOR LIGHT POLES.
- PAYMENT: THE COST OF ALL LABOR, CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONSTRUCTION OF THE PILASTERS AND ALL CONDUITS, EXPANSION COUPLINGS, JUNCTION BOXES AND MISCELLANEOUS HARDWARE REQUIRED FOR COMPLETION OF THE ELECTRICAL INSTALLATION WITHIN THE LIMITS SHOWN ON THIS SHEET, SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE FOR THE MSE WALLS.



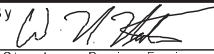
BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
4P01	4	6	7'-0"
4P02	4	2	24'-5"
4P03	4	1	14'-9"
4P04	4	4	9'-8"
4P05	4	2	7'-11"
4P06	4	2	6'-2"
4P07	4	2	6'-4"
4P08	4	3	22'-1"

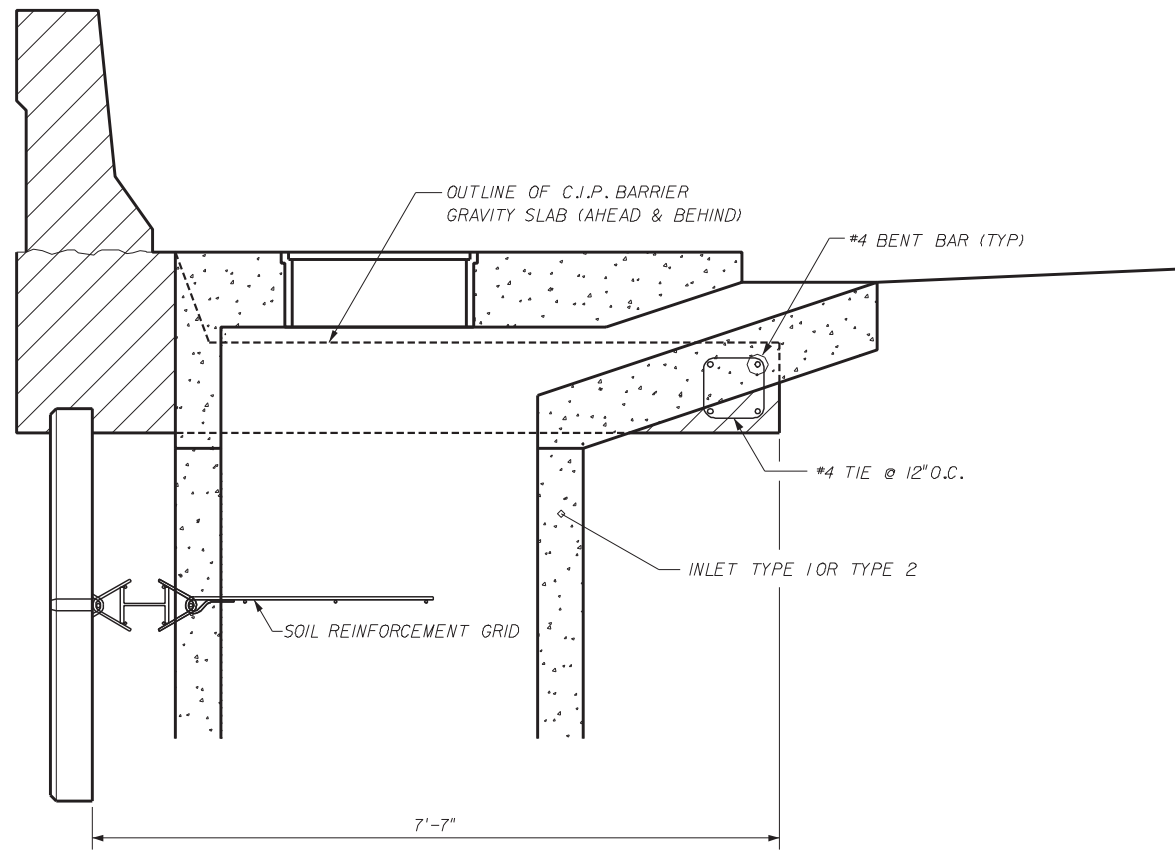


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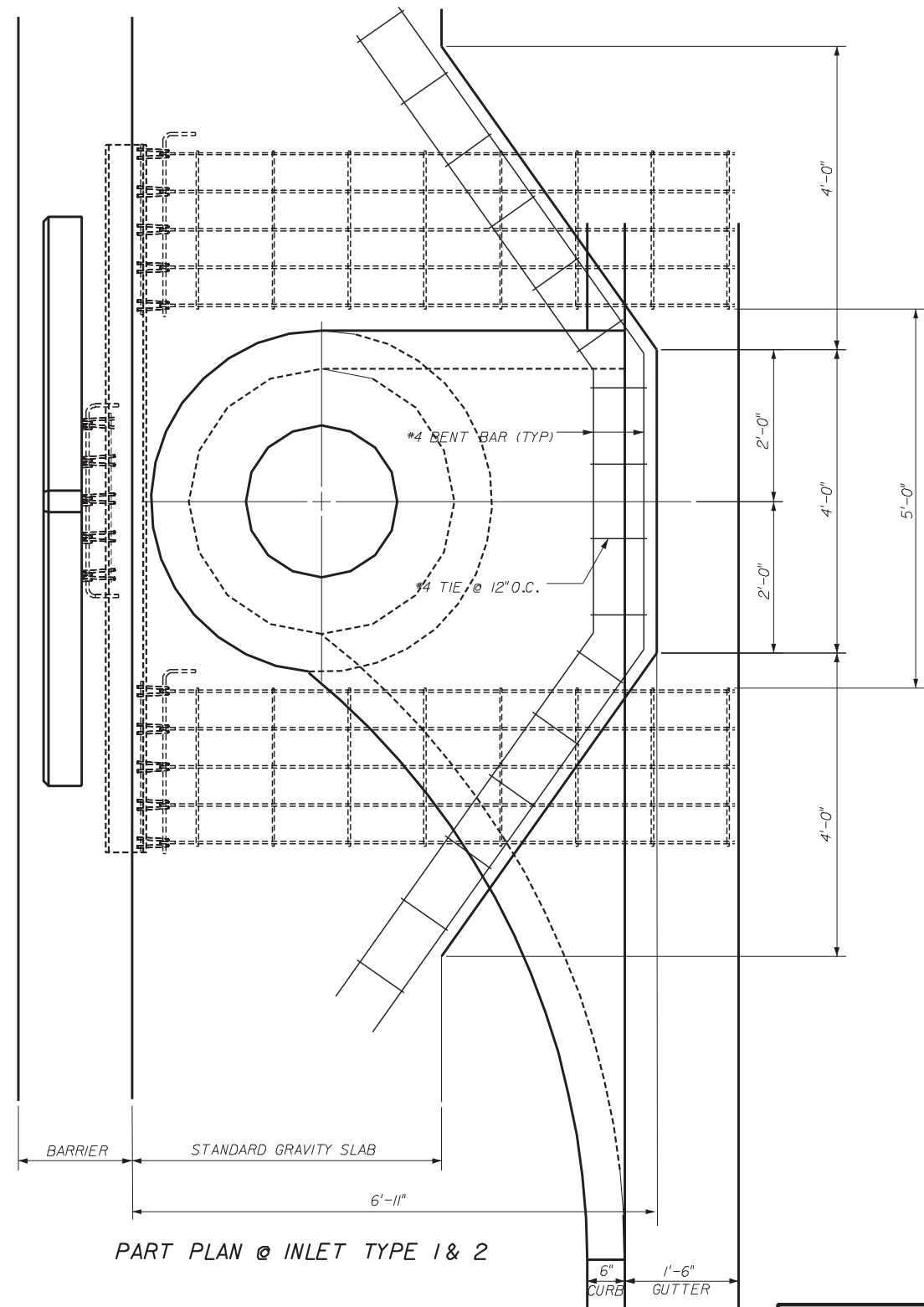
THE NEEL COMPANY
 8328 D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: 1703/913-7858
 FX: 1703/913-7859

PRECASTER:
OLDCASTLE PRECAST, INC.
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: 1904/778-2990
 FX: 1904/778-2992

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	11 of 20
			Index No.	5012



PART SECTION @ INLET TYPE 1 & 2
 NOTE: GRID RELOCATION HARDWARE, SEE SHEET 13 OF 20 FOR DETAILS

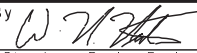


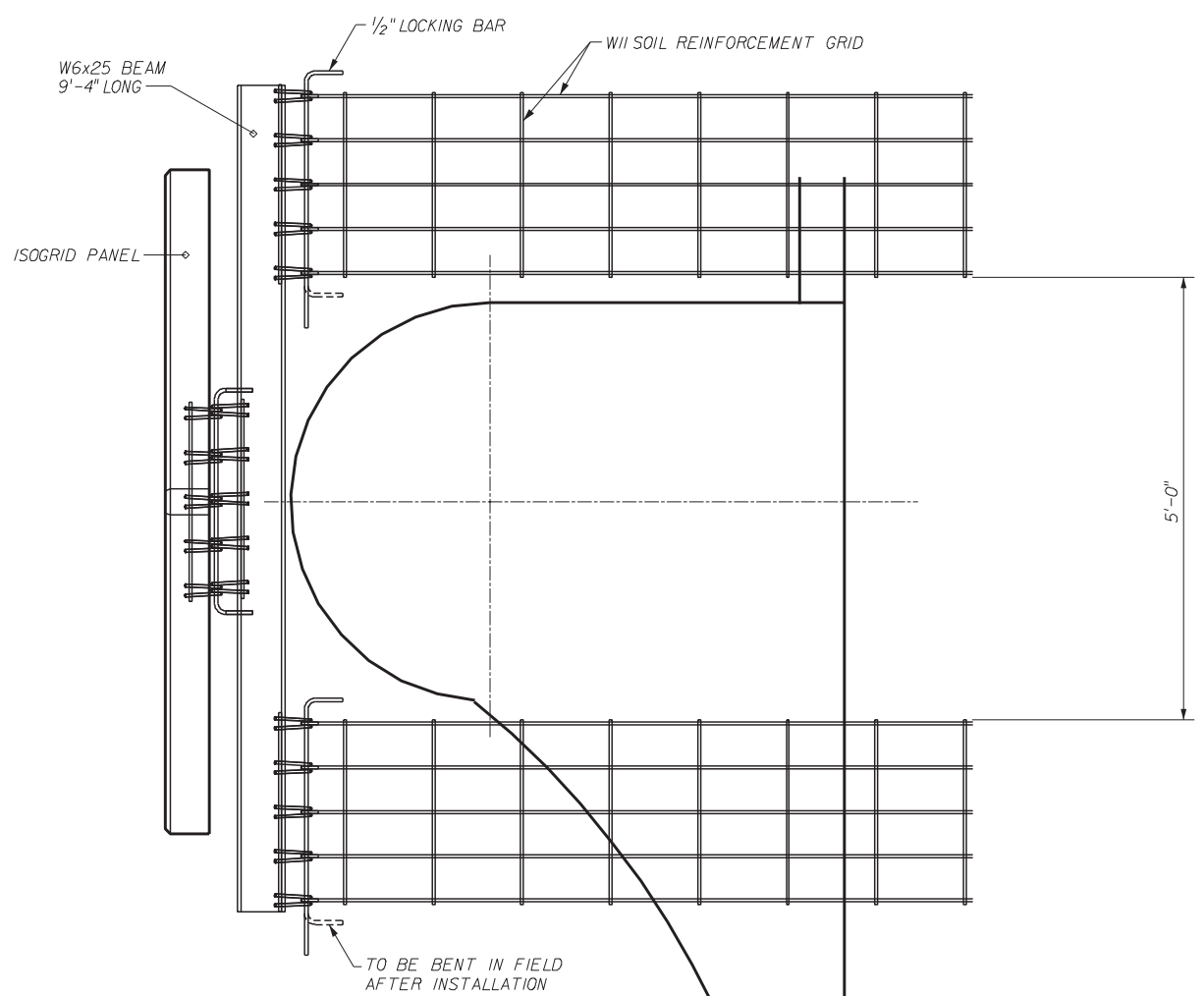
PART PLAN @ INLET TYPE 1 & 2

GRAVITY SLAB AT INLET TYPE 1 & 2

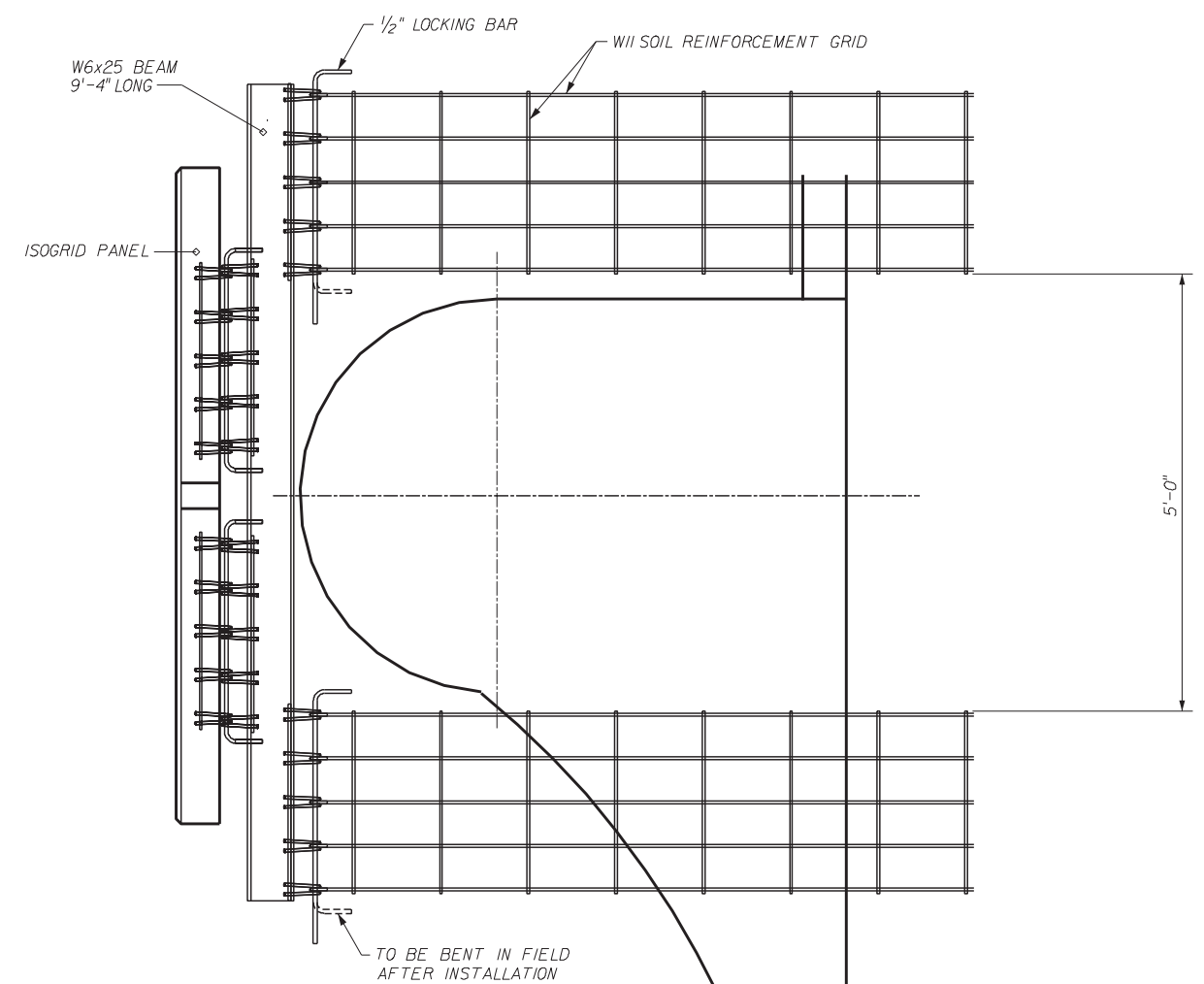
DESIGNER:
 **THE NEEL COMPANY**
 8328-D TRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

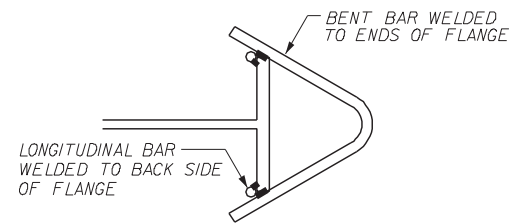
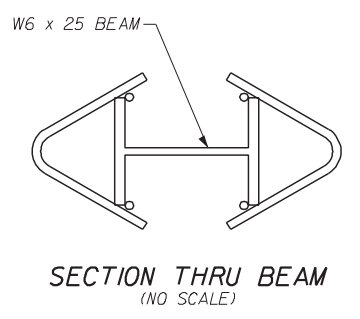
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Drawn By	CAA	10/01/98	Revision	Sheet No.
Checked By	JMC	10/01/98	00	12 of 20
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SOIL GRID RELOCATION HARDWARE
FOR SINGLE GRID PANEL
(2 ea. REQUIRED)



SOIL GRID RELOCATION HARDWARE
FOR DOUBLE GRID PANEL
(3 ea. REQUIRED)



- NOTES:
1. WELDING:
*CONNECTION INSERTS TO BE WELDED TO W6 x 25 BEAM.
 2. GALVANIZATION:
*AFTER FABRICATION, BEAM/INSERT ASSEMBLY TO BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 (AASHTO M111-80)

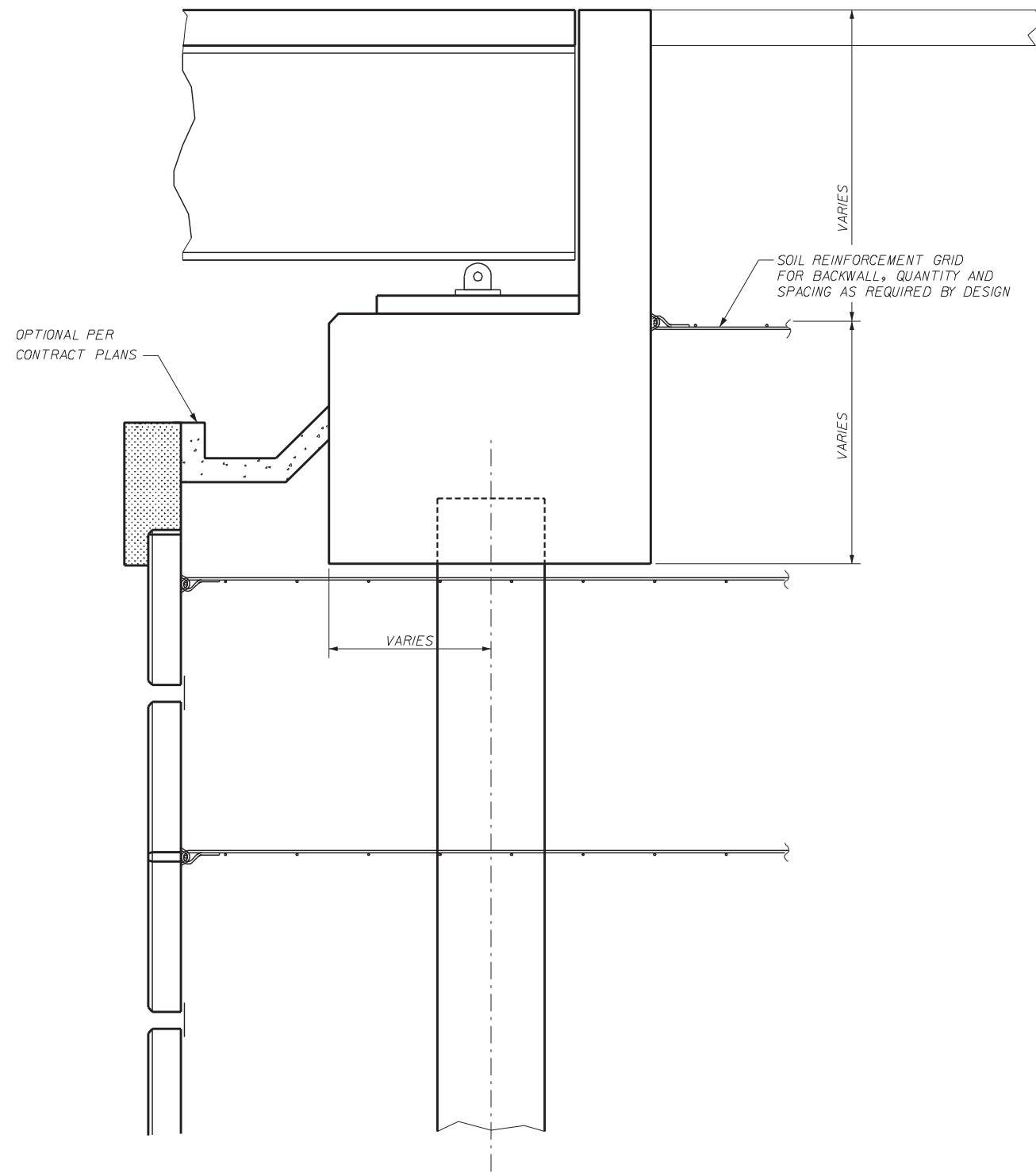
DESIGNER:
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SPRINGFIELD, VIRGINIA 22152
PH: 703/913-7858
FX: 703/913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
PH: 904/778-2990
FX: 904/778-2992

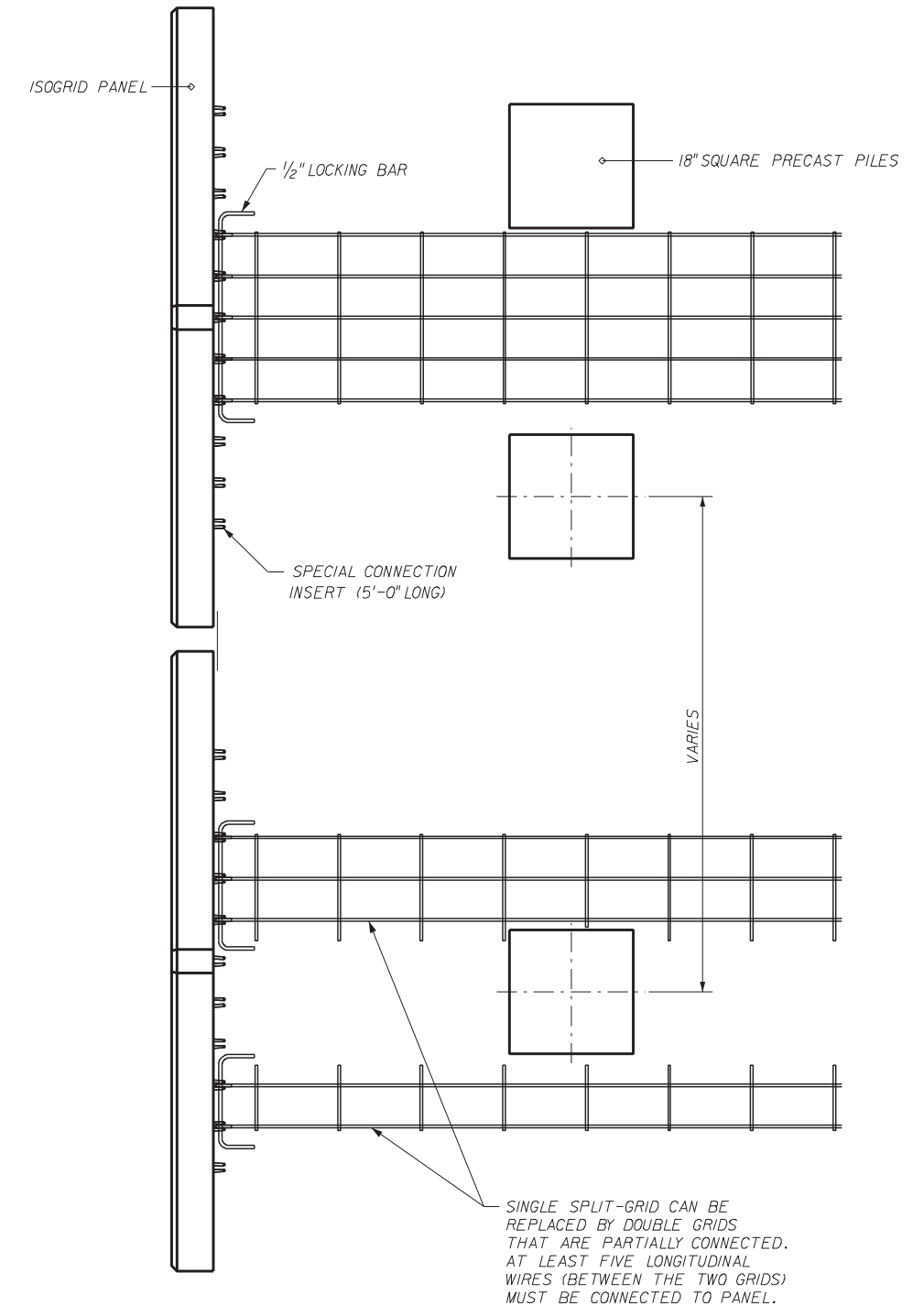
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID

Names	Dates	Approved By		
Designed By	JMC 10/01/98	 State Structures Design Engineer		
Drawn By	CAA 10/01/98			
Checked By	JMC 10/01/98	00	13 of 20	5012



SECTION THRU ABUTMENT

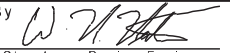


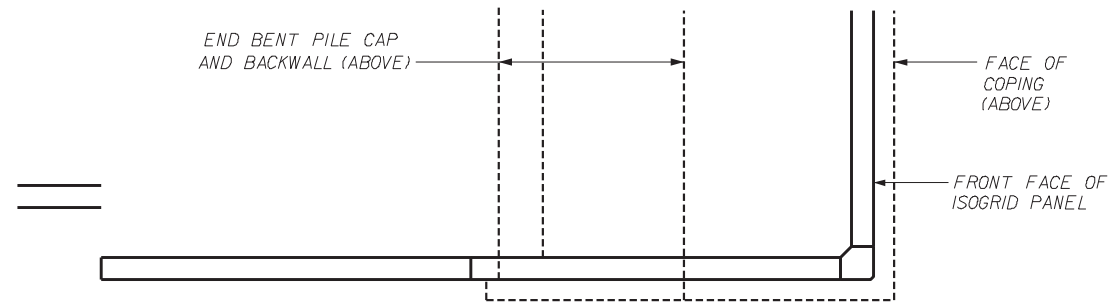
PLAN VIEW OF GRID/PILE ARRANGEMENT

DESIGNER:

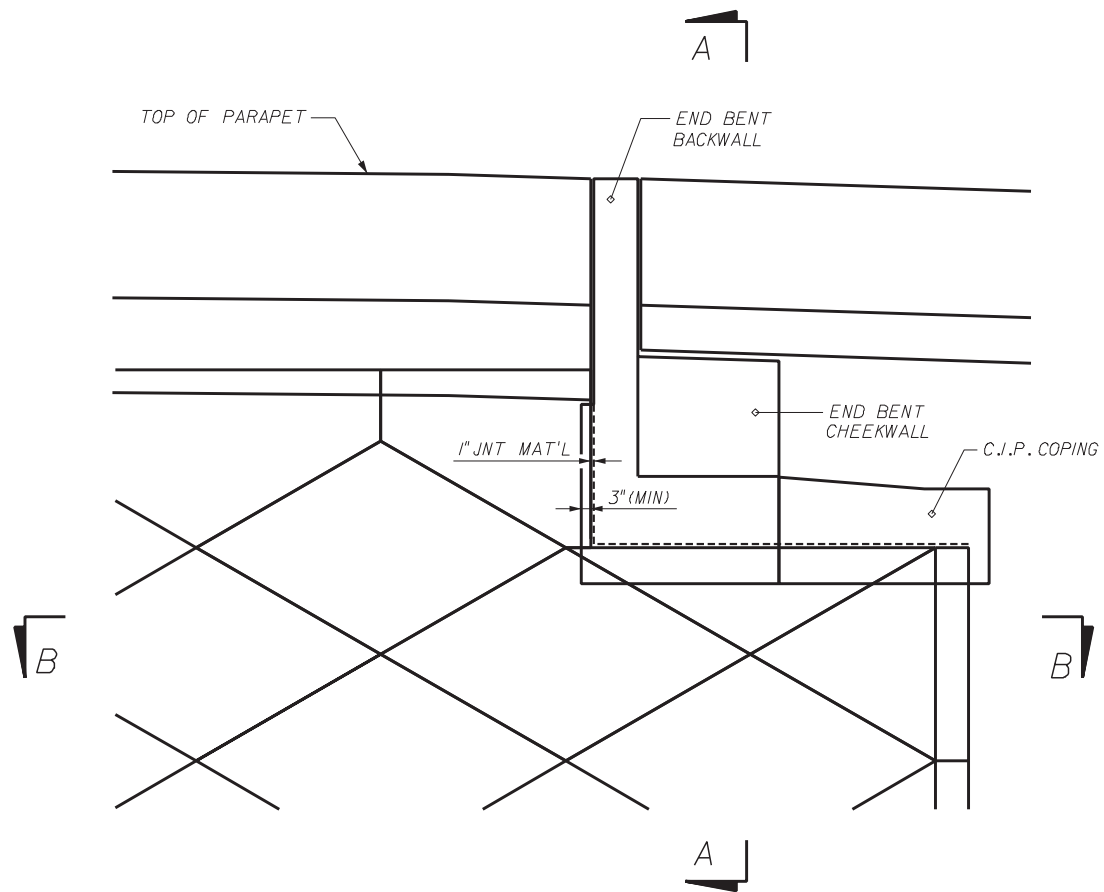
THE NEEL COMPANY
 8328-D TIRAFORD LANE
 SPRINGFIELD, VIRGINIA 22152
 PH: (703) 913-7858
 FX: (703) 913-7859

PRECASTER:
OLDCASTLE PRECAST, INC
 11643 103rd STREET
 JACKSONVILLE, FL 32210
 PH: (904) 778-2990
 FX: (904) 778-2992

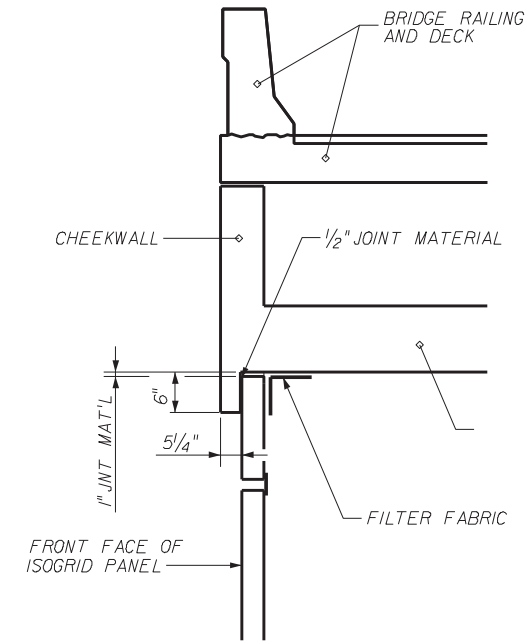
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE NEEL COMPANY ISOGRID				
Names	Dates	Approved By 		
Designed By	JMC	10/01/98	State Structures Design Engineer	
Drawn By	CAA	10/01/98	Revision	Sheet No. Index No.
Checked By	JMC	10/01/98	00	14 of 20 5012



SECTION B-B
STEM / END BENT PILE INTERFACE



PART ELEVATION SHOWING
WINGWALL / END BENT INTERFACE



SECTION A-A
SECTION THRU PILE CAP

DESIGNER:



THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: (703) 913-7858
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PRECASTER:

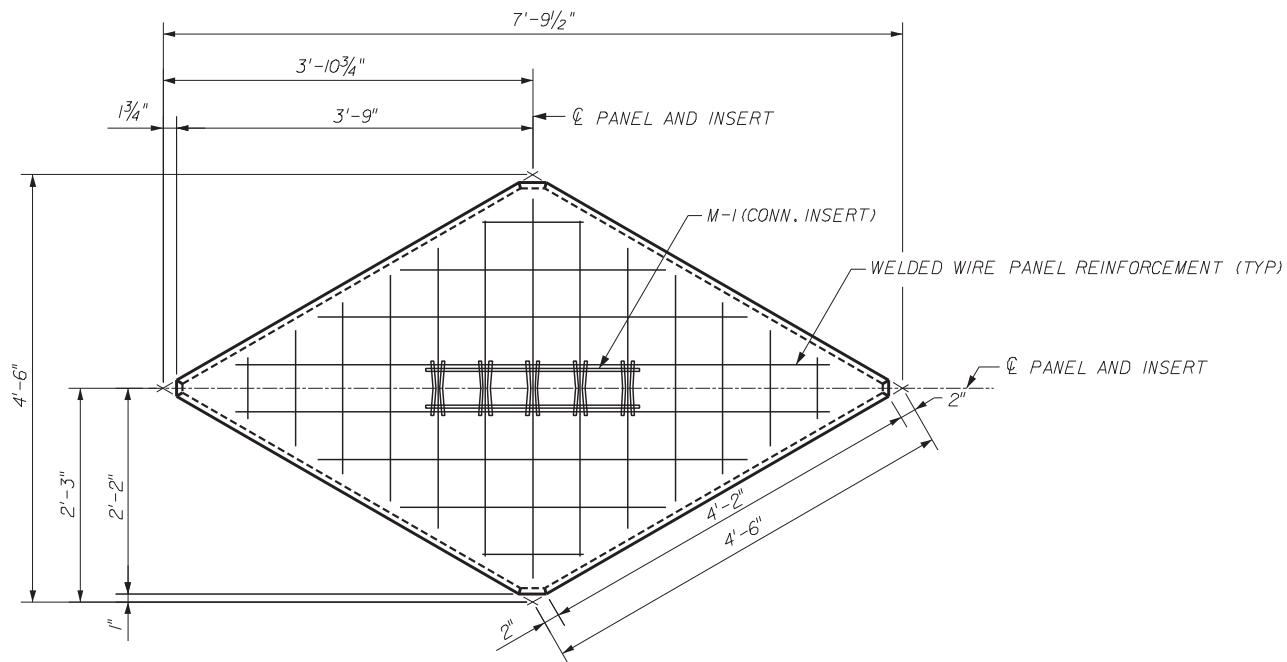
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
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Fk: (703) 913-7859

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

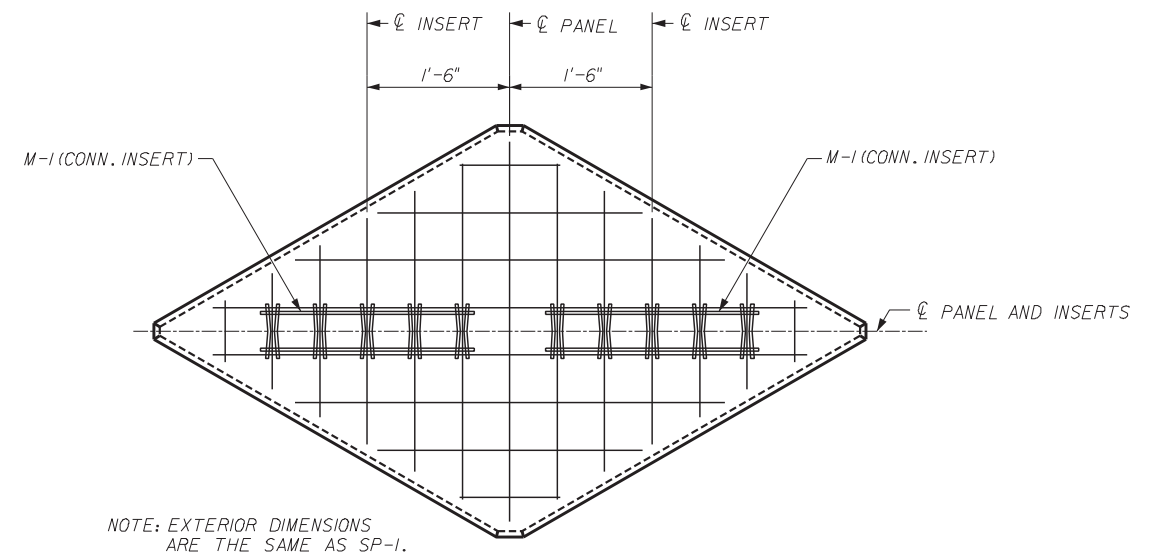
RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID

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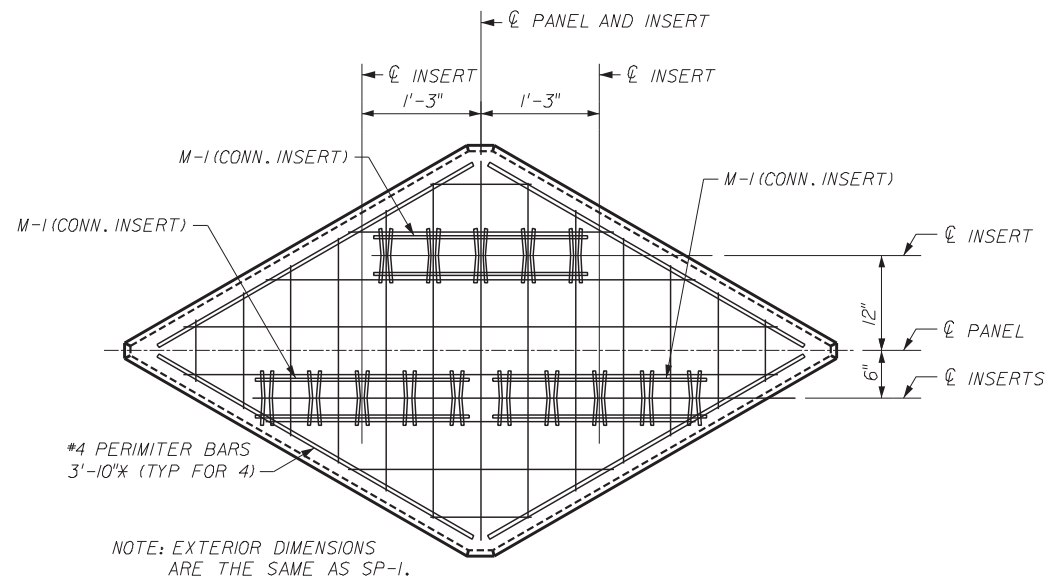
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*****SYTIME*****



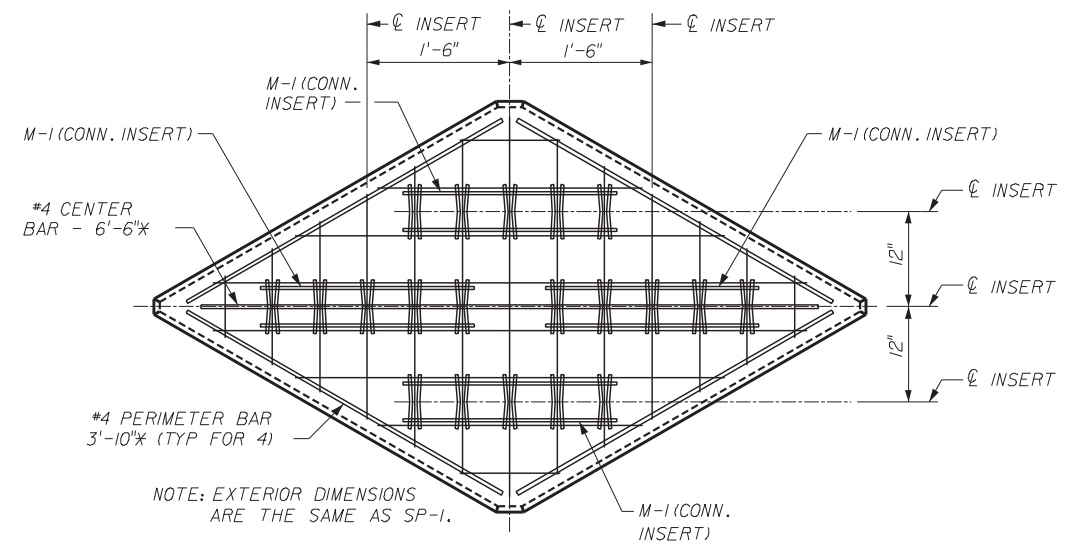
SP-1
FULL-SIZE PANEL - ONE GRID
ELEVATION (REAR FACE)




SP-2
FULL-SIZE PANEL - TWO GRIDS
ELEVATION (REAR FACE)



SP-3
FULL-SIZE PANEL - THREE GRIDS
ELEVATION (REAR FACE)

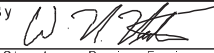


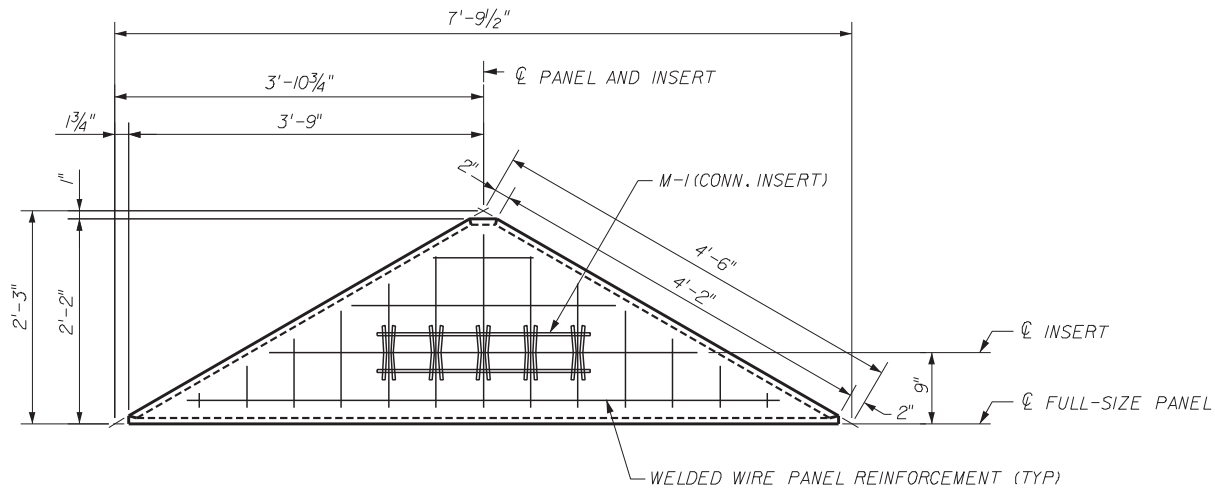
SP-4
FULL-SIZE PANEL - FOUR GRIDS
ELEVATION (REAR FACE)

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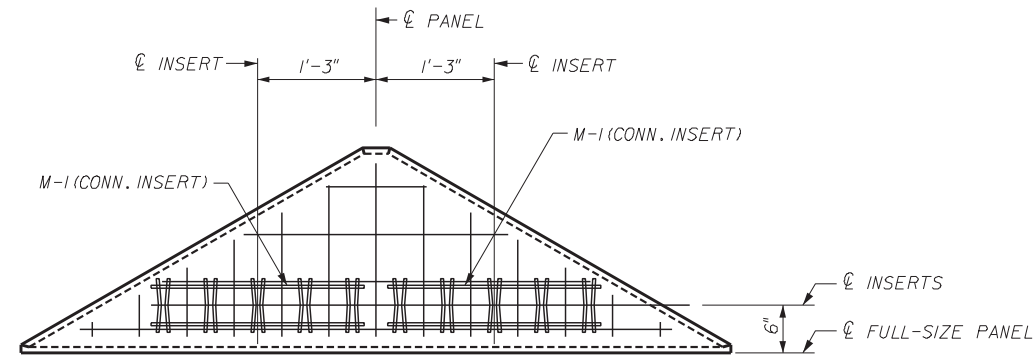
PRECASTER:
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NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
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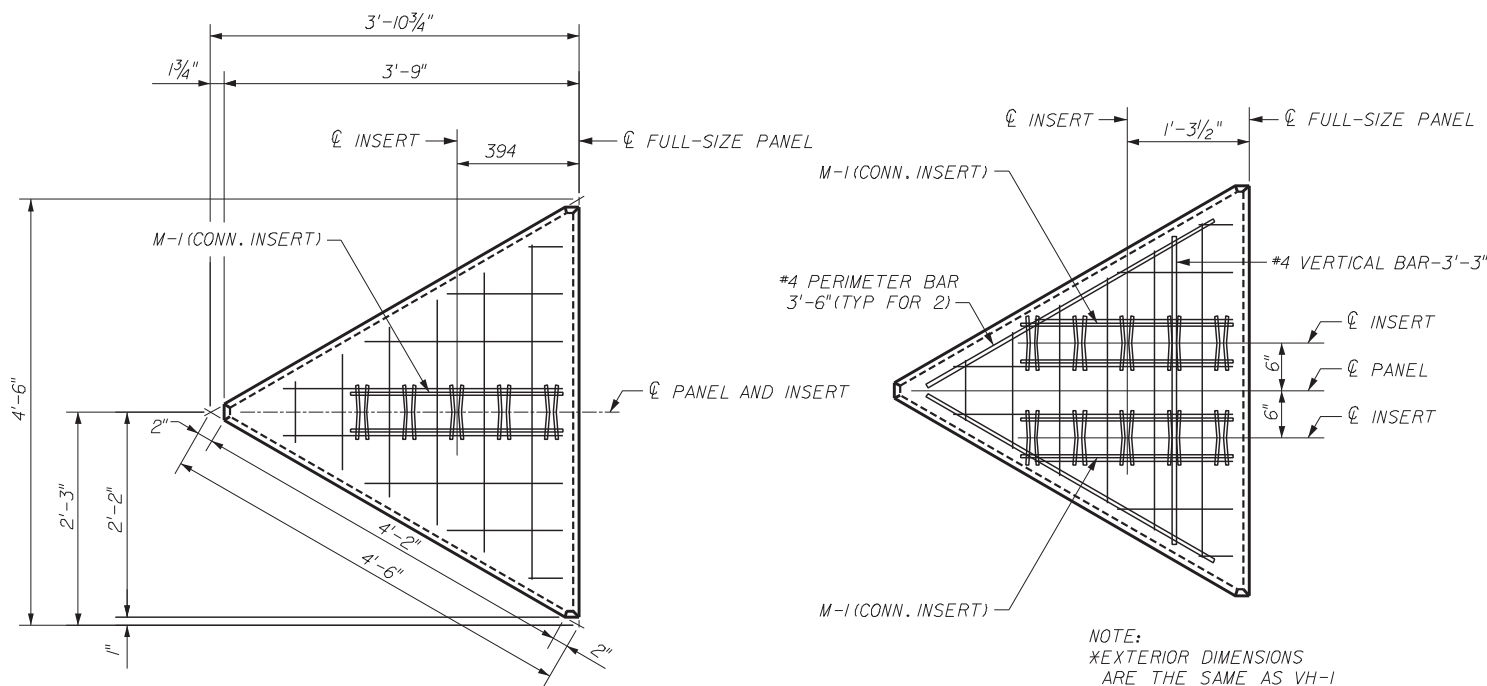


HH-1
HORIZ.-HALF PANEL - ONE GRID
ELEVATION (REAR FACE)

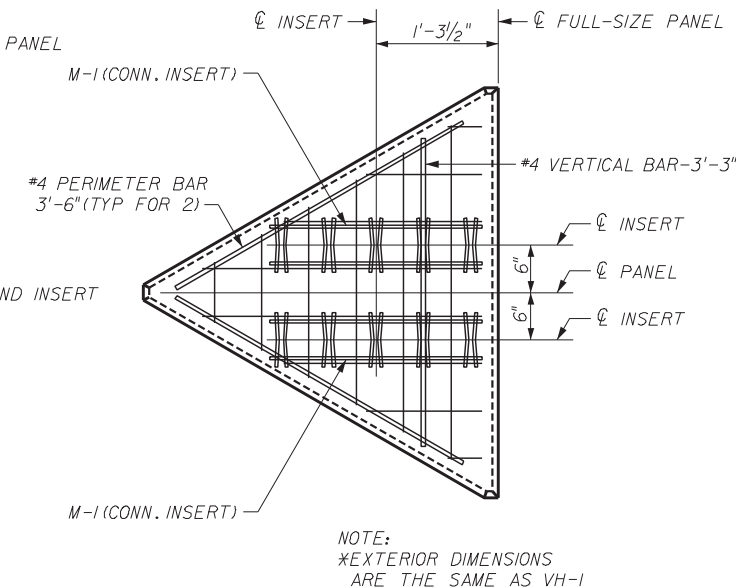


NOTE:
*EXTERIOR DIMENSIONS
ARE THE SAME AS HH-1

HH-2
HORIZ.-HALF PANEL - TWO GRIDS
ELEVATION (REAR FACE)

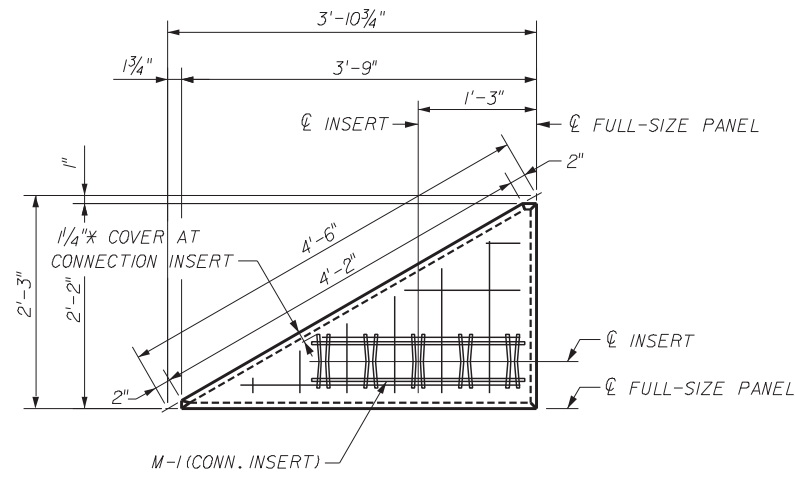


VH-1
VERT.-HALF PANEL - ONE GRID
ELEVATION (REAR FACE)

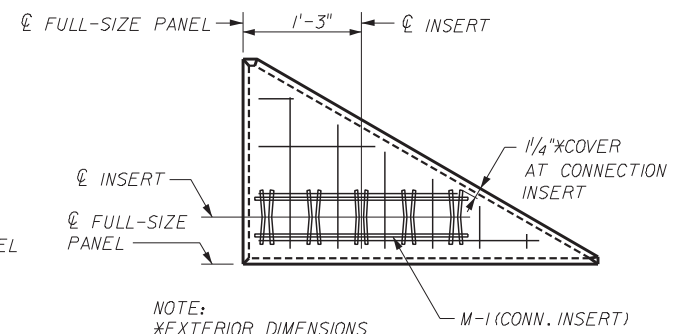


VH-2
VERT.-HALF PANEL - TWO GRIDS
ELEVATION (REAR FACE)

NOTE:
*EXTERIOR DIMENSIONS
ARE THE SAME AS VH-1



QP-R
TOP RIGHT / BOTTOM LEFT
QUARTER PANEL - ONE GRID
ELEVATION (REAR FACE)



QP-L
TOP LEFT / BOTTOM RIGHT
QUARTER PANEL - ONE GRID
ELEVATION (REAR FACE)

NOTE:
*EXTERIOR DIMENSIONS
ARE THE SAME AS QP-R
BUT OPPOSITE HAND

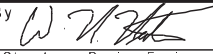
DESIGNER:
THE NEEL COMPANY
8328-D TRAFORD LANE
SPRINGFIELD, VIRGINIA 22152
Ph: 17031 913-7858
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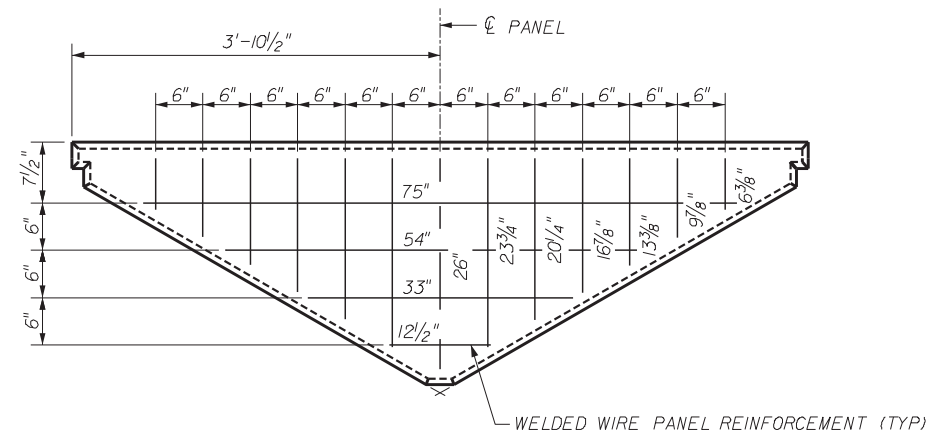
PRECASTER:
OLDCASTLE PRECAST, INC
11643 103rd STREET
JACKSONVILLE, FL 32210
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NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

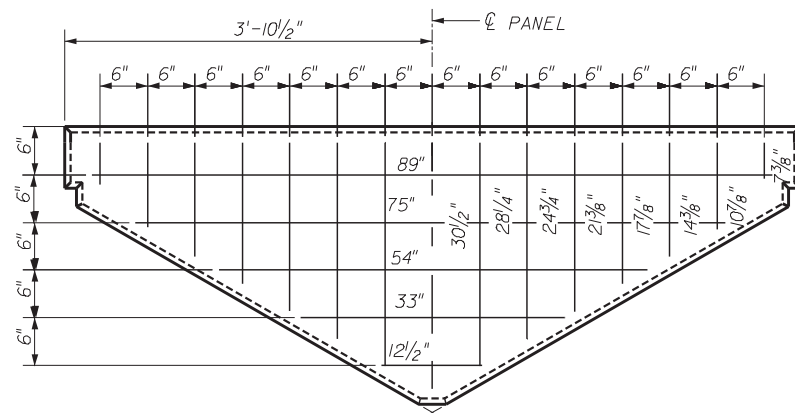
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID**

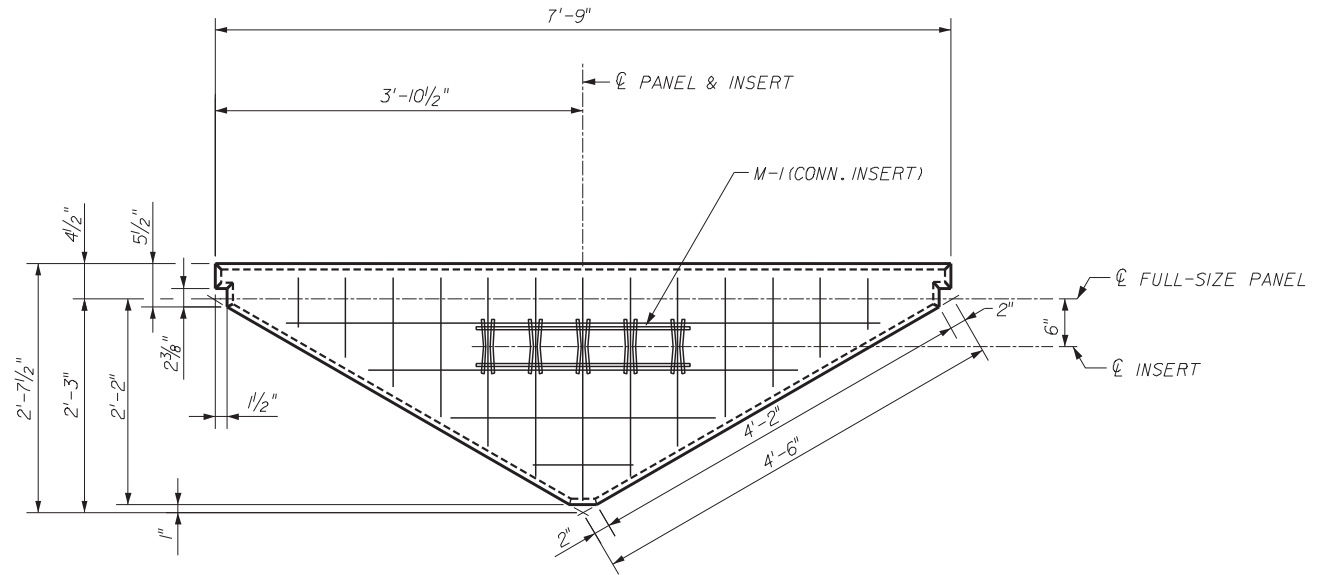
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Drawn By	CAA 03/20/98			
Checked By	JMC 10/01/98	00	17 of 20	5012



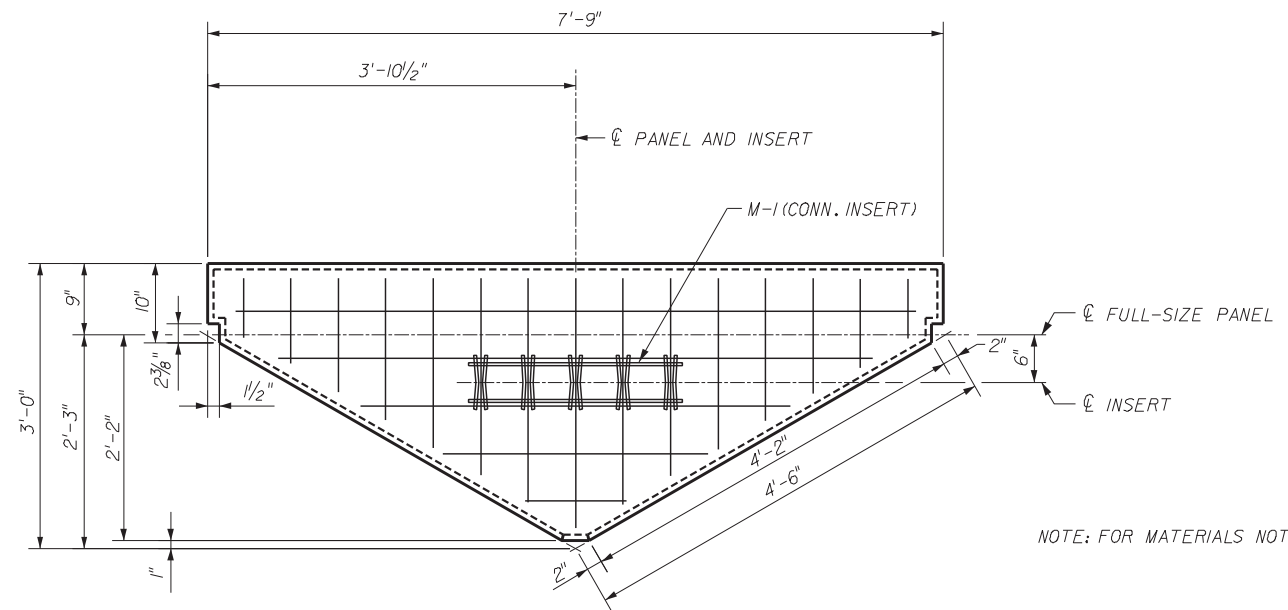
WELDED WIRE MESH PANEL REINFORCEMENT - X-1 PANEL
ELEVATION (REAR FACE)



WELDED WIRE MESH PANEL REINFORCEMENT - X-2 PANEL
ELEVATION (REAR FACE)



X-1
4 1/2" RISER - ONE GRID
ELEVATION (REAR FACE)



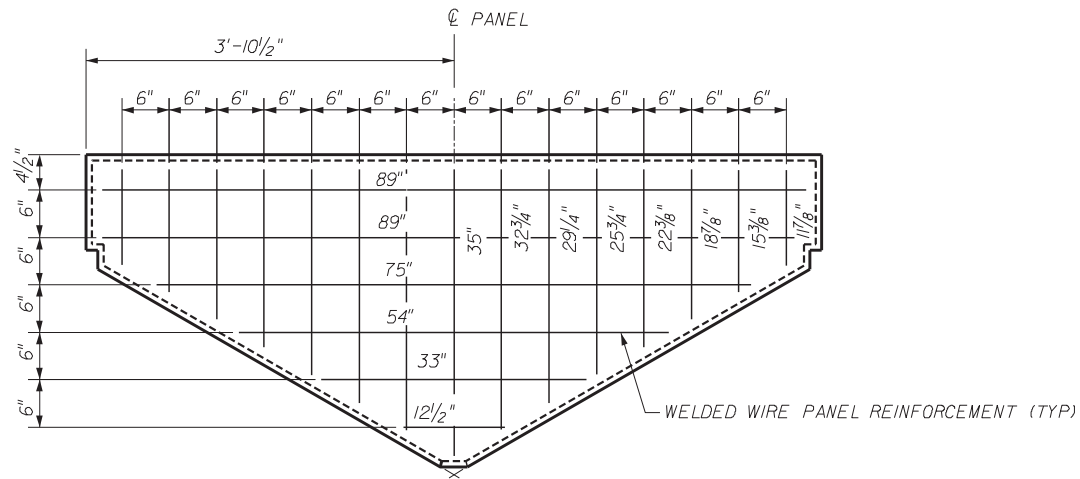
X-2
9" RISER PANEL - ONE GRID
ELEVATION (REAR FACE)

NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

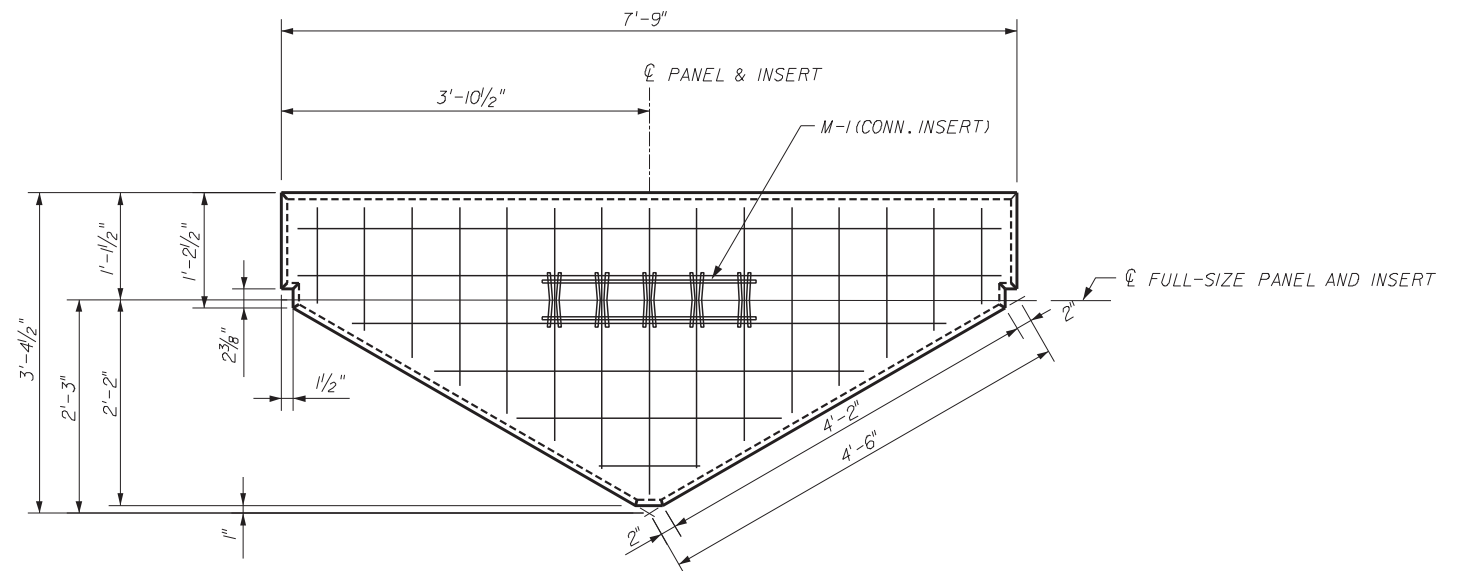
DESIGNER:
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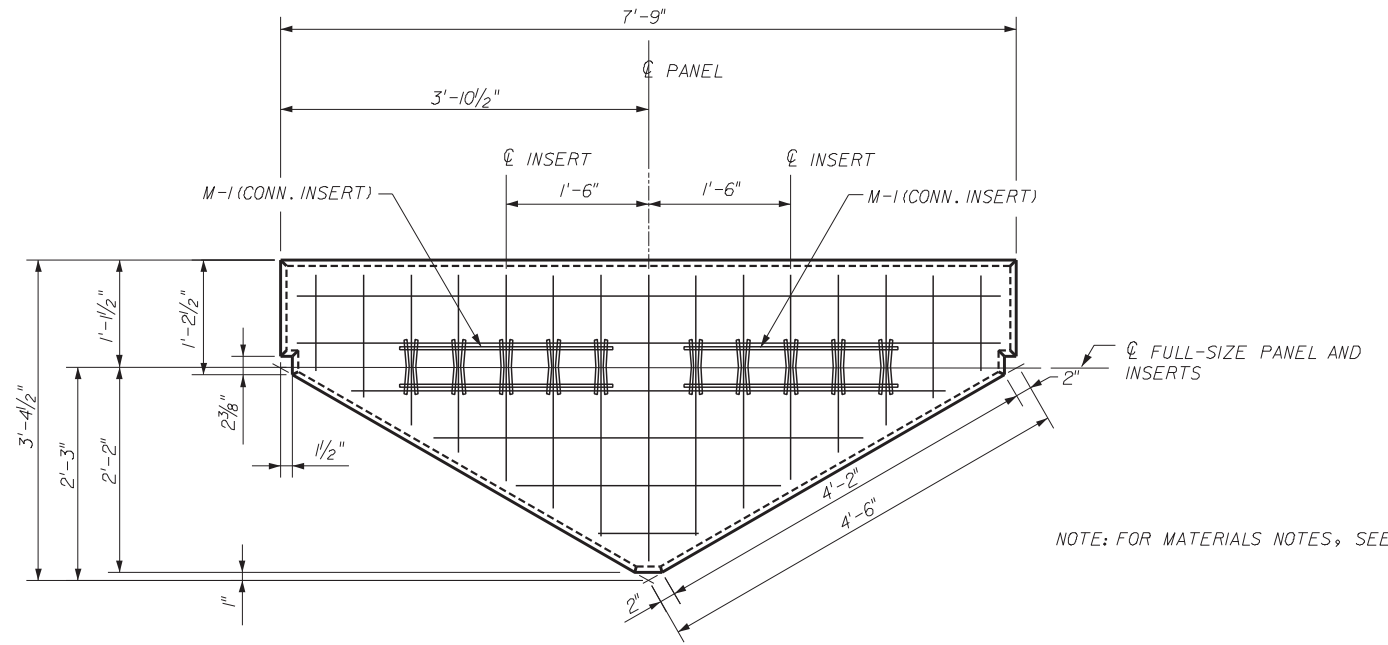
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WELDED WIRE MESH PANEL REINFORCEMENT - X-3 AND X-3(2) PANELS
ELEVATION (REAR FACE)



X-3
13 1/2" RISER - ONE GRID
ELEVATION (REAR FACE)

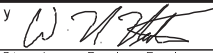


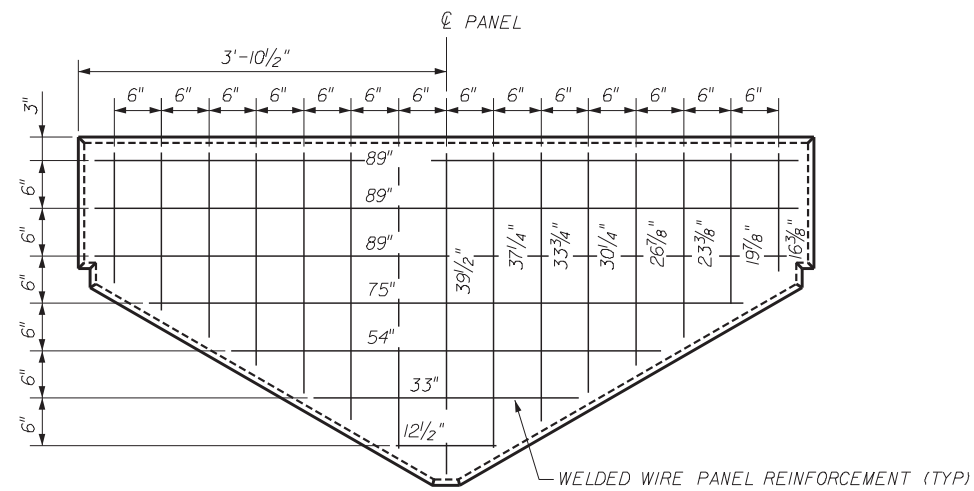
X-3 (2)
13 1/2" RISER - TWO GRIDS
ELEVATION (REAR FACE)

NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

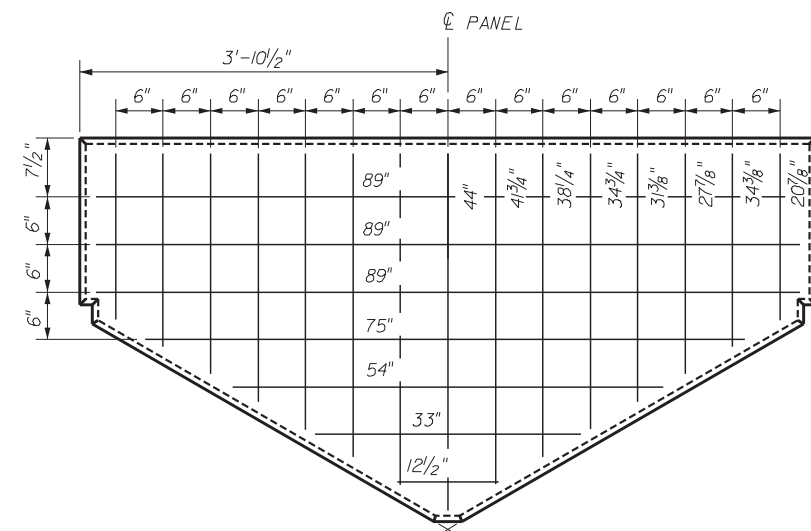
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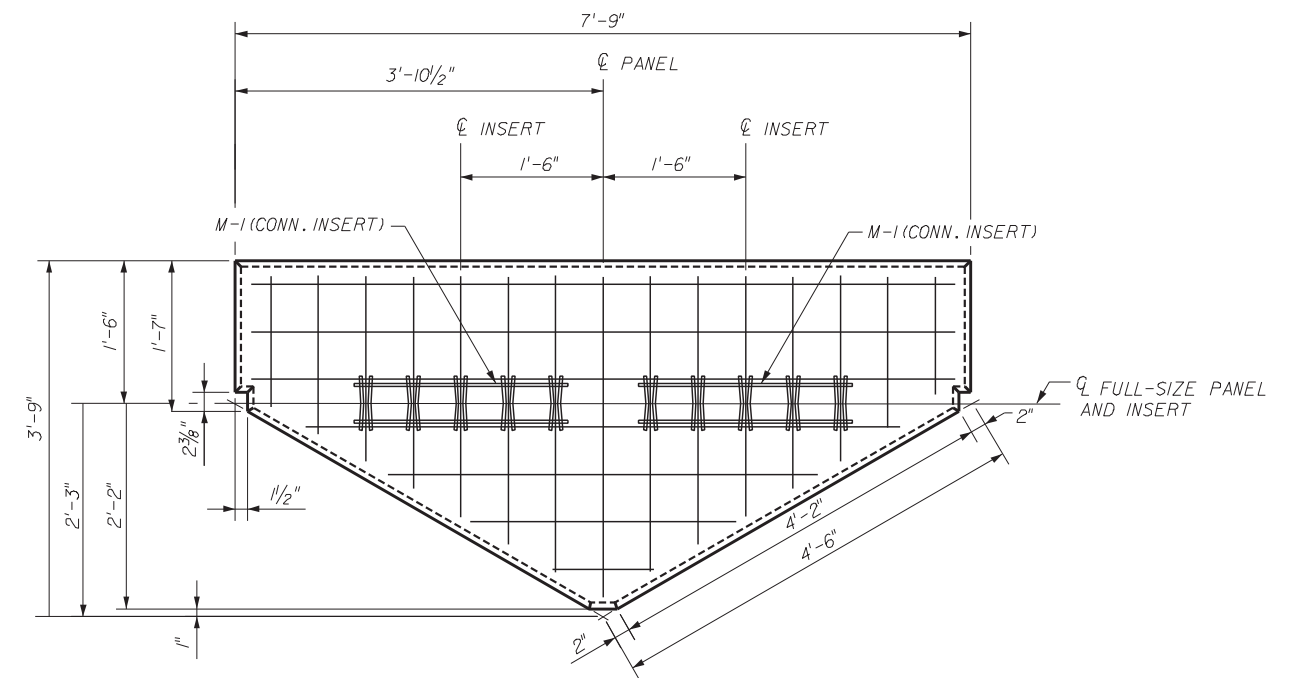
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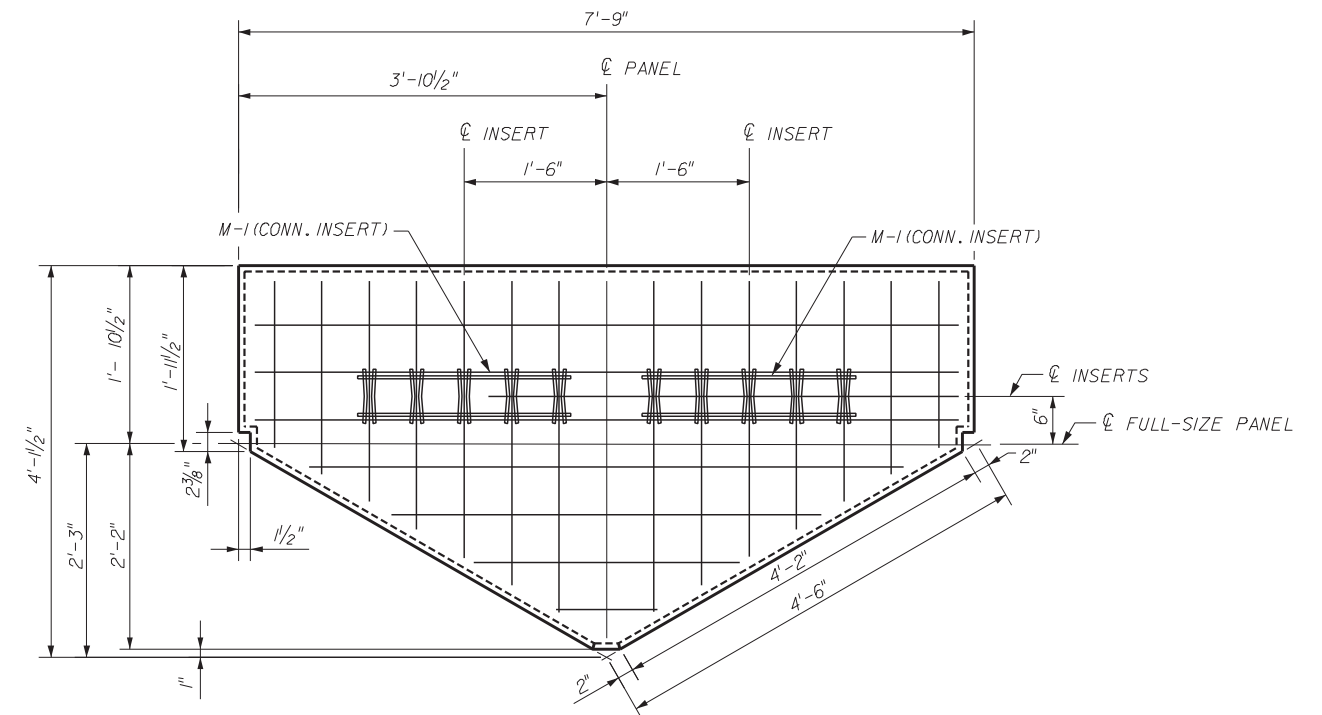
WELDED WIRE MESH PANEL REINFORCEMENT - X-4 PANEL
ELEVATION (REAR FACE)



WELDED WIRE MESH PANEL REINFORCEMENT - X-5 PANEL
ELEVATION (REAR FACE)



X-4
18" RISER - TWO GRIDS
ELEVATION (REAR FACE)



X-5
22 1/2" RISER - TWO GRIDS
ELEVATION (REAR FACE)

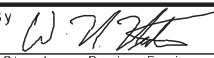
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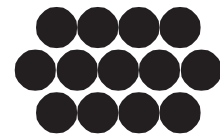
NOTE: FOR MATERIALS NOTES, SEE SHEET 2.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
THE NEEL COMPANY ISOGRID

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Checked By	JMC	10/01/98		
Revision	00	20 of 20	5012	Index No.

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



TAI

The Reinforced Earth Company

8614 WESTWOOD CENTER DRIVE SUITE 1100, VIENNA VIRGINIA 22182 (703) 821-1175

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE REINFORCED EARTH VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE CONTRACTING AGENCY'S TECHNICAL SPECIFICATIONS (SECTION 548) FOR REINFORCED EARTH WALLS
2. SOIL PARAMETERS:
SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE (ϕ), COHESION (c) AND TOTAL UNIT WEIGHT (γ) SHALL BE PROVIDED IN THE SHOP DRAWINGS.
3. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE OWNER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED EARTH VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.
5. REINFORCING STRIPS FOR REINFORCED EARTH WALLS SHALL BE $1\frac{3}{32}$ " WIDE AND $\frac{5}{32}$ " THICK, AND SHALL CONFORM TO THE PHYSICAL AND MECHANICAL PROPERTIES OF ASTM A-572 GRADE 65. GALVANIZATION SHALL BE APPLIED IN ACCORDANCE WITH ASTM A-123.
6. THE MINIMUM FACTORS OF SAFETY REQUIRED FOR DESIGN
OVERTURNING = 2.0
SLIDING = 1.5
INTERNAL PULLOUT = 1.5
(ALLOWABLE DEFORMATION = 0.75 INCH)
BEARING CAPACITY = 2.5
OVERALL STABILITY = 1.5
STEEL SOIL REINFORCEMENT = 0.55F_y AT END OF DESIGN LIFE
AND 0.50 F_u AT NET SECTION OF BOLTED CONNECTION
MAXIMUM PULLOUT FACTOR f* (FOR SAND) = 1.5
(FOR LIMEROCK) = 2.0

WALL CONSTRUCTION

7. REINFORCED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 4'-11" EACH TO MATCH DESIRED WALL ALIGNMENT.
8. FOR LOCATION AND ALIGNMENT OF REINFORCED EARTH WALLS, SEE RETAINING WALL CONTROL PLANS.
9. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.
10. IF PILES ARE LOCATED WITHIN THE REINFORCED EARTH VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE REINFORCED EARTH WALL UNLESS A METHOD TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE REINFORCED EARTH COMPANY, AND IS PROPOSED AND APPROVED IN WRITING.

11. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SEC 548 TO A LEVEL OF 2"± ABOVE THE TIE STRIPS EMBEDDED IN THE PANELS. INSTALLATION OF REINFORCING STRIPS SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
12. IF STRUCTURES IN EXCESS OF 20' IN HEIGHT OCCUR, THE FINISHED GRADE IN FRONT OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS A HEIGHT OF 20'. FINISHED GRADE BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
13. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS BEHIND THE REINFORCED EARTH PANELS PRIOR TO PLACEMENT OF THE TOP LAYER OF REINFORCING STRIPS. INDIVIDUAL STRIPS MAY BE SKEWED UP TO 15° TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER. ANY DAMAGE DONE TO THE REINFORCING STRIPS DUE TO THE INSTALLATION OF THE GUARDRAIL SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
14. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN THE REINFORCED EARTH VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING STRIPS AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN.
15. TOP PANELS BENEATH COPING SHALL HAVE #4 DOWELS PROTRUDING FROM THEIR TOP EDGE.
16. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO THE REINFORCED EARTH CONSTRUCTION MANUAL.
17. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING STRIPS DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPERELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

18. NOMINAL STRIP LENGTHS
THE REINFORCING STRIP LENGTHS SHOWN ON THE PLANS, MEASURED FROM BACK FACE OF PANEL, ARE THE NOMINAL LENGTHS REQUIRED BY CALCULATION. THE ACTUAL FABRICATED STRIP LENGTHS ARE OFTEN LONGER (UP TO 6") DUE TO MANUFACTURING TOLERANCES. THE REQUIRED HORIZONTAL LIMIT OF GRANULAR BACKFILL IS EQUAL TO THE NOMINAL STRIP LENGTH.
19. PANEL FINISH
THE PRECAST PANELS FOR THIS PROJECT SHALL HAVE A PLAIN STEEL FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINING WALL CONTROL PLANS.

20. NOTE TO CONTRACTORS

ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY THE REINFORCED EARTH COMPANY:

- PRECAST CONCRETE FACING PANELS
- REINFORCING STRIPS
- BOLT SETS (FOR ATTACHING PANELS TO THE REINFORCING STRIPS)
- BEARING BLOCKS
- RUBBER SHIMS
- FILTER CLOTH AND ADHESIVE (FOR PANEL JOINTS ONLY)

ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTION CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED/INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

21. THE REINFORCED EARTH COMPANY SUPPLIES PRECAST CONCRETE FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF THE REINFORCED EARTH RETAINING WALLS DETAILED HEREIN. THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY THE REINFORCED EARTH COMPANY IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE, PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA. COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.
22. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE REINFORCED EARTH COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.
23. THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO THE INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY
24. THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO THE REINFORCED EARTH COMPANY, AND IS BEING FURNISHED FOR THE USE IN CONNECTION WITH FDOT PROJECTS ONLY, AND THE INFORMATION CONTAINED HEREIN IS NOT TO BE TRANSMITTED TO ANY OTHER ORGANIZATION UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE REINFORCED EARTH COMPANY. THE REINFORCED EARTH COMPANY IS EXCLUSIVE LICENSEE IN THE UNITED STATES UNDER PATENTS ISSUED TO HENRY VIDAL, AND THE FURNISHING OF THIS DRAWING DOES NOT CONSTITUTE AN EXPRESSED OR IMPLIED LICENSE UNDER THE VIDAL PATENTS.

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

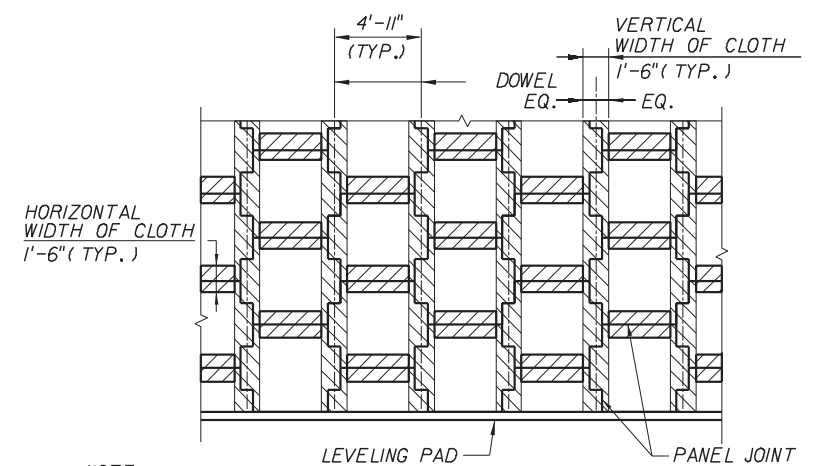
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
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PANEL THICKNESS	REINFORCEMENT DESIGNATION	* PANEL REINFORCEMENT (IN ²)	MAXIMUM ALLOWABLE HORIZONTAL STRESS AT FACING (KPA)
5 1/2"	R4	0.44 VERTICAL 0.58 HORIZONTAL	1.19
	R6	0.66 VERTICAL 0.78 HORIZONTAL	1.46
	R7	1.18 VERTICAL 1.78 HORIZONTAL	2.58

* TOTAL AREA OF STEEL REQUIRED PER "TYPE A" PANEL.

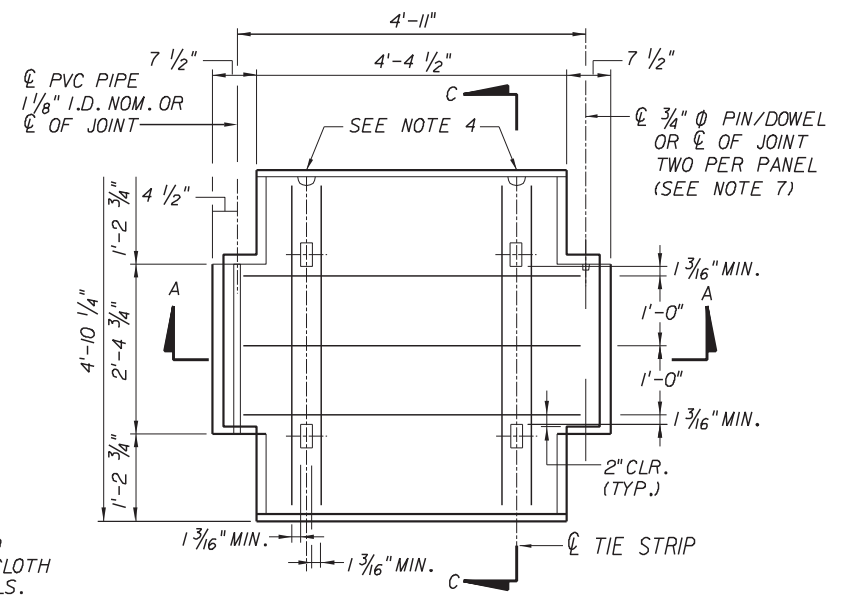
NOTES:

1. REINFORCING STEEL TO BE A615 GRADE 60.
2. 3/8" x 3/8" CHAMFER SHALL BE PROVIDED ON ALL EXPOSED EDGES (FRONT FACE ONLY).
3. ALL PANEL TYPES AND OTHER RELATED ELEMENTS WILL BE DETAILED ON SHOP DRAWINGS.
4. ALL PANELS SHALL HAVE TWO LIFTING INSERTS OF ONE TON CAPACITY EACH.
5. PANEL DESIGN THICKNESS IS 5 1/2". THICKNESS OF CONCRETE MUST INCREASE TO ACCOMMODATE ANY ARCHITECTURAL SURFACE FINISH THAT MAY BE SPECIFIED.
6. ACTUAL PANEL REINFORCEMENT FOR ALL PANEL TYPES ON THIS PROJECT IS DESIGNATED ABOVE. R4 ILLUSTRATED FOR INFORMATION ONLY.
7. EACH 3/4" Ø DOWEL SHALL HAVE A TYP. LENGTH OF 10". DOWELS MAY BE GALVANIZED STEEL OR PVC ROD. A SINGLE FULL LENGTH DOWEL MAY BE USED AT THE DISCRETION OF THE MANUFACTURER.

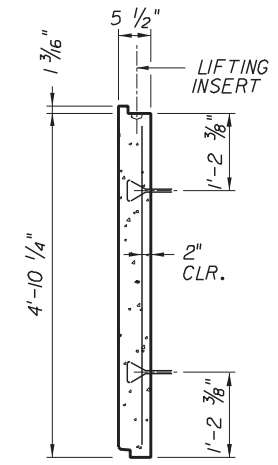


NOTE:
STRIPS OF FILTER CLOTH SHALL BE PLACED ON BACK FACE OF PANEL, OVER PANEL JOINTS. FILTER CLOTH SHALL BE ADHERED TO BACK FACE OF PANELS USING AN ADHESIVE COMPOUND SUPPLIED BY THE REINFORCED EARTH COMPANY. ADHESIVE SHALL BE APPLIED TO PANEL THEN FILTER CLOTH (CARTHAGE MILLS TYPE FX-40HS OR EQUAL) SHALL BE APPLIED TO PANELS.

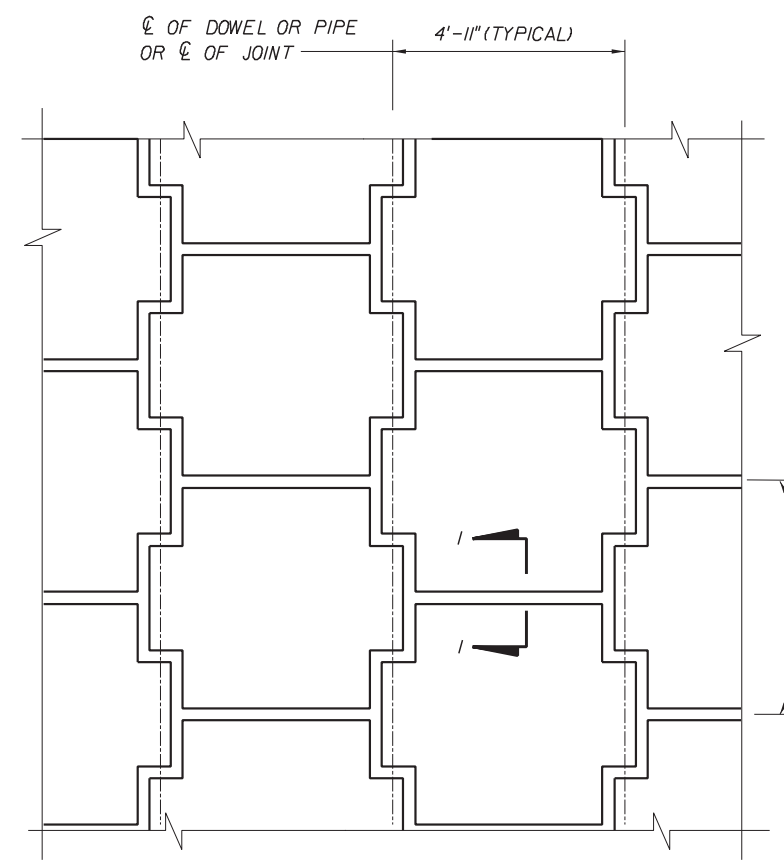
FILTER CLOTH DETAIL
PARTIAL ELEVATION - BACK FACE



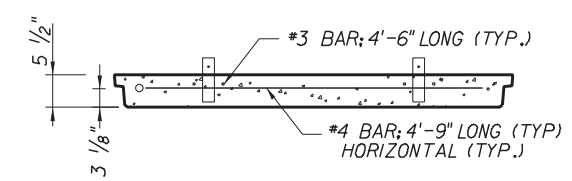
PANEL TYPE "A"
WITH R4 REINFORCEMENT
FRONT VIEW



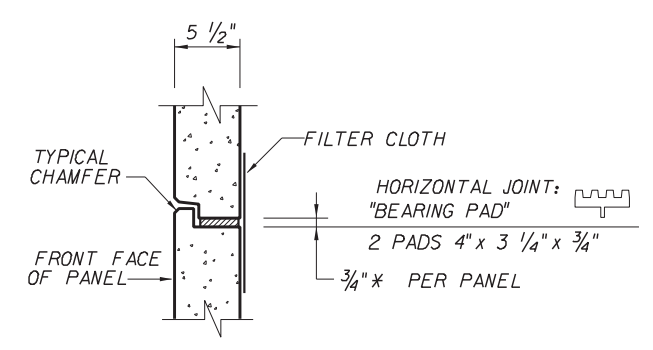
SECTION C-C



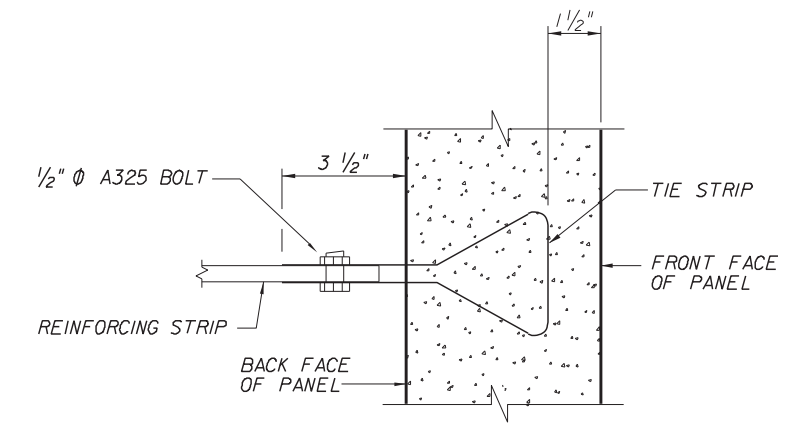
TYPICAL PANEL LAYOUT
PARTIAL ELEVATION - FRONT FACE



SECTION A-A



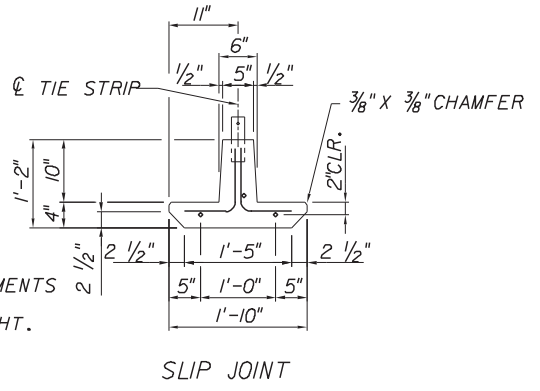
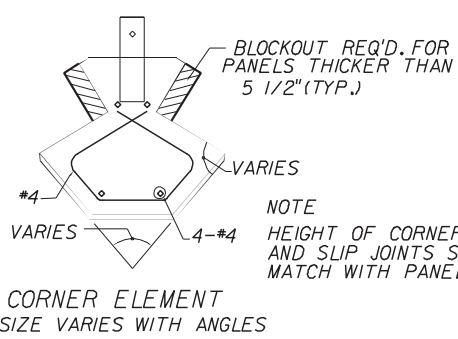
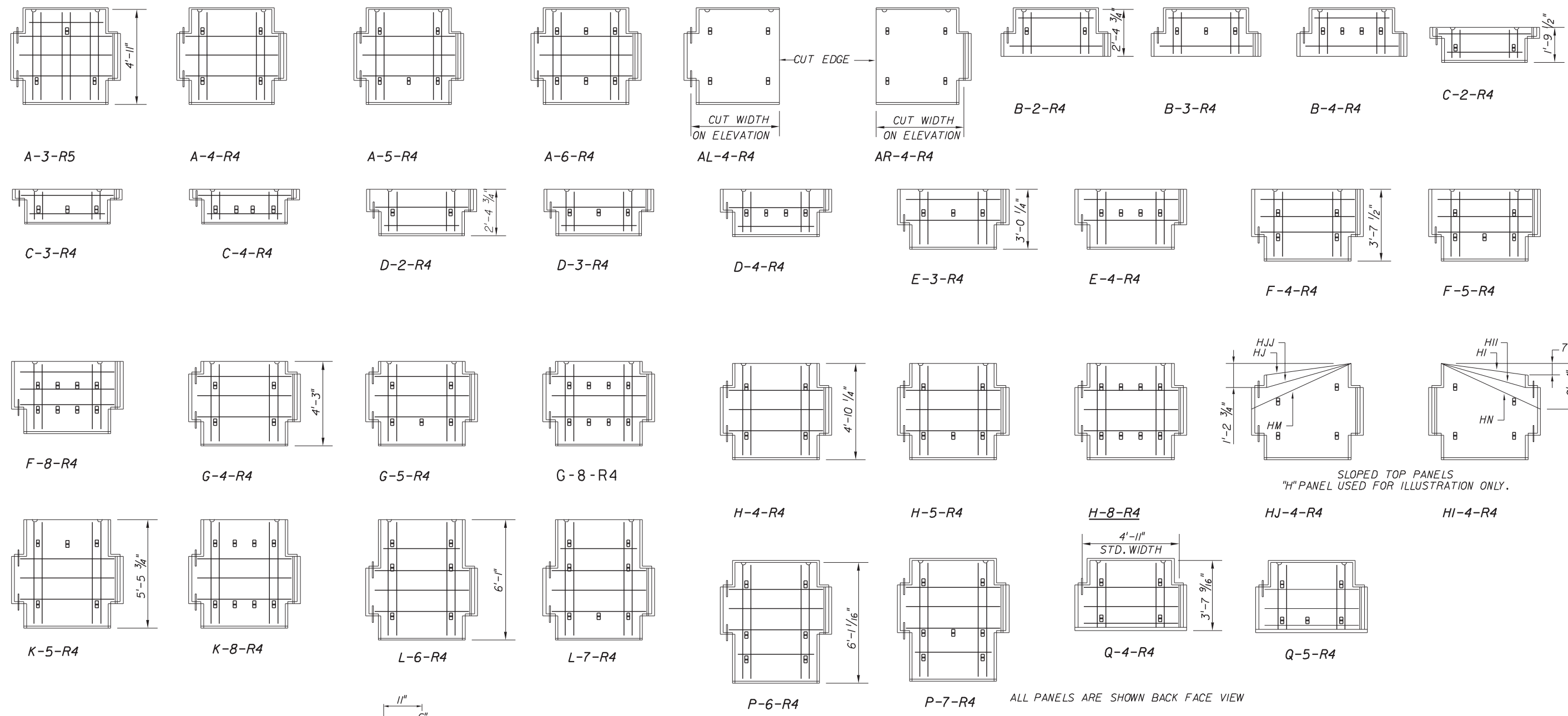
SECTION I-I



CONNECTION DETAIL

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Designed By	Names	Dates	Approved By <i>W. J. [Signature]</i>	
Drawn By			Revision	Sheet No. 2 of 14
Checked By			00	Index No. 5015



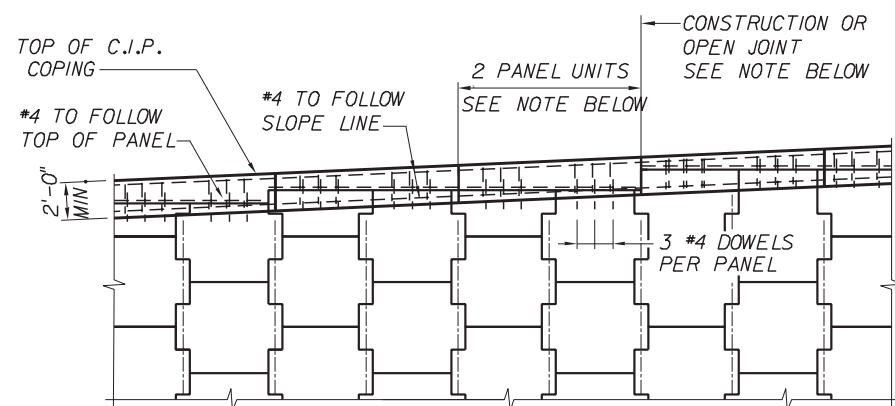
ALL PANELS ARE SHOWN BACK FACE VIEW

- B TIE STRIP LOCATION
- R4 VERTICAL BARS ARE #3 AS SHOWN
HORIZONTAL BARS ARE #4 AS SHOWN
- R5 VERTICAL BARS ARE #3 AS SHOWN
HORIZONTAL BARS ARE #4 AS SHOWN
- R6 VERTICAL BARS ARE 6-#3
HORIZONTAL BARS ARE 4-#4
- R7 VERTICAL BARS ARE 6-#4
HORIZONTAL BARS ARE 4-#6

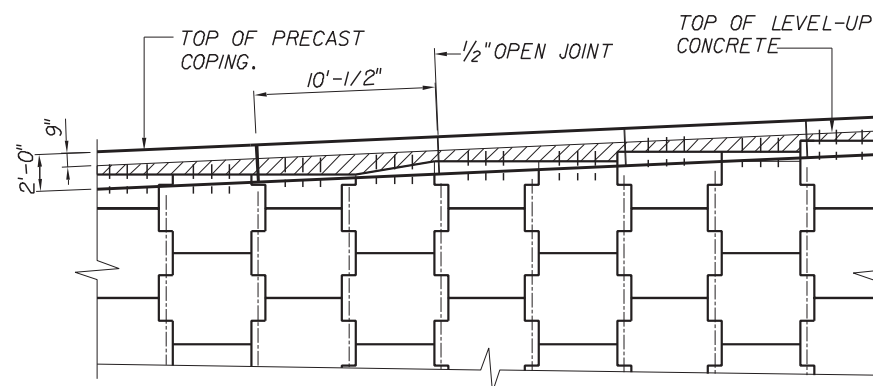
SEE PANEL TPE "A" WITH R4 REINFORCEMENT ON SHEET TITLED "PANEL DETAILS" FOR TYPICAL REINFORCEMENT SPACING

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM PANELS

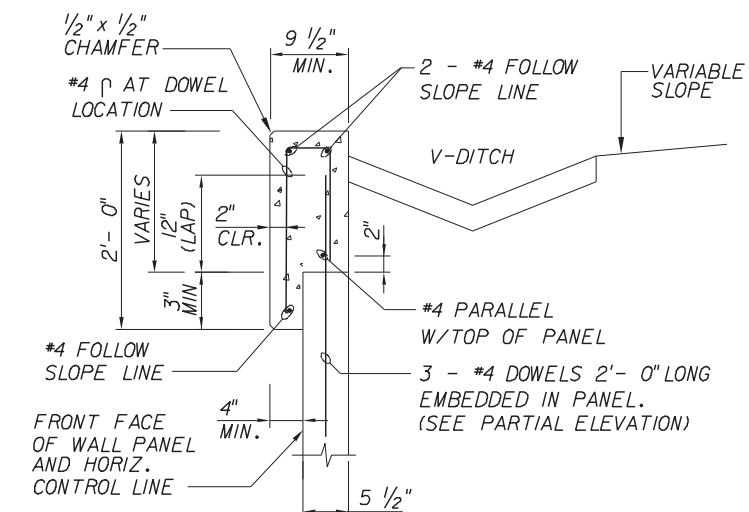
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN			
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL			
Names	Dates	Approved By <i>W. J. [Signature]</i>	
Designed By		State Structures Design Engineer	
Drawn By		Revision	Sheet No. Index No.
Checked By		00	3 of 14 5015



C.I.P. COPING - PARTIAL ELEVATION



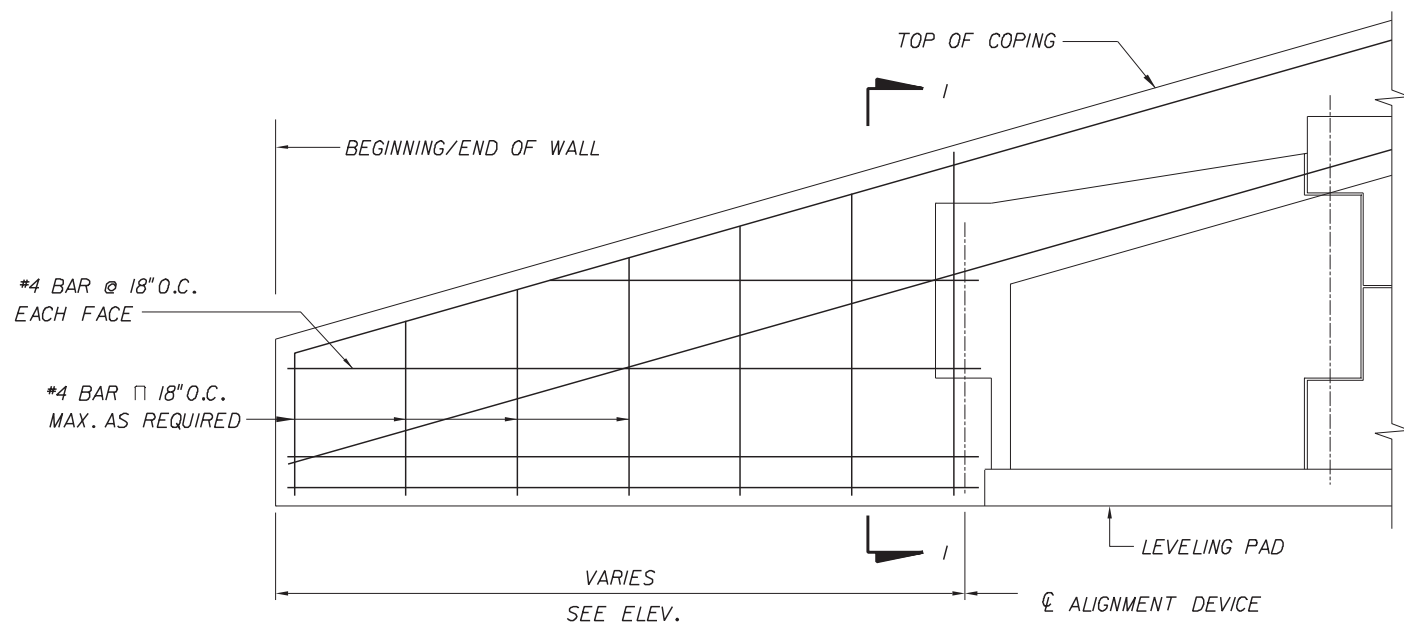
PRECAST COPING PARTIAL ELEVATION



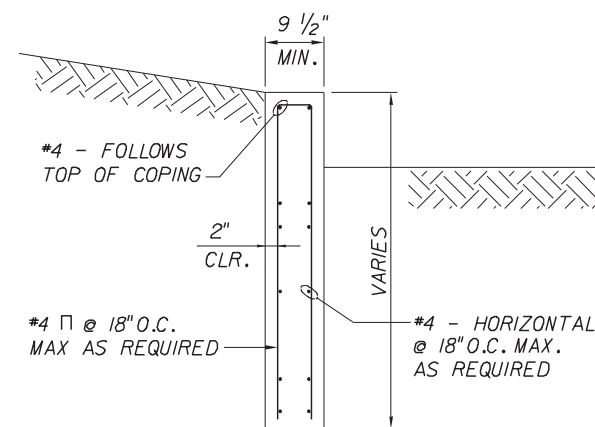
C.I.P. CONC. COPING W/DITCH

NOTE:

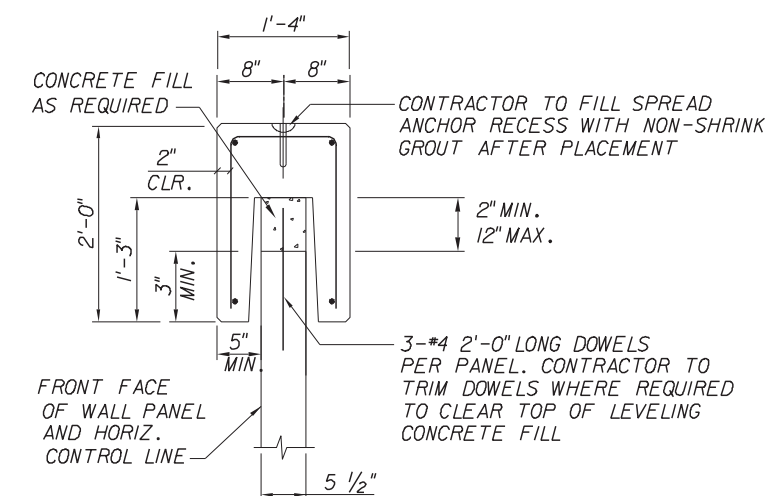
1/2-INCH OPEN JOINTS IN COPING SHALL BE AT 6 PANEL INTERVALS AND COINCIDE APPROXIMATELY WITH ϕ OF ALIGNMENT PINS. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE JOINTS. CONSTRUCTION JOINTS IN BETWEEN THE OPEN JOINTS SHALL BE PROVIDED AT 2 PANELS INTERVALS.



COPING ENCLOSURE DETAIL



SECTION A-A



PRECAST COPING SECTION

NOTE:

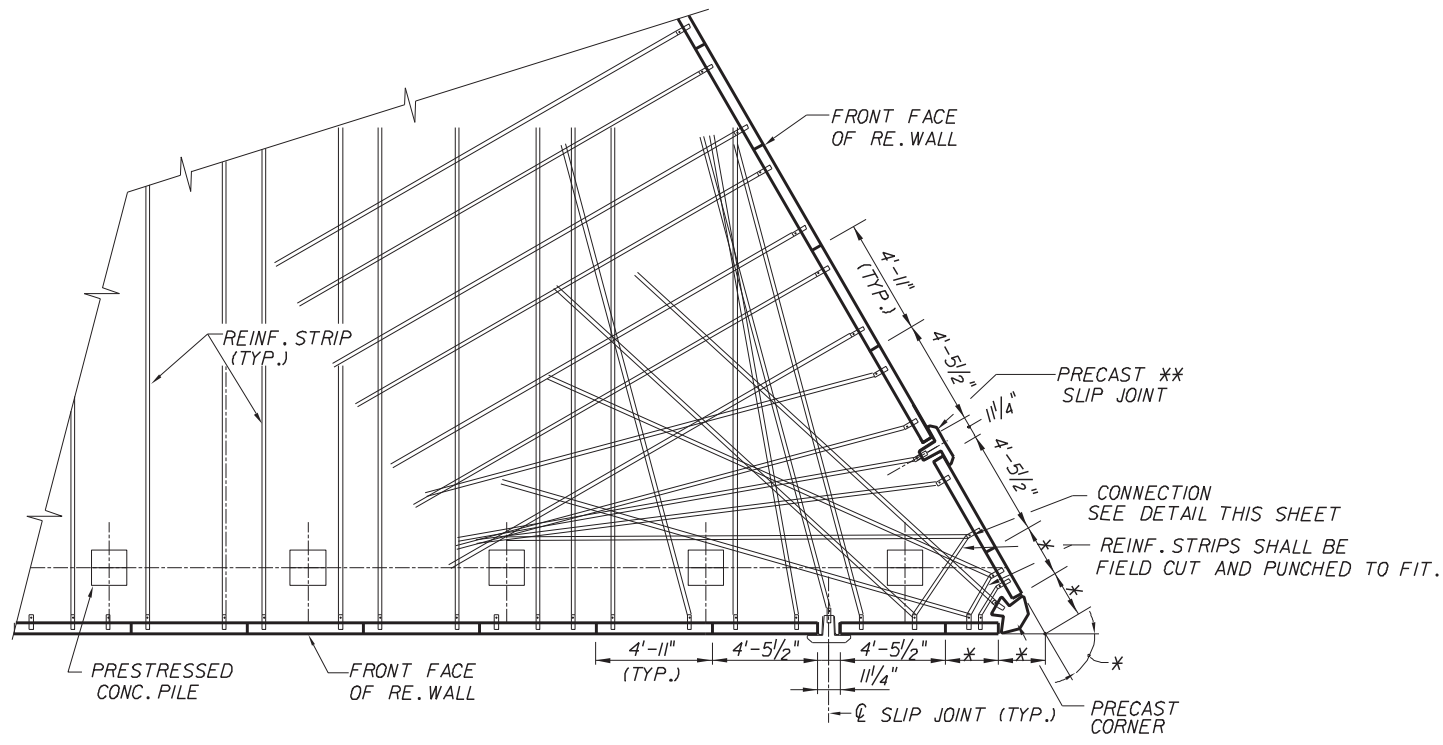
STANDARD COPING UNIT IS 10' LONG WITH SQUARE ENDS.

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
 CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

RETAINING WALL SYSTEM
 REINFORCED EARTH COMPANY
 REINFORCED EARTH WALL

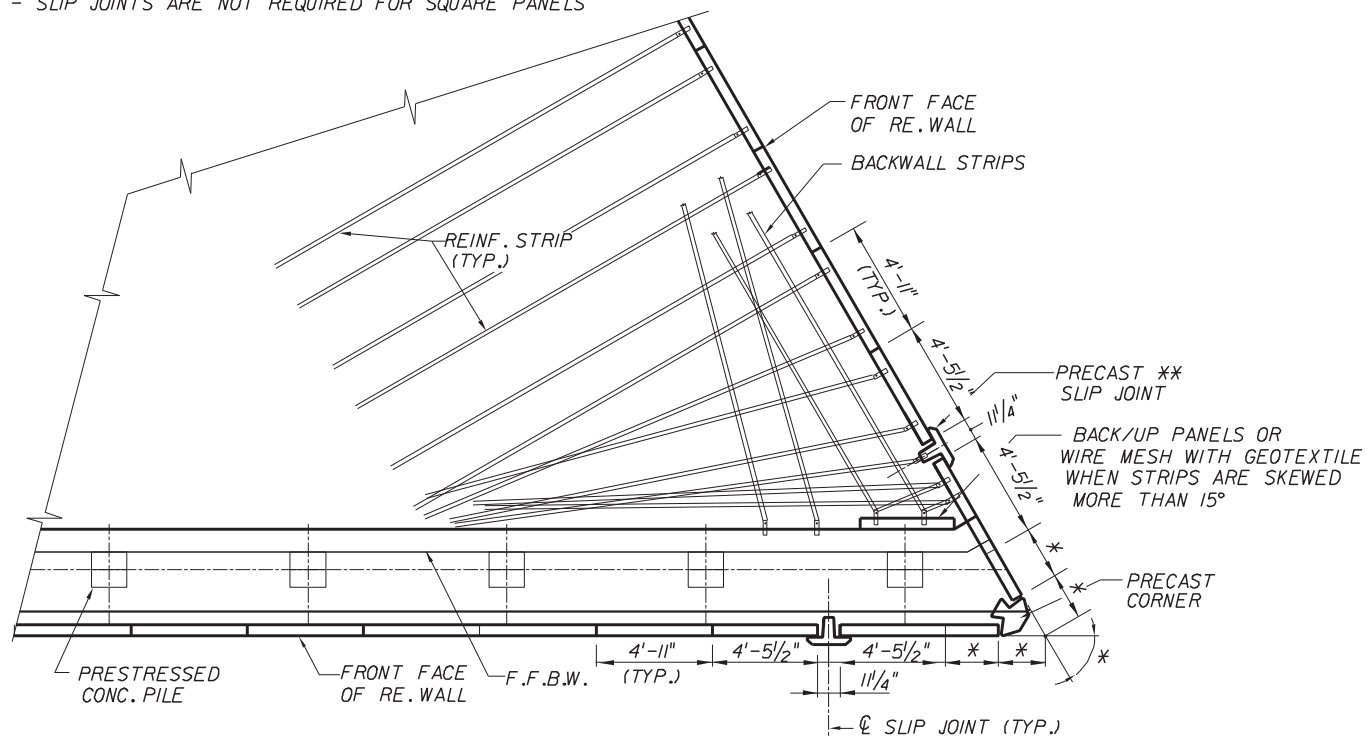
Names	Dates	Approved By		
Designed By		 State Structures Design Engineer	Revision	Sheet No.
Drawn By			00	4 of 14
Checked By				5015



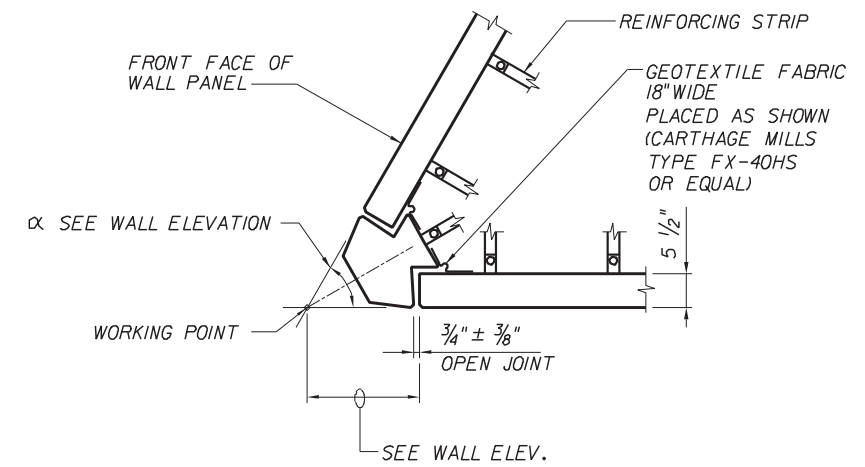
EXAMPLE ACUTE CORNER - SKEWED STRIPS UNDER PILE CAP

NOTE:

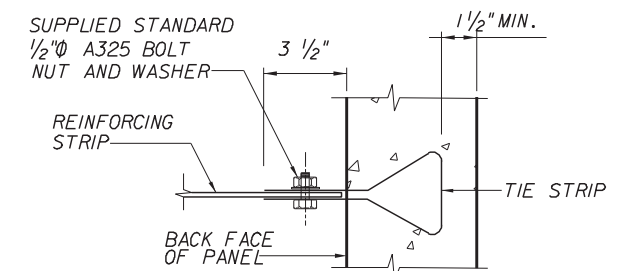
- * - DIMENSION OR ANGLE VARIES, SEE WALL ELEVATION
- ** - SLIP JOINTS ARE NOT REQUIRED FOR SQUARE PANELS



EXAMPLE ACUTE CORNER - SKEWED STRIPS AT ABUTMENT LEVEL



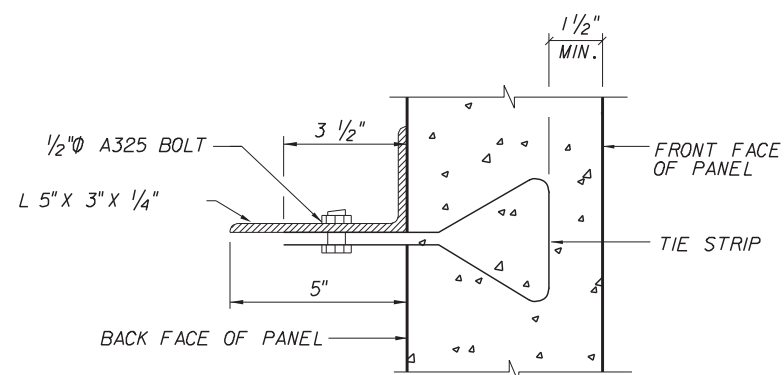
ACUTE CORNER ELEMENT DETAIL



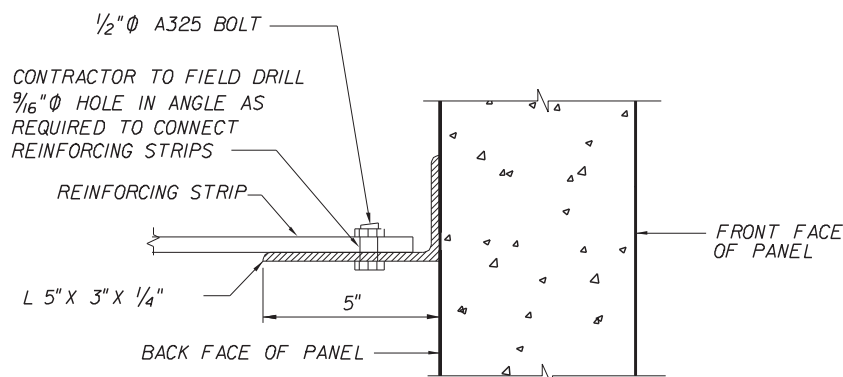
CONNECTION DETAIL

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY CRUCIFORM AND SQUARE PANELS

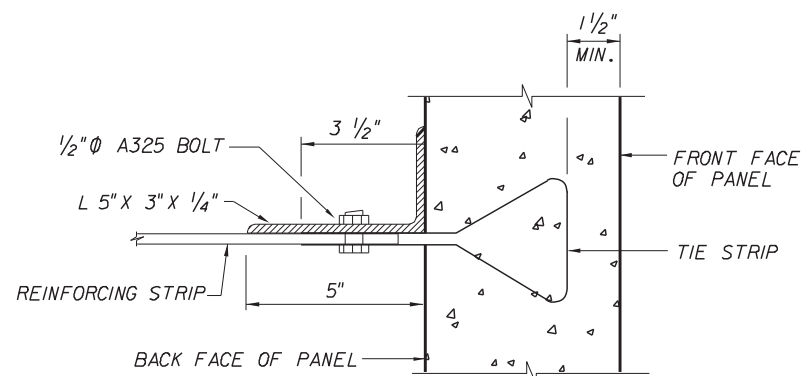
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	5 of 14	5015



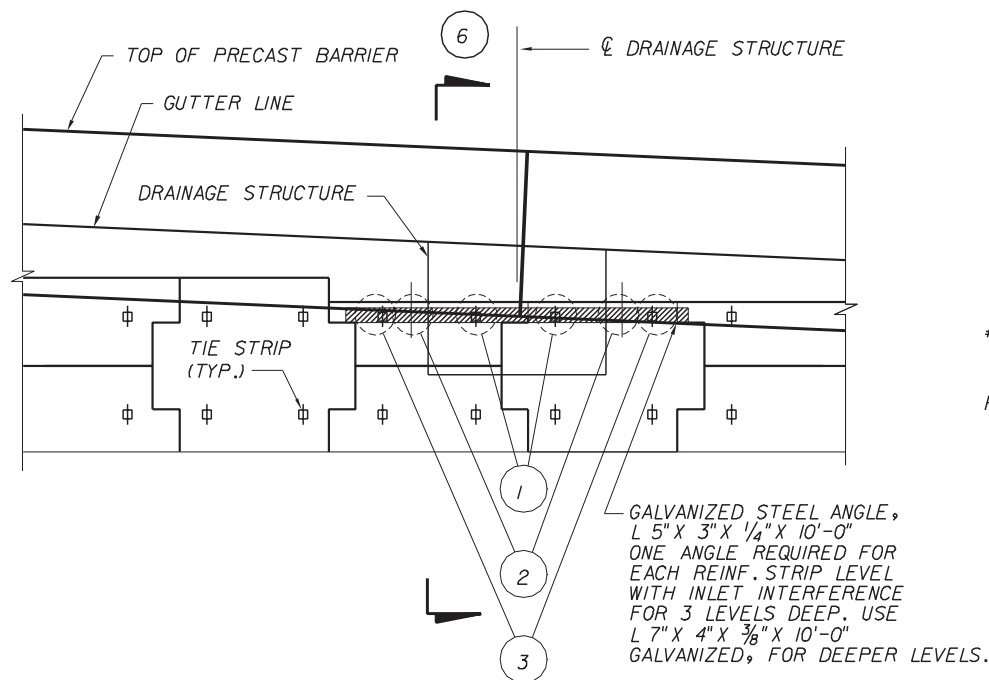
1 CONNECTION DETAIL
ANGLE BOLTED TO TIE STRIP



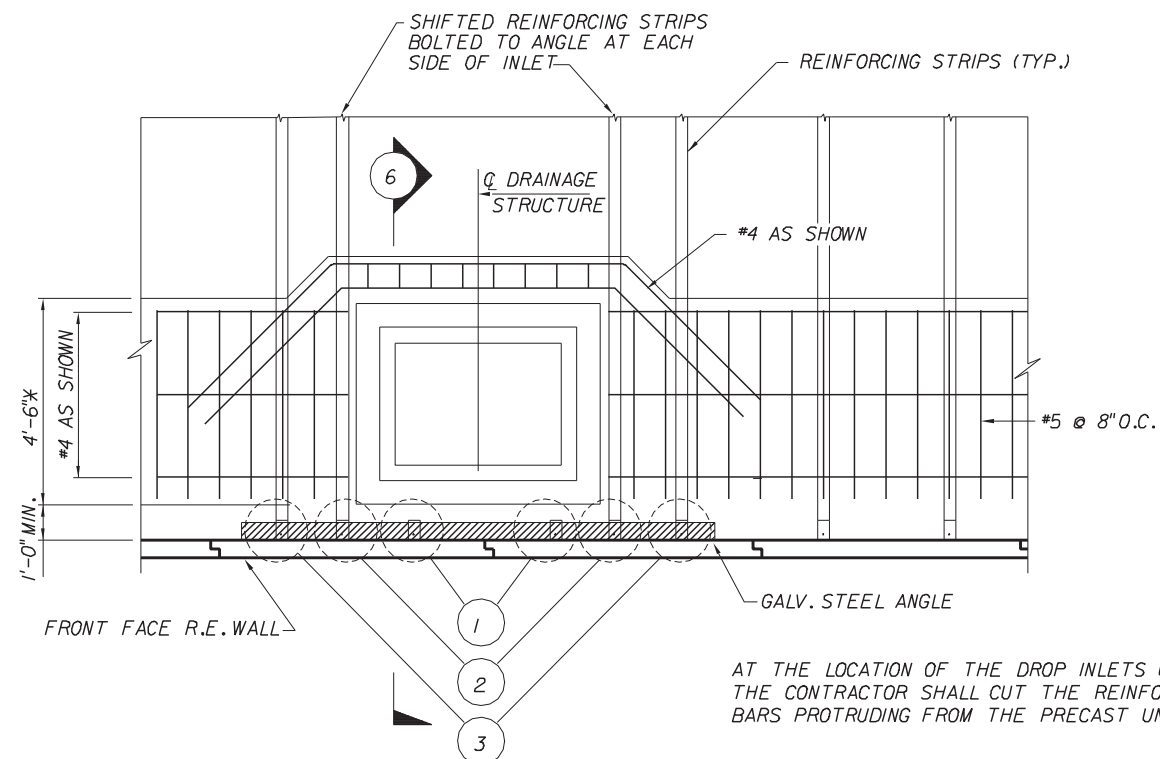
2 CONNECTION DETAIL
SHIFTED REINF. STRIP BOLTED TO ANGLE



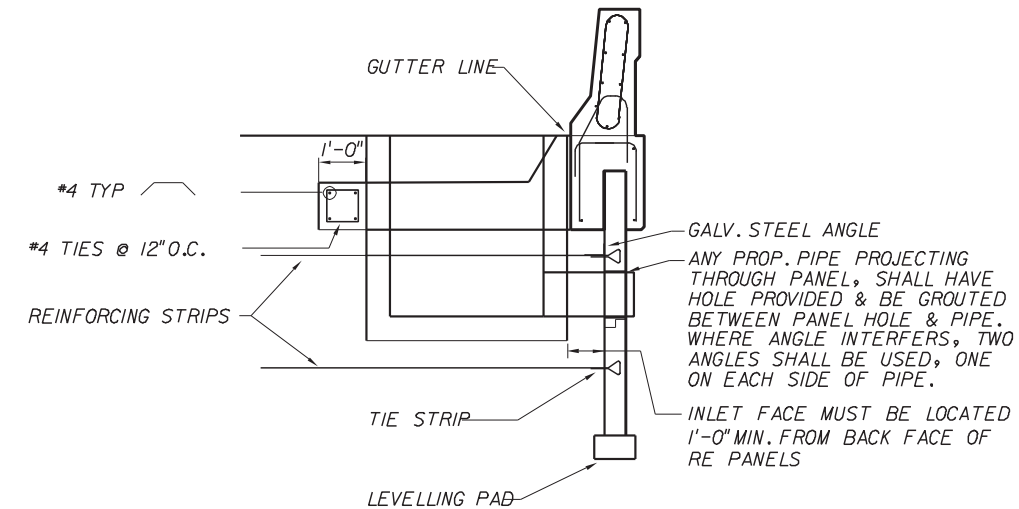
3 CONNECTION DETAIL
ANGLE BOLTED TO TIE STRIP WITH REINF. STRIP



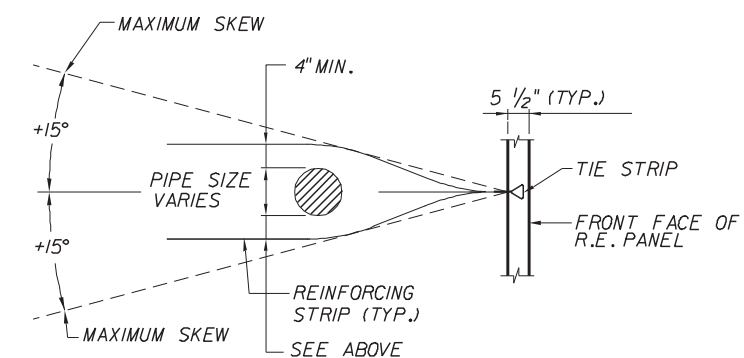
4 PARTIAL ELEVATION



5 PARTIAL PLAN



6 SECTION AT INLET



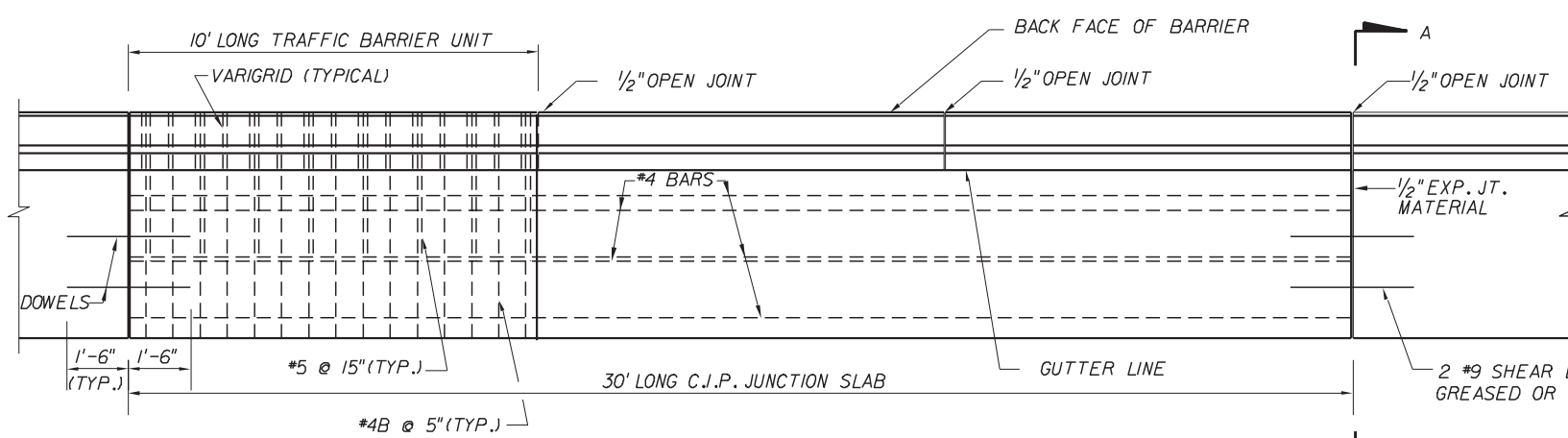
7 TYPICAL STRIP BENDING DETAIL AT ANY PROPOSED & EXISTING PIPES

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY CRUCIFORM AND SQUARE PANELS

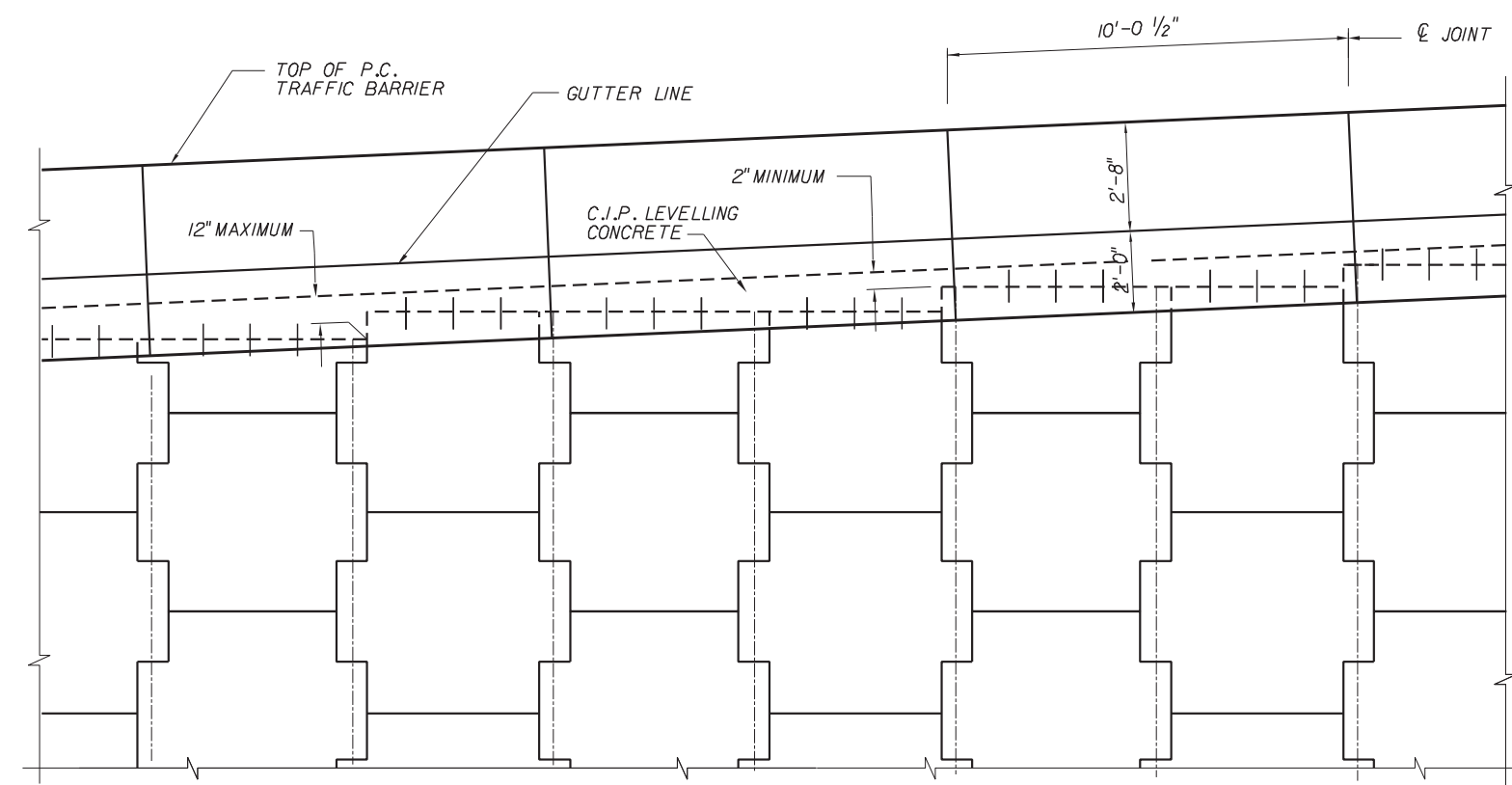
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

Designed By	Names	Dates	Approved By		
Drawn By			 State Structures Design Engineer	Revision	Sheet No.
Checked By				00	6 of 14

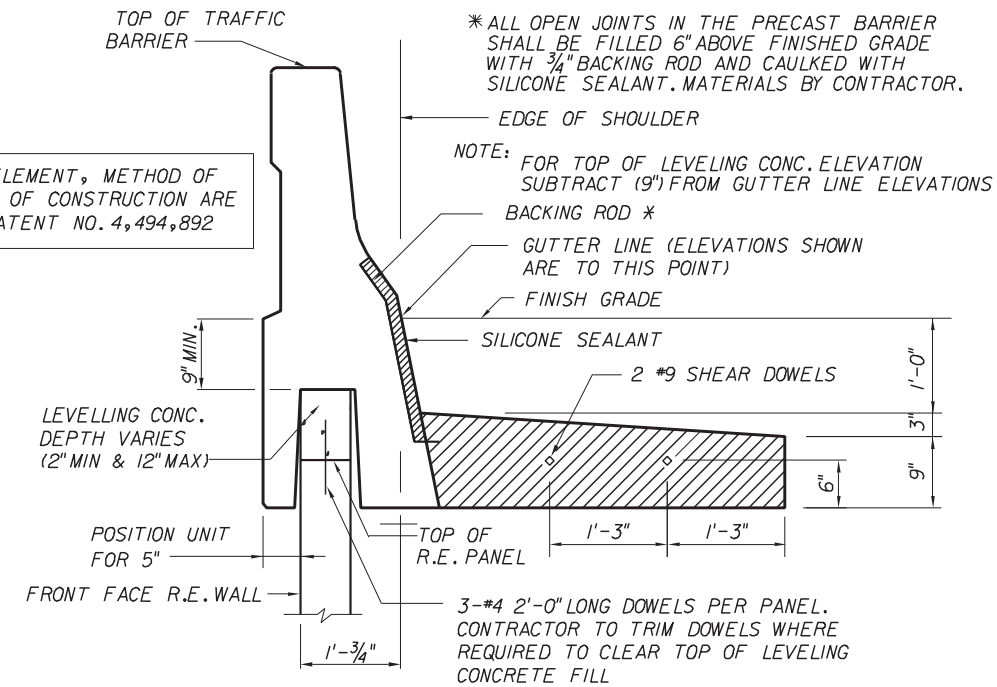


PRECAST TRAFFIC BARRIER
PLAN VIEW

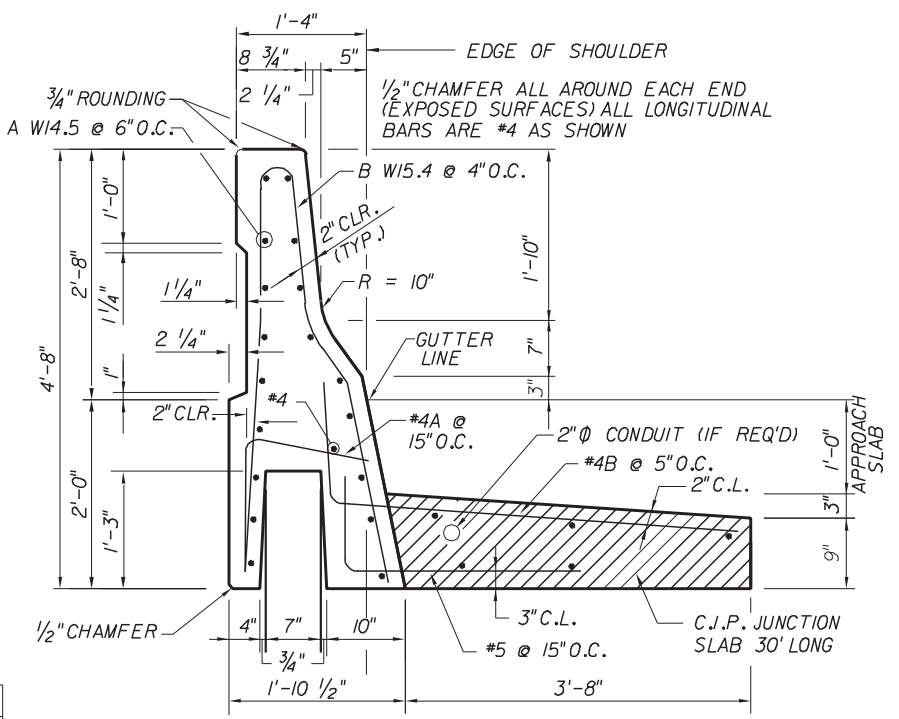
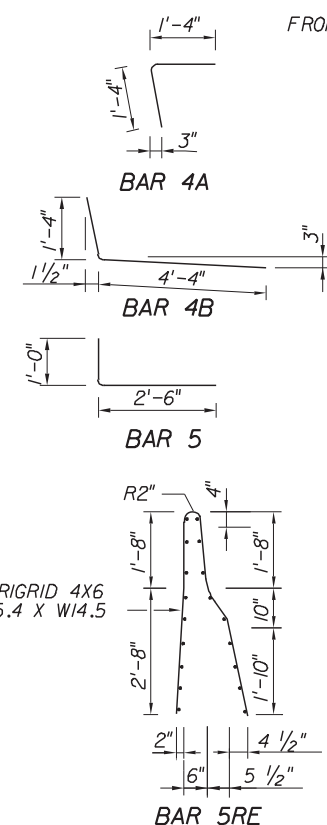


PRECAST TRAFFIC BARRIER
PARTIAL ELEVATION

TRAFFIC BARRIER ELEMENT, METHOD OF SUPPORT AND METHOD OF CONSTRUCTION ARE COVERED BY U.S. PATENT NO. 4,494,892



SECTION A-A AT APPROACH SLAB



TRAFFIC BARRIER REINFORCEMENT

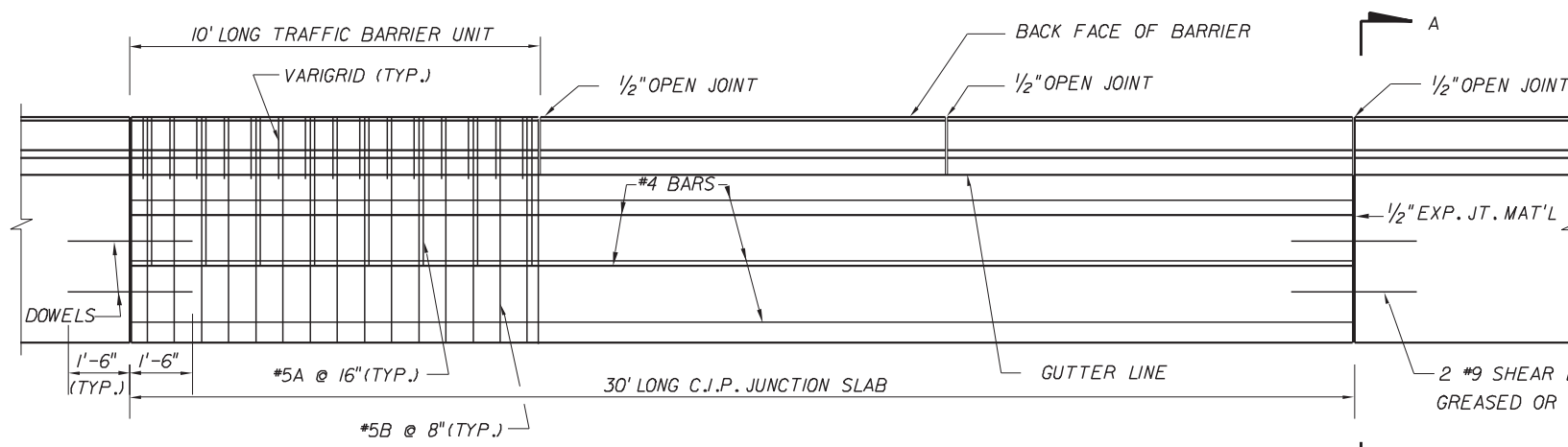
MARK	QUANTITY	REMARKS
5	8	3'-6" LONG
A	VARIGRID	W14.5 @ 6" O.C.
B	VARIGRID	W15.4 @ 4" O.C.
4A	8	2'-8" LONG
4B	24	5'-8" LONG

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

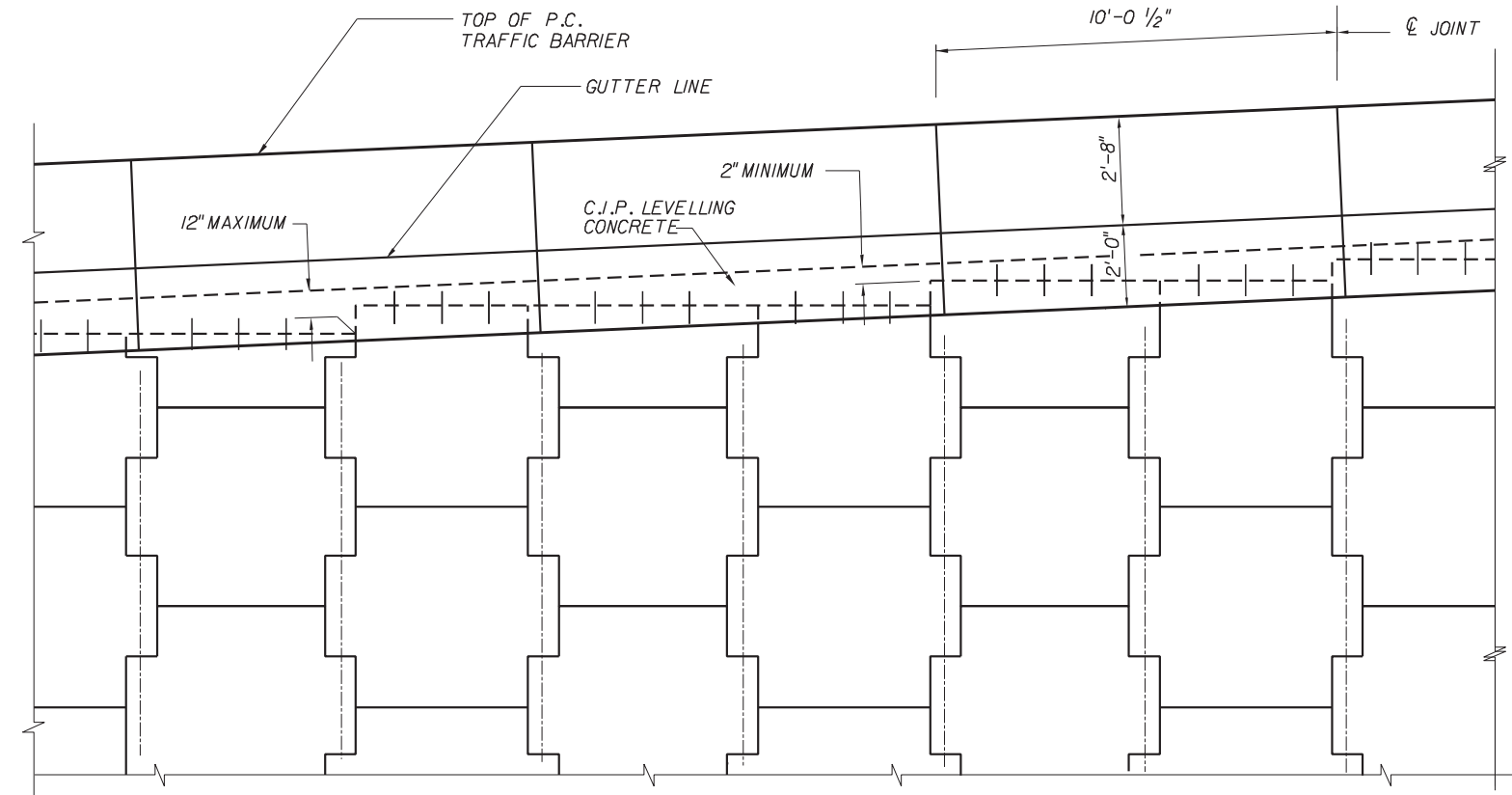
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL**

Names	Dates	Approved By	[Signature]	
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	7 of 14	5015

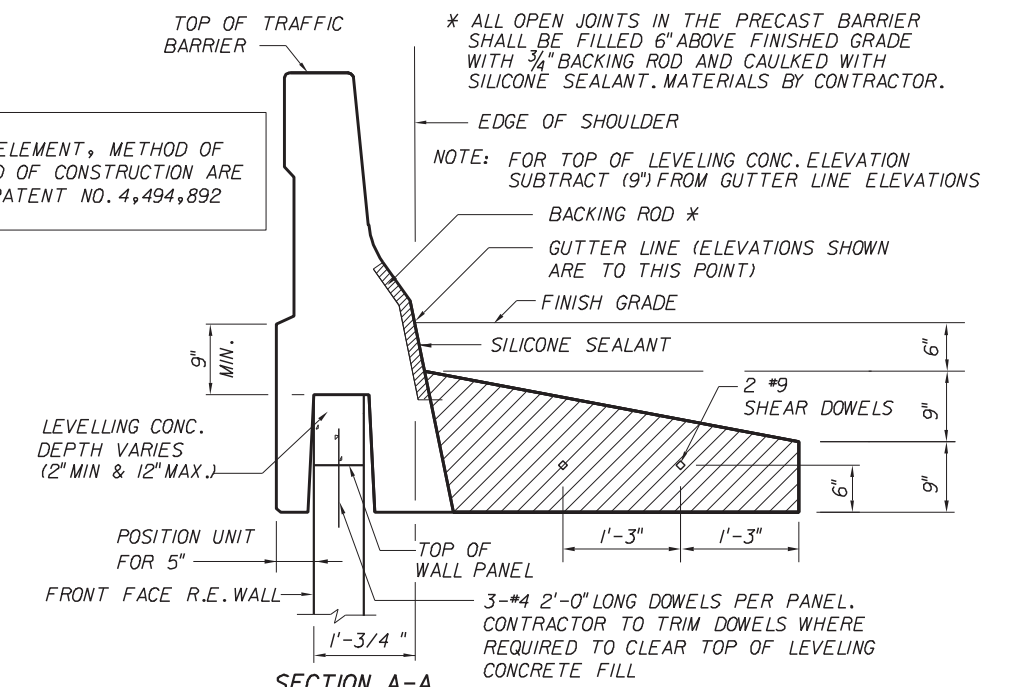


PRECAST TRAFFIC BARRIER
PLAN VIEW

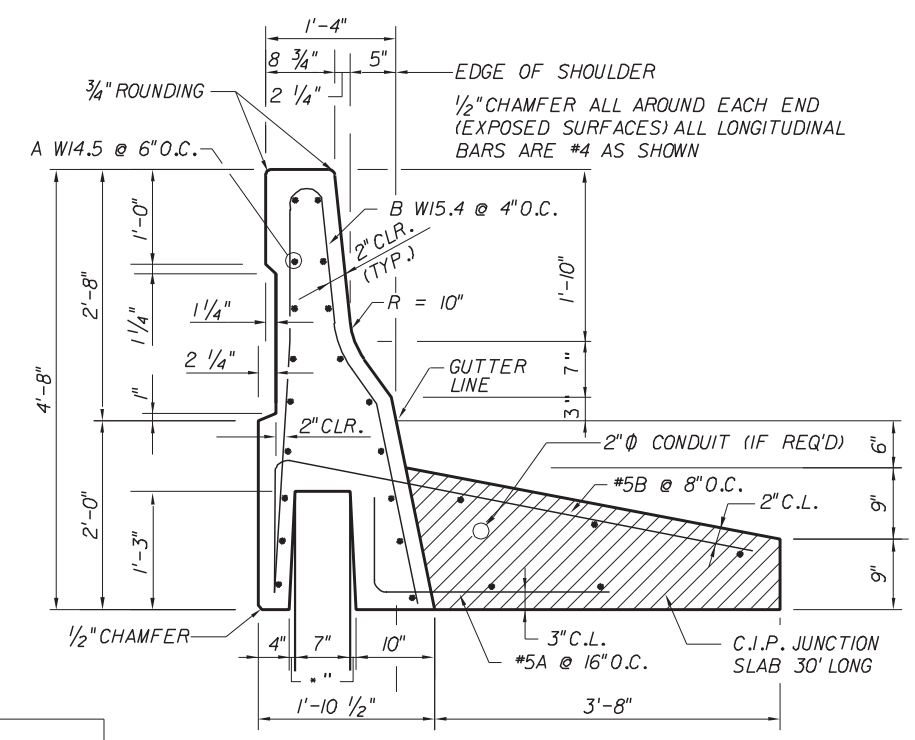
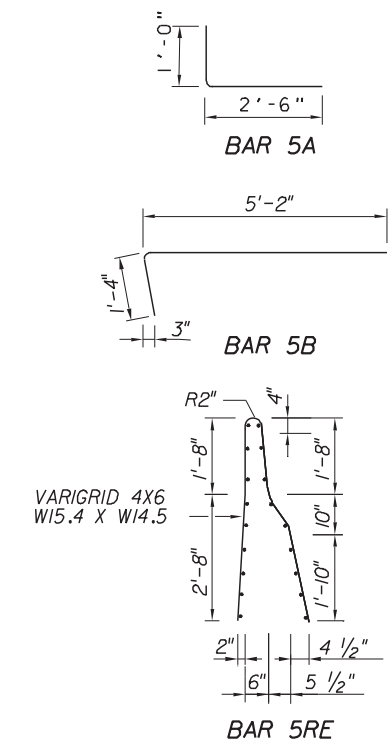


PRECAST TRAFFIC BARRIER
PARTIAL ELEVATION

TRAFFIC BARRIER ELEMENT, METHOD OF SUPPORT AND METHOD OF CONSTRUCTION ARE COVERED BY U.S. PATENT NO. 4,494,892



SECTION A-A



TRAFFIC BARRIER REINFORCEMENT

MARK	QUANTITY	REMARKS
5A	8	3'-6" LONG
5B	15	6'-6" LONG
A	VARIGRID	W14.5 @ 6" O.C.
B	VARIGRID	W15.4 @ 4" O.C.

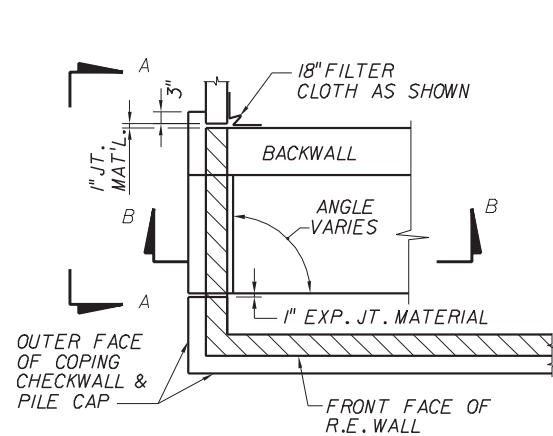
THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

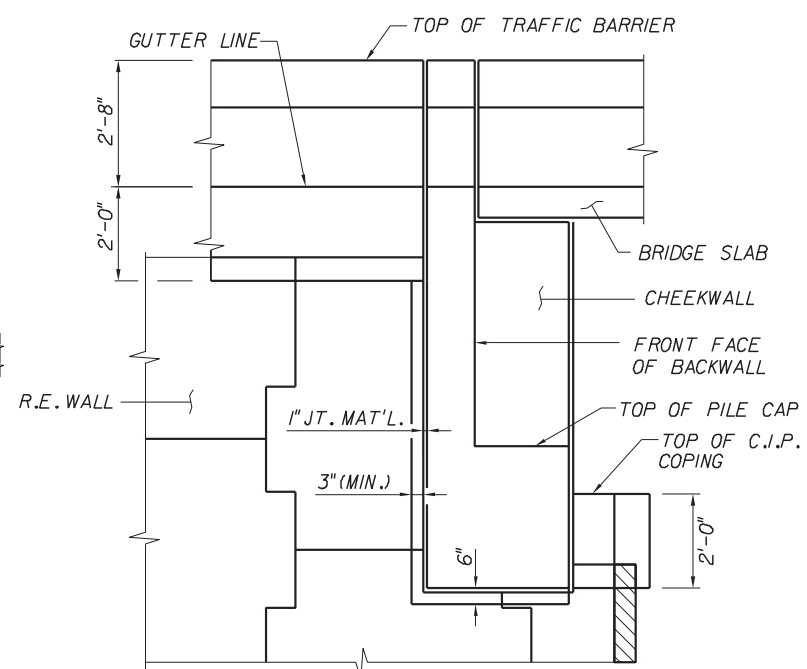
**RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL**

Designed By	Names	Dates	Approved By	<i>W. V. [Signature]</i>
Drawn By			State Structures Design Engineer	
Checked By			Revision	Sheet No.
			00	8 of 14
				5015

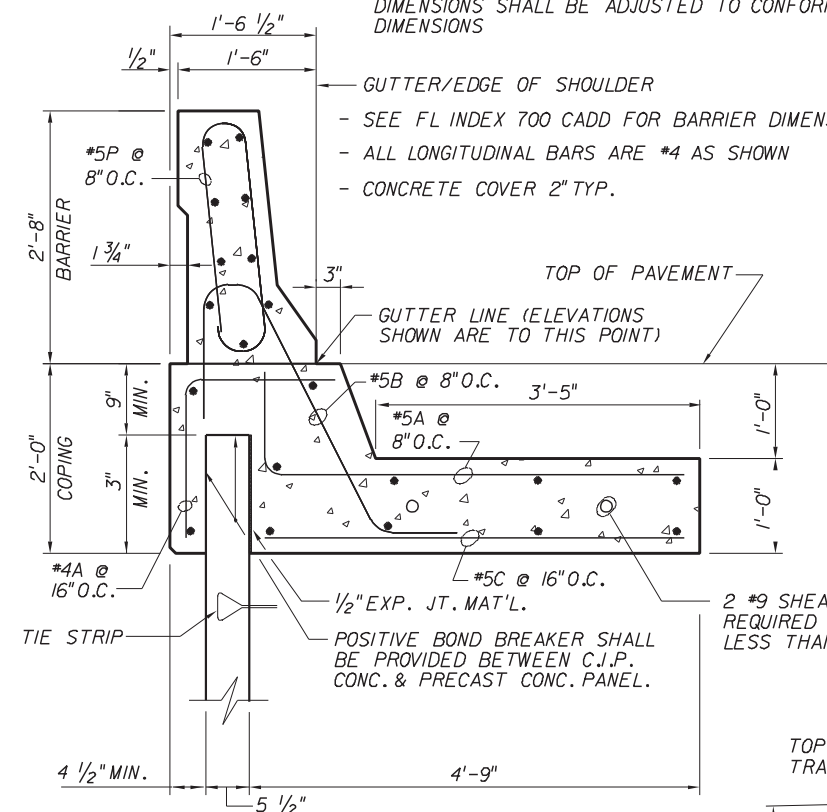
NOTE:
IF SHORT C.J.P. BARRIER SECTIONS ARE TO BE CONSTRUCTED
ADJACENT TO PRECAST BARRIER SECTIONS, THEN THIS SECTION'S
DIMENSIONS SHALL BE ADJUSTED TO CONFORM TO THE PRECAST
DIMENSIONS



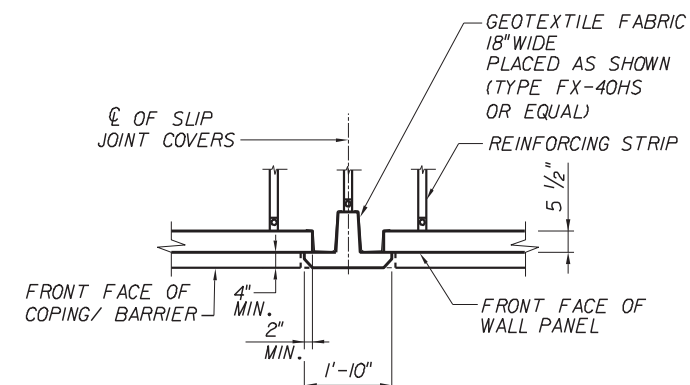
PLAN VIEW @ BEND (TYP.)



SECTION A-A

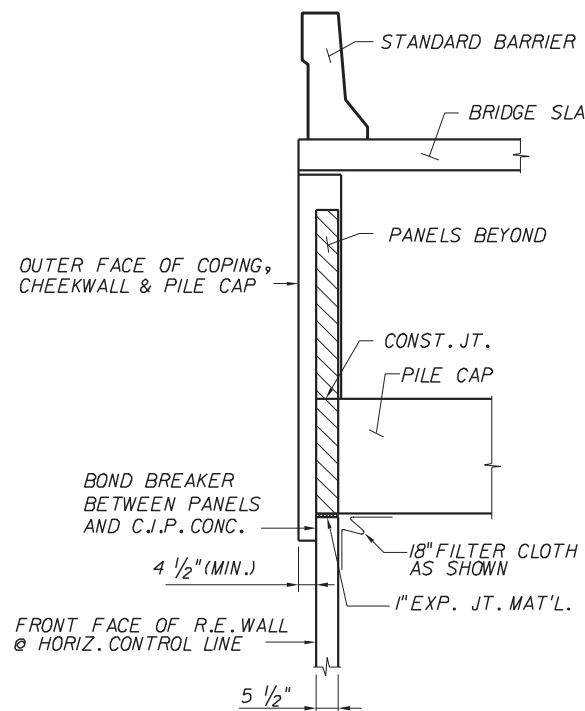


C.J.P. CONC. TRAFFIC BARRIER

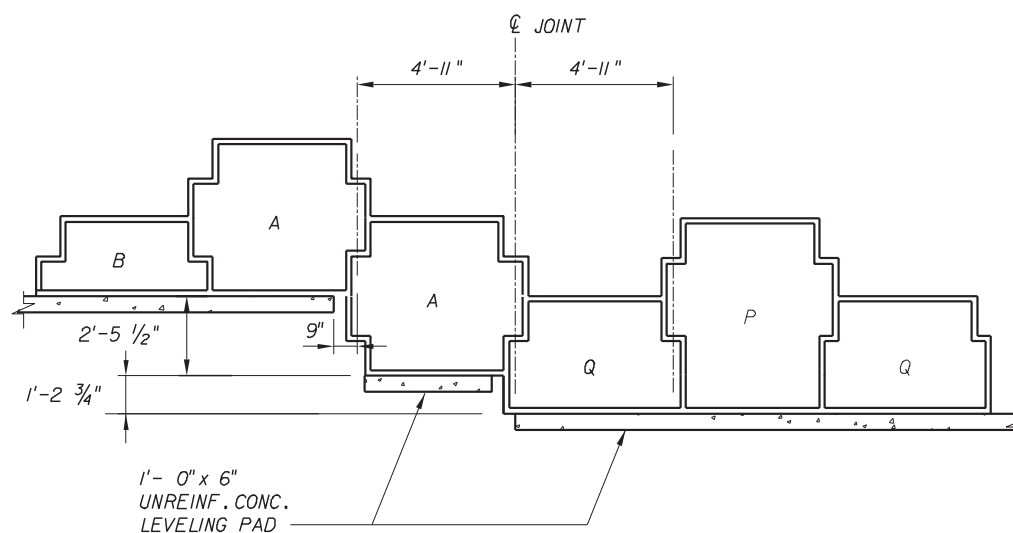


SLIP JOINT COVER DETAIL

2 #9 SHEAR DOWELS - 3' LONG
REQUIRED AT EXP. JT. IF UNIT IS
LESS THAN SIX PANELS LONG.

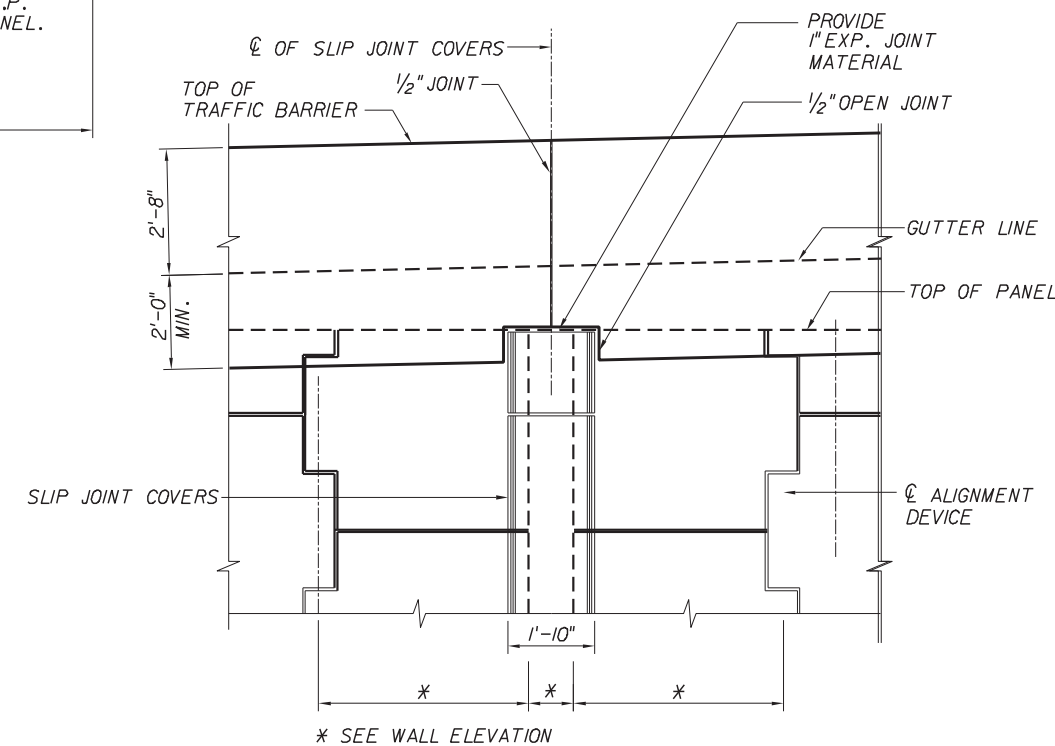


SECTION B-B



TYPICAL LEVELING PAD STEP DETAIL

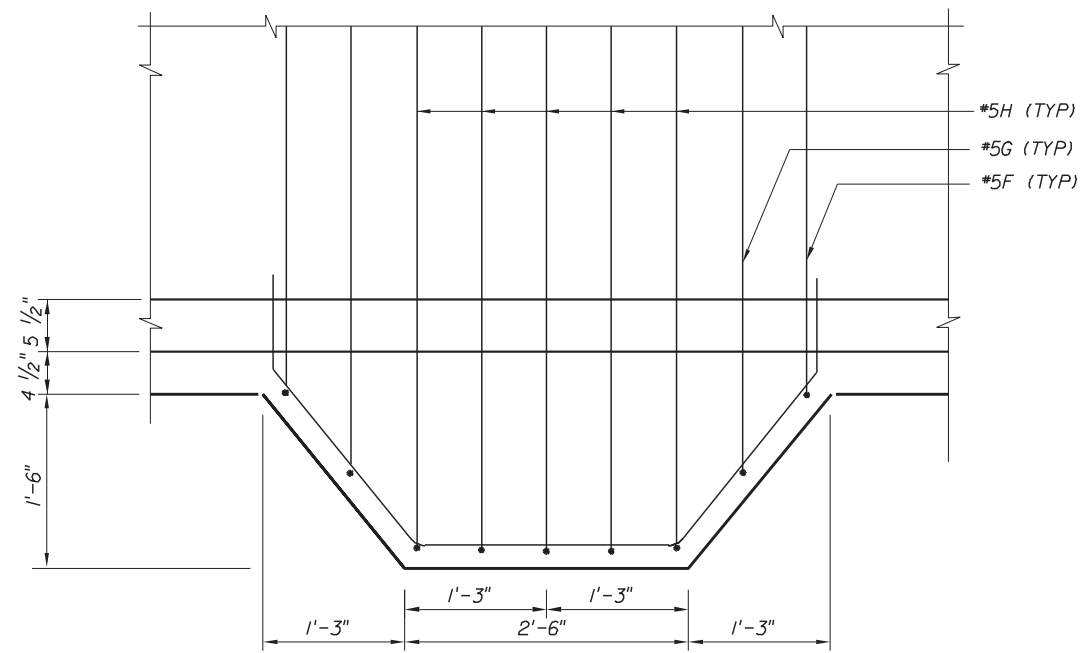
(LEVELING PAD DIMENSIONS ARE THE SAME FOR BOTH
CRUCIFORM AND SQUARE PANELS, SEE WALL ELEVATIONS
FOR PANEL TYPES AT STEPS)



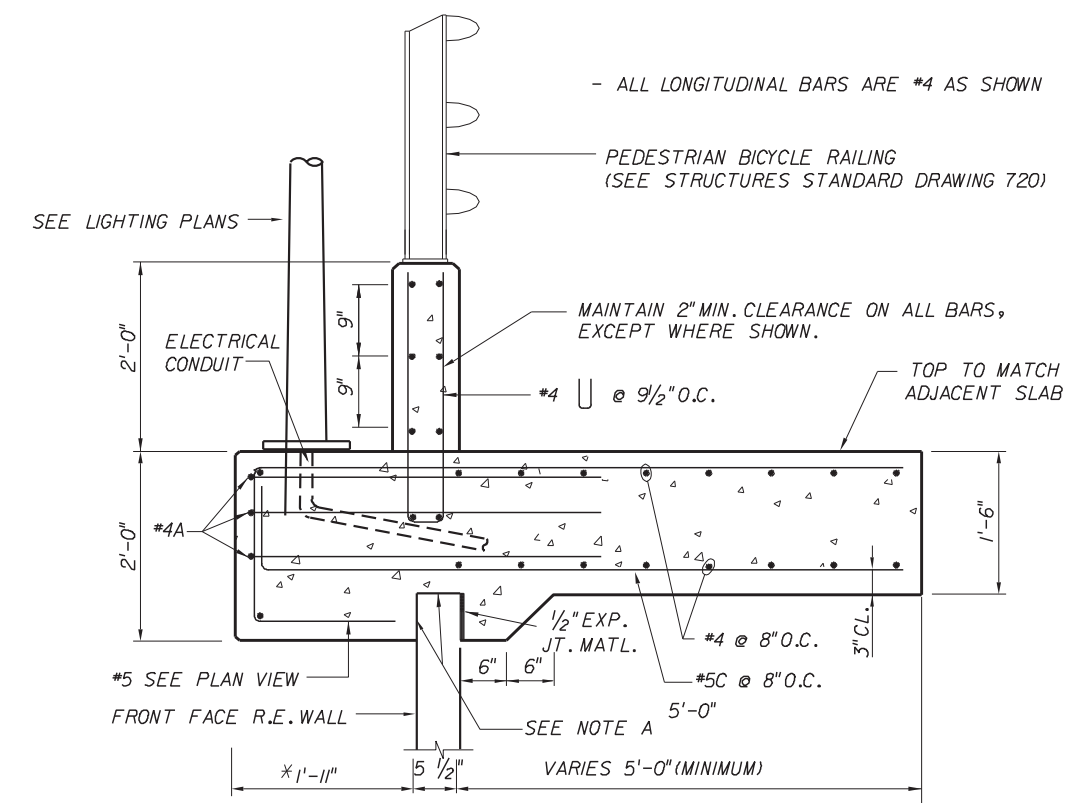
C.J.P. TRAFFIC BARRIER
OVER SLIP JOINT COVER

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR
MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Designed By	Names	Dates	Approved By <i>W. V. [Signature]</i>	
Drawn By			Revision	Sheet No. Index No.
Checked By			00	9 of 14 5015



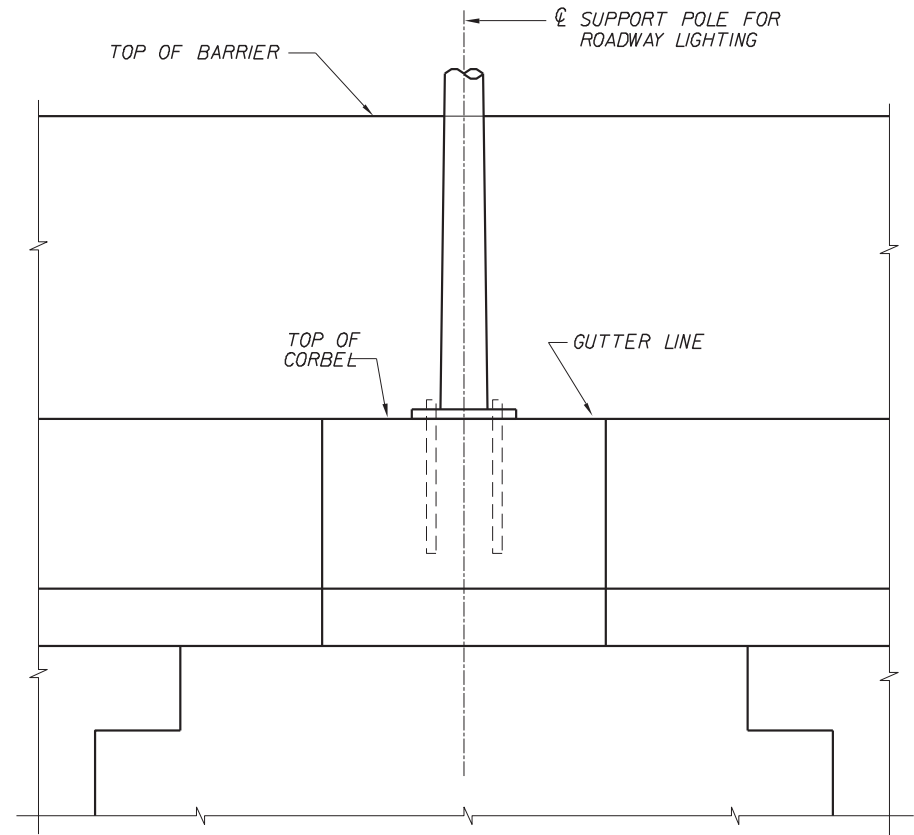
1 PLAN



* DIMENSION MAY VARY AS REQUIRED FOR LIGHT POLE BASE PLATE.

(SEE NOTE B)
(6-PANEL UNIT STD)
(5-PANEL UNIT MIN)

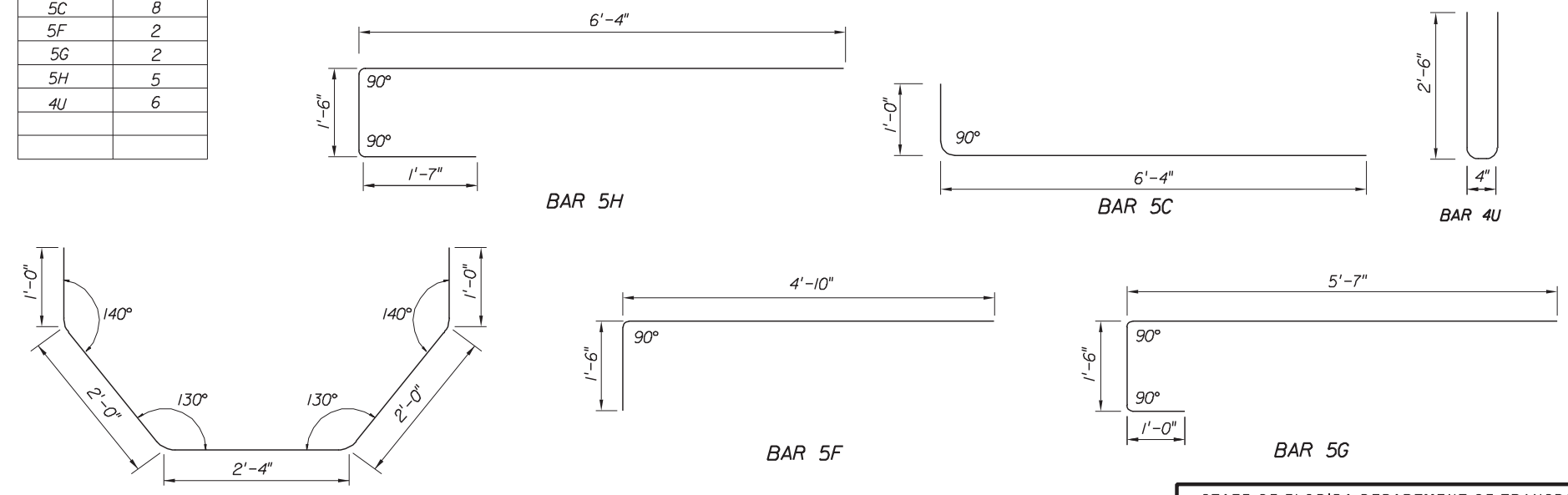
- NOTE A:
POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN C.I.P. CONCRETE AND CONCRETE PANEL
- NOTE B:
THE BARRIER JUNCTION SLAB HAVE THESE DIMENSIONS FOR ONE PRECAST UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE
- NOTE C:
2 - #9 SHEAR DOWELS - 3'-0" LONG REFER TO PRECAST BARRIER SHEET
- NOTE D:
LIGHT POLE MANUFACTURER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.
- NOTE E:
SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS.



3 PARTIAL ELEVATION

REBAR SCHEDULE	
MARK	QTY.
4A	3
5C	8
5F	2
5G	2
5H	5
4U	6

2 BARRIER DETAIL @ LIGHT POLE



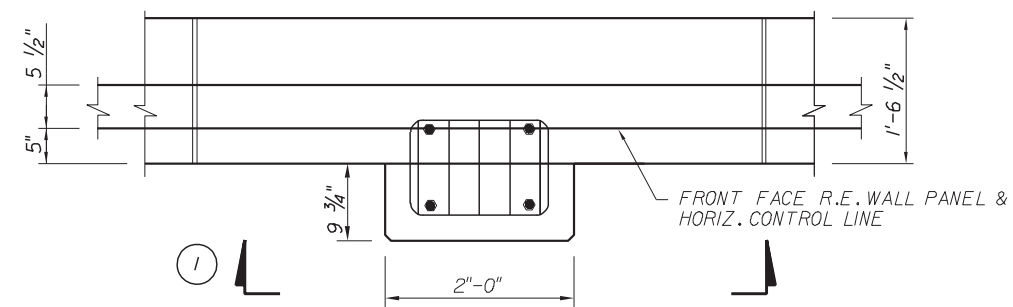
4 BAR BENDING DETAILS

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

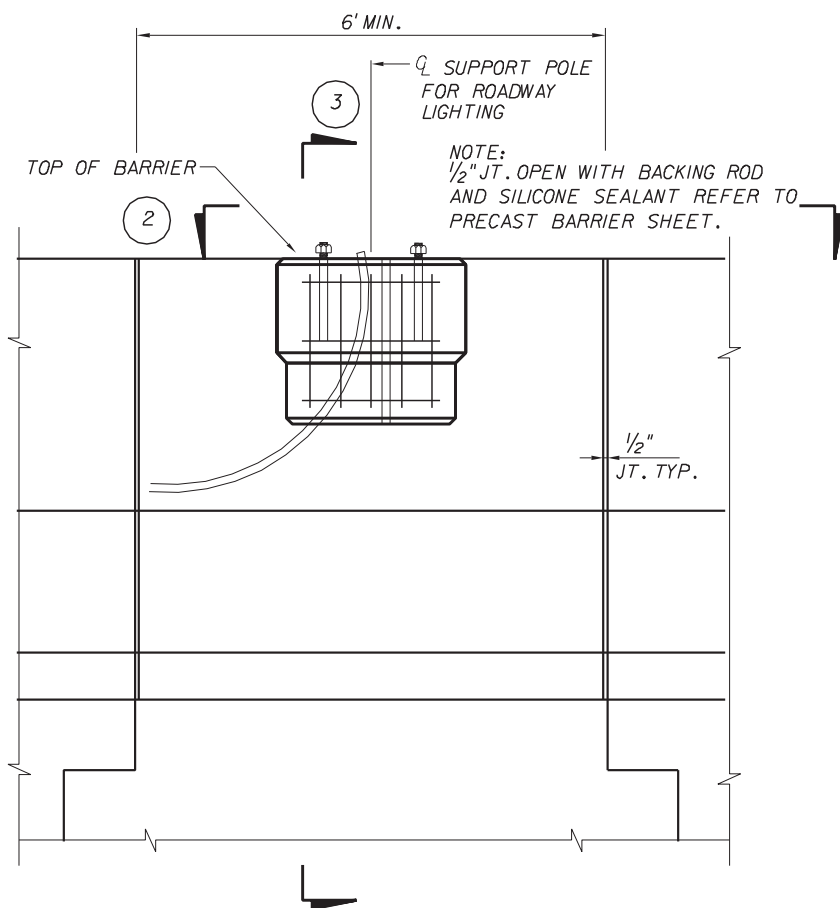
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL**

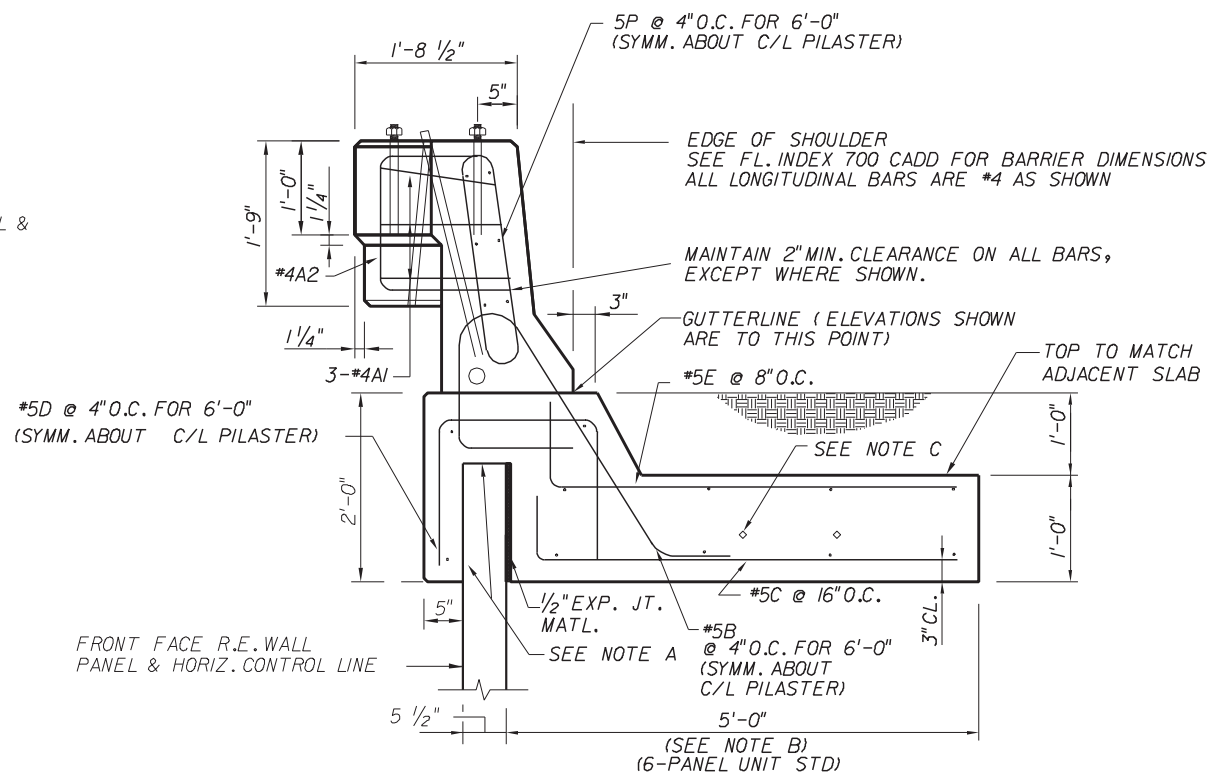
Names	Dates	Approved By	W. V. [Signature]	
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	10 of 14	5015



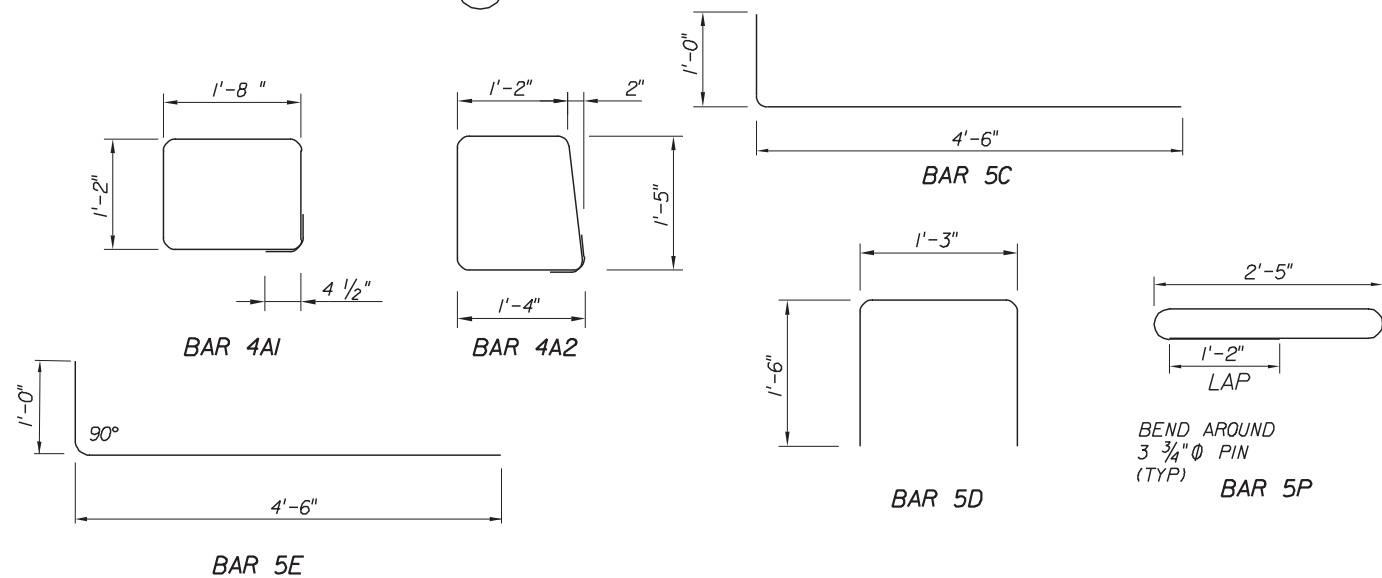
2 PLAN



1 PARTIAL ELEVATION



3 BARRIER DETAIL @ LIGHT POLE

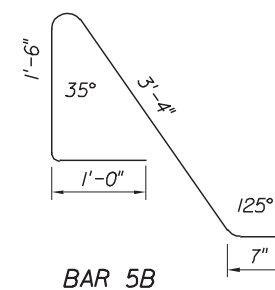


4 BAR BENDING DETAILS

NOTES:

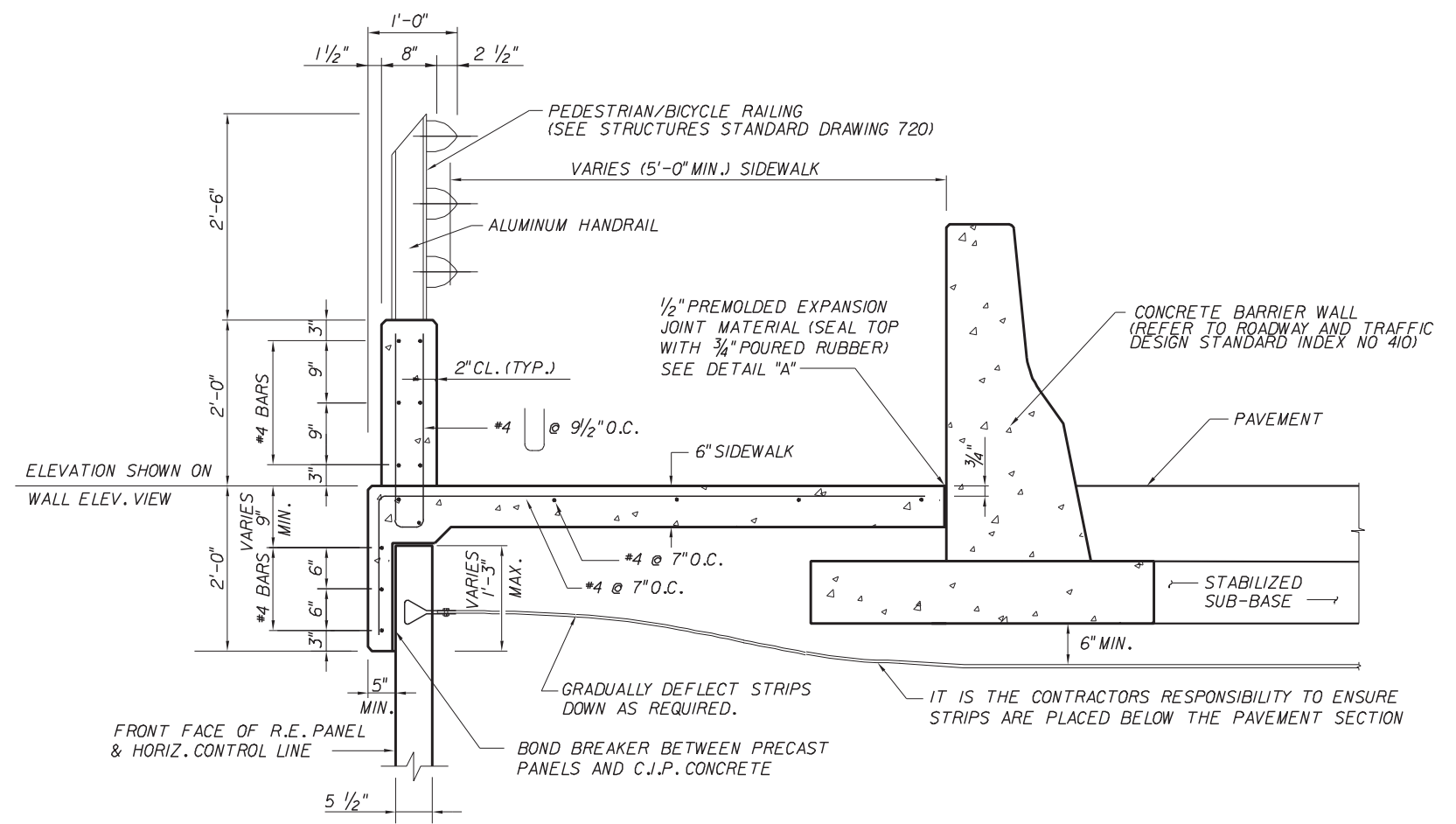
- A. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN CAST IN PLACE CONC. AND PRECAST CONC. PANEL.
- B. THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR ONE PRECAST UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE.
- C. 2 - #9 SHEAR DOWELS - 3'-0" LONG REFER TO PRECAST BARRIER SHEET
- D. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.
- E. SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS.

REBAR SCHEDULE	
MARK	QTY.
4A1	3
4A2	5
5B	18
5C	4
5D	18
5E	9
5P	18

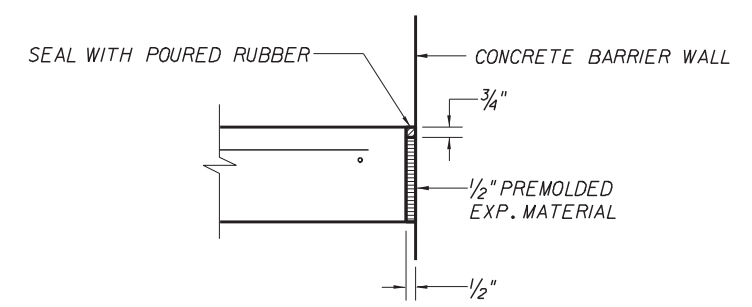


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	11 of 14	5015

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS



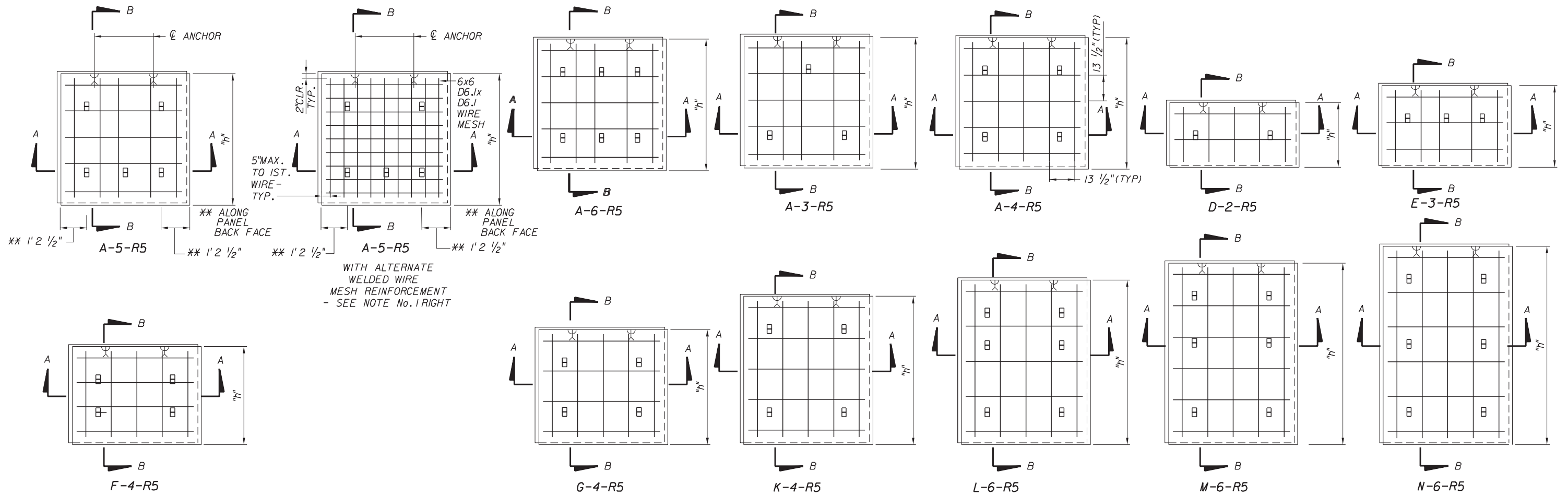
C.I.P. PARAPET DETAIL w/ HANDRAIL



DETAIL "A"

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	12 of 14	5015

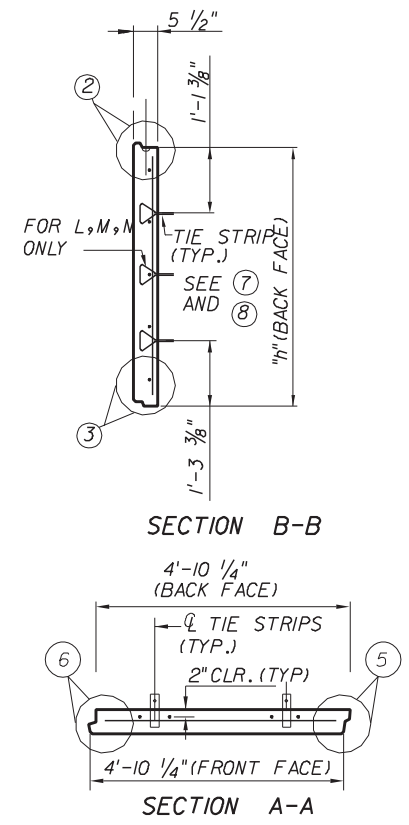


WITH ALTERNATE WELDED WIRE MESH REINFORCEMENT - SEE NOTE No. 1 RIGHT

TYPICAL PANELS

NOTES:

1. REINFORCING STEEL TO BE A615, GRADE 60. DEFORMED WELDED WIRE MESH (ASTM A497) MAY BE SUBSTITUTED FOR REBARS. DEFORMED WELDED MESH REQUIREMENTS FOR PANEL "A" IS SHOWN IN THIS SHEET. MESH FOR OTHER PANEL TYPES SHALL BE DETERMINED BASED ON PANEL SHAPE MESH STYLE, AND MINIMUM EDGE CLEAR DISTANCES SHOWN ON THIS SHEET.
2. 1/2" x 1/2" CHAMFER SHALL BE PROVIDED ON ALL EXPOSED EDGES (FRONT FACE ONLY).
3. ALL PANEL TYPES AND OTHER RELATED ELEMENTS WILL BE DETAILED ON PANEL SHOP DRAWINGS.
4. ALL PANELS SHALL HAVE TWO 1 TON ANCHORS.
5. PANEL DESIGN THICKNESS IS 5 1/2" THICKNESS OF CONCRETE MUST INCREASE TO ACCOMMODATE ANY ARCHITECTURAL SURFACE FINISH THAT MAY BE SPECIFIED.
6. ACTUAL LOCATION OF REBARS WILL BE ADJUSTED TO ACCOMMODATE PANEL CASTING. MINIMUM 1 3/16" CLEARANCE IS REQUIRED BETWEEN REBARS & TIE-STRIPS.



PANEL TYPE	"h"
A	4'-10 1/4"
D	2'-4 3/4"
E	3'-0 1/4"
F	3'-7 1/2"
G	4'-3"
K	5'-5 3/4"
L	6'-1"
M	6'-8 1/2"
N	7'-4"

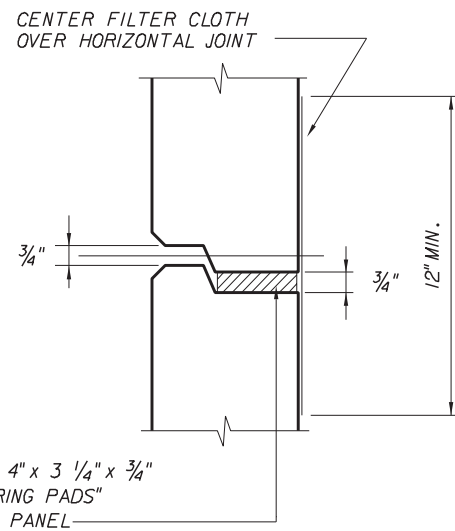
NOTE: CONCRETE COVER ON ALL REINFORCEMENT TO BE 2" MIN.

PANEL THICKNESS	REINFORCEMENT DESIGNATION	PANEL REINFORCEMENT A ₅	MAXIMUM ALLOWABLE HORIZONTAL STRESS AT FACING (KSF)
5 1/2" (MIN.)	R5	5-#3 VERTICAL 5-#3 HORIZONTAL	1.19
		ALTERNATE 6 x 6 D6.1 x D6.1	
	R7	7-#3 VERTICAL 6-#3 HORIZONTAL	1.78
		ALTERNATE 6 x 6 D8.5 x D8.5	

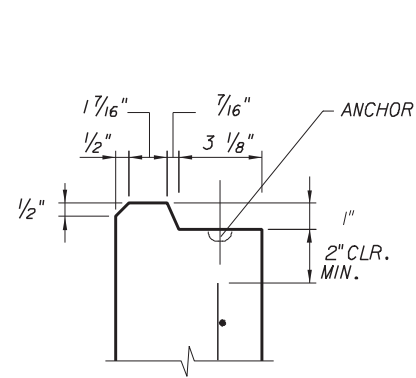
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL**

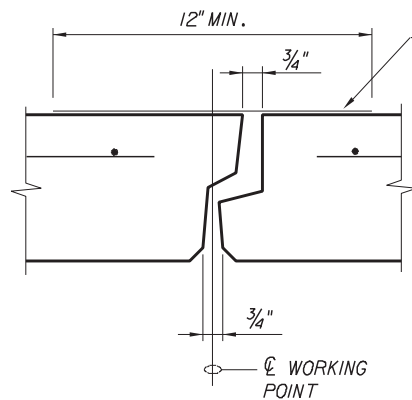
Names	Dates	Approved By	W. J. [Signature]	
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Checked By		00	13 of 14	5015



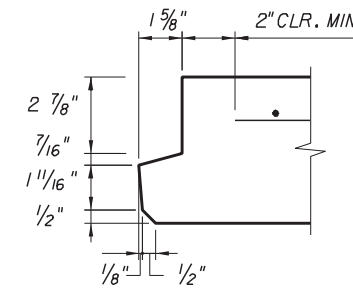
1 HORIZONTAL JOINT



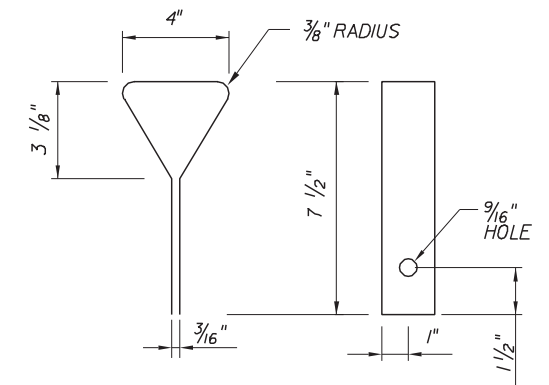
2 SECTION @ PANEL TOP



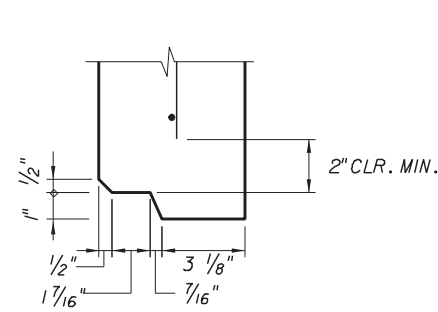
4 VERTICAL JOINT



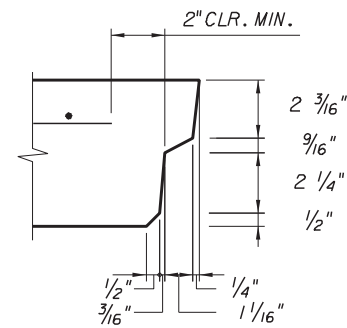
6 SECTION @ PANEL LEFT SIDE



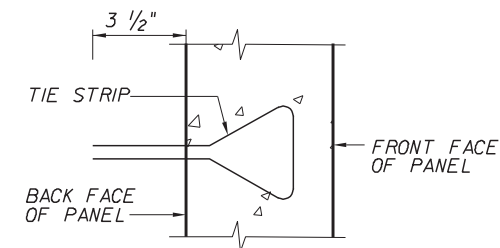
8 TIE STRIP DETAIL



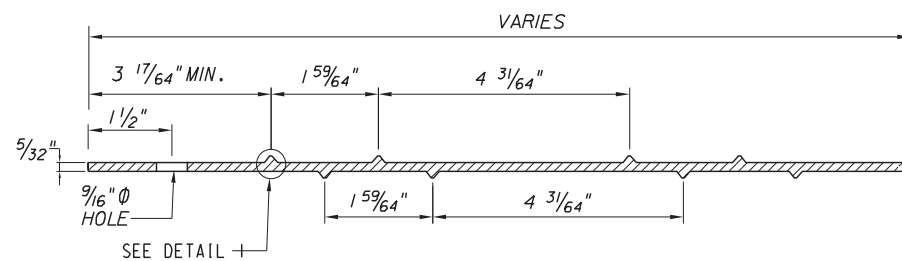
3 SECTION @ PANEL BOTTOM



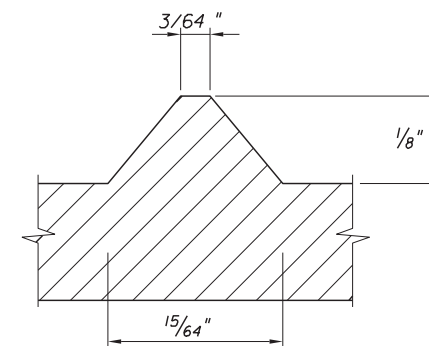
5 SECTION @ PANEL RIGHT SIDE



7 PARTIAL SECTION @ TIE STRIP



REINFORCING STRIP DETAIL



DETAIL I

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
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Checked By		00	14 of 14	5015



The Reinforced Earth Company

8614 WESTWOOD CENTER DRIVE SUITE 1100, VIENNA, VIRGINIA 22182 (703) 821-1175

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL BEHIND THE PRECAST TECHWALL, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE SPECIFICATIONS FOR TECHWALL.
2. SOIL PARAMETERS:
SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF ϕ , c AND α SHALL BE PROVIDED IN THE SHOP DRAWINGS.
3. THE MAXIMUM APPLIED BEARING PRESSURE AT THE TOE OF THE TECHWALL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE OWNER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE CAST-IN-PLACE FOOTING, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.
5. THE MINIMUM FACTORS OF SAFETY REQUIRED FOR DESIGN
OVERTURNING = 2.0
SLIDING = 1.5
BEARING CAPACITY = 2.5
OVERALL STABILITY = 1.5
REINFORCING STEEL DESIGN SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND FDOT DESIGN GUIDELINES NO. 625-020-150B.

