

ROAD

DESIGN

STANDARDS



JANUARY 1979

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 GEC-04 Erosion Control Devices, Silt Barrier
 GEC-05 Erosion Control Devices, Baled Hay or Straw
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NUMBER

TITLE

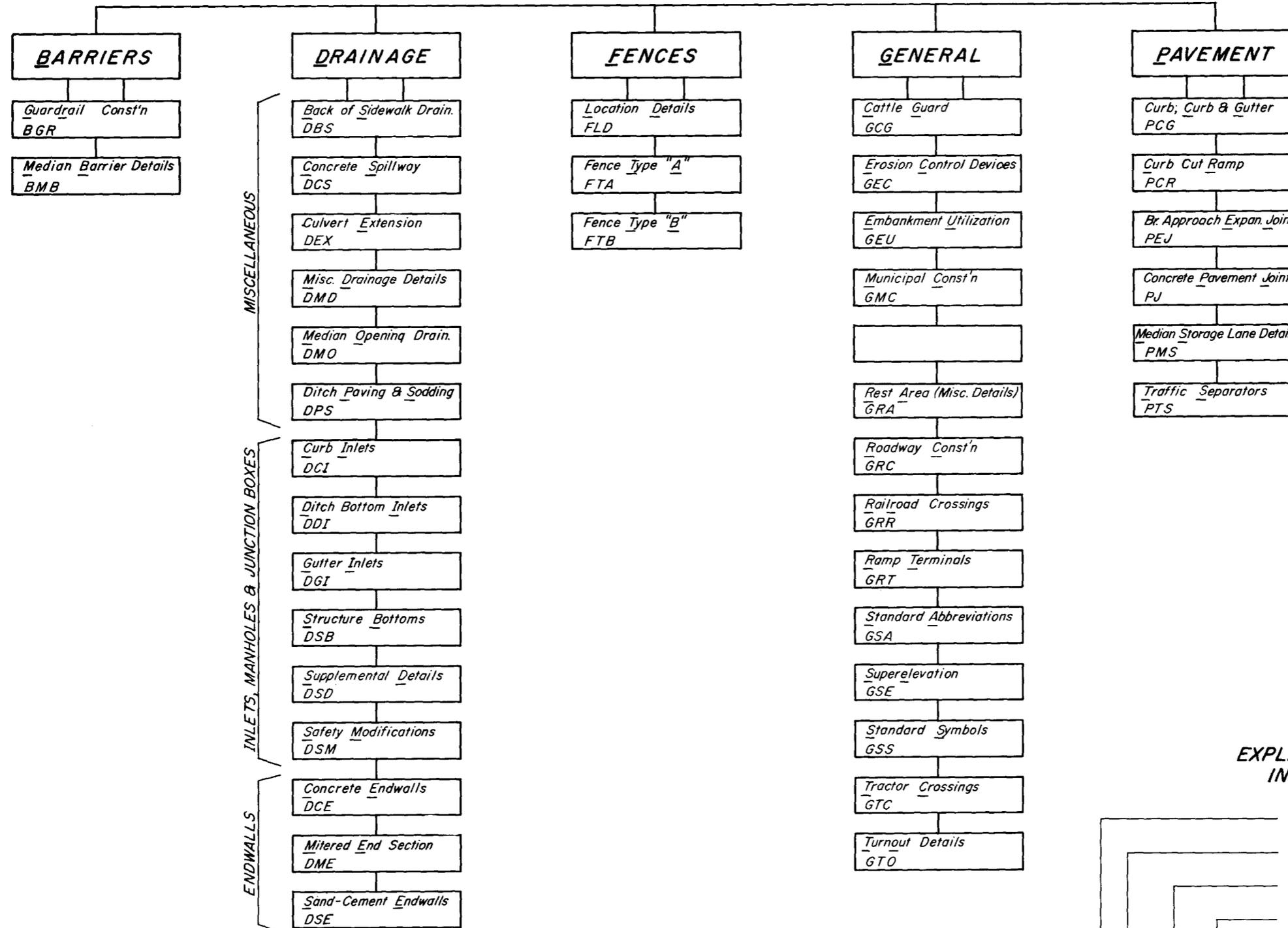
GENERAL (CONT.)

- GTO-01-1 Turnout Details

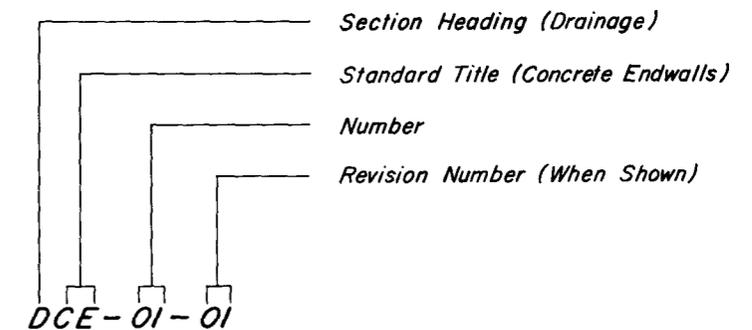
PAVEMENT

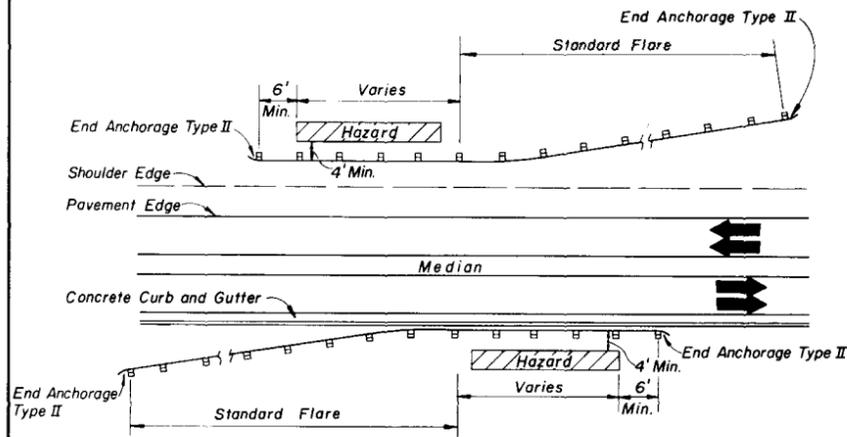
- PCG-01 Curb, Curb and Gutter
 PCR-01 Curb Cut Ramp for Physically Handicapped
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FLORIDA ROAD DESIGN STANDARDS



EXPLANATION OF ALPHANUMERIC INDEX NUMBERING SYSTEM

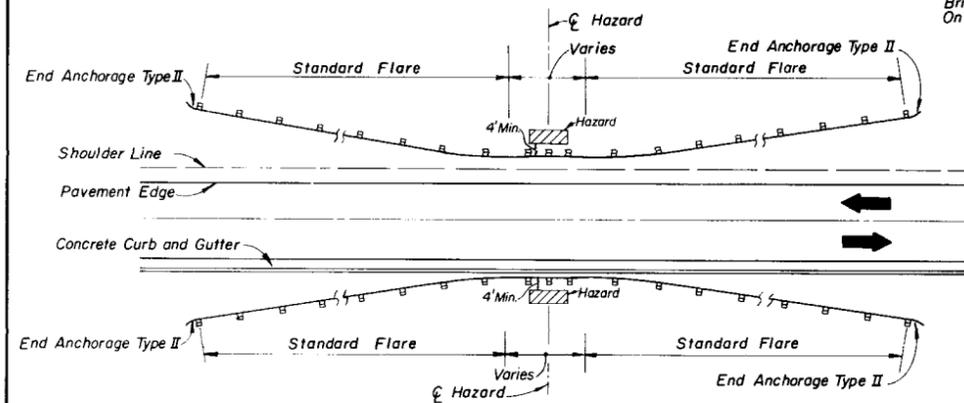




DETAIL B

GUARDRAIL INSTALLATION FOR ROADSIDE HAZARD (4-LANE)

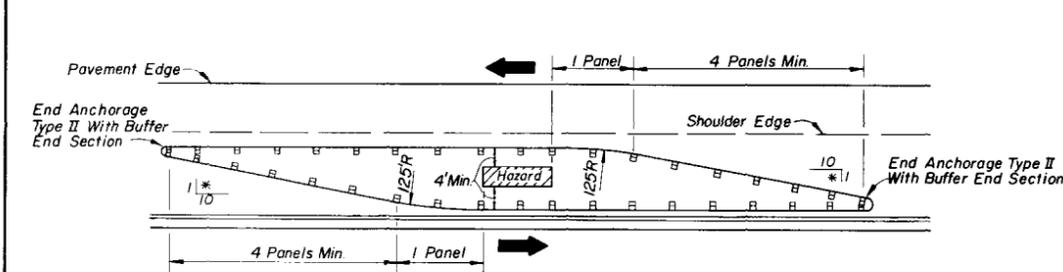
Note: See general notes Nos. 1, 2, 3, 4, 7, 11 and 12 on sheet No. 2.
See details J, K and L for guardrail offsets.
See detail P for standard flare.



DETAIL C

GUARDRAIL INSTALLATION FOR ROADSIDE HAZARD (2-LANE)

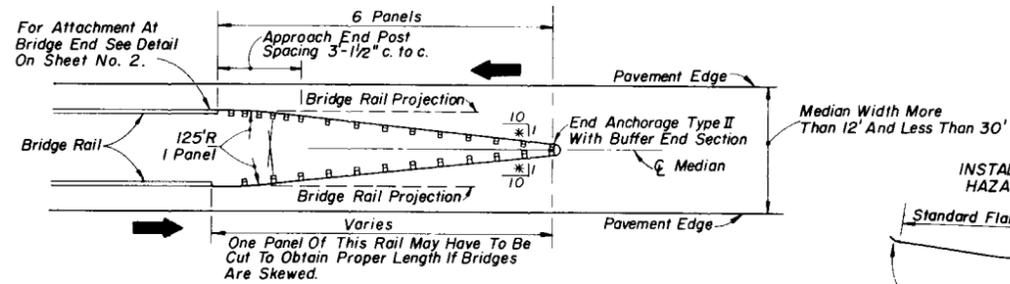
Note: See general notes Nos. 1, 2, 3, 4, 7, 11 and 12 on sheet No. 2.
See details J, K and L for guardrail offsets.
See detail P for standard flare.



DETAIL D

GUARDRAIL - MEDIAN INSTALLATION

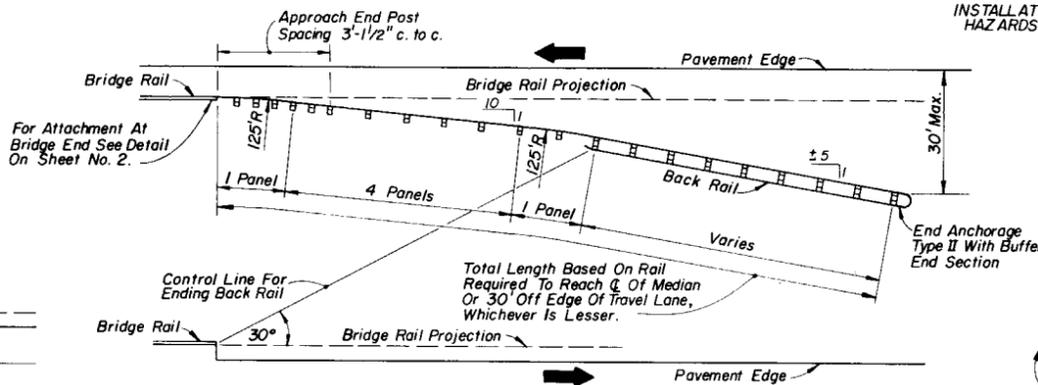
Note: See general notes Nos. 1, 2, 3, 4, 11 and 12 on sheet No. 2.
See details J, K and L for guardrail offsets.



DETAIL E

MINIMUM BRIDGE END GUARDRAIL INSTALLATION - NARROW MEDIAN (LESS THAN 30')

Note: See general notes Nos. 1, 2, and 3 on sheet No. 2.

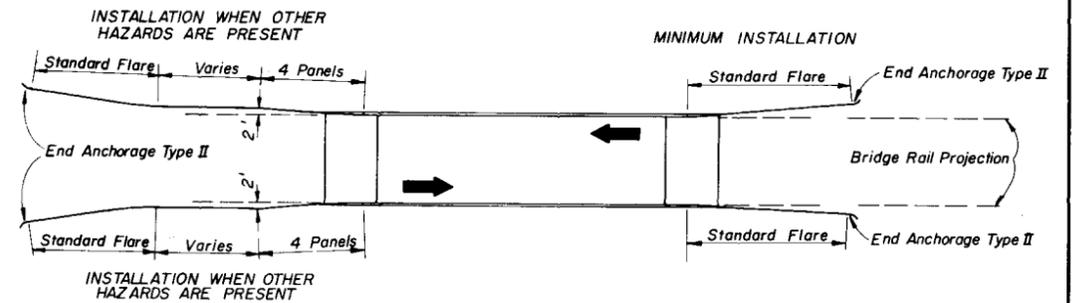


DETAIL F

MINIMUM BRIDGE END GUARDRAIL INSTALLATION - WIDE MEDIAN (30' OR GREATER)

Note: See general notes Nos. 1, 3, and 4 on sheet No. 2.

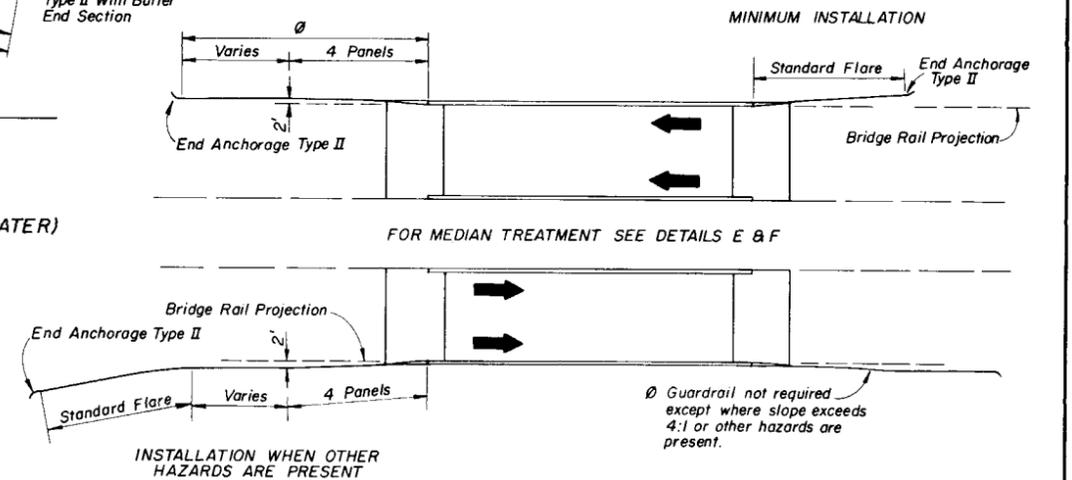
Backrail is required for protection of off-bridge traffic where median edge of pav't for off-bridge traffic passes less than 30' from end anchorage. Backrail is not required where median width is 64' or greater. Payment for backrail is to be included in the total length of guardrail required, measured along both the front rail and along the backrail.



DETAIL H

GUARDRAIL INSTALLATION FOR BRIDGE ENDS (2-LANE)

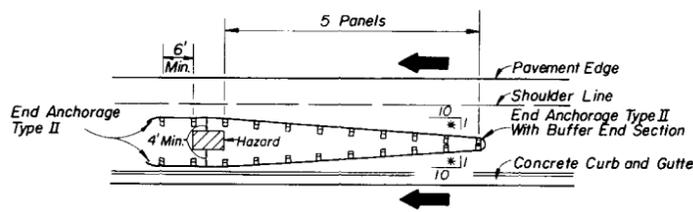
Note: See general notes Nos. 1, 2, 3, 4 and 7 on sheet No. 2.
See sheet No. 2, detail N for attachment to bridge ends.
See detail P for standard flare.



DETAIL I

GUARDRAIL INSTALLATION FOR BRIDGE ENDS (4 LANE)

Note: See general notes Nos. 1, 2, 3, 4 and 7 on sheet No. 2.
See sheet No. 2, detail N for attachment to bridge ends.
See detail P for standard flare.



DETAIL G

GUARDRAIL - HAZARD INSTALLATION

Note: See general notes Nos. 1, 2 and 3 on sheet No. 2.
See details J, K and L for guardrail offsets.

NOTES: For details D, E, F, and G only one end anchor is required on each double rail end of the installation and should be attached to and in line with the traffic approach side.

*10:1 Maximum desirable, may be flatter or slightly steeper where other factors control length of installation.

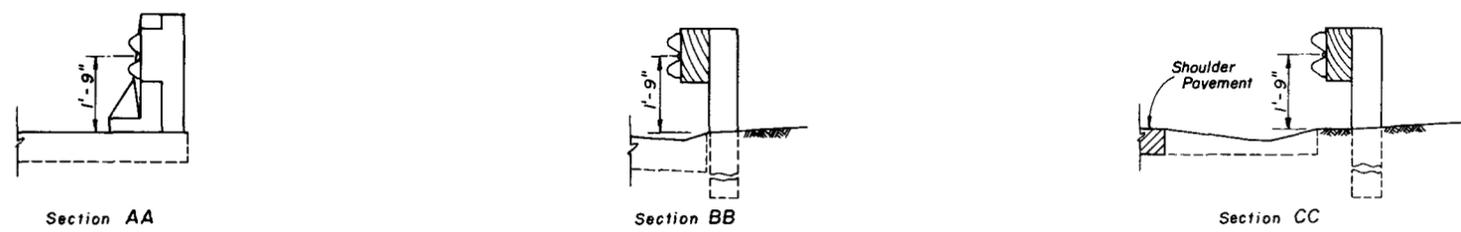
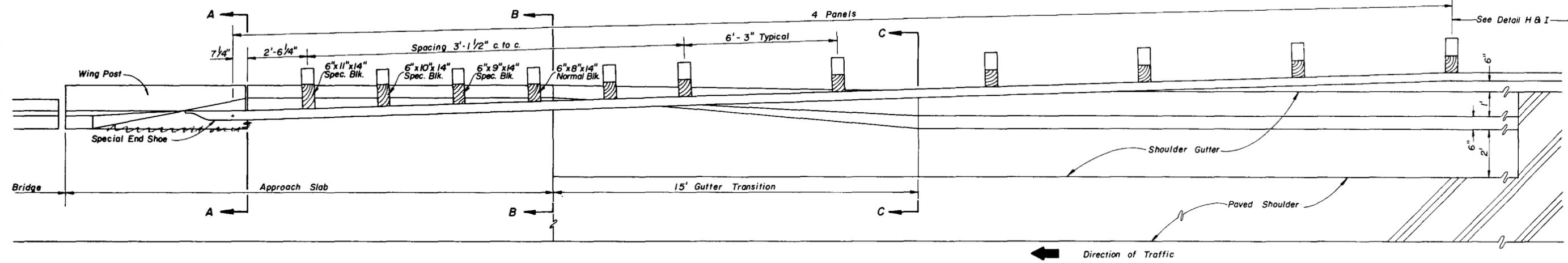
For details B and C the depth of hazard must be considered when determining the length of guardrail needed.

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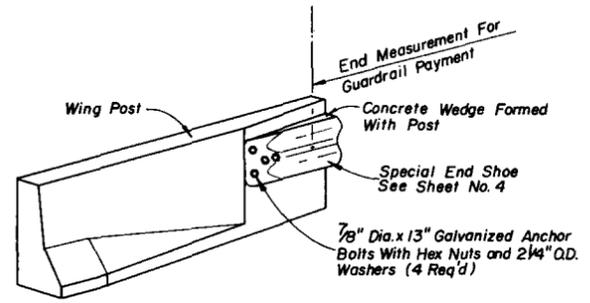
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

GUARDRAIL CONSTRUCTION

REVISIONS		REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	Date	Description	APPROVED BY		
10/74	Changed Index No.	9/69	Revised guardrail installation bridge end, approach ends and other minor changes.	Names	Dates	
6/76	Redrawn	H.W.	Removed twist from guardrail and added panels.	Designed by		
H.D.		2/70		Checked by	J.K.C.	7-69
		G.F.		Quantities by		
		7/71	Changed number of panels required.	Checked by		
		L.F.	Changed end anchorages.	Supervised by		
		7/72	Changed end anchorage type			

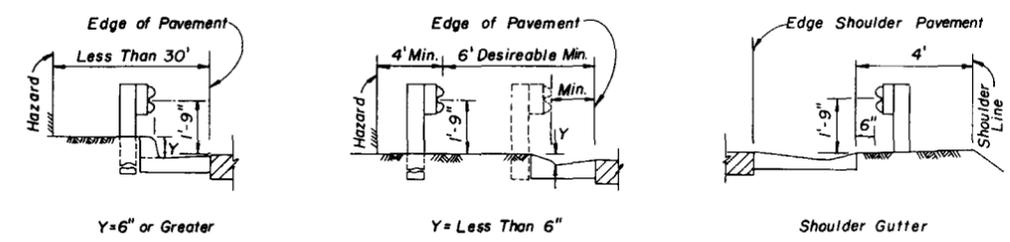


GUARDRAIL AND SHOULDER GUTTER TRANSITIONS AT BRIDGE APPROACHES (TRAILING END OPPOSITE HAND)
DETAIL J

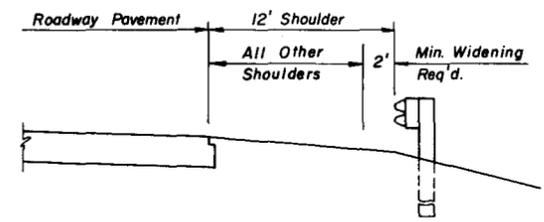


All component parts shall be included in the contract unit price for guardrail

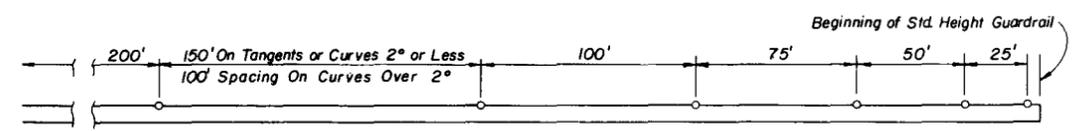
GUARDRAIL ATTACHMENT AT BRIDGE ENDS
DETAIL N



GUARDRAIL LOCATION AT CURB & GUTTER SECTIONS
DETAIL L



SHOULDER WIDENING WHERE GUARDRAIL IS INSTALLED
DETAIL K



Adjustment in spacing may be required to fit exact guardrail lengths as directed by the Engineer. For minimum installations (length 62.5') provide one reflector at each end and at approximate center.

REFLECTOR SPACING
DETAIL M

GENERAL NOTES

- The illustrated limits for guardrail installation are standard requirements, one panel equals 12.5ft.
- Installations shown are typical. The intent is that 62.5ft. of rail be available approaching earliest hazard.
- Post spacing shall be 6.25ft except that a reduced spacing of 3'-1/2" shall be used at bridge anchorages (See detail J). At hazards, where the face of guardrail offset from hazard is less than 4ft., 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 125ft. or greater. For radii less than 125ft. 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 8ft, 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"x 8"x 14" nominal treated timber block. A 5"x 8"x 14" 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 3/8"x 1 1/2" bolt on each side of block. Blocks used with Thrie Beam rail shall be 22" long. The bolt hole in timber blocks shall be located 7" (± 1/4") from the end and centered (± 1/4") in the block.
- 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 control by installation of non-mountable curb.
- If desirable 4ft. minimum offset between face of rail and hazard can not be provided, a 2ft. 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' 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: 11-16-78

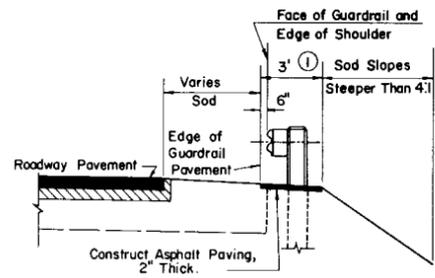
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION

GUARDRAIL CONSTRUCTION

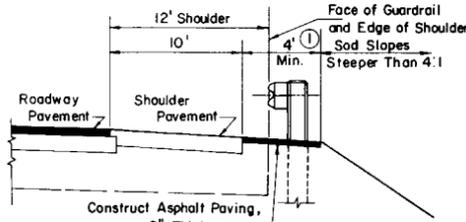
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
9-69	Revised Guardrail and Gutter Transitions at Bridge Approaches			
7-71	Changed Post Spacing on Trailing End. Changed Notes 1, 5, 7, 8, 11 & 13. Added Note 13.			
10-74	Changed Index No.			
3-76	Revised Note 8.			
8-78	Redrawn. Revised Note 8.			

Designed by	Checked by	Quantities by	Checked by	Supervised by
	J. K. C.			

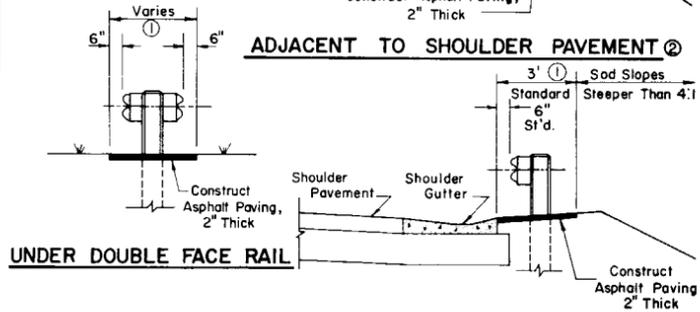
APPROVED BY	Drawing No.	Index No.
<i>E. H. Hart</i>	2 of 5	BGR-01-2



ADJACENT TO UNPAVED SHOULDER



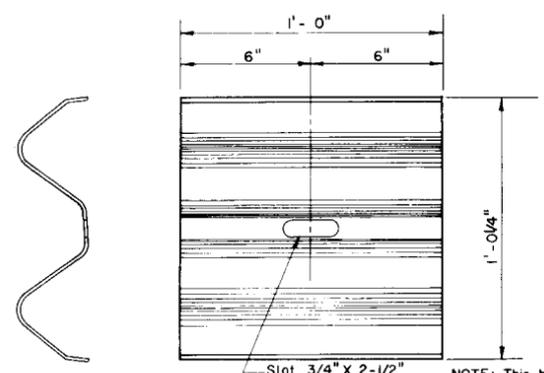
ADJACENT TO SHOULDER PAVEMENT



ADJACENT TO SHOULDER GUTTER

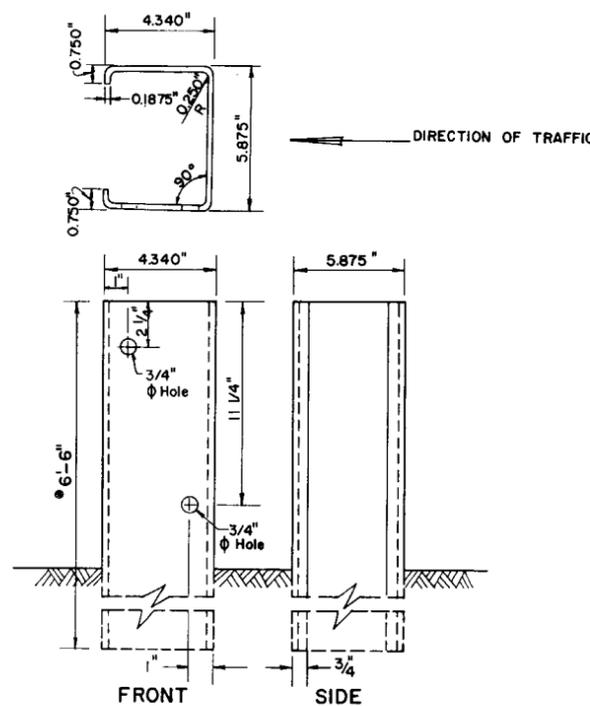
DETAIL OF GUARDRAIL PAVEMENT

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 and the guardrail pavement shall extend out to the shoulder pavement or gutter in front of the flare.



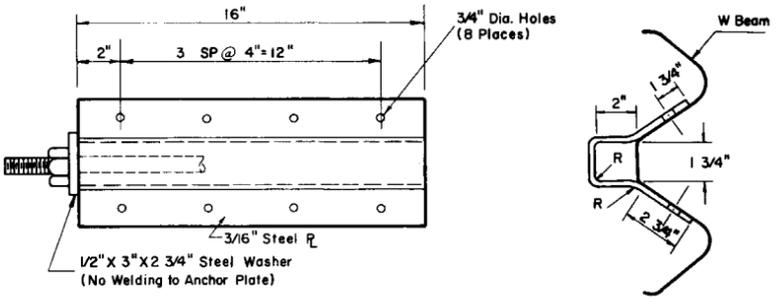
BACK-UP PLATE

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

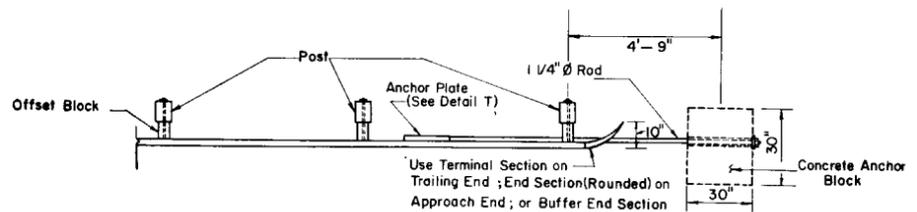


6\"/>

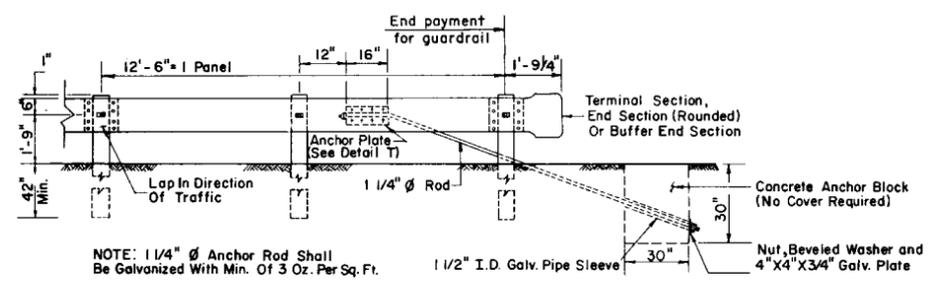
NOTES:
 ① Type "C" Steel Post placed back of slope break point in slopes steeper than 4:1 shall be 6'9" long unless otherwise noted. See note 8, sheet 2.



ONE-PIECE ANCHOR PLATE (ALTERNATE)



PLAN

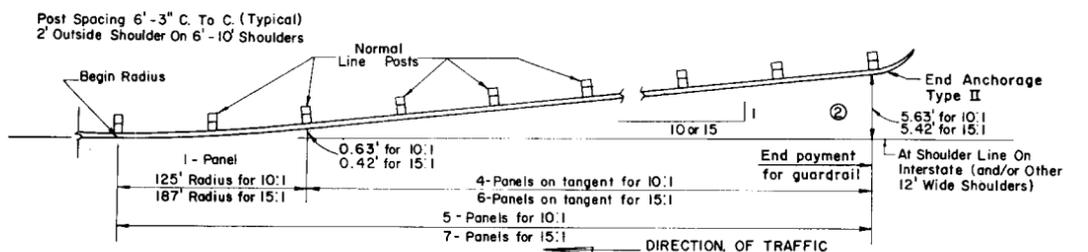


ELEVATION

**END ANCHORAGE TYPE II
 DETAIL R**

NOTE: 1/4" Anchor Rod Shall Be Galvanized With Min. Of 3 Oz. Per Sq. Ft.

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.



**STANDARD FLARE
 DETAIL P**

Use 10:1 flare rate for design speeds under 50mph.
 Use 15:1 flare rate for design speeds 50mph and higher.

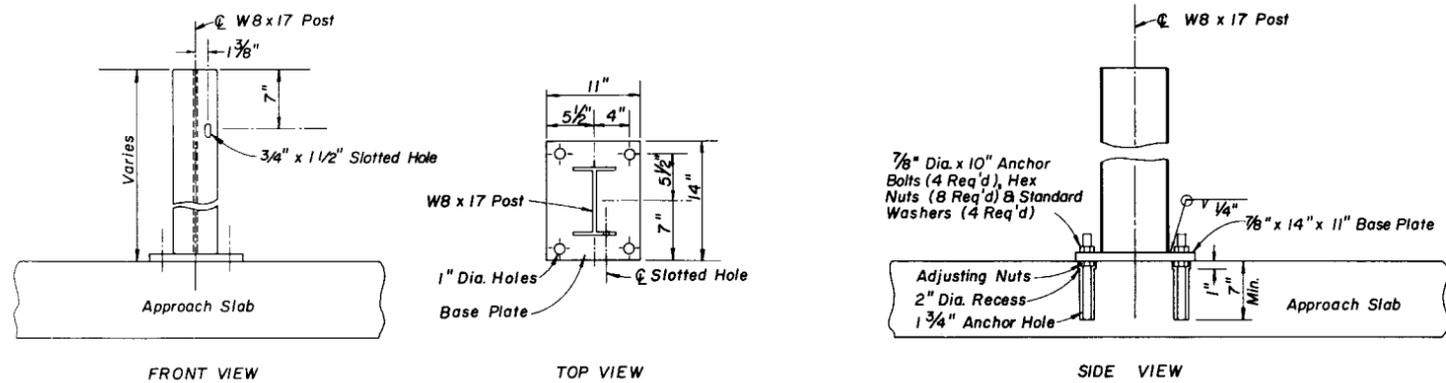
FHWA APPROVED: 11-16-78

FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
GUARDRAIL CONSTRUCTION

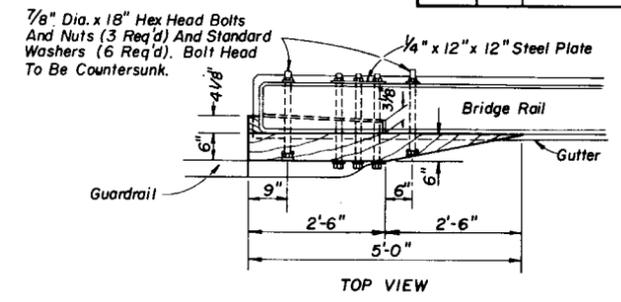
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
7/72	Sheet redrawn - Changed type of end anchorage			
12/73	Moved details from top of sheet to new sheet no. 4. Added details R & S.			
10/74	Redrawn - Removed detail Q & detail S - Added new details - Changed Index N's			
3-76	Added notes & minor changes			

Designed by	Checked by	Quantities by	Checked by	Supervised by

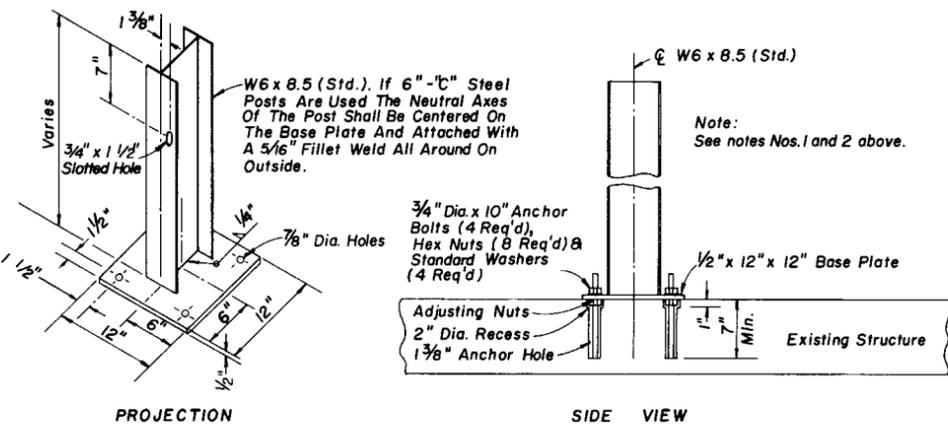
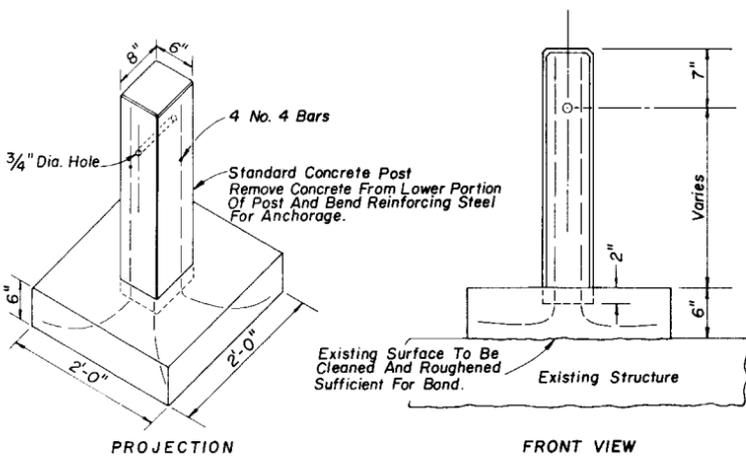
Recommended For Approval By	APPROVED BY	Drawing No.	Index No.
		3 OF 5	BGR-01-2



Note:
 No. 1 Anchor holes and recesses are to be drilled. Encountered reinforcing steel shall be drilled through. Holes shall be thoroughly clean and dry for setting bolts. Set bolts in epoxy mortar. Plumb posts with adjusting nuts and place base plate in grout with neat finish.
 No. 2 Steel post assembly to be galvanized except for base plate and weld area which are to be metalized in accordance with Section 562 of Standard Specifications.

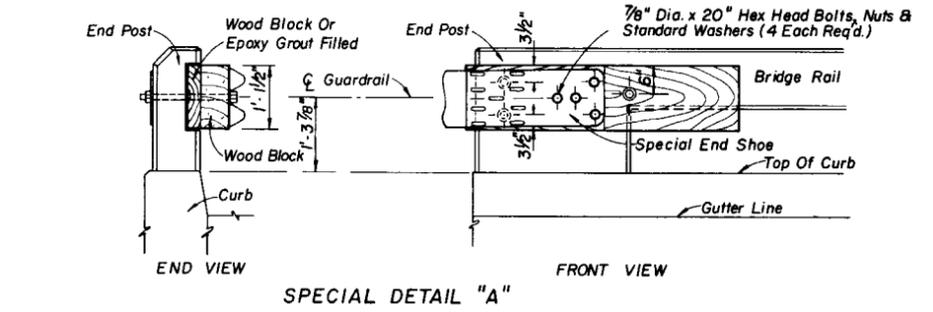


STEEL GUARDRAIL POST MOUNTING TO EXISTING APPROACH SLAB



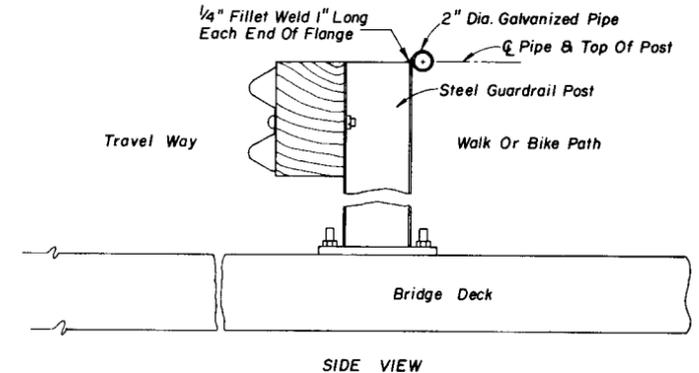
CONCRETE POST SPECIAL CONCRETE AND STEEL GUARDRAIL POSTS

FOR CONSTRUCTION OF GUARDRAIL WHERE CULVERT, PIER FOOTING OR OTHER STRUCTURE PRECLUDES NORMAL POST INSTALLATION. WHEN WOOD POSTS ARE SELECTED AS ALTERNATES THE POST INSTALLATION FOR THE ABOVE CONDITIONS WILL BE STEEL.



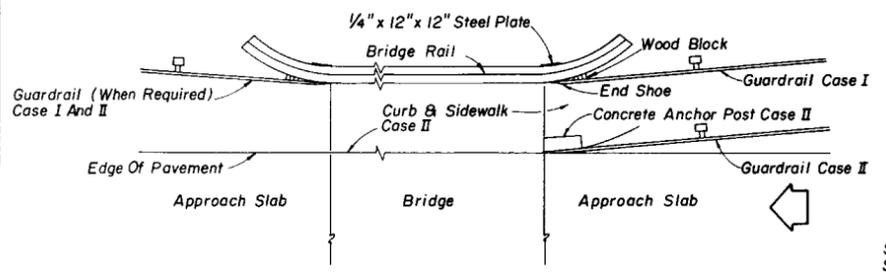
GUARDRAIL ATTACHMENT AT END POST ON EXISTING BRIDGES

FOR APPROACH AND TRAILING ENDS OF TWO-WAY BRIDGES AND APPROACH ENDS OF ONE WAY BRIDGES. GUARDRAIL ON TRAILING ENDS OF ONE-WAY BRIDGES CAN BE MOUNTED DIRECTLY IN THE END POST RECESS.

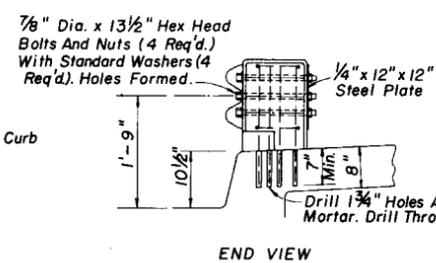
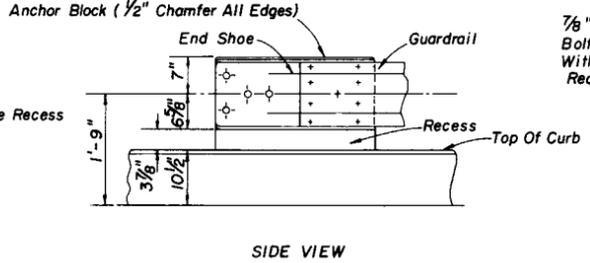
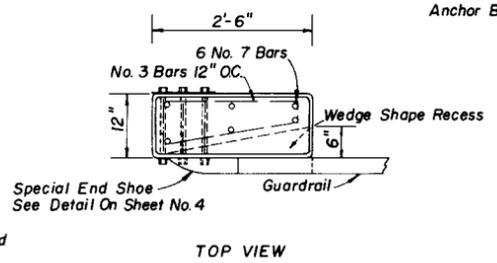


SPECIAL SAFETY PIPE RAIL

FOR LOCATIONS USED BY SUBSTANTIAL NUMBERS OF PEDESTRIANS, CYCLISTS OR FISHERMEN



Note: The pentachlorophenol treated wood block and end shoe shall be mounted to the existing bridge rail and located to provide a 6" clearance from back of guardrail to the face of bridge rail.



TYPICAL GUARDRAIL INSTALLATION AT EXISTING BRIDGE ENDS

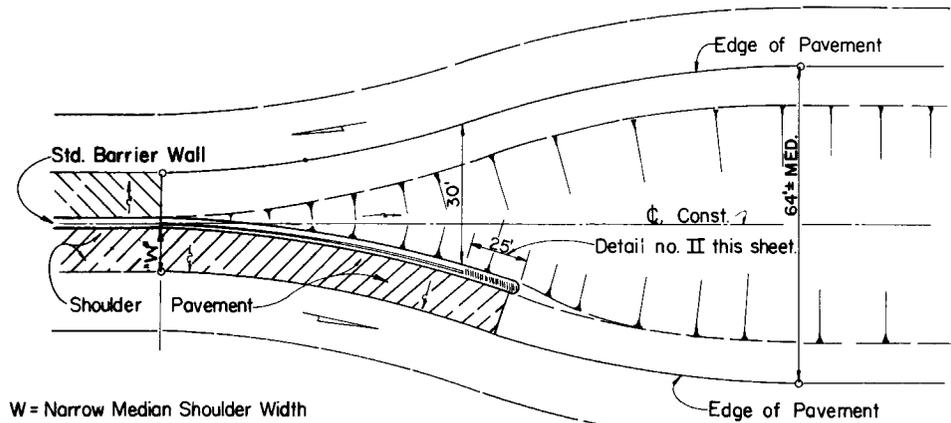
ANCHOR POST - CASE II

TYPICAL GUARDRAIL INSTALLATION AT EXISTING BRIDGE ENDS

CASE I - BRIDGE RAIL WITHOUT SIDEWALK
 CASE II - BRIDGE RAIL WITH SIDEWALK & CURB

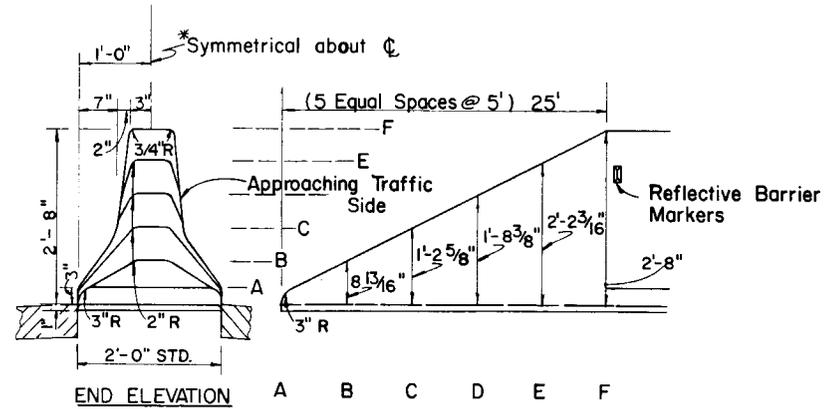
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY PLANS SECTION			
GUARDRAIL CONSTRUCTION			
REVISONS		ROAD NO.	COUNTY
Dates	Descriptions		PROJECT NO.
9-69	Added Attachment Data		
6-7	Anchor Block Case II And Special Detail "A"		
7-71	Added Special Post, Added All To Wood Block On Special Detail "A"	Designed by	APPROVED BY <i>E. H. ...</i> Deputy Design Engineer, Structures
10-74	Changed Inter. Size	Checked by	
3-76	Added 6" C Post Note to Spec Post Detail	Quantities by	
5-78	Three Details Deleted, Two Details Added, Redrawn.	Checked by	
		Supervised by	Drawing No. 5 of 5
			Index No. BGR-01-2

F.H.W.A. APPROVED: 11-16-78



W = Narrow Median Shoulder Width

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



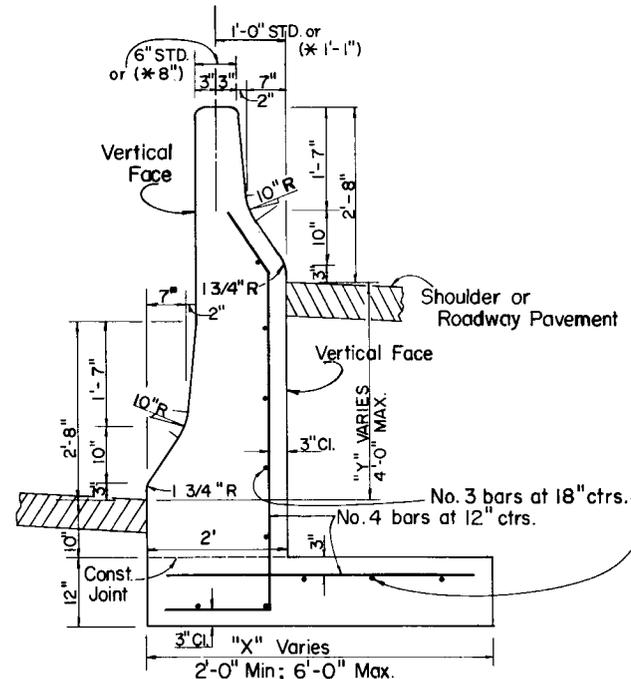
CONCRETE MEDIAN BARRIER TERMINAL

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

DETAIL II

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.

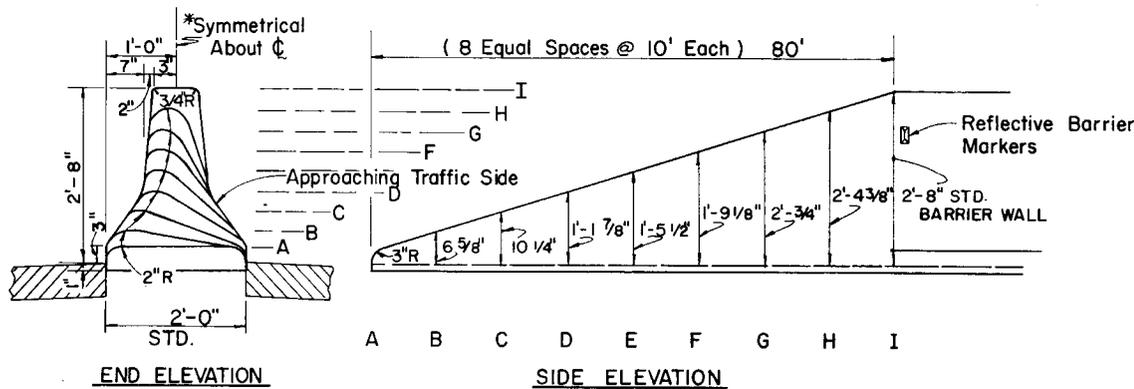


MEDIAN BARRIER WALL FOR SUPERELEVATED SECTION OR VARIABLE ROADWAY PROFILE GRADES

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"



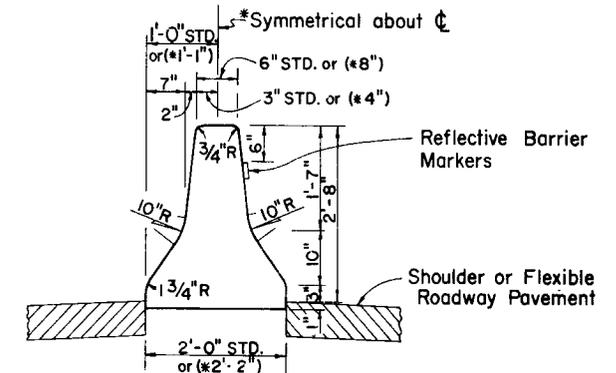
CONCRETE MEDIAN BARRIER TERMINAL NARROW MEDIAN

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.



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.

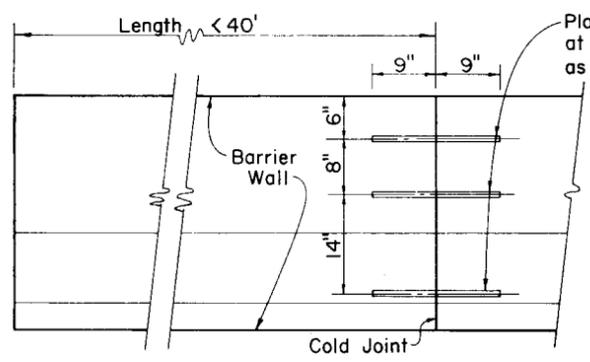
For Median Barrier and 'Special' Barrier Wall Inlet details see sheet 3 of 3.

FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN SECTION

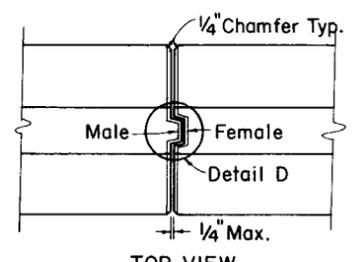
MEDIAN BARRIER DETAILS

FHWA Approved: 5-20-77

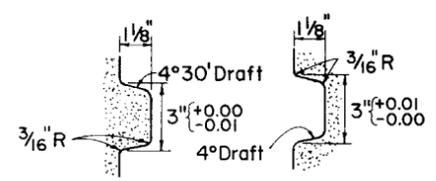
REVISIONS		INITIALS	DATES	Recommended For Approval By:
4-74	Sheet Deleted			DEPUTY DESIGN ENGINEER-ROADWAYS
10-74	Changed Index No.	CHECKED BY	LMF 7-73	Approved By:
4-75	Revised Barrier Reflective Markers	QUANTITIES BY		STATE DESIGN ENGINEER
6-76	Revised Barrier Base depth, added Notes 5, 6, 7 & 8	CHECKED BY		
5-77	Revised Gen. Note No. 1	SUPERVISED BY	DCB	DRAWING NO. 1 of 3
		INDEX NO.	BMB-01-1	



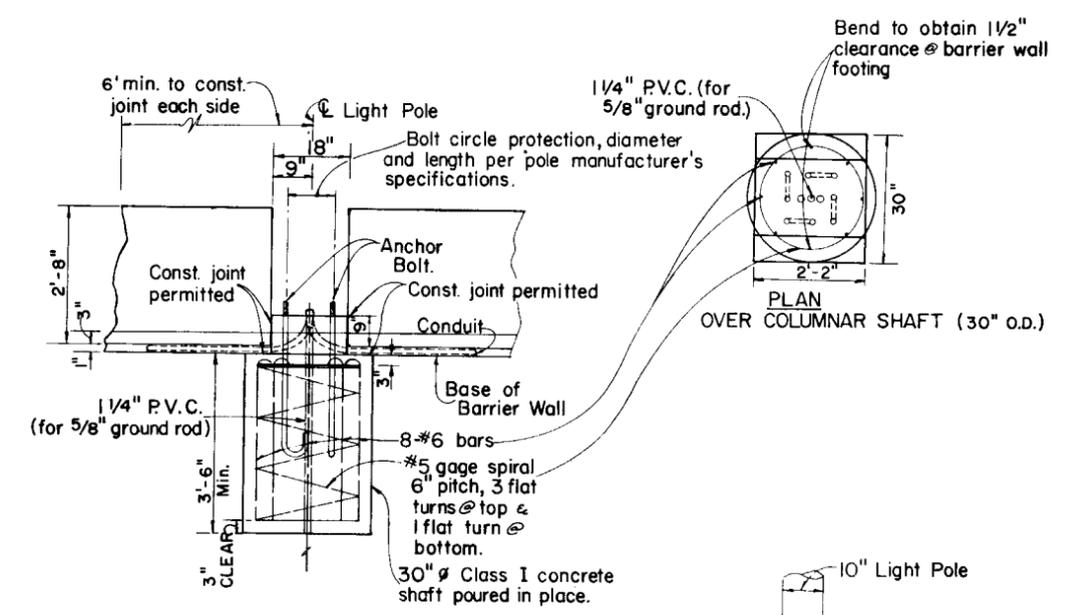
DOWELED TRANSVERSE CONSTRUCTION JOINT
DETAIL B



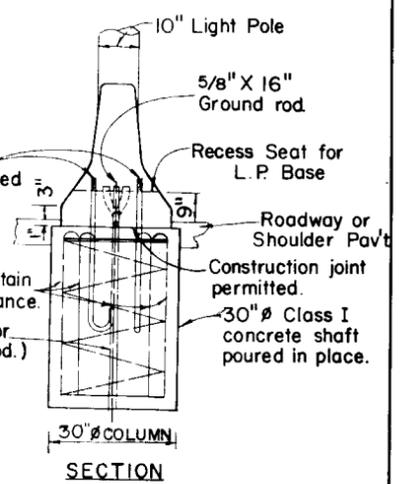
TOP VIEW
DETAIL C
PRECAST BARRIER TRANSVERSE JOINTS



DETAIL D

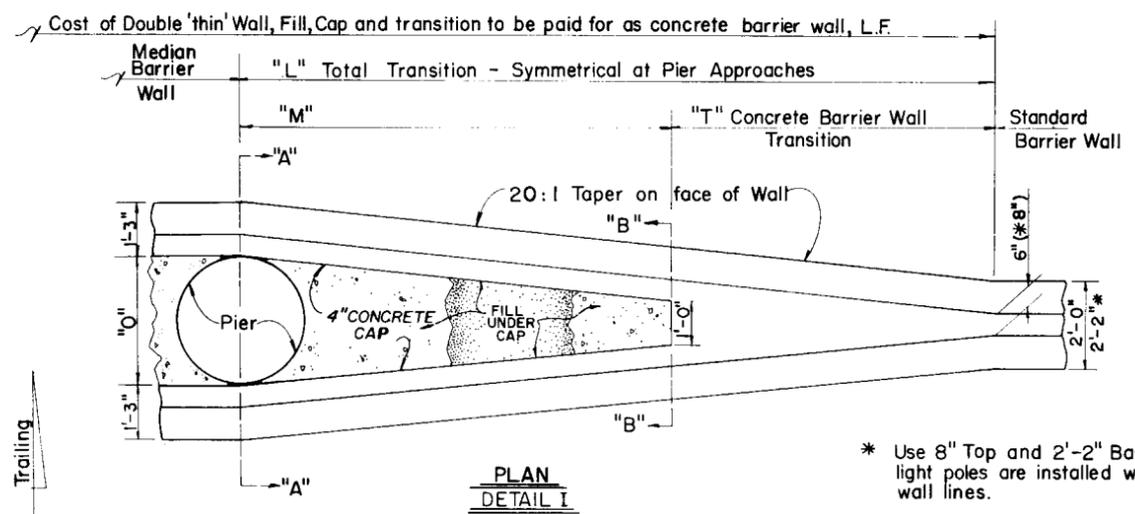


PLAN
OVER COLUMN SHAFT (30" O.D.)



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

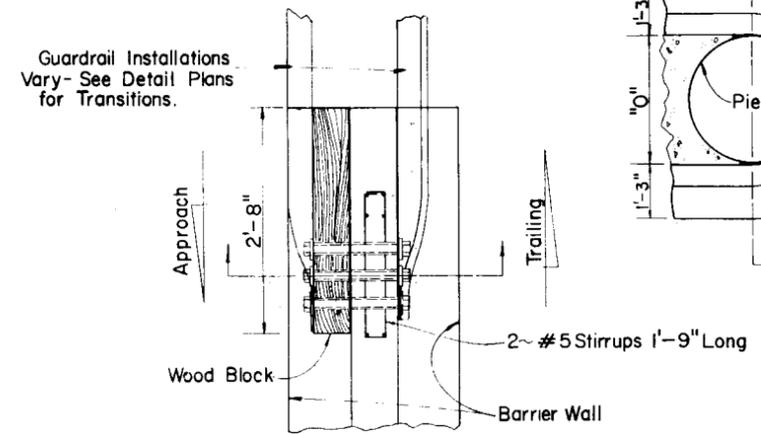
NOTES:
Bolt circle; 8" pole - 11 1/2", 10" pole - 15"
Refer to Highway Lighting Plans for size of Conduit
Payment for the 30" concrete column including reinforcing steel, anchor bolts and accessories shall be included in the contract unit price for Lighting Pole complete, Highway Lighting.



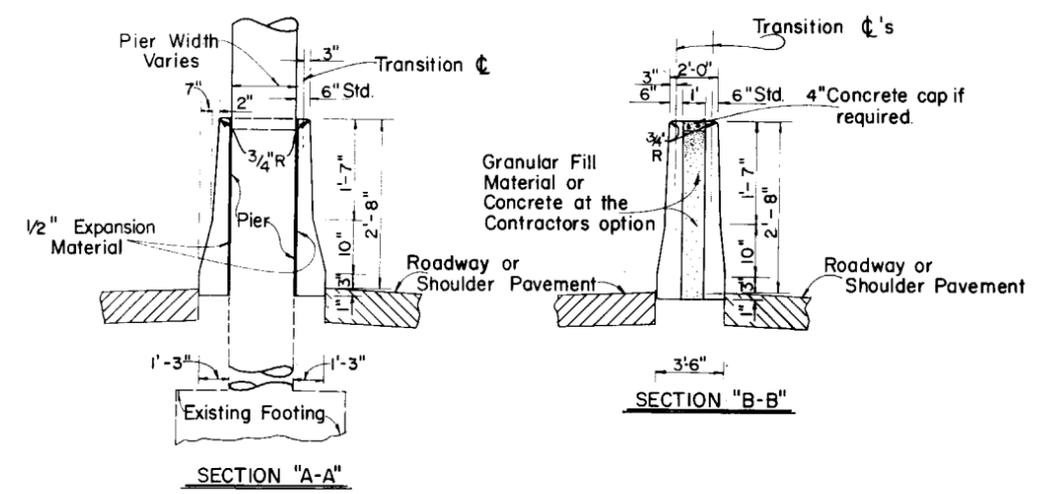
PLAN
DETAIL I

DIMENSIONS - DETAIL I				
"O" Varies 3' Shown	"L" Total Trans.	"M" Barrier Wall	"T" Std. to M. Trans.	WALL TYPE
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.



GUARDRAIL CONNECTION TO STD. CONCRETE BARRIER WALL
SECTION



SECTION "A-A"

SECTION "B-B"

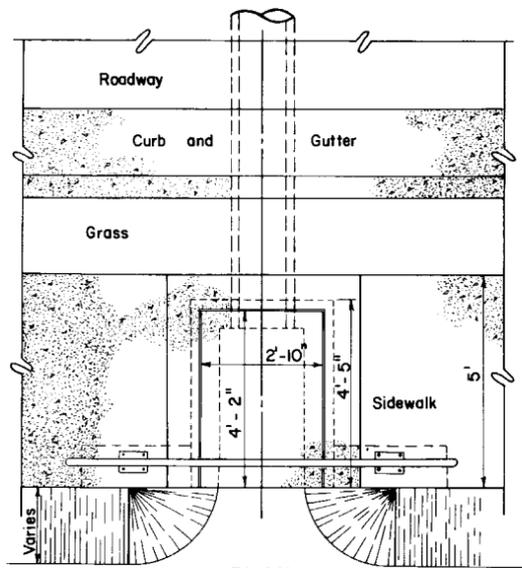
CONCRETE MEDIAN BARRIER WALL

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.

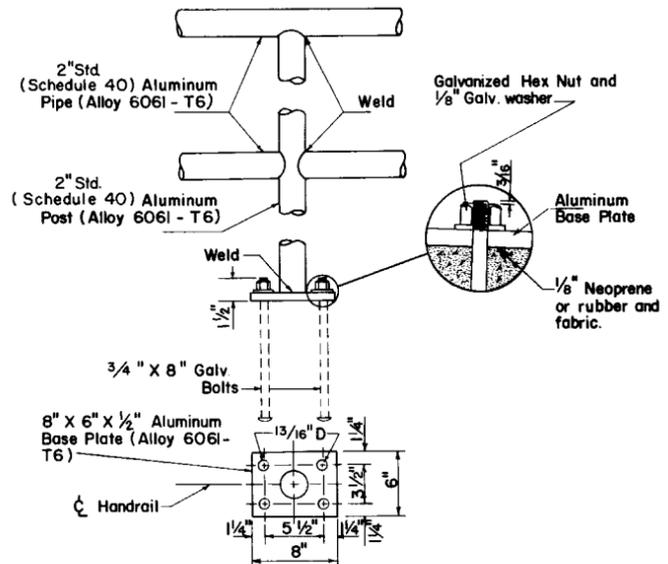
FHWA Approved: 10-8-76

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
MEDIAN BARRIER DETAILS

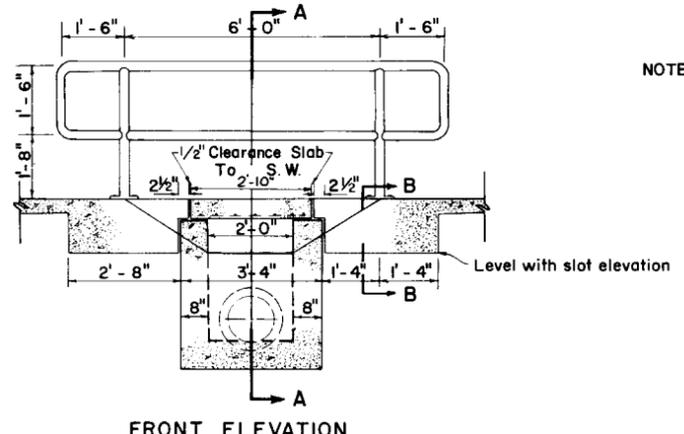
REVISIONS		INITIALS	DATES	Recommended For Approval By:
4-74	Added guardrail to barrier wall section			DEPUTY DESIGN ENGINEER-ROADWAYS
6-74	Light Pole Mounting Revised	LMF	7-73	Approved By:
7-74	Added Rebar to Wall			STATE DESIGN ENGINEER
10-74	Changed Index No.			
6-76	Revised Barrier Base Depth, added Details B, C, & D. Changed Paper to 201 (Det.)			
LMF				
Supervised by		D.C.B.	DRAWING NO. 2 of 3	INDEX NO. BMB-01-1



PLAN

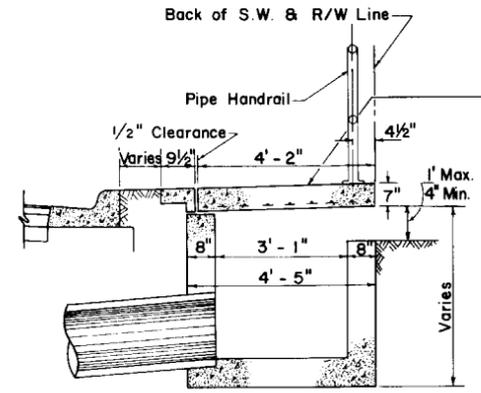


HANDRAIL DETAIL



FRONT ELEVATION

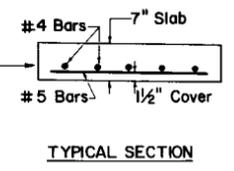
NOTES: At the option of the contractor, Standard Rail Fittings may be used where welded connections are shown.
 After the nuts have been tightened the anchor bolt threads shall be nicked or the nut shall be spot welded to the bolt.
 Bolts, nuts and washers shall be hot dip galv. to conform to requirements 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. DDI -03.
 Grading back of sidewalk varies and shall be done as directed by the engineer.



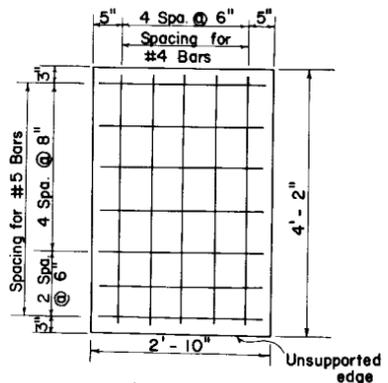
SECTION A - A

TYPE "C" MODIFIED INLET

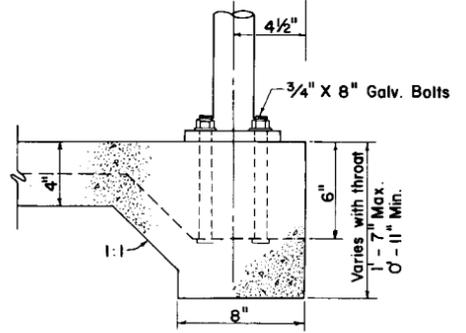
To be paid for as each



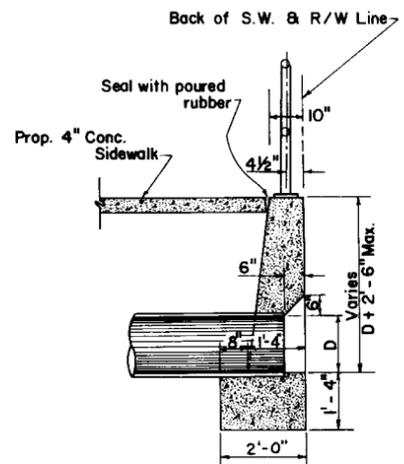
TYPICAL SECTION



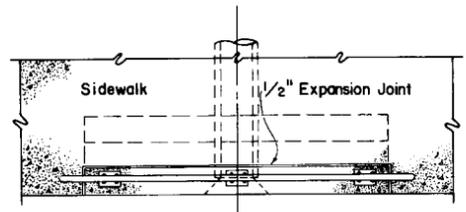
Unsupported edge



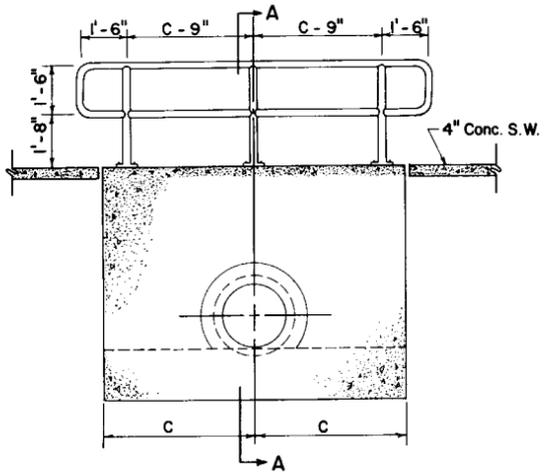
SECTION B - B



SECTION A - A



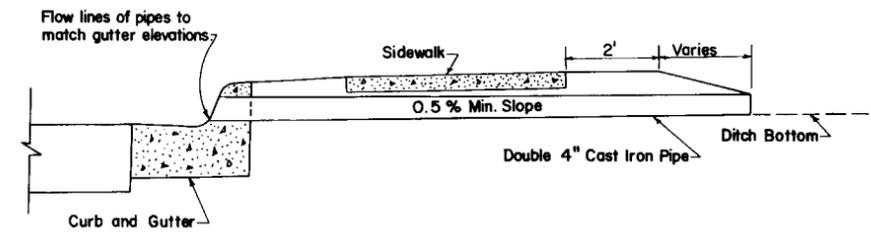
PLAN



FRONT ELEVATION

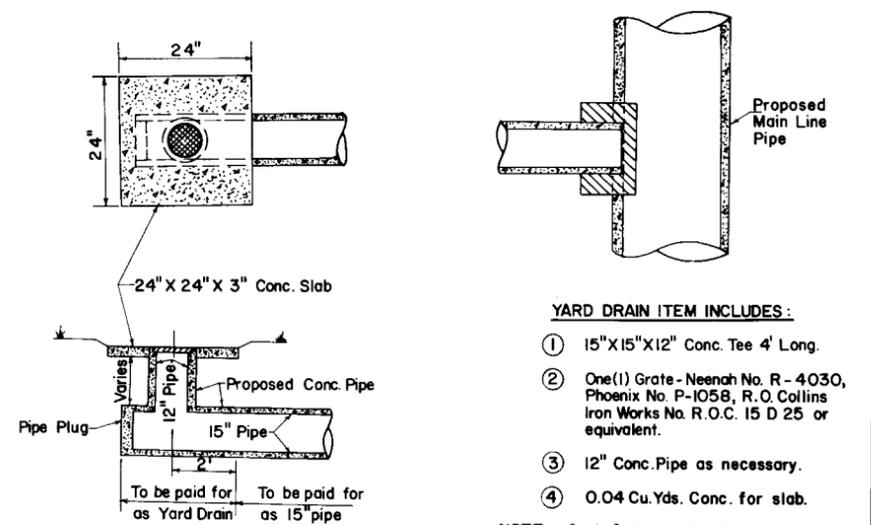
SPECIAL ENDWALL

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.

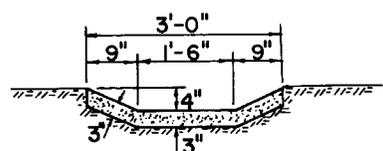
FHWA Approved: 5-1-75

FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section

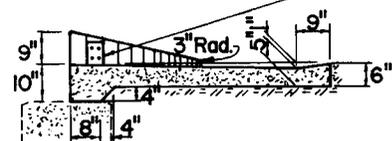
BACK OF SIDEWALK DRAINAGE DETAILS

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

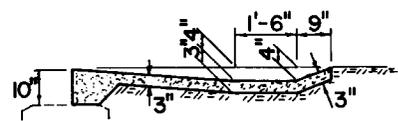
Note: Set reflector plates on right hand curb at bridge ends as shown. Plates to be furnished by D.O.T. and installed by the contractor. Cost of installing plates to be included in the contract unit price for concrete ditch pavement (3" thick).



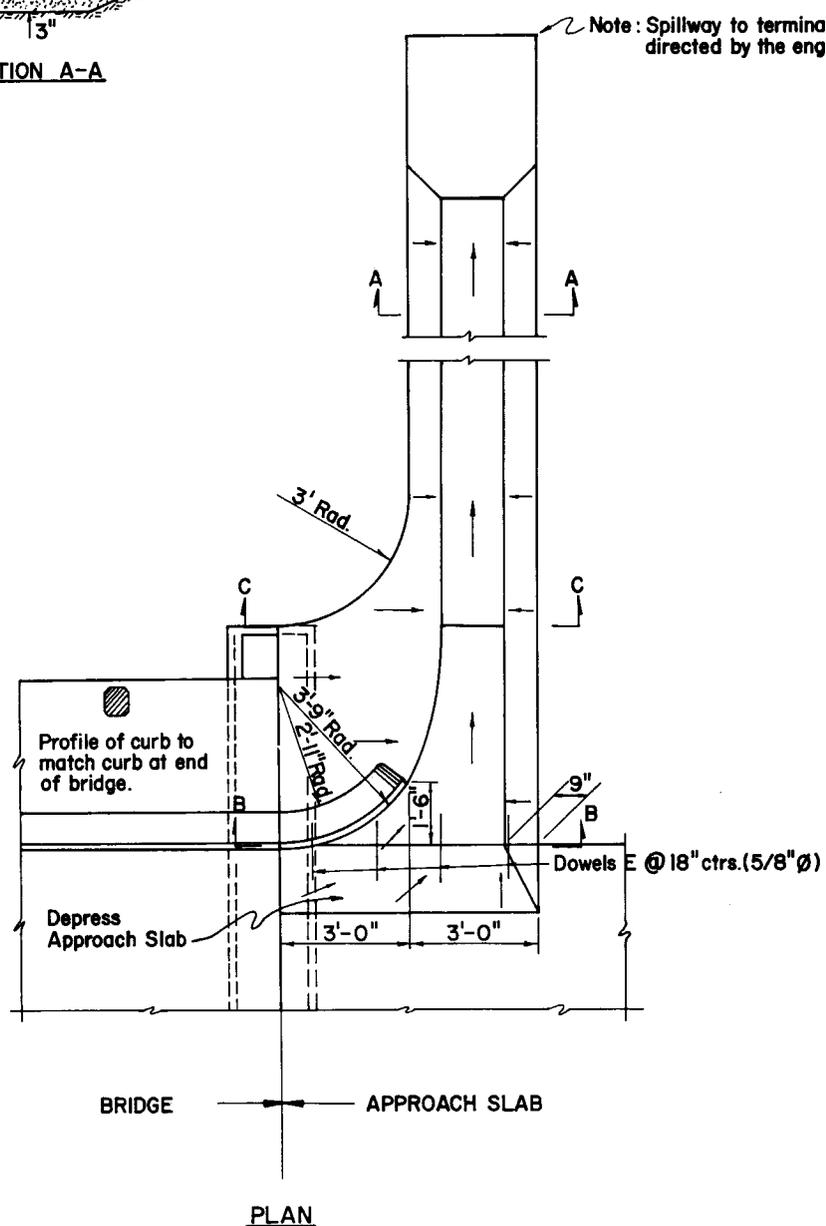
SECTION A-A



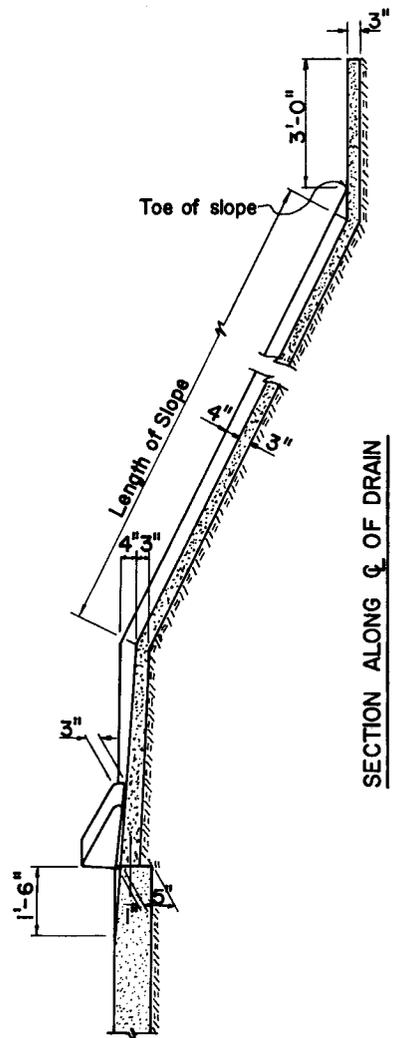
SECTION B-B



SECTION C-C



Note: Spillway to terminate as directed by the engineer.



SECTION ALONG Q OF DRAIN

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.

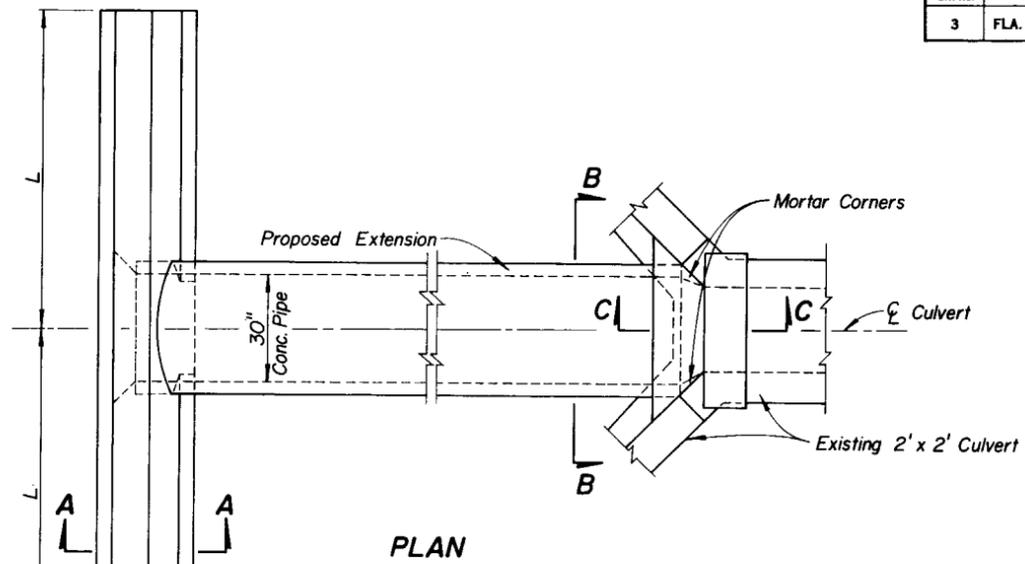
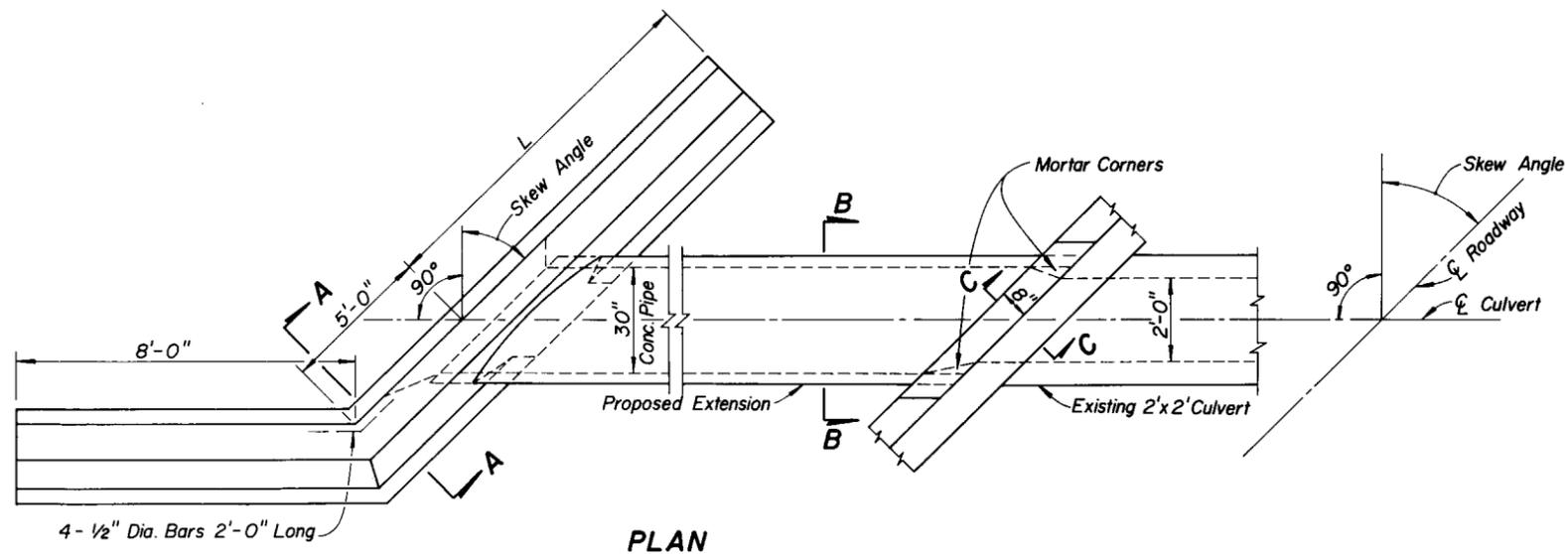
FHWA APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN SECTION

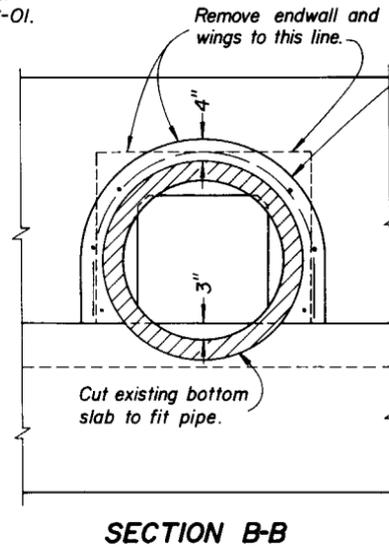
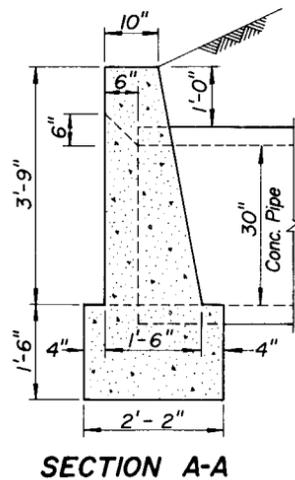
CONCRETE SPILLWAY AT BRIDGE ENDS

ROAD NO.	COUNTY	PROJECT NO.
DESIGNED BY	CHECKED BY	APPROVED BY
C. E. S.	H. L. F.	<i>E.H. Hart</i>
DATE	DATE	INDEX NO.
12-51	12-51	
DRAWING NO.		SHEET NO.
1 of 1		DCS-01

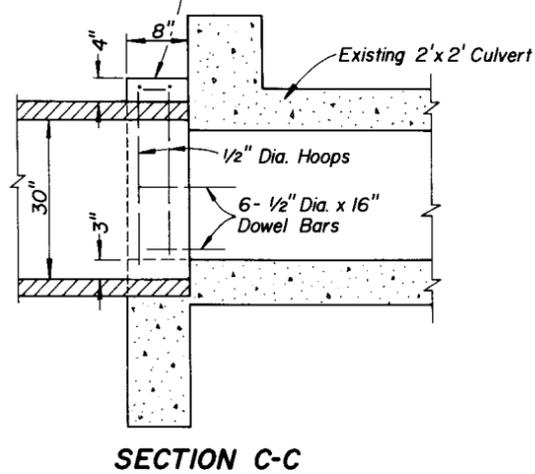
REVISIONS	DATE	DESCRIPTION
9-74	Changed	Index N ^o



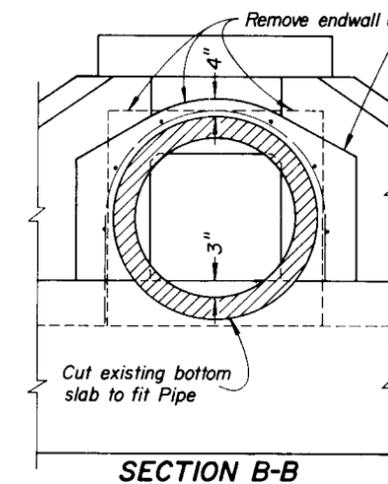
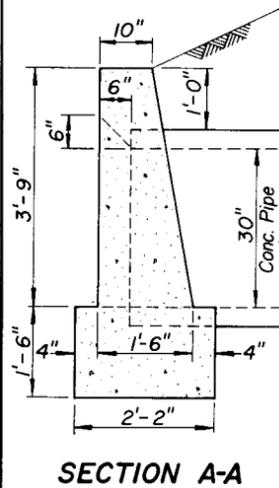
Note: For sodding around endwall see detail on Index No. GRC-01.



