



TAI

The Reinforced Earth Company

8614 WESTWOOD CENTER DRIVE SUITE 1100, VIENNA VIRGINIA 22182 (703) 821-1175

DESIGN CRITERIA

1. DESIGN IS BASED ON THE ASSUMPTION THAT THE MATERIAL WITHIN THE REINFORCED EARTH VOLUME, METHODS OF CONSTRUCTION AND QUALITY OF PREFABRICATED MATERIALS SHALL CONFORM TO THE CONTRACTING AGENCY'S TECHNICAL SPECIFICATIONS (SECTION 548) FOR REINFORCED EARTH WALLS
2. SOIL PARAMETERS:
SEE WALL CONTROL DRAWINGS FOR SOIL CHARACTERISTICS OF FOUNDATION MATERIAL TO BE USED IN THE DESIGN OF THE WALL SYSTEM. THE CONTRACTOR SHALL PROVIDE SOIL DESIGN PARAMETERS FOR BACKFILL MATERIAL BASED ON THE ACTUAL SOIL CHARACTERISTICS UTILIZED AT THE SITE. THE VALUES OF FRICTION ANGLE (ϕ), COHESION (c) AND TOTAL UNIT WEIGHT (γ) SHALL BE PROVIDED IN THE SHOP DRAWINGS.
3. THE MAXIMUM APPLIED BEARING PRESSURE AT THE FOUNDATION LEVEL IS AS SHOWN ON THE WALL ELEVATIONS FOR EACH DESIGN CASE. IT IS THE RESPONSIBILITY OF THE OWNER TO DETERMINE THAT THIS APPLIED BEARING PRESSURE IS ALLOWABLE FOR THAT LOCATION.
4. ANY UNSUITABLE FOUNDATION MATERIAL BELOW THE REINFORCED EARTH VOLUME, AS DETERMINED BY THE ENGINEER, SHALL BE EXCAVATED AND REPLACED WITH SUITABLE MATERIAL OR OTHERWISE STABILIZED AS DIRECTED BY THE ENGINEER.
5. REINFORCING STRIPS FOR REINFORCED EARTH WALLS SHALL BE 1-3/8" WIDE AND 3/32" THICK, AND SHALL CONFORM TO THE PHYSICAL AND MECHANICAL PROPERTIES OF ASTM A-572 GRADE 65. GALVANIZATION SHALL BE APPLIED IN ACCORDANCE WITH ASTM A-123.
6. THE MINIMUM FACTORS OF SAFETY REQUIRED FOR DESIGN
OVERTURNING = 2.0
SLIDING = 1.5
INTERNAL PULLOUT = 1.5
(ALLOWABLE DEFORMATION = 0.75 INCH)
BEARING CAPACITY = 2.5
OVERALL STABILITY = 1.5
STEEL SOIL REINFORCEMENT = 0.55F_y AT END OF DESIGN LIFE AND 0.50 F_y AT NET SECTION OF BOLTED CONNECTION
MAXIMUM PULLOUT FACTOR (FOR SAND) = 1.5
(FOR LIMESTONE) = 2.0
- WALL CONSTRUCTION
7. REINFORCED EARTH WALLS IN CURVES WILL FORM A SERIES OF SHORT CHORDS OF 4'-10" EACH TO MATCH DESIRED WALL ALIGNMENT.
8. FOR LOCATION AND ALIGNMENT OF REINFORCED EARTH WALLS, SEE RETAINING WALL CONTROL PLANS.
9. IF MANHOLES AND DROP INLETS ARE PRESENT, THEY SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS.
10. IF PILES ARE LOCATED WITHIN THE REINFORCED EARTH VOLUME, THEY SHALL BE DRIVEN PRIOR TO CONSTRUCTION OF THE REINFORCED EARTH WALL UNLESS A METHOD TO PROTECT THE STRUCTURE WHICH IS ACCEPTABLE TO THE ENGINEER AND THE REINFORCED EARTH COMPANY, AND IS PROPOSED AND APPROVED IN WRITING.

11. BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SEC 548 TO A LEVEL OF 2" ABOVE THE TIE STRIPS EMBEDDED IN THE PANELS. INSTALLATION OF REINFORCING STRIPS SHALL BE PERMITTED ONLY AFTER PLACEMENT AND COMPACTION OF THE BACKFILL MATERIAL HAS REACHED THE REQUIRED LEVEL.
12. IF STRUCTURES IN EXCESS OF 20' IN HEIGHT OCCUR, THE FINISHED GRADE IN FRONT OF THE WALL SHALL BE PLACED AND COMPACTED BEFORE WALL CONSTRUCTION EXCEEDS A HEIGHT OF 20'. FINISHED GRADE BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-100 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
13. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE LOCATION OF ANY GUARDRAIL POSTS BEHIND THE REINFORCED EARTH PANELS PRIOR TO PLACEMENT OF THE TOP LAYER OF REINFORCING STRIPS. INDIVIDUAL STRIPS MAY BE SKewed UP TO 15:10 AVOID THE POST LOCATIONS IF AUTHORIZED BY THE ENGINEER. ANY DAMAGE DONE TO THE REINFORCING STRIPS DUE TO THE INSTALLATION OF THE GUARDRAIL SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
14. IF EXISTING OR FUTURE STRUCTURES, PIPES, FOUNDATIONS OR GUARDRAIL POSTS WHICH ARE WITHIN THE REINFORCED EARTH VOLUME INTERFERE WITH THE NORMAL PLACEMENT OF REINFORCING STRIPS AND SPECIFIC DIRECTION HAS NOT BEEN PROVIDED ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHAT COURSE OF ACTION SHOULD BE TAKEN.
15. TOP PANELS BENEATH COPING SHALL HAVE 4" DOWELS PROTRUDING FROM THEIR TOP EDGE.
16. FOR OTHER INFORMATION PERTAINING TO WALL CONSTRUCTION PLEASE REFER TO THE REINFORCED EARTH CONSTRUCTION MANUAL.
17. THE CONTRACTOR IS RESPONSIBLE FOR GRADUALLY DEFLECTING UPPER REINFORCING STRIPS DOWNWARD TO AVOID CONFLICTS WITH PAVING AND SUBGRADE PREPARATION. THE CONTRACTOR'S ATTENTION IS DIRECTED ESPECIALLY TO SITUATIONS WHERE ROADWAY SUPERELEVATION AND/OR SOIL MIXING ARE ANTICIPATED.

MATERIALS NOTES

18. NOMINAL STRIP LENGTHS
THE REINFORCING STRIP LENGTHS SHOWN ON THE PLANS, MEASURED FROM BACK FACE OF PANEL, ARE THE NOMINAL LENGTHS REQUIRED BY CALCULATION. THE ACTUAL FABRICATED STRIP LENGTHS ARE OFTEN LONGER UP TO 6" DUE TO MANUFACTURING TOLERANCES. THE REQUIRED HORIZONTAL LIMIT OF GRANULAR BACKFILL IS EQUAL TO THE NOMINAL STRIP LENGTH.
19. PANEL FINISH
THE PRECAST PANELS FOR THIS PROJECT SHALL HAVE A PLAIN STEEL FINISH UNLESS OTHERWISE SPECIFIED ON THE RETAINING WALL CONTROL PLANS.

20. NOTE TO CONTRACTORS

ONLY THE FOLLOWING MATERIALS ARE SUPPLIED BY THE REINFORCED EARTH COMPANY:

- PRECAST CONCRETE FACING PANELS
- REINFORCING STRIPS
- BOLT SETS (FOR ATTACHING PANELS TO THE REINFORCING STRIPS)
- BEARING BLOCKS
- RUBBER SHIMS
- FILTER CLOTH AND ADHESIVE (FOR PANEL JOINTS ONLY)

ANY OTHER MATERIALS CALLED FOR IN THE CONTRACT PLANS OR SPECIFICATIONS ARE TO BE SUPPLIED BY THE CONTRACTOR. ANY JOINT MATERIALS SHOWN AT THE INTERFACE OF PRECAST PANELS AND CAST-IN-PLACE CONCRETE STRUCTURES ARE TO BE SUPPLIED BY THE ERECTING CONTRACTOR. ALL SANDBLASTING, PAINTING, SEALERS OR OTHER SPECIAL APPLIED COATINGS ARE ALSO SUPPLIED/INSTALLED BY THE CONTRACTOR IN THE FIELD FOLLOWING PANEL ERECTION.