WALL CONSTRUCTION

6. FOR LOCATION AND ALIGNMENT OF TECHWALL, SEE RETAINING WALL CONTROL PLANS
7. TECHWALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 8.00' EACH TO MATCH DESIRED WALL ALIGNMENT.
8. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.
9. IF PILES ARE LOCATED WITHIN THE TECHWALL RETAINED VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE TECHWALL UNLESS A METHOD IS USED TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE REINFORCED EARTH COMPANY, AND IS PROPOSED AND APPROVED IN WRITING.

10. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 OF THE FLORIDA DOT SPECIFICATIONS.
11. IF STRUCTURES IN EXCESS OF 20' IN HEIGHT OCCUR, THE FINISHED GRADE IN FRONT OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS A HEIGHT OF 20'. FINISHED GRADE BACKFILL SHALL BE COMPACTED TO 95% OF ASSHTO T-180, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
12. TECHWALL PANELS TO BE FINISHED WITH COPING SHALL HAVE #4 DOWELS PROTRUDING FROM THEIR TOP EDGE.
13. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO THE REINFORCED EARTH CONSTRUCTION MANUAL FOR TECHWALL.
14. IF UNDERDRAIN IS SHOWN, THE FLOWLINE AND OUTLETS SHALL BE AS PER THE CONTRACT PLANS.

MATERIALS NOTES

15. PANEL FINISH
THE PRECAST PANELS FOR THIS PROJECT SHALL HAVE A PLAIN STEEL FORM FINISH UNLESS OTHERWISE SPECIFIED IN THE CONTROL PLANS.
16. ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY THE REINFORCED EARTH COMPANY:

- PRECAST CONCRETE FACING PANELS
- GEOCOMPOSITE TERRADRAIN 101 OR EQUIVALENT (FOR PANEL JOINTS ONLY)
- LIFTING HARDWARE FOR HANDLING PRECAST PANELS. (ON LOAN BASIS)
- PANEL LEVELLING BOLTS AND PLATES.

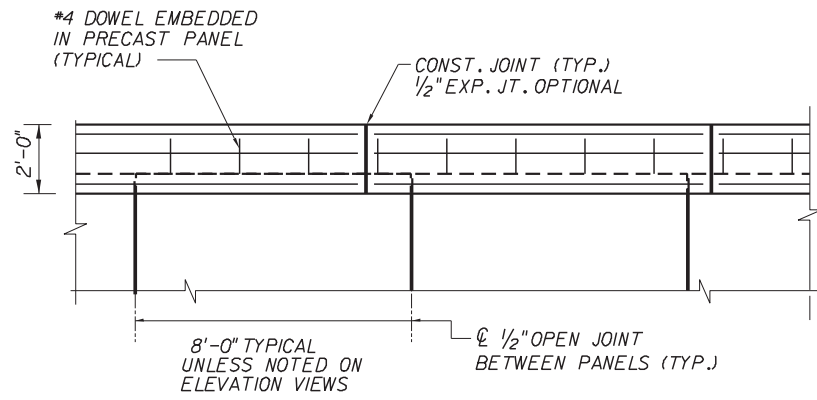
ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTION CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED/INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, SUPPLY, AND INSTALLATION OF A TEMPORARY FALSEWORK SUPPORT SYSTEM TO ADEQUATELY BRACE THE ASSEMBLED PRECAST WALL UNITS UNTIL THE CONCRETE FOOTING HAS BEEN POURED AND ADEQUATELY CURED ACCORDING TO THE REINFORCED EARTH COMPANY SPECIFICATIONS. PLANS FOR THE TEMPORARY FALSEWORK SUPPORT SYSTEM SHOWING DIMENSIONS, SUPPORT POINTS, MEMBER SIZES, CONNECTIONS AND MATERIAL SPECIFICATIONS SHALL BE SUBMITTED TO THE REINFORCED EARTH COMPANY PRIOR TO WALL ERECTION. NOTWITHSTANDING ITS REVIEW OF THE TEMPORARY FALSEWORK SUPPORT SYSTEM, THE REINFORCED EARTH COMPANY SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE OR LOSS CAUSED BY ANY DEFECT IN THE DESIGN AND/OR CONSTRUCTION OF THE TEMPORARY FALSEWORK SUPPORT SYSTEM. THRUST BLOCKS OR REACTION ASSEMBLIES SHALL BE OF SUFFICIENT SIZE SO THAT THE APPLIED SOIL PRESSURE DOES NOT EXCEED THE ALLOWABLE SOIL PRESSURE OR PRODUCE DETRIMENTAL DEFORMATIONS IN THE RESULTING POSITIONING OF THE ASSEMBLED PRECAST WALL UNITS.
18. CONCRETE COVER
- CAST-IN-PLACE
4" CLEAR ON REBAR FOR CONCRETE CAST AGAINST EARTH.
3" CLEAR ON REBAR FOR ALL OTHER C.I.P. CONCRETE UNLESS NOTED OTHERWISE.
- PRECAST CONCRETE
ALL REBARS IN PRECAST CONCRETE SHALL HAVE 2" MINIMUM CONCRETE COVER.
19. CONCRETE FOR PRECAST PANELS WILL BE PROVIDED BY THE REINFORCED EARTH COMPANY'S MANUFACTURING PLANT IN ACCORDANCE WITH SECTION 346 OF THE FLORIDA DOT SPECIFICATIONS.
20. THE REINFORCED EARTH COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.
21. THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO THE INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY
22. THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO THE REINFORCED EARTH COMPANY, AND IS BEING FURNISHED FOR THE USE IN CONNECTION WITH FDOT PROJECTS ONLY, AND THE INFORMATION CONTAINED HEREIN IS NOT TO BE TRANSMITTED TO ANY OTHER ORGANIZATION UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE REINFORCED EARTH COMPANY. THE REINFORCED EARTH COMPANY IS EXCLUSIVE LICENSEE IN THE UNITED STATES UNDER PATENTS ISSUED TO HENRY VIDAL, AND THE FURNISHING OF THIS DRAWING DOES NOT CONSTITUTE AN EXPRESSED OR IMPLIED LICENSE UNDER THE VIDAL PATENTS.

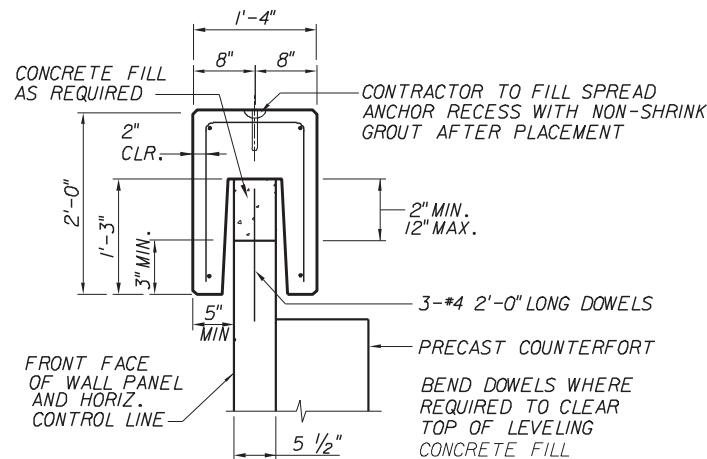
THIS SYSTEM SHALL NOT BE USED IN ACUTE ANGLE SMALLER THAN 60°

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TECHWALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Names	Dates	Approved By <i>W. Vidal</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
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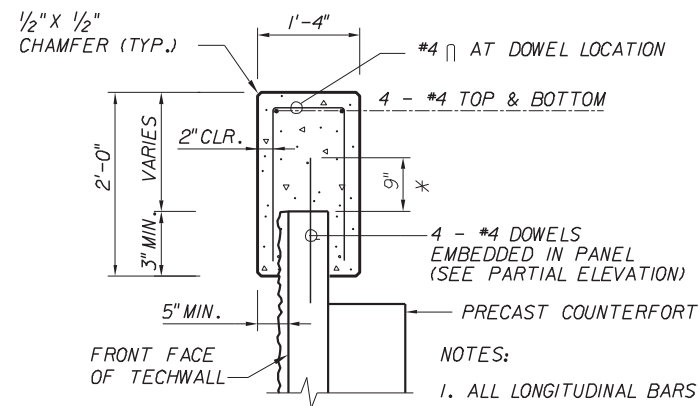


PRECAST COPING - PARTIAL ELEVATION



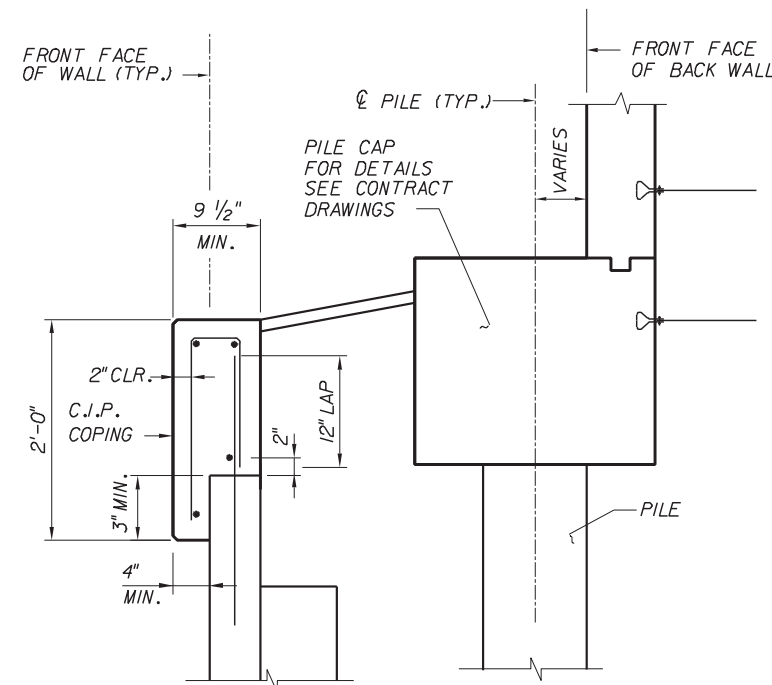
PRECAST COPING SECTION

NOTE:
STANDARD COPING UNIT IS 10.0' LONG WITH SQUARE ENDS.

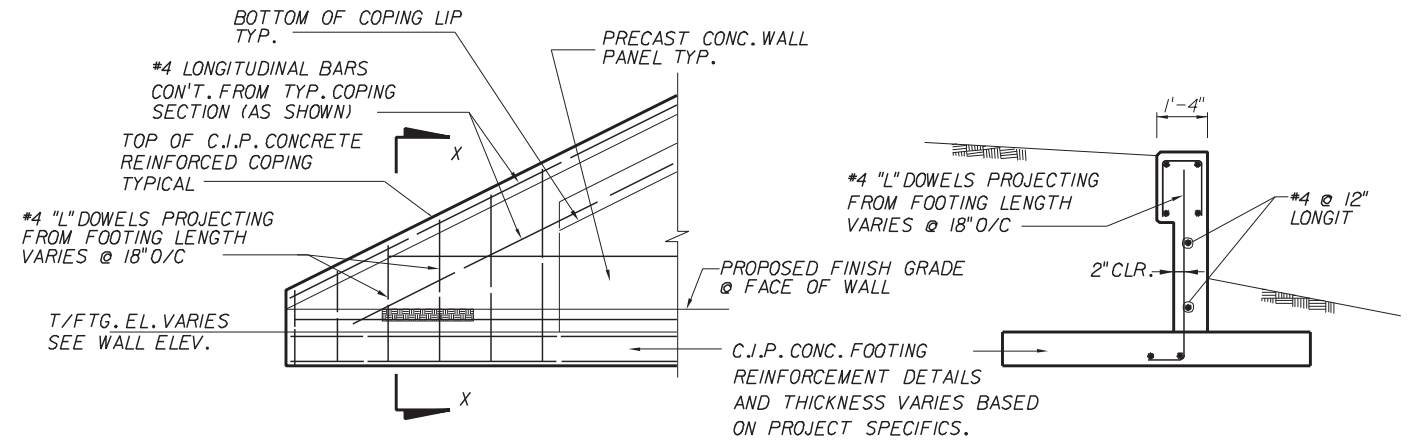


C.J.P. CONC. COPING DETAIL
(TO MATCH ADJACENT PRECAST COPING)

NOTES:
1. ALL LONGITUDINAL BARS ARE #4
2. * BEND DOWELS AS REQUIRED TO FIT WITHIN COPING.

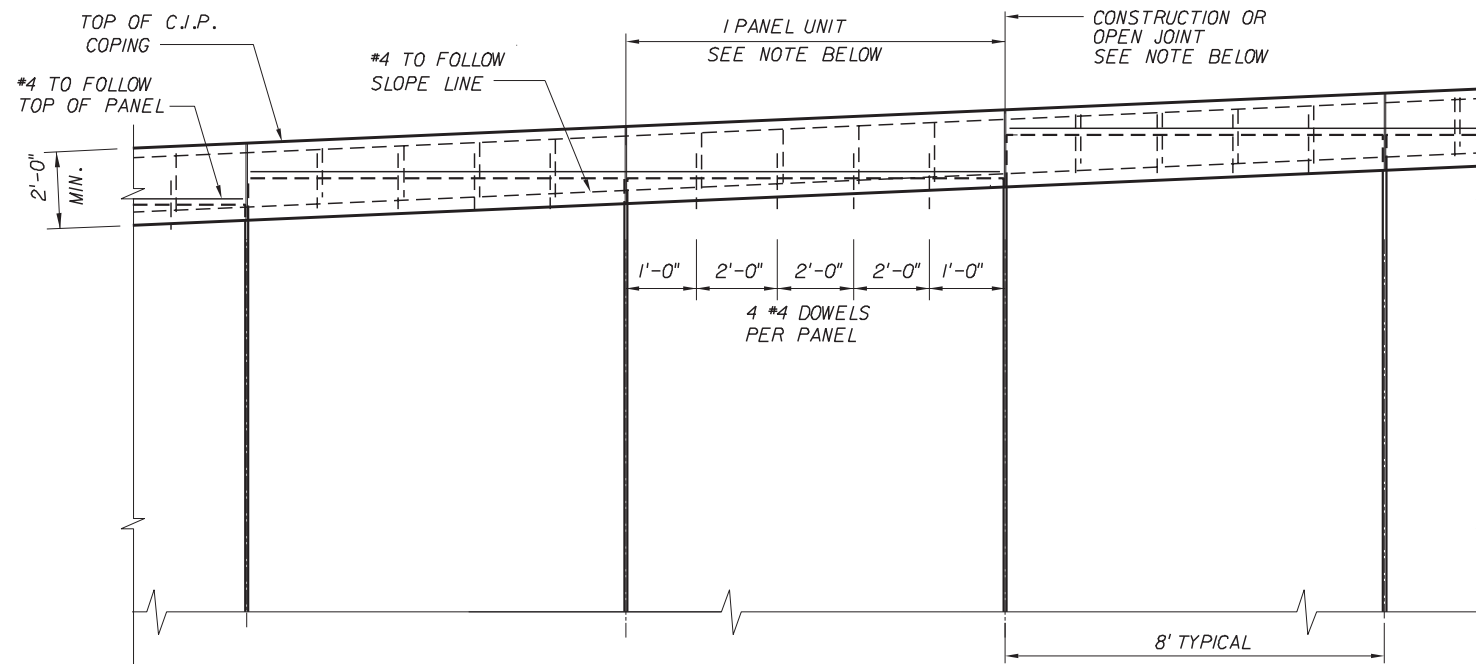


WALL LOCATION SECTION



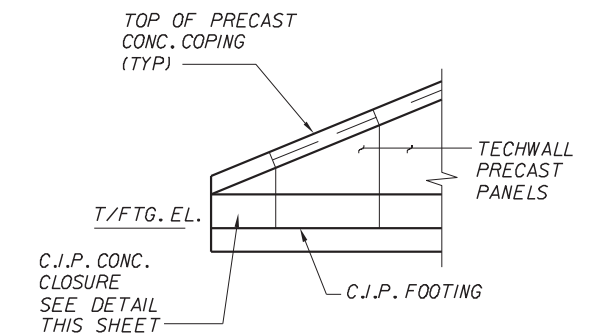
C.J.P. CLOSURE - PARTIAL ELEVATION

SECTION X-X
SECTION THRU C.J.P. END



C.J.P. COPING - PARTIAL ELEVATION

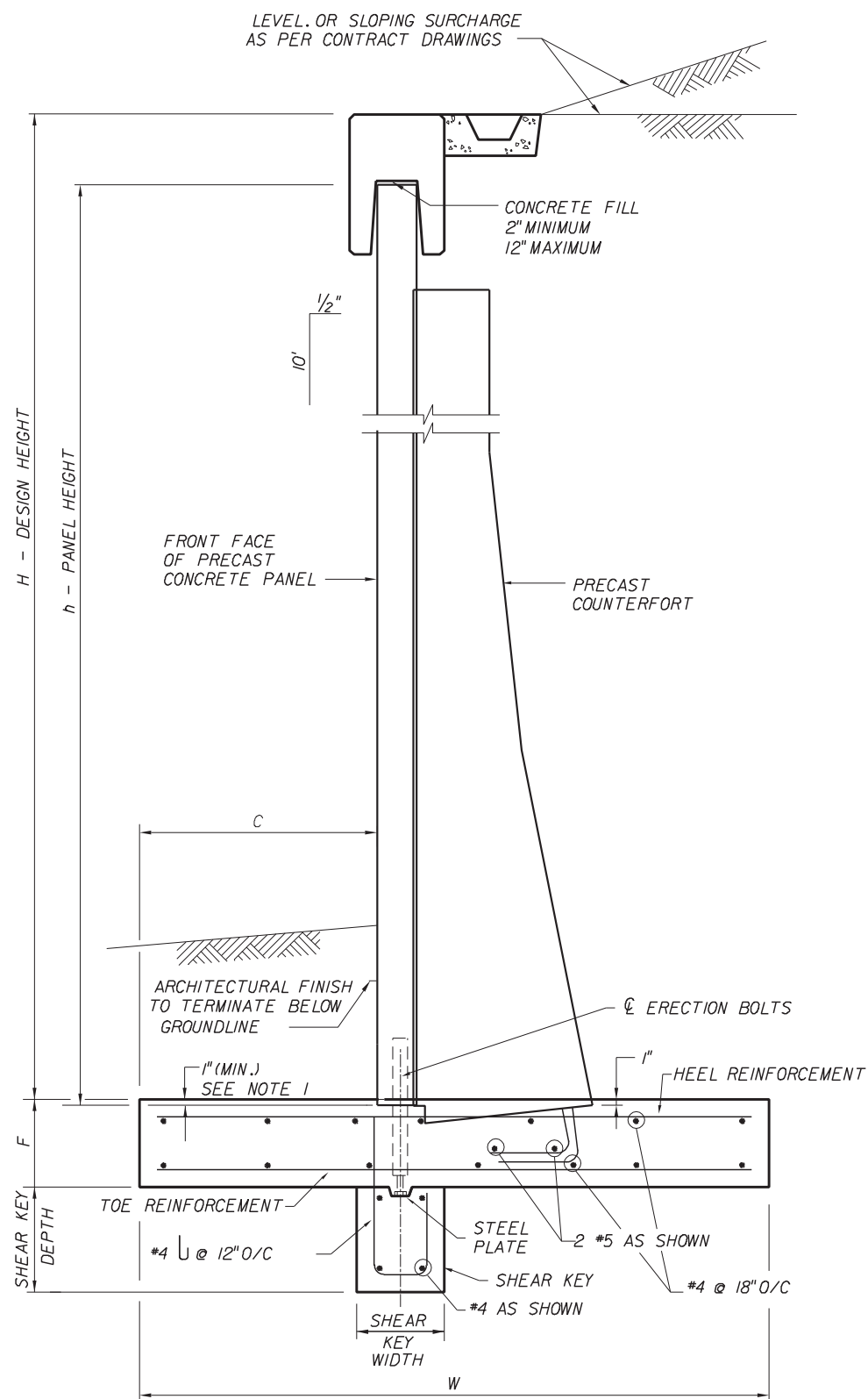
NOTE:
1/2" OPEN JOINTS IN COPING SHALL BE AT 4 PANEL INTERVALS AND COINCIDE APPROXIMATELY WITH PANEL JOINTS. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE JOINTS. CONSTRUCTION JOINTS IN BETWEEN THE OPEN JOINTS SHALL BE PROVIDED AT EVERY PANEL JOINT.



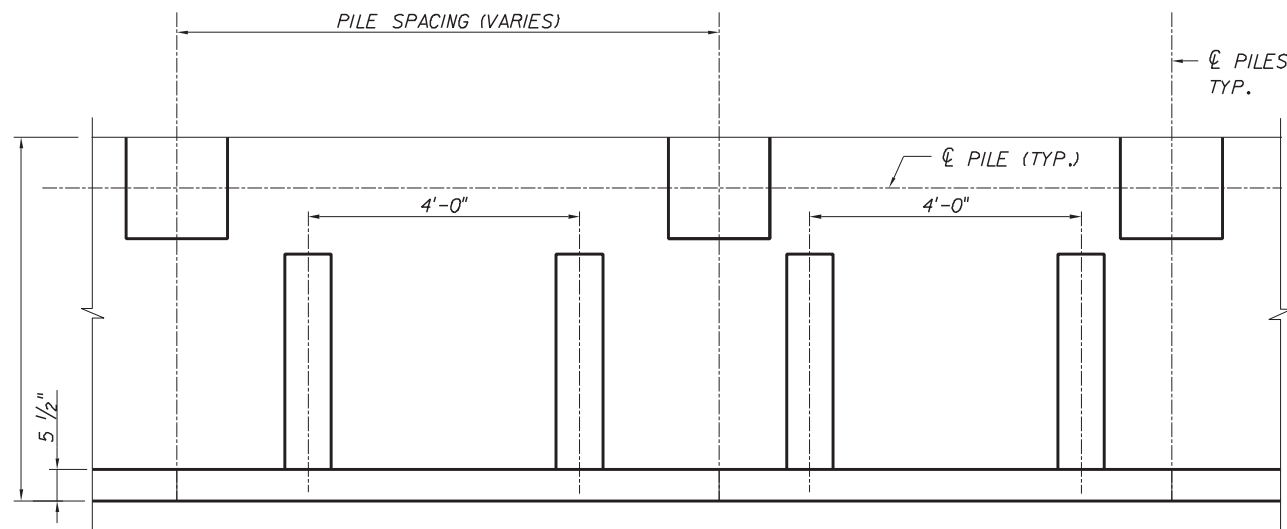
PARTIAL ELEVATION
C.J.P. CONCRETE CLOSURE

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TECHWALL

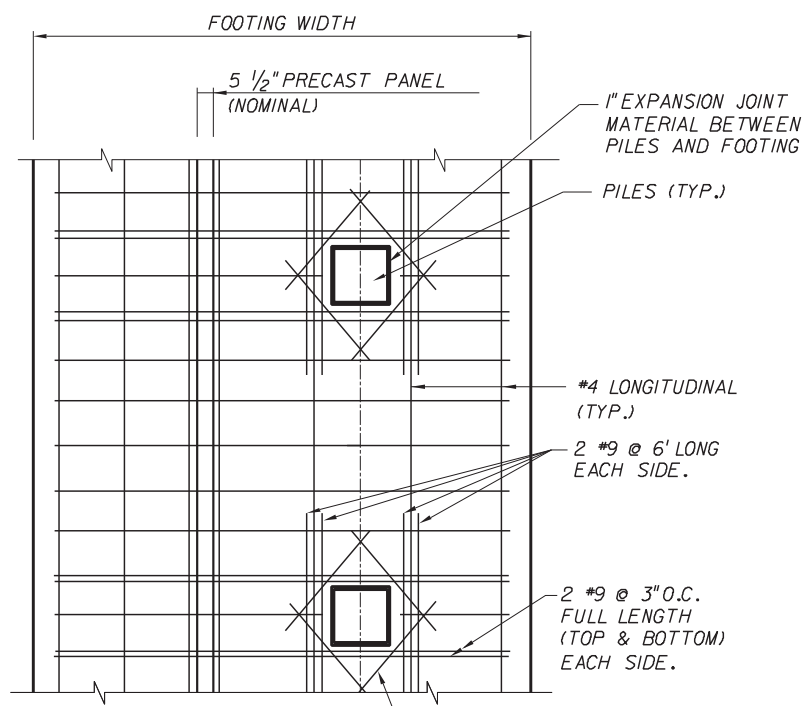
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
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TYPICAL SECTION THRU WALL



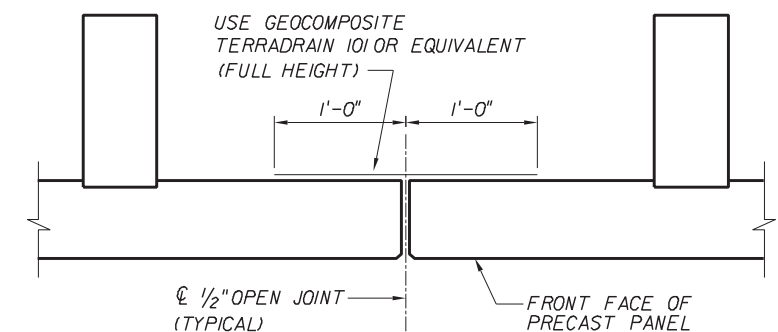
LAYOUT PRECAST PANEL W/COUNTERFORTS RELATED TO PILE LAYOUT



NOTE:
TOE REINFORCEMENT NOT SHOWN FOR CLARITY

PLAN-FOOTING AT ABUTMENT PILES

C, F, H, W AND THE REINFORCEMENT DETAILS ARE DETERMINED BY PROJECT SPECIFICS.



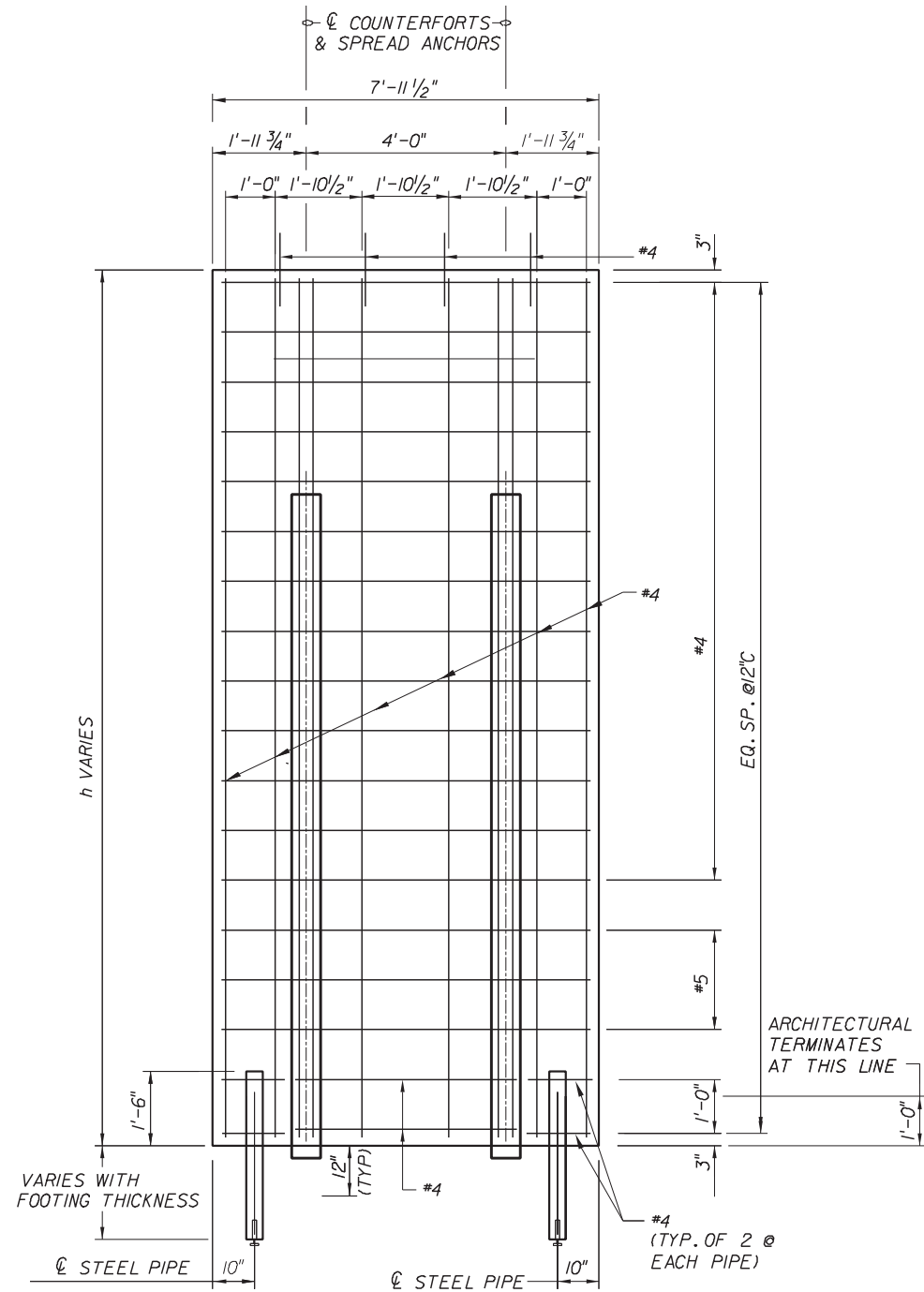
JOINT DETAIL

NOTES:

1. THE BOTTOM EDGE OF THE ASSEMBLED PRECAST PANEL SHALL BE COVERED BY 1" MINIMUM OF CAST-IN-PLACE FOOTING CONCRETE.
2. PRECAST WALL UNITS SHALL BE INSTALLED AT BATTER OF 1/2" PER 10' UNLESS OTHERWISE SHOWN ON CONSTRUCTION DRAWINGS.
3. FOR PANEL HEIGHTS OF 6.0' OR LESS COUNTERFORTS ARE NOT REQUIRED. PANELS WITHOUT COUNTERFORTS SHALL BE 8" THICK (NOMINAL). DETAILS WILL BE SHOWN ON CASTING DRAWINGS.

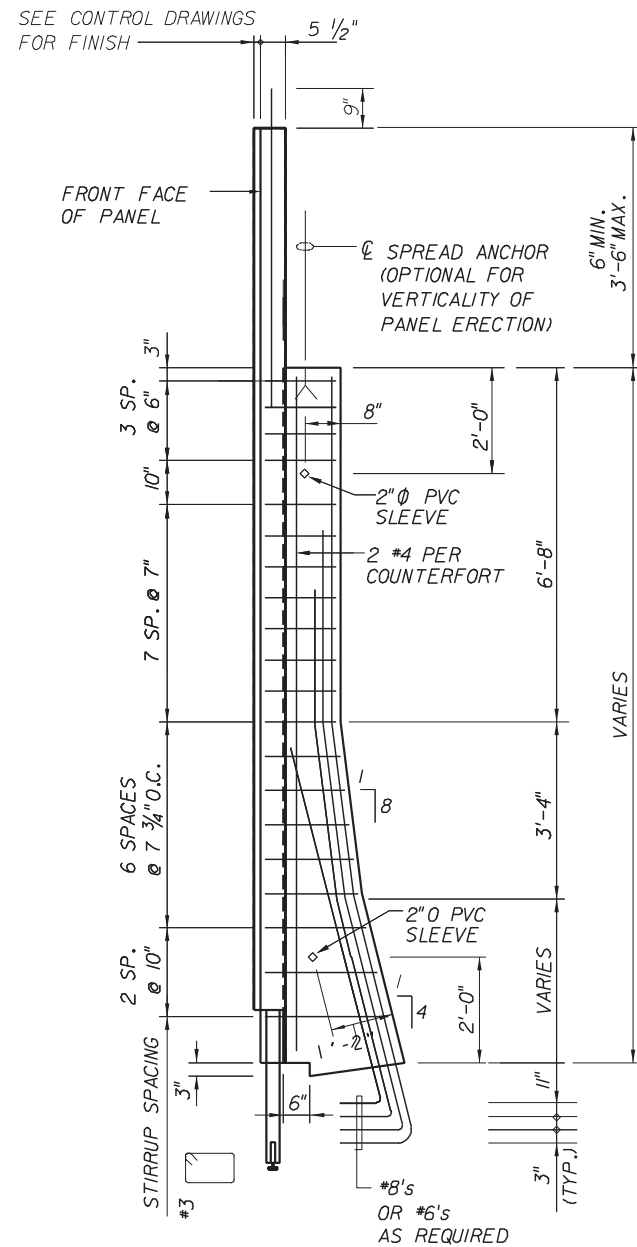
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TECHWALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
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PANEL ELEVATION

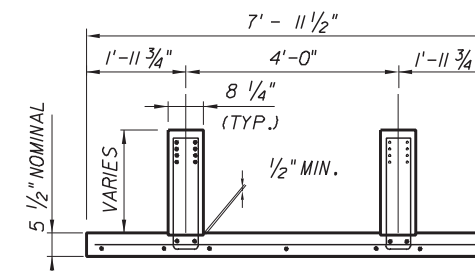
(REINFORCEMENT DETAILS MAY VARY WITH PROJECT SPECIFICS.)



COUNTERFORT - SIDE ELEVATION

(REINFORCEMENT DETAILS MAY VARY WITH PROJECT SPECIFICS.)

LIST OF MATERIALS	
CONCRETE: PANEL FACING (CY)	VARIES
COUNTERFORT, EACH (CY)	VARIES
TOTAL (CY)	VARIES
TOTAL PANEL WT. (LB)	VARIES
2" I.D. X 1'-0" PVC SLEEVE	4
SPREAD ANCHORS	2



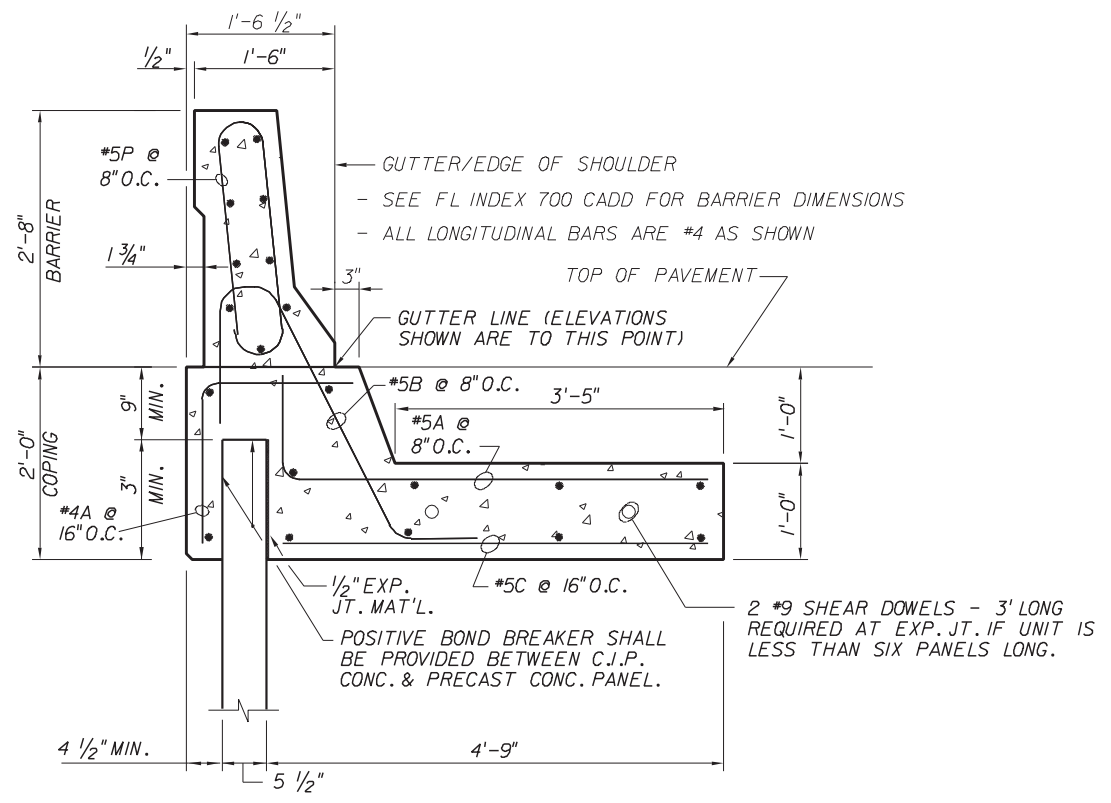
PANEL SECTION

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TECHWALL

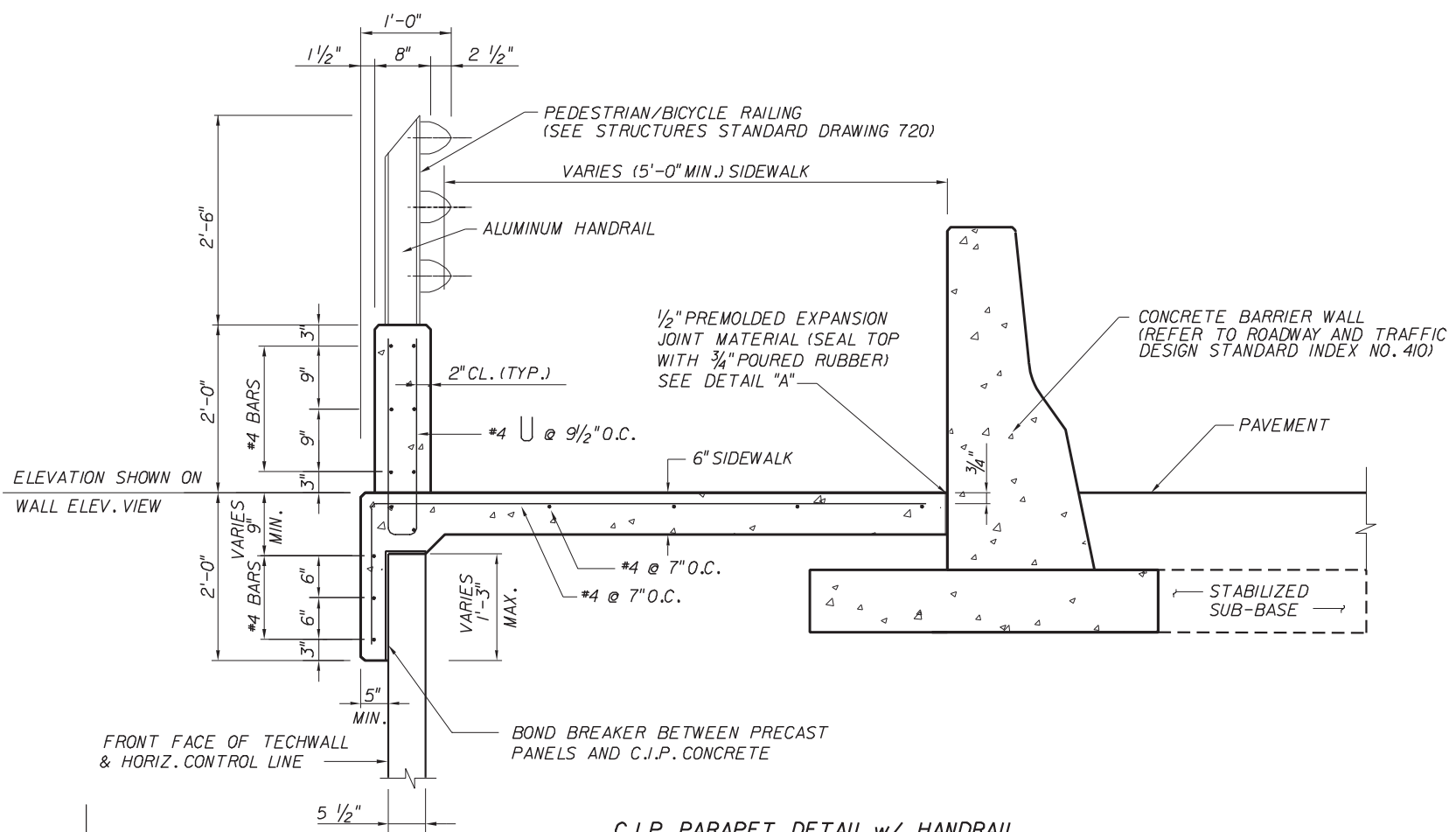
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
TECHWALL

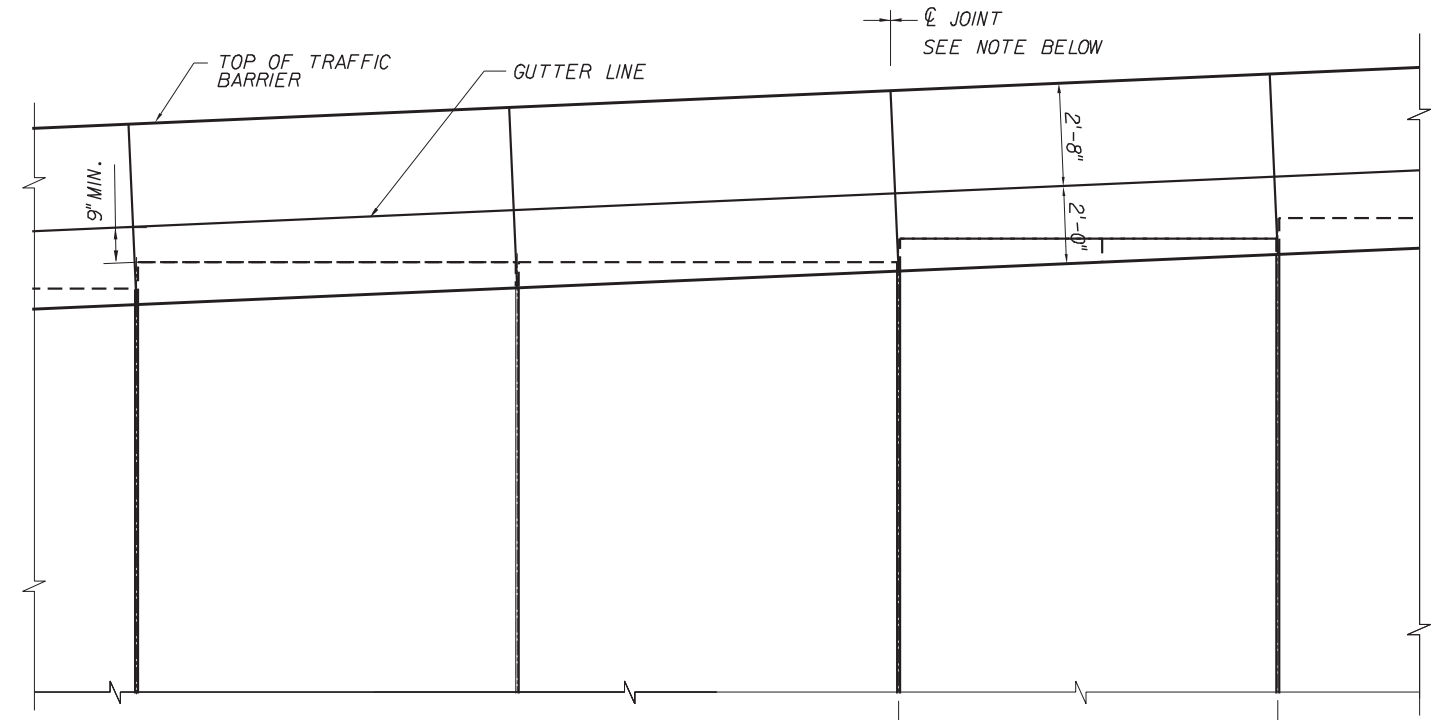
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C.J.P. CONC. TRAFFIC BARRIER

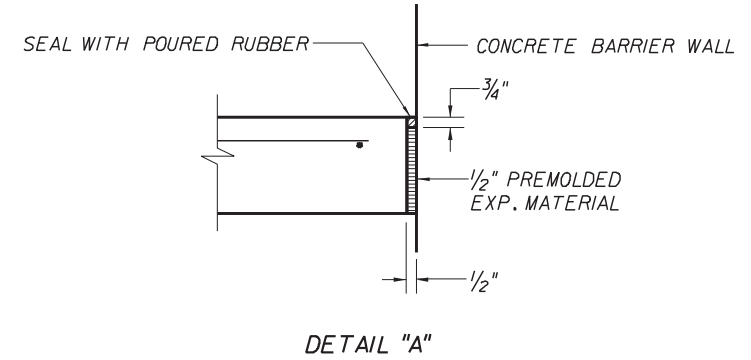


C.J.P. PARAPET DETAIL w/ HANDRAIL



C.J.P. TRAFFIC BARRIER PARTIAL ELEVATION

NOTE:
 1/2-INCH OPEN JOINTS IN COPING SHALL BE AT 4 PANEL INTERVALS AND COINCIDE APPROXIMATELY WITH PANEL JOINTS. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE JOINTS. CONSTRUCTION JOINTS IN BETWEEN THE OPEN JOINTS SHALL BE PROVIDED AT EVERY PANEL JOINT.



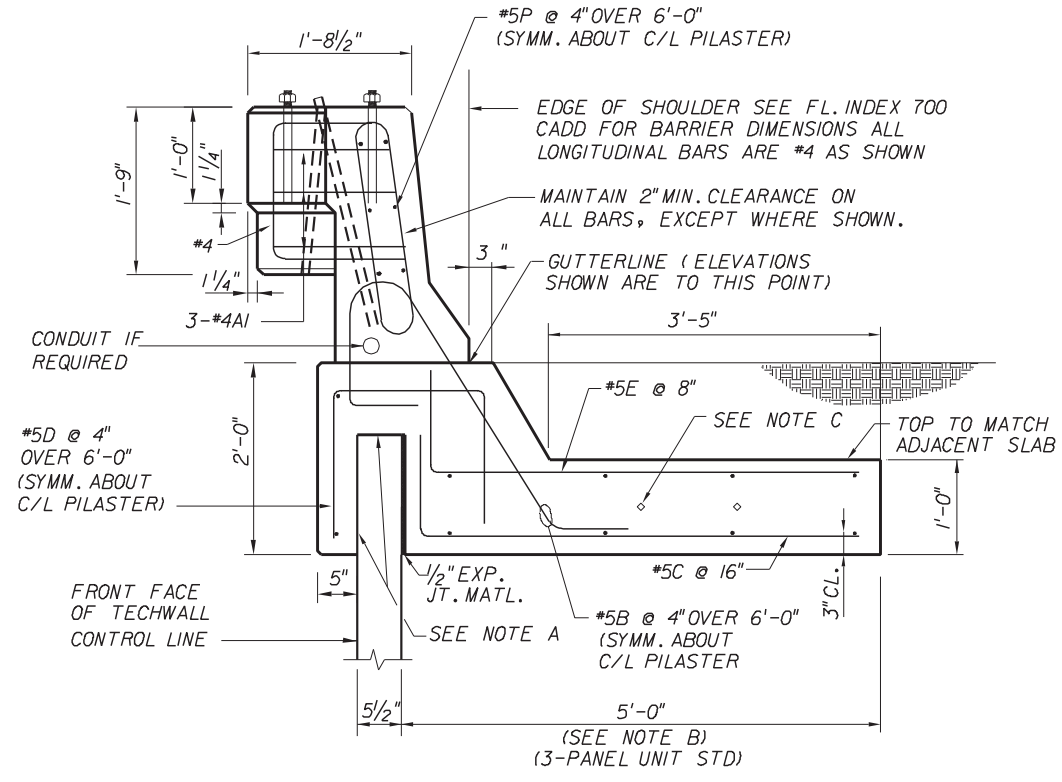
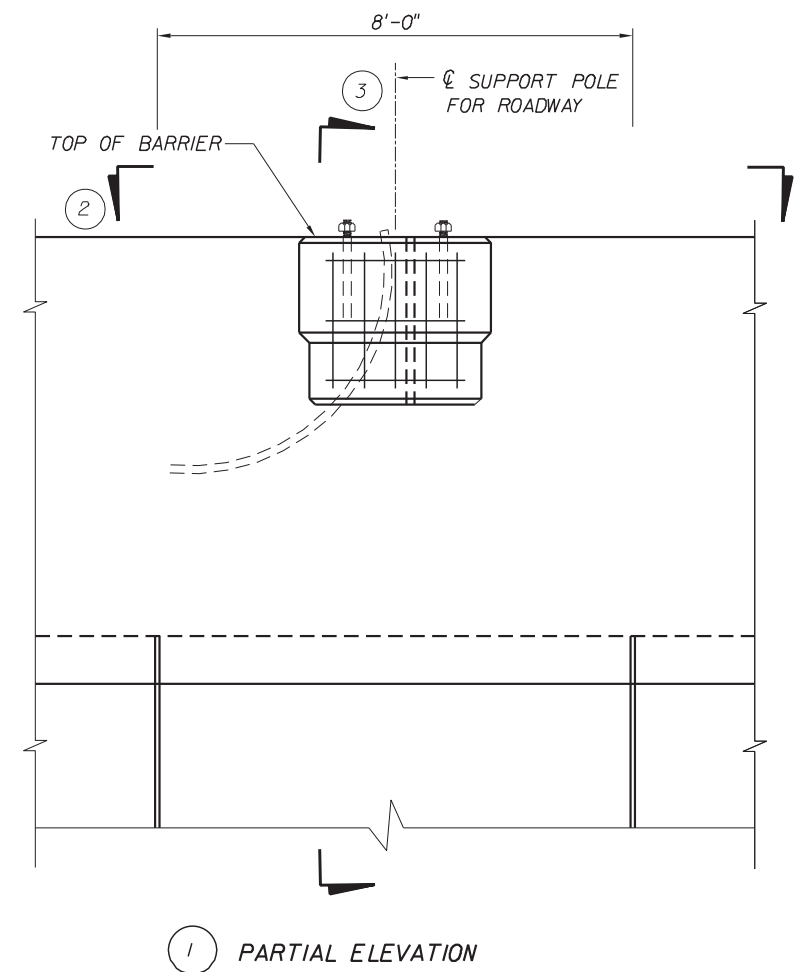
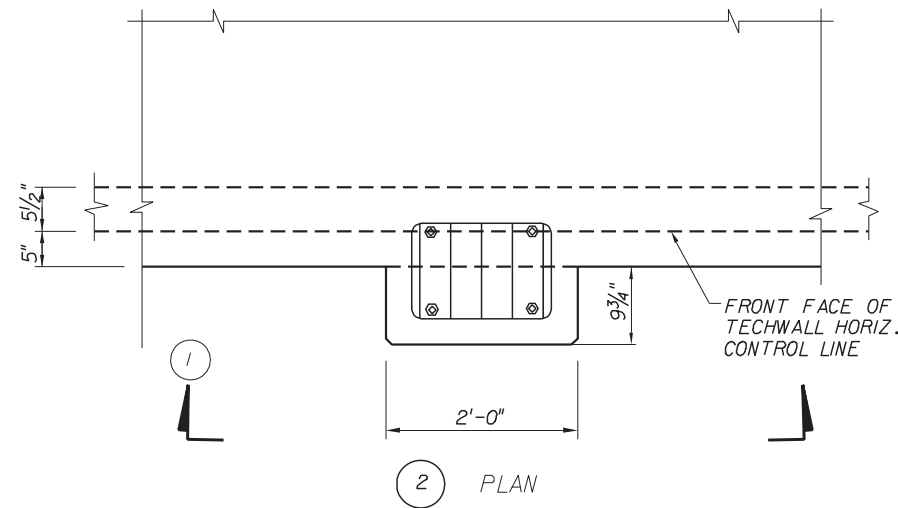
DETAIL "A"

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

RETAINING WALL SYSTEM
 REINFORCED EARTH COMPANY
 TECHWALL

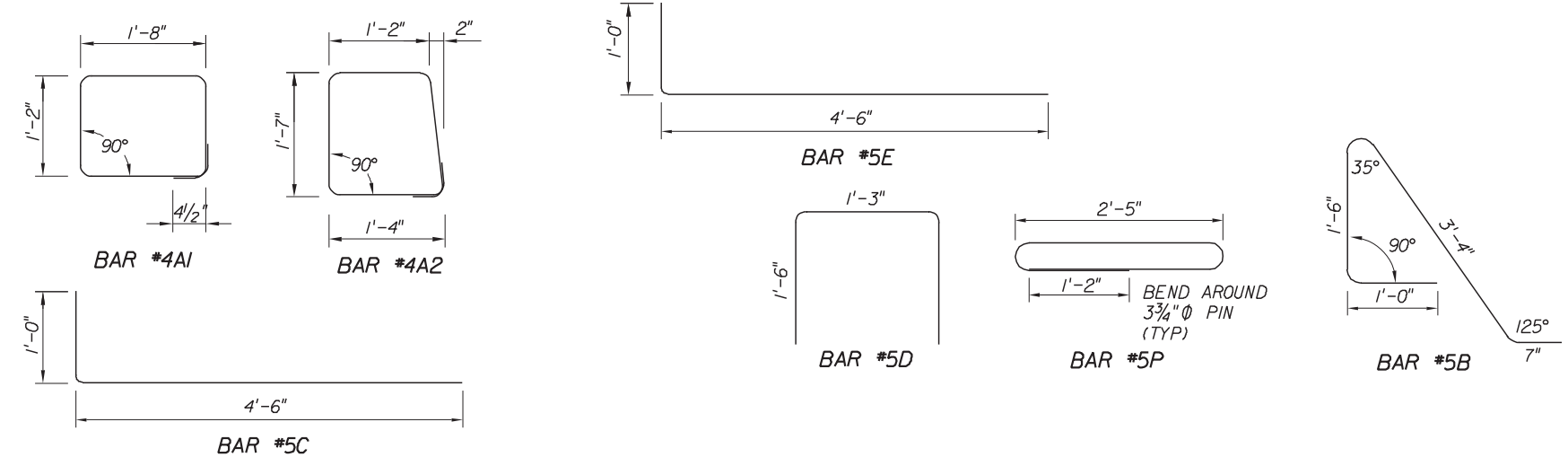
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THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
 TECHWALL



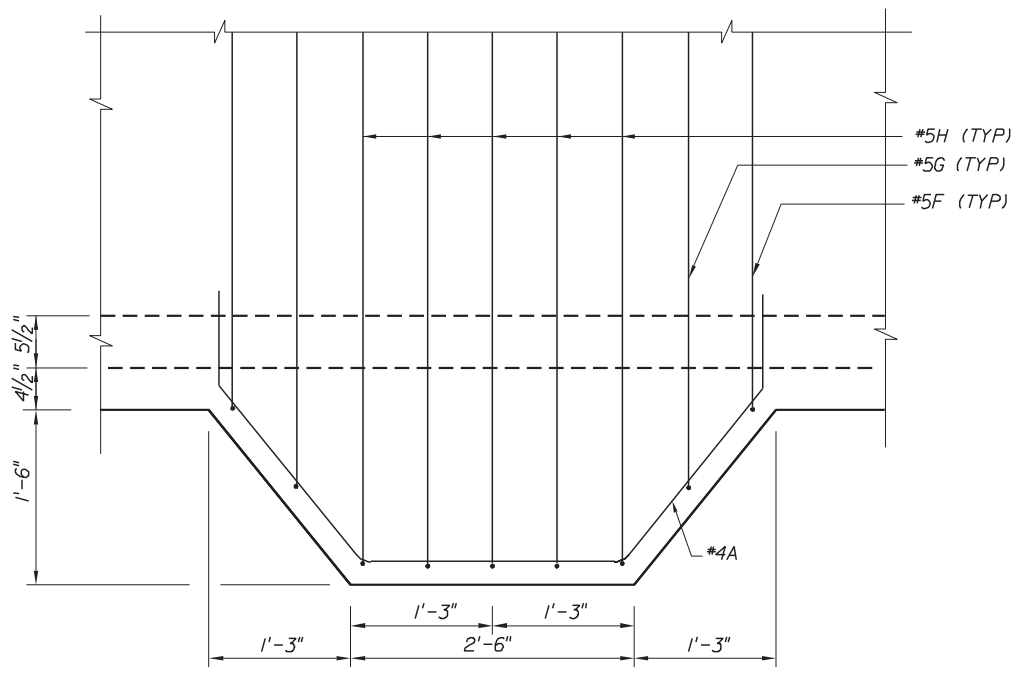
- NOTES:
- A. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN CAST IN PLACE CONC. AND PRECAST CONC. PANEL.
 - B. THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR ONE PRECAST UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE
 - C. 2 - #9 SHEAR DOWELS - 3'-0" LONG
 - D. LIGHTPOLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHTPOLE LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.
 - E. SEE STRUCTURES STANDARD DRAWING 500 FOR ADDITIONAL DETAILS.

REBAR SCHEDULE	
MARK	QTY.
#4A1	3
#4A2	5
#5B	18
#5C	4
#5D	18
#5E	9
#5P	18

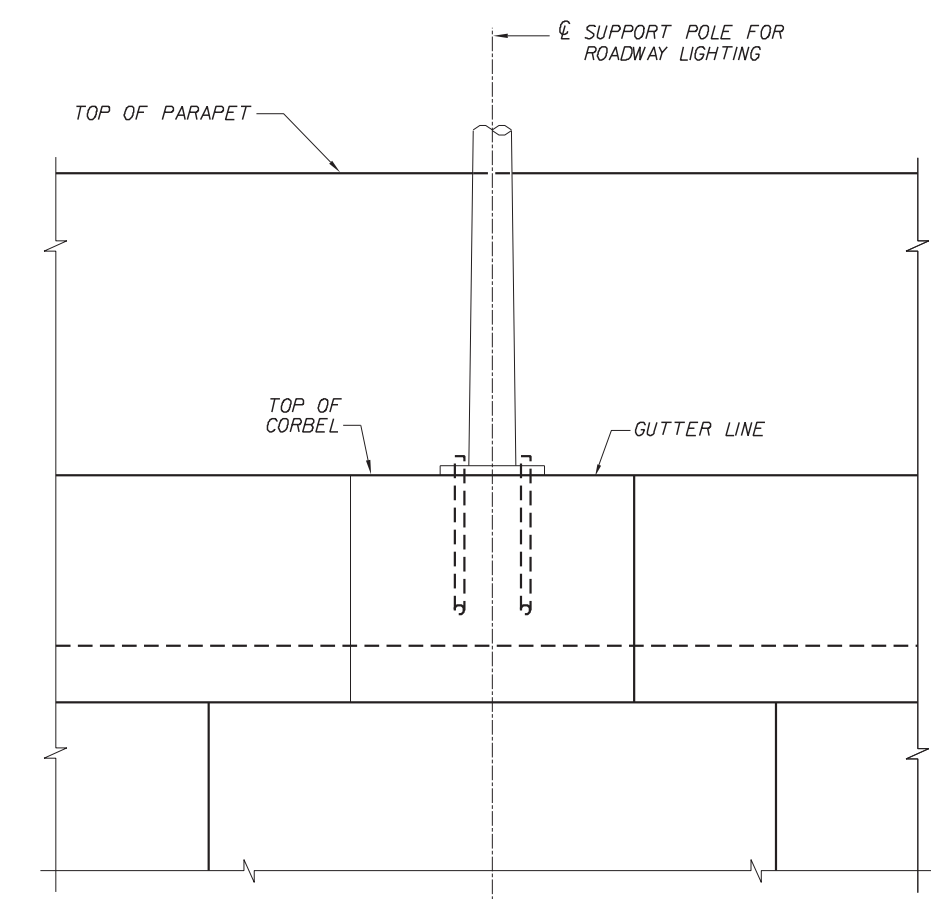


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TECHWALL

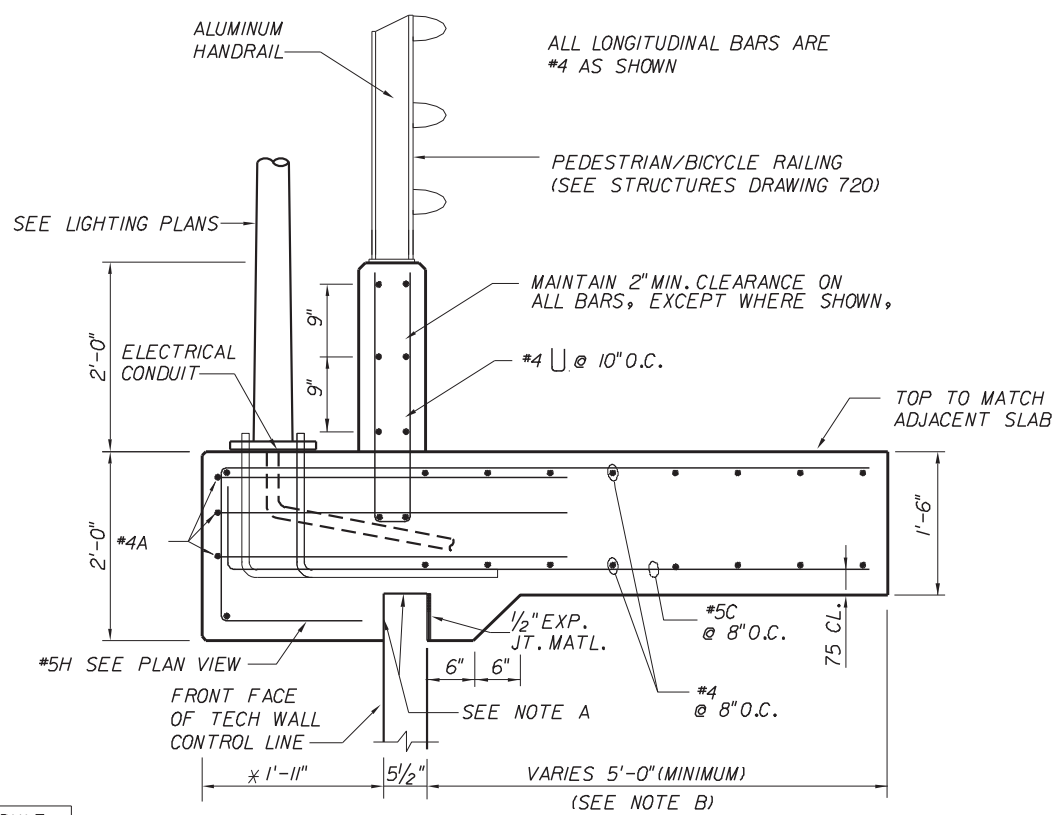
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Checked By		00	6 of 8	5016



1 PLAN



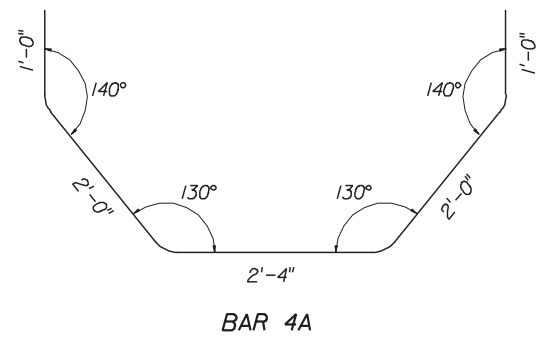
3 PARTIAL ELEVATION



2 BARRIER DETAIL @ LIGHT POLE

REBAR SCHEDULE	
MARK	QTY.
#4A	3
#5C	8
#5F	2
#5G	2
#5H	5
#4U	6

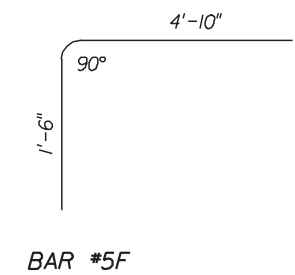
* DIMENSION MAY VARY AS REQUIRED FOR LIGHT POLE BASE PLATE.



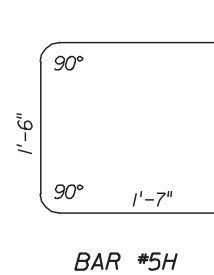
BAR 4A



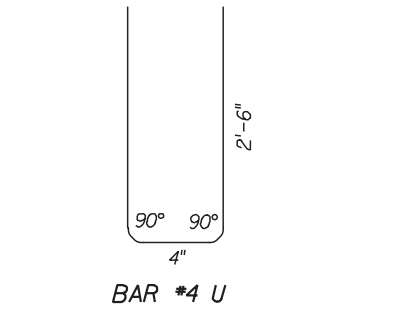
BAR #5C



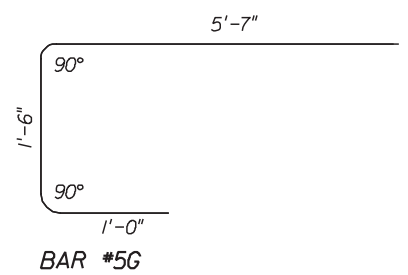
BAR #5F



BAR #5H



BAR #4U



BAR #5G

4 BAR BENDING DETAILS

NOTE A:
POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN CAST IN PLACE CONC. AND PRECAST CONC. PANEL.

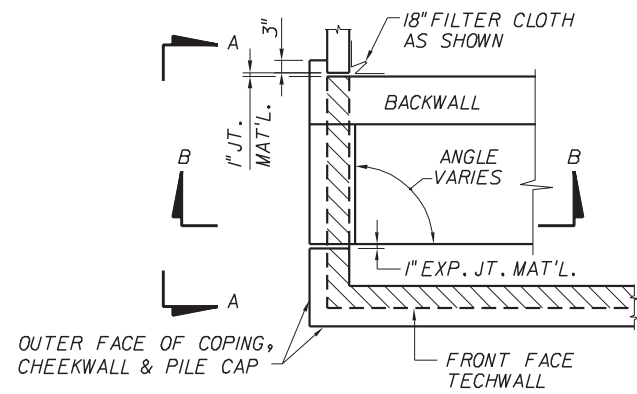
NOTE B:
THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR 5' UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE

NOTE C:
SEE STRUCTURES DRAWING 500 FOR ADDITIONAL DETAILS

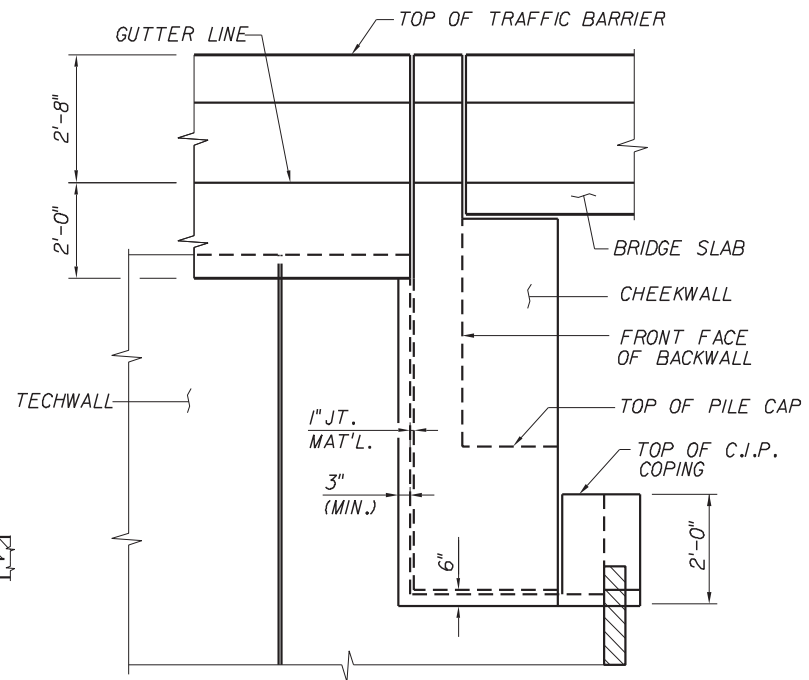
NOTE D:
LIGHT POLE MANUFACTURER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TECHWALL

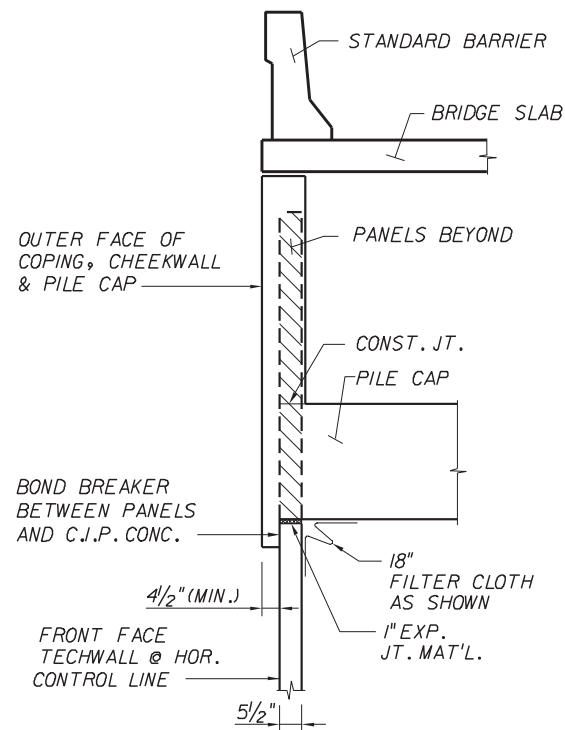
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM REINFORCED EARTH COMPANY TECHWALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
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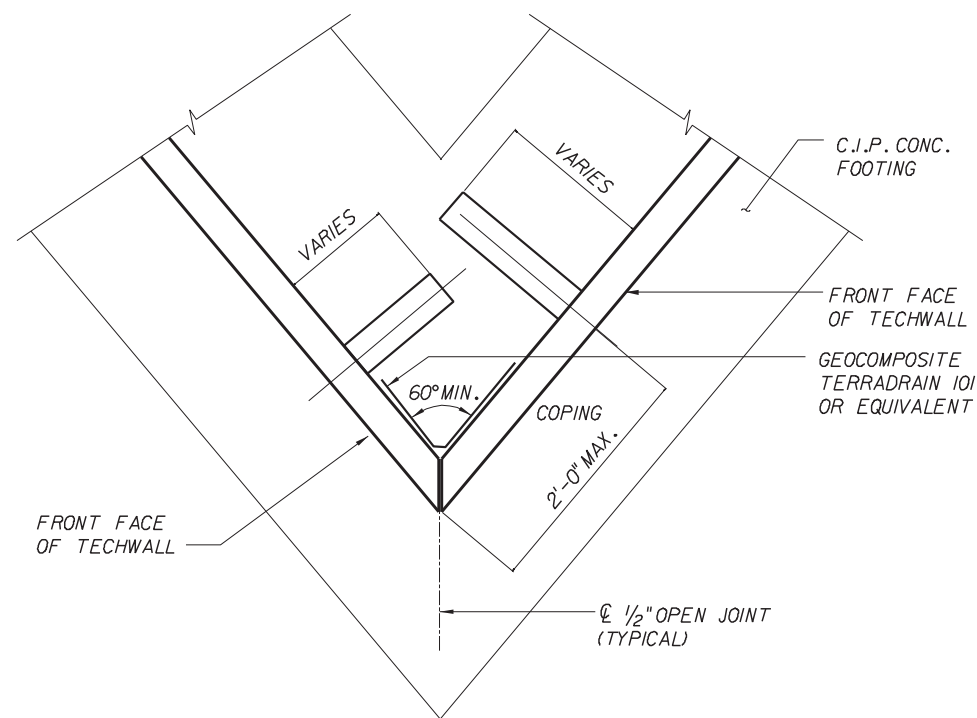
PLAN VIEW @ BEND (TYP.)



SECTION A-A



SECTION B-B



ACUTE CORNER DETAIL

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TECHWALL

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HILFIKER MSE SQUARE PANEL WALL SYSTEM



GENERAL NOTES

DESIGN CRITERIA

1. THE ATTACHED DETAILS ARE BASED ON THE ASSUMPTIONS THAT THE MATERIAL WITHIN THE REINFORCED VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED COMPONENTS MEET THE GOVERNING AGENCIES SPECIFICATION FOR MECHANICALLY STABILIZED EARTH STRUCTURES

2. MINIMUM DESIGN PARAMETERS

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UNITIZED AT THE SITE. THE VALUE OF THE INTERNAL FRICTION ANGLE, ϕ , THE COHESION, c , AND THE UNIT WEIGHT, γ , SHALL BE PROVIDED IN THE SHOP DRAWINGS.

EXTERNAL STABILITY

OVERTURNING ≥ 2.0
SLIDING ≥ 1.5
BEARING PRESSURE ≥ 2.5

OVERALL STABILITY ≥ 1.5

INTERNAL STABILITY

PULLOUT ≥ 1.5
STEEL YIELD STRESS = $0.47 F_y$

SERVICE LIFE = 75 YEARS

LIVE LOAD SURCHARGE = 250 PSF

3. THE MAXIMUM APPLIED BEARING PRESSURE AT THE INTERFACE OF THE FOUNDATION AND SELECT BACKFILL MATERIAL IS SHOWN ON THE PLANS. THE BEARING PRESSURE SHOWN IS THE MAXIMUM FOR THE GIVEN BASE MAT LENGTH. IT IS THE RESPONSIBILITY OF OTHERS TO DETERMINE THAT THE BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.

4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED VOLUME AS DETERMINED BY THE ENGINEER SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL AS DIRECTED BY THE ENGINEER.

5. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, T&B STRUCTURAL SYSTEMS IS RESPONSIBLE FOR THE INTERNAL STABILITY OF THE STRUCTURE. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

WALL CONSTRUCTION

1. WALLS FOUNDED ON CURVES SHALL HAVE THEIR PANELS DIMENSIONED AS A SERIES OF CORDS (AS DIMENSIONED IN SHOP DRAWINGS) IN ORDER TO MATCH THE REQUIRED WALL RADIUS.

2. FOR LOCATION AND ALIGNMENT OF THE MSE STRUCTURES REFERENCE THE RETAINING WALL CONTROL PLANS.

3. IF MANHOLE AND DROP INLETS ARE REQUIRED, THEY SHALL BE LOCATED AS SHOWN ON THE RETAINING WALL ELEVATION DRAWINGS.

4. IF PILES ARE LOCATED WITHIN THE REINFORCED VOLUME THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE WALL UNLESS AN ALTERNATE METHOD IS USED TO ISOLATE THE COLUMNS FROM THE REINFORCED VOLUME AS APPROVED BY THE ENGINEER.

5. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 TO A LEVEL 2" (PLUS OR MINUS) ABOVE THE ELEVATION OF THE SOIL REINFORCING ELEMENT. NO SOIL REINFORCEMENT SHALL BE ATTACHED TO ANY PANEL BEFORE THE BACKFILL IS PLACED AT THE REQUIRED ELEVATION AND IS COMPACTED.

6. STRUCTURES GREATER THAN 20 FEET SHALL HAVE THE FINISHED GRADE PLACED AND COMPACTED AT THE FRONT FACE OF THE STRUCTURE BEFORE THE STRUCTURE HEIGHT EXCEEDS 20 FEET. FINISH GRADE SHALL BE COMPACTED TO 95 % OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ANY GUARDRAIL POSTS PRIOR TO PLACING THE TOP ROW OF SOIL REINFORCEMENT. THE POST SPACING SHALL BE ADJUSTED TO AVOID CONFLICTS WITH THE LONGITUDINAL SOIL REINFORCING WIRE. CUTTING OF THE LONGITUDINAL WIRE SHALL BE ALLOWED ONLY AS DIRECTED BY THE ENGINEER.

8. IF EXISTING OR FUTURE STRUCTURES ARE TO BE PLACED IN THE REINFORCED VOLUME THAT INTERFERE WITH THE PROPER PLACEMENT OF THE SOIL REINFORCEMENT THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR A COURSE OF ACTION.

9. TOP COPING PANELS BENEATH CAST-IN-PLACE COPING SHALL HAVE 1/2" DOWELS PROTRUDING FROM THEIR TOP EDGE.

10. FOR OTHER INFORMATION PERTAINING TO THE CONSTRUCTION OF THE HILFIKER RETAINING WALL PLEASE REFER TO T&B STRUCTURAL SYSTEMS ERECTION MANUAL.

11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DEFLECT THE TOP ROW OF SOIL REINFORCEMENT DOWNWARD SO AS TO NOT CONFLICT WITH ROADWAY MIXING OPERATIONS AND/OR ROADWAY CONSTRUCTION OPERATIONS. ANY SOIL REINFORCING MATERIAL THAT IS DAMAGED SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

MISCELLANEOUS NOTES

1. NOMINAL SOIL REINFORCING GRID LENGTH

THE WELDED WIRE MESH IS MANUFACTURED IN LENGTHS CORRESPONDING TO THE DIMENSION "B" AS GIVEN IN THE RETAINING WALL ELEVATIONS. THE ACTUAL LENGTH FROM THE FRONT FACE OF THE PANEL TO THE TAIL OF THE SOIL REINFORCING GRID IS PLUS 12" THIS ACCOUNTS FOR THE THICKNESS OF THE PANEL AND THE LOCATION OF THE CONNECTION OF THE SOIL REINFORCING MAT WITH THE PANEL ANCHOR. THE FOUNDATION SHALL BE EXCAVATED TO AN EXTENT OF "B" PLUS 12".

2. SELECT BACKFILL QUANTITY

THE REQUIRED VOLUME OF IN-PLACE SELECT BACKFILL IS CALCULATED BY MULTIPLYING THE RETAINING WALL FACE AREA BY THE SOIL REINFORCING LENGTH. THIS IS PERFORMED AT EACH INDIVIDUAL SEGMENT OF WALL FOR EACH CORRESPONDING "B". THE BACKFILL QUANTITY IF GIVEN BY T&B STRUCTURAL SYSTEMS IS AN ESTIMATE ONLY. THE CONTRACTOR IS ULTIMATELY TO DETERMINE THE QUANTITY OF SELECT BACKFILL MATERIAL THAT IS REQUIRED.

3. PANEL FINISH

THE CONCRETE PANELS SHALL HAVE A PLAIN STEEL FORM FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINING WALL CONTROL PLANS.

4. THE FOLLOWING MATERIALS ARE SUPPLIED BY T&B STRUCTURAL SYSTEMS

- PRECAST CONCRETE FACING PANEL
- SOIL REINFORCING GRIDS
- CONNECTION PINS
- 1/2" DIAMETER ALIGNMENT PINS
- 60 DURO 3/4" X 8" BEARING PADS
- SYNTHETIC INDUSTRIES GEOTEX 40 NONWOVEN GEOTEXTILE FILTER FABRIC

****THIS SYSTEM FOR USE IN MODERATELY OR SLIGHT AGGRESSIVE ENVIRONMENTS ONLY****

ANY OTHER MATERIAL REQUIRED TO BUILD THE MSE STRUCTURES ACCORDING TO THE GOVERNING SPECIFICATION SHALL BE SUPPLIED BY THE CONTRACTOR.



5. T&B STRUCTURAL SYSTEM SUPPLIES MECHANICALLY STABILIZED EARTH STRUCTURAL COMPONENTS FOR USE WITH THE HILFIKER RETAINING WALL SYSTEMS FOR THE STRUCTURES DETAILED HEREIN. THE ERECTION MANUAL PROVIDED BY T&B STRUCTURAL SYSTEMS IS A GENERAL GUIDELINE FOR ERECTING THE HILFIKER RETAINING WALL SYSTEM. ALL QUALITY CONTROL PROCEDURES, STAGING PROCEDURES, MATERIAL HANDLING, AND SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE OBLIGATION TO CONSTRUCT THE RETAINING WALL ACCORDING TO THE PROJECT PLANS AND SPECIFICATIONS AND ALL LAWS OF THE GOVERNING STATE.


ENGLISH

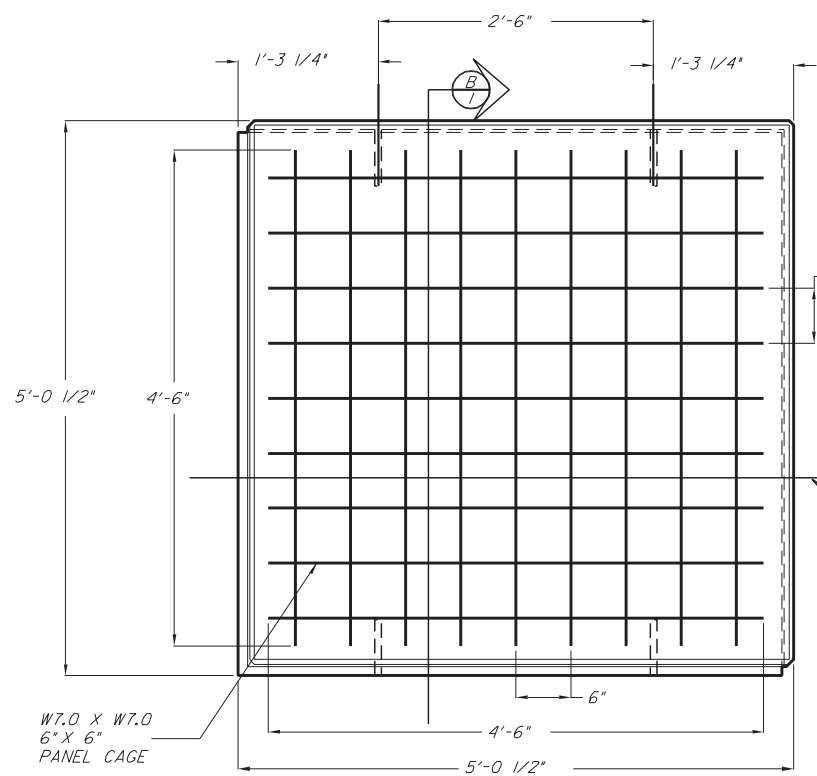
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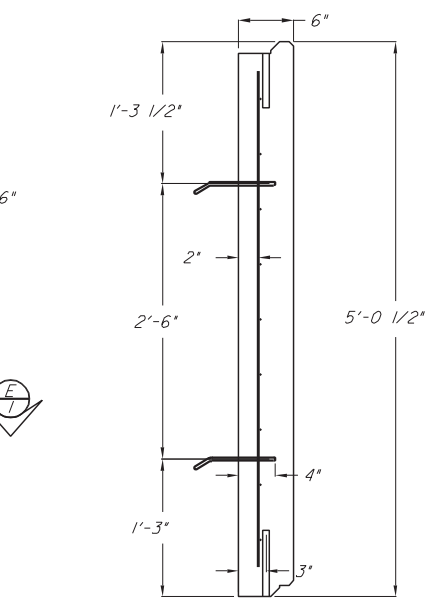
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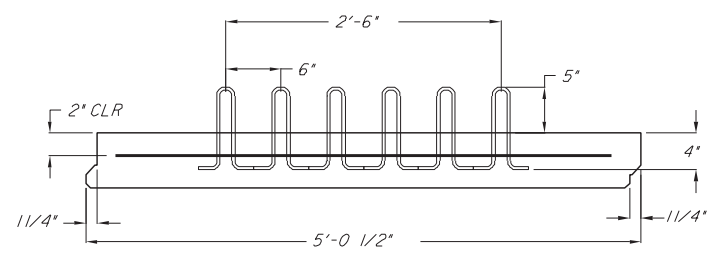
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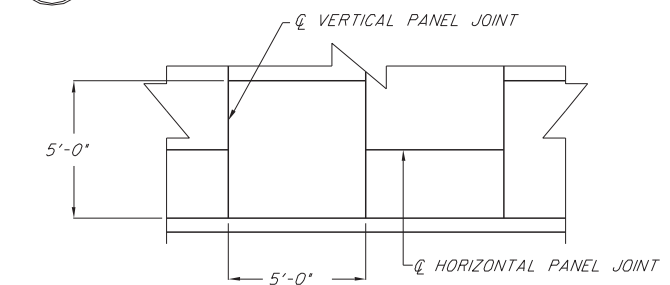
A STANDARD SQUARE PANEL
TYPE G - FRONT FACE



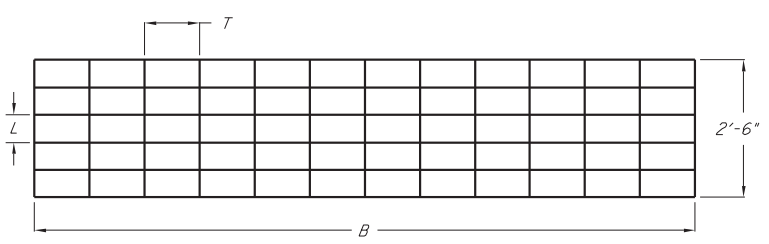
B STANDARD SQUARE PANEL
TYPE G SECTION



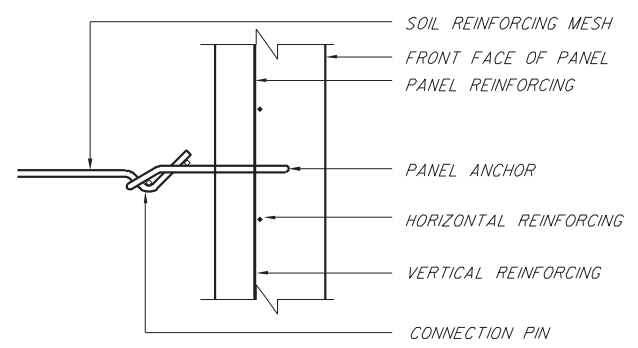
E STANDARD SQUARE PANEL
TYPE B/G



F TYPICAL PANEL LAYOUT
PARTIAL ELEVATION - FRONT FACE

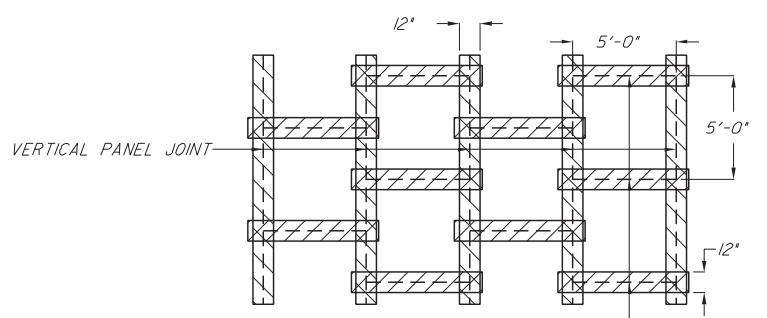


G SOIL REINFORCING ELEMENT
MW45 MINIMUM WIRE SIZE



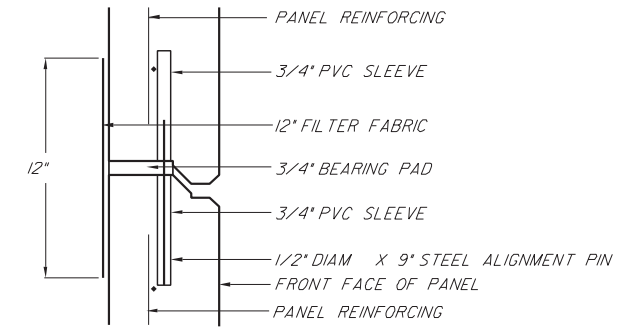
NOTE: ANCHOR SIZE SHALL BE MINIMUM SIZE OF ATTACHED SOIL REINFORCING

H CONNECTION DETAIL - TYP

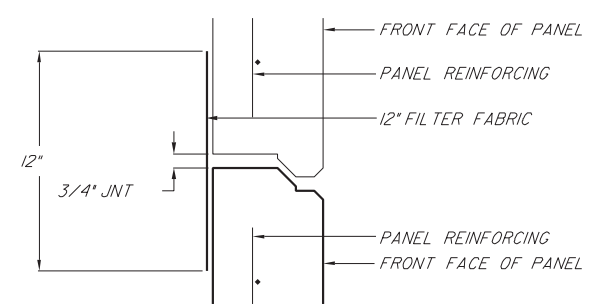


NOTE:
1. FILTER FABRIC SHALL BE PLACED OVER ALL VERTICAL AND HORIZONTAL JOINTS
2. FABRIC SHALL BE ADHERED TO BACK FACE OF PANEL WITH THE USE OF AN APPROVED CONSTRUCTION ADHESIVE
3. MINIMUM OVER LAP OF 12" REQUIRED BETWEEN ROLLS.

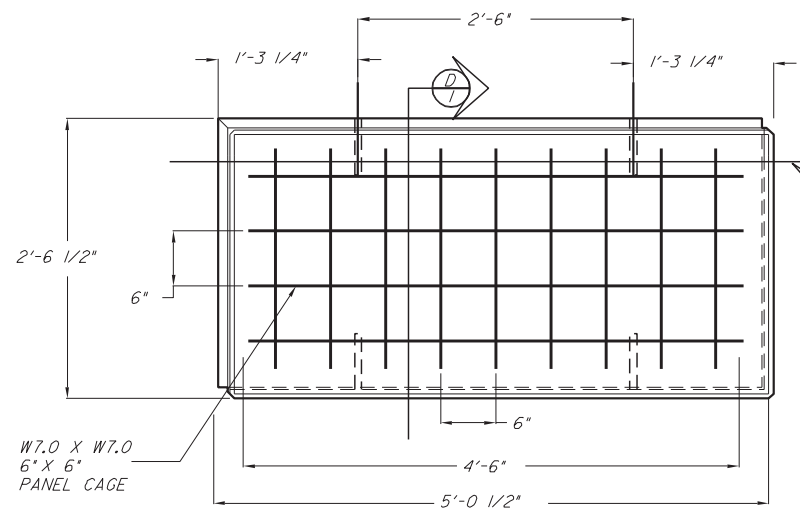
J FILTER CLOTH - JOINT DETAIL
PARTIAL ELEVATION - BACK FACE



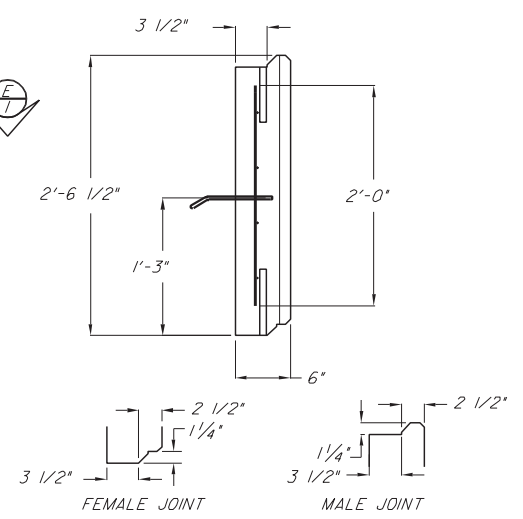
K HORIZONTAL JOINT DETAIL
PARTIAL SECTION



L VERTICAL JOINT DETAIL
PARTIAL SECTION



C STANDARD HALF PANEL
TYPE B - FRONT FACE



D STANDARD HALF PANEL
TYPE B SECTION

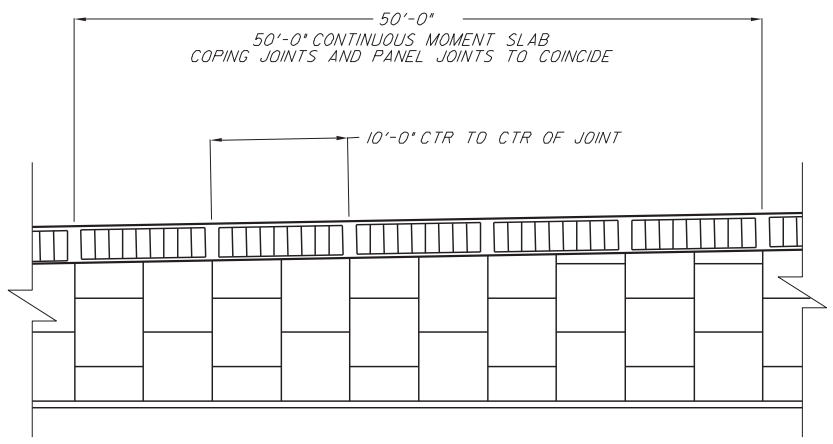
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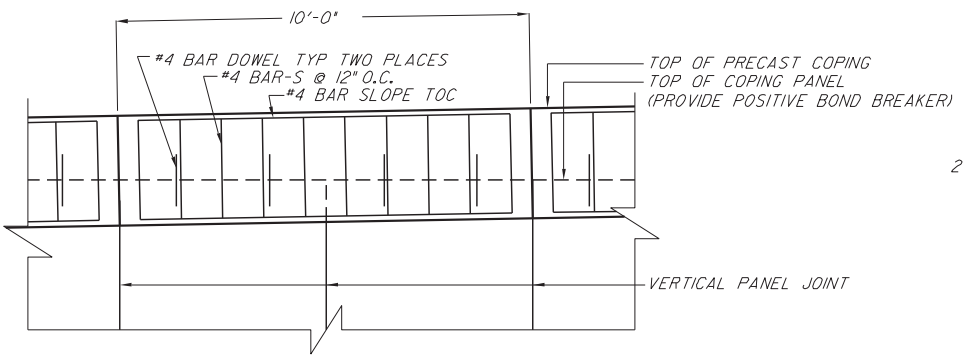
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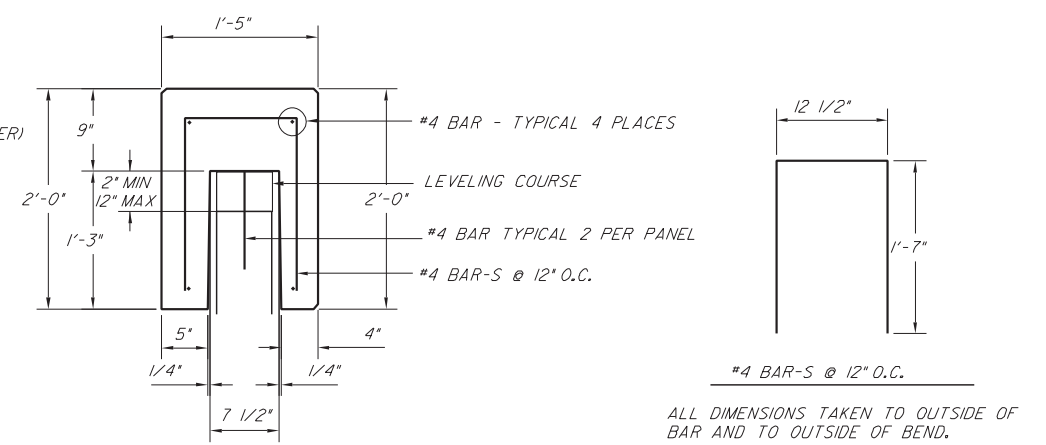
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\$\$\$\$\$SYTIME\$\$\$\$\$



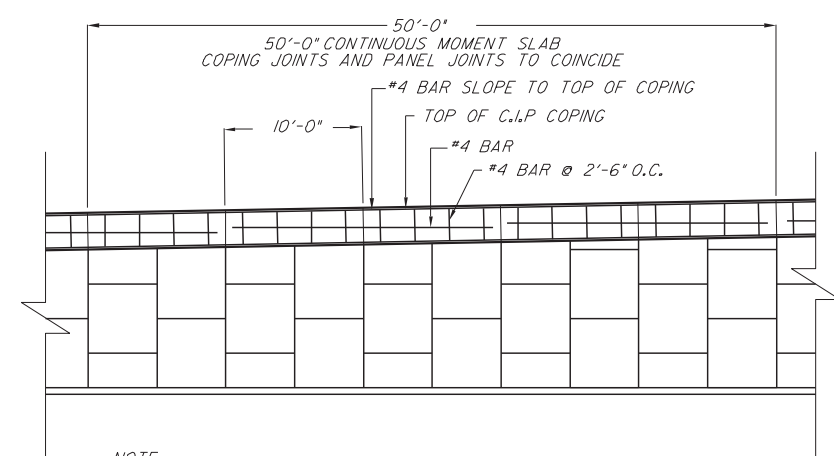
A PRECAST COPING ELEVATION



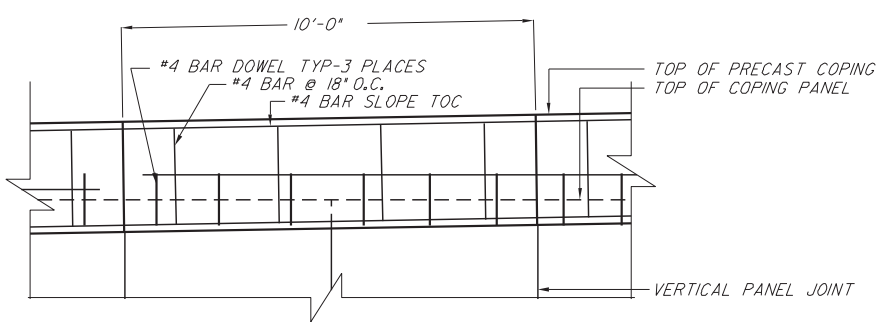
B PRECAST COPING PARTIAL ELEVATION



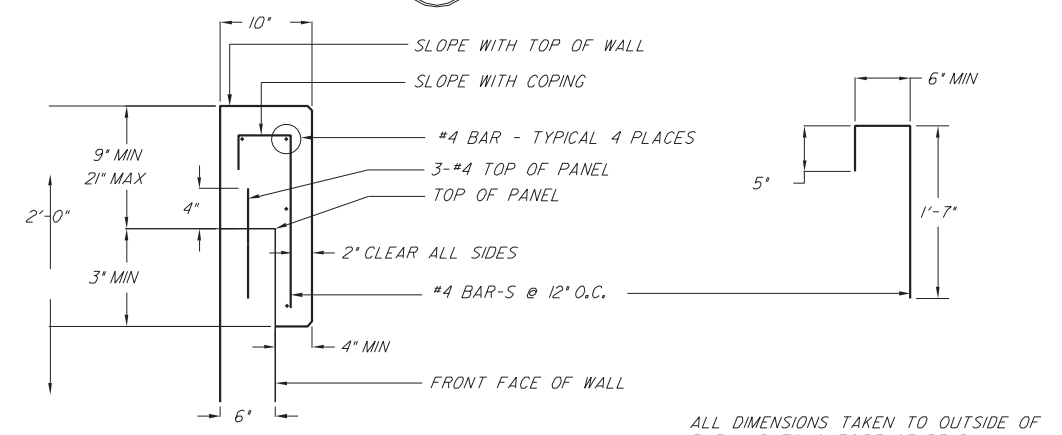
C PRECAST COPING



D C.I.P. COPING ELEVATION



E C.I.P. COPING PARTIAL ELEVATION



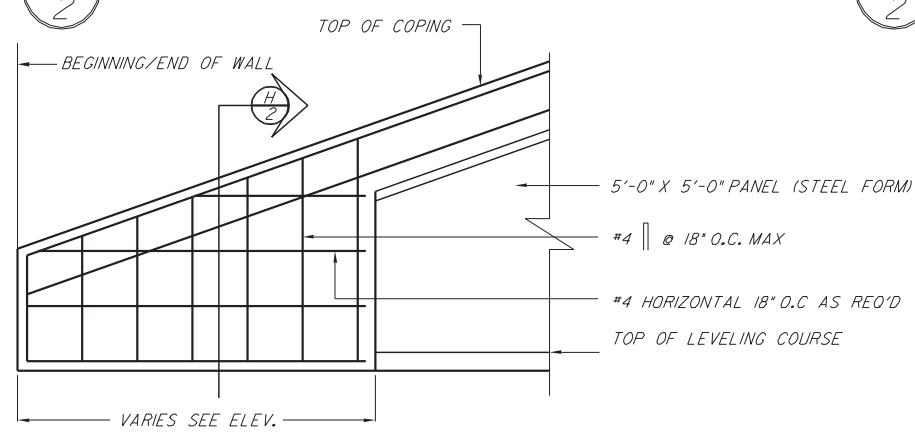
F C.I.P. COPING

NOTE: JOINTS TO BE 10' O.C. AND SHALL LINE UP WITH THE PANEL JOINT BELOW

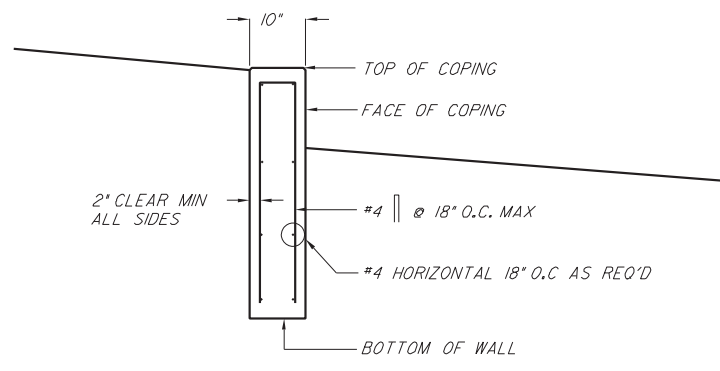
NOTE: PLACE PRE-CAST COPING SO JOINTS LINE UP WITH COPING PANEL BELOW. USE GROUT TO BRING TOP COPING PANEL TO GRADE.

ALL DIMENSIONS AS SHOWN ARE MINIMUMS

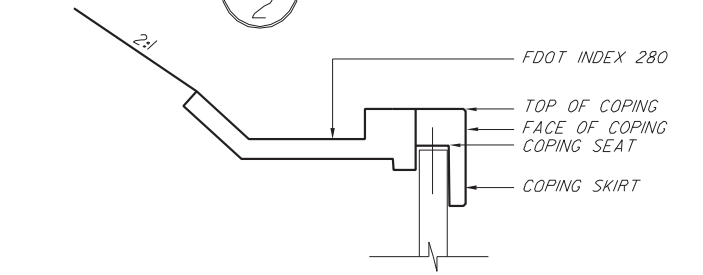
ALL DIMENSIONS TAKEN TO OUTSIDE OF BAR AND TO OUTSIDE OF BEND.



G COPING ENCLOSURE ELEVATION



H COPING ENCLOSURE SECTION

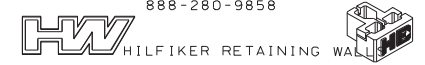


I COPING-DRAINAGE SECTION DETAIL

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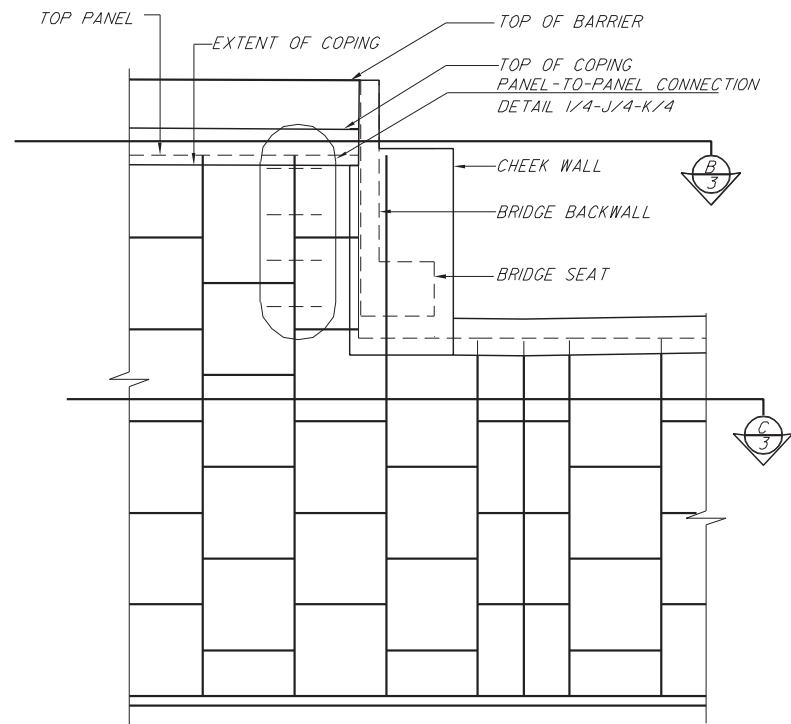
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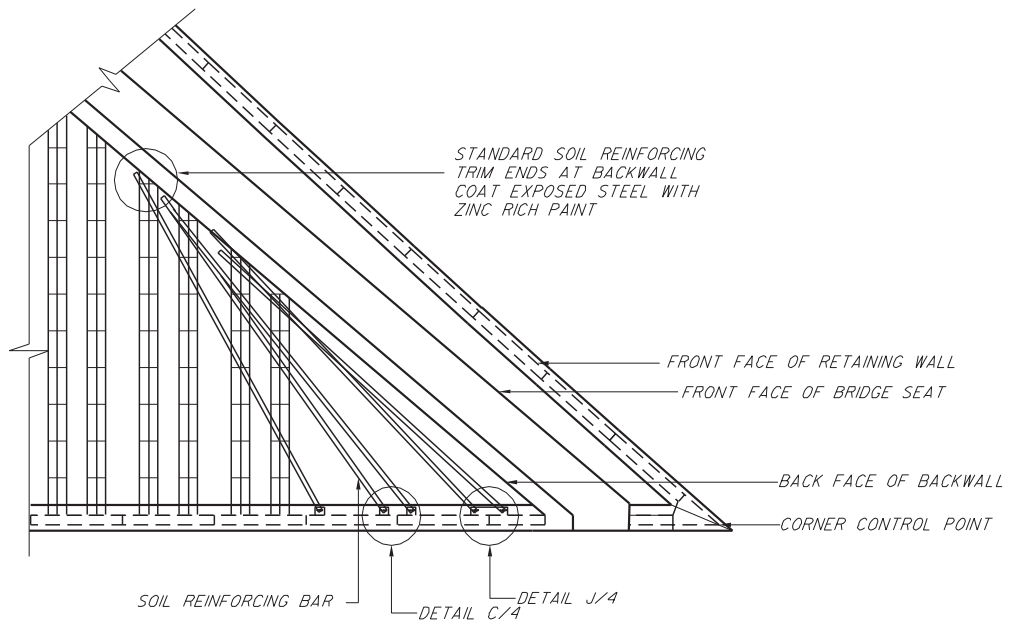


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Drawn By	TPT		Revision	Sheet No. 3 of 13
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\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$

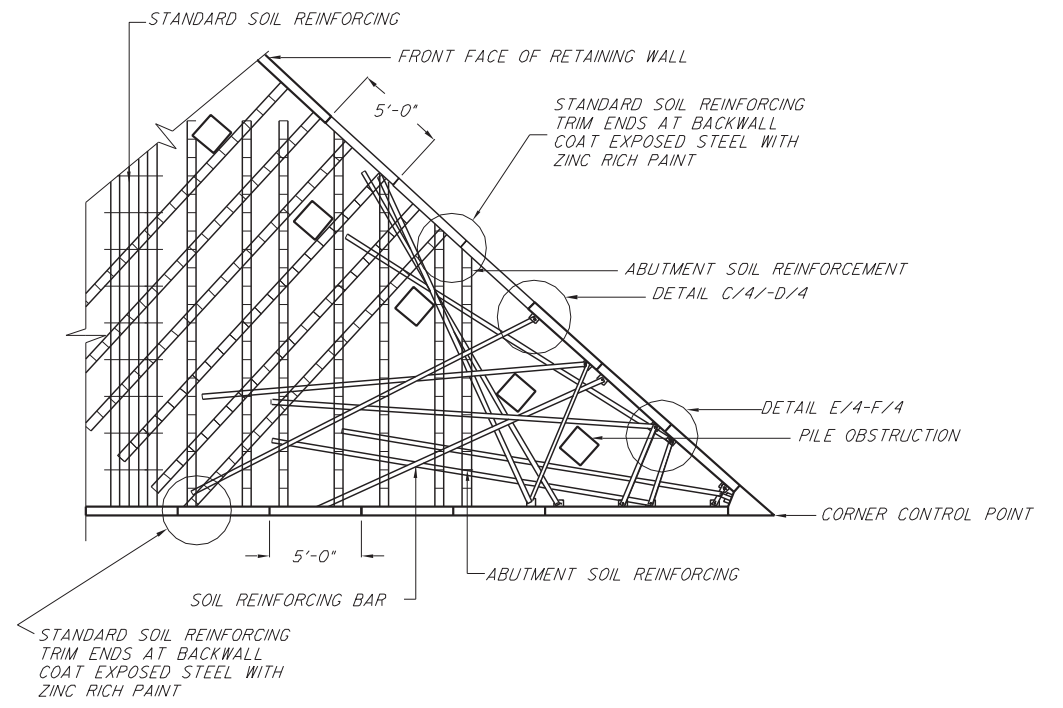


A ELEVATION ACUTE CORNER
3



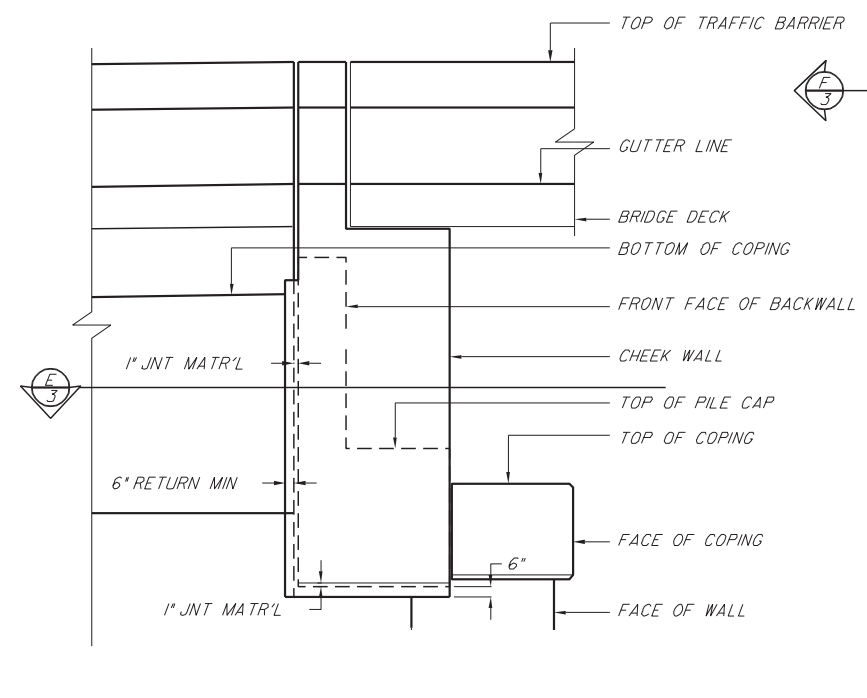
ABUTMENT RETAINING WALL SOIL REINFORCEMENT NOT SHOWN FOR CLARITY
END BENT BACK WALL REINFORCING NOT SHOWN FOR CLARITY

B ACUTE CORNER PLAN SECTION
3

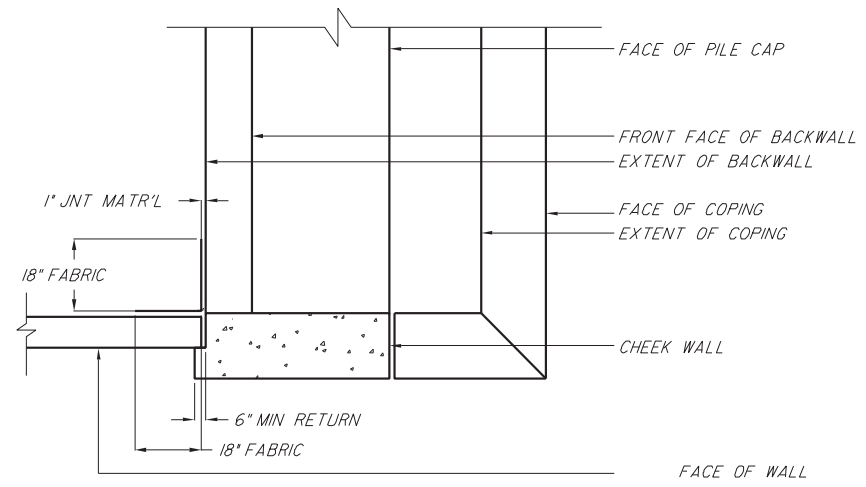


NOTE: REFERENCE DETAIL G/5 FOR ABUTMENT SOIL REINFORCEMENT SHOWN

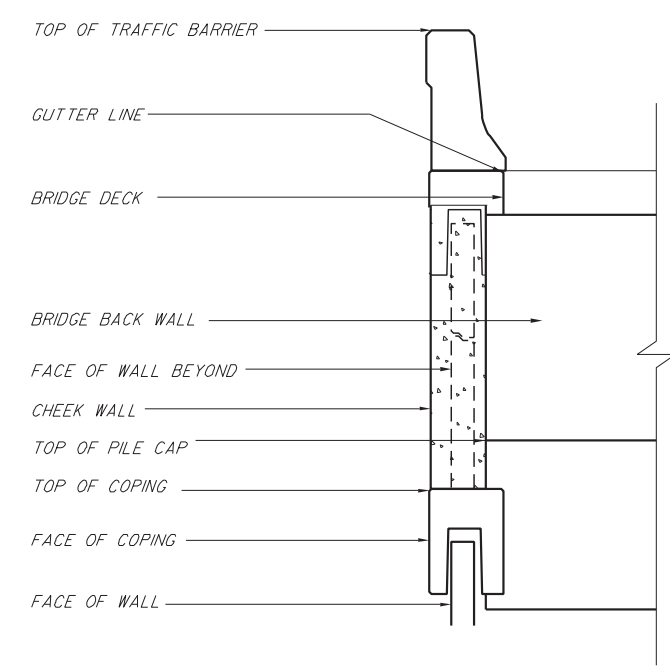
C ACUTE CORNER PLAN SECTION
3



D ELEVATION AT CHEEK WALL
3



E PLAN SECTION AT CHEEK WALL
3



F SECTION AT CHEEK WALL
3

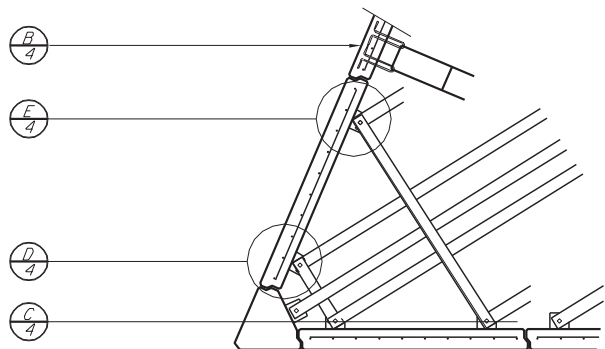
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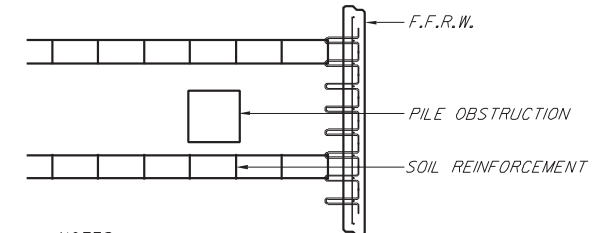
T&B STRUCTURAL SYSTEMS INC.
ENGINEERED STRUCTURES
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HURST, TEXAS 76053
888-280-9858
HILFIKER RETAINING WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	TPT	Revision	Sheet No.	Index No.
Checked By	T&B	00	4 of 13	5021

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$

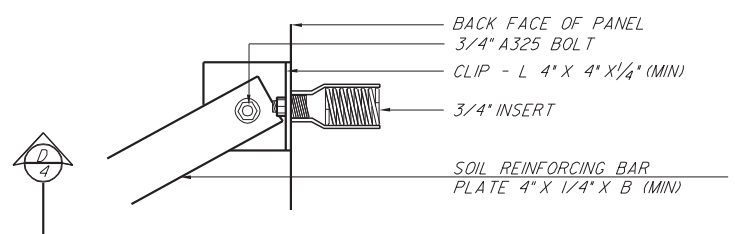


A ACUTE CORNER DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.

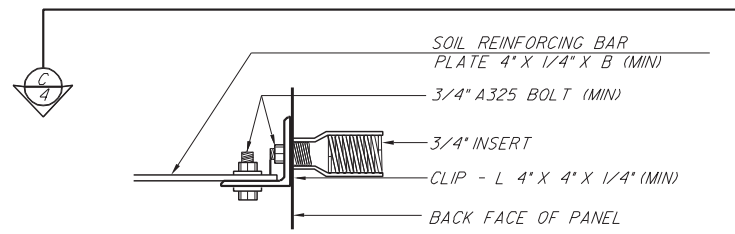


NOTES:
1. SPACE SOIL REINFORCEMENT SO AS TO MISS OBSTRUCTION

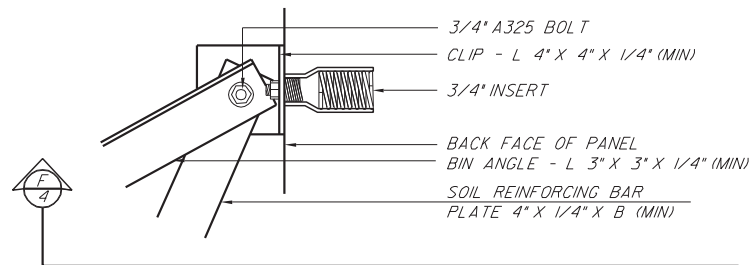
B CONTINUOUS ANCHOR PLAN
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



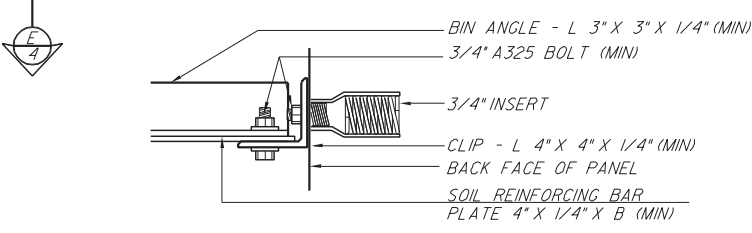
C SOIL REINFORCING BAR PLAN
4



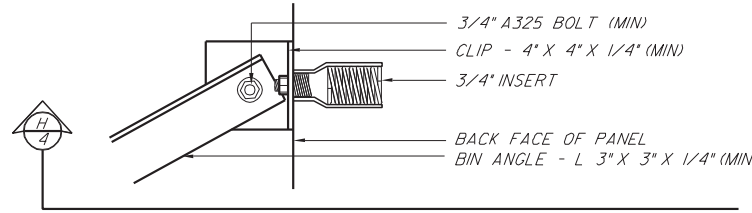
D SOIL REINFORCING BAR DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



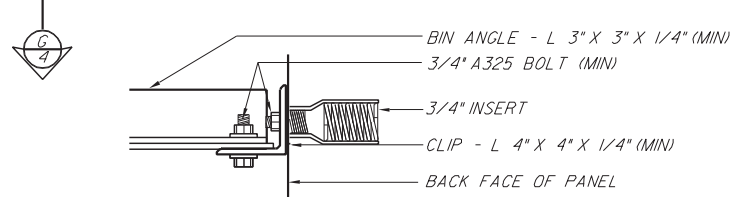
E COMBINATION ANGLE/BAR PLAN
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



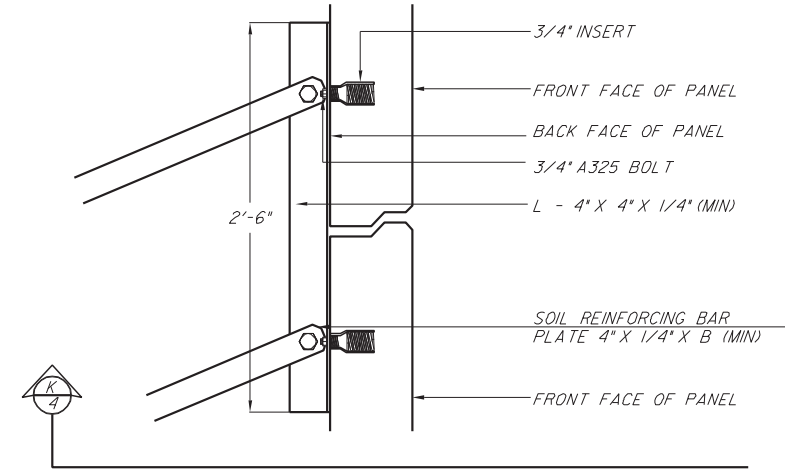
F COMBINATION STRAP/BAR DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



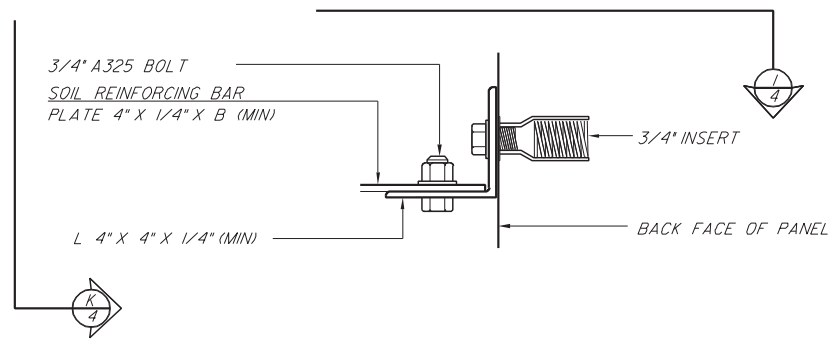
G BIN CLIP PLAN DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



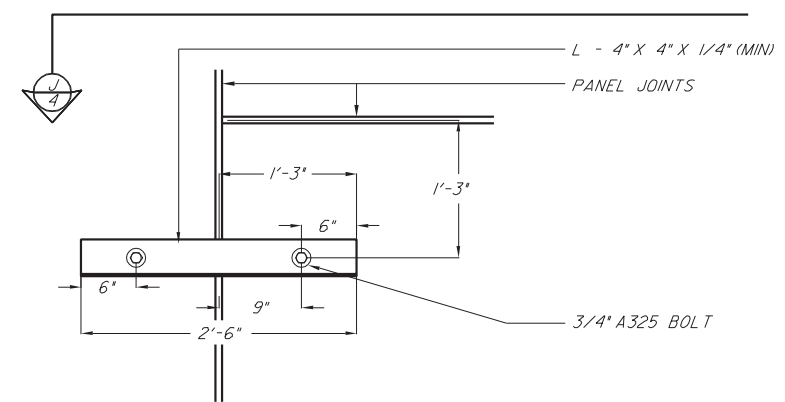
H BIN CLIP SECTION DETAIL
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



I PANEL-TO-PANEL CONNECTION PLAN
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



J PANEL-TO-PANEL CONNECTION SECTION
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.



K PANEL-TO-PANEL CONNECTION ELEVATION
4 ALL STEEL TO BE HOT DIP GALVANIZED U.N.O.

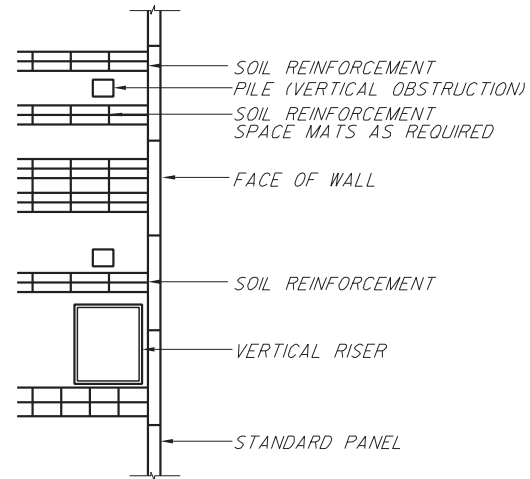
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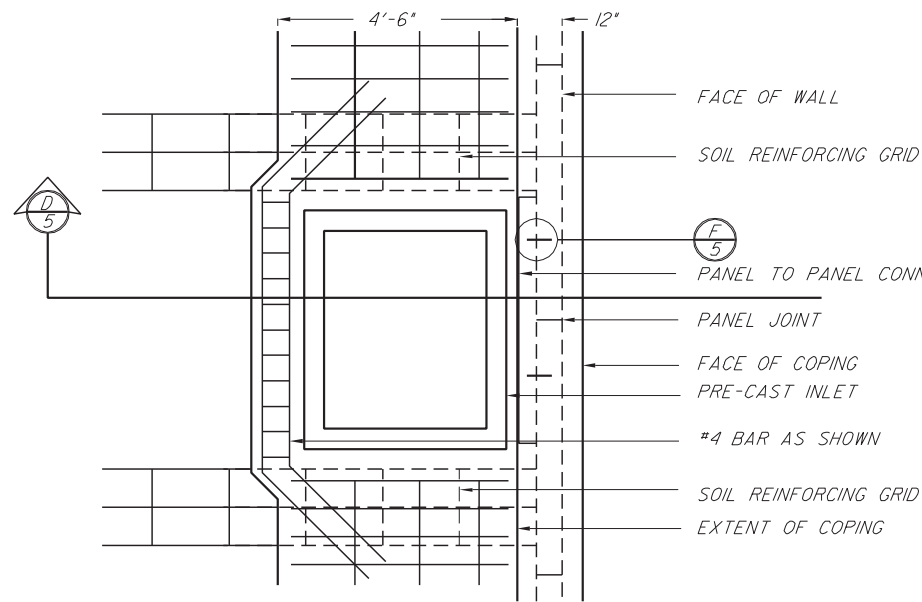
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Names	Dates	Approved By		
Designed By		State Structures Design Engineer		
Drawn By	TPT	Revision	Sheet No.	Index No.
Checked By	TBN	00	5 of 13	5021

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



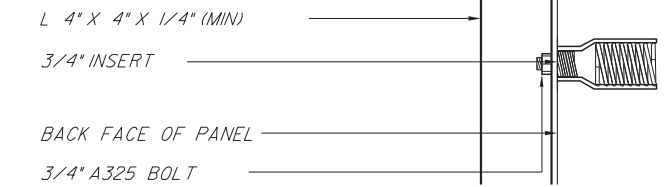
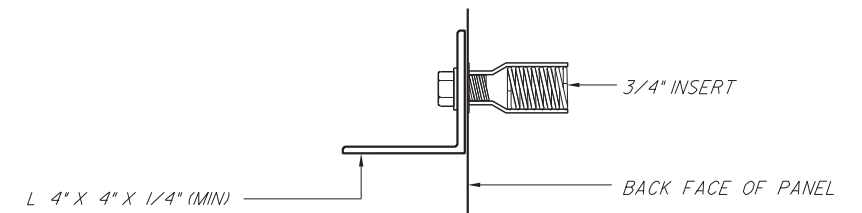
- NOTE:
1. VERTICAL OBSTRUCTIONS REQUIRE SPECIAL DESIGN CONSIDERATIONS
 2. THE DETAIL AS SHOWN IS FOR CONCEPT ONLY AND MAY VARY ON FINAL DESIGN
 3. REFERENCE SPECIAL DESIGN CALCULATIONS FOR DETAILS AND COMPONENT TYPE AND SIZE
 4. OBSTRUCTION SHALL BE INSTALLED BEFORE WALL

A VERTICAL OBSTRUCTION
5

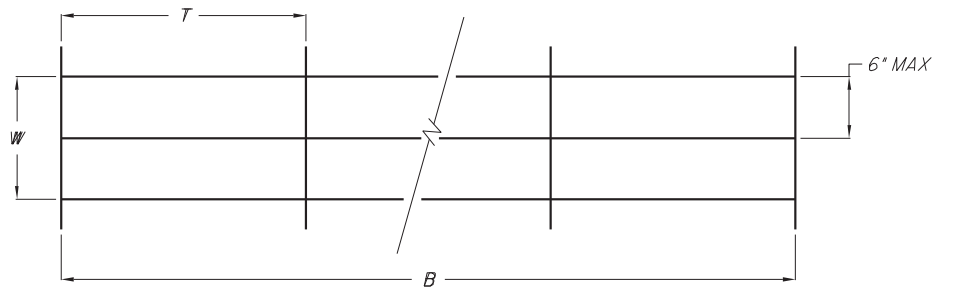


C VERTICAL OBSTRUCTION
5

E PANEL-TO-PANEL CONNECTION DETAIL
5 SECTION



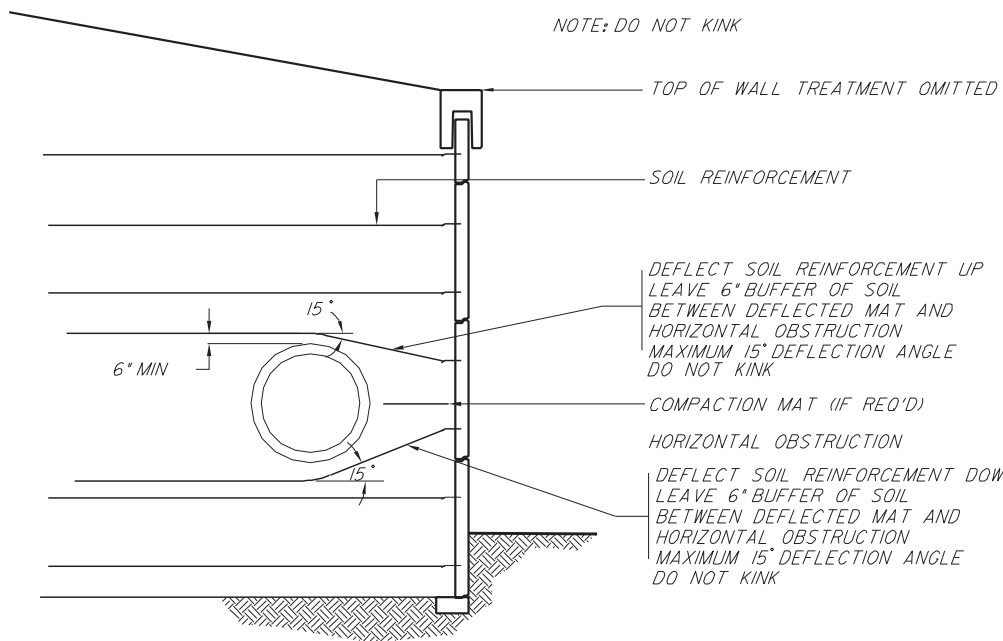
F PANEL-TO-PANEL CONNECTION DETAIL
5 PLAN



B = SOIL REINFORCING LENGTH
T = TRANSVERSE WIRE SPACING (2'-0" MAX)
W = WIDTH OF SOIL REINFORCING ELEMENT

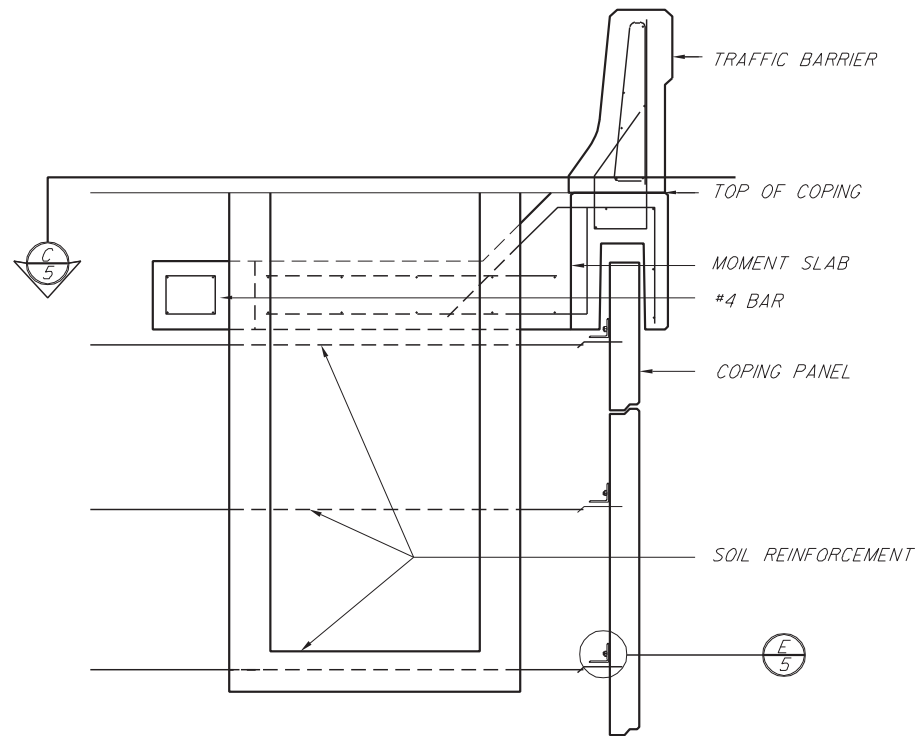
NOTE: THE MAT SHOWN IS USED TO PASS OBSTRUCTIONS AND TYPICALLY IS A WELDED WIRE MESH WITH LARGE DIAMETER WIRES. THE LONGITUDINAL WIRE SHALL BE EQUAL TO OR SMALLER THAN THE PANEL ANCHOR. A MINIMUM OF THREE LONGITUDINAL WIRES IS REQUIRED. THE MINIMUM WIRE SIZE SHALL BE AN W7.0

G OBSTRUCTION SOIL REINFORCING PLAN
5 PLAN



- NOTE:
1. HORIZONTAL OBSTRUCTIONS REQUIRE SPECIAL DESIGN CONSIDERATIONS
 2. THE DETAIL AS SHOWN IS FOR CONCEPT ONLY AND MAY VARY ON FINAL DESIGN
 3. REFERENCE SPECIAL DESIGN CALCULATIONS FOR DETAILS AND COMPONENT TYPE AND SIZE

B HORIZONTAL OBSTRUCTION
5



D PANEL-TO-PANEL CONNECTION DETAIL
5

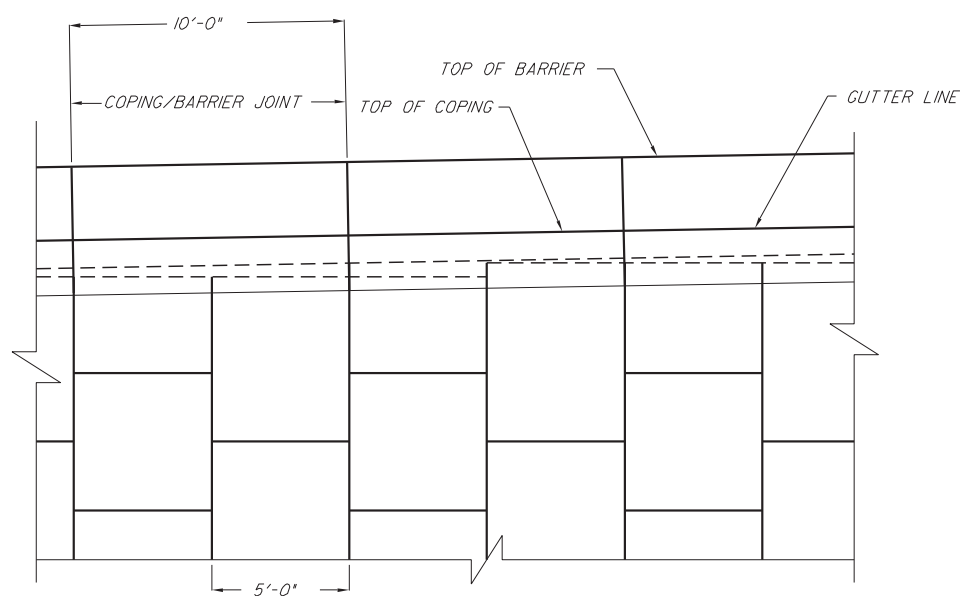
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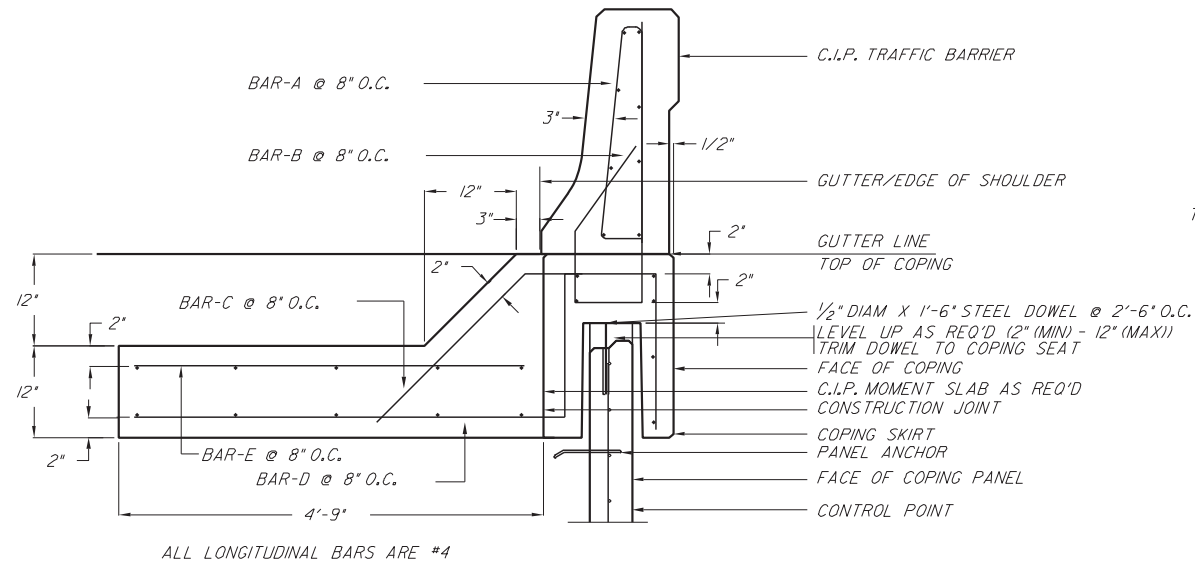
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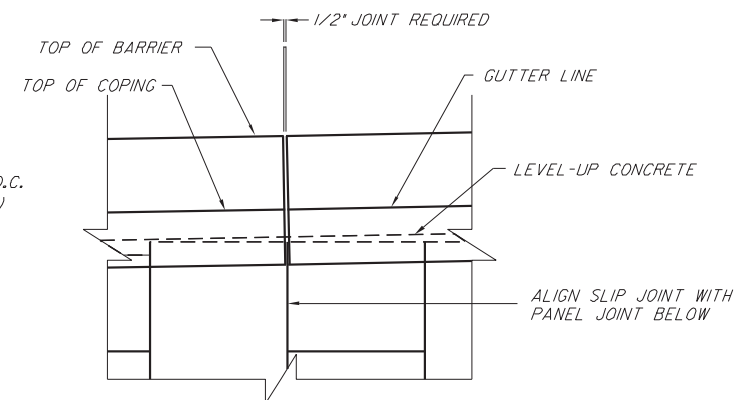
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	TPT	Revision	Sheet No.	Index No.
Checked By	TBW	00	6 of 13	5021



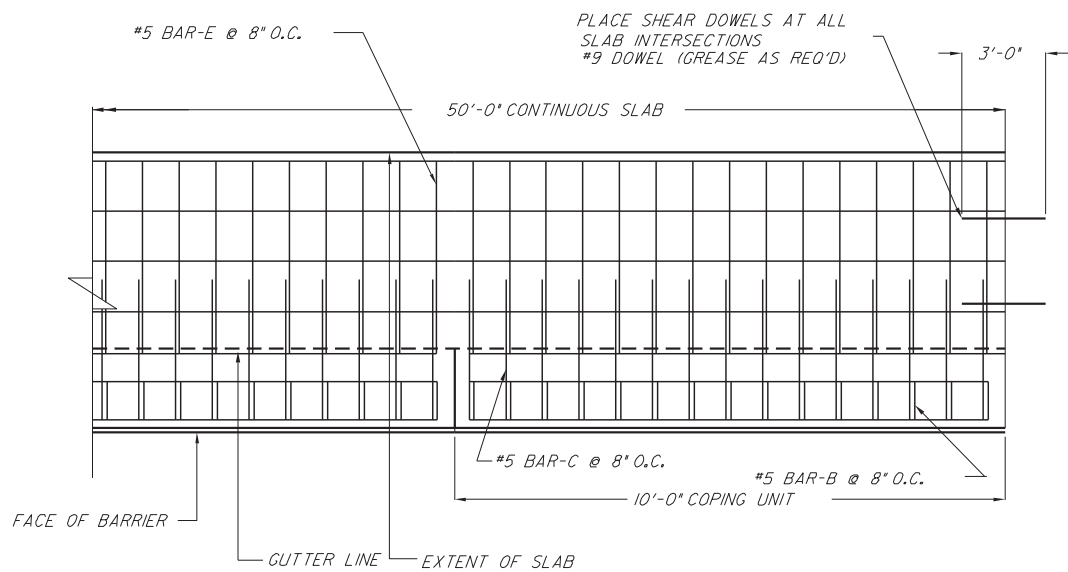
A PRECAST COPING WITH C.I.P. BARRIER ELEVATION



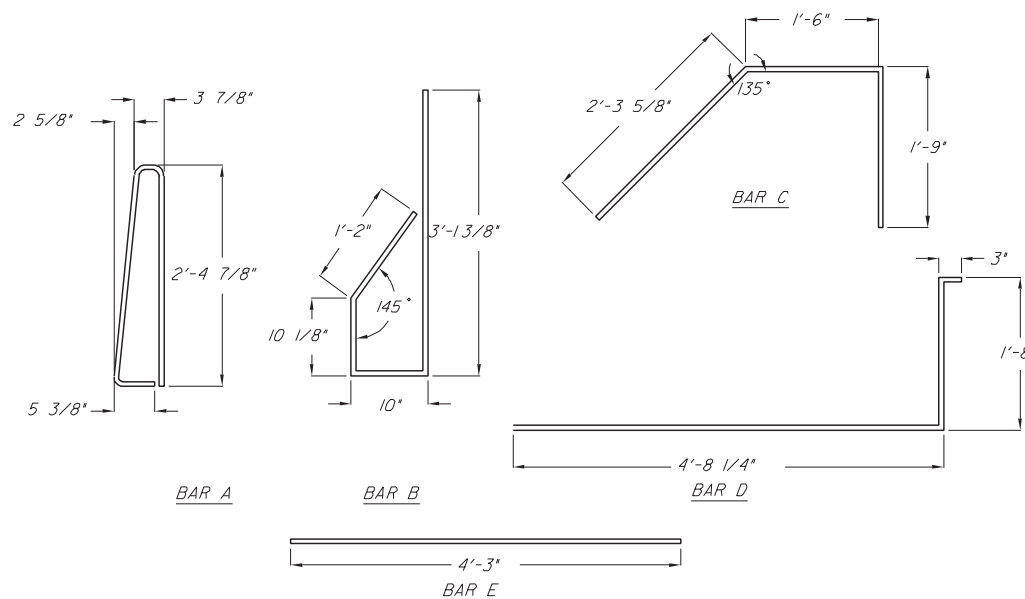
C PRECAST COPING WITH C.I.P. BARRIER AND C.I.P. JUNCTION SLAP



E TRAFFIC BARRIER SLIP JOINT



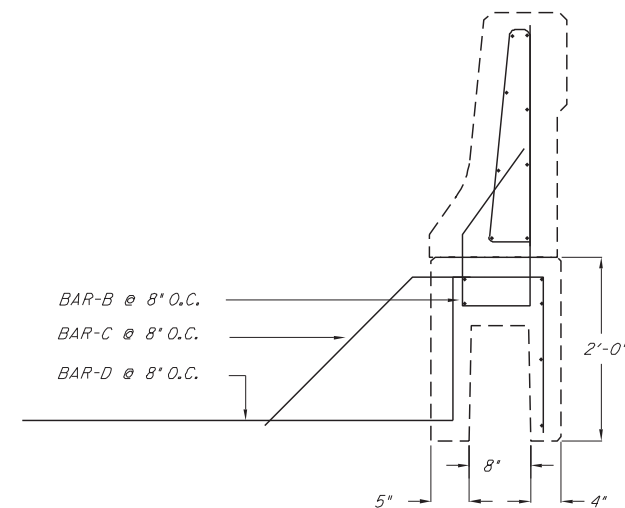
B PRECAST COPING WITH C.I.P. BARRIER PLAN



REBAR SCHEDULE

MARK	SIZE	QTY	LENGTH	BENDING
A	#5	11	AS DETAILED	AS DETAILED
B	#5	11	AS DETAILED	AS DETAILED
C	#5	11	AS DETAILED	AS DETAILED
D	#5	11	AS DETAILED	AS DETAILED

QUANTITIES SHOWN ARE FOR A 10'-0" COPING SECTION



F PRECAST COPING REBAR LAYOUT

REFERENCE FDOT INDEX 700 FOR BARRIER DIMENSIONS NOT SHOWN

D PRECAST BARRIER/COPING REINFORCING

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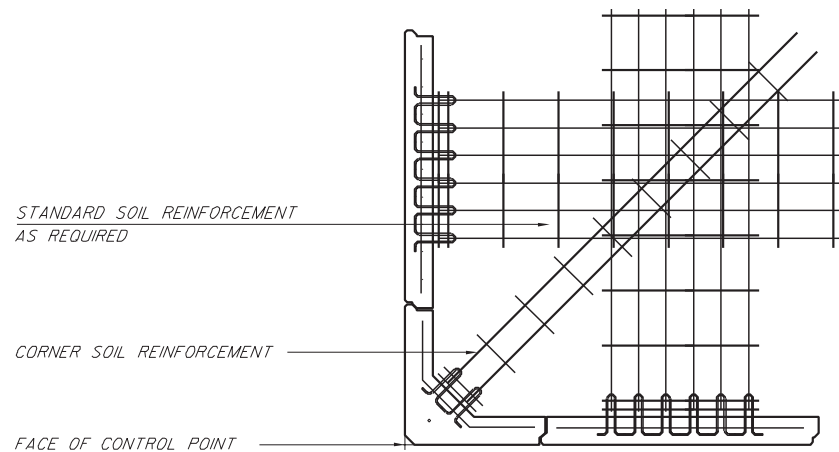
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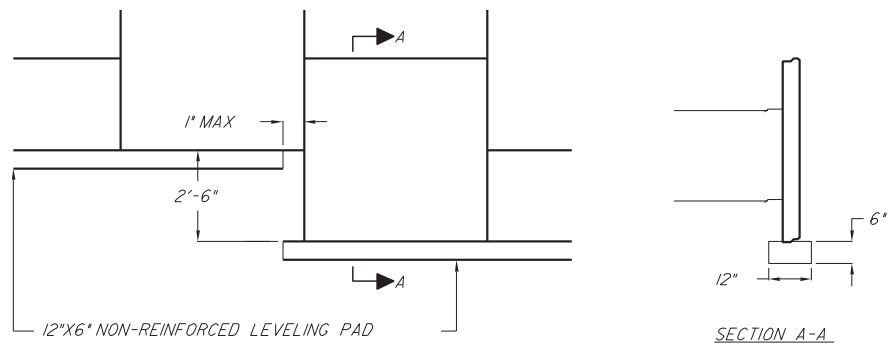


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Designed By	Names	Dates	Approved By <i>[Signature]</i>	
Drawn By	TPT		Revision	Sheet No. 7 of 13
Checked By	TBN		00	Index No. 5021

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$

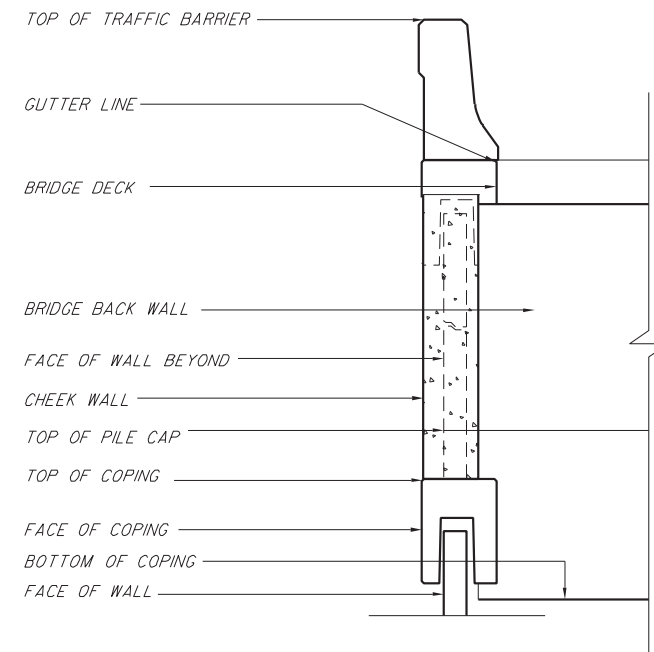


A 90° CORNER PLAN
7



NOTE: LEVELING COURSE SHALL BE PLACED TO THE ELEVATIONS AS SHOWN ON THE PLANS. TOLERANCE FOR ELEVATIONS SHALL BE PLUS-MINUS 1/8"

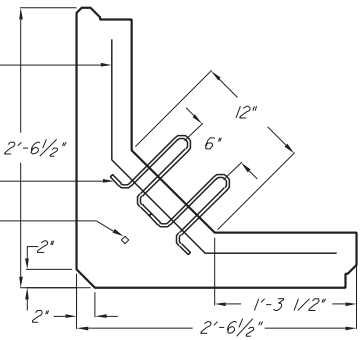
D LEVELING COURSE STEP ELEVATION
7



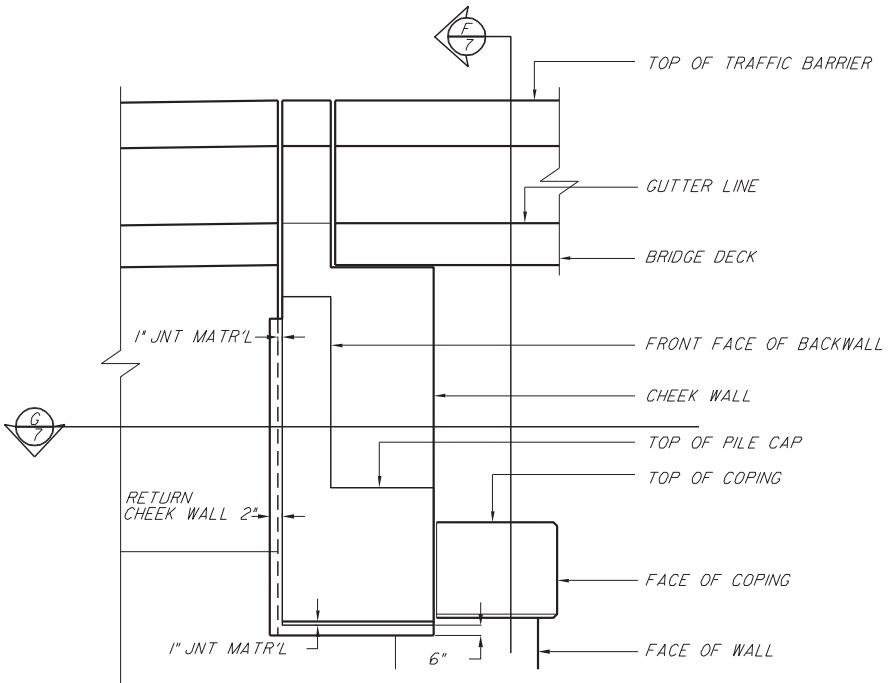
F SECTION AT CHEEK WALL
7

PANEL REINFORCEMENT
WWF W7.0 X W7.0 - 6" X 6"

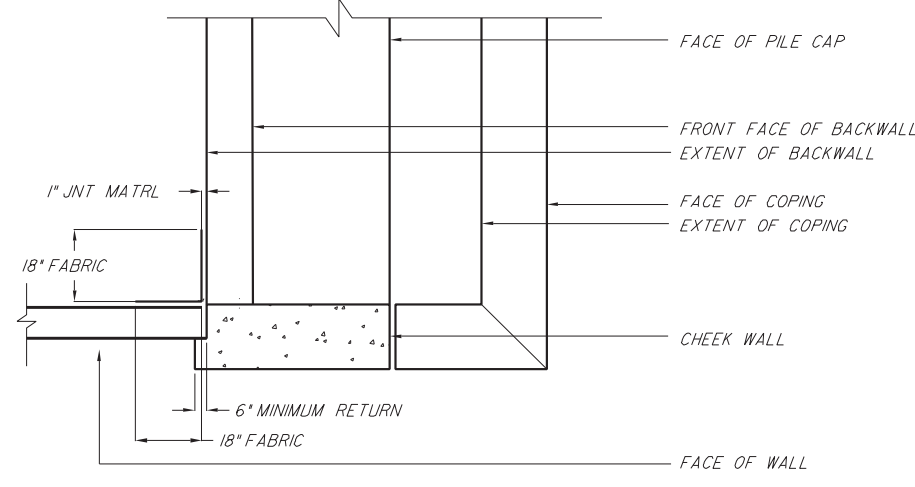
PANEL ANCHOR
1/2" ALIGNMENT HOLE



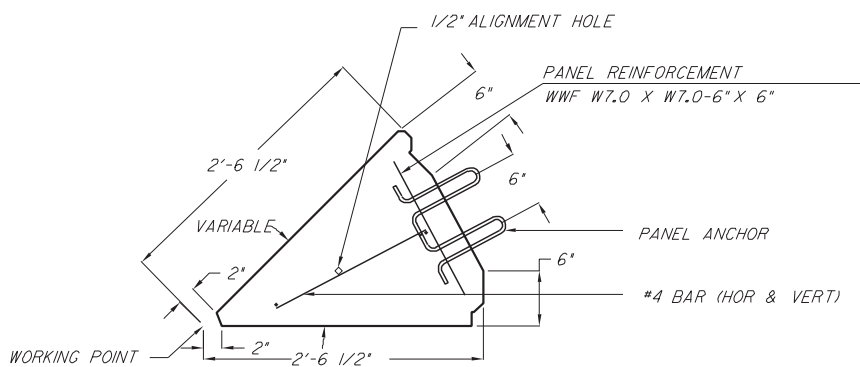
B ABTUSE CORNER PANEL
7
PANEL ANGLE VARIES FROM 90° TO 180°



E ELEVATION AT CHEEK WALL
7



G PLAN SECTION AT CHEEK WALL
7

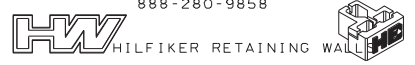


C ADJUSTABLE CORNER PANEL
7

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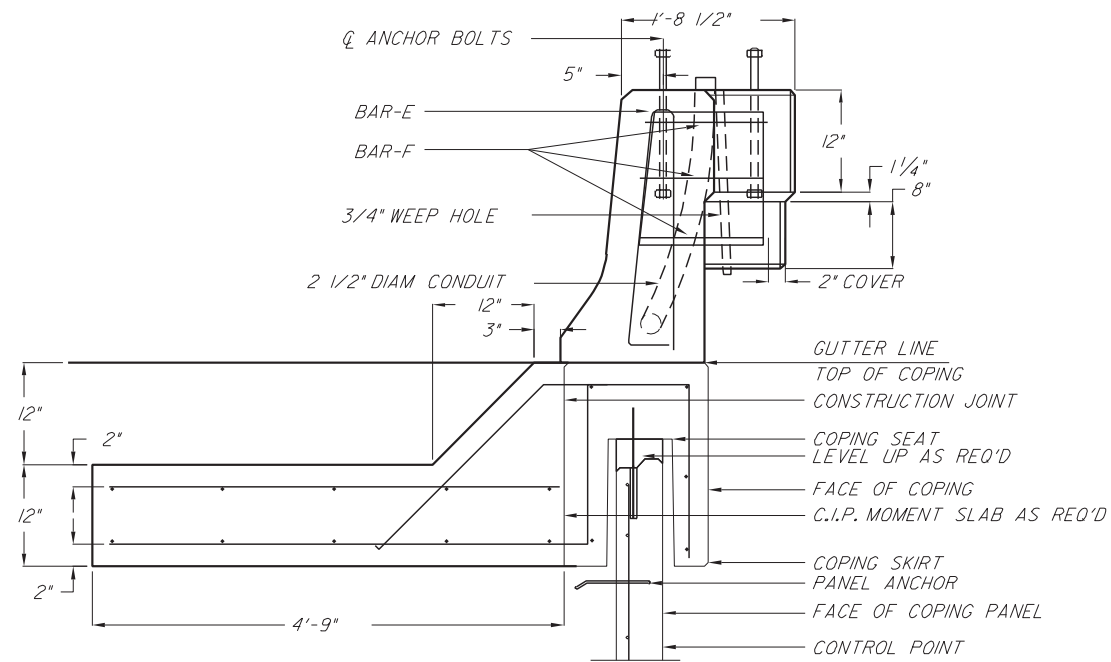


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

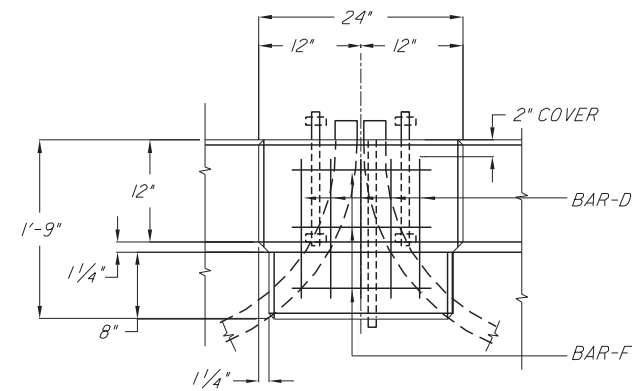
Names	Dates	Approved By				
Designed By		 State Structures Design Engineer				
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Checked By	T&B				00	8 of 13
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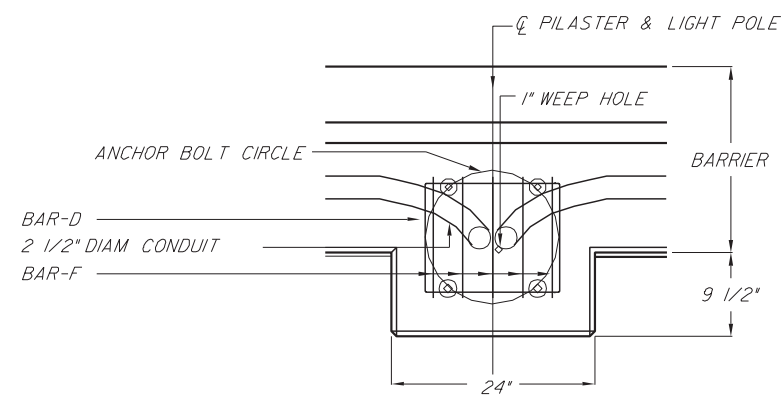
FOR ADDITIONAL DETAILS REFERENCE FDOT LIGHT POLE PILASTER SEE STRUCTURES STANDARD DRAWING 500
FOR JUNCTION SLAB DIMENSIONS AND REINFORCING REFERENCE SHEET HW-6

A
8 PRECAST COPING WITH PILASTER SECTION



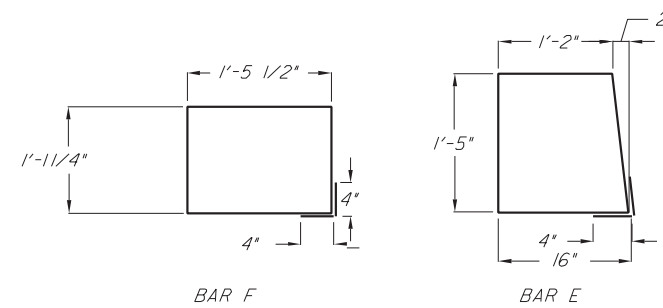
FOR ADDITIONAL DETAILS REFERENCE FDOT LIGHT POLE PILASTER SEE STRUCTURES STANDARD DRAWING 500

C
8 PILASTER ELEVATION



FOR ADDITIONAL DETAILS REFERENCE FDOT LIGHT POLE PILASTERS SEE STRUCTURES STANDARD DRAWING 500

B
8 PILASTER PLAN VIEW



REBAR SCHEDULE

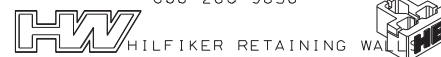
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F	#5	3	AS DETAILED	AS DETAILED

D
8 PILASTER REINFORCING SCHEDULE

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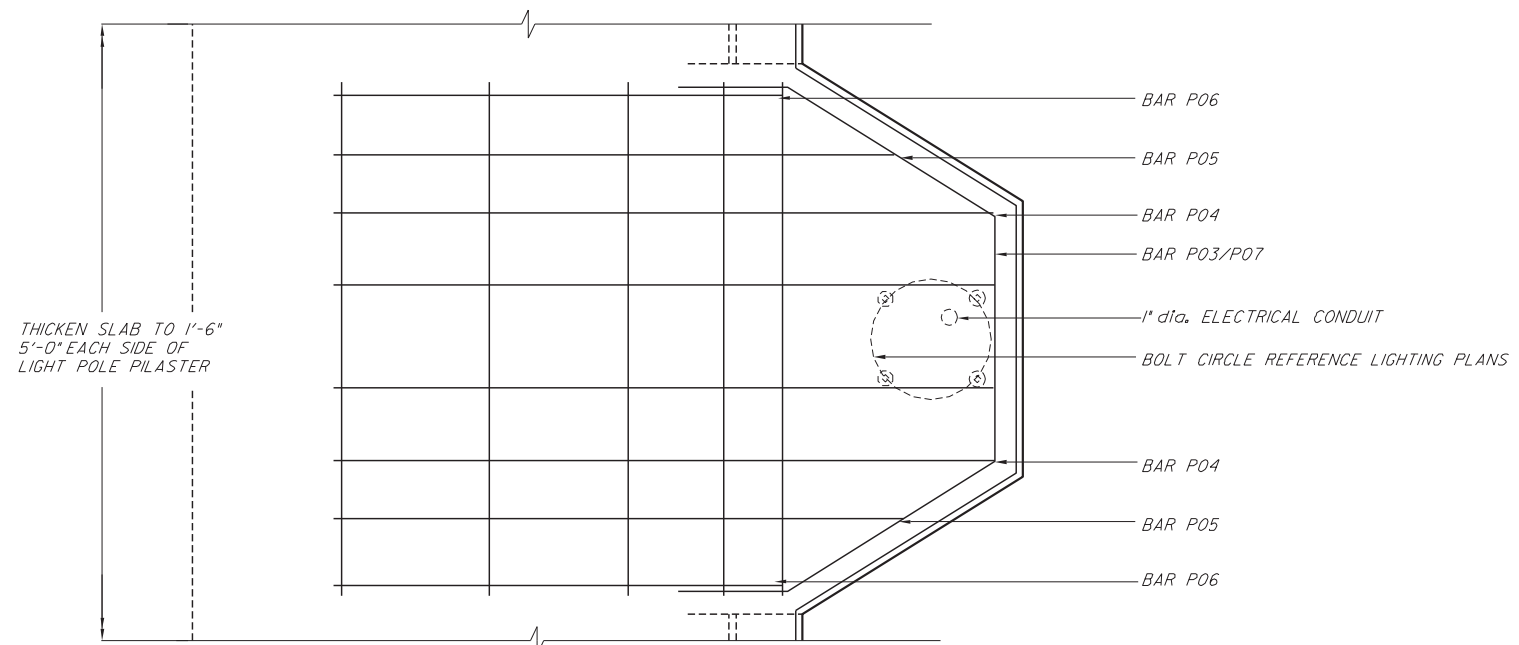


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

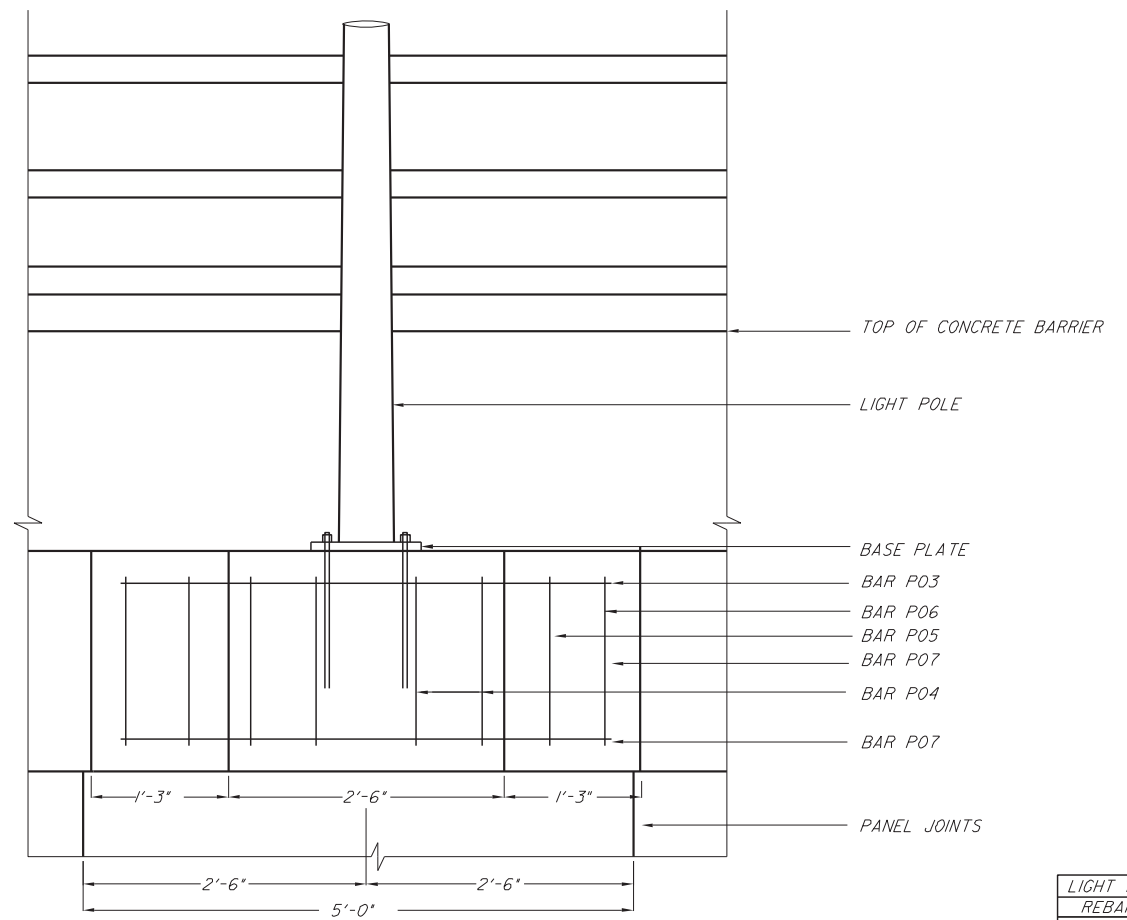
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Designed By		W. J. [Signature]	Revision	Sheet No.
Drawn By	TPT		00	9 of 13
Checked By	T&B			Index No. 5021

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\$\$\$\$\$SYTIME\$\$\$\$\$



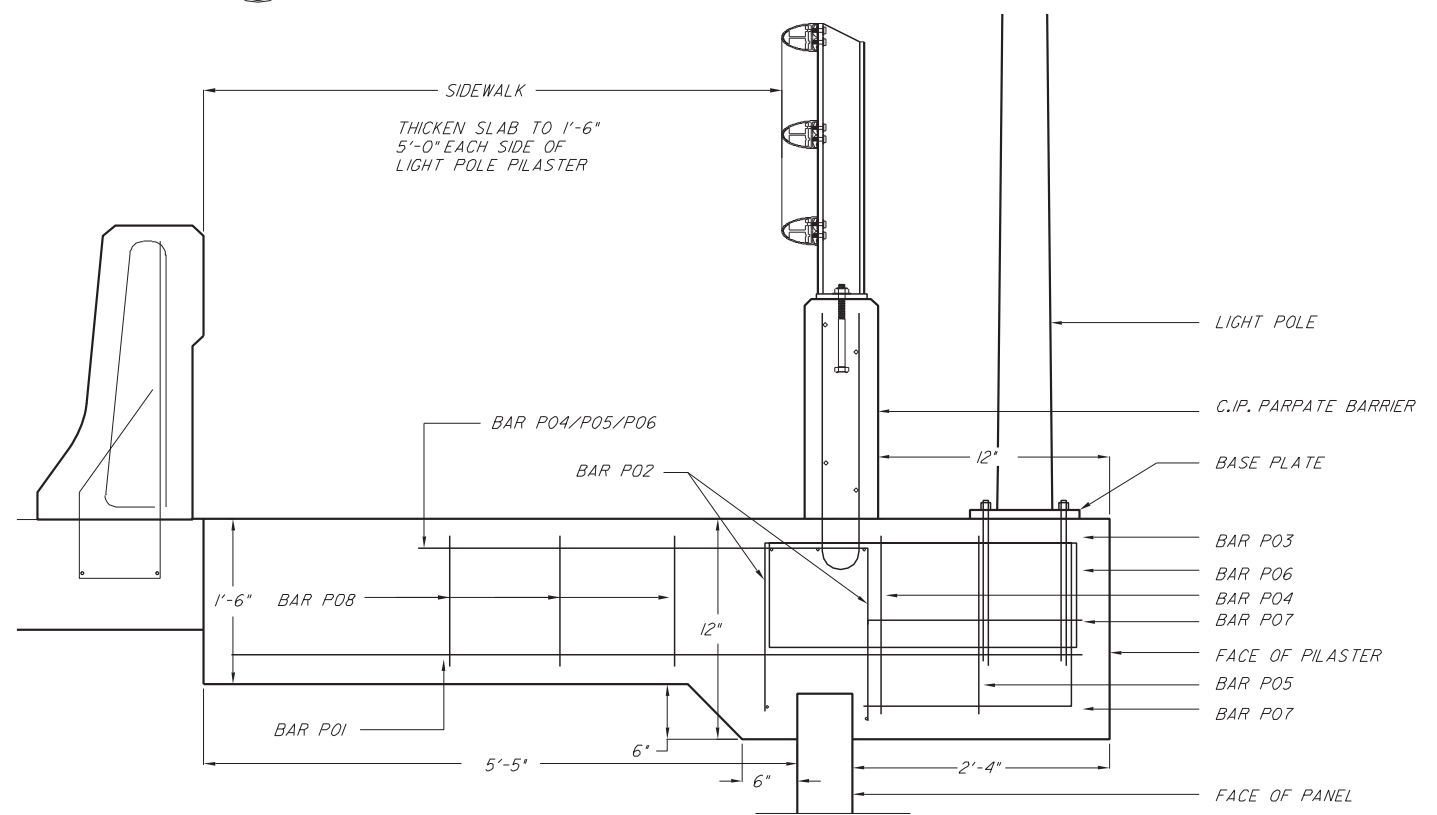
FOR ADDITIONAL DETAILS REFERENCE STRUCTURES STANDARD DRAWING 720

A PLAN BARRIER DETAIL @ LIGHT POLE
9 HORIZONTAL REINFORCING NOT SHOWN FOR CLARITY

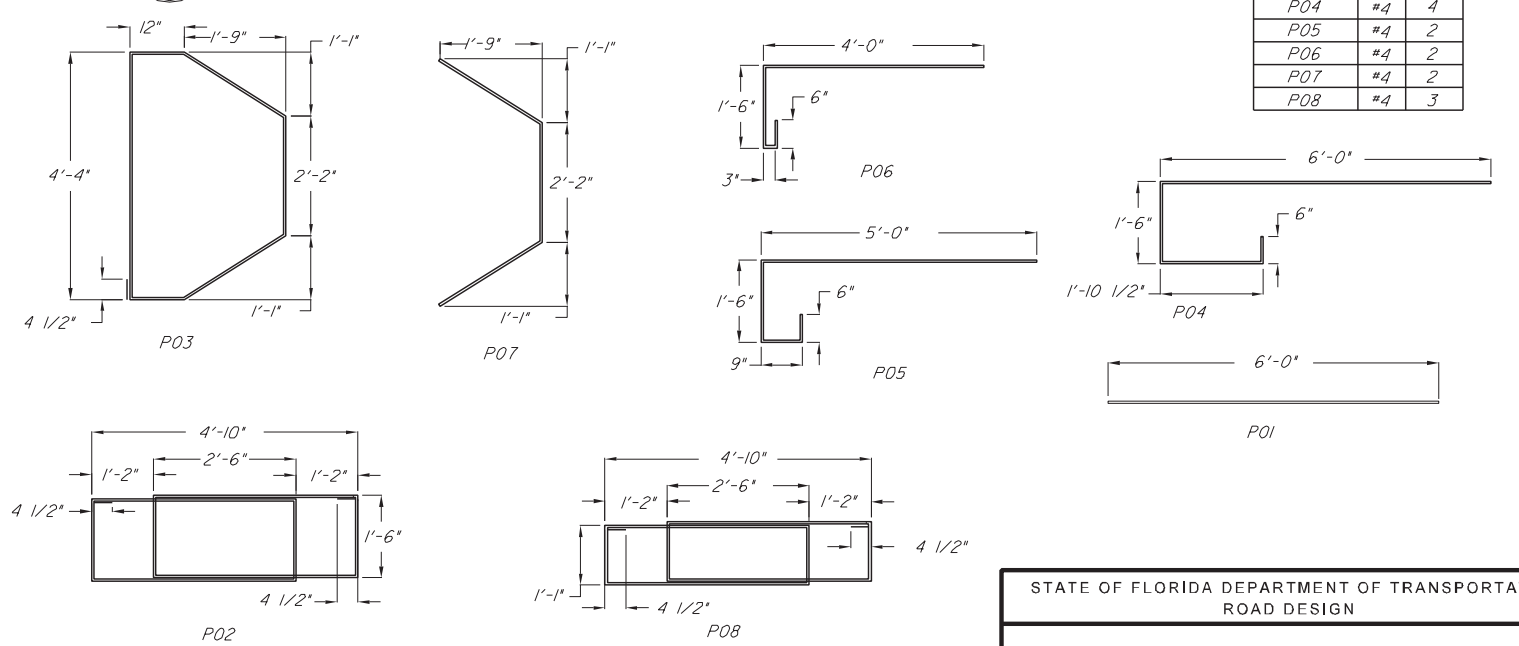


B ELEVATION BARRIER DETAIL @ LIGHT POLE
9

LIGHT POLE PILASTER REBAR SCHEDULE		
MARK	SIZE	QTY
P01	#4	6
P02	#4	2
P03	#4	1
P04	#4	4
P05	#4	2
P06	#4	2
P07	#4	2
P08	#4	3



C SECTION BARRIER DETAIL @ LIGHT POLE
9



D LIGHT POLE PILASTER REINFORCING DETAIL
9

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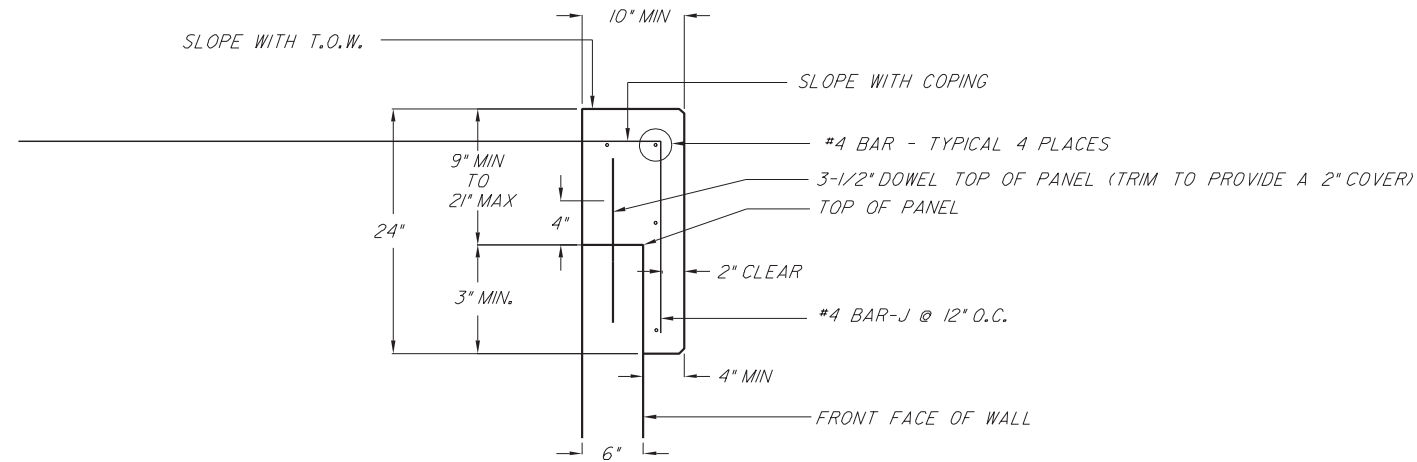
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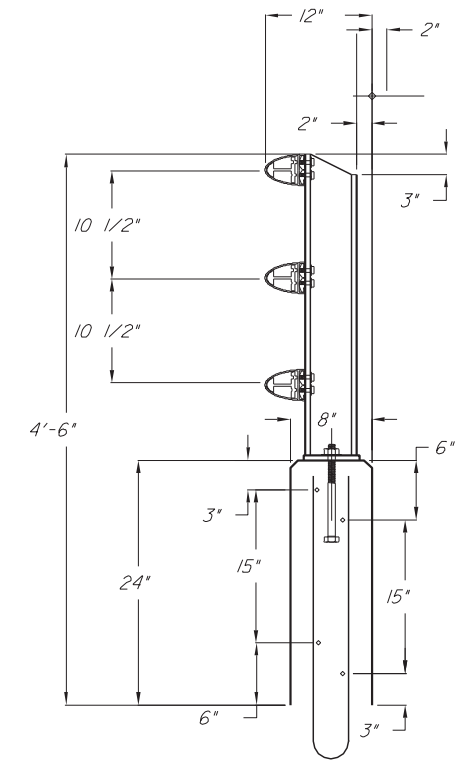
HW HILFIKER RETAINING WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
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Designed By	Names	Dates	Approved By <i>W. V. [Signature]</i>	
Drawn By	TPT		Revision	Sheet No. 10 of 13
Checked By	T&B		00	5021

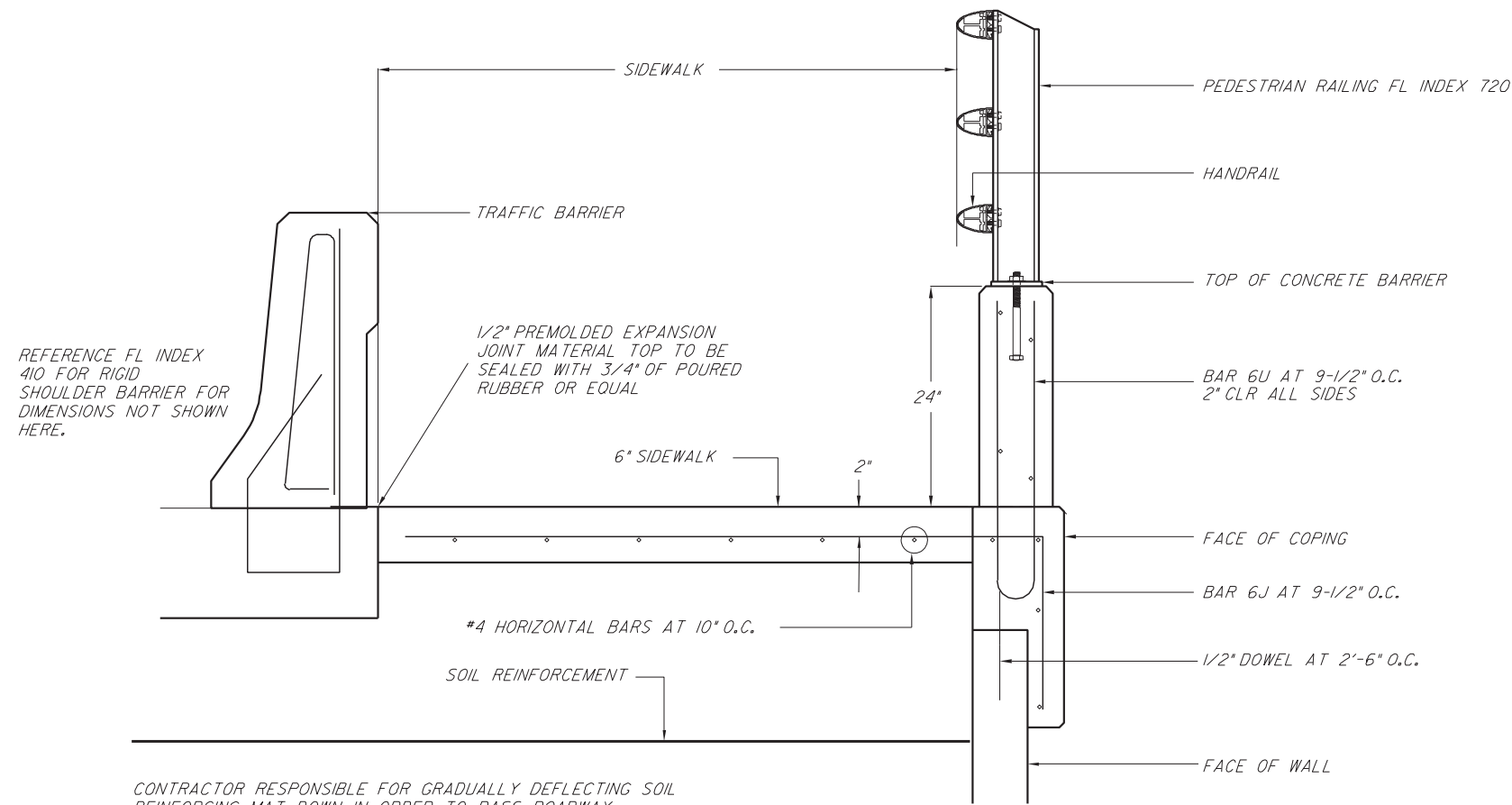
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\$\$\$\$\$SYTIME\$\$\$\$\$



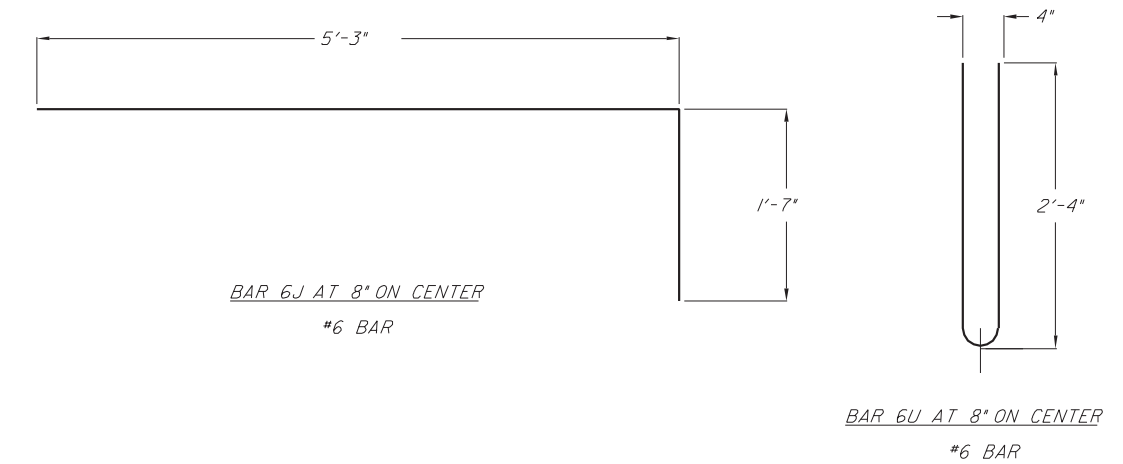
A SECTION C.I.P. PARAPET COPING
 10 HORIZONTAL REINFORCING NOT SHOWN FOR CLARITY



B SECTION C.I.P. PEDESTRIAN BARRIER
 10 REFERENCE STRUCTURES STANDARD DRAWING 720 FOR DETAILS NOT SHOWN



C SECTION C.I.P. BARRIER WITH PEDESTRIAN RAILING
 10



D C.I.P. COPING WITH PEDESTRIAN BARRIER BAR DETAILS
 10

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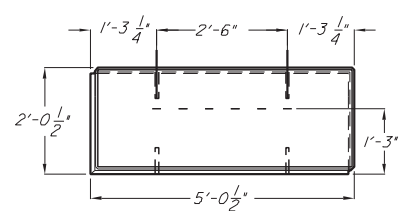
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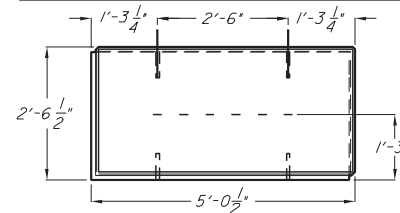
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM HILFIKER SQUARE PANEL				
Designed By	Names	Dates	Approved By <i>W. J. [Signature]</i>	
Drawn By	TPT		Revision	Sheet No. Index No.
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 \$\$\$SYTIME\$\$\$



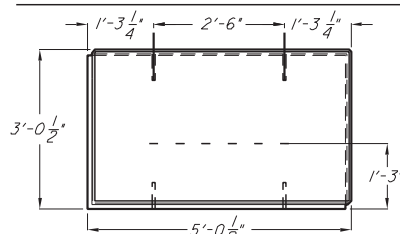
PANEL MATERIAL LIST		
DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE A - 2'-0" PANEL



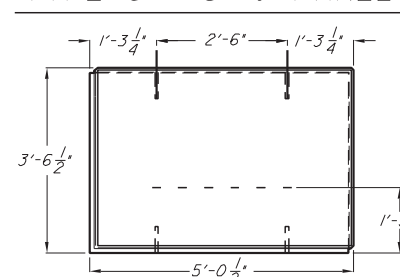
PANEL MATERIAL LIST		
DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE B - 2'-6" PANEL



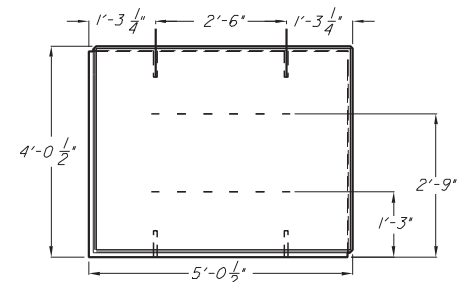
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE C - 3'-0" PANEL



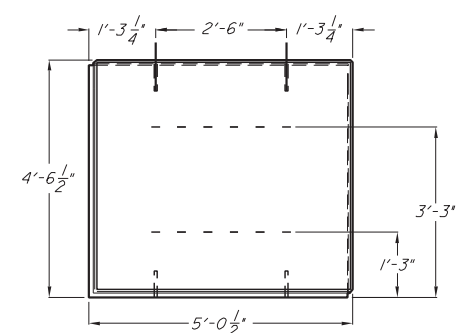
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE D - 3'-6" PANEL



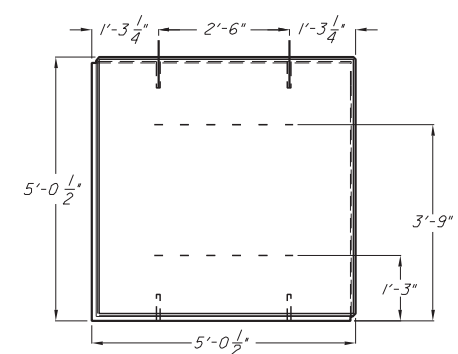
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE E - 4'-0" PANEL



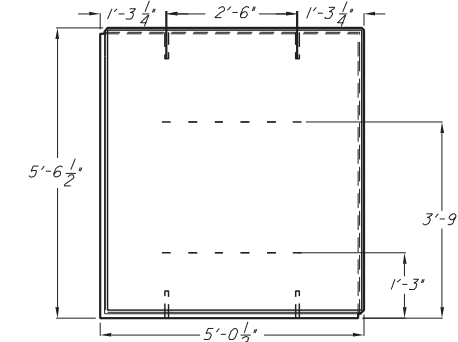
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE F - 4'-6" PANEL



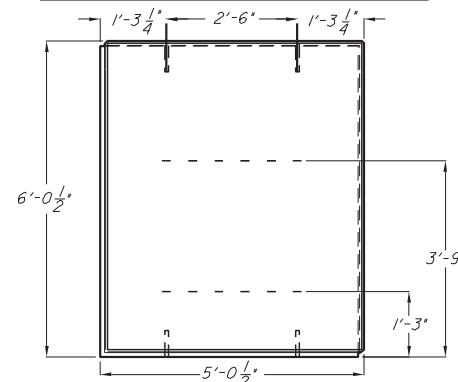
PANEL MATERIAL LIST		
DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE G - 5'-0" PANEL



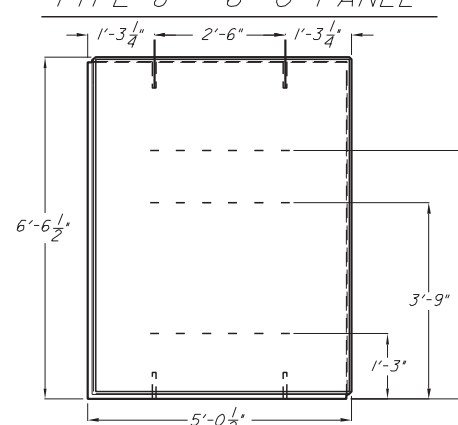
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE H - 5'-6" PANEL



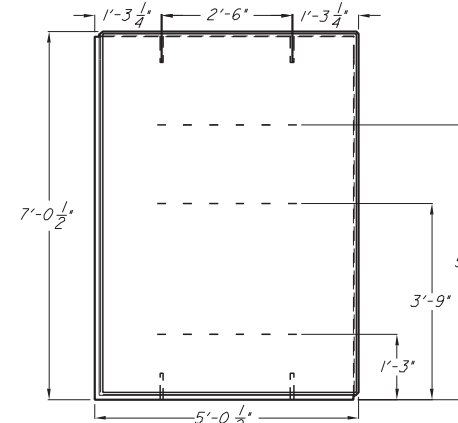
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	2 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE J - 6'-0" PANEL



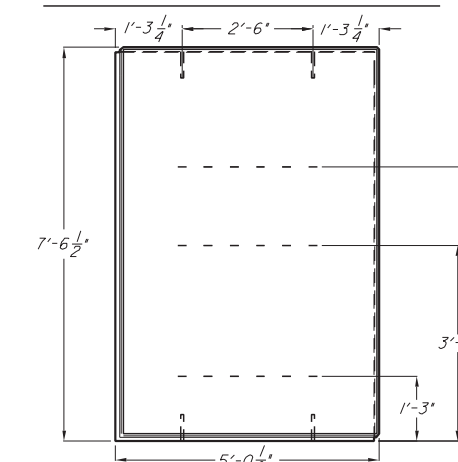
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	3 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE K - 6'-6" PANEL



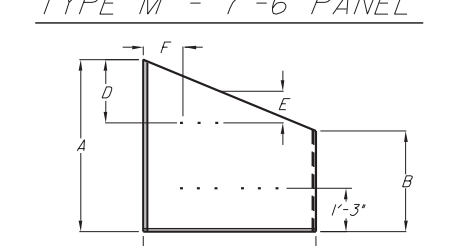
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	3 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE L - 7'-0" PANEL



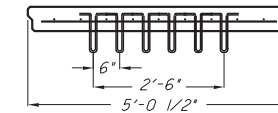
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DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	1 OF 6
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

TYPE M - 7'-6" PANEL

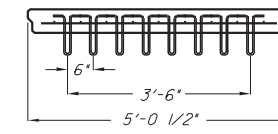


PANEL MATERIAL LIST		
DESG.	SIZE AND TYPE	QTY.
ANCHOR	W12	VARIABLE
CAGE	W7.0 - 6" X 6"	1
PVC	3/4" DIAM	4
HOOK	PRE-BENT	4

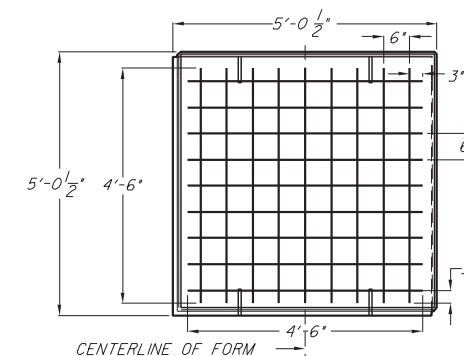
SPECIAL SLOPED PANEL



STANDARD ANCHOR LAYOUT

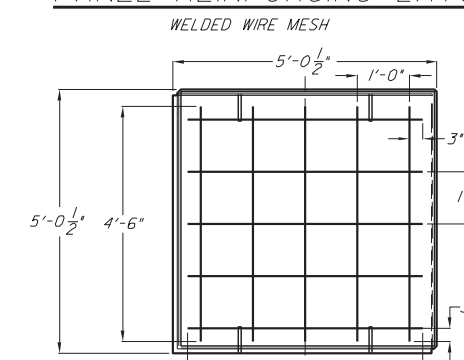


CONTINUOUS ANCHOR LAYOUT



- NOTE:
 1. MINIMUM 3" COVER AT ALL EDGES
 2. CENTER MESH IN FORM
 3. WIRE MESH TO BE PLACED ON TOP OF PVC ALIGNMENT SLEEVES.
 4. TRIM AS REQUIRED
 5. MINIMUM W7.0 X W7.0 WWF

PANEL REINFORCING LAYOUT



- NOTE:
 1. MINIMUM 3" COVER AT ALL EDGES
 2. CENTER REBAR IN FORM
 3. REBAR TO BE PLACED ON TOP OF PVC ALIGNMENT SLEEVES.
 4. TRIM AS REQUIRED
 5. MINIMUM #4 BAR BOTH WAYS
 6. TIE REBAR TOGETHER AT INTERSECTION POINTS

PANEL REINFORCING LAYOUT

OPTIONAL REBAR

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ROAD DESIGN

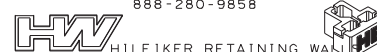
RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

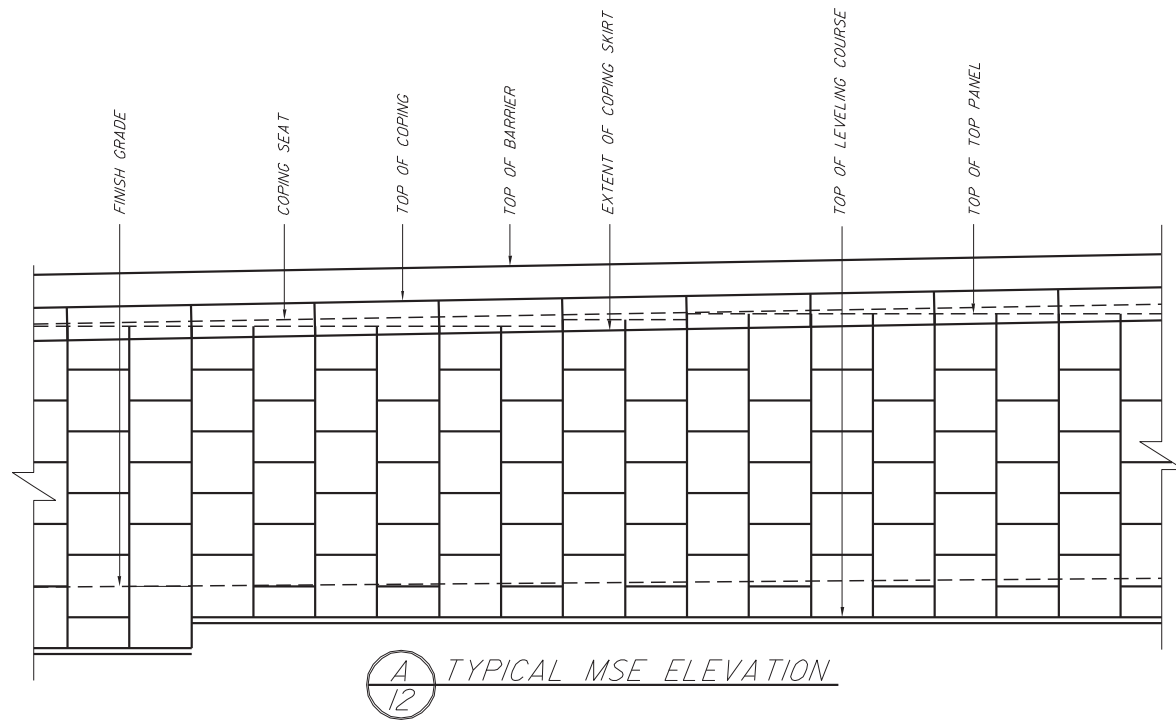
Names	Dates	Approved By				
Designed By		State Structures Design Engineer				
Drawn By	TPT				Revision	Sheet No.
Checked By	TBM				00	12 of 13
				Index No.		
				5021		

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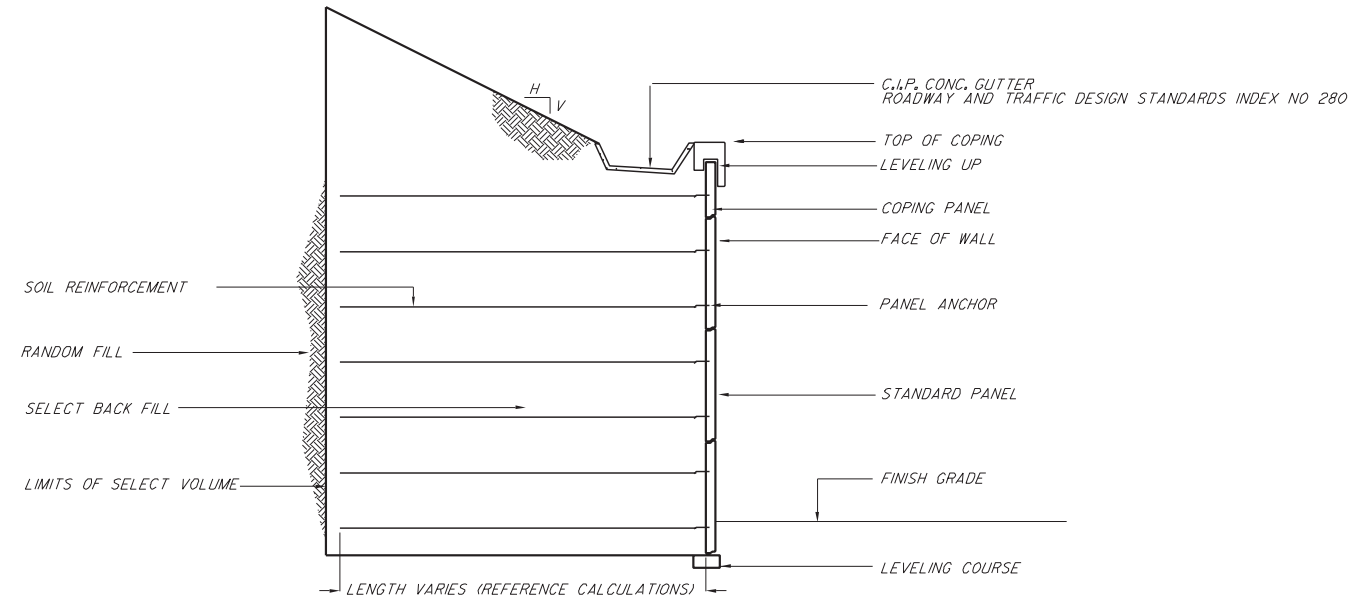
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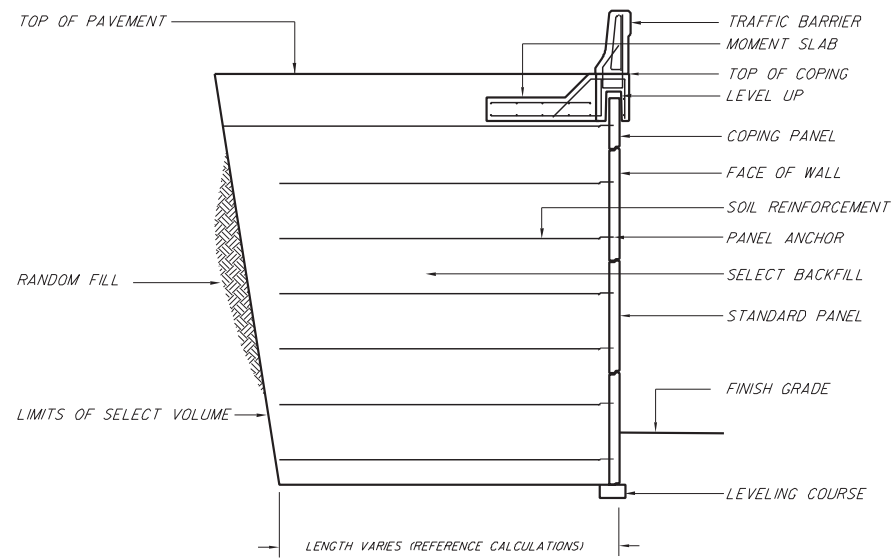




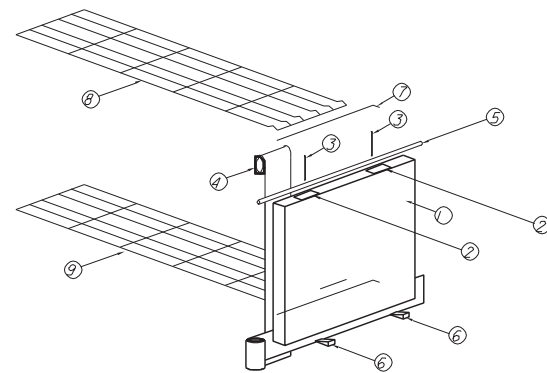
A TYPICAL MSE ELEVATION



B TYPICAL MSE SECTION WITH SLOPE

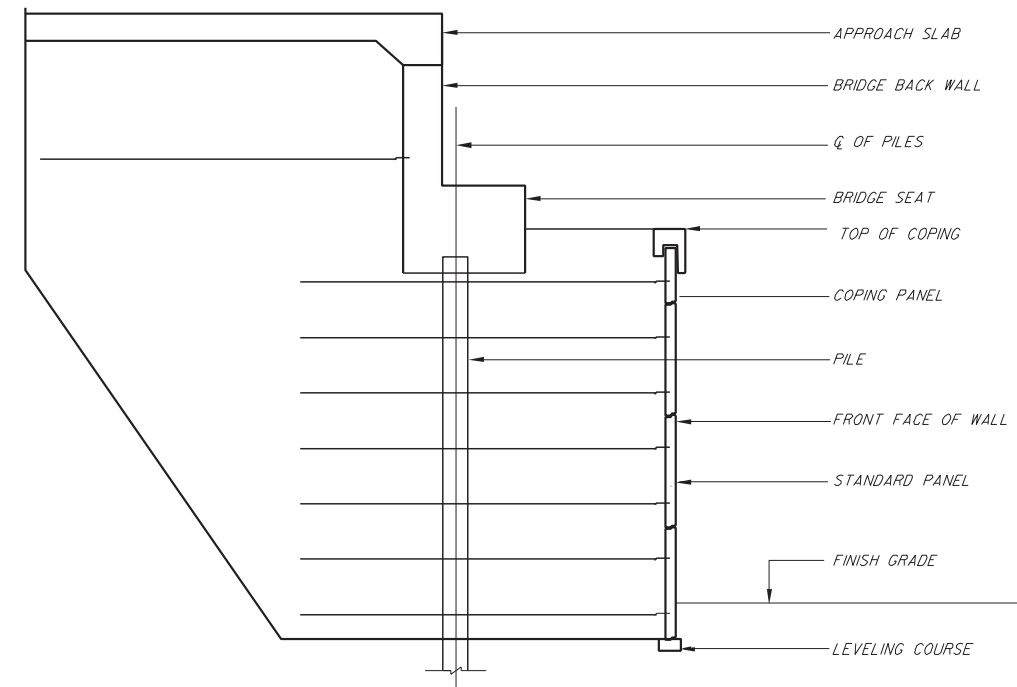


C TYPICAL MSE SECTION WITH BARRIER



1. TYPICAL PRE-CAST PANEL WITH CAST IN PLACE ANCHORS
2. 3" X 8" X 3/4" NEOPRENE PAD 2 PER PANEL
3. 1/2" X 8" GALVANIZED STEEL ALIGNMENT PIN
4. 12" FILTER FABRIC
5. 3/4" BACKER ROD (OPTIONAL BY OTHERS)
6. HARD WOOD SHIMS (USE IF NECESSARY)
7. CONNECTION PIN - 1PER SOIL REINFORCING MAT
8. WELDED WIRE GRID SOIL REINFORCING MAT (AS REQUIRED)
9. WELDED WIRE GRID SOIL REINFORCING MAT (AS REQUIRED)

D TYPICAL MATERIAL ISOMETRIC

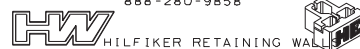


E TYPICAL MSE SECTION AT ABUTMENT

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
HILFIKER SQUARE PANEL

Names	Dates	Approved By				
Designed By		 State Structures Design Engineer				
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				Index No.		
				5021		

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**CONSTRUCTION NOTES FOR PLACEMENT OF TENSAR GEOGRIDS AND BACKFILL SOILS
FOR TENSAR PRECAST CONCRETE REINFORCED WALLS
TENSAR MSE RETAINING WALL SYSTEM**

1.0 MATERIALS

1.1 GEOGRID REINFORCING SHALL BE TENSAR BIAXIAL AND UNIAXIAL GEOGRIDS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.