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.

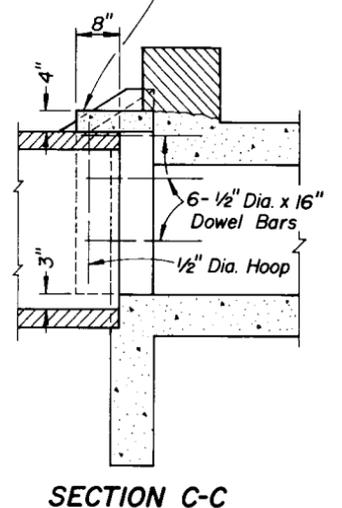


TABLE OF DIMENSIONS AND QUANTITIES		
SKEW Δ	L	CLASS I CONCRETE
0° to 30°	7'-6"	5.6 Cu. Yd.
30° to 45°	8'-6"	6.0 " "
45° to 50°	9'-0"	6.2 " "

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

DETAILS FOR L-TYPE ENDWALLS

TABLE OF DIMENSIONS AND QUANTITIES		
SKEW 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.

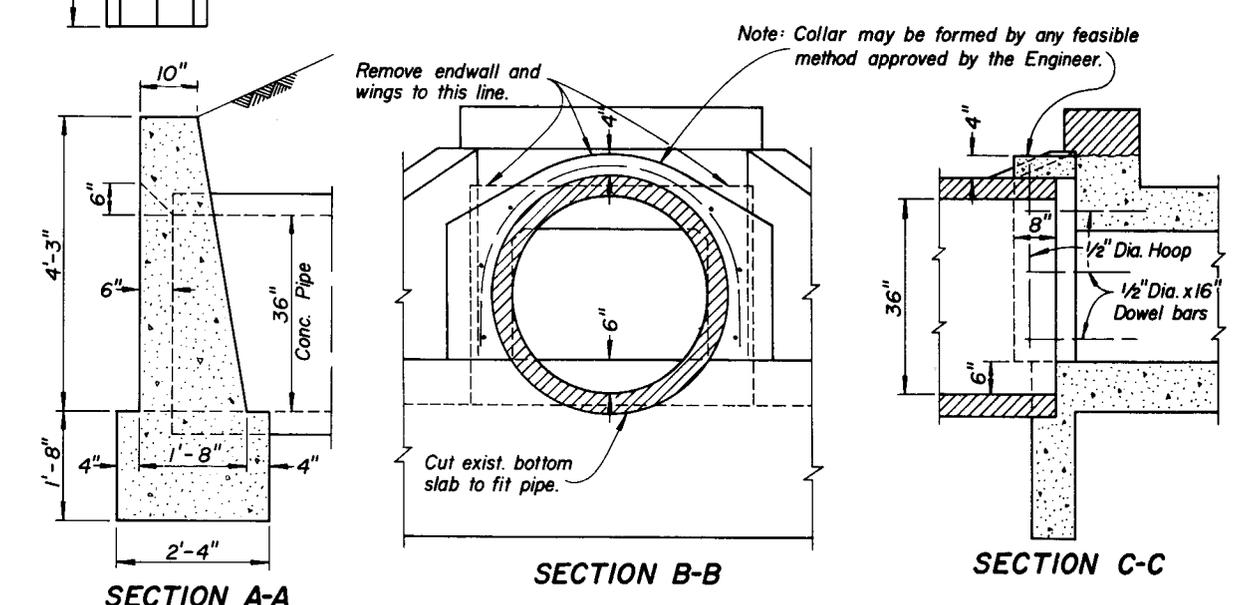
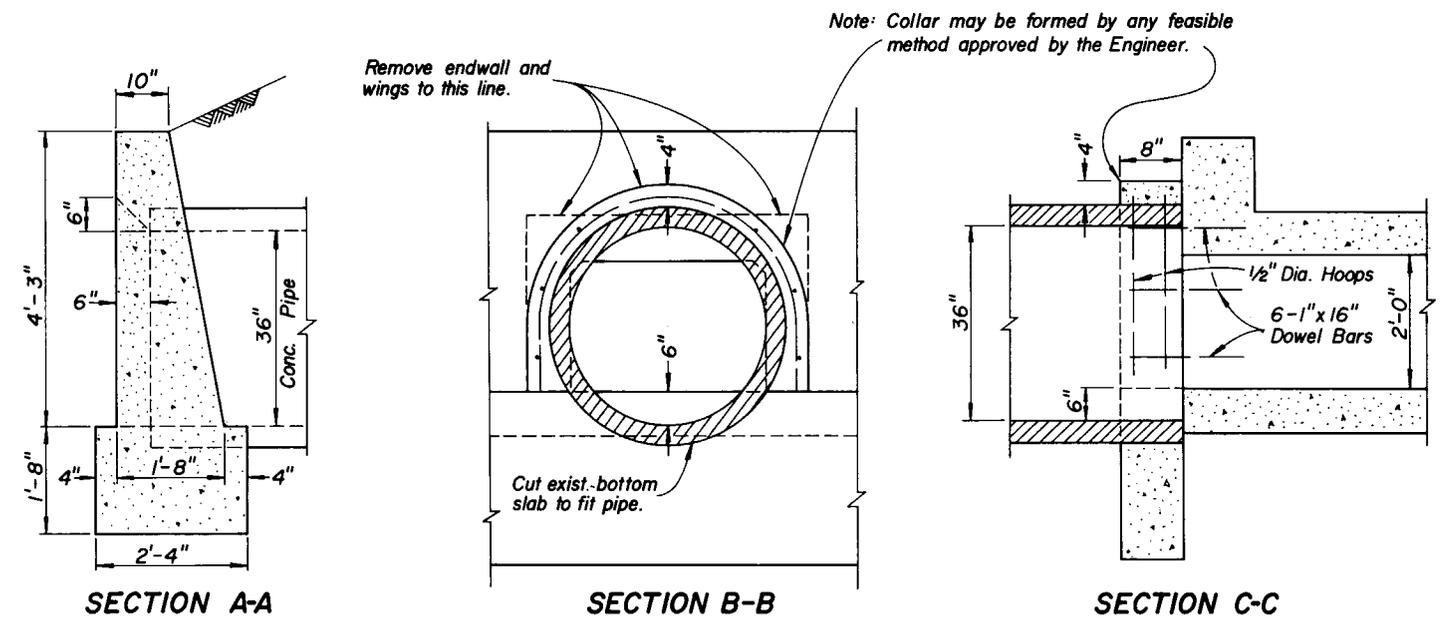
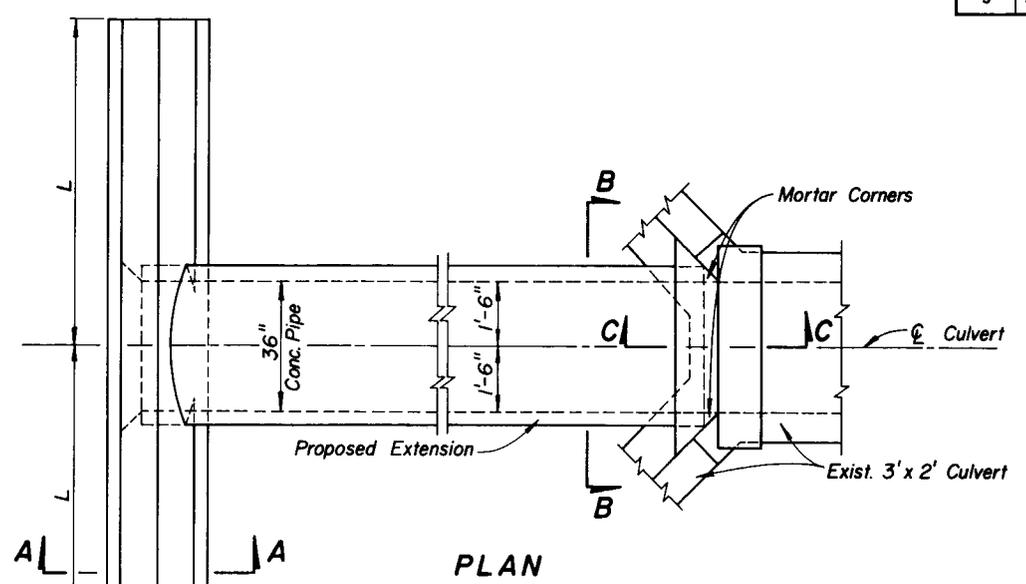
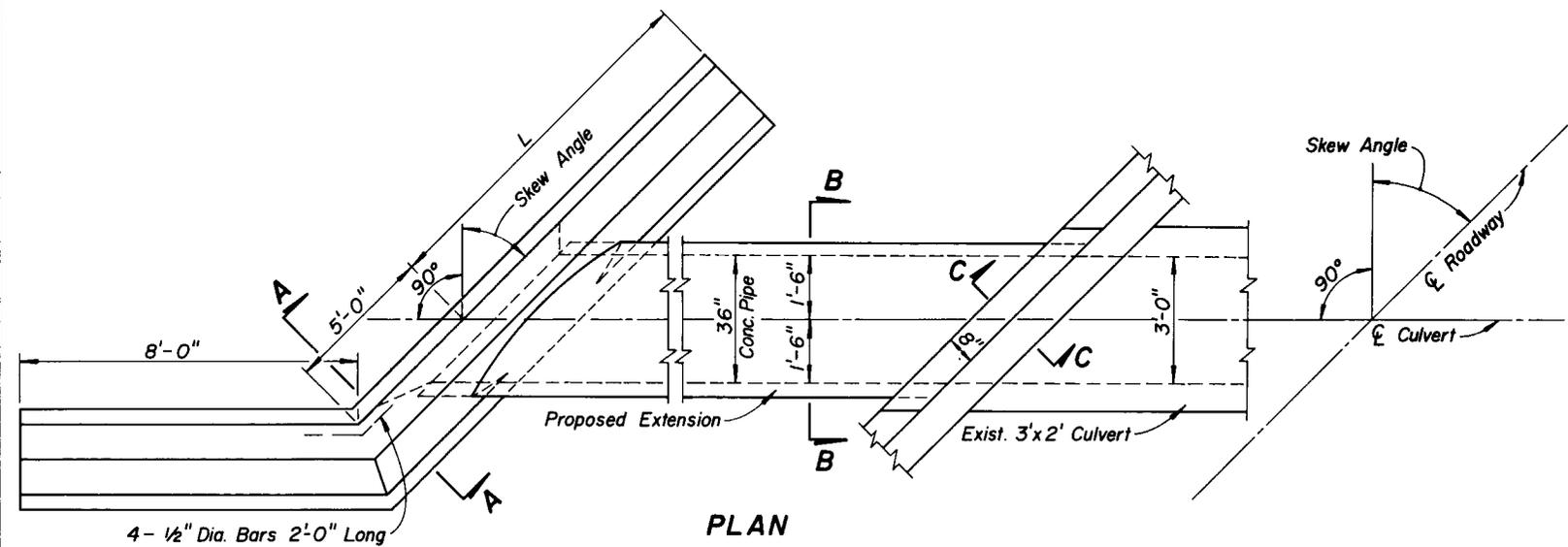
F.H.W.A. APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION
**CONC. PIPE CULVERT EXTENSION
FOR 2'-0" x 2'-0" BOX CULVERT**

REVISIONS		REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions	Dates	Descriptions			
9-77	Retraced	10-51	Retraced			
		1-52	Note: Forms for Collar	Designed by	H.L.F.	10-46
		4-66	Remove mortar from Pipe Invert	Checked by	T.W.J.	10-46
		8-70	Raised side slope to top of endwall	Quantities by	H.L.F.	10-46
		3-73	Added Cl. I Conc.	Checked by	T.W.J.	10-46
		10-74	Changed Index No.	Traced by	C.E.S.	10-46

APPROVED BY: *E.H. Hunt*
Deputy Design Engineer, Roadways

Drawing No. **1 of 1** Index No. **DEX-01**



SKIEW 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 " "

- 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-OI.
 - For sodding around endwall see detail on Index No. GRC-OI.

DETAILS FOR L-TYPE ENDWALLS

DETAILS FOR STRAIGHT TYPE ENDWALLS

SKIEW 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 " "

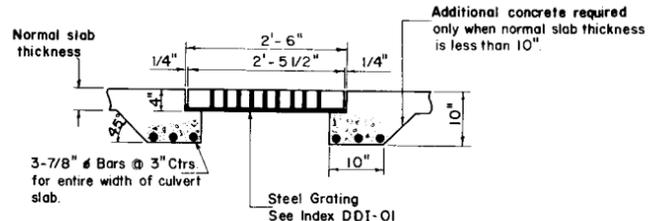
- Note: Reinforcing steel to be included in Contract Unit Price for Concrete.

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

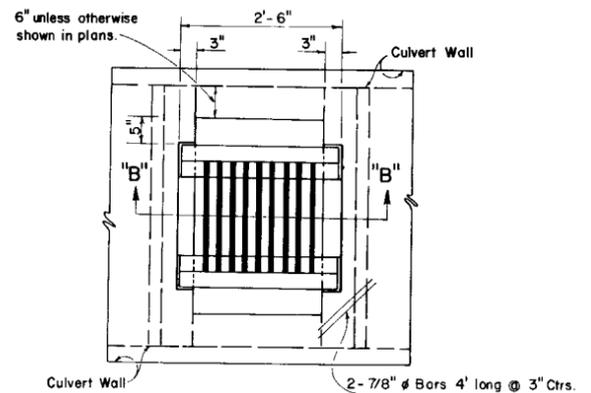
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION
**CONC. PIPE CULVERT EXTENSION
FOR 3'-0" x 2'-0" BOX CULVERT**

REVISIONS		REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions	Dates	Descriptions			
10-74	Changed Index No.	10-51	Retraced			
9-77	Retraced	1-52	Note: Forms for Collar	Designed by	H.L.F.	11-46
		4-66	Remove mortar from Pipe Inset	Checked by	C.H.J.	11-46
		7-69	Added Note No. 2	Quantities by	H.L.F.	11-46
		8-70	Raised side slope to top of endwall	Checked by	C.H.J.	11-46
		3-73	Added Cl. I Conc.	Supervised by		

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

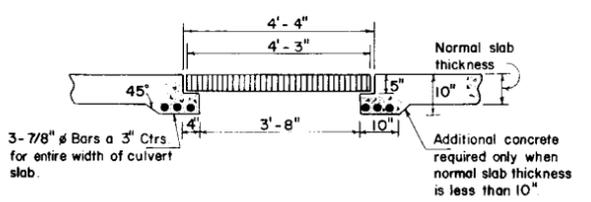


SECTION "B-B"

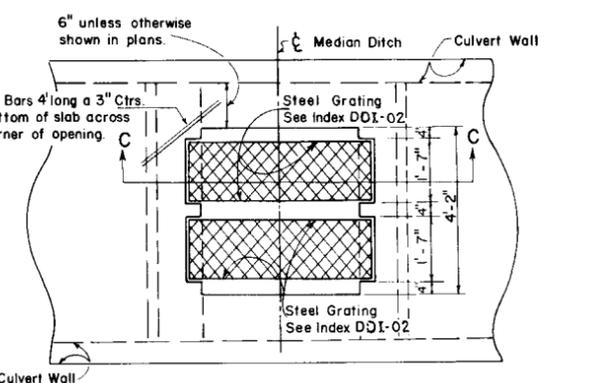


PLAN

MODIFIED TOP (TYPE "A" INLET)



SECTION C-C

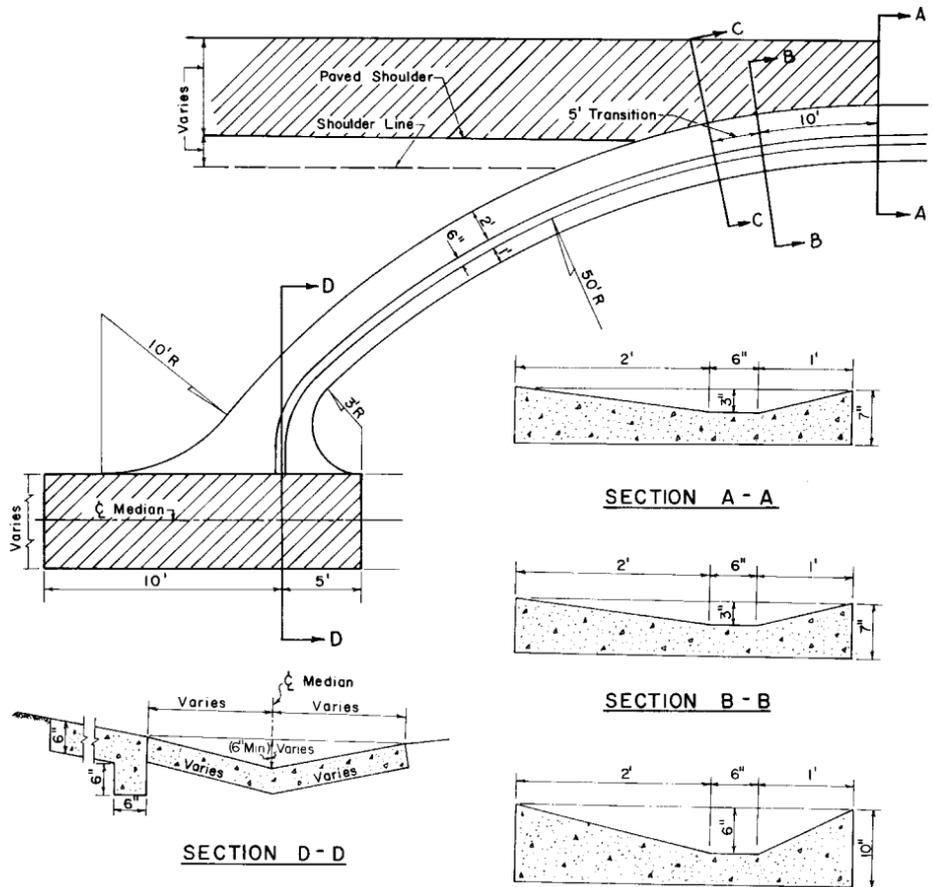


PLAN

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 1/4" clear



SECTION A - A

SECTION B - B

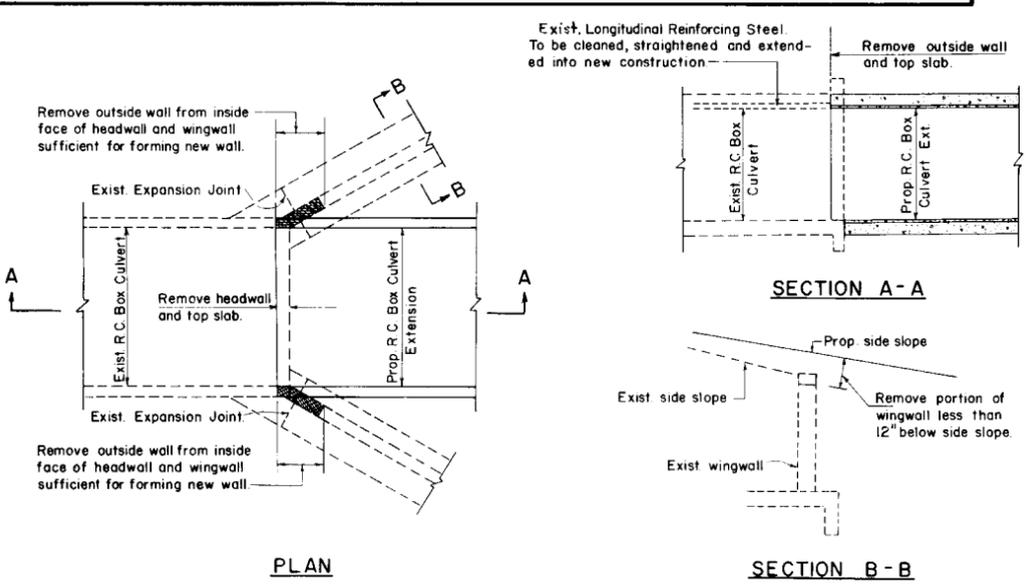
SECTION C - C

SECTION D - D

- 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

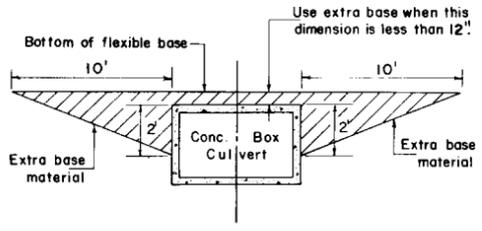
(TO BE USED WHERE INLETS, PIPES & ENDWALLS ARE IMPRACTICAL)



PLAN

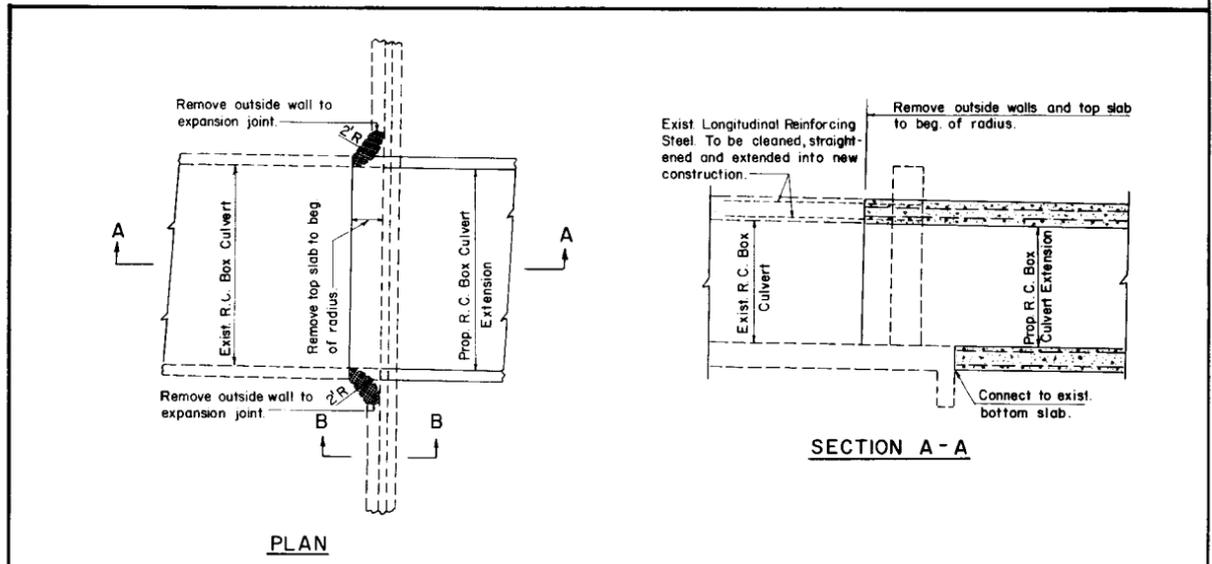
SECTION B - B

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

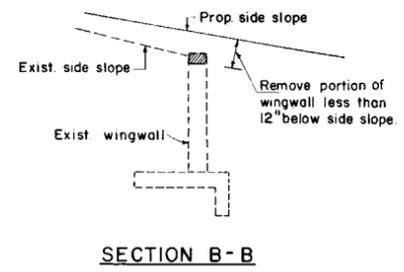


PLAN

SECTION A - A

ENDWALLS PARALLEL TO ROADWAY

CONNECTION DETAILS R.C. BOX CULVERT EXTENSIONS

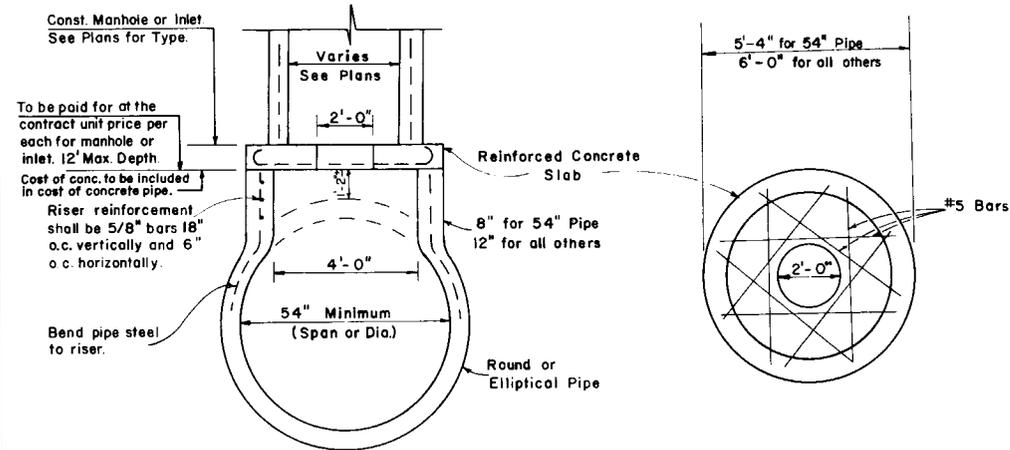


SECTION B-B

FHWA Approved: 11-16-78
 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
		Checked by		APPROVED BY
		Quantities by		Asst. State Highway Engineer
		Checked by		Drawing No.
		Traced by		Index No.
				1 of 3
				DMD-01-2

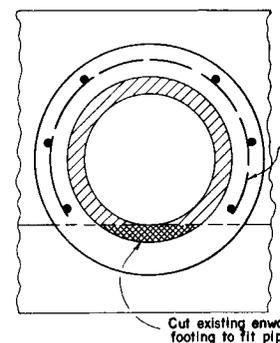


Reinforced slabs are required when inlet or manhole riser is less than 4' in diameter or when Type P, Alt. B manhole or inlet riser is used. For optional construction joints see Index NO. DSD-01.

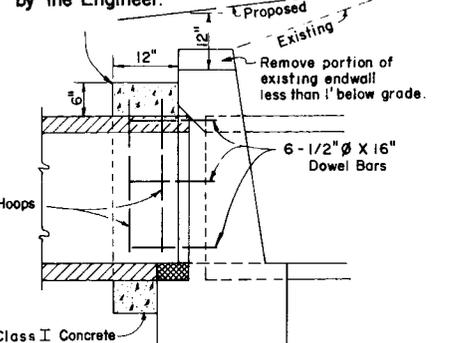
DETAILS OF CONSTRUCTION OF INLETS OR MANHOLES ON INTEGRAL PRECAST CONCRETE RISER FOR CONCRETE PIPE

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

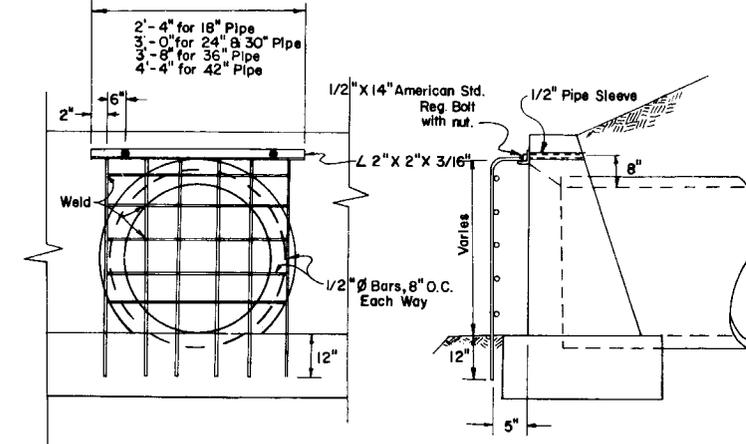
Note: Collar may be formed by any feasible method approved by the Engineer.



DETAIL OF CONCRETE COLLAR FOR EXTENSION OF EXISTING PIPE CULVERTS

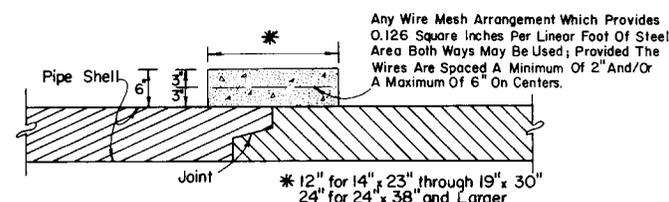


Note: Spigot end to be placed in existing Endwall regardless of direction of flow.



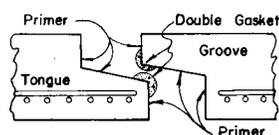
GUARD AT PIPE ENDS

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.

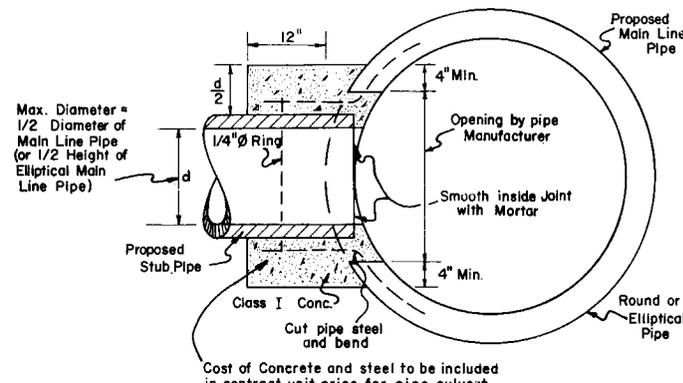


DETAIL OF CONCRETE COLLAR FOR ELLIPTICAL CONCRETE PIPE JOINTS

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.

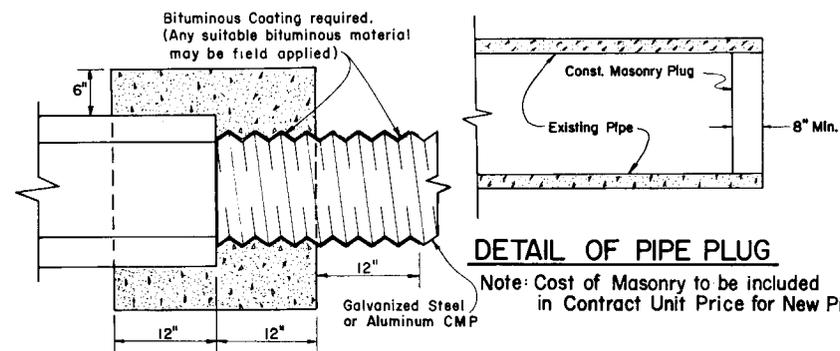


DETAIL FOR APPLICATION OF GASKET MATERIAL (BEFORE JOINT PULL-UP)



DETAILS OF CONSTRUCTION AT JUNCTIONS OF MAINLINE PIPE AND STUB PIPE

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



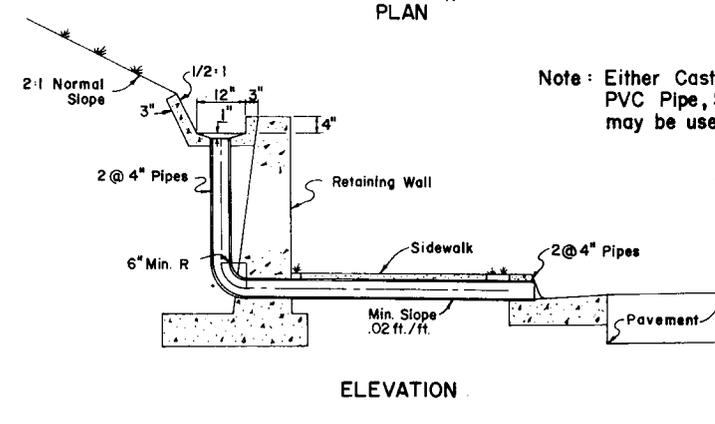
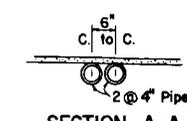
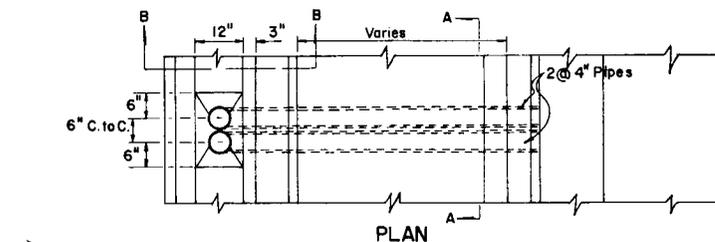
DETAIL OF PIPE PLUG

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.



DETAILS OF CONCRETE GUTTER AND DRAINS AT RETAINING WALLS

Note: Either Cast Iron Pipe or PVC Pipe, Schedule 40, may be used.

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.

FHWA APPROVED: 11-16-78

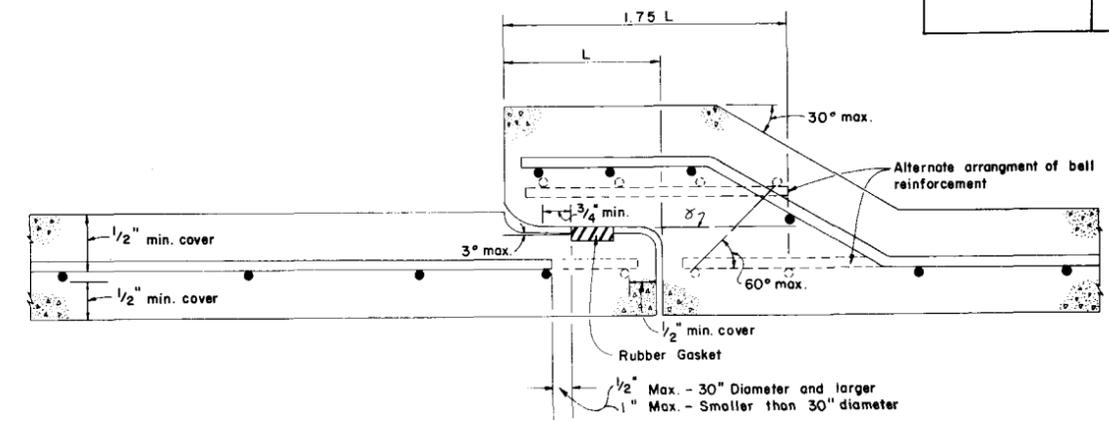
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

MISC. DRAINAGE DETAILS

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

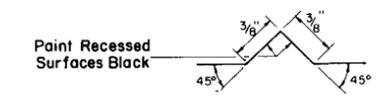
SCHEDULE OF BELL REINFORCEMENT
Classes - III, IV, V; Wall- A,B,C

Nominal Pipe Diameter	Design Bell Reinforcement	Maximum Reinforcement Under Tolerance
	SQUARE INCHES	SQUARE INCHES
15"	0.12	0.010
18"	0.16	0.010
24"	0.20	0.010
30"	0.24	0.010
36"	0.28	0.010
42"	0.32	0.010
48"	0.36	0.011
54"	0.40	0.012
60"	0.45	0.0135
66"	0.50	0.015
72"	0.55	0.0165
78"	0.60	0.018
84"	0.65	0.0195
90"	0.70	0.021
96"	0.75	0.0225
102"	0.80	0.024
108"	0.85	0.0255



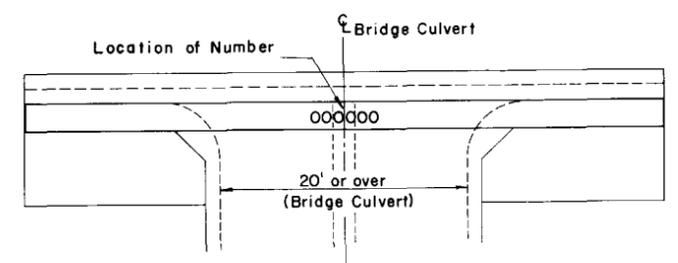
∅ All circumferential steel located above this line within 1.75 L is defined as bell reinforcement.

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



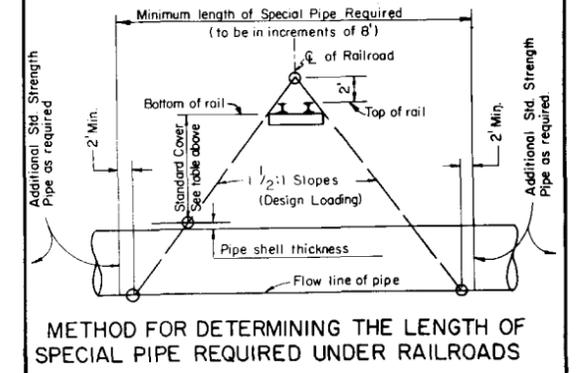
SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED FIGURES

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

RAILROAD COMPANY	CLEARANCE BELOW BOTTOM OF RAIL (FEET)	STRENGTH (A.S.T.M.) TABLE NO.
APALACHICOLA NORTHERN	4.0	IV
ATLANTA AND ST. ANDREWS BAY	3.0	IV
FLORIDA EAST COAST	5.5 *	IV
LOUISVILLE AND NASHVILLE	4.6	IV
ST. LOUIS - SAN FRANCISCO	4.5	IV WALL B
SEABOARD COASTLINE	5.5	IV
SOUTHERN RAILWAY SYSTEM		
GEORGIA SOUTHERN AND FLORIDA	5.5	V
LIVE OAK, PERRY AND SOUTH GEORGIA	5.5	V
ST. JOHNS RIVER TERMINAL	5.5	V



METHOD FOR DETERMINING THE LENGTH OF SPECIAL PIPE REQUIRED UNDER RAILROADS

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

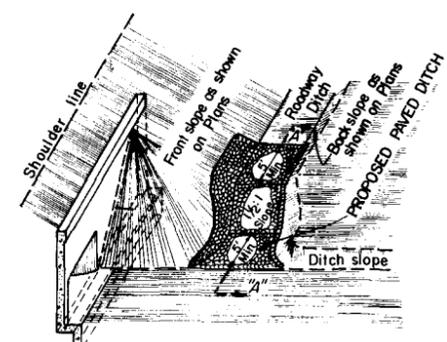
FHWA APPROVED 11-16-78

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

MISCELLANEOUS DRAINAGE DETAILS

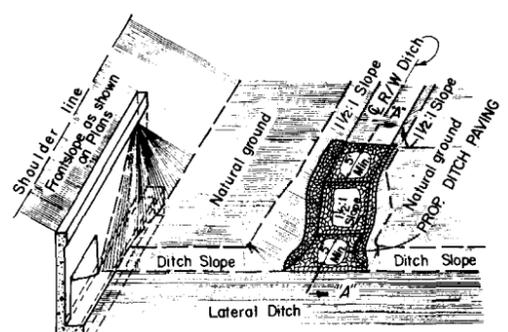
REV.	DESCRIPTION	INITIALS	DATES	Recommended for approval
11-74	Changed Index No.			Deputy Design Engineer
11-75	Added Detail of Br. Cully No. Local			Approved
	Quantities by			State Engineer
	Checked by			
	Supervised by			

DRAWING NO. **3 of 3** | SHEET NO. **DMD-01-2**

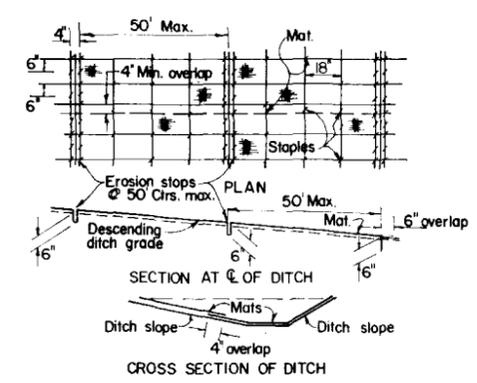


DETAIL AT JUNCTION OF ROADWAY DITCH* AND LATERAL DITCH

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

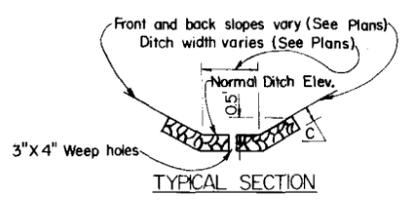
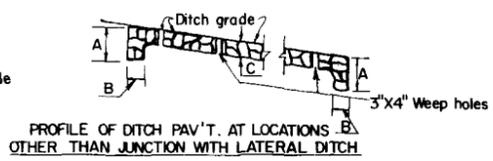
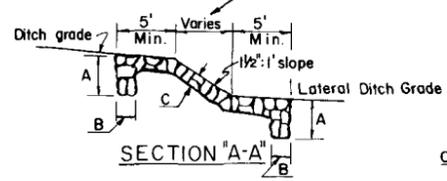


DETAIL AT JUNCTION OF R/W DITCH* AND LATERAL DITCH

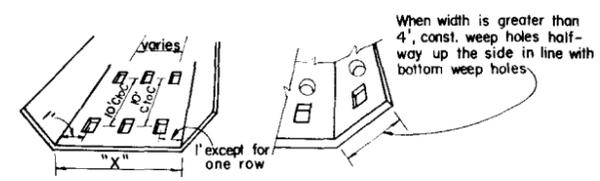


DETAILS OF INSTALLATION OF MATTING FOR EROSION CONTROL

Do not construct weep holes in this area or 5' upstream



TYPICAL SECTION

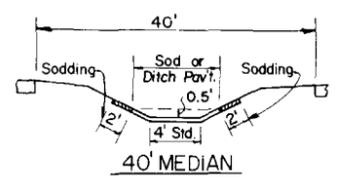


- When "X" = 1' to 4' Const. 1 Row (centered)
- "X" = 5' to 7' Const. 2 Rows
- "X" = 8' to 12' Const. 3 Rows
- "X" = 13' to 17' Const. 4 Rows
- "X" = 18' to 22' Const. 5 Rows

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

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"

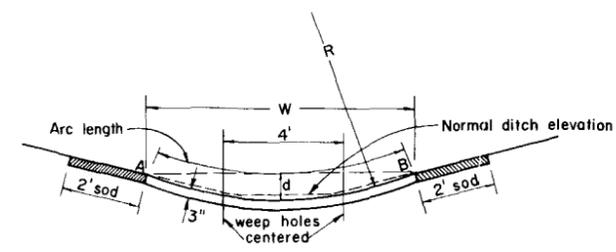


40' MEDIAN

DITCH PAVEMENT & SODDING

GENERAL NOTES

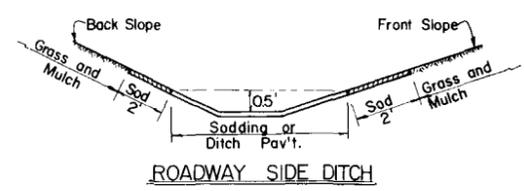
- Type of ditch pavement shall be as shown on plans.
- In concrete ditch pavement, contraction joints are to be spaced at 25' maximum intervals, or as directed by the Engineer. Contraction joints may be either formed (construction joint) or tooled. No open joints will be permitted.
- 1/2" expansion joints with preformed joint filler shall be constructed at all inlets, endwalls, and at intervals of not more than 200'.
- 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.



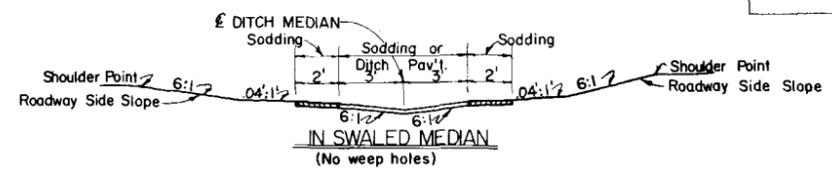
TO REPLACE:	W	d	R	No. of rows of weep holes	Arc Length
6' Median Swale	6'	.24'	19'	0	6.0
6:1 Front Slopes; 4:1 Back Slope					
5' B.W. Ditch	10'	.67'	19'	2	10.1
4' B.W. Ditch	9'	.54'	19'	2	9.1
4:1 Front slope & Back slope					
5' B.W. Ditch	9'	.74'	14'	2	9.2
4' B.W. Ditch	8'	.58'	14'	1 in center	8.1

ALTERNATE DITCH PAVEMENT

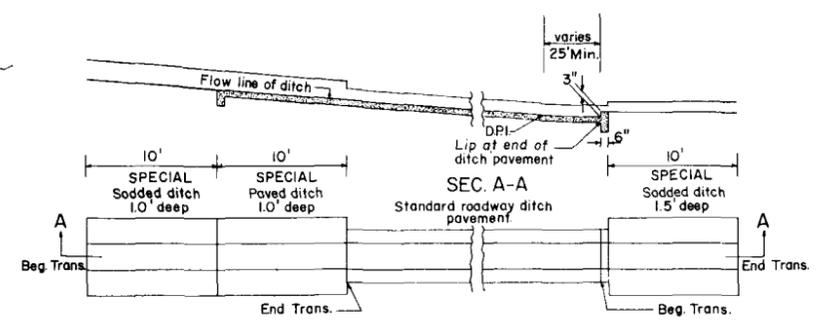
For use only where side slopes are 4:1 or flatter. Point "A" and "B" are to be the same elevation and should be used to locate the paved section.



ROADWAY SIDE DITCH



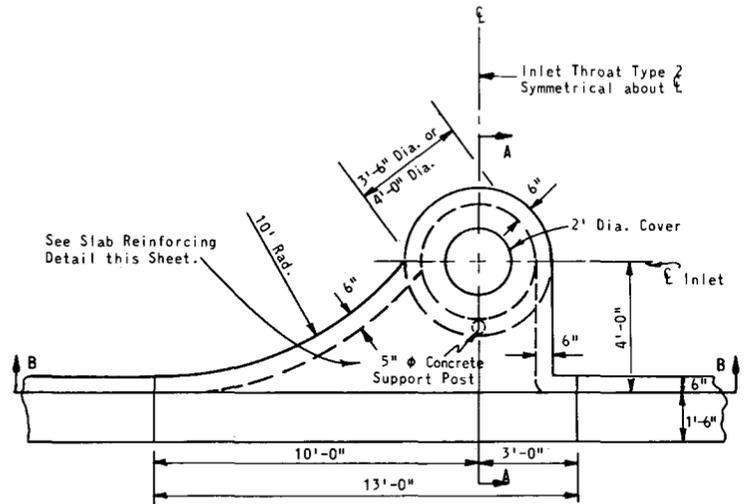
IN SWALED MEDIAN (No weep holes)



TYPICAL PAVED DITCH SECTION FOR TRANSITIONS FROM PAVED TO UNPAVED SECTIONS

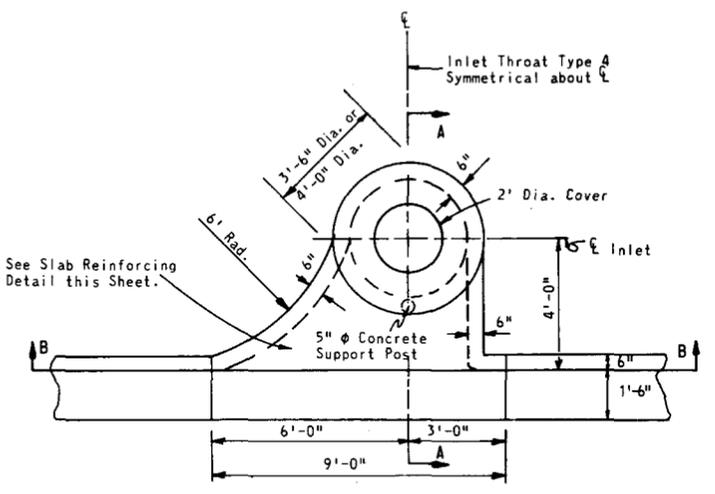
FHWA Approved: 5-1-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY PLANS SECTION			
DITCH PAVEMENT & SODDING			
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Date			
10-74 Redrawn - Chgd Index NR			
Designed by	Names	Date	Recommended For Approval By: Deputy Design Engineer - Roadways
Checked by			APPROVED BY: [Signature]
Quantities by			State Design Engineer
Checked by			Drawing No. 1 OF 1 Index No. DPS-01
Supervised by			



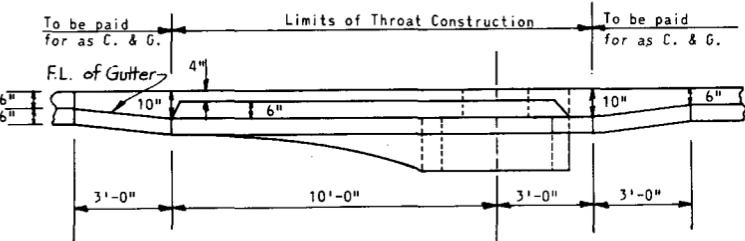
INLET THROAT TYPE 1

Inlet Throat Type 2
Symmetrical about ϵ

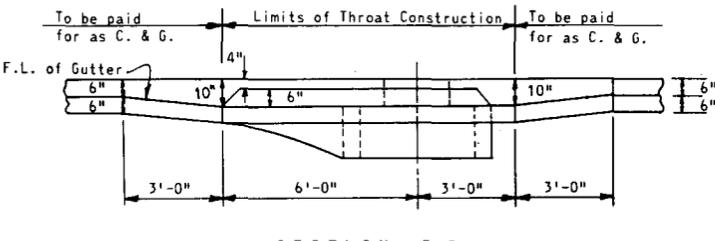


INLET THROAT TYPE 3

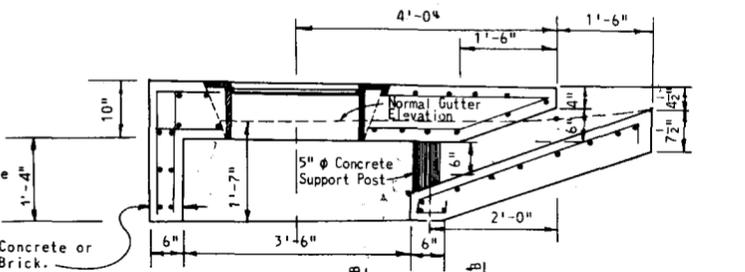
Inlet Throat Type 4
Symmetrical about ϵ



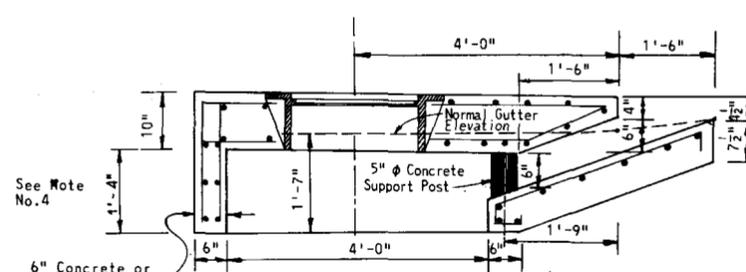
SECTION B-B



SECTION B-B

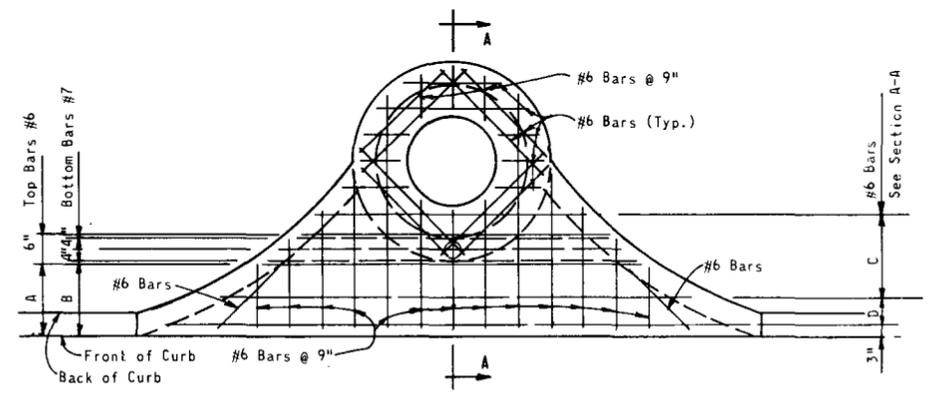
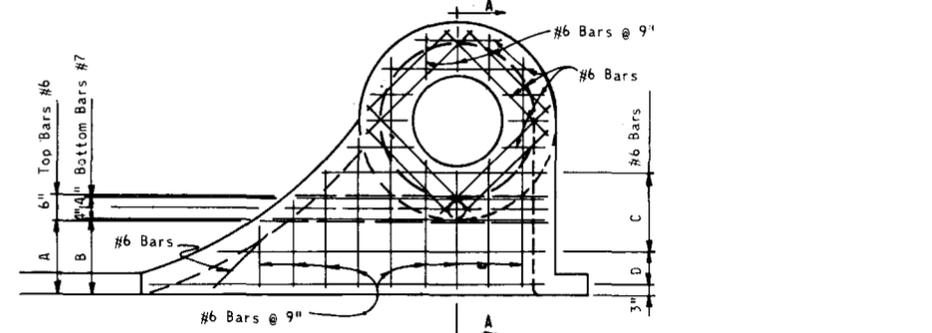


3'-6" DIAMETER



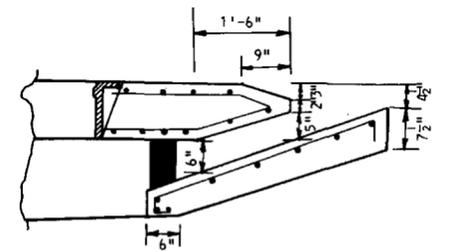
4'-0" DIAMETER

- 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 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.



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**

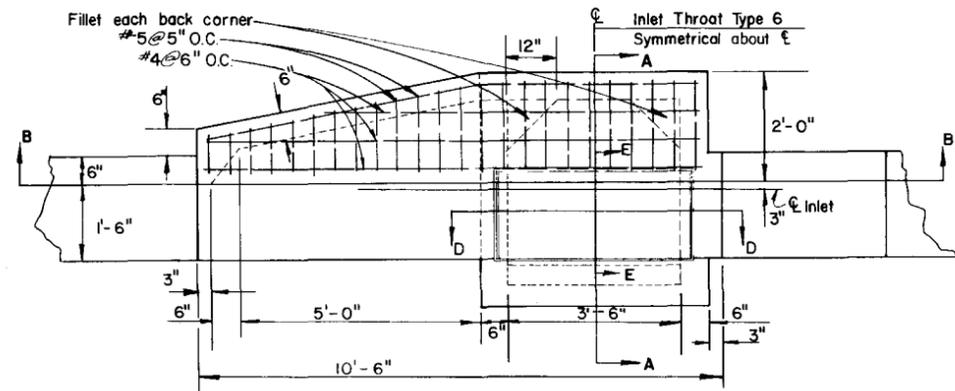


**INLET TOP MODIFICATION
FOR TYPE "E" CURB**

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

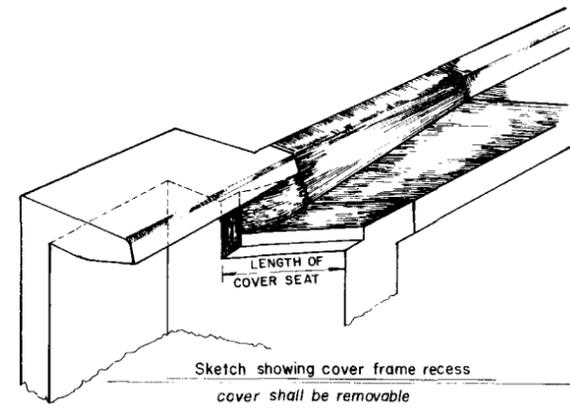
CURB INLET-TYPES 1, 2, 3 & 4

REVISIONS		INITIALS	DATES	Recommended for approval by <i>E.H. Hart</i> Deputy Design Engineer - Roadways
5-74	Redrawn-Chgd Index No.			
				Checked by
				Checked by
				Supervised by
				DRAWING NO. 1 of 1
				INDEX NO. DCI-01

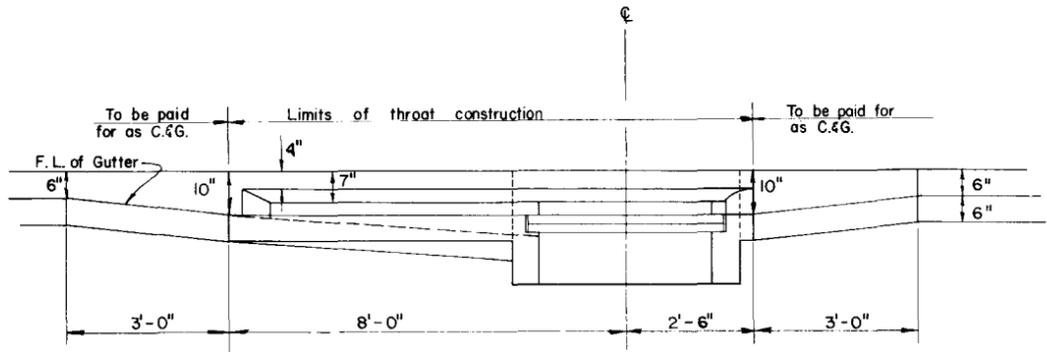


INLET THROAT TYPE 5

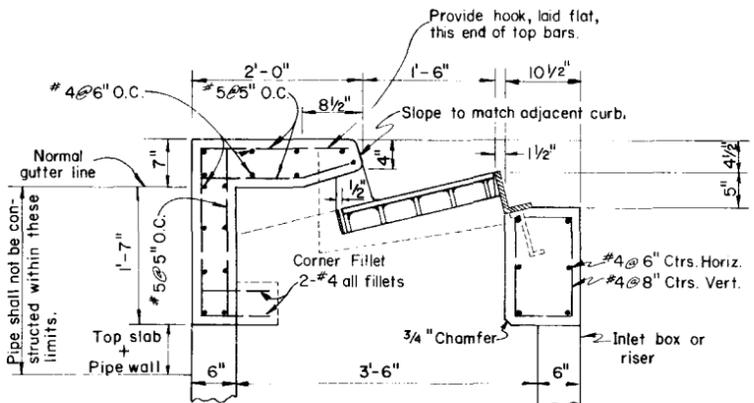
Inlet Throat Type 6
 Symmetrical about E



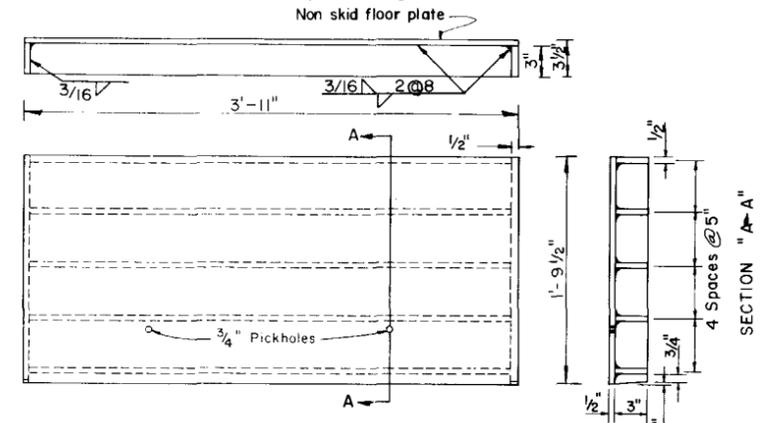
- GENERAL NOTES:
- The finished grade and slope of the inlet tops are to conform with the finished cross slope and grade of the proposed sidewalk and/or parkway.
 - When inlets are to be constructed on a curve, refer to the plans to determine the radius and, where necessary, modify the inlet details accordingly. Bend steel when necessary.
 - All steel in throats shall have 1/4" minimum cover unless otherwise shown. Inlet throats shall be either cast-in-place or precast concrete.
 - The corner fillets shown for rectangular throats (Type 5B6) are necessary only when throats are to be used in conjunction with circular inlet boxes or when used on skew with rectangular inlet boxes.
 - See Index DSD-01 for supplemental details.
 - These inlet throats were designed for use with std. curb & gutter and Type E curb. Locate outside of pedestrian cross traffic if possible.
 - For inlet bottoms see index no. DSB-01.
 - Tack weld cover to frame in 4 places.
 - All steel used for frame and cover shall meet the requirements of ASTM A-36.
 - 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.



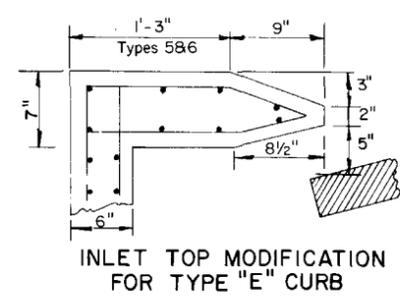
SECTION "B-B"



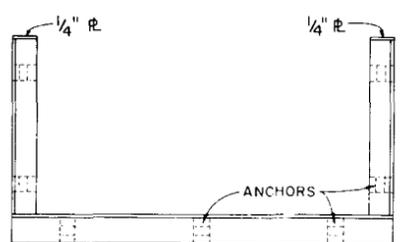
SECTION "A-A"



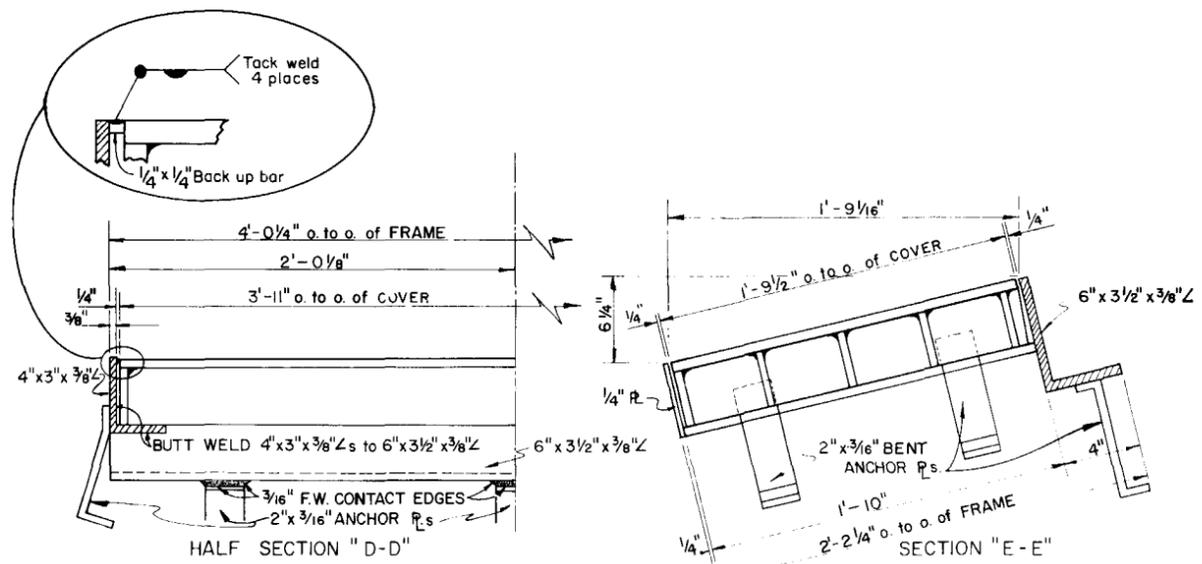
SOLID STEEL COVER DETAIL



INLET TOP MODIFICATION FOR TYPE "E" CURB



TOP VIEW OF FRAME

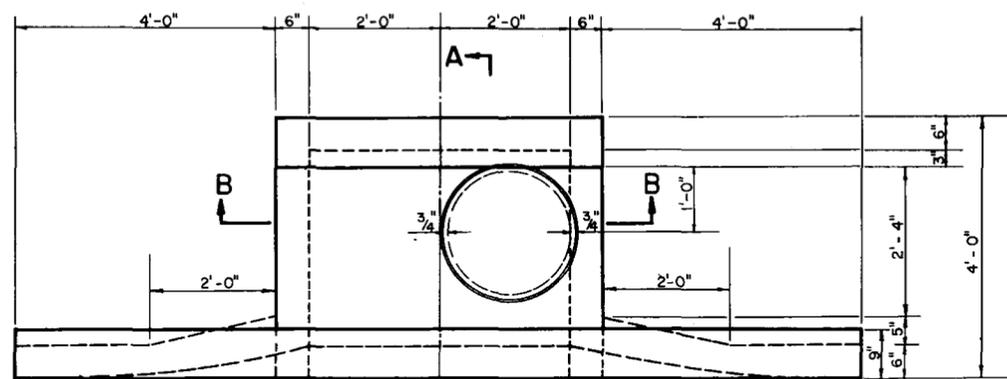


DETAILS OF FRAME and SOLID STEEL COVER

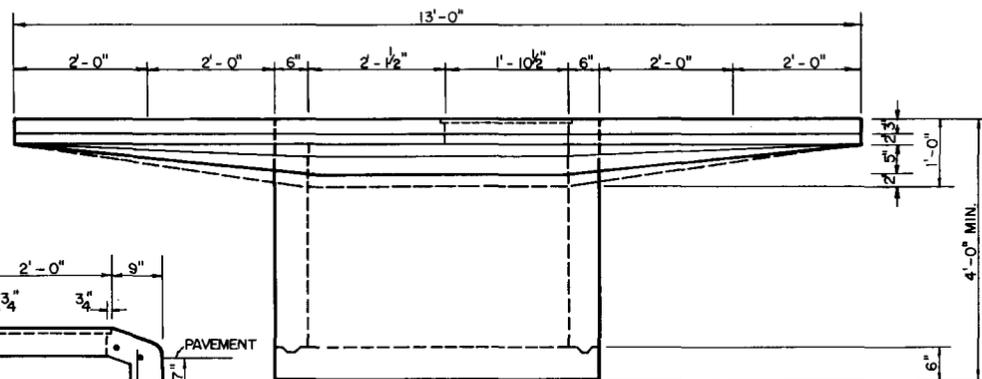
FHWA Approved: 12-14-76
 FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section
CURB INLET - TYPES 5 & 6

REVISIONS		INITIALS	DATES	Recommended For Approval By
Dates	Descriptions	Designed By		Deputy Design Engineer --- Roadways
5-74	Redrawn Chgd Index No	Checked By		APPROVED BY
6-76	Removed Irwing Type Grade	Quantities By		STATE DESIGN ENGINEER
12-76	Revised welding on Steel Cover, Added to Note 10	Checked By		
		Supervised		

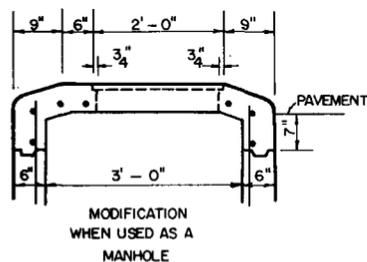
DRAWING NO. 1 of 1 INDEX NO. DCI-02-2



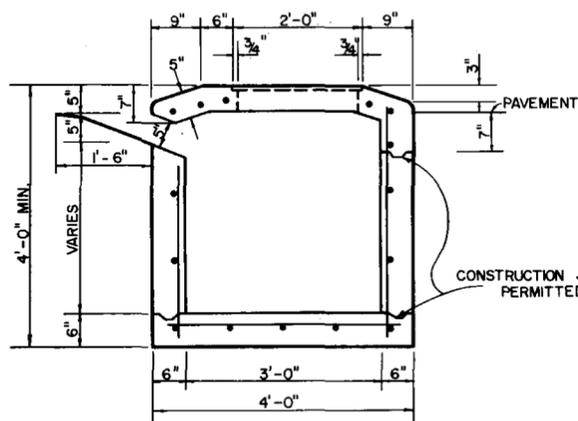
A
PLAN



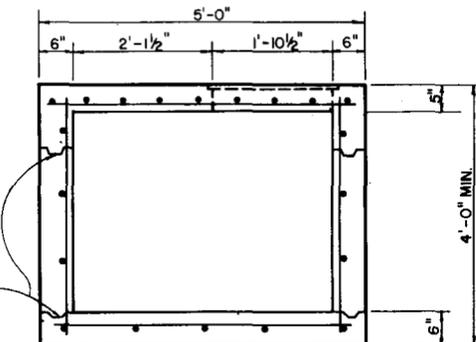
ELEVATION



MODIFICATION
WHEN USED AS A
MANHOLE

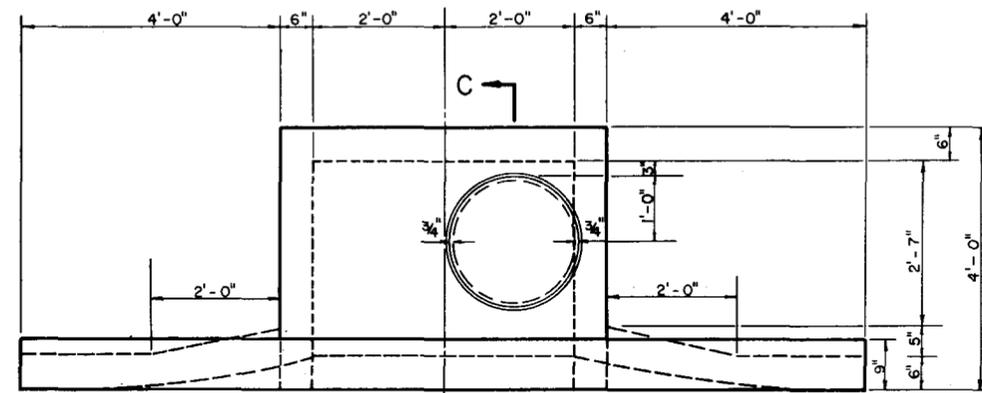


SECTION A-A

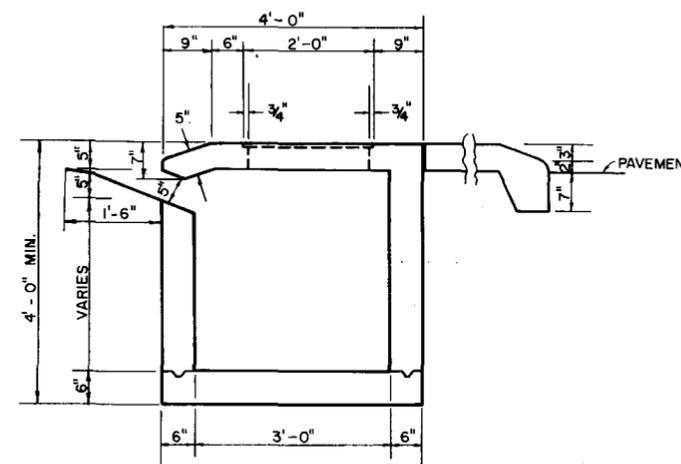


SECTION B-B

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

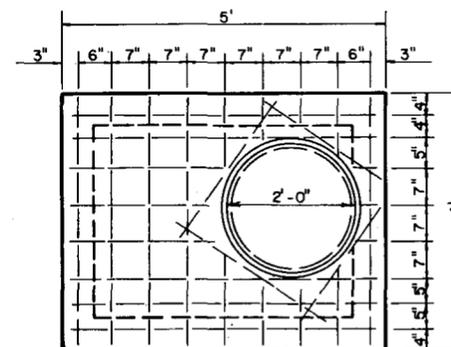


C
PLAN



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 1/2" CLEARANCE TO INSIDE FACE.

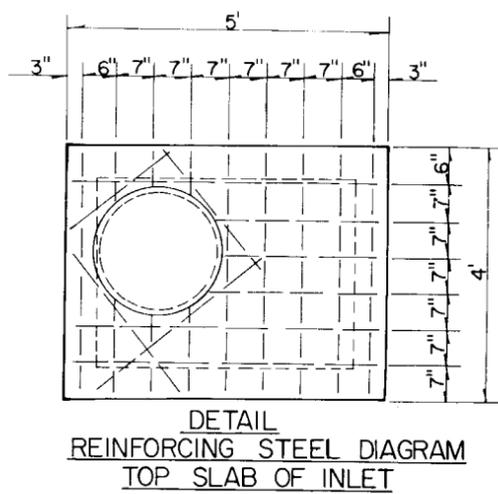
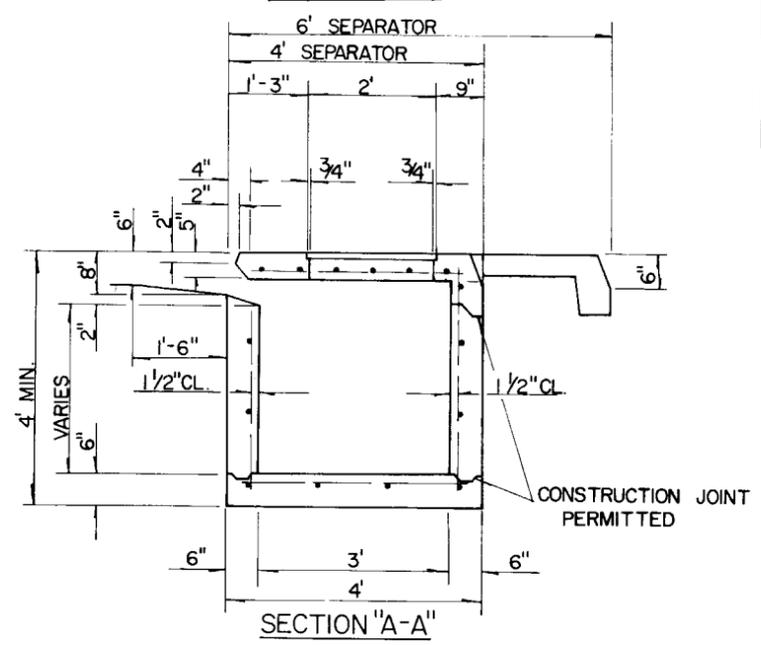
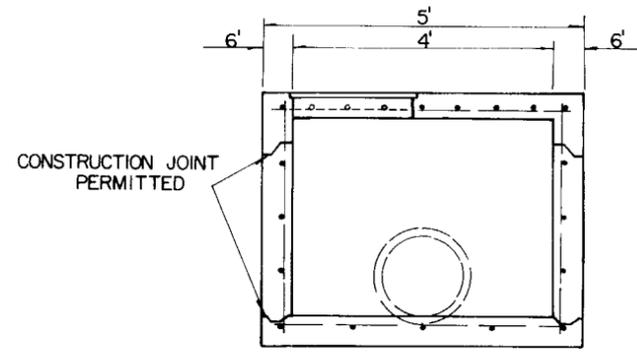
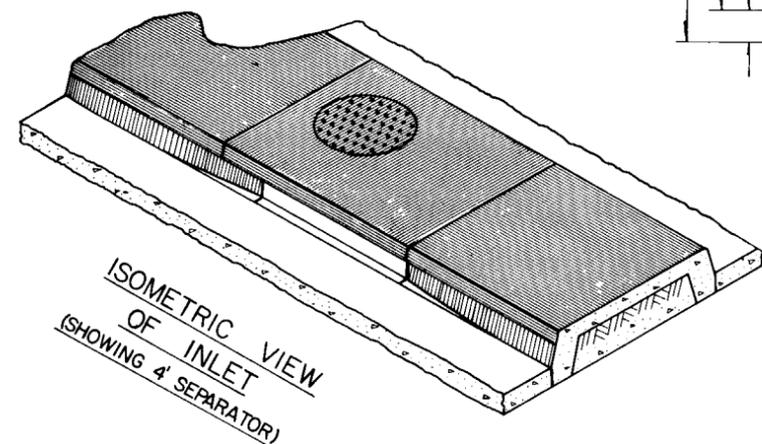
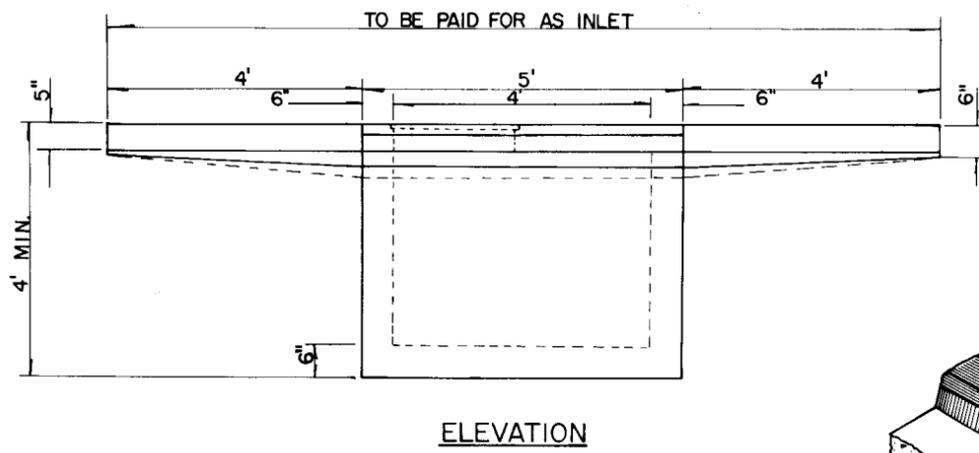
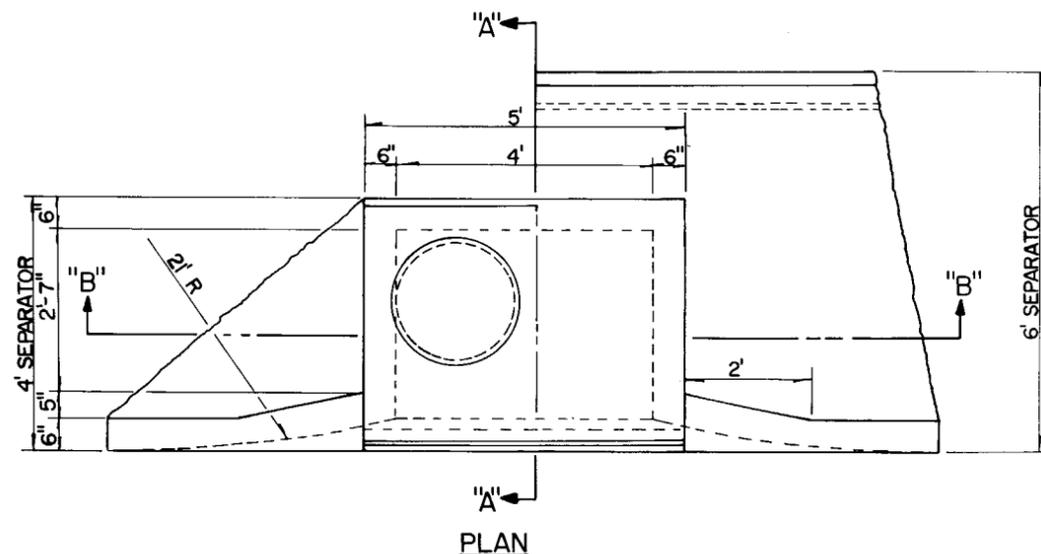
FOR SUPPLEMENTARY DETAILS SEE INDEX DSD -01.
THIS INLET WAS DESIGNED FOR USE WITH TYPE A & B MEDIAN CURB OR TYPE I & II
TRAFFIC SEPARATOR. LOCATE OUTSIDE OF PEDESTRIAN CROSS TRAFFIC.

