

ROAD

DESIGN

STANDARDS



JANUARY 1978

TABLE OF CONTENTS

NUMBER

TITLE

BARRIERS

BGR-01-1	Guardrail Construction (5 Sheets)
BMB-01-1	Median Barrier Details (3 Sheets)

DRAINAGE

DBS-01	Back of Sidewalk Drainage Details
DCS-01	Concrete Spillway at Bridge Ends
DEX-01	Pipe Culvert Extension for 2' x 2' Box Culvert
DEX-02	Pipe Culvert Extension for 3' x 2' Box Culvert
DMD-01-1	Miscellaneous Drainage Details (3 Sheets)
DMO-01	Drainage Details for Median Openings
DPS-01	Ditch Pavement and Sodding
DCI-01	Curb Inlet - Types 1, 2, 3 and 4
DCI-02-2	Curb Inlet - Types 5 and 6
DCI-03	Curb Inlet - Type 7
DCI-04	Curb Inlet - Type 8
DDI-01	Ditch Bottom Inlet - Type A
DDI-02	Ditch Bottom Inlet - Type B
DDI-03	Ditch Bottom Inlet - Types C, D, E and H
DDI-04	Ditch Bottom Inlet - Types F and G
DDI-05	Ditch Bottom Inlet - Type J
DGI-01	Gutter Inlet - Type S
DGI-02	Gutter Inlet - Type V
DSB-01	Inlet, Manhole, Junction Box - Types J and P
DSD-01	Supplementary Details for Manholes and Inlets (2 Sheets)
DSM-01	Safety Modification (2 Sheets)
DCE-01-1	Concrete Endwalls
DCE-02	Standard Endwalls for Pipe Culverts
DCE-03	U-Endwalls for Pipe Culverts (3 Sheets)
DCE-04-1	Flared End Section for Pipe Culverts
DCE-05	U-Endwalls for 60" and 66" Pipe Culverts
DCE-06	Standard Endwall for 60" Concrete Pipe
DCE-07	Standard Endwall for Double 60" Concrete Pipe
DCE-08	Standard Endwall for 66" Concrete Pipe
DCE-09	Standard Endwall for 72" Concrete Pipe
DCE-10	Standard Endwall for Double 72" Concrete Pipe
DCE-11	Standard Endwall for 84" Concrete Pipe
DCE-12	Standard Endwall for 79" x 49" CMP Arch
DCE-13	Standard Endwall for 76" x 57" CMP Arch
DCE-14	Standard Endwall for 106" x 73" CMP Arch
DCE-15	Standard Endwall for Double 106" x 73" CMP Arch
DCE-16	Standard Endwall for Quadruple 106" x 73" CMP Arch
DCE-17	Standard Endwall for 123" x 81" CMP Arch

NUMBER

TITLE

DRAINAGE (CONT.)

DCE-18	Standard Endwall for Triple 123" x 81" CMP Arch
DCE-19	Standard Endwall for Triple 154" x 100" CMP Arch
DCE-20	U-Endwall for Pipe Culverts
DME-01-1	Mitered End Section (5 Sheets)
DSE-01-1	Sand-Cement Endwalls for Pipe Culverts
DSE-02-1	Sand-Cement Endwalls for Pipe Culverts
DSE-03	Sand-Cement Endwall for 72" CM Pipe
DSE-04	Sand-Cement Endwall for 90" CM Pipe
DSE-05	Sand-Cement Endwall for 76" x 57" CMP Arch
DSE-06	Sand-Cement Endwall for 92" x 65" CMP Arch
DSE-07	Sand-Cement Endwall for 106" x 73" CMP Arch
DSE-08	Sand-Cement Endwall for 123" x 81" CMP Arch
DSE-09	Sand-Cement Endwall for 142" x 91" CMP Arch
DSE-10	Sand-Cement Endwall for 154" x 100" CMP Arch

FENCES

FLD-01	Fence Location Details
FTA-01-2	Fence, Type A
FTB-01-2	Fence, Type B

GENERAL

GCG-01	Cattle Guard
GEC-01	Erosion Control Devices, Temporary Slope Drains
GEC-02	Erosion Control Devices, Sediment Basins
GEC-03	Erosion Control Devices, Sediment Check
GEC-04	Erosion Control Devices, Silt Barrier
GEC-05	Erosion Control Devices, Bailed Hay or Straw
GEC-06	Erosion Control Details for Permanent Construction
GEU-01	Embankment Utilization Details
GMC-01	Details for Municipal Construction
GRA-01	Miscellaneous Rest Area Details
GRC-01-1	Miscellaneous Roadway Construction Details (2 Sheets)
GRR-01	Details of Railroad Crossings (6 Sheets)
GRT-01	Standard Details for Ramp Terminals (4 Sheets)
GSA-01	Standard Abbreviations
GSE-01	Superelevation Details
GSE-02-1	Superelevation Details for Municipal Construction (2 Sheets)
GSS-01	Standard Symbols for Key Maps and Plan Sheets (3 Sheets)
GTC-01	Tractor Crossings

NUMBER

TITLE

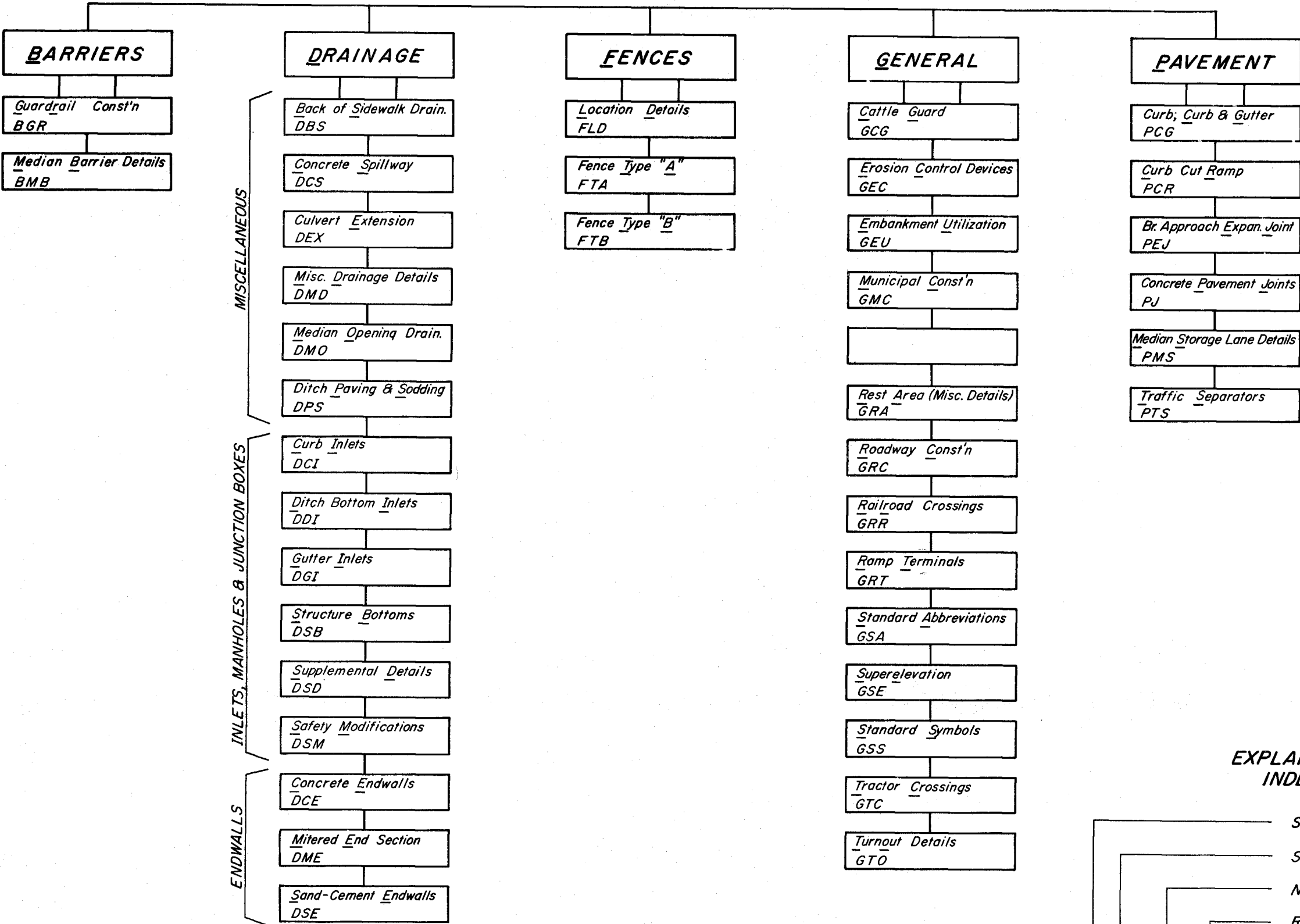
GENERAL (CONT.)

GTO-01-1	Turnout Details
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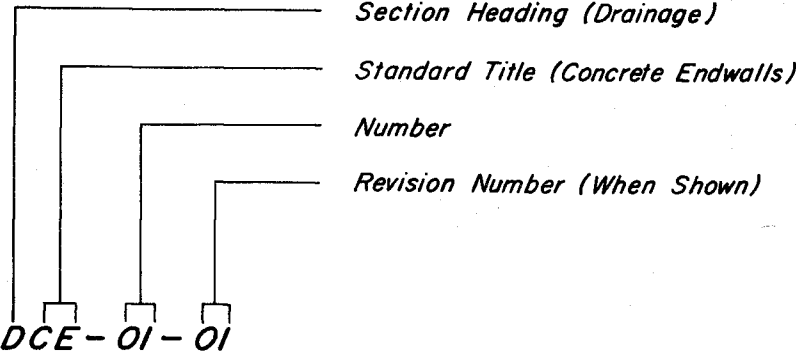
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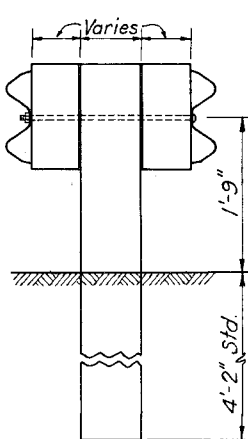
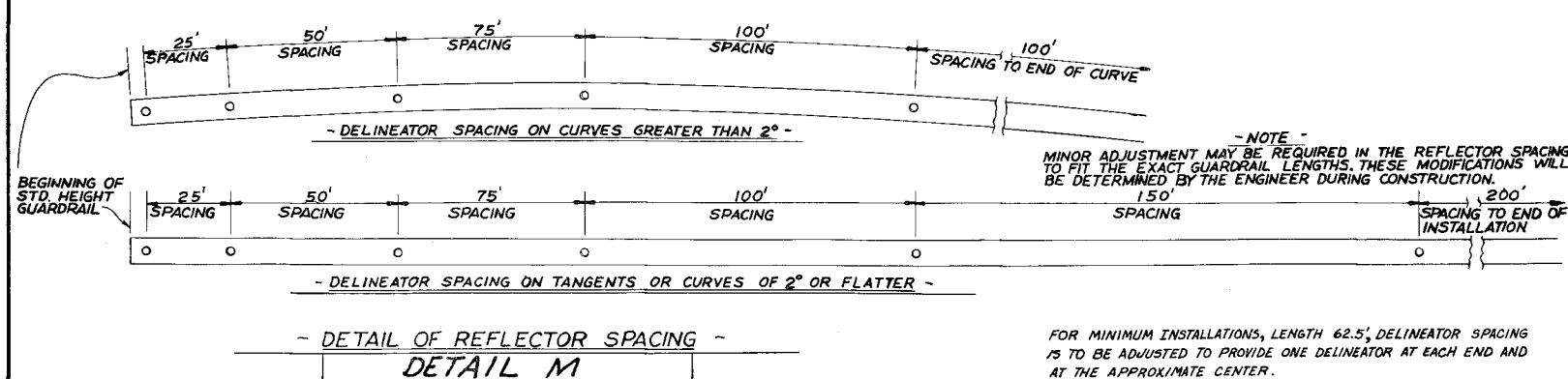
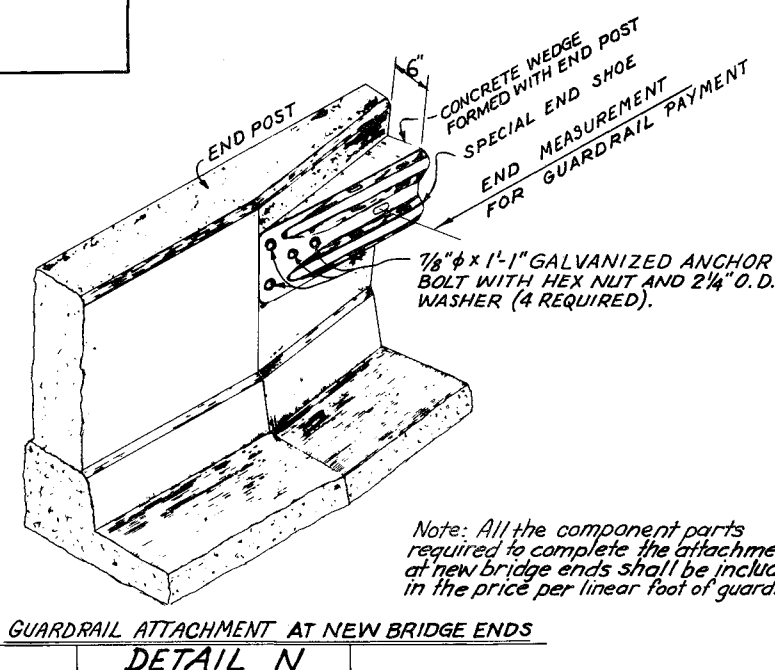
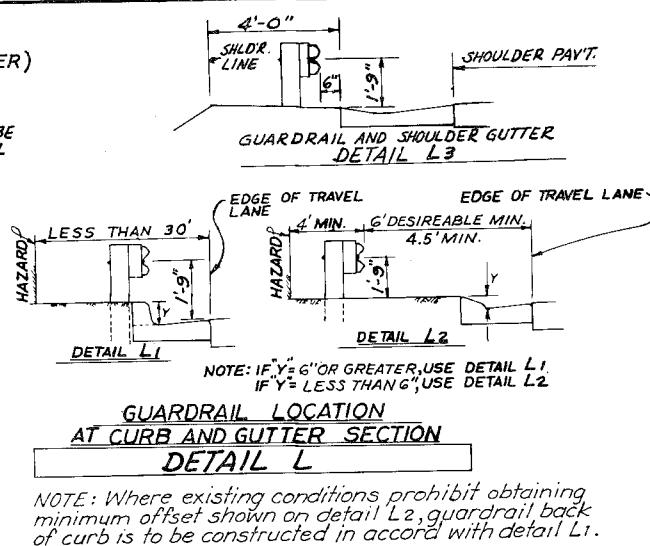
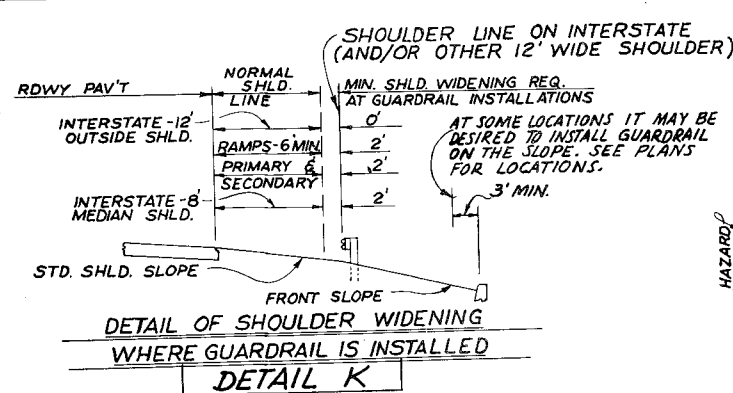
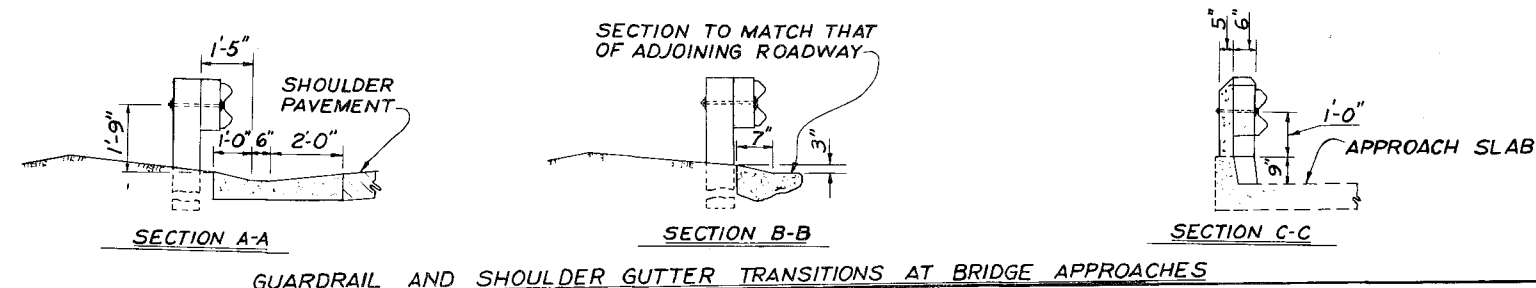
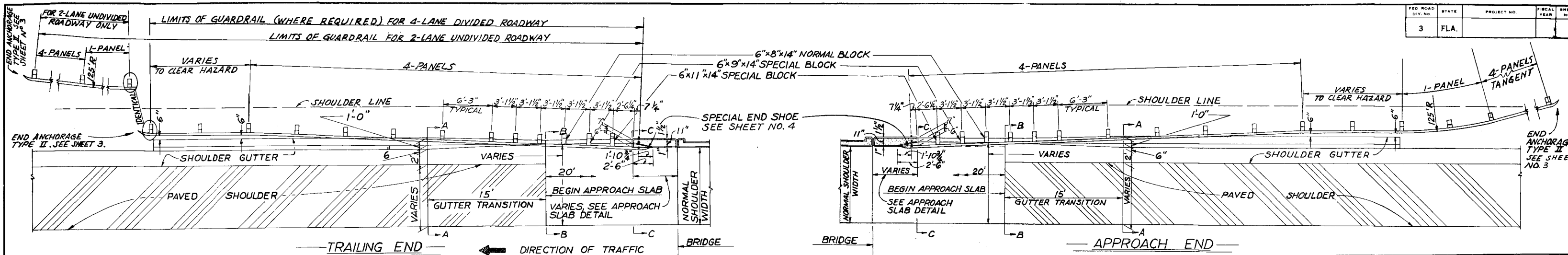
PCG-01	Curb, Curb and Gutter
PCR-01	Curb Cut Ramp for Physically Handicapped
PEJ-01	Bridge Approach Expansion Joint for Concrete Pavement
PEJ-02-1	Bridge Approach Expansion Joint for Concrete Pavement
PJ-01	Concrete Pavement Joints (3 Sheets)
PMS-01	Median Storage Lanes
PTS-01	Traffic Separators

FLORIDA ROAD DESIGN STANDARDS



EXPLANATION OF ALPHANUMERIC
INDEX NUMBERING SYSTEM





- GENERAL NOTES -**
- The illustrated limits for guardrail installation are standard requirements, one panel equals 12.5 ft..
 - Installations shown are typical. The intent is that 62.5 ft. of rail be available approaching earliest hazard.
 - Post spacing shall be 6.25 ft. except that a reduced spacing of 3'-1 1/2" shall be used at bridge anchorages (see Detail J). At hazards, where the face of guardrail offset from hazard is less than 4 ft., a reduced spacing shall also be provided for the length of the hazard plus one panel of approach rail.
 - Straight rail sections may be used for all radii of 125 ft. or greater. For radii less than 125 ft. the rail must be fabricated to fit.
 - For specifications of materials refer to standard specifications.
 - Design load of rail equals 80,000 pounds in tension.
 - In addition to use at conventional roadside hazards, guardrail will be required where fill slopes exceed 4:1, except that where fill heights are less than 8 ft. guardrail may be omitted (regardless of fill slope) unless in the opinion of the Engineer its use is deemed necessary due to other roadside features.
 - Undressed timber will be permitted for 6"x8"x14" nominal treated timber block. A 5"x8"x14" nominal treated timber block or a 14" section of the steel post will be permitted as an alternate. The 14" alternate steel section shall be bolted to the alternate post with one 5/8"x1/2" bolt on each side of block. Blocks used with Thrie Beam rail shall be 22" long.
 - Where guardrail is constructed for street barricade no anchorage, offset blocks or terminal end panels will be required.
 - Where necessary to enlarge or add additional holes to galvanized guardrail, the work will be done by drilling or reaming. Damaged galvanized guardrail will be coated with a zinc compound. No burning of holes will be permitted.
 - Guardrail to be installed at maximum practical distance from travel lane except at locations controlled by installation of non-mountable curb.
 - If desirable 4 ft. minimum offset between face of rail and hazard can not be provided, a 2 ft. offset may be used. A special detail should be prepared by the designer and forwarded to the Deputy Design Engineer, Roadway Office for review and approval if minimum 2 ft. offset can not be provided.
 - Amber reflectors shall be used adjacent to auxiliary lanes and within 250 ft. of intersections; at all other locations clear reflectors shall be used.

FHWA APPROVED: 7-27-76

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

- GUARDRAIL CONSTRUCTION -

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
7-69			
7-71			
7-72			
7-73			
7-74			
7-75			
7-76			

Dates	Descriptions	Checked by	Traced by	Quantities by	Recommended for Approval by	Approved by
7-69	Revised Guardrail and Gutter Transitions at Bridge Approaches	L. J. W.				
7-71	Changed post spacing on trailing end. Changed notes 1, 6, 7, 8, 11 & 12. Added note 13.	L. J. W.				
7-72	Changed index No. 8	L. J. W.				

Drawing No. 2 of 5
BGR-01-1



NOTE: ① Soil Sterilization - Cost of soil sterilization to be included in the cost of Asphalt Paving. See Special Provisions.
② Where shoulder pavement and/or shoulder gutter is present adjacent to a standard flare end the guardrail pavement shall extend out to the shoulder pavement or gutter in front of the flare.



NOTE: This back-up plate is placed behind rail elements at intermediate posts (non-splice posts).



NOTES: Type "C" Steel Post may be used with Double Face Guardrail.

⊗ Type "C" Steel Post placed back of slope break point in slopes steeper than 4:1 shall be 6'9" long unless otherwise noted.

See note 8, sheet 2.



ELEVATION

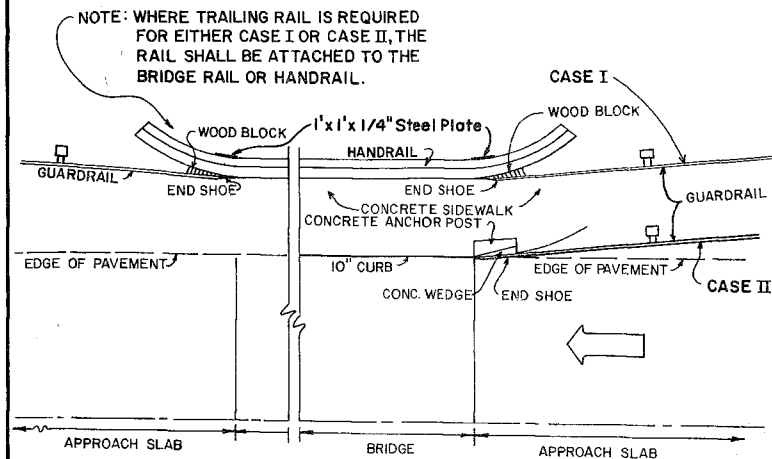
END ANCHORAGE TYPE II

DETAIL R

NOTE: The payment for the items of End Anchorage Assemblies Type II shall include furnishing and installing the Terminal and End Sections, Anchor Plates, Rods, Pipe Sleeves, Anchor Blocks, Plates and the necessary hardware.



				REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
				Dates Descriptions			
				7/72 Sheet redrawn - Changed type of end anchorage. LMF			
				12/73 Moved details from top of sheet to new sheet no.4. Added details R & S.	Designed by _____ Checked by _____ Quantities by _____ Checked by _____ Supervised by _____	Recommended For Approval By _____ APPROVED BY: _____ _____ State Design Engr.	
				10-74 Redrawn - Removed detail Q & detail S -Added new details-Changed Index N's LMF		Drawing No. _____ Index No. _____ 3 OF 5	BGR-01-1
3-76	Added notes & minor changes						



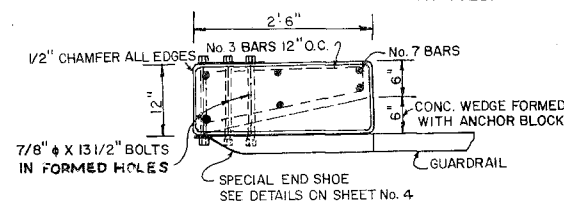
TYPICAL GUARDRAIL INSTALLATION AT EXISTING BRIDGE ENDS

CASE I - BRIDGERAIL WITHOUT SIDEWALK
CASE II - BRIDGERAIL WITH SIDEWALK & CURB

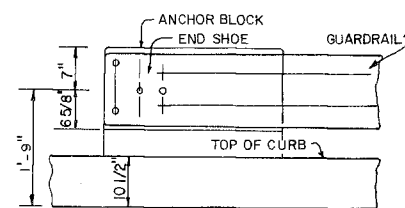
NOTE: DETAILS SHOWN ARE TYPICAL FOR GUARDRAIL
INSTALLATION AT EXISTING BRIDGE ENDS.

NOTE: AT BRIDGE ENDS WITHOUT SIDEWALKS (CASE I)
THE PENTACHLOROPHENOL TREATED WOOD BLOCK
AND END SHOE SHALL BE MOUNTED TO THE EXISTING
HANDRAIL AND LOCATED TO PROVIDE A 6" CLEARANCE
FROM BACK OF GUARDRAIL TO THE FACE OF BRIDGE
RAIL.

NOTE: AT BRIDGE ENDS WITH SIDEWALK & CURB (CASE II) THE CONCRETE ANCHOR POST IS TO BE CONSTRUCTED.

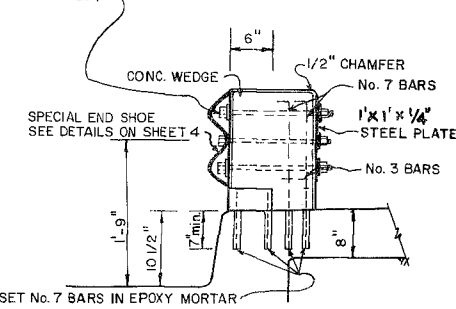


PLAN VIEW ANCHOR BLOCK CASE II



SIDE VIEW CASE II

7/8" ϕ X 13 1/2" BOLTS WITH HEX
NUTS AND 1 1/2" O.D. WASHERS.
IN FORMED HOLES(4 EACH
REQUIRED)



END VIEW CASE II

DRILL 1 3/4" HOLES AND SET No. 7 BARS IN EPOXY MORTAR

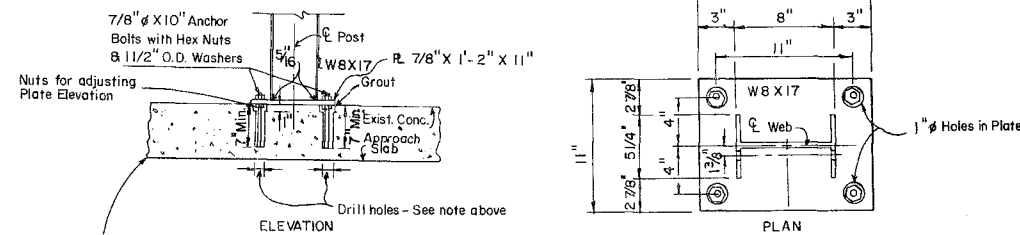
NOTE:
When guardrail posts are not immediately set the contractor is to protect the drilled holes from water entry as directed by the Engineer.

NOTE: Drill 1/34" Holes with a rotary drill and set Anchor Bolt in Epoxy Mortar. The top 1" of the holes shall be drilled 2" Ø to provide clearance for the adjusting nuts. Holes to be drilled thru existing Reinforcing Steel if encountered. After drilling, all Holes shall be thoroughly cleaned to remove all dust prior to placing Epoxy and Bolts.

After adjusting Nuts are set, place 7/8" Plate on Grout.

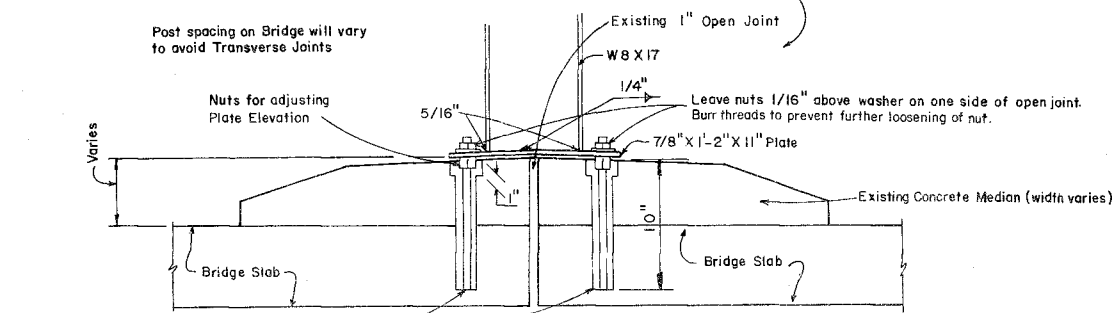
The Grout shall be finished to the neat lines of the 7/8" Plate.

Guardrail Post shall be set Plumb.



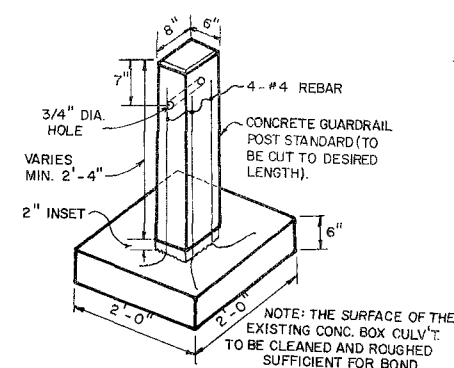
DETAIL OF GUARDRAIL POST MOUNTING TO EXIST. APPROACH SLAB

Note: All Steel Posts and Accessories To Be Galvanized.

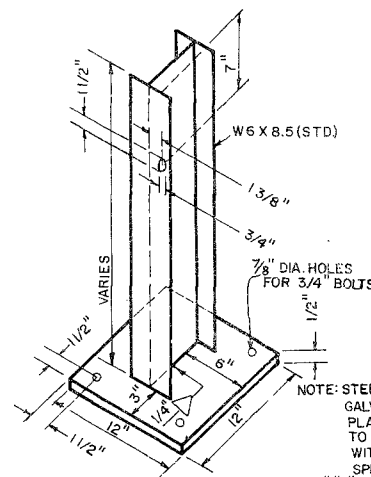


ELEVATION DETAIL OF GUARDRAIL POST
MOUNTING TO EXISTING BRIDGE DECK

Note: Use 7/8" ϕ Bolts with 1 1/2" ϕ O.D. Washers for Anchoring Guardrail Posts where Slab and Median thickness is not sufficient for Anchorage as shown.



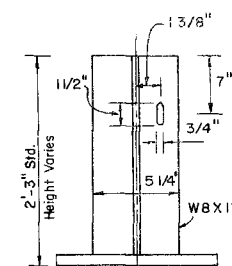
CONCRETE POST



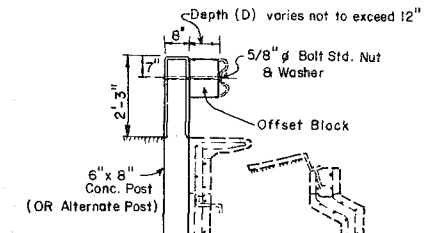
STEEL POST

NOTE: STEEL POST ASSEMBLY TO BE GALVANIZED EXCEPT FOR BASE PLATE AND WELD AREA WHICH IS TO BE METALIZED IN ACCORDANCE WITH SECTION 562 OF STANDARD SPECIFICATIONS.

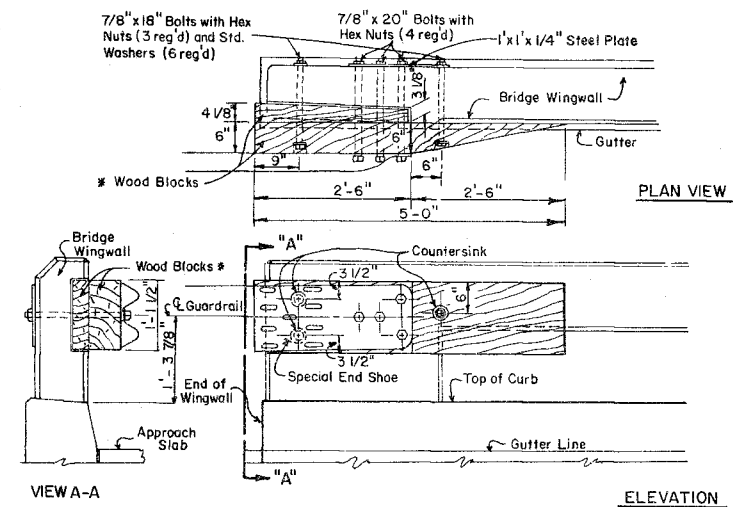
IF 6" "C" STEEL POSTS ARE USED FOR SPECIAL POSTS THE NEUTRAL AXIS OF THE POST SHALL BE CENTERED ON THE BASE PLATE AND ATTACHED WITH A 5/16" FILLET WELD ALL AROUND ON OUTSIDE.



DETAIL OF BOLT LOCATION
IN STEEL POST



DETAIL OF GUARDRAIL POST
BACK OF EXISTING INLETS



SPECIAL DETAIL "A"
GUARDRAIL ATTACHMENT AT WINGWALLS ON EXISTING BRIDGES

NOTE: FOR ALL TWO-WAY BRIDGES AND APPROACH ENDS ON ONE-WAY BRIDGES WITH THIS TYPE WINGWALLS, RAIL ON TRAILING END OF ONE-WAY BRIDGES CAN BE RECESSED INTO SLOT.



* Alternate to back Wood Block.
Anchor recess to be filled with Epoxy Grout.

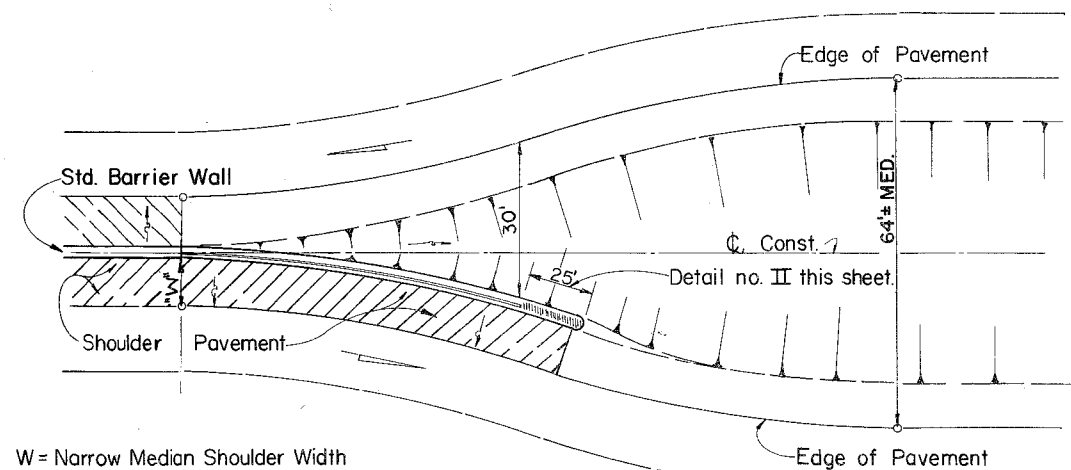
Where concrete block is provided on bridge handrail the wood blocks will not be required.

FHWA APPROVED; 7-27-76

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

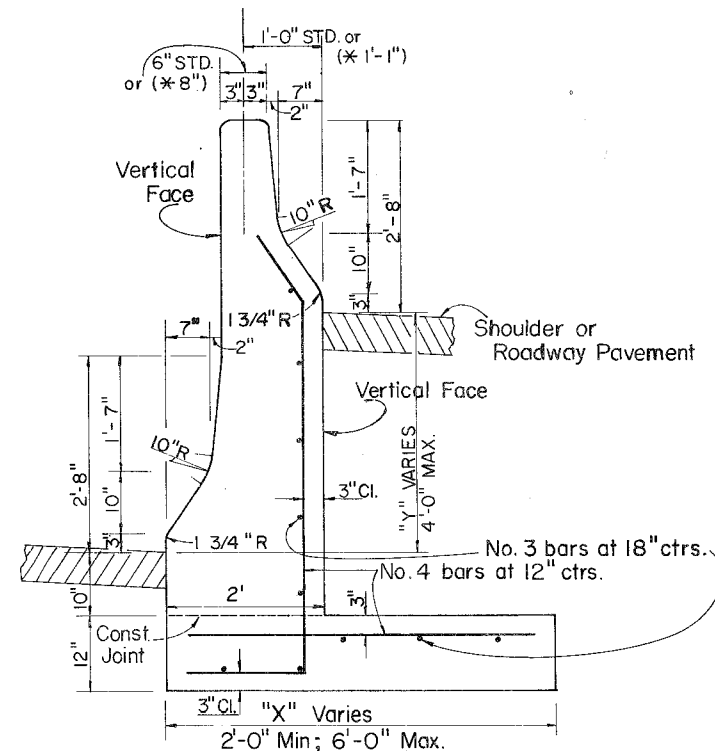
GUARDRAIL CONSTRUCTION

REVISONS		ROAD NO.		COUNTY		PROJECT NO.	
Dates	Descriptions	Names		Dates	Recommended For Approval by	By	
9-69	ADDED ATTACHMENT DATA ANCHOR BLOCK CASE II AND SPECIAL DETAIL "A"	Drawn by	H. Walters	7-69	APPROVED BY	 Deputy Design Engineer - Roadways	
G.F.		Checked by	J.K.C.	7-69		 Store Design Engineer	
7-71	ADDED SPEC. POSTS, ADDED ALL TO WOOD BLOCK ON SPECIAL DETAIL "A"	Quantities by			Drawing No	5	Index No
L.F.		Traced by				5	BGR-01-1



W = Narrow Median Shoulder Width

TERMINATION OF BARRIER WALL
AT APPROACH TO WIDE MEDIAN SECTION
DETAIL A

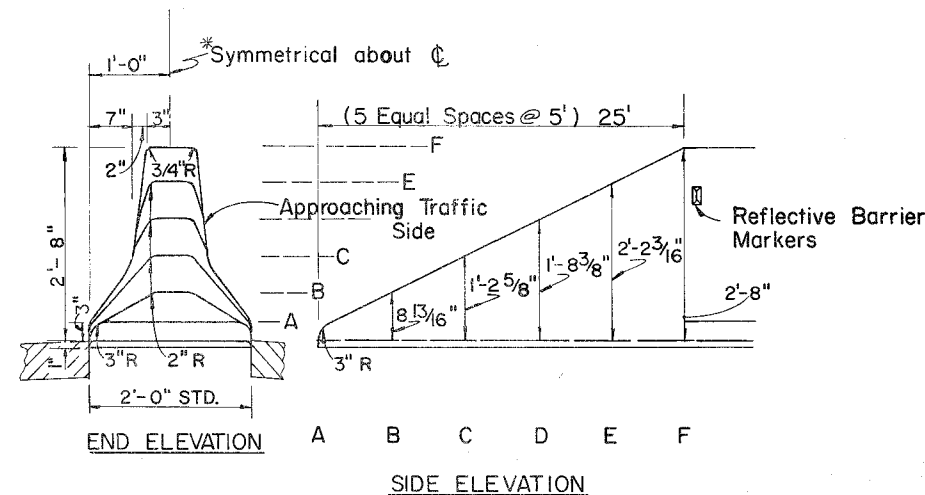


MEDIAN BARRIER WALL
FOR SUPERELEVATED SECTION OR VARIABLE
ROADWAY PROFILE GRADES

Note: Steel not required until height "Y" is 1'-0" or more and footing width "X" is 3'-0" or more. Cost of the steel and concrete footing to be included in the Contract unit price for Concrete Barrier Wall.

Height "Y"	0'-0"	0'-6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"
Width "X"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"

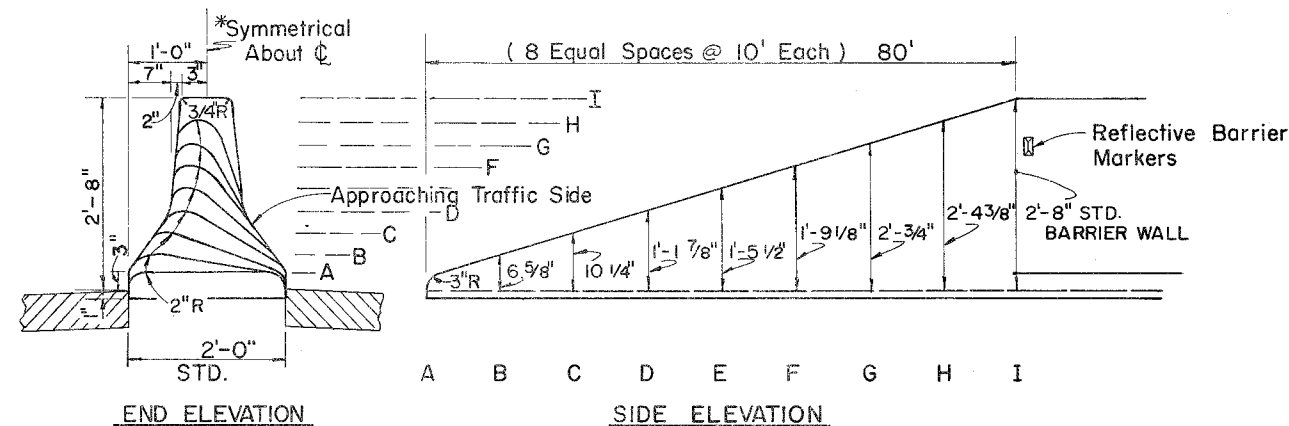
TABLE OF DIMENSIONS FOR DIFFERENCE-HEIGHT "Y" AND
BARRIER WALL FOOTING - WIDTH "X"



CONCRETE MEDIAN BARRIER TERMINAL

(To be used only as a Temporary Barrier Terminal or where located 30' from edge of approach lane. See Detail A Lt.)

DETAIL II



CONCRETE MEDIAN BARRIER TERMINAL

NARROW MEDIAN

DESIGN SPEED 45 M.P.H. or LESS

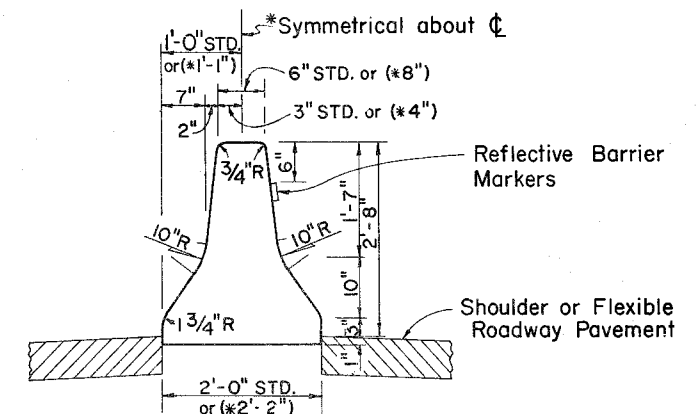
DETAIL III

GENERAL NOTES:

- Cost of installation of all conduits and utility accessories, reinforcing steel and reflective barrier markers shall be included in the contract unit price for Concrete Barrier Wall.
- Terminal Barrier Notes for Design Speeds greater than 45 m.p.h.:
 - Terminated in a wide median section outside recovery area of the approach traffic. - See Detail A Lt.
 - Terminated from a shielded location.
 - Terminal protection by the use of an impact attenuator system.
 - Terminated in conjunction with a suitably designed transition to another type median barrier that can be introduced more safely.
- 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 to match an existing or proposed expansion joint.
- Expansion joints in conduits shall be required only at the expansion joints in the wall.
- 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 sections with a length < 40' shall be joined to adjacent sections by doweling. See Detail 'B' on sheet 2 of 3.
- Precast construction is allowed as an alternate to cast-in-place construction.
 - Section lengths will not be < 20' in length.
 - 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.
 - See detail 'C' on sheet 2 of 3 for transverse joint details.

BARRIER MARKER SPACING ON WALL		
Distance - Edge of travel lane to barrier wall.	Spacing	Number per side
1' to < 4'	40'	1
4' to < 8'	80'	1
> than 8'	none required	

Use Amber Markers only.
Use 10' spacing on Terminal ends.
Hold or clamp reflective barrier markers to wall until dry or set.



TYPICAL BARRIER WALL SECTION
NARROW MEDIAN INSTALLATION
ADJACENT TO PAVEMENT

* Use 8" top, 2'-2" base when 10" light poles are installed within barrier wall line.

For Concrete Median Barrier Wall details at Piers, Highway Lighting and Guardrail Connections, See Sheet 2 of 3.

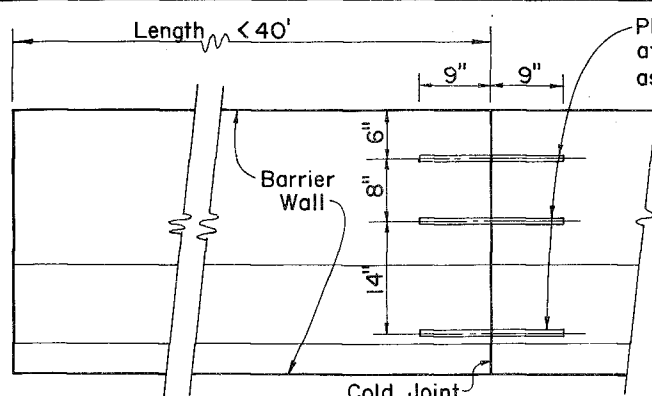
For Median Barrier and 'Special' Barrier Wall Inlet details see sheet 3 of 3.

FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN SECTION

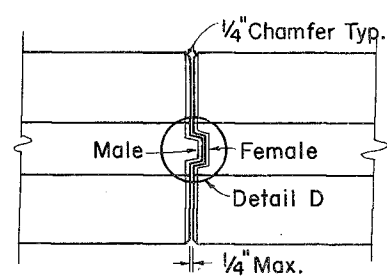
MEDIAN BARRIER DETAILS

FHWA Approved: 5-20-77

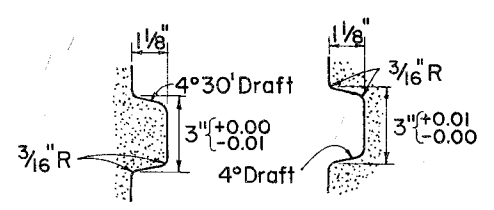
REVISIONS		INITIALS	DATES	Recommended For Approval By:
DATES	DESCRIPTIONS	DESIGNED BY		
4-74	Sheet Added	A.F.	6-73	DEPUTY DESIGN ENGINEER-ROADWAYS
10-74	Changed Index #2	LMF	7-73	
4-75	Revised Barrier Reflective Markers			Approved By: STATE DESIGN ENGINEER
6-76	Revised Barrier Base depth, added Notes 5, 6, 7, 8, 9			
5-77	Revised Gen. Note No 1			DRAWING NO. 1 of 3
				INDEX NO. BMB-01-1



DOWELED TRANSVERSE CONSTRUCTION JOINT
DETAIL B

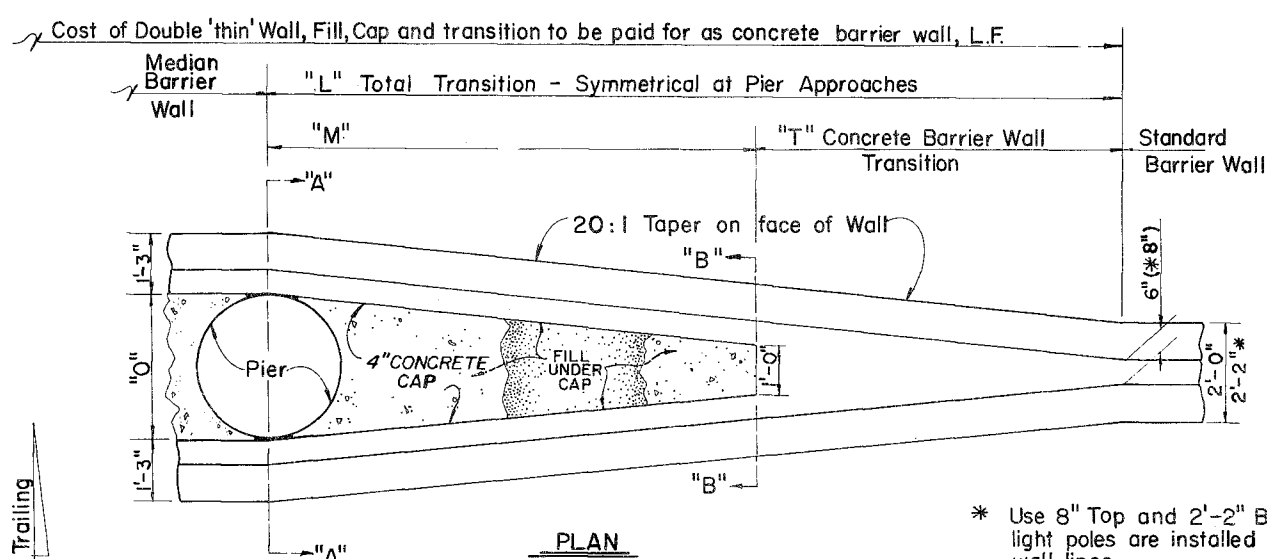


TOP VIEW
DETAIL C



DETAIL D

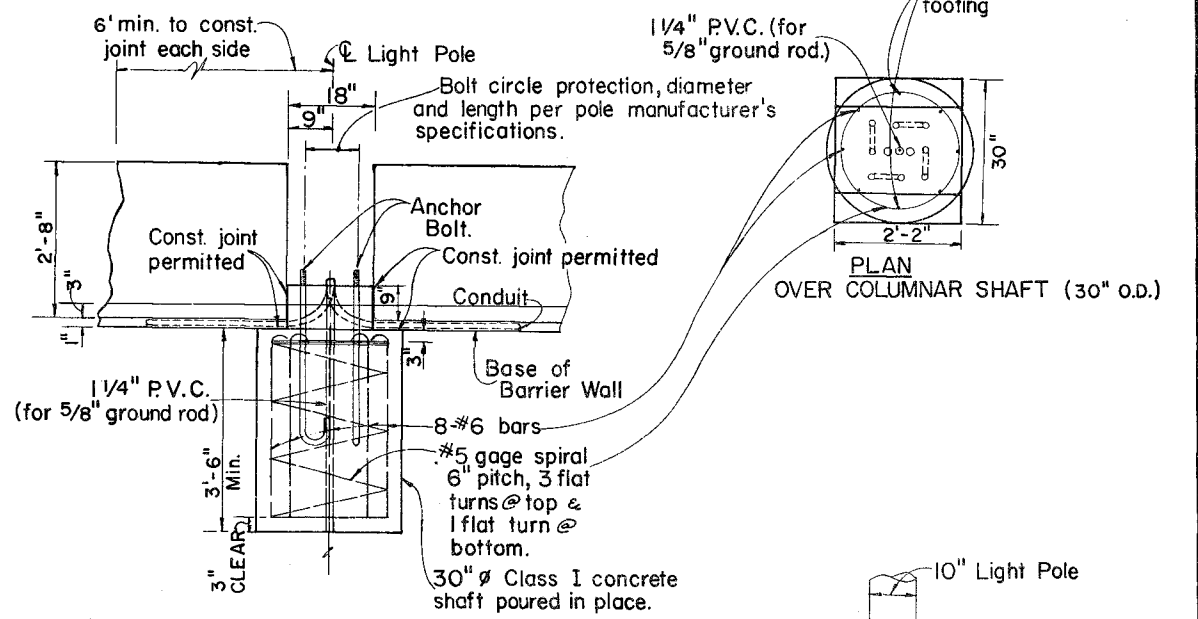
PRECAST BARRIER TRANSVERSE JOINTS



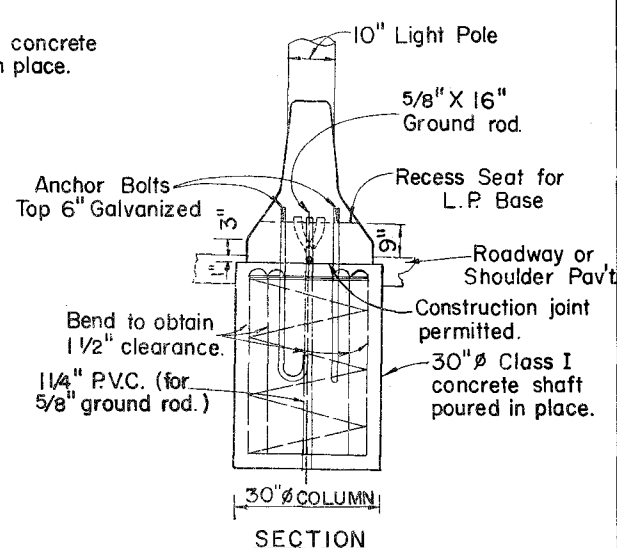
PLAN
DETAIL I

DIMENSIONS - DETAIL I				
"O"	"L"	"M"	"T"	WALL TYPE
Varies 3' Shown	Total Trans.	Barrier Wall	Std. to M. Trans.	
3'	35.8'	20.8'	15.0'	STD., (6" Top, 2'-0" Base)
3'	34.2'	20.8'	13.4'	* (8" Top, 2'-2" Base)

* Use 8" Top and 2'-2" Base when 10" light poles are installed within barrier wall lines.



PLAN
OVER COLUMNAR SHAFT (30" O.D.)



SECTION
DETAIL OF 10" LIGHT POLE MOUNTING ON MEDIAN BARRIER WALL WITH 8" TOP, 2'-2" BASE

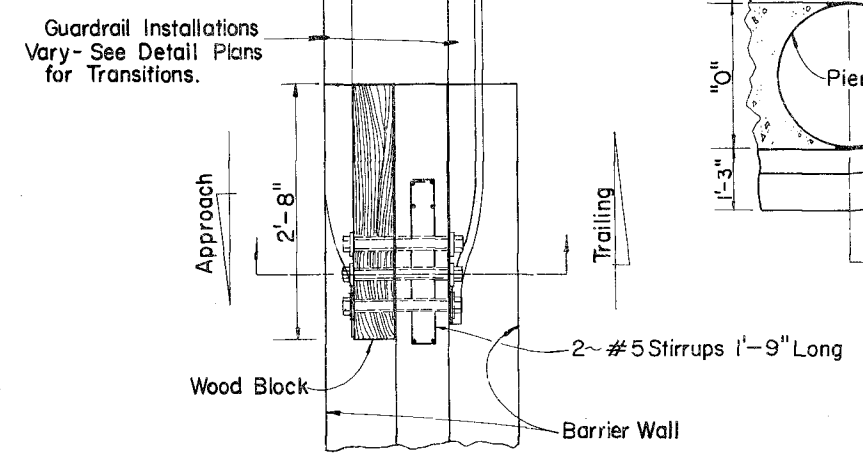
NOTES:
Bolt circle; 8" pole - 11 1/2", 10" pole - 15"
Refer to Highway Lighting Plans for size of Conduit
Payment for the 30" Ø concrete column including reinforcing steel, anchor bolts and accessories shall be included in the contract unit price for Lighting Pole complete, Highway Lighting.

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
MEDIAN BARRIER DETAILS

FHWA Approved: 10-8-76

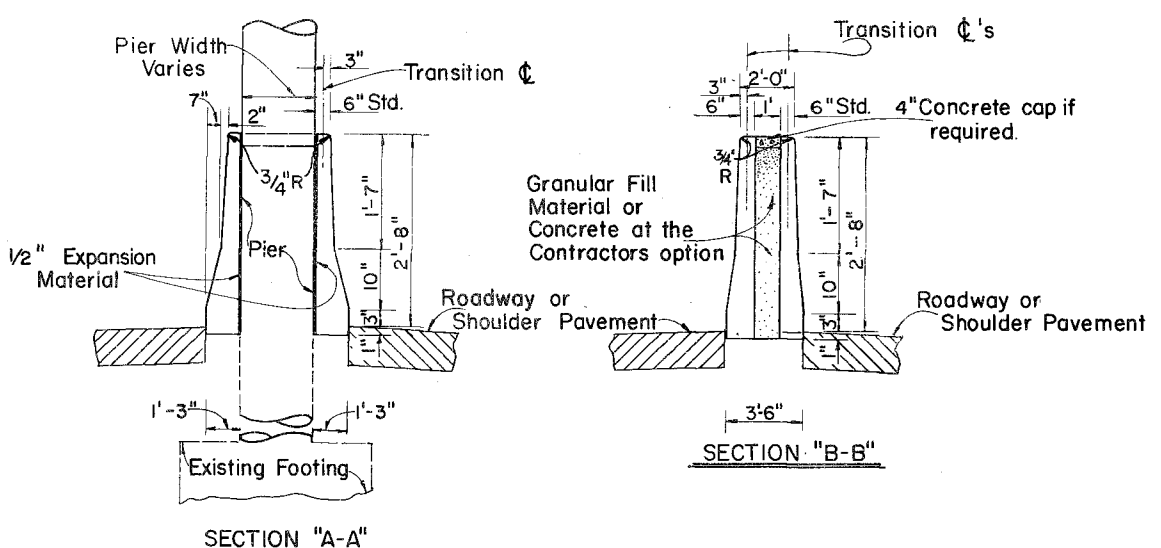
REVISIONS		INITIALS	DATES	Recommended For Approval By:	
Dates	Descriptions	Designed by	A.F.	6-73	DEPUTY DESIGN ENGINEER-ROADWAYS
4-76	Added guardrail to barrier wall detail	Checked by	LMF	7-73	Approved By:
6-76	Added detail for light pole mounting	Quantities by			STATE DESIGN ENGINEER
7-76	Added Rebar to Wall	Checked by			
10-76	Changed Index No	Supervised by			
6-76	Revised Barrier Base depth; added details B, C, & D. Changed Taper to 20:1 (Det. I)				
6-76	LMF				

DRAWING NO. **2 of 3**
INDEX NO. **BMB-01-1**



GUARDRAIL CONNECTION TO STD. CONCRETE BARRIER WALL

SECTION

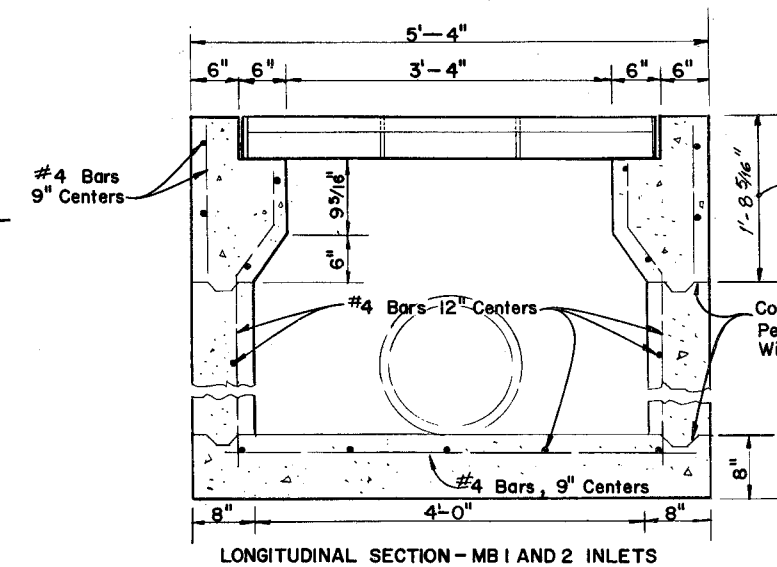
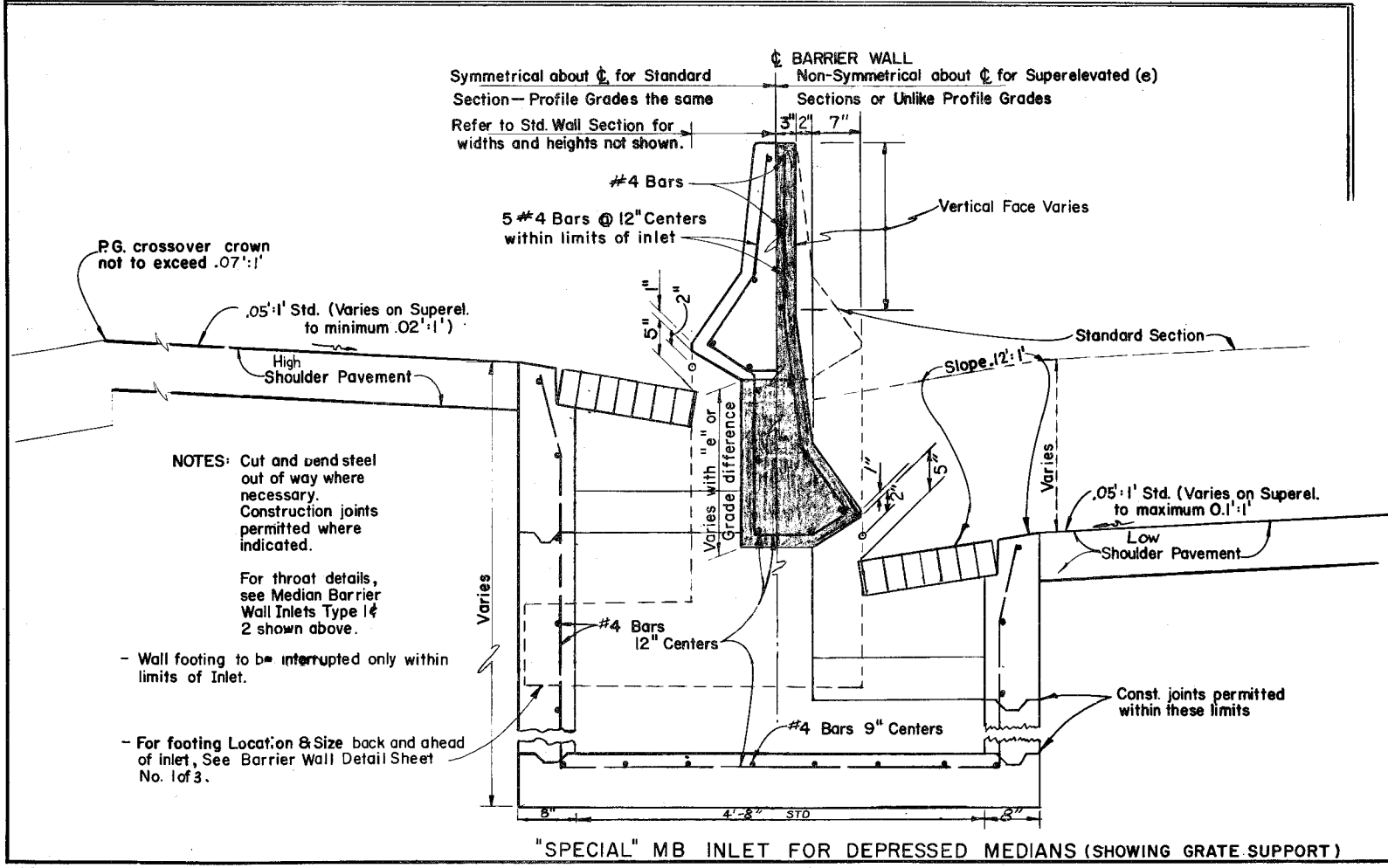
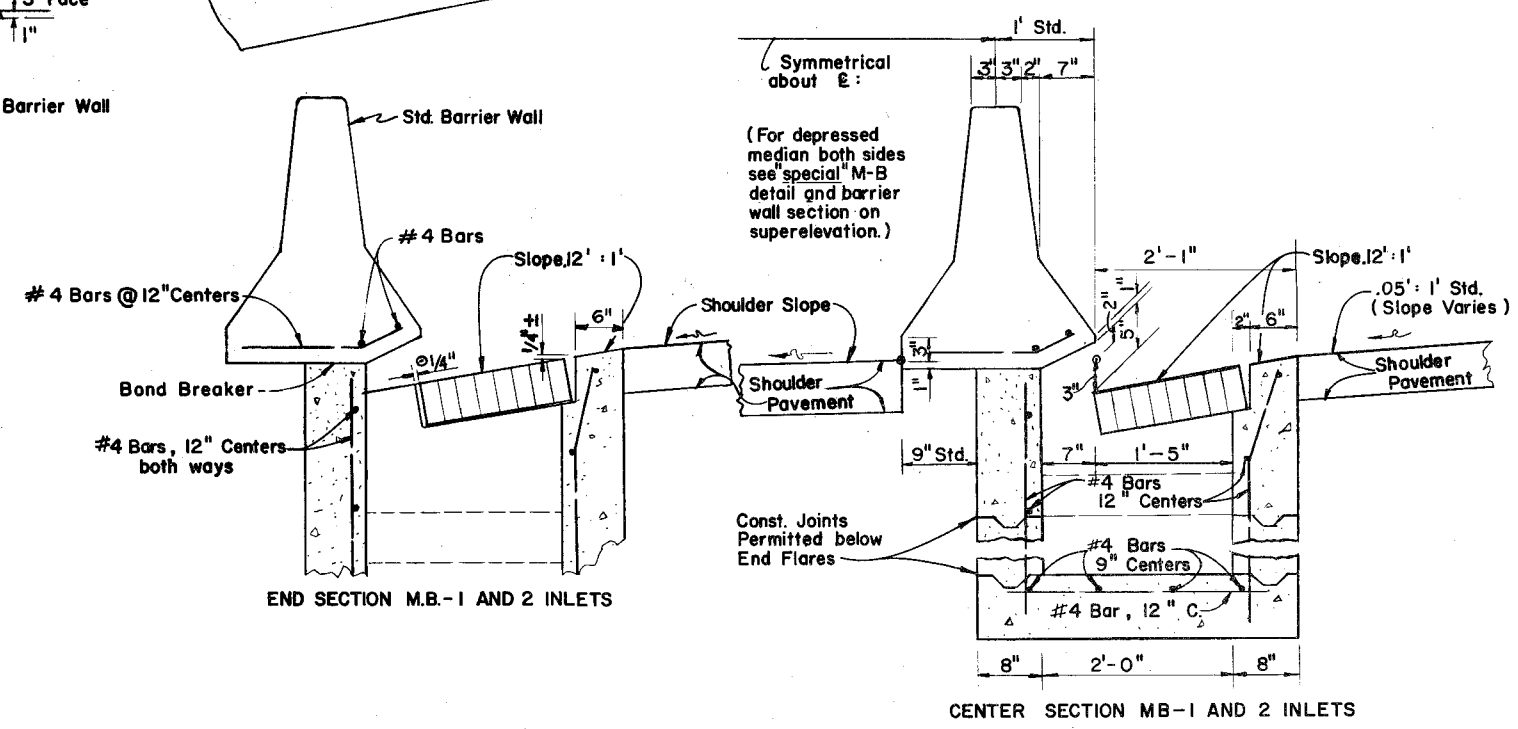
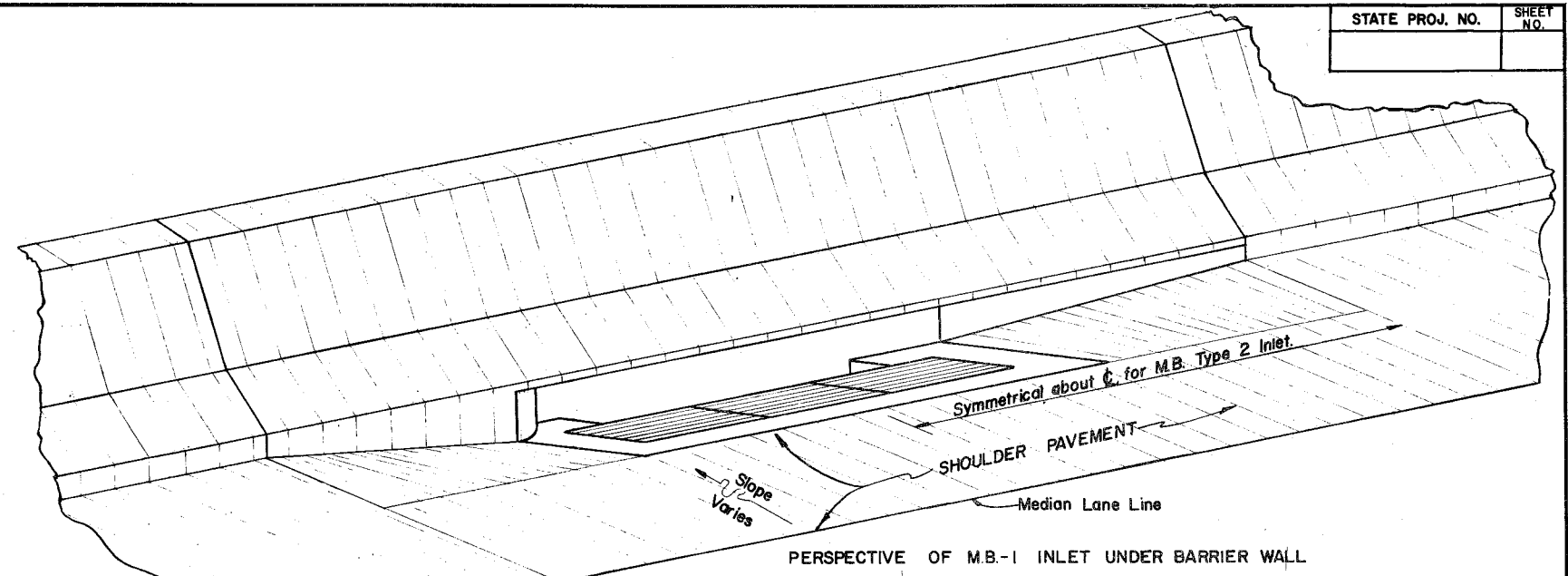
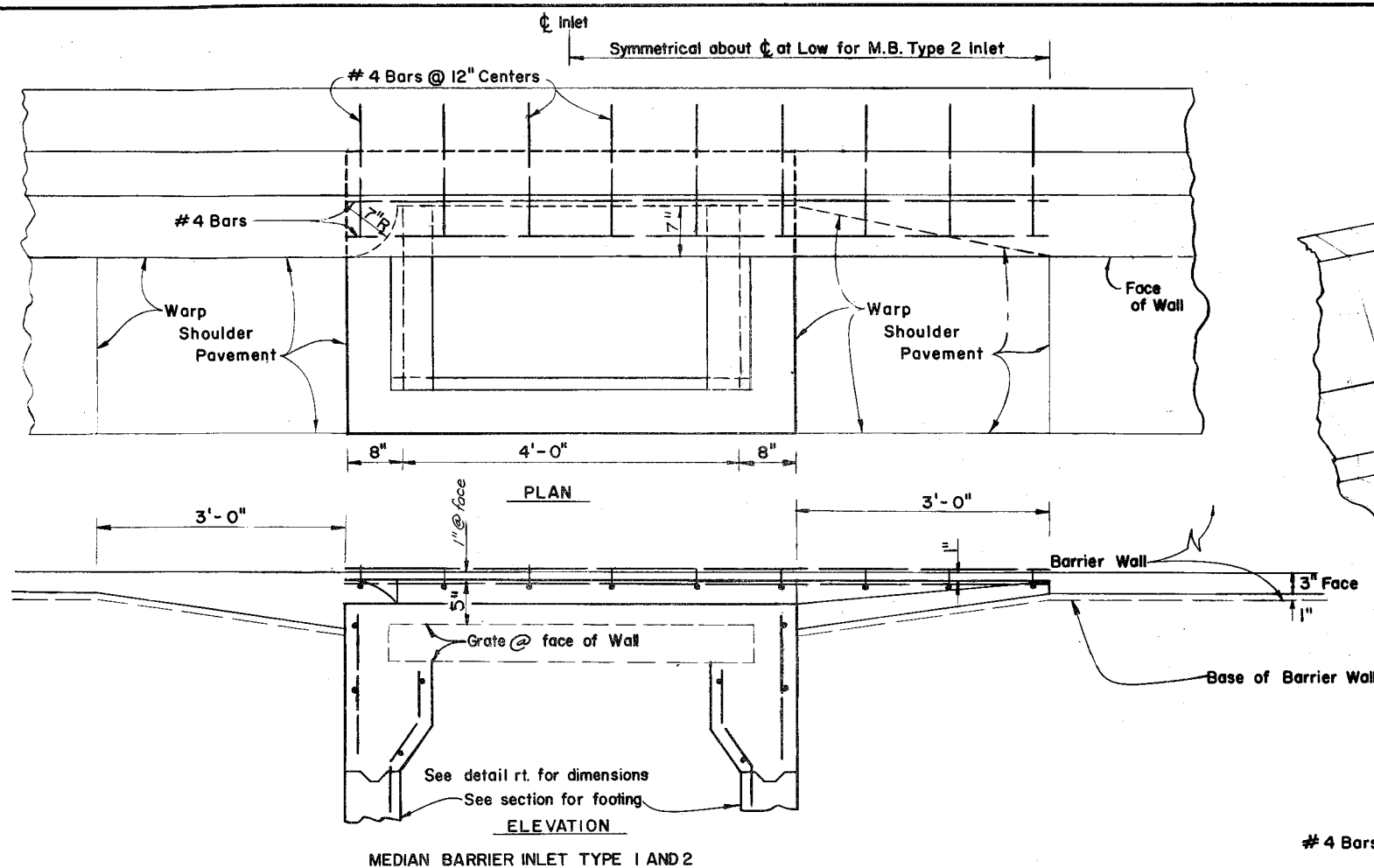


SECTION "A-A"

SECTION "B-B"

CONCRETE MEDIAN BARRIER WALL

NOTE: Cost of Double 'thin' wall, Fill, Concrete Cap and Transitions are to be paid for under Concrete Barrier Wall [Roadway] per lin. ft. as indicated.

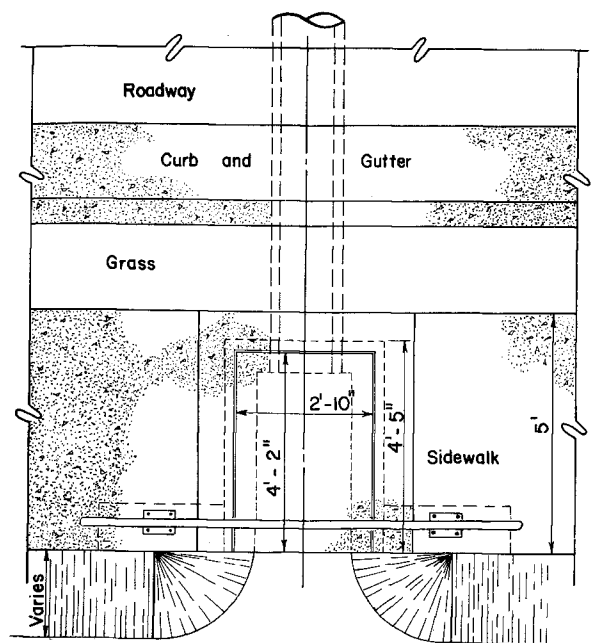


- GENERAL NOTES:
1. For standard barrier wall dimensions, see sheet 1.
 2. For flow channel details see Index No. DSD-01.
 3. For grate details see Index No. DGI-01. In those rare situations where bicycle traffic is anticipated, the grate type should be changed to Index No. DDI-02.
 4. Theoretical grade point at junction of 3" barrier wall face and pavement.
 5. For barrier wall dimensions, incorporating Light Standards within wall, refer to sheet land 2.
 6. Minimum cover for reinforcing steel shall be 2".

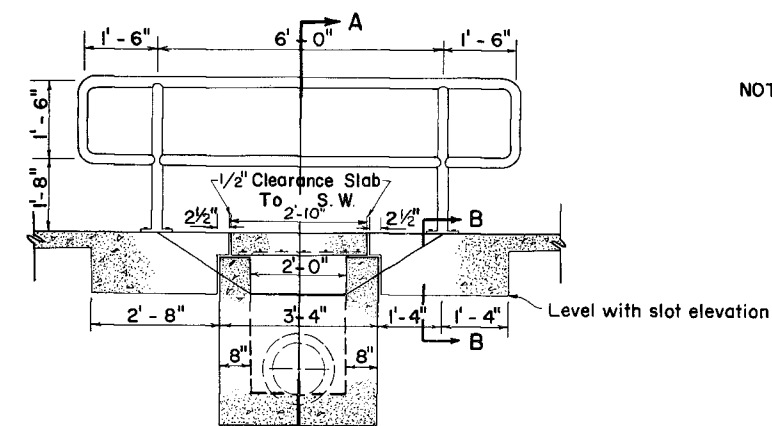
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

MEDIAN BARRIER DETAILS

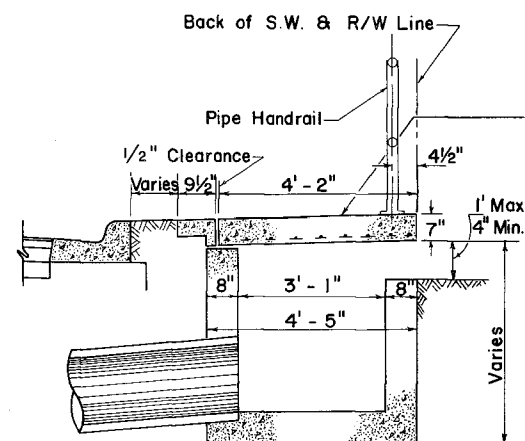
REVISIONS		INITIALS	DATES	RECOMMENDED FOR APPROVAL
9-28-73	Revised	A.F.	9-27-73	BY: <i>[Signature]</i>
9-28-73	Revised	E.R.	9-27-73	DEPUTY DESIGN ENGINEER ROADWAYS
10-74	Revised			APPROVED BY: <i>[Signature]</i>
6-76	Revised			STATE DESIGN ENGINEER
SUPERVISED BY		D.C.B.		DRAWING NO. 3 of 3
				INDEX NO. BMB-01-1



PLAN



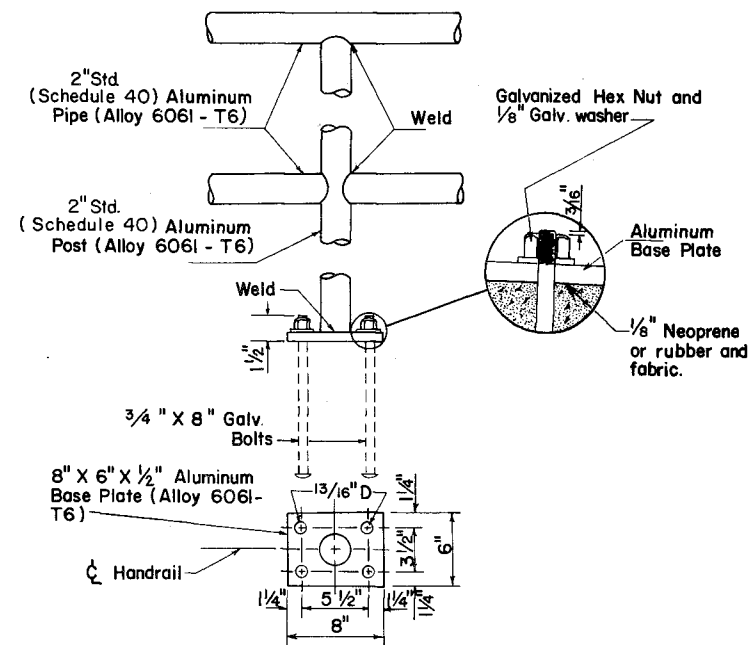
FRONT ELEVATION



SECTION A - A

TYPE "C" MODIFIED INLET

To be paid for as each



HANDRAIL DETAIL

NOTES: At the option of the contractor, Standard Rail Fittings may be used where welded connections are shown.

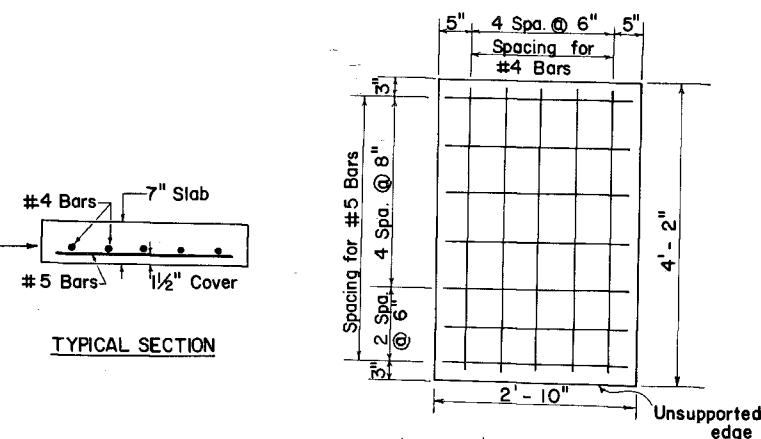
After the nuts have been tightened the anchor bolt threads shall be nicked or the nut shall be spot welded to the bolt.

Bolts, nuts and washers shall be hot dip galv. to conform to requirements of A.S.T.M. Spec. A-153. Steel Nicks and Welds shall be repaired in accordance with Section 562, Standard Specifications.

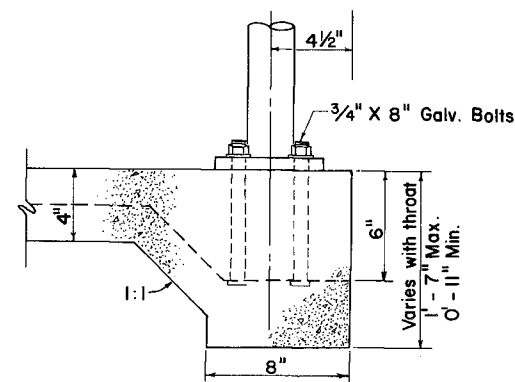
Aluminum Weld Filler Alloy 5556 or 4043.

For additional Inlet Details see Index No. DD1-03.

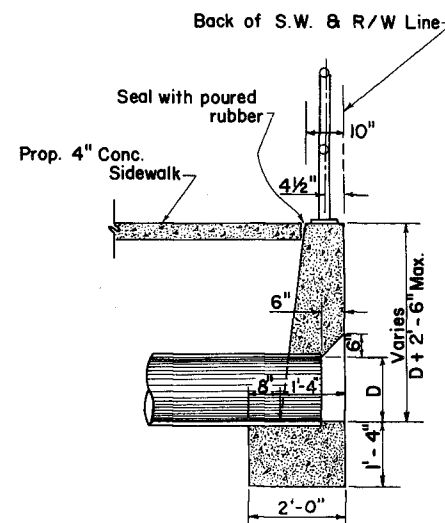
Grading back of sidewalk varies and shall be done as directed by the engineer.



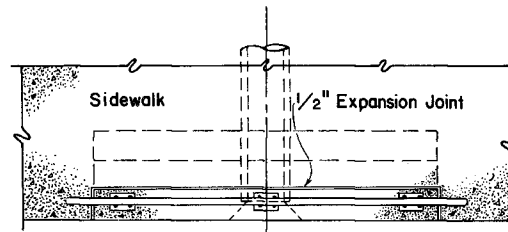
TYPICAL SECTION



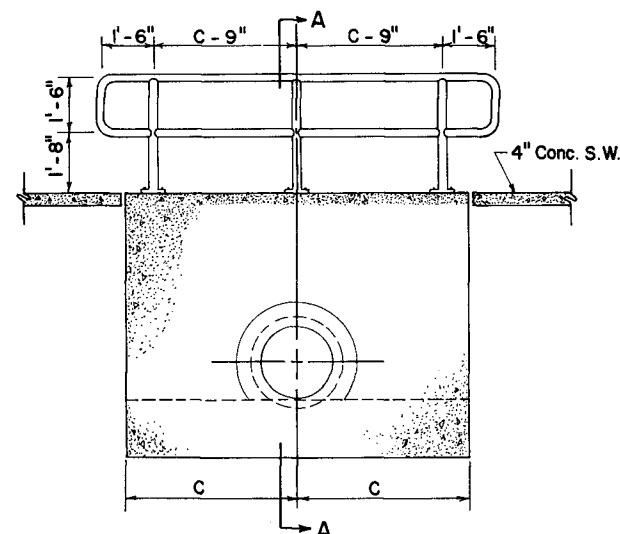
SECTION B - B



SECTION A - A



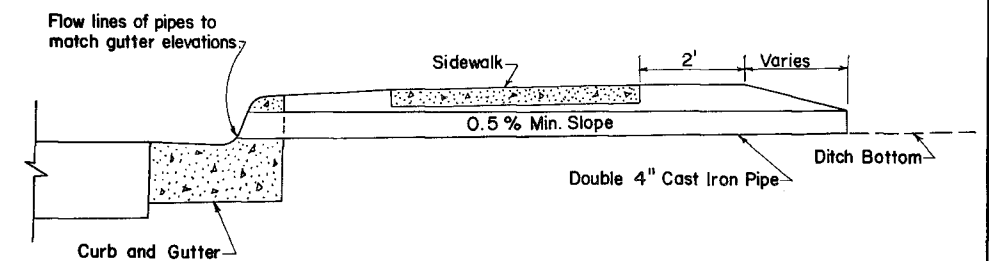
PLAN



FRONT ELEVATION

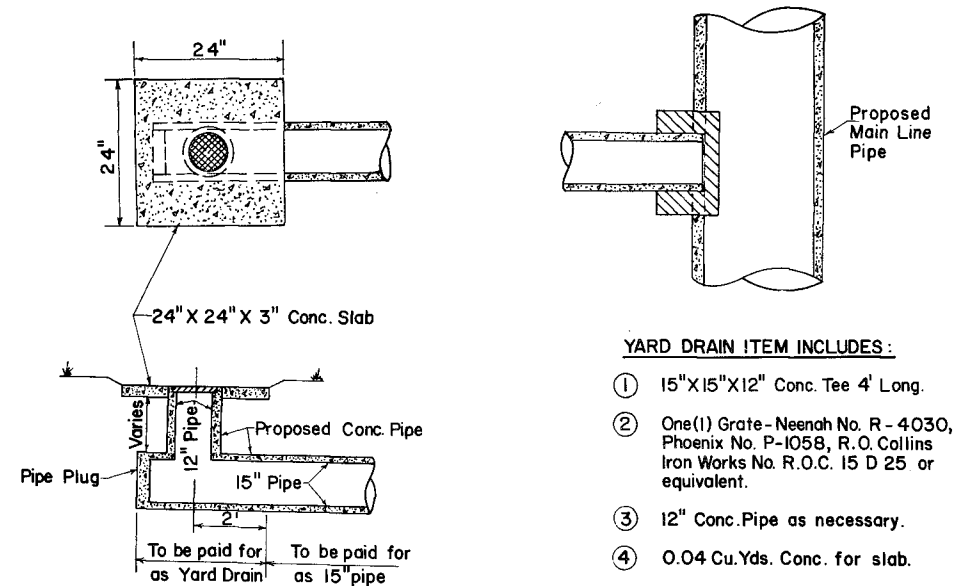
SPECIAL ENDWALL

Pipe Size "C" Value
 15" = 4'-9"
 18" = 5'-3"
 24" = 6'-3"
 27" = 6'-9"
 Maximum pipe size shall be 27".



METHOD OF DRAINING SHALLOW DITCHES BACK OF SIDEWALK

To be constructed at locations as directed by the engineer.



YARD DRAIN ITEM INCLUDES:

- 15" X 15" X 12" Conc. Tee 4' Long.
- One (1) Grate - Neenah No. R-4030, Phoenix No. P-1058, R.O. Collins Iron Works No. R.O.C. 15 D 25 or equivalent.
- 12" Conc. Pipe as necessary.
- 0.04 Cu. Yds. Conc. for slab.

NOTE: Cost of plugs and collars to be included in Bid Price for 15" Conc. Pipe. For Collar and Plug Detail see Index No. DMD-01.

DETAILS OF YARD DRAINS

Yard Drains may be constructed at the option of the property owner as shown on the plans.

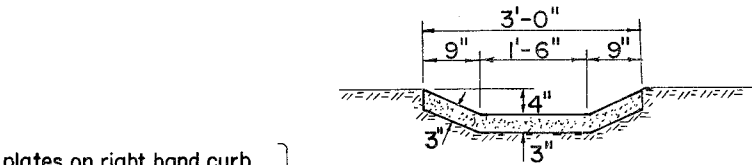
FHWA Approved: 5-1-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

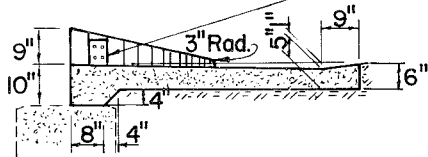
BACK OF SIDEWALK DRAINAGE DETAILS

REVISIONS		INITIALS	DATES	Recommended for approval by
Dates	Descriptions			
		Designed by		Deputy Design Engineer - Roadways
		Checked by		Approved by
		Quantities by		State Design Engineer
		Checked by		
		Supervised by		
		DRAWING NO. 1 OF 1		INDEX NO. DBS-01

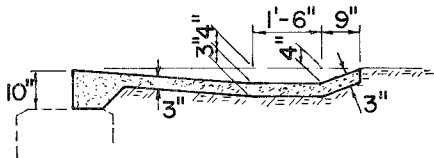
Note: Set reflector plates on right hand curb at bridge ends as shown. Plates to be furnished by D.O.T. and installed by the contractor. Cost of installing plates to be included in the contract unit price for concrete ditch pavement (3" thick).



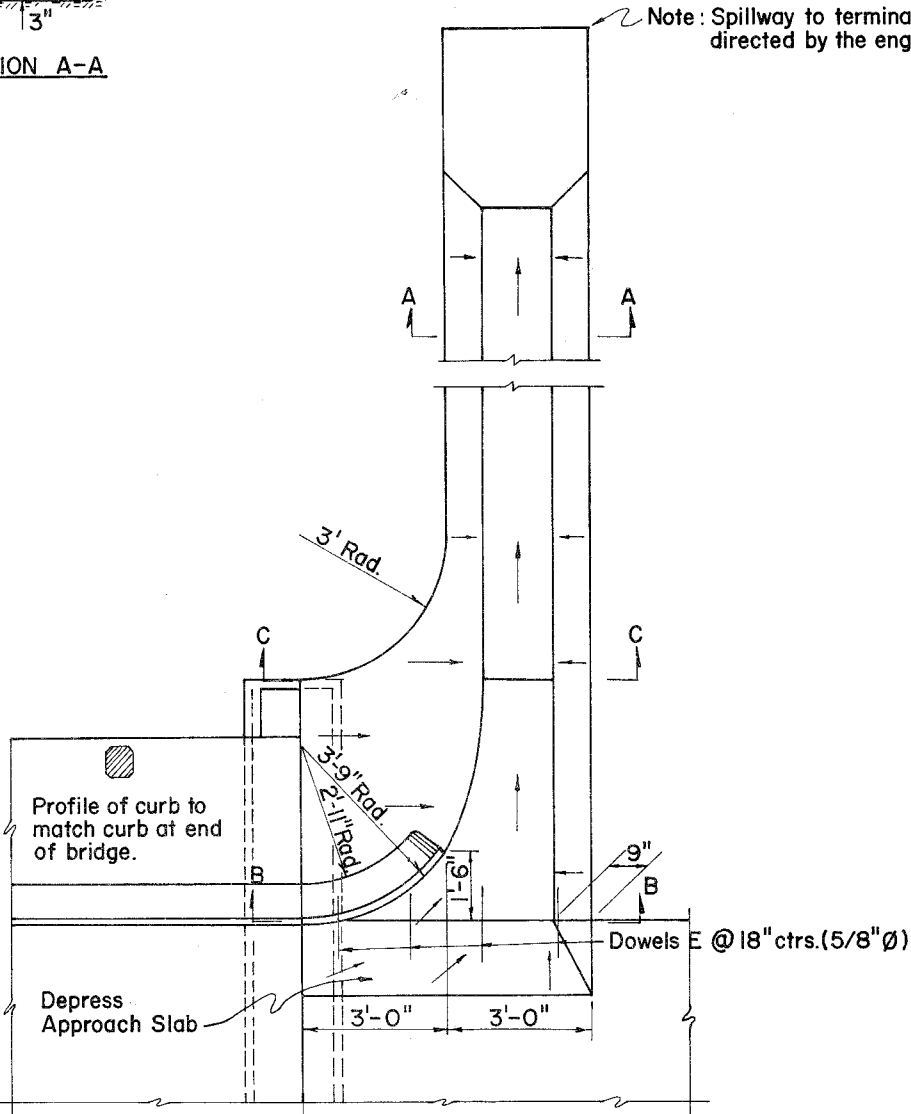
SECTION A-A



SECTION B-B



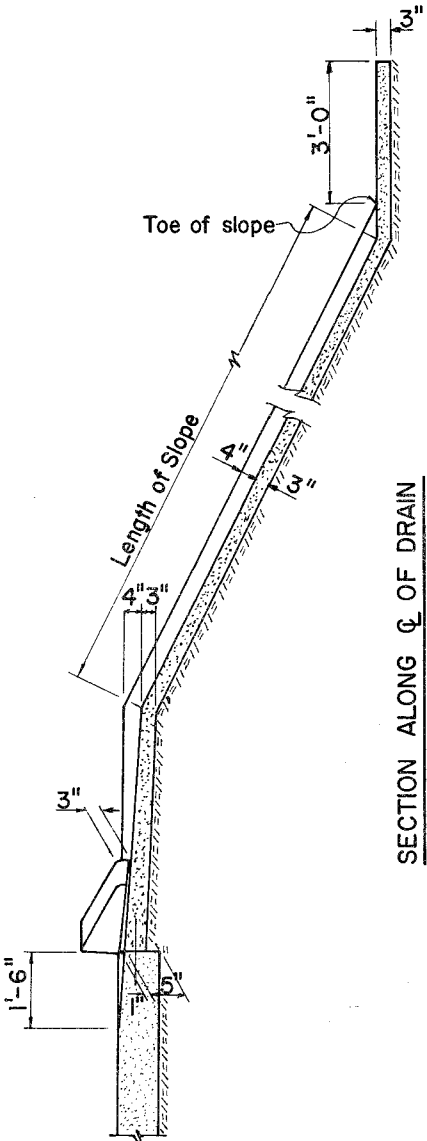
SECTION C-C



BRIDGE APPROACH SLAB

PLAN

Note: Spillway to terminate as directed by the engineer.



Dowels to be included in the contract unit price for concrete ditch pavement (3" thick).

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete Ditch Pavement (3" Thick)	Sq. Yd.	* 10.87

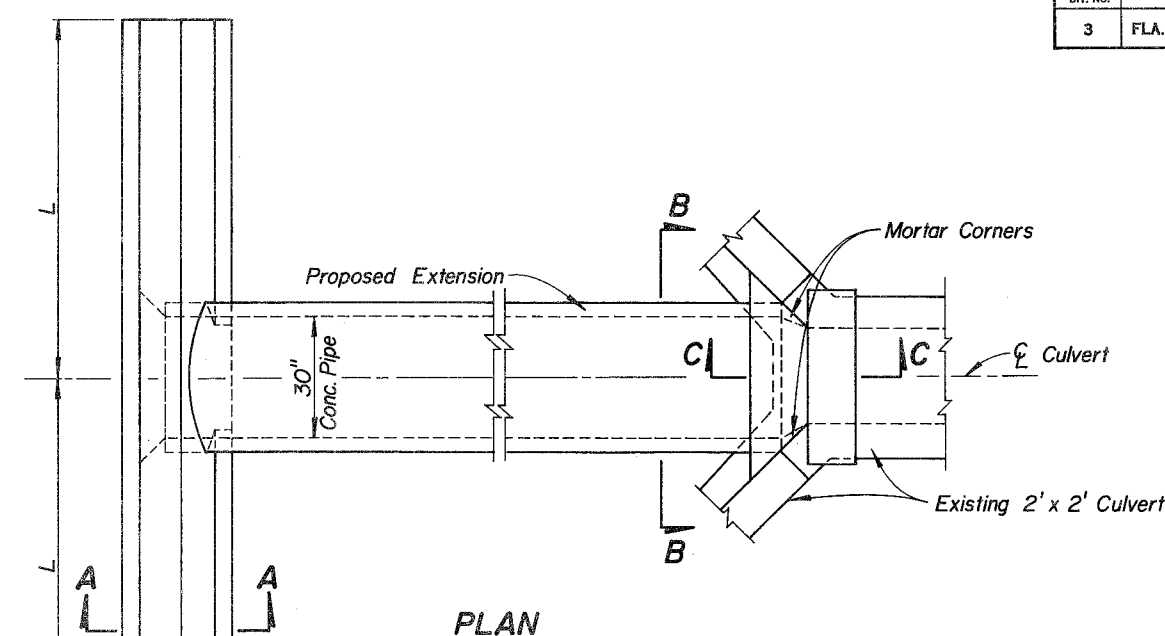
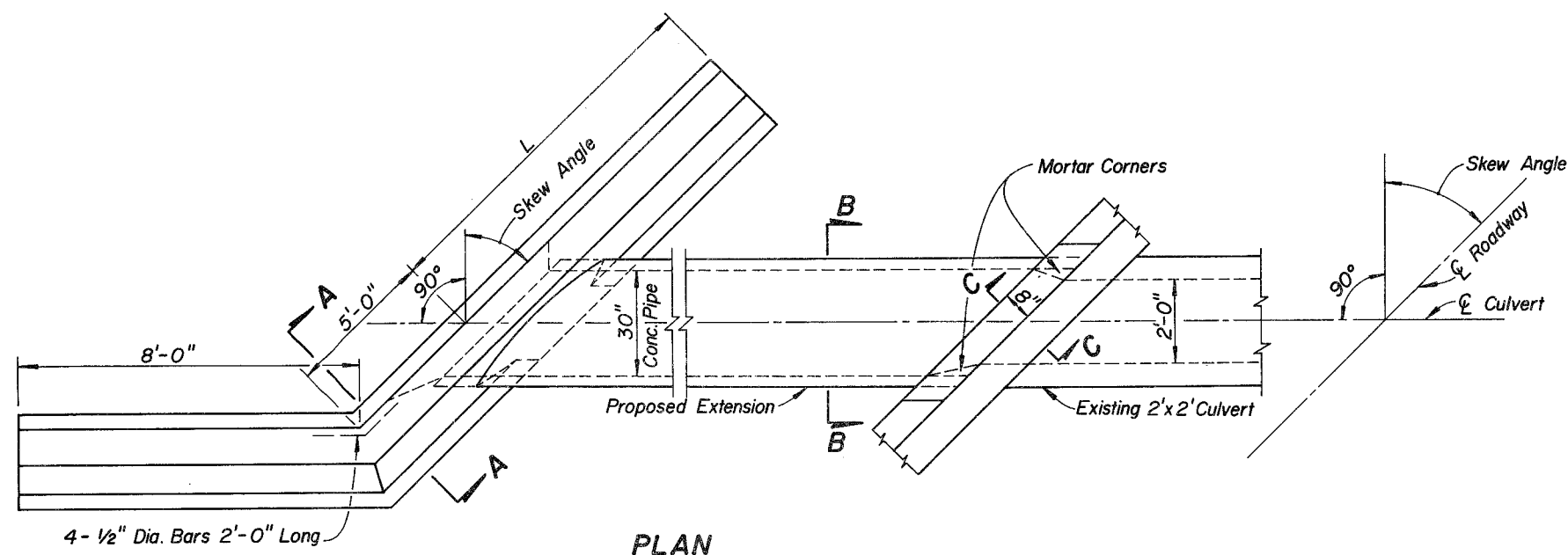
*Quantity shown above includes pavement for 10 ft. " Length of Slope "
For each additional foot of slope length add 0.349 sq. yds.

FHWA APPROVED : 3-20-75

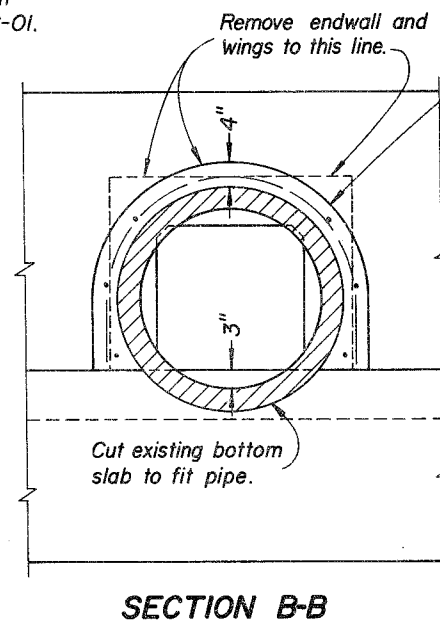
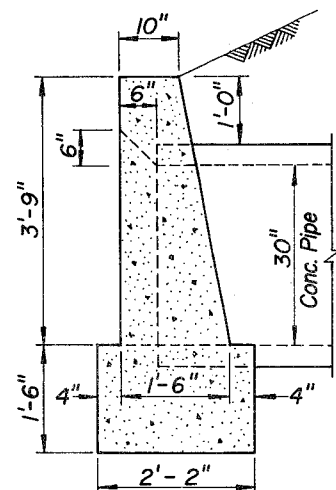
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN SECTION

CONCRETE SPILLWAY AT BRIDGE ENDS

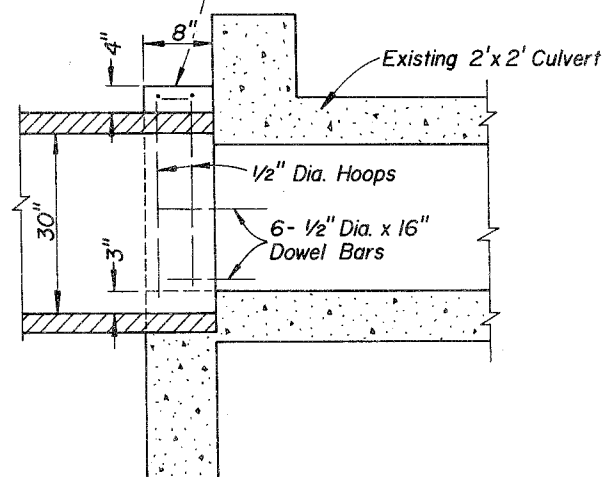
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
9-74	Changed Index N ^o			
		Designed by	C. E. S.	12-51
		Checked by		
		Quantities by	H. L. F.	12-51
		Checked by		
		Supervised by		
		APPROVED BY		
		E. H. Haest		
		Deputy Design Engineer, Roadways		
		Drawing No. Index No.		
		1 of 1 DCS-01		



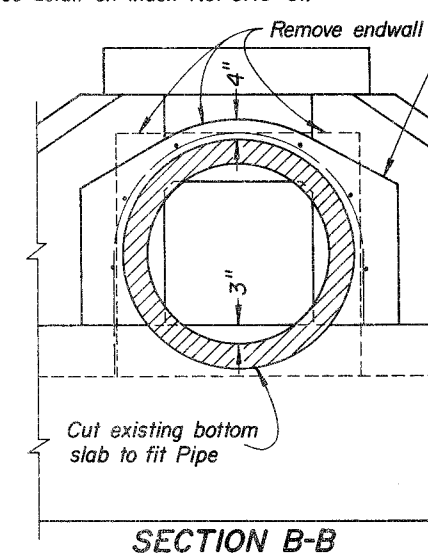
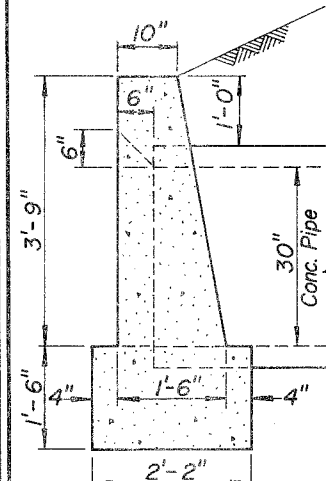
Note: For sodding around endwall see detail on Index No. GRC-01.



Note: Collar may be formed by any feasible method approved by the Engineer.



Note: For sodding around endwalls see detail on Index No. GRC-01.



Note: Collar may be formed by any feasible method approved by the Engineer.

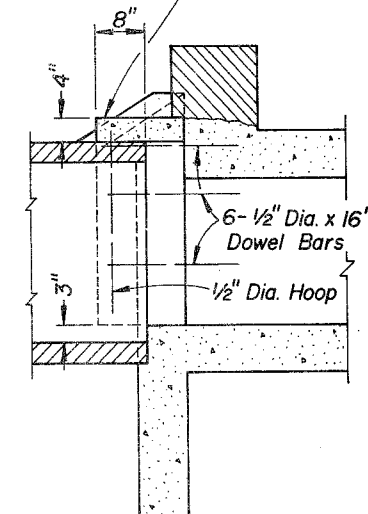


TABLE OF DIMENSIONS AND QUANTITIES		
SKIEW Δ	L	CLASS I CONCRETE
0° to 30°	7'-6"	5.6 Cu. Yd.
30° to 45°	8'-6"	6.0 " "
45° to 50°	9'-0"	6.2 " "

Note: Reinforcing steel to be included in Contract Unit Price for Concrete.

DETAILS FOR L-TYPE ENDWALLS

TABLE OF DIMENSIONS AND QUANTITIES		
SKIEW Δ	L	CLASS I CONCRETE
0° to 30°	7'-6"	3.9 Cu. Yd.
30° to 45°	8'-6"	4.5 " "
45° to 50°	9'-0"	4.8 " "

DETAILS FOR STRAIGHT TYPE ENDWALLS

Note: Reinforcing Steel to be included in Contract Unit Price for Concrete.

F.H.W.A. APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

**CONC. PIPE CULVERT EXTENSION
FOR 2'-0" x 2'-0" BOX CULVERT**

REVISIONS		REVISIONS		REVISIONS	
Dates	Descriptions	Dates	Descriptions	Dates	Descriptions
9-77	Retraced	10-51	Retraced	10-46	Retraced
		1-52	Note: Forms for Collar	10-46	Retraced
		4-66	Remove mortar from Pipe Invert	10-46	Retraced
		8-70	Raised side slope to top of endwall	10-46	Retraced
		3-73	Added Cl. I Conc.	10-46	Retraced
		10-74	Changed Index No.	10-46	Retraced

ROAD NO.	COUNTY	PROJECT NO.

DESIGNED BY	CHECKED BY	QUANTITIES BY	TRACED BY
H.L.F.	T.W.J.	H.L.F.	T.W.J.
10-46	10-46	10-46	10-46

APPROVED BY
E.H. Hunt
Deputy Design Engineer, Roadways
Drawing No. 1 of 1
Index No. DEX-01

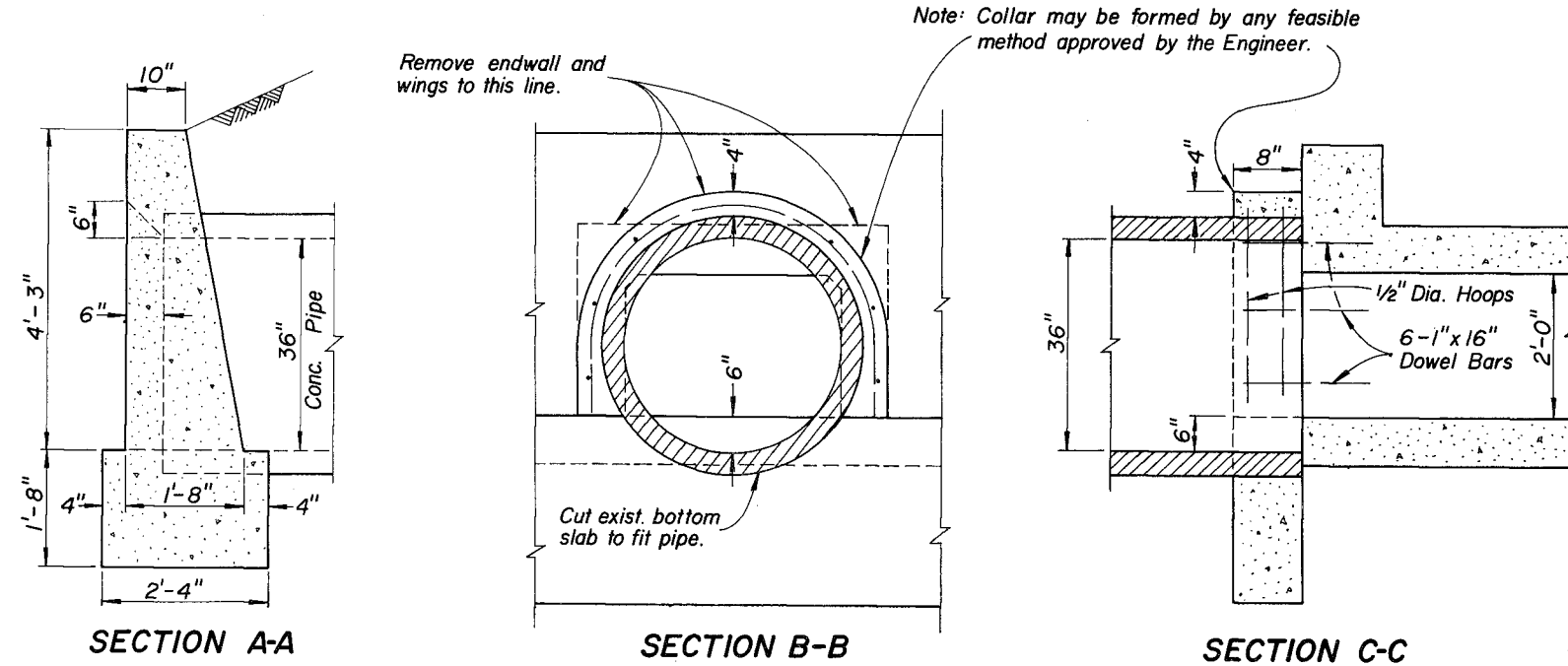
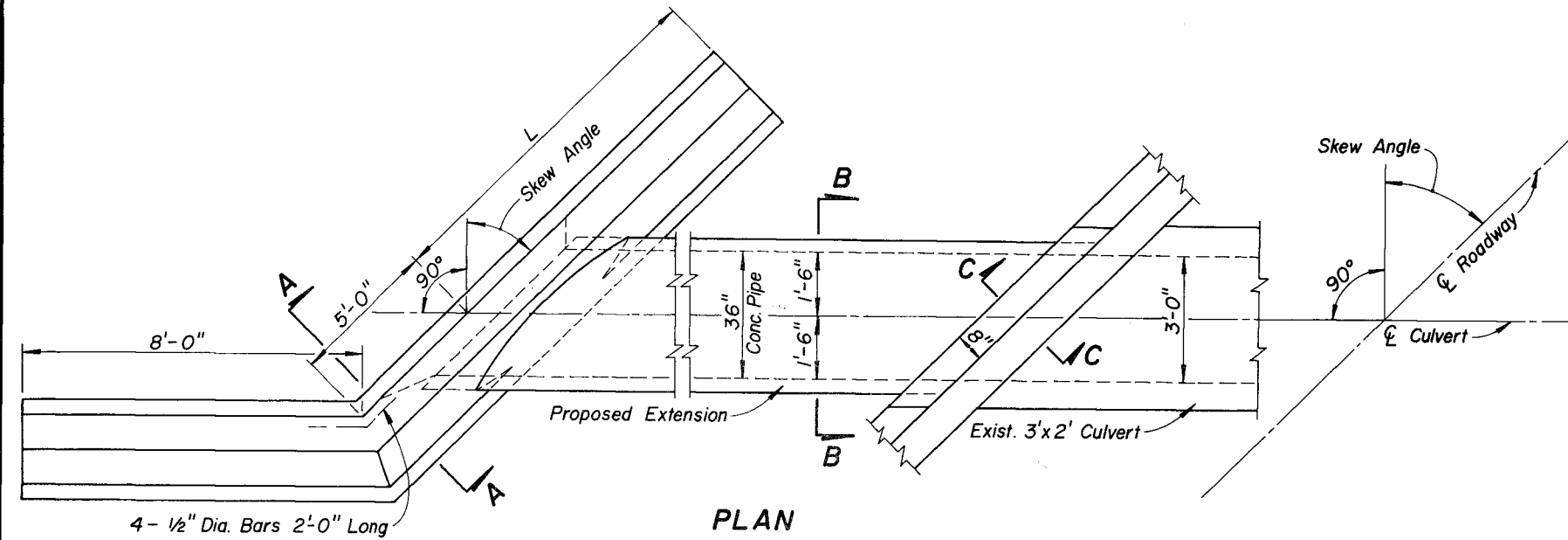
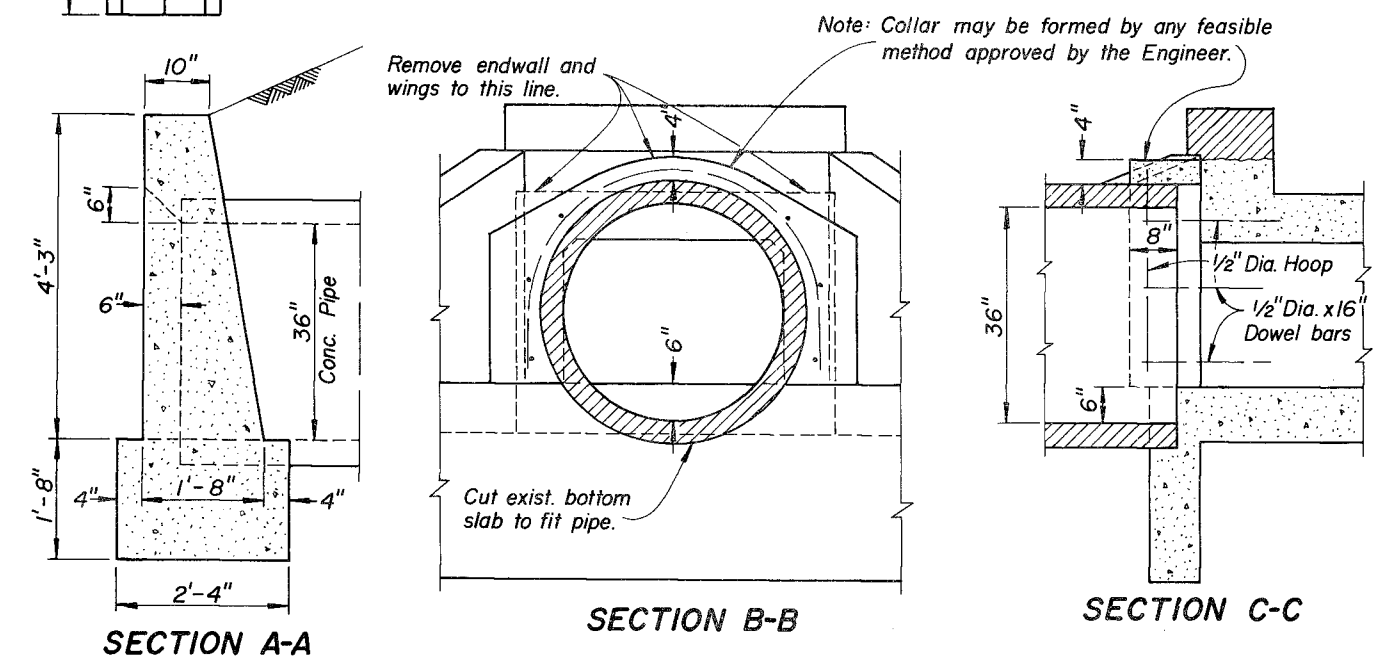
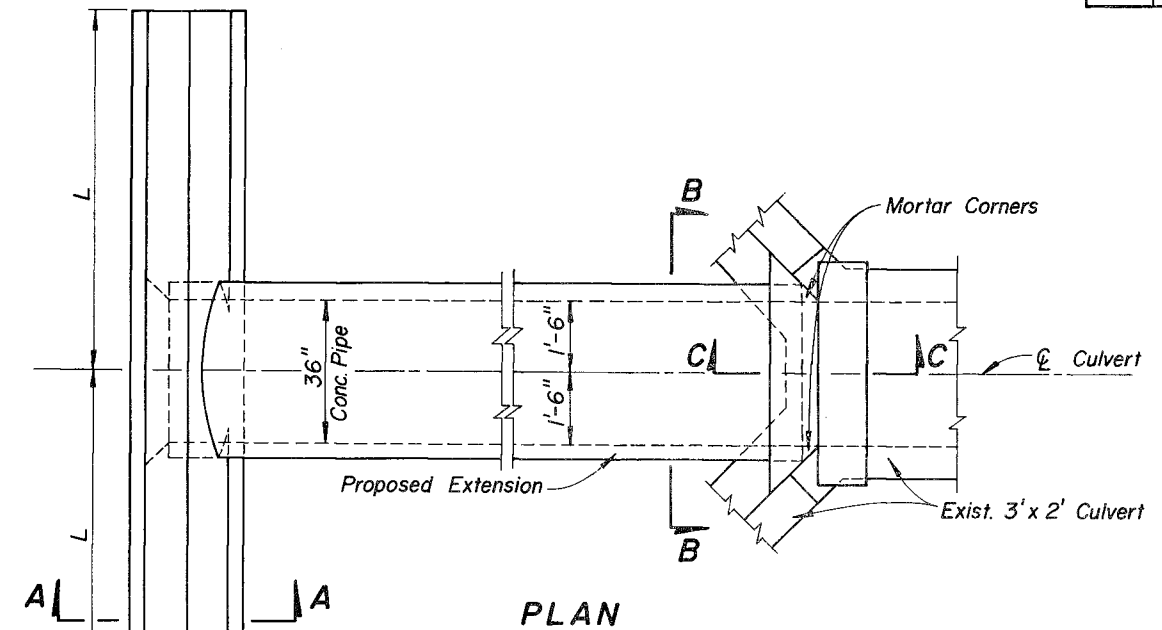


TABLE OF DIMENSIONS AND QUANTITIES		
SKEW Δ	L	CLASS I CONCRETE
0° to 30°	8'-0"	6.9 Cu. Yd.
30° to 45°	9'-0"	7.3 " "
45° to 50°	9'-6"	7.5 " "

DETAILS FOR L-TYPE ENDWALLS

- Note:
- Reinforced steel to be included in Contract Unit Price for Concrete.
 - As an alternate to the endwalls shown the contractor may construct endwalls in accordance with Index No. DCE-01.
 - For sodding around endwall see detail on Index No. GRC-01.



DETAILS FOR STRAIGHT TYPE ENDWALLS

TABLE OF DIMENSIONS AND QUANTITIES		
SKEW Δ	L	CLASS I CONCRETE
0° to 30°	8'-0"	5.0 Cu. Yd.
30° to 45°	9'-0"	5.7 " "
45° to 50°	9'-6"	6.1 " "

- Note: Reinforcing steel to be included in Contract Unit Price for Concrete.

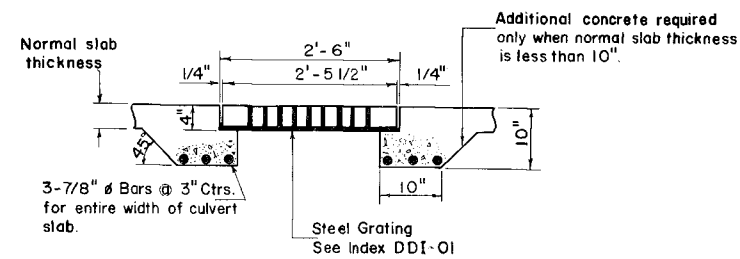
F.H.W.A. APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

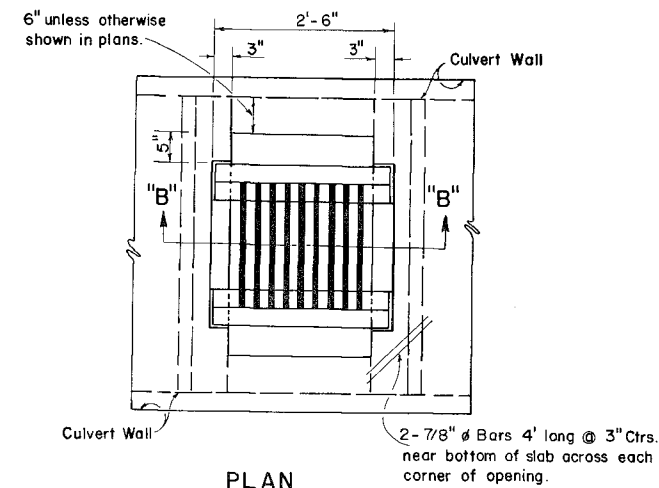
CONC. PIPE CULVERT EXTENSION
FOR 3'-0" x 2'-0" BOX CULVERT

REVISIONS		REVISIONS		REVISIONS	
Dates	Descriptions	Dates	Descriptions	Dates	Descriptions
10-74	Changed Index No.	10-51	Retraced		
9-77	Retraced	1-52	Note: Forms for Collar		
		4-66	Remove mortar from Pipe Invert		
		7-69	Added Note No. 2		
		8-70	Raised side slope to top of endwall		
		3-73	Added Cl. I Conc.		

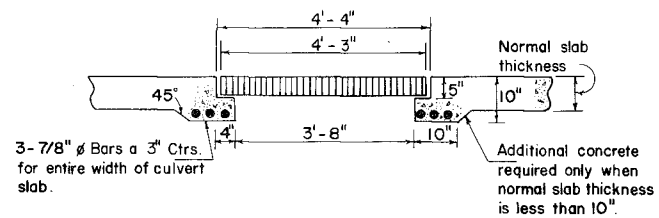
APPROVED BY
E. H. Hart
Deputy Design Engineer, Roadways
Index No.
1 of 1 DEX-02



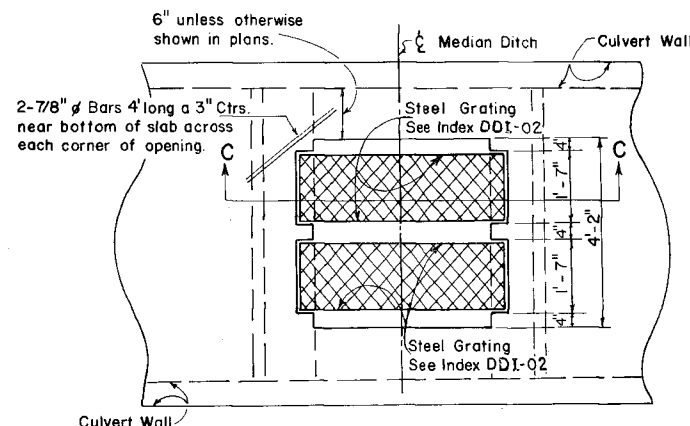
SECTION "B-B"



MODIFIED TOP (TYPE "A" INLET)



SECTION C-C

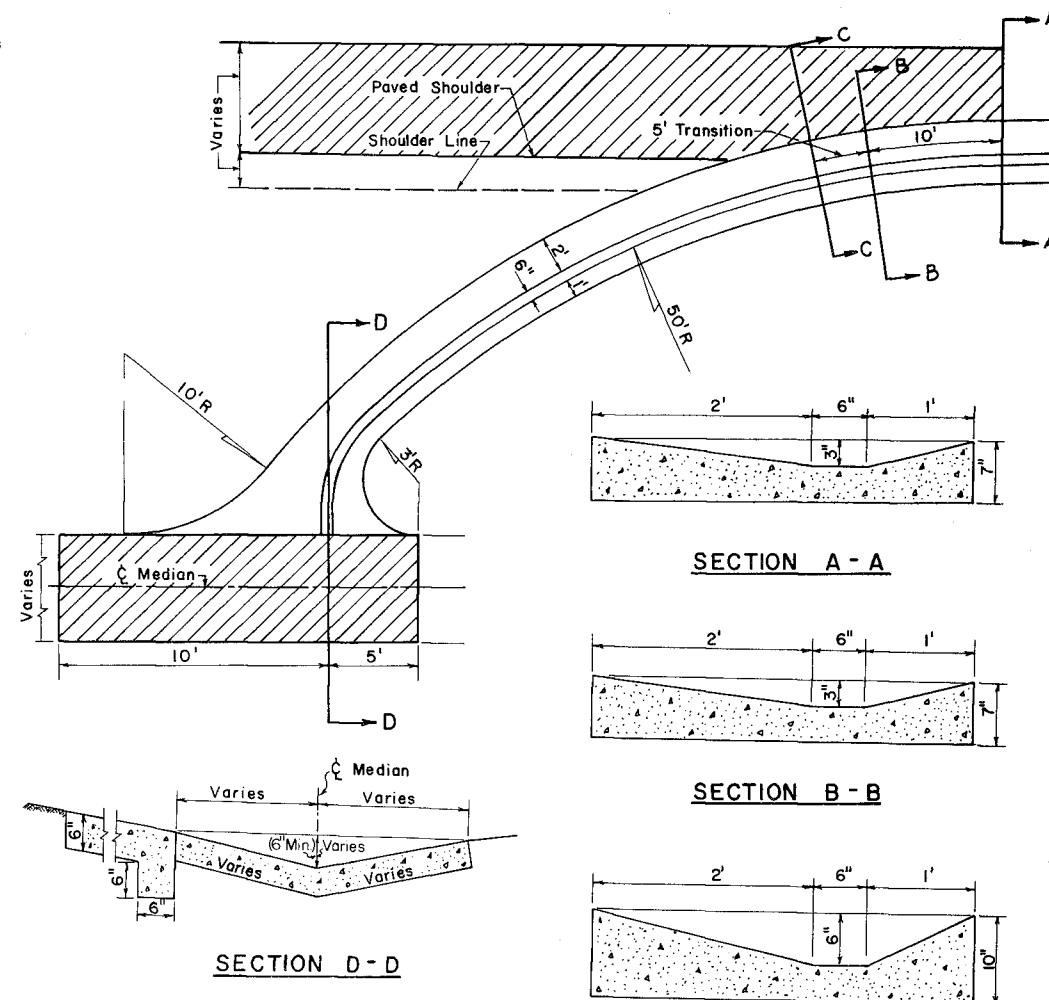


MODIFIED TOP (TYPE "B" INLET)

DETAIL SHOWING OPENING IN TOP OF BOX CULVERT
FOR DRAINING MEDIAN DITCH

NOTE :

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

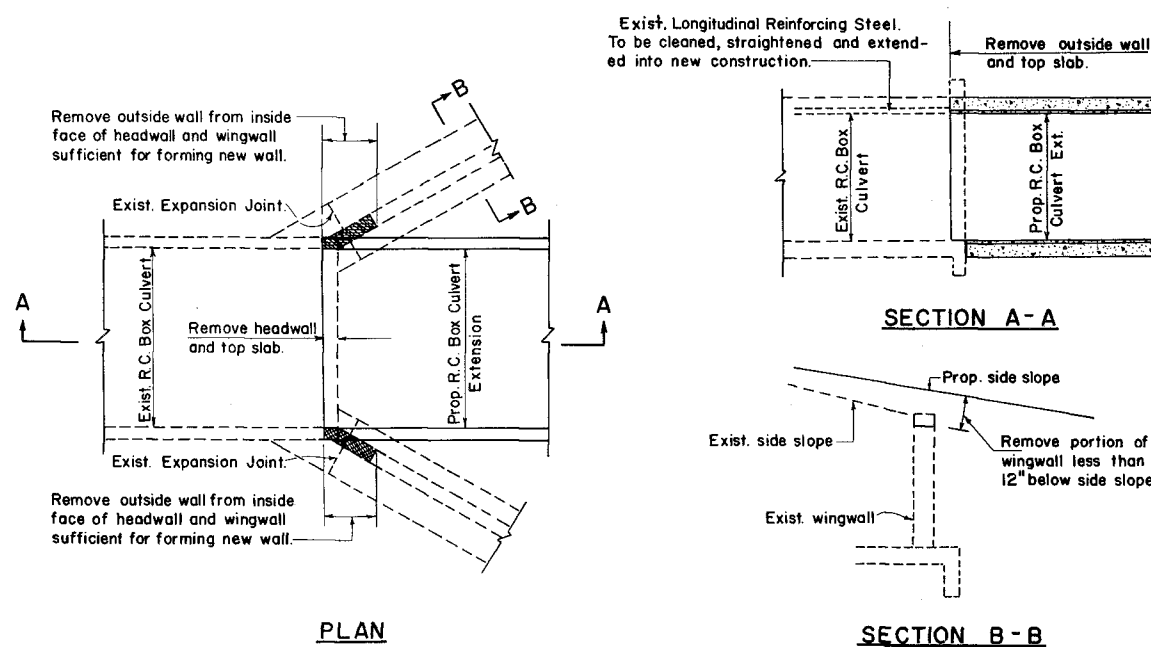


NOTES :

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.