1.2 BODKIN BARS SHALL BE 1/2" x 1/4" HDPE BARS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.

1.3 DRAINAGE MATERIALS

1.3.J GEOTEXTILE TG600 FABRIC SHALL BE MANUFACTURED BY EVERGREEN TECHNOLOGIES, INC., EVERGREEN, ALABAMA, OR EQUIVALENT AS APPROVED BY THE ENGINEER.

2.0 TECHNICAL REQUIREMENTS

2.1 FILL MATERIALS SHALL BE PLACED FROM THE BACK FACE OF THE WALL TOWARDS THE TAILS OF THE GEOGRID TO ENSURE FURTHER TENSIONING.

2.2 FILL SHALL BE COMPACTED AS SPECIFIED IN SECTION 548 OF THE PROJECT SPECIFICATIONS.

2.3 AN APPROVED SET OF CONSTRUCTION DRAWINGS AND CONTRACT SPECIFICATIONS SHALL BE ON-SITE AT ALL TIMES, DURING CONSTRUCTION OF THE TENSAR RETAINING WALL.

3.0 TENSAR GEOGRID PLACEMENT

3.1 TENSAR GEOGRID SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE SHOP DRAWINGS.

3.2 TENSAR GEOGRID LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS. REINFORCED FILL ZONE LENGTH IS MEASURED FROM THE BACK FACE OF THE CONCRETE PANEL, EXTENDING TO THE TAIL OF THE GEOGRIDS.

3.2.J TENSAR GEOGRID REINFORCEMENT SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTH(S). THE BODKIN CONNECTION SHALL NOT BE UTILIZED UNLESS PRE-APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.

3.2.2 IF PRE-APPROVED, TENSAR UNIAXIAL GEOGRIDS MAY BE SPLICED UTILIZING THE BODKIN CONNECTION DETAIL. NO MORE THAN ONE SPICE SHALL BE ALLOWED IN ANY ONE LENGTH OF REINFORCING.

3.3 PRIOR TO PLACING FILL, THE GEOGRID MATERIALS SHALL BE CONNECTED TO THE PANELS PER PANEL CONNECTION DETAIL (SEE TYPICAL DETAILS) AND PULLED TAUT AND ANCHORED TO REMOVE ANY SLACK IN THE GEOGRIDS.

3.4 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL THICKNESS OF SIX INCHES IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND/OR THE GEOGRID.

3.5 RUBBER-TIRED VEHICLES MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

3.6 TENSAR UNIAXIAL GEOGRID SHALL BE ROLLED OUT WITH THE LONG AXIS OF THE APERTURES (MACHINE DIRECTION) PERPENDICULAR TO THE WALL FACE. TENSAR BIAXIAL GEOGRIDS SHALL BE ROLLED OUT WITH THE MACHINE DIRECTION BAR PARALLEL TO THE WALL FACE.

4.0 CHANGES TO GEOGRID LAYOUT OR PLACEMENT

4.1 NO CHANGES TO THE TENSAR GEOGRID LAYOUT, INCLUDING, BUT NOT LIMITED TO, LENGTH, GEOGRID TYPE, OR ELEVATION, SHALL BE MADE WITHOUT THE EXPLICIT WRITTEN CONSENT OF TENSAR EARTH TECHNOLOGIES, INC.

5.0 DRAINAGE

5.1 AT THE END OF EACH WORK DAY, BACKFILL SURFACE SHALL BE GRADED AWAY FROM THE WALL FACE. A MINIMUM OF 2 PERCENT SLOPE AND A TEMPORARY SOIL BERM SHALL BE CONSTRUCTED NEAR THE WALL CREST TO PREVENT SURFACE WATER RUNOFF FROM OVERTOPPING THE WALL.

5.2 AT THE END OF EACH WORK DAY, BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH WHEEL ROLLER TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL.

5.3 THE TENSAR WALL HAS BEEN DESIGNED ON THE ASSUMPTION THAT THE REINFORCED FILL MATERIAL SHALL BE FREE OF SUBSURFACE DRAINAGE OF WATER (SEEPAGE).

5.4 THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATER RETENTION AS NEEDED DURING CONSTRUCTION.

6.0 DESIGN PARAMETERS

6.J SOIL PARAMETERS

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE, APPARENT COHESION AND UNIT WEIGHT SHALL BE PROVIDED IN THE SHOP DRAWINGS.

6.J.J DESIGN:

THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, THE TENSAR CORPORATION IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

6.2 FACTORS OF SAFETY:

6.2.J INTERNAL STABILITY:
 MAXIMUM GEOGRID DESIGN STRENGTH = 0.19 ULT
 MINIMUM FACTOR OF SAFETY FOR GEOGRID PULLOUT = 1.5
 MINIMUM FACTOR OF SAFETY FOR SLIDING AT LOWEST GEOGRID = 1.5
 SOIL-GEOGRID INTERACTION COEFFICIENT = 0.8
 PERCENT COVERAGE OF GEOGRID:
 (ONE ROLL WIDTHS) = 89%
 (ONE-HALF ROLL WIDTH) = 44%

6.2.2 EXTERNAL STABILITY:

MINIMUM FACTOR OF SAFETY FOR SLIDING AT BASE = 1.5
 MINIMUM FACTOR OF SAFETY FOR OVERTURNING = 2.0
 MINIMUM FACTOR OF SAFETY FOR BEARING = 2.5

(EXTERNAL STABILITY, INCLUDING SLIDING, OVERTURNING, AND BEARING CAPACITY, IS THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR EXTERNAL STABILITY. (SEE NOTES 7.6 & 7.7))

6.2.3 GLOBAL STABILITY:

MINIMUM FACTOR OF SAFETY FOR GLOBAL STABILITY = 1.5

GLOBAL STABILITY IS THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR GLOBAL STABILITY. (SEE NOTES 7.6 & 7.7)

6.3 SURCHARGE LOADING = 250 psf

6.4 HYDROSTATIC DESIGN = NONE

6.5 SEISMIC DESIGN = NONE

6.6 GEOGRID LONG TERM ALLOWABLE DESIGN STRENGTH (LTADS): GEOGRID LTADS SHALL BE 19 PERCENT OF ULTIMATE GEOGRID STRENGTH AS DETERMINED IN ACCORDANCE WITH GEOSYNTHETIC RESEARCH INSTITUTE, (GRI), TEST METHOD GGI-87, SINGLE RIB TEST.

7.0 SPECIAL PROVISIONS

7.1 WALL ELEVATION VIEWS AND LOCATIONS AND GEOMETRY OF EXISTING STRUCTURES MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

7.2 TENSAR EARTH TECHNOLOGIES, INC. ASSUMES NO LIABILITY FOR INTERPRETATION OR VERIFICATION OF SUBSURFACE CONDITIONS, SUITABILITY OF SOIL DESIGN PARAMETERS AND INTERPRETATION OF SUBSURFACE GROUNDWATER CONDITIONS.

7.3 THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND VERIFYING THAT THE ACTUAL SITE CONDITIONS ARE AS DESCRIBED IN SECTION 6.0 PRIOR TO AND DURING CONSTRUCTION. THE ENGINEER SHALL BE ON-SITE TO ASSURE THE PROVISIONS IN THE CONSTRUCTION NOTES ARE FOLLOWED.

7.4 THE SOIL DESIGN PARAMETERS STATED IN SECTION 6.0 SHALL BE VERIFIED BY THE CONSTRUCTOR. WRITTEN VERIFICATION OF DESIGN PARAMETERS SHALL BE SUBMITTED TO TENSAR EARTH TECHNOLOGIES, INC. PRIOR TO COMMENCING WITH CONSTRUCTION.

7.5 ANY REVISIONS TO DESIGN PARAMETERS STATED IN SECTION 6.0 OR STRUCTURE GEOMETRY SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION

7.6 PER THE MSE RETAINING WALL GENERAL NOTES, TENSAR EARTH TECHNOLOGIES, INC HAS CONSIDER INTERNAL STABILITY OF THE RETAINING WALLS ONLY. EXTERNAL AND GLOBAL STABILITY OF THE WALL IS THE RESPONSIBILITY OF OTHERS.

7.7 DIFFERENTIAL SETTLEMENT AND ITS EFFECTS ON THE TENSAR RETAINING WALL SYSTEM SHALL BE THE RESPONSIBILITY OF OTHERS.

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA. 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

THIS DRAWING, DESIGN NOTES AND ASSOCIATED CALCULATIONS HAVE BEEN PREPARED BY TENSAR EARTH TECHNOLOGIES, INC. FOR PRELIMINARY DESIGN PURPOSES AND SHALL NOT BE USED FOR FINAL DESIGN OR CONSTRUCTION.

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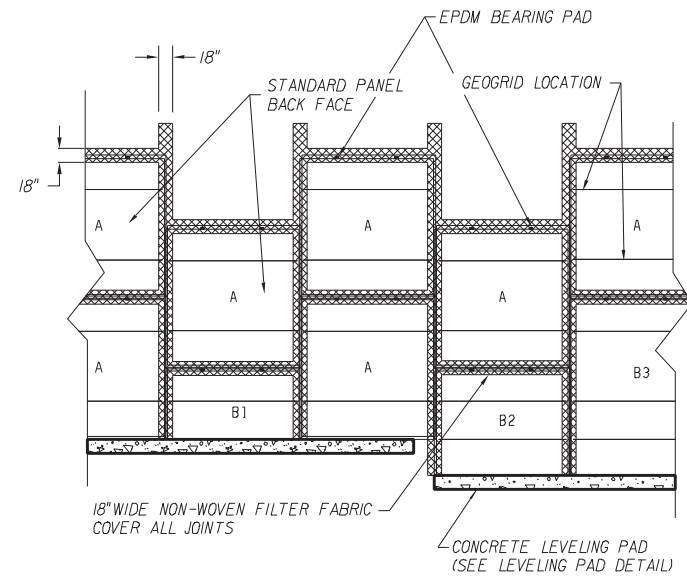
TENSAR
EARTH TECHNOLOGIES, INC.
5775-B Glenridge Drive
Lakeside Center Suite 450
Atlanta, GA 30328
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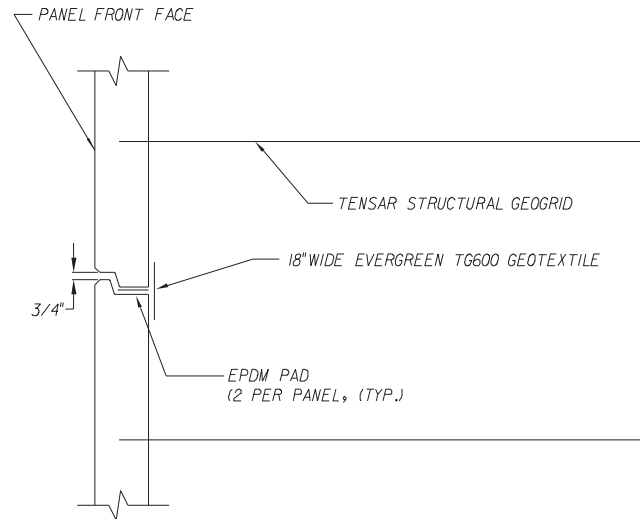
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS AS NOTED IN THESE PLANS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	1 of 17	5025

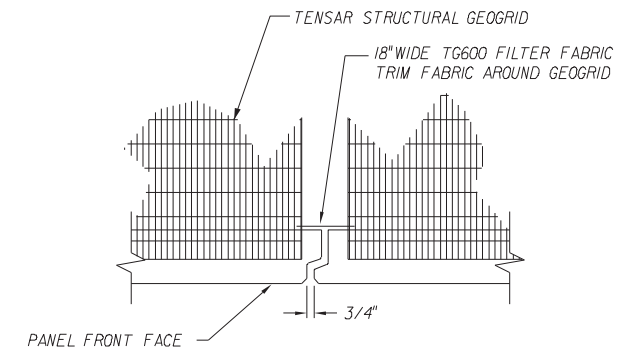
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\$\$\$\$\$SYTIME\$\$\$\$\$



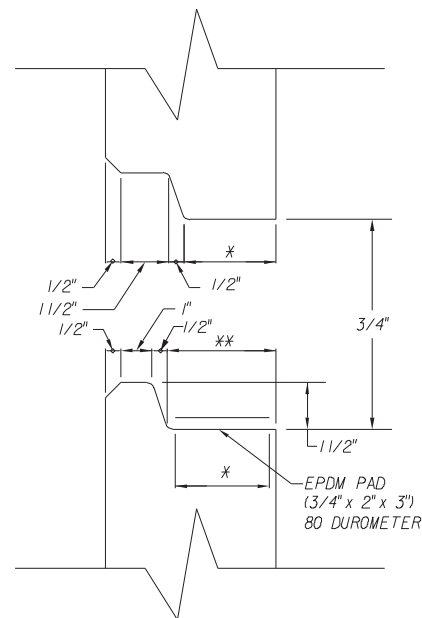
TYPICAL FILTER FABRIC COVERAGE DETAIL
NOT TO SCALE



HORIZONTAL JOINT DETAIL
NOT TO SCALE



VERTICAL JOINT DETAIL



PANEL JOINT DETAIL
NOT TO SCALE

- * - 3" FOR MODERATELY & SLIGHTLY AGGRESSIVE ENVIRONMENT
- 4 1/2" FOR EXTREMELY AGGRESSIVE ENVIRONMENT
- ** - 3 1/2" FOR MODERATELY & SLIGHTLY AGGRESSIVE ENVIRONMENT
- 4 3/4" FOR EXTREMELY AGGRESSIVE ENVIRONMENT

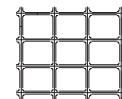
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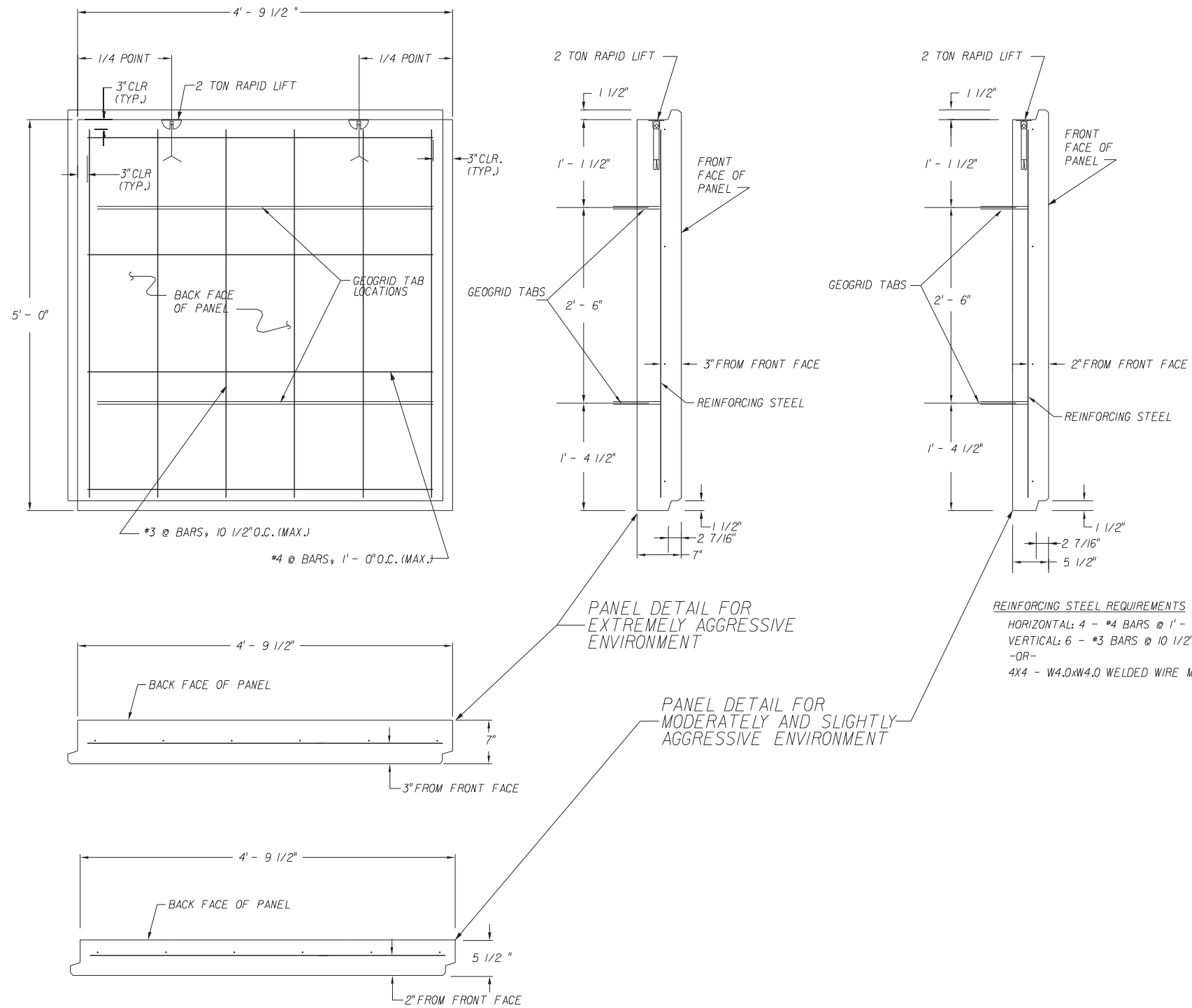
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
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Designed By		State Structures Design Engineer		
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\$\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$\$
\$\$\$\$\$\$SYTIME\$\$\$\$\$\$



REINFORCING STEEL REQUIREMENTS
 HORIZONTAL: 4 - #4 BARS @ 1' - 6" O.C. (MAX.)
 VERTICAL: 6 - #3 BARS @ 10 1/2" O.C. (MAX.)
 -OR-
 4X4 - W4.0xW4.0 WELDED WIRE MESH

PANEL DETAIL FOR
 EXTREMELY AGGRESSIVE
 ENVIRONMENT

PANEL DETAIL FOR
 MODERATELY AND SLIGHTLY
 AGGRESSIVE ENVIRONMENT

TYPICAL PANEL DETAILS - STANDARD A PANEL

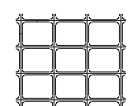
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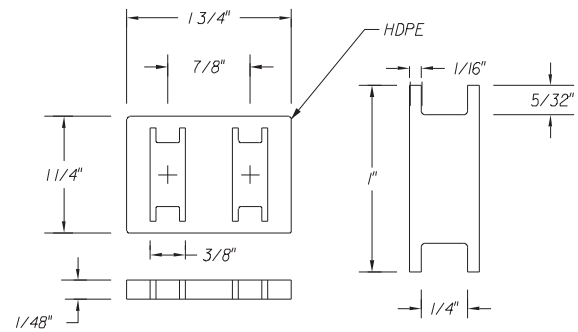
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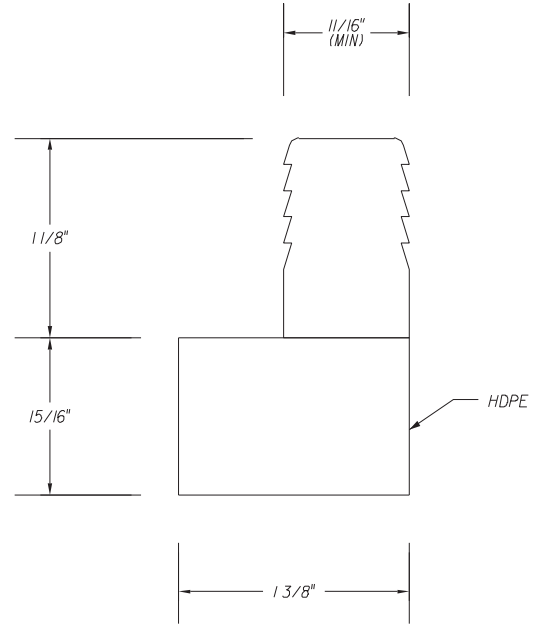


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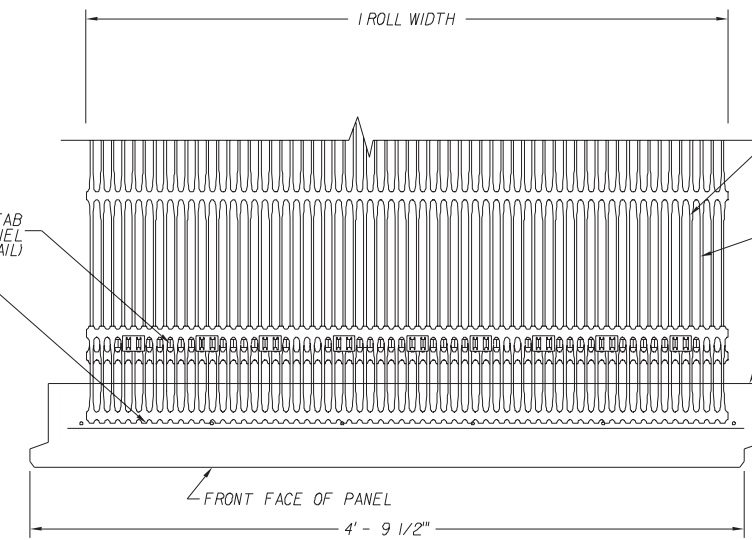
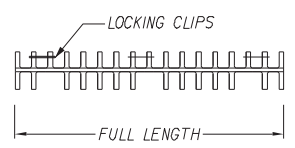
\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
 \$\$\$\$\$SYTIME\$\$\$\$\$



LOCKING CLIP
NOT TO SCALE



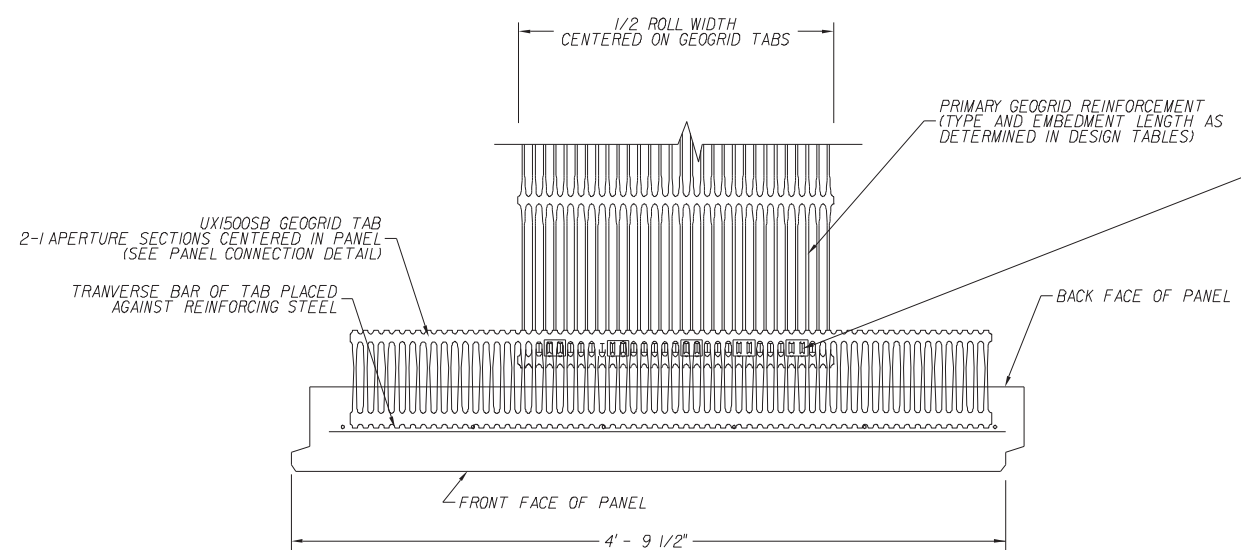
MESA HIGH PERFORMANCE CONNECTOR
NOT TO SCALE



CONNECTION DETAIL PLAN VIEW (89% COVERAGE)
MAXIMUM COVERAGE
NOT TO SCALE

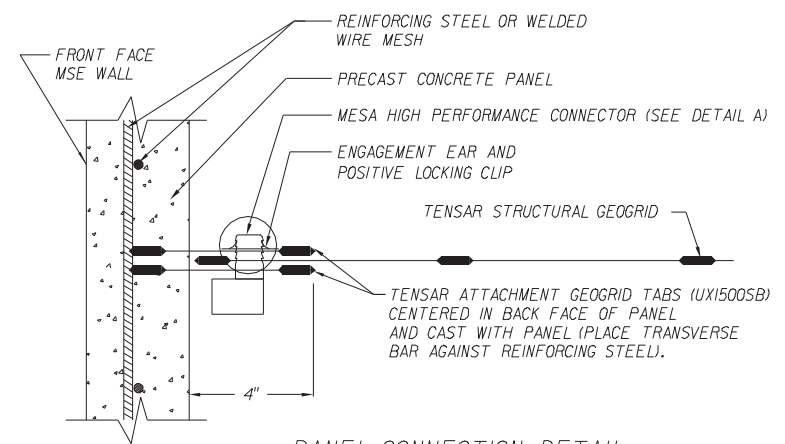
PRIMARY GEOGRID REINFORCEMENT
(TYPE AND EMBEDMENT LENGTH AS
DETERMINED IN DESIGN TABLES)

3 MESA HIGH PERFORMANCE CONNECTORS
PER ROLL WIDTH EVENLY DISTRIBUTED
WITH A MAXIMUM OF 3 APERTURES
BETWEEN CONNECTORS. PLACE
3 LOCKING CLIPS PER CONNECTOR.

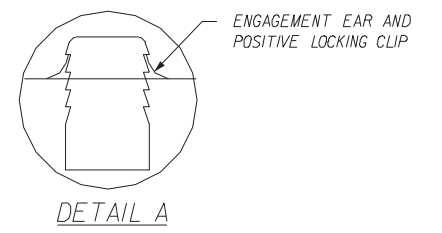


CONNECTION DETAIL PLAN VIEW (44% COVERAGE)
NOT TO SCALE

1 FULL LENGTH MESA HIGH PERFORMANCE
CONNECTOR AND ONE 1/2 LENGTH (8 TEETH MIN.)
MESA HIGH PERFORMANCE CONNECTOR PER
1/2 ROLL WIDTH EVENLY DISTRIBUTED WITH A
MAXIMUM OF 3 APERTURES BETWEEN CONNECTORS.
PLACE 2 LOCKING CLIPS PER 1/2 LENGTH
CONNECTOR AND 3 LOCKING CLIPS PER
FULL CONNECTOR.



PANEL CONNECTION DETAIL
NOT TO SCALE



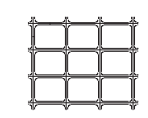
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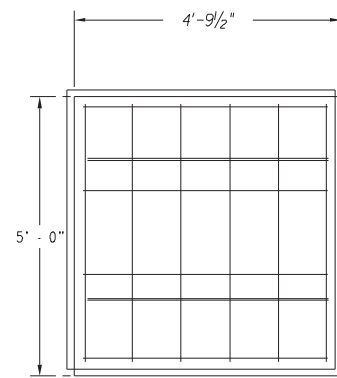
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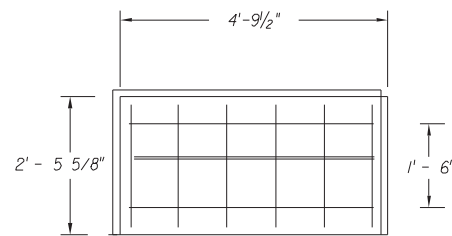


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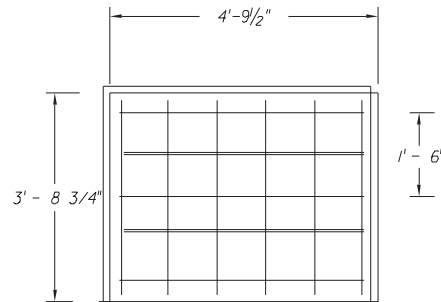
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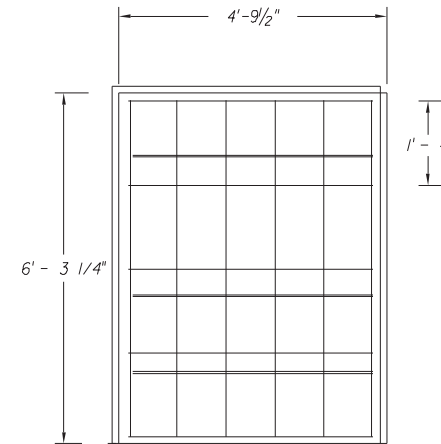
STANDARD A PANEL



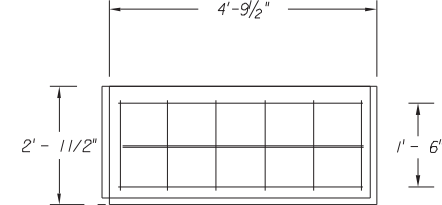
STANDARD B1 PANEL



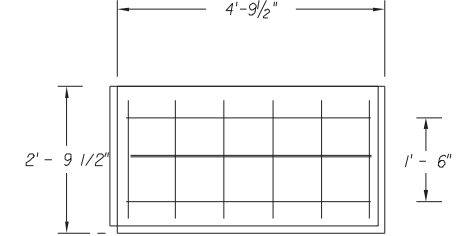
STANDARD B2 PANEL



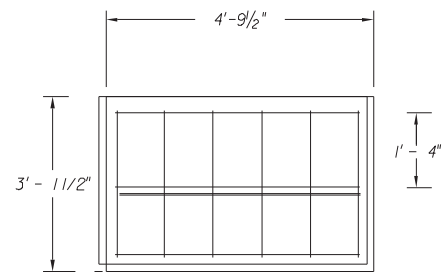
STANDARD B3 PANEL



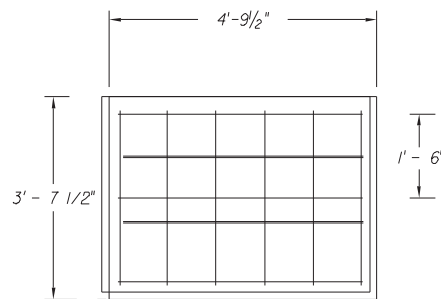
STANDARD T24 PANEL



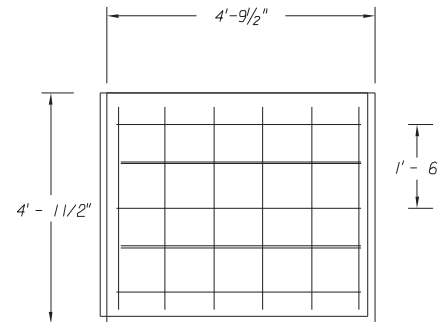
STANDARD T30 PANEL



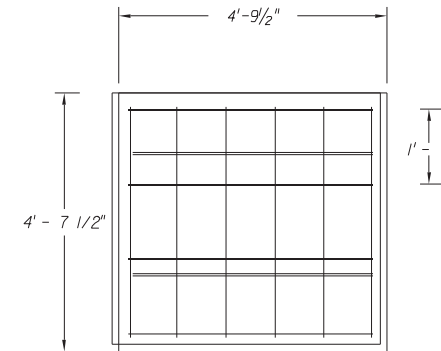
STANDARD T36 PANEL



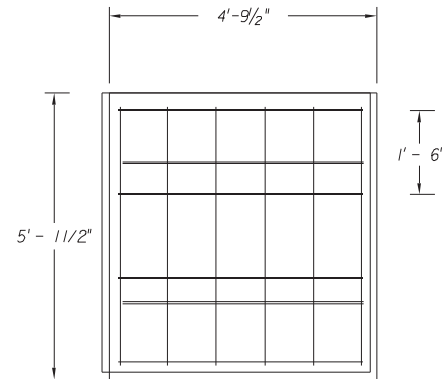
STANDARD T42 PANEL



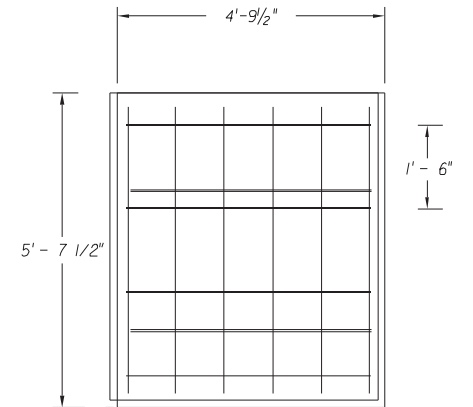
STANDARD T48 PANEL



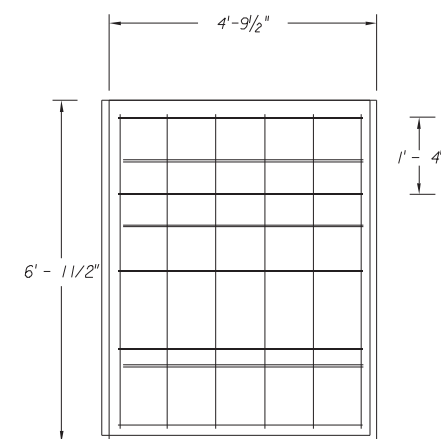
STANDARD T54 PANEL



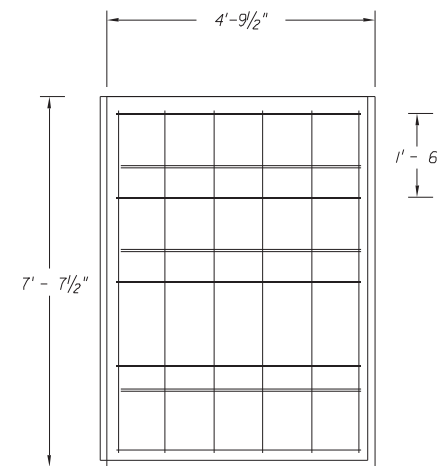
STANDARD T60 PANEL



STANDARD T66 PANEL



STANDARD T72 PANEL

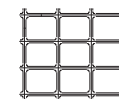


STANDARD T78 PANEL

ALL PANELS ARE SHOWN BACK FACE VIEW

STANDARD STEEL LAYOUT
 REINFORCING STEEL REQUIREMENTS
 HORIZONTAL: #4 BARS (60 KSI) @ 1' - 6" O.C. (MAX.)
 VERTICAL: #3 BARS (60 KSI) @ 10 1/2" O.C. (MAX.)
 OR
 STANDARD WWF LAYOUT
 REINFORCING STEEL REQUIREMENTS
 4X4-W4.0XW4.0 WELDED WIRE MESH
 FABRICATION PER ASTM A-185

— GEOGRID TAB LOCATIONS



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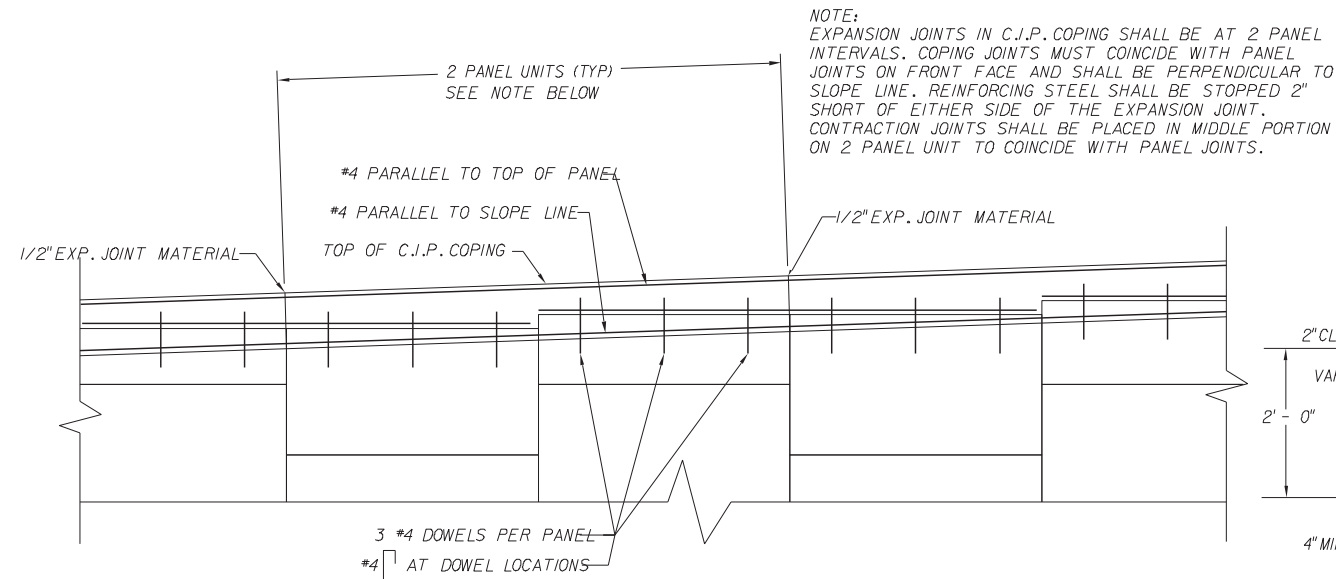
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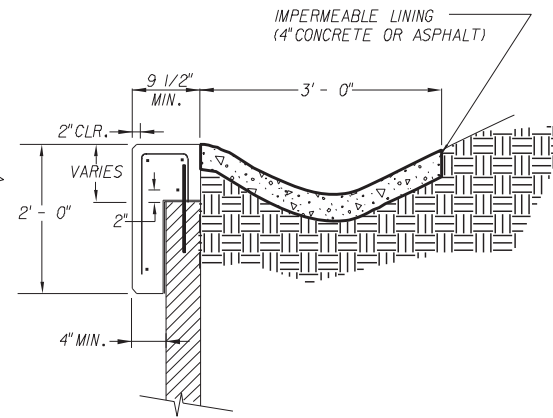
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
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Names	Dates	Approved By <i>W. V. [Signature]</i>		
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 \$\$\$\$\$SYTIME\$\$\$\$\$

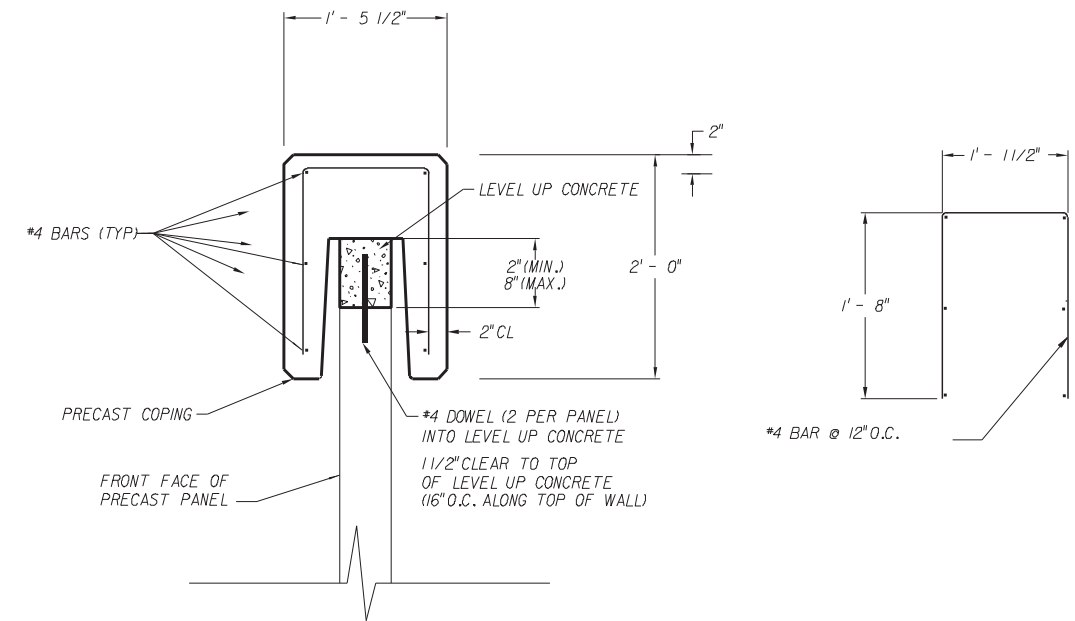


C.I.P. COPING PARTIAL ELEVATION VIEW
NOT TO SCALE

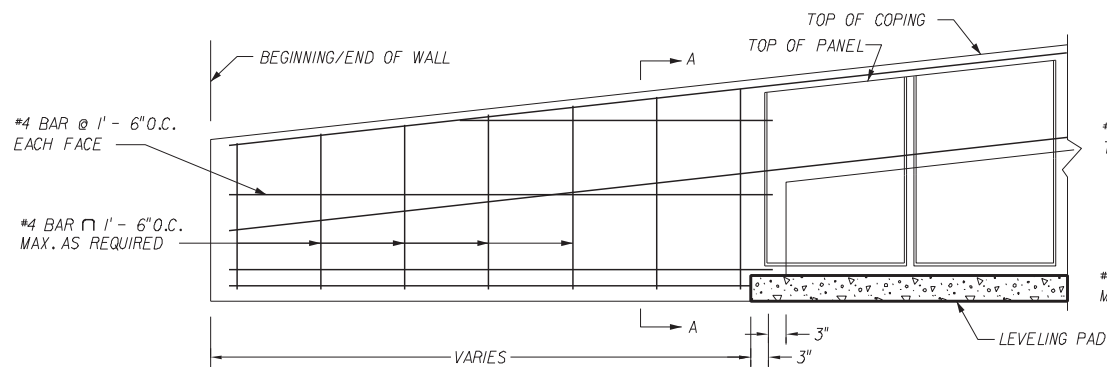
NOTE:
EXPANSION JOINTS IN C.I.P. COPING SHALL BE AT 2 PANEL INTERVALS. COPING JOINTS MUST COINCIDE WITH PANEL JOINTS ON FRONT FACE AND SHALL BE PERPENDICULAR TO SLOPE LINE. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE EXPANSION JOINT. CONTRACTION JOINTS SHALL BE PLACED IN MIDDLE PORTION ON 2 PANEL UNIT TO COINCIDE WITH PANEL JOINTS.



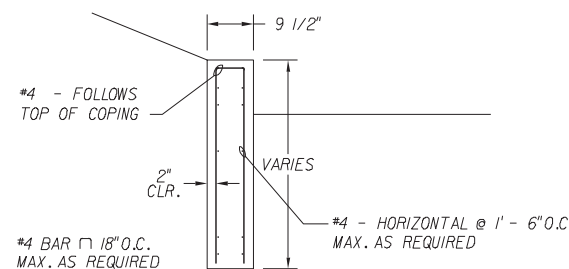
C.I.P. COPING WITH SWALE
NOT TO SCALE



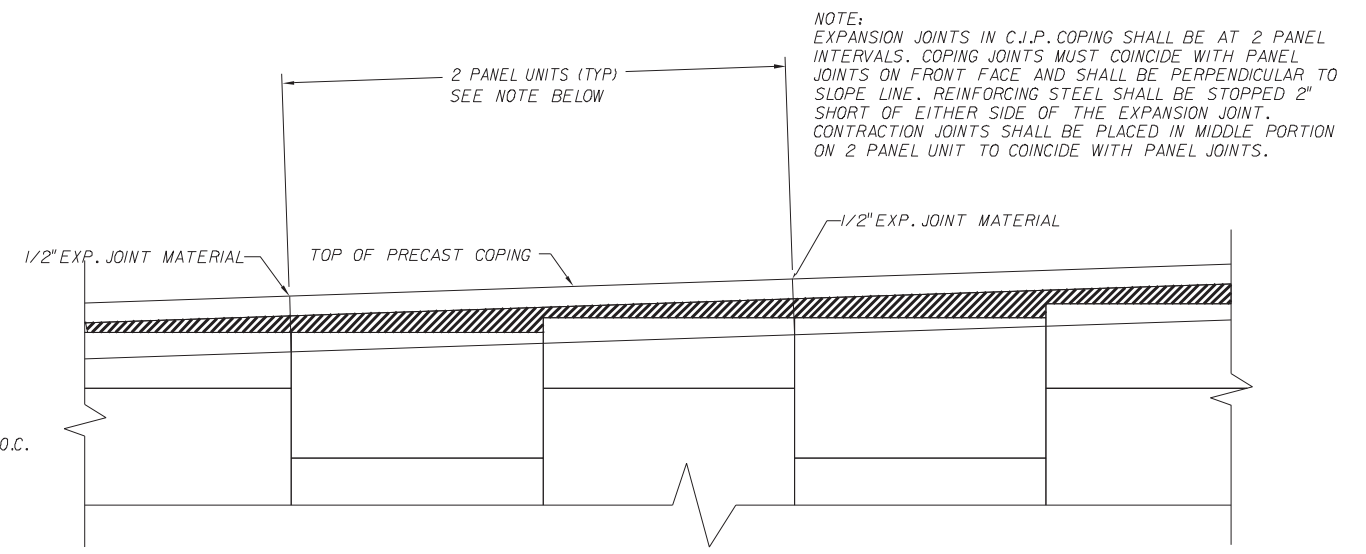
PRECAST COPING SECTION
NOT TO SCALE



COPING ENCLOSURE DETAIL
NOT TO SCALE



SECTION A-A



PRECAST COPING PARTIAL ELEVATION VIEW
NOT TO SCALE

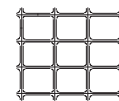
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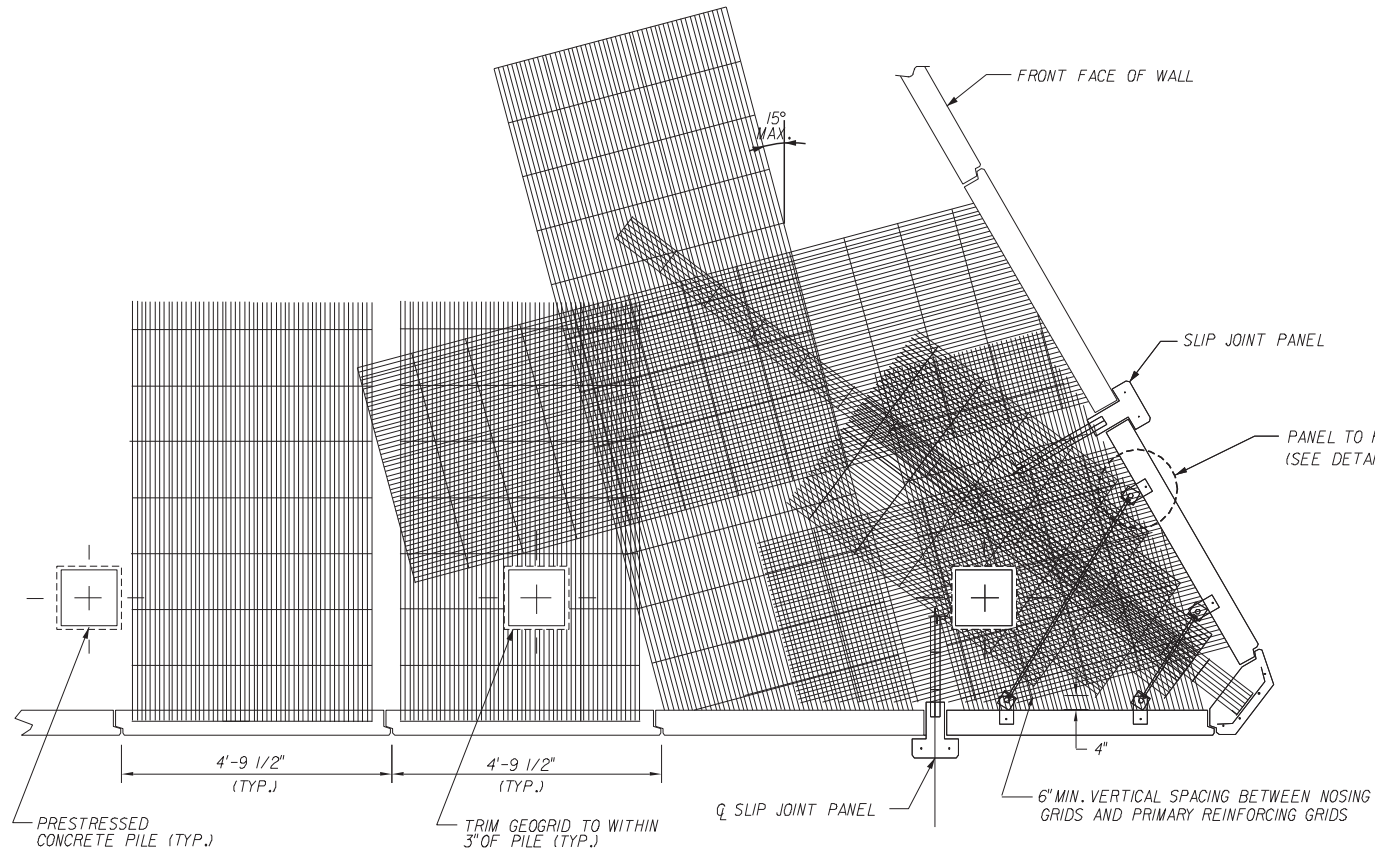
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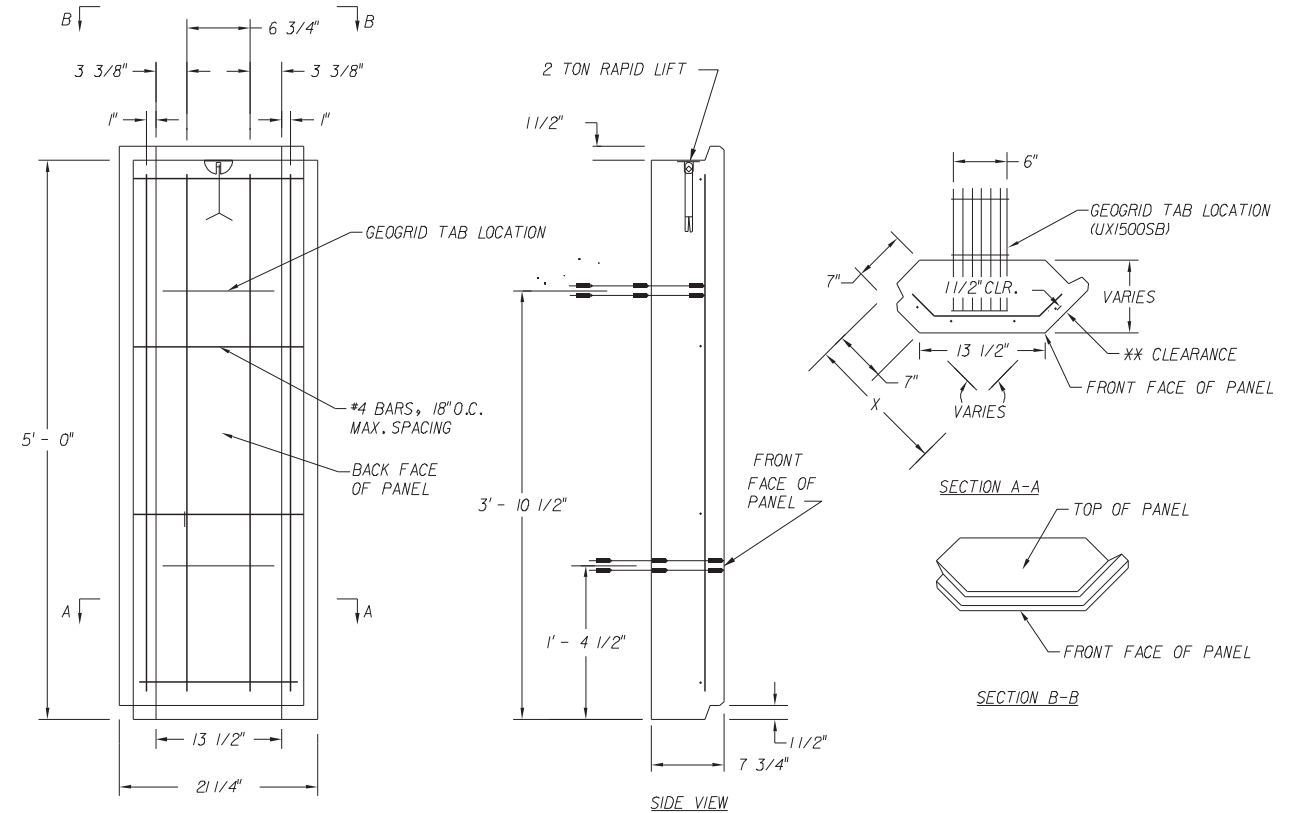


LESS THAN 75° ACUTE CORNER - SKEWED GEOGRID UNDER PILE CAP
(SEE DETAIL BELOW FOR BIN REINFORCEMENT)

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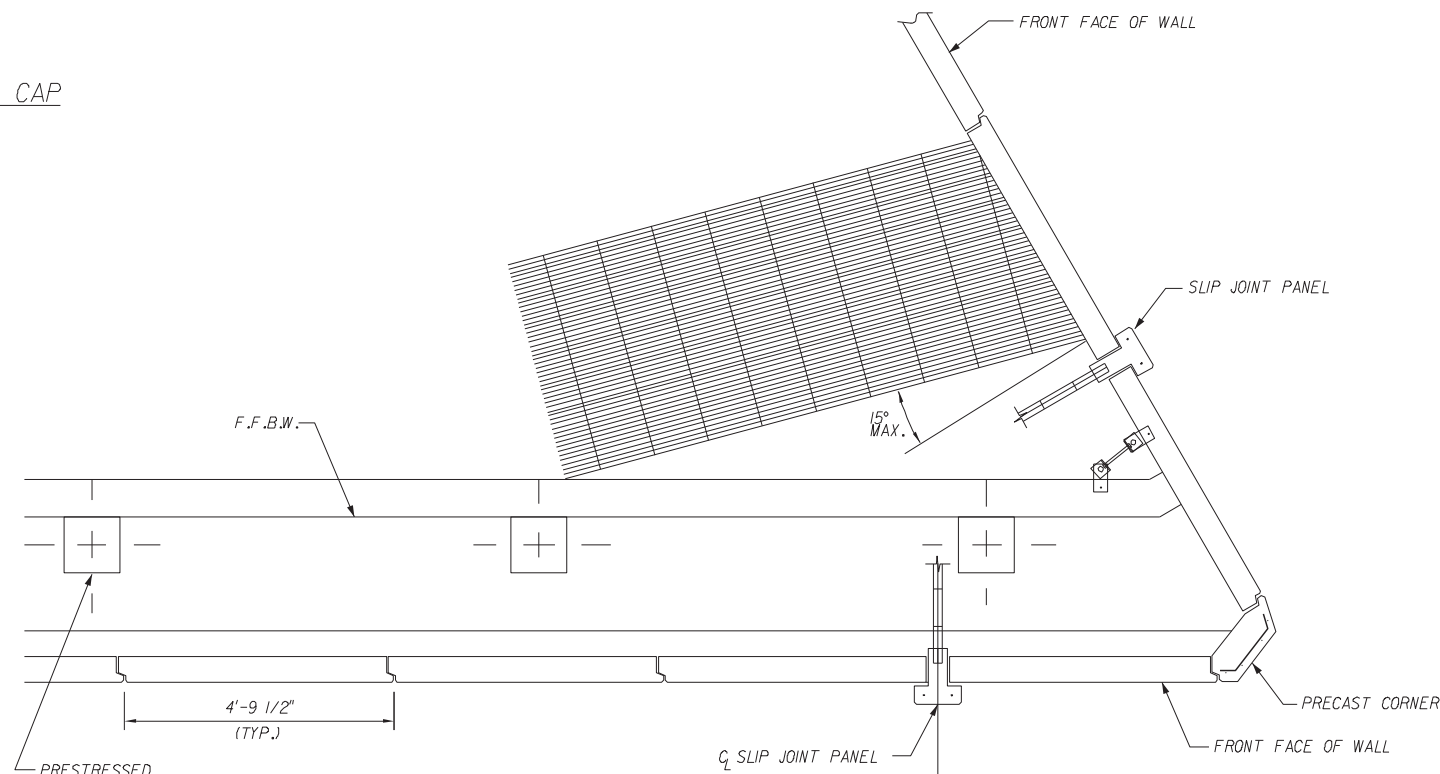
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ACUTE CORNER ELEMENT DETAIL

* SEE SHEET 3 OF 17 FOR PANEL THICKNESS
** VARIES
3" FOR MARINE ENVIRONMENTS
2" FOR MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS



EXAMPLE ACUTE CORNER - SKEWED GEOGRID AT ABUTMENT LEVEL

NOT TO SCALE

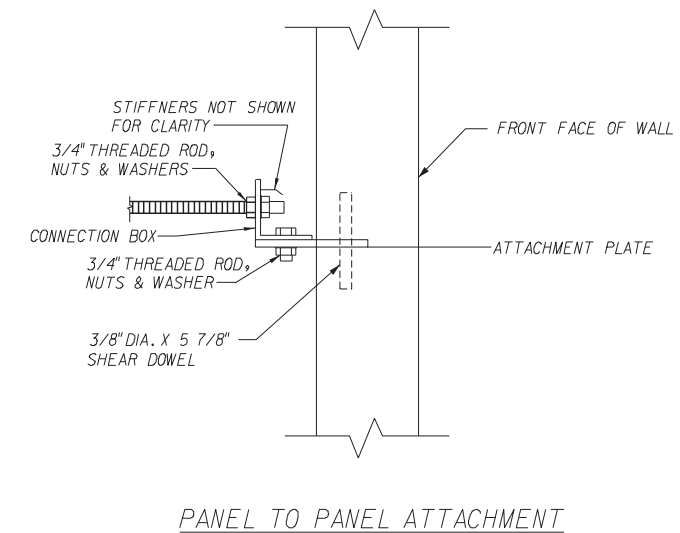
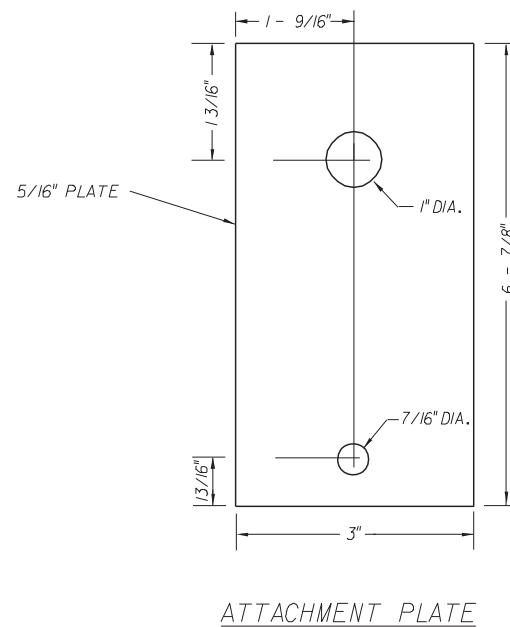
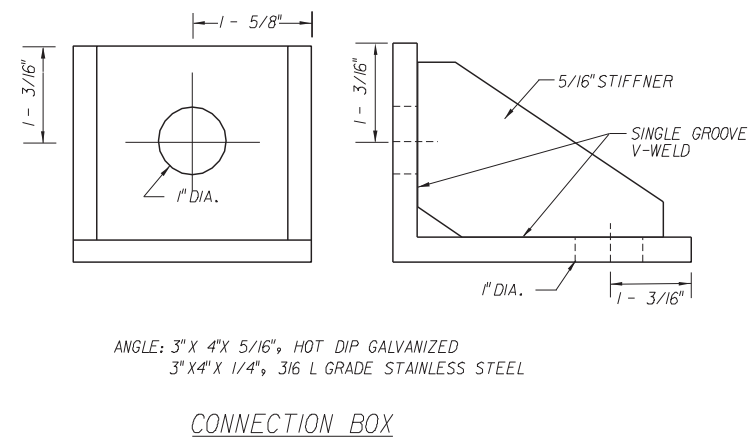
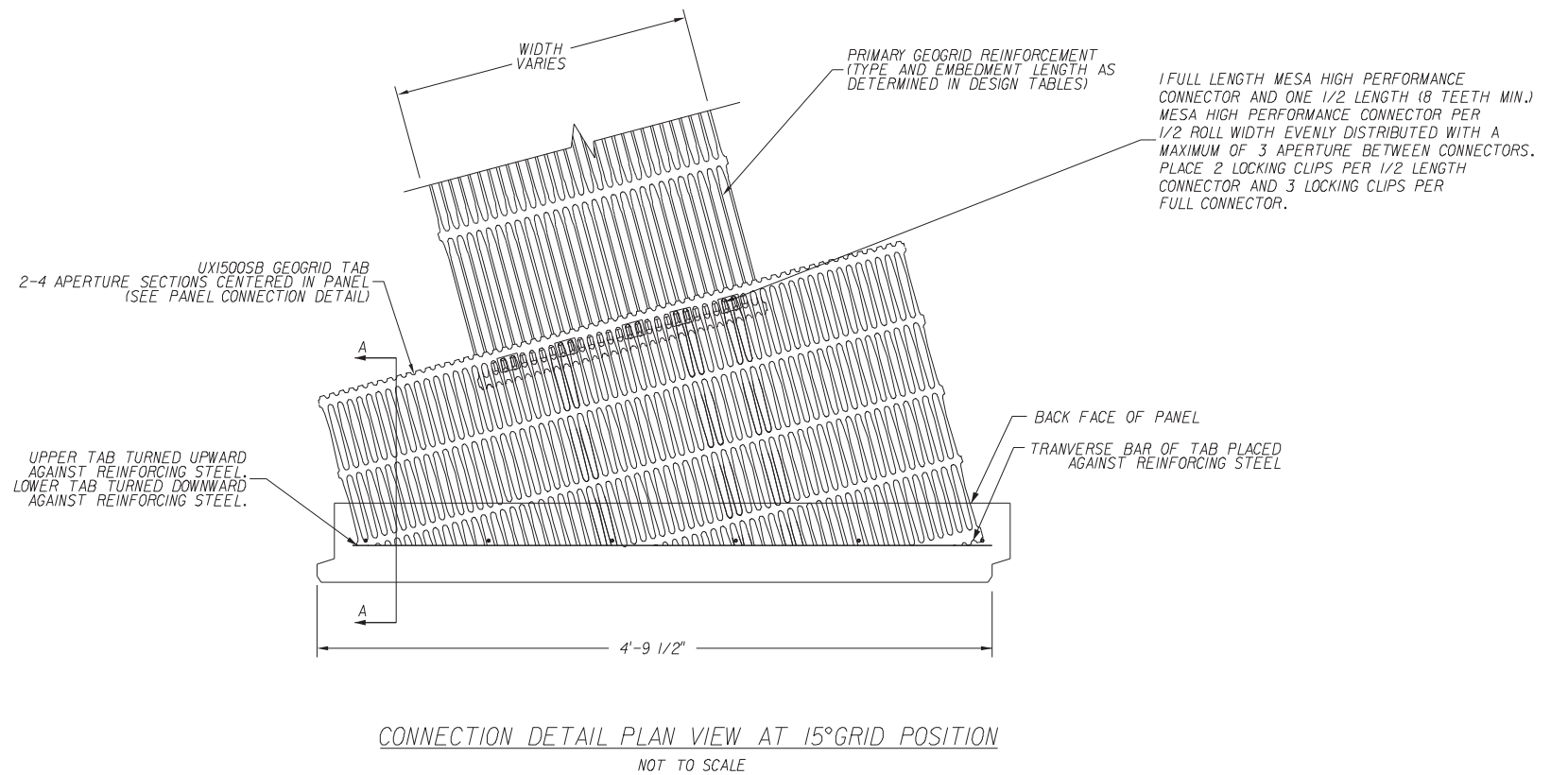
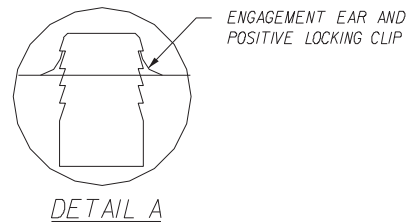
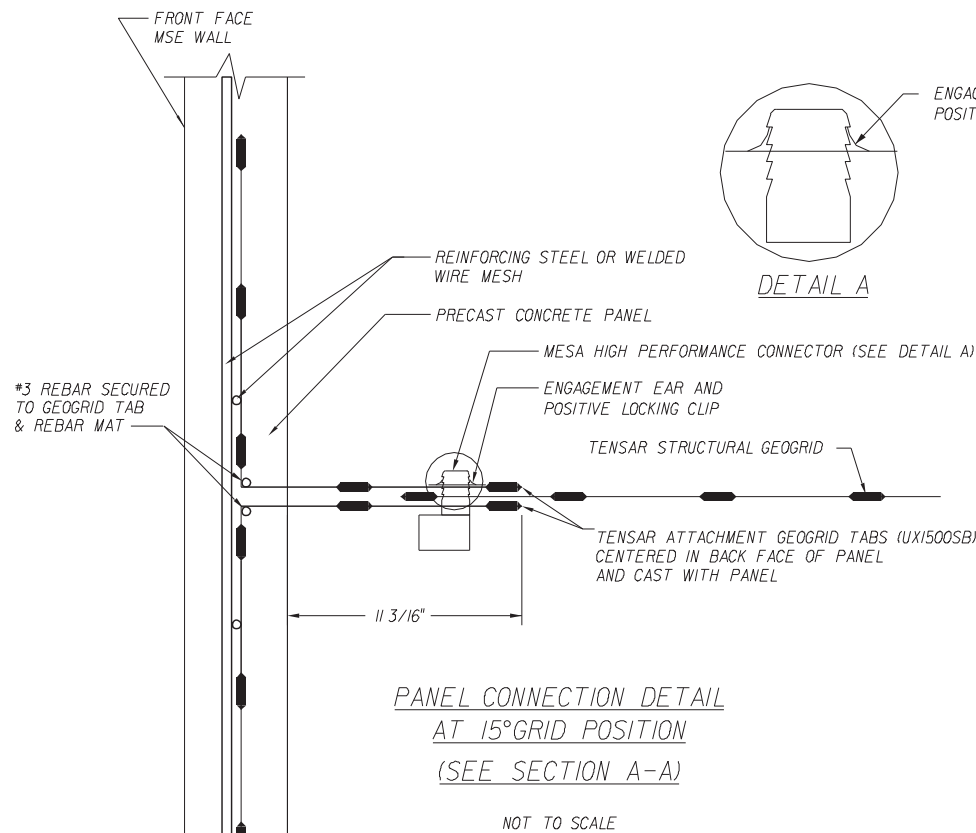
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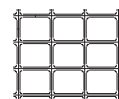
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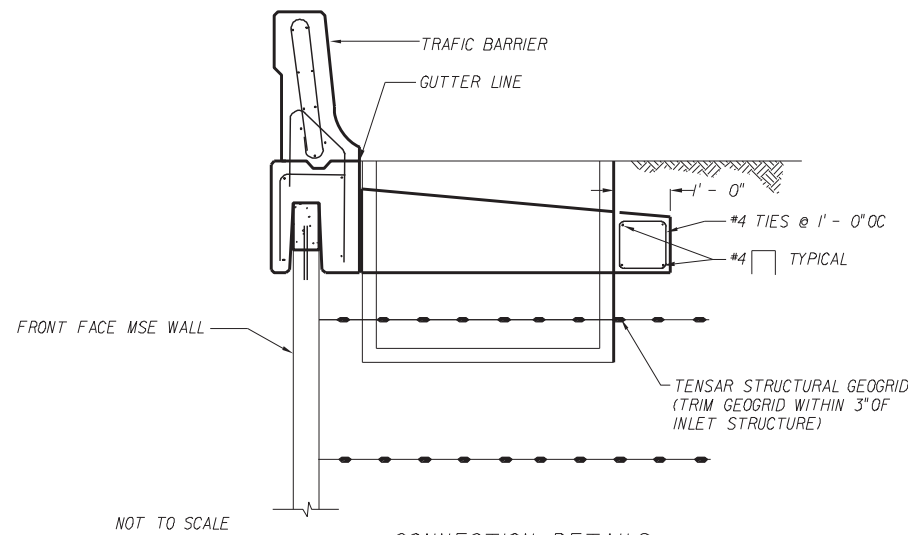
TENSAR EARTH TECHNOLOGIES, INC.
5775-B Glenridge Drive
Lakeside Center Suite 450
Atlanta, GA 30328
(404) 250-1290



- NOTES:
1. ALL PARTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION FOR MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS.
 2. ALL PARTS SHALL BE FABRICATED FROM 316 L GRADE STAINLESS STEEL FOR USE IN A SALT WATER

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	8 of 17	5025

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$

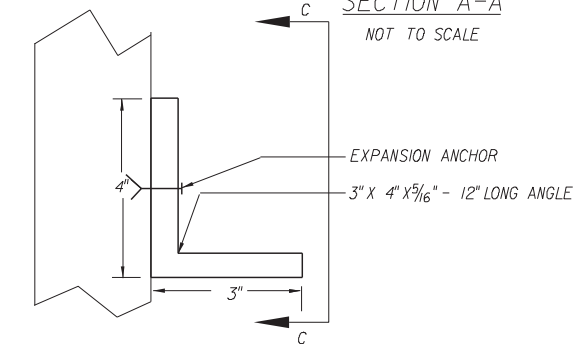


NOT TO SCALE

CONNECTION DETAILS

SECTION A-A

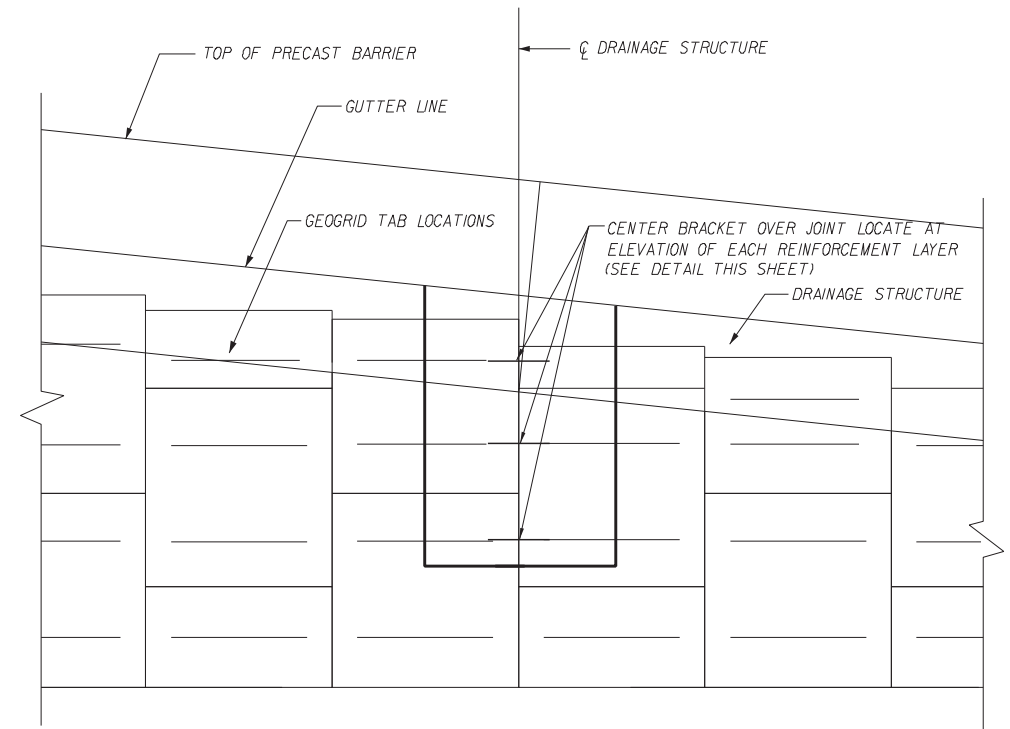
NOT TO SCALE



DETAIL OF TENSAR PANELS @ INLETS

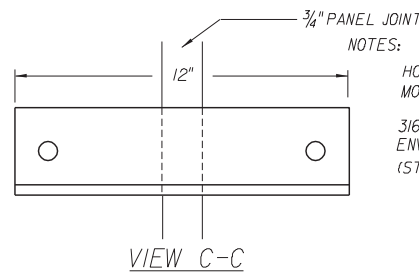
SECTION B-B

NOT TO SCALE



PARTIAL ELEVATION - WALL @ DRAINAGE INLET

NOT TO SCALE



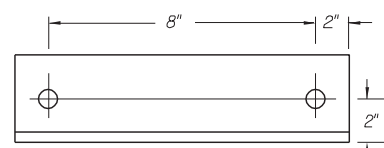
3/4" PANEL JOINT

NOTES:

HOT DIP GALVANIZED ANGLE FOR SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENT

316 L GRADE STAINLESS STEEL FOR EXTREMELY AGGRESSIVE ENVIRONMENT ANGLE HILTI HSLG RM 10/20 EXPANSION ANCHOR (STAINLESS) (OR APPROVED EQUAL)

VIEW C-C

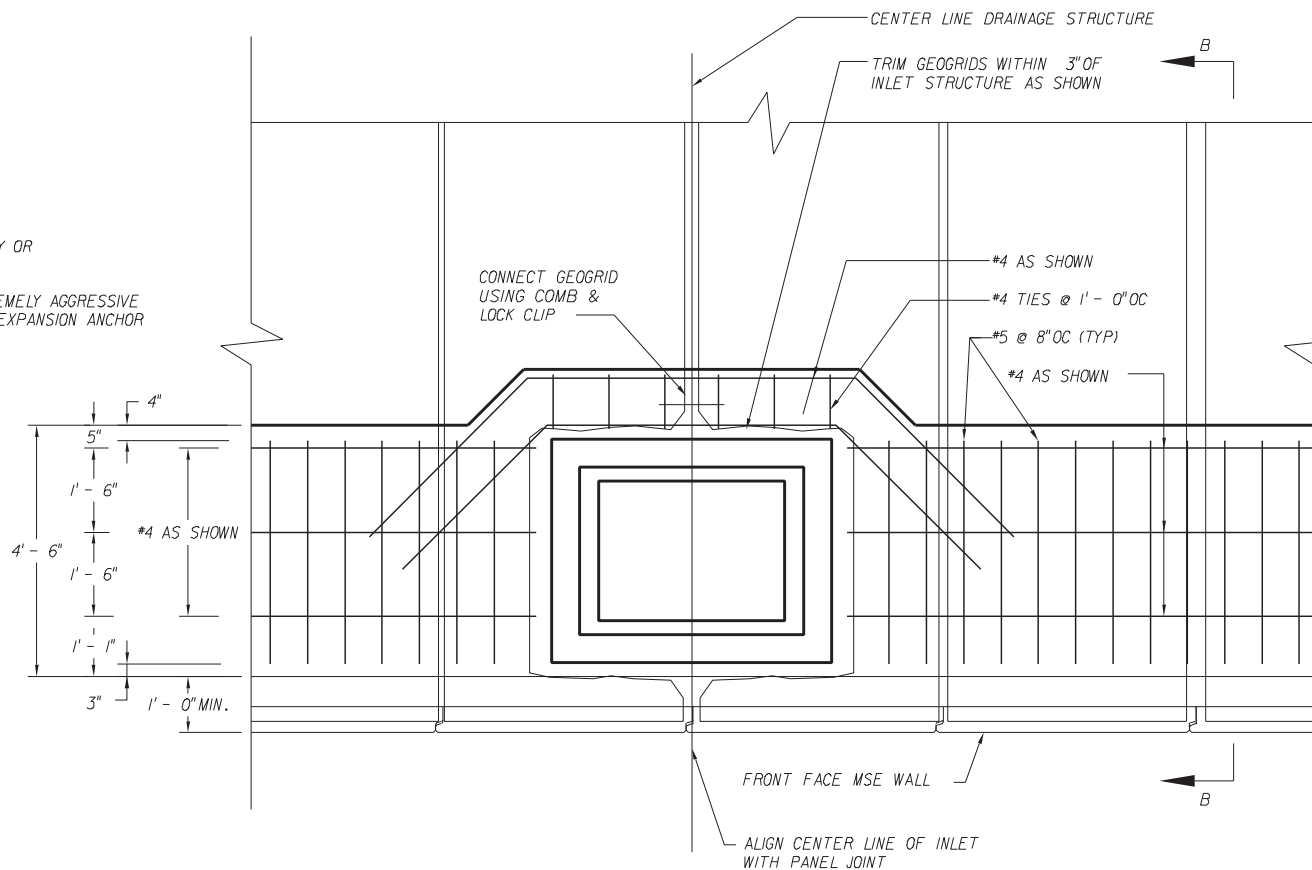


CENTER BRACKET OVER JOINT DETAIL

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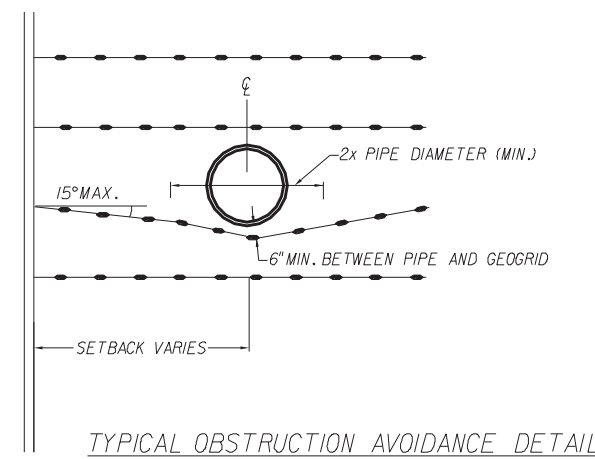
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PARTIAL PLAN - WALL @ DRAINAGE INLET

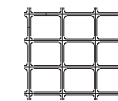
NOT TO SCALE



TYPICAL OBSTRUCTION AVOIDANCE DETAIL

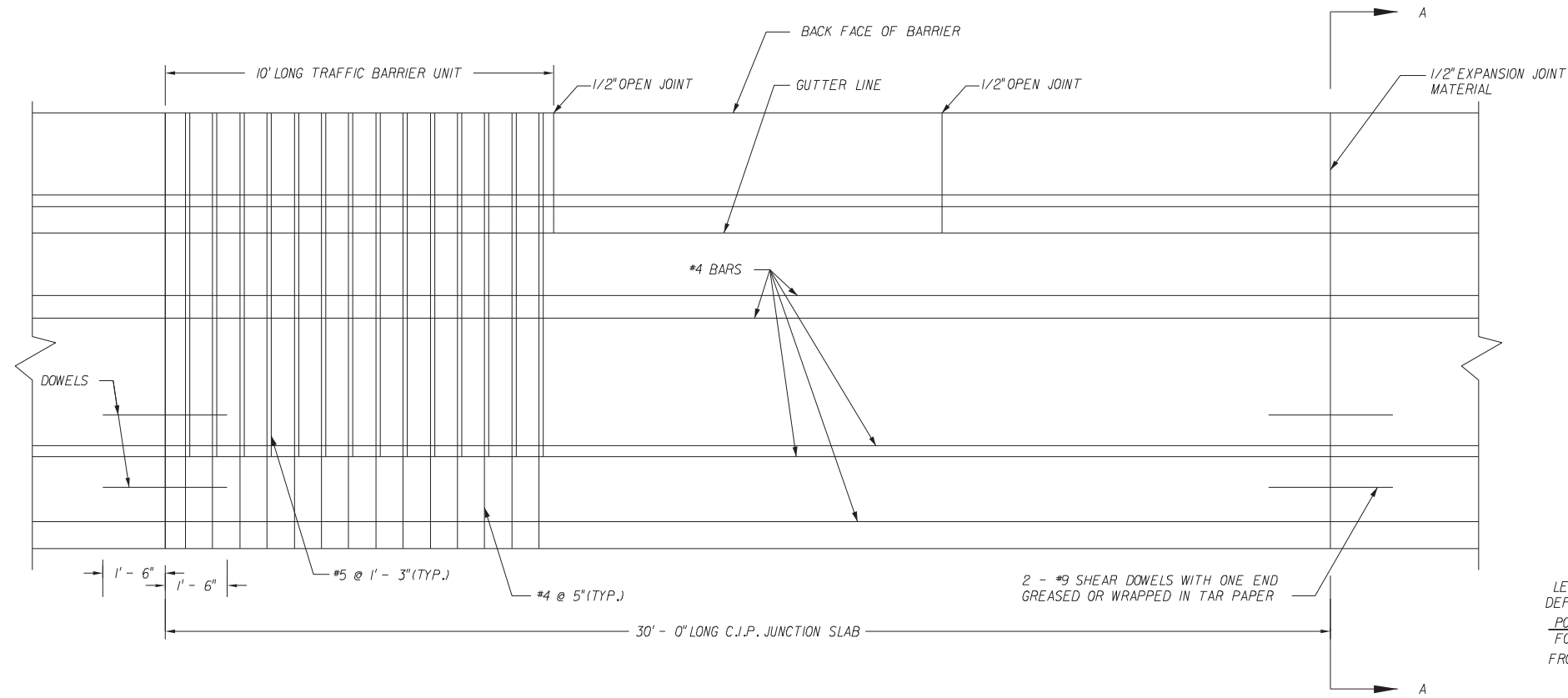
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

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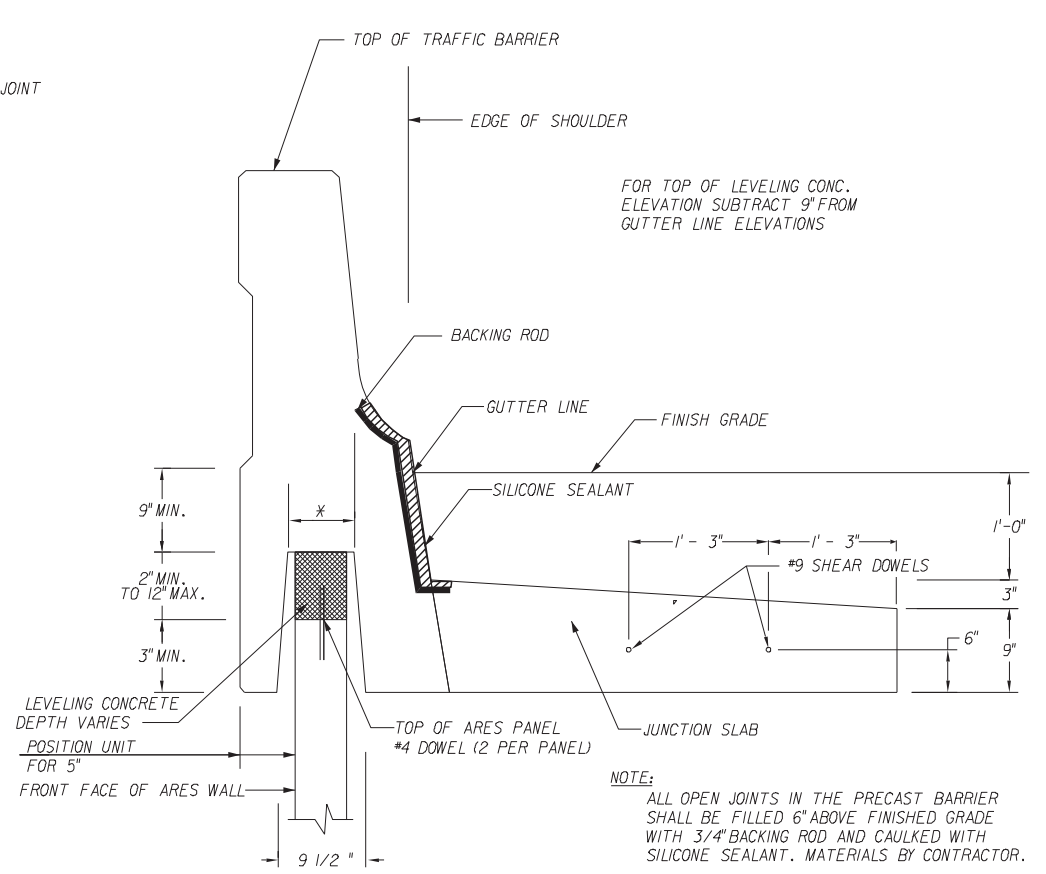


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	9 of 17	5025

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



PLAN VIEW
 PRECAST TRAFFIC BARRIER
 NOT TO SCALE

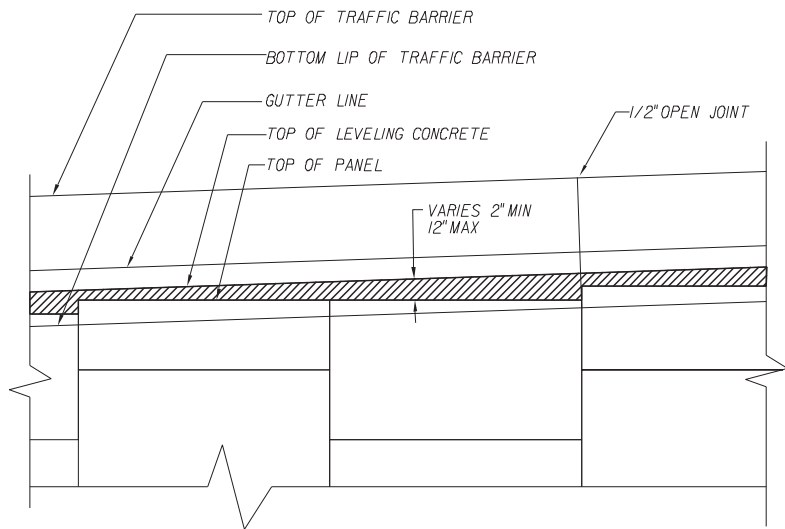


SECTION A-A AT APPROACH SLAB
 NOT TO SCALE

FOR TOP OF LEVELING CONC.
 ELEVATION SUBTRACT 9\"/>

NOTE:
 ALL OPEN JOINTS IN THE PRECAST BARRIER SHALL BE FILLED 6\"/>

* 7 7/8\"/>



PRECAST TRAFFIC BARRIER PARTIAL ELEVATION VIEW
 NOT TO SCALE

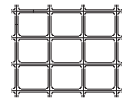
THIS SYSTEM WALL MAY BE USED IN ALL ENVIRONMENTS.

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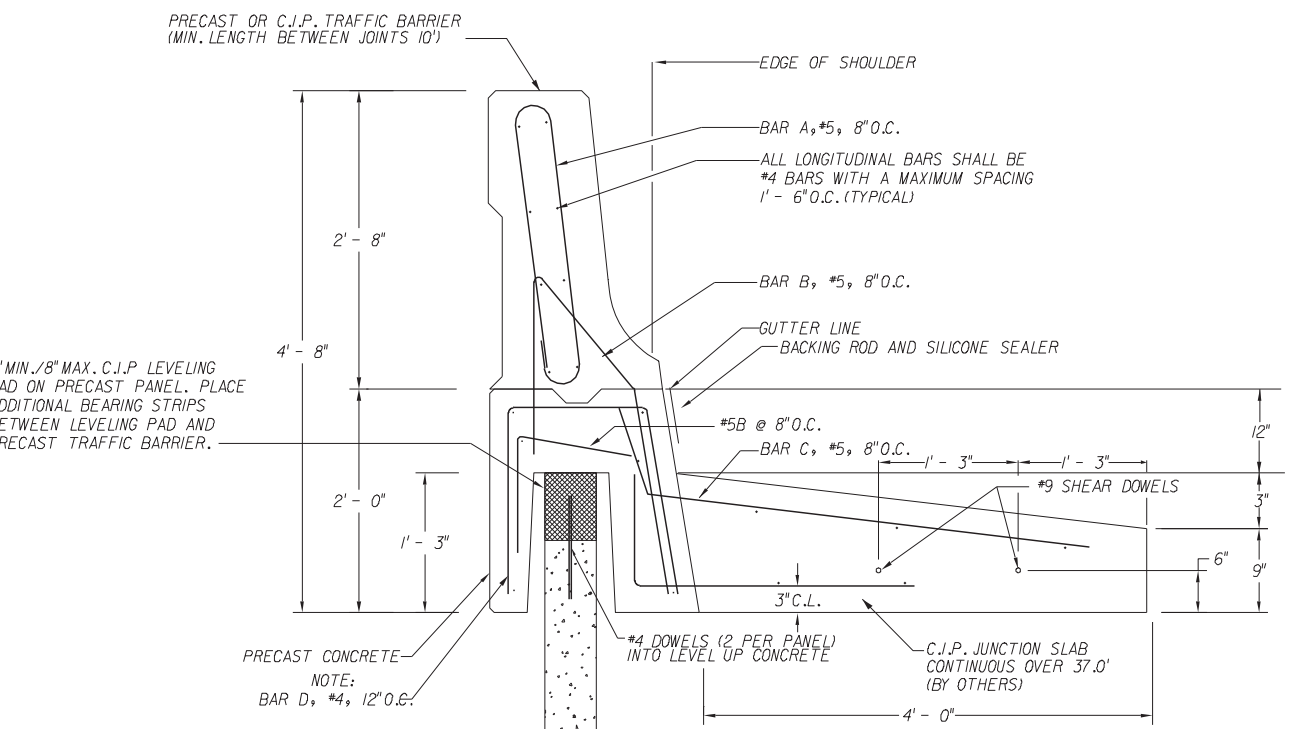
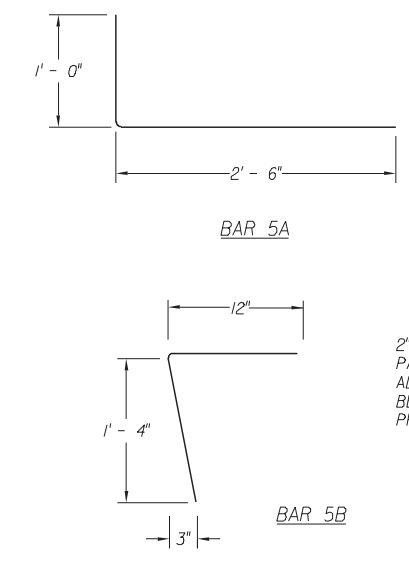
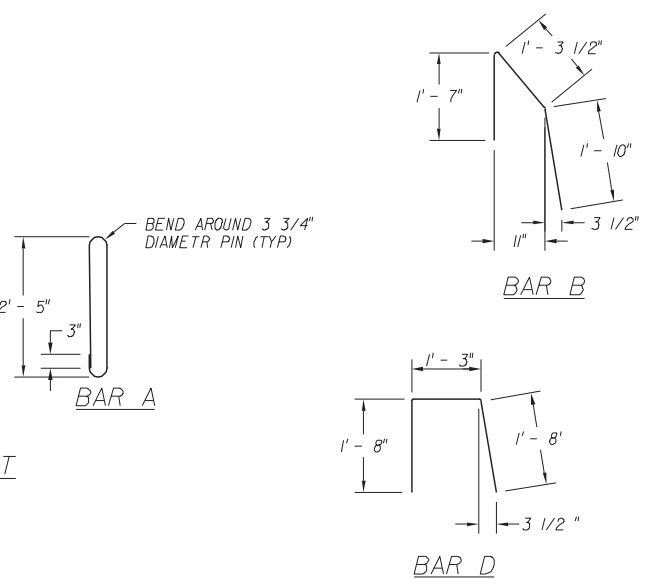
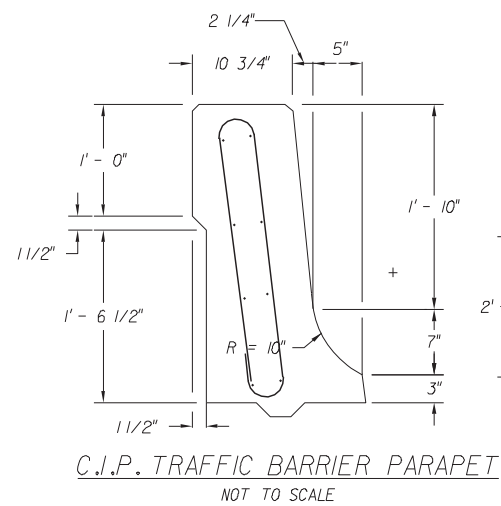
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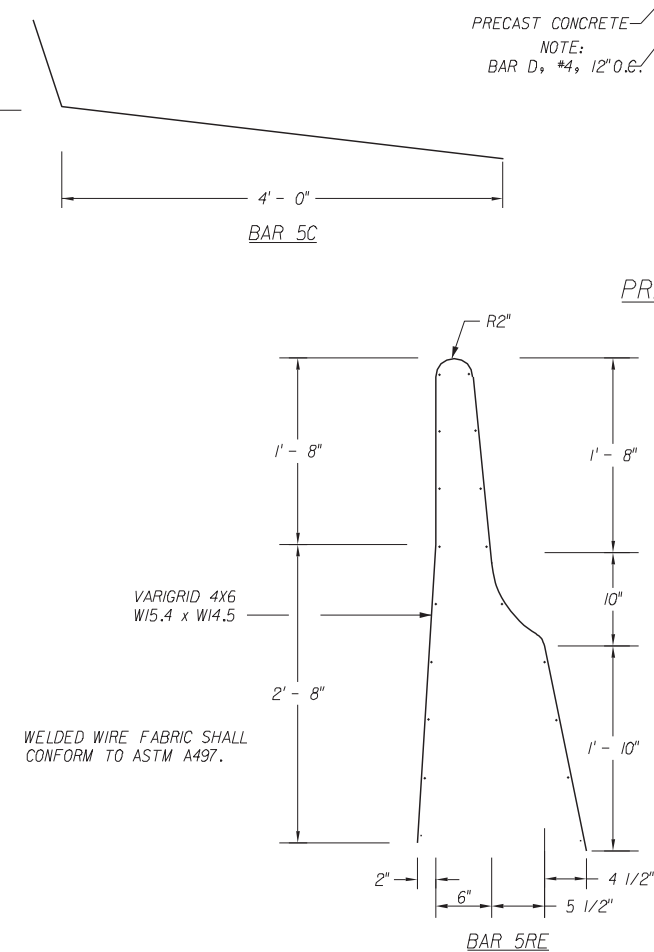
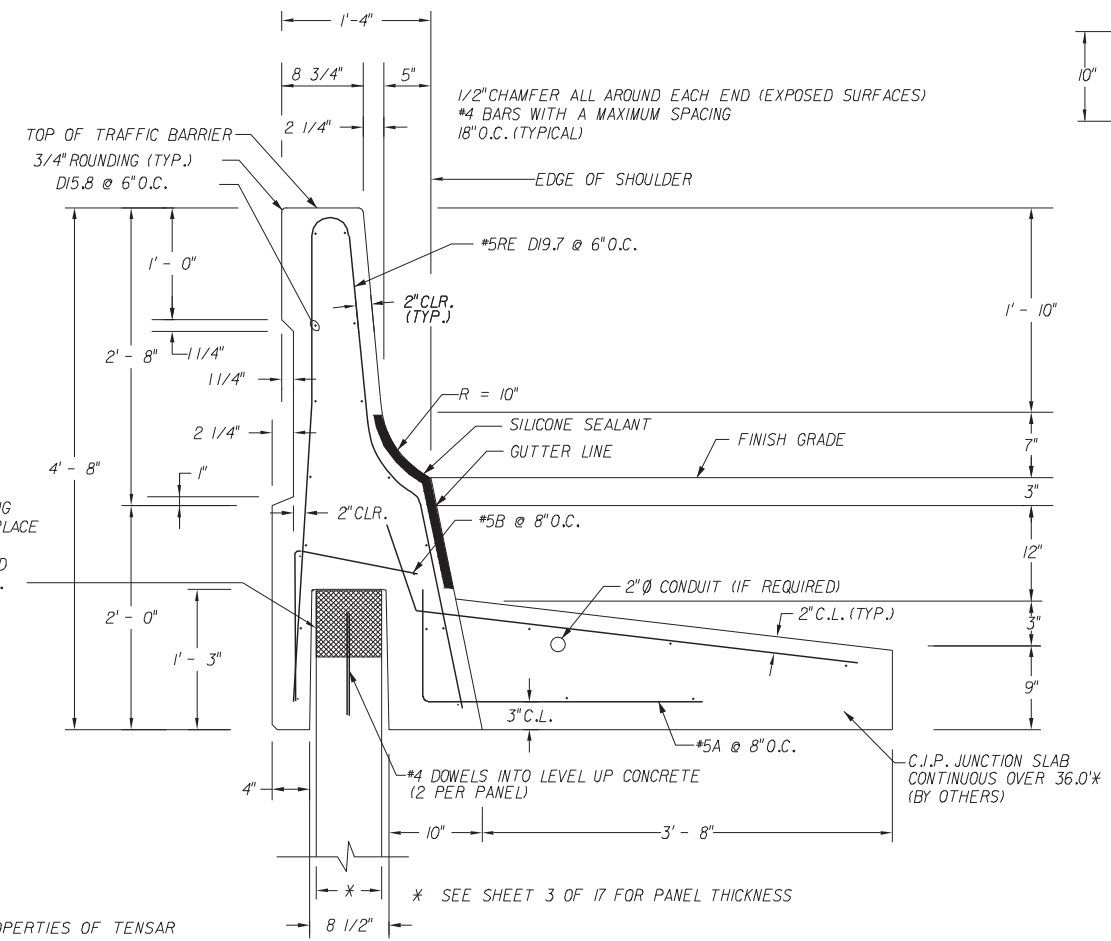
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	10 of 17	5025

\$\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$\$
 \$\$\$SYTIME\$\$\$



NOTES:
 A. ALL OPEN JOINTS IN PRECAST BARRIER SHALL BE FILLED 6\"/>

PRECAST BARRIER - STANDARD REBAR REINFORCEMENT
 NOT TO SCALE



WELDED WIRE FABRIC SHALL CONFORM TO ASTM A497.

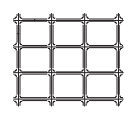
PRECAST BARRIER - VARIGRID REINFORCEMENT
 NOT TO SCALE

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MARK	QUANTITY	REMARKS
5A	8	3'-6" LONG
5B	15	6'-6" LONG
A	VARIGARD	W14.5 @ 6" O.C.
B	VARIGARD	W15.4 @ 4" O.C.

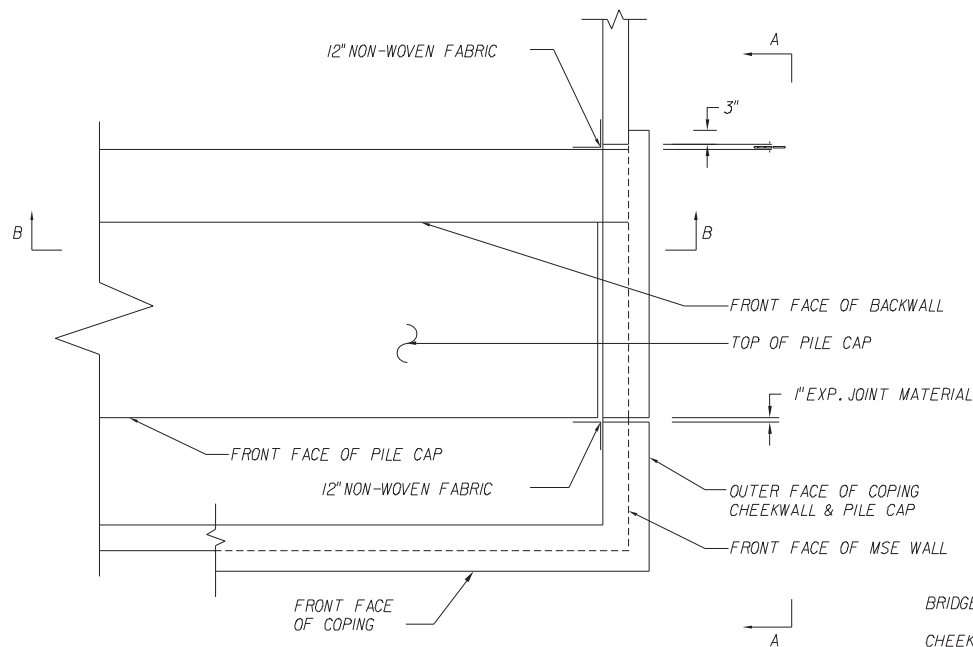
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

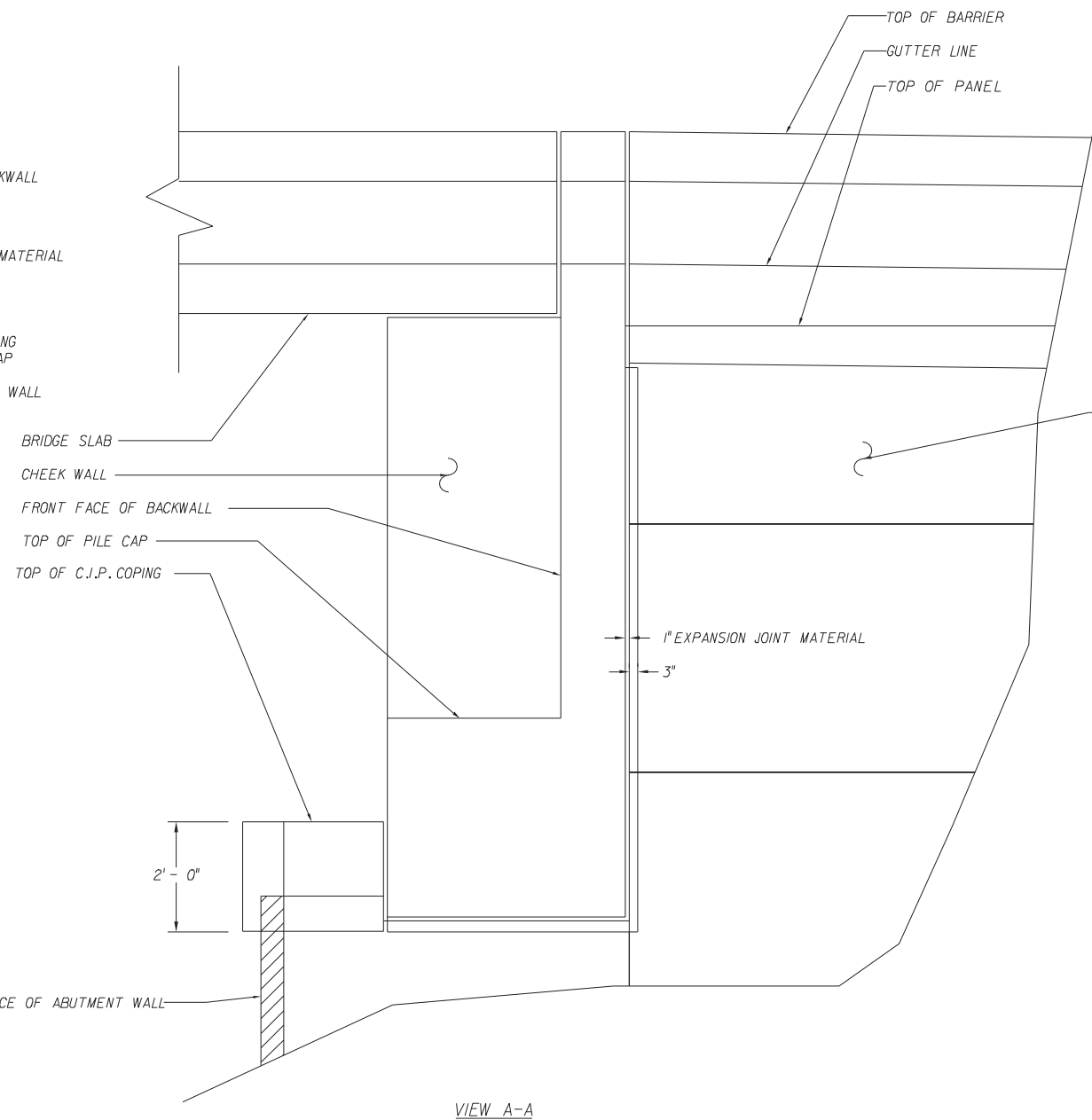
**RETAINING WALL SYSTEM
 TENSAR EARTH TECHNOLOGIES
 MSE RETAINING WALL**

Names	Dates	Approved By	State Structures Design Engineer	
Designed By			Revision	Sheet No.
Drawn By	JMS 8/14/98		00	11 of 17
Checked By				5025

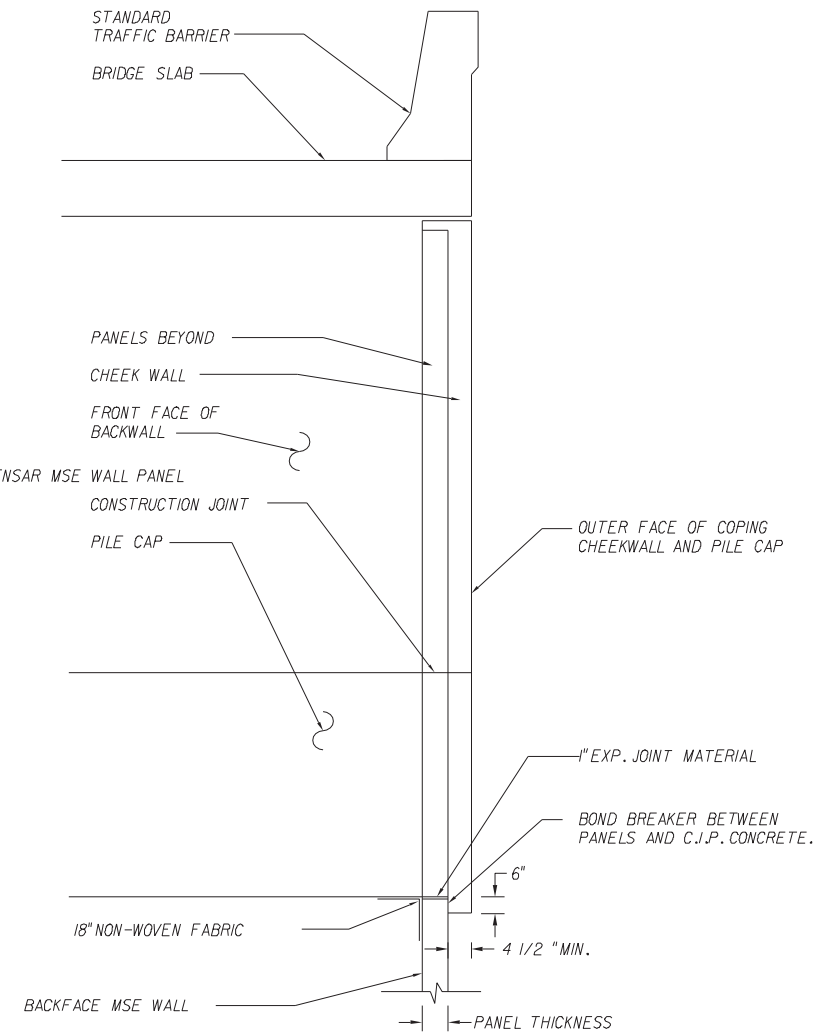
\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
 \$\$\$SYTIME\$\$\$



PLAN VIEW @ ENDBENT
NOT TO SCALE



VIEW A-A



SECTION B-B

SECTIONS @ ENDBENT
NOT TO SCALE

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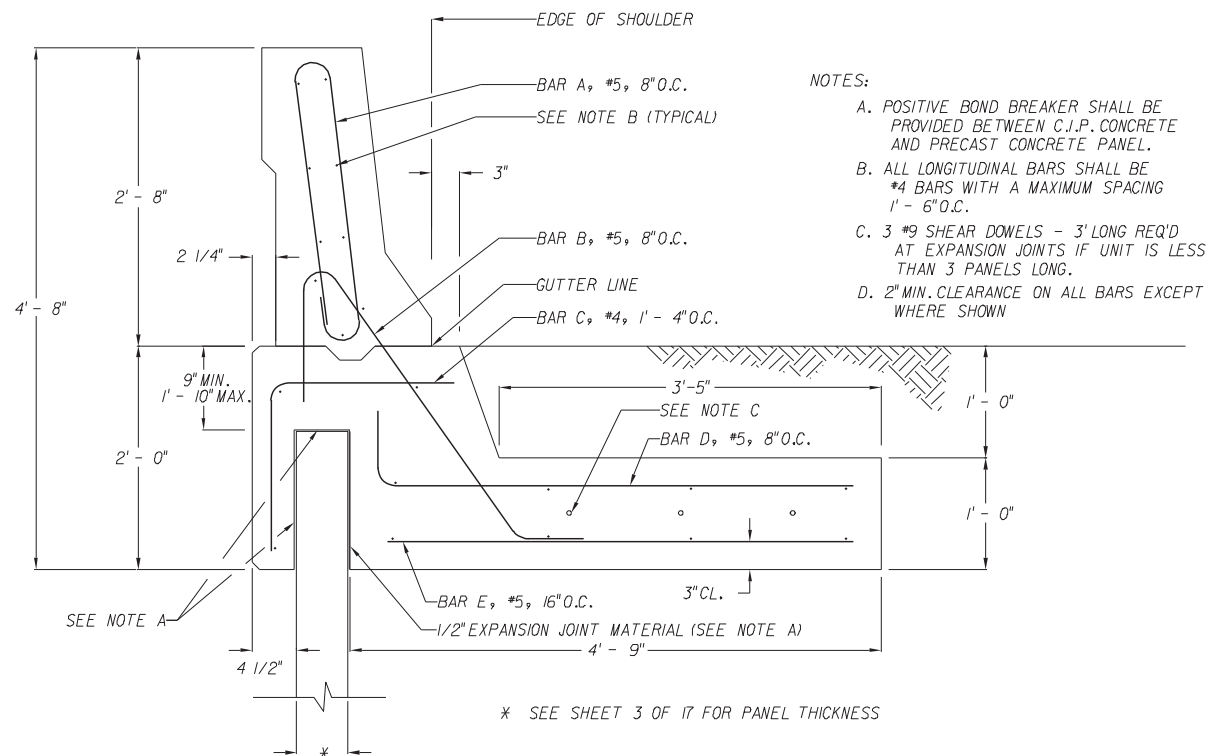
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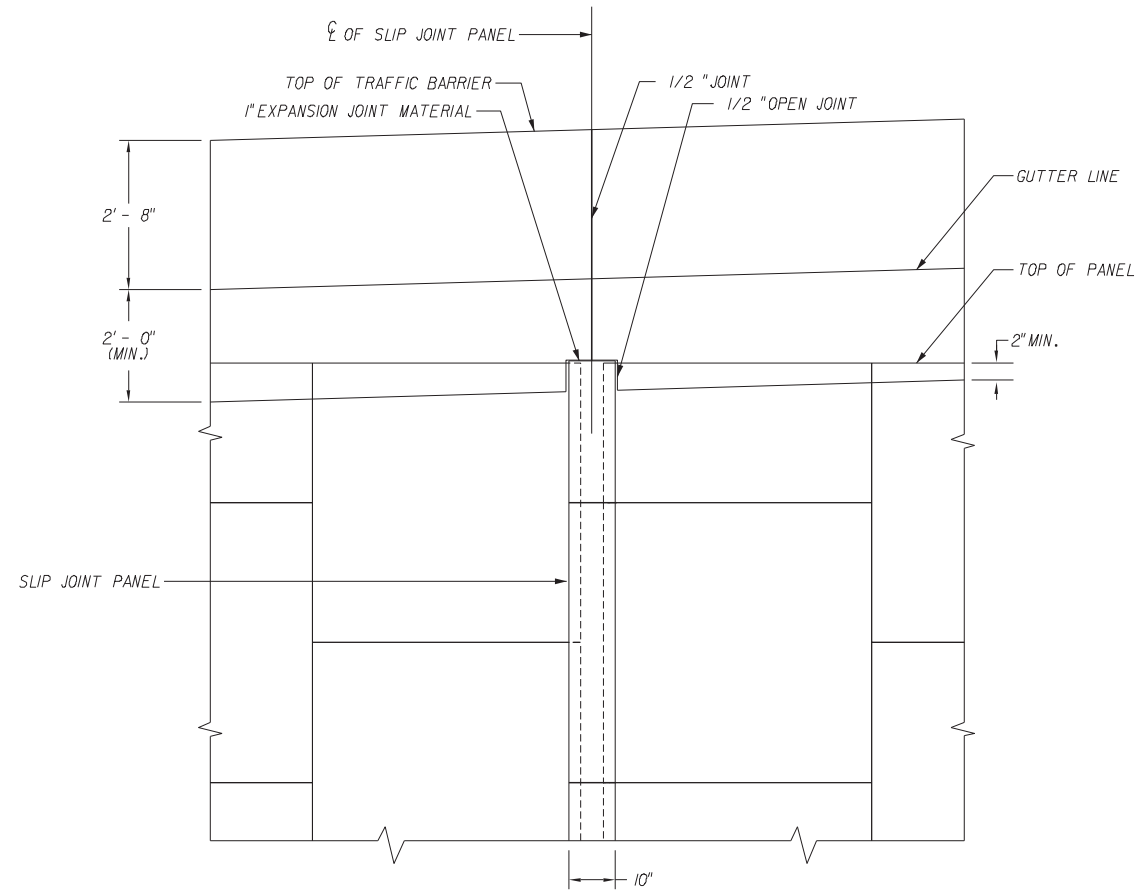
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	12 of 17	5025

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$

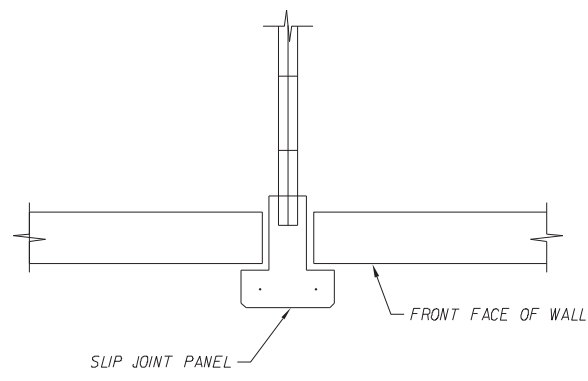


- NOTES:
- A. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN C.I.P. CONCRETE AND PRECAST CONCRETE PANEL.
 - B. ALL LONGITUDINAL BARS SHALL BE #4 BARS WITH A MAXIMUM SPACING 1' - 6" O.C.
 - C. 3 #9 SHEAR DOWELS - 3' LONG REQ'D AT EXPANSION JOINTS IF UNIT IS LESS THAN 3 PANELS LONG.
 - D. 2" MIN. CLEARANCE ON ALL BARS EXCEPT WHERE SHOWN

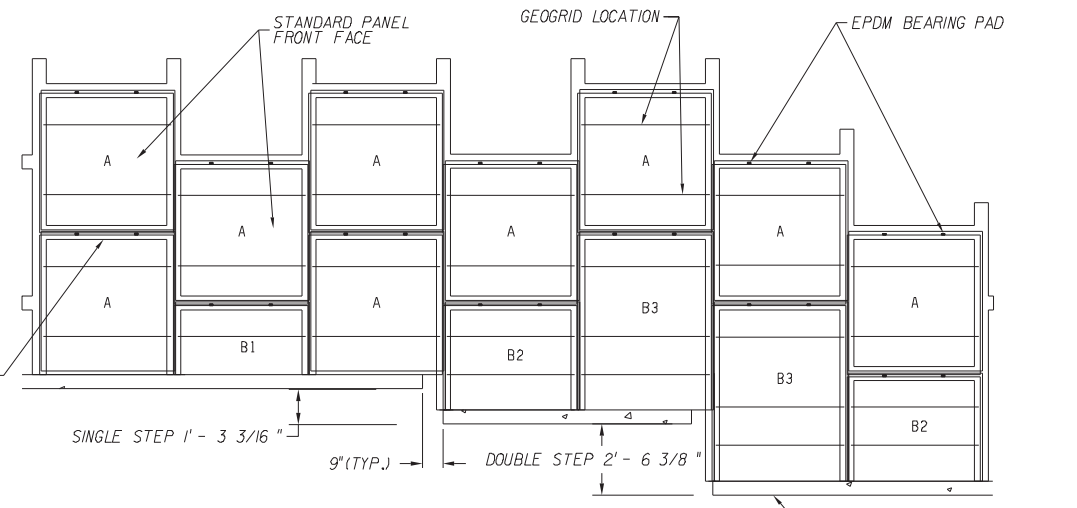
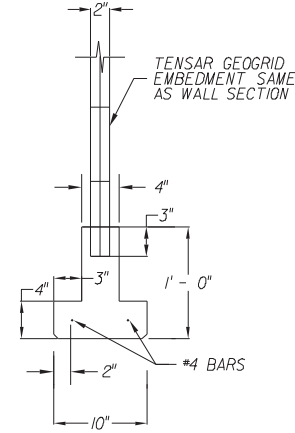
C.I.P. CONCRETE TRAFFIC BARRIER
NOT TO SCALE



C.I.P. TRAFFIC BARRIER
OVER SLIP JOINT PANEL



SLIP JOINT DETAIL
NOT TO SCALE



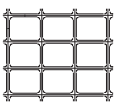
TYPICAL LEVELING PAD STEP DETAIL
NOT TO SCALE

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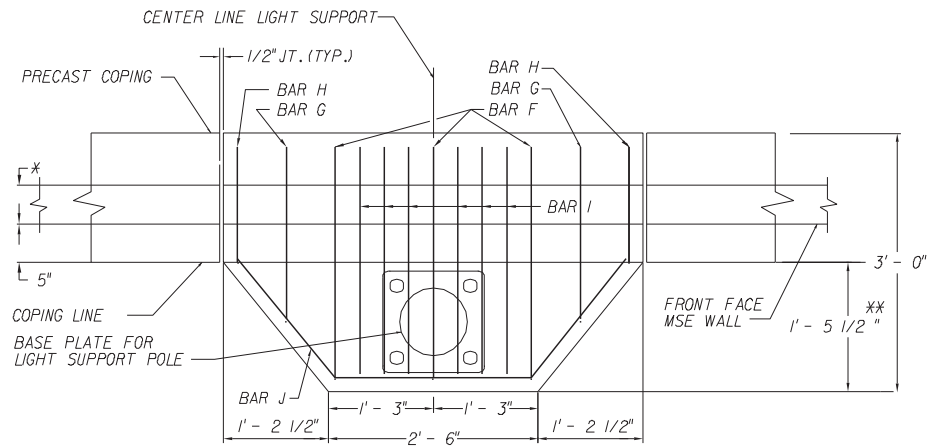
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL

Names	Dates	Approved By		
Designed By		<i>W. V. [Signature]</i>	State Structures Design Engineer	
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	13 of 17	5025

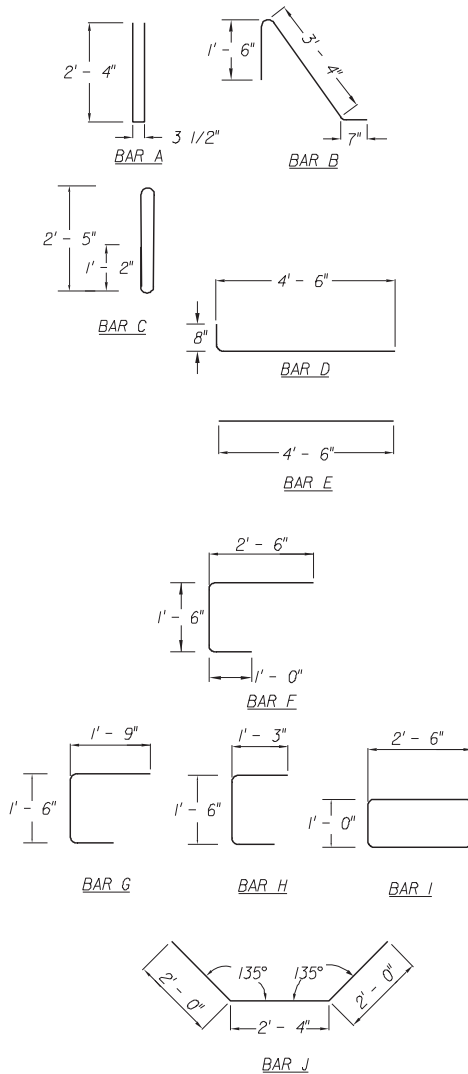
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*****SYTIME*****



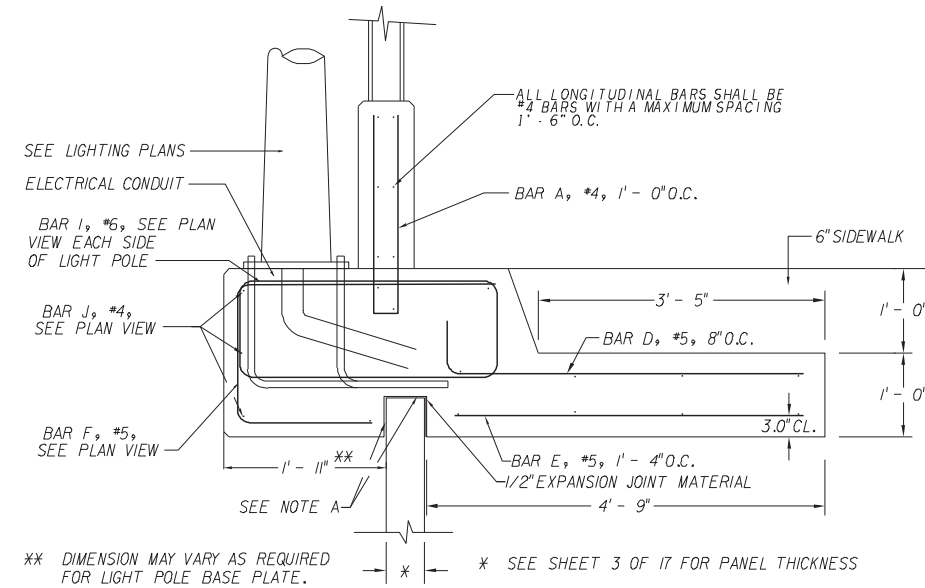
PLAN
NOT TO SCALE

NOTE:
REBAR IN BARRIER AND JUNCTION
SLAB NOT SHOWN FOR CLARITY

NOTE:
REFER TO LIGHT POLE PILASTER DETAILS
IN BRIDGE PLANS FOR NOTES AND ADDITIONAL
DETAILS (CONDUIT, JUNCTION BOXES, ETC.)

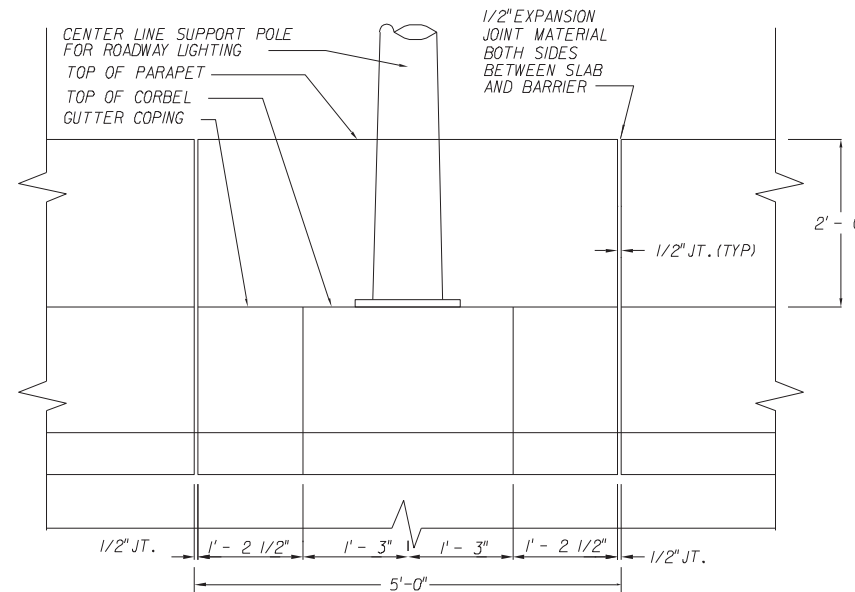


BAR BENDING DETAIL
NOT TO SCALE



PARAPET DETAIL AT LIGHT POLE
NOT TO SCALE

NOTES:
A. POSITIVE BOND BREAKER (6 MIL. POLYETHYLENE
OR APPROVED EQUAL) SHALL BE
PROVIDED BETWEEN CAST IN PLACE
CONC. AND PRECAST CONC. PANEL.
B. MAINTAIN A 2" MIN. CLEARANCE ON ALL BARS,
EXCEPT WHERE NOTED OTHERWISE.



PARTIAL ELEVATION

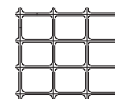
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

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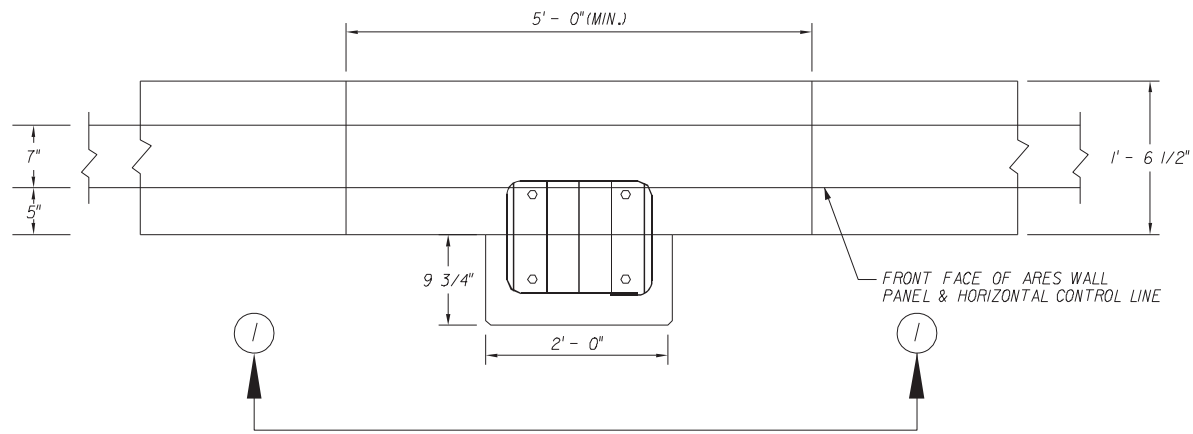
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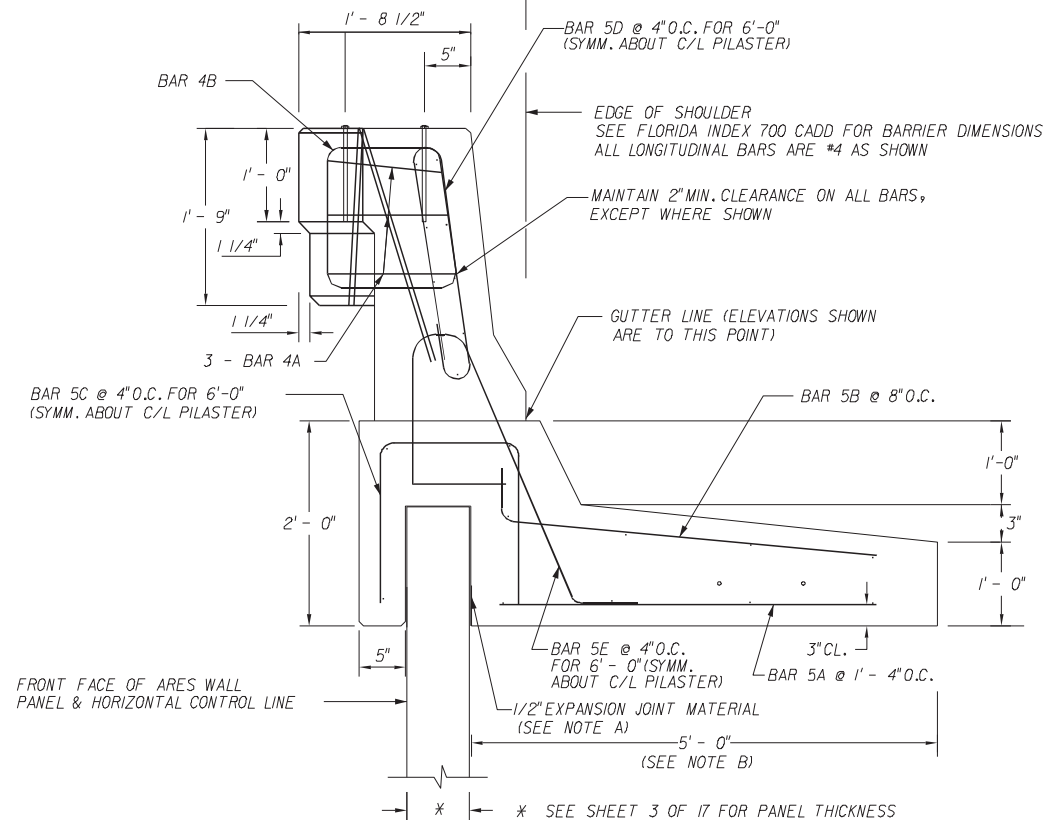


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	14 of 17	5025

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



2 PLAN
NOT TO SCALE



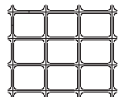
3 BARRIER DETAIL AT LIGHT POLE
NOT TO SCALE

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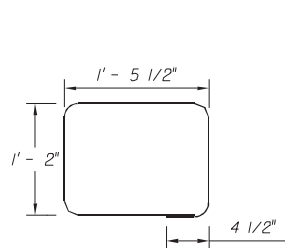
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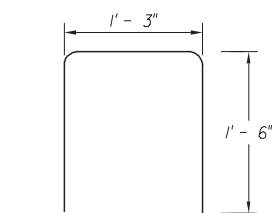
NOTES:

- A. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN CAST IN PLACE CONCRETE AND PRECAST CONCRETE PANEL.
- B. THE BARRIER JUNCTION SLAB SHALL HAVE THESE DIMENSIONS FOR ONE PRECAST UNIT EITHER SIDE OF LIGHT POLE BARRIER LONGITUDINAL BARS SHALL BE AS SHOWN ABOVE.
- C. 2 - #9 SHEAR DOWELS - 3'-0" LONG REFER TO PRECAST BARRIER SHEET.
- D. LIGHT POLE SUPPLIER IS RESPONSIBLE FOR PROVIDING ANCHOR BOLTS THAT EFFECTIVELY TRANSMIT THE LIGHT POLE LOADS TO THE PILASTER AND FIT THE REINFORCING CAGE.
- E. SEE STANDARD INDEX 500 FOR ADDITIONAL DETAILS.

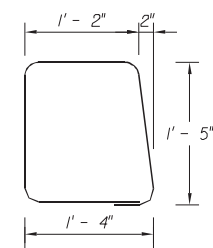
REBAR QUANTITY	
BAR	QTY
4A	3
4B	5
5A	18
5B	9
5C	18
5D	18
5E	18



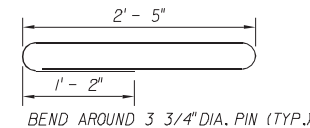
BAR 4A



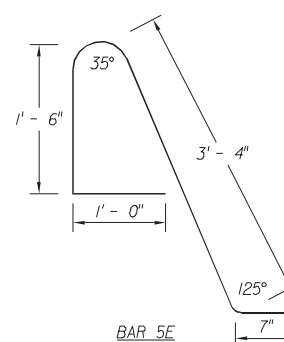
BAR 4B



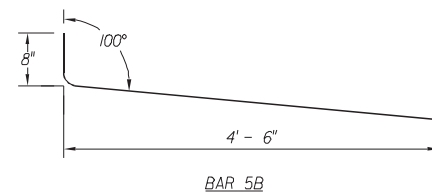
BAR 5A



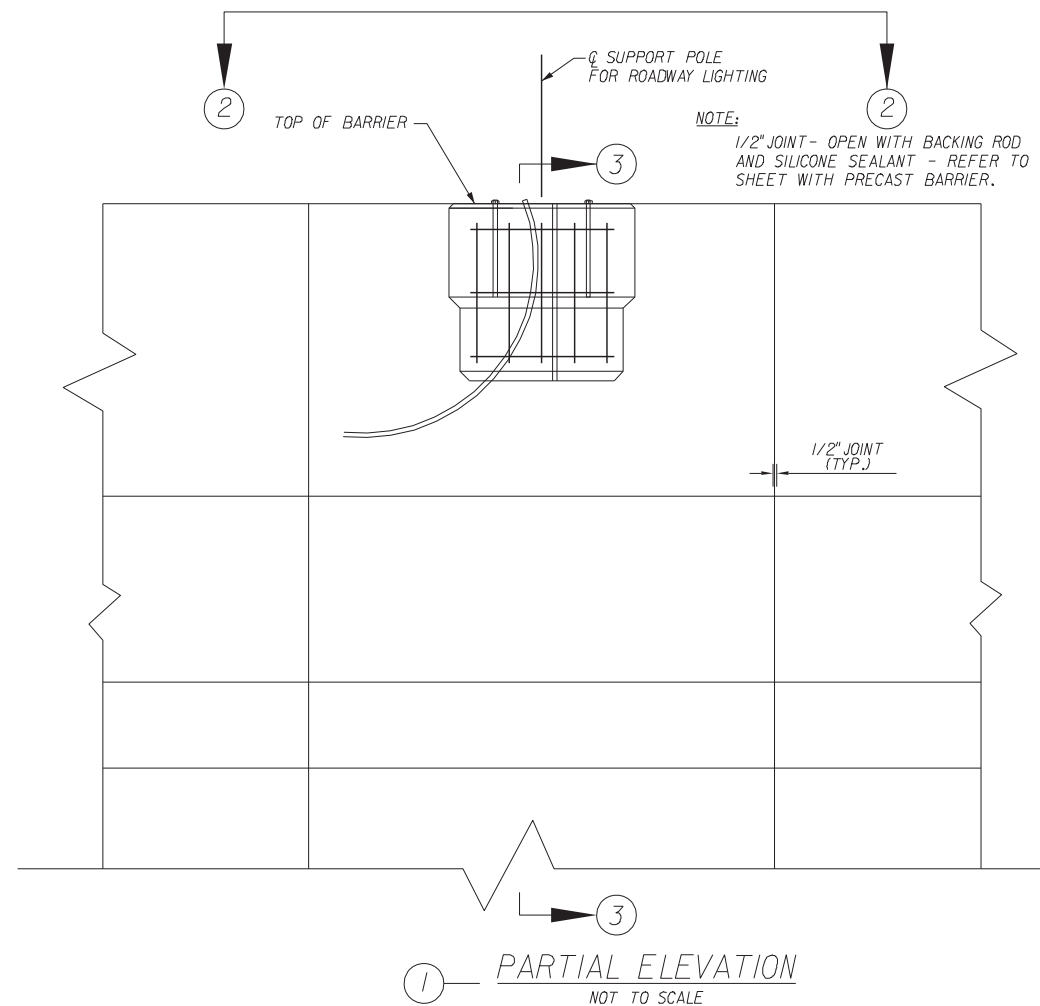
BAR 5B



BAR 5C



BAR 5D



1 PARTIAL ELEVATION
NOT TO SCALE

4 BAR BENDING DETAIL
NOT TO SCALE

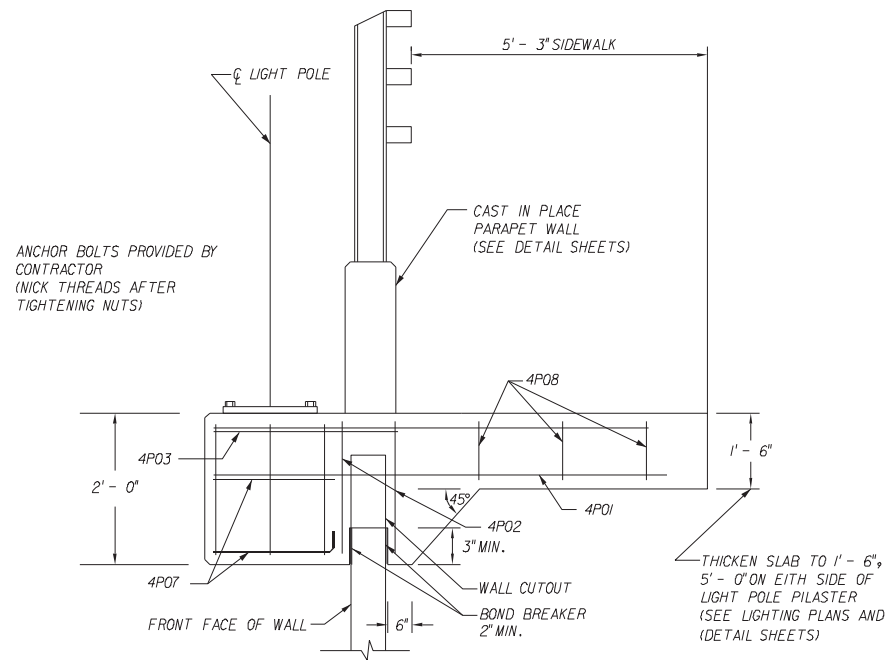
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL

Names	Dates	Approved By				
Designed By		 State Structures Design Engineer				
Drawn By	JMS 8/14/98				Revision	Sheet No.
Checked By					00	15 of 17
		Index No.	5025			

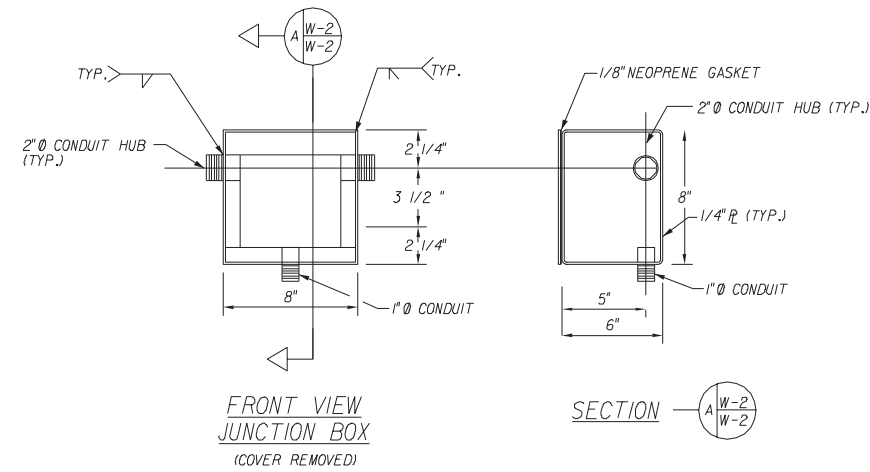
\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



ANCHOR BOLTS PROVIDED BY CONTRACTOR (NICK THREADS AFTER TIGHTENING NUTS)

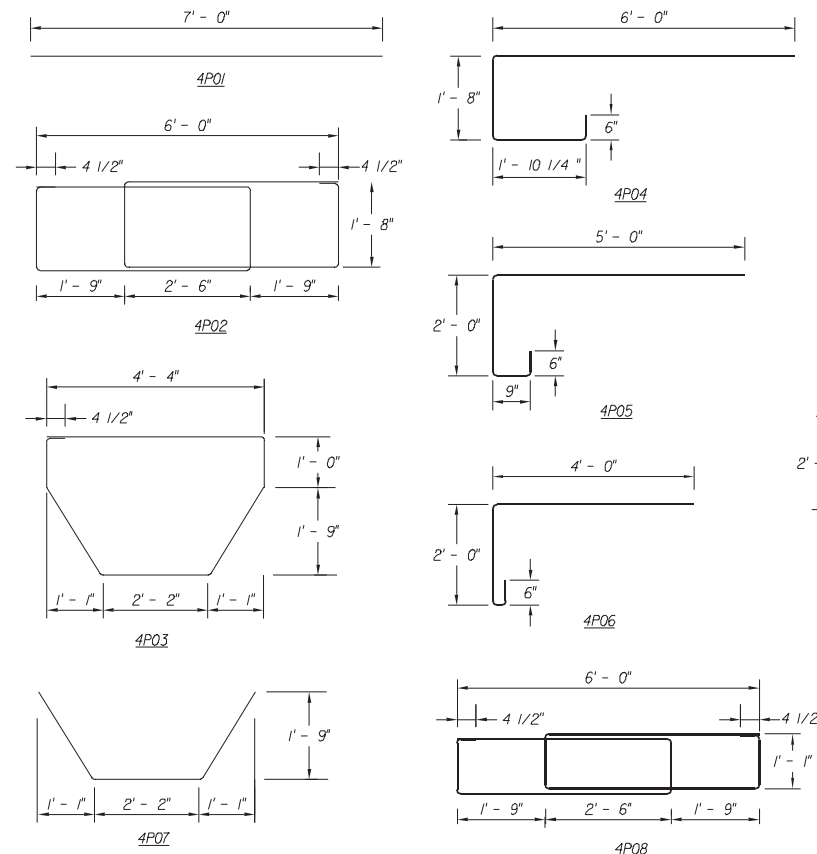
CAST IN PLACE PARAPET WALL (SEE DETAIL SHEETS)

THICKEN SLAB TO 1'-6", 5'-0" ON EITHER SIDE OF LIGHT POLE PILASTER (SEE LIGHTING PLANS AND (DETAIL SHEETS))



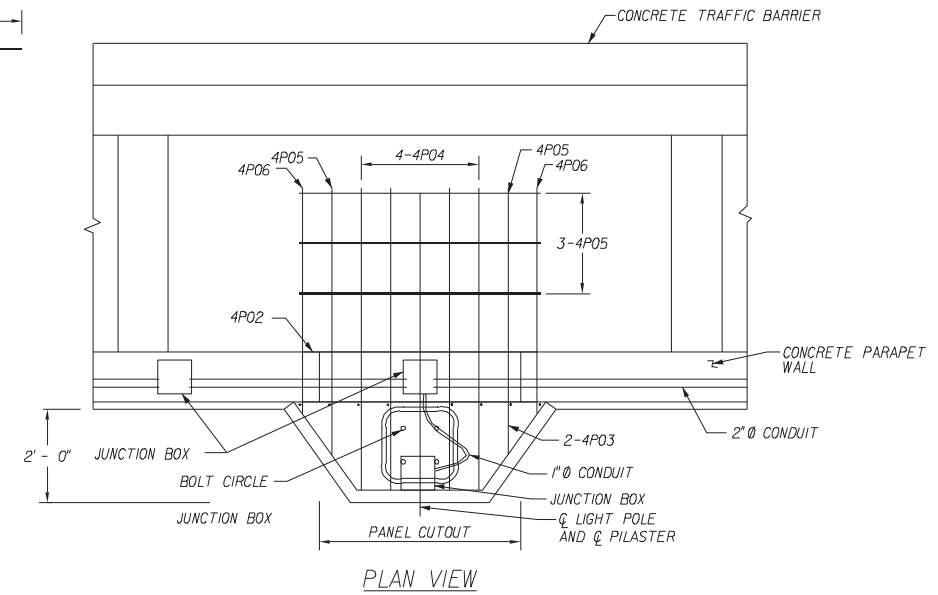
FRONT VIEW JUNCTION BOX (COVER REMOVED)

SECTION

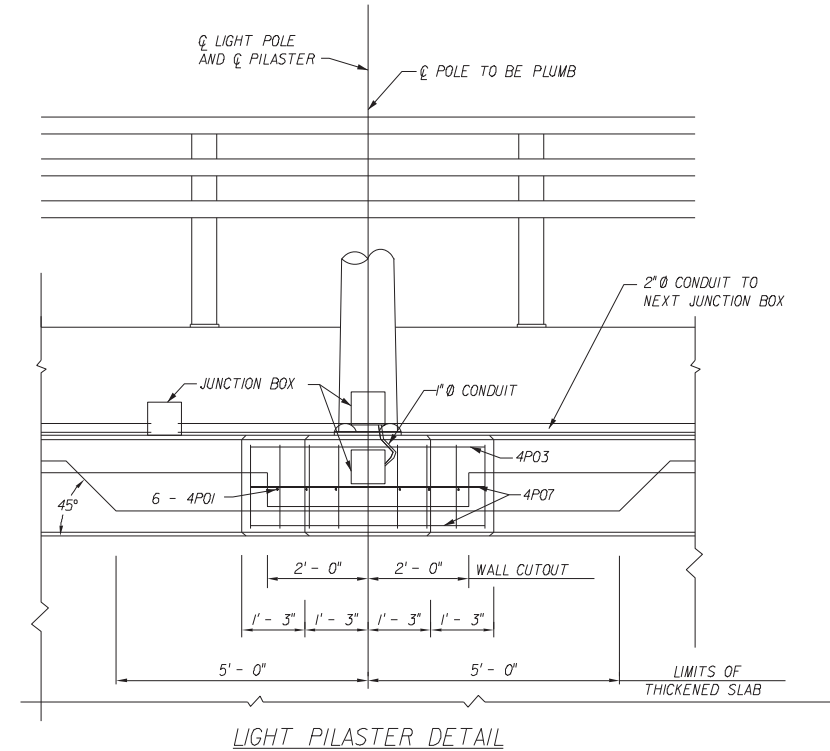


BAR BENDING DIAGRAM

BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQUIRED	LENGTH
4P01	4	6	7'-0"
4P02	4	2	24'-5"
4P03	4	1	14'-9"
4P04	4	4	9'-8"
4P05	4	2	7'-11"
4P07	4	2	6'-2"
4P07	4	2	6'-4"
4P08	4	3	22'-1"



PLAN VIEW



LIGHT PILASTER DETAIL

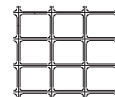
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

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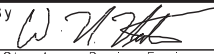
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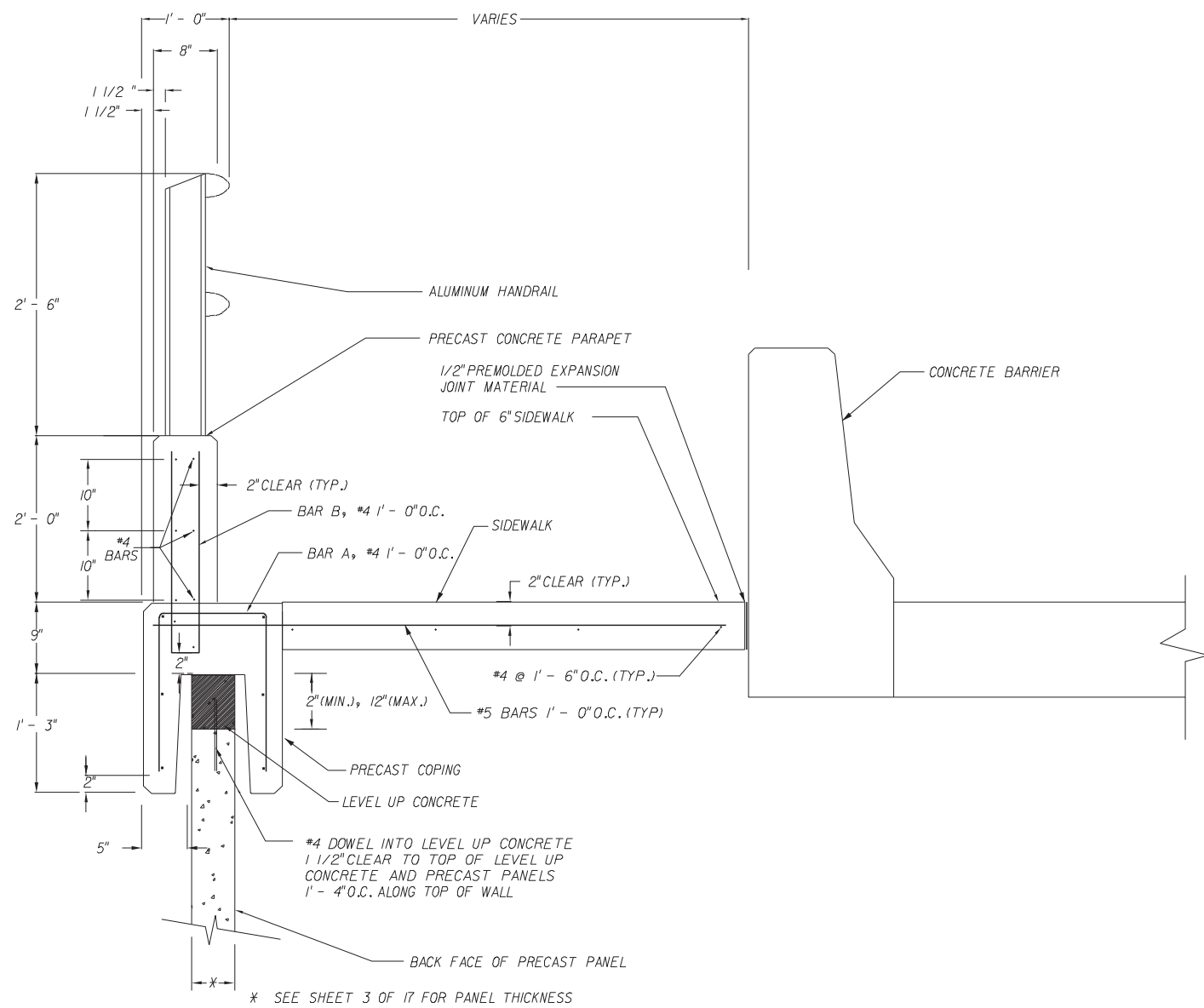


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

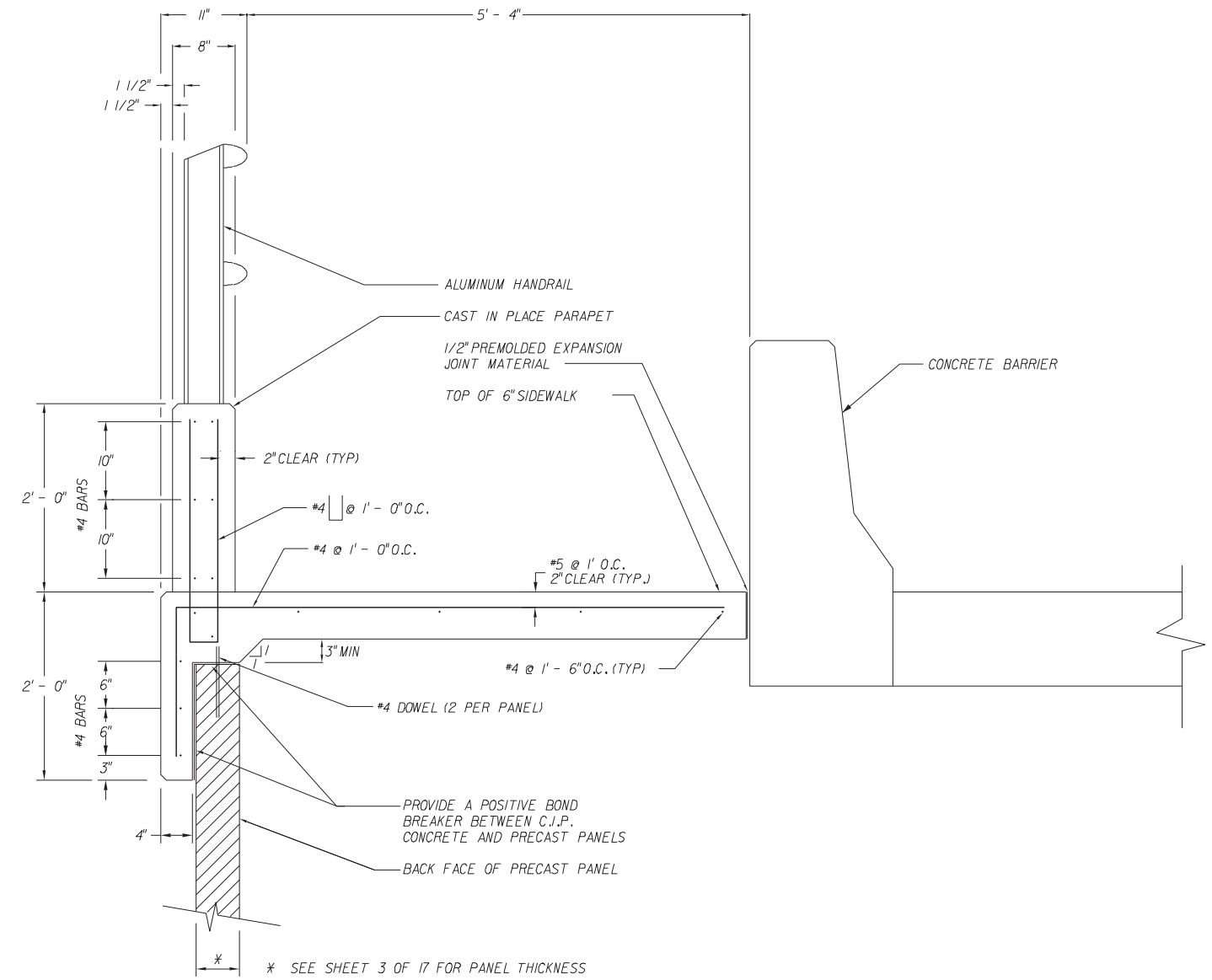
RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL

Names	Dates	Approved By				
Designed By		 State Structures Design Engineer				
Drawn By	JMS 8/14/98				Revision	Sheet No.
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						5025

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\$\$\$\$\$SYTIME\$\$\$\$\$



PRECAST PARAPET DETAIL
NOT TO SCALE



C.I.P. PARAPET DETAIL
NOT TO SCALE

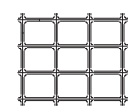
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES MSE RETAINING WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	17 of 17	5025

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$

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GENERAL NOTES

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE REINFORCED EARTH VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE CONTRACTING AGENCY'S TECHNICAL SPECIFICATIONS FOR RETAINED EARTH WALLS.

2. FACTORS OF SAFETY

- OVERTURNING 2.0
- INTERNAL PULLOUT 1.5 (ALLOW DEFORMATION 3/4")
- OVERALL STABILITY 1.5
- SLIDING 1.5
- BEARING 2.5

SOIL REINFORCEMENT MESH 0.47 F_y AT END OF DESIGN LIFE

3. SOIL CHARACTERISTICS ASSUMED FOR DESIGN:

SOIL PARAMETERS:

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF ϕ , C AND δ SHALL BE PROVIDED IN THE SHOP DRAWINGS.

4. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF OTHERS TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.

5. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED EARTH VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.

WIRE FACING PANELS & REINFORCING ELEMENTS

6. REINFORCING MESH ELEMENTS SHALL BE SHOP FABRICATED FROM COLD DRAWN STEEL ROD CONFORMING TO THE MINIMUM REQUIREMENTS OF ASTM A-82 AND SHALL BE WELDED AT THE JUNCTIONS BETWEEN LONGITUDINAL AND TRANSVERSE WIRES IN ACCORDANCE WITH ASTM A-185. GALVANIZATION SHALL BE APPLIED AFTER MESH FABRICATION AND SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF ASTM A-123.

LOOP EMBEDS SHALL BE FABRICATED FROM COLD DRAWN STEEL ROD CONFORMING TO ASTM A-510 OR ASTM A-82. LOOP EMBEDS SHALL BE WELDED IN ACCORDANCE WITH ASTM A-185. LOOP EMBEDS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM B-633.

DESIGN:

7. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, THE WALL COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

WALL CONSTRUCTION

- 8. RETAINED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 10.0' EACH TO MATCH DESIRED WALL ALIGNMENT.
- 9. FOR LOCATION AND ALIGNMENT OF RETAINED EARTH WALLS. SEE RETAINING WALL CONTROL PLANS.
- 10. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.
- 11. IF PILES ARE LOCATED WITHIN REINFORCED SOIL VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE REINFORCED EARTH WALL UNLESS A METHOD TO PROTECT THE STRUCTURE WHICH IS ACCEPTABLE TO THE ENGINEER AND FOSTER GEOTECHNICAL COMPANY AND IS PROPOSED AND APPROVED IN WRITING.
- 12. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 TO A LEVEL OF 2" (+/-) ABOVE THE TIE MESH EMBEDDED IN THE PANELS. INSTALLATION OF REINFORCING MESH SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
- 13. WALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 548.
- 14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS BEHIND RETAINED EARTH PANELS. PRIOR TO PLACEMENT OF THE TOP LAYER OF REINFORCING MESH, INDIVIDUAL REINFORCING MESH MAY BE SKEWED TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER (NO CUTTING OF SOIL REINFORCEMENT GRIDS ALLOWED UNLESS SHOWN ON SHOP DRAWINGS AND APPROVED BY THE ENGINEER). ANY DAMAGE DONE TO THE REINFORCING MESH DUE TO THE INSTALLATION OF THE GUARDRAIL SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
- 15. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN REINFORCED SOIL VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING MESH AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN.
- 16. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO FOSTER GEOTECHNICAL CONSTRUCTION MANUAL.
- 17. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING MESH DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPER ELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

18. NOMINAL MESH LENGTHS

THE REINFORCING MESH LENGTH SHOWN ON THE PLANS, MEASURED FROM BACK FACE OF PANEL ARE THE NOMINAL LENGTHS REQUIRED BY CALCULATION. THE ACTUAL FABRICATED MESH LENGTHS ARE OFTEN LONGER (UP TO 6") DUE TO MANUFACTURING TOLERANCES. THE REQUIRED HORIZONTAL LIMIT OF GRANULAR BACKFILL IS EQUAL TO THE NOMINAL MESH LENGTH. ADDITIONAL GRANULAR BACKFILL BEYOND THE NOMINAL MESH LENGTH IS NOT REQUIRED BY CALCULATION.

19. SELECT BACKFILL QUANTITY

THE SELECT BACKFILL QUANTITY INDICATED BY FOSTER GEOTECHNICAL IS CALCULATED BY MULTIPLYING THE NOMINAL MESH LENGTHS SHOWN ON THE PLANS BY THEIR TRIBUTARY WALL SURFACE AREA AND CONVERTING THE RESULT TO A NEATER CUBIC METER QUANTITY. THIS INFORMATION IS FURNISHED FOR THE CONTRACTOR'S INFORMATION ONLY AND IS NOT INTENDED TO PRESENT THE ACTUAL QUANTITIES REQUIRED TO COMPLETE THE WORK. THE CONTRACTOR MUST CALCULATE HIS OWN EXCAVATION AND BACKFILL QUANTITIES BASED UPON THE SPECIFIC CONDITIONS OF THE PROJECT.

20. NOTE TO CONTRACTORS

ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY FOSTER GEOTECHNICAL

- PREFABRICATED FACING PANELS
- REINFORCING MESH
- NON-WOVEN FILTER CLOTH (FOR BEHIND FACING PANELS ONLY) (WEBTECH-TERRATEX NO4 OR EQUAL)

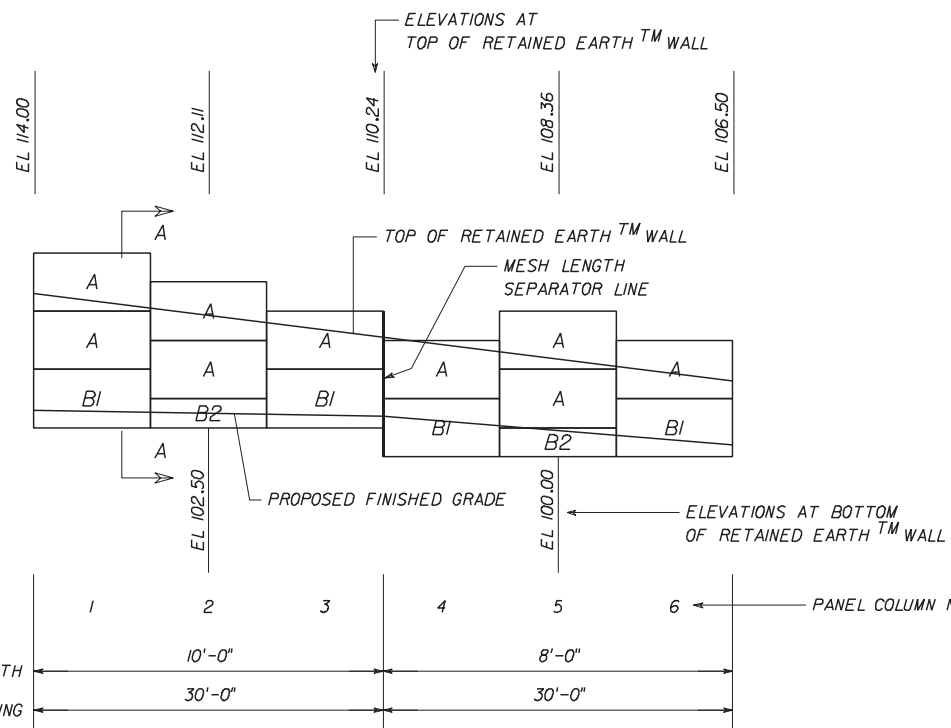
ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTION CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED / INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

21. FOSTER GEOTECHNICAL SUPPLIES PREFABRICATED WIRE FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF RETAINED EARTH WALLS DETAILED HEREIN. THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY FOSTER GEOTECHNICAL IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE. PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.

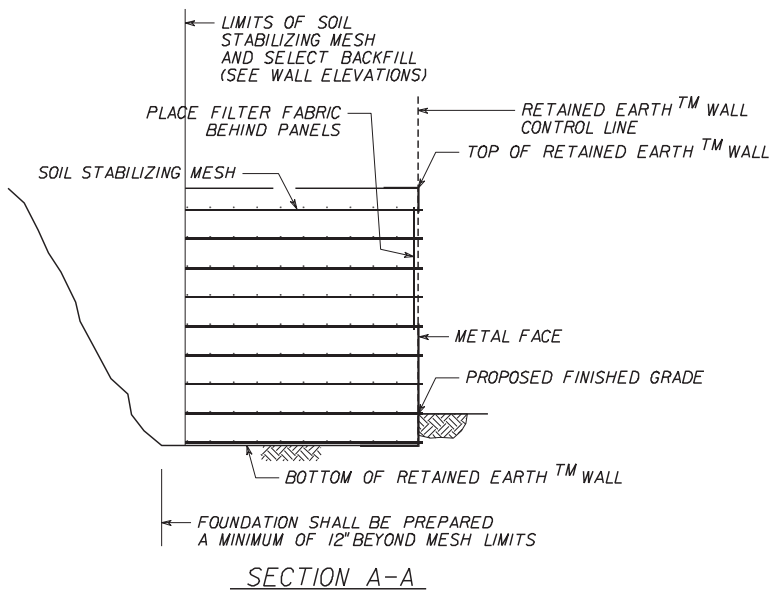
THIS SYSTEM MAY BE USED IN MODERATELY OR SLIGHTLY AGGRESSIVE ENVIRONMENTS ONLY.

WIRE FACED PANELS

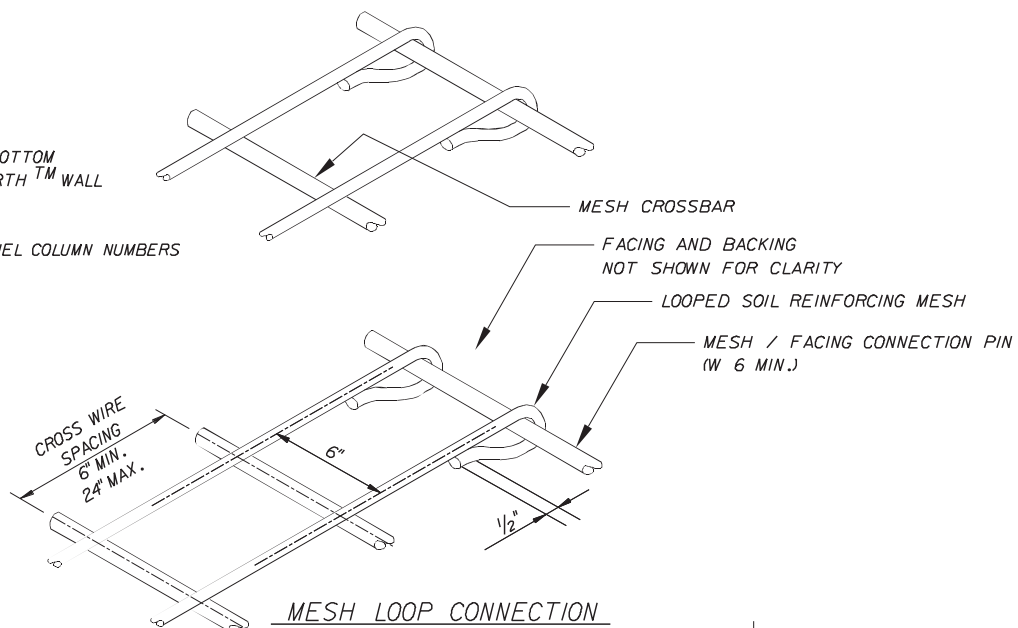
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM FOSTER GEOTECHNICAL WIRE FACE WALL				
Designed By	TCHA	11/98	Approved By <i>W. N. [Signature]</i> State Structures Design Engineer	
Drawn By	CAD	11/98	Revision	Sheet No.
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				5105



WALL ELEVATION KEY
(FRONT FACE SHOWN)

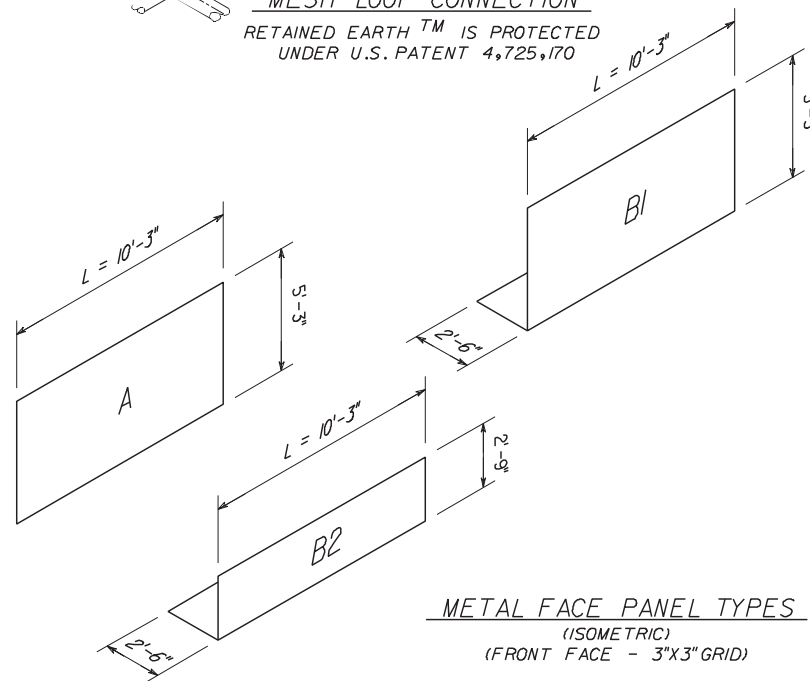


SECTION A-A



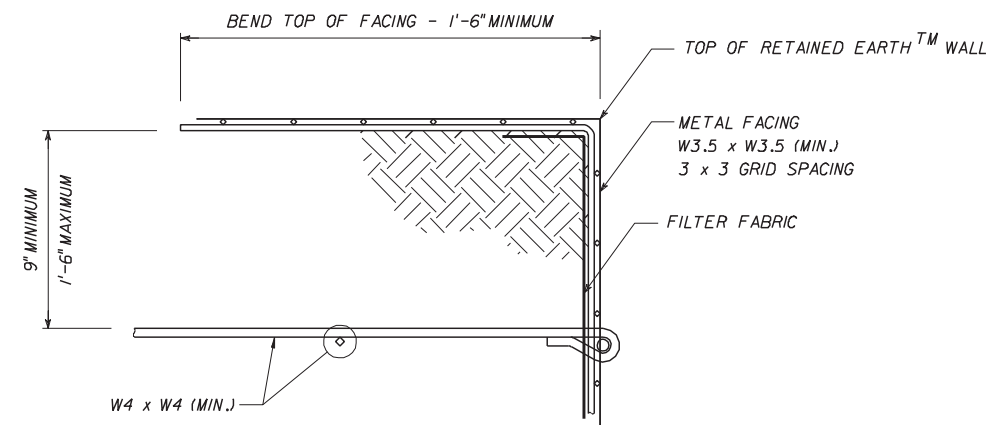
MESH LOOP CONNECTION

RETAINED EARTH™ IS PROTECTED UNDER U.S. PATENT 4,725,170

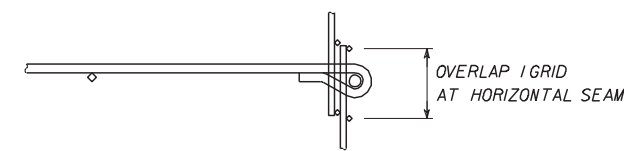


METAL FACE PANEL TYPES

(ISOMETRIC)
(FRONT FACE - 3"X3" GRID)

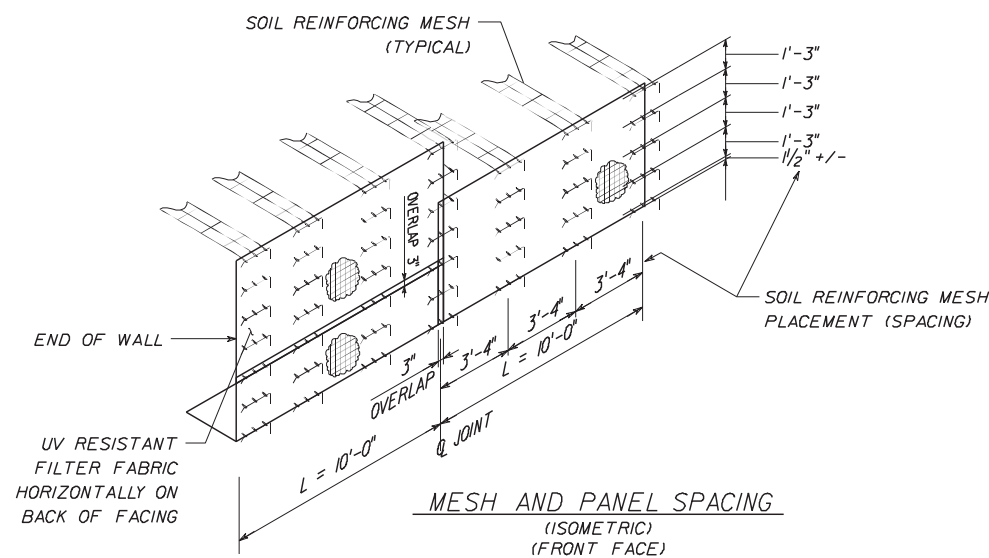


TOP OF WALL DETAIL



DETAIL OF HORIZONTAL OVERLAP

(VERTICAL OVERLAP SIMILAR)



MESH AND PANEL SPACING

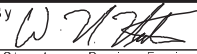
(ISOMETRIC)
(FRONT FACE)

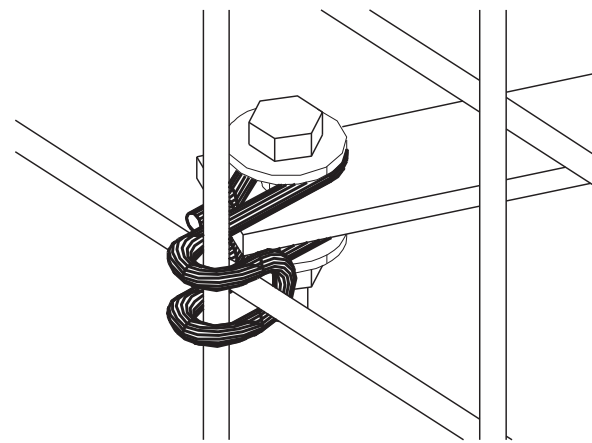
WIRE FACED PANELS

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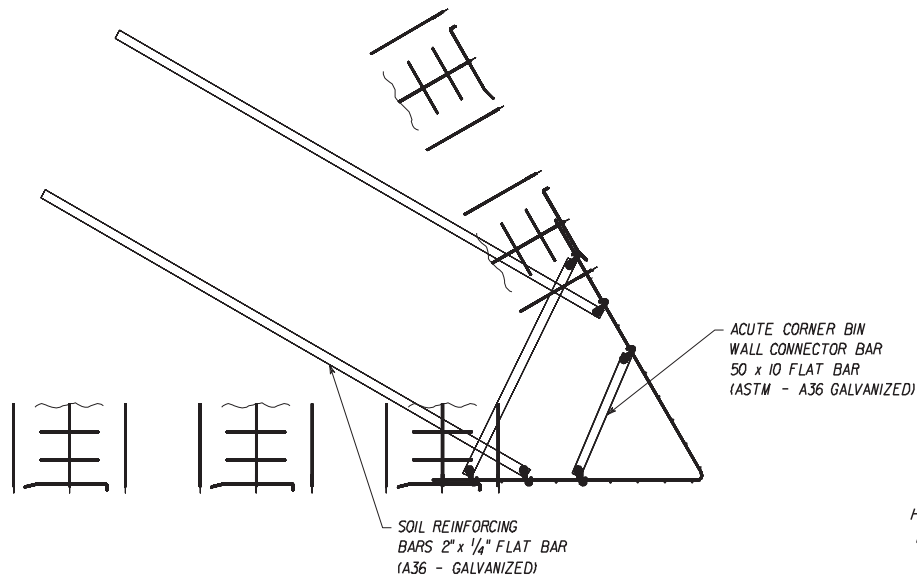
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
FOSTER GEOTECHNICAL WIRE
FACE WALL

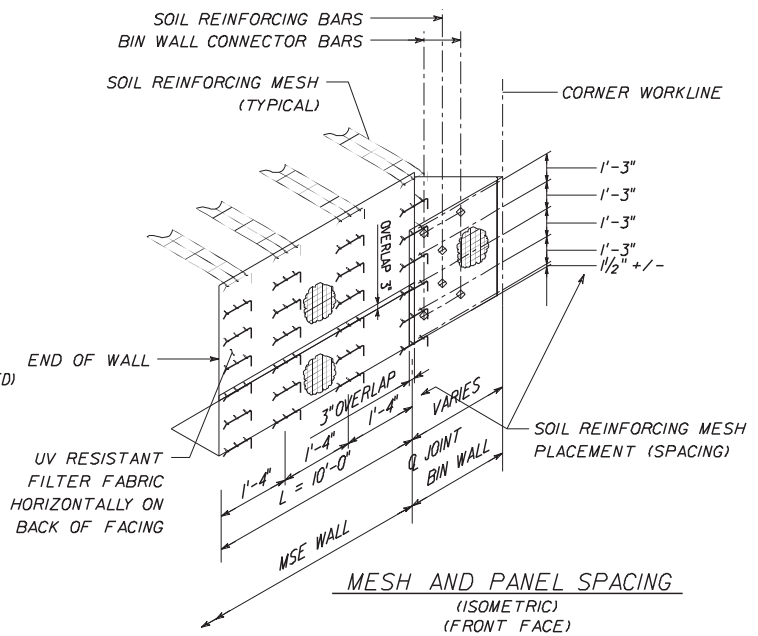
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				5105		



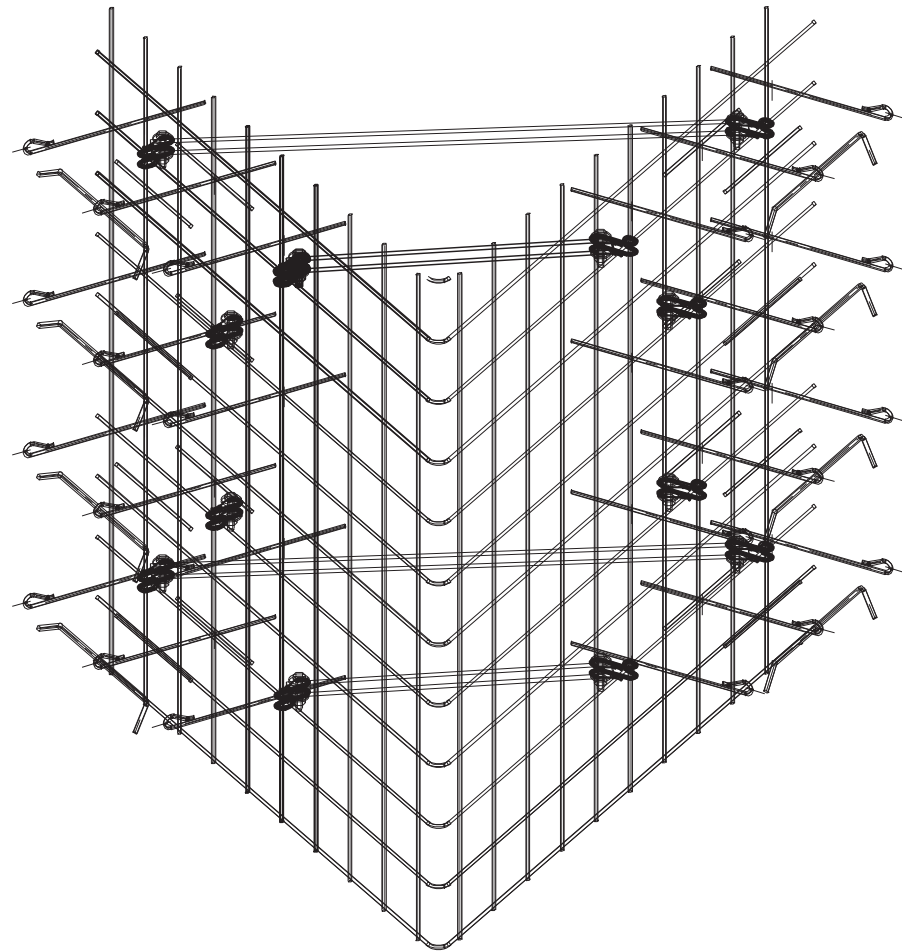
ISOMETRIC VIEW OF CONNECTION



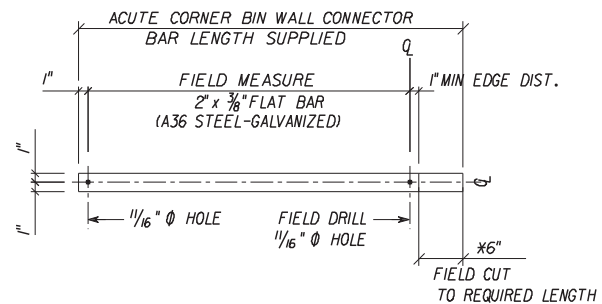
BIN WALL CONNECTOR & SOIL REINF. BAR LAYOUT



MESH AND PANEL SPACING
(ISOMETRIC)
(FRONT FACE)

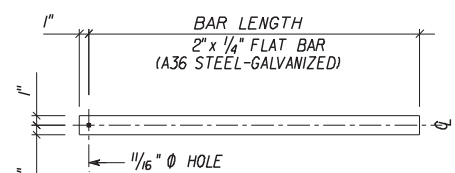


ISOMETRIC VIEW OF BIN WALL

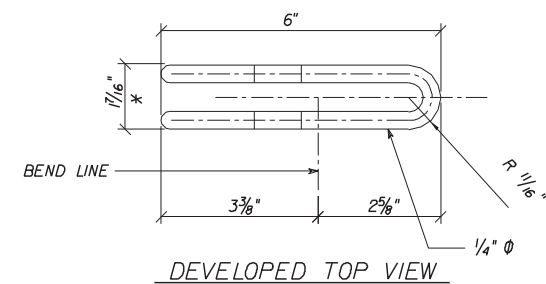


* EXPOSED STEEL ON FIELD MODIFIED END SHALL BE COATED WITH ZINC RICH PAINT

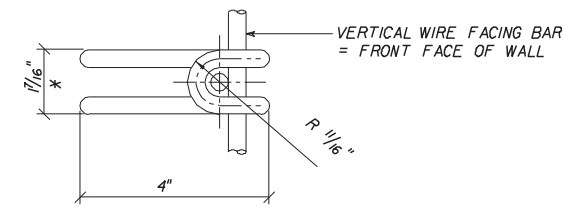
32 BIN WALL CONNECTOR BAR



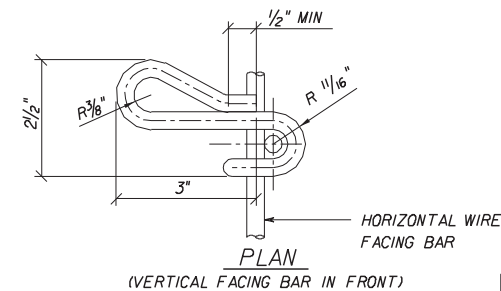
33 SOIL REINFORCING BAR



DEVELOPED TOP VIEW



ELEVATION



PLAN
(VERTICAL FACING BAR IN FRONT)

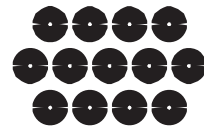
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
FOSTER GEOTECHNICAL WIRE
FACE WALL

Names	Dates	Approved By				
Designed By	TCNA 11/98	 State Structures Design Engineer				
Drawn By	CAD 11/98				Revision	Sheet No.
Checked By	GEO 11/98				00	3 of 3
				Index No. 5105		

\$\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$\$
\$\$\$\$\$\$SYTIME\$\$\$\$\$\$



TAI

The Reinforced Earth Company

8614 WESTWOOD CENTER DRIVE SUITE 1100, VIENNA, VIRGINIA 22182 (703) 821-1175

TERRATREL™ A WIRE FACED MSE WALL SYSTEM

DESIGN CRITERIA

- DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN, BEHIND, AND BENEATH THE REINFORCED VOLUME; METHODS OF CONSTRUCTION; AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO SECTION 548.
- SOIL PARAMETERS:
SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE (ϕ), COHESION (c) AND TOTAL UNIT WEIGHT (γ) SHALL BE PROVIDED IN THE SHOP DRAWINGS.
- THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE ENGINEER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
- ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.
- THE MINIMUM FACTORS OF SAFETY REQUIRED FOR DESIGN
OVERTURNING = 2.0
SLIDING = 1.5
INTERNAL PULLOUT = 1.5
(ALLOWABLE DEFORMATION = 0.75 INCH)
BEARING CAPACITY = 2.5
OVERALL STABILITY = 1.5
STEEL SOIL REINFORCEMENT = $0.55F_y$ AT END OF DESIGN LIFE AND $0.50 F_u$ AT NET SECTION OF BOLTED CONNECTION
MAXIMUM PULLOUT FACTOR
FOR STRIPS f_x (FOR SAND) = 1.5
(FOR LIMEROCK) = 2.0
FOR LADDERS N_{pMAX} = 30

LAYOUT

- FOR LOCATION OF THE WALLS, SEE RETAINING WALL CONTROL PLANS.

CONSTRUCTION

- BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548. INSTALLATION OF REINFORCING LADDERS SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
- IF STRUCTURES IN EXCESS OF 20' IN HEIGHT OCCUR, THE FINISHED GRADE IN FRONT OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS A HEIGHT OF 20'. FINISHED GRADE BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

CONFLICTING STRUCTURES

- IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON THE WALL ELEVATIONS.
- IF PILES ARE LOCATED WITHIN THE REINFORCED VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE WALL UNLESS A METHOD TO PROTECT THE STRUCTURE, WHICH IS ACCEPTABLE TO THE ENGINEER AND THE REINFORCED EARTH COMPANY, IS PROPOSED AND APPROVED IN WRITING.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS WITHIN THE REINFORCED VOLUME. PRIOR TO PLACEMENT OF THE TOP LAYERS OF REINFORCEMENTS, INDIVIDUAL REINFORCING LADDERS MAY BE SYSTEMATICALLY SHIFTED TO AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER. ANY DAMAGE DONE TO THE REINFORCING ADDERS DUE TO INSTALLATION OF GUARDRAIL POSTS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
- IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN THE REINFORCED VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING LADDERS AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN, UNLESS SHOWN OTHERWISE.
- THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING LADDERS DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPERELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

14. SUPPLIES

ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY THE REINFORCED EARTH COMPANY:

- PREFABRICATED WIRE FACING PANELS
- WIRE REINFORCING LADDERS OR STRIPS
- HANDLE BAR CONNECTORS OR PINS
- MX4 SOIL RETENTION FABRIC OR EQUAL

ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR.

15. LADDER OR STRIP LENGTH

THE REINFORCING LADDER LENGTHS SHOWN ON THE PLANS ARE MEASURED FROM THE BACK FACE OF THE WIRE FACING PANELS TO THE LIMIT OF THE SELECT BACKFILL MATERIAL, AND ARE THE LENGTHS USED IN THE REINFORCEMENT DESIGN CALCULATIONS.

- THE REINFORCED EARTH COMPANY SUPPLIES FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF THE REINFORCED EARTH (®) RETAINING WALLS DETAILED HEREIN. THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY THE REINFORCED EARTH COMPANY IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE, PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA. COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.

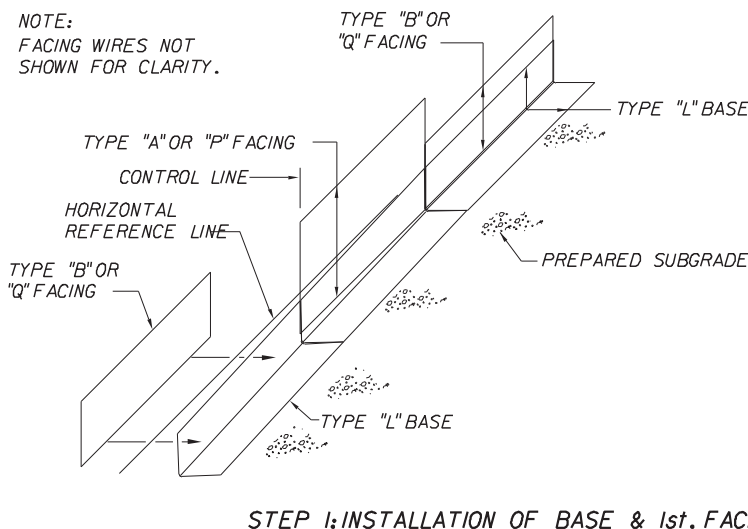
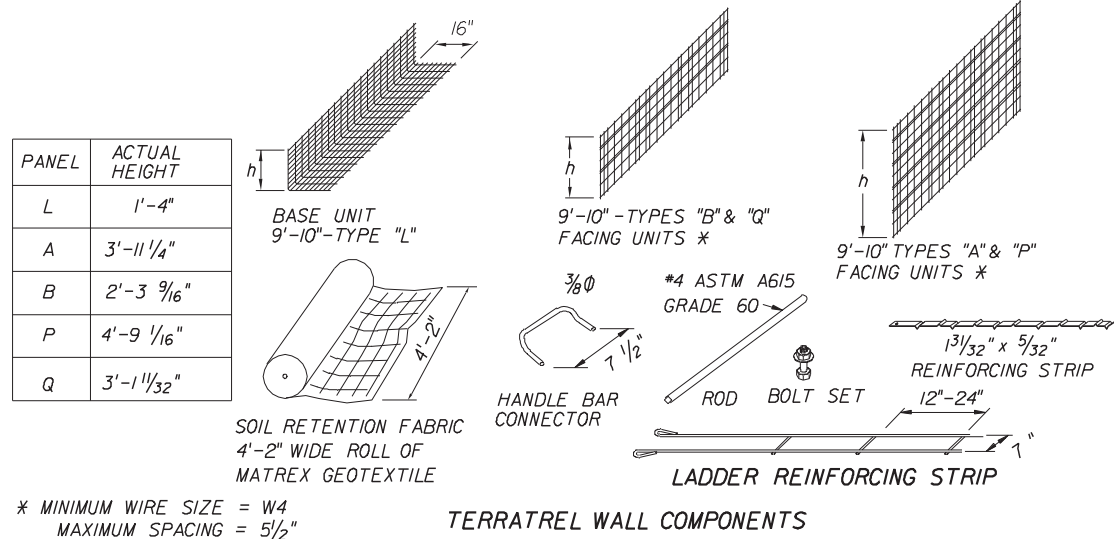
- THE REINFORCED EARTH COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

- THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO THE REINFORCED EARTH COMPANY, AND IS BEING FURNISHED FOR THE USE OF FLORIDA DEPARTMENT OF TRANSPORTATION ONLY IN CONNECTION WITH FDOT PROJECTS, AND THE INFORMATION CONTAINED HEREIN IS NOT TO BE TRANSMITTED TO ANY OTHER ORGANIZATION UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE REINFORCED EARTH COMPANY. THE REINFORCED EARTH COMPANY IS EXCLUSIVE LICENSEE IN THE UNITED STATES UNDER PATENTS ISSUED TO HENRY VIDAL, AND THE FURNISHING OF THIS DRAWING DOES NOT CONSTITUTE AN EXPRESSED OR IMPLIED LICENSE UNDER THE VIDAL PATENTS.

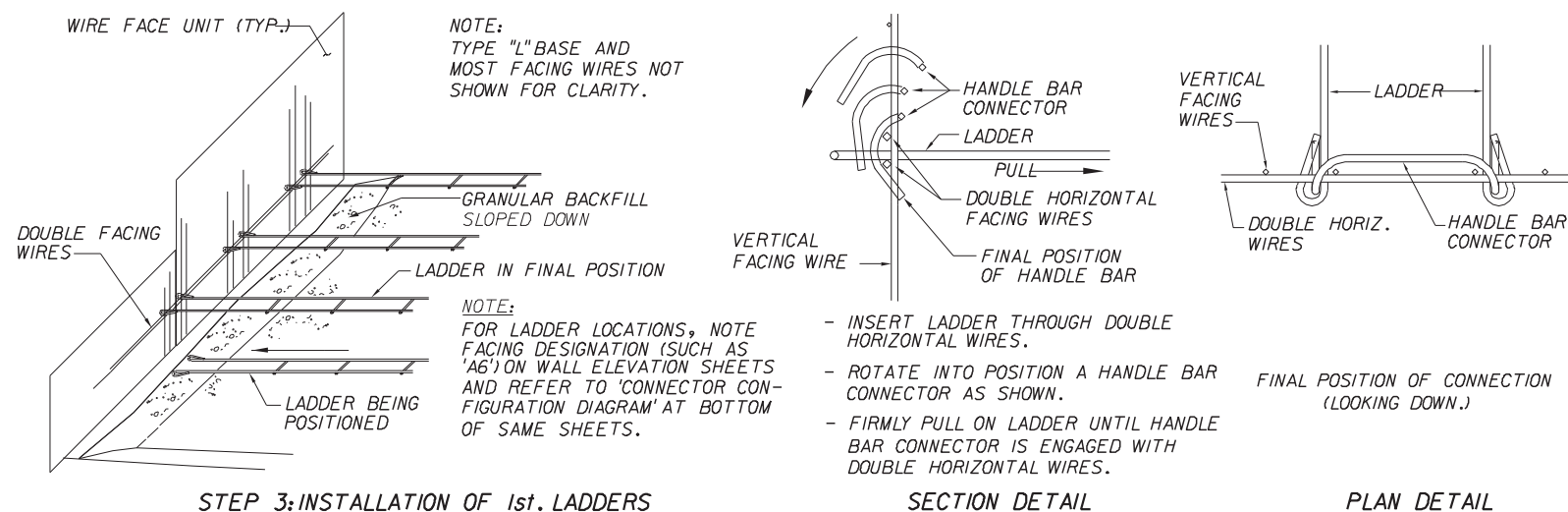
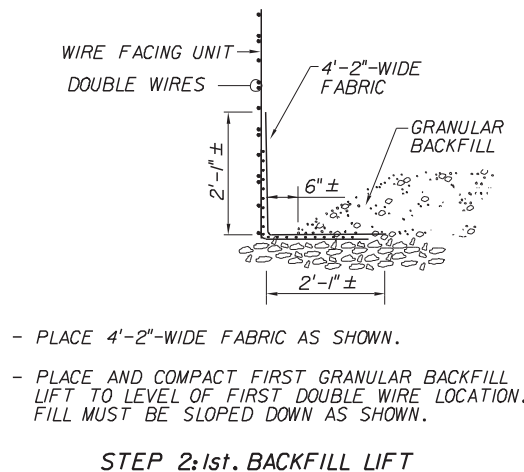
- THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO THE INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
TERRATREL WIRE WALL

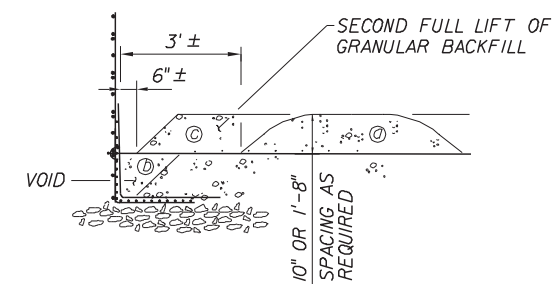
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM THE REINFORCED EARTH COMPANY TERRATREL WIRE WALL				
Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By		Revision	Sheet No.	Index No.
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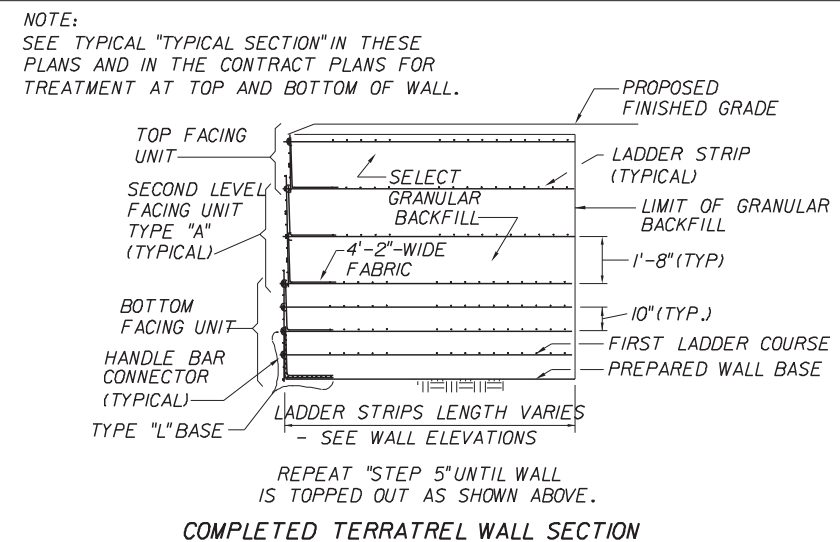
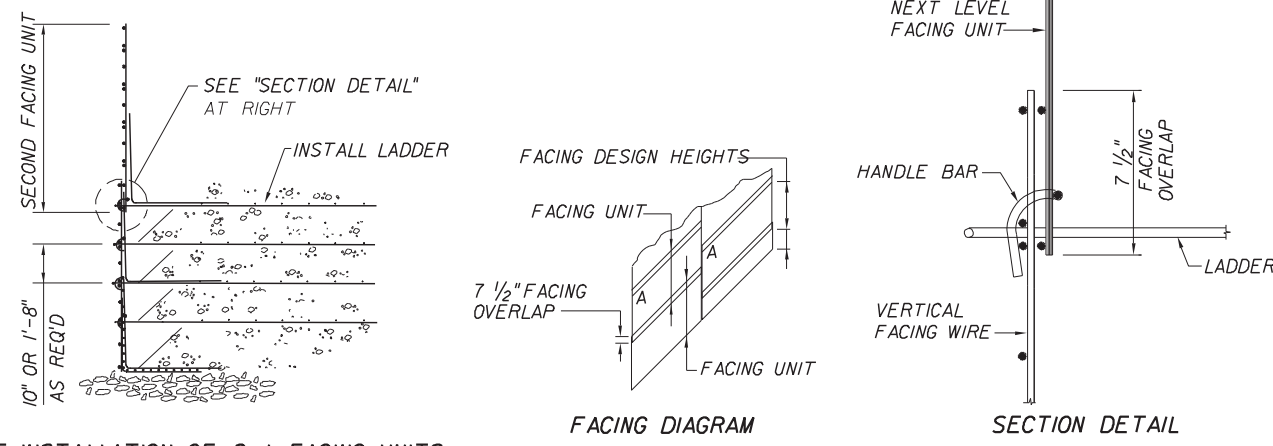
- SET TYPE "L" BASE DIRECTLY ON SUBGRADE (FOLLOW SLOPE).
- ATTACH FIRST FACING UNITS TO TYPE "L" BASES. SET FACING UNITS HORIZONTALLY TO PROPER DESIGN ELEVATION (EXCEPT WHEN NOTE ON ELEV. SHEETS REQUIRE UNITS TO FOLLOW SLOPE).
- ALIGN THE WIRES BETWEEN MATCHING GRIDS AND TIE-WIRE THE TWO ELEMENTS SECURELY TOGETHER.