FHWA APPROVED: 5-1-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

CURB INLET-TYPE "7"

REVISIONS		INITIALS	DATES	Recommended for approval by <i>[Signature]</i> Deputy Design Engineer - Roadways Approved by <i>[Signature]</i> State Design Engineer DRAWING NO. INDEX NO. 1 OF 1 DCI-03
Dates	Descriptions	Designed by		
5-14-74 W.G.L.	REVISED	Checked by		
		Quantities by		
		Checked by		
		Supervised by		

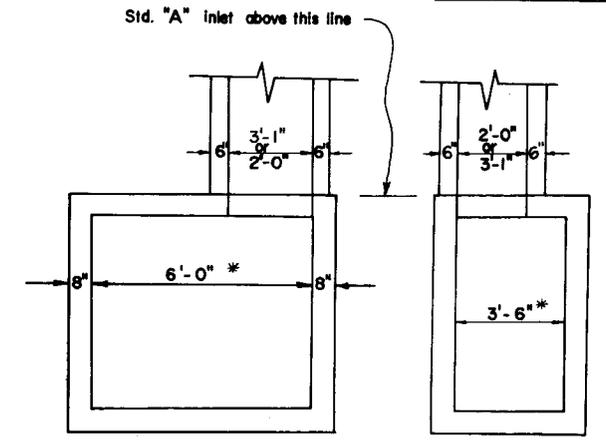
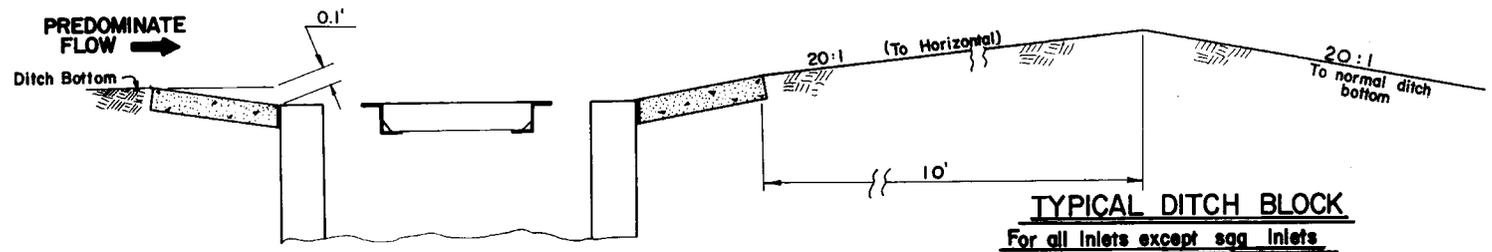


- NOTES:
- NO. 4 REINFORCING BARS 12" CENTERS UNLESS OTHERWISE NOTED.
 - CUT AND BEND BARS OUT OF WAY OF PIPE WHEN NECESSARY. BARS TO CLEAR PIPE BY 1/2".
 - FOR SUPPLEMENTAL DETAILS SEE INDEX NO. DSD-01.
 - THIS INLET WAS DESIGNED FOR USE WITH TYPE D MEDIAN CURB OR TYPE III & V TRAFFIC SEPARATOR. LOCATE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

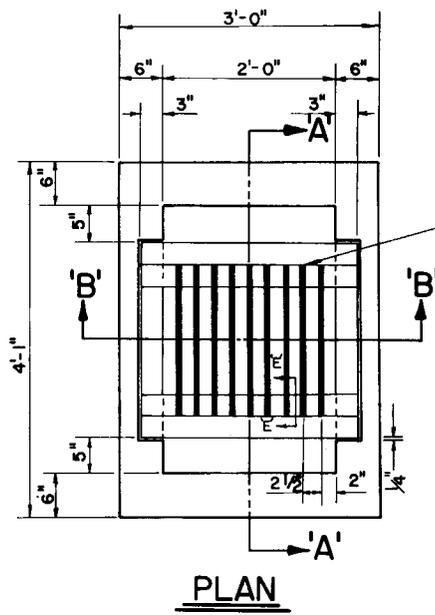
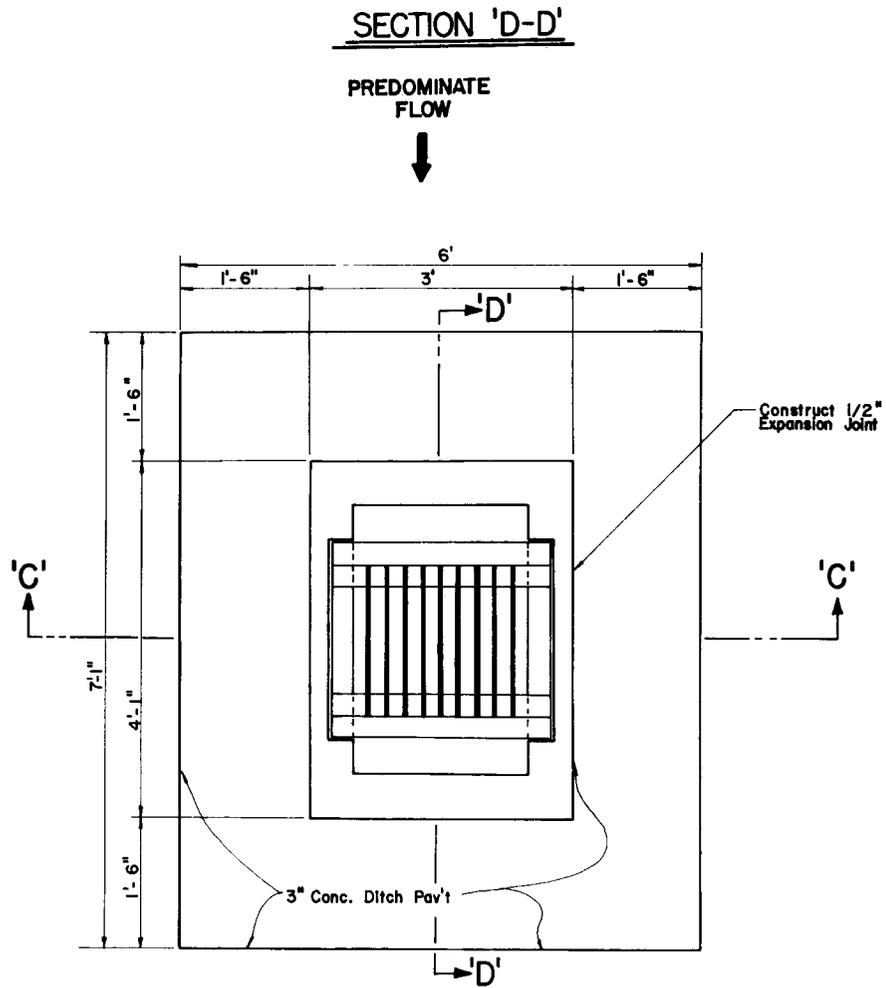
FHWA APPROVED 5-1-75
 STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN SECTION

CURB INLET - TYPE "8"

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
3-73	Added Class Conc.			
10-74	Revised notes, changed inlet type & Index No.			
		Designed by	APPROVED BY	
		Checked by	E. H. Hart	
		Quantities by	Deputy Design Engineer, Roadways	
		Checked by	Drawing No. Index No.	
		Supervised by	H. W.	11-68

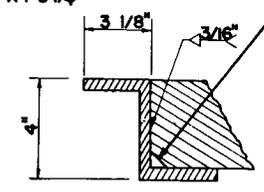


* unless otherwise shown in plans



3/4" notch permitted (at the option of the manufacturer)

9 Bars 1/2" x 3 1/2" x 1-8 1/4"
Locate as shown

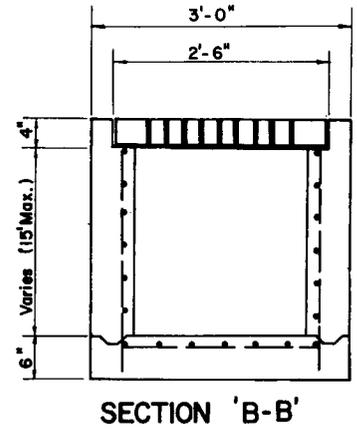
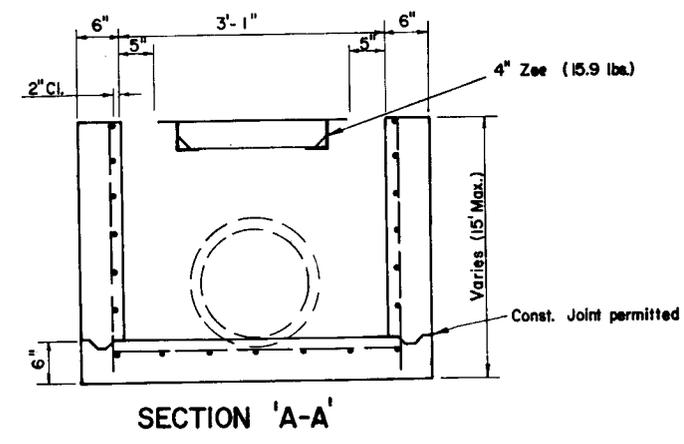
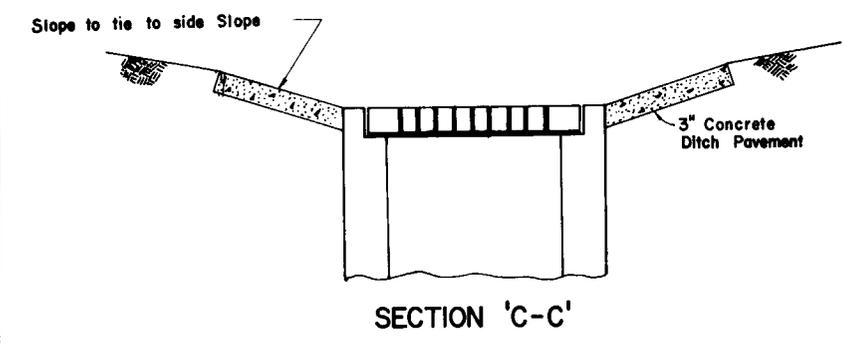


DETAIL 4" ZEE SECTION 'E-E'

Recommended Maximum Pipe Sizes *
2'-0" Side - 18" Pipe
3'-1" Side - 24" Pipe

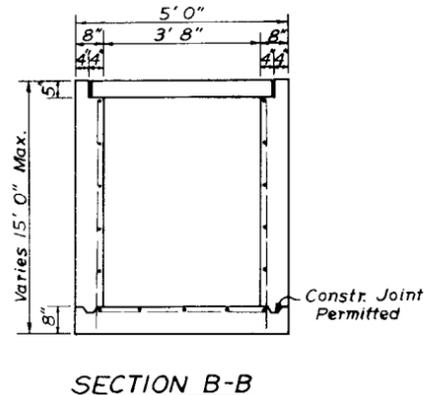
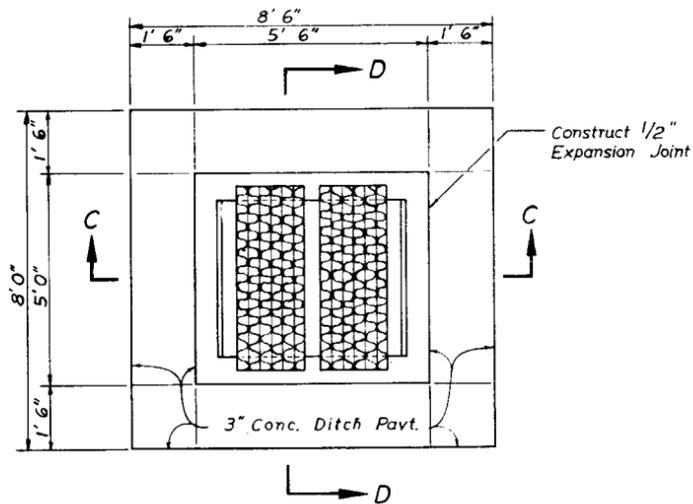
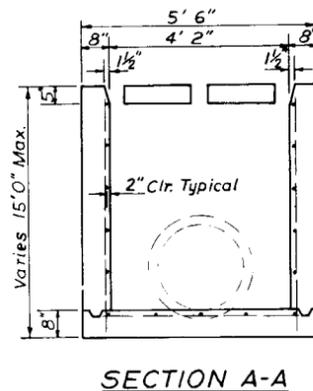
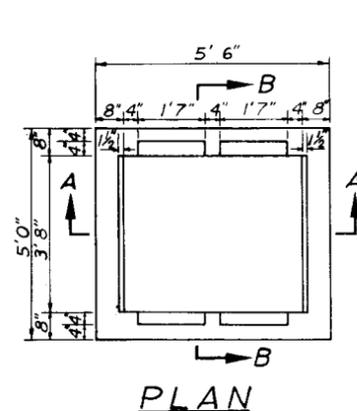
*See note * 9

- NOTES:**
For details of "J" bottom, see Index DSB-OJ (Alt. "B" only).
"A" top to be oriented as required by Note * 5.
- GENERAL NOTES**
1. Cost of ditch paving to be included in cost of inlet.
 2. Reinforcing - No. 4 bars at each 12" center both ways, 2" clearance to inside face.
 3. Inlet to be used only where flow thru grate is less than 7 c.f.s.
 4. Where material unsatisfactory for foundation is encountered at F.L. Elev. omit floor and carry walls down to satisfactory foundation. Backfill to F.L. with clear sand.
 5. Direction of 1/2" x 3 1/2" bars to be in same direction as predominant flow.
 6. Chamfer exposed edges. (3/4" chamfer.)
 7. Cut and bend bars out of way of pipe when necessary. Bars to clear pipe by 1/2".
 8. For supplemental detail, see Index DSD-OI.
 9. 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.
 10. 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.
 11. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.



FHWA Approved: 7-18-75
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
DITCH BOTTOM INLET - TYPE "A"

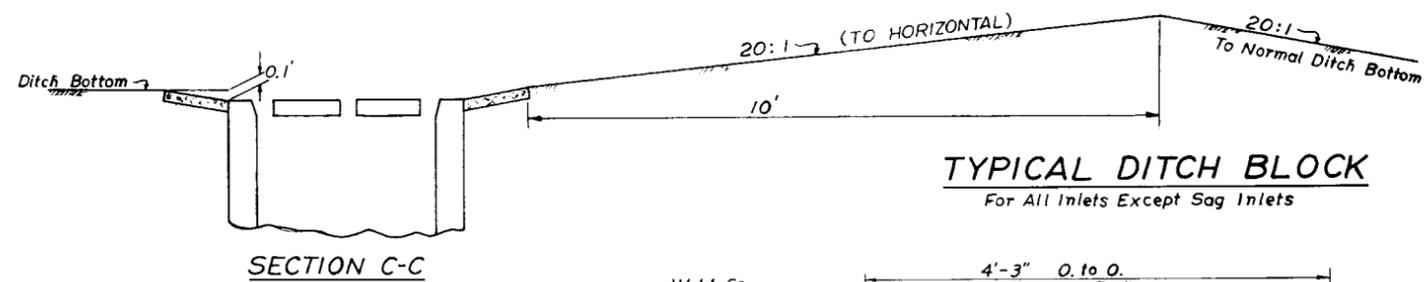
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Date: 10-74 Description: Revised notes, changed inlet type & Index No.			
Designed by	Name	Date	Recommended For Approval by
Checked by			APPROVED BY
Quantity by			State Design Engineer
Checked by			Drawing No.
Supervised by			Sheet No. of
			DDI-OI



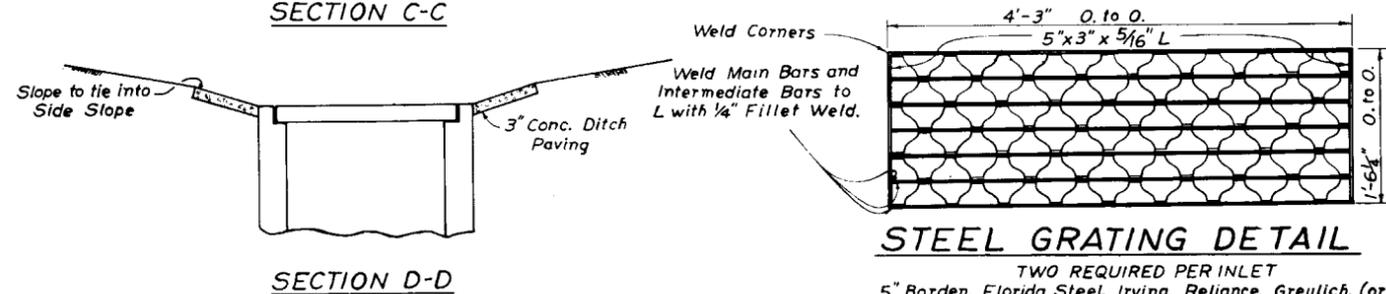
~GENERAL NOTES~

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.
8. WHEN ALTERNATE "G" GRATE IS SPECIFIED IN PLANS, THE GRATE IS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.

PAVING DETAIL FOR ALL INLETS



TYPICAL DITCH BLOCK
For All Inlets Except Sag Inlets



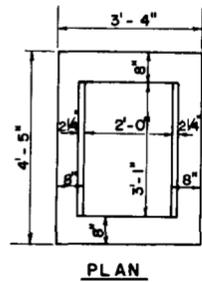
STEEL GRATING DETAIL

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

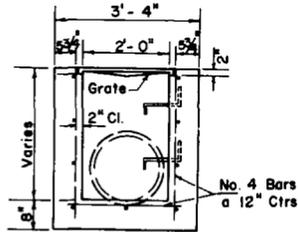
FHWA Approved: 7-18-75
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
DITCH BOTTOM INLET - TYPE "B"

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
1-69	CHANGED 0.3 TO 0.1 (SEE INDEX)			
1-70	ADD DETAIL OF LATER BARS			
10-74	Revised notes, changed inlet type & Index No.			

Checked by	H.A.B.	APR. 67	Recommended For Approval by	C.D. Dunlap
Checked by			APPROVED	
Checked by			Drawing No.	1 of 1
Traced by	G.C.B.	APR. 67	Index No.	DDI-02

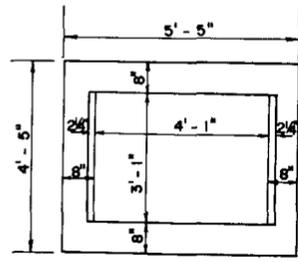


PLAN

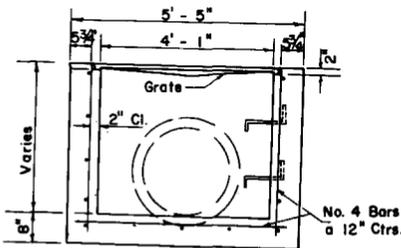


SECTION
TYPE C

Recommended Maximum Pipe Size:
2'-0" Wall - 18" Pipe
3'-1" Wall - 24" Pipe

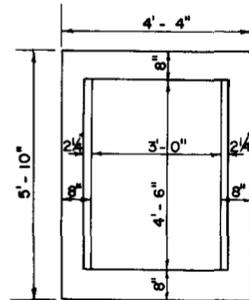


PLAN

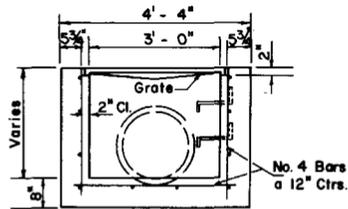


SECTION
TYPE D

Recommended Maximum Pipe Size:
3'-1" Wall - 24" Pipe
4'-1" Wall - 36" Pipe

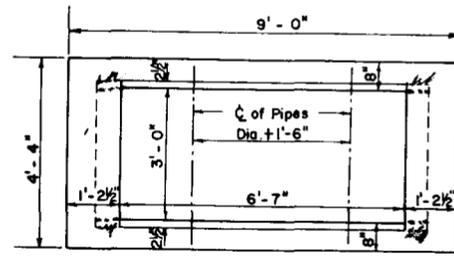


PLAN

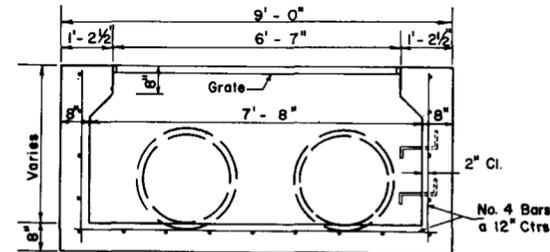


SECTION
TYPE E

Recommended Maximum Pipe Size:
3'-0" Wall - 24" Pipe
4'-6" Wall - 42" Pipe

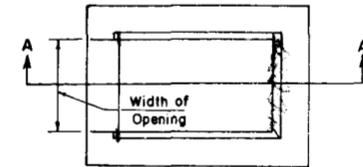


PLAN

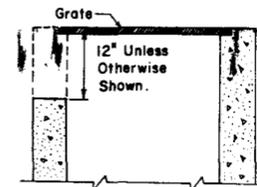


SECTION
TYPE H

Recommended Maximum Pipe Size:
3'-0" Wall - 30" Pipe
7'-8" Wall - 1 - 66" Pipe
2 - 30" Pipe

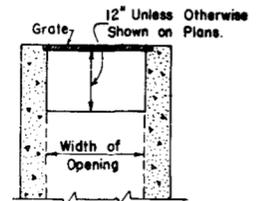


PLAN



SECTION A-A

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

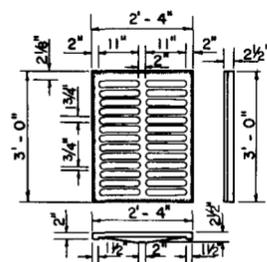


END VIEW

DETAIL OF OPENINGS IN DITCH BOTTOM INLETS

GENERAL NOTES:

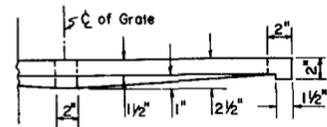
1. BEVELED EDGES: All exposed corners and edges to be chamfered 3/4".
2. FOUNDATION MATERIAL: Where material unsatisfactory for foundation is encountered at FL. EL. omit floor and carry walls down to satisfactory foundation. Backfill to FL. with clear sand.
3. CAST IRON: In accordance with Florida Department of Transportation Specifications.
4. STEEL GRATING: Manufactured by Borden, Florida Steel, Irving, Reliance, Greulich (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.
9. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.



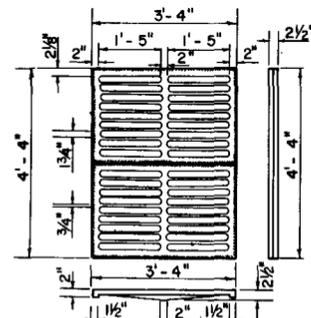
TYPE C

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.

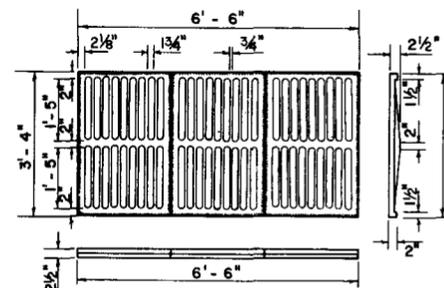


HALF SECTION DETAIL OF CAST IRON GRATES



TYPE E

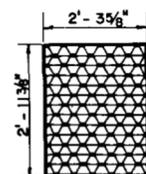
Approx. Weight 465 Lbs.



TYPE H

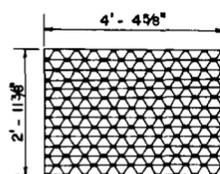
Approx. Weight 725 Lbs.

DETAILS OF CAST IRON GRATING



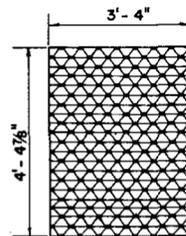
TYPE C

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



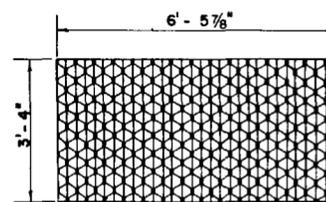
TYPE D

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



TYPE E

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



TYPE H

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

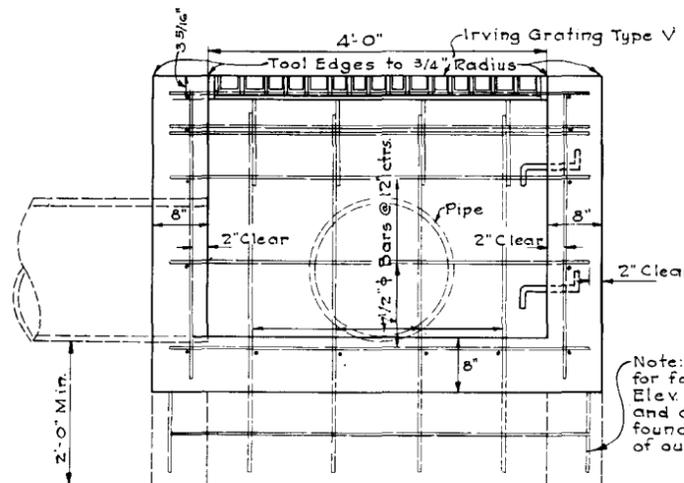
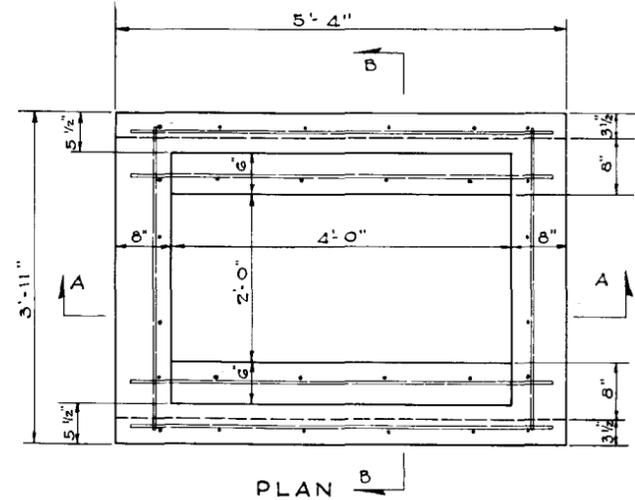
DETAILS OF STEEL GRATING

FHWA Approved: 5-1-75

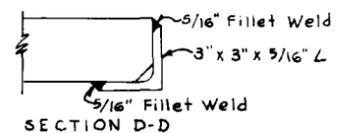
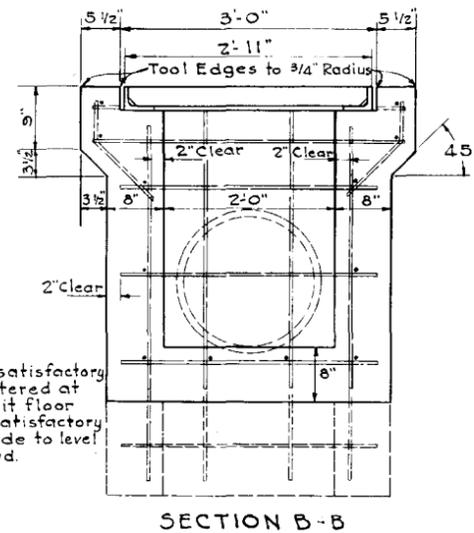
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
STANDARD DITCH BOTTOM INLET TYPES
C, D, E, & H

REVISIONS		INITIALS	DATES	Recommended for approval by <i>[Signature]</i> Deputy Design Engineer - Roadways
3-74	REVISED			
10-74	Added note no. 8. Changed Index N°			
				Supervised by LMF
				DRAWING NO. 1 of 1
				INDEX NO. DDI-03

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



Note: Where Material unsatisfactory for foundation is encountered at Elev. of F.L. of Pipe, omit floor and carry walls down to satisfactory foundation. Backfill inside to level of outlet with clean sand.

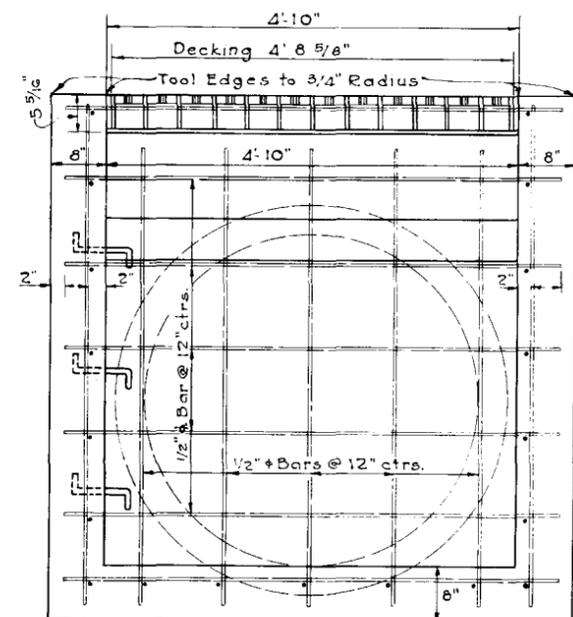
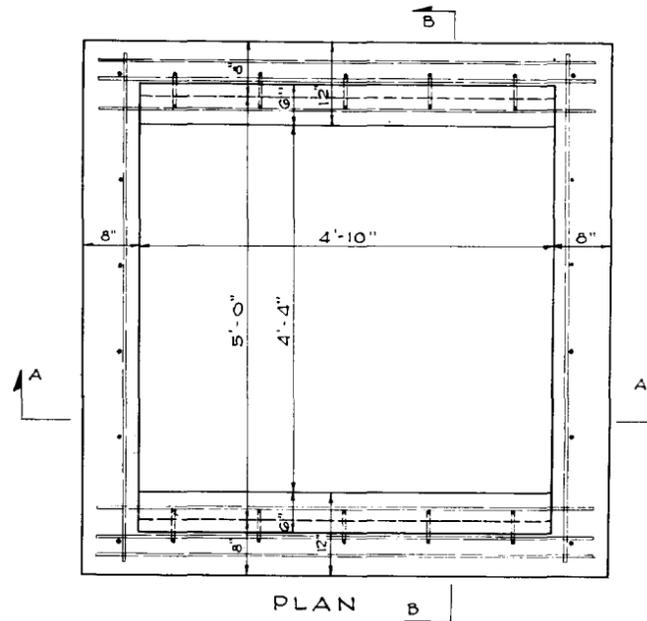


Weld Straight Bars to L with 5/16" Fillet Weld.
3" x 3" x 5/16" L

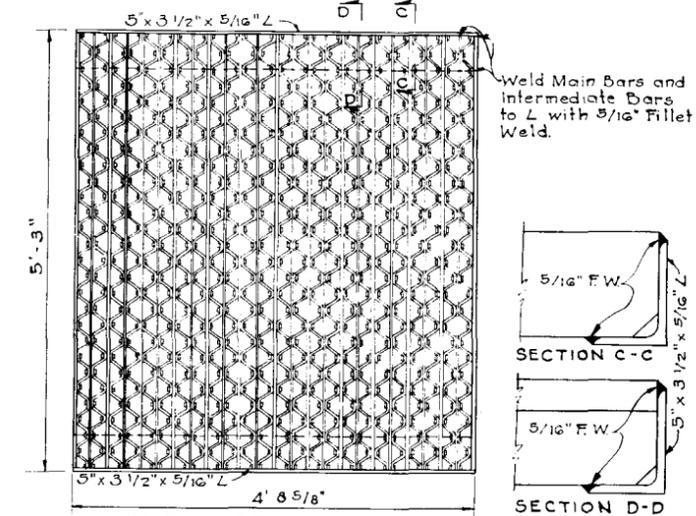
Note: Grate shall be free of warp to seat on plane surface. VIEW C-C

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

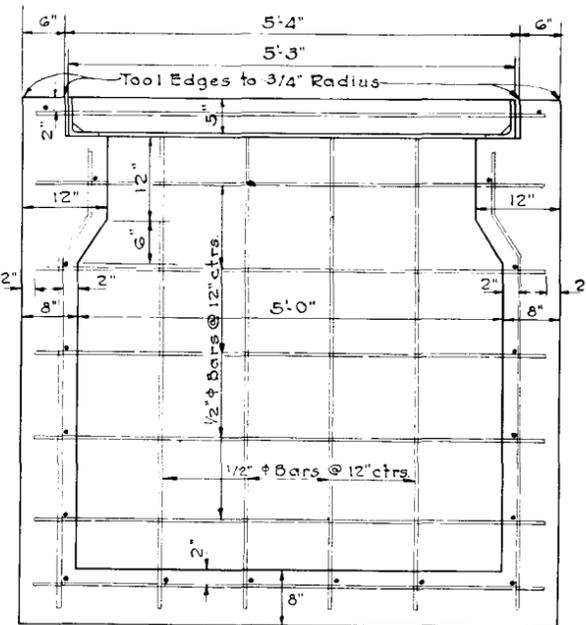
2' x 4' DROP INLET - TYPE "F"



SECTION A-A



STEEL GRATING
5" STEEL DECKING, WEIGHT 630 LBS MAIN BARS 5" x 1/4"
INTERMEDIATE BARS 1 1/2" x 1/4", RETICULINE BARS 1 1/2" x 3/16"
STEEL DECKING: Manufactured by Borden, Florida Steel, Irving, Reliance, Greulich (or equal).



SECTION B-B

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.

When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.

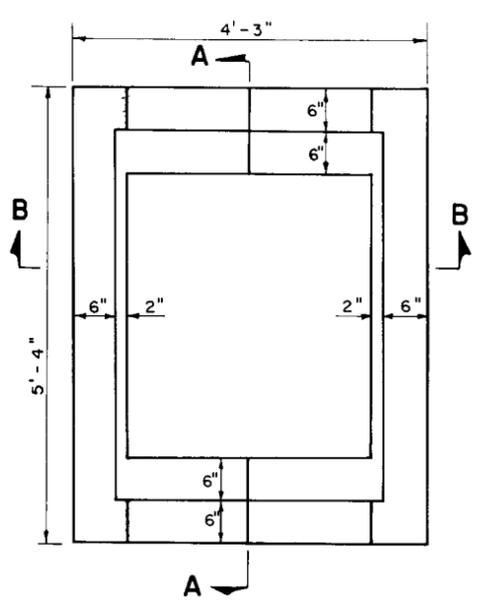
Note: For construction of bottom where unsatisfactory foundation is encountered (see Note Section A-A, Type "F")

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

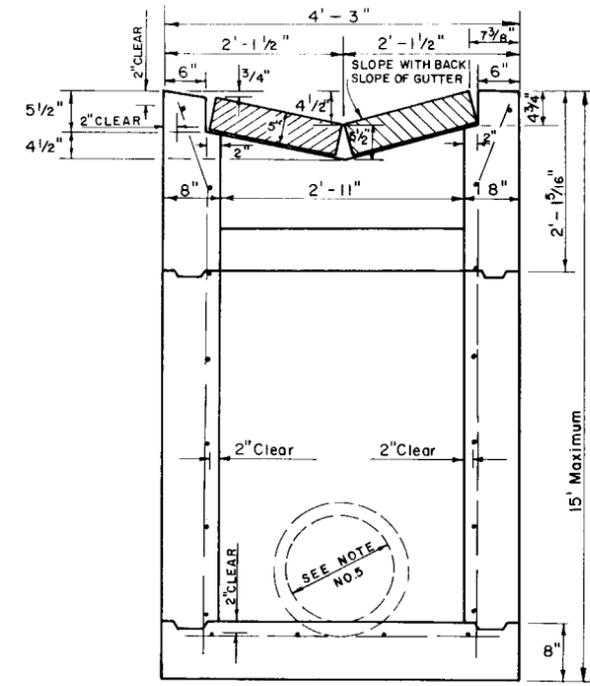
ROAD NO.	COUNTY	SECTION	JOB NO.

REVISIONS		Names	Dates	Approved by
Names	Date	Descriptions	Designed by	T. W. J. 1-50
B.A.S.	9-20-51	Retraced	Checked by	
H.Y.	2-56	Added Ladder Bar	Drawn by	M. E. F. 1-50
L.H.	3-62	Rev Ladder Bars	Checked by	W. H. M. 1-50
L.F.	7-70	Added All Install. For Ladder Bars	Quantities by	M. E. F. 1-50
G.F.	7-70	Added Detail of Eye Bolt Chain	Checked by	W. H. M. 1-50
LMF	3-73	Removed Detail of Ladder Bars & Bolt Chain	Traced by	M. E. F. 1-50

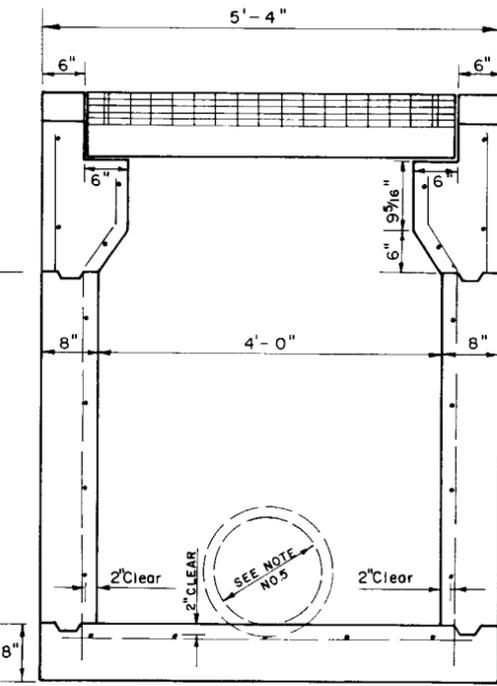
Recommended For Approval By:	<i>E. H. Hart</i>
Deputy Design Engineer - Rd	
APPROVED BY:	<i>[Signature]</i>
State Design Engineer	
Drawing No.	Index No.
1 of 1	DDI-04



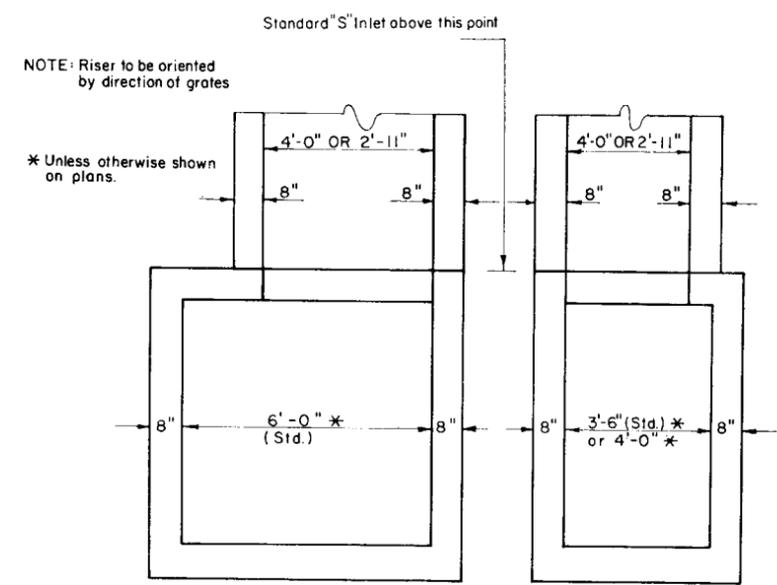
PLAN
(WITHOUT GRATE)



SECTION B-B



SECTION A-A

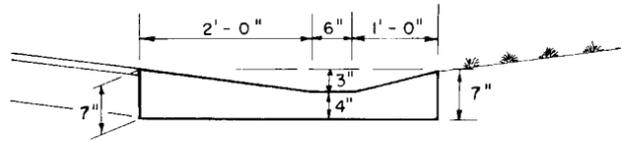


"S" INLET WITH "J" TYPE BOTTOM

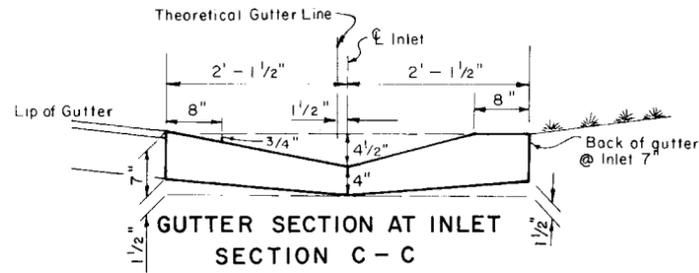
NOTE: FOR DETAILS OF "J" BOX SEE INDEX NUMBER DSB-01.

GENERAL NOTES

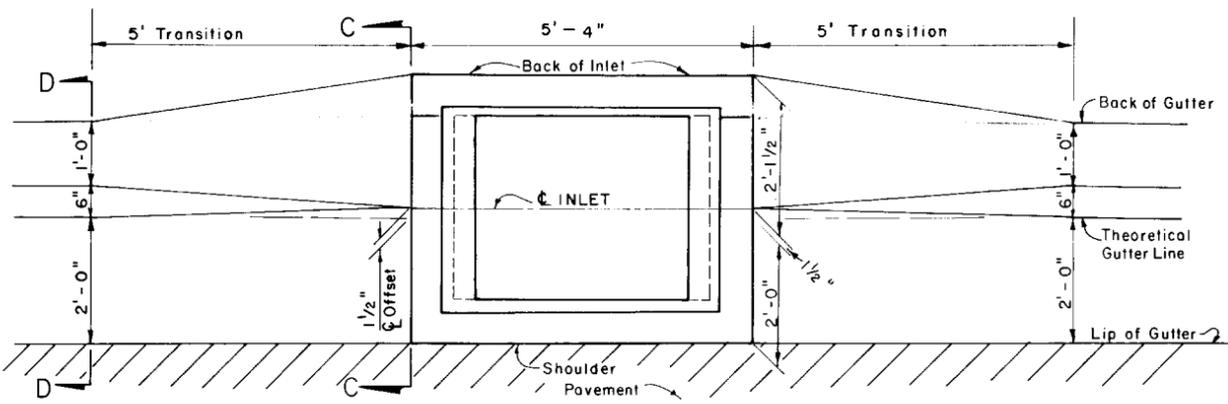
1. This inlet was designed for shoulder gutters subject to heavy wheel loads on sections where bicycle traffic is not anticipated (ie: limited access, rural sections). Also may be used in locations where the wide openings in the "A" and "B" inlets are unacceptable. Where a bicycle safe grate is necessary use the steel grating shown on index no. DGI-02.
2. All reinforcing steel bars are 1/2" @ 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.
8. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.



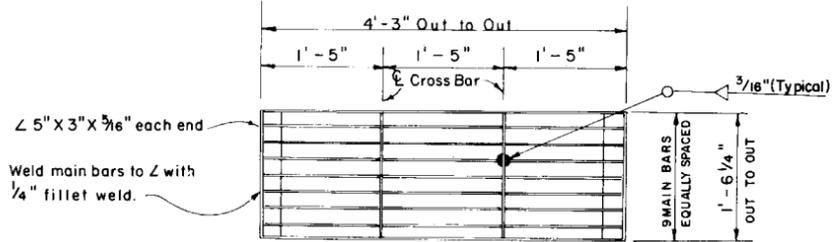
DETAIL OF SHOULDER GUTTER SECTION D-D



GUTTER SECTION AT INLET SECTION C-C



SHOULDER GUTTER TRANSITION AT INLET TYPE "S"



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.

FHWA APPROVED: 5-1-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

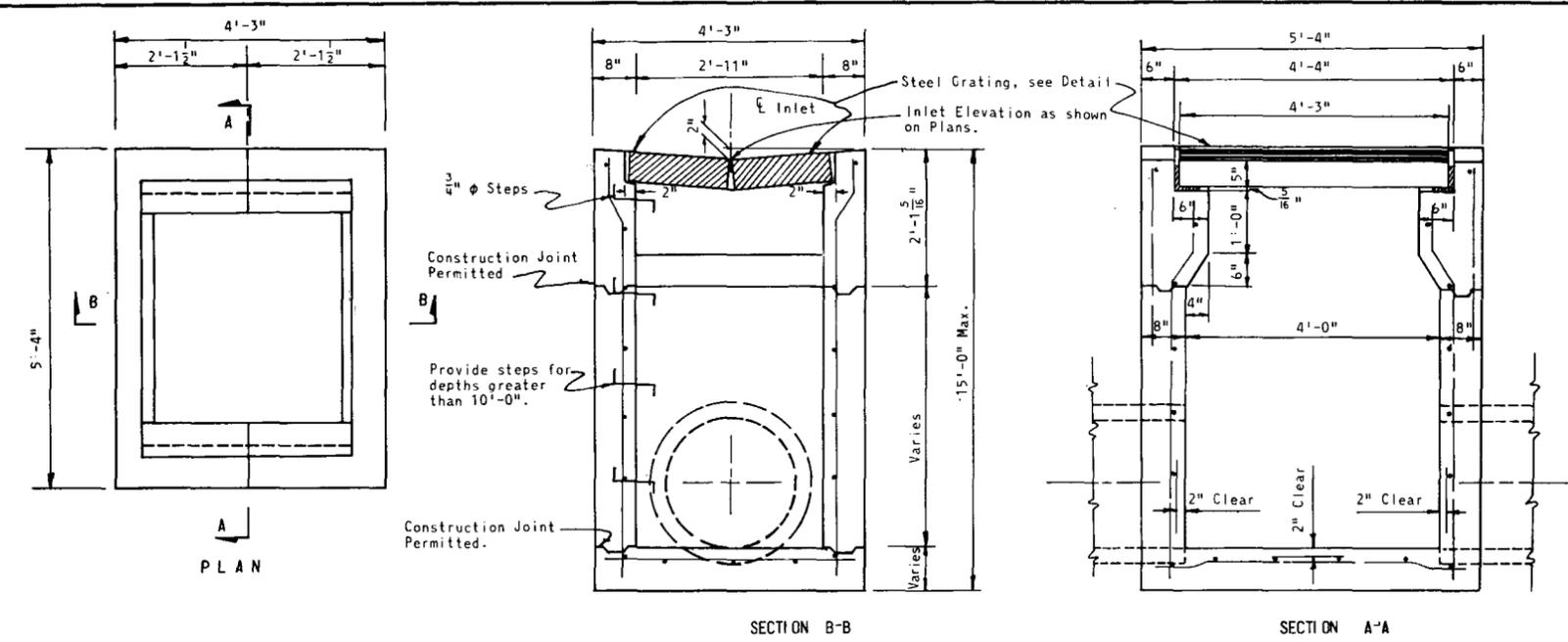
GUTTER INLET-TYPE "S"

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

Designed by	Checked by	Quantities by	Checked by	Supervised by

APPROVED BY	Drawing No.	Index No.
<i>E.H. Hart</i>	1 of 1	DGI-01

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

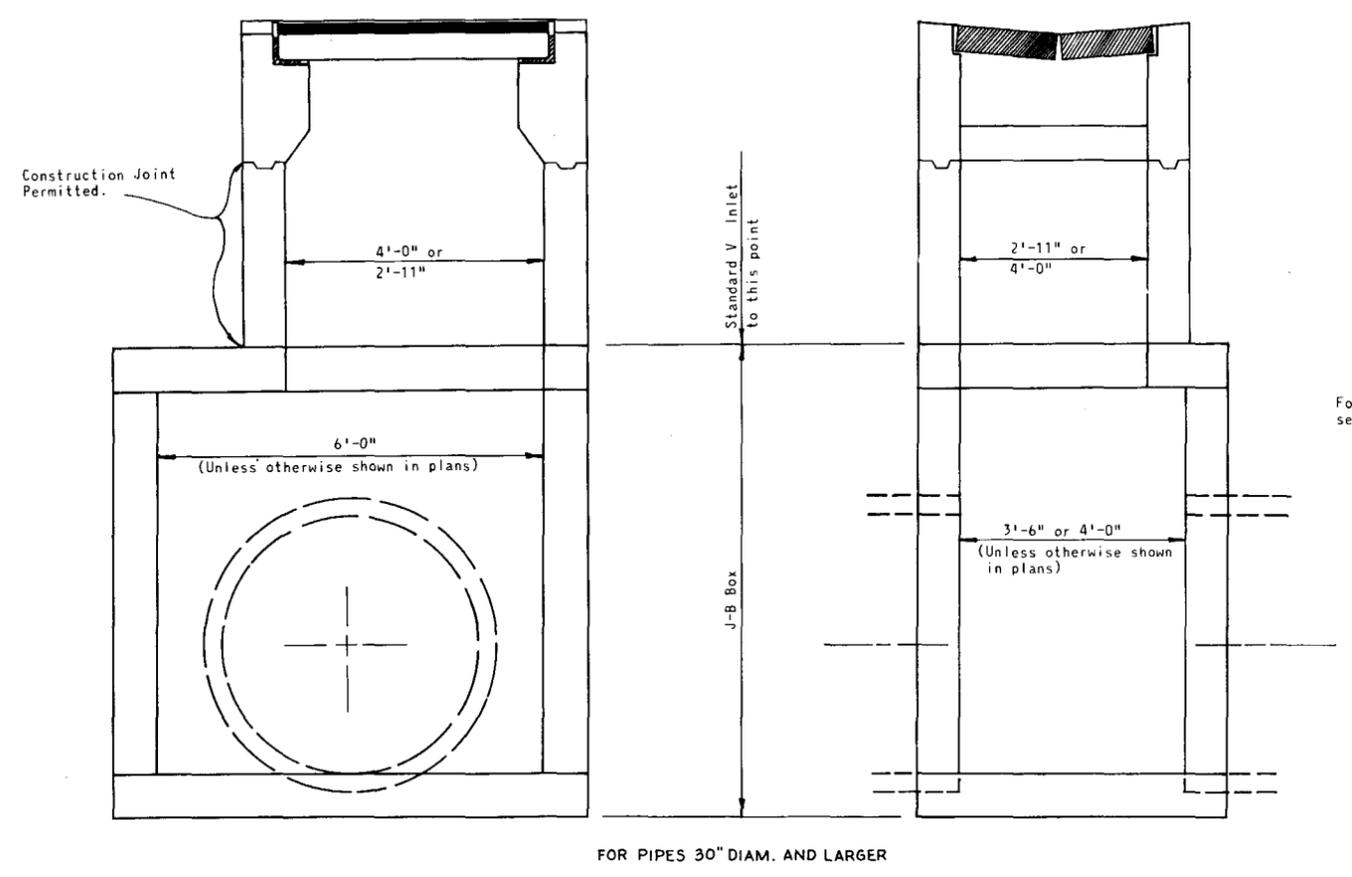


- GENERAL NOTES**
1. All exposed edges and corners shall be tooled to 1/4" radius.
 2. For supplementary details see index no. DSD-01.
 3. This inlet was designed for village swales, ditches, or other areas subject to heavy wheel loads where debris is minimum and it is subject to pedestrian and/or bicycle traffic.
 4. When alternate "G" grate is specified in plans, the grate is to be hot dipped galvanized after fabrication.

NOTE: Cut and bend Bars out of way of Pipe when necessary. Bars to clear Pipe 1 1/2".

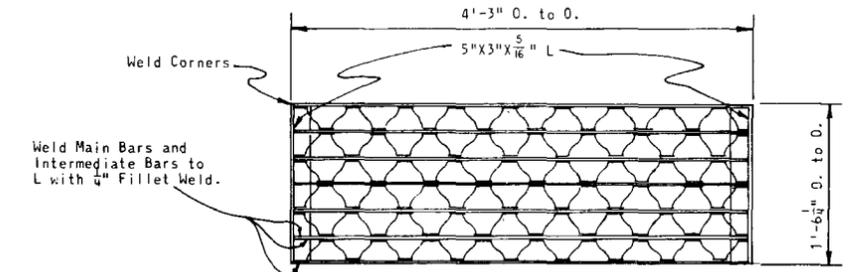
NOTE: All Reinforcing Steel Bars are 2" φ @ 12" Ctrs.

GUTTER INLET TYPE V
FOR PIPES 24" DIAM. AND UNDER



FOR PIPES 30" DIAM. AND LARGER

For details of J-B Box see Index No. DSB-01.



STEEL GRATING DETAIL

TWO REQUIRED PER INLET

5" Steel Decking Main Bars 5" x 1/4"

Intermediate Bars 1 1/2" x 1/4" Reticuline Bars 1 1/4" x 3/16"

STEEL DECKING: MANUFACTURED BY BORDEN, FLORIDA STEEL, IRVING, RELIANCE, GREULICH (OR EQUAL).

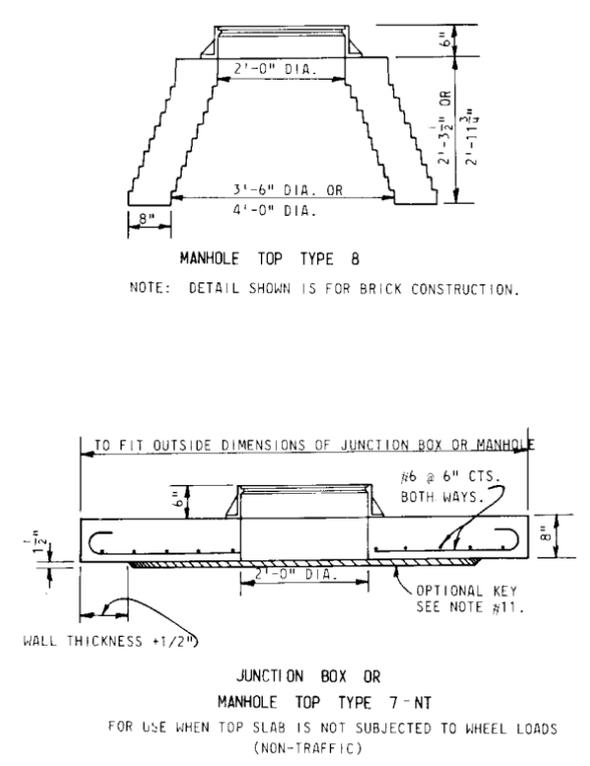
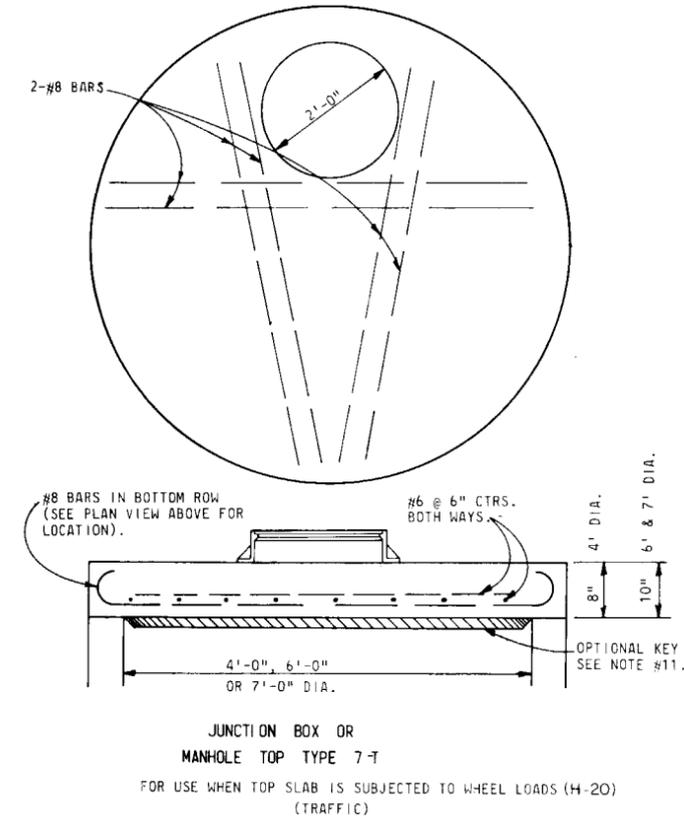
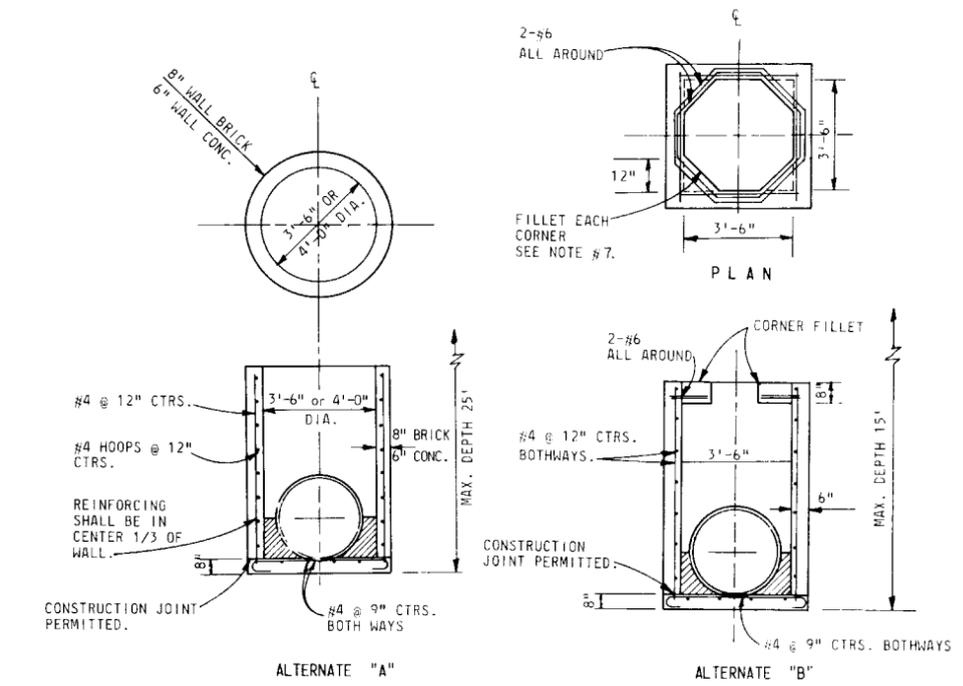
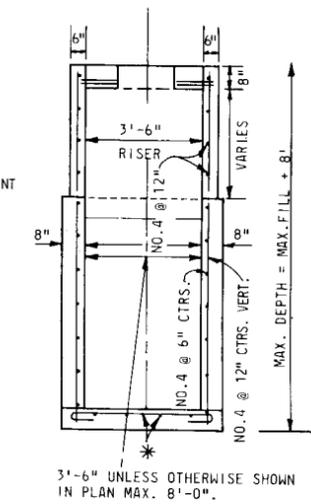
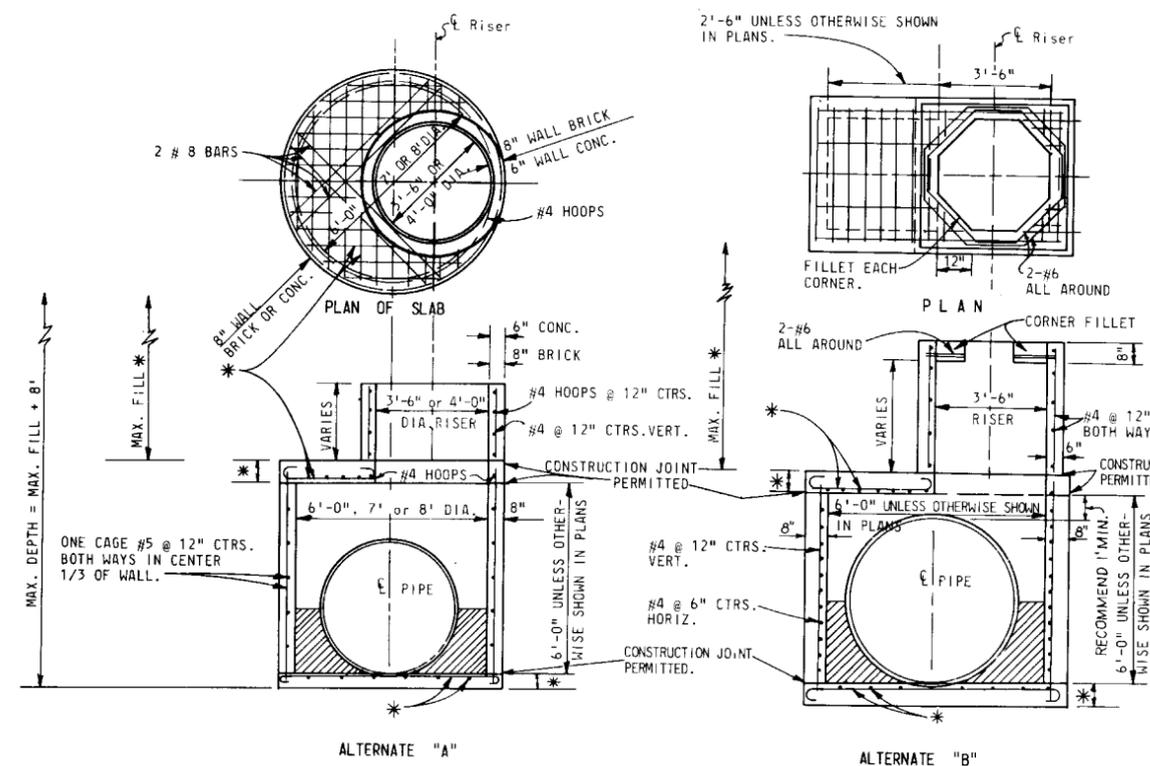
FHWA Approved: 5-1-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
GUTTER INLET-TYPE "V"

REVISIONS		REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	Date	Description			
3-71	Changed max. depth to 15' & step requirement to 10'	L.H. 3-62	Rev Ladder Bars			
10-72	Removed VB Inlet & Ladder Bar detail. Added J-VA Inlet	K.S. 1-63	Rev. Dimensions			
10-74	Added note no. 3, Changed inlet type and Index No.	L.F. 12-69	Added Alternate Installation on Ladder bars			

Checked by	W.H.W. 4-57	Recommended For Approval By:	<i>E.H. Hunt</i>
Checked by	R.M.M. 4-57	Deputy Design Eng. - Rdways	
Checked by		APPROVED BY:	<i>[Signature]</i>
Traced by	W.H.W. 4-57	State Design Engineer	
		Drawing No.	Index No.
		1 of 1	DGI-02

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



GENERAL NOTES

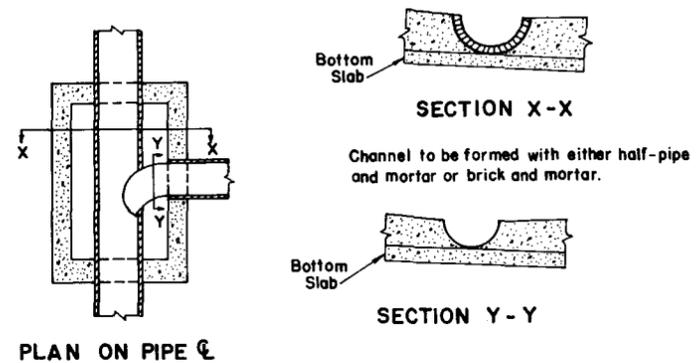
- WALLS OF CIRCULAR STRUCTURES (ALTERNATE "A") MAY BE CONSTRUCTED OF CONCRETE OR BRICK, BUT RECTANGULAR STRUCTURES (ALTERNATE "B") SHALL BE CONSTRUCTED OF CONCRETE ONLY. THE CONCRETE MAY BE CAST-IN-PLACE OR PRECAST.
- WALL REINFORCEMENT AND THICKNESS ARE FOR EITHER CAST-IN-PLACE OR PRECAST CONCRETE UNITS EXCEPT THAT THE MANUFACTURER MAY FURNISH PRECAST CIRCULAR UNITS IN ACCORDANCE WITH A.S.T.M. SPECIFICATION C-478 1" TO 22" IN DIA. OR PRECAST CIRCULAR UNITS A.S.T.M. SPECIFICATION C-76, TABLE III FOR "3" WALL CONCRETE PIPE TOP AND FLOOR SLAB THICKNESS AND REINFORCEMENT ARE FOR ALL TYPES OF CONSTRUCTION.
- ELLIPTICAL STEEL, ASTM SPECIFICATION C-76, TABLE III, "B" WALL, IS MODIFIED TO USE A CIRCULAR CAGE OF STEEL AREA EQUAL TO THAT OF THE ELLIPTICAL CAGE AND PLACED IN THE CENTER ONE-THIRD OF THE WALL. THIS MODIFICATION IS FOR PRECAST CIRCULAR UNITS PRODUCED IN ACCORDANCE WITH ASTM C-76.
- 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.
- 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.
- RECTANGULAR STRUCTURES MAY BE ROTATED AS DIRECTED BY THE ENGINEER IN ORDER TO FACILITATE CONNECTIONS BETWEEN THE STRUCTURE WALLS AND STORM SEWER PIPES.
- 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).
- 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.DSD-01.
- STRUCTURES WITH DEPTHS OVER 14' ARE TO BE CHECKED FOR FLOTATION BY DESIGNER OF PROJECT DRAINAGE.
- ALL STEEL BARS SHALL HAVE 1/2" 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 DWEL BARS (A MINIMUM OF 6 DWELS) PUSHED INTO THE WET CONCRETE AFTER THE FLOOR SLAB IS PLACED.
- 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 DWELS. 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.
- 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.
- 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.
- FOR SUPPLEMENTARY DETAILS SEE INDEX NO.DSD-01.

FHWA Approved: 5-1-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

INLET, MANHOLE, JUNCTION BOX TYPES J & P

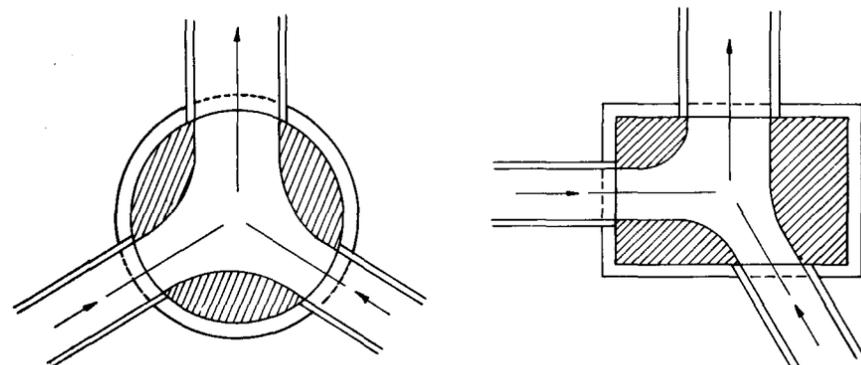
REVISIONS	INITIALS	DATES	Recommended for approval
10-74 Changed Index No.			by: <i>[Signature]</i> Deputy Design Engineer - Roadways
			Approved by: <i>[Signature]</i> State Design Engineer
			DRAWING NO. INDEX NO. 1 of 1 DSB-01



DETAIL OF BOTTOM CONSTRUCTION WHEN INLET SERVES AS MANHOLE

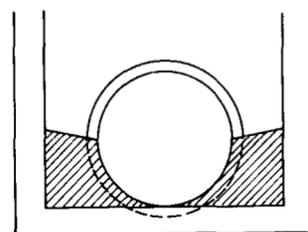
GENERAL NOTE:

Mortar used to seal the pipe into the walls of 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 the O.D. of the pipe required plus 6".

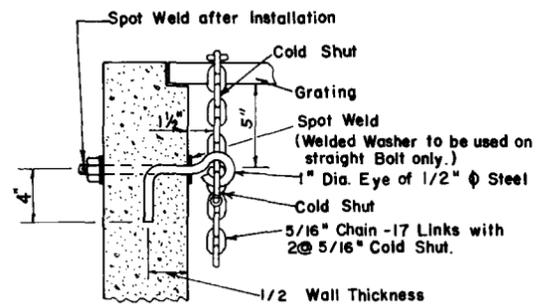


DETAIL OF CHANNELIZATION

Note: Channelization required at all drainage structures with two or more pipes.

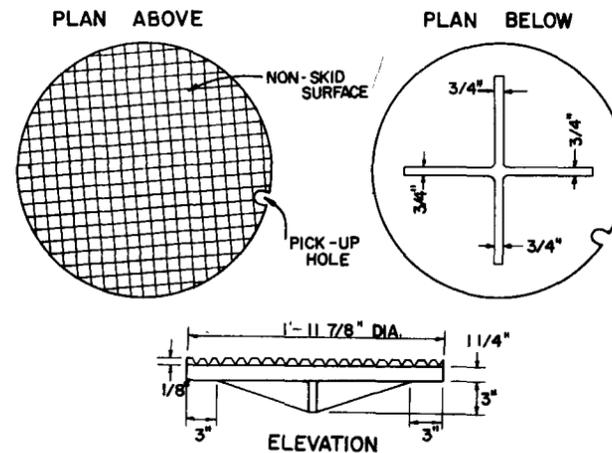


Smooth flow channels composed of concrete, or brick and mortar shall be constructed in the bottoms of all structures to a depth equal to half the diameter of the largest pipe.

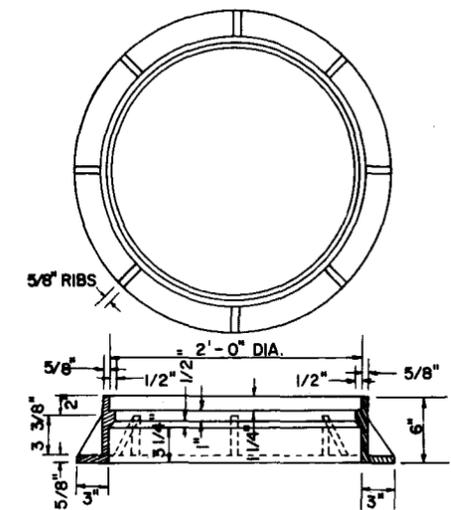


DETAIL OF EYE BOLT AND CHAIN FOR LOCKING GRATES TO INLETS

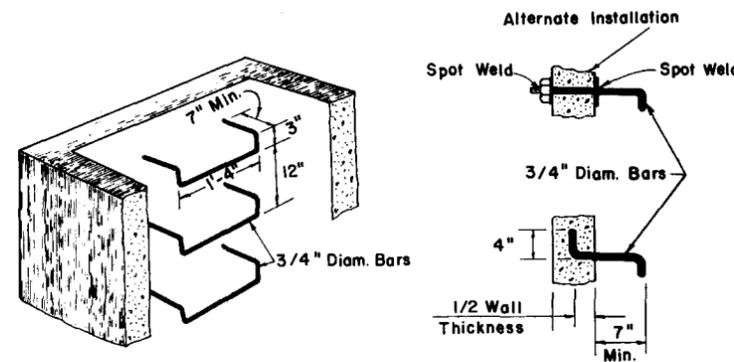
Note: One required per inlet grate.



COVER FOR ALL FRAMES (WHEEL LOADS H-20)

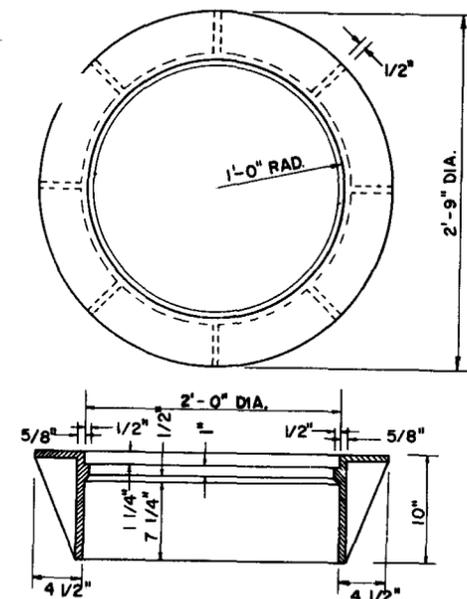


TYPE I FRAME FOR MANHOLES AS SHOWN ON INDEX DSB-01



DETAIL OF LADDER BARS

Use for box heights over 10'-0"



TYPE II FRAME For Type 1, 2, 3 & 4 Inlets

CAST IRON

FRAME AND COVER DETAILS

Note: Tack Weld all Covers to Frames (3 places) as directed by the Engineer.

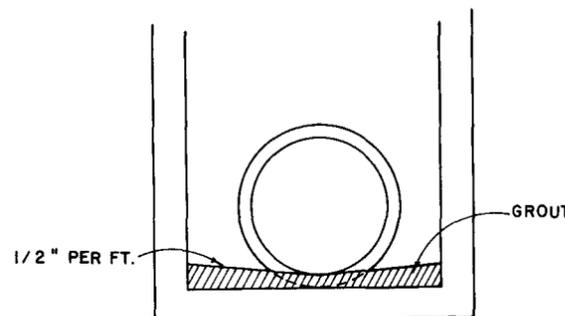
FHWA Approved: 11-16-78

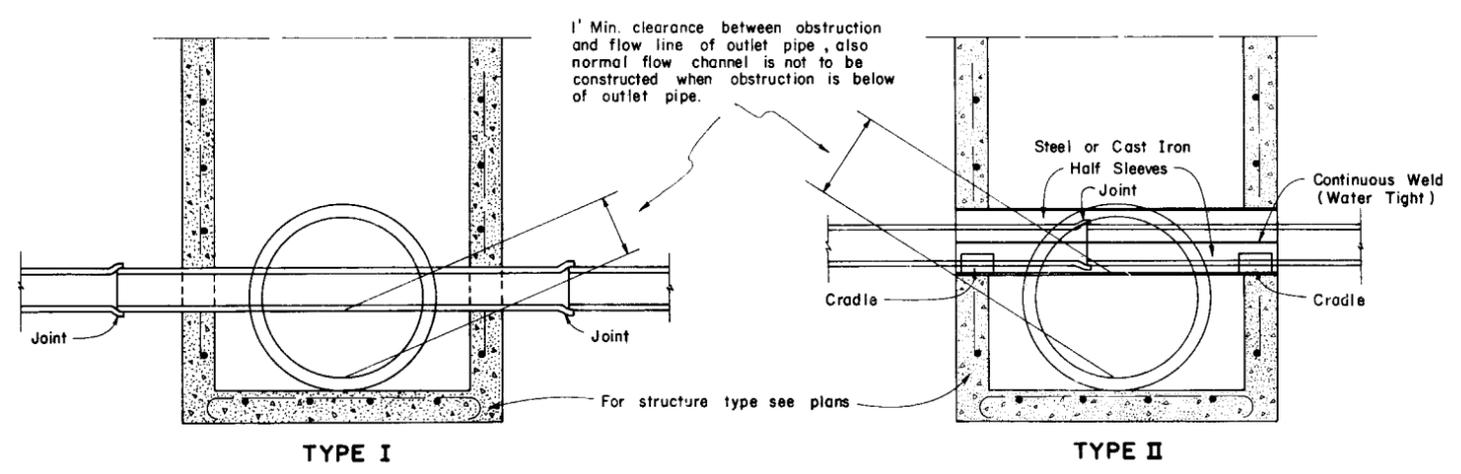
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
SUPPLEMENTARY DETAILS FOR
MANHOLE & INLET STRUCTURES

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
Designed by		Name	Date	Recommended For Approval By
Checked by		APPROVED BY: <i>[Signature]</i> Deputy Design Eng. - Rdwy.		
Quantities by		State Design Engineer		
Checked by		Drawing No.	Index No.	
Supervised by		1 of 2	DSD-01	

ALTERNATE LOCATION OF PIPE IN STRUCTURE WHEN PREFABRICATED FLOOR SLAB IS USED

COMPLETE FLOW CHANNEL IS REQUIRED WHEN THERE IS FLOW THROUGH THE STRUCTURE





NOTE:

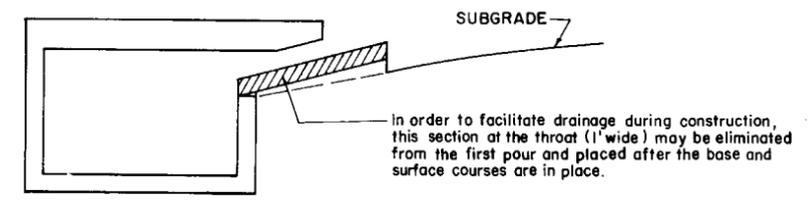
- No joints allowed in Type I structure opening.
- Only cast iron or steel water mains will be allowed to pass directly through structure.
- Only cast iron sanitary sewer will be allowed to pass directly through structure.

NOTE:

- Only water mains will be allowed to pass through a Type II structure.

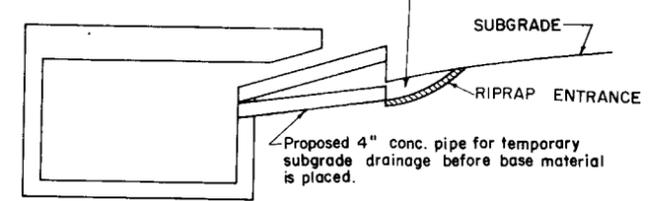
DESIGNERS NOTE: "Sumped" conflict manholes shall not be used unless the system is hydraulically designed to take in account the headloss generated if the sump is completely blocked. "Sumped" conflict manholes must be larger than those normally provided.

DETAIL SHOWING PIPE CONSTRUCTION THRU STORM SEWER STRUCTURES



ALTERNATE A

Remove riprap and place concrete plug in pipe just prior to placing base material. Fill hole in subgrade and compact.

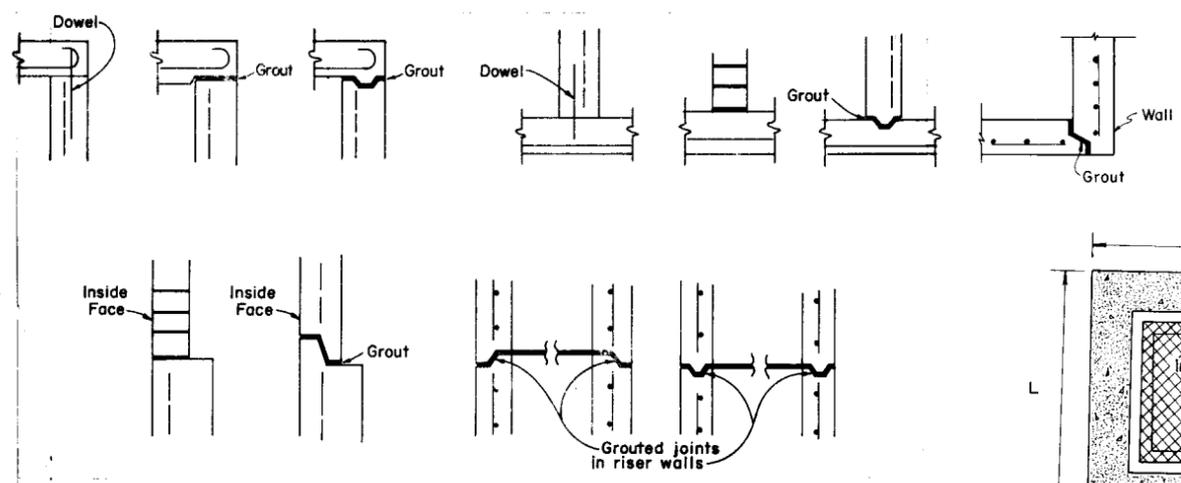


ALTERNATE B

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

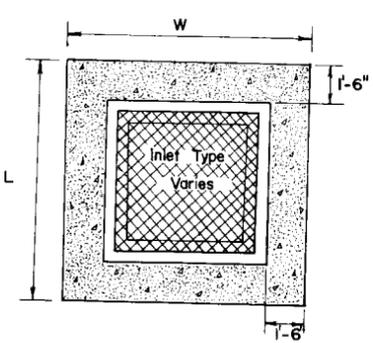
DETAIL OF TEMPORARY SUBGRADE DRAINS

(Optional with Contractor)



- 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



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
 1. Cost of ditch pavement pad to be included in cost of inlet.
 2. 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: 11-16-78

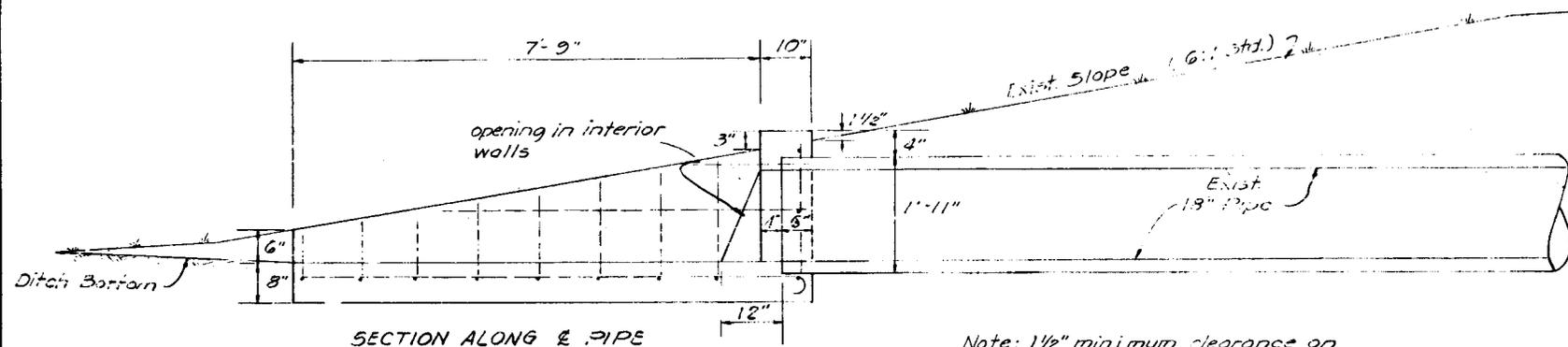
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION

SUPPLEMENTARY DETAILS FOR MANHOLE & INLET STRUCTURES

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
2-75	REDRAWN			

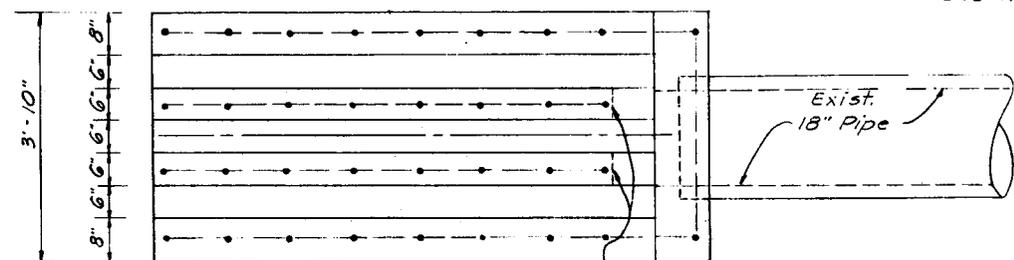
Designed by	Name	Date	Recommended For Approval By:
Checked by	LMF		Deputy Design Engr. - R03wys.
Quantity by			State Design Engineer
Checked by			Drawing No.
Supervised by	WJR		Index No.

2 of 2 DSD-01-1

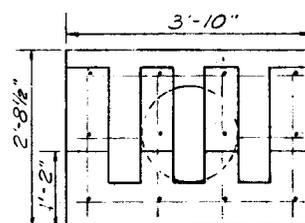


SECTION ALONG & PIPE

Note: 1 1/2" minimum clearance on all reinforcing bars. All reinforcing steel 1/2" ϕ bars and on 12" c. to c.



PLAN

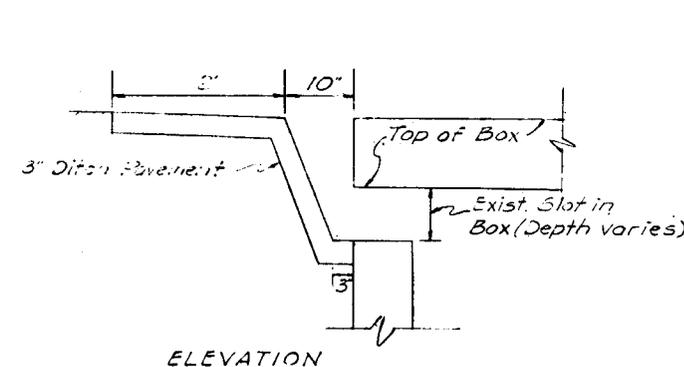


END VIEW

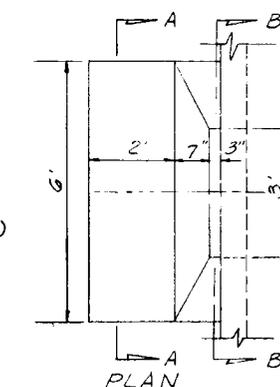
DETAIL OF MEDIAN ENDWALL

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

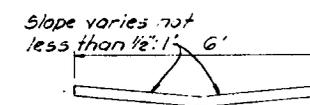
Class I Concrete 1.72 Cu. Yds., Cost of Steel to be included in price for Concrete



ELEVATION

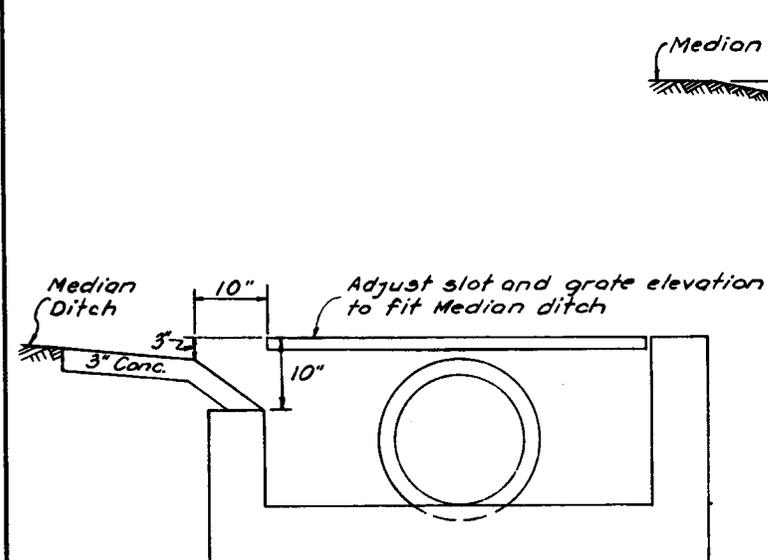


SECTION 3-B

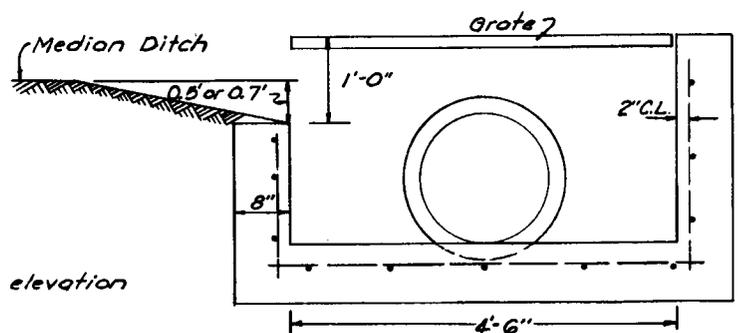


SECTION A-A

SAFETY MODIFICATION FOR OPENING IN BOX CULVERTS

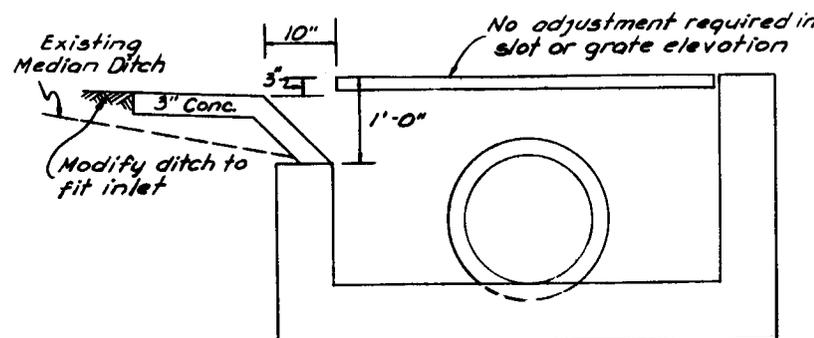


PROPOSED INLET MODIFICATION WHERE GRATE WAS SET 0.5' ABOVE THE DITCH



MEDIAN INLET DESIGN AS SHOWN ON THE PLANS

SAFETY MODIFICATION FOR MEDIAN INLETS

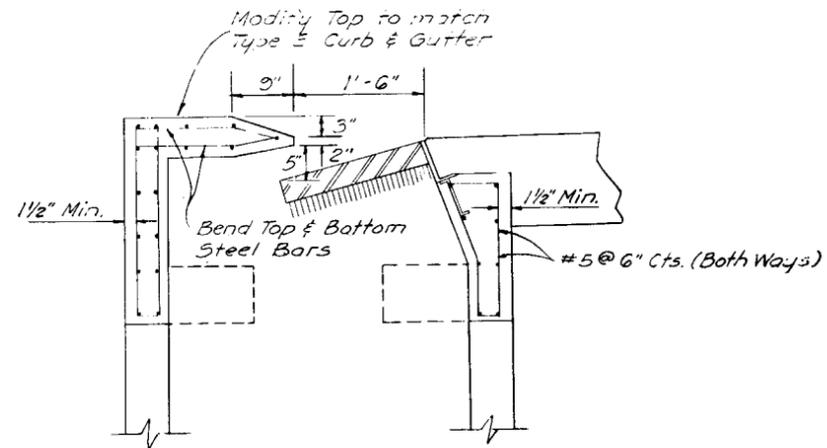


PROPOSED DITCH MODIFICATIONS WHERE GRATE WAS SET 0.3' ABOVE DITCH ELEV.