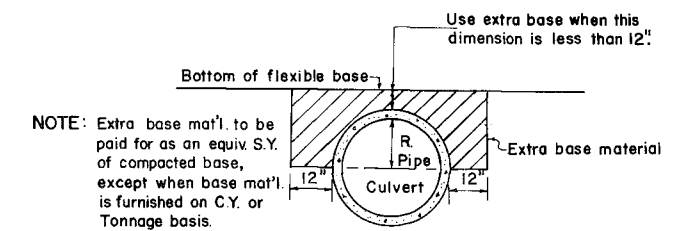
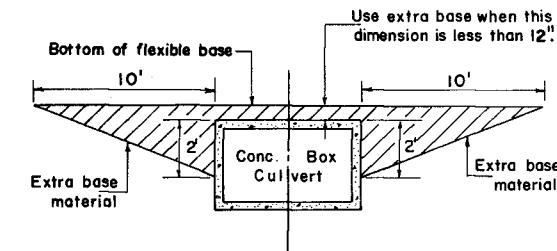
DETAIL OF CONC. SPILLWAY AT END OF SHOULDER GUTTER

(TO BE USED WHERE INLETS, PIPES & ENDWALLS ARE IMPRACTICAL)



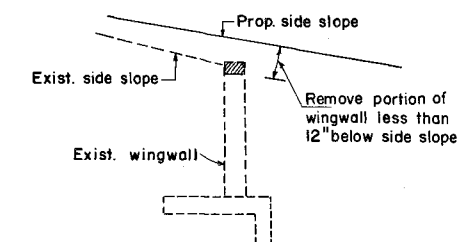
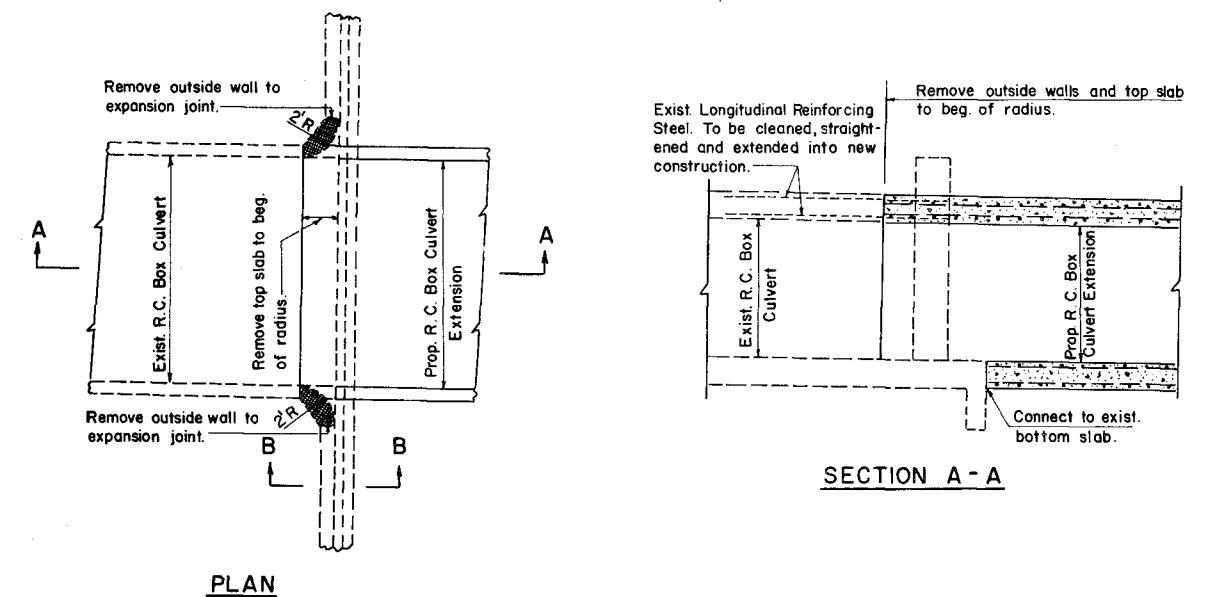
PLAN

FLARED ENDWALL



NOTE: Extra base mat'l. to be paid for as an equiv. S.Y. of compacted base, except when base mat'l. is furnished on C.Y. or Tonnage basis.

DETAIL OF EXTRA BASE CONSTRUCTION FOR THE
PROTECTION OF CULVERTS WITH LESS THAN
MINIMUM COVER



SECTION B-B

ENDWALLS PARALLEL TO $\frac{1}{2}$ ROADWAY

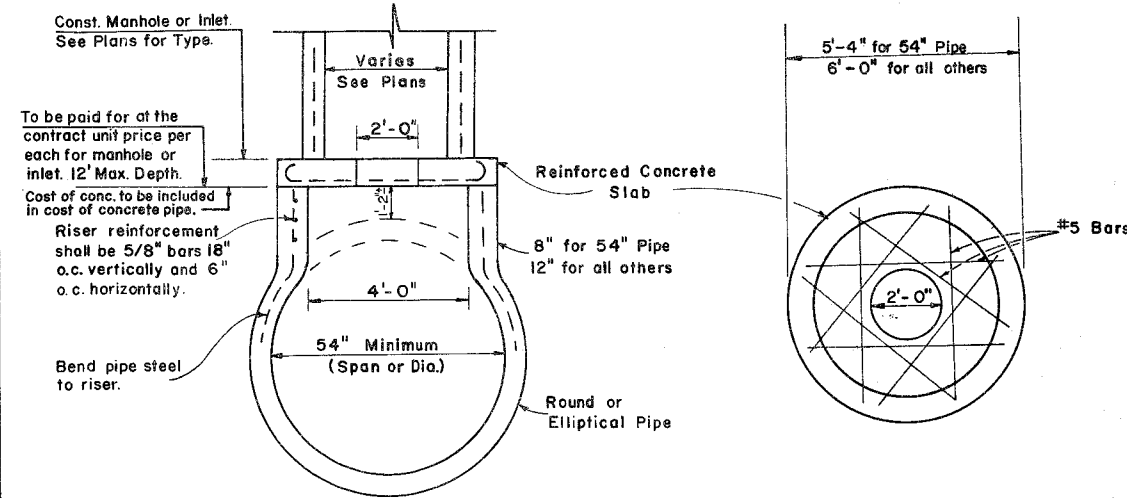
CONNECTION DETAILS
R.C. BOX CULVERT EXTENSIONS

FHWA Approved: 5-1-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

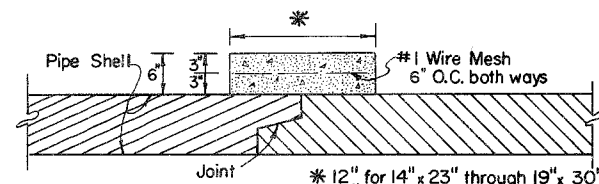
MISCELLANEOUS DRAINAGE DETAILS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
9-74	Changed Index N ^o & Redrawn			
		Names	Dates	Recommended For Approval by
				Engineer of Road Design
				APPROVED BY
				Asst. State Highway Engineer
				Drawing No.
				Index No.
				1 of 3
				DMD-01-1



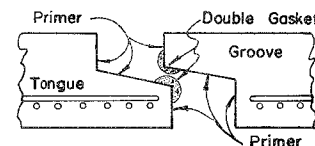
Reinforced slabs are required when inlet or manhole riser is less than 4' in diameter or when Type P, Alt. B manhole or inlet riser is used. For optional construction joints see Index NO. DSD-01.

DETAILS OF CONSTRUCTION OF INLETS OR MANHOLES ON INTEGRAL PRECAST CONCRETE RISER FOR CONCRETE PIPE

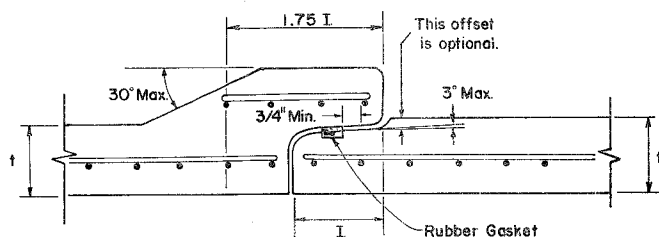


DETAIL OF CONCRETE COLLAR FOR ELLIPTICAL CONCRETE PIPE JOINTS

NOTE: Cost to be included in the cost of Elliptical concrete pipe. Cold adhesive preformed gaskets may be used in lieu of Concrete collars. See Special Provisions.



DETAIL FOR APPLICATION OF GASKET MATERIAL (BEFORE JOINT PULL-UP)

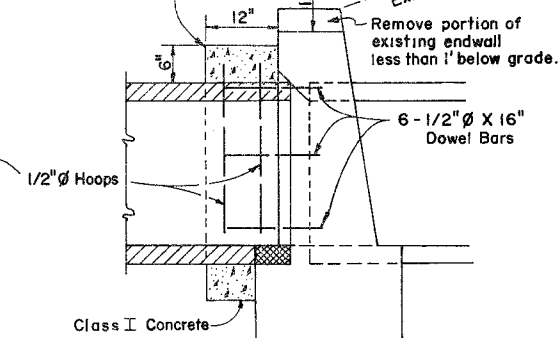
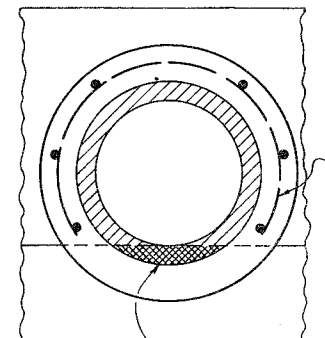


DETAIL OF BELL & SPIGOT CONCRETE PIPE JOINT USING ROUND RUBBER GASKET

The area of circumferential steel in the bell shall not be less than that provided for an equivalent length of the pipe barrel plus an area equal to $0.005(D+2t)$ where D is the internal diameter of the pipe and t is the minimum shell thickness specified for the class and size of pipe (ASTM C-76).

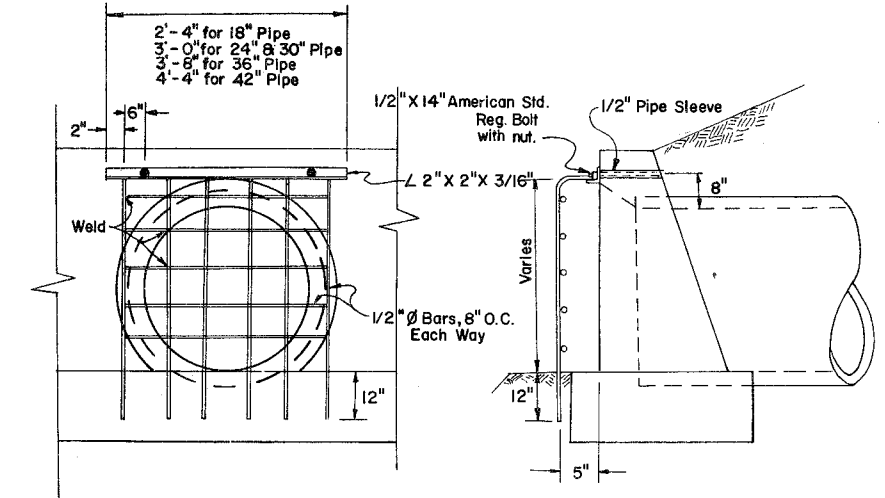
Cost of Concrete and Reinforcing Steel to be included in Contract Unit Price for Pipe Culvert.

Note: Collar may be formed by any feasible method approved by the Engineer.



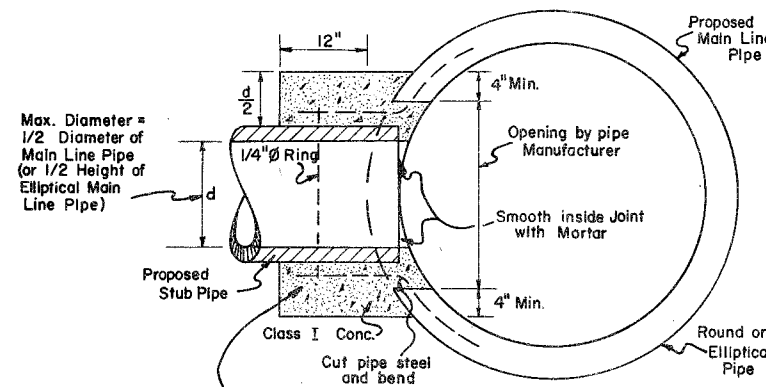
Note: Spigot end to be placed in existing Endwall regardless of direction of flow.

DETAIL OF CONCRETE COLLAR FOR EXTENSION OF EXISTING PIPE CULVERTS

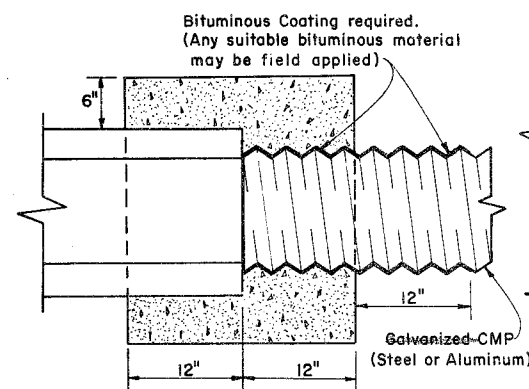


GUARD AT PIPE ENDS

Notes: Guards to be constructed only at locations specified in detail plans. Cost of guard bolts, nuts and sleeves to be included in the contract unit price for concrete.



DETAILS OF CONSTRUCTION AT JUNCTIONS OF MAINLINE PIPE AND STUB PIPE



DETAIL OF PIPE PLUG

Note: Cost of Masonry to be included in Contract Unit Price for New Pipe.

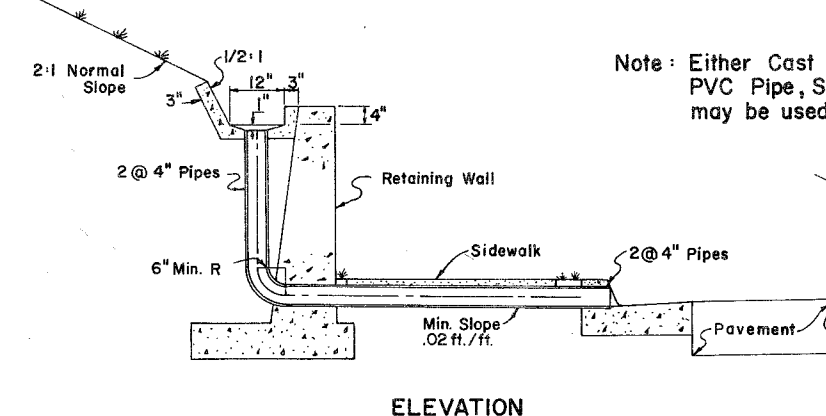
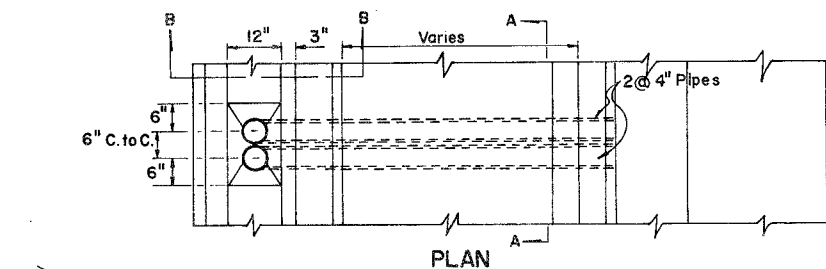
DETAIL OF CONCRETE JACKET

REQUIRED AT JUNCTION OF DISSIMILAR TYPES OF PIPE

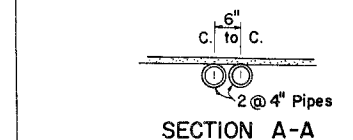
Note: COST OF CONCRETE AND BITUMINOUS COATING TO BE INCLUDED IN CONTRACT UNIT PRICE FOR NEW PIPE.

GENERAL NOTE

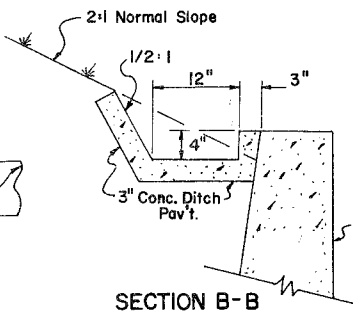
ALL CROSS DRAIN AND SIDE DRAIN PIPE STRUCTURES TO BE CONSTRUCTED TO A LENGTH THAT WILL BE A MULTIPLE OF 4' JOINT LENGTHS FURNISHED TO THE NEAREST MULTIPLE LENGTH EQUAL TO, OR ABOVE THAT SHOWN IN PLANS.



DETAILS OF CONCRETE GUTTER AND DRAINS AT RETAINING WALLS



SECTION A-A



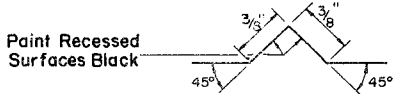
SECTION B-B

FWHA APPROVED: 4-28-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

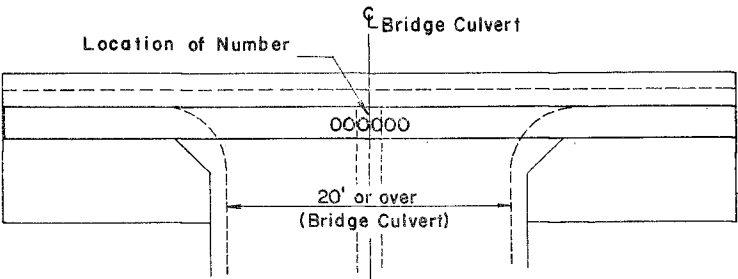
MISC. DRAINAGE DETAILS

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Date: 10-74 Description: Changed Index N ^o			
Date: 4-77 Description: Added B.T. Coat. to Conc. Jacket Detail			
Designed by	Names	Dates	Recommended For Approval By: Deputy Design Engineer-Roadways
Checked by			APPROVED BY: E. J. J. Design Engineer
Quantities by			Drawing No. 2 of 3
Checked by			Index No. DMD-01-1
Supervised by			

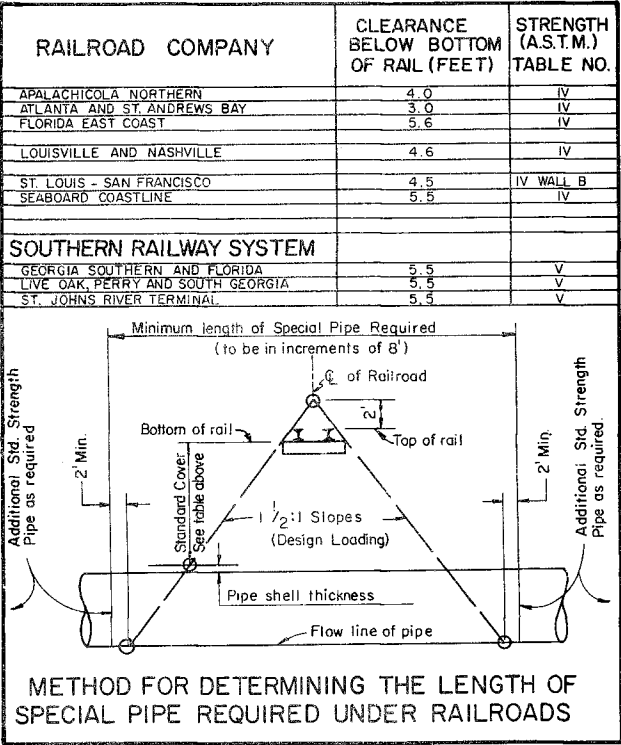


SECTION THRU RECESSED "V" GROOVE
TO FORM INSCRIBED FIGURES

The number is to be placed in the center of the top surface of all BRIDGE CULVERT headwalls.
Black Plastic Figures 3" in height as approved by the Engineer may be used in lieu of Figures formed by 3/8" "V" Grooves.
"V" Grooves shall be formed by preformed Figures.



TOP VIEW OF HEADWALL
SHOWING BRIDGE CULVERT NUMBER LOCATION
For Bridge Number see Key Map

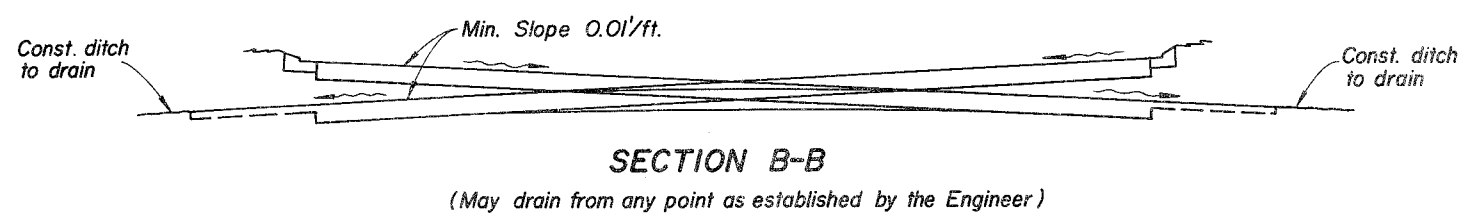
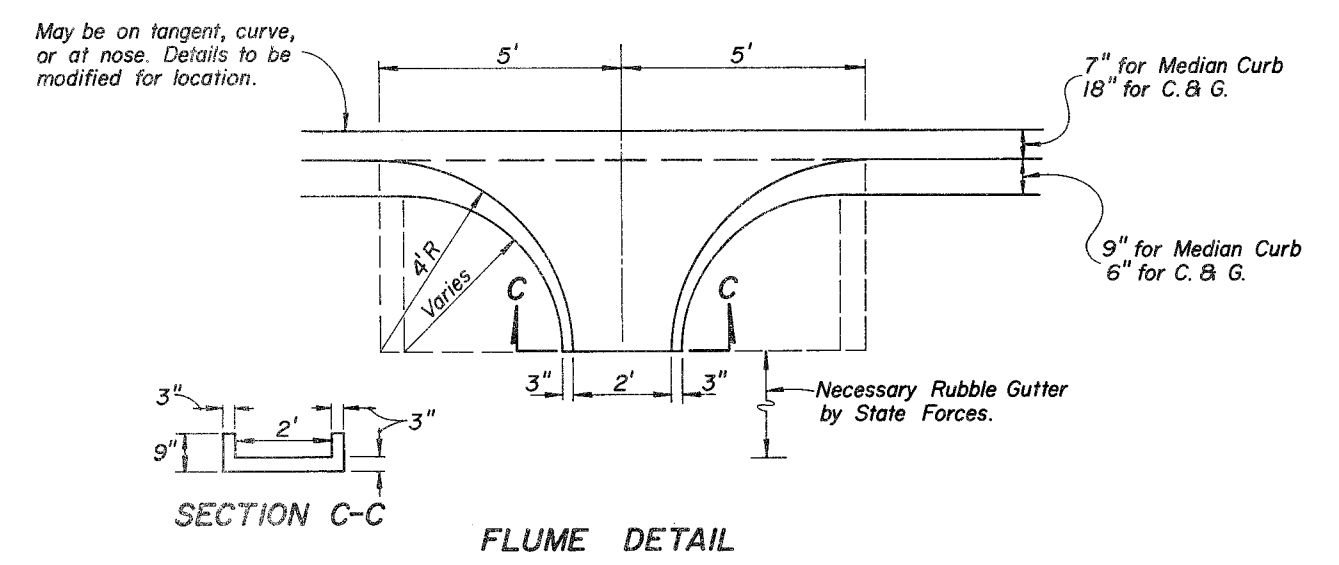
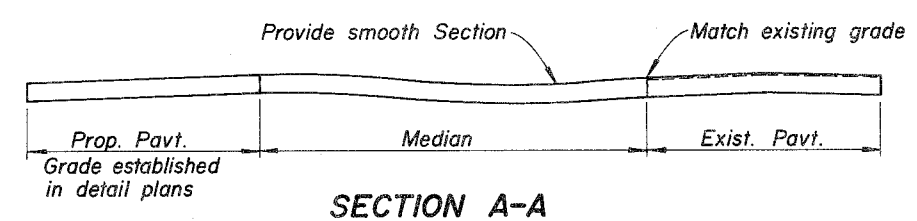
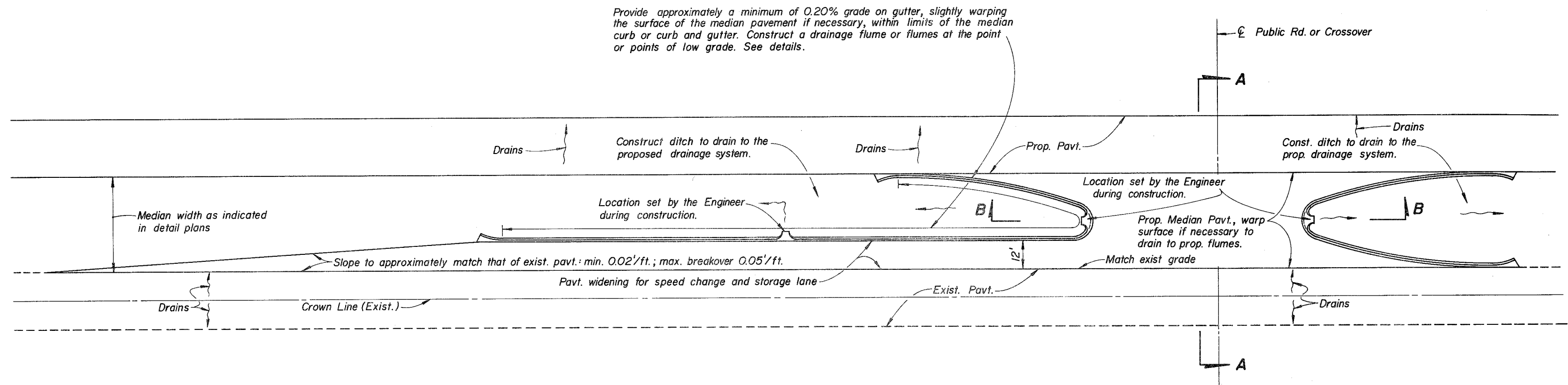


FHWA APPROVED: 11-10-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

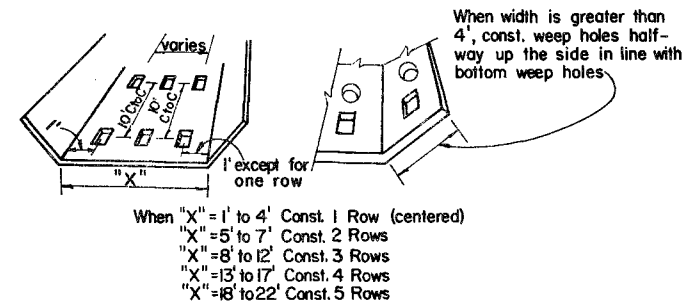
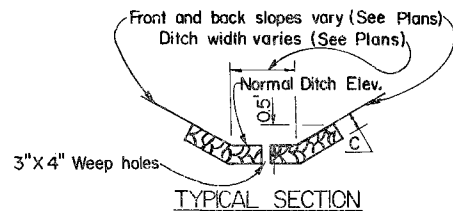
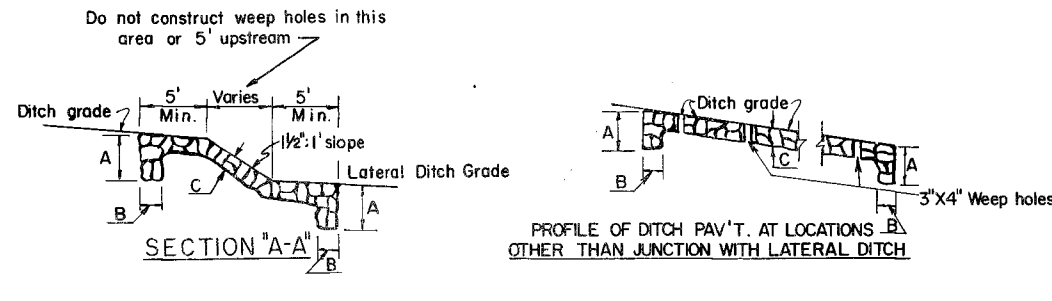
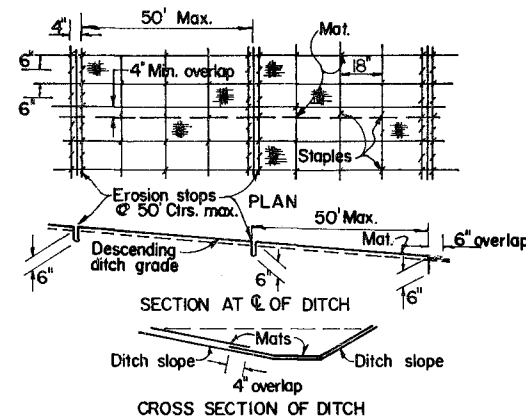
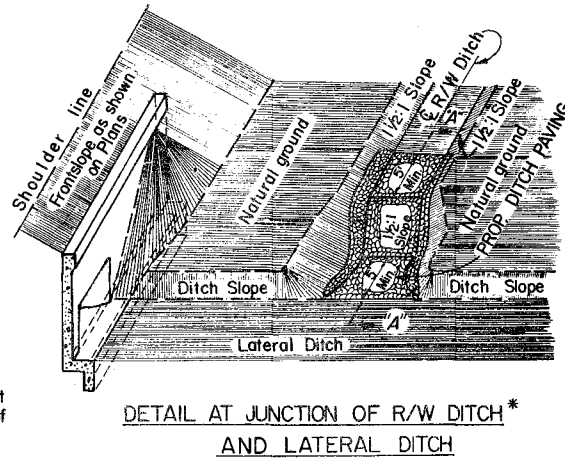
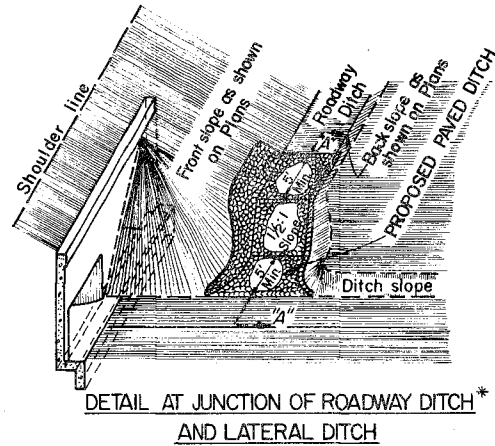
MISCELLANEOUS DRAINAGE DETAILS

REVISIONS		INITIALS		DATES		Recommended for approval by Deputy Design Engineer - Roadways
Dates	Descriptions	Designed by	Checked by			
11-74	Changed Index No.	Checked by				Approved by State Design Engineer
11-75	Added Detail of Br. Culv. No. Locat.	Quantities by				
		Checked by				
		Supervised by				
				DRAWING NO.	INDEX NO.	
				3 of 3	DMD-01-1	



GENERAL NOTES: 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. Location of low point or points in gutters is to be set by the Engineer during construction and will establish locations of flumes. The number of flumes is to be maintained at a minimum. Plans for median openings to conform to detail plans. Layout above is illustration only. Cost of flumes to be included in the contract price for Median Curb or Curb and Gutter.

F.H.W.A. APPROVED: 3-20-75			
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN SECTION			
DRAINAGE DETAILS FOR MEDIAN OPENINGS			
ROAD NO.		COUNTY	
PROJECT NO.		PROJECT NO.	
REVISED		REVISED	
Dates	Descriptions	Dates	Descriptions
10-74	Changed Index No.	3-26-59	
9-77	Redrawn	3-26-59	
Designed by C.H.R.		Checked by C.D.D.	
Checked by C.D.D.		Checked by C.D.D.	
Supervised by W.C.L.		Supervised by W.C.L.	
APPROVED BY <i>E.H. Hart</i>		APPROVED BY <i>E.H. Hart</i>	
Drawing No. 1 of 1		Index No. DMO-OI	



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.

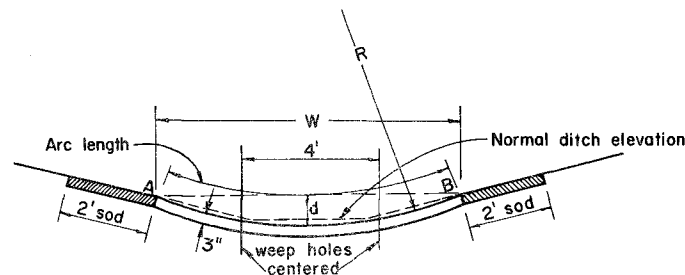
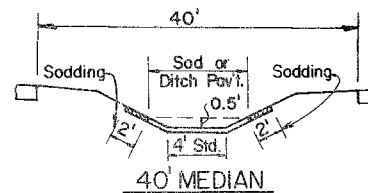
WEEP HOLE ARRANGEMENT

DITCH PAVEMENT & SODDING

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 tooled. No open joints will be permitted.
- Salvaged concrete ditch pavement shall consist of concrete pav't., sidewalk, curb and gutter with a 3 sq. ft. minimum surface area.
- All joints shall be grouted when rubble, sand cement or salvaged concrete paving is used for ditch paving.
- 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.
- 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.

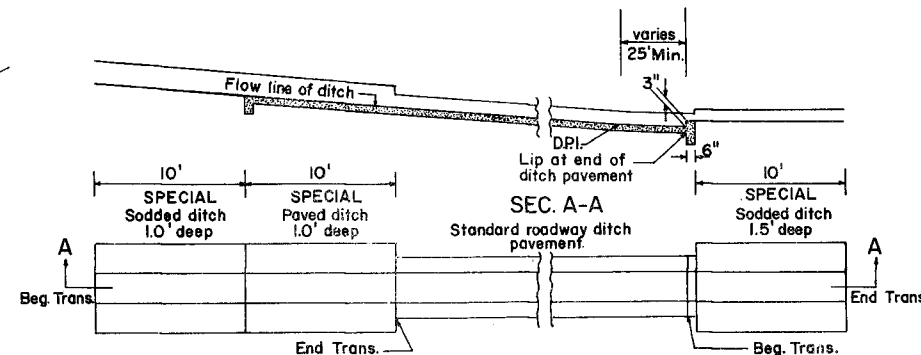
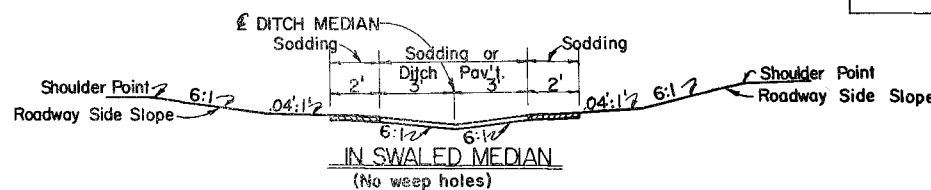
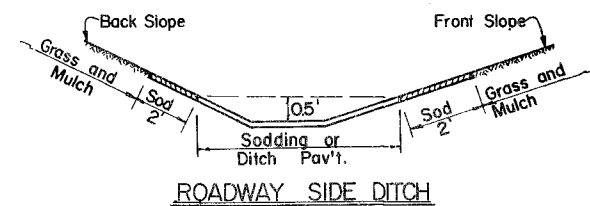
SCHEDULE OF MIN. DIMENSIONS			
TYPE OF PAVEMENT	A	B	C
Concrete	24"	6"	3"
Rubble	24"	12"	9"
Sand-Cement	24"	12"	4"
Soil-Cement	24"	12"	4"
S.B.R.M.	24"	12"	4"
Salvaged Concrete	24"	12"	3"



TO REPLACE:	W	d	R	No. of rows of weep holes	Arc Length
6' Median Swale	6'	.24'	19'	0	6.0
6:1 Front Slopes; 4:1 Back Slope					
5' B.W. Ditch	10'	.67'	19'	2	10.1
4' B.W. Ditch	9'	.54'	19'	2	9.1
4:1 Front slope & Back slope					
5' B.W. Ditch	9'	.74'	14'	2	9.2
4' B.W. Ditch	8'	.58'	14'	1 in center	8.1

ALTERNATE DITCH PAVEMENT

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



TYPICAL PAVED DITCH SECTION FOR TRANSITIONS FROM PAVED TO UNPAVED SECTIONS

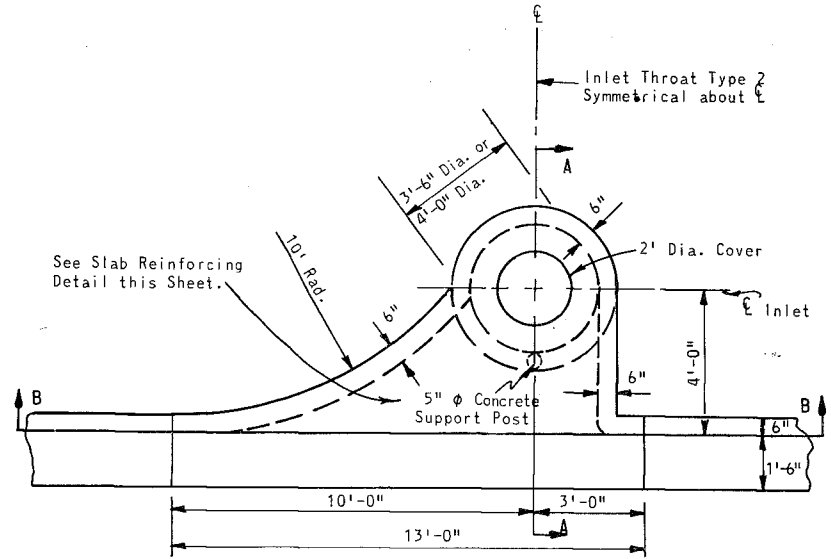
FHWA Approved: 5-1-75

REVISIONS	DATE	DESCRIPTION
10-74	Redrawn - Chgd Index N/A	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY PLANS SECTION			
DITCH PAVEMENT & SODDING			
ROAD NO.	COUNTY	PROJECT NO.	
Designed by	Names	Dates	Recommended For Approval By: <i>E. H. Hart</i>
Checked by			APPROVED BY: <i>[Signature]</i>
Quantities by			State Design Engineer
Checked by			Drawing No. 1 OF 1
Supervised by			DPS-01

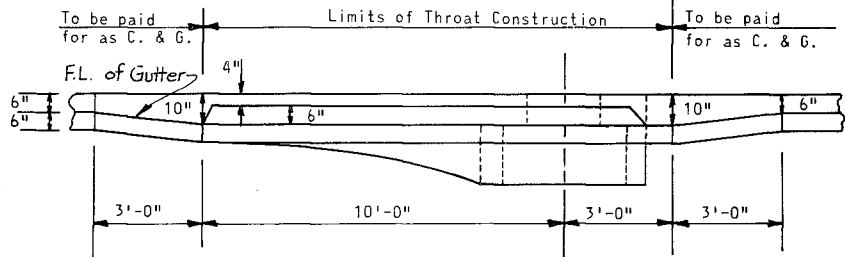
GENERAL NOTES

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 steel in throats shall have 1 1/4" minimum cover unless otherwise shown. Inlet throats shall be either cast-in-place or precast concrete.
4. The rear wall portion of throat 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. DSD-01.
7. These inlet throats were designed for use with std. curb & gutter and Type E curb. Locate outside of pedestrian cross traffic if possible.
8. For inlet bottoms see index no. DSB-01.

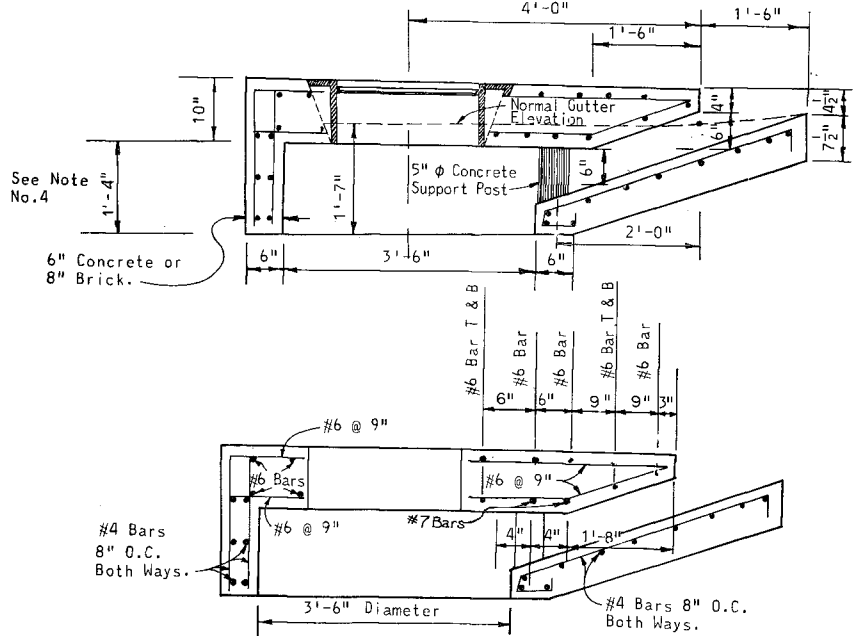


INLET THROAT TYPE 1

Inlet Throat Type 2
Symmetrical about E

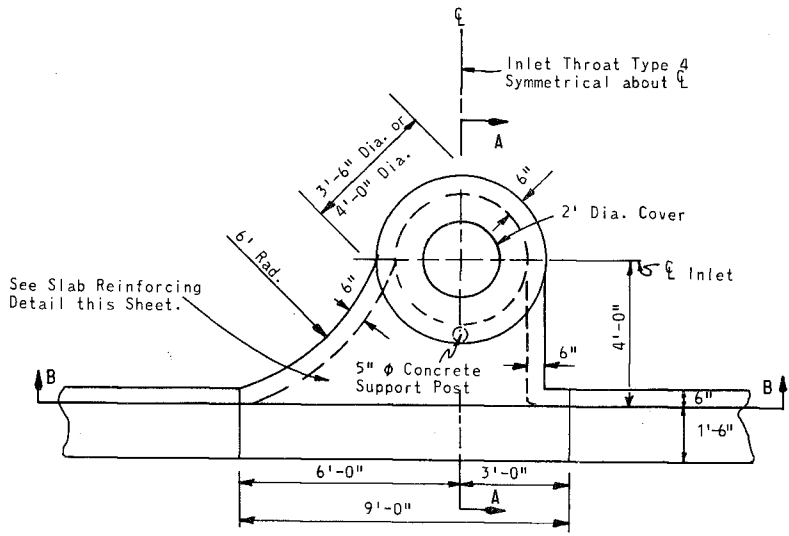


SECTION B-B



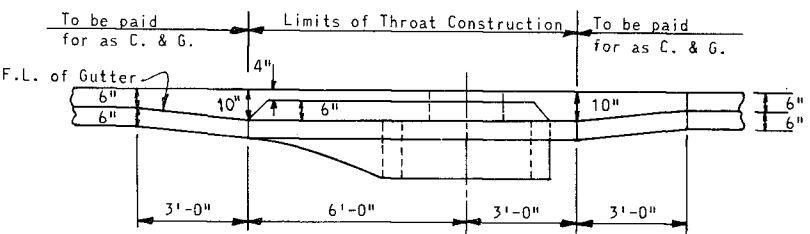
3'-6" DIAMETER

SECTION A-A FOR INLETS TYPE 1, 2, 3 & 4

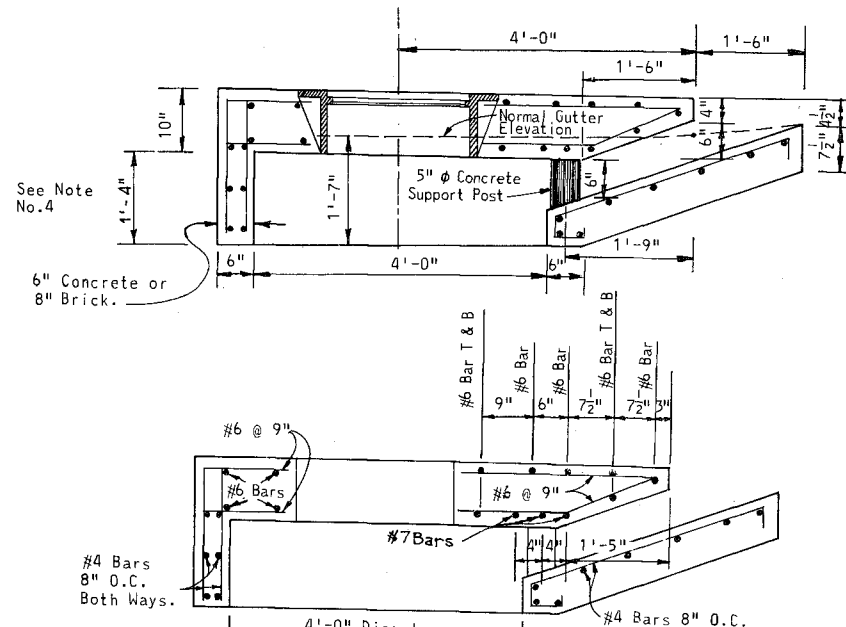


INLET THROAT TYPE 3

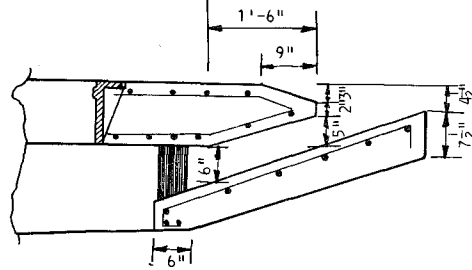
Inlet Throat Type 4
Symmetrical about E



SECTION B-B



4'-0" DIAMETER



INLET TOP MODIFICATION
FOR TYPE "E" CURB

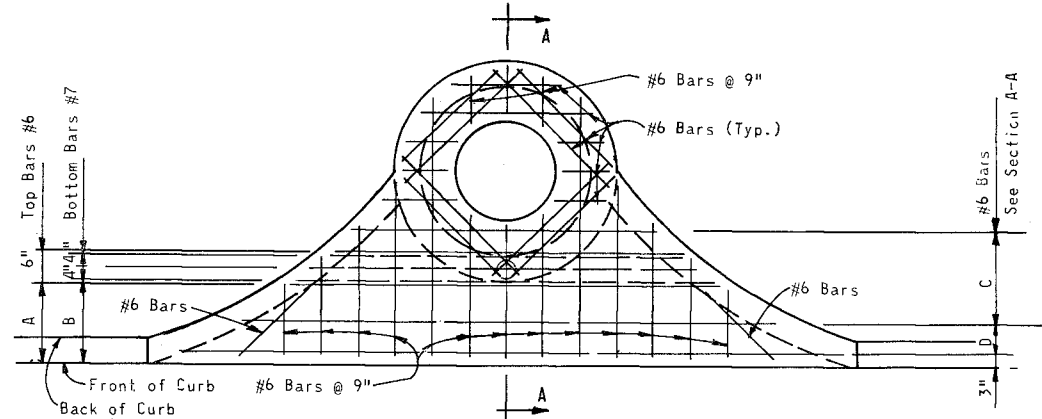
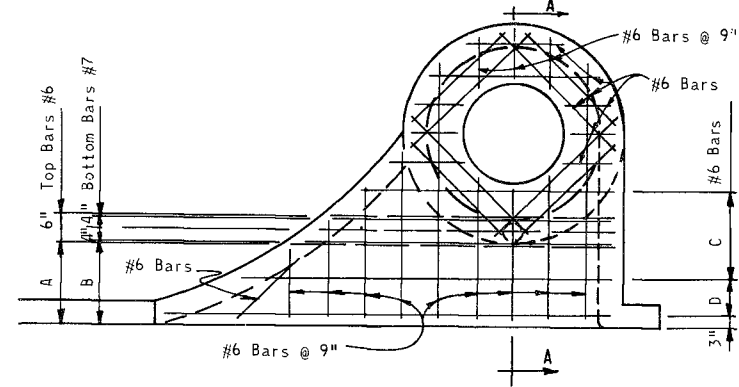


TABLE OF VARIABLE DIMENSIONS		
DIMENSION	3'-6"	4'-0"
A	1'-9"	1'-6"
B	1'-8"	1'-5"
C	1'-9"	1'-10 1/2"
D	9"	7 1/2"

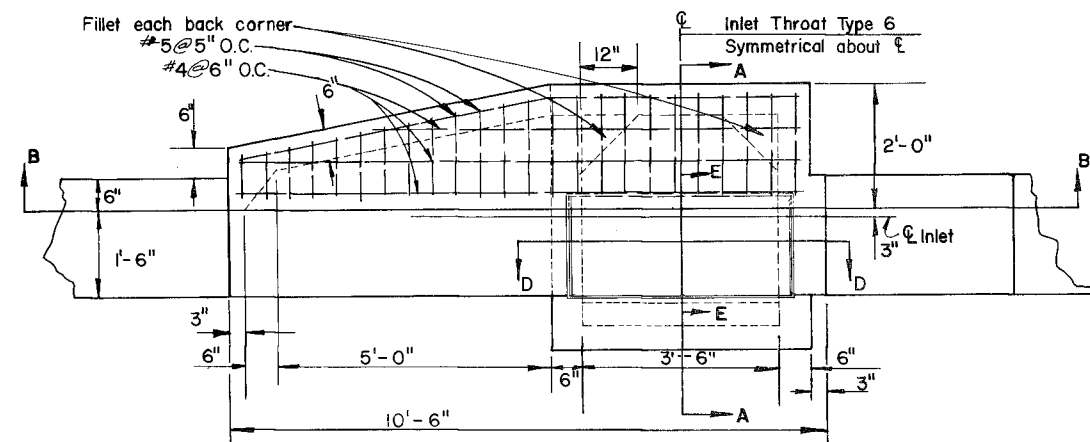
SLAB REINFORCING DETAILS
INLETS 1, 2, 3 & 4

FHWA Approved: 5-1-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

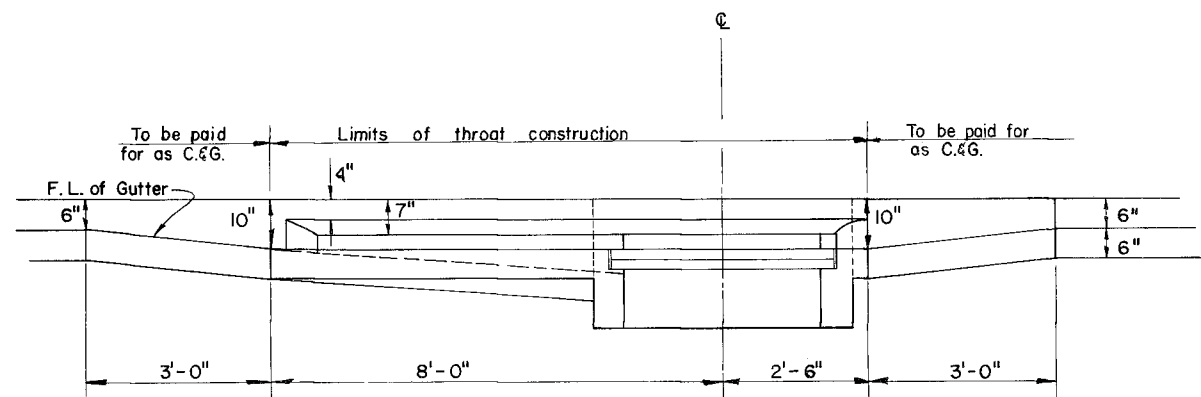
CURB INLET-TYPES 1, 2, 3 & 4

REVISIONS		INITIALS	DATES	Recommended for approval by
Dates	Descriptions	Designed by	Checked by	
5-74	Redrawn-Chgd Index No.			Deputy Design Engineer-Roadways
		Checked by		Approved by:
		Checked by		State Design Engineer
		Supervised by		DRAWING NO. 1 of 1
				INDEX NO. DCI-01

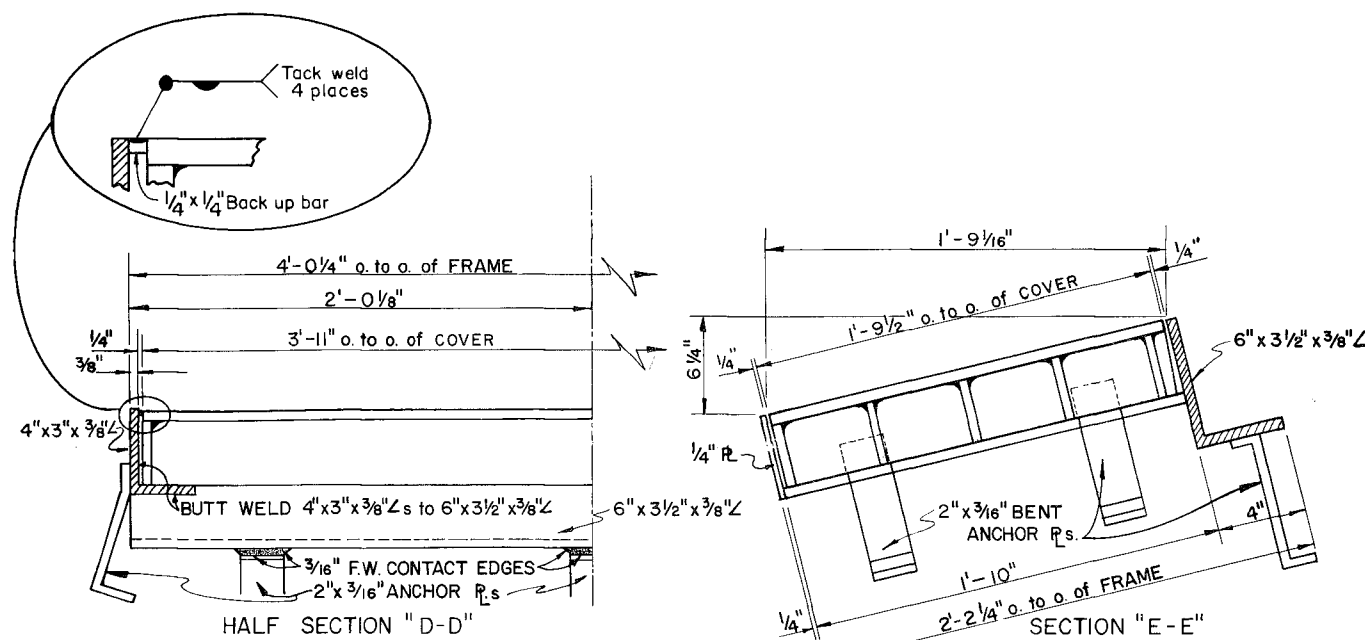


INLET THROAT TYPE 5

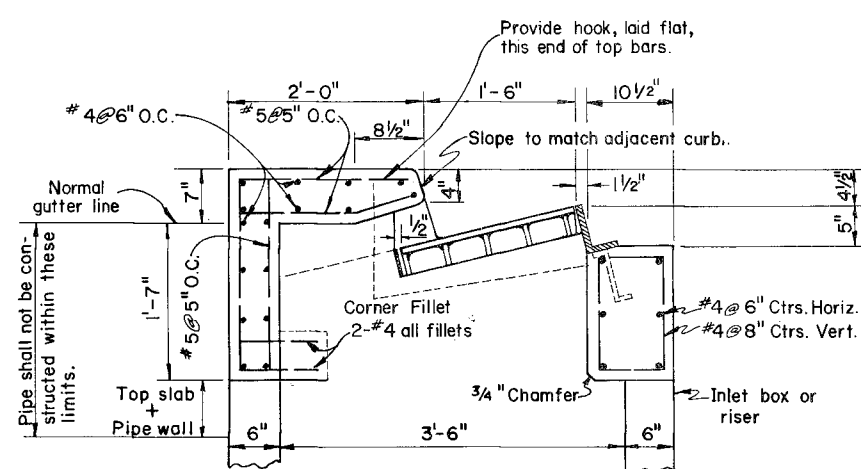
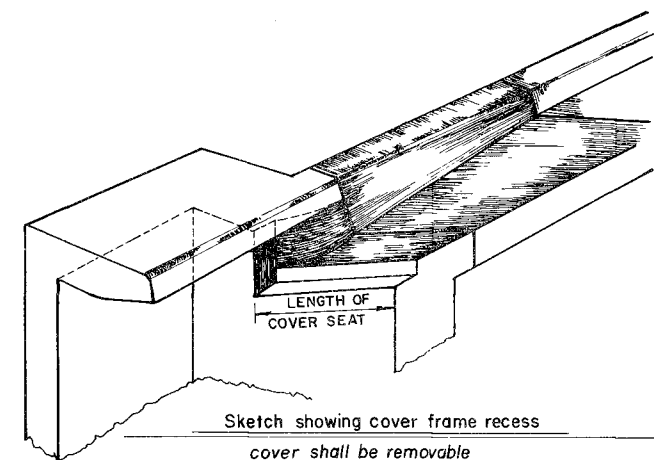
Inlet Throat Type 6
Symmetrical about C



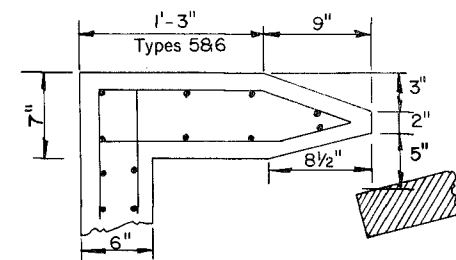
SECTION "B-B"



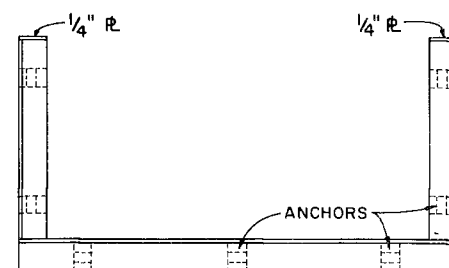
DETAILS OF FRAME and SOLID STEEL COVER



SECTION "A-A"

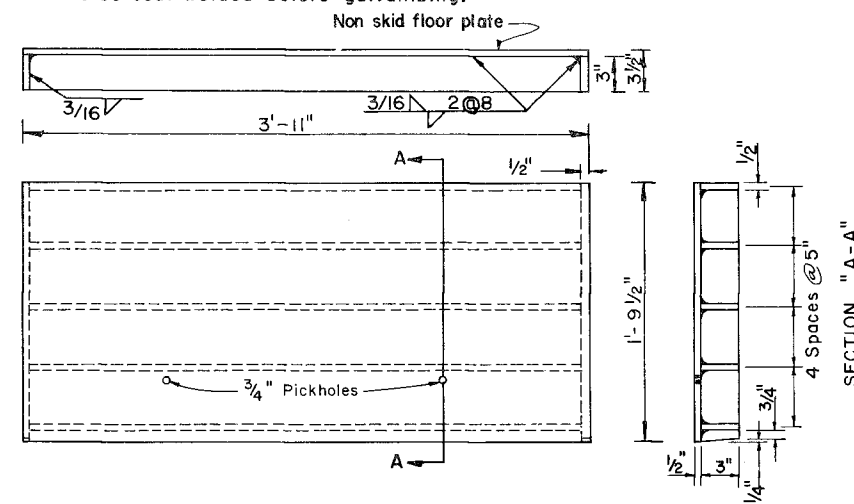


INLET TOP MODIFICATION
FOR TYPE "E" CURB



TOP VIEW OF FRAME

- 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 steel in throats shall have 1/4" minimum cover unless otherwise shown. Inlet throats shall be either cast-in-place or precast concrete.
 4. The corner fillets shown for rectangular throats (Type 5&6) are necessary only when throats are to be used in conjunction with circular inlet boxes or when used on skew with rectangular inlet boxes.
 5. See Index DSD-01 for supplemental details.
 6. These inlet throats were designed for use with std. curb & gutter and Type E curb. Locate outside of pedestrian cross traffic if possible.
 7. For inlet bottoms see index no. DSB-01.
 8. Tack weld cover to frame in 4 places.
 9. All steel used for frame and cover shall meet the requirements of ASTM A-36.
 10. When Alternate "G" Cover is specified in plans, steel cover to be hot dip galvanized after fabrication. All exposed joints to be seal welded before galvanizing.



SOLID STEEL COVER DETAIL

FHWA Approved: 12-14-76

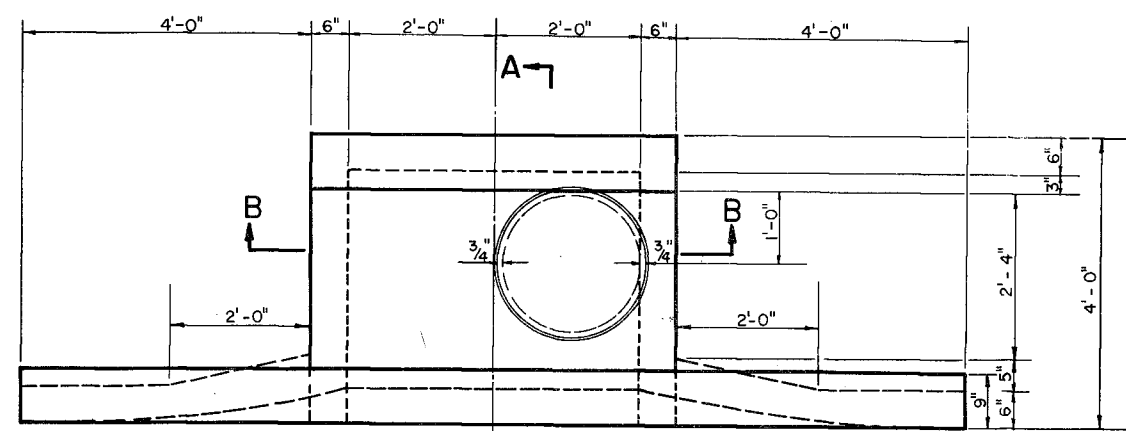
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

CURB INLET - TYPES 5 & 6

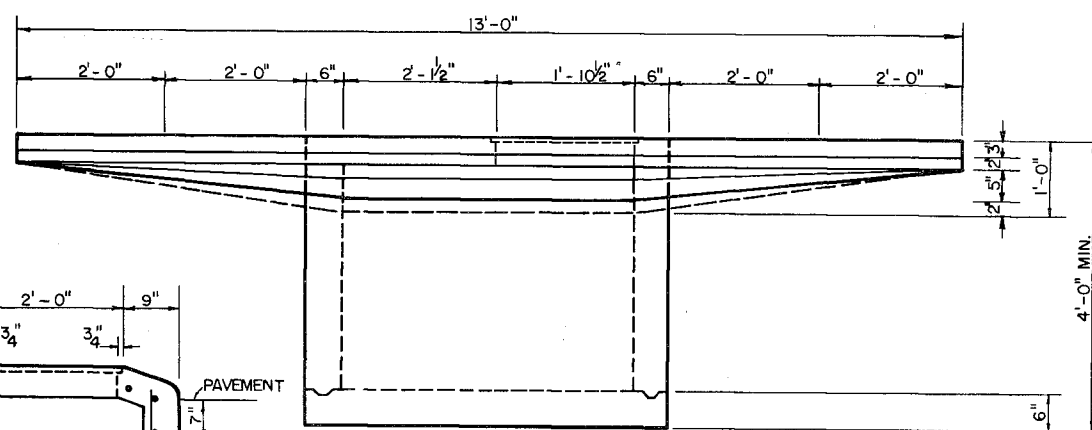
REVISIONS		INITIALS	DATES
5-74	Redrawn - Chgd Index No.	Designed By	
6-76	Removed Irving Type Grate	Checked By	
12-76	Revised welding on Steel Cover. Added to Note 10	Quantities By	
		Checked By	
		Supervised	

Recommended For Approval By
Deputy Design Engineer - Roadways
APPROVED BY
STATE DESIGN ENGINEER

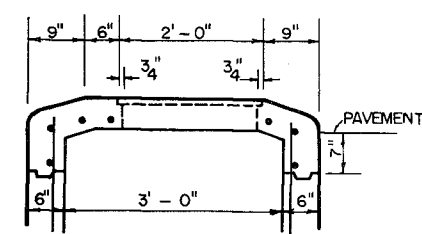
DRAWING NO. 1 of 1
INDEX NO. DCI-02-2



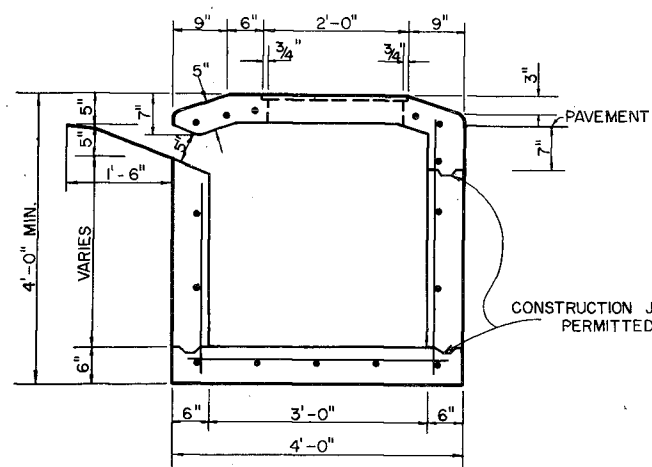
A
PLAN



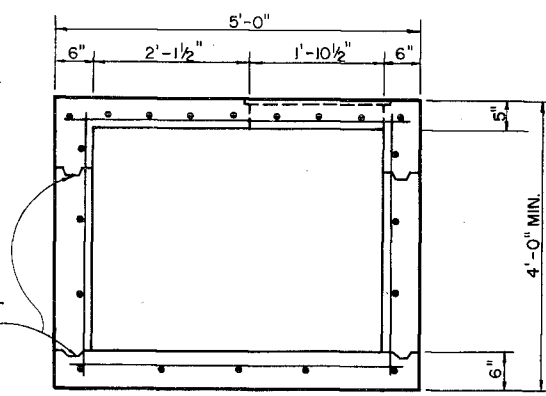
ELEVATION



MODIFICATION
WHEN USED AS A
MANHOLE

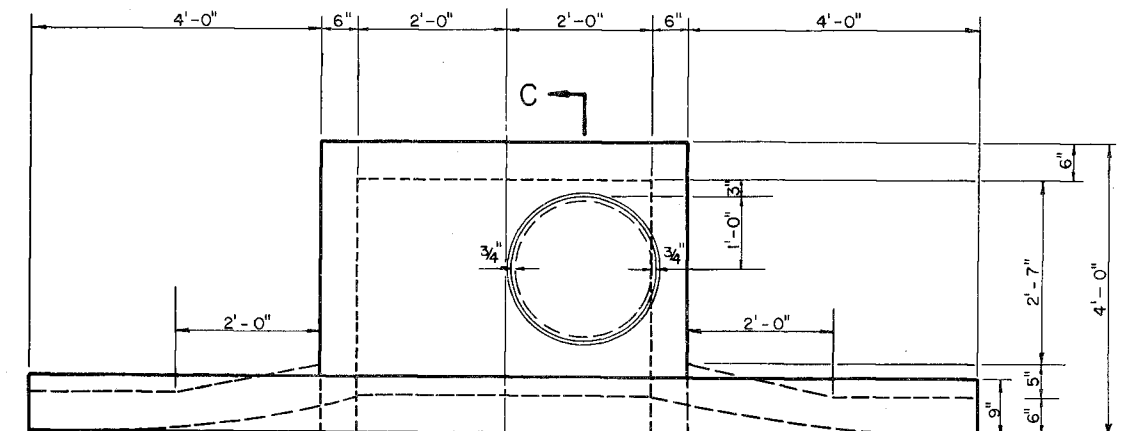


SECTION A-A

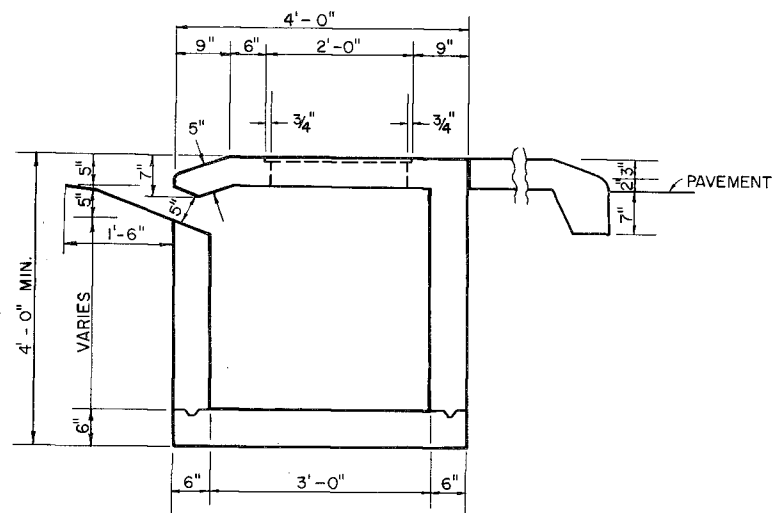


SECTION B-B

DETAILS OF TYPE "7" INLET FOR FOUR FEET WIDE MEDIAN

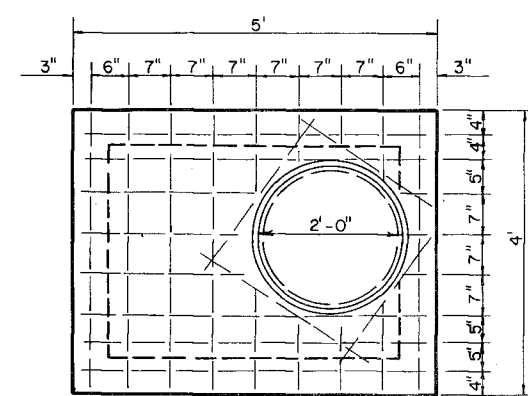


C
PLAN



SECTION C-C

DETAILS OF TYPE "7" INLETS FOR MEDIAN WIDER THAN FOUR FEET



DETAIL
REINFORCING STEEL DIAGRAM
TOP SLAB OF INLET

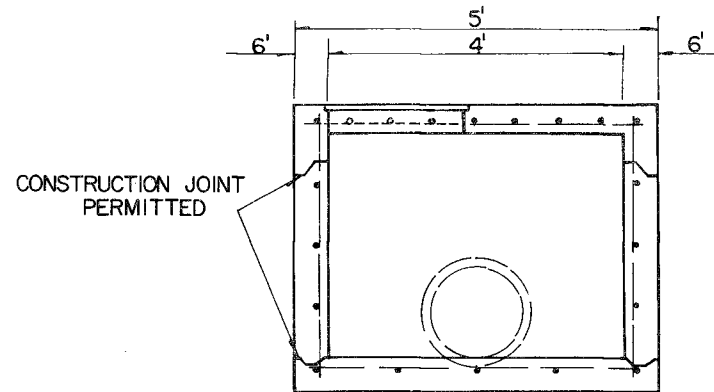
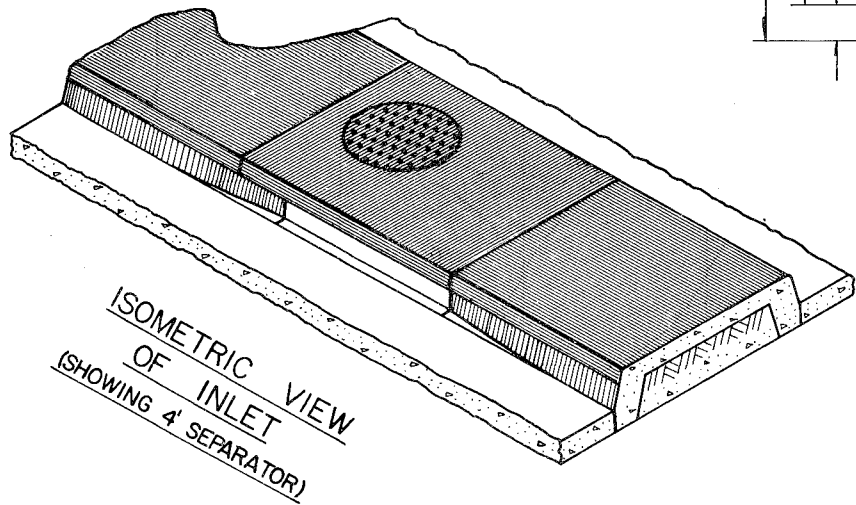
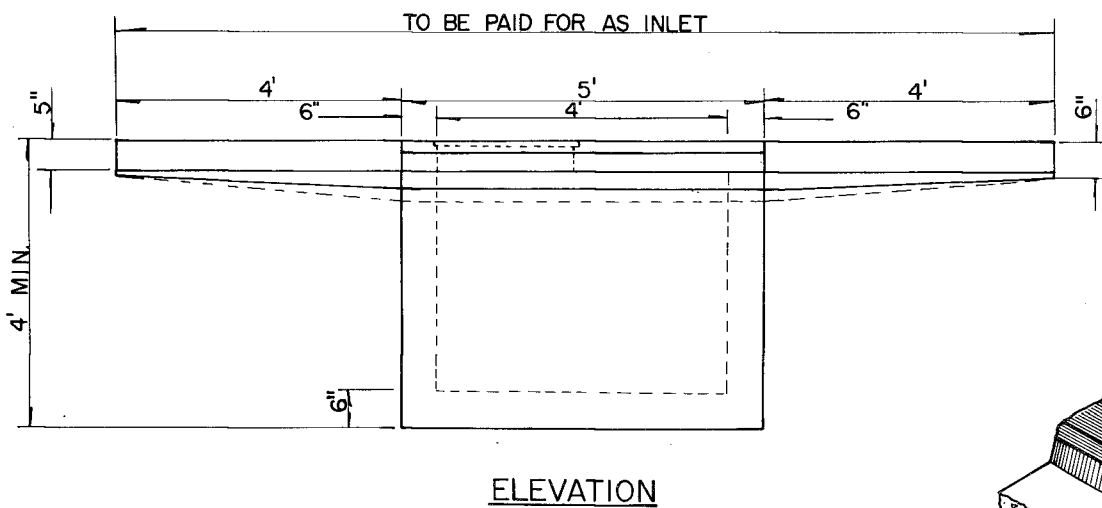
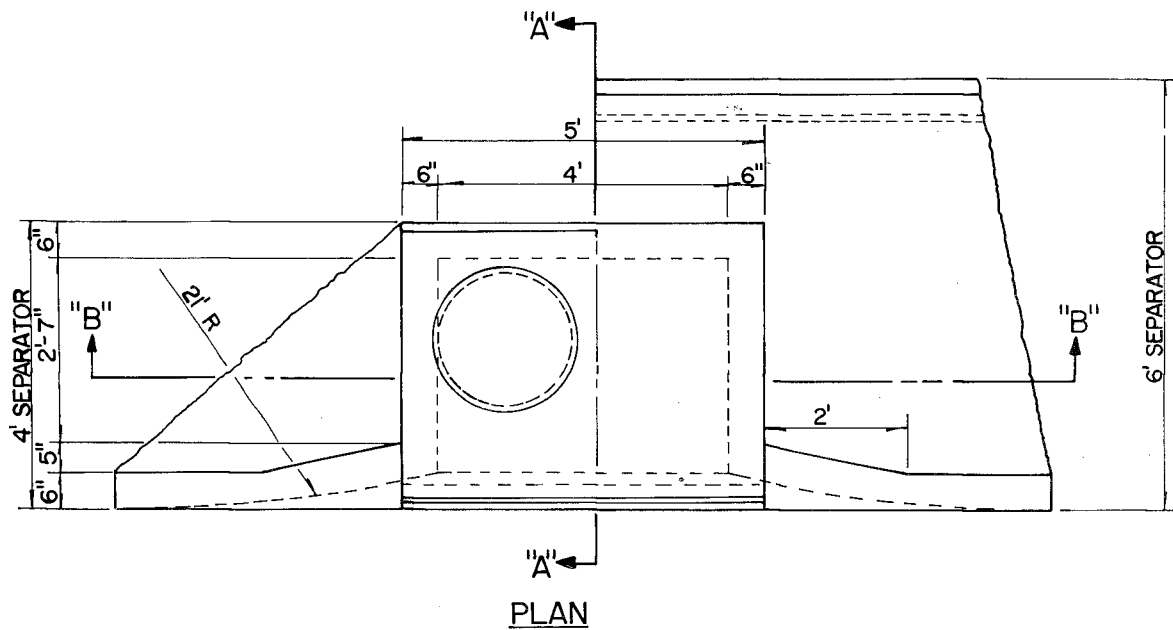
GENERAL NOTES

DESIGN SPECIFICATIONS: A.A.S.H.O.-1973.
CHAMFER: ALL EXPOSED EDGES TO BE CHAMFERED
3/4" UNLESS OTHERWISE SHOWN.
CONCRETE CURB: FOR SHAPE OF CONCRETE CURB
SEE INDEX NO. PCG-01.
STEEL: NO. 4 REINFORCING BARS 12" CENTERS UNLESS
OTHERWISE NOTED. 1/2" CLEARANCE TO INSIDE FACE.
FOR SUPPLEMENTARY DETAILS SEE INDEX DSD-01.
THIS INLET WAS DESIGNED FOR USE WITH TYPE A & B MEDIAN CURB OR TYPE I & II
TRAFFIC SEPARATOR. LOCATE OUTSIDE OF PEDESTRIAN CROSS TRAFFIC.

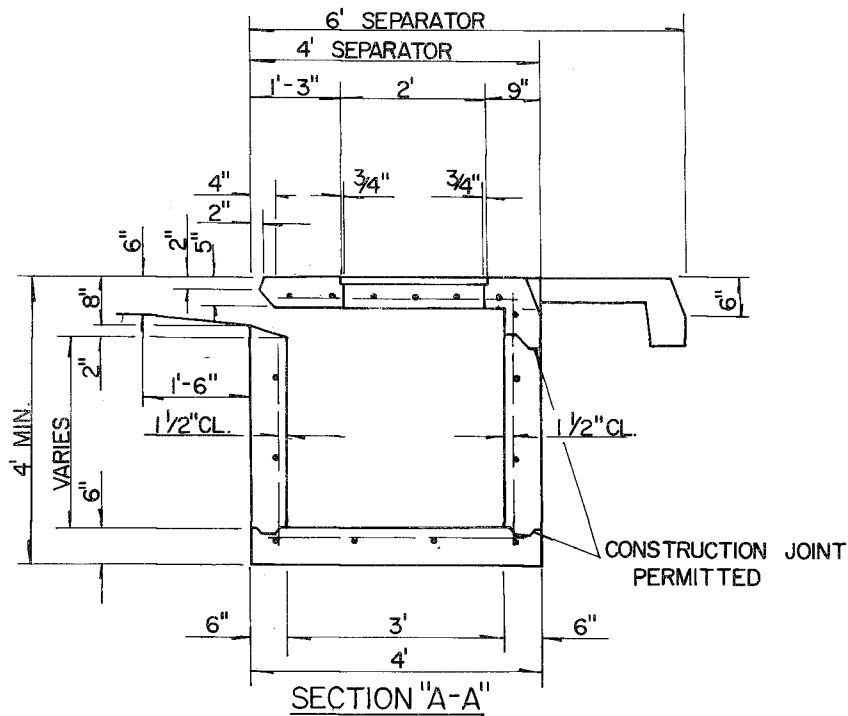
FHWA APPROVED: 5-1-75
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

CURB INLET-TYPE "7"

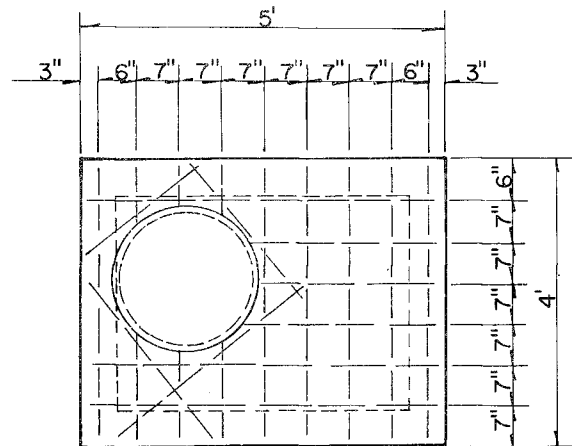
REVISIONS	INITIALS	DATES	Recommended for approval by
5-14-74 WGL	REVISOR		Deputy Design Engineer - Roadways
	Checked by		Approved by
	Checked by		State Design Engineer
	Supervised by		DRAWING NO. INDEX NO.
			1 OF 1 DCI-03



SECTION "B-B"



SECTION "A-A"



NOTES:

1. NO. 4 REINFORCING BARS 12" CENTERS UNLESS OTHERWISE NOTED.
2. CUT AND BEND BARS OUT OF WAY OF PIPE WHEN NECESSARY. BARS TO CLEAR PIPE BY 1 1/2".
3. FOR SUPPLEMENTAL DETAILS SEE INDEX NO. DSD-01.
4. THIS INLET WAS DESIGNED FOR USE WITH TYPE D MEDIAN CURB OR TYPE IV & V TRAFFIC SEPARATOR. LOCATE OUTSIDE OF PEDESTRIAN CROSS TRAFFIC.

FHWA APPROVED 5-1-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

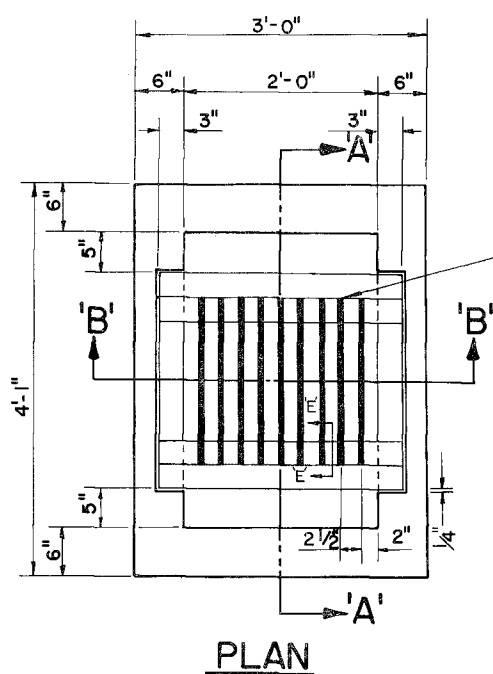
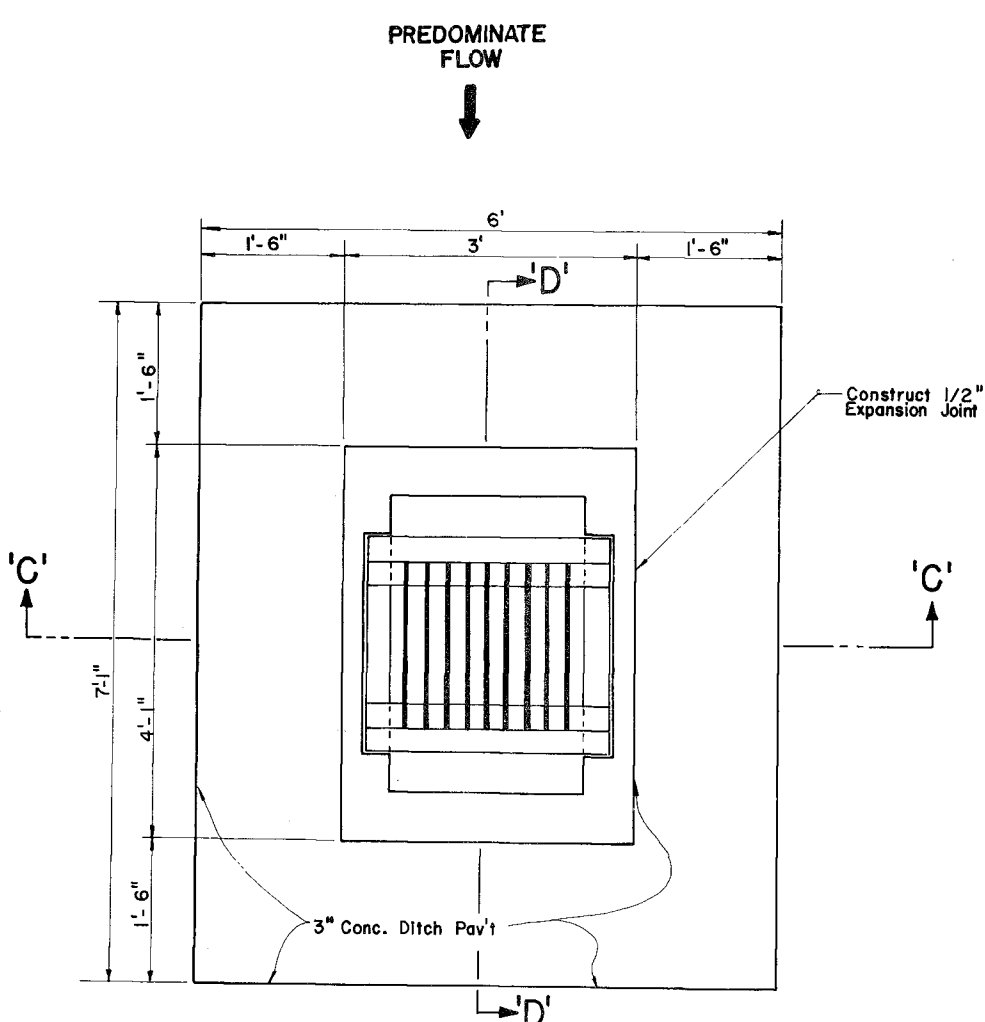
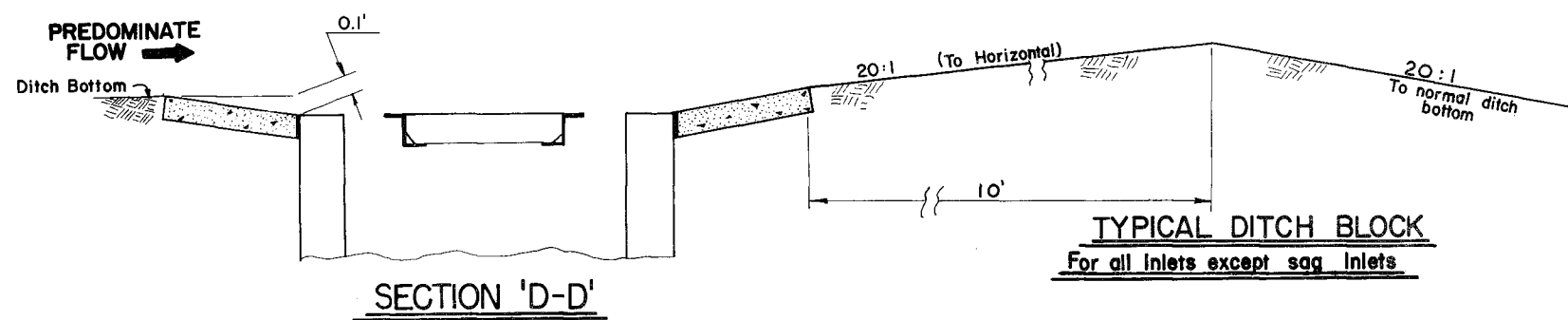
CURB INLET - TYPE "8"

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
3-73	Added Class 1 Conc.			
10-74	Revised notes, changed Inlet type & Index No.			
		Names	Dates	APPROVED BY
		Designed by	H. W.	11-68
		Checked by		
		Quantities by		
		Checked by		
		Supervised by	H. W.	11-68
		Drawing No.	Index No.	

E. H. Hart
Deputy Design Engineer, Roadways

Drawing No. Index No.

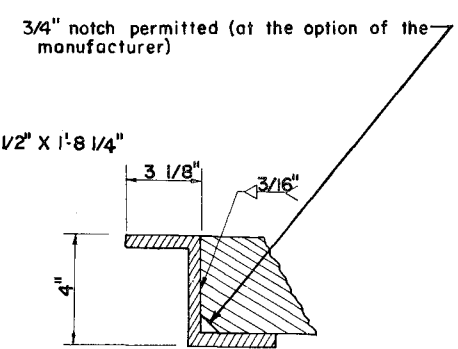
1 OF 1 DCI-04



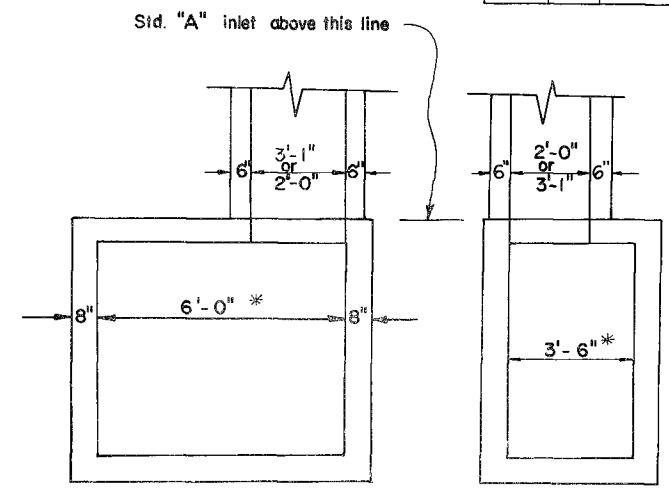
Recommended Maximum Pipe Sizes *

2'-0"	Side - 18" Pipe
3'-1"	Side - 24" Pipe

* See note # 9



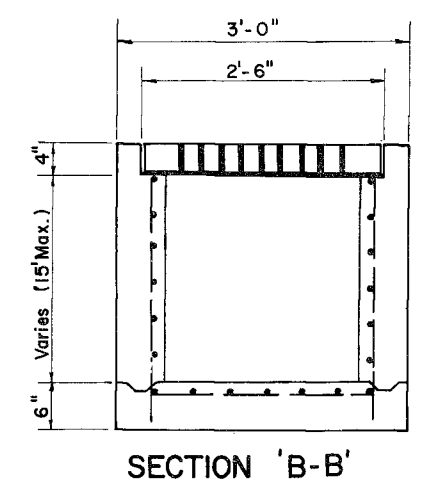
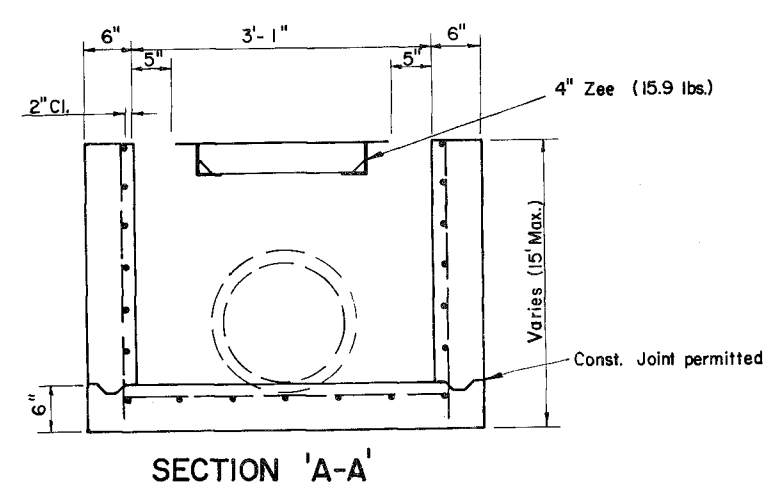
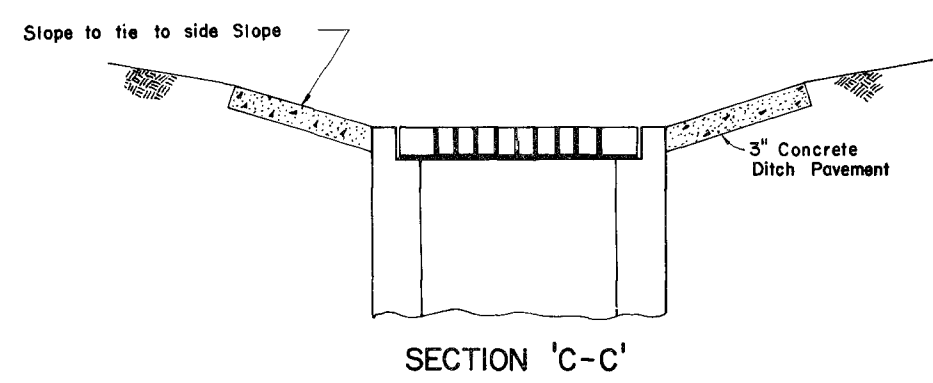
SECTION 'E-E'



NOTES:
For details of "J" bottom, see Index DSB-01 (Alt. "B" only).
"A" top to be oriented as required by Note #5.

GENERAL NOTES

- Cost of Ditch Paving to be included in cost of inlet.
- Reinforcing - N# 4 bars at each 12" center both ways 2" clearance to inside face
- Inlet to be used only where flow thru Grate is less than 7 c.f.s.
- Where material unsatisfactory for foundation is encountered at F.L. EL. omit floor and carry walls down to satisfactory foundation. Backfill to F.L. with clear sand.
- Direction of 1/2" X 3 1/2" bars to be in same direction as predominant flow.
- Chamfer exposed edges. (3/4" Chamfer.)
- Cut and bend Bars out of way of Pipe when necessary; Bars to clear Pipe by 1 1/2".
- For supplemental detail, see Index DSD-01.
- Recommended maximum pipe sizes, are for concrete pipe. Check larger sizes for fit. For larger pipe, Type "B" inlet or "J-A" inlet (see detail above) should be considered.
- This inlet was designed for ditches, medians, or other areas subject to heavy wheel loads where debris may be a problem. It is not for use in areas subject to pedestrian and/or bicycle traffic.

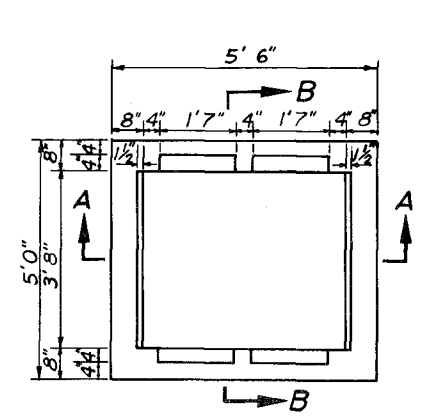


FHWA Approved: 7-18-75

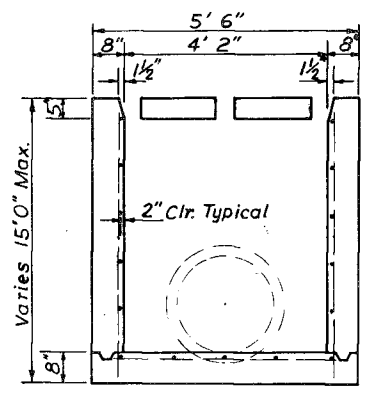
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

DITCH BOTTOM INLET - TYPE "A"

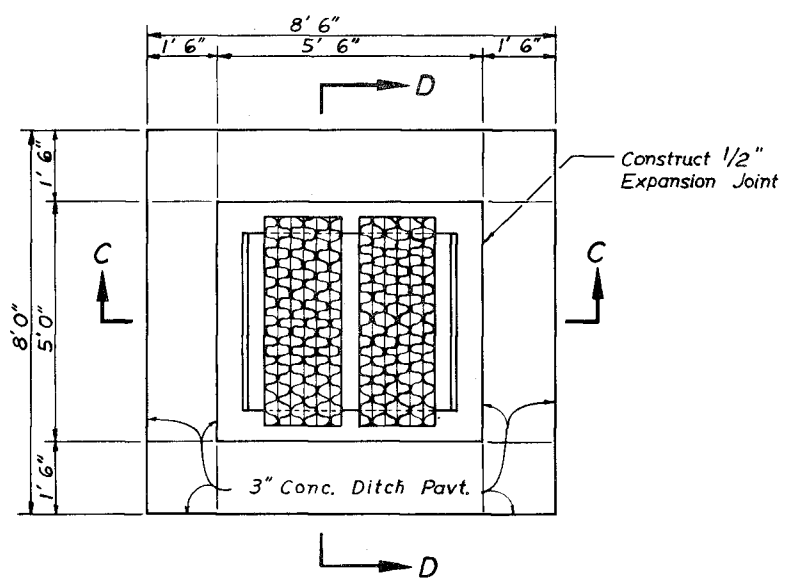
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
10-74	Revised notes, changed inlet type & Index No			
Designed by	Checked by	Quantities by	Checked by	Supervised by
APPROVED BY		APPROVED BY		
State Design Engineer		State Design Engineer		
Drawing No.		Index No.		
1 of 1		DDI-01		



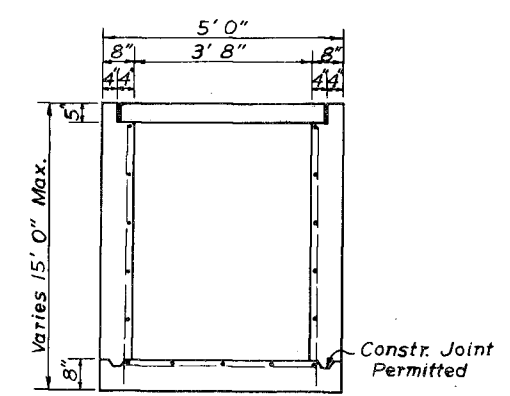
PLAN



SECTION A-A



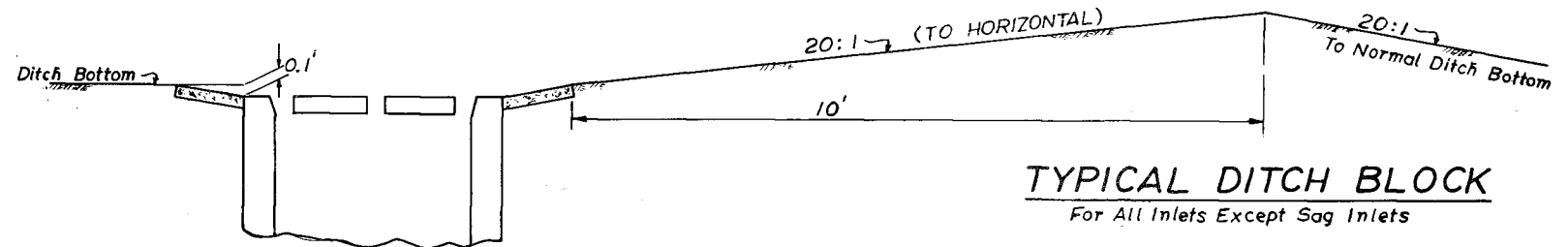
PAVING DETAIL FOR ALL INLETS



SECTION B-B

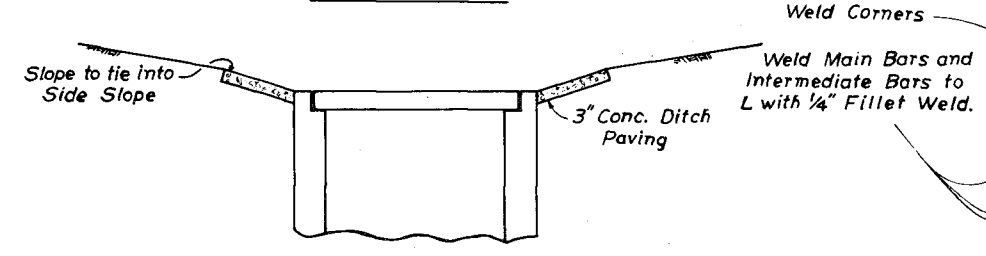
~GENERAL NOTES~

1. COST OF DITCH PAVING TO BE INCLUDED IN COST OF INLET.
2. REINFORCING-N# 4 BARS AT 12" CENTERS BOTH WAYS 2" CLEARANCE TO INSIDE FACE.
3. FOR SUPPLEMENTARY DETAILS SEE INDEX NO. DSD-01
4. CUT AND BEND BARS OUT OF WAY OF PIPE WHEN NECESSARY; BARS TO CLEAR PIPE BY 1 1/2"
5. WHERE MATERIAL UNSATISFACTORY FOR FOUNDATION IS ENCOUNTERED AT FL. EL. OMIT FLOOR AND CARRY WALLS DOWN TO SATISFACTORY FOUNDATION. BACKFILL TO FL. WITH CLEAR SAND.
6. THIS INLET WAS DESIGNED FOR DITCHES, MEDIANS, OR OTHER AREAS SUBJECT TO HEAVY WHEEL LOADS WHERE DEBRIS MAY BE A PROBLEM (FOR MORE THAN 7 CFS THRU GRATE). IT IS NOT FOR USE IN AREAS SUBJECT TO PEDESTRIAN AND/OR BICYCLE TRAFFIC.
7. RECOMMEND 36" PIPE AS MAXIMUM SIZE FOR CONCRETE PIPE. FOR LARGER PIPE, "J-B" INLET SHOULD BE CONSIDERED.

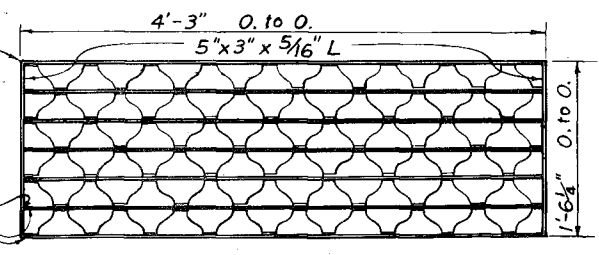


TYPICAL DITCH BLOCK
For All Inlets Except Sag Inlets

SECTION C-C



SECTION D-D



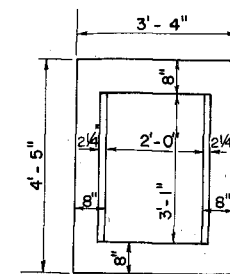
STEEL GRATING DETAIL

TWO REQUIRED PER INLET
5" Borden, Florida Steel, Irving, Reliance, Greulich, (or equal).
Main Bars 5" x 1/4" Intermediate Bars 1 1/2" x 1/4" Reticuline Bars
1 1/4" x 3/16" (or equal).

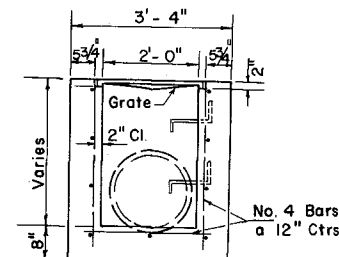
FHWA Approved: 7-18-75
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

DITCH BOTTOM INLET - TYPE "B"

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
1-6-73	CHANGED 0.5' TO 0.1' 10:1 TO 20:1, REVISE NOTES ADDED DETAIL OF LATER BARS, ADDED STRAIGHT PIPE ONLY CHANGED 12" MAX. TO 15" MAX.			
11-74	Revised notes, changed inlet type & Index No.			
LMF				
Checked by		Names	Dates	Recommended For Approval by
Checked by		H.A.B.	APR. 67	C.D. Dyer
Checked by				APPROVED
Checked by				Assistant State Highway Engineer
Checked by				Drawing No.
Checked by				Index No.
Traced by		G.C.B.	APR. 67	1 of 1
				DDI-02



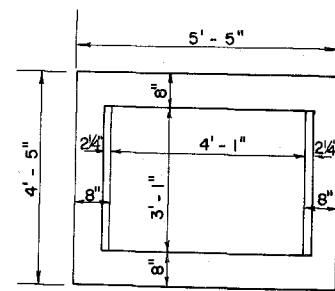
PLAN



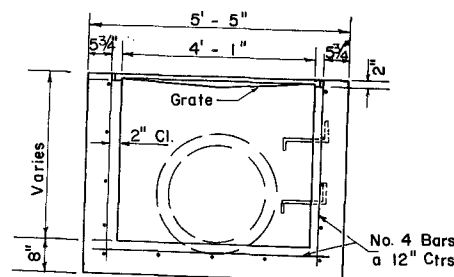
SECTION
TYPE C

Recommended Maximum Pipe Size:

2'-0" Wall - 18" Pipe
3'-1" Wall - 24" Pipe



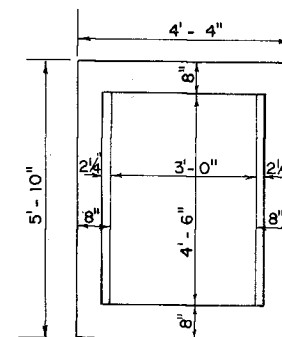
PLAN



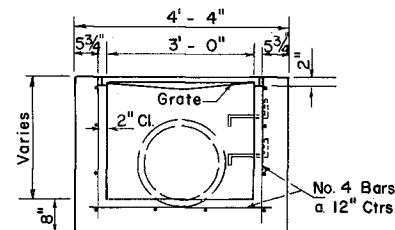
SECTION
TYPE D

Recommended Maximum Pipe Size:

3'-1" Wall - 24" Pipe
4'-1" Wall - 36" Pipe



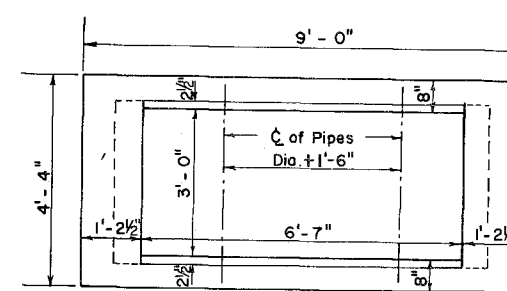
PLAN



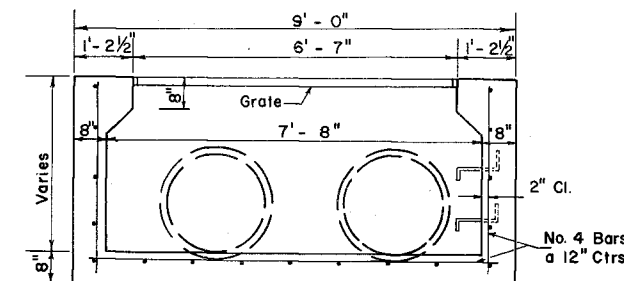
SECTION
TYPE E

Recommended Maximum Pipe Size:

3'-0" Wall - 24" Pipe
4'-6" Wall - 42" Pipe



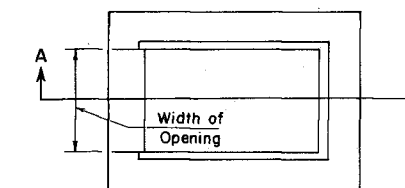
PLAN



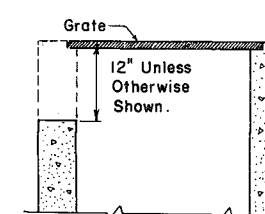
SECTION
TYPE H

Recommended Maximum Pipe Size:

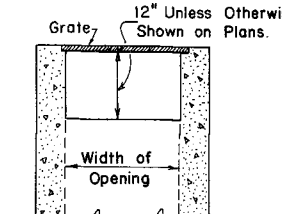
3'-0" Wall - 30" Pipe
7'-8" Wall - 1 - 66" Pipe
2 - 30" Pipe



PLAN



SECTION A-A



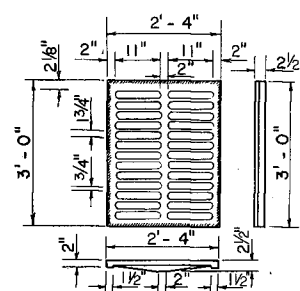
END VIEW

NOTE:
Opening may be constructed at either end or at both ends as shown on plans.

DETAIL OF OPENINGS IN DITCH BOTTOM INLETS

GENERAL NOTES:

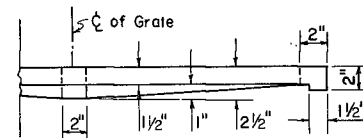
1. BEVELED EDGES: All exposed corners and edges to be chamfered 3/4".
2. FOUNDATION MATERIAL: Where material unsatisfactory for foundation is encountered at FL. EL. omit floor and carry walls down to satisfactory foundation. Backfill to FL. with clear sand.
3. CAST IRON: In accordance with Florida Department of Transportation Specifications.
4. STEEL GRATING: Manufactured by Borden, Florida Steel, Irving, Reliance, Grulich (or equal).
5. STRUCTURES: These structures are not to be placed in areas subject to heavy wheel loads.
6. DETAILS: For supplementary details see Standard Index DSD-01.
7. PIPE SIZES: Recommended maximum pipe sizes given are for concrete pipe. Larger than recommended sizes must be checked for fit.
8. USES: When used without slots - For ditches, medians & other areas subject to infrequent traffic loads where debris is minimum. Where debris is a problem slots should be used unless controlled by safety criteria.



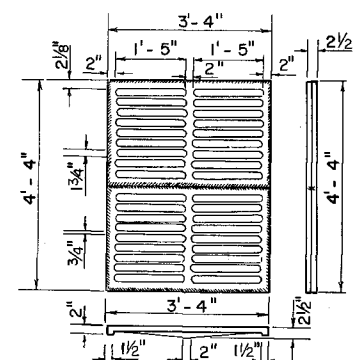
TYPE C

Approx. Weight 235 Lbs.

Note:
Type D Inlet to be used only when openings are required in wide side of Inlet. Cast Iron Grate not permitted.

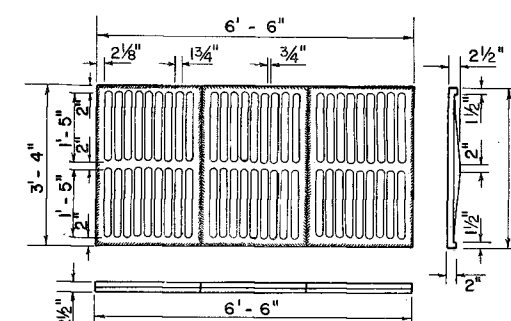


HALF SECTION DETAIL OF
CAST IRON GRATES



TYPE E

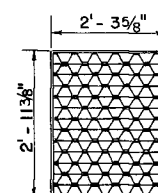
Approx. Weight 465 Lbs.



TYPE H

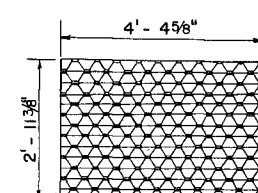
Approx. Weight 725 Lbs.

DETAILS OF CAST IRON GRATING



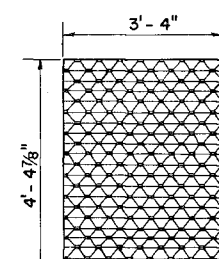
TYPE C

Straight Bars 2" X 3/16"
Reticulate Bars 1 1/4" X 3/16"
Approx. Weight 100 Lbs.



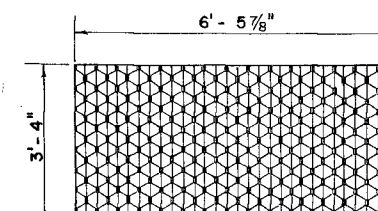
TYPE D

Straight Bars 2" X 3/16"
Reticulate Bars 1 1/4" X 3/16"
Approx. Weight 180 Lbs.



TYPE E

Straight Bars 2" X 3/16"
Reticulate Bars 1 1/4" X 3/16"
Approx. Weight 215 Lbs.



TYPE H

Straight Bars 2" X 3/16"
Reticulate Bars 1 1/4" X 3/16"
Approx. Weight 315 Lbs.

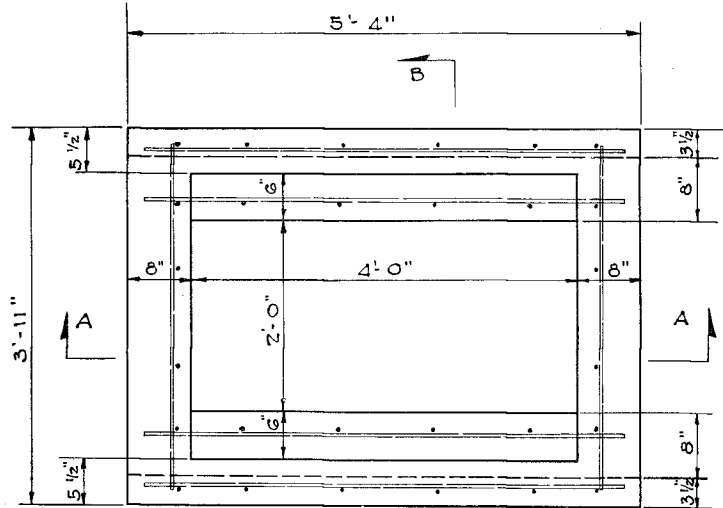
DETAILS OF STEEL GRATING

FHWA Approved: 5-1-75

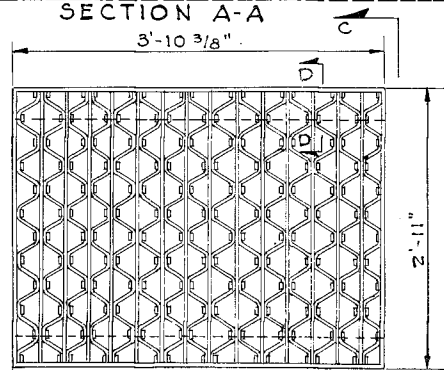
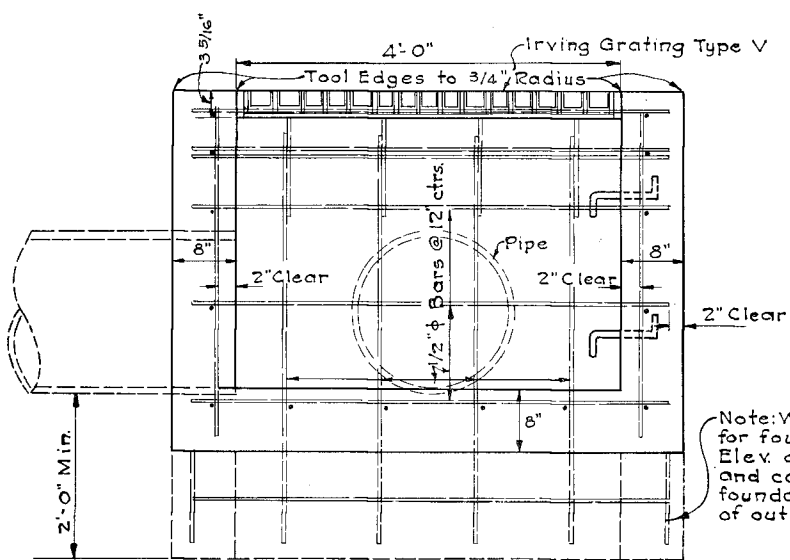
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
STANDARD DITCH BOTTOM INLET TYPES
C, D, E, & H

REVISIONS		INITIALS	DATES	Recommended for approval by
Dates	Descriptions	Designed by		
3-74	REVISED	Checked by		Deputy Design Engineer - Roadways
10-74	Added note no. 8, Changed Index H's	Quantities by		Approved by
		Checked by		State Design Engineer
		Supervised by	LMF	DRAWING NO. INDEX NO.
				1 of 1 DDI-03

FED. ROAD DIV. NO.	STATE	SECTION	JOB NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	FLA.					

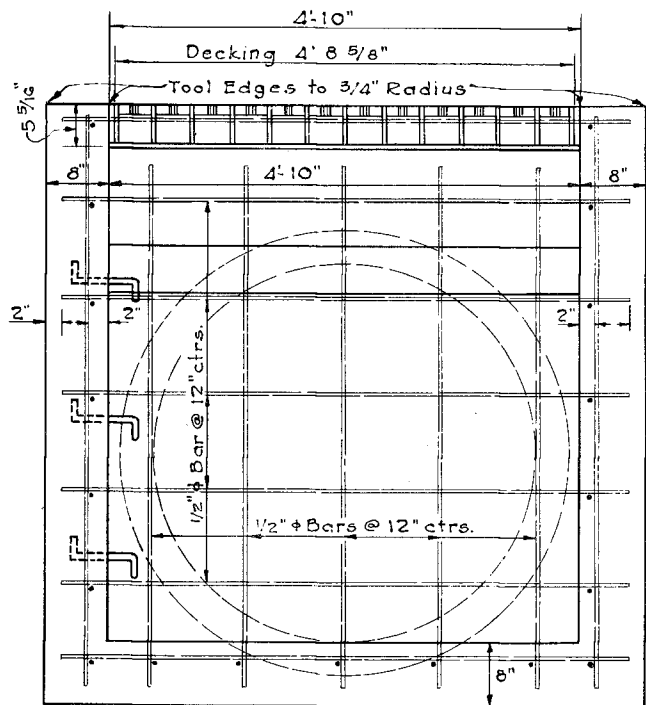
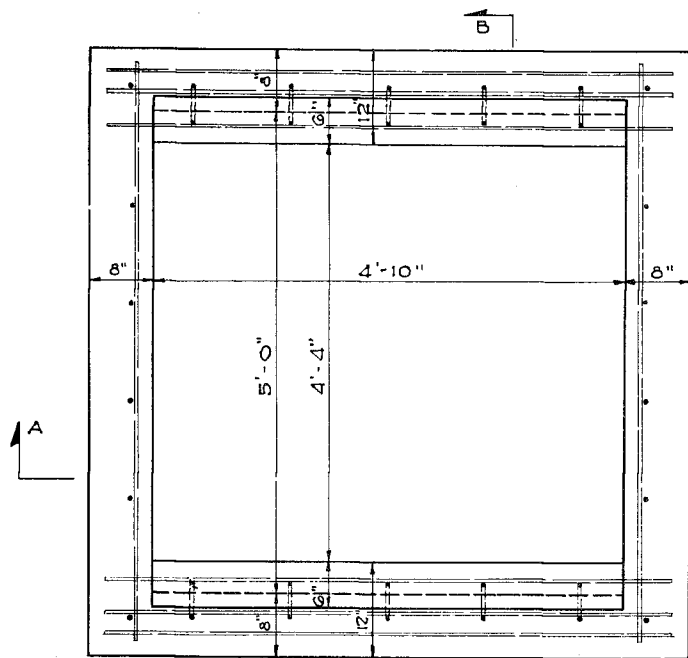
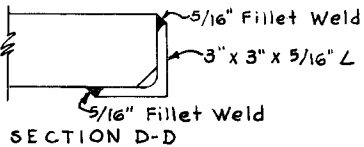
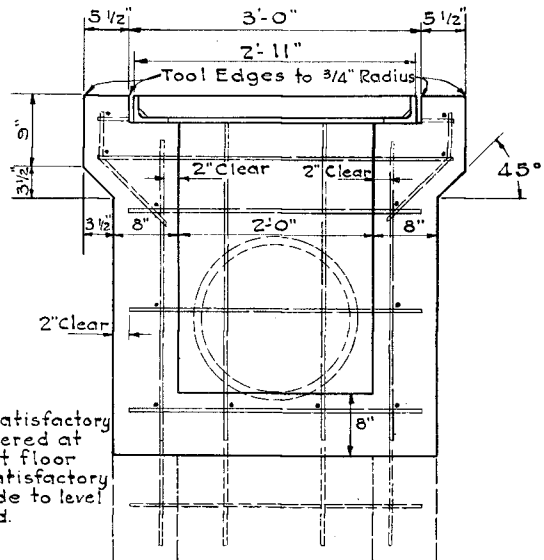


ESTIMATED QUANTITIES		
HEIGHT OF WALLS	CONCRETE CU. YD.	REINFORCING STEEL, LBS.
2'-0"	0.07	81
3'-0"	1.15	102
4'-0"	1.51	124
5'-0"	1.87	145
6'-0"	2.23	166
Floor only (Inside of Walls)	0.20	25



STEEL GRATING
STEEL GRATING, STRAIGHT BARS 3"x 1/4"
RETICULATE BARS 2"x 3/16"
STEEL DECKING: Manufactured by Borden, Florida Steel, Irving, Reliance, Greulich (or equal).

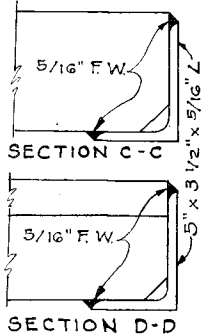
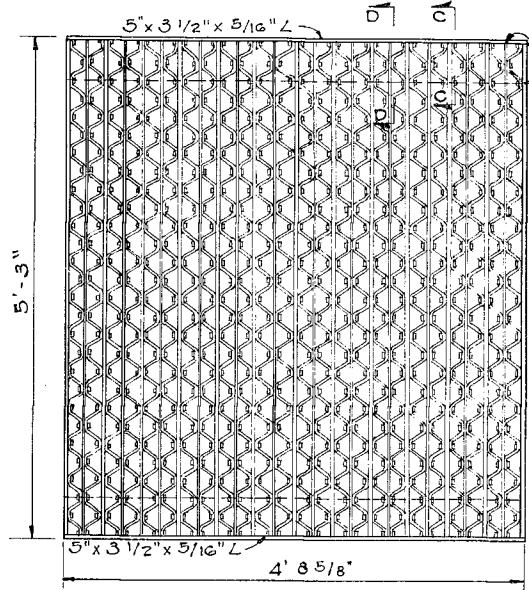
2' x 4' DROP INLET - TYPE "F"



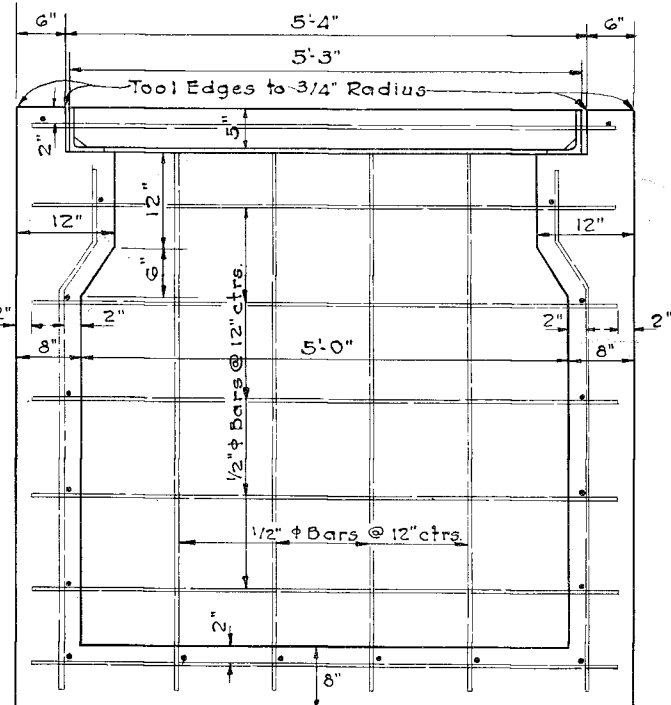
SECTION A-A

5' x 5' DITCH BOTTOM INLET - TYPE "G"

Note: These inlets were designed for use in ditches, medians, pavement areas, or other areas subject to heavy wheel loads where debris is minimum and it is subject to pedestrian and/or bicycle traffic.



STEEL GRATING
5" STEEL DECKING, WEIGHT G30 LBS. MAIN BARS 5"x 1/4"
INTERMEDIATE BARS 1 1/2"x 1/4" RETICULATE BARS 1 1/4"x 3/16"
STEEL DECKING: Manufactured by Borden, Florida Steel, Irving, Reliance, Greulich (or equal).