- Ⓐ PLACE ENOUGH BACKFILL OVER LADDERS TO SECURE POSITION AS SHOWN.
- Ⓑ THEN FILL VOID UNDER LADDERS NEAR FACING.
- Ⓒ THEN PLACE AND COMPACT SECOND GRANULAR BACKFILL LIFT TO NEXT LADDER LEVEL. FILL BEHIND WIRE FACING UNITS MUST BE SLOPED DOWN AS SHOWN.



- POSITION SECOND FACING UNIT DIRECTLY BEHIND, AND OVERLAP, LOWER FACING UNIT. TIE ITS LOWER PORTION TO ADJACENT FACING UNITS.
- PLACE LADDERS AS PER "STEP 3."
- BACKFILL AS PER "STEP 4a AND 4b."
- PLACE 4'-2" WIDE FABRIC AS SHOWN IN "STEP 2." NOTE: FABRIC MUST ALWAYS BE APPROX. 2'-1" VERTICAL; WHEN WALL ELEVATIONS CALL FOR 10" SPACING BETWEEN LADDERS, FABRIC MUST BE SLIT FOR PENETRATION OF MID-LEVEL LADDERS.
- BACKFILL AS PER "STEP 4c."

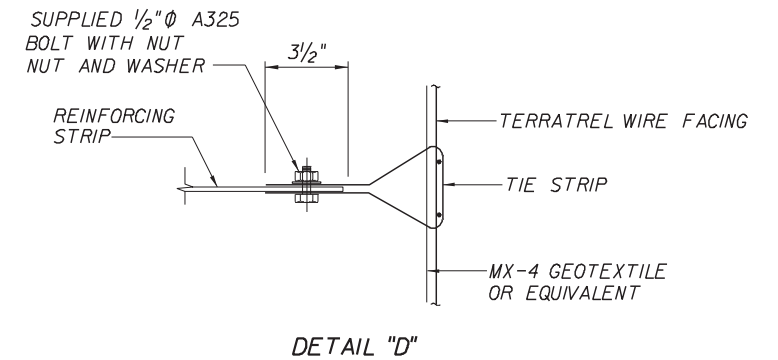
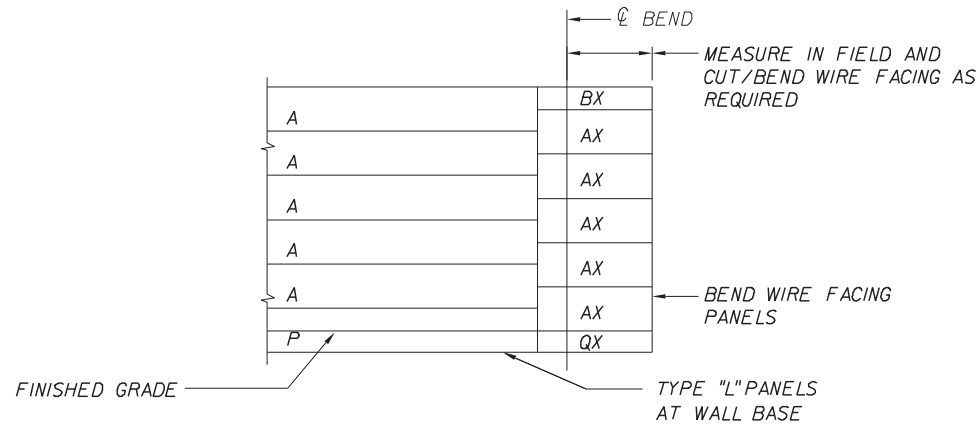
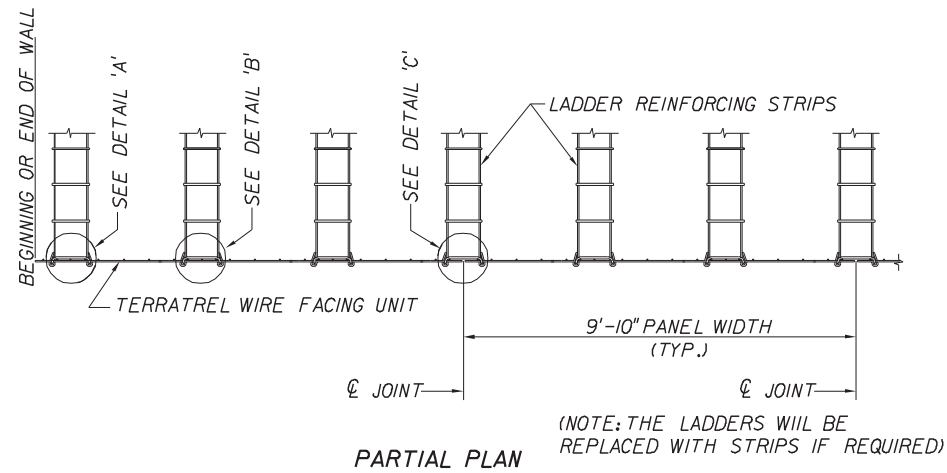


TEMPORARY TERRATREL WIRE WALL CONSTRUCTION PROCEDURE

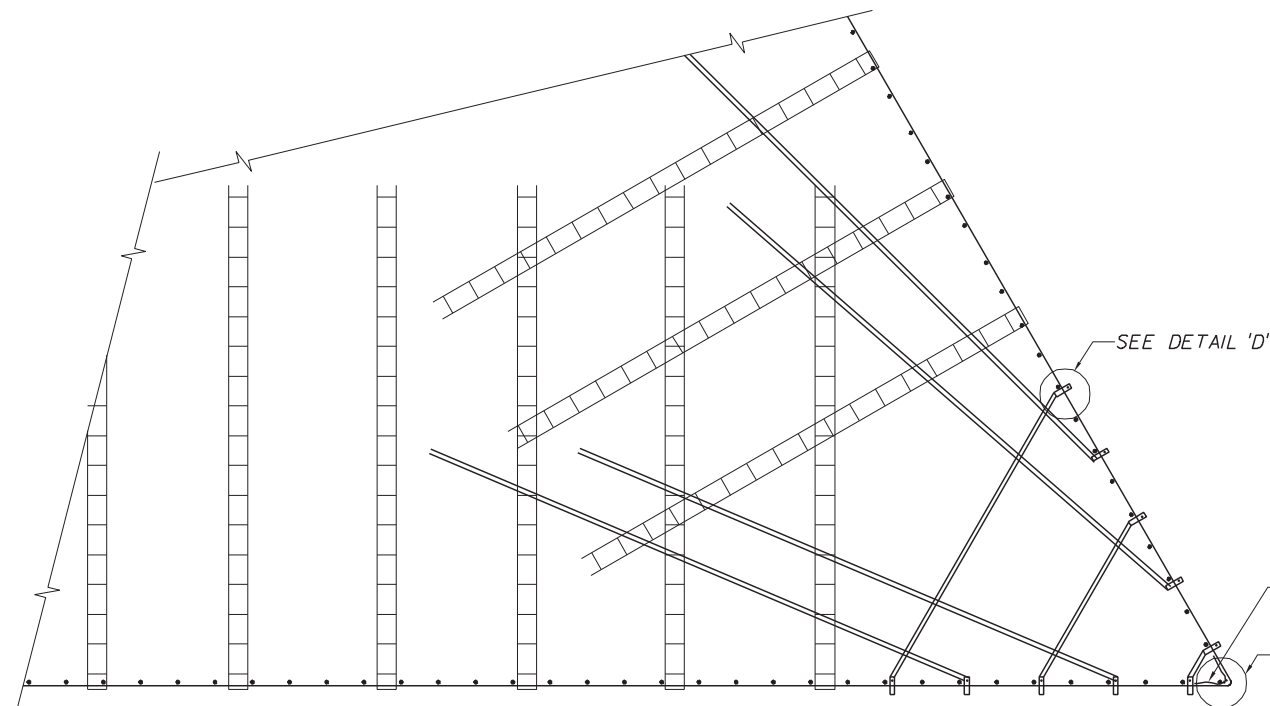
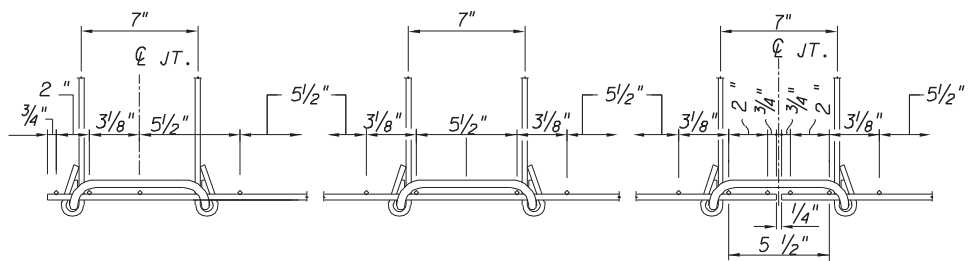
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TERRATREL WIRE WALL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
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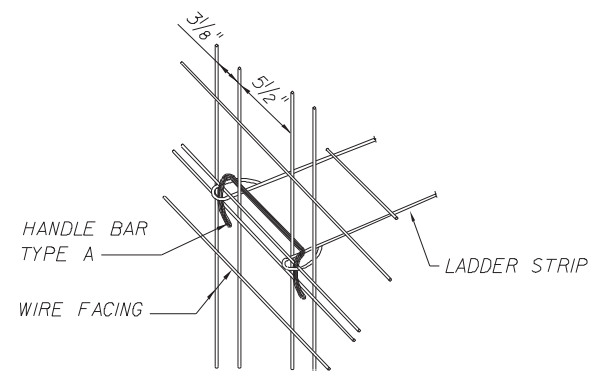


WIRE FACING AT
INSIDE AND OUTSIDE CORNERS



EXAMPLE ACUTE CORNER - SKEWED STRIPS

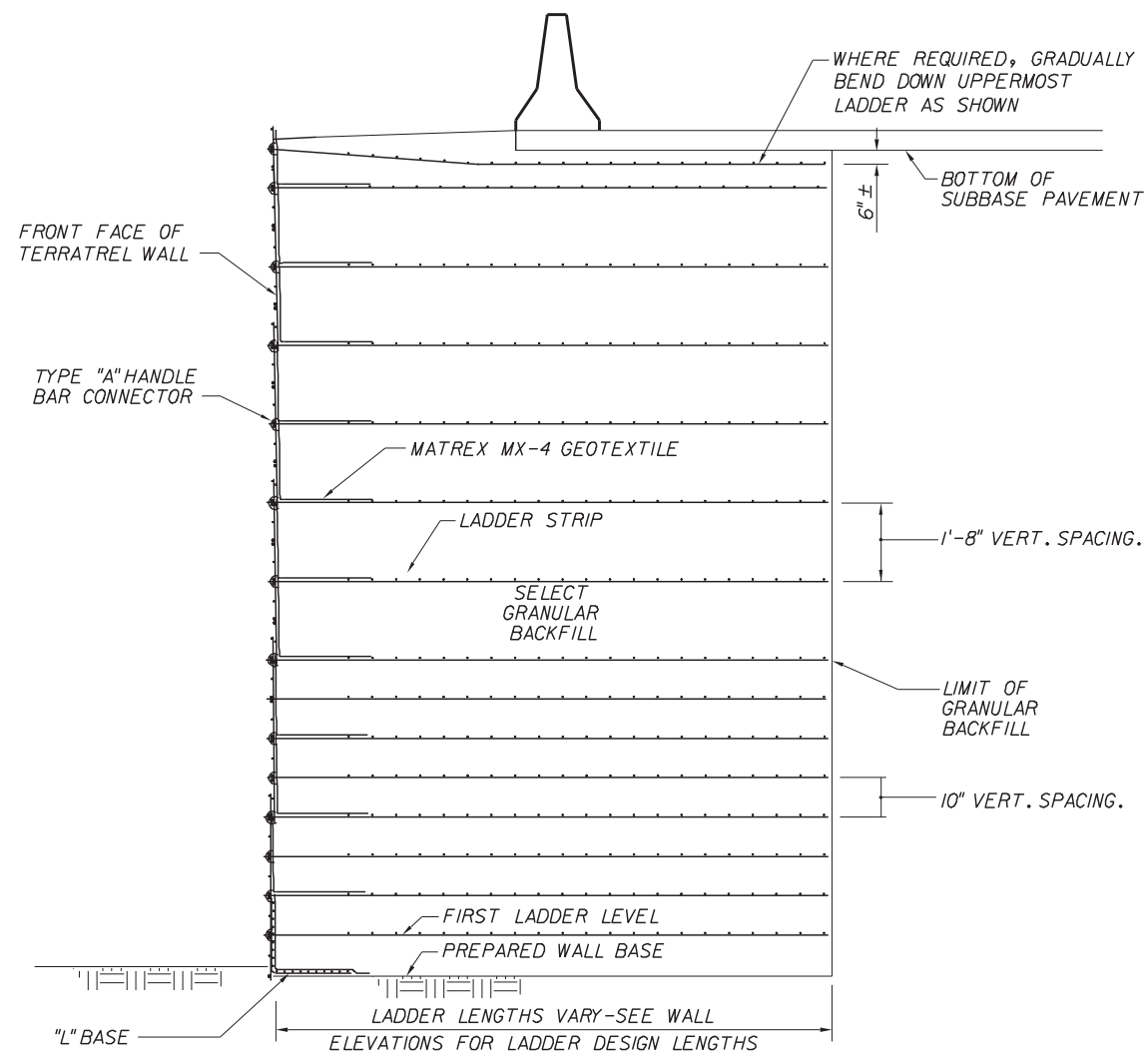
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TERRATREL WIRE WALL



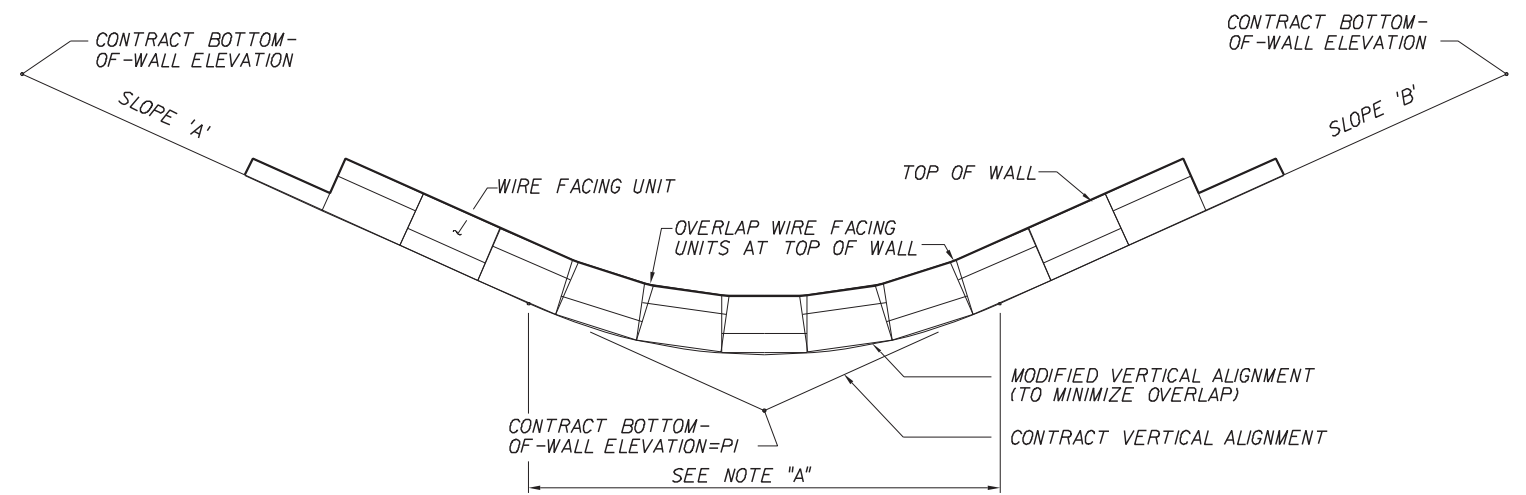
TYPE A HANDLE BAR CONNECTION IN PERSPECTIVE

TERRATREL TYPE A CONNECTION DETAILS

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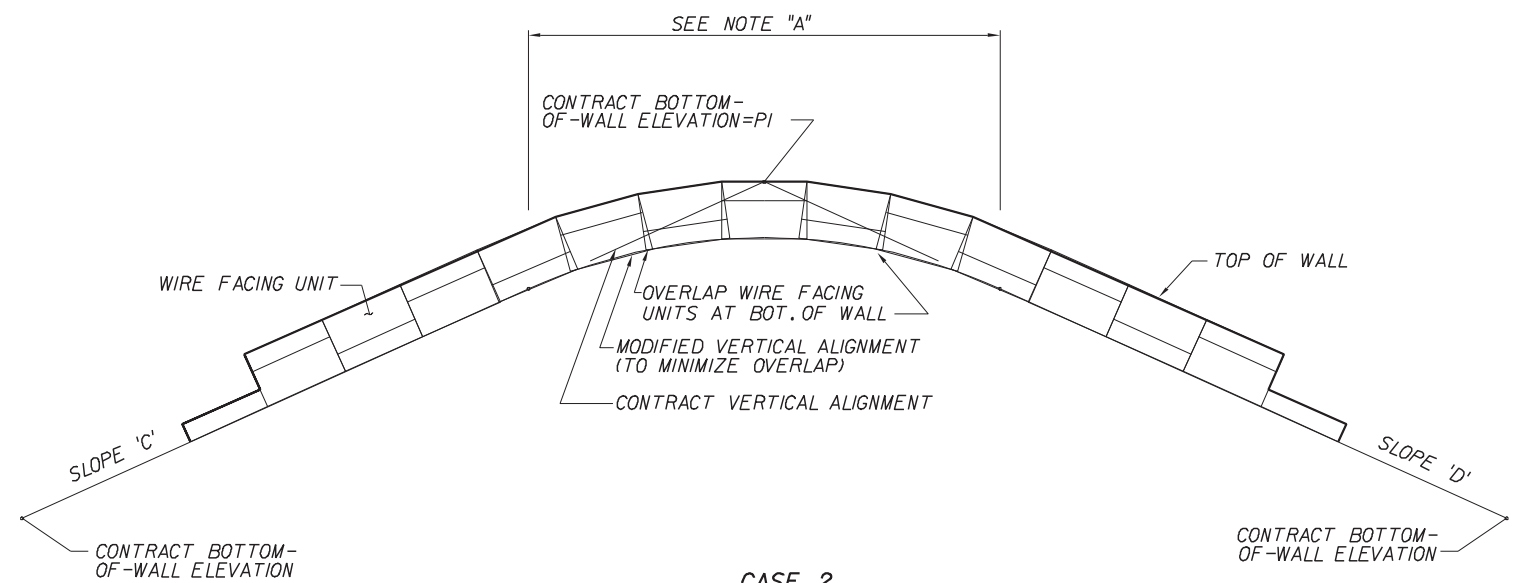


TYPICAL WALL SECTION



CASE 1

NOTE "A"
WALL LIMITS WHERE BOTTOM OF WALL ELEVATIONS WERE MODIFIED TO MINIMIZE PANEL OVERLAP



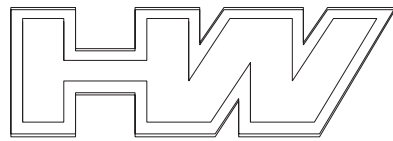
CASE 2

VERTICAL ALIGNMENT DIAGRAMS

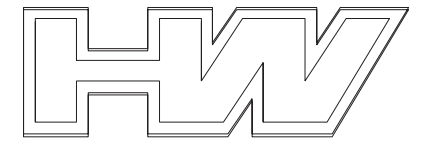
(SLOPES HAVE BEEN SHOWN EXAGGERATED FOR CLARITY)
ADDING THE CURVES TO THE VERTICAL ALIGNMENT IS OPTIONAL, AND WHEN USED, MAY ELIMINATE OVERLAPPING FOR LOW WALLS (10 TO 15 FT. IN HEIGHT) WITH SMALL CHANGES IN SLOPE UP TO 3%.

THIS SYSTEM SHALL BE USED IN ALL ENVIRONMENTS.

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HILFIKER MSE WELDED WIRE WALL SYSTEM



GENERAL NOTES

DESIGN CRITERIA

- THE ATTACHED DETAILS ARE BASED ON THE ASSUMPTIONS THAT THE MATERIAL WITHIN THE REINFORCED VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED COMPONENTS MEET THE GOVERNING AGENCIES SPECIFICATION FOR MECHANICALLY STABILIZED EARTH STRUCTURES
- MINIMUM DESIGN PARAMETERS
REFERENCE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF THE INTERNAL FRICTION ANGLE, ϕ , THE COHESION, c , AND THE UNIT WEIGHT, γ , SHALL BE PROVIDED IN THE SHOP DRAWINGS.

EXTERNAL STABILITY
OVERTURNING ≥ 2.0
SLIDING ≥ 1.5
BEARING PRESSURE ≥ 2.5

OVERALL STABILITY ≥ 1.5
INTERNAL STABILITY
PULLOUT ≥ 1.5
STEEL YIELD STRESS = $0.47 F_y$
SERVICE LIFE = 75 YEARS
LIVE LOAD SURCHARGE = 250 PSF
- THE MAXIMUM APPLIED BEARING PRESSURE AT THE INTERFACE OF THE FOUNDATION AND SELECT BACKFILL MATERIAL IS SHOWN ON THE PLANS. THE BEARING PRESSURE SHOWN IS THE MAXIMUM FOR THE GIVEN BASE MAT LENGTH. IT IS THE RESPONSIBILITY OF OTHERS TO DETERMINE THAT THE BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
- ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED VOLUME AS DETERMINED BY THE ENGINEER SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL AS DIRECTED BY THE ENGINEER.
- THE DESIGN CONTAINED ON THESE DRAWINGS ARE BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, T&B STRUCTURAL SYSTEMS IS RESPONSIBLE FOR THE INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY, INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

WALL CONSTRUCTION

- WALLS FOUNDED ON CURVES SHALL HAVE THEIR PANELS DIMENSIONED AS A SERIES OF SHORT CORDS (AS DIMENSIONED) IN ORDER TO MATCH THE REQUIRED WALL RADIUS.
- FOR LOCATION AND ALIGNMENT OF THE MSE STRUCTURES REFERENCE THE RETAINING WALL CONTROL PLANS.
- IF MANHOLE AND DROP INLETS ARE REQUIRED, THEY SHALL BE LOCATED AS SHOWN ON THE RETAINING WALL ELEVATION DRAWINGS.
- IF PILES ARE LOCATED WITHIN THE REINFORCED VOLUME THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE WALL UNLESS AN ALTERNATE METHOD IS USED TO ISOLATE THE COLUMNS FROM THE REINFORCED VOLUME AS APPROVED BY THE ENGINEER.
- BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 548 TO A LEVEL 2" (PLUS OR MINUS) ABOVE THE ELEVATION OF THE SOIL REINFORCING ELEMENT. NO SOIL REINFORCEMENT SHALL BE ATTACHED TO ANY PANEL BEFORE THE BACKFILL IS PLACED AT THE REQUIRED ELEVATION AND IS COMPACTED.
- STRUCTURES GREATER THAN 20 FEET SHALL HAVE THE FINISHED GRADE PLACED AND COMPACTED AT THE FRONT FACE OF THE STRUCTURE BEFORE THE STRUCTURE HEIGHT EXCEEDS 20 FEET. THE FINISH GRADE SHALL BE COMPACTED TO 95 PERCENT OF AASHTO T-180 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ANY GUARDRAIL POSTS PRIOR TO PLACING THE TOP ROW OF SOIL REINFORCEMENT. THE POST SPACING SHALL BE ADJUSTED TO AVOID CONFLICTS WITH THE LONGITUDINAL SOIL REINFORCING WIRE. CUTTING OF THE LONGITUDINAL WIRE SHALL BE ALLOWED ONLY AS DIRECTED BY THE ENGINEER.
- IF EXISTING OR FUTURE STRUCTURES ARE TO BE PLACED IN THE REINFORCED VOLUME THAT INTERFERE WITH THE PROPER PLACEMENT OF THE SOIL REINFORCEMENT THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR A COURSE OF ACTION.
- THE CAP MAT SHALL BE PLACED AS CLOSE TO THE TOP OF WALL LOCATION AS POSSIBLE THE REMAINING FACE PANEL ABOVE THE CAP MAT MAY BE CUT FREE
- FOR OTHER INFORMATION PERTAINING TO THE CONSTRUCTION OF THE HILFIKER RETAINING WALL PLEASE REFER TO T&B STRUCTURAL SYSTEMS ERECTION MANUAL.
- IT IS THE RESPONSIBILITY OF THE THE CONTRACTOR TO DEFLECT THE TOP CAP MAT OF THE SOIL REINFORCEMENT DOWNWARD SO AS TO NOT CONFLICT WITH ROADWAY MIXING OPERATIONS AND/OR ROADWAY CONSTRUCTION OPERATIONS. ANY SOIL REINFORCING MATERIAL THAT IS DAMAGED SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES

- NOMINAL SOIL REINFORCING GRID LENGTH
THE WELDED WIRE MESH IS MANUFACTURED IN LENGTHS CORRESPONDING TO THE DIMENSION "B" AS GIVEN IN THE RETAINING WALL ELEVATIONS. THE ACTUAL LENGTH FROM THE FRONT FACE OF THE PANEL TO THE TAIL OF THE SOIL REINFORCING GRID IS PLUS 2'-4". THE FOUNDATION SHALL BE EXCAVATED TO AN EXTENT OF "B" PLUS 6".
- THE FOLLOWING MATERIALS ARE SUPPLIED BY T&B STRUCTURAL SYSTEMS
 - WELDED WIRE FACING PANEL
 - SOIL REINFORCING GRIDS
 - CAP MATS
 - CONNECTION PINS
 - SYNTHETIC INDUSTRIES GEOTEX 40NONWOVEN GEOTEXTILE FILTER FABRIC
 ANY OTHER MATERIAL REQUIRED TO BUILD THE MSE STRUCTURES ACCORDING TO THE GOVERNING SPECIFICATION SHALL BE SUPPLIED BY THE CONTRACTOR.
- T&B STRUCTURAL SYSTEM SUPPLIES MECHANICALLY STABILIZED EARTH STRUCTURAL COMPONENTS FOR USE WITH THE HILFIKER RETAINING WALL SYSTEMS FOR THE STRUCTURES DETAILED HEREIN. THE ERECTION MANUAL PROVIDED BY T&B STRUCTURAL SYSTEMS IS A GENERAL GUIDELINE FOR ERECTING THE HILFIKER RETAINING WALL SYSTEM. ALL QUALITY CONTROL PROCEDURES, STAGING PROCEDURES, MATERIAL HANDLING, AND SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE OBLIGATION TO CONSTRUCT THE RETAINING WALL ACCORDING TO THE PROJECT PLANS AND SPECIFICATIONS AND ALL LAWS OF THE GOVERNING STATE.

ENGLISH

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS

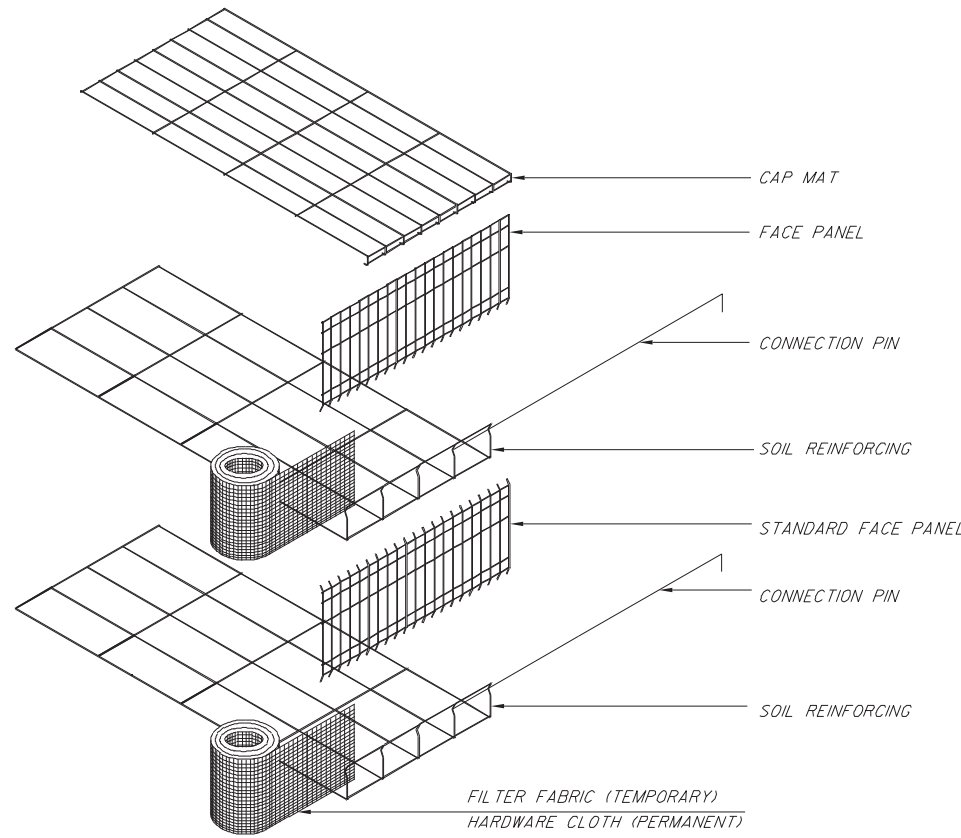
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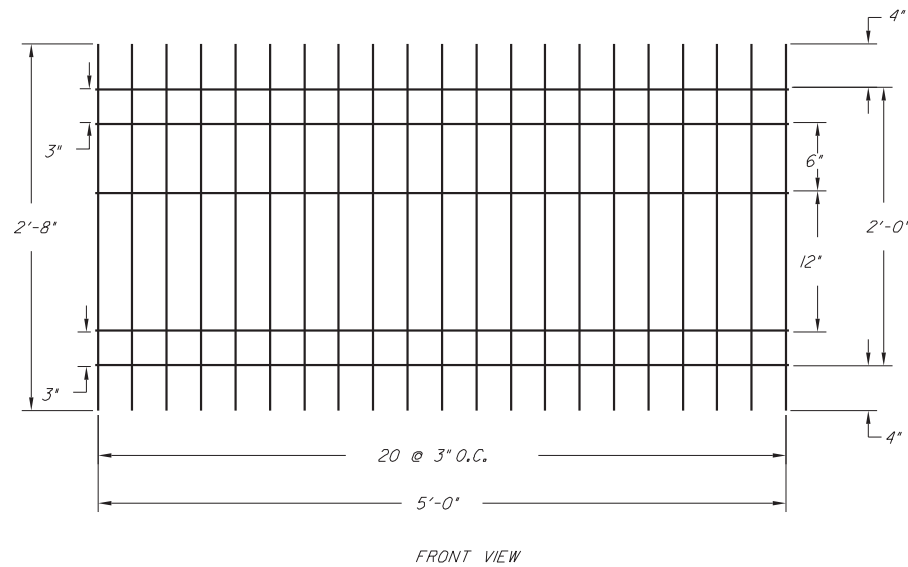
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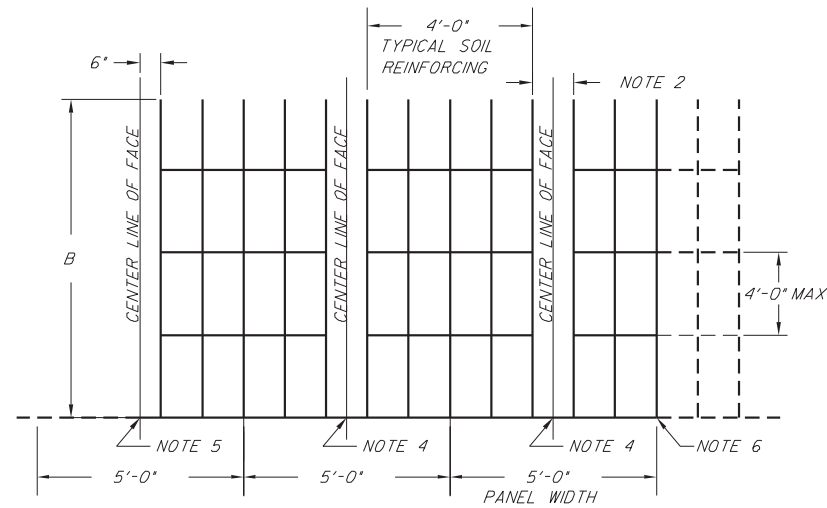
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
RETAINING WALL SYSTEM HILFIKER WELDED WIRE WALL					
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A WELDED WIRE WALL COMPONENT ISOMETRIC

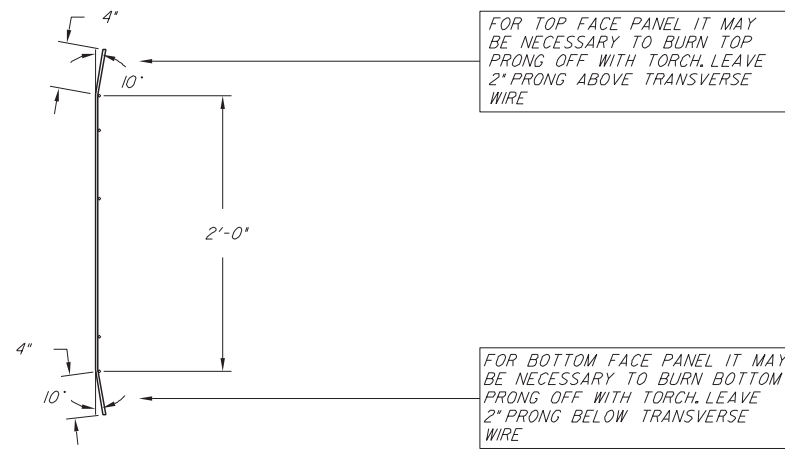


B FACE PANEL DETAIL
MINIMUM WIRE SIZE IS W4.5 BOTH DIRECTIONS



- NOTE:**
1. SOIL REINFORCING MAT TO BE PLACED ON PREPARED SURFACE
 2. 12" SPACE BETWEEN SOIL REINFORCING MAT U.N.O.
 3. PLACE FACE PANEL AT MIDPOINT OF SOIL REINFORCING MAT
 4. BUTT FACE PANEL TOGETHER AND SECURE WITH A HOG RING
 5. AT START OF WALL PLACE SOIL MAT AND TRIM EXCESS FACE PANEL
 6. AT END OF WALL PLACE SOIL MAT AND FACE PANEL AND TRIM EXCESS

C SOIL REINFORCING LAYOUT PLAN

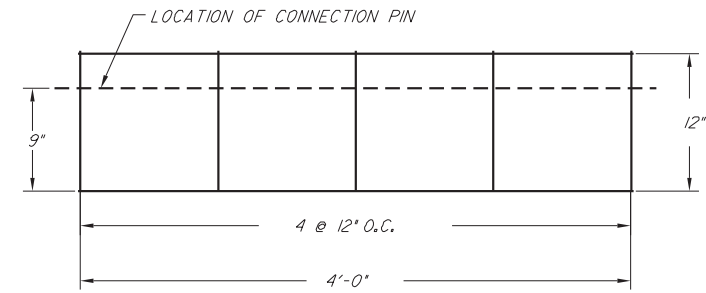


FOR TOP FACE PANEL IT MAY BE NECESSARY TO BURN TOP PRONG OFF WITH TORCH LEAVE 2" PRONG ABOVE TRANSVERSE WIRE

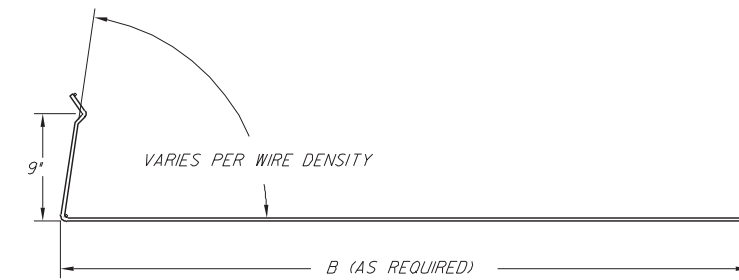
FOR BOTTOM FACE PANEL IT MAY BE NECESSARY TO BURN BOTTOM PRONG OFF WITH TORCH LEAVE 2" PRONG BELOW TRANSVERSE WIRE

- NOTE:**
1. BOTTOM FACE PANEL MAY NEED TO HAVE PRONGS BURNED OFF IN FIELD
 2. BURN PRONGS OFF 2" FROM TRANSVERSE WIRE
 3. GALVANIZED FACE PANELS REQUIRE EXPOSED BLACK STEEL TO BE COATED WITH RICH ZINC PAINT OR APPROVED EQUAL
 4. INTERSECTION OF ADJACENT FACE PANEL SECURE VERTICAL WIRES TOGETHER AT INTERFACE

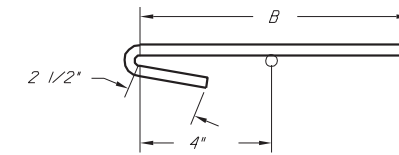
D FACE PANEL SECTION



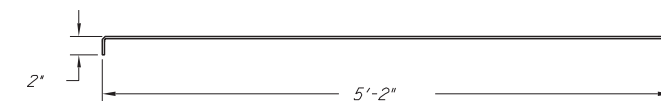
E SOIL REINFORCEMENT FRONT ELEVATION



F SOIL REINFORCEMENT SIDE ELEVATION
MINIMUM WIRE SIZE IS W4.5



G CAP MAT DETAIL



H CONNECTION PIN DETAIL
MINIMUM WIRE SIZE IS W4.5

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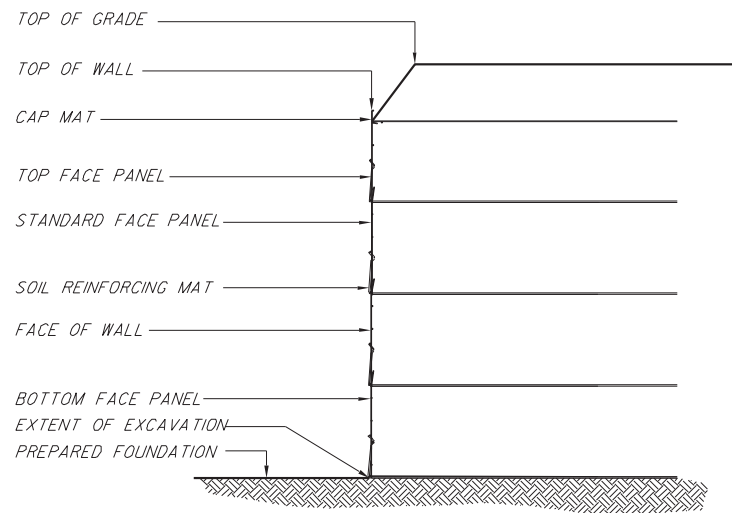
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HILFIKER RETAINING WALL

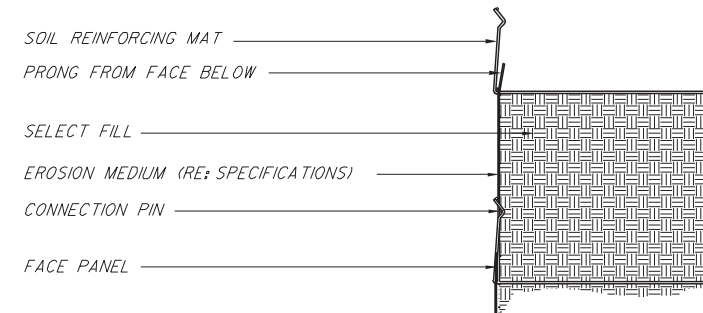
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
HILFIKER WELDED WIRE WALL

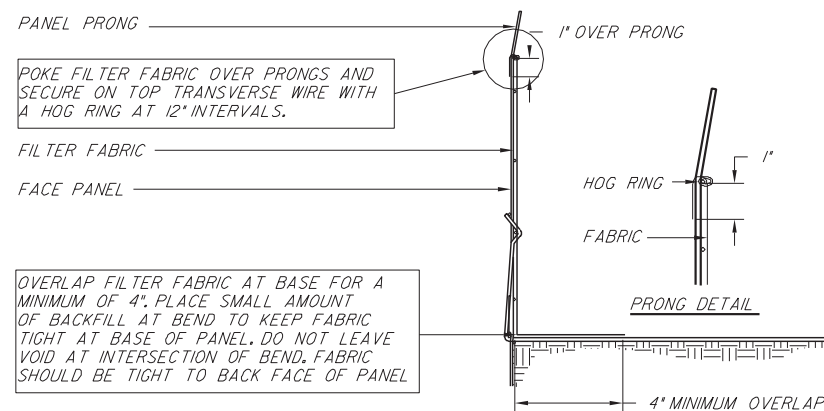
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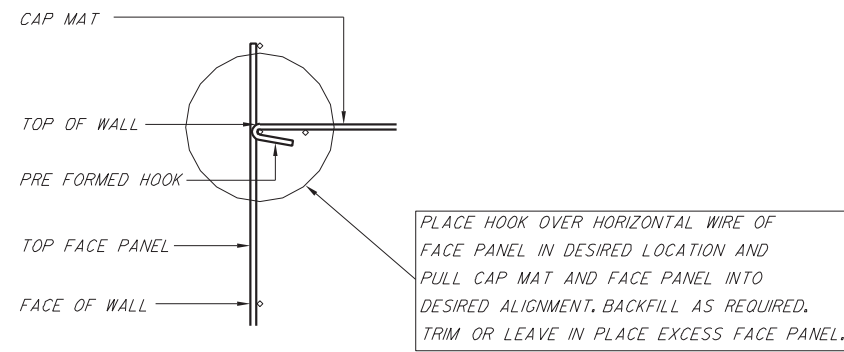
A TYPICAL SECTION WELDED WIRE WALL



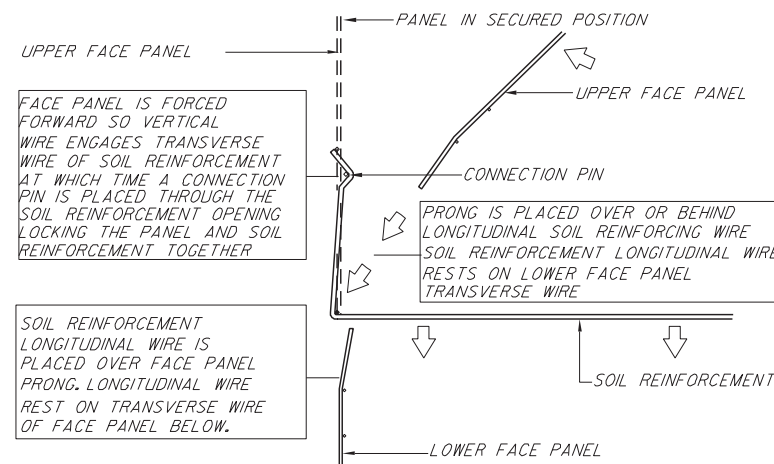
B WELDED WIRE WALL LIFT SECTION



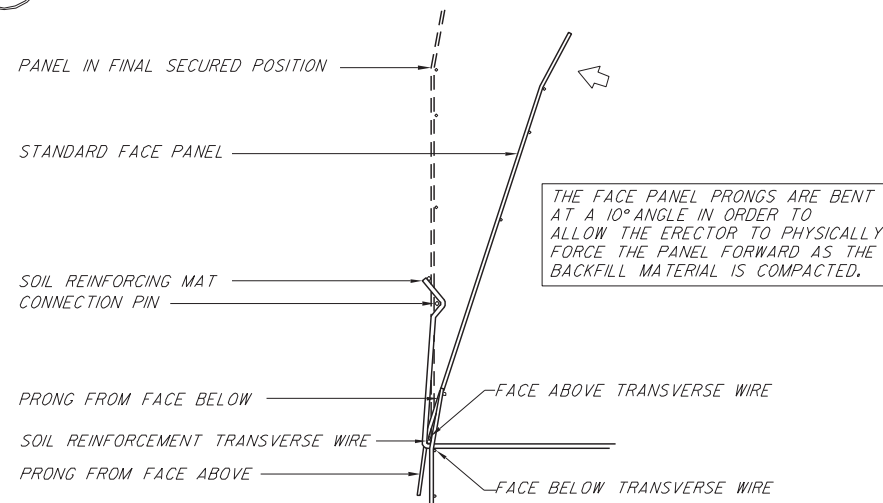
C FILTER FABRIC PLACEMENT



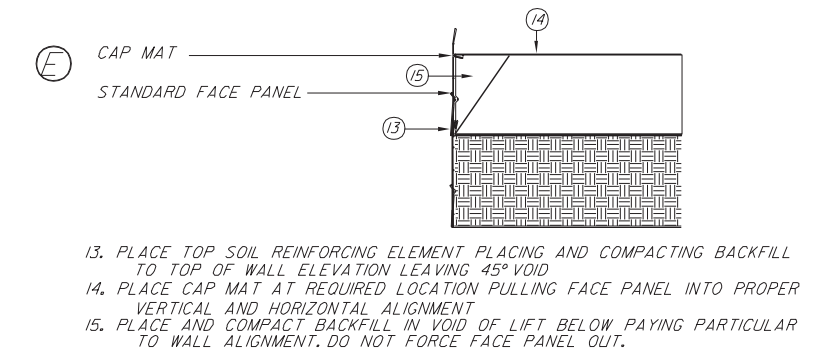
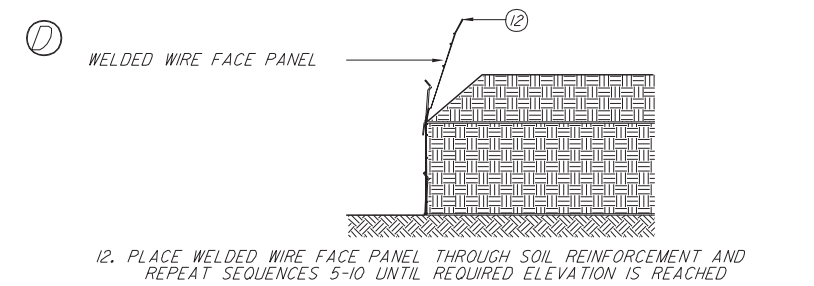
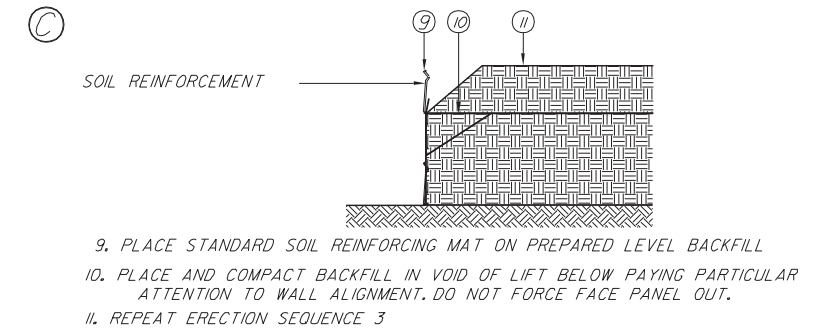
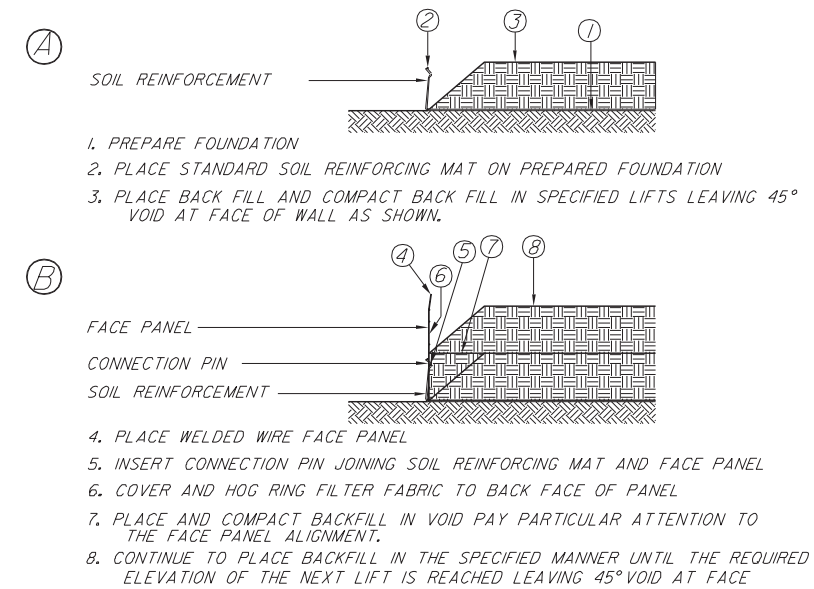
D CAP MAT CONNECTION DETAIL



E SOIL REINFORCEMENT CONNECTION SEQUENCE



F SOIL REINFORCEMENT CONNECTION SEQUENCE



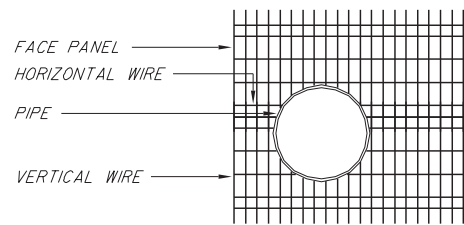
G CONSTRUCTION SEQUENCE

HILFIKER PRODUCTS ARE COVERED BY UNITED STATES AND FOREIGN PATENTS AND PATENTS PENDING. MATERIAL CONTAINED HERE WITHIN IS PROPRIETARY PROPERTY OF T&B STRUCTURAL SYSTEMS AND MAY NOT BE REPRODUCED OR TRANSMITTED.
 US. PATENTS 4,260,296/4,324,508/4,343,572/4,616,959/4,661,023/4,929,125/
 4,993,819/4,329,089/4,111,686/4,505,621/5,484,235/5,702,208/5,722,199/O.P.

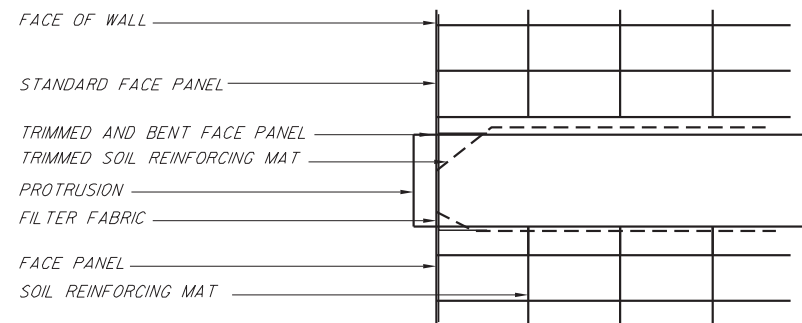
THE DESIGN CONTAINED IN THIS DRAWING IS BASED ON INFORMATION SUPPLIED BY THE FDOT CONSULTANT. TBSS IS CERTIFYING THE INTERNAL STABILITY OF THE MSE MASS ONLY. ALL EXTERNAL STABILITY REQUIREMENTS ARE THE RESPONSIBILITY OF THE OWNER.

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 ENGINEERED STRUCTURES
 637 WEST HURST BLVD.
 HURST, TEXAS 76053
 888-280-9858

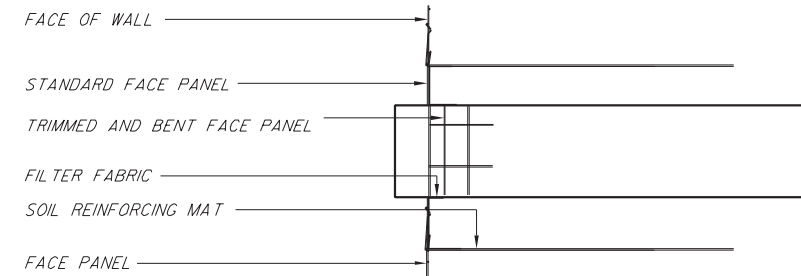
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM HILFIKER WELDED WIRE WALL				
Designed By	Names	Dates	Approved By	
Drawn By	TPT		State Structures Design Engineer	
Checked By	TBW		Revision	Sheet No. Index No.
			00	3 of 4 5120



NOTE:
TRIM PROTRUSION AREA FROM FACE PANEL BY CUTTING HORIZONTAL WIRE BETWEEN EACH VERTICAL WIRE. BEND WIRES BACK INTO MSE MASS AND AS CLOSE TO PROTRUSION AS POSSIBLE. APPLY FILTER FABRIC OVER AND AROUND PROTRUSION MAKING SURE FACE PANEL IS COVERED. MAKE SURE THAT ALL GAPS BETWEEN FACE AND PROTRUSION ARE COVERED WITH FILTER FABRIC. IF PROTRUSION INTERFERES WITH SOIL REINFORCING MAT CUT TRANSVERSE WIRES OF MAT AND BEND LONGITUDINAL WIRE TO PASS PROTRUSION AND CONFORM TO THE PROTRUSIONS SHAPE.

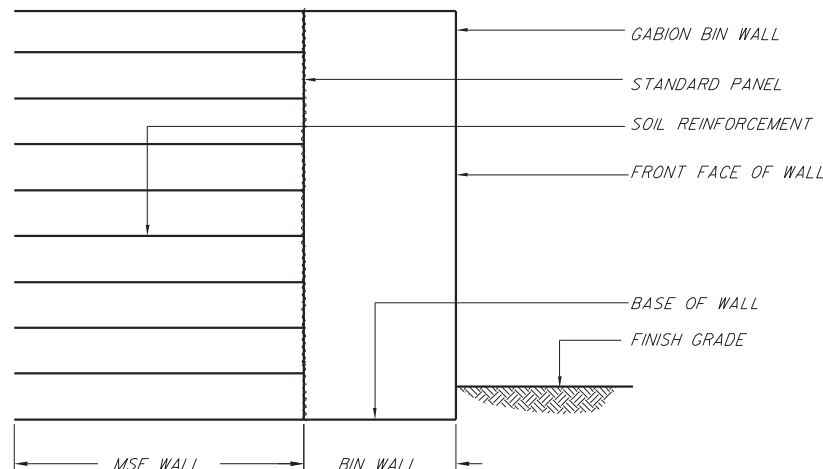


NOTE:
TRIM PROTRUSION AREA FROM FACE PANEL BY CUTTING HORIZONTAL WIRE BETWEEN EACH VERTICAL WIRE. BEND WIRES BACK INTO MSE MASS AND AS CLOSE TO PROTRUSION AS POSSIBLE. APPLY FILTER FABRIC OVER AND AROUND PROTRUSION MAKING SURE FACE PANEL IS COVERED. MAKE SURE THAT ALL GAPS BETWEEN FACE AND PROTRUSION ARE COVERED WITH FILTER FABRIC. IF PROTRUSION INTERFERES WITH SOIL REINFORCING MAT CUT TRANSVERSE WIRES OF MAT AND BEND LONGITUDINAL WIRE TO PASS PROTRUSION AND CONFORM TO THE PROTRUSIONS SHAPE.

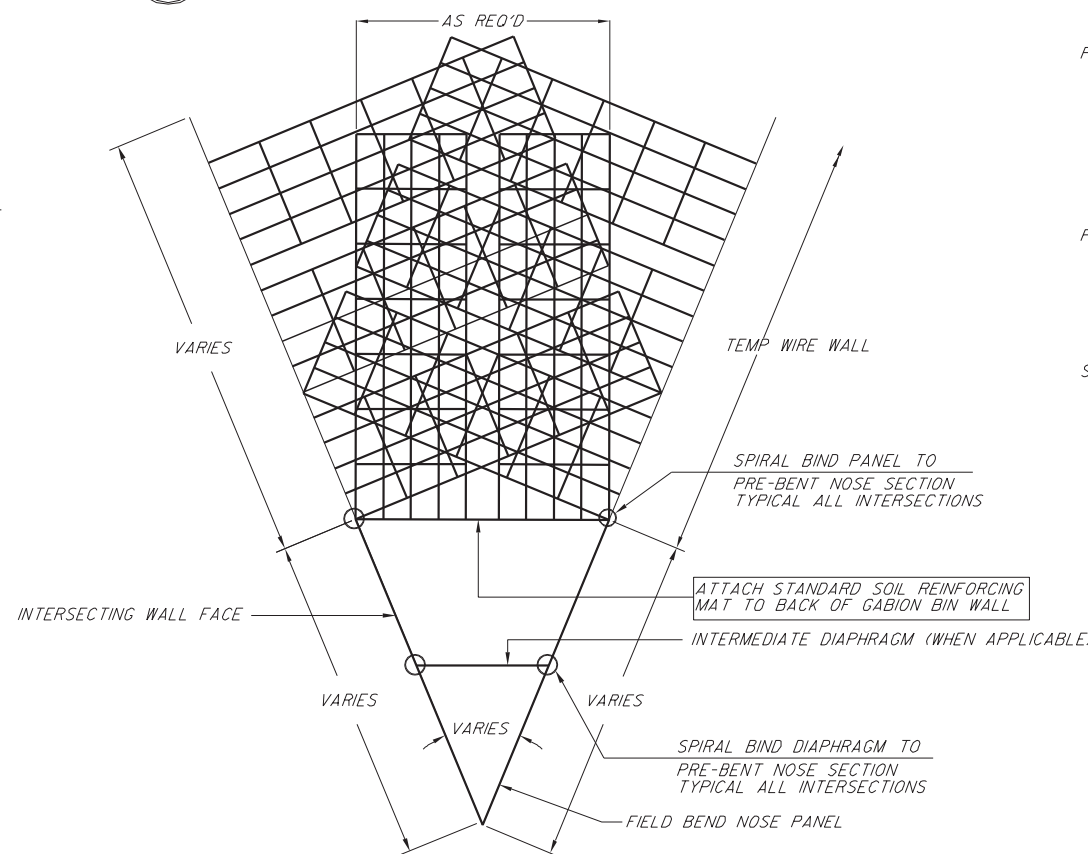


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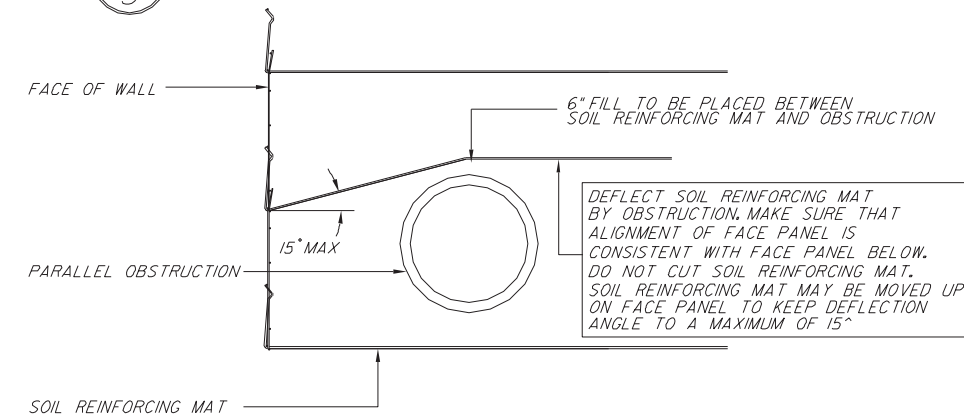
A TYPICAL ELEVATION THROUGH PENETRATION



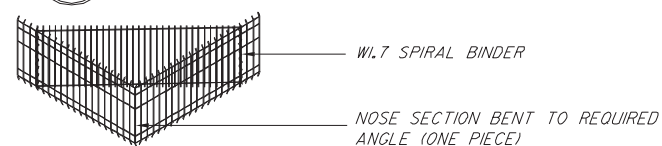
D TYPICAL PLAN VIEW THROUGH PENETRATION



F TYPICAL SECTION THROUGH PENETRATION



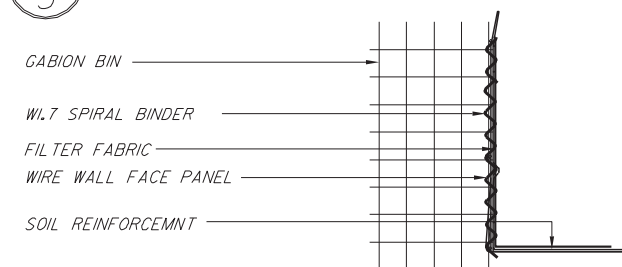
B TYPICAL SECTION THROUGH BIN



NOTE: 12 GAUGE GALVAINZED STEEL HOG RING MAY BE SUBSTITUED FOR SPIRAL BINDER. HOG RINGS TO BE ATTACHED AT 3" CENTERS TOP TO BOTTOM.

C ISOMETRIC OF BIN GABION NOSE SECTION

G SECTION AT PARALLEL OBSTRUCTION



NOTE: 12 GAUGE GALVAINZED STEEL HOG RING MAY BE SUBSTITUED FOR SPIRAL BINDER. HOG RINGS TO BE ATTACHED AT 3" CENTERS

H SPIRAL BINDER CONNECTION

E TYPICAL PLAN VIEW AT BIN

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ENGINEERED STRUCTURES
637 WEST HURST BLVD.
HURST, TEXAS 76053
888-280-9858

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
HILFIKER WELDED WIRE WALL

Designed By		Names	Dates	Approved By	
Drawn By	TPT				State Structures Design Engineer
Checked By	TBW			00	Revision
				4 of 4	Sheet No.
				5120	Index No.

\$\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$\$
\$\$\$\$\$\$SYTIME\$\$\$\$\$\$

**CONSTRUCTION NOTES FOR THE PLACEMENT OF TENSAR GEOGRIDS AND BACKFILL
SOILS FOR TENSAR WWF TEMPORARY RETAINING WALL**

1.0 MATERIALS

1.1 GEOGRID REINFORCING SHALL BE TENSAR UNIAXIAL GEOGRID AND BIAXIAL GEOGRIDS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.

1.2 BODKIN BARS SHALL BE 1/2"x1/4" HDPE BARS MANUFACTURED BY THE TENSAR CORPORATION, MORROW, GEORGIA.

1.3 GEOTEXTILE FILTER FABRIC T6600 SHALL BE MANUFACTURED BY EVERGREEN TECHNOLOGIES, INC., EVERGREEN, ALABAMA OR EQUIVALENT AS APPROVED BY THE ENGINEER.

1.4 WALL FACING

1.4.J FACING SHALL BE PRE-FABRICATED BLACK STEEL WELDED WIRE FORMS (WWF) 4" x 4" - W4.0 x W4.0 AND GEOTEXTILE FABRIC. WIRE FORM GEOMETRY SHALL BE AS DETAILED IN THE CONSTRUCTION DRAWINGS.

2.0 TECHNICAL REQUIREMENTS

2.1 FILL MATERIALS SHALL BE PLACED FROM THE BACK OF THE WELDED WIRE FACING FORMS TOWARDS THE ENDS OF THE GEOGRID TO ENSURE FURTHER TENSIONING.

2.2 WELDED WIRE FACING SHALL BE MONITORED DURING FILL PLACEMENT AND COMPACTION. COMPACTION EQUIPMENT AND OPERATION PROCEDURES MAY HAVE TO BE MODIFIED TO PREVENT EXCESSIVE DEFORMATION OF THE FLEXIBLE WELDED WIRE FACING.

2.3 TIE WIRES OR HOG RINGS MAY BE REQUIRED IF WWF MOVES DURING BACKFILL OPERATIONS.

3.0 TENSAR GEOGRID PLACEMENT

3.1 TENSAR GEOGRID SHALL BE PLACED AT THE SAME LOCATIONS AND ELEVATIONS SHOWN ON THE SHOP DRAWINGS.

3.2 TENSAR GEOGRID REINFORCEMENT SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTH(S). THE BODKIN CONNECTION SHALL NOT BE UTILIZED UNLESS PRE-APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.

3.2.1 IF PRE-APPROVED, TENSAR UNIAXIAL GEOGRIDS MAY BE SPLICED UTILIZING THE BODKIN CONNECTION DETAIL. NO MORE THAN ONE SPLICE SHALL BE ALLOWED IN ANY ONE LENGTH OF REINFORCING AND NO SPLICES SHALL BE ALLOWED FOR GEOGRIDS LESS THAN 6 feet IN LENGTH (EACH). THE BODKIN CONNECTION SHALL NOT BE PLACED LESS THAN 6 feet BELOW PLANNED FINISHED GRADE, NOR HORIZONTALLY NOR VERTICALLY ADJACENT TO ANOTHER BODKIN CONNECTION.

3.3 PRIOR TO PLACING FILL, THE GEOGRID MATERIALS SHALL BE PLACED TO LAY FLAT AND PULLED TAUT TO REMOVE ANY SLACK IN THE GEOGRIDS.

3.4 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL THICKNESS OF 6 inches IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND/OR THE GEOGRID.

3.5 RUBBER-TIRED VEHICLES MAY PASS OVER THE GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

3.6 TENSAR UNIAXIAL GEOGRIDS SHALL BE ROLLED OUT WITH THE LONG AXIS OF THE APERTURES (MACHINE DIRECTION) PERPENDICULAR TO THE WELDED WIRE FORM FACE. TENSAR BIAXIAL GEOGRIDS SHALL BE ROLLED OUT WITH THE MACHINE DIRECTION BAR PARALLEL TO THE WELDED WIRE FORM FACE.

3.6.1 UNIAXIAL (UX) GEOGRIDS SHALL BE CUT NEXT TO THE CROSS MACHINE DIRECTION BAR. UX GEOGRIDS SHALL BE UNROLLED PERPENDICULAR TO THE WALL FACE.

3.6.2 BIAXIAL GEOGRIDS SHALL BE CUT NEXT TO THE MACHINE DIRECTION BAR. BX GEOGRIDS SHALL BE UNROLLED PARALLEL TO THE WALL FACE

3.7 GEOGRIDS SHALL BE CUT AND PLACED SO THAT A TRANSVERSE BAR IS EXTENDED TO THE BACK FACE OF THE WELDED WIRE FORM.

3.8 A MINIMUM OF 3 inches OF FILL MATERIAL SHALL BE REQUIRED BETWEEN LAYERS OF BIAXIAL, UNIAXIAL AND FILTER FABRIC, UNLESS OTHERWISE SHOWN.

4.0 CHANGES TO GEOGRID LAYOUT OR PLACEMENT

4.1 NO CHANGES TO THE TENSAR GEOGRID LAYOUT, INCLUDING, BUT NOT LIMITED TO, LENGTH, GEOGRID TYPE, OR ELEVATION, SHALL BE MADE WITHOUT THE EXPRESSED PRIOR WRITTEN CONSENT OF TENSAR EARTH TECHNOLOGIES, INC.

5.0 DRAINAGE

5.1 THE TENSAR REINFORCED WALL HAS BEEN DESIGNED ON THE ASSUMPTION THAT THE REINFORCED BACKFILL MATERIAL SHALL BE FREE OF SUBSURFACE DRAINAGE OF WATER (SEEPAGE).

6.0 DESIGN PARAMETERS

6.1 SOIL PARAMETERS

SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE, APPARENT COHESION AND UNIT WEIGHT SHALL BE PROVIDED IN THE SHOP DRAWINGS.

6.1.1 DESIGN

THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS. ON THE BASIS OF THIS INFORMATION, THE TENSAR CORPORATION IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.

6.2 FACTORS OF SAFETY:

6.2.1 INTERNAL STABILITY:
 MAXIMUM GEOGRID DESIGN STRENGTH = 0.29 ULT
 MINIMUM FACTOR OF SAFETY FOR GEOGRID PULLOUT = 1.5
 MINIMUM FACTOR OF SAFETY FOR SLIDING AT LOWEST GEOGRID = 1.5
 GEOGRID-SOIL INTERACTION COEFFICIENT = 0.8
 PERCENT COVERAGE OF GEOGRID = VARIES

6.2.2 EXTERNAL STABILITY:
 MINIMUM FACTOR OF SAFETY FOR SLIDING = 1.5
 MINIMUM FACTOR FOR SAFETY FOR OVERTURNING = 2.0
 EXTERNAL STABILITY IS THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR GLOBAL STABILITY. (SEE SECTION 7.5)

6.2.3 GLOBAL STABILITY:
 GLOBAL STABILITY IS THE RESPONSIBILITY OF OTHERS. TENSAR EARTH TECHNOLOGIES, INC. ACCEPTS NO LIABILITY OR RESPONSIBILITY FOR GLOBAL STABILITY. (SEE SECTION 7.5)

7.0 SPECIAL PROVISIONS

7.1 WALL ELEVATION VIEWS AND LOCATIONS AND GEOMETRY OF EXISTING STRUCTURES MUST BE VERIFIED BY THE CONTRACTOR BEFORE COMMENCEMENT OF SHOP DRAWINGS.

7.2 TENSAR EARTH TECHNOLOGIES, INC. ASSUMES NO LIABILITY FOR INTERPRETATION OR VERIFICATION OF SUBSURFACE CONDITIONS, SUITABILITY OF SOIL DESIGN PARAMETERS AND INTERPRETATION OF SUBSURFACE GROUNDWATER CONDITIONS.

7.3 ANY REVISIONS TO DESIGN PARAMETERS STATED ON CONTROL DRAWINGS OR STRUCTURE GEOMETRY SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

7.4 THIS DESIGN IS ONLY VALID FOR THE INTERNAL STABILITY OF THE PROPOSED TENSAR REINFORCED RETAINING WALLS AS SHOWN HEREIN.

7.5 BEARING CAPACITY, TOTAL SETTLEMENT, DIFFERENTIAL SETTLEMENT, AND THEIR EFFECTS ON THE TENSAR REINFORCED RETAINING WALL SYSTEM SHALL BE THE RESPONSIBILITY OF OTHERS

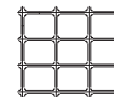
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

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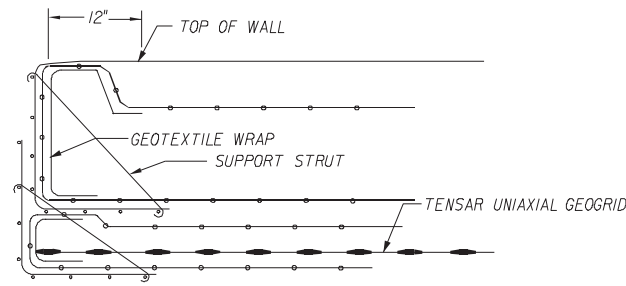
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EARTH TECHNOLOGIES, INC.**
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 (404) 250-1290

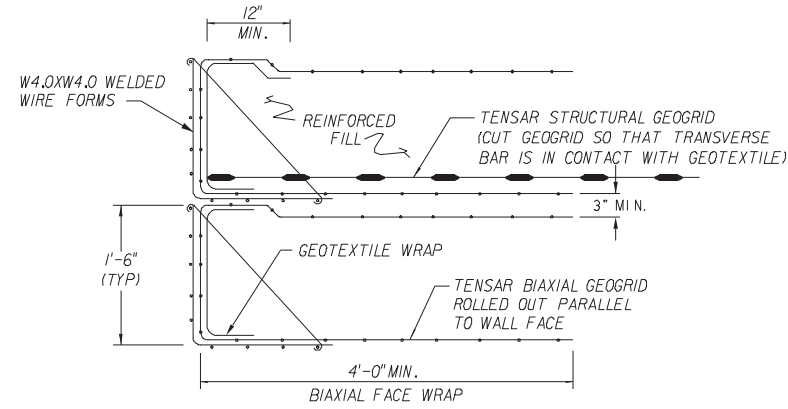


STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES TEMPORARY RETAINING WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	1 of 3	5125

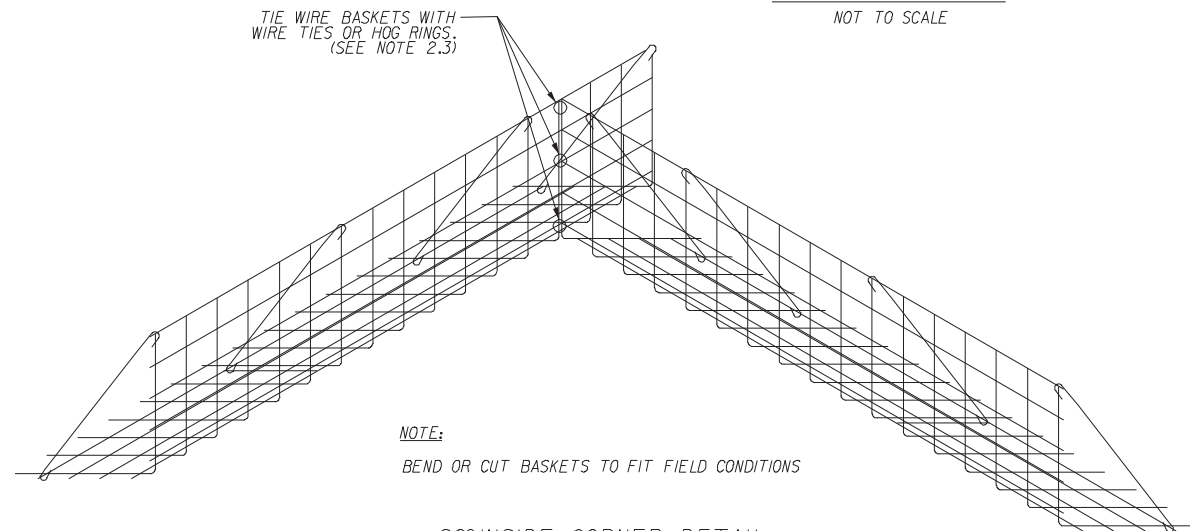


SET TOP MOST WIRE FORM INSIDE WIRE FORM BELOW TO FOLLOW GRADE.

TOP WIRE BASKET DETAIL
NOT TO SCALE

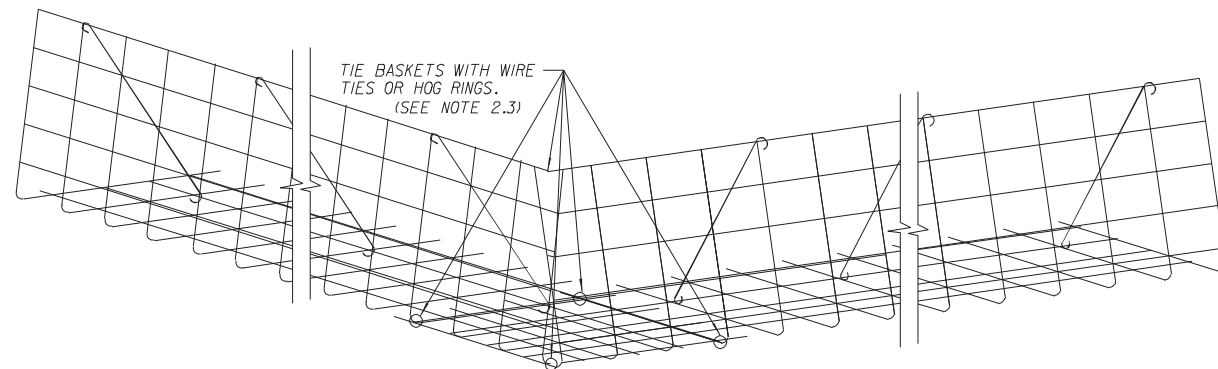


WALL FACE DETAIL
NOT TO SCALE



NOTE:
BEND OR CUT BASKETS TO FIT FIELD CONDITIONS

90° INSIDE CORNER DETAIL
NOT TO SCALE



NOTE:
BEND OR CUT BASKETS TO FIT FIELD CONDITIONS AND ENSURE THAT GEOTEXTILE FILTER FABRIC TG600 AND BIAxIAL GEOGRID OVERLAP 1'-0" MINIMUM.

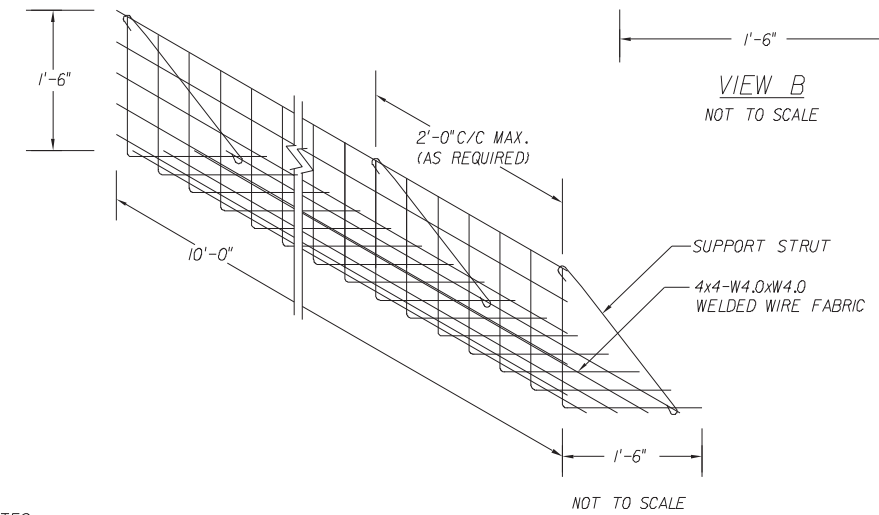
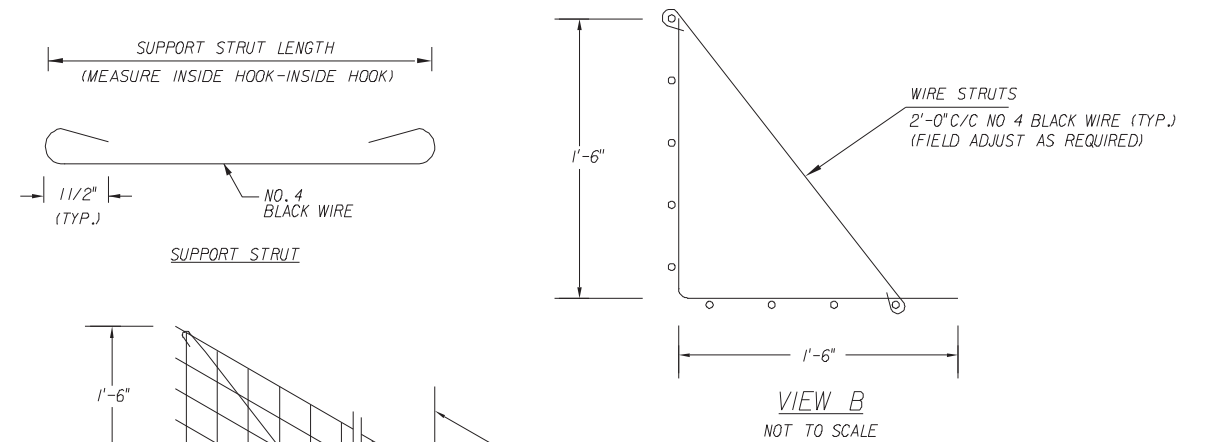
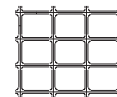
90° OUTSIDE CORNER DETAIL
NOT TO SCALE

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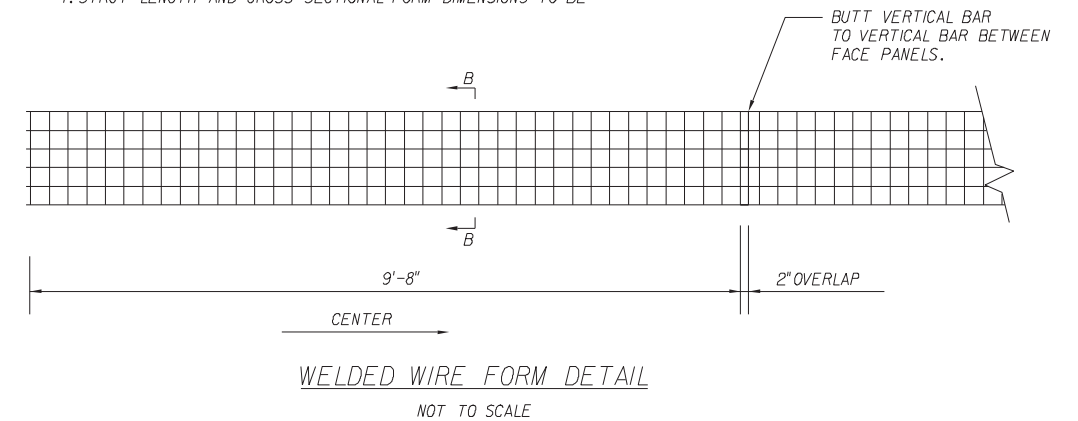
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NOTES:

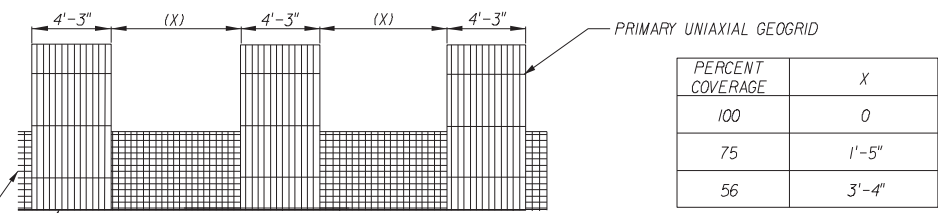
1. FACING TO CONSIST OF PREFABRICATED WWF 4x4-W4.0xW4.0 FORMS, PER ASTM A497.
2. ALL FORMS AND STRUTS WILL BE FABRICATED WITH NO. 4 BLACK WIRE.
3. OVERALL LENGTH OF WIRE FORMS IS 10'-0". EFFECTIVE CONSTRUCTED WIDTH IS 9'-8" WITH 2" OVER LAPPING AT ENDS.
4. STRUT LENGTH AND CROSS-SECTIONAL FORM DIMENSIONS TO BE



THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES TEMPORARY RETAINING WALL				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	2 of 3	5125

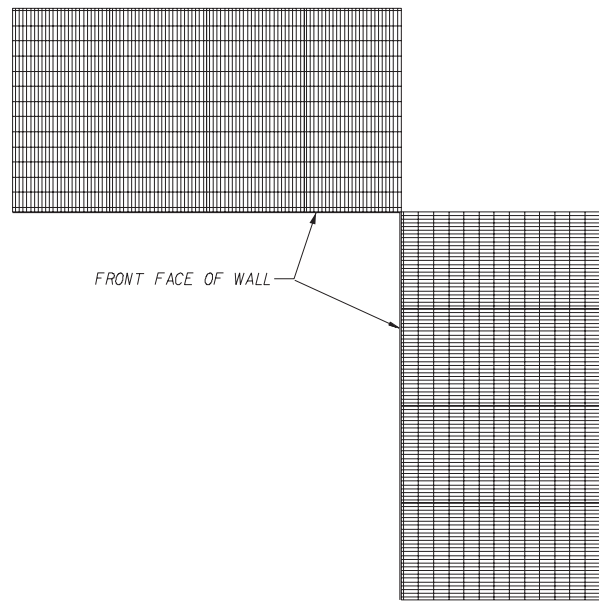
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\$\$\$\$\$\$SYTIME\$\$\$\$\$\$



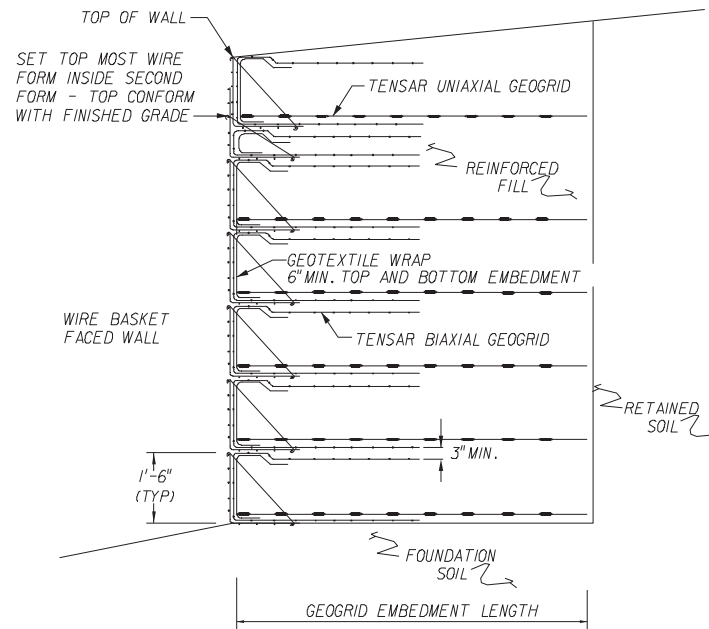
BIAxIAL (1/3 ROLL WIDTH) 4'-3" WIDE ROLLED OUT PARALLEL TO WALL FACE. BIAxIAL GEOGRID SHALL BE PROVIDED BETWEEN PRIMARY REINFORCEMENT ONLY WHEN 56% COVERAGE IS SPECIFIED.

NOTE:
ALTERNATE LAYERS OF UNIAXIAL PRIMARY REINFORCEMENT SHALL BE PLACED IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS PLACED WITH THE CENTERLINE OF THE GEOGRID IN ALIGNMENT WITH THE CENTERLINE OF THE SPACE BELOW.

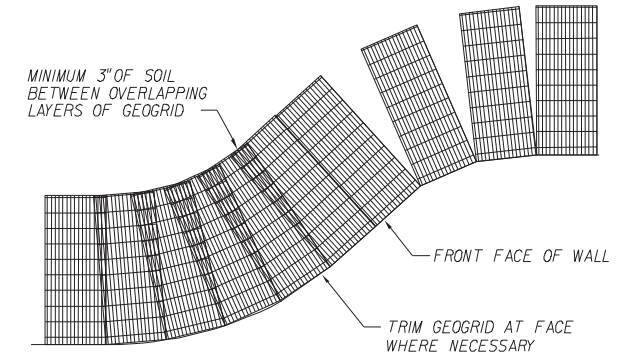
TYPICAL GEOGRID COVERAGE
NOT TO SCALE



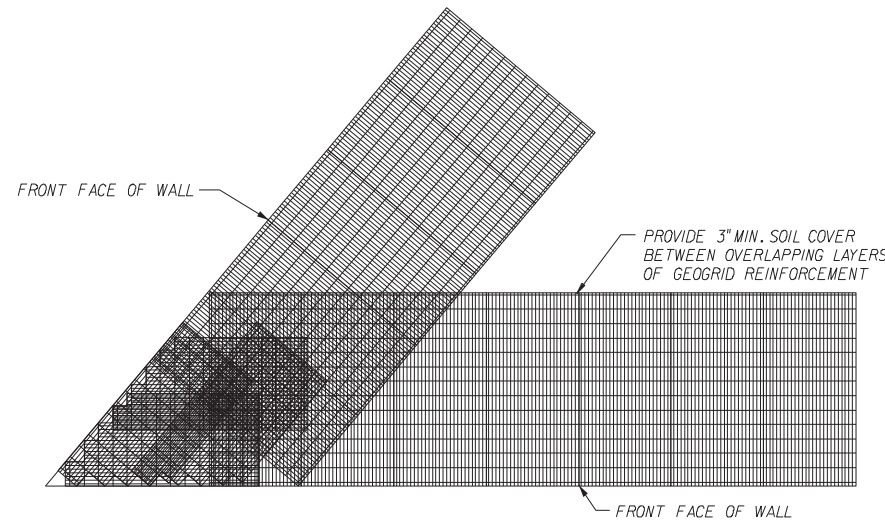
GEOGRID 90° INSIDE CORNER DETAIL
NOT TO SCALE



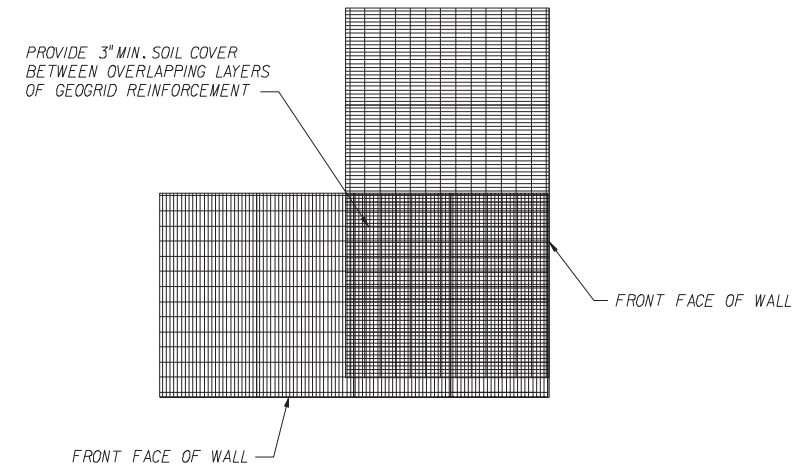
TYPICAL CROSS-SECTION
NOT TO SCALE



GEOGRID PLACEMENT ON CURVES
NOT TO SCALE



GEOGRID ACUTE CORNER DETAIL
NOT TO SCALE



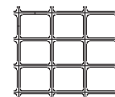
GEOGRID 90° OUTSIDE CORNER DETAIL
NOT TO SCALE

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Atlanta, GA 30328
(404) 250-1290



THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TENSAR EARTH TECHNOLOGIES TEMPORARY RETAINING WALL				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By		State Structures Design Engineer		
Drawn By	JMS 8/14/98	Revision	Sheet No.	Index No.
Checked By		00	3 of 3	5125

\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$
\$\$\$\$\$SYTIME\$\$\$\$\$



TC Mirafi Engineering Services, Inc.

365 SOUTH HOLLAND DRIVE, PENDERGRASS, GA 30567 TEL (706) 693-2226

CONSTRUCTION NOTES FOR THE PLACEMENT OF MIRAFI REINFORCEMENT AND BACKFILL SOILS FOR TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

1.0 DESIGN CRITERIA

1.1 SOIL PARAMETERS:
SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUE OF ϕ , C, AND γ SHALL BE PROVIDED IN THE SHOP DRAWINGS.

1.2 MINIMUM FACTOR OF SAFETY

1.2.J EXTERNAL STABILITY

SLIDING	1.5
OVERTURNING	2.0
BEARING CAPACITY	2.5

1.2.2 INTERNAL STABILITY

RUPTURE	1.5
PULLOUT	1.5

1.2.3 GLOBAL STABILITY 1.5

1.2.4 UNIFORM SURCHARGE 250 PSF

1.2.5 HYDROSTATIC FORCES NONE

1.2.6 SEISMIC FORCES

IN ACCORDANCE WITH AASHTO AND FDOT PLANS PREPARATION MANUAL.

2.0 MATERIALS

2.1 GEOSYNTHETIC REINFORCEMENT AND RETENTION FABRIC, MIRAFI 140N, SHALL BE MANUFACTURED BY TC MIRAFI, PENDERGRASS, GEORGIA.

2.2 REINFORCED BACKFILL SHALL MEET THE REQUIREMENTS IN FLORIDA DOT SPECIFICATIONS - SECTION 548 RETAINING WALL SYSTEMS.

2.3 WALL FACING SHALL BE PRE-FABRICATED STEEL WIRE FORMS COMPOSED OF A MINIMUM W3.5 SIZE STANDARD WIRE WELDED ORTHOGONALLY 4 INCHES ON CENTER. STEEL WIRE FORMS SHALL BE AS DETAILED IN THE DRAWINGS.

2.4 RING FASTENER SHALL BE BLAIR STYLE #3-LOXIT, 10 GAUGE GALVANIZED, MANUFACTURED BY DECKER MANUFACTURING CO. OR EQUIVALENT.

3.0 WALL CONSTRUCTION

3.1 FOR LOCATION AND ALIGNMENT OF REINFORCED SOIL STRUCTURES, SEE RETAINING WALL CONTROL PLANS.

3.2 STEEL WIRE FORMS, REINFORCEMENT, SOIL RETENTION FABRIC, AND COMPACTED FILL SHALL BE PLACED IN SUCCESSIVE LIFTS IN THE SEQUENCE SHOWN IN THE CONSTRUCTION DRAWINGS.

3.3 GEOSYNTHETIC REINFORCEMENT SHALL BE PLACED AT THE ELEVATIONS, LOCATION, TYPE, ORIENTATION, AND TO THE LENGTHS SHOWN ON THE CONSTRUCTION DRAWINGS. THE REINFORCEMENT SHALL BE PLACED IN A MANNER SO AS TO AVOID SLACK OR WRINKLES. PINNING OR STAKES MAY BE REQUIRED TO MAINTAIN WRINKLE-FREE PLACEMENT DURING INSTALLATION.

3.4 AT EACH REINFORCEMENT ELEVATION, BACKFILL SOILS SHALL BE COMPACTED TO A LEVEL SURFACE BEFORE PLACING THE REINFORCEMENT. ALL REINFORCEMENT SHALL BE PLACED NORMAL TO THE FACE OF THE WALL.

3.5 ADJACENT WIRE FORMS SHALL BE CONNECTED ALONG VERTICAL AND HORIZONTAL SEAMS WITH GALVANIZED INTERLOCKING FASTENERS PLACED 8 INCHES ON CENTER.

3.6 BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH FDOT SPECIFICATIONS - SECTION 548.

3.7 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED FOR THE OPERATION OF TRACKED VEHICLES OVER THE REINFORCEMENT. TURNING OF TRACKED VEHICLES SHOULD BE AVOIDED TO PREVENT TRACKS FROM DISPLACING THE FILL AND THE REINFORCEMENT.

3.8 RUBBER Tired VEHICLES MAY PASS OVER THE REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

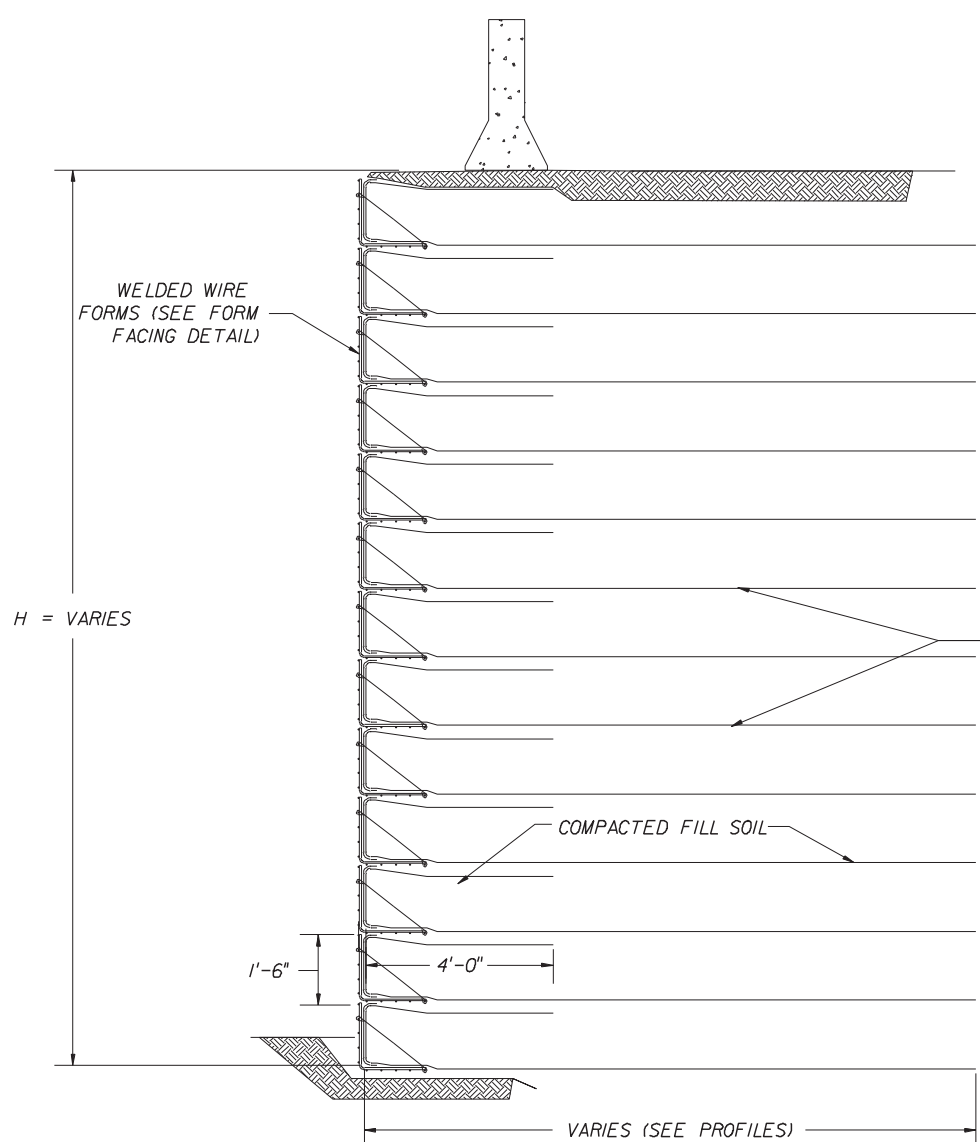
3.9 TC MIRAFI ENGINEERING SERVICES, INC. IS RESPONSIBLE FOR THE INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY IS THE RESPONSIBILITY OF OTHERS.

TC Mirafi
Engineering
Services, Inc.
365 SOUTH HOLLAND DRIVE
PENDERGRASS, GEORGIA 30567

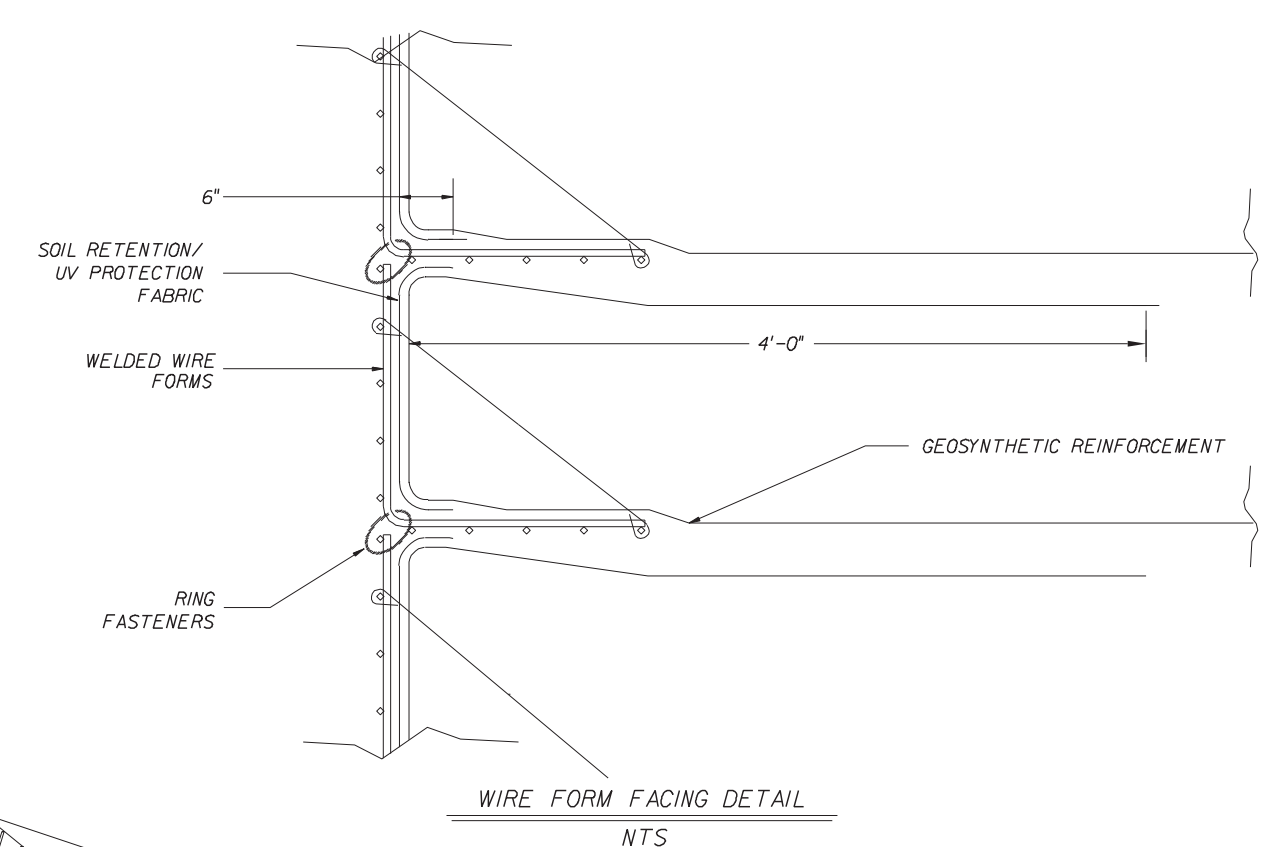


THIS SYSTEM SHALL NOT BE USED FOR ACUTE ANGLE BIN WALLS.
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN					
RETAINING WALL SYSTEM TC MIRAFI WIRE FORM TEMPORARY					
	Names	Dates	Approved By		
Designed By	NPA	11/5/98	State Structures Design Engineer		
Drawn By	CGA	11/5/98	Revision	Sheet No.	Index No.
Checked By	NPA	11/5/98	00	1 of 4	5130

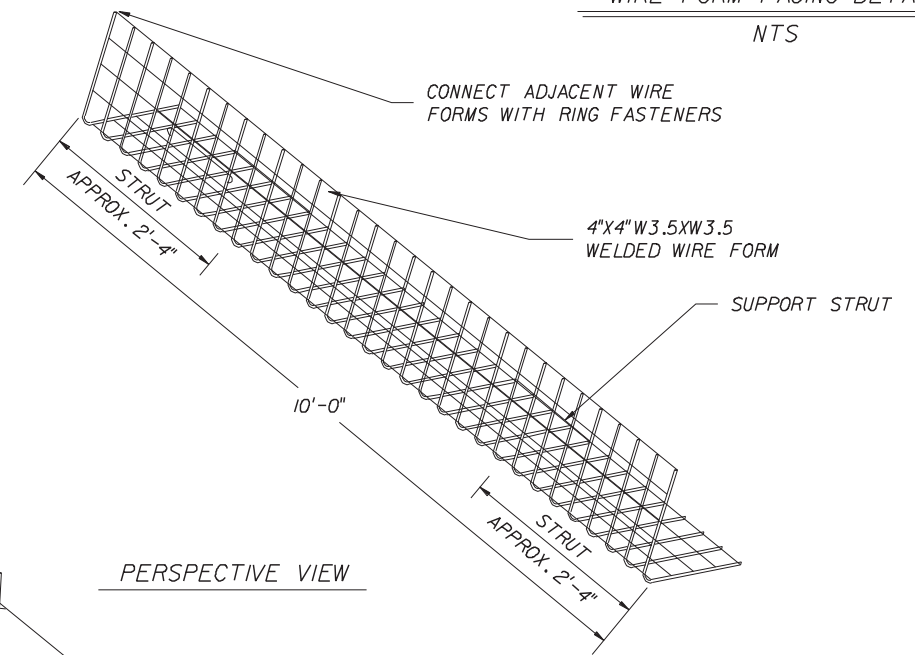


WIRE FORM
TEMPORARY WALL SECTION
NTS

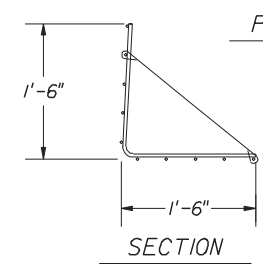


WIRE FORM FACING DETAIL
NTS

MIRAFI GEOSYNTHETIC PRIMARY SOIL
REINFORCEMENT (SEE WALL
PROFILE FOR PLACEMENT DETAILS)

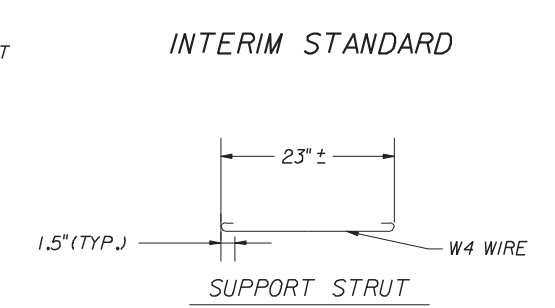


PERSPECTIVE VIEW



SECTION

WELDED WIRE FORM DETAIL
NTS



INTERIM STANDARD

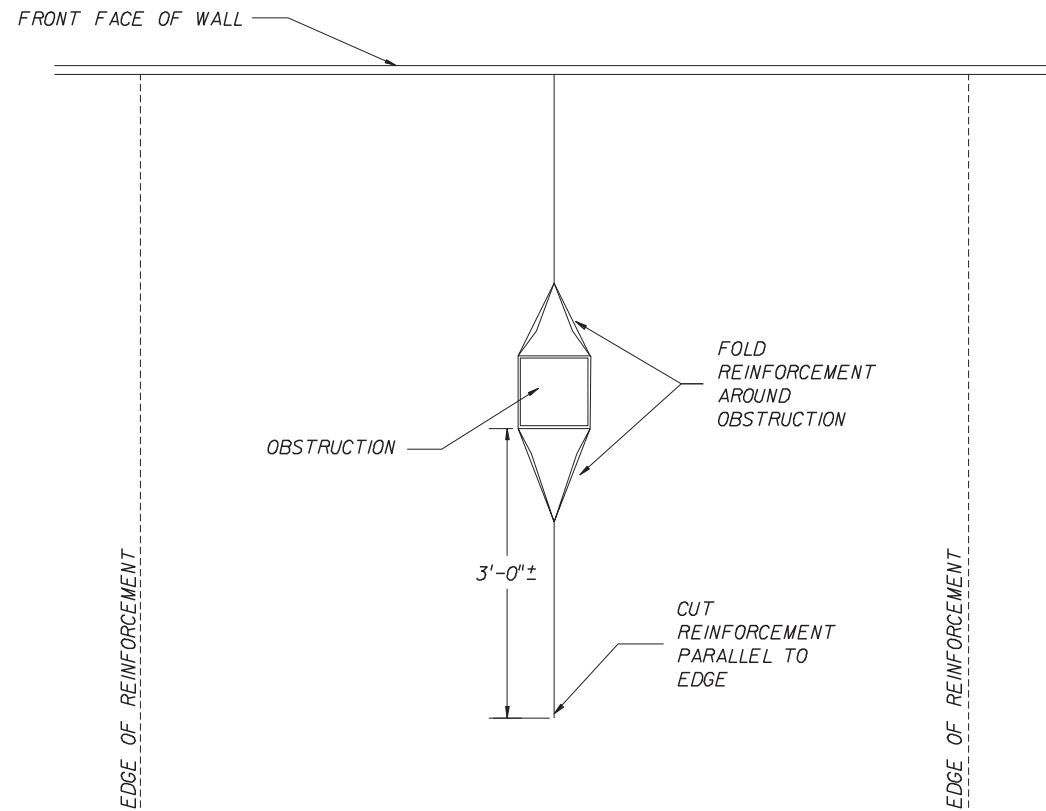
TC Mirafi
Engineering
Services, Inc.
365 SOUTH HOLLAND DRIVE
PENDERGRASS, GEORGIA 30567



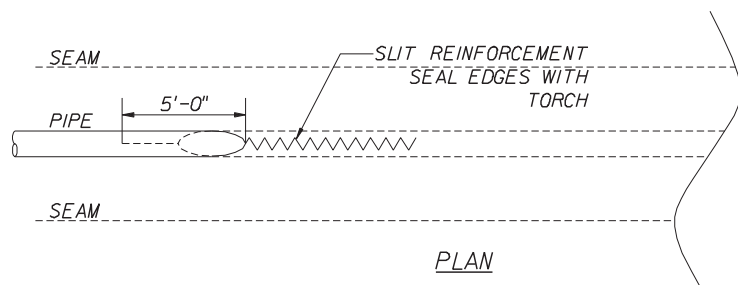
THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

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RETAINING WALL SYSTEM TC MIRAFI WIRE FORM TEMPORARY				
	Names	Dates	Approved By	
Designed By	NPA	11/5/98	_____ State Structures Design Engineer	
Drawn By	CGA	11/5/98	Revision	Sheet No. Index No.
Checked By	NPA	11/5/98	00	2 of 4 5130

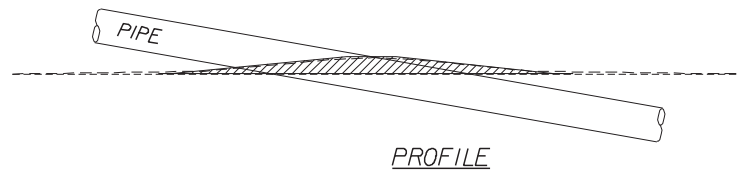
\$\$\$\$\$\$DGN SPECIFICATION\$\$\$\$\$\$
\$\$\$\$\$\$SYTIME\$\$\$\$\$\$



PLACEMENT AROUND OBSTRUCTIONS
NTS



PLAN

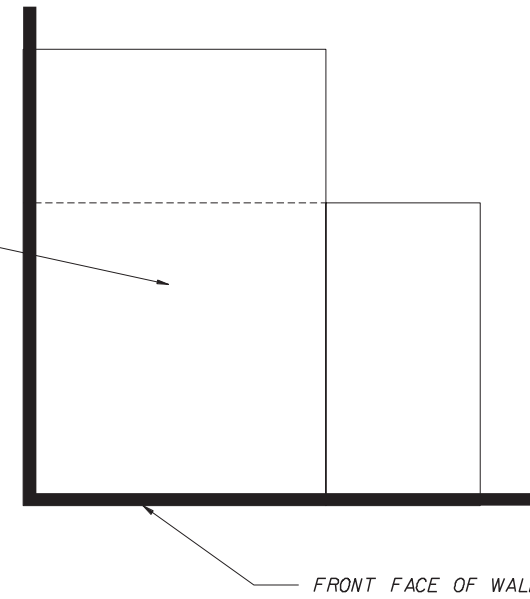


PROFILE

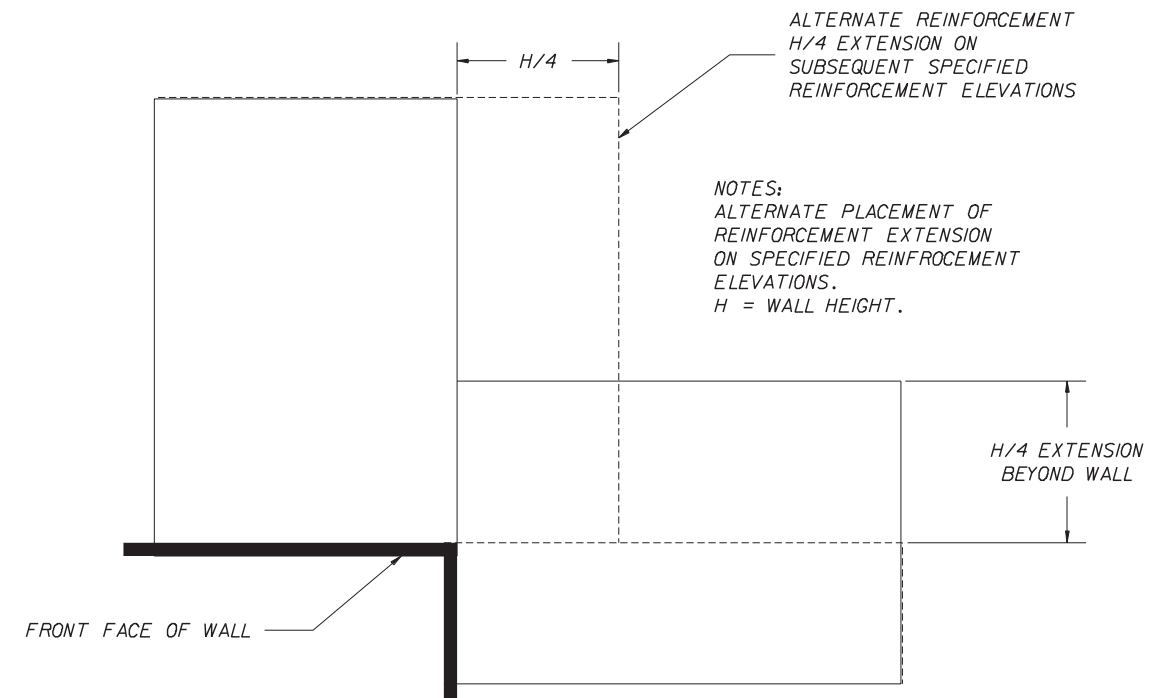
INSTALLATION AROUND PIPE RUNNING PARALLEL TO MACHINE (ROLL) DIRECTION OF REINFORCEMENT
NTS

- ◇ SLIT REINFORCEMENT FROM END CLOSEST TO PIPE TO 6 FEET BEYOND.
- ◇ LAY REINFORCEMENT IN AROUND PIPE.

PROVIDED 6" MIN. OF SOIL BETWEEN OVERLAPPING LAYERS OF REINFORCEMENT FOR PROPER ANCHORAGE.



CONVEX CORNER DETAIL
NTS



CONCAVE CORNER DETAIL
NTS

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Engineering
Services, Inc.
365 SOUTH HOLLAND DRIVE
PENDERGRASS, GEORGIA 30567

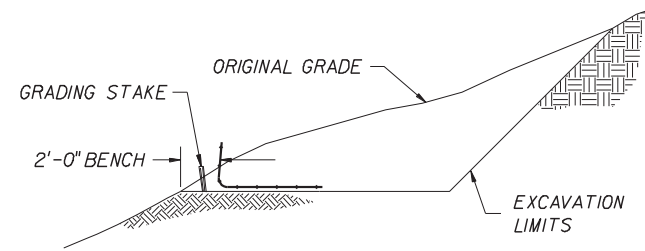


THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
RETAINING WALL SYSTEM TC MIRAFI WIRE FORM TEMPORARY				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	NPA	11/5/98	State Structures Design Engineer	
Drawn By	CGA	11/5/98	Revision	Sheet No.
Checked By	NPA	11/5/98	00	3 of 4
			Index No.	5130

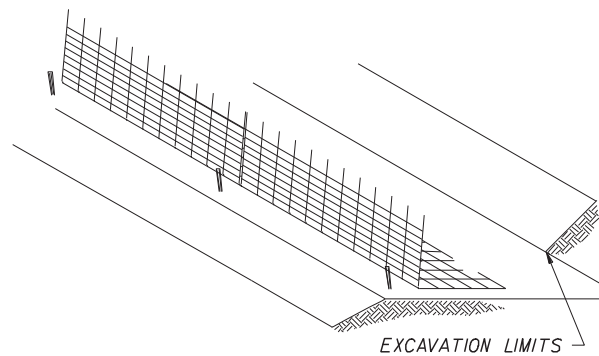
CONSTRUCTION SEQUENCE

- EXCAVATE FOR LEVEL BASE TO A LENGTH ADEQUATE FOR REINFORCEMENT EMBEDMENT.
- SET GRADING STAKES AT A 6 INCHES OFFSET TO FACILITATE PROPER WIRE FORM ALIGNMENT.
- EMBED BOTTOM BASKET 6 INCHES BELOW FINISHED GRADE AT FRONT FACE OF WALL OR AS SHOWN ON WALL PROFILE.



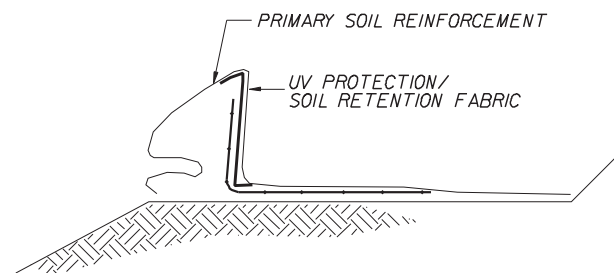
STEP 1

- FOR THE FIRST COURSE OF THE WALL, ALIGN BASKETS WITHOUT SPACES AND ATTACH WITH RING FASTENERS.
- INSTALL STRUTS AT ABOUT 5 FOOT SPACING.



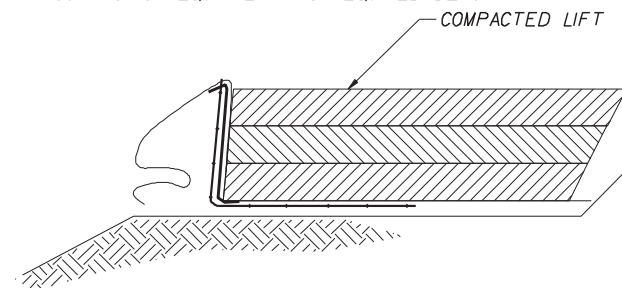
STEP 2

- PLACE UV PROTECTION/SOIL RETENTION FABRIC AT ELEVATIONS AS SHOWN.
- PLACE FACE FABRIC AGAINST WIRE FORM FACE.
- DRAPE FABRIC OVER WIRE FORM ALLOWING FOR THE REQUIRED WRAP EMBEDMENT.



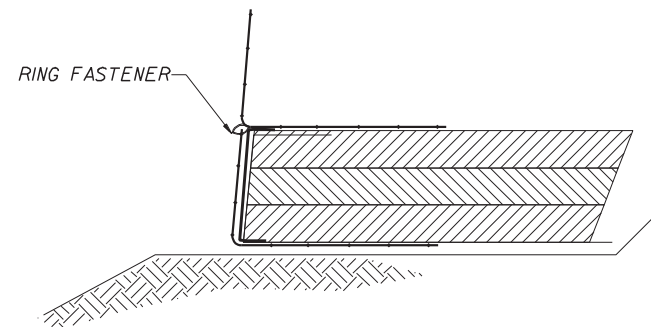
STEP 3

- PLACE BACKFILL SOIL IN 6 INCHES MAXIMUM LIFTS.
- COMPACT SOILS WITHIN 1M OF WIRE FORM USING LIGHT WEIGHT COMPACTION EQUIPMENT.
- COMPACT REMAINING BACKFILL SOILS WITH STANDARD COMPACTION EQUIPMENT TO REQUIRED DENSITY.



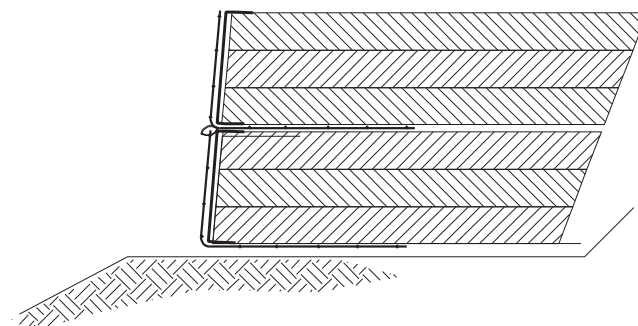
STEP 4

- PULL UV PROTECTION/SOIL RETENTION FABRIC AND PRIMARY REINFORCEMENT OVER COMPACTED FILL AND ANCHOR WITH SOIL.
- PLACE THE NEXT WIRE FORM AGAINST THE LOWER FORM AND ATTACH WITH RING FASTENERS.
- INSTALL STRUTS ON SUCCEEDING LIFT.



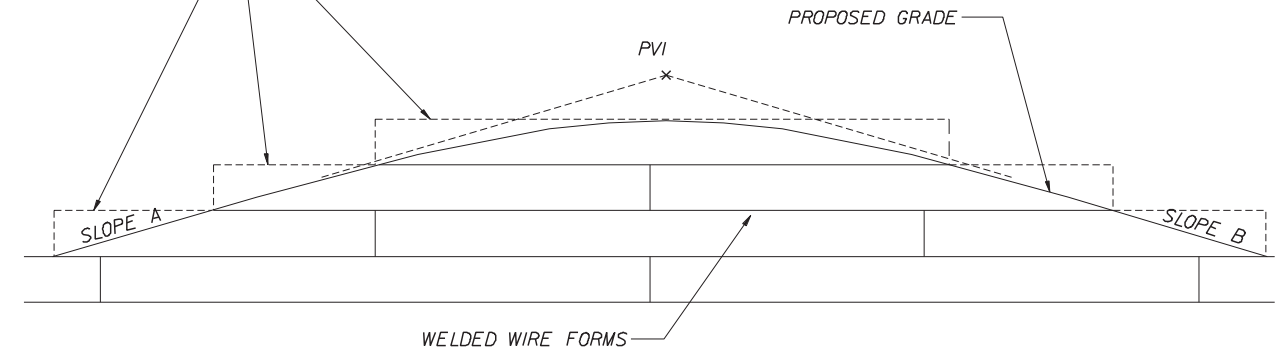
STEP 5

- REPEAT STEPS 2 THRU 5 UNTIL DESIRED HEIGHT OF WALL IS REACHED.



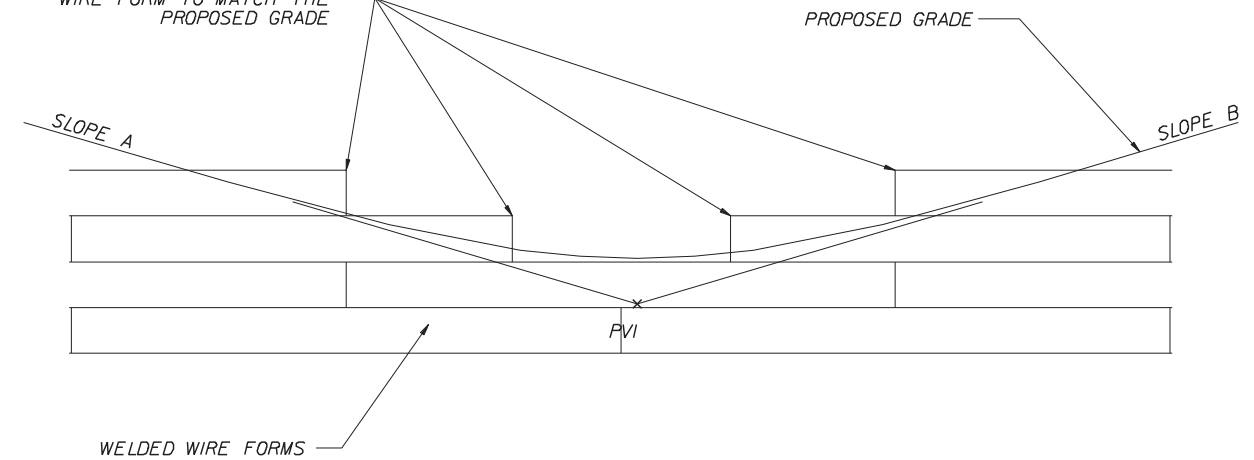
STEP 6

CUT OR BEND THE WELDED WIRE FORM TO MATCH THE PROPOSED GRADE



WELDED WIRE FORM ON VERTICAL CREST CURVE
NTS

CUT OR BEND THE WELDED WIRE FORM TO MATCH THE PROPOSED GRADE



WELDED WIRE FORM ON VERTICAL SAG CURVE
NTS

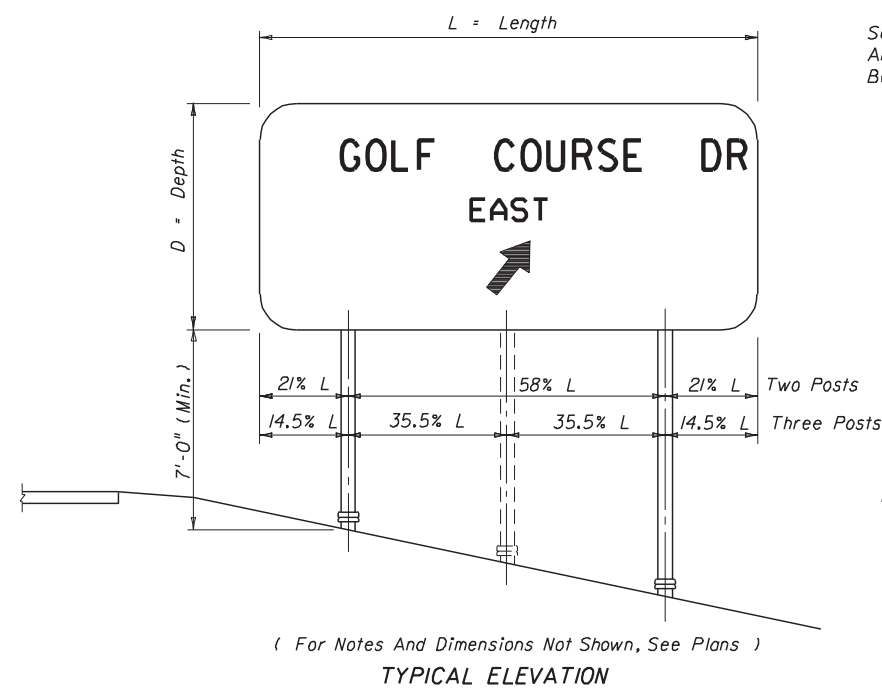
TC Mirafi
Engineering
Services, Inc.
365 SOUTH HOLLAND DRIVE
PENDERGRASS, GEORGIA 30567



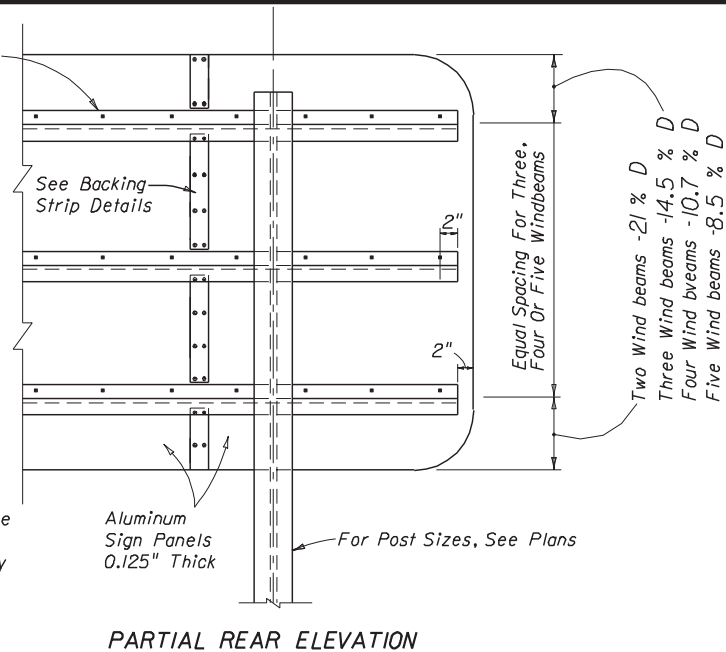
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
TC MIRAFI WIRE FORM TEMPORARY

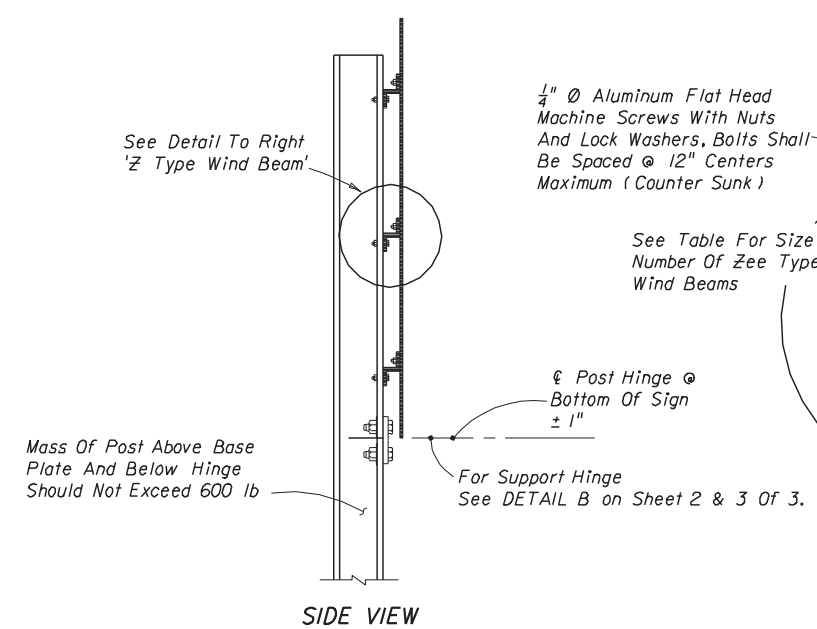
Names	Dates	Approved By		
Designed By	NPA 11/5/98	 State Structures Design Engineer		
Drawn By	CGA 11/5/98			
Checked By	NPA 11/5/98	Revision	Sheet No.	Index No.
		00	4 of 4	5130



See Tables For Size And Number Of Wind Beams



Note: It shall be the contractors responsibility to determine the length of the column supports in the field prior to fabrication.



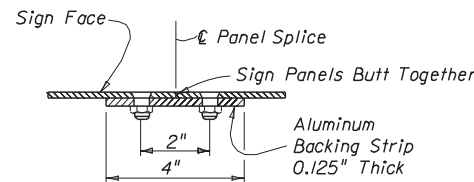
GENERAL NOTES

- DESIGN SPECIFICATION** Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals, AASHTO 1994. For welding refer to the latest editions of the AWS Structural Welding Codes for Steel and Aluminum, the AASHTO Standard Specifications for Welding Structural Steel Highway Bridges, and the FDOT Standard Specifications with Supplement.
- DESIGN WIND LOAD** See Design Wind Speeds By County for wind in miles per hour on flat sign area. The allowable working stress shall be increased by 40% for combination dead load and wind load.
- ALUMINUM MATERIALS** All aluminum materials shall meet the requirements of the Aluminum Association's Alloy 6061-T6 and also the following ASTM specifications: Sheets and plates, B209; extruded tube, bars, rods & shapes, B221; and standard structural shapes, B308. Sheets are to be degressed, etched, neutralized and treated with Alodine 1200, Iridite 14-2, Bonderite 721, or equal. No stenciling permitted on sheets. Aluminum welding rods shall meet the requirements of Aluminum Association Alloy No. 5556 filler wire.
- STRUCTURAL STEEL** All structural steel shall meet the requirements of ASTM A709 Grade 36.
- ALUMINUM BOLTS, NUTS, & LOCKWASHERS** Aluminum bolts shall meet the requirements of Aluminum Association Alloy 2024-T4 (ASTM F468). The bolts shall have an anodic coating at least 0.0002" thick and be Chromate sealed. Lock washers shall meet the requirements of Aluminum Association Alloy 7075-T6 (ASTM B221). Nuts shall meet the requirements of Aluminum Association Alloy 6061-T6 or 6262-T9 (ASTM F467).
- STEEL BOLTS, NUTS, & WASHERS** All steel bolts, nuts and washers shall meet the requirements of ASTM A325 Types 1 & 2 and shall be galvanized in accordance with Standard Specifications 962-7.
- ALTERNATE MATERIAL** Material meeting the requirements of ASTM B209 or Aluminum Association Alloys 5154-H38 or 5052-H38 may be used for sheet and plate. Material meeting the requirements of Aluminum Association Alloy 6351-T5 and ASTM B221 may be used for extruded bars, rods, shapes and tubes.
- TOLERANCES** All above materials shall be in accordance with the governing ASTM specifications.
- GALVANIZING** All steel shapes, angles, tees, plates, bolts, nuts and washers shall be galvanized in accordance with Standard Specifications 962-7.
- BASE CONNECTION** High strength bolts L₂ in the base connection shall be tightened only to the torque shown in the tables on sheets 2 & 3 of 3. Overtightened base connections will not be accepted.
- FUSE PLATES** All holes in fuse plates shall be drilled. All plate cuts shall, preferably, be saw cuts; however, flame cutting will be permitted provided all edges are ground. Metal projecting beyond the plane of the plate face will not be tolerated.
- SIGN FACE** All sign face corners shall be rounded. See Sign Layout Sheet.
- SHOP DRAWINGS** When ground sign supports are fabricated in accordance with these plans no shop drawings are required. Shop drawings will be required for approval when the column length exceeds the length shown in the plans by more than 2'-0". However, shop drawings for sign panels, messages, lettering and quantities shall be submitted to traffic plans for approval.
- FABRICATOR NOTE** All bolted connections, except L₂ bolts and Zee to Post bolts, shall be high strength bolts. Bolts shall be tightened in the shop following a method approved by the engineer. Tightening shall be to such a degree so as to attain in each bolt the residual tension specified in the tabulation below:
- FOUNDATION** Contractor may use precast foundations in pre-drilled holes a minimum of 12" larger than the foundation indicated on the plans in either wet or dry conditions. The holes shall be clean and without loose material. Temporary casing shall be required if the soil is unstable. The holes shall be filled with flowable concrete after the precast foundation is in place. The cost of flowable concrete, installing and removal of casing shall be included in the unit price of Sign Multi-Post.

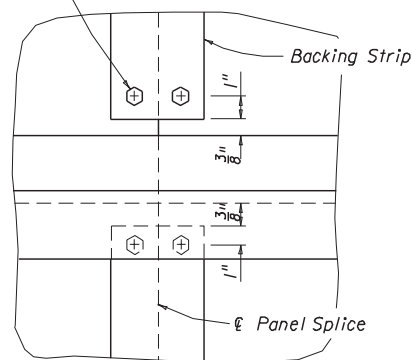
Note: If the sign panels are deeper than 14', a Horizontal Panel Splice is allowed at an interior Z bar support, shop drawings shall be required. Minimum panel section width = 2'-6".

DESIGN WIND SPEEDS BY COUNTY

- ZONE NO. 1 (60 mph)**
Alachua, Baker, Bay, Bradford, Calhoun, Clay, Columbia, Escambia, Gadsden, Gilchrist, Hamilton, Holmes, Jackson, Jefferson, Lafayette, Lake, Leon, Liberty, Madison, Marion, Okaloosa, Putnam, Santa Rosa, Sumter, Suwannee, Union, Walton and Washington Counties.
- ZONE NO. 2 (70 mph)**
Citrus, Desoto, Dixie, Duval, Flagler, Franklin, Glades, Gulf, Hardee, Hendry, Hernando, Highlands, Hillsborough, Levy, Nassau, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Seminole, St. Johns, Taylor and Wakulla Counties.
- ZONE NO. 3 (80 mph)**
Brevard, Charlotte, Collier, Indian River, Lee, Manatee, Martin, Palm Beach, Sarasota, St. Lucie and Volusia Counties.
- ZONE NO. 4 (90 mph)**
Broward, Dade and Monroe Counties.



Pairs Of 1/4" Ø Aluminum Flat Head Machine Screws With Nuts And Lock Washers Spaced At 1'-0" Centers Maximum



NUMBER OF WIND BEAMS FOR GIVEN DEPTH & WIND					
Wind	No. Beams	Max. Depth	Wind	No. Beams	Max. Depth
60	2	8'-0"	80	2	6'-8"
60	3	13'-4"	80	3	11'-4"
60	4	18'-0"	80	4	15'-4"
60	5	22'-8"	80	5	19'-0"
70	2	7'-0"	90	2	6'-0"
70	3	12'-0"	90	3	10'-4"
70	4	16'-4"	90	4	14'-0"
70	5	20'-8"	90	5	17'-8"

SIZE OF WIND BEAMS		
Size Of Zee*	Length Of Sign (Feet)	
	2 Posts	3 Posts
Z 1.75 x 1.75 x 1.08	0 - 11'-0"	0 - 17'-4"
Z 3 x 2.69 x 2.33	11'-1" - 19'-0"	17'-5" - 29'-6"
Z 3 x 2.69 x 2.33	19'-1" - 20'-8"	29'-7" - 31'-6"

*Note: Zees Are Aluminum - No Steel Equivalent Available Designation Gives (Member Depth) x (Width) x (lb/ft)

HIGH STRENGTH BOLTS (A-325) MINIMUM RESIDUAL TENSION

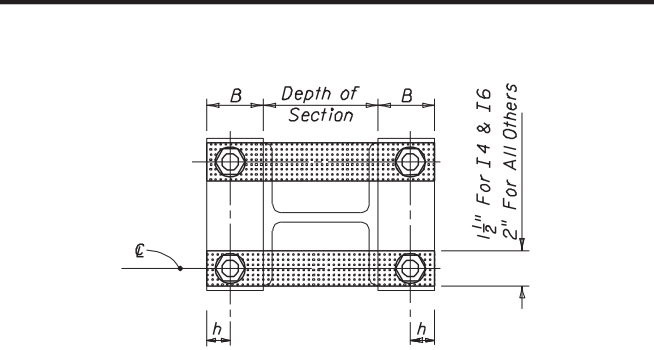
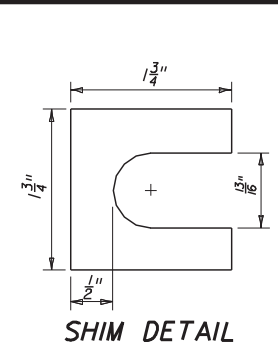
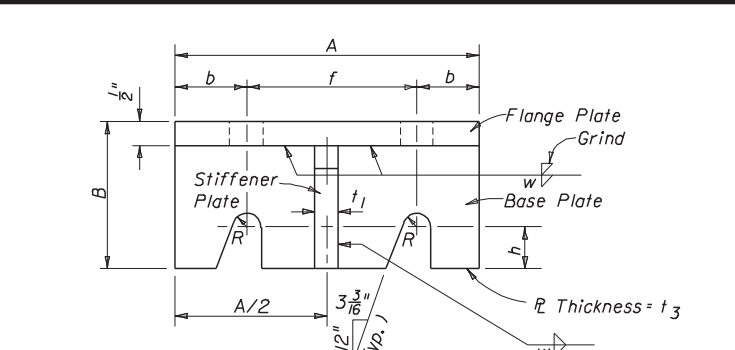
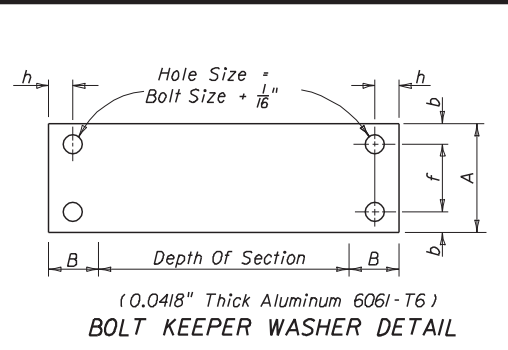
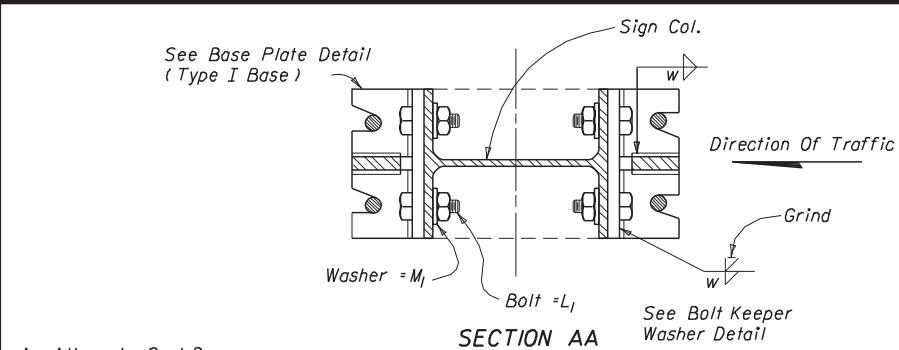
BOLT SIZE	TENSION (lb)
5/8"	19,200
3/4"	28,400
7/8"	39,250
1"	51,500
1 1/8"	56,450
1 1/4"	71,700

SIGN PANEL AND WIND BEAMS

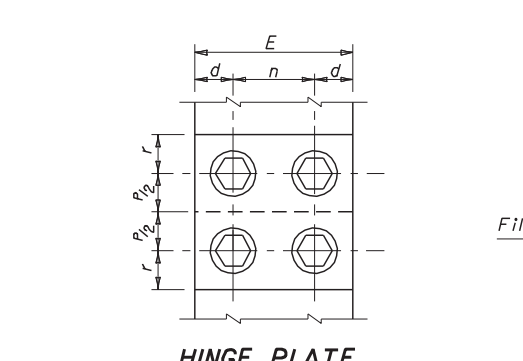
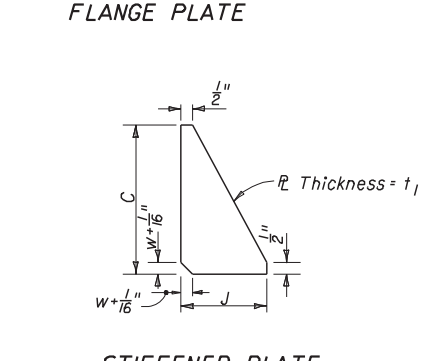
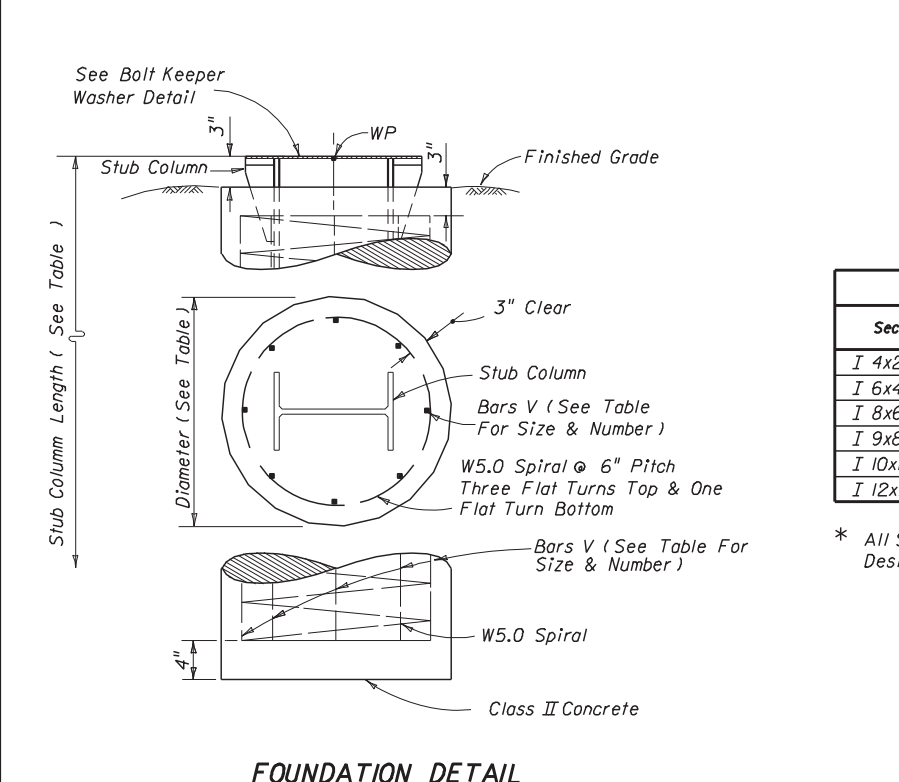
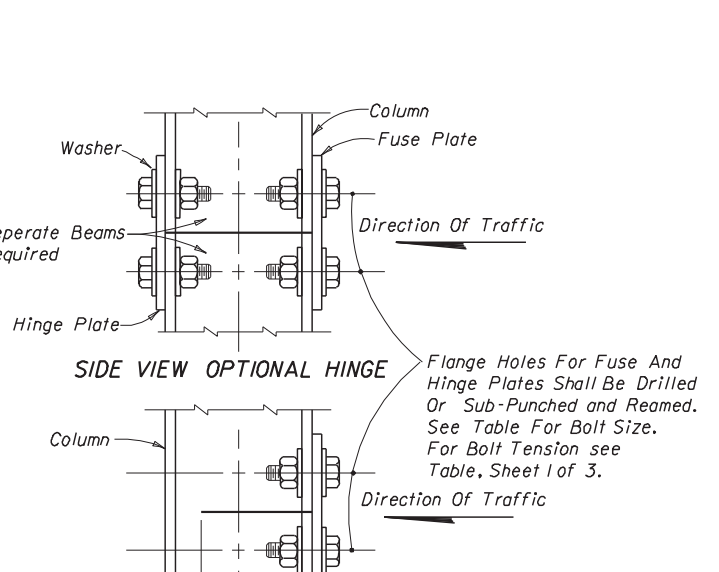
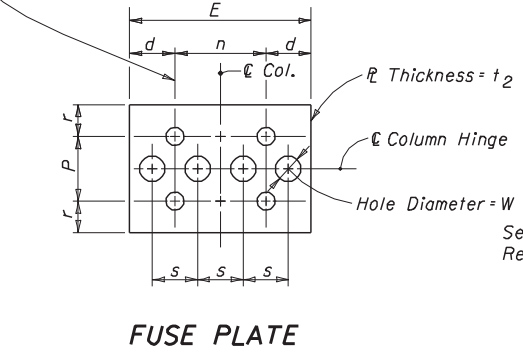
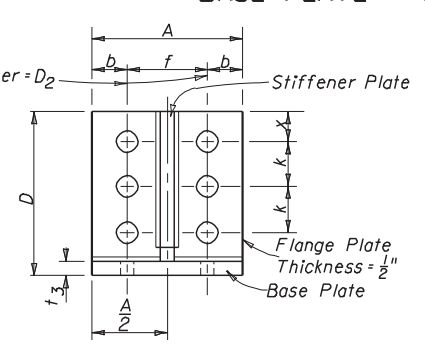
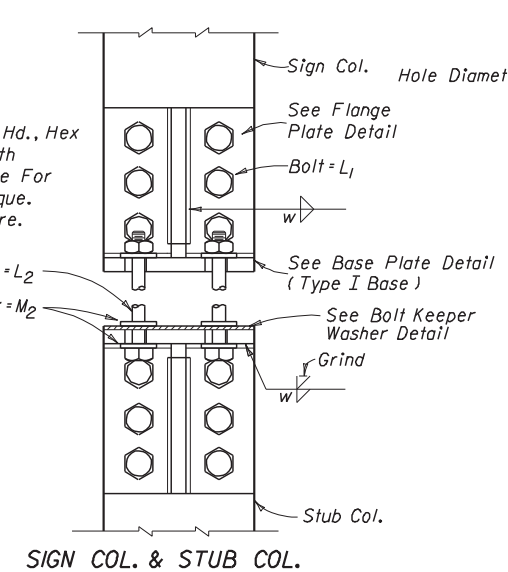
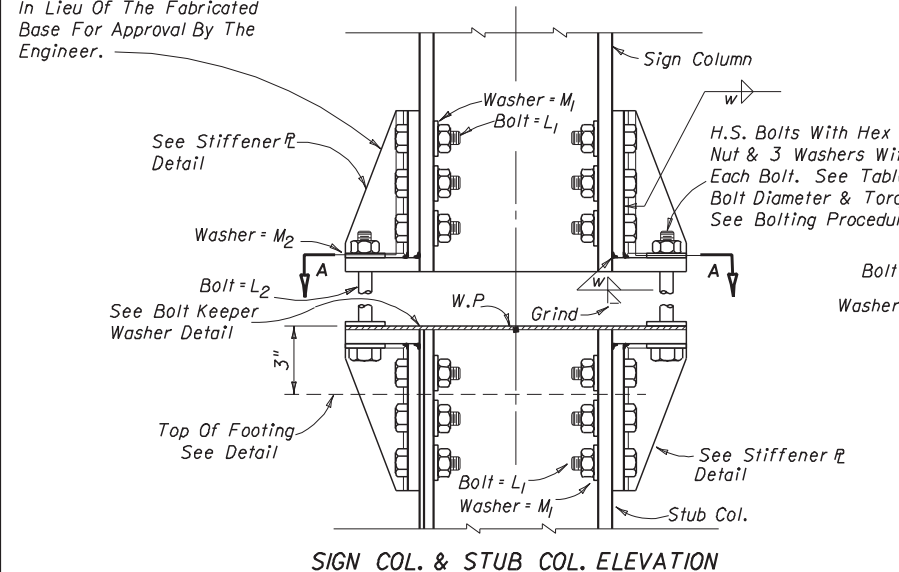
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN

STANDARD ROADSIDE SIGN BREAK-AWAY PANEL DETAIL

Names	Dates	Approved By		
Designed By	RFS	11-94		
Drawn By	DDUS	11-94		
Checked By	DER	11-94		
Revision		00		
			1 of 3	9535



An Alternate Cast Base Of Alloy 356 And T6 May Be Submitted For Consideration In Lieu Of The Fabricated Base For Approval By The Engineer.



(See Fabricator Note On Sheet 1 of 3)
SIDE VIEW TYPICAL HINGE FUSE & HINGE PLATE DETAIL B

Section*	BASE CONNECTION DATA TABLE																FUSE (HINGE) PLATE DATA TABLE										FOUNDATION DATA TABLE							
	A	B	C	D	J	L ₁ (Dia.)	Bolt Size (Dia.) & Torque (L ₂) (In.-lb)	M ₁	M ₂	D ₂	R	x	b	f	h	k	t ₁	t ₃	w	Bolt Size	E	P	D ₁	d	n	r	s	t ₂	W	Dia.	Depth	Stub Length	Reinforcing Bars "v"	
I 4x2.79	3 5/8	2 1/8	5 1/16	6 5/16	2 1/4	5/8	Ø 345	1 1/16	1 5/16	1 1/16	3/8	1 1/4	1 1/16	1 3/8	1 1/8	9/16	3/8	3/8	3/8	3/8	3 5/8	2 1/4	1 1/16	1 1/16	1 1/4	1 1/8	1/8	1/8	5/16	5/8	1'-8"	4'-6"	1'-8"	10-#5
I 6x4.03	4 1/8	2 5/8	5 1/16	6 5/16	2 1/4	5/8	Ø 345	1 1/16	1 5/16	1 1/16	3/8	1 1/4	1 1/16	1 3/8	1 1/8	9/16	3/8	3/8	3/8	3/8	4 1/8	2 1/4	1 1/16	1 1/16	1 1/4	1 1/8	1/8	1/8	5/16	3/4	2'-0"	5'-9"	2'-2"	10-#7
I 8x6.18	5 1/8	3 1/8	7 1/16	8 1/16	2 3/4	5/8	Ø 345	1 1/8	1 5/8	1 1/8	3/8	1 1/2	1 1/16	1 3/8	1 1/8	9/16	3/8	3/8	3/8	3/8	5 1/8	2 1/4	1 1/16	1 1/16	1 1/4	1 1/8	1/8	1/8	5/16	3/4	2'-0"	7'-6"	2'-8"	10-#7
I 9x8.36	5 5/8	3 3/8	7 1/16	8 1/16	2 3/4	1/2	Ø 550	1 3/4	1 5/8	1 1/8	3/8	1 3/4	1 1/16	1 3/8	1 1/8	9/16	3/8	3/8	3/8	3/8	5 3/8	2 1/4	1 1/16	1 1/16	1 1/4	1 1/8	1/8	1/8	5/16	3/4	2'-4"	8'-0"	2'-8"	8-#8
I 10x10.3	6	3 3/8	8 1/16	9 1/16	2 3/4	1/2	Ø 550	2	1 5/8	1 1/8	3/8	1 3/4	1 1/16	1 3/8	1 1/8	9/16	3/8	3/8	3/8	3/8	6	4 1/4	1 1/16	1 1/16	1 1/4	1 1/8	1/8	1/8	5/16	3/4	2'-4"	9'-6"	3'-3"	8-#8
I 12x14.3	7 1/16	3 9/16	9 1/16	10 1/16	3	1/2	Ø 690	2 3/16	2	1 1/8	3/8	2	1 1/16	1 3/8	1 1/8	9/16	3/8	3/8	3/8	3/8	7 1/16	5 1/4	1 1/16	1 1/16	1 1/4	1 1/8	1/8	1/8	5/16	3/4	2'-8"	11'-0"	3'-9"	10-#8

* All Shapes Listed are Aluminum Association I Beams. Designation Gives (Member Depth) x (lb/ft).

PROCEDURE FOR ASSEMBLY OF BASE CONNECTION: FOR BOLTS L₂

- Assemble post to stub with bolts and with one flat washer on each bolt between plates.
- Shim as required to plumb post (See Shim Detail).
- Tighten all bolts the maximum possible with 1'-0" to 1'-3" wrench to bed washers and shims and to clean bolt threads then loosen each bolt in turn and retighten in a Systematic order to the prescribed torque (See Table).
- Burr threads at junction with nut using a center punch to prevent nut loosening.

NOTE: Sections shown are for installation on right shoulder and in gore. Plate slot bevels are opposite hand from that shown for installations in the median.

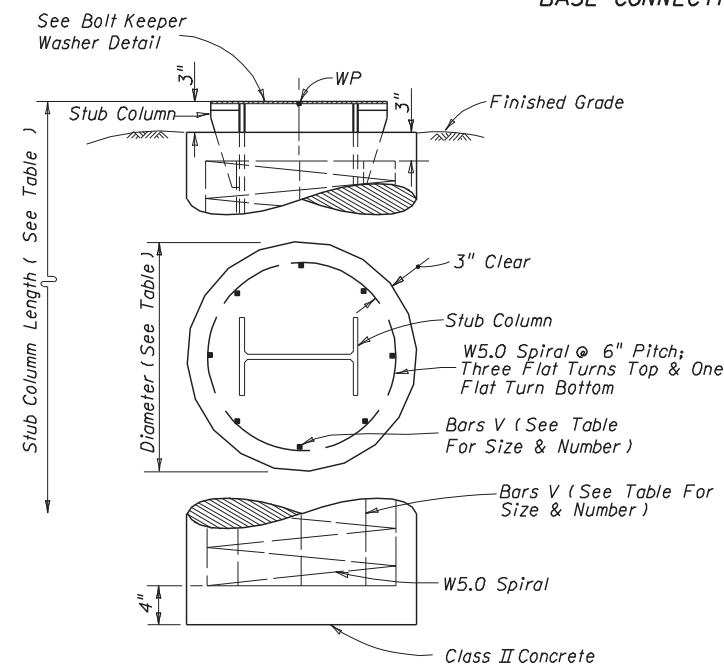
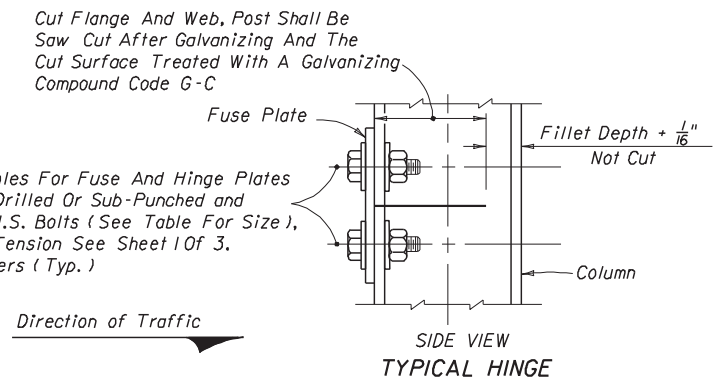
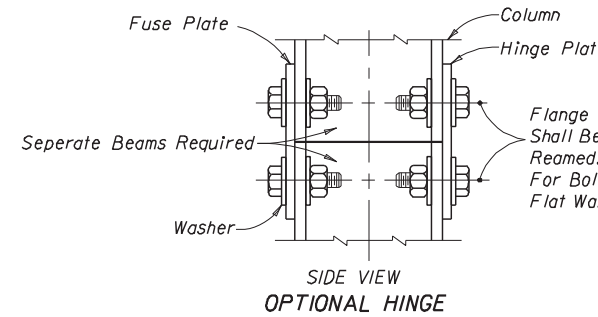
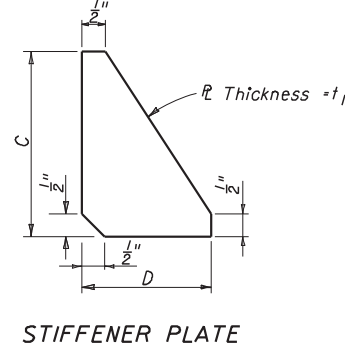
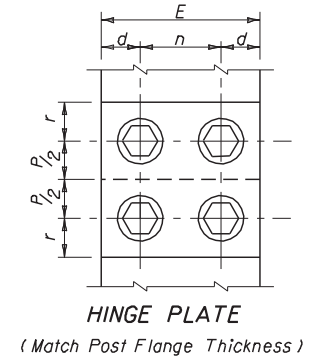
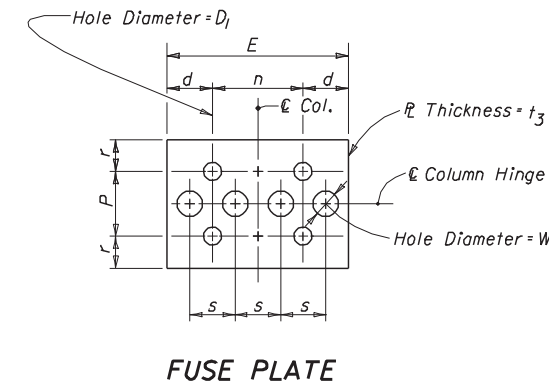
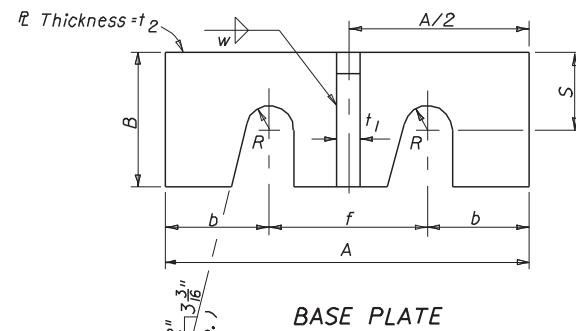
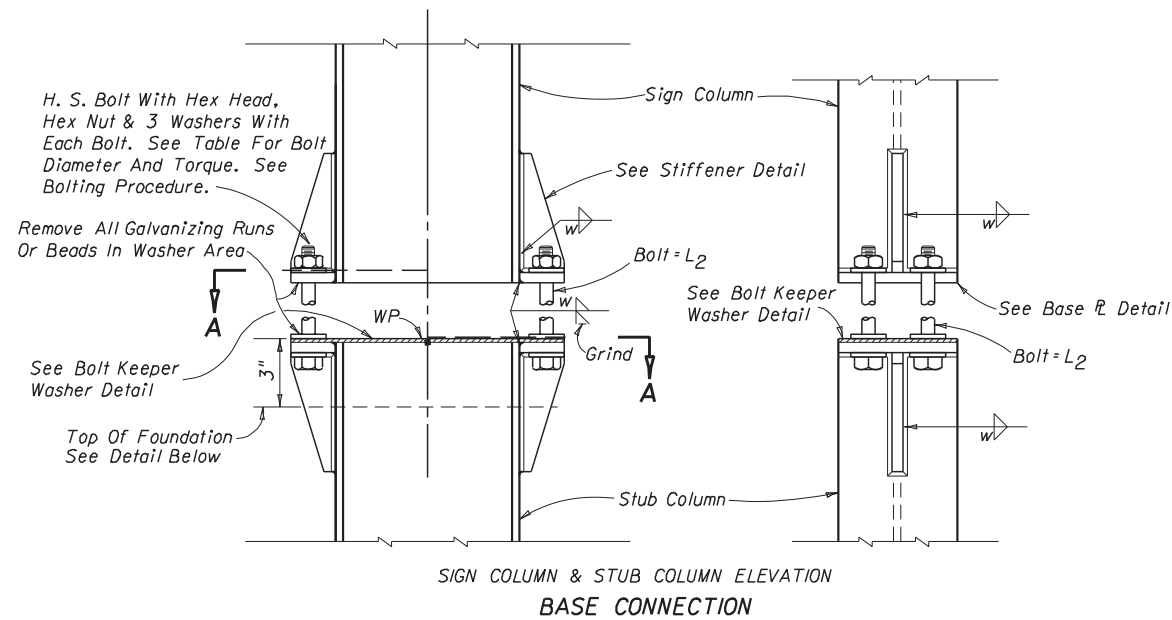
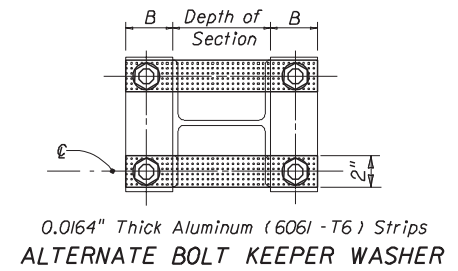
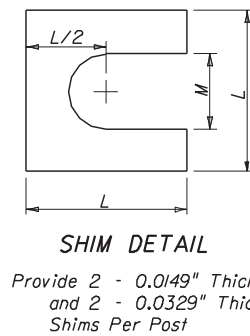
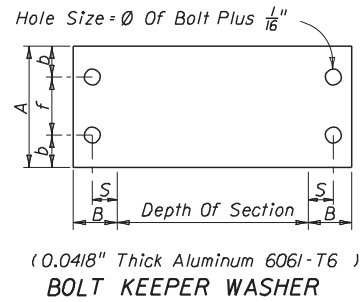
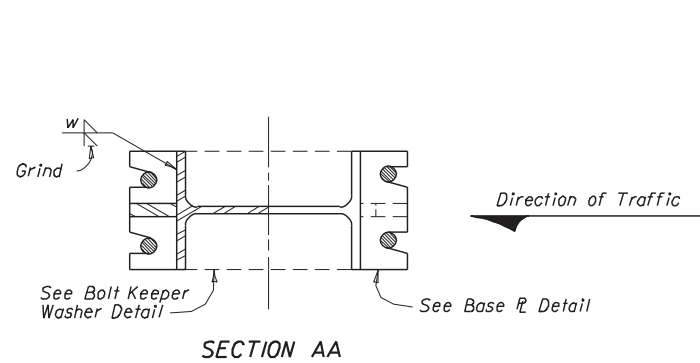
ALUMINUM POST, BASE, FOUNDATION & FUSE R DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN

STANDARD ROADSIDE SIGN BREAK-AWAY POST DETAILS

Designed By	RFS	11-94	Names	Dates	Approved By	W. J. [Signature]
Drawn By	SGR	11-94	Revision	Sheet No.	Index No.	
Checked By	DER	11-94	00	2 of 3	9535	

NOTES: To prevent galvanic corrosion, reinforcing steel shall not be in contact with the aluminum stud column. All reinforcing to be Grade 60.



Section*	BASE CONNECTION DATA											FUSE (HINGE) PLATE DATA										FOUNDATION DATA				SHIM		
	A	B	C	D	Bolt Size L2 & Torque in-lb	R	b	f	S	t1	t2	w	Bolt Size	E	P	D1	d	n	r	s	t3	W	Dia.	Depth	Stub Length	Reinf. Bars V	L	M
W 6x12	4 3/4	2	5 1/8	2	5/8 Ø 345	3/8	1 1/8	2 1/2	1 3/16	9/16	9/16	1/4	5/8	4 1/4	3	1 1/16	1 1/8	2	1 3/16	1	1/4	1 3/16	2'-0"	5'-6"	2'-4"	10-#7	1 3/8	1 1/16
W 8x18	5 3/4	2 3/16	6 1/4	2 1/4	3/4 Ø 550	7/16	1 1/2	2 3/4	1 3/8	9/16	5/8	1/4	7/8	5 1/2	3 1/2	1 1/2	2 1/2	1 3/8	1 1/16	3/8	1 1/16	2'-0"	7'-6"	2'-10"	10-#7	1 3/4	7/8	
W 10x22	6 1/8	2 3/8	8	2 3/8	7/8 Ø 640	1	1 9/16	3	1 3/8	9/16	3/4	1/4	1	6 3/8	4 1/8	1 1/16	1 3/4	2 1/4	1 3/4	1 1/2	3/8	1 3/16	2'-4"	8'-6"	3'-4"	8-#8	2	1 5/8
W 10x33	8	2 3/4	8	2 3/4	1 1/8 Ø 780	5/8	2	4	1 9/16	9/16	3/4	1/4	1 1/8	7 1/8	5 1/8	1 3/16	2 1/4	3 3/8	2	1 7/8	1/2	1 9/16	2'-4"	10'-3"	4'-0"	8-#8	2 3/8	1 1/8
W 12x40	8	3	8	3	1 1/2 Ø 780	5/8	2	4	1 9/16	9/16	3/4	1/4	1 1/4	8 3/8	5 3/4	1 1/2	2 1/4	3 7/8	2 1/2	2	1 11/16	2'-8"	11'-3"	4'-8"	10-#8	2 3/8	1 1/8	

* Designations Give (Nominal Depth) x (lb/ft)

PROCEDURE FOR ASSEMBLY OF BASE CONNECTION

1. Assemble post to stub with bolts and with one flat washer on each end bolt between plates.
2. Shim as required to plumb post (see shim detail).
3. Tighten all bolts the maximum possible with 1'-0" to 1'-3" wrench to bed washers and shims and to clean bolt threads then loosen each bolt in turn and retighten in a systematic order to the prescribed torque (see table).
4. Burr threads at junction with nut using a center punch to prevent nut loosening.

NOTE:

Sections shown are for installation on right shoulder and in gore. Plate slot bevels are opposite hand from that shown for installations in the median.

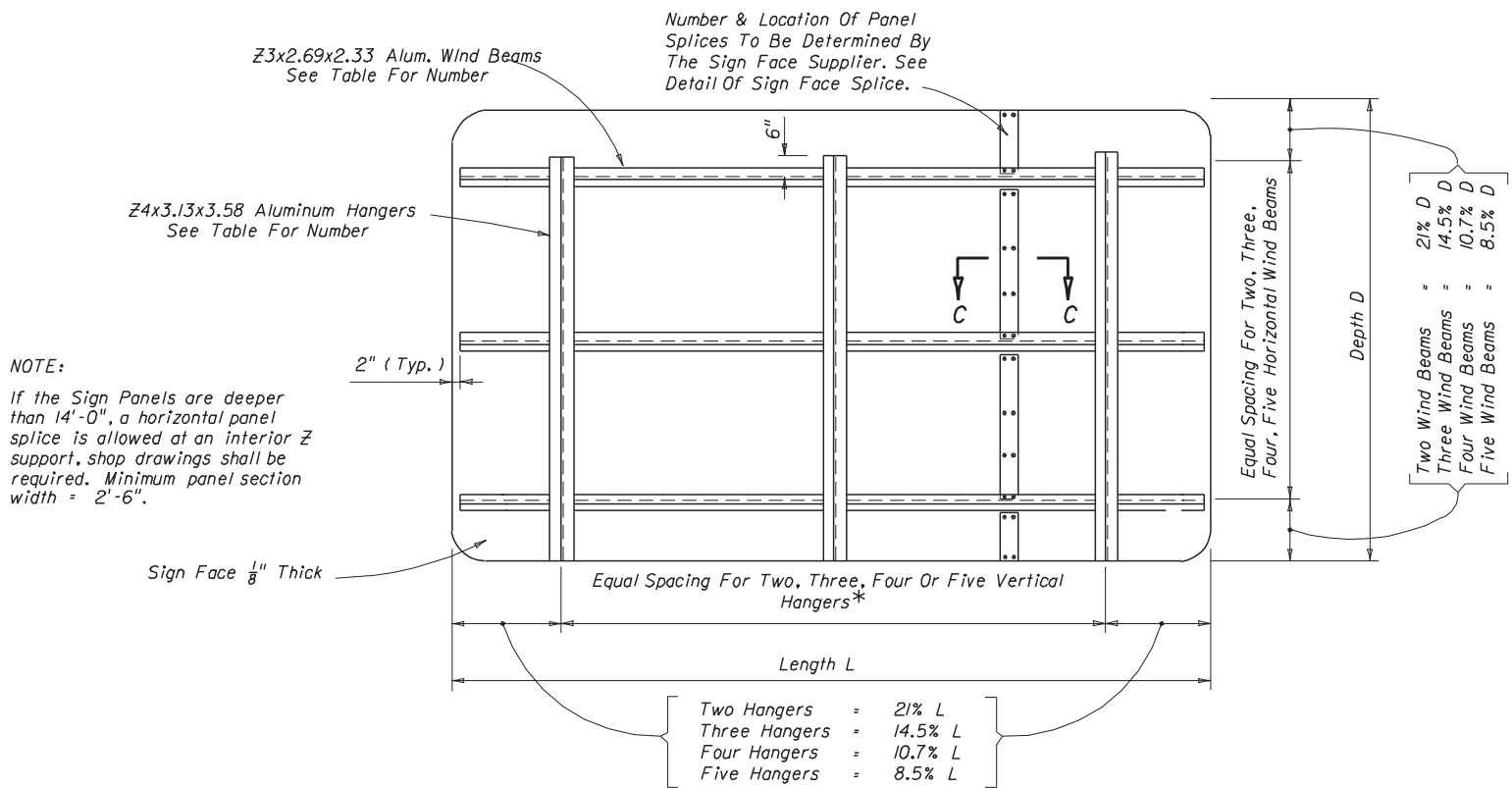
STEEL POST, BASE, FOUNDATION & FUSE R DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN

STANDARD ROADSIDE SIGN BREAK-AWAY POST DETAILS

Names	Dates	Approved By	Index No.	
Designed By	RFS 11-94	[Signature]	State Structures Design Engineer	
Drawn By	SGR 11-94		Revision	Sheet No.
Checked By	DER 11-94	00	3 of 3	9535

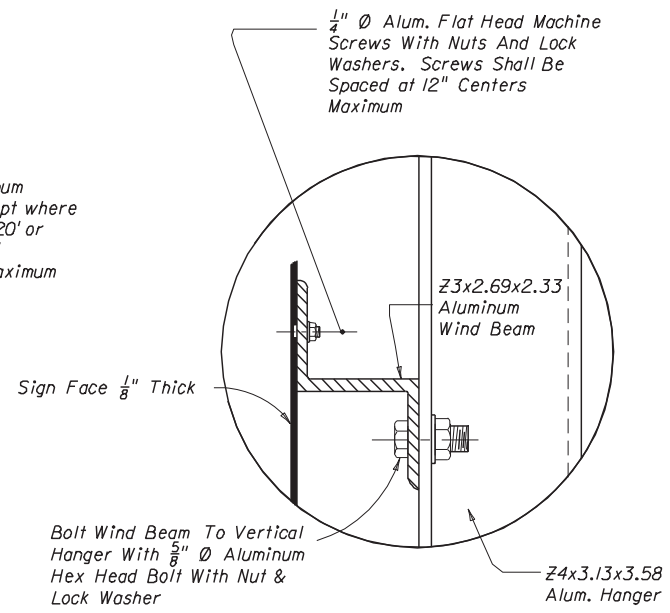
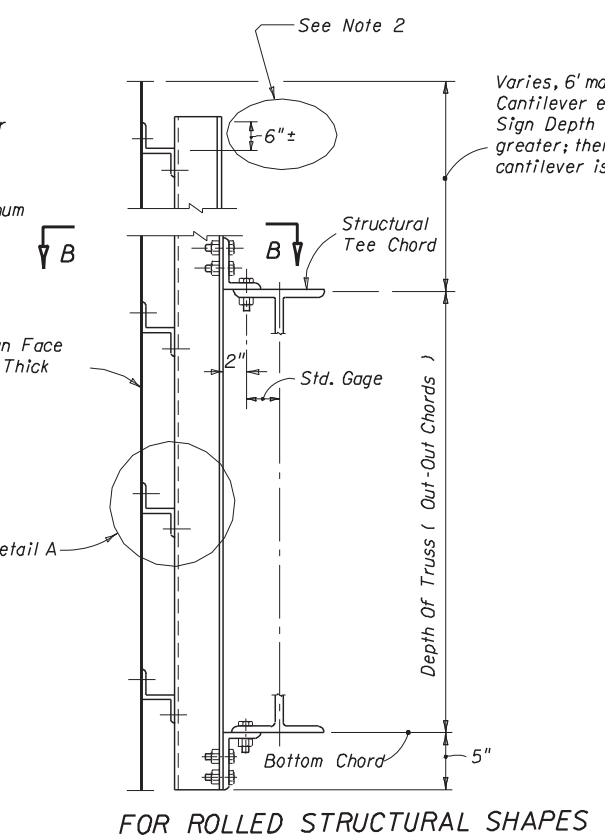
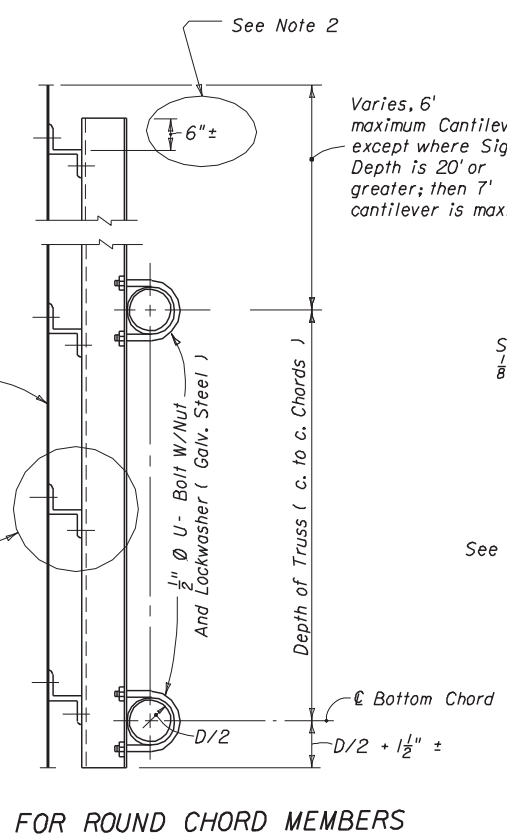
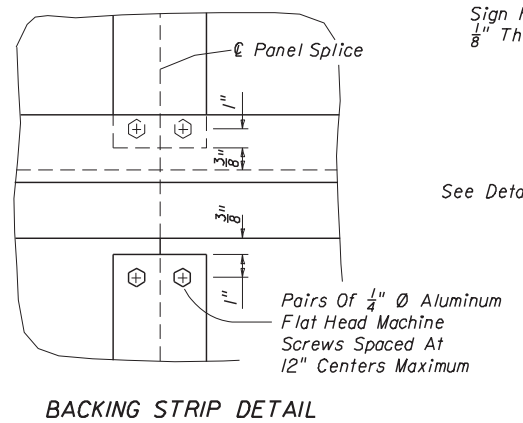
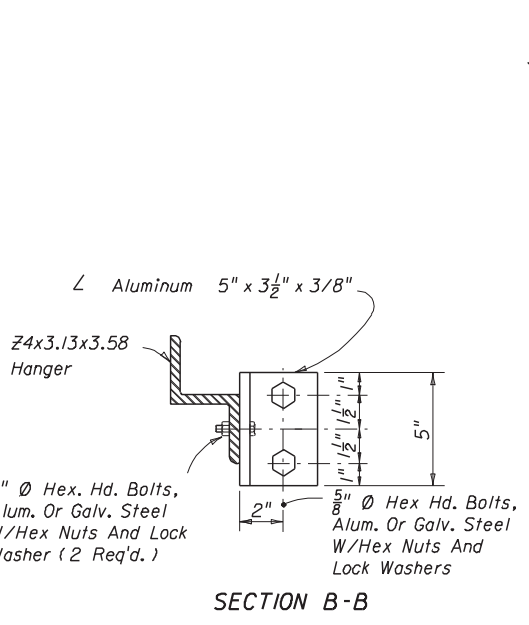
NOTE: All Reinforcing To Be Grade 60.



*Note: Spacing of vertical hangers may be varied slightly or as necessary to clear the truss struts and diagonals at panel points.

TYPICAL SIGN FACE ELEVATION FOR OVERHEAD TRUSS

Number Of Z3x2.69x2.33 Horiz. Wind Beams For Sign Depth And Wind			Number Of Z4x3.13x3.58 Vertical Hanger Beams For Sign Length			
Wind M.P.H.	No. Beams	Max. Depth	2 Hangers	3 Hangers	4 Hangers	5 Hangers
			Sign Length	Sign Length	Sign Length	Sign Length
110	2	5'-0"	0-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
110	3	8'-6"	0-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
110	4	11'-6"	0-13'-0"	13'-1"-18'-3"	18'-4"-24'-9"	24'-10"-31'-4"
110	5	14'-0"	0-13'-0"	13'-1"-18'-3"	18'-4"-24'-9"	24'-10"-31'-4"
100	2	5'-3"	0-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
100	3	8'-10"	0-15'-0"	15'-1"-22'-3"	22'-4"-30'-0"	30'-1"-38'-0"
100	4	12'-0"	0-15'-0"	15'-1"-22'-3"	22'-4"-30'-0"	30'-1"-38'-0"
100	5	15'-0"	0-11'-7"	11'-8"-16'-4"	16'-5"-22'-2"	22'-3"-28'-0"
90	2	5'-6"	0-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
90	3	9'-6"	0-15'-0"	15'-1"-27'-3"	27'-4"-37'-0"	
90	4	12'-9"	0-15'-0"	15'-1"-27'-3"	27'-4"-37'-0"	
90	5	16'-0"	0-14'-3"	14'-4"-20'-0"	20'-1"-27'-0"	27'-1"-34'-3"
80	2	6'-0"	0-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
80	3	10'-0"	0-15'-0"	15'-1"-30'-0"	30'-1"-45'-0"	
80	4	14'-0"	0-15'-0"	15'-1"-25'-9"	25'-10"-34'-10"	



GENERAL NOTES

(1) For "General Notes" covering Material Specifications; see Sheets 1 of 3, Index 9535.

(2) This dimension shall be adjusted for porcelain enameled sign panel.

(LIGHTING NOT SHOWN)

TYPICAL DETAILS OF SIGN & TRUSS CONNECTION

DETAILS OF SIGN FACE & TRUSS CONNECTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

ALUMINUM & STEEL OVERHEAD SIGN STRUCTURES		Approved By	
Designed By	RES 11/94	State Structures Design Engineer	
Drawn By	DDDS 11/94	Revision	Sheet No.
Checked By	DER 11/94	00	1 of 1
		Index No. 11037	

Sign Identification Number	SIGN			TYPE OF SIGN BRACKET				Sign Identification Number	SIGN			TYPE OF SIGN BRACKET				Sign Identification Number	SIGN			TYPE OF SIGN BRACKET			
	PROFILE	SIZE	SQ. FT.	WIND ZONE					PROFILE	SIZE	SQ. FT.	WIND ZONE					PROFILE	SIZE	SQ. FT.	WIND ZONE			
				60	70	80	90					60	70	80	90					60	70	80	90
1		24 x 24	1.7	2-I	2-I	2-I	2-I	30		15 x 30 24 x 30	8.1	1-I	1-I	1-I	1-I	55		30 x 24	5.0	2-I	2-I	2-I	2-I
2		30 x 30	2.7	2-I	2-I	2-I	2-I	31		15 x 21 36 x 30	9.7	1-I	1-I	1-I	1-I	56		36 x 48	5.6	2-II	2-II	2-II	2-II
3		36 x 36	3.9	2-I	2-I	2-I	2-I	32		15 x 30 36 x 30	10.6	1-I	1-I	1-I	1-I	57		24 x 36	6.0	2-I	2-I	2-I	2-I
4		48 x 48	6.9	1-II & 1-I	1-II & 1-I	1-II & 1-I	1-II & 1-I	33		12 x 24 24 x 24 15 x 21	8.2	1-I	1-I	1-I	1-I	58		36 x 24	6.0	2-I	2-I	2-I	2-I
5		60 x 60	10.8	DO NOT USE SINGLE COLUMN				34		15 x 30 24 x 24 15 x 21	9.3	1-I	1-I	1-I	1-I	59		30 x 30	6.3	2-I	2-I	2-I	2-I
6		36 Ø	7.1	2-I	2-I	2-I	2-I	35		12 x 24 24 x 30 15 x 21	9.2	1-I	1-I	1-I	1-I	60		30 x 30	6.3	2-I	2-I	2-I	3-I
7		48 Ø	12.6	2-II	2-II	2-II	2-II	36		15 x 30 24 x 30 15 x 21	10.3	1-I	1-I	1-I	1-I	61		36 x 36	6.75	2-I	2-I	2-I	2-I
8		18 x 18	1.9	2-I	2-I	2-I	2-I	37		12 x 24, 12 x 24 24 x 24, 24 x 24 15 x 21	13.6	1-II	1-II	1-II	1-II	62		30 x 36	7.5	2-I	2-I	2-I	2-I
9		24 x 24	3.3	2-I	2-I	2-I	2-I	38		12 x 24, 12 x 24 24 x 24, 24 x 24 15 x 21, 15 x 21	15.2	1-II	1-II	1-II	1-II	63		36 x 30	7.5	2-I	2-I	2-I	2-I
10		30 x 30	5.2	2-I	2-I	2-I	2-I	39		12 x 24, 12 x 24 24 x 24, 24 x 24 15 x 21, 15 x 21	16.4	1-II	1-II	1-II	1-II	64		24 x 48	8.0	2-II	2-II	2-II	2-II
11		36 x 36	7.5	2-I	2-I	2-I	2-I	40		15 x 30, 15 x 30 24 x 30, 24 x 30 15 x 21, 15 x 21	19.2	DO NOT USE SINGLE COLUMN				65		12 x 36 30 x 30	8.2	1-I	1-I	1-I	1-I
12		48 x 48	13.3	2-II	2-II	2-II	2-II	41		12 x 24, 12 x 24 12 x 24, 12 x 24 24 x 24, 24 x 24 15 x 21, 15 x 21	20.4	1-II	1-II	1-II	1-II	66		30 x 42	8.8	2-I	2-I	2-II	2-II
13		12 x 24 24 x 24	5.4	1-I	1-I	1-I	1-I	42		15 x 21	22.6	1-I	1-I	1-I	1-I	67		36 x 36	9.0	2-I	2-I	2-I	2-I
14		15 x 30 24 x 24	6.5	1-I	1-I	1-I	1-I	43		12 x 24, 12 x 24 24 x 24, 24 x 24 15 x 21, 15 x 21	25.6	DO NOT USE SINGLE COLUMN				68		36 x 36	9.0	2-I & 1-II	2-I & 1-II	2-I & 1-II	2-I & 1-II
15		12 x 24 24 x 30	6.3	1-I	1-I	1-I	1-I	44		18 x 12	1.5	1-I	1-I	1-I	1-I	69		12 x 36 30 x 30	9.3	1-I	1-I	1-I	1-I
16		15 x 30 24 x 30	7.4	1-I	1-I	1-I	1-I	45		12 x 36	3.0	1-I	1-I	1-I	1-I	70		30 x 30 18 x 24	9.3	2-I	2-I	2-I	3-I
17		15 x 30 36 x 36	10.8	1-I	1-I	1-I	1-I	46		18 x 24	3.0	2-I	2-I	2-I	2-I	71		48 x 64	9.9	DO NOT USE SINGLE COLUMN			
18		15 x 30 36 x 45	12.6	1-I	1-I	1-I	1-I	47		24 x 18	3.0	2-I	2-I	2-I	2-I	72		30 x 48	10.0	2-II	2-II	2-II	2-II
19		15 x 30 48 x 48	16.7	1-I	1-I	1-I	1-I	48		18 x 18 9 x 12	3.0	2-I	2-I	2-I	2-I	73		12 x 36 36 x 36	10.5	1-I	1-I	1-I	1-I
20		15 x 30 48 x 60	20.1	DO NOT USE SINGLE COLUMN				49		18 x 30	3.8	2-I	2-I	2-I	2-I	74		30 x 54	11.3	DO NOT USE SINGLE COLUMN			
21		12 x 24 24 x 24 15 x 21	7.6	1-I	1-I	1-I	1-I	50		30 x 40	3.9	2-I	2-I	2-I	2-I	75		36 x 48	12.0	2-II	2-II	2-II	2-II
22		15 x 30 24 x 24 15 x 21	8.7	1-I	1-I	1-I	1-I	51		24 x 24	4.0	2-I	2-I	2-I	2-I	76		48 x 36	12.0	2-I	2-I	2-I	2-I
23		12 x 24 24 x 30 15 x 21	8.5	1-I	1-I	1-I	1-I	52		24 x 24	4.0	2-I	2-I	2-I	2-I	77		36 x 36 18 x 24	12.0	2-I & 1-II	2-I & 1-II	2-I & 1-II	2-I & 1-II
24		15 x 30 24 x 30 15 x 21	9.6	1-I	1-I	1-I	1-I	53		18 x 36	4.5	2-I	2-I	2-I	2-I	78		48 x 48	12.0	1-I	1-I	1-I	1-I
25		12 x 24 24 x 24	6.0	1-I	1-I	1-I	1-I	54		30 x 30	4.7	2-I	2-I	2-I	2-I	79		30 x 60	12.5	DO NOT USE SINGLE COLUMN			
26		24 x 24 15 x 21	6.2	2-I	2-I	2-I	2-I							80		48 x 48	16.0	2-II	2-II	2-II	2-II		
27		15 x 30 24 x 24	7.1	1-I	1-I	1-I	1-I							81		48 x 48	16.0	2-I & 1-II	2-I & 1-II	2-I & 1-II	2-I & 1-II		
28		12 x 24 24 x 30	7.0	1-I	1-I	1-I	1-I							82		30 x 78	16.3	DO NOT USE SINGLE COLUMN					
29		24 x 30 15 x 21	7.2	2-I	2-I	2-I	2-I							83		30 x 84	17.5	DO NOT USE SINGLE COLUMN					
														84		48 x 54	18.0	DO NOT USE SINGLE COLUMN					
														85		42 x 66	19.3	DO NOT USE SINGLE COLUMN					
														86		60 x 48	20.0	3-II	3-II	3-II	3-II		
														87		66 x 48	22.0	3-II	3-II	3-II	3-II		
														88		60 x 72	30.0	DO NOT USE SINGLE COLUMN					
														89		96 x 48	32.0	DO NOT USE SINGLE COLUMN					
														90		24 x 78	13.0	DO NOT USE SINGLE COLUMN					
														91		36 x 78	19.5	DO NOT USE SINGLE COLUMN					

NOTE:

- The Gore Exit Panel (FTP-31, Index I7355, Sheet 3), Sign identification Number 88, can be installed on a single column with the following stipulations:
- Maximum height to bottom of sign is 14'.
 - Column size is 6" aluminum round tube with 1/4" wall.
 - 3 Type II Brackets required for attachment.
 - For Type II Bracket details, Attachment and General Notes see Index No. I1860.
 - For Footing size and Slip Base Details, see Index No. I1863.

Sign size is in inches unless other wise specified.

**SINGLE COLUMN
GROUND SIGNS**

Names	Dates	Approved By		
Designed By	RES	10/94	State Structures Design Engineer	
Drawn By	DDDS	10/94	Revision	Sheet No.
Checked By	DER	11/94	00	1 of 3
				I1860

GENERAL NOTES

GENERAL SPECIFICATIONS : Florida Department of Transportation Standard Specifications for Road and Bridge Construction (1999) and Supplements thereto.

DESIGN SPECIFICATIONS : Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, AASHTO 1994.

ALUMINUM : Except as noted below, Aluminum Materials shall meet the requirements of Aluminum Association Alloy 6061-T6 (ASTM B209, B221, or B308).

1. Permitted Alternate for Sheets and Plates --- Alloy 5154-H38 (ASTM-B209)

CONCRETE : All concrete shall be Class I (Special), the specified compressive strength at 28 days (f'c) shall be 3 ksi min.

SIGN PANELS : Sign Panels shall be 1/8" min. thick Aluminum Plate with all corners rounded. See sign layout sheet. Panels are to be degreased, etched, neutralized and treated with Alodine 1200, Irdine 14-2, Bonderite 721 or equal. No stenciling permitted on panels.

ALUMINUM BOLTS, NUTS & LOCKWASHERS : Aluminum bolts shall meet the requirements of ASTM F468, Alloy 2024-T4.

The Bolts shall have an Anodic Coating of at least 0.0002 inches thick and be chromate sealed. Lockwashers shall meet the requirements of Aluminum Association Alloy 7075-T6 (ASTM B221). Nuts shall meet the requirements of ASTM F-467, Alloy 6061-T6 or 6262-T9.

STAINLESS STEEL BOLTS, NUTS AND LOCKWASHERS : Stainless Steel Bolts, Nuts and Lockwashers conforming to ASTM F593 Alloy Group 2 Condition A, CW2, or SH4 may be provided in lieu of Aluminum Bolts, Nuts and Washers.

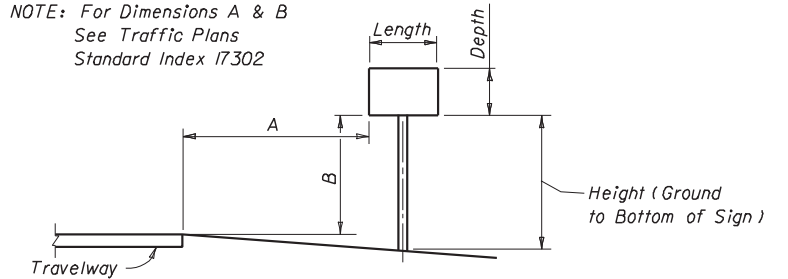
U-BOLTS, NUTS & LOCKWASHERS : U-Bolts, Nuts and Lockwashers shall meet the requirements of ASTM A307, Grade A and shall be galvanized in accordance with ASTM A153.

INSTALLING FRANGIBLE COLUMN SUPPORTS : Columns (Posts) may be installed by driving the columns in accordance with index Nos. 11861 thru 11865, or as an alternate method the contractor may set the columns (Posts) to the depth indicated in preformed holes backfilled with suitable material tamped in layers not thicker than 6" to provide adequate compaction.

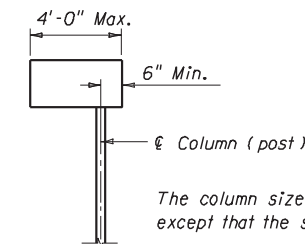
SHOP DRAWINGS : When Type C ground sign supports are furnished and fabricated in accordance with these plans, shop drawings will NOT be required for approval by the Engineer.

HOW TO USE THIS TABLE : Select the appropriate Sign Profile and Size to determine the Sign Identification Number. If the exact Sign Size of all Components are not listed, select the appropriate profile and larger Component Sizes. This table also gives the Quantity and Type of Sign Brackets required for each Sign for each Wind Zone. Where the Sign Size is given as a Vertical and Horizontal Dimension, the Vertical Dimension (Depth) is given first and the Horizontal Dimension (Length) is given last. For Column Sizes, Heights and Footings see appropriate (Wind Zone or Height -14' Max.) sheets titled "Column Sizes, Column Heights and Footings" Index Numbers 11861 thru 11865. No Shop or Field Splice is allowed in Sign Panels. All Panels shall be furnished in one piece.

NOTE: For Dimensions A & B See Traffic Plans Standard Index 17302



TYPICAL SECTION



The column size shall be as tabulated in the Standard except that the size shall not be smaller than 3 1/2" Ø.

Note: All cantilever sign installations shall comply with standard Index 17302. The sign shall be supported by an aluminum round column with concrete footing and breakaway support. All sign brackets shall be Type II.

CANTILEVER SIGN

WIND SPEEDS BY COUNTY

ZONE NO. 1 (60 M.P.H.)

Alachua, Baker, Bay, Bradford, Calhoun, Clay, Columbia, Escambia, Gadsden, Gilchrist, Hamilton, Holmes, Jackson, Jefferson, Lafayette, Lake, Leon, Liberty, Madison, Marion, Okaloosa, Putnam, Santa Rosa, Sumter, Suwannee, Union, Walton and Washington Counties.

ZONE NO. 2 (70 M.P.H.)

Citrus, De Soto, Dixie, Duval, Flagler, Franklin, Glades, Gulf, Hardee, Hendry, Hernando, Highlands, Hillsborough, Levy, Nassau, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Seminole, St. Johns, Taylor and Wakulla Counties.

ZONE NO. 3 (80 M.P.H.)

Brevard, Charlotte, Collier, Indian River, Lee, Manatee, Martin, Palm Beach, Sarasota, St. Lucie and Volusia Counties.

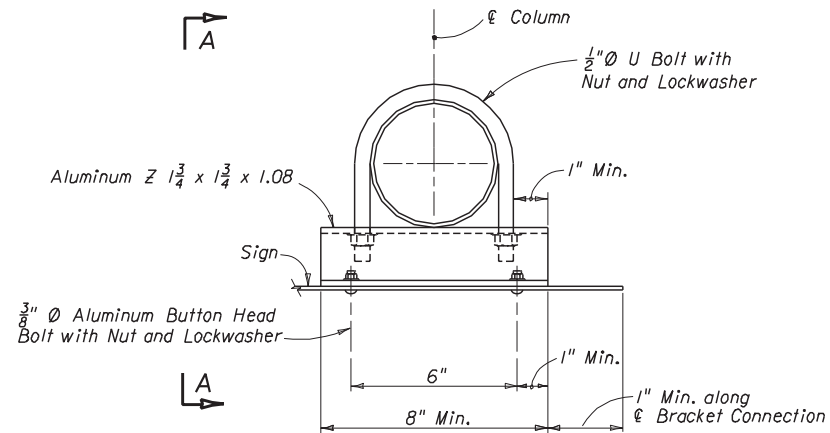
ZONE NO. 4 (90 M.P.H.)

Broward, Dade and Monroe Counties.

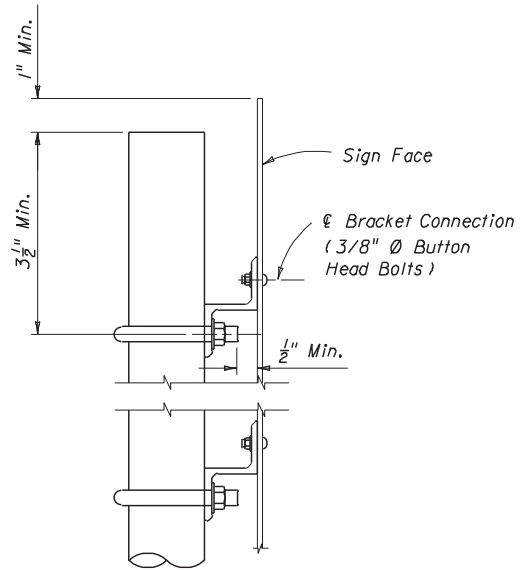
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**SINGLE COLUMN
GROUND SIGNS**

	Names	Dates	Approved By <i>[Signature]</i>		
Designed By	RES	10/94	State Structures Design Engineer		
Drawn By	DDDS	10/94	Revision	Sheet No.	Index No.
Checked By	DER	11/94	00	2 of 3	11860

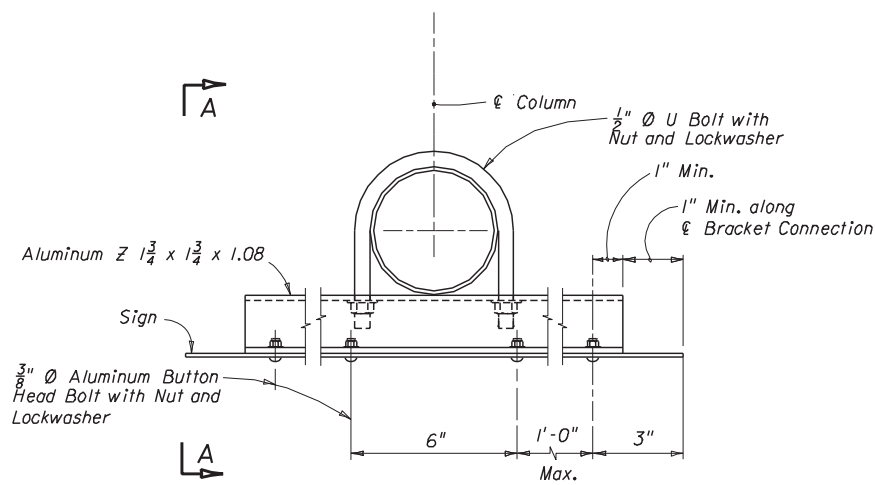


TYPE I BRACKET

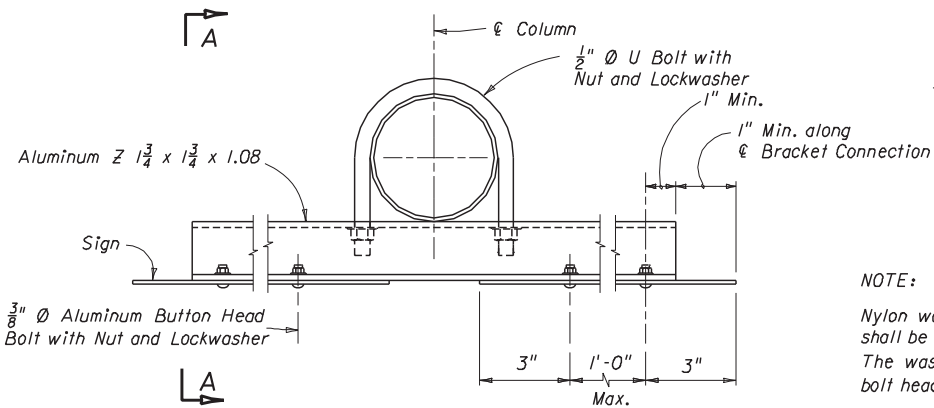


VIEW AA

NOTE: Use profile of largest sign and height to bottom of largest sign to determine column size.