21. THE REINFORCED EARTH COMPANY SUPPLIES PRECAST CONCRETE FACING PANELS AND ACCESSORIES TO BE USED IN CONJUNCTION WITH OTHER MATERIALS IN THE CONSTRUCTION OF THE REINFORCED EARTH RETAINING WALLS DETAILED HEREIN. THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL FURNISHED BY THE REINFORCED EARTH COMPANY IS INTENDED TO PROVIDE A GENERAL EXPLANATION OF THE SYSTEM. IT IS THE CONTRACTOR'S OBLIGATION TO DEVISE AND EXECUTE A PROJECT SPECIFIC ERECTION SEQUENCE, PANEL UNLOADING, HANDLING AND BRACING SYSTEM, AND FALL PROTECTION SYSTEM. THE BRACING SYSTEM SHOWN IN THE CONSTRUCTION AND QUALITY CONTROL PROCEDURES MANUAL IS GENERAL IN NATURE AND DOES NOT ACCOUNT FOR PROJECT SPECIFIC CRITERIA. COMPLIANCE WITH THE GUIDELINES IN THIS MANUAL DOES NOT RELIEVE THE CONTRACTOR OF ITS RESPONSIBILITY TO ADHERE TO THE PROJECT PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS OR COMPLIANCE WITH ALL FALL PROTECTION, SAFETY, LAWS, STANDARDS AND PROCEDURES AT THE JOBSITE. CONTRACTORS SHOULD TAKE SPECIAL PRECAUTIONS TO PREVENT THE PANELS FROM SHIFTING OR FALLING DURING THE ERECTION PROCESS.
22. THE DESIGN CONTAINED ON THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY THE OWNER. ON THE BASIS OF THIS INFORMATION, THE REINFORCED EARTH COMPANY IS RESPONSIBLE FOR INTERNAL STABILITY OF THE STRUCTURE ONLY. EXTERNAL STABILITY DESIGN INCLUDING FOUNDATION AND SLOPE STABILITY IS THE RESPONSIBILITY OF OTHERS.
23. THESE DRAWINGS ARE CERTIFIED WITH RESPECT TO THE INTERNAL STABILITY OF REINFORCED EARTH STRUCTURES ONLY
24. THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO THE REINFORCED EARTH COMPANY, AND IS BEING FURNISHED FOR THE USE IN CONNECTION WITH FOOT PROJECTS ONLY, AND THE INFORMATION CONTAINED HEREIN IS NOT TO BE TRANSMITTED TO ANY OTHER ORGANIZATION UNLESS SPECIFICALLY AUTHORIZED BY THE REINFORCED EARTH COMPANY. THE REINFORCED EARTH COMPANY IS EXCLUSIVE LICENSEE IN THE UNITED STATES UNDER PATENTS ISSUED TO HENRY VIDAL, AND THE FURNISHING OF THIS DRAWING DOES NOT CONSTITUTE AN EXPRESSED OR IMPLIED LICENSE UNDER THE VIDAL PATENTS.

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY

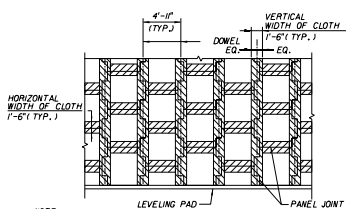
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM REINFORCED EARTH COMPANY REINFORCED EARTH WALL

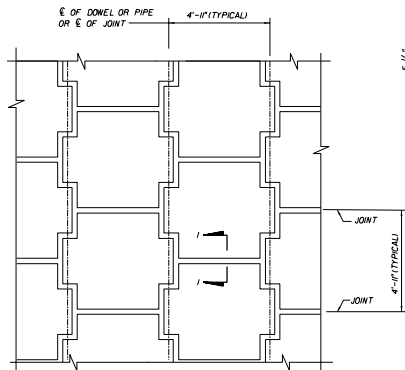
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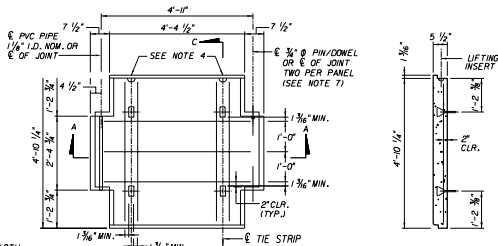


NOTE:
STRIPS OF FILTER CLOTH SHALL BE PLACED ON BACK FACE OF PANEL OVER PANEL JOINTS. FILTER CLOTH SHALL BE ADHERED TO BACK FACE OF PANELS USING AN ADHESIVE COMPOUND SUPPLIED BY THE REINFORCED EARTH COMPANY. ADHESIVE SHALL BE APPLIED TO PANEL THEN FILTER CLOTH (CARTRIDGE MILLS TYPE FX-40HS OR EQUAL) SHALL BE APPLIED TO PANELS.