SECTION B-B

Note: For construction of bottom where unsatisfactory foundation is encountered (see Note Section A-A, Type "F")

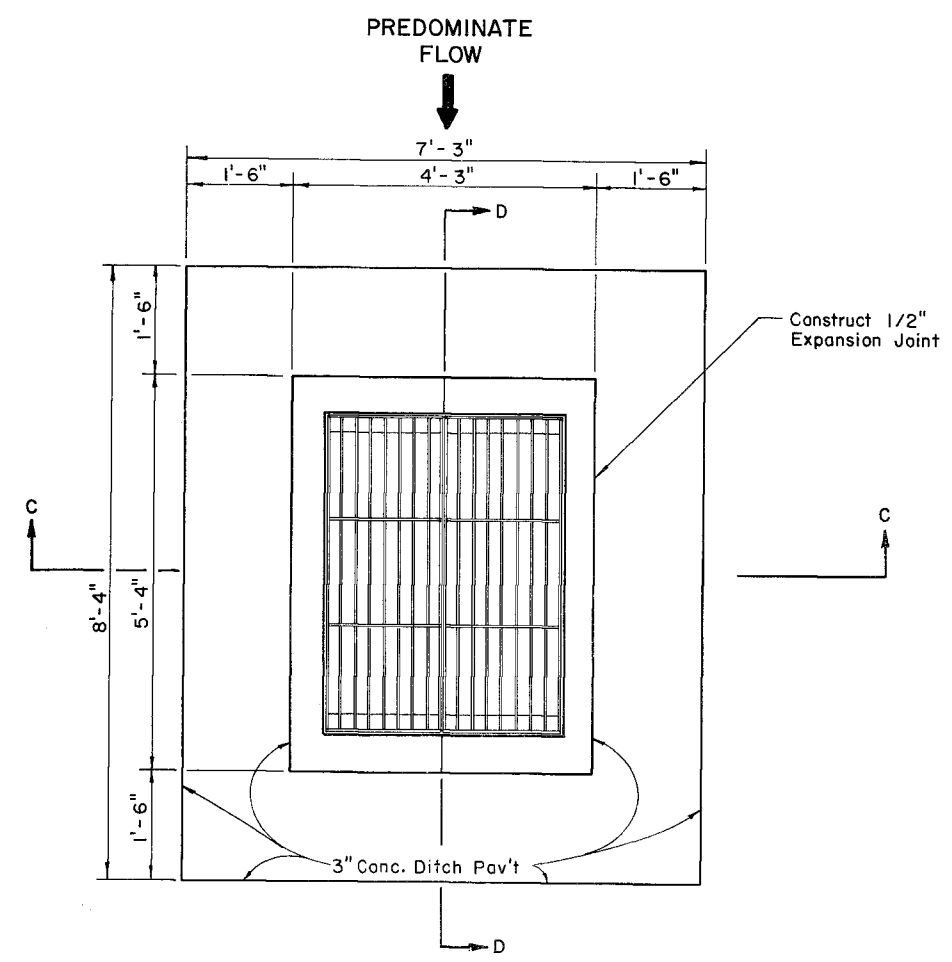
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
STANDARD DITCH BOTTOM INLETS
(LOAD BEARING) TYPES "F" & "G"

FHWA Approved: 5-1-75

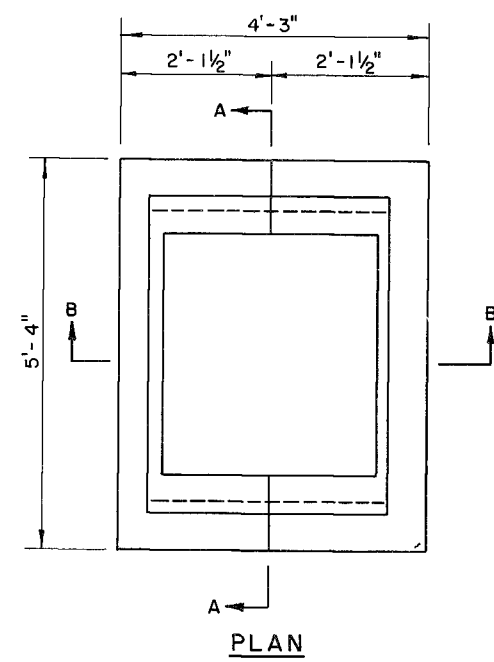
REVISIONS			APPROVED BY		
Names	Dates	Descriptions	Names	Dates	Recommended For Approval By
B.A.S.	1-20-51	Revised	T. W. J.	1-50	
H. H.	2-56	Added Ladder Bar	M. E. F.	1-50	
L. H.	3-62	Rev Ladder Bars	W. H. M.	1-50	
L. F.	7-70	Added All Install. for Ladder Bars	M. E. F.	1-50	
Q. F.	7-70	Rev Belt - Change	W. H. M.	1-50	
L. M. F.	3-73	Removed Details for Ladder Bars	M. E. F.	1-50	

10-74 Changed Index No. to 10-74

1 of 1
DDI-04

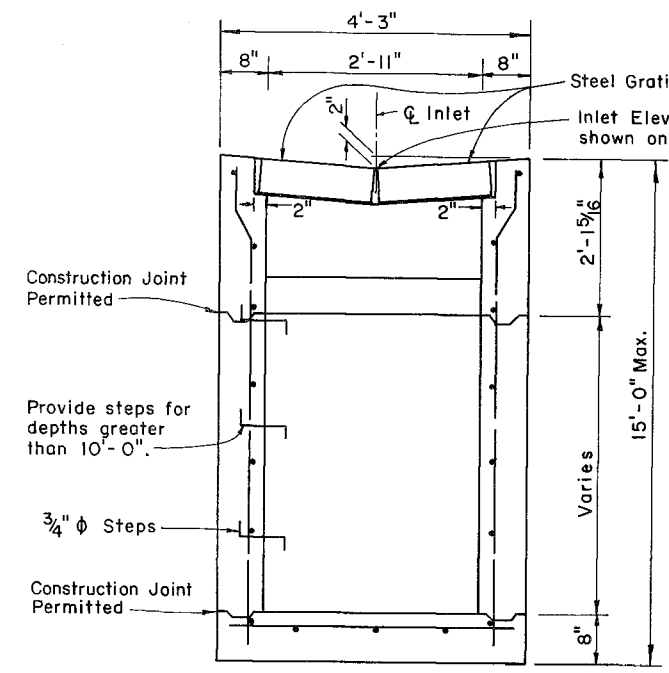


PAVEMENT DETAIL FOR ALL "J" INLETS

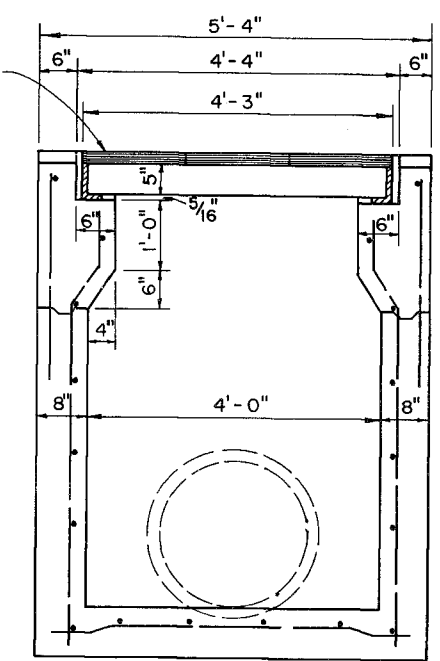


PLAN

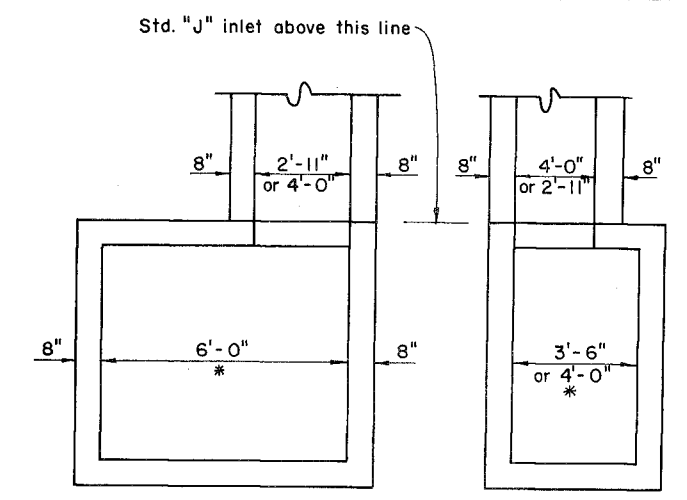
Recommended Maximum Pipe Sizes (See Notes 4 & 8)
 2'-11" Wall - 24"
 4'-0" Wall - 36"



SECTION B-B



SECTION A-A



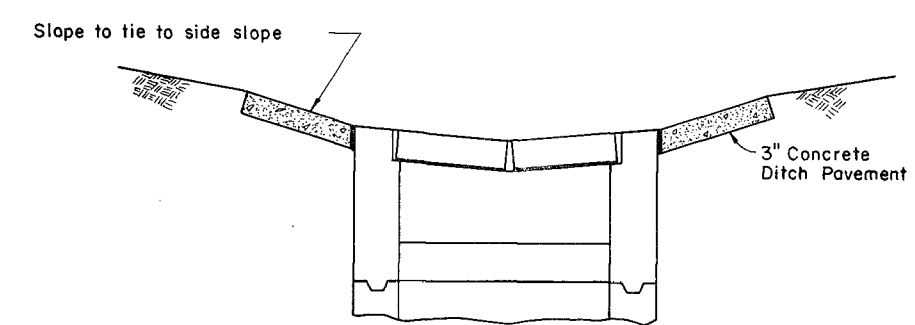
* unless otherwise shown in plans.

"J-J" DETAIL

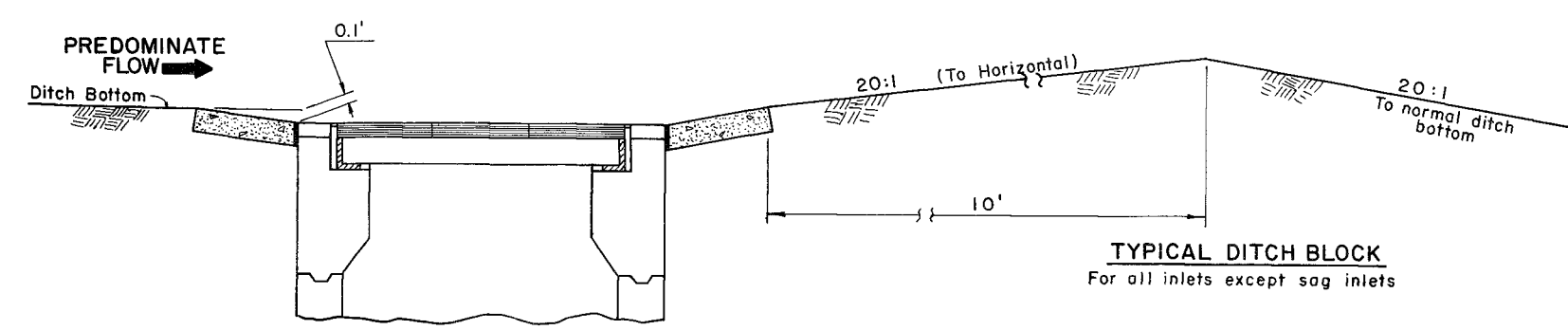
NOTES:
 For details of "J" bottom, see Index DSB-OI (Alt. "B" only).
 "J" top to be oriented as required by Note 4.

GENERAL NOTES

1. Cost of Ditch Paving to be included in cost of inlet.
2. Reinforcing - N^o 4 bars at 12" centers both ways with 2" clearance to inside face.
3. Where material unsatisfactory for foundation is encountered at F.L. elevation omit floor and carry walls down to satisfactory foundation. Backfill to F.L. with cleansand.
4. Direction of 1/4" x 5" Main bars to be in same direction as predominant flow.
5. Chamfer exposed edges. (3/4" Chamfer)
6. Cut and bend bars out of way of pipe when necessary; Bars to clear pipe by 1 1/2".
7. For supplemental details, see Index DSD-OI.
8. Recommended maximum pipe sizes are for concrete pipe. Check larger sizes for fit. For larger pipe, a "J-J" inlet should be considered (see detail above).
9. This inlet was designed for ditches, medians or other areas subject to heavy wheel loads where debris may be a problem and pedestrian traffic is anticipated. It is not for use in areas subject to bicycle traffic.

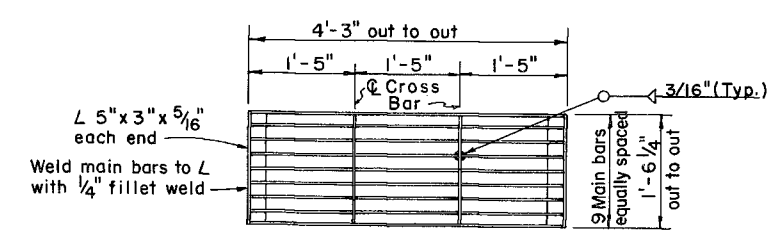


SECTION C-C



SECTION D-D

TYPICAL DITCH BLOCK
 For all inlets except sag inlets



STEEL GRATING DETAIL

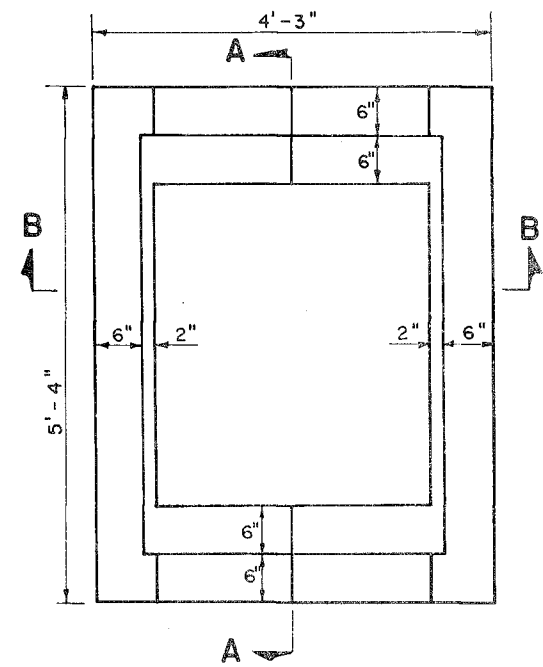
Note: Two required per inlet
 Main Bars 5" x 3" x 5/16" (Notched for cross bars).
 Cross Bars 1 3/4" x 1/4" (Continuously welded at main bar notches).
 Main Bars and Cross Bars flush on top.

F.H.W.A. Approved: 9-3-76

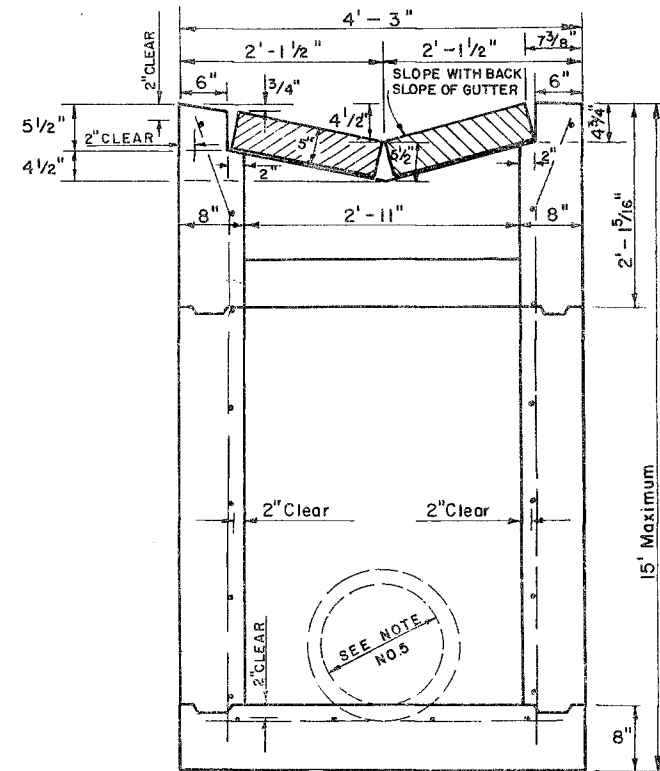
FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section

DITCH BOTTOM INLET-TYPE "J"

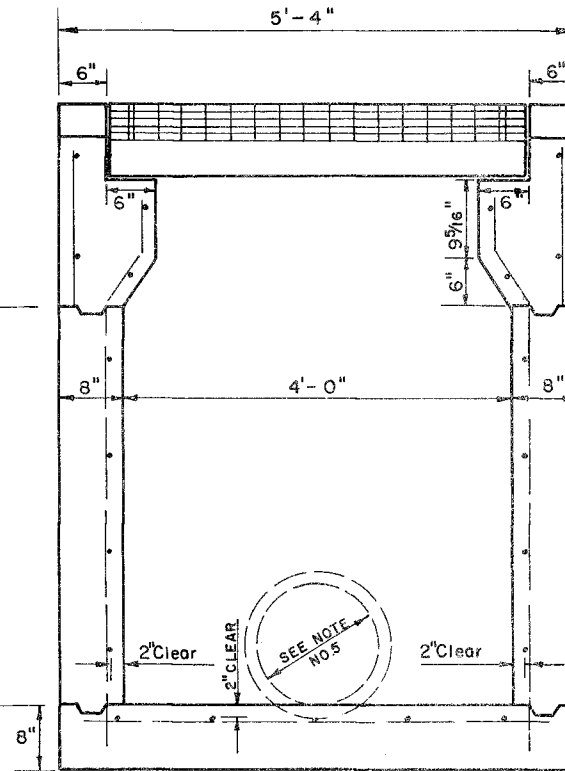
REVISIONS		INITIALS	DATES	Approved by: Deputy Design Engineer - Roadways
Dates	Descriptions	Designed by	8-76	
		Checked by	8-76	
		Quantities by		
		Supervised by		
				DRAWING NO. 1 OF 1
				INDEX NO. DDI-05



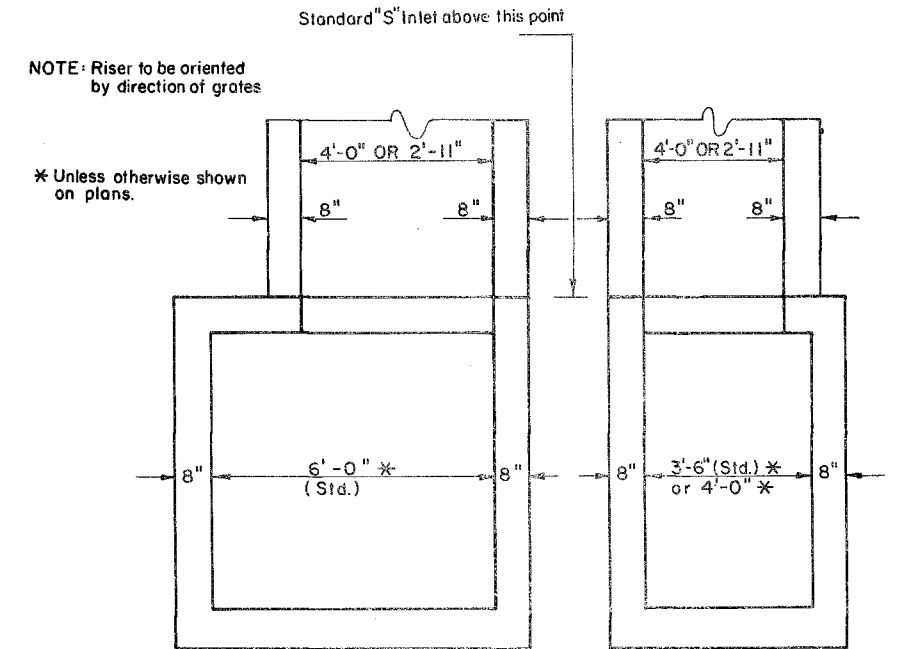
PLAN
(WITHOUT GRATE)



SECTION B-B



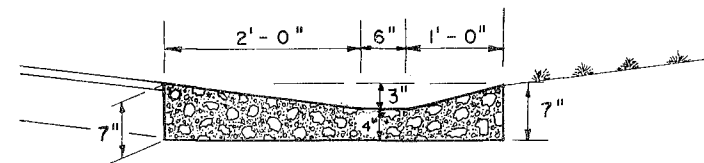
SECTION A-A



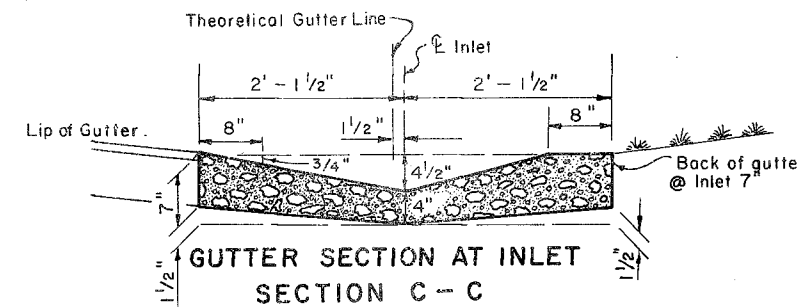
"S" INLET WITH "J" TYPE BOTTOM
NOTE: FOR DETAILS OF "J" BOX SEE INDEX NUMBER DSB-01.

GENERAL NOTES

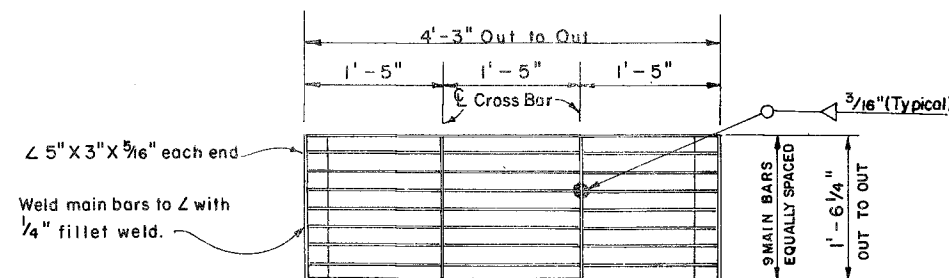
1. This inlet was designed for shoulder gutters subject to heavy wheel loads on sections where bicycle traffic is not anticipated (ie: limited access, rural sections). Also may be used in locations where the wide openings in the "A" and "B" inlets are unacceptable. Where a bicycle safe grate is necessary use the steel grating shown on index no. DGI-02.
2. All reinforcing steel bars are 1/2" ϕ @ 12" centers.
3. Cut and bend bars out of way of pipe when necessary. Bars to clear pipe by 1/2".
4. All exposed edges and corners shall be tooled to 3/4" radius.
5. Recommended maximum pipe sizes based on concrete pipe: Section A-A, 36" pipe; Section B-B, 24" pipe. Larger pipe sizes may be used but should be checked for fit. "J-S" detail is recommended for larger pipe sizes.
6. For supplementary details see index numbers DSD-01 and DSB-01.
7. Grate and top of structure shall be true to grade shown on plans.



DETAIL OF SHOULDER GUTTER
SECTION D-D

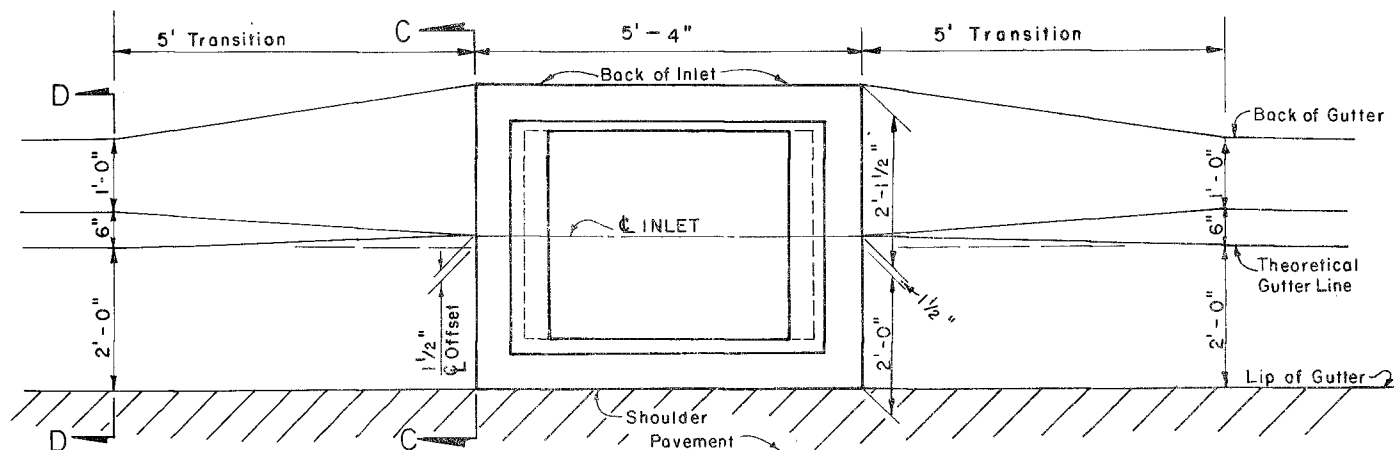


GUTTER SECTION AT INLET
SECTION C-C



STEEL GRATING DETAIL

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.



SHOULDER GUTTER TRANSITION AT INLET
TYPE "S"

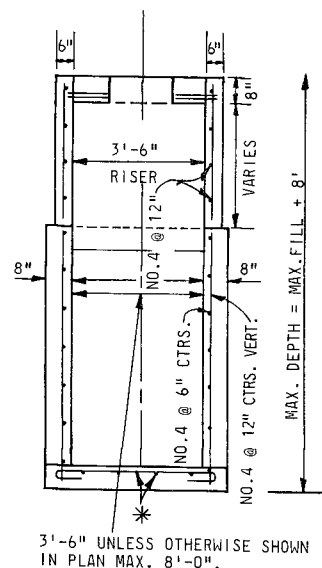
FHWA APPROVED: 5-1-75
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

GUTTER INLET-TYPE "S"

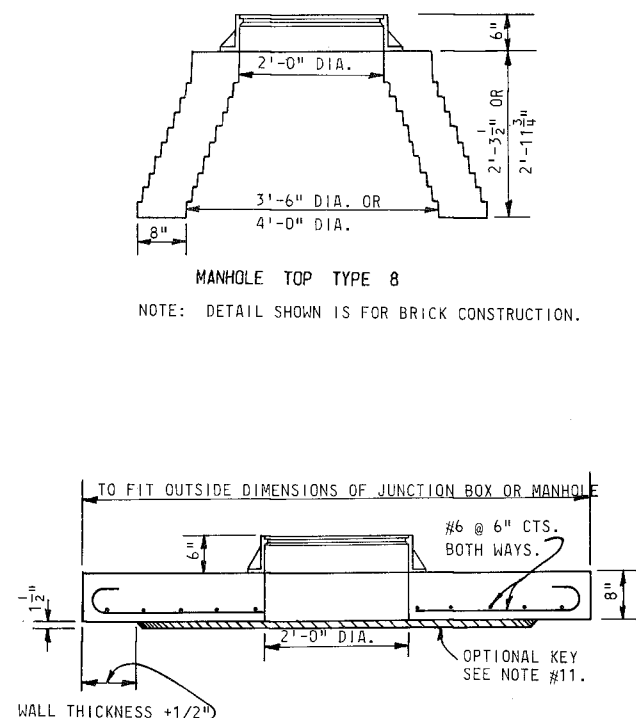
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
6-71	Redrawn - Added shldr. gutter transition and J-Y detail.			
10-74	Revised notes, changed inlet type and index no.			

Designed by	Names	Dates	APPROVED BY
Checked by			E. H. Hart
Quantities by			Deputy Design Engineer, Roadways
Checked by			
Supervised by			

Drawing No. 1 of 1 Index No. DGI-01



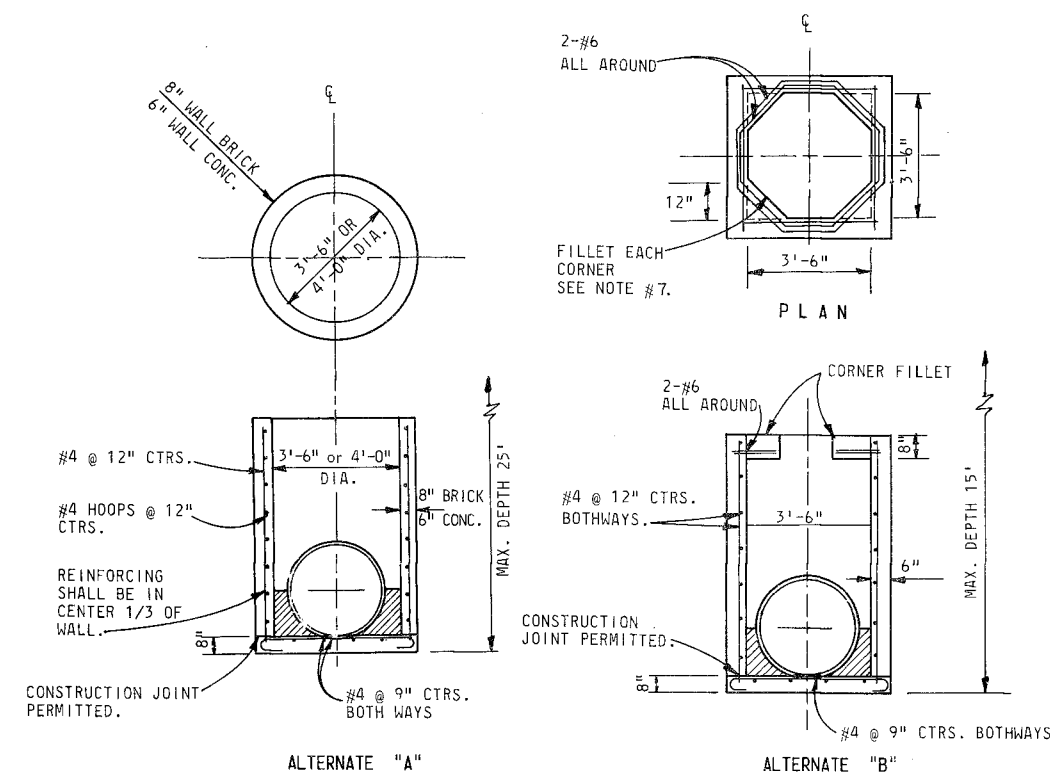
INLET, MANHOLE, JUNCTION BOX TYPE J



JUNCTION BOX OR
MANHOLE TOP TYPE 7-T
FOR USE WHEN TOP SLAB IS SUBJECTED TO WHEEL LOADS (H-20)
(TRAFFIC)

JUNCTION BOX OR
MANHOLE TOP TYPE 7-NT
FOR USE WHEN TOP SLAB IS NOT SUBJECTED TO WHEEL LOADS
(NON-TRAFFIC)

TOP AND FLOOR SLAB TABLE					
TYPE "J"					
ALT. "A"	ALT. "B"	SLAB THICKNESS	ALLOWABLE FILL OVER TOP SLAB		REINFORCING TOP & FLOOR SLABS
			MIN.	MAX.	
I.D.	BOX WIDTH				
	3'-6"	8"	2'	29'	#6 @ 6" CTRS. B.W.
	5'-0"	8"	2'	25'	#6 @ 6" CTRS. B.W.
	5'-0"	10"	2'	27'	#7 @ 6" CTRS. B.W.
6'	6'-0"	8"	2'	20'	#6 @ 6" CTRS. B.W.
6'	6'-0"	10"	2'	25'	#7 @ 6" CTRS. B.W.
7' or 8'	8'-0"	10"	2'	11'	#7 @ 6" CTRS. B.W.



INLET, MANHOLE, JUNCTION BOX TYPE P

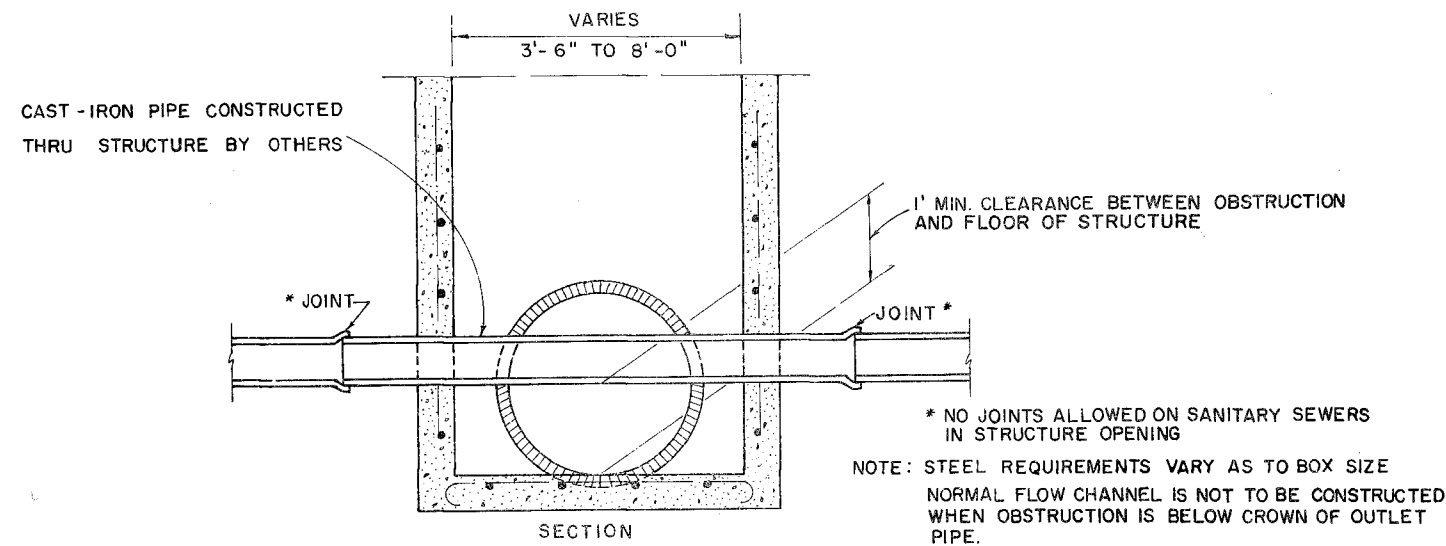
1. WALLS OF CIRCULAR STRUCTURES (ALTERNATE "A") MAY BE CONSTRUCTED OF CONCRETE OR BRICK, BUT RECTANGULAR STRUCTURES (ALTERNATE "B") SHALL BE CONSTRUCTED OF CONCRETE ONLY. THE CONCRETE MAY BE CAST-IN-PLACE OR PRECAST.
2. WALL REINFORCEMENT AND THICKNESS ARE FOR EITHER CAST-IN-PLACE OR PRECAST CONCRETE UNITS EXCEPT THAT THE MANUFACTURER MAY FURNISH PRECAST CIRCULAR UNITS IN ACCORDANCE WITH A S.T.M. SPECIFICATION C-478 UP TO 72" IN DIA. OR PRECAST CIRCULAR UNITS A.S.T.M. SPECIFICATION C-76, TABLE III, FOR "B" WALL CONCRETE PIPE, TOP AND FLOOR SLAB THICKNESS AND REINFORCEMENT ARE FOR ALL TYPES OF CONSTRUCTION.
3. ELLIPTICAL STEEL, ASTM SPECIFICATION C-76, TABLE III, "B" WALL, IS MODIFIED TO USE A CIRCULAR GAGE OF STEEL AREA EQUAL TO THAT OF THE ELLIPTICAL GAGE AND PLACED IN THE CENTER ONE-THIRD OF THE WALL. THIS MODIFICATION IS FOR PRECAST CIRCULAR UNITS PRODUCED IN ACCORDANCE WITH ASTM C-76.
4. TOP AND FLOOR SLABS FOR TYPE J UNITS AND TYPE 7 MANHOLE TOPS SHALL BE OF CLASS II CONCRETE. CONCRETE AS SPECIFIED IN ASTM C-478 MAY BE USED FOR PRECAST UNITS.
5. ANY INLET, MANHOLE OR JUNCTION BOX MAY BE USED IN CONJUNCTION WITH ANY INLET THROAT OR MANHOLE TOP. FOR EXAMPLE, AN INLET WITH A TYPE J BOX AND A TYPE 2 THROAT WOULD BE CALLED AN INLET TYPE J-2 IN THE PLANS. THE CONTRACTOR MAY AT HIS OPTION USE EITHER ALTERNATE A OR B STRUCTURES, UNLESS OTHERWISE SHOWN IN THE PLANS.
6. RECTANGULAR STRUCTURES MAY BE ROTATED AS DIRECTED BY THE ENGINEER IN ORDER TO FACILITATE CONNECTIONS BETWEEN THE STRUCTURE WALLS AND STORM SEWER PIPES.
7. THE CORNER FILLETS SHOWN FOR RECTANGULAR STRUCTURES ARE NECESSARY ONLY WHEN STRUCTURES ARE USED IN CONJUNCTION WITH CIRCULAR INLET THROATS (TYPES 1, 2, 3 & 4) OR WHEN USED ON SKEW WITH RECTANGULAR INLET THROATS (TYPES 5 & 6).
8. INLET THROATS, RISERS OR MANHOLE TOPS SHALL BE SECURED TO STRUCTURES WITH A MINIMUM OF 6 - NO. 4 BARS 12" LONG OR AS SHOWN ON INDEX NO. OSD-01.
9. STRUCTURES WITH A MINIMUM OF 6 - NO. 4 BARS 12" LONG OR AS SHOWN ON INDEX NO. OSD-01.
10. ALL STEEL BARS SHALL HAVE 1" MINIMUM COVER UNLESS OTHERWISE SHOWN AND SHALL BE HOOKED WHERE INDICATED. HORIZONTAL STEEL IN RECTANGULAR STRUCTURES SHALL BE LAPPED A MINIMUM OF 24 BAR DIAMETERS AT CORNERS. ON PRECAST UNITS, FLOOR SLABS MAY BE SECURED TO STRUCTURE WALLS BY NO. 4 DOWEL BARS (A MINIMUM OF 6 DOWELS) PUSHED INTO THE WET CONCRETE AFTER THE FLOOR SLAB IS PLACED.
11. TYPE 7 TOP SLABS MAY BE OF CAST-IN-PLACE OR PRECAST CONSTRUCTION. THE OPTIONAL KEY IS FOR PRECAST TOPS AND IS IN LIEU OF DOWELS. FRAME AND SLAB OPENINGS ARE TO BE OMITTED WHEN TOP IS USED OVER A JUNCTION BOX. FRAME CAN BE ADJUSTED WITH FROM ONE TO SIX COURSES OF BRICK.
12. 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.
13. LARGER THAN SPECIFIED STANDARD UNITS 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.
14. FOR SUPPLEMENTARY DETAILS SEE INDEX NO. OSD-01.

FHWA Approved: 5-1-75

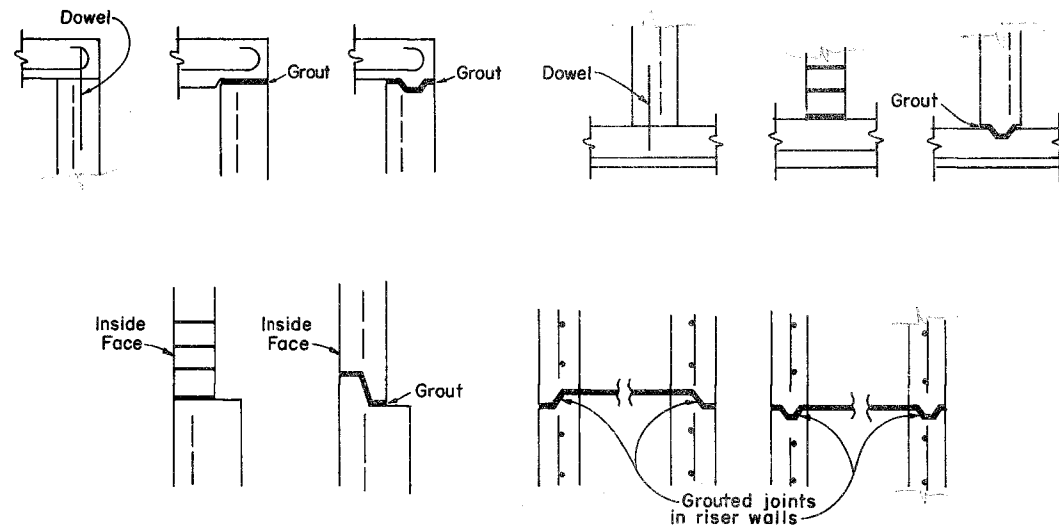
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

INLET, MANHOLE, JUNCTION BOX TYPES J & P

REVISIONS		INITIALS	DATES	Recommended for approval by: <u>E.H. Hart</u>	
Dates	Descriptions	Designed by			Deputy Design Engineer - Roadways
10-74	Changed Index No.	Checked by			Approved
		Quantities by			by: <u>M. H. Smith</u>
		Checked by			State Design Engineer
		Supervised by			DRAWING NO. INDEX NO. 1 of 1 DSB -OI



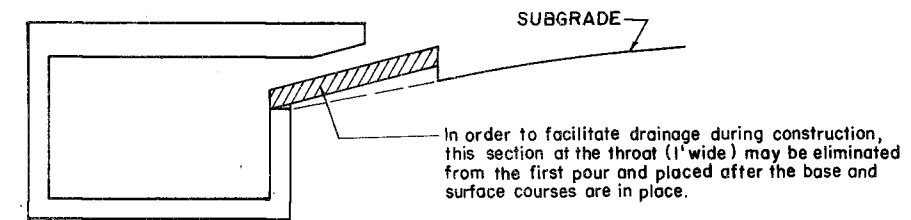
DETAIL SHOWING PIPE CONSTRUCTED THRU STORM SEWER STRUCTURE



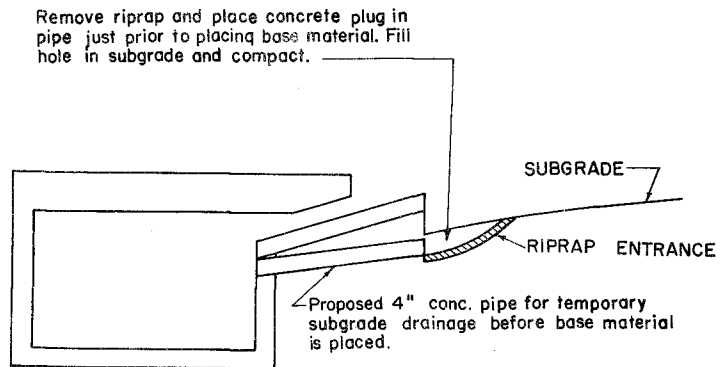
NOTES -

- Any type joint may be used in conjunction with any other type joint.
- 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 evenly spaced.
- Minimum cover on reinforcing bars is 1 1/4".

OPTIONAL CONSTRUCTION JOINTS



ALTERNATE A

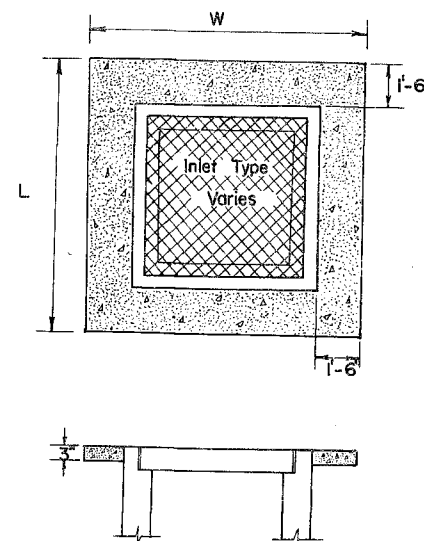


ALTERNATE B

(Cost to be included in the unit price bid for inlets.)

DETAIL OF TEMPORARY SUBGRADE DRAINS

(Optional with Contractor)



Inlet	"L"	"W"	C.Y.
C	7'-5"	6'-4"	0.30
D	8'-5"	7'-5"	0.36
E	8'-10"	7'-4"	0.37
F	8'-4"	6'-11"	0.34
G	9'-4"	9'-2"	0.43
H	12'-0"	7'-4"	0.45

* for estimating purposes only

- Cost of ditch pavement pad to be included in cost of inlet.
- Ditch pavement pad to be used only where shown on the plans.

DITCH PAVEMENT PAD FOR STANDARD DITCH BOTTOM INLETS

NOTE:

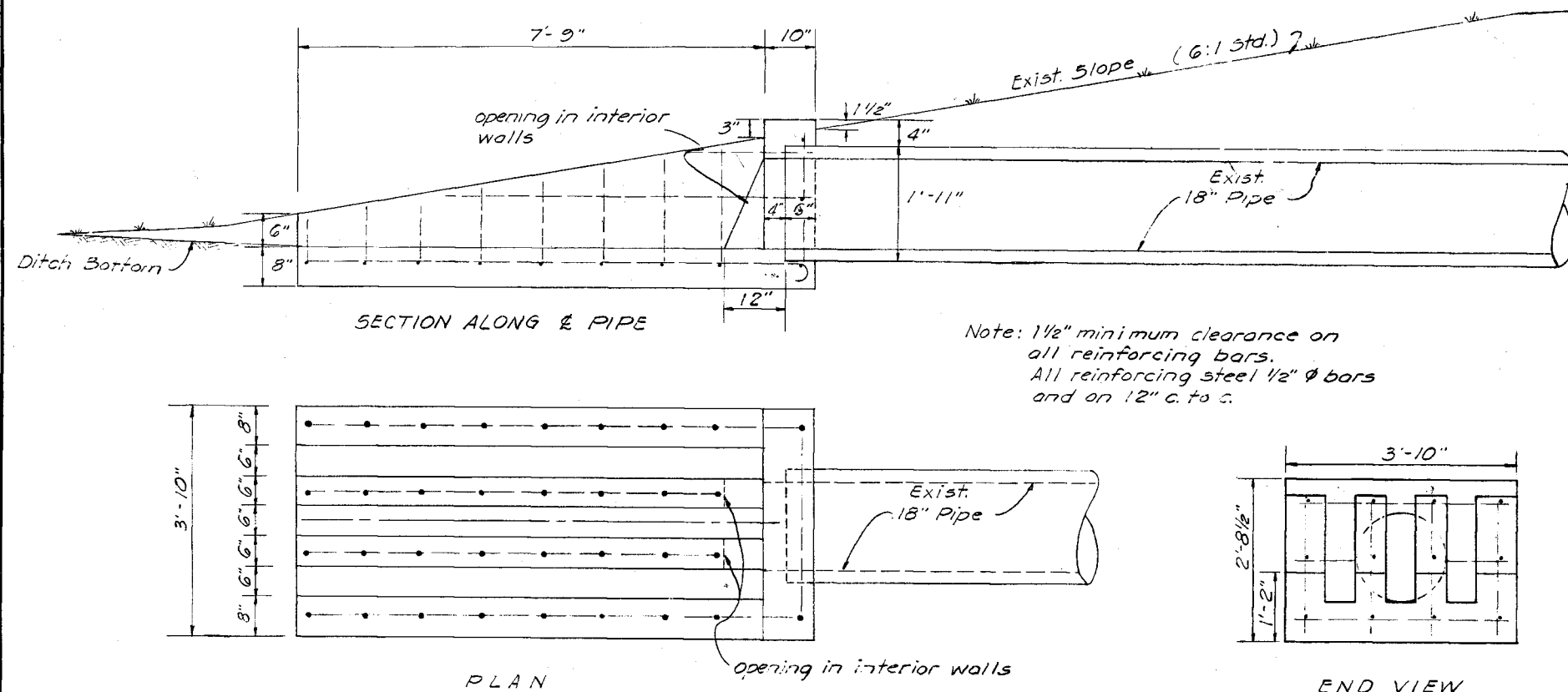
For all manhole, inlet and junction box structures the mortar used to seal the pipe into the walls of the precast units will be of such a mix that shrinkage will not cause leakage into or out of the units. Maximum opening for pipe shall be max. req'd O D + 6".

FHWA Approved: 5-1-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

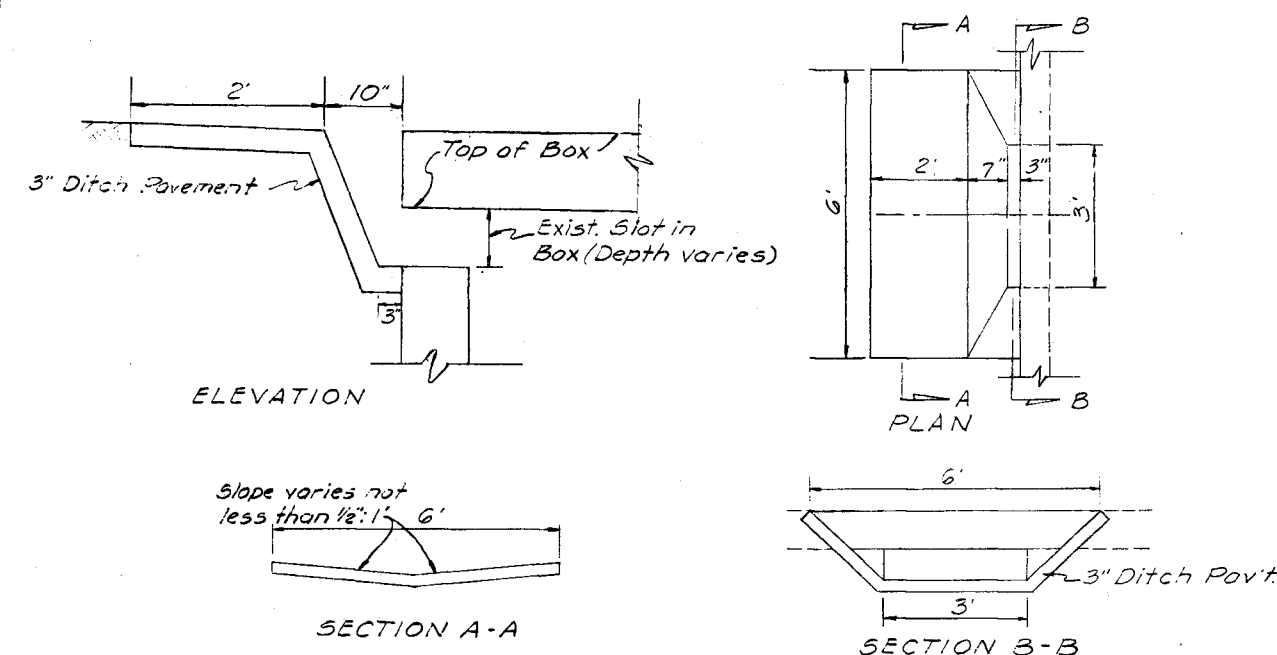
SUPPLEMENTARY DETAILS FOR
MANHOLE & INLET STRUCTURES

REVISED	DATE	DESCRIPTION	ROAD NO.	COUNTY	PROJECT NO.
2-75		REDRAWN			
Designed by	HLB	Checked by	LMF	Supervised by	WJR
Recommended For Approval By:	Deputy Design Engr. - Rdways.	State Design Engineer	Drawing No.	2 of 2	Index No.
					DSD-01

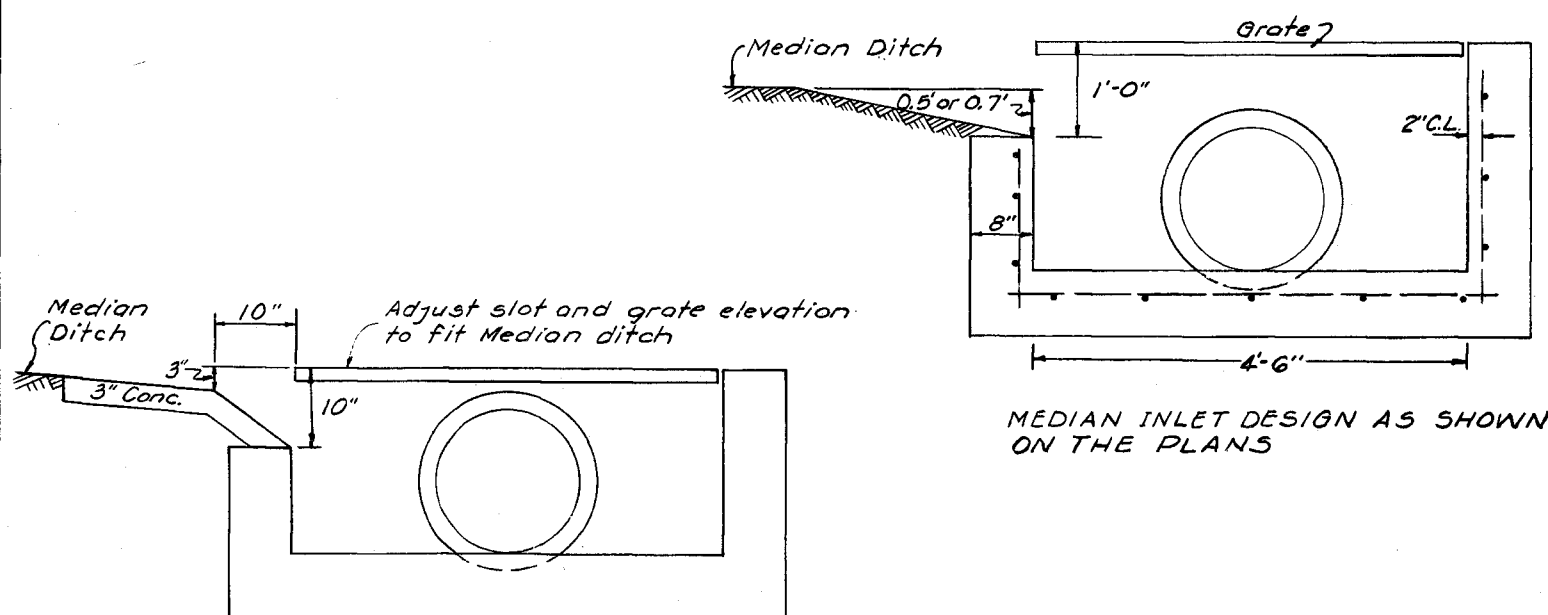


DETAIL OF MEDIAN ENDWALL
(MODIFICATION OF DETAILS SHOWN ON INDEX DCE03.
Scale: 3/4" = 1'

Class I Concrete 1.72 Cu. Yds., Cost of Steel to be included in price for Concrete

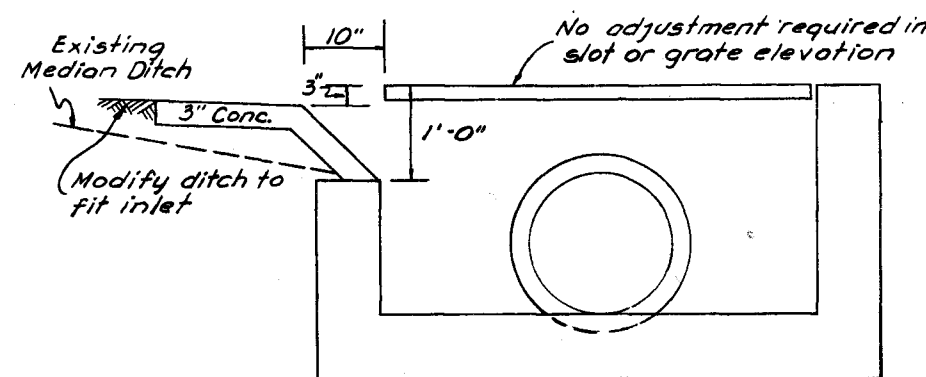


SAFETY MODIFICATION FOR OPENING IN BOX CULVERTS



SAFETY MODIFICATION FOR MEDIAN INLETS

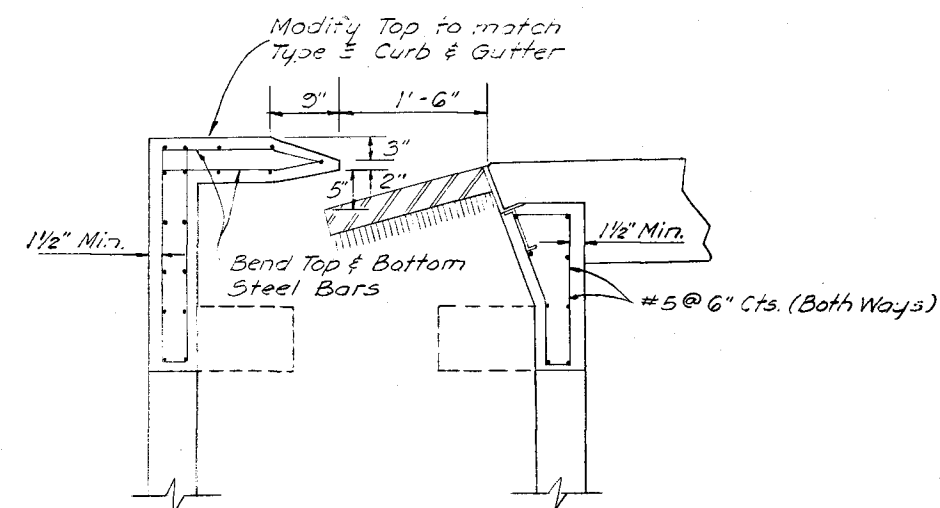
PROPOSED INLET MODIFICATION
WHERE GRATE WAS SET 0.5' ABOVE
THE DITCH



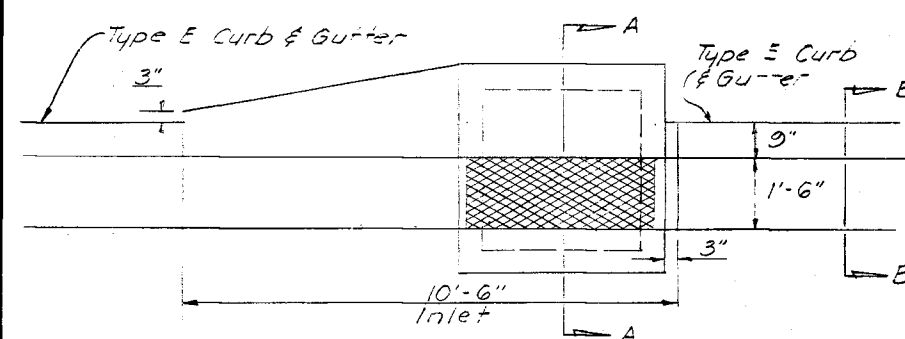
PROPOSED DITCH MODIFICATIONS WHERE
GRATE WAS SET 0.3' ABOVE DITCH ELEV.

NOTE: These modifications will be made only
on Projects now under construction.
Do not use this index for Projects
being designed.

STATE ROAD DEPARTMENT OF FLORIDA ROADWAY PLAINS DEPARTMENT			
SAFETY MODIFICATION			
FHWA Approved: 3-20-75			
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions	Names	Dates
3-73	Added Class I Conc.	H. A. B.	7-67
10-74	Changed Index N/S	D. W. S.	7-67
Checked by		Recommended For Approval by	
Checked by		APPROVED BY	
Checked by		Asst. State Highway Engineer	
Traced by		Drawing No.	
Traced by		of 2	
Traced by		DSM-01	

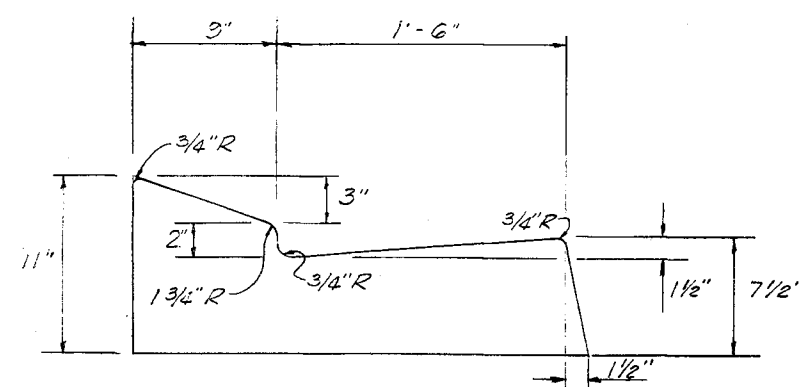


SECTION A-A



PLAN

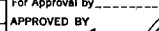
Note: This modification will be required where
Type E Curb & Gutter is constructed adjacent
to the Inlet.



SECTION B-B
TYPE E CURB AND GUTTER

SAFETY MODIFICATION FOR TYPE P-5
INLET (FROM DETAILS ON INDEX DCI-02)

NOTE: These modifications will be made only on Projects now under construction.
Do not use this Index for Projects being designed.

STATE ROAD DEPARTMENT OF FLORIDA ROADWAY PLANS DEPARTMENT				
<h1 style="margin: 0;">SAFETY MODIFICATION</h1>				
FHWA Approved: 3-20-75				
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
10-74	<i>Changed Index N's</i>			
		Names	Dates	Recommended For Approval by
		Detailed by	<i>H.A.B.</i>	<i>7-67</i>
		Checked by	<i>D.W.S.</i>	<i>7-67</i>
		APPROVED BY		
				
		Engineer of Road Design		
		Quantities by		
		Checked by		
		Traced by	<i>M.L.T.</i>	<i>7-67</i>
		Drawing No.		
		2 of 2		
		Index No.		
		DSM-0		

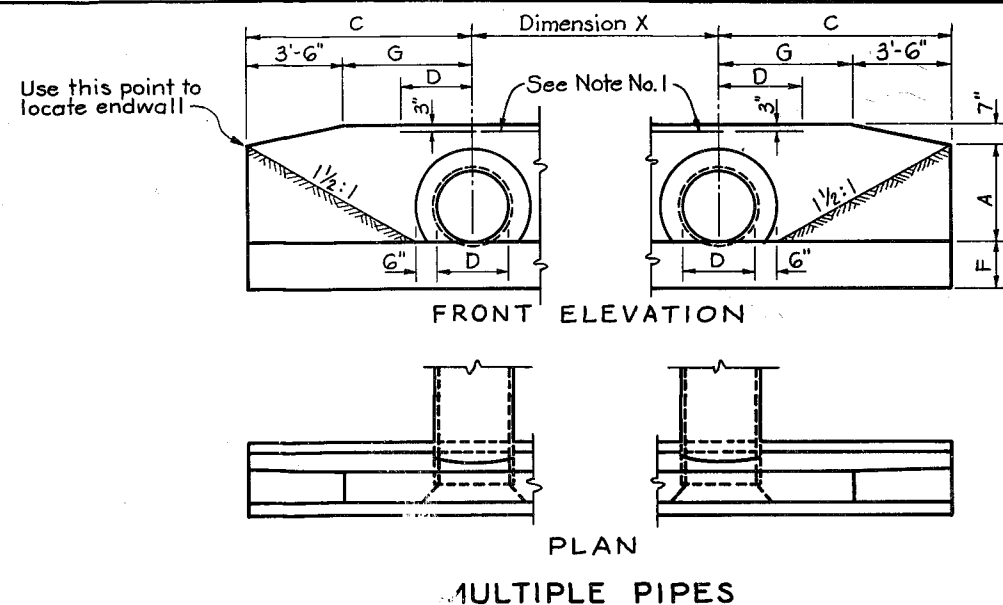


TABLE OF CONSTRUCTION DATA AND ESTIMATED QUANTITIES FOR ROUND PIPE CULVERT ENDWALLS																									
CONSTRUCTION DATA												QUANTITIES IN ONE ENDWALL CU. YDS. OF CLASS I CONCRETE													
D	AREA OF OPENING SQUARE FEET				DIMENSIONS								ONE PIPE CULVERT			TWO PIPE CULVERT			THREE PIPE CULVERT			FOUR PIPE CULVERT			D
	1 PIPE	2 PIPES	3 PIPES	4 PIPES	A	B	C	E	F	G	X	CONC.	C.M.	C.I.	CONC.	C.M.	C.I.	CONC.	C.M.	C.I.	CONC.	C.M.	C.I.		
15"	1.23	2.46	3.69	4.92	1'-11"	1'-2"	4'-0"	1'-10"	1'-2"	0'-6"	2'-7"	1.23	1.24	1.24	1.59	1.62	1.61	1.94	1.99	1.98	2.30	2.37	2.36	15"	
18"	1.77	3.54	5.31	7.08	2'-2"	1'-3"	4'-6"	1'-11"	1'-3"	1'-0"	2'-10"	1.56	1.59	1.58	1.99	2.04	2.03	2.43	2.51	2.49	2.86	2.96	2.94	18"	
21"	2.41	4.82	7.23	9.64	2'-5"	1'-4"	5'-0"	2'-0"	1'-4"	1'-6"	3'-2"	1.97												21"	
24"	3.14	6.28	9.42	12.56	2'-8"	1'-4"	5'-6"	2'-0"	1'-4"	2'-0"	3'-5"	2.24	2.29	2.28	2.82	2.91	2.89	3.39	3.52	3.48	3.97	4.14	4.09	24"	
27"	3.98	7.96	11.94	15.92	2'-11"	1'-5"	6'-0"	2'-1"	1'-5"	2'-6"	3'-10"	2.73												27"	
30"	4.91	9.82	14.73	19.64	3'-2"	1'-6"	6'-6"	2'-2"	1'-6"	3'-0"	4'-3"	3.26	3.34	3.32	4.13	4.28	4.24	4.98	5.20	5.14	5.84	6.13	6.05	30"	
36"	7.07	14.14	21.21	28.28	3'-8"	1'-8"	7'-6"	2'-4"	1'-8"	4'-0"	5'-1"	4.53	4.64	4.61	5.73	5.95	5.89	6.92	7.25	7.17	8.13	8.57	8.46	36"	
42"	9.62	19.24	28.86	38.48	4'-2"	1'-10"	8'-6"	2'-6"	2'-0"	5'-0"	6'-0"	6.33	6.49	6.45	8.11	8.43	8.35	9.90	10.38	10.26	11.68	12.32	12.16	42"	
48"	12.57	25.14	37.71	50.28	4'-8"	2'-1"	9'-6"	2'-9"	2'-0"	6'-0"	6'-9"	8.15	8.38	8.32	10.40	10.85	10.74	12.64	13.34	13.17	14.89	15.82	15.59	48"	
54"	15.90	31.80	47.70	63.60	5'-2"	2'-6"	10'-6"	3'-2"	2'-3"	7'-0"	7'-8"	11.71			15.23			18.77			22.29			54"	

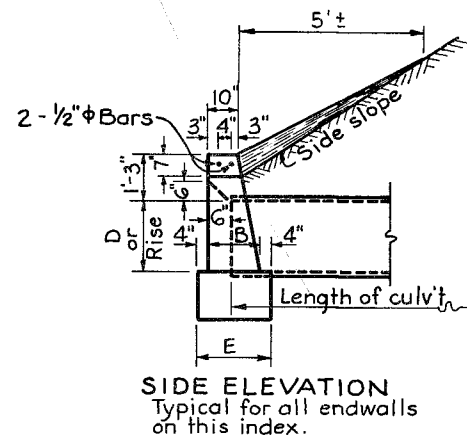
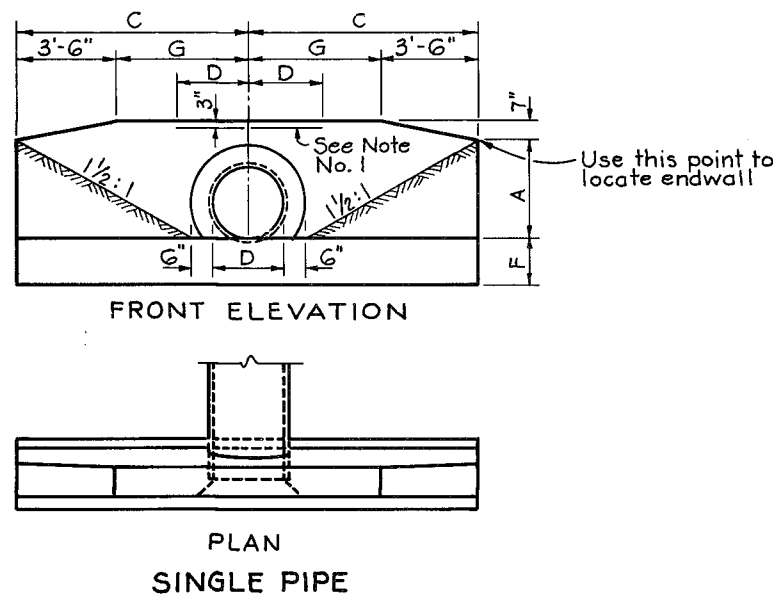
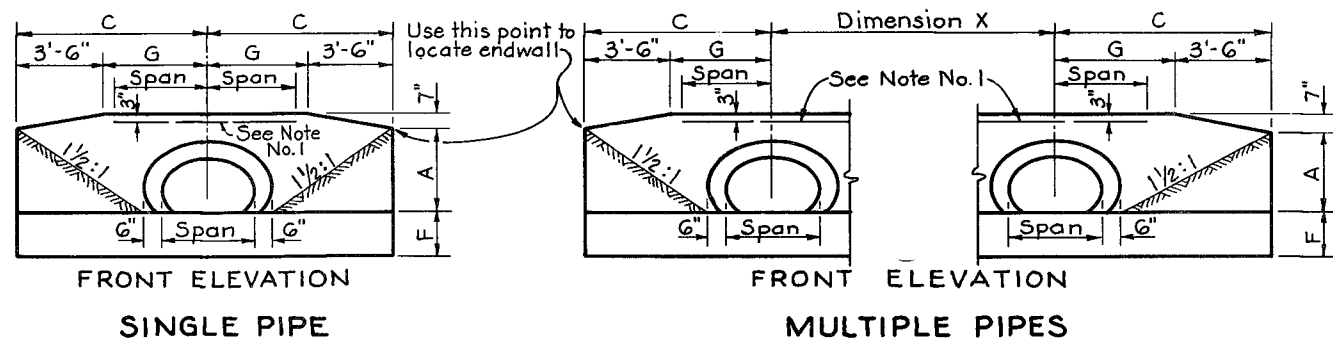


TABLE OF CONSTRUCTION DATA AND ESTIMATED QUANTITIES FOR METAL PIPE ARCH CULVERT ENDWALLS																			
CONSTRUCTION DATA										QUANTITIES IN ONE ENDWALL CU. YDS. OF CLASS I CONCRETE									
SPAN	RISE	AREA OF OPENING SQUARE FEET				DIMENSIONS						1 PIPE	2 PIPES	3 PIPES	4 PIPES	SPAN	RISE	EQUIV. ROUND PIPE	
		1 PIPE	2 PIPES	3 PIPES	4 PIPES	A	B	C	E	F	G	X							
28"	20"	2.8	5.6	8.4	11.2	2'-4"	1'-3"	5'-2"	1'-11"	1'-3"	1'-8"	3'-5"	1.78	2.31	2.83	3.36	28"	20"	24"
35"	24"	4.3	8.6	12.9	17.2	2'-8"	1'-4"	5'-11 1/2"	2'-0"	1'-4"	2'-5 1/2"	4'-0"	2.34	3.03	3.72	4.40	35"	24"	30"
42"	29"	5.9	11.8	17.7	23.6	3'-1"	1'-5"	6'-10 1/2"	2'-1"	1'-5"	3'-4 1/2"	4'-9"	3.13	4.06	4.99	5.93	42"	29"	36"
49"	33"	8.4	16.8	25.2	33.6	3'-5"	1'-6"	7'-8"	2'-2"	1'-6"	4'-2"	5'-6"	3.83	5.00	6.16	7.32	49"	33"	42"
57"	38"	10.6	21.2	31.8	42.4	3'-10"	1'-7"	8'-7 1/2"	2'-3"	1'-7"	5'-1 1/2"	6'-4"	4.87	6.31	7.74	9.18	57"	38"	48"
64"	43"	13.2	26.4	39.6	52.8	4'-3"	1'-8"	9'-6 1/2"	2'-4"	1'-8"	6'-0 1/2"	7'-1"	5.88	7.64	9.40	11.15	64"	43"	54"
71"	47"	16.9	33.8	50.7	67.6	4'-7"	1'-10"	10'-4"	2'-6"	2'-0"	6'-10"	7'-10"	7.80	10.15	12.49	14.85	71"	47"	60"

CONCRETE ENDWALLS FOR ROUND PIPE CULVERTS



CONCRETE ENDWALLS FOR METAL PIPE ARCH CULVERTS AND CONCRETE ELLIPTICAL PIPE CULVERTS

TABLE OF CONSTRUCTION DATA AND ESTIMATED QUANTITIES FOR CONCRETE ELLIPTICAL PIPE CULVERT ENDWALLS																			
CONSTRUCTION DATA										QUANTITIES IN ONE ENDWALL CU. YDS. OF CLASS I CONCRETE									
SPAN	RISE	AREA OF OPENING SQUARE FEET				DIMENSIONS						1 PIPE	2 PIPES	3 PIPES	4 PIPES	SPAN	RISE	EQUIV. ROUND PIPE	
		1 PIPE	2 PIPES	3 PIPES	4 PIPES	A	B	C	E	F	G	X							
30"	19"	3.10	6.20	9.30	12.40	2'-3"	1'-4"	5'-1 1/2"	2'-0"	1'-4"	1'-7 1/2"	4'-2"	1.89	2.55	3.22	3.88	30"	19"	24"
38"	24"	4.98	9.96	14.94	19.92	2'-8"	1'-5"	6'-3"	2'-1"	1'-5"	2'-9"	5'-2"	2.64	3.55	4.48	5.39	38"	24"	30"
45"	29"	7.13	14.26	21.39	28.52	3'-1"	1'-6"	7'-0"	2'-2"	1'-6"	3'-6"	6'-0"	3.32	4.48	5.64	6.80	45"	29"	36"
53"	34"	9.82	19.64	29.46	39.28	3'-6"	1'-7"	7'-11 1/2"	2'-3"	1'-7"	4'-5 1/2"	7'-1"	4.24	5.76	7.29	8.81	53"	34"	42"
60"	38"	12.45	24.90	37.35	49.80	3'-10"	1'-8"	8'-9"	2'-4"	1'-8"	5'-3"	7'-11"	5.22	7.16	9.10	11.05	60"	38"	48"
68"	43"	15.94	31.88	47.82	63.76	4'-3"	1'-10"	9'-8 1/2"	2'-6"	1'-10"	6'-3 1/2"	8'-10"	6.63	9.01	11.39	13.77	68"	43"	54"
76"	48"	19.89	39.78	59.67	79.56	4'-8"	2'-1"	10'-8"	2'-9"	2'-0"	7'-2"	9'-9"	8.66	11.74	14.82	17.91	76"	48"	60"
83"	53"	24.02	48.04	72.06	96.08	5'-1"	2'-6"	11'-7"	3'-2"	2'-6"	8'-1"	10'-7"	12.50	16.98	21.47	25.97	83"	53"	66"
91"	58"	28.76	57.52	86.28	115.04	5'-6"	2'-10"	12'-6 1/2"	3'-6"	2'-10"	9'-0 1/2"	11'-4"	16.46	22.26	28.05	33.85	91"	58"	72"

- GENERAL NOTES**
- Reinforcing Steel grade 40 or 60. Cost of bars shall be included in the contract unit price for concrete.
 - For sodding around endwall see detail on Index N^o GRC-01.
 - Provide 20' transition from endwall to ditch slopes where sideslopes on outfall ditches are flatter than 1 1/2:1.

FHWA APPROVED: 8-30-77

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

CONCRETE ENDWALLS

REVISIONS	INITIALS	DATES
8-77	Up-date CMP Arch to 1974 AASHTO	5/73

Designed by *HAB*
Checked by *LMF*
Quantities by *HAB*
Checked by *LMF*
Supervised by

Recommended for approval by: *[Signature]*
Deputy Design Engineer - Roadways
Approved by: *[Signature]*
State Design Engineer

DRAWING NO. 1 OF 1
INDEX NO. DCE-01-1

FED. ROAD DIV. No.	STATE	SECTION	NO. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
3	FLA.					

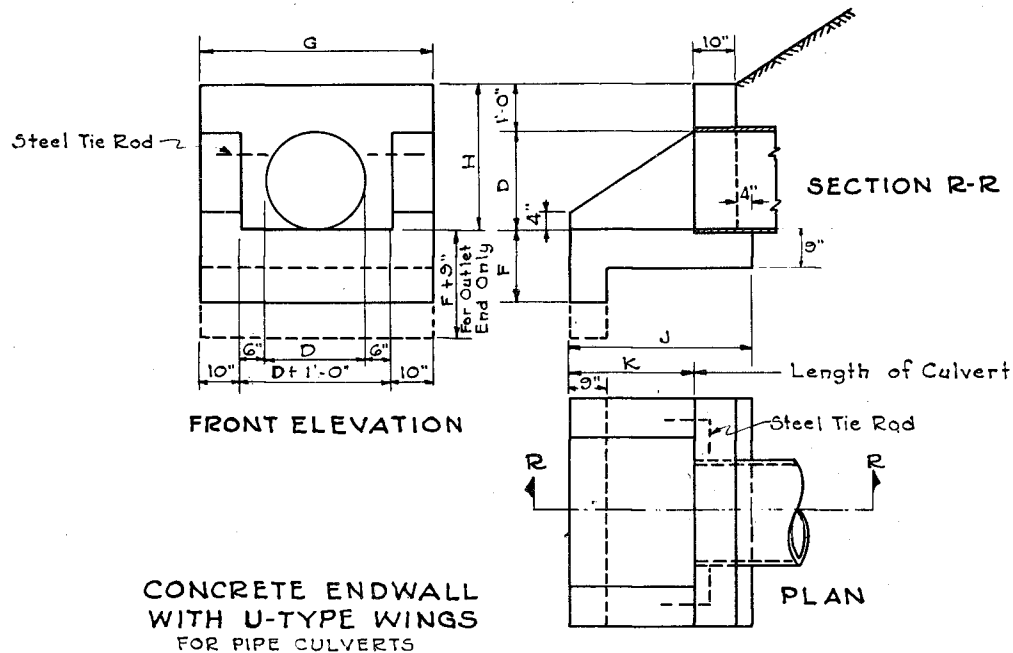


TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES
PIPE CULVERT ENDWALLS WITH U-TYPE WINGS

DIMENSIONS							QUANTITIES IN ONE ENDWALL							
Opening		Wall			Footing		Total Cu.Yds. Concrete, Class I						Steel Tie Rods	
D	Area Sq.Ft.	G	H	K	F	J	Conc. Pipe Inlet	Conc. Pipe Outlet	C.M. Pipe Inlet	C.M. Pipe Outlet	C.I. Pipe Inlet	C.I. Pipe Outlet		
12"	0.8	3'-8"	2'-0"	1'-0"	1'-3"	2'-2"	0.50	0.57	0.51	0.59	0.51	0.59	none	
15"	1.2	3'-11"	2'-3"	1'-5"	1'-3"	2'-7"	0.61	0.69	0.64	0.72	0.63	0.72	none	
18"	1.8	4'-2"	2'-6"	1'-9"	1'-3"	2'-11"	0.72	0.81	0.76	0.84	0.76	0.84	none	
24"	3.1	4'-8"	3'-0"	2'-6"	1'-6"	3'-8"	1.03	1.13	1.08	1.18	1.08	1.18	2-3/4" φ x 2'-0"	
30"	4.9	5'-2"	3'-6"	3'-3"	1'-6"	4'-5"	1.35	1.46	1.43	1.53	1.42	1.53	2-3/4" φ x 2'-0"	
36"	7.1	5'-8"	4'-0"	4'-0"	1'-9"	5'-2"	1.75	1.87	1.86	1.98	1.84	1.96	2-3/4" φ x 2'-6"	
42"	9.6	6'-2"	4'-6"	4'-9"	2'-0"	5'-11"	2.21	2.34	2.34	2.47			2-3/4" φ x 2'-6"	
48"	12.6	6'-8"	5'-0"	5'-6"	2'-0"	6'-8"	2.66	2.80	2.83	2.97			2-3/4" φ x 3'-0"	

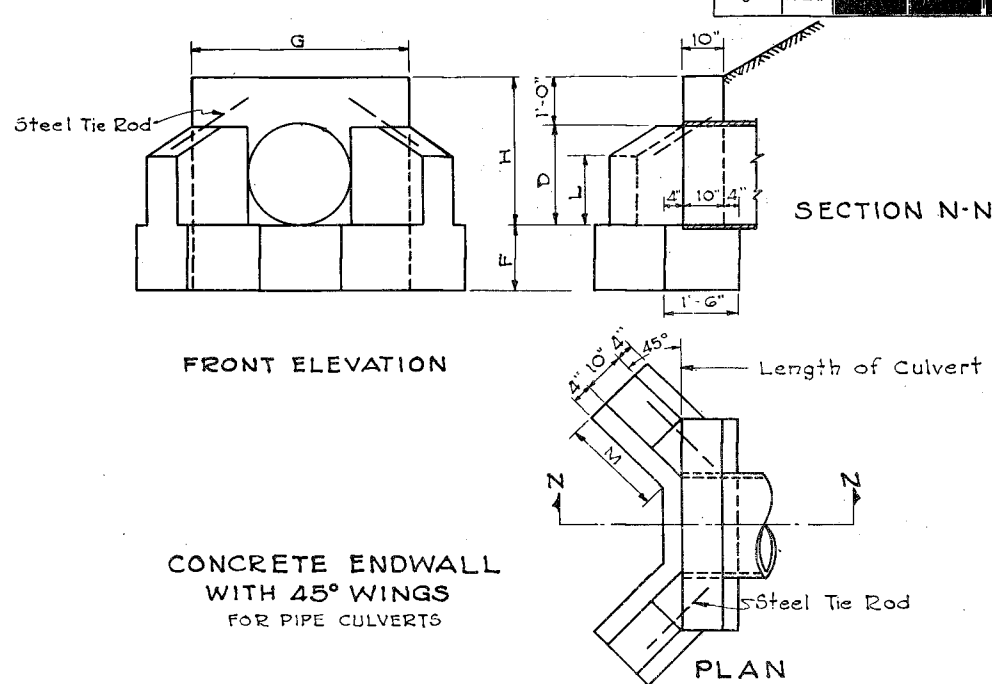


TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES
PIPE CULVERT ENDWALLS WITH 45° WINGS

DIMENSIONS							QUANTITIES IN ONE ENDWALL				
Opening		Wall				Footing	Concrete, Class I			Steel Tie Rods	
D	Area Sq. Ft.	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"	0.76	0.79	0.79	none	
24"	3.1	3'-0"	4'-4"	1'-5"	2'-1"	1'-4"	1.03	1.08	1.08	2-3/4" φ x 2'-0"	
30"	4.9	3'-6"	4'-10"	1'-9"	2'-5"	1'-6"	1.34	1.42	1.41	2-3/4" φ x 2'-0"	
36"	7.1	4'-0"	5'-4"	2'-0"	2'-11"	1'-8"	1.74	1.85	1.84	2-3/4" φ x 3'-0"	
42"	9.6	4'-6"	5'-10"	2'-3"	3'-6"	2'-0"	2.36	2.49		2-3/4" φ x 3'-0"	
48"	12.6	5'-0"	6'-4"	2'-6"	4'-0"	2'-0"	2.76	2.92		2 3/4" φ x 3'-0"	
15"	1.2	2'-3"	3'-7"	1'-0"	1'-3"	1'-3"	0.58	0.61	0.61	none	

Note:
Chamfer all exposed edges 3/4".
Provide good foundation under pipes using concrete, if natural conditions are very bad.
Where tie rods are required the cost of same shall be included in the unit price bid for Concrete.

Rev. 6-14-46

FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION

ROADWAY PLANS SECTION

STANDARD ENDWALLS FOR PIPE CULVERTS.

ROAD NO.

COUNTY

SECTION

JOB NO.

DESIGNED BY

CHECKED BY

DRAWN BY

CHECKED BY

QUANTITIES BY

CHECKED BY

TRACED BY

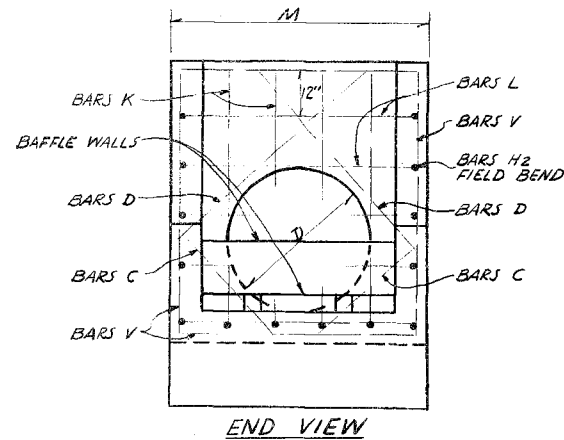
APPROVED BY

DEPUTY DESIGN ENGINEER - ROADWAYS

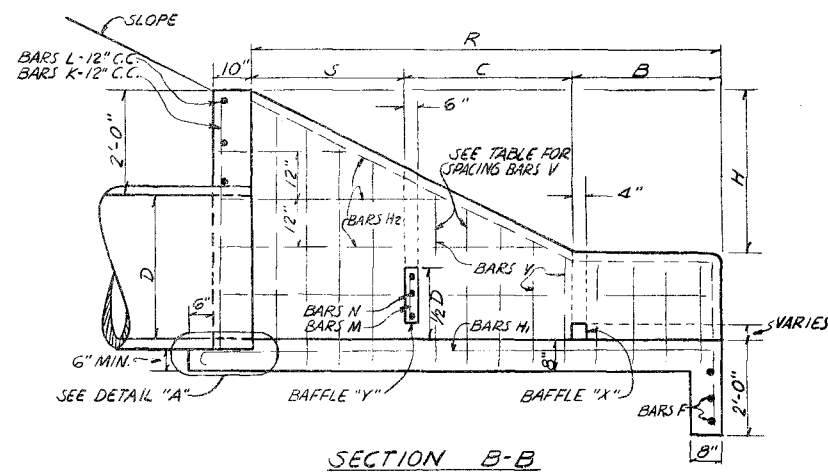
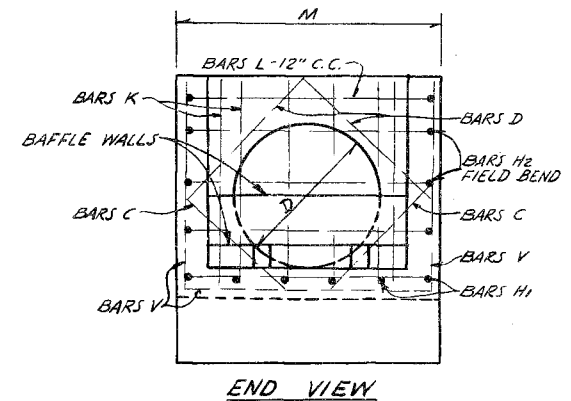
DRAWING NO.

INDEX NO.

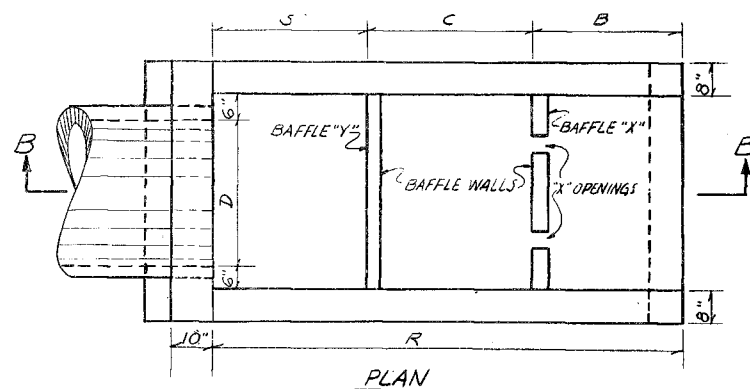
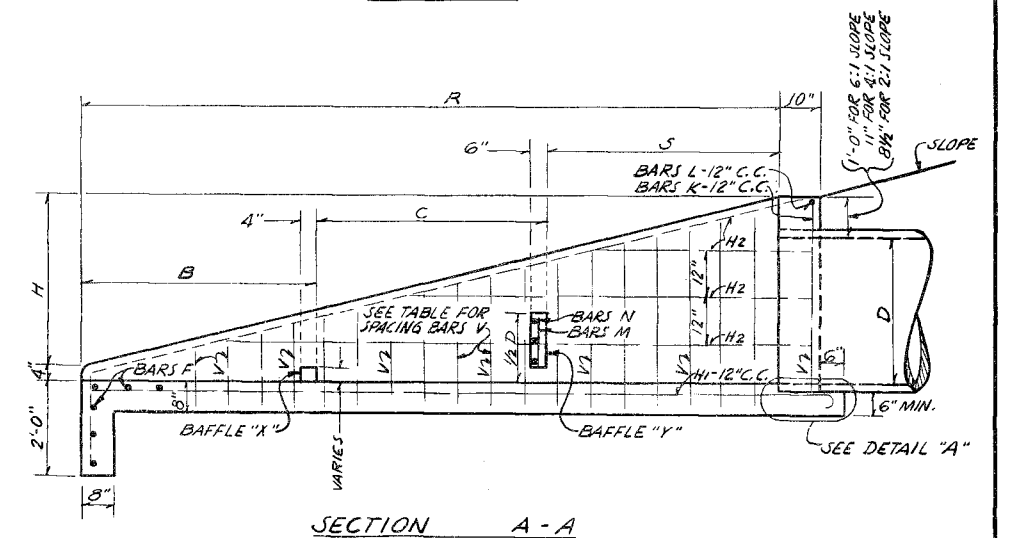
REVISIONS			REVISIONS			REVISIONS		
Names	Dates	Descriptions	Names	Dates	Descriptions	Names	Dates	Descriptions
LMF	8-70	Raised side slope to top of endwall	C.A.H.	7-10-39				
LMF	3-73	Added Class I Conc	H.L.F.	7-20-43	Retraced			
LMF	4-74	Removed straight endwall details	C.H.R.	6-14-44	Tie Rods			
LMF	10-74	Changed Index No.	B.A.S.	9-26-51	Retraced			
			H.W.	11-7-55	15' 45" added			
			LMF	8-12-70	Added bevel to straight endwall			



RATE OF SLOPE	PIPE SIZE "D"	AREA OF OPENING SQ. FT.	R	H	M	BAFFLE LOCATIONS (WHEN REQUIRED)			CONCRETE CLASS I CU. YD.	REINFORCING STEEL LBS.
						S	B	C		
2:1	15"	1.23	3'-3"	1'-7 1/2"	3'-7"				0.89	43
	18"	1.77	3'-9"	1'-10 1/2"	3'-10"				1.05	60
	24"	3.14	4'-9"	2'-4 1/2"	4'-4"				1.40	82
	30"	4.91	5'-9"	2'-10 1/2"	4'-10"				1.88	146
4:1	15"	1.23	7'-4"	1'-10"	3'-7"	2'-6"	2'-6"	2'-4"	1.54	80
	18"	1.77	8'-4"	2'-1"	3'-10"	2'-10"	2'-10"	2'-8"	1.84	109
	24"	3.14	10'-4"	2'-7"	4'-4"	3'-6"	3'-6"	3'-4"	2.53	139
	30"	4.91	12'-4"	3'-1"	4'-10"	4'-2"	4'-2"	4'-0"	3.34	236
6:1	15"	1.23	11'-6"	1'-11"	3'-7"	3'-10"	3'-10"	3'-10"	2.19	138
	18"	1.77	13'-0"	2'-2"	3'-10"	4'-4"	4'-4"	4'-4"	2.63	145
	24"	3.14	16'-0"	2'-8"	4'-4"	5'-4"	5'-4"	5'-4"	3.59	227
	30"	4.91	19'-0"	3'-2"	4'-10"	6'-4"	6'-4"	6'-4"	4.81	333



PIPE SIZE "D"	X BAFFLE OPENINGS			Y BAFFLE OPENING VERTICAL CLEARANCE	Y BAFFLE - REINFORCING STEEL		CONCRETE CLASS I CU. YD.	REINFORCING STEEL LBS.
	WIDTH	HEIGHT	LENGTH		BAR# M	BAR# N		
15"	4"	4"	4"	4"	3 - #4	1 - #4	0.03	4
18"	4"	4"	4"	4"	4 - #4	2 - #4	0.04	8
24"	5"	5"	4"	4"	5 - #4	3 - #4	0.05	12
30"	5"	5"	4"	4"	6 - #4	4 - #4	0.07	18



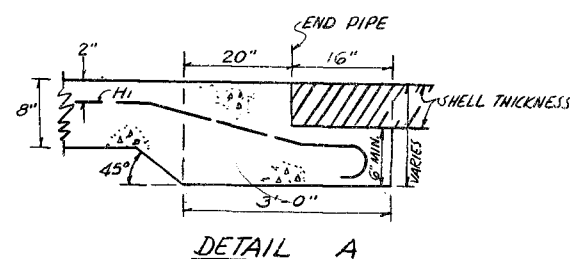
PIPE SIZE "D"	AREA OF OPENING SQ. FT.	R	H	M	S	B	C	X BAFFLE OPENINGS		Y BAFFLE OPENING VERTICAL CLEAR.	Y BAFFLE REINFORCING STEEL		*CONCRETE CLASS I CU.YD.	*REINFORCING STEEL LBS.
								WIDTH	HEIGHT		BAR# M	BAR# N		
15"	1.23	5'-9"	2'-3 1/2"	3'-7"	2'-3"	1'-3"	2'-3"	4"	4"	4"	3-#4	1-#4	1.61	99
18"	1.77	6'-6"	2'-5"	3'-10"	2'-6"	1'-6"	2'-6"	4"	4"	4"	4-#4	2-#4	1.89	142
24"	3.14	8'-0"	2'-8"	4'-4"	3'-0"	2'-0"	3'-0"	5"	5"	4"	5-#4	3-#4	2.52	193
30"	4.91	9'-6"	2'-11"	4'-10"	3'-6"	2'-6"	3'-6"	5"	5"	4"	6-#4	4-#4	3.34	241

* NOTE: CONCRETE AND REINFORCING STEEL QUANTITIES IN THIS TABLE INCLUDE BAFFLE QUANTITIES.

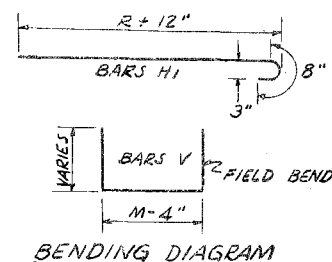
DETAILS OF U-ENDWALL WITH BAFFLES
FOR 2:1 SLOPE

NOTE: FOR SODDING AROUND ENDWALL SEE INDEX NO GRC-01.

NOTE: ALL REINFORCING STEEL IS $\frac{1}{2}$ " ϕ BARS. ALL BAR DIMENSIONS ARE GIVEN OUT TO OUT. BAR CLEARANCE 2" EXCEPT AS NOTED.



V & F BAR SPACING	
PIPE DIAMETER	C. C.
15"	12"
18"	12"
24"	10"
30"	10"



BENDING DIAGRAM

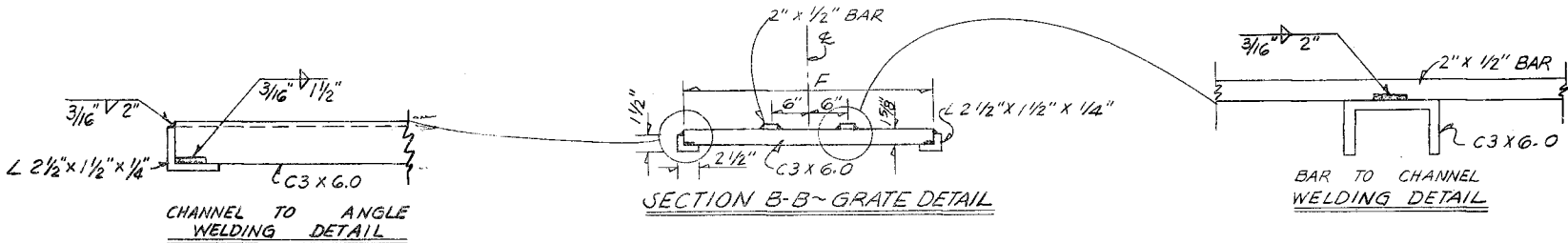
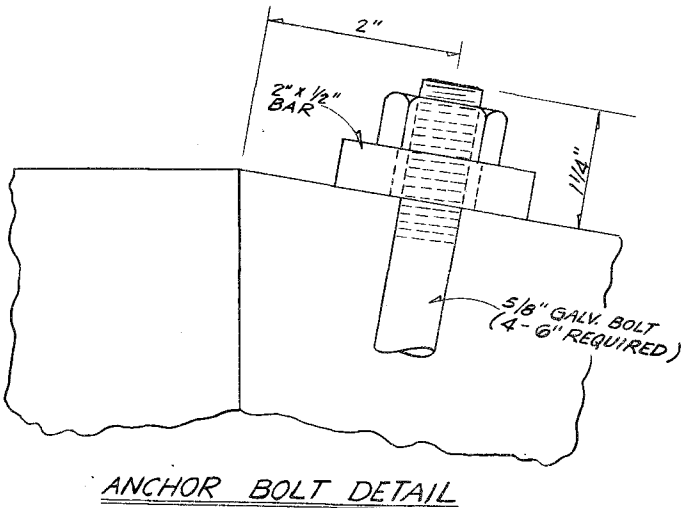
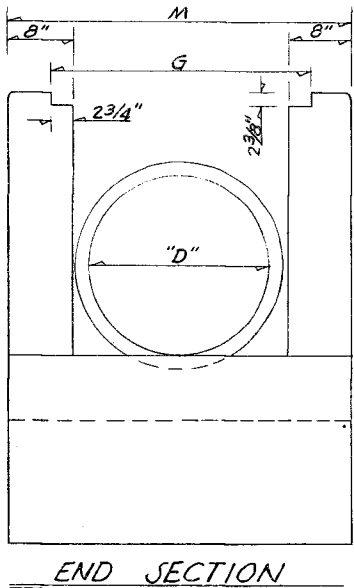
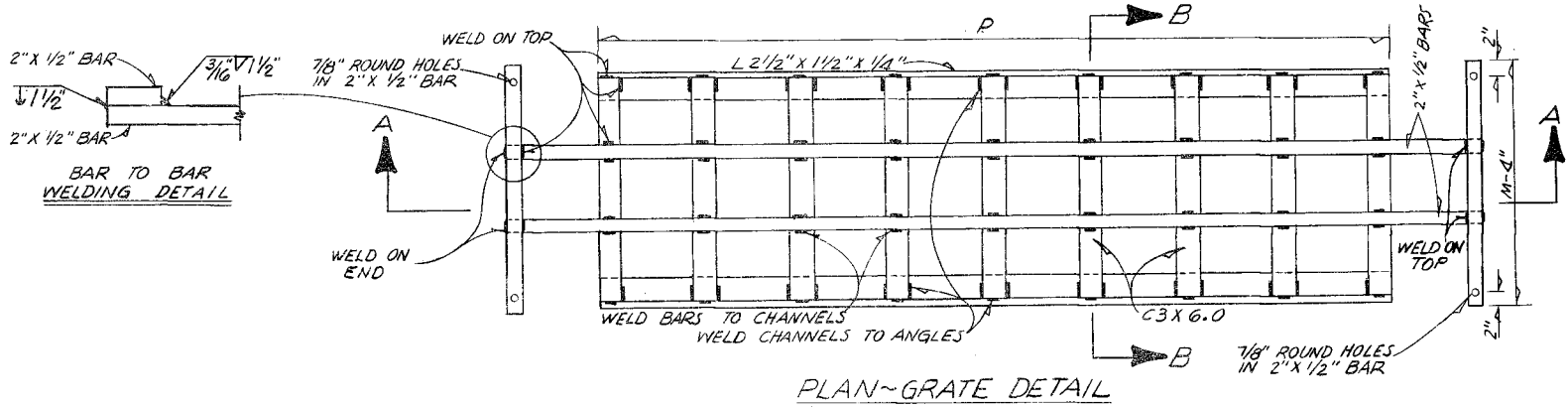
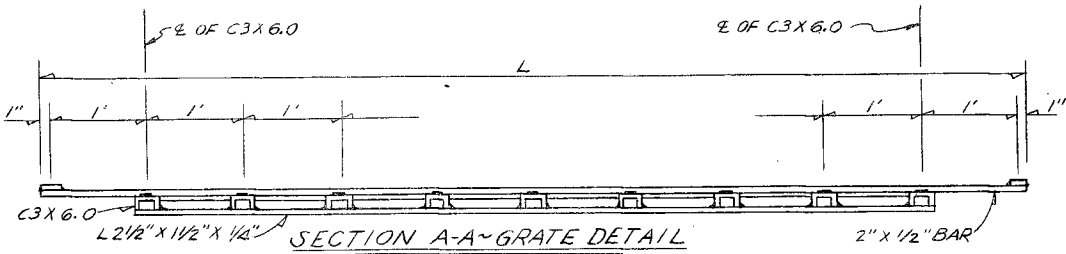
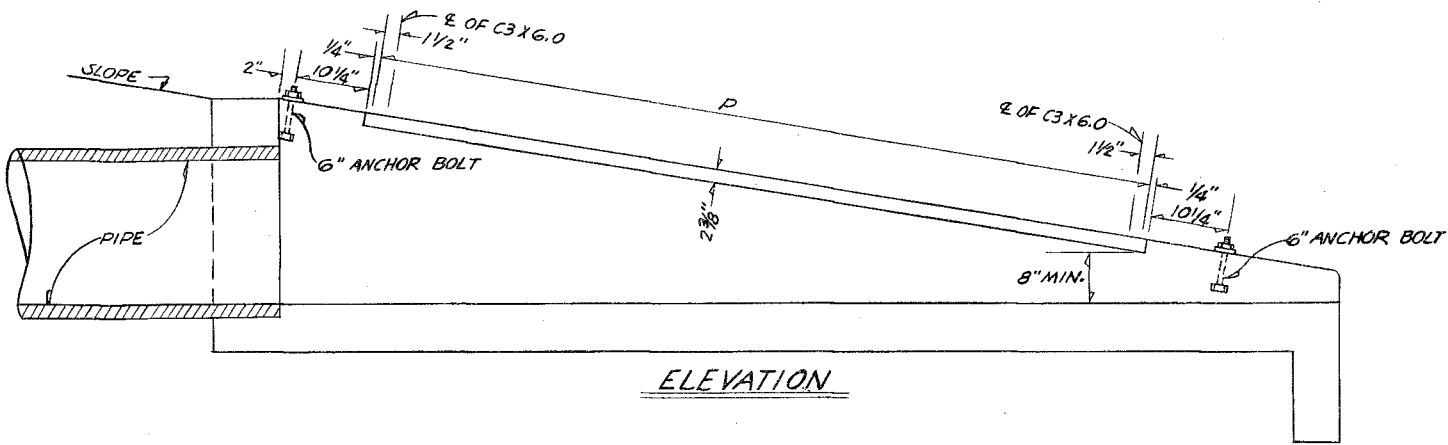
NOTE: BAFFLE WALLS TO BE CONSTRUCTED ONLY WHERE SPECIFIED IN THE PLANS.

-PLAN-
DETAILS OF U-ENDWALL WITH OR WITHOUT BAFFLES
FOR 4:1 AND 6:1 SLOPES
AND WITHOUT BAFFLES FOR 2:1 SLOPE

NOTE: WHEN STEEL GRATING IS REQUIRED ON ENDWALL SEE SHEET NO 2 OF 3 FOR MOUNTING DETAILS.

REVISIONS		REVISIONS		ROAD NO.		COUNTY	PROJECT NO.	
Date	Description	Date	Description		Name	Date	Recommended for approval by	
10/69	REMOVED SCOURINGS IN BATTLE X & ADDED S.H. 2	3-62	Rev. Baffles & Redrown	Checked by			APPROVED BY: [Signature] DEPUTY DESIGN ENGINEER - ROUTE	
L.W.		L.H.		Quantities by				
8/70	Raised Side slope to top of endwall	6-64	Rev. Baffles "X" & "L"	Checked by				
LMF		L.H.		Traced by				
7/71	REVISED TO ACCOMMODATE STEEL GATING	2-68	Quantities Extended To Include Thru 6" Pipe					
G.D.R.		S.B.						

(See Sheet 2 for additional revisions)



DETAILS OF STEEL GRATING FOR U-ENDWALL

GENERAL NOTES:

1. COST OF GRATING TO BE PAID FOR AS ENDWALL GRATE PER POUND.
2. COST OF GALVANIZED BOLTS AND NUTS TO BE INCLUDED IN BID PRICE FOR ENDWALL GRATE.
3. ALL ANGLE, CHANNEL AND BAR STEEL TO BE A.S.T.M. A-588 WEATHERING STEEL EXCEPT AS NOTED IN GENERAL NOTE NO. 4.
4. WHEN GRATING WILL BE EXPOSED TO SALT WATER ALL ANGLE, CHANNEL AND BAR STEEL TO BE A.S.T.M. A-572 GRADE 50, GALVANIZED.
5. CHANNEL SECTION C4 X 5.4 MAY BE USED AS AN ALTERNATE FOR C3 X 6.0 CHANNEL.

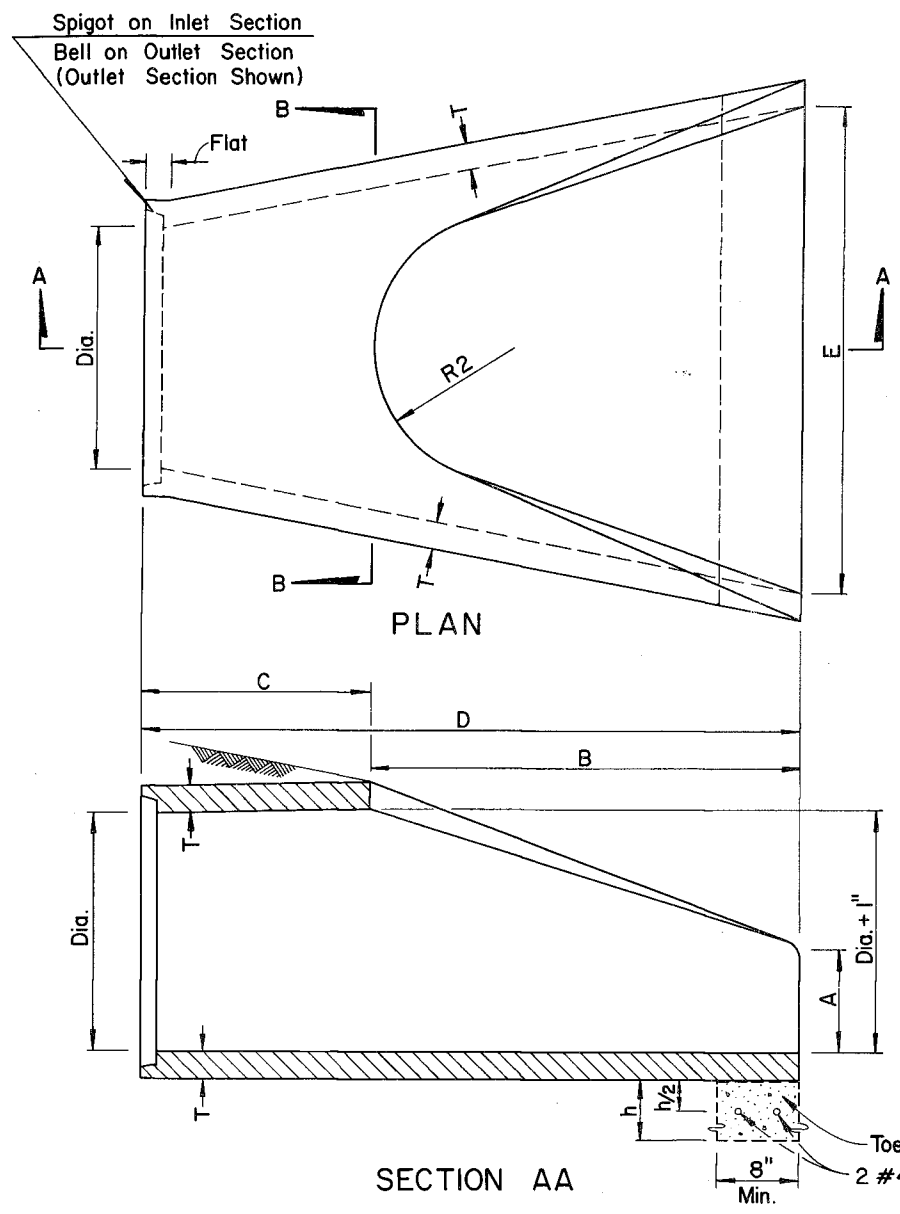
STEEL GRATING USE CRITERIA

1. GRATED HEADWALL AND/OR ENDWALL TO BE USED ON PIPE CULVERTS WHEN IN THE DESIGNATED CLEAR RECOVERY AREA AND WHEN ANY 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 AND ONLY ON HEADWALLS AND/OR ENDWALLS HAVING EITHER 4:1 OR 6:1 RATES OF SLOPE.

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 @ 6 LBS./L.F.			2 ANGLES @ 3.2 LBS./L.F.		
			L	M-4"	LBS.	(X)	F	LBS.	P	LBS.	TOTAL WEIGHT LBS.
6:1	15"	2'-8 1/2"	9'-2"	3'-3"	85	8	2'-7 1/2"	126	7'-3"	47	258
	18"	2'-11 1/2"	10'-2"	3'-6"	93	9	2'-10 1/2"	156	8'-3"	53	302
	24"	3'-5 1/2"	13'-2"	4'-0"	117	12	3'-4 1/2"	243	11'-3"	72	432
	30"	3'-11 1/2"	16'-2"	4'-6"	141	15	3'-10 1/2"	349	14'-3"	92	582
4:1	15"	2'-8 1/2"	6'-2"	3'-3"	64	5	2'-7 1/2"	79	4'-3"	28	171
	18"	2'-11 1/2"	7'-2"	3'-6"	73	6	2'-10 1/2"	104	5'-3"	34	211
	24"	3'-5 1/2"	9'-2"	4'-0"	90	8	3'-4 1/2"	162	7'-3"	47	299
	30"	3'-11 1/2"	11'-2"	4'-6"	107	10	3'-10 1/2"	233	9'-3"	60	400

FHWA APPROVED: 3-20-75
 FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
 U-ENDWALLS FOR PIPE CULVERTS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
3-73	Revised Weld Locations & Size			
10-74	Changed Index No.			
Detailed by		Names	Dates	Recommended For Approval by
Checked by				
Quantities by				
Checked by				
Traced by				
APPROVED BY				State Design Engineer
Drawing No.				Index No.
2 of 3				DCE-03



DIA.	T	REINF. Sq. In. Lin. Ft.	BELL or SPIGOT	A	B	C	D	E	P	R1	R2	FLAT	WEIGHT (LBS.)	TOE WALL h
12"	2"	0.07	1 1/2"	4"	2'-0"	4'-0 7/8"	6'-0 7/8"	2'-0"	19 15/16"	10 1/8"	9"	3 1/2"	530	12"
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"
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"
21"	2 3/4"	0.07	2 1/2"	9"	2'-11"	3'-2"	6'-1"	3'-6"	31 5/8"	16 1/8"	13"	4"	1280	15"
24"	3"	0.07	2 1/2"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	33 3/16"	16 3/16"	14"	4 1/2"	1520	18"
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 3/16"	14 1/2"	4 1/2"	1930	18"
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"
36"	4"	0.148	3 1/2"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	47 15/16"	24 9/16"	20"	5 1/2"	4100	21"
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"
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"
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"
60"	6"	0.174	5"	2'-6"	5'-0"	3'-3"	8'-3"	8'-0"	72 1/2"	36 1/16"	24"	6 3/4"	8750	24"
66"	6 1/2"	0.174	5 1/2"	2'-0"	6'-6"	1'-9"	8'-3"	8'-6"	72"	36 1/8"	24"	7 1/4"	10630	24"
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"

GENERAL NOTES

- Flared end sections shall conform to the requirements of ASTM 76 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 Engineer of Drainage.
- 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.

The manufacturer of the flared end section shall identify the manufacturer of the pipe culvert and certify that the flared end section is suited to joining the pipe culvert.
 - Joints sealed with preformed plastic gaskets.

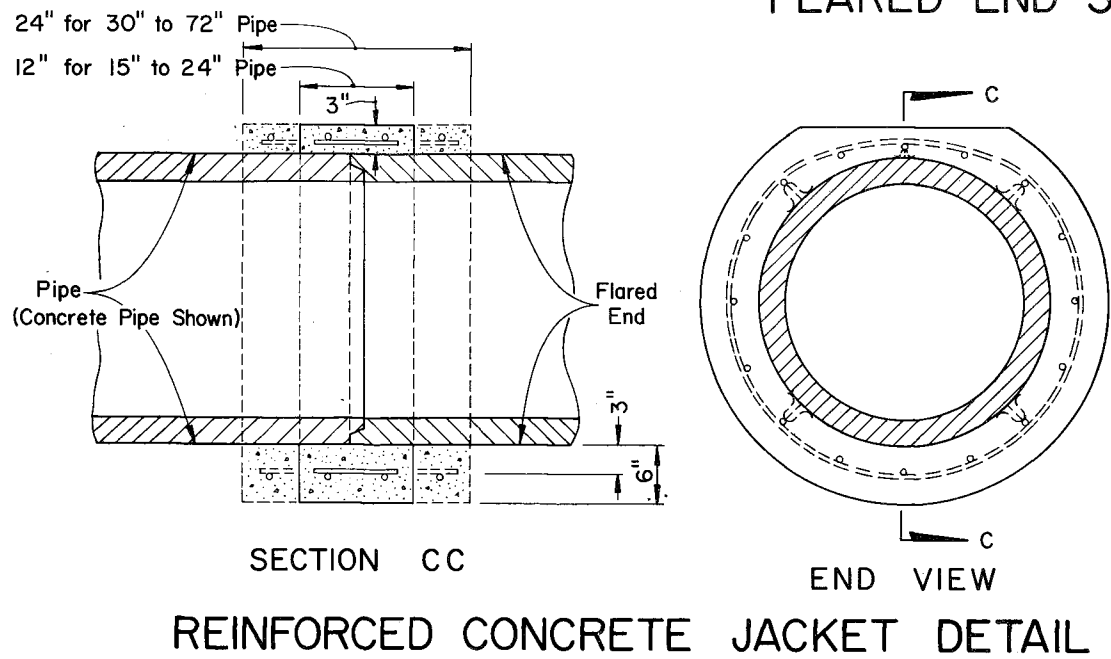
The gaskets shall meet the requirements of Section 942-2 of the Standard Specifications and the minimum sizes for gaskets shall be as that specified for equivalent sizes of elliptical pipe.
 - Reinforced concrete jackets, as detailed on this drawing.

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 DMD-01. Bituminous coating to 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). Reinforcing steel to be included in cost of toe wall.
- Sodding shall be placed about the flared end section in accordance with Index GRC-01, and paid for under the contract unit price for Sodding.
- 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.

DESIGN NOTES

- Flared end sections are intended for use outside the clear recovery area on median drain and cross drain installations. 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 will 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.

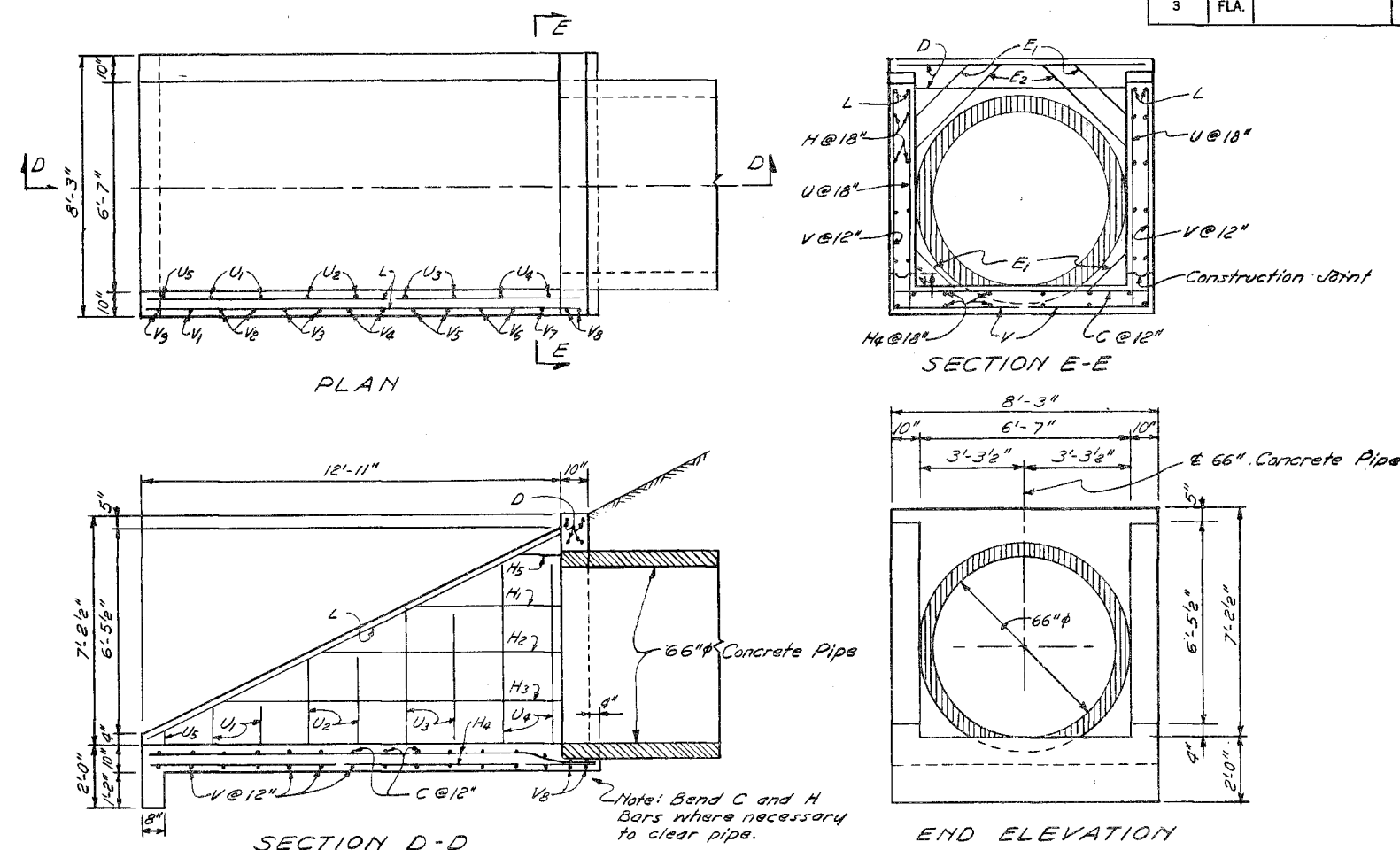
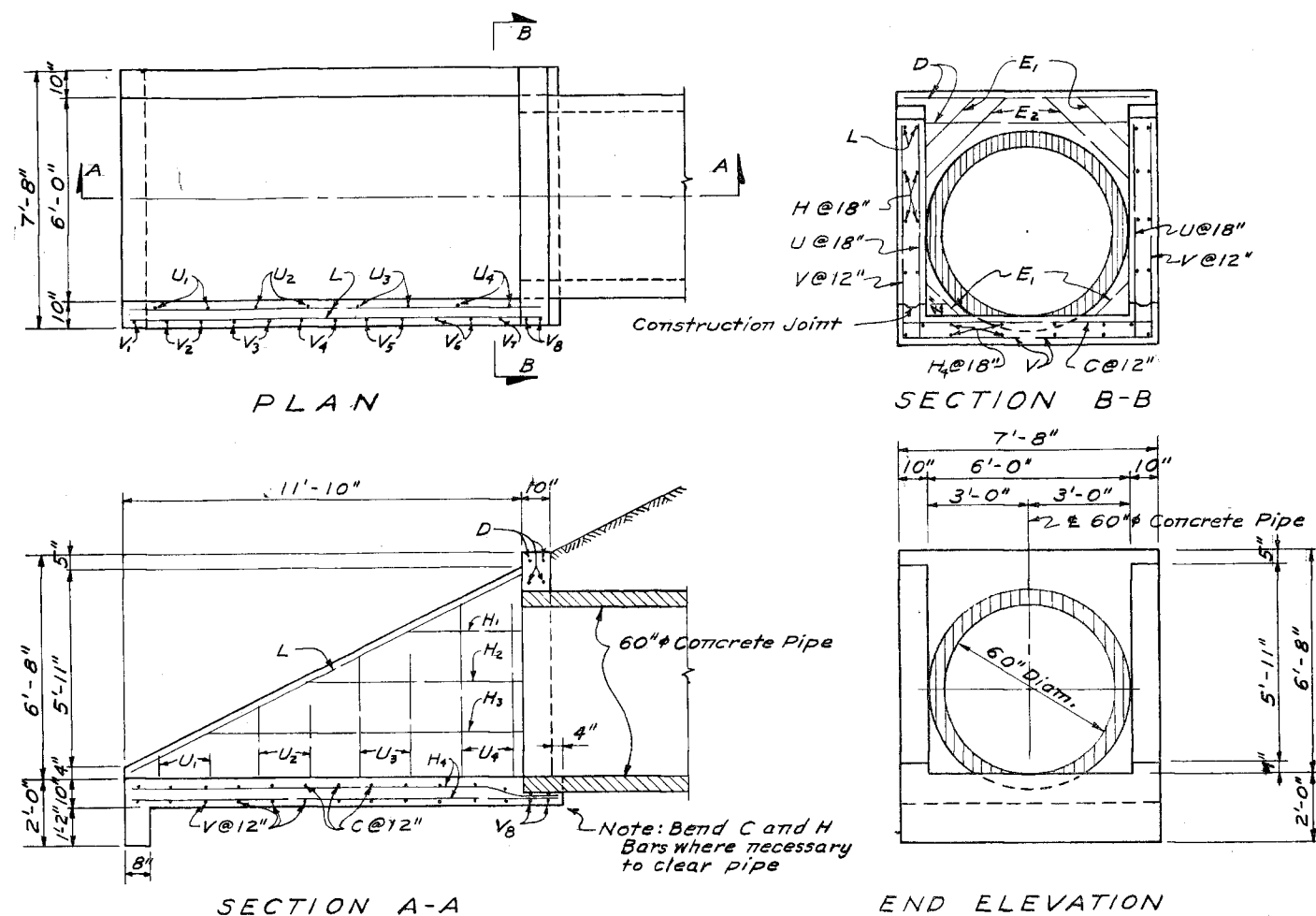


F.H.W.A. APPROVED: 9-23-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

**FLARED END SECTION
FOR PIPE CULVERTS**

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
9-77	Redrawn & Sheet 2 Deleted			
Designed by	E.G.R.	Dates	9-77	APPROVED BY
Checked by	J.V.G.	Dates	9-77	<i>E.H. Hart</i> Deputy Design Engineer, Roadways
Drawn by	H.K.H.	Dates	9-77	
Checked by	J.V.G.	Dates	9-77	
Supervised by	D.C.B.			Drawing No. Index No.
				1 of 1 DCE-04-1



BILL OF REINFORCING STEEL						ESTIMATED QUANTITIES		
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING	ITEM	UNIT	QUANTITY
C	4	14	7'-4"	Slab	Straight	Concrete, Class II Reinforcing Steel	Cu. Yd.	6.39
D	4	4	7'-4"	Headwall	"		Lb.	488
E ₁	4	8	3'-3"	"	"	BENDING DIAGRAMS		
E ₂	4	4	4'-4"	"	"			
H ₁	4	4	4'-1"	Wings	"	BENDING DIAGRAMS		
H ₂	4	4	7'-1"	"	"			
H ₃	4	4	10'-1"	"	"	BENDING DIAGRAMS		
H ₄	4	12	12'-8"	Slab	"			
L	4	4	13'-9"	Wings	"	BENDING DIAGRAMS		
U ₁	4	4	1'-3"	"	"			
U ₂	4	4	2'-9"	"	"	BENDING DIAGRAMS		
U ₃	4	4	4'-3"	"	"			
U ₄	4	4	5'-9"	"	"	BENDING DIAGRAMS		
V ₁	4	2	4'-4"	Wings & Slab	See Diagram			
V ₂	4	4	4'-10"	" "	" "	BENDING DIAGRAMS		
V ₃	4	4	5'-10"	" "	" "			
V ₄	4	4	6'-10"	" "	" "	BENDING DIAGRAMS		
V ₅	4	4	7'-10"	" "	" "			
V ₆	4	4	8'-10"	" "	" "	BENDING DIAGRAMS		
V ₇	4	2	9'-10"	" "	" "			
V ₈	4	4	10'-7"	" "	" "	BENDING DIAGRAMS		

3'-6"		V ₁	11"	V ₂	1'-5"	V ₃	2'-5"	V ₄	3'-5"	V ₅	4'-5"	V ₆	5'-5"	V ₇	6'-5"	V ₈	7'-2"
BARS V																	
Note: Bar dimensions are given out to out.																	

Note: Bar dimensions are given out to out.

BILL OF REINFORCING STEEL						ESTIMATED QUANTITIES		
MARK	SIZE	NO. REQ'D	LENGTH	LOCATION	BENDING	ITEM	UNIT	QUANTITY
C	4	15	7'-11"	Slab	Straight	Concrete, Class II	Cu. Yd.	7.43
D	4	4	7'-11"	Headwall	"	Reinforcing Steel	Lb.	535
E ₁	4	8	3'-6"	"	"	BENDING DIAGRAMS		
E ₂	4	4	4'-8"	"	"			
H ₁	4	4	5'-2"	Wings	"	BENDING DIAGRAMS		
H ₂	4	4	8'-2"	"	"			
H ₃	4	4	11'-2"	"	"	BENDING DIAGRAMS		
H ₄	4	12	13'-9"	Slab	"			
H ₅	4	4	2'-2"	Wings	"	BENDING DIAGRAMS		
L	4	4	15'-1"	"	"			
U ₁	4	4	1'-10"	"	"	BENDING DIAGRAMS		
U ₂	4	4	3'-4"	"	"			
U ₃	4	4	4'-10"	"	"	BENDING DIAGRAMS		
U ₄	4	4	6'-4"	"	"			
U ₅	4	2	1'-1"	"	"	BENDING DIAGRAMS		
V ₁	4	2	5'-4"	Wing & Slab	See Diagram			
V ₂	4	4	5'-10"	"	"	BENDING DIAGRAMS		
V ₃	4	4	6'-10"	"	"			
V ₄	4	4	7'-10"	"	"	BENDING DIAGRAMS		
V ₅	4	4	8'-10"	"	"			
V ₆	4	4	9'-10"	"	"	BENDING DIAGRAMS		
V ₇	4	2	10'-10"	"	"			
V ₈	4	4	11'-6"	"	"	BENDING DIAGRAMS		
V ₉	4	2	4'-10"	"	"			

Note: All bar dimensions are out-to-out.

Note: For splicing around endwall see detail on Index No. GRC-0'

CONCRETE ENDWALL WITH U-TYPE WINGS
FOR 60" CONCRETE PIPE

CONCRETE ENDWALL WITH
U-TYPE WINGS FOR 66" CONCRETE PIPE

FHWA APPROVED: 3-20-75

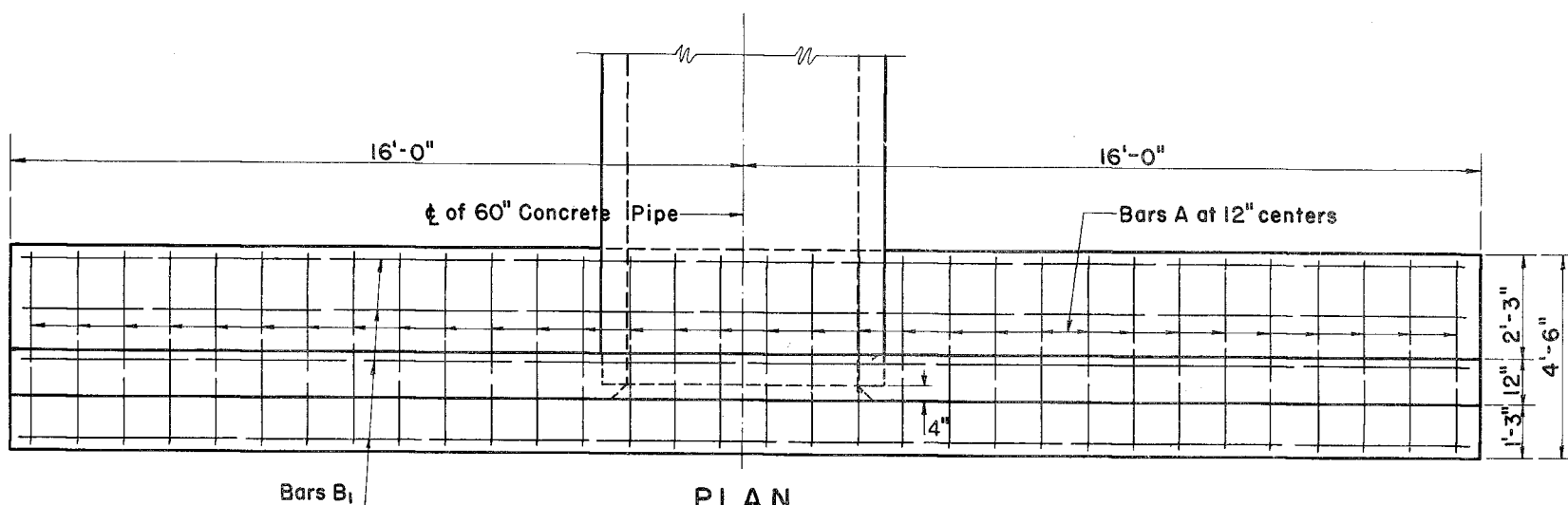
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
U- ENDWALL FOR
60" and 66" PIPE CULVERT

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
11-60 Endwall for 66" Pipe added.			
8-70 Raised side slope LMF to top of endwall			
3-73 Added Class II Conc.			
10-74 Changed Index No.			