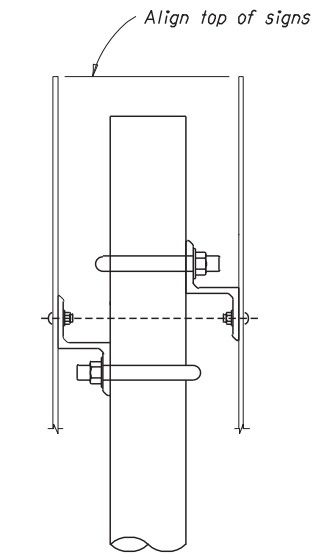
TYPE II BRACKET (SINGLE SIGN)



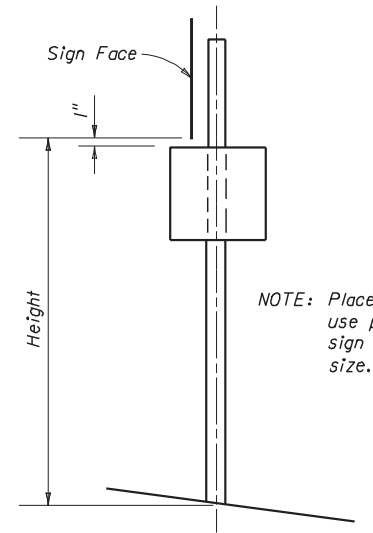
TYPE II BRACKET (DOUBLE SIGNS)

NOTE: 5/16 inch diameter Stainless Steel Hex Head Bolts with Flat Washer under Head and Lockwasher under Nut may be used in lieu of 3/8 inch diameter Aluminum Button Head Bolts.

NOTE: Nylon washers provided by the sheeting supplier shall be used on all ground mounted signs. The washers shall be installed under the sign bolt head to protect the sheeting.



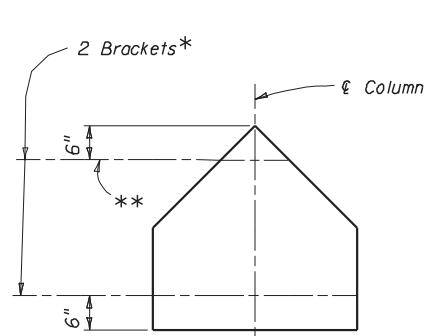
SIGN CLEARANCE



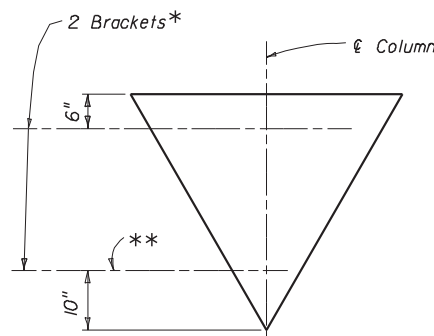
SIGNS AT 90°

NOTE: Place largest sign on top, use profile of largest sign to determine column size.

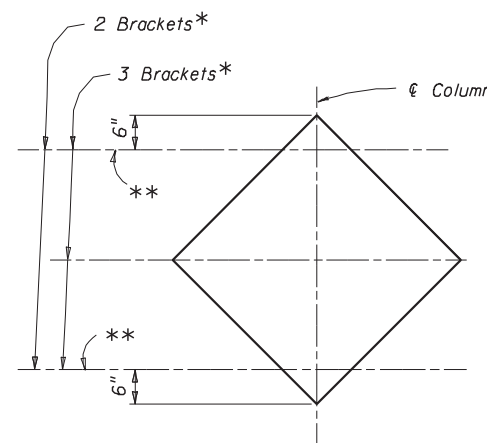
SIGNS BACK-TO-BACK



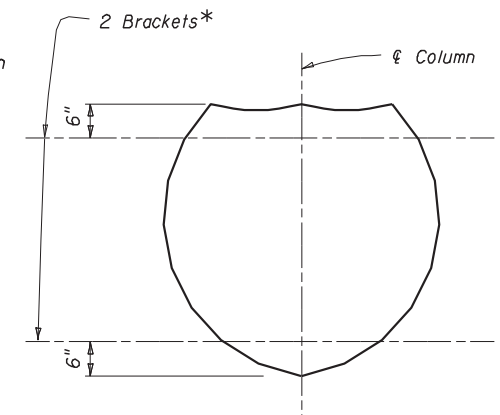
SCHOOL



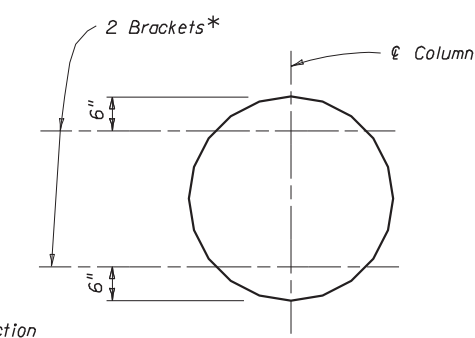
YIELD



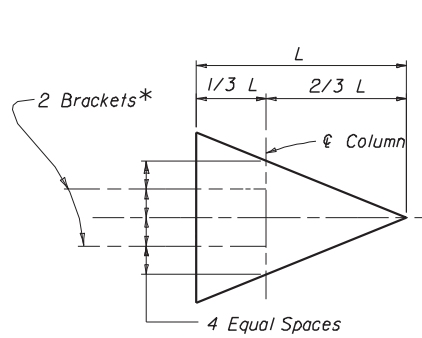
DIAMOND



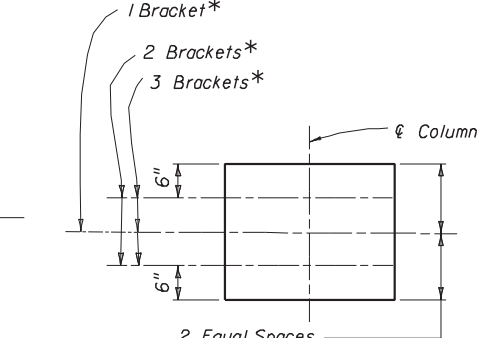
SHIELD



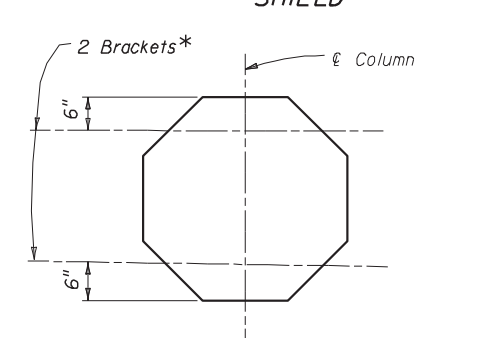
RAILROAD



PENDANT



RECTANGLE



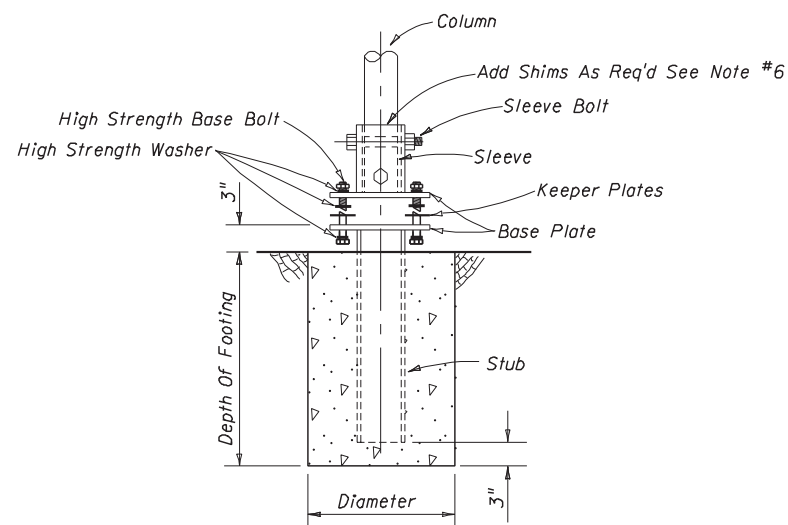
STOP

BRACKET LOCATIONS (SEE VIEW AA)

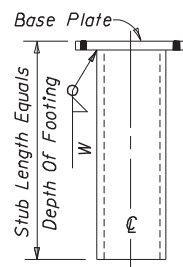
* NOTE : The above Bracket locations apply at the center of Bracket-Sign Connection (3/8 inch diameter Button Head Bolts). See View AA. The locations also apply at Double Signs configurations. When installing back-to-back signs the topmost bracket location of one of the signs will require adjustment as shown on the above detail.

** NOTE : Use Type I Bracket at the apex location (always).

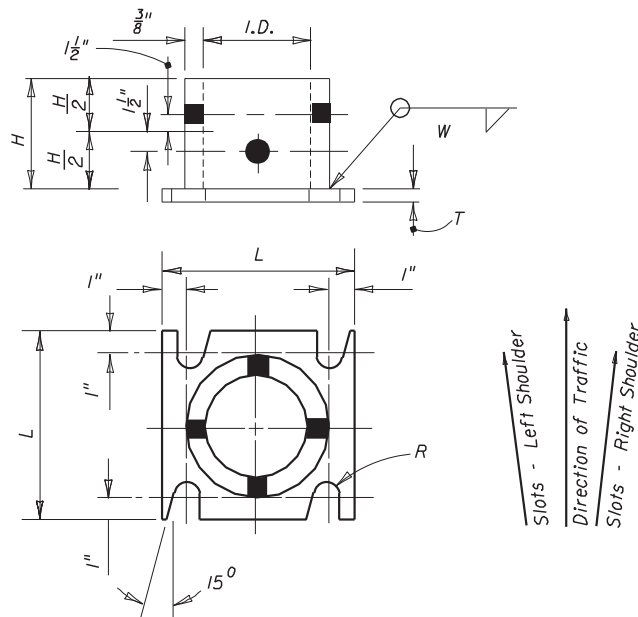
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SINGLE COLUMN GROUND SIGNS				
Names	Dates	Approved By <i>[Signature]</i>		
Designed By	RES	10/94	State Structures Design Engineer	
Drawn By	DDDS	10/94	Revision	Sheet No.
Checked By	DER	11/94	00	3 of 3
				11860



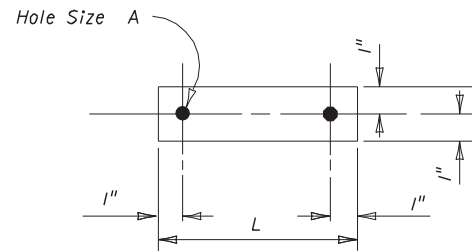
SLIP BASE AND FOOTING DETAIL



**Stub Size Equals Min. Sleeve Size Or Longer
STUB DETAIL**



SLEEVE & BASE PLATE DETAILS



**0.04" Thick Alum. Strip-2 Req'd Per Base
BOLT KEEPER DETAIL**

SLIP BASE DETAILS

Note: Unless noted otherwise, all dimensions are in inches

Column Size	Sleeve I.D. (Max)	Sleeve Height H	Weld W	Base Plate		Radius R	Base Bolt		Base Bolt Torque		Hole Size A
				L	T		Size	Length	Ft-lbs	In-lbs	
4 x 1/4	4 1/16	6	5/8	8	3/4	11/32	5/8	3	29	355	11/16
4 1/2 x 1/4	4 3/16	6	5/8	8	7/8	11/32	5/8	3 1/4	29	355	11/16
5 x 1/4	5 1/16	7	5/8	8	7/8	11/32	5/8	3 1/4	29	355	11/16
6 x 1/4	6 1/16	8	11/16	9	1	7/16	3/4	3 1/2	48	580	13/16
8 x 5/16	8 1/16	10	3/4	11	1	1/2	7/8	3 3/4	53	640	15/16

NOTES

1. Work this Standard with Standard Index Numbers 11860 and 11865.
2. To determine column (post) size and footing requirements use the required Sign Identification Number and Sign Height (H), Designs for Heights (H) lower than those listed in the Table are included in Standard Index Number 11865.
3. Single Column installations are not allowed for heights (H) exceeding the maximum height shown in the Table, and for sign profiles (Sign Identification Numbers) without any design tabulated. In this event, the sign(s) will have to be supported by multiple columns (posts) featuring breakaway devices. See Standard Index Number 9535.
4. The Column (Post) material shall be aluminum. The size is given as outside diameter and wall thickness. Columns (posts) larger than 3 1/2" x 1/8" are non-fragible and shall be installed with breakaway supports and will have concrete footings and slip bases.
5. The foundation size is given as outside diameter and depth.
 - a) Frangible Supports: Foundations for Frangible Supports do not require concrete. The column (post) shall be driven into the ground to the depth indicated.
 - b) Breakaway Supports: Foundations for Breakaway Supports require concrete. The column support shall be set in a concrete foundation, sized as shown in the table. The first dimension indicates the diameter and the second dimension the depth into the ground. In all cases the ground is to be considered as undisturbed earth, road material, or properly compacted fill.
6. SLIP BASE NOTES :
 - a) The Inside Diameter (I.D.) of the sleeve shall be no more than 1/16" larger than the Outside Diameter (O.D.) of the Column.
 - b) The sleeve bolts shall be 1/2" Ø with locknuts. The bolts shall be galvanized steel (ASTM A-307) or Aluminum Association Alloy 2024-T4 or 6061-T6 (ASTM B-211).
 - c) The base bolts, nuts and washers shall be high strength ASTM A-325 and shall have an electroplated zinc coating SC3, Type II applied in accordance with ASTM B633.
 - d) An alternate cast base of aluminum alloy 356 and T6 temper in lieu of the fabricated base may be submitted for approval by the Engineer. If a cast base is used the stub will be the same as the column and will be bolted to the casting.
 - e) Assemble the slip base connection in the following manner :
 Connect column to sleeve using two (2) 1/2" Ø machine bolts.
 Assemble top base plate to stub base plate using high strength bolts with three (3) hardened washers per bolt. One (1) washer per bolt and two (2) bolt keeper plates go between the base plates.
 Use shim stock as required to plumb the column.
 Tighten all bolts the maximum possible with a 12" to 15" wrench to bed the washers and shims and to clear the bolt threads. Loosen each bolt one (1) turn and retighten to the prescribed torque (see table). Bolts shall be tightened with properly calibrated wrenches under the supervision of the project engineer.
 Burr threads at junction with nut using a center punch to prevent nut loosening.
 - f) Use galvanized steel shims to obtain a tight fit between the column face and the sleeve. Place shims in all quadrants between the 1/2" Ø sleeve bolts. The shim length shall be 1" shorter than the height of the sleeve.

COLUMN SIZE, COLUMN HEIGHT & COLUMN FOOTINGS			
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN			
SINGLE COLUMN GROUND SIGNS			
Names	Dates	Approved By <i>W. V. [Signature]</i>	
Designed By	DER	10/94	State Structures Design Engineer
Drawn By	DDDS	10/94	Revision
Checked By	RES	11/94	Sheet No. 1 of 2
			Index No. 11861

**60 M.P.H.
WIND
LOADING**

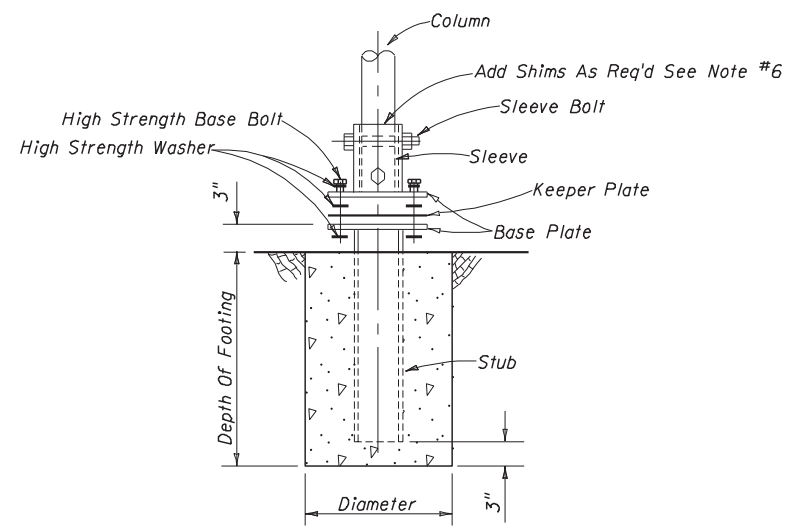
COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16				
FOUNDATION	0 x 4-0	0 x 4-3	0 x 4-9	0 x 5-3	2-0 x 3-9	2-0 x 4-0	2-0 x 4-3	2-0 x 4-9	2-0 x 4-9				
Sign Identification Number	HEIGHT (Feet)												
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to			
1	15	15	20	20	25								
2			17	17	22	22	25						
3			13	13	18	18	25						
4			9	9	11	11	18	18	25				
5													
6			9	9	12	12	18	18	25				
7					6	6	12	12	23	23	25		
8	15	15	20	20	25								
9			15	15	20	20	25						
10			12	12	15	15	22	22	25				
11			9	9	12	12	18	18	25				
12						12	12	22	22	25			
13			12	12	14	14	22	22	25				
14					12	12	20	20	25				
15			11	11	13	13	20	20	25				
16			9	9	12	12	18	18	25				
17					9	9	13	13	25				
18						12	12	23	23	25			
19						9	9	18	18	23	23	25	
20													
21			8	8	11	11	17	17	25				
22					11	11	15	15	25				
23			7	7	11	11	16	16	25				
24					10	10	14	14	25				
25			11	11	13	13	20	20	25				
26			10	10	12	12	20	20	25				
27			9	9	12	12	18	18	25				
28			9	9	12	12	18	18	25				
29			9	9	12	12	18	18	25				
30			8	8	12	12	16	16	25				
31			6	6	10	10	14	14	25				
32					8	8	12	12	25				
33			7	7	11	11	16	16	25				
34			6	6	10	10	14	14	25				
35					10	10	14	14	25				
36					9	9	12	12	25				
37						11	11	21	21	25			
38						11	11	20	20	25	25	25	
39						9	9	18	18	23	23	25	
40													
41							14	14	18	18	23	23	25
42							12	12	16	16	20	20	25
43													
44	16	16	22	22	25								
45			16	16	21	21	25						
46			16	16	21	21	25						
47			16	16	21	21	25						
48			16	16	21	21	25						
49			14	14	18	18	25						
50			13	13	18	18	25						
51					18	18	25						
52			13	13	17	17	25						

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16				
FOUNDATION	0 x 4-0	0 x 4-3	0 x 4-9	0 x 5-3	2-0 x 3-9	2-0 x 4-0	2-0 x 4-3	2-0 x 4-9	2-0 x 4-9				
Sign Identification Number	HEIGHT (Feet)												
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to			
53			13	13	16	16	24	24	25				
54			13	13	16	16	24	24	25				
55			12	12	15	15	23	23	25				
56			11	11	13	13	21	21	25				
57			11	11	13	13	21	21	25				
58			11	11	13	13	20	20	25				
59			11	11	13	13	20	20	25				
60			10	10	12	12	20	20	25				
61			10	10	13	13	19	19	25				
62			9	9	12	12	17	17	25				
63					12	12	17	17	25				
64			8	8	12	12	17	17	25				
65					11	11	16	16	25				
66					11	11	15	15	25				
67			7	7	11	11	15	15	25				
68					10	10	14	14	25				
69					10	10	14	14	25				
70			6	6	10	10	14	14	25				
71													
72					9	9	14	14	25				
73					9	9	13	13	25				
74													
75					7	7	12	12	24	24	25		
76					7	7	12	12	23	23	25		
77							11	11	23	23	25		
78					7	7	12	12	24	24	25		
79													
80						10	10	19	19	23	23	25	
81						9	9	18	18	23	23	25	
82													
83													
84													
85													
86							15	15	19	19	23	23	25
87							13	13	17	17	21	21	25
88													
89													
90													
91													

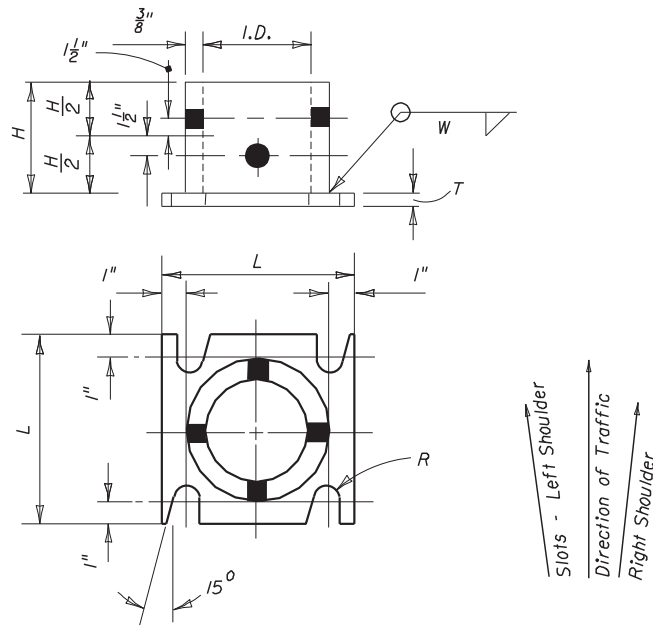
The Column Size is O.D. x Wall Thickness in inches.
The Foundation Size is O.D. x Depth in feet & inches.
A zero O.D. means that a concrete foundation is not necessary.

COLUMN SIZE , COLUMN HEIGHT & COLUMN FOOTINGS				
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SINGLE COLUMN GROUND SIGNS				
Names	Dates	Approved By <i>W. V. [Signature]</i>		
Designed By	DER	10/94	State Structures Design Engineer	
Drawn By	DDDS	10/94	Revision	Sheet No.
Checked By	RES	11/94	00	2 of 2
				11861

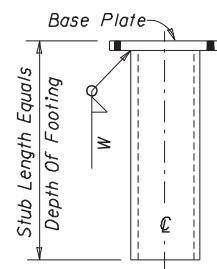
60 M.P.H.
WIND
LOADING



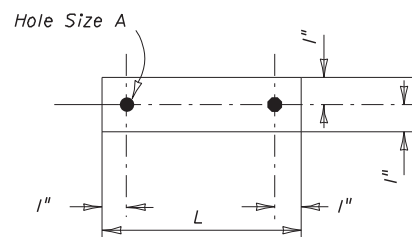
BASE DETAIL



SLEEVE & BASE PLATE DETAILS



Stub Size Equals Min. Sleeve Size Or Longer
STUB DETAIL



0.040" Thick Alum. Strip-2 Req'd Per Base
BOLT KEEPER DETAIL

SLIP BASE DETAILS

Note: Unless noted otherwise, all dimensions are in inches

Column Size	Sleeve I.D. (Max)	Sleeve Height H	Weld W	Base Plate		Radius R	Base Bolt		Base Bolt Torque		Hole Size A
				L	T		Size	Length	Ft-lbs	In-lbs	
4 x 1/4	4 1/16	6	5/8	8	3/4	11/32	5/8	3	29	355	11/16
4 1/2 x 1/4	4 9/16	6	5/8	8	7/8	11/32	5/8	3 1/4	29	355	11/16
5 x 1/4	5 1/16	7	5/8	8	7/8	11/32	5/8	3 1/4	29	355	11/16
6 x 1/4	6 1/16	8	11/16	9	1	7/16	3/4	3 1/2	48	580	13/16
8 x 5/16	8 1/16	10	3/4	11	1	1/2	7/8	3 3/4	53	640	15/16

NOTES

1. Work this Standard with Standard Index Numbers I1860 and I1865.
2. To determine column (post) size and footing requirements use the required Sign Identification Number and Sign Height (H), Designs for Heights (H) lower than those listed in the Table are included in Standard Index Number I1865.
3. Single Column installations are not allowed for heights (H) exceeding the maximum height shown in the Table, and for sign profiles (Sign Identification Numbers) without any design tabulated. In this event, the sign(s) will have to be supported by multiple columns (posts) featuring breakaway devices. See Standard Index Number 9535.
4. The Column (Post) material shall be aluminum. The size is given as outside diameter and wall thickness. Columns (posts) larger than 3 1/2" x 1/8" are non-fragible and shall be installed with breakaway supports and will have concrete footings and slip bases.
5. The foundation size is given as outside diameter and depth.
 - a) Frangible Supports: Foundations for Frangible Supports do not require concrete. The column (post) shall be driven into the ground to the depth indicated.
 - b) Breakaway Supports: Foundations for Breakaway Supports require concrete. The column support shall be set in a concrete foundation, sized as shown in the table. The first dimension indicates the diameter and the second dimension the depth into the ground. In all cases the ground is to be considered as undisturbed earth, road material, or properly compacted fill.
6. SLIP BASE NOTES :
 - a) The Inside Diameter (I.D.) of the sleeve shall be no more than 1/16" larger than the Outside Diameter (O.D.) of the Column.
 - b) The sleeve bolts shall be 1/2" Ø with locknuts. The bolts shall be galvanized steel (ASTM A-307) or Aluminum Association Alloy 2024-T4 or 6061-T6 (ASTM B-211).
 - c) The base bolts, nuts and washers shall be high strength ASTM A-325 and shall have an electroplated zinc coating SC3, Type II applied in accordance with ASTM B633.
 - d) An alternate cast base of aluminum alloy 356 and T6 temper in lieu of the fabricated base may be submitted for approval by the Engineer. If a cast base is used the stub will be the same as the column and will be bolted to the casting.
 - e) Assemble the slip base connection in the following manner :
Connect column to sleeve using two (2) 1/2" Ø machine bolts.
Assemble top base plate to stub base plate using high strength bolts with three (3) hardened washers per bolt. One (1) washer per bolt and two (2) bolt keeper plates go between the base plates.
Use shim stock as required to plumb the column.
Tighten all bolts the maximum possible with a 12" to 15" wrench to bed the washers and shims and to clear the bolt threads. Loosen each bolt one (1) turn and retighten to the prescribed torque (see table). Bolts shall be tightened with properly calibrated wrenches under the supervision of the project engineer.
Burr threads at junction with nut using a center punch to prevent nut loosening.
 - f) Use galvanized steel shims to obtain a tight fit between the column face and the sleeve. Place shims in all quadrants between the 1/2" Ø sleeve bolts. The shim length shall be 1" shorter than the height of the sleeve.

COLUMN SIZE, COLUMN HEIGHT & COLUMN FOOTINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SINGLE COLUMN GROUND SIGNS

70 M.P.H. WIND LOADING	Names	Dates	Approved By <i>W. V. [Signature]</i>		
	Designed By	DER	10/94	State Structures Design Engineer	
	Drawn By	DDDS	10/94	Revision	Sheet No.
	Checked By	RES	11/94	00	1 of 2
					Index No. I1862

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 3/16	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16					
FOUNDATION	0 x 4-3	0 x 4-3	0 x 4-9	0 x 6-0	2-0 x 4-0	2-0 x 4-0	2-0 x 4-3	2-0 x 5-0	2-0 x 5-0					
Sign Identification Number	HEIGHT (Feet)													
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to				
1		16	16	20	20	25								
2				17	17	24	24	25						
3				13	13	20	20	25						
4		6	6	9	9	13	13	25						
5														
6				10	10	13	13	25						
7					9	9	17	17	21	21	25			
8		16	16	20	20	25								
9				15	15	22	22	25						
10				12	12	17	17	25						
11				9	9	13	13	25						
12					8	8	16	16	21	21	25			
13				12	12	17	17	25						
14				11	11	15	15	25						
15				12	12	15	15	25						
16				10	10	13	13	25						
17					11	11	20	20	25					
18					10	10	18	18	22	22	25			
19						14	14	17	17	21	21	25		
20														
21		6	6	9	9	13	13	25						
22				7	7	11	11	23	23	25				
23				8	8	12	12	23	23	25				
24					11	11	21	21	25					
25				12	12	16	16	25						
26				11	11	15	15	25						
27				10	10	14	14	25						
28				10	10	14	14	25						
29				10	10	13	13	25						
30				8	8	12	12	24	24	25				
31				7	7	12	12	21	21	25				
32				6	6	11	11	20	20	24	24	25		
33				8	8	12	12	23	23	25				
34				7	7	11	11	21	21	25				
35				7	7	11	11	22	22	25				
36				6	6	11	11	20	20	24	24	25		
37					8	8	16	16	20	20	24	24	25	
38					7	7	14	14	19	19	23	23	25	
39				6	6	13	13	17	17	21	21	25		
40														
41						11	11	14	14	17	17	25		
42						10	10	12	12	15	15	22	22	25
43														
44				17	17	21	21	25						
45				16	16	23	23	25						
46				16	16	23	23	25						
47				16	16	23	23	25						
48				16	16	23	23	25						
49				14	14	21	21	25						
50				14	14	20	20	25						
51				14	14	20	20	25						
52				13	13	20	20	25						

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 3/16	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16					
FOUNDATION	0 x 4-3	0 x 4-3	0 x 4-9	0 x 6-0	2-0 x 4-0	2-0 x 4-0	2-0 x 4-3	2-0 x 5-0	2-0 x 5-0					
Sign Identification Number	HEIGHT (Feet)													
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to				
53				13	13	19	19	25						
54				12	12	18	18	25						
55				12	12	18	18	25						
56			8	8	12	12	17	17	25					
57				12	12	16	16	25						
58				12	12	16	16	25						
59				11	11	15	15	25						
60				11	11	19	19	25						
61				11	11	15	15	25						
62				9	9	13	13	25						
63				9	9	13	13	25						
64				9	9	12	12	24	24	25				
65				8	8	12	12	23	23	25				
66					12	12	23	23	25					
67				7	7	12	12	22	22	25				
68				7	7	12	12	22	22	25				
69				7	7	12	12	22	22	25				
70				6	6	11	11	21	21	25				
71														
72					12	12	21	21	25					
73				6	6	11	11	20	20	24	24	25		
74														
75					10	10	18	18	22	22	25			
76					10	10	18	18	22	22	25			
77					9	9	17	17	22	22	25			
78					10	10	18	18	22	22	25			
79														
80						14	14	18	18	22	22	25		
81						13	13	17	17	21	21	25		
82														
83														
84														
85														
86						11	11	14	14	17	17	25		
87						11	11	12	12	16	16	23	23	25
88														
89														
90														
91														

The Column Size is O.D. x Wall Thickness in inches.

The Foundation Size is O.D. x Depth in feet & inches. A zero O.D. means that a concrete foundation is not necessary.

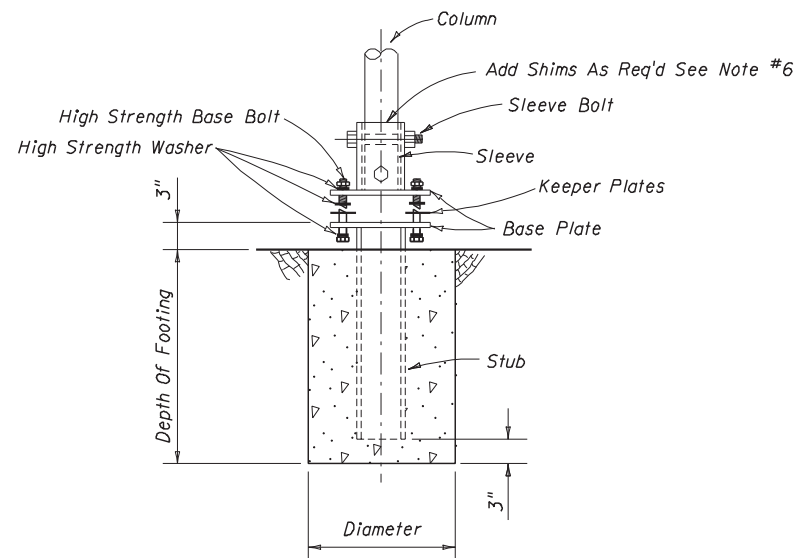
COLUMN SIZE , COLUMN HEIGHT & COLUMN FOOTINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

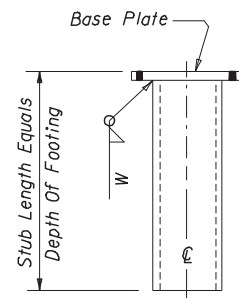
SINGLE COLUMN GROUND SIGNS

70 M.P.H. WIND LOADING

Names	Dates	Approved By		
Designed By	DER	10/94		
Drawn By	DDDS	10/94	Revision	Sheet No.
Checked By	RES	11/94	00	2 of 2
			Index No.	11862

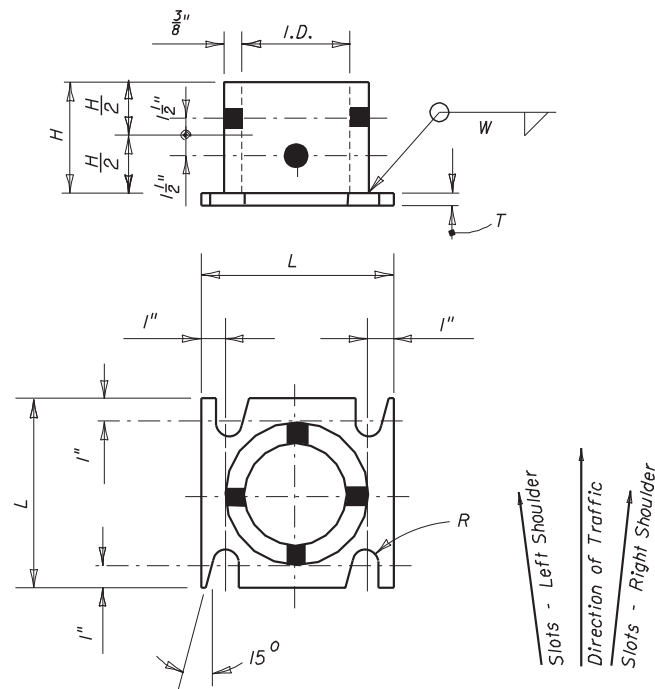


SLIP BASE AND FOOTING DETAIL

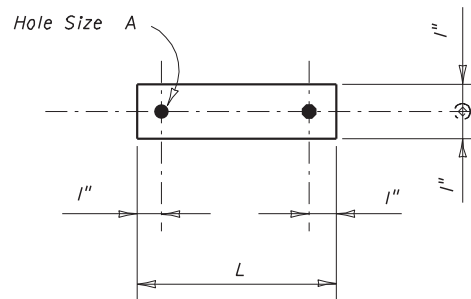


Stub Size Equals Min. Sleeve Size Or Longer

STUB DETAIL



SLEEVE & BASE PLATE DETAILS



0.04" Thick Alum. Strip-2 Req'd Per Base

BOLT KEEPER DETAIL

SLIP BASE DETAILS

Column Size	Sleeve I.D. (Max)	Sleeve Height H	Weld W	Base Plate		Radius R	Base Bolt		Base Bolt Torque		Hole Size A
				L	T		Size	Length	Ft-lbs	In-lbs	
4 x 1/4	4 1/16	6	5/8	8	3/4	11/32	5/8	3	29	355	11/16
4 1/2 x 1/4	4 9/16	6	5/8	8	7/8	11/32	5/8	3 1/4	29	355	11/16
5 x 1/4	5 1/16	7	5/8	8	7/8	11/32	5/8	3 1/4	29	355	11/16
6 x 1/4	6 1/16	8	11/16	9	1	7/16	3/4	3 1/2	48	580	13/16
8 x 5/16	8 1/16	10	3/4	11	1	1/2	7/8	3 3/4	53	640	15/16

Note: Unless noted otherwise, all dimensions are in inches.

NOTES

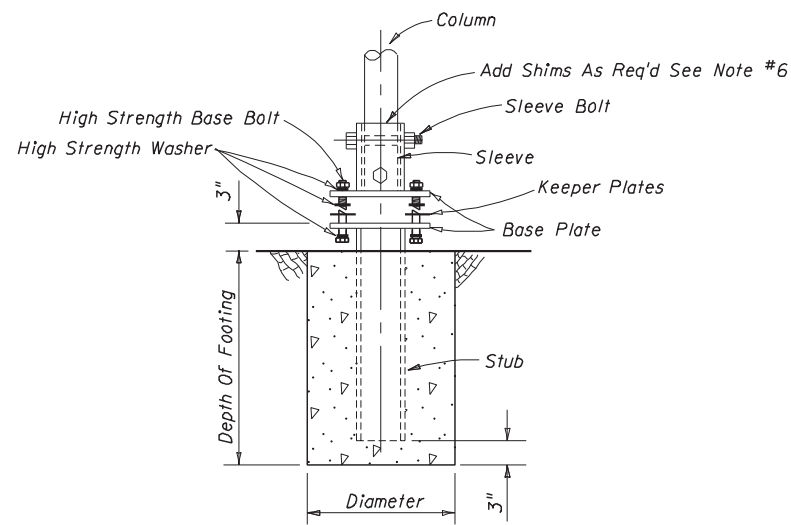
- Work this Standard with Standard Index Numbers 11860 and 11865.
- To determine column (post) size and footing requirements use the required Sign Identification Number and Sign Height (H), Designs for Heights (H) lower than those listed in the Table are included in Standard Index Number 11865.
- Single Column installations are not allowed for heights (H) exceeding the maximum height shown in the Table, and for sign profiles (Sign Identification Numbers) without any design tabulated. In this event, the sign(s) will have to be supported by multiple columns (posts) featuring breakaway devices. See Standard Index Number 9535.
- The Column (Post) material shall be aluminum. The size is given as outside diameter and wall thickness. Columns (posts) larger than 3"x 1/8" are non-fragible and shall be installed with breakaway supports and will have concrete footings and slip bases.
- The foundation size is given as outside diameter and depth.
 - Frangible Supports: Foundations for Frangible Supports do not require concrete. The column (post) shall be driven into the ground to the depth indicated.
 - Breakaway Supports: Foundations for Breakaway Supports require concrete. The column support shall be set in a concrete foundation, sized as shown in the table. The first dimension indicates the diameter and the second dimension the depth into the ground. In all cases the ground is to be considered as undisturbed earth, road material, or properly compacted fill.
- SLIP BASE NOTES :
 - The Inside Diameter (I.D.) of the sleeve shall be no more than 1/16" larger than the Outside Diameter (O.D.) of the Column.
 - The sleeve bolts shall be 12 Ø with locknuts. The bolts shall be galvanized steel (ASTM A-307) or Aluminum Association Alloy 2024-T4 or 6061-T6 (ASTM B-211).
 - The base bolts, nuts and washers shall be high strength ASTM A-325 and shall have an electroplated zinc coating SC3, Type II applied in accordance with ASTM B633.
 - An alternate cast base of aluminum alloy 356 and T6 temper in lieu of the fabricated base may be submitted for approval by the Engineer. If a cast base is used the stub will be the same as the column and will be bolted to the casting.
 - Assemble the slip base connection in the following manner :
 Connect column to sleeve using two (2) 1/2" Ø machine bolts.
 Assemble top base plate to stub base plate using high strength bolts with three (3) hardened washers per bolt. One (1) washer per bolt and two (2) bolt keeper plates go between the base plates.
 Use shim stock as required to plumb the column.
 Tighten all bolts the maximum possible with a 12" to 15" wrench to bed the washers and shims and to clear the bolt threads. Loosen each bolt one (1) turn and retighten to the prescribed torque (see table). Bolts shall be tightened with properly calibrated wrenches under the supervision of the project engineer.
 Burr threads at junction with nut using a center punch to prevent nut loosening.
 - Use galvanized steel shims to obtain a tight fit between the column face and the sleeve. Place shims in all quadrants between the 1/4" Ø sleeve bolts. The shim length shall be 1" shorter than the height of the sleeve.

COLUMN SIZE, COLUMN HEIGHT & COLUMN FOOTINGS

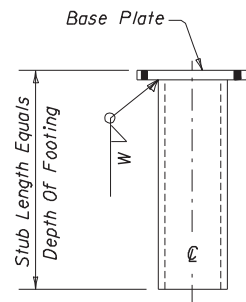
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

SINGLE COLUMN
GROUND SIGNS

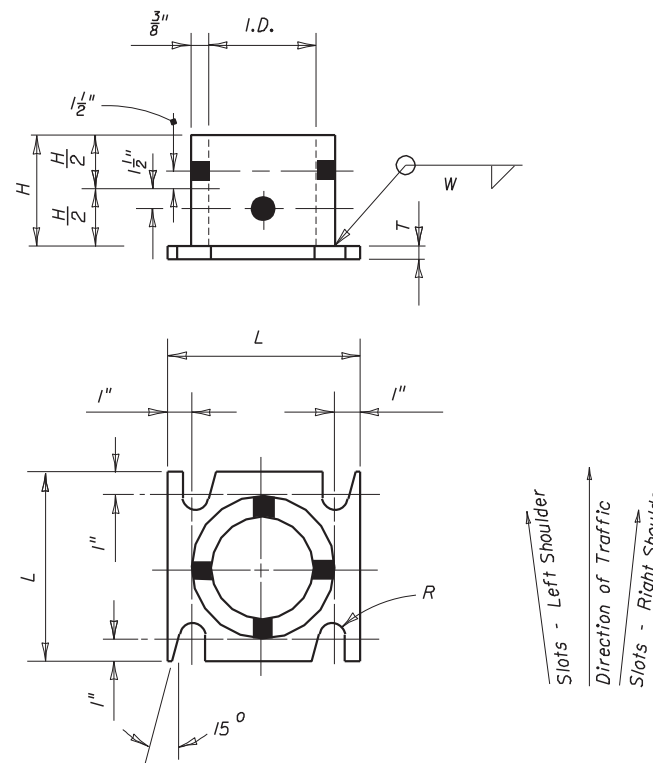
80 WIND LOADING	Names	Dates	Approved By <i>W. V. [Signature]</i>		
	Designed By	DER	10/94	State Structures Design Engineer	
	Drawn By	DDDS	10/94	Revision	Sheet No.
	Checked By	RES	11/94	00	1 of 2
					Index No. 11863



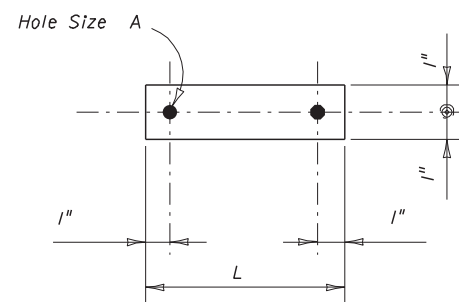
SLIP BASE AND FOOTING DETAIL



**Stub Size Equals Min. Sleeve Size Or Longer
STUB DETAIL**



SLEEVE & BASE PLATE DETAILS



0.04\"/>

SLIP BASE DETAILS

Column Size	Sleeve I.D. (Max)	Sleeve Height H	Weld W	Base Plate		Radius R	Base Bolt		Base Bolt Torque		Hole Size A
				L	T		Size	Length	Ft-lbs	In-lbs	
4 x 1/4	4 1/16	6	5/8	8	3/4	11/32	5/8	3	29	355	11/16
4 1/2 x 1/4	4 9/16	6	5/8	8	7/8	11/32	5/8	3 1/4	29	355	11/16
5 x 1/4	5 1/16	7	5/8	8	7/8	11/32	5/8	3 1/4	29	355	11/16
6 x 1/4	6 1/16	8	11/16	9	1	7/16	4 3/4	3 1/2	48	580	13/16
8 x 5/16	8 1/16	10	3/4	11	1	1/2	7/8	3 3/4	53	640	15/16

Note: Unless noted otherwise, all dimensions are in inches.

NOTES

1. Work this Standard with Standard Index Numbers 11860 and 11865.
2. To determine column (post) size and footing requirements use the required Sign Identification Number and Sign Height (H), Designs for Heights (H) lower than those listed in the Table are included in Standard Index Number 11865.
3. Single Column installations are not allowed for heights (H) exceeding the maximum height shown in the Table, and for sign profiles (Sign Identification Numbers) without any design tabulated. In this event, the sign(s) will have to be supported by multiple columns (posts) featuring breakaway devices. See Standard Index Number 9535.
4. The Column (Post) material shall be aluminum. The size is given as outside diameter and wall thickness. Columns (posts) larger than 3 1/2" x 1/8" are non-fragible and shall be installed with breakaway supports and will have concrete footings and slip bases.
5. The foundation size is given as outside diameter and depth.
 - a) Frangible Supports: Foundations for Frangible Supports do not require concrete. The column (post) shall be driven into the ground to the depth indicated.
 - b) Breakaway Supports: Foundations for Breakaway Supports require concrete. The column support shall be set in a concrete foundation, sized as shown in the table. The first dimension indicates the diameter and the second dimension the depth into the ground. In all cases the ground is to be considered as undisturbed earth, road material, or properly compacted fill.
6. SLIP BASE NOTES :
 - a) The Inside Diameter (I.D.) of the sleeve shall be no more than 1/16" larger than the Outside Diameter (O.D.) of the Column.
 - b) The sleeve bolts shall be 1/2" Ø with locknuts. The bolts shall be galvanized steel (ASTM A-307) or Aluminum Association Alloy 2024-T4 or 6061-T6 (ASTM B-211).
 - c) The base bolts, nuts and washers shall be high strength ASTM A-325 and shall have an electroplated zinc coating SC3, Type II applied in accordance with ASTM B633.
 - d) An alternate cast base of aluminum alloy 356 and T6 temper in lieu of the fabricated base may be submitted for approval by the Engineer. If a cast base is used the stub will be the same as the column and will be bolted to the casting.
 - e) Assemble the slip base connection in the following manner :
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 Assemble top base plate to stub base plate using high strength bolts with three (3) hardened washers per bolt. One (1) washer per bolt and two (2) bolt keeper plates go between the base plates.
 Use shim stock as required to plumb the column.
 Tighten all bolts the maximum possible with a 12" to 15" wrench to bed the washers and shims and to clear the bolt threads. Loosen each bolt one (1) turn and retighten to the prescribed torque (see table). Bolts shall be tightened with properly calibrated wrenches under the supervision of the project engineer.
 Burr threads at junction with nut using a center punch to prevent nut loosening.
 - f) Use galvanized steel shims to obtain a tight fit between the column face and the sleeve. Place shims in all quadrants between the 1/2" Ø sleeve bolts. The shim length shall be 1" shorter than the height of the sleeve.

COLUMN SIZE, COLUMN HEIGHT & COLUMN FOOTINGS				
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
SINGLE COLUMN GROUND SIGNS				
	Names	Dates	Approved By <i>W. V. [Signature]</i>	
90 M.P.H. WIND LOADING	Designed By	DER	10/94	State Structures Design Engineer
	Drawn By	DDDS	10/94	Revision
	Checked By	RES	11/94	00
				Index No. 11864

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16					
FOUNDATION	0 x 4-6	0 x 4-9	0 x 4-9	0 x 6-0	2-0 X 4-0	2-0 X 4-0	2-0 X 4-3	2-0 X 5-0	2-0 X 6-0					
Sign Identification Number	HEIGHT (Feet)													
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to				
1			15	15	20	20	25							
2					17	17	25							
3					14	14	25							
4					10	10	18	18	22	22	25			
5														
6					10	10	18	18	22	22	25			
7						12	12	14	14	18	18	25		
8			14	14	20	20	25							
9					16	16	25							
10					12	12	22	22	25					
11					10	10	17	17	21	21	25			
12						12	12	13	13	17	17	24	24	25
13					12	12	21	21	25					
14					11	11	19	19	23	23	25			
15					12	12	20	20	24	24	25			
16					10	10	18	18	22	22	25			
17						13	13	16	16	20	20	25		
18						12	12	14	14	18	18	25		
19						10	10	11	11	14	14	21	21	25
20														
21					9	9	17	17	21	21	25			
22					8	8	15	15	19	19	23	23	25	
23					8	8	16	16	19	19	24	24	25	
24					7	7	14	14	18	18	22	22	25	
25					12	12	20	20	24	24	25			
26					11	11	19	19	23	23	25			
27					10	10	18	18	22	22	25			
28					10	10	18	18	22	22	25			
29					10	10	17	17	21	21	25			
30					9	9	16	16	20	20	24	24	25	
31					7	7	14	14	17	17	22	22	25	
32					6	6	13	13	16	16	20	20	25	
33					8	8	16	16	19	19	24	24	25	
34					7	7	14	14	18	18	22	22	25	
35					7	7	14	14	18	18	22	22	25	
36					6	6	13	13	16	16	20	20	25	
37						11	11	13	13	16	16	24	24	25
38						11	11	12	12	15	15	22	22	25
39						10	10	11	11	13	13	20	20	25
40														
41							10	10	11	11	16	16	25	
42								10	10	14	14	25		
43														
44					16	16	21	21	25					
45						17	17	25						
46						17	17	25						
47						16	16	25						
48						16	16	25						
49						15	15	25						
50						14	14	25						
51						14	14	25						
52						14	14	24	24	25				

COL. SIZE	2 x 1/8	2 1/2 x 1/8	3 x 1/8	3 1/2 x 3/16	4 x 1/4	4 1/2 x 1/4	5 x 1/4	6 x 1/4	8 x 5/16					
FOUNDATION	0 x 4-6	0 x 4-9	0 x 4-9	0 x 6-0	2-0 X 4-0	2-0 X 4-0	2-0 X 4-3	2-0 X 5-0	2-0 X 6-0					
Sign Identification Number	HEIGHT (Feet)													
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to				
53					13	13	23	23	25					
54					13	13	23	23	25					
55					12	12	22	22	25					
56					12	12	21	21	25					
57					12	12	20	20	24	24	25			
58					12	12	20	20	24	24	25			
59					12	12	20	20	24	24	25			
60					11	11	19	19	23	23	25			
61					11	11	19	19	23	23	25			
62					10	10	17	17	21	21	25			
63					10	10	17	17	21	21	25			
64					9	9	17	17	21	21	25			
65					8	8	16	16	20	20	24	24	25	
66						15	15	19	19	23	23	25		
67					8	8	15	15	19	19	23	23	25	
68					7	7	14	14	18	18	22	22	25	
69					8	8	14	14	18	18	22	22	25	
70					7	7	14	14	18	18	22	22	25	
71														
72						14	14	17	17	21	21	25		
73					6	6	13	13	16	16	20	20	25	
74														
75						12	12	15	15	19	19	25		
76						12	12	15	15	18	18	25		
77						11	11	14	14	17	17	25		
78						12	12	15	15	19	19	25		
79														
80						10	10	12	12	14	14	21	21	25
81						9	9	11	11	13	13	20	20	25
82														
83														
84														
85														
86							10	10	11	11	17	17	25	
87									11	11	15	15	25	
88														
89														
90														
91														

The Column Size is O.D. x Wall Thickness in inches.

The Foundation Size is O.D. x Depth in feet & inches.
A zero O.D. means that a concrete foundation is not necessary.

COLUMN SIZE , COLUMN HEIGHT & COLUMN FOOTINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

**SINGLE COLUMN
GROUND SIGNS**

**90 M.P.H.
WIND
LOADING**

Names	Dates	Approved By <i>W. J. [Signature]</i>		
Designed By	DER	10/94	State Structures Design Engineer	
Drawn By	DDDS	10/94	Revision	Sheet No.
Checked By	RES	11/94	00	2 of 2
				11864

COL. SIZE	2x1/2	2x1/2	2x1/2	2 1/2x1/2	2 1/2x1/2	2 1/2x1/2	3x1/2	3x1/2	3x1/2	*	COL. SIZE	2x1/2	2x1/2	2x1/2	2 1/2x1/2	2 1/2x1/2	2 1/2x1/2	3x1/2	3x1/2	3x1/2	*	ALUMINUM ROUND POST											
FOUNDATION	0x2-0	0x2-0	0x2-0	0x2-3	0x2-3	0x2-3	0x2-6	0x2-6	0x2-6	*	FOUNDATION	0x2-0	0x2-0	0x2-0	0x2-3	0x2-3	0x2-3	0x2-6	0x2-6	0x2-6	*	STEEL FLANGED CHANNEL POST											
COL. SIZE	2.5 #/FT	2.5 #/FT	3.0 #/FT	4.0 #/FT	4.0 #/FT	N/A	N/A	N/A	N/A	*	COL. SIZE	2.5 #/FT	2.5 #/FT	3.0 #/FT	4.0 #/FT	4.0 #/FT	N/A	N/A	N/A	N/A	*	FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	N/A	N/A	N/A	*	STEEL SQUARE TUBE POST
FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	N/A	N/A	N/A	*	FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	*											
COL. SIZE	W=1 1/2	W=1 3/4	W=1 3/4	W=2	W=2 1/4	W=2 1/4	W=2 1/4	W=2 1/2	N/A	*	COL. SIZE	W=1 1/2	W=1 3/4	W=1 3/4	W=2	W=2 1/4	W=2 1/4	W=2 1/4	W=2 1/2	N/A	*	FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	*	
FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	*	FOUNDATION	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	0x3-0	N/A	*											
Sign Identification Number	HEIGHT (FT)										Sign Identification Number	HEIGHT (FT)																					
	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to		(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to	(+) to			
1	To 8		8 - 10	10 - 13			13 - 14				47	To 6	6 - 7	7 - 9	9 - 11	11 - 12	12 - 13	13 - 14															
2	To 6	6 - 7	7 - 8	8 - 12		12 - 13	13 - 14				48	To 7	7 - 8	8 - 11	11 - 12		12 - 13	13 - 14															
3	To 6	6 - 7	7 - 9	9 - 11		11 - 12	12 - 13				49	To 6	6 - 7	7 - 10	10 - 11		11 - 12	12 - 14															
4											50																						
5											51	To 6	6 - 7	7 - 9	9 - 11		11 - 12	12 - 14															
6					To 6		6 - 8	8 - 9			52	To 6	6 - 9	9 - 10		10 - 12	12 - 13																
7											53	To 6	6 - 8	8 - 10		10 - 11	11 - 13																
8	To 8	8 - 9	9 - 10	10 - 13		13 - 14					54	To 8	8 - 9		9 - 11	11 - 12																	
9	To 7	7 - 8	8 - 11	11 - 12	12 - 13		13 - 14				55	To 8	8 - 9		9 - 10	10 - 12																	
10				To 8	8 - 9		9 - 10	10 - 12			56																						
11					To 6		6 - 7	7 - 9			57	To 7			7 - 9	9 - 10																	
12											58	To 6	6 - 7		7 - 9	9 - 11																	
13					To 8		8 - 9	9 - 11	11 - 12		59	To 6	6 - 7		7 - 9	9 - 10																	
14				To 6	6 - 7		7 - 8	8 - 10	10 - 11		60	To 6	6 - 7		7 - 8	8 - 10																	
15				To 6	6 - 7		7 - 8	8 - 10			61	To 6			6 - 8																		
16					To 6		6 - 7	7 - 9			62	To 6			6 - 7	7 - 8																	
17											63	To 6			6 - 7	7 - 9																	
18											64																						
19											65					To 6	6 - 8																
20											66																						
21										To 6	67																						
22											68																						
23											69																						
24										To 6	70																						
25				To 6	6 - 7		7 - 9	9 - 11			71																						
26				To 6			6 - 8	8 - 9			72																						
27					To 6		6 - 7	7 - 9			73																						
28					To 6		6 - 7	7 - 9			74																						
29								To 7	7 - 8		75																						
30								To 6	6 - 8		76																						
31									To 6		77																						
32									To 6		78																						
33									To 6	6 - 7	79																						
34									To 6		80																						
35									To 7		81																						
36									To 6		82																						
37											83																						
38											84																						
39											85																						
40											86																						
41											87																						
42											88																						
43											89																						
44	To 9		9 - 10	10 - 13		13 - 14					90																						
45	To 6	6 - 7	7 - 9	9 - 11	11 - 12	12 - 13	13 - 14				91																						
46	To 6	6 - 7	7 - 9	9 - 11	11 - 12	12 - 13	13 - 14																										

* Aluminum Round Post dimensions are given in inches. The size is shown as outside diameter times wall thickness.

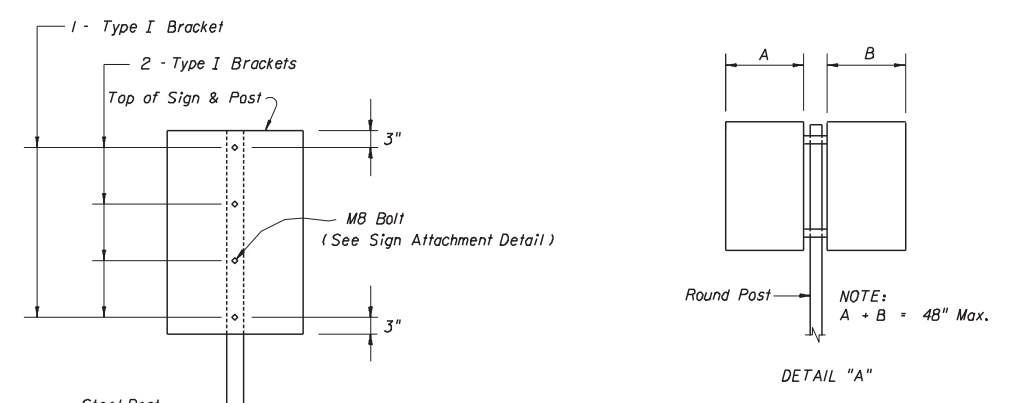
Steel Flanged Channel Post sizes are given in lb/ft. Section definitions and properties are shown on Sheet 2 of 2. (See OPL for approved posts).

Steel Square Tube Post dimensions for "W" are given in inches. The "W" dimension is defined on Section F-F. (See OPL for approved posts).

Foundation dimensions shown are given in feet & inches. The dimension shown is the minimum embedment of the driven post.

NOTES

- This Standard Index 11865 provides designs for driven single post sign installations for implementation at all locations within the State of Florida. The designs adhere to the following criteria:
 - Mounting Height = 14' Maximum
 - Sign(s) Area = 25 sq. ft. Maximum
 - Sign(s) Width: Single = 36" Maximum
Dual = 48" Maximum (See Detail "A")
 - Driven Post only
- Designs exceeding above criteria or requiring concrete footings are included on Index 11861 thru 11864.
- Specifications for Aluminum materials, Sign Panel Details, etc. are shown on standard Index 11860. Additional information and details are shown on Index 11861 thru 11864. Therefore, work this Standard Index 11865 with Standard Indices 11860 to 11864.
- Sign Bracket requirements are shown on Index 11860 (80 mph WIND ZONE). If Flanged Channels or Square Tubes are used, substitute two 3/16" bolts for each Type I Bracket. See Detail "B".
- All posts shall be installed Plumb.
- Steel for Flanged Channel Posts shall conform with ASTM A499 Grade 60, or ASTM A576 Grade 1080.
- Steel for fabrication of square Tubes shall conform with ASTM A653 or ASTM A570. HOWEVER, STEEL FROM THE FABRICATED SQUARE TUBES MUST MEET A CERTIFIED MINIMUM YIELD STRENGTH OF 55 ksi.
- Steel Flanged Channel Posts with a 4 lb/ft are non-frangible and shall be installed with approved breakaway (frangible) bases. See Detail "C". The base and the sign posts shall be same size and type and the splice shall be 6" long and fastened with two bolts, 4" apart. The bolts shall be wrench-tightened sufficiently to clamp splice assembly tightly together. Bolts shall conform with ASTM A 354 Grade DH or SAE J995 Grade 8. Washers and spacers shall conform with ASTM A307 or A36.
- Steel Flanged Channel Posts with masses of 2.5 lb/ft and 3 lb/ft, all Aluminum Round Posts and all Steel Square Tubes included in this standard are frangible and do not require breakaway (frangible) bases. However, the contractor may mount frangible posts on approved breakaway bases.
- Bolts, Nuts and washers not included in note 8 above, shall conform with ASTM A307.
- Steel Posts shall be selected from the Department's book of Qualified Product List (QPL).
- All steel posts, and hardware shall be galvanized in accordance with ASTM A123 or A153, or AASHTO M181 Grade 2.
- Shop Drawings: If the contractor proposes to utilize sign panel connections and/or breakaway devices not shown in this standard or in the above referenced standards, the Contractor shall submit shop drawings for approval.
- All dimensions are in inches, unless otherwise noted.



COLUMN SIZE , COLUMN HEIGHT & COLUMN FOOTINGS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN

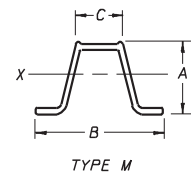
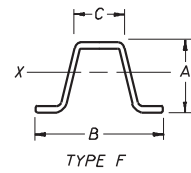
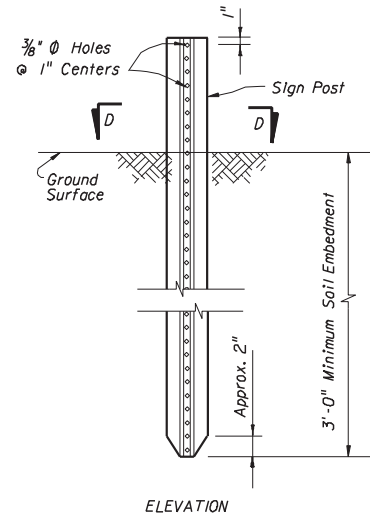
**SINGLE COLUMN
GROUND SIGNS**

Designed By	JMD	Date	4-94	Approved By		[Signature]	
Drawn By	SHW	Date	4-94	Revision	Sheet No.	Index No.	
Checked By	AGG	Date	4-94	00	1 of 2	11865	

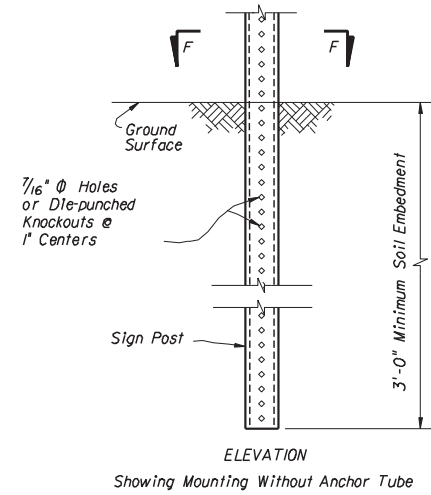
**HEIGHT = 14' MAX.
(ALL WIND ZONES)**

APPROVED STEEL FLANGED CHANNEL POSTS					
lb/ft*	Type	A (in)	B (in)	C (in)	Sx (in ³)
2.50	F	1.562	3.125	1.250	.310
2.50	M	1.500	3.063	1.281	.313
3.00	F	1.750	3.500	1.625	.430
3.00	M	1.875	3.500	1.313	.447
4.00	F	1.750	3.500	1.671	.560
4.00	M	1.938	3.500	1.313	.625

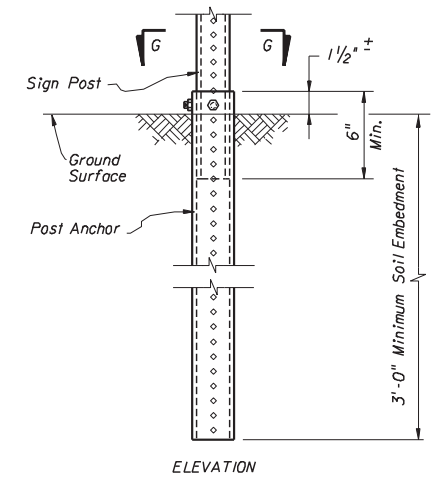
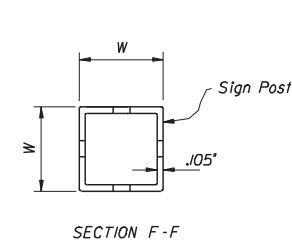
* ± 4 %



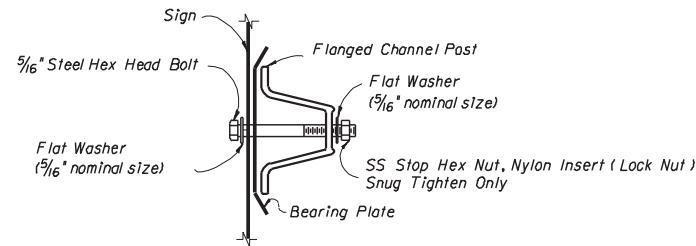
SECTION D-D



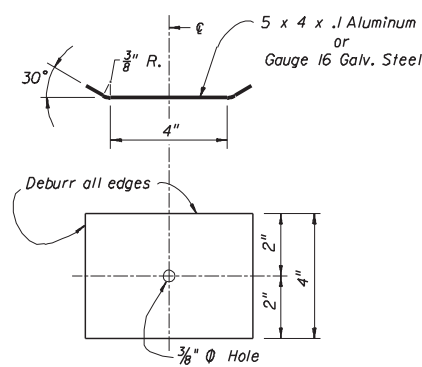
ELEVATION
Showing Mounting Without Anchor Tube



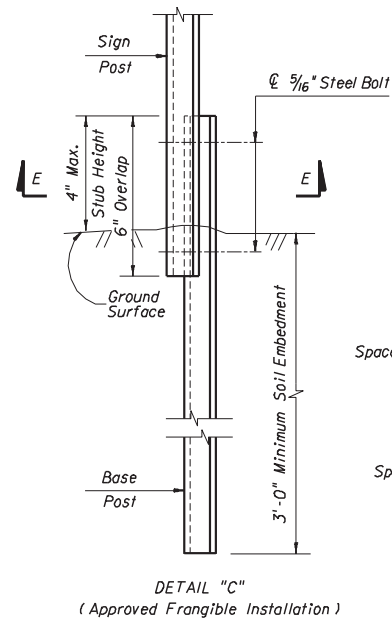
ELEVATION
Showing Mounting Using Optional Anchor Tube



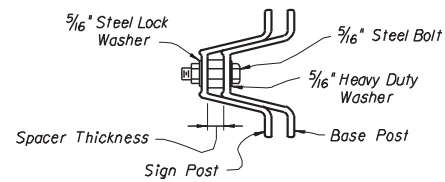
SIGN ATTACHMENT DETAIL



BEARING PLATE DETAIL

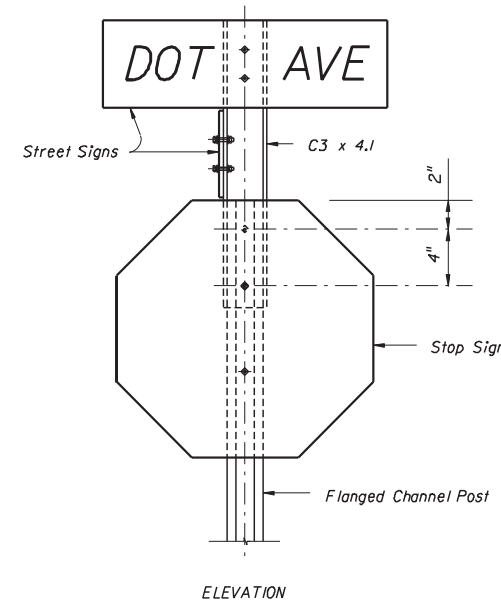


STEEL FLANGED CHANNEL POST DETAILS

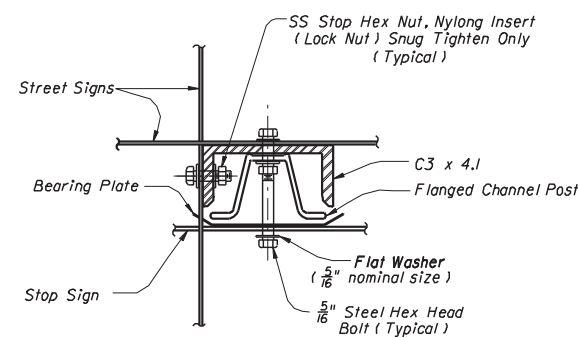


SECTION E-E

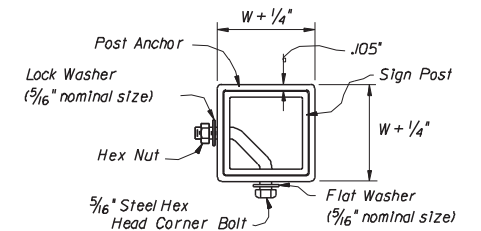
Spacer Thickness shall be as follows:
2.5 lb/ft Type M posts shall use 5/16" spacer.
Other posts shall use 3/8" spacer (or two 5/16").



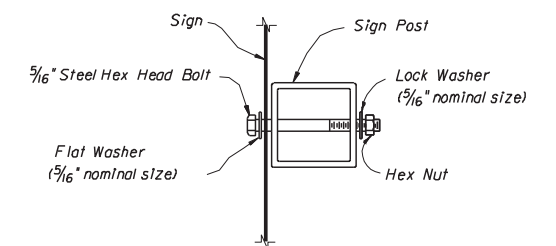
ELEVATION



TOP VIEW
SIGN ATTACHMENT DETAIL



SECTION G-G



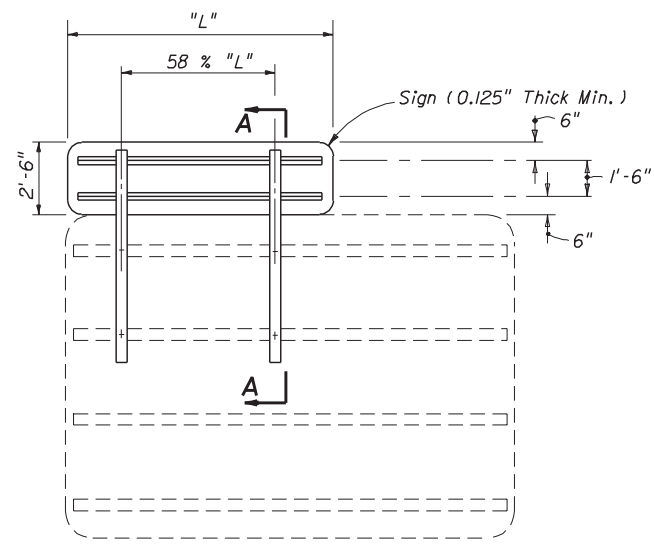
SIGN ATTACHMENT DETAIL

STEEL SQUARE TUBE POST DETAILS

NOTE: All dimensions are in inches, unless otherwise noted.

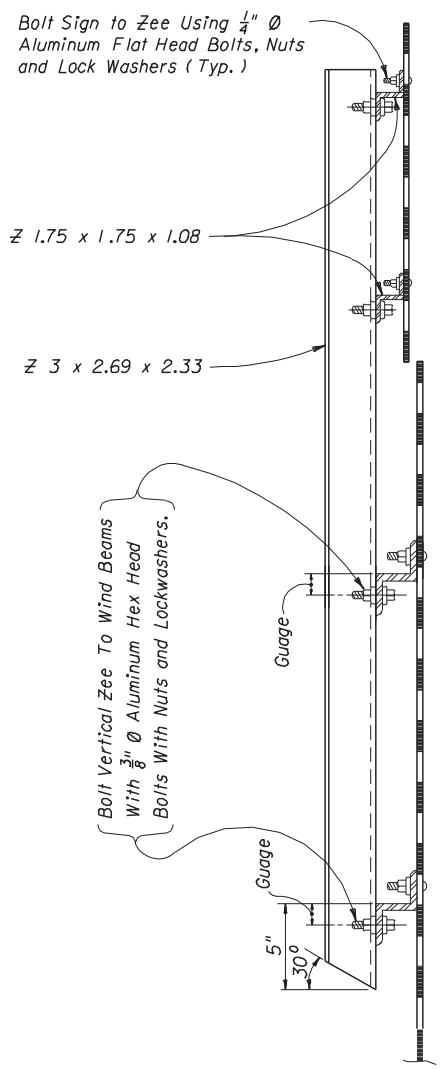
HEIGHT = 14' MAX.
(ALL WIND ZONES)

COLUMN SIZE, COLUMN HEIGHT & COLUMN FOOTINGS				
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN				
SINGLE COLUMN GROUND SIGNS				
Designed By	JJD/TJB	6/99	Approved By	<i>W. J. [Signature]</i>
Drawn By	JP	6/99	Revision	Sheet No. Index No.
Checked By	TJB	6/99	00	2 of 2 11865



NOTE: Exit numbering panel shall be located to the right side for right exit and to the left for left exit.

Mounting of Exit Numbering Panels To Highway Signs
ELEVATION



Bolt Sign to Zee Using $\frac{1}{4}$ " \varnothing Aluminum Flat Head Bolts, Nuts and Lock Washers (Typ.)

Bolt Vertical Zee To Wind Beams With $\frac{3}{8}$ " \varnothing Aluminum Hex Head Bolts With Nuts and Lockwashers.

SECTION AA

GENERAL NOTES

DESIGN SPECIFICATION: Latest Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, AASHTO 1994.

SHEETS AND PLATES: Material used shall meet the requirements of Aluminum Association Alloy 6061-T6 and ASTM B209. Sheets are to be degreased, etched, neutralized and treated with Alodine II200, Iridite 14-2 Bonderite 721, or equal. No stenciling permitted on sheets.

MATERIALS: All aluminum materials shall meet the requirements of the Aluminum Association Alloy 6061-T6 and also the following ASTM specifications for the following: Sheets and plates B209; extruded shapes B221 and standard structural shapes B308.

ALUMINUM BOLTS, NUTS & LOCK WASHERS: Aluminum bolts shall meet the requirements of the Aluminum Association Alloy 2024-T4 or 6061-T6 (ASTM B211). The bolts shall have an anodic coating of at least .0002" thick and be chromate sealed. Lockwashers shall meet the requirement of Aluminum Association Alloy 7075-T6 (ASTM B221). Nuts shall meet the requirement of Aluminum Association Alloy 6262-T9 or 6061-T6.

SIGN FACE: All sign face corners shall be rounded. See sign layout sheet for dimension "L" and sign face details.

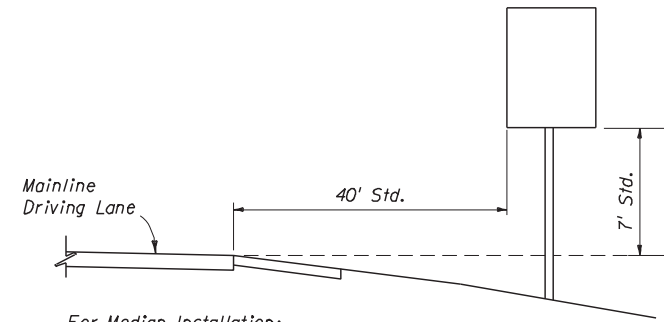
MATERIAL STRESSES: All allowable stresses are in accordance with Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. AASHTO for all materials shown in the plans.

For mounting details refer to Index No. 11037.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN					
MOUNTING EXIT NUMBERING PANELS TO HIGHWAY SIGNS					
Designed By	Names	Dates	Approved By <i>W. H. [Signature]</i>		
Drawn By	CK/CWR	7-82	State Structures Design Engineer		
Checked By	CK	7-82	Revision	Sheet No.	Index No.
			00	1 of 1	13417

CASE I

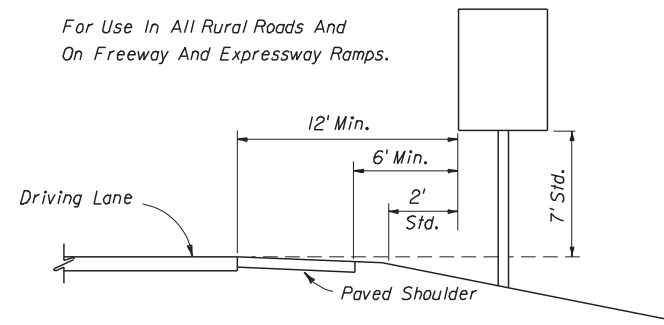
For use on Freeway and Expressway systems for signs on mainline.



For Median Installation:
If Median Width Does Not Allow Std. Offset From Both Roadways, Center Sign In Median.

CASE II

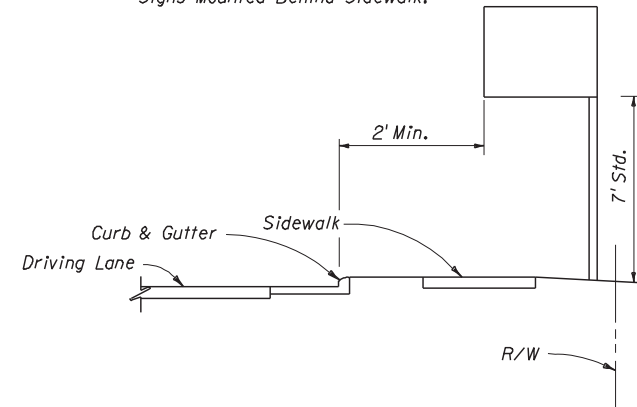
For Use In All Rural Roads And On Freeway And Expressway Ramps.



14' Horizontal Clearance Standard On All Freeway And Expressway Ramps
For Sections Without Paved Shoulder The 6' Min Does Not Apply.

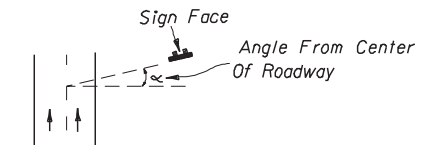
CASE III

For Use On All Roads With Signs Mounted Behind Sidewalk.



GENERAL NOTES:

1. The typical sections shown hereon serve as a guide for locating the traffic signs required under various roadside conditions. For size and details of sign construction and footing, refer to the appropriate standard index drawing for roadside sign.
2. It shall be the CONTRACTORS responsibility to verify the length of sign supports in the field prior to fabrication.
3. Roadside signs shall be installed at an angle of 1 to 4 degrees away from the traffic flow (see illustration). Shoulder mounted signs shall be rotated counterclockwise and median mounted signs rotated clockwise. Signs on curves shall be mounted as noted above from the perpendicular to the motorist line of sight.



4. The setback for stop and yield signs may be reduced to 3' minimum from the driving lane if required for visibility in business or residential sections with no curb and speeds of 30 MPH or less.
5. The mounting heights are measured from the bottom of the sign panel to a horizontal line extended from the edge of the driving lane. If the standard heights cannot be met, the minimum heights are as follows:

Expressway & Freeway Systems	7'
Other Roadway Systems	
Rural	5'
Urban (including residential with parking and /or pedestrian activity)	7'

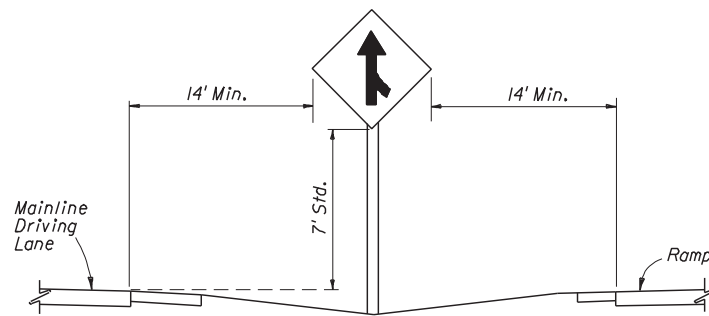
If a secondary sign is mounted below the major sign, the major sign shall be at least 8' and the secondary sign at least 5' for expressway & freeway systems and for other systems the height to the secondary sign shall be at least 4' for rural and 6' for urban sections.

6. Sign supports should never be placed in the bottom of ditches where erosion might affect the proper operation of the breakaway feature.

7. Sign supports shall not reduce the accessible route /continuous passage to less than 3' min. clear width as required by the Americans with Disabilities Act (ADA) Accessibility Guidelines.

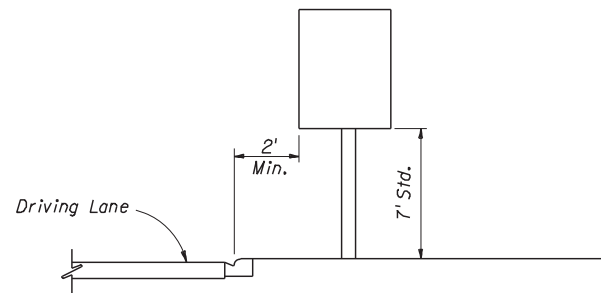
CASE IV (Merge Sign)

For Use On All Rural, Freeway And Expressway Systems.



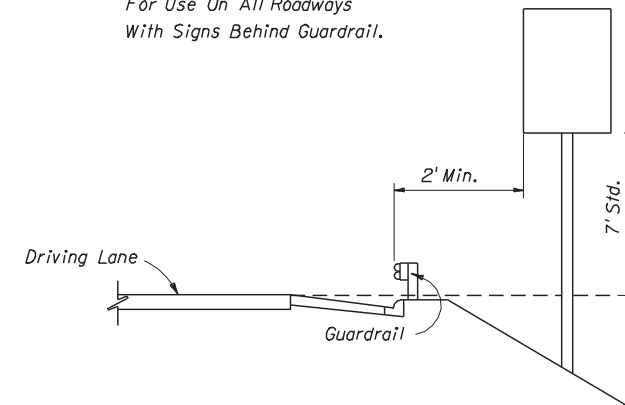
CASE V

For Use In Business Or Residential Areas Only.



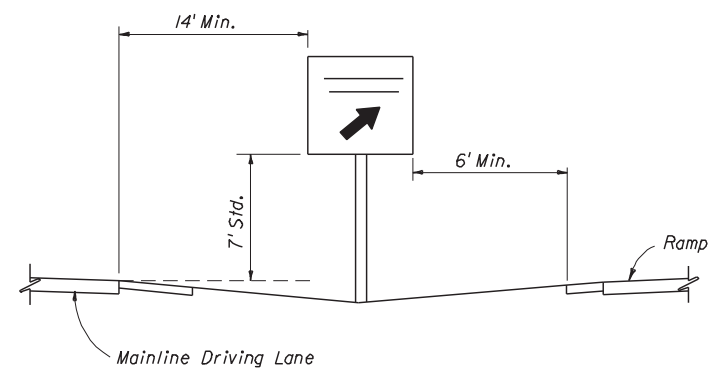
CASE VI

For Use On All Roadways With Signs Behind Guardrail.



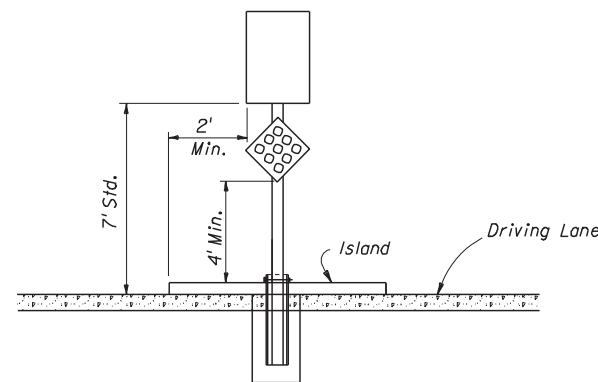
CASE VII (REST AREA & EXIT GORE SIGNS)

For Use On All Freeway And Expressway Systems



CASE VIII

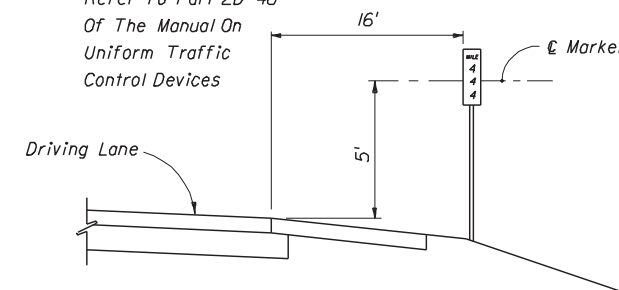
Sign On Island



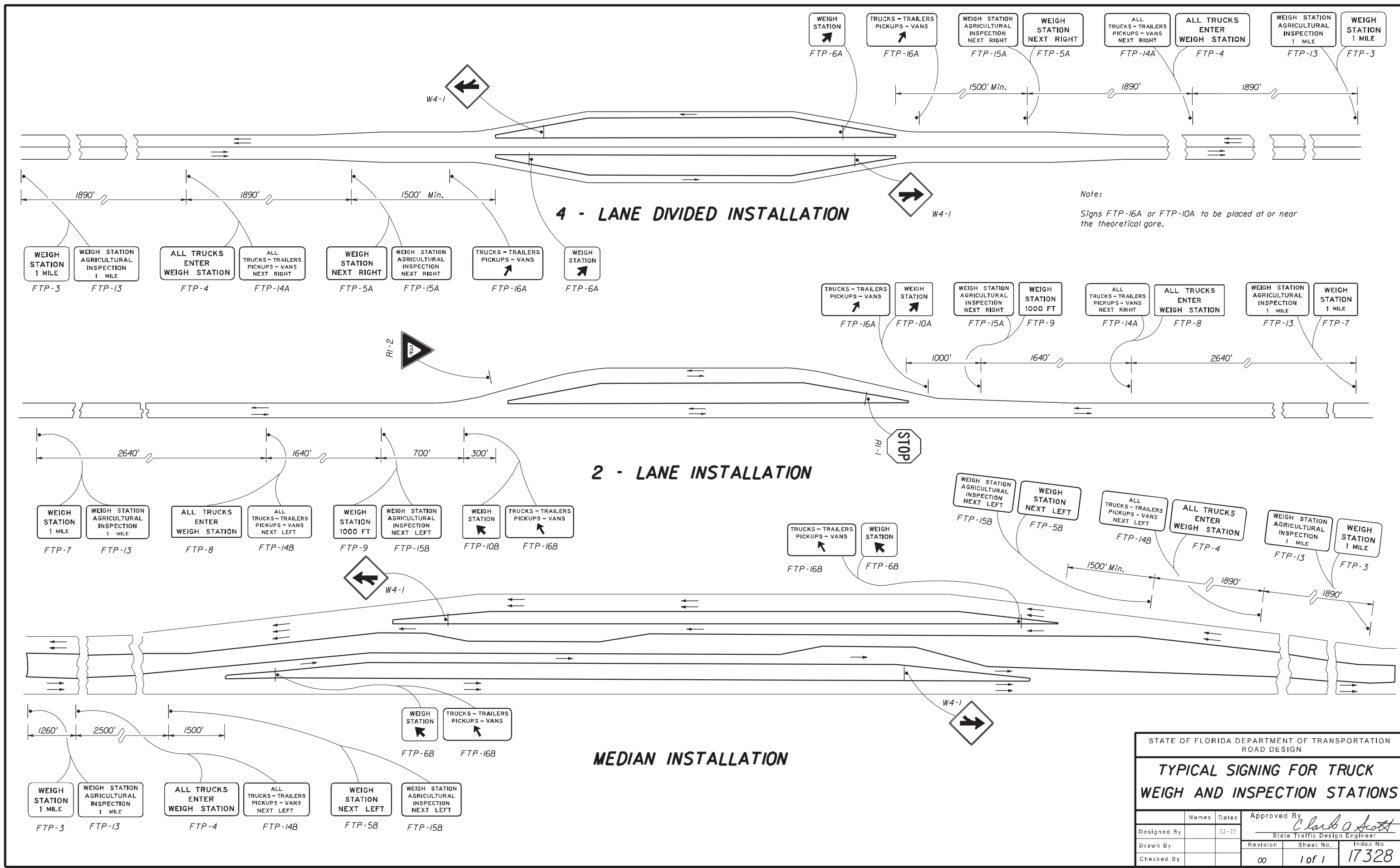
Center Sign Column On Island

CASE IX (MILE POST MARKER)

For More Information Refer To Part 2D-46 Of The Manual On Uniform Traffic Control Devices




STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
TYPICAL SECTIONS FOR PLACEMENT OF SINGLE & MULTI-COLUMN SIGNS				
Names	Dates	Approved By		
Designed By	3-75	Clark A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	17302



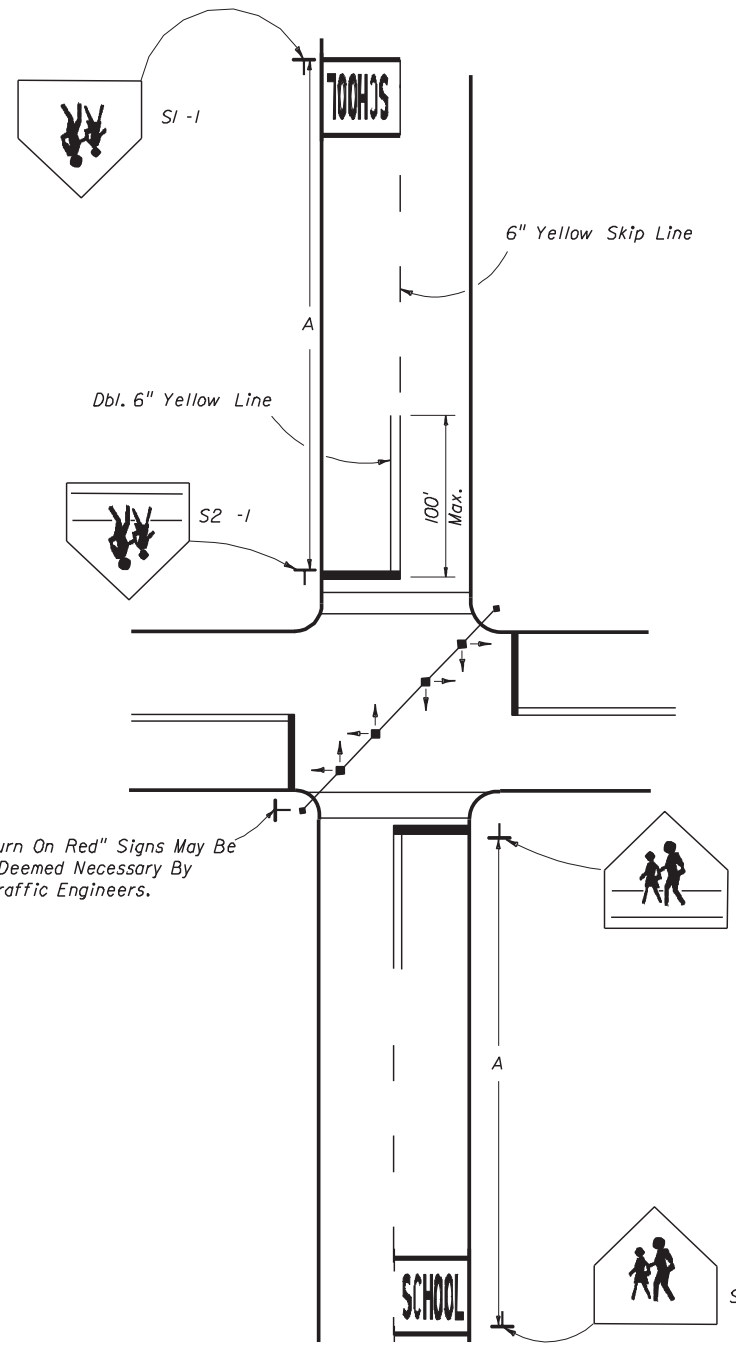
Note:
Signs FTP-16A or FTP-10A to be placed at or near the theoretical gore.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

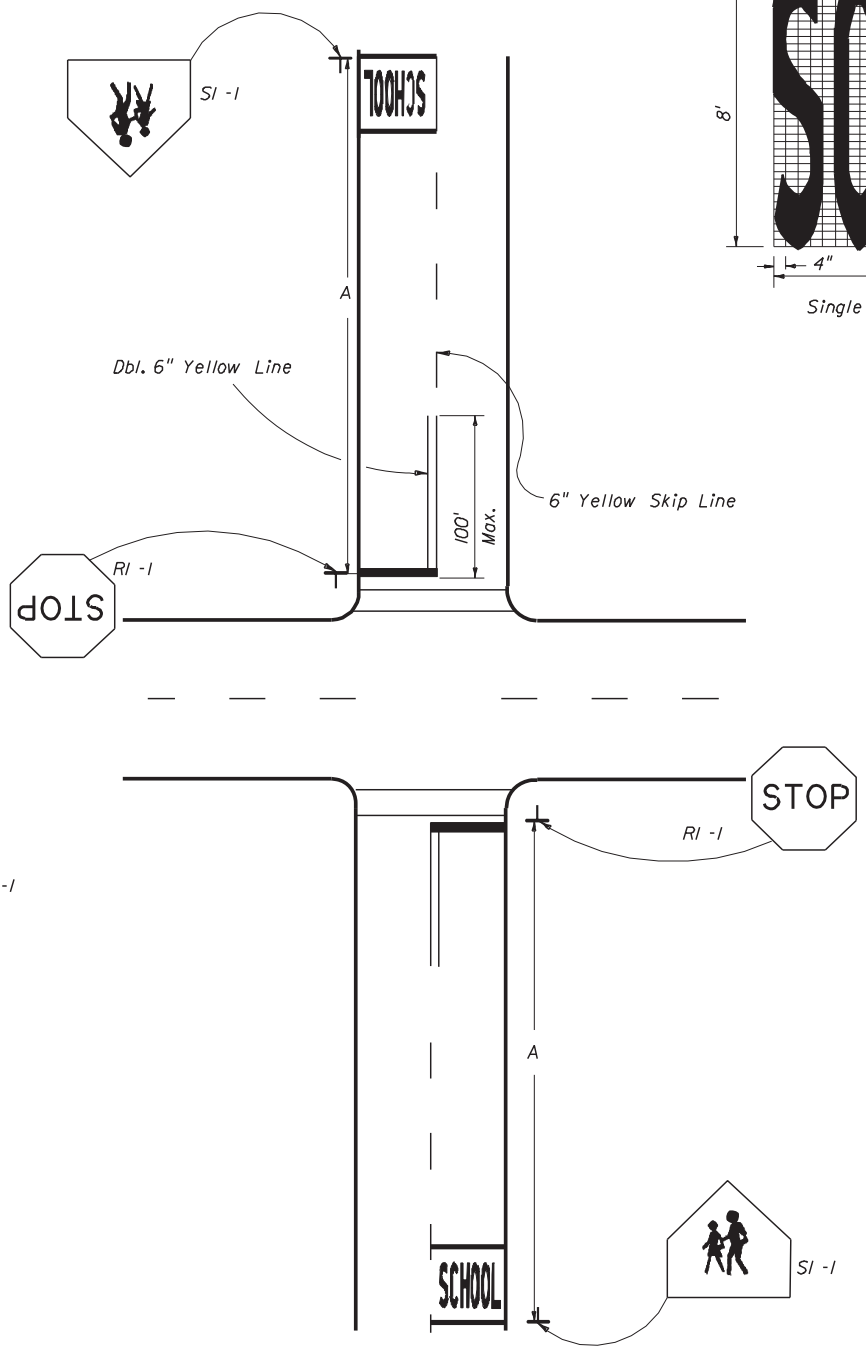
**TYPICAL SIGNING FOR TRUCK
WEIGH AND INSPECTION STATIONS**

Names	Dates	Approved By				
Designed By	01-75	 State Traffic Design Engineer				
Drawn By					Revision	Sheet No.
Checked By					00	1 of 1
						17328

Approach Speed (MPH)	Distance A (FT)
25 To 35	200
36 To 45	350
46 To 55	500

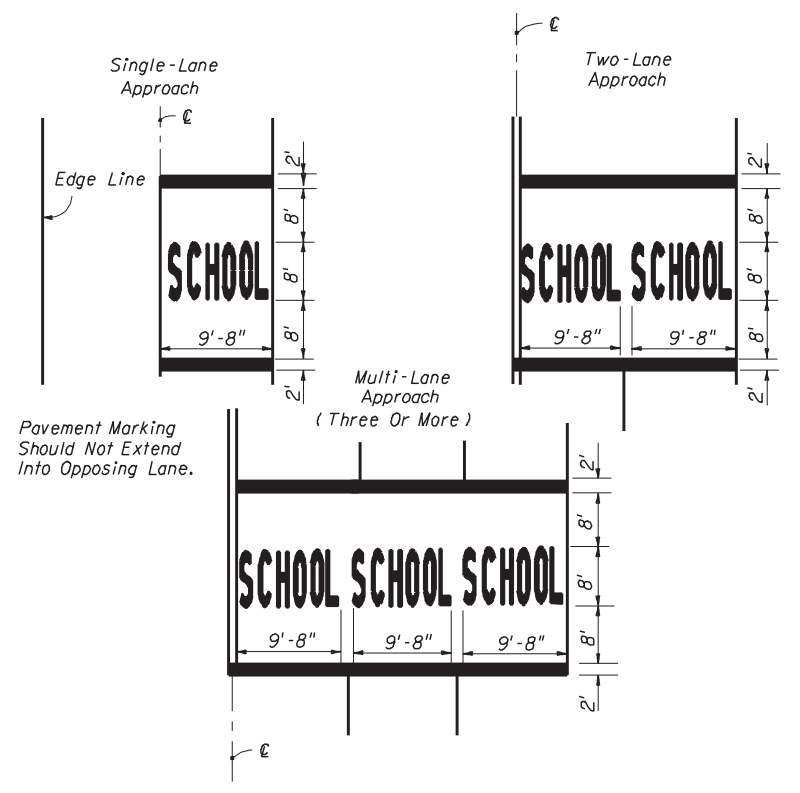
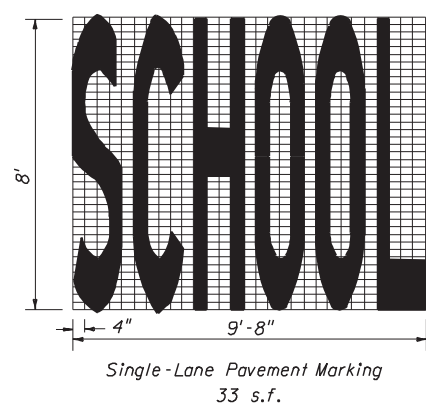


1. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK AT A SIGNALIZED INTERSECTION



2. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK AT A STOP CONTROLLED INTERSECTION

Note: Special speed restrictions are not normally applicable to these two cases.

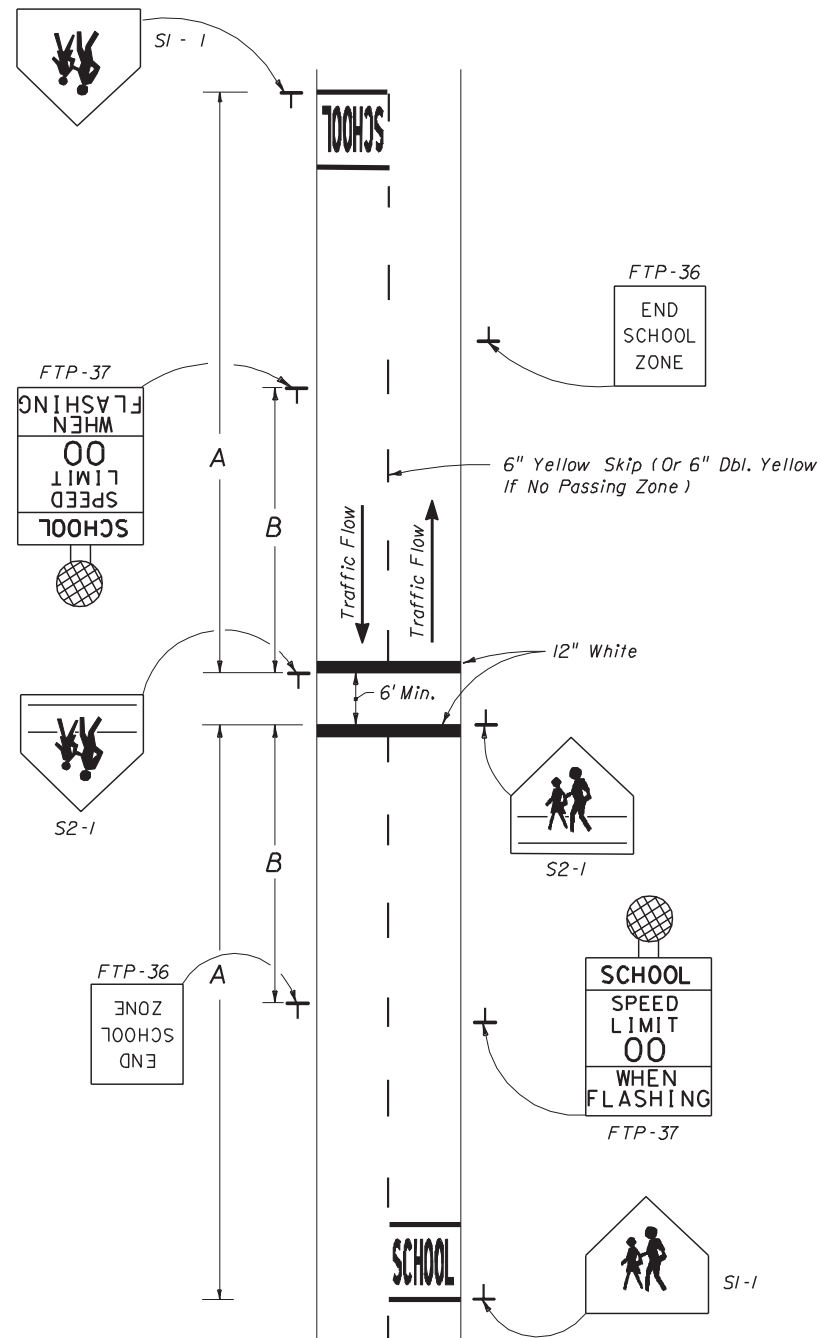


PAVEMENT MARKINGS

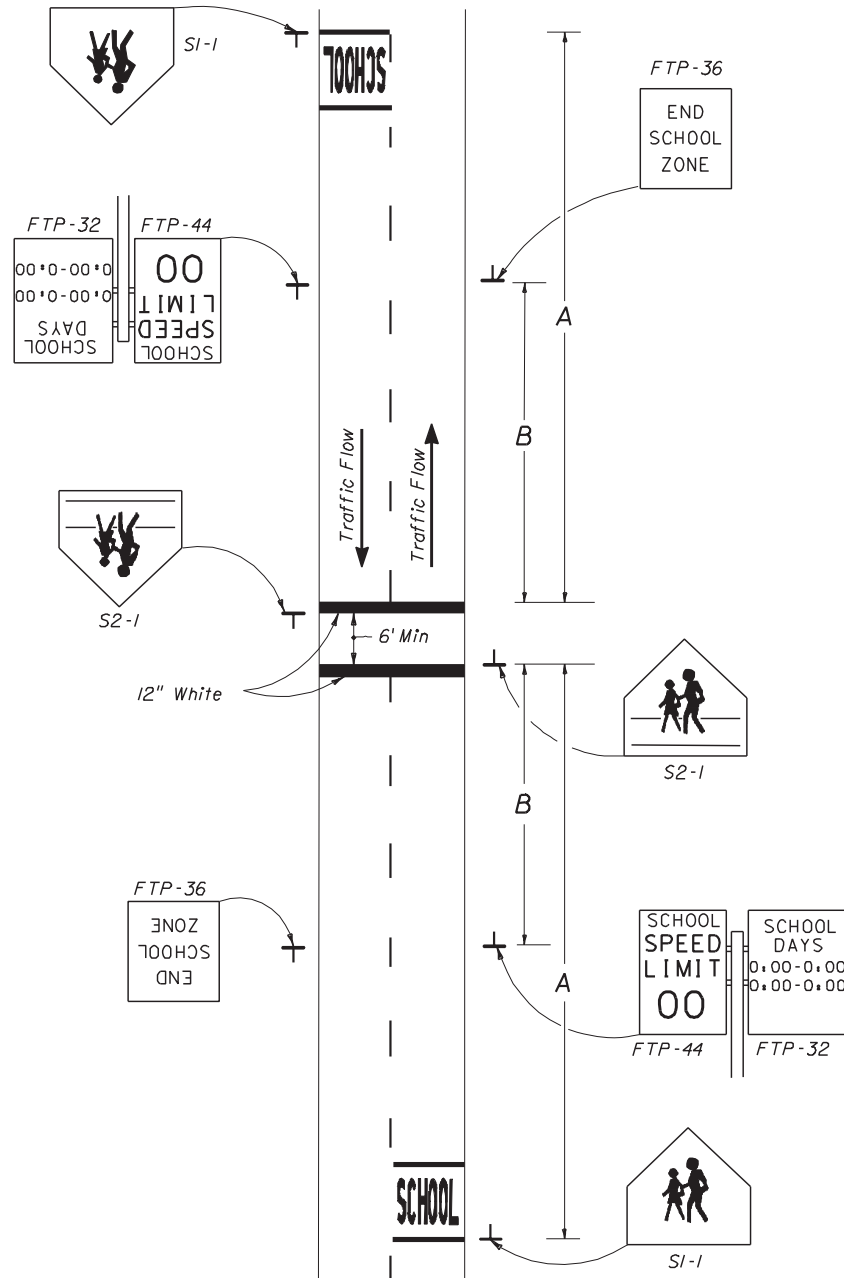
- Notes**
- Signs shall be erected in accordance with Index No. 17302.
 - When computing pavement message quantities do not include transverse lines.
 - All school signs shall be reflective.
 - School crosswalk width shall be 6' min, 10' std, without public sidewalk curb ramps 10' min, with public sidewalk curb ramps. See Index No. 17346 sheet 9 of 9.
 - For signalized intersections or mid-block signalized crossings where flashing beacon speed limit signs (post mounted or overhead) are installed, the minimum distance from the speed limit sign to the stop line shall be 100'. The sign shall not block the view of the signal.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC PLANS				
SCHOOL SIGNS & MARKINGS				
Names	Dates	Approved By		
Designed By	7-76	Charles A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	7-76	00	1 of 6	17344

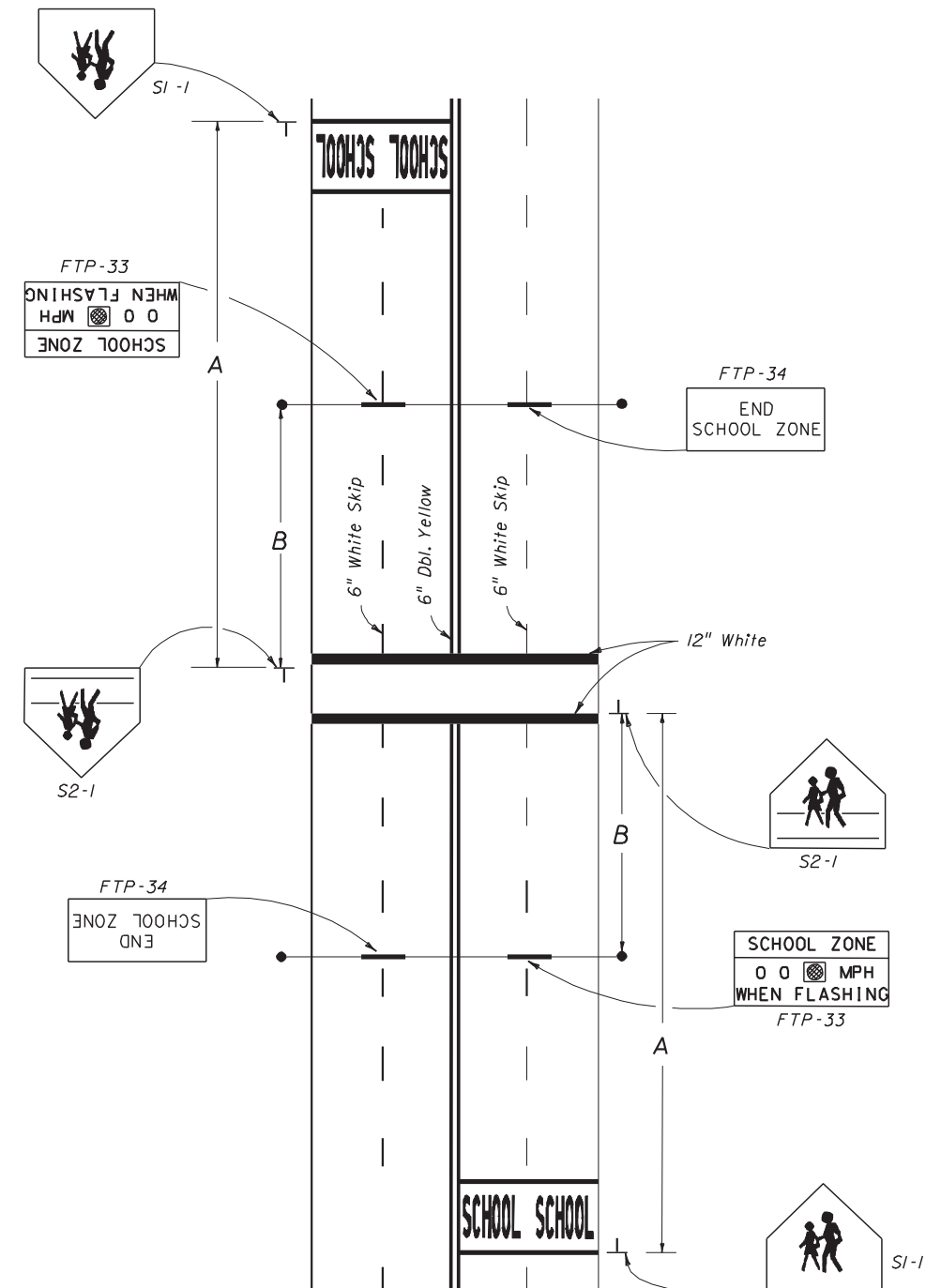
3. TRAFFIC CONTROL DEVICES WITH FLASHING BEACON FOR REDUCED SPEED ZONE AT A SCHOOL CROSSWALK (2 LANES - 2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)



4. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK (NO FLASHING BEACON) (2 LANES - 2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)



5. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS (4 LANES UNDIVIDED - 2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)



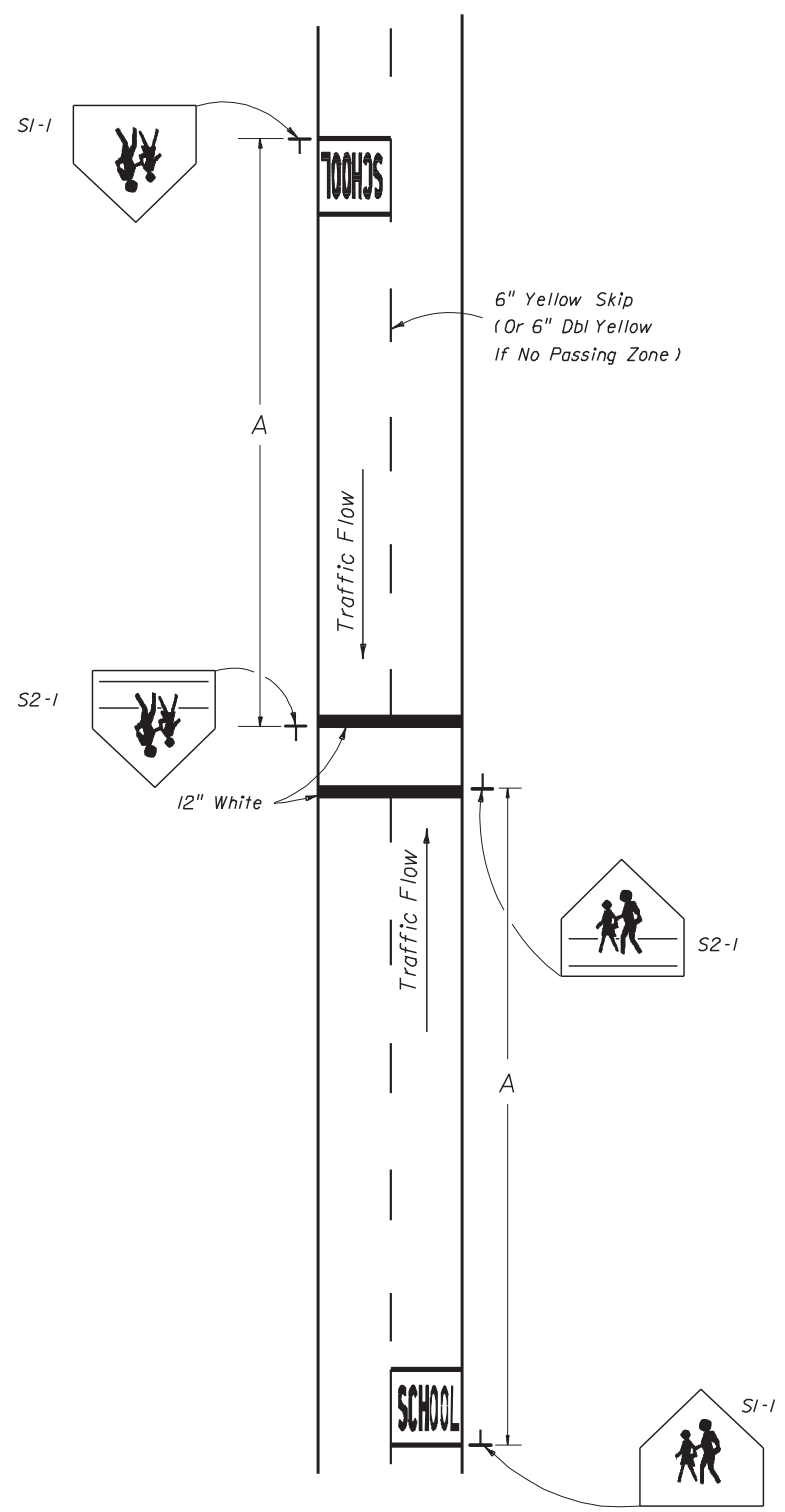
APPROACH SPEED MPH	SUGGESTED DISTANCE IN FEET	
	A	B
25 To 35	200	50
36 To 45	350	65
46 To 55	500	80

School crosswalk width shall be 6' min. 10' std. without public sidewalk curb ramps. 10' min. with public sidewalk curb ramps. See Index No. 17346 sheet 9 of 9.

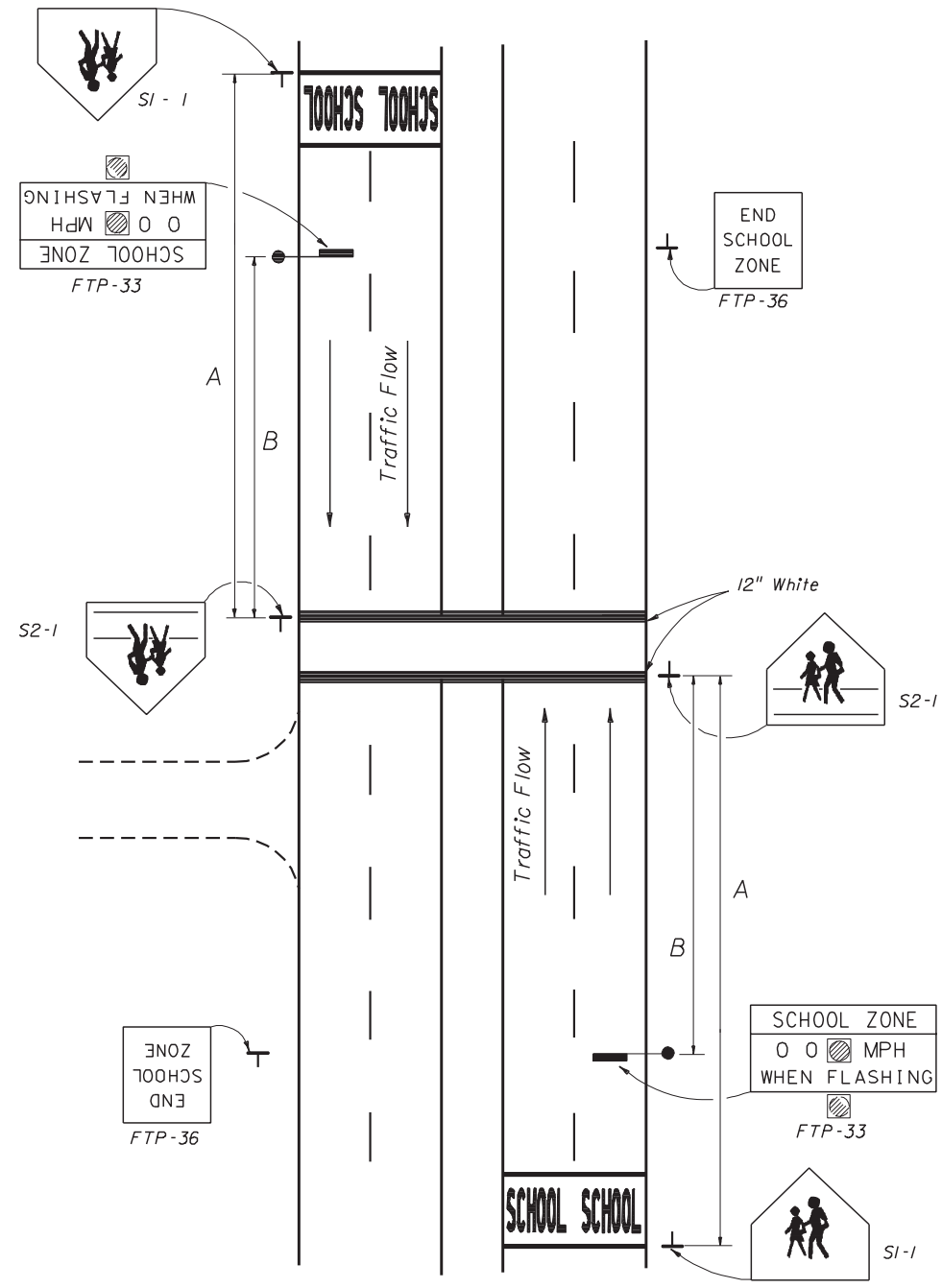
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN

SCHOOL SIGNS & MARKINGS

Names	Dates	Approved By
Designed By	7-76	Clark A. Scott
Drawn By		State Traffic Plans Engineer
Checked By	7-76	Revision
		Sheet No.
		Index No.
		00
		2 of 6
		17344



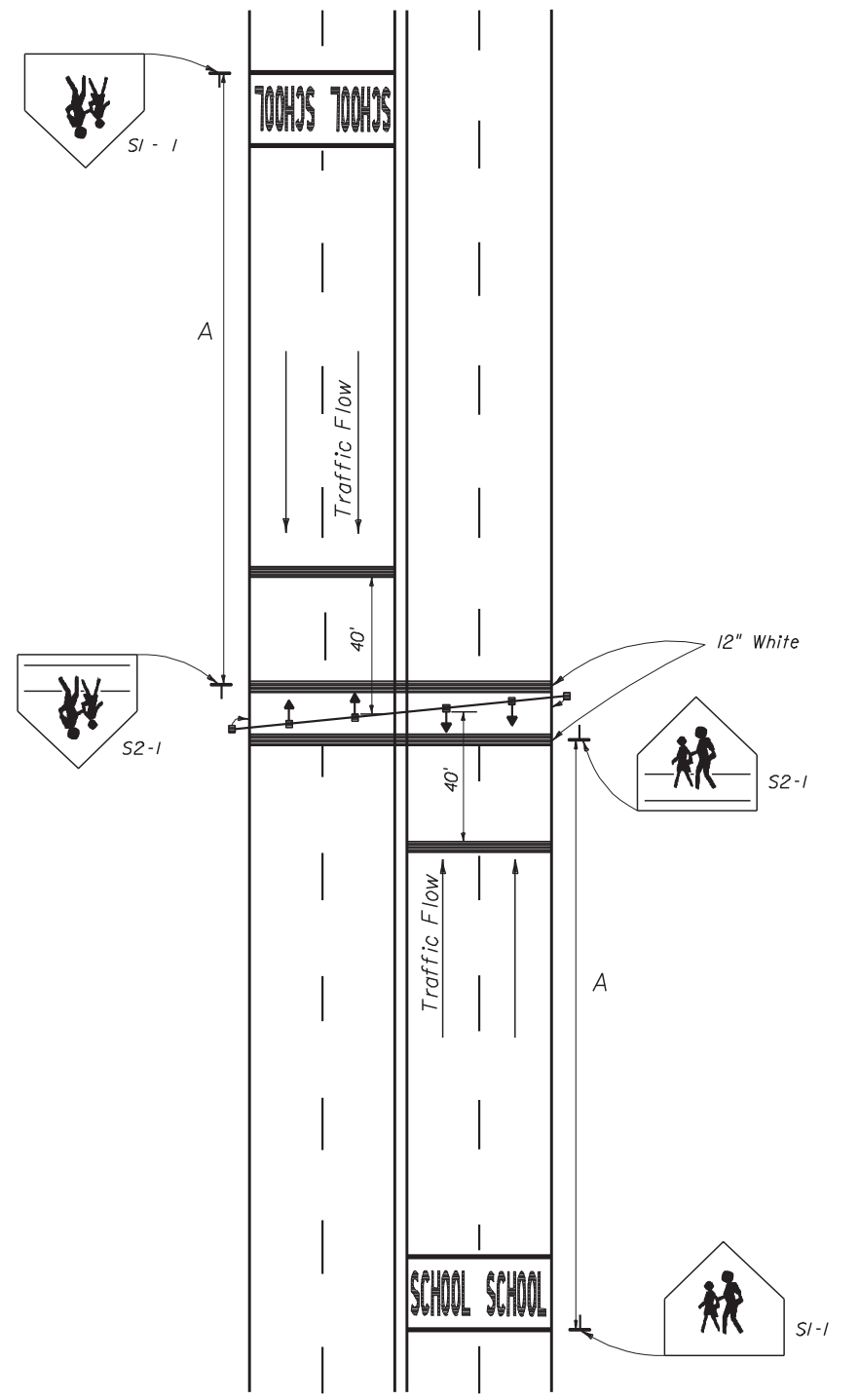
6. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK WITHOUT A SPEED REDUCTION (2 LANES - 2 WAY TRAFFIC)



7. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS (4 LANES DIVIDED - 2 WAY TRAFFIC)

APPROACH SPEED MPH	SUGGESTED DISTANCE IN FEET	
	A	B
25 To 35	200	50
36 To 45	350	65
46 To 55	500	80

School crosswalk width shall be 6' min. 10' std. without public sidewalk curb ramps. 10' min. with public sidewalk curb ramps. See Index No. 17346 sheet 9 of 9.



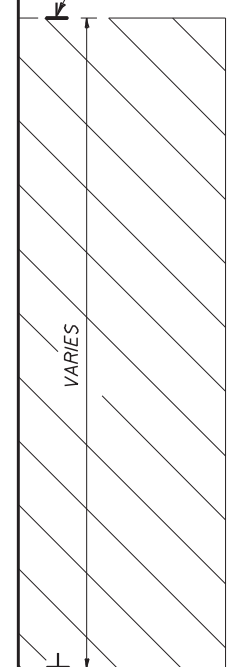
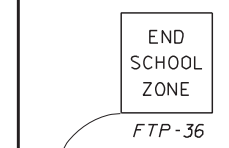
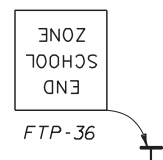
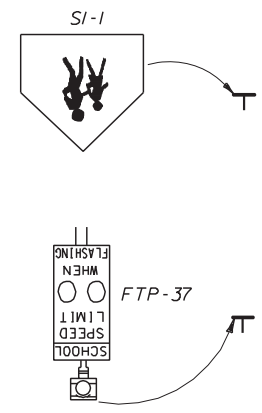
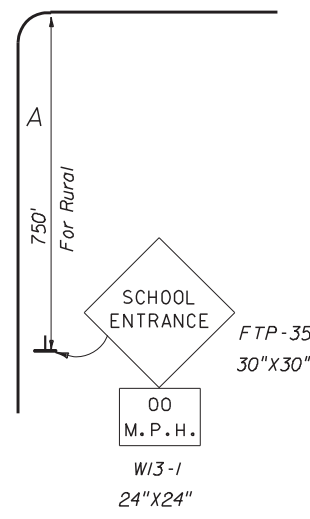
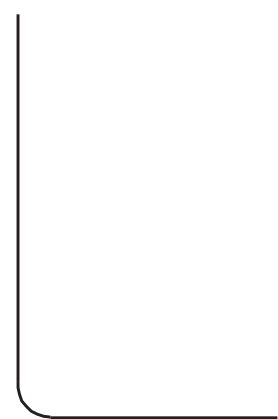
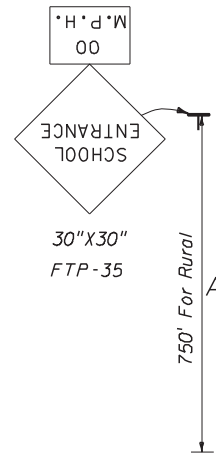
8. TRAFFIC CONTROL DEVICES FOR SIGNALIZED MIDBLOCK SCHOOL CROSSWALK

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN

SCHOOL SIGNS & MARKINGS

Names	Dates	Approved By		
Designed By	7-76	C. Clark & Scott State Traffic Plans Engineer		
Drawn By				
Checked By	7-76	Revision	Sheet No.	Index No.
		00	3 of 6	17344

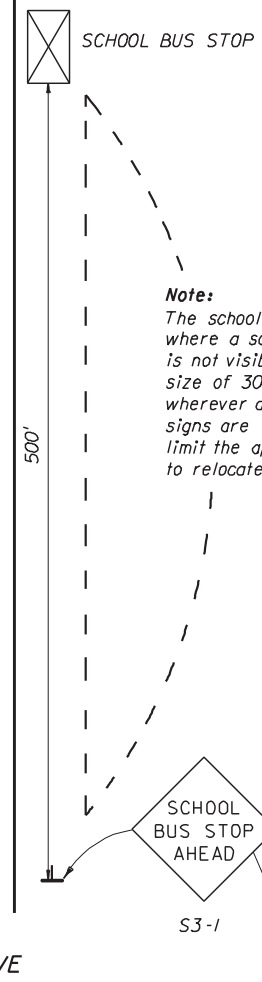
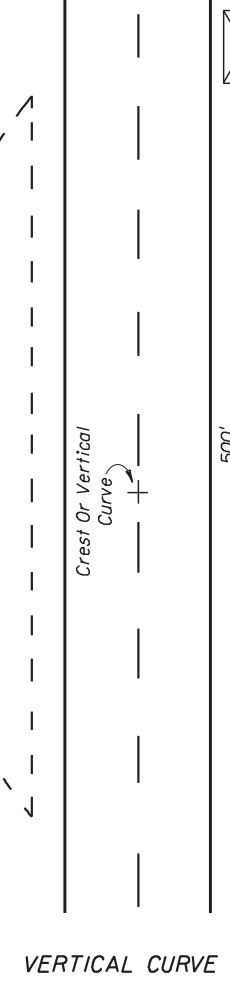
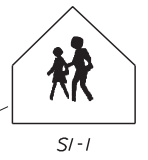
24"X24"
W13-1



School zone limits or unprotected activity as defined by local school board through the local traffic engineers

Note: Roll out school signs shall not be utilized to control traffic through an established school zone

Note: Location Of School Speed Limit Sign When A Reduced Speed Limit Has Been Approved



Note: The school bus stop ahead sign is to be used in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 500' in advance. It shall have a min. size of 30"X30". It is not intended that these signs be used wherever a school bus stops to pick up or discharge passengers. These signs are intended for use only where terrain and roadway features limit the approach sight distance and where there is no opportunity to relocate the stop to another location with adequate visibility.

II. SCHOOL BUS STOP

9. TRAFFIC CONTROL DEVICES AT SCHOOL ENTRANCES WITH LOW VOLUMES OF WALKING STUDENTS

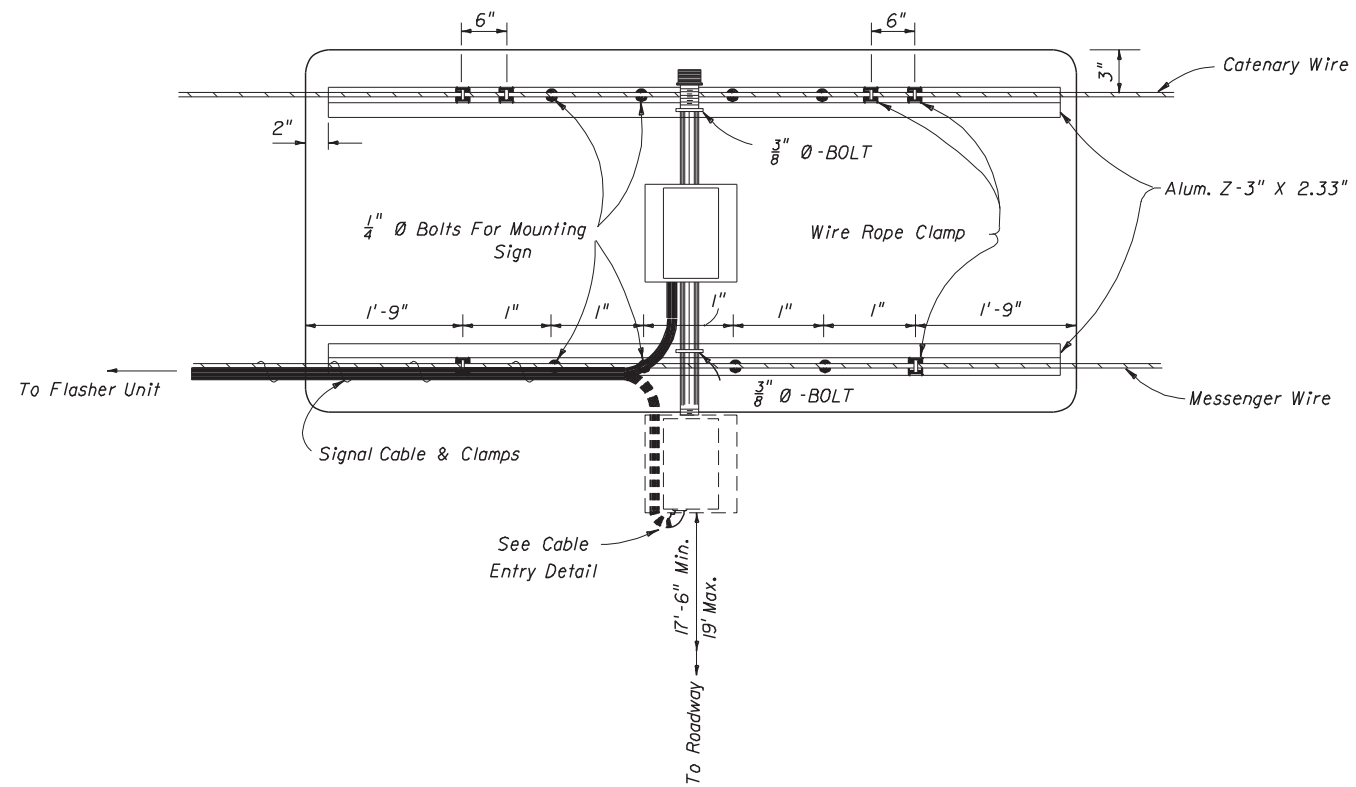
These signs are intended for use only at those few locations where the school entrance is not evident to the motorist, and must be approved in advance by the responsible traffic engineering authority.

10. TRAFFIC CONTROL DEVICES FOR A TYPICAL SCHOOL ZONE FRONTING THE SCHOOL PROPERTY

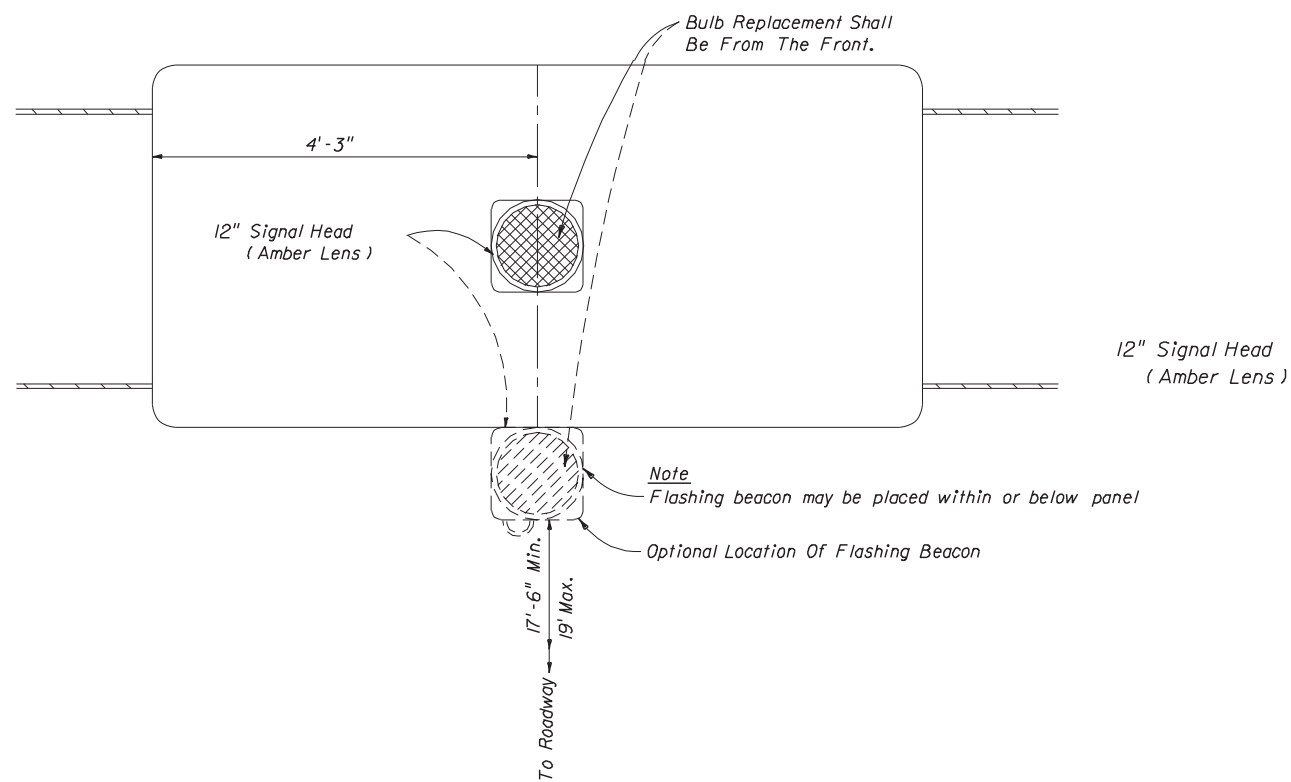
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SCHOOL SIGNS & MARKINGS

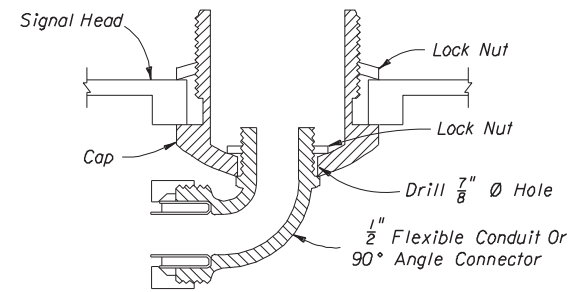
Names	Dates	Approved By		
Designed By	7-76	Charles A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	7-76	00	4 of 6	17344



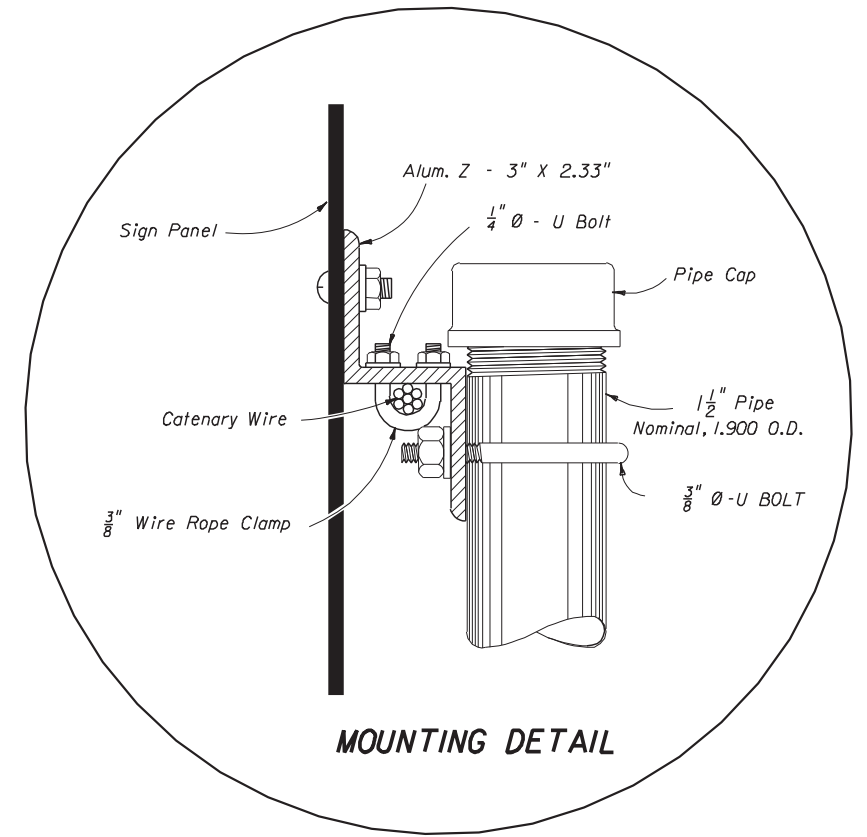
REAR VIEW



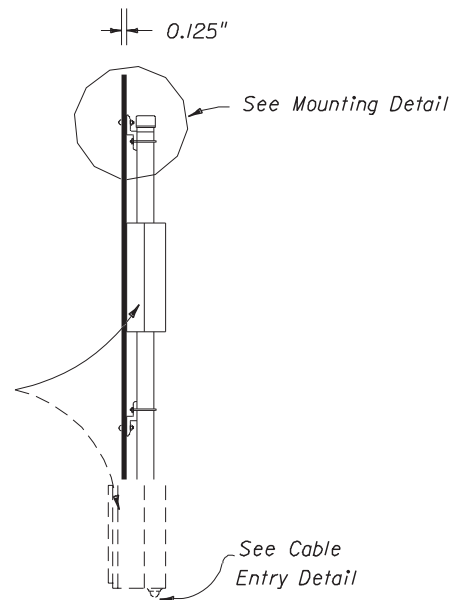
FRONT VIEW



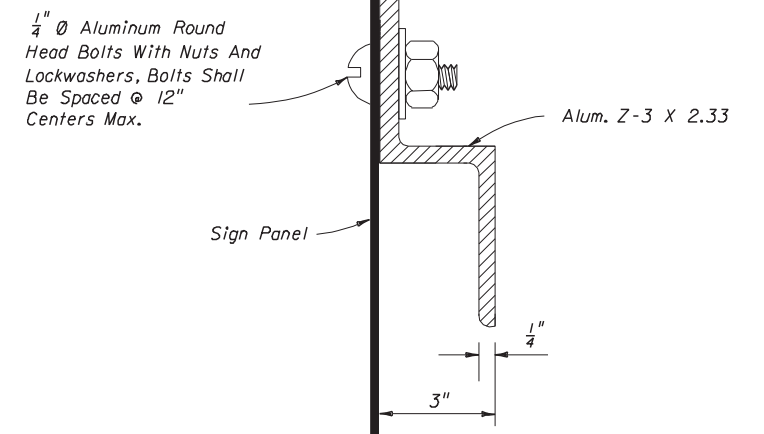
CABLE ENTRY DETAIL



MOUNTING DETAIL



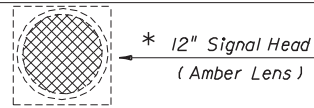
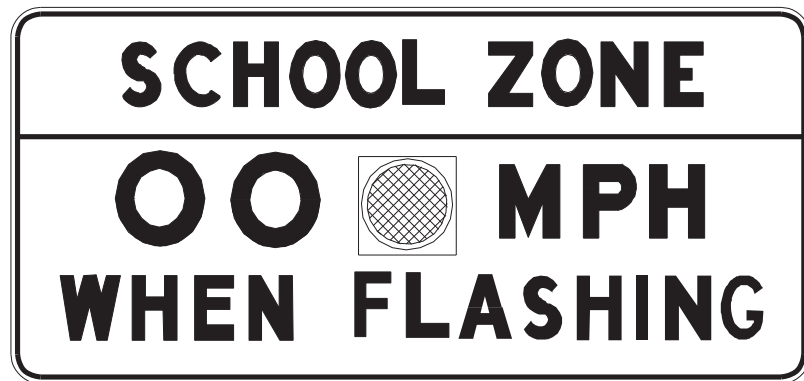
SIDE VIEW



Z SECTION DETAIL

Flasher unit and cabinet to be placed on the strain pole supporting overhead sign assembly or on service pole. The flasher unit not to overhang private property or sidewalk.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
SCHOOL SIGNS & MARKINGS				
Designed By	Names	Dates	Approved By	
Drawn By			<i>Clark A. Scott</i> State Traffic Plans Engineer	
Checked By		7-76	Revision	Sheet No.
			00	5 of 6
				17344



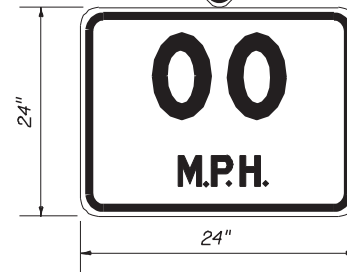
FTP - 33

OVERHEAD STANDARD

* Flashing Beacon May Be Placed Within Or Below Panel

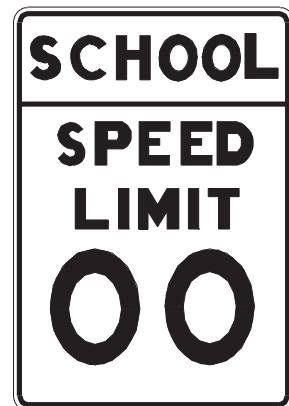


FTP - 35

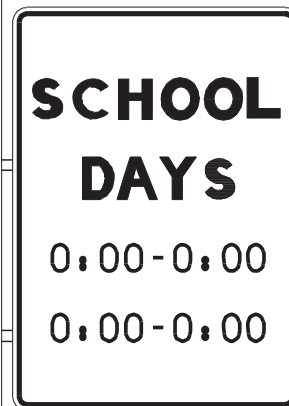


W13 - 1

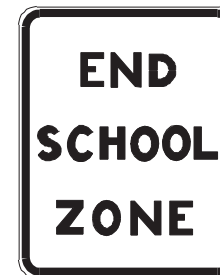
SPEED LIMIT ASSEMBLY



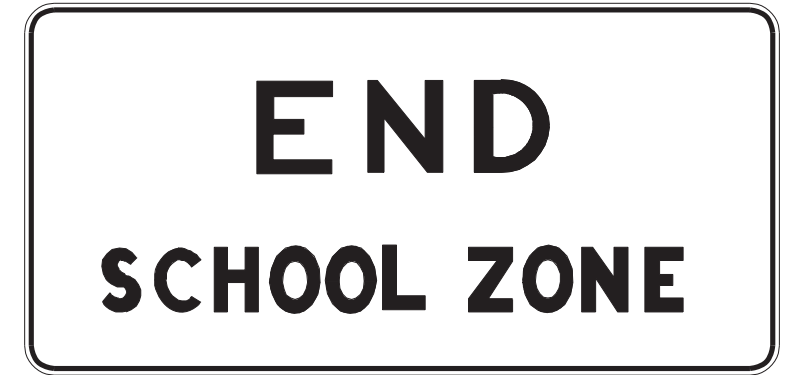
FTP - 44



FTP - 32



FTP - 36



FTP - 34

12" Signal Head (Amber Lens)



FTP - 37

Ground Mount Standard

Note:
Existing ground mount school speed limit signs utilizing a single 8" min. size beacon or two 6" min. size beacons inside the sign border are considered meeting the standard. However, replacement or upgrading of these school speed limit signs shall conform to the above standard. Numerical speed limit displayed shall be established by appropriate regulatory authorities.

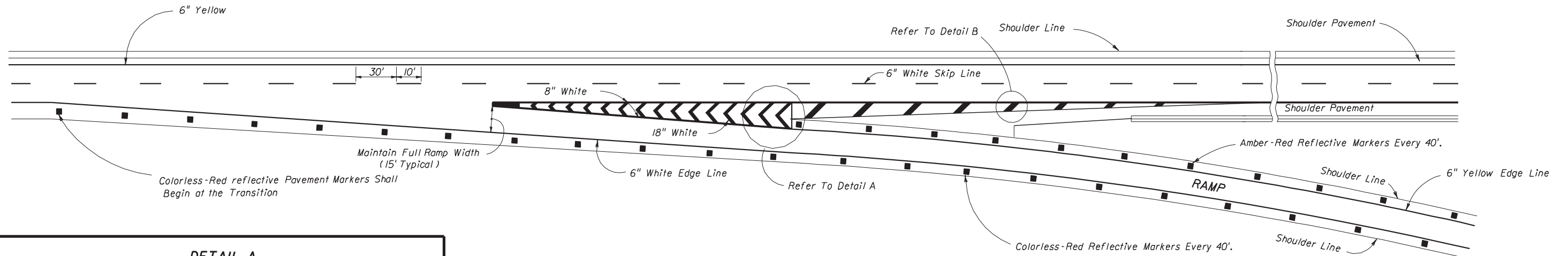
Notes:

1. Standard size signs should be used whenever possible. Minimum sizes may be used only on low volume, low speed (less than 35 m.p.h.) streets. Special sizes should be used on expressway facilities where special emphasis is needed.
2. The value of the actual school zone speed limit shall be determined by the District Traffic Operations Engineer in cooperation with local school superintendents. In no case shall it be less than the 15 m.p.h. min. as set by law.
3. See Index No. 17355 for sign details.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

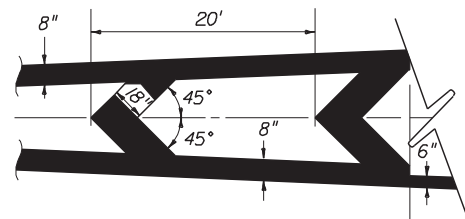
SCHOOL SIGNS & MARKINGS

Designed By	Names	Dates	Approved By		
Drawn By		7-76	Clark A. Scott State Traffic Plans Engineer		
Checked By		7-76	Revision	Sheet No.	Index No.
			00	6 of 6	17344



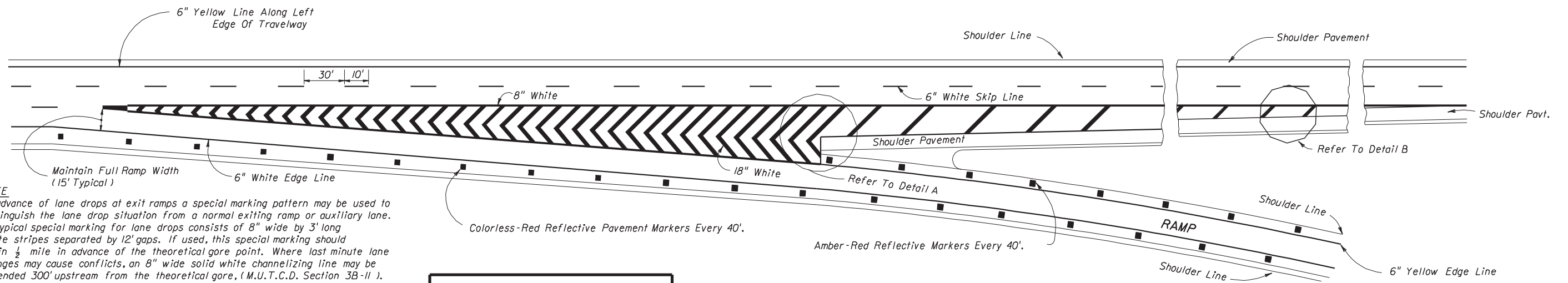
DETAIL A

For RPM Location Refer To Index 17352.



Note:
Reflective pavement markers
are installed adjacent to the
edge line.

**NORMAL TAPERED EXIT
(TWO THRU LANES)**

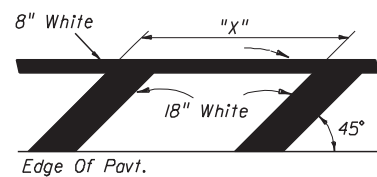


NOTE
In advance of lane drops at exit ramps a special marking pattern may be used to distinguish the lane drop situation from a normal exiting ramp or auxiliary lane. A typical special marking for lane drops consists of 8" wide by 3' long white stripes separated by 12' gaps. If used, this special marking should begin 1/2 mile in advance of the theoretical gore point. Where last minute lane changes may cause conflicts, an 8" wide solid white channelizing line may be extended 300' upstream from the theoretical gore. (M.U.T.C.D. Section 3B-II).

DETAIL B

"S" MPH	30	35	40	45	50	55
"X" Ft.	20	20	40	40	60	60

Passenger Car, Daytime, Posted Speeds
Or 85th Percentile (Use Higher Value)

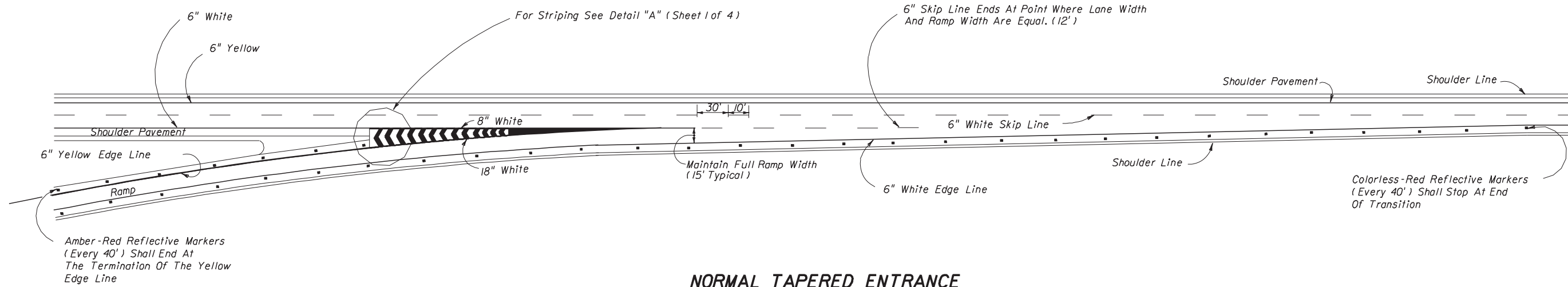


**NORMAL TAPERED EXIT ONLY
(TWO THRU LANES - THREE APPROACH LANES)**

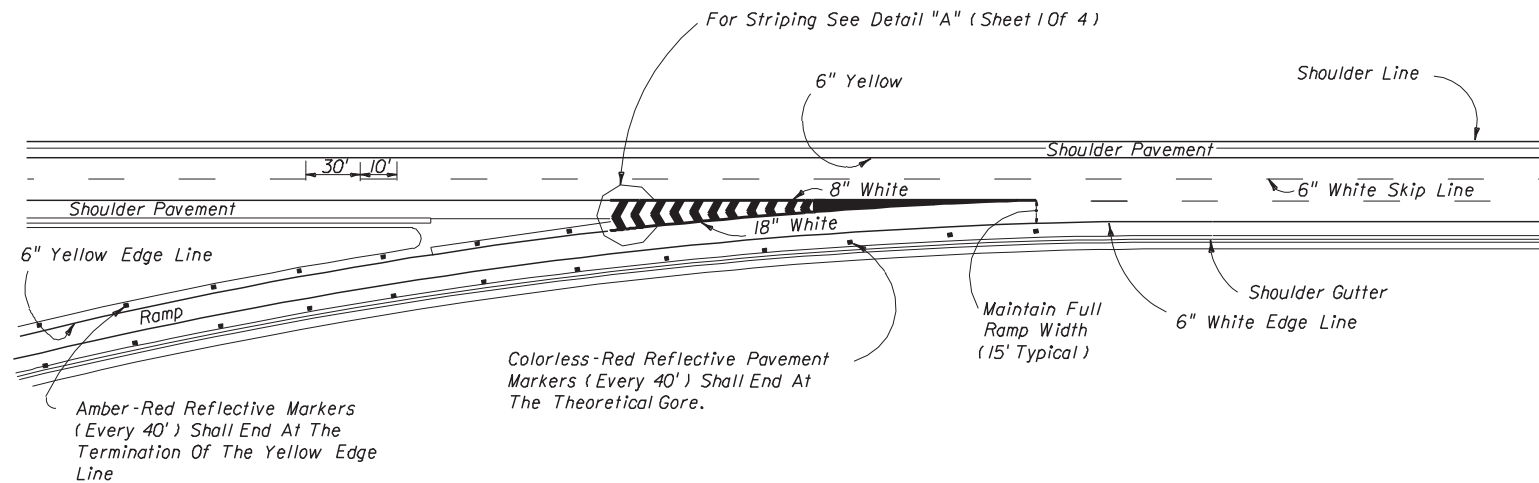
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

INTERCHANGE MARKINGS

Names	Dates	Approved By		
Designed By	3-73	Clark A. Scott State Traffic Plans Engineer	Revision	Sheet No.
Drawn By			00	1 of 4
Checked By	9-73			Index No. 17345



NORMAL TAPERED ENTRANCE

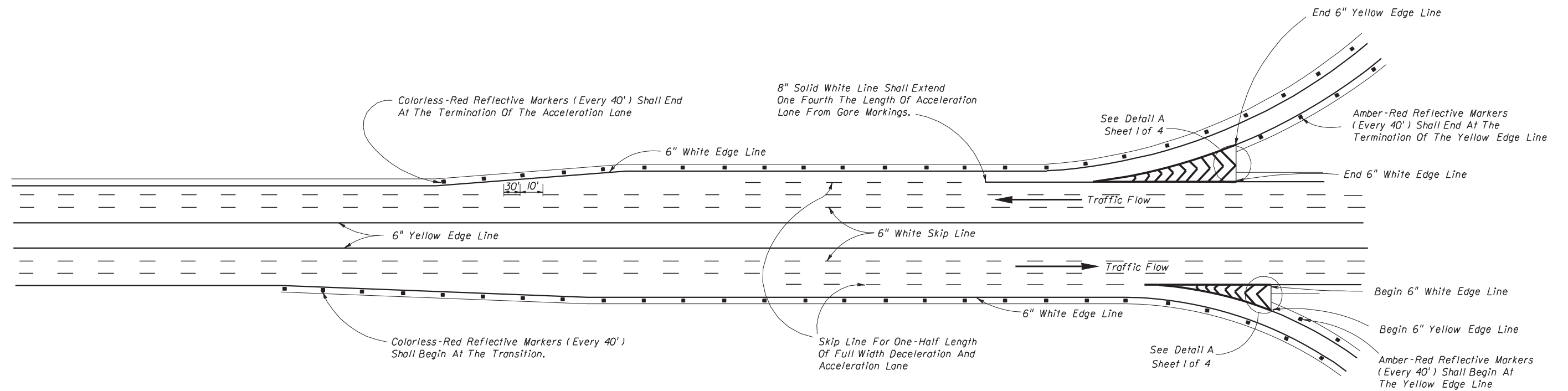


**NORMAL TAPERED ENTRANCE
WITH ADDED LANE**

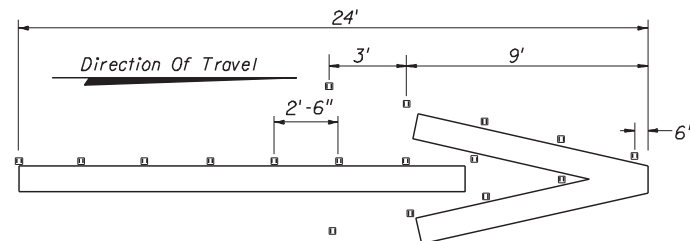
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

INTERCHANGE MARKINGS

Names	Dates	Approved By		
Designed By	7-73	<i>Charles A. Scott</i>	State Traffic Plans Engineer	
Drawn By		Revision	Sheet No.	Index No.
Checked By	7-73	00	2 of 4	17345



PARALLEL ACCELERATION AND DECELERATION LANE



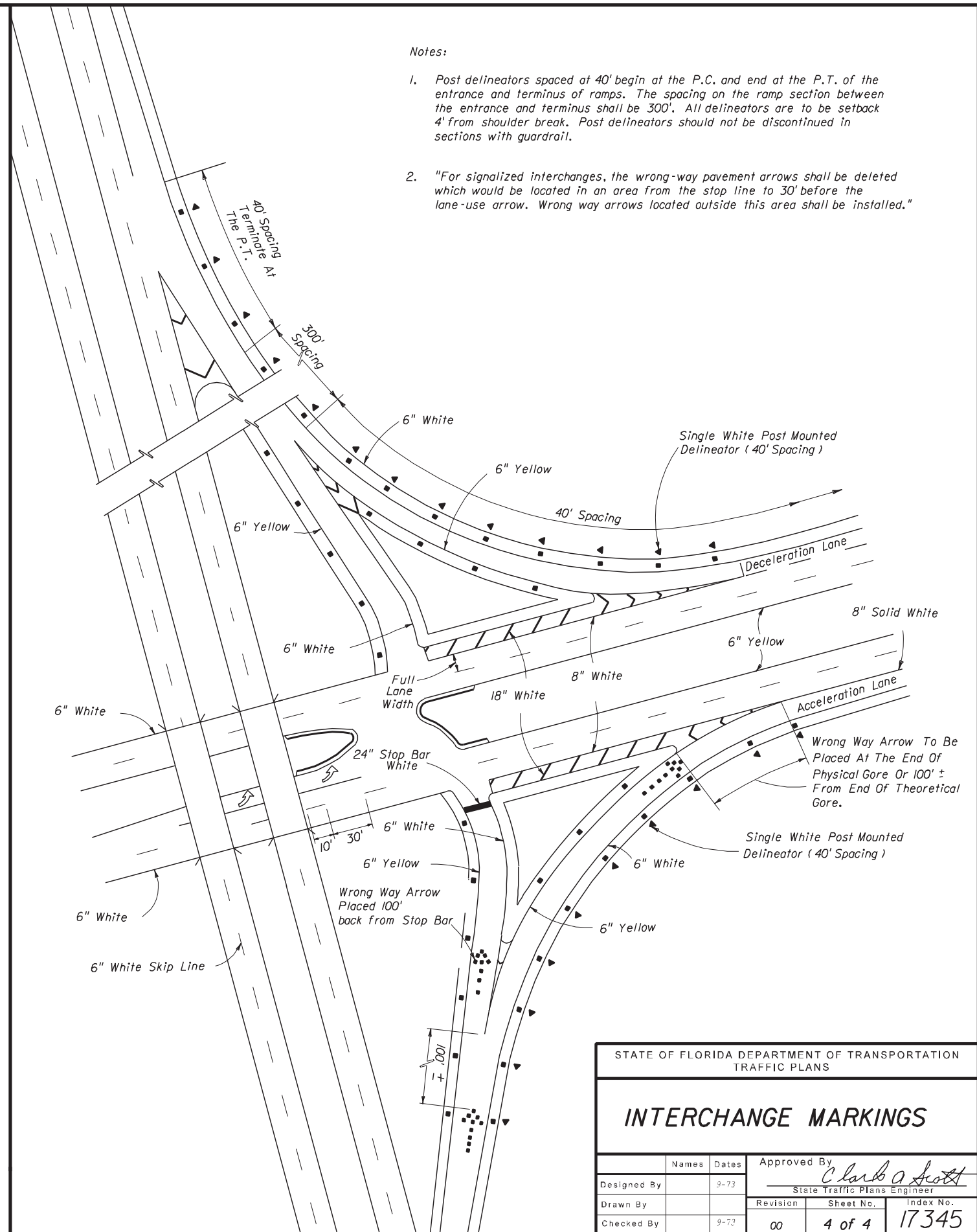
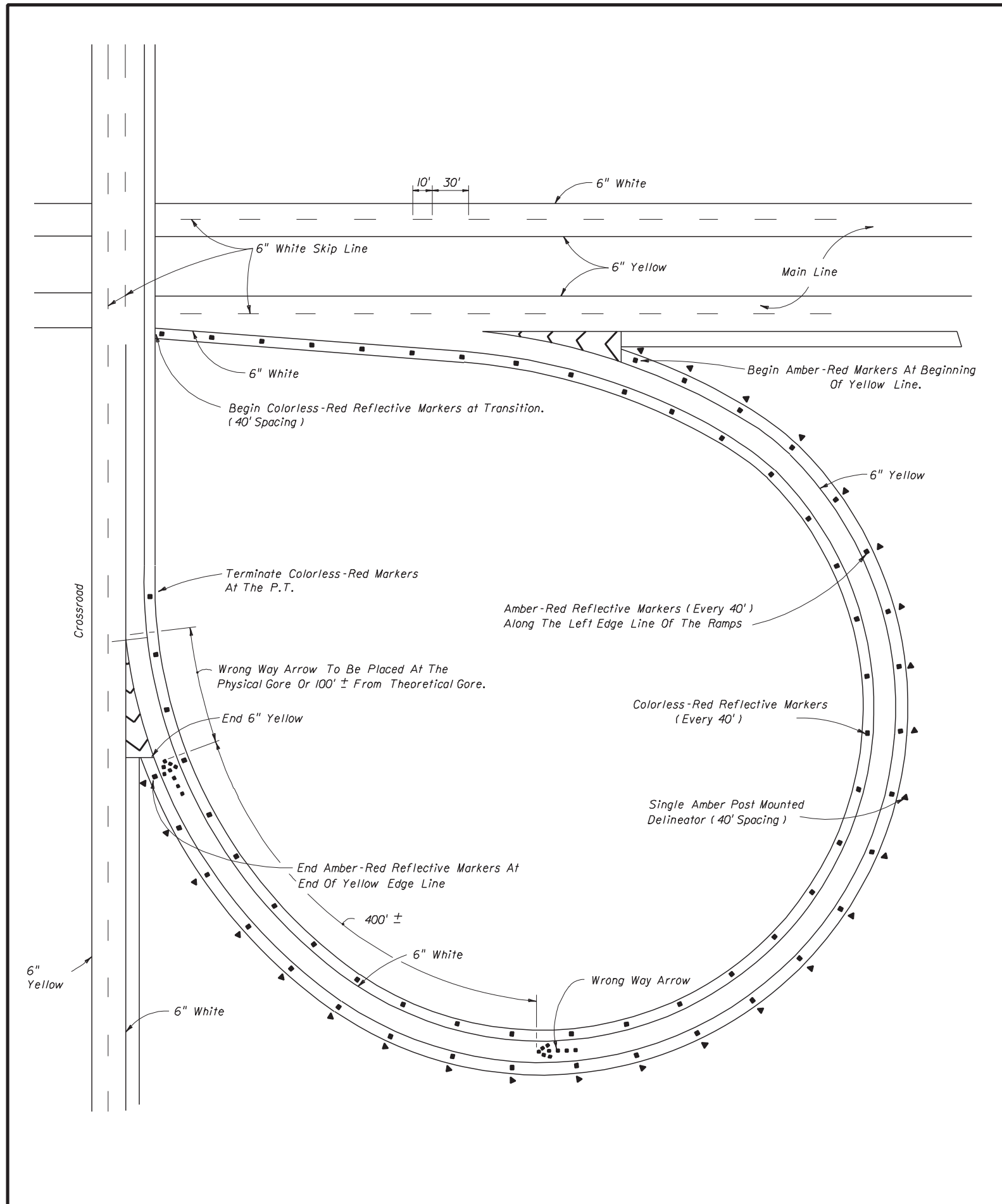
White Arrow With
Colorless-Red Reflective Markers
For Arrow details see Index No. 17346
sheet 1 of 9.

WRONG WAY ARROW

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC PLANS

INTERCHANGE MARKINGS

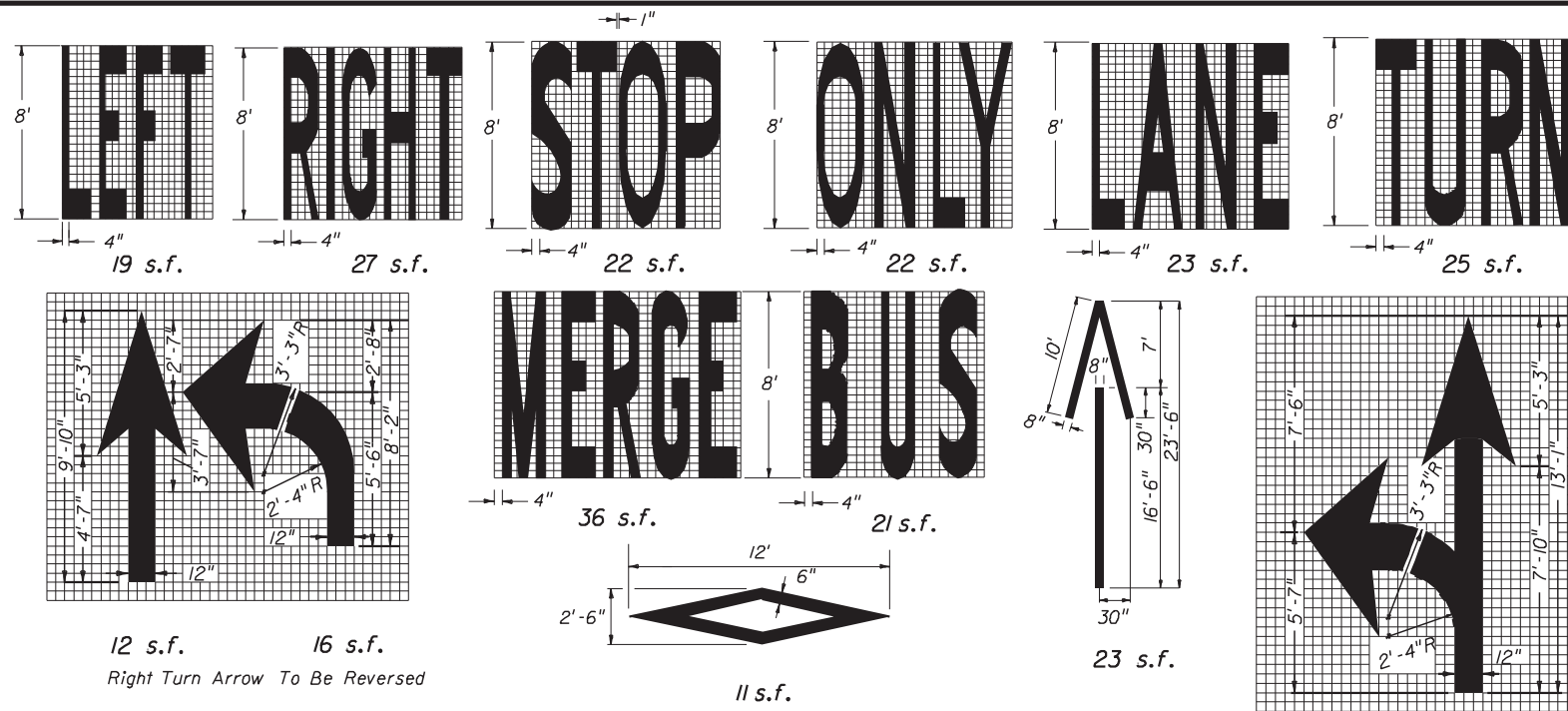
Names	Dates	Approved By		
Designed By	9-73	 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	9-73	00	3 of 4	17345



Notes:

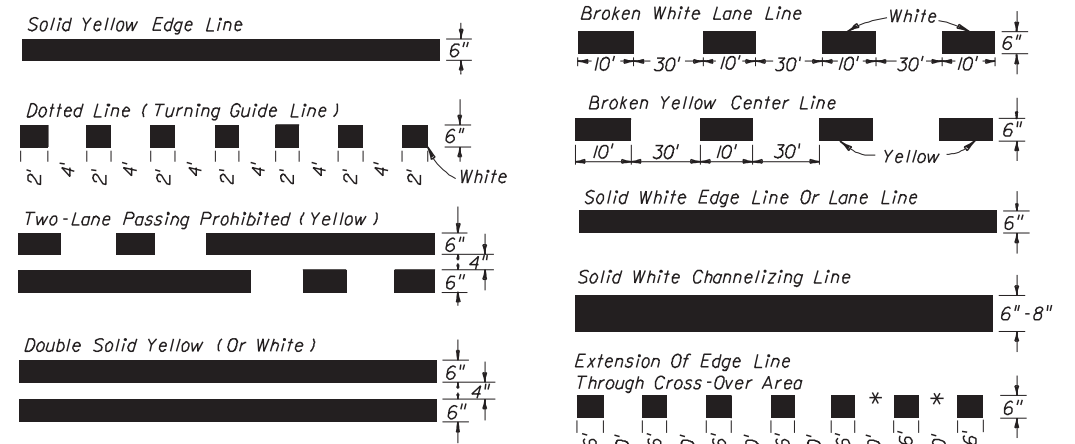
1. Post delineators spaced at 40' begin at the P.C. and end at the P.T. of the entrance and terminus of ramps. The spacing on the ramp section between the entrance and terminus shall be 300'. All delineators are to be setback 4' from shoulder break. Post delineators should not be discontinued in sections with guardrail.
2. "For signalized interchanges, the wrong-way pavement arrows shall be deleted which would be located in an area from the stop line to 30' before the lane-use arrow. Wrong way arrows located outside this area shall be installed."

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC PLANS				
INTERCHANGE MARKINGS				
Names	Dates	Approved By		
Designed By	3-73	<i>Clark A. Scott</i> State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	9-73	00	4 of 4	17345

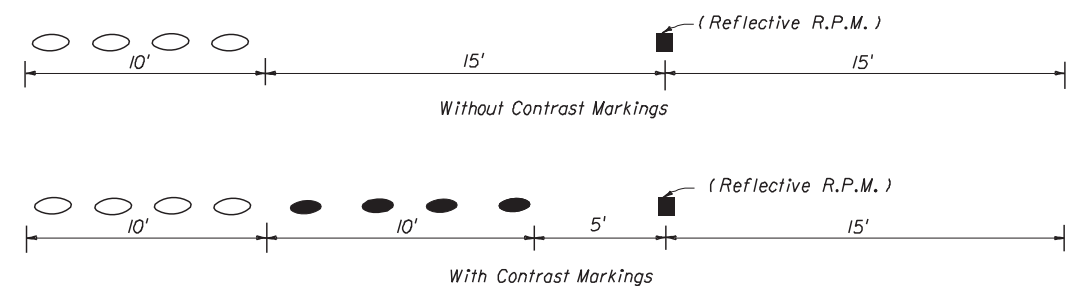


NOTE: When arrow and pavement message are used together, the arrow shall be located down stream of the pavement message and shall be separated from the pavement message by a distance of 25' (Base of the arrow to the base of the message).
 DIMENSIONS ARE WITHIN 1" ±

PAVEMENT ARROW AND MESSAGE DETAILS



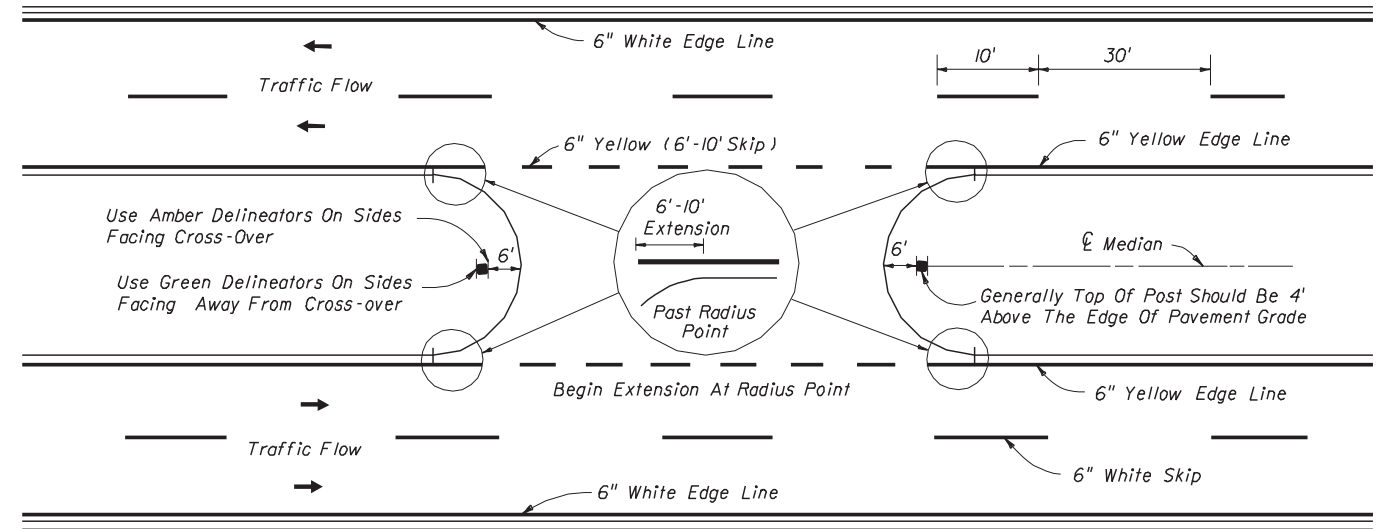
TYPES OF PERMANENT LONGITUDINAL LINES *White Or Yellow



NOTE: Ceramic Markers should not be installed unless specifically called for in the plans. Use is limited to high volume sections with ADT's greater than 50,000 where lane changing is to be discouraged or other areas where channelization is required.

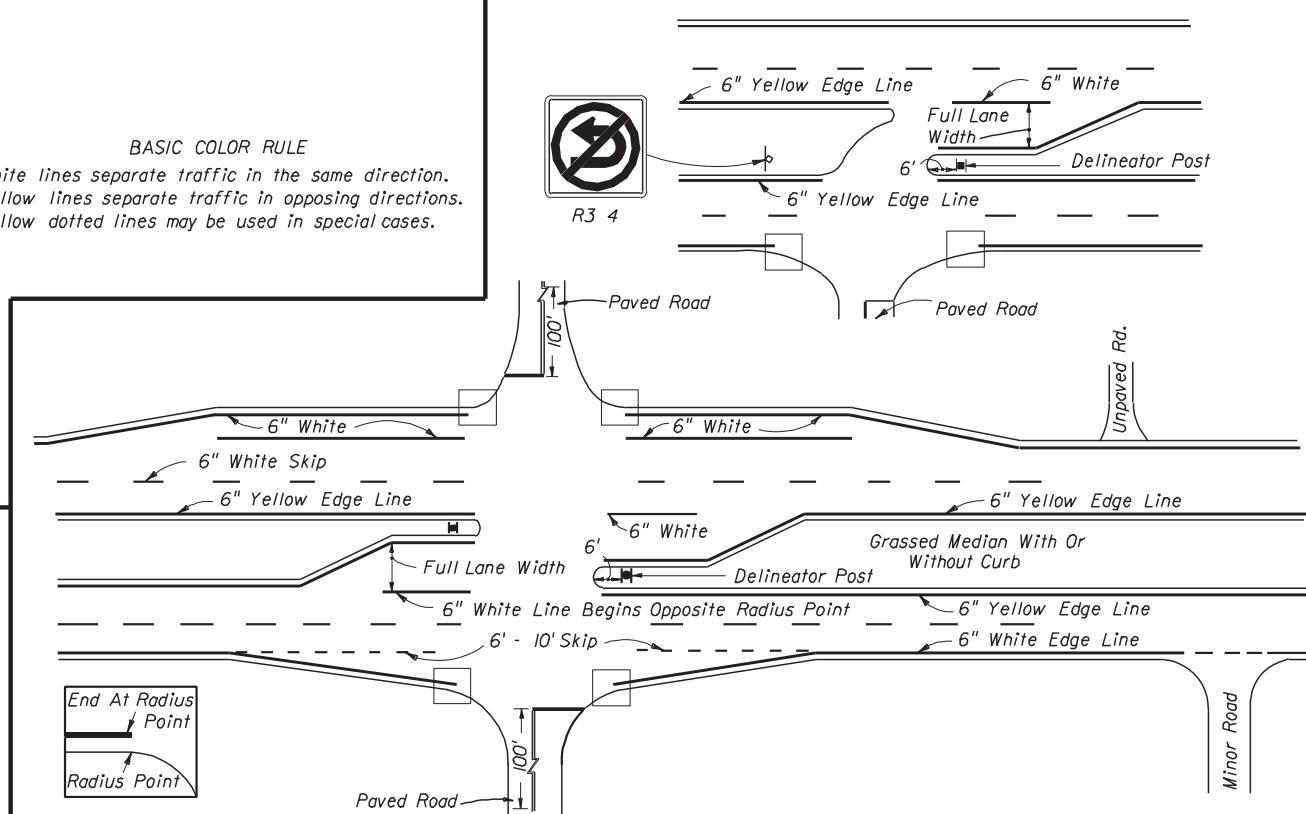
NON-REFLECTIVE CERAMIC PAVEMENT MARKER PLACEMENT

BASIC COLOR RULE
 White lines separate traffic in the same direction.
 Yellow lines separate traffic in opposing directions.
 Yellow dotted lines may be used in special cases.

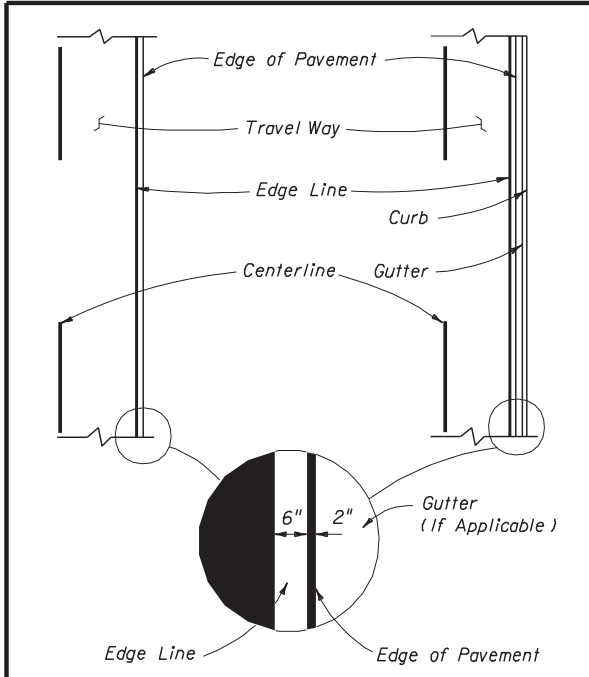


PAVEMENT MARKINGS AND DELINEATORS FOR MEDIAN CROSS-OVER

NOTE:
 Markings applied to median noses shall be yellow in color.



PAVEMENT MARKINGS FOR INTERSECTIONS WITH MAJOR AND MINOR ROADS

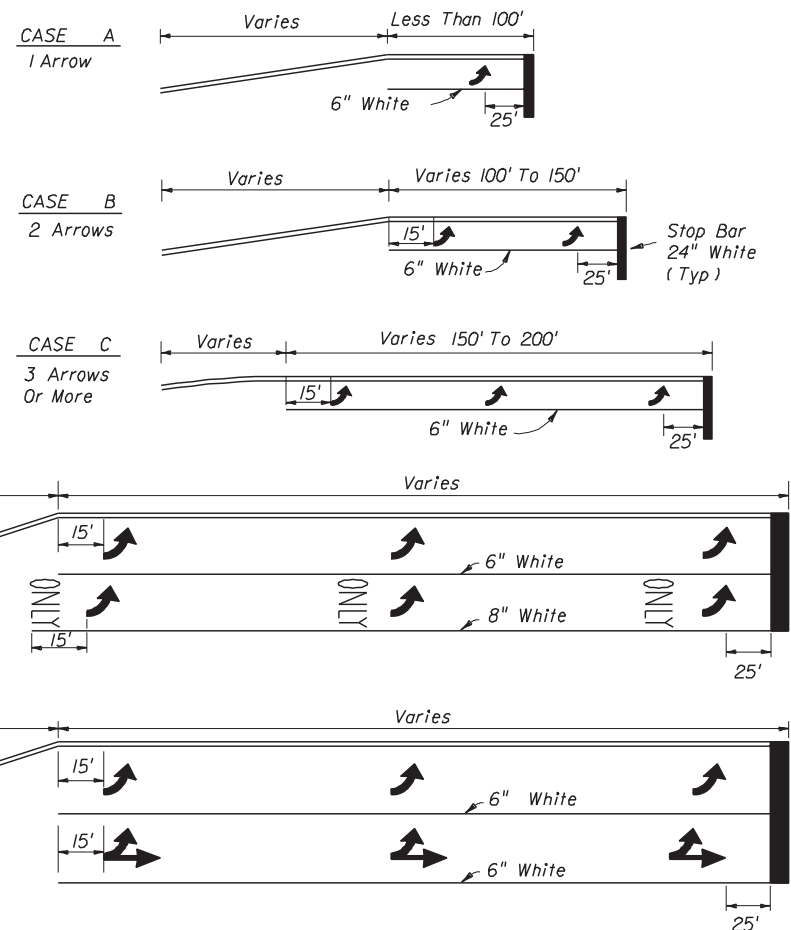


PLACEMENT OF EDGE LINES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 TRAFFIC DESIGN

SPECIAL MARKING AREAS

Names	Dates	Approved By		
Designed By	8-78	Charles A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	8-78	00	1 of 9	17346



NOTE:

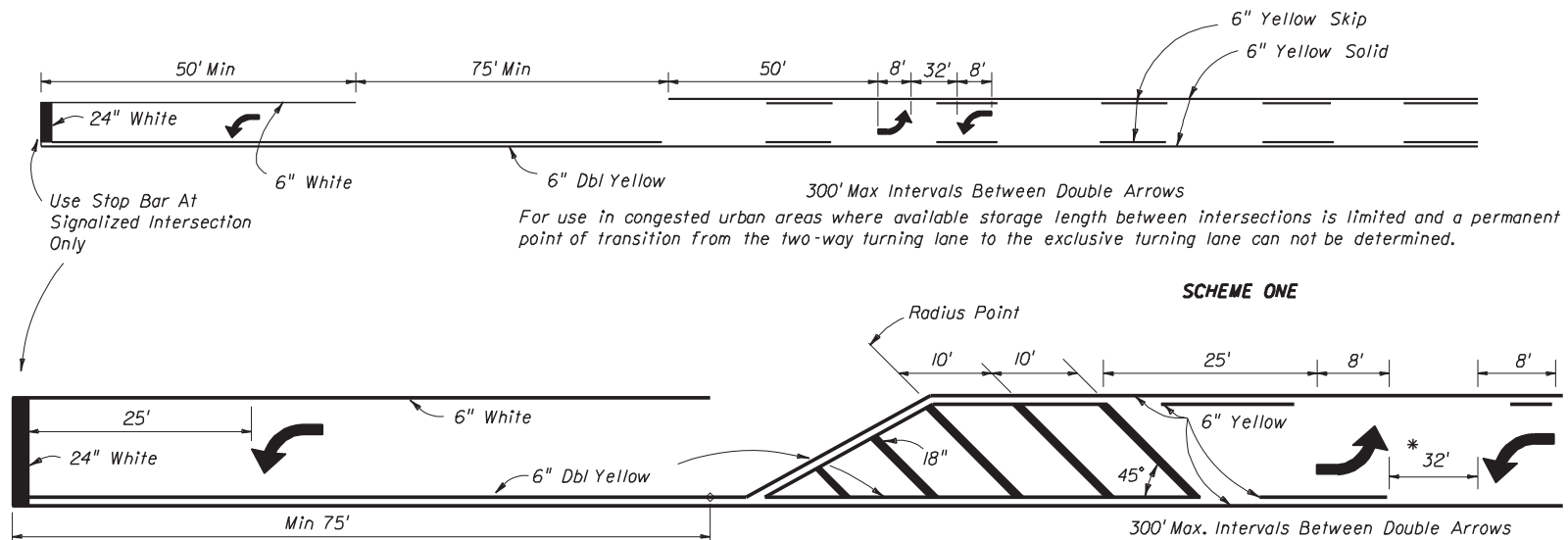
Yellow left turn edge marking may be used adjacent to raised curb or grass medians if lane use is not readily apparent to drivers approaching a left turn storage lane.

Turn lanes longer than 200' add one arrow for each 100' additional length.

Arrows should be evenly spaced between first and last arrow

Pavement message ONLY is not required for created (shadowed) turn lanes, single or dual, where the driver must exit the thru lane to enter a turn lane.

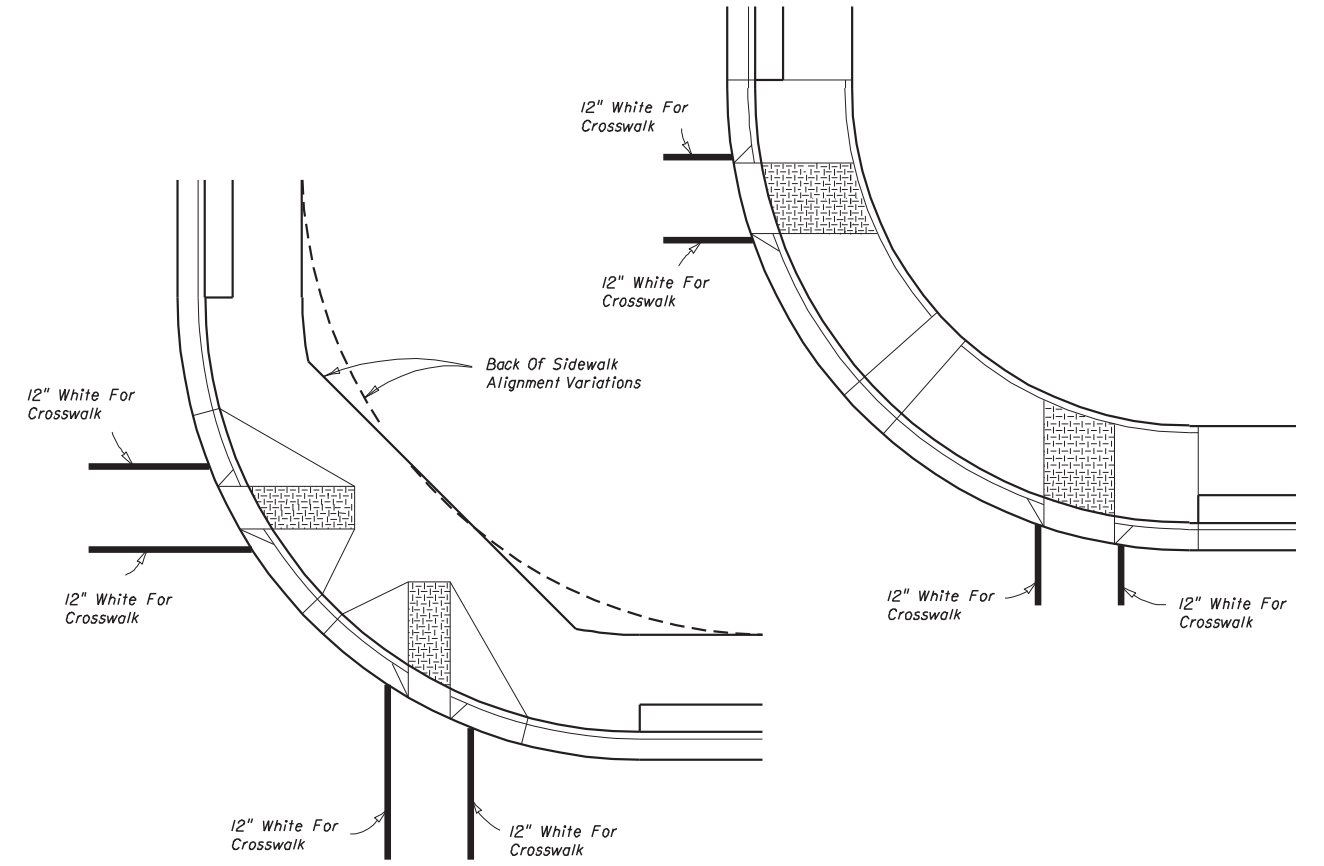
(STOP CONTROLLED OR SIGNALIZED INTERSECTIONS)
PAINTED LEFT TURN STORAGE LANE(S) DETAILS



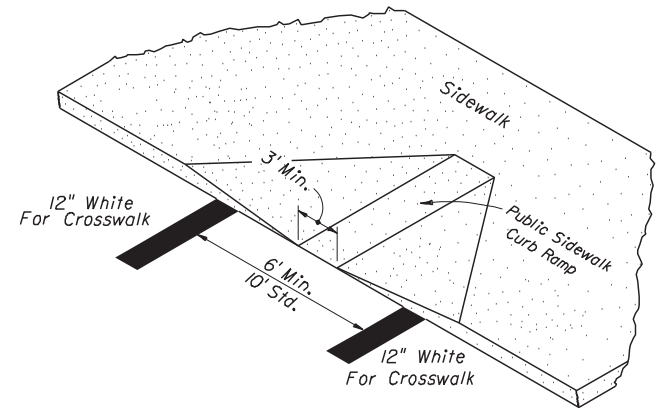
(WITH SINGLE LANE LEFT TURN CHANNELIZATION)
TWO WAY LEFT TURN LANE

*Typical spacing reference page 3B-6 in the M.U.T.C.D.

For use in rural & suburban areas where an adequate storage lane length can be specifically determined.



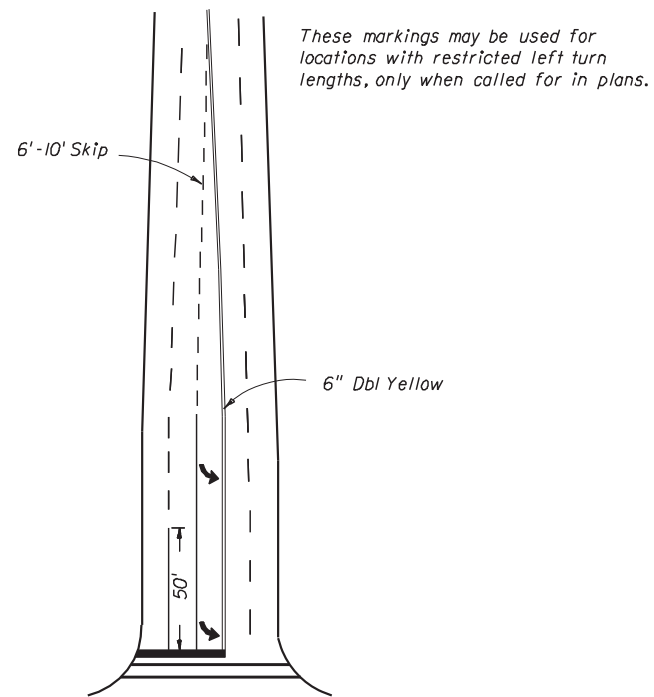
TYPICAL CROSSWALK MARKINGS FOR CURB RAMP



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 TRAFFIC DESIGN

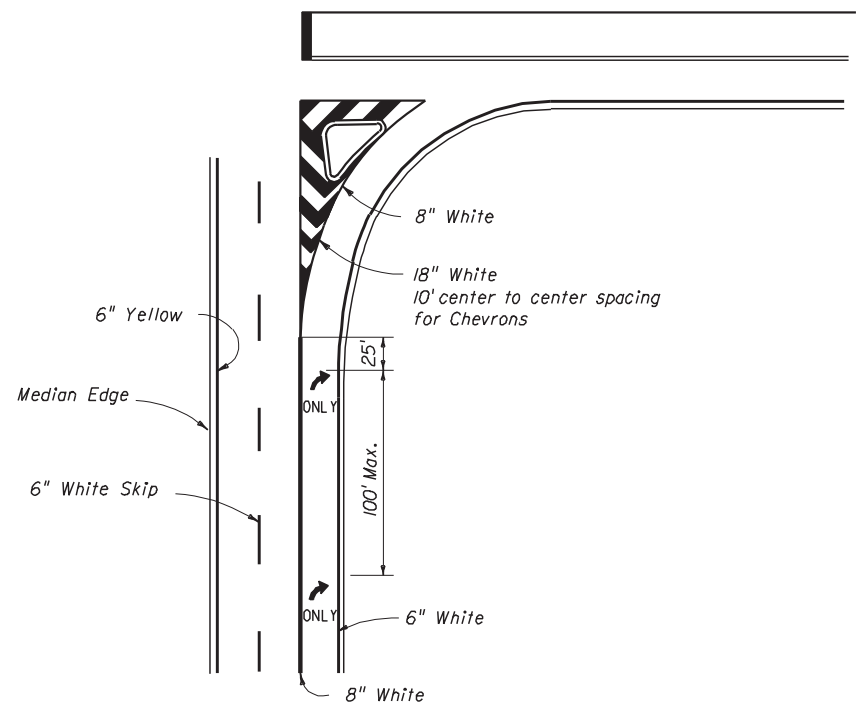
SPECIAL MARKING AREAS

Names	Dates	Approved By		
Designed By	3-76	Charles A. Scott State Traffic Plans Engineer		
Drawn By				
Checked By	9-76	Revision	Sheet No.	Index No.
		00	2 of 9	17346

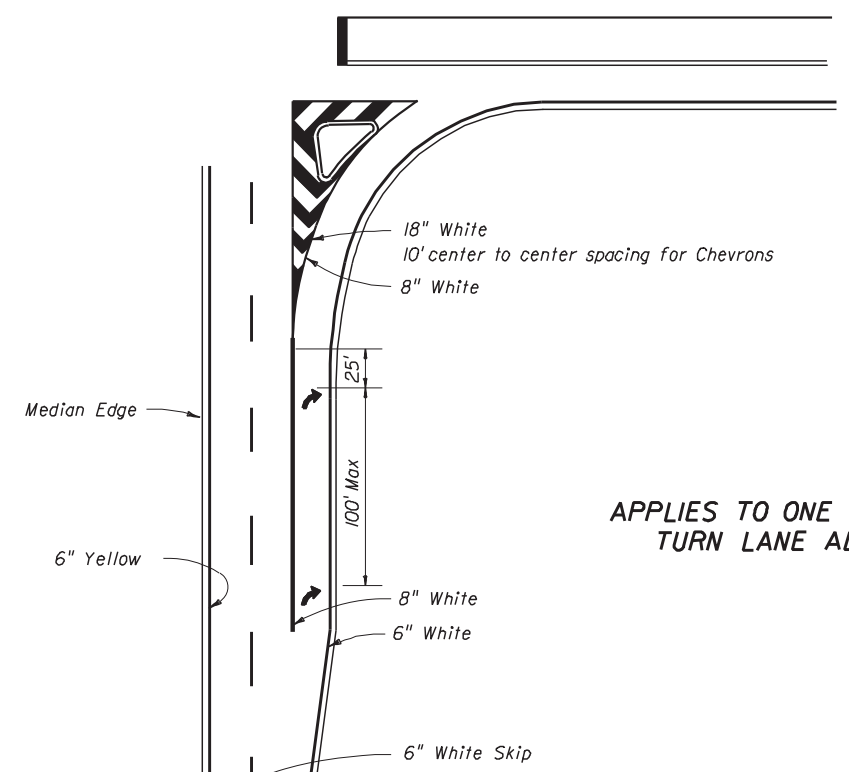


These markings may be used for locations with restricted left turn lengths, only when called for in plans.

RESTRICTED LEFT TURN MARKING



RIGHT TURN LANE DROP AND ISLAND DETAILS
LEFT TURN LANE DROP IS MIRROR IMAGE

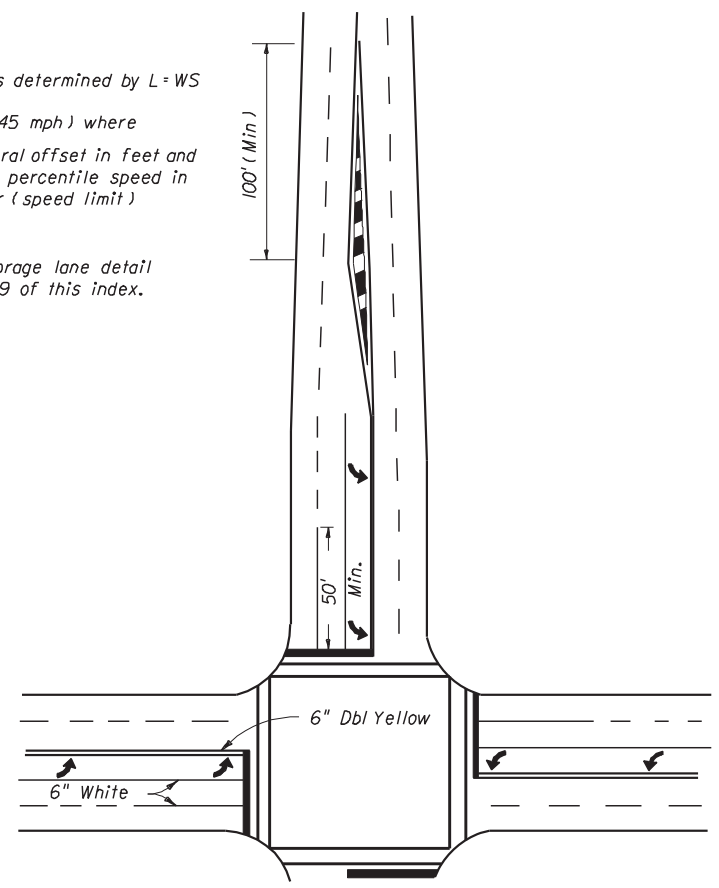


APPLIES TO ONE WAY LEFT TURN LANE ALSO

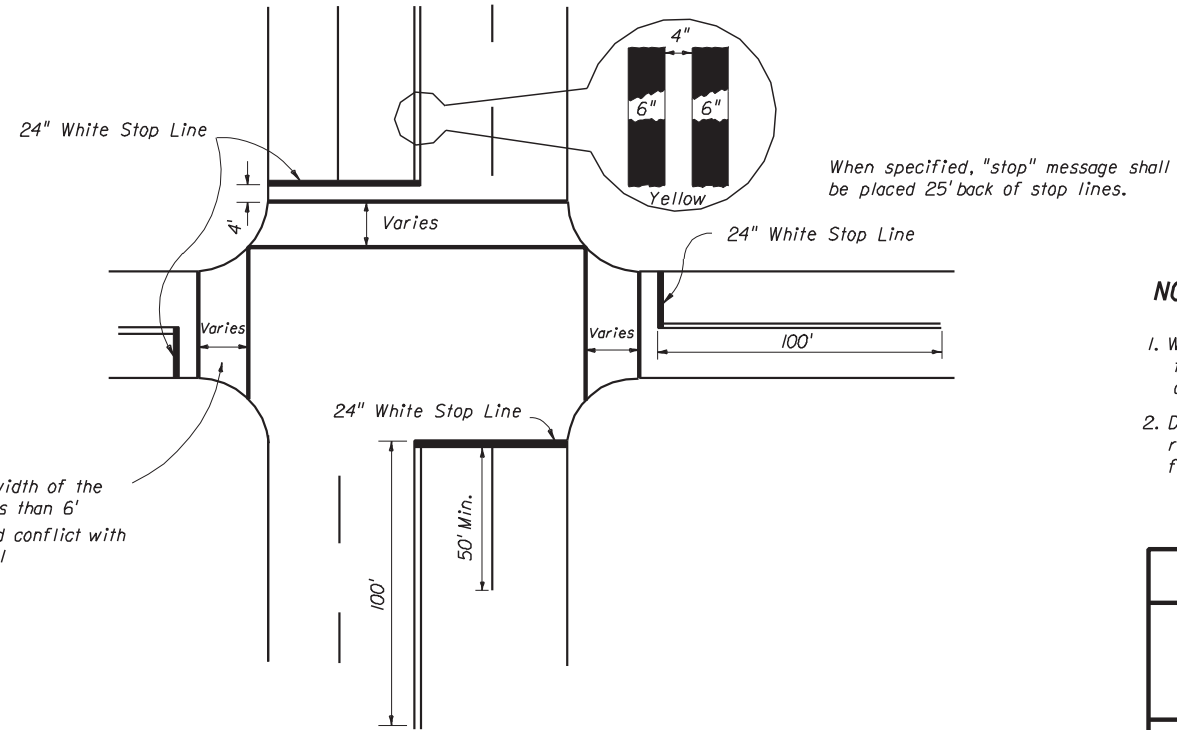
RIGHT TURN LANE AND ISLAND DETAILS

100' Minimum or as determined by $L = WS$
 $(L = \frac{WS^2}{60} < 45 \text{ mph})$ where
 W is the lateral offset in feet and
 S is the 85th percentile speed in miles per hour (speed limit)

For left turn storage lane detail see sheet 2 of 9 of this index.