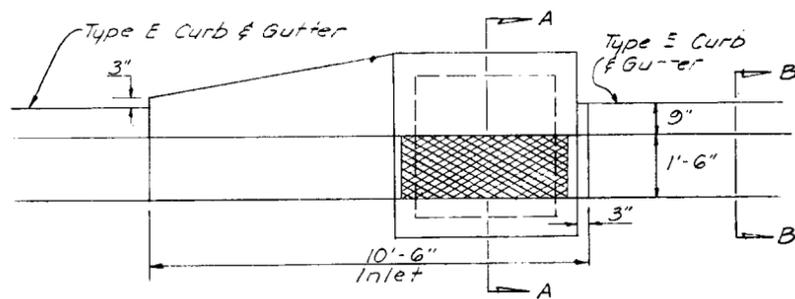
NOTE: These modifications will be made only on Projects now under construction. Do not use this Index for Projects being designed.

STATE DEPARTMENT OF FLORIDA
ROADWAY PLANS DEPARTMENT
SAFETY MODIFICATION

FHWA Approved: 3-20-75		ROAD NO.		COUNTY		PROJECT NO.	
REVISIONS							
Date	Description	Names		Dates		Recommended For Approval by	
3-75	Added Class I Conc.	H.A.B.		7-67		APPROVED BY	
10-74	Changed Index N#	D.W.S.		7-67		Engineer of Road Design	
Checked by		Quantities by		Checked by		Traced by	
				M.J.T.		7-67	
Drawing No.						Index No.	
1 of 2						DSM-01	

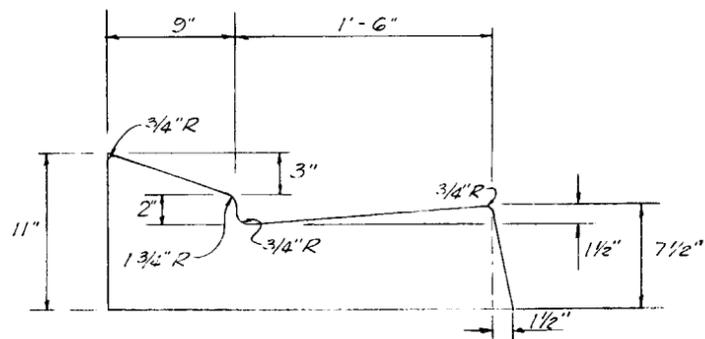


SECTION A-A



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

SAFETY MODIFICATION

Final Approved: 3-20-75

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions			
10-74	Changed Index N1			
		Names	Dates	Recommended For Approval by
		Checked by	H.A.B. 7-67	Engineer of Road Design
		Checked by	D.W.S. 7-67	APPROVED BY
		Checked by		<i>[Signature]</i> Asst. State Highway Engineer
		Checked by		Drawing No.
		Traced by	M.J.T. 7-67	2 of 2
				Index No. DSM-01

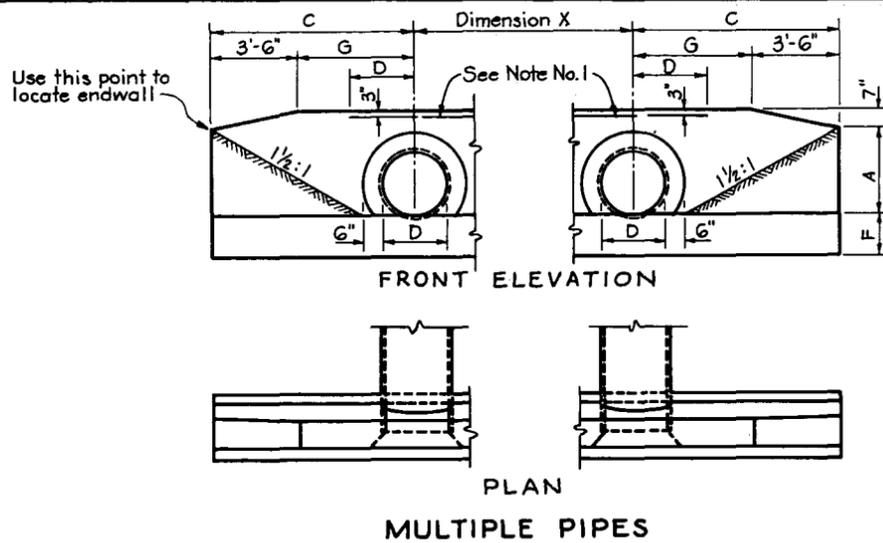


TABLE OF CONSTRUCTION DATA AND ESTIMATED QUANTITIES FOR ROUND PIPE CULVERT ENDWALLS

D	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				
	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'-5"	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"

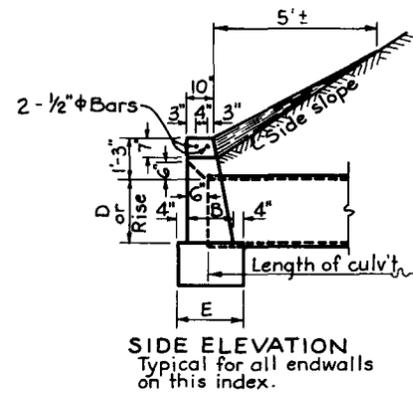
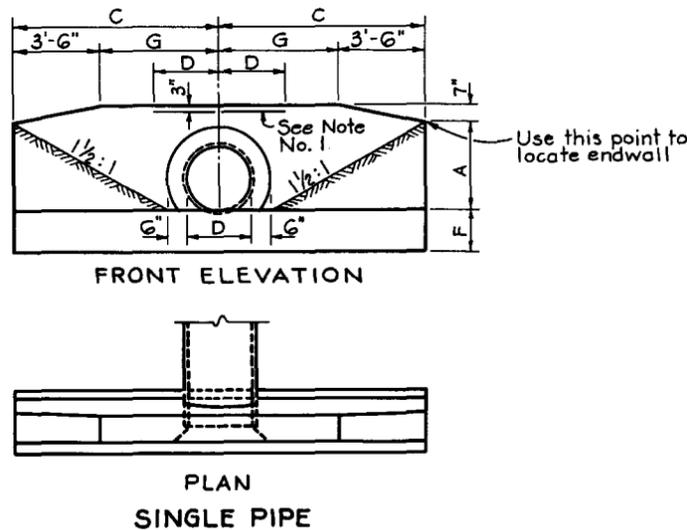


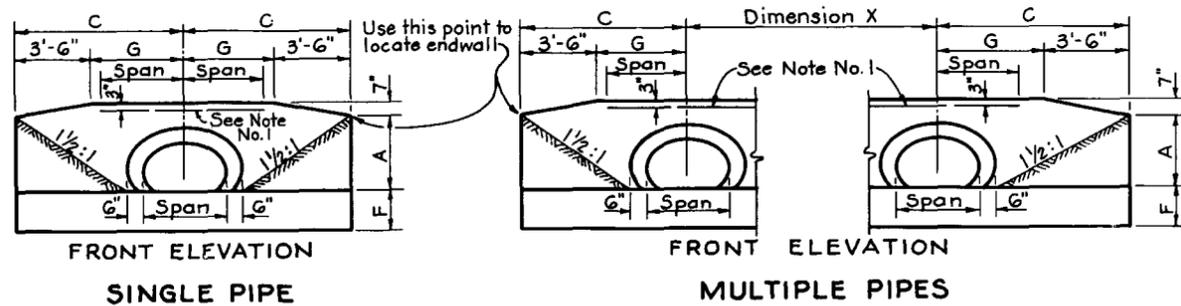
TABLE OF CONSTRUCTION DATA AND ESTIMATED QUANTITIES FOR METAL PIPE ARCH CULVERT ENDWALLS

SPAN	RISE	CONSTRUCTION DATA										QUANTITIES IN ONE ENDWALL CU. YDS. OF CLASS I CONCRETE				SPAN	RISE	EQUIV. ROUND PIPE	
		AREA OF OPENING SQUARE FEET				DIMENSIONS						CONCRETE							
		1 PIPE	2 PIPES	3 PIPES	4 PIPES	A	B	C	E	F	G	X	1 PIPE	2 PIPES	3 PIPES				4 PIPES
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

TABLE OF CONSTRUCTION DATA AND ESTIMATED QUANTITIES FOR CONCRETE ELLIPTICAL PIPE CULVERT ENDWALLS

SPAN	RISE	CONSTRUCTION DATA										QUANTITIES IN ONE ENDWALL CU. YDS. OF CLASS I CONCRETE				SPAN	RISE	EQUIV. ROUND PIPE	
		AREA OF OPENING SQUARE FEET				DIMENSIONS						CONCRETE							
		1 PIPE	2 PIPES	3 PIPES	4 PIPES	A	B	C	E	F	G	X	1 PIPE	2 PIPES	3 PIPES				4 PIPES
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"



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

- 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	Recommended for approval
6-77	Update CMP Arch to 1974 AASHTO	Designed by HAB	5/73	by: <i>[Signature]</i> Deputy Design Engineer - Roadways
		Checked by LMF	5/73	Approved
		Quantities by HAB	5/73	by: <i>[Signature]</i> State Design Engineer
		Checked by LMF	5/73	Supervised by

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

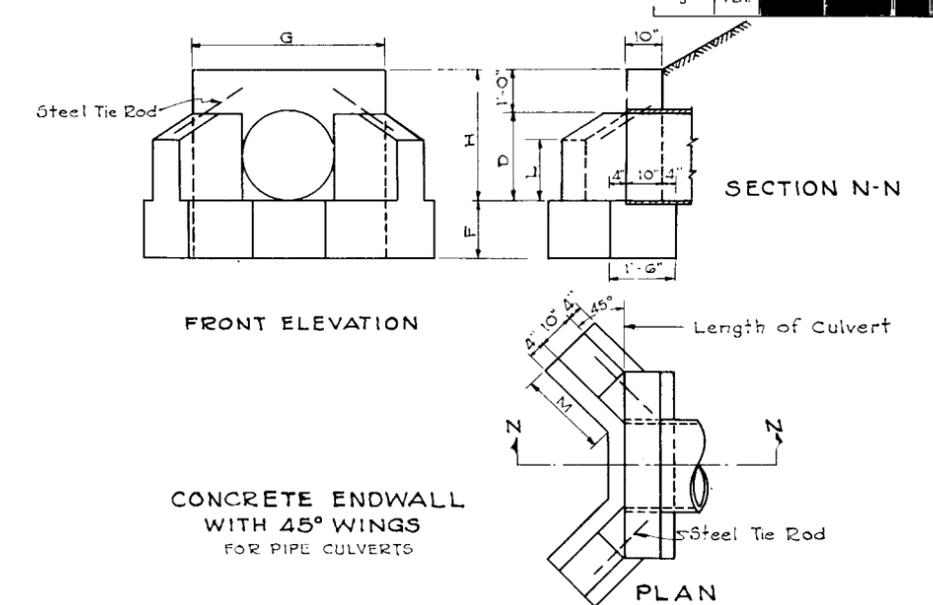
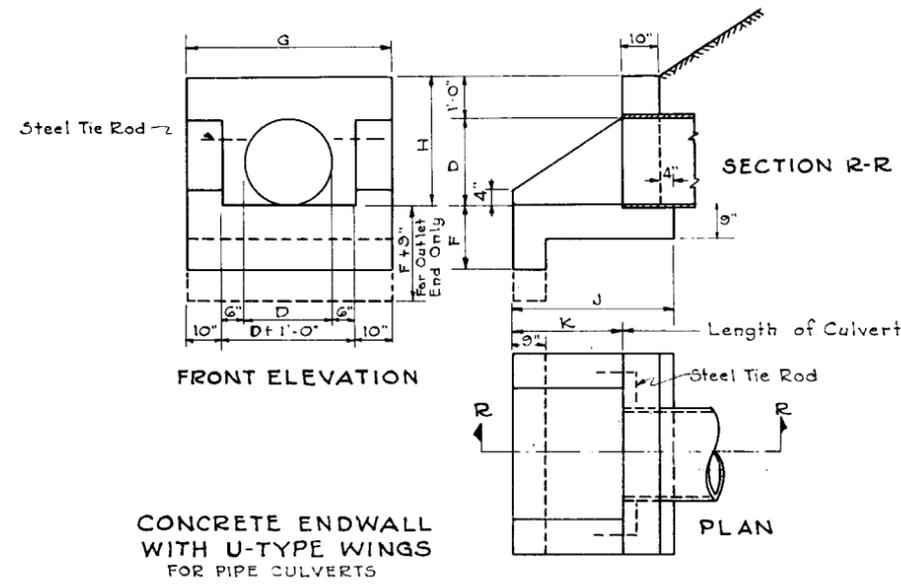


TABLE OF DIMENSIONS AND ESTIMATED QUANTITIES
PIPE CULVERT ENDWALLS WITH U-TYPE WINGS

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
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	Area Sq. Ft.	Wall				Footing	Concrete, Class I			Steel Tie Rods	
		H	G	L	M		F	Total Cu. Yds.			
D							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.
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REVISIONS			REVISIONS			DESIGNED BY		APPROVED BY	
Name	Date	Description	Name	Date	Description	Name	Date	Name	Date
LMF	8-70	Raised side slope to top of endwall	S.A.H.	7-10-56					
LMF	3-73	Added Class I Conc.	H.L.F.	7-20-45	Retraced				
LMF	4-74	Removed straight endwall detail	C.H.R.	6-14-48	Tie Rods				
LMF	10-74	Changed Index No.	B.A.S.	9-26-51	Retraced				
			H.W.	11-7-55	15' 45" added			G.E.F.	3-2-92
			LMF	8-72-70	Added level to straight endwall			T.J.K.	12-11-51

Deputy Design Engineer-Roadways
Drawing No. 1 of 1
Index No. DCE-02

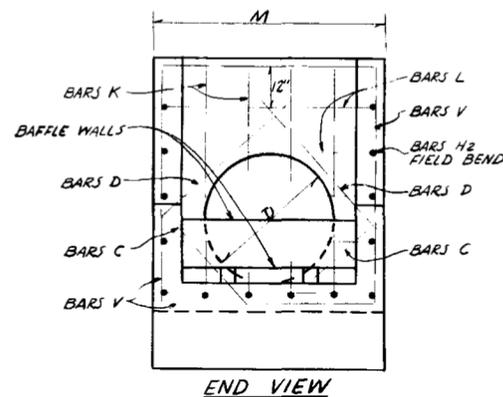


TABLE OF DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL (SECTION A-A)

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	49
	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
4:1	15"	1.23	7'-4"	1'-10"	3'-7"	2'-6"	2'-6"	2'-4"	1.88	146
	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
6:1	15"	1.23	11'-6"	1'-11"	3'-7"	3'-10"	3'-10"	3'-10"	3.34	236
	18"	1.77	13'-0"	2'-2"	3'-10"	4'-4"	4'-4"	4'-4"	2.19	138
	24"	3.14	16'-0"	2'-8"	4'-4"	5'-4"	5'-4"	5'-4"	2.63	145
	30"	4.91	19'-0"	3'-2"	4'-10"	6'-4"	6'-4"	6'-4"	3.59	227
	30"	4.91	19'-0"	3'-2"	4'-10"	6'-4"	6'-4"	6'-4"	4.81	333

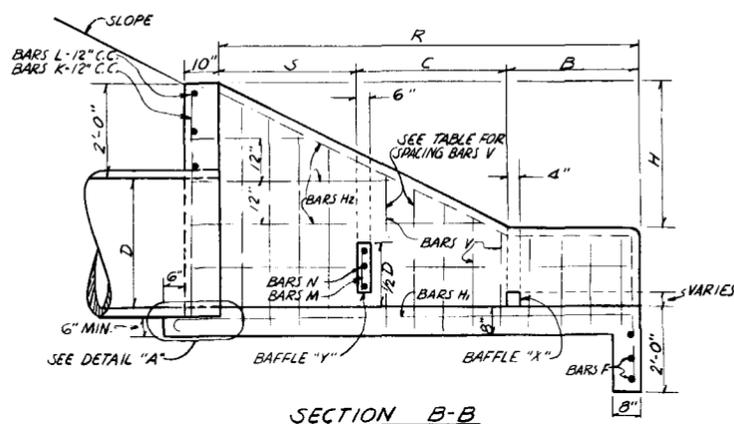
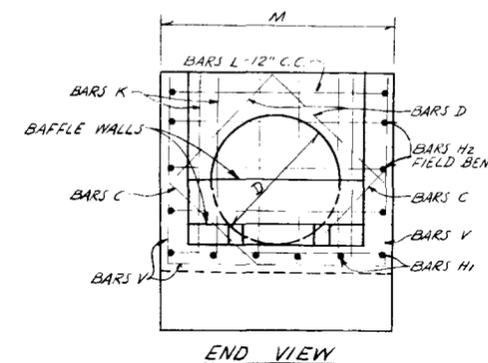


TABLE OF DIMENSIONS AND QUANTITIES FOR BAFFLES (SECTION A-A)

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

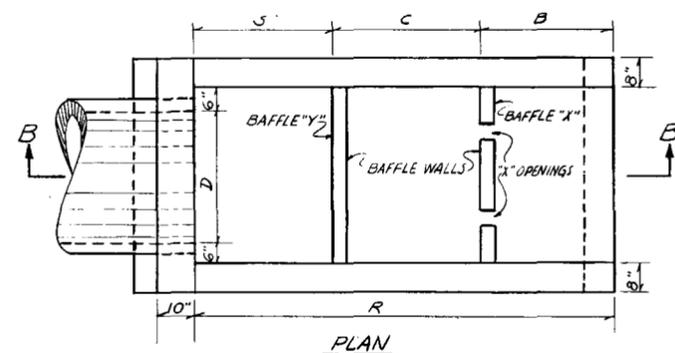
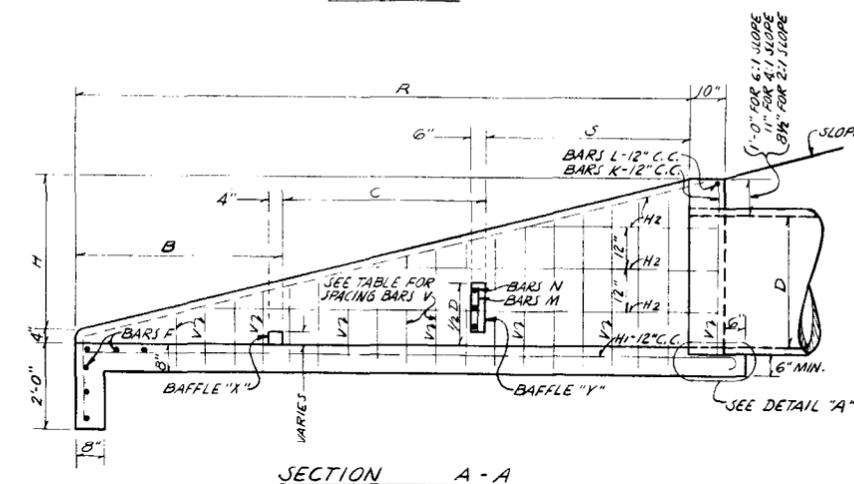


TABLE OF DIMENSIONS AND QUANTITIES FOR ONE U-ENDWALL WITH BAFFLES FOR 2:1 SLOPE (SECTION B-B)

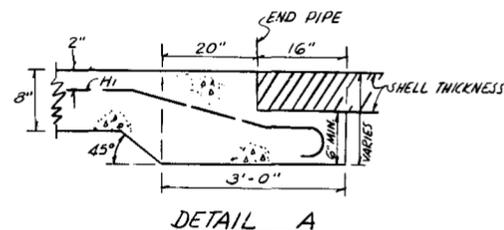
PIPE SIZE "D"	AREA OF OPENING SQ. FT.	R	H	M	S	B	C	X BAFFLE OPENINGS			Y BAFFLE OPENING VERTICAL CLEAR.	Y BAFFLE REINFORCING STEEL		#CONCRETE CLASS I CU. YD.	REINFORCING STEEL LBS.
								WIDTH	HEIGHT	LENGTH		BAR M	BAR N		
15"	1.23	5'-9"	2'-3 1/2"	3'-7"	2'-3"	1'-3"	2'-3"	4"	4"	4"	4"	3-#4	1-#4	1.61	99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

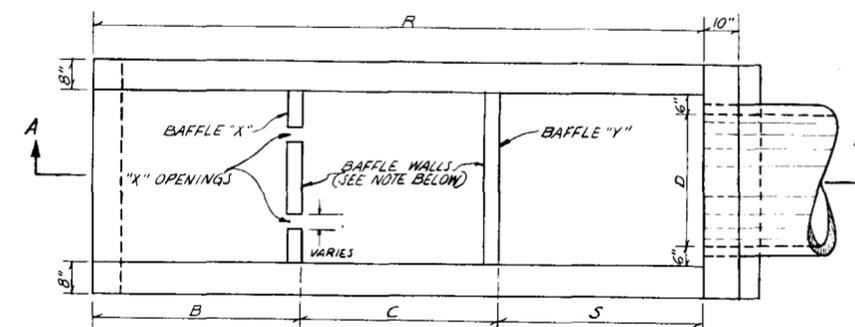
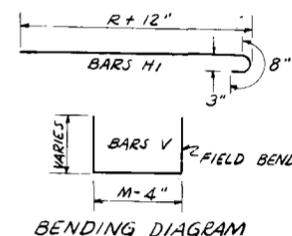
NOTE: FOR SODDING AROUND ENDWALL SEE INDEX NO GRC-01.

NOTE: ALL REINFORCING STEEL IS 1/2" Ø 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"



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

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.

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

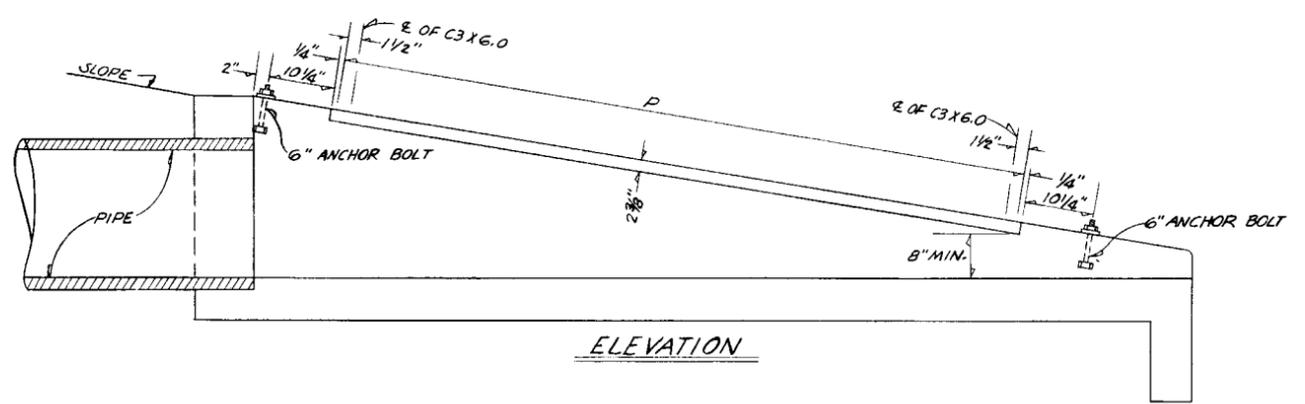
REVISIONS		REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions	Date	Descriptions			
10/69	REMOVED BARRIERS AND BAFFLES FROM DRAWING SH. 2	3-62	Rev Baffles & Redrawn			
8/70	Raised Side slope to top of endwall	6-64	Rev. Baffles X & Y			
7/71	REVISED TO ACCOMMODATE STEEL GRATING	2-68	Quantities Extended to include Thru 54" Pipe			

Checked by	Names	Date	Recommended for approval by
Checked by			
Checked by			
Checked by			

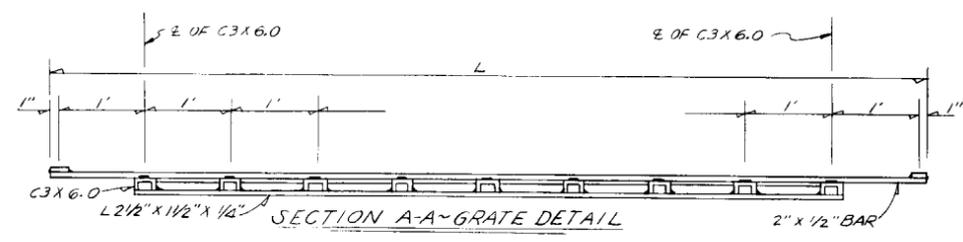
APPROVED BY: [Signature]

Drawing No. 1 of 3

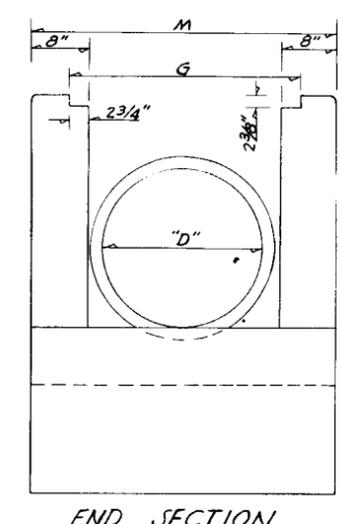
DCE-03



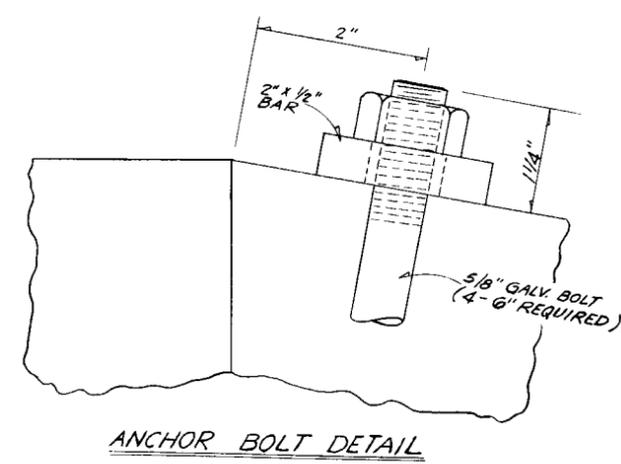
ELEVATION



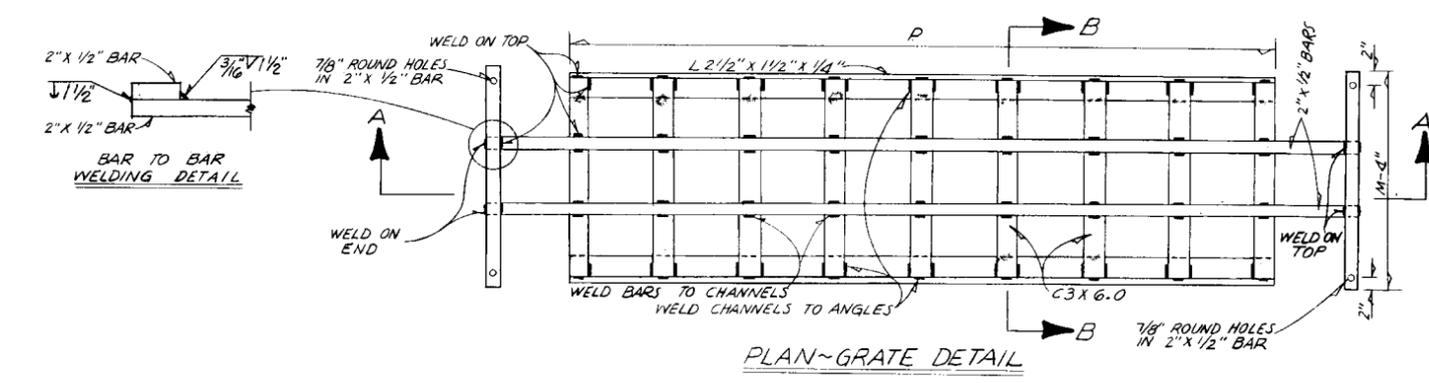
SECTION A-A - GRATE DETAIL



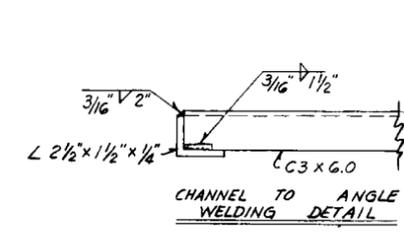
END SECTION



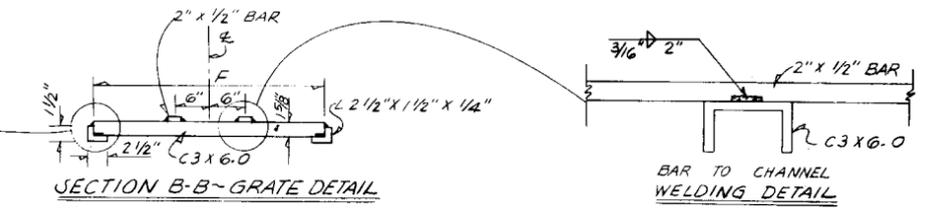
ANCHOR BOLT DETAIL



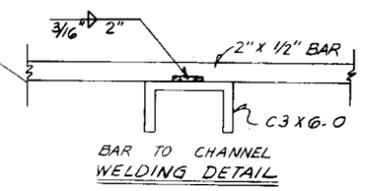
PLAN - GRATE DETAIL



CHANNEL TO ANGLE WELDING DETAIL



SECTION B-B - GRATE DETAIL



BAR TO CHANNEL WELDING DETAIL

DETAILS OF STEEL GRATING FOR U-ENDWALL

MOUNTING DETAILS FOR STEEL GRATING

GENERAL NOTES:

- COST OF GRATING TO BE PAID FOR AS ENDWALL GRATE PER POUND.
- COST OF GALVANIZED BOLTS AND NUTS TO BE INCLUDED IN BID PRICE FOR ENDWALL GRATE.
- ALL ANGLE, CHANNEL AND BAR STEEL TO BE A.S.T.M. A-588 WEATHERING STEEL EXCEPT AS NOTED IN GENERAL NOTE NO. 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. SPECIFIC LOCATIONS WILL BE DESIGNATED IN PLANS.
- CHANNEL SECTION C4 X 5.4 MAY BE USED AS AN ALTERNATE FOR C3 X 6.0 CHANNEL.

STEEL GRATING USE CRITERIA

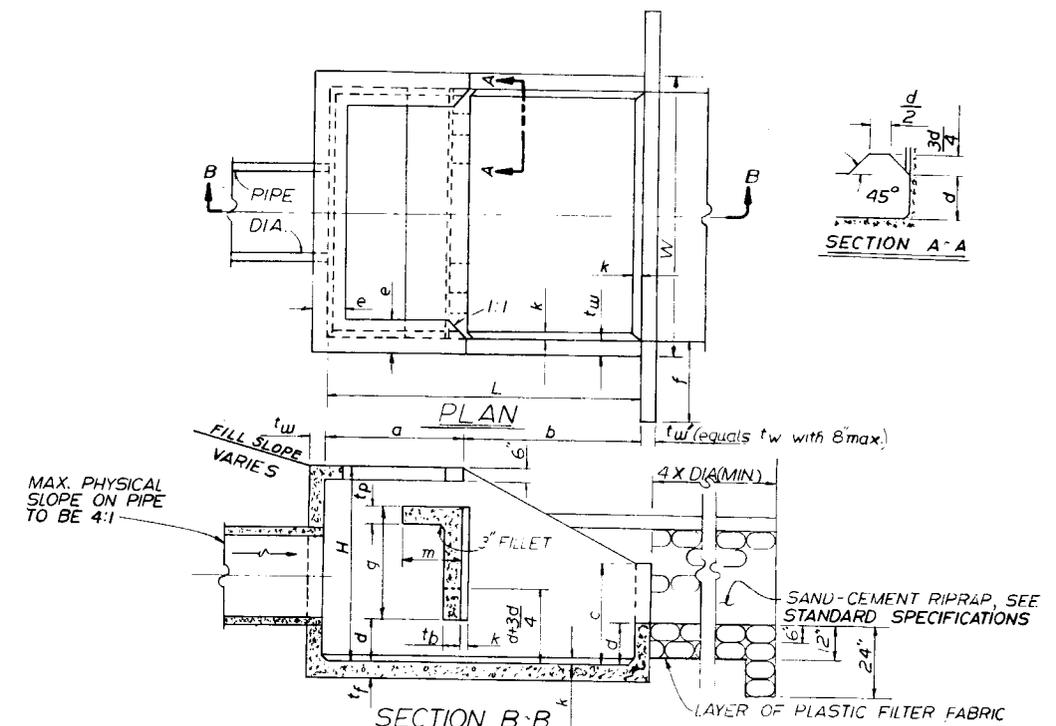
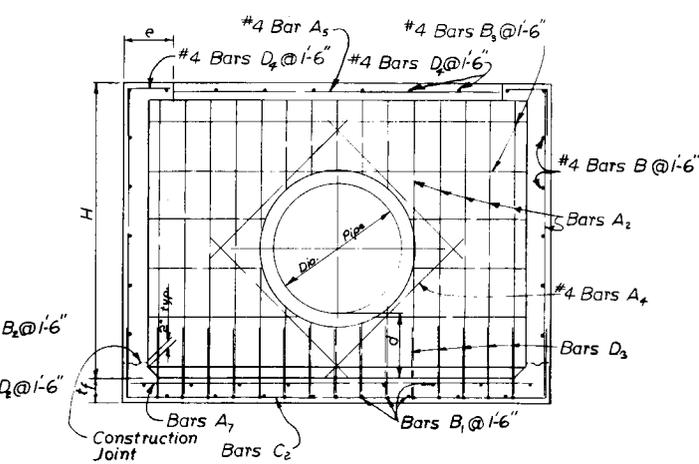
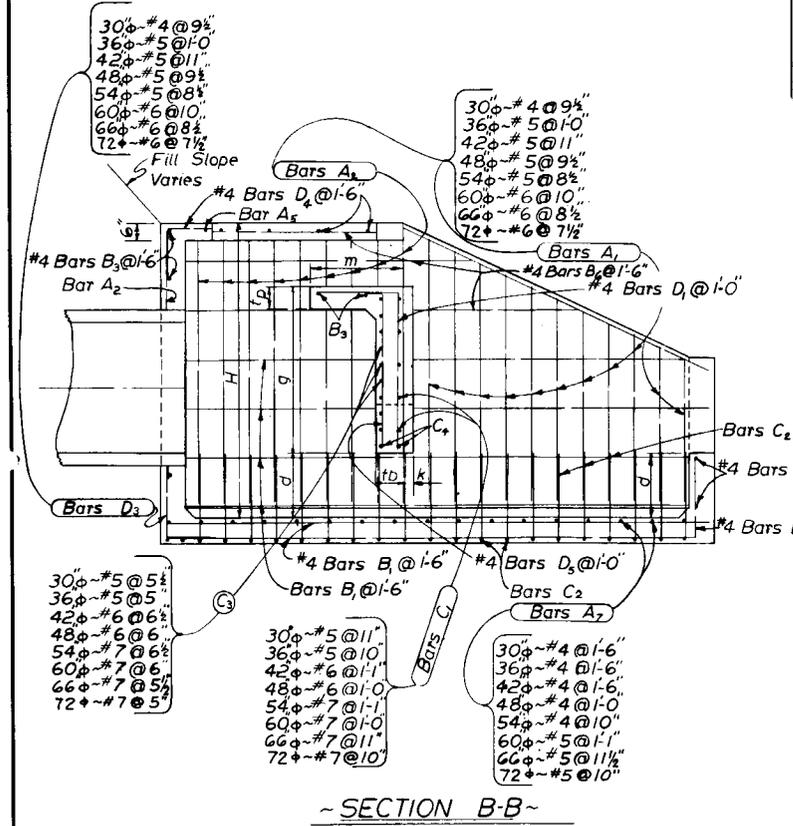
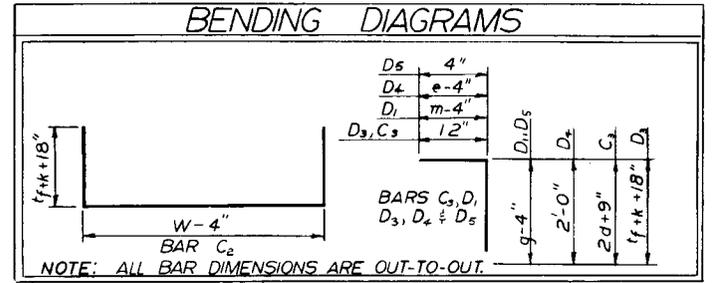
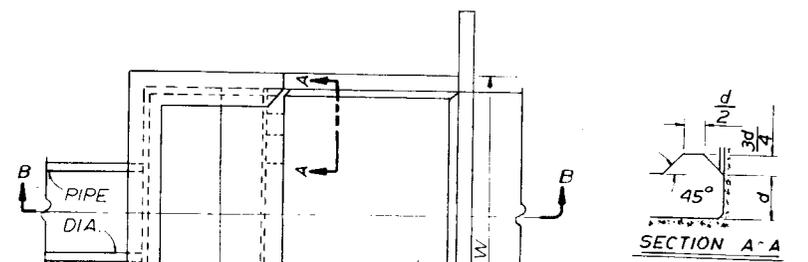
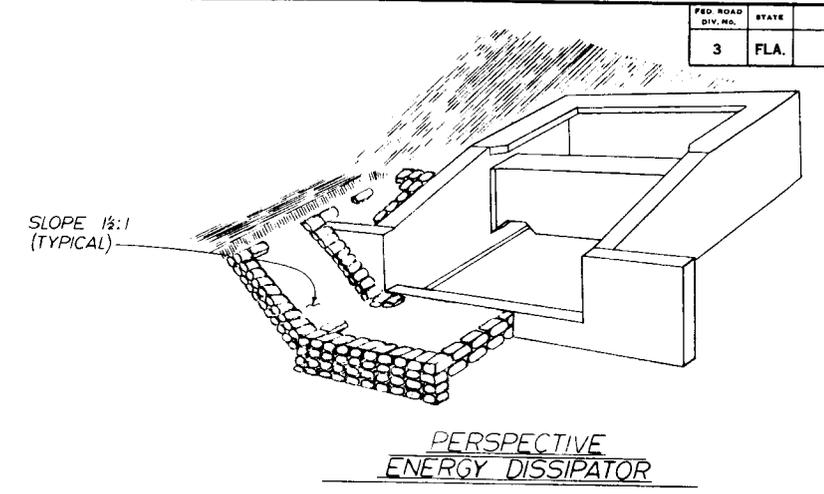
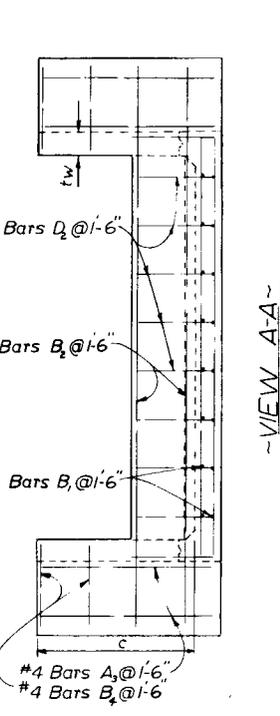
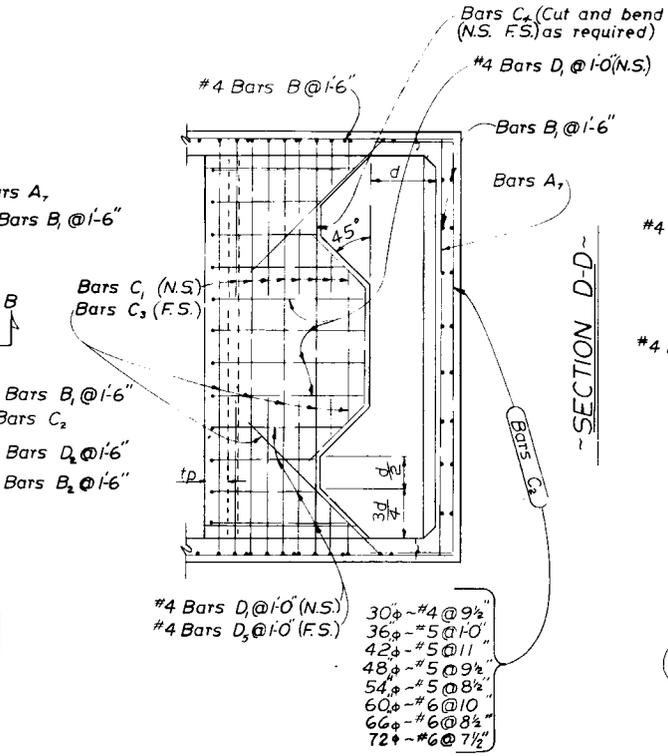
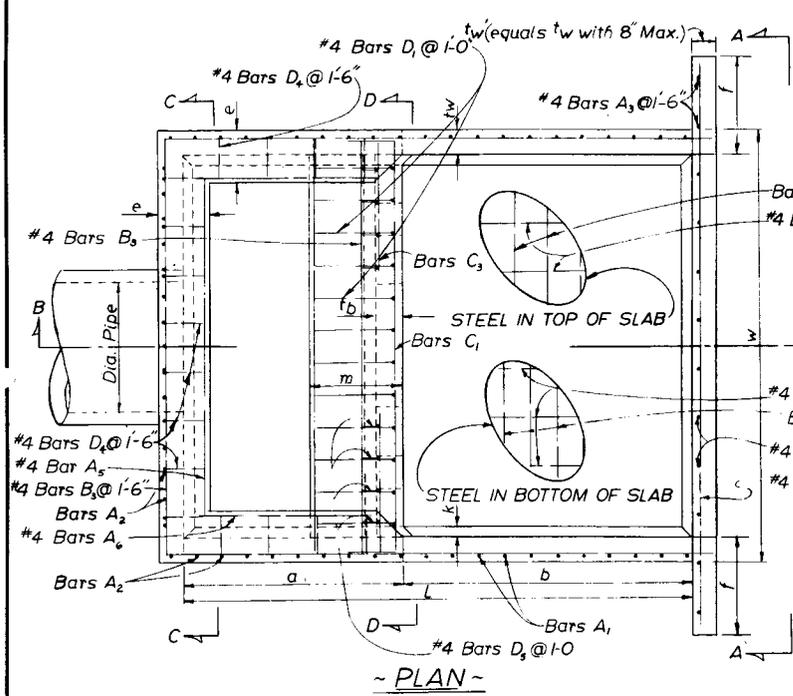
- GRATED HEADWALL AND/OR ENDWALL TO BE USED ON PIPE CULVERTS WHEN IN THE DESIGNATED CLEAR RECOVERY AREA AND WHEN ANY OF THE FOLLOWING CONDITIONS EXIST:
 - DRAINAGE AREA TO CULVERT CONSISTS OF MEDIAN OR INFIELD AREAS OR AREAS WHERE DEBRIS AND/OR DRIFT IS NEGLIGIBLE.
 - RUNOFF TO CULVERT IS BY SHEET FLOW OR IN SUCH ILL DEFINED CHANNELS THAT DEBRIS TRANSPORT IS NOT CONSIDERED A MAJOR PROBLEM.
 - 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.
 - AREAS WHERE CULVERT BLOCKAGE WITH RESULTANT BACKWATER WOULD NOT SERIOUSLY AFFECT ROADWAY EMBANKMENT, TRAFFIC OPERATION OR UPLAND PROPERTY.
- 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.

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.			TOTAL WEIGHT LBS.
			L	M-4"	LBS.	(X)	F	LBS.	P	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			
3-75	Revised Weld Locations & Size			
10-74	Changed Index No.			
Checked by		Names	Dates	Recommended For Approval by
Checked by		C.D.P.	7-20-71	E.H. Hart
Checked by		APPROVED BY Deputy Design Engineer - Roadways		
Checked by		State Design Engineer		
Traced by		Drawing No.	Index No.	
		2 of 3	DCE-03	



SIZE	PIPE DIA. INCHES	AREA SQ. FT.	MAX. DISCHARGE Q	FEET AND INCHES											CONCRETE CLASS I CU. YD.	REINF. STEEL LBS.				
				W	H	L	a	b	c	d	e	f	g	m			t _w	t _f	t _b	t _p
30	4.91	59	9-0	6-3	10-8	4-7	6-1	3-4	1-4	1-2	2-6	3-0	1-11	6	6-1/2	7	7	3	6.72	736
36	7.07	85	10-5	7-3	12-4	5-3	7-1	3-10	1-7	1-3	3-0	3-6	2-3	7	7-1/2	8	8	3	10.34	1,072
42	9.62	115	11-10	8-0	14-0	6-0	8-0	4-5	1-9	1-6	3-0	3-11	2-6	8	8-1/2	9	8	4	14.82	1,429
48	12.57	151	13-3	9-0	15-8	6-9	8-11	4-11	2-0	1-7	3-0	4-5	2-10	9	9-1/2	10	8	4	20.32	2,000
54	15.90	191	14-8	9-9	17-4	7-4	10-0	5-5	2-2	1-10	3-0	4-11	3-0	10	10-1/2	10	8	4	27.19	2,659
60	19.63	236	16-1	10-9	19-0	8-0	11-0	5-11	2-5	1-11	3-0	5-4	3-4	11	11-1/2	11	8	6	36.52	3,552
66	23.76	285	17-3	11-6	20-6	8-8	11-10	6-5	2-7	2-1	3-0	5-9	3-7	12	12-1/2	12	8	6	42.82	4,472
72	28.27	339	18-6	12-3	22-0	9-3	12-9	6-11	2-9	2-3	3-0	6-2	3-9	12	12-1/2	12	8	6	50.68	5,426

IMPACT TYPE ENERGY DISSIPATOR

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

U-ENDWALLS FOR PIPE CULVERTS

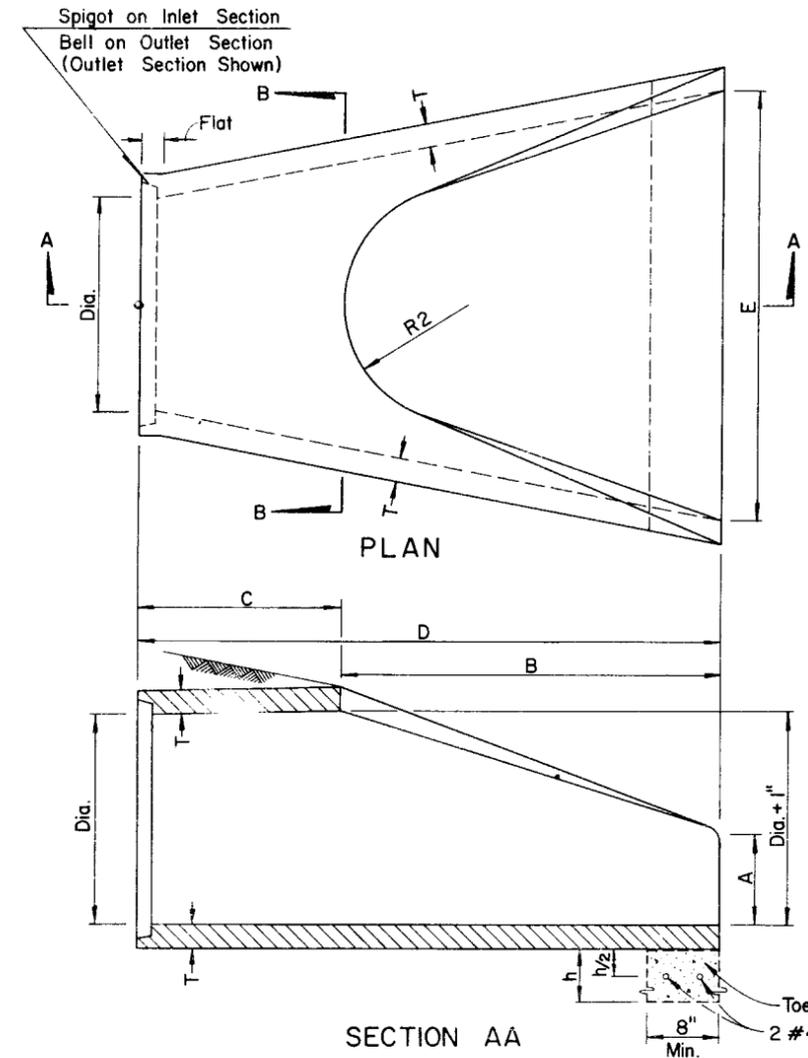
FHWA APPROVED: 3-20-75

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
7/71	DRAWING NO. CHANGED FROM 2072 TO 3073			
3/73	Added Class I L.F. Conc. Sheets 1 & 3			
10-74	Changed Index No			

Checked by	H.W. JAC.	11-69	Recommended For Approval by	[Signature]
Checked by	DEE	11-69	APPROVED BY	[Signature]
Traced by	G.F.	10-69	State Design Engineer	

Drawing No.	3 of 3	Index No.	DCE-03
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Note: Cut bars as required.



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 1/4"	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 13/16"	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 9/16"	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 13/16"	24 5/16"	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 1/8"	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.

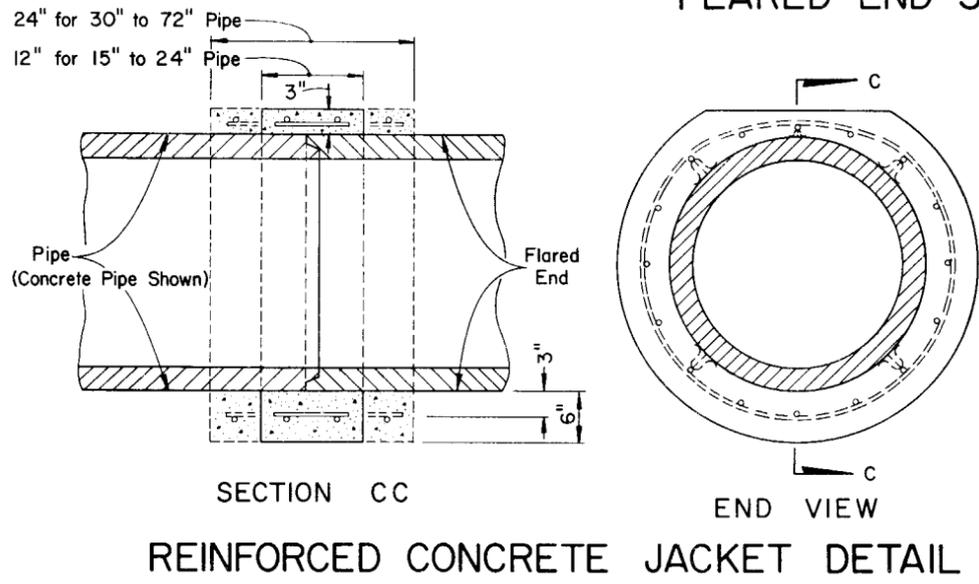
The manufacturer of the flared end section shall identify the manufacturer of the pipe culvert and certify that the flared end section is suited to joining the pipe culvert.
 - Joints sealed with preformed plastic gaskets.

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.

FLARED END SECTION



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 disjoints. 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 disjoints would occur if the ditch pavement should fail.

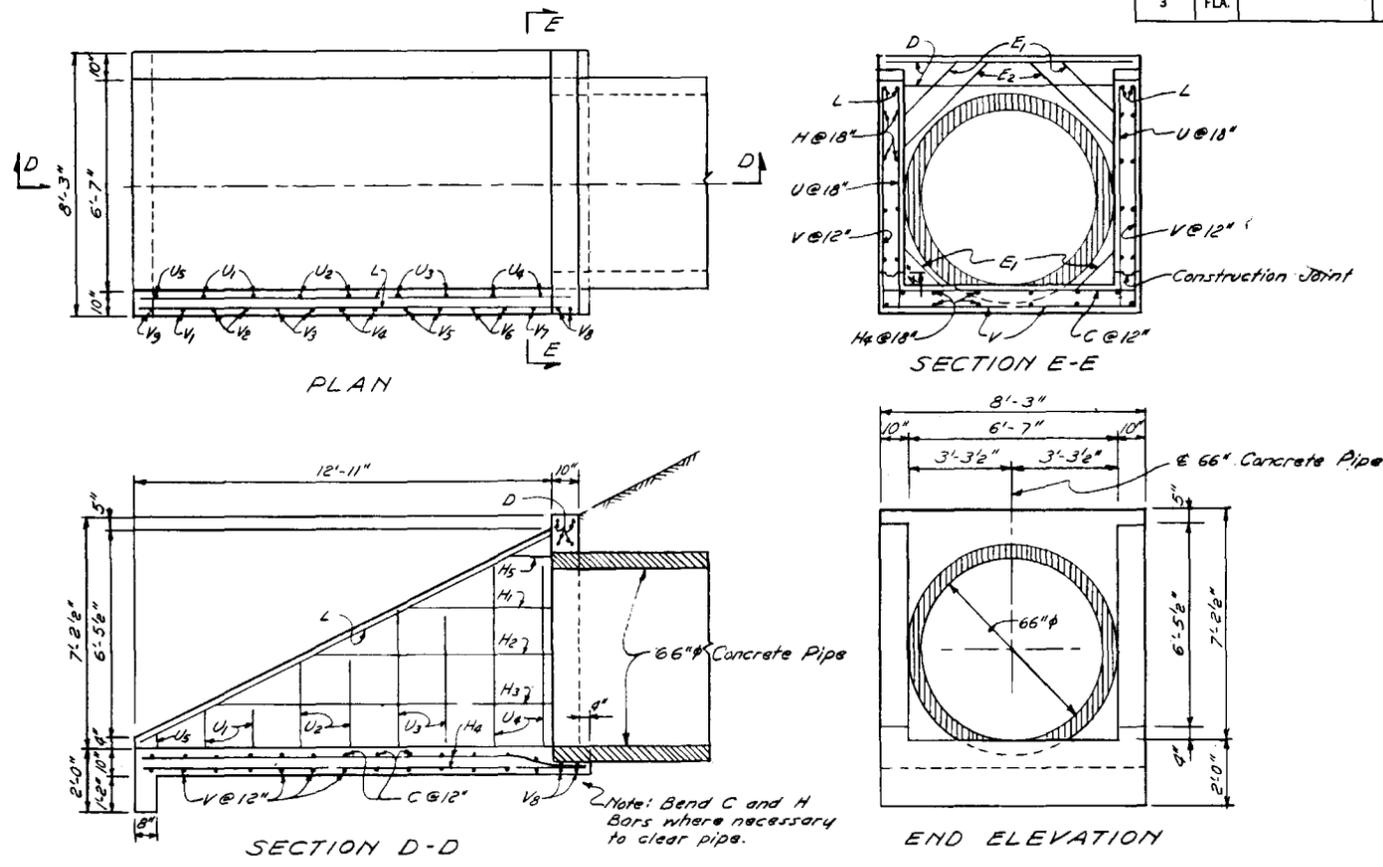
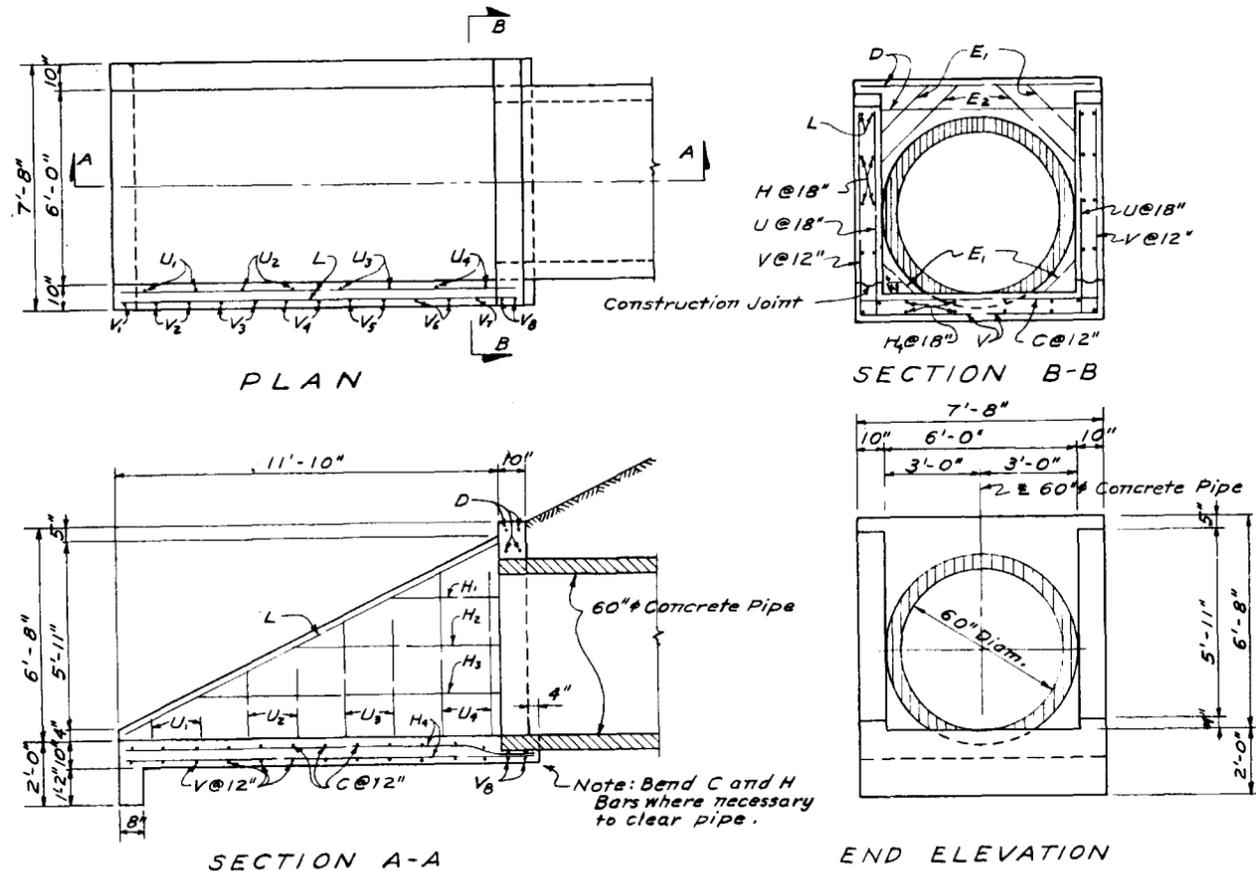
F.W.A. APPROVED: 9-23-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

FLARED END SECTION FOR PIPE CULVERTS

REVISED	ROAD NO.	COUNTY	PROJECT NO.
Date			
Description	Series	Dates	APPROVED BY
9-77 Redrawn & Sheet 2 Deleted			<i>E.H. Hart</i>
Designed by	Checked by	J.V.G. 9-77	Deputy Design Engineer, Roadways
Drawn by	H.K.H. 9-77		
Checked by	J.V.G. 9-77		
Supervised by	D.C.B.		

Drawing No. 1 of 1 Index No. DCE-04-1



BILL OF REINFORCING STEEL						ESTIMATED QUANTITIES		
MARK	SIZE	NO. REQD	LENGTH	LOCATION	BENDING	ITEM	UNIT	QUANTITY
C	4	14	7'-4"	Slab	Straight	Concrete, Class II	Cu. Yd.	6.39
D	4	4	7'-4"	Headwall	"			
E ₁	4	8	3'-3"	"	"	BENDING DIAGRAMS BARS V Note: Bar dimensions are given out to out.		
E ₂	4	4	4'-4"	"	"			
H ₁	4	4	4'-1"	Wings	"			
H ₂	4	4	7'-1"	"	"			
H ₃	4	4	10'-1"	"	"			
H ₄	4	12	12'-8"	Slab	"			
L	4	4	13'-9"	Wings	"			
U ₁	4	4	1'-3"	"	"			
U ₂	4	4	2'-9"	"	"			
U ₃	4	4	4'-3"	"	"			
U ₄	4	4	5'-9"	"	"			
V ₁	4	2	4'-4"	Wings & Slab	See Diagram			
V ₂	4	4	4'-10"	"	"			
V ₃	4	4	5'-10"	"	"			
V ₄	4	4	6'-10"	"	"			
V ₅	4	4	7'-10"	"	"			
V ₆	4	4	8'-10"	"	"			
V ₇	4	2	9'-10"	"	"			
V ₈	4	4	10'-7"	"	"			

BILL OF REINFORCING STEEL						ESTIMATED QUANTITIES		
MARK	SIZE	NO. REQD	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	"			
E ₁	4	8	3'-6"	"	"	BENDING DIAGRAMS BARS V Note: All bar dimensions are out-to-out.		
E ₂	4	4	4'-8"	"	"			
H ₁	4	4	5'-2"	Wings	"			
H ₂	4	4	8'-2"	"	"			
H ₃	4	4	11'-2"	"	"			
H ₄	4	12	13'-9"	Slab	"			
H ₅	4	4	2'-2"	Wings	"			
L	4	4	15'-1"	"	"			
U ₁	4	4	1'-10"	"	"			
U ₂	4	4	3'-4"	"	"			
U ₃	4	4	4'-10"	"	"			
U ₄	4	4	6'-4"	"	"			
U ₅	4	2	1'-1"	"	"			
V ₁	4	2	5'-4"	Wing & Slab	See Diagram			
V ₂	4	4	5'-10"	"	"			
V ₃	4	4	6'-10"	"	"			
V ₄	4	4	7'-10"	"	"			
V ₅	4	4	8'-10"	"	"			
V ₆	4	4	9'-10"	"	"			
V ₇	4	2	10'-10"	"	"			
V ₈	4	4	11'-6"	"	"			
V ₉	4	2	4'-10"	"	"			

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

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

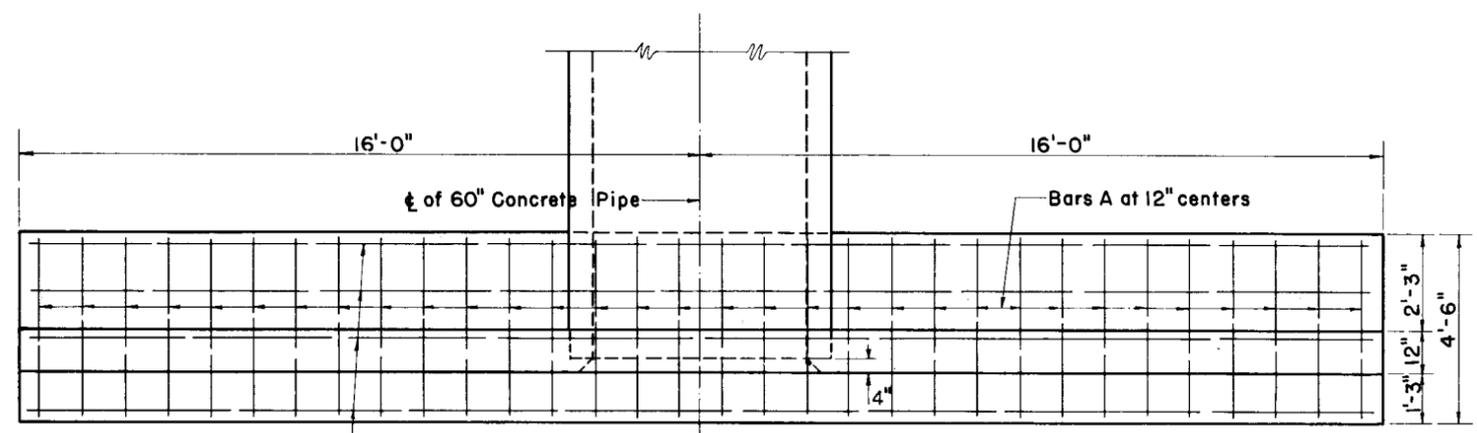
FHWA APPROVED: 3-20-75

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

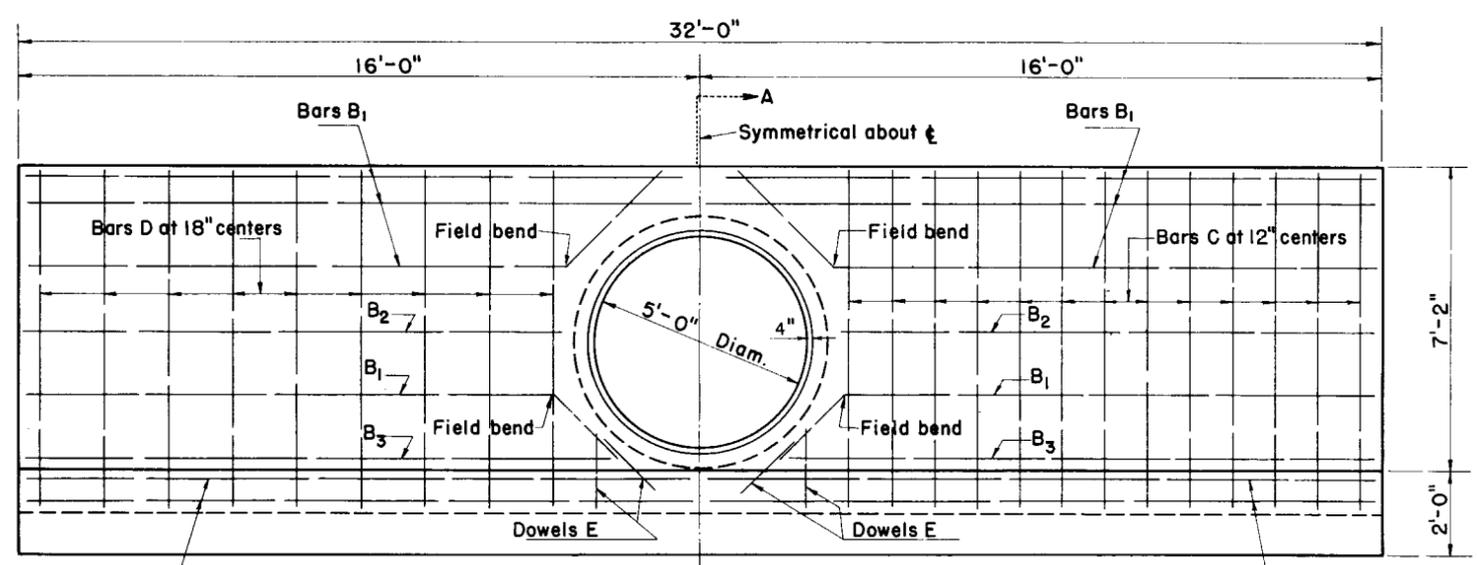
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.																				
<table border="1"> <tr> <th>Date</th> <th>Description</th> <th>Name</th> <th>Date</th> </tr> <tr> <td>11-60</td> <td>Endwall for 66" Pipe added.</td> <td>M.E.P.</td> <td>2-30-60</td> </tr> <tr> <td>8-70</td> <td>Raised side slope LMF to top of endwall</td> <td>R.G.L.</td> <td>11-60</td> </tr> <tr> <td>3-73</td> <td>Added Class II Conc.</td> <td>R.G.L.</td> <td>2-33-68</td> </tr> <tr> <td>10-74</td> <td>Changed Index N^o</td> <td>M.E.P.</td> <td>2-33-68</td> </tr> </table>	Date	Description	Name	Date	11-60	Endwall for 66" Pipe added.	M.E.P.	2-30-60	8-70	Raised side slope LMF to top of endwall	R.G.L.	11-60	3-73	Added Class II Conc.	R.G.L.	2-33-68	10-74	Changed Index N ^o	M.E.P.	2-33-68			
Date	Description	Name	Date																				
11-60	Endwall for 66" Pipe added.	M.E.P.	2-30-60																				
8-70	Raised side slope LMF to top of endwall	R.G.L.	11-60																				
3-73	Added Class II Conc.	R.G.L.	2-33-68																				
10-74	Changed Index N ^o	M.E.P.	2-33-68																				

Approved by: *E.H. Hunt*
Deputy Design Engineer - Roadways

Drawing No. 1 of 1
Index No. DCE-05



PLAN
SHOWING BARS IN FOOTING



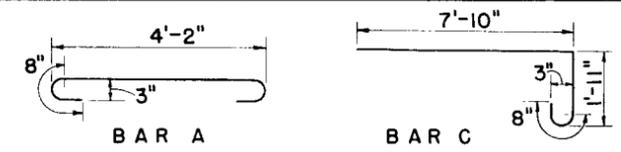
HALF ELEVATION
SHOWING BARS IN FRONT FACE OF WALL

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

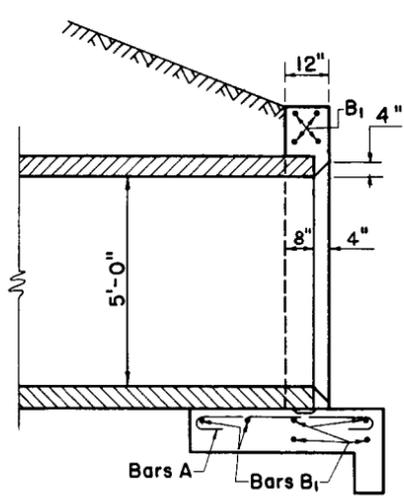


NOTE: All bar dimensions are out to out

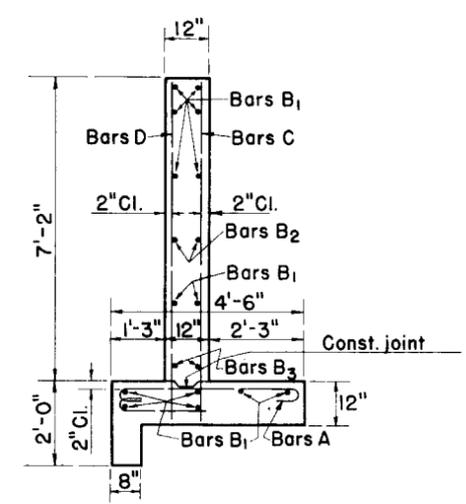
ESTIMATED QUANTITIES

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

Note: For saddling around endwall see detail on Index no. GRC-01.



SECTION A-A

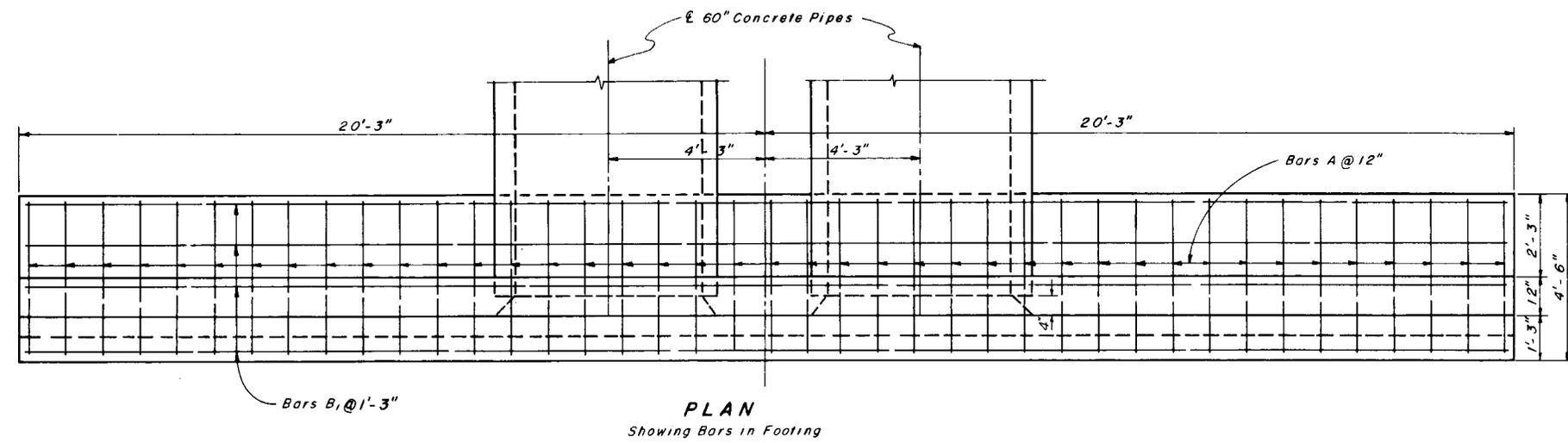


TYPICAL SECTION THRU ENDWALL

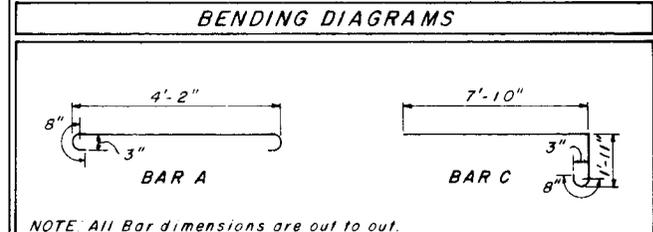
FHWA APPROVED: 3-20-75
FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
STANDARD ENDWALL FOR 60" CONCRETE PIPE

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
8-55	Redrawn and Traced-H.W.			
1-72	Raised side slope 1' MF to top of headwall			
3-73	Added Cl. II Conc.			
10-74	Changed Index No.			

Names	Dates	Approved by:
T.W.J.	11-49	<i>E.H. Hunt</i> Deputy Design Engineer - Roadways
W.H.M.	11-49	
R.G.L.	11-49	

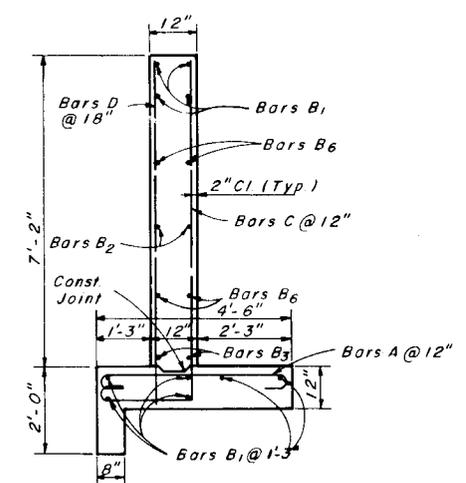
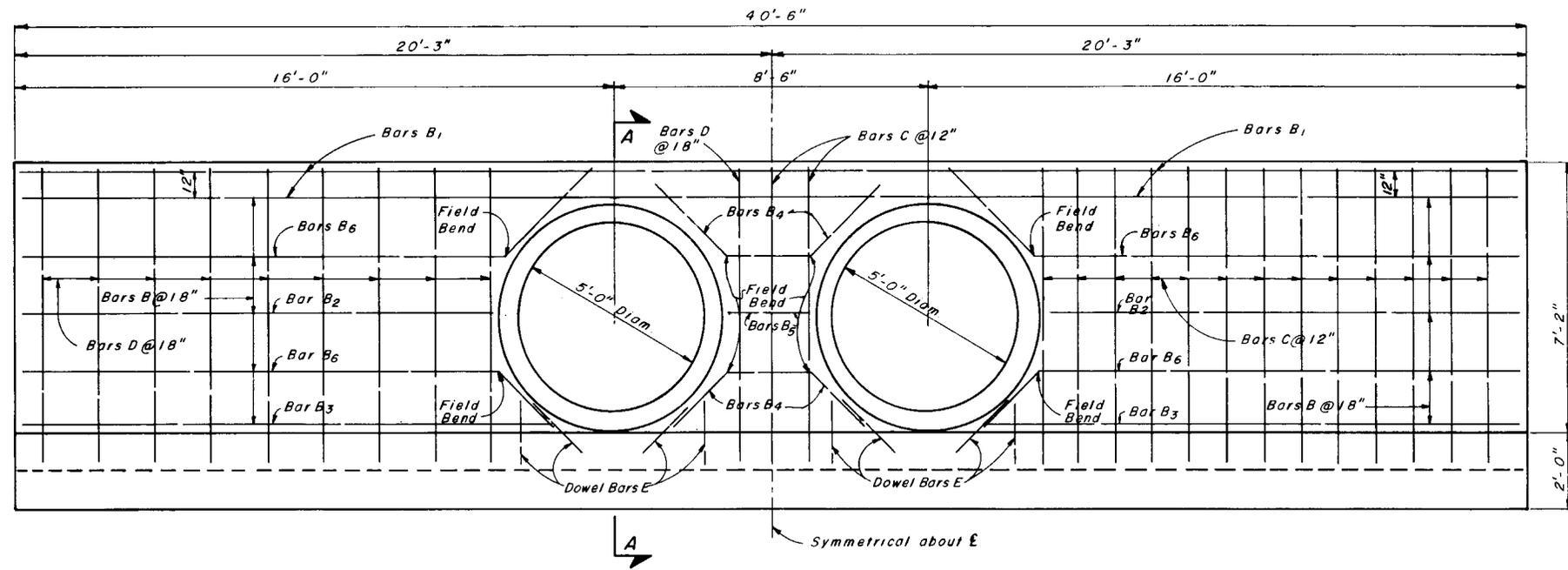
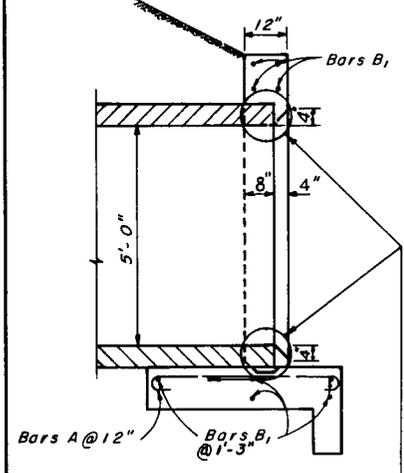


BILL OF REINFORCING STEEL					
MARK	SIZE	No. REQ'D	LENGTH	LOCATION	BENDING
A	4	41	5'-3"	Footing	Bend
B1	4	10	40'-2"	Footing & Wall	Straight
B2	4	4	12'-6"	Wall	Straight
B3	4	4	13'-9"	Wall	Straight
B4	4	4	6'-0"	Wall	Field Bend
B5	4	2	2'-2"	Wall	Straight
B6	4	8	15'-0"	Wall	Field Bend
C	4	29	10'-3"	Footing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

NOTE: For seating 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

ALTERNATE ENTRANCE

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

FHWA APPROVED: 3-20-75

Date	Descriptions
3/73	Added Class II Conc.
10-74	Changed Index No

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

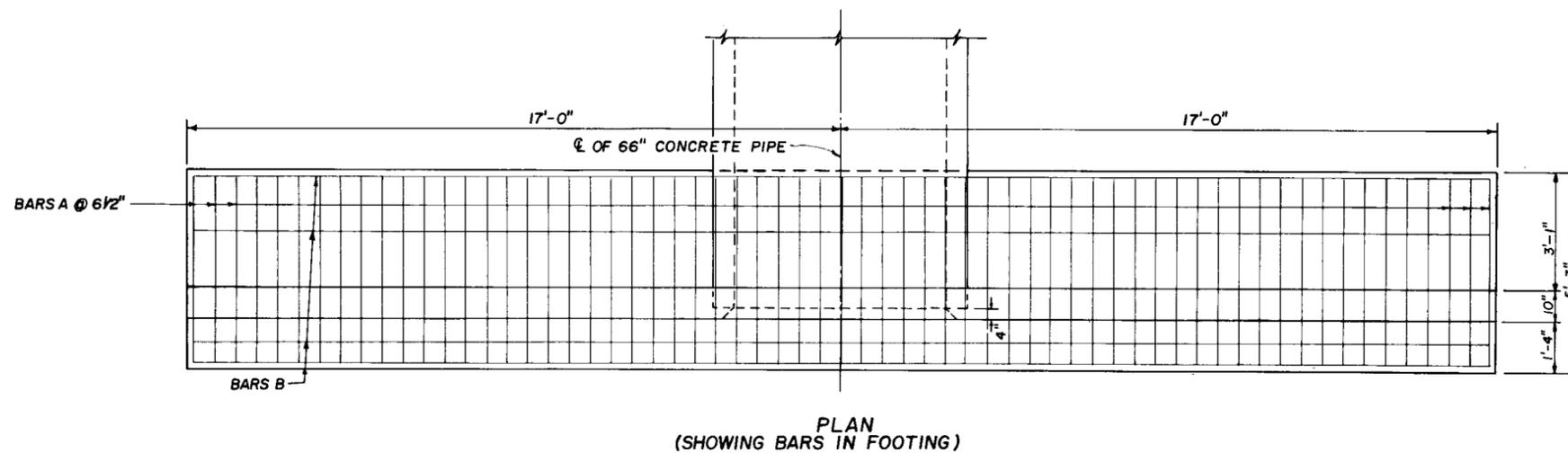
STANDARD ENDWALL FOR DOUBLE 60" CONCRETE PIPE

ROAD NO.	COUNTY	PROJECT NO.

Designed by	J.B.L.	Date	1-72
Checked by	J.C.C.	Date	2-72
Quantities by	J.B.L.	Date	1-72
Checked by	J.C.C.	Date	2-72
Supervised by	F.V.L.		

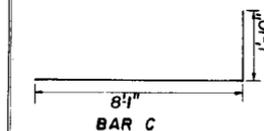
APPROVED BY: *[Signature]*
Deputy Design Engineer, Structures

Drawing No. 1 of 1
Index No. DCE-07



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

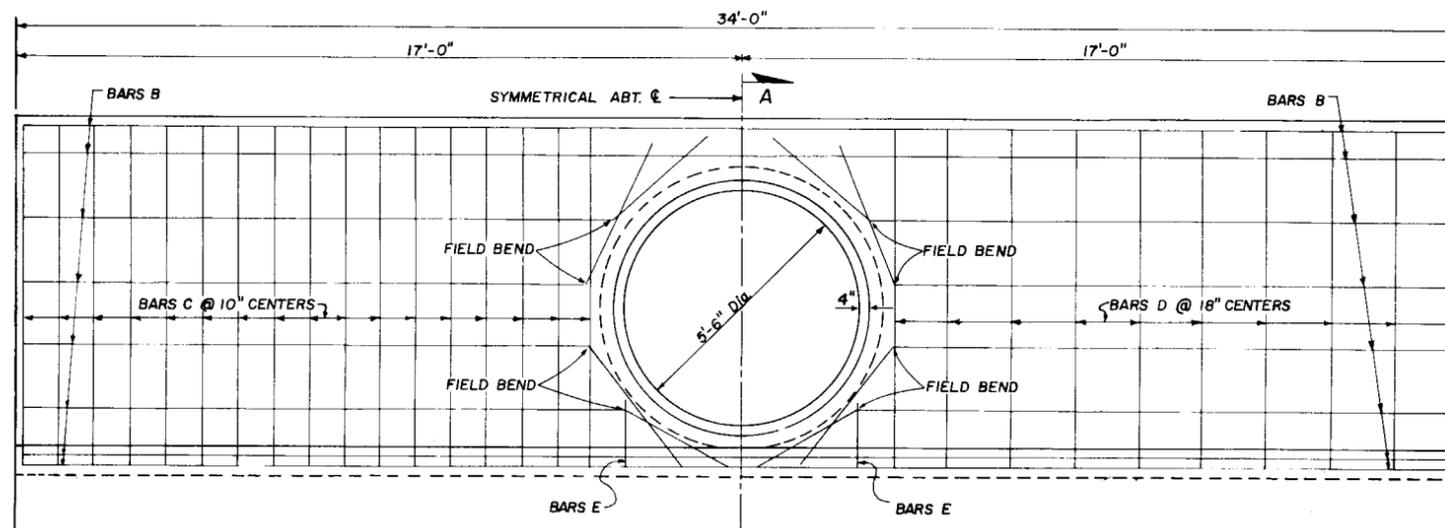
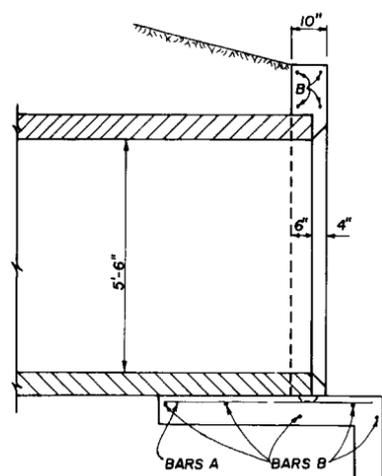


NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

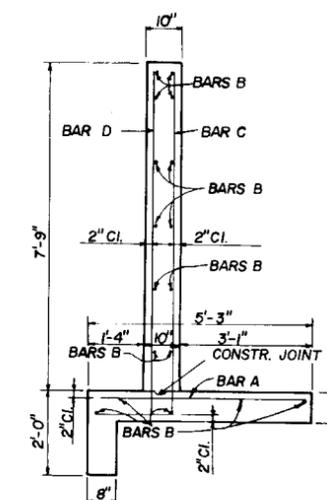
ESTIMATED QUANTITIES

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

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



NOTE: CUT AND FIELD BEND BARS B AS SHOWN.