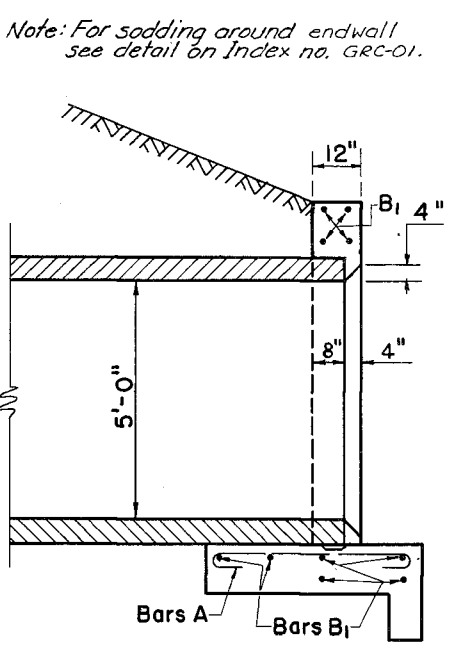
Approved by:

Deputy Design Engineer-Roadways

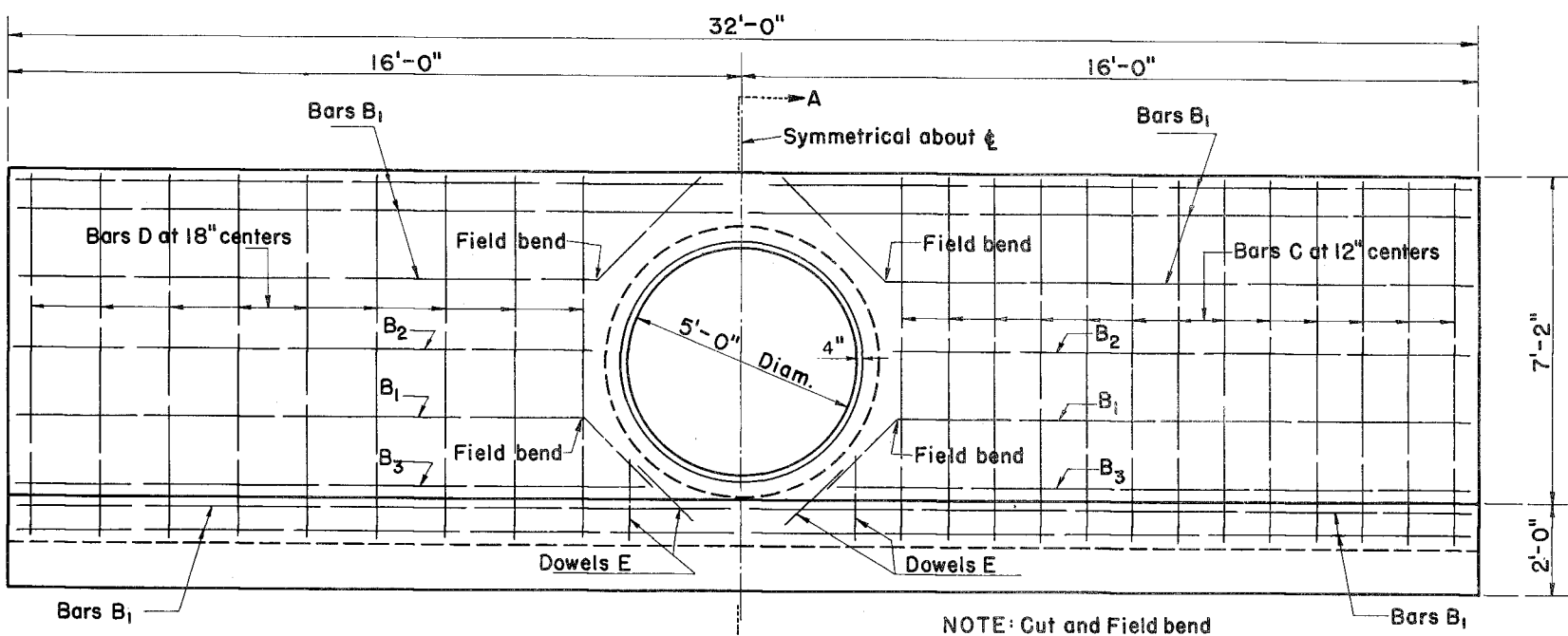
DCE-05



PLAN
SHOWING BARS IN FOOTING



SECTION A-A



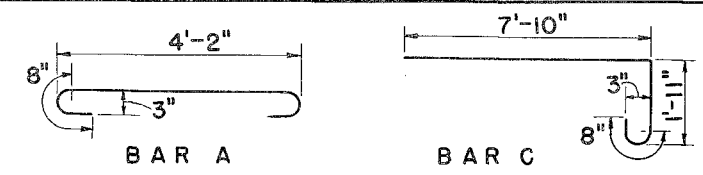
HALF ELEVATION
SHOWING BARS IN FRONT FACE OF WALL

HALF ELEVATION
SHOWING BARS IN BACK FACE OF WALL

- GENERAL NOTES -
DESIGN SPECIFICATIONS: A.A.S.H.O., 1973
CHAMFER: All exposed edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown
REINFORCING STEEL: Grade 40 or 60

BILL OF REINFORCING STEEL					
MARK	SIZE	Nº REQ'D.	LENGTH	LOCATION	BENDING
A	Nº 4	32	5'-3"	Footing	Bend
B ₁	Nº 4	14	31'-6"	Footing and Wall	Straight
B ₂	Nº 4	4	12'-4"	Wall	Straight
B ₃	Nº 4	4	13'-9"	Wall	Straight
C	Nº 4	26	10'-3"	Wall	Bend
D	Nº 4	18	7'-10"	Wall	Straight
E	Nº 4	8	1'-8"	Footing and Wall	Straight

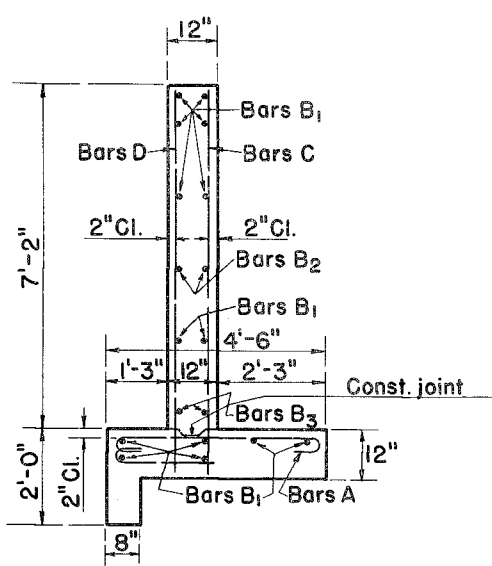
BENDING DIAGRAMS



NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Concrete Class II	Cu. Yd.	13.56
Reinforcing Steel	Pound	758



**TYPICAL SECTION
THRU ENDWALL**

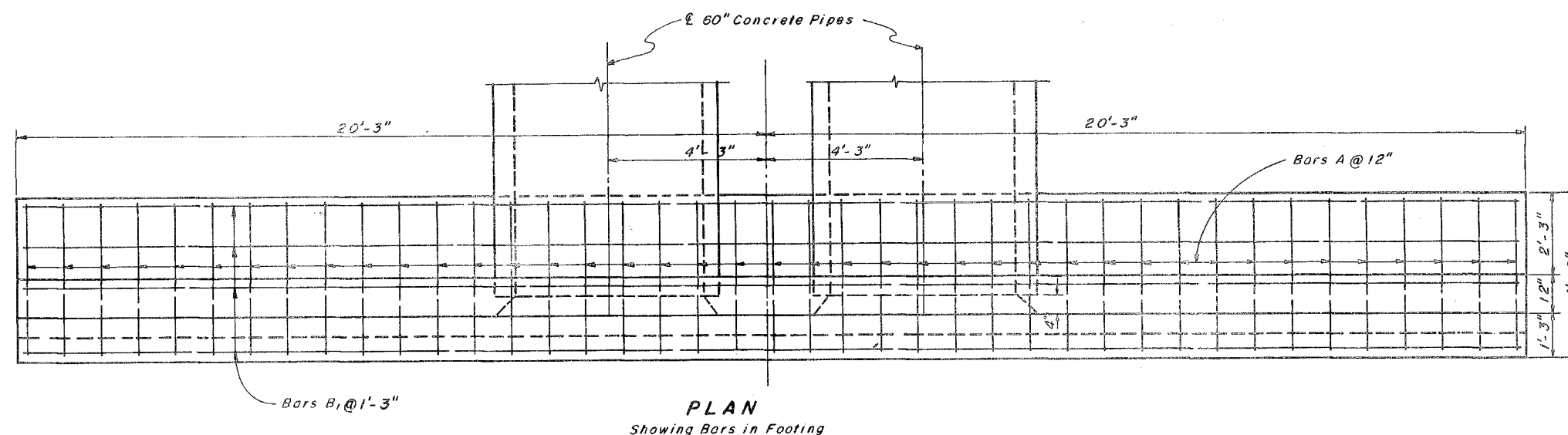
FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
STANDARD ENDWALL FOR
60" CONCRETE PIPE

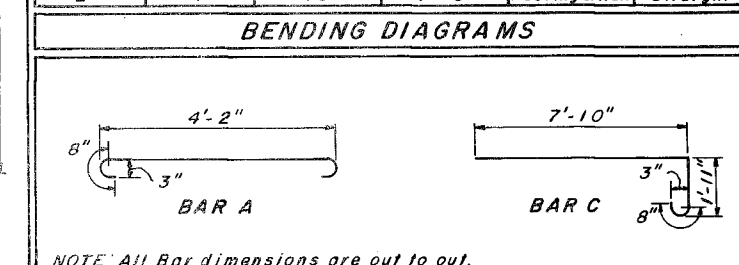
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
8-56 Redrawn and Traced - H.W.			
1-72 Raised side slope L.M.P. to top of headwall			
3-73 Added Cl. II Conc.			
10-74 Changed Index No.			

Detailed by	T.W.J.	11-49
Checked by	W.H.M.	11-49
Quantities by	R.G.L.	11-49
Checked by		
Traced by		

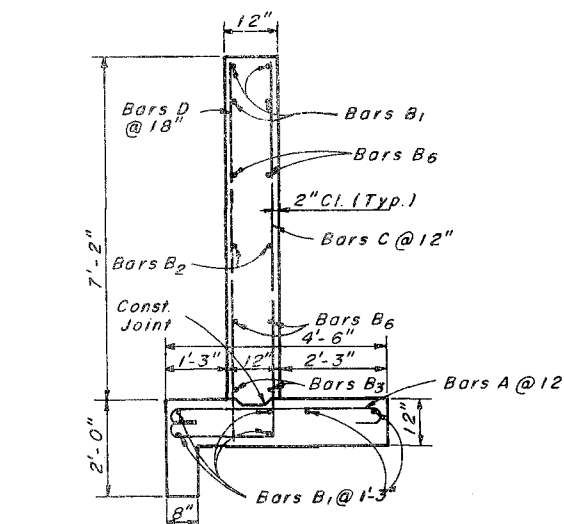
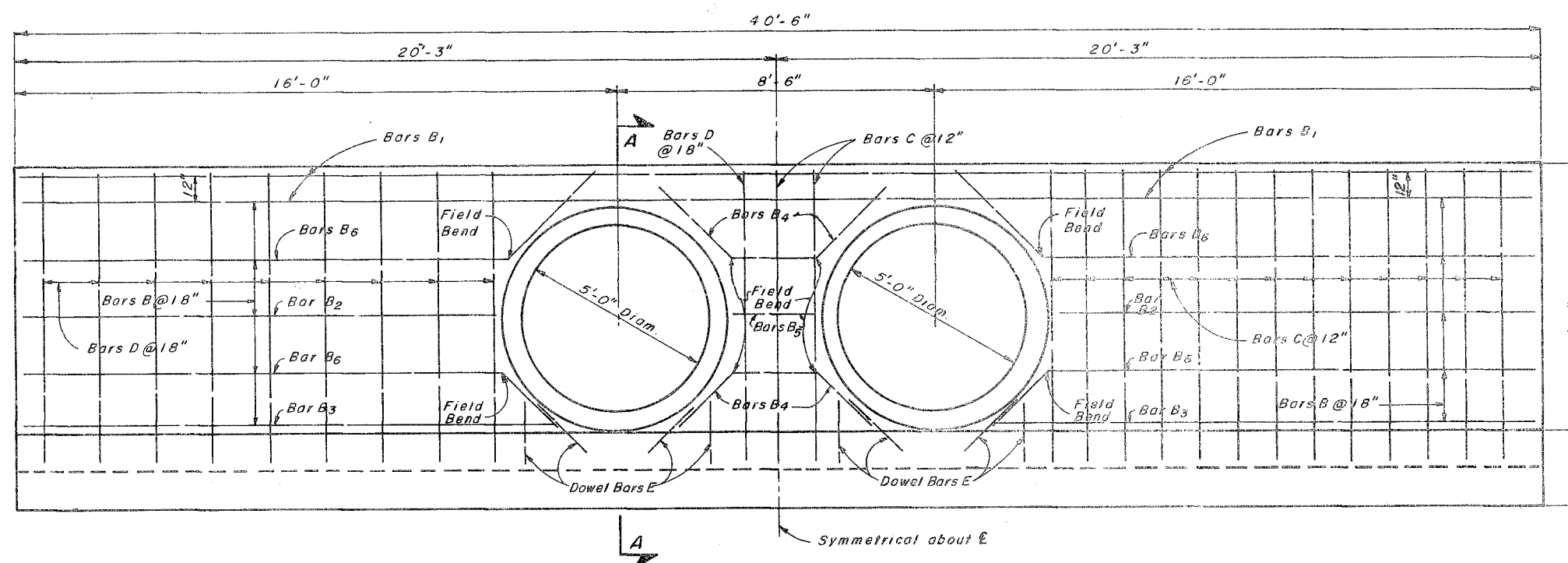
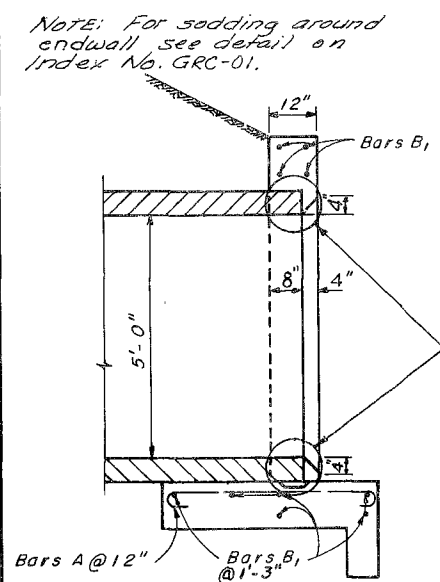
Approved by: *[Signature]*
Deputy Design Engineer - Roadways
Drawing No. **DCE-06**



BILL OF REINFORCING STEEL					
MARK	SIZE	No. REQ'D.	LENGTH	LOCATION	BENDING
A	4	41	5'-3"	Footing	Bend
B1	4	10	40'-2"	Footing & Wall	Straight
B2	4	4	12'-6"	Wall	Straight
B3	4	4	13'-9"	Wall	Straight
B4	4	4	6'-0"	Wall	Field Bend
B5	4	2	2'-2"	Wall	Straight
B6	4	8	15'-0"	Wall	Field Bend
C	4	29	10'-3"	Footing & Wall	Bend
D	4	20	7'-10"	Footing & Wall	Straight
E	4	16	1'-8"	Footing & Wall	Straight



ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class II Concrete	Cu. Yd.	16.39
Reinforcing Steel	Lb.	901

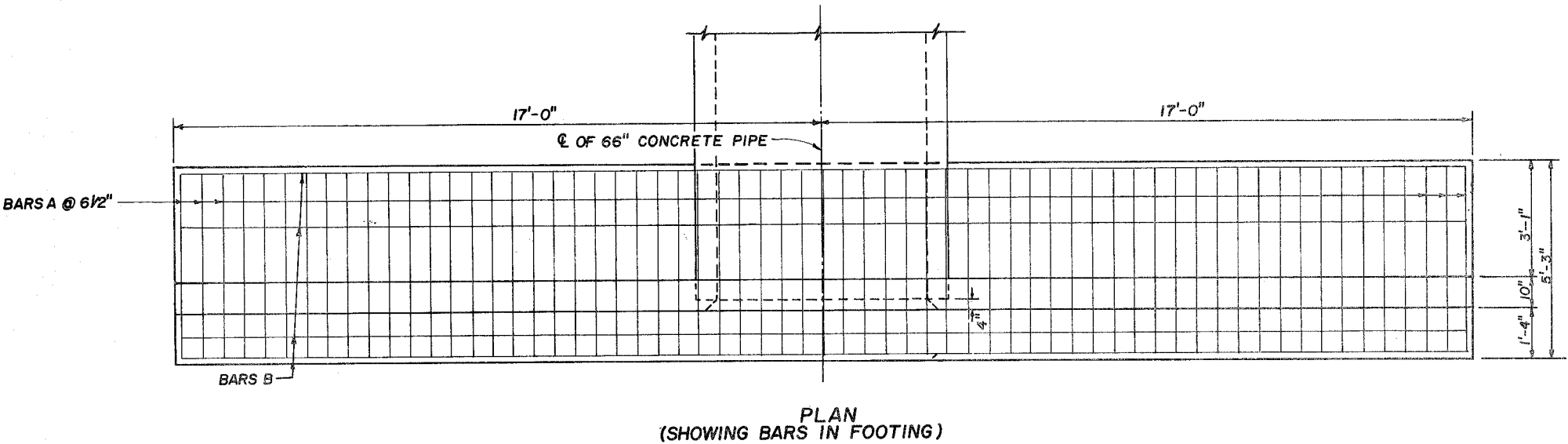


GENERAL NOTES
DESIGN SPECIFICATIONS: A.A.S.H.O. 1973
CHAMFER: All Exposed Edges and Corners to be Chamfered $\frac{3}{4}$ " unless otherwise shown.
MAXIMUM WORKING STRESSES:
Class II Concrete 1360 PSI
Reinforcing Steel 20,000 PSI
REINFORCING STEEL: Grade 40 or 60

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION STRUCTURES			
STANDARD ENDWALL FOR DOUBLE 60" CONCRETE PIPE			
ROAD NO.	COUNTY	PROJECT NO.	
DESIGNED BY	DATES	APPROVED BY	
J.B.L.	1-72		
CHECKED BY	DATES	APPROVED BY	
M.C.C.	2-72		
QUANTITIES BY	DATES	APPROVED BY	
J.B.L.	1-72		
CHECKED BY	DATES	APPROVED BY	
M.C.C.	2-72		
SUPERVISOR	DATES	APPROVED BY	
P.W.E.			

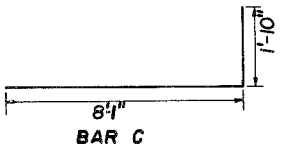
ALTERNATE ENTRANCE

FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.			



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	"
C	5	34	9'-10"	WALL	BEND
D	4	20	8'-1"	"	STRAIGHT
E	4	4	1'-8"	"	"

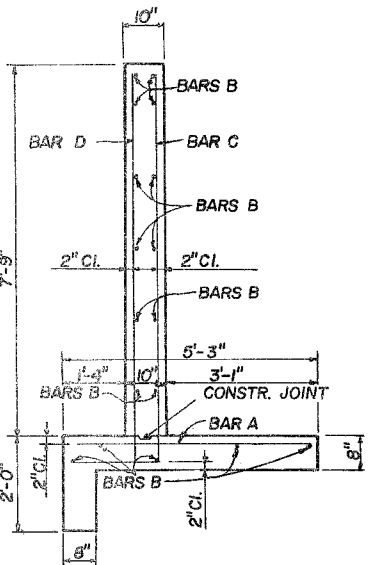
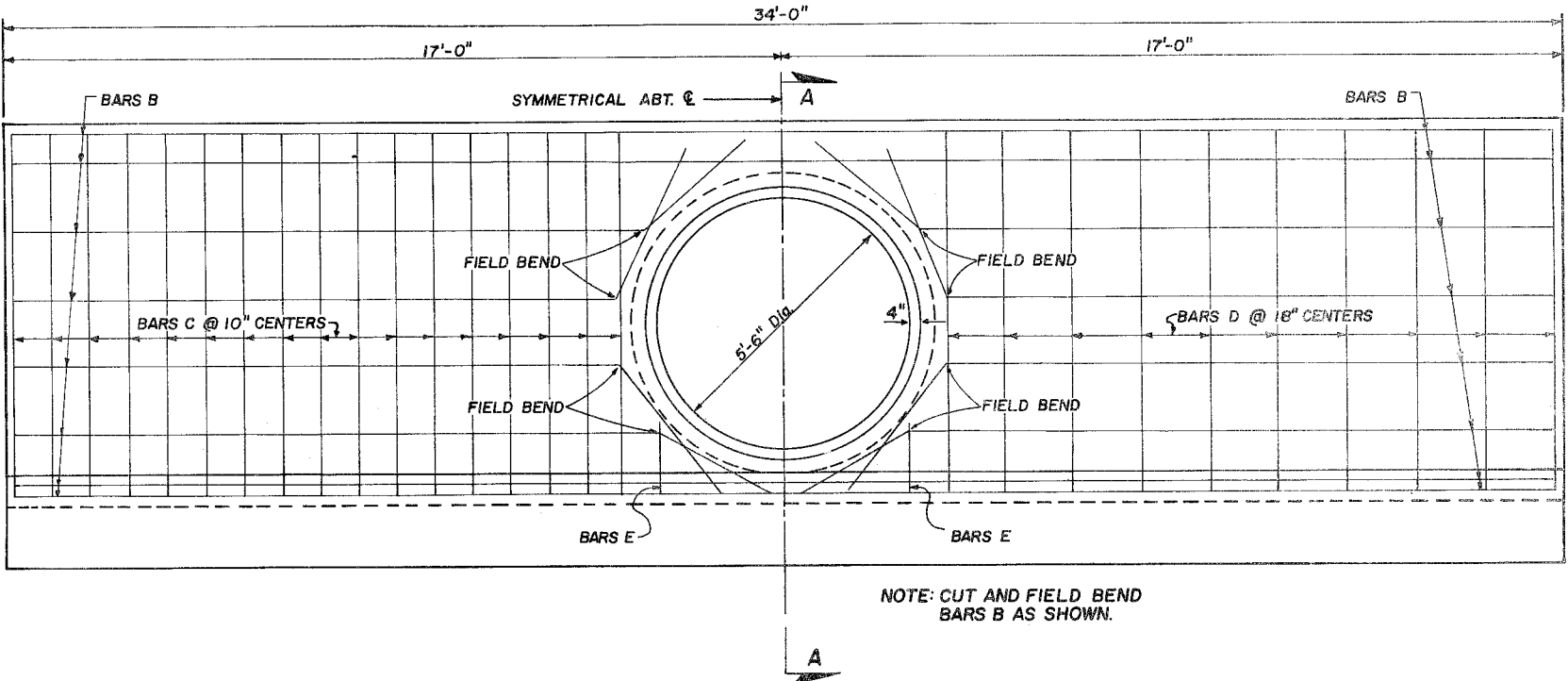
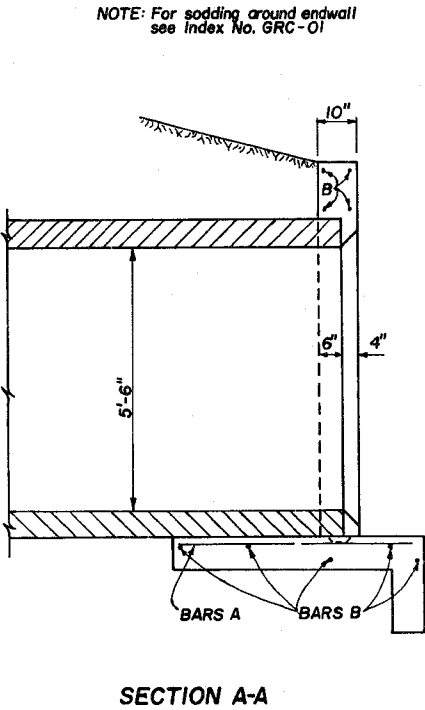
BENDING DIAGRAMS



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE, CLASS II	CU. YD.	12.60
REINFORCING STEEL	L.B.	1167



HALF ELEVATION
(SHOWING BARS IN BACK FACE OF WALL)


HALF ELEVATION
(SHOWING BARS IN FRONT FACE OF WALL)

GENERAL NOTES
DESIGN SPECIFICATION: A.A.S.H.O., 1973
CHAMFER: ALL EXPOSED EDGES AND CORNERS
TO BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED
REINFORCING STEEL: GRADE 40 OR 60

FHWA APPROVED 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

STANDARD ENDWALL FOR
66" CONCRETE PIPE

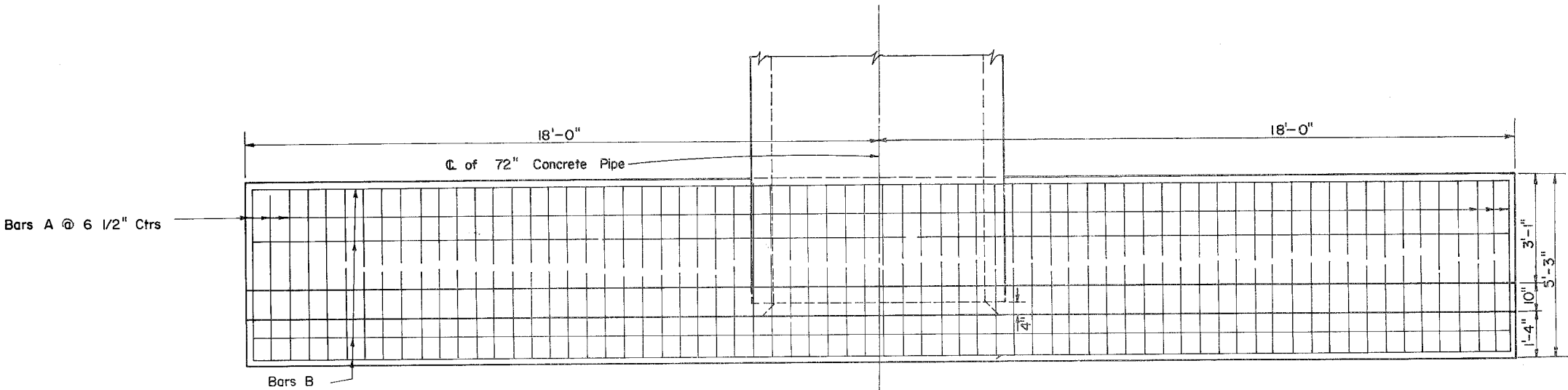
REVISIONS		COUNTY		PROJECT NO.	
Dates	Descriptions	Names	Dates	APPROVED BY	
8-70	Raised side slope to top of endwall.	J.L.W.	3-54		
3-73	Added Class II Concrete	R.C.B.	3-54		
10-74	Changed Index No.	J.L.W.	3-54		
		Checked by	R.C.B.	3-54	Drawing No.
		Quantities by	J.L.W.	3-54	Index No.
		Supervised by	R.C.B.	3-54	1 of 1

DCE-08

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.			

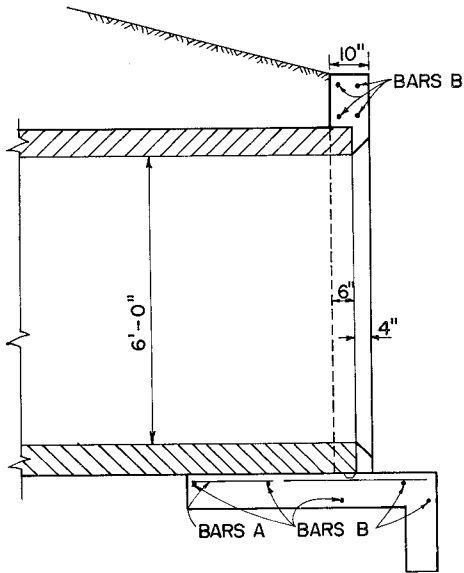
BILL OF REINFORCING STEEL					
MARK	SIZE	No. Req'd	LENGTH	LOCATION	BENDING
A	5	68	4' - 11"	FOOTING	STRAIGHT
B	4	17	35' - 8"	FOOTING & Wall	"
C	5	34	10' - 5"	WALL	BEND
D	4	20	6' - 7"	WALL	STRAIGHT
E	4	4	2' - 6"	WALL	"
F	4	4	1' - 6"	WALL	"

BENDING DIAGRAMS		
NOTE: All bar dimensions are out to out		
ESTIMATED QUANTITIES		
ITEMS	UNIT	QUANTITY
CONCRETE CLASS II	CU. YD.	13.76
REINFORCING STEEL	LB.	1249

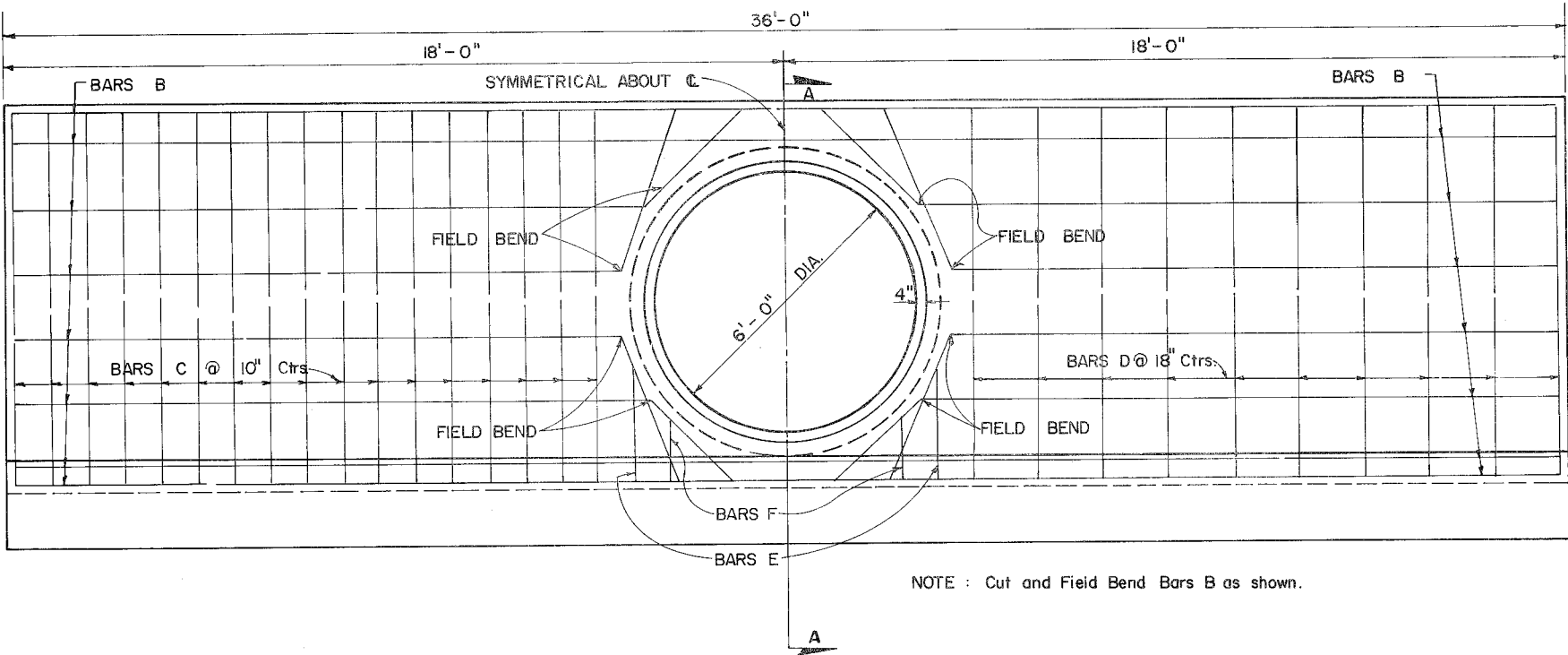


PLAN
SHOWING BARS IN FOOTING

NOTE: For sodding around endwall
see Index No. GRC-OI.



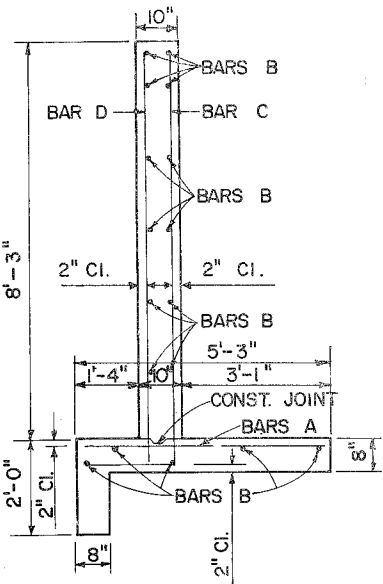
SECTION A-A



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

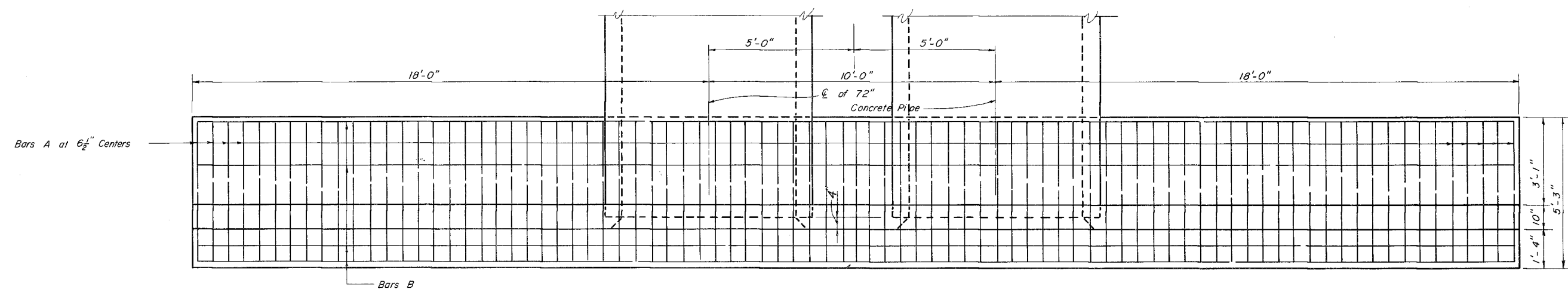


TYPICAL SECTION
THRU ENDWALL

GENERAL NOTES
DESIGN SPECIFICATIONS: A.A.S.H.O., 1973
CHAMFER: All exposed edges and corners to be chamfered 3/4"
unless otherwise noted.
REINFORCING STEEL: GRADE 40 or 60

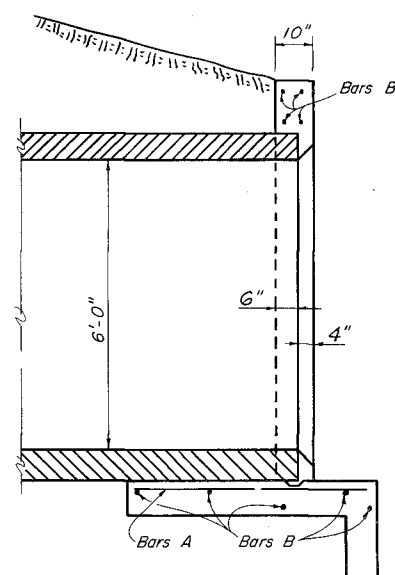
FHWA APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN SECTION			
STANDARD ENDWALL FOR 72" CONCRETE PIPE			
REVISED	ROAD NO.	COUNTY	PROJECT NO.
8-70 Raised side slope to LMF top of endwall.			
3-73 Added class II conc.			
10-74 Changed index no.			
Designed by	Names	Dates	APPROVED BY
Checked by	WHW	10-55	<i>E. H. Hunt</i> Deputy Design Engineer, Roadways
Quantities by	EVC	10-55	
Checked by	WHW	10-55	
Supervised by			
			Drawing No. 1 OF 1
			Index No. DCE-09

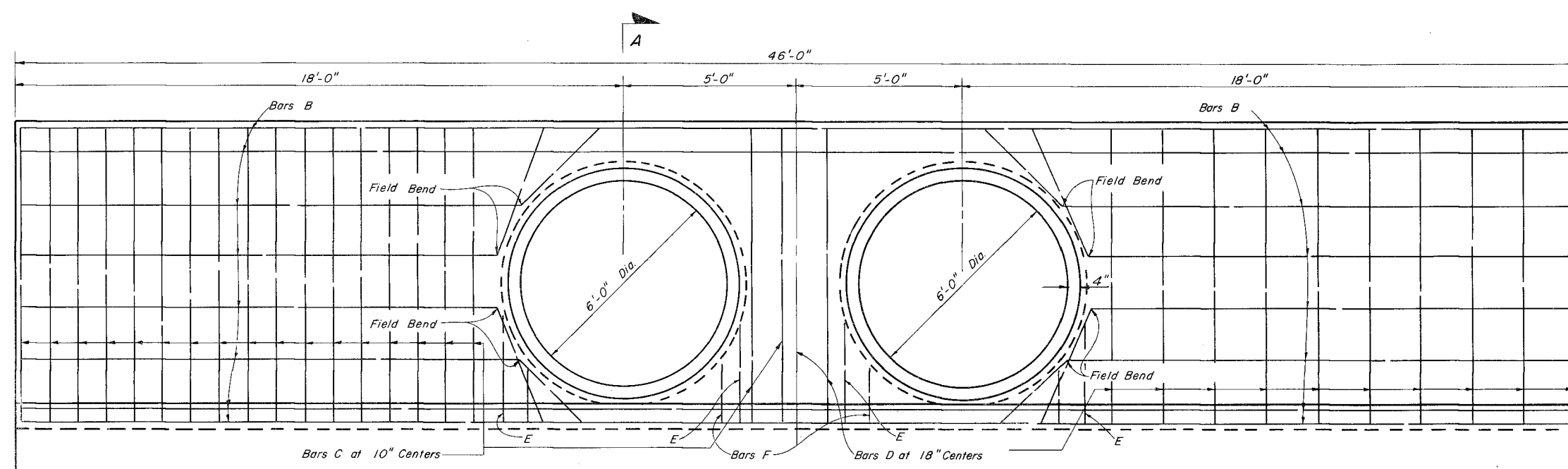


PLAN
(SHOWING BARS IN FOOTING)

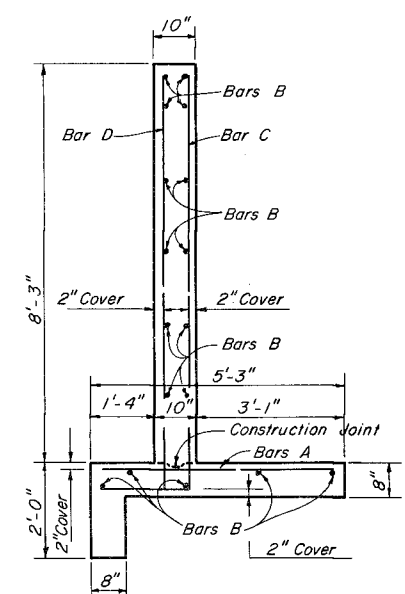
NOTE: For sodding around endwall
see Index No. GRC-01.



SECTION A-A



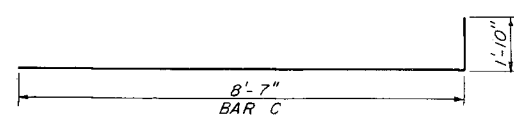
NOTE: Cut and Field Bend Bars B as shown.



TYPICAL SECTION
THRU ENDWALL

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	"
C	5	38	10'-5"	Wall	Bend
D	4	23	8'-7"	Wall	Straight
E	4	8	2'-6"	Wall	"
F	4	8	1'-6"	Wall	"

BENDING DIAGRAM



NOTE: All Bar dimensions are out-to-out.

HALF ELEVATION
(SHOWING BARS IN BACK FACE OF WALL)

HALF ELEVATION
(SHOWING BARS IN FRONT FACE OF WALL)

GENERAL NOTES

DESIGN SPECIFICATIONS: A.A.S.H.O. 1973

CHAMFER: All exposed edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise noted.

REINFORCING STEEL: Grade 40 or 60

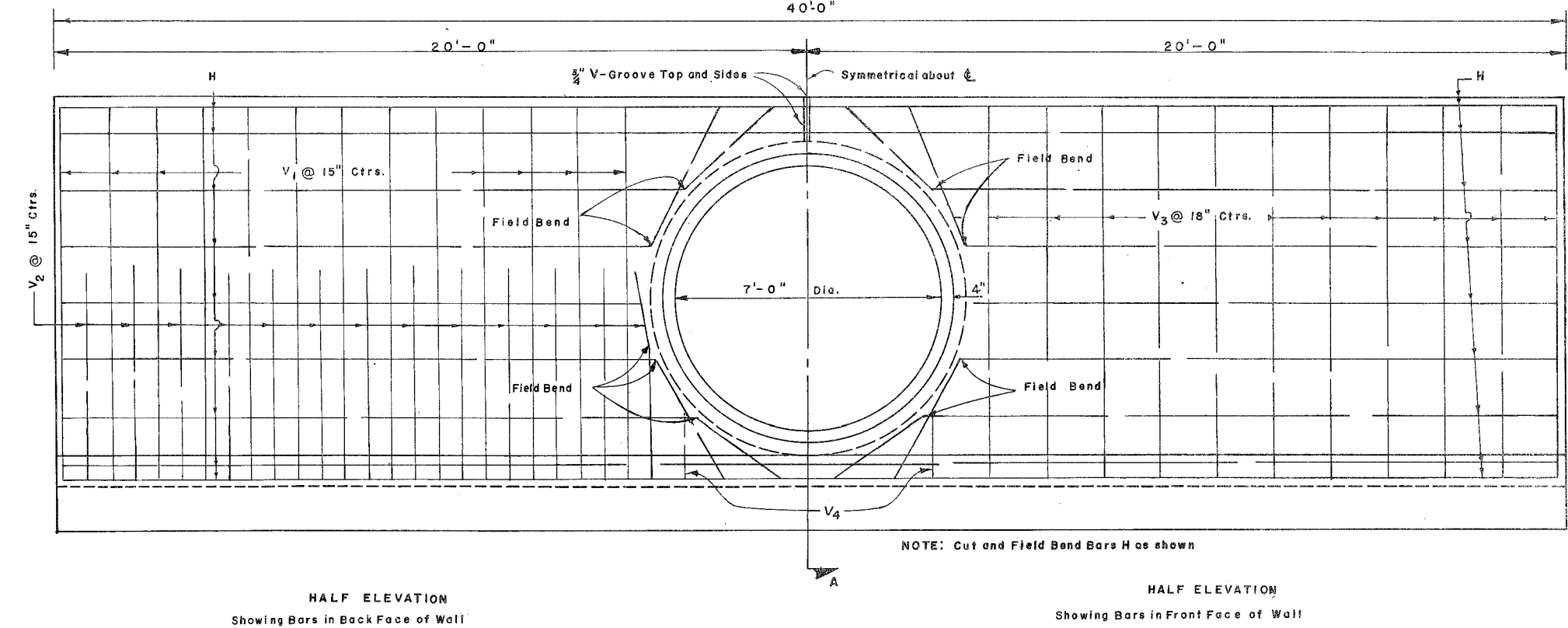
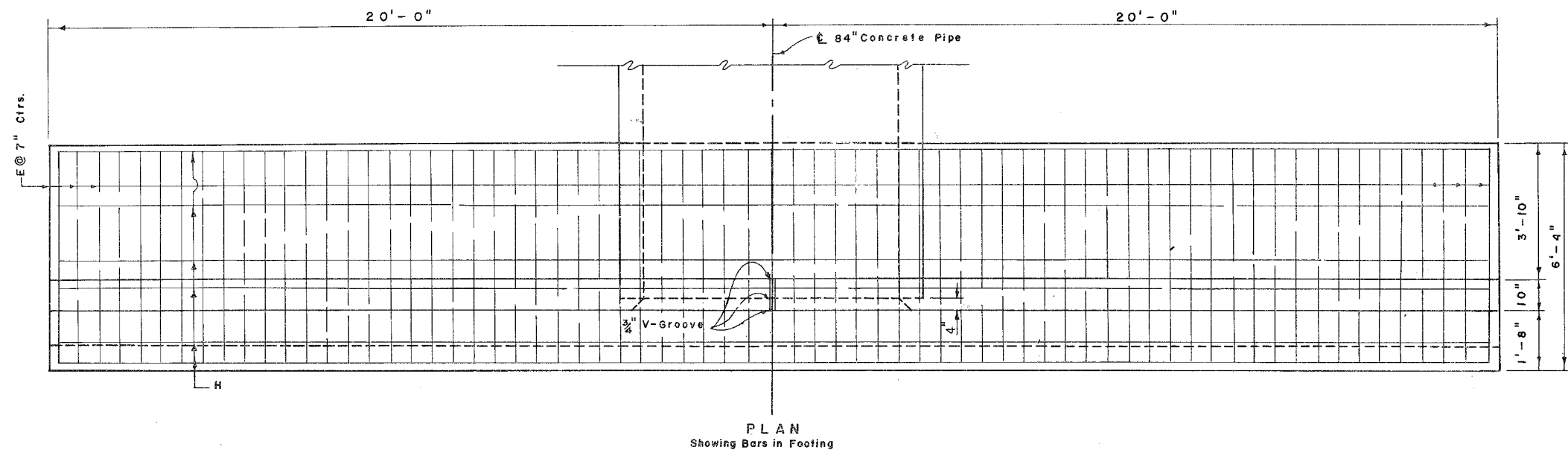
ESTIMATED QUANTITIES		
Item	Unit	Quantity
Class II Concrete	Cu. Yd.	16.74
Reinforcing Steel	Lb.	1519

FHWA APPROVED: 7-7-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

ENDWALL FOR DOUBLE 72" PIPE

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.												
Dates	Descriptions															
		Approved by:														
		<table><thead><tr><th>Names</th><th>Dates</th></tr></thead><tbody><tr><td>Designed by G.F.G.</td><td>1-75</td></tr><tr><td>Checked by W.H.W.</td><td>1-75</td></tr><tr><td>Quantities by G.F.G.</td><td>1-75</td></tr><tr><td>Checked by W.H.W.</td><td>1-75</td></tr><tr><td>Supervised by S.P.I.</td><td></td></tr></tbody></table>	Names	Dates	Designed by G.F.G.	1-75	Checked by W.H.W.	1-75	Quantities by G.F.G.	1-75	Checked by W.H.W.	1-75	Supervised by S.P.I.		<div>Signature</div> <div>Deputy Design Engineer - Roadways</div> <div>Drawing No. 1 of 1</div> <div>Index No. DCE-10</div>	
Names	Dates															
Designed by G.F.G.	1-75															
Checked by W.H.W.	1-75															
Quantities by G.F.G.	1-75															
Checked by W.H.W.	1-75															
Supervised by S.P.I.																

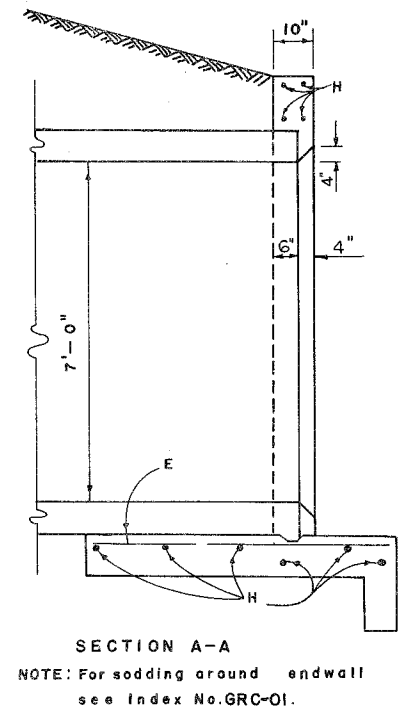


GENERAL NOTES

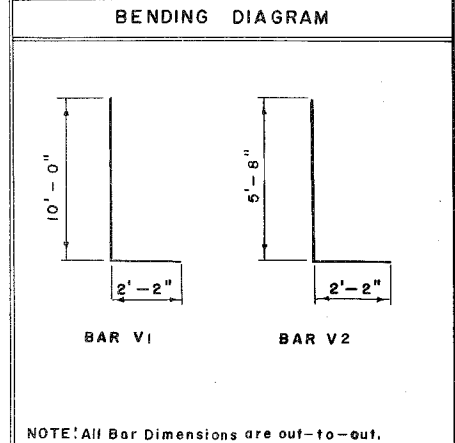
DESIGN SPECIFICATIONS: A.A.S.H.O. 1973

CHAMFER: All exposed edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise noted.

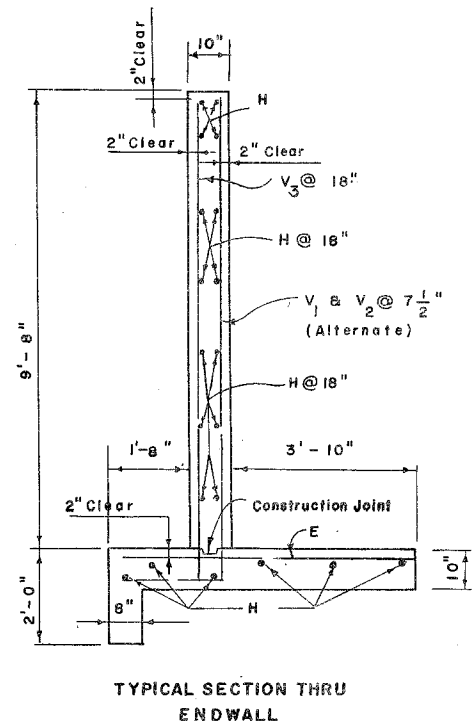
REINF. STEEL: Grade 40 to 60.



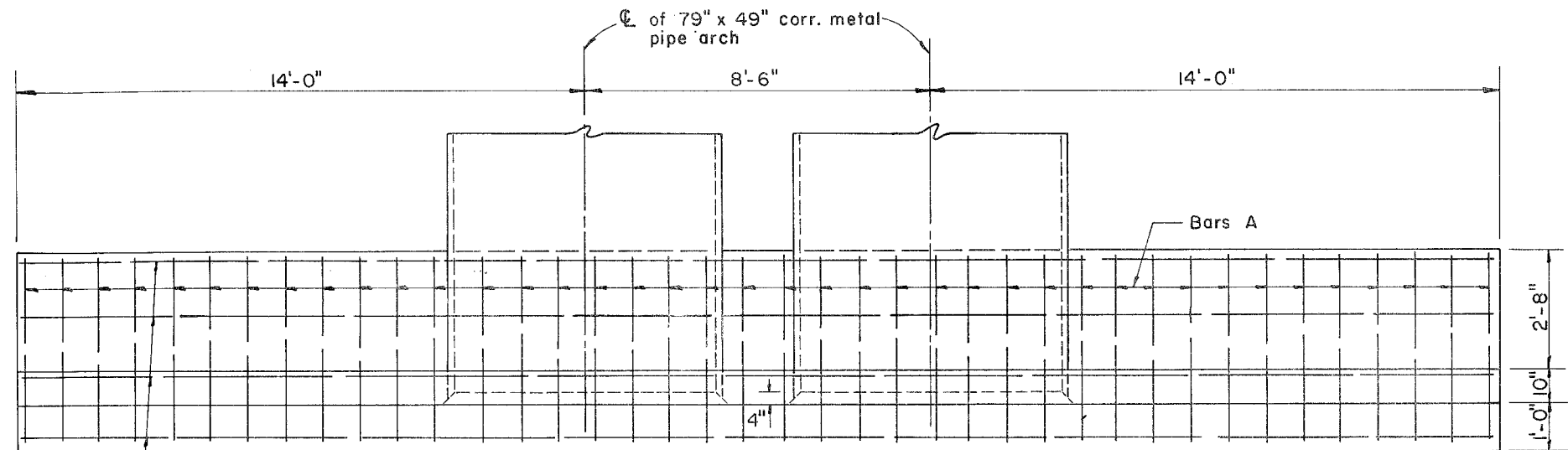
BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D.	LENGTH
E	6	69	6'-0"
H	4	20	39'-8"
V ₁	6	26	12'-2"
V ₂	6	26	7'-10"
V ₃	4	22	10'-0"
V ₄	4	4	2'-0"



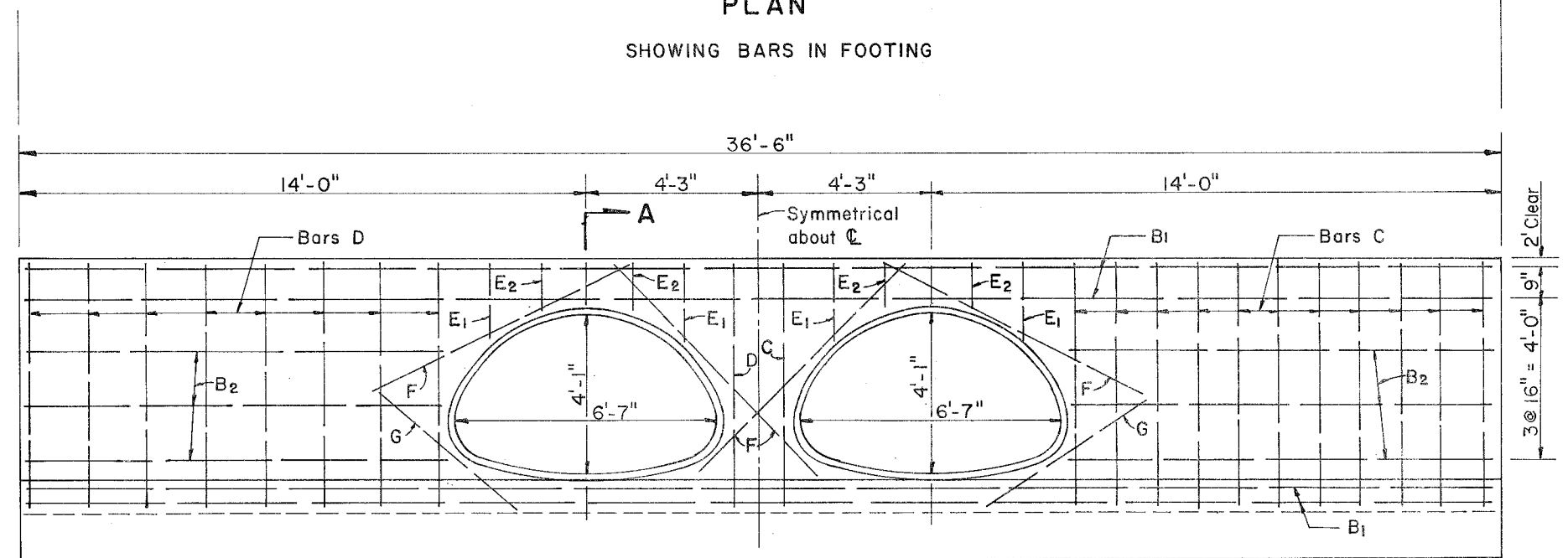
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	19.3
Reinforcing Steel	Lb.	2,085



F.H.W.A. APPROVED: 3-20-75			
FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY PLANS SECTION			
STANDARD ENDWALL FOR 84" CONCRETE PIPE			
REVISIONS	ROAD No.	COUNTY	PROJECT No.
Date	Descriptions	Names	Dates
3-73	Traced from		
V.A.C.	8 Sepia	W.H.W.	7-58
10-74	Changed Index No.	H.C.G.	7-58
		W.H.W.	7-58
		H.C.G.	7-58
		W.H.W.	7-58
		APPROVED BY	
		Deputy Design Engineer - Roadways	
		Drawing No.	Index No.
		1 of 1	DCE-11



PLAN
SHOWING BARS IN FOOTING



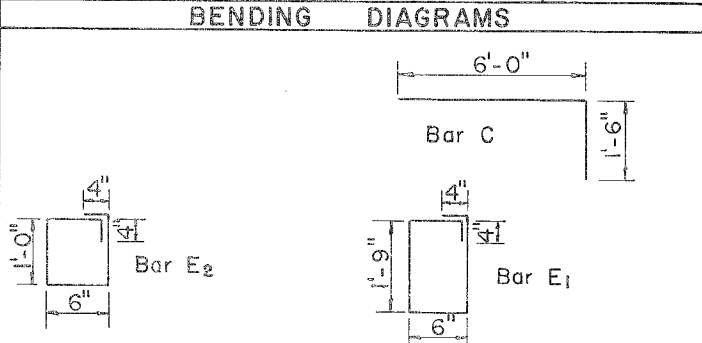
HALF ELEVATION

SHOWING BARS IN FRONT
FACE OF WALL

HALF ELEVATION

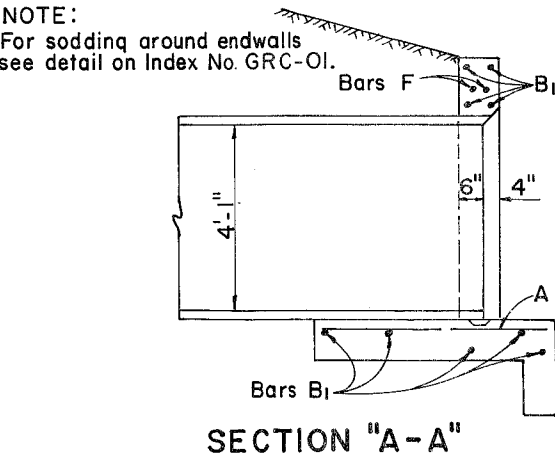
SHOWING BARS IN BACK
FACE OF WALL

BILL OF REINFORCING STEEL					
MARK	SIZE	No. REQ'D	LENGTH	LOCATION	BENDING
A	4	40	4'-2"	Footing	Straight
B ₁	4	9	36'-2"	F'tg. & Wall	Straight
B ₂	4	12	10'-3"	Wall	Straight
C	4	24	7'-5"	F'tg. & Wall	See Diag.
D	4	18	6'-0"	F'tg. & Wall	Straight
E ₁	4	4	4'-9"	Wall	See Diag.
E ₂	4	4	3'-3"	Wall	See Diag.
F	4	8	7'-3"	Wall	Straight
G	4	4	4'-6"	F'tg. & Wall	Straight

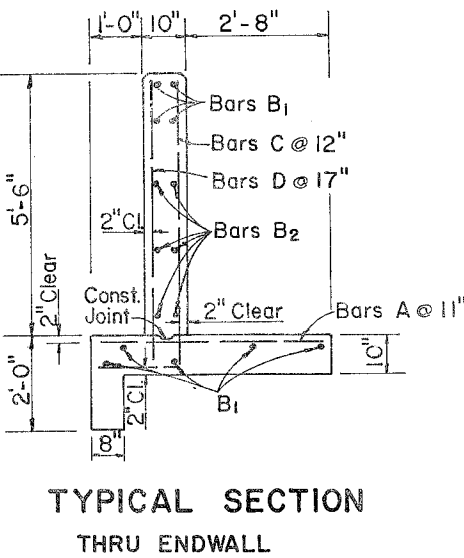


NOTE: All bar dimensions are out to out.

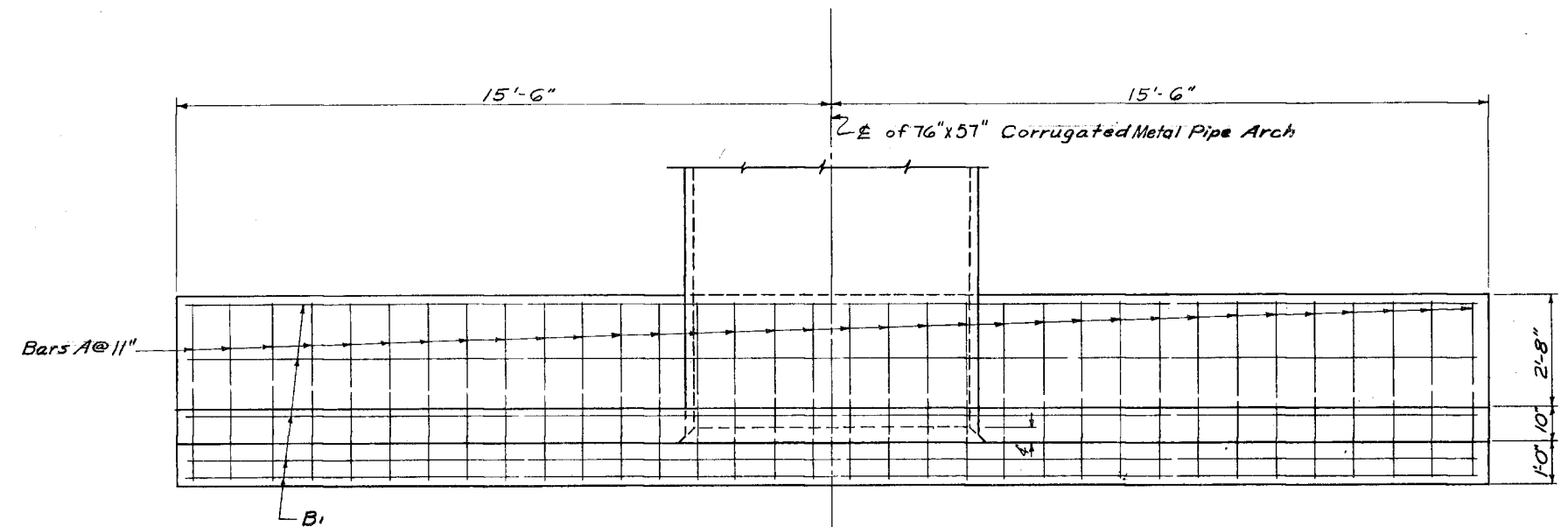
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	11.19
Reinforcing Steel	Lb.	674



GENERAL NOTES
DESIGN SPECIFICATIONS: A.A.S.H.O. 1973.
CHAMFER: All exposed edges and corners to be
chamfered 3/4" unless otherwise shown.
REINFORCING STEEL: Grade 40 or 60.



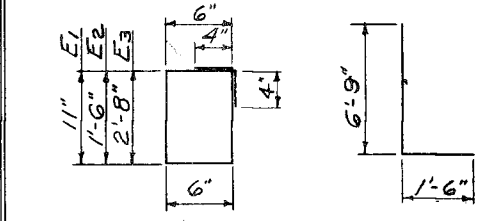
FHWA APPROVED: 3-20-75			
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN SECTION			
STANDARD ENDWALL FOR 79" x 49" CMP ARCH			
ROAD NO.	COUNTY	PROJECT NO.	
REVISED			
Dates	Descriptions	Names	Dates
8-70	Raised side slope to LMF top of endwall	J. J. B.	5-52
3-73	Added Class II Conc.	J. L. W.	5-52
10-74	Changed Index No.	J. J. B.	5-52
Checked by		J. L. W.	5-52
Supervised by			
APPROVED BY		E. H. Hart	
Deputy Design Engineer - Roadways		Drawing No.	Index No.
		1 OF 1	DCE-12



PLAN
SHOWING BARS IN FOOTING

BILL OF REINFORCING STEEL				
MARK	SIZE	Nº REQ.	LENGTH	BENDING
A	4	34	4'-2"	Straight
B ₁	"	9	30'-6"	"
B ₂	"	12	11'-8"	"
C	"	26	8'-2"	See Diagram
D	"	18	6'-9"	Straight
E ₁	"	3	3'-1"	See Diagram
E ₂	"	2	4'-3"	"
E ₃	"	2	6'-7"	"
F	"	4	8'-0"	Straight
G	"	4	6'-6"	"

BENDING DIAGRAMS

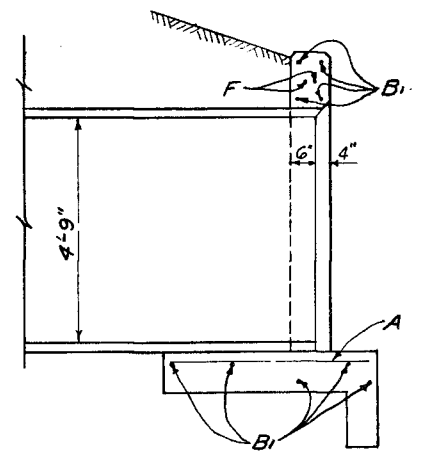


BAR E BAR C
Note: All bar dimensions are out-to-out.

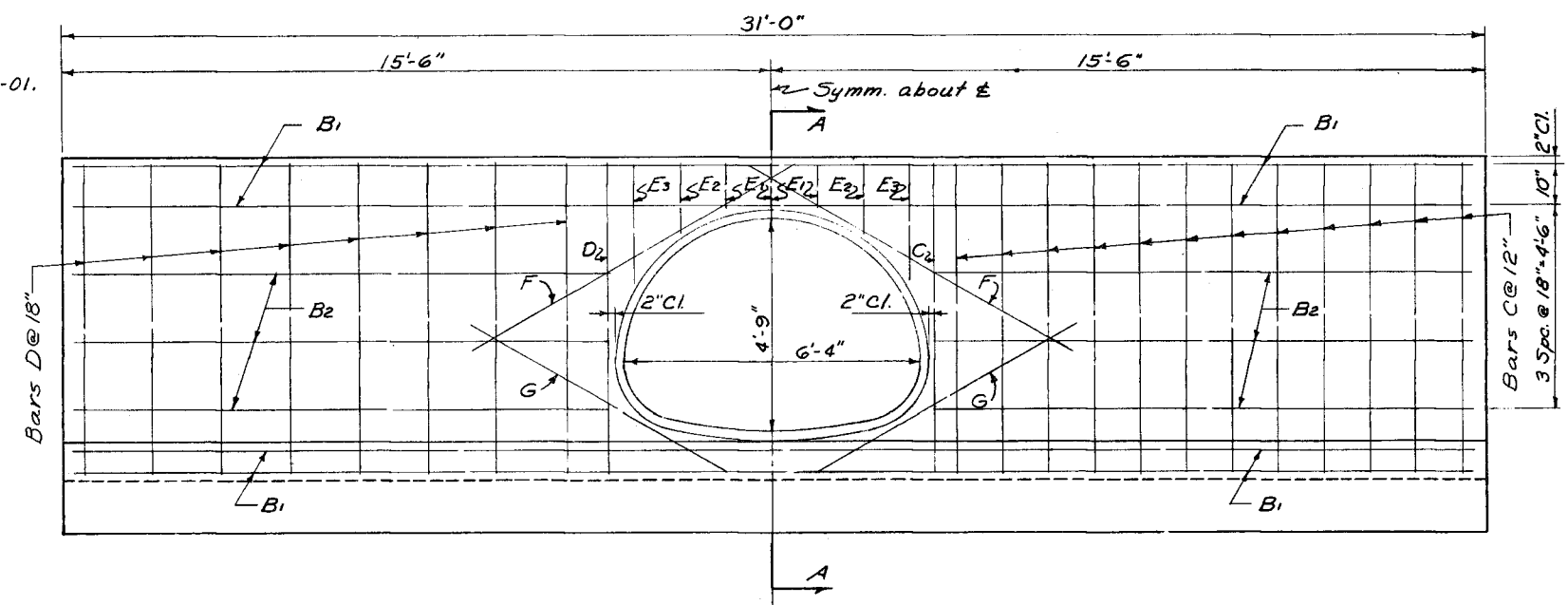
ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	10.51
Reinforcing Steel	Lb.	654

Note: For sodding around endwall see detail on Index No. GRC-01.

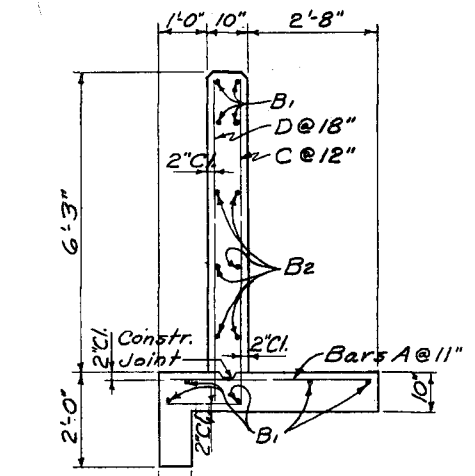


SECTION A-A



HALF ELEVATION
SHOWING BARS IN FRONT
FACE OF WALL

HALF ELEVATION
SHOWING BARS IN BACK
FACE OF WALL



TYPICAL SECTION
THRU ENDWALL

GENERAL NOTES
DESIGN SPECIFICATIONS: AASHTO - 1973
REINFORCING STEEL: GRADE 40 or 60
STRESSES: $f_s = 20,000$ $f_c = 1,000$
CHAMFER: All edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise noted.

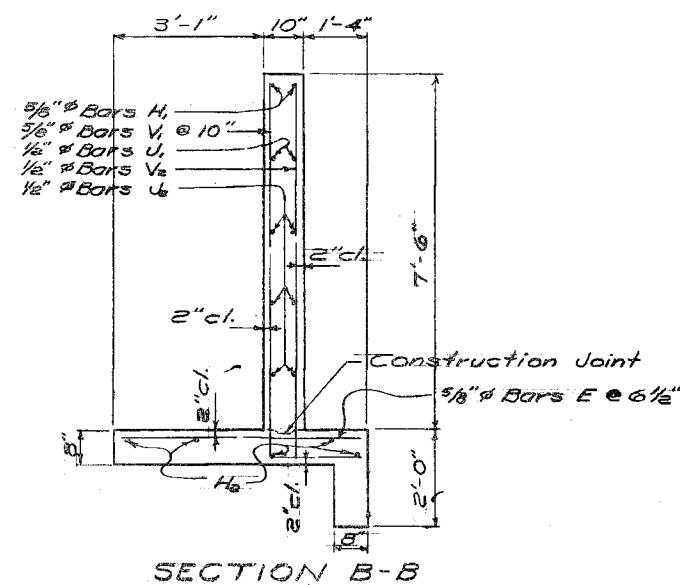
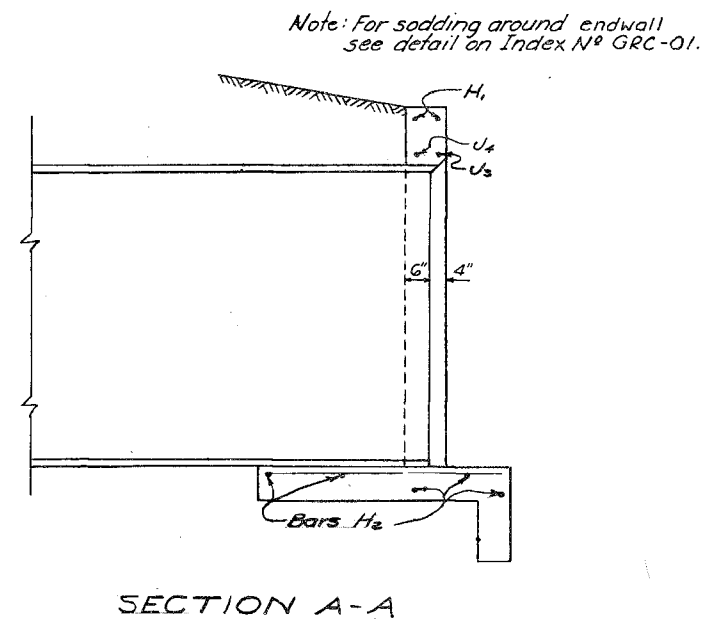
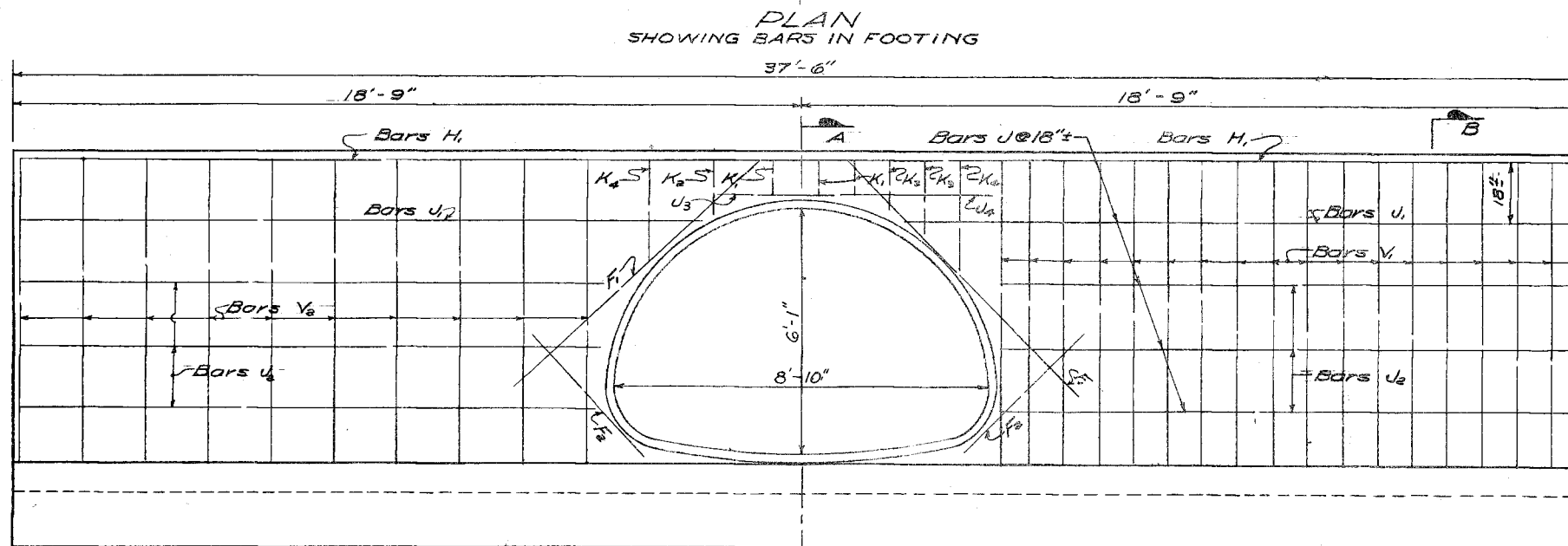
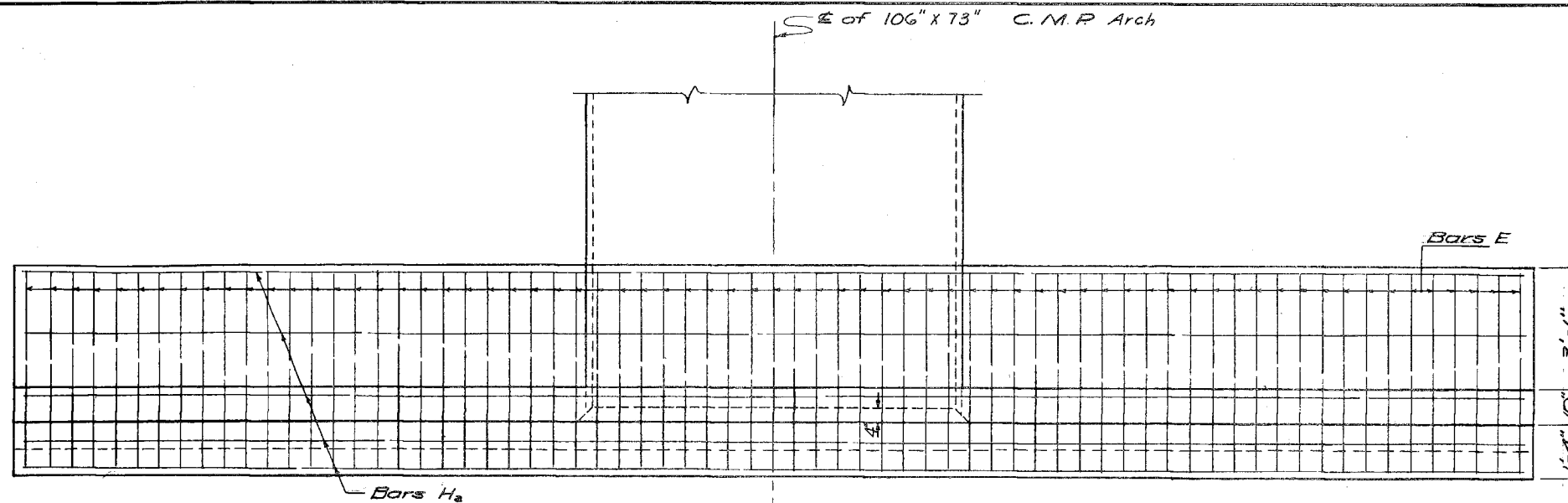
FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION			
ROADWAY PLANS SECTION			
STANDARD ENDWALL FOR 76" x 57" CMP ARCH			
ROAD NO.	COUNTY	PROJECT NO.	
Date	Description	Name	Date
8-70	Raised side slope	J.L.W.	12-52
LMF	to top of endwall		
3-73	Added Class II Conc.	H.L.F.	12-52
10-74	Changed Index No.	J.L.W.	12-52

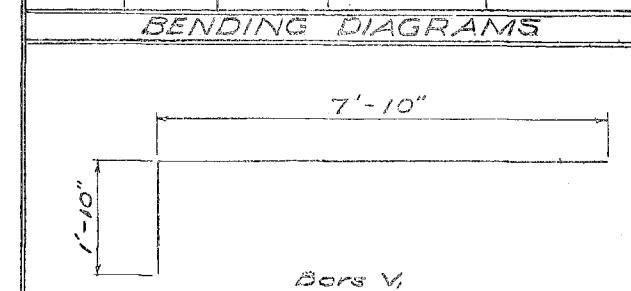
APPROVED BY: *[Signature]* Office Engineer

Checked by: *[Signature]* Engineer of Bridges

Drawing No. 1 of 1 Index No. DCE-13



BILL OF REINFORCING STEEL				
MARK	SIZE	NO. REQD	LENGTH	BENDING
E	5	69	4'-11"	Straight
F ₁	5	4	8'-0"	"
F ₂	4	4	4'-0"	"
H ₁	5	2	37'-2"	"
H ₂	4	5	37'-2"	"
U ₁	4	4	16'-4"	"
U ₂	4	12	13'-10"	"
U ₃	4	1	4'-0"	"
U ₄	4	1	9'-0"	"
K ₁	4	6	0'-10"	"
K ₂	4	4	7'-4"	"
K ₃	4	2	1'-10"	"
H ₄	4	4	2'-6"	"
V ₁	5	36	9'-7"	See Diagram
V ₂	4	20	7'-10"	Straight



ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	13.46
Reinforcing Steel	Lb.	1244

Note: Quantities are for one endwall only.

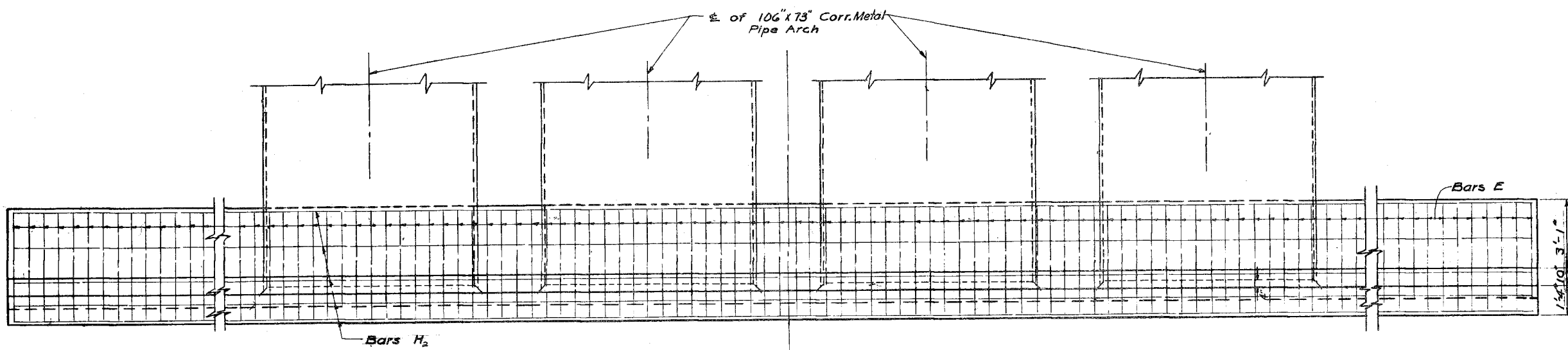
~ GENERAL NOTES ~

DESIGN SPECIFICATIONS: A.A.S.H.O. 1973

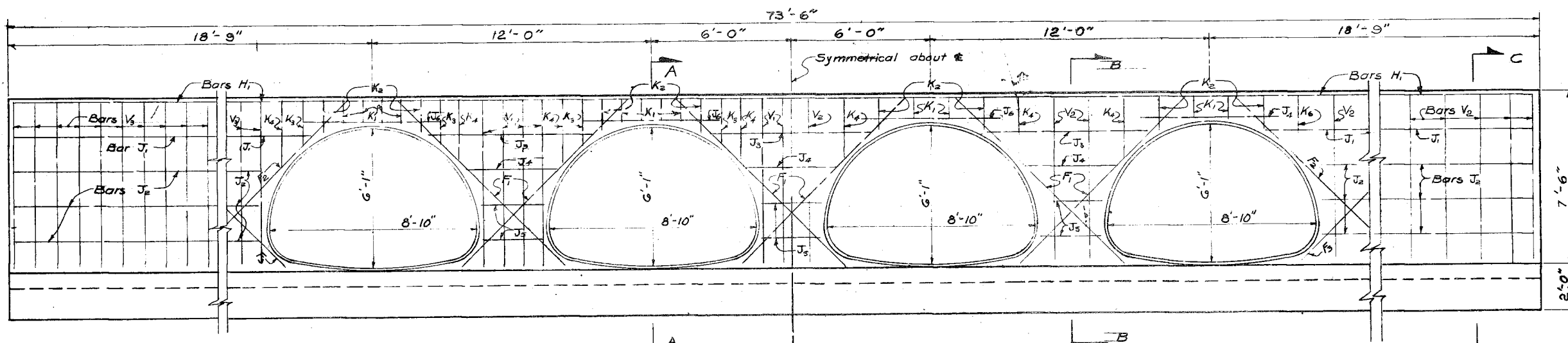
CHAMFER: All edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown.

REINFORCING STEEL: Grade 40 or 60.

FHWA APPROVED: 3-20-75																																				
FLORIDA DEPARTMENT OF TRANSPORTATION																																				
ROADWAY PLANS SECTION																																				
ENDWALL FOR SINGLE		106" x 73" CMP ARCH																																		
ROAD NO.		COUNTY																																		
PROJECT NO.																																				
<table border="1"> <thead> <tr> <th colspan="2">REVISIONS</th> <th>Names</th> <th>Dates</th> <th>Recommended For Approval by</th> </tr> </thead> <tbody> <tr> <td>8-70</td> <td>Raised side slopes LMF to top of endwall</td> <td>Checked by</td> <td>E.C.D. 2-53</td> <td rowspan="3"> <i>W. J. [Signature]</i> OFFICE ENGINEER APPROVED BY <i>[Signature]</i> ENGINEER IN CHARGE </td> </tr> <tr> <td>3-73</td> <td>Added Class II Canal</td> <td>Checked by</td> <td>J.L.W. 2-53</td> </tr> <tr> <td>10-74</td> <td>Changed Index No.</td> <td>Checked by</td> <td>E.C.D. 8/89</td> </tr> <tr> <td colspan="2"></td> <td>Quantity by</td> <td>J.L.W. 2-53</td> <td>Drawing title</td> </tr> <tr> <td colspan="2"></td> <td>Checked by</td> <td>E.C.D. 3-53</td> <td>Engineer or Station Index Book</td> </tr> <tr> <td colspan="2"></td> <td>Transd by</td> <td></td> <td>DCE-4</td> </tr> </tbody> </table>				REVISIONS		Names	Dates	Recommended For Approval by	8-70	Raised side slopes LMF to top of endwall	Checked by	E.C.D. 2-53	<i>W. J. [Signature]</i> OFFICE ENGINEER APPROVED BY <i>[Signature]</i> ENGINEER IN CHARGE	3-73	Added Class II Canal	Checked by	J.L.W. 2-53	10-74	Changed Index No.	Checked by	E.C.D. 8/89			Quantity by	J.L.W. 2-53	Drawing title			Checked by	E.C.D. 3-53	Engineer or Station Index Book			Transd by		DCE-4
REVISIONS		Names	Dates	Recommended For Approval by																																
8-70	Raised side slopes LMF to top of endwall	Checked by	E.C.D. 2-53	<i>W. J. [Signature]</i> OFFICE ENGINEER APPROVED BY <i>[Signature]</i> ENGINEER IN CHARGE																																
3-73	Added Class II Canal	Checked by	J.L.W. 2-53																																	
10-74	Changed Index No.	Checked by	E.C.D. 8/89																																	
		Quantity by	J.L.W. 2-53	Drawing title																																
		Checked by	E.C.D. 3-53	Engineer or Station Index Book																																
		Transd by		DCE-4																																

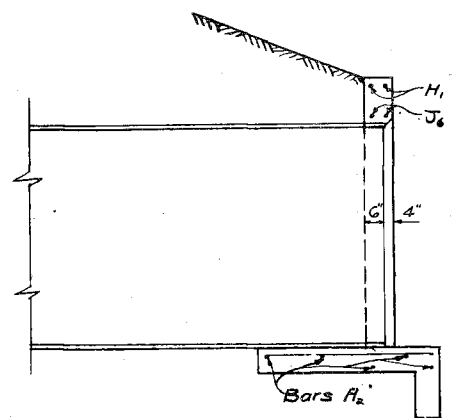


PLAN
SHOWING BARS IN FOOTING

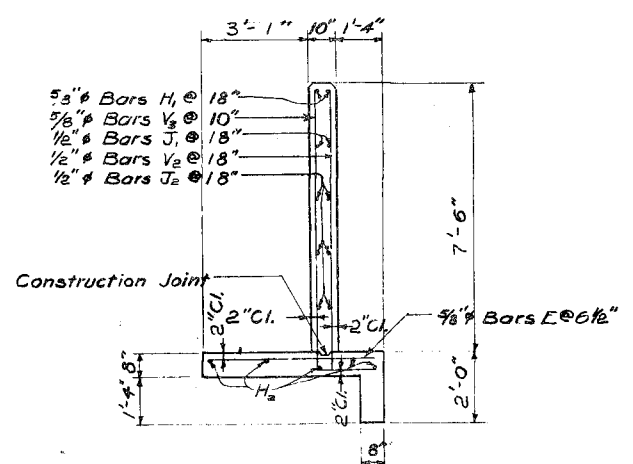


HALF ELEVATION
SHOWING BARS IN BACK FACE OF WALL

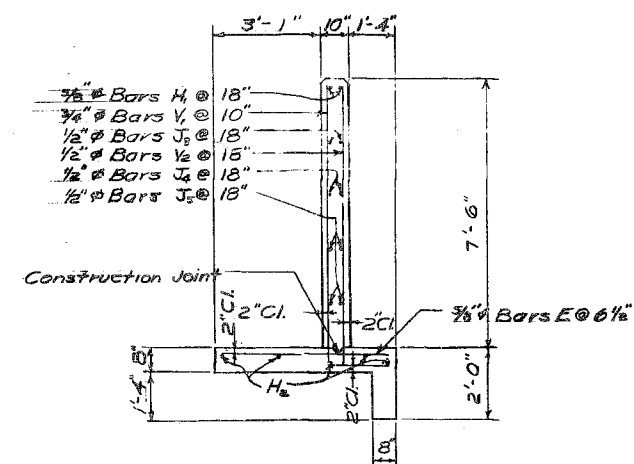
HALF ELEVATION
SHOWING BARS IN FRONT FACE OF WALL



SECTION A-A

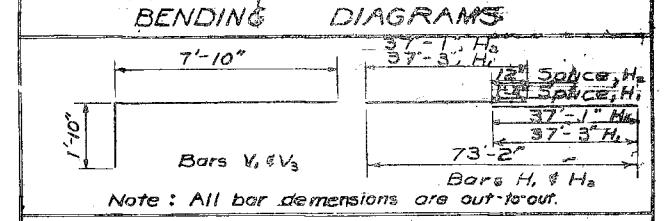


SECTION C-C



SECTION B-B

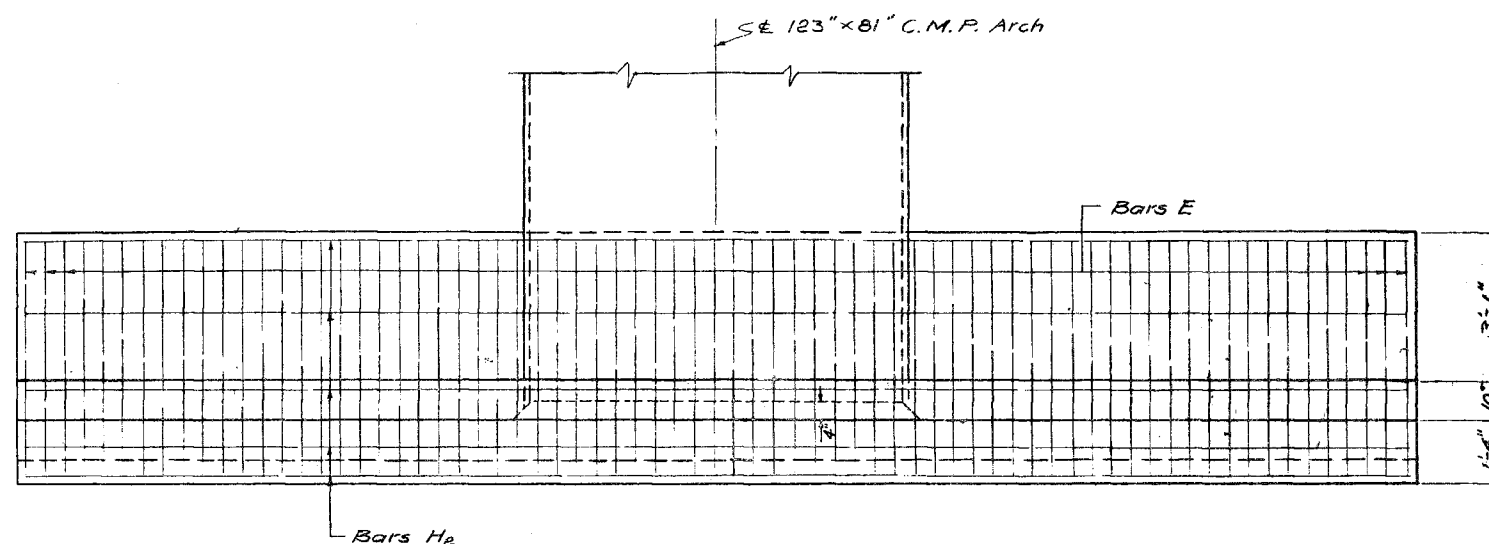
BILL OF REINFORCING STEEL				
MARK	SIZE	NO. REQD	LENGTH	BENDING
E	5	136	4'-11"	Straight
F	5	12	10'-0"	"
G	5	4	8'-0"	"
H	5	4	4'-0"	"
H1	5	2	7'-6"	See Diagram
H2	4	5	7'-2"	"
J1	4	4	16'-2"	Straight
J2	4	12	13'-1"	"
J3	4	0	7'-3"	"
J4	4	6	4'-0"	"
J5	4	12	2'-6"	"
J6	4	8	9'-0"	"
K1	4	24	1'-0"	"
K2	4	16	1'-6"	"
K3	4	8	2'-0"	"
K4	4	16	2'-5"	"
V1	6	12	9'-7"	See Diagram
V2	4	36	7'-10"	Straight
V3	5	37	9'-7"	See Diagram



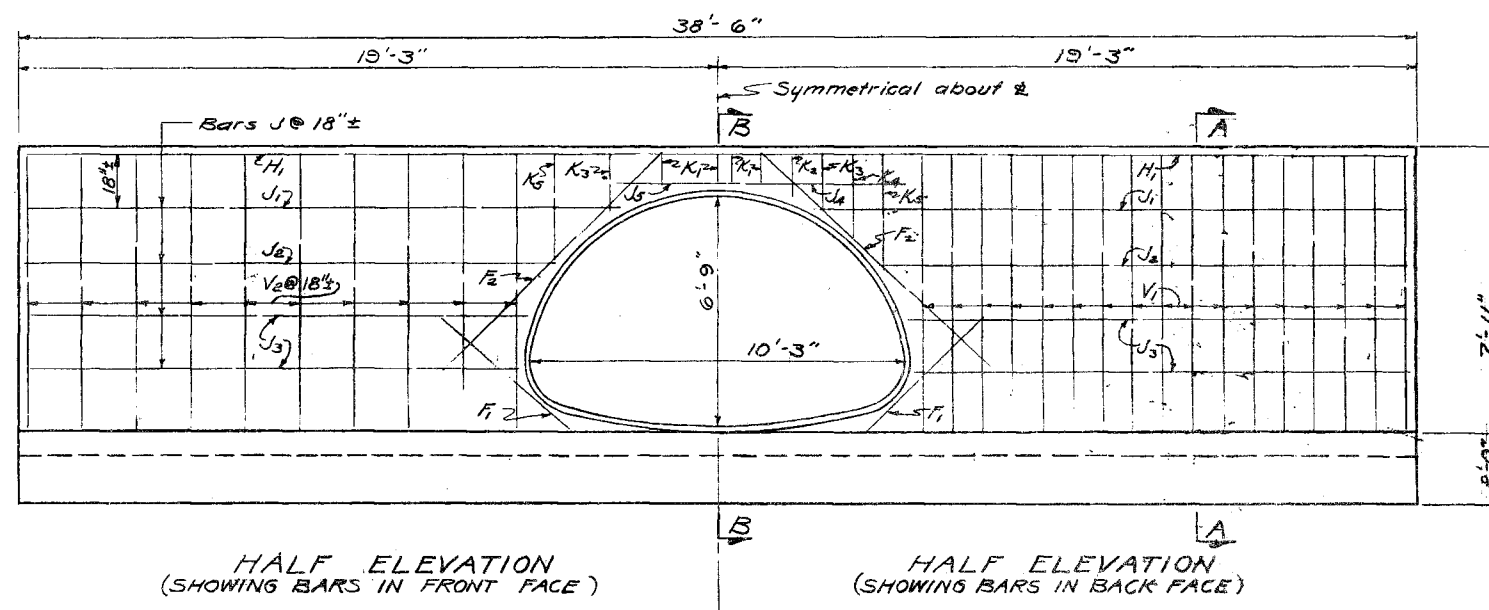
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete Class II	Cu. Yd.	23.49
Reinforcing Steel	Lb.	2278

GENERAL NOTES
 DESIGN SPECIFICATIONS: A.A.S.H.O. 1973.
 CHAMFER: All edges and corners to be chamfered 3/4" unless otherwise shown.
 REINFORCING STEEL: Grade 40 or 60

FHWA APPROVED: 3-20-75				
FLORIDA DEPARTMENT OF TRANSPORTATION				
ROADWAY PLANS SECTION				
ENDWALL FOR QUADRUPLE				
106" x 73" CMP ARCH				
REVISED	ROAD NO.	COUNTY	PROJECT NO.	
Date	Description	Name	Date	Recommended For Approval by
8-70	Raised side slope	R.C.B.	6-52	
1-71	Added Class II Conc.	J.L.W.	7-52	
10-74	Changed Index No.	J.L.W.	7-52	
	Checked by	E.C.D.	7-52	
	Traced by	R.C.B.	6-52	
APPROVED BY			DCE-16	



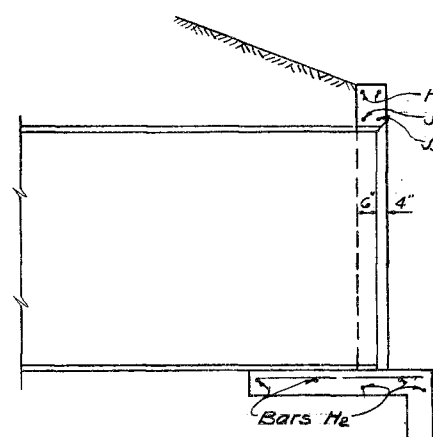
PLAN
SHOWING BARS IN FOOTING



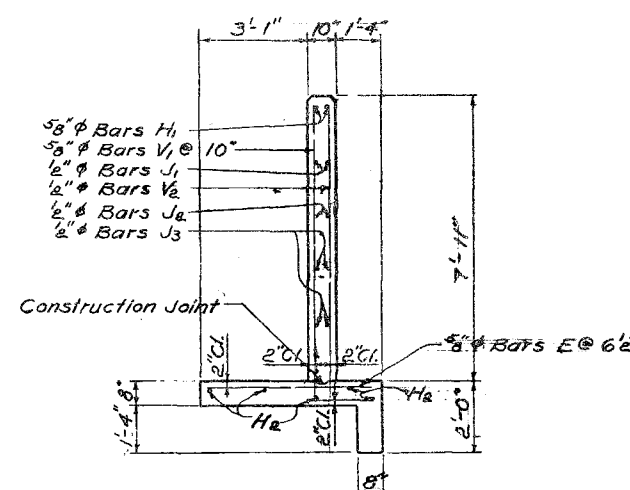
HALF ELEVATION
(SHOWING BARS IN FRONT FACE)

HALF ELEVATION
(SHOWING BARS IN BACK FACE)

Note: For sodding around endwall
see Index No. GRC-01.



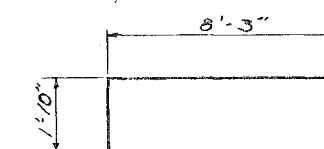
SECTION B-B



SECTION A-A

BILL OF REINFORCING STEEL				
MARK	SIZE	NO. REQD	LENGTH	BENDING
E	5	71	4'-11"	Straight
F ₁	5	4	4'-9"	"
F ₂	5	4	8'-3"	"
H ₁	5	2	32'-2"	"
H ₂	4	5	38'-2"	"
J ₁	4	4	16'-6"	"
J ₂	4	4	14'-8"	"
J ₃	4	8	13'-8"	"
J ₄	4	1	10'-0"	"
J ₅	4	1	5'-8"	"
K ₁	4	7	0'-10"	"
K ₂	4	2	1'-3"	"
K ₃	4	4	1'-9"	"
K ₄	4	2	2'-5"	"
K ₅	4	4	3'-4"	"
V ₁	5	34	10'-0"	See Diagram
V ₂	4	20	8'-3"	Straight

BENDING DIAGRAMS



BAR V.

Note: All bar dimensions are out-to-out.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	14.0
Reinforcing Steel	Lb.	1279

Note: Quantities and Bill of Reinforcing Steel
are for one endwall.

~GENERAL NOTES~

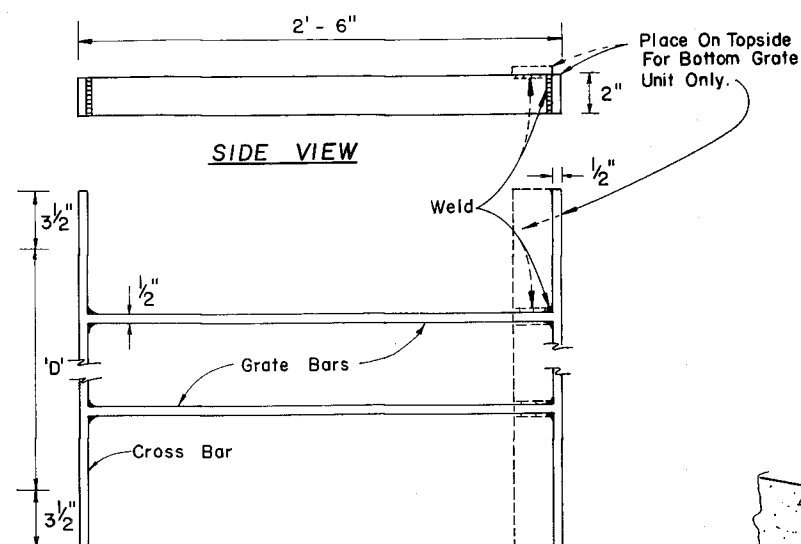
DESIGN SPECIFICATIONS: A. A. S. H. O. 1973
CHAMFER: All edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown.
REINFORCING STEEL: Grade 40 or 60

FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

ENDWALL FOR SINGLE
123" x 81" CMP ARCH

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions	Name	Date	Recommended For Approval by
8-70	Raised side slope			
LMF	to top of endwall	Checked by	8-70	APPROVED BY
3-73	Added Class II Conc.	Checked by		
10-74	changed Index N°	Quantities by		
		Checked by		
		Tracked by		



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

Bars to be evenly spaced across dimension 'D'.
All bars $\frac{1}{2}$ " x 2".

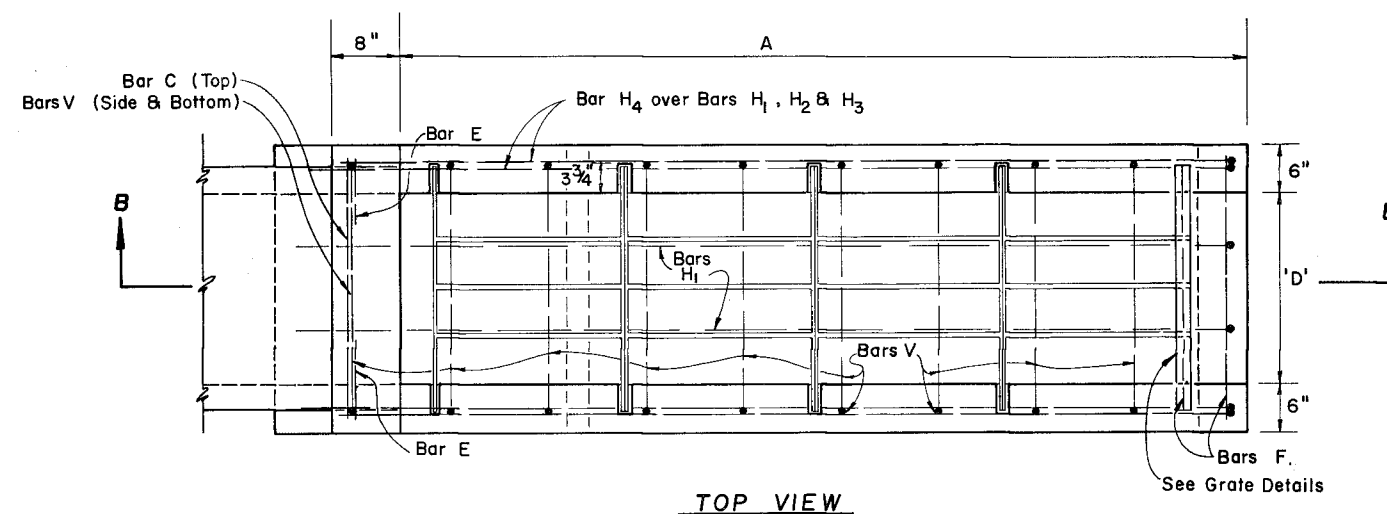
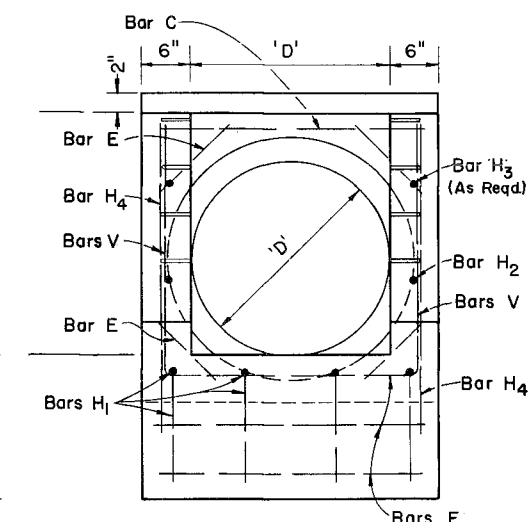
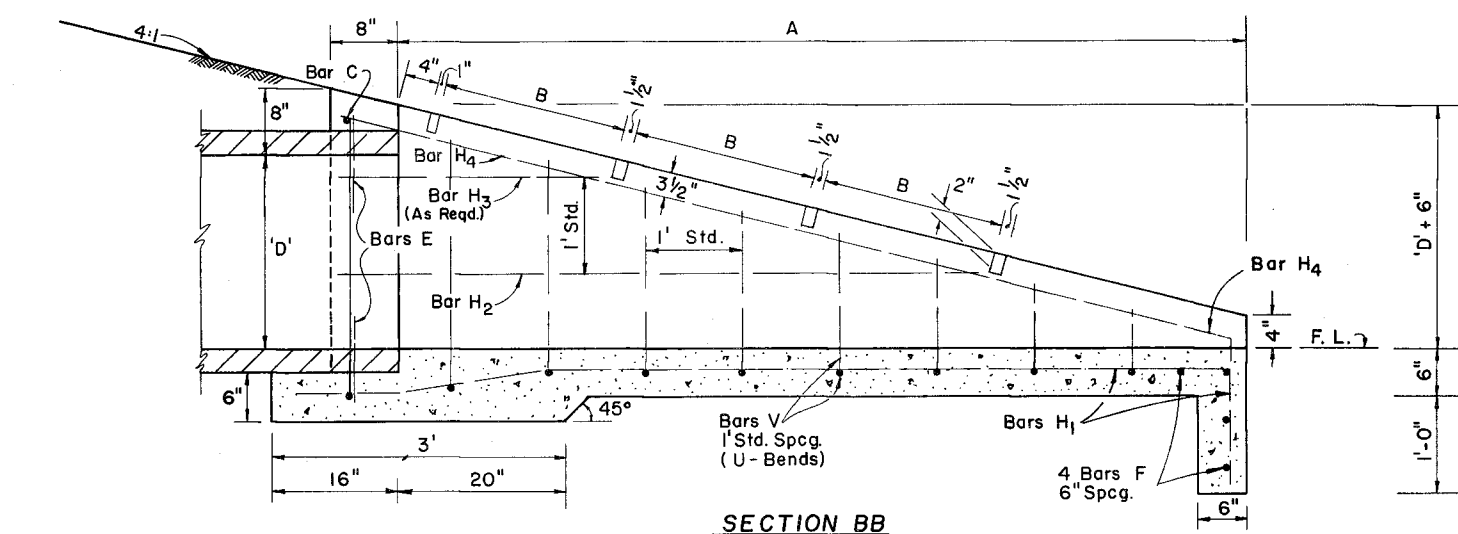
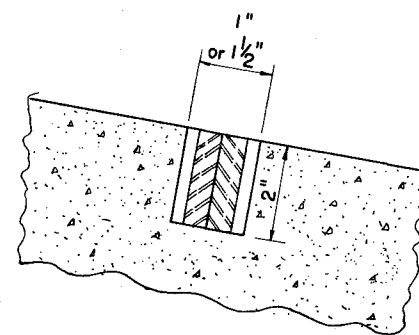
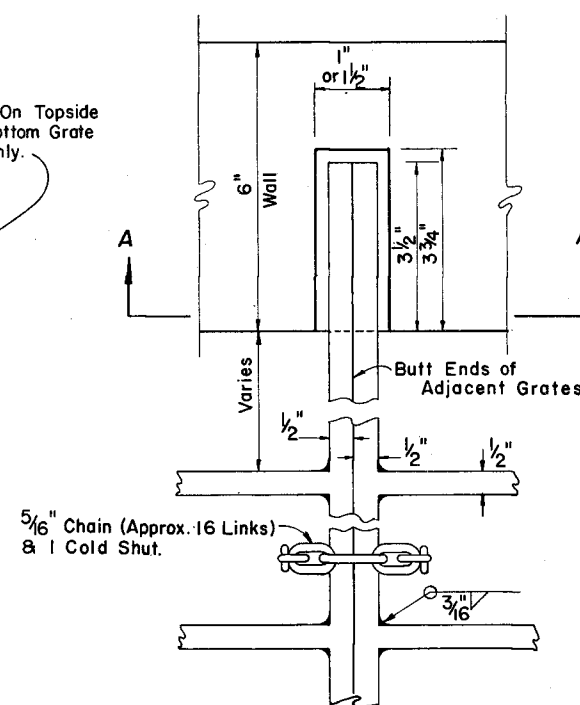
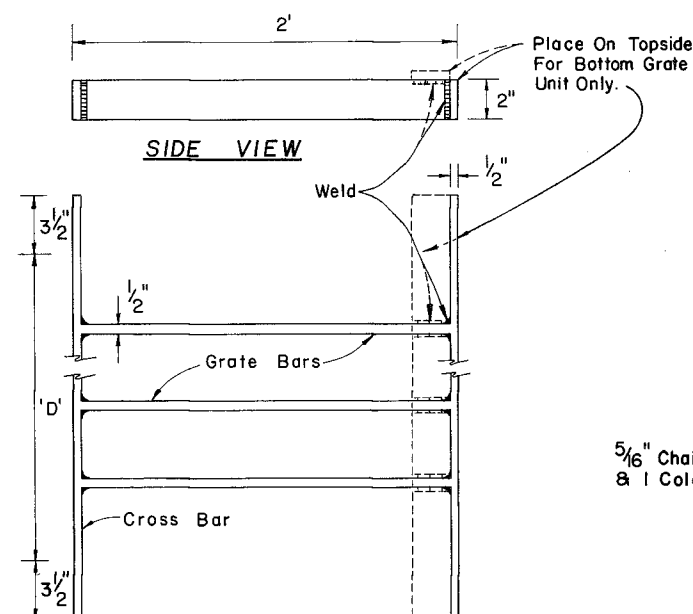


TABLE OF DIMENSIONS AND QUANTITIES									
RATE OF SLOPE	PIPE SIZE 'D'	A	B	CONC. CLASS I (Cu Yds)	REINF STEEL (lbs.)	NUMBER OF GRATES REQ'D.		TOTAL	SODDING (Sq. Yds)
						GRATE TYPE NO. 1	GRATE TYPE NO. 2	GRATE WT (lbs.)	
4:1	15"	5.67'	2.38'	0.85	56	2	0	57.86	14.5
	18"	6.67'	1.875'	1.01	73	3	0	101.08	15.8
	24"	8.67'	1.875'	1.65	97	0	3	174.52	18.4
	30"	10.67'	1.875'	2.33	129	0	5	267.75	21.0

GENERAL NOTES

1. This endwall is to be used only in the clear recovery area for the drainage of medians and other areas having low design velocities and negligible debris.
2. 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.
3. Grates to be ASTM A 588 weathering steel. If exposed to salt water, grate to be fabricated from ASTM A 572, Grade 50, then galvanized.
4. Endwall to be paid for per each. Payment shall include cost of concrete, reinforcing steel, grate, and accessories. Quantities shown are for estimating purposes only.
5. Sod slopes 5' each side and above endwall. Sodding to be paid for under contract unit price for Sodding.
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 D.O.T. Engineer of Drainage.
7. 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.



GRATE, SEAT, WELD & CHAIN DETAIL

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

Bars to be evenly spaced across dimension 'D'.
All bars $\frac{1}{2}$ " x 2".

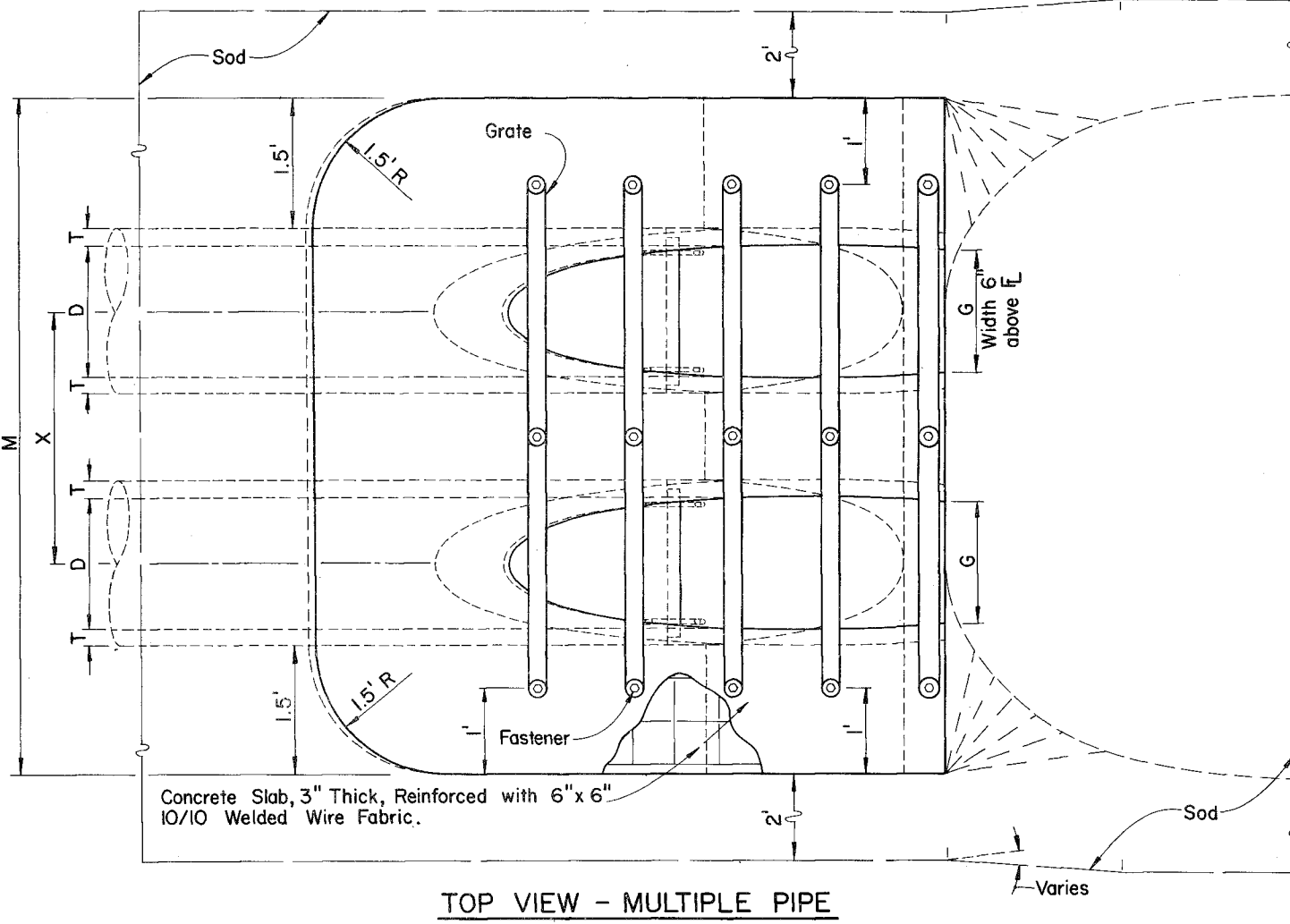
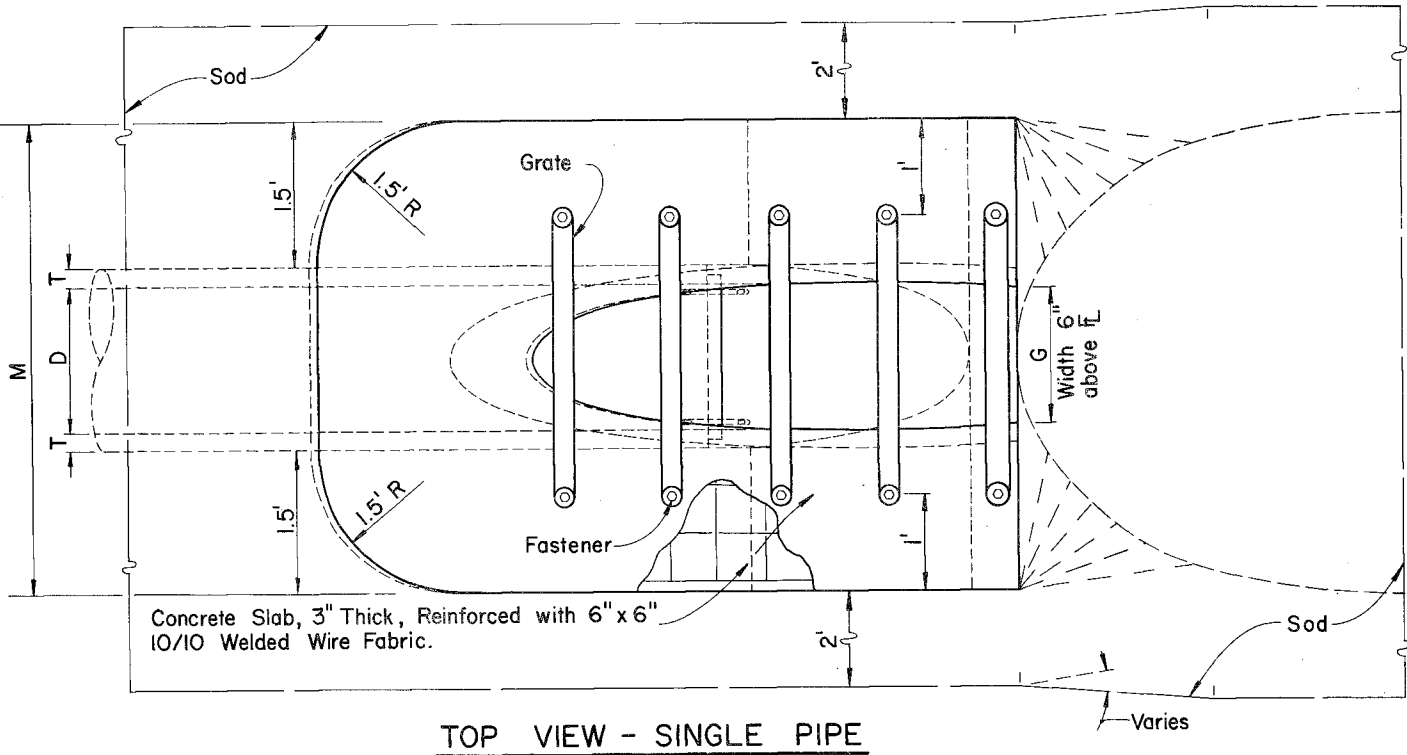
F.H.W.A. Approved: 7-15-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

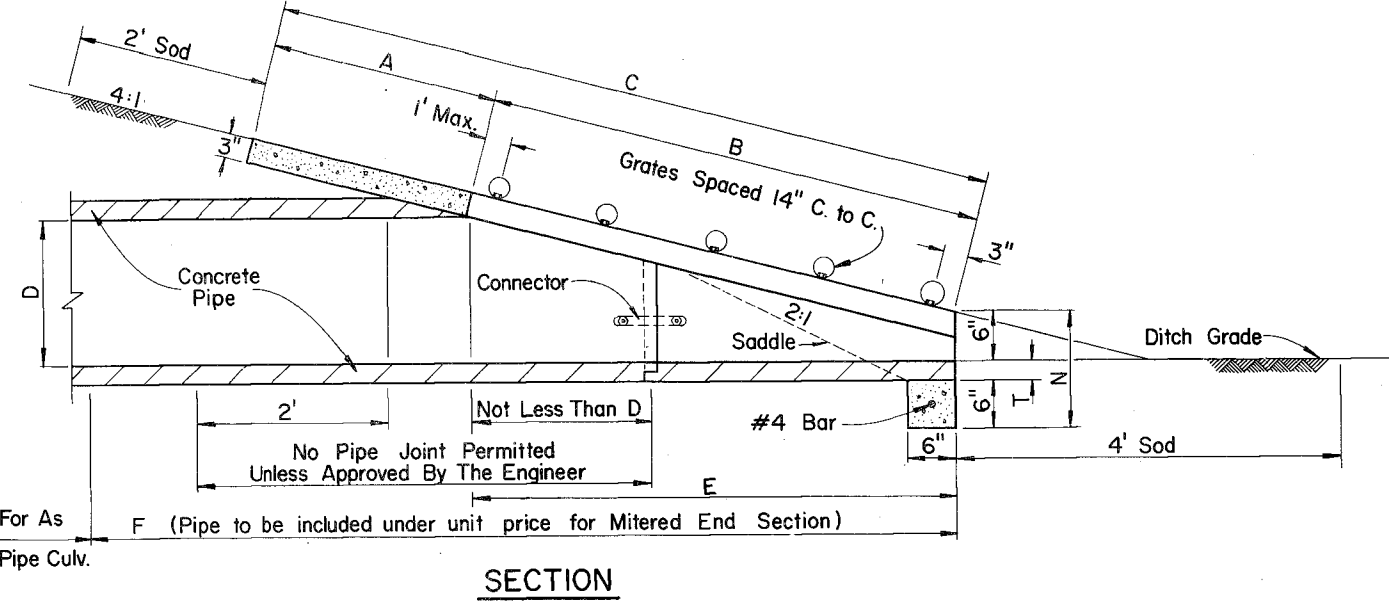
U- ENDWALL FOR PIPE CULVERTS

REVISIONS		ROAD NO.		COUNTY		PROJECT NO.	
Date	Descriptions						
		Names		Dates		APPROVED BY	
		Designed by	E. G. R.	6-77	<i>E. H. Hart</i>		
		Checked by	J. V. G.	6-77			
		Quantities by	A. F.	6-77			
		Checked by	J. V. G.	6-77			
		Supervised by	E. G. R.		Drawing No.		Index No.
					1 OF 1		DCE-20

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'			0.40	0.61	0.80	1.00	8.69	10.41	12.13	13.86
18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.92'	7.75'	10.58'	13.42'	1.21'			0.47	0.69	0.91	1.14	9.39	11.25	13.14	15.02
24"	3'-5"	2.53'	7.18'	9.71'	7.03'	11'	1.73'	5.50'	8.92'	12.33'	15.75'	1.25'			0.60	0.90	1.21	1.52	10.76	13.03	15.31	17.59
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"	0.76	1.19	1.63	2.07	12.14	14.97	17.81	20.64
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"	0.89	1.48	2.05	2.63	13.52	16.92	20.30	23.69
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"	1.05	1.82	2.57	3.34	14.90	18.90	22.90	26.90
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"	1.21	2.15	3.07	4.00	16.28	20.78	26.50	29.78
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"	1.39	2.55	3.72	4.88	17.67	22.78	27.89	33.00
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"	1.59	3.02	4.44	5.86	19.04	24.71	30.38	36.04



Note:
See Sheet 4 for Details and Sheet 5 for Notes.



F.H.W.A. APPROVED: 10-21-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

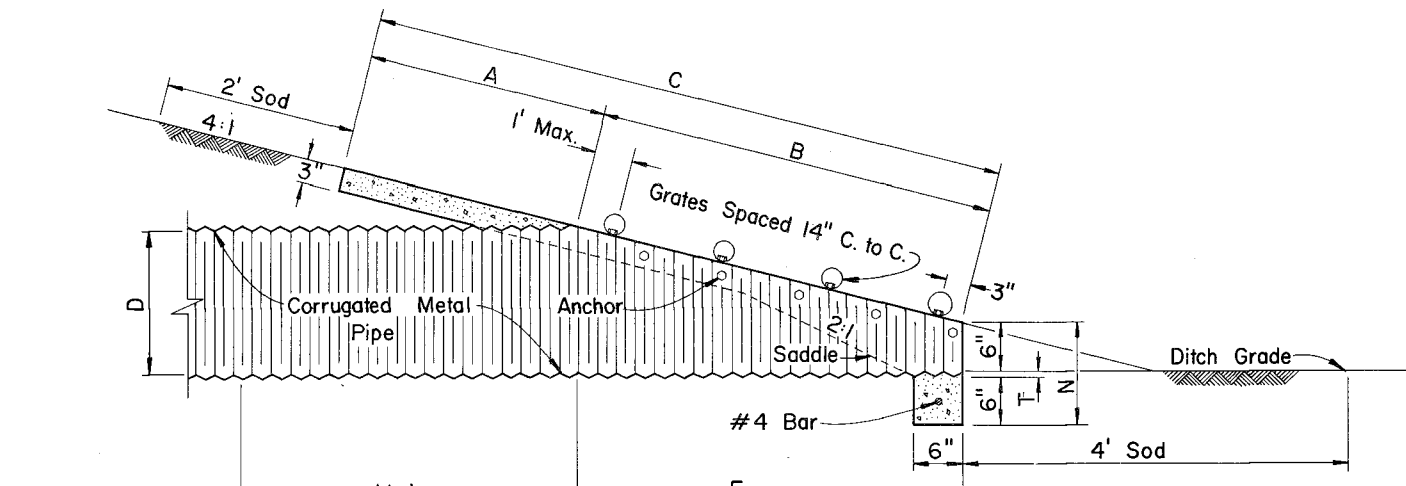
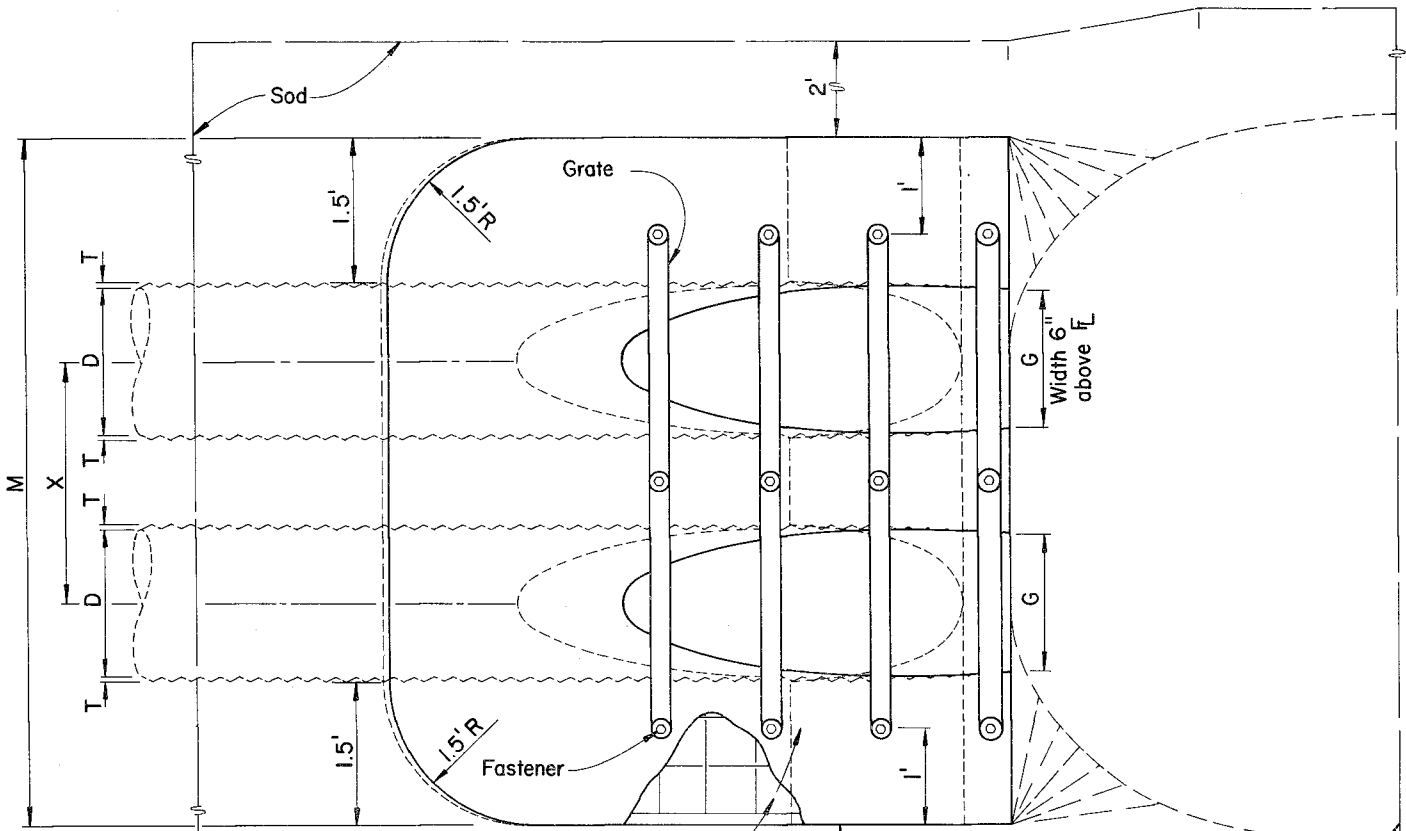
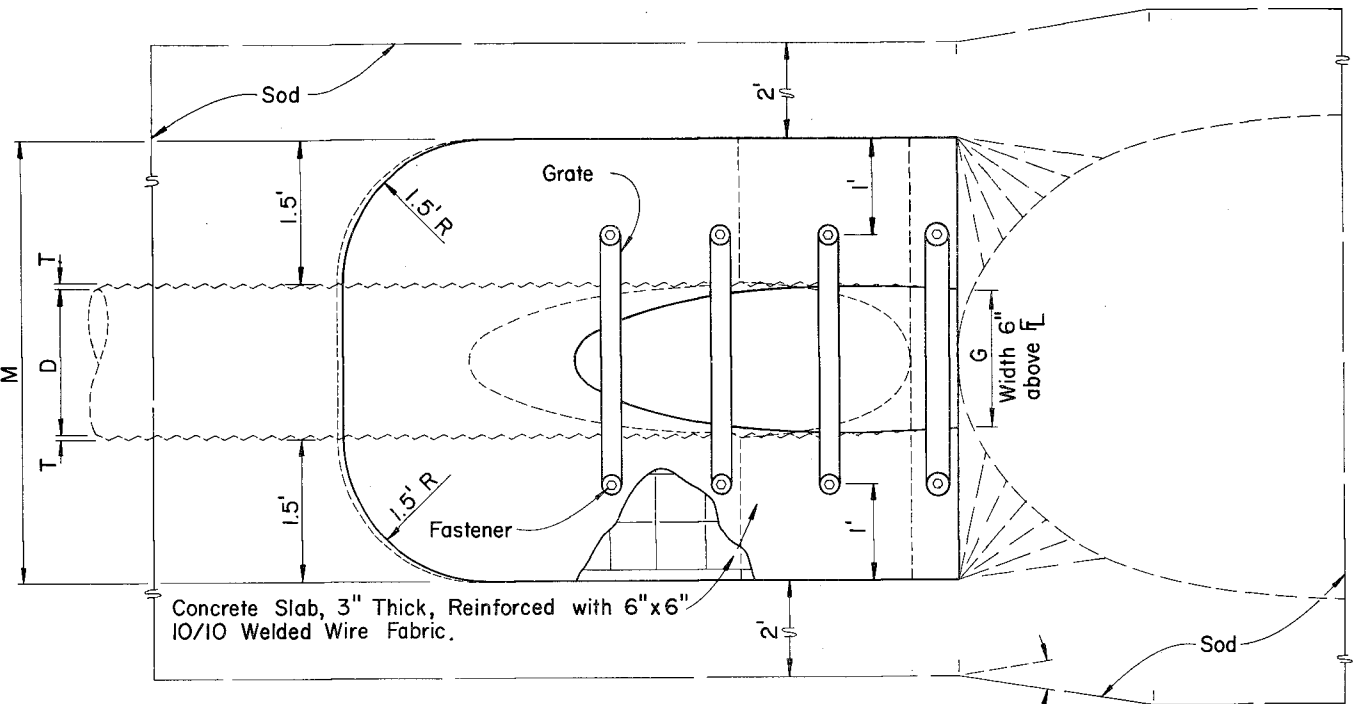
**SIDE DRAIN
MITERED END SECTION
SINGLE AND MULTIPLE ROUND CONCRETE PIPE**

ROAD NO.	COUNTY	PROJECT NO.