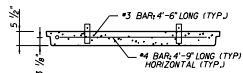
FILTER CLOTH DETAIL
PARTIAL ELEVATION - BACK FACE



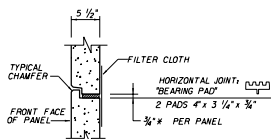
TYPICAL PANEL LAYOUT
PARTIAL ELEVATION - FRONT FACE



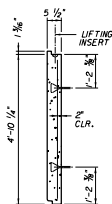
PANEL TYPE "A"
WITH R4 REINFORCEMENT
FRONT VIEW



SECTION A-A



SECTION I-I



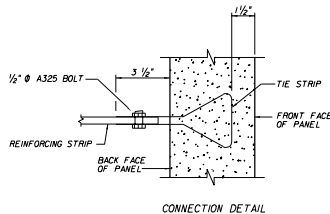
SECTION C-C

PANEL THICKNESS	REINFORCEMENT DESIGNATION	# PANEL REINFORCEMENT (IN#)	MAXIMUM ALLOWABLE HORIZONTAL STRESS AT FACING (KPA)
5 1/2"	R4	0.44 VERTICAL 0.58 HORIZONTAL	1.19
	R6	0.56 VERTICAL 0.78 HORIZONTAL	1.46
	R7	1.18 VERTICAL 1.78 HORIZONTAL	2.58

* TOTAL AREA OF STEEL REQUIRED PER "TYPE A" PANEL.

NOTES:

1. REINFORCING STEEL TO BE A615 GRADE 60.
2. 3/8" x 3/8" CHAMFER SHALL BE PROVIDED ON ALL EXPOSED EDGES (FRONT FACE ONLY).
3. ALL PANEL TYPES AND OTHER RELATED ELEMENTS WILL BE DETAILED ON SHOP DRAWINGS.
4. ALL PANELS SHALL HAVE TWO LIFTING INSERTS OF ONE TON CAPACITY EACH.
5. PANEL DESIGN THICKNESS IS 5 1/2". THICKNESS OF CONCRETE MUST INCREASE TO ACCOMMODATE ANY ARCHITECTURAL SURFACE FINISH THAT MAY BE SPECIFIED.
6. ACTUAL PANEL REINFORCEMENT FOR ALL PANEL TYPES ON THIS PROJECT IS DESIGNATED ABOVE. R4 ILLUSTRATED FOR INFORMATION ONLY.
7. EACH 3/4" Ø DOWEL SHALL HAVE A TYP. LENGTH OF 10". DOWELS MAY BE GALVANIZED STEEL OR PVC ROD. A SINGLE FULL LENGTH DOWEL MAY BE USED AT THE DISCRETION OF THE MANUFACTURER.



CONNECTION DETAIL

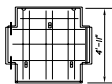
THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY

CRUCIFORM PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

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A-3-R5



A-4-R4



A-5-R4



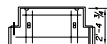
A-6-R4



AL-4-R4



AR-4-R4



B-2-R4



B-3-R4



B-4-R4



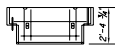
C-2-R4



C-3-R4



C-4-R4



D-2-R4



D-3-R4



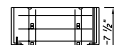
D-4-R4



E-3-R4



E-4-R4



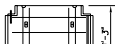
F-4-R4



F-5-R4



F-8-R4



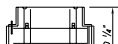
G-4-R4



G-5-R4



G-8-R4



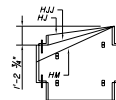
H-4-R4



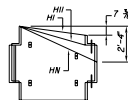
H-5-R4



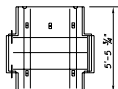
H-8-R4



HJ-4-R4



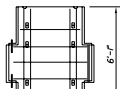
HI-4-R4



K-5-R4



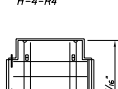
K-8-R4



L-6-R4



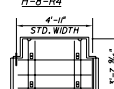
L-7-R4



P-6-R4



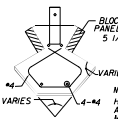
P-7-R4



Q-4-R4



Q-5-R4

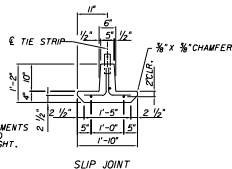


CORNER ELEMENT
SIZE VARIES WITH ANGLES

BLOCKOUT REQ'D FOR
PANELS THICKER THAN
5 1/2" (TYP.)