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

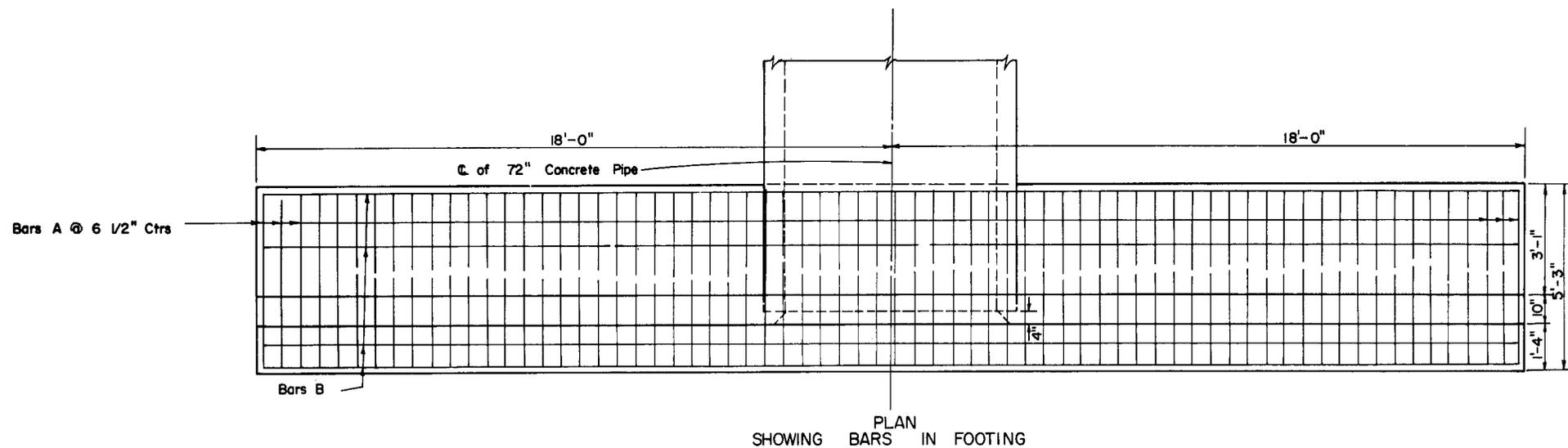
FHWA APPROVED 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN SECTION

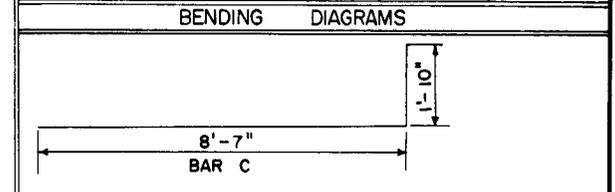
STANDARD ENDWALL FOR 66" CONCRETE PIPE

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
8-70 MF	Raised side slope to top of endwall			
3-73	Added Class II Concrete			
10-74	Changed index No.			

Designed by	J.L.W.	3-54	APPROVED BY <i>E.H. Hart</i> Deputy Design Engineer, ROADWAYS
Checked by	R.C.B.	3-54	
Quantities by	J.L.W.	3-54	
Checked by	R.C.B.	3-54	
Supervised by			Drawing No. Index No.
			1 of 1 DCE-08



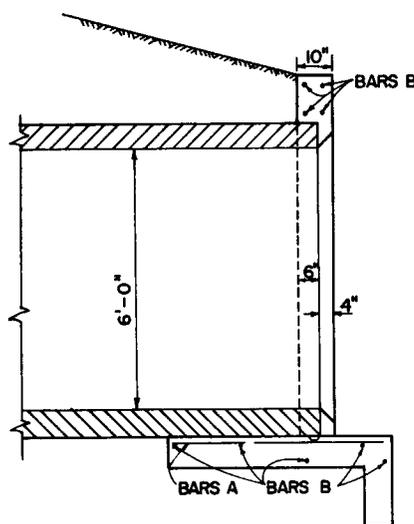
BILL OF REINFORCING STEEL					
MARK	SIZE	No. Req'd	LENGTH	LOCATION	BENDING
A	5	68	4' - 11"	FOOTING	STRAIGHT
B	4	17	35' - 8"	FOOTING & WALL	"
C	5	34	10' - 5"	WALL	BEND
D	4	20	8' - 7"	WALL	STRAIGHT
E	4	4	2' - 6"	WALL	"
F	4	4	1' - 6"	WALL	"



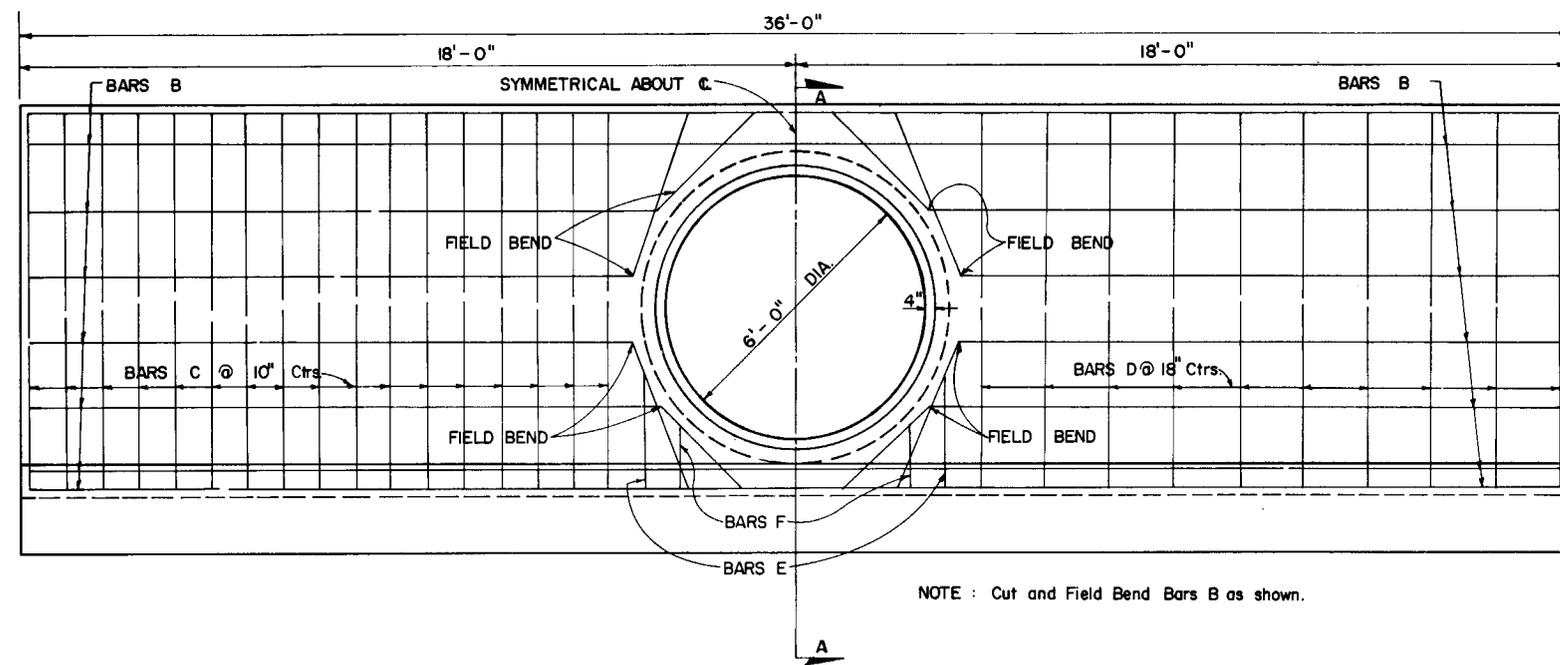
NOTE: All bar dimensions are out to out

ESTIMATED QUANTITIES		
ITEMS	UNIT	QUANTITY
CONCRETE CLASS II	CU. YD.	13.76
REINFORCING STEEL	LB.	1249

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



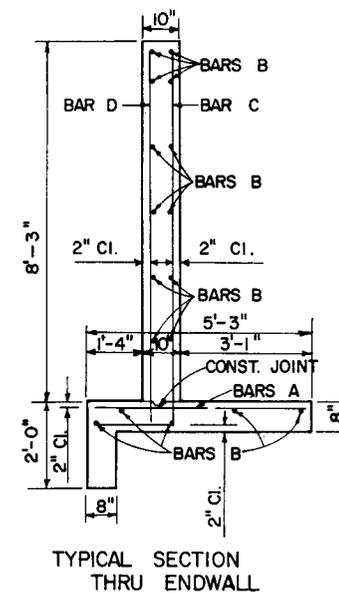
SECTION A-A



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

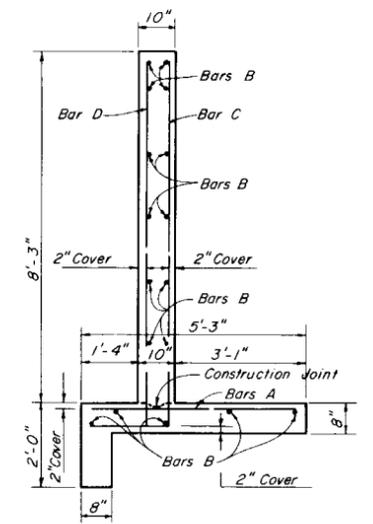
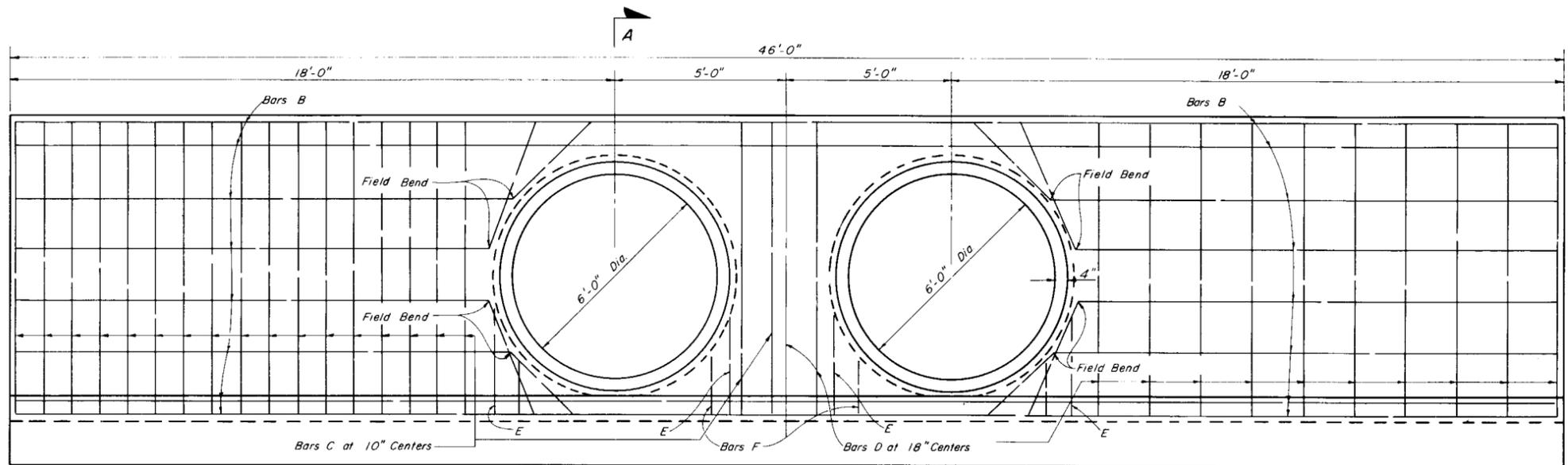
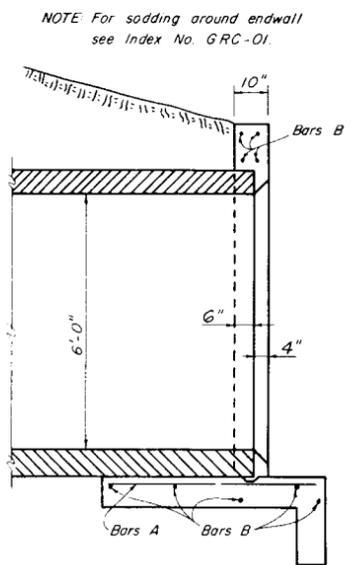
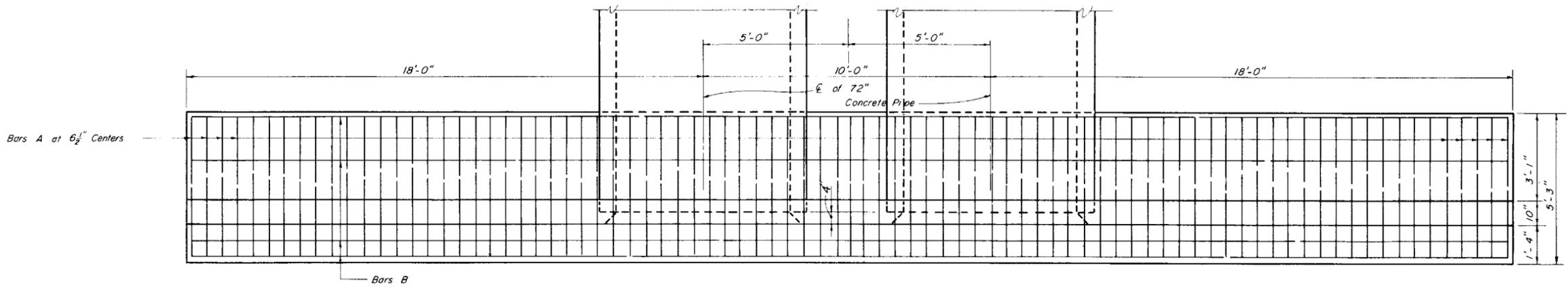
GENERAL NOTES
 DESIGN SPECIFICATIONS: A.A.S.H.O., 1973
 CHAMFER: All exposed edges and corners to be chamfered 3/4" unless otherwise noted.
 REINFORCING STEEL: GRADE 40 or 60

FHWA APPROVED: 3-20-76

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN SECTION
 STANDARD ENDWALL FOR
 72" CONCRETE PIPE

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
8-70	Raised side slope to LMF top of endwall.			
3-73	Added class II conc.			
10-74	Changed index no.			

Designed by	EVC	10-55	APPROVED BY <i>E. H. Hunt</i> Deputy Chief Engineer, Roadways	
Checked by	WHW	10-55		
Quantities by	EVC	10-55		
Checked by	WHW	10-55		
Supervised by				Drawing No. 1 OF 1 Index No. DCE-09



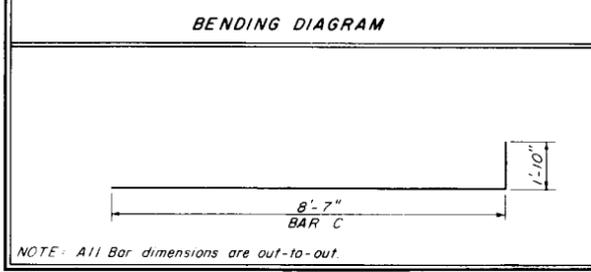
NOTE: Cut and Field Bend Bars B as shown

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 3/8" unless otherwise noted.
 REINFORCING STEEL: Grade 40 or 60

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	"



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

FHWA APPROVED: 7-7-75

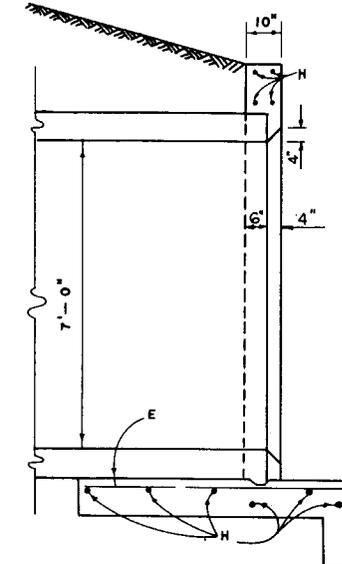
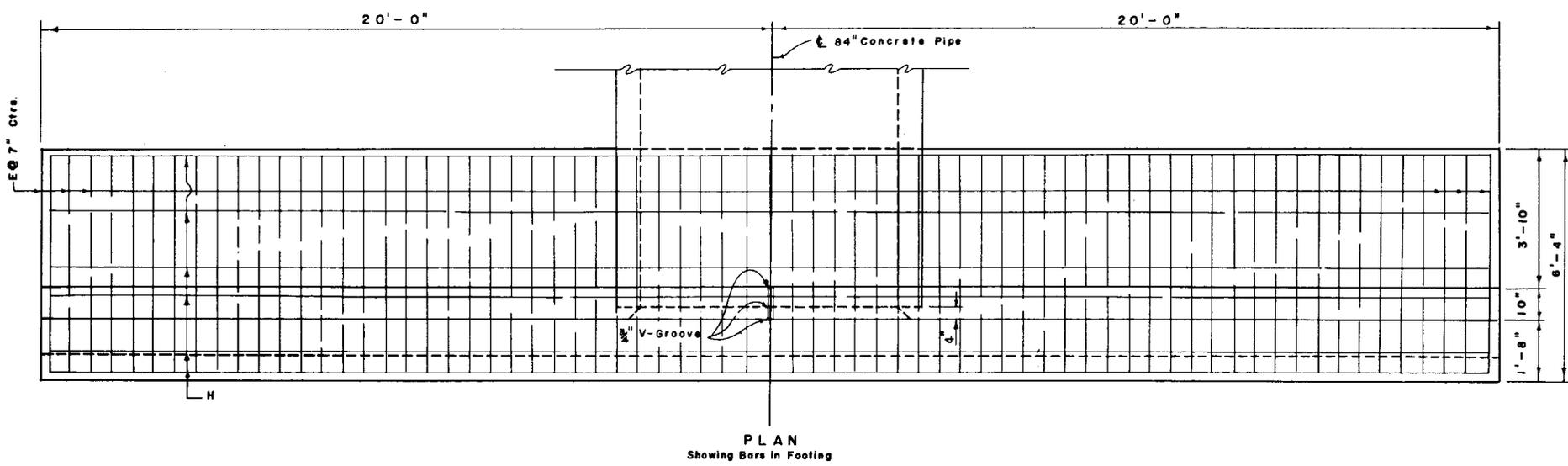
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION

ENDWALL FOR DOUBLE 72" PIPE

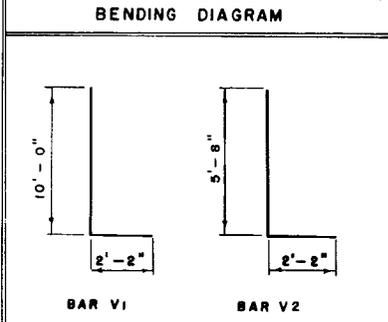
ROAD NO.	COUNTY	PROJECT NO.

REVISIONS	DATES	DESCRIPTIONS

Designed by	G.F.G.	1-75	Approved by: Deputy Design Engineer - Roadways Drawing No. 1 of 1 Index No. DCE-10
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.J.		

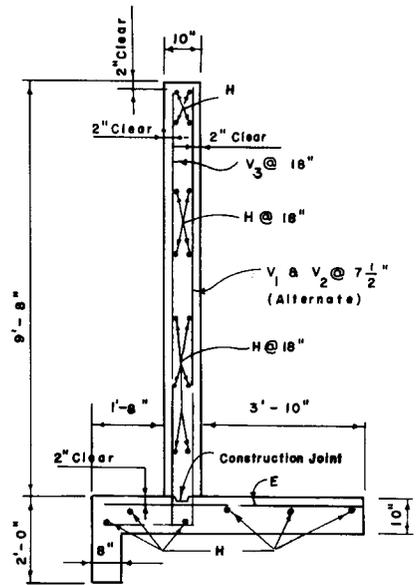
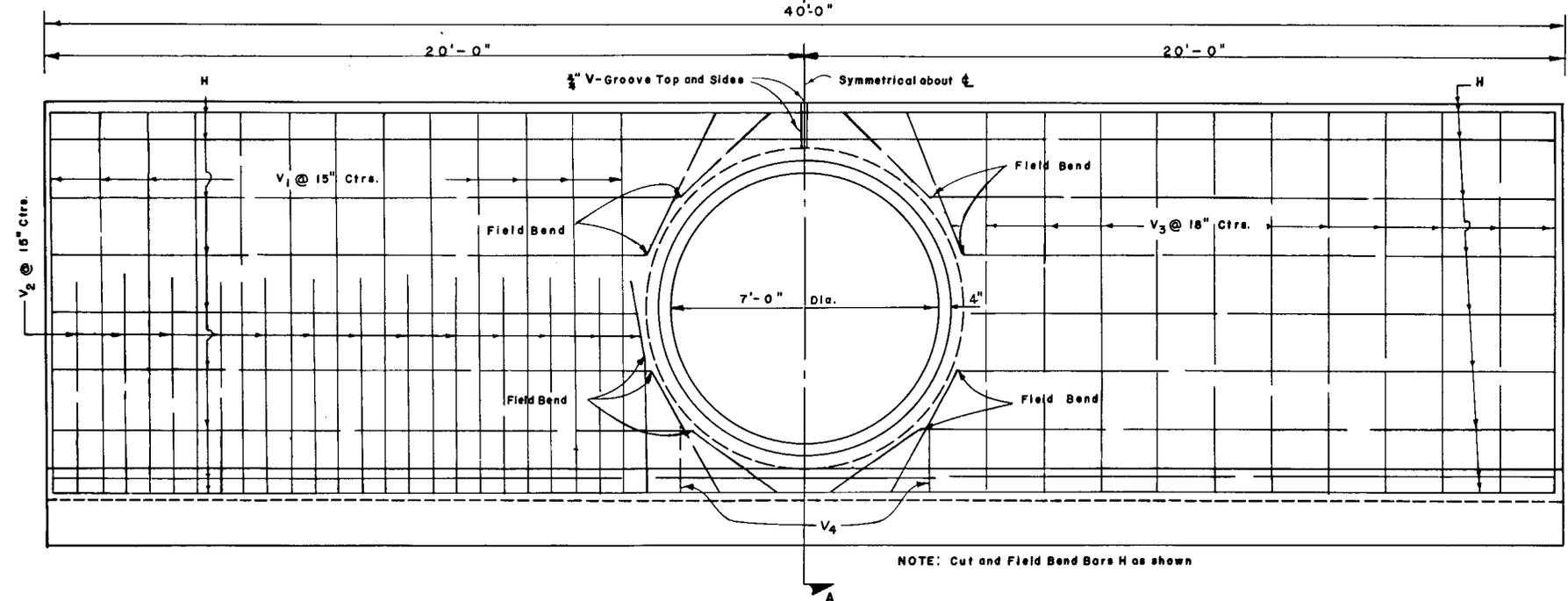


BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D.	LENGTH
E	6	69	6'-0"
H	4	20	39'-8"
V ₁	6	26	12'-2"
V ₂	6	26	7'-10"
V ₃	4	22	10'-0"
V ₄	4	4	2'-0"



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

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



NOTE: Cut and Field Bend Bars H as shown

GENERAL NOTES
DESIGN SPECIFICATIONS: A. A. S. H. O. 1973
CHAMFER: All exposed edges and corners to be chamfered 3/8" unless otherwise noted.
REINF. STEEL; Grade 40 to 60.

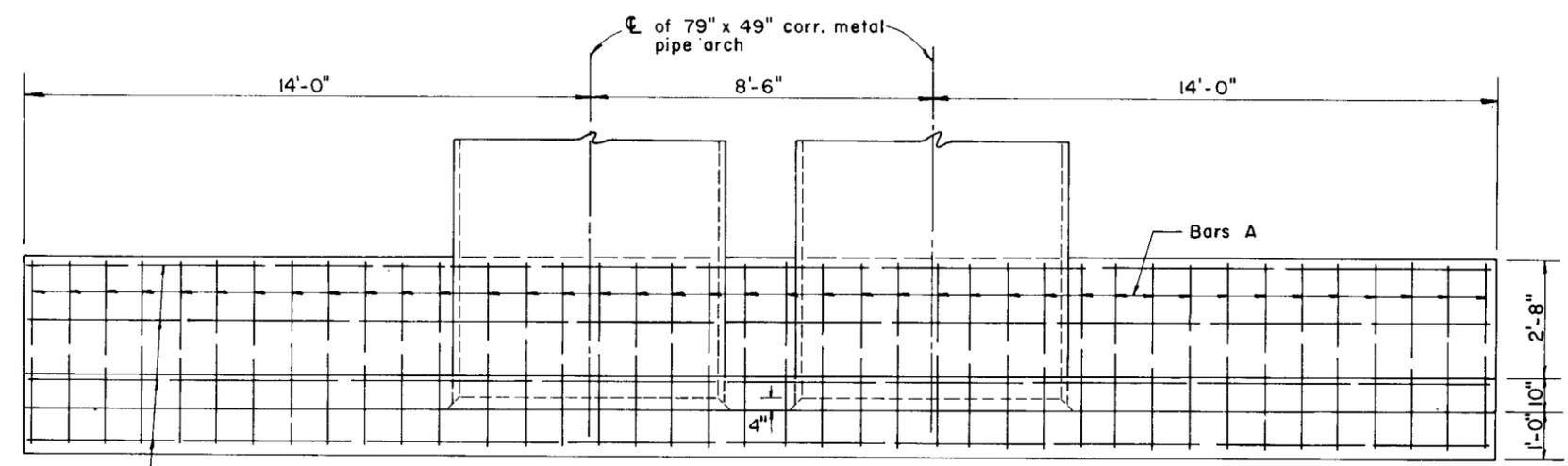
F.H.W.A. APPROVED: 3-20-75

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

REVISIONS		ROAD No.	COUNTY	PROJECT No.
Date	Descriptions			
3-73	Traced from			
V.A.C.	Sepia			
10-74	Changed Index No.			

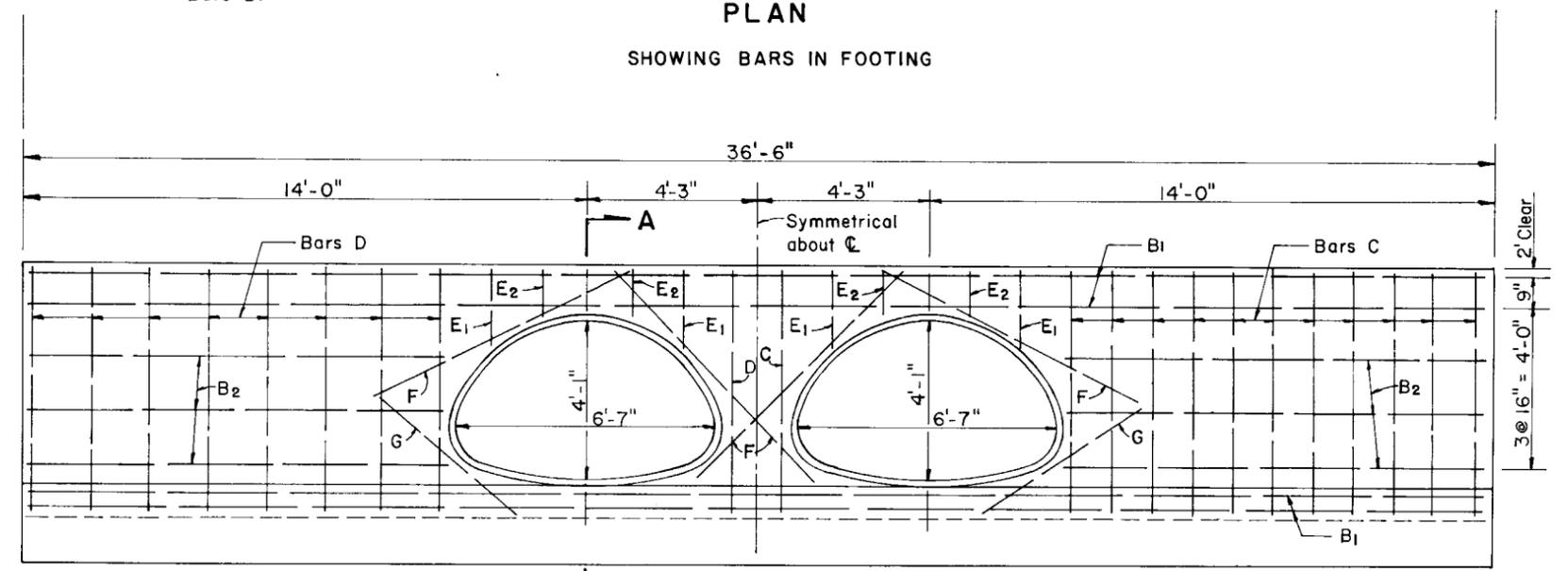
Names	Dates	APPROVED BY
W.H.W.	7-58	 Deputy Design Engineer - Roadways
H.G.G.	7-58	
W.H.W.	7-58	
H.G.G.	7-58	

Drawing No. 1 of 1
Index No. DCE-11



PLAN

SHOWING BARS IN FOOTING



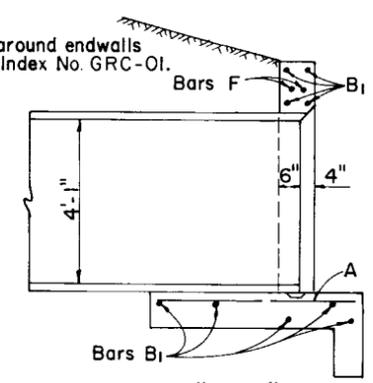
HALF ELEVATION

SHOWING BARS IN FRONT FACE OF WALL

HALF ELEVATION

SHOWING BARS IN BACK FACE OF WALL

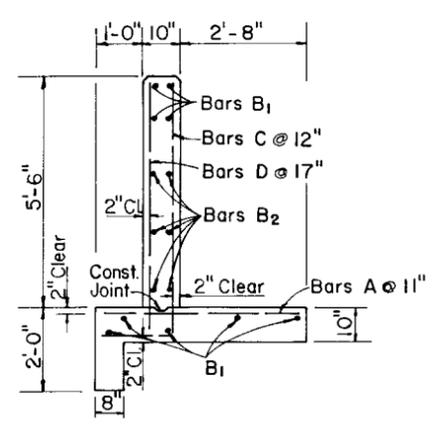
NOTE:
For sodding around endwalls see detail on Index No. GRC-01.



SECTION "A-A"

GENERAL NOTES

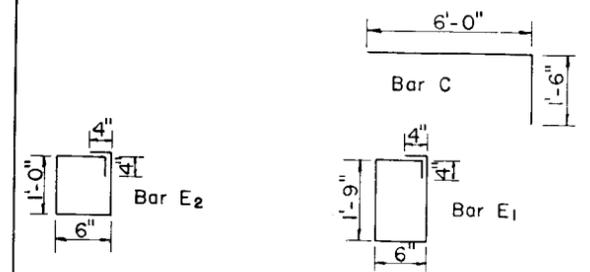
DESIGN SPECIFICATIONS: A. A. S. H. O. 1973.
CHAMFER: All exposed edges and corners to be chamfered 3/4" unless otherwise shown.
REINFORCING STEEL: Grade 40 or 60.



TYPICAL SECTION THRU ENDWALL

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

BENDING DIAGRAMS



NOTE: All bar dimensions are out to out.

ESTIMATED QUANTITIES

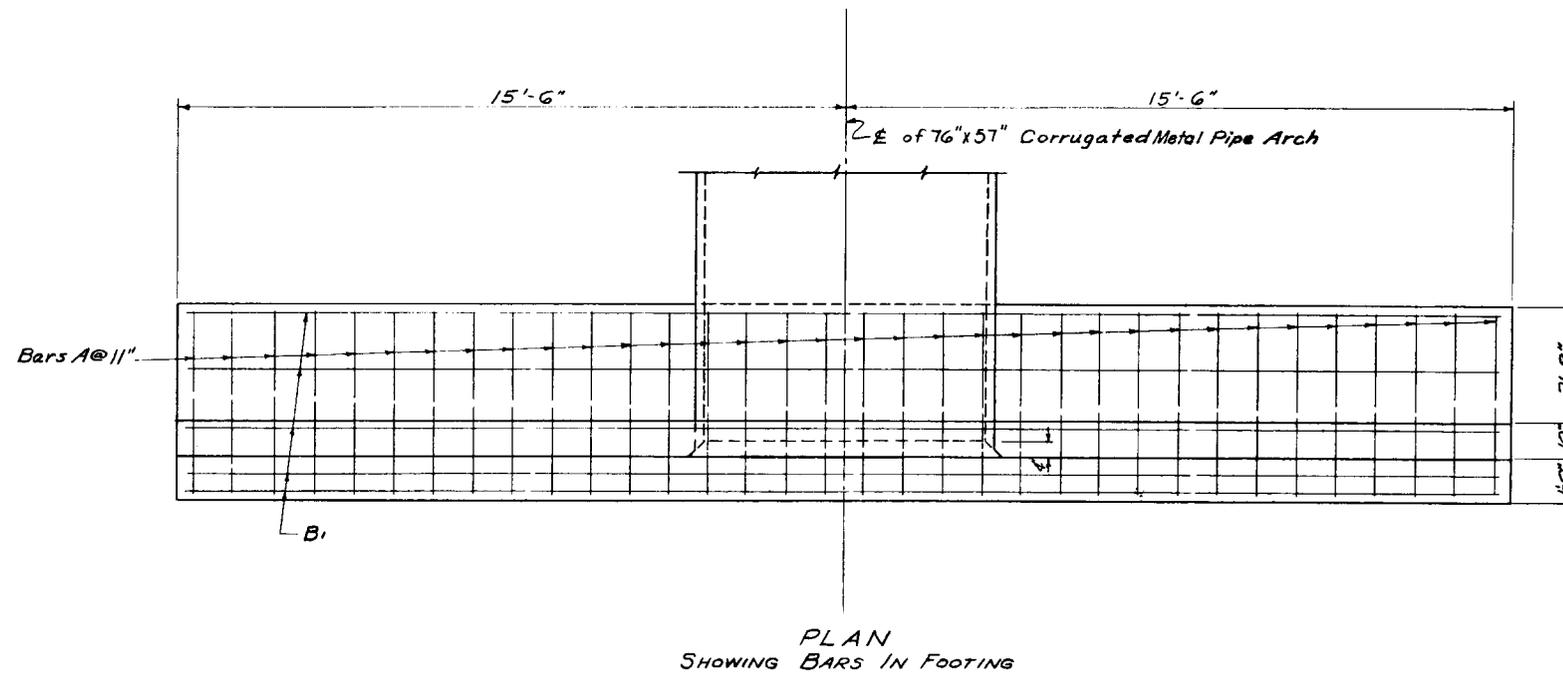
ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	11.19
Reinforcing Steel	Lb.	674

FHWA APPROVED: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION
STANDARD ENDWALL FOR 79" x 49" CMP ARCH

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions			
8-70	Raised side slope to LMF top of endwall			
3-73	Added Class II Conc.			
10-74	Changed Index No.			

Designed by	J. J. B.	Date	5-52	APPROVED BY <i>E. H. Hart</i> Deputy Design Engineer - Roadways
Checked by	J. L. W.	Date	5-52	
Checked by	J. J. B.	Date	5-52	
Checked by	J. L. W.	Date	5-52	
Supervised by				Drawing No. 1 OF 1
				Index No. DCE-12

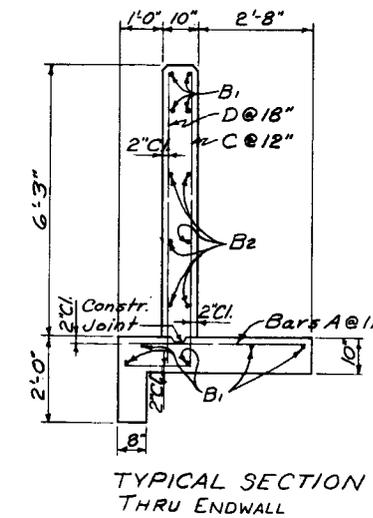
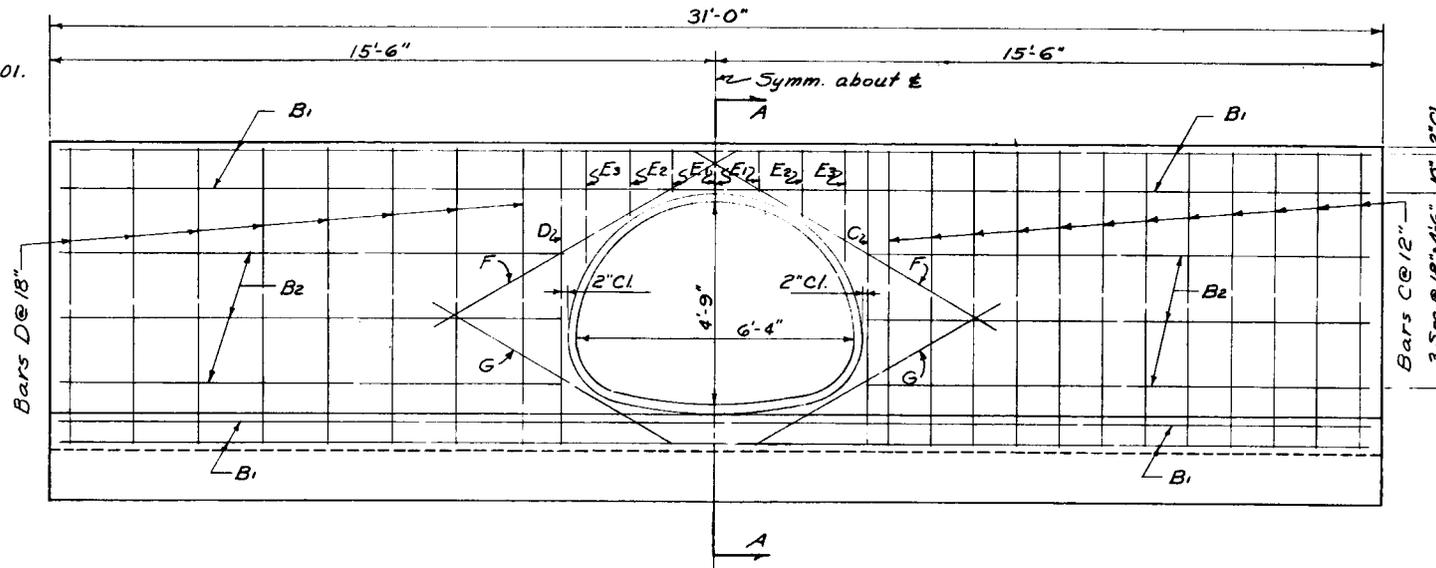
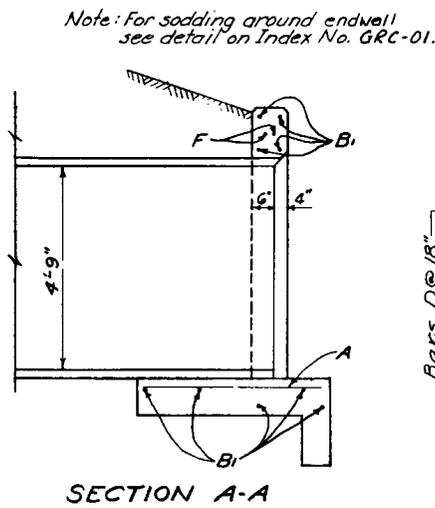


MARK	SIZE	№ REQ.	LENGTH	BENDING
A	4	34	4'-2"	Straight
B1	"	9	30'-6"	"
B2	"	12	11'-8"	"
C	"	26	8'-2"	See Diagram
D	"	18	6'-9"	Straight
E1	"	3	3'-1"	See Diagram
E2	"	2	4'-3"	"
E3	"	2	6'-7"	"
F	"	4	8'-0"	Straight
G	"	4	6'-6"	"

BARS E BAR C

Note: All bar dimensions are out to out.

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



GENERAL NOTES

DESIGN SPECIFICATIONS: AASHO - 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.

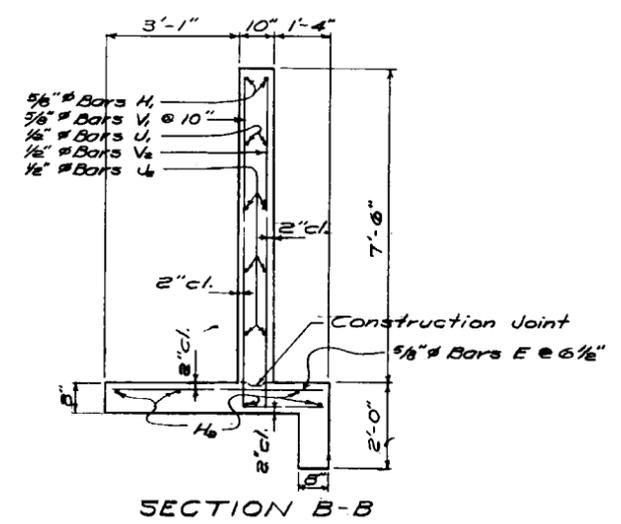
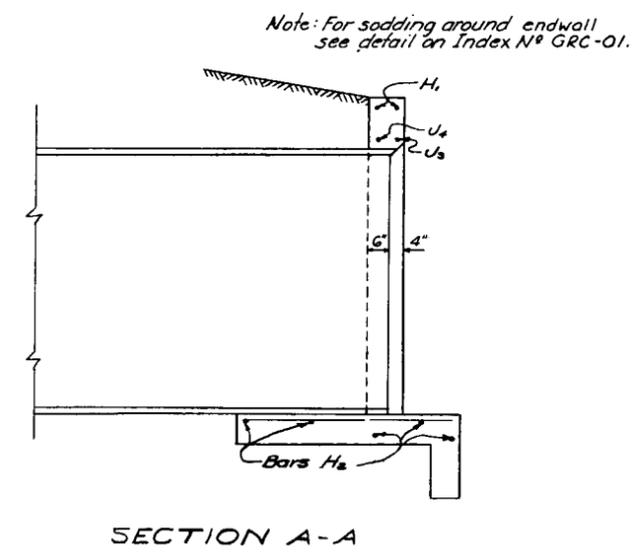
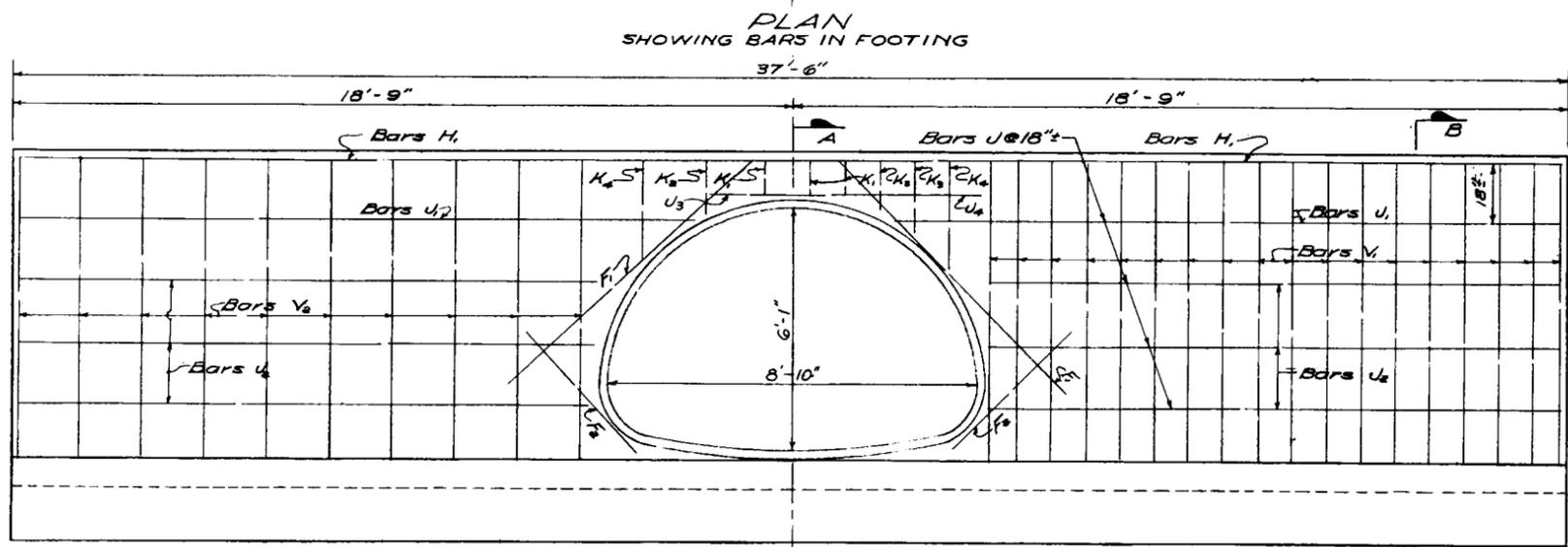
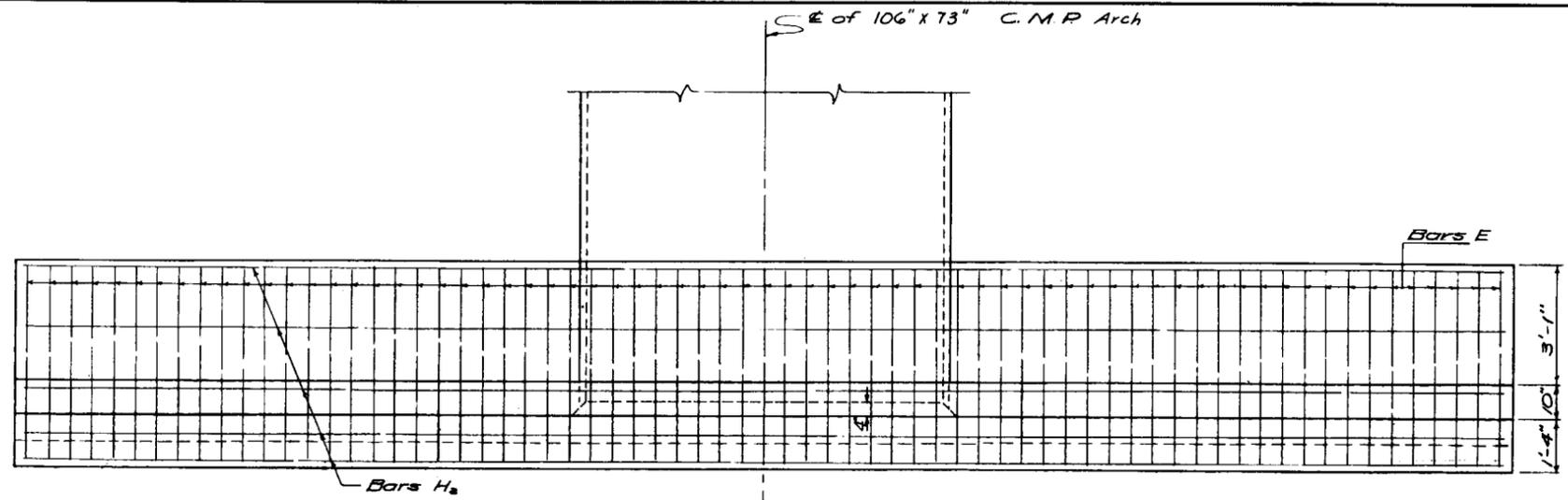
HALF ELEVATION SHOWING BARS IN FRONT FACE OF WALL

HALF ELEVATION SHOWING BARS IN BACK FACE OF WALL

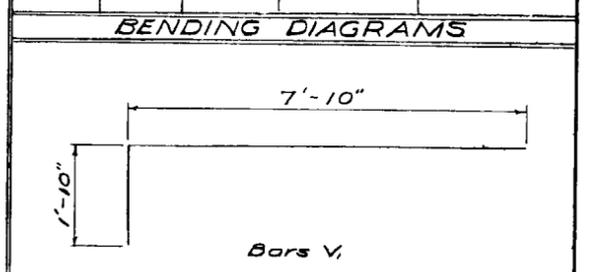
TYPICAL SECTION THRU ENDWALL

FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION				
ROADWAY PLANS SECTION				
STANDARD ENDWALL FOR 76" x 57" CMP ARCH				
REVISONS	ROAD NO.	COUNTY	PROJECT NO.	
8-70 Raised side slope LMF to top of endwall				Names Dates Recommended For Approval by J.L.W. 12-52
3-73 Added Class II Conc.				Checked by H.L.F. 12-52
10-74 Changed Index No.				Checked by J.L.W. 12-52
				Checked by H.L.F. 12-52
				Traced by J.L.W. 12-52
				Approved by J.L.W. 12-52
				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	5	4	8'-0"	"
F2	4	4	4'-0"	"
H1	5	2	37'-2"	"
H2	4	5	37'-2"	"
U1	4	4	16'-4"	"
U2	4	12	13'-10"	"
U3	4	1	4'-0"	"
U4	4	1	9'-0"	"
K1	4	6	0'-10"	"
K2	4	4	1'-4"	"
K3	4	2	1'-10"	"
K4	4	4	2'-8"	"
V1	5	36	9'-7"	See Diagram
V2	4	20	7'-10"	Straight



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

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 3/4" unless otherwise shown.
 REINFORCING STEEL: Grade 40 or 60

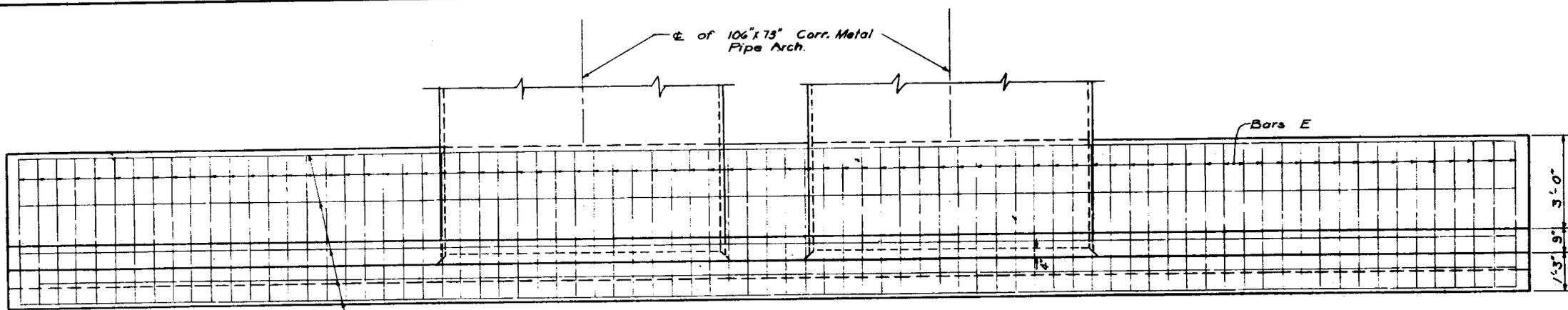
FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
 ENDWALL FOR SINGLE
 106" x 73" CMP ARCH

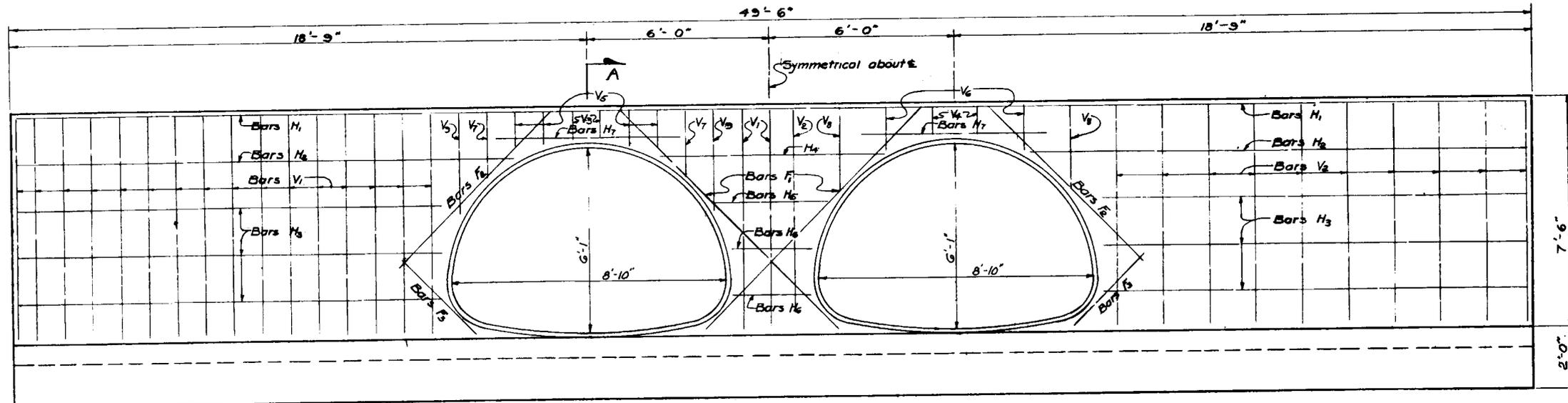
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
8-70 Raised side slope LMF to top of endwall			
3-73 Added Class II Concrete			
10-74 Changed Index N°			

Date	Description	Checked by	Traced by	Names	Date	Recommended For Approval by	Approved by
				E.C.D.	2-53		
				J.L.W.	2-53		
				E.C.D.	2-53		
				J.L.W.	2-53		
				E.C.D.	2-53		

Drawing No. 1 of 1
 Index No. DCE-14

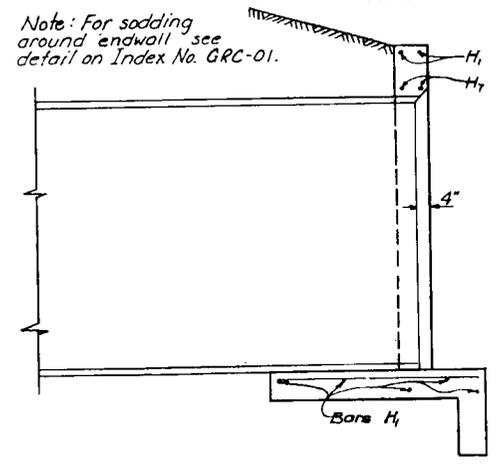


PLAN
SHOWING BARS IN FOOTING

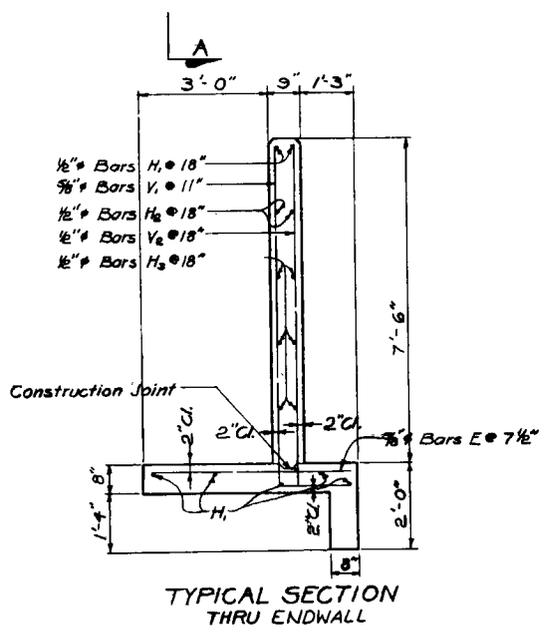


HALF ELEVATION
SHOWING BARS IN FRONT
FACE OF WALL

HALF ELEVATION
SHOWING BARS IN BACK
FACE OF WALL



SECTION A-A



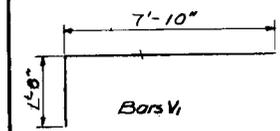
TYPICAL SECTION
THRU ENDWALL

~GENERAL NOTES~

DESIGN SPECIFICATIONS: A.A.S.H.O. 1973
 CHAMFER: All edges and corners to be chamfered 1/4" unless otherwise shown.
 REINFORCING STEEL: Grade 40 or 60

BILL OF REINFORCING STEEL				
MARK	SIZE	NO. REQD	LENGTH	BENDING
E	5	75	4'-8"	Straight
F	4	4	10'-0"	"
G	4	4	7'-0"	"
H	4	4	3'-0"	"
I	4	7	49'-2"	"
J	4	4	16'-2"	"
K	4	12	13'-3"	"
L	4	2	7'-3"	"
M	4	2	3'-3"	"
N	4	4	2'-8"	"
O	4	4	6'-0"	"
P	5	35	9'-5"	See Diagram
Q	4	22	7'-10"	Straight
R	5	4	1'-0"	"
S	4	4	1'-0"	"
T	5	8	1'-1"	"
U	4	4	1'-5"	"
V	5	4	2'-1"	"
W	4	4	2'-8"	"
X	5	4	3'-3"	"

BENDING DIAGRAMS



Note: All bar dimensions are cut-treat.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	15.60
Reinforcing Steel	Lb.	1,372.00

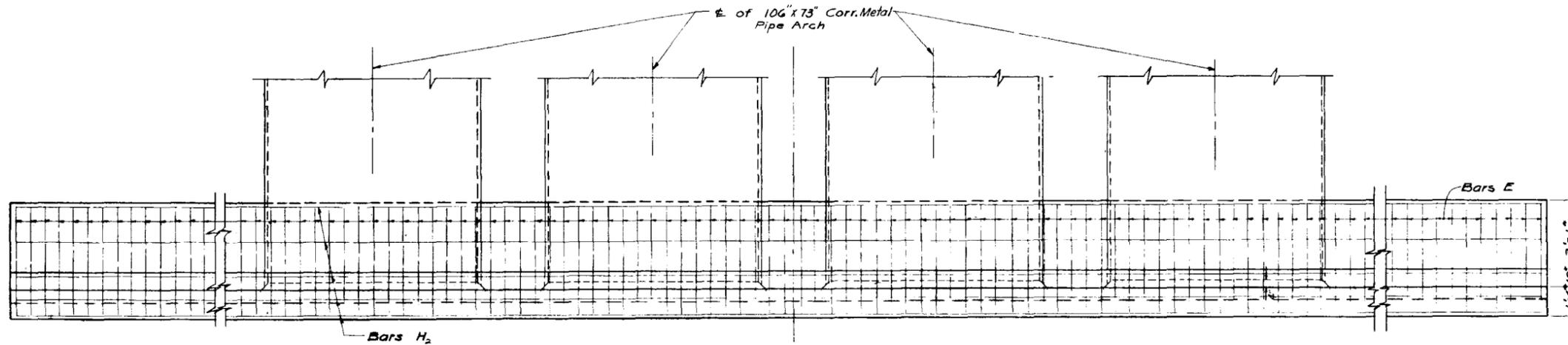
FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
 STANDARD ENDWALL FOR
 DBL 106" x 73" CMP ARCH

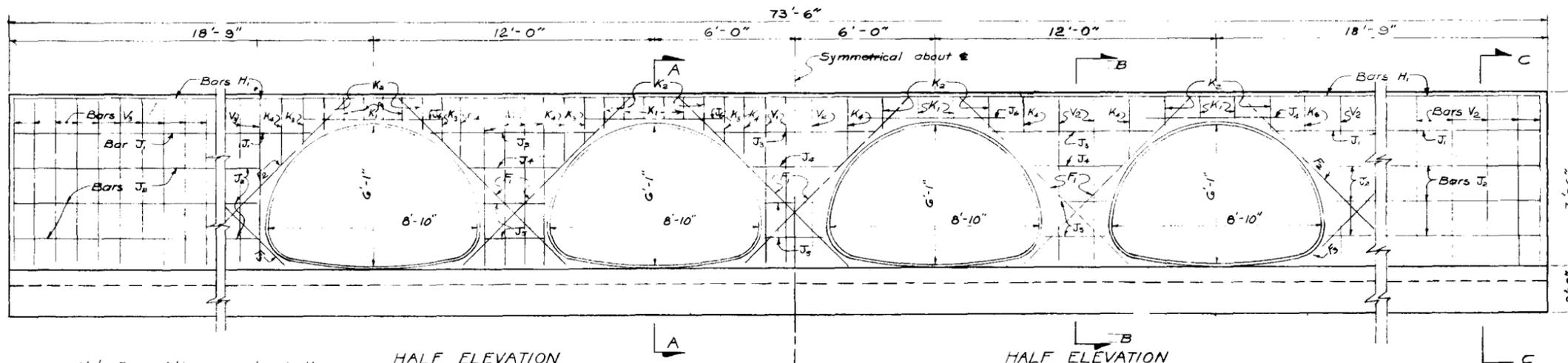
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
8-70	Raised side slope LMF to top of endwall			
3-75	Added Class II Conc.			
10-74	Changed Index No.			

Approved by: *[Signature]*
 Deputy Design Engineer - Roadways

Traced by: R.C.B. 6-58
 1107 DCE-15



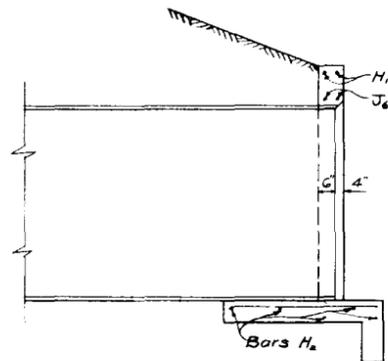
PLAN
SHOWING BARS IN FOOTING



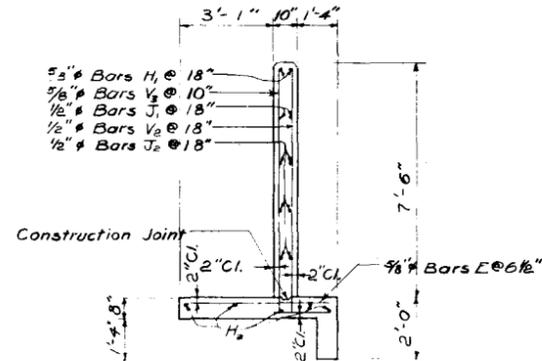
HALF ELEVATION
SHOWING BARS IN BACK FACE OF WALL

HALF ELEVATION
SHOWING BARS IN FRONT FACE OF WALL

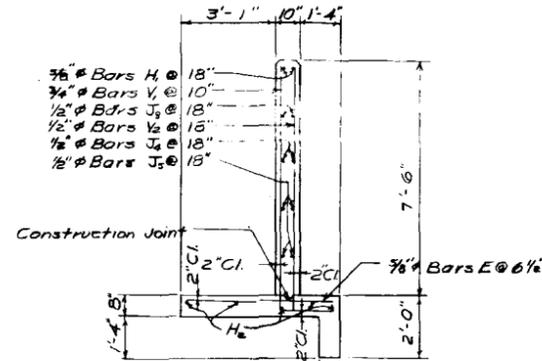
Note: For sodding around endwall see detail on Index No. GRC-01.



SECTION A-A

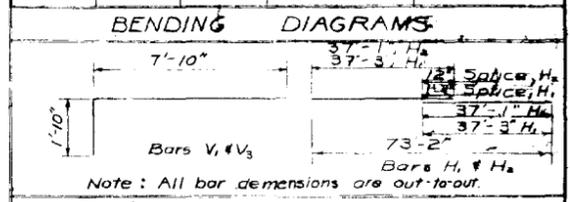


SECTION C-C



SECTION B-B

BILL OF REINFORCING STEEL				
MARK	SIZE	NO. REQD	LENGTH	BENDING
E	5	136	4'-11"	Straight
F	5	12	10'-0"	"
H ₁	5	4	8'-0"	"
H ₂	4	4	4'-0"	"
H ₃	5	2	7'-6"	See Diagram
H ₄	4	5	7'-2"	"
J ₁	4	4	16'-2"	Straight
J ₂	4	12	78'-11"	"
J ₃	4	0	7'-5"	"
J ₄	4	6	4'-0"	"
J ₅	4	12	2'-6"	"
J ₆	4	0	9'-0"	"
K ₁	4	24	1'-0"	"
K ₂	4	16	1'-5"	"
K ₃	4	8	2'-0"	"
K ₄	4	16	2'-9"	"
V ₁	6	12	9'-7"	See Diagram
V ₂	4	26	7'-10"	Straight
V ₃	5	37	9'-7"	See Diagram



ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete Class II	Cu. Yd.	23.69
Reinforcing Steel	Lb.	2278

GENERAL NOTES

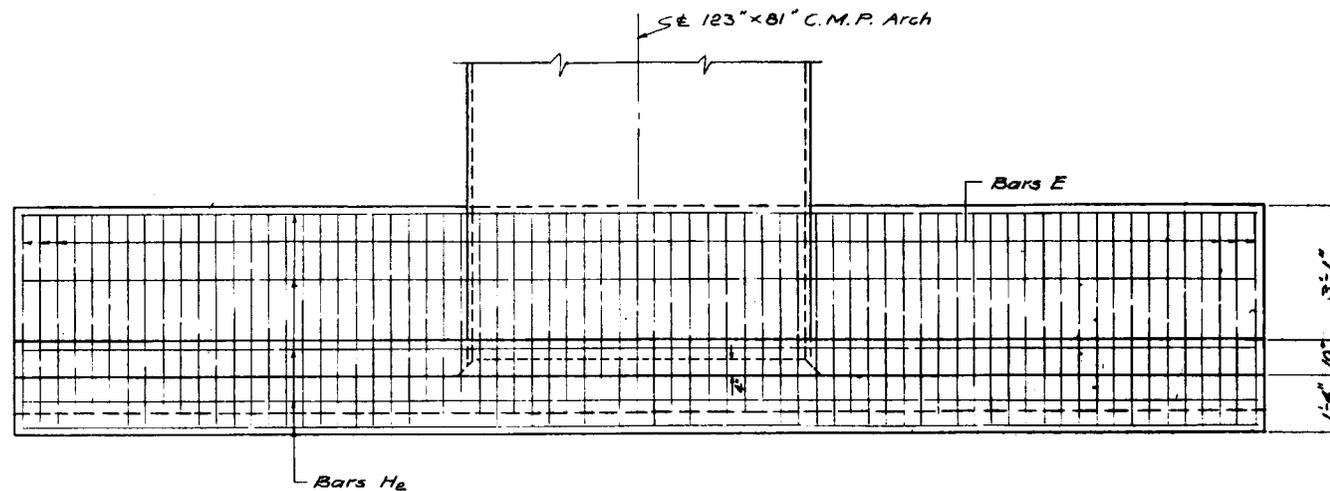
DESIGN SPECIFICATIONS: A.A.S.H.O. 1973.
CHAMFER: All edges and corners to be chamfered 3/4" unless otherwise shown.
REINFORCING STEEL: Grade 40 or 60.

FHWA APPROVED: 3-20-75

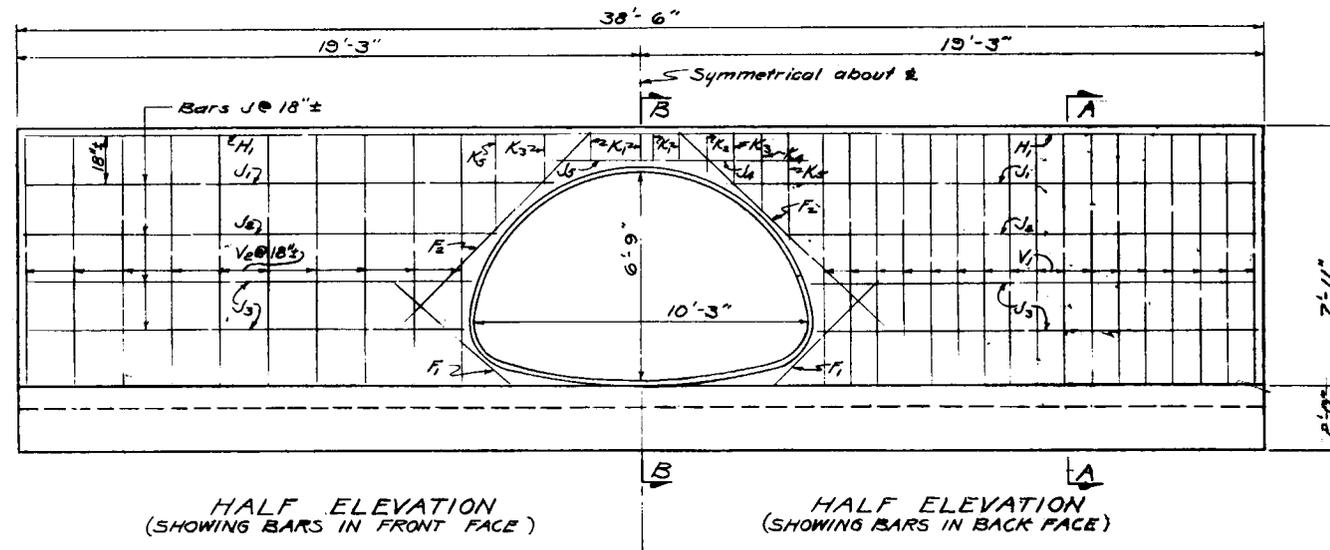
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
ENDWALL FOR QUADRUPLE
106" x 73" CMP ARCH

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
8-70	Raised side slope L.M.F. to top of endwall			
3-73	Added Class II Conc.			
10-74	Changed Index No.			

Checked by	R.C.B.	6-52	APPROVED BY <i>J.E. Dean</i> Engineer of Bridges
Checked by	J.L.W.	7-52	
Checked by	J.L.W.	7-52	
Checked by	E.C.D.	7-52	
Traced by	R.C.B.	6-52	Drawing No. 1 of 1



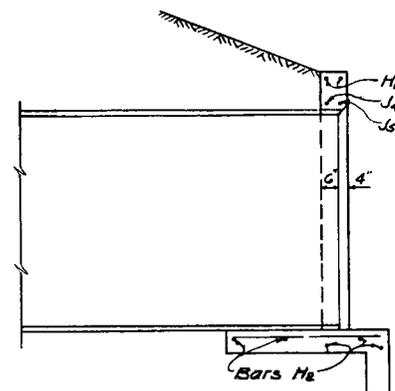
PLAN
SHOWING BARS IN FOOTING



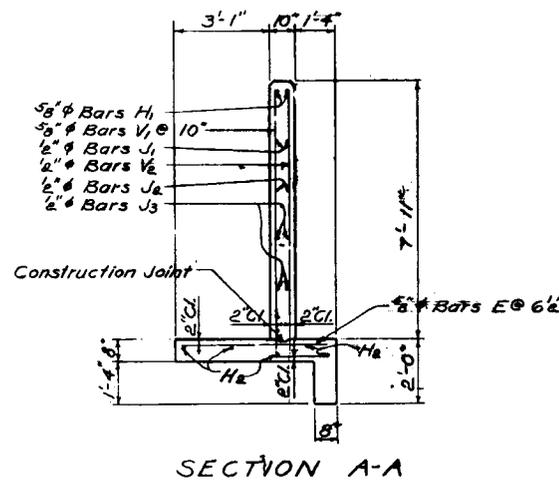
HALF ELEVATION
(SHOWING BARS IN FRONT FACE)

HALF ELEVATION
(SHOWING BARS IN BACK FACE)

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



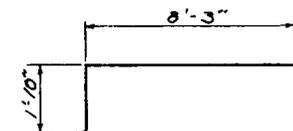
SECTION B-B



SECTION A-A

BILL OF REINFORCING STEEL				
MARK	SIZE	NO. REQD.	LENGTH	BENDING
E	5	71	4'-11"	Straight
F	5	4	4'-9"	"
H	5	4	8'-3"	"
H1	5	2	38'-2"	"
H2	4	5	38'-2"	"
J1	4	4	16'-6"	"
J2	4	4	14'-8"	"
J3	4	8	13'-8"	"
J4	4	1	10'-0"	"
J5	4	1	5'-8"	"
K1	4	7	0'-10"	"
K2	4	2	1'-3"	"
K3	4	4	1'-9"	"
K4	4	2	2'-5"	"
K5	4	4	3'-4"	"
V1	5	34	10'-0"	See Diagram
V2	4	20	8'-3"	Straight

BENDING DIAGRAMS



BAR V1
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.

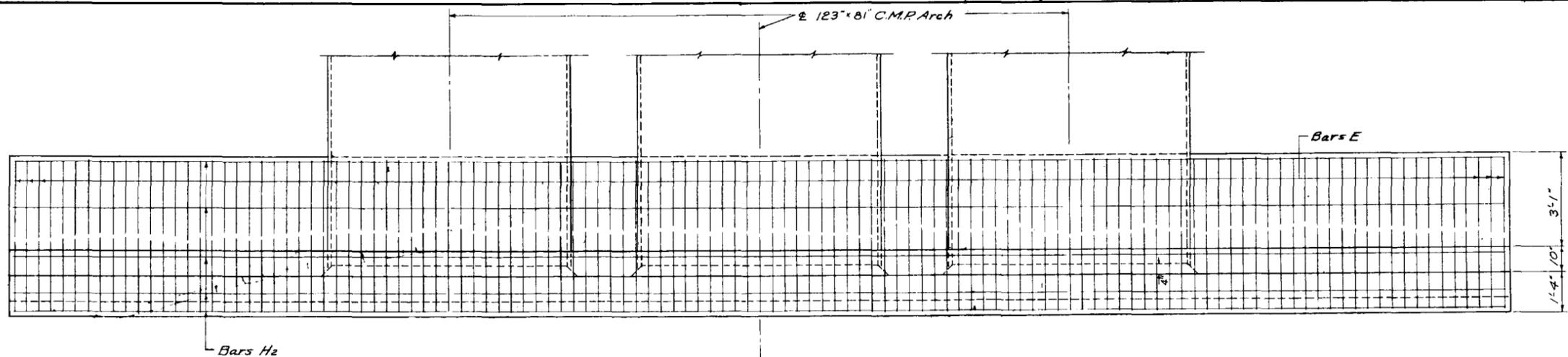
~GENERAL NOTES~
DESIGN SPECIFICATIONS: A.A.S.H.O. 1973
CHAMFER: All edges and corners to be chamfered $\frac{3}{4}$ " unless otherwise shown.
REINFORCING STEEL: Grade 40 or 60.

FHWA APPROVED: 3-20-75

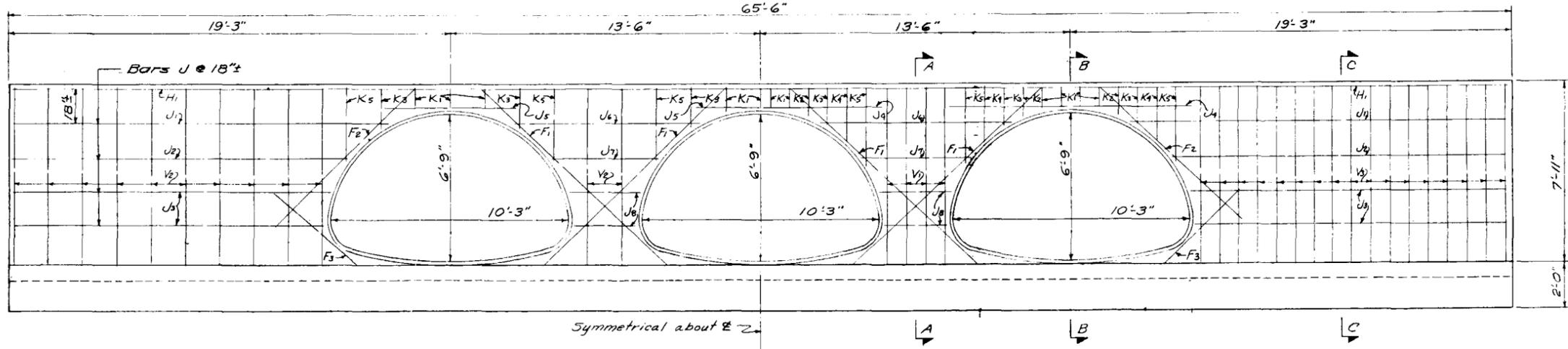
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

ENDWALL FOR SINGLE
123" x 81" CMP ARCH

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Date	Description	Name	Checked by
8-70	Raised side slope LMF to top of endwall		
3-73	Added Class II Conc.		
10-74	Changed Index No.		



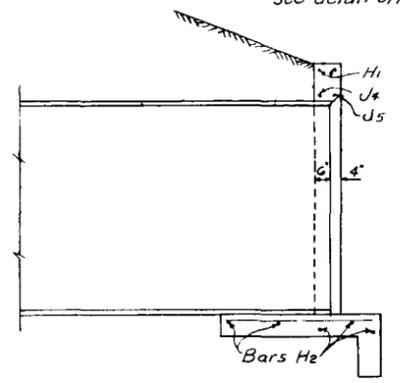
PLAN
SHOWING BARS IN FOOTING



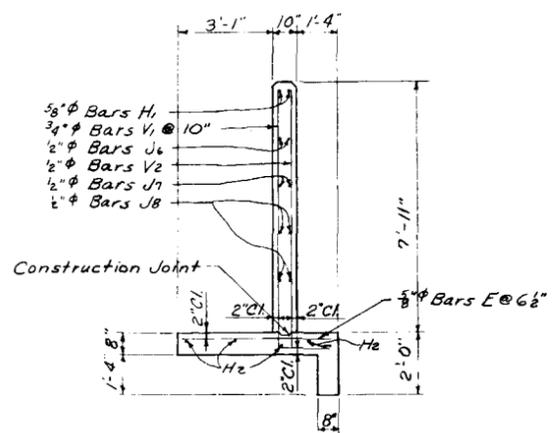
HALF ELEVATION
SHOWING BARS IN FRONT FACE

HALF ELEVATION
SHOWING BARS IN BACK FACE

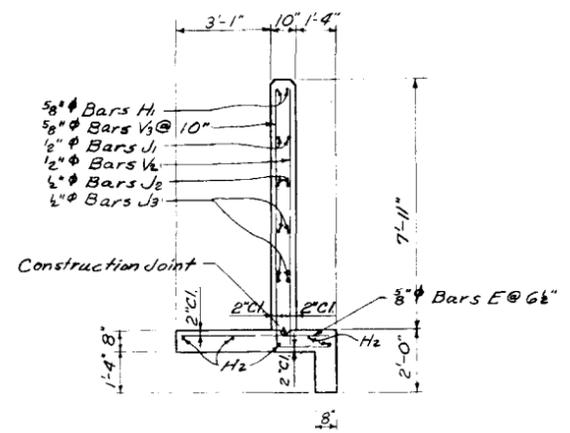
Note: For sodding around endwall see detail on Index No: GRC-01.



SECTION B-B



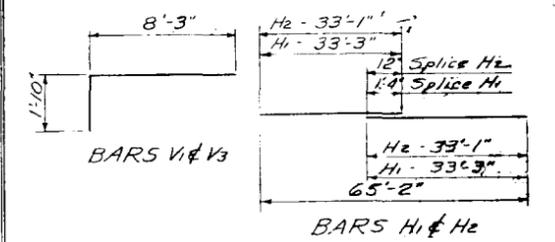
SECTION A-A



SECTION C-C

BILL OF REINFORCING STEEL				
MARK	SIZE	NO. REQ.	LENGTH	BENDING
E	5	121	4'-11"	Straight
F1	5	8	9'-0"	"
F2	5	4	8'-3"	"
F3	4	4	4'-9"	"
H1	5	2	66'-6"	See Diagram
H2	4	5	66'-2"	"
J1	4	4	16'-8"	Straight
J2	4	4	14'-8"	"
J3	4	8	13'-8"	"
J4	4	3	10'-0"	"
J5	4	3	5'-8"	"
J6	4	4	8'-5"	"
J7	4	4	4'-8"	"
J8	4	8	2'-7"	"
K1	4	21	0'-10"	"
K2	4	6	1'-3"	"
K3	4	12	1'-9"	"
K4	4	6	2'-5"	"
K5	4	12	3'-4"	"
V1	6	8	10'-0"	See Diagram
V2	4	24	8'-3"	Straight
V3	5	34	10'-0"	See Diagram

BENDING DIAGRAMS



Note: All bar dimensions are out to out.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	21.61
Reinforcing Steel	Lb.	2013

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 3/8" unless otherwise shown.
 REINFORCING STEEL: Grade 40 or 60

FHWA APPROVED: 3-20-75

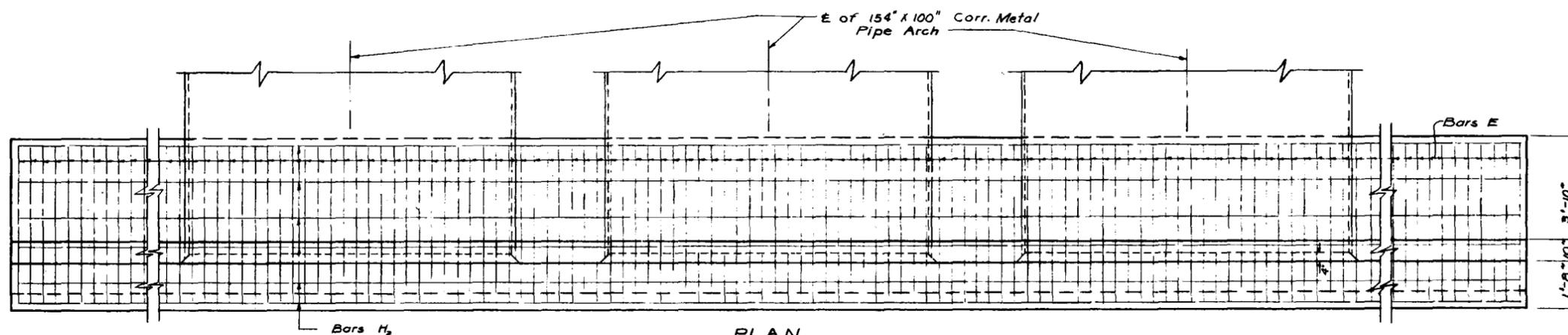
FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION

ENDWALL FOR TRIPLE
 123" x 81" CMP ARCH

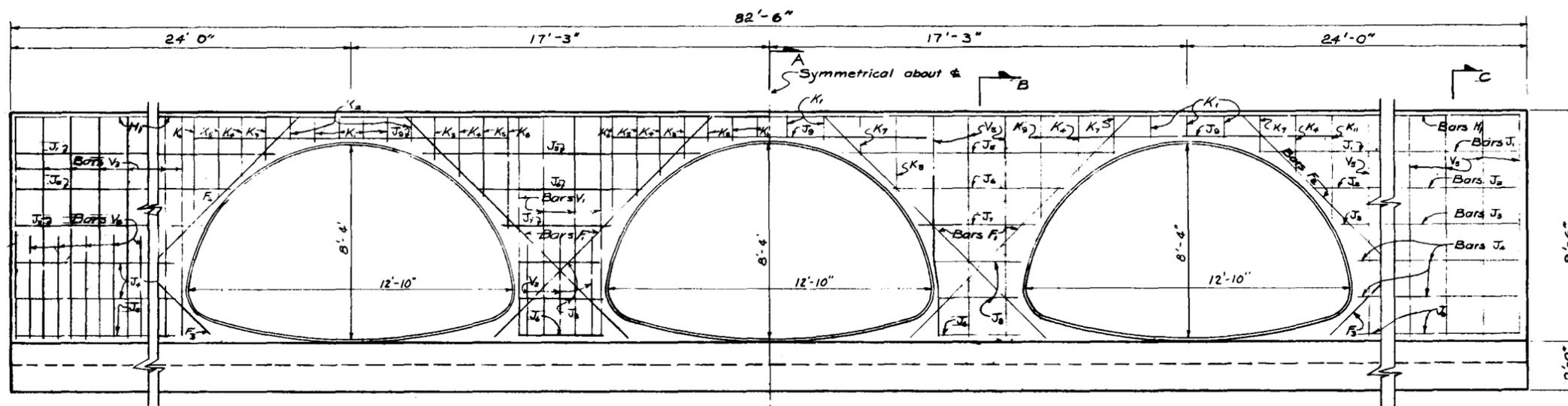
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions			
8-70	Raised side slope LMF to top of endwall			
3-73	Added Class II Conc.			
10-74	Changed Index N/A			

Checked by	J.L.W.	Date	2-53
Checked by	E.C.D.	Date	2-53
Checked by	J.L.W.	Date	2-53
Checked by	E.C.D.	Date	2-53
Traced by	J.L.W.	Date	2-53

Recommended For Approval by	T. W. [Signature]	Office Engineer
Approved by	M. E. [Signature]	Engineer of Bridges
Drawing No.	1 of 1	Index No.
		DCE-18



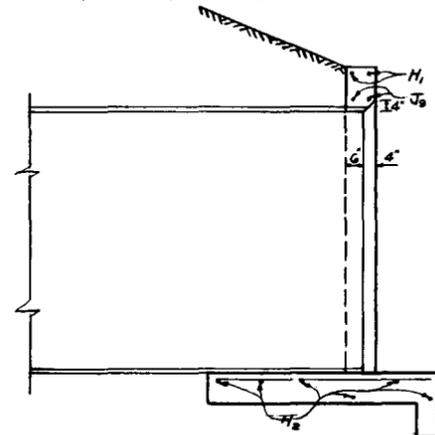
PLAN
SHOWING BARS IN FOOTING



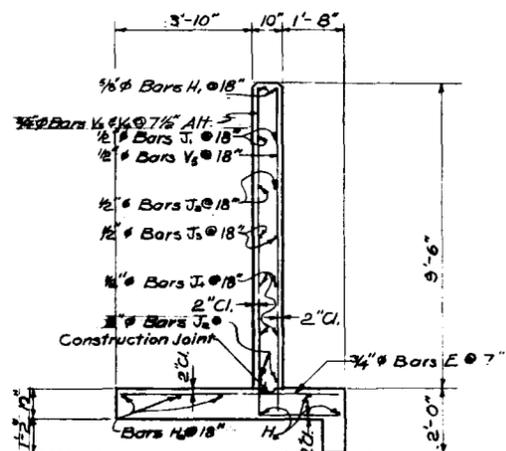
HALF ELEVATION
SHOWING BARS IN BACK FACE OF WALL

HALF ELEVATION
SHOWING BARS IN FRONT FACE OF WALL

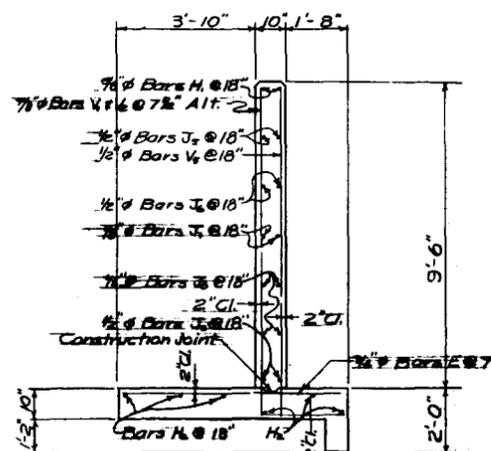
Note: For sodding around endwall
see detail on Index No. GRC-01.