TYPICAL INTERSECTION 2 THRU LANES PLUS LEFT TURN LANE, WITH CROSSWALK



Width of crosswalk to equal width of the adjacent sidewalk, but not less than 6'
 Crosswalk locations shall avoid conflict with drainage inlets when practical

When specified, "stop" message shall be placed 25' back of stop lines.

STOP BARS, CROSSWALKS AND DOUBLE CENTER LINE DETAILS

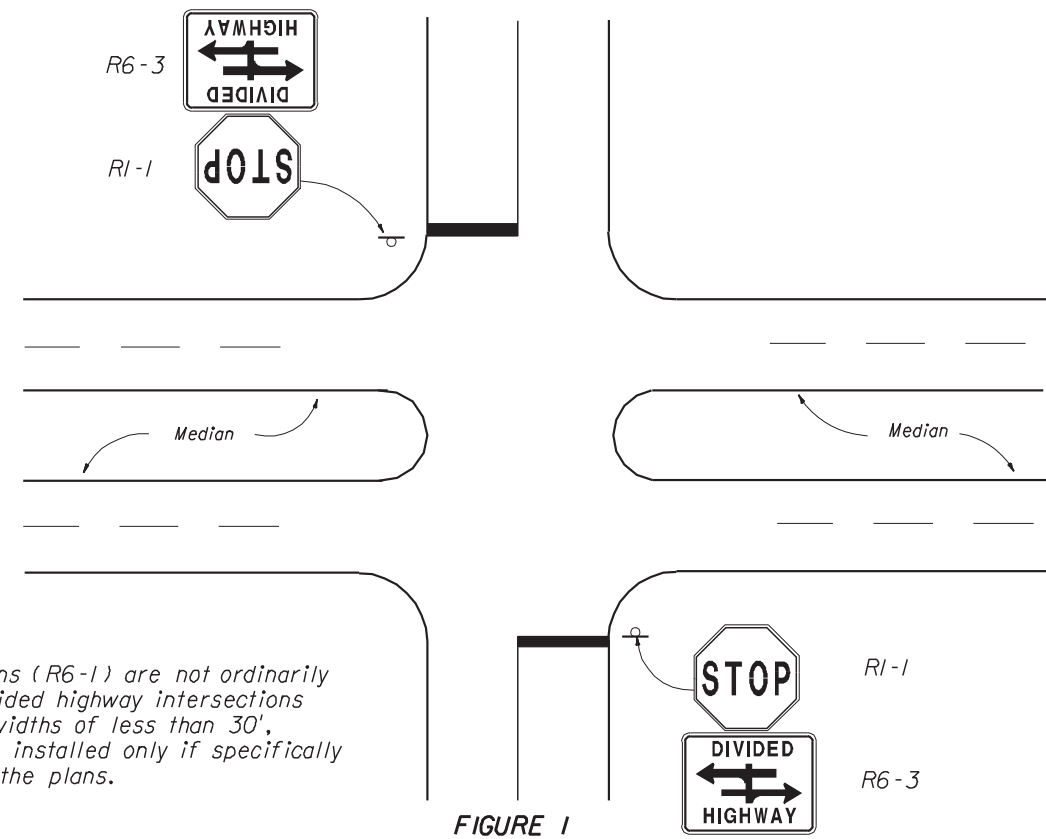
NOTES:

- When public sidewalk curb ramps are present, refer to sheet 2 of 9 & 7 of 9 of this index 17346 and Index No. 304 for crosswalk widths.
- Double yellow longitudinal center lines on all roadway approaches shall be extended back 100' for projects involving intersection improvements only.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

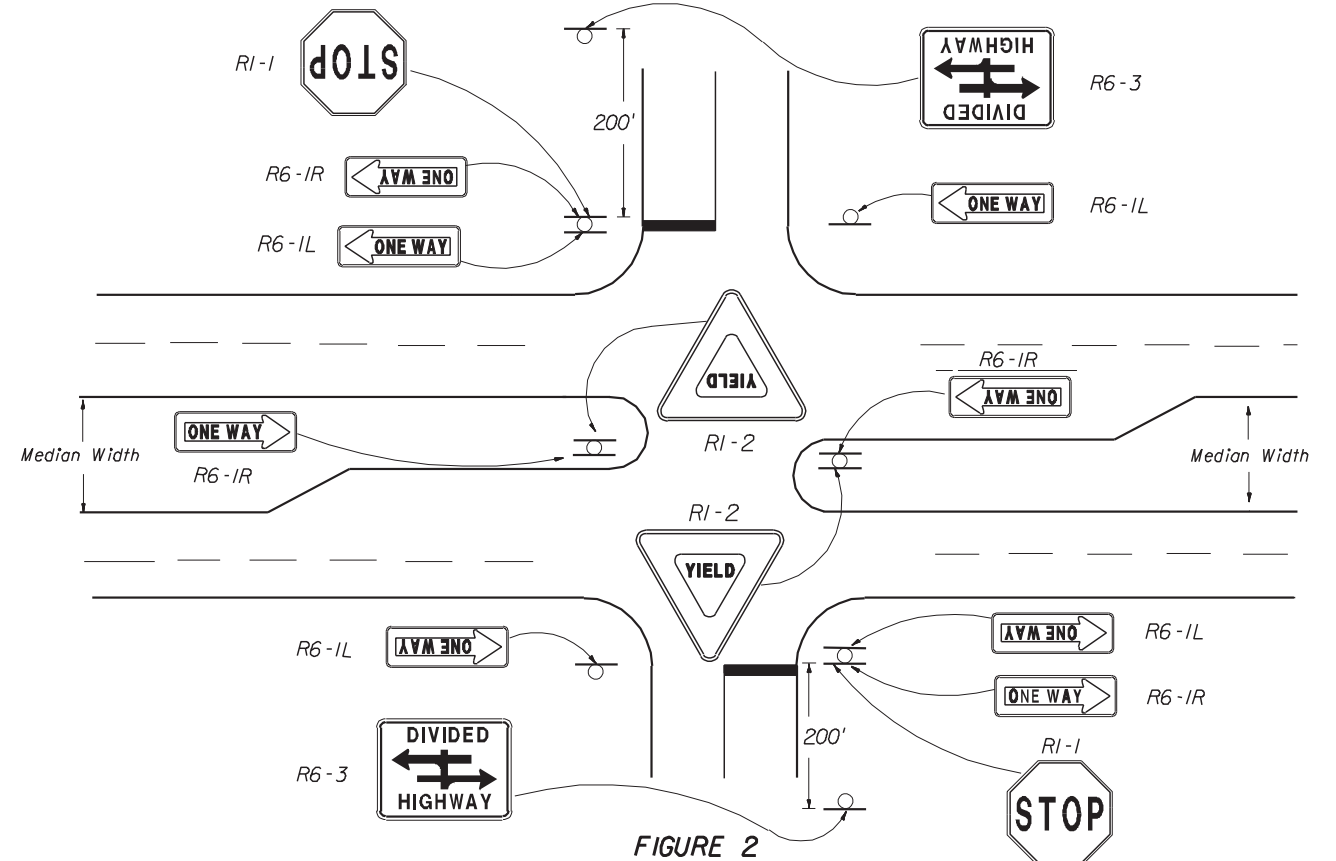
SPECIAL MARKING AREAS

Names	Dates	Approved By		
Designed By	3-76	C. Clark & Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	9-76	00	3 of 9	17346



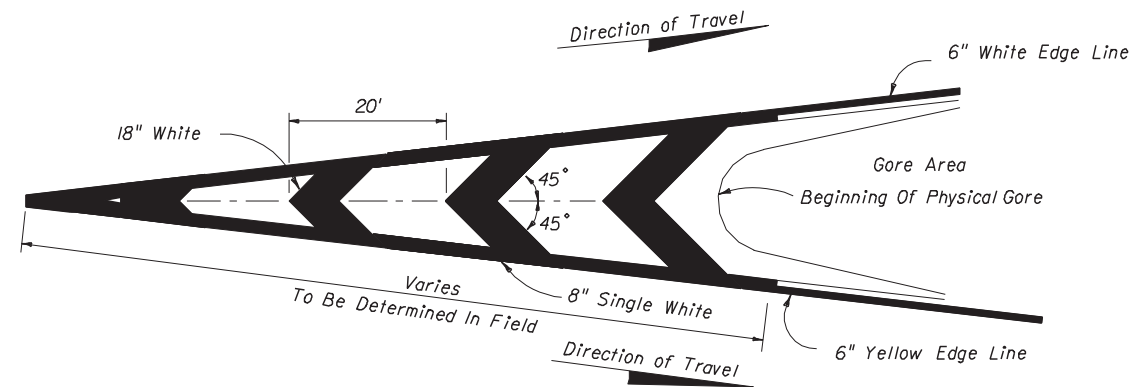
ONE WAY signs (R6-1) are not ordinarily needed at divided highway intersections with median widths of less than 30', and should be installed only if specifically called for in the plans.

FIGURE 1
MEDIAN WIDTHS UNDER 30'

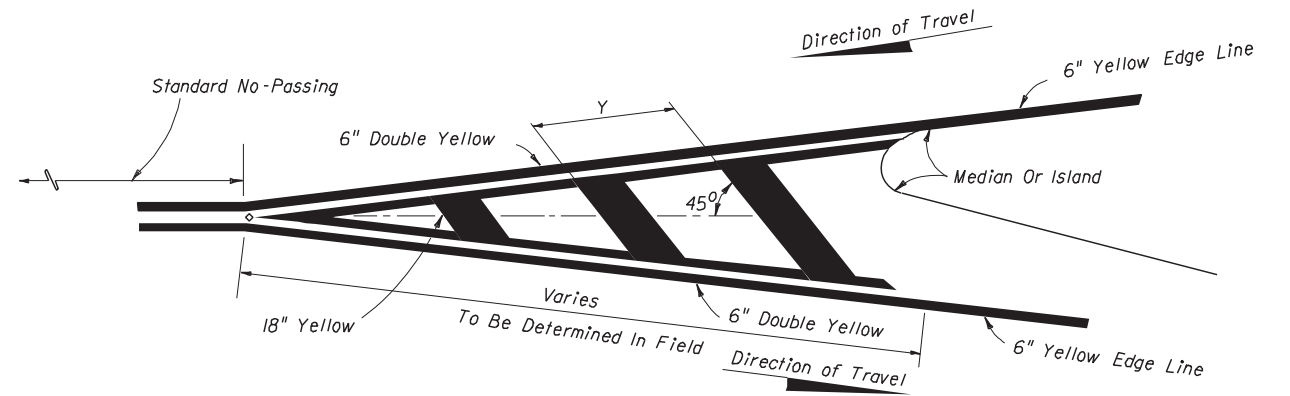


ONE-WAY SIGNS ON DIVIDED HIGHWAY INTERSECTIONS

FIGURE 2
MEDIAN WIDTHS 30' AND GREATER



PAVEMENT MARKINGS FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)



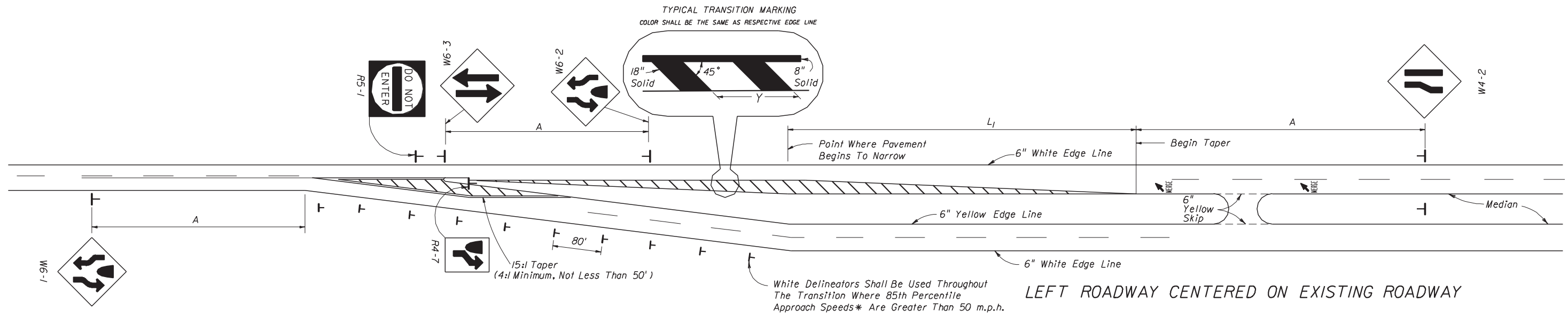
PAVEMENT MARKING FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSING DIRECTIONS)

POSTED (DAY) SPEED LIMIT M.P.H.	"y" ft
30 OR LESS	10
35	20
40	20
45	30
50 OR MORE	40

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SPECIAL MARKING AREAS

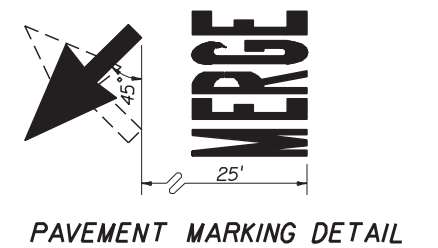
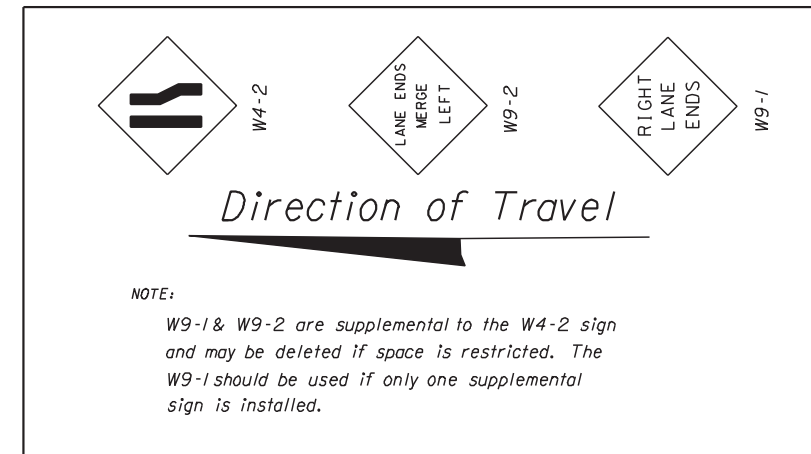
Names	Dates	Approved By	
Designed By	8-78	Clark A. Scott State Traffic Plans Engineer	
Drawn By			
Checked By	8-78		
Revision	00	Sheet No.	Index No.
		4 of 9	17346



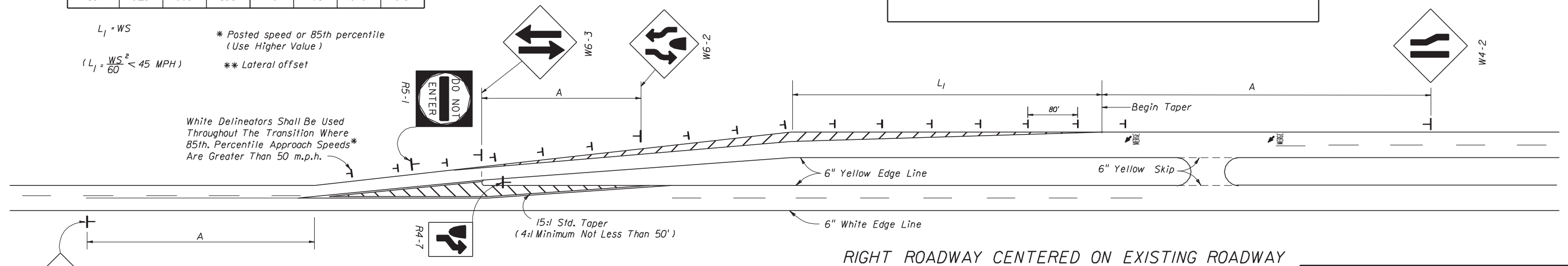
**W	TRANSITION DISTANCE L_1 (FEET)						
*S	8	9	10	11	12	13	14
30	120	135	150	165	180	195	210
35	165	185	205	225	245	265	285
40	215	240	270	295	320	350	375
45	360	405	450	495	540	585	630
50	400	450	500	550	600	650	700
55	440	495	550	605	660	715	770
60	480	540	600	660	720	780	840
65	520	585	650	715	780	845	910

SPEED M.P.H.*	"A" (FT.)
55	700
50	625
45	550
40	475
30	325

POSTED (DAY) SPEED LIMIT M.P.H.	"Y" (FT.)
30 OR LESS	10
35	20
40	20
45	30
50 OR MORE	40



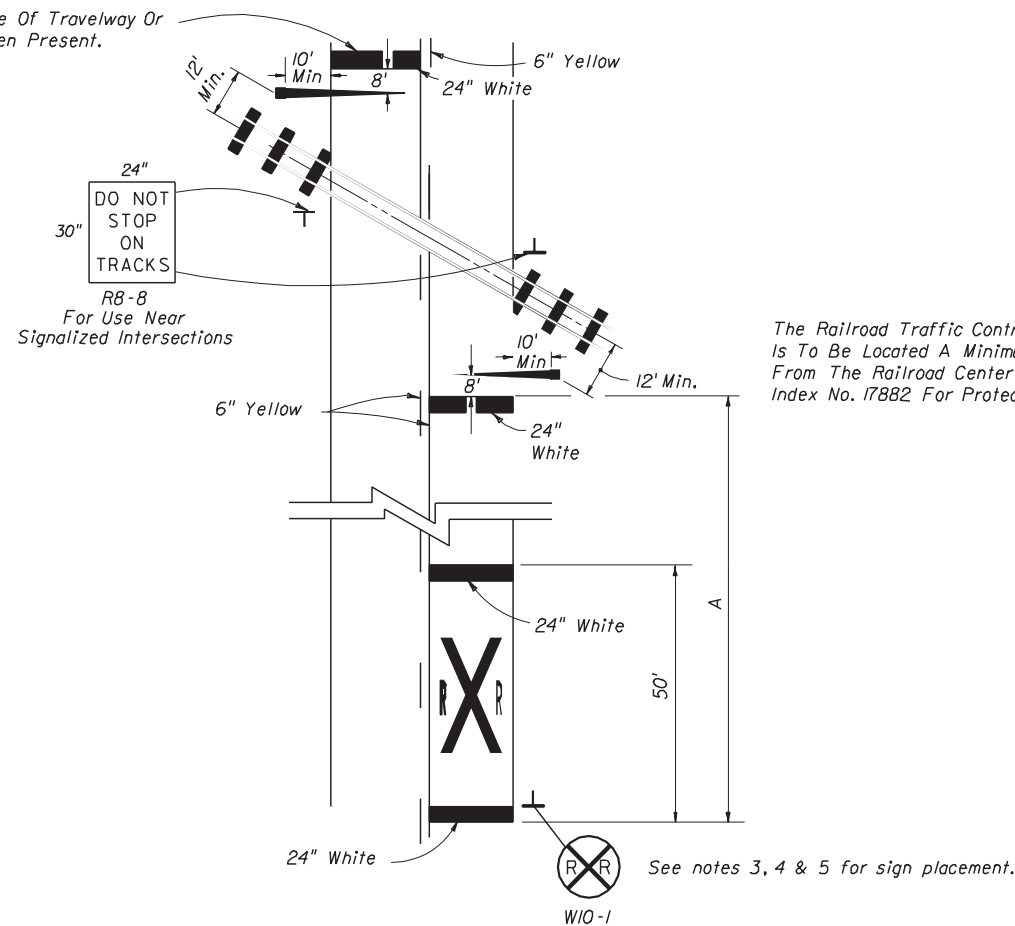
$L_1 = WS$
* Posted speed or 85th percentile (Use Higher Value)
 $(L_1 = \frac{WS^2}{60} < 45 \text{ MPH})$ ** Lateral offset



SCHMES FOR TRANSITION - 2 LANE / 4 LANE ROADWAY

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
SPECIAL MARKING AREAS				
Names	Dates	Approved By		
Designed By	8-78	Clark A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	8-78	00	5 of 9	17346

Stop Bar Perpendicular To Edge Of Travelway Or 8' From & Parallel To Gate When Present.

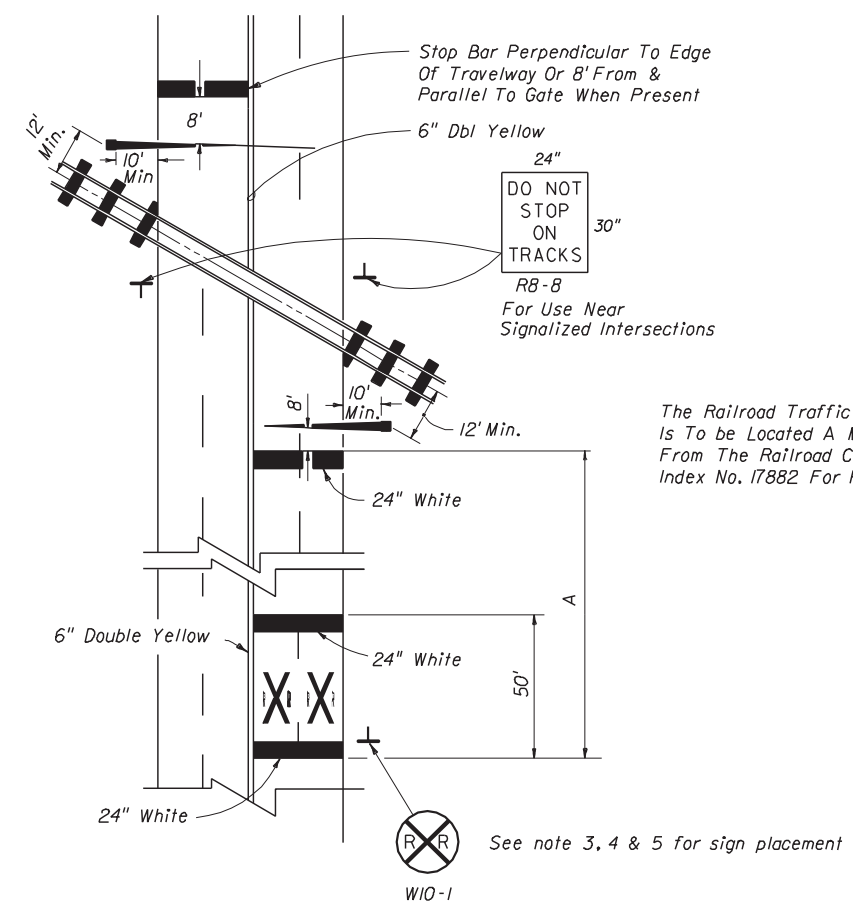


The Railroad Traffic Control Device Is To Be Located A Minimum Of 12' From The Railroad Centerline. See Index No. I7882 For Protection Devices.

See notes 3, 4 & 5 for sign placement.

RAILROAD CROSSING AT 2-LANE ROADWAY

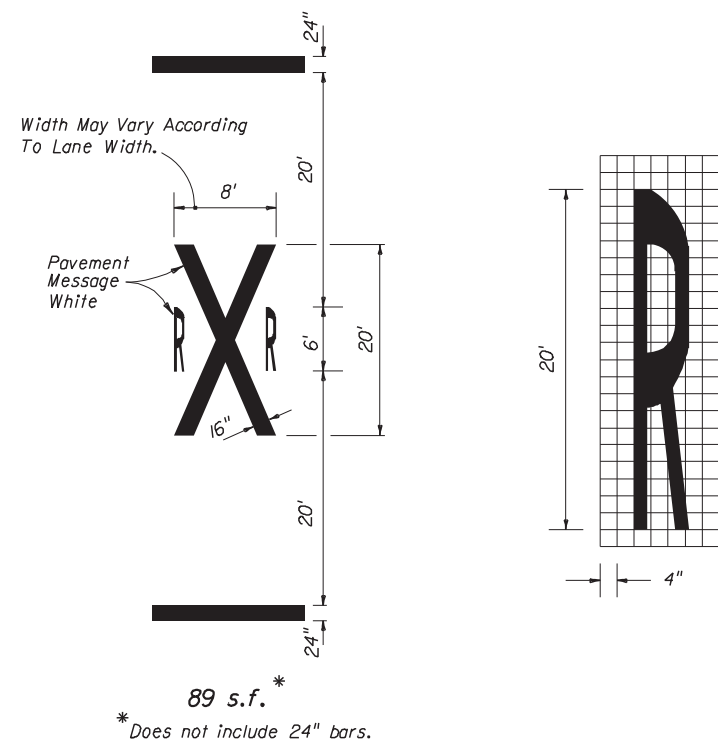
Stop Bar Perpendicular To Edge Of Travelway Or 8' From & Parallel To Gate When Present



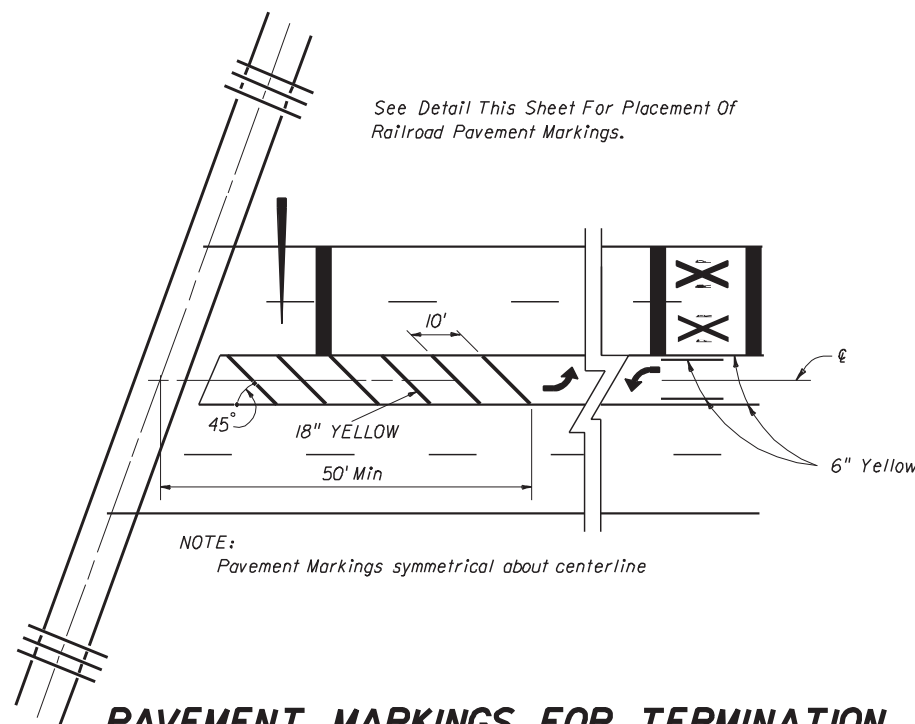
The Railroad Traffic Control Device Is To Be Located A Minimum Of 12' From The Railroad Centerline. See Index No. I7882 For Protection Devices.

See note 3, 4 & 5 for sign placement

RAILROAD CROSSING AT 4-LANE ROADWAY



TYPICAL PAVEMENT MARKINGS FOR R/R CROSSING



PAVEMENT MARKINGS FOR TERMINATION OF TWO WAY LEFT TURN AT R/R CROSSINGS

NOTES:

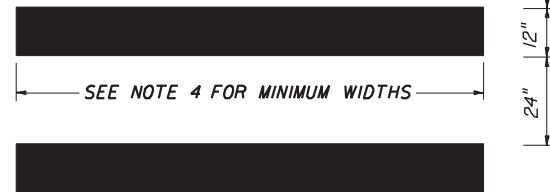
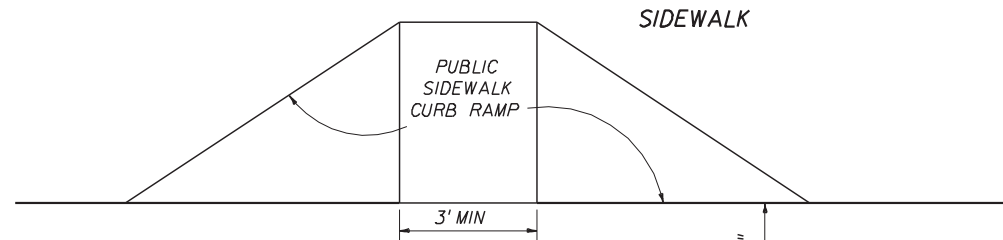
- When computing pavement messages, quantities do not include transverse lines.
- When dynamic devices are not present or are to be installed, the crossbuck shall be located at the future location of the RR gate or signal and gate in accordance with Index No. I7882.
- Placement of sign W10-1 in a residential or business district, where low speeds are prevalent, the W10-1 sign may be placed a minimum distance of 100' from the crossing. Where street intersections occur between the RR pavement message and the tracks an additional W10-1 sign & additional pavement message should be used.
- Recommended location for FTP-38 or FTP 38B sign, 100' urban & 300' rural in advanced of the crossing.
- A portion of the pavement marking symbol should be directly opposite the W10-1 sign.

SPEED MPH	A (Ft)
65	650
60	550
55	450
50	375
45	300
40	225
35	150
30	100
Urban	50 Min.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

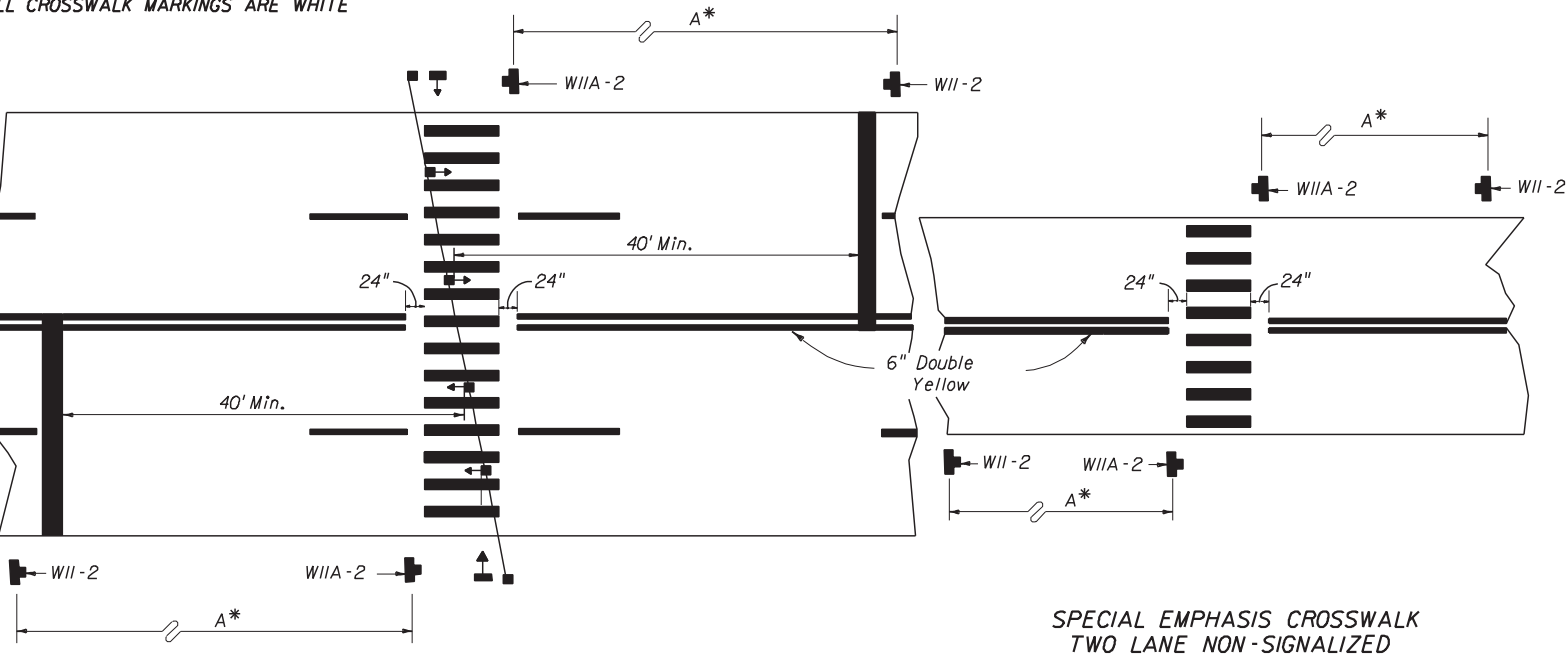
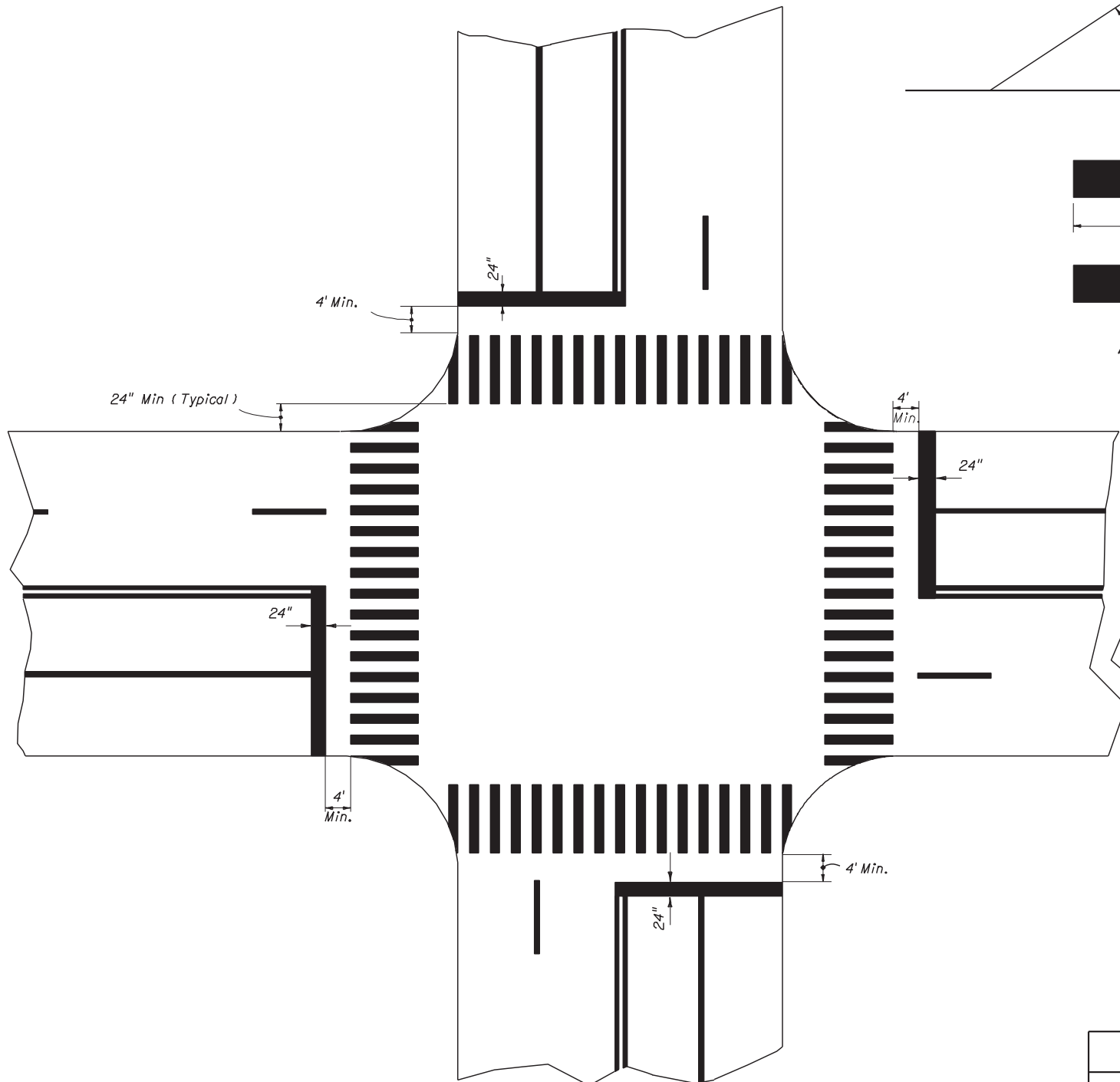
SPECIAL MARKING AREAS

Names	Dates	Approved By
Designed By	5-76	Charles A. Scott State Traffic Plans Engineer
Drawn By		Revision
Checked By	6-76	00
		Sheet No. 6 of 9
		Index No. 17346



ALL CROSSWALK MARKINGS ARE WHITE

- GENERAL NOTES**
1. For traffic and pedestrian signal installation, refer to Index No. 17721 through 17890.
 2. For public sidewalk curb ramps, refer to Index No. 304.
 3. For pavement marking and sign installation, refer to Indexes 9535 through 17356.
 4. Crosswalk minimum widths:
Intersection Crosswalk 6'
Mid Block Crosswalk 10'



SPECIAL EMPHASIS CROSSWALK
SIGNALIZED OR STOP SIGN CONTROLLED INTERSECTION

SPECIAL EMPHASIS CROSSWALK
MID BLOCK - SIGNALIZED

SPECIAL EMPHASIS CROSSWALK
TWO LANE NON-SIGNALIZED

APPROACH SPEED MPH	A* SUGGESTED DISTANCE (Ft)
25 To 35	275
36 To 45	350
46 To 55	500

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SPECIAL MARKING AREAS

Names	Dates	Approved By
Designed By	3-83	<i>Charles Scott</i> State Traffic Plans Engineer
Drawn By		Revision
Checked By		Sheet No. 7 of 9
		Index No. 17346

Markings in or adjacent to bike lanes should be thermoplastic with a mixture of 50 percent glass spheres and 50 percent sharp silica sand applied at a rate of 0.2 lb/ft².

The sharp silica sand shall meet the following gradation requirements:

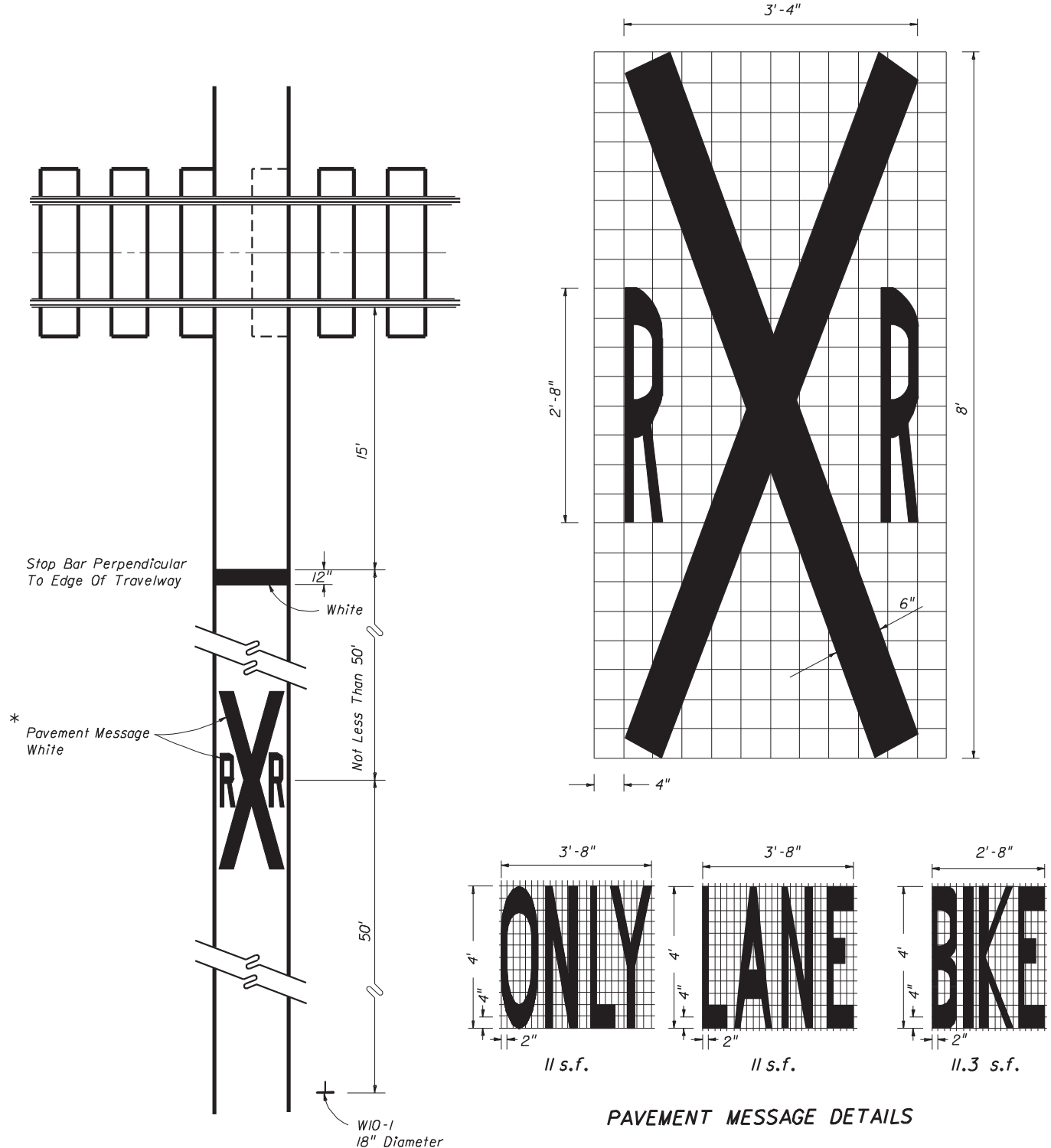
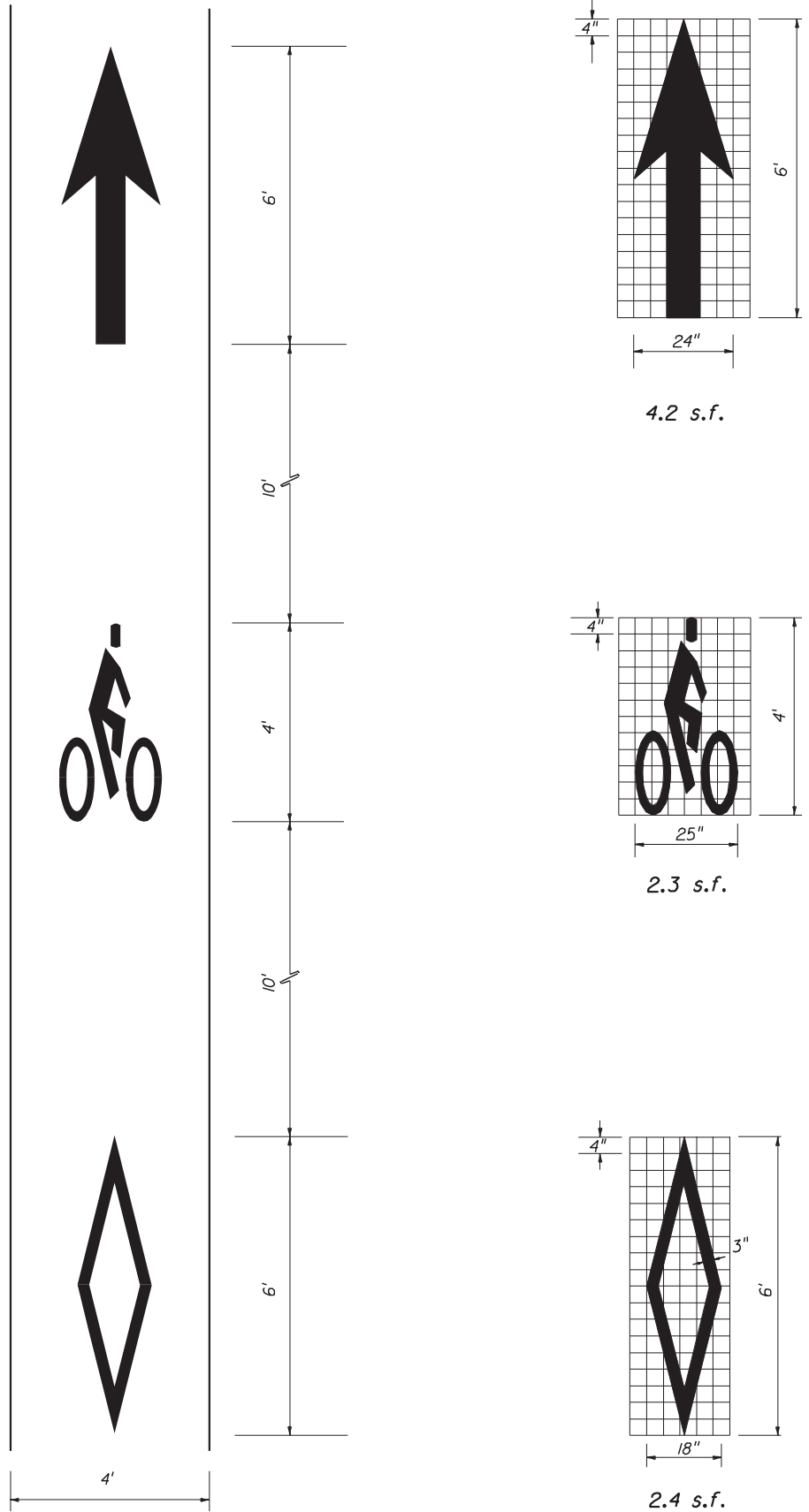
U.S. Sieve Number	Sieve Size (µm)	Percent Passing
20	850	100
50	300	0-10

(Florida Standard Spec. 711-4.6)

Recommended spacing of diamond symbol: Immediately after intersections and major driveways and at a maximum spacing of 600 feet for urban sections and 1320 feet for rural sections.

Raised pavement markings and raised barriers can cause steering difficulties and should not be used to delineate bicycle lanes. All pavement markings and pavement messages shall be white.

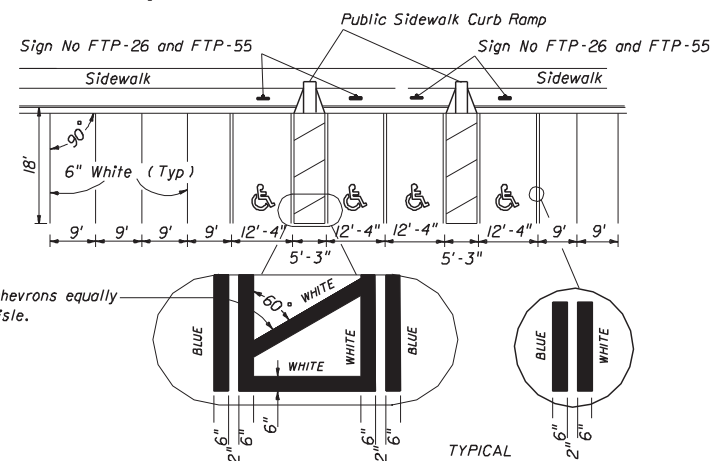
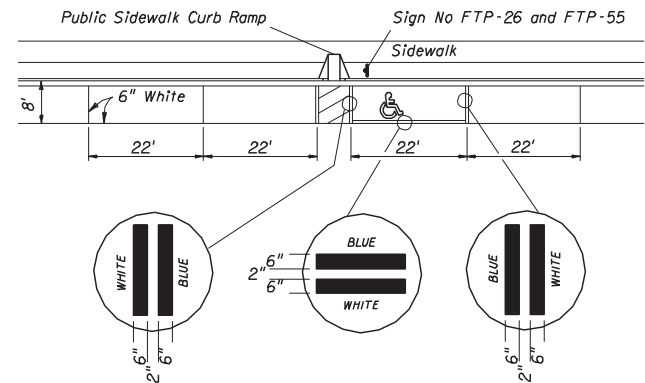
DETAIL OF BIKE LANE MARKINGS



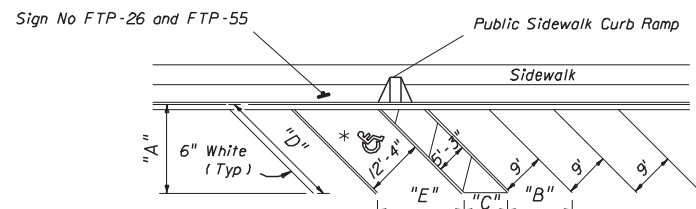
* NOTE
When used on a bike lane (adjacent to vehicle lane) markings shall be placed adjacent to markings for vehicles & W10-1 sign shall be sized and placed for vehicles.

PAVEMENT MESSAGE DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
SPECIAL MARKING AREAS (BICYCLE)				
Names	Dates	Approved By		
Designed By	8-84	 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	8 of 9	17346



3-6" white chevrons equally spaced per aisle.

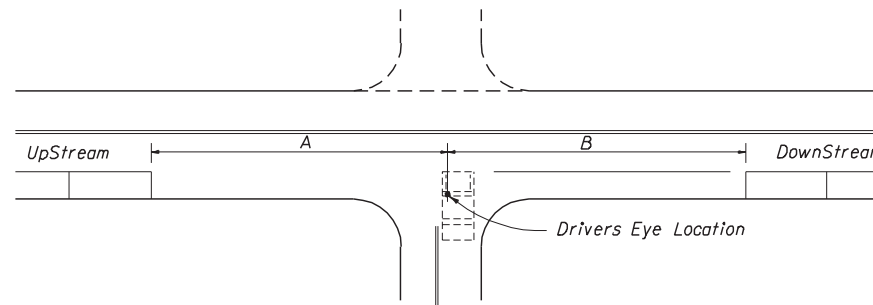


* FOR ACCESSIBLE MARKINGS - SEE ABOVE

"DIMENSIONS"					
Δ°	"A"	"B"	"C"	"D"	"E"
45°	19'-1"	12'-9"	7'-6"	27'-0"	17'-8"
60°	20'-1"	10'-5"	6'-4"	23'-2"	14'-4"

- NOTES:
- Dimensions are to the centerline of markings.
 - An Access Aisle is required for each accessible space when angle parking is used.
 - Criteria for pavement markings only, not public sidewalk curb ramp locations. For ramp locations refer to plans.
 - Blue pavement markings shall be tinted to match shade 15180 of Federal Standards 595a.
 - The FTP-55 panel shall be mounted below the FTP-26 sign.

PAVEMENT MARKING FOR PUBLIC SIDEWALK CURB RAMP IN REST AREAS

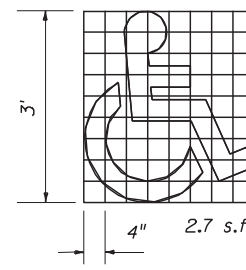
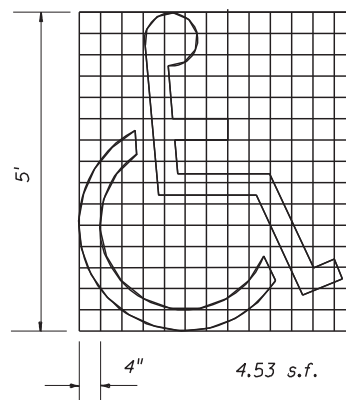


SPEED MPH	UP STREAM (A)		DOWN STREAM (B)	
	2 LANE	4 LANE	2 LANE	4 LANE
0-30	85'	60'	60'	45'
35	100'	70'	70'	50'

NOTES

- Distances measured longitudinally along the street from driver location of entering vehicle to end of parking restriction.
- Distances applicable to intersecting street, major driveways and other driveways to the extent practical.
- For non-signalized intersections, the values above shall be compared with the values for signalized intersections and the maximum restrictions implemented. These restrictions apply to both accessible and non-accessible parking.

MINIMUM PARKING RESTRICTION FOR NON-SIGNALIZED INTERSECTIONS

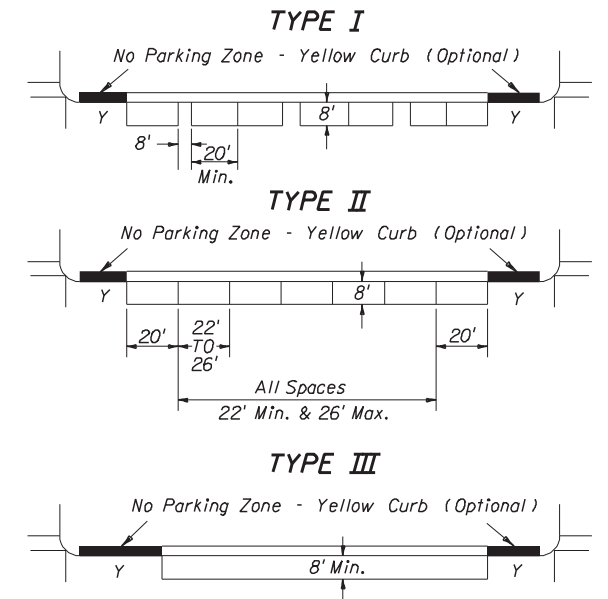


Use of pavement symbol in accessible parking spaces is optional, when used the symbol shall be 3' or 5' high and white in color.

"UNIVERSAL SYMBOL OF ACCESSIBILITY"

GENERAL NOTES (Signalized & Non-signalized)

- For entrances to a one-way street, the downstream restriction may be reduced to 20'.
- Parking shall not be allowed within 20' of a crosswalk.
- All parking lane markings shall be 6" white.
- Parking lane lines shall be broken at driveways.
- Refer to Chapter 316, Fla. statutes, for laws governing parking spaces.
- Where curb and gutter is used, the gutter pan width may be included as part of the minimum width of parking lane, but desirably the lane width should be in addition to that of the gutter pan.



SPEED LIMIT MPH	SIGNALIZED INTERSECTIONS	DISTANCE FROM CURB RADIUS (Y)
0 - 30	30	
35	50	

PARKING RESTRICTION (FT.) FOR SIGNALIZED INTERSECTION

NOTES:

- Parking restrictions measured from curb radius point.
- Restrictions for accessible parking are the same as those applied to non-signalized intersections.

MINIMUM PARKING RESTRICTION FOR SIGNALIZED INTERSECTION

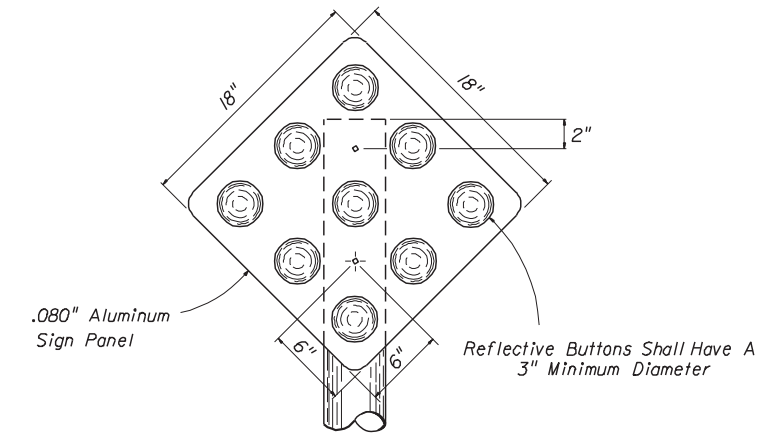
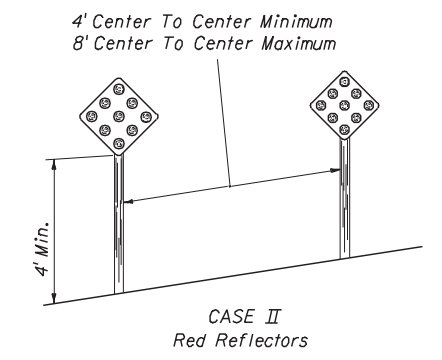
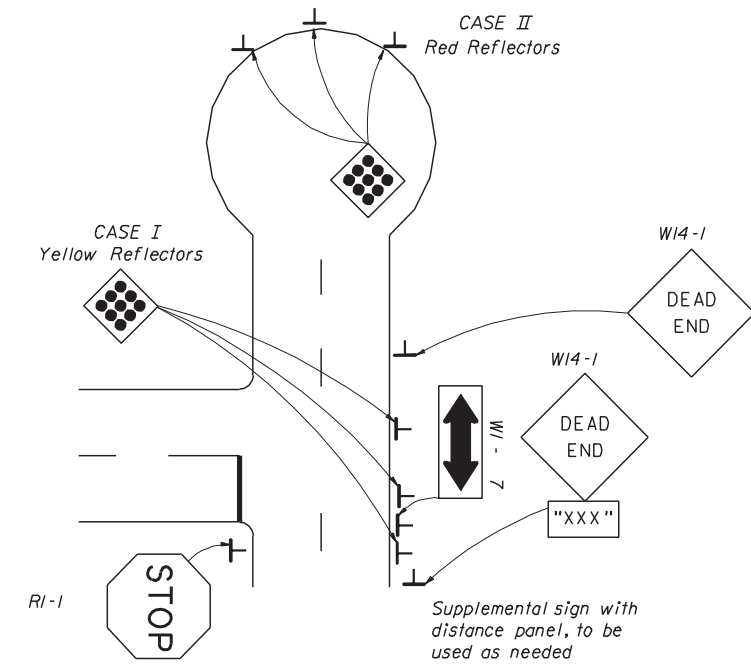
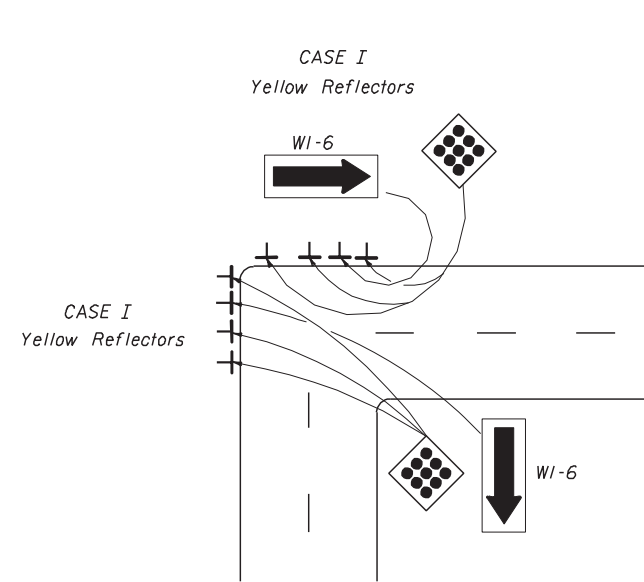
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN					
SPECIAL MARKING AREAS (PARKING)					
Names	Dates	Approved By			
Designed By	8-86	Clark A. Scott State Traffic Plans Engineer			
Drawn By		Revision	Sheet No.	Index No.	
Checked By	8-86	00	9 of 9	17346	

CASE I Type I Object Markers shall consist of nine yellow reflectors mounted on a yellow reflective background or consist of a reflective panel of the same size with Type III-A, III-B or III-C yellow sheeting.

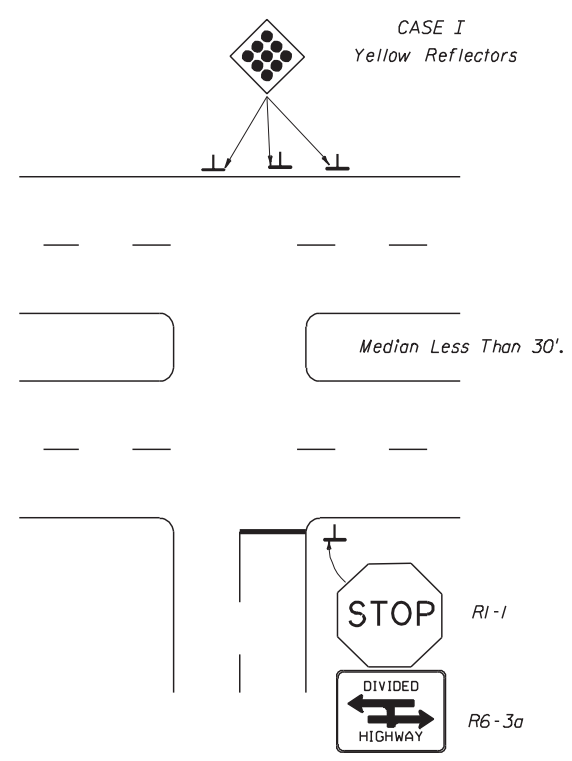
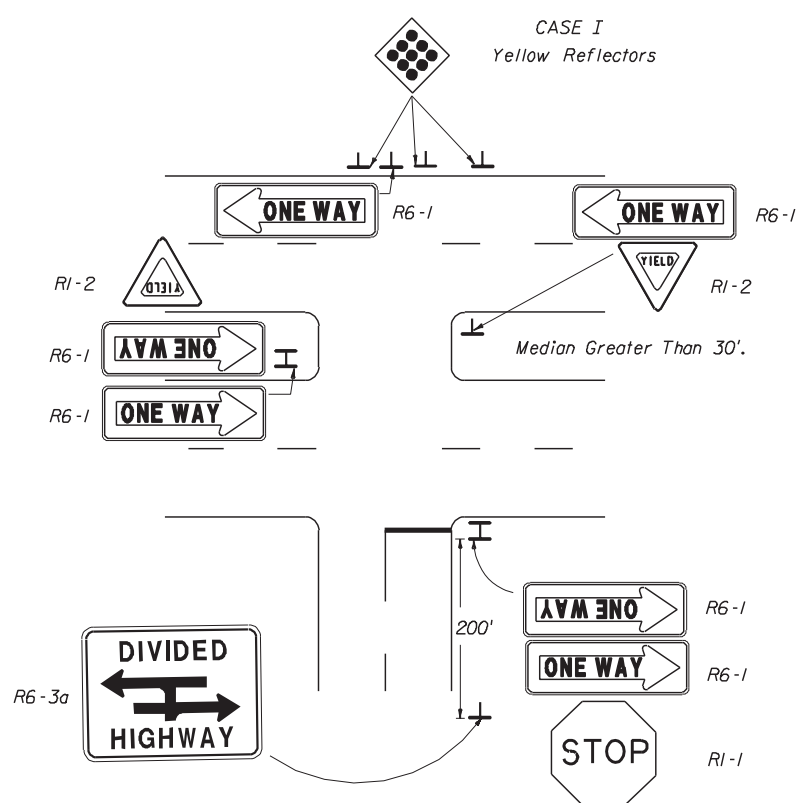
CASE II End of Road Markers shall consist of nine red reflectors mounted on a red reflective background or consist of a reflective panel of the same size with Type III-A, III-B or III-C red sheeting.

NOTES:

1. This index applicable to residential and minor streets only. Major streets to be evaluated on a case by case basis.
2. "T"-intersection-Two-Way arrows and reflectors are optional. The need should be based on a review of each location.
3. For additional details on aluminum round post, steel flanged channel post, sign panel material and bolts, nuts and washers see Index Nos. 11860 and 11865.
4. Case I Installation - The arrow panels and object markers shall be located approximately 20', but not less than 12' from the edge of the travel lane.
5. Dead end sign shall be posted a sufficient advance distance to permit the vehicle operator to avoid the dead end by turning off, if possible, at the nearest intersecting street.
6. For pavement marking see index no. 17346
7. No guardrail is required unless special field conditions require its use.



Supports shall be driven 3' into the ground.
 2" Ø X 1/8" Aluminum Round Post or 2.5 #/Ft. Steel Flanged Channel Post.
 Aluminum Post: 3/8" Ø Aluminum Button Head Bolt with Nut and Lockwasher or 1/2" Ø Stainless Steel Hex Head Bolt with Flat Washer under Head and Lockwasher under Nut.
 Channel Post: Provide Attachment in Accordance with the "Sign Attachment Detail" on Index No. 11865.



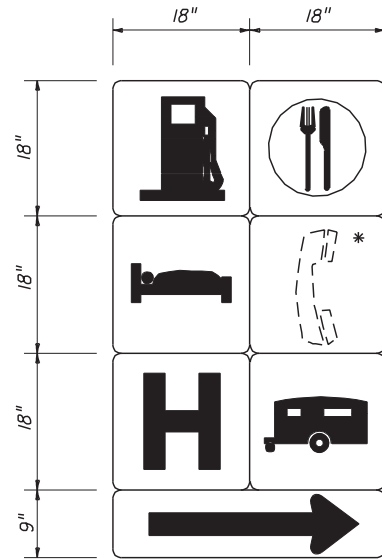
ONE WAY signs (R6-1) are not ordinarily needed at divided highway intersections with median widths of less than 30', and should be installed only if specifically called for in the plans.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
TRAFFIC CONTROLS FOR STREET TERMINATIONS				
Names	Dates	Approved By		
Designed By	11 74	<i>Clark A. Scott</i> State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	11 74	00	1 of 1	17349

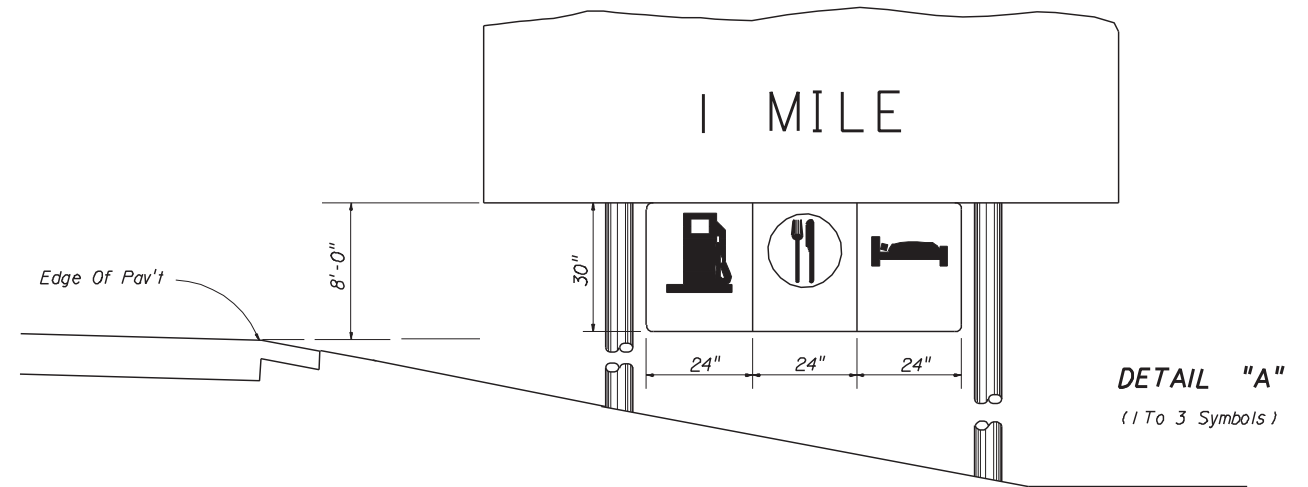
**** Note:**

Two assemblies are required; one for each side of the ramp, showing those services in each particular direction from the ramp terminal.

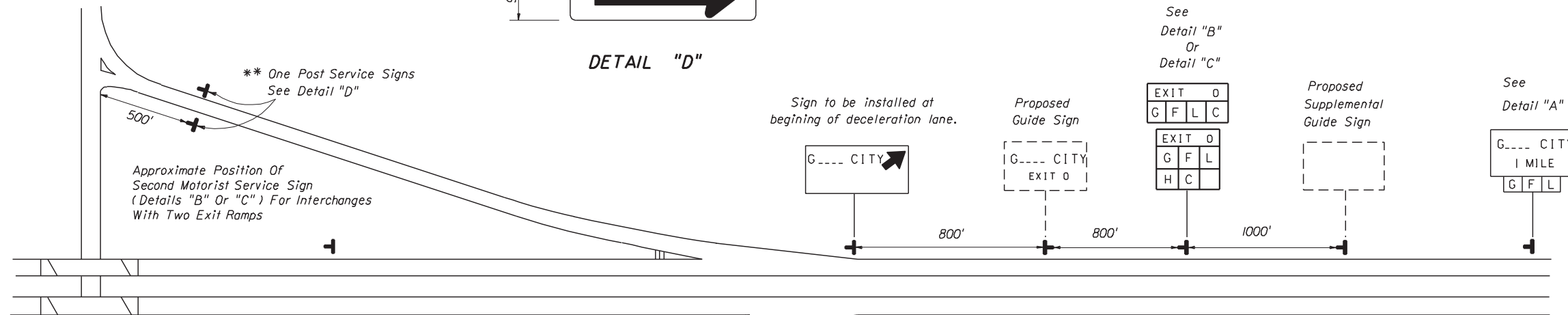
Ramp mounted signs shall be installed to avoid conflict with existing signs and in no case should they be placed within 100' of another sign.



DETAIL "D"

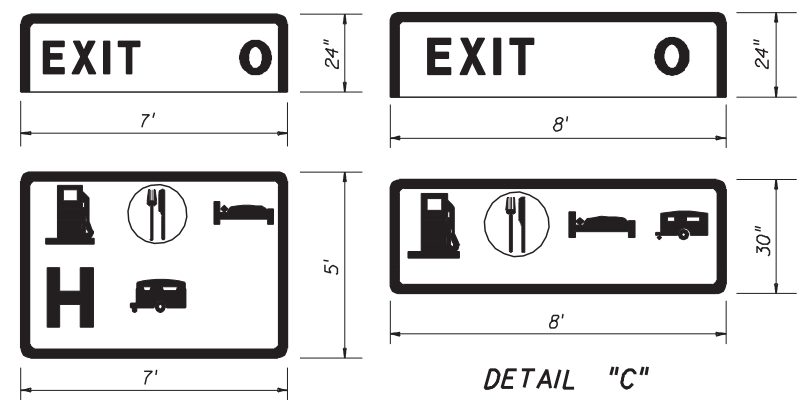
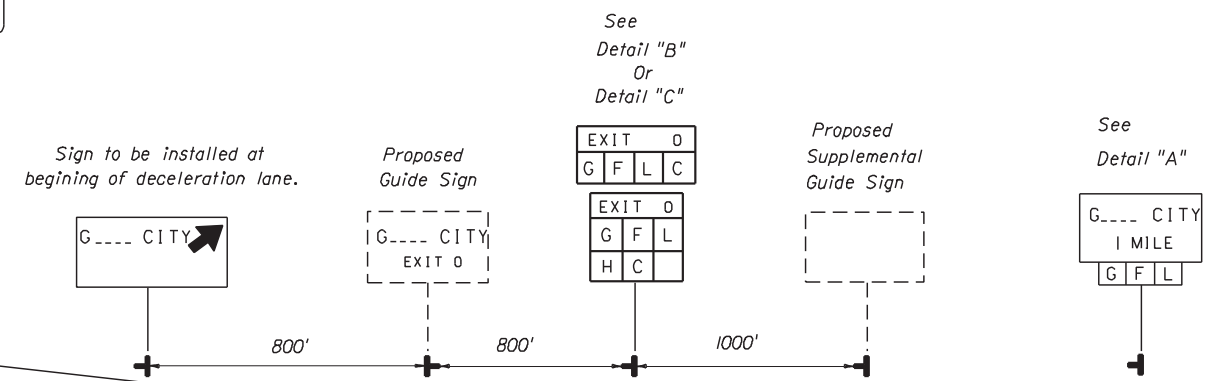


DETAIL "A"
(1 To 3 Symbols)



** One Post Service Signs See Detail "D"

Approximate Position Of Second Motorist Service Sign (Details "B" Or "C") For Interchanges With Two Exit Ramps



DETAIL "B"
(4 To 6 Symbols)

DETAIL "C"
(4 Symbols)

NOTE
When approved for attachment to the advance guide signs, up to 3 services may be used for an exit. The symbol signs shall be suspended from the guide sign panel or existing wind beams. Symbol signs are not to be connected to existing sign posts.
The mounting height of the advance guide sign shall be increased, where necessary, to provide 8' between the level of the pavement edge and the bottom of the guide sign, prior to mounting the supplementary panel.

GENERAL NOTES

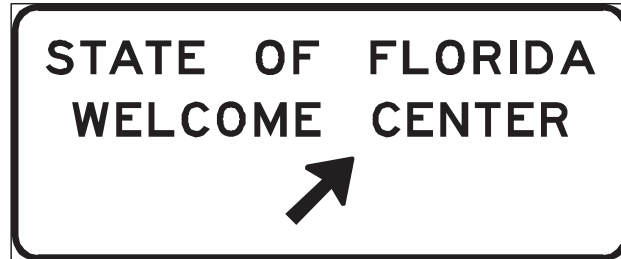
- 1 - Only those services meeting criteria established by the Department and approved by the State Traffic Operations Engineer for each interchange shall be shown. Symbol signs for motorist services shall always appear in the following order reading from left to right and top to bottom: Gas, Food, Lodging, Phone*, Hospital, Camping.
- * The phone symbol shall not be shown whenever any Gas, Food, Lodging or Camping symbol appears.
- 2 - Symbols shall appear consecutively on the sign with no positions left blank or reserved for intermediate symbols not currently approved for a particular interchange.

- 3 - All motorist service signs to have White Legend and Border with Blue Background.
- 4 - For mounting details see Index 9535 for Type "A" breakaway or Index 11860 for Type "C" Frangibility.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
SIGNING FOR MOTORIST SERVICES				
Names	Dates	Approved By		
Designed By	3-76	<i>Clark A. Scott</i> State Traffic Plans Engineer		
Drawn By	3-76	Revision	Sheet No.	Index No.
Checked By	3-76	00	1 of 1	17350



Sign No. FTP-17



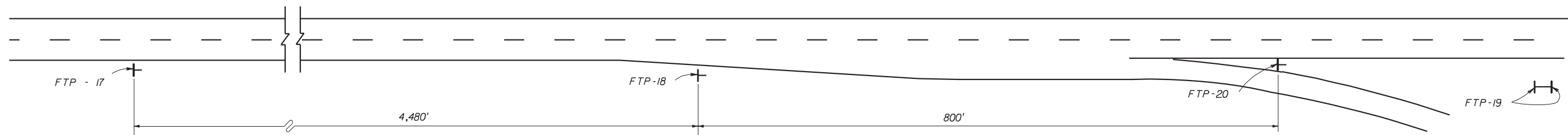
Sign No. FTP-18



Sign No. FTP-19



Sign No. FTP-20



Note : Roadway not drawn to scale
Distances shown are adequate for driver communication
but may be altered slightly if conditions require.

Notes :

- (1) Signs and sign structures shall be erected in accordance with the details shown on Index 9535.
- (2) Sign FTP-19 shall be located on the Welcome Center grounds in proximity to the building and as far from the main line roadway as possible (2 signs back to back).
- (3) Sign FTP-17, 18, 19 shall be located on limited access highways only.
- (4) All legend to be Series E.
- (5) See Index 17355 for sign details.



Sign No. FTP-21

Note: Sign FTP-21 shall be used as a supplemental guide sign at interchanges which have a Tourist Information Center approved for such signing (locate half-way between normal guide signs)

FOR LIMITED ACCESS HIGHWAYS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

WELCOME CENTER SIGNING

Names	Dates	Approved By		
Designed By	6-75	Charles A. Scott State Traffic Plans Engineer		
Drawn By	6-75	Revision	Sheet No.	Index No.
Checked By	6-75	00	1 of 2	17351



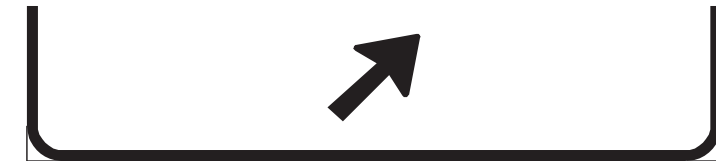
SIGN NO. FTP-22A



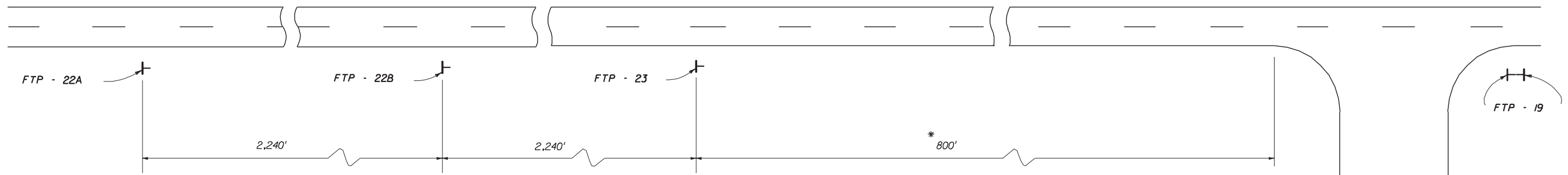
SIGN NO. FTP-19



SIGN NO. FTP-22B



SIGN NO. FTP-23



Note :
One sign FTP-22A or 22B should be used depending on speed, roadside development & geometric conditions.

NOTE :
Roadway not drawn to scale

* 800' Maximum For Rural Conditions
50' Minimum For Congested Areas

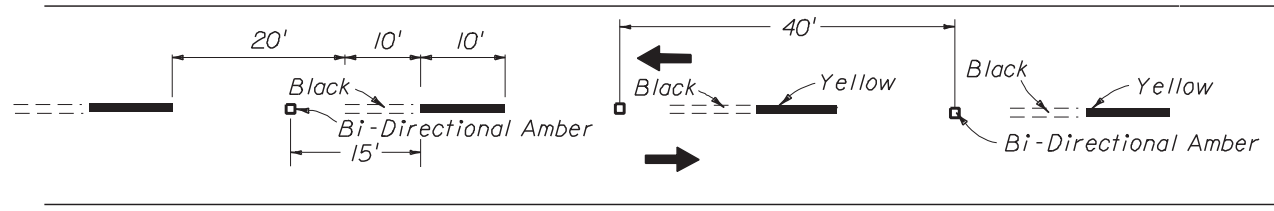
- Notes
- (1) Signs and sign structures shall be erected in accordance with the details shown on Index 9535.
 - (2) Sign FTP-19 shall be located on the Welcome Center grounds in proximity to the building and as far from the Main Line Roadway as possible (2 signs back to back)
 - (3) All legend to be Series E.

FOR PRIMARY HIGHWAYS

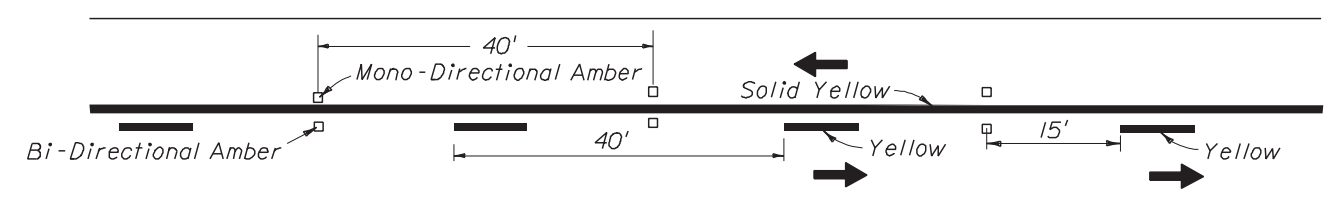
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

WELCOME CENTER SIGNING

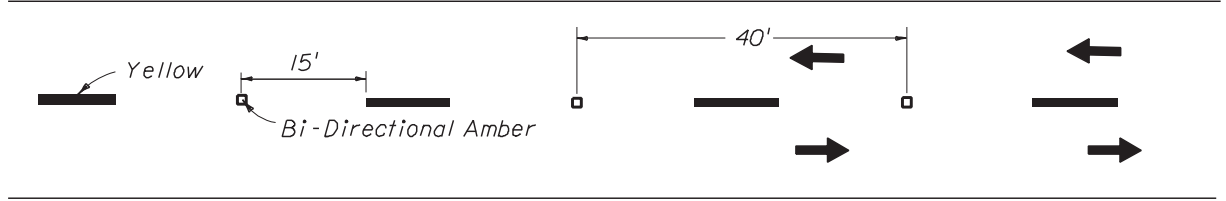
Names	Dates	Approved By		
Designed By	6-75	 State Traffic Plans Engineer		
Drawn By	6-75			
Checked By	6-75	Revision	Sheet No.	Index No.
		00	2 of 2	17351



ALTERNATING SKIP LINE



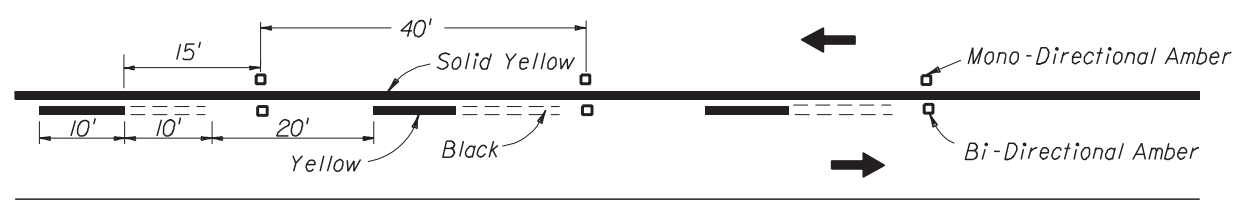
SOLID LINE WITH SKIP



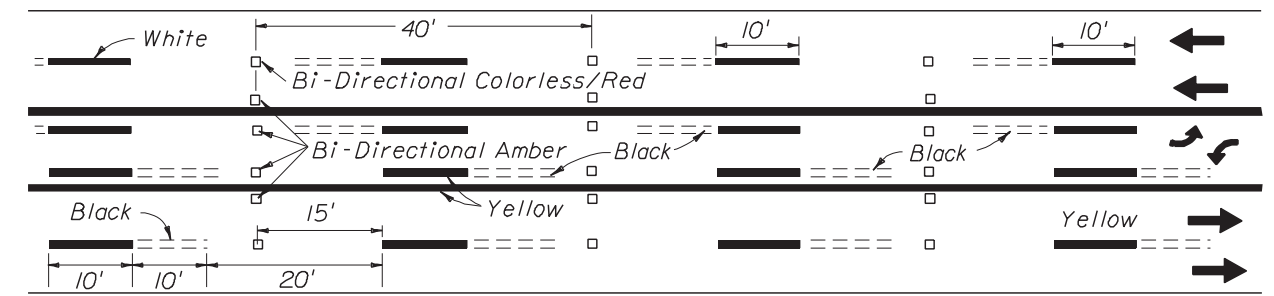
SKIP LINE



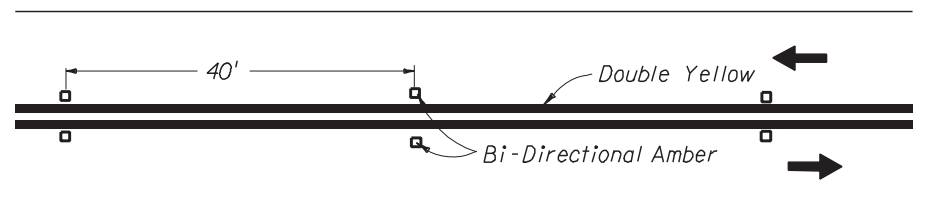
SKIP LINE WITH TWO WAY LEFT TURN LANE



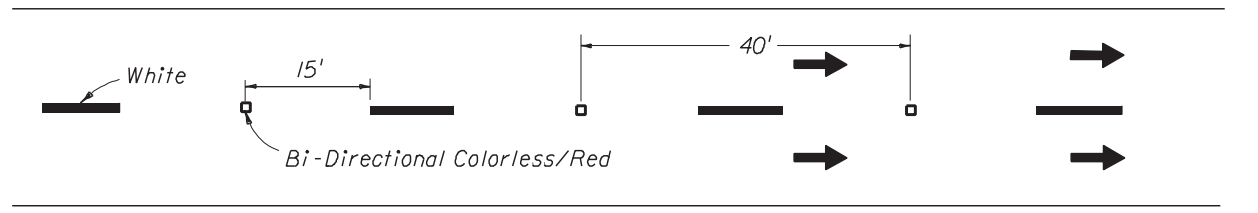
SOLID LINE WITH ALTERNATING SKIP



ALTERNATING SKIP LINE WITH TWO WAY LEFT TURN LANE



DOUBLE SOLID LINE



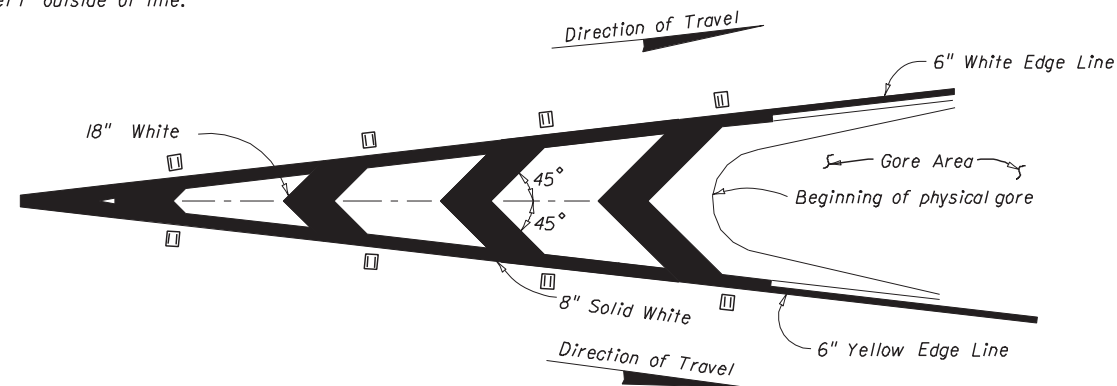
MULTI-LANE

1. Reflective Pavement Markers shall be spaced at 40' on all skip lane lines and skip center lines. This spacing may be reduced to 20' if specifically called for in the plans.
2. The spacing on solid lines and solid/skip combination lines shall be 40'.
3. All R.P.M.s shall be offset 1" from solid lines.
4. These spacings may be reduced for sharp curves if required.
5. All R.P.M.s shall be class "B".

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS				
Names	Dates	Approved By		
Designed By	10-87	<i>Charles O. Scott</i> State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	10-87	00	1 of 2	17352

NOTE

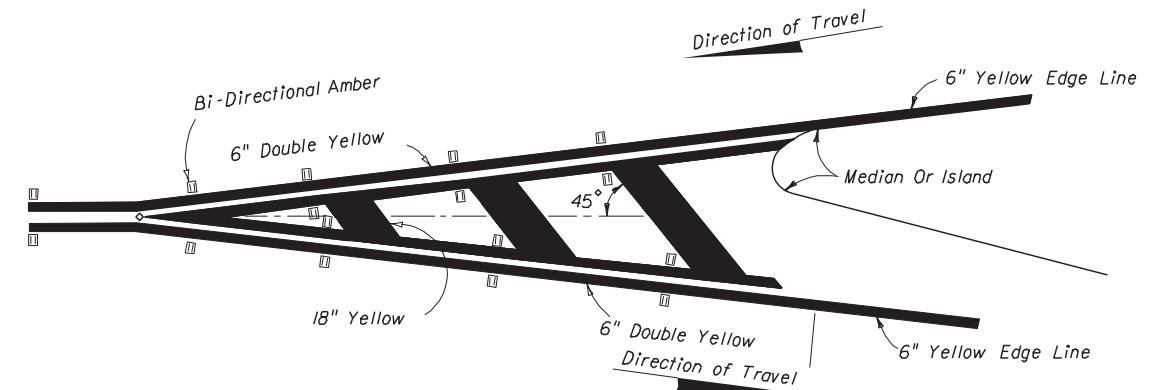
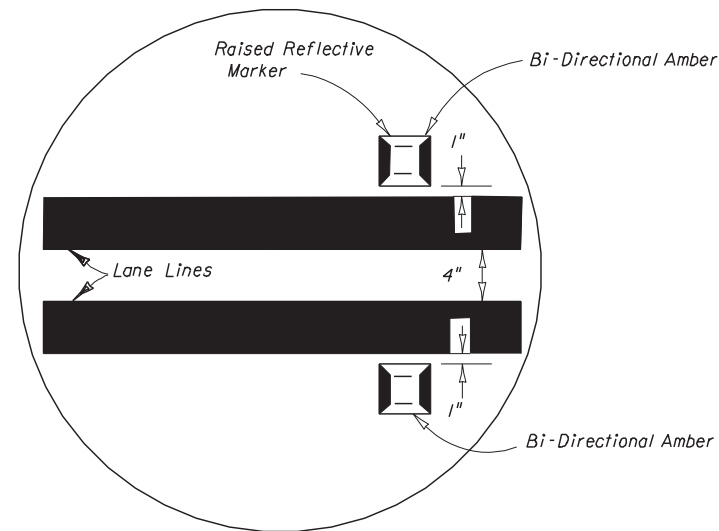
Raised pavement markers shall be set 1" outside of line.



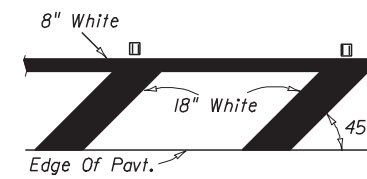
**RPM PLACEMENT FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)**

NOTE

Raised pavement markers (Bi-Directional Colorless/Red) should be used in all gores of this type



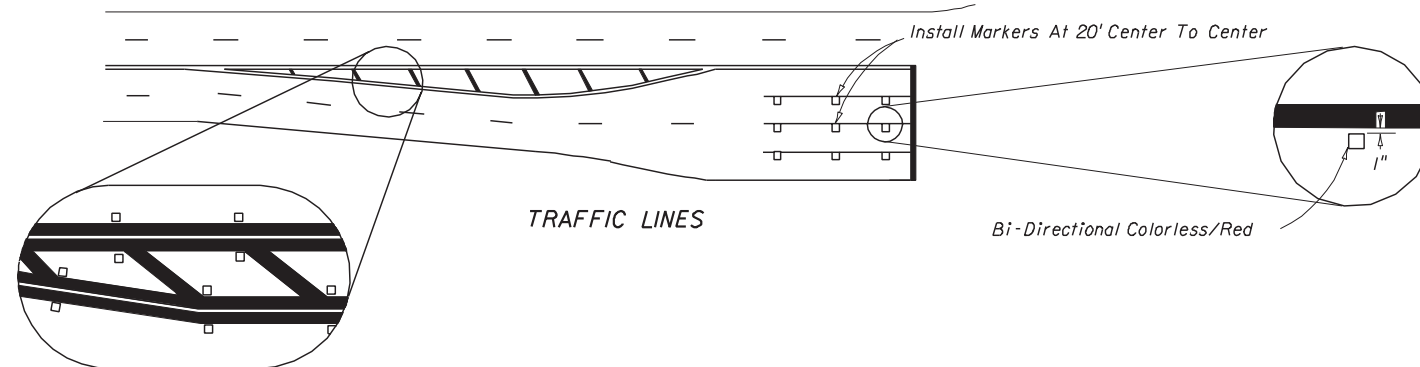
**RPM PLACEMENT FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSITE DIRECTION)**



PLACEMENT OF RPMS ON SHOULDER MARKINGS

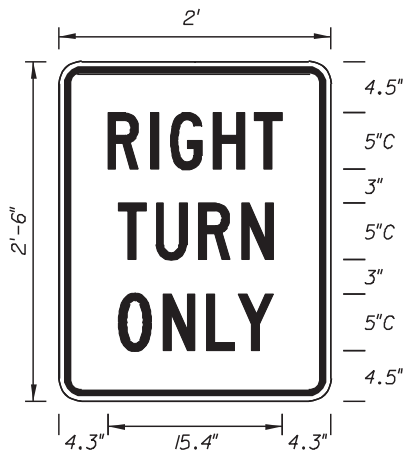
Shoulder Markings For Left Side Of Roadway Shall Be Yellow.

For Placement Of RPMS On Ramps See Index 17345.

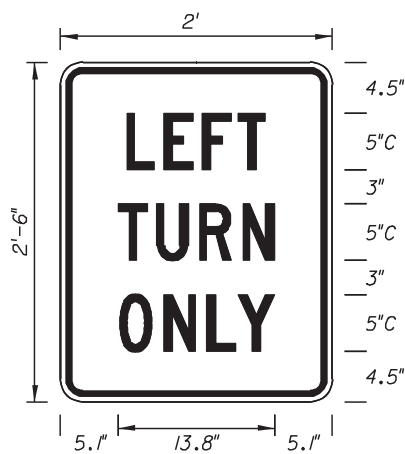


Reflective Pavt. Markers To Be Bi-Directional Amber

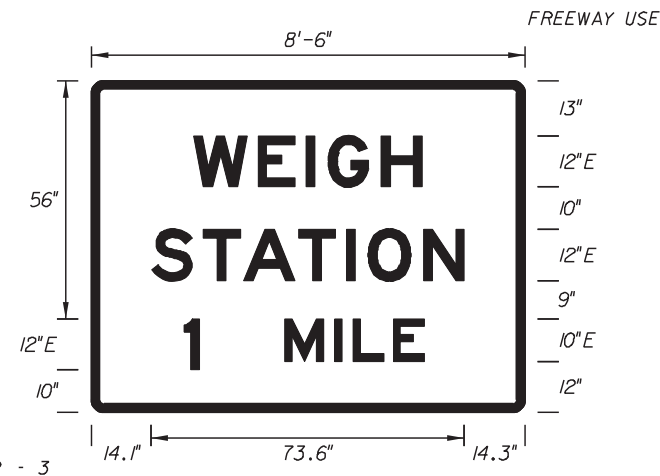
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS				
Names	Dates	Approved By		
Designed By	10-75	<i>Charles Scott</i> State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	10-75	00	2 of 2	17352



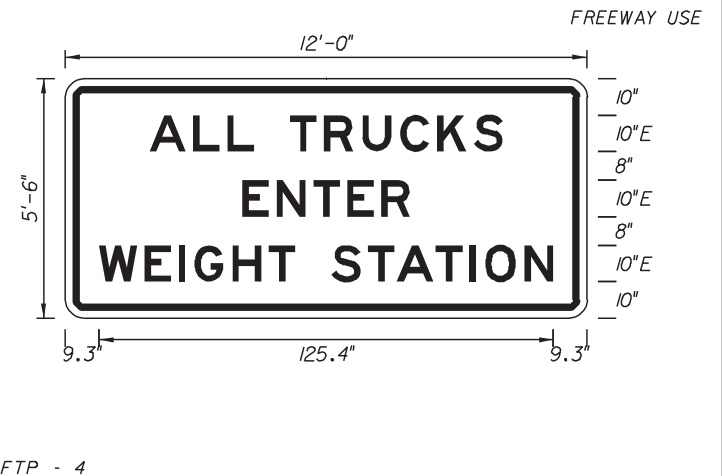
FTP - 1
2' X 2'-6"
1 1/2" Radii 3/4" Border
5" Series C Legend
White Background
Black Legend & Border



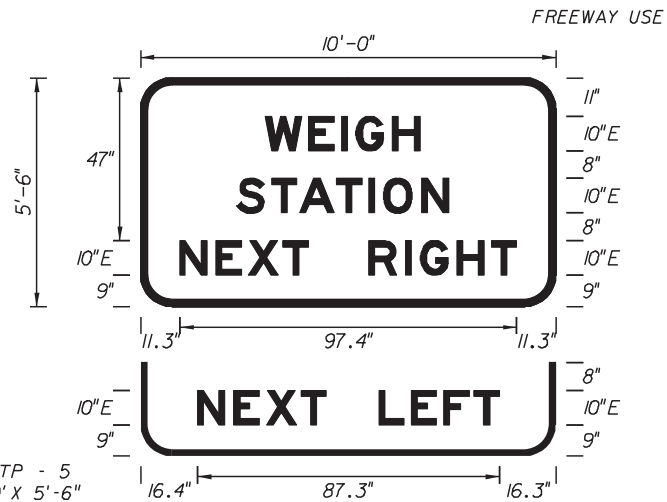
FTP - 2
2' X 2'-6"
1 1/2" Radii 3/4" Border
5" Series C Legend
White Background
Black Legend & Border



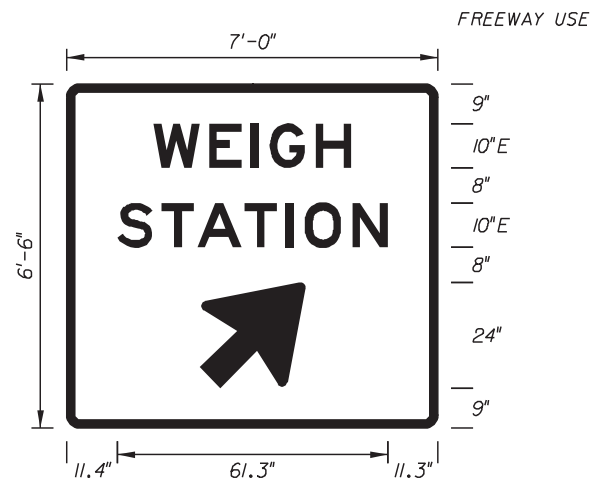
FTP - 3
8'-6" X 6'-6"
3" Radii 2" Border
Series E Legend
Green Background
White Legend & Border



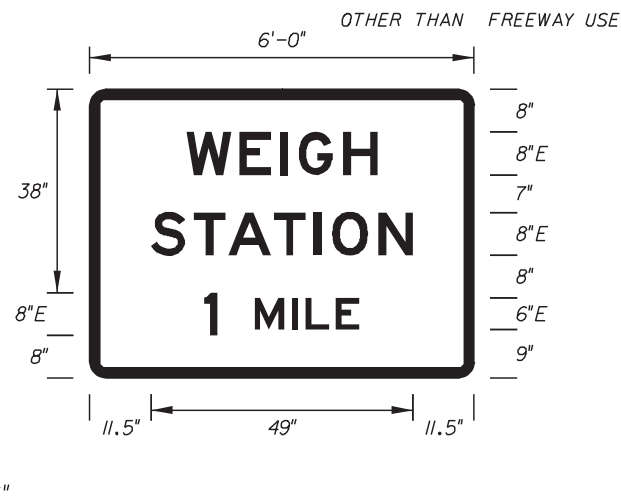
FTP - 4
12' X 5'-6"
3" Radii 2" Border
10" Series E Legend
White Background
Black Legend & Border



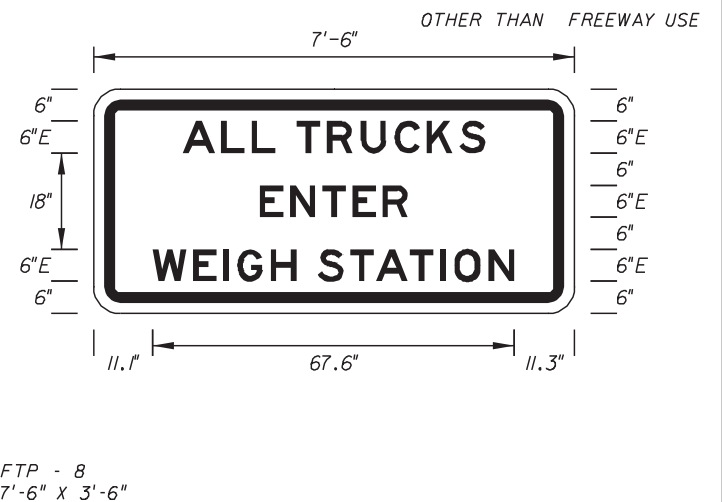
FTP - 5
10' X 5'-6"
3" Radii 2" Border
10" Series E Legend
Green Background
White Legend & Border



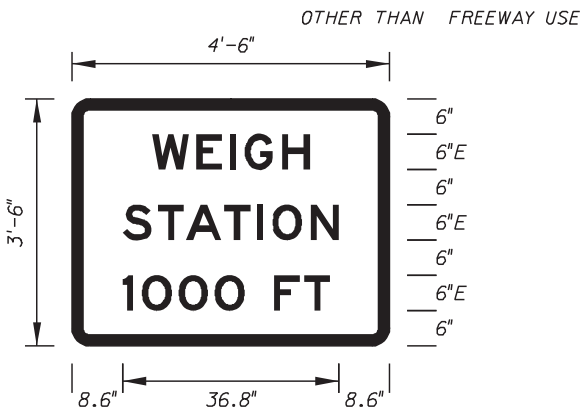
FTP - 6
7' X 6'-6"
3" Radii 2" Border
10" Series E Legend
Green Background
White Legend & Border



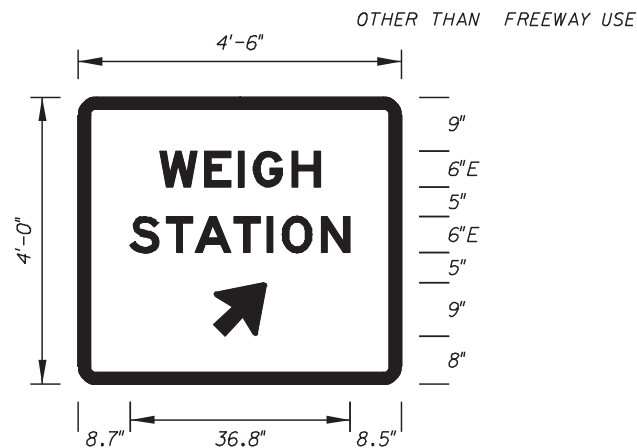
FTP - 7
6' X 4'-6"
3" Radii 2" Border
Series E Legend
Green Background
White Legend & Border



FTP - 8
7'-6" X 3'-6"
3" Radii 2" Border
6" Series E Legend
White Background
Black Legend & Border

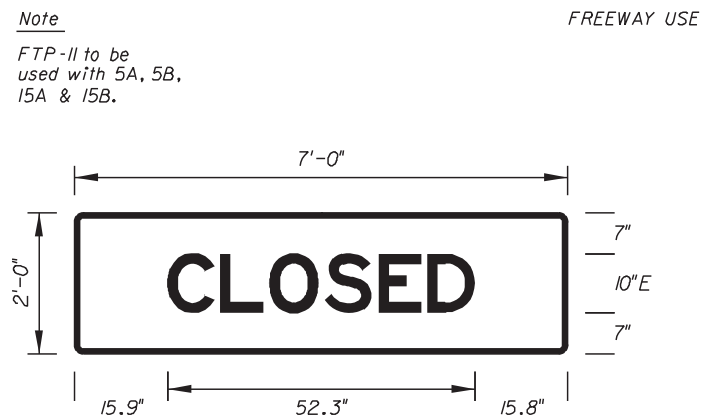


FTP - 9
4'-6" X 3'-6"
3" Radii 2" Border
6" Series E Legend
Green Background
White Legend & Border

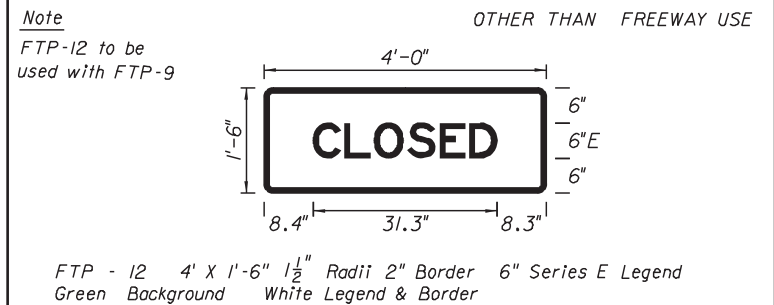


FTP - 10
4'-6" X 4'
3" Radii 2" Border
6" Series E Legend
Green Background
White Legend & Border

FTP - 10A - Right Arrow
FTP - 10B - Left Arrow



FTP - 11
7' X 2'
1 1/2" Radii 2" Border
10" Series E Legend
Green Background
White Legend & Border

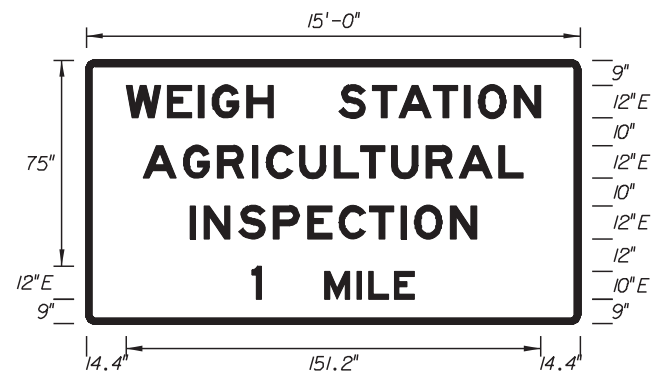


FTP - 12 4' X 1'-6" 1 1/2" Radii 2" Border 6" Series E Legend
Green Background White Legend & Border

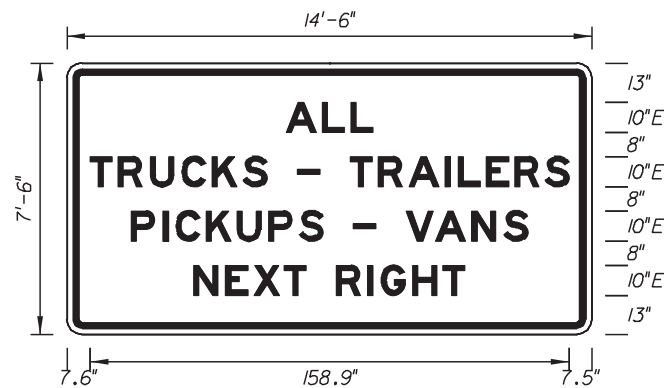
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SPECIAL SIGN DETAILS

Names	Dates	Approved By
Designed By		 State Traffic Plans Engineer
Drawn By		
Checked By		
Revision	00	Sheet No. 1 of 12
		Index No. 17355



FTP - 13
15' X 8'
3" Radii 2" Border
Series E Legend
Green Background
White Legend & Border

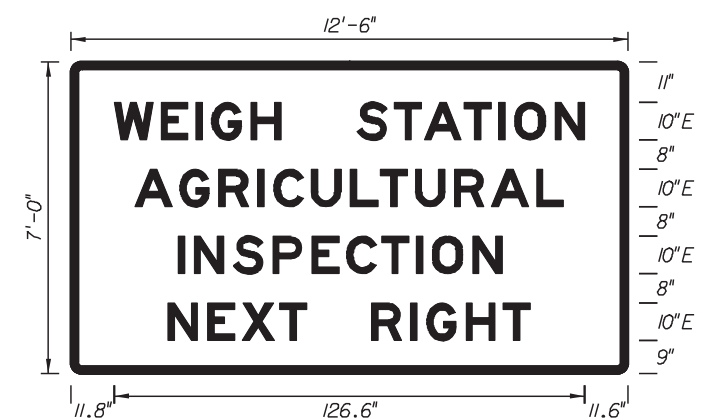


FTP - 14A
14'-6" X 7'-6"
3" Radii 2" Border
10" Series E Legend
White Background
Black Legend & Border

On Interstate Station
Delete, Pickups-Vans,
and reduce Sign height
accordingly.



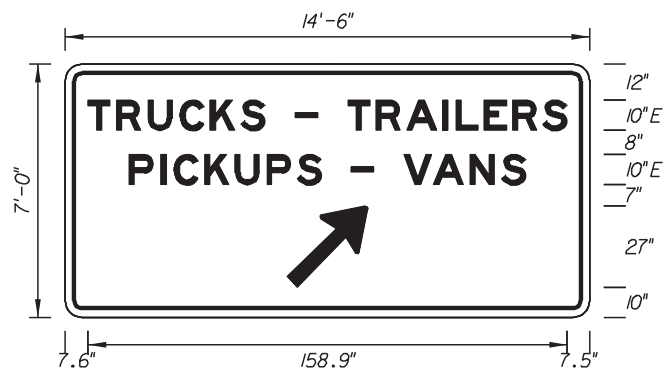
FTP - 14B
14'-6" X 7'-6"
3" Radii 2" Border
10" Series E Legend
White Background
Black Legend & Border



FTP - 15A
12'-6" X 7'
3" Radii 2" Border
10" Series E Legend
Green Background
White Legend & Border

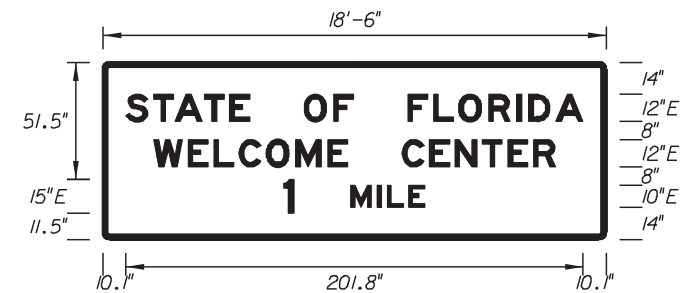


FTP - 15B
12'-6" X 7'
3" Radii 2" Border
Series E Legend
Green Background
White Legend & Border

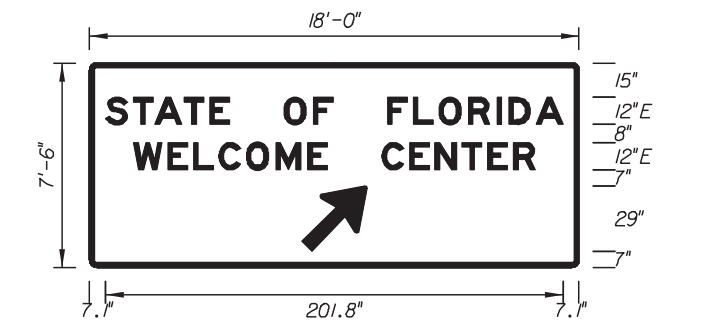


FTP - 16
14'-6" X 7'
3" Radii 2" Border
Series E Legend
Green Background
White Legend & Border

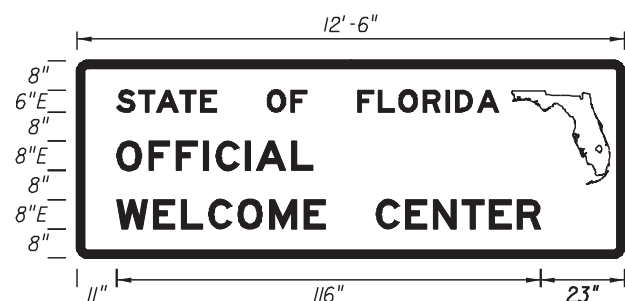
FTP - 16A - RIGHT ARROW
FTP - 16B - LEFT ARROW



FTP - 17
18'-6" X 6'-6"
3" Radii 2" Border
Series E Legend
Blue Background
White Legend & Border



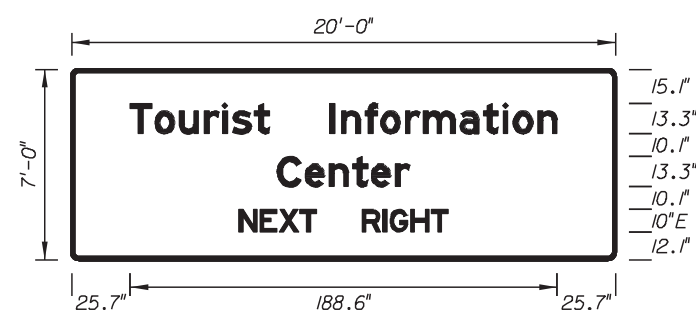
FTP - 18
18' X 7'-6"
3" Radii 2" Border
Series E Legend
Blue Background
White Legend & Border



FTP - 19
12'-6" X 4'-6"
3" Radii 2" Border
Series E Legend
Blue Background
White Legend & Border

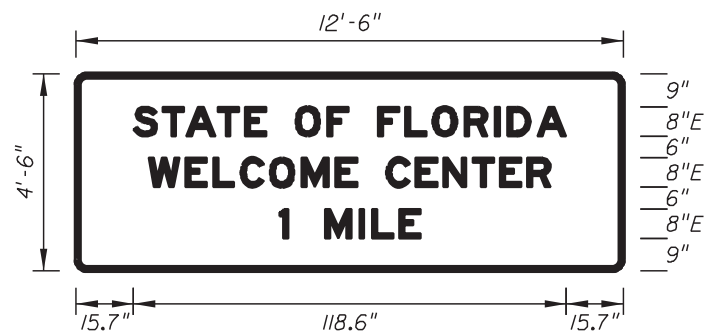


FTP - 20
6'-6" X 5'-6"
3" Radii 2" Border
Series E Legend
Blue Background
White Legend & Border

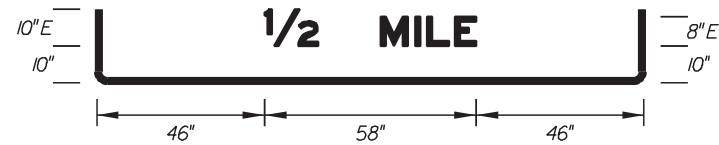


FTP - 21
20' X 7'
3" Radii 2" Border
Blue Background
White Legend & Border

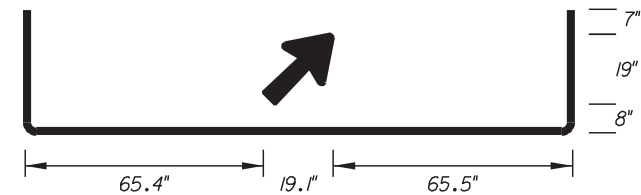
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
SPECIAL SIGN DETAILS				
	Names	Dates	Approved By	
Designed By			_____ State Traffic Plans Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			00	2 of 12 17355



FTP - 22A
12'-6" X 4'-6"
3" Radii 2" Border
8" Series E Legend
Blue Background
White Legend & Border



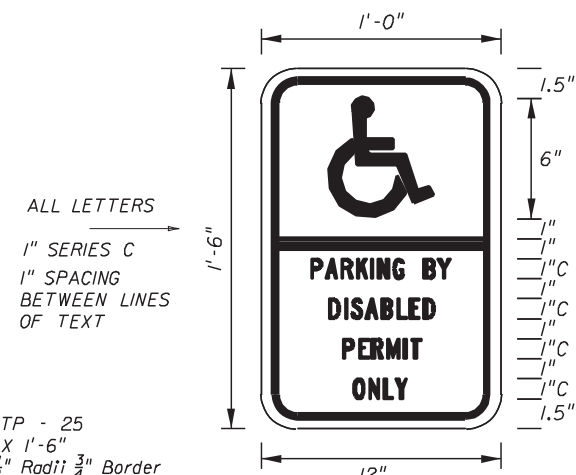
FTP - 22B
12'-6" X 5"
3" Radii 2" Border
8" Series E Legend
Blue Background
White Legend & Border



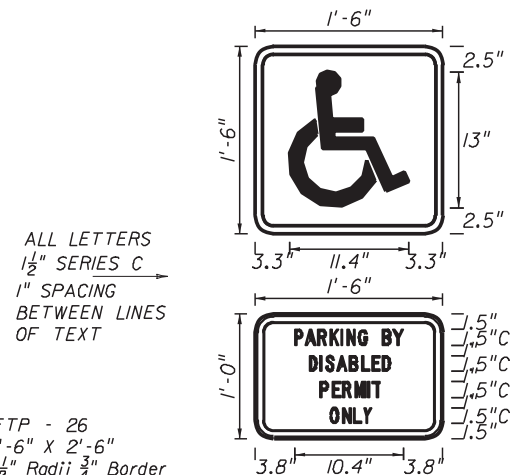
FTP - 23
12'-6" X 5'-6"
3" Radii 2" Border
Blue Background
White Legend & Border



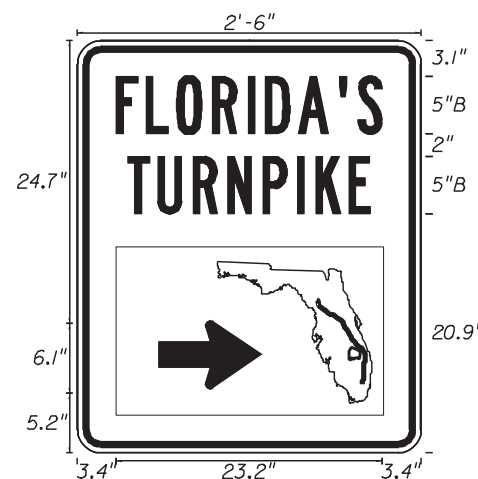
FTP - 24
1' X 1'-6"
1 1/2" Radii 3/4" Border
White Background
Green Legend & Border



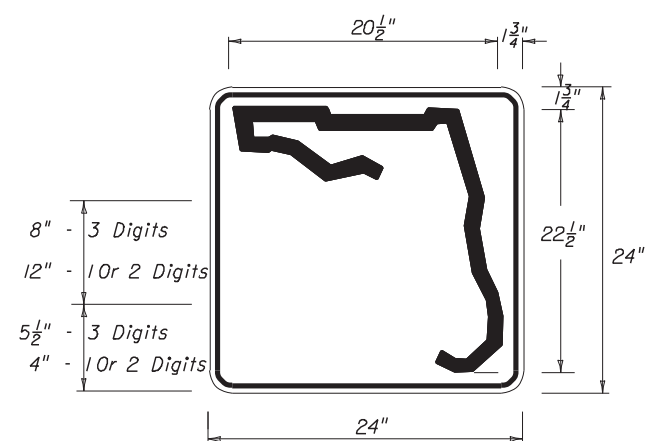
FTP - 25
1' X 1'-6"
1 1/2" Radii 3/4" Border
1" Series C Legend
Color Top Bottom
Background Blue White
Legend and Border White Black



FTP - 26
1'-6" X 2'-6"
1 1/2" Radii 3/4" Border
1 1/2" Series C Legend
Color Top Bottom
Background Blue White
Legend and Border White Black



FTP - 27
1'-6" X 3'
1 1/2" Radii 3/4" Border
Green Background
White Legend & Border



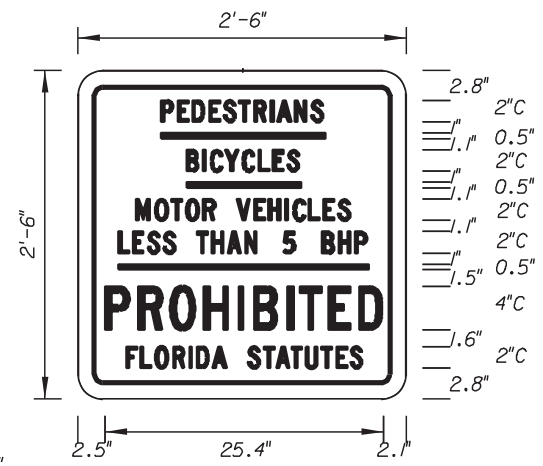
FTP - 28
2' X 2'
3/8" Radii 1 1/2" Border
White Background
Black Legend & Border

See Sheet 4 For Additional Details



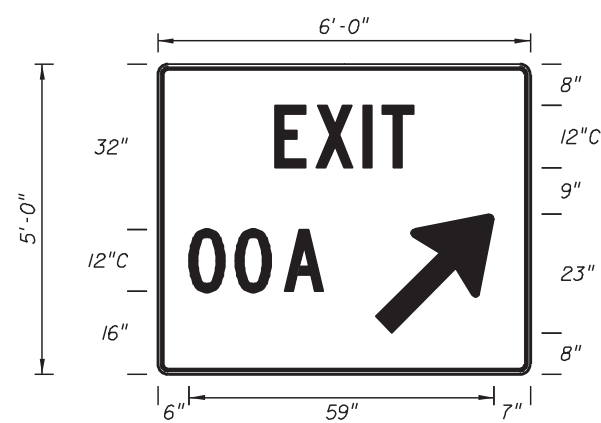
FTP - 29
Blue Background
Yellow Legend & Border

SEE SHEET 4 FOR DETAILS.

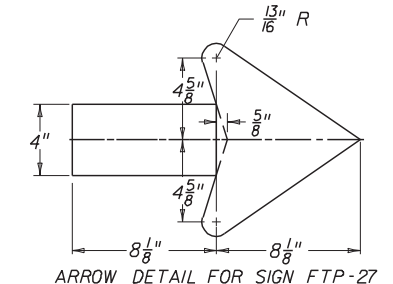


* 2" Series C
** 4" Series C

FTP - 30
2'-6" X 2'-6"
1 1/2" Radii 3/4" Border
White Background
Black Legend & Border



FTP - 31
6' X 5'
3" Radii 2" Border
Series C Legend
Green Background
White Legend & Border

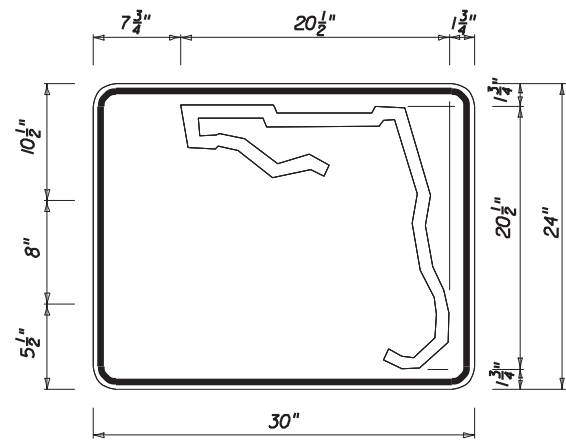


ARROW DETAIL FOR SIGN FTP-27

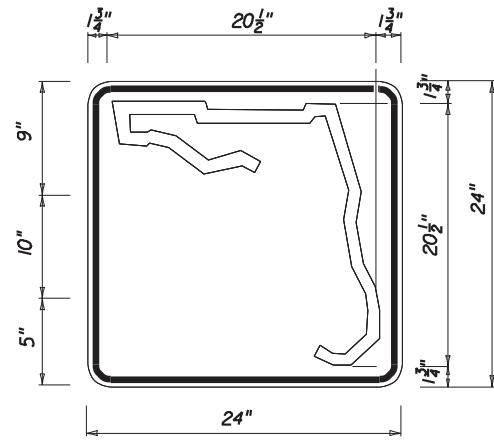
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SPECIAL SIGN DETAILS

Names		Dates		Approved By	
Designed By				Clark A. Scott State Traffic Plans Engineer	
Drawn By		Revision	Sheet No.	Index No.	
Checked By		00	3 of 12	17355	



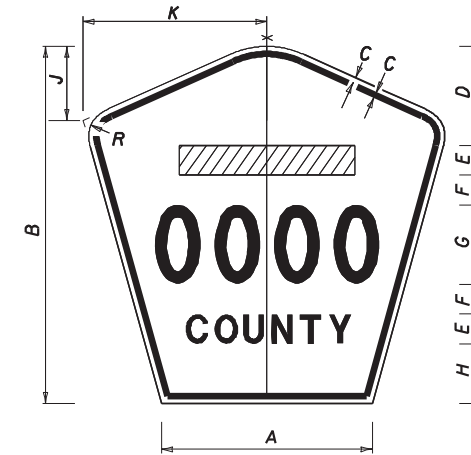
3 or 4 DIGITS



1 or 2 DIGITS

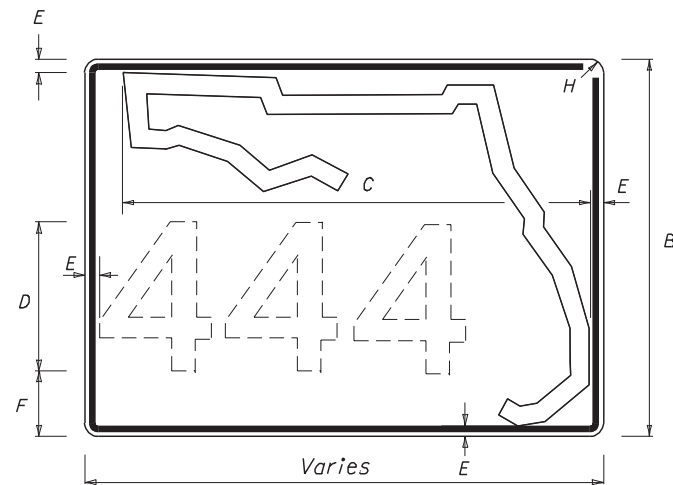
NUMERAL SIZE

DIGITS	NUMERAL SIZE (mm)	SERIES	PANEL SIZE (mm)
1-2	10"	D	24" x 24"
3	8"	C	24" x 30"
4	8"	C	24" x 30"

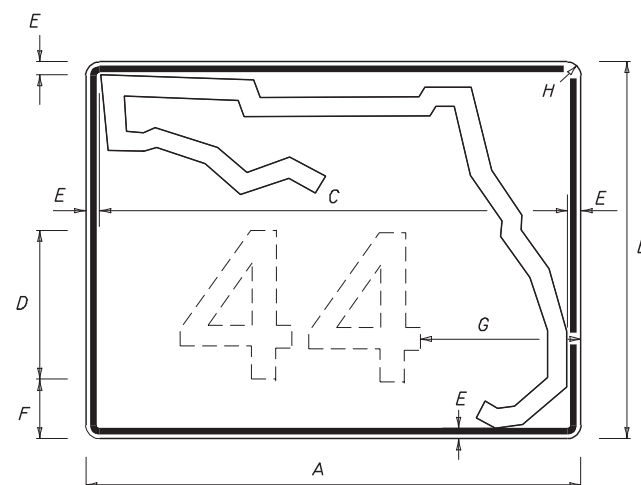


- Notes :
- All Legend Series "D".
 - Color: Yellow Legend and Border on Blue Background.
 - When used on a guide sign, marker must be overlaid on a rectangular Yellow Background as shown in chart. **

INDEPENDENT USE OTHER THAN FREEWAY



3 OR MORE DIGITS



1 OR 2 DIGITS

A	B	C	D	E	F	G	H
30"	24"	26"	12"	1 1/4"	2 3/4"	8 1/4"	1 1/4"
36"	30"	32"	15"	1 1/4"	3 1/4"	8 3/4"	1 1/4"
42"	36"	38"	15"	1 1/4"	6 1/4"	11"	1 1/4"

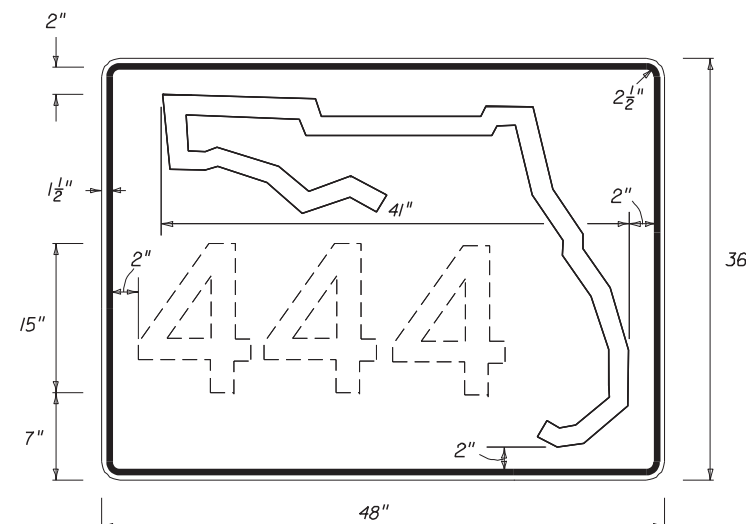
GUIDE SIGN USE

- Notes: 1. Florida marker shall have Black Legend with White Background.
 2. Stroke width of State outline to be 1" for independent use and 1/4" for Guide Sign.
 3. Numbers are series D.

FLORIDA ROUTE MARKER
FTP - 28

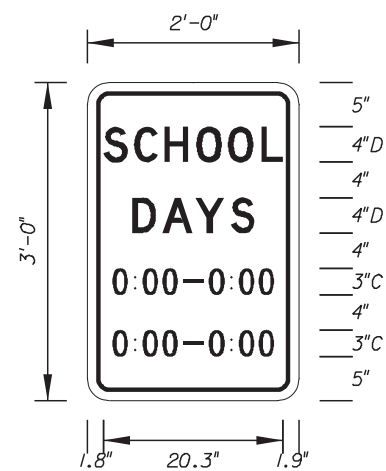
SIGN	DIMENSIONS												**
	A	B	C	D	E	F	G	H	J	K	R	S	
1 & 2 DIGIT POST MOUNTED	14 3/16"	24"	1/2"	5"	2"	2"	8"	3"	5 5/8"	12 3/8"	1 1/4"	5 5/16"	
3 DIGIT POST MOUNTED	17 3/4"	30"	1/2"	7 1/4"	2 1/2"	2 1/2"	8"	4 3/4"	6 1/2"	15 1/2"	1 1/4"	6 5/8"	
4 DIGIT POST MOUNTED	21 1/4"	36"	1/2"	8"	3"	3"	8"	8"	7 1/2"	18 1/2"	1 3/8"	7 1/2"	
2 DIGIT OVERHEAD	21 1/4"	36"	3/4"	8"	3"	3"	12"	4"	7 1/2"	18 1/2"	1 3/8"	7 1/2"	*** 40" x 41"
3 DIGIT OVERHEAD	29 1/4"	36"	3/4"	8"	3"	3"	12"	4"	8"	21 3/8"	2 1/4"	8 1/4"	*** 40" x 44"
4 DIGIT OVERHEAD	36 3/4"	42"	3/4"	11"	3"	3"	12"	7"	10 1/2"	26"	2 1/4"	8 1/2"	*** 42" x 52"

COUNTY ROUTE MARKER DETAIL
FTP - 29

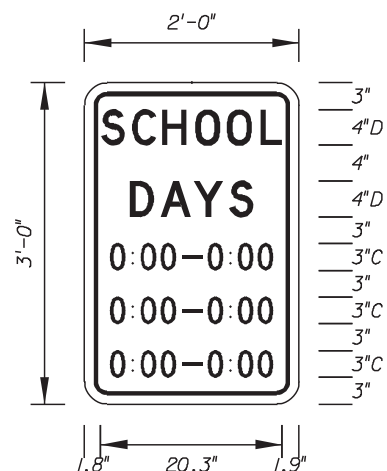


1-3 DIGITS 375 SERIES C
4 DIGITS 300 SERIES C
INDEPENDENT USE FOR FREEWAY

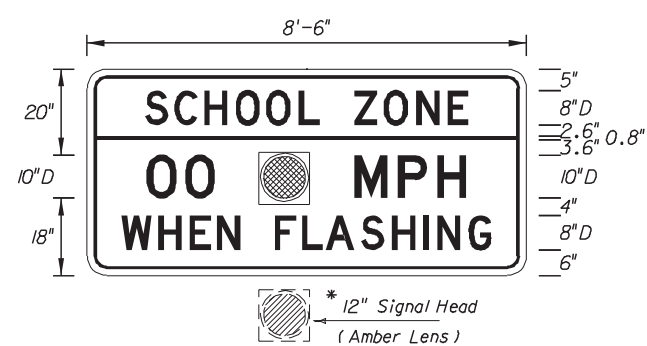
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
SPECIAL SIGN DETAILS				
Names	Dates	Approved By		
Designed By		 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	4 of 12	17355



FTP - 32
2' X 3'
1/2" Radii 3/4" Border
White Background
Black Legend & Border

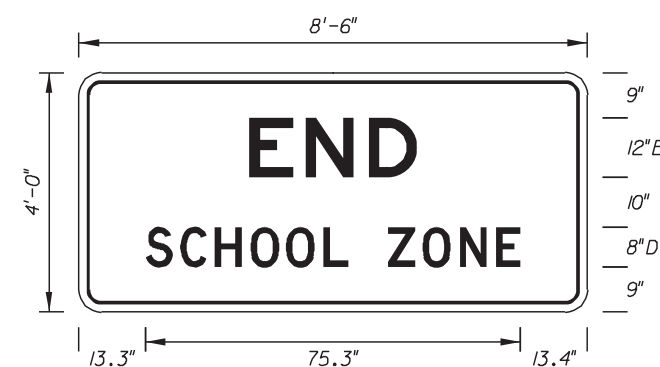


FTP - 32A
2' X 3'
1/2" Radii 3/4" Border
White Background
Black Legend & Border

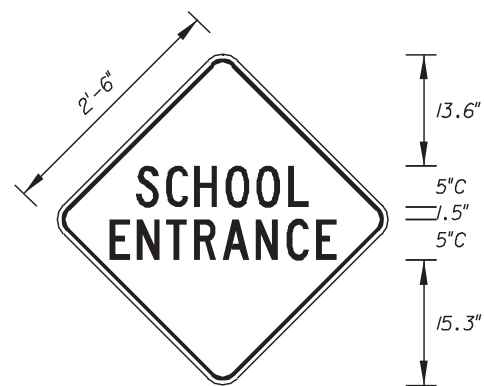


FTP - 33
8'-6" X 4'
3" Radii 2" Border
Series D Legend
Yellow Background Top White Background Bottom
Black Legend & Border

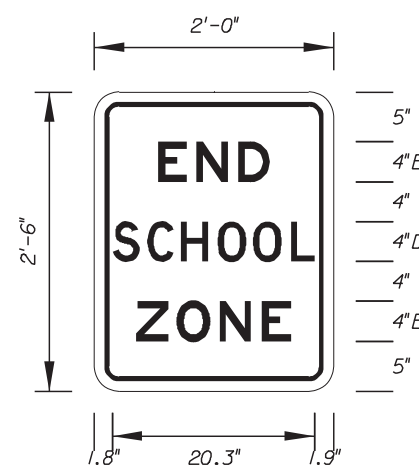
* Note:
Flashing beacon may
be placed within or
below panel.



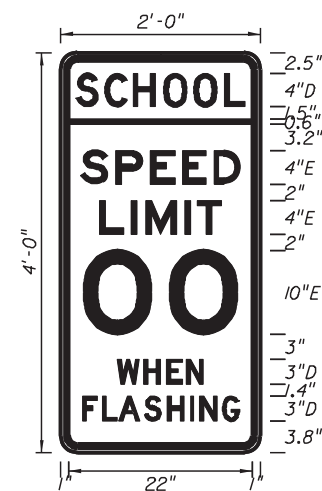
FTP - 34
8'-6" X 4'
3" Radii 3/4" Border
White Background
Black Legend & Border



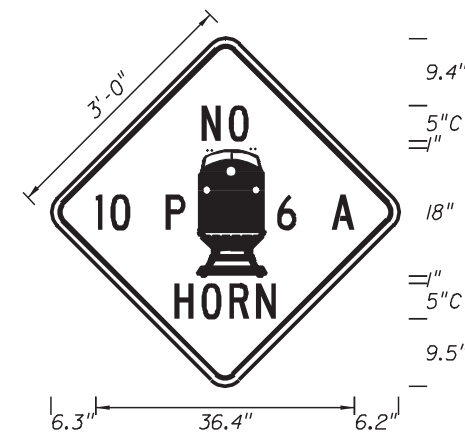
FTP - 35
2'-6" X 2'-6"
5" Series C Legend
2" Radii 3/4" Border
Yellow Background
Black Legend & Border



FTP - 36
2' X 2'-6"
4" Series D and E Legend
1/2" Radii 3/4" Border
White Background
Black Legend & Border



FTP - 37
2' X 4'
1/2" Radii 3/4" Border
Top Background Yellow Bottom Background White
Black Legend & Border Top and Bottom



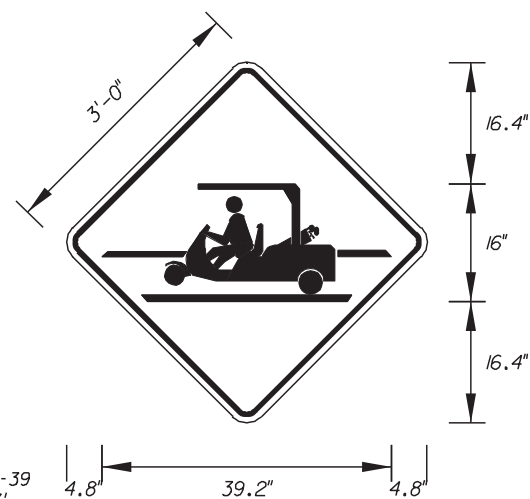
FTP - 38
3' X 3'
2" Radii 3/4" Border
5" Series C Legend
Yellow Background
Black Legend & Border



FTP - 38A
3' X 2'
Series C Legend
2" Radii 3/4" Border
Yellow Background
Black Legend & Border



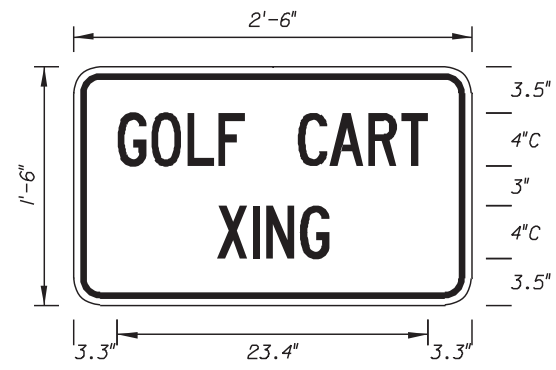
FTP - 38B
3' X 3'
Series C Legend
2" Radii 3/4" Border
Yellow Background
Black Legend & Border



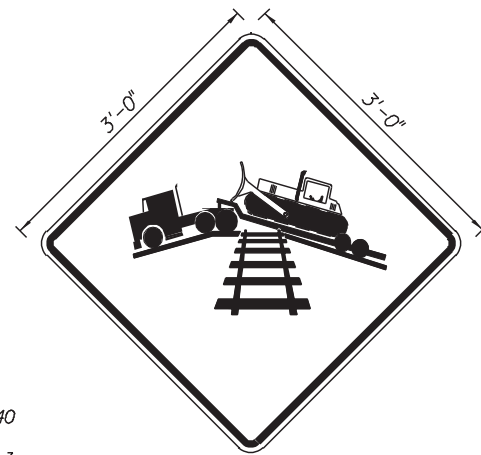
FTP - 39
3' X 3'
2" Radii 3/4" Border
Yellow Background
Black Legend & Border

Remove the two crosswalk
stripes for advance warning sign.

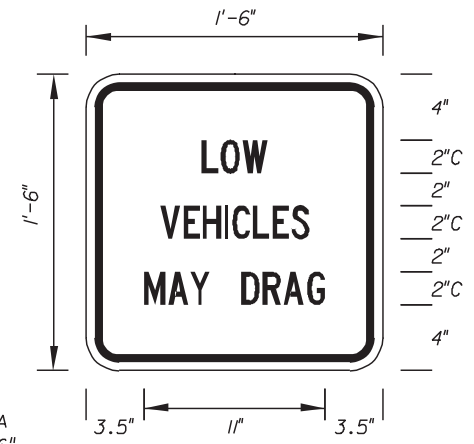
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
SPECIAL SIGN DETAILS				
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Designed By		 State Traffic Plans Engineer		
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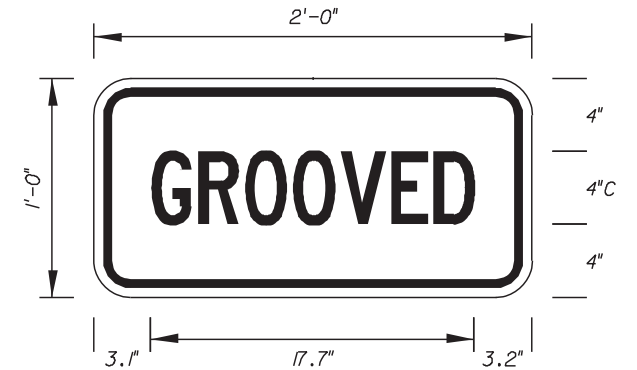
FTP - 39A
2'-6" X 1'-6"
1/2" Radii 3/4" Border
4" Series C Legend
Yellow Background
Black Legend & Border



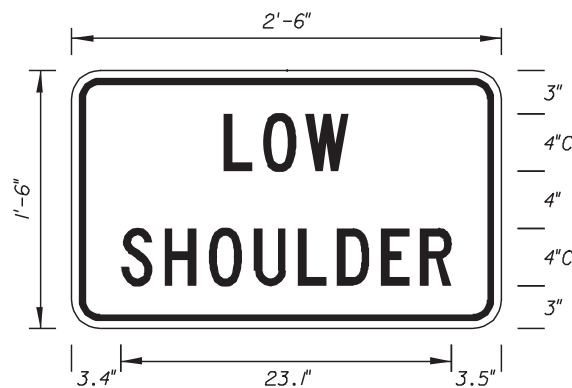
FTP - 40
3' X 3'
2" Radii 3/4" Border
Yellow Background
Black Legend & Border



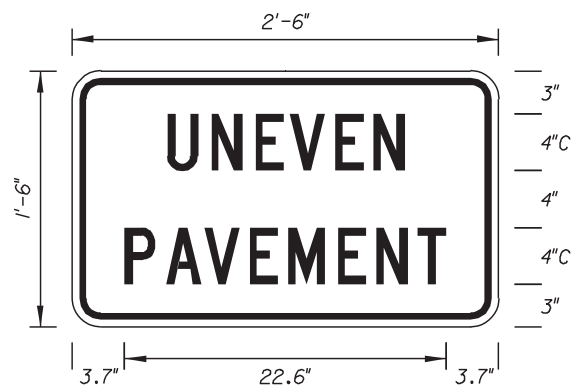
FTP - 40A
1'-6" X 1'-6"
1/2" Radii 3/4" Border
2" Series C Legend
Yellow Background
Black Legend & Border



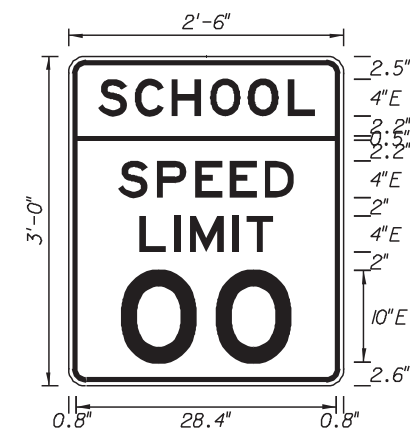
FTP - 41
2' X 1'
1/2" Radii 3/4" Border
4" Series C Legend
Yellow Background
Black Legend & Border



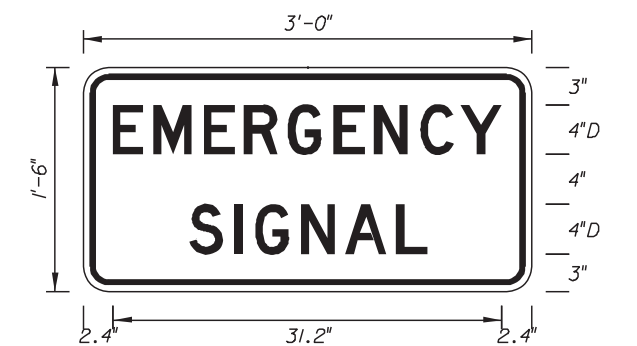
FTP - 42
2'-6" X 1'-6"
1/2" Radii 3/4" Border
4" Series C Legend
Yellow Background
Black Legend & Border



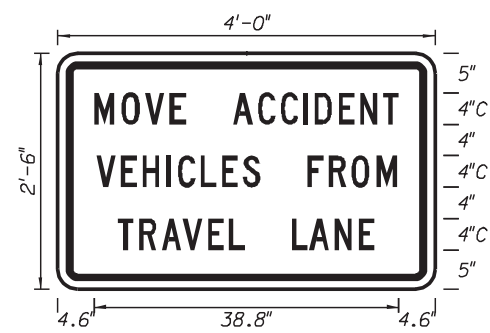
FTP - 43
2'-6" X 1'-6"
1/2" Radii 3/4" Border
4" Series C Legend
Yellow Background
Black Legend & Border



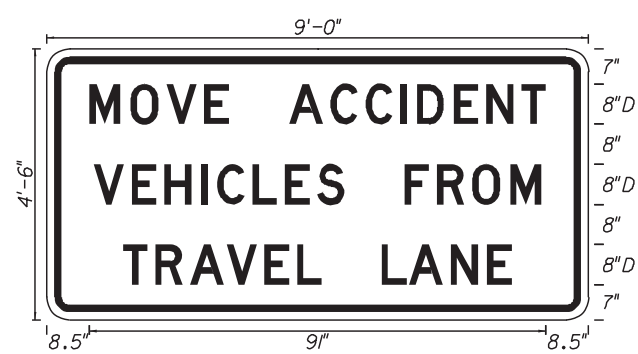
FTP - 44
2'-6" X 3'
1/2" Radii 3/4" Border
Series E Legend
Yellow Background Top White Background Bottom
Black Legend & Border



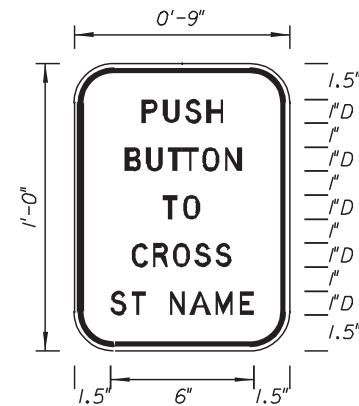
FTP - 45
3' X 1'-6"
1/2" Radii 3/4" Border
4" Series D Legend
Yellow Background
Black Legend & Border



FTP - 46
4' X 2'-6"
2" Radii 3/4" Border
4" Series C Legend
White Background
Black Legend & Border

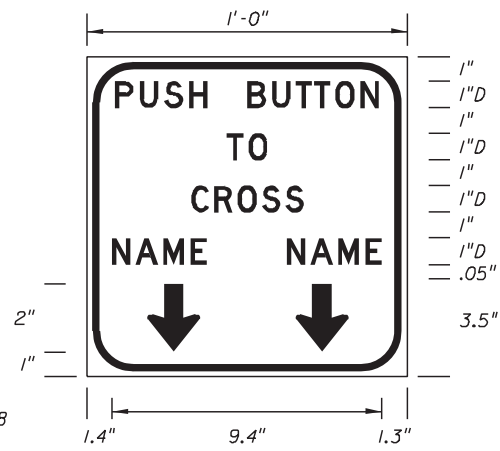


FTP - 46A
9' X 4'-6"
3" Radii 3/4" Border
8" Series D Legend
White Background
Black Legend & Border

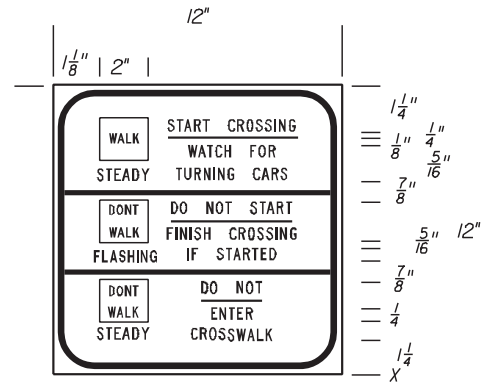


FTP - 47
9" X 12"
1/2" Radii 3/4" Border
1" Series D Legend
White Background
Black Legend & Border

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
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Designed By		<i>Clark O. Scott</i> State Traffic Plans Engineer		
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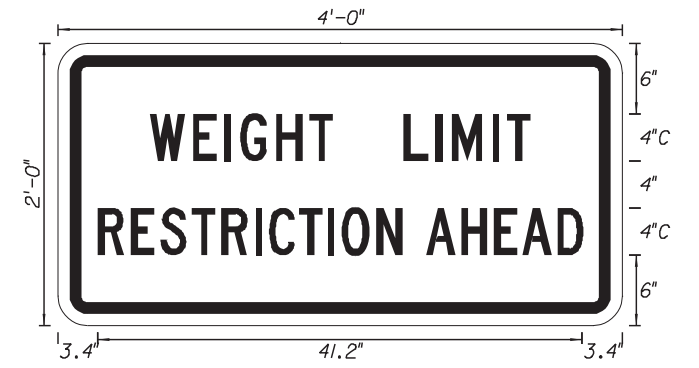
FTP - 48
1' X 1'
1/2" Radii 3/4" Border
1" Series D Legend
White Background
Black Legend & Border



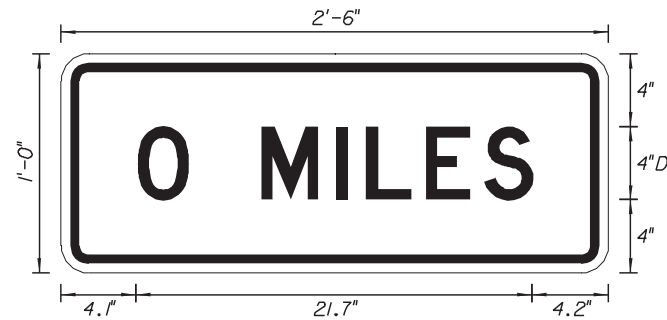
FTP - 49
1' X 1'
1/2" Radii 3/4" Border
Series C Legend
White Background
Black Legend & Border

Notes for FTP 49:

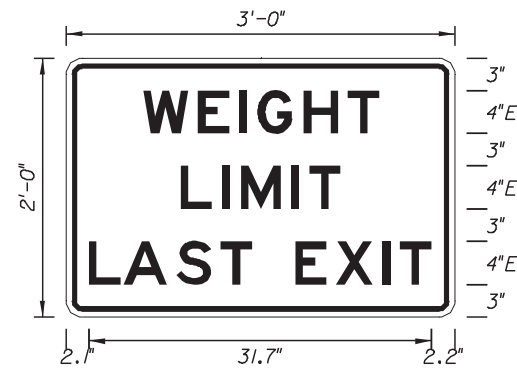
1. Text for FTP 49 shall be 1/2" except (WALK) and (DONT WALK) which will be 7/16".
2. Spacing between lines of legend shall be 5/16" except as noted.
3. Underbar spacing as detailed.
4. Colors shall be White background with Black legend and border
Walk Plaque - White legend on Black background
Dont Walk Plaque - Orange legend on Black background
The international symbol may be used for walk and don't walk



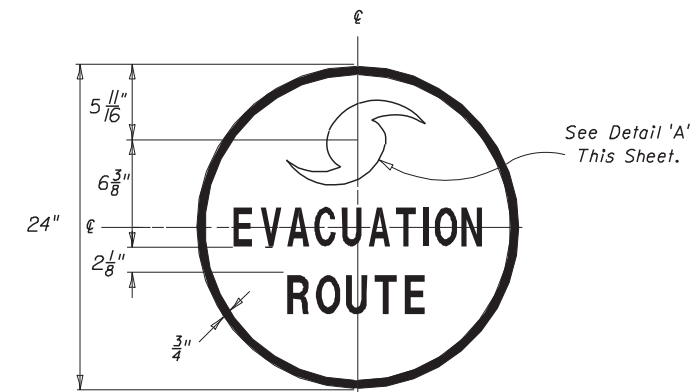
FTP - 50
5' X 2'
1/2" Radii 3/4" Border
4" Series C
Yellow Background
Black Legend & Border



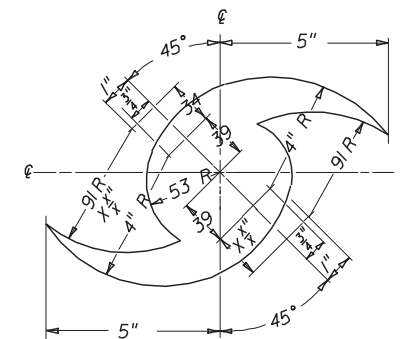
FTP - 51
3' X 1'
1/2" Radii 3/4" Border
4" Series D
White Background
Black Legend & Border



FTP - 52
3' X 2'
1/2" Radii 3/4" Border
4" Series E
White Background
Black Legend & Border

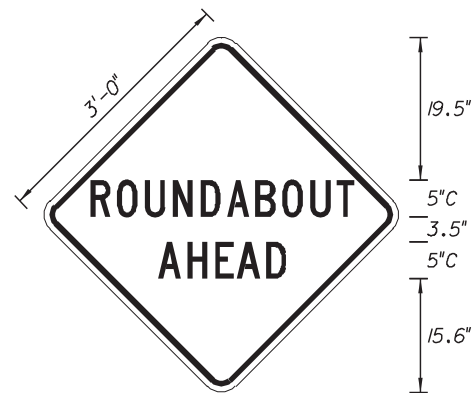


FTP - 53
2' Diameter
3" Border
3" Series C
Blue Background
White Legend, Border & Symbol

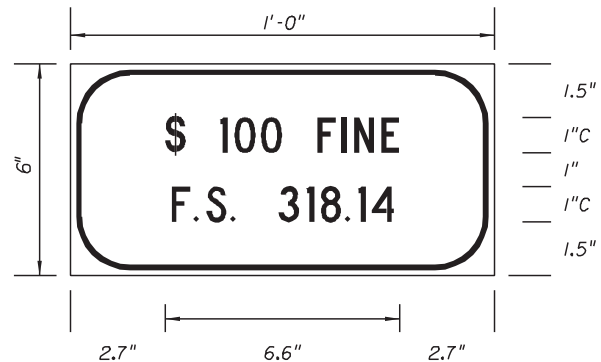


DETAIL 'A' for FTP - 53

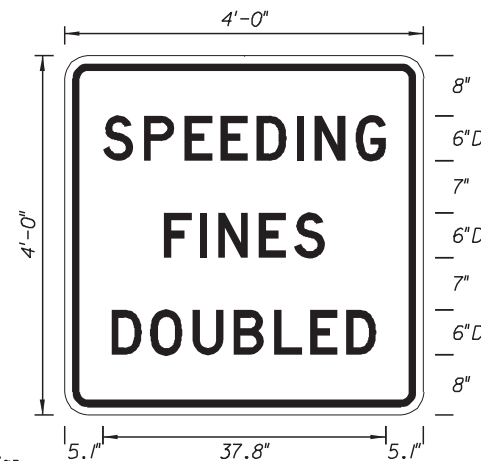
Symbol



FTP - 54
3' X 3'
2" Radii 3/4" Border
5" Series D
Yellow Background
Black Legend & Border



FTP - 55
1' X 6"
1/2" Radii 3/4" Border
1" Series C
White Background
Black Legend & Border
Supplemental panel for the FTP-25 and FTP-26 signs

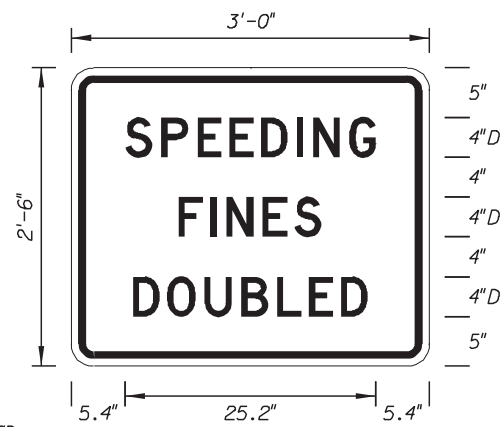


FTP - 56
Freeway Sign
4' X 4'
3" Radii 3/4" Border
6" Series D
White Background
Black Legend & Border

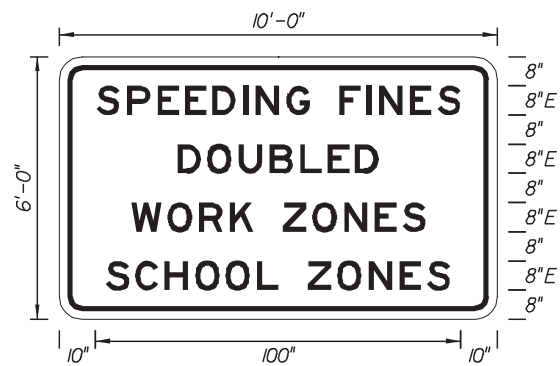
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
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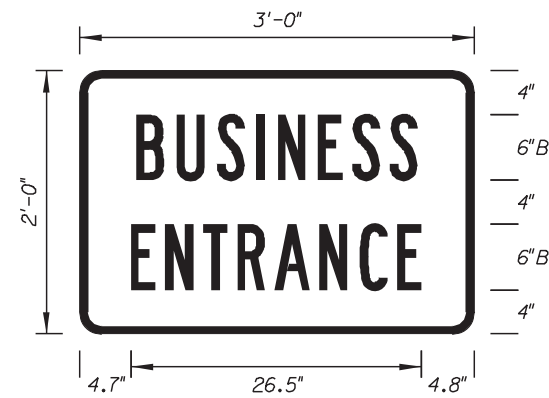
Names	Dates	Approved By
Designed By		<i>Clark A. Scott</i> State Traffic Plans Engineer
Drawn By		Revision
Checked By		Sheet No. 7 of 12
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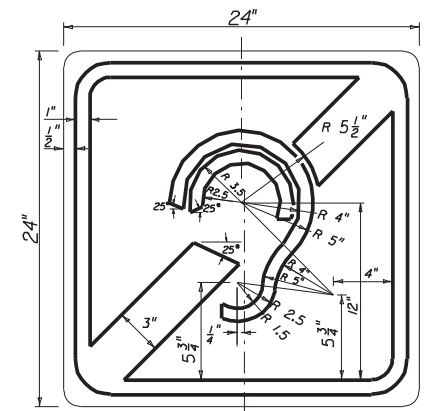
FTP - 57
Arterial Sign
3' X 2'-6"
2" Radii $\frac{3}{4}$ " Border
4" Series D
White Background
Black Legend & Border



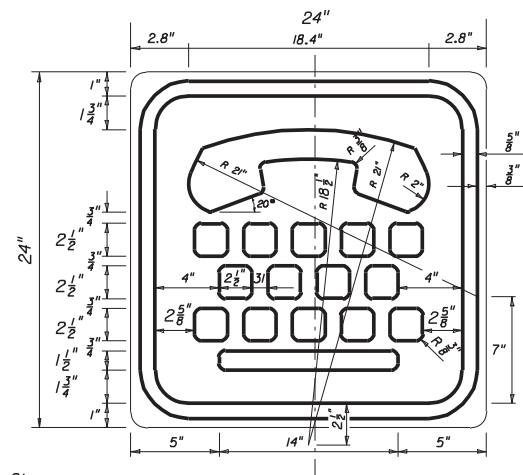
FTP - 58
State Line Sign
10' X 6'
3" Radii 2" Border
8" Series E
White Background
Black Legend & Border



FTP - 59
3' X 2'
 $\frac{1}{2}$ " Radii $\frac{3}{4}$ " Border
6" Series B
Blue Background
White Legend & Border

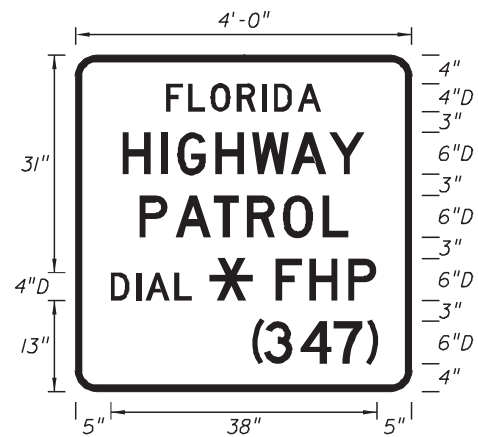


FTP - 60 INTERNATIONAL SYMBOL OF ACCESS FOR HEARING LOSS
24" X 24"
 $\frac{1}{2}$ " Radii $\frac{3}{4}$ " Border
Blue Background
White Legend & Border



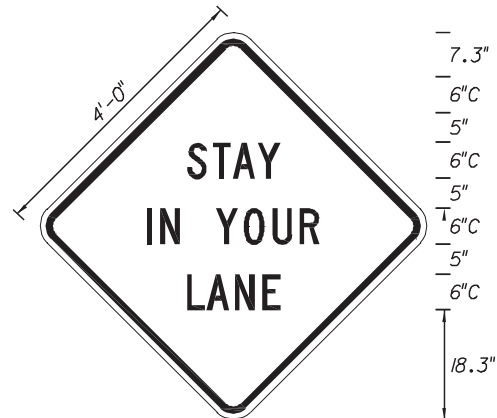
FTP - 61
2' X 2'
 $\frac{1}{2}$ " Radii $\frac{3}{4}$ " Border
Blue Background
White Legend & Border

INTERNATIONAL TDD SYMBOL

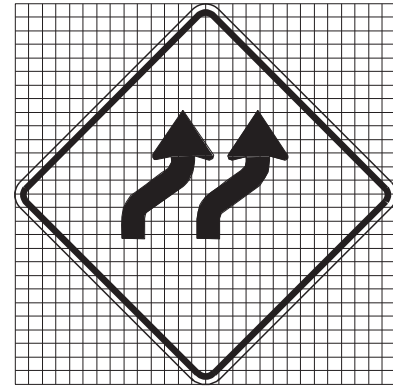


FTP - 62
4' X 4'
3" Radii 1" Border
Series D
Blue Background
White Legend & Border

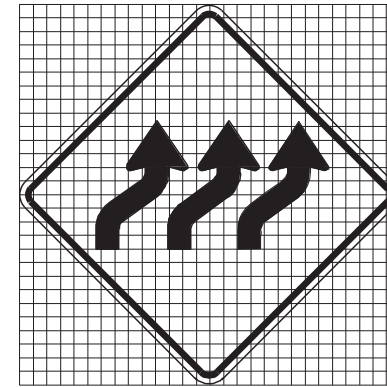
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
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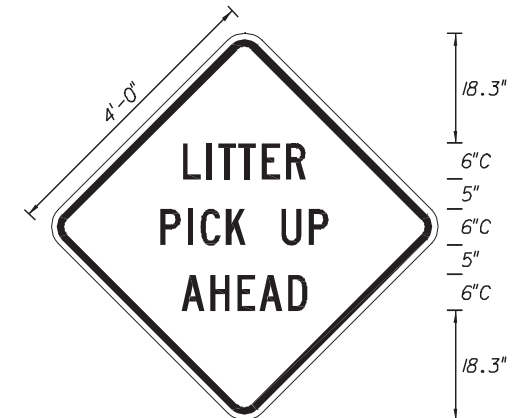
MOT - 1
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border



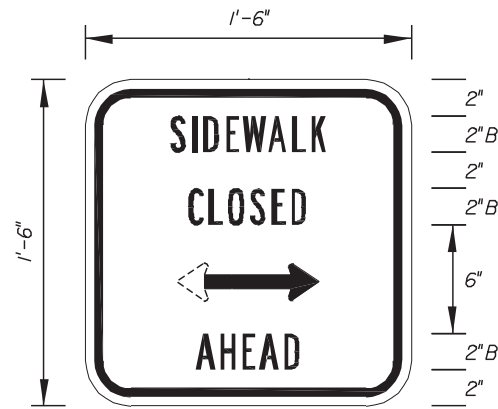
MOT - 2
4' X 4'
3" Radii $\frac{3}{4}$ " Border
Grid = 2" X 2"
Orange Background
Black Arrows & Border



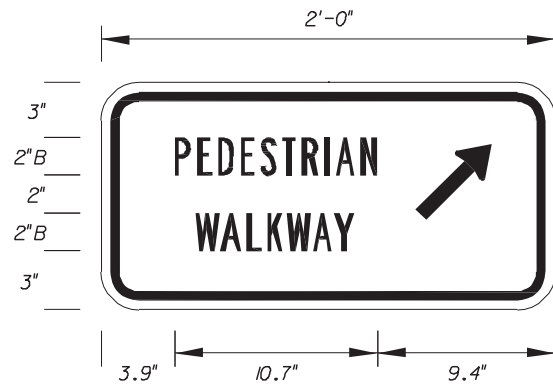
MOT - 3
4' X 4'
3" Radii $\frac{3}{4}$ " Border
Grid = 2" X 2"
Orange Background
Black Arrows & Border



MOT - 4
4' X 4'
3" Radii $\frac{3}{4}$ " Border
Orange Background
Black Arrows & Border



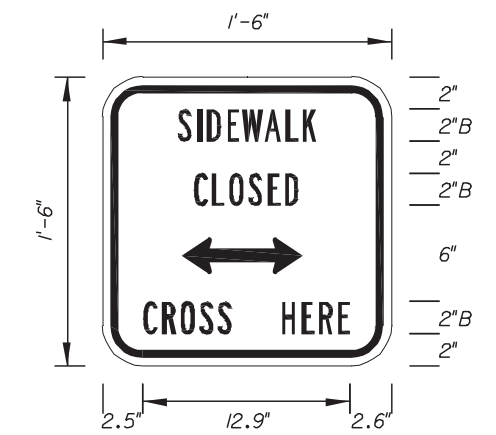
MOT - 5
1'-6" X 1'-6"
2" Radii $\frac{3}{4}$ " Border
2" Series B Legend
White Background
Black Legend & Border



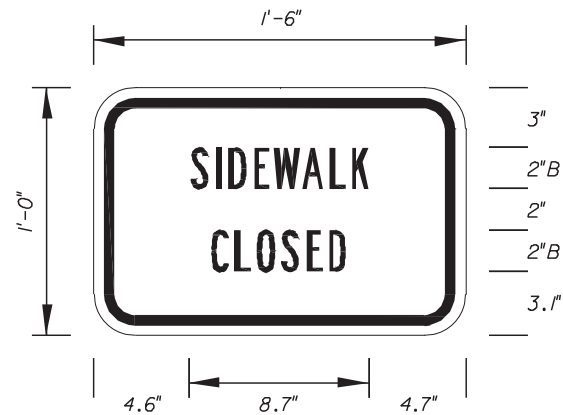
MOT - 6
2' X 1'
1 1/2" Radii $\frac{3}{4}$ " Border
2" Series B Legend
White Background
Black Legend & Border



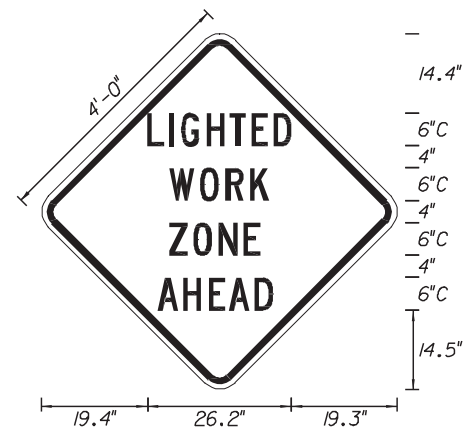
MOT - 7
1'-6" X 1'
1 1/2" Radii $\frac{3}{4}$ " Border
2" Series B Legend
White Background
Black Legend & Border



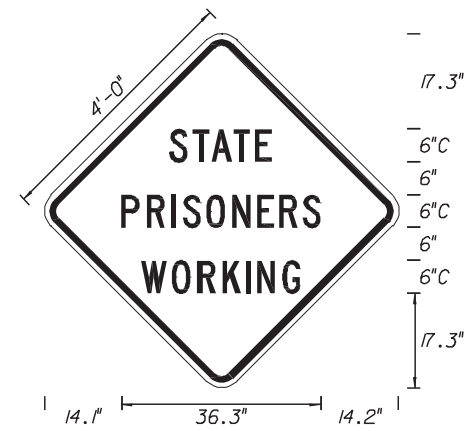
MOT - 8
1'-6" X 1'-6"
2 1/4" Radii $\frac{3}{4}$ " Border
2" Series B Legend
White Background
Black Legend & Border



MOT - 9
1'-6" X 1'
1 1/2" Radii $\frac{3}{4}$ " Border
2" Series B Legend
White Background
Black Legend & Border

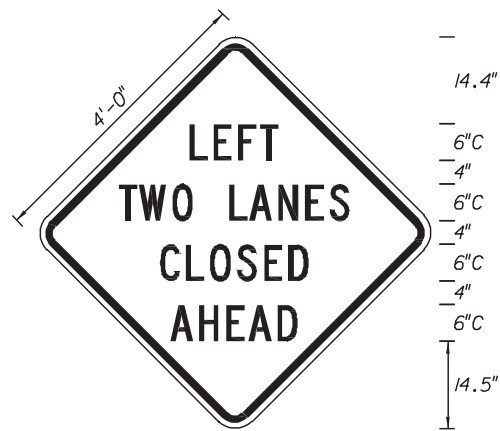


MOT - 10
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border

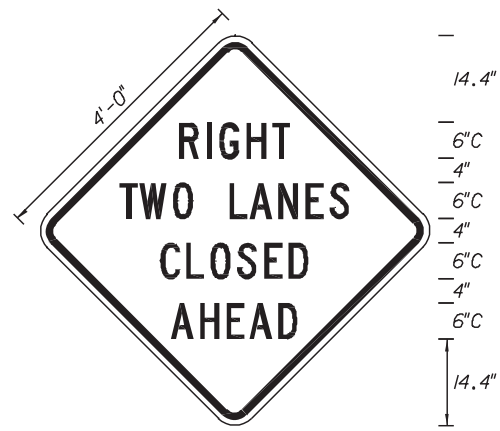


MOT - 11
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border

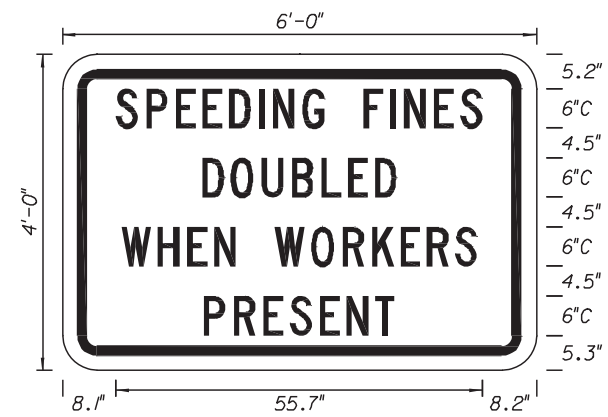
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
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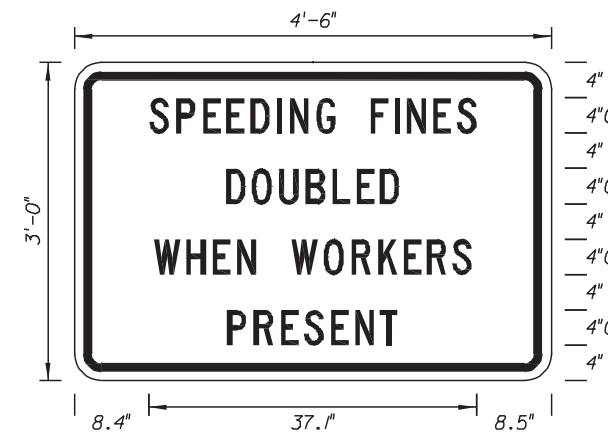
MOT - 12
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border



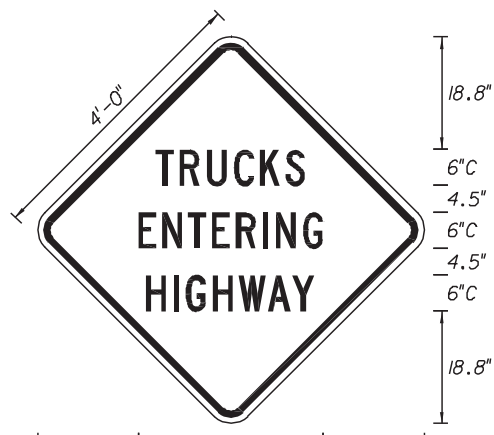
MOT - 13
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border



MOT - 14
6' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
White Background
Black Legend & Border



MOT - 15
4'-6" X 3'
3" Radii $\frac{3}{4}$ " Border
4" Series C Legend
White Background
Black Legend & Border



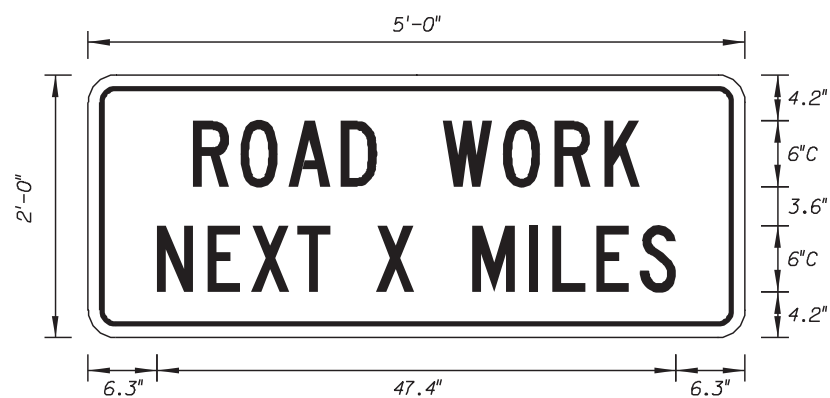
MOT - 16
4' X 4'
3" Radii $\frac{3}{4}$ " Border
6" Series C Legend
Orange Background
Black Legend & Border

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
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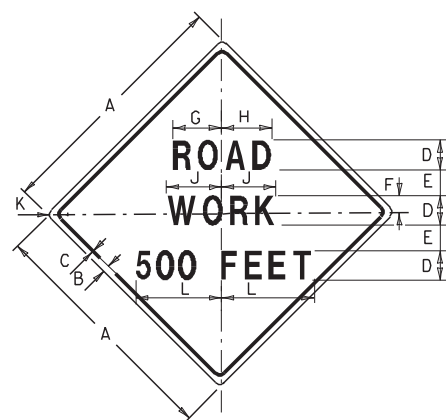
SPECIAL SIGN DETAILS

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Designed By			<i>Charles A. Scott</i> State Traffic Plans Engineer
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Checked By			Sheet No. Index No.

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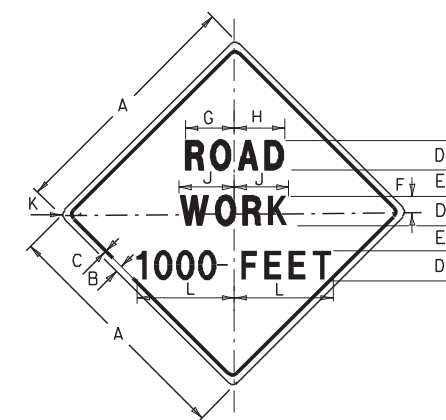


G20-1
5' X 2'
1.5 Radii .75 Border
6" Series C Legend
Orange Background
Black Legend & Border



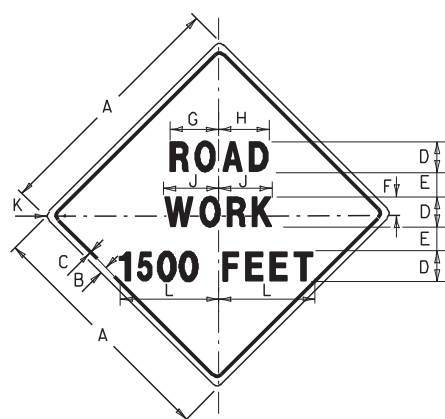
W20-1A
LEGEND AND BORDER: BLACK
BACKGROUND: ORANGE

DIMENSIONS IN INCHES										
A	B	C	D	E	F	G	H	J	K	L
36	$\frac{5}{8}$	$\frac{7}{8}$	5D	$3\frac{1}{2}$	$3\frac{1}{4}$	$8\frac{3}{8}$	$8\frac{7}{8}$	9	$2\frac{1}{4}$	$17\frac{1}{4}$
48	$\frac{3}{4}$	$1\frac{1}{4}$	7D	$4\frac{3}{4}$	$4\frac{1}{2}$	$11\frac{11}{16}$	$12\frac{7}{16}$	$12\frac{5}{8}$	3	24



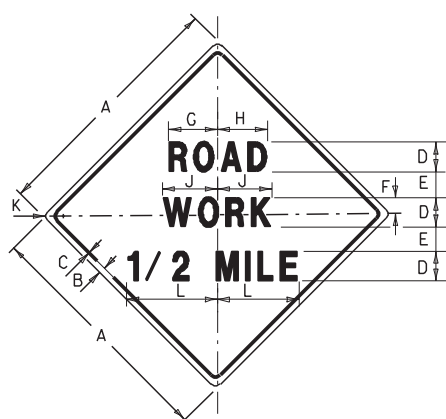
W20-1B
LEGEND AND BORDER: BLACK
BACKGROUND: ORANGE

DIMENSIONS IN INCHES										
A	B	C	D	E	F	G	H	J	K	L
36	$\frac{5}{8}$	$\frac{7}{8}$	5D	$3\frac{1}{2}$	$3\frac{1}{4}$	$8\frac{3}{8}$	$8\frac{7}{8}$	9	$2\frac{1}{4}$	$18\frac{3}{8}$
48	$\frac{3}{4}$	$1\frac{1}{4}$	7D	$4\frac{3}{4}$	$4\frac{1}{2}$	$11\frac{11}{16}$	$12\frac{5}{8}$	$12\frac{5}{8}$	3	$25\frac{7}{8}$



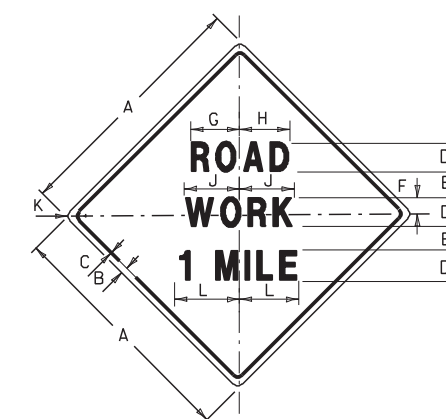
W20-1C
LEGEND AND BORDER: BLACK
BACKGROUND: ORANGE

DIMENSIONS IN INCHES										
A	B	C	D	E	F	G	H	J	K	L
36	$\frac{5}{8}$	$\frac{7}{8}$	5D	$3\frac{1}{2}$	$3\frac{1}{4}$	$8\frac{3}{8}$	$8\frac{7}{8}$	9	$2\frac{1}{4}$	$18\frac{3}{8}$
48	$\frac{3}{4}$	$1\frac{1}{4}$	7D	$4\frac{3}{4}$	$4\frac{1}{2}$	$11\frac{11}{16}$	$12\frac{7}{16}$	$12\frac{5}{8}$	3	$25\frac{3}{4}$



W20-1D
LEGEND AND BORDER: BLACK
BACKGROUND: ORANGE

DIMENSIONS IN INCHES										
A	B	C	D	E	F	G	H	J	K	L
36	$\frac{5}{8}$	$\frac{7}{8}$	5D	$3\frac{1}{2}$	$3\frac{1}{4}$	$8\frac{3}{8}$	$8\frac{7}{8}$	9	$2\frac{1}{4}$	$16\frac{3}{4}$
48	$\frac{3}{4}$	$1\frac{1}{4}$	7D	$4\frac{3}{4}$	$4\frac{1}{2}$	$11\frac{11}{16}$	$12\frac{7}{16}$	$12\frac{5}{8}$	3	22



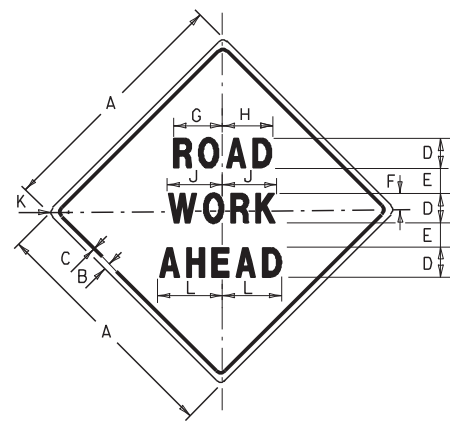
W20-1E
LEGEND AND BORDER: BLACK
BACKGROUND: ORANGE

DIMENSIONS IN INCHES										
A	B	C	D	E	F	G	H	J	K	L
36	$\frac{5}{8}$	$\frac{7}{8}$	5D	$3\frac{1}{2}$	$3\frac{1}{4}$	$8\frac{3}{8}$	$8\frac{7}{8}$	9	$2\frac{1}{4}$	$11\frac{3}{8}$
48	$\frac{3}{4}$	$1\frac{1}{4}$	7D	$4\frac{3}{4}$	$4\frac{1}{2}$	$11\frac{11}{16}$	$12\frac{5}{8}$	$12\frac{5}{8}$	3	$15\frac{7}{8}$

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

SPECIAL SIGN DETAILS

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	00	11 of 12
		17355



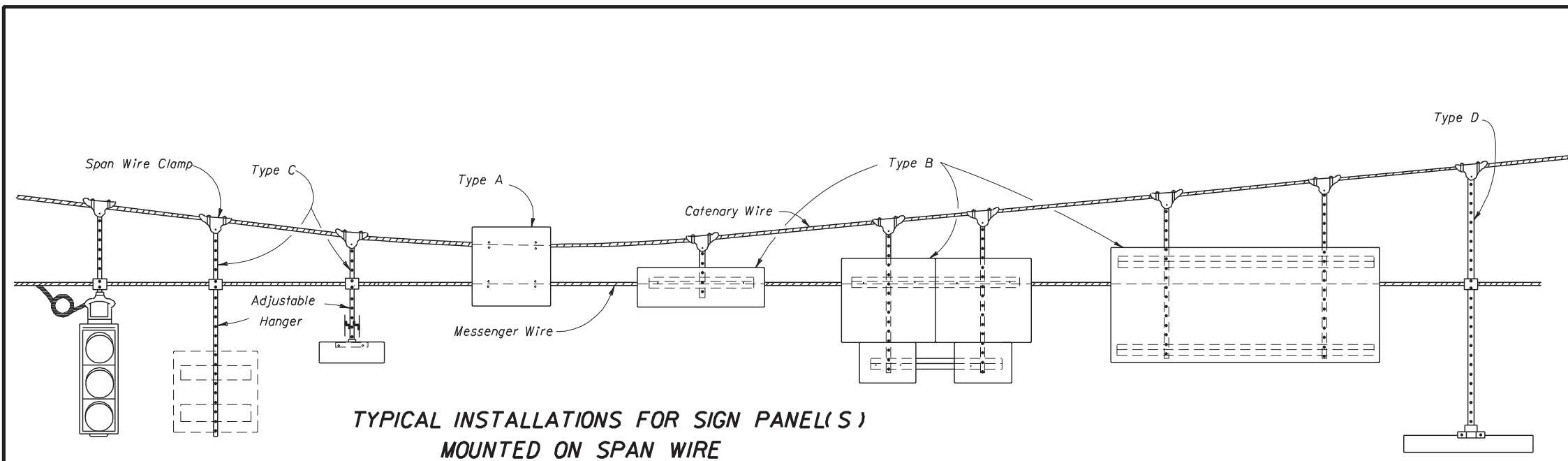
W20-IF
 LEGEND AND BORDER: BLACK
 BACKGROUND: ORANGE

DIMENSIONS IN INCHES										
A	B	C	D	E	F	G	H	J	K	L
36	$\frac{5}{8}$	$\frac{7}{8}$	5D	$3\frac{1}{2}$	$3\frac{1}{4}$	$8\frac{3}{8}$	$8\frac{7}{8}$	9	$2\frac{1}{4}$	11
48	$\frac{3}{4}$	$1\frac{1}{4}$	7D	$4\frac{3}{4}$	$4\frac{1}{2}$	$11\frac{11}{16}$	$12\frac{7}{16}$	$12\frac{5}{8}$	3	$15\frac{1}{4}$

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 TRAFFIC DESIGN

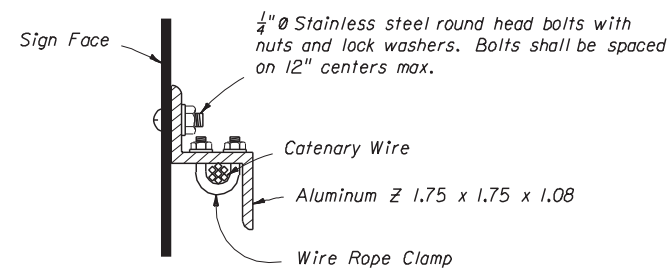
SPECIAL SIGN DETAILS

Names	Dates	Approved By		
Designed By		<i>Charles A. Scott</i>	State Traffic Plans Engineer	
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	12 of 12	17355

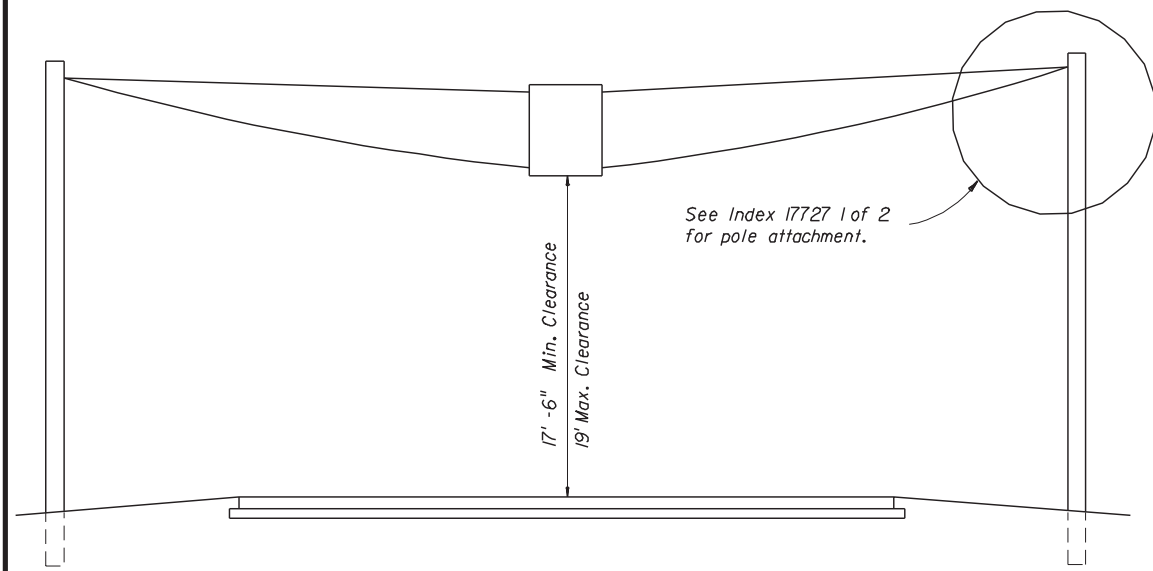


**TYPICAL INSTALLATIONS FOR SIGN PANEL(S)
MOUNTED ON SPAN WIRE**

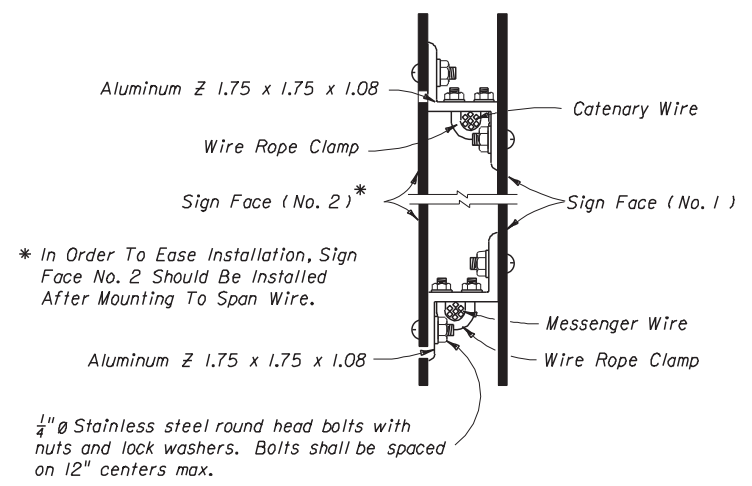
- Notes :
1. Bottom edge of signs shall be approximately at the same elevation.
 2. Span wire installations that support only signs should be provided with a minimum panel weight of 7 PSF.
 3. Type B & C attachments with one hanger shall have wind beams for signs wider than 3 1/2'. The beams shall extend to within 6" of the sign edge.
 4. Type B & C attachments for signs 4' and wider shall have 2 hangers. Signs 7' and wider shall have wind beams that extend to within 6" of the sign edge.
 5. Type D attachments shall be for signs 3 1/2' wide or less.
 6. Sign panels shall meet the requirements of Index 9535.
 7. Refer to section 634 of the Standard Specifications For Road And Bridge Construction.
 8. All bolts, nuts, and washers shall be passivated stainless steel, AISI 300 series, commercial grade, type 316.



SIGN MOUNTING DETAIL

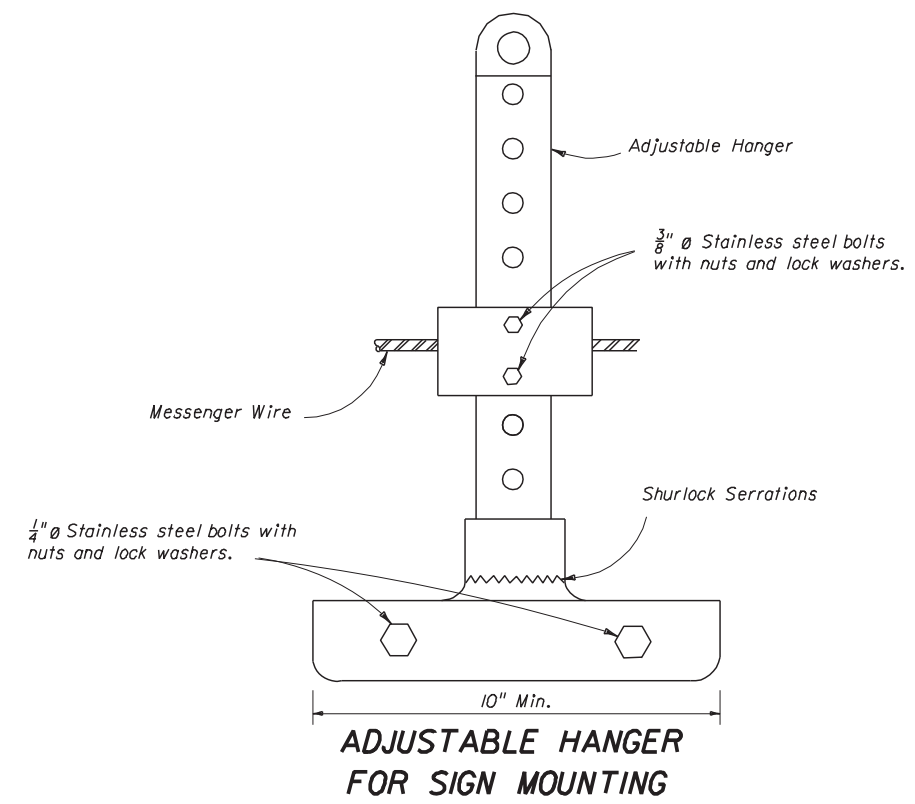


TYPICAL SPAN WIRE INSTALLATION



The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing between bolts of 2".

**DETAIL OF OPPOSING
SIGNS SPAN WIRE MOUNTED**



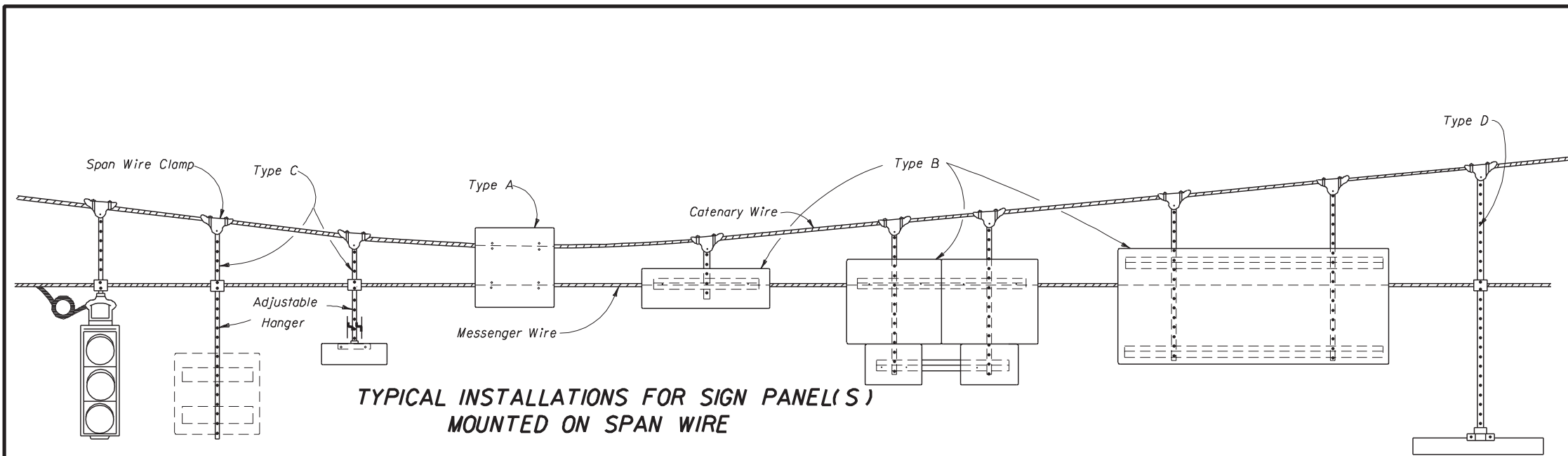
**ADJUSTABLE HANGER
FOR SIGN MOUNTING**

SINGLE POINT ATTACHMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

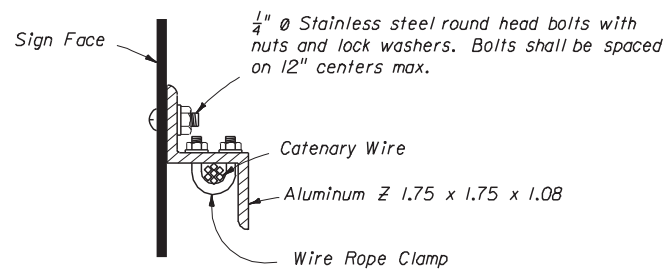
**SPAN WIRE MOUNTED
SIGN DETAILS**

Names	Dates	Approved By		
Designed By		 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	17356

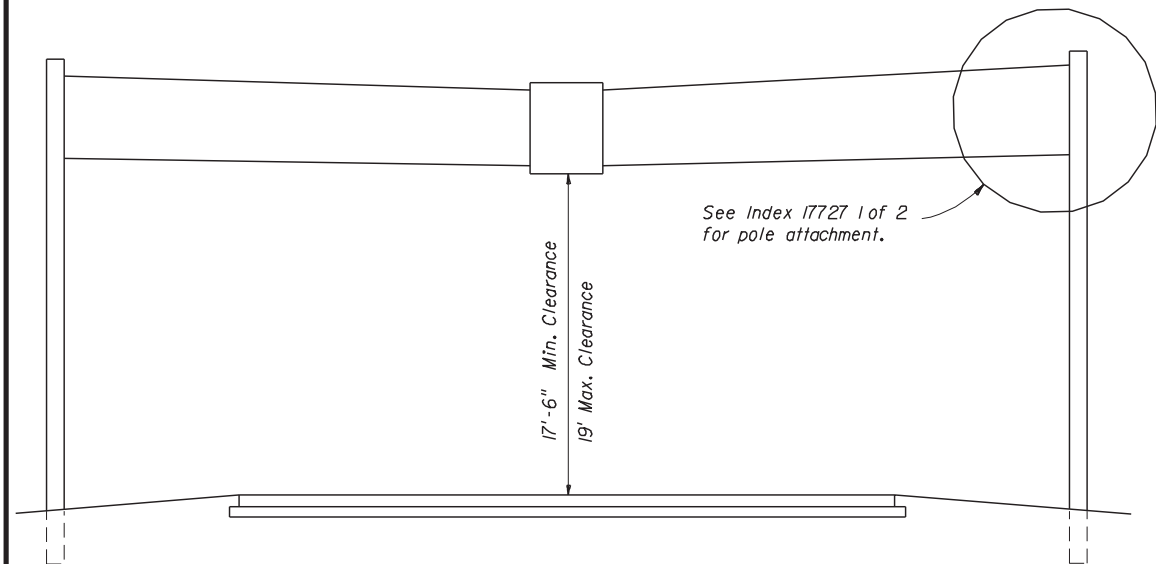


**TYPICAL INSTALLATIONS FOR SIGN PANEL(S)
MOUNTED ON SPAN WIRE**

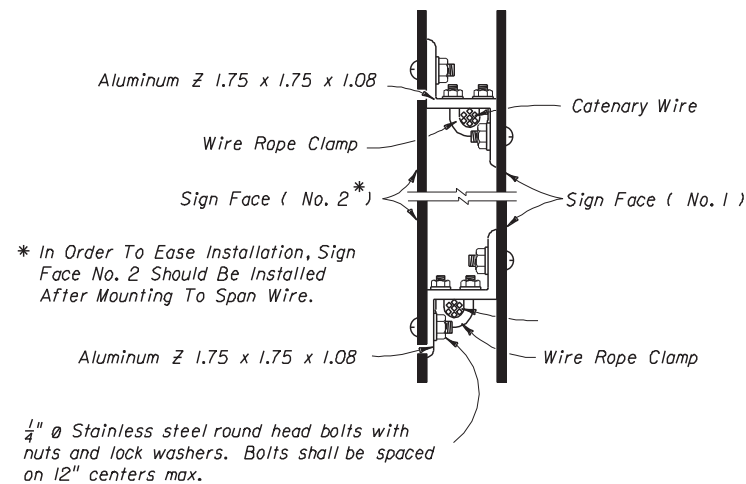
- Notes :
1. Bottom edge of signs shall be approximately at the same elevation.
 2. Type B & C attachments with one hanger shall have wind beams for signs wider than 3½'. The beams shall extend to within 6" of the sign edge.
 3. Type B & C attachments for signs 4' and wider shall have 2 hangers. Signs 7' and wider shall have wind beams that extend to within 6" of the sign edge.
 4. Type D attachments shall be for signs 3½' wide or less.
 5. Sign panels shall meet the requirements of Index 9535.
 6. Refer to section 634 of the Standard Specifications For Road And Bridge Construction.
 7. All bolts, nuts, and washers shall be passivated stainless steel, AISI 300 series, commercial grade, type 316.



SIGN MOUNTING DETAIL



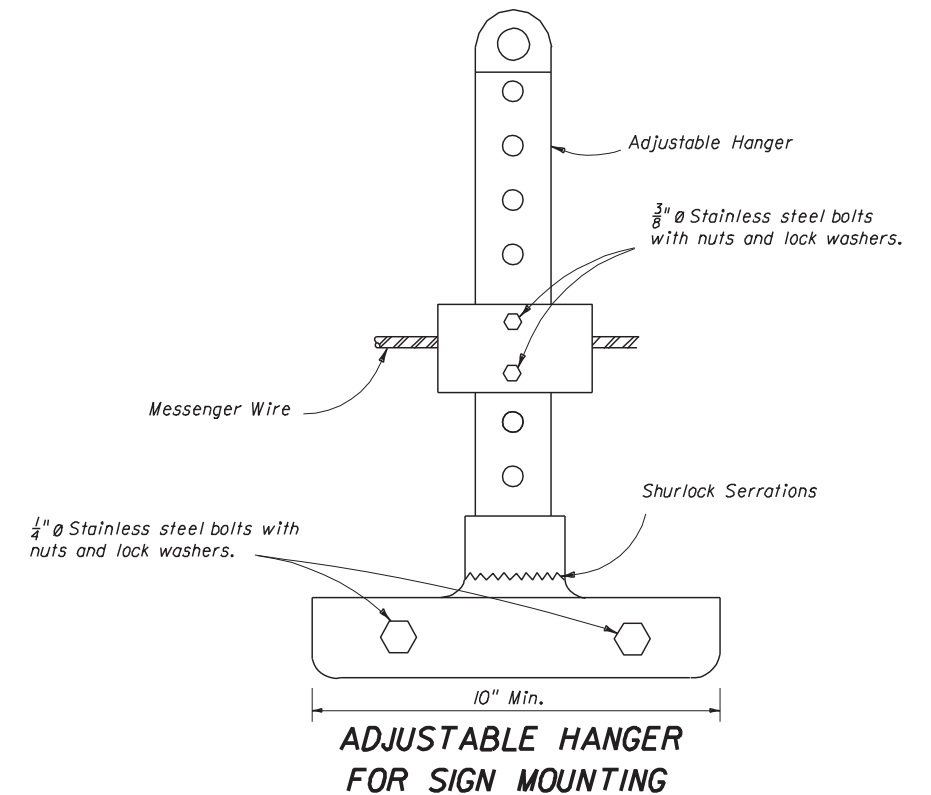
TYPICAL SPAN WIRE INSTALLATION



* In Order To Ease Installation, Sign Face No. 2 Should Be Installed After Mounting To Span Wire.

The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing between bolts of 2".