VARIES

NOTE
HEIGHT OF CORNER ELEMENTS
AND SLIP JOINTS SHOULD
MATCH WITH PANEL HEIGHT.



SLIP JOINT

CUT EDGE

CUT WIDTH
ON ELEVATION

CUT WIDTH
ON ELEVATION

SLOPED TOP PANELS
*R PANEL USED FOR ILLUSTRATION ONLY.

ALL PANELS ARE SHOWN BACK FACE VIEW

R TIE STRIP LOCATION

R4 VERTICAL BARS ARE #3 AS SHOWN
HORIZONTAL BARS ARE #4 AS SHOWN

R6 VERTICAL BARS ARE #6-#3
HORIZONTAL BARS ARE #4-#4

R7 VERTICAL BARS ARE #6-#4
HORIZONTAL BARS ARE #4-#6

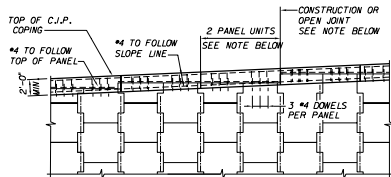
SEE PANEL TYPE "A" WITH R4 REINFORCEMENT
ON SHEET TITLED "PANEL DETAILS" FOR TYPICAL
REINFORCEMENT SPACING

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR
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CRUCIFORM PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

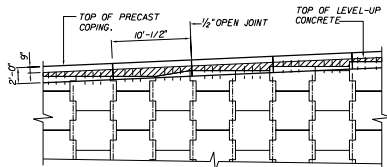
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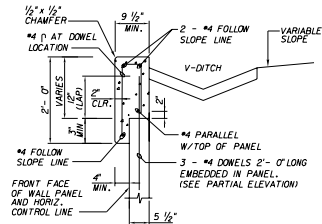
C.J.P. COPING - PARTIAL ELEVATION

NOTE:

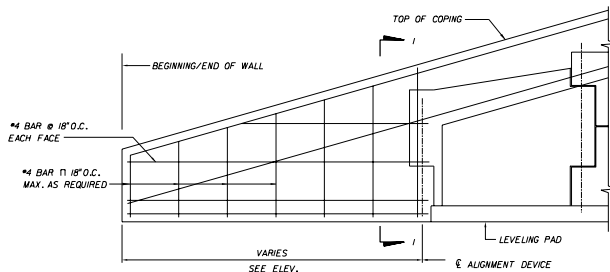
1/2-INCH OPEN JOINTS IN COPING SHALL BE AT 6 PANEL INTERVALS AND COINCIDE APPROXIMATELY WITH \bar{C} OF ALIGNMENT PINS. REINFORCING STEEL SHALL BE STOPPED 2" SHORT OF EITHER SIDE OF THE JOINTS. CONSTRUCTION JOINTS IN BETWEEN THE OPEN JOINTS SHALL BE PROVIDED AT 2 PANELS INTERVALS.



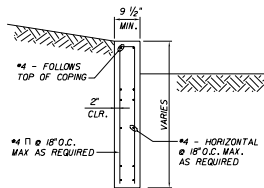
PRECAST COPING PARTIAL ELEVATION



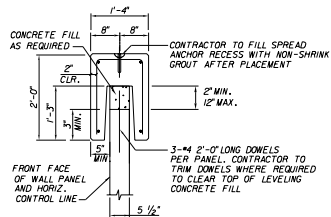
C.J.P. CONC. COPING W/DITCH



COPING ENCLOSURE DETAIL



SECTION A-A



PRECAST COPING SECTION

NOTE:

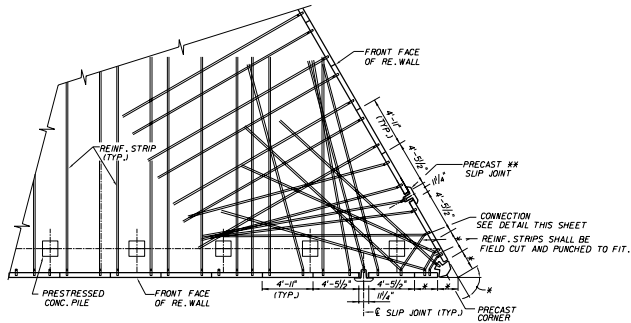
STANDARD COPING UNIT IS 10' LONG WITH SQUARE ENDS.