SECTION A-A



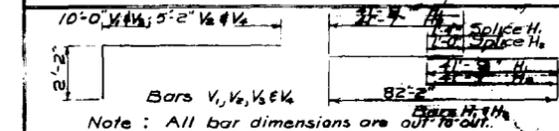
SECTION C-C



SECTION B-B

BILL OF REINFORCING STEEL				
MARK	SIZE	NO. REQD	LENGTH	BENDING
E	6	142	6'-0"	Straight
F	5	8	12'-11"	"
F ₂	5	4	10'-0"	"
F ₃	4	4	5'-0"	"
H	5	2	83'-2"	See Diagram
H ₂	4	6	63'-6"	"
J	4	4	20'-10"	Straight
J ₂	4	8	18'-9"	"
J ₃	4	4	17'-7"	"
J ₄	4	8	16'-10"	"
J ₅	4	4	11'-3"	"
J ₆	4	8	7'-0"	"
J ₇	4	4	4'-10"	"
J ₈	4	8	3'-4"	"
J ₉	4	6	18'-0"	"
K ₁	4	22	1'-0"	"
K ₂	4	6	1'-4"	"
K ₃	4	6	1'-10"	"
K ₄	4	10	2'-7"	"
K ₅	4	6	3'-6"	"
K ₆	4	6	5'-0"	"
K ₇	4	6	1'-6"	"
K ₈	4	2	3'-2"	"
K ₉	4	4	4'-2"	"
V	7	8	12'-1"	See Diagram
V ₂	7	6	7'-3"	"
V ₃	6	30	12'-1"	See Diagram
V ₄	6	28	7'-3"	"
V ₅	4	30	10'-0"	Straight

BENDING DIAGRAMS



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

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Concrete Class II	Cu. Yd.	34.84
Reinforcing Steel	Lb.	3830

GENERAL NOTES

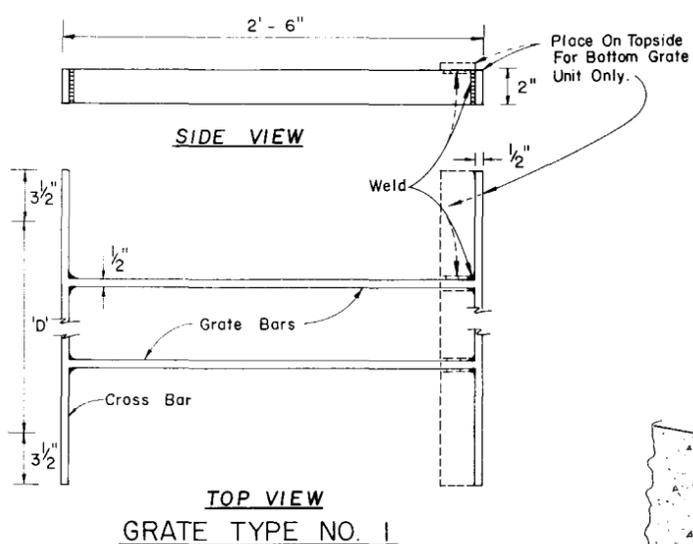
DESIGN SPECIFICATIONS: A. A. S. H. O. 1973
CHAMFER: All edges and corners shall be chamfered 3/4" unless otherwise shown.
REINFORCING STEEL: Grade 40 or 60

FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
ENDWALL FOR TRIPLE
154" x 100" CMP ARCH

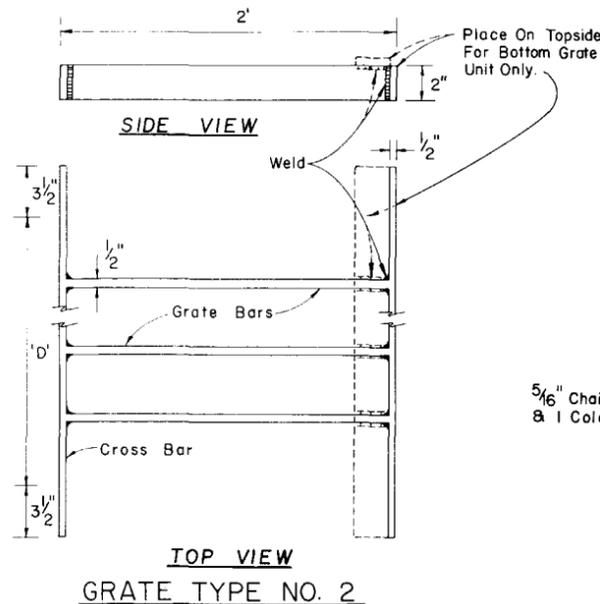
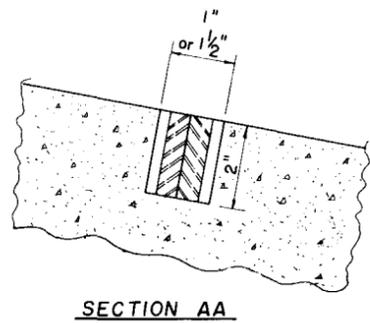
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Date: Description			
8-70 Raised side slope LMF to top of archway			
3-73 Added Class II Conc			
10-74 Changed Index N ^o			

Checked by	REB	6-52	Recommended For Approval by	J.L.V.	7-52
Checked by	J.L.V.	7-52	Checked by	REB	9-63
Checked by	E.C.A.	7-53	Checked by	REB	6-54
Traced by	REB	6-54			



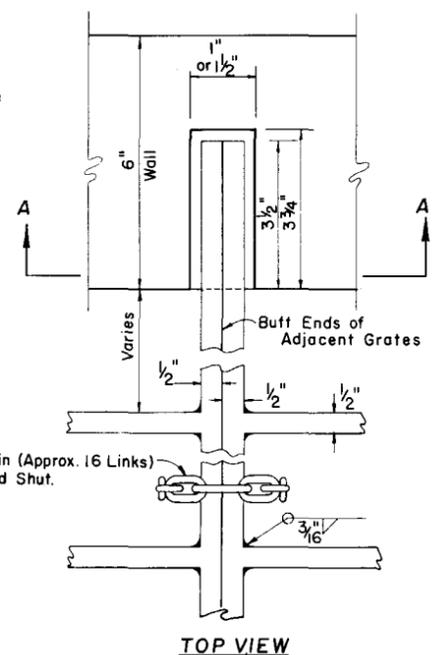
Pipe Size	Grate Bars Req'd.	Grate Wt.
15"	2	28.93

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

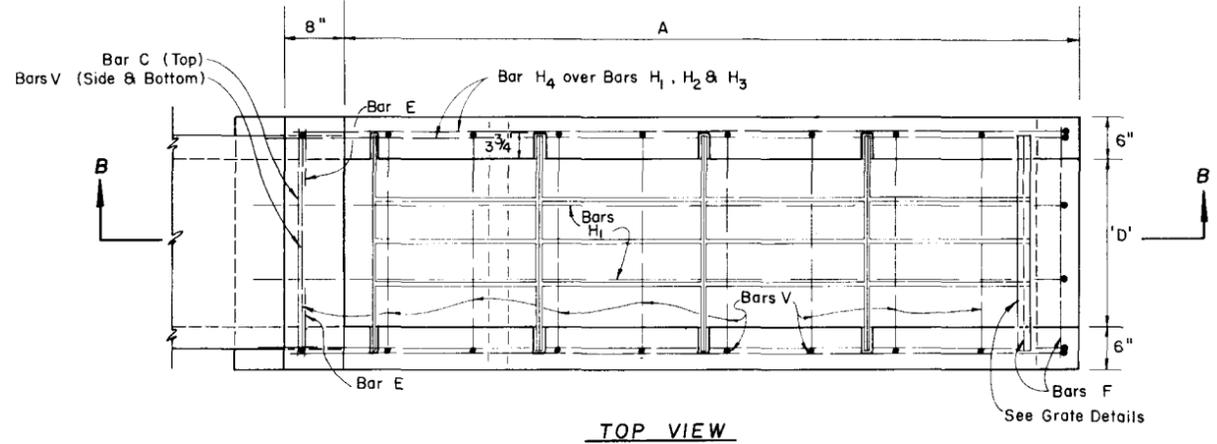
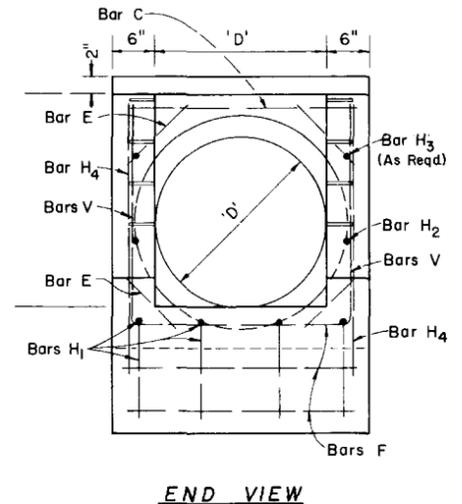
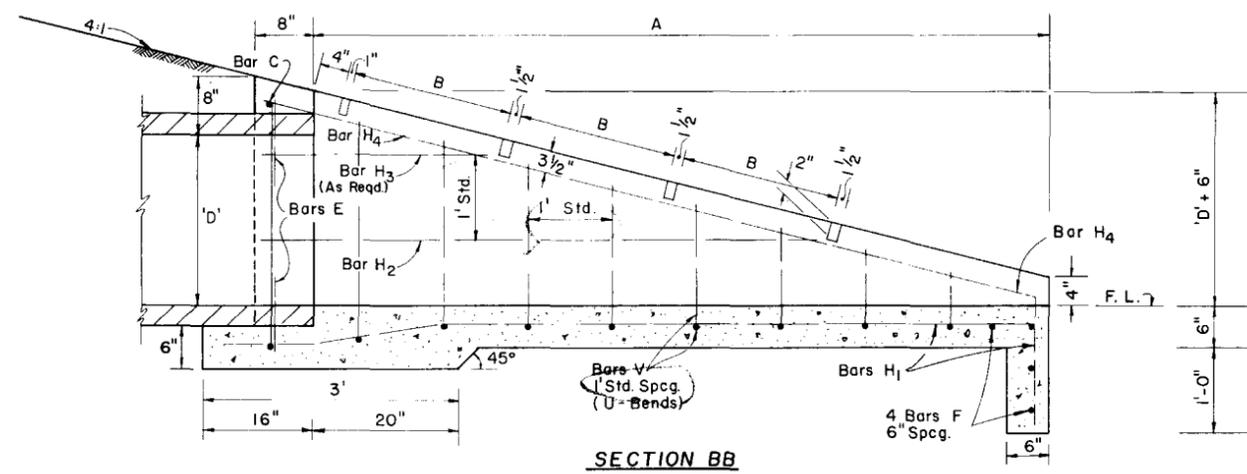


Pipe Size	Grate Bars Req'd.	Grate Wt.
18"	3	33.69
24"	4	43.63
30"	5	53.55

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



GRATE, SEAT, WELD & CHAIN DETAIL



RATE OF SLOPE	PIPE SIZE 'D'	TABLE OF DIMENSIONS AND QUANTITIES		CONC. CLASS I (Cu Yds)	REINF STEEL (lbs.)	NUMBER OF GRATES REQ'D.		TOTAL GRATE WT. (lbs.)	SODDING (Sq. Yds.)
		A	B			GRATE TYPE NO. 1	GRATE TYPE NO. 2		
4:1	15"	5.67'	2.38'	0.85	56	2	0	57.86	14.5
	18"	6.67'	1.875'	1.01	73	0	3	101.08	5.8
	24"	8.67'	1.875'	1.65	97	0	4	174.52	18.4
	30"	10.67'	1.875'	2.33	129	0	5	267.75	21.0

GENERAL NOTES

- 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.
- Reinforcing Steel: All bars are size #4. Spacings shown are center to center. Laps to be 12" minimum. Clearance is 2" except as noted.
Square welded wire fabric (two cages max.) having an equivalent cross sectional area (0.20 sq. in.) may be substituted for bar reinforcement.
- Grates to be ASTM A 588 weathering steel. If exposed to salt water, (Specific locations will be designated in plans.) grate to be fabricated from ASTM A 572, Grade 50, then galvanized.
- 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.
- Sod slopes 5' each side and above endwall. Sodding to be paid for under contract unit price for Sodding.
- Precasting of this endwall will be permitted. Precast units shall conform to the dimensions shown or in accordance with approved shop drawings. Request for shop drawing approval shall be directed to the D.O.T. Engineer of Drainage.
- Concrete meeting the requirements of A.S.T.M. C 478 (4,000 PSI.) may be used in lieu of Class I concrete for precast units.

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

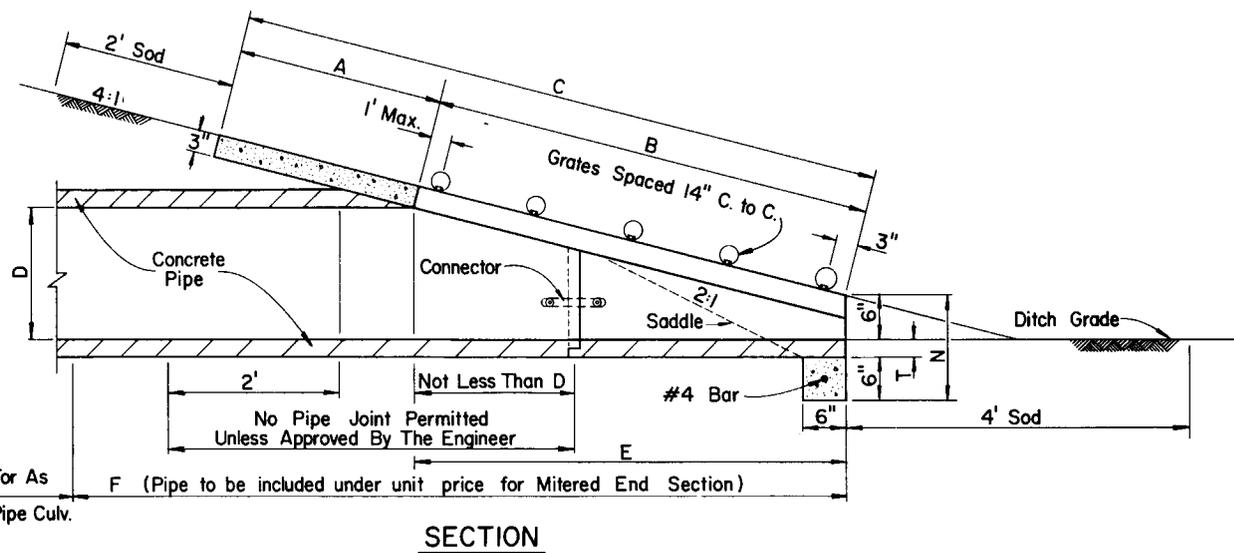
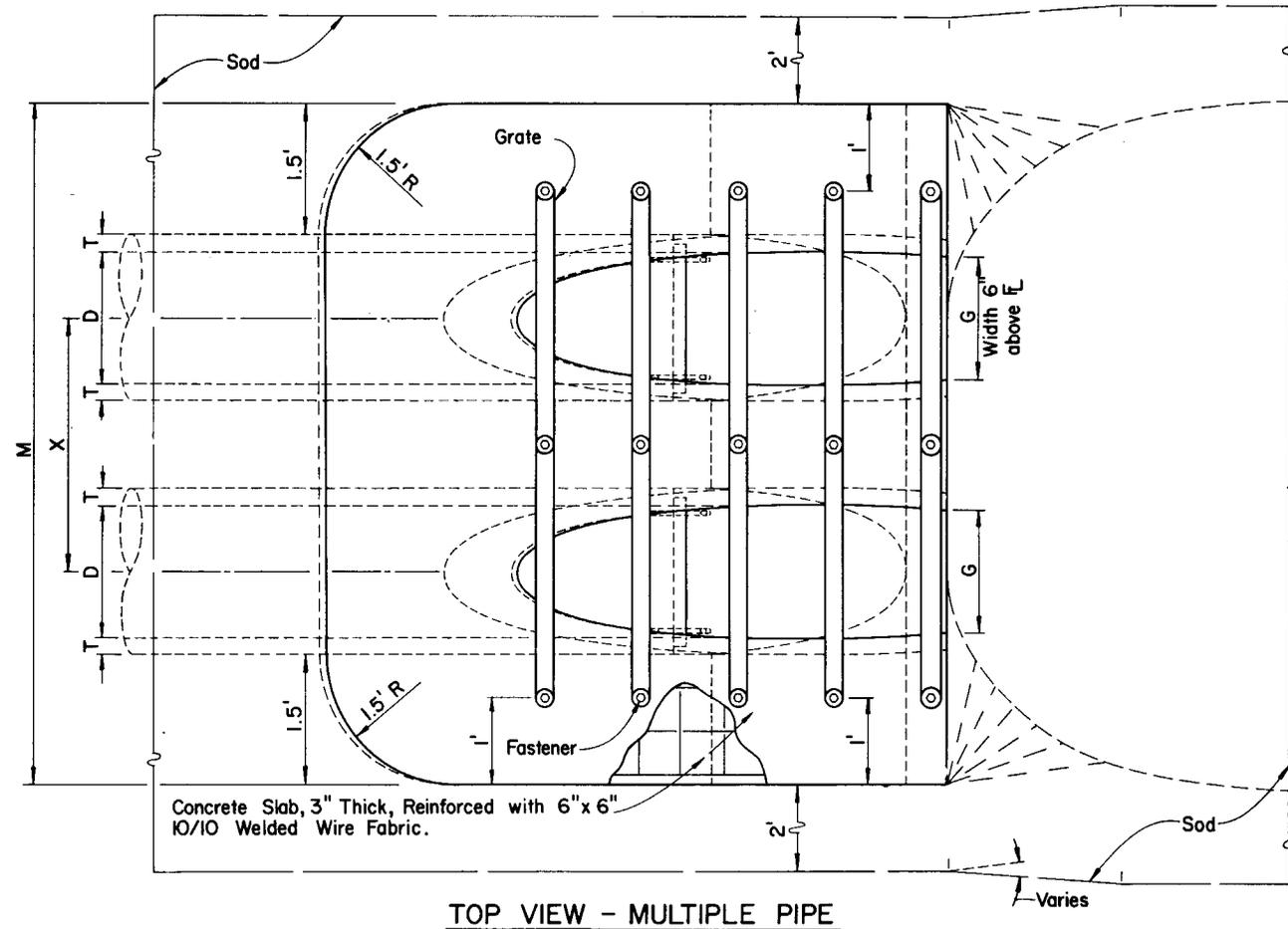
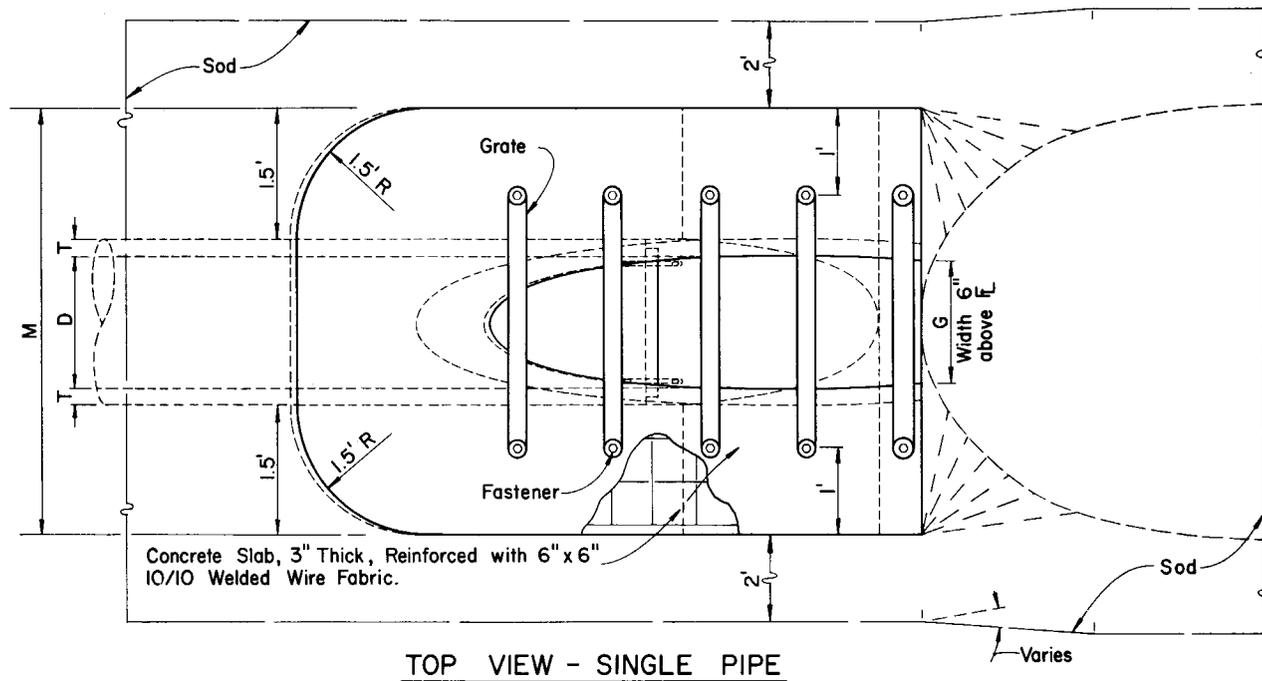
U- ENDWALL FOR PIPE CULVERTS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			

Designed by	Names	Dates	APPROVED BY	
Checked by	J. V. G.	6-77	E. H. Hart	
Quantity by	A. F.	6-77		
Checked by	J. V. G.	6-77		
Supervised by	E. G. R.		Drawing No.	Index No.
			10F1	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.

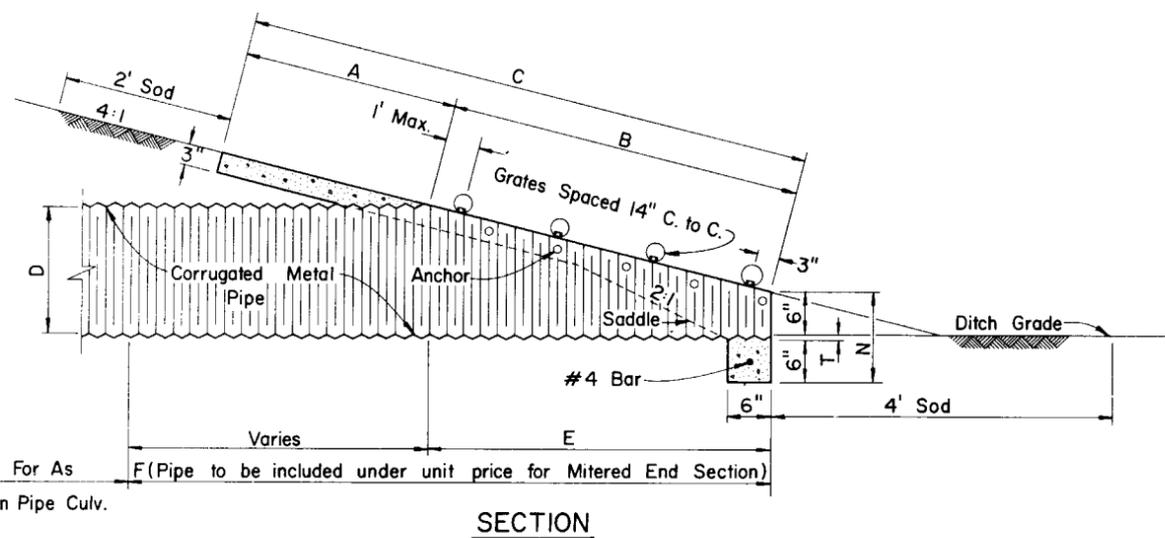
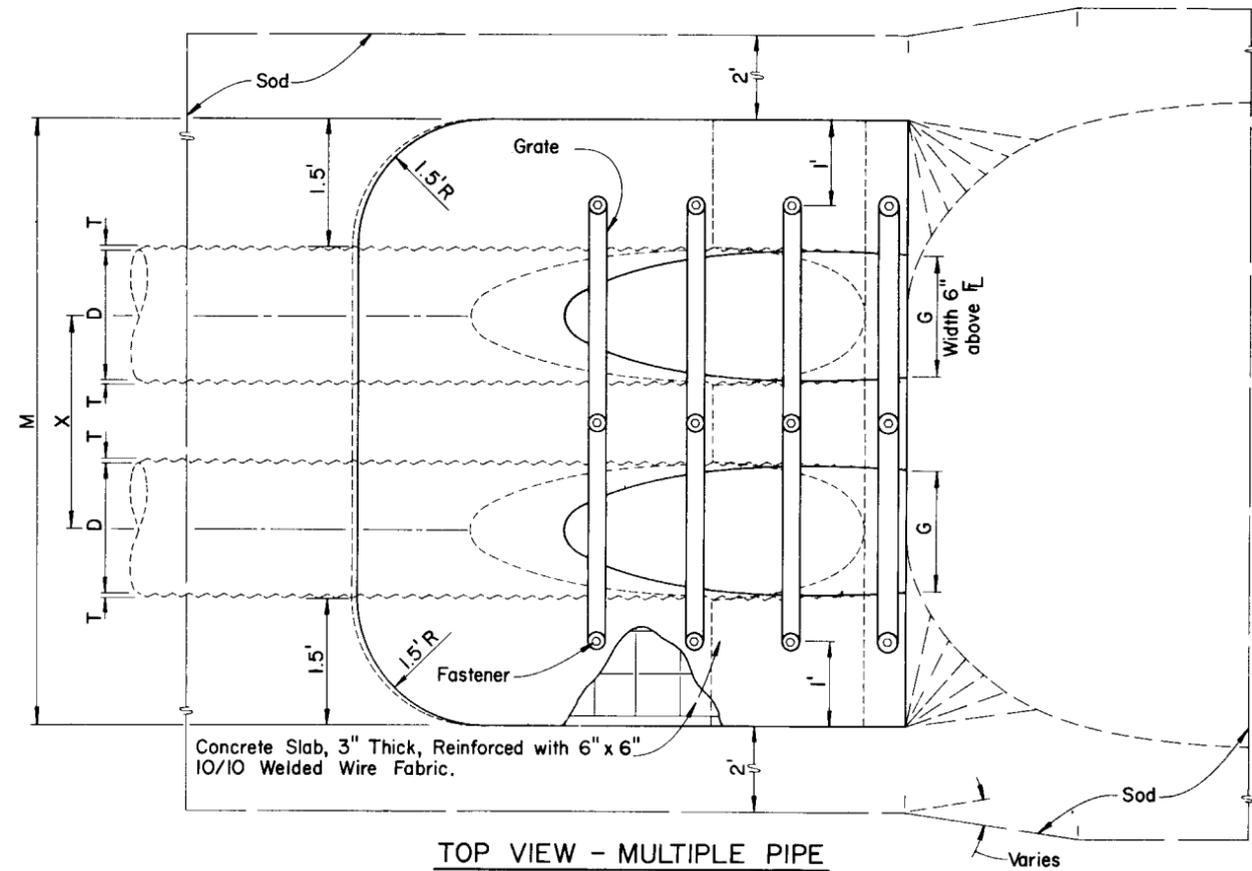
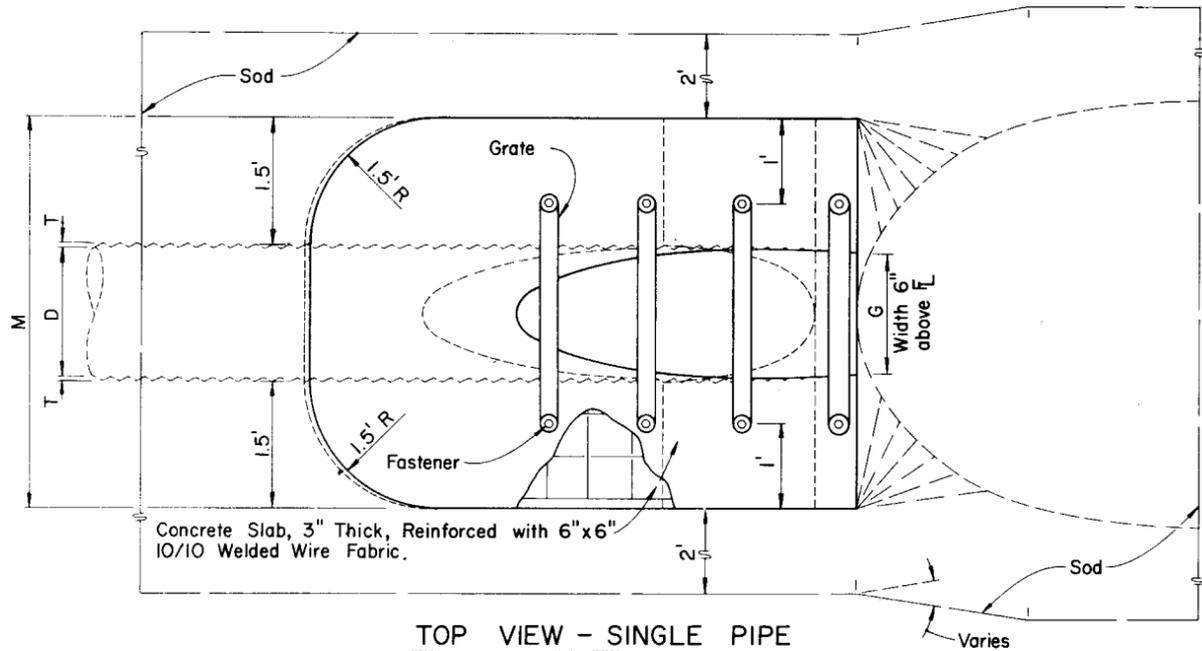
F.H.W.A. APPROVED: 10-21-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			
SIDE DRAIN MITERED END SECTION SINGLE AND MULTIPLE ROUND CONCRETE PIPE			
ROAD NO.	COUNTY	PROJECT NO.	
DESIGNED BY		APPROVED BY	
Checked by	J. V. G.	8-77	<i>E. H. Hart</i> Deputy Design Engineer, Roadways
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



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.

REVISIONS	ROD NO.	APPROVED BY
Dates	Descriptions	Names

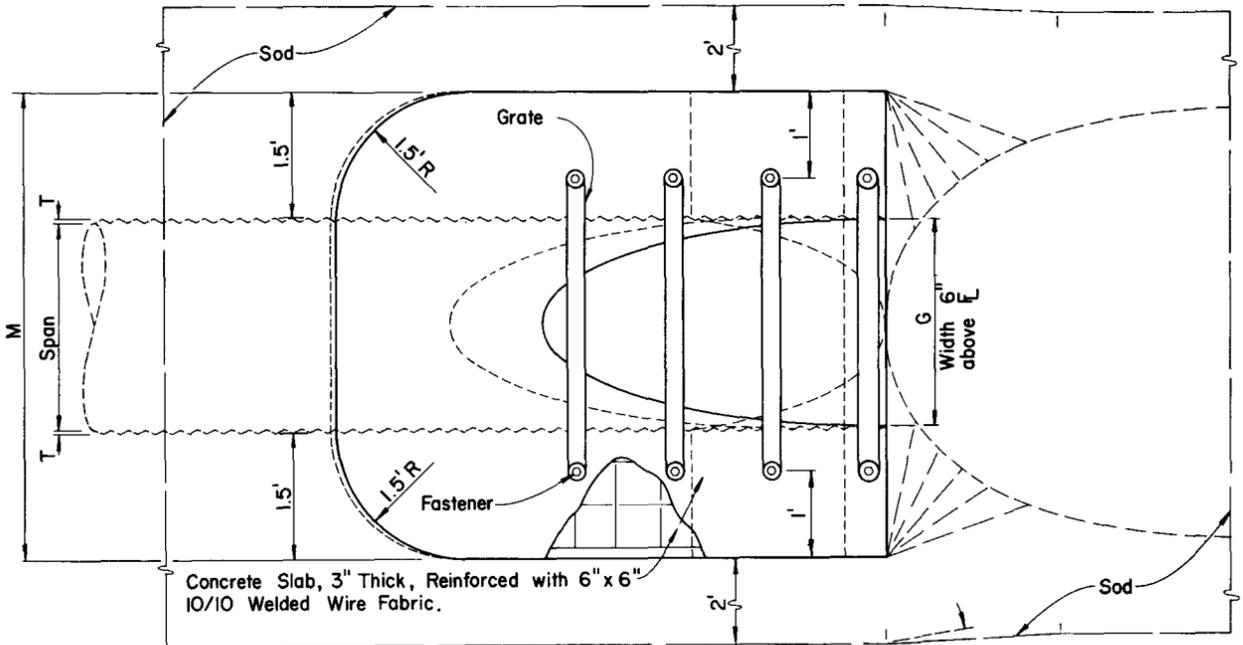
Designed by: J.V.G. 8-77
Checked by: A.F. 8-77
Quantities by: J.V.G. 8-77
Checked by: J.V.G. 8-77
Supervised by: D.C.B.

APPROVED BY: *E.H. Hart*
Deputy Design Engineer, Roadways

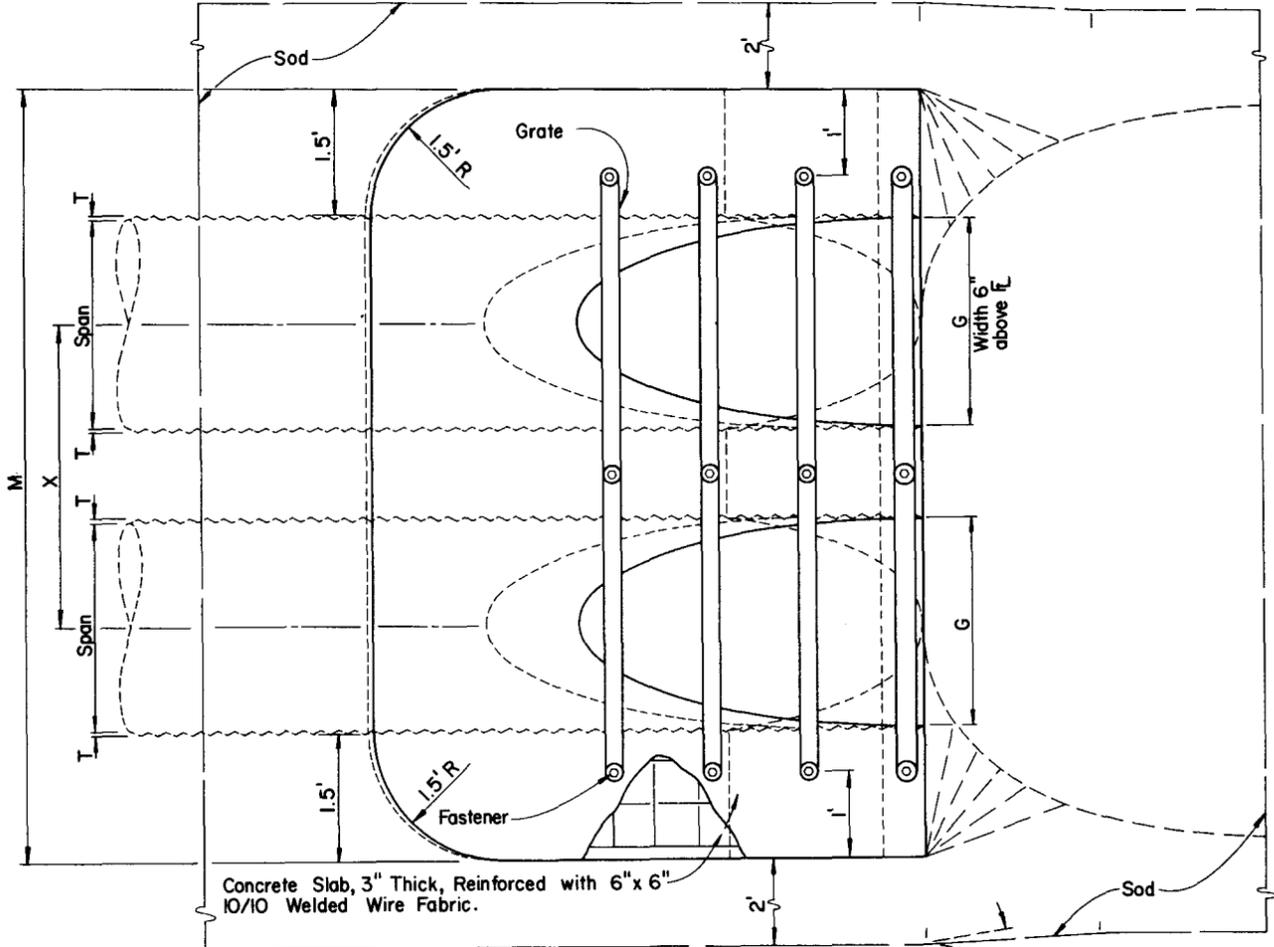
Drawing No. 2 of 5 Index No. DME-01-1

DIMENSIONS & QUANTITIES

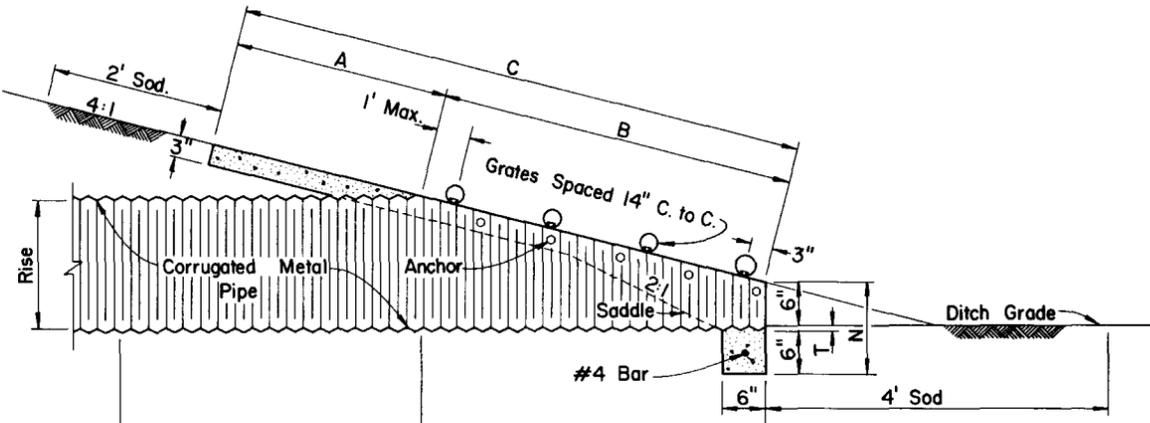
1974 AASHTO		M				N		GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)								
Span	Rise	X	A	B	C	E	F	G	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
17"	13"	2'-6"	2.5'	2.41'	4.91'	2.33'	7'	1.39'	4.50'	7.00'	9.50'	12.00'			.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'			.32	.49	.66	.78	8.48	10.37	12.26	14.15
26"	20"	3'-5"	2.5'	4.81'	7.31'	4.67'	9'	2.22'	5.42'	8.83'	12.25'	15.67'			.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'	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'	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'	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'	20.50'	26.83'	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'	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'	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.

Paid For As
Side Drain Pipe Culv. F (Pipe to be included under unit price for Mitered End Section)

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

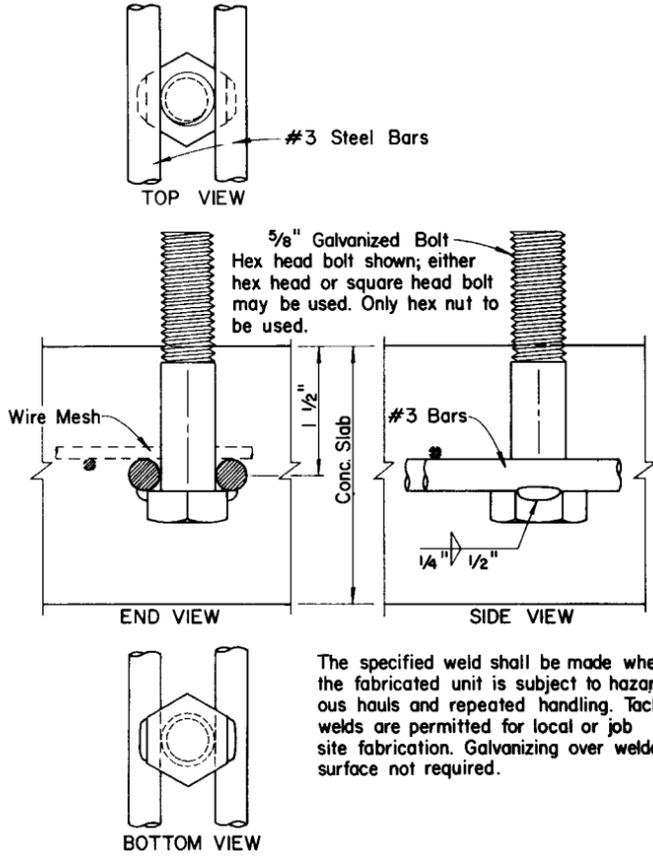
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

SIDE DRAIN MITERED END SECTION

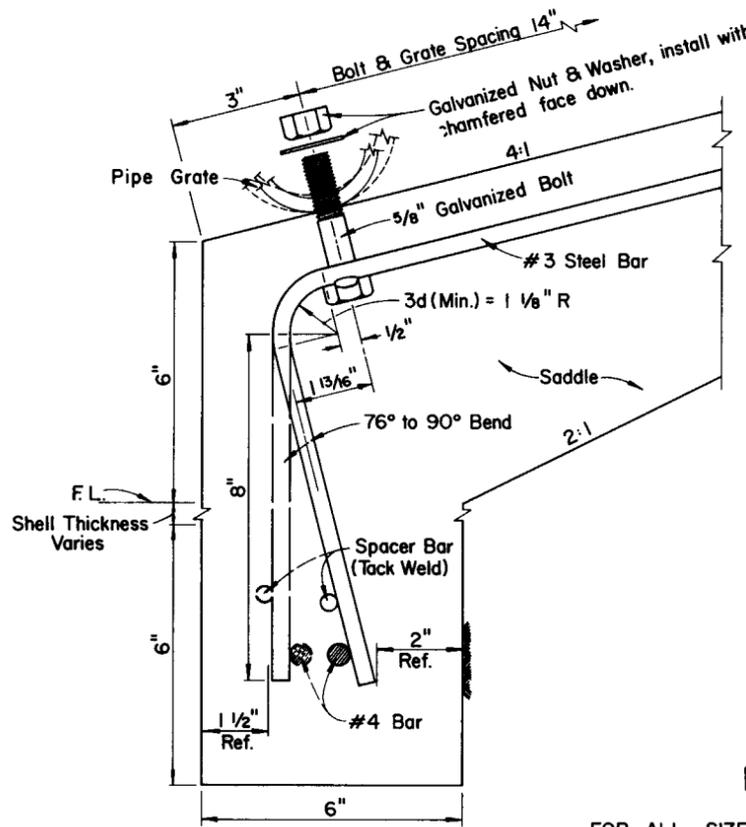
SINGLE AND MULTIPLE CORRUGATED METAL PIPE-ARCH

ROAD NO.	COUNTY	PROJECT NO.	
DESIGNED BY		APPROVED BY	
Checked by	J. V. G.	8-77	 Drawing No. _____ Index No. _____
Quantities by	A. F.	8-77	
Checked by	J. V. G.	8-77	
Supervised by	D. C. B.		3 of 5 DME-0-1

REVISIONS	
Dates	Descriptions

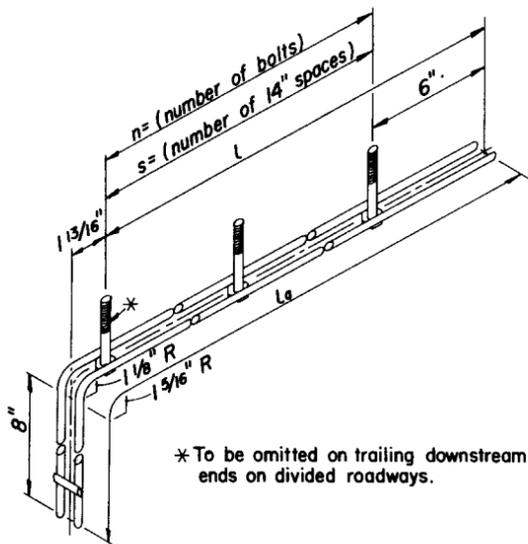


The specified weld shall be made when the fabricated unit is subject to hazardous hauls and repeated handling. Tack welds are permitted for local or job site fabrication. Galvanizing over welded surface not required.



FASTENER UNIT

FOR ALL SIZES OF SINGLE AND MULTIPLE DRAIN PIPE

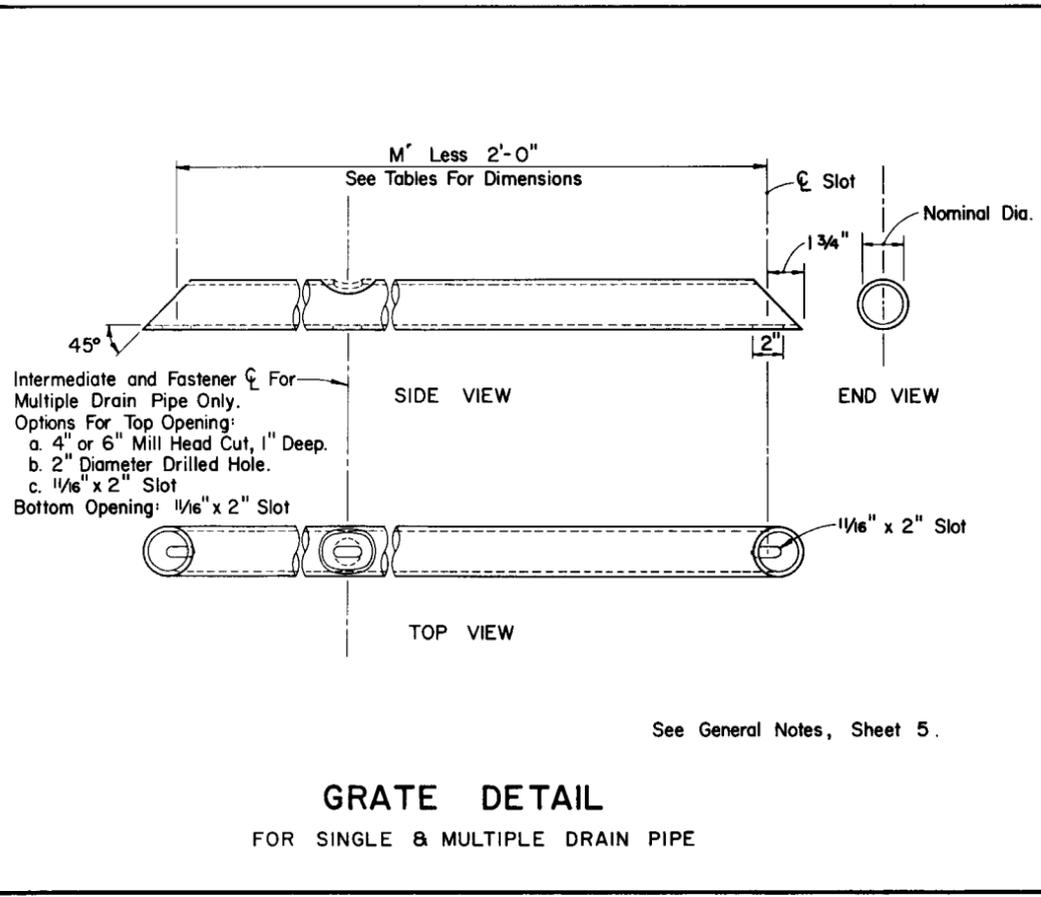


Drain Size	s	n	L	La
CONCRETE PIPE (ROUND)				
15"	3	4	4'-0"	4'-11"
18"	4	5	5'-2"	6'-1"
24"	6	7	7'-6"	8'-5"
30"	7	8	8'-8"	9'-7"
36"	9	10	11'-0"	11'-11"
42"	11	12	13'-4"	14'-3"
48"	13	14	15'-8"	16'-7"
54"	14	15	16'-10"	17'-9"
60"	16	17	19'-2"	20'-11"
CORRUGATED METAL PIPE (ROUND)				
15"	2	3	2'-10"	3'-9"
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"
CORRUGATED METAL PIPE (ARCH)				
17" x 13"	1	2	1'-8"	2'-7"
21" x 15"	2	3	2'-10"	3'-9"
28" x 20"	4	5	5'-2"	6'-1"
35" x 24"	5	6	6'-4"	7'-3"
42" x 29"	6	7	7'-6"	8'-5"
49" x 33"	7	8	8'-8"	9'-7"
57" x 38"	9	10	11'-0"	11'-11"
64" x 43"	10	11	12'-2"	13'-1"
71" x 47"	12	13	14'-6"	15'-5"

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

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

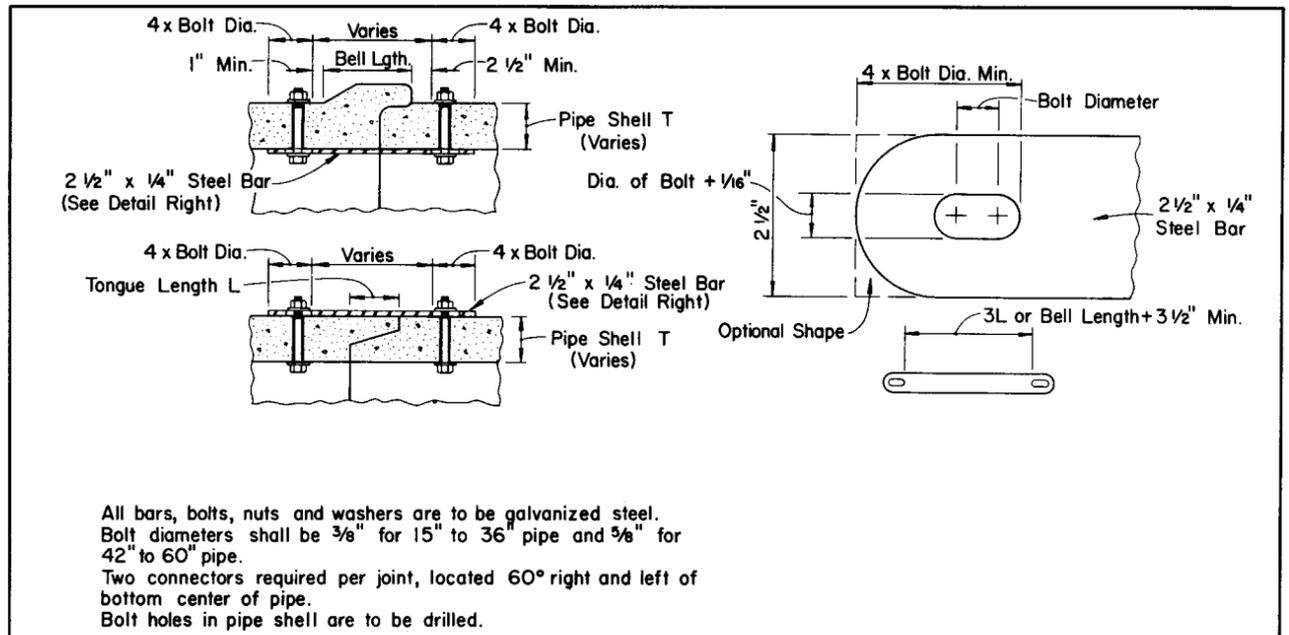
** To be used only when grates are called for in the plans.
*** 1974 AASHTO Pipe Arch Sizes.



GRATE DETAIL

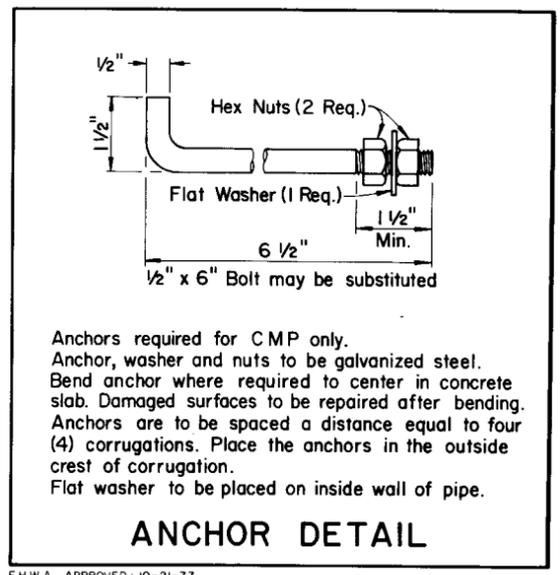
FOR SINGLE & MULTIPLE DRAIN PIPE

See General Notes, Sheet 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



Anchors required for CMP only.
Anchor, washer and nuts to be galvanized steel.
Bend anchor where required to center in concrete slab. Damaged surfaces to be repaired after bending.
Anchors are to be spaced a distance equal to four (4) corrugations. Place the anchors in the outside crest of corrugation.
Flat washer to be placed on inside wall of pipe.

ANCHOR DETAIL

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

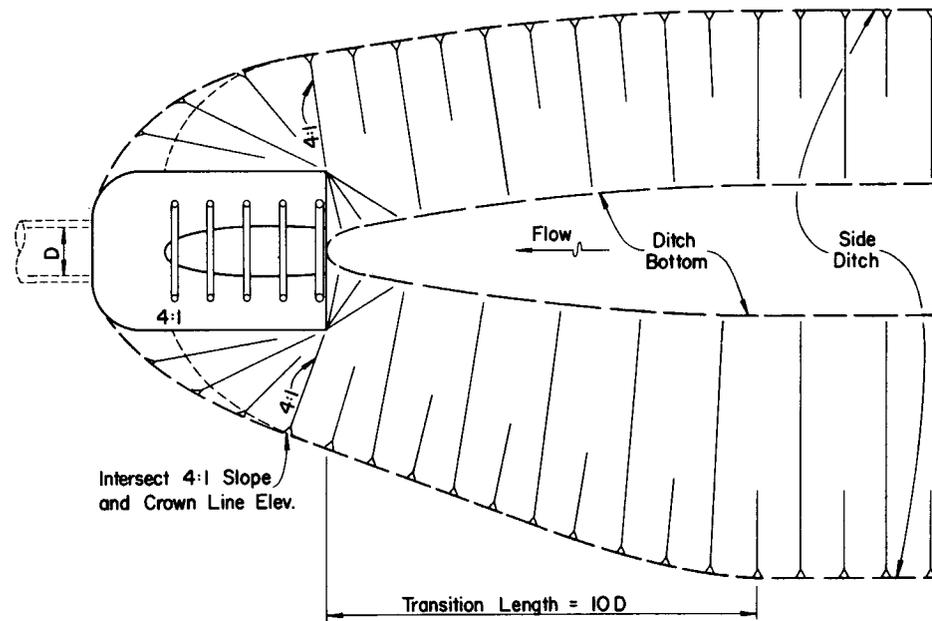
SIDE DRAIN MITERED END SECTION
DETAILS FOR CONCRETE & CORRUGATED METAL PIPE

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			

Designed by	Names	Dates	APPROVED BY
Checked by	J. V. G.	8-77	<i>E. H. Hart</i> District Design Engineer, Roadways
Quantities by	A. F.	8-77	
Checked by	J. V. G.	8-77	
Supervised by	D. C. B.		

Drawing No. 4 of 5
Index No. DME-OI-1

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 ASTM A 53, Grade B, pipe. The lower grate on all traffic approach ends shall be Schedule 80 and all remaining grates shall be Schedule 40.
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. Bituminized-Fiber pipe mitered end sections constructed in accordance with the details shown for corrugated metal pipe (including anchor bolts, apron, etc.) may be used with any type of 15", 18", or 24" side drain 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).
3. The design engineer shall determine and designate in the plans which alternate types of mitered end section will not be permitted. The restriction shall be based on corrosive or structural requirements.

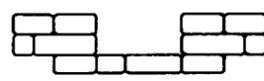
F.H.W.A. APPROVED: 10-21-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

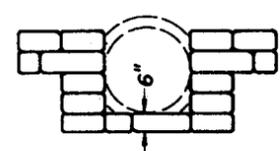
SIDE DRAIN MITERED END SECTION

NOTES & INFORMATION

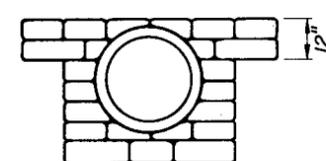
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
8-78	Changed Gen. Notes 4 & 8			
		APPROVED BY		
		Names	Dates	
		Designed by	E. G. R. 8-77	 Deputy Design Engineer, Roadways
		Checked by	J. V. G. 8-77	
		Quantities by	A. F. 8-77	
		Checked by	J. V. G. 8-77	
		Supervised by	D. C. B.	Drawing No. 5 of 5 Index No. DME-01-1



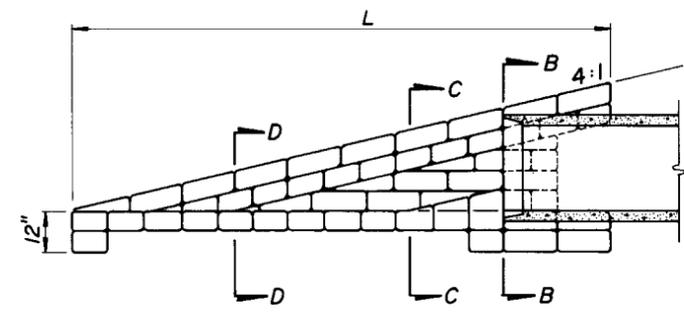
SECTION DD



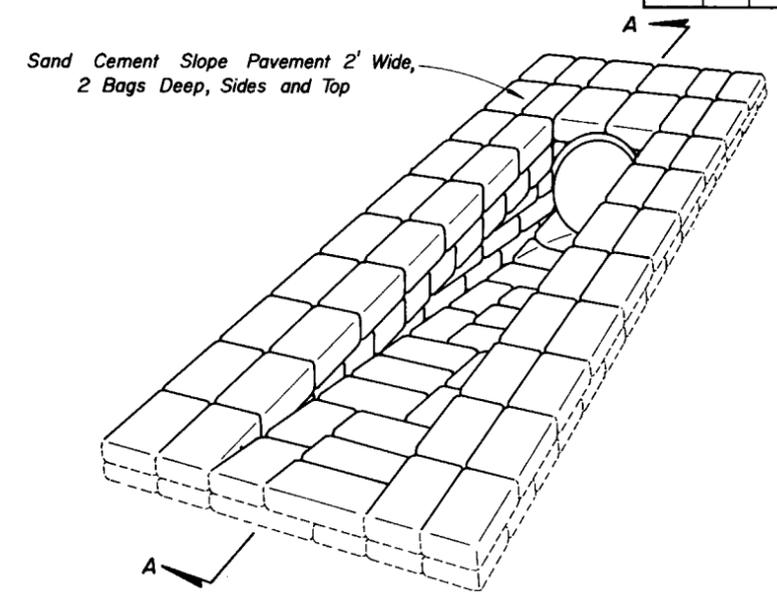
SECTION CC



SECTION BB



SECTION AA

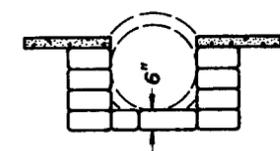


ISOMETRIC

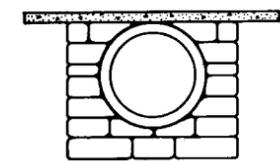
ESTIMATED QUANTITIES & DIMENSIONS					
PIPE SIZE	L CMP	L Conc. Pipe	SAND-CEMENT RIPRAP (Cu. Yd.)	Bags (Jute)	SOD (Sq. Yd.)
15"	8'-2"	8'-9"	2.2	90	8.40
18"	9'-2"	9'-10"	2.5	100	9.10
24"	11'-2"	12'-0"	3.5	140	10.40



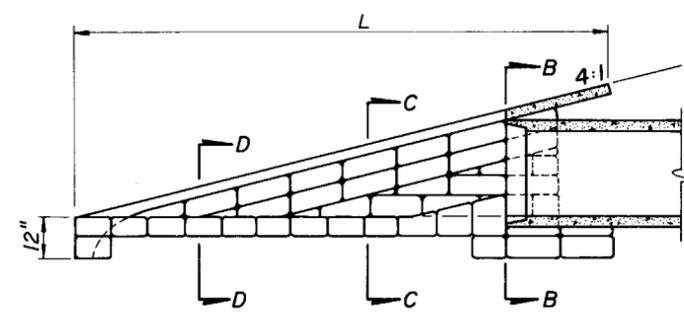
SECTION DD



SECTION CC

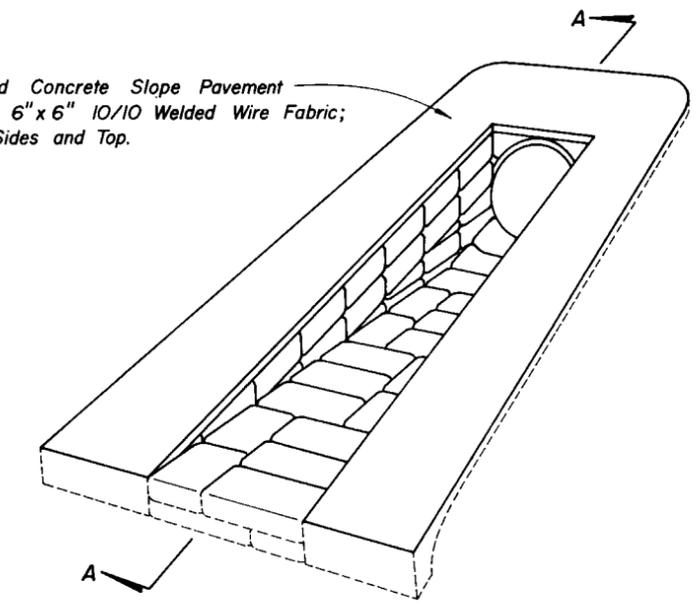


SECTION BB



SECTION AA

Reinforced Concrete Slope Pavement
3" Thick; 6" x 6" 10/10 Welded Wire Fabric;
2' Wide Sides and Top.



ISOMETRIC

ESTIMATED QUANTITIES & DIMENSIONS						
PIPE SIZE	L CMP	L Conc. Pipe	SAND-CEMENT RIPRAP (Cu. Yd.)	Bags (Jute)	CONCRETE (Cu. Yd.)	SOD (Sq. Yd.)
15"	8'-2"	8'-9"	1.0	40	0.45	8.40
18"	9'-2"	9'-10"	1.4	60	0.50	9.10
24"	11'-2"	12'-0"	2.0	80	0.60	10.40

GENERAL NOTE

1. Details for concrete and round corrugated metal pipe, concrete pipe shown.
2. Sod slopes 2' each side and top and ditch 4' beyond toe.

F.H.W.A. APPROVED: 10-23-78

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

**SIDE DRAIN
MITERED END SECTION**
SINGLE ROUND CONCRETE & CORRUGATED METAL PIPE

ROAD NO.	COUNTY	PROJECT NO.

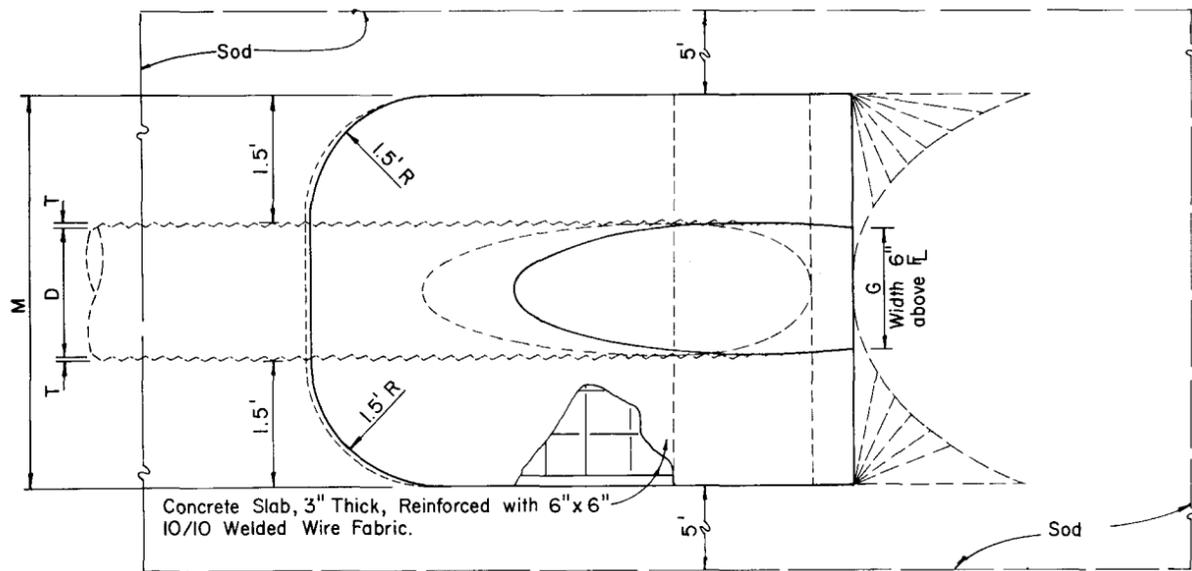
REVISIONS		APPROVED BY	
Date	Description	Names	Dates

Designed by	H. K. H.	10-77
Drawn by	A. B. K.	10-77
Checked by	J. V. G.	10-77
Supervised by	J. V. G.	

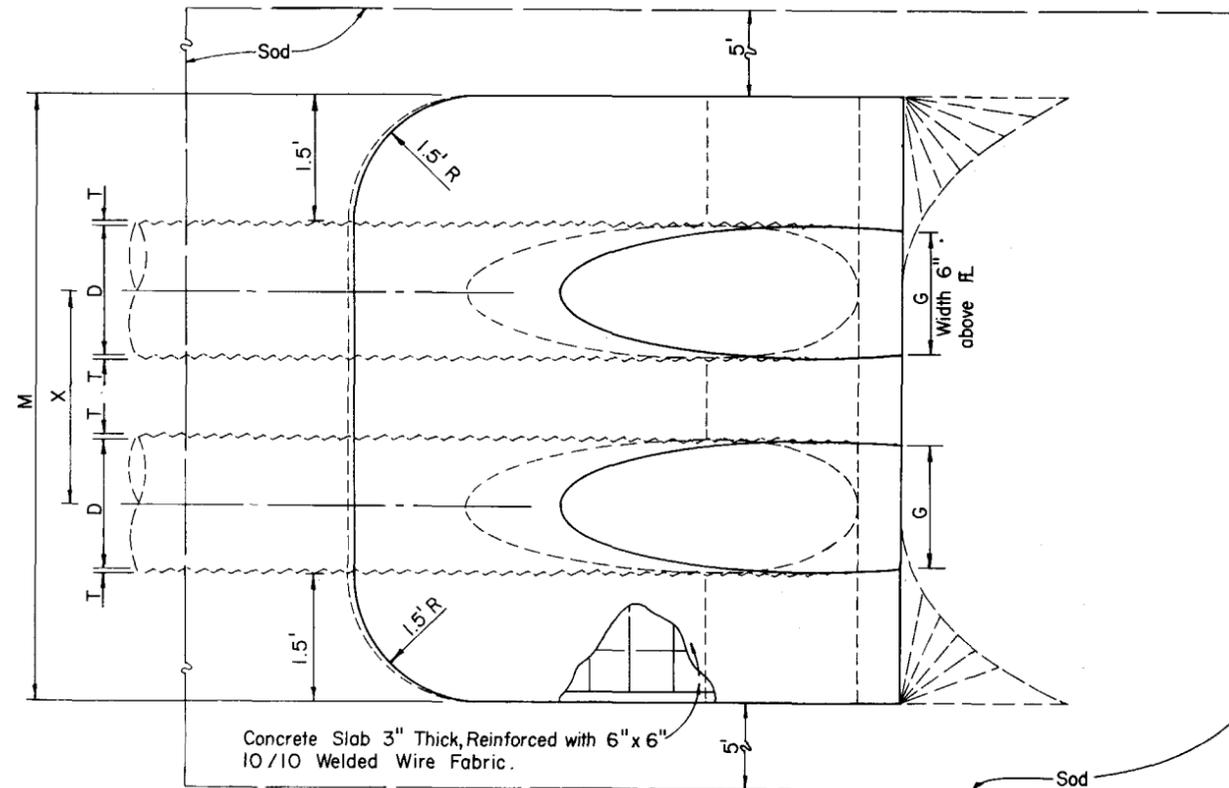
APPROVED BY: *E. H. Hart*
Deputy Design Engineer, Roadways

Drawing No. 1 of 1 Index No. DME-02

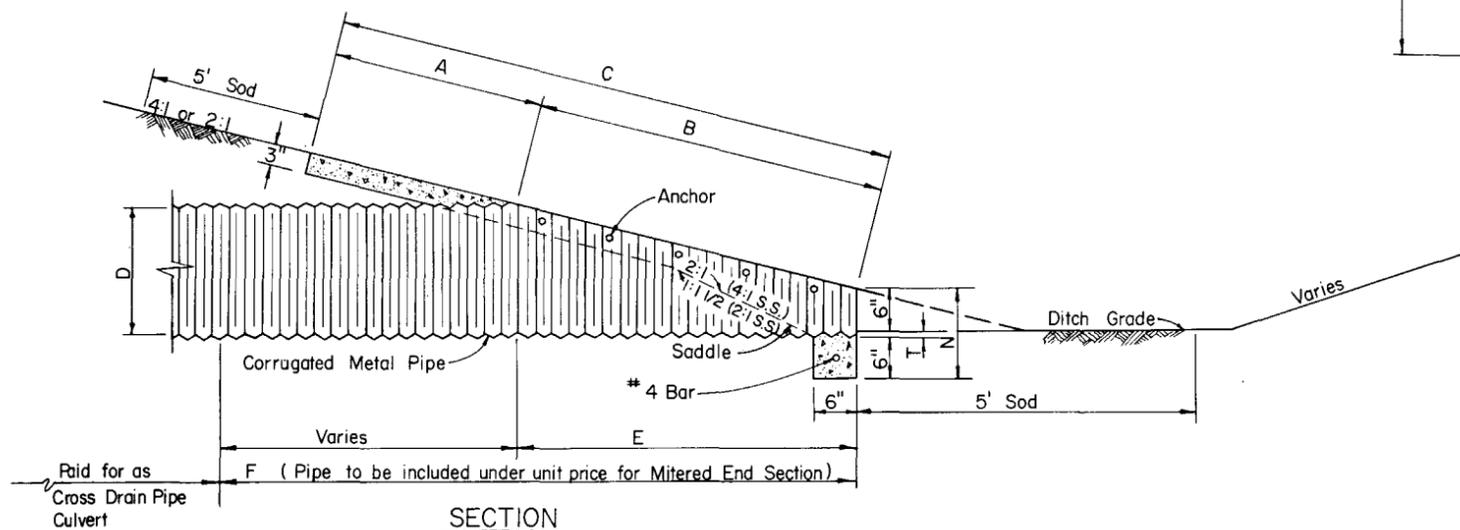
DIMENSIONS AND QUANTITIES																					
	D	X	A	B	C	E	F	G	M				N	CONCRETE (CU.YDS.)				SODDING (SQ.YDS.)			
									Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
2:1 Slope	15"	2'-7"	2.5'	1.68'	4.18'	1.50'	5'	1.23'	4.33'	6.92'	9.50'	12.08'	1.04'	0.24	0.37	0.51	0.64	20.58	23.46	26.32	29.19
	18"	2'-10"	2.5'	2.24'	4.74'	2.00'	6'	1.41'	4.58'	7.42'	10.25'	13.08'	1.04'	0.26	0.43	0.61	0.78	21.43	24.65	27.78	30.92
	24"	3'-5"	2.5'	3.35'	5.85'	3.00'	7'	1.73'	5.08'	8.50'	11.92'	15.33'	1.04'	0.32	0.52	0.72	0.91	23.28	27.07	30.87	34.66
	30"	4'-3"	2.5'	4.47'	6.97'	4.00'	8'	2.00'	5.58'	9.83'	14.08'	18.33'	1.04'	0.38	0.64	0.91	1.18	25.07	29.79	34.51	39.23
	36"	5'-1"	2.5'	5.59'	8.09'	5.00'	9'	2.24'	6.08'	11.17'	16.25'	21.33'	1.04'	0.44	0.78	1.13	1.48	26.87	32.52	38.17	43.81
	42"	6'-0"	2.5'	6.71'	9.21'	6.00'	10'	2.45'	6.58'	12.58'	18.58'	24.58'	1.04'	0.51	0.96	1.41	1.87	28.67	35.33	42.00	48.67
	48"	6'-9"	2.5'	7.83'	10.33'	7.00'	11'	2.65'	7.08'	13.83'	20.58'	27.33'	1.04'	0.57	1.09	1.63	2.15	30.47	37.97	45.47	52.97
	54"	7'-8"	2.5'	8.94'	11.44'	8.00'	12'	2.83'	7.58'	15.25'	22.92'	30.58'	1.04'	0.65	1.32	1.99	2.66	32.26	40.76	49.30	57.81
60"	8'-6"	2.5'	10.06'	12.56'	9.00'	13'	3.00'	8.08'	16.58'	25.08'	33.58'	1.04'	0.71	1.49	2.28	3.07	34.06	43.50	52.94	62.39	
4:1 Slope	15"	2'-7"	2.5'	3.09'	5.59'	3.0'	7.0'	1.23'	4.33'	6.92'	9.50'	12.08'	1.04'	0.31	0.47	0.63	0.79	22.14	25.02	27.89	30.76
	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	23.57	26.72	29.87	33.01
	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	26.41	30.21	34.01	37.80
	30"	4'-3"	2.5'	8.25'	10.75'	8.0'	12.0'	2.00'	5.58'	9.83'	14.08'	18.33'	1.04'	0.53	0.88	1.25	1.60	29.27	33.99	38.71	43.43
	36"	5'-1"	2.5'	10.31'	12.81'	10.0'	14.0'	2.24'	6.08'	11.17'	16.25'	21.33'	1.04'	0.62	1.07	1.53	2.00	32.11	37.77	43.41	49.06
	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'	0.71	1.30	1.92	2.52	34.96	41.62	48.29	54.96
	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'	0.80	1.54	2.29	3.02	37.80	45.30	52.80	60.30
	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'	0.91	1.83	2.74	3.67	40.64	49.17	57.69	66.20
60"	8'-6"	2.5'	18.55'	21.05'	18.0'	22.0'	3.00'	8.08'	16.58'	25.08'	33.58'	1.04'	1.02	2.15	3.27	4.39	43.49	52.93	62.38	71.82	



TOP VIEW - SINGLE PIPE



TOP VIEW - MULTIPLE PIPE



SECTION

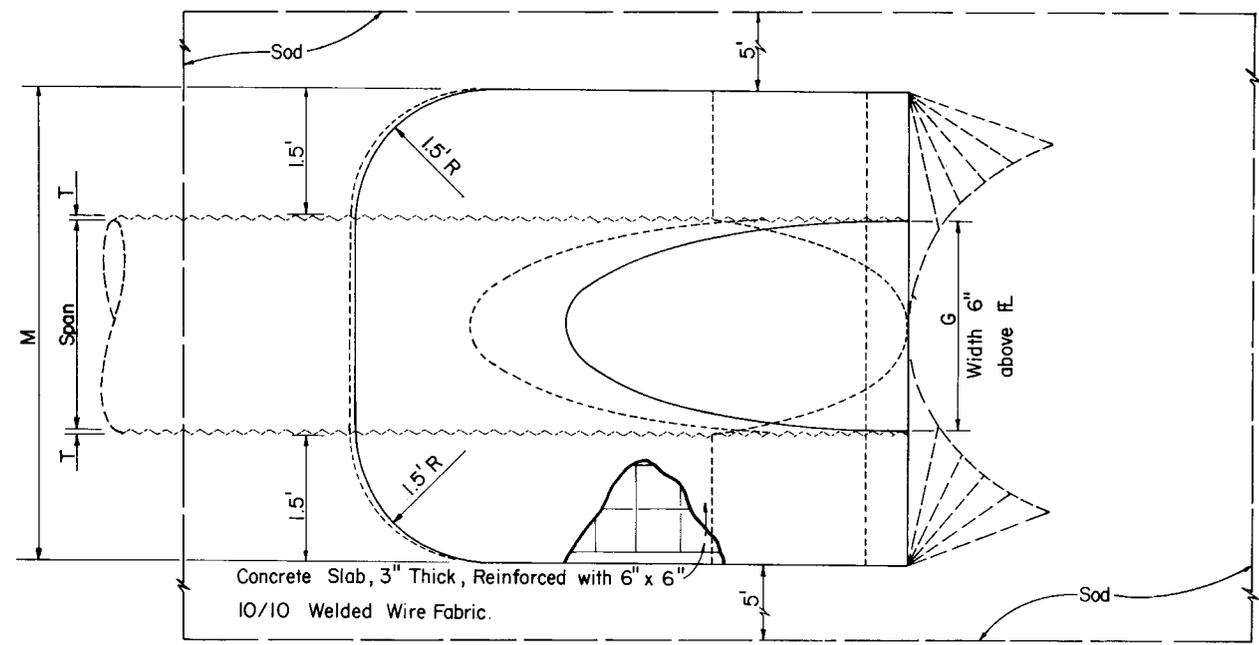
NOTE: See Sheet 4 for Details and Notes.