**DETAIL OF OPPOSING
SIGNS SPAN WIRE MOUNTED**



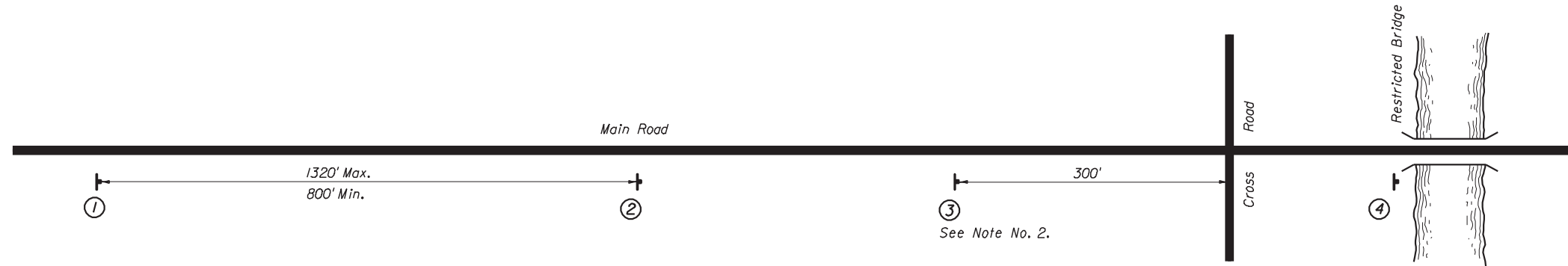
**ADJUSTABLE HANGER
FOR SIGN MOUNTING**

TWO POINT ATTACHMENT

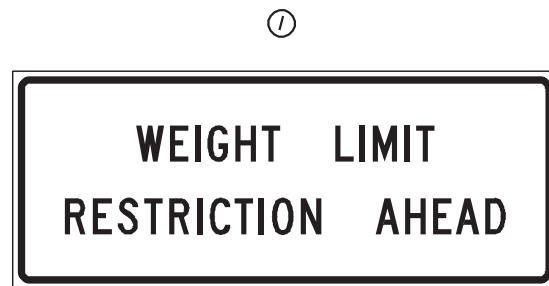
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

**SPAN WIRE MOUNTED
SIGN DETAILS**

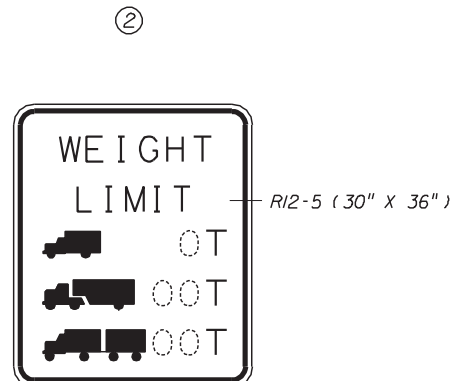
Names	Dates	Approved By		
Designed By		 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 2	17356



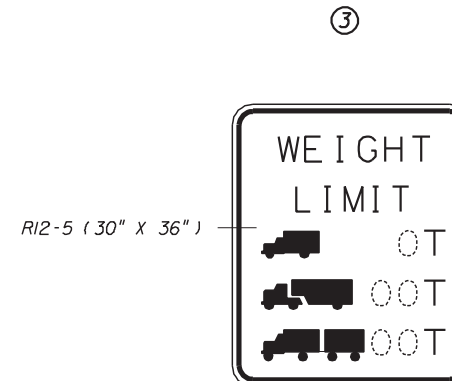
SIGN LOCATIONS TYPICAL



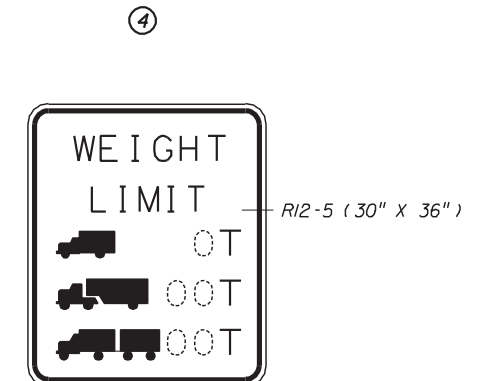
FTP - 50



FTP - 51

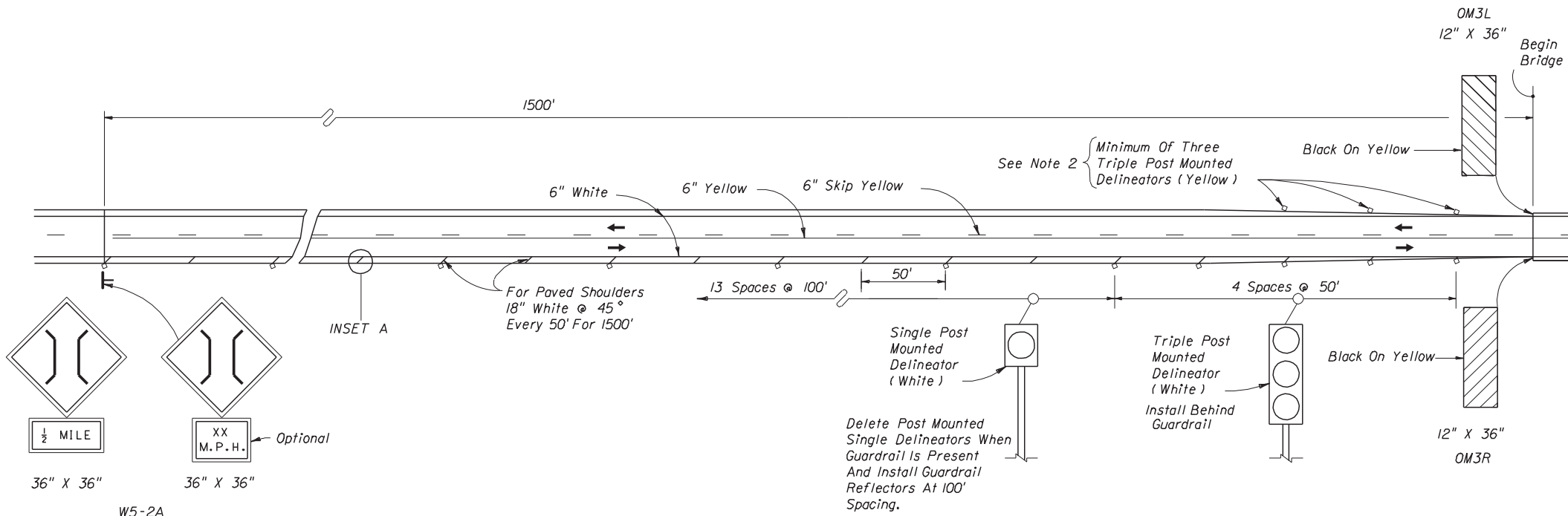


FTP - 52

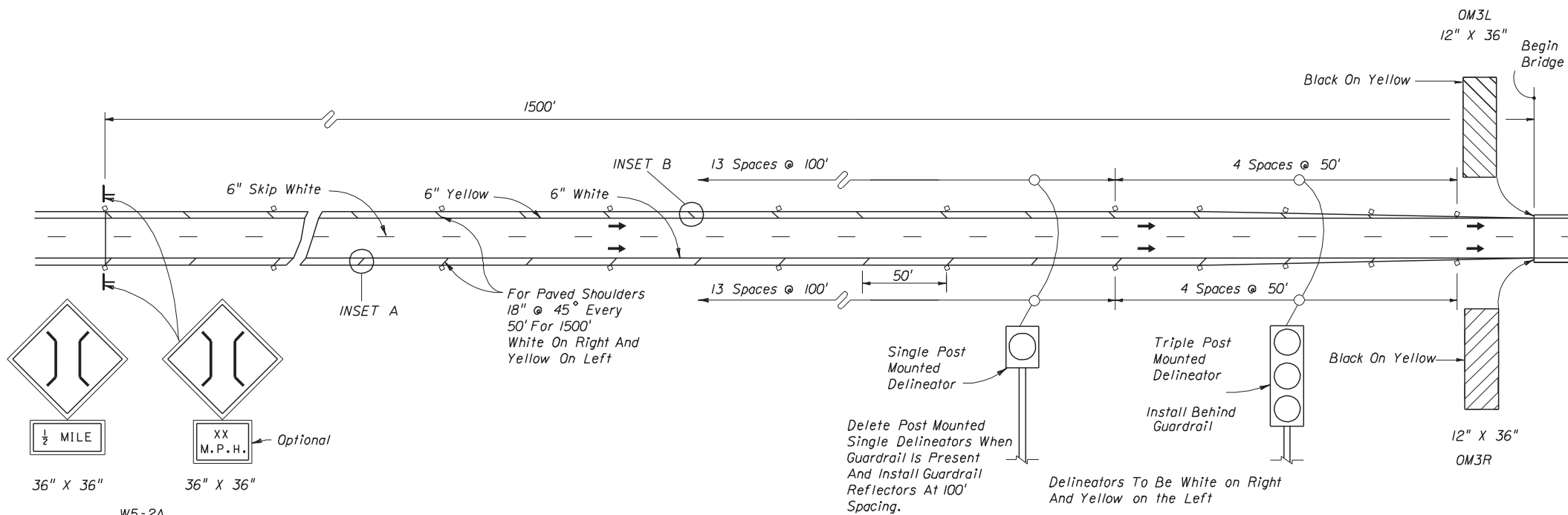


- NOTE:
1. See Standard Highway Signs dated 1979 for sign R12-5 detail.
 2. Sign location No. 3 may require some field adjustment.
 3. Signs FTP-50, FTP-51 & FTP-52 shall have a $\frac{1}{2}$ " edge and $\frac{3}{4}$ " border with a 4" radius.
 4. The Cross Road is the last detour around the restricted bridge.
 5. Sign location No. 2 should be established from the Cross Road the following approximate distances:
Interstate - 1 Mile Non-Interstate - 1/2 Mile.
 6. See Index I7355 for sign details.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
BRIDGE WEIGHT RESTRICTIONS				
Names	Dates	Approved By <i>Charles A. Scott</i> State Traffic Plans Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	1 of 1	17357
Checked By				



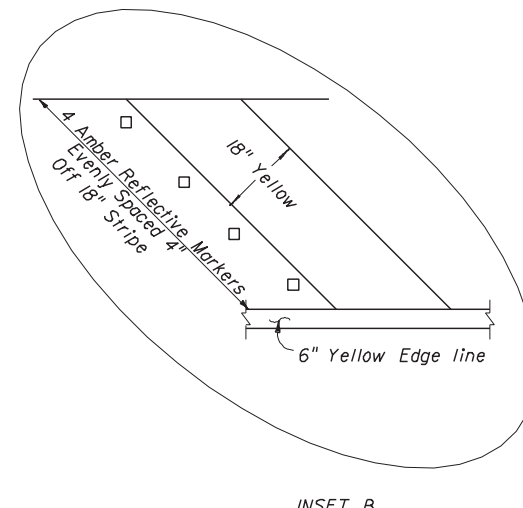
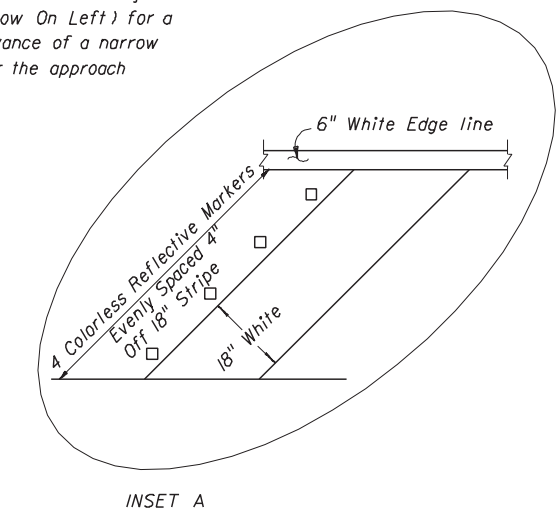
TWO - WAY TRAFFIC



ONE - WAY TRAFFIC

NOTES:

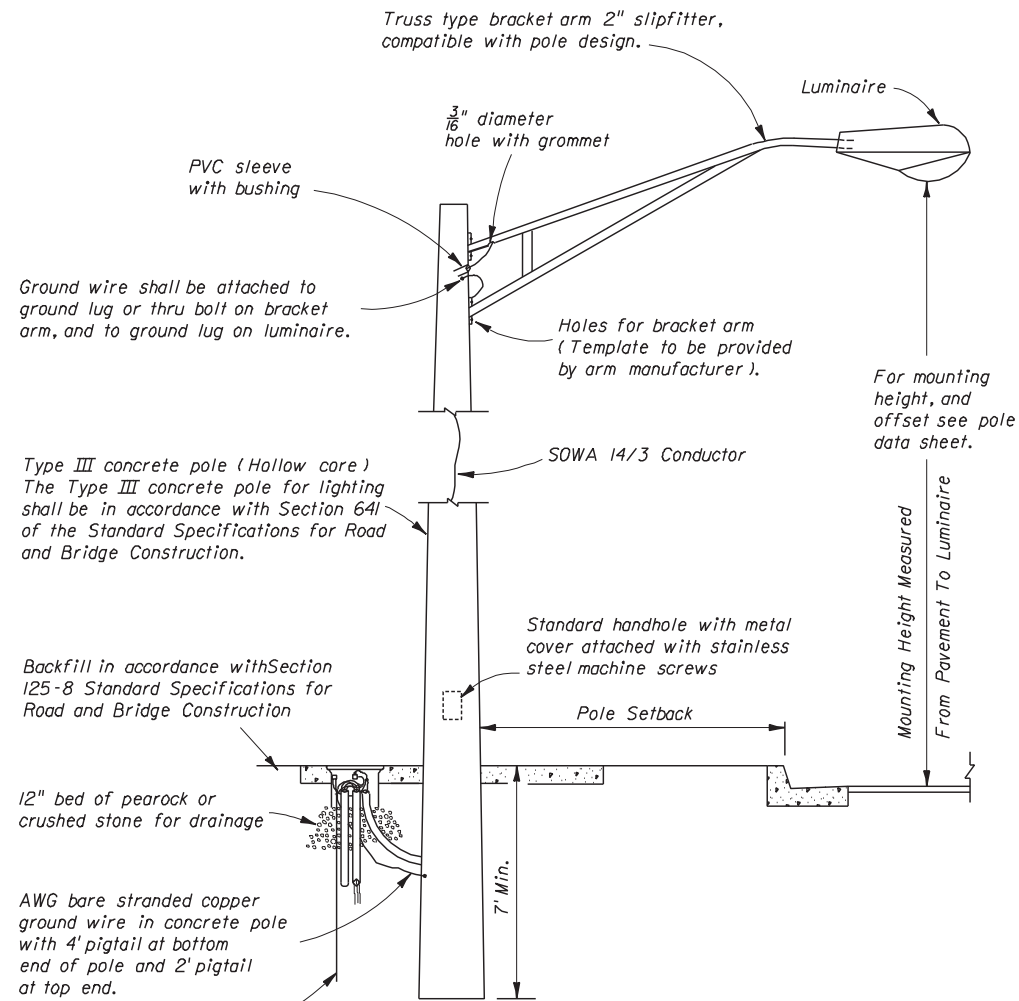
- Bridges should be marked as narrow bridges under the following conditions:
 - For approach roadways with paved shoulders when the bridge width including shoulders is less than the width of the approach roadway including paved shoulders.
 - For approach roadways without paved shoulders when the bridge shoulder width is less than 2'.
- Roadways with two-way traffic:
 - No passing zone should be extended 1500' in advance of narrow bridge.
 - The post mounted delineators shall be installed on both sides of the roadway (White On Right / Yellow On Left) for a distance of 1500' in advance of a narrow bridge if the bridge or the approach is on a curve.
- Delineators on both sides of roadway shall face traffic approaching bridge.
- Delineators to be placed not less than 2' or more than 8' outside the outer edge of pavement.
- The OM-3R & OM-3L mounting height shall be 4' above the roadway edge. The panels may be post mounted at the bridges.



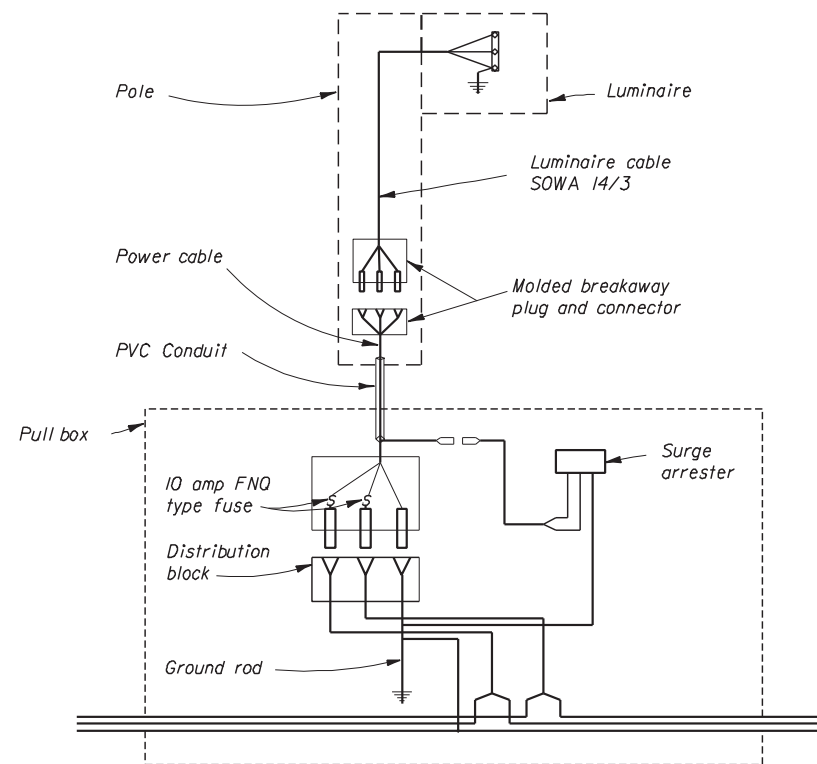
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

**RURAL NARROW
BRIDGE TREATMENT**

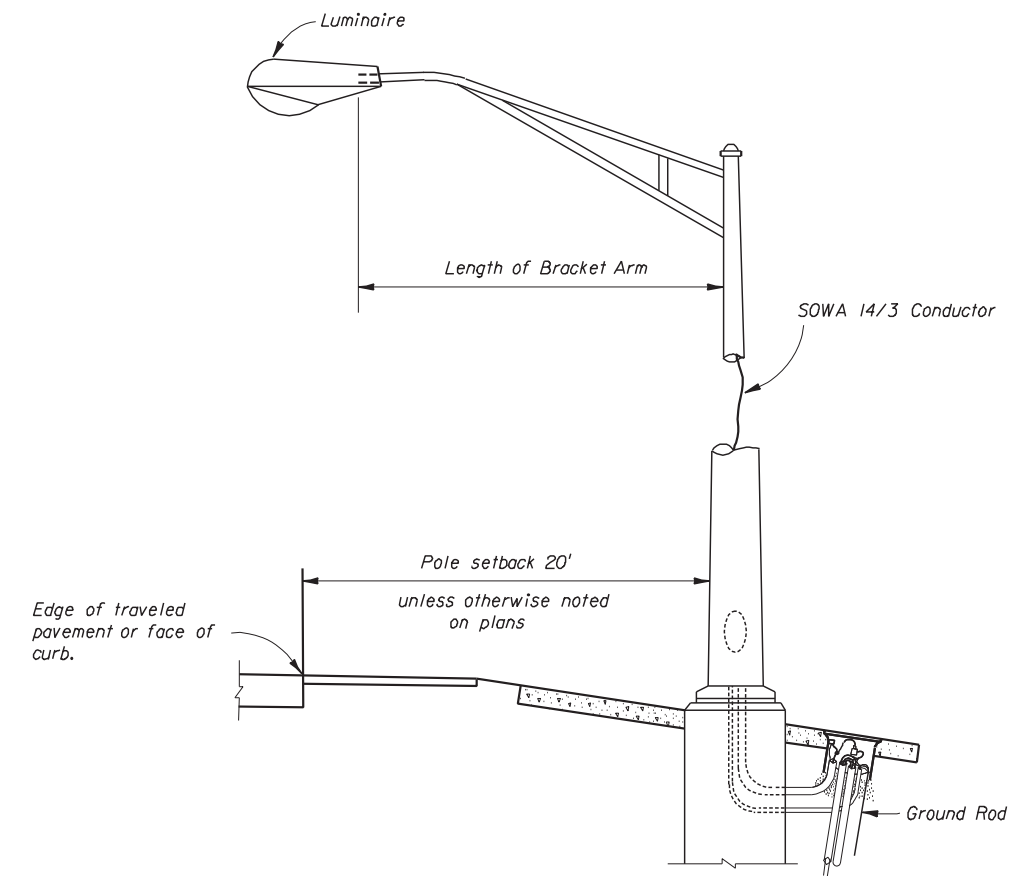
Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i>	State Traffic Plans Engineer	
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	17359



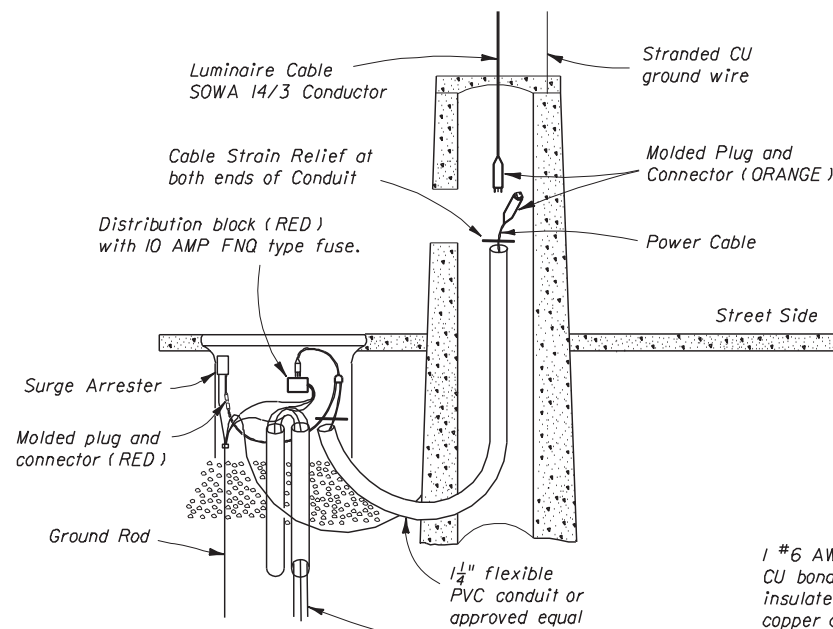
CONCRETE POLE DETAIL



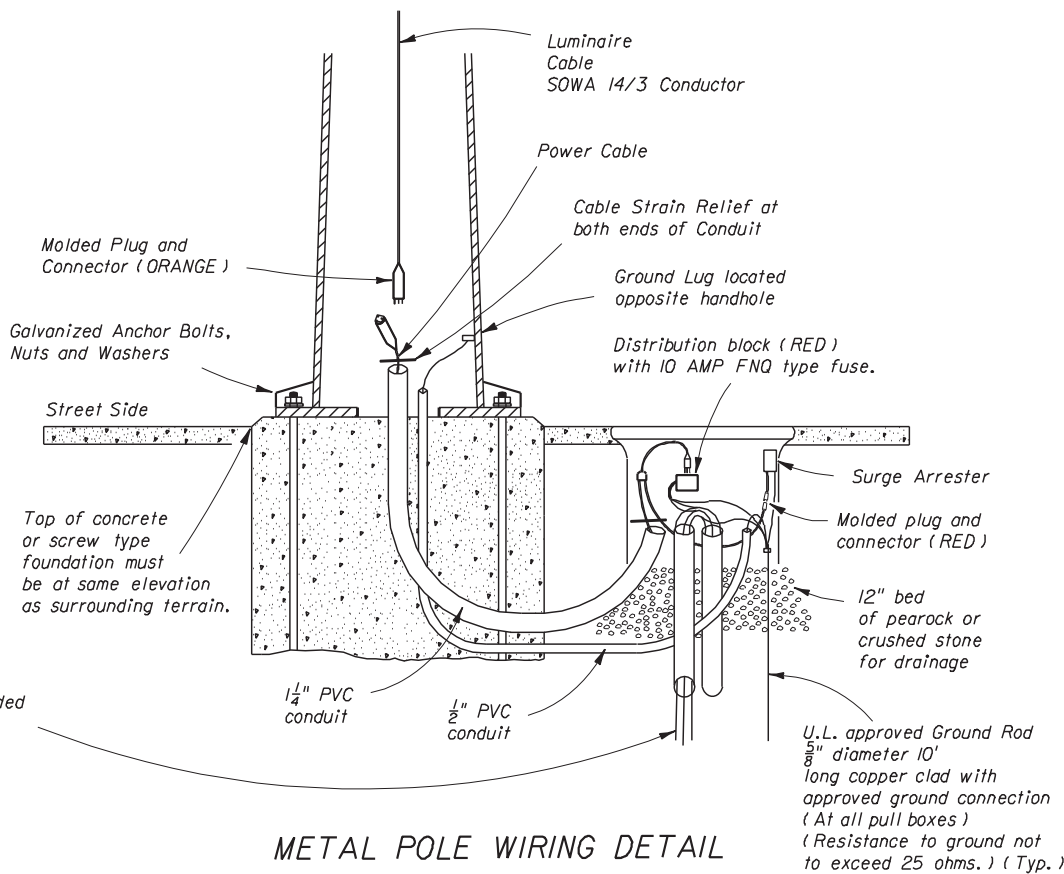
WIRING DIAGRAM



METAL POLE DETAIL



CONCRETE POLE WIRING DETAIL



METAL POLE WIRING DETAIL

1 #6 AWG insulated (TW Green) stranded CU bond wire connecting all poles, and insulated (THW or THWN) stranded copper circuit conductors in schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plans. (Typical)

NOTE:

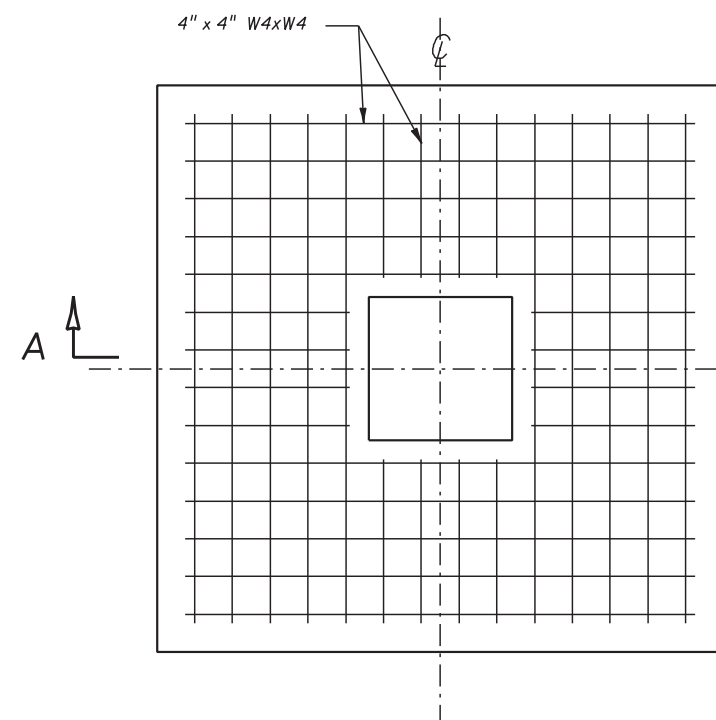
The Duraline Division of the J.B. Nottingham Company (Duraline) claims exclusive rights to the wiring diagram illustrated in this drawing under U. S. Patent 5,335,160. Any infringement on the rights claimed by Duraline shall be the sole responsibility of the contractor or supplier infringing on the rights of Duraline.

LIGHTING POLE DETAILS

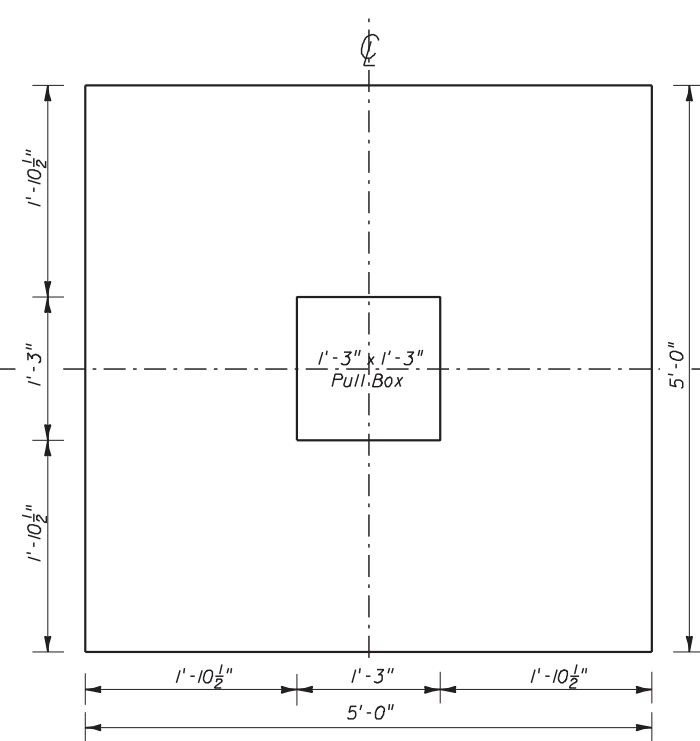
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

CONVENTIONAL LIGHTING

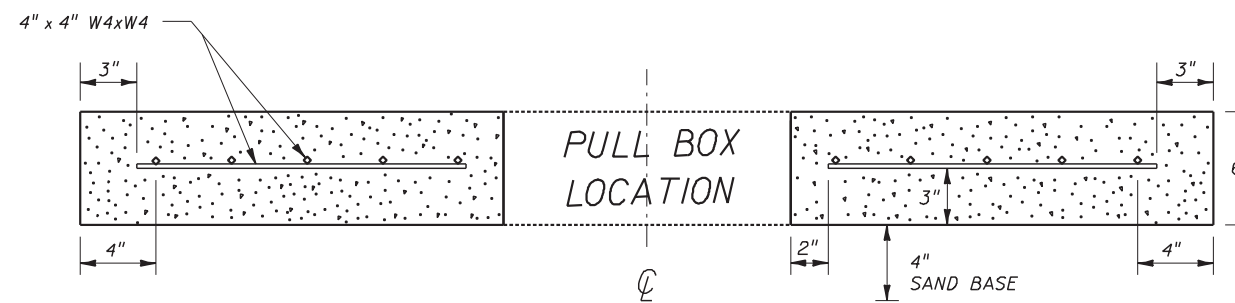
Names	Dates	Approved By		
Designed By		Charles A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 3	17500



REINFORCEMENT LAYOUT



SLAB DIMENSIONS



SECTION A-A

NOTES:

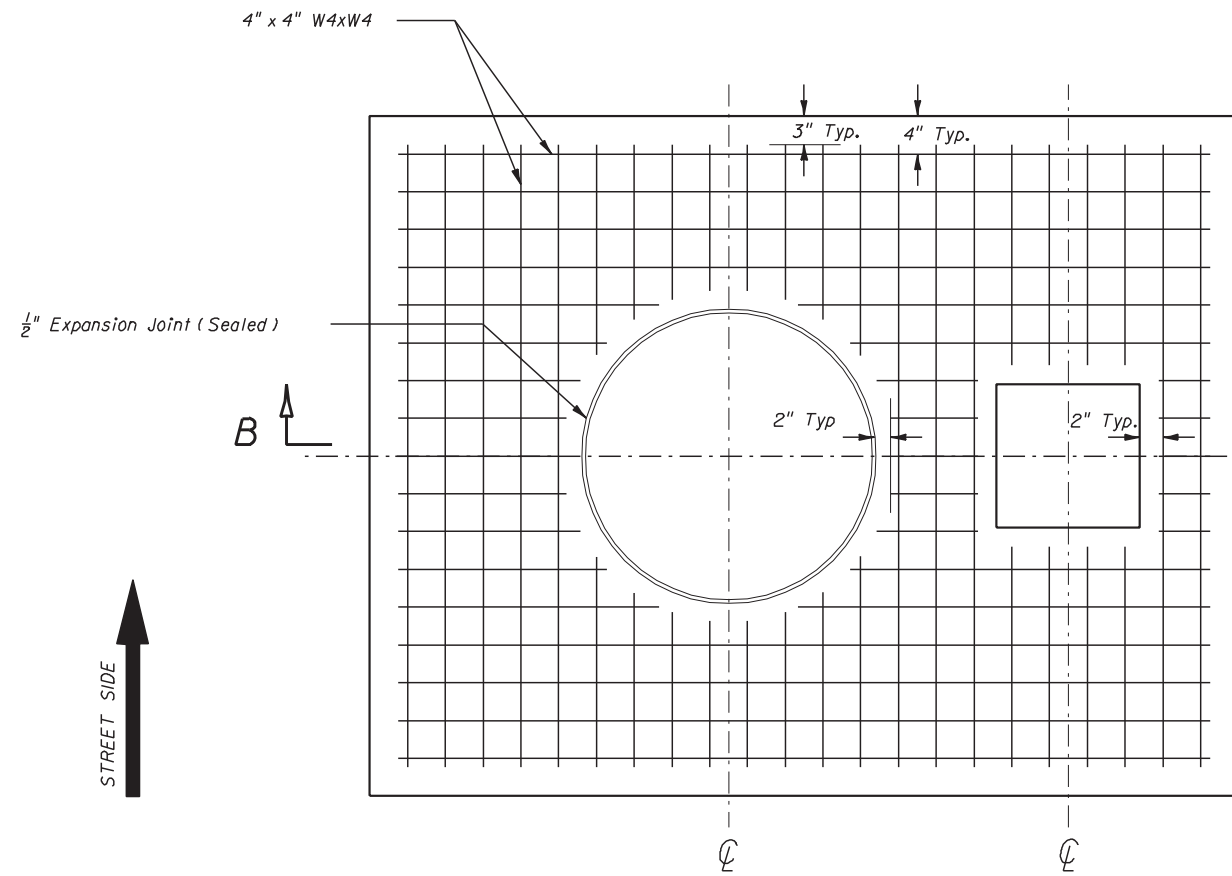
1. Use clean free draining sand < 5% passing No. 200 sieve for base.
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete strength at 28 days shall be $f'c = 3$ ksi
4. Outside edges of slab shall be cast against formwork.
5. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.

LIGHTING GENERAL NOTES AND SLAB DETAILS FOR PULLBOX LOCATIONS

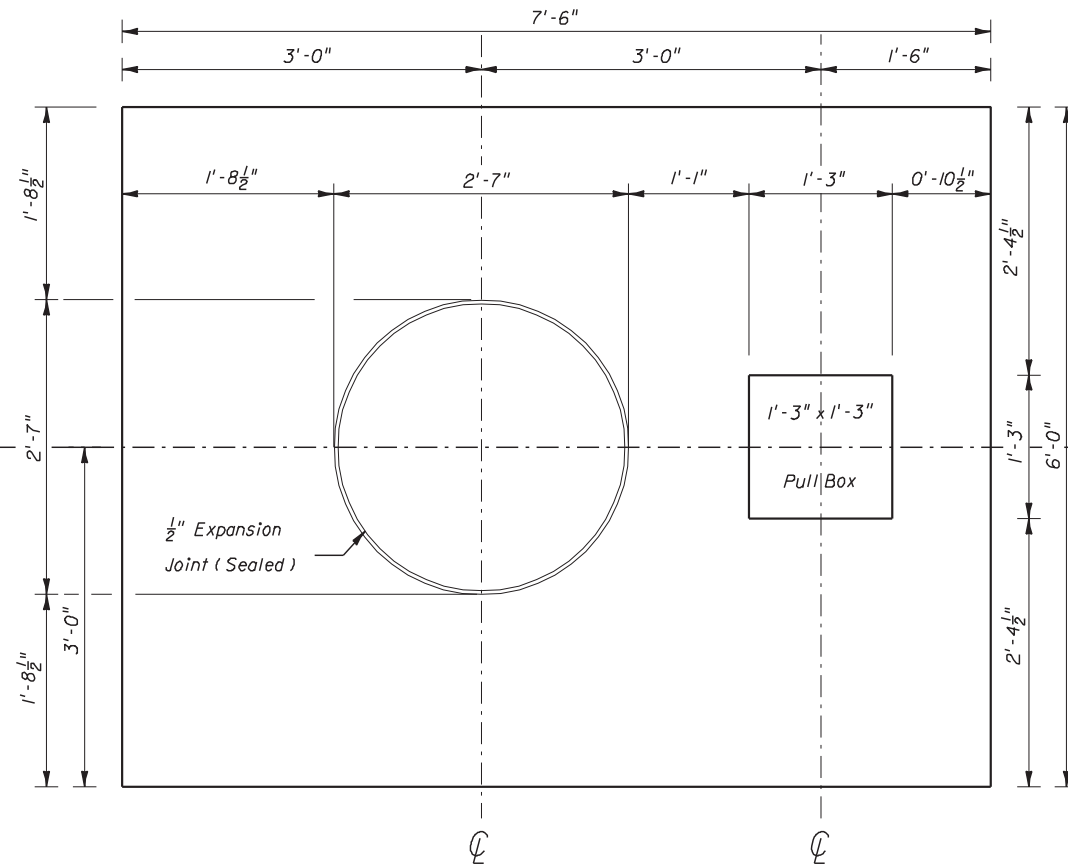
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

CONVENTIONAL LIGHTING

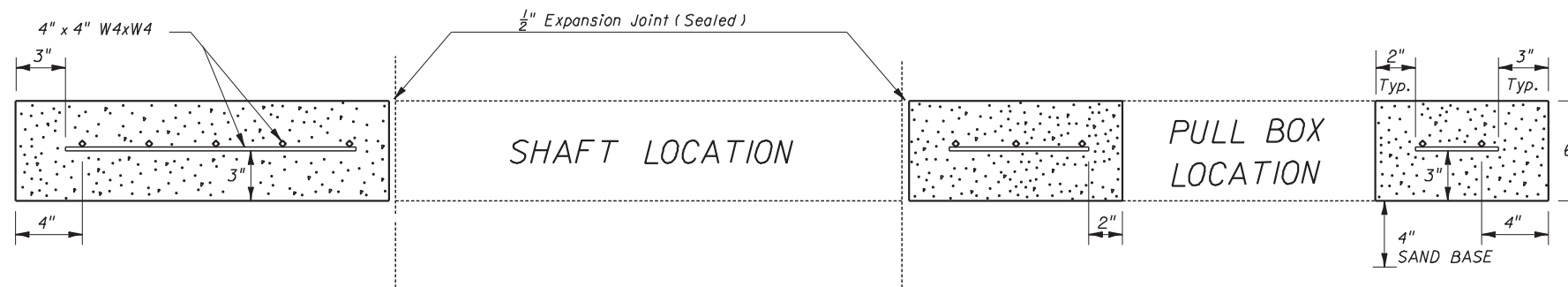
Names	Dates	Approved By <i>Charles A. Scott</i> State Traffic Plans Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	2 of 3	17500
Checked By				



REINFORCEMENT LAYOUT



SLAB DIMENSIONS



SECTION B-B

NOTES:

1. Use clean free draining sand < 5% passing No. 200 sieve for base (4").
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete strength at 28 days shall be $f'c = 3$ ksi.
4. Outside edges of slab shall be cast against formwork.

5. The $\frac{1}{2}$ " thick expansion joint between shaft and slab shall be sealed with a hot poured elastic joint sealer.
6. Slabs to be placed around all Poles and Pull Boxes in rural locations. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
7. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.

SLAB DETAILS FOR POLE AND PULL BOX LOCATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

CONVENTIONAL LIGHTING

Names	Dates	Approved By		
Designed By		 State Traffic Plans Engineer		
Drawn By				
Checked By				
		Revision	Sheet No.	Index No.
		00	3 of 3	17500

- 1) Ground rods shall have a resistance to ground not to exceed 25 ohms. Where the resistance is greater than 25 ohms, two or more ground rods connected in parallel shall be used. Contractor shall have necessary test equipment (current calibration certificate required) at final inspection to ensure acceptability of grounding system. Total grounding system not to exceed 10 ohms. All grounding system connections shall be exothermically welded. This includes all cable connections, ground rod connections, rod to rod connections, and splices. Method of Measurement and Basis of Payment as per Section 620 of the Standard Specifications.
- 2) The contractor shall be responsible for contacting all utility companies prior to any underground work. The utility company will locate and identify their facilities.
- 3) Contractor shall determine the service required date for the power company transformer installation at the pre-construction conference.
- 4) The power company reserves the right to install the riser, switch gear and weatherhead on power company poles at the expense of the contractor. Contact the power company for cost or for authorization for an alternate procedure.
- 5) Any damaged portions of galvanized steel poles and bracket arms shall be painted in accordance with Section 562 of the Standard Specifications.
- 6) Poles and bracket arms shall be designed in accordance with the design criteria, as indicated in the plans and using the applicable equations found in the AASHTO 'Standard Specifications For Structural Supports For Highway Signs, Luminaires And Traffic Signals'. The calculations shall be based on the actual projected area of the luminaire or 3.0 square feet whichever is greater.
- 7) The luminaire manufacturer shall place a permanent tag on the luminaire housing on which is imprinted the following information : Wattage, ballast type, lamp shown on design plans, lamp setting (position of luminaire), IES light distribution with this lamp in the position specified, input voltage and power factor. Luminaire photometric submittals required.
- 8) Before final acceptance, contractor shall provide 2 sets of full size as built plans to the maintaining agency.
- 9) Conduit routing shall be pole to pole, maintaining pole setback distance from edge of pavement. Any cable routing in locations where guardrail is proposed shall be 2'.
- 10) Pole positions and conduit routing may be adjusted, as approved by the Engineer, to prevent conflicts with utility and drainage structures not indicated, and prevent guardrail post conflict with underground lighting circuits.
- 11) Where guardrail is constructed, the poles shall be placed a minimum of 4' behind the face of the guardrail.
- 12) Pole foundation installations shall be backfilled to the top of the foundation, compacted to a firm, stable condition approximately equal to that of the adjacent soil. The fill shall conform to existing grade and be fully sodded.
- 13) All splices shall be made in pullboxes or the pole base. No splices shall be made inside the conduit. The wires at pullboxes shall have sufficient length to completely remove connectors to the outside of pullboxes to make connectors accessible for changing fuses and trouble shooting the system.

- 14) Neutral wires to have white insulation. Do not use white or green insulated wires for ungrounded conductors.
- 15) Unless otherwise specified, all cable shall be single conductor, 98 percent conductivity stranded copper, with THW or THWN insulation.
- 16) All exposed or surfaced mounted conduit shall be rigid or intermediate metal. These exposed runs of conduit shall be provided with either expansion joints or flexible metal conduit sections adequate to take care of vibrations and thermal expansions. All metal conduit shall be grounded. Steel conduit shall be hot dipped galvanized.
- 17) All conduit that will remain empty as spares shall be mandrel tested, cleaned inside and both ends capped. Leave the corrosion resistant pull/drag wire and place duct makers, or pullboxes to mark the location of the ends of the conduits.
- 18) Pull boxes shall be located at ends of conduit crossing roadways, and as necessary for the completion of the project.
- 19) These plans represent minimum acceptable criteria. The inspection per these drawings represent the minimum base of acceptance.
- 20) All material, unless otherwise specified, shall be Underwriters Laboratory approved.
- 21) Pull boxes shall meet the requirements of Section 635 of the 'Standard Specifications For Road And Bridge Construction' and Section 635 of the 'Minimum Specifications For Traffic Control Signals And Devices'.
- 22) A pull box shall be installed at each pole location. Pull boxes should be located 2' max from pole unless otherwise directed by the project engineer. Metal pull box covers shall be grounded. See General Requirements Section 635-4 of the Standard Specifications for Road and Bridge Construction.
- 23) At all pull boxes and pole bases, ends of conduit shall be sealed in accordance with Section 630 of the Standard Specifications for Road and Bridge Construction.
- 24) Luminaire shall be supplied with a regulator type ballast mounted on a hinged door or panel. The unit shall swing open to provide access to the ballast assembly by release of captive screws. The electrical connector shall be a quick disconnect plug. The unit shall be easily removed from the luminaire after release of the captive screws and disconnect plug.
- 25) All mounting heights are $\pm 2'-6"$ unless otherwise noted in plans.
- 26) A handhole is required in all poles. Handhole should be located opposite approaching traffic with cover fastened with Stainless Steel Screws. The handhole opening shall be at least 20 square inches.
- 27) The luminaire and arm on JOINT USE POLES shall be grounded.
- 28) Concrete slabs around poles and pull boxes shall be paid for under the contract unit price for Class I Concrete (Miscellaneous); the cost of reinforcing steel fabric shall be included in the price for Class I Concrete (Miscellaneous).

BREAKAWAY FEATURE

All conventional mounting height poles shall be mounted on a frangible metal base or system of breakaway couplings. If couplings are used, one coupling shall be provided for each anchor bolt connection. The only continuous connection of the pole to the foundation at each anchor bolt shall be provided by the couplings. The area between the top of the pole foundation and the base of the pole including the couplings shall be enclosed with a non-structural aluminum skirt.

If a frangible metal base is used, it shall be one piece and be designed to breakaway without the aid of any slipping or sliding surfaces.

The design of the breakaway feature shall be in accordance with the breakaway performance requirements of the AASHTO 'Standard Specifications For Structural Supports For Highway Signs, Luminaires and Traffic Signals'. The contractor (supplier) shall submit copies of test reports as evidence the breakaway feature meets the above specifications and calculations to verify the design will meet the AASHTO wind loading specified in the contract plans. No poles are to be installed prior to approval of submittal data.

Any substantial remains of a breakaway support, when it is broken away, should not project more than 4" as discussed in Section 7 of the above AASHTO specifications, and, Chapter 4, Section 4.2 of the AASHTO 'Roadside Design Guide'.

Poles behind bridge rail or barrier wall mounted, shall be non-frangible.

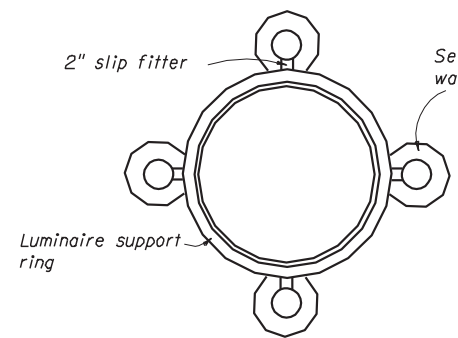
SURGE PROTECTOR SPECIFICATIONS

1. The unit shall withstand a surge current up to 20,000 Amps, and repetitive surges of 200 Amps for a minimum of 10,000 occurrences.
2. The unit shall respond in less than 50 nanoseconds and within this time have a peak clamping voltage better than 1,100 Vrms.
3. The maximum allowable voltage that can pass continuously through the hot leg of the protector must be less than 550 Vrms.
4. The current drain shall be less than 100 microamps.
5. The unit shall be insulated 600 V. to ground and shall be weatherproof.
6. The unit shall not allow holdover current or conduction to ground after the surge ends.
7. Protection shall be achieved for both the 480 V. and neutral conductors with the surges being passed to ground and NOT to neutral.
8. There shall be no discharge lag in the protection of the 480 V. conductor over the neutral conductor.
9. Underwriters Laboratory approval not required.

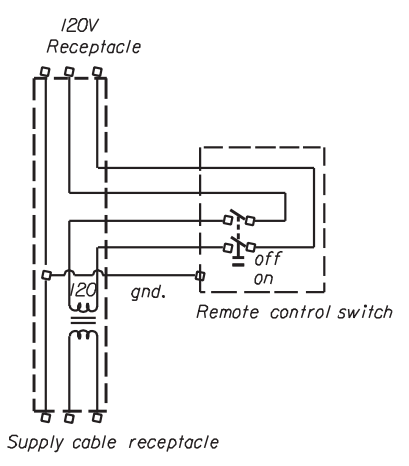
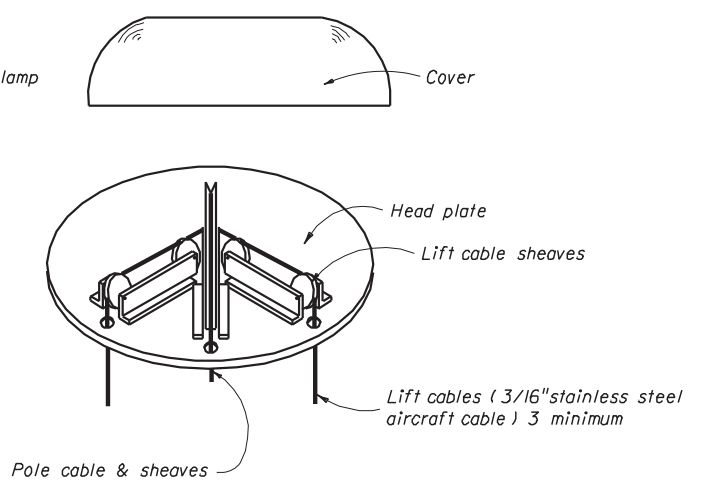
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

HIGHWAY LIGHTING GENERAL NOTES

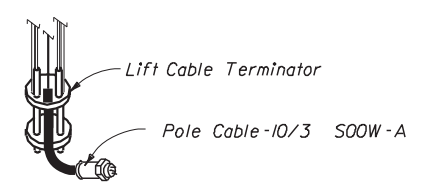
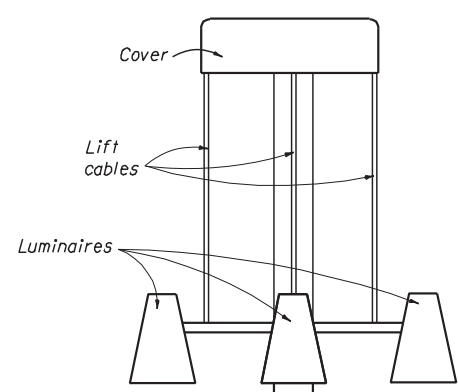
	Names	Dates	Approved By		
Designed By			Clark A. Scott State Traffic Plans Engineer		
Drawn By			Revision	Sheet No.	Index No.
Checked By			00	1 of 1	17501



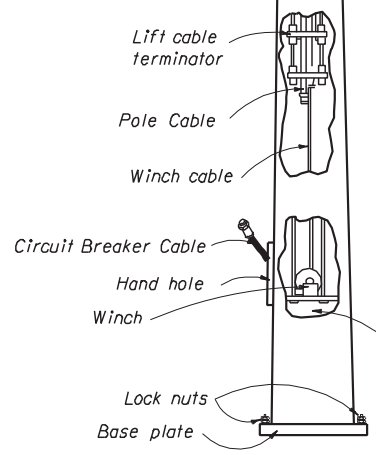
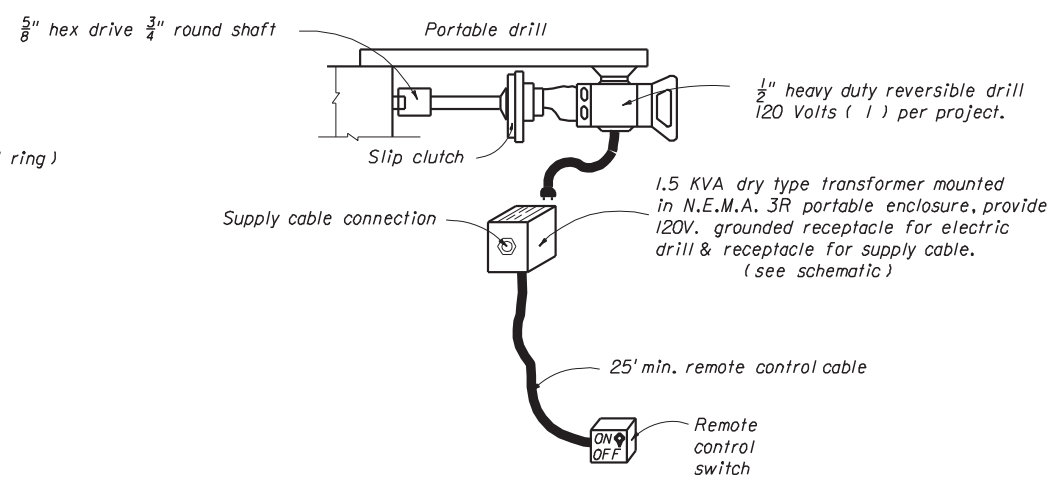
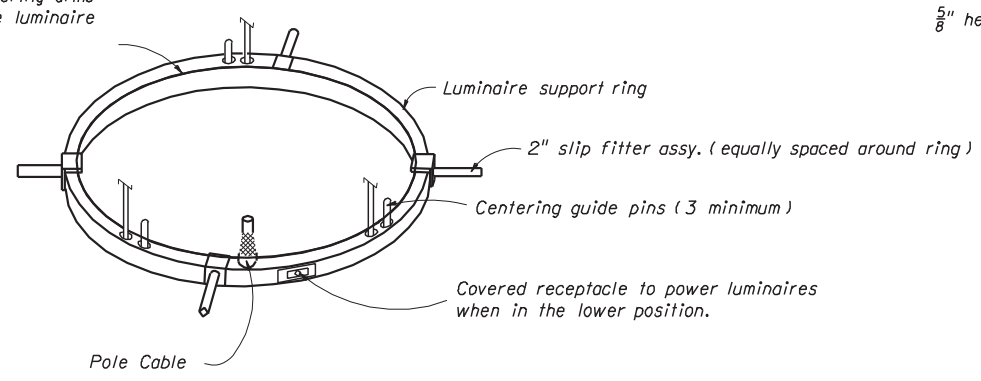
See legend for number of luminaires, lamp wattage and light distribution.



SCHEMATIC OF REMOTE AUXILIARY POWER UNIT

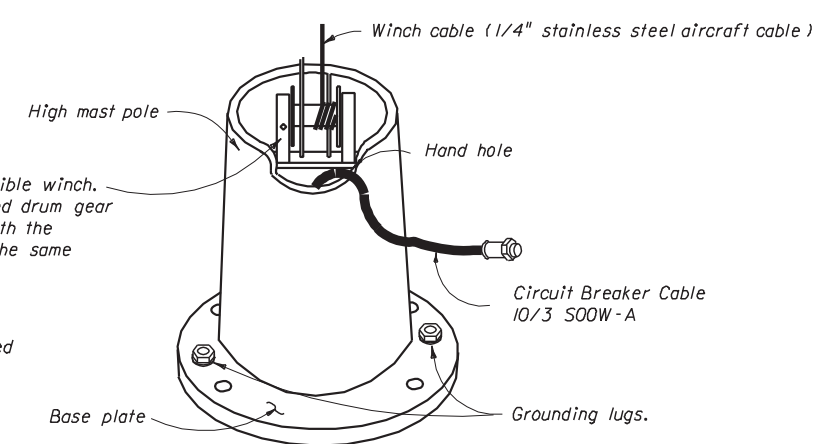


Spring supported centering arms provided to center the luminaire ring.



Surge protector shall be located in pole with circuit breaker.

Positive drive reversible winch. The complete enclosed drum gear shall directly mesh with the worm gear train, in the same enclosure.



POLE DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

HIGHMAST LIGHTING

Names	Dates	Approved By		
Designed By		 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 4	17502

LUMINAIRE SPECIFICATIONS

The reflector with its aluminum cover shall be firmly attached to a cast ring. This ring shall have keyhole slots in its upper surface such that the reflector/refractor assembly may be readily attached to, or detached from, the luminaire bracket entry and lamp support assembly without completely removing the support bolts.

Each luminaire shall contain an integral auto-regulator type ballast connected for 480 volts input $\pm 10\%$ and a power factor of more than 90%. The luminaire ballast shall be enclosed within an aluminum housing which integrally attaches to the luminaire bracket entry and lamp support assembly. It shall be readily removable without removing the luminaire from the bracket arm.

The luminaire shall be attached to the bracket arm by means of a bracket entry and lamp support assembly. The assembly shall include a side entry slipfitter designed for 2" pipe with provision for 3° adjustment for leveling the luminaire. An enclosed terminal block shall be included such that all electrical connections shall be protected from exposure to weather.

All electrical connections shall be made waterproof or be made inside a weather resistant enclosure. All luminaires shall be ANSI/IES light distribution as indicated in plans. Each luminaire shall be labeled with a permanent label which states the type of lamp, voltage input, power input, power factor, ballast type, socket position, ANSI/IES light distribution, and such other catalog information that a complete replacement can be readily ordered.

The contractor's attention is directed to those plan sheets detailing the mounting of luminaires at the pole top. Particular attention is directed to alignment of luminaire light distributions. Special attention must be exercised in the physical alignment of these luminaires to ensure that the approved photometric layout is physically produced at each lighting standard in the field. A marking shall be placed on the external face of the refractor to allow visual inspection of alignment. The marking shall correspond to the 0° axis of the refractor.

FOOTING

The high mast foundations shall be constructed in accordance with the details shown in the plans.

Anchor bolts per manufacturer's Specifications. Submittals shall be supplied to the engineer of record prior to purchase.

One leveling nut, one hold-down nut, and one locking/jam nut shall be supplied per anchor bolt. All small metal parts, (nuts, screws, washers, etc.) shall be rustproofed either by galvanizing per ASTM A153 or by the nature of the material used in their fabrication.

LOWERING SYSTEM SPECIFICATIONS

- The lowering system shall consist of the following:
- A. Head frame and cover
 - B. Luminaire ring
 - C. Cables
 - D. Winch
 - E. Portable power unit (1 per project)

The head frame unit shall rigidly mate the top of the pole to the head frame platform. The platform with its associated sheaves, etc. shall be covered and raintight. The head frame structure shall be zinc coated steel, attached to the pole by means of a steel slipfitter. Head frame shall encompass six 5" nominal steel cable sheaves grooved to the exact cable diameter, for 180° cable bearing surface. The sheave shall be zinc electroplated to ASTM 164 and dipped in yellow chromate for corrosion resistance. Bearings and cable keepers shall have permanent lubrication. Three (3) stainless steel 7 x 19 aircraft cables of $\frac{3}{16}$ " or greater diameter shall be provided.

The pole cable shall be attached to the luminaire ring with a waterproof connector capable of withstanding the pull of the weight of the pole cable. Where the wire ropes are required to bend over sheaves or over the winch drum, the maximum working stress in the outer fibers of wire rope shall not exceed 20 % of the wire rope manufacturer's rated ultimate stress.

Drum design shall cause level wind of wire rope. The power cord shall travel on sheave (s) or a combination of rollers providing a radius for the cord of 6" or larger. Each end of the sheave (s) or rollers shall have a keeper to prevent the cable from jumping out of the roller track.

The head frame shall also include three (3) latching devices to support the luminaire ring assembly when the lowering device is not in operation. The latches shall be actuated by alternate raising and lowering of the hoisting cables. Locking of luminaire ring shall be signaled by indicators visible from ground. All moving parts of the latch mechanism shall be serviceable from the ground. Each of the three latches shall be strong enough, by itself, to support twice the weight of the ring and all the luminaires. Latching mechanisms which depend primarily upon spring operation or contain dissimilar metals are not acceptable. The latching mechanism shall not require adjustment after the original installation.

The luminaire ring shall be constructed of a minimum of 6" x 2" x 7 gauge steel channel galvanized in accordance with ASTM A123 Class "B" steel channel with the appropriate number of 2" steel pipe mounting arms. The luminaire ring shall be prewired with Type "W" or specially reinforced Type "SO" power cable with suitable conductor quantity and size for proper operation and Type "ST" distribution wiring with insulation suitable for at least 105° C. All power cables should be attached to the aluminum weathertight wiring chamber with weathertight cable connectors. A 600 volt terminal block, completely prewired shall be included in the weathertight wiring chamber. A weather-tight twistlock power inlet shall be provided on the luminaire ring to allow testing of the luminaire while in the lowered position. The power inlet shall face away from the pole for easy access.

The ultimate support of the luminaire ring shall not be dependent upon the lowering and raising cables.

The system shall be provided with circuit-breaker switches and twistlock disconnects in the pole base. Raising speed of luminaire ring shall be a minimum of 12' per minute.

The winch shall be a reversible worm gear self locking type with an integral friction drag brake to prevent freespooling. The winch shall be designed for hand operation or for operation by means of a $\frac{1}{2}$ " heavy duty reversing electric drill motor, remote controlled to enable the operator to stand 25' from the pole. Stainless Steel 7 x 19 aircraft cables of $\frac{1}{4}$ " or greater diameter equal to MIL-W-5424 shall be supplied on the winch. The winch shall be provided with keepers above the drum to force the cable away from the ends of the drum for spooling. The drum shall have a wire guard to prevent the cable from coming off.

The winch shall be mounted in such a way that the cable terminator and the riser cable connector may be reached and worked on by a person with his arm through the handhole.

Roller contact spring-loaded centering arms shall be provided to center the luminaire ring while ascending or descending the pole. The rollers for the centering arm shall be made of a water resistant non-marking composition material. All shafts and washers shall be #304 stainless steel. The spring-loading mechanism shall consist of an oil-tempered steel compression spring over an aluminum rod. The rollers shall be in contact with the pole at all times.

POLE SPECIFICATIONS

The pole shaft may be jointed or single piece, polygon or round, high strength steel having a minimum yield strength of 50 ksi. All material shall be single thickness steel plate with no laminations. Steel shall be as specified.

All poles shall be equipped with a reinforced handhole approximately 1' above the base plate. The handhole shall be 10" wide by 20" high minimum.

All poles and hardware will be adequately packed to assure protection to the finish during shipping and handling, poles shall not be shipped pre-assembled.

Drawings shall be provided with the equipment which show assembly sequence, lift point, and recommended erection procedure. A permanent decal or card shall be fixed on the inside of the handhole cover which describes the sequence for lowering the luminaires and the cautions.

The proportioning of weld details and the operation of welding shall be in accordance with the current edition of the AASHTO Standard Specifications for Welding of Structural Steel Highway Bridges, and The Referenced American Welding Society Structural Welding Code.

Shop drill two (2) $\frac{5}{8}$ " diameter holes 180 degrees apart through total thickness of base plate. Tap top of hole for $\frac{5}{8}$ " x $\frac{3}{4}$ " IN C stainless steel hex head bolt.

Finished poles shall have a protective coating of hot galvanizing applied in accordance with ASTM A123.

Note : It is the responsibility of the contractor to coordinate the anchor bolt design with foundation design.

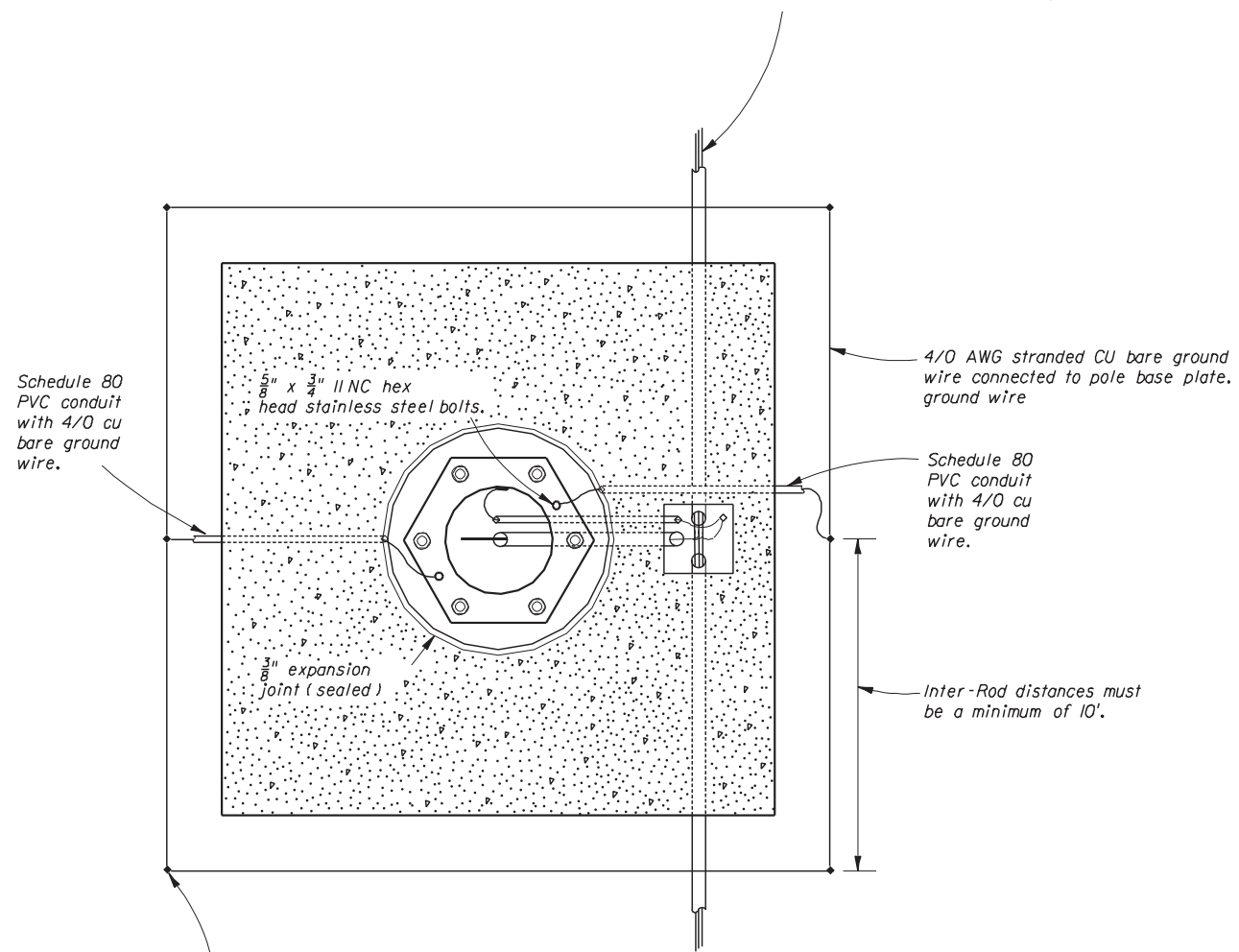
ALTERNATE POLE

A spun high mast prestressed concrete pole listed on the Qualified Products List may be substituted for a steel pole with approved shop drawings and calculations. If the concrete pole is provided as a substitute for the steel pole, payment will be made under the items bid for steel poles and associated foundations and plan quantity of these items will be the basis for payment.

NOTES

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
HIGHMAST LIGHTING				
Names	Dates	Approved By		
Designed By	2-72	<i>Clark A. Scott</i> State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 4	17502

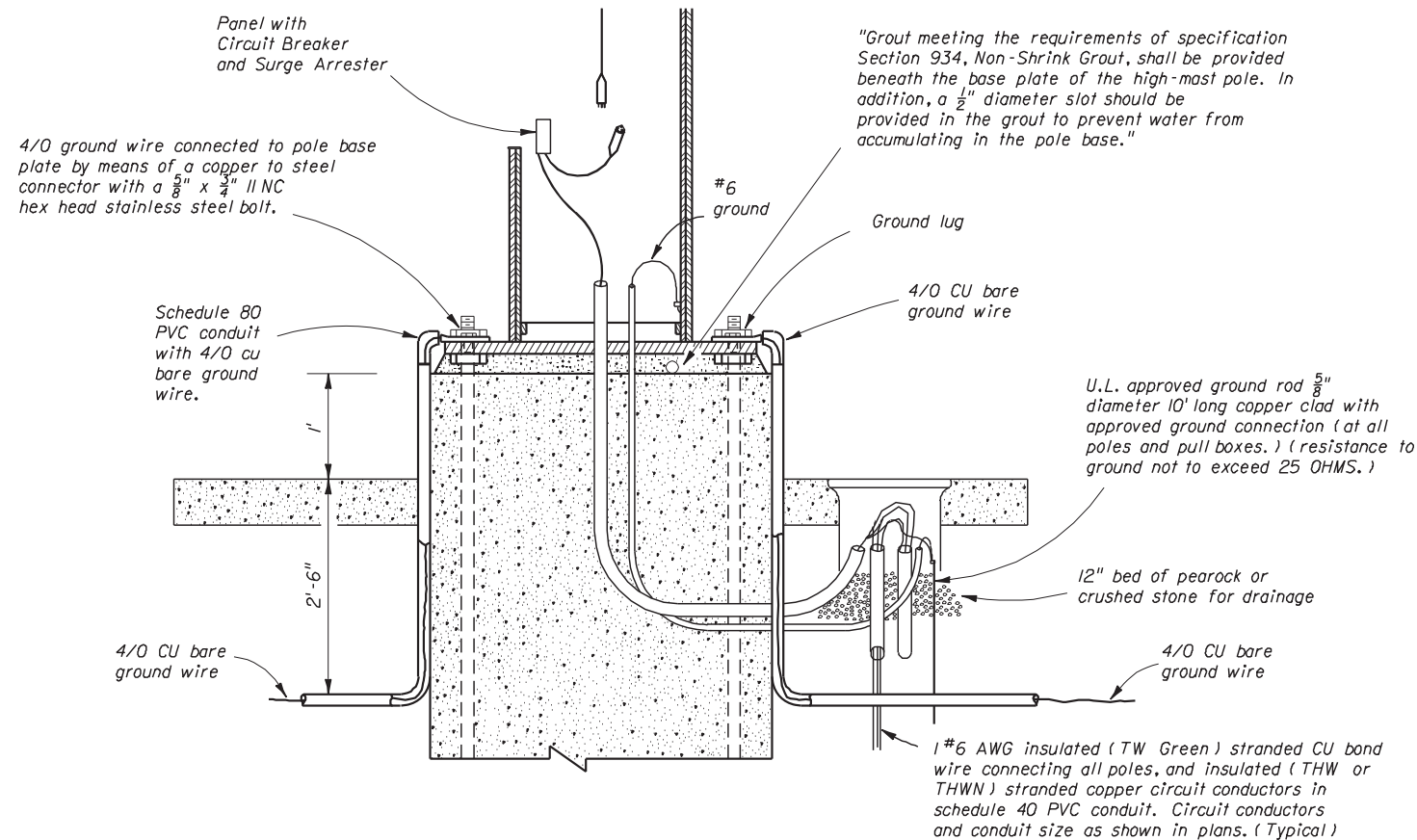
1#6 AWG insulated (TW Green) stranded CU bond Wire connecting all poles, and insulated (THW or THWN) stranded copper circuit conductors in schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plans. (Typical)



Minimum $\frac{5}{8}$ " x 20' approved ground rods (6).
Maximum resistance to ground 25 ohms per rod and total system not to exceed 10 ohms.

Notes:

1. At all pull boxes and pole bases, ends of conduit shall be sealed in accordance with Section 630 of The Standard Specifications For Road And Bridge Construction.
2. 1# 6 AWG insulated (TW Green) stranded CU bond wire connecting all poles, and insulated (THW or THWN) stranded copper circuit conductors in schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plans. (Typical)
3. Slabs to be placed around all Poles and Pull Boxes.
4. For Pull Boxes between Poles refer to index I7500 sheet 2 of 3.

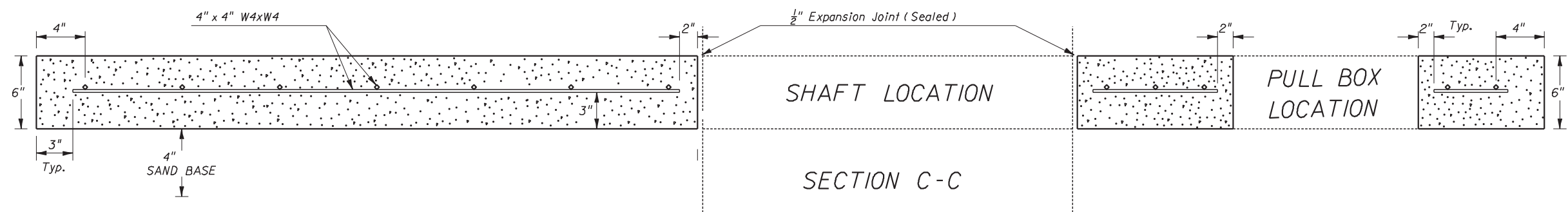
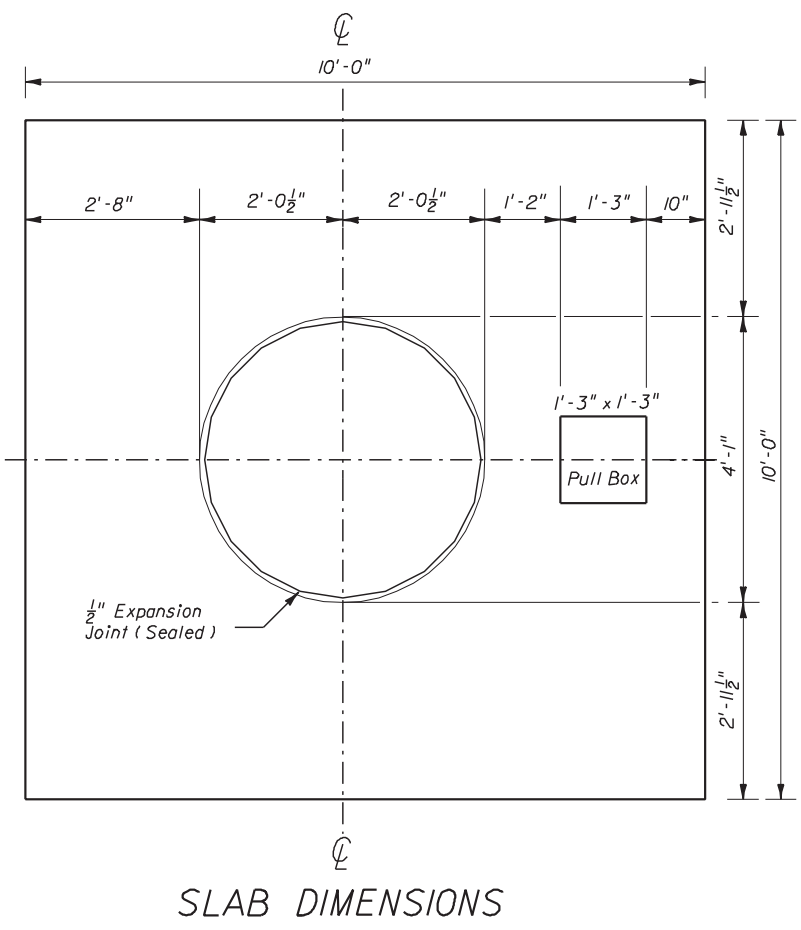
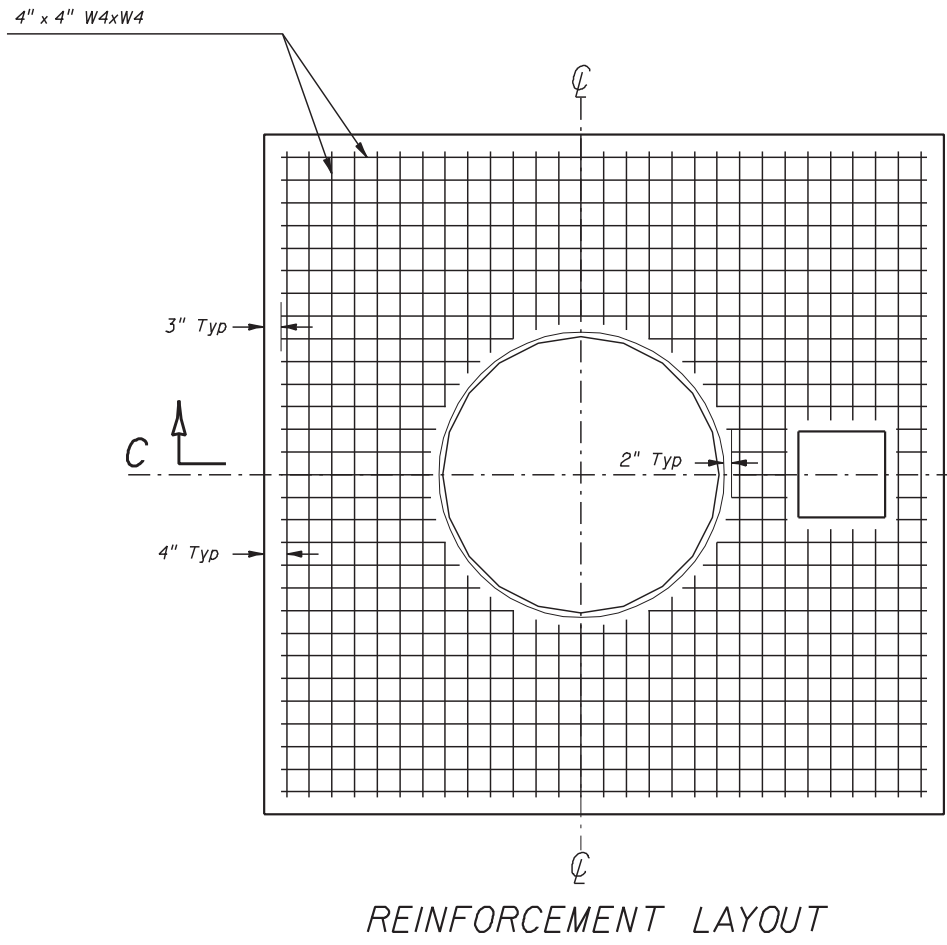


WIRING DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

HIGHMAST LIGHTING

Names	Dates	Approved By		
Designed By		<i>Charles A. Scott</i>	State Traffic Plans Engineer	
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	3 of 4	17502



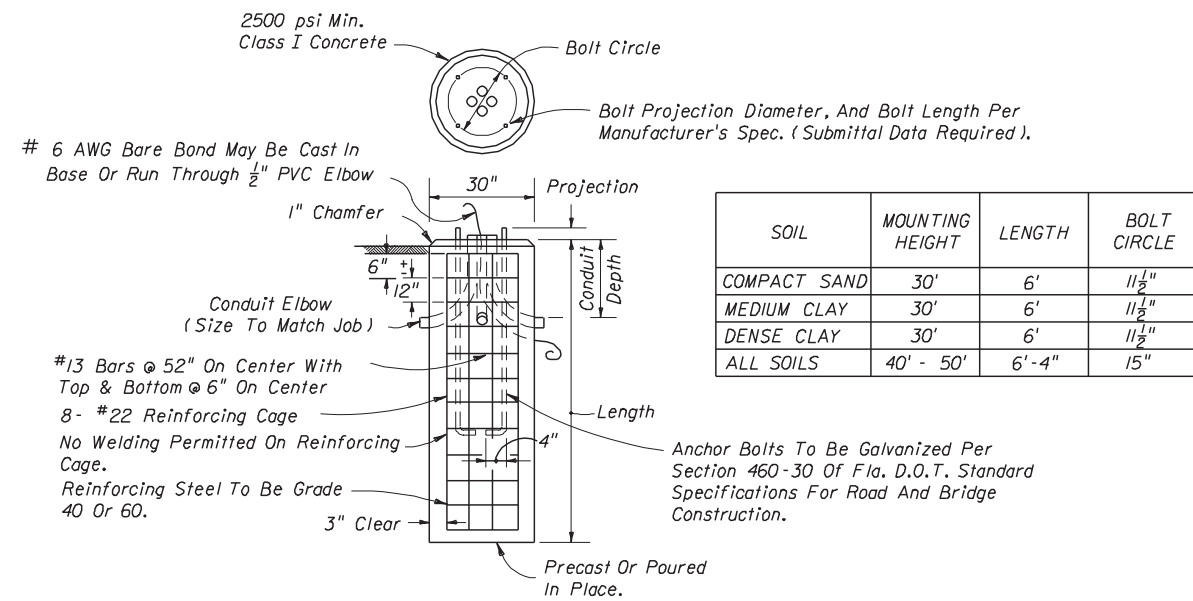
NOTES:

1. Use clean free draining sand < 5% passing No. 200 sieve for base (4").
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete strength at 28 days shall be $f'c = 3$ ksi.
4. Outside edges of slab shall be cast against formwork.
5. The 1/2" thick expansion joint between shaft and slab shall be sealed with a hot poured elastic joint sealer.
6. Concrete slabs around poles and pull boxes shall be paid for under the contract unit price for Class I Concrete (Miscellaneous); the cost for reinforcing steel fabric shall be included in the price for Class I Concrete (Miscellaneous).
7. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.

SLAB DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
HIGHMAST LIGHTING				
Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i> State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	4 of 4	17502

Foundations apply only to slopes of 1:4 or flatter.

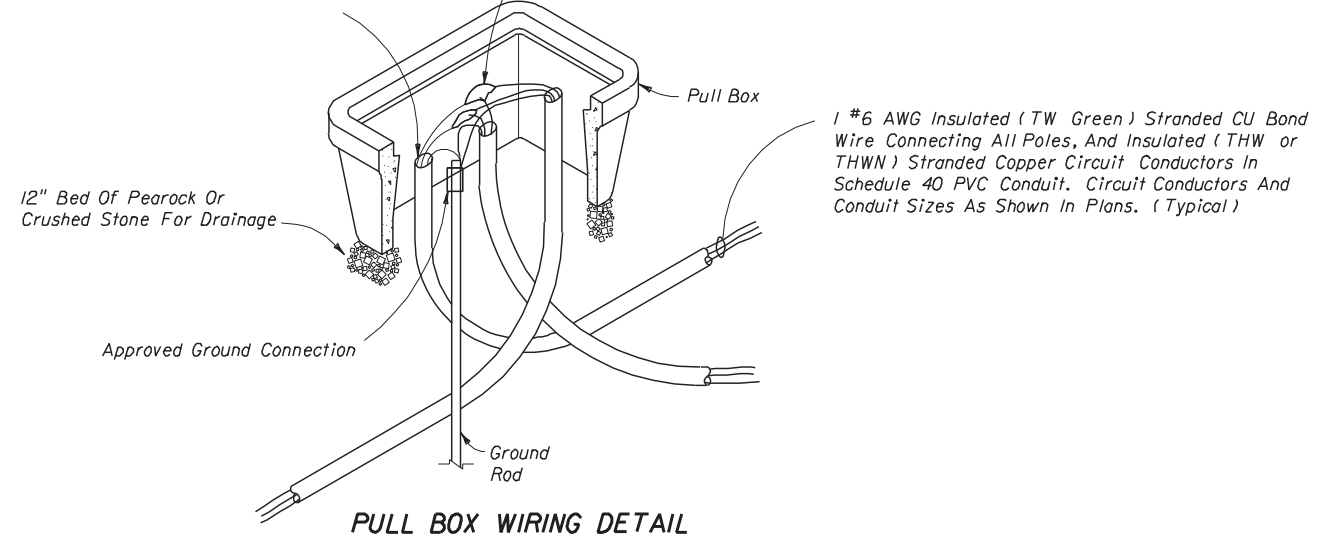


SOIL	MOUNTING HEIGHT	LENGTH	BOLT CIRCLE
COMPACT SAND	30'	6'	11 1/2"
MEDIUM CLAY	30'	6'	11 1/2"
DENSE CLAY	30'	6'	11 1/2"
ALL SOILS	40' - 50'	6'-4"	15"

METAL POLE CONCRETE FOUNDATION DETAIL

At All Pull Boxes, And Pole Bases,
Ends Of Conduit Shall Be Sealed
In Accordance With Section 630
Of The Standard Specifications
For Road And Bridge Construction.

All Splices Shall Be Made In Pull Box
Or Pole Base With Compression Sleeves
Or Split Bolt Connectors Properly Taped
And Weatherproofed.



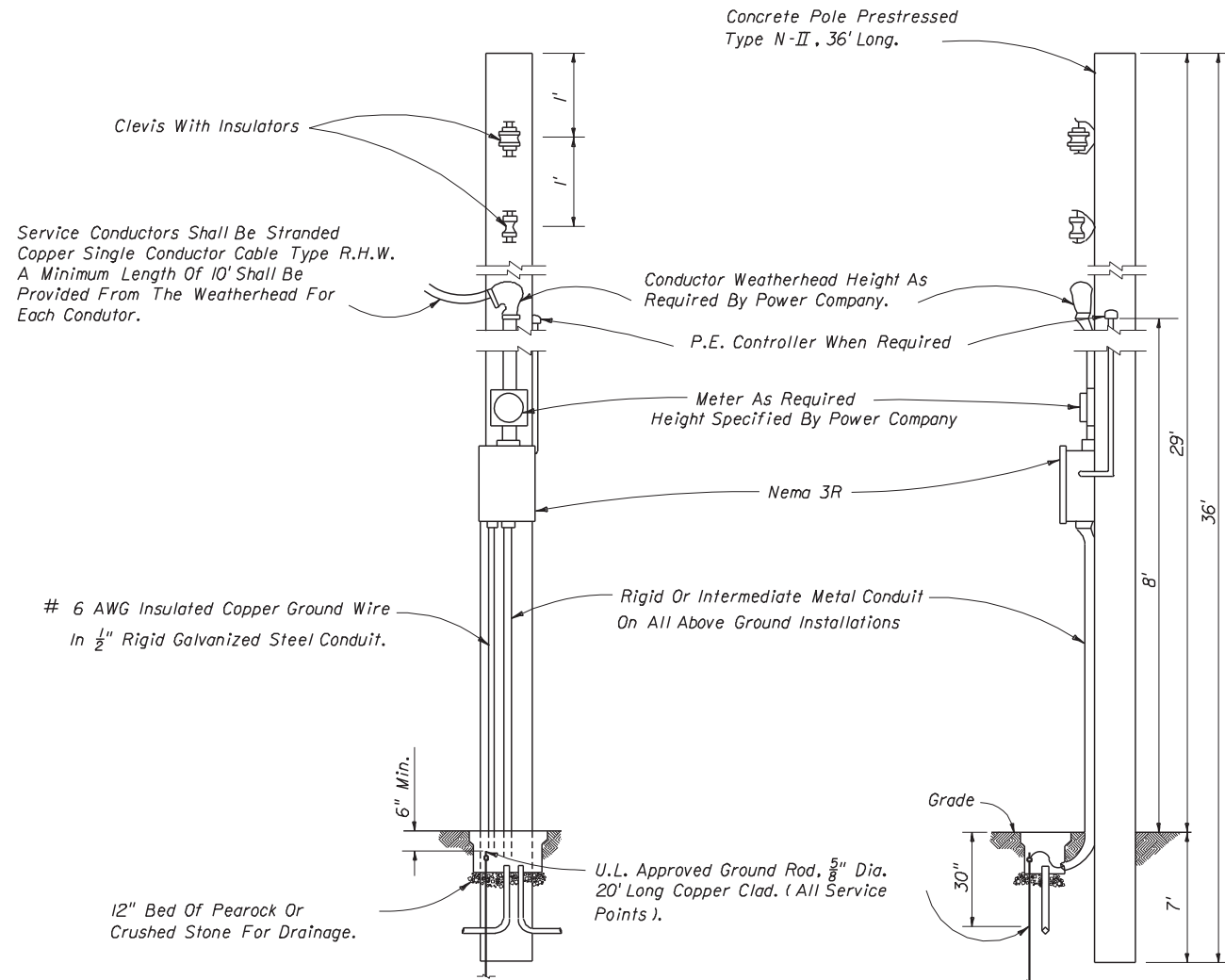
PULL BOX WIRING DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

ROADWAY LIGHTING DETAILS

Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i>	State Traffic Plans Engineer	
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	17503

NOTE :
 It shall be the contractors responsibility to provide a complete service assembly as per the plans and service specifications. The service installation shall meet the requirements of the national electric code and applicable local codes. Shop drawings are not required for service equipment, unless noted in the plans.



DETAIL A
AERIAL FEED

Notes:

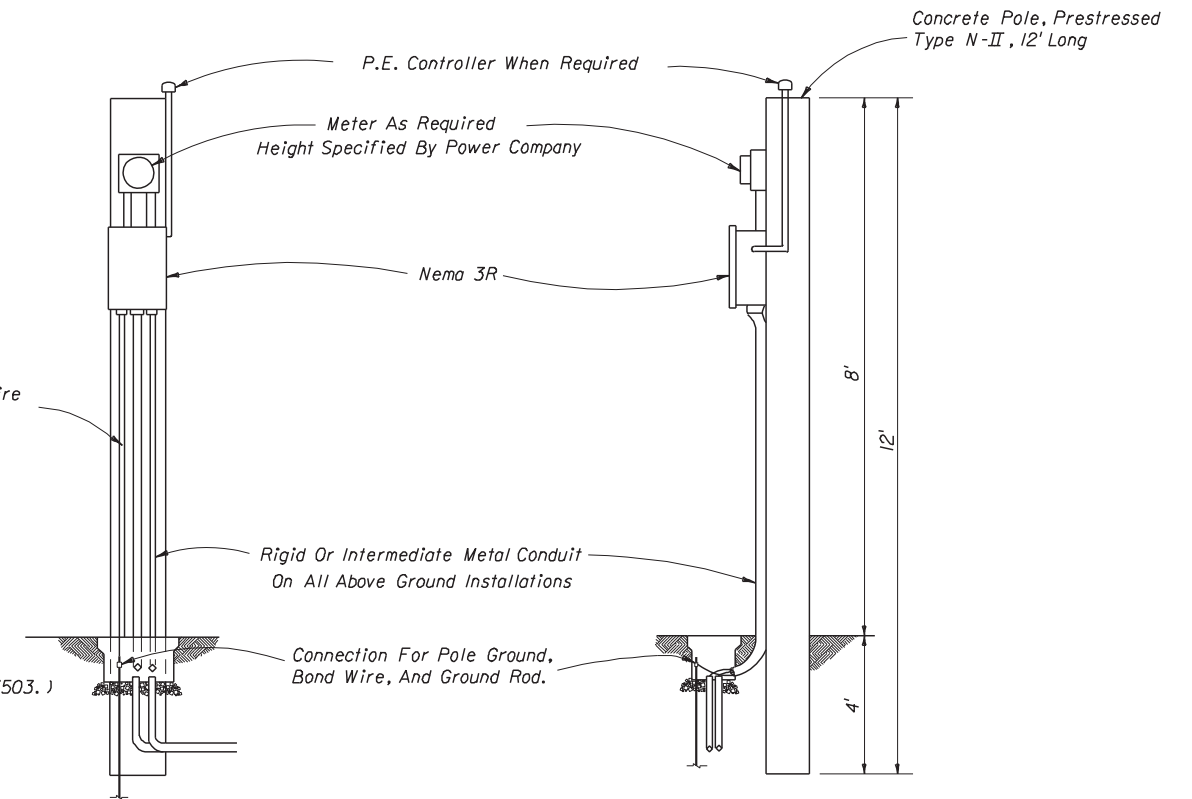
1. Photo electric control as required.
2. All neutral wires to have white insulation, do not use white or green insulated wires for ungrounded conductors.
3. A pull box is required at each service point.

SERVICE SPECIFICATIONS

1. The enclosure shall be NEMA 3R, pole mounted, rain-tight.
2. The enclosure door shall be lockable by padlock and four keys provided to the maintaining agency. The door shall have a minimum of three hinges and be latchable. No screws to be used to attach door.
3. 480 V minimum rating bolt-in type breakers shall be used.
4. Busbar to be copper coated and have a minimum rating of 100 amps. When main breaker exceeds 100 amps busbar to match breaker amperage.
5. Locate contactor, transformer, and H.O.A. switch inside enclosure. The enclosure to be sized to accommodate as many breakers as called for and all other service equipment.
6. The Enclosure to be rigidly attached to the pole face.
7. A 600 V lightning protector shall be wired inside the enclosure.
8. A main breaker is required in all service panels with 2 or more feeder breakers.
9. All service equipment shall be U.L. approved.

6 AWG Insulated Copper Ground Wire
 In 1/2" Rigid Galvanized Steel Conduit.

Pull Box
 (See Detail Index 17503.)

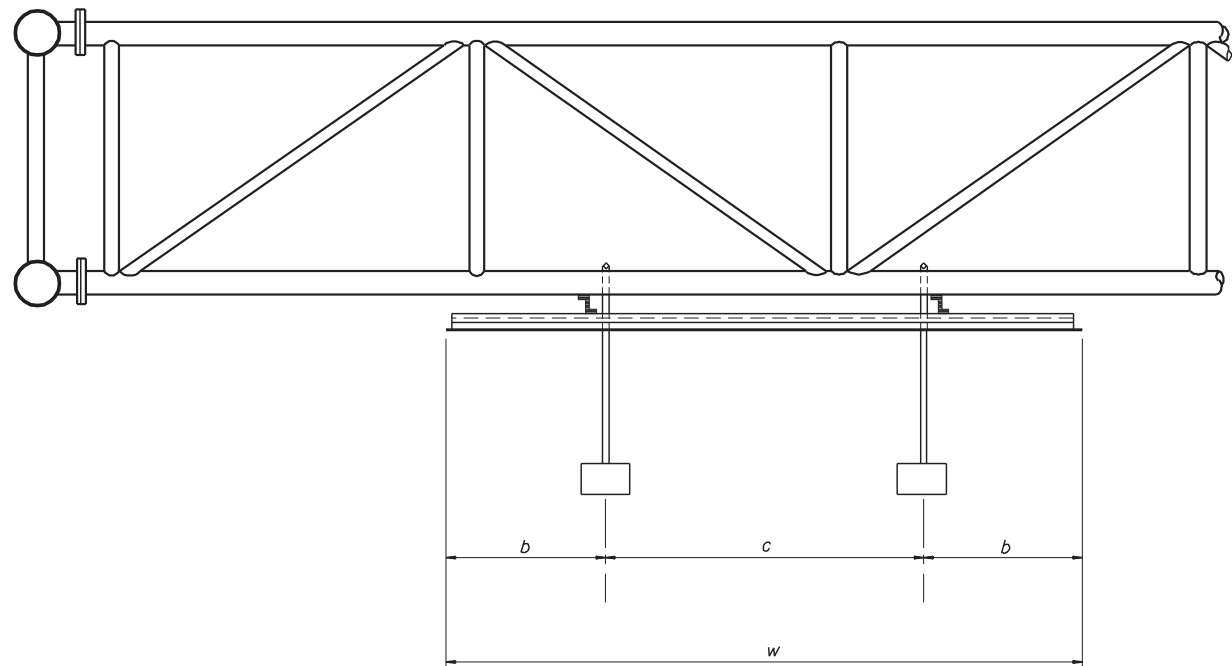


DETAIL B
UNDERGROUND FEED

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 TRAFFIC DESIGN

SERVICE POINT DETAILS

Names	Dates	Approved By		
Designed By	8-78	Charles A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	17504



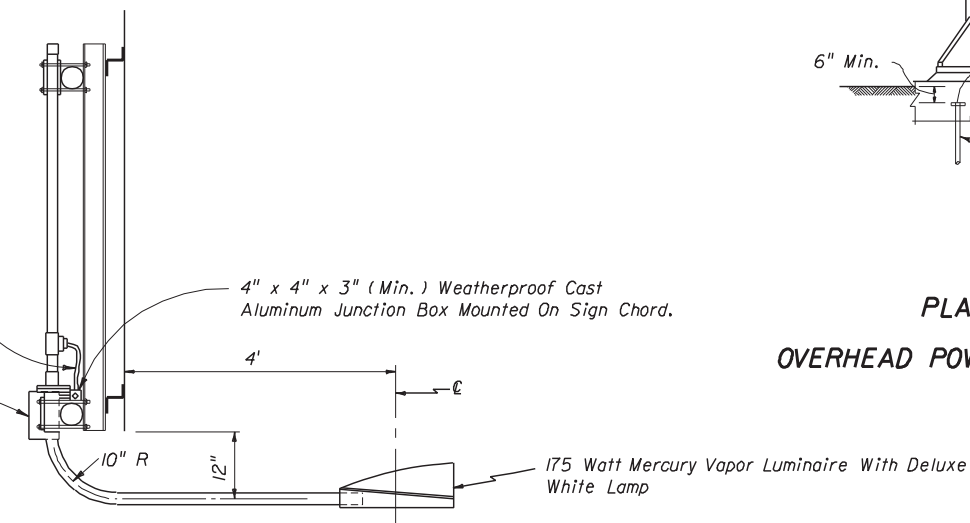
WIDTH OF SIGN FACE	To 10'	To 21'-6"	To 32'-6"	To 43'-4"
NUMBER OF FIXTURES	ONE	TWO	THREE	FOUR
EQUATIONS FOR PLACING FIXTURES ALONG SIGN WIDTH	$W = 2b$ $c = 0$	$W = 2b + c$ $c = 2.2b$	$W = 2b + 2c$ $c = 2.2b$	$W = 2b + 3c$ $c = 2.2b$

PLACEMENT OF SIGN LIGHTS

- 1- Luminaire shall be mounted so the lamp center is 4' in front of the sign face.
- 2- Luminaire shall be mounted so the back of the fixture is placed 1' below the bottom edge of the sign face.
- 3- Luminaires from manufacturers who recommended their fixture be tilted shall be mounted on a bracket which provides this recommended tilt.
- 4- Photometric data for mercury vapor luminaire proposed for sign lighting shall be submitted for approval to the District Lighting Engineer, Florida Department Of Transportation.

Use 3/4" Liquid Tight Flexible Conduit From Junction Box To Ballast And From Junction Box To Tee In Luminaire Bracket. Conduit Shall Be Of Sufficient Length To Allow Rotation Of Luminaire Bracket 90° In Either Direction.

Ballast Shall Be Mounted To Sign Chord With Stainless Steel Band. Bracket For Ballast To Be Fabricated From Galvanized Steel Plate For Steel Sign Structures And Aluminum Plate For Aluminum Sign Structures. (Submittal Data Required)



PLAN OVERHEAD POWER SUPPLY

SIGN LIGHTING INSTALLATION

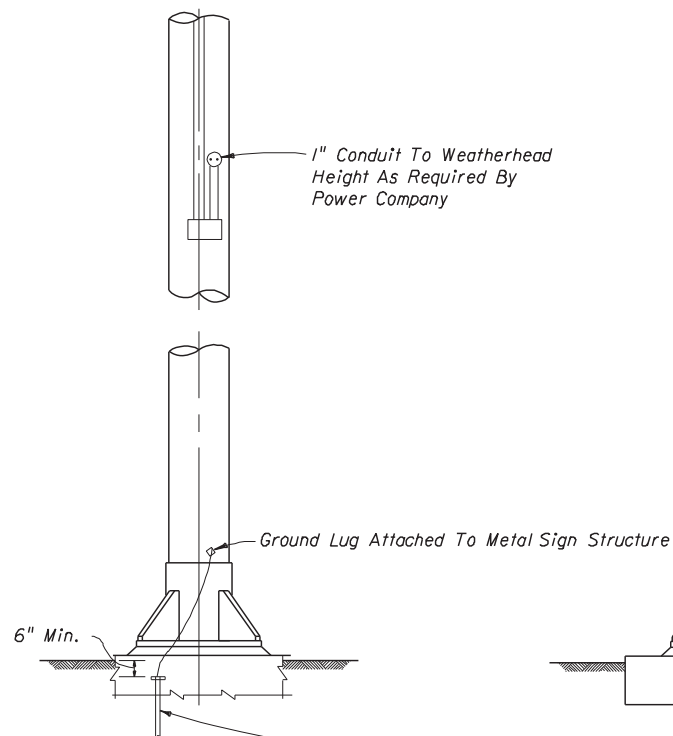
Roadway Lighting included in contract:

The power for the sign lighting shall be provided from the roadway lighting circuit. The lighting plans shall indicate the sign location and a pull-box location for connection to the sign lights. The lighting contractor shall install pull-box and loop 2" of lighting circuit conductors in the pull-box for connection by the signing contractor

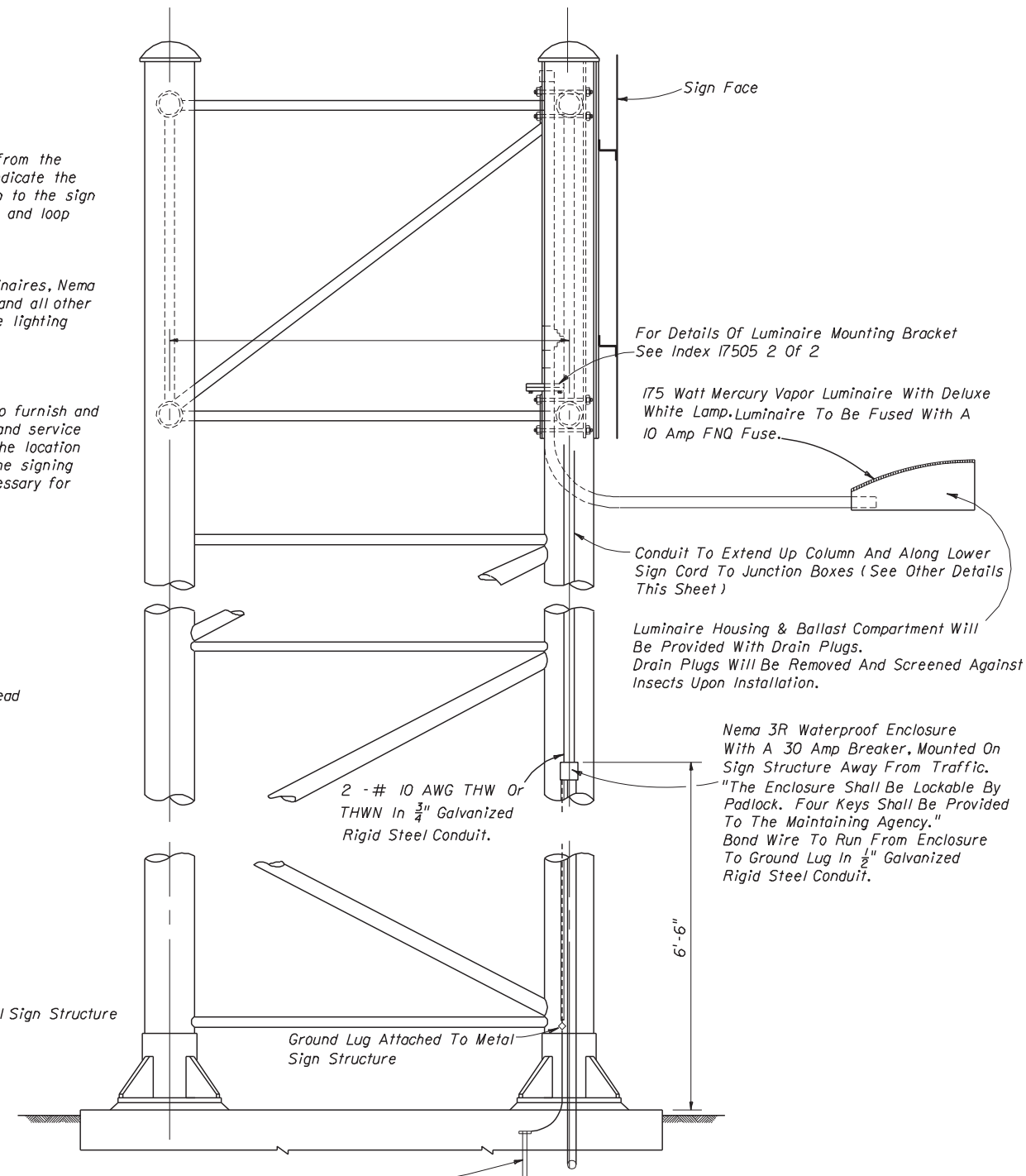
The signing contractor shall furnish and install luminaires, Nema 3R enclosure, 30 amp breaker, conduit, conductors and all other electrical equipment necessary for connection to the lighting circuit.

Roadway Lighting not included in contract:

The signing plans shall include pay item numbers to furnish and install conduit, conductors, ground rods, pull-boxes and service point equipment. The signing plans shall indicate the location of the service point equipment and circuit runs. The signing contractor shall provide all electrical equipment necessary for connection of the sign lights.



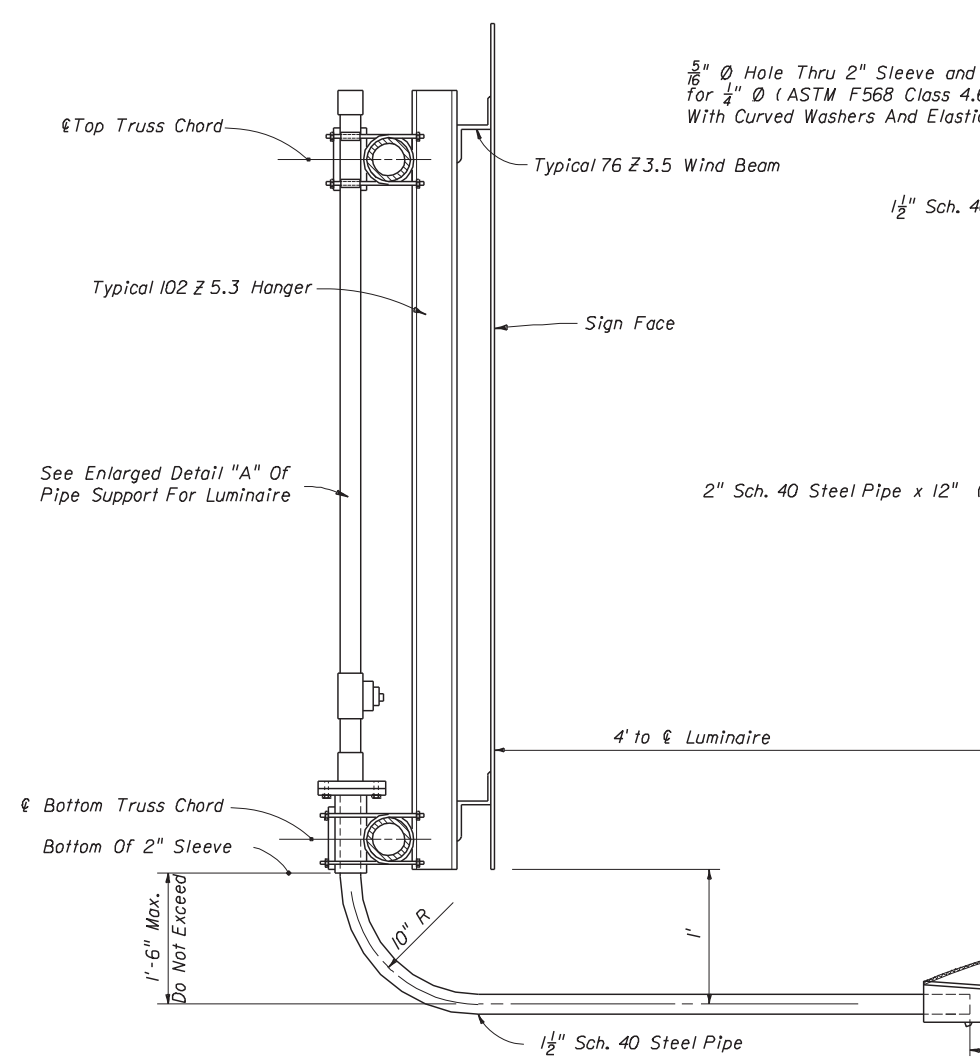
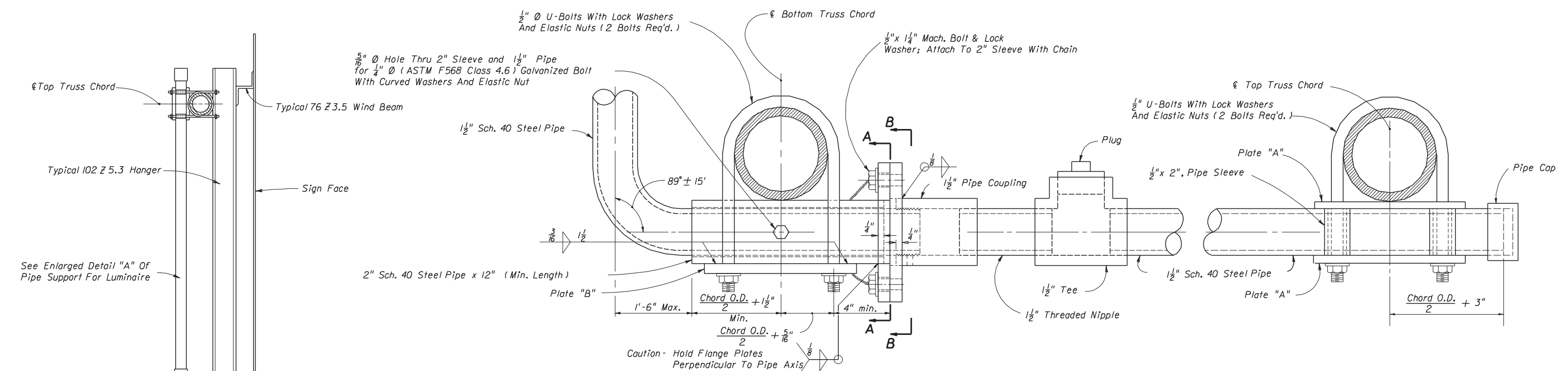
Splices To Be Made With Compression Sleeves Then Properly Insulated & waterproofed



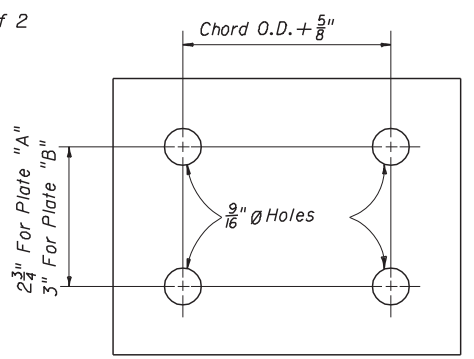
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

EXTERNAL LIGHTING FOR SIGN (MERCURY VAPOR)

Names	Dates	Approved By		
Designed By		 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	17505



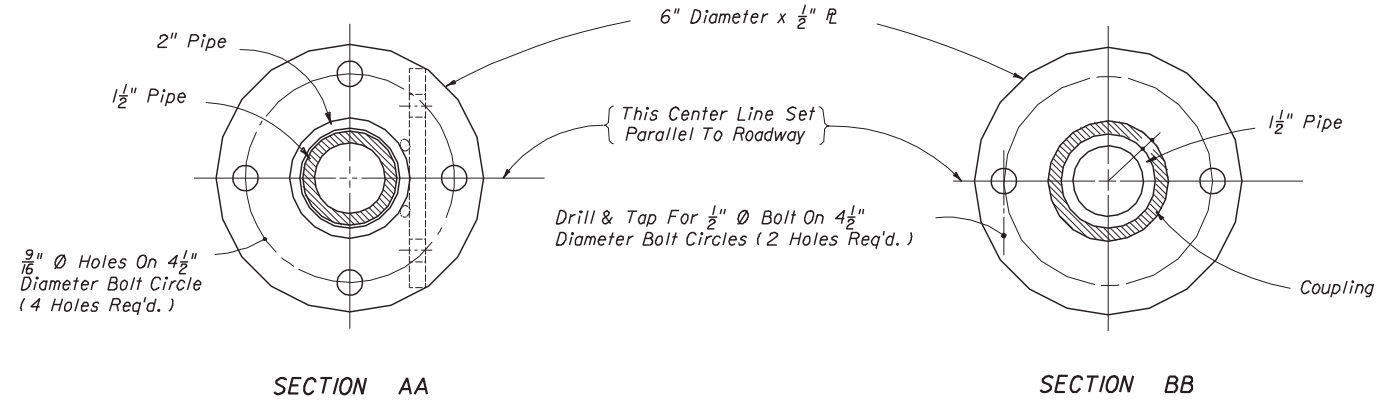
DETAIL "A"



NOTES

- 1- Dimension "A" to be established by type and make of luminaire to be purchased and used on the project.
- 2- The center lines of both flange plates and the luminaire support arm are to be set parallel to the roadway before the set screw is seated.
- 3- Minor adjustments in the horizontal location of the luminaire support arm along the bottom chord of the truss will be allowed so that the flange plates will clear the truss web members.
- 4- All steel pipe shall meet the strength requirements of ASTM Specification A53 Grade "A" or Grade "B". Steel plates shall meet the requirements of A36 and bolts, nuts and washers shall meet the requirements of ASTM F568 Class 4.6.
- 5- All items shall be hot dip galvanized after fabrication in accordance with the requirements of ASTM A123 and /or A153.
- 6- Luminaire support arm shall be free to rotate in a clockwise or counter clockwise direction. When service or maintenance is required for sign face or vertical face of truss; Support arm shall be capable of being locked in a position 90° from parallel to the roadway for unobstructed working clearance.

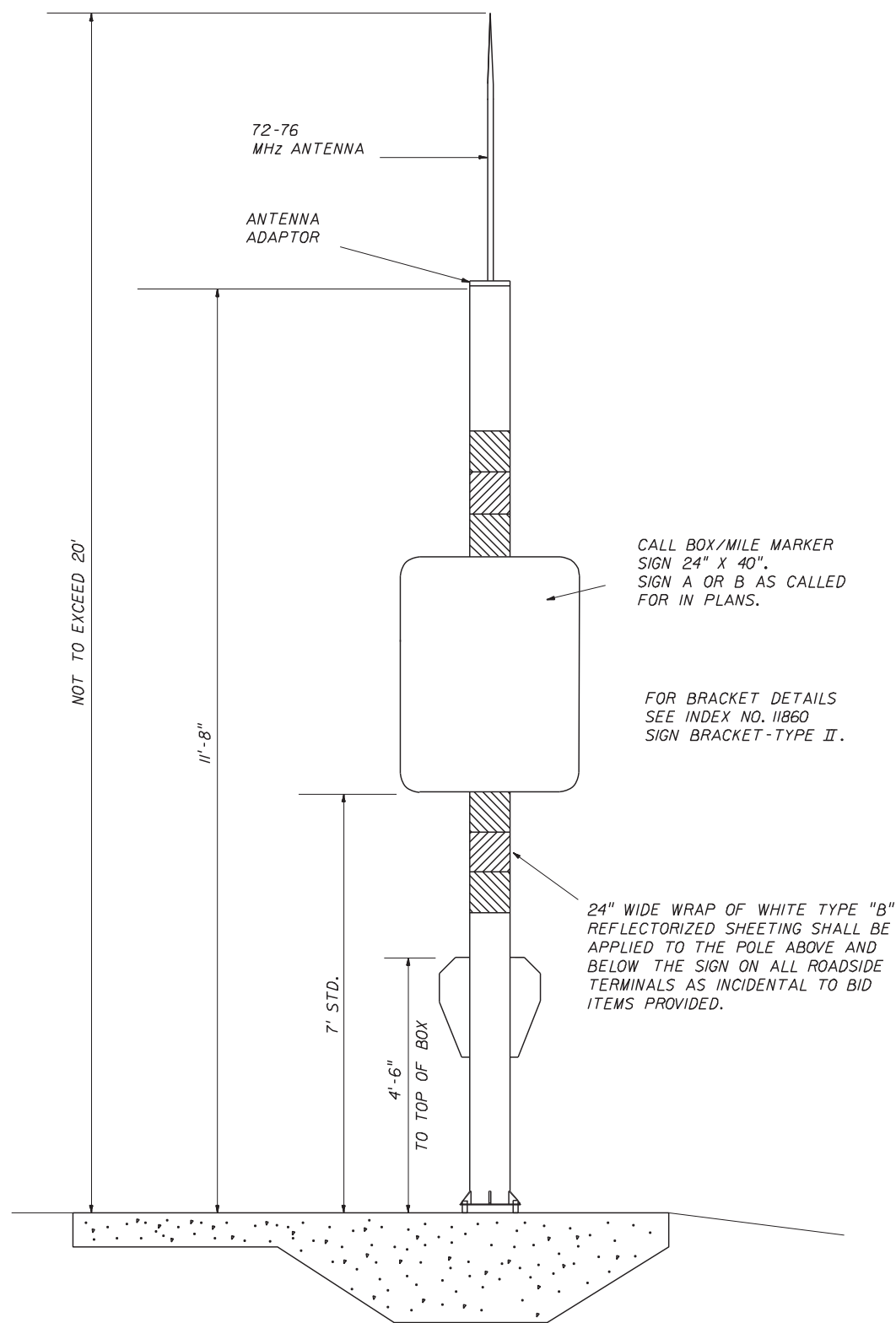
Plate "A": $\frac{1}{4}$ " x $4\frac{3}{4}$ " x Chord O.D. + $2\frac{1}{2}$ "
 Plate "B": $\frac{3}{8}$ " x 5" x Chord O.D. + $2\frac{1}{2}$ "



SECTION AA

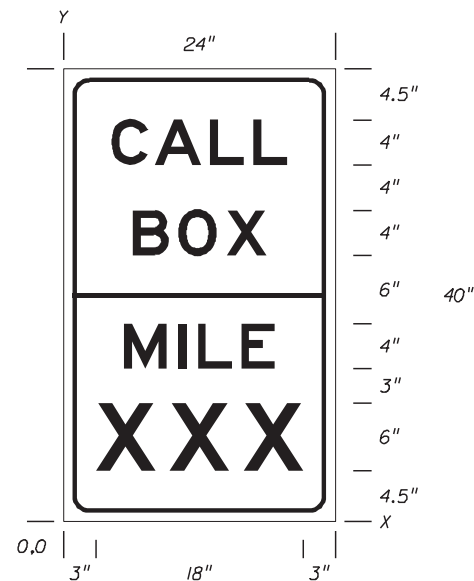
SECTION BB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
EXTERNAL LIGHTING FOR SIGNS (MERCURY VAPOR)				
Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Plans Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	2 of 2	17505
Checked By				

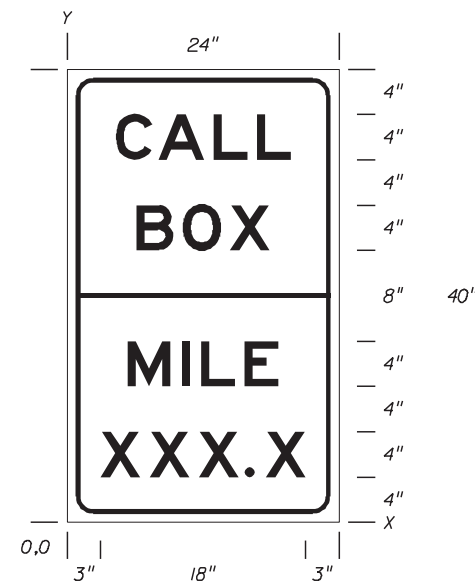


SEE SHEET 2 OF 2 FOR CONCRETE PAD DETAILS.

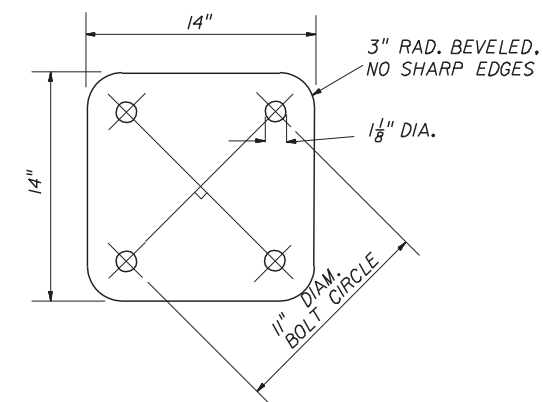
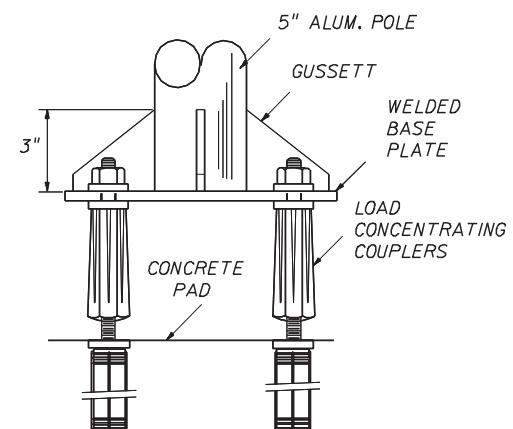
TYPICAL MOTORIST AID CALL BOX TERMINAL



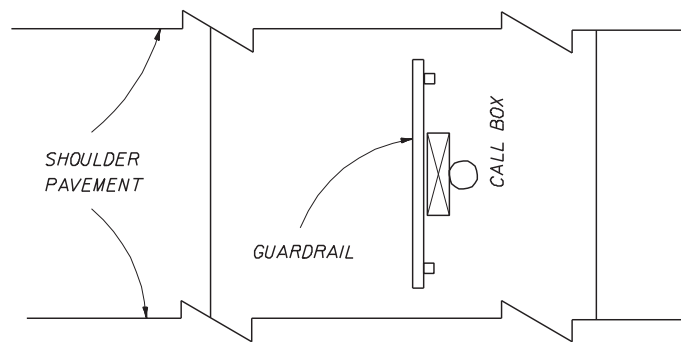
SIGN A



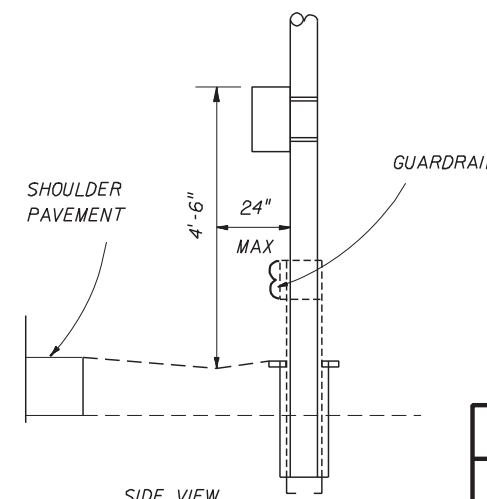
SIGN B



BASE PLATE & BOLT PATTERN



PLAN VIEW



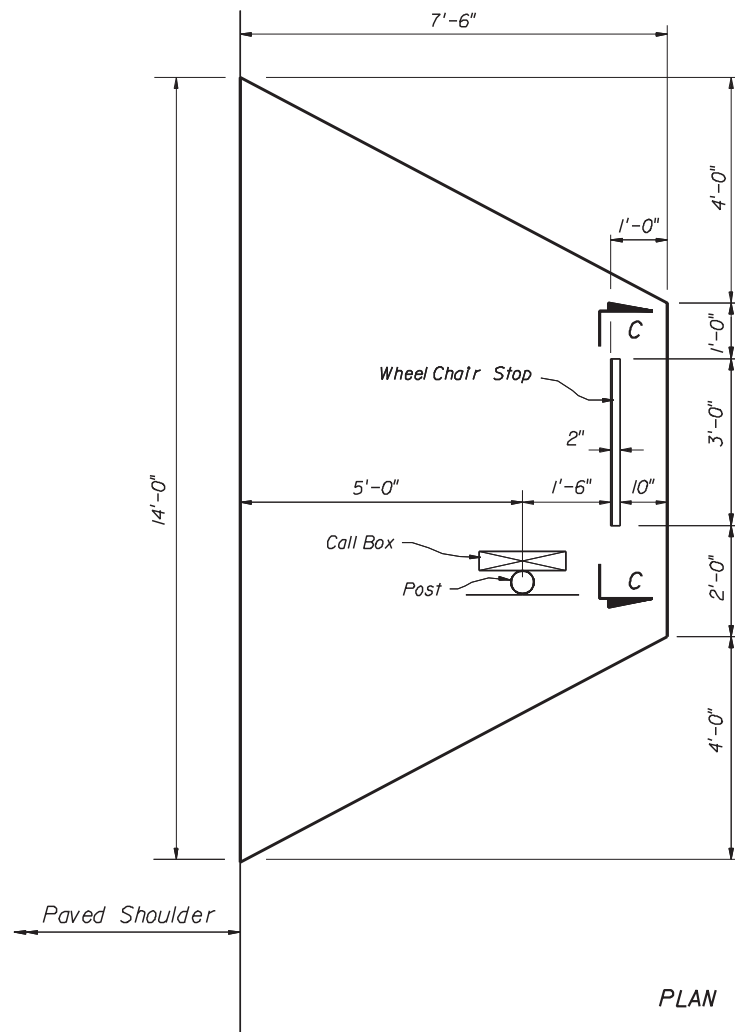
SIDE VIEW

TERMINALS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

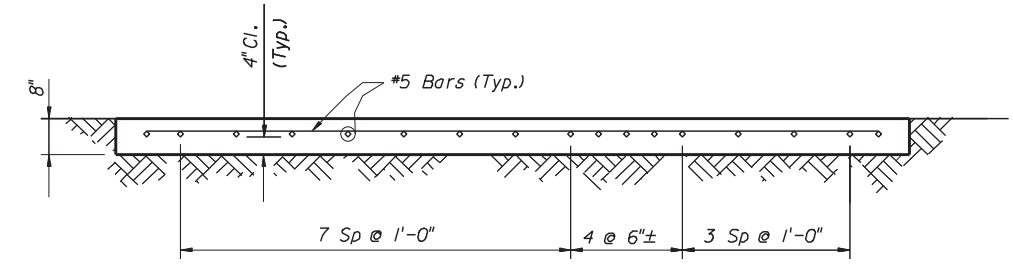
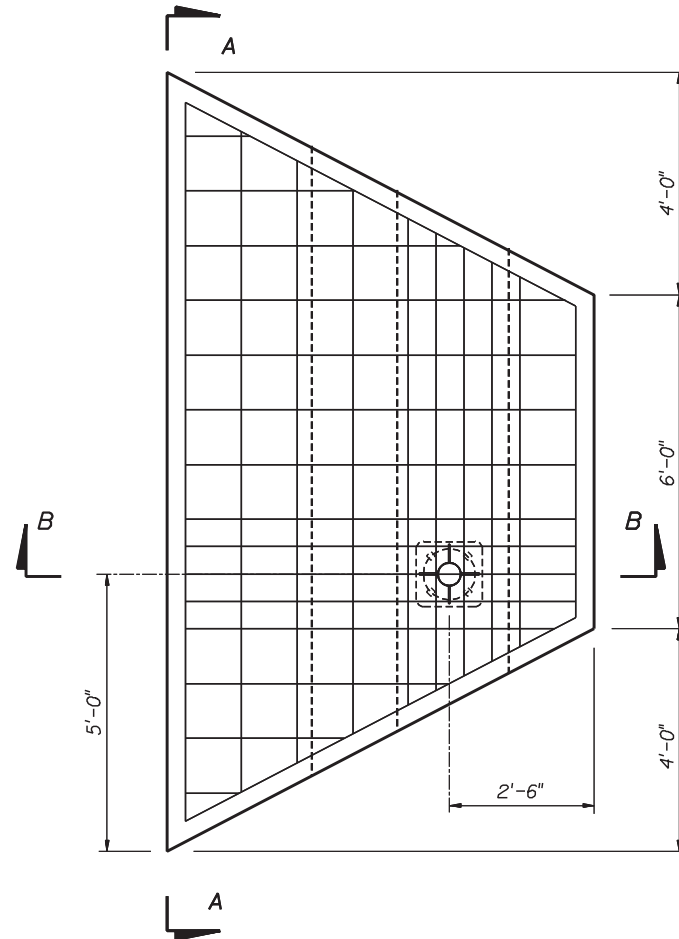
MOTORIST AID CALL BOX

Names	Dates	Approved By	
Designed By	CAS 5-98	 State Traffic Plans Engineer	
Drawn By	LW 5-98		
Checked By	CAS 5-98		
Revision	00	Sheet No.	Index No.
		1 of 2	17600



Call Box Attachment To Slab
As Per Manufacturer's Recommendation.

PLAN



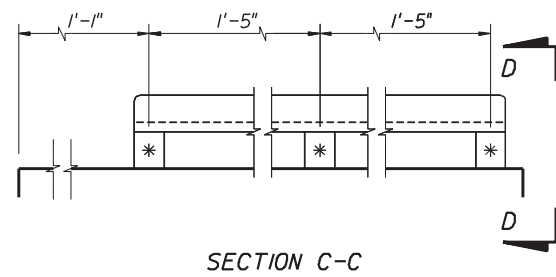
SECTION A-A

MOTORIST AID CALL BOX CONCRETE PAD QUANTITIES

Concrete : 3.5 c.y. (each)
Reinforcing Steel : 243 lb (each)

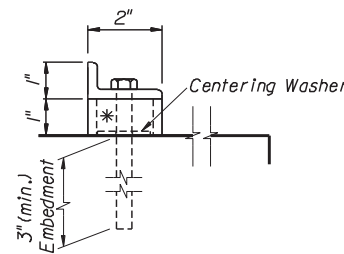
GENERAL NOTES

1. General Specifications: FDOT Standard Specifications for Road and Bridge Construction (Current Edition) and Supplements thereto.
2. Design Specifications: AASHTO Standard Specifications For Highway Bridges (Current Edition and approved revisions thereto).
3. Concrete: Concrete strength shall be Class II ($f'c = 3,400$ psi).
4. Reinforcing Steel: Reinforcing Steel shall conform to ASTM A615-96a, Grade 60.
5. Payment : Motorist Aid Call Box Concrete Pads shall be paid for under the contract unit price for Class II Concrete (Miscellaneous), c.y. and shall include all labor, materials, and installation of embedded breakaway device sleeves, and miscellaneous galvanized steel for wheel chair stop and attachments.
6. Breakaway Device shall be paid for under Call Box Assembly.



SECTION C-C

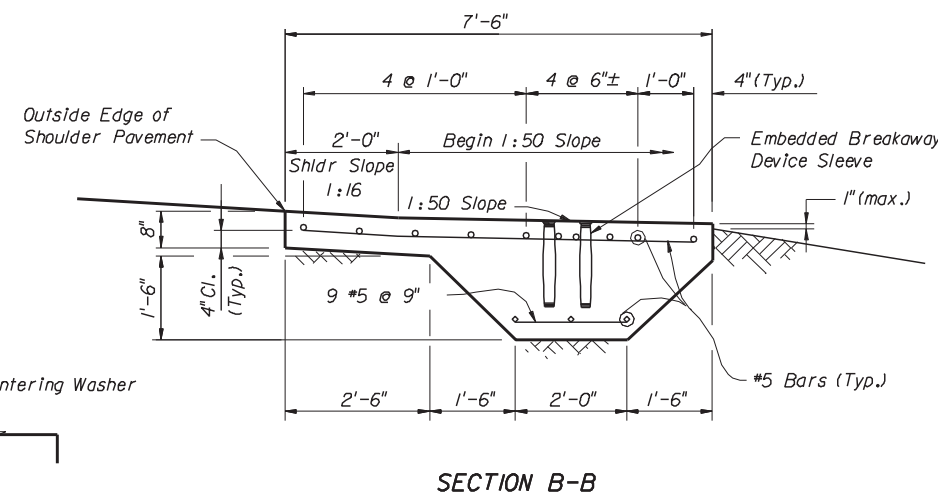
2" x 1" x 1/4" Galv. Angle And
3-3/8" Ø x 5" Galvanized Steel Expansion
Anchor Bolt With 3" Min. Embedment



VIEW D-D

* 1 1/2" Ø x 1" High
Galvanized Steel Pipe Spacer

WHEEL CHAIR STOP DETAIL



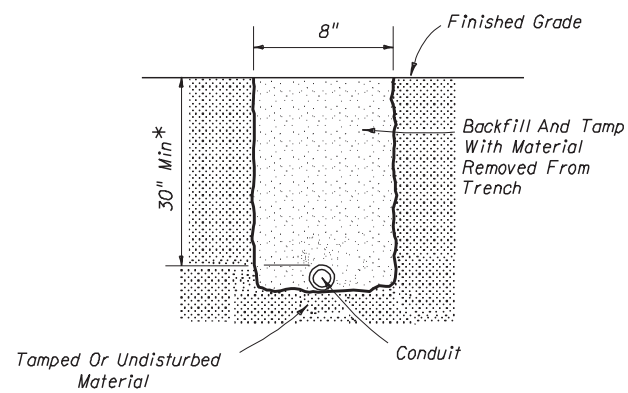
SECTION B-B

CONCRETE PAD

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

MOTORIST AID CALL BOX

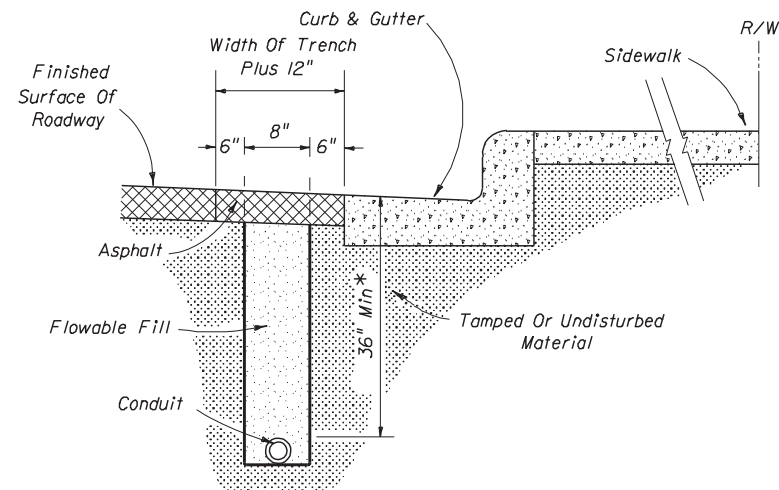
Names	Dates	Approved By		
Designed By	TJB	4-98	W. V. [Signature]	
Drawn By	SEM	4-98	State Structures Design Engineer	
Checked By	TJB	4-98	Revision	Sheet No.
			00	2 of 2
				17600



FOR USE IN AREAS NOT EXPOSED TO VEHICULAR TRAFFIC AND UNDER DRIVEWAYS

FIGURE A

*May be adjusted due to field conditions upon approval of project engineer.

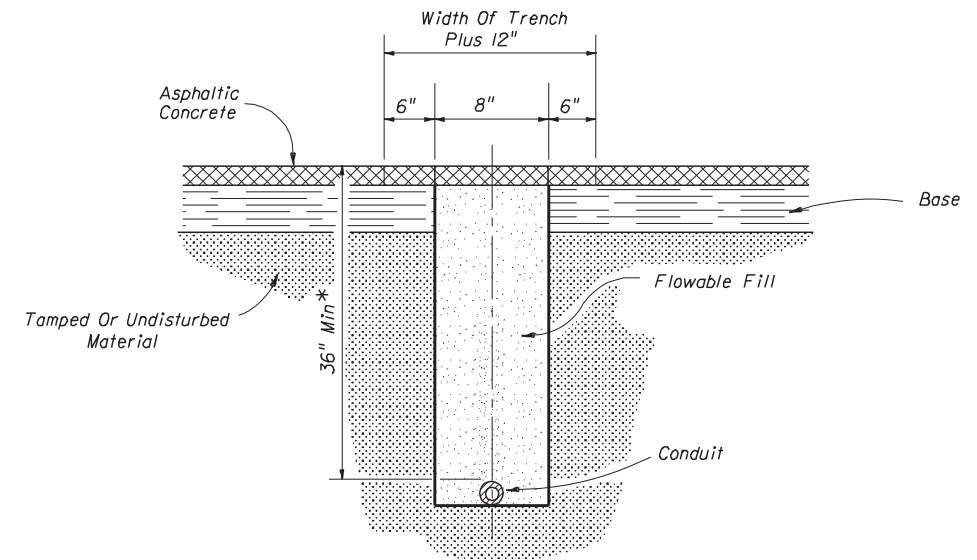


FOR USE IN ASPHALT ROADWAY ADJACENT TO GUTTER WHEN PLACEMENT OUTSIDE OF THE PAVEMENT IS NOT FEASIBLE.

Note

1. Trench not to be open more than 3' at a time when construction area is subject to vehicular or pedestrian traffic.
2. Asphalt to be sawcut and removed to leave neat lines on both sides of the 12" pavement cut.
3. See note 3 Figure C.

FIGURE B

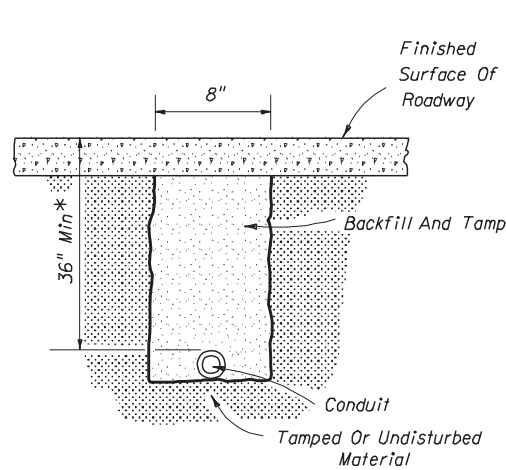


FOR USE IN INSTALLING CONDUIT UNDER EXISTING ASPHALT PAVEMENT NOT ADJACENT TO GUTTER WHEN JACKING IS NOT FEASIBLE

Note:

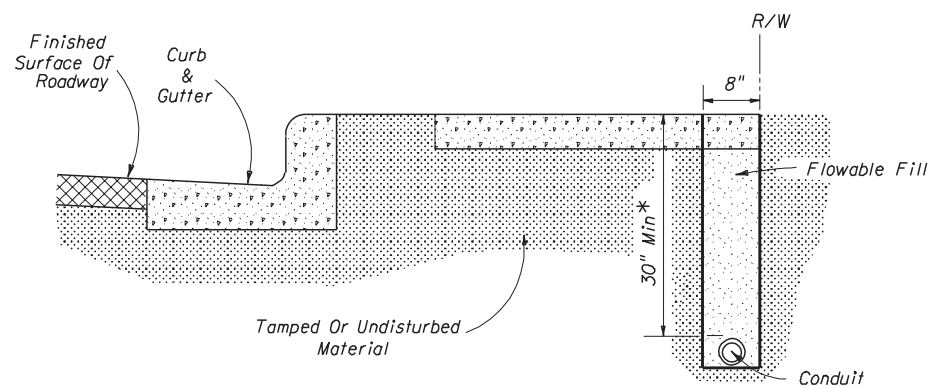
1. Rigid conduit must be used when jacking under existing pavement at 36" minimum depth.
2. Asphalt to be sawcut at the edges of the trench.
3. The removal and replacement of the additional pavement width (6") will not be required when the trench can be constructed without disturbing the asphalt surface on either side.

FIGURE C



FOR USE INSTALLING CONDUIT UNDER A NEW ROADWAY PRIOR TO INSTALLATION OF CURBS, BASE AND PAVEMENT

FIGURE D



FOR USE IN INSTALLING CONDUIT UNDER SIDEWALK

Note:

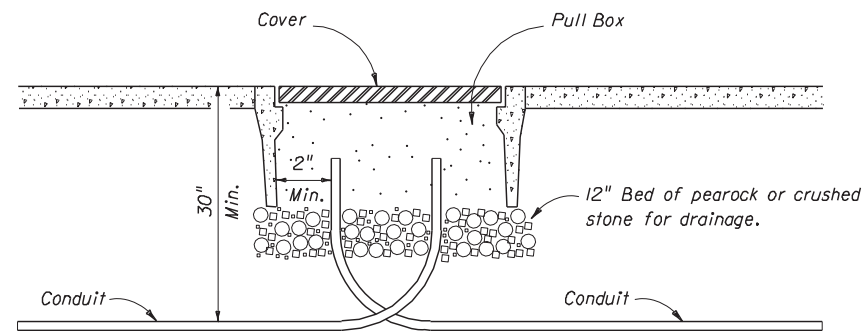
1. Sidewalk patches to match existing joints.
2. Entire sidewalk slab must be replaced when specified in the plans.
3. Backfill and tamp with material from trench except at driveways. At driveways, backfill a length of trench within the driveway entirely with Flowable Fill.

FIGURE E

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

CONDUIT INSTALLATION DETAILS

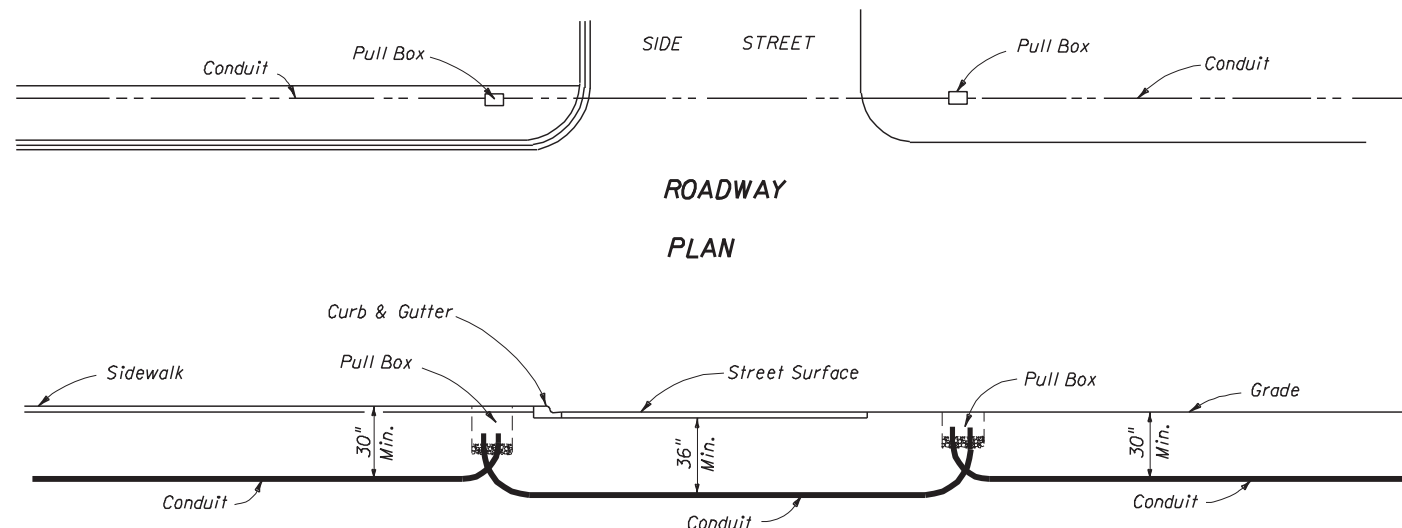
Names	Dates	Approved By		
Designed By	2-75	Clark A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	2-75	00	1 of 2	17721



PULL BOX ENTRY OF CONDUIT UNDER SIDEWALKS

FIGURE A

Note:
Ends of conduit shall be sealed in accordance with Section 630 of the Standard Specifications for Road and Bridge Construction.



UNDER SIDEWALK

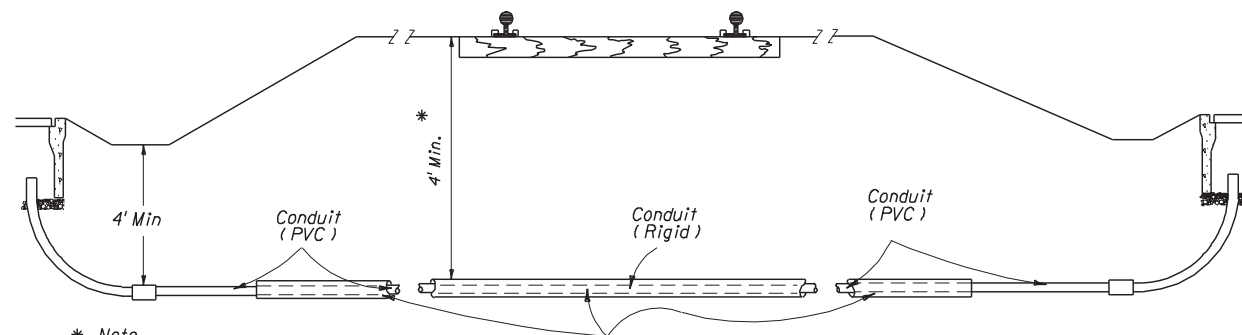
UNDER ROADWAY

UNDER NON-TRAFFIC BEARING SURFACE

SECTION

FIGURE B

Note:
One run of conduit (between pull boxes) shall not contain more than 360° of bend including pull box bends.



* Note
Conduit depth to be at R/R requirement but not less 4'.

After jacking, leave rigid conduit as a sleeve extending to R/R right of way limits.

FOR USE UNDER RAILROADS

FIGURE C

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
CONDUIT INSTALLATIONS DETAILS				
Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Plans Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	2 of 2	17721
Checked By				

NOTES:

Design Poles (Concrete and Strain Poles) in accordance with the latest edition of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" and Supplement thereto. For allowable unit stresses, meet the requirements of Section 6.

Place the prestressing symmetrically. Supply a sufficient amount of prestressing to provide a calculated compressive stress of 2.2 ksi for Type N-II and 3 ksi for Type N-III at the top of pole after all losses.

Concrete Strength shall be 6 ksi minimum at 28 days and 4 ksi minimum at transfer of the Prestressing force.

Reinforcing steel shall be A615 Grade 60. Provide a minimum area of non-prestressed reinforcement equal to 0.33% of the concrete area.

Prestressed Strands shall be A416 Grade 270 stress relieved or low relaxation.

One turn required for spiral splices and two turns required at the top and bottom of poles. Spiral shall be manufactured from cold-drawn steel wire meeting the requirements of ASTM A82.

Attach span wire assemblies (consisting of the catenary wire, the messenger wire, and the tether wire) to the concrete poles in accordance with Section 634.

If a two point attachment is required by the plans, provide an eye bolt hole for the messenger wire, or field drill one at the location indicated in the plans. Field drill the eyebolt hole for the tether wire, when required, prior to installation.

Use cover plates made of non-corrosive materials and attached to the pole using lead anchors or threaded inserts embedded in the pole and round head chrome plated screws.

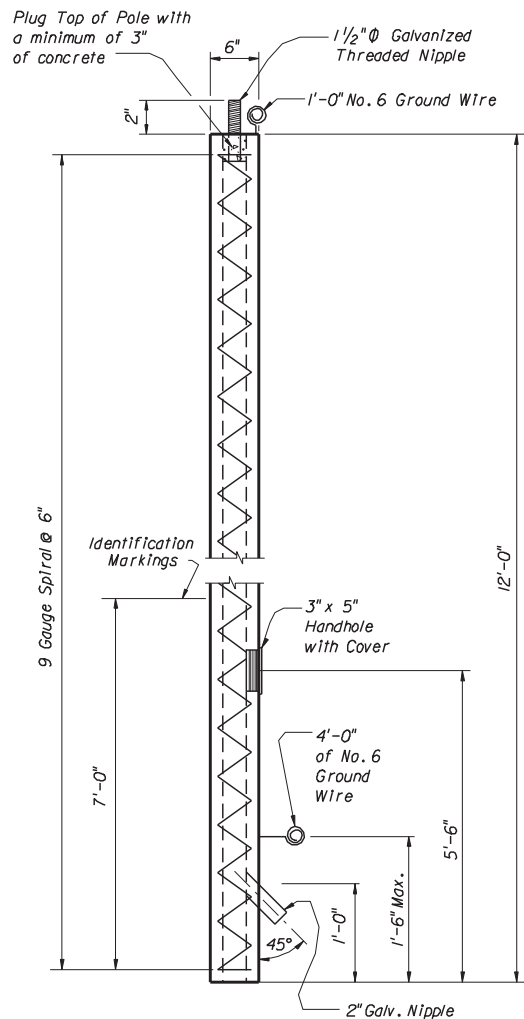
Attach ground wires to the reinforcing steel in the pole as necessary to prevent the ground wire from being displaced during concreting operations.

Identify concrete poles as to pole manufacturer, Department's pole type, length and Qualified Product List qualification number by inset numerals 1" in height inscribed on the same face of the pole as the handhole and ground wire.

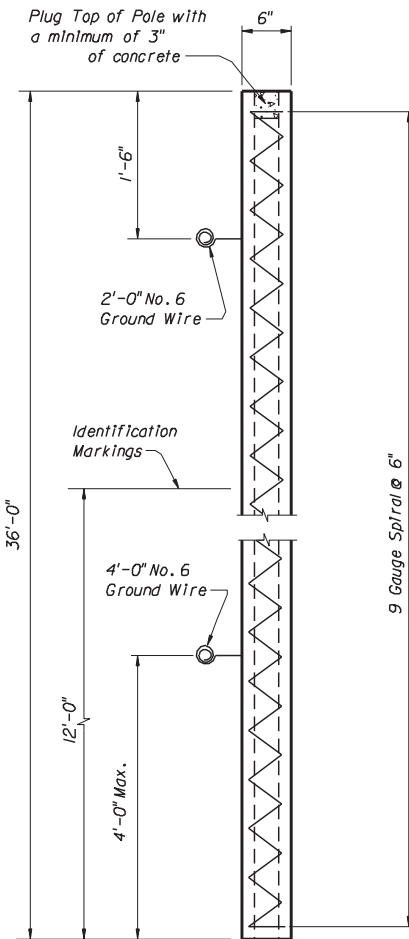
Provide a Class 3 Surface Finish as Specified in 400-15.2.4.

Provide a minimum cover of 1".

Provide all poles with total taper of 0.152 IN/FT.

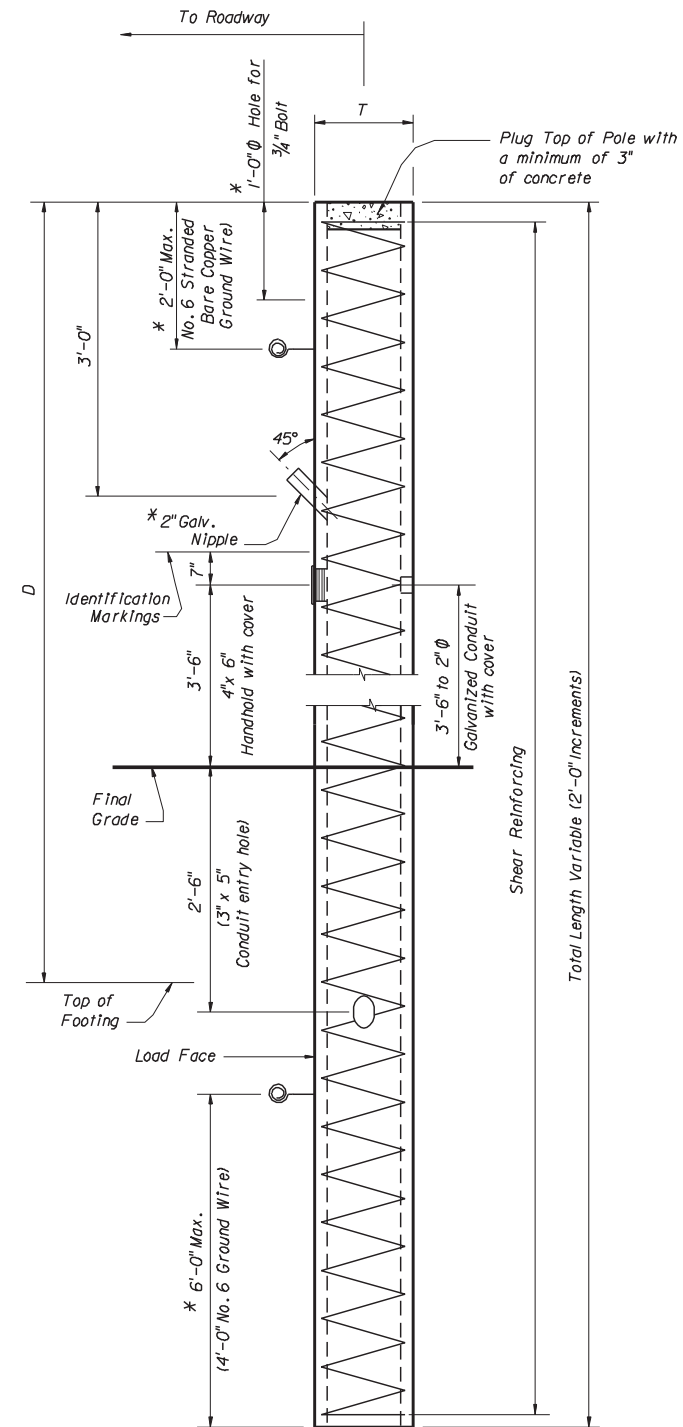
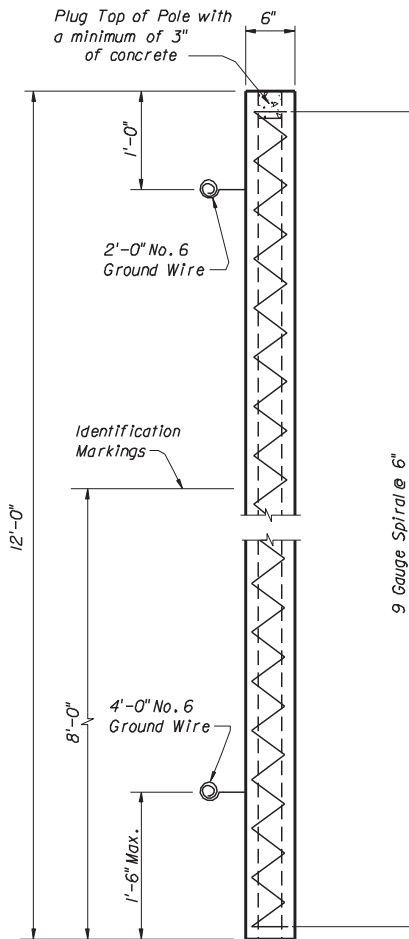


TYPE N-II POLE ON CONCRETE PEDESTAL



SERVICE POLES - TYPE N-II

(For Installation, refer to Roadway and Traffic Design Standard, Index No. 17504)



POLE TYPES N-III THROUGH N-VII

* Do not apply these items to Type N-III. Establish bolt hole locations, ground wire location and conduit location as shown in the plans.

**MINIMUM REQUIRED MOMENT CAPACITY				
D (feet)	TYPE OF POLE			
	N-IV (k-ft)	N-V (k-ft)	N-VI (k-ft)	N-VII (k-ft)
20	33	106	152	200
22	37	111	159	218
24	41	116	163	226
26	44	121	172	234
28	48	127	179	242
30	52	132	185	250
32	56	137	192	258
34	60	142	199	266
36	63	148	205	274
38	67	153	212	282
40	71	158	219	290
42	75	163	225	298
44	79	168	232	306
46	82	173	239	314
48	86	177	245	322
50	90	180	252	330

** Service Conditions: Design poles to carry the "Minimum Required Moment Capacity." These moments are based on a dead load plus wind load combinations, therefore obtain the allowable stresses by multiplying those for normal exposure conditions given in Section 6 by the applicable factor from Section 2 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

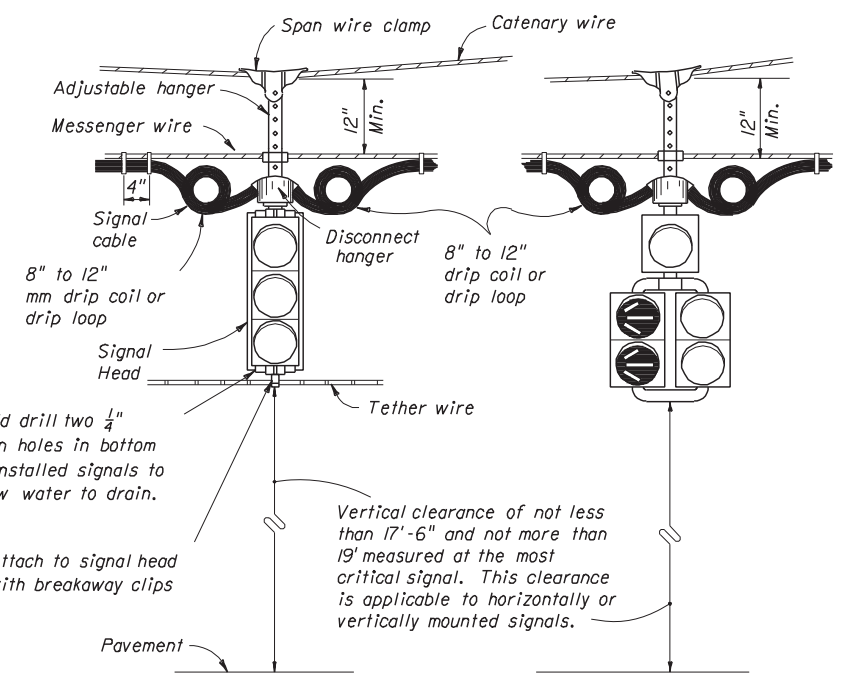
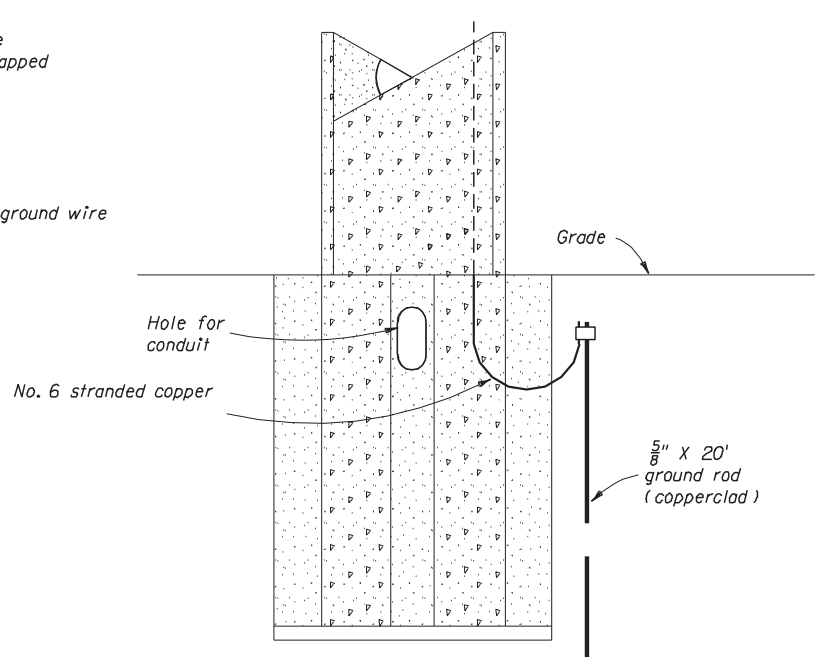
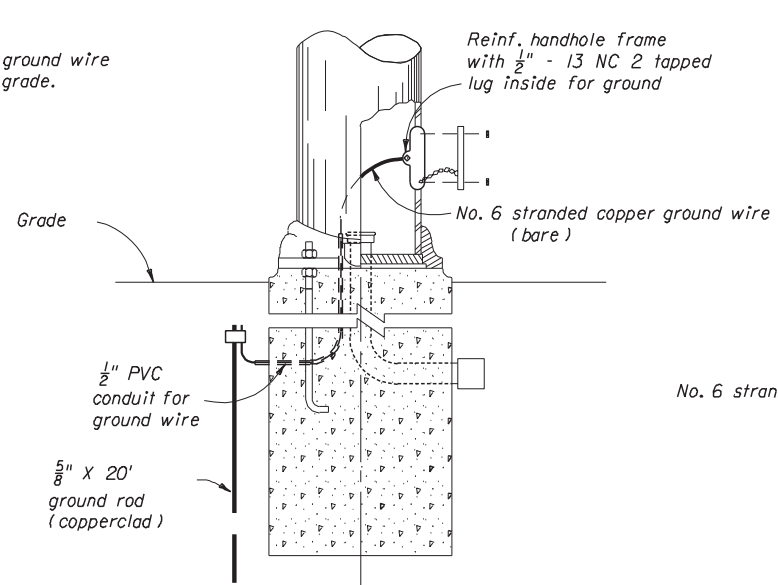
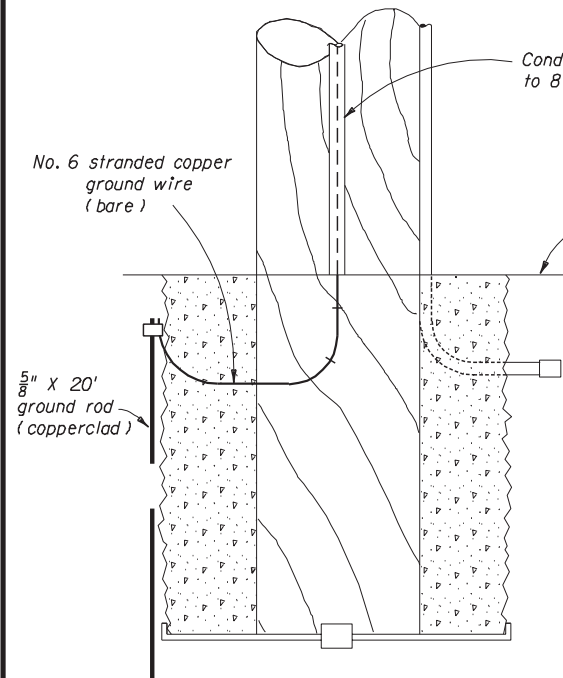
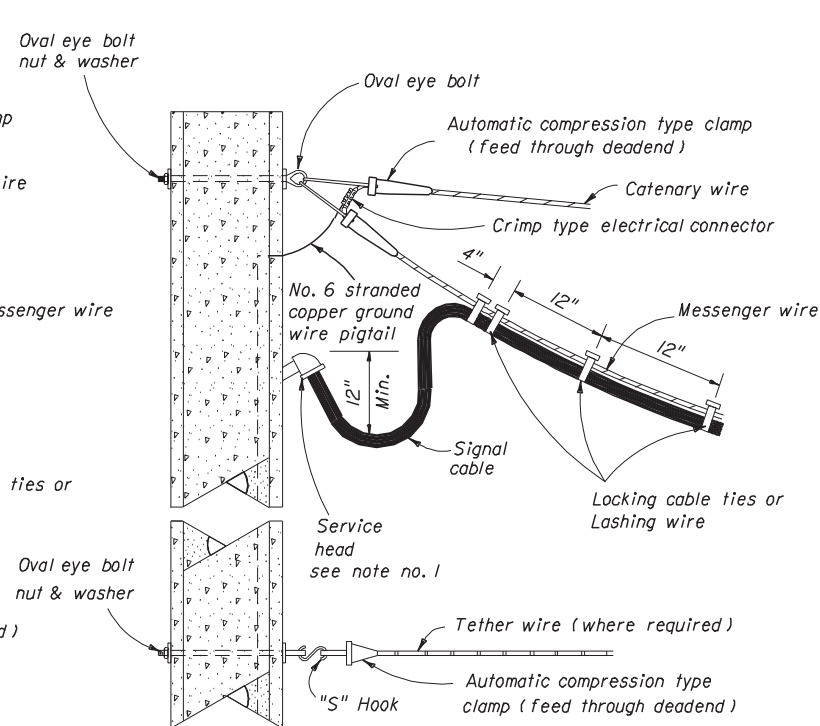
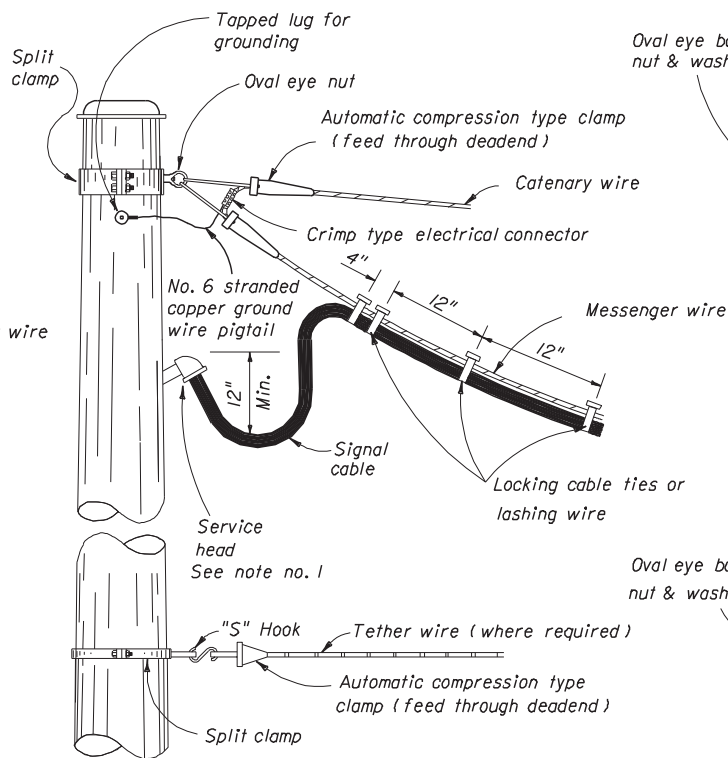
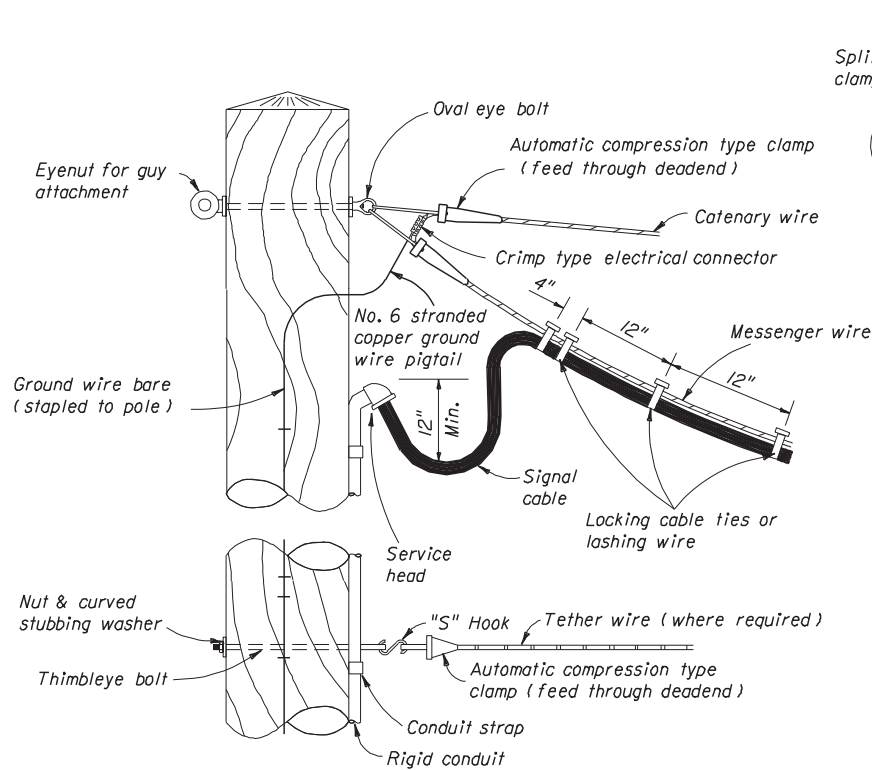
The ultimate moment capacity of each pole shall be a minimum of 1.3 times the "Minimum Required Moment Capacity."

TYPE OF POLE	CONCRETE POLE	
	SIZE AT TOP (T)	SHEAR REINFORCING
Type II	6" x 6"	9 Gauge Spiral @ 6"
Type III	6" x 6"	6 Gauge Spiral @ 6"
Type IV	8" x 8"	5 Gauge Spiral @ 6"
Type V	10" x 10"	5 Gauge Spiral @ 6"
Type VI	12" x 12"	5 Gauge Spiral @ 6"
Type VII	14" x 14"	5 Gauge Spiral @ 6"

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

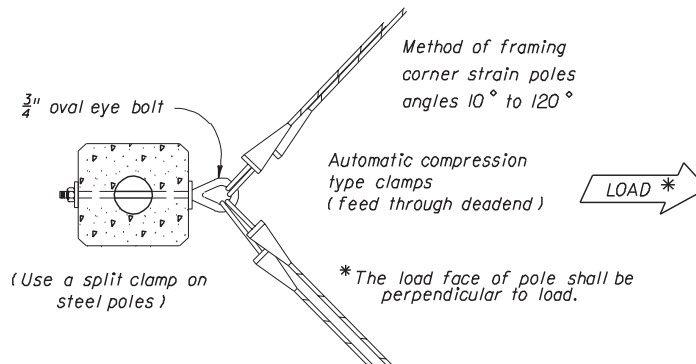
CONCRETE POLES

Names	Dates	Approved By		
Designed By			State Structures Design Engineer	
Drawn By	JP 10/99	Revision	Sheet No.	Index No.
Checked By	TJB 10/99	00	1 of 1	17725



Notes:

1. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
2. Lashing wire should normally be used for distances of 12' or greater.
3. The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing of 2" between bolts.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.

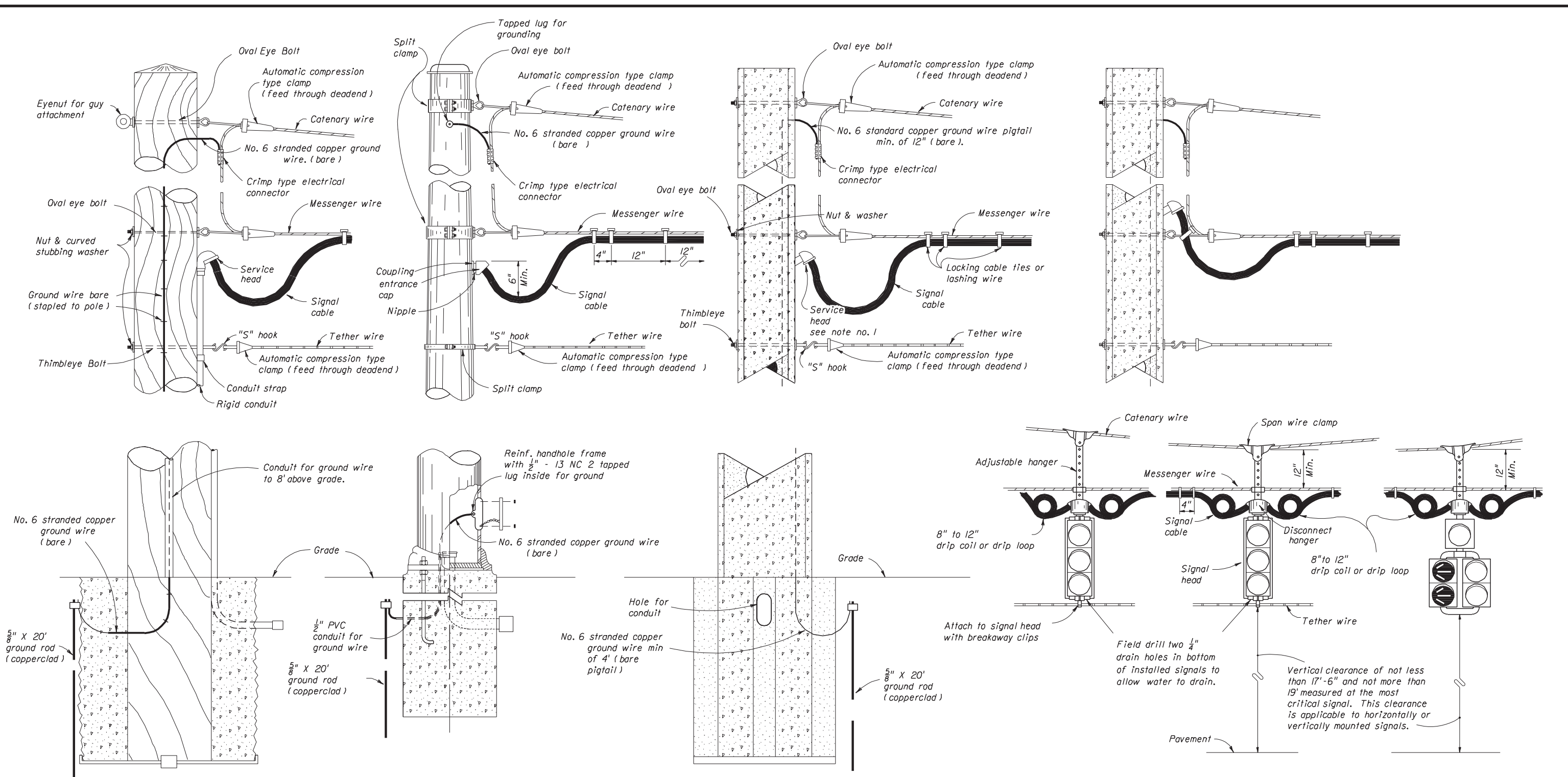


SINGLE POINT ATTACHMENT

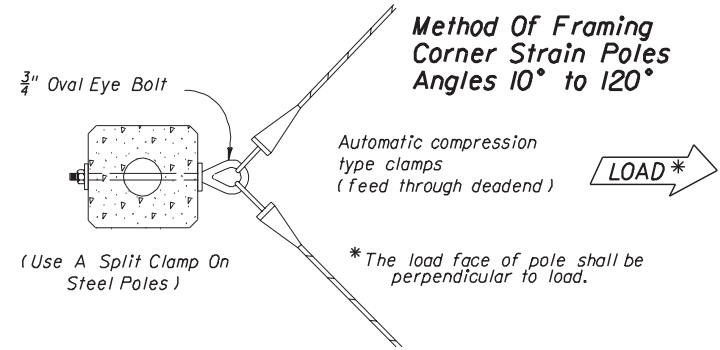
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

**SIGNAL CABLE & SPAN WIRE
INSTALLATION DETAILS**

Names	Dates	Approved By <i>Charles A. Scott</i> State Traffic Plans Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	1 of 2	17727
Checked By				



- Notes:
1. With the approval of the resident engineer. The service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
 2. Lashing wire should normally be used for distances of 12' or greater.
 3. The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing of 2" between bolts.
 4. Meet all grounding requirements of Section 620 of the Standard Specifications.



TWO POINT ATTACHMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

**SIGNAL CABLE & SPAN WIRE
INSTALLATION DETAILS**

Names	Dates	Approved By		
Designed By		 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 2	17727

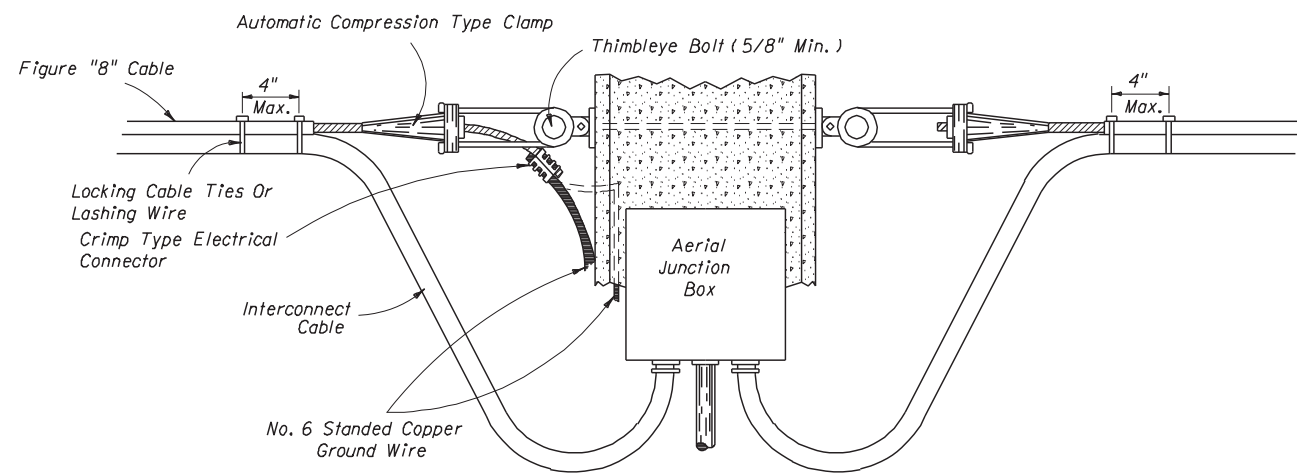


FIGURE A
CABLE DROP AND
TERMINATION DETAIL
AERIAL INTERCONNECT FIGURE "8"

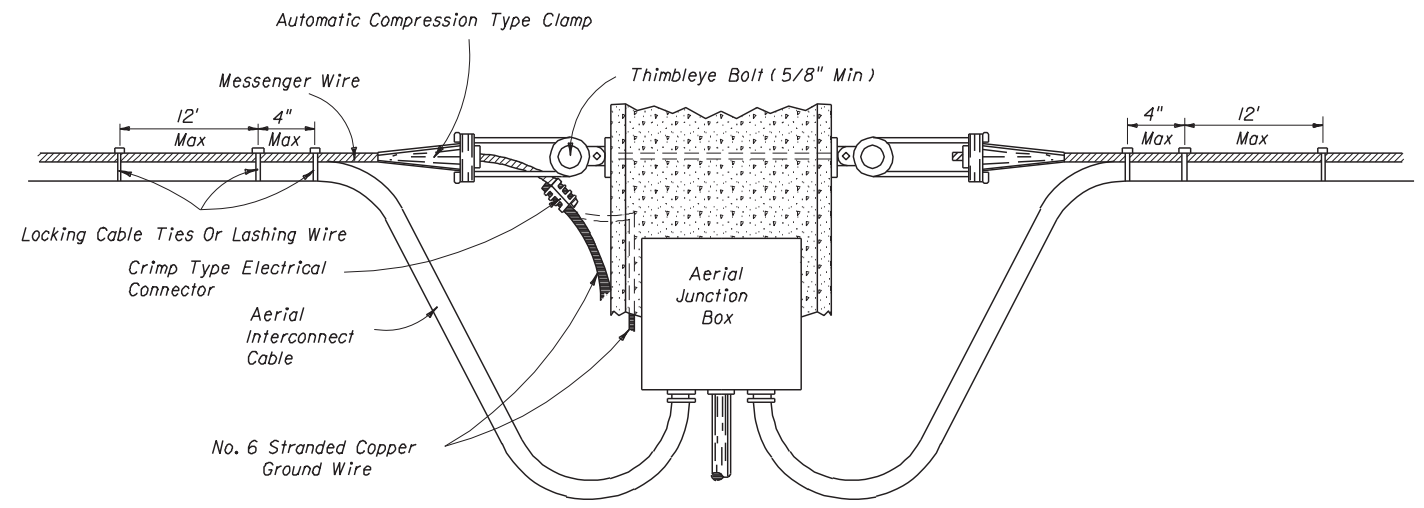


FIGURE B
CABLE DROP AND
TERMINATION DETAIL
AERIAL INTERCONNECT MESSENGER
WIRE WITH CLAMPS

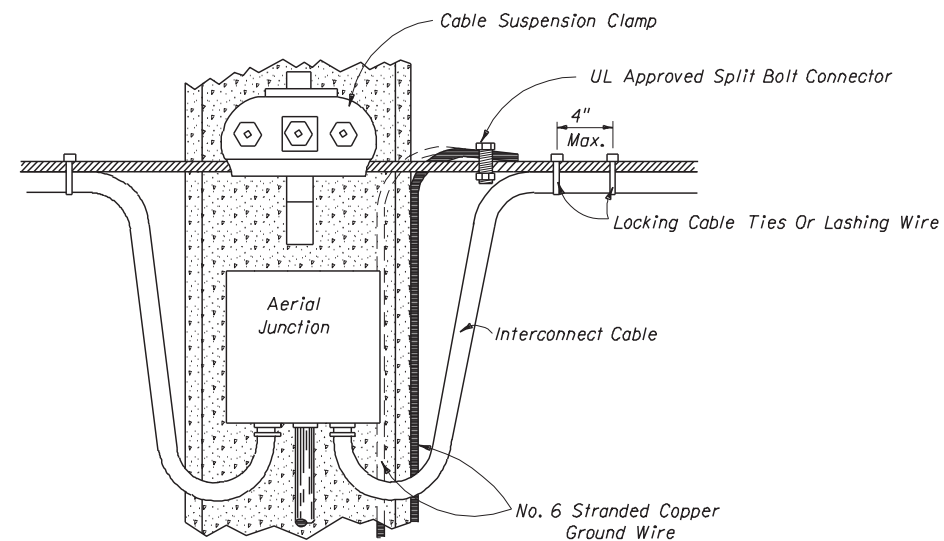


FIGURE C
CABLE DROP DETAIL
AERIAL INTERCONNECT MESSENGER
WIRE WITH CLAMPS

Notes:

1. The messenger wire of the interconnect cables shall be grounded to the copper ground wire of the pole or to the external wire extending down the pole.
2. When utilizing the external ground wire to the pole, a piece of $\frac{1}{2}$ " conduit shall extend up the pole externally to a point 8' above finish grade to protect the ground wire connecting the messenger wire to the ground rod.
3. Locking cable ties or lashing wire when used shall be placed no further than 12" apart except at the point of cable drop or terminations where one (1) shall be placed at the point where the cables separate from the messenger wire and another placed 4" (max) from that tie. When using figure "8" interconnect cable only the locking cable ties shall be used.
4. If accessible the internal ground wire of the support pole may be used to ground the messenger wire.
5. Lashing wire should normally be used for distances of 12' or greater.
6. Meet all grounding requirements of Section 620 of the Standard Specifications.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
AERIAL INTERCONNECT				
Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Plans Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	1 of 1	17733
Checked By				

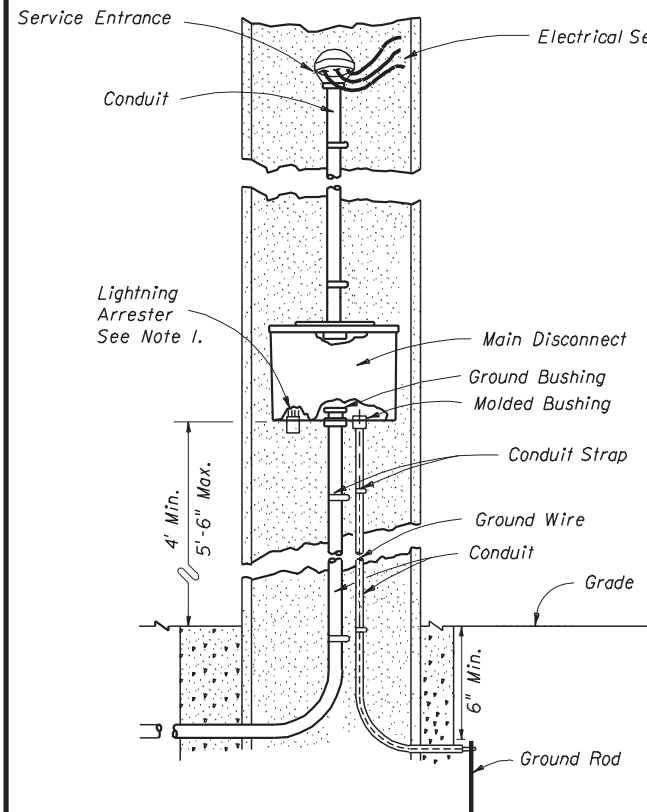
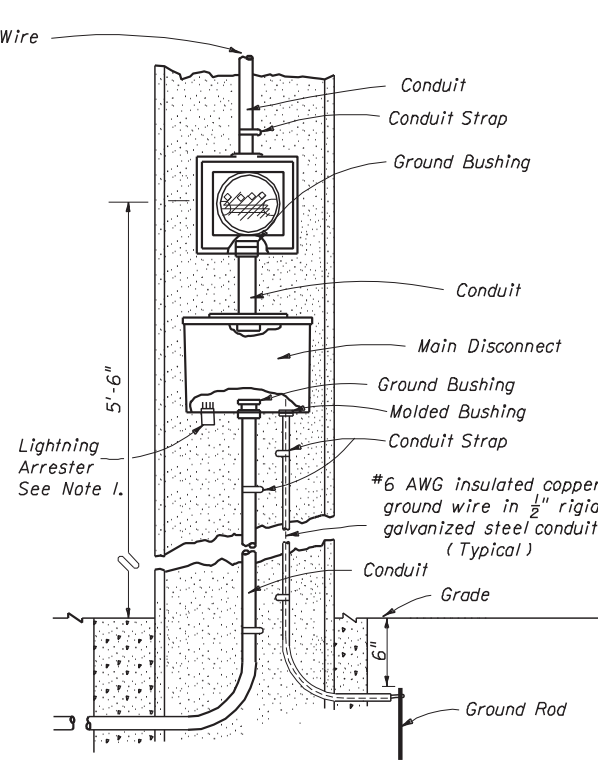
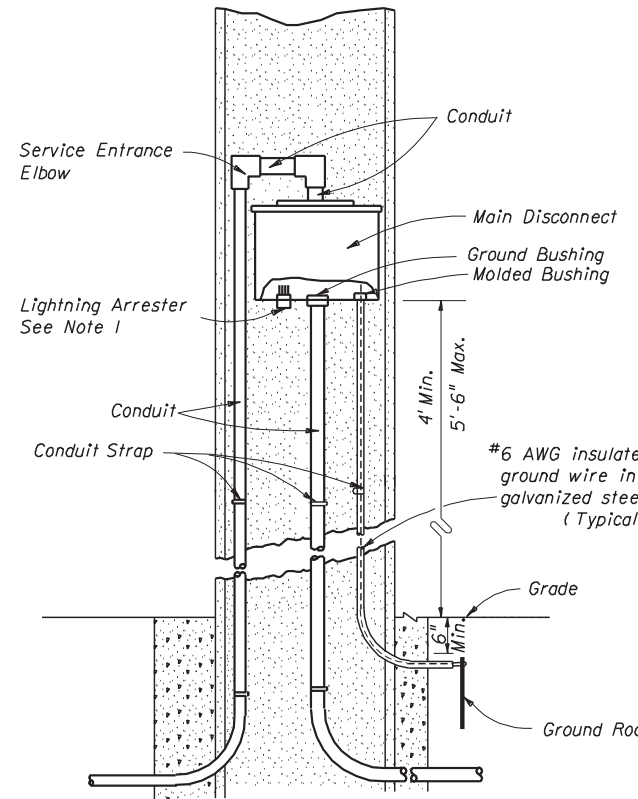


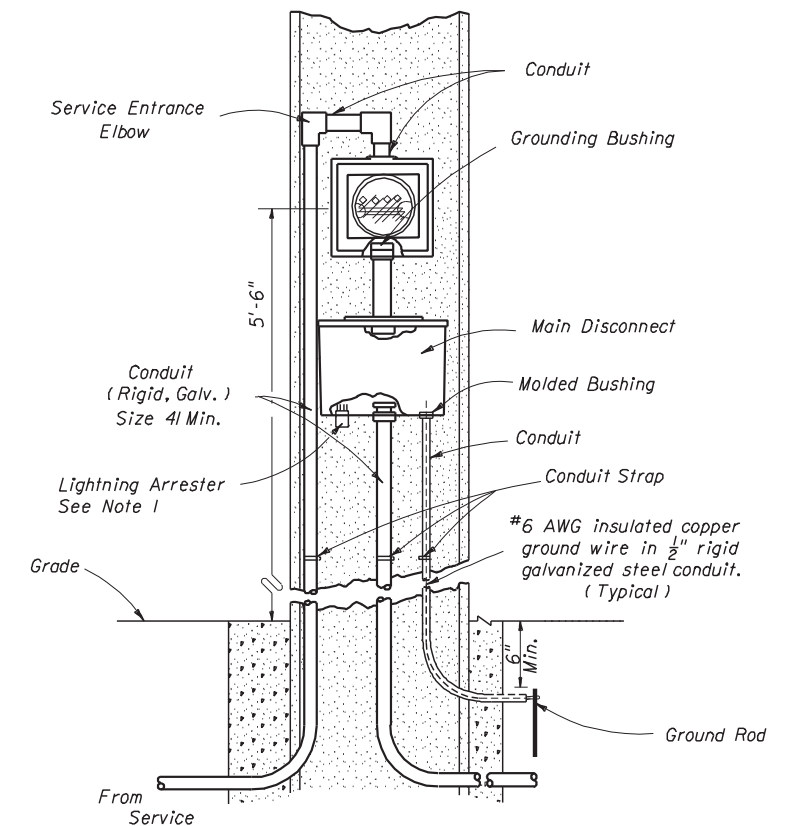
FIGURE A
AERIAL FEED
(NO METER USED)



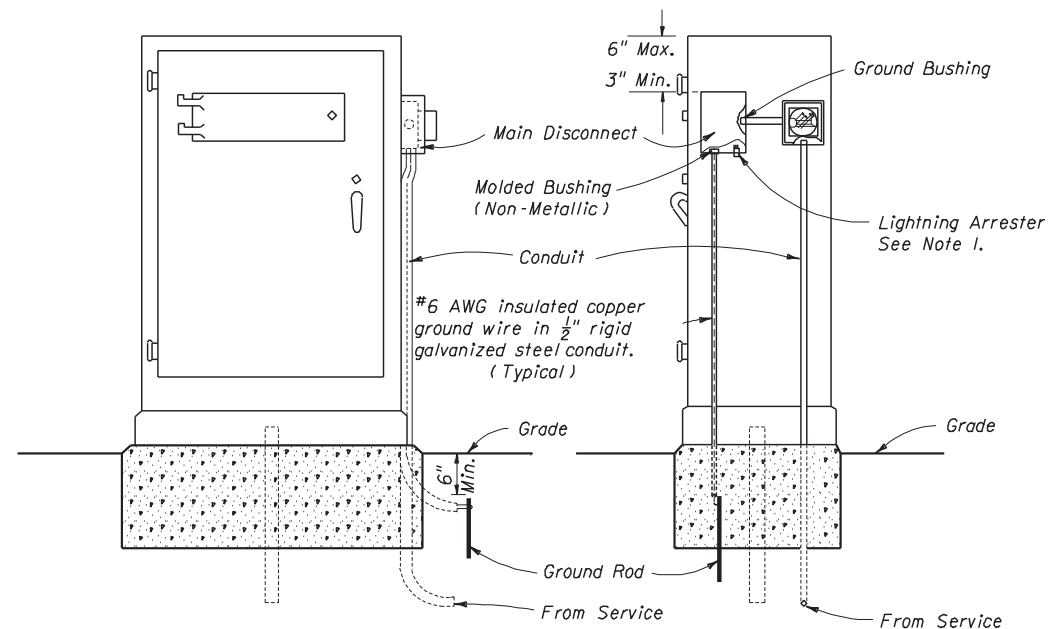
AERIAL FEED
(METER USED)
FIGURE B



UNDERGROUND FEED
(NO METER USED)
FIGURE C



TYPE "B" UNDERGROUND FEED
(METER USED)
FIGURE D



UNDERGROUND CABINET MOUNTED
(METER USED)
FIGURE E

NOTES:

1. The lightning arrester can be located on the side or bottom of the main disconnect enclosure at the Contractor's Option.
2. Liquidtight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.
3. Bond all elements together to form an Intersection Grounding Network in accordance with Section 620 of the Department's current Standard Specifications for Road and Bridge Construction. The bond wire shall be run in conduit with the Electrical Service Wire or Signal Cable.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

ELECTRIC POWER SERVICE

Names	Dates	Approved By		
Designed By	9-88	Clark A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	17736

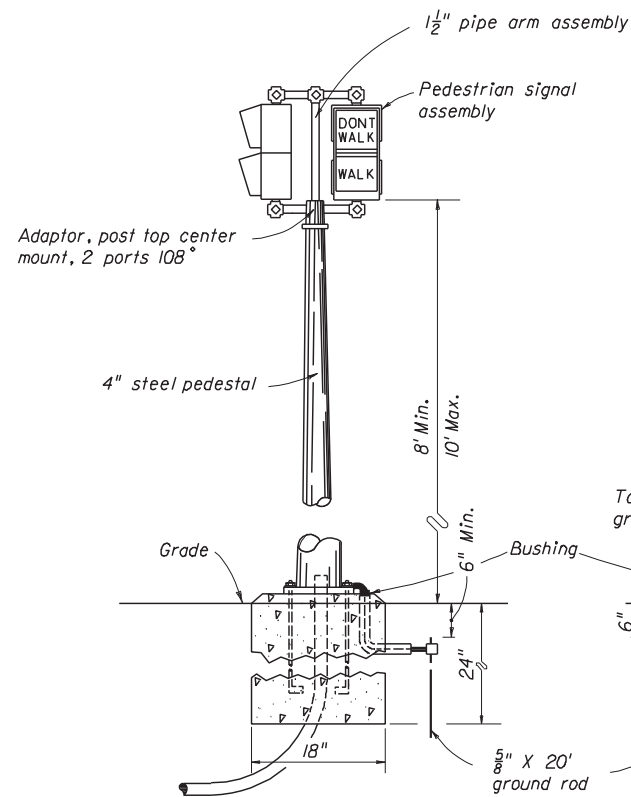


FIGURE A

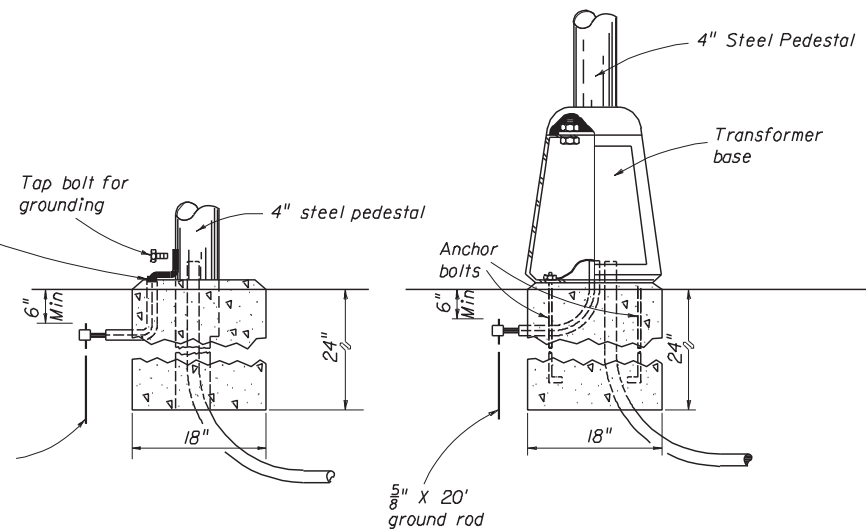
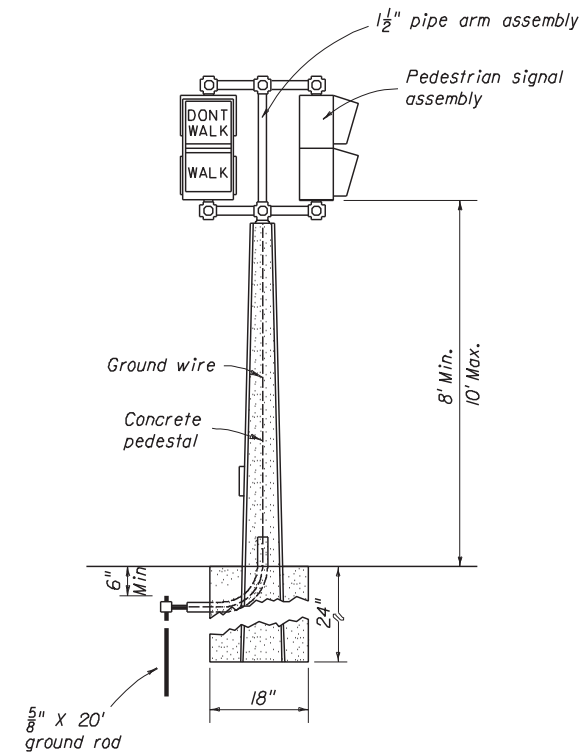


FIGURE B



Notes:

1. As an option, the contractor will be allowed to install pedestrian signals on concrete poles and pedestals with the use of lead anchors (two bolts same size per hub.) in lieu of the standard steel bands.
2. Holes drilled or punched in metal poles or pedestals shall be thoroughly reamed, cleaned of all burrs and covered with two (2) coats of zinc rich paint as specified in the standard specifications for road and bridge, construction. Grommets or bushings shall be installed in holes.
3. Meet all grounding requirements of Section 620 of the Standard Specifications.

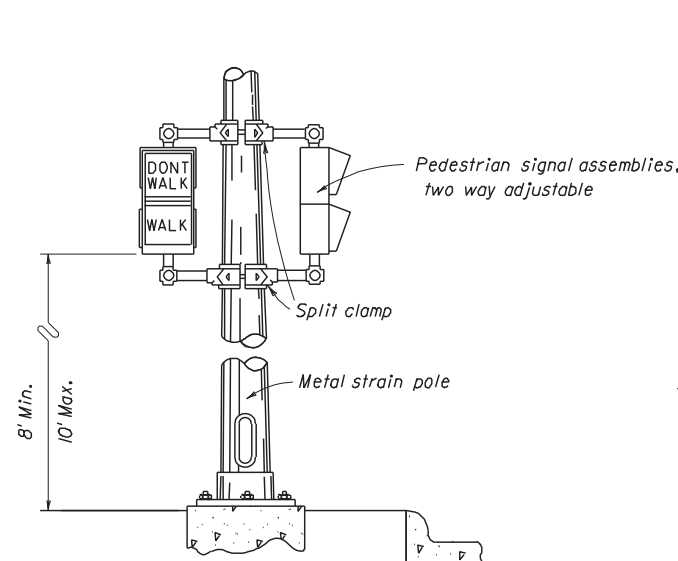


FIGURE C

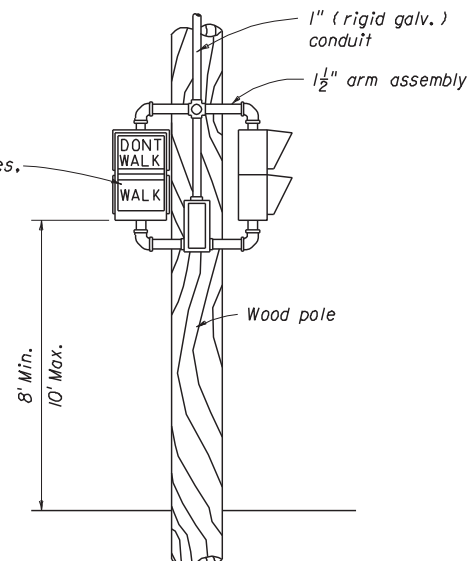


FIGURE D

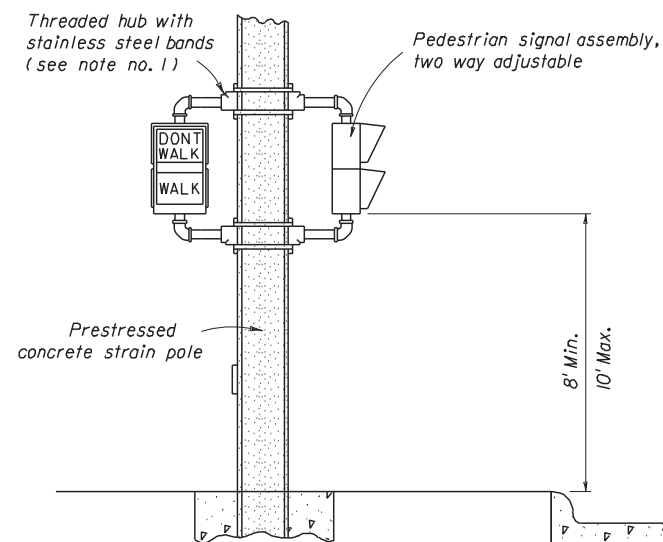

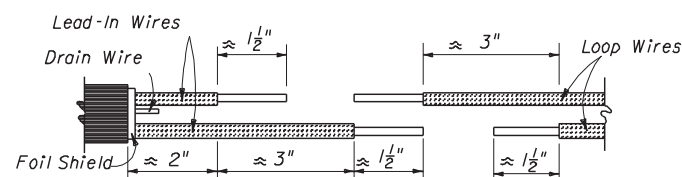


FIGURE E

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
PEDESTRIAN CONTROL SIGNAL INSTALLATION DETAILS				
Names	Dates	Approved By		
Designed By	3-85	 State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	17764

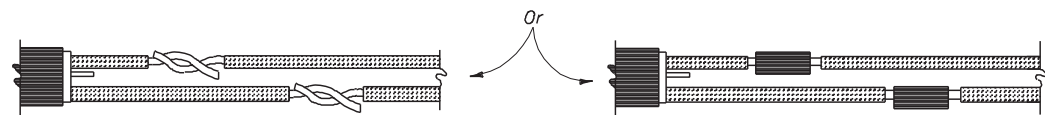
**DETAILS FOR SPLICING
LOOP WIRE TO LEAD-IN WIRE**

STEP 1



Strip Loop And Lead-In Cable Conductors. If Heat Shrinkable Silicone Lined, Cross Linked Polyethylene Insulating Tubing Is To Be Used, Slip Tubing Over Lead-In Cable And Individual Conductors.