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CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

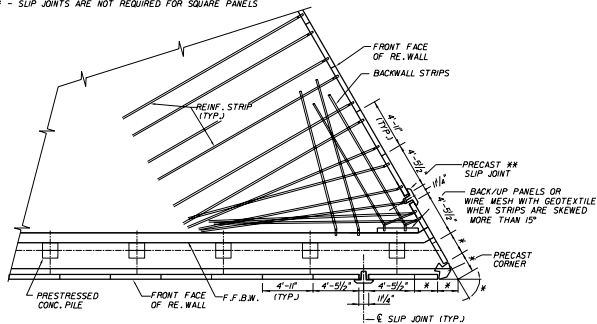
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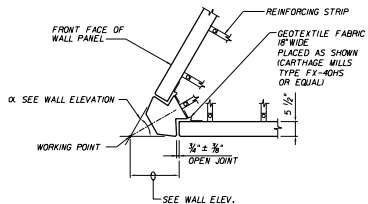
EXAMPLE ACUTE CORNER - SKEWED STRIPS UNDER PILE CAP

NOTE:

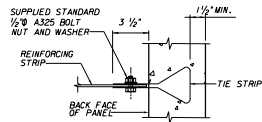
- * - DIMENSION OR ANGLE VARIES, SEE WALL ELEVATION
- ** - SLIP JOINTS ARE NOT REQUIRED FOR SQUARE PANELS



EXAMPLE ACUTE CORNER - SKEWED STRIPS AT ABUTMENT LEVEL



ACUTE CORNER ELEMENT DETAIL



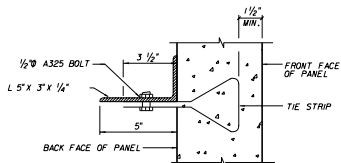
CONNECTION DETAIL

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
RECTANGULAR AND SQUARE PANELS

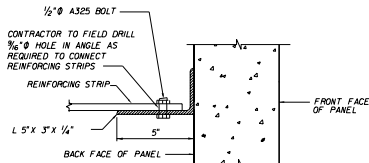
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

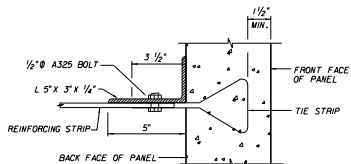
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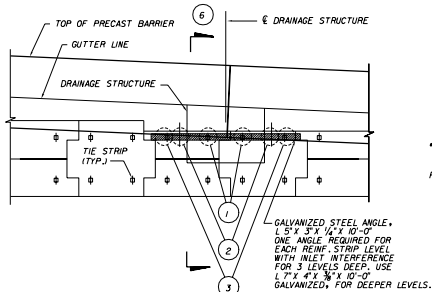
1 CONNECTION DETAIL
ANGLE BOLTED TO TIE STRIP



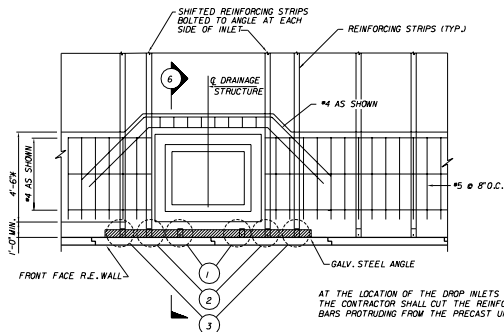
2 CONNECTION DETAIL
SHIFTED REINF. STRIP BOLTED TO ANGLE



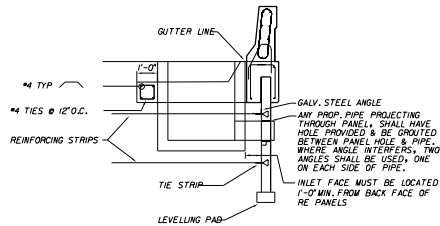
3 CONNECTION DETAIL
ANGLE BOLTED TO TIE STRIP WITH REINF. STRIP