FHWA Approved 7-21-78

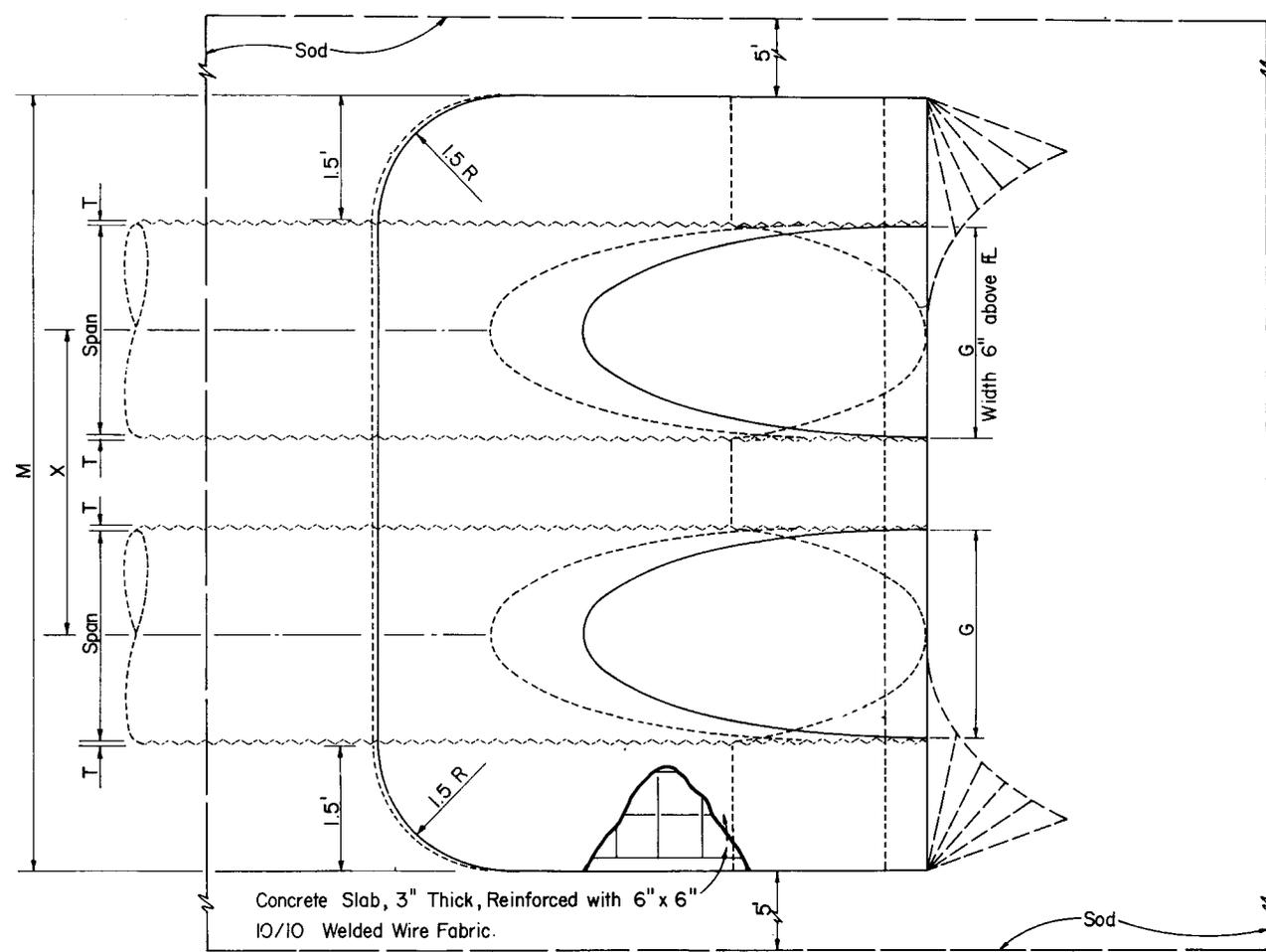
REVISIONS	
Dates	Descriptions

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN SECTION			
CROSS DRAIN - MITERED END SECTION			
SINGLE and MULTIPLE ROUND CORRUGATED METAL PIPE			
ROAD NO.	COUNTY	PROJECT NO.	
DESIGNED BY		APPROVED BY	
CHECKED BY	A.F.	6-78	<i>E.H. Hart</i> Deputy Design Engineer - Roadways
QUANTITIES BY	K.N.M.	6-78	
CHECKED BY	A.F.	6-78	
SUPERVISED BY	D.C.B.	2 of 4	DME-03

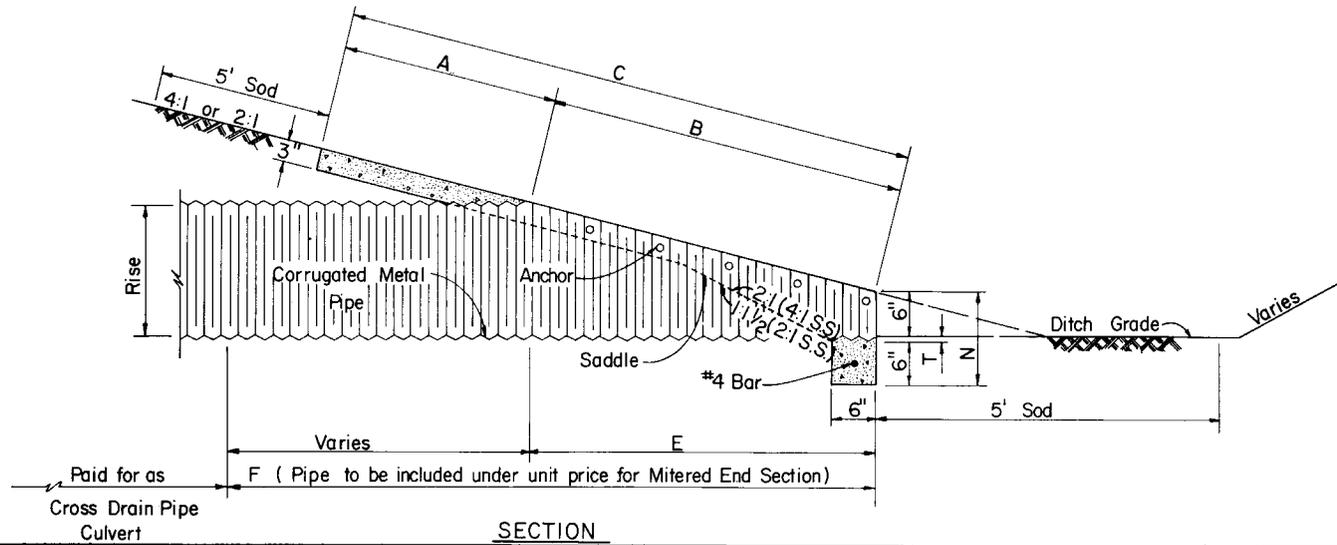
1974 AASHTO		DIMENSIONS AND QUANTITIES																				
SLOPE	SPAN	RISE	X	A	B	C	E	F	G	M				N	CONCRETE (CU.YDS.)				SODDING (SQ.YDS.)			
										Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe		Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
2:1	17'	13"	2'-6"	2.5'	1.30'	3.80'	1.17'	4'	1.39'	4.50'	7.00'	9.50'	12.00'	1.04'	0.25	0.37	0.49	0.61	20.34	23.12	25.90	28.68
	20'	15"	2'-10"	2.5'	1.68'	4.17'	1.50'	5'	1.76'	4.83'	7.67'	10.50'	13.33'	1.04'	0.26	0.39	0.53	0.66	21.13	24.29	27.43	30.58
	24'	18"	3'-2"	2.5'	2.61'	5.11'	2.33'	6'	2.22'	5.42'	8.83'	12.25'	15.67'	1.04'	0.32	0.49	0.66	0.83	22.83	26.62	30.42	34.22
	28'	21"	3'-6"	2.5'	3.35'	5.85'	3.00'	7'	2.55'	6.00'	10.00'	14.00'	18.00'	1.04'	0.37	0.58	0.79	1.00	24.29	28.73	33.18	37.62
	32'	24"	4'-0"	2.5'	4.29'	6.79'	3.83'	8'	2.97'	6.58'	11.33'	16.08'	20.83'	1.04'	0.42	0.69	0.96	1.22	25.98	31.26	36.53	41.81
	36'	27"	4'-6"	2.5'	5.03'	7.53'	4.50'	9'	3.34'	7.17'	12.67'	18.17'	23.67'	1.04'	0.49	0.82	1.15	1.48	27.46	33.57	39.68	45.78
	40'	30"	5'-0"	2.5'	5.96'	8.46'	5.33'	10'	3.65'	7.83'	14.17'	20.50'	26.83'	1.04'	0.55	0.95	1.35	1.75	29.23	36.28	43.31	50.34
	44'	33"	5'-6"	2.5'	6.89'	9.39'	6.17'	11'	3.89'	8.42'	15.50'	22.58'	29.67'	1.04'	0.62	1.10	1.57	2.05	30.91	38.78	46.64	54.52
4:1	17'	13"	2'-6"	2.5'	2.41'	4.91'	2.33'	7'	1.39'	4.50'	7.00'	9.50'	12.00'	1.04'	0.28	0.42	0.56	0.70	21.58	24.36	27.13	29.91
	20'	15"	2'-10"	2.5'	3.09'	5.59'	3.00'	8'	1.76'	4.83'	7.67'	10.50'	13.33'	1.04'	0.32	0.49	0.66	0.78	22.70	25.85	29.00	32.14
	24'	18"	3'-2"	2.5'	4.81'	7.31'	4.67'	9'	2.22'	5.42'	8.83'	12.25'	15.67'	1.04'	0.40	0.60	0.82	1.03	25.27	29.06	32.86	36.66
	28'	21"	3'-6"	2.5'	6.18'	8.68'	6.00'	11'	2.55'	6.00'	10.00'	14.00'	18.00'	1.04'	0.49	0.77	1.05	1.33	27.43	31.88	36.32	40.77
	32'	24"	4'-0"	2.5'	7.90'	10.40'	7.67'	12'	2.97'	6.58'	11.33'	16.08'	20.83'	1.04'	0.57	0.92	1.27	1.62	29.99	35.27	40.52	45.82
	36'	27"	4'-6"	2.5'	9.28'	11.78'	9.00'	14'	3.34'	7.17'	12.67'	18.17'	23.67'	1.04'	0.65	1.08	1.50	1.93	32.18	38.29	44.40	50.51
	40'	30"	5'-0"	2.5'	11.00'	13.50'	10.67'	16'	3.65'	7.83'	14.17'	20.50'	26.83'	1.04'	0.76	1.30	1.83	2.37	34.82	41.87	48.90	55.93
	44'	33"	5'-6"	2.5'	12.71'	15.21'	12.33'	17'	3.89'	8.42'	15.50'	22.58'	29.67'	1.04'	0.87	1.55	2.18	2.83	37.38	45.24	53.11	60.99
	47'	7'-10"	2.5'	14.09'	16.59'	13.67'	19'	4.14'	9.00'	16.83'	24.67'	32.50'	1.04'	0.95	1.68	2.43	3.17	39.96	48.26	56.97	65.67	



TOP VIEW - SINGLE PIPE



TOP VIEW - MULTIPLE PIPE



SECTION

NOTE: See Sheet 4 for Details and Notes.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION
CROSS DRAIN - MITERED END SECTION
SINGLE and MULTIPLE CORRUGATED METAL PIPE-ARCH

FHWA Approved: 7-21-78

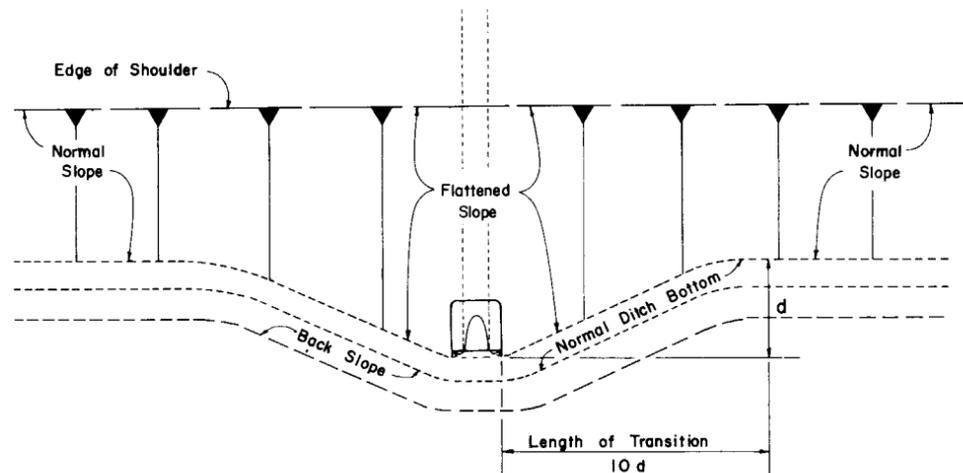
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			

Designed by		APPROVED BY	
Checked by	A.F. 6-78	 Deputy Design Engineer - Roadways Drawing No. Index No.	
Quantities by	K.N.M. 6-78		
Checked by	A.F. 6-78		
Supervised by	D.C.B.	3 of 4	DME-03

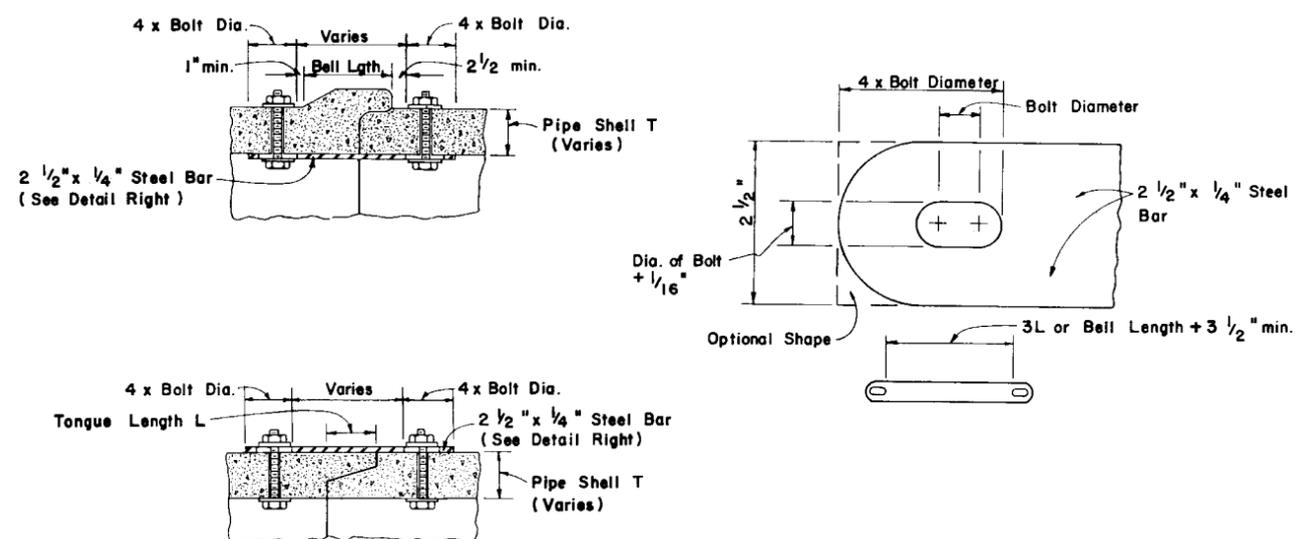
GENERAL NOTES

- The cost of all pipe (s), reinforcing, connectors, anchors and concrete shall be included in the contract unit price for mitered end section, each. Sodding not included.
- The reinforced concrete slab shall be constructed for all sizes of cross drain pipe and cast in place with Class I concrete.
- Concrete pipe used in the assembly of mitered end sections shall be selective lengths to avoid excessive connections.
- Corrugated metal pipe galvanizing that is damaged during beveling and perforating for mitered end section shall be repaired.
- That portion of corrugated metal pipe in direct contact with the concrete slab shall be bituminous coated prior to placing of the concrete.
- Unless otherwise designated in the plans, concrete pipe mitered end sections may be used with any type of cross drain pipe ; corrugated steel pipe mitered end sections may be used with any type of cross drain pipe except aluminum pipe ; and, corrugated aluminum mitered end sections may be used with any type of cross drain pipe except steel pipe. When bituminous coated metal pipe is specified for cross drain pipe , mitered end sections shall be constructed with like pipe or concrete pipe.

When the mitered end section pipe is dissimilar to the cross drain pipe , a concrete jacket shall be constructed in accordance with Standard Index DMD-01 .
- When existing multiple cross drain pipes are spaced other than the dimensions shown in this detail ,or have non-parallel axes, or have non-uniform sections, the mitered end sections will be constructed either separately as single pipe mitered end sections or collectively as multiple pipe end sections as directed by the Engineer ; however , mitered end sections will be paid for each, based on each independent pipe end.
- Slope and ditch transitions shall be used when the normal roadway slope must be flattened to place end section outside clear recovery area. See detail left.
- Cross Drain - Mitered End Sections only to be used outside of clear recovery area.

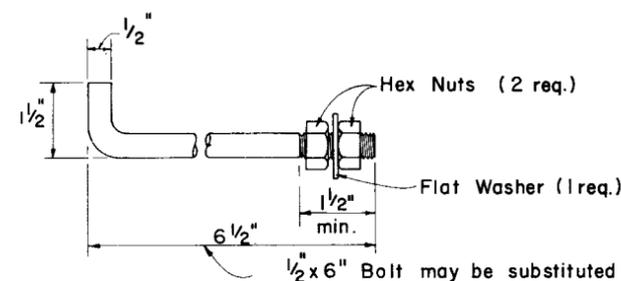


SLOPE AND DITCH TRANSITIONS (Plan View)



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

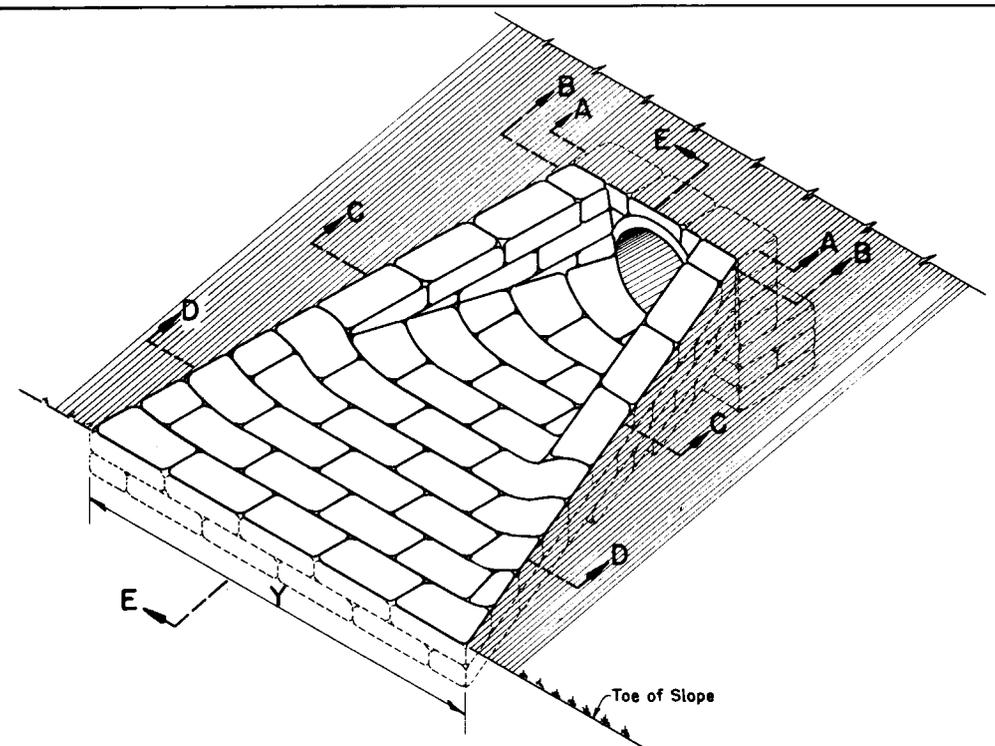
CONCRETE PIPE CONNECTOR DETAIL



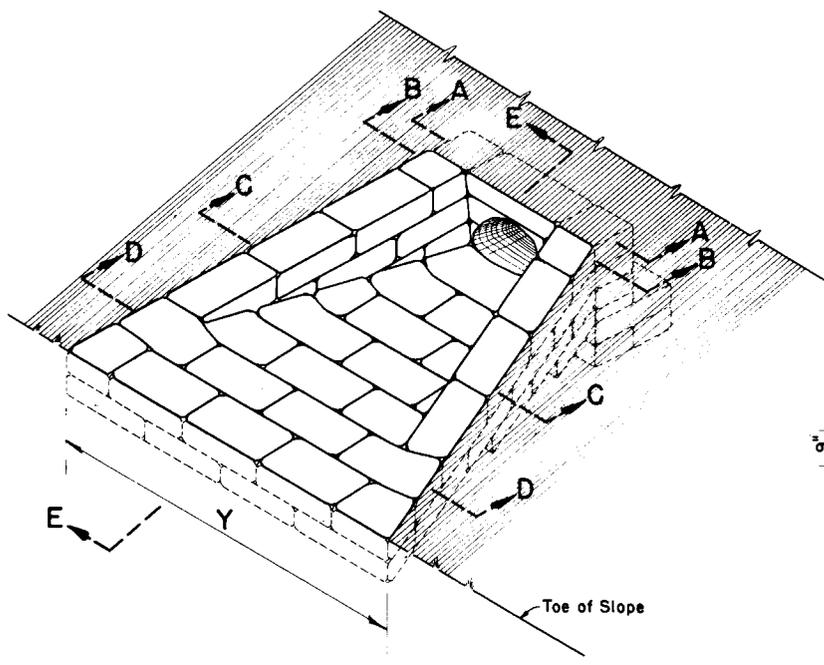
Anchors required for CMP only.
 Anchor ,washer and nuts to be galvanized steel.
 Bend anchor where required to center in concrete slab. Damaged surfaces to be repaired after bending. Anchors are to be spaced a distance equal to four (4) corrugations. Place the anchors in the outside crest of corrugation.
 Flat washers to be placed on inside wall of pipe.

ANCHOR DETAIL

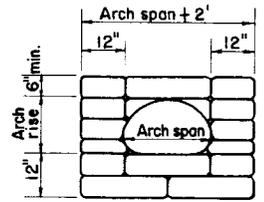
FHWA Approved : 7-21-78		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD DESIGN SECTION	
REVISIONS		CROSS DRAIN-MITERED END SECTION SPECIAL DETAILS and NOTES	
Date	Description	ROAD NO.	COUNTY PROJECT NO.
		Names	Dates
		APPROVED BY	
Designed by		<i>E.H. Hart</i>	
Checked by	A.F.	6-78	Deputy Design Engineer - Roadways
Quantity by	K.N.M.	6-78	Drawing No. Index No.
Checked by	A.F.	6-78	4 of 4 DME-03
Supervised by	D.C.B.		



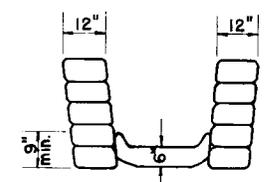
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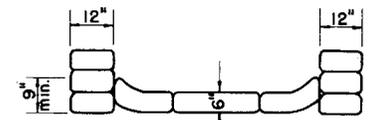
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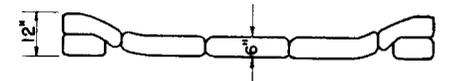
SECTION A-A



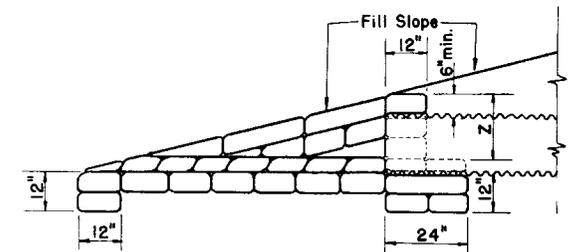
SECTION B-B



SECTION C-C



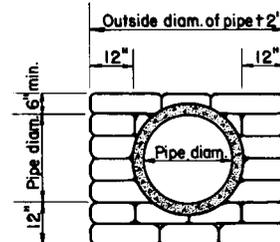
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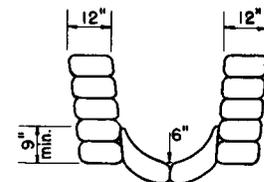
SECTION E-E

DETAILS FOR SINGLE METAL PIPE ARCH CULVERTS

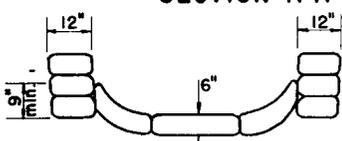
NOTE: For Multiple Metal Pipe Arch Culvert spacing between Arch centers = X



SECTION A-A



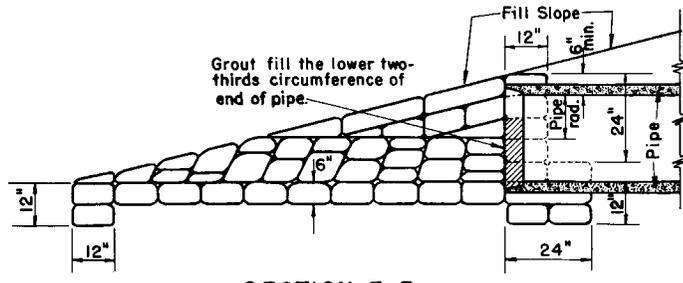
SECTION B-B



SECTION C-C



SECTION D-D



SECTION E-E

DETAIL FOR SINGLE PIPE CULVERT

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

DIMENSIONS and QUANTITIES for METAL PIPE ARCH CULVERTS

Span	Rise	Dimensions				Quantity of Sand-Cement Riprap in Cu. Yds. for One Endwall													
		X		Y		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				

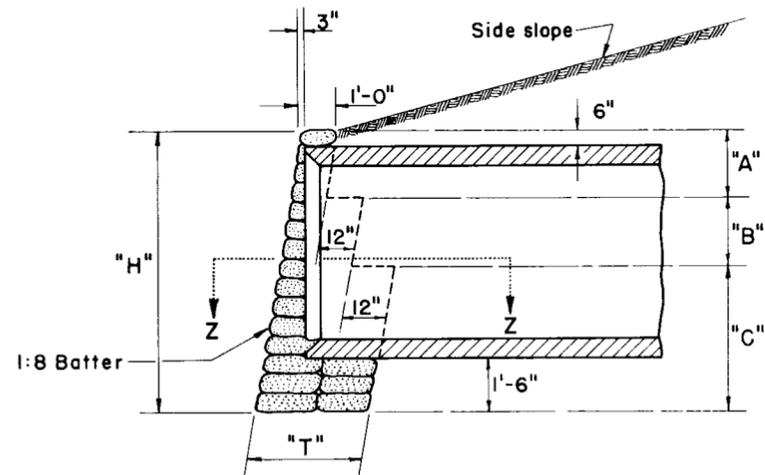
DIMENSIONS and QUANTITIES for ROUND PIPE CULVERTS

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"	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"	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"	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"	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"	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"	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"	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"	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"	6.2	9.7	13.3	16.9	10.0	15.3	20.6	25.9				

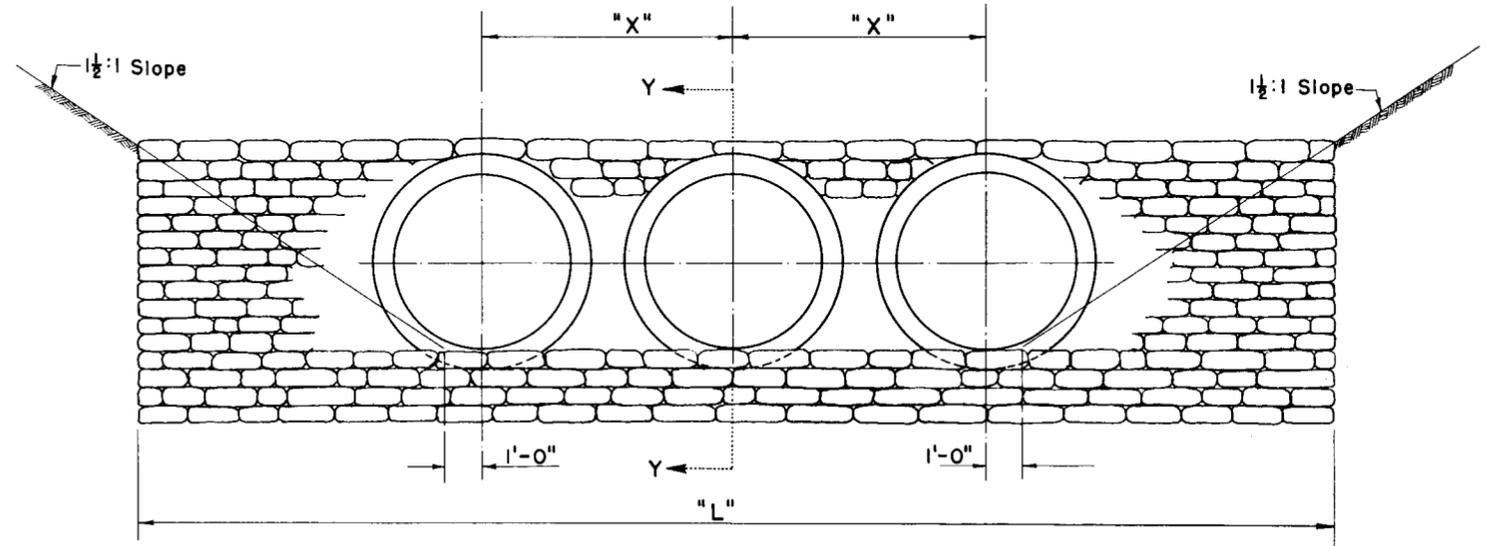
FHWA APPROVED: 8-30-77

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
SAND-CEMENT ENDWALLS FOR PIPE CULVERTS

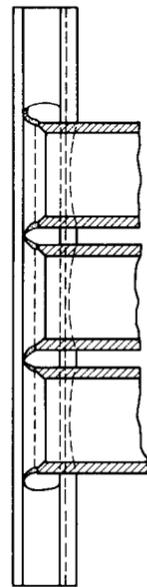
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
10-74	Changed Index N19			
8-77	Up-date CMP Arch to 1974 AASHTO			
		Name	Date	Approved by:
		Detailed by	J.E.P., Jr. 12-3-48	 Deputy Design Engineer - Roadways Drawing No. 1 OF 1 Index No. DSE-01-1
		Checked by	CDD 12-6-48	
		Traced by	H-W 3-9-54	



SECTION Y-Y



FRONT ELEVATION



SECTION Z-Z

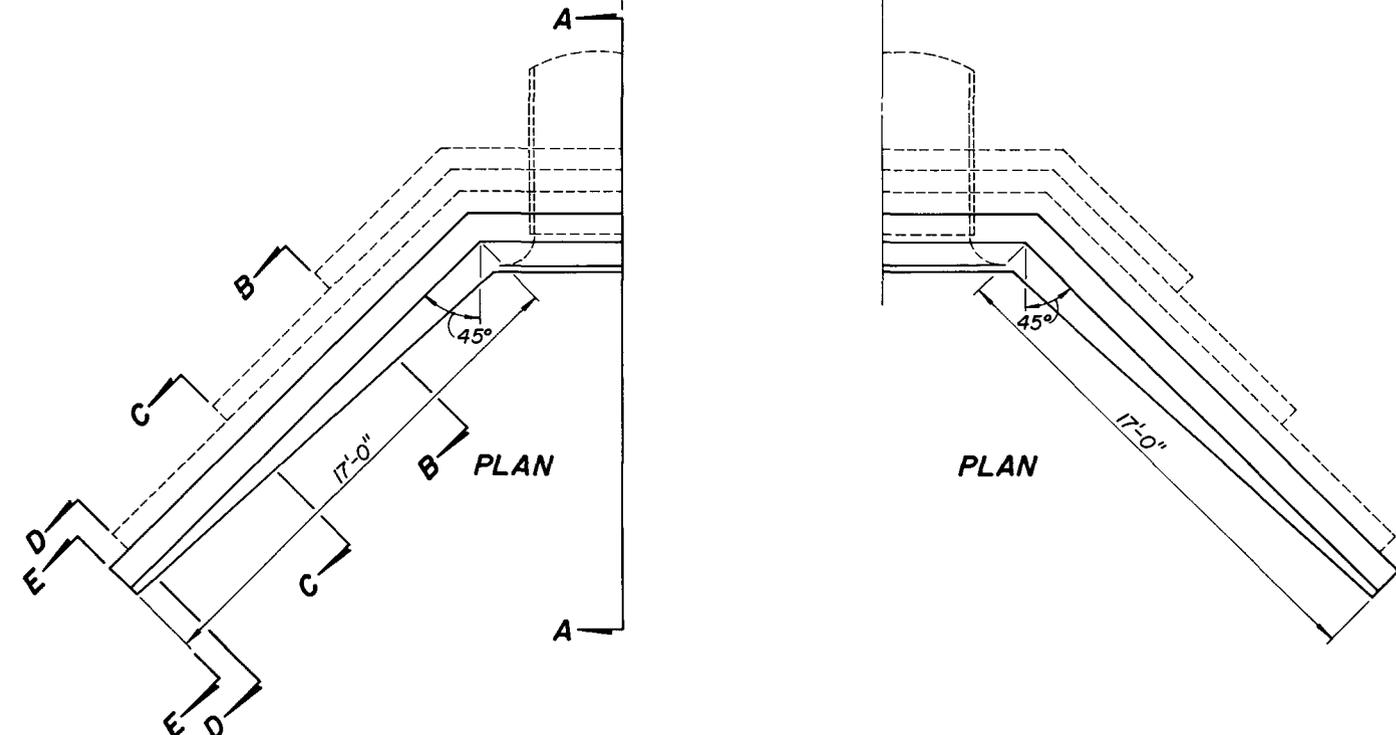
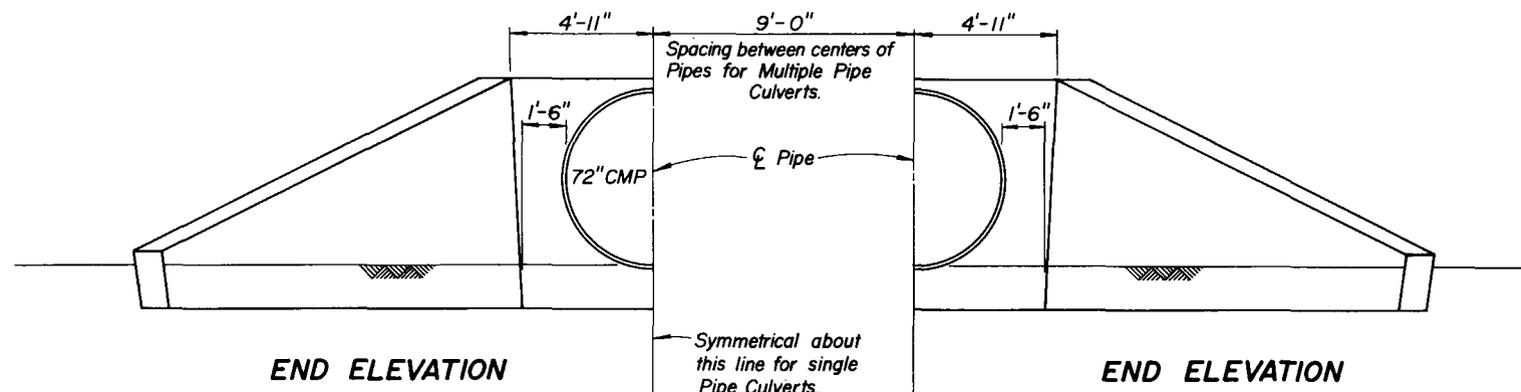
SIZE OF PIPE	TABLE OF DIMENSIONS						QUANTITIES FOR ONE ENDWALL							
	H	T	A	B	C	X	ONE PIPE CULVERTS		TWO PIPE CULVERTS		THREE PIPE CULVERTS		FOUR PIPE CULVERTS	
							L	RIPRAP CU. YDS.	L	RIPRAP CU. YDS.	L	RIPRAP CU. YDS.	L	RIPRAP CU. YDS.
18"	3'-10"	1'-0"	3'-10"	0'-0"	0'-0"	2'-10"	8'-0"	1.04	10'-10"	1.34	13'-8"	1.65	16'-6"	1.95
24"	4'-5"	2'-0"	2'-0"	2'-5"	0'-0"	3'-5"	9'-8"	2.22	13'-1"	2.85	16'-6"	3.49	19'-11"	4.13
30"	5'-0"	2'-0"	2'-0"	3'-0"	0'-0"	4'-3"	11'-3"	2.94	15'-6"	3.81	19'-9"	4.67	24'-0"	5.54
36"	5'-7"	2'-0"	2'-0"	3'-7"	0'-0"	5'-1"	12'-11"	3.79	18'-0"	4.91	23'-1"	6.04	28'-2"	7.17
42"	6'-3"	3'-0"	2'-0"	2'-0"	2'-3"	6'-0"	14'-7"	5.94	20'-7"	7.83	26'-7"	9.71	32'-7"	11.60
48"	6'-10"	3'-0"	2'-0"	2'-0"	2'-10"	6'-9"	16'-3"	7.45	23'-0"	9.81	29'-9"	12.16	36'-6"	14.51
54"	7'-6"	3'-0"	2'-0"	2'-0"	3'-6"	7'-8"	18'-0"	9.22	25'-8"	12.12	33'-4"	15.02	41'-0"	17.92
60"	8'-2"	3'-0"	2'-0"	2'-0"	4'-2"	8'-6"	19'-9"	11.23	28'-3"	14.75	36'-9"	18.27	45'-3"	21.79
66"	8'-7"	3'-0"	2'-0"	2'-0"	4'-7"	9'-2"	21'-7 1/2"	12.92	30'-9 1/2"	15.18				
72"	9'-2"	3'-0"	2'-0"	2'-0"	5'-2"		23'-3"	15.07						
84"	10'-4"	3'-0"	2'-0"	2'-0"	6'-4"		26'-6"	18.72						

FHWA APPROVED: 12-6-76

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

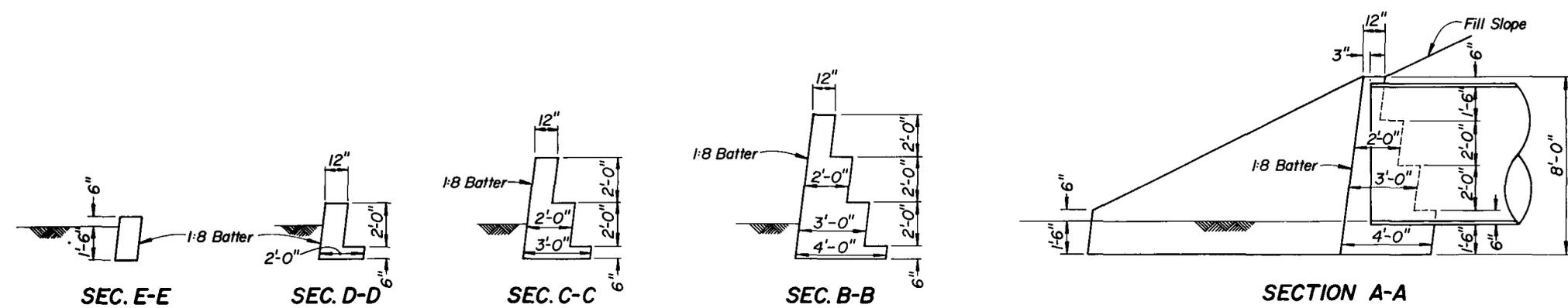
SAND - CEMENT ENDWALLS FOR PIPE CULVERTS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
2-61	Added 72" Pipe			
10-74	Changed Index No			
11-76	Added 84" Pipe			
DAM				
Checked by		Names	Dates	Approved by:
Checked by		J.E.P. Jr.	5-48	Deputy Design Engineer - Roadways
Checked by		H.B.	5-48	
Traced by		E.H.	5-48	
		Quantities by		Drawing No.
				Index No.
				1 OF 1
				DSE-02-1



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

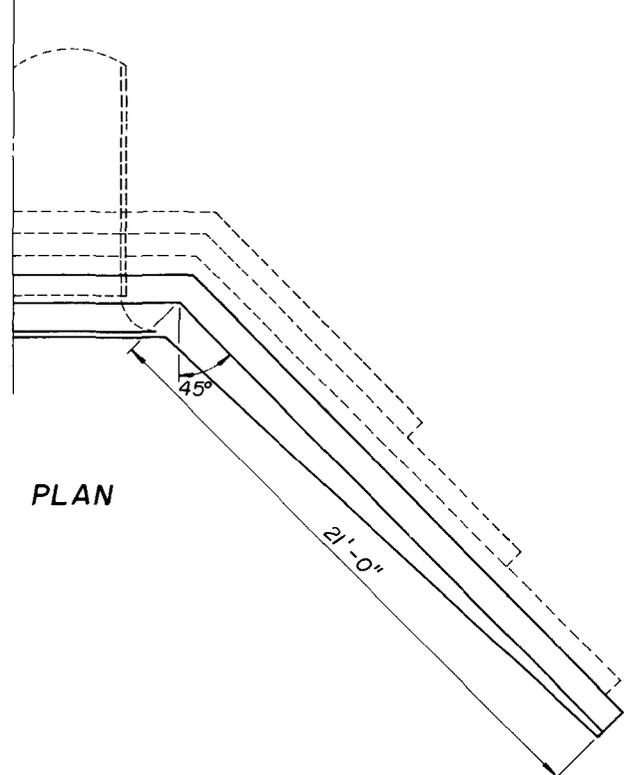
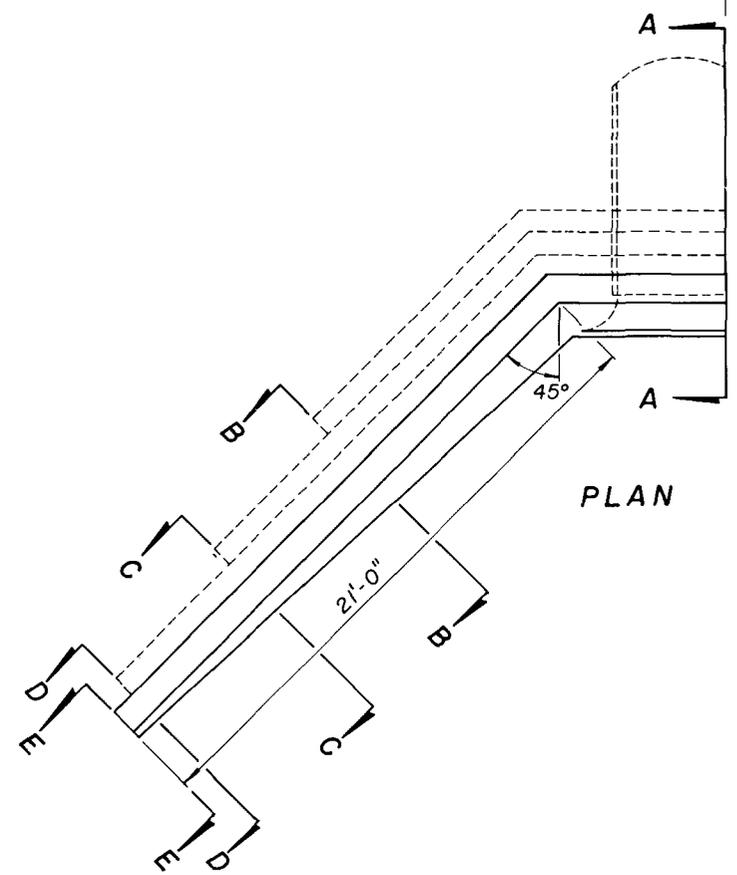
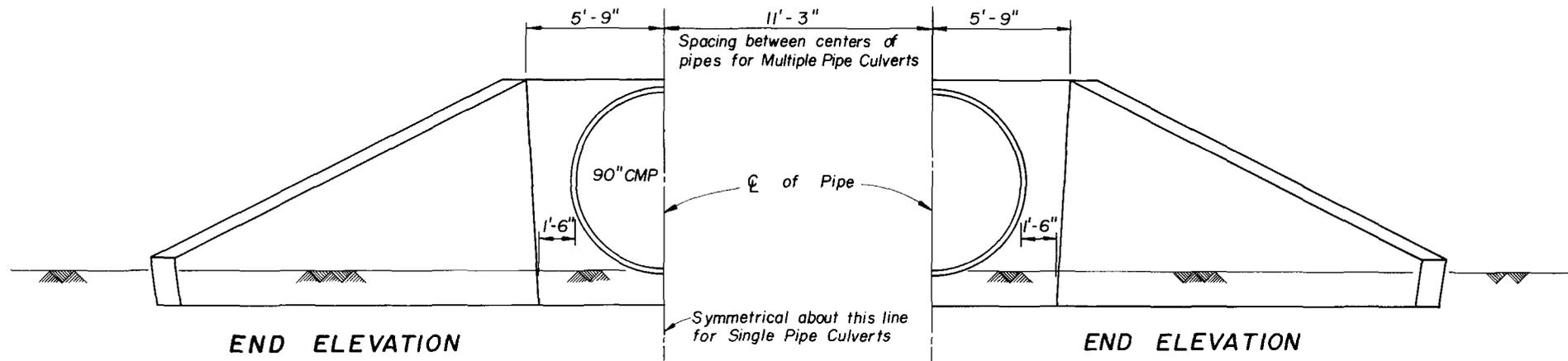
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

SAND-CEMENT ENDWALLS FOR 72" C.M. PIPE

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
10-74	Changed Index No.			
10-77	Retraced			

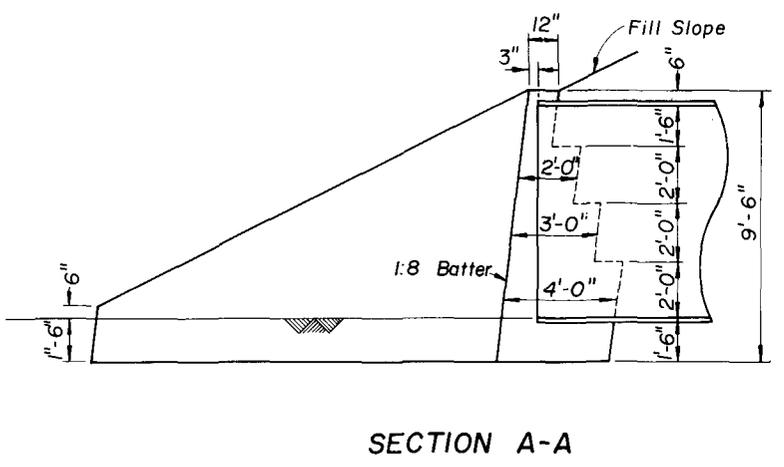
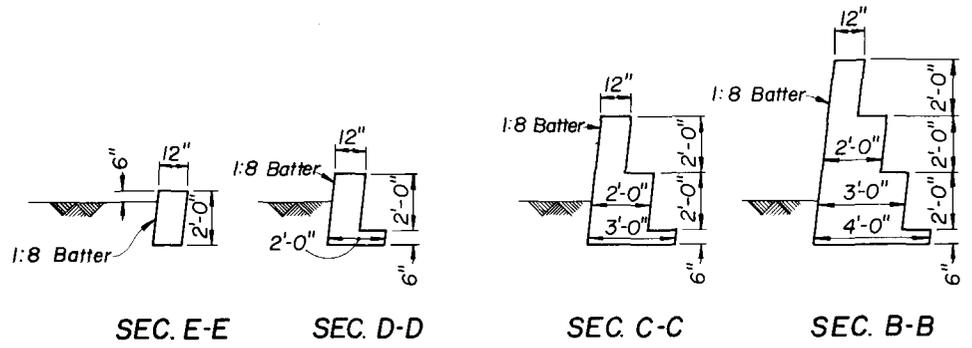
Names	Dates	APPROVED BY
Designed by W.C.L.	5-54	<i>E.H. Hunt</i> County Design Engineer, Roadways
Checked by S.G.B.	5-54	
Quantities by W.C.L.	5-54	
Checked by S.G.B.	5-54	
Supervised by		

Drawing No. 1 of 1 Index No. 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

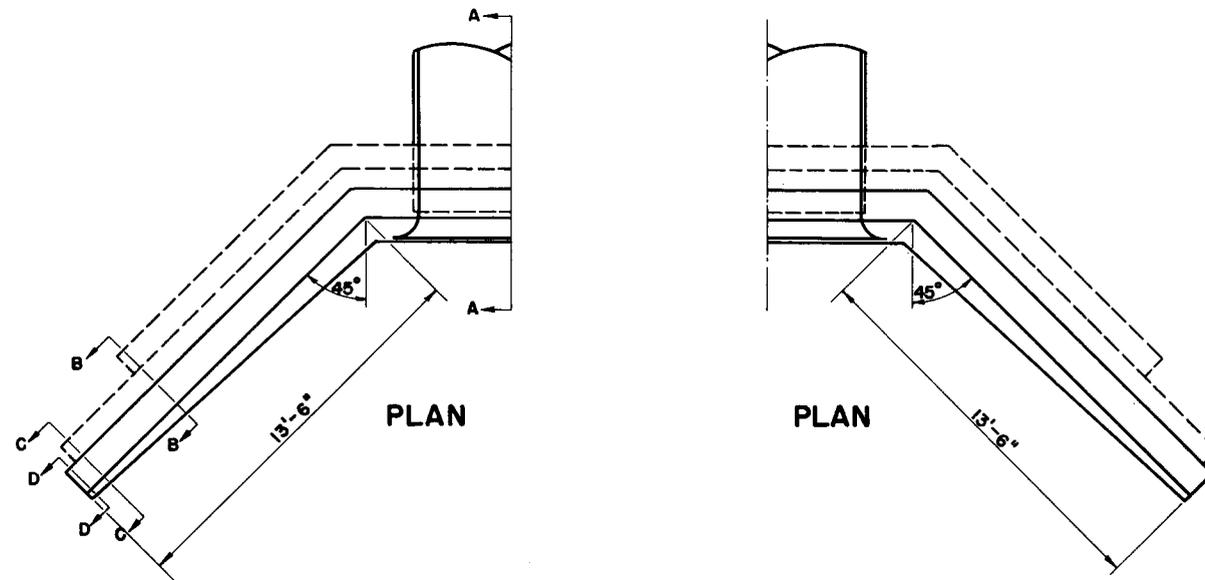
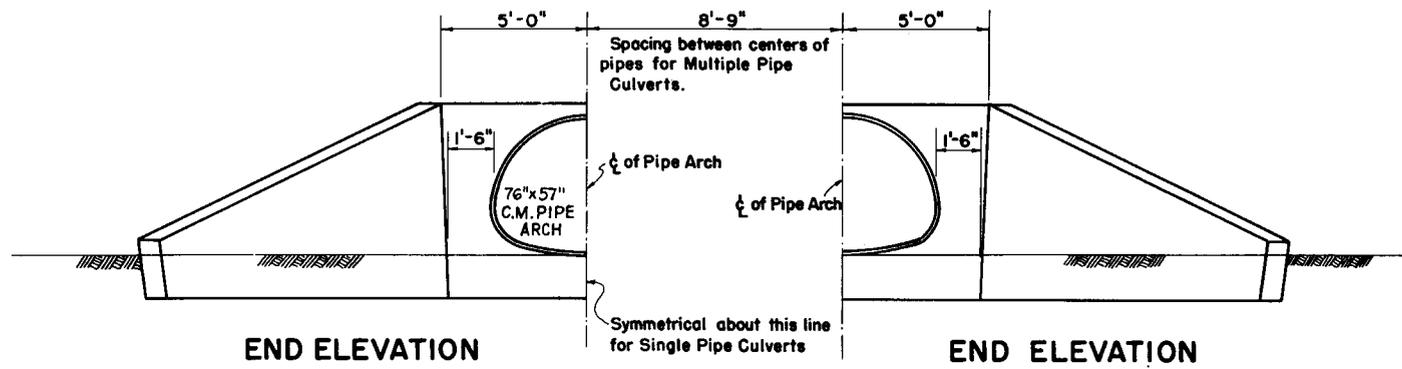
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

SAND-CEMENT ENDWALLS FOR 90" CM. PIPE

ROAD NO.	COUNTY	PROJECT NO.

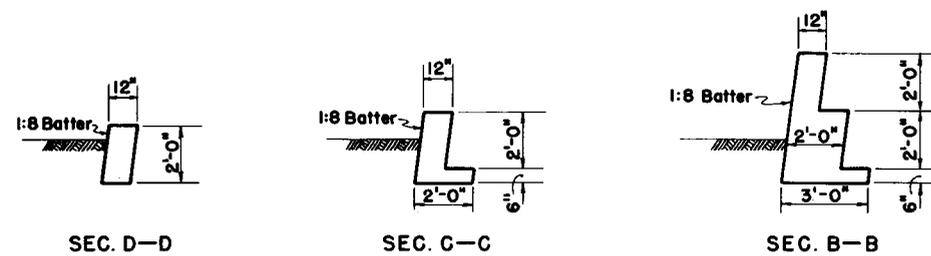
REVISIONS	Names	Dates	APPROVED BY
10-74	E.H.H.	5-12-54	<i>E.H.H.</i> Deputy Design Engineer, Roadways
10-77	W.C.L.	5-13-54	
	E.H.H.	5-12-54	
	W.C.L.	5-13-54	

Drawing No. 1 of 1
Index No. DSE-04



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"

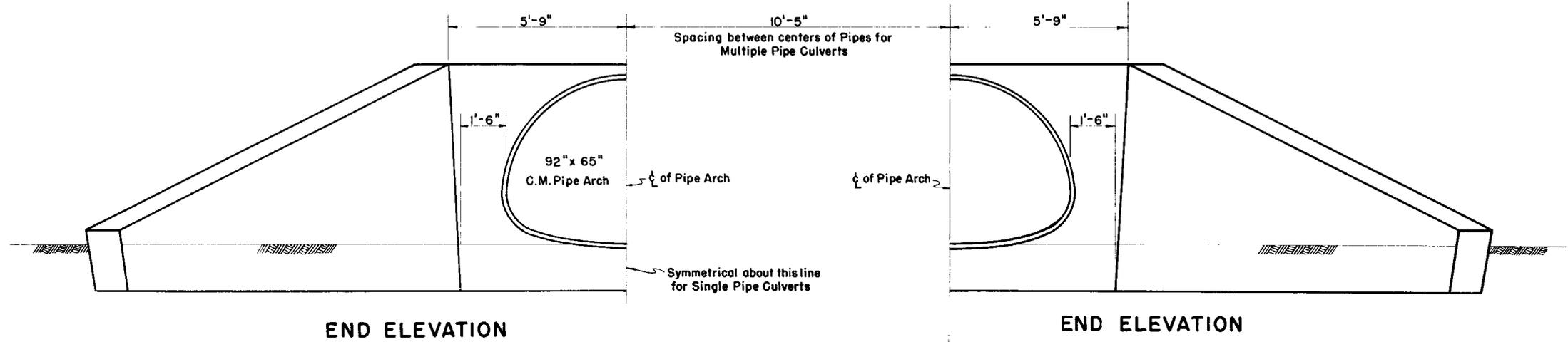


FHWA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
SAND-CEMENT ENDWALLS FOR 76" x 57" C.M. PIPE ARCH

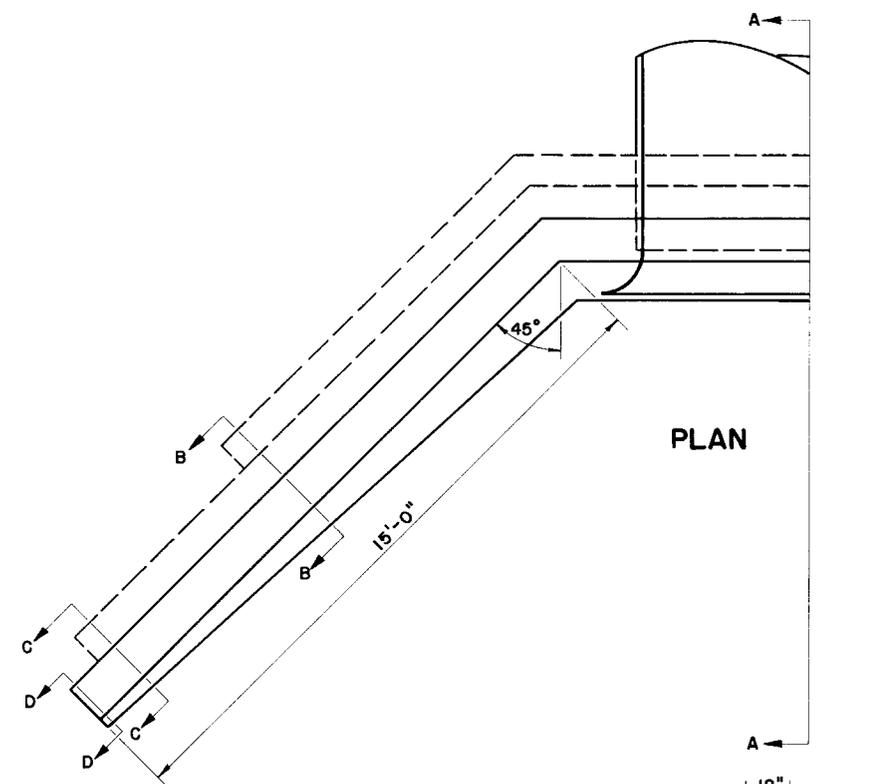
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Date			
10-74			
Changed Index N ^e			

Names	Date	Approved by:
Detailed by S.G.B.	10-15-53	<i>E.H. Hart</i> Deputy Design Engineer - Roadways
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	Drawing No. 1 of 1 Index No. DSE-05

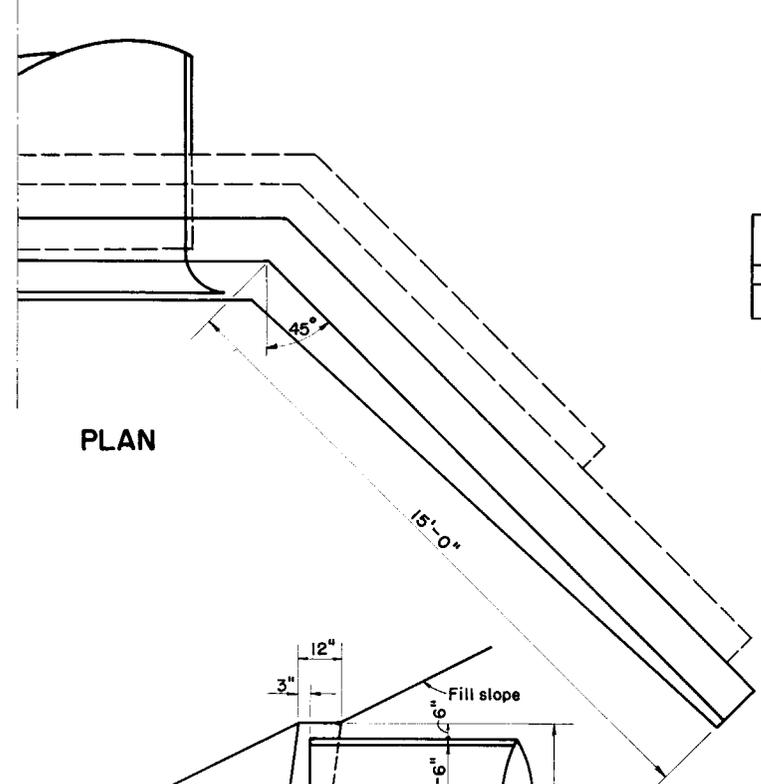


END ELEVATION

END ELEVATION



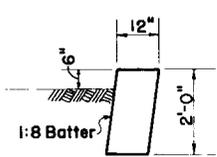
PLAN



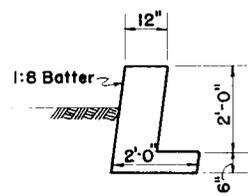
PLAN

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

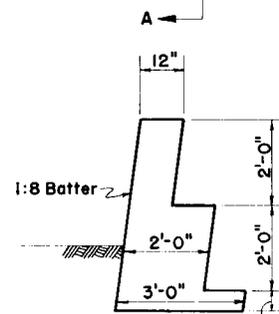
NOTE: Wingwalls based on 2:1 slope
SCALE: 1" = 2'-0"



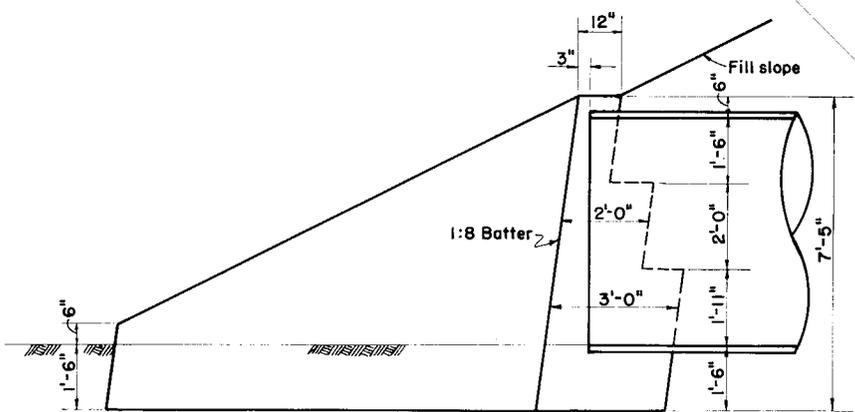
SEC. D-D



SEC. C-C



SEC. B-B

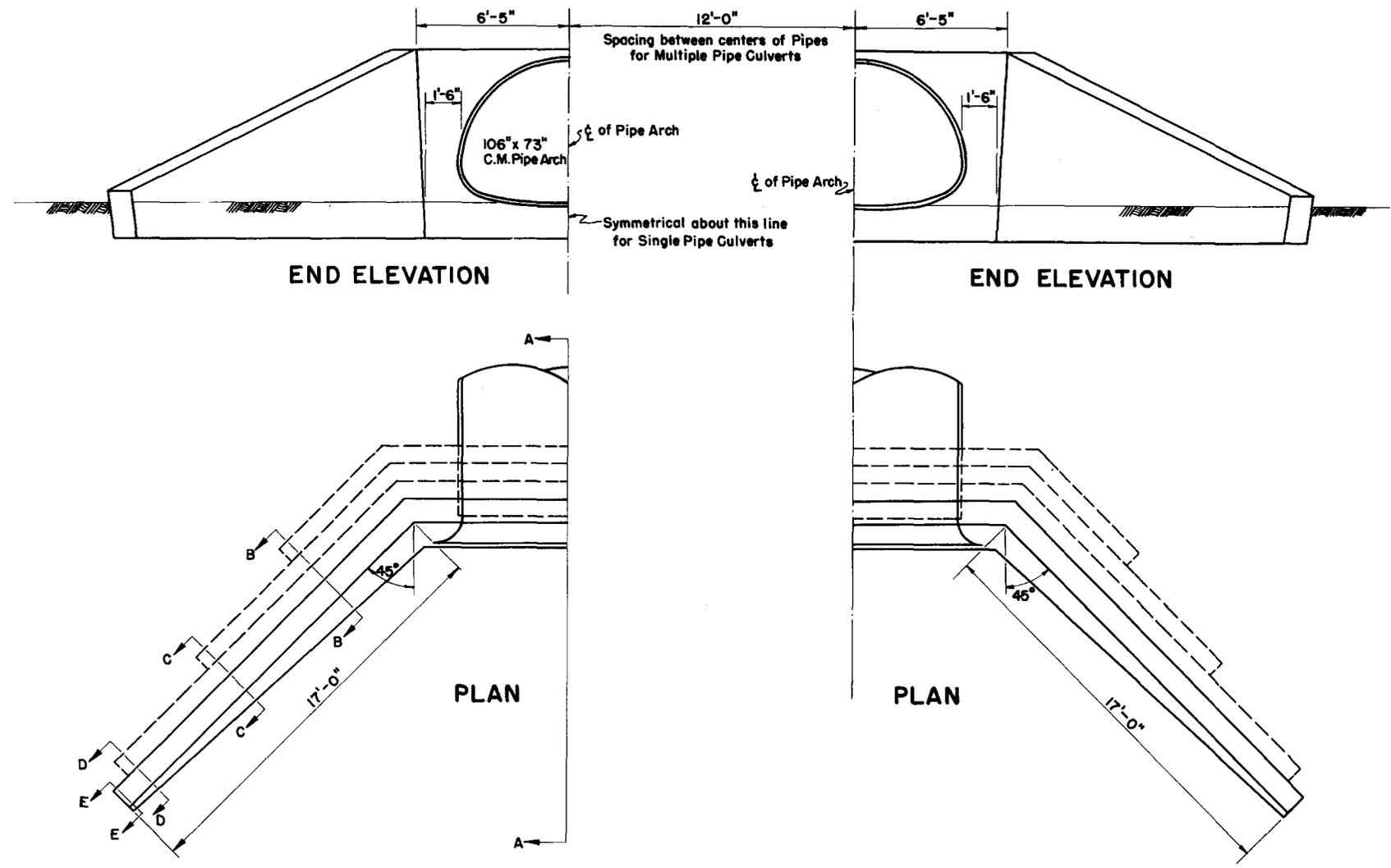


SECTION A-A

FHWA APPROVED: 3-20-75
FLORIDA DEPARTMENT OF TRANSPORTATION
PROJECT PLAN SECTION
SAND-CEMENT ENDWALLS FOR 92" x 65" C.M. PIPE ARCH

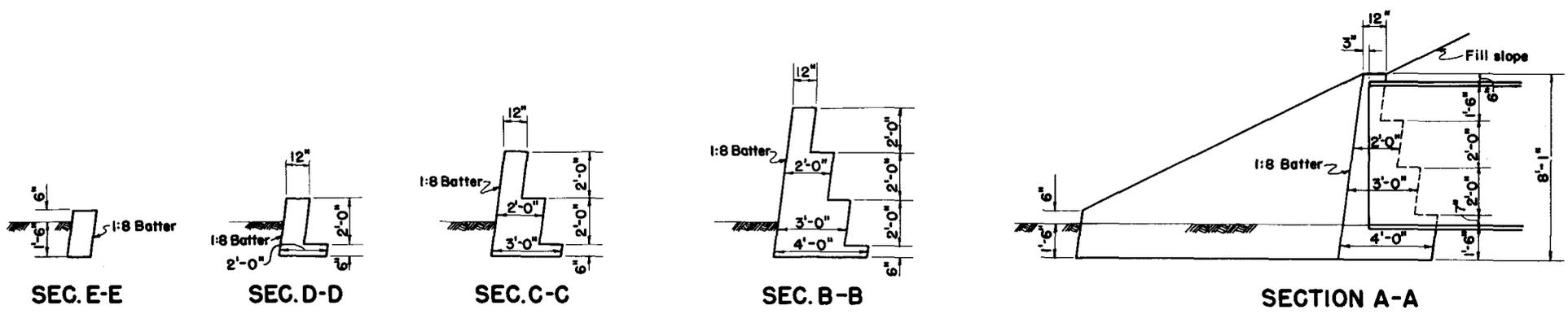
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
10-74	Changed Index No.			

Detailed by	E.H.A.	10-53	Approved by: <i>E.H.A.</i> Deputy Design Engineer - Roadways
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	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"



FHWA APPROVED: 3-20-75

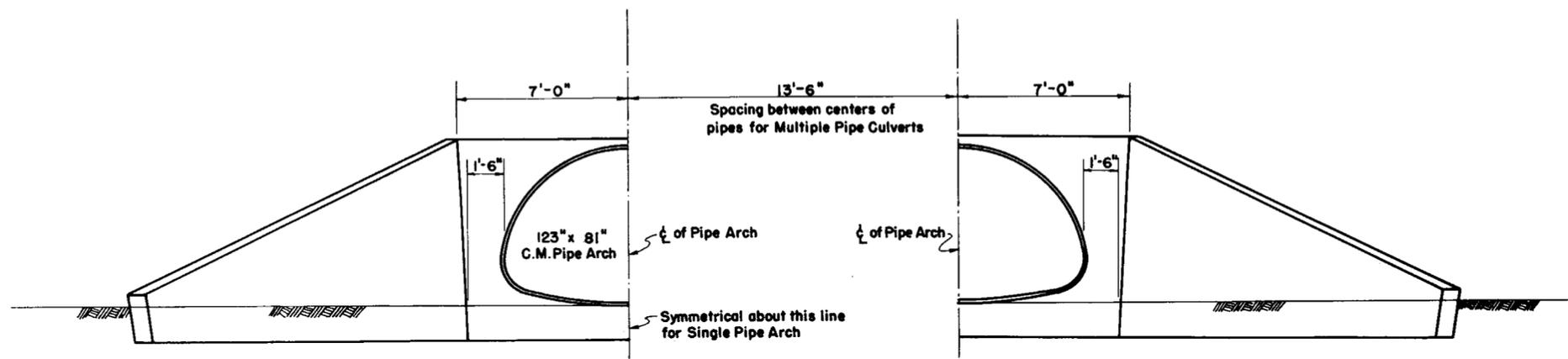
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

SAND-CEMENT ENDWALLS FOR 106" x 73" C.M. PIPE ARCH

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions	Names	Dates
10-74	Changed Index NR		

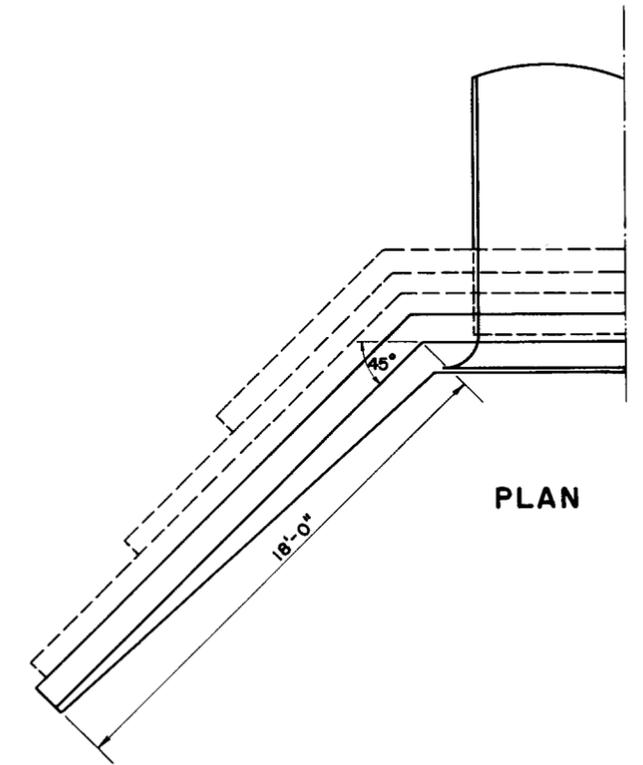
Approved by: *E.H.H.*
Deputy Design Engineer-Roadways

Drawn by	H.W.	Date	11-53
Index No.	1 of 1	DSE-07	

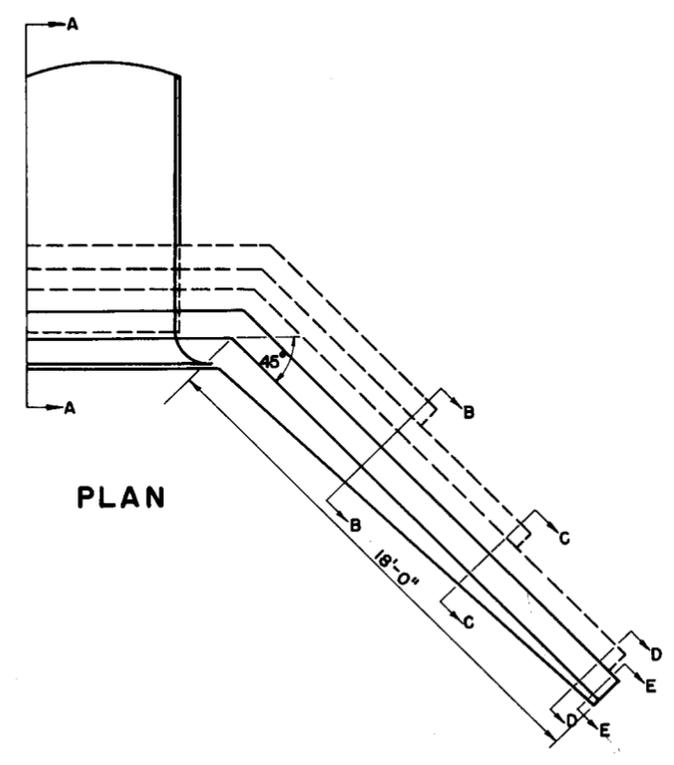


END ELEVATION

END ELEVATION



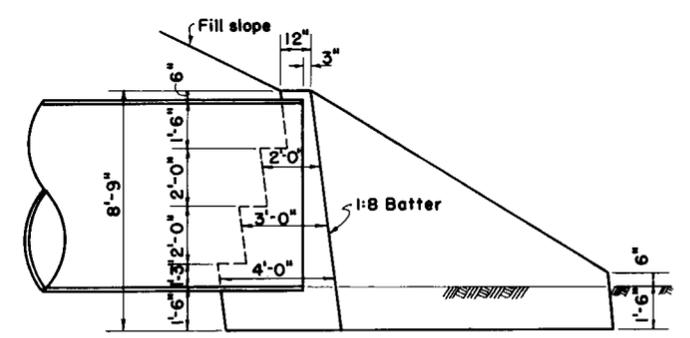
PLAN



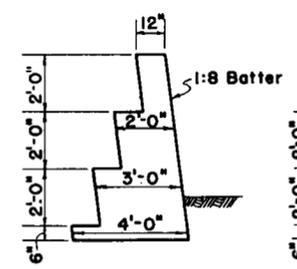
PLAN

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	

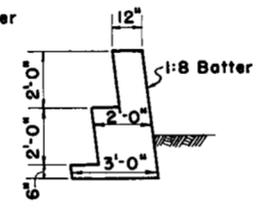
NOTE: Wingwalls based on 2:1 slope
SCALE = 1" = 3'-0"



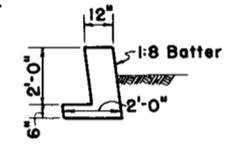
SECTION A-A



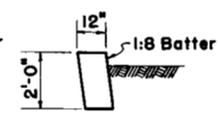
SEC. B-B



SEC. C-C



SEC. D-D



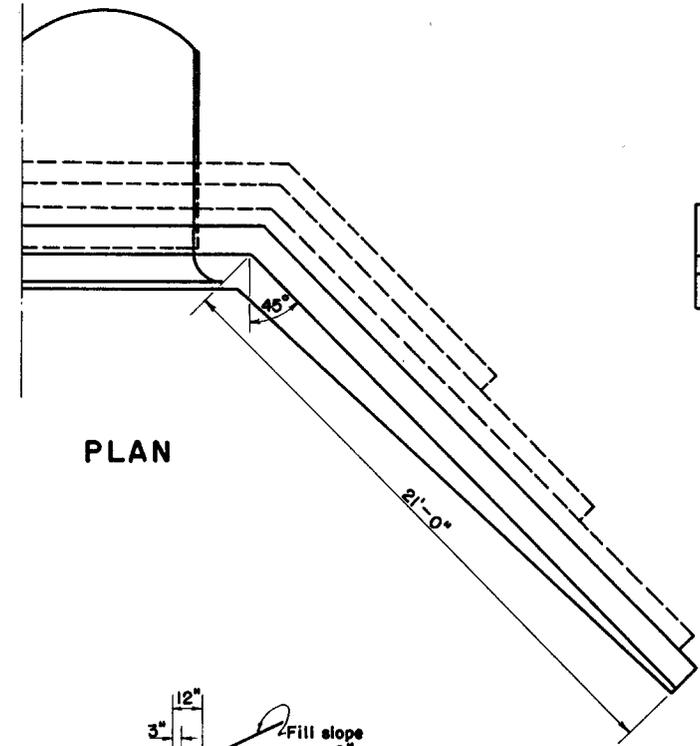
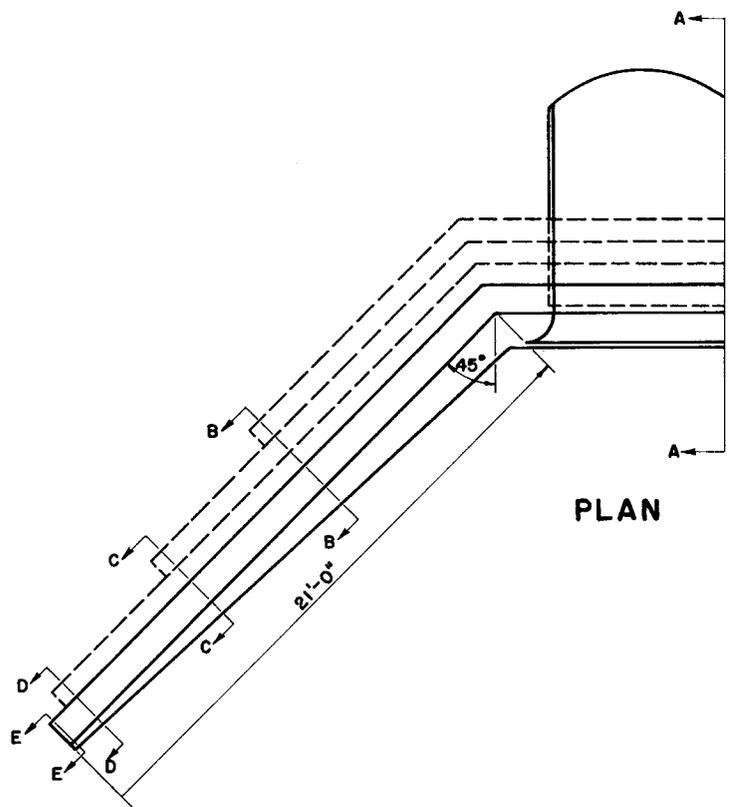
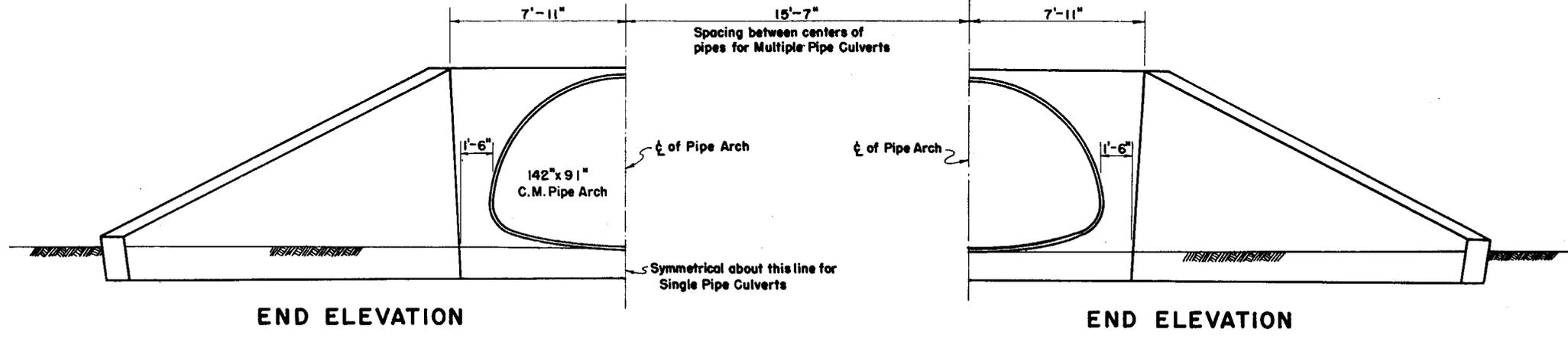
SEC. E-E

FHWA APPROVED: 3-20-75
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
SAND-CEMENT ENDWALLS FOR 123" x 81" C.M. PIPE ARCH

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions			
10-74	Changed Index N.Y.			