Names	Dates	APPROVED BY
Designed by E. G. R.	8-77	<i>E. H. Hart</i> Deputy Design Engineer, Roadways
Checked by J. V. G.	8-77	
Quantities by A. F.	8-77	
Checked by J. V. G.	8-77	
Supervised by D. C. B.		Drawing No. 1 of 5 Index No. DME-01-1

REVISIONS	
Date	Descriptions
8-77	Expanded to include multiple pipe, pipe-arch and fastener details. Revised dimensions, quantities and general notes. 3 sheets added.

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"	2.5'	3.09'	5.59'	3.0'	7.0'	1.23'	4.33'	6.92'	9.50'	12.08'	1.04'			0.31	0.47	0.63	0.79	8.15	9.88	11.59	13.31
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'			0.34	0.53	0.71	0.90	8.77	10.67	12.55	14.44
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'			0.44	0.69	0.92	1.18	10.02	12.30	14.59	16.86
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"	0.53	0.88	1.25	1.60	11.28	14.12	16.95	19.77
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"	0.62	1.07	1.53	2.00	12.52	15.92	19.30	22.69
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"	0.70	1.30	1.92	2.52	13.77	17.78	21.77	25.77
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"	0.80	1.54	2.29	3.02	15.02	19.53	24.02	28.52
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"	0.90	1.83	2.74	3.67	16.27	21.39	26.49	31.61
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"	1.02	2.15	3.27	4.39	17.52	23.19	28.85	34.52



Paid For As
Side Drain Pipe Culv.

SECTION

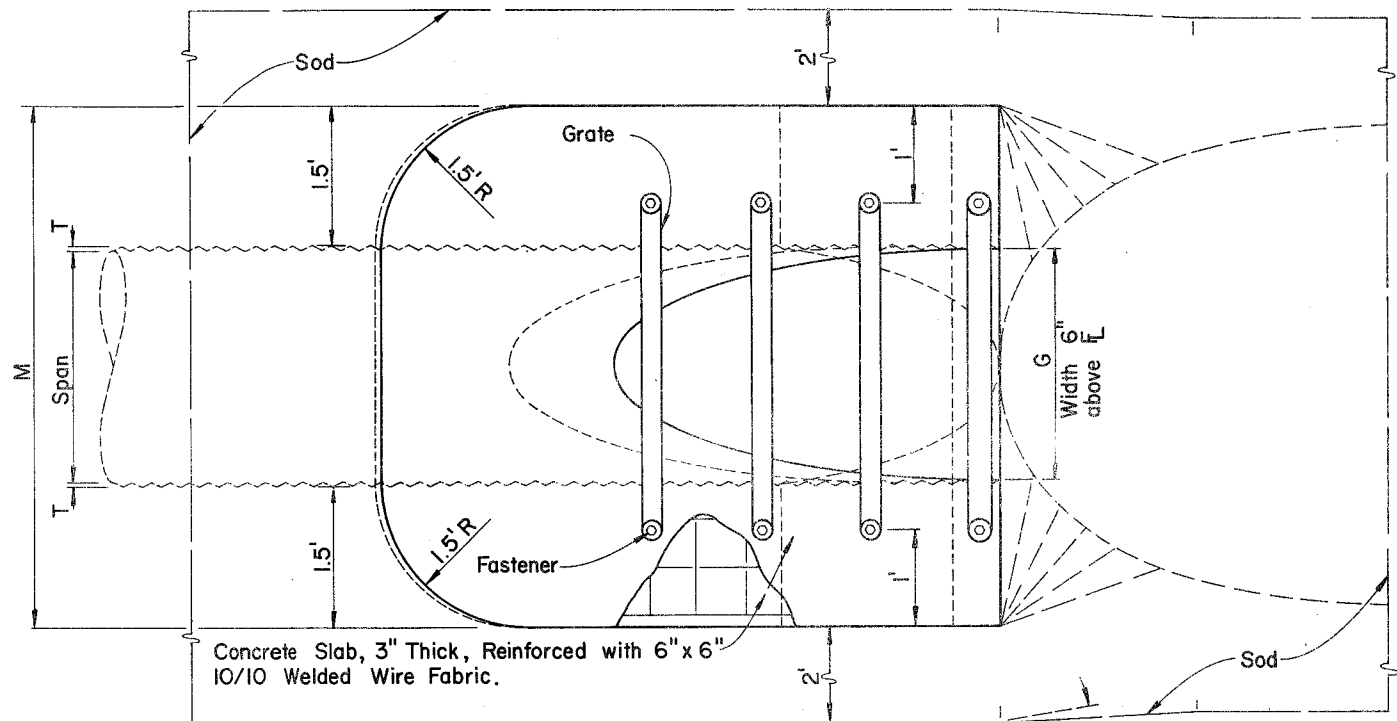
Note:
See Sheet 4 for Details and Sheet 5 for Notes.

F.H.W.A. APPROVED: 10-21-77			
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			
SIDE DRAIN MITERED END SECTION			
SINGLE AND MULTIPLE ROUND CORRUGATED METAL PIPE			
ROAD NO.		COUNTY	PROJECT NO.
APPROVED BY		APPROVED BY	
Designed by E. G. R. 8-77		Checked by J. V. G. 8-77	
Quantities by A. F. 8-77		Checked by J. V. G. 8-77	
Supervised by D. C. B.		Drawing No. 2 of 5 Index No. DME-01-1	

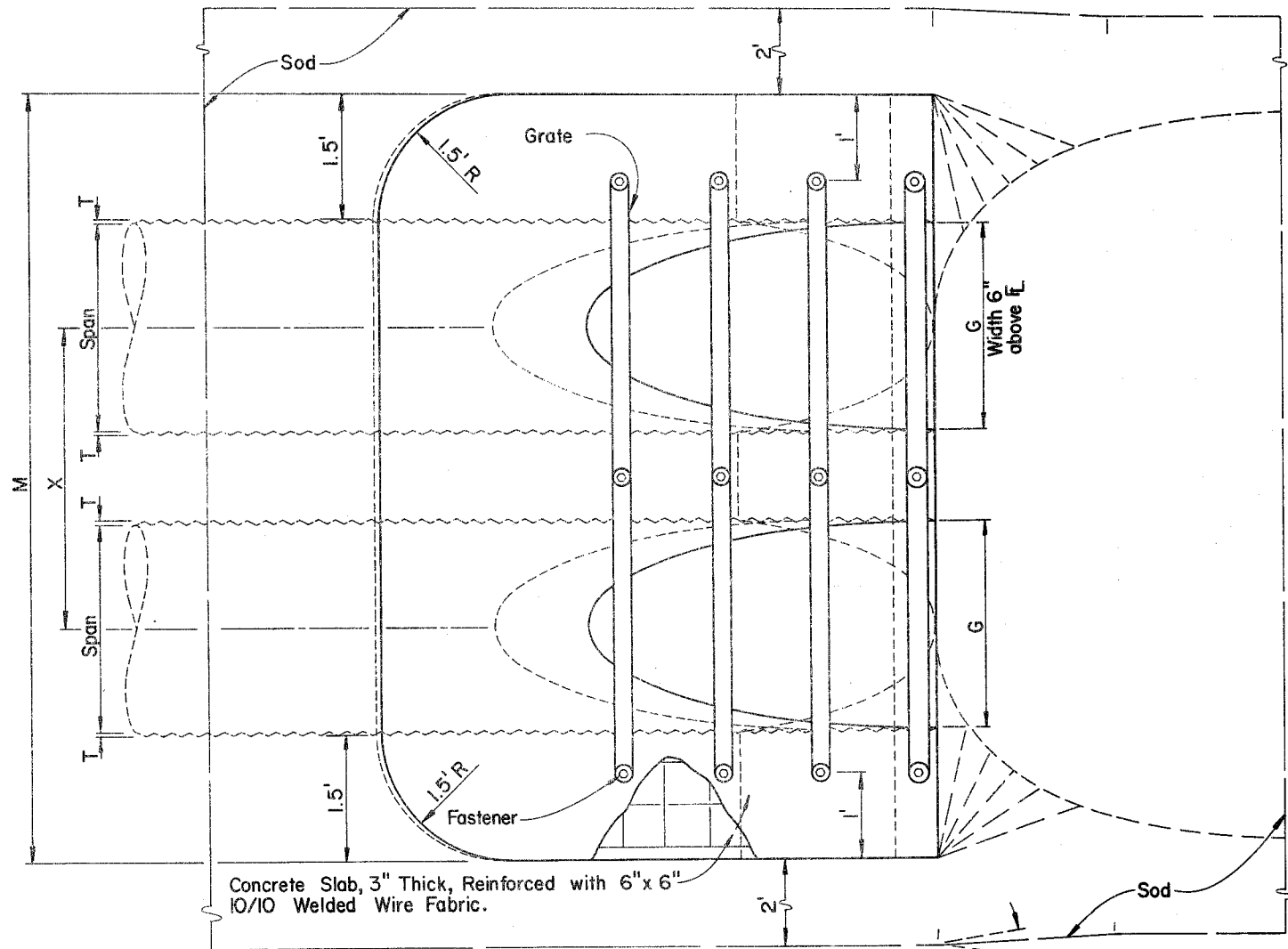
DIMENSIONS & QUANTITIES

FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.			

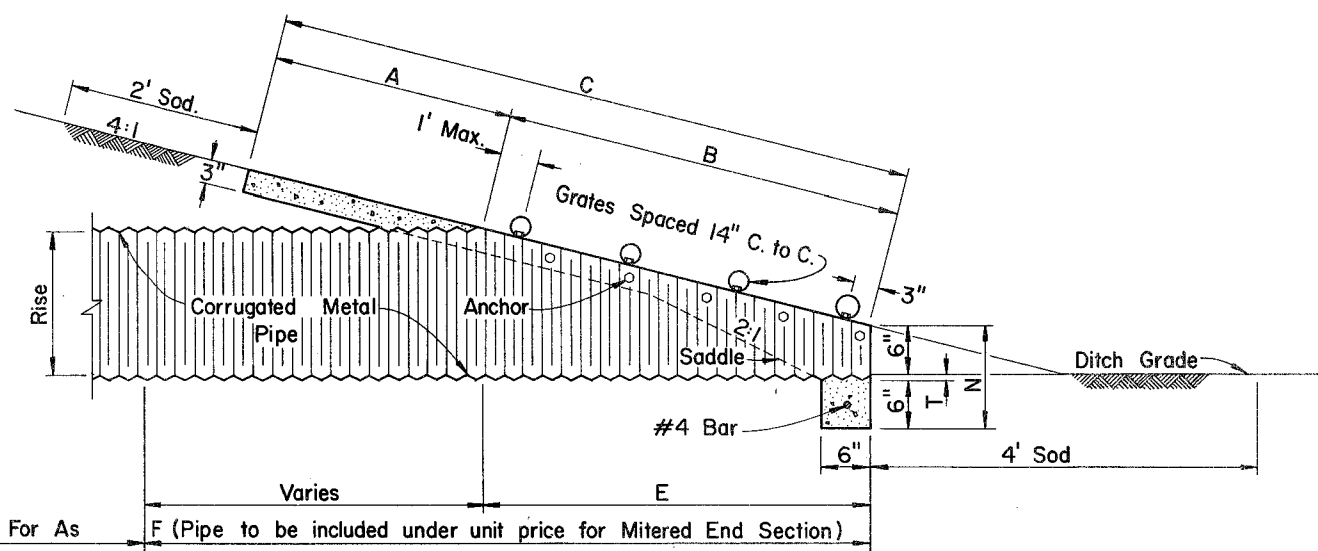
1974 AASHTO		M												N		GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)			
Span	Rise	X	A	B	C	E	F	G	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe				Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
17"	13"	2'-6"	2.5'	2.41'	4.91'	2.33'	7'	1.39'	4.50'	7.00'	9.50'	12.00'	1.04'					.28	.42	.56	.70	7.96	9.62	11.29	12.96
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'					.32	.49	.66	.78	8.48	10.37	12.26	14.15
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'					.40	.60	.82	1.03	9.64	11.91	14.19	16.47
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"	3"	.49	.77	1.05	1.33	10.63	13.30	15.97	18.63
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"	3 1/2"	.57	.92	1.27	1.62	11.78	14.95	18.12	21.28
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"	3 1/2"	.65	1.08	1.50	1.93	12.79	16.45	20.12	23.79
57"	38"	6'-4"	2.5'	11.00'	13.50'	10.67'	16'	3.65'	7.83'	14.17'	20.30'	26.83'	1.04'			3"	4"	.76	1.30	1.83	2.37	13.99	18.22	22.44	26.66
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"	4"	.87	1.55	2.18	2.83	15.15	19.86	24.59	29.31
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"	4"	.95	1.68	2.43	3.17	16.15	21.37	26.59	31.82



TOP VIEW - SINGLE PIPE



TOP VIEW - MULTIPLE PIPE



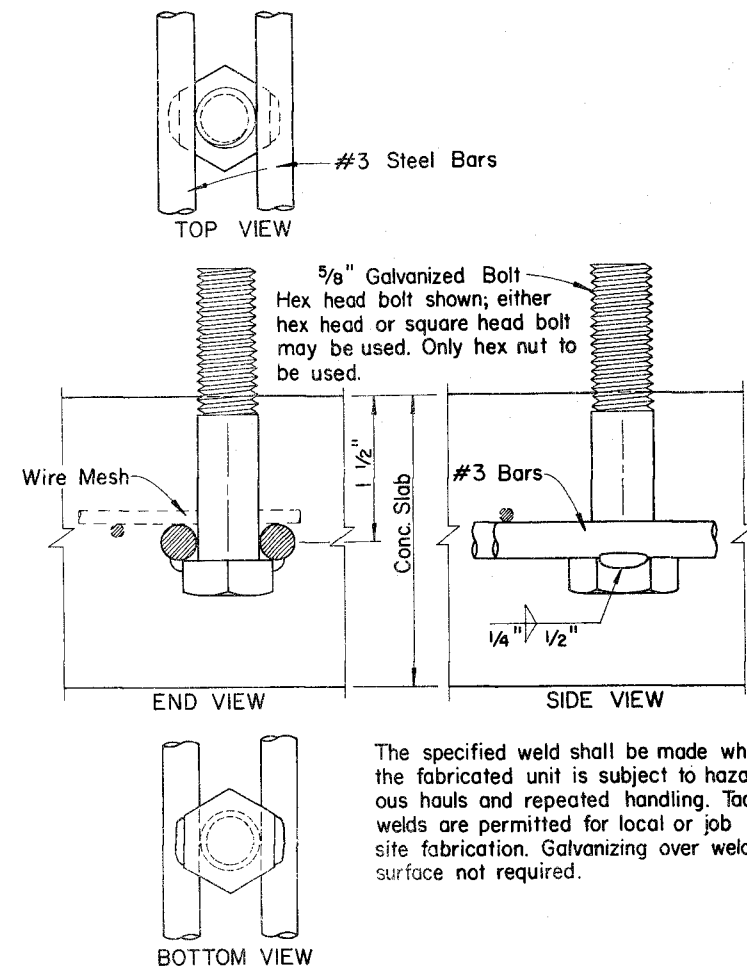
SECTION

Note:
See Sheet 4 for Details and Sheet 5 for Notes.

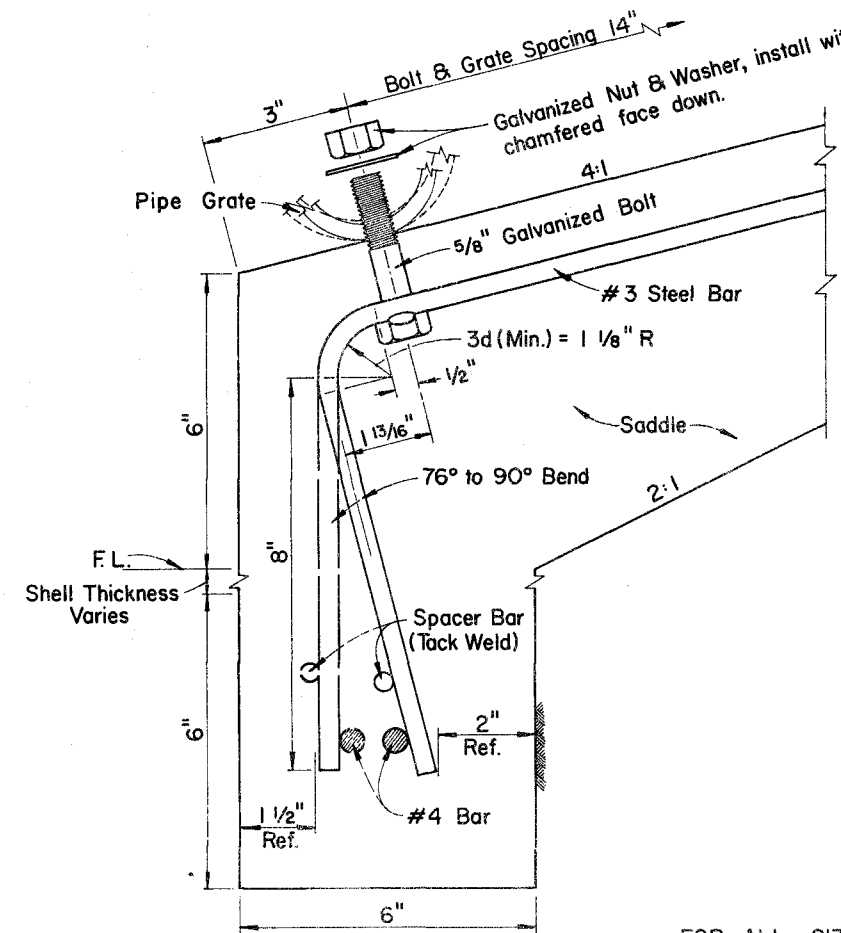
F.H.W.A. APPROVED: 10-21-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			
SIDE DRAIN MITERED END SECTION			
SINGLE AND MULTIPLE CORRUGATED METAL PIPE-ARCH			
ROAD NO.	COUNTY	PROJECT NO.	
DESIGNED BY		APPROVED BY	
E. G. R.		E. H. Hart	
CHECKED BY		DEPUTY DESIGN ENGINEER, ROADWAYS	
J. V. G.			
QUANTITIES BY		DRAWING NO.	
A. F.		3 of 5	
SUPERVISED BY		INDEX NO.	
D. C. B.		DME-OI-1	

H.K.H.

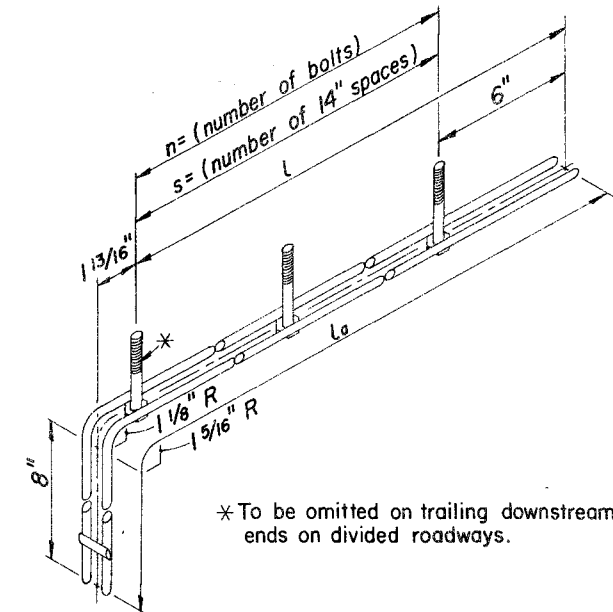


The specified weld shall be made when the fabricated unit is subject to hazardous hauls and repeated handling. Tack welds are permitted for local or job site fabrication. Galvanizing over welded surface not required.



FASTENER UNIT

FOR ALL SIZES OF SINGLE AND MULTIPLE DRAIN PIPE



* To be omitted on trailing downstream ends on divided roadways.

Drain Size	s	n	L	L _o
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"

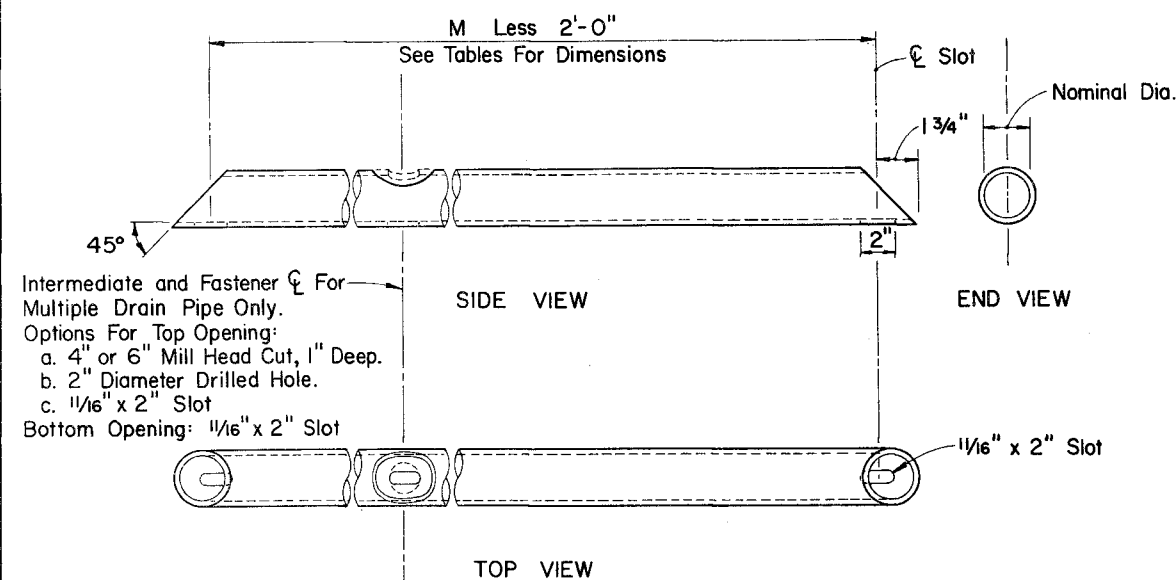
Note: 5/8" x 3" bolts are standard for all grate fasteners, except when the contractor elects to use the slotted upper holes for the intermediate fasteners on multiple drain pipe, which will require the following bolt lengths:

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

Drain Size	s	n	L	L _o
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	L _o
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"

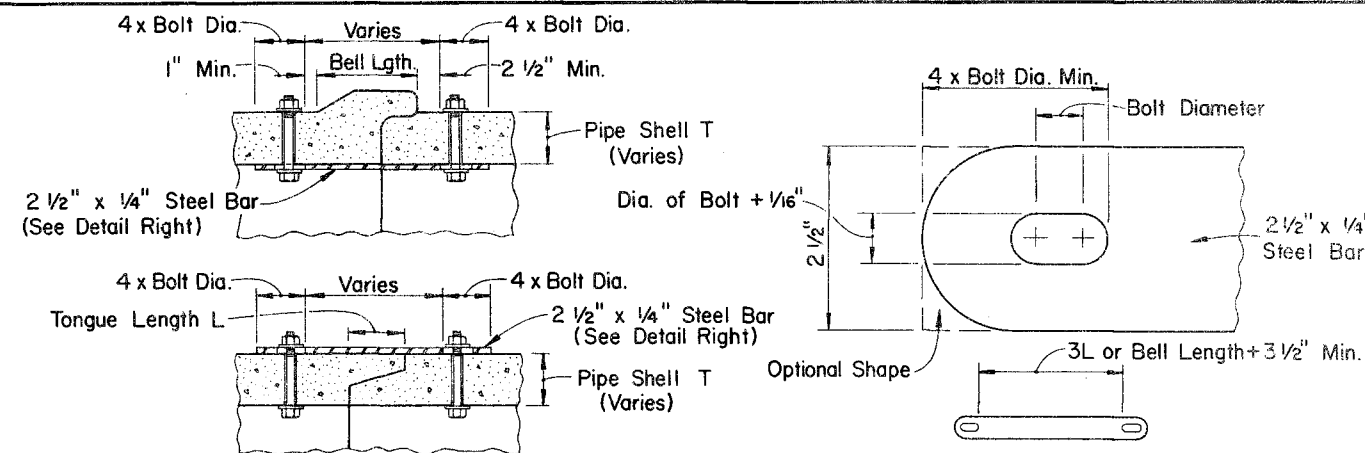
** To be used only when grates are called for in the plans.
*** 1974 AASHTO Pipe Arch Sizes.



GRATE DETAIL

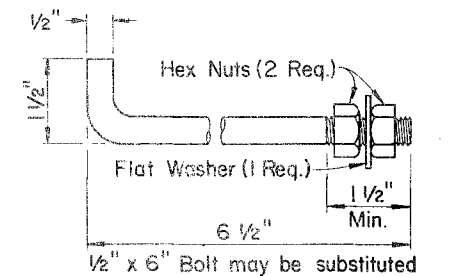
FOR SINGLE & MULTIPLE DRAIN PIPE

See General Notes, Sheet 5.



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



Anchor 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.

ANCHOR DETAIL

F.H.W.A. APPROVED: 10-21-77

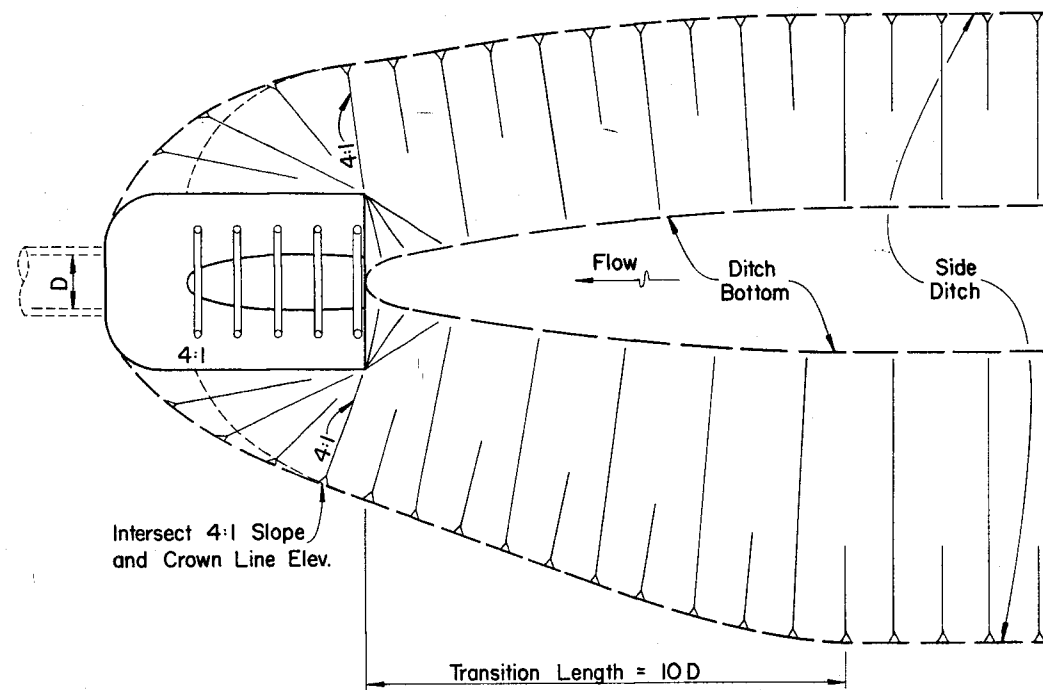
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

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

REVISED		ROAD NO.		COUNTY		PROJECT NO.	
Dates	Descriptions						
		Names		Dates		APPROVED BY	
		Designed by		E. G. R.		8-77	
		Checked by		J. V. G.		8-77	
		Quantities by		A. F.		9-77	
		Checked by		J. V. G.		8-77	
		Supervised by		D. C. B.			
						Drawing No.	
						Index No.	
						4 of 5	
						DME-01-1	

H.K.H.

GENERAL NOTES



PLAN

DITCH TRANSITION

1. The cost of all pipe(s), grates, fasteners, reinforcing, connectors, anchors, and concrete shall be included in the contract unit price for mitered end section, each. Sodding not included.
2. The reinforced concrete slab shall be constructed for all sizes of side drain pipe and cast in place with Class I concrete.
3. Round pipe size 30" or greater and pipe-arch size 35" x 24" or greater shall be grated unless excepted in the plans. Smaller sizes of pipe shall be grated only when called for in the plans.

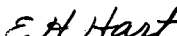
The lower grate on trailing downstream ends on divided highways shall be omitted.
4. Grates are to be fabricated from galvanized steel. The lower grate on all traffic approach ends shall be Schedule 80 ASTM A 120 extra strong pipe. All remaining grates shall be either ASTM A 501 structural tubing or A 53, grade B, pipe.

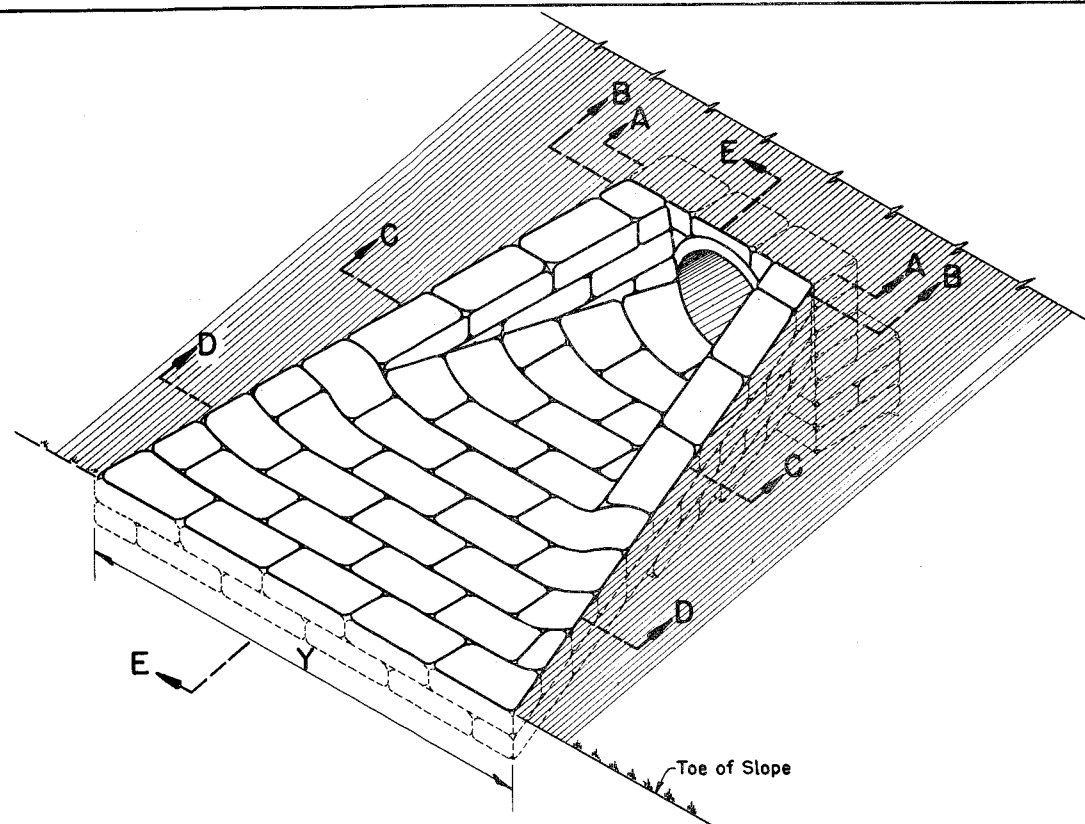
Base metal exposed during fabrication shall be repaired as specified in Section 562, Standard Specifications. Grates subject to salt water or highly corrosive environment shall be hot dipped galvanized after fabrication in accordance with ASTM A 123.
5. Concrete pipe used in the assembly of mitered end sections shall be of selective lengths to avoid excessive connections.
6. Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered end section shall be repaired.
7. That portion of corrugated metal pipe in direct contact with the concrete slab shall be bituminous coated prior to placing of the concrete.
8. 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 Standard Index DMD-01.
9. 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.
10. Ditch transitions shall be used on all grades in excess of 3% as directed by the Engineer.

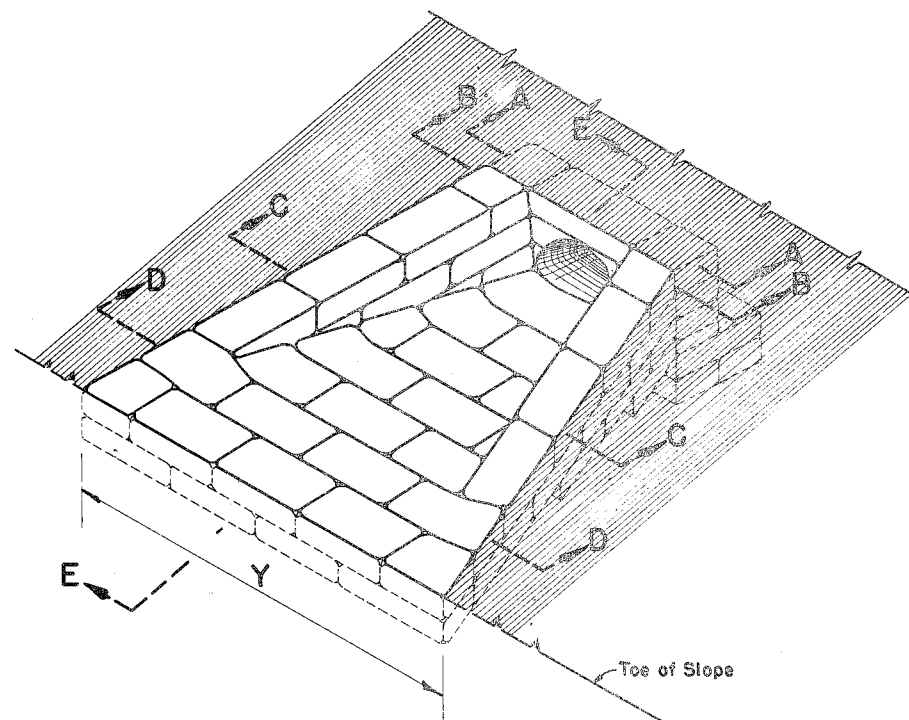
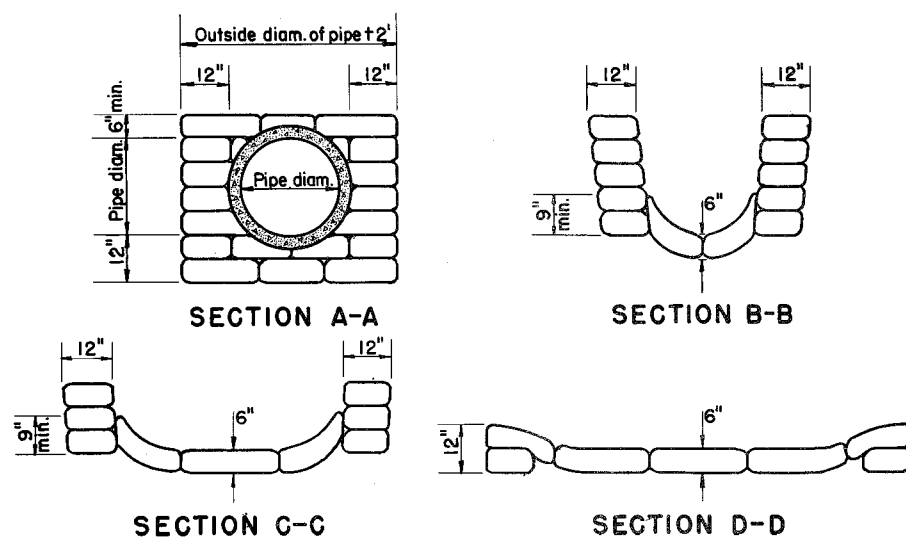
DESIGN NOTES

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 3).
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 4).

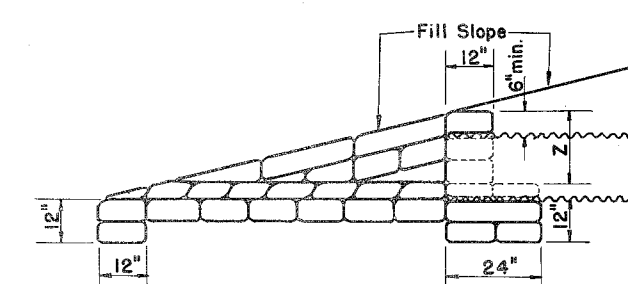
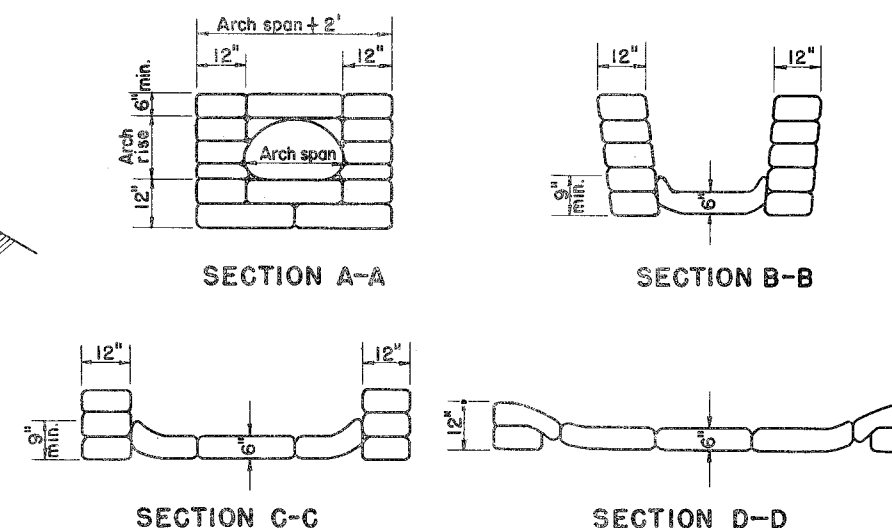
F.H.W.A. APPROVED: 10-21-77				
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
<h1 style="margin: 0;">SIDE DRAIN MITERED END SECTION</h1>				
NOTES & INFORMATION				
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
		Names	Dates	APPROVED BY  Deputy Design Engineer, Roadways
		Designed by E. G. R.	8 - 77	
		Checked by J. V. G.	8 - 77	
		Quantities by A. F.	8 - 77	
		Checked by J. V. G.	8 - 77	
		Supervised by D. C. B.		Drawing No. _____ Index No. _____
		5 of 5		DME-OI-I



ISOMETRIC



ISOMETRIC



SECTION E-E

DETAILS FOR SINGLE METAL PIPE ARCH CULVERTS

NOTE: For Multiple Metal Pipe Arch Culvert spacing between Arch centers = X

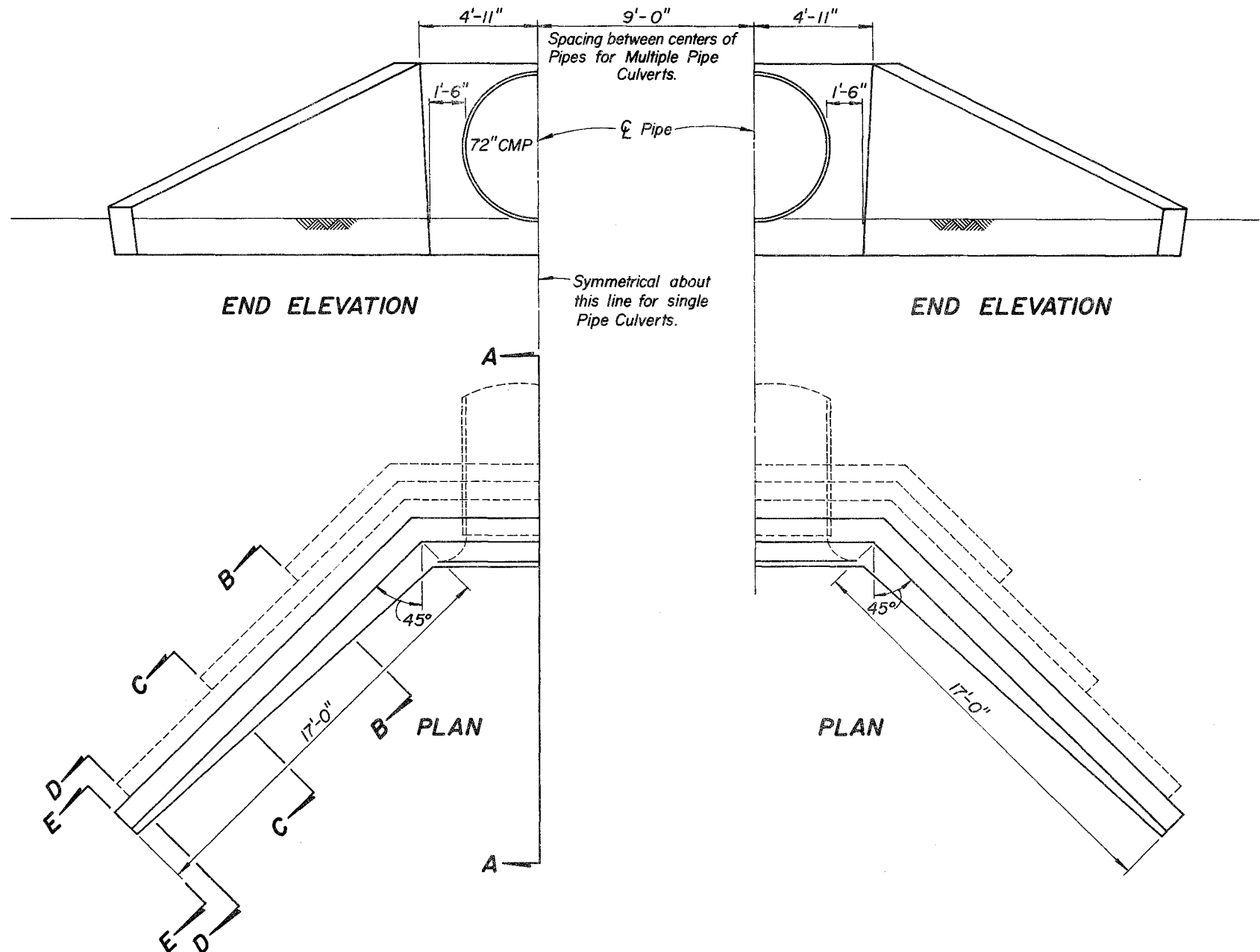
DIMENSIONS and QUANTITIES for METAL PIPE ARCH CULVERTS																					
Span	Rise	Dimensions						Quantity of Sand-Cement Riprap in Cu. Yds. for One Endwall													
		X		Y				Z	For 2:1 Slopes				For 4:1 Slopes				For 6:1 Slopes				
				1-Arch	2-Arch	3-Arch	4-Arch		1-Arch	2-Arch	3-Arch	4-Arch	1-Arch	2-Arch	3-Arch	4-Arch	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						

DIMENSIONS and QUANTITIES for ROUND PIPE CULVERTS																	
Pipe Diam.	Dimensions					Quantity of Sand-Cement Riprap in Cu.Yds. for One Endwall											
	X	Y				For 2:1 Slopes				For 4:1 Slopes				For 6:1 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				

FHWA APPROVED: 8-30-77		FLORIDA DEPARTMENT OF TRANSPORTATION	
ROADWAY PLANS SECTION		SAND-CEMENT ENDWALLS FOR PIPE CULVERTS	
ROAD NO.	COUNTY	PROJECT NO.	
REVISIONS		APPROVED BY:	
Date	Description	Names	Dates
10-74	Changed Index No.	J.E.P. Jr.	12-3-48
8-77	Update CMP Arch to 1974 AASH TO	C.D.D.	12-6-48
Checked by		Deputy Design Engineer - Roadways	
Checked by		Drawing No.	
Traced by		Index No.	
H.W.		39-54	
		DSE-OI-1	

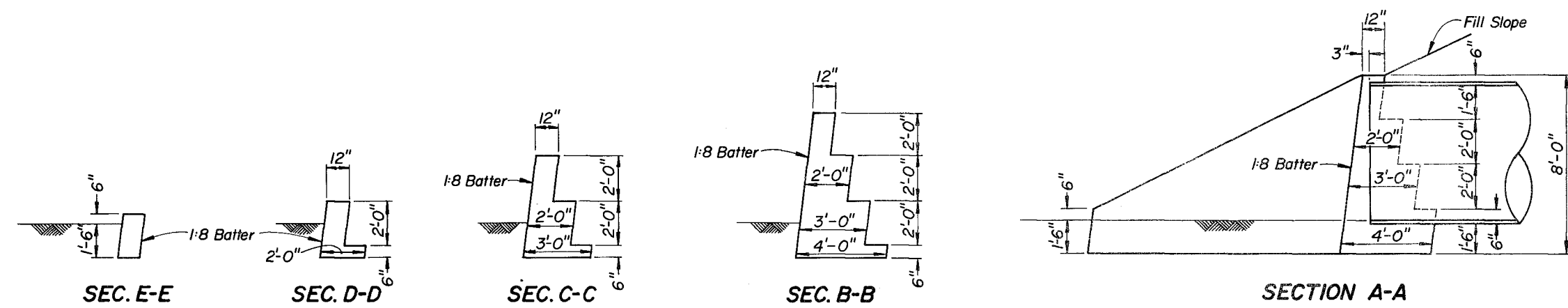
DETAIL FOR SINGLE PIPE CULVERT

NOTE: For Multiple Pipe Culvert spacing between pipe centers = X



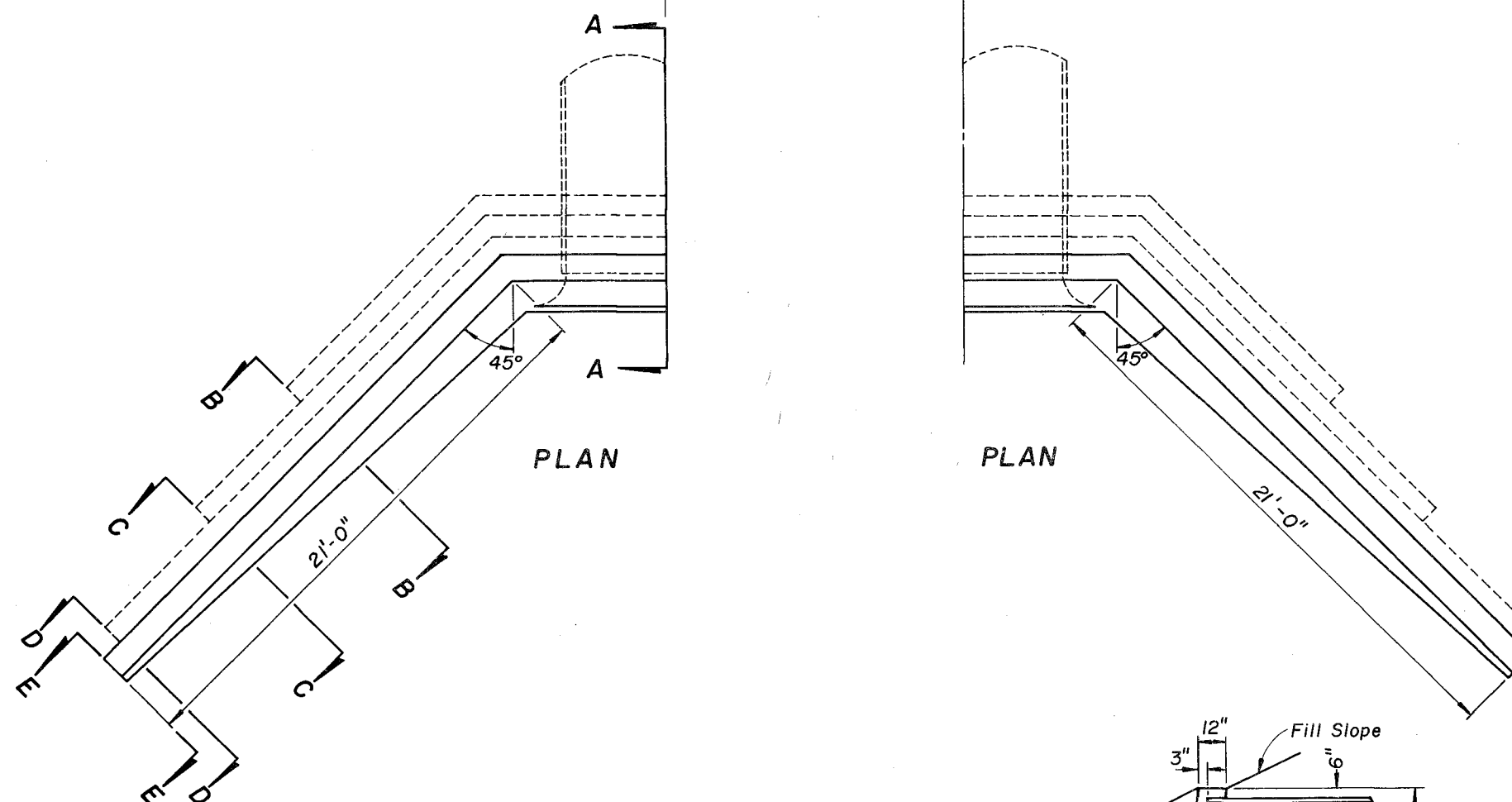
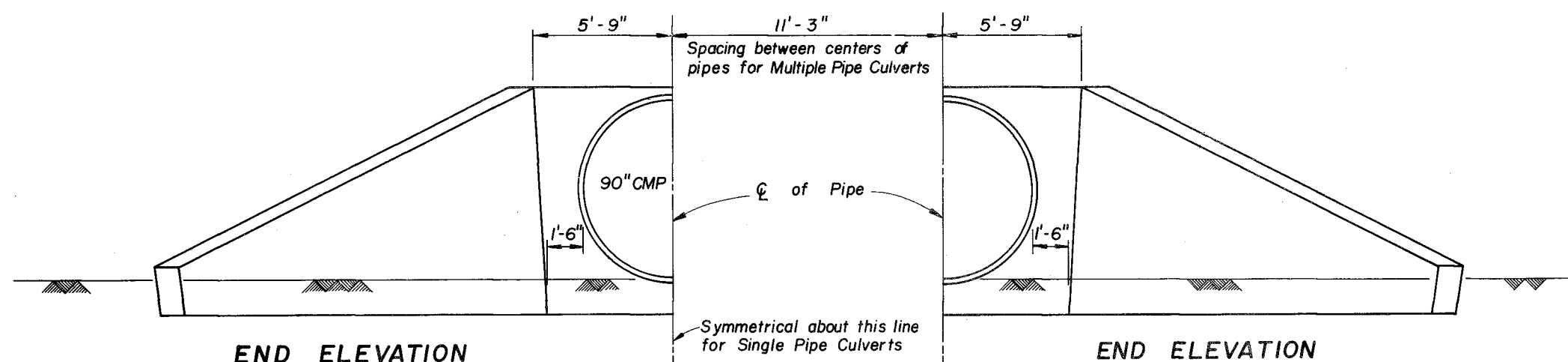
QUANTITY IN ONE ENDWALL, CU. YDS. OF SAND-CEMENT RIPRAP				
1 PIPE	2 PIPES	3 PIPES	4 PIPES	
19.3	23.6	27.9	32.2	

Note: Wingwalls based on 2:1 slope
Scale: 1"= 3'-0"



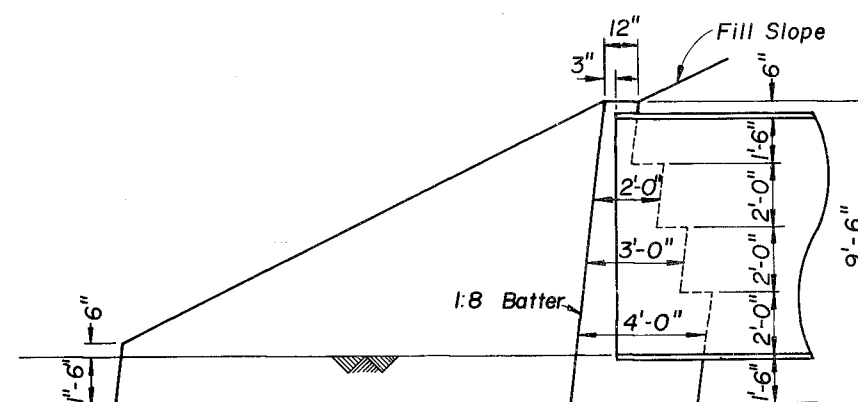
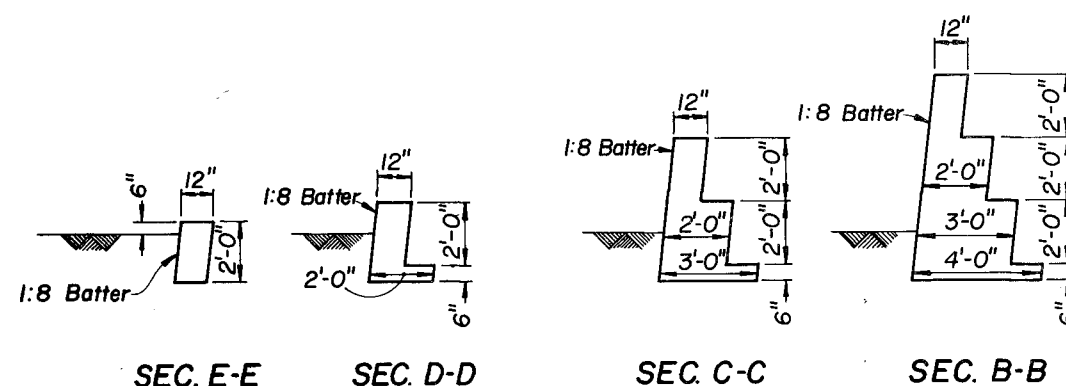
F.H.W.A. APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				
ROAD DESIGN SECTION				
SAND-CEMENT ENDWALLS FOR 72" C.M. PIPE				
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.	
Dates				
Descriptions				
10-74 Changed Index No.				
10-77 Retraced				
Designed by	W. C. L.	Dates	5-54	APPROVED BY
Checked by	S. G. B.		5-54	
Quantities by	W. C. L.		5-54	
Checked by	S. G. B.		5-54	
Supervised by				
				Deputy Design Engineer, Roadways
				Drawing No.
				Index No.
				1 of 1
				DSE-03



QUANTITY IN ONE ENDWALL, CU. YDS. OF SAND-CEMENT RIPRAP				
1 PIPE	2 PIPES	3 PIPES	4 PIPES	
28.8	35.4	42.0	48.6	

NOTE: Wingwalls based on 2:1 slope
Scale: 1" = 3'-0"



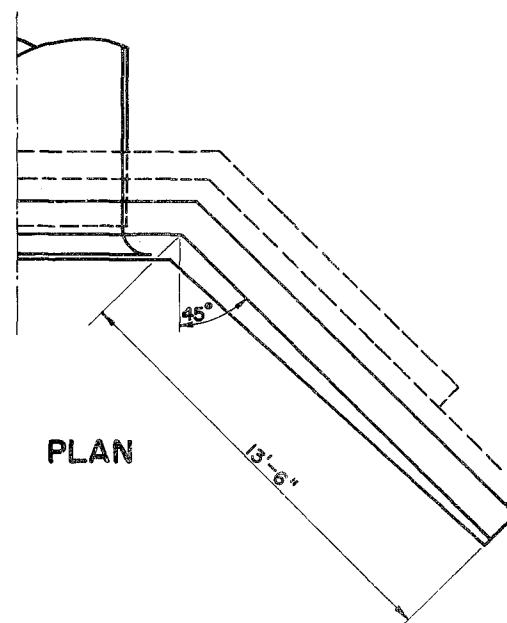
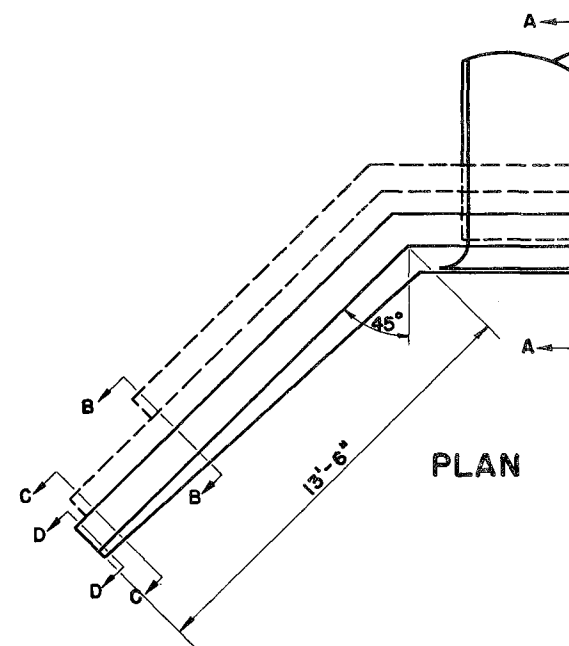
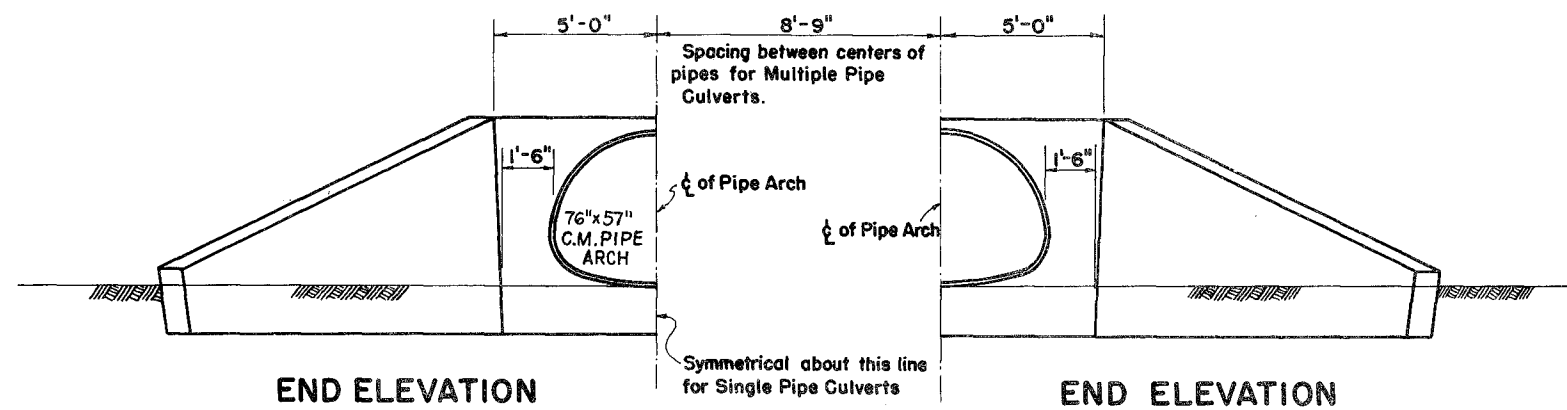
FHWA APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

**SAND-CEMENT ENDWALLS FOR
90" CM PIPE**

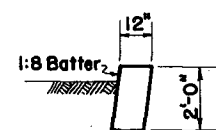
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
10-74	Changed Index No.			
10-77	Retraced			
		Names	Dates	APPROVED BY
		Designed by	E.H.H.	5-12-54
		Checked by	W.C.L.	5-13-54
		Quantities by	E.H.H.	5-12-54
		Checked by	W.C.L.	5-13-54
		Supervised by		
		Deputy Design Engineer, Roadways		
		Drawing No.	Index No.	
		1 of 1	DSE-04	

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.			

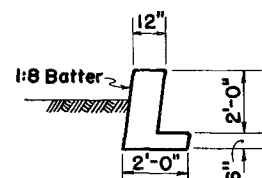


QUANTITY IN ONE ENDWALL, CU. YDS. OF SAND-CEMENT RIPRAP				
1 PIPE	2 PIPES	3 PIPES	4 PIPES	
11.8	14.6	17.3	20.1	

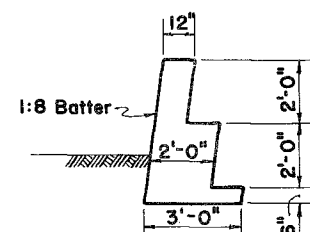
NOTE: Wingwalls based on 2:1 slope
SCALE = 1" = 3'-0"



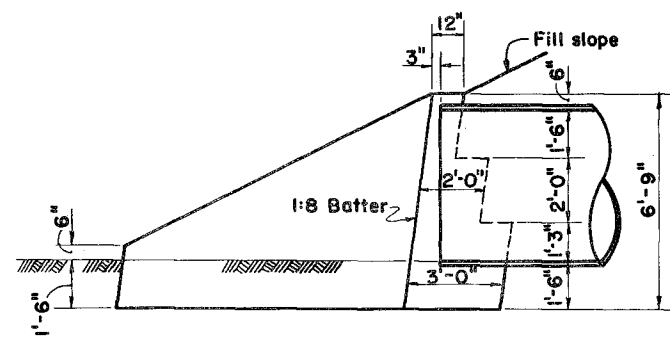
SEC. D-D



SEC. C-C



SEC. B-B



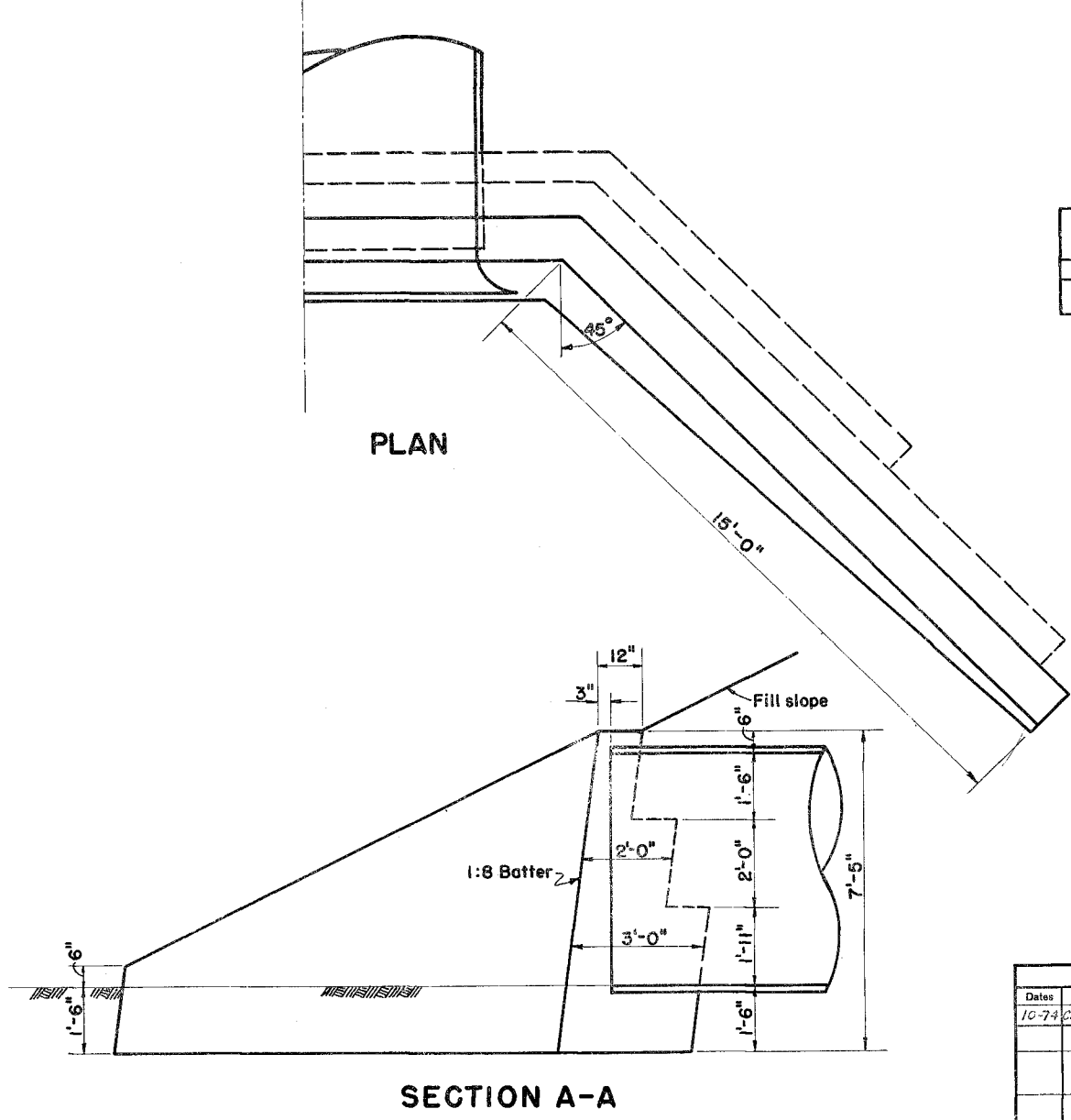
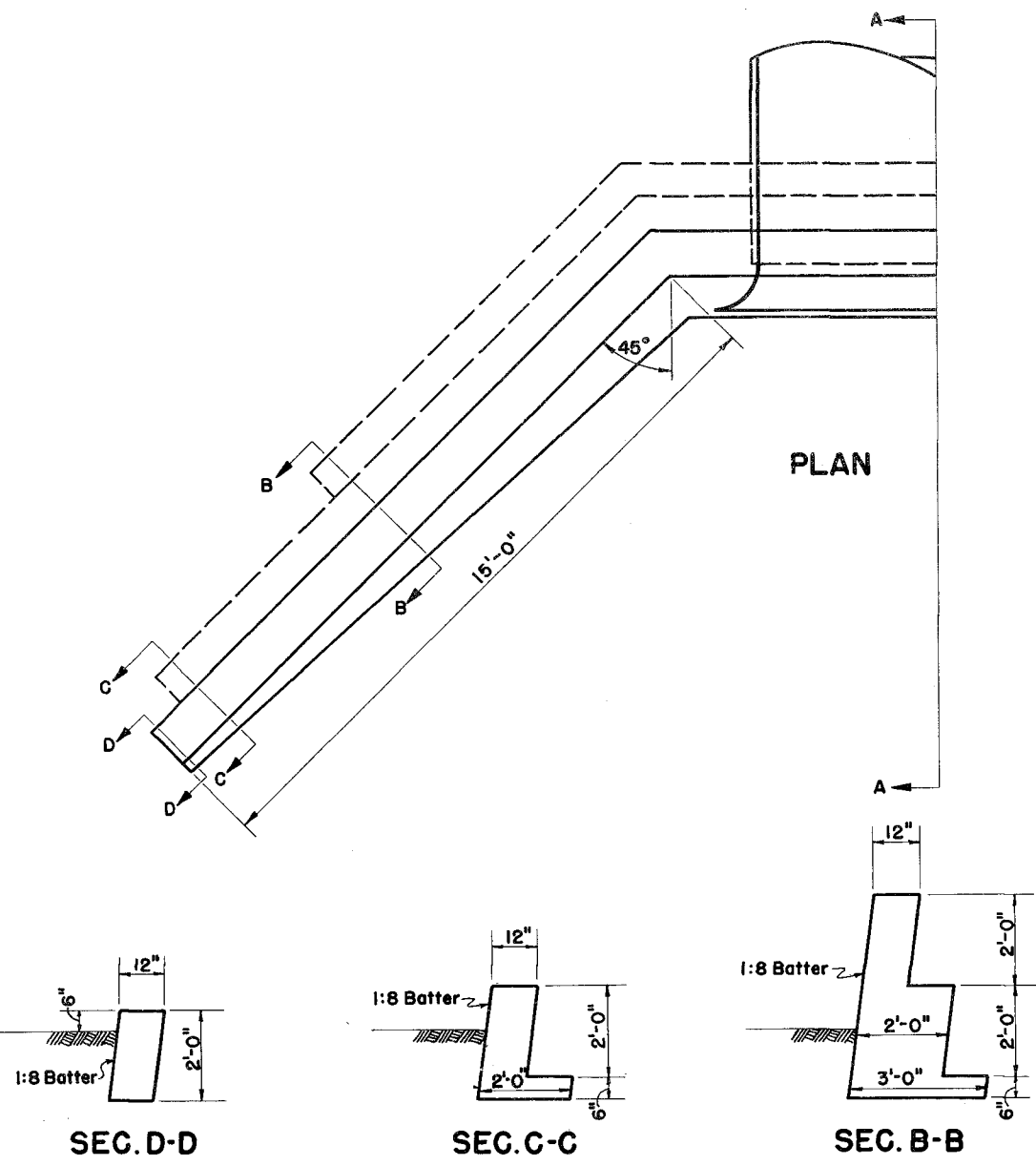
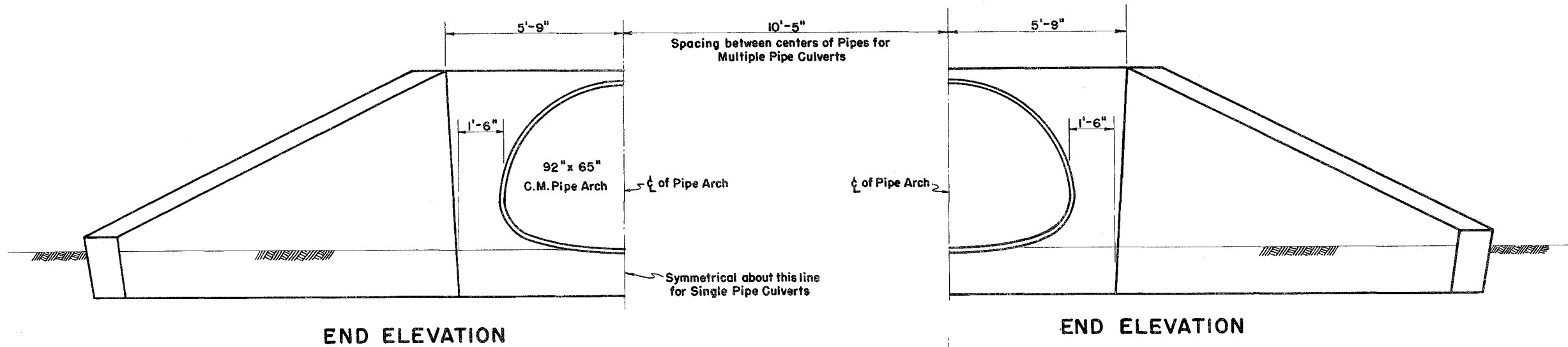
SECTION A-A

FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

SAND-CEMENT ENDWALLS FOR
76" x 57" C.M. PIPE ARCH

REVISIONS		ROAD NO.		COUNTY		PROJECT NO.	
Dates	Descriptions						
10-74	Changed Index N ^o						
		Names	Dates	Approved by:			
		Detailed by	S.G.B. 10-15-53				
		Checked by	E.H.A. 10-16-53				
		Quantities by	S.G.B. 10-15-53				
		Checked by	G.A.C. 10-19-53				
		Traced by	H.W. 10-22-53				
		Deputy Design Engineer - Roadways		Drawing No.		Index No.	
		1 of 1		DSE-05			



QUANTITY IN ONE ENDWALL, CU. YDS. OF SAND-CEMENT RIPRAP			
1 PIPE	2 PIPES	3 PIPES	4 PIPES
14.9	18.4	21.9	25.4

NOTE: Wingwalls based on 2:1 slope
SCALE: 1" = 2'-0"

FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

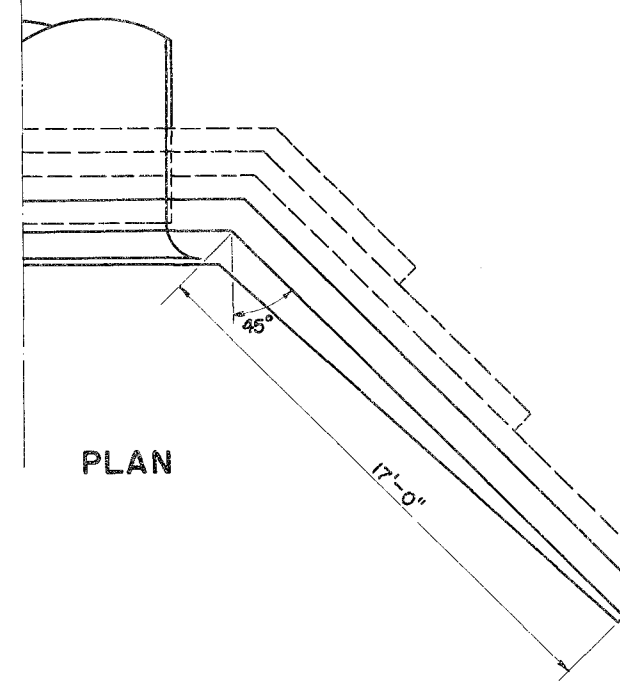
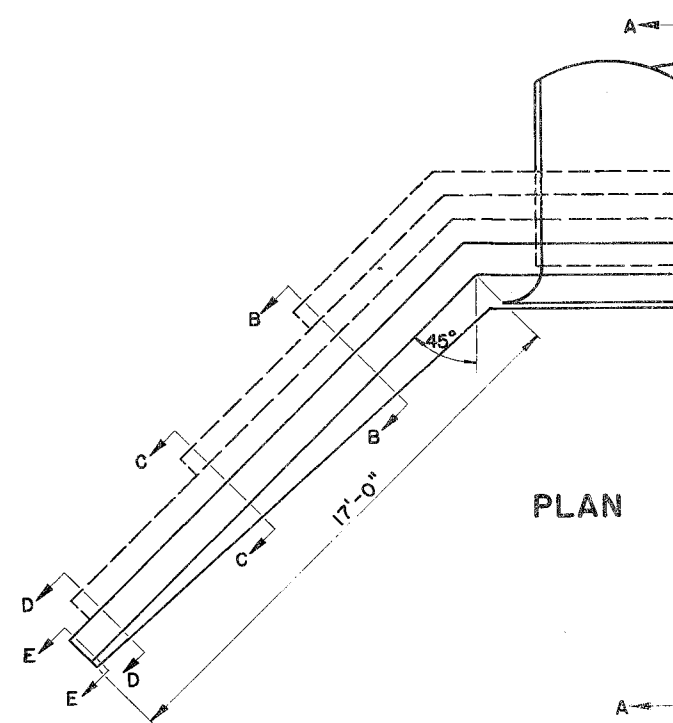
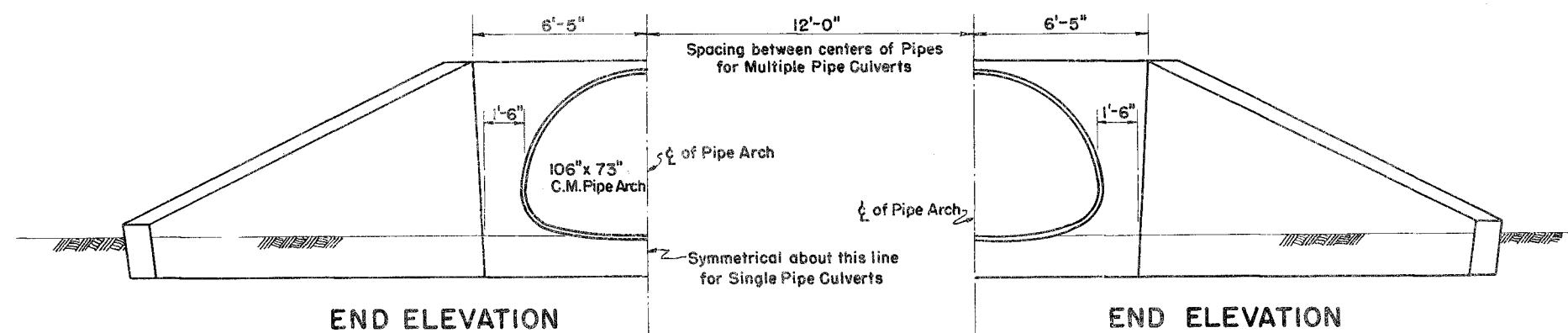
SAND-CEMENT ENDWALLS FOR 92" x 65" C.M. PIPE ARCH

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
10-74	Changed Index No.			

Names	Dates	Approved by:
E.H.A.	10-53	
E.H.H.	10-53	
E.H.A.	10-53	
E.H.H.	10-53	
H.W.	11-53	

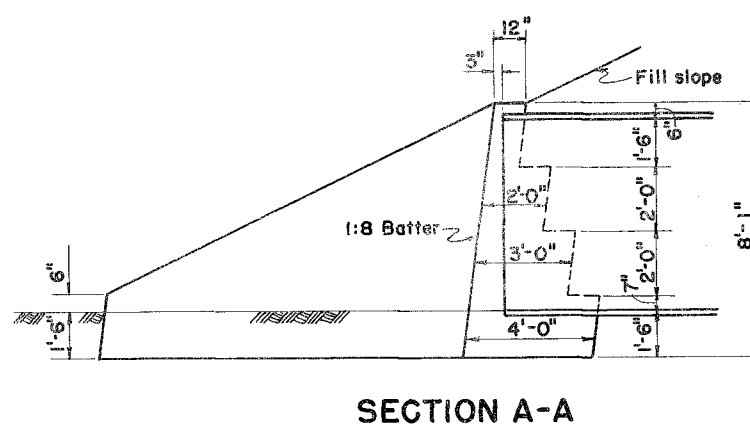
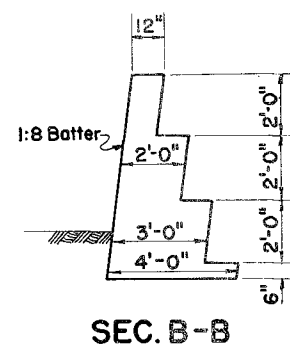
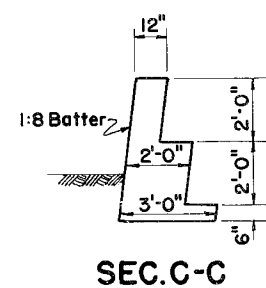
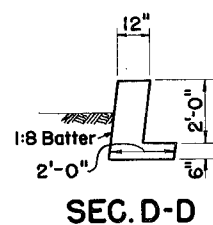
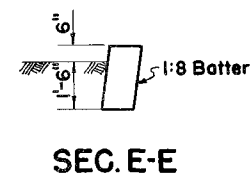
Deputy Design Engineer - Roadways

Drawing No. 1 of 1 Index No. DSE-06

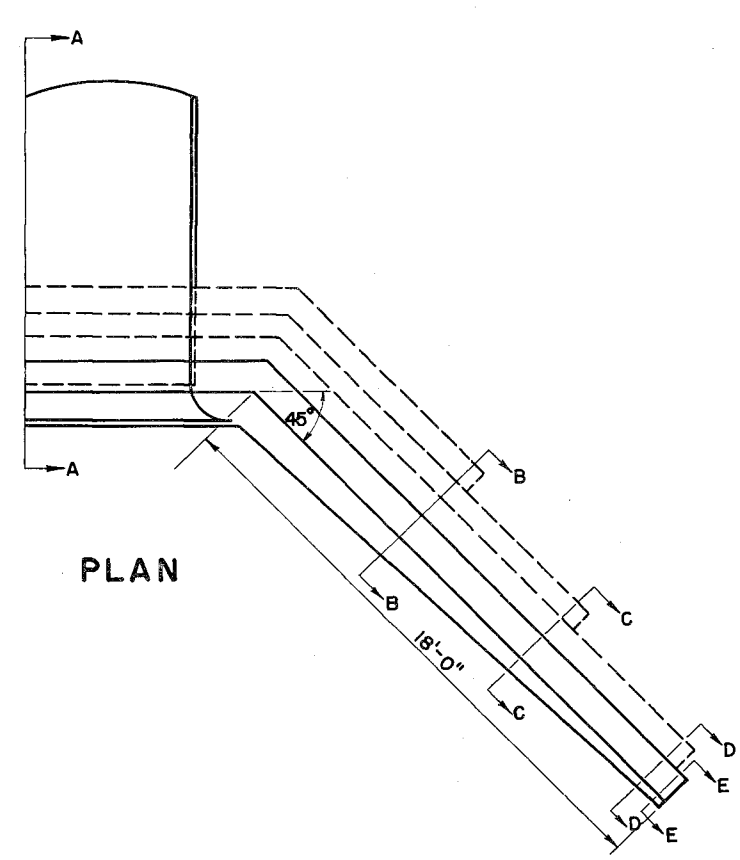
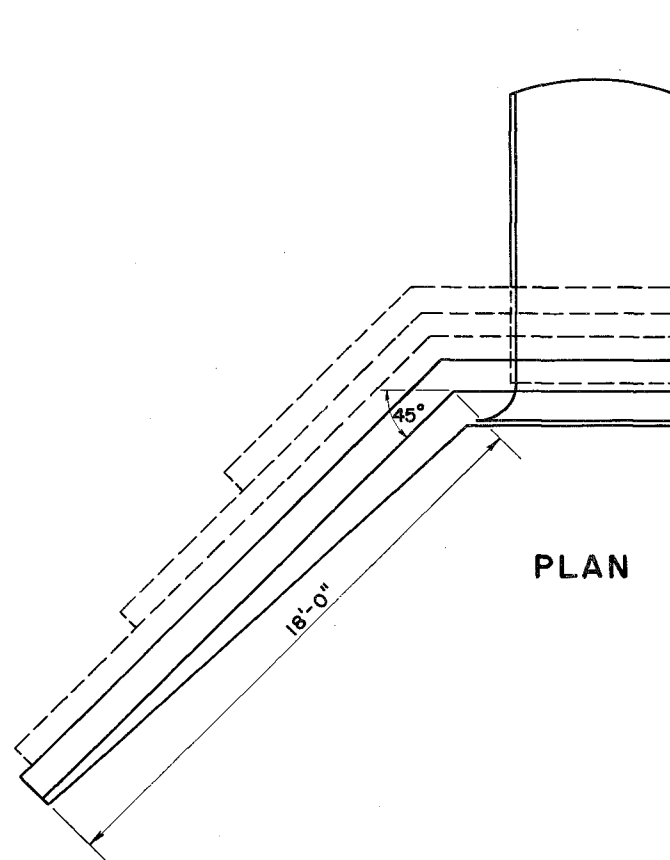
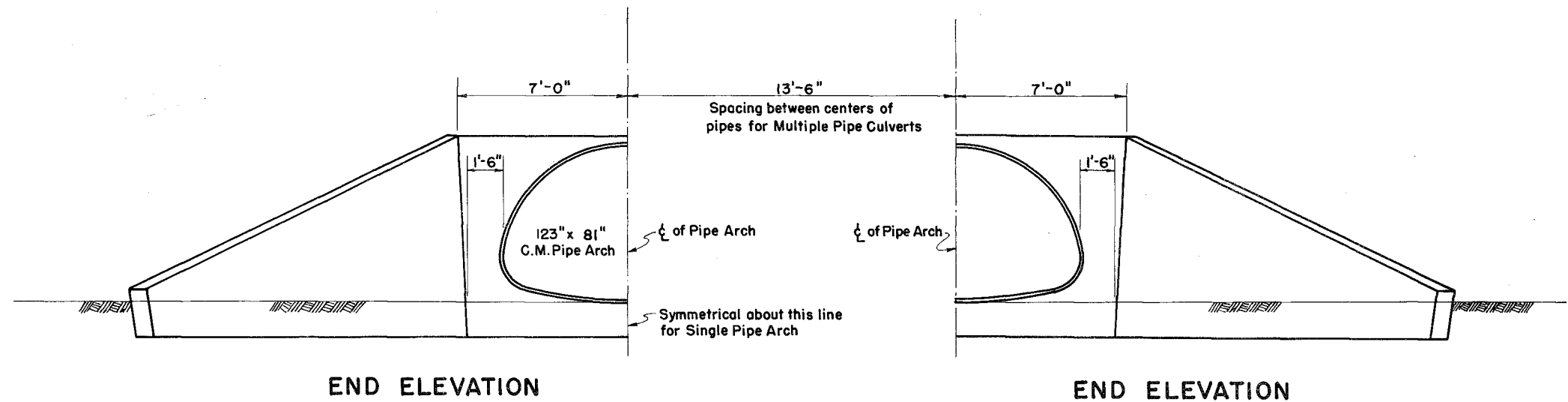


QUANTITY IN ONE ENDWALL, CU. YDS OF SAND-CEMENT RIPRAP			
1 PIPE	2 PIPES	3 PIPES	4 PIPES
20.4	25.5	30.6	35.7

NOTE: Wingwalls based on 2:1 slope
SCALE: 1" = 3'-0"

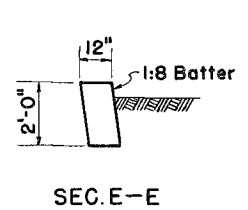
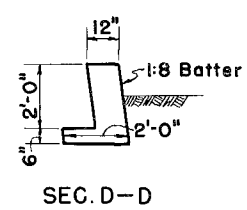
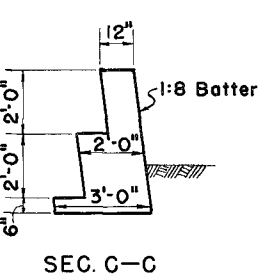
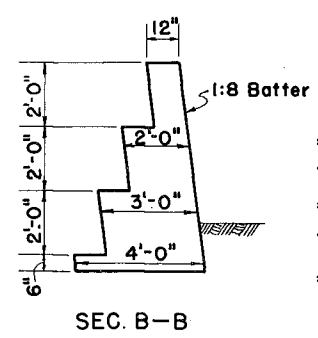
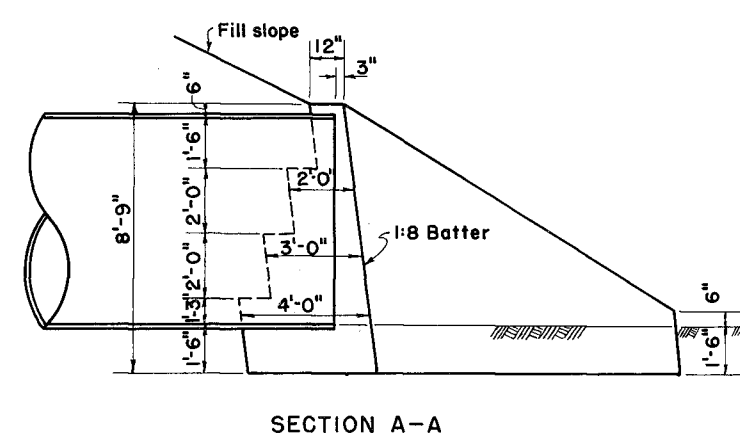


REVISIONS Dates Descriptions 10-74 <i>Changed Index N°</i>		ROAD NO. COUNTY PROJECT NO.	
		Names Dates Detailed by E.H.A. 10-53 Checked by E.H.H. 10-53 Quantities by E.H.A. 10-53 Checked by E.H.H. 10-53 Traced by HW 11-53	Approved by: <i>[Signature]</i> Deputy Design Engineer-Roadwork Drawing No. Index No. 1 of 1 DSE-07



QUANTITY IN ONE ENDWALL, CU. YDS. OF SAND-CEMENT RIPRAP				
1 PIPE	2 PIPES	3 PIPES	4 PIPES	
22.6	28.3	34.0	39.7	

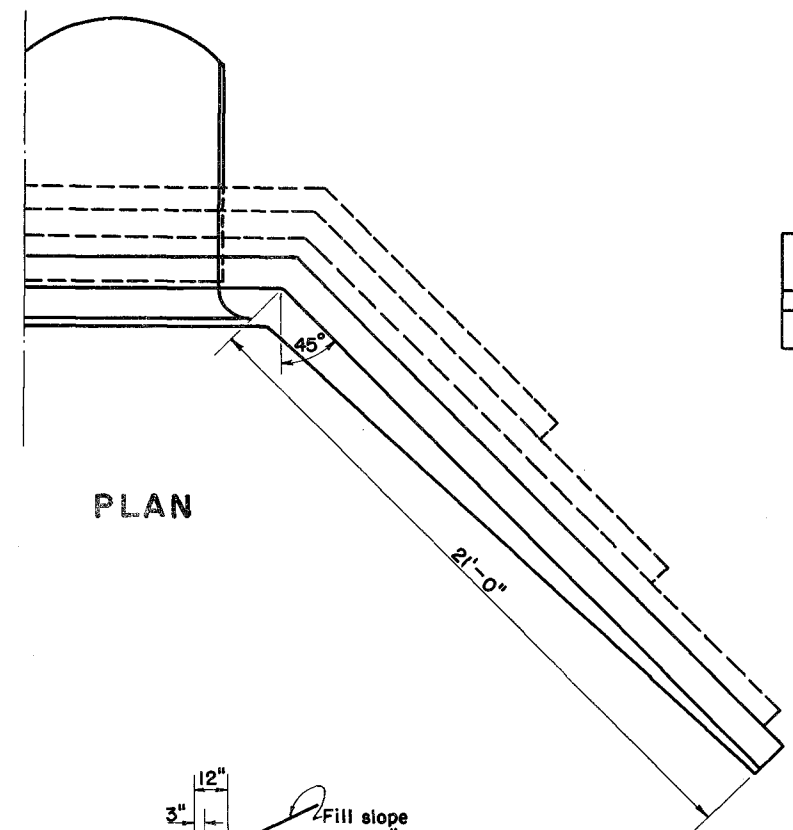
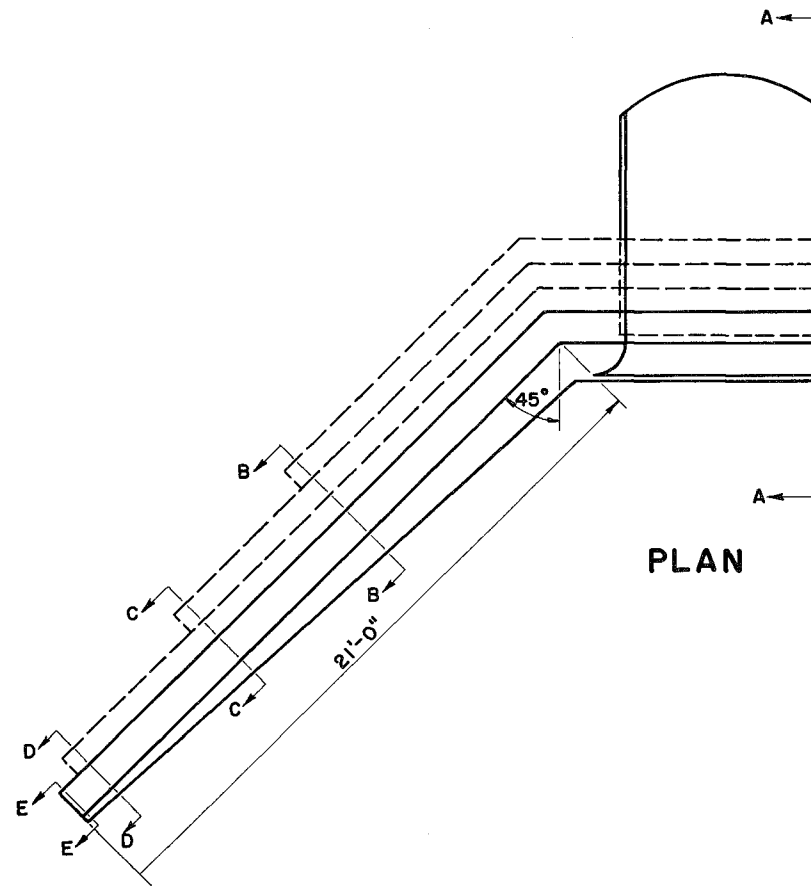
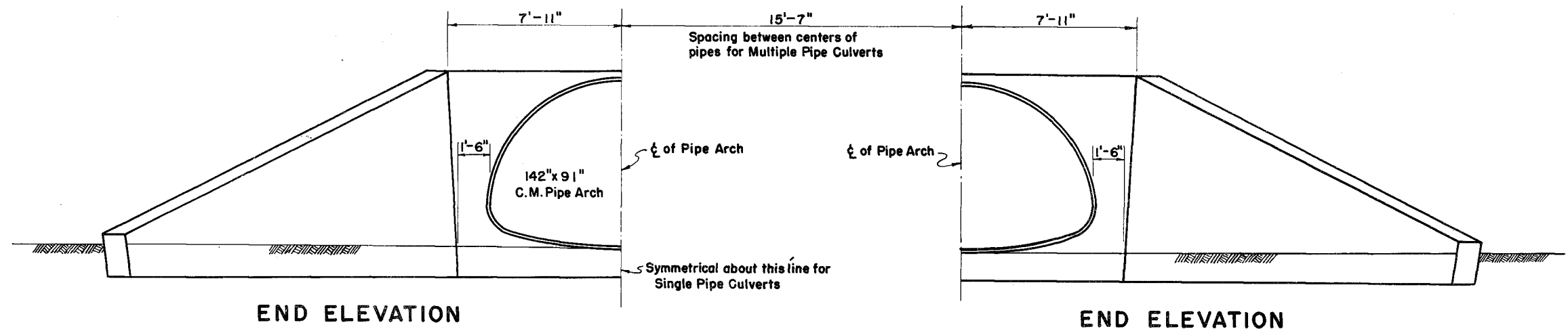
NOTE: Wingwalls based on 2:1 slope
SCALE = 1" = 3'-0"



FHWA APPROVED: 3-20-75

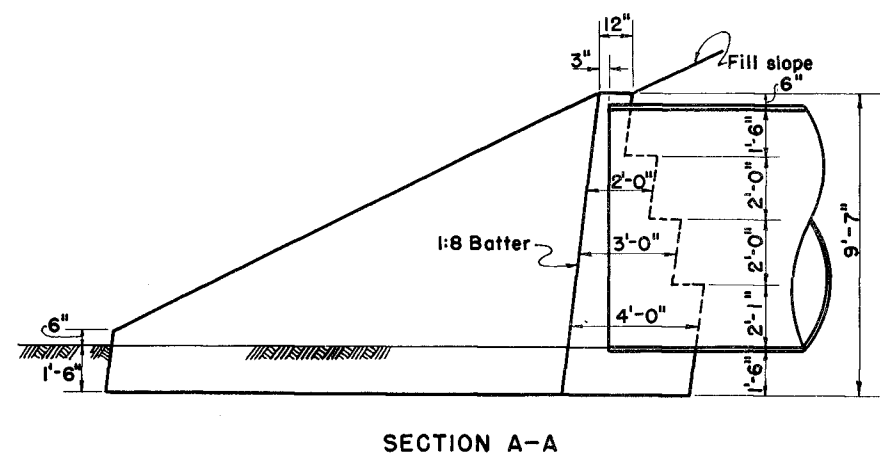
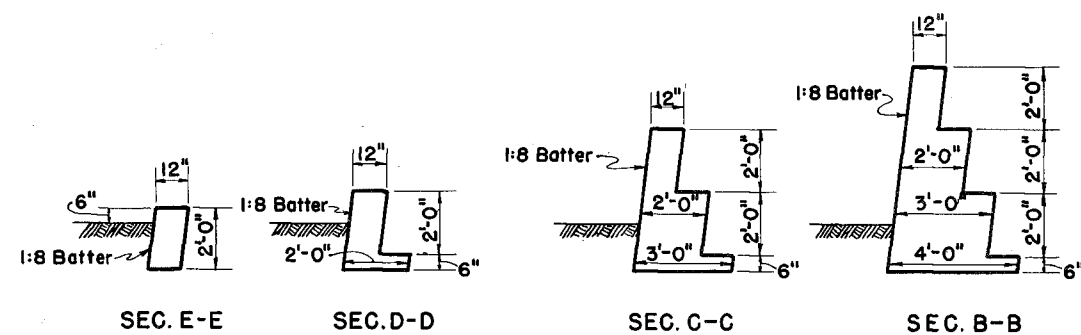
SAND-CEMENT ENDWALLS FOR 123" x 81" C.M. PIPE ARCH

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
10-74	Changed Index No.			
		Names	Dates	Approved by:
		Detailed by	G.A.C. 10-2-53	
		Checked by	E.H.A. 10-19-53	
		Quantities by	G.A.C. 10-2-53	
		Checked by	E.H.A. 10-19-53	
		Traced by	H.W. 10-21-53	
		Deputy Design Engineer - Roadways		
		Drawing No. 1 of 1 Index No. DSE-08		



QUANTITY IN ONE ENDWALL, CU. YDS. OF SAND-CEMENT RIPRAP			
1 PIPE	2 PIPES	3 PIPES	4 PIPES
30.6	38.4	46.2	54.0

NOTE: Wingwalls based on 2:1 slope
SCALE = 1" = 3'-0"



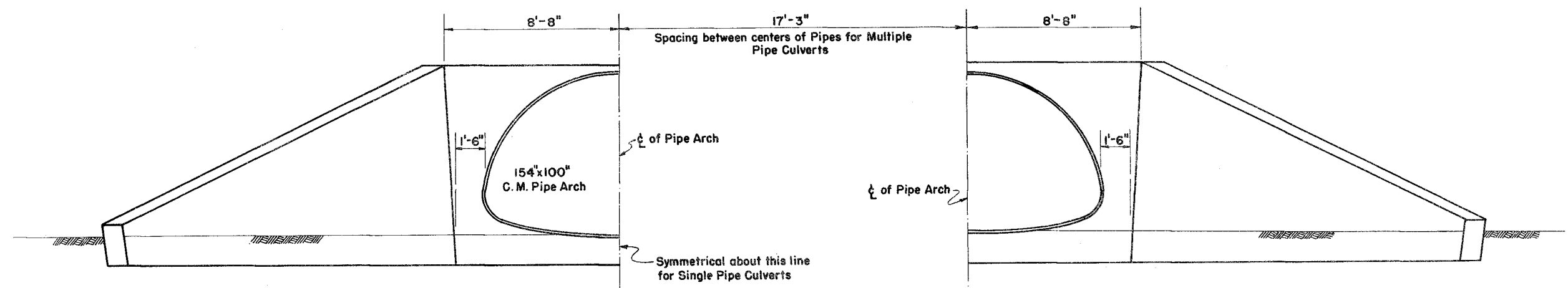
FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION

ROADWAY PLANS SECTION

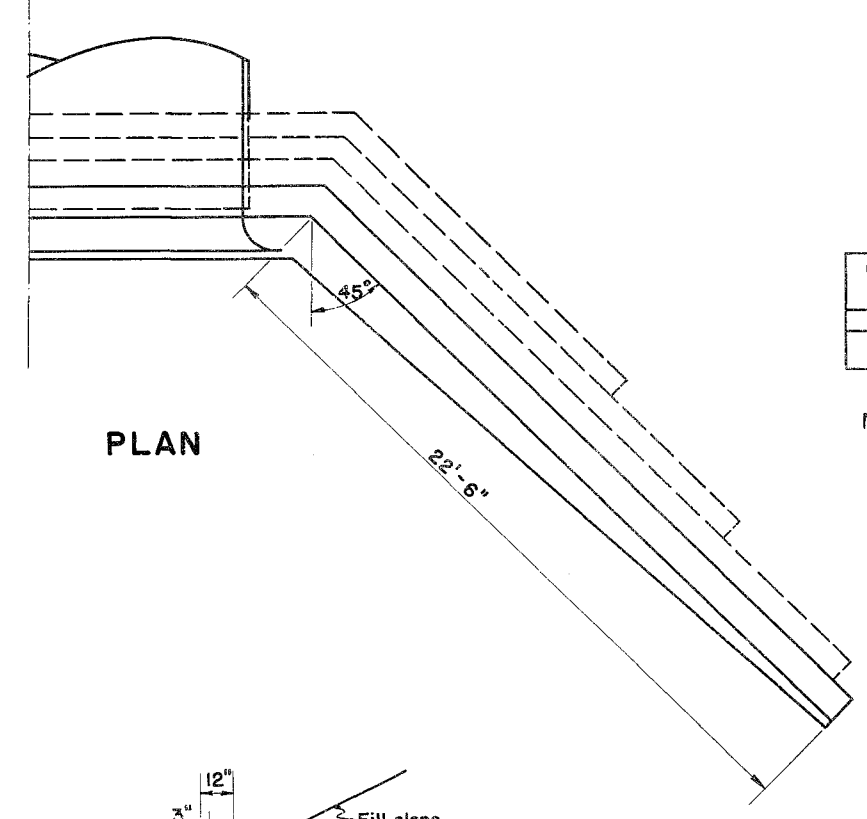
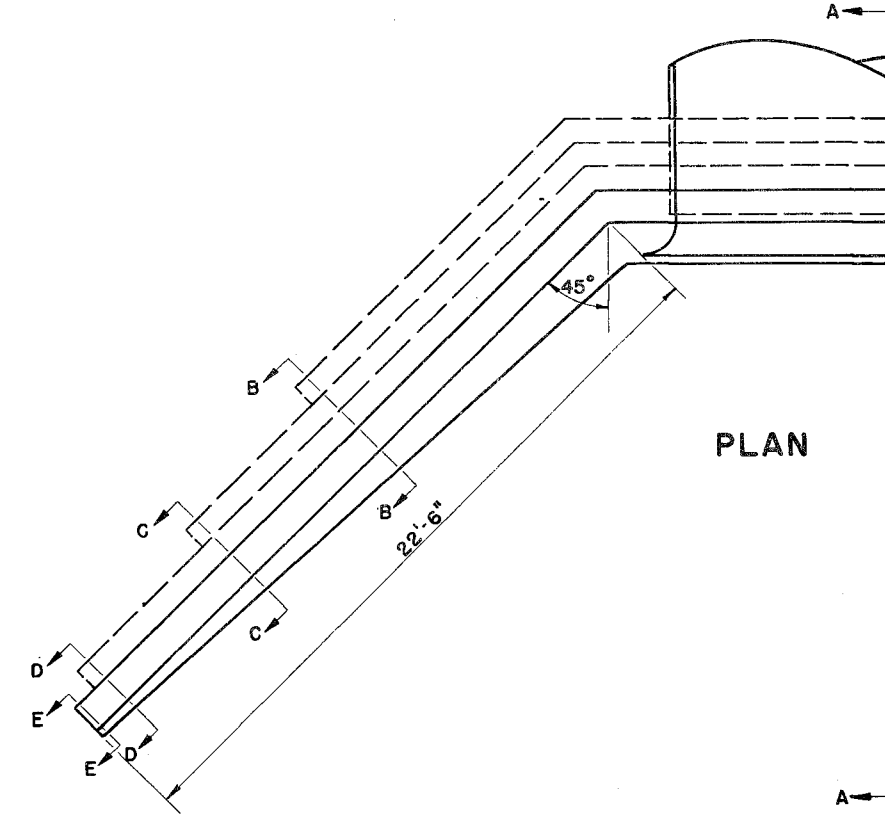
**SAND-CEMENT ENDWALLS FOR
142" x 91" C.M. PIPE ARCH**

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions			
10-74	Changed Index N ^o			
		Names	Date	Approved by:
		Detailed by	E.H.A. 10-12-53	
		Checked by	E.H.H. 10-14-53	
		Quantities by	E.H.A. 10-12-53	
		Checked by	G.A.C. 10-14-53	
		Traced by	H.W. 10-20-53	
		Drawing No.	1 of 1	DSE-09



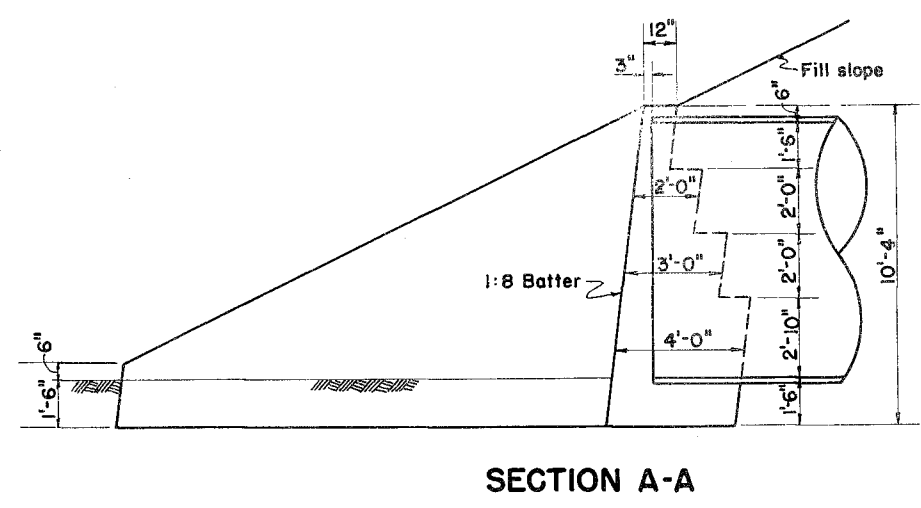
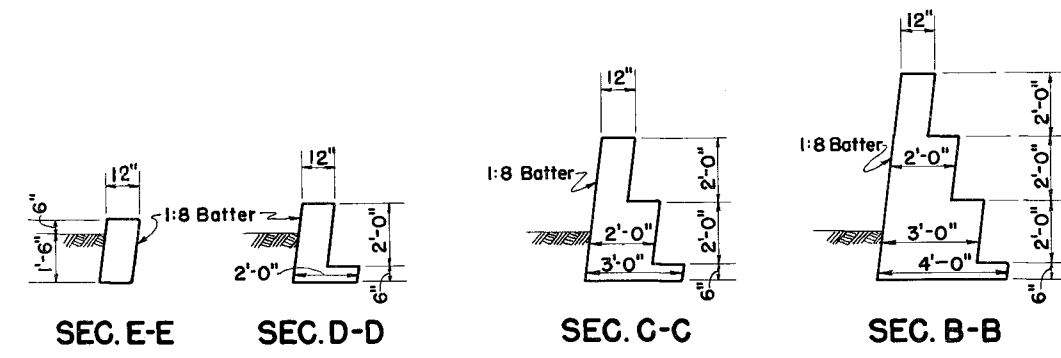
END ELEVATION

END ELEVATION



QUANTITY IN ONE ENDWALL, CU.YDS. OF SAND-CEMENT RIPRAP			
1 PIPE	2 PIPES	3 PIPES	4 PIPES
33.4	42.1	50.9	59.6

NOTE: Wingwalls based on 2:1 slope
SCALE: 1" = 3'-0"



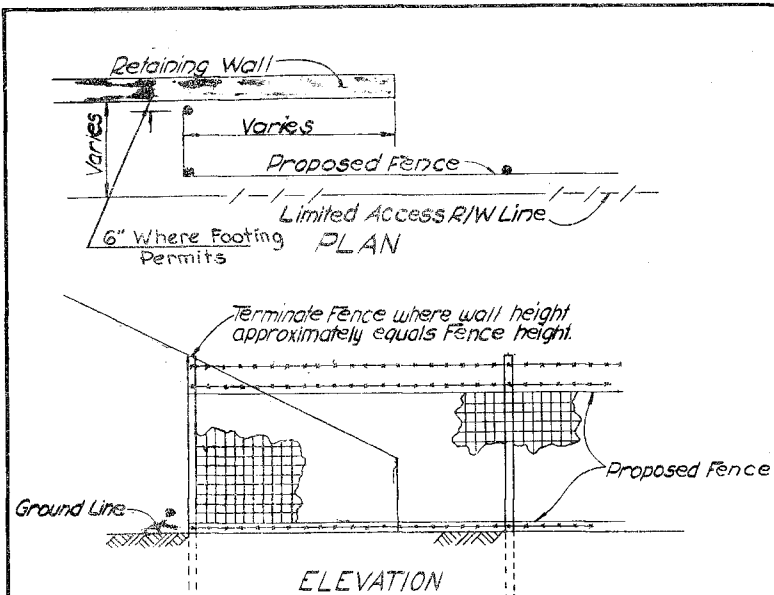
FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

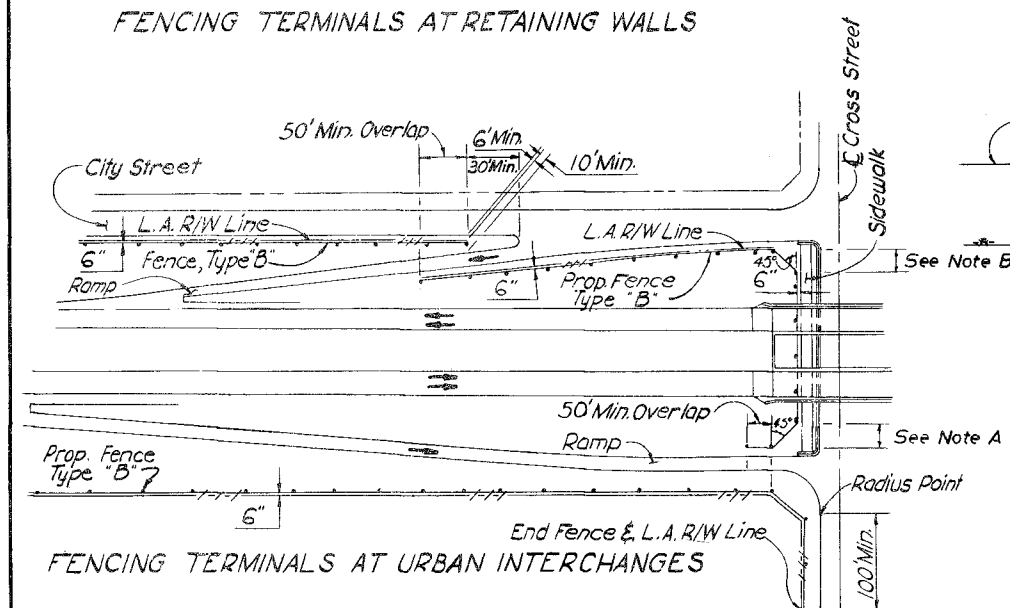
SAND-CEMENT ENDWALLS FOR 154"x100" C.M. PIPE ARCH

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
10-74	Changed Index N/E			

Names	Dates	Approved by: Deputy Design Engineer - Roadways Drawing No. 1 of 1 DSE-10
Detailed by E.H.A.	10-53	
Checked by E.H.H.	10-53	
Quantities by E.H.A.	10-53	
Checked by E.H.H.	10-53	
Traced by H.W.	11-53	



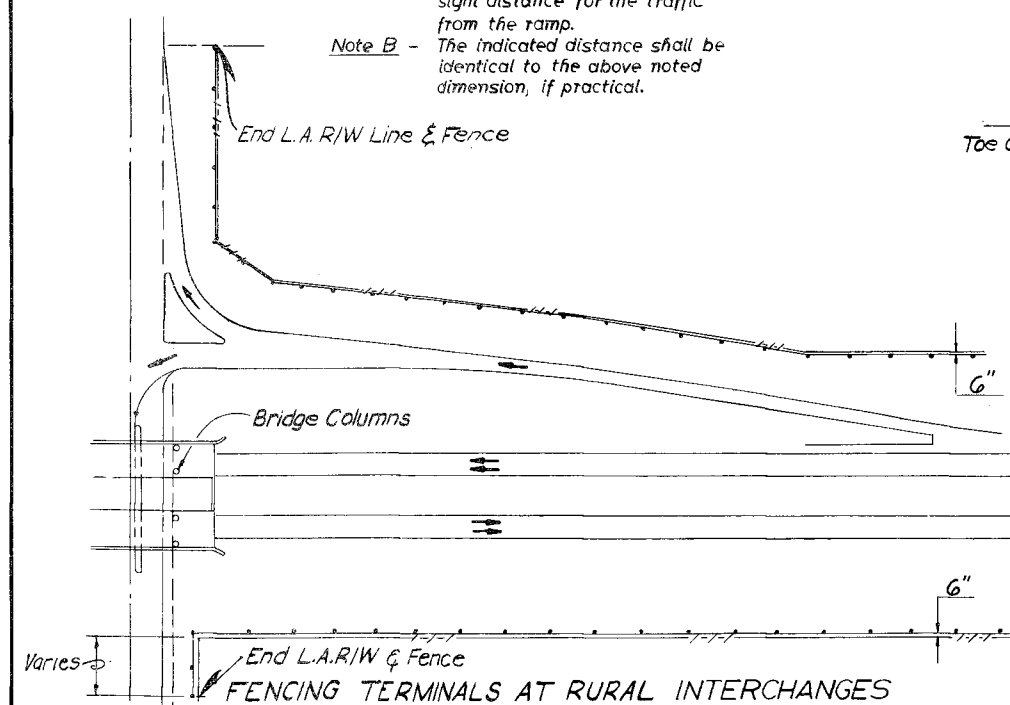
FENCING TERMINALS AT RETAINING WALLS



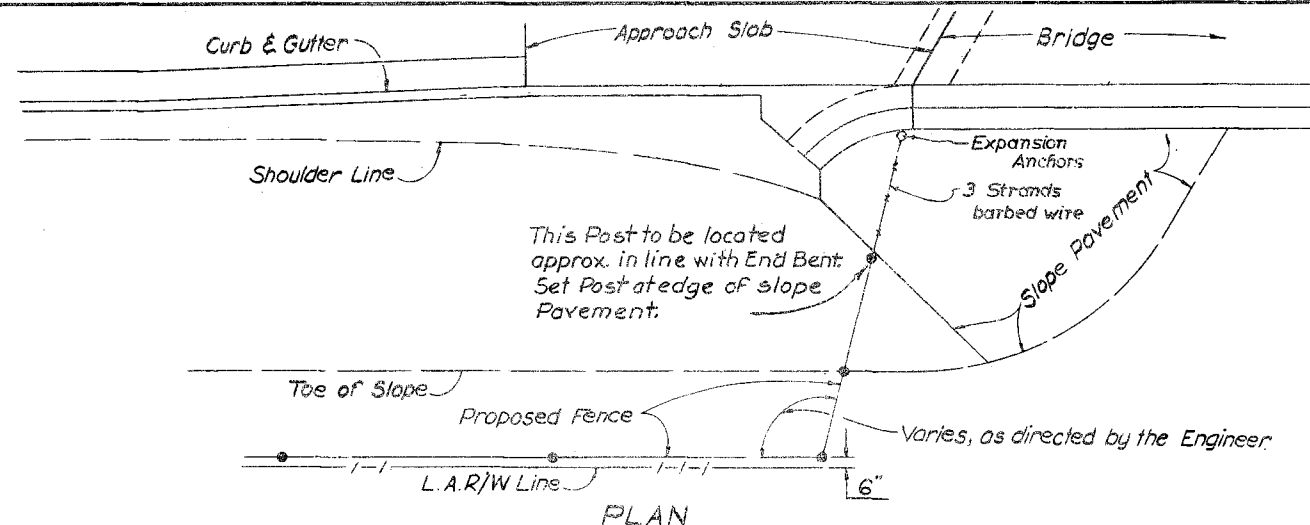
FENCING TERMINALS AT URBAN INTERCHANGES

Note A - The indicated distance shall be sufficient to provide satisfactory sight distance for the traffic from the ramp.

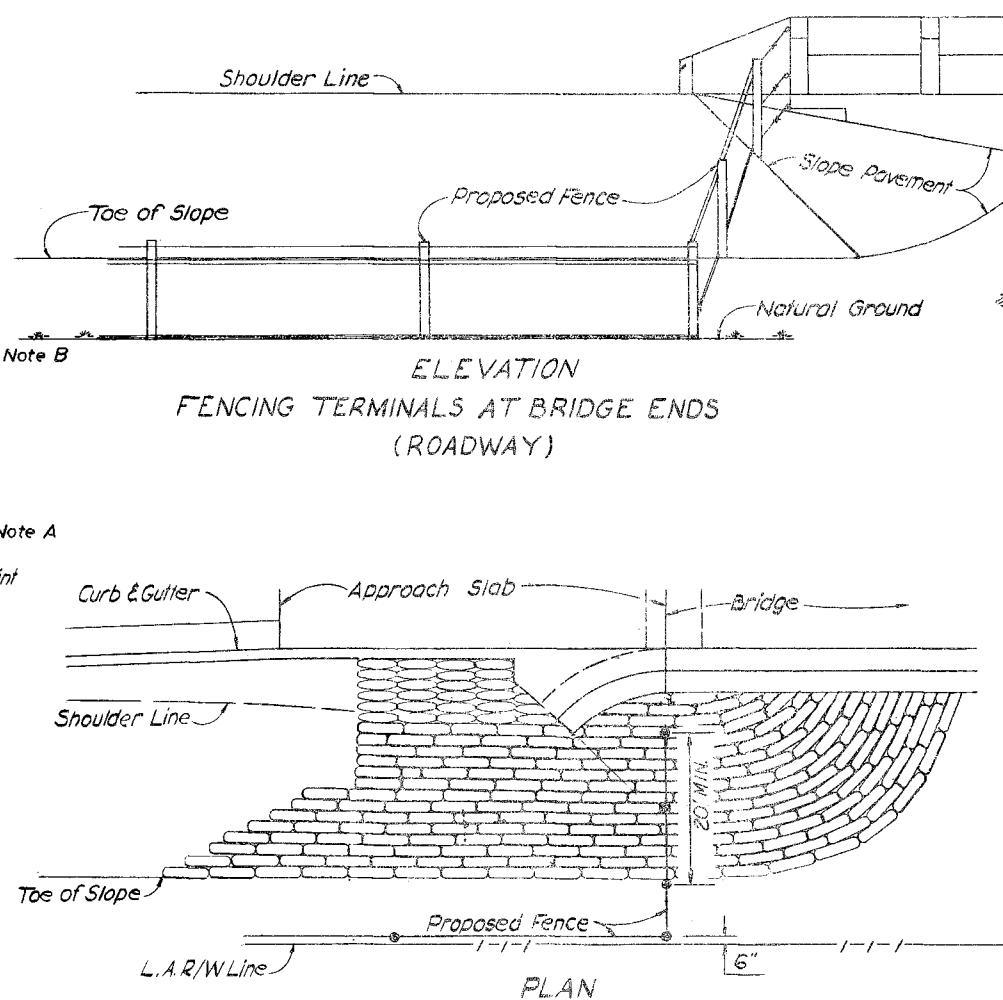
Note B - The indicated distance shall be identical to the above noted dimension, if practical.



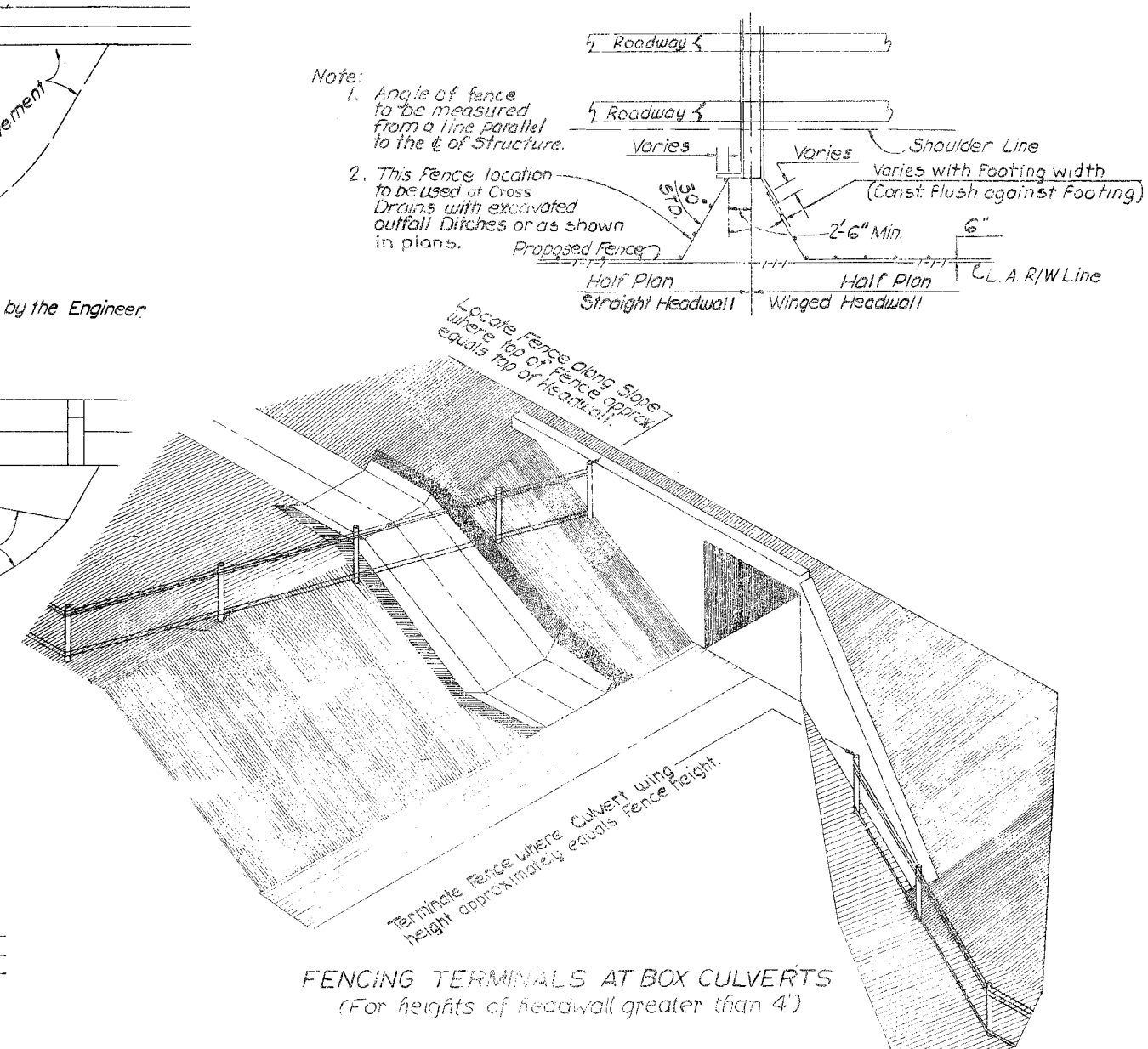
FENCING TERMINALS AT RURAL INTERCHANGES



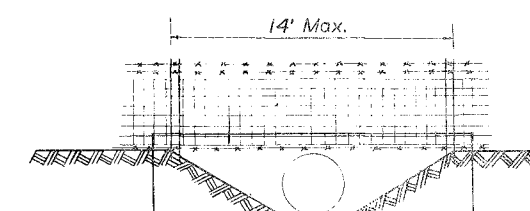
ELEVATION
FENCING TERMINALS AT BRIDGE ENDS
(ROADWAY)



ELEVATION
FENCING TERMINALS AT BRIDGE ENDS
(STREAM CROSSING)



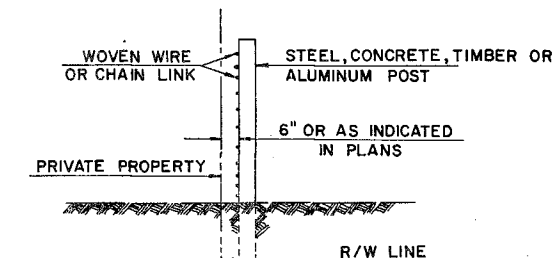
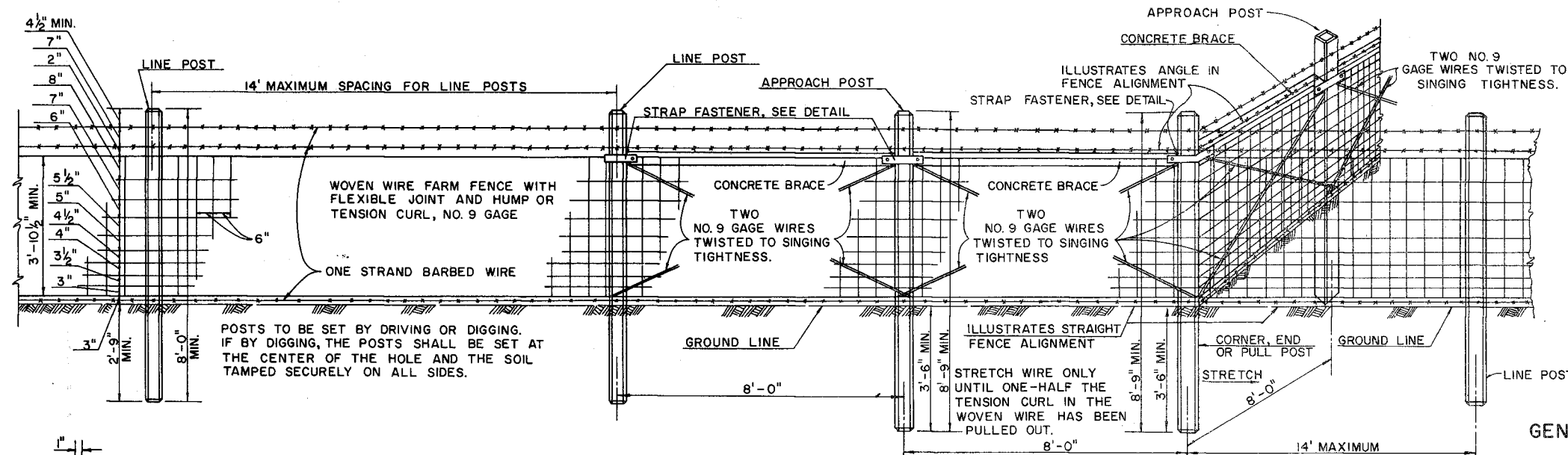
FENCING TERMINALS AT BOX CULVERTS (For heights of headwall greater than 4')



FENCING DETAIL AT CULVERT
(For heights of headwalls 4' or
less.)

Note: When height of headwall is 4' or less (pipe culverts 36" or less) the fence shall not be tied to the headwall, but shall span the lateral ditch.