STEP 2



Twist The Bare Conductors Together.

Crimp The Bare Conductors Together With An Uninsulated Butt Connector.

STEP 3



Solder Each Splice Using Resin-Core Solder.

Solder Each Splice Using Resin-Core Solder.

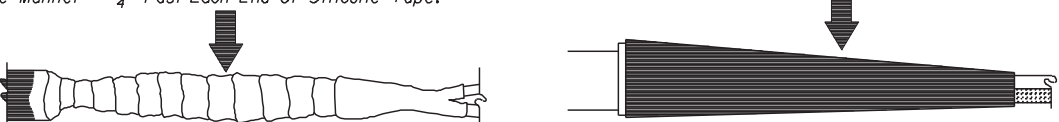
STEP 4



Wrap Each Splice With Silicone Tape. Half Lap Starting At Center Of Splice And Proceeding To The Right (Or Left) $\approx \frac{3}{4}$ " Past End Of Splice, Then Proceeding To The Left (Or Right) $\approx \frac{3}{4}$ " Past Other End Of Splice And Returning To Center. Wrap Each Splice, With An All Weather Heavy Duty Electrical Tape In The Same Manner $\approx \frac{3}{4}$ " Past Each End Of Silicone Tape.

Slide Heat Shrinkable Tubing Over Splices. The Tubing Shall Cover ≈ 1 " Of Conductor Insulation At Each End Of Splice. Heat Tubing As Specified By Manufacturer.

STEP 5



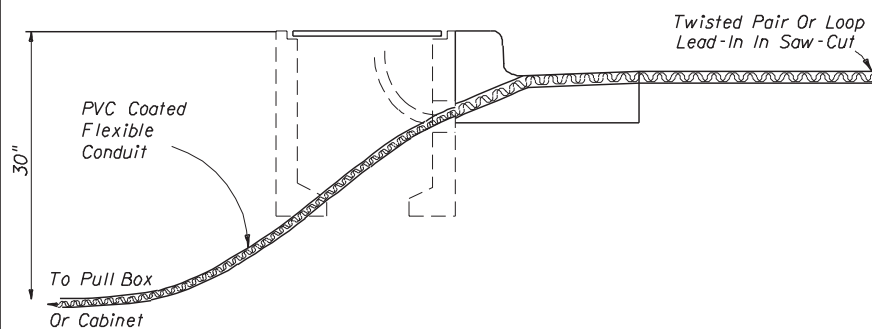
Half Lap The Two Splices Together With An All Weather Heavy Duty Electrical Tape ≈ 1 " Past The End Of The Lead-In Cable Outside Cover And ≈ 1 " Past Farther Most Wrap Of Step 4.

Slide Outer Heat Shrinkable Tubing Over Entire Splice Area. The Tubing Shall Cover $\approx 1\frac{1}{2}$ " Of The Lead-In Cable Outside Cover And ≈ 1 " Of The Loop Conductor Insulation.

**TWISTED PAIR AND LOOP LEAD-IN
INSTALLATION WITH CURB & GUTTER**

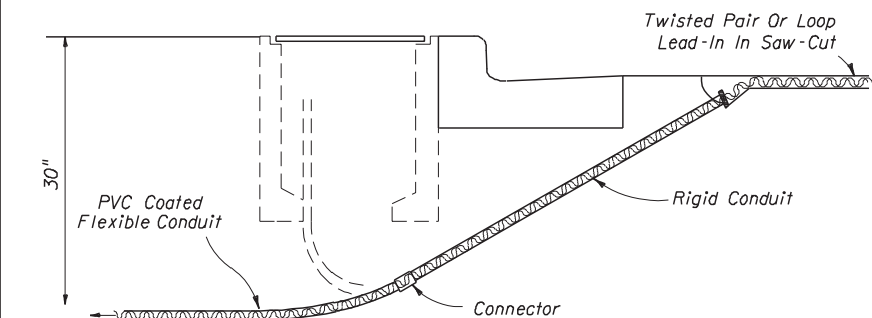
ALTERNATIVE 1

Drill A Hole Through The Curb At The Point Which The Required Saw-Cut Depth Is Obtained Just Prior To Cutting The Top Inside Edge Of The Curb. Slide A Section Of Flexible Conduit At Least 6" Into The Hole From The Back Side Of The Curb But Not Within 2" Of The Top Of The Hole. The Conduit Shall Fit Snug Within The Drilled Hole. Fill The Top Of The Hole With Loop Sealant To The Level Of The Curb Surface. A Nonmetallic Material Should Be Used To Prevent Excessive Loop Sealant From Entering The Flexible Conduit.



ALTERNATIVE 2

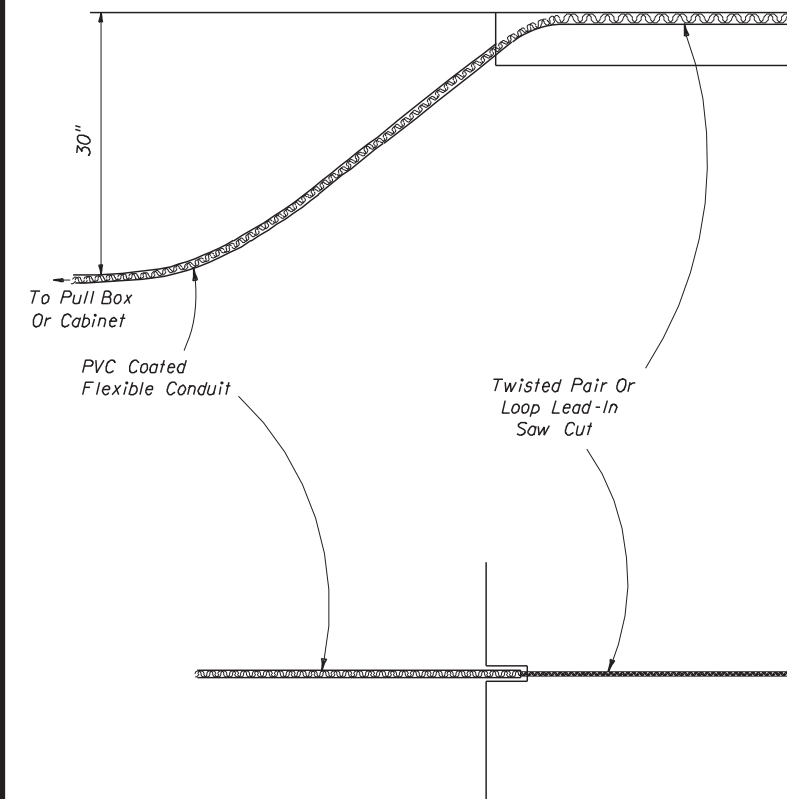
Drill A Hole $\frac{1}{2}$ " To 1" Larger In Diameter Than The Rigid Conduit To Be Used Through The Roadway Asphalt (Or Concrete) Surface And Base At An Appropriate Angle To Intercept The Trench Or Pull Box Hole. Place A Predetermined Length Of Rigid Conduit In The Hole And Drive The Conduit Into The Trench Or Hole. Install A Molded Bushing (Nonmetallic) On The Roadway End Of The Rigid Conduit. The Top Of The Rigid Conduit Shall Be Approximately 2" Below The Roadway Surface. Fill The Hole With Loop Sealant To The Level Of The Roadway Surface. A Nonmetallic Material Should Be Used To Prevent Excessive Loop Sealant From Entering The Rigid Conduit.



Note
Other alternatives may be approved by the State Traffic Operations Engineer

**TWISTED PAIR AND LOOP LEAD-IN
INSTALLATION WITHOUT CURB & GUTTER**

Cut A Slot In The Edge Of The Roadway Of Sufficient Size And Depth To Snugly Place The End Of The Flexible Conduit. The End Of The Conduit Shall Be At Least 6" Into The Roadway And 2" \approx Below The Top Of The Roadway Surface. The Departure Angle Of The Conduit From The Roadway Shall Be 30° To 45°.



Note
Other alternatives may be approved by the State Traffic Operations Engineer

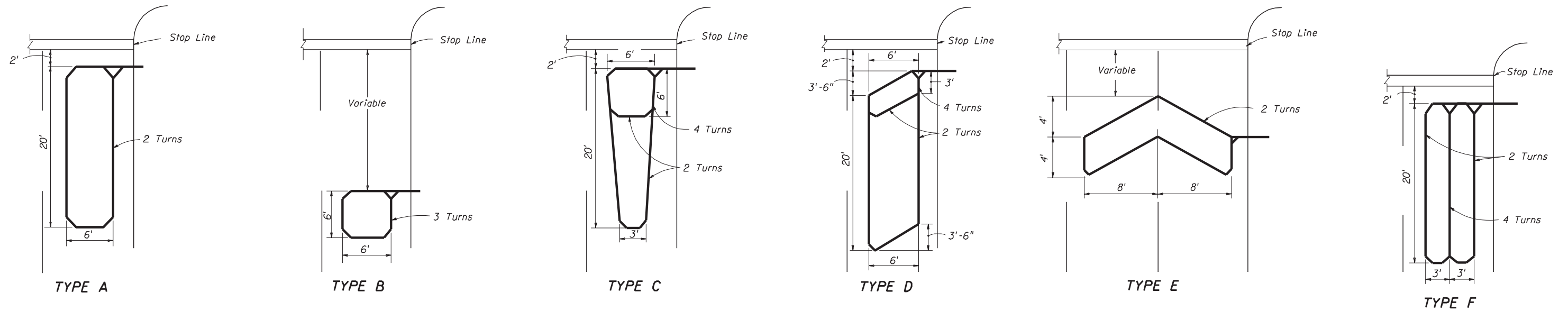
GENERAL NOTES

- If the loop lead-in is 75' or less from the edge of the loop to the detector or controller cabinet, continue the twisted pair to the cabinet. If the loop lead-in is greater than 75' continue the twisted pair to the specified pull box, splice to shielded lead-in wire and continue to the detector or controller cabinet.
- The width of all saw cuts shall be sufficient to allow unforced placement of loop wires or lead-in cables into the saw cut. The depth of all saw cuts, except across expansion joints, shall be 3" standard with a maximum of 4".
- On resurfacing or new roadway construction projects, the loop wires and lead-in cables may be installed in the asphalt structural course prior to the placement of the final asphalt wearing course. The loop wires and lead-in cables shall be placed in a saw cut in the structural course. The depth of the cables below the top of the final surface shall comply with note 2.
- A nonmetallic hold down material shall be used to secure loop wires and lead-ins to the bottom of saw-cuts. Hold down material shall be placed at approximately 12" intervals around loops and 24" intervals on lead-ins.
- The minimum distance between the twisted pairs of loop lead-in wire is 6" from the loop to 12" from the pavement edge or curb.
- Splice connections in pull boxes may be made with U.L. listed, watertight, insulated connectors in lieu of the details above. The lead-in cable insulation shall be sealed using electrical tape or heat shrinkable tubing (refer to step 5 above). The seal shall extend approximately 1" either side of the lead-in cable outer cover.

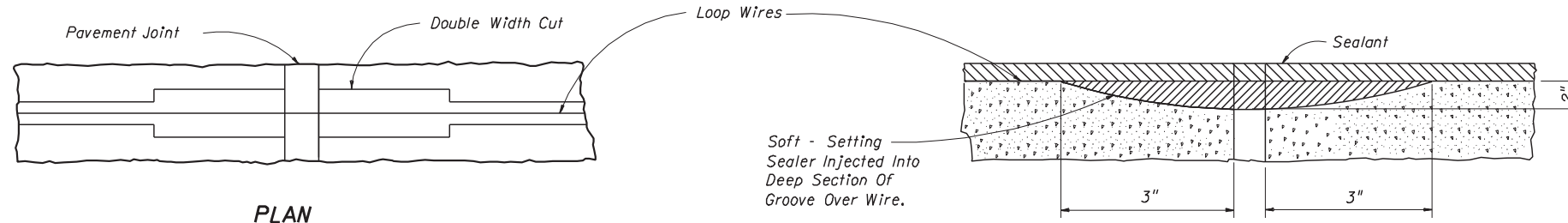
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

**VEHICLE LOOP
INSTALLATION DETAILS**

Names	Dates	Approved By		
Designed By		 State Traffic Plans Engineer		
Drawn By				
Checked By				
		Revision	Sheet No.	Index No.
		00	1 of 2	17781



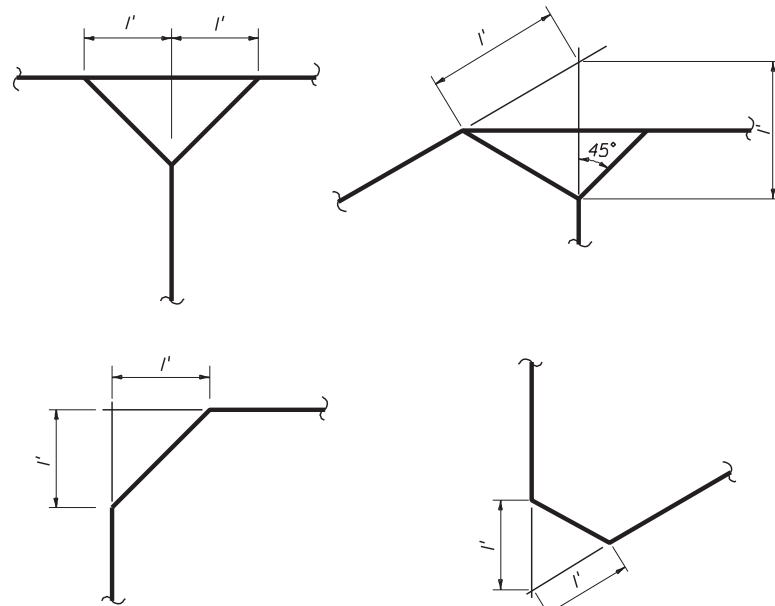
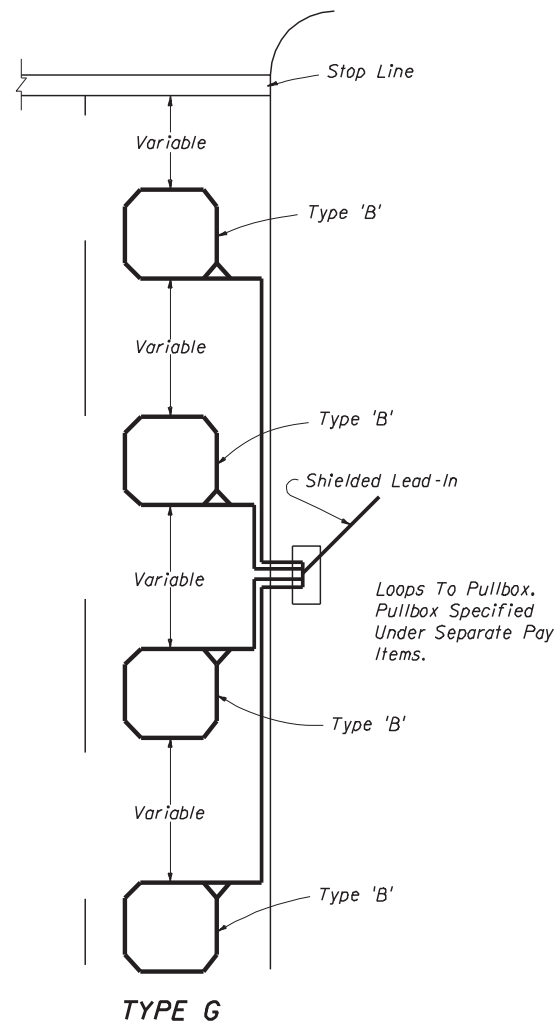
Note: Loop conductors must follow saw-cut to bottom forming slack section at joint.



CONCRETE PAVEMENT EXPANSION JOINTS VERTICAL SECTION

Notes:

1. The "number of turns" indicated at the specified point on the loop refers to the number of passes of loop wires which are placed in the saw-cut forming the complete loop.
2. Loop types or details not drawn to scale.
3. Loop Types are centered in a single lane except Type E which is centered on two lanes.
4. The number of individual loops in the Type G loop may vary up to a maximum of four (4).
5. Lead-in may be connected to either end of loop.
6. The leading edge of loop Types A,C,D,& F may extend past the stop line a maximum of 10'. The length of these loops may be extended to a maximum of 60'. Each intersection should be individually designed and if the modifications noted above is required it must be noted or detailed in the plans.
7. Loop lead-in wires should not be installed in the same pull box with signal power cable.



LOOP CORNER AND LEAD-IN DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
VEHICLE LOOP INSTALLATION DETAILS				
Designed By	Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Plans Engineer	
Drawn By			Revision	Sheet No. / Index No.
Checked By			00	2 of 2 / 17781

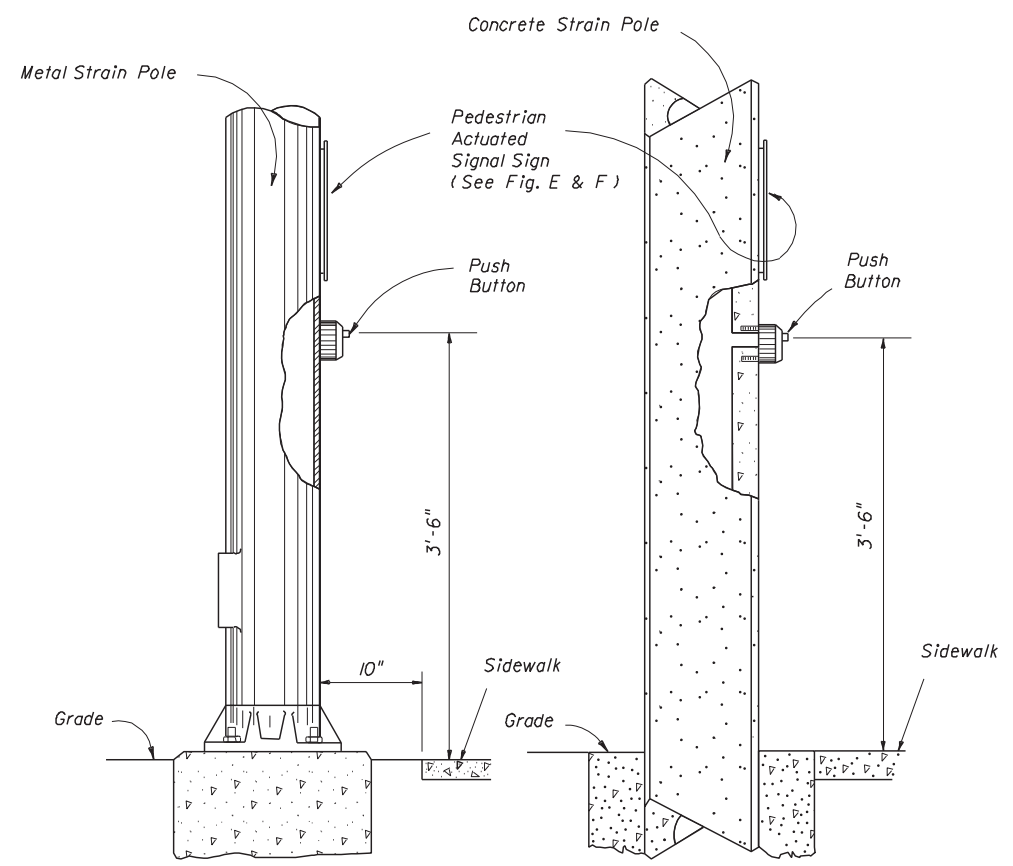


FIGURE A
POLE MOUNTED
DETECTOR STATION

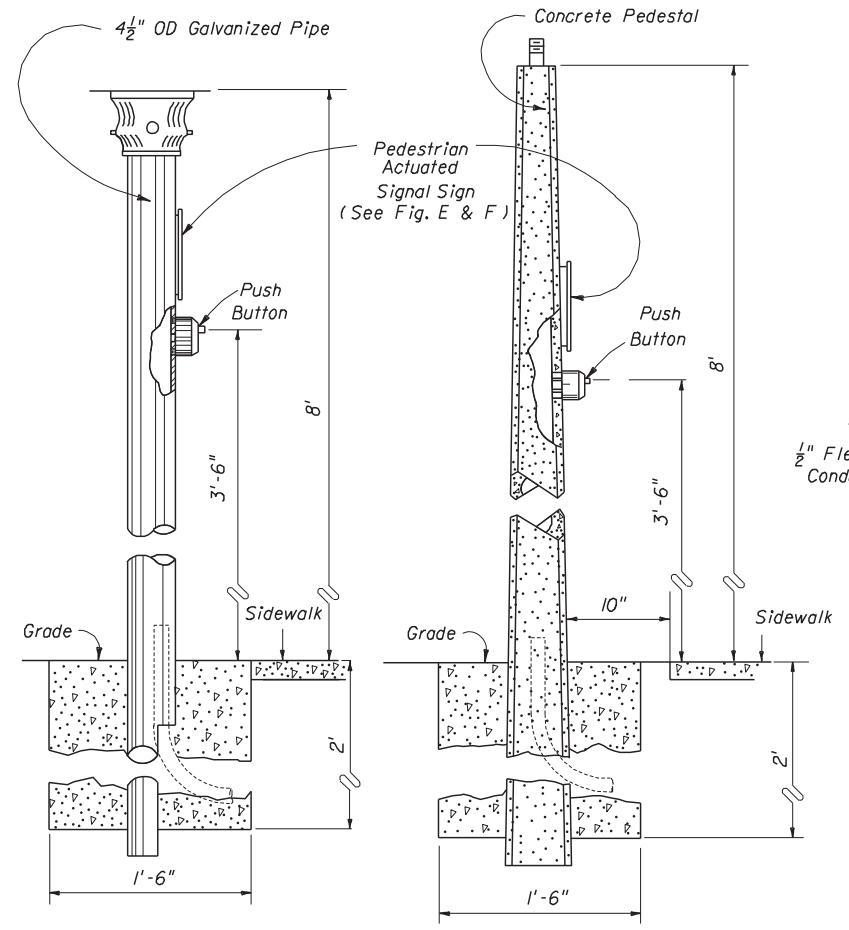


FIGURE B
PEDESTAL STATION
DETECTOR STATION

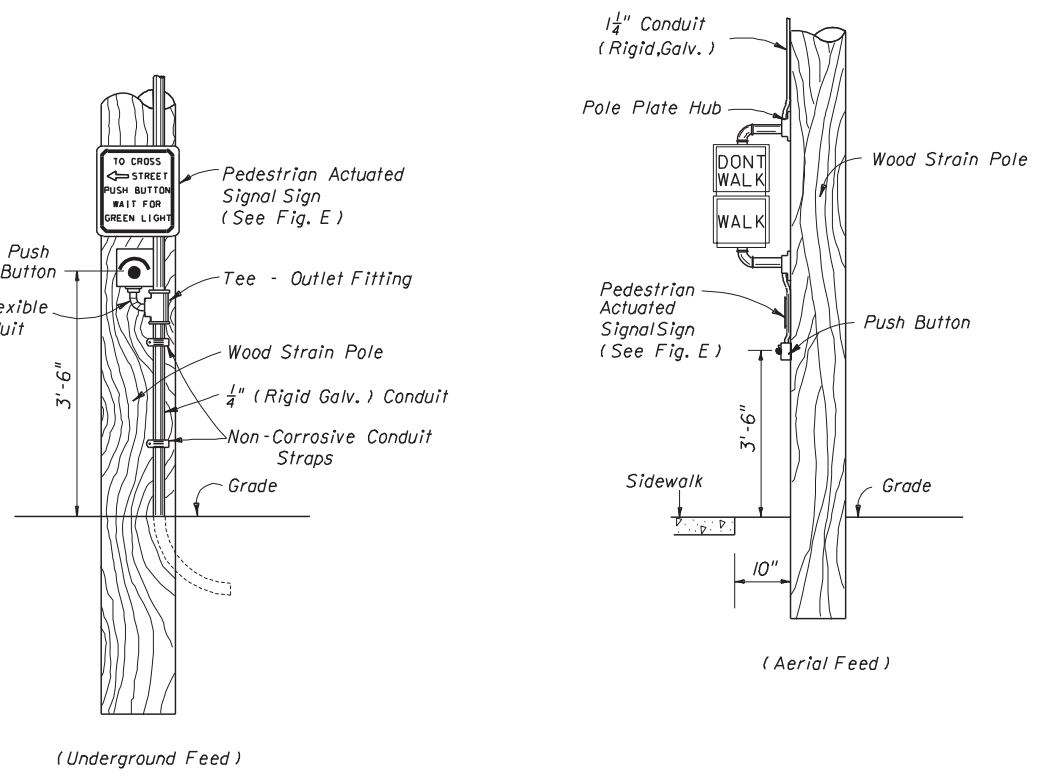


FIGURE C
WOOD POLE MOUNTED
DETECTOR STATION

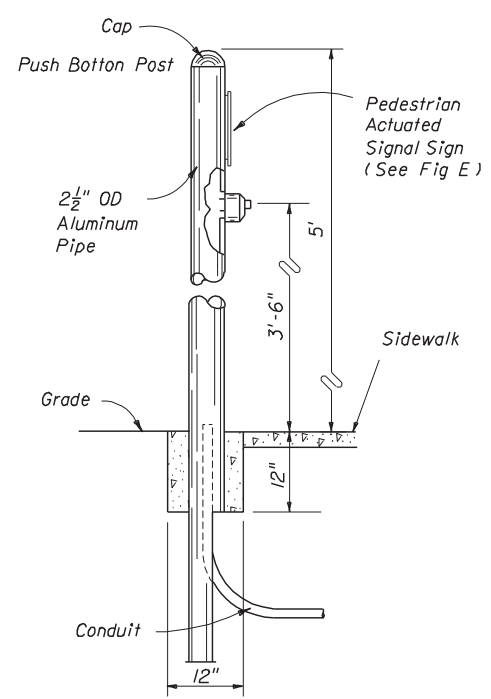


FIGURE D
POST DETECTOR STATION
DETECTOR STATION

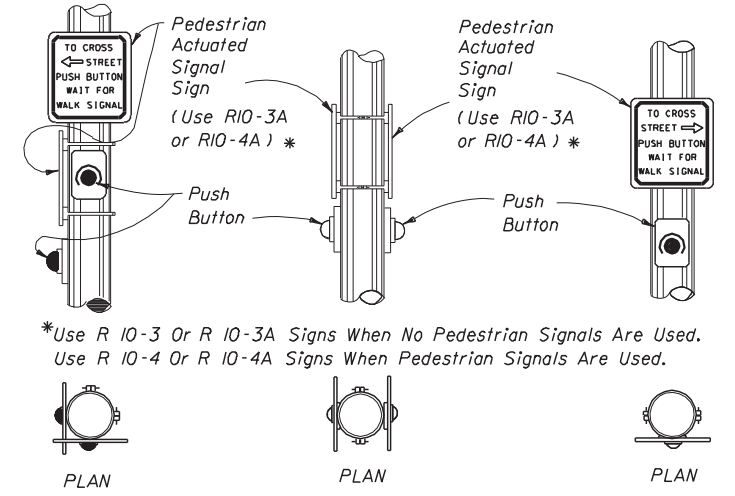


FIGURE E

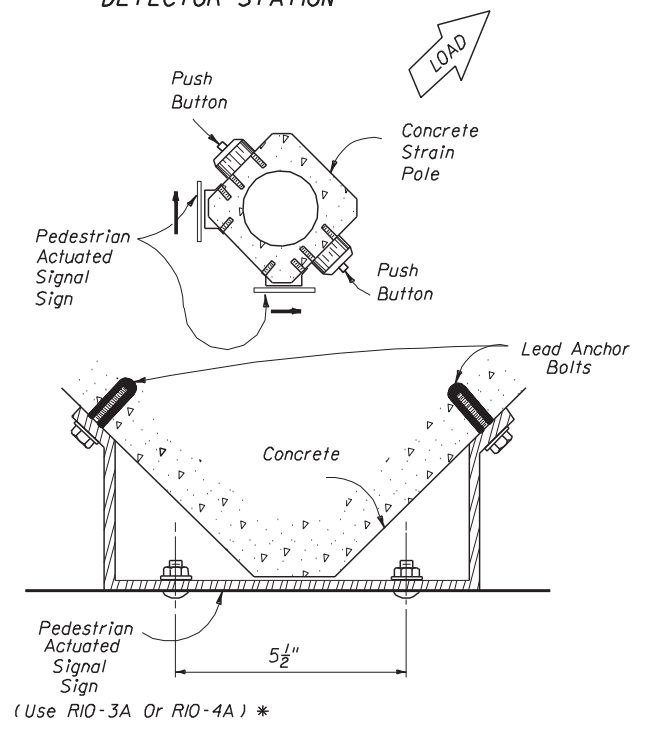
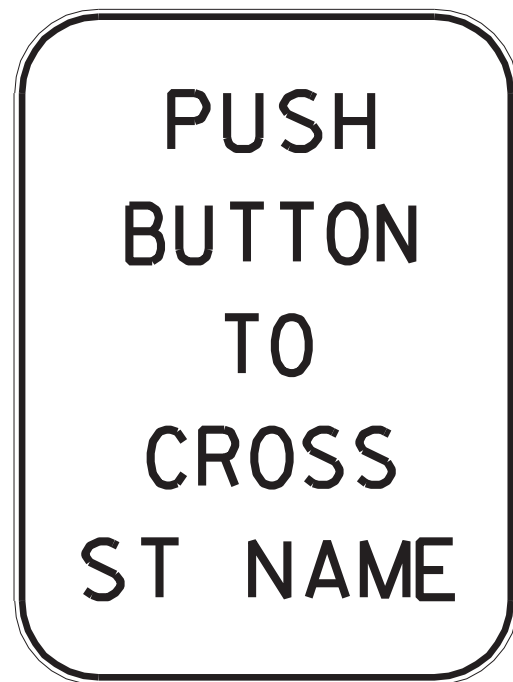


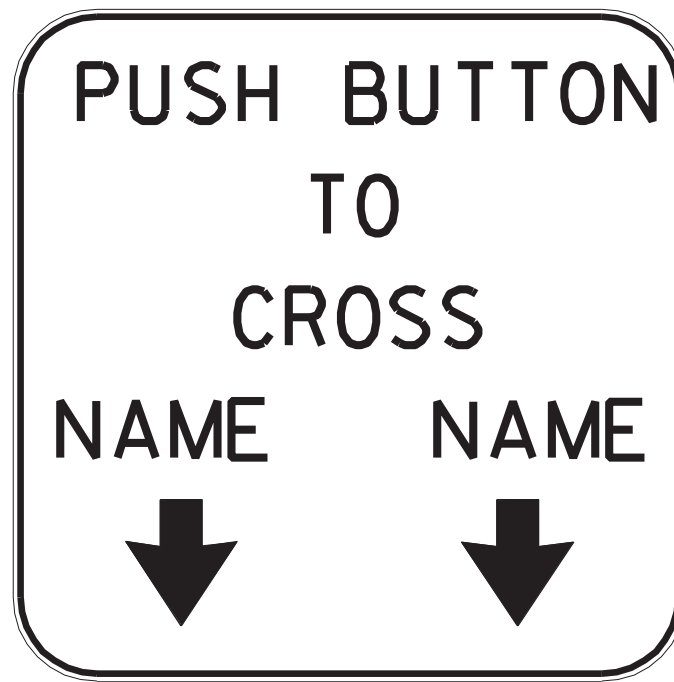
FIGURE F

- Notes:
- 1 Signs (RIO-3A & RIO-4A) shall be mounted above detectors, explaining their purpose and use.
 - 2 The positioning of pedestrian push button should clearly indicate which cross-walk signal is actuated by each push button.
 - 3 Push buttons and signs are to be mounted in accordance with Standard Specifications, section 665.
 - 4 Meet all grounding requirements of Section 620 of the Standard Specifications.

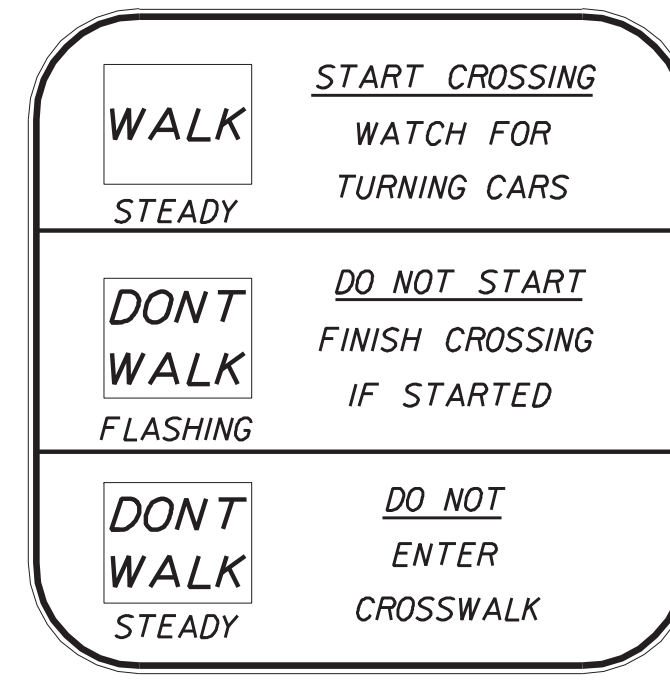
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
PEDESTRIAN DETECTOR ASSEMBLY INSTALLATION DETAILS				
Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Plans Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	1 of 2	17784
Checked By				



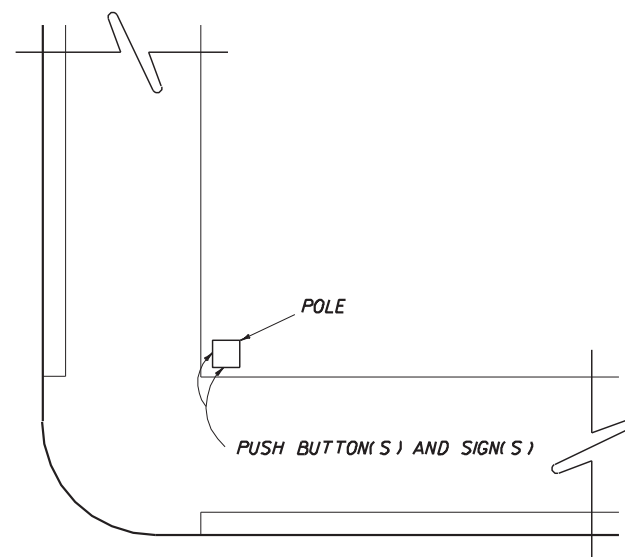
FTP-47



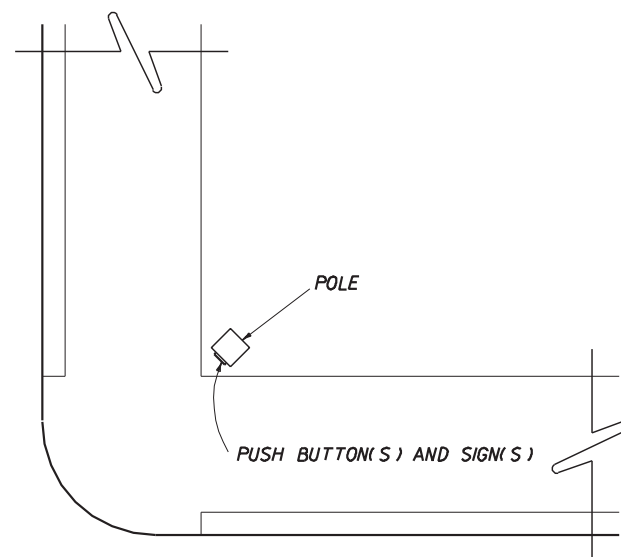
FTP-48



FTP-49



CASE I
POLE PARALLEL TO CURBLINE
ALTERNATE TO FIGURE F

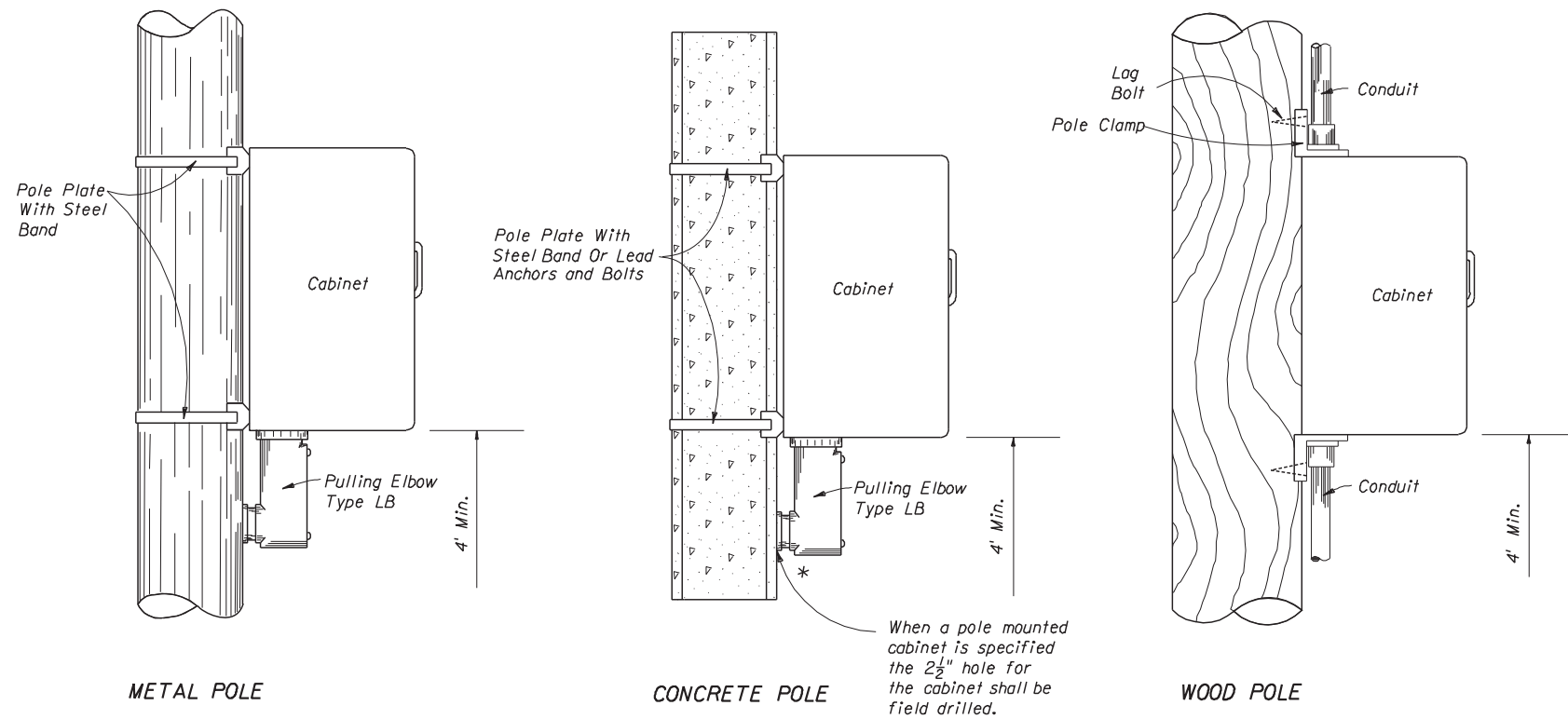


CASE II
POLE DIAGONAL TO CURBLINE

WHITE BACKGROUND WITH BLACK LEGEND AND BORDER
WALK PLAQUE - WHITE LEGEND ON BLACK BACKGROUND
DONT WALK PLAQUE - ORANGE LEGEND ON BLACK BACKGROUND
THE INTERNATIONAL SYMBOLS MAY BE USED FOR WALK AND DONT WALK.

Note:
1. See Index 17355 for sign details.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
PEDESTRIAN DETECTOR ASSEMBLY INSTALLATION DETAILS				
Designed By	Names	Dates	Approved By <i>Clark A. Scott</i> State Traffic Plans Engineer	
Drawn By			Revision	Sheet No. Index No.
Checked By			00	2 of 2 17784

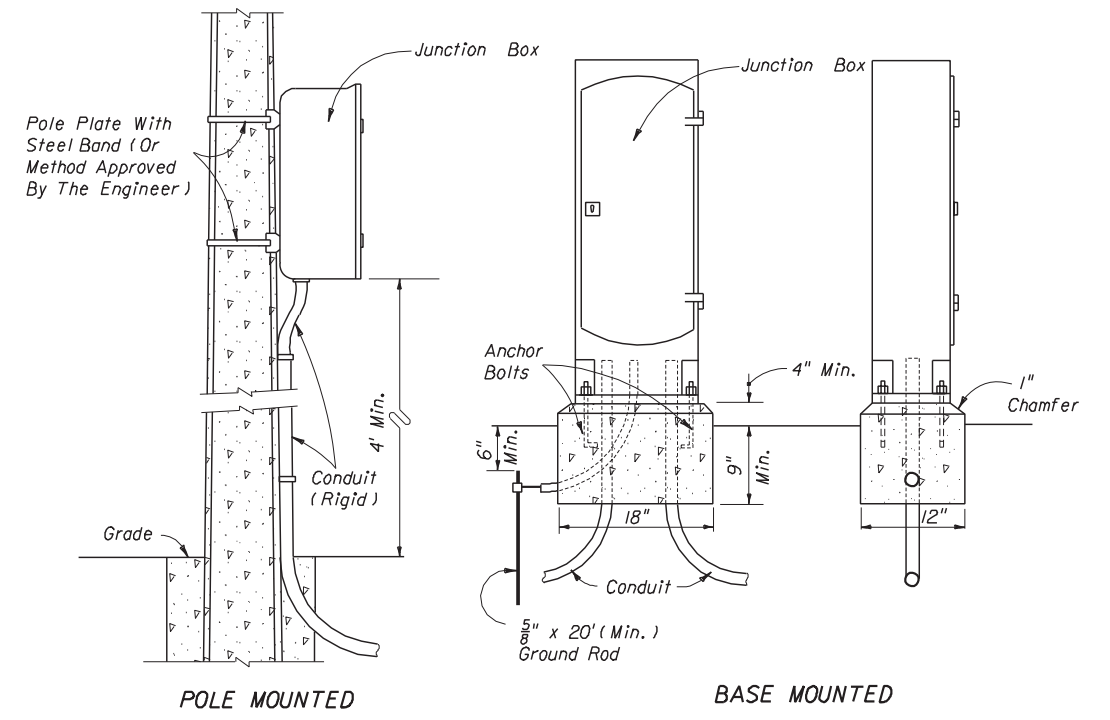


Liquid tight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.

When a pole mounted cabinet is specified the 2 1/2" hole for the cabinet shall be field drilled.

POLE MOUNTED CABINET

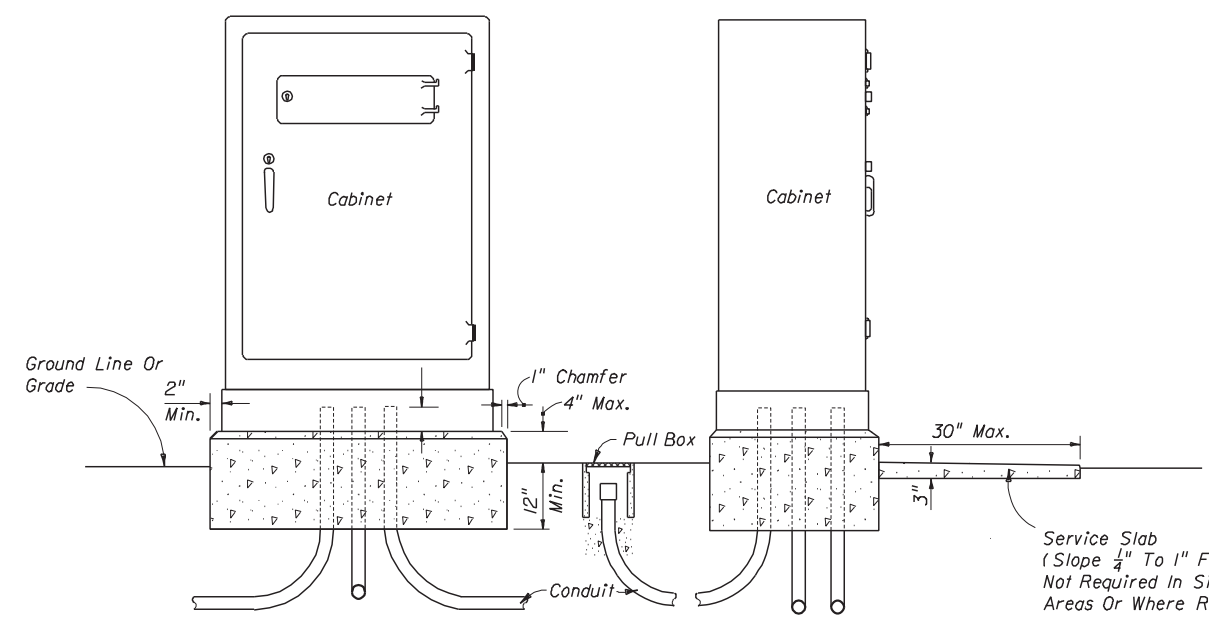
* If holes for cabinet mounting require relocation, original holes shall be filled in with concrete or covered with a non corrosive cover plate.



INTERCONNECT JUNCTION BOX

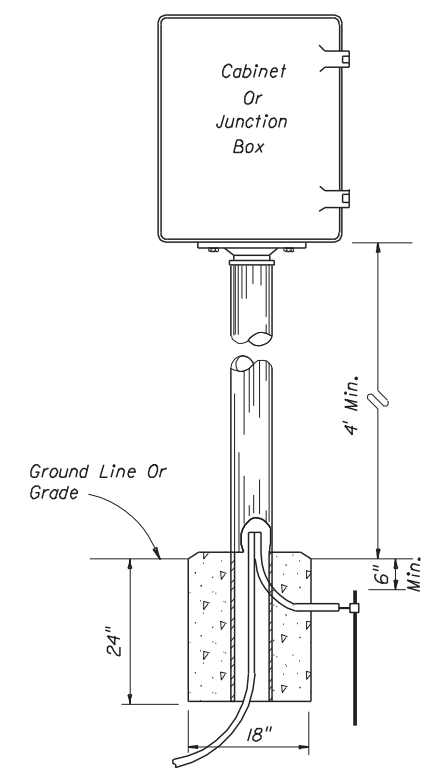
Notes:

- The number, size and orientation of conduit sweep will vary according to site condition or locations. Two spare 2" PVC conduits shall be provided in all bases. The spares shall exit in the direction of the center rear of the cabinet base, into a pull box and capped with a weather tight fitting. If obstructions prevent the spare conduit from exiting to the rear, or the rear of the cabinet is located on the R/W line, a side exit of the spare conduits will have to be approved by the project engineer. All spare conduit sweeps shall be capped with a weather proof fitting.
- Meet all grounding requirements of Section 620 of the Standard Specifications.



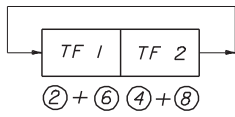
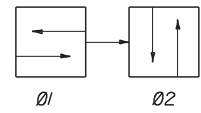
BASE MOUNTED CABINET

Service Slab (Slope 1/4" To 1" For Drainage) Not Required In Sidewalk Or Pavement Areas Or Where R/W Is Restricted.

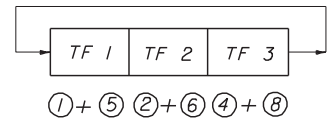
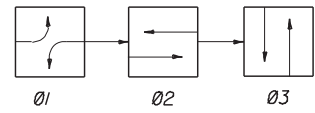


PEDESTAL MOUNTED

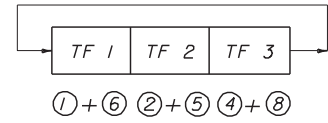
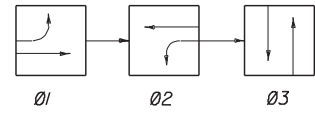
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
CABINET INSTALLATION DETAILS				
Names	Dates	Approved By		
Designed By		<i>Clark A. Scott</i> State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 1	17841



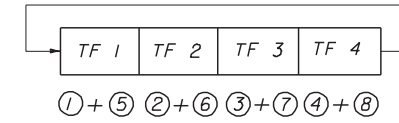
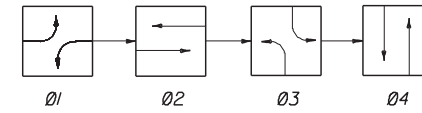
SOP 1



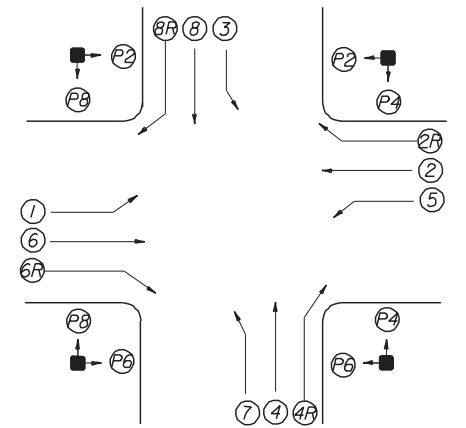
SOP 2



SOP 3



SOP 4

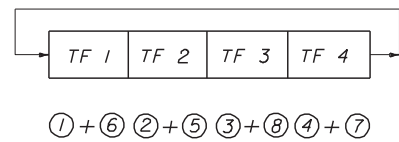
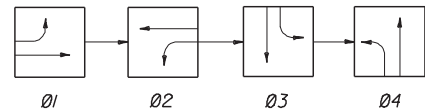


SIGNALIZED INTERSECTION

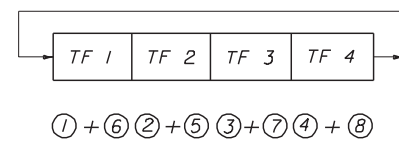
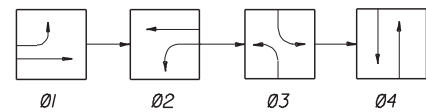
Vehicle movements & signal head number assignments are not directionally oriented but shall maintain their relative orientation about the intersection (I.E. movements 7 and 4 are always to the right of movements 1 and 6 etc.)

LEGEND

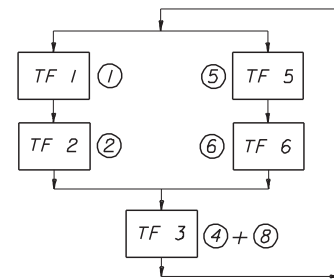
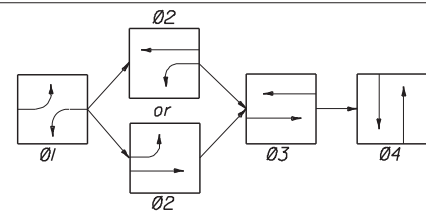
- (X) Vehicle Movement Number
- (PX) Pedestrian Movement Number
- TF x Timing Function Number
- 0x Phase Number
- ↔ Green Arrow (Left or Right)
- ↔ Red Arrow
- ↔ Yellow Arrow



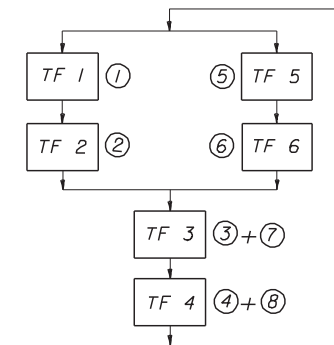
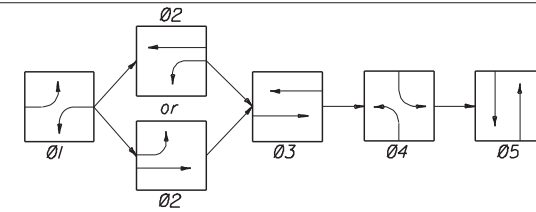
SOP 5



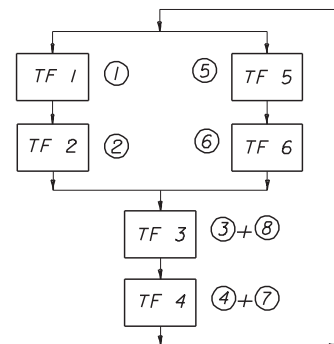
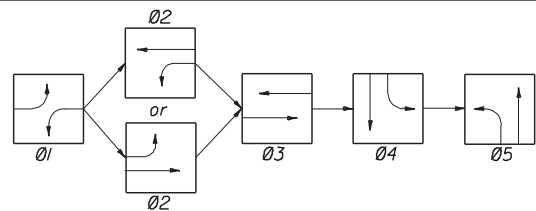
SOP 6



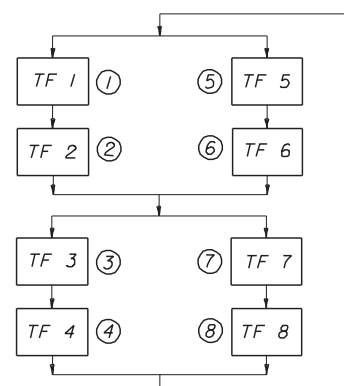
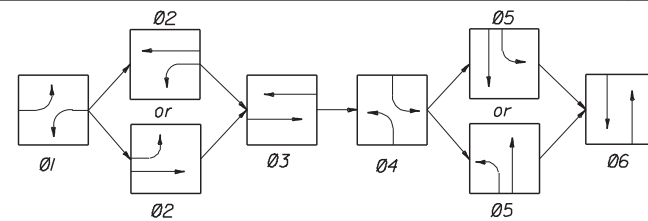
SOP 7



SOP 8



SOP 9



SOP 10

SIGNAL CLEARANCE TABLE
(Blank Indicates No Clearance Required)

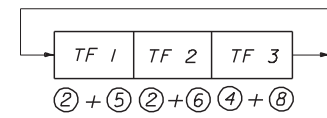
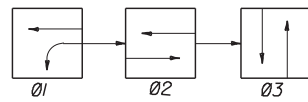
From \ To		SIGNAL INDICATIONS							
		R	R	G	G	G*	G	WALK	DONT WALK
S I G N A L I N D I C A T I O N S	R			Y	Y	Y	Y		
	R			Y	Y	Y	Y		
	G				Y	Y			
	G								
	G*								
	G								
	WALK								
	DONT WALK								Flash DONT WALK

* Clearance Indication When Yellow Arrow Is Used.

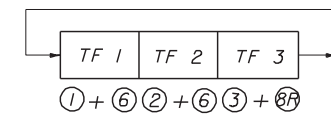
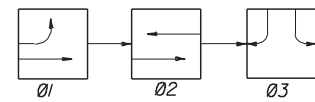
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

**STANDARD SIGNAL
OPERATING PLANS**

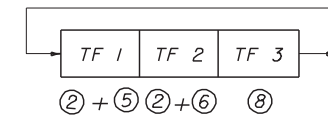
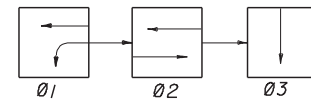
Names	Dates	Approved By		
Designed By	4-73	Clark A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	1 of 2	17870



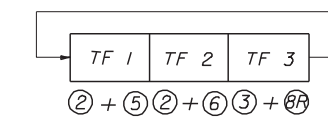
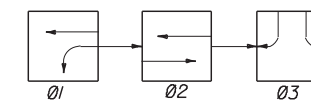
SOP 11



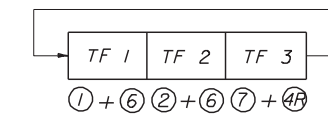
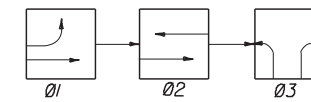
SOP 12



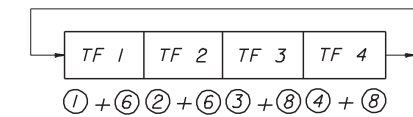
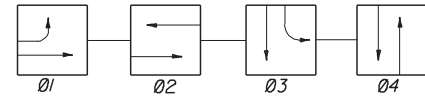
SOP 13
(ONE-WAY STREET INTERSECTION)



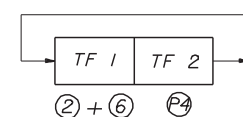
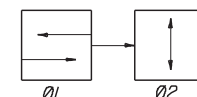
SOP 14
(DIAMOND INTERCHANGE OPERATION)



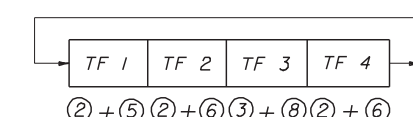
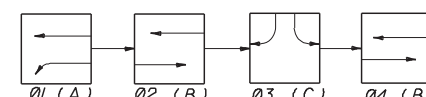
SOP 15
(DIAMOND INTERCHANGE OPERATION)



SOP 16

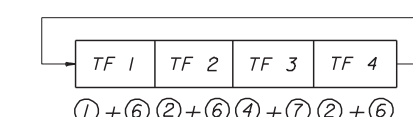
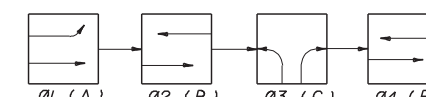


SOP 17
(MID-BLOCK)



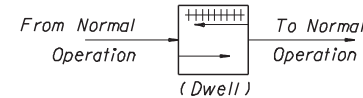
NOTE:
Only Ø2 Or Ø4 Used, Not Both To Obtain
ABC, Or ACB Operation.

SOP 18
(DIAMOND INTERCHANGE OPERATIONS)



NOTE:
Only Ø2 Or Ø4 Used, Not Both To Obtain
ABC, Or ACB Operation.

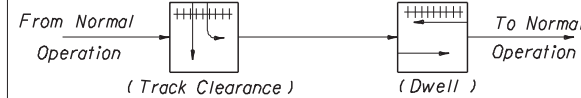
SOP 19
(DIAMOND INTERCHANGE OPERATIONS)



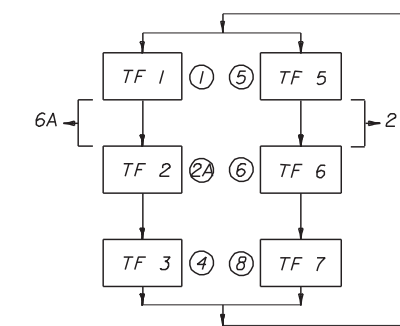
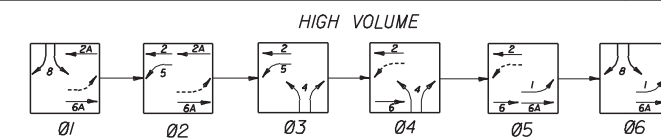
POP 1



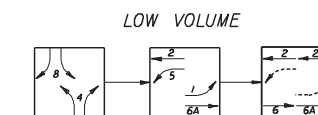
POP 2



POP 3



SOP 20
(DIAMOND INTERCHANGE OPERATIONS)



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

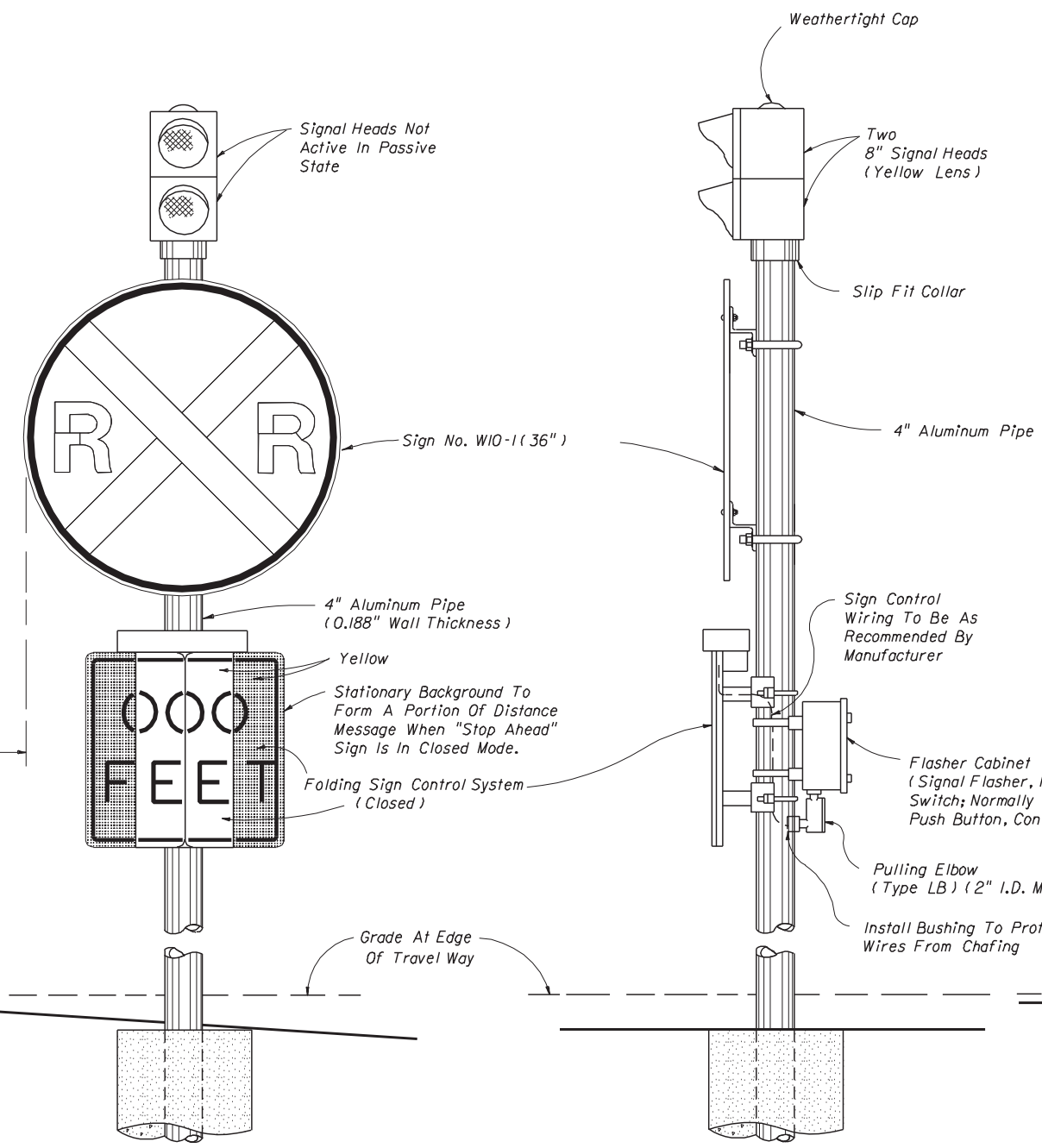
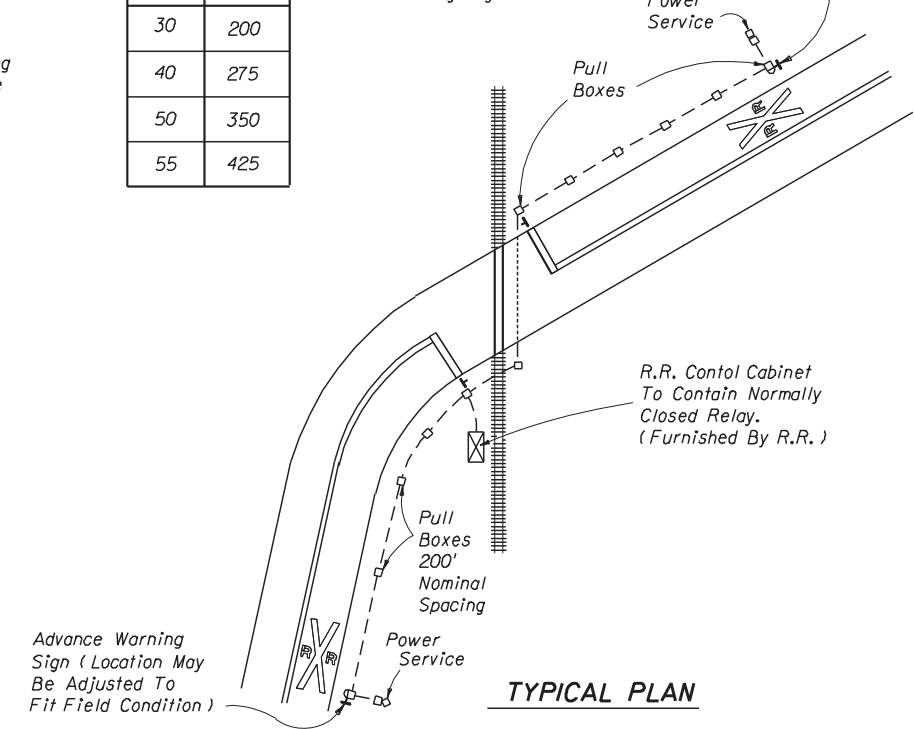
STANDARD SIGNAL
OPERATING PLANS

Names	Dates	Approved By		
Designed By	3-73	<i>Charles A. Scott</i>	Revision	Sheet No.
Drawn By		State Traffic Plans Engineer	00	2 of 2
Checked By				17870

LOCATION OF THE ADVANCE WARNING SIGN

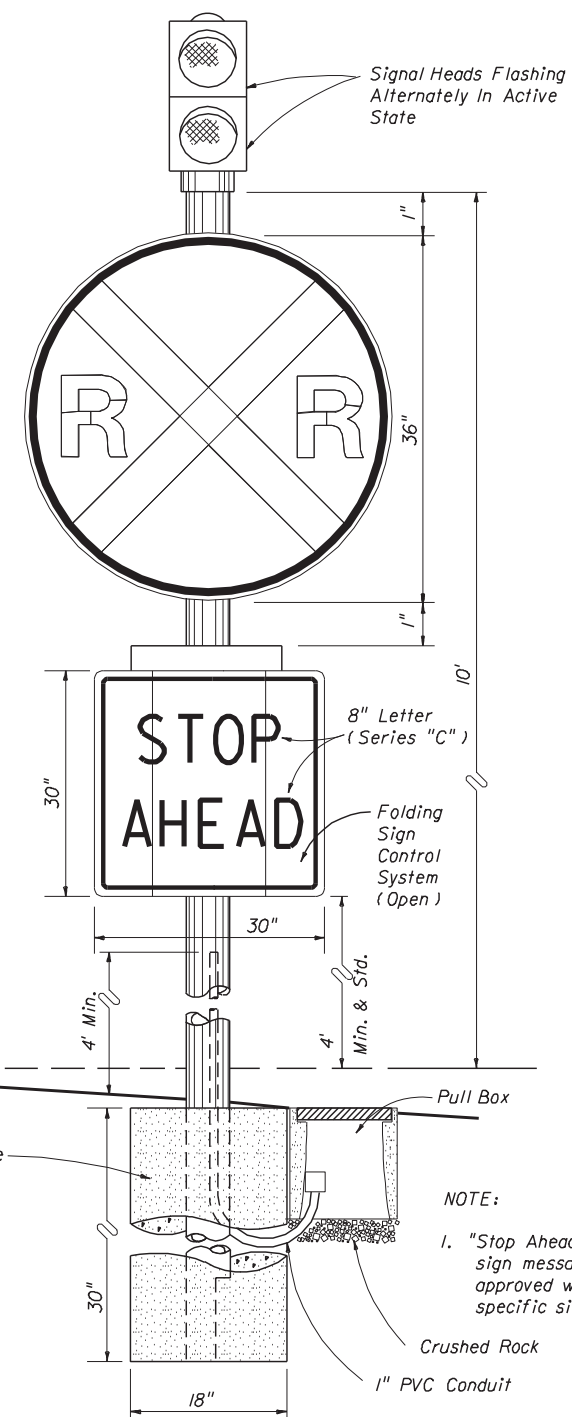
SPEED M.P.H.	DISTANCE FEET
30	200
40	275
50	350
55	425

The Distance Is Measured Along Right Edge Of Pavement From R/R Stop Bar To Sign Advance Warning Sign.



FRONT VIEW

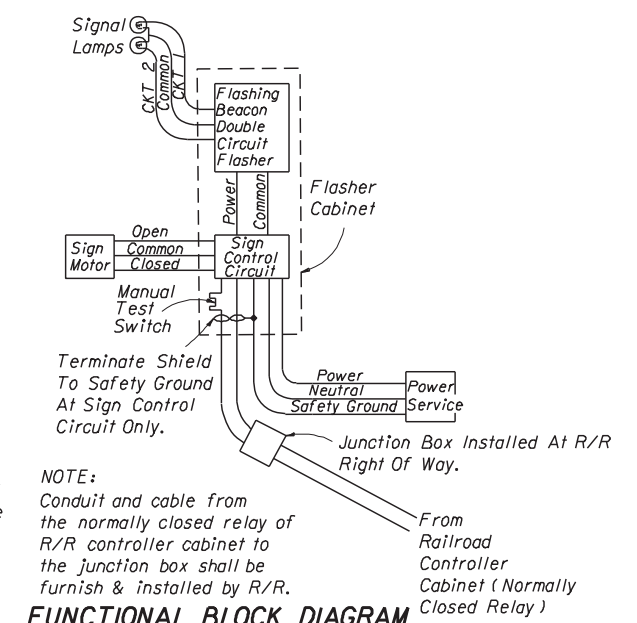
PASSIVE STATE
(TRAIN CIRCUIT NOT ACTUATED)



FRONT VIEW

ACTIVE STATE
(TRAIN CIRCUIT ACTUATED)

NOTE:
1. "Stop Ahead" is standard and preferred sign message. Another message may be approved when appropriate for specific situations.

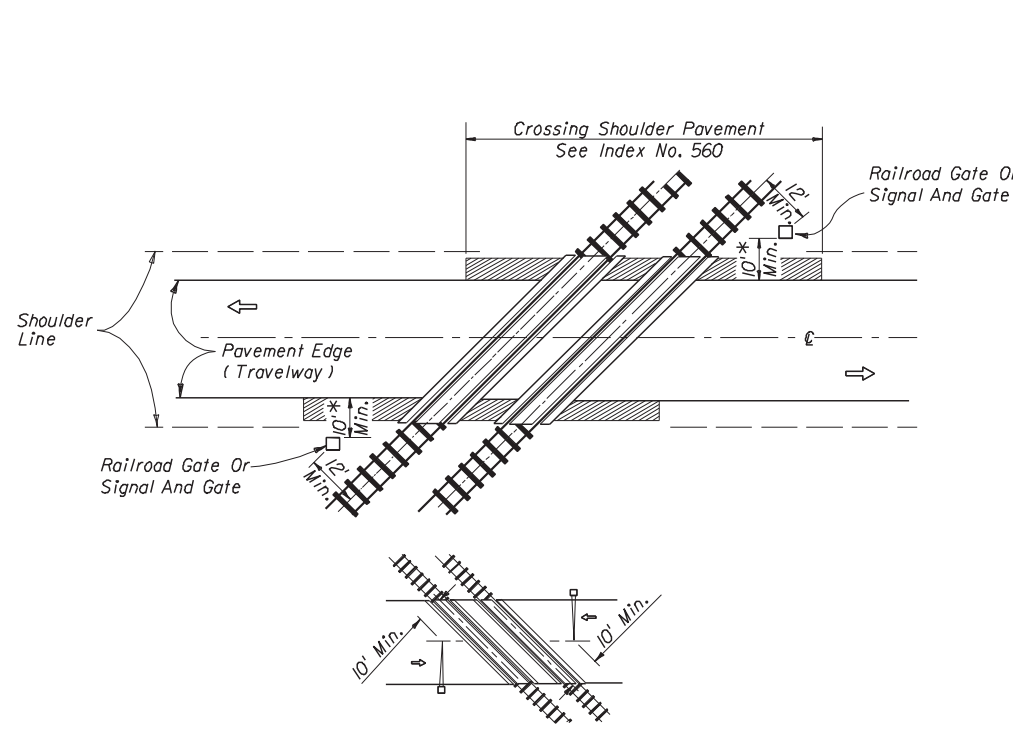


NOTE:
Conduit and cable from the normally closed relay of R/R controller cabinet to the junction box shall be furnished & installed by R/R.

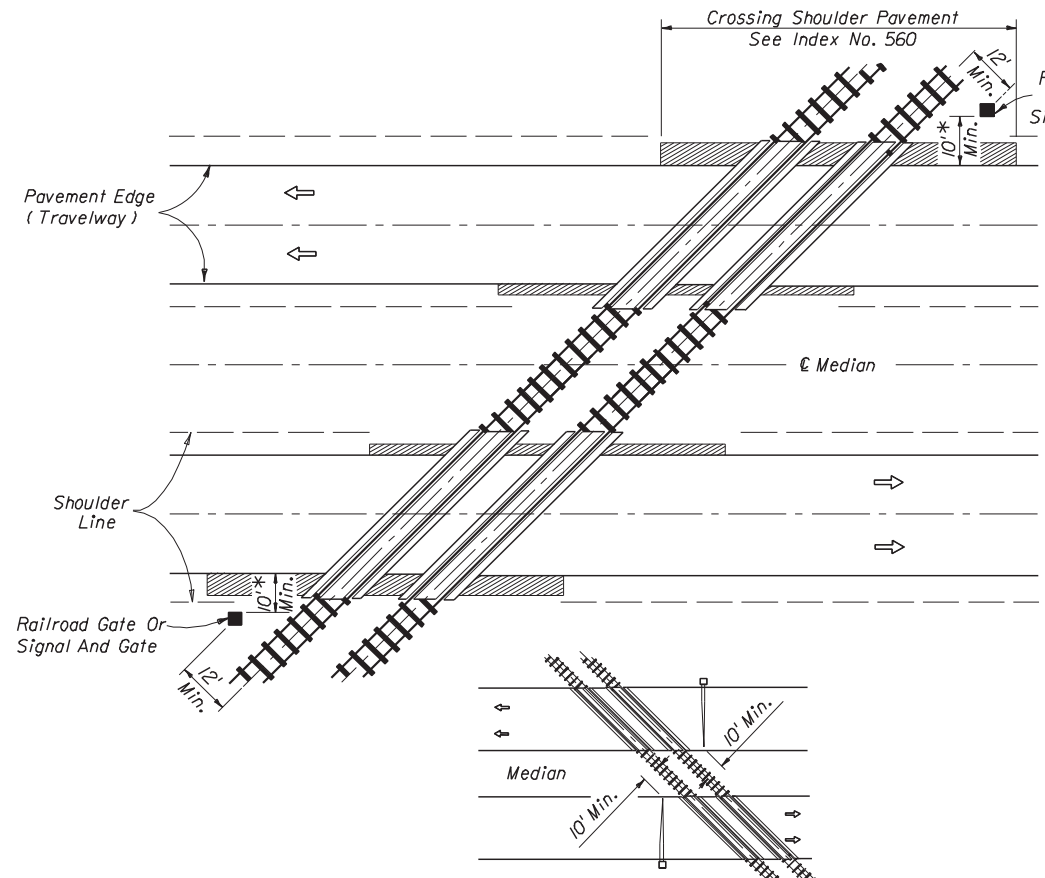
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

ADVANCE WARNING FOR R.R. CROSSING

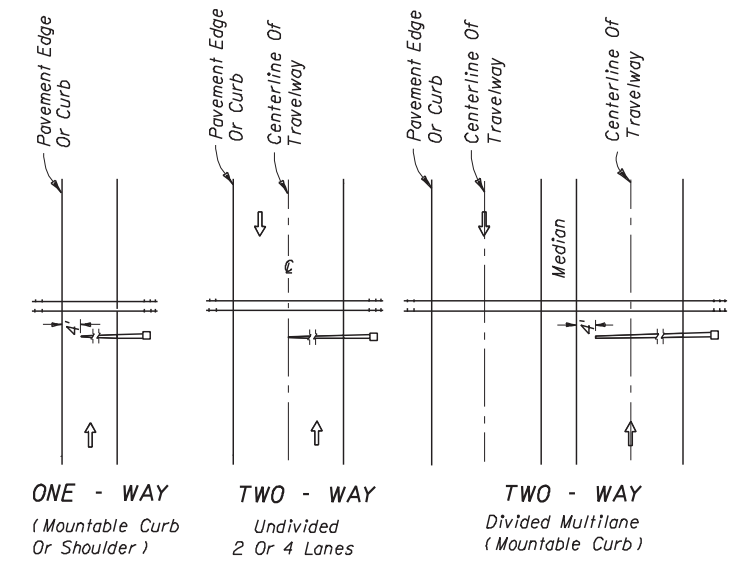
Names	Dates	Approved By		
Designed By	12-75	Charles A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	12-75	00	1 of 1	17881



**SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 - LANE DESIGN)**

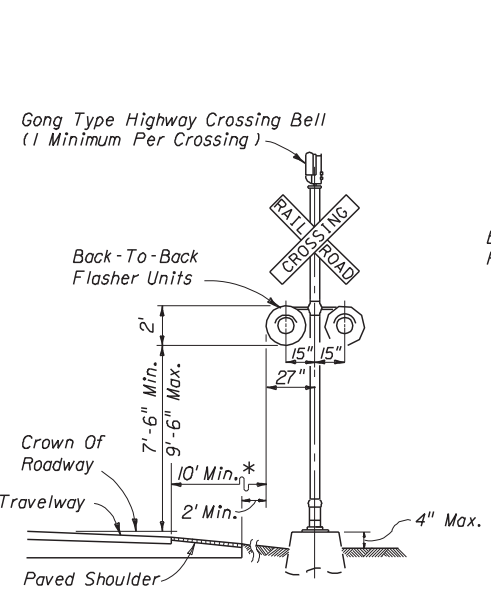


**SIGNAL PLACEMENT AT RAILROAD CROSSING
(4 - LANE DESIGN)**

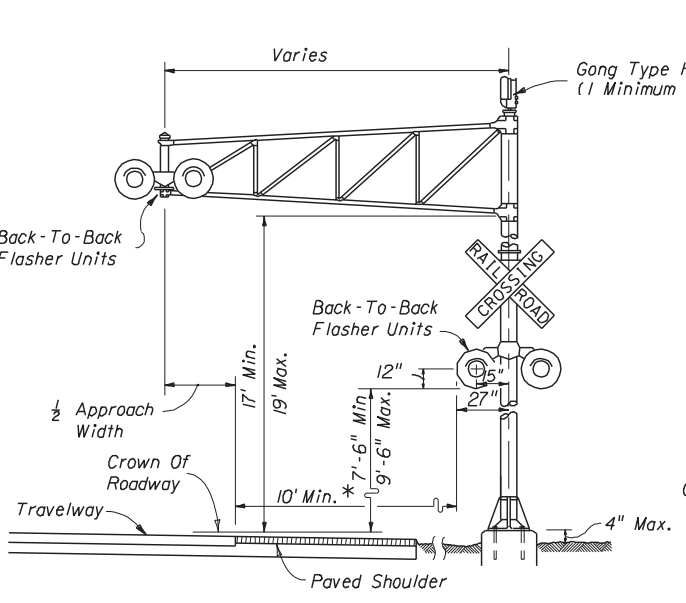


Note :
Arrows denote direction of travel not lane indication

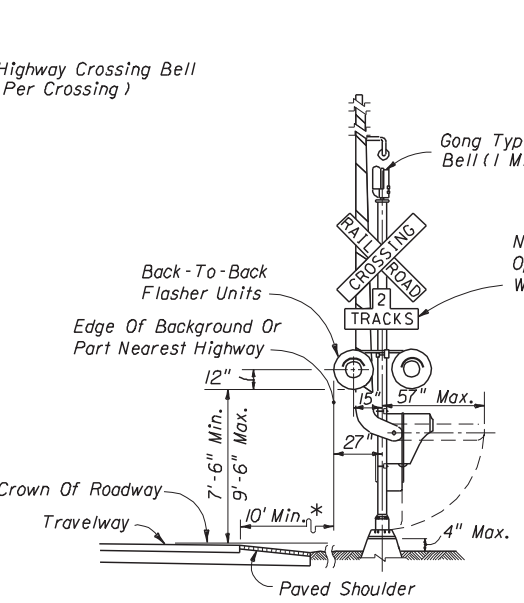
**FIGURE 1
Gate Length Requirements
See Note 6 Sheet 3**



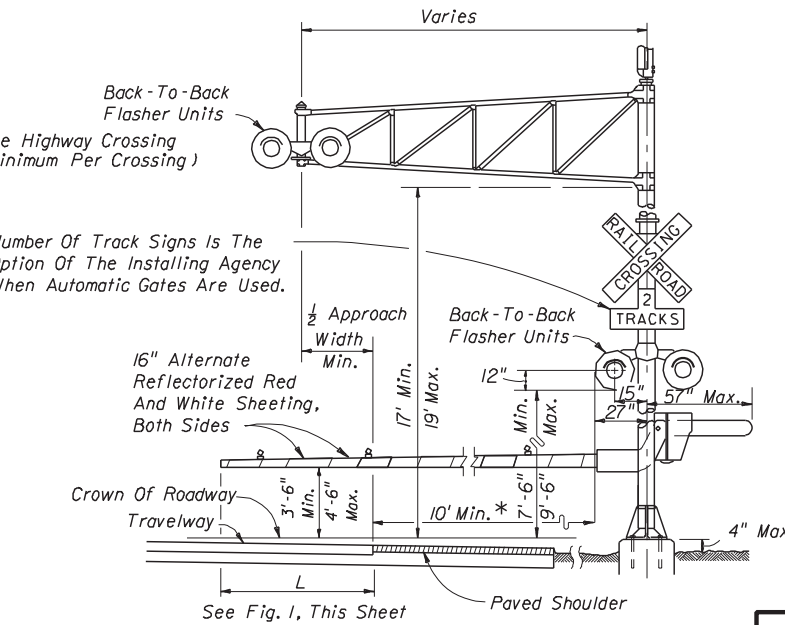
TYPE I



TYPE II



TYPE III



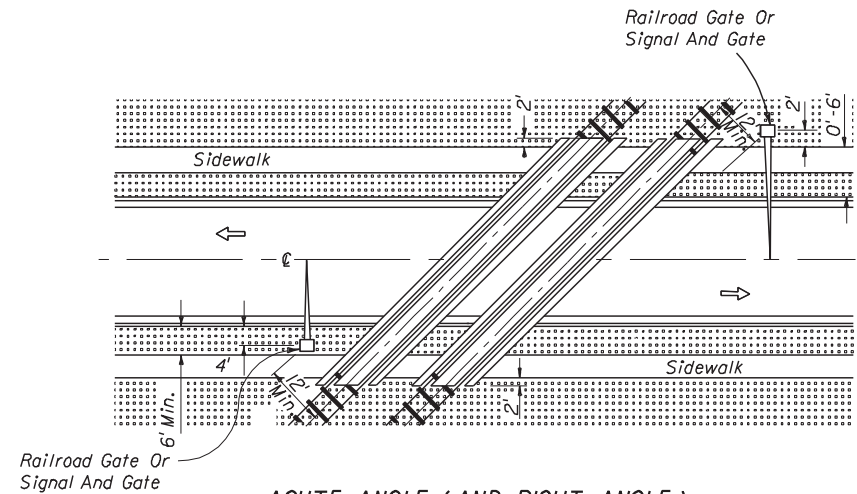
TYPE IV

* When 10' is deemed impracticable the control device can be located as close as 2' from the edge of a paved shoulder but not less than 6' from the edge of the near traffic lane.

Note :
Two separate foundations may be required (one for signals, one for gate), depending on type of equipment used.

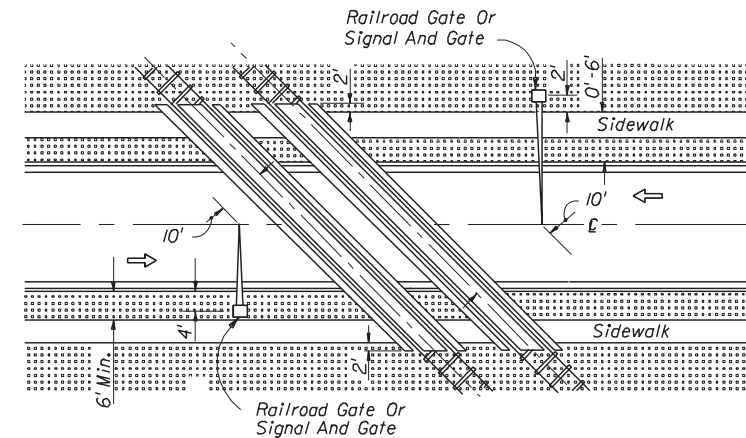
- General Notes**
- No guardrail is proposed for signals; however, some form of impact attenuation device may be specified for certain locations.
 - Advance flasher to be installed when and if called for in plans or specifications.
 - Top of foundation shall be no higher than 4" above finished shoulder grade.
 - Type of traffic control device
 - Flashing signals
 - Flashing signals with cantilever
 - Flashing signals with gate
 - Flashing signals with cantilever & gate
 - Gate
 - Class of traffic control devices
 - Flashing signals - one track
 - Flashing signals - multiple tracks
 - Flashing signals and gates - one track
 - Flashing signals and gates - multiple tracks

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES				
Names	Dates	Approved By		
Designed By	4-76	Clark A. Scott State Traffic Plans Engineer		
Drawn By		Revision	Sheet No.	Index No.
Checked By	4-76	00	1 of 4	17882



ACUTE ANGLE (AND RIGHT ANGLE)

**SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 LANES, CURB & GUTTER)**

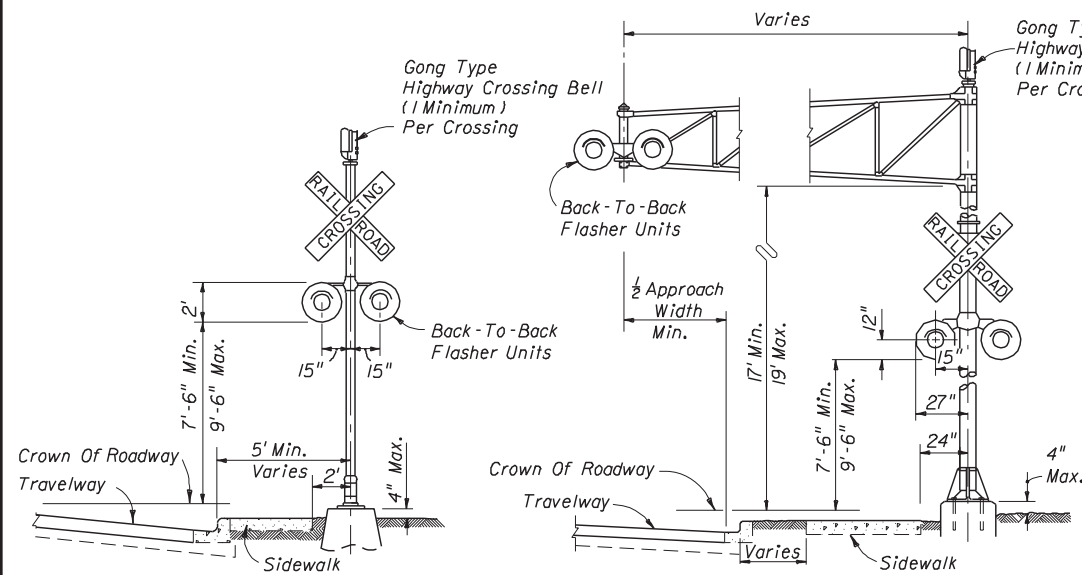


OBTUSE ANGLE

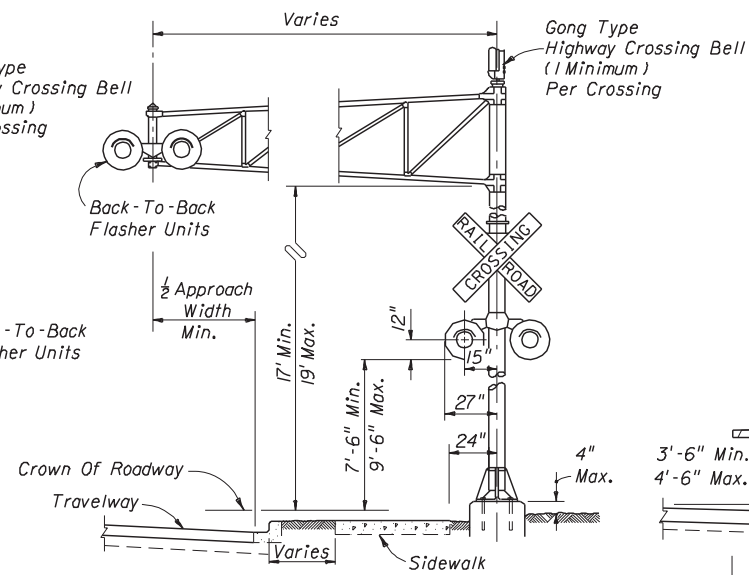
**SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 LANES, CURB & GUTTER)**

GENERAL NOTES

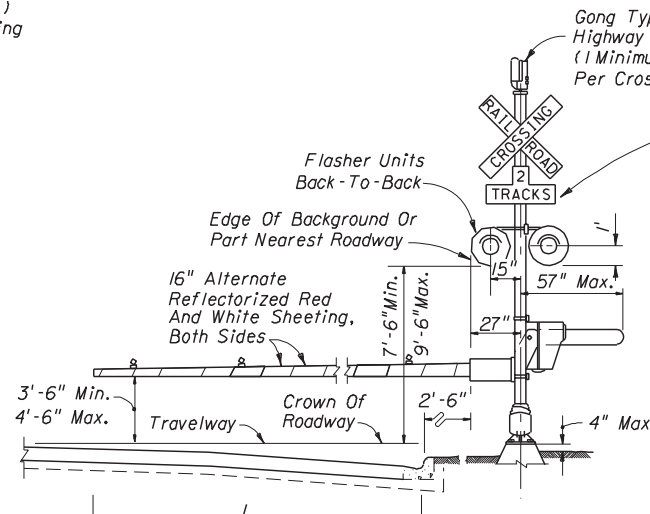
1. The location of flashing signals and stop lines shall be established based on future (or present) installation of gate with appropriate track clearances.
2. Where plans call for railroad traffic control devices to be installed in curbed medians, the minimum median width shall be 12'-6".
3. Location of railroad traffic control device is based on the distance available between face of curb & sidewalk.
0' to 6' - Locate device outside sidewalk.
Over 6' - Locate device between face of curb and sidewalk.
4. Stop line to be perpendicular to edge of roadway, approx. 15' from nearest rail; or 8' from and parallel to gate when present.



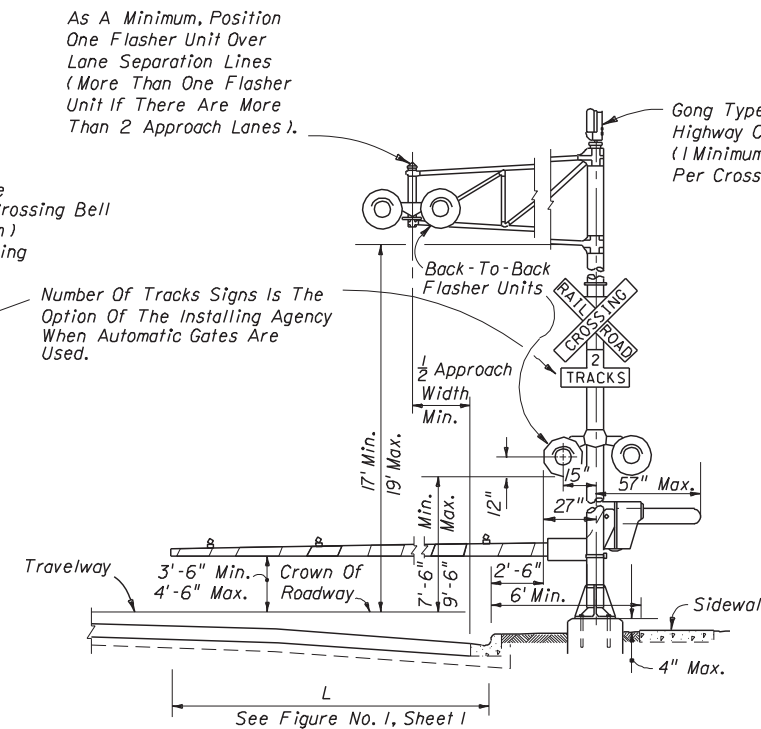
TYPE I



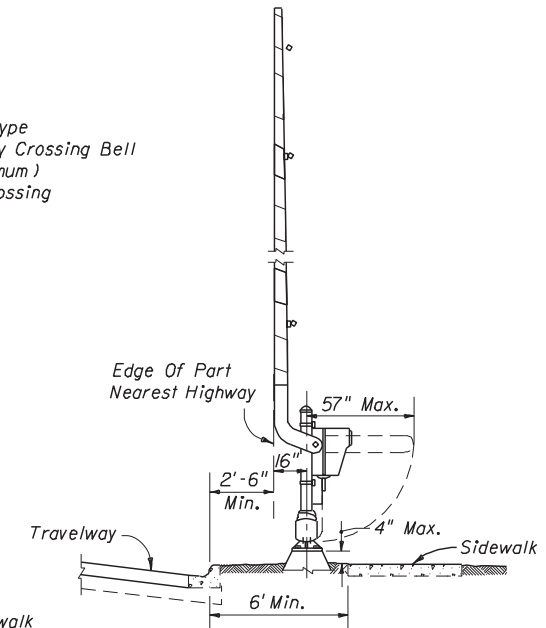
TYPE II



TYPE III



TYPE IV



TYPE V

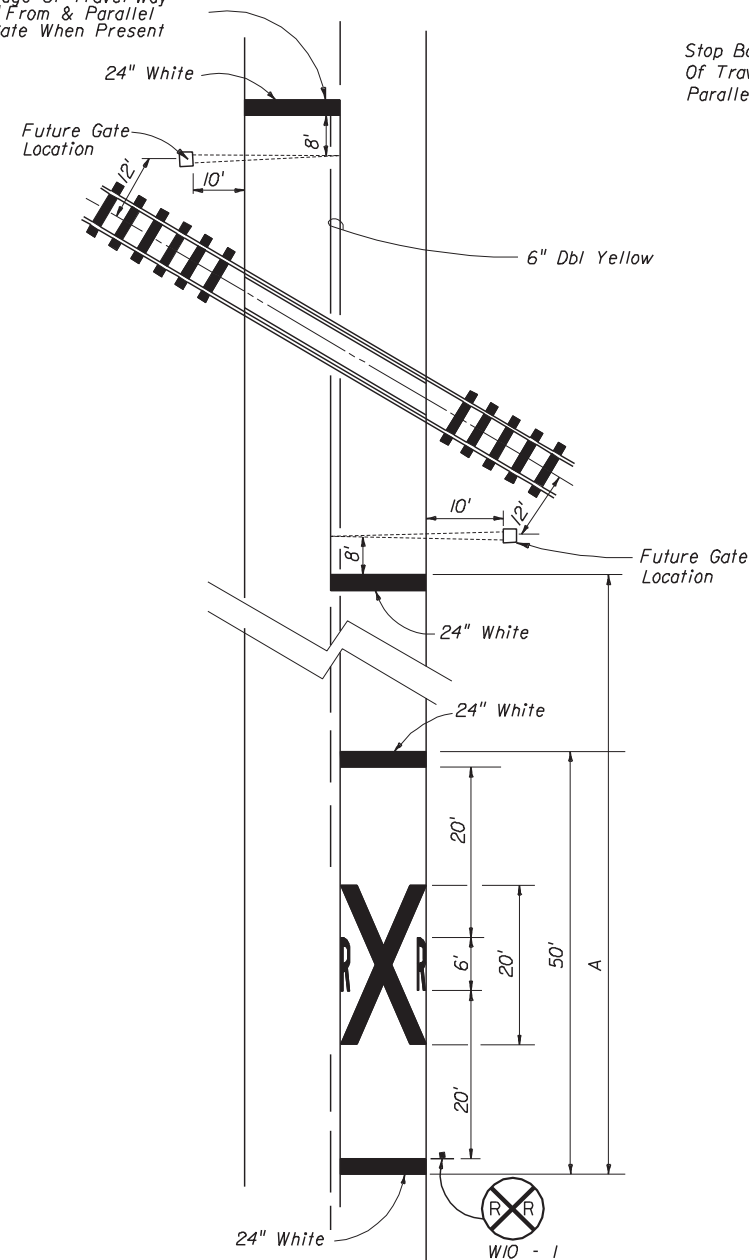
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

**RAILROAD GRADE CROSSING
TRAFFIC CONTROL DEVICES**

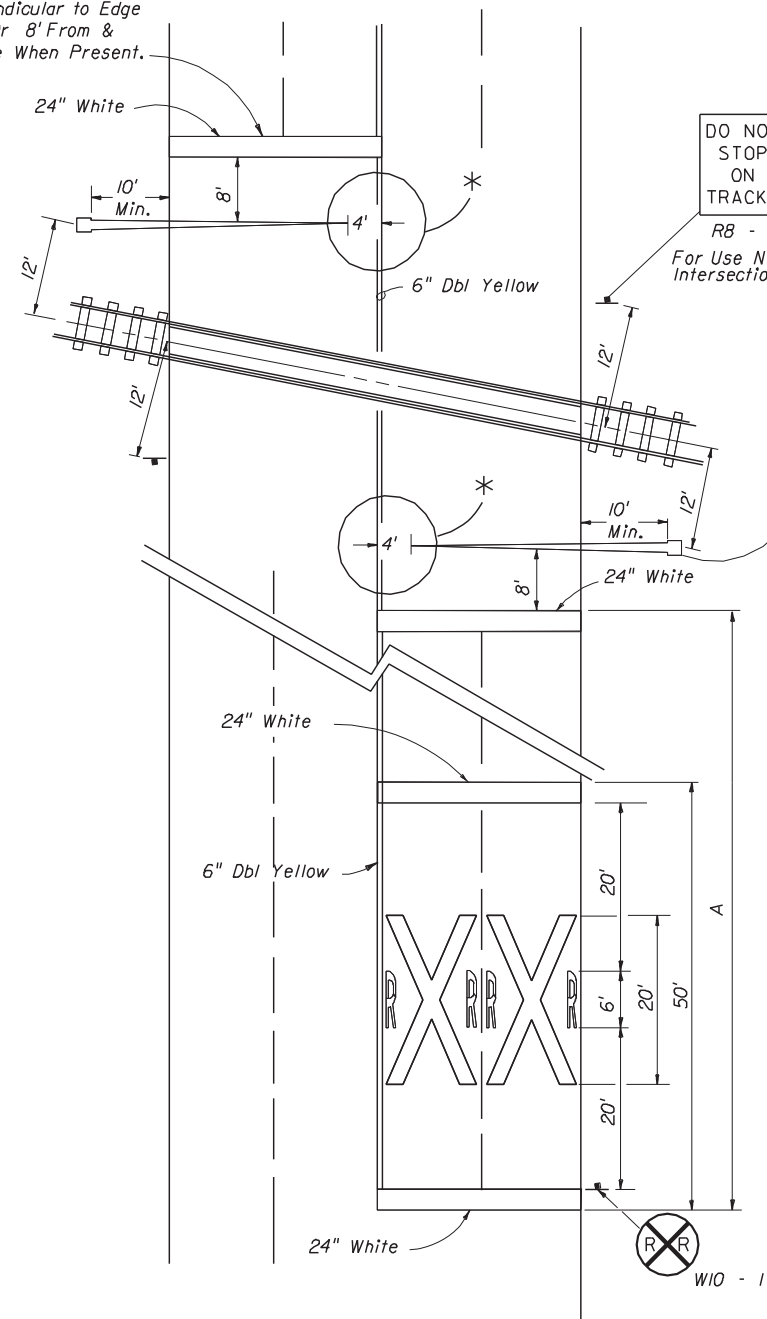
Names	Dates	Approved By		
Designed By	4-76	Charles A. Scott State Traffic Plans Engineer		
Drawn By				
Checked By	4-76	Revision	Sheet No.	Index No.
		00	2 of 4	17882

RAILROAD CROSSING AT TWO (2) - LANE ROADWAY

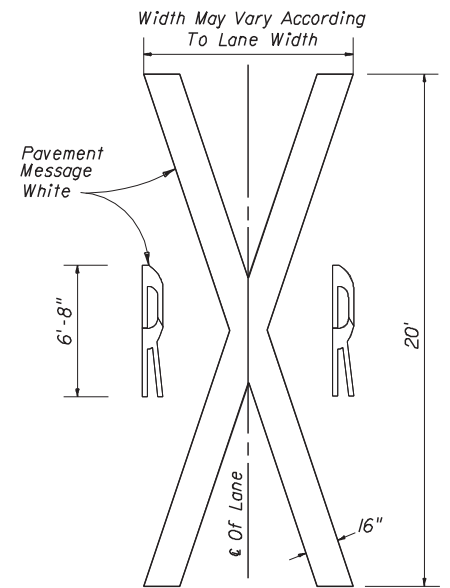
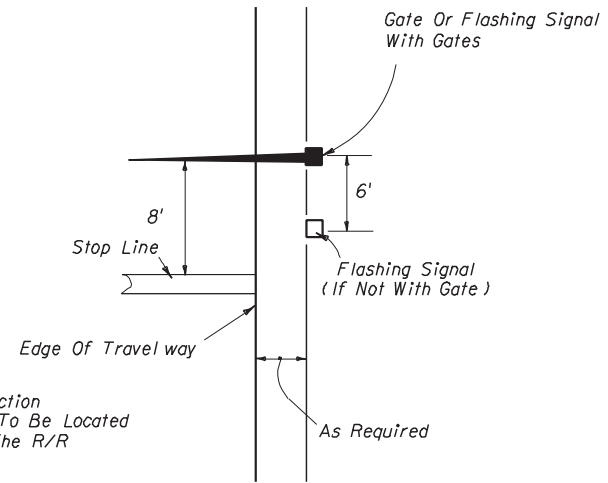
Stop Bar Perpendicular To Edge Of Travel Way Or 8' From & Parallel To Gate When Present



Stop Bar Perpendicular to Edge Of Travel Way Or 8' From & Parallel To Gate When Present.



RELATIVE LOCATION OF CROSSING TRAFFIC CONTROL DEVICES



NOTES:

1. When computing pavement message, quantities do not include transverse lines.
2. Placement of sign W10-1 in a residential or business district, where low speeds are prevalent, the W10-1 sign may be placed a minimum distance of 100' from the crossing. Where street intersections occur between the R/R pavement message and the tracks an additional W10-1 sign and additional pavement message should be used.
3. Recommended location for sign FTP-38, 100' Urban & 300' Rural in advance of the crossing.
4. A portion of the pavement markings symbol should be directly opposite the W10-1 sign.
5. Recommended location for FTP-38 A or B signs, 100' urban and 300' rural. See index 17355 for sign details.

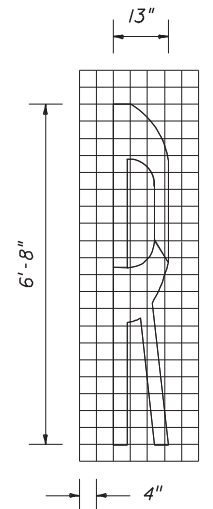
* 6. Gate Length Requirements

For two-way undivided sections:

The gate should extend to within 1' of the center line. On multilane approaches the maximum gate length may not reach to within 1' of the center line. For those cases, the distance from the gate to the center line shall be a maximum of 4'.

For one-way or divided sections:

The gate shall be of sufficient length such that the distance from the gate tip to the inside edge of pavement is a maximum of 4'.

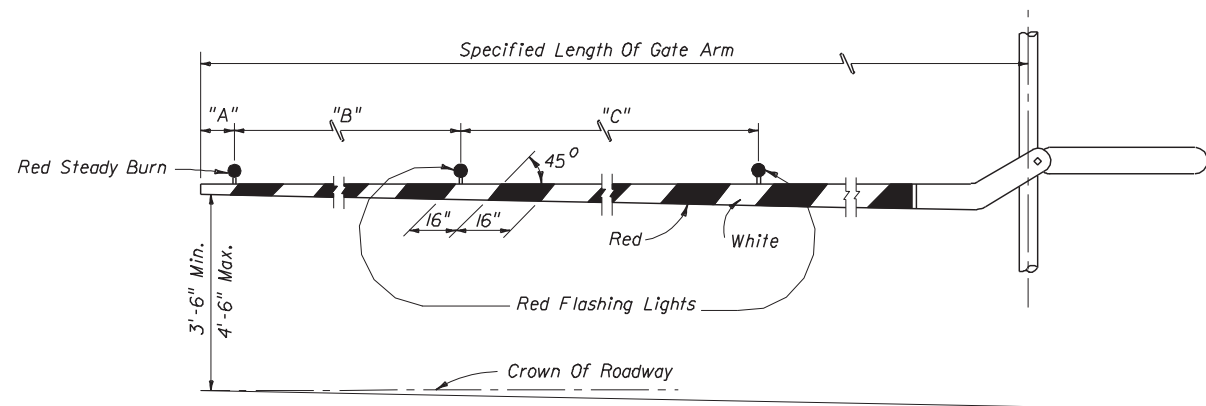


SPEED MPH	" A " IN FT
60	550
55	450
50	375
45	300
40	225
35	150
30	100
URBAN	50 MIN.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

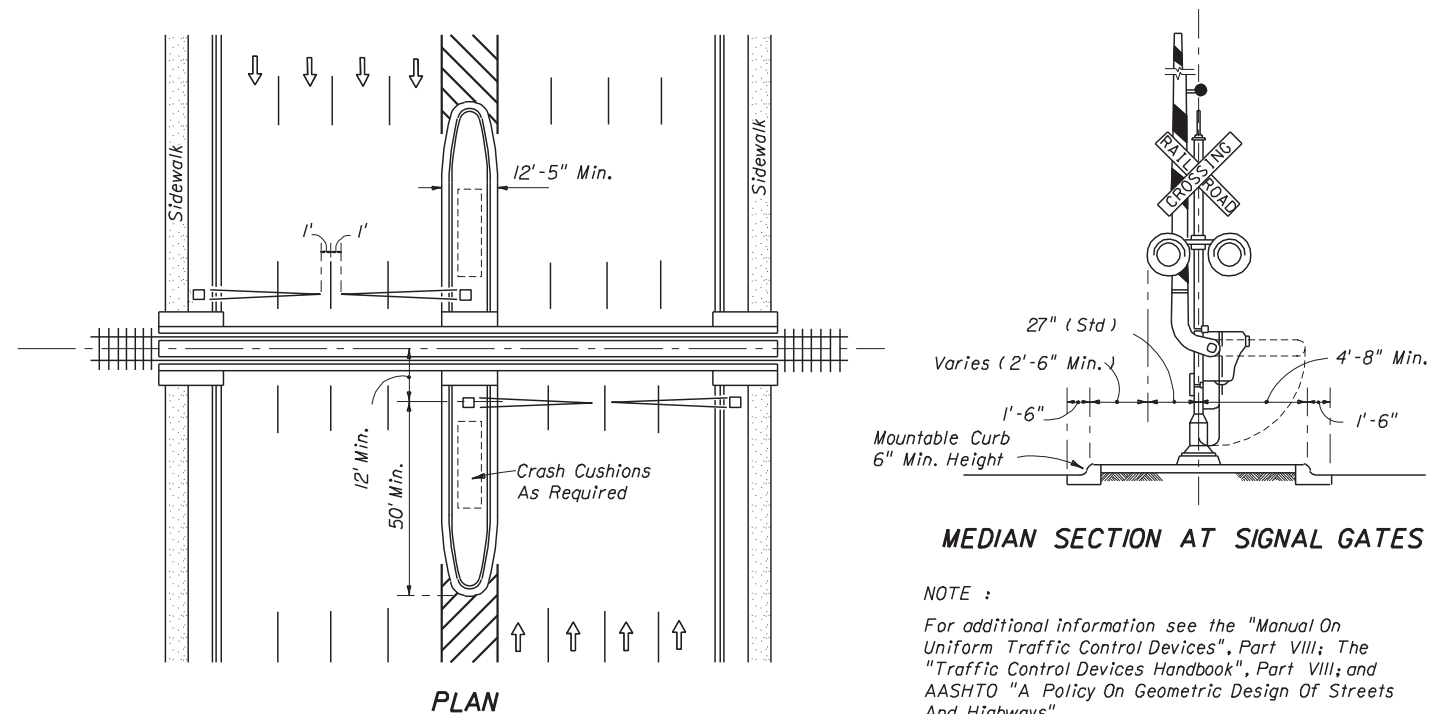
RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES

Names	Dates	Approved By
Designed By	10-77	<i>Clark A. Scott</i> State Traffic Plans Engineer
Drawn By		Revision
Checked By		Sheet No. 3 of 4
		Index No. 17882



RAILROAD GATE ARM LIGHT SPACING

Specified Length Of Gate Arm	Dimension "A"	Dimension "B"	Dimension "C"
14 Ft.	6"	36"	5'
15 Ft.	18"	36"	5'
16-17 Ft.	24"	36"	5'
18-19 Ft.	28"	41"	5'
20-23 Ft.	28"	4'	5'
24-28 Ft.	28"	5'	5'
29-31 Ft.	36"	6'	6'
32-34 Ft.	36"	7'	7'
35-37 Ft.	36"	9'	9'
38 And Over	36"	10'	10'



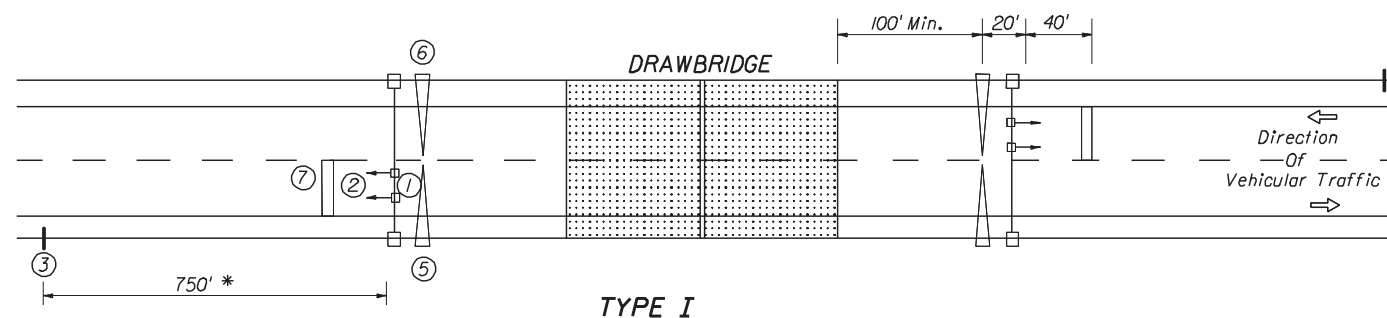
MEDIAN SECTION AT SIGNAL GATES

NOTE :
 For additional information see the "Manual On Uniform Traffic Control Devices", Part VIII; The "Traffic Control Devices Handbook", Part VIII; and AASHTO "A Policy On Geometric Design Of Streets And Highways".

**MEDIAN SIGNAL GATES FOR
 MULTI LANE UNDIVIDED URBAN SECTIONS**
 (THREE OR MORE DRIVING LANES IN ONE DIRECTION, 45 mph OR LESS)

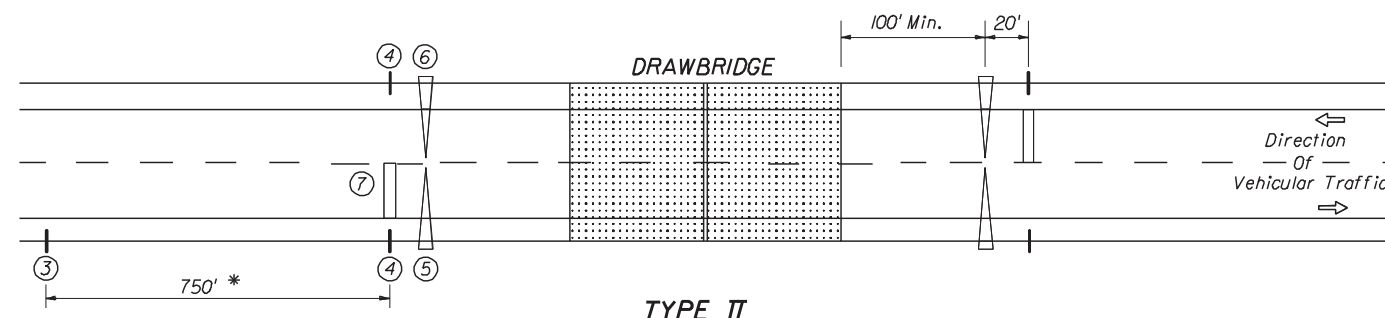
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
RAILROAD GRADE CROSSING TRAFFIC CONTROL DEVICES				
Names	Dates	Approved By		
Designed By	10-85	Clark A. Scott State Traffic Plans Engineer		
Drawn By	10-85	Revision	Sheet No.	Index No.
Checked By		00	4 of 4	17882

TYPICAL BRIDGE MOUNTS



TYPE I

TO BE USED WHERE BRIDGE OPERATORS ARE FULL TIME OR A DAILY BASIS



TYPE II

TO BE USED WHERE TYPE I IS NOT APPLICABLE (USUALLY WHEN THE BRIDGE OPERATOR IS "ON CALL")

* Field conditions may require adjustment of this standard distance.

SEQUENCE CHART

SIGNALS & SIGNS	SIGNAL SWITCH	
	OFF	ON
FLASHING BEACON DRAWBRIDGE AHEAD SIGN (See Note 9)	BLANK	FLASHING YELLOW
STOP HERE ON RED (Type II only)	BLANK	FLASHING RED
TRAFFIC SIGNALS (Type I only)	GREEN	YELLOW
ENTRANCE GATES	RAISED	LOWERED
EXIT GATES	RAISED	LOWERED

TIMING	Operation During Bridge Preemption					
	Variable Time (See Note No. 3)	5 Sec. Min.	15 Sec. Min. Variable Time (See Note No. 4)	Variable Time (See Note No. 5)	Variable Time - Bridge Open (See Note No. 6)	Variable Time (See Note No. 5)
Normal Operation	[Timing Diagram]					

- LEGEND**
- ① TRAFFIC SIGNALS } Mast Arm Mounted (Off Bridge)
 - ② DRAWBRIDGE SIGN } Monotube Support Mounted (On Bridge)
 - ③ DRAWBRIDGE AHEAD SIGN } Ground Mounted
 - ④ STOP HERE ON RED SIGN } Ground Mounted
 - ⑤ ENTRANCE GATE
 - ⑥ EXIT GATE
 - ⑦ 24" THERMOPLASTIC STOP BAR

NOTES:

- A bypass switch shall be installed to override each timing interval in case of a malfunction.
- "STOP HERE ON RED" is omitted in Type I operation and "TRAFFIC SIGNALS" are omitted in Type II operation.
- The time between beginning of flashing yellow on "Drawbridge Ahead" sign and the clearance of traffic signal to red, or beginning of flashing red should not be less than the travel time of a passenger car, from the sign location to the stop line, traveling at the 85 percentile approach speed.
- Beginning of operation of drawbridge gates shall not be less than 15 seconds after steady red or 20 seconds after flashing red (Actual time may be determined by the bridge tender.)
- Time of gate lowering and raising is dependent upon gate type.
- Time of bridge opening is determined by the bridge tender.
- Each gate shall be operated by a separate switch.
- On each approach (Type II), all four red signals shall be on the same two circuit flashers, with the two top signals on one circuit, and the two bottom signals on the alternately flashing circuit.
- A Drawbridge Ahead sign is required for both types of signal operation, However a flashing beacon shall be added to the sign when physical conditions prevent a driver traveling at the 85% approach speed from having continuous view of at least one signal indication for approximately 10 seconds.
- Requirements on gate installation are contained in Section 4E-14 through 4E-17 of the Manual on Uniform Traffic Control Devices.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC DESIGN				
TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS				
Designed By	Names	Dates	Approved By	
Drawn By		4-75	<i>Clark A. Scott</i> State Traffic Plans Engineer	
Checked By		4-75	Revision	Sheet No. Index No.
			00	1 of 3 17890

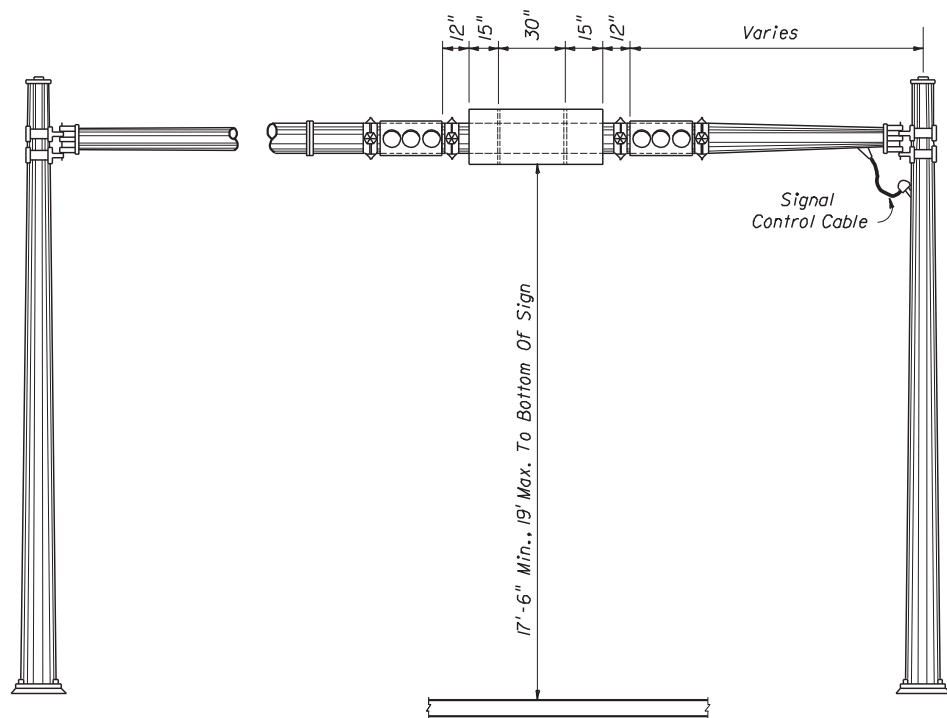


FIGURE - A
MONOTUBE SUPPORT MOUNTING

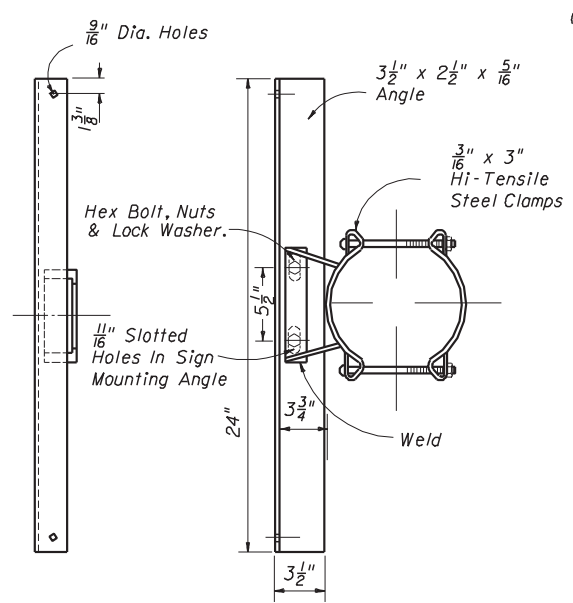


FIGURE - B
SIGN PANEL MOUNTING ASSEMBLY

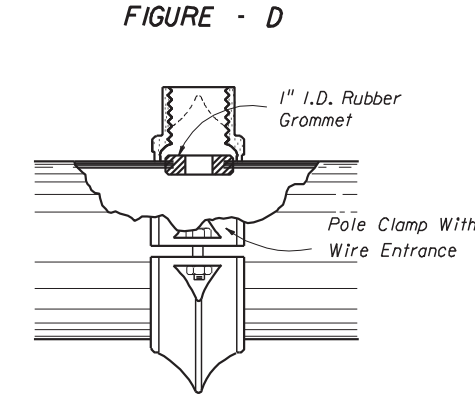
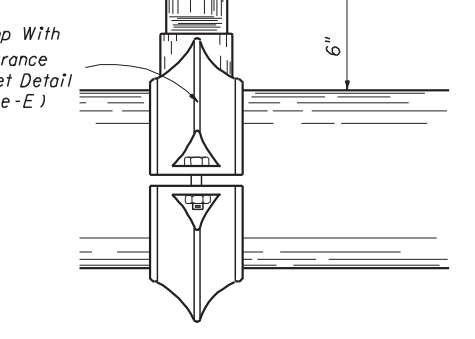
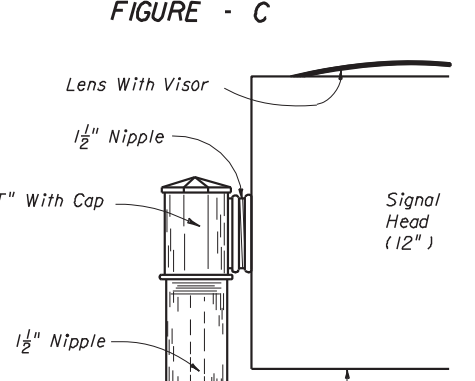
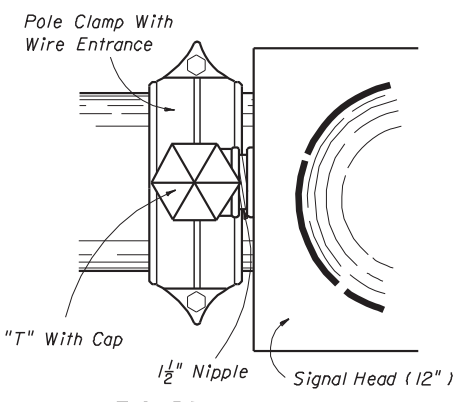


FIGURE - D
SIGNAL HEAD MOUNTING ASSEMBLY

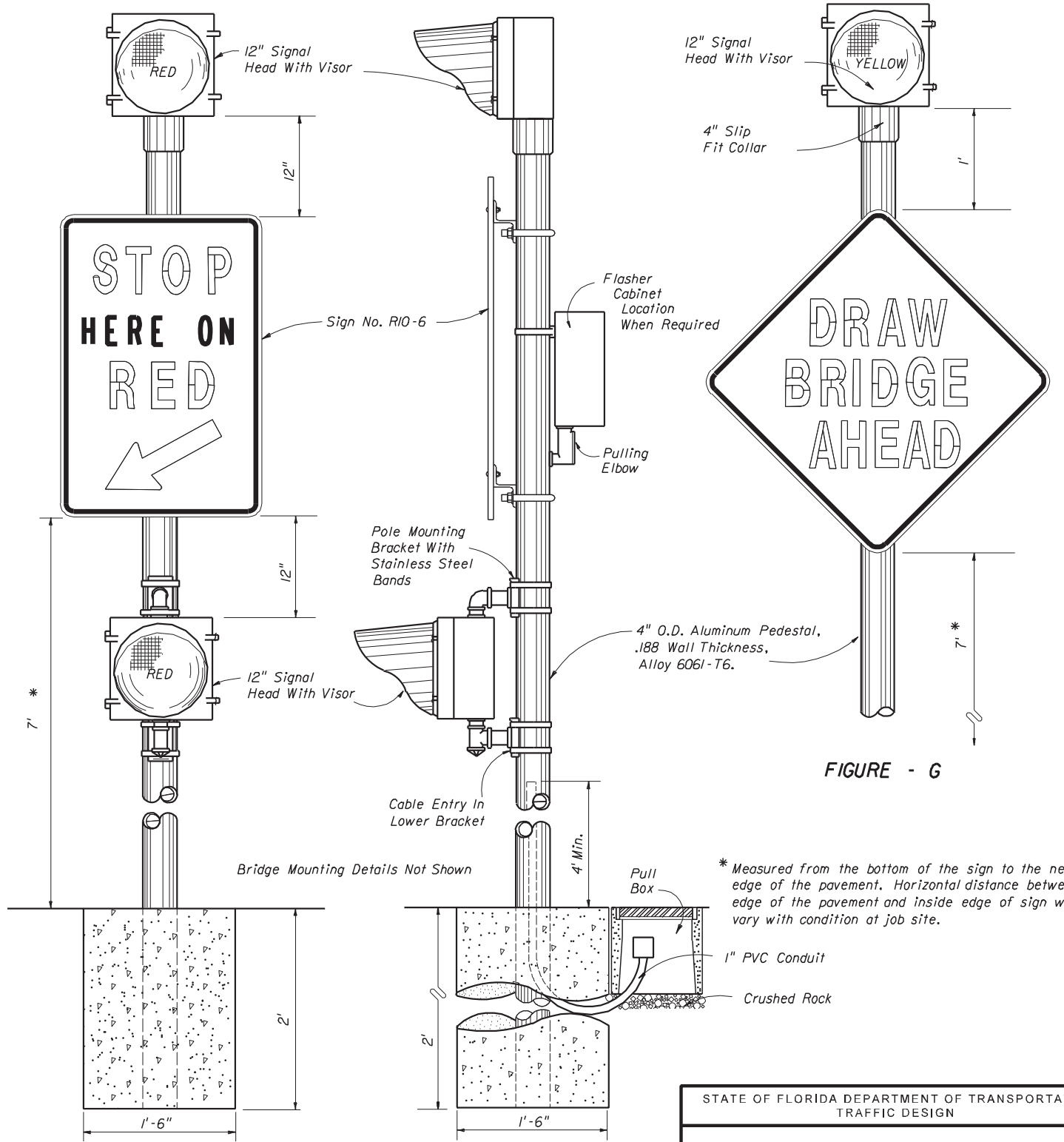


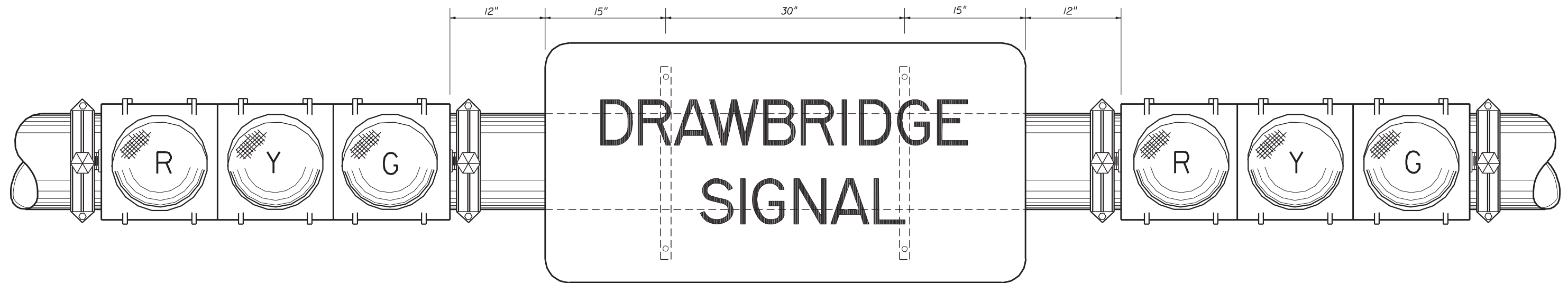
FIGURE - F

* Measured from the bottom of the sign to the near edge of the pavement. Horizontal distance between edge of the pavement and inside edge of sign will vary with condition at job site.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
TRAFFIC DESIGN

TRAFFIC CONTROL DEVICES FOR MOVABLE SPAN BRIDGE SIGNALS

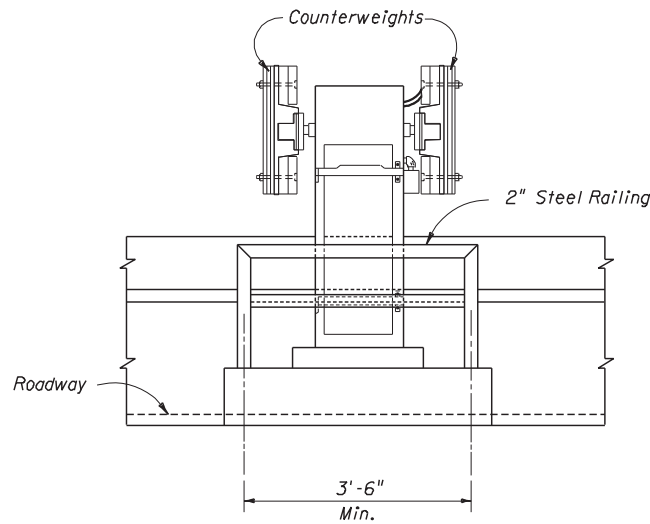
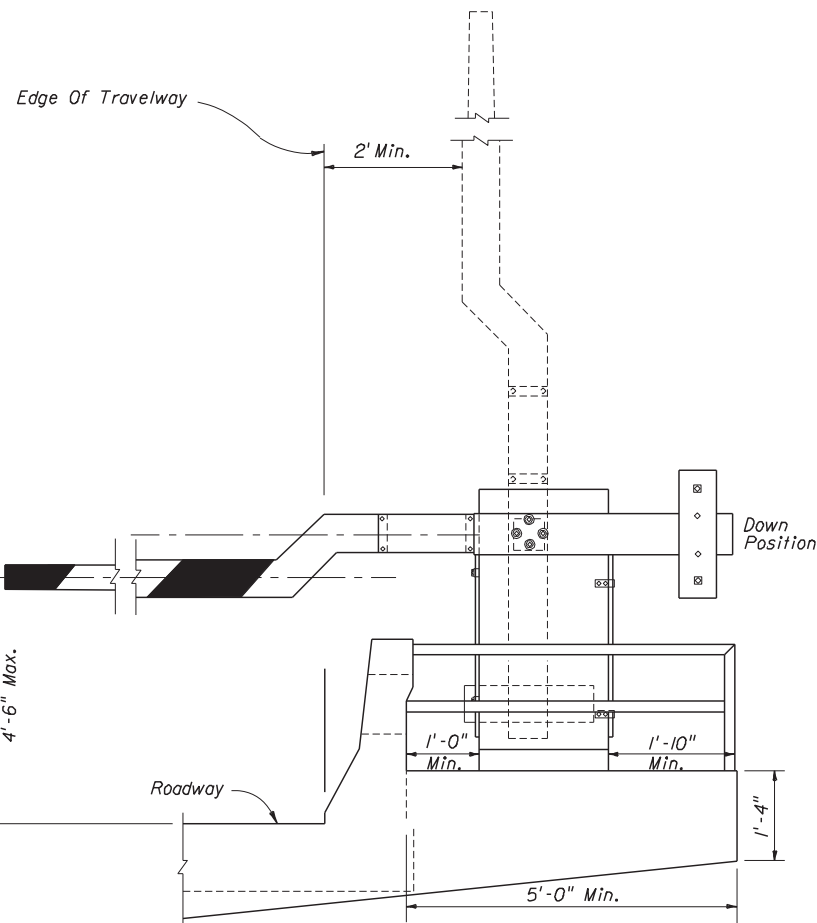
Names	Dates	Approved By		
Designed By	4-75	 State Traffic Plans Engineer		
Drawn By				
Checked By	4-75	Revision	Sheet No.	Index No.
		00	2 of 3	17890



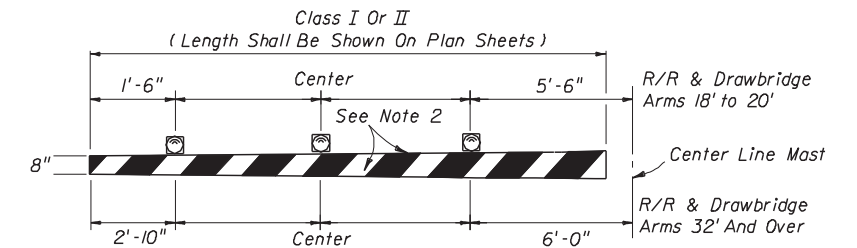
5' x 2'-6"
 2" Border-4" Radius
 6" Series "D" Letters

BLACK OPAQUE LEGEND AND BORDER ON REFLECTORIZED YELLOW BACKGROUND

TO BE USED WITH TYPE I OPERATION, AS SHOWN
 ON PREVIOUS SHEET
MONOTUBE SUPPORT MOUNTING



GATE & ARM DETAIL



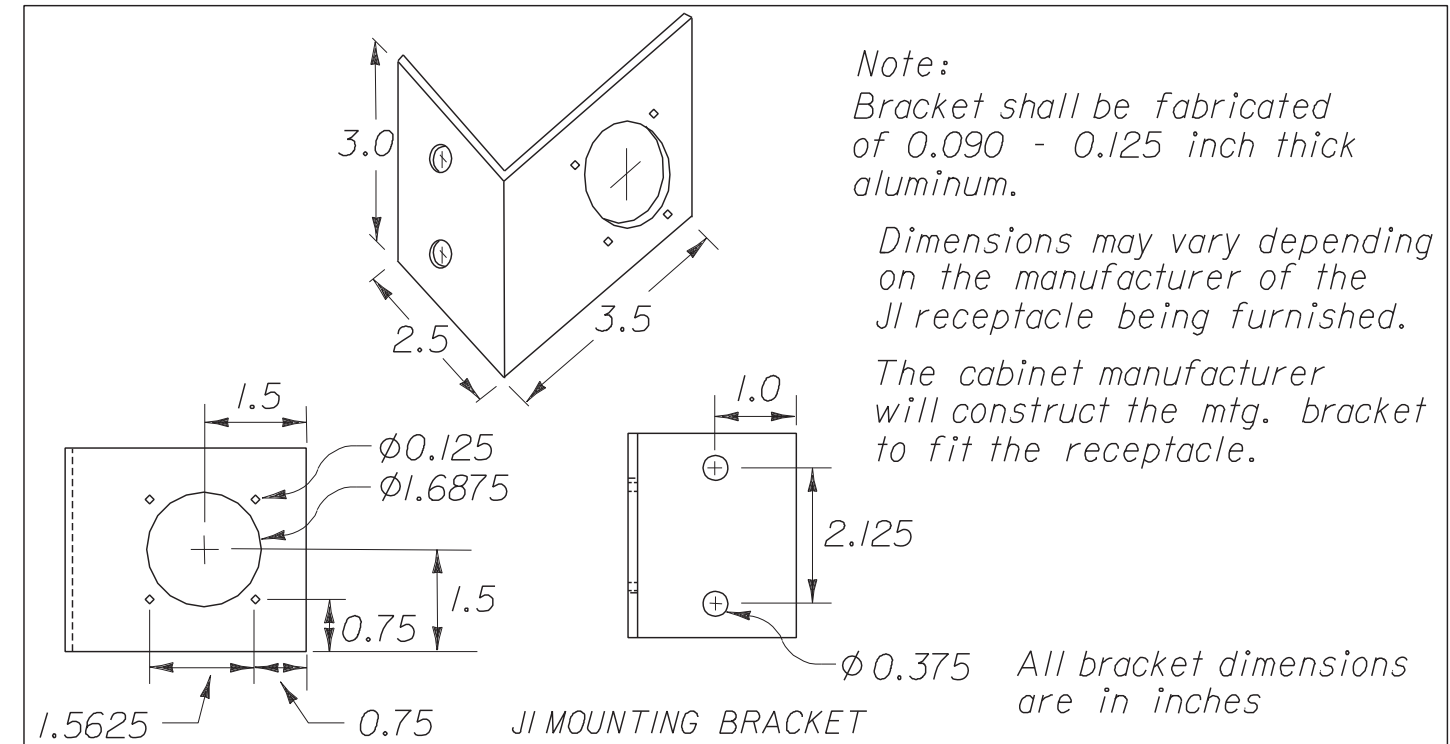
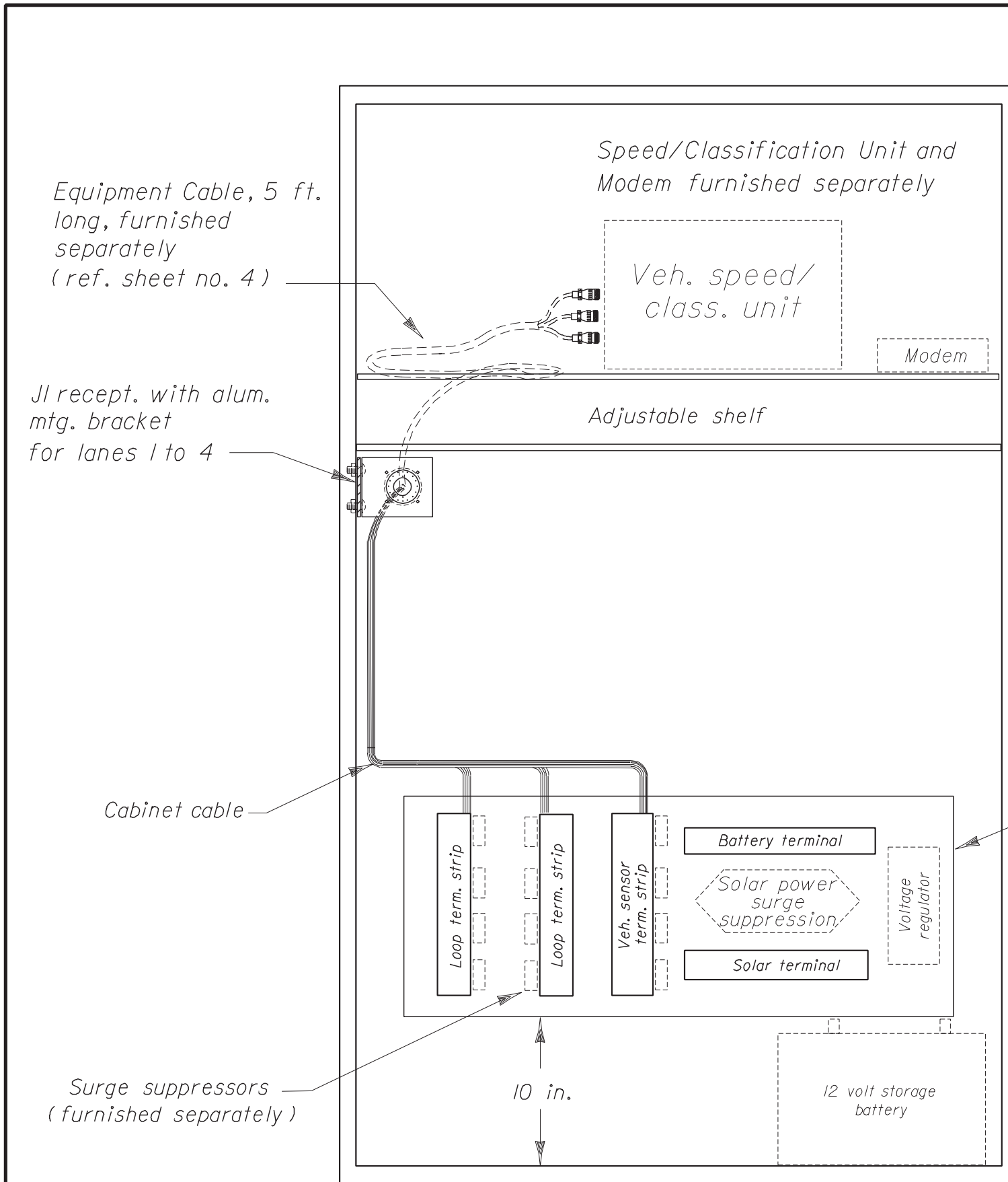
- Note :
- 12 volt flashing red lights shall be mounted on gate arm and shall operate in the flashing mode only when gate arm is in the lower position or in the process of being lowered. The number of lights shall vary accordingly to length of the gate arm.
 - 16" alternate diagonal fully reflectorized red and white stripes.

TYPICAL LAMP PLACEMENT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 TRAFFIC DESIGN

**TRAFFIC CONTROL DEVICES FOR
 MOVABLE SPAN BRIDGE SIGNALS**

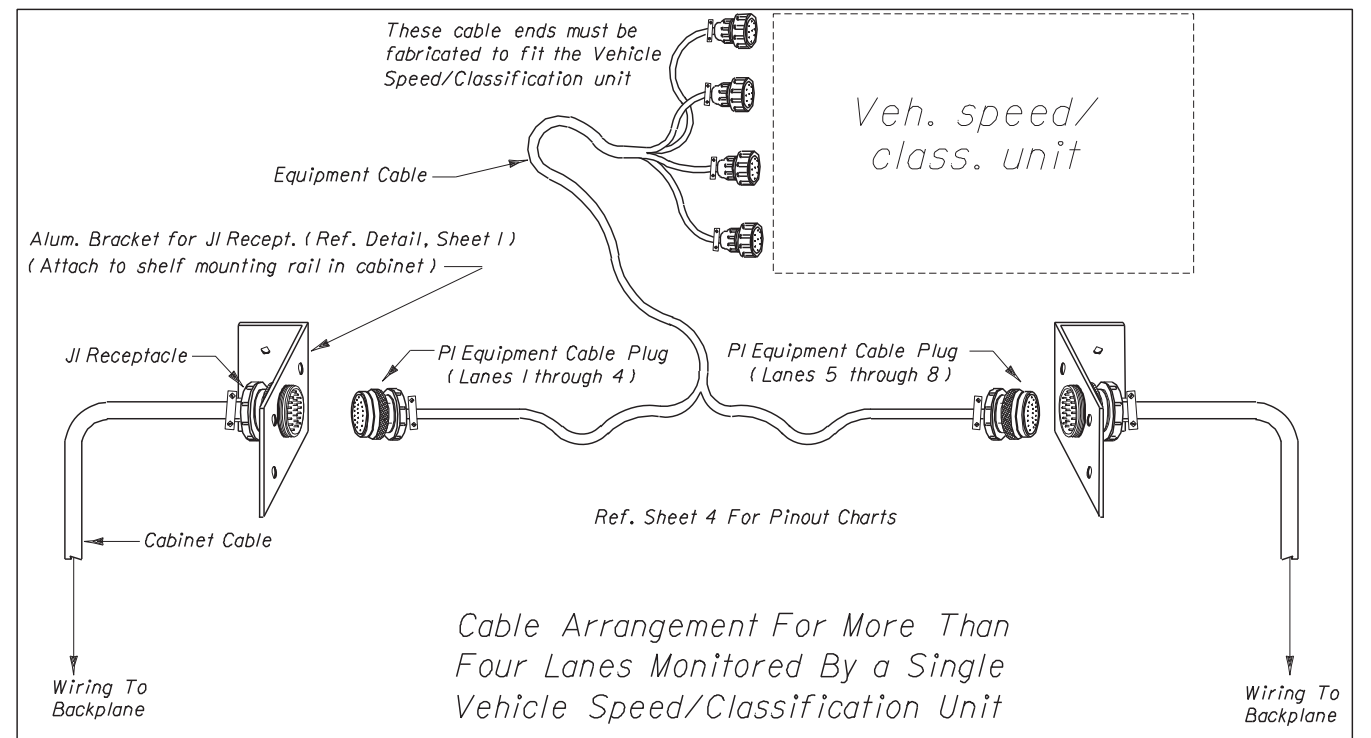
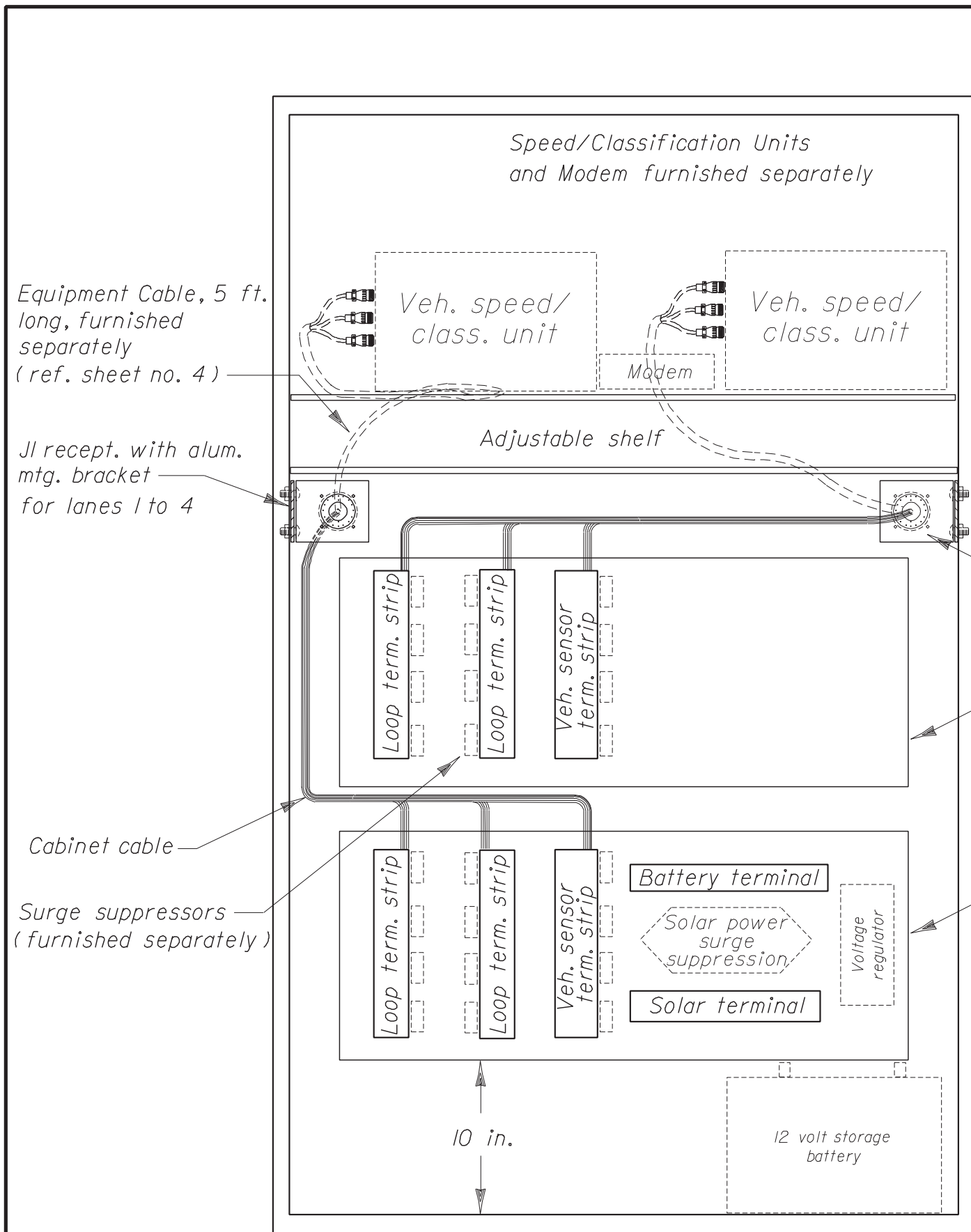
Names	Dates	Approved By <i>Charles A. Scott</i> State Traffic Plans Engineer		
Designed By		Revision	Sheet No.	Index No.
Drawn By		00	3 of 3	17890
Checked By				



1. Traffic monitoring site cabinet includes:
 - A. One adjustable shelf;
 - B. One backplane ass'y;
 - C. One JI receptacle with mounting bracket;
 - D. All associated wiring and wiring harnesses.
2. Basic backplane assembly consists of:
 - A. Two inductive loop terminal strips;
 - B. One vehicle sensor terminal strip;
 - C. One battery terminal strip;
 - D. One solar panel terminal strip.
3. When piezoelectric axle sensors are used, the shields must be connected to earth ground.

CABINET LAYOUT DETAIL
(For Up To Four Lanes)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC MONITORING SITE				
Names	Dates	Approved By		
Designed By				
Drawn By		Mgr Of Transportation Statistics		
Checked By		Revision	Sheet No.	Index No.
		00	1 of 9	17900




JI recept. with alum. mtg. bracket for lanes 5 to 8

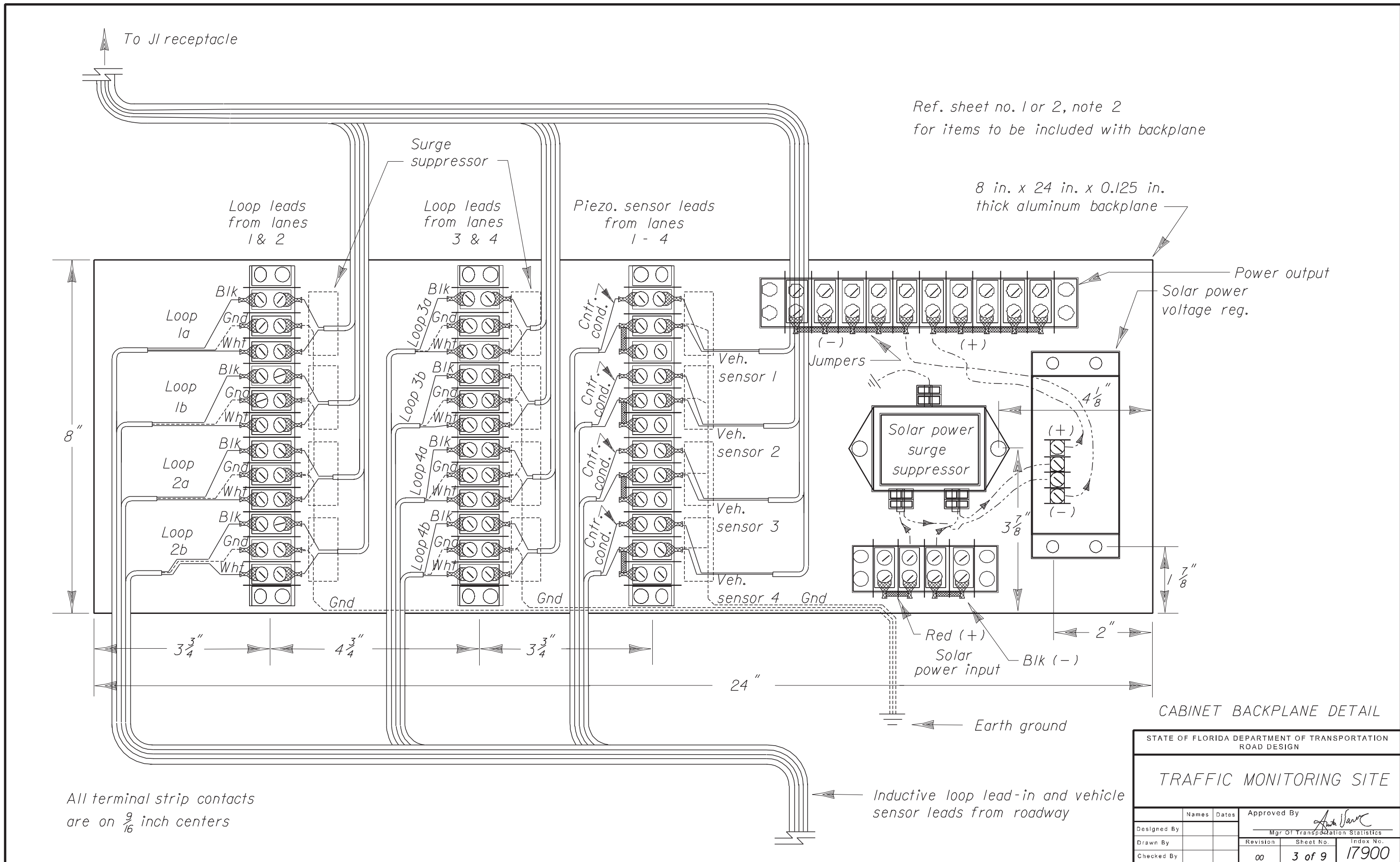
Backplane for lanes 5 to 8 (Does not require battery terminal, solar terminal, voltage regulator, or solar power surge suppressor.)

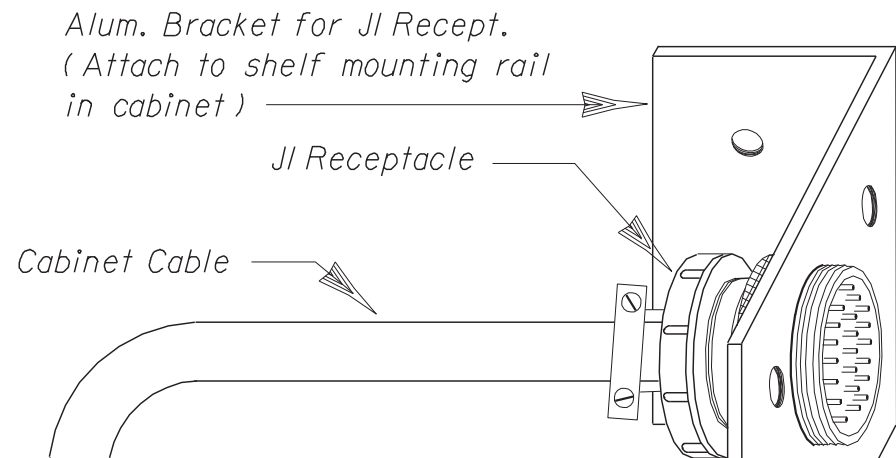
Backplane for lanes 1 to 4

- Traffic monitoring site cabinet includes:
 - One adjustable shelf;
 - Two backplane assemblies (equipped as shown);
 - Two JI receptacles with mtg. brackets;
 - All associated wiring and wiring harnesses.
- Basic backplane assembly consists of:
 - Two inductive loop terminal strips;
 - One vehicle sensor terminal strip;
 - One battery terminal strip;
 - One solar panel terminal strip.
- When piezoelectric axle sensors are used, the shields must be connected to earth ground.

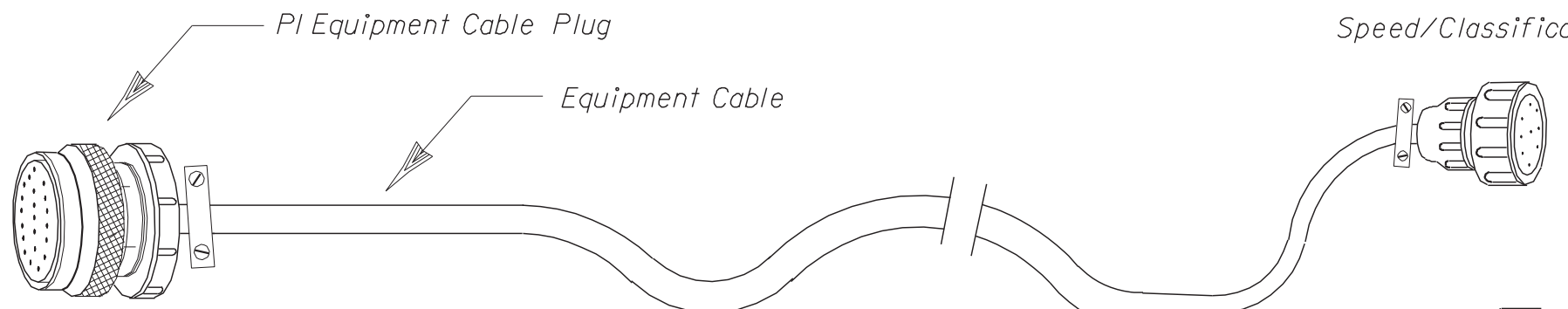
CABINET LAYOUT DETAIL
(For More Than Four Lanes
And Up to Eight Lanes)

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC MONITORING SITE				
Names	Dates	Approved By		
Designed By		 Mgr Of Transportation Statistics		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	2 of 9	17900





J1 Receptacle Pinout	
26 Recessed Male Pins	
A	Loop 1a (5a) yellow
B	Loop 1a (5a) purple
C	Loop 1b (5b) gray
D	Loop 1b (5b) pink
E	Loop 2a (6a) brown
F	Loop 2a (6a) blue
G	Loop 2b (6b) orange
H	Loop 2b (6b) tan
J	Loop 3a (7a) white
K	Loop 3a (7a) green
L	Loop 3b (7b) red
M	Loop 3b (7b) black
N	Gnd
P	Loop 4a (8a) w/yellow
R	Loop 4a (8a) w/purple
S	Loop 4b (8b) w/gray
T	Loop 4b (8b) w/brown
U	Piezo 1 (5) (+) w/blue
V	Piezo 1 (5) sh w/orange
W	Piezo 2 (6) (+) w/green
X	Piezo 2 (6) sh w/red
Y	Piezo 3 (7) (+) w/black
Z	Piezo 3 (7) sh w/red/blk
a	Piezo 4 (8) (+) red/green
b	Piezo 4 (8) sh red/orange
d	Gnd red/black



PI Equipment Cable Plug	
26 Female Pin Slots	
A	Loop 1a (5a)
B	Loop 1a (5a)
C	Loop 1b (5b)
D	Loop 1b (5b)
E	Loop 2a (6a)
F	Loop 2a (6a)
G	Loop 2b (6b)
H	Loop 2b (6b)
N	Gnd
J	Loop 3a (7a)
K	Loop 3a (7a)
L	Loop 3b (7b)
M	Loop 3b (7b)
P	Loop 4a (8a)
R	Loop 4a (8a)
S	Loop 4b (8b)
T	Loop 4b (8b)
d	Gnd
U	Piezo 1 (5) (+)
V	Piezo 1 sh
W	Piezo 2 (6) (+)
X	Piezo 2 sh
Y	Piezo 3 (7) (+)
Z	Piezo 3 sh
a	Piezo 4 (8) (+)
b	Piezo 4 sh

Connects to electronics unit

NOTE:

The equipment cable can accommodate up to four lanes of inductive loop and vehicle sensor inputs. (Ref. Sheet No. 1 for cabinet layout)

For more than four lanes and up to eight lanes of inputs, the following options are available:

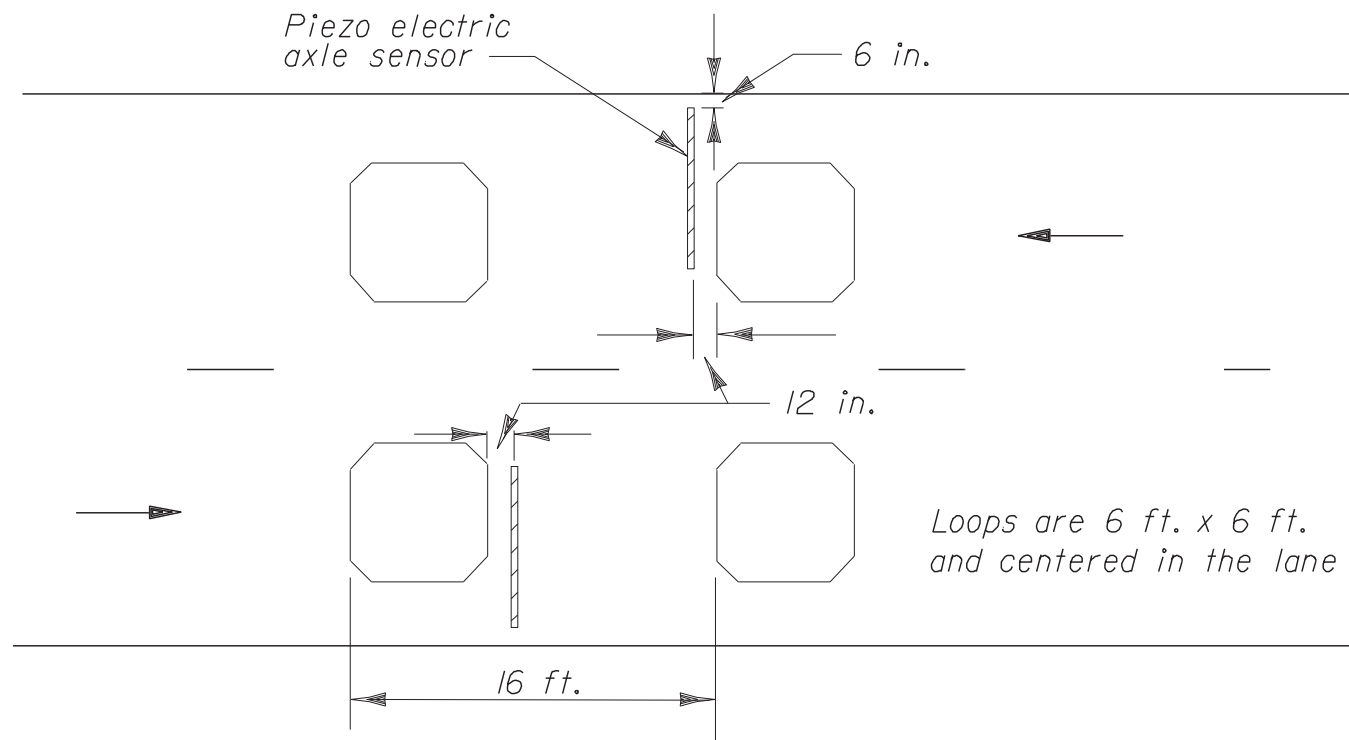
1. A second Vehicle Speed/Class. Unit and separate equipment cable connecting to a second J1 receptacle; or
2. A single Vehicle Speed/Class. Unit capable of up to eight lanes of inputs and a single equipment cable with split ends to fit two J1 receptacles. (Ref. Sheet 2 detail)

Numbers in parenthesis in the pinout chart identify lane numbers when a second backplane for lanes 5 through 8 is required.

EQUIPMENT CABLE DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC MONITORING SITE				
Designed By	Names	Dates	Approved By <i>Ann Vanic</i>	
Drawn By			Mgr Of Transportation Statistics	
Checked By			Revision	Sheet No. Index No.
			00	4 of 9 17900

SPEED/CLASSIFICATION LOOP ASSEMBLY WITH AXLE SENSORS PLACEMENT DETAIL



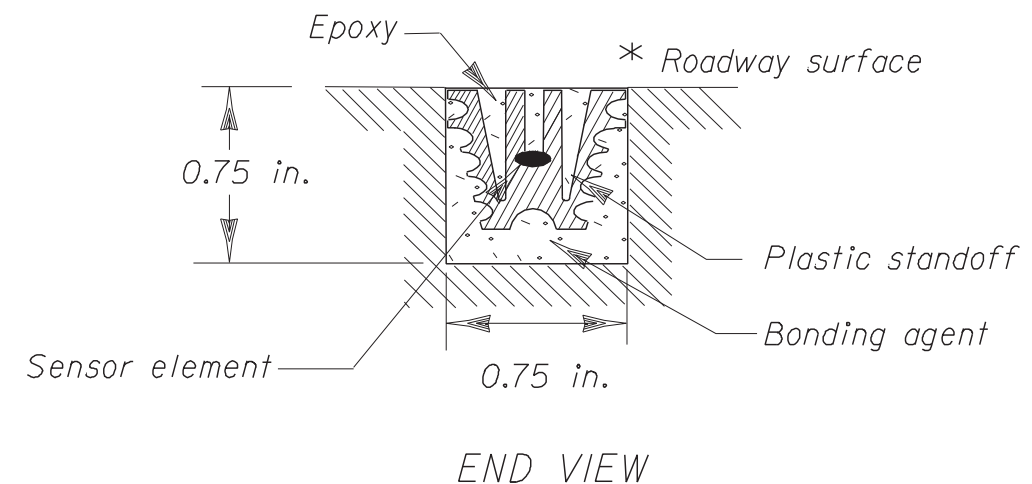
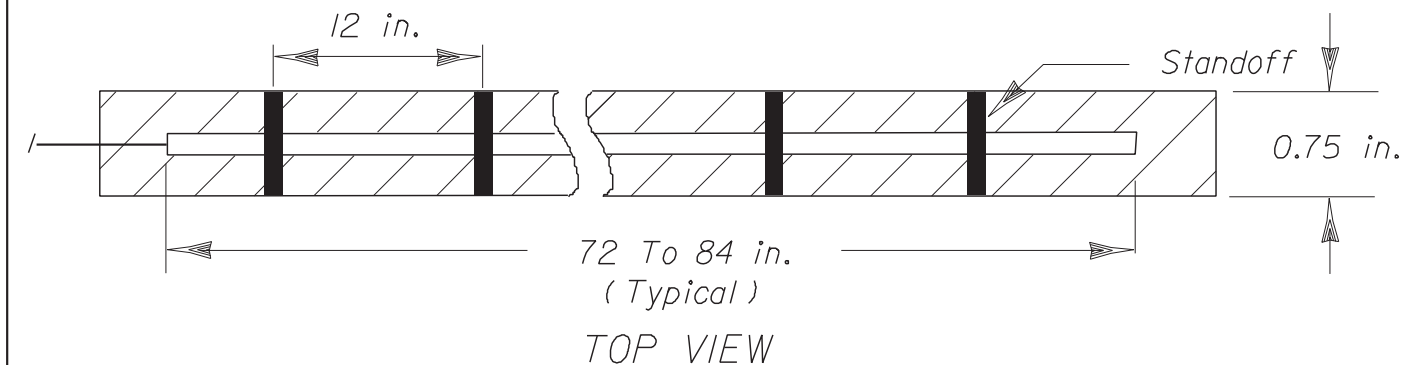
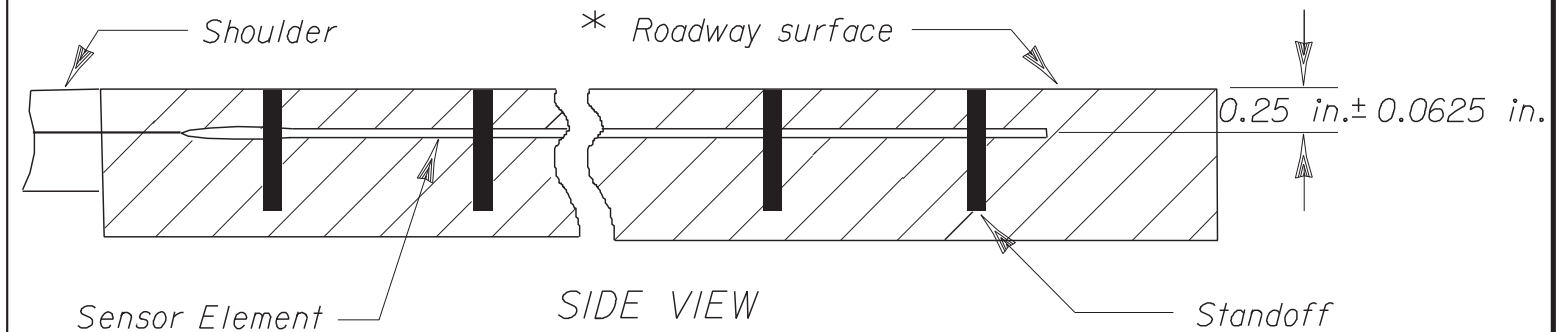
Note:

Loop slots shall be 0.25 inches wide (approx.) by 1.5 inches to 2 inches deep. Three turns of #12 AWG, type XHHW stranded copper wire shall be placed in the slot. Backer rod shall be used to hold the loop wire in the bottom of the slot.

Loop leads shall be twisted at the rate of 10 to 12 twists per foot. The twisted pair shall extend to the pull box with three feet of spare length coiled in the pull box.

All leads (inductive loop & vehicle sensor) shall be identified according to the lane numbering convention shown on sheet 8 and 9.

TYPICAL UNENCAPSULATED CLASS II VEHICLE SENSOR



* Some installations may require axle sensors to be placed in the structural course, prior to placement of the friction course.


Note:

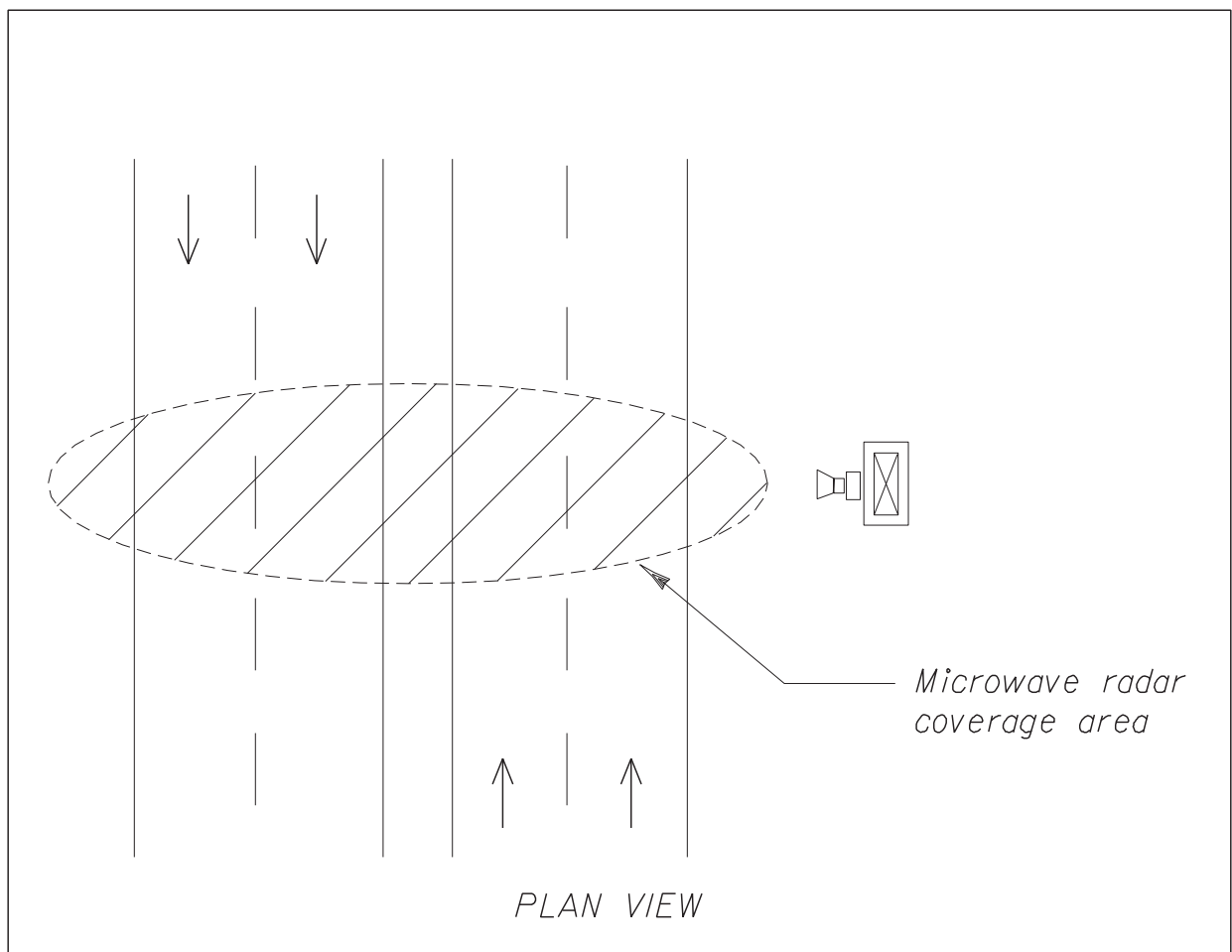
These are typical dimensions. actual dimensions, element cross-sections and standoffs may vary depending on manufacturer and model.

LOOP AND PIEZOELECTRIC VEHICLE SENSOR DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TRAFFIC MONITORING SITE

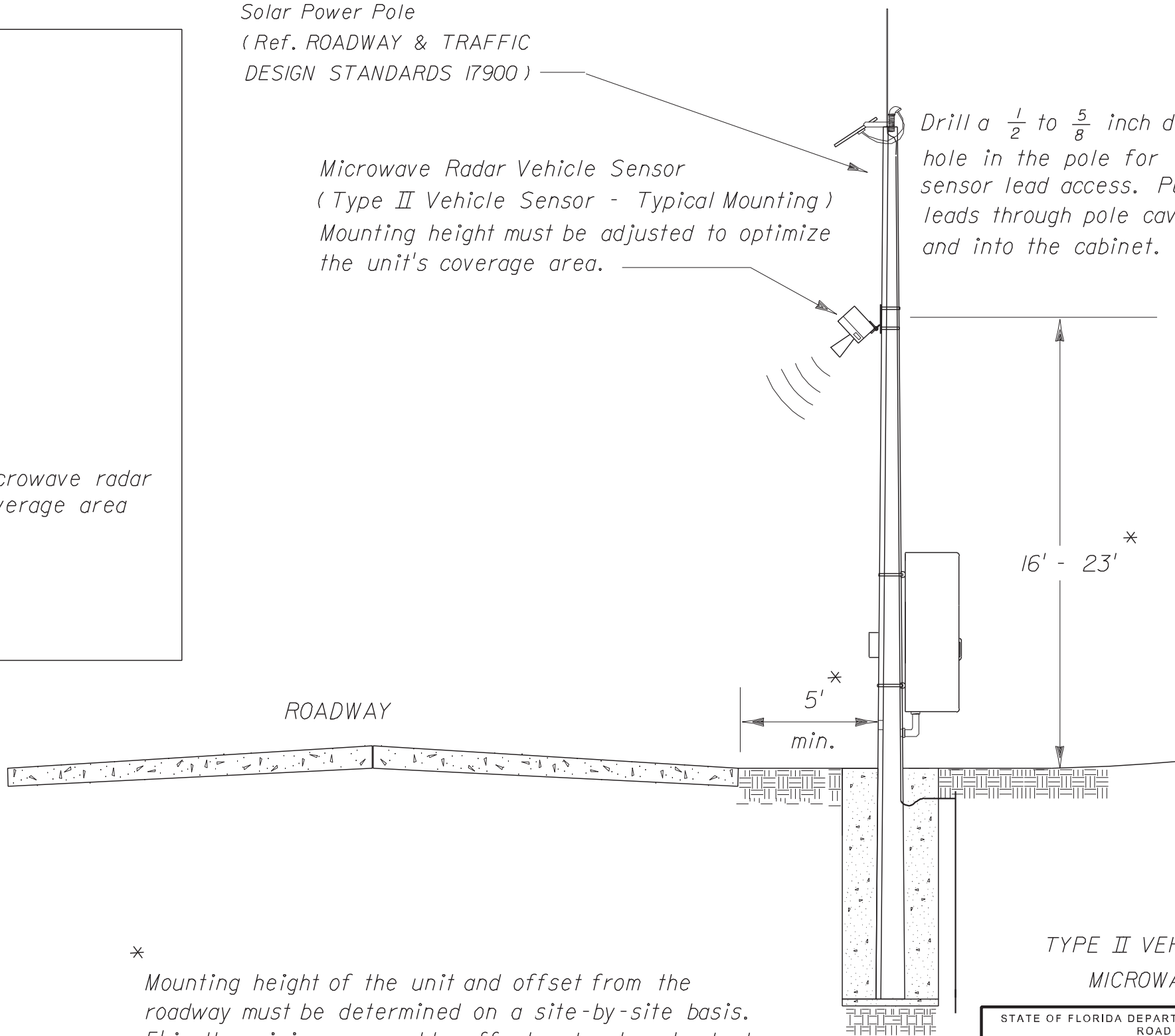
Names	Dates	Approved By		
Designed By		 Mgr of Transportation Statistics		
Drawn By				
Checked By				
		Revision	Sheet No.	Index No.
		00	5 of 9	17900



Solar Power Pole
 (Ref. ROADWAY & TRAFFIC
 DESIGN STANDARDS 17900)

Microwave Radar Vehicle Sensor
 (Type II Vehicle Sensor - Typical Mounting)
 Mounting height must be adjusted to optimize
 the unit's coverage area.

Drill a $\frac{1}{2}$ to $\frac{5}{8}$ inch dia.
 hole in the pole for
 sensor lead access. Pull
 leads through pole cavity
 and into the cabinet.



The unit must be capable of detecting up to eight
 lanes of traffic (in either or both directions) when
 mounted perpendicular to the roadway.

Coverage area of the unit is affected by the
 roadway geometry: distance from the travel lanes,
 median type and width, barrier walls, etc.

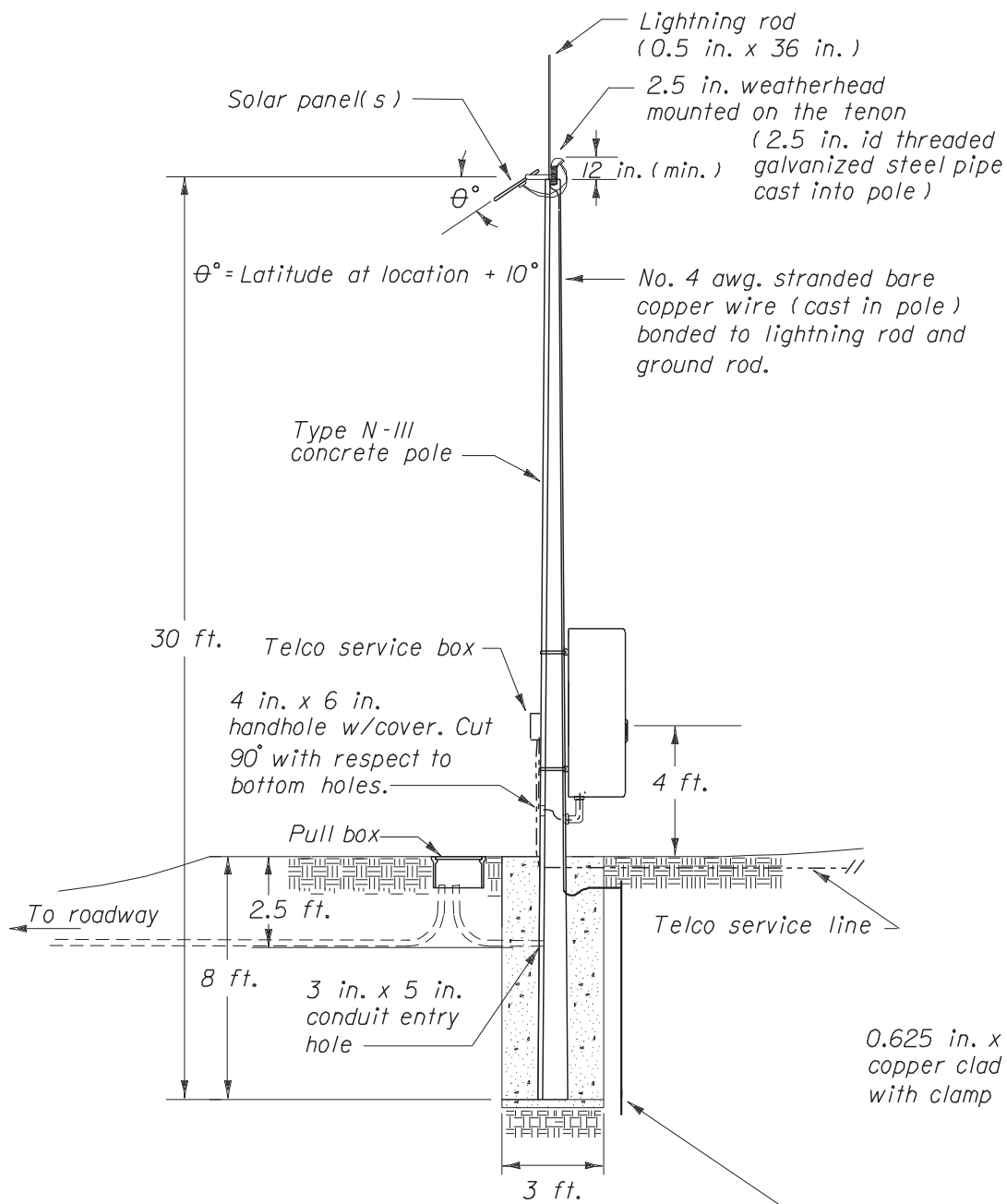
*
 Mounting height of the unit and offset from the
 roadway must be determined on a site-by-site basis.
 5' is the minimum operable offset and not a standard.

TYPE II VEHICLE SENSOR
 MICROWAVE RADAR

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN

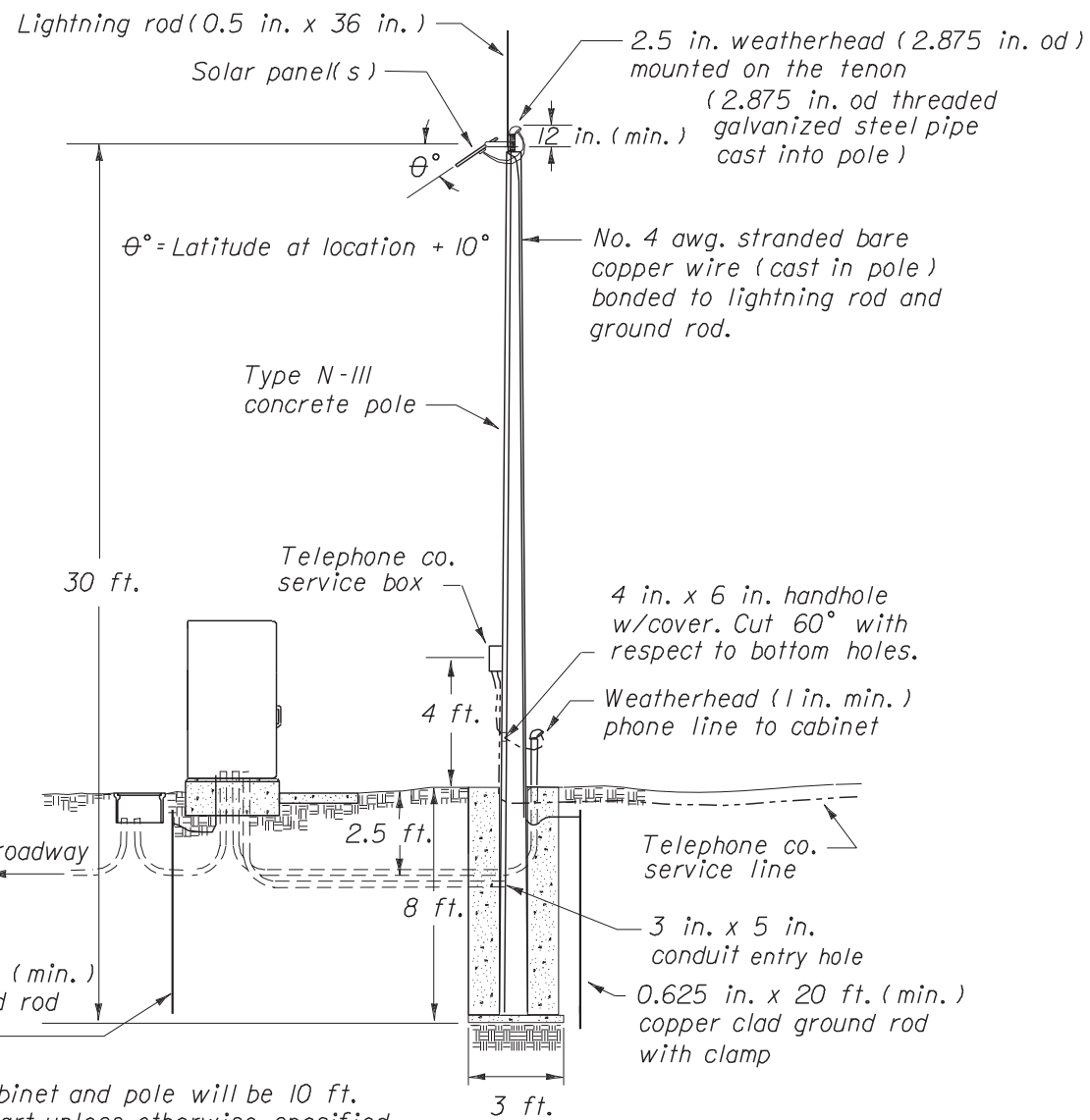
TRAFFIC MONITORING SITE

Names	Dates	Approved By		
Designed By				
Drawn By			Revision	Sheet No.
Checked By			00	6 of 9
			Index No.	17900



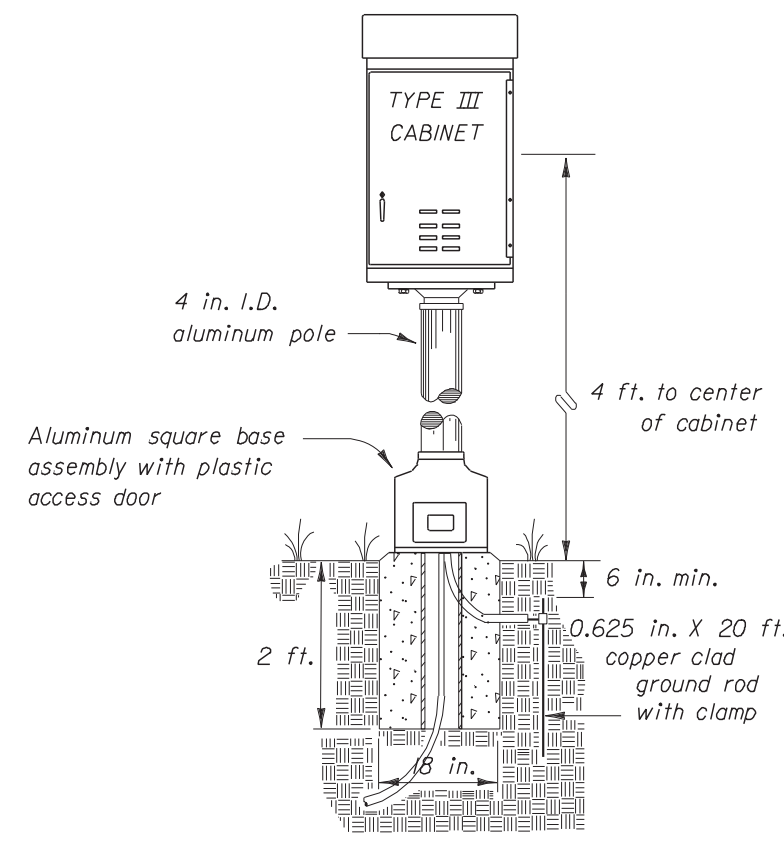
0.625 in. x 50 ft. (min.) copper clad ground rod w/clamp

SOLAR POWER POLE WITH POLE MTD. CABINET



Cabinet and pole will be 10 ft. apart unless otherwise specified in the plans

SOLAR POWER POLE WITH BASE MTD. CABINET



PEDESTAL MTD. CABINET

SOLAR POWER POLE DETAIL

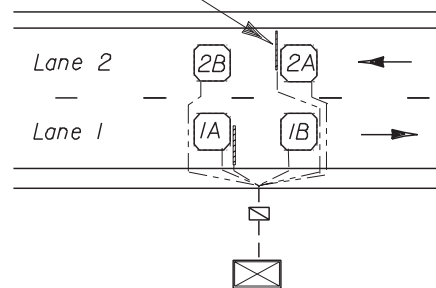
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN				
TRAFFIC MONITORING SITE				
Names	Dates	Approved By		
Designed By		 Mgr Of Transportation Statistics		
Drawn By		Revision	Sheet No.	Index No.
Checked By		00	7 of 9	17900

Note: When cabinets are located on both shoulders, lane numbering begins with the outside lane.

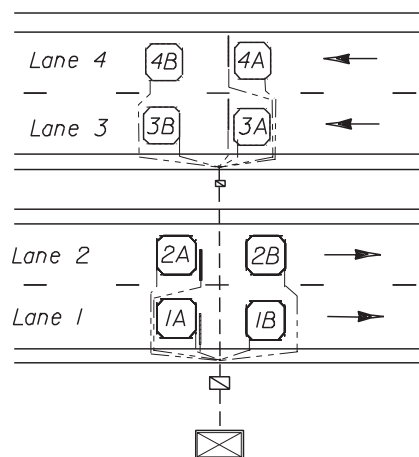
SINGLE CABINET CONFIGURATION

Vehicle sensors will be identified by, and leads marked with, the letters "VS" followed with the lane number.

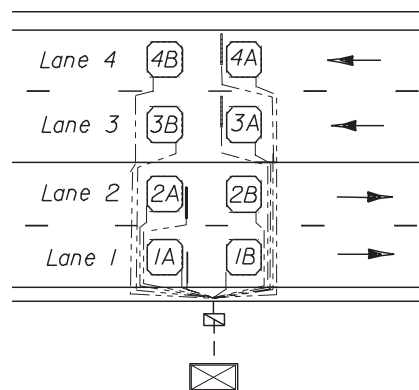
Example: "VS2"



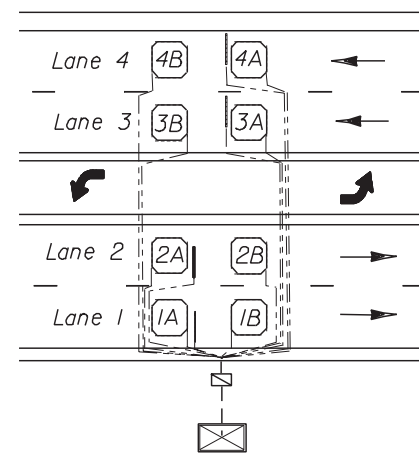
(A) TWO LANE - TWO WAY



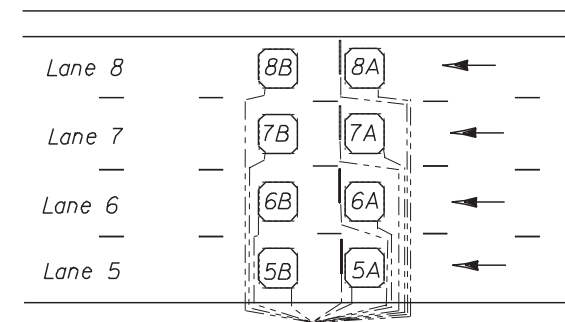
(B) FOUR LANE, DIVIDED - TWO WAY



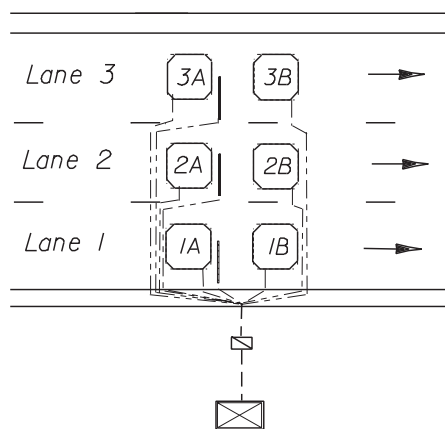
(C) FOUR LANE, UNDIVIDED - TWO WAY



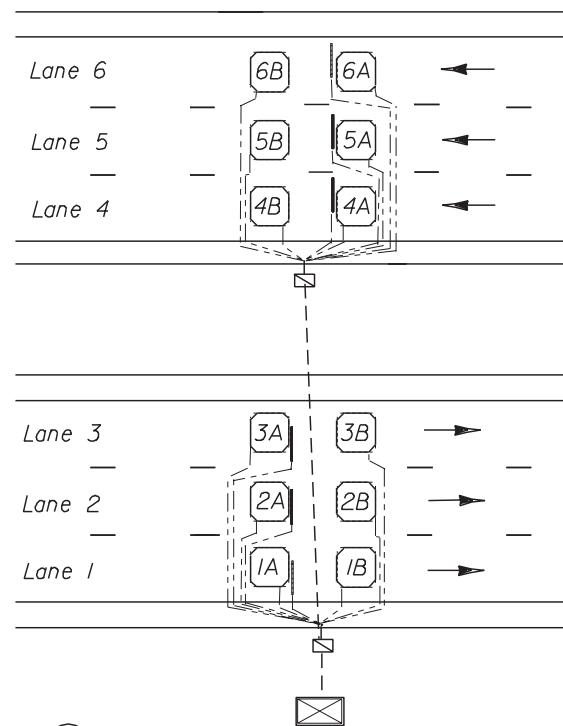
(D) FOUR LANE/CONTINUOUS LEFT TURN LANE



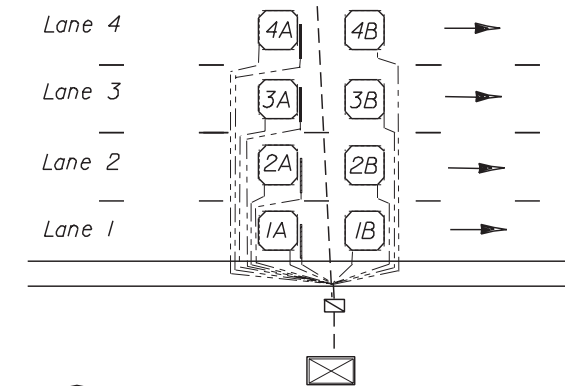
(E) TWO LANE - ONE WAY



(F) THREE LANE - ONE WAY



(G) SIX LANE, DIVIDED - TWO WAY



(H) SIX LANE, DIVIDED - TWO WAY

LANE NUMBERING CONVENTION DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

TRAFFIC MONITORING SITE

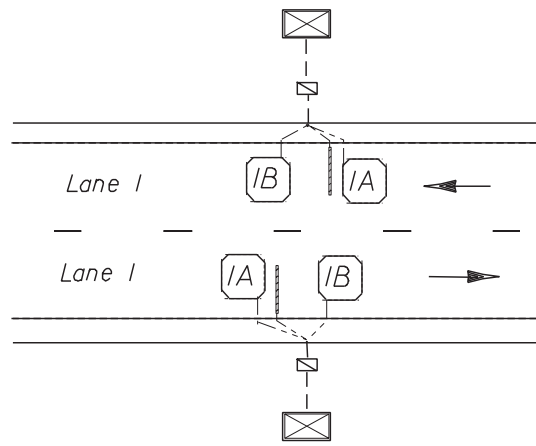
Names	Dates	Approved By
Designed By		Approved By: <i>Anda Vance</i>
Drawn By		Mgr Of Transportation Statistics
Checked By		Revision: 00, Sheet No: 8 of 9, Index No: 17900

Note: When cabinets are located on both shoulders, lane numbering begins with the outside lane.

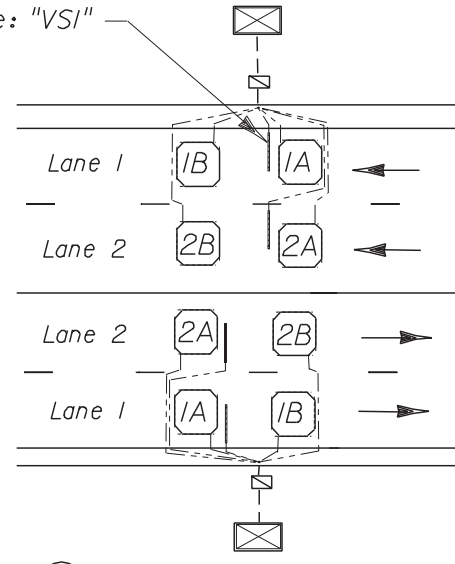
Vehicle sensors will be identified by, and leads marked with, the letters "VS" followed with the lane number.

TWO CABINET CONFIGURATION

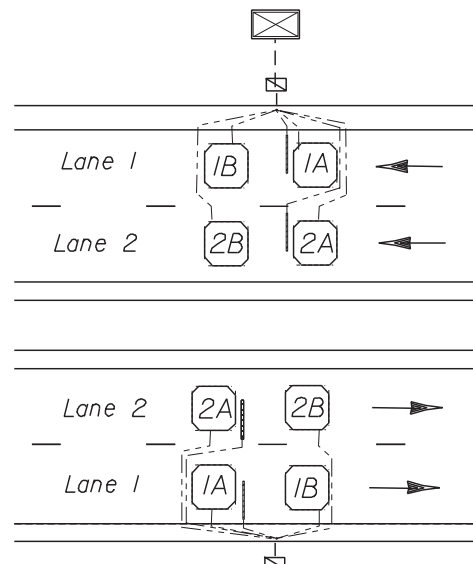
Example: "VS1"



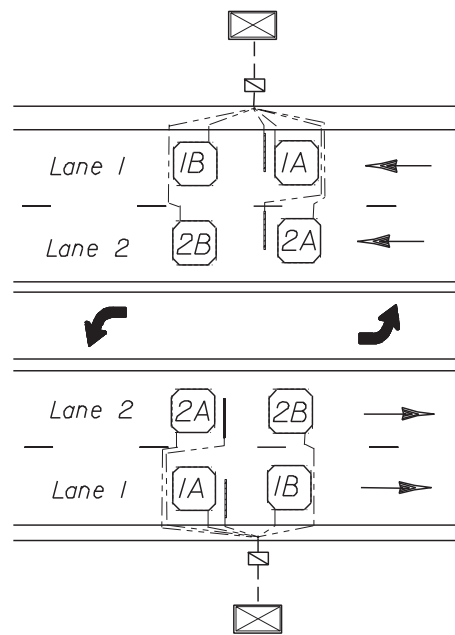
(A) TWO LANE - TWO WAY



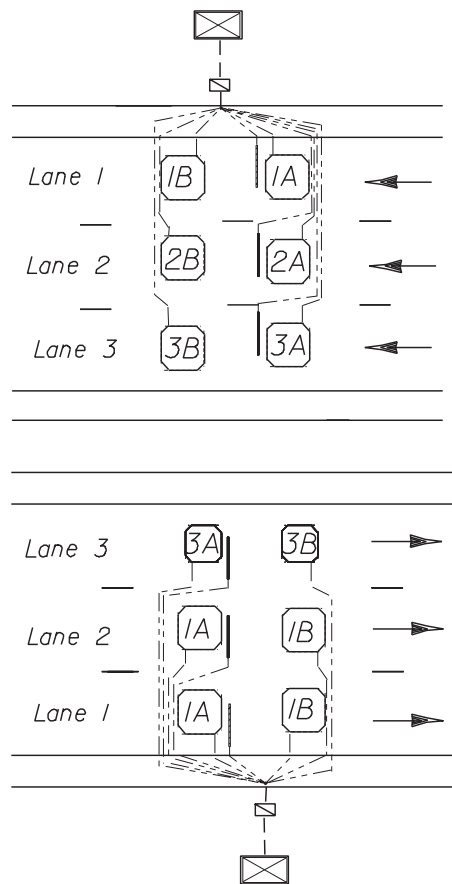
(B) FOUR LANE, UNDIVIDED TWO WAY



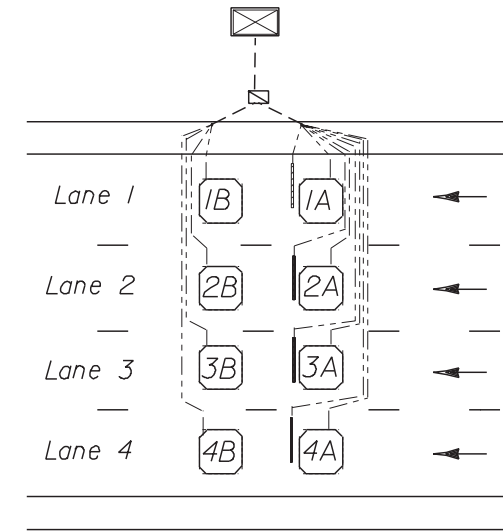
(C) FOUR LANE, DIVIDED - TWO WAY



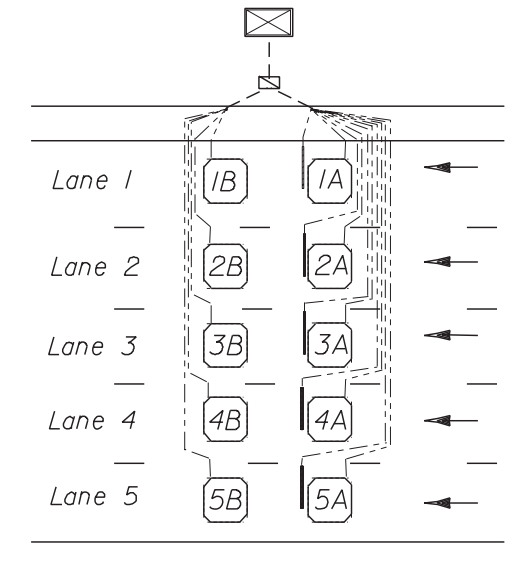
(D) FOUR LANE/CONTINUOUS LEFT TURN LANE



(E) SIX LANE, DIVIDED - TWO WAY



(F) EIGHT LANE, DIVIDED TWO WAY




(G) TEN LANE, DIVIDED TWO WAY

LANE NUMBERING CONVENTION DETAIL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN

TRAFFIC MONITORING SITE

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Designed By		 Mgr Of Transportation Statistics		
Drawn By				
Checked By				
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