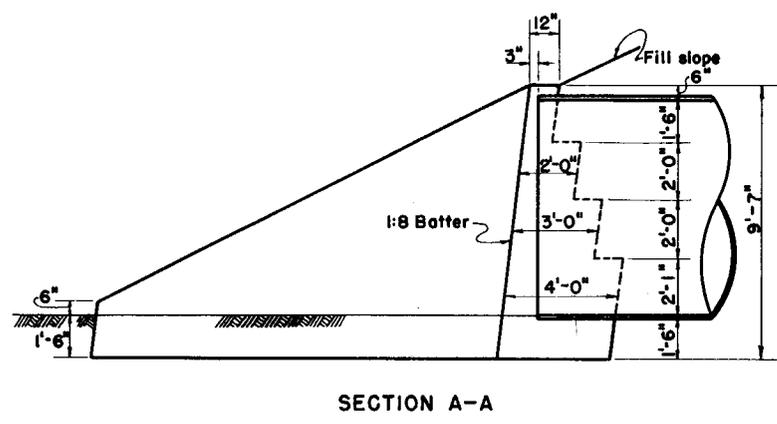
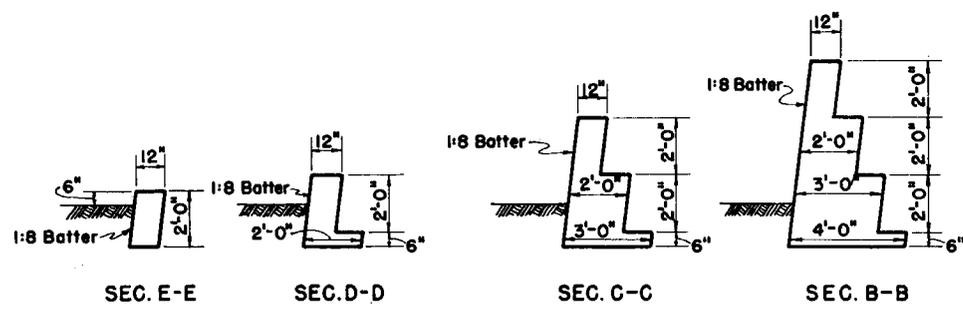
Detailed by	G.A.C.	10-2-53	Approved by: <i>E.H. Hunt</i> Deputy Design Engineer - Roadways
Checked by	E.H.A.	10-19-53	
Quantities by	G.A.C.	10-2-53	
Checked by	E.H.A.	10-19-53	
Traced by	H.W.	10-21-53	

Drawing No.	Index No.
1 of 1	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

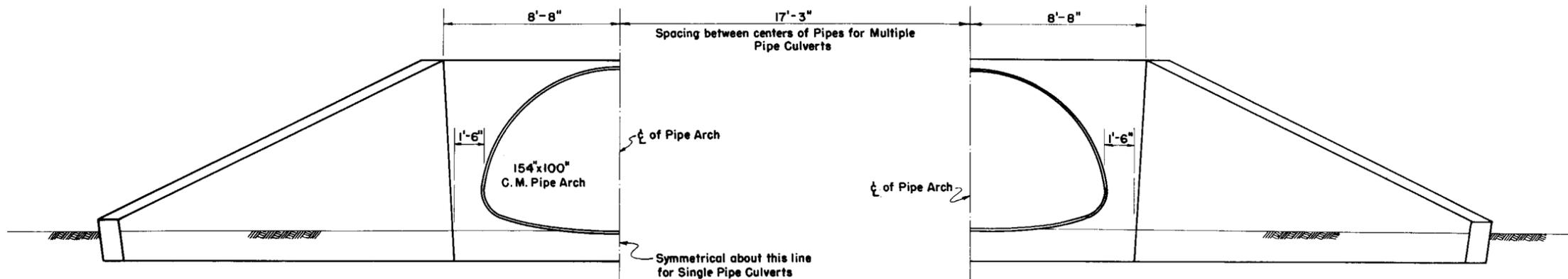
NOTE: Wingwalls based on 2:1 slope
SCALE = 1" = 3'-0"



FHWA APPROVED: 3-20-75
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION
SAND-CEMENT ENDWALLS FOR 142" x 91" C.M. PIPE ARCH

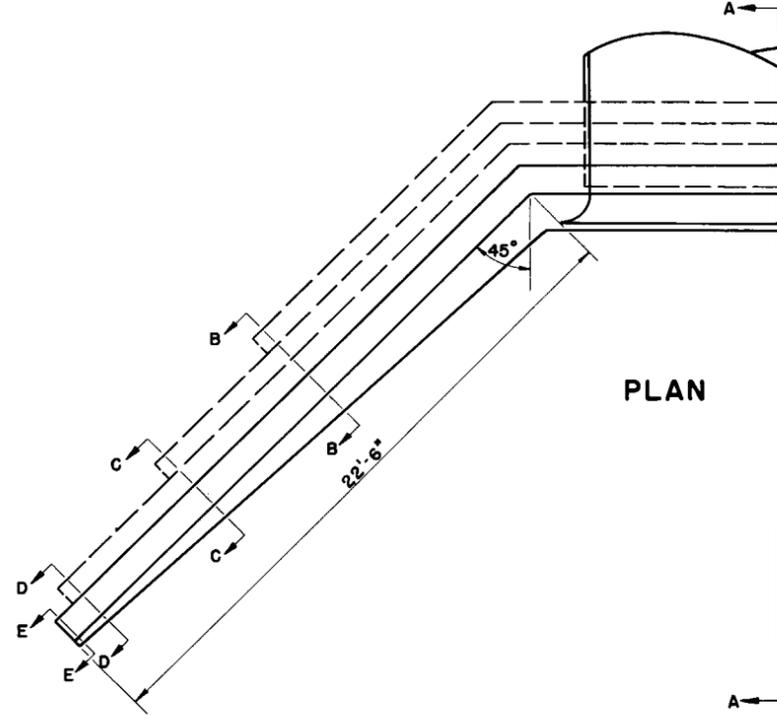
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions			
10-78	Changed Index N ^o			

Detailed by	E.H.A.	10-12-53	Approved by: <i>E.H.A.</i> Deputy Design Engineer - Roadways
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
			Index No. DSE-09

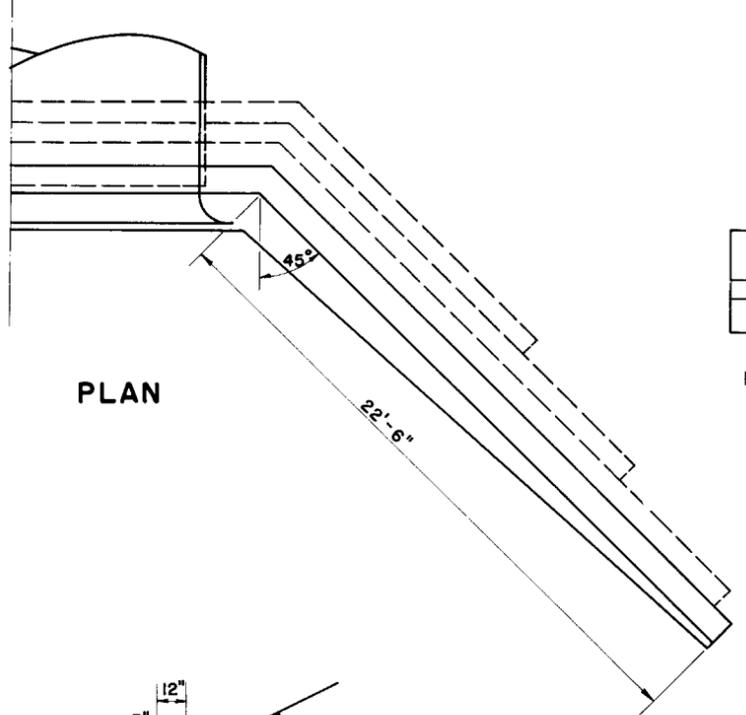


END ELEVATION

END ELEVATION



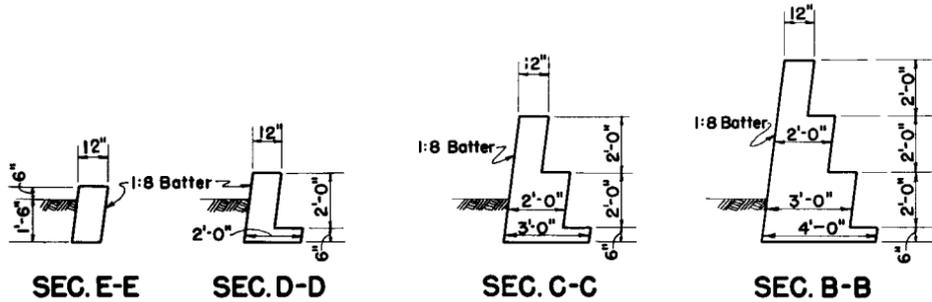
PLAN



PLAN

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"

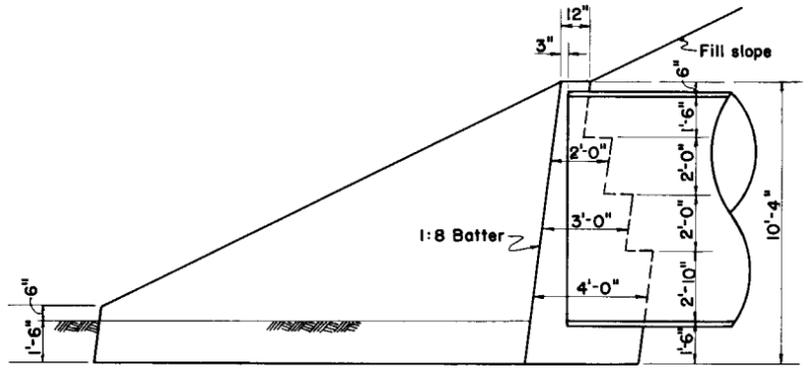


SEC. E-E

SEC. D-D

SEC. C-C

SEC. B-B

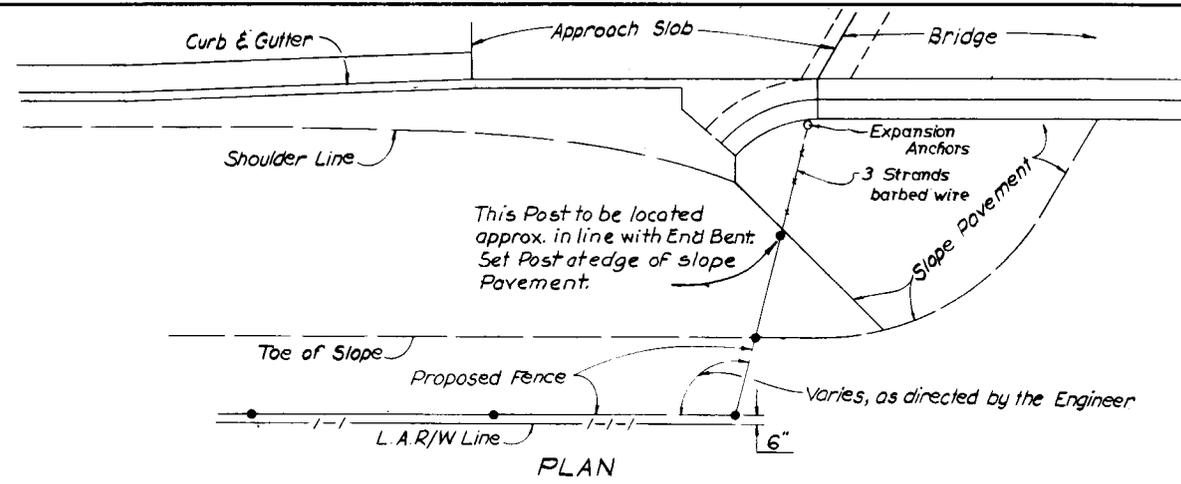
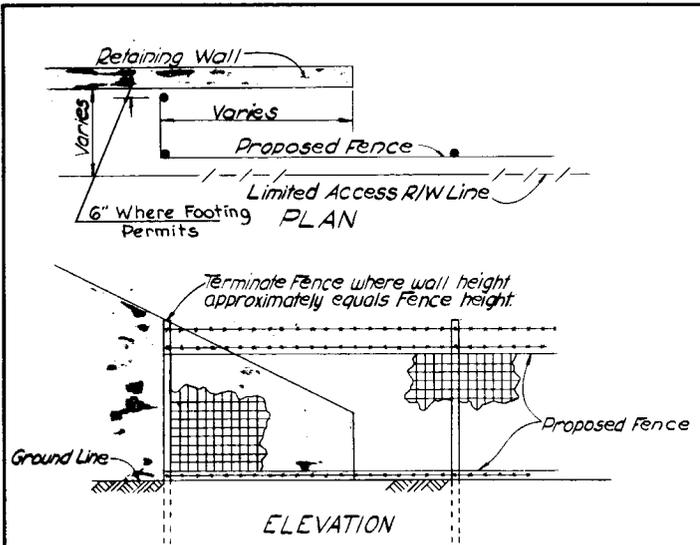


SECTION A-A

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

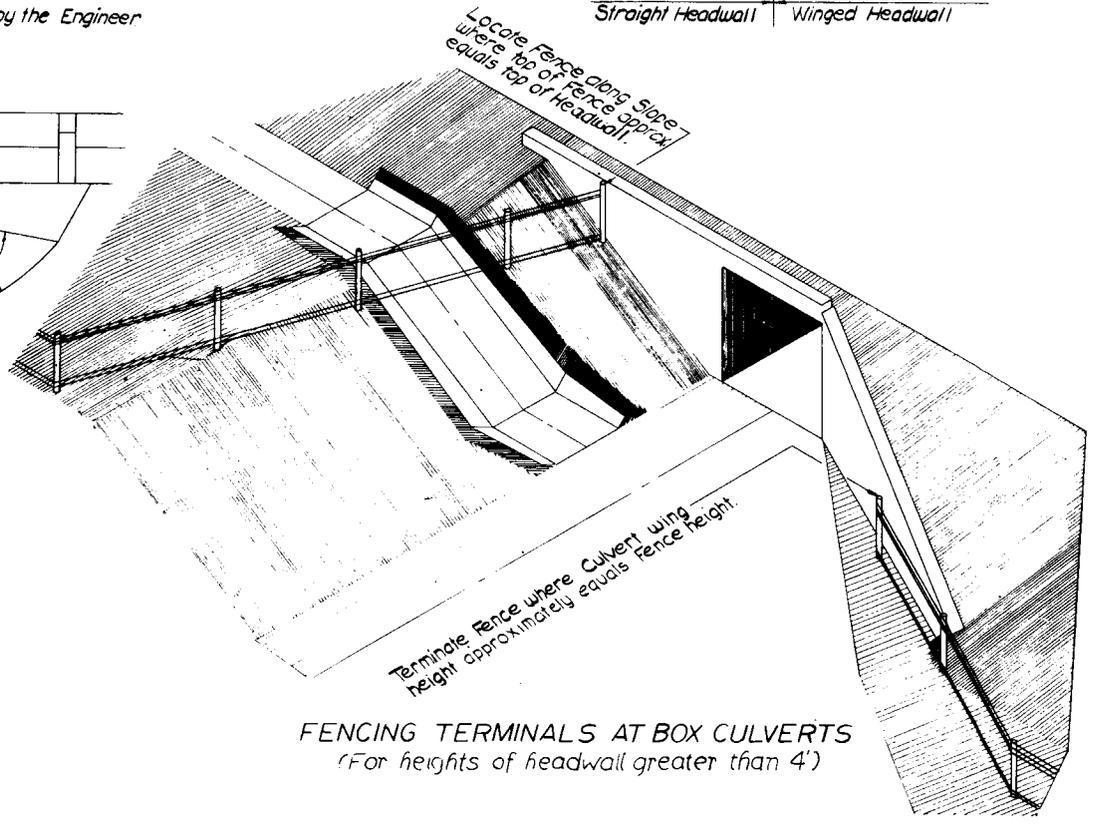
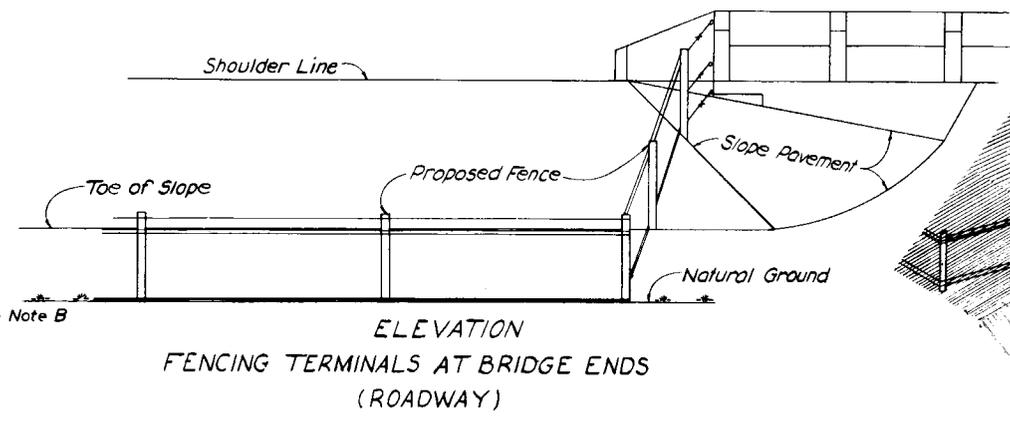
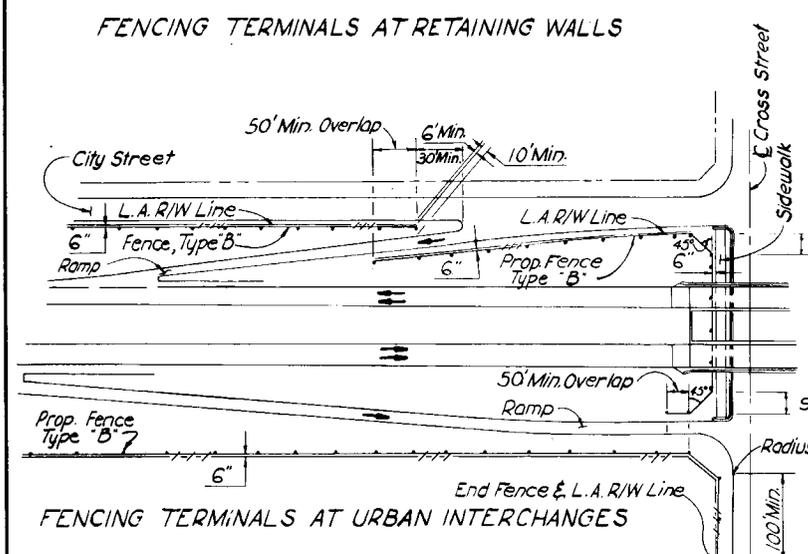
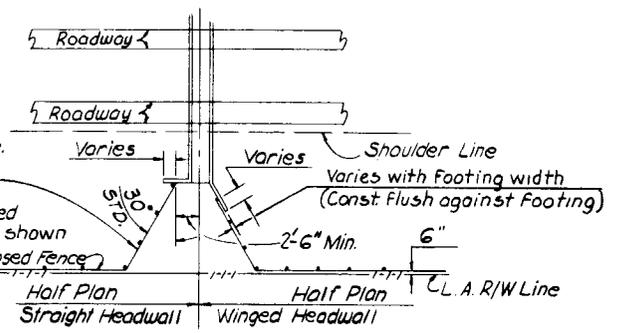
Detailed by	E.H.A.	10-53
Checked by	E.H.H.	10-53
Quantities by	E.H.A.	10-53
Checked by	E.H.H.	10-53
Traced by	H.W.	11-53

FHWA APPROVED: 3-20-75	
FLORIDA DEPARTMENT OF TRANSPORTATION	
ROADWAY PLANS SECTION	
SAND-CEMENT ENDWALLS FOR	
154"x100" C.M. PIPE ARCH	
Approved by:	
Deputy Design Engineer - Roadways	
Drawing No.	1 of 1
Index No.	DSE-10

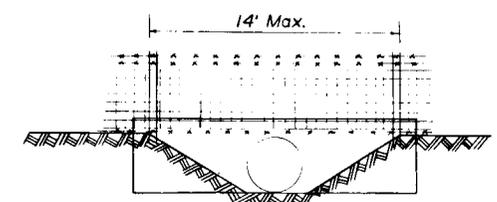
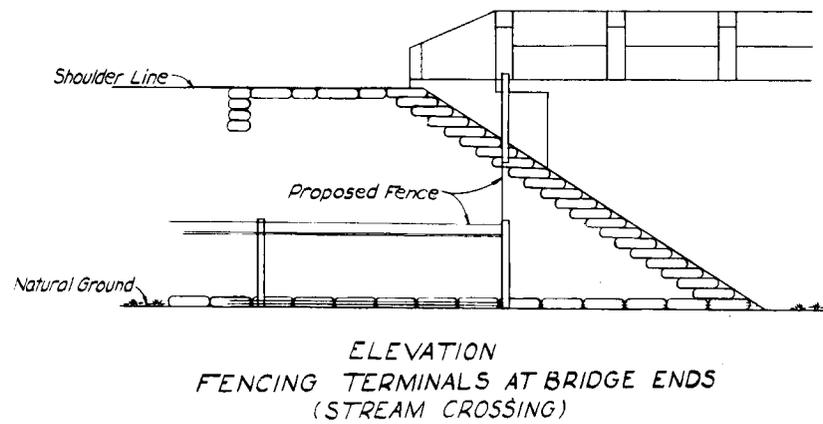
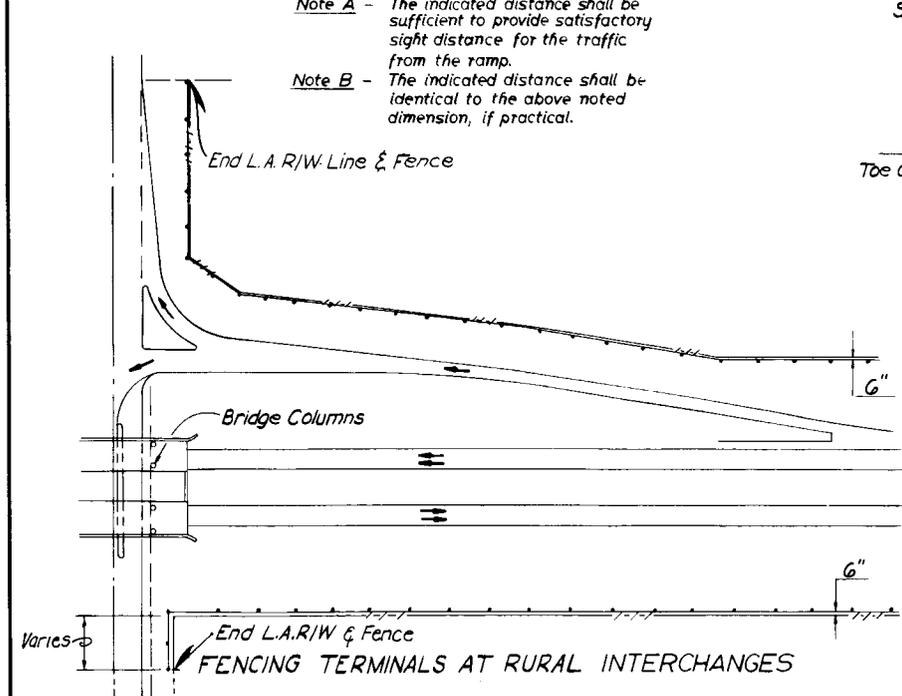
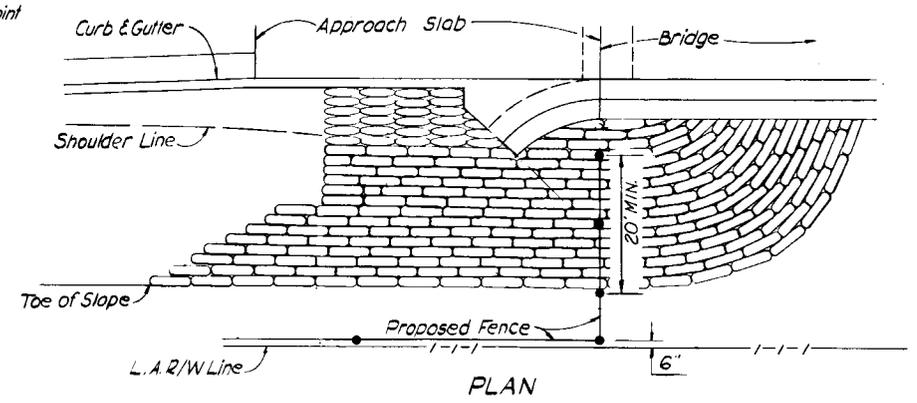


Note:

1. Angle of fence to be measured from a line parallel to the ϵ of Structure.
2. This Fence location to be used at Cross Drains with excavated outfall Ditches or as shown in plans.



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



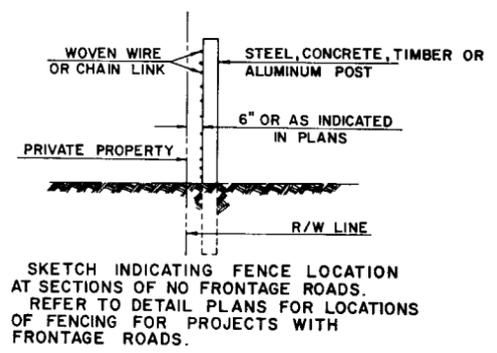
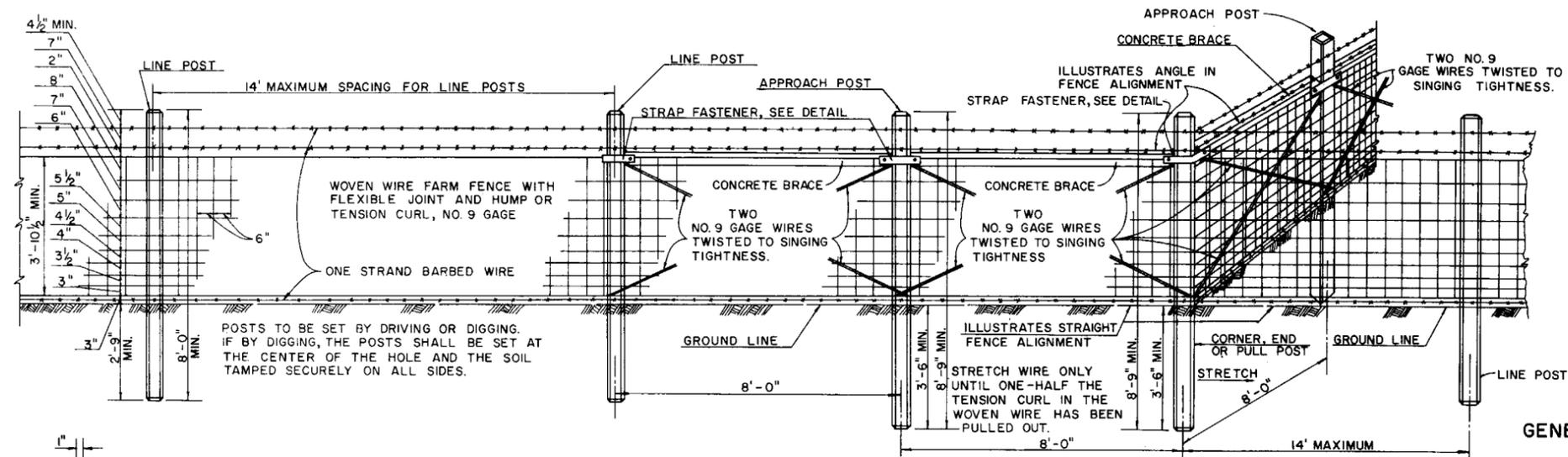
FENCING DETAIL AT CULVERT
(For heights of headwalls 4' or less.)

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.

F.H.W.A. APPROVED: 6-18-74
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

FENCE LOCATION DETAILS

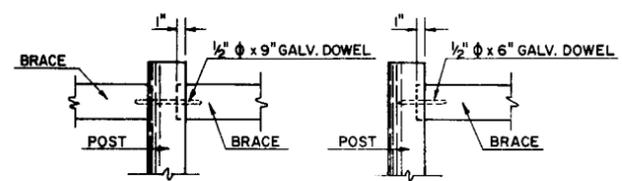
REVISIONS		REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	Date	Description	Name	Date	Recommended For Approval by
10/68	ADDED TO TOP TYPE 'B' FENCING (SH-1) POSITION VIEW OF FENCING TERMINALS AT BOX CULVERTS (SH-2)	8-66	REVISED INTERM. FENCING. ADDED NOTES TO CULV. DETAILS (SH-2)	h.f.w.	2-19-65	C. D. [Signature] Engineer of Road Design
4-67	REVISED 'B' Fence to G; Revised 'A' fence note to read 'Two No. 9 Gage Wires.'	RLO				APPROVED BY [Signature] Asst. State Highway Engineer
				Checked by		Drawing No.
				Quantity by		1 OF 1
				Checked by	h.f.w.	Index No.
				Traced by	2-19-65	FLD-01



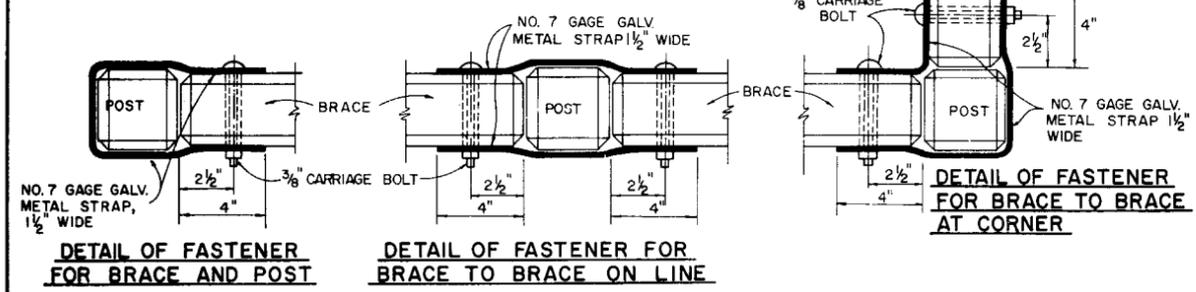
GENERAL NOTES (TYPE "A" FENCE)

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.

DETAILS OF TYPE "A" FENCE
(ILLUSTRATED FOR CONC. POSTS AND BRACES)



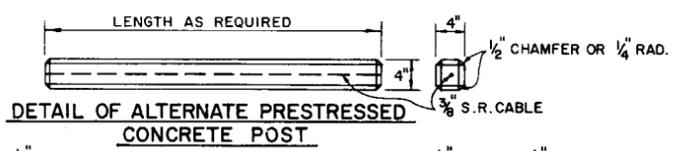
**ALTERNATE
TIMBER BRACING DETAILS**



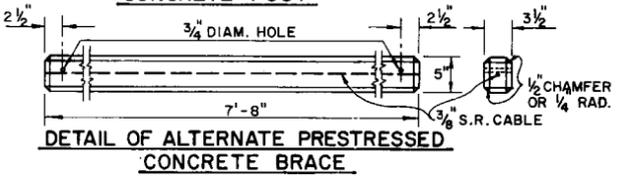
**DETAIL OF FASTENER
FOR BRACE AND POST**

**DETAIL OF FASTENER FOR
BRACE TO BRACE ON LINE**

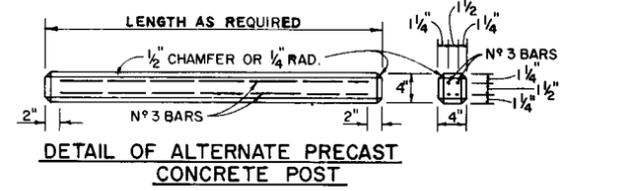
**DETAIL OF FASTENER
FOR BRACE TO BRACE
AT CORNER**



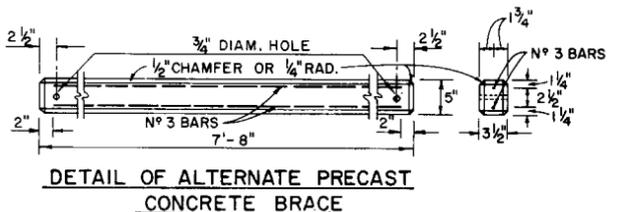
**DETAIL OF ALTERNATE PRESTRESSED
CONCRETE POST**



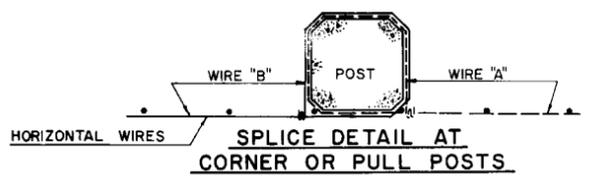
**DETAIL OF ALTERNATE PRESTRESSED
CONCRETE BRACE**



**DETAIL OF ALTERNATE PRECAST
CONCRETE POST**

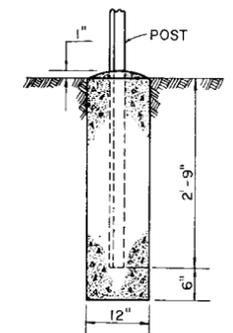


**DETAIL OF ALTERNATE PRECAST
CONCRETE BRACE**



**SPLICE DETAIL AT
CORNER OR PULL POSTS**

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.

FHWA APPROVED: 9-3-76
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

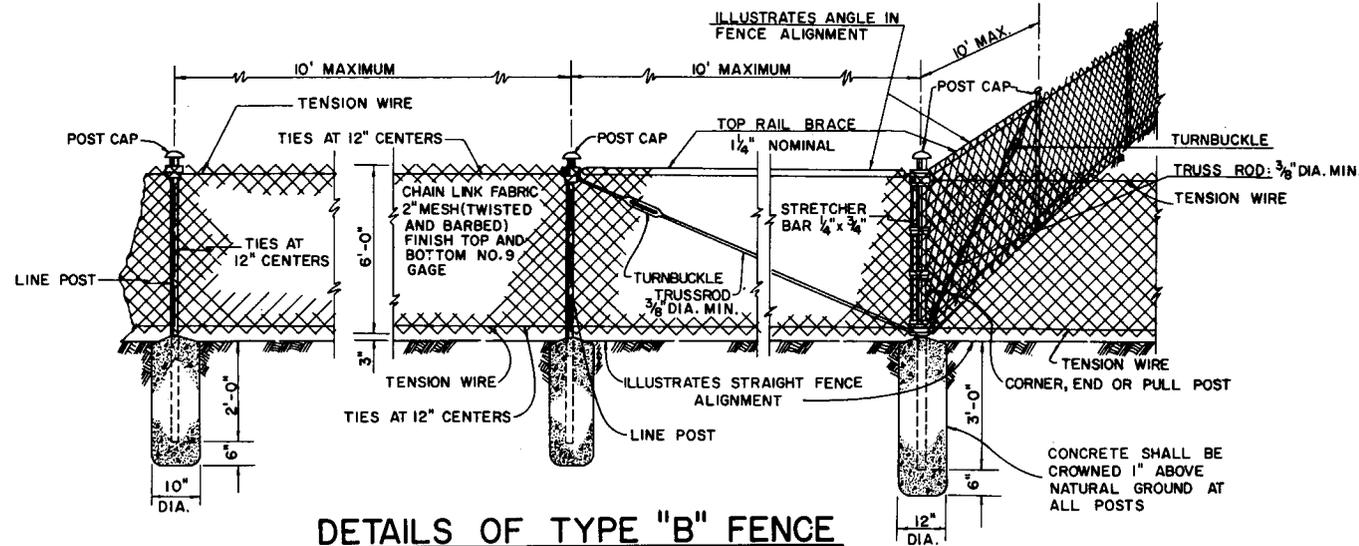
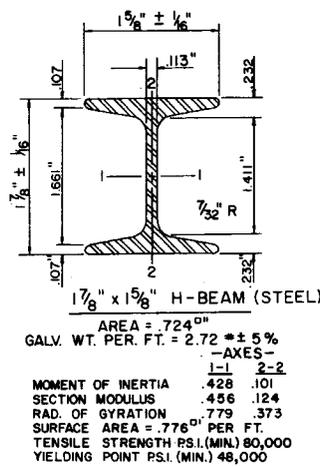
FENCE, TYPE A

REVISIONS			INITIALS	DATES	Recommended, for approval by <i>[Signature]</i> Deputy Design Engineer - Roadways
Dates	Descriptions	Designed by			
5-10-74 WGL	REVISED	Checked by			Approved by <i>[Signature]</i> State Design Engineer
11-75 L.M.F.	REVISED NOTE 3 ADDED NOTES 5 & 6	Quantities by			
7-76 L.M.F.	ADDED CONC. POSTS AND BRACES	Checked by			
		Supervised by			

DRAWING NO. **1 OF 1** INDEX NO. **FTA-01-2**



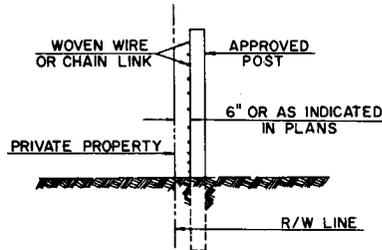
ALTERNATE H-BEAM LINE POST FOR TYPE "B" FENCE



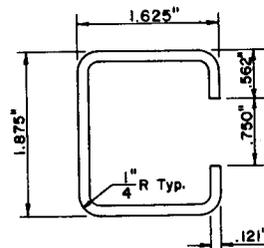
DETAILS OF TYPE "B" FENCE
(ILLUSTRATED FOR STEEL TUBULAR POSTS)

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, TIE WIRES, 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.

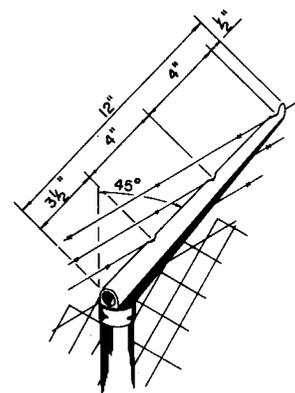


SKETCH INDICATING FENCE LOCATION AT SECTIONS OF NO FRONTAGE ROADS. REFER TO DETAIL PLANS FOR LOCATIONS OF FENCING FOR PROJECTS WITH FRONTAGE ROADS.



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

GALV. WT. PER. FT. = 2.34 ± 5%
YIELDING POINT P.S.I. (MIN.) 45,000



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

GENERAL NOTES FOR ALL FENCE

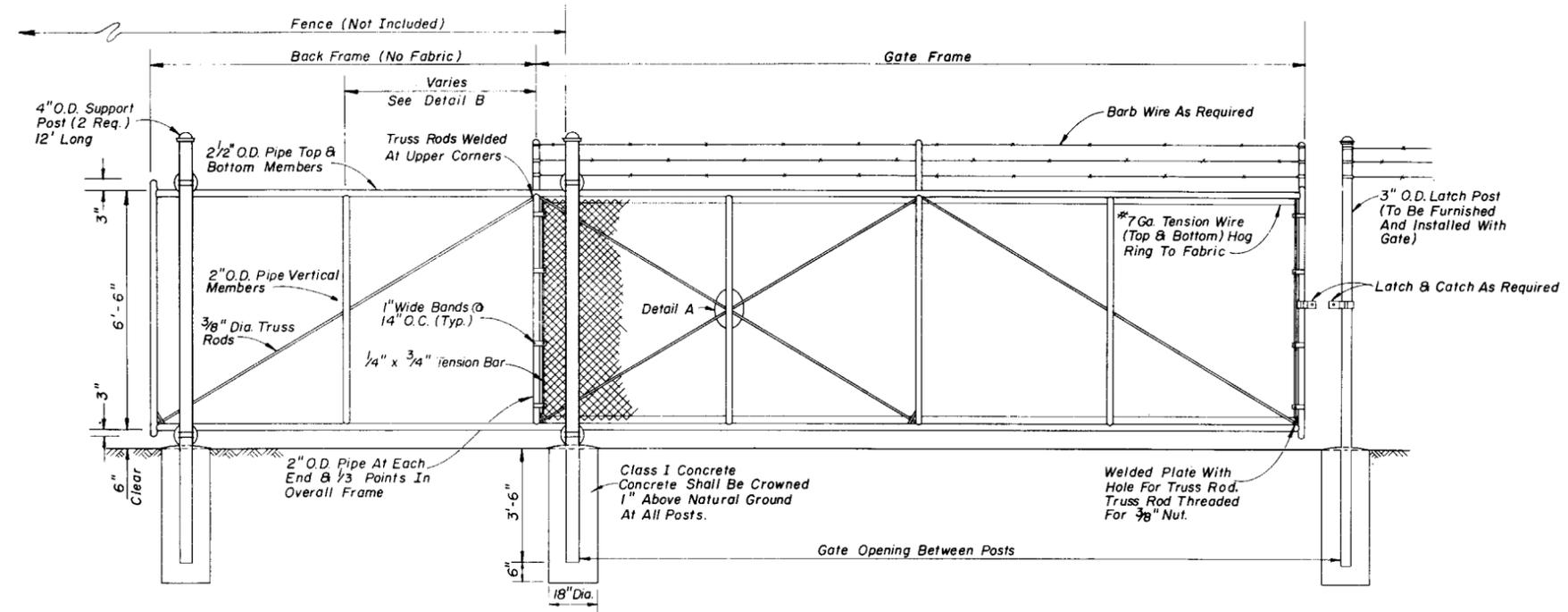
THE TYPE OF FENCE TO BE INSTALLED SHALL BE SHOWN ON PLANS. PULL POSTS SHALL BE USED AT BREAKS IN VERTICAL GRADES OF 15° OR MORE, OR AT APPROXIMATELY 330' CENTERS EXCEPT THAT THIS MAXIMUM INTERVAL MAY BE REDUCED BY THE ENGINEER ON CURVES WHERE THE DEGREE OF CURVATURE IS GREATER THAN 3 DEGREES. PULL POSTS 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: 9-8-76

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

FENCE, TYPE B

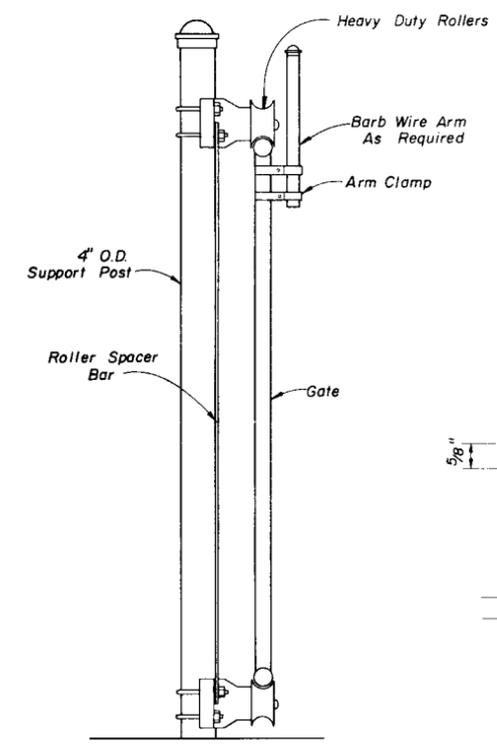
REVISIONS		INITIALS	DATES	Recommended for approval by <i>[Signature]</i> Deputy Design Engineer - Roadways
Dates	Descriptions	Designed by		
5-7-74 G.L.	REVISED	Checked by		Approved by <i>[Signature]</i> State Design Engineer
11-75 L.M.F.	REVISED NOTE 4 AND OTHER NOTES	Quantities by		
7-76	ADDED "C" POST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



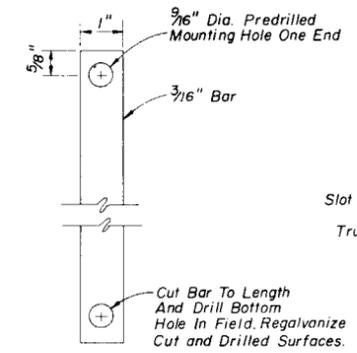
GENERAL NOTES

1. All fabric shall be #9 gage 2" mesh knuckled top & bottom selvages.
2. All gate components shall meet the galvanizing requirements specified in Index No. FTB-01.
3. Cost of all gate components shall be included in the contract unit price for Cantilever Slide Gate.
4. The Contractor may substitute any equivalent cantilever slide gate approved by the Engineer.

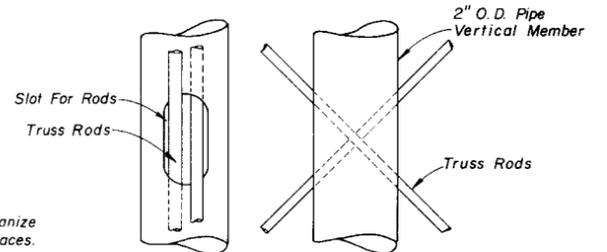
FRONT ELEVATION



SUPPORT POST DETAIL

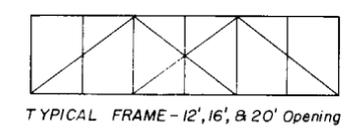


ROLLER SPACER BAR

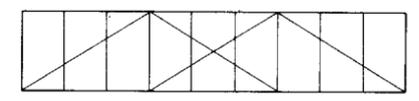


DETAIL A

GATE OPENING	GATE FRAME	BACK FRAME
12'	12'-3"	6'
16'	16'-3"	8'
20'	20'-3"	10'
24'	24'-3"	12'



TYPICAL FRAME - 12', 16', & 20' Opening



TYPICAL FRAME - 24' Opening

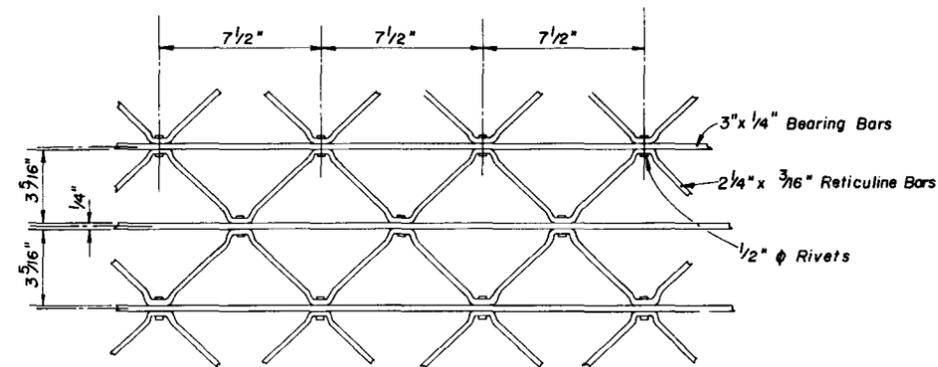
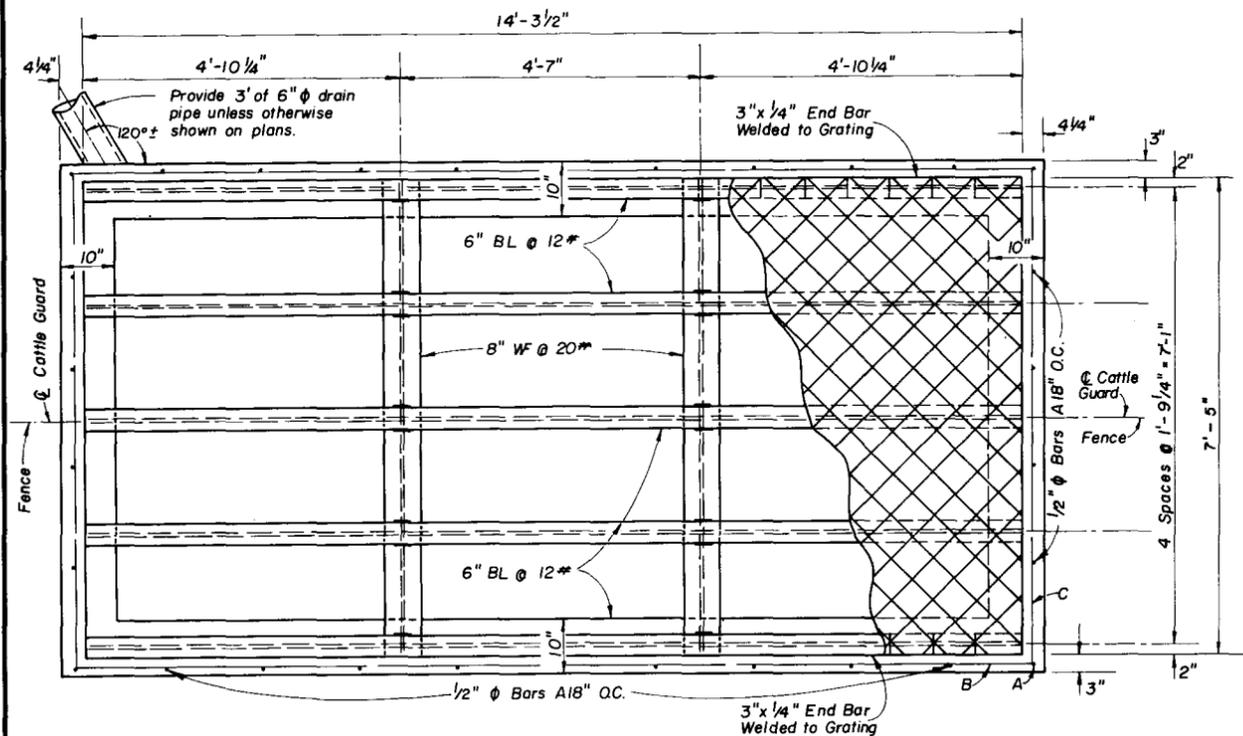
DETAIL B

FHWA APPROVED: 10-26-78

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION
CANTILEVER SLIDE GATE

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions			
		APPROVED BY		
		Names	Dates	
		Designed by		
		Checked by		
		Quantities by		
		Checked by		
		Supervised by		

E.H. Hart
Deputy Design Engineer - Roadways
Drawing No. Index No.
1 of 1 FTB-02

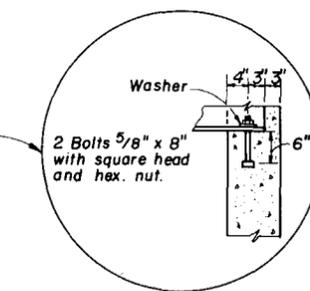
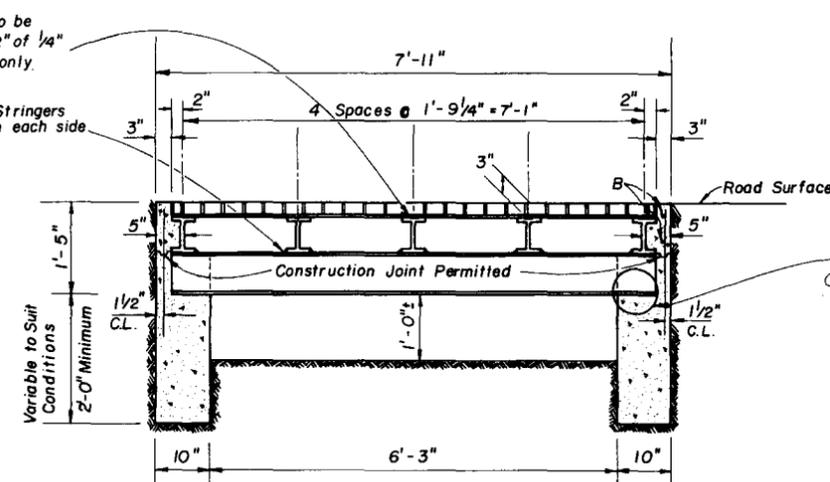
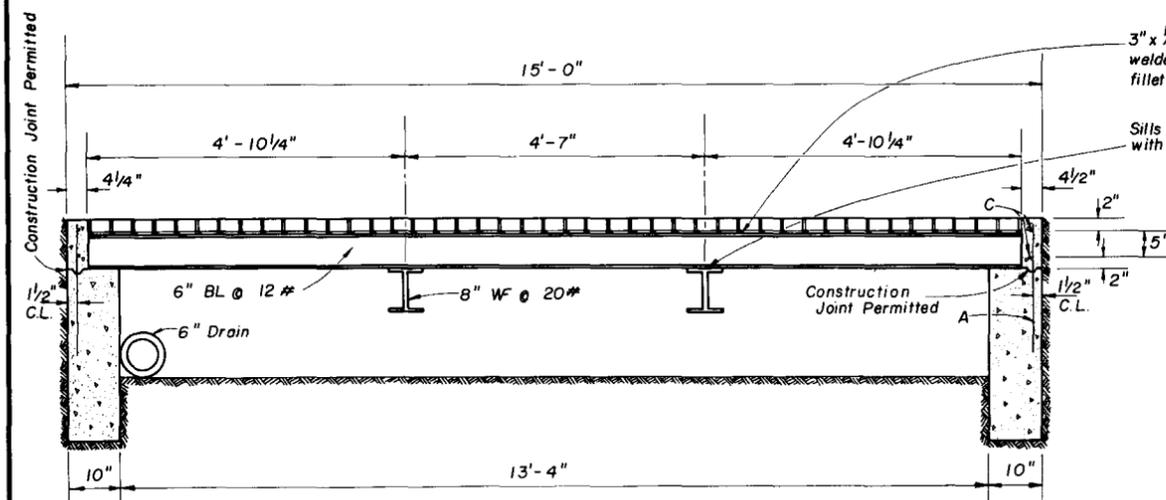


BILL OF REINFORCING STEEL					
MARK	SIZE	NO. REQ'D.	LENGTH	LOCATION	BENDING
A	1/2" φ	30	2'-0"	Wall	Straight
B	1/2" φ	4	14'-8"	Wall	Straight
C	1/2" φ	4	7'-7"	Wall	Straight

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete, Class II	Cu. Yd.	3.95
Reinforcing Steel	Lb.	100
Structural Steel	Lb.	1162
Steel Bridge Floor	Sq. Ft.	106.0

NOTES

- Decking to be welded to sills (6" BL 12#).
- Sills (6" BL 12#) to be welded to 8" WF 20#.
- Stringers (8" WF 20#) to be anchored to concrete with 5/8" φ anchor bolts (4 bolts per stringer).
- Steel bridge floor to be "A.F." type Air Field Grid, as manufactured by Irving Subway Grating Co., Inc., Long Island City, 1, New York (or equal).
- Steel flooring shall be given one shop coat of red lead according to manufacturer's specifications and one field coat of graphite paint.
- Structural steel beams shall be given one shop coat of red lead and two field coats of cut back asphalt, grade R.C.-70.
- Cut back asphalt may be applied by mopping.



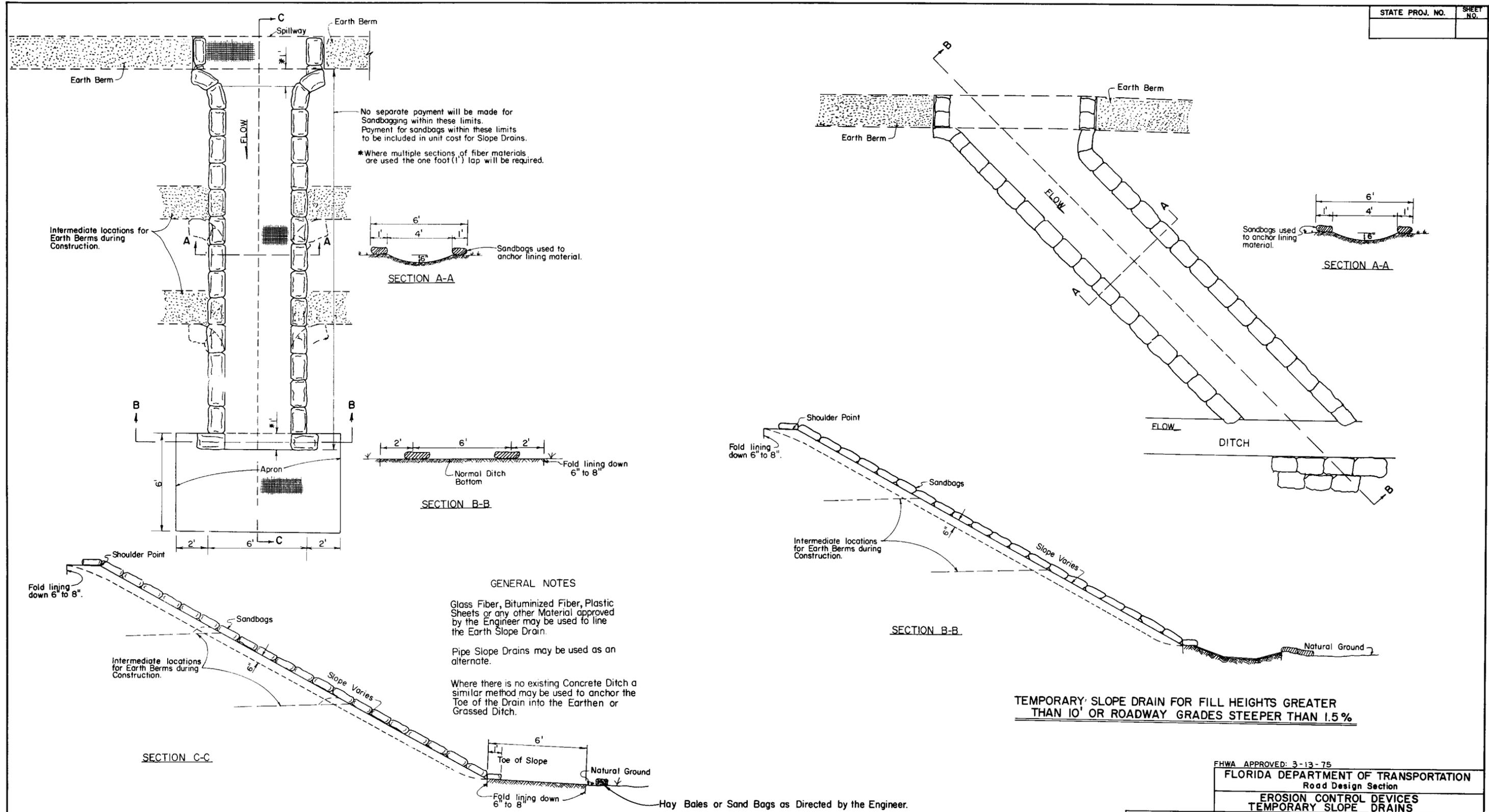
FHWA. Approved: 3-20-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

CATTLE GUARD

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
10-3-51	Retraced			
3-73	Added Class II Conc.	Designed by	J. L. W.	4-50
10-74	Changed Index No.	Checked by	W. G. B.	4-50
9-77	Retraced	Quantities by	J. L. W.	4-50
		Checked by	W. G. B.	4-50
		Supervised by		

APPROVED BY	
<i>E.H. Hunt</i>	
Drawing No.	Index No.
1 of 1	GCG-01



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

TEMPORARY SLOPE DRAINS FOR FILL SECTIONS

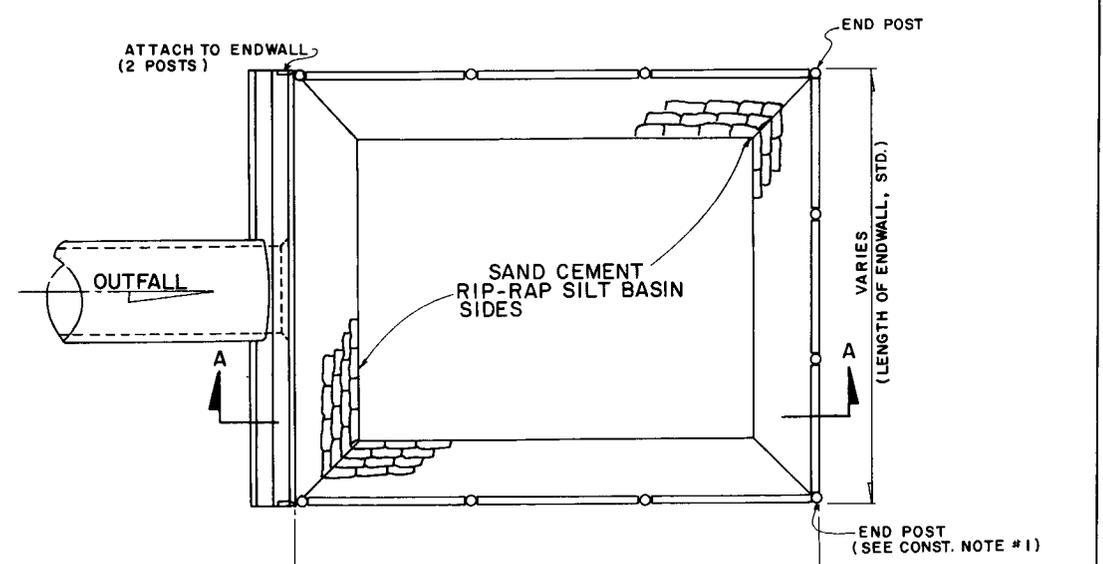
NOTE: THIS IS A SUGGESTED METHOD ONLY. ANY ALTERNATE SOLUTION MAY BE USED AS APPROVED BY THE PROJECT ENGINEER.

FHWA APPROVED: 3-13-75

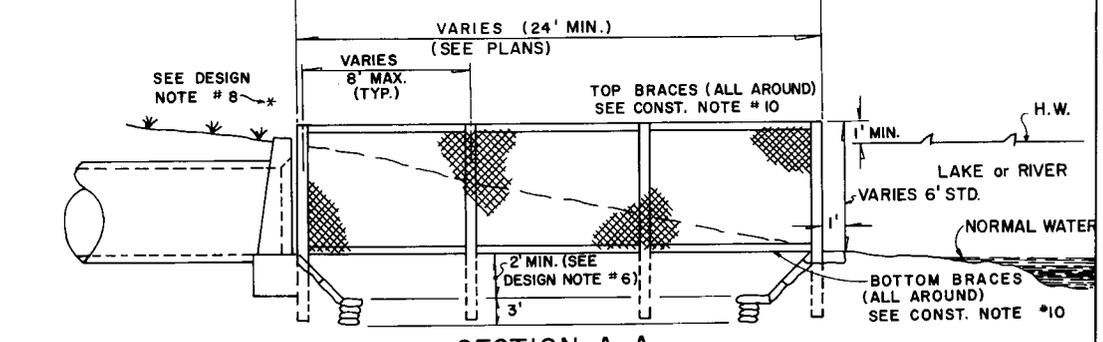
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

EROSION CONTROL DEVICES
TEMPORARY SLOPE DRAINS

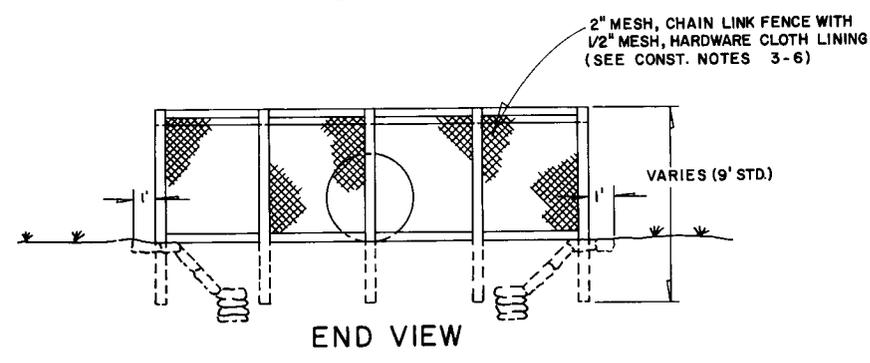
REVISIONS		INITIALS	DATES	Recommended for approval by <i>E. H. Hart</i> Deputy Design Engineer - Roadways
Dates	Descriptions	Designed by		
		Checked by HLB	6/74	Approved by <i>[Signature]</i> State Design Engineer
		Supervised by	DCB	DRAWING NO. 1 OF 1 INDEX NO. GEC-01



PLAN VIEW

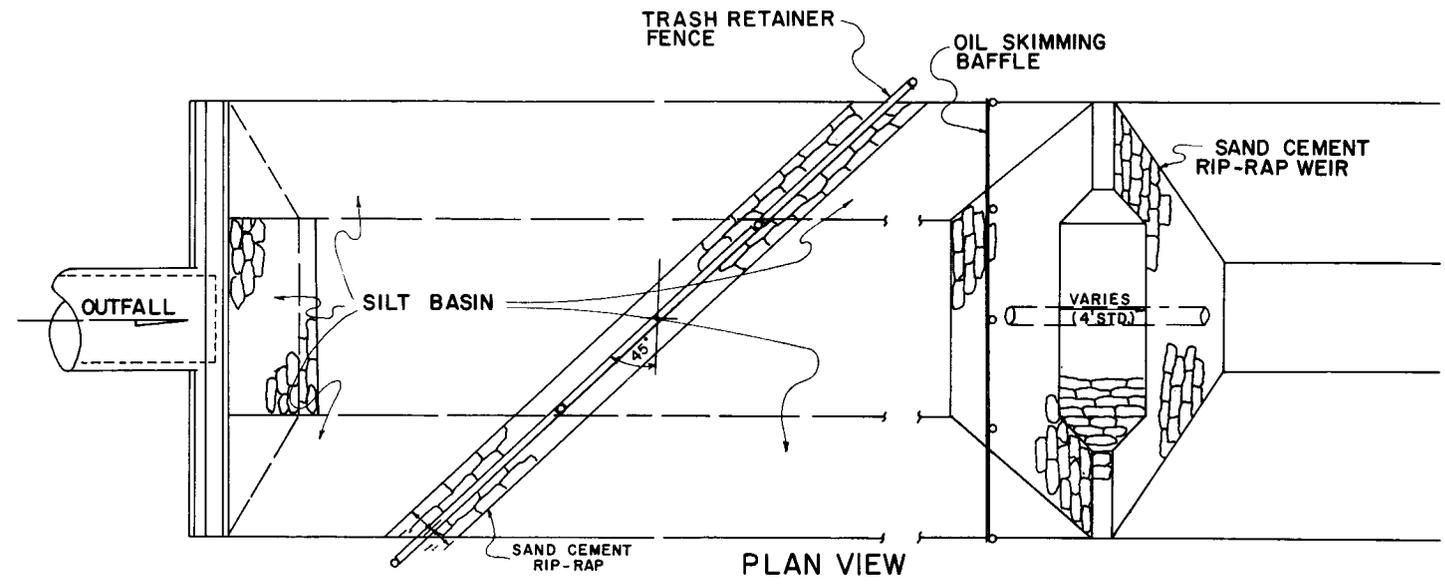


SECTION A-A

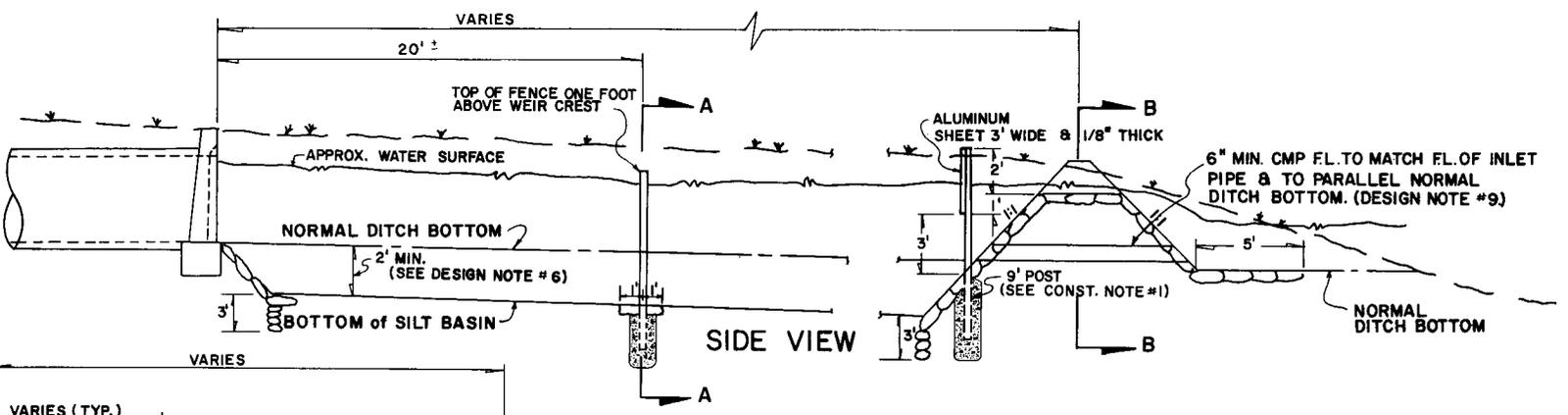


END VIEW

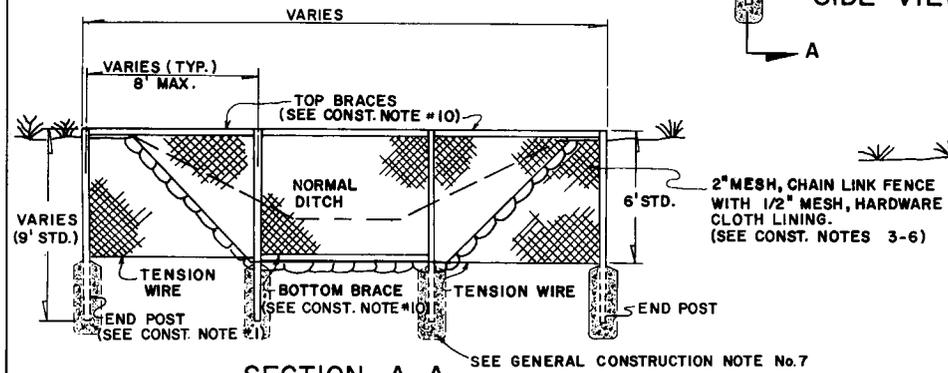
TYPE 'A' TRASH RETAINER & SILT BASIN INTENDED FOR USE ON STORM SEWER OUTFALL PIPES WHICH TERMINATE ADJACENT TO SHORE LINES OF NATURAL WATER BODIES.



PLAN VIEW

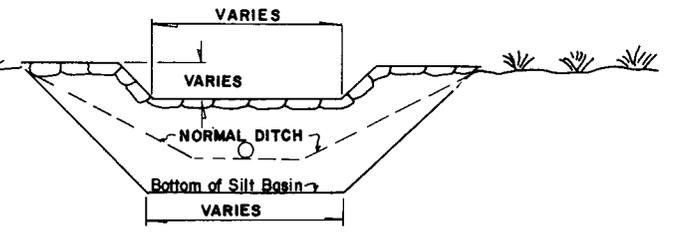


SIDE VIEW



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

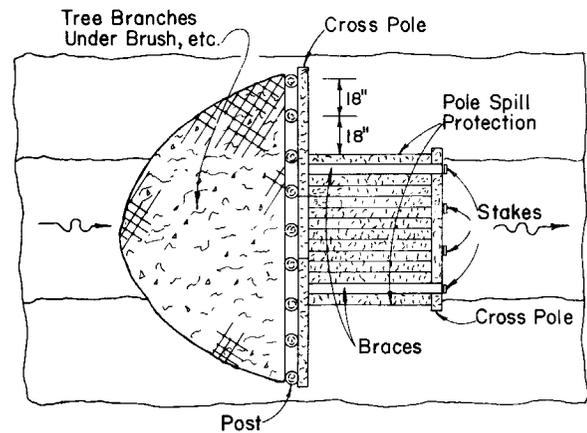
1. FENCE POSTS TO BE ALUMINUM OR CONCRETE ONLY.
2. ALL METAL HARDWARE TO BE ALUMINUM.
3. FENCE TO BE INSTALLED TO INSIDE OF POSTS.
4. FENCE TO BE ALUMINUM CHAIN LINK FABRIC, 2" MESH.
5. FENCE TO BE TIED TO ALL POSTS & BRACES AT 6" CENTERS.
6. ALUMINUM HARDWARE CLOTH, 1/2" MESH TO BE ATTACHED TO INSIDE 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

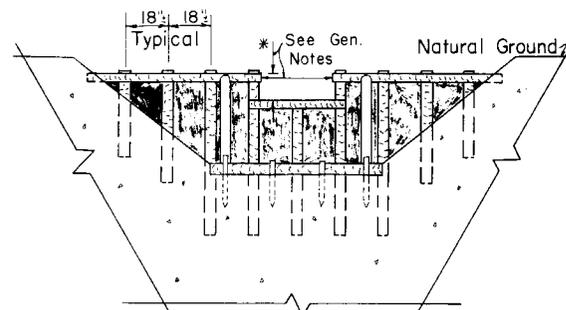
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section
EROSION CONTROL DEVICES
SEDIMENT BASINS

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

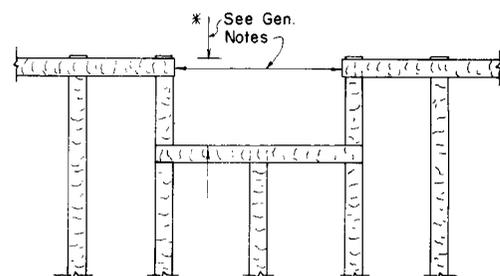
Recommended for approval by *E.H. Hunt*
Deputy Design Engineer - Roadways
Approved by *[Signature]*
State Design Engineer
DRAWING NO. INDEX NO.
1 OF 1 GEC-02



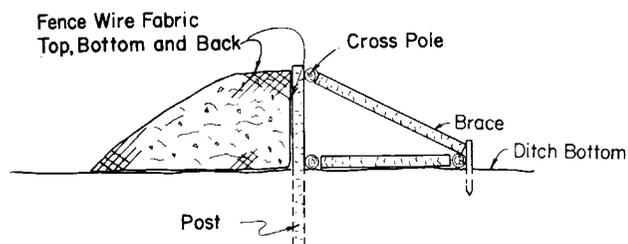
TOP VIEW



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

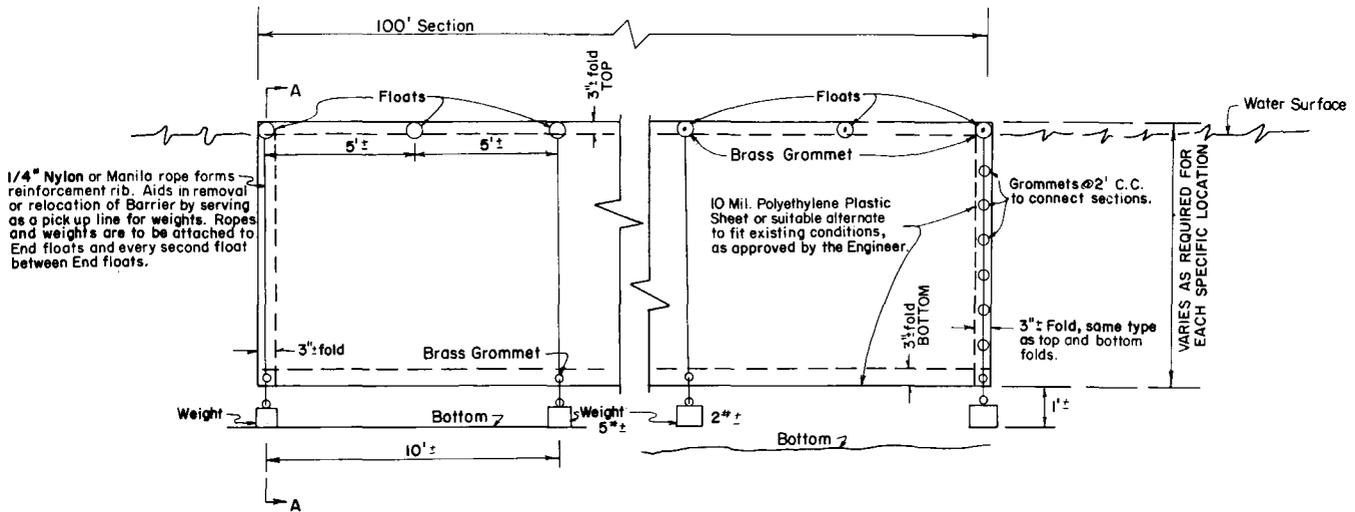
REVISIONS		INITIALS		DATES	
Dates	Descriptions	Designed by			
		Checked by	HLB	6/74	
		Quantities by			
		Checked by			
		Supervised by	DCB		

Recommended for approval
by *EMHOUT*
Deputy Design Engineer -
Roadways

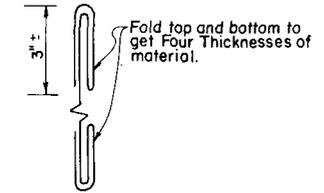
Approved
by *[Signature]*
State Design Engineer

DRAWING NO. 1 OF 1

INDEX NO. GEC-03

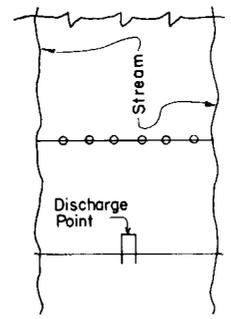


FRONT VIEW

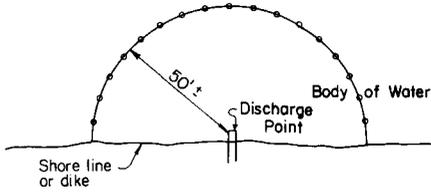


SIDE VIEW

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.

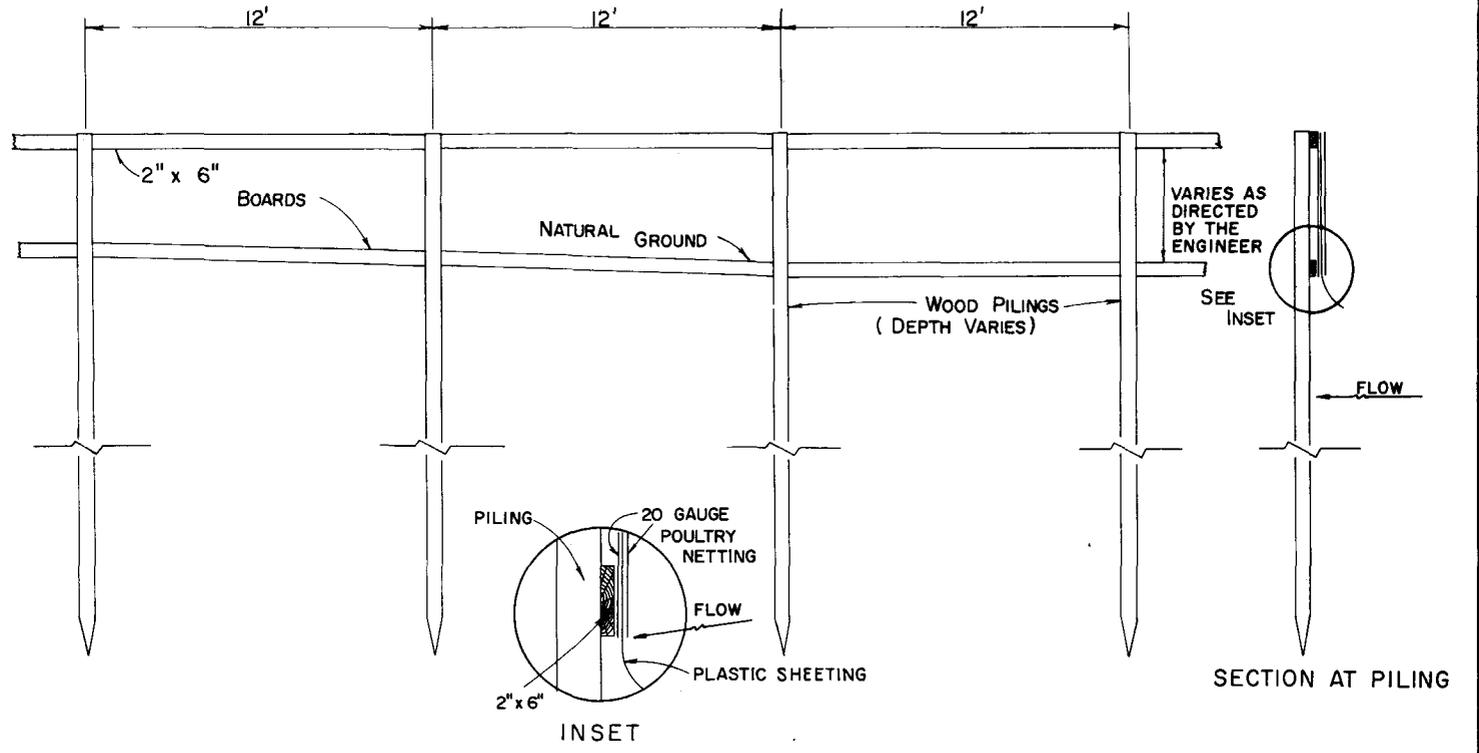
Exact placement of silt barrier shall be so as to effectively control silt dispersion under the conditions present on a particular project.

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

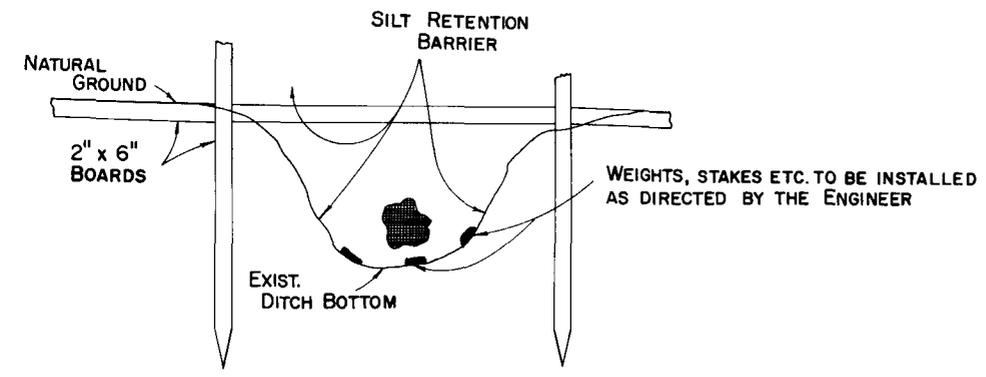
NOTE: At shallow water locations the plastic sheet or suitable alternate may be fastened to stakes driven into the bottom in lieu of floats and weights.



DETAIL OF STAKED SILT BARRIER

NOTES

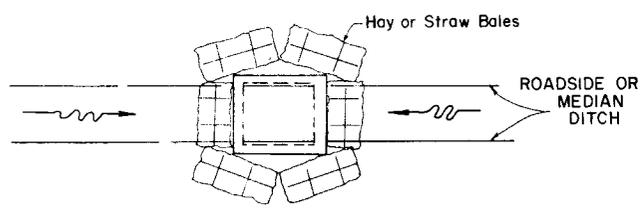
THE FRAME WILL BE CONSTRUCTED WITH 2" x 6" BOARDS. PILINGS WILL BE A MINIMUM OF 6" IN DIAMETER AT THE BUTT END. THE DEPTH OF PILINGS WILL BE AT THE DISCRETION OF THE PROJECT ENGINEER. ATTACHED TO THE FRAME WILL BE 20 GAUGE POULTRY NETTING WITH 1" NET. THE SILT RETAINER WILL BE PLASTIC SHEETING, EXTENDING 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)



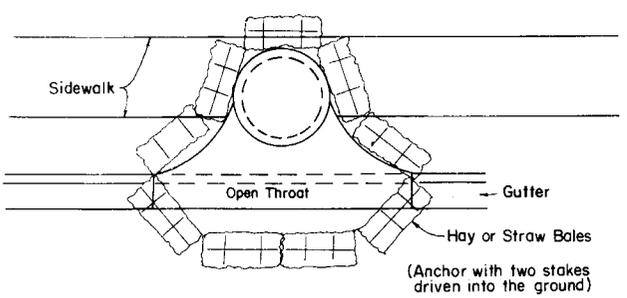
DETAIL SHOWING PLACEMENT OF STAKED SILT BARRIER AT EXISTING DITCH LOCATIONS

FHWA APPROVED: 3-13-75
FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section
ERROSION CONTROL DEVICES
 SILT BARRIERS

REVISIONS		INITIALS	DATES	Recommended for approval by <i>[Signature]</i> Deputy Design Engineer - Roadways
Dates	Descriptions			
	Designed by			Approved by <i>[Signature]</i> State Design Engineer
	Checked by	HLB	6/74	
	Quantities by			Supervised by <i>[Signature]</i> DCB
	Checked by			
	DRAWING NO.	INDEX NO.		
	1 OF 1	GEC-04		



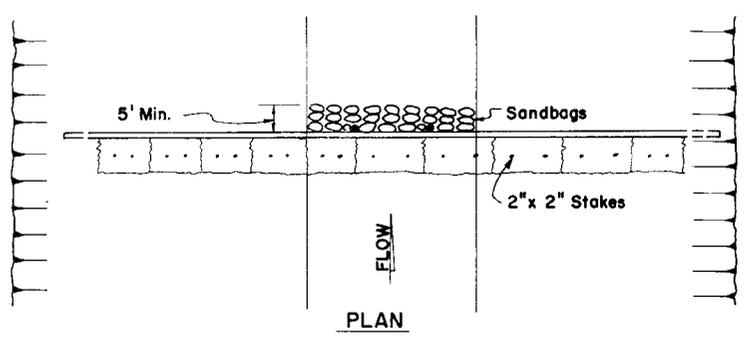
DITCH BOTTOM INLET



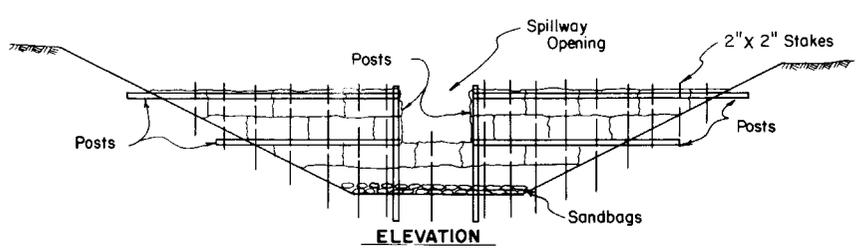
CURB AND GUTTER INLETS

TEMPORARY PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

Note: For use on completed or partially completed structures.



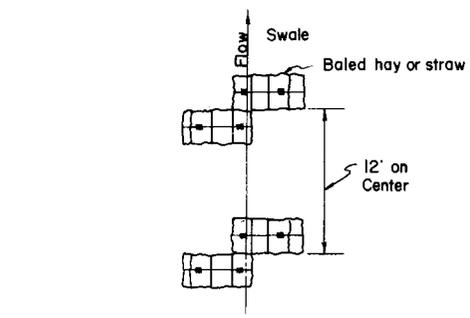
PLAN



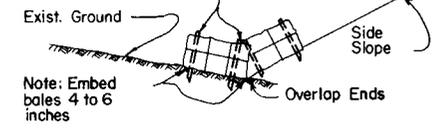
ELEVATION

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.

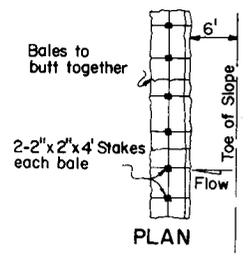


PLAN

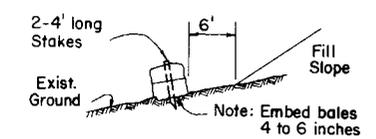


ELEVATION

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

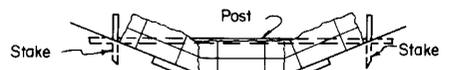


PLAN

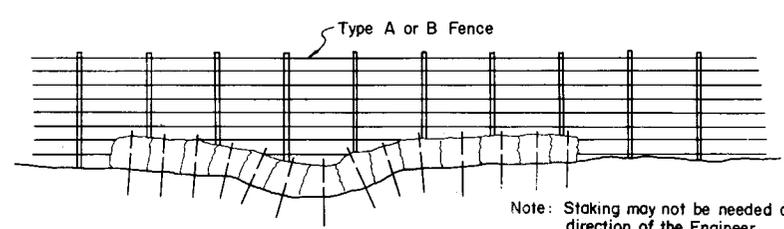


ELEVATION

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

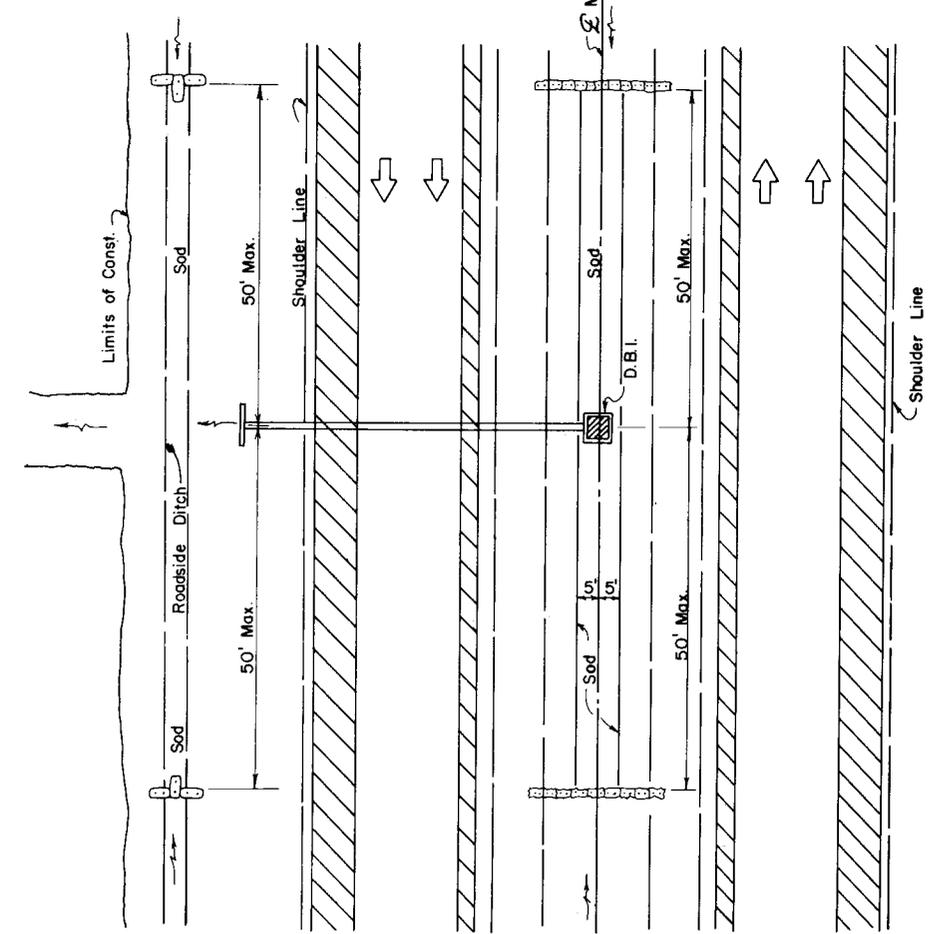


DETAIL OF HAY OR STRAW BALE DAM ON PAVED DITCH

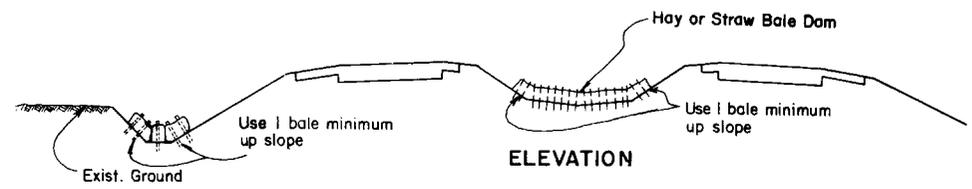


HAY OR STRAW BALES BACKED BY FENCE

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



PLAN



ELEVATION

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

HAY OR STRAW BALE DAMS ON TYPICAL 4 LANE DIVIDED HIGHWAY