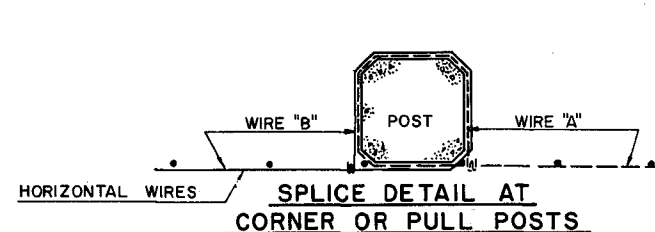
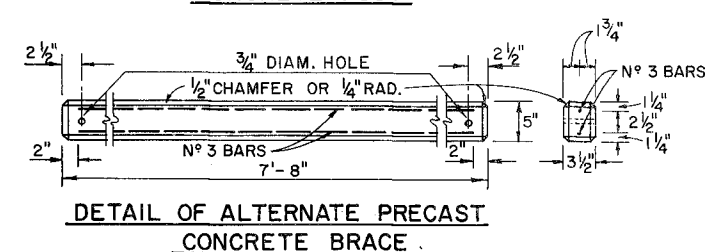
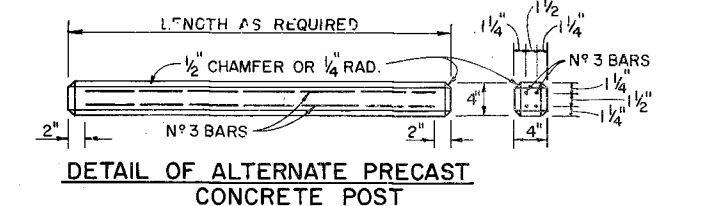
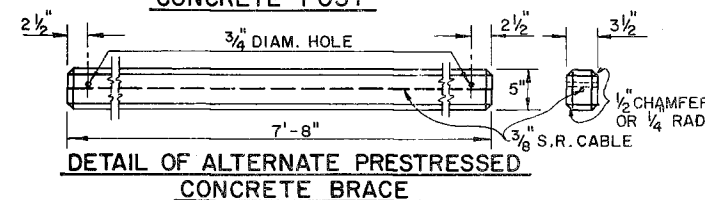
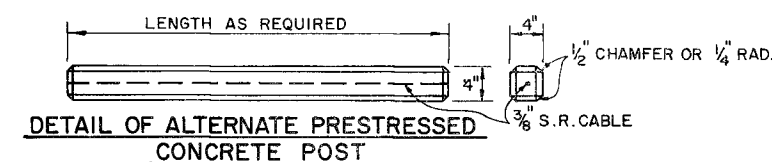
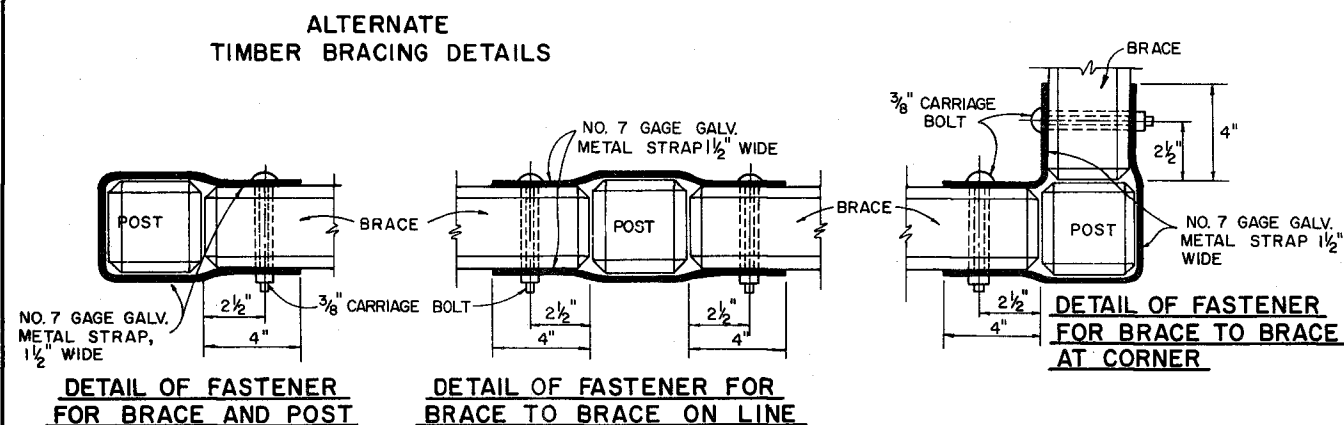
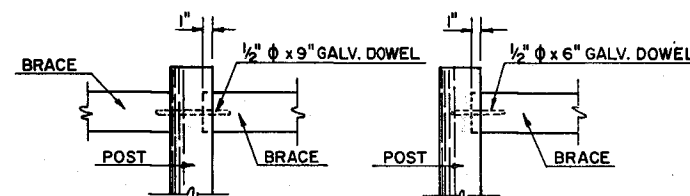
REVISIONS		REVISIONS		ROAD NO.		COUNTY		PROJECT NO.	
Dates	Descriptions	Dates	Descriptions		Memo	Date	Recommended For Approval by	Unit, State	Index No.
10/6/68	ADDED NHD MADE THE FOLLOWING VIEW OF FENCING BOX CURBETS N-2	3-6-69	REVISED INTERCH. NOTES TO CLUT R.L.D. DETAILS BOX 21	Installed by	H.F.W.	2-19-65	C.D. Dunlap Engineer of Road Dist.		
N/A		4-7-69	Revised "B" Fence note to add two #2's gauge wire.	Checked by			<i>[Signature]</i>		
		R.L.O.		Quantified by					
				Checked by					
				Traced by	H.F.W.	2-19-65	JOF	FLD-O	



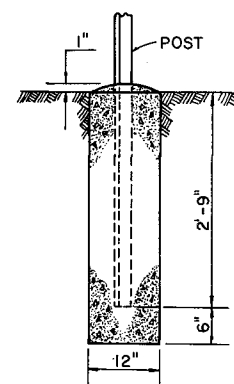
SKETCH INDICATING FENCE LOCATION
AT SECTIONS OF NO FRONTAGE ROADS.
REFER TO DETAIL PLANS FOR LOCATIONS
OF FENCING FOR PROJECTS WITH
FRONTAGE ROADS.

DETAILS OF TYPE "A" FENCE

(ILLUSTRATED FOR CONC. POSTS AND BRACES)



EACH HORIZONTAL WIRE TO BE WRAPPED COMPLETELY AROUND PULL POST AND TIED TO SAME WIRE. CONC. POST ILLUSTRATED. THIS METHOD ALSO APPLIES TO STEEL POST INSTALLATIONS AND TIMBER POST INSTALLATIONS.



**DETAIL OF CONCRETE
SETTING FOR ANGULAR
STEEL POSTS**
(PULL, CORNER, END AND
APPROACH POSTS)

GENERAL NOTES FOR ALL FENCE

THE TYPE OF FENCE TO BE INSTALLED SHALL BE SHOWN ON PLANS. PULL POSTS SHALL BE USED AT BREAKS IN VERTICAL GRADES OF 15° OR MORE, OR AT APPROXIMATELY 330' CENTERS EXCEPT THAT THIS MAXIMUM INTERVAL MAY BE REDUCED BY THE ENGINEER ON CURVES WHERE THE DEGREE OF CURVATURE IS GREATER THAN 3 DEGREES. PULL POSTS SHALL ALSO BE PLACED AT THE END OF EACH ROLL OR PIECE OF WOVEN WIRE. CORNER POSTS ARE TO BE INSTALLED AT ALL HORIZONTAL BREAKS IN FENCE OF 15° OR MORE. A MAXIMUM LENGTH OF 1320' OF WIRE MAY BE INSTALLED AS A UNIT.

1. THIS FENCE TO BE PROVIDED GENERALLY IN RURAL AREAS.
2. POSTS AND BRACES MAY BE EITHER STEEL, ALUMINUM, TIMBER OR CONCRETE.
3. STEEL POSTS AND BRACES SHALL BE STANDARD STEEL POSTS, GALVANIZED AT THE RATE OF 2 OZ. PER SQ. FT., TOGETHER WITH NECESSARY HARDWARE AND WIRE CLAMPS AND MEETING THE FOLLOWING REQUIREMENTS:
 - (A) LINE POSTS: 8' LONG; 1.33 LBS. PER LIN. FT.; STUDDED, ANCHOR PLATE ATTACHED; WITH NECESSARY CLAMPS, ETC.
 - (B) APPROACH POSTS: 2 1/2" x 2 1/2" x 1/4" ANGLES, 8' LONG; FABRICATED FOR ATTACHING BRACE; WITH NECESSARY HARDWARE, CLAMPS, ETC.
 - (C) PULL, END AND CORNER POSTS: 2 1/2" x 2 1/2" x 1/4" ANGLES, 8' LONG, FABRICATED FOR ATTACHING BRACE; WITH NECESSARY HARDWARE, CLAMPS, ETC.
 - (D) BRACES: 2" x 2" x 1/4" ANGLES WITH NECESSARY HARDWARE AND FABRICATED FOR ATTACHING TO POST.
 - (E) THE PULL, CORNER, APPROACH AND END POSTS ARE TO BE SET IN CONCRETE AS PER DETAIL. (ALSO SEE NOTE NO. 6)
4. ALL TIMBER POSTS, EXCEPT CORNER AND PULL POSTS ARE TO BE MINIMUM 4" DIAMETER. TIMBER CORNER AND PULL POSTS ARE TO BE MINIMUM 5" DIAMETER. BRACES ARE TO BE 4" MINIMUM DIAMETER. LENGTHS OF TIMBER POSTS TO BE AS INDICATED ABOVE FOR CONCRETE POSTS.
 - (A) 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.
 - (B) ADEQUATE CONNECTIONS BETWEEN TIMBER POSTS AND BRACES ARE TO BE PROVIDED.
 - (C) WIRE TO BE WRAPPED AROUND END OR SPLICE POSTS ONLY.
5. LONGER POSTS THAN THOSE INDICATED ABOVE MAY BE REQUIRED BY THE PLANS OR FOR DEEPER INSTALLATIONS.
6. MATERIAL FOR CLASS I CONCRETE FOR FENCE FOOTINGS MAY BE MEASURED BY VOLUMETRIC AND/OR BY WEIGHT. SECTIONS 345-5.1, 345-10 AND 345-11 OF D.O.T. STANDARD SPECIFICATIONS WILL BE DELETED.
7. THE CONTRACTOR, AT HIS OPTION, MAY USE ANY SUITABLE PRECAST OR PRESTRESSED CONCRETE POST; HOWEVER, APPROVAL BY THE ENGINEER, OF POSTS NOT SHOWN ON THIS DRAWING, WILL BE REQUIRED PRIOR TO CONSTRUCTION OF THE FENCE.

FHWA APPROVED: 9-3-76

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

Road Design Section

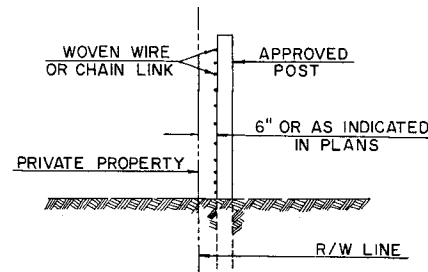
DETAILS OF FENCING

REVISIONS		INITIALS	DATES	Recommended for approval by <u>W. B. Smith</u> Deputy Design Engineer Roadways Approved by <u>W. B. Smith</u> State Design Engineer
Dates	Descriptions	Designed by		
5-10-74 WGL	REVISED	Checked by		
11-75 LMF	REVISED NOTE 3 ADDED NOTES 5 & 6	Quantities by		
7-76 LMF	ADDED CONC. POSTS AND BRACES	Checked by		
		Supervised by		DRAWING NO. 1 OF 1
				INDEX NO. FTA-01-2

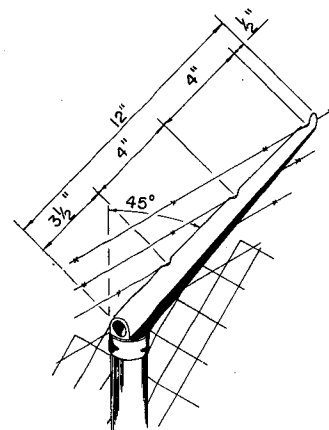


ALTERNATE H-BEAM LINE POST FOR TYPE "B" FENCE

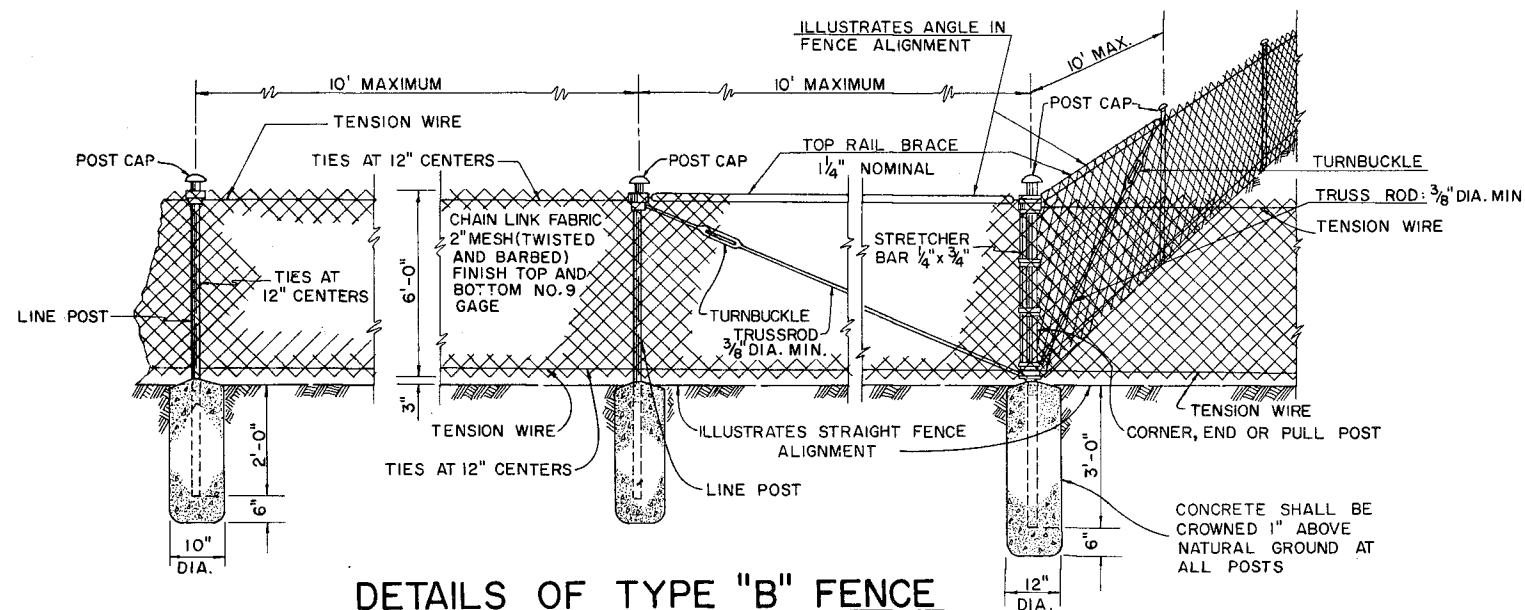
1 7/8" x 1 5/8" H-BEAM (STEEL)		1 1/2" x 1 1/2" H-BEAM (ALUM)	
AREA = .724 ^{sq} in.		AREA = .724 ^{sq} in.	
GALV. WT. PER FT. = 2.72 # ± 5%		GALV. WT. PER FT. = 2.34 # ± 5%	
-AXES-		-AXES-	
MOMENT OF INERTIA .428 .101		MOMENT OF INERTIA .428 .101	
SECTION MODULUS .456 .124		SECTION MODULUS .456 .124	
RAD. OF GYRATION .779 .373		RAD. OF GYRATION .779 .373	
SURFACE AREA = .776 ^{sq} in. PER FT.		SURFACE AREA = .776 ^{sq} in. PER FT.	
TENSILE STRENGTH PSI (MIN.) 80,000		TENSILE STRENGTH PSI (MIN.) 80,000	
YIELDING POINT PSI (MIN.) 48,000		YIELDING POINT PSI (MIN.) 48,000	



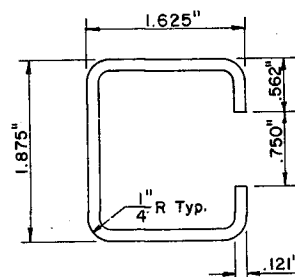
SKETCH INDICATING FENCE LOCATION AT SECTIONS OF NO FRONTAGE ROADS. REFER TO DETAIL PLANS FOR LOCATIONS OF FENCING FOR PROJECTS WITH FRONTAGE ROADS.



MODIFICATION OF TYPE "B" FENCING SHOWING BARB WIRE AT ATTACHMENT.



DETAILS OF TYPE "B" FENCE
(ILLUSTRATED FOR STEEL TUBULAR POSTS)



ALTERNATE "C" LINE POST FOR TYPE "B" FENCE

GALV. WT. PER FT. = 2.34 # ± 5%
YIELDING POINT PSI (MIN.) 45,000

GENERAL NOTES (TYPE "B" FENCE)

- THIS FENCE TO BE PROVIDED GENERALLY IN URBAN AREAS.
- LINE POSTS MAY BE ANY OF THE FOLLOWING:
(A) GALVANIZED STEEL PIPE - 1 1/2" NOMINAL; (B) ALUMINUM COATED STEEL PIPE - 1 1/2" NOMINAL; (C) ALUMINUM ALLOY PIPE - 2" NOMINAL; (D) GALVANIZED STEEL H-BEAM - 1 7/8" x 1 5/8"; (E) ALUMINUM ALLOY H-BEAM - 1 7/8" x 1 5/8"; (F) GALV. STEEL "C" - 1 7/8" x 1 5/8".
- CORNER, END OR PULL POSTS MAY BE ANY OF THE FOLLOWING:
(A) GALVANIZED STEEL PIPE - 2" NOMINAL; (B) ALUMINUM COATED STEEL PIPE - 2" NOMINAL; (C) ALUMINUM ALLOY PIPE - 2 1/2" NOMINAL.
NOTE: OTHER STEEL OR ALUMINUM SHAPES FOR CORNER, END OR PULL POST ASSEMBLIES MAY BE USED IF APPROVED BY THE ENGINEER.
- CHAIN LINK FABRIC, POSTS, RAILS, GATE FRAMES, EXPANSION SLEEVES, WIRE TIES, TENSION WIRES, AND ALL MISCELLANEOUS FITTINGS AND HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M-181-74 AND M-111 UNLESS OTHERWISE NOTED:
(A) UNLESS OTHERWISE CALLED FOR IN THE PLANS OR SPECIAL PROVISIONS;
(1) THE CHAIN LINK FABRIC WIRE SHALL BE NO. 9 GAGE AND GALVANIZED AT RATE OF 2 OZ. PER SQ. FT.
(2) THE TENSION WIRE SHALL BE EITHER NO. 7 GAGE STEEL WIRE GALVANIZED AT THE RATE OF 2 OZ. PER SQ. FT. MIN. OR ALUMINUM WIRE OF ALLOY ALCLAD 5056-H38 OR EQUAL WITH A WIRE DIAMETER OF 0.1875 INCH OR LARGER, OR NO. 7 GAGE ALUMINUM COATED STEEL WIRE COATED AT THE RATE OF 0.4 OZ. PER SQ. FT. MIN.
(3) TIE WIRE AND HOG RINGS SHALL BE NO. 9 GAGE (0.148 INCH) GALVANIZED OR ALUMINUM ALLOY.
(B) THE CONTRACTOR MAY ELECT TO USE A COMBINATION OF ZINC-COATED STEEL FENCE MEMBERS, ALUMINUM COATED STEEL FENCE MEMBERS, AND ALUMINUM ALLOY FENCE MEMBERS; BUT IN GENERAL ONLY ONE COMBINATION OF MATERIALS WILL BE ALLOWED IN FENCE CONSTRUCTION.
- SEE SECTION 966 OF D.O.T. STANDARD SPECIFICATIONS FOR OPTIONAL MATERIALS.
- MATERIAL FOR CLASS I CONCRETE FOR FENCE FOOTINGS MAY BE MEASURED BY VOLUMETRIC AND/OR BY WEIGHT. SECTIONS 345-5.1, 345-10 AND 345-11 OF D.O.T. STANDARD SPECIFICATIONS WILL BE DELETED.

GENERAL NOTES FOR ALL FENCE

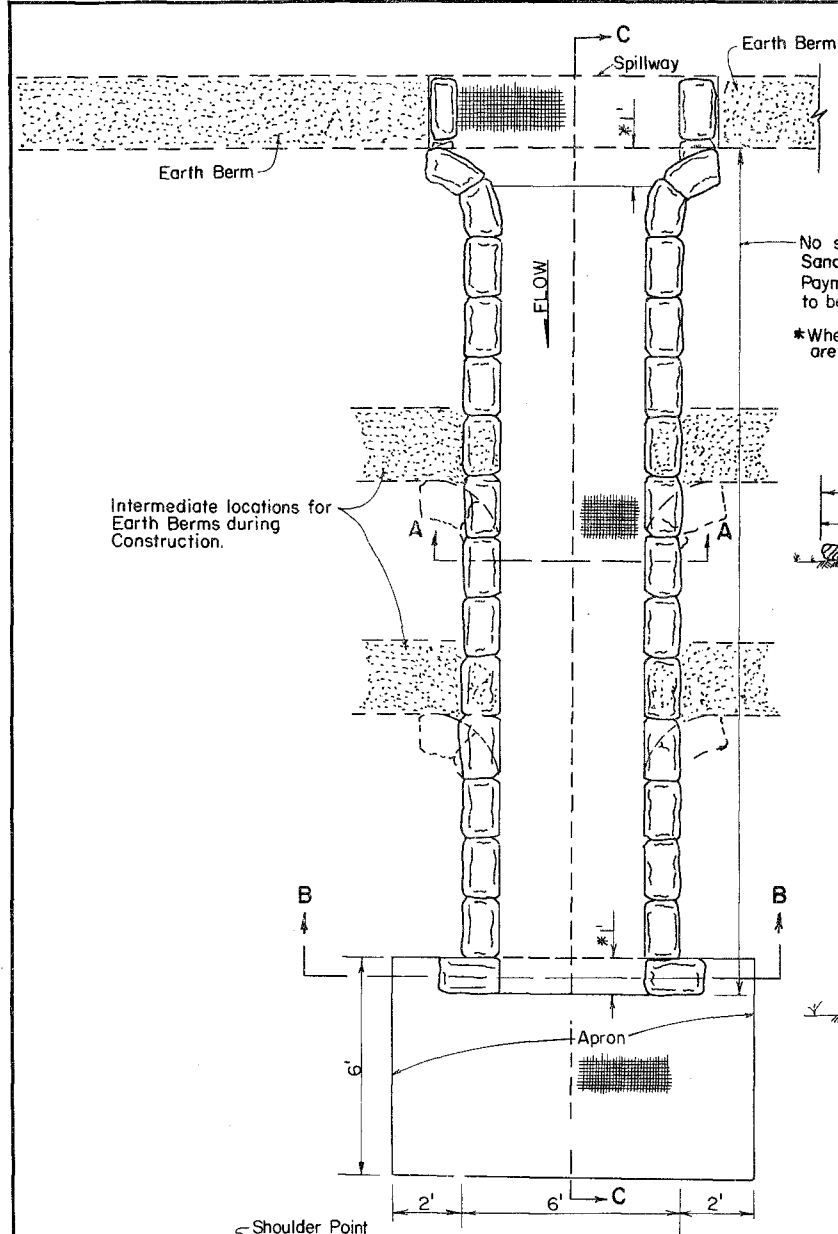
THE TYPE OF FENCE TO BE INSTALLED SHALL BE SHOWN ON PLANS. PULL POSTS SHALL BE USED AT BREAKS IN VERTICAL GRADES OF 15° OR MORE, OR AT APPROXIMATELY 330' CENTERS EXCEPT THAT THIS MAXIMUM INTERVAL MAY BE REDUCED BY THE ENGINEER ON CURVES WHERE THE DEGREE OF CURVATURE IS GREATER THAN 3 DEGREES. PULL POSTS SHALL ALSO BE PLACED AT THE END OF EACH ROLL OR PIECE OF WOVEN WIRE. CORNER POSTS ARE TO BE INSTALLED AT ALL HORIZONTAL BREAKS IN FENCE OF 15° OR MORE. A MAXIMUM LENGTH OF 1320' OF WIRE MAY BE INSTALLED AS A UNIT.

FHWA APPROVED: 9-3-76

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

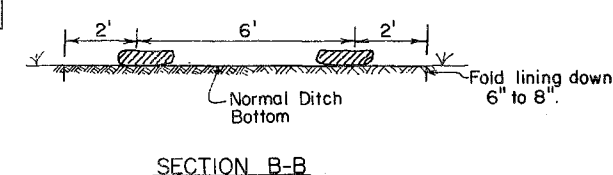
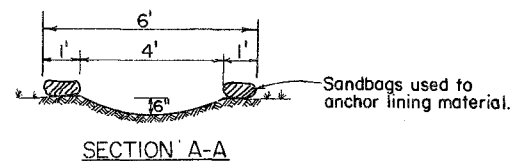
DETAILS OF FENCING

REVISIONS		INITIALS	DATES	Recommended for approval	
Dates	Descriptions	Designed by		by	Deputy Design Engineer - Roadways
5-7-74 G.L.	REVISED	Checked by		Approved	by [Signature]
11-75 L.M.F.	REVISED NOTE 4 and OTHER NOTES	Quantities by		State Design Engineer	
7-76	ADDED "C" POST	Checked by		DRAWING NO.	INDEX NO.
		Supervised by		1 OF 1	FTB-01-2



No separate payment will be made for Sandbagging within these limits. Payment for sandbags within these limits to be included in unit cost for Slope Drains.

*Where multiple sections of fiber materials are used the one foot (1') lap will be required.

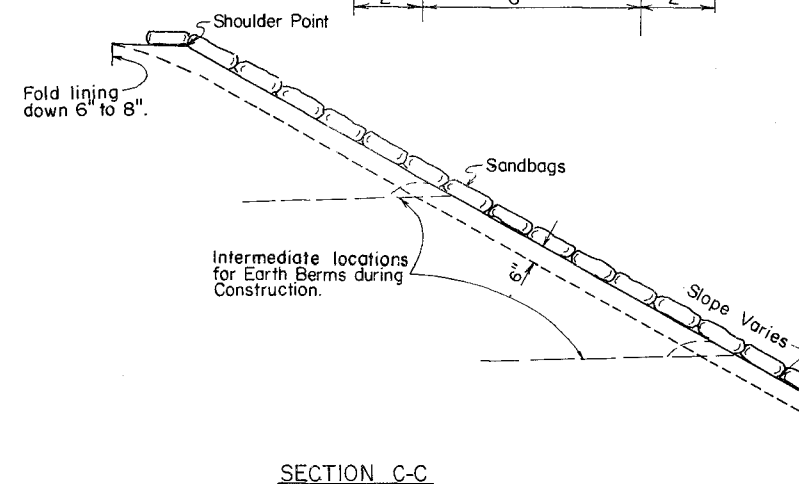


GENERAL NOTES

Glass Fiber, Bituminized Fiber, Plastic Sheets or any other Material approved by the Engineer may be used to line the Earth Slope Drain.

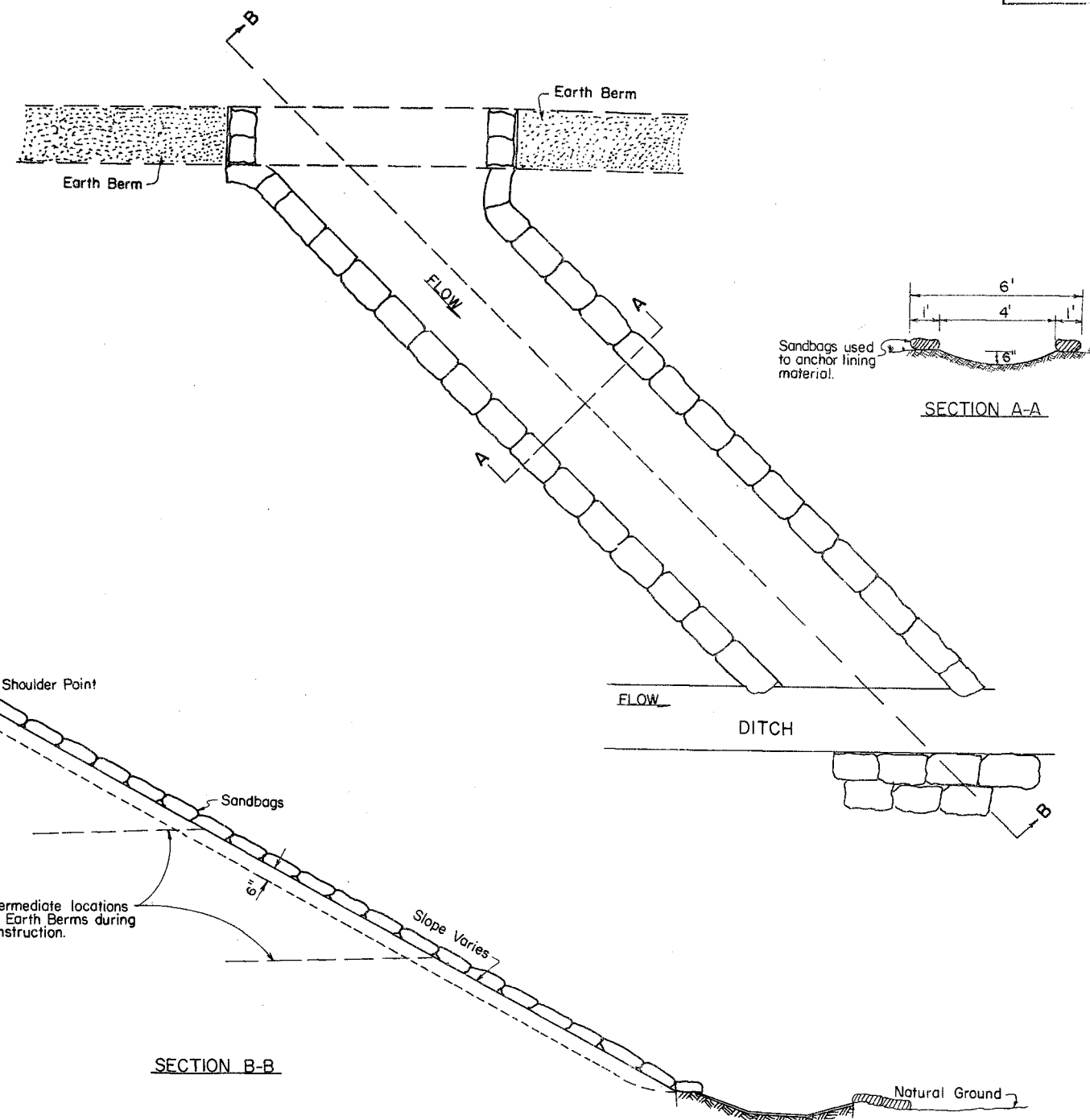
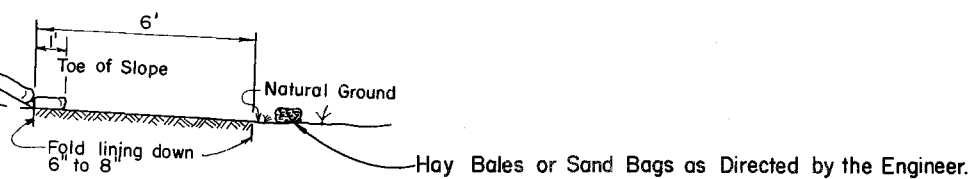
Pipe Slope Drains may be used as an alternate.

Where there is no existing Concrete Ditch a similar method may be used to anchor the Toe of the Drain into the Earthen or Grassed Ditch.



TEMPORARY SLOPE DRAINS FOR FILL SECTIONS

NOTE: THIS IS A SUGGESTED METHOD ONLY. ANY ALTERNATE SOLUTION MAY BE USED AS APPROVED BY THE PROJECT ENGINEER.



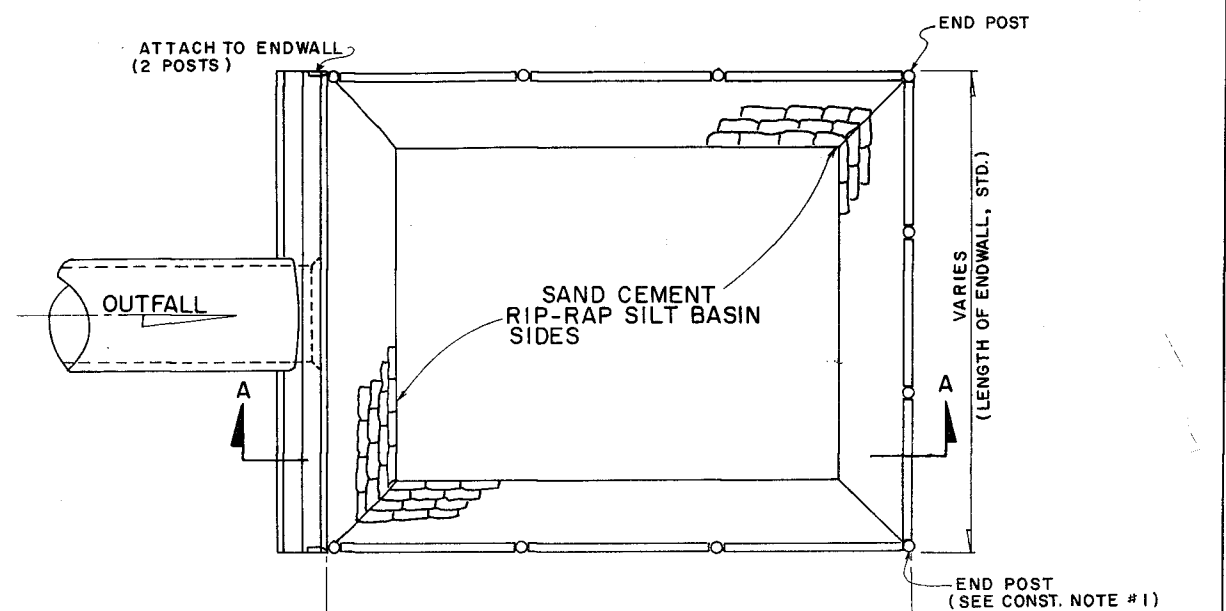
TEMPORARY SLOPE DRAIN FOR FILL HEIGHTS GREATER THAN 10' OR ROADWAY GRADES STEEPER THAN 1.5%

FHWA APPROVED: 3-13-75

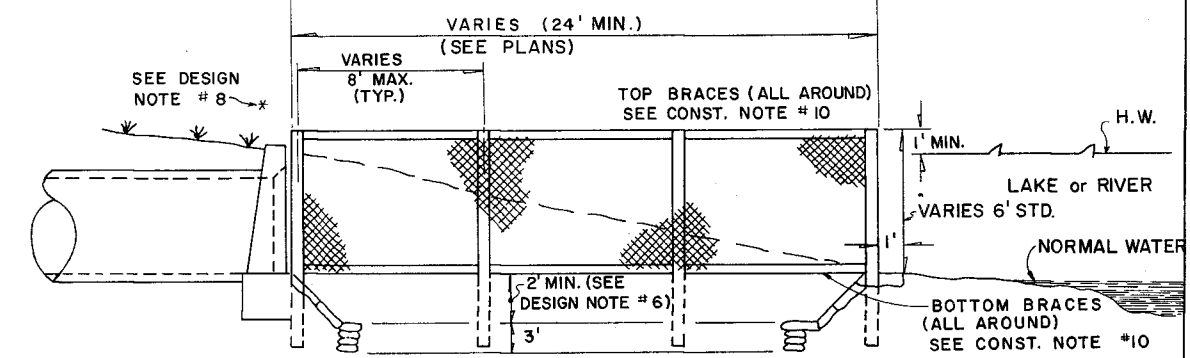
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

EROSION CONTROL DEVICES TEMPORARY SLOPE DRAINS

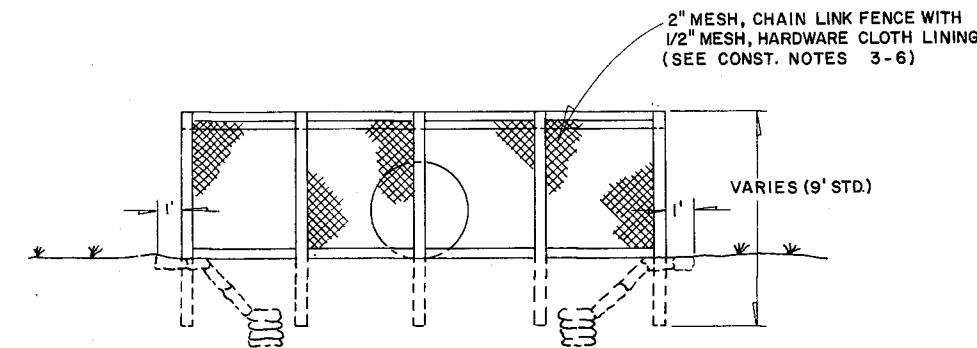
REVISIONS		INITIALS	DATES	Recommended for approval by <i>[Signature]</i> Deputy Design Engineer - Roadways Approved by <i>[Signature]</i> State Design Engineer
Dates	Descriptions	Designed by	WJR	5/74
		Checked by	HLB	6/74
		Quantities by		
		Checked by		
		Supervised by	DCB	
DRAWING NO. 1 OF 1				INDEX NO. GEC-01



PLAN VIEW

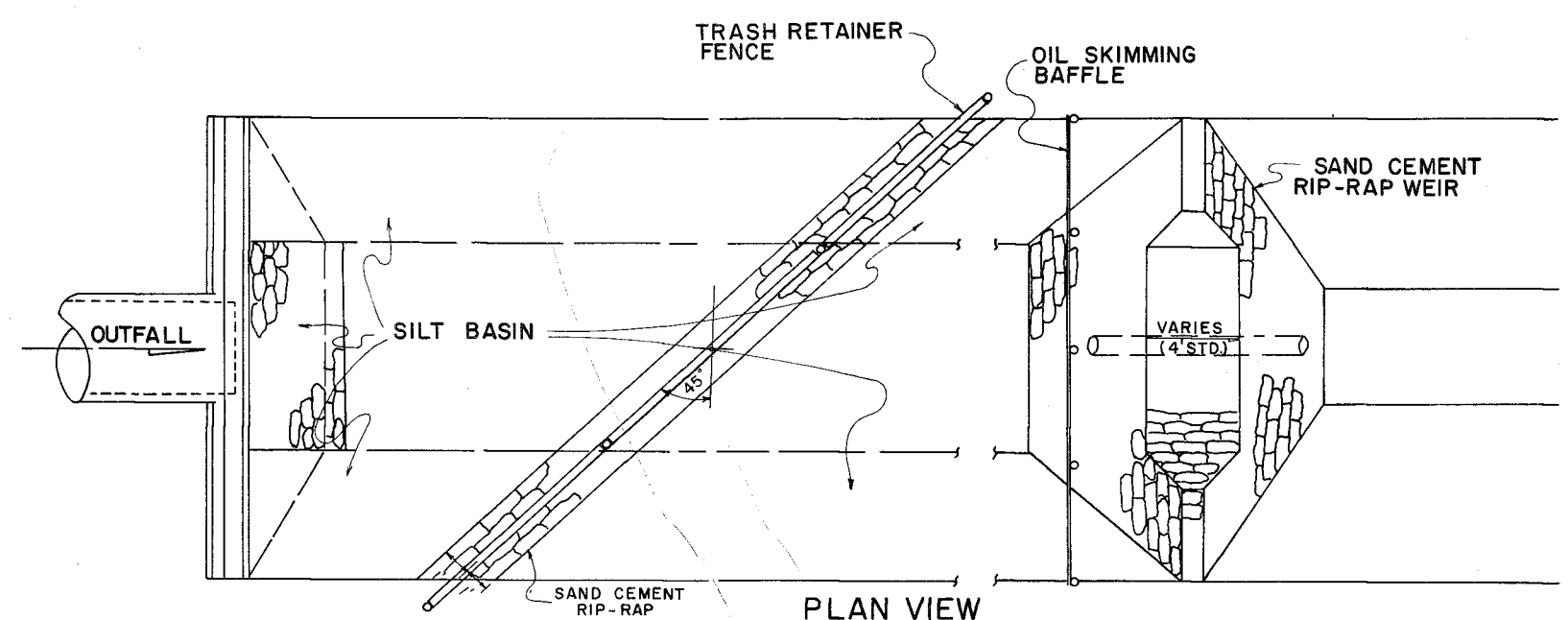


SECTION A-A

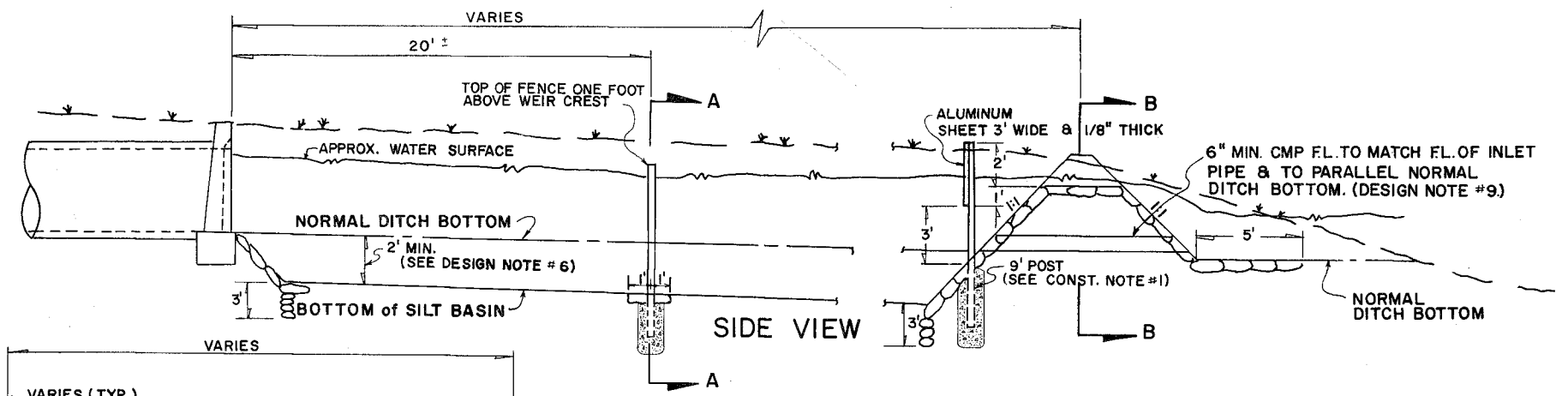


END VIEW

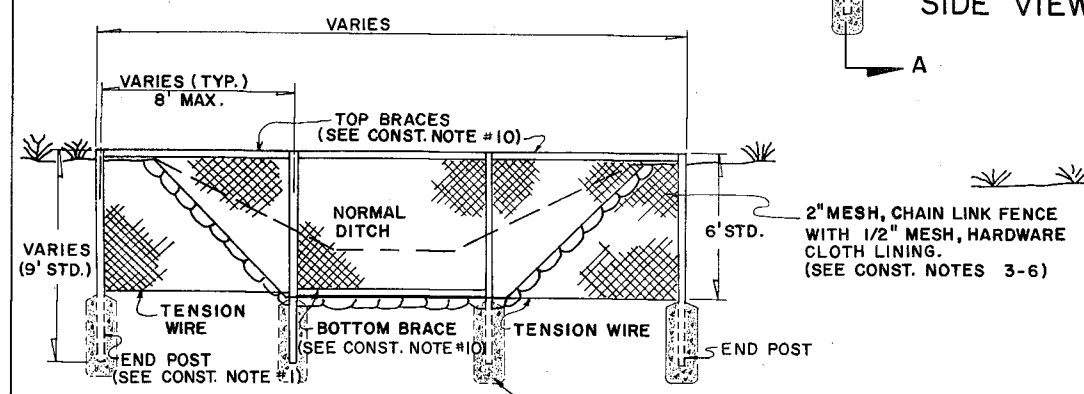
TYPE 'A' TRASH RETAINER & SILT BASIN
INTENDED FOR USE ON STORM SEWER OUTFALL PIPES WHICH
TERMINATE ADJACENT TO SHORE LINES OF NATURAL WATER
BODIES.



PLAN VIEW

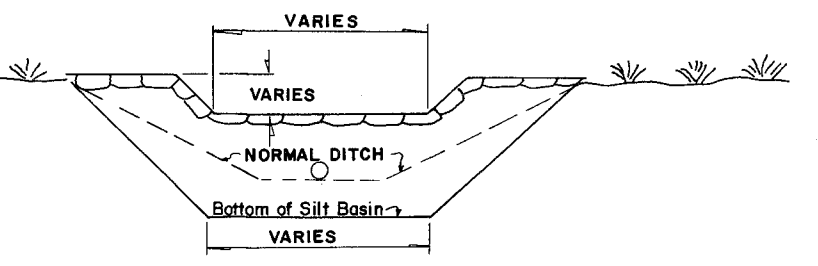


SIDE VIEW



SECTION A-A
TRASH RETAINER

TYPE 'B' TRASH RETAINER & SILT BASIN
INTENDED FOR USE ON STORM SEWER OUTFALL PIPES WHICH TERMINATE
IN AN OPEN OUTFALL DITCH BEFORE SPILLING INTO A NATURAL WATER BODY.



SECTION B-B
SAND CEMENT RIP-RAP WEIR

GENERAL DESIGN NOTES

1. THE TYPE 'B' RETAINER & BASIN IS PREFERRED OVER THE TYPE 'A' BECAUSE OF THE OIL BAFFLE & A LARGER SILT BASIN. THE TYPE 'A' RETAINER SHOULD BE USED ONLY IN CASES WHERE IT IS NOT PRACTICAL TO CONST. AN OPEN DITCH BETWEEN THE ENDWALL & THE WATER.
2. THE CHAIN LINK FENCE & HARDWARE CLOTH IS INTENDED TO SCREEN OUT & RETAIN DEBRIS WASHED INTO STORM SEWER SYSTEM FOR LATER REMOVAL BY MAINTENANCE FORCES.
3. THE SILT BASIN IS INTENDED TO ALLOW SILT & SAND WASHED INTO STORM SEWER SYSTEM TO SETTLE OUT BEFORE SPILLING INTO NATURAL WATER BODY.
4. THE OIL SKIMMING BAFFLE IN TYPE 'B' RETAINER IS INTENDED TO PREVENT ANY OILS WASHED INTO STORM SEWER SYSTEM FROM SPILLING OVER WEIR.
5. THE WEIR IN TYPE 'B' RETAINER SHOULD BE LOCATED AS FAR FROM THE ENDWALL AS PRACTICAL. ON STEEP DITCH GRADES TWO OR MORE WEIRS MAY BE REQUIRED.
6. THE DEPTH OF THE SILT BASIN SHOULD BE AS DEEP AS PRACTICAL WITH A MINIMUM OF 2.0 FT.
7. THE SILT BASIN IN TYPE 'A' RETAINER CAN BE EXTENDED BEYOND THE LIMITS OF THE FENCE IF REQUIRED. IN THESE INSTANCES, FENCE WILL EXTEND DOWN TO BOTTOM OF BASIN.
8. WHERE TOP OF ENDWALL IS BELOW HIGH WATER (H.W.), FENCE WILL BE REQUIRED ALONG ENDWALL TO ENCLOSE BASIN.
9. 6" CMP IS MINIMUM DRAINAGE UNLESS SHOWN OTHERWISE IN PLANS.

GENERAL CONSTRUCTION NOTES

1. FENCE POSTS TO BE ALUMINUM OR CONCRETE ONLY.
2. ALL METAL HARDWARE TO BE ALUMINUM.
3. FENCE TO BE INSTALLED TO INSIDE OF POSTS.
4. FENCE TO BE ALUMINUM CHAIN LINK FABRIC, 2" MESH.
5. FENCE TO BE TIED TO ALL POSTS & BRACES AT 6" CENTERS.
6. ALUMINUM HARDWARE CLOTH, 1/2" MESH TO BE ATTACHED TO INSIDE OF FENCE.
7. ALL POSTS TO BE SET IN CONCRETE.
8. ALUMINUM POSTS TO BE 3" DIA. MINIMUM.
9. FOR ADDITIONAL DETAILS ON FENCING, SEE INDEX NOS. FTA-01 AND FTB-01.
10. BRACES TO BE ALUMINUM OR CONCRETE ONLY.
11. ALL SLOPES TO BE 1:1.
12. THE WORDS SILT & SEDIMENT ARE INTERCHANGABLE.
13. SEDIMENT BASINS TO BE CONSTRUCTED PRIOR TO CONSTRUCTION OF PIPE OUTFALL. MAINTENANCE AND CLEAN OUT TO BE BY THE CONTRACTOR UNTIL ACCEPTANCE BY THE ENGINEER.

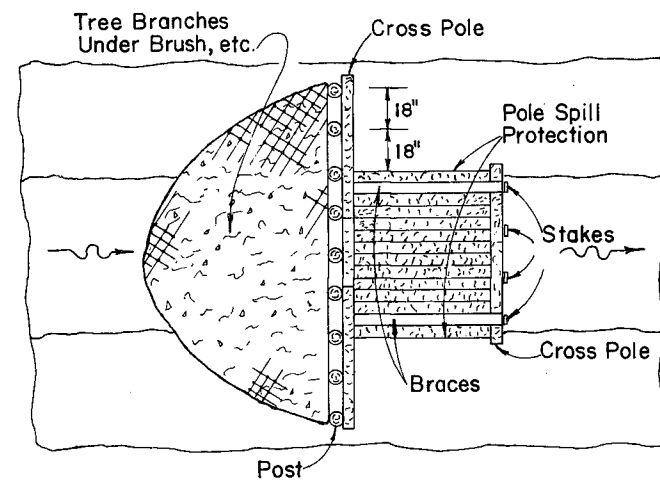
FHWA APPROVED: 3-13-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

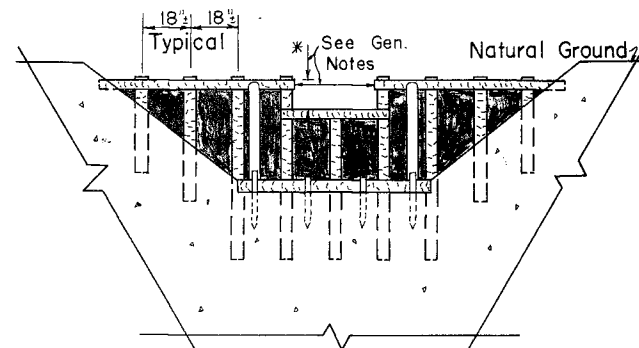
EROSION CONTROL DEVICES
SEDIMENT BASINS

REVISIONS		INITIALS		DATES	
Dates	Descriptions	Designed by	WJR	5/74	
		Checked by	HLB	6/74	
		Quantities by			
		Checked by			
		Supervised by	DCB		

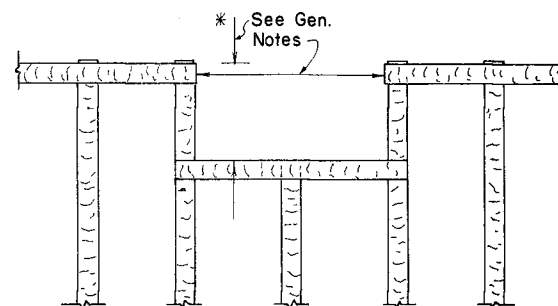
Recommended for approval
by *[Signature]*
Deputy Design Engineer -
Roadways
Approved
by *[Signature]*
State Design Engineer
DRAWING NO. INDEX NO.
1 OF 1 GEC-02



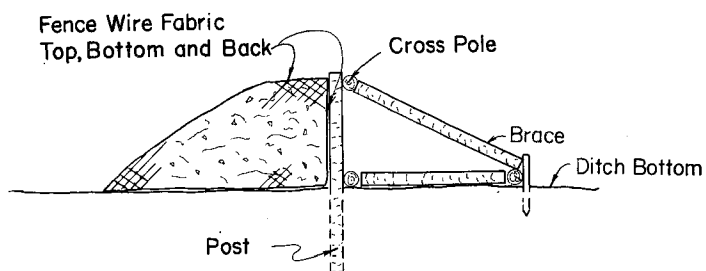
TOP VIEW



FRONT VIEW



WEIR DETAIL



SIDE VIEW

SUGGESTED SEDIMENT CHECK

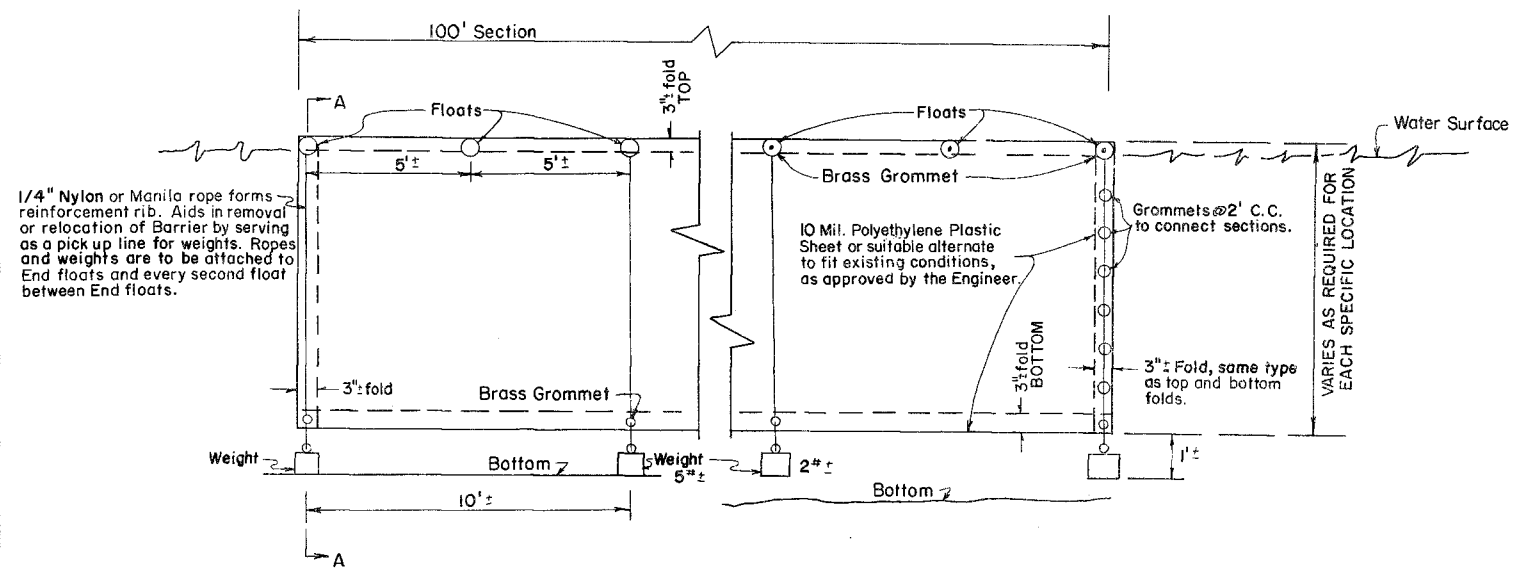
General Notes:

1. Width and depth of weir may be varied to fit conditions at site. However, as a general guide it shall have a depth between 6" to 12" deep with a width between 3' to 6' wide.
2. Top elevation of ditch check should be set to provide an effective check for silt without causing an objectionable backwater. Depending upon site conditions and the particular season of the year this top elevation will have a wide range. As a general guide a suggested trial height of approximately 1/4 the distance between natural ground and ditch bottom be used unless other criteria controls.
3. Additional spill protection may be provided for slope protection if desired.
4. For use in lateral ditches or side ditches.

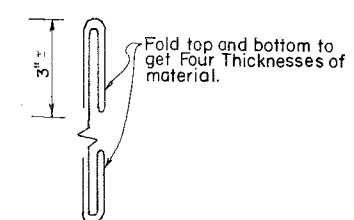
FHWA APPROVED: 3-13-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
EROSION CONTROL DEVICES
SEDIMENT CHECK

REVISIONS		INITIALS	DATES	Recommended for approval by
Dates	Descriptions			
		Designed by	WJR 5/74	by <i>ENHART</i> Deputy Design Engineer - Roadways
		Checked by	HLB 6/74	
		Quantities by		Approved by <i>[Signature]</i> State Design Engineer
		Checked by		
		Supervised by	DCB	DRAWING NO. INDEX NO.
				1 OF 1 GEC-03

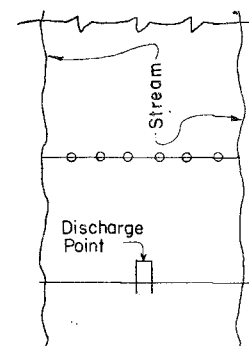


FRONT VIEW

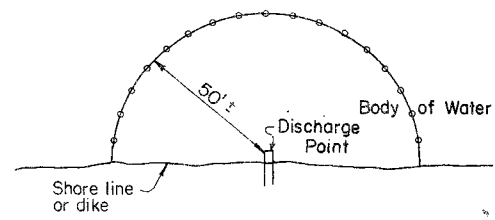


SIDE VIEW

FOLDING DETAIL



TYPICAL APPLICATION



TYPICAL APPLICATION

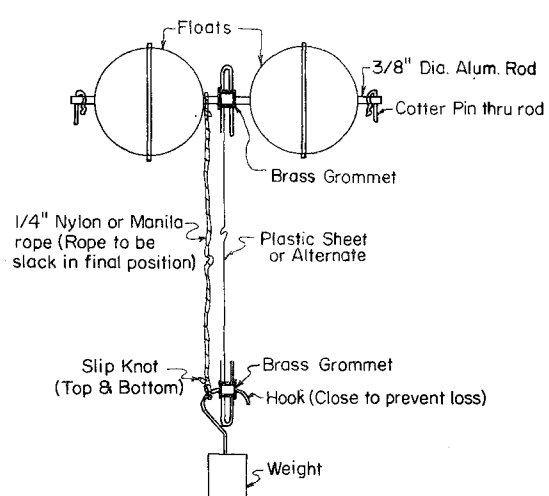
GENERAL NOTES

Silt Barrier to Prevent drifting of Silt caused by discharge of Storm Sewers during Construction, dredging or filling Operations.

Exact placement of silt barrier shall be so as to effectively control silt dispersion under the conditions present on a particular project.

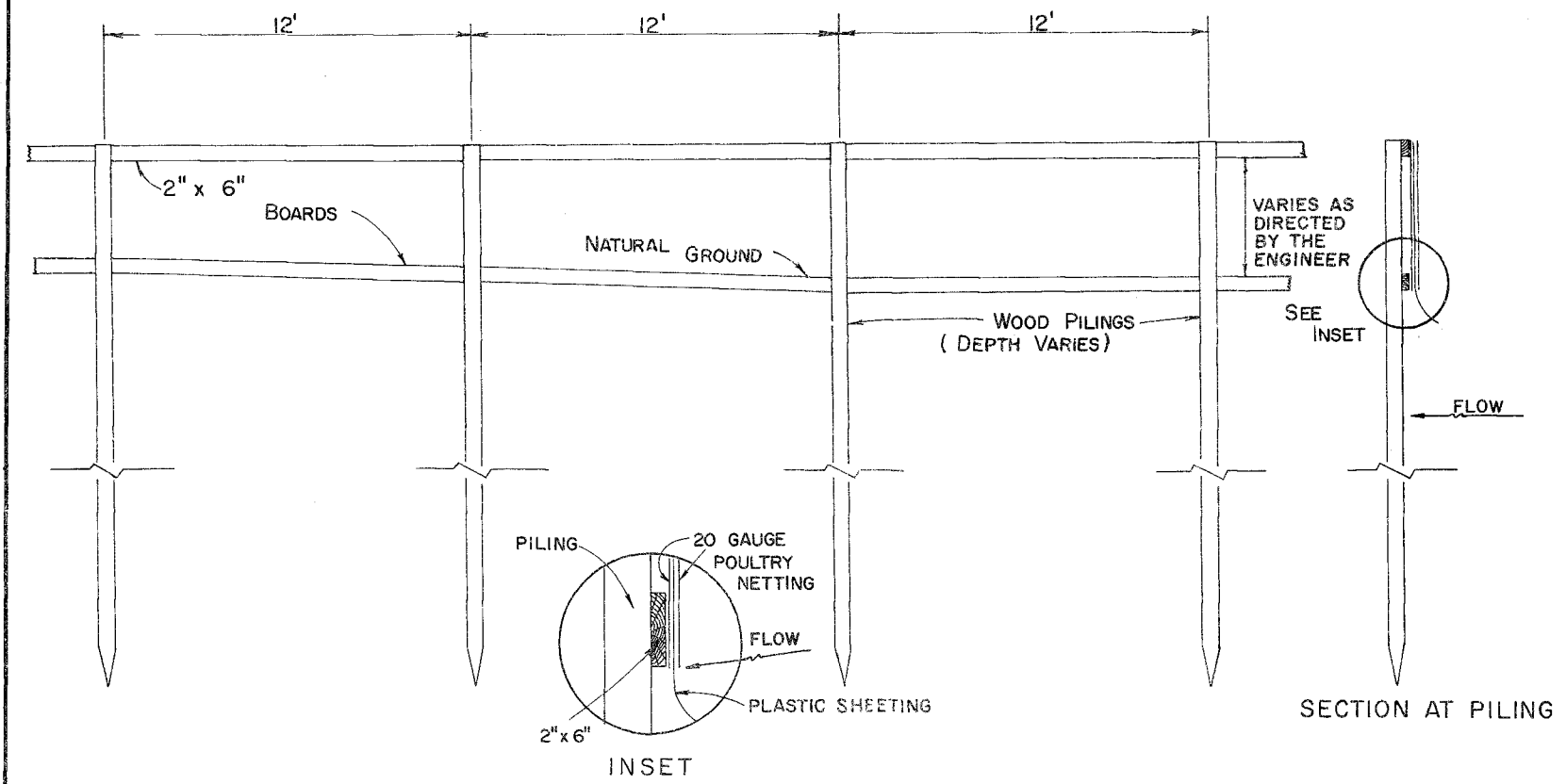
The details shown on this sheet are suggested methods only. Alternate solutions and usage of materials may be used as approved by the Engineer.

DETAIL OF FLOATING SILT BARRIER



SECTION A-A

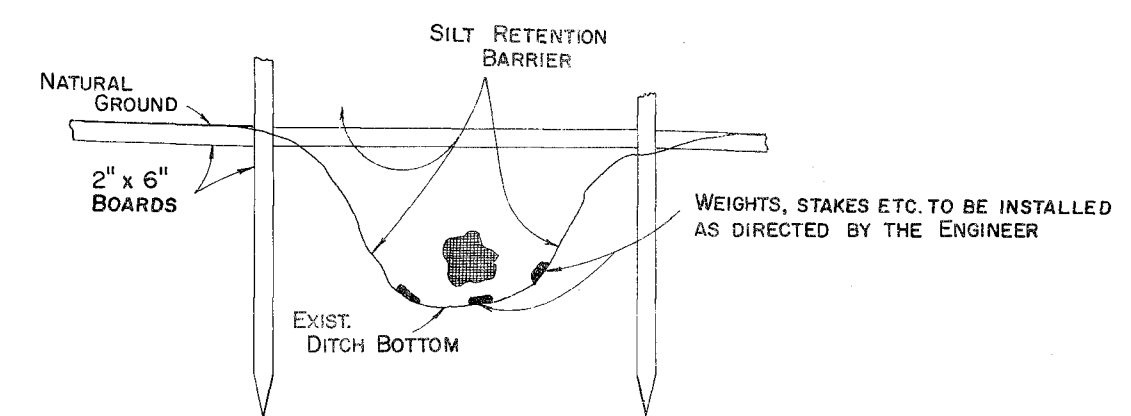
NOTE: At shallow water locations the plastic sheet or suitable alternate may be fastened to stakes driven into the bottom in lieu of floats and weights.



DETAIL OF STAKED SILT BARRIER

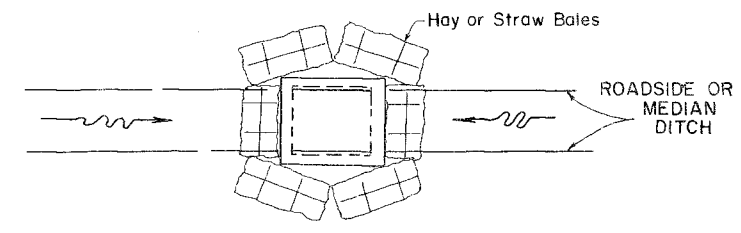
NOTES

THE FRAME WILL BE CONSTRUCTED WITH 2" x 6" BOARDS. PILINGS WILL BE A MINIMUM OF 6" IN DIAMETER AT THE BUTT END. THE DEPTH OF PILINGS WILL BE AT THE DISCRETION OF THE PROJECT ENGINEER. ATTACHED TO THE FRAME WILL BE 20 GAUGE POULTRY NETTING WITH 1" NET. THE SILT RETAINER WILL BE PLASTIC SHEETING, EXTENDING FROM THE TOP 2" x 6" BOARD TO 4' BEYOND THE BOTTOM 2" x 6" BOARD. IN THE DITCH BOTTOM, THE SHEETING AND POULTRY NETTING SHOULD EXTEND TO THE DITCH BOTTOM AND BE ANCHORED IN PLACE BY MEANS AVAILABLE TO THE CONTRACTOR TO EFFECTIVELY PREVENT SILT FROM ESCAPING FROM UNDER THE BOTTOM OF THE BARRIER. (SEE DETAIL BELOW)

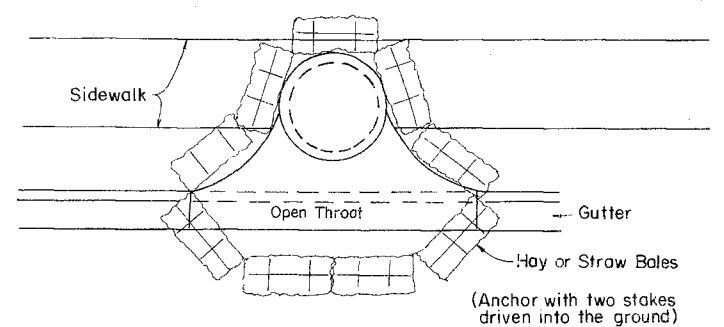


DETAIL SHOWING PLACEMENT OF STAKED SILT BARRIER AT EXISTING DITCH LOCATIONS

FHWA APPROVED: 3-13-75			
FLORIDA DEPARTMENT OF TRANSPORTATION			
Road Design Section			
ERROSION CONTROL DEVICES			
SILT BARRIERS			
REVISIONS		INITIALS	DATES
Dates	Descriptions	Designed by	WJR 5/74
		Checked by	HLB 6/74
		Quantities by	
		Checked by	
		Supervised by	DCB
		Recommended for approval by <i>E. J. Hout</i>	
		Deputy Design Engineer - Roadways	
		Approved by <i>W. J. Hout</i>	
		State Design Engineer	
		DRAWING NO.	INDEX NO.
		1 OF 1	GEC-04



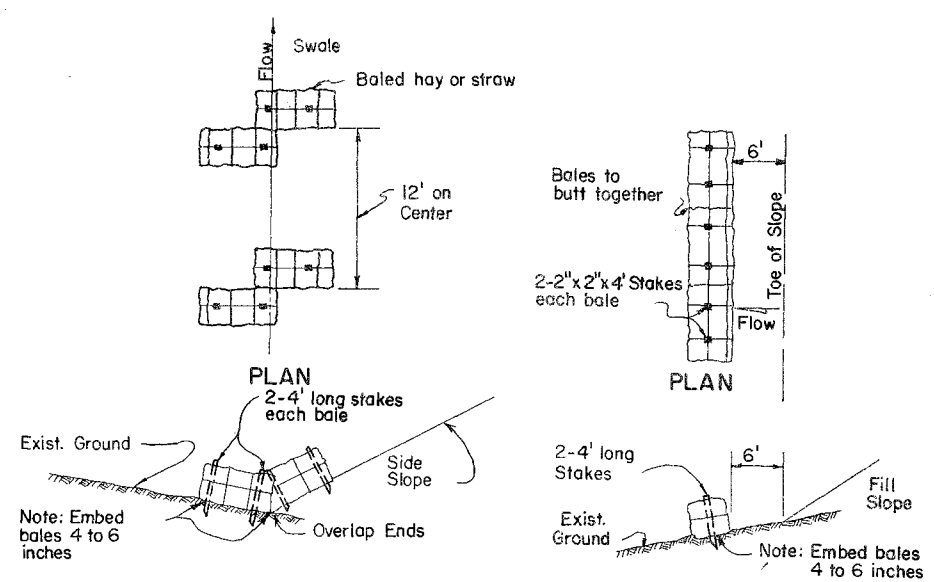
DITCH BOTTOM INLET



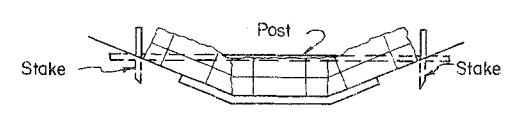
CURB AND GUTTER INLETS

TEMPORARY PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

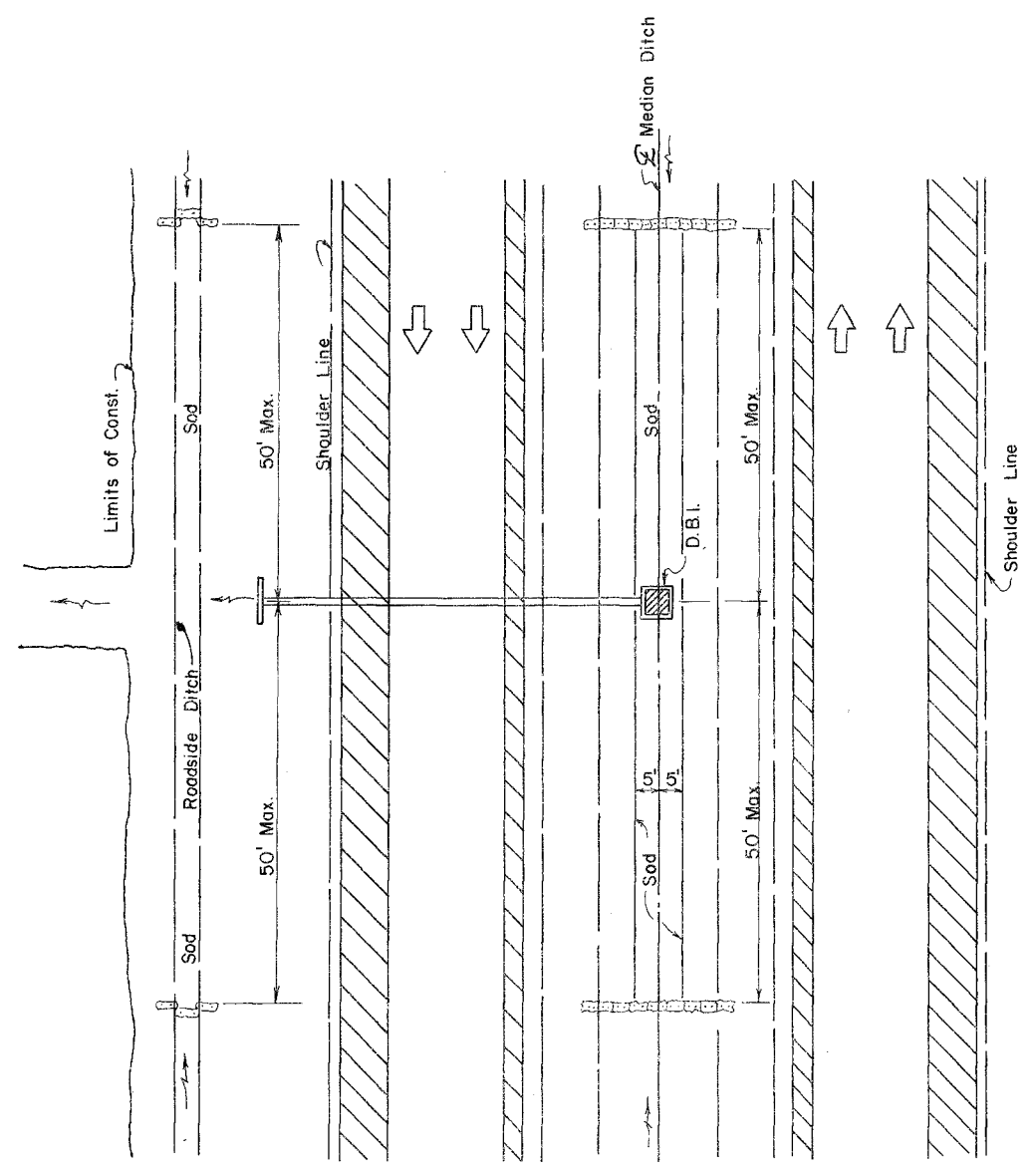
Note: For use on completed or partially completed structures.



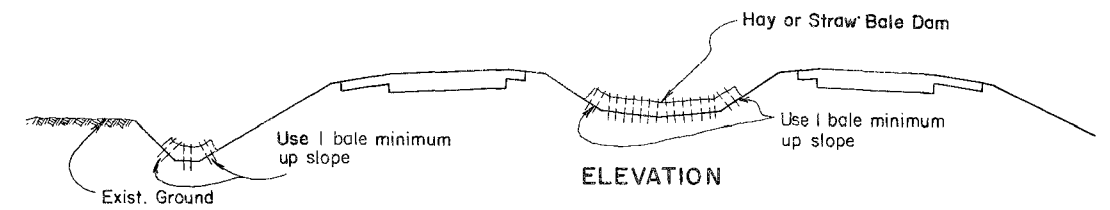
Note: To be used where the natural ground slopes toward the toe of slope.



DETAIL OF HAY OR STRAW BALE DAM ON PAVED DITCH



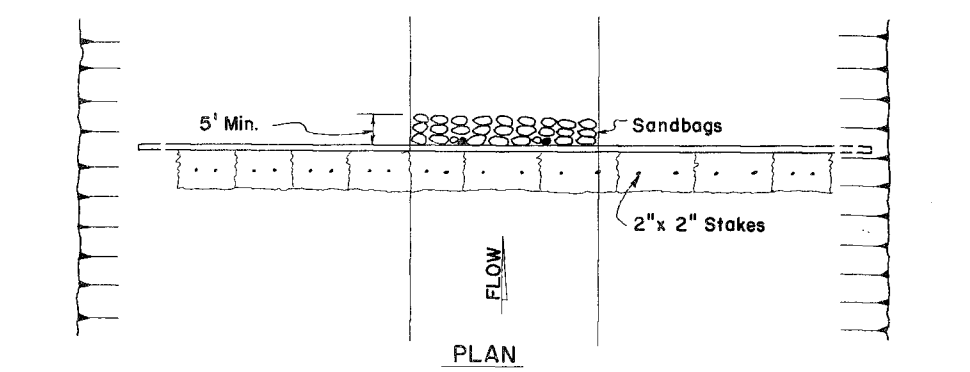
PLAN



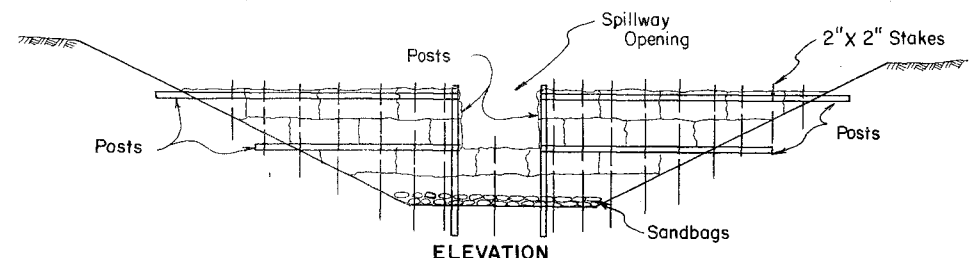
ELEVATION

Note: Secure each bale with 2-4' long stakes

HAY OR STRAW BALE DAMS ON TYPICAL 4 LANE DIVIDED HIGHWAY



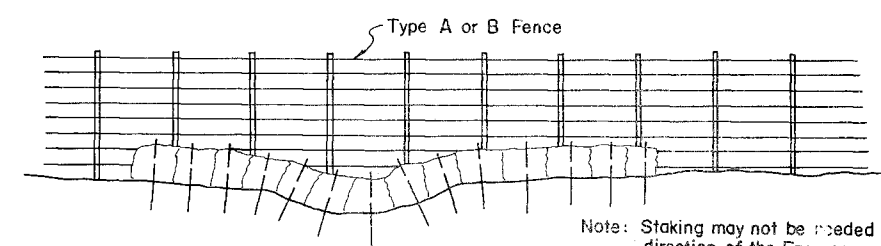
PLAN



ELEVATION

STAKED HAY OR STRAW BALES

Note: Dam should extend far enough up ditch side slopes to effectively pond the runoff and prevent erosion and washout.



HAY OR STRAW BALES BACKED BY FENCE

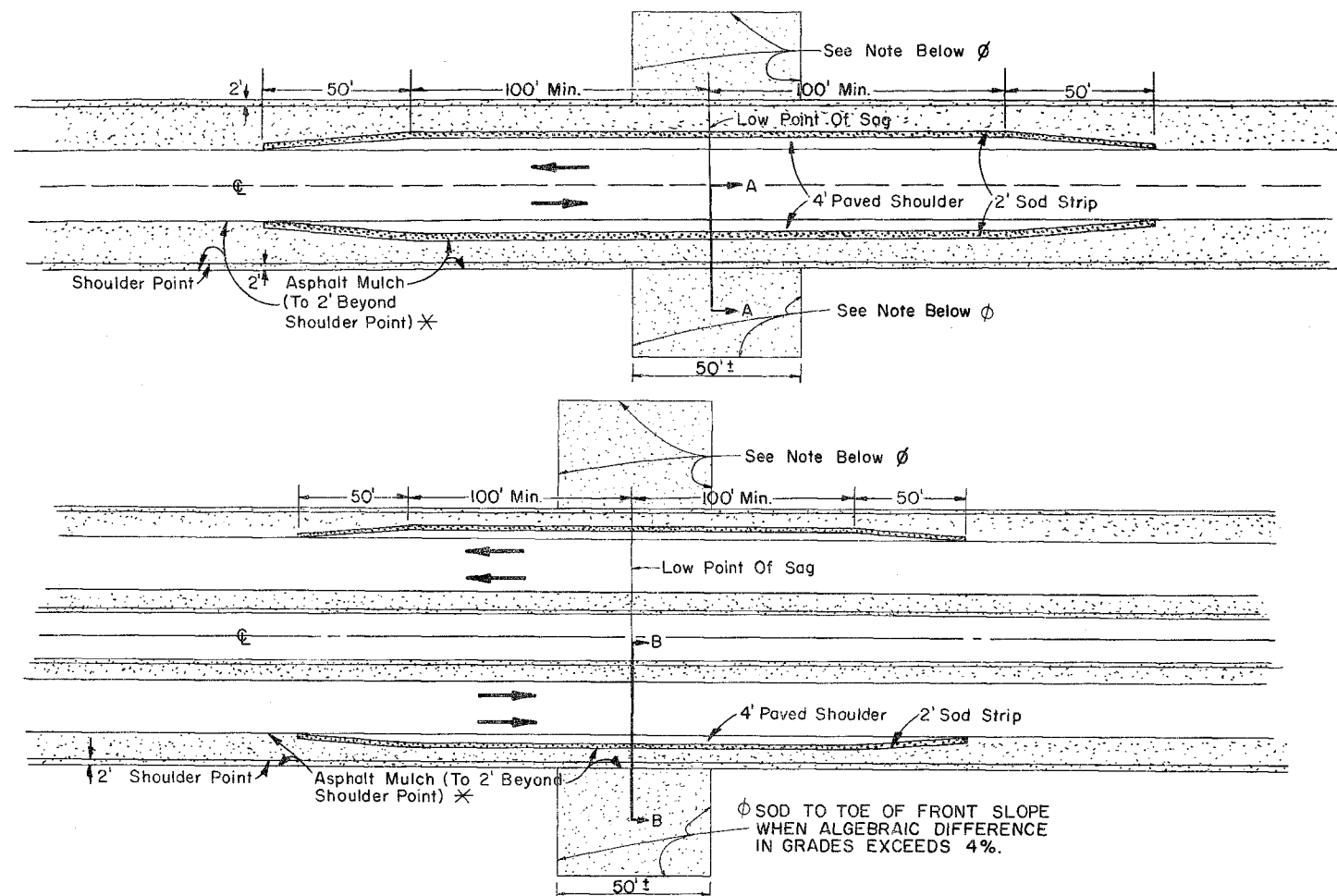
Note: Staking may not be needed at the direction of the Engineer.

TYPES OF TEMPORARY DAMS

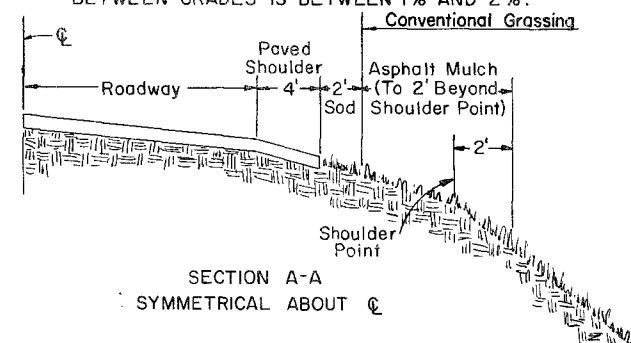
Note: Payment to be made under Item 104 ~ Baled Hay or Straw ~ Ton

FHWA APPROVED: 3-13-75			
FLORIDA DEPARTMENT OF TRANSPORTATION			
Road Design Section			
EROSION CONTROL DEVICES			
BALED HAY OR STRAW			
REVISIONS		INITIALS	DATES
Dates	Descriptions	Designed by	WJR 5/74
		Checked by	HLB 6/74
		Quantities by	
		Checked by	
		Supervised by	DCB
		Recommended for approval by <i>[Signature]</i>	
		Deputy Design Engineer - Roadways	
		Approved by <i>[Signature]</i>	
		State Design Engineer	
		DRAWING NO.	INDEX NO.
		1 OF 1	GEC-05

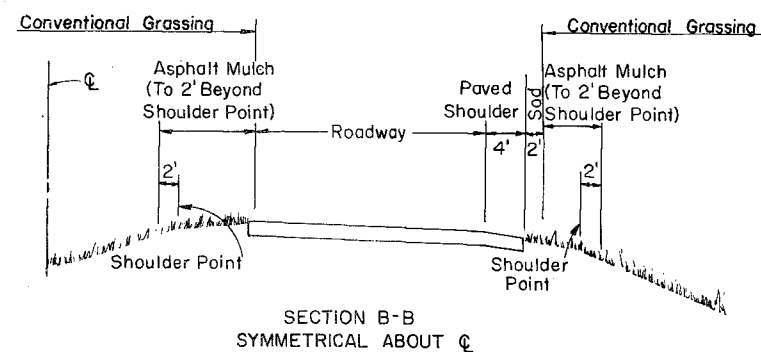
TO BE USED AT SAG VERTICAL CURVES



1. USE 4' PAVED SHOULDER AND 2' SOD STRIP WHEN NEGATIVE GRADE INTERSECTS POSITIVE GRADE AND ALGEBRAIC DIFFERENCE IN GRADES IS 2% OR GREATER.
2. USE ONLY 2' SOD STRIP WHEN NEGATIVE GRADE INTERSECTS POSITIVE GRADE AND ALGEBRAIC DIFFERENCE BETWEEN GRADES IS BETWEEN 1% AND 2%.

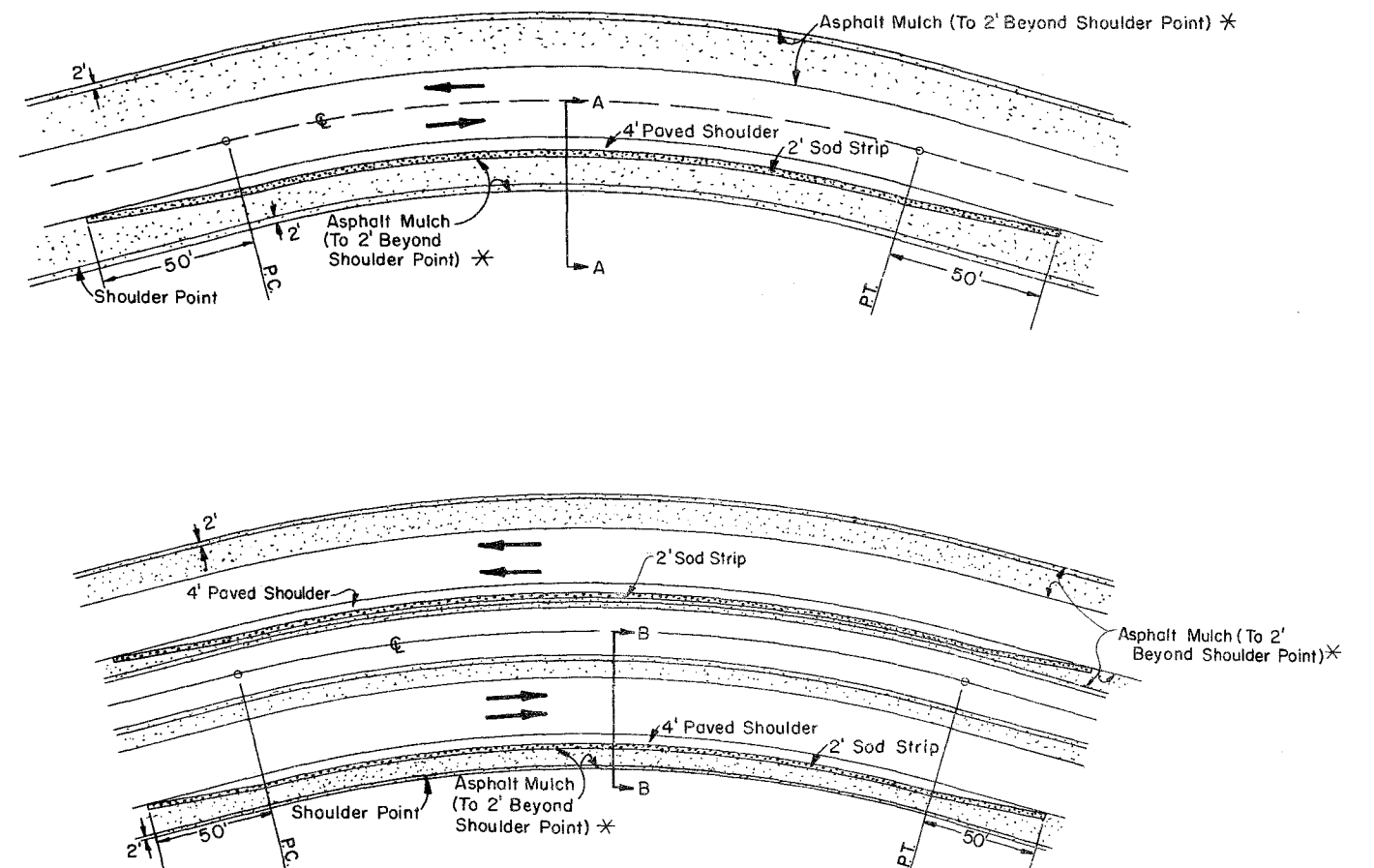


SECTION A-A
SYMMETRICAL ABOUT C



SECTION B-B
SYMMETRICAL ABOUT C

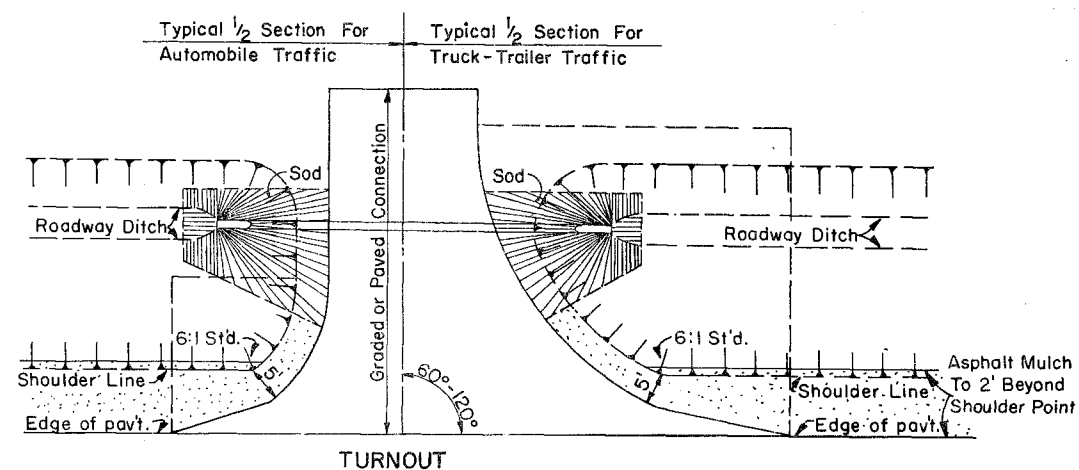
TO BE USED AT SUPER ELEVATED HORIZONTAL CURVES
AS INDICATED IN TABLE BELOW

PAVED SHOULDER CRITERIA
AT SUPER ELEVATED HORIZONTAL CURVES

DESIGN SPEED	DEGREE OF CURVE
30	7° or greater
40	5° or greater
50	4° or greater
60	3° or greater
65	3° or greater
70	2° or greater

NOTES:


- * 1. ASPHALT MULCH WILL EXTEND THROUGH THE ENTIRE LIMITS OF PROJECT. ASPHALT MULCH WILL NORMALLY NOT BE NECESSARY WHEN TOPSOIL OR MUCK BLANKET IS USED.
- 2. FOR SODDING ADJACENT TO DITCHES SEE INDEX DPS-01.
- 3. FOR SODDING AT HEADWALLS SEE SHEET 2 OF 2 ON INDEX GRC-01.
- 4. ALL FRONT SLOPES STEEPER THAN 4:1 ARE TO BE SODDED.

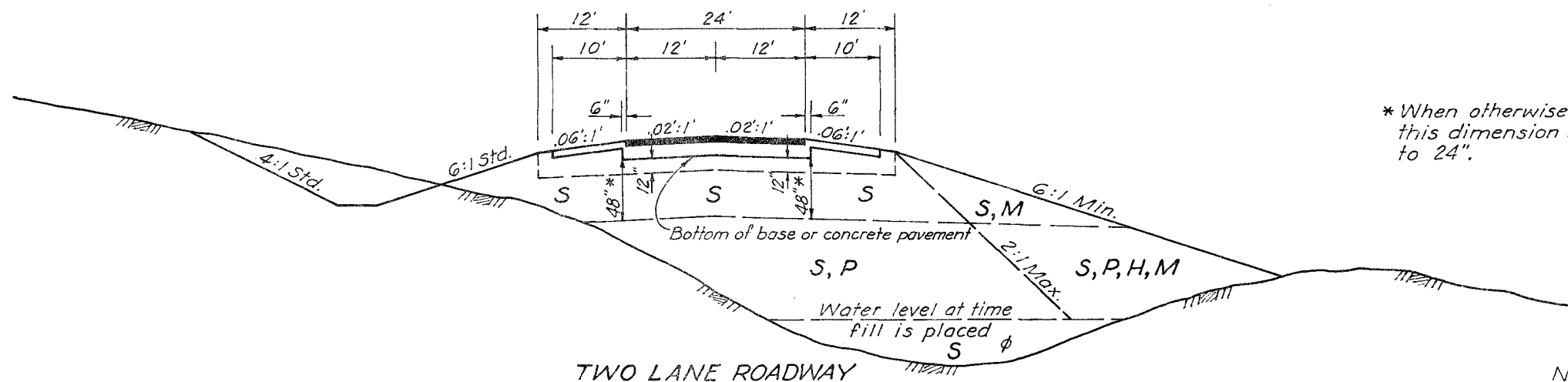
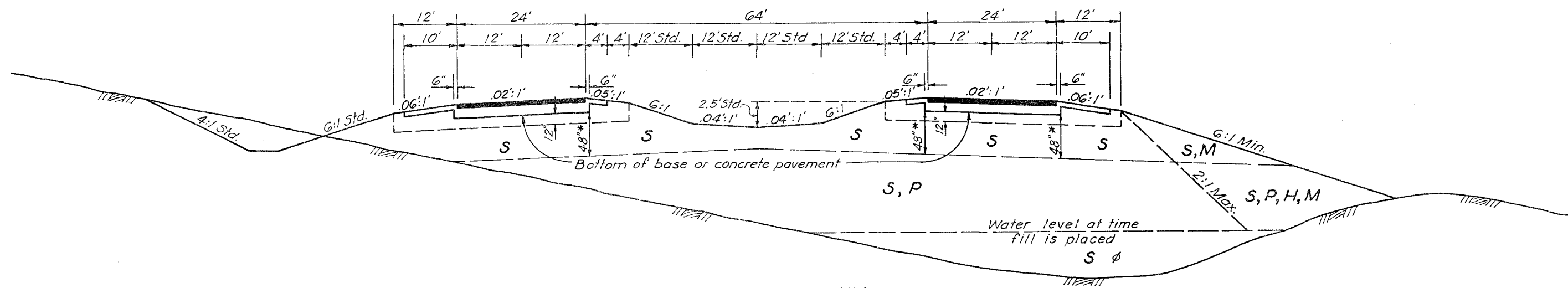


TURNOUT

F.H.W.A. APPROVED: 11-21 -75

FLORIDA DEPARTMENT OF TRANSPORTATION Road Design Section
EROSION CONTROL DETAILS FOR PERMANENT CONSTRUCTION

REVISONS		INITIALS		DATES		Approved by:
Dates	Descriptions	Designed by	H.L.G.	4-75		
10-17-75	Added E and S to Slope Vertical Details	Checked by				 Deputy Design Engineer - Roadways
		Quantities by				
		Checked by				
		Supervised by	D.C.B.		DRAWING NO. INDEX NO.	
					1 OF 1	GEC-06



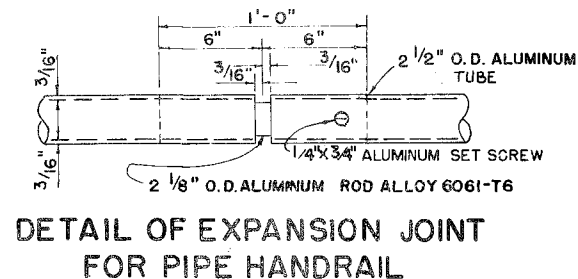
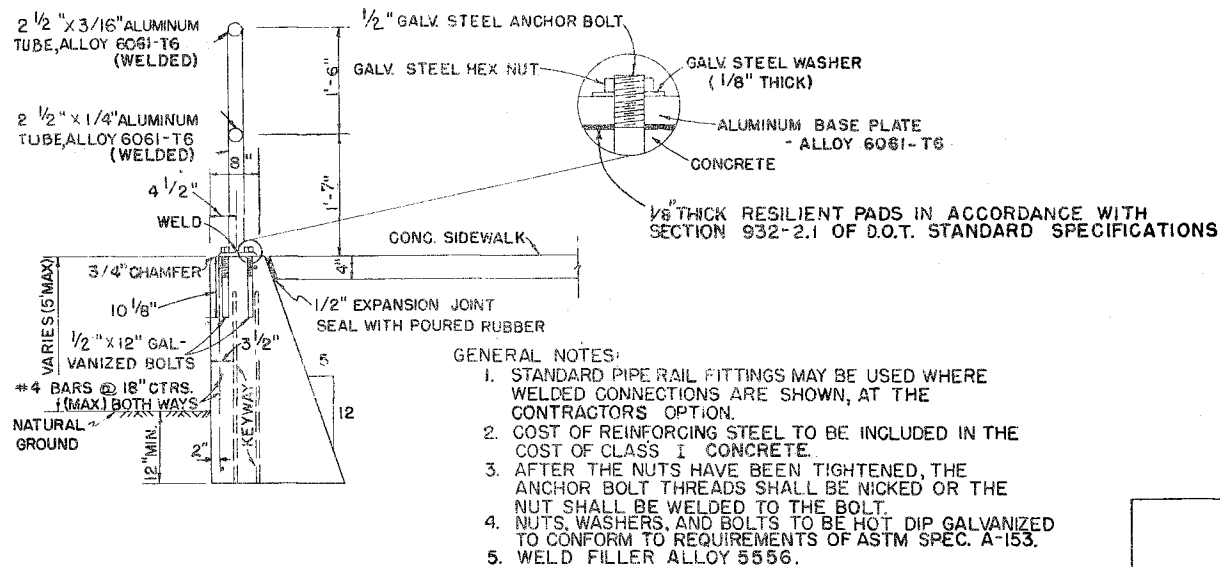
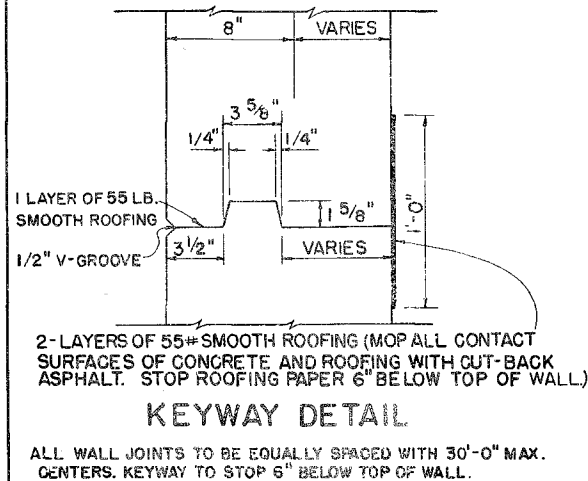
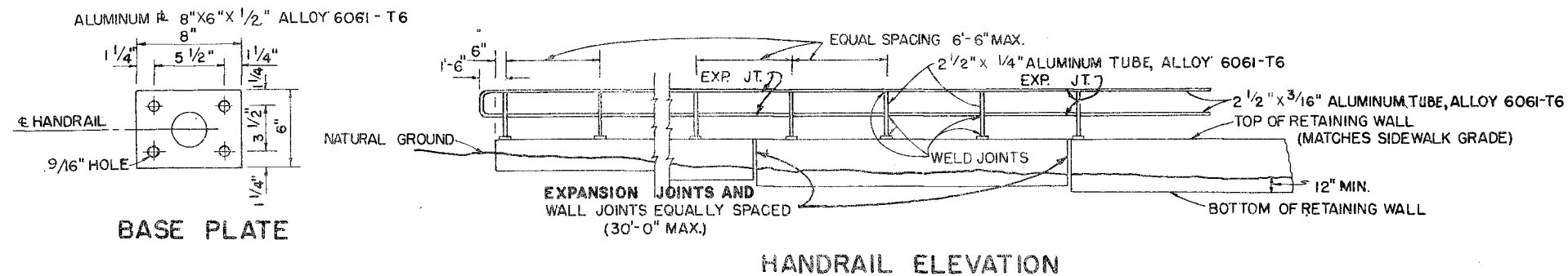
*When otherwise shown on plans this dimension may be reduced to 24".

Note: All dimensions shown are standard.
The details shown on this Index drawing do not supersede the details shown on Index GRC-01.

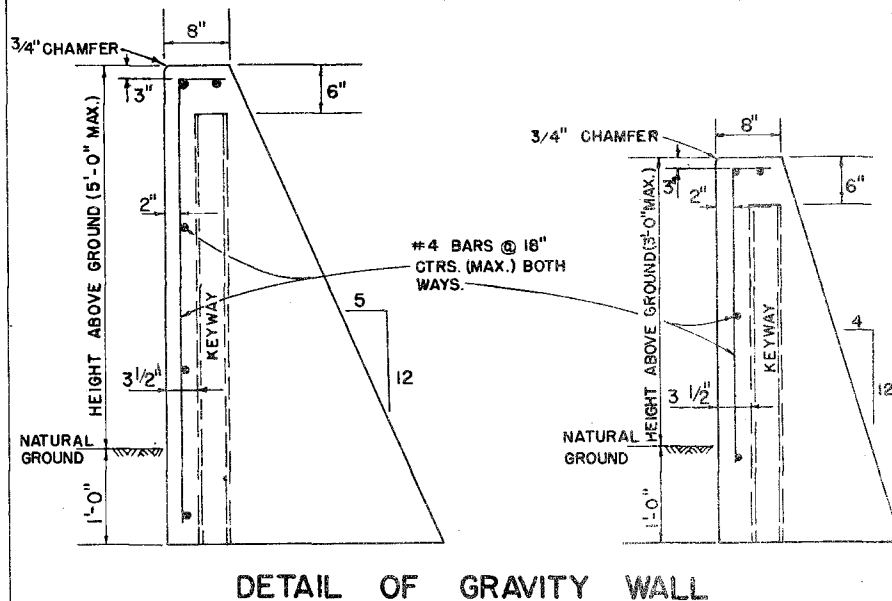
SYMBOL	SOIL	CLASSIFICATION*
S	Select	A-1, A-3, A-2-4
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (All with LL < 50)
H	High Plastic	A-5 or A-7 (both with LL > 50)
M	Muck	A-8

Symbols listed L to R in order of preference.
* AASHTO Soil Classification System (AASHTO - M-145)
ø Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and therefore should be used in the embankment above water level existing at time of construction.

FHWA APPROVED: 4-23-74									
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY PLANS SECTION									
EMBANKMENT UTILIZATION DETAILS									
ROAD NO.	COUNTY	PROJECT NO.							
<table border="1"> <tr> <th>REVISIONS</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>				REVISIONS	DATE	DESCRIPTION			
REVISIONS	DATE	DESCRIPTION							
Designed by	Names	Dates	Recommended For Approval By						
Checked by			APPROVED BY						
Quantities by			State Design Engineer						
Checked by			Drawing No.						
Supervised by			Index No.						



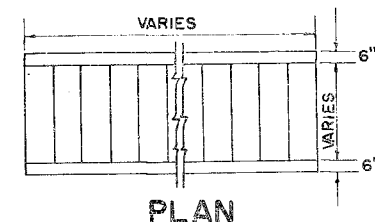
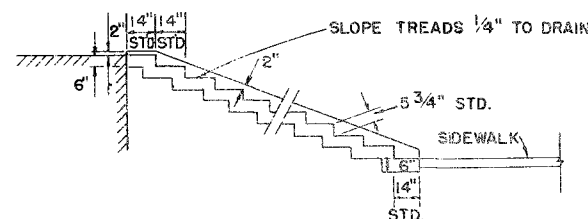
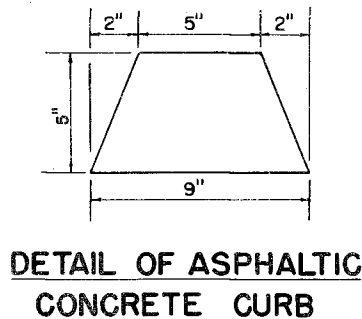
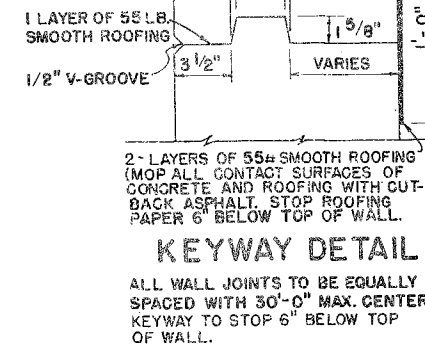
DETAIL OF ALUMINUM PIPE HANDRAIL ON GRAVITY WALL



ESTIMATED QUANTITIES FOR WALL		
HEIGHT ABOVE GROUND	CUBIC YARDS CONCRETE	POUNDS STEEL
2'	.13	4
3'	.20	5
4'	.32	6
5'	.43	7

GENERAL NOTES:

1. COST OF REINFORCING STEEL TO BE INCLUDED IN THE COST OF CLASS I CONCRETE.
2. QUANTITIES SHOWN ARE FOR ONE LINEAR FOOT OF WALL.



DETAIL OF CONCRETE STEPS

REVISIONS

DATE	DESCRIPTION
3/68	Transferred details to 5916-2 added all details as shown
3/73	Added C.I. Conc.
10-74	Changed Index No.

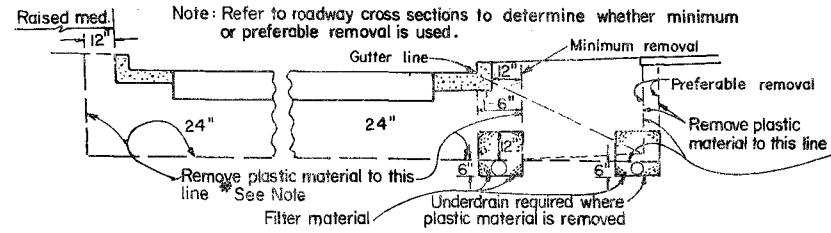
DETAILS FOR MUNICIPAL CONST.

ROAD NO.	COUNTY	PROJECT NO.

NAMES	DATES	RECOMMENDED FOR APPROVAL BY
DETAILED BY COK	2-68	APPROVED BY R.R. Russell
CHECKED BY R.H.C	2-68	ENGINEER OF ROAD DESIGN
QUANTITIES BY		
CHECKED BY		
TRACED BY C.O.R	2-68	

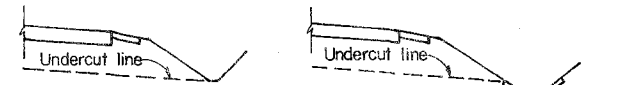
ASST. STATE HIGHWAY ENGINEER

DRAWING NO. 1 of 1 INDEX NO. GMC-01



* NOTE: 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, the project engineer may authorize total removal of this material after clearing this change thru the Asst. Dist. Engr. - Const.

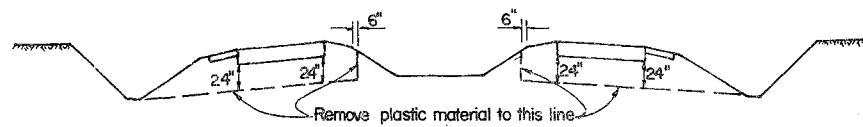
HALF SECTION SHOWING REMOVAL OF PLASTIC MATERIAL AND LOCATION OF UNDERDRAIN IN MUNICIPAL CONST.



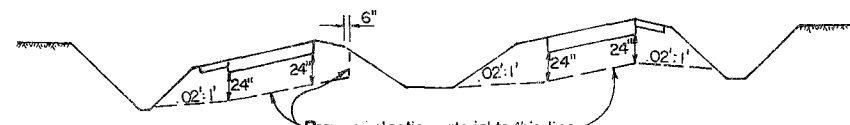
At locations where plastic material is being removed, the side ditches must be at least as deep as the undercut plane.

Where paved side ditches are used in areas of removal of plastic material, the top of the ditch pavement must be no higher than the undercut plane.

MISCELLANEOUS DETAILS

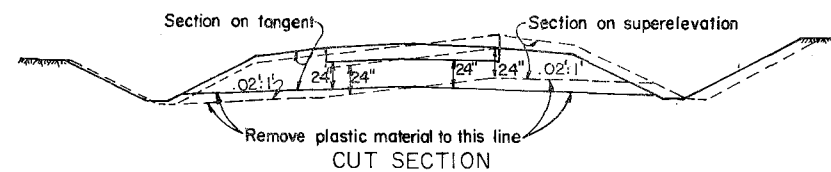


TYPICAL CUT SECTION ON TANGENT

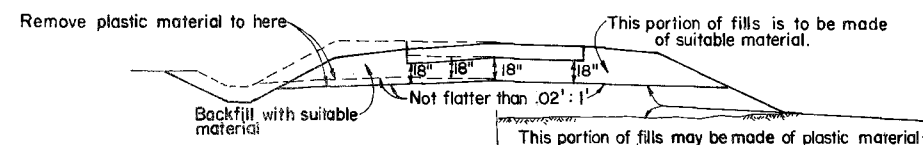


TYPICAL CUT SECTION ON SUPERELEVATION

TYPICAL SECTIONS FOR REMOVAL OF PLASTIC MATERIAL ON INTERSTATE AND PRIMARY SYSTEM HAVING DEPRESSED MEDIAN

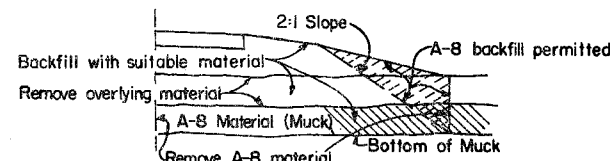


TYPICAL SECTION FOR REMOVAL OF PLASTIC MATERIAL ON MAJOR PRIMARY SYSTEM ROADS

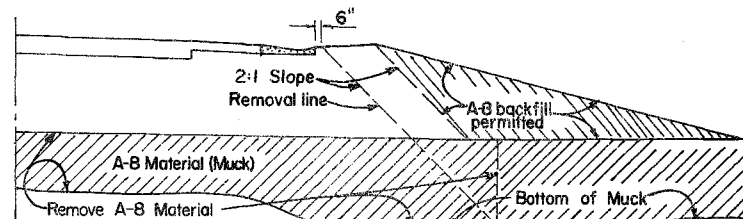


REMOVAL AND DISPOSAL OF PLASTIC MATERIAL FOR SECONDARY AND MINOR PRIMARY SYSTEM ROADS

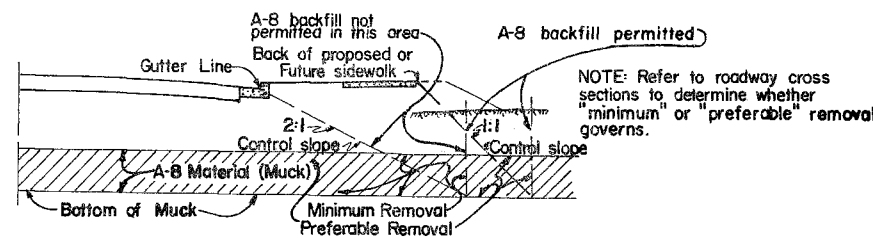
Where preferable method of removal governs and it is impossible to place the underdrain at the outer cut limit due to conflict with storm sewer mains, remove to these limits and place underdrain at location shown for minimum removal.



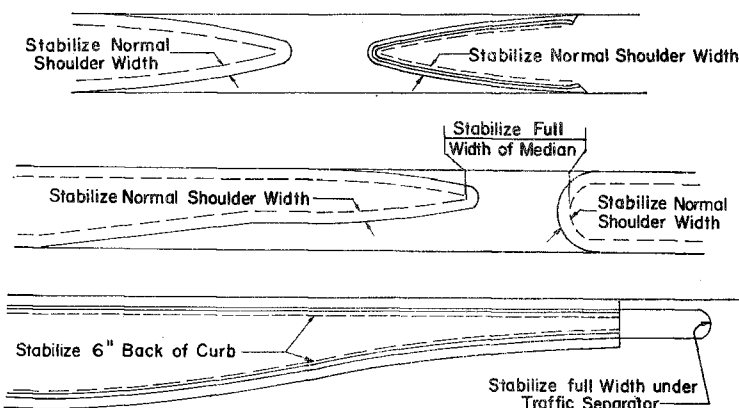
HALF SECTION SHOWING REMOVAL AND DISPOSAL OF A-8 MATERIAL IN RURAL CONSTRUCTION



HALF SECTION SHOWING MUCK REMOVAL WHERE SHOULDER GUTTER IS CONSTRUCTED



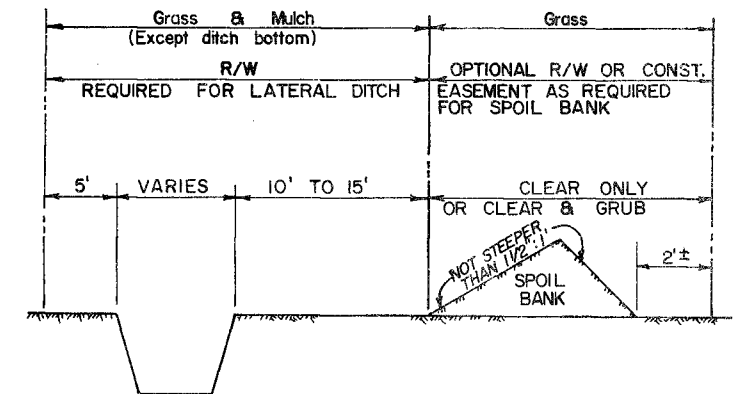
HALF SECTION SHOWING REMOVAL AND DISPOSAL OF A-8 MATERIAL IN MUNICIPAL CONSTRUCTION



MEDIAN STABILIZING DETAILS

GENERAL STABILIZING NOTES:

- (1) When typical section has curb or curb and gutter in median stabilize 6" back of curb.
- (2) When typical section has shoulder with no curb or curb and gutter in median stabilize to normal shoulder width.
- (3) Stabilize entire area under all paved traffic islands.
- (4) Stabilize full width under all traffic separators.



NOTE:

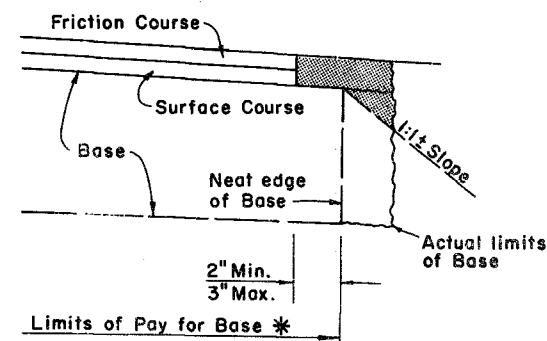
1. Where no spoil is anticipated or when a large ditch or Canal is involved and spoil is anticipated on both sides, R/W should be adjusted accordingly.
2. Clearing and Grubbing is to extend 200' beyond the end of the ditch if necessary.
3. The bottom width of Lateral Ditches is to be 2' wider than the span of the Structure they drain or as shown on Plans.
4. No Spoil Bank will be permitted within 300' of the ∇ of the Project, measured at right angles thereto. Waste materials in this section shall be either hauled and deposited in areas approved by the Engineer, or spread on adjacent areas to the depth designated by the Engineer.
5. All excavation from Lateral Ditches shall be wasted unless otherwise shown on Lateral Ditch Sheets.

TYPICAL SECTION

LATERAL DITCH SHOWING SPOIL BANK

GENERAL NOTES

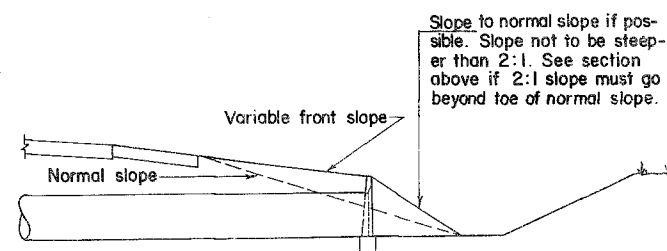
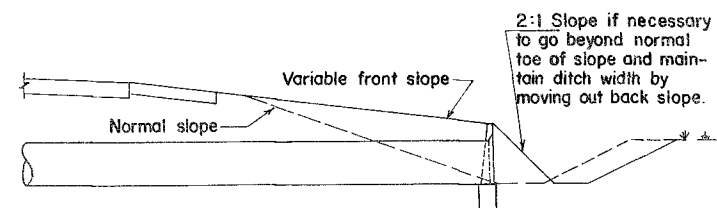
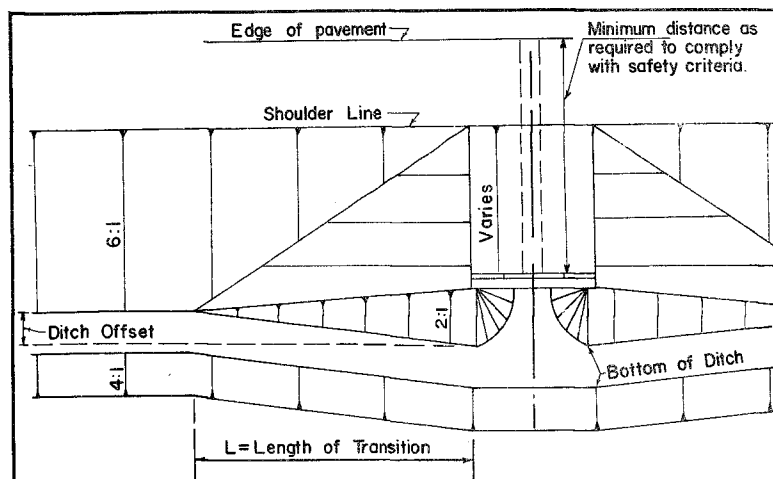
1. Minimum grade on underdrain pipe shall be 0.2%.
2. Gradation of the filter material shall conform to standard specifications.
3. In rural projects, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain is to be such that the underdrain filter material will not extend above the bottom of the stabilized section of the subgrade.
4. All details shown on this sheet for the removal and disposal of unsuitable materials apply unless otherwise shown on the plans.
5. Where plastic material is undercut, backfill shall be made of suitable material.
6. The term "plastic material" used in this drawing in conjunction with removal of plastic material is defined as any material of the soils classifications of A-2-6, A-2-7, A-4, A-5, A-6 and A-7.
7. The normal depth of side ditches for Interstate and major Primary System roads shall be 3.5' below the shoulder point except in special cases.
8. On Primary and Interstate highways where plastic material is permitted for use in roadway fill, the material may be placed above the existing water level (at the time of Construction) to within 4' 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.



DETAIL FOR REMOVAL OF EXCESS BASE MATERIAL

- NOTES:
1. All surplus material in shaded area to be removed.
 2. Payment for removal is included in the Base item.
 3. * Area of base for payment will be calculated using the nominal width (3" Overhang).

REVISIONS		ROAD NO.		COUNTY		PROJECT NO.	
Date	Description						
10-74	Redrawn & Index Not Changed						
8-76	Added Detail for Removal of Excess Base Material						
Designed by		Checked by		Approved by:			
Quantities by		Checked by		Deputy Design Engineer - Roadways			
Supervised by				Drawing No.		Index No.	
				1 of 2		GRC-01-1	



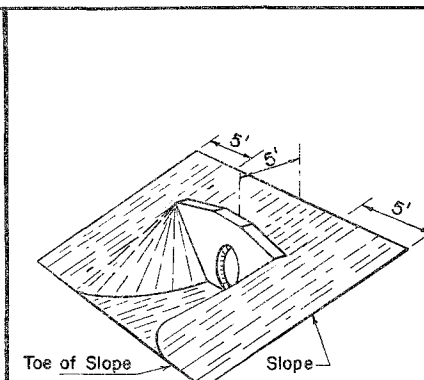
NOTE: Filling or excavation of variable slopes to be done during normal grading operations.

SECTION C-C

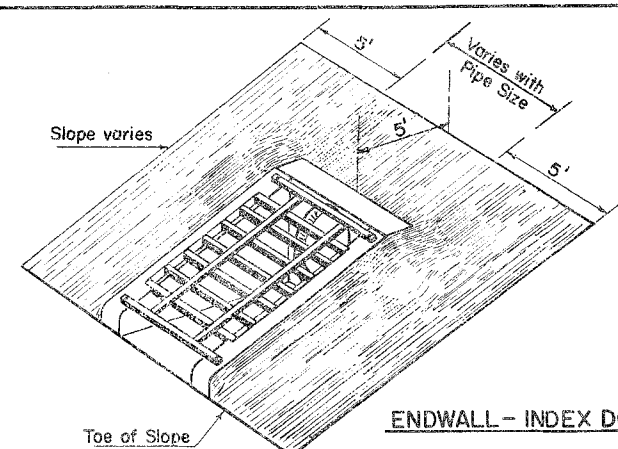
Use larger value of either:

1. $L = 10 \times H$ (No maximum)
2. $L = 10 \times \text{Ditch Offset}$ (Maximum $L = 100'$)

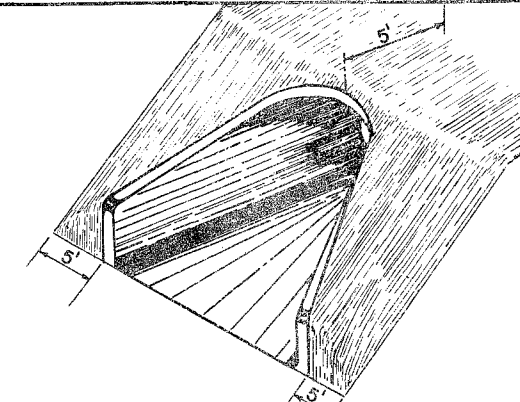
DETAIL FOR SETTING LIMITS OF VARIABLE FRONT SLOPES AT DRAINAGE STRUCTURES WHERE FRONT SLOPES ARE FLATTER THAN NORMAL SLOPES.



ENDWALL - INDEX DCE-01



ENDWALL - INDEX DCE-03



ENDWALL - INDEX DCE-04

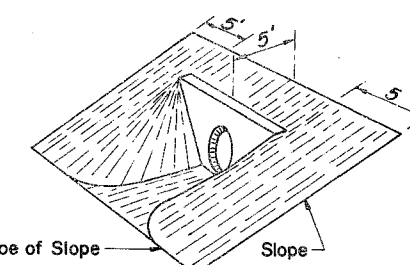
SODDING QUANTITIES

PIPE SIZE	INDEX DCE-01									INDEX DCE-02		
	2:1 SLOPE	4:1 SLOPE	6:1 SLOPE	2:1 SLOPE	4:1 SLOPE	6:1 SLOPE	2:1 SLOPE	4:1 SLOPE	6:1 SLOPE	2:1 SLOPE	4:1 SLOPE	6:1 SLOPE
12"										14.73 S.Y.	20.61 S.Y.	26.71 S.Y.
15"										16.72 S.Y.	23.80 S.Y.	31.12 S.Y.
18"	25 S.Y.	28 S.Y.	31 S.Y.	35 S.Y.	40 S.Y.	45 S.Y.	45 S.Y.	51 S.Y.	57 S.Y.	18.83 S.Y.	27.22 S.Y.	35.93 S.Y.
21"												
24"	30	34	39	43	50	57	57	65	74	23.42 S.Y.	34.74 S.Y.	46.50 S.Y.
27"												
30"	35	42	48	53	62	72	70	86	95	28.51 S.Y.	43.18 S.Y.	58.42 S.Y.
36"	42	50	58	63	76	88	85	102	118	30.08 S.Y.	52.53 S.Y.	71.70 S.Y.
42"	49	59	70	75	91	107	101	123	144	40.16 S.Y.	63.80 S.Y.	86.32 S.Y.
48"	56	69	86	87	107	126	119	145	172	46.74 S.Y.	74.01 S.Y.	102.30 S.Y.
54"	64	79	94	100	124	143	137	170	203			
60"	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.	S.Y.			

Note: These quantities are for one pipe.

PIPE SIZE	INDEX DCE-03			INDEX DCE-04		
	2:1 SLOPE	4:1 SLOPE	6:1 SLOPE	2:1 SLOPE	4:1 SLOPE	6:1 SLOPE
12"				15.14 S.Y.	14.44 S.Y.	14.30 S.Y.
15"	14.77 S.Y.	17.18 S.Y.	22.55 S.Y.	15.57	14.84	14.70
18"	15.46	18.76	24.35	16.06	15.31	15.17
21"				16.33	15.56	15.41
24"	16.44	20.93	27.96	16.60	15.80	15.64
27"				16.91	16.08	15.92
30"	18.24 S.Y.	23.43 S.Y.	31.57 S.Y.	17.17	16.32	16.15
36"				17.53	16.63	16.45
42"				22.07	20.82	20.58
48"				22.40	21.10	20.85
54"				23.86	22.49	22.22
60"				24.79	23.39	23.12
66"				24.49	23.04	22.76
72"				25.26 S.Y.	23.77 S.Y.	23.48 S.Y.

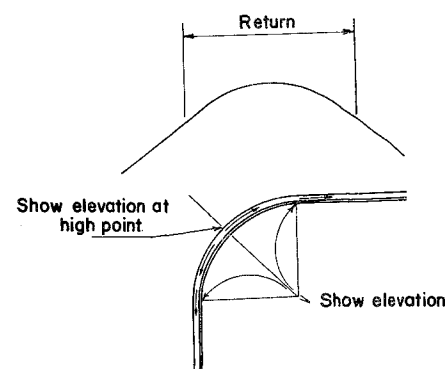
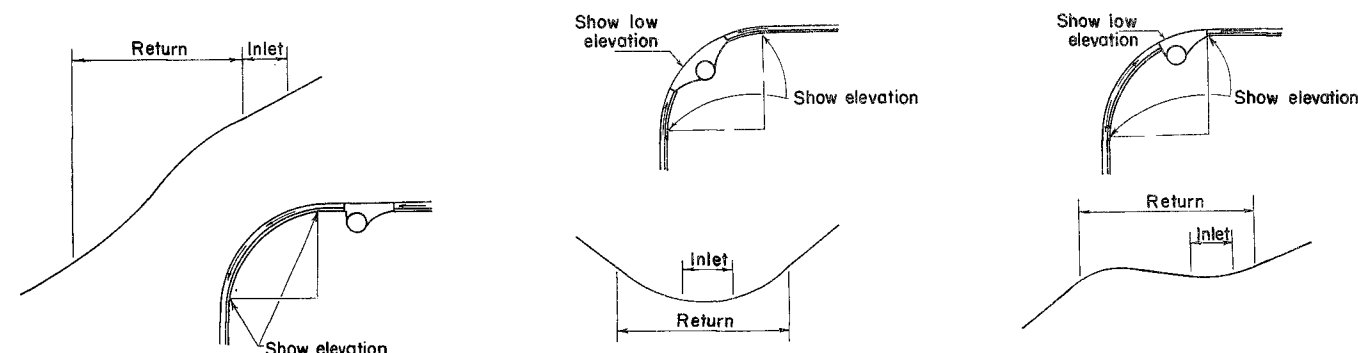
Note: Quantity for 2:1 is for endwall with baffles.



STRAIGHT ENDWALLS

NOTE: All straight endwalls except index DCE-01 will require sodding as shown in this drawing. Quantities for each particular case to be determined by the designer.

TYPICAL RETURN PROFILES INCLUDING DETAIL SHOWING LOCATION OF INLETS ON RETURN



- NOTE:
1. On normal intersections, profiles need not be included in the plans as the above typicals adequately present the desired configuration.
 2. For major intersections, where extreme grades are involved or where it is deemed necessary to include profiles in order to present adequate design data, return profiles may be included in the plans.
 3. Inlet locations and low points should be located, as much as possible, to be compatible with pedestrian traffic and drop curb location.
 4. A minimum 0.2% grade should be maintained on all sag grades outside inlet limits.