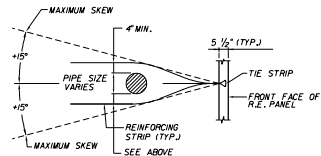
4 PARTIAL ELEVATION



5 PARTIAL PLAN



6 SECTION AT INLET



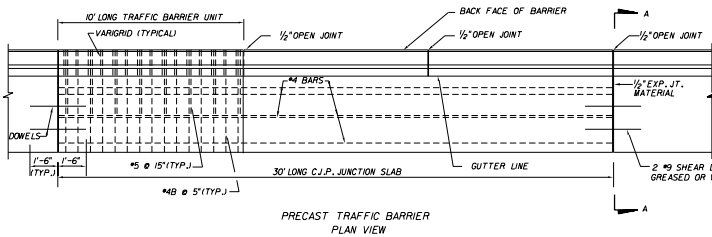
7 TYPICAL STRIP BENDING DETAIL AT
ANY PROPOSED & EXISTING PIPES

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR
MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
RECTANGULAR AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

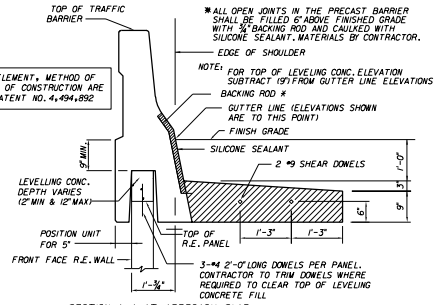
RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

Designed By	Checked By	Approved By	DATE
		<i>[Signature]</i>	00 6 of 14 5015
Drawn By	Checked By		

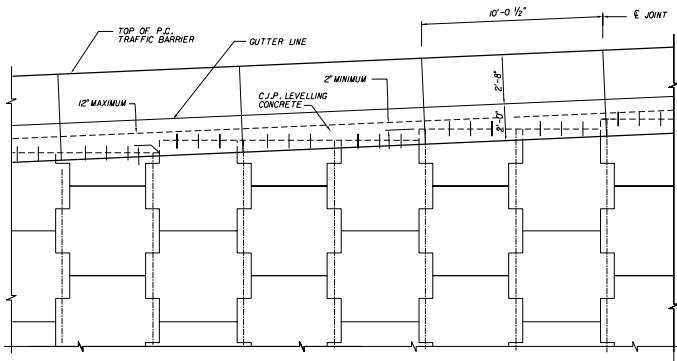


PRECAST TRAFFIC BARRIER
PLAN VIEW

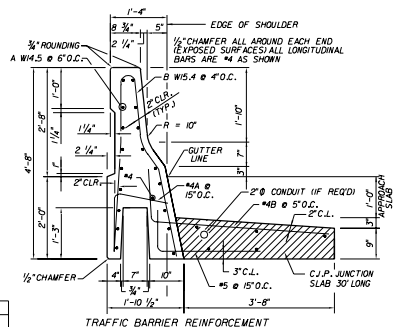
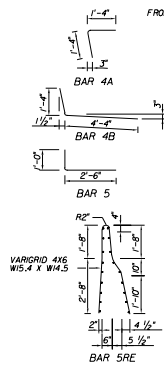
TRAFFIC BARRIER ELEMENT. METHOD OF SUPPORT AND METHOD OF CONSTRUCTION ARE COVERED BY U.S. PATENT NO. 4,494,892



SECTION A-A AT APPROACH SLAB



PRECAST TRAFFIC BARRIER
PARTIAL ELEVATION



TRAFFIC BARRIER REINFORCEMENT

MARK	QUANTITY	REMARKS
5	8	3'-6" LONG
A		VARIGRID W14.5 @ 6" O.C.
B		VARIGRID W15.4 @ 4" O.C.
4A	8	2'-8" LONG
4B	24	5'-8" LONG

* ALL OPEN JOINTS IN THE PRECAST BARRIER SHALL BE FILLED 6" ABOVE FINISHED GRADE WITH 3/4" BACKING ROD AND CALKED WITH SILICONE SEALANT. MATERIALS BY CONTRACTOR.

NOTE: FOR TOP OF LEVELLING CONC. ELEVATION SUBTRACT (19") FROM GUTTER LINE ELEVATIONS

THIS SYSTEM SHALL BE USED IN SLIGHTLY OR MODERATELY AGGRESSIVE ENVIRONMENTS ONLY
CRUCIFORM AND SQUARE PANELS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
REINFORCED EARTH COMPANY
REINFORCED EARTH WALL

Approved By: *[Signature]*
 Drawn By: *[Signature]*
 Checked By: *[Signature]*

DATE: 7/14/14

00 7 of 14 5015