SOD QUANTITIES FOR PIPE CULVERT ENDWALLS

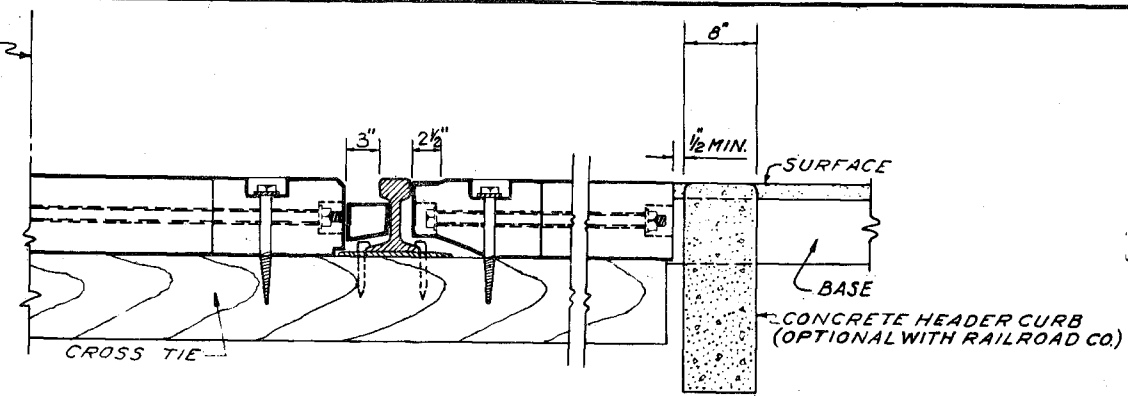
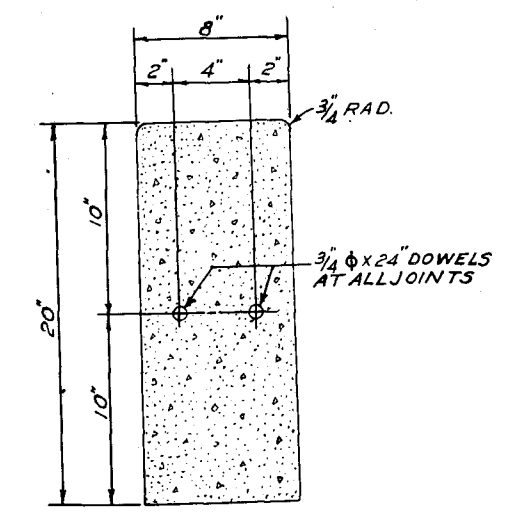
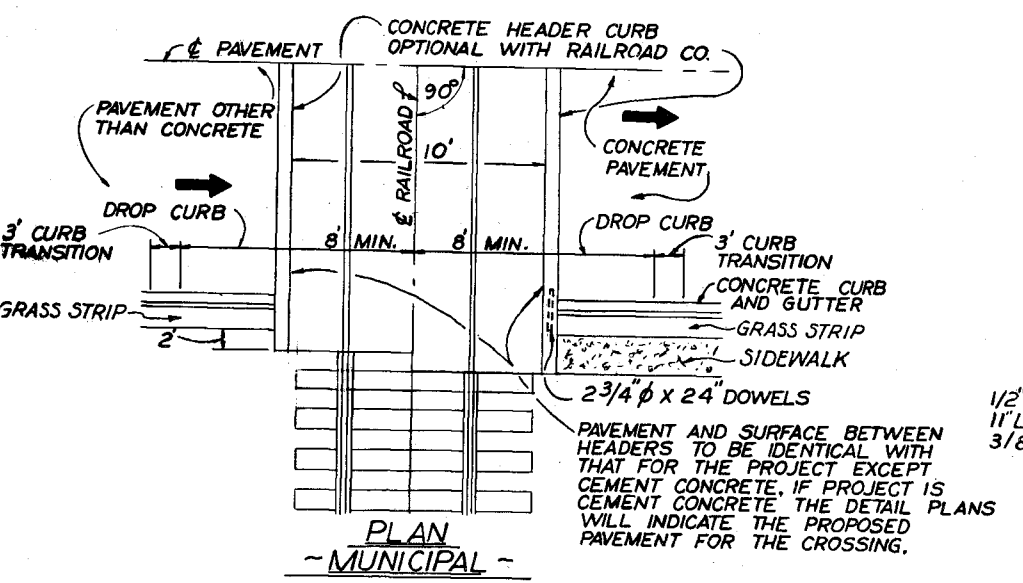
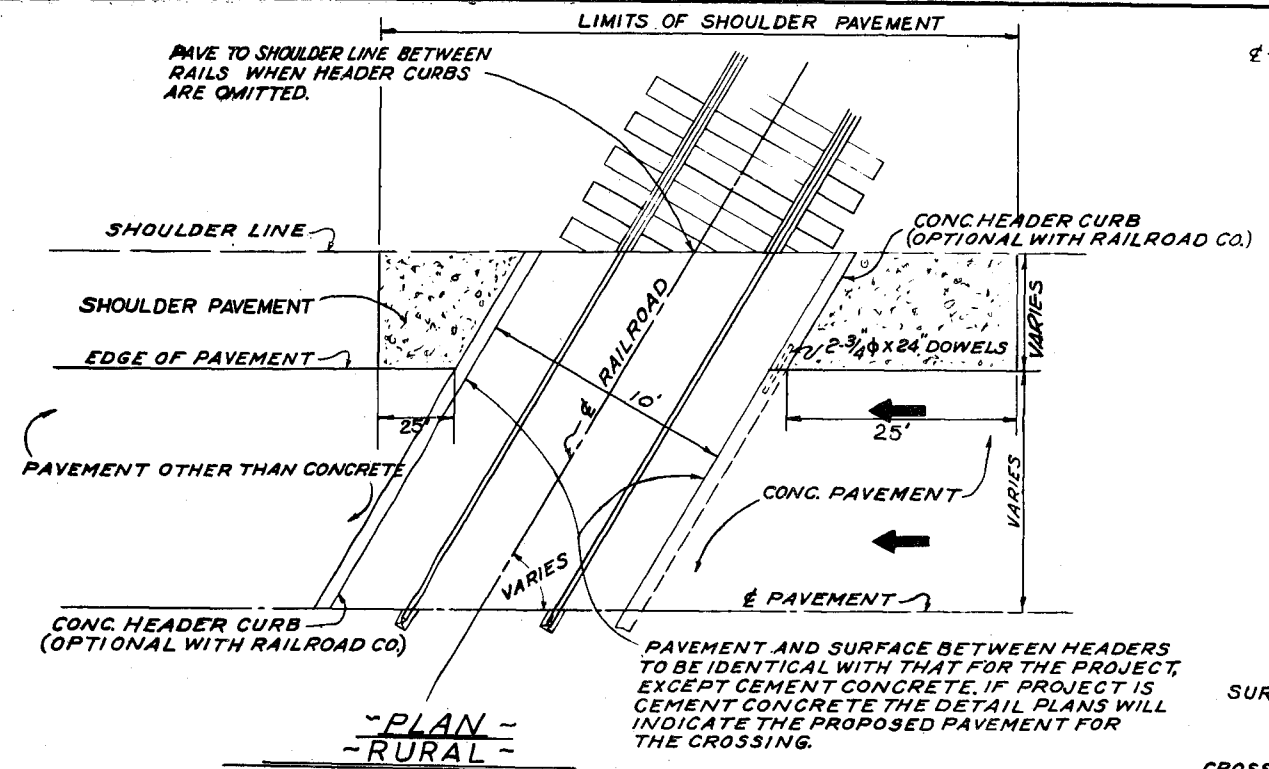
FHWA APPROVED: 7-7-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

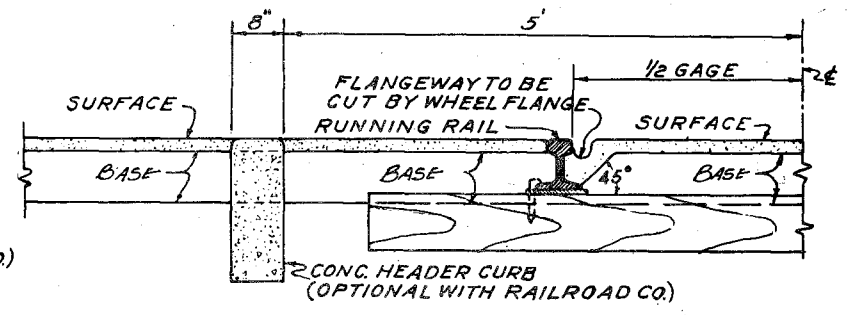
MISC. ROADWAY CONSTRUCTION DETAILS

REVISIONS	INITIALS	DATES	APPROVED BY:
Dates	Descriptions	Designed by	
3-74	Redrawn & Index No. Changed	Checked by	
		Quantities by	
		Checked by	
		Supervised by	

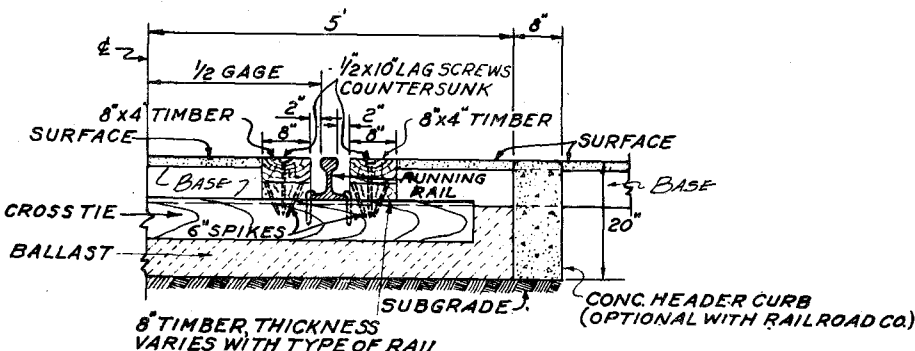
Deputy Design Engineer-Roadways
DRAWING NO. 2 OF 2 INDEX NO. GRC-01-1



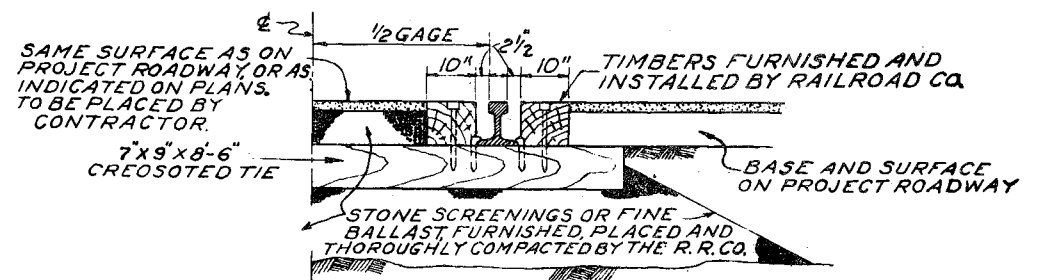
HALF SECTION TYPE "D"
NOTE: THIS TYPE OF CROSSING TO BE CONSTRUCTED ENTIRELY BY THE RAILROAD CO.



HALF SECTION TYPE "E"



HALF SECTION TYPE "G"

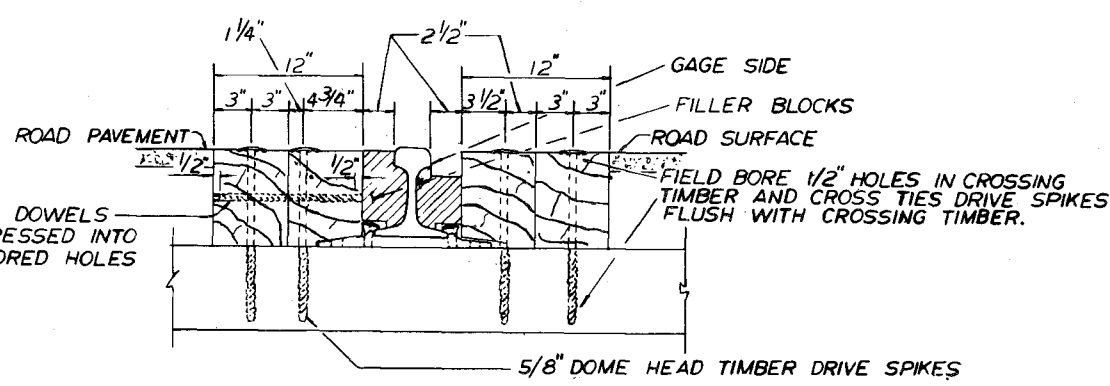


HALF SECTION TYPE "H"

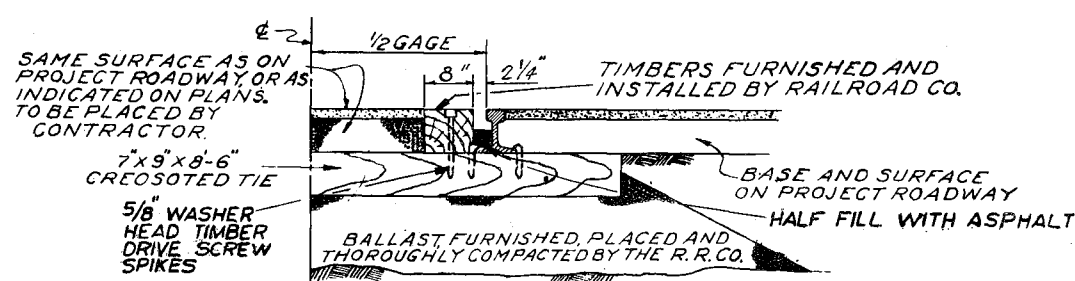
~ NOTES ~

1. THE CONTRACTOR WILL CONSTRUCT HEADER CURBS AT LOCATIONS REQUESTED BY THE RAILROAD COMPANY, AND CONSTRUCT PAVEMENT AS SHOWN FOR ALL CROSSINGS EXCEPT J AND K.
2. THE RAILROAD COMPANY WILL FURNISH AND INSTALL ALL MATERIAL WITHIN 5' OF C OF TRACKS, EXCEPT PAVEMENT, FOR ALL CROSSINGS EXCEPT J AND K.
3. ALL RAILS WITHIN CROSSING SHALL BE LINED AND LEVELED TO ELEVATIONS SHOWN ON PLANS.
4. UNLESS OTHERWISE REQUESTED BY THE RAILROAD COMPANY, THE VARIOUS TYPES OF CROSSING WILL BE USED AS FOLLOWS:

APALACHICOLA NORTHERN R. R. CO.	TYPE "E"
ATLANTA AND ST. ANDREWS BAY RAILWAY CO.	E
FLORIDA EAST COAST RAILWAY CO.	G
ST. LOUIS ~ SAN FRANCISCO RAILWAY CO.	H
SEABOARD COAST LINE R. R. CO.	L
LOUISVILLE AND NASHVILLE R. R. CO.	L
SOUTHERN RAILWAY SYSTEM	L
(a) GEORGIA SOUTHERN AND FLORIDA RAILWAY CO.	G
(b) LIVE OAK, PERRY AND SOUTH GEORGIA RAILWAY CO.	G
(c) ST. JOHNS RIVER TERMINAL CO.	G
(d) GEORGIA AND FLORIDA RAILWAY CO.	TYPE "G"



HALF SECTION TYPE "L"



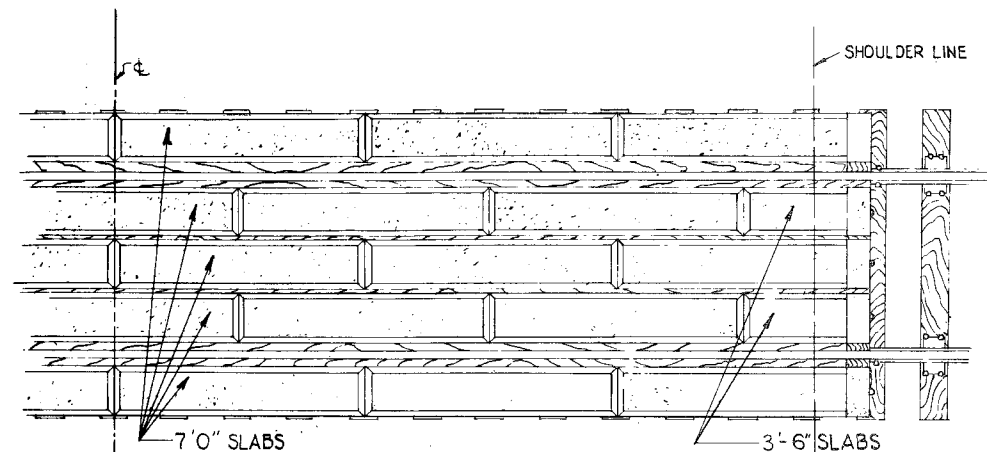
HALF SECTION TYPE "S"

FILED APPROVED: 3-20-15

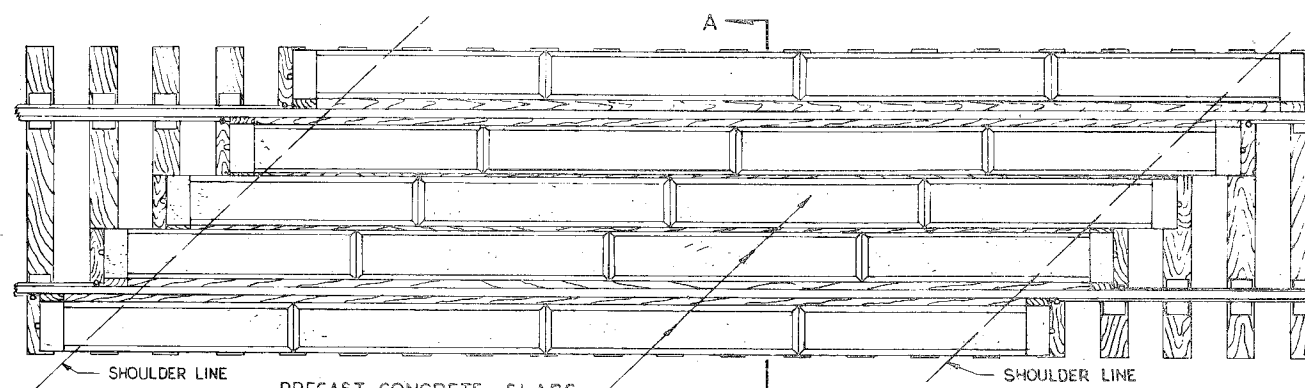
- DETAILS OF RAILROAD -
- CROSSINGS -

REVISIONS		REVISIONS		ROAD NO.	COUNTY		PROJECT NO.	
Dates	Descriptions	Dates	Descriptions		Names	Dates	Recommended For Approval by	
10-74	Changed Index N ^o	11-69	Added gross Strip on PLAN MUNICIPAL				Approved by	
		L.F.		Detailed by	A. W. H. H. H.	8/60		
				Checked by	L. A. G.	1-62		
		2-79	Changed crossing type from 3' to 6' on Southern Justice	Quantities by				
		L.F.		Checked by				
		3-73	Added Class I Conc Sheets 2-63	Traced by				
		L.F.					Drawing No	Index No
							1 of 6	GRR-OI

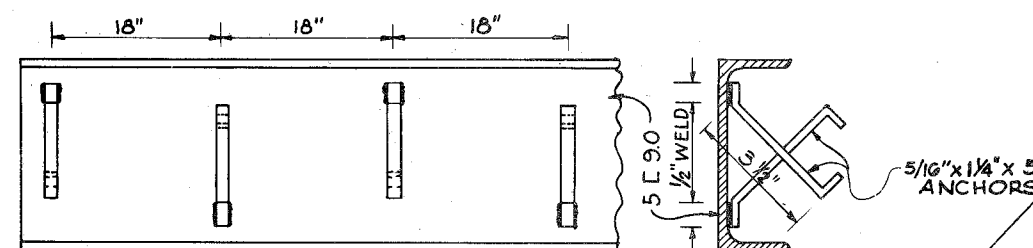
DETAIL OF HEADER CURB
(OPTIONAL WITH RAILROAD CO.)



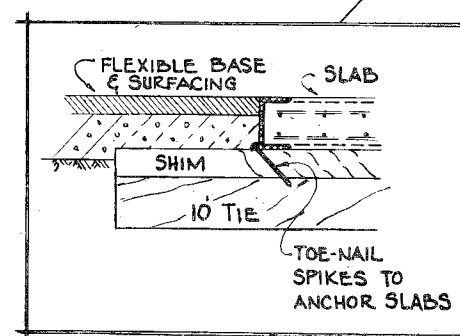
PLAN - 90° CROSSING



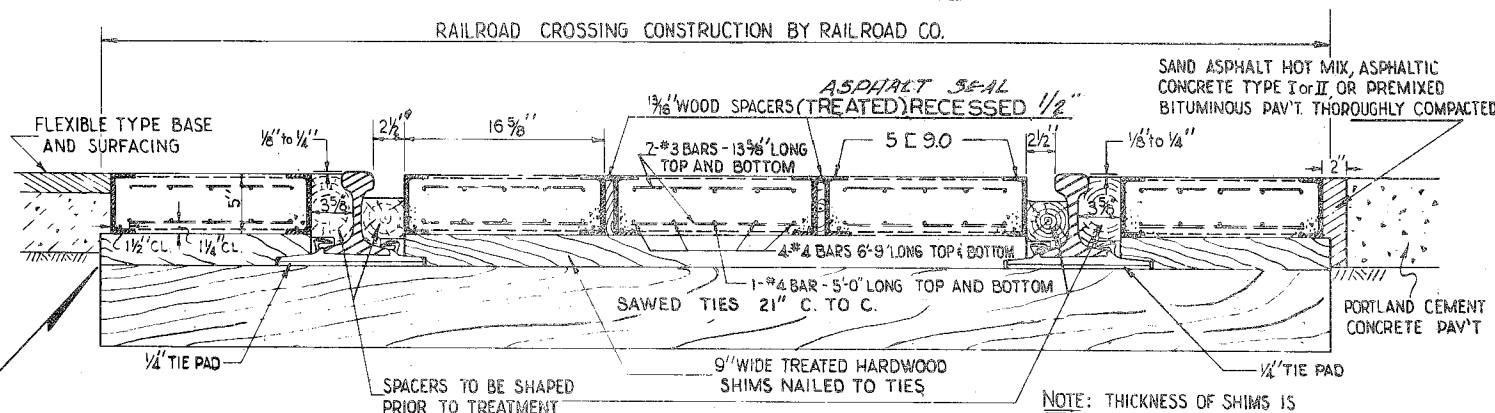
PLAN - SKEW CROSSING



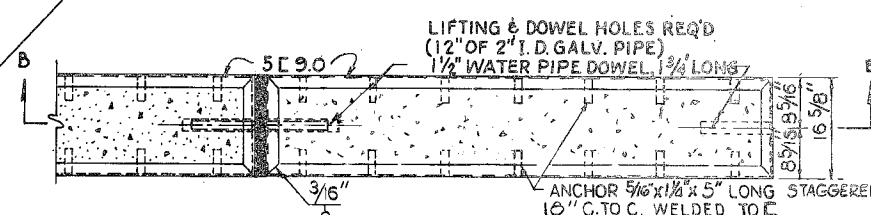
ELEVATION
DETAIL OF 5/16" x 1 1/4" x 5" ANCHORS
ANCHORS STAGGERED 18" C. TO C.
TWO ANCHORS EACH END CHANNEL
NOTE: 1/2" x 5" STUDS MAY BE USED
IN LIEU OF ANCHORS.



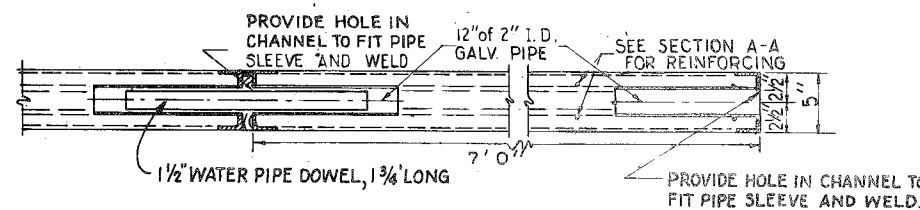
OPTIONAL DETAIL
WHEN 10' TIES ARE USED



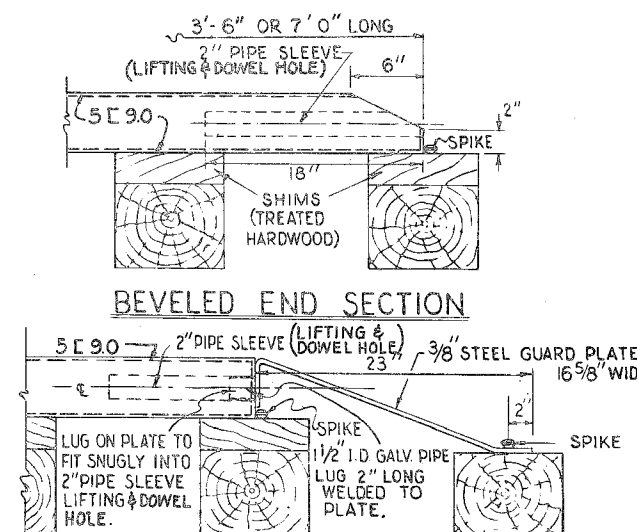
SECTION A-A



PLAN TYPICAL SLAB



SECTION B-B



ALTERNATE END SECTION

NOTES

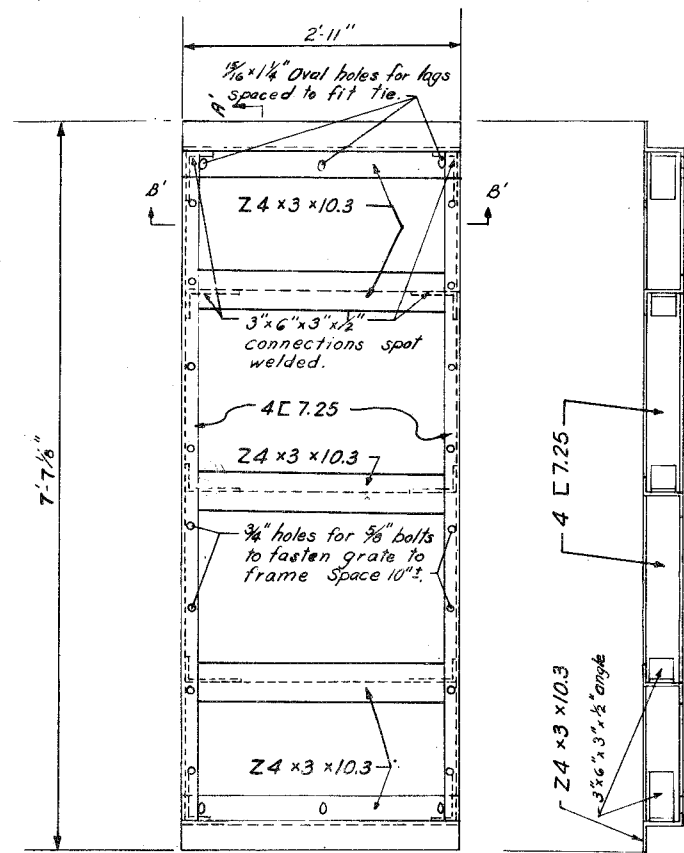
1. SPACERS ADJACENT TO RAIL TO BE DENSE STRUCTURAL 65 GRADE.
2. SPACERS BETWEEN SLABS TO BE NO. 1 COMMON GRADE.
3. ALL TIMBER TO BE SHAPED PRIOR TO TREATMENT.
4. CLASS I CONCRETE TO BE USED IN THE CONSTRUCTION OF THE PRECAST CONCRETE SLABS.
5. ALL TIMBER SHIMS AND SPACERS AND PRECAST CONCRETE SLABS WILL BE FURNISHED AND INSTALLED BY THE RAILROAD CO. THE TRACK SHALL BE CONDITIONED TRUE TO LINE AND GRADE BY THE RAILROAD CO. PRIOR TO INSTALLATION OF THE CROSSING ELEMENTS.
6. CONSTRUCTION OF THIS CROSSING REQUIRES A STABLE SUBGRADE FOR A MINIMUM OF 2' BELOW THE BOTTOM OF THE BALLAST. THE SUBGRADE SHALL BE CONSTRUCTED TO THE SAME REQUIREMENTS AS SPECIFIED FOR THE ADJOINING ROADWAY.

~ DETAILS OF RAILROAD CROSSING TYPE "J" ~

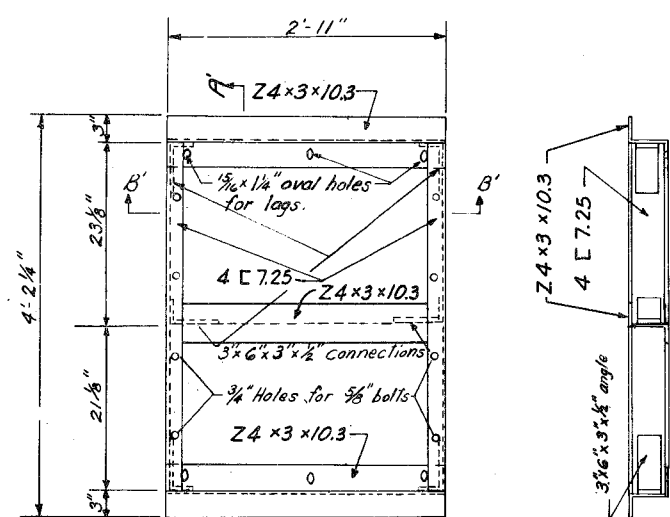
FHWA APPROVED: 3-20-75

RAILROAD CROSSING TYPE - J

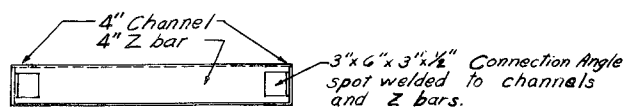
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
8/70	Changed L to C			
10/74	added dowel			
10-74	Changed Index No.			
Checked by: <i>[Signature]</i> Drawn by: <i>[Signature]</i> Traced by: <i>[Signature]</i>		Names: <i>[Signature]</i> Date: <i>[Signature]</i> Approved by: <i>[Signature]</i> Title: State Highway Engineer	Drawing No. 2 of 6 GRR-01	



PLAN INTER-TRACK UNIT



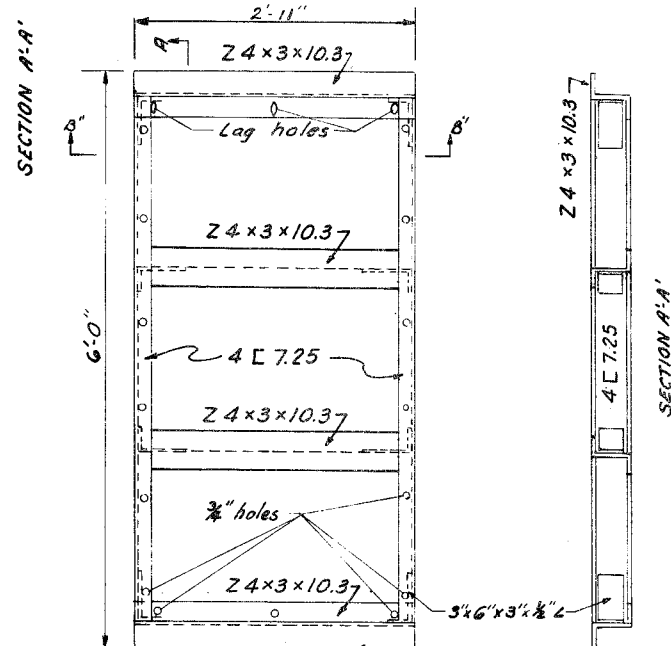
PLAN INTER-RAIL UNIT



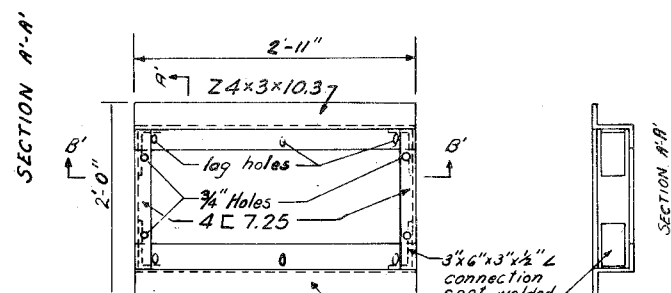
SECTION B-B'

FRAME DETAILS

Scale: 1"=1'



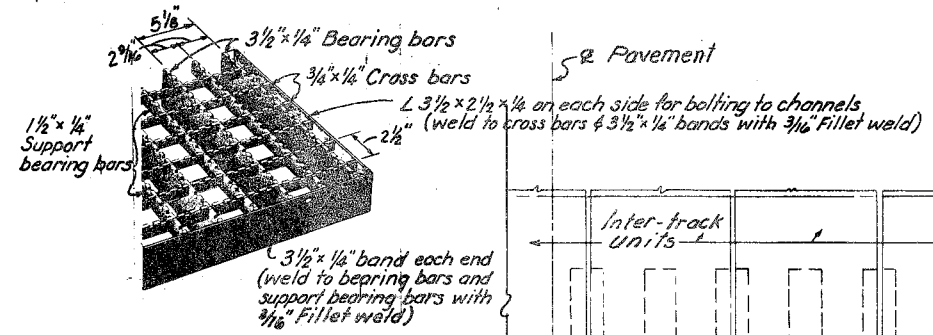
PLAN ALTERNATE OUTER-TRACK UNIT



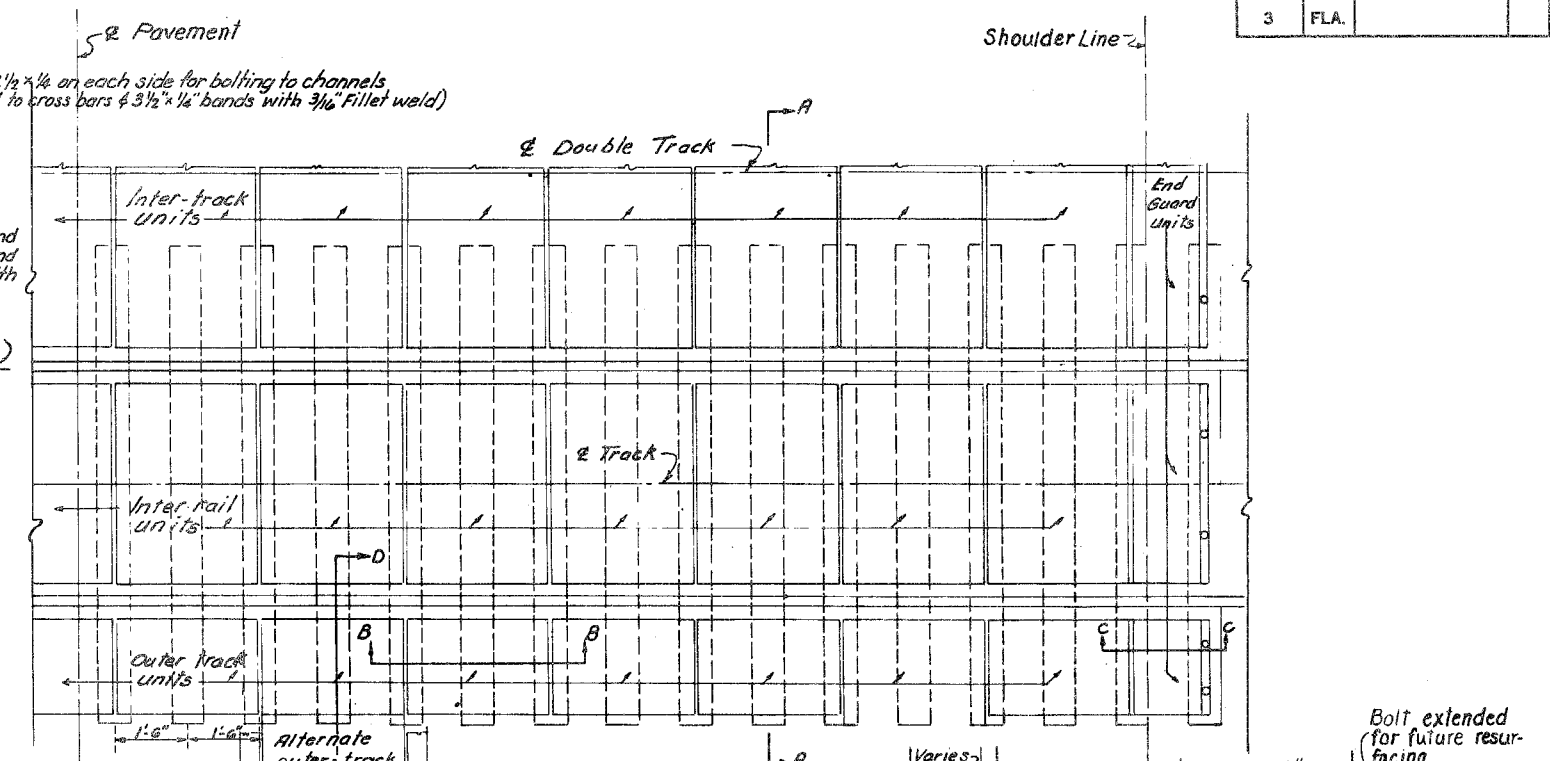
PLAN OUTER TRACK UNIT

GENERAL NOTES

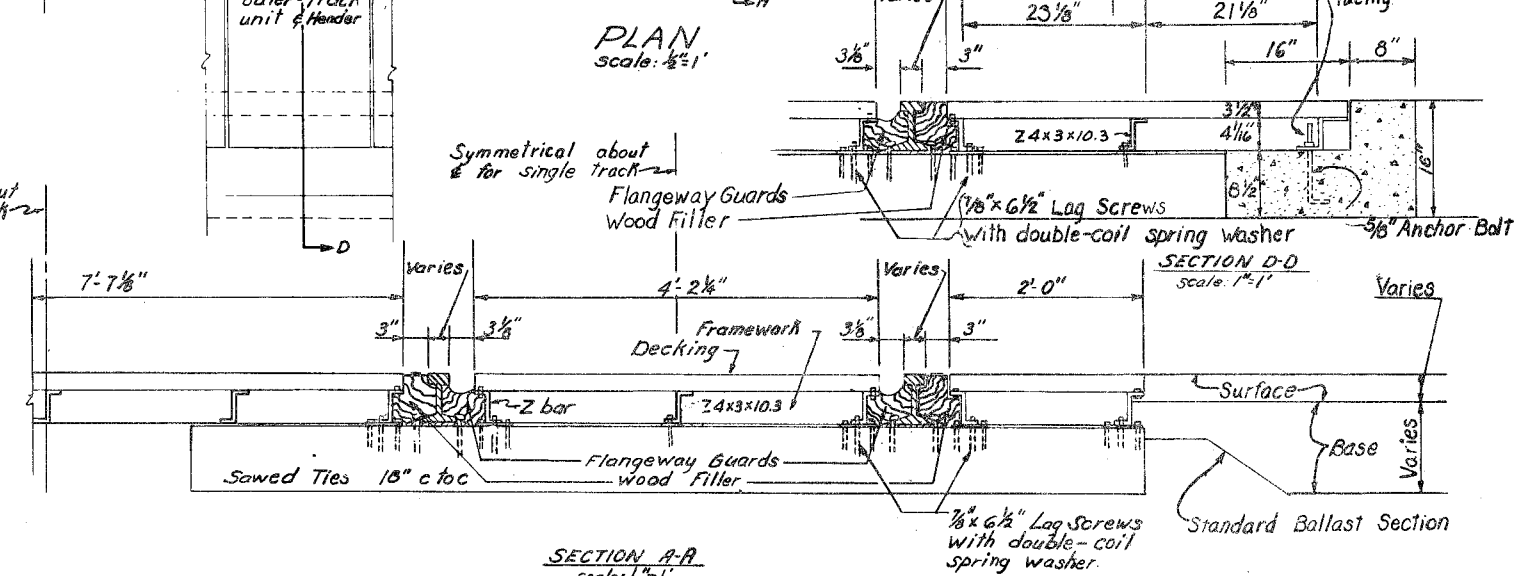
1. This drawing is based on using 131# rail on a tangent section and Decking fabricated in sections to fit the corresponding sections of the supporting frame. The depth of the Z bars and channels may be varied to fit other rail sections.
2. The framework units are attached to ties by 7/8" x 6 1/2" lag screws, and to Headwall by 5/8" anchor bolts. Double-coil spring washers are used with lags to compensate for vertical motion.
3. The decking is attached to the framework with 5/8" bolts. The head of the bolt is to be spot welded to the underside of the channel flange.
4. Flangeway and outside filler timbers to be rabbetted to assure close fit prior to treatment.
5. Ties to be sawed and spaced 18" C to C.
6. Crossing of any angle can be equipped with units of either 45°, 67°30' or 90°.
7. Decking may be as shown or equal (Submit shop drawings for approval by the Engineer).



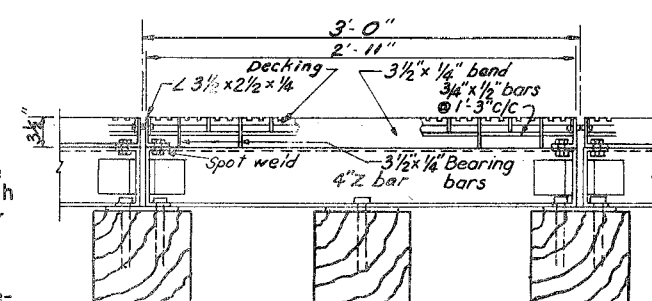
DECKING (14.81 LBS/S.F.)



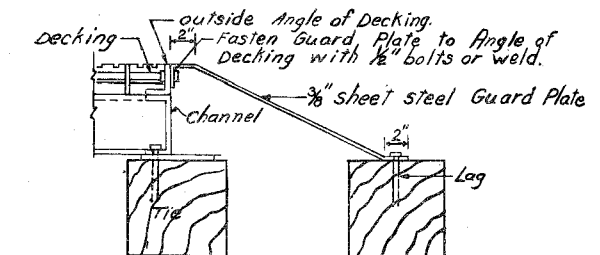
PLAN scale: 1/2"=1'



SECTION A-A' scale: 1"=1'



SECTION B-B' scale: 1/2"=1'

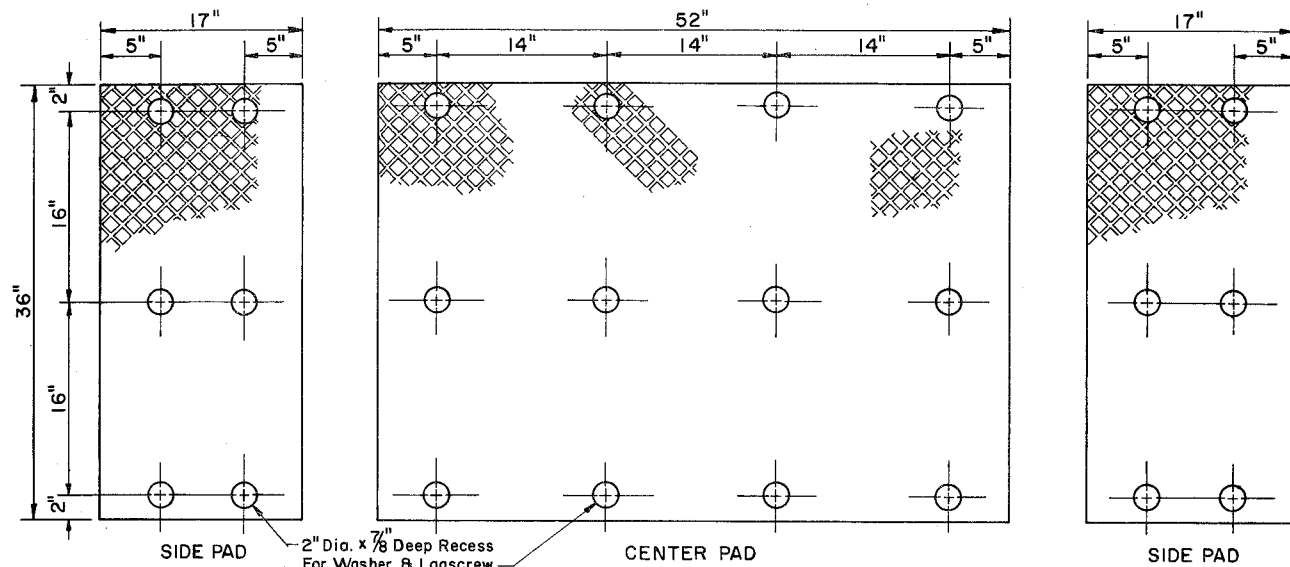


SECTION C-C' scale: 1/2"=1'

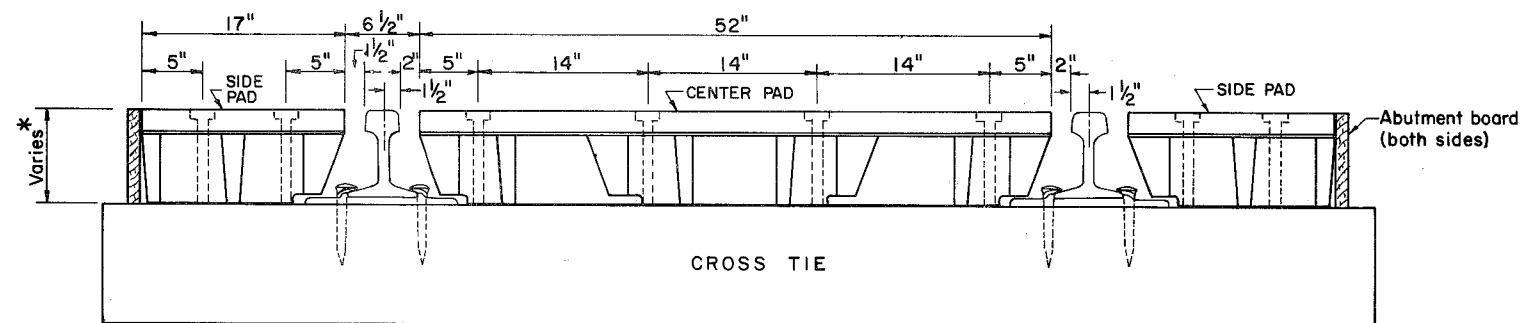
FHWA APPROVED: 3-20-75

RAILROAD CROSSING TYPE-M

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
5/70	Changed type & thickness of decking			
10-74	Changed Index No.			
Checked by: <i>[Signature]</i> Quantities by: <i>[Signature]</i> Checked by: <i>[Signature]</i> Traced by: <i>[Signature]</i>		Recommended For Approval by: <i>[Signature]</i> APPROVED BY: <i>[Signature]</i> Date: 8/6/70 4 of 6 GRR-01		

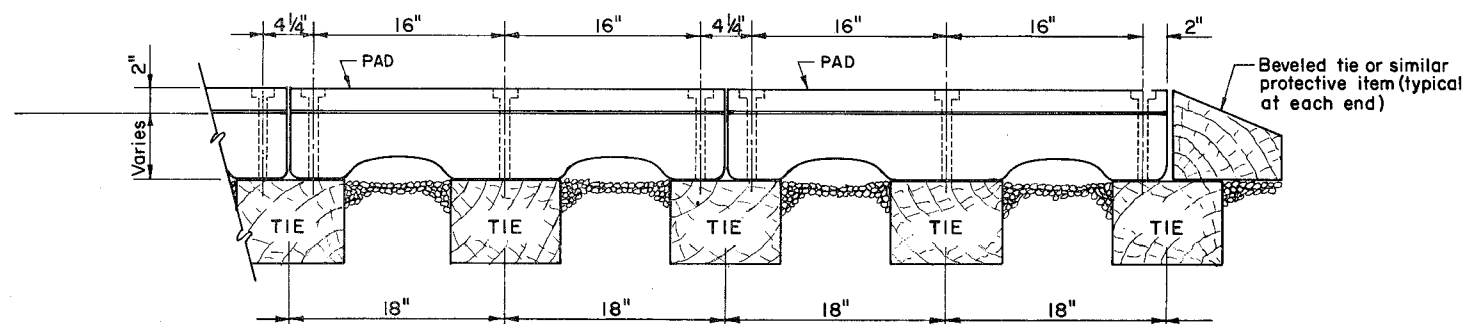


TOP VIEW



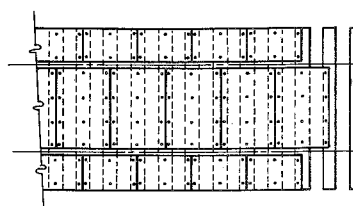
SECTION

- * O.A. Height 6 1/2" - Pads typical for 90-100 lb rails.
 O.A. Height 7 3/8" - Pads typical for 110-130 lb rails.
 O.A. Height 7 7/8" - Pads typical for 131, 133 or 136 lb rails.



PARTIAL SECTION PARALLEL TO RAIL

CROSSING TYPE "P"
(POLYETHYLENE)



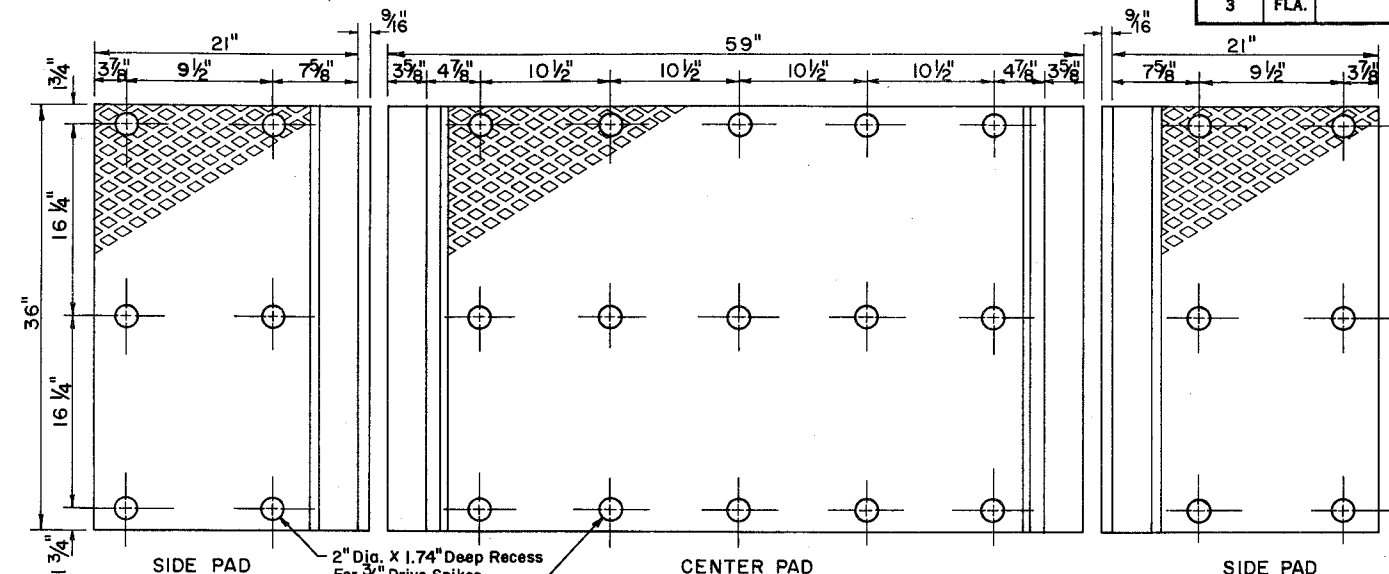
PARTIAL PLAN DEPICTING SUGGESTED PAD PLACEMENT

GENERAL NOTES

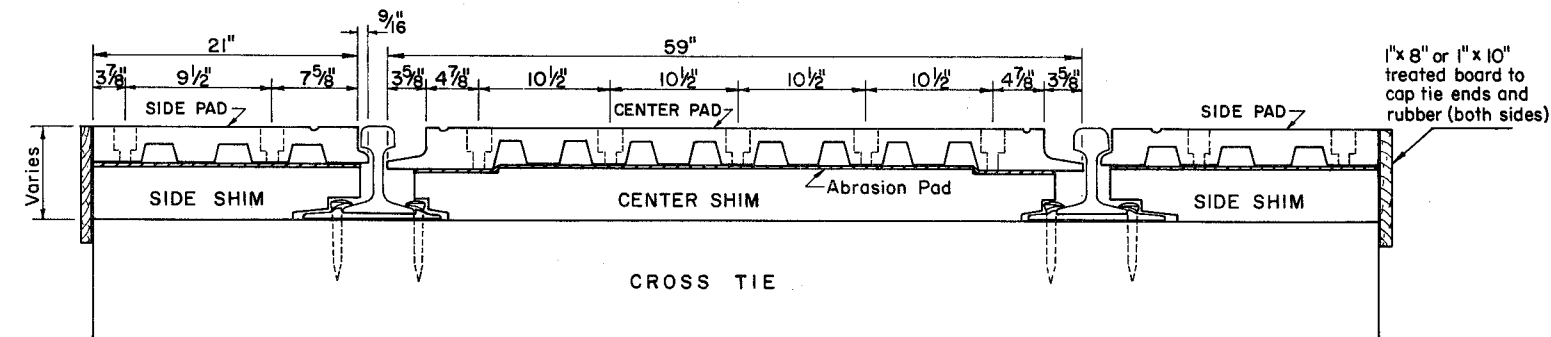
- The crossings shown on this sheet are NOT to be used under the following conditions: (a) at locations with more than double tracks, (b) at crossings with a skew angle in excess of 30 degrees or (c) within zones for an existing or scheduled future vehicular stop. Zone lengths are charted above.
- For additional details, materials required and installation procedures refer to the manufacturers specifications.
- Details shown are for straight track installations. Materials are also available for curved track installations.

STOP ZONE

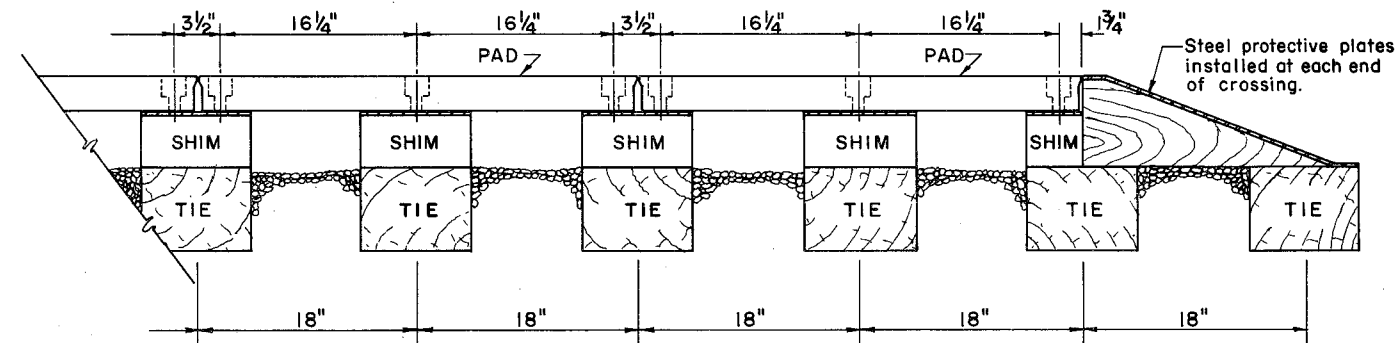
Design Speed	Zone length- Distance from stop
45 MPH or less	250'
50 - 55	350'
60 - 65	500'
70	600'



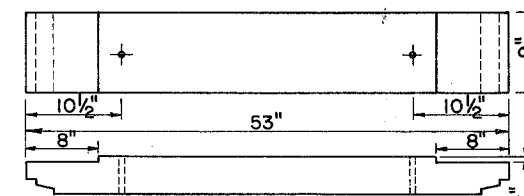
TOP VIEW



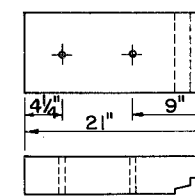
SECTION



PARTIAL SECTION PARALLEL TO RAIL



CENTER SHIM
(Treated timber)
Shim thickness varies with height of rail.



SIDE SHIM
(Treated timber)

CROSSING TYPE "R"
(RUBBER)

FHWA APPROVED: 2-10-76

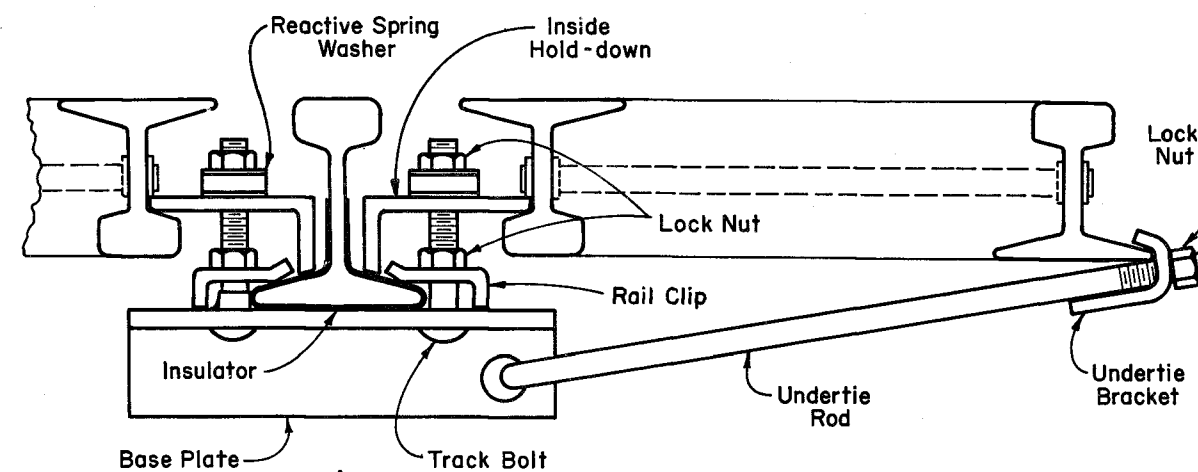
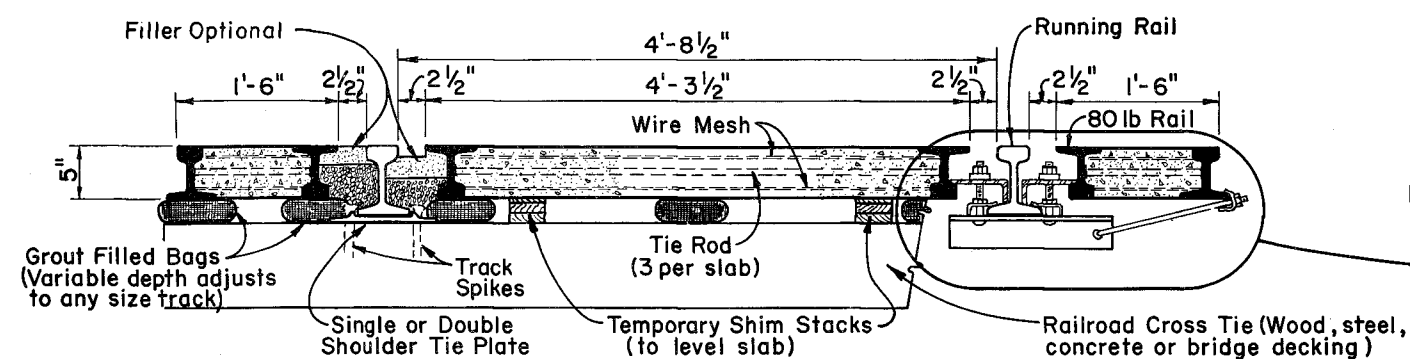
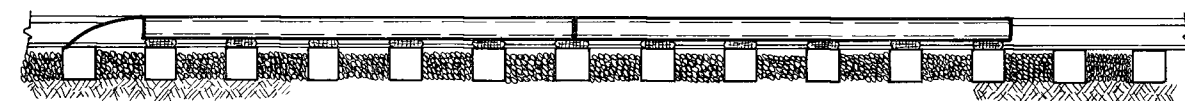
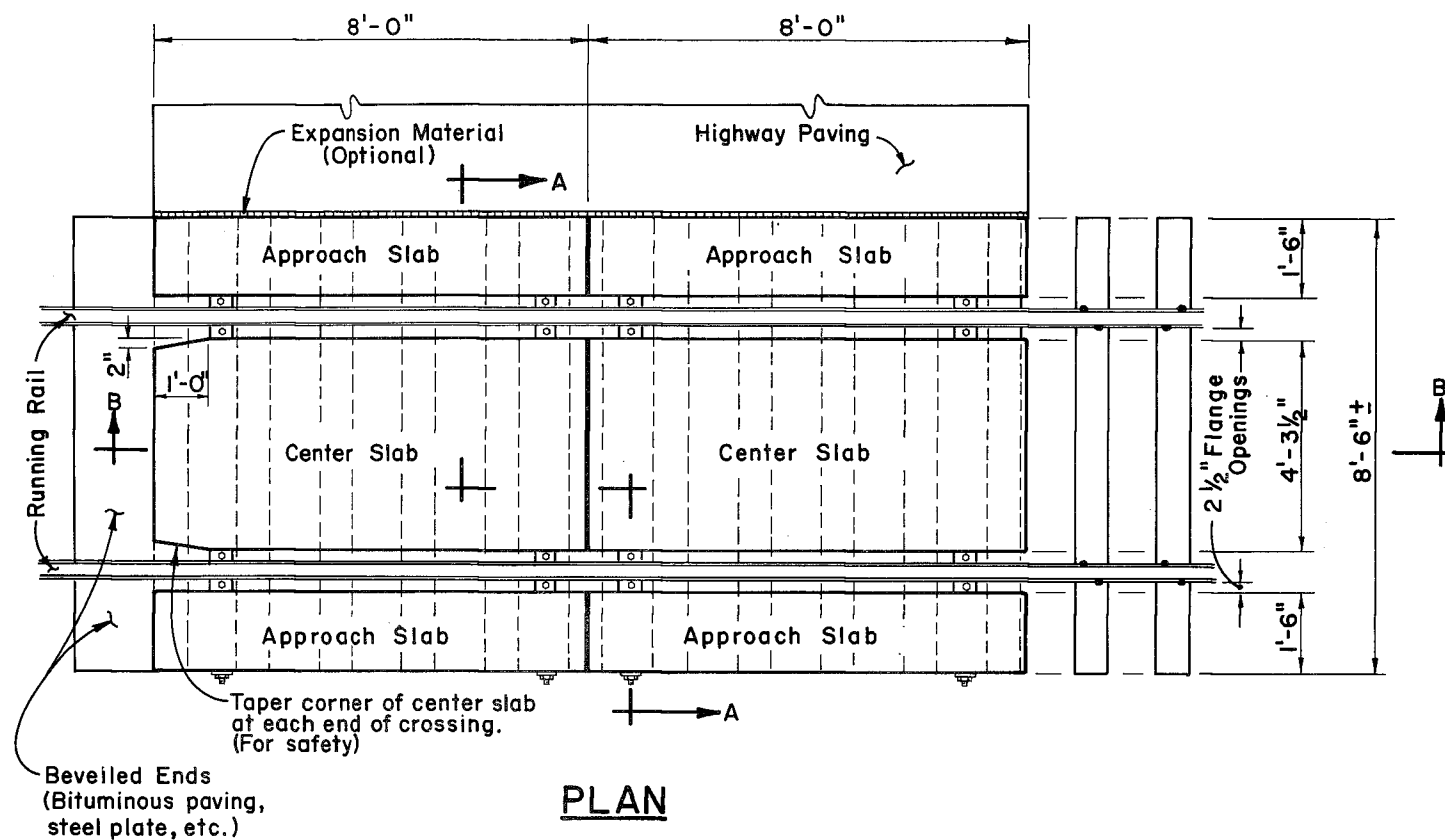
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

RAILROAD CROSSING TYPES "P" & "R"

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Date	Description		
Designed by	Names	Dates	APPROVED BY
Checked by	LMF	11-75	
Checked by	GSB	11-75	
Quantities by			
Checked by			
Supervised by	GSB		
Drawing No.	5 of 6	Index No.	GRR-01

GENERAL 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 slab.
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 crossings 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.

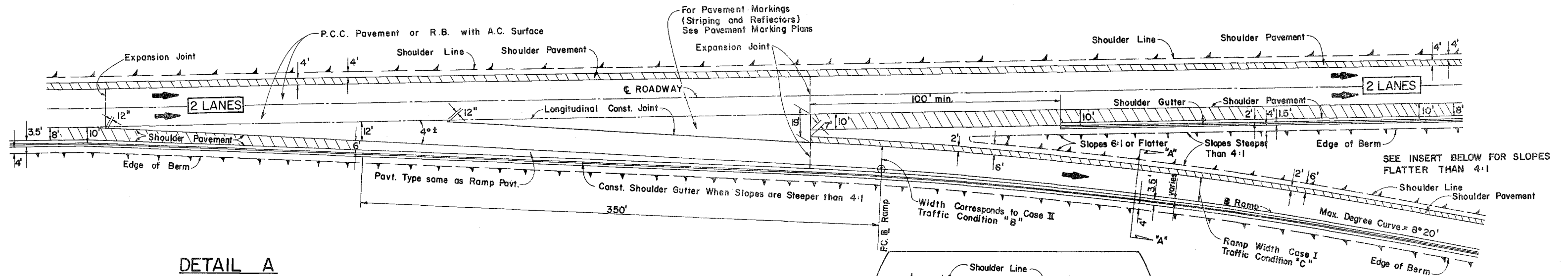


FHWA Approved: 5-3-77

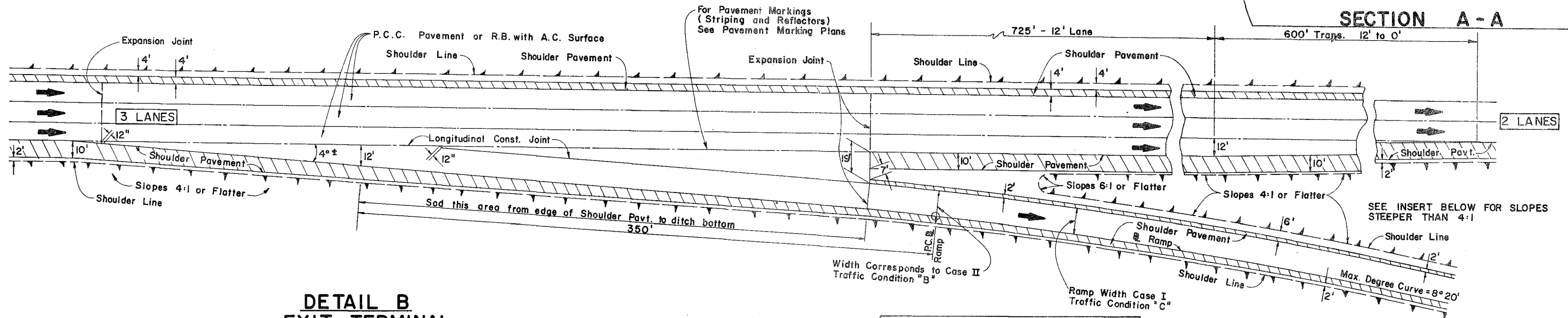
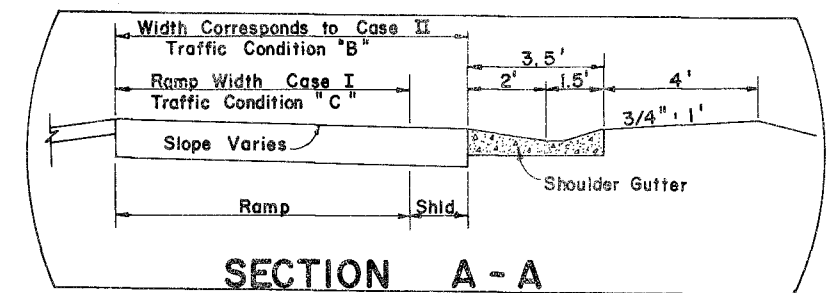
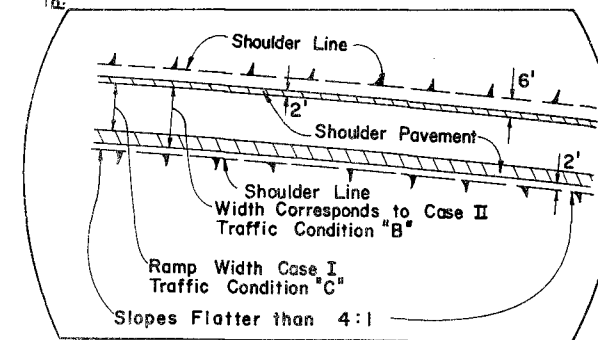
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

RAILROAD CROSSING TYPE "T"

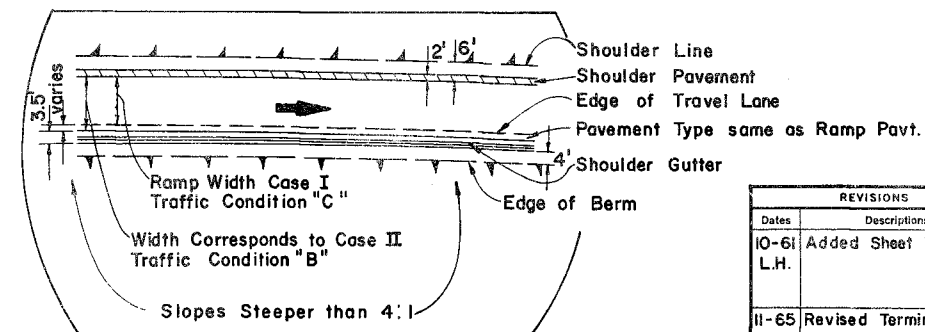
REVISIONS		INITIALS	DATES	Approved by: Deputy Design Engineer - Roadways
Dates	Descriptions	Designed by		
		Checked by		
		Quantities by		
		Supervised by		
DRAWING NO.		INDEX NO.		
6 of 6		GRR-01		



DETAIL A
EXIT TERMINAL
TWO THRU LANES



DETAIL B
EXIT TERMINAL
TWO THRU LANES
THREE APPROACH LANES



NOTES:
1. FOR GENERAL NOTES SEE SHEET NO. 2

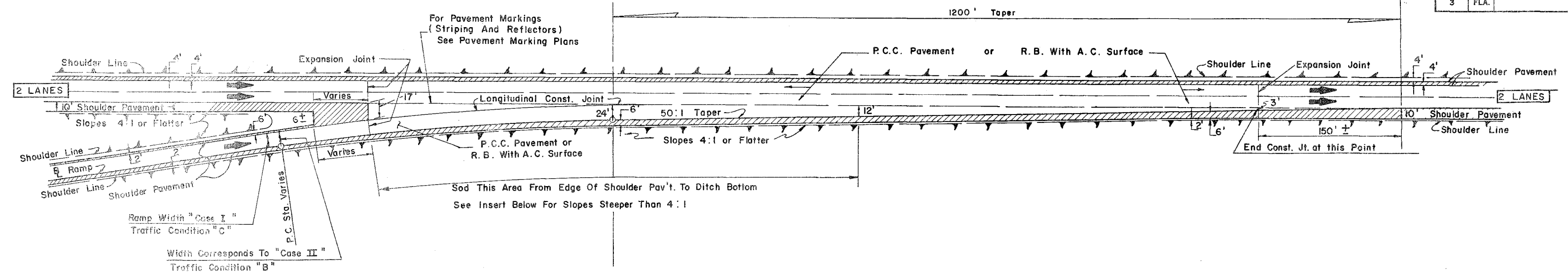
FHWA. APPROVED: 7-18-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

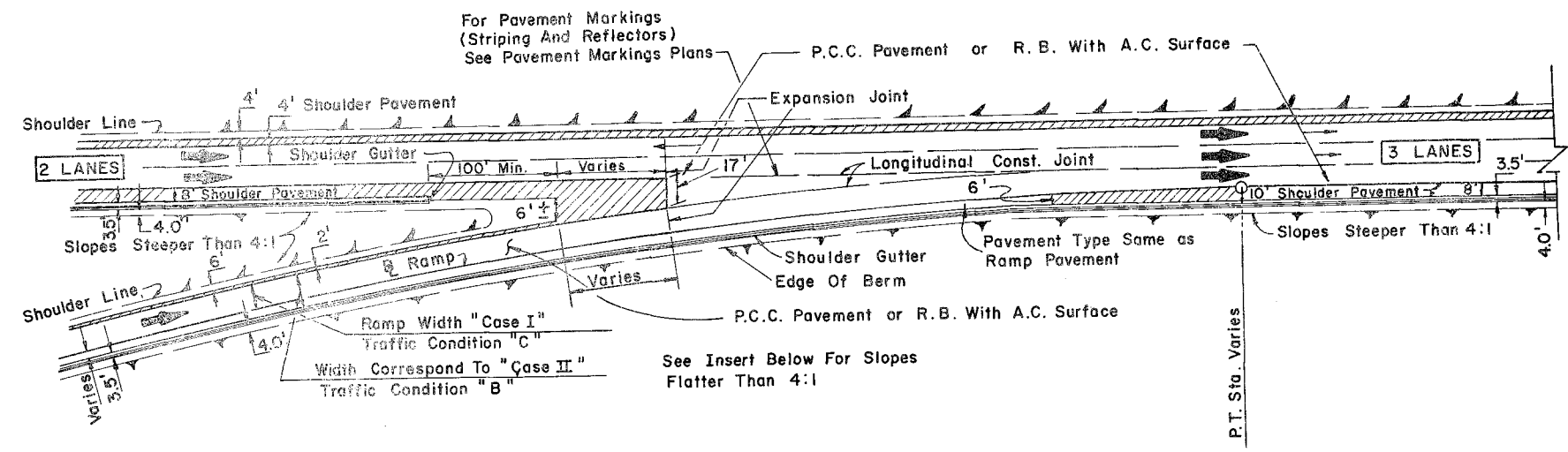
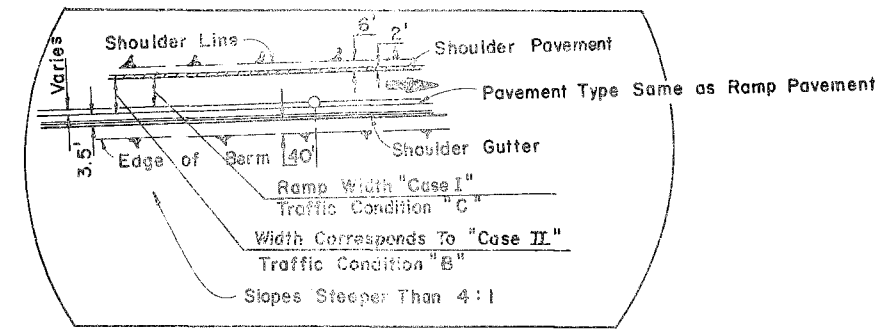
STANDARD DETAILS FOR RAMP TERMINALS

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
10-61 L.H. Added Sheet No. 3			
11-65 Revised Terminal M.J.T. Details Sheets 1,2,3			
12-65 Added Detail of Conc. M.J.T. S.W. Const.			
Designed by Checked by Quantities by Checked by Supervised by	H.E.W. E.H. M.J.T. M.J.T. M.J.T.	Dates 1-65 3-65	APPROVED BY E.H. Hart Deputy Design Engineer, Roadways
		Drawing No. Index No.	1 of 4 GRT-01

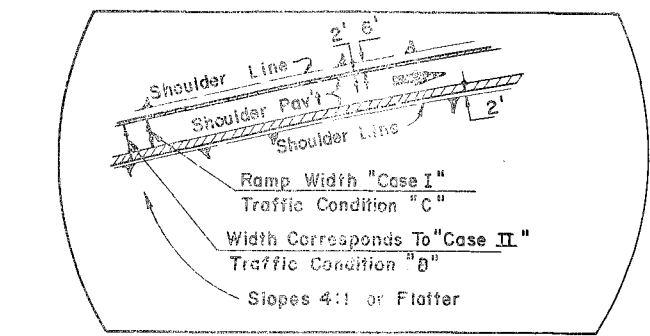
(FOR CONTINUATION OF REVISIONS SEE SHEET No. 2)



DETAIL C
ENTRANCE TERMINAL
TWO THRU LANES



DETAIL D
ENTRANCE TERMINAL
WITH ADDED LANE



GENERAL NOTES

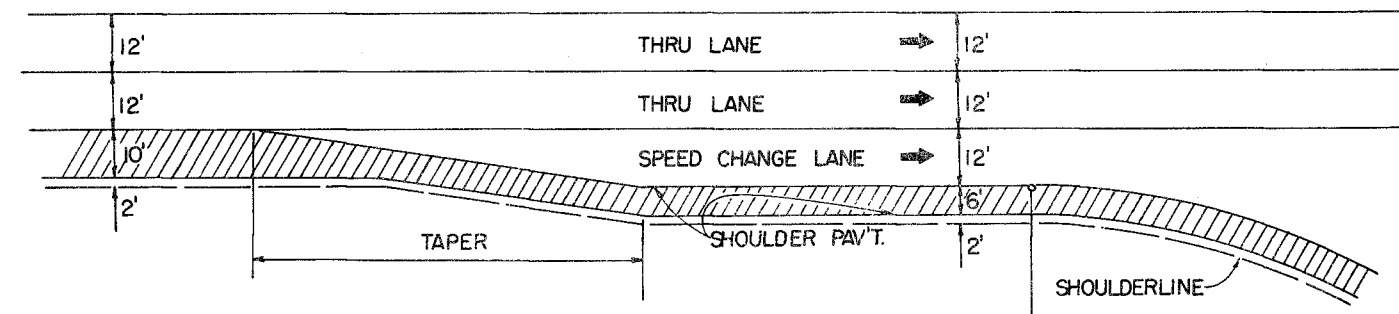
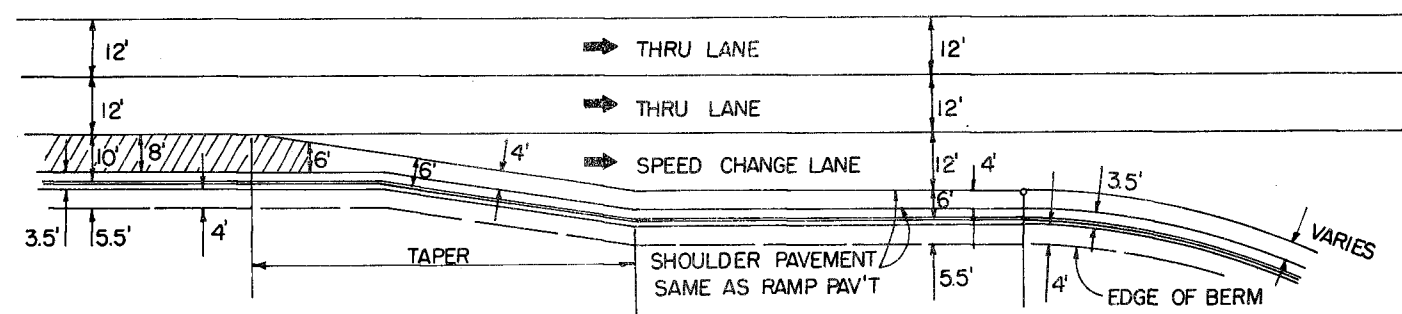
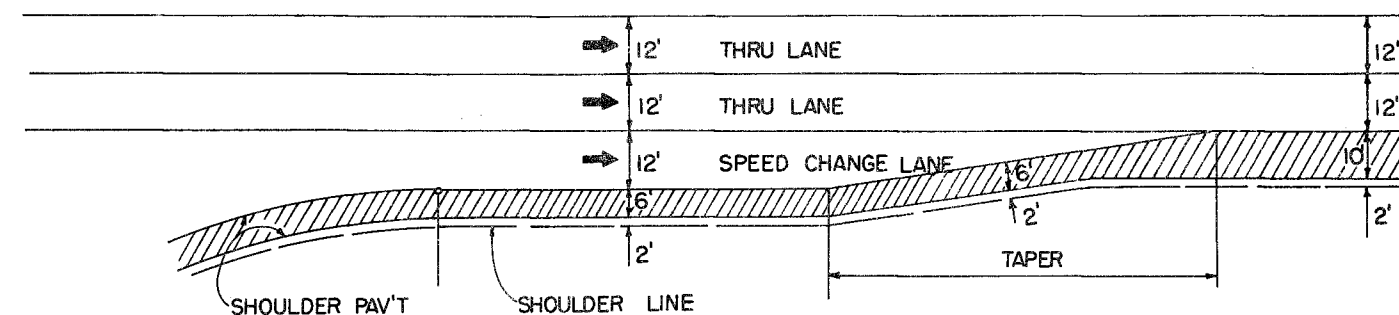
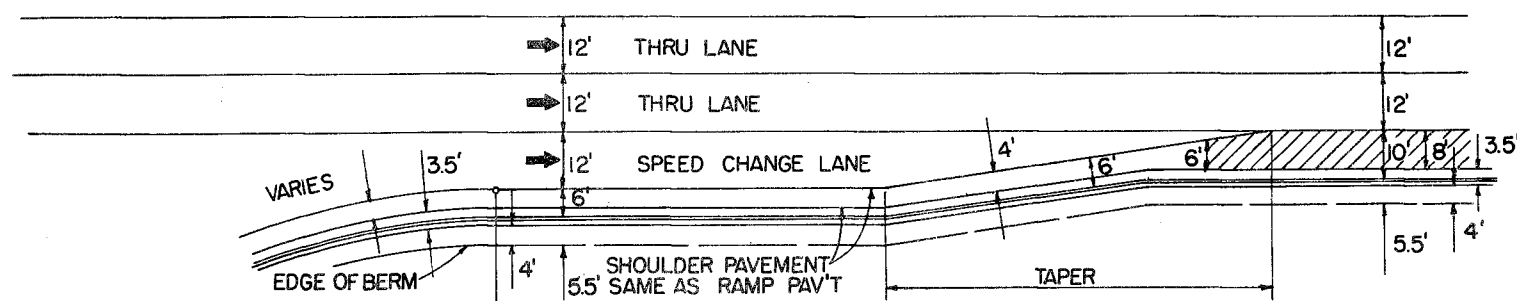
- The notes applying to P.C.C. Pavement are not applicable to R. B. A. C. Pavement.
- (a) P.C.C. Pavement Projects :
Where shoulder pavement adjacent to shoulder gutter is less than 6' wide, it shall be identical to the adjacent roadway pavement beginning with the transverse joint nearest the point of 6' width.
- (b) Flexible Base 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.
- Exit and Entrance terminals as detailed shall not be used on ramps for which a speed of 50 M. P. H. 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 table J-8 & J-10 (1973 A-A-S-H-O - Red Book).

FHWA APPROVED: 7-18-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

STANDARD DETAILS FOR RAMP TERMINALS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
1-70	REMOVED CURB FROM GORE, REVISED SHOULDER			
G.F.	5-73			
5-73	REVISED SHOULDER PAVEMENT IN GORE AREA			
L.F.	10-74			
	INCREASED TAPER LENGTH & CHANGED INDEX NO.			
5-67	REVISED EXIT TERMINALS & 4' BERM (SH. 1)			
R.H.C.	6-67			
6-67	ADDED TYPE "E" CURB & GUTTER (SH. 1 & 3)			
R.L.O.	9-67			
9-67	REVISED DETAILS TO SHOW SHOULDER GUTTER			
R.L.O.				
		Names	Dates	APPROVED BY
		Designed by	W.L.B.	1-65
		Checked by	E.H.	3-65
		Quantities by		
		Checked by		
		Supervised by		
		Drawing No.	2 of 4	Index No.
				GRT-01

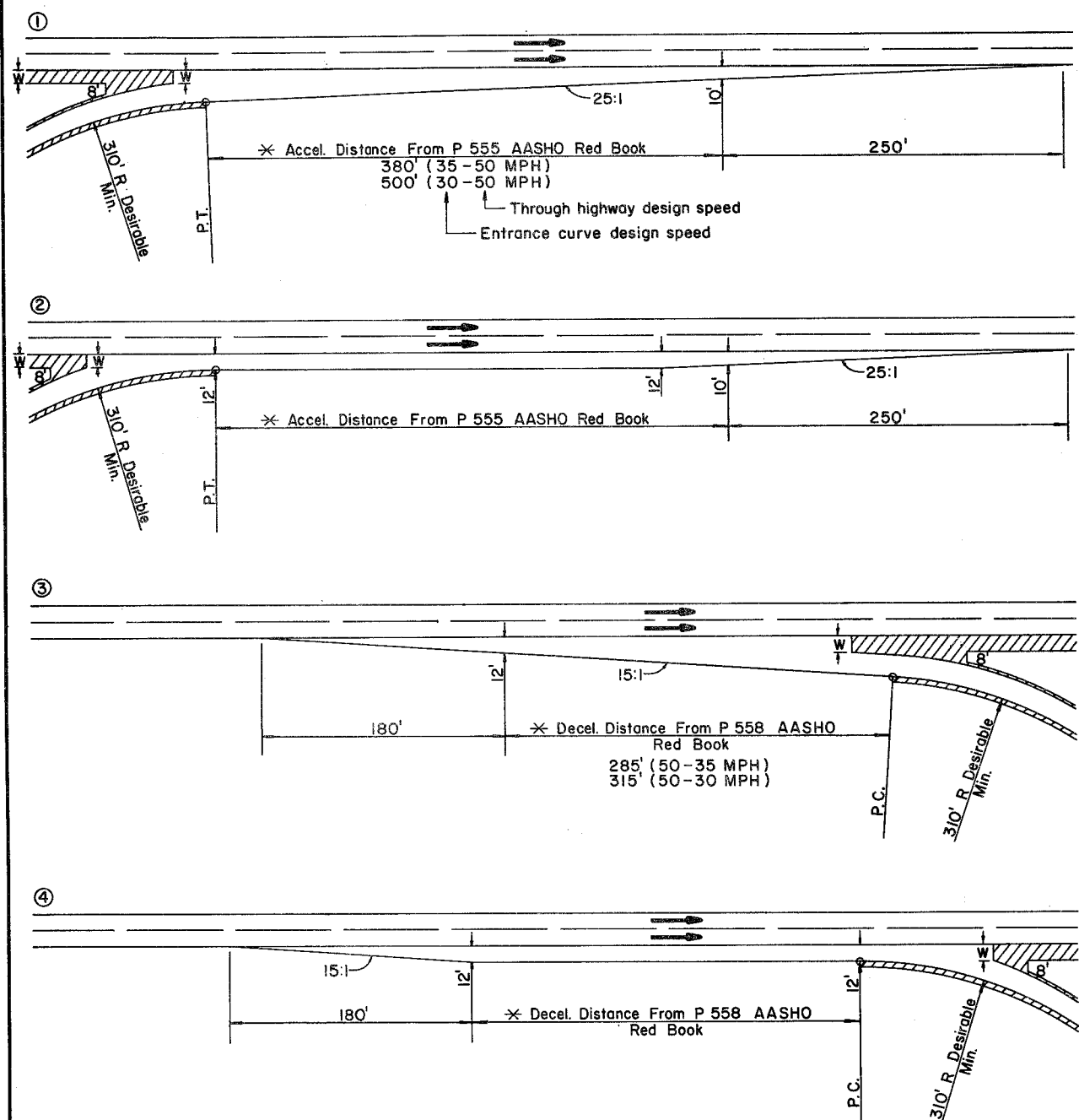


SKETCHES INDICATING SHOULDER TREATMENT AT
SPEED CHANGE LANES WITH SHOULDER GUTTER

SKETCHES INDICATING SHOULDER TREATMENT AT SPEED CHANGE
LANES WITHOUT SHOULDER GUTTER

REVISED		DATE		DESCRIPTION	
2-68	RHC				REVISED EXIT & ENT. TERMINAL
9-68	RHC				CHANGED CASE II COND. B LINE TO EDGE OF PAVT WHERE SHOULDER GUTTER IS INVOLVED
10-74	IC				CHANGED INDEX NO.

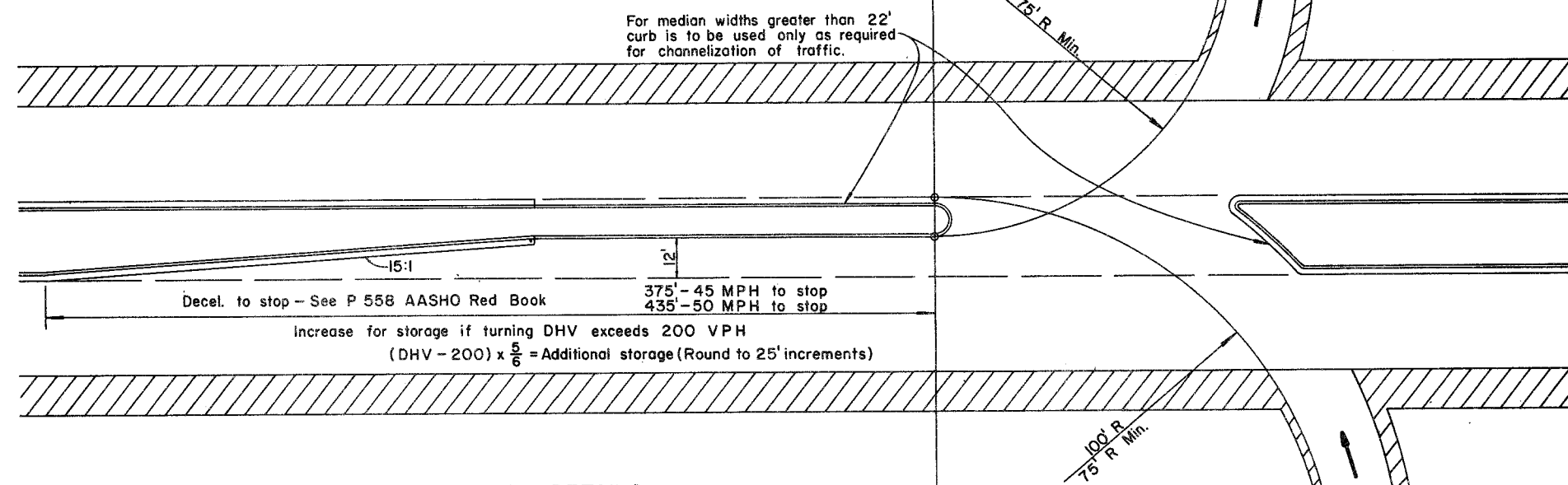
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN SECTION	
STANDARD DETAILS FOR RAMP TERMINALS	
ROAD NO.	COUNTY
PROJECT NO.	
DESIGNED BY	APPROVED BY
CHECKED BY	<i>E. H. Hunt</i>
QUANTITIES BY	DEPUTY DESIGN ENGINEER, ROADWAYS
CHECKED BY	DRAWING NO.
SUPERVISED BY	INDEX NO.
	3 of 4
	GRT-01



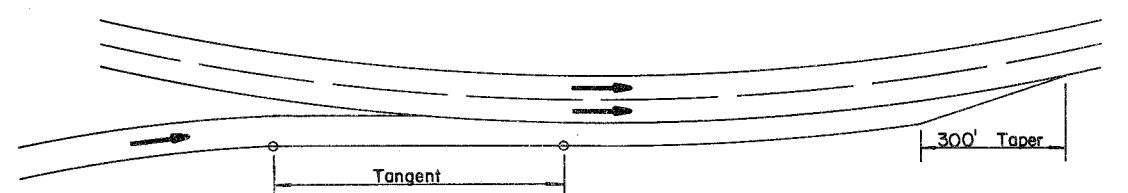
ENTRANCE AND EXIT RAMP TERMINAL DETAILS

To be used along the cross road at all rural type, unsignalized ramp terminals (Interstate and Expressway Interchanges).

- W Normal shoulder pavement width
- * Adjust for grades if greater than 2% (See P 556 AASHO Red Book).
- ① Standard cross road entrance terminals. To be used when roadway alignment is tangent and no bridges are located within the merging lane.
- ② 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.
- ③ Standard cross road exit terminal. To be used when roadway alignment is tangent.
- ④ 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.



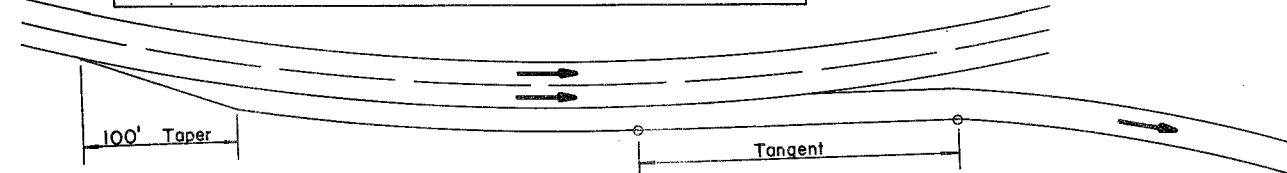
LEFT TURN CONTROL DETAILS



ENTRANCE ON CURVE

For additional detail see drawing ② and footnote ②

NOTE: Entrances and exits on curves should be avoided when possible.



EXIT ON CURVE

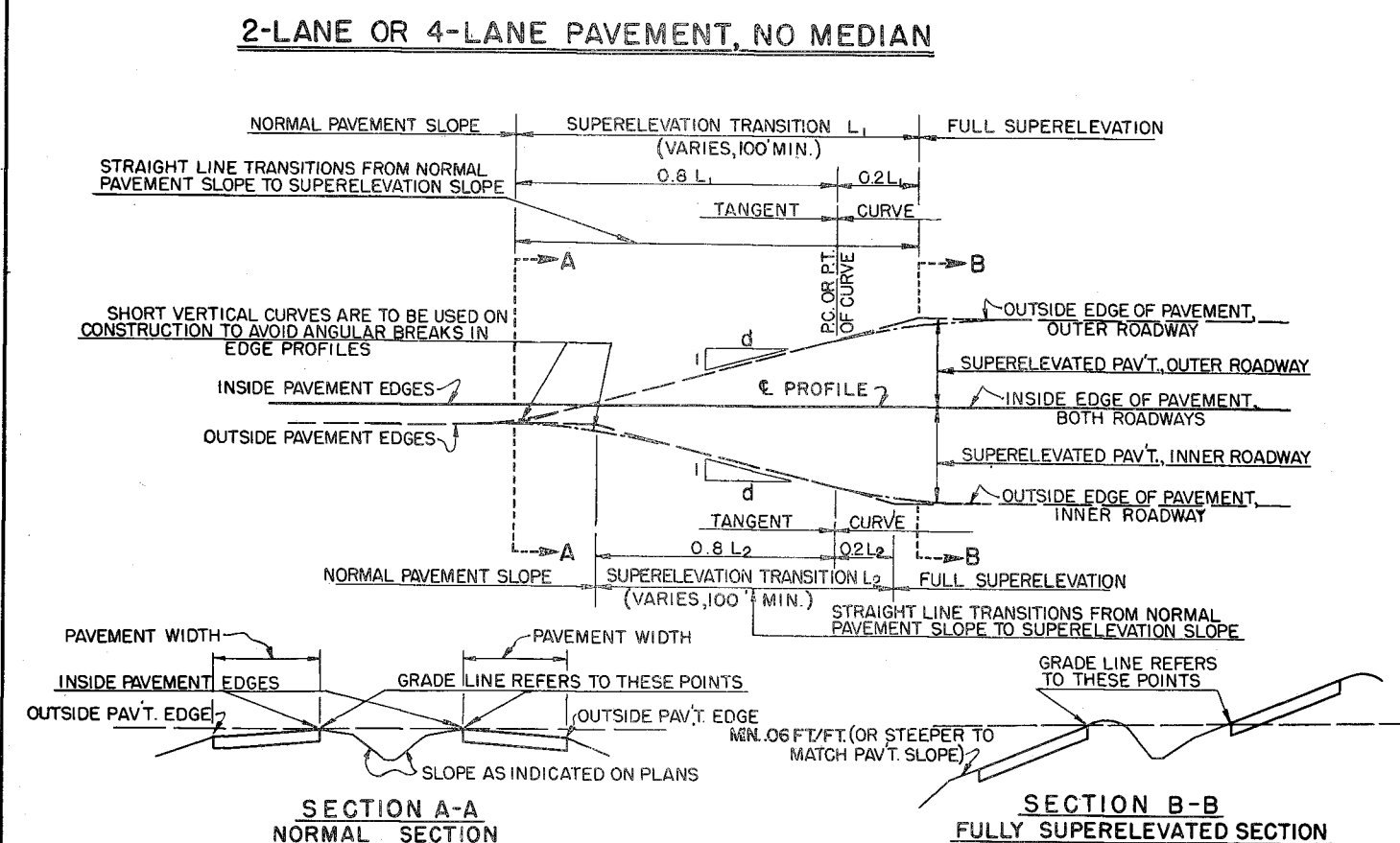
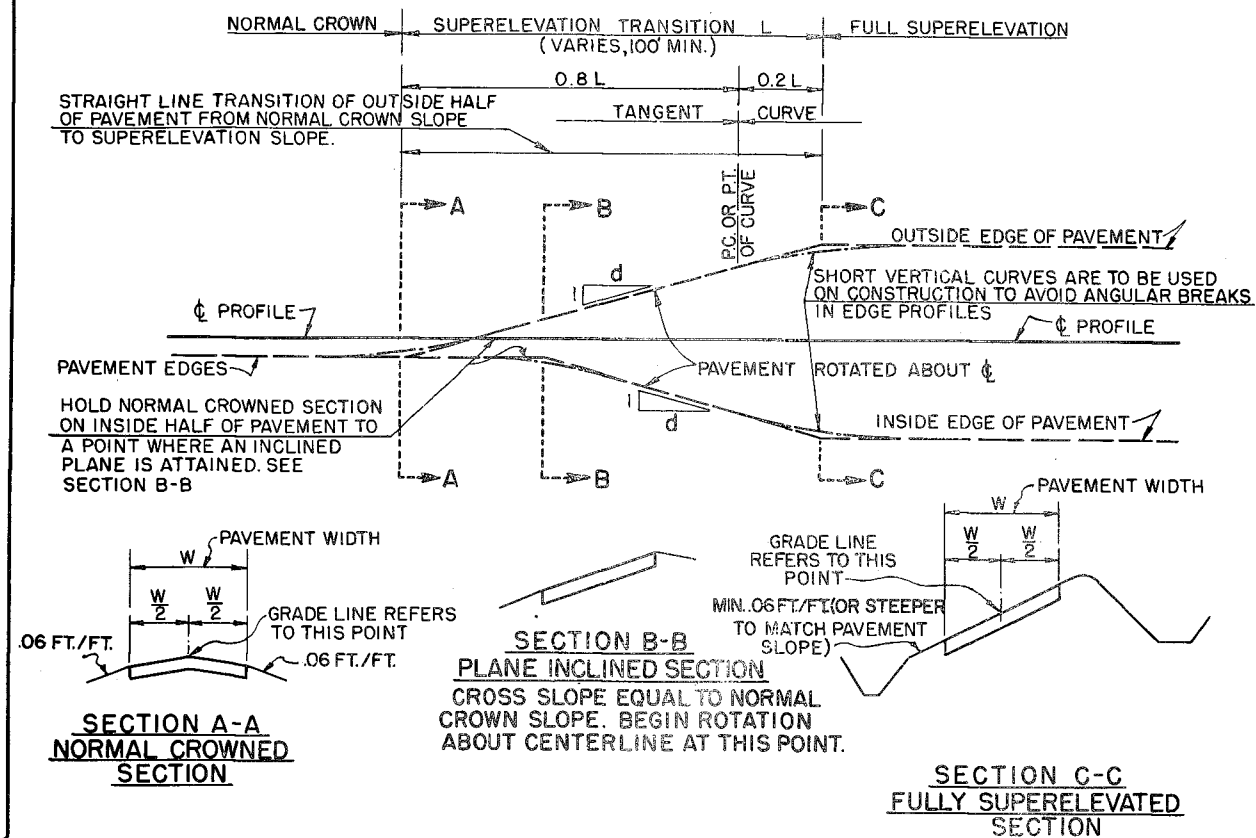
For additional detail see drawing ④ and footnote ④

The details shown on this sheet apply to the cross road design of rural type, unsignalized interchanges.

The details shown on this sheet apply to Cross Road Ramp Terminals ONLY.

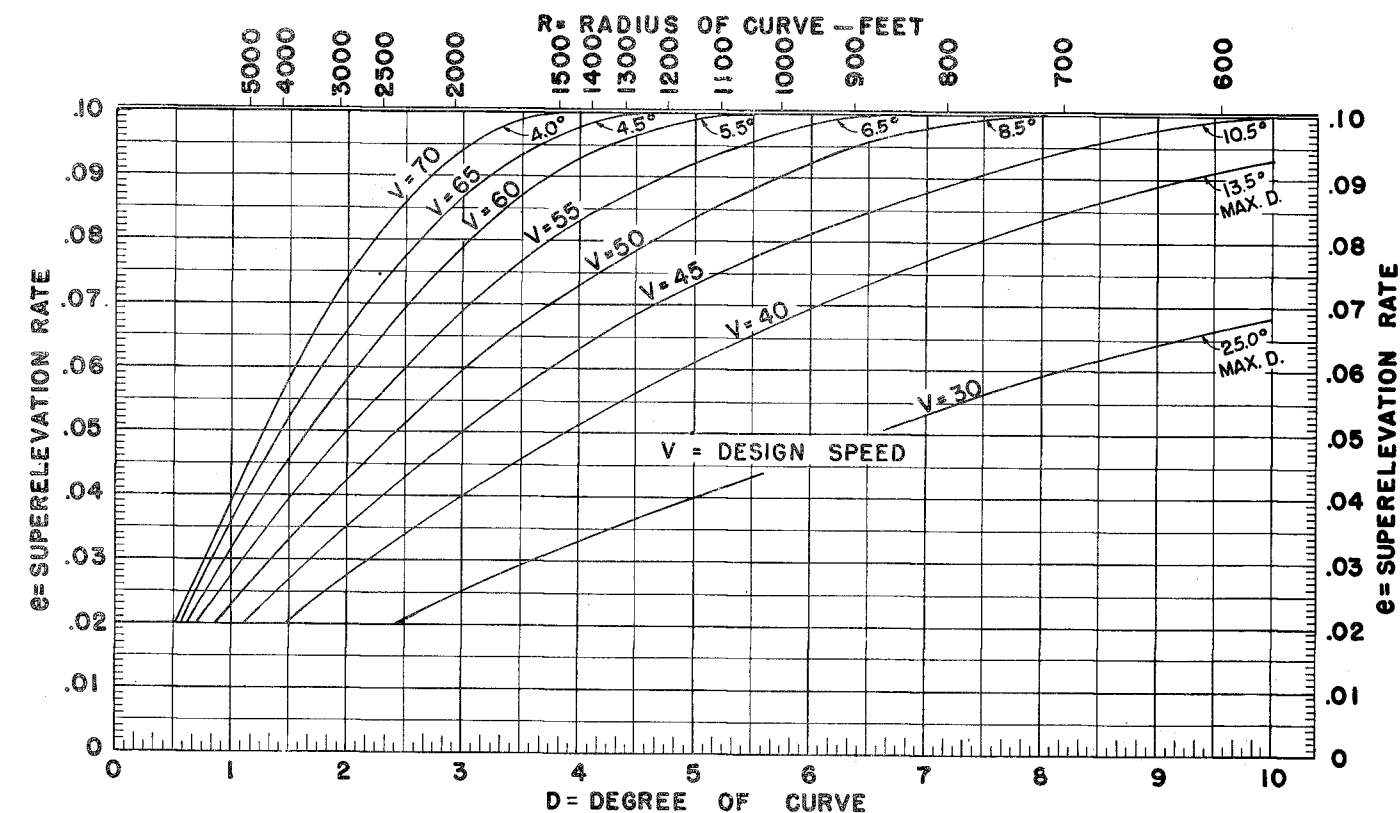
FHWA APPROVED: 7-25-75
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
STANDARD DETAILS FOR RAMP TERMINALS

REVISIONS		INITIALS	DATES	Approved by: by: <i>E.H. Hunt</i> Deputy Design Engineer-Roadways
Dates	Descriptions	Designed by	DCB	
		Checked by		
		Quantities by		
		Checked by		
		Supervised by		
				DRAWING NO. 4 OF 4
				INDEX NO. GRT-01



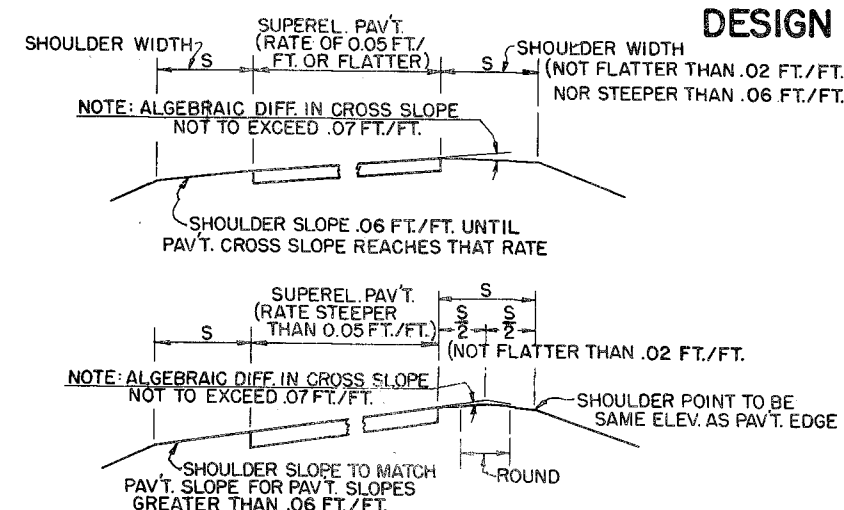
DETAIL OF TRANSITION FROM NORMAL CROWNED SECTION TO SUPERELEVATED SECTION

THESE TRANSITION DETAILS ARE TO APPLY IN ALL CASES, EXCEPT AT CURVES OF INSUFFICIENT LENGTH. INSUFFICIENT TANGENT LENGTH BETWEEN CURVES, P.C.'S OR P.R.C.'S, IN WHICH CASE THE DETAILS OF THE TRANSITIONS ARE TO BE INCLUDED IN THE DETAIL PLANS.



GENERAL NOTES FOR SUPERELEVATION

- USE NORMAL SECTION WITH NO SUPERELEVATION FOR CURVES UP TO 0°-20' (0°-14' FOR DESIGN SPEEDS OF 70 MPH).
- WHEN THE DEGREE OF CURVE IS 0°-21' OR GREATER (0°-15' FOR DESIGN SPEEDS OF 70 MPH) AND IS IN THE RANGE OF THE HORIZONTAL PORTION OF THE CURVE, SUPERELEVATE AT THE NORMAL CROSS SLOPE RATE OF 0.02 FT./FT. OR AS INDICATED BY THE CURVE FOR THE APPROVED DESIGN SPEED.
- THE LENGTH OF SUPERELEVATION TRANSITION IS TO BE DETERMINED BY USING A RELATIVE SLOPE OF PAVEMENT EDGE TO PROFILE GRADE GIVEN IN THE TABLE BELOW, EXCEPT THAT THE MINIMUM LENGTH OF TRANSITION SHALL BE 100 FT.
- FOR CURVES IN MUNICIPAL AREAS, SEE INDEX NO. GSE-02.



NOTES

SHOULDER ON HIGH SIDE A SHOULDER SLOPE OF 0.06 FT./FT. DOWNWARD FROM THE EDGE OF PAVEMENT WILL BE MAINTAINED UNTIL A 0.07 FT./FT. BREAK IN SLOPE AT THE PAVEMENT EDGE IS REACHED DUE TO SUPERELEVATION OF THE PAVEMENT. AS THE PAVEMENT SUPERELEVATION INCREASES, THE 0.07 FT./FT. BREAK IN SLOPE WILL BE MAINTAINED AND THE SHOULDER FLATTENED UNTIL THE SHOULDER SLOPE REACHES THE MINIMUM OF 0.02 FT./FT. 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 FT./FT. THESE SLOPES WILL BE HELD WITH FURTHER INCREASE IN PAVEMENT SUPERELEVATION UNTIL THE MAXIMUM BREAK OF 0.07 FT./FT. AT THE PAVEMENT EDGE IS AGAIN REACHED. THIS MAXIMUM BREAK WILL THEN BE HELD AND SHOULDER SLOPES STEEPENED WITH ADDITIONAL SUPERELEVATION.

SHOULDER ON LOW SIDE MAINTAIN 0.06 FT./FT. DROP ACROSS INSIDE SHOULDER UNTIL PAVEMENT CROSS SLOPE REACHES 0.06 FT./FT. FOR PAVEMENT CROSS SLOPES GREATER THAN 0.06 FT./FT., SHOULDER TO HAVE SAME SLOPE AS PAVEMENT.

THESE DETAILS APPLY TO BOTH PAVED AND GRASSED SHOULDER.

SLOPE RATIOS FOR SUPERELEVATION TRANSITIONS				
DESIGN SPEED, M.P.H.	45-50	55-60	65-70	
1:1	1:200	1:225	1:250	2 Lane & 4 Lane
1:1.5	1:160	1:180	1:200	6 Lane
1:2	1:150	1:170	1:190	8 Lane

FHWA APPROVED: 7-7-75

SUPERELEVATION DETAILS

ROAD NO.	COUNTY	PROJECT NO.
Names	Dates	Recommended For Approval by
Detailed by	Checked by	Quantities by
Checked by	Traced by	
APPROVED BY		State Design Engineer
Drawing No.		Index No.
1 of 1		GSE-01

REVISIONS	DATE	DESCRIPTION
1-75	5-58	Changed all fractions to decimals.
2-75	10-67	ADDED NOTE N°5
3-75	1-67	REVISED S.E. CHART
4-75	5-65	Rev. for 1/4 Cross Slope
5-75	9-61	SUPER. TRANS. RATE REV. TO CONFORM TO AASHTO
6-75	1-67	REVISED S.E. CHART
7-75	10-74	Revised S.E. Chart & changed Index N°

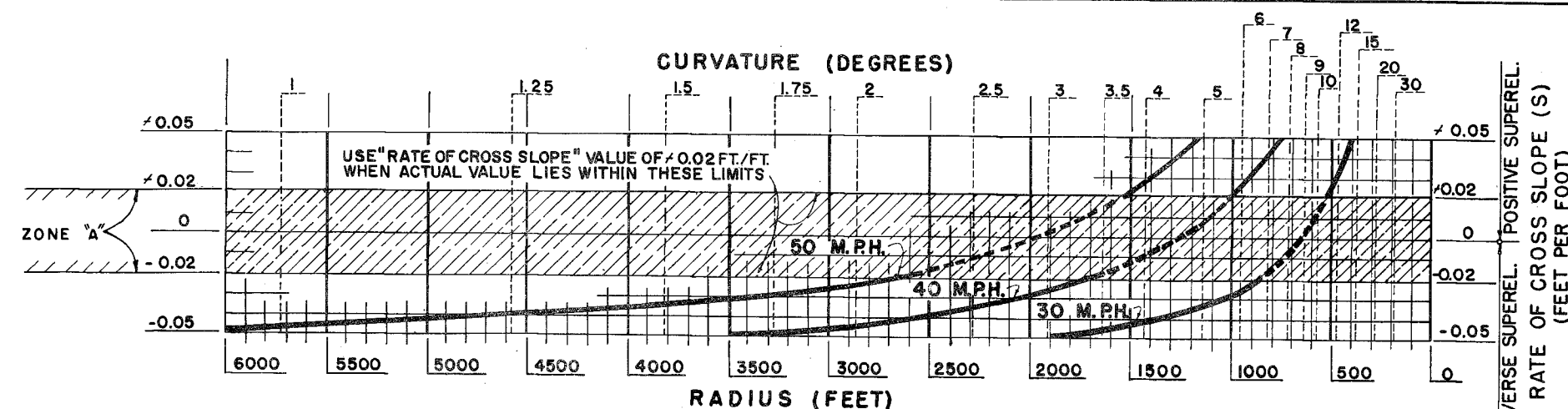
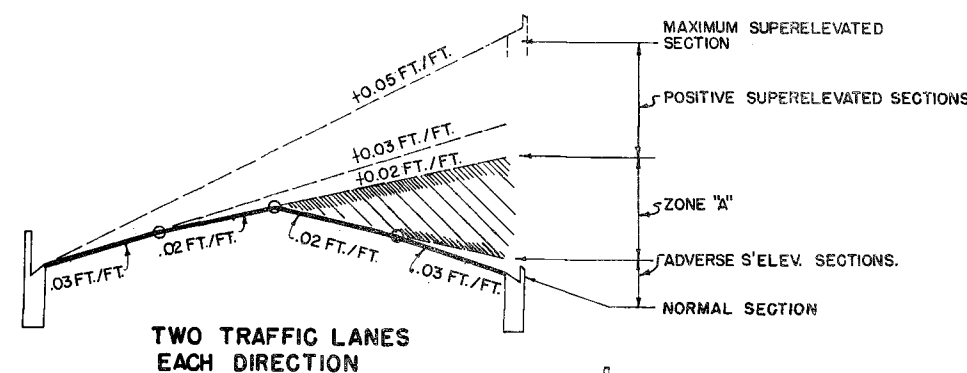


CHART SHOWING REMOVAL OF CROWN AND OR SUPERELEVATION NECESSARY FOR CURVATURE AT VARIOUS DESIGN SPEEDS

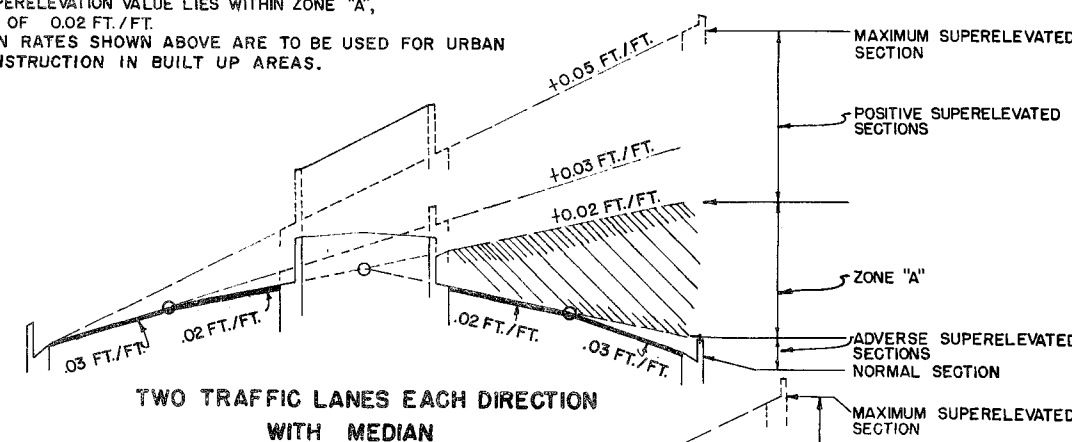
NOTE: WHEN THE ACTUAL SUPERELEVATION VALUE LIES WITHIN ZONE "A", USE A POSITIVE RATE OF 0.02 FT./FT. THE SUPERELEVATION RATES SHOWN ABOVE ARE TO BE USED FOR URBAN (CURB & GUTTER) CONSTRUCTION IN BUILT UP AREAS.

GENERAL NOTES FOR SUPERELEVATION

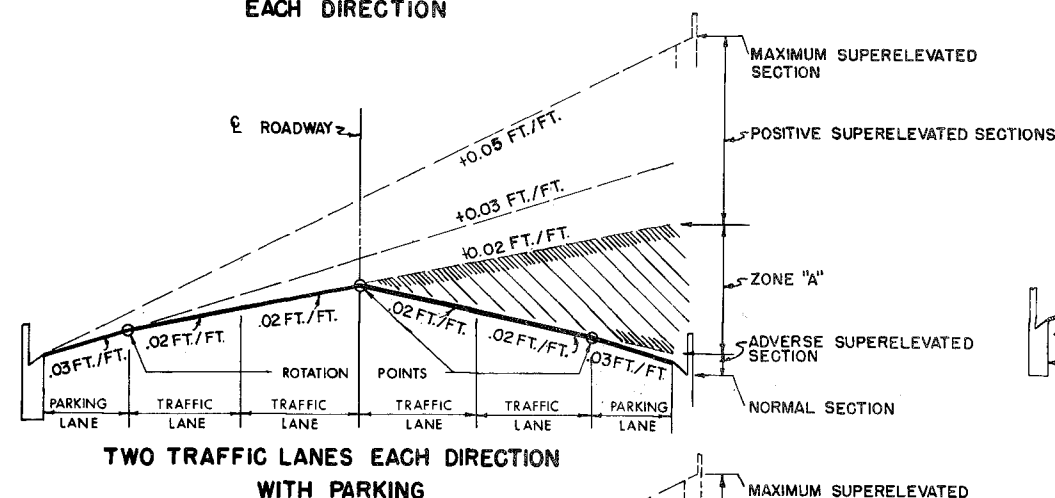
1. MAXIMUM RATE OF SUPERELEVATION (IN MUNICIPAL CONSTRUCTION) SHALL BE 0.05 FT./FT.
2. SUPERELEVATION SHALL BE OBTAINED BY ROTATING THE PLANE SUCCESSIVELY ABOUT THE BREAK POINTS OF THE SECTION UNTIL THE PLANE HAS ATTAINED A SLOPE EQUAL TO THAT REQUIRED BY THE CHART. SHOULD THE ROTATION TRAVERSE THE ENTIRE SECTION AND FURTHER SUPERELEVATION BE REQUIRED, THE REMAINING ROTATION OF THE PLANE SHALL BE ABOUT THE LOW EDGE OF THE INSIDE TRAVEL LANE.
ADVERSE SUPERELEVATION OF SECTIONS WITH PARKING LANES.
NO SUPERELEVATION WILL BE REQUIRED WHEN THE MAXIMUM ADVERSE SUPERELEVATION RATE IS GREATER THAN THE NORMAL SLOPE OF THE TRAFFIC LANE ADJACENT TO THE PARKING LANE.
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. MINIMUM GUTTER GRADES WITHIN THE LIMITS OF THE SUPERELEVATION TRANSITION SHALL BE 0.2%.
6. THE VARIABLE SUPERELEVATION TRANSITION LENGTH "L" SHALL HAVE A MINIMUM VALUE OF 50 FEET FOR DESIGN SPEEDS UNDER 40 M.P.H. AND 75 FEET FOR DESIGN SPEEDS OF 40 M.P.H. OR GREATER.
7. MUNICIPAL SECTIONS HAVING LANE ARRANGEMENTS DIFFERENT FROM THOSE SHOWN, BUT COMPOSED OF A SERIES OF PLANES, SHALL BE SUPERELEVATED IN A SIMILAR MANNER.
8. FOR CURVES IN RURAL AREAS, SEE INDEX NO. GSE-01.



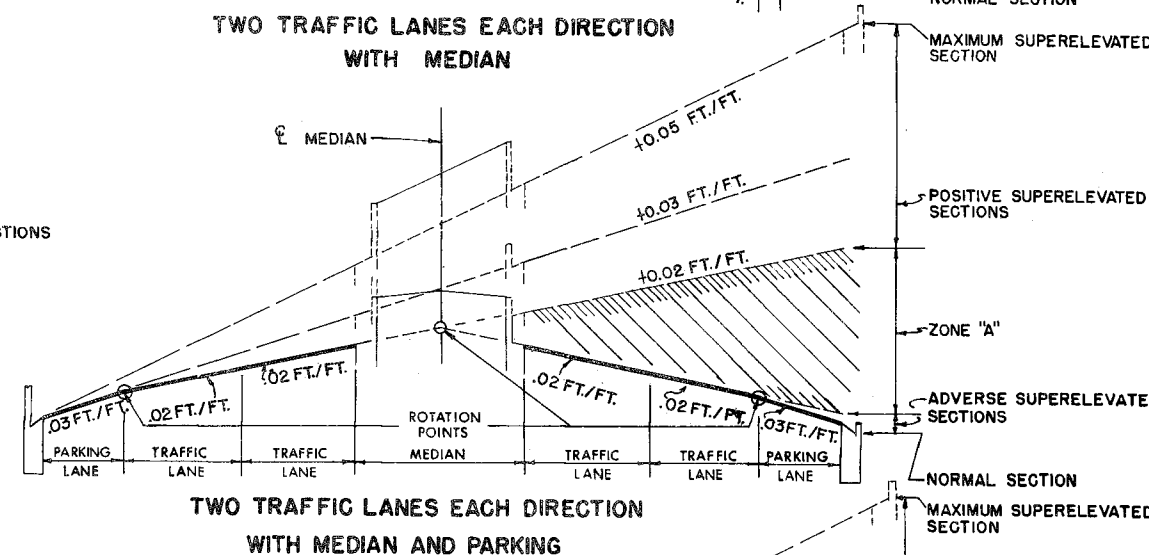
TWO TRAFFIC LANES EACH DIRECTION



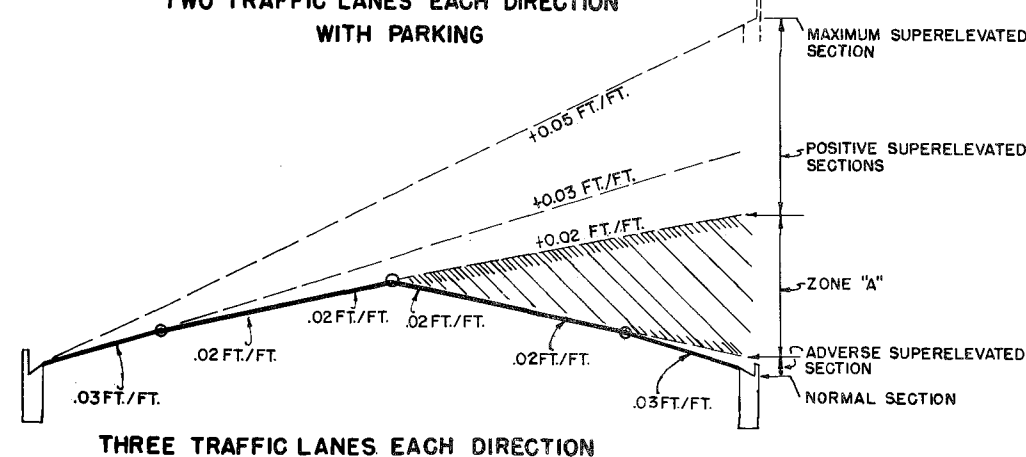
TWO TRAFFIC LANES EACH DIRECTION WITH MEDIAN



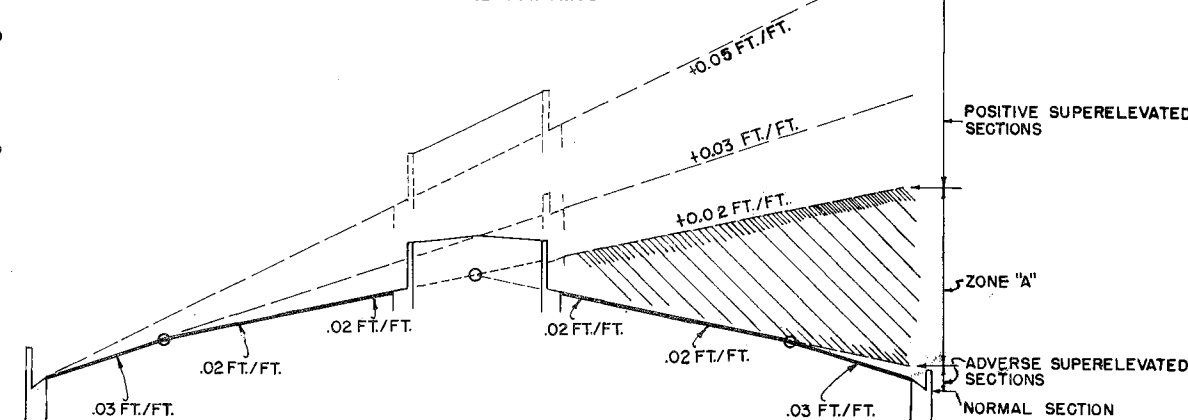
TWO TRAFFIC LANES EACH DIRECTION WITH PARKING



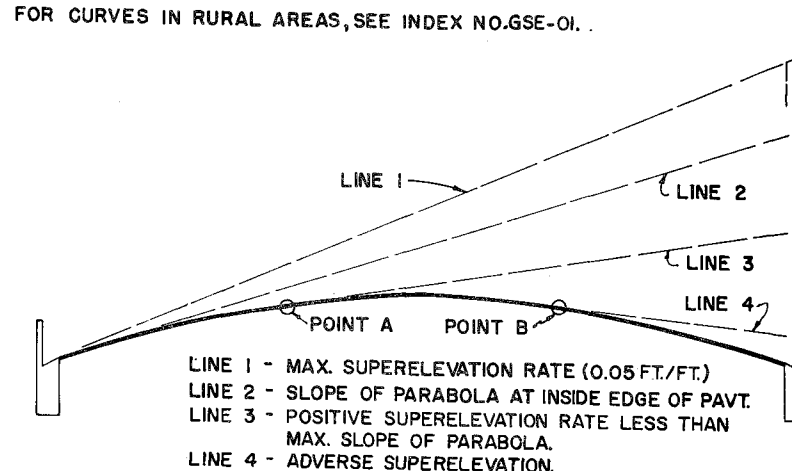
TWO TRAFFIC LANES EACH DIRECTION WITH MEDIAN AND PARKING



THREE TRAFFIC LANES EACH DIRECTION



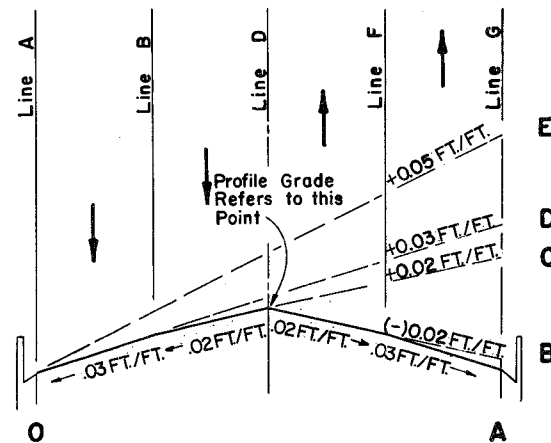
THREE TRAFFIC LANES EACH DIRECTION WITH MEDIAN



VALUES OBTAINED FROM THE CHART ARE ALSO APPLICABLE TO A PARABOLIC CROWN SECTION. WHEN THIS TYPE 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.

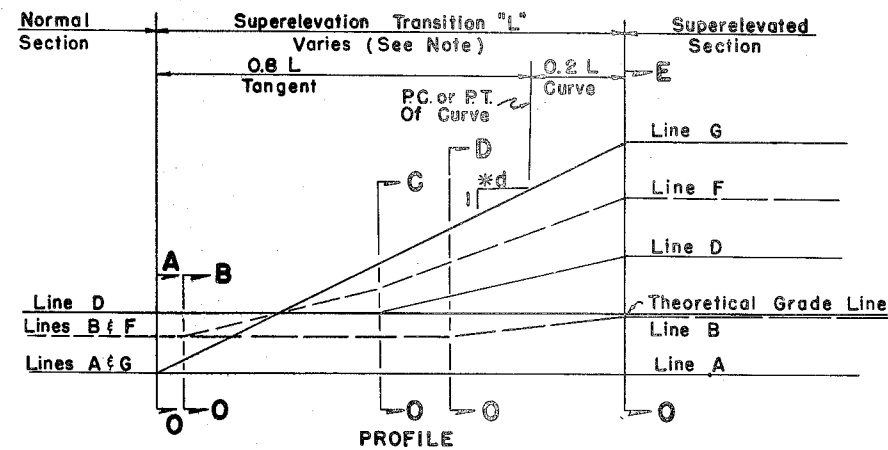
SUPERELEVATION OF PARABOLIC SECTION

FHWA APPROVED: 5-20-77			
FLORIDA DEPARTMENT OF TRANSPORTATION			
ROADWAY PLANS SECTION			
SUPERELEVATION DETAILS FOR MUNICIPAL CONSTRUCTION			
ROAD NO.		COUNTY	
PROJECT NO.		PROJECT NO.	
REVISED FOR PLANE SECTION		REVISED FOR PLANE SECTION	
Checked by W.L.B.		Checked by R.L.O.	
Checked by R.L.O.		Checked by C.D.R.	
1-67		1-67	
1 OF 2		GSE-02-1	

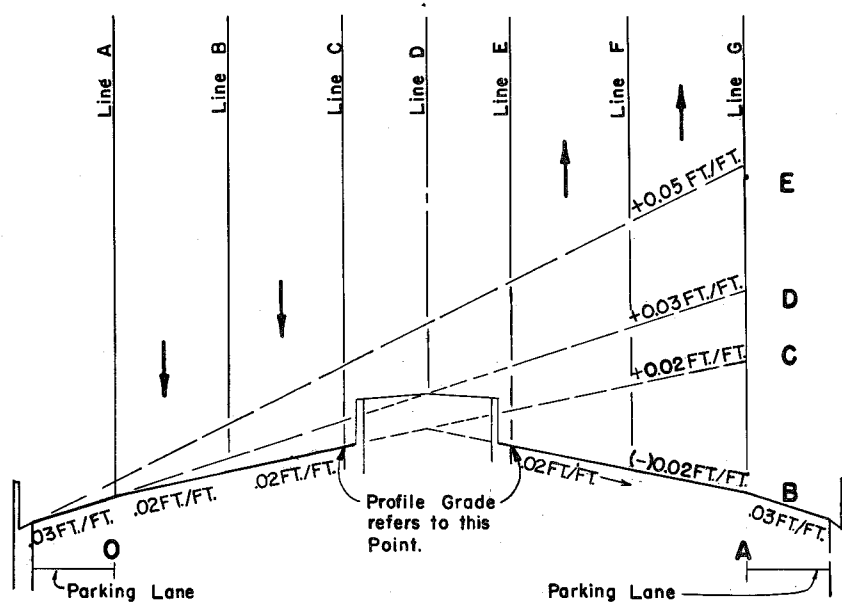


SECTION O-A TO O-E

DETAIL OF SUPERELEVATION TRANSITION
FOR TWO TRAFFIC LANES EACH DIRECTION

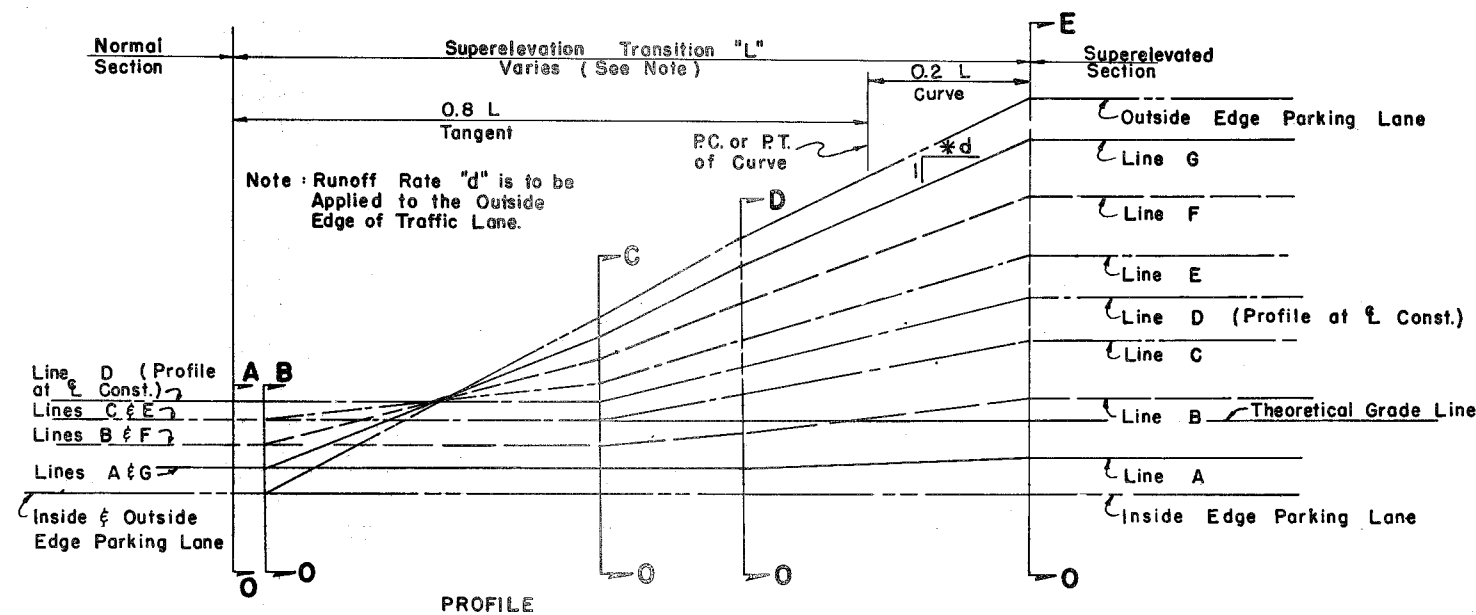


LINE	DESCRIPTION
A	INSIDE TRAFFIC LANE
B	INSIDE LANE LINE
C	INSIDE MEDIAN EDGE PAVEMENT
D	ℓ CONSTRUCTION
E	OUTSIDE MEDIAN EDGE PAVEMENT
F	OUTSIDE LANE LINE
G	OUTSIDE TRAFFIC LANE



SECTION O-A TO O-E

DETAIL OF SUPERELEVATION TRANSITION
FOR TWO TRAFFIC LANES EACH DIRECTION WITH MEDIAN AND PARKING



*d (SLOPE RATIO)	
30 MPH	1 : 100
40 MPH	1 : 125
50 MPH	1 : 150

D	R	V=30mph	V=40mph	V=50mph
0° 15'	22918'	NC	NC	NC
0° 30'	11459'	NC	NC	NC
0° 45'	7639'	NC	NC	NC
1° 00'	5730'	NC	RC	RC
1° 30'	3820'	RC	RC	.024
2° 00'	2865'	RC	.022	.028
2° 30'	2292'	RC	.026	.031
3° 00'	1910'	.020	.029	.033
3° 30'	1637'	.023	.032	.036
4° 00'	1432'	.025	.033	.038
5° 00'	1146'	.028	.036	.043
6° 00'	955'	.031	.039	.047
7° 00'	819'	.032	.041	
8° 00'	716'	.034	.044	
9° 00'	637'	.035	.046	
10° 00'	573'	.037	.048	
11° 00'	521'	.038		
12° 00'	477'	.039		
13° 00'	441'	.040		
14° 00'	409'	.043		
16° 00'	358'	.045		
18° 00'	318'	.047		
20° 00'	286'	.050		

The superlevation rates shown above are to be used for urban (curb & gutter) arterials in suburban areas where sufficient R/W may be acquired to make suitable connections.

e Max.=0.05

NOTE: THE SECTIONS AND PROFILES SHOWN ON THIS SHEET ARE EXAMPLES OF THE SUPERELEVATION TRANSITIONS. SIMILAR SCHEMES SHOULD BE USED FOR ROADWAYS HAVING DIFFERENT SECTION DESIGNS.

FHWA APPROVED: 5-20-77

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

SUPERELEVATION DETAILS FOR
MUNICIPAL CONSTRUCTION

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions	Names	Dates
1-73	Changed all fractions to decimals.	W. L. B.	2-66
10-74	Changed Index N ^o to current policy.	R. L. O.	12-66
5-77	Added S.E. chart for e Max 0.05		
LMF			
Traced by	C.D.P.	1-67	2 OF 2
Drawing No.			GSE-02-1
Index No.			

STANDARD SYMBOLS FOR KEY MAPS

	HIGHWAY WITH FULL CONTROL OF ACCESS
	CONTROLLED ACCESS HIGHWAY WITH FRONTAGE ROADS
	INTERCHANGE
	PROPOSED CONTROLLED ACCESS HIGHWAY
	DIVIDED HIGHWAY
	PAVED ROAD—HIGH TYPE
	BITUMINOUS ROAD—MEDIUM AND LOW TYPE
	GRAVEL OR STONE ROAD
	SOIL SURFACED ROAD
	GRADED AND DRAINED ROAD
	UNIMPROVED ROAD
	PRIMITIVE ROAD
	IMPASSABLE ROAD
	PRIVATE ROAD
	DISTANCE BETWEEN POINTS
	STREETS IN INSET AREAS OR DELIMITED URBAN COMPACT AREAS
	EXTENSION OF LOCAL ROADS WITHIN CITY LIMITS
	FEDERAL AID INTERSTATE HIGHWAY
	FEDERAL AID PRIMARY HIGHWAY
	FEDERAL AID SECONDARY HIGHWAY
	NATIONAL FOREST ROAD
	INTERSTATE HIGHWAY
	U. S. NUMBERED HIGHWAY
	STATE HIGHWAY
	RAILROAD
	ABANDONED RAILROAD OR LOGGING TRAM
	RAILROAD STATION OR PREPAY STATION
	GRADE CROSSING
	RAILROAD ABOVE
	RAILROAD BELOW
	AIRPORT, COMPLETE FACILITIES
	AIRFIELD, LIMITED FACILITIES
	LANDING AREA OR STRIP
	RUNWAYS
	CANAL OR DRAINAGE DITCH
	NARROW STREAM

	WIDE STREAM
	WIDE STREAM WITH DAM
	DAM WITH ROAD
	LAKE, RESERVOIR OR POND
	LAKE, RESERVOIR OR POND WITH DAM
	INTERMITTENT POND
	MARSH
	SWAMP
	HIGHWAY BRIDGE
	HIGHWAY GRADE SEPARATION
	PEDESTRIAN UNDERPASS OR OVERPASS
	STATE BOUNDARY LINE
	COUNTY BOUNDARY LINE
	CIVIL TOWNSHIP BOUNDARY
	FORBES PURCHASE LINE
	LAND SECTION LINE
	SURVEY BY OTHERS
	NATIONAL OR STATE PARK BOUNDARY
	NATIONAL OR STATE FOREST BOUNDARY
	SCHOOL
	COMMUNITY HALL
	POST OFFICE
	POLICE SCHOOL
	GARBAGE DUMP
	AUTO JUNKYARD
	SANITARY FILL
	SEWAGE DISPOSAL PLANT
	POWER PLANT
	POWER SUBSTATION
	RADIO OR TV CONTROL TOWER
	RADAR STATION
	ANIMAL SHELTER
	LOCKED GATE OR FENCE
	DIRECTIONAL ARROW
	TRIANGULATION STATION WITH NAME
	LOCATION OF SYMBOL

	LOCATION OF INSET BOUNDARY WITHIN MAP
	STATE CAPITAL
	OTHER CITY OR VILLAGE
	CORPORATE LIMITS
	DELIMITED URBAN COMPACT AREA BOUNDARY
	PICNIC GROUND
	BATHING BEACH SWIMMING POOL
	CAMP SITE, TRAILER PARK
	TOURIST COURT OR MOTEL
	CAMP OR LODGE
	SMALL STATE PARK
	NATIONAL FOREST PARK
	COUNTY PARK
	WAYSIDE PARK
	BOAT RAMP
	FIRE CONTROL HEADQUARTERS
	LOOKOUT TOWER
	FISH HATCHERY (POND)
	GAME CHECKING STATION
	PISTOL RANGE
	GOLF COURSE
	COUNTRY CLUB
	FIRE STATION
	RACE COURSE, SPEEDWAY
	DOG TRACK, RODEO ARENA
	RECREATION AREA, HISTORIC SITE
	DWELLING
	GROUP OF DWELLINGS
	SEASONAL DWELLING
	SEASONAL DWELLINGS CLOSELY SPACED
	CHURCH
	CEMETERY
	CHURCH AND CEMETERY
	BUSINESS
	GAUGING OR SMALL PUMPING STATION
	DAIRY

FHWA APPROVED: 7-7-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
STANDARD SYMBOLS
FOR KEY MAPS AND PLAN SHEETS

REVISIONS		INITIALS	DATE	Recommended for approval by:
Dates	Descriptions	Designed by	C.D.R.	8-72
4-75	Chgd Index No	Checked by	C.D.R.	8-72
		Quantities by		
		Checked by		
		Supervised by	D.C.B.	

Approved by:

State Design Engineer

DRAWING NO. 1 of 3

INDEX NO. GSS-01

STANDARD SYMBOLS FOR PLAN SHEETS

SYMBOLS	
	STATE LINE
	COUNTY LINE
	TOWNSHIP LINE
	SECTION LINE
	CITY LINE
	BASE OR SURVEY LINE
	RIGHT-OF-WAY 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
	SIDE DRAIN PIPE
	STORM SEWER
	INLET
	MANHOLE
	TIED LONGITUDINAL JOINT
	KEYED LONGITUDINAL JOINT
	DOWELED TRANSVERSE EXPANSION JOINT
	DOWELED TRANSVERSE CONTRACTION JOINT
	TRANSVERSE CONTRACTION JOINT WITHOUT DOWELS
	TRIANGULATION STATION
	BENCH MARK
	POINT OF INTERSECTION
	NORTH POINT
	EDGES OF EXISTING PAVEMENT AND SIDEWALK
	BASE LINE
	CENTERLINE
	PROPERTY LINE
	DELTA ANGLE
	APPROXIMATE
	ROUND
	CURB
	CURB AND GUTTER
	WATER WELL, SPRING
	LEVEE
	RAILROAD MILE POST
	GATE
	PUMP ISLAND
	STORAGE TANK (SURFACE)
	STORAGE TANK (UNDERGROUND)

SYMBOLS	
	MINE OR QUARRY
	BORROW PIT
	CHURCH
	STORE
	RESIDENCE
	BARN
	SCHOOL
	STREAM
	SHORE LINE
	MARSH
	HEDGE
	TREES
	EDGE OF WOODED AREA
	SHRUBBERY
	GROVE OR ORCHARD
	DEFINITION OF SKEW
	CONCRETE
	WOOD
	RATE OF SUPERELEVATION

UTILITY ADJUSTMENT SYMBOLS		
	EXISTING	PROPOSED
POWER POLE		
OVERHEAD POWER CABLE	--OE(7.5KV)--	--OE(7.5KV)--
TELEPHONE POLE		
OVERHEAD TELEPHONE CABLE	--OT(100PR)--	--OT(100PR)--
COMBINATION POLE		
GUY WIRE AND ANCHOR PIN		
BURIED POWER CABLE	---BE(7.5KV)---	---BE(7.5KV)---
ELECTRIC DUCT	==BE4MTD(7.5KV)==	==BE4MTD(7.5KV)==
BURIED TELEPHONE CABLE	---BT(200PR)---	---BT(200PR)---
TELEPHONE DUCT	===BT6MTD===	===BT6MTD===
TOWER		
LIGHT POLE		
GAS MAIN	---6"GM---	---6"GM---
WATER MAIN	---6"WM---	---6"WM---
SANITARY SEWER	---8"SAN---	---8"SAN---
MANHOLE		
WATER METER		
VALVE		
FIRE HYDRANT		
UNDERGROUND CABLE TELEVISION	---UG(CATV)---	---UG(CATV)---
OVERHEAD CABLE TELEVISION	---OH(CATV)---	---OH(CATV)---

FHWA APPROVED: 7-7-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

STANDARD SYMBOLS FOR KEY MAPS AND PLAN SHEETS

REVISIONS		INITIALS	DATE	Recommended for approval by:
Date	Description	Designed by	Checked by	
4-75	Updated & New Index No.	C. D. P.	8-77	 Deputy Design Engineer - Roadways
		Checked by	8-77	
		Quantities by		 State Design Engineer
		Checked by		
		Supervised by	D. C. B.	Drawing No. 2 of 3 Index No. GSS-01

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 (OTHERS)		
PEDESTRIAN DETECTOR (PUSHBUTTON)		
PEDESTRIAN SIGNAL HEAD (POLE OR PEDESTAL MOUNTED)		
CONTROLLER CABINET (BASE MOUNTED)		
CONTROLLER CABINET (POLE MOUNTED)		
WALK - DON'T WALK		W - DW
FLASH		FL.
SIGNAL FACE NUMBER		5
ITEM NUMBER		630-113
SIGNAL LENS		
PROGRAMED SIGNAL HEAD		
MESSENGER WIRE		
POLE TABULATION CROSS REFERENCE		
POLE TABULATION CROSS REFERENCE (JOINT USE POLE)		*
SIGNAL PHASE		

LIGHTING SYMBOLS	
	NEW POLE & LUMINAIRE
	EXISTING POLE & LUMINAIRE
	EXISTING POLE & LUMINAIRE TO BE REMOVED
	FINAL POSITION OF RELOCATED OR ADJUSTED POLE & LUMINAIRE
	NEW HIGH MAST LIGHTING TOWER
	CITY OR UTILITY OWNED LUMINAIRE & POLE
	PVC (POLYVINYL CHLORIDE) LIGHTING CONDUIT AND CONDUCTORS
	RIGID GALVANIZED LIGHTING CONDUIT AND CONDUCTORS
	CONCRETE LIGHTING PULL-BOX
	WATERPROOF LIGHTING PULL-BOX
	LIGHTING DISTRIBUTION POINT
	NEW JOINT USE POLE
	EXISTING USE POLE
	UNDER DECK LIGHTING FIXTURE

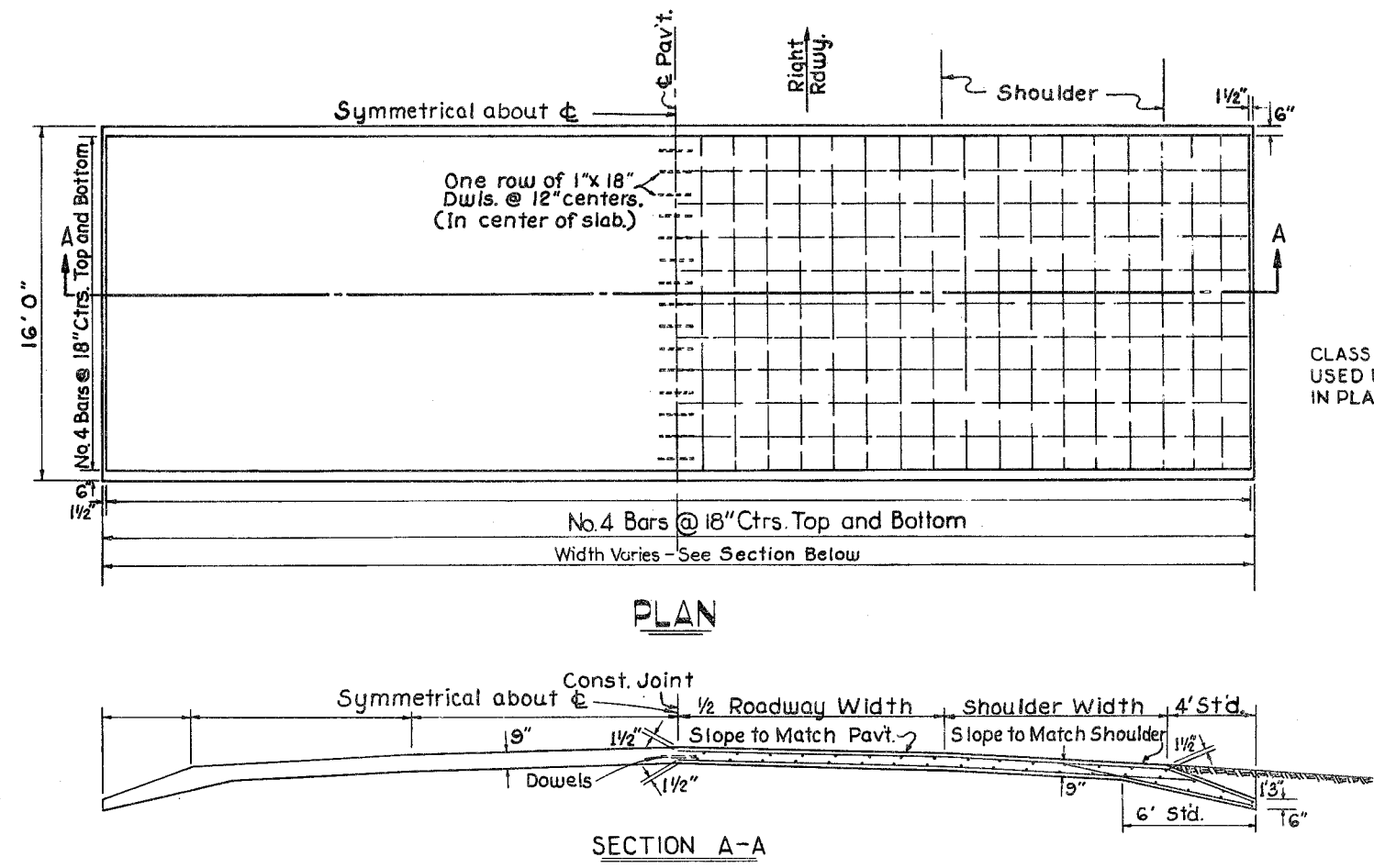
SIGNING AND PAVEMENT MARKING SYMBOLS	
PAVEMENT ARROW	
SINGLE SOLID LINE	
DOUBLE SOLID LINE	
SKIP LINE	
STOP BAR	
TRAFFIC SIGN (POST MOUNTED)	
TRAFFIC SIGN (OVERHEAD)	
SIGN NUMBER	
SIGN ITEM NUMBER	
TRAFFIC FLOW ARROW	

FHWA APPROVED: 7-7-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

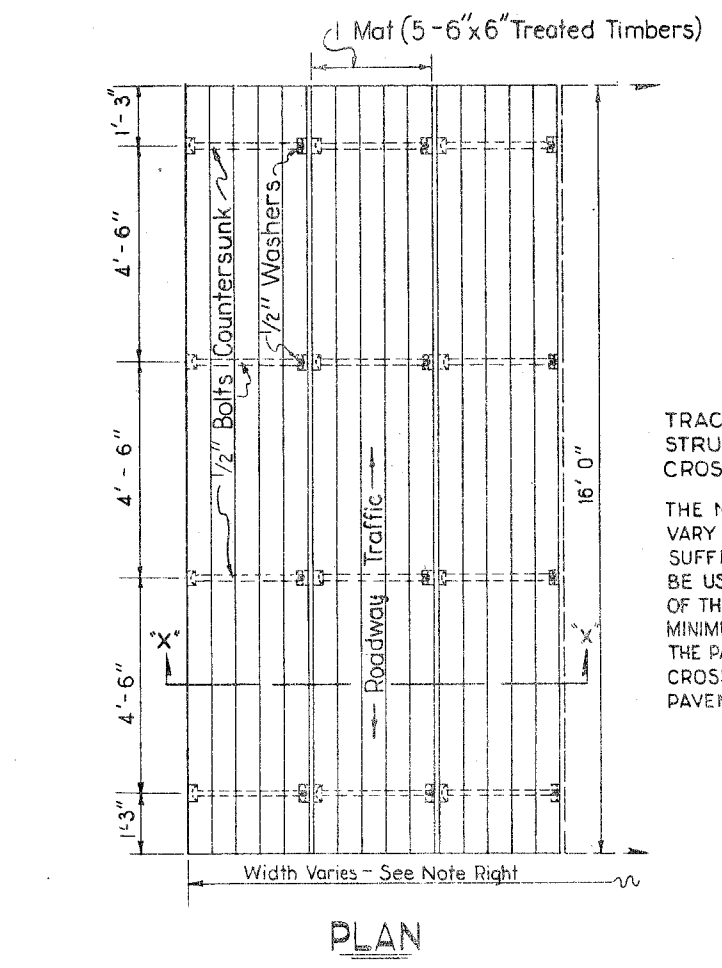
STANDARD SYMBOLS FOR KEY MAPS AND PLAN SHEETS

REVISIONS	INITIALS	DATE	Recommended for approval by:	
DATE DESCRIPTION	Designed by	C. D. P.	8-72	
4-75 Up-dated & New Index No	Checked by	E. O. R.	8-72	Deputy Design Engineer - Roadways
	Quantities by			Approved by:
	Checked by			
	Supervised by	D. C. B.		State Design Engineer
			Drawing No.	Index No.
			3 of 3	GSS-01



DETAIL OF TRACTOR CROSSING, TYPE "A"
 REINFORCED CONCRETE

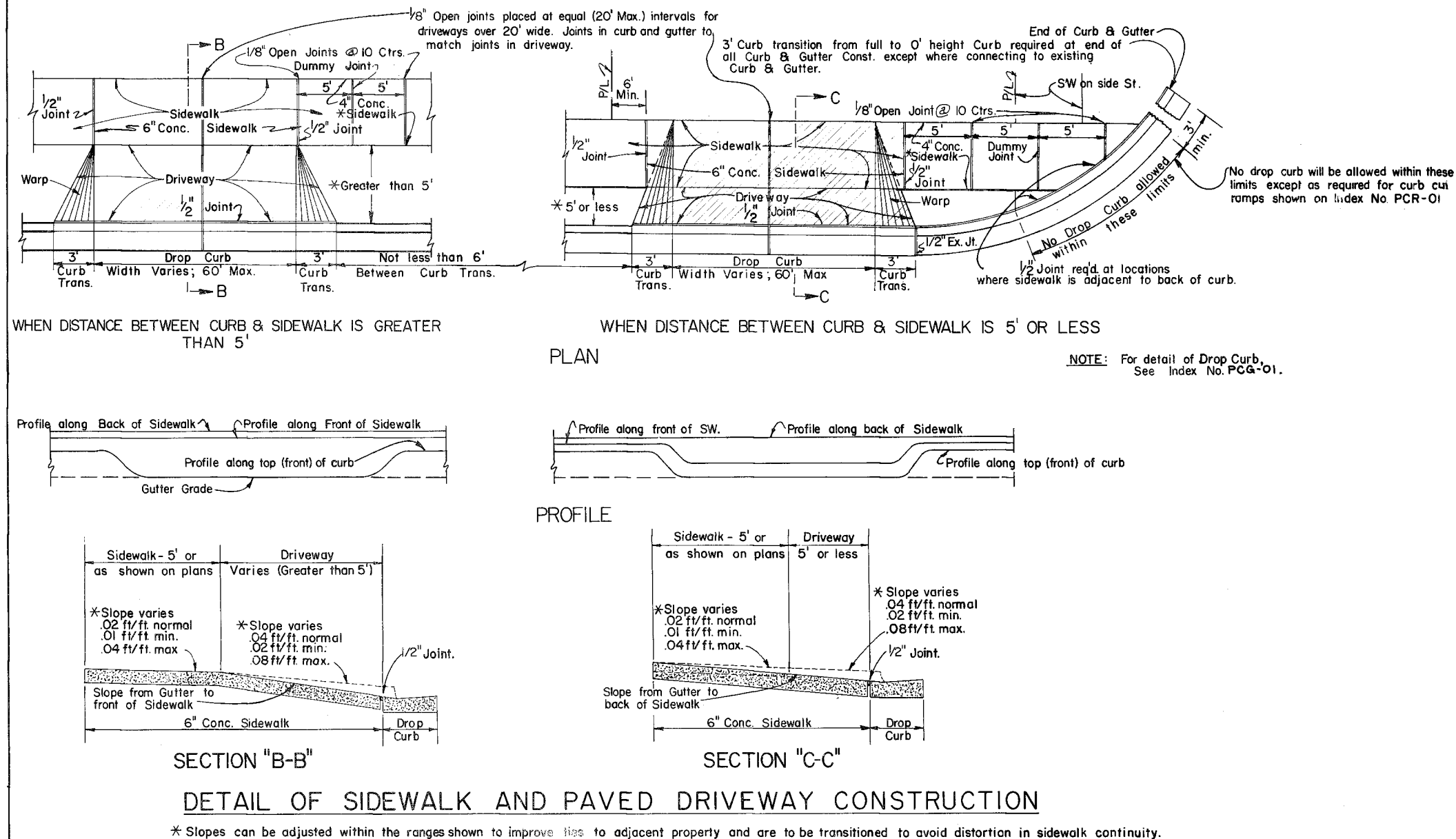
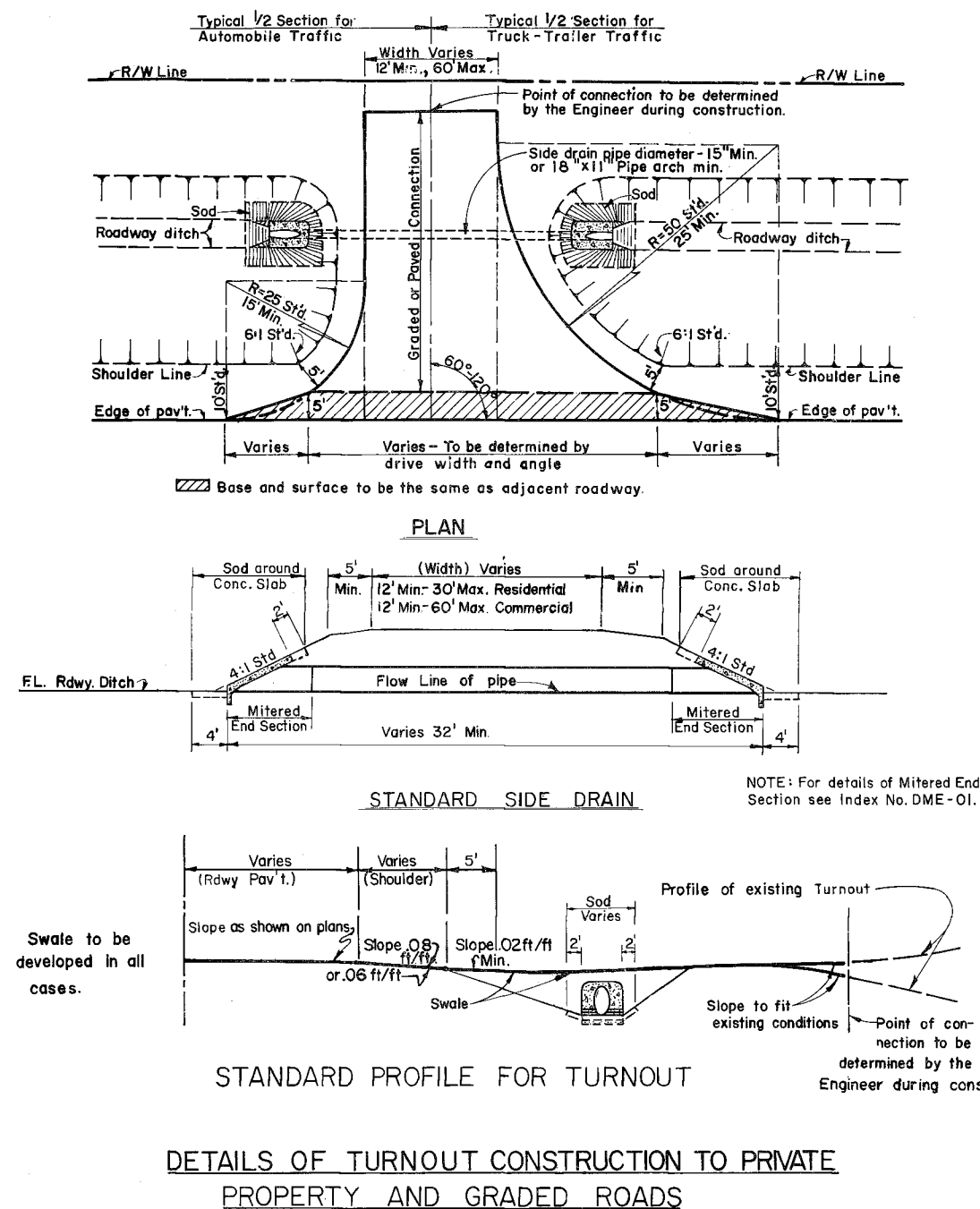
NOTE
 CLASS I CONCRETE IS TO BE
 USED UNLESS OTHERWISE NOTED
 IN PLANS OR SPECIAL PROVISIONS



NOTE
 TRACTOR CROSSING TO BE CON-
 STRUCTED 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 OVERALL WIDTH
 OF THE TRACTOR CROSSING WILL BE A
 MINIMUM OF ONE FOOT GREATER THAN
 THE PAVEMENT WIDTH, THE TRACTOR
 CROSSING WILL BE CENTERED ON THE
 PAVEMENT CENTERLINE.

DETAIL OF TRACTOR CROSSING, TYPE "B"
 TREATED TIMBER

FHWA APPROVED: 3-20-75				
FLORIDA DEPARTMENT OF TRANSPORTATION				
ROADWAY PLANS SECTION				
TRACTOR CROSSINGS				
ROAD NO.		COUNTY		PROJECT NO.
Names		Dates		Recommended For Approval by
Detailed by		L.H. JAN '61		APPROVED BY L.H. Jones Highway Engineer
Checked by		C.D.D. JAN '61		
Quantities by				
Checked by				
Traced by				Drawing No. 1 of 1
				Index No. GTC-01

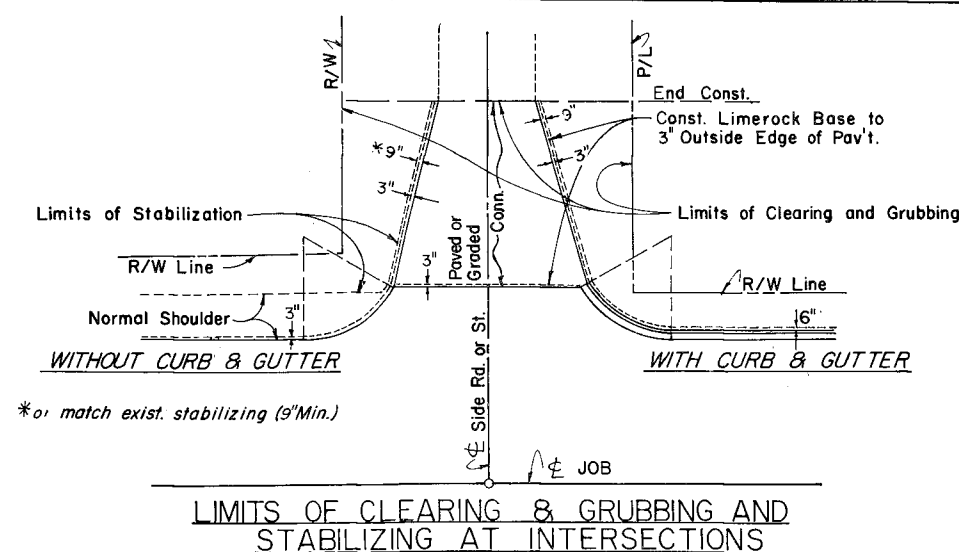


GENERAL NOTES

1. No driveways, turnouts, or side drains are to be constructed without compensation for materials from the owner except for replacement of driveways, turnouts, and/or side drains existing at the time of beginning of const. of the project and if desired by the owner. All new or reconstructed driveways, turnouts, and side drains must conform to the size limits indicated above.
2. In a rural section where the abutting property owner desires installation of turnouts, the Department will construct or will allow the construction of a maximum of two 60' turnouts, to any business establishment or parcel of property, with a minimum of 25' of space between them.
3. In urban areas, at the request of the abutting property owner or his assignee, and to the extent that there is sufficient property, the Department will construct or will allow the construction of up to two entrances (drop curbs) of sixty feet each, maximum, separated by a minimum of six feet of curbing, but curbing shall be required around all corners.
4. In both urban and rural areas, wherever dual driveways are allowed, that portion of the Right-of-Way between the drives and outside the pavement limits of the highway shall be maintained as a "No-Parking-Area" and shall be suitably outlined by such fences, hedges, curbs, or other obstructions as are safe and effective.

GENERAL STABILIZING NOTES

1. No Stabilizing will be required for Paved Turnouts to Private Property.
2. Stable Material may be required for Unpaved Turnouts to Private Property as directed by the Engineer in accordance with Section 102-6 of the Standard Specifications.

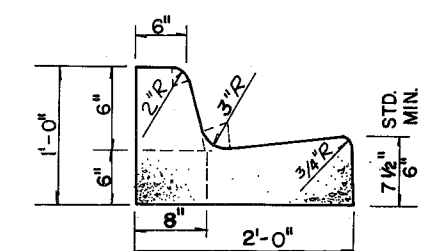
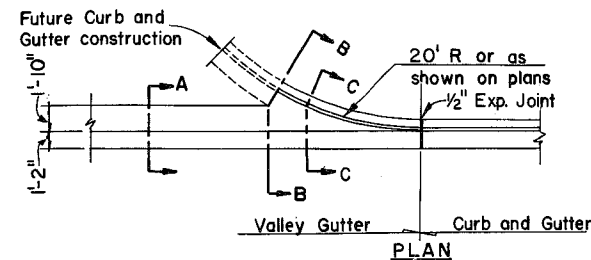


FHWA APPROVED: 12-6-76

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN SECTION

TURNOUT DETAILS

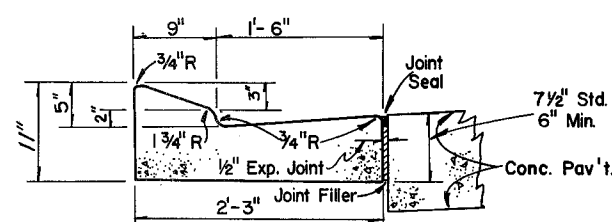
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
9/73	REDRAWN & NEW N°			
11/76	Changed end protection for Side Drain Pipe. Changed limits of C&G and Stab. Rev. Gen. Notes 2 & 3.			
		Names	Dates	APPROVED BY
		Designed by		
		Checked by		
		Quantities by		
		Checked by		
		Submitted by		
		<div style="text-align: center;">Deputy Design Engineer - Roadways</div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">Drawing No.</div> <div style="width: 45%;">Index No.</div> </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 10px;"> <div style="width: 45%; text-align: center;"> <div style="font-size: 2em;">of</div> </div> <div style="width: 45%; text-align: center;"> <div style="font-size: 2em;">GTO-01-1</div> </div> </div>		



CONC. CURB AND GUTTER (6" CURB, 1.5' GUTTER)

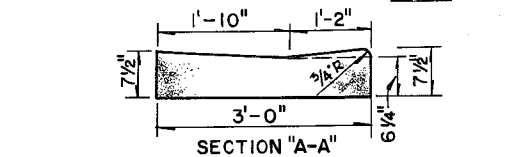
* Note "X": When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement and the thickness of the lip shall be 6", unless otherwise shown on plans.

TYPE F

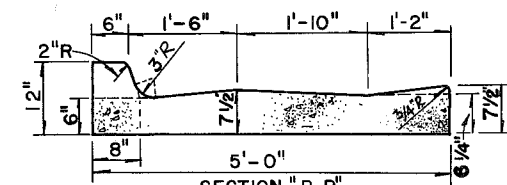


TYPE E

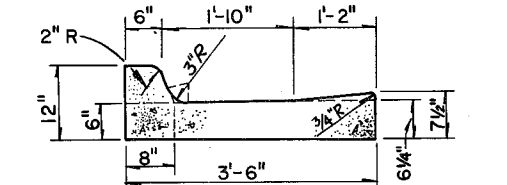
* See Note "X" above



SECTION "A-A"

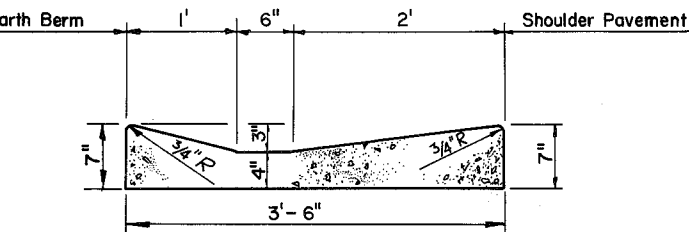


SECTION "B-B"

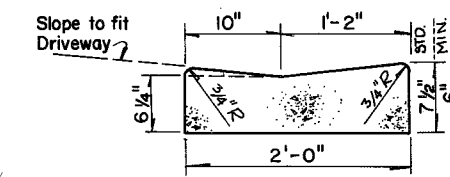


SECTION "C-C"

-DETAIL- VALLEY GUTTER



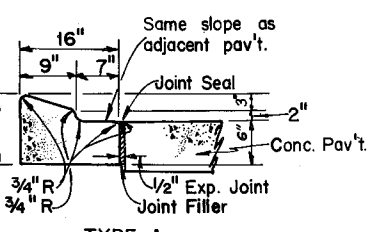
-DETAIL- SHOULDER GUTTER



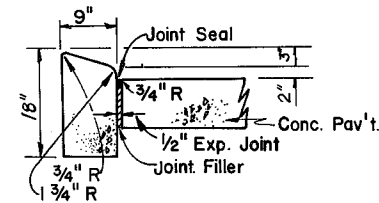
DETAIL DROP CURB

* See note "X" above.

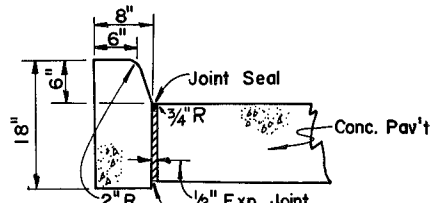
-CONCRETE CURB AND GUTTER DETAILS-



TYPE A



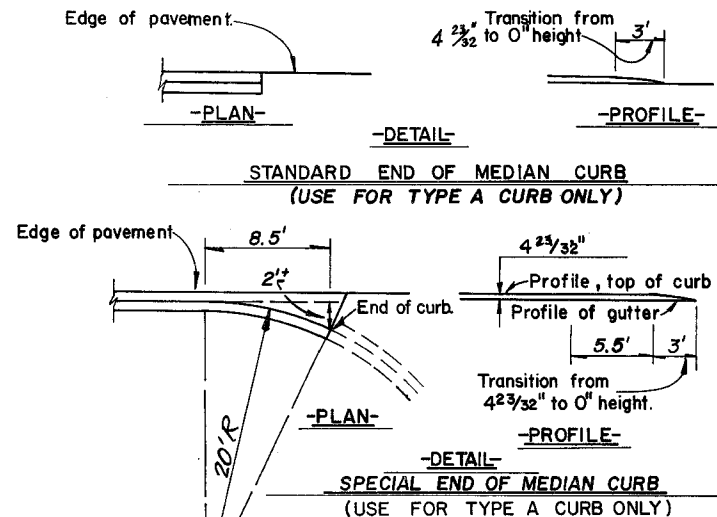
TYPE B



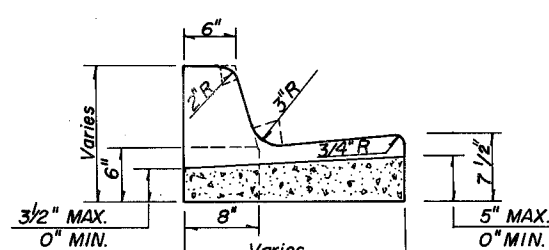
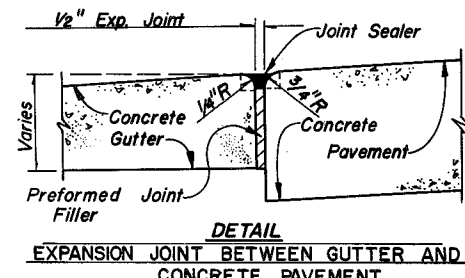
TYPE D

DETAILS OF CONCRETE CURB

Note: When Curb or Curb and Gutter is constructed adjacent to Flexible Pavement, the 1/2" Expansion Joint shown above will not be used.

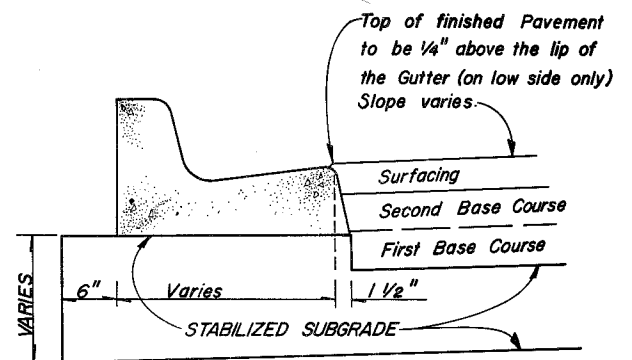
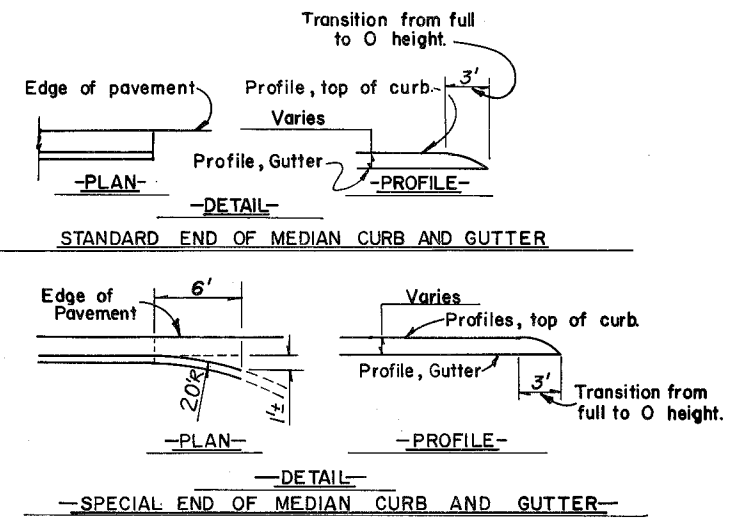


-MEDIAN CURB AND GUTTER ENDINGS-



CONTRACTION JOINT IN CURB OR CURB AND GUTTER JOINTS 10' CENTER TO CENTER MAXIMUM

Note: Joint on Tangent sections and flat curves should match where Curb and Gutter is adjacent to P.C.C. Pavement.



CONSTRUCTION OF CURB AND GUTTER ADJACENT TO FLEXIBLE PAVEMENT

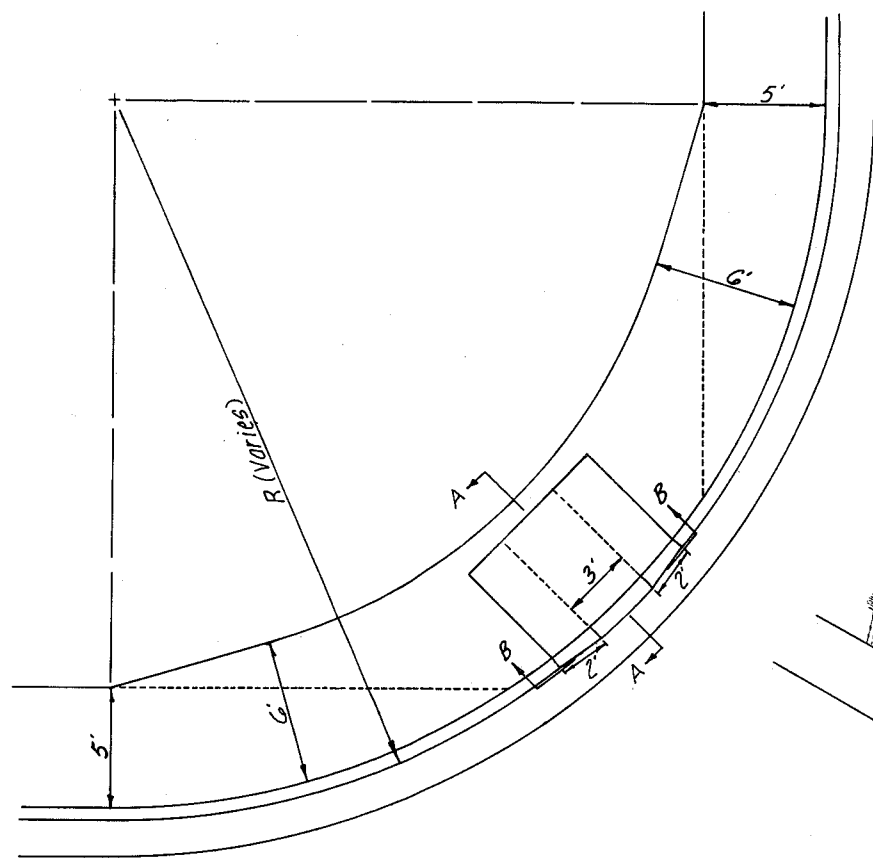
Note: When Curb and Gutter, Shoulder Gutter, Valley Gutter and Drop Curb are constructed adjacent to flexible base, the Face at the lip of the gutter shall be sloped as shown in this detail.

GENERAL NOTES

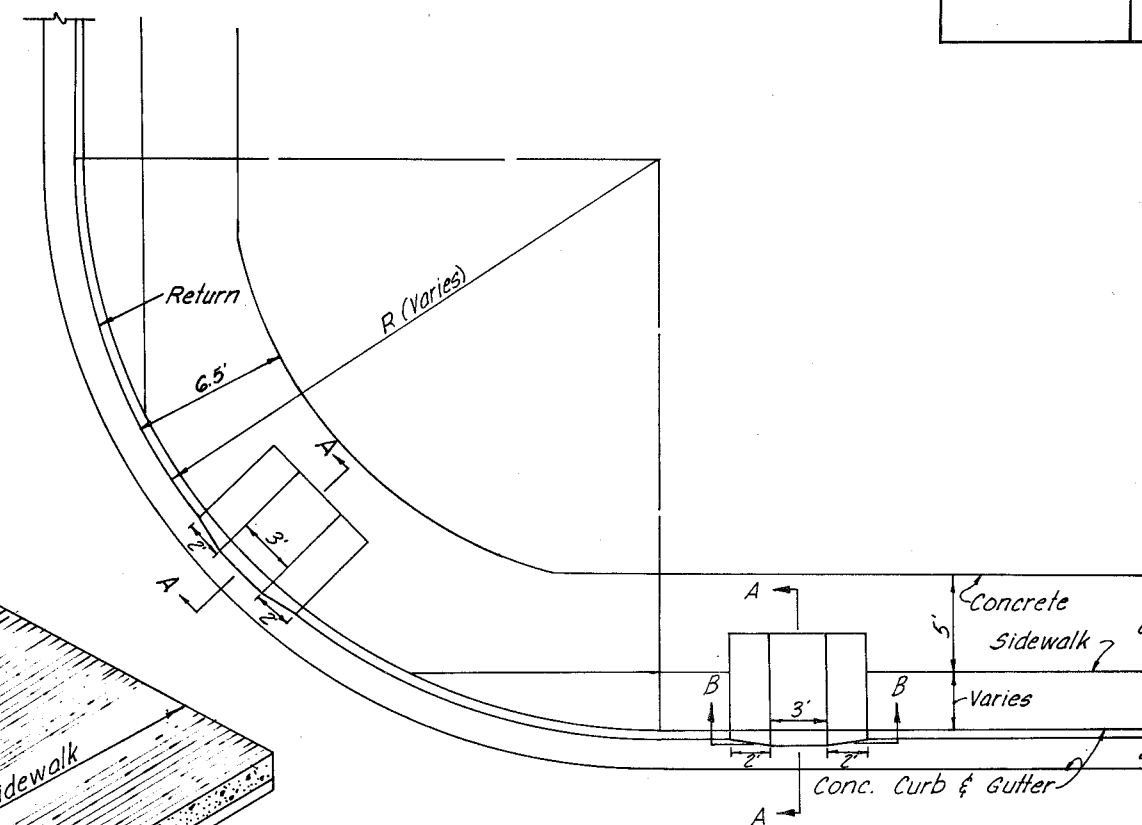
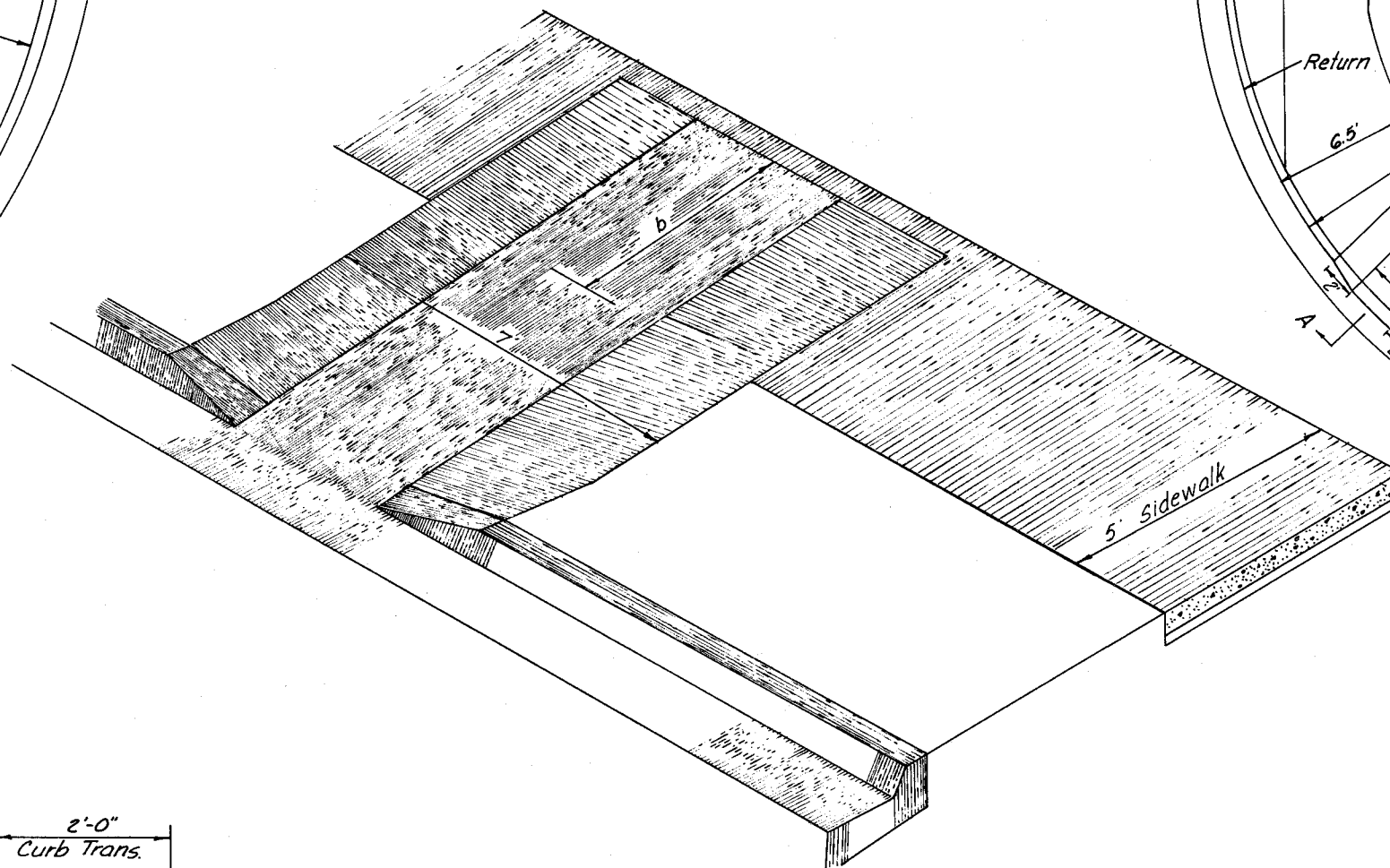
1. For Curb and Gutter and Traffic Separator provide 1/8"-1/4" contraction joints at 10' centers.
2. All Curb and Gutter Details are shown for construction adjacent to Concrete Pavement, unless otherwise noted.

FHWA APPROVED: 7-7-75
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
CURB, CURB AND GUTTER

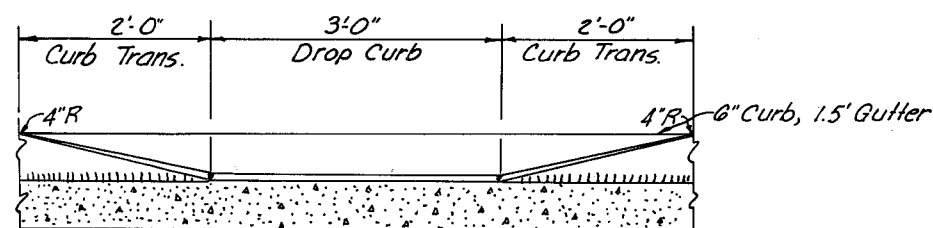
REVISIONS			INITIALS	DATES	Approved by: Deputy Design Engineer - Roadways
Dates	Descriptions	Designed By			
6-73	Redrawn	Checked By			
10-74	Changed Index No.	Quantities By			
		Checked By			
		Supervised by			
DRAWING NO. 1 of 1			INDEX NO. PCG-OI		



PLAN
SHOWING LOCATION TO
MATCH CROSS WALK



PLAN
SHOWING VARIOUS LOCATIONS
TO MATCH CROSS WALKS



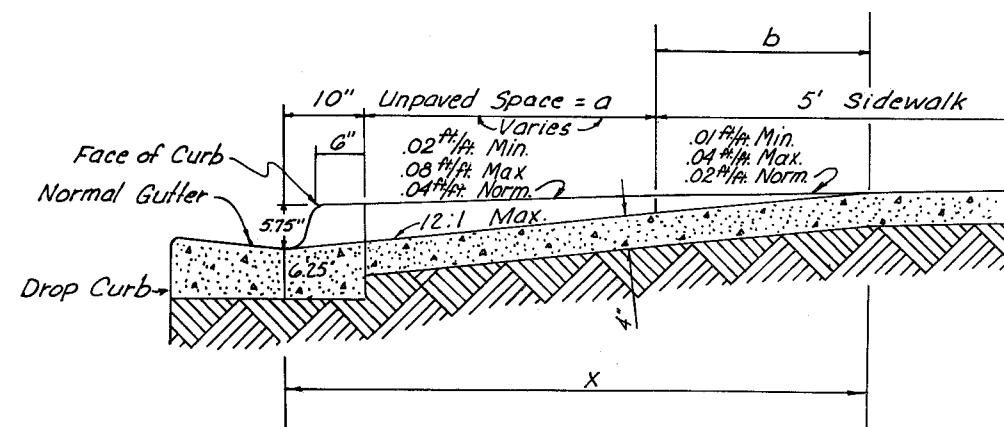
Section B-B

S.W.	a	S.W.+a+10'	X	b
5'	0	5.8	6.8	6.0
6'	0	6.8	6.8	6.0
7'	0	7.8	7.3	6.5
8'	0	8.8	7.3	6.5
5'	2.0	7.8	7.8	5.0
5'	2.5	8.3	8.1	4.8
5'	3.0	8.8	8.3	4.4
5'	3.5	9.3	8.4	4.1
5'	4.0	9.8	8.6	3.8
5'	4.5	10.3	8.7	3.4
5'	5.0	10.8	8.9	3.1

b = distance from front edge of sidewalk to back point of 12:1 slope.
 $b = x - (a + 10')$

- NOTES:
- Ramp surface shall be constructed to conform to Section 522-7.2 of Florida Department of Transportation Standard Specifications. Ramp shall not exceed a maximum slope of 12:1.
 - Curb cut ramps are to be located as shown on the plans.
 - Basis of payment: contract unit price per Sq. Yd. of Concrete sidewalk.
 - Complete curb cut ramps are to be constructed at all locations shown on plans even when sidewalk is not constructed concurrently.

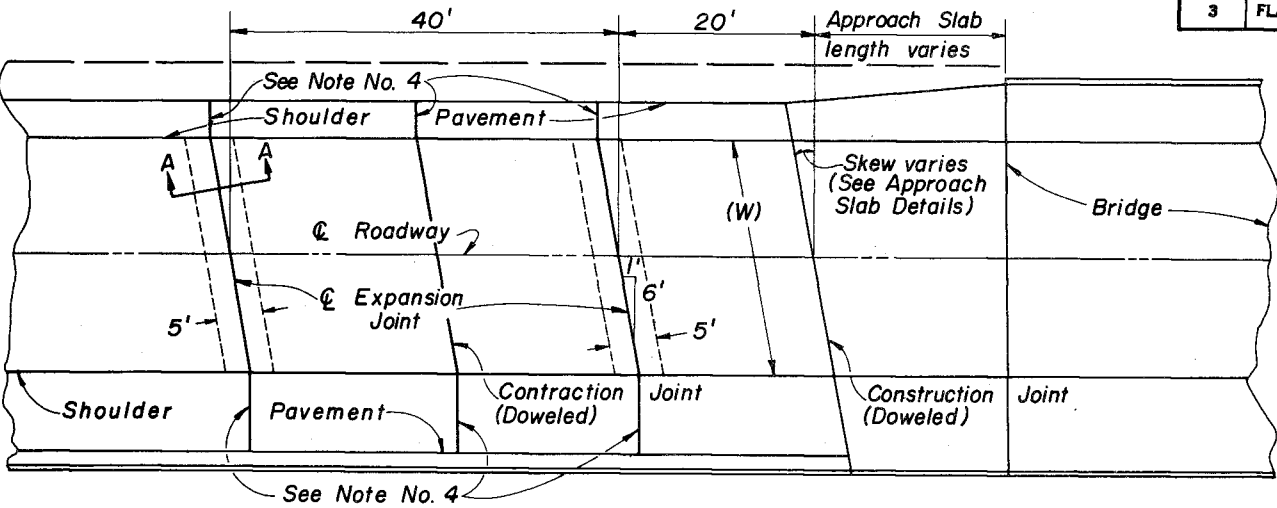
**CURB CUT RAMP
FACILITY FOR PHYSICALLY HANDICAPPED**



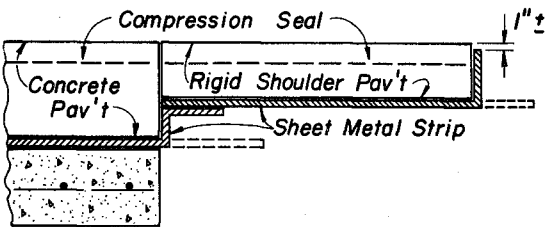
Section A-A

Dates	Descriptions
10-74	Changed Index IV

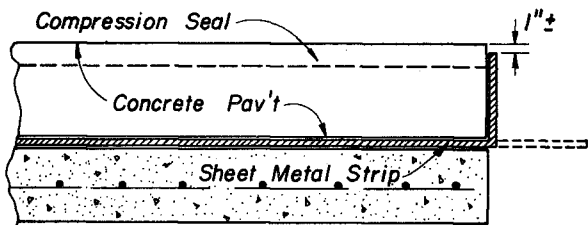
FHWA APPROVED: 8-20-75			
FLORIDA DEPARTMENT OF TRANSPORTATION			
Road Design Section			
CURB CUT RAMP			
FOR PHYSICALLY HANDICAPPED			
Designed by	INITIALS	DATES	Recommended for approval by:
Checked by	DCB	2-74	Deputy Design Engineer - Roadways
Quantities by			Approved by:
Checked by			State Design Engineer
Supervised by	E.H.H.		
DRAWING NO.		INDEX NO.	
1 OF 1		PCR-01	



PLAN



DETAIL SHOWING RIGID SHOULDER PAVEMENT



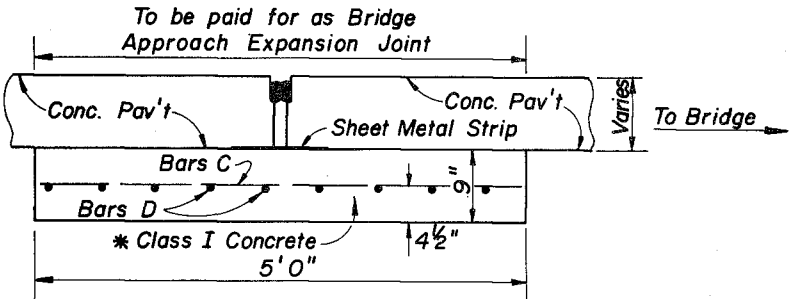
DETAIL SHOWING SHEET METAL STRIP

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, 12" wide and shall be galvanized in accordance with ASTM A-526, Coating Designation G90.

GENERAL NOTES

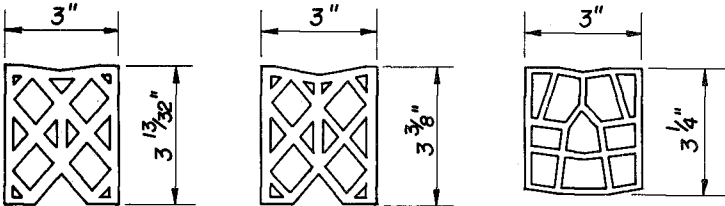
- Quantity of expansion joint to be determined by measurement along the entire length of the joint.
- For additional details see Index No. PJ-01.
- The ϕ of roadway and the ϕ of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the ϕ of the roadway pavement shall be determined.
- When the shoulder pavement is constructed with either concrete or econocrete the expansion joints and contraction joints shall be continued across the shoulder pavement. See detail for construction in rigid shoulder pavement.



REINFORCING STEEL				
MK	Size	Spac.	No. Req.	Lgth.
C	5	6"	Varies	4'-6"
D	5	6"	9	W-4"

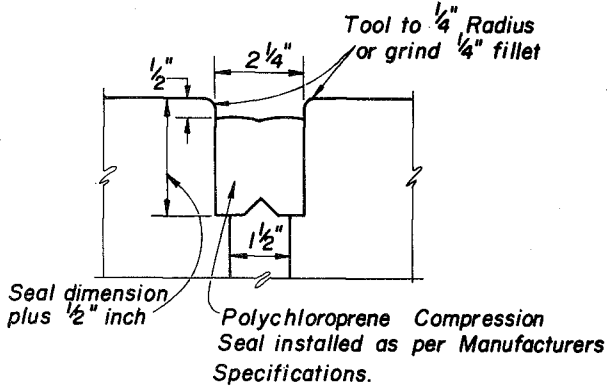
* Finish surface smooth. Cure with heavy coating of wax base white pigmented curing compound. Apply second application immediately prior to placing pavement.

SECTION A-A
THROUGH EXPANSION JOINT



SECTION THRU SEALS

Either of the three Seals shown may be used.



COMPRESSION SEAL DETAIL

NOTE: All contacting surfaces between the compression seal and Concrete shall be thoroughly coated with a lubricating adhesive.

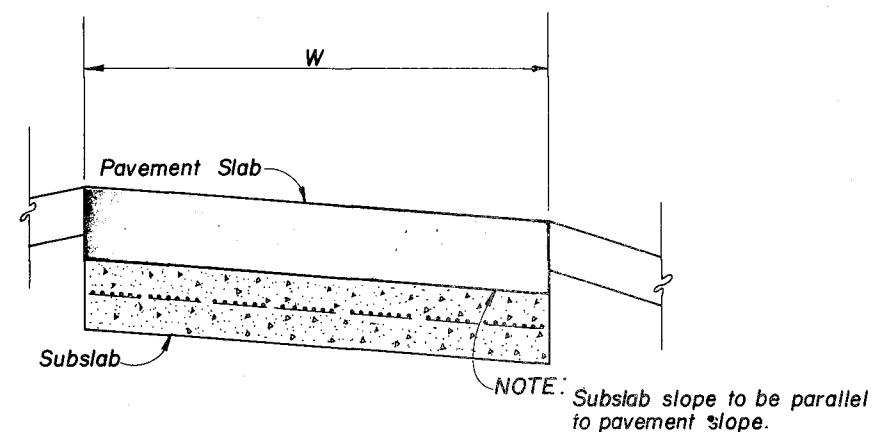
FHWA. APPROVED: 8-16-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

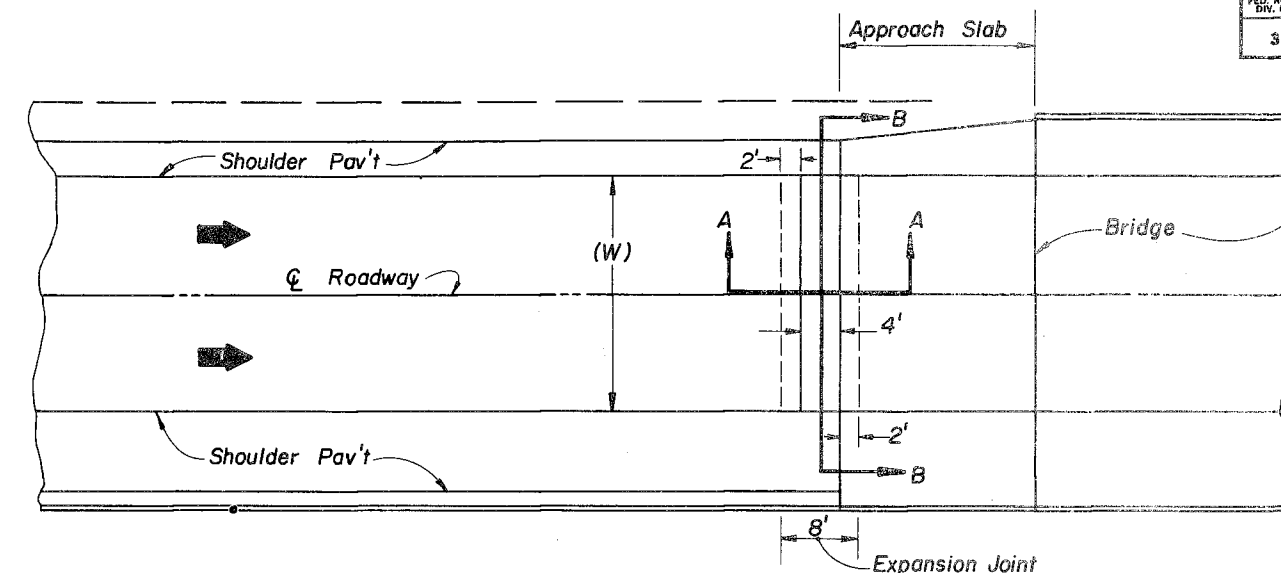
BRIDGE APPROACH EXPANSION JOINT FOR
CONCRETE PAVEMENT

REVISIONS		ROAD NO.		COUNTY		PROJECT NO.	
Dates	Descriptions						
JULY 77	Extended Joint Across Shoulder						
		Designed by	L M F	Dates	6-75	APPROVED BY <i>E. H. Hunt</i> Deputy Design Engineer, Roadways	
		Checked by	S F A	Dates	6-75		
		Quantities by					
		Checked by					
		Supervised by				Drawing No.	Index No.
						1 of 1	PEJ-02-1

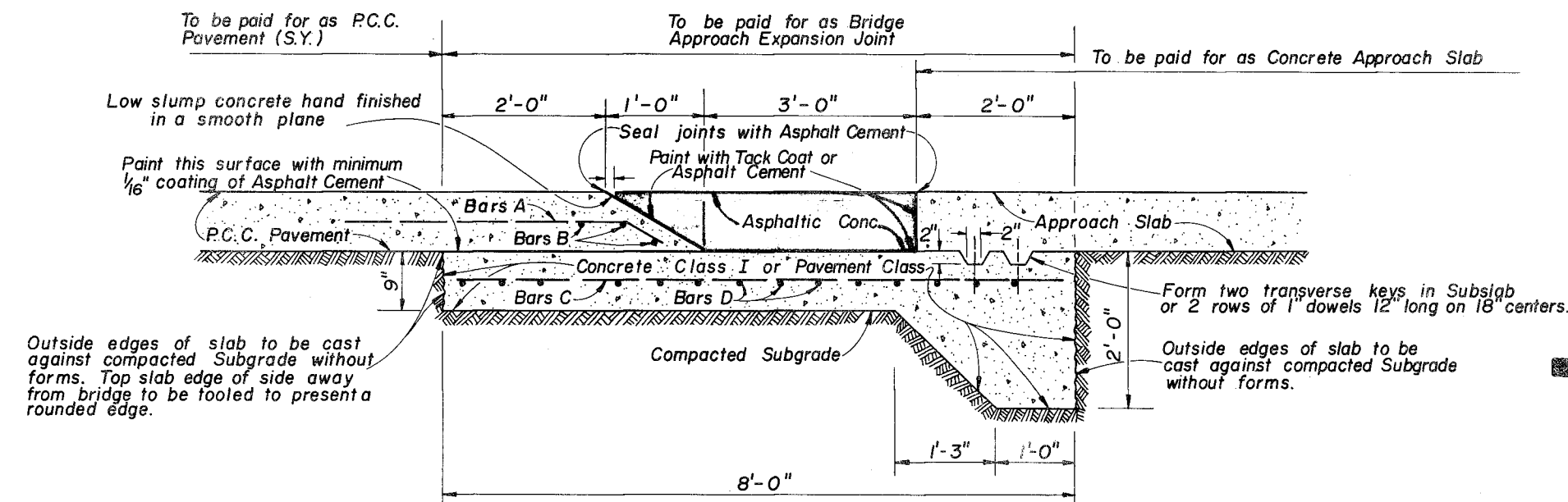
FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.			



SECTION BB



PLAN



SECTION AA

- NOTES:**
- (1) Basis of payment to be linear feet of transverse measure (W) of the complete joint including subslab, asphaltic concrete, portion of pavement slab over the subslab between the pay lines shown in Section AA and all additional excavation.
 - (2) Concrete in subslab to be Class I or Concrete Pavement Class.
 - (3) Portions of bars A which are outside of the indicated pay lines are to be included in the price bid for complete joint.
 - (4) For additional details see Index No. PJ-01.
 - (5) The ϕ of roadway and the ϕ of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the ϕ of the roadway pavement shall be determined.

SCHEDULE OF REINFORCING STEEL					
Mark	Size	Spacing C-C	Length	No. Req'd	Weight / Ft. Transverse Measure lbs
A	5	12"	4'-0" (W)	4.172	
B	5	6"	W-4"	3	3.129
C	4	6"	7'-8" (W)(2)	10.240	
D	4	6"	W-4"	16	10.688

3'-6"
 Bars A
 10'-6" 35°

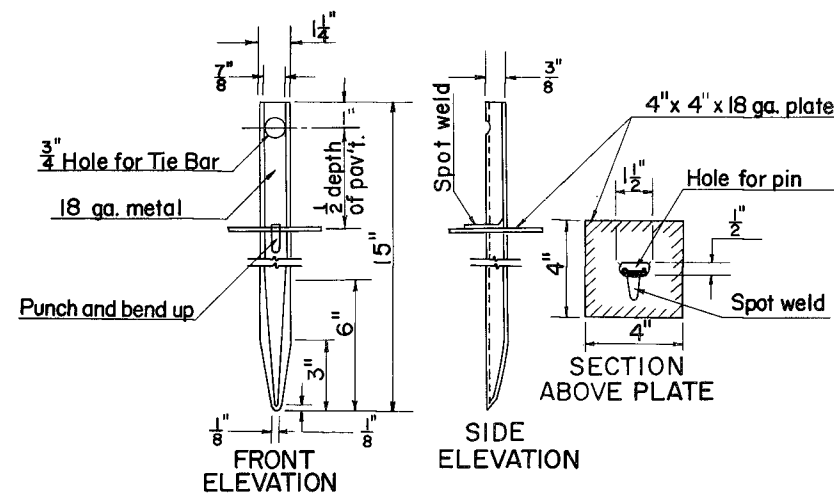
APPROXIMATE QUANTITIES PER FOOT OF TRANSVERSE MEASURE		
	MAIN LINE PAVEMENT DEPTH	
	8"	9"
Cu. Yds. Class I Conc.	0.30	0.30
Lbs. Reinf. Steel	28.23	28.23
Tons Asphaltic Conc.	0.156	0.173
Sq. Yds. P.C.C. Pavement	0.28	0.28

***NOTE:** Beveled portion of pavement slab has been converted to equivalent design depth of main line pavement.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN SECTION			
BRIDGE APPROACH EXPANSION JOINT FOR CONCRETE PAVEMENT			
REVISED	DESCRIPTION	DATE	APPROVED BY
8/67	Moved Joint to Approach Slab		
4/71	Added note No. 5		
3/73	Added Class I Conc.		
10-74	Changed Index No.		
10-77	Revised		

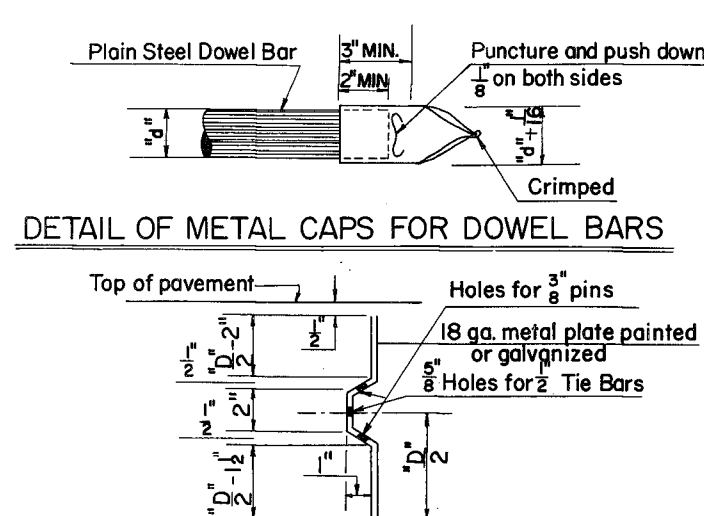
DESIGNED BY	CHECKED BY	QUANTITIES BY	CHECKED BY	SUPERSEDED BY
W.L.B.	E.H.H.	W.L.B.	E.H.H.	h.f.w.
4-65	4-65	4-65	4-65	4-65

DRAWING NO.	INDEX NO.
1 of 1	PEJ-01

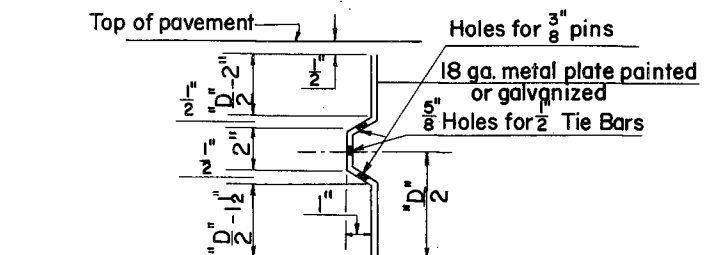


DETAIL OF CHAIR FOR TIE BARS

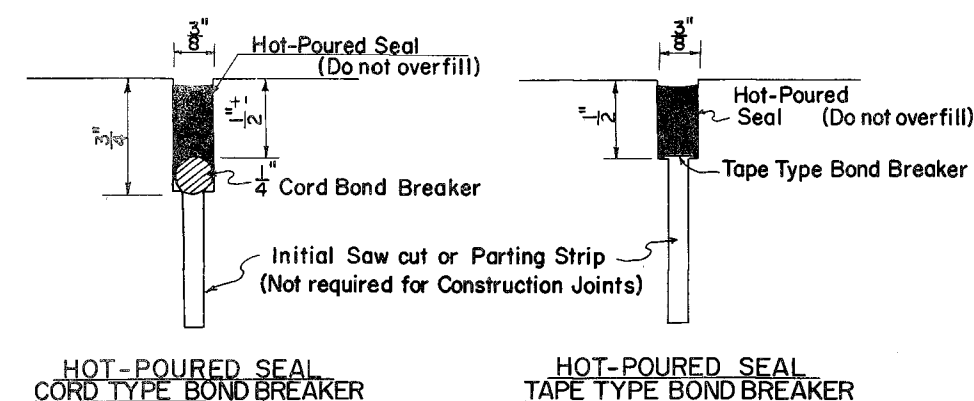
OTHER CHAIR OR SUPPORT MAY BE APPROVED BY THE ENGINEER



DETAIL OF METAL CAPS FOR DOWEL BARS



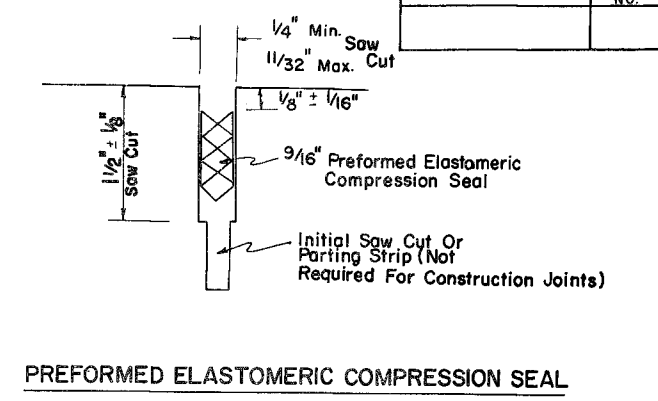
DETAIL OF DEFORMED METAL PLATE



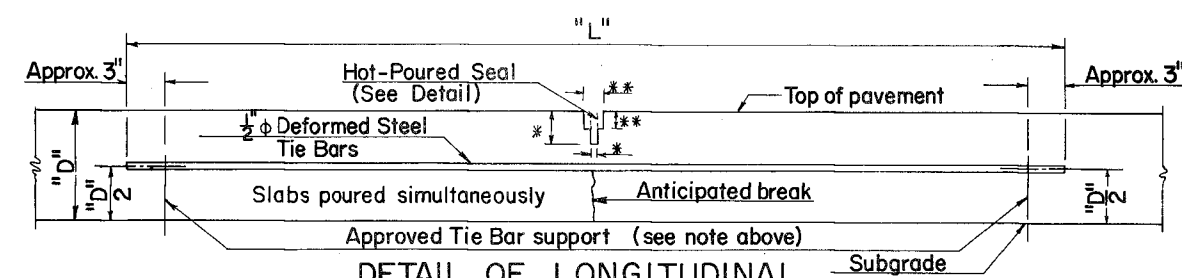
HOT-POURED SEAL CORD TYPE BOND BREAKER

HOT-POURED SEAL TAPE TYPE BOND BREAKER

JOINT SEALANT DETAILS

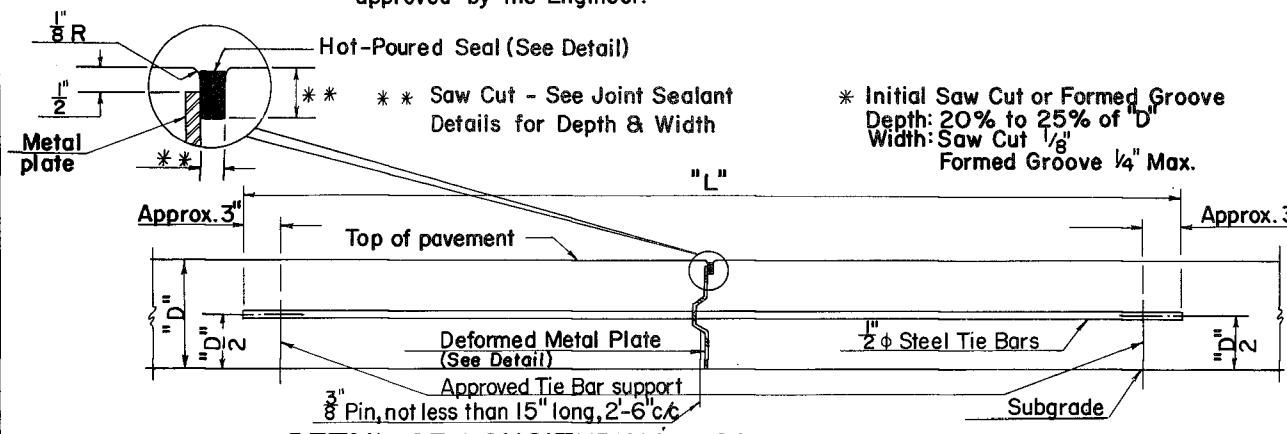


PREFORMED ELASTOMERIC COMPRESSION SEAL



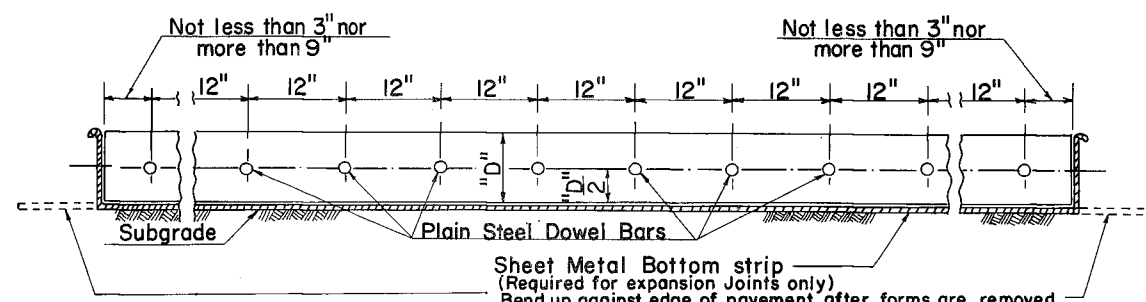
DETAIL OF LONGITUDINAL LANE-TIE JOINT

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

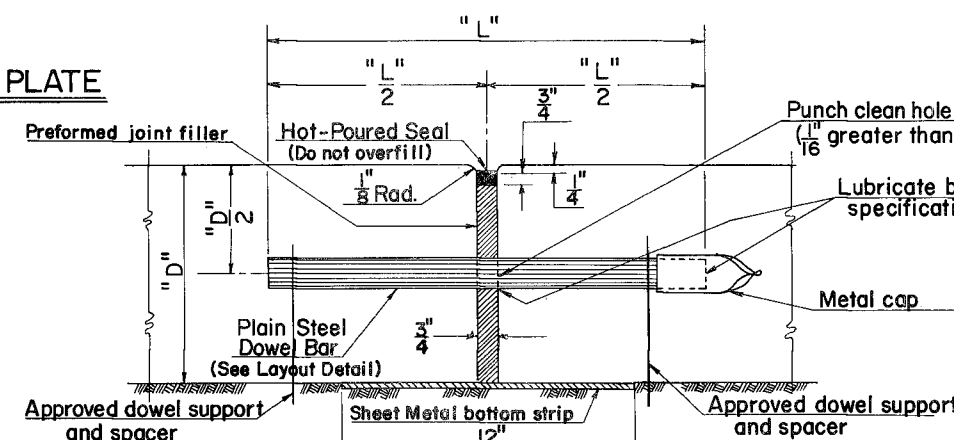


DETAIL OF LONGITUDINAL CONSTRUCTION JOINT

Note: Metal plate optional. Keyway may be formed by bolting shaped timber to the side form or by extrusion from slip-form paver. Alternate keyway shape and tie bar details may be approved by the Engineer.

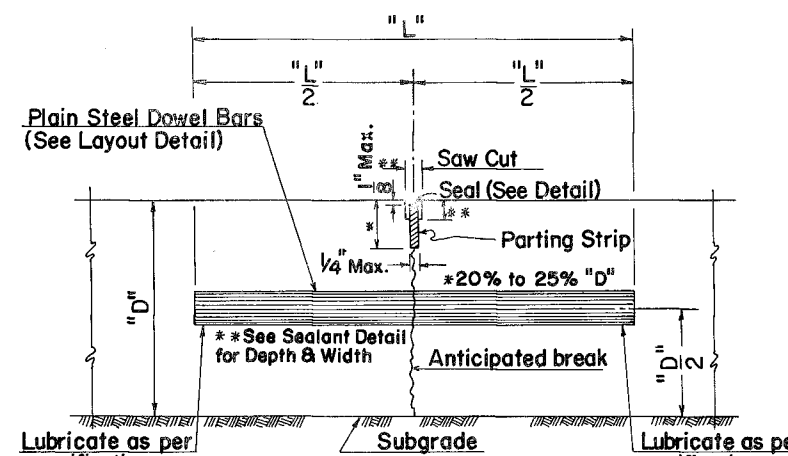


DOWEL BAR LAYOUT



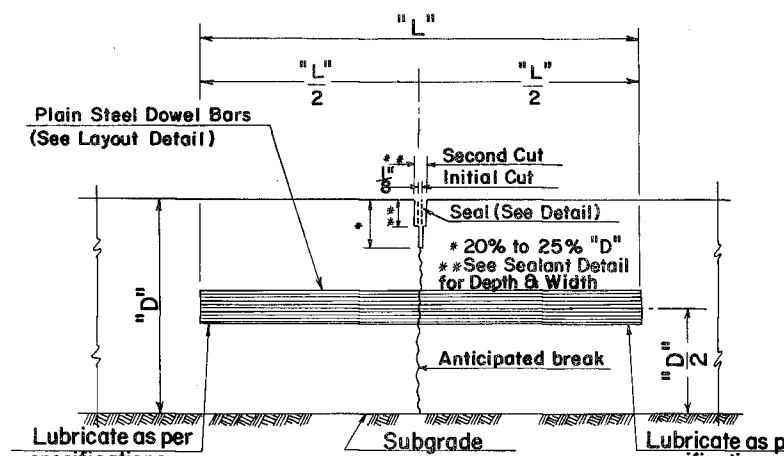
DETAIL OF TRANSVERSE EXPANSION JOINT

EXPANSION JOINTS TO BE PLACED AT JUNCTIONS WITH APPROACH SLAB, AT STREET INTERSECTIONS AND OTHER LOCATIONS INDICATED IN DETAIL PLANS.



DETAIL OF TRANSVERSE CONTRACTION JOINT, VIBRO CAST METHOD

CONTRACTION JOINTS TO BE SPACED AT 20' INTERVALS. DOWELS REQUIRED ONLY AT FIRST FIVE JOINTS ADJACENT TO EXPANSION JOINTS OR END OF PAVEMENT EXCEPT AS OTHERWISE INDICATED IN DETAIL PLANS.



DETAIL OF TRANSVERSE CONTRACTION JOINT, SAWED METHOD

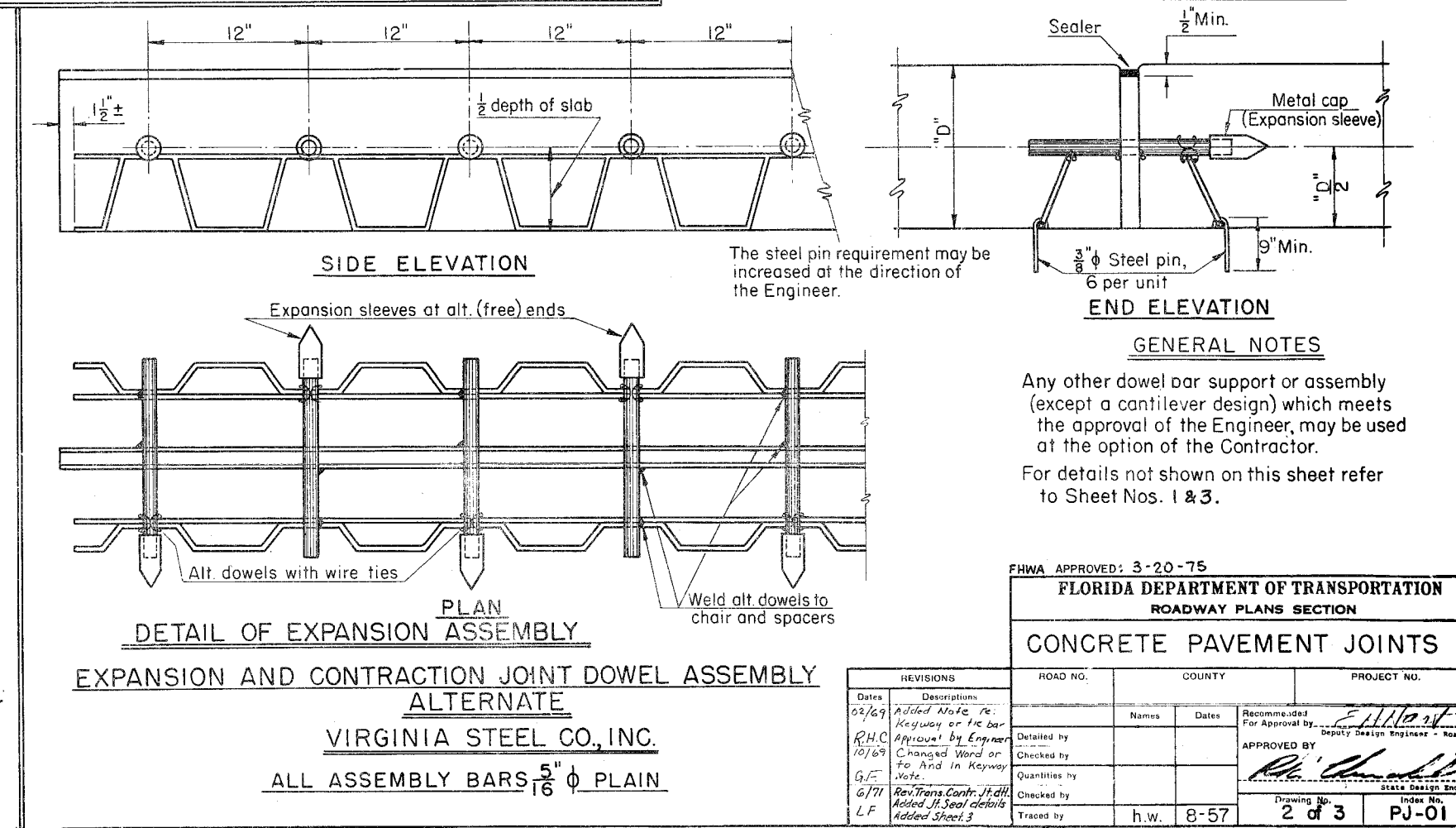
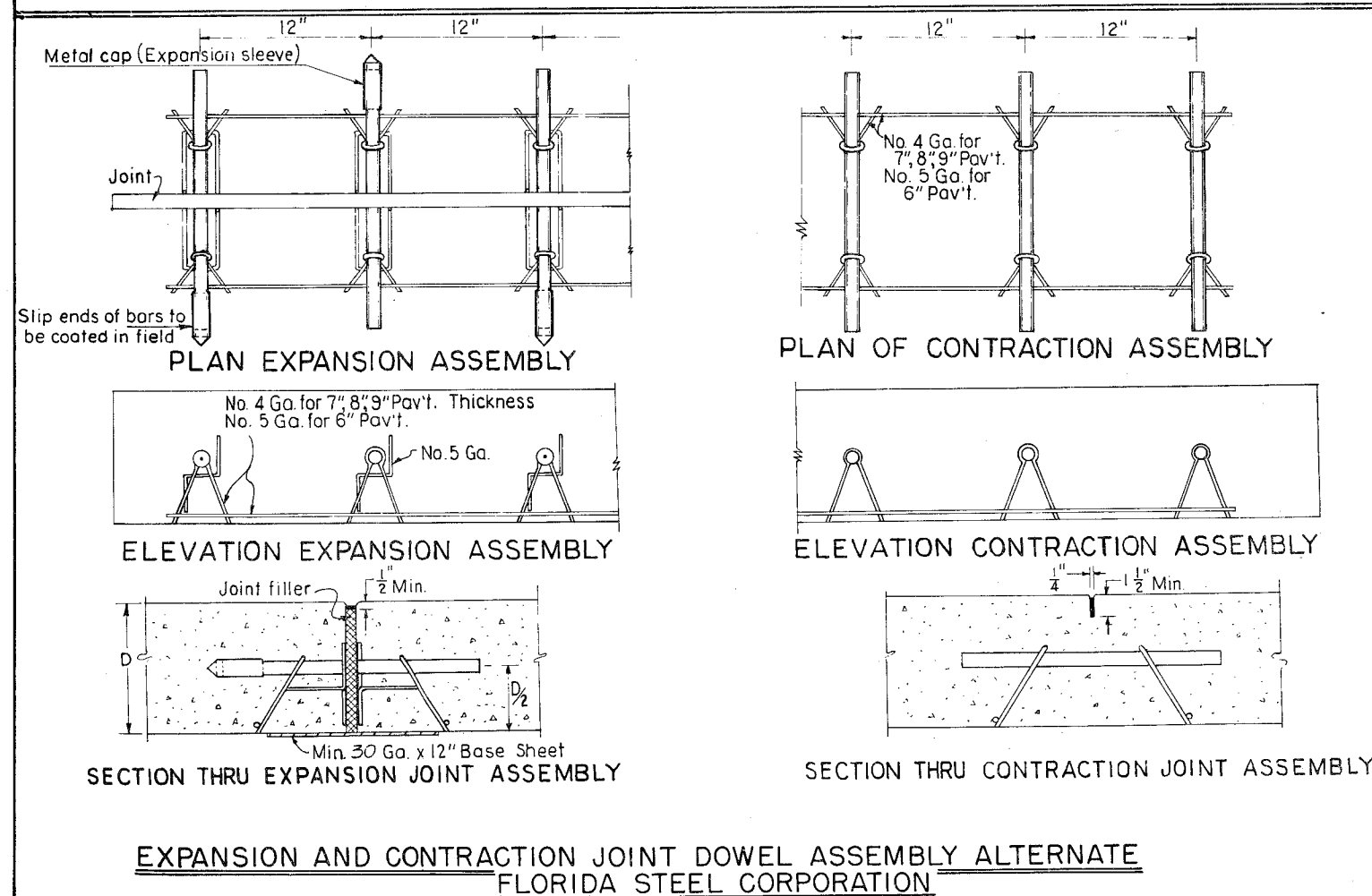
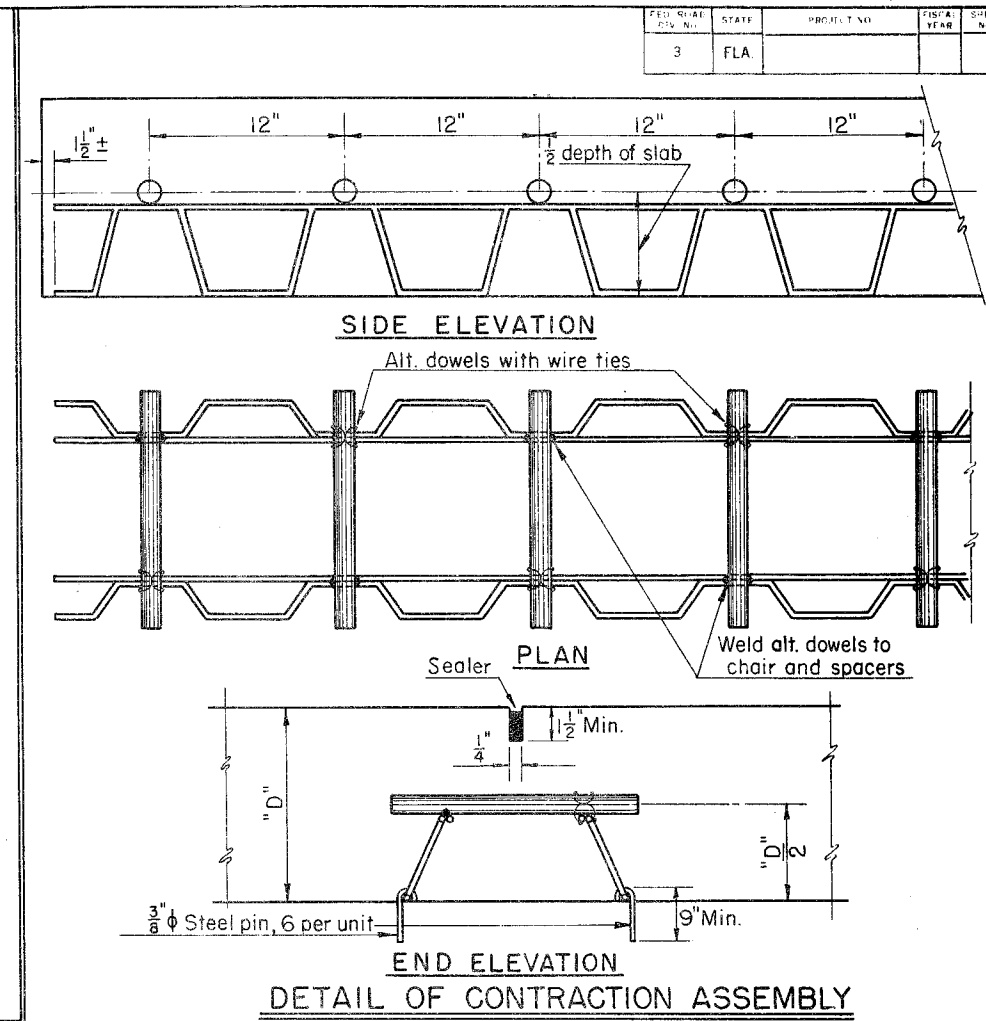
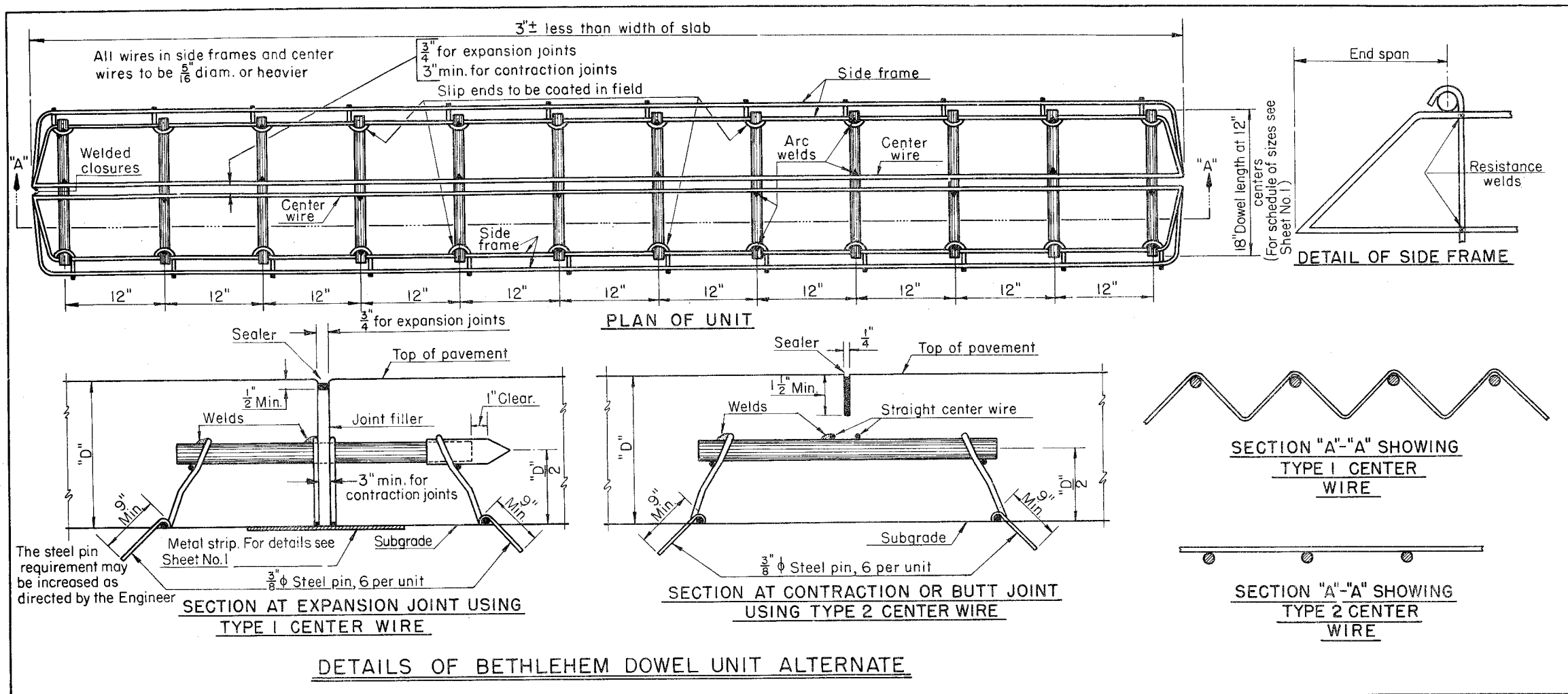
MAX. SPACING FOR 1/2" Ø TIE BARS		
PAVEMENT THICKNESS ("D")	LENGTH OF BARS (inches)	SPACING OF BARS (inches)
6"	24"	47"
7"	24"	40"
8"	24"	35"
9"	24"	31"

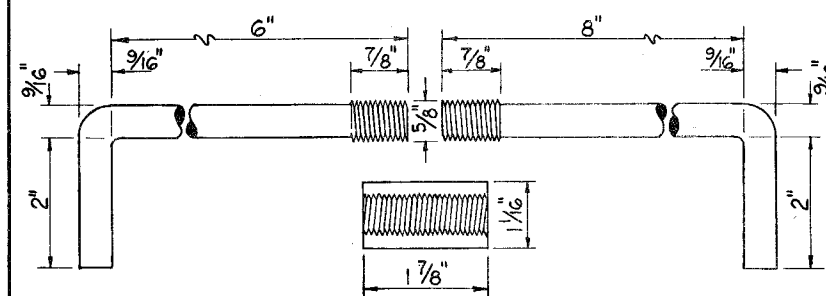
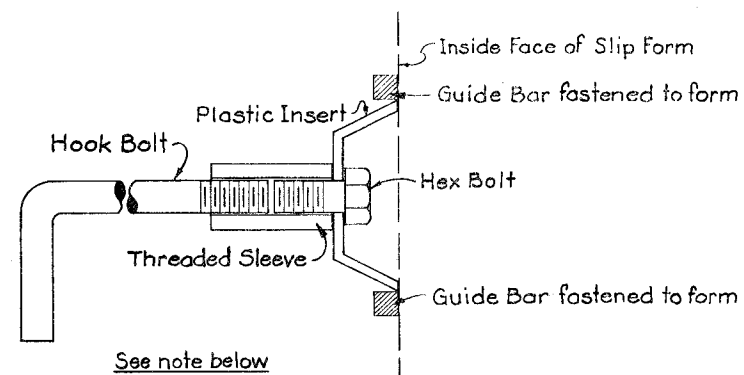
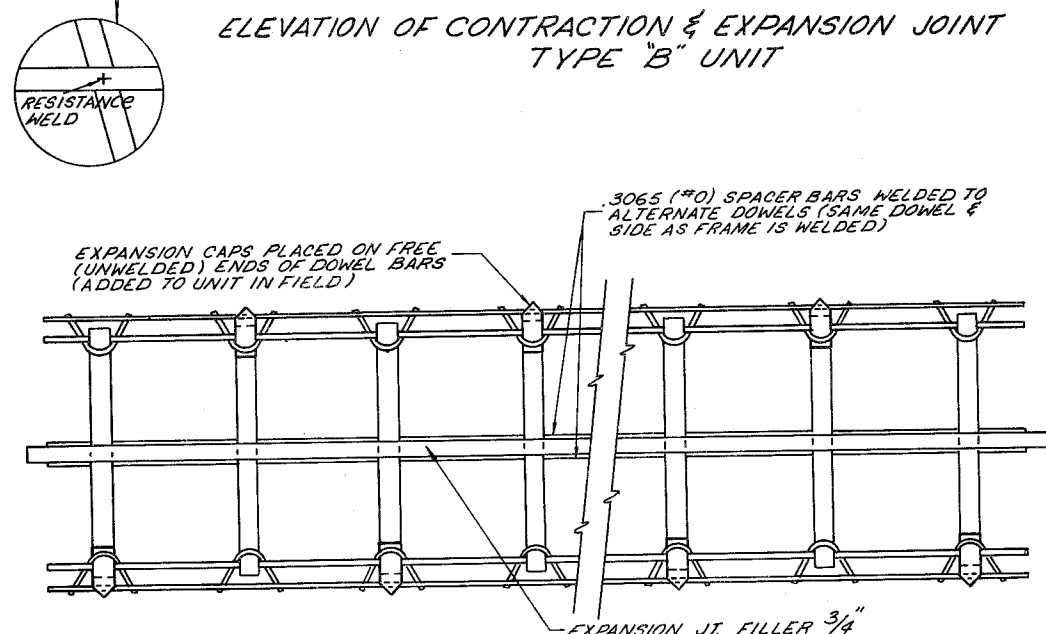
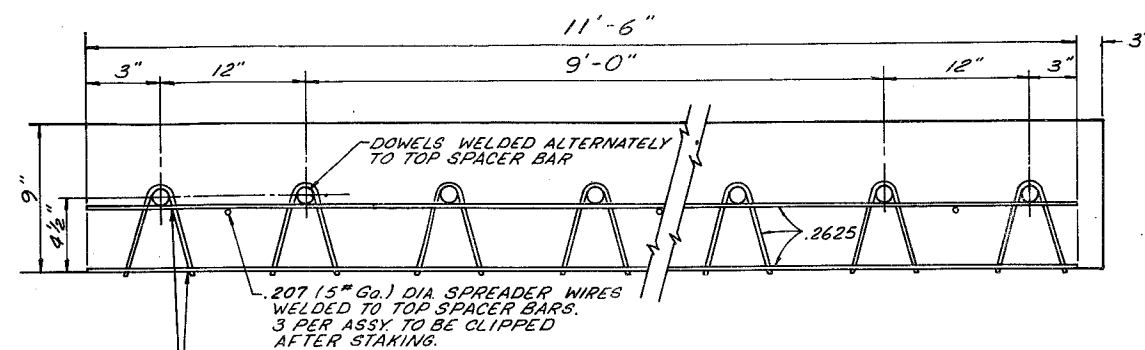
DOWEL REQUIREMENTS		
PAVEMENT THICKNESS ("D")	DOWEL dia. (inches)	DOWEL LENGTH "L" (inches)
6"	3/4"	18"
7"	1"	18"
8"	1"	18"
9"	1"	18"

* Provide 1 1/4" diam. dowels at Expansion joints and Butt Construction joints.

FHWA APPROVED: 3-20-75
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
CONCRETE PAVEMENT JOINTS

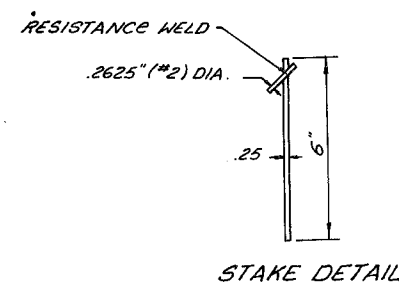
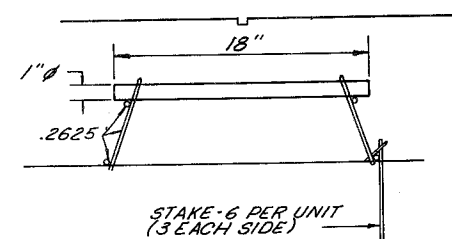
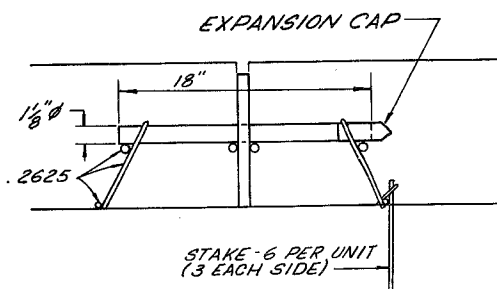
REVISIONS		INITIALS	DATES	Recommended for approval by
Dates	Descriptions	Designed by	Checked by	
9-73	Changed Joint Details (Redrawn)			Deputy Design Engineer - Roadways
8-73	Changed Index			
10-74	Changed Index			Approved by
				State Design Engineer
				DRAWING NO. 1 OF 3
				INDEX NO. PJ-01



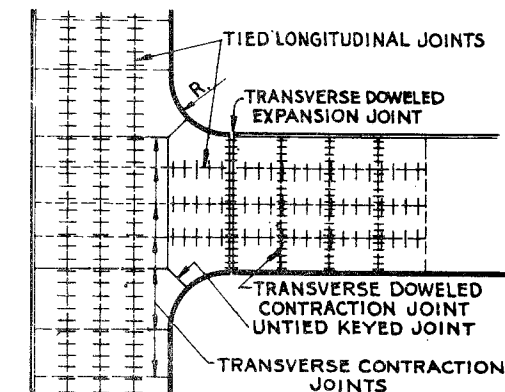
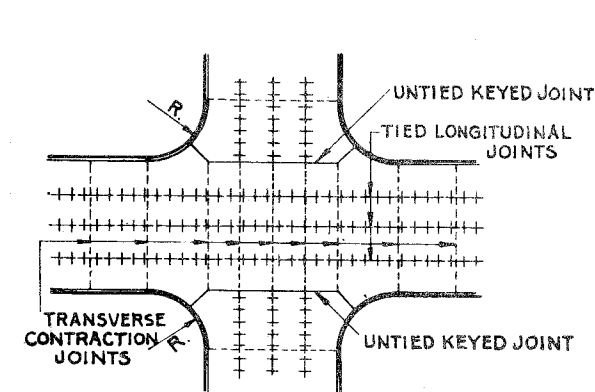
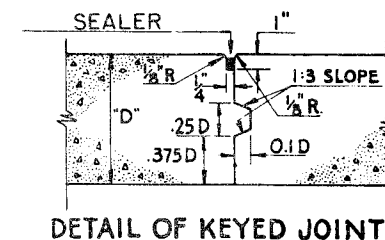
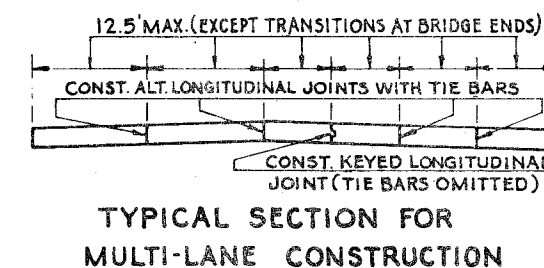


DETAIL FOR STEEL HOOK BOLT ASSEMBLY

NOTE: After the concrete has set to the extent that the assembly will retain its shape, the excess 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.



EXPANSION AND CONTRACTION JOINT DOWEL ASSEMBLY ALTERNATE



GENERAL NOTES

- GENERAL NOTES
1. LONGITUDINAL JOINTS WILL NOT BE REQUIRED FOR SINGLE LANE PAVEMENT 16' OR LESS IN WIDTH.
 2. WHEN PAVEMENT WIDTH NECESSITATES FIVE OR MORE LONGITUDINAL JOINTS PROVIDE ONE OR MORE UNTIED BUT KEYED JOINTS, (NO JOINT SHALL BE TIED THAT IS MORE THAN TWO LANES FROM A FREE EDGE OR FREE JOINT.)
 3. ARRANGEMENT OF LONGITUDINAL JOINTS NOT SHOWN ON TYPICAL SECTION TO BE AS DIRECTED BY THE ENGINEER.
 4. ALL MANHOLES, METER BOXES AND OTHER PROJECTIONS INTO THE PAVEMENT SHALL BE BOXED-IN WITH $\frac{1}{2}$ " PREFORMED EXPANSION JOINT MATERIAL.

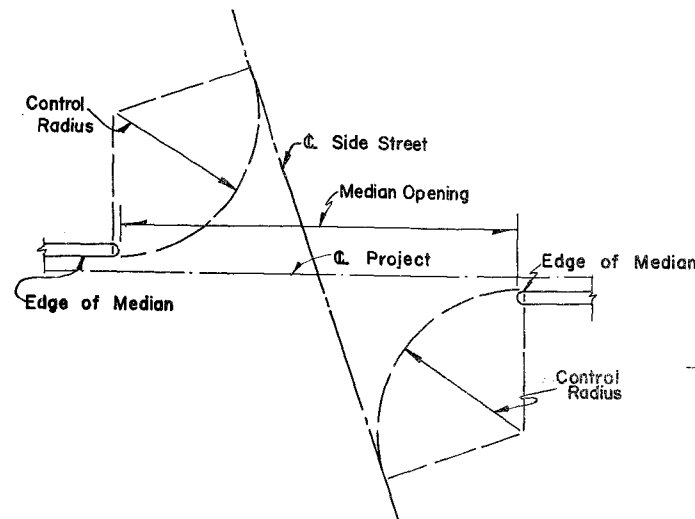
DETAIL OF JOINT ARRANGEMENT

FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

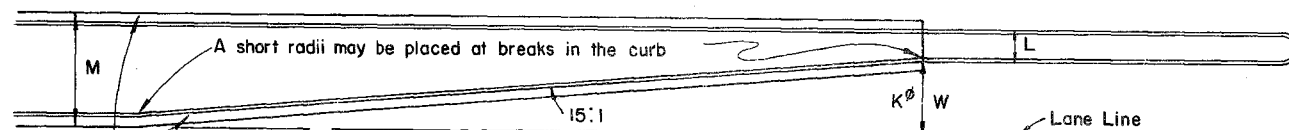
CONCRETE PAVEMENT JOINTS

REVISIONS		ROAD NO.	COUNTY		PROJECT NO.	
Dates	Descriptions		Names	Dates	Recommended For Approval by	
		Detailed by	LMF	6-71	APPROVED BY	<i>Ed Hart</i> Deputy Design Engineer - Road
		Checked by				<i>Ed Hart</i> Deputy Design Engineer - Road
		Quantities by				<i>Ed Hart</i> Deputy Design Engineer - Road
5-75	Added Joint Dowel Assembly Alternate	Checked by			Drawing No.	Index No.
		Traced by			3 of 3	PJ-01

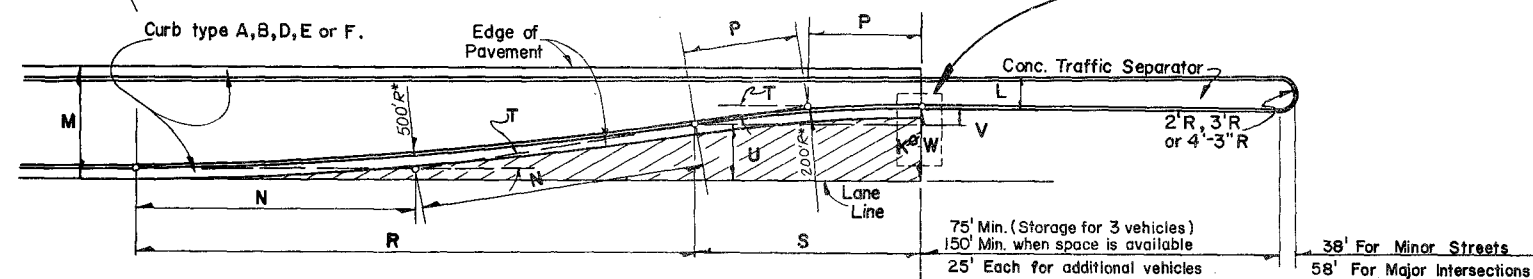


METHOD OF DETERMINING MEDIAN OPENINGS AT SKEWED SIDE STREETS

DESIGN VEHICLE	MEDIAN OPENING 90°	CONTROL RADIUS EDGE OF LANE
P	76	40'
SU	96	50'
WB-40, WB-50	146	75'



MEDIAN STORAGE LANE-ALT. I

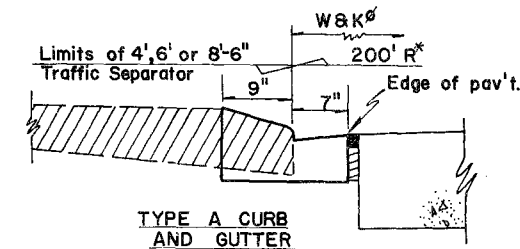


* Radii are measured from face of curb, regardless of curb type. These radii are minimums recommended for urban construction. For rural primary construction, the radii are to be in conformity with the design speed of the highway where practicable.
 # Dimensions K and W are identical except when median curb is type D or curb and gutter type F.
 Dimension K is from lane line to the face of curb. Dimension W is from lane line to traffic separator.

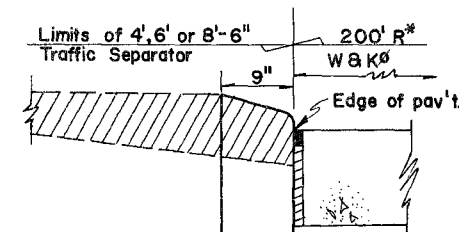
-DETAILS OF MEDIAN STORAGE LANE- ALT II
 NOTE: HACHURED PORTION INDICATES AREA GIVEN IN TABLE BELOW

TABLE OF DIMENSIONS AND QUANTITIES FOR MEDIAN STORAGE LANES												
L	M	CURB TYPE	N	P	R	S	T	U	V	K [#]	W	AREA SQ. FT.
4'	15'-6"	A	43.12'	17.25'	85.60'	34.24'	09° 51' 25.3"	7.96'	2.95'	10'-11"	10'-11"	529.8
		B	45.50'	18.20'	90.26'	36.10'	10° 24' 00.1"	8.21'	3.29'	11'-6"	11'-6"	622.1
		D	45.50'	18.20'	90.26'	36.10'	10° 24' 00.1"	8.38'	3.12'	11'-6"	11'-6"	622.0
		E	39.09'	15.63'	77.68'	31.07'	08° 56' 16.7"	7.57'	2.43'	10'-0"	10'-0"	395.2
		F	39.84'	15.94'	79.18'	31.67'	09° 06' 42.8"	7.81'	2.36'	10'-4"	10'-2"	418.6
4'	17'-6"	A	47.14'	18.86'	93.44'	37.38'	10° 46' 16.8"	9.39'	3.52'	12'-11"	12'-11"	690.2
		B	49.34'	19.73'	97.72'	39.09'	11° 16' 15.0"	9.64'	3.86'	13'-6"	13'-6"	790.5
		D	49.34'	19.73'	97.72'	39.09'	11° 16' 15.0"	9.81'	3.69'	13'-8"	13'-6"	790.4
		E	43.46'	17.39'	86.28'	34.51'	09° 56' 10.9"	9.00'	3.00'	12'-0"	12'-0"	542.1
		F	44.15'	17.66'	87.63'	35.05'	10° 05' 35.7"	9.24'	2.93'	12'-4"	12'-2"	568.0
6'	17'-6"	A	43.12'	17.25'	85.60'	34.24'	09° 51' 25.3"	7.96'	2.95'	10'-11"	10'-11"	529.8
		B	45.50'	18.20'	90.26'	36.10'	10° 24' 00.1"	8.21'	3.29'	11'-6"	11'-6"	622.1
		D	45.50'	18.20'	90.26'	36.10'	10° 24' 00.1"	8.38'	3.12'	11'-6"	11'-6"	622.0
		E	39.09'	15.63'	77.68'	31.07'	08° 56' 16.7"	7.57'	2.43'	10'-0"	10'-0"	395.2
		F	39.84'	15.94'	79.18'	31.67'	09° 06' 42.8"	7.81'	2.36'	10'-4"	10'-2"	418.6
6'	19'-6"	A	47.14'	18.86'	93.44'	37.38'	10° 46' 16.8"	9.39'	3.52'	12'-11"	12'-11"	690.2
		B	49.34'	19.73'	97.72'	39.09'	11° 16' 15.0"	9.64'	3.86'	13'-6"	13'-6"	790.5
		D	49.34'	19.73'	97.72'	39.09'	11° 16' 15.0"	9.81'	3.69'	13'-8"	13'-6"	790.4
		E	43.46'	17.39'	86.28'	34.51'	09° 56' 10.9"	9.00'	3.00'	12'-0"	12'-0"	542.1
		F	44.15'	17.66'	87.63'	35.05'	10° 05' 35.7"	9.24'	2.93'	12'-4"	12'-2"	568.0
8'-6"	22'-0"	A	47.14'	18.86'	93.44'	37.38'	10° 46' 16.8"	9.39'	3.52'	12'-11"	12'-11"	690.2
		B	49.34'	19.73'	97.72'	39.09'	11° 16' 15.0"	9.64'	3.86'	13'-6"	13'-6"	790.5
		D	49.34'	19.73'	97.72'	39.09'	10° 16' 15.0"	9.81'	3.69'	13'-8"	13'-6"	790.4
		E	43.46'	17.39'	86.28'	34.51'	09° 56' 10.9"	9.00'	3.00'	12'-0"	12'-0"	542.1
		F	44.15'	17.66'	87.63'	35.05'	10° 05' 35.7"	9.24'	2.93'	12'-4"	12'-2"	568.0

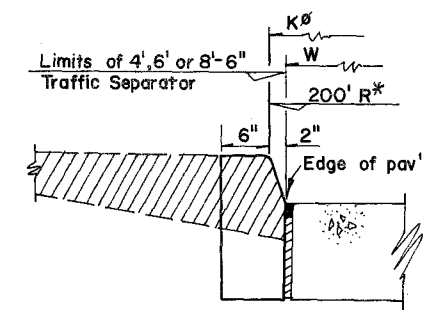
Note: The table above is applicable only where median storage lanes occur on tangent construction.



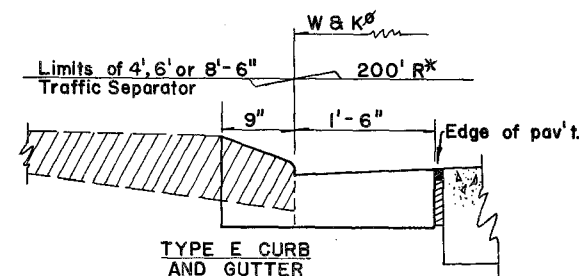
TYPE A CURB AND GUTTER



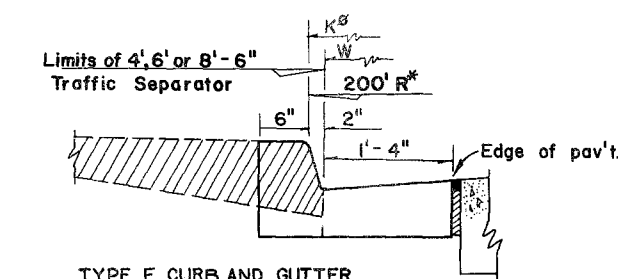
TYPE B CURB



TYPE D CURB



TYPE E CURB AND GUTTER



TYPE F CURB AND GUTTER

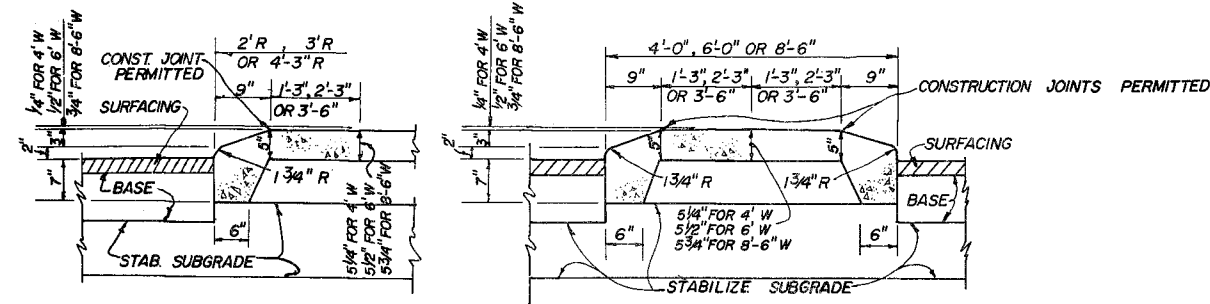
-JUNCTURE DETAILS-
 MEDIAN CURBS AND
 TRAFFIC SEPARATORS

FHWA APPROVED: 7-7-75

FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section

MEDIAN STORAGE LANES

REVISIONS		INITIALS	DATES	Approved by:
Dates	Descriptions	Designed by		
6-73	Redrawn S.H.B.	Checked by		E.H. Hart Deputy Design Engineer-Roadways
10-74	Changed Index No.	Quantities by		
		Checked by		
		Supervised by		DRAWING NO. 1 of 1
				INDEX NO. PMS-01

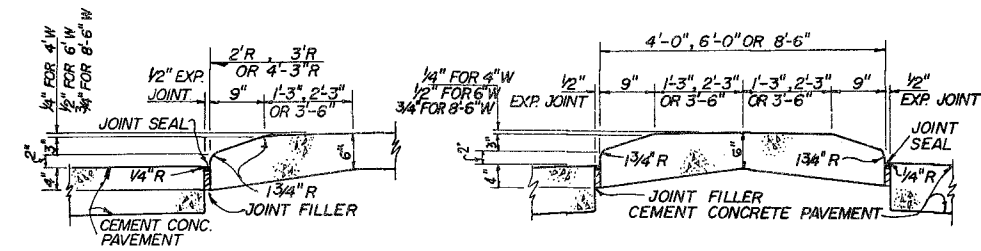


LONGITUDINAL SECTION

TRANSVERSE SECTION

DETAILS OF TYPE I CONCRETE TRAFFIC SEPARATOR

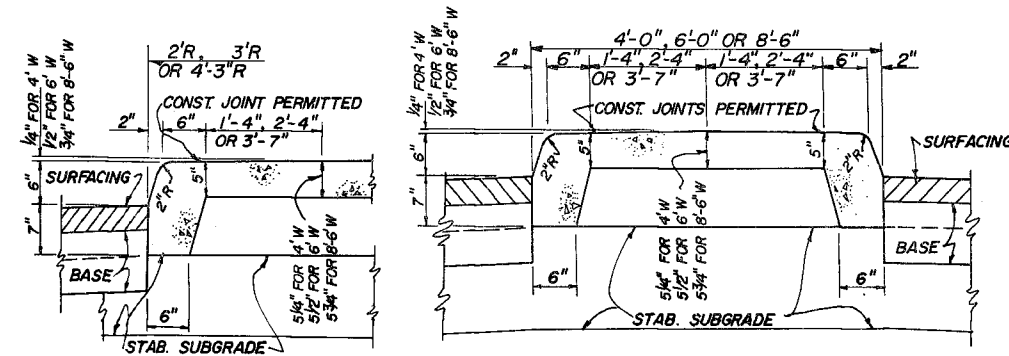
NOTE: STABILIZE FULL WIDTH OF TRAFFIC SEPARATOR.



LONGITUDINAL SECTION

TRANSVERSE SECTION

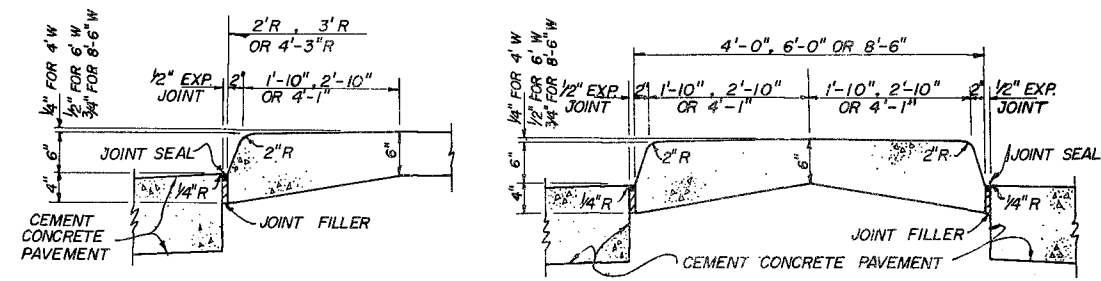
DETAILS OF TYPE II CONCRETE TRAFFIC SEPARATOR



LONGITUDINAL SECTION

TRANSVERSE SECTION

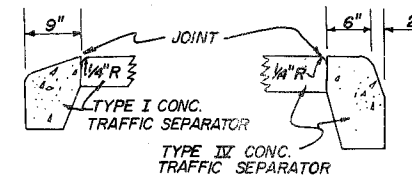
DETAILS OF TYPE III CONCRETE TRAFFIC SEPARATOR



LONGITUDINAL SECTION

TRANSVERSE SECTION

DETAILS OF TYPE IV CONCRETE TRAFFIC SEPARATOR



CONSTRUCTION JOINT DETAILS

NOTE: CONCRETE TRAFFIC SEPARATORS TYPE I AND TYPE II ARE TO BE USED WHEN ADJACENT PAVEMENT IS FLEXIBLE. CONCRETE TRAFFIC SEPARATORS TYPE III AND TYPE IV ARE TO BE USED WHEN ADJACENT PAVEMENT IS CEMENT CONCRETE.

FHWA APPROVED: 7-7-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

TRAFFIC SEPARATORS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
DATES	DESCRIPTIONS		NAMES	DATES
6-73	Redrawn S.H.B.		Detailed by	h.f.w. 1-69
10-74	Changed Index No.		Checked by	
			Quantities by	
			Checked by	
			Traced by	N.F.W. 3-69

Approved by:

Deputy Design Engineer - Roadways

Drawing No. Index No.

1 of 1 PTS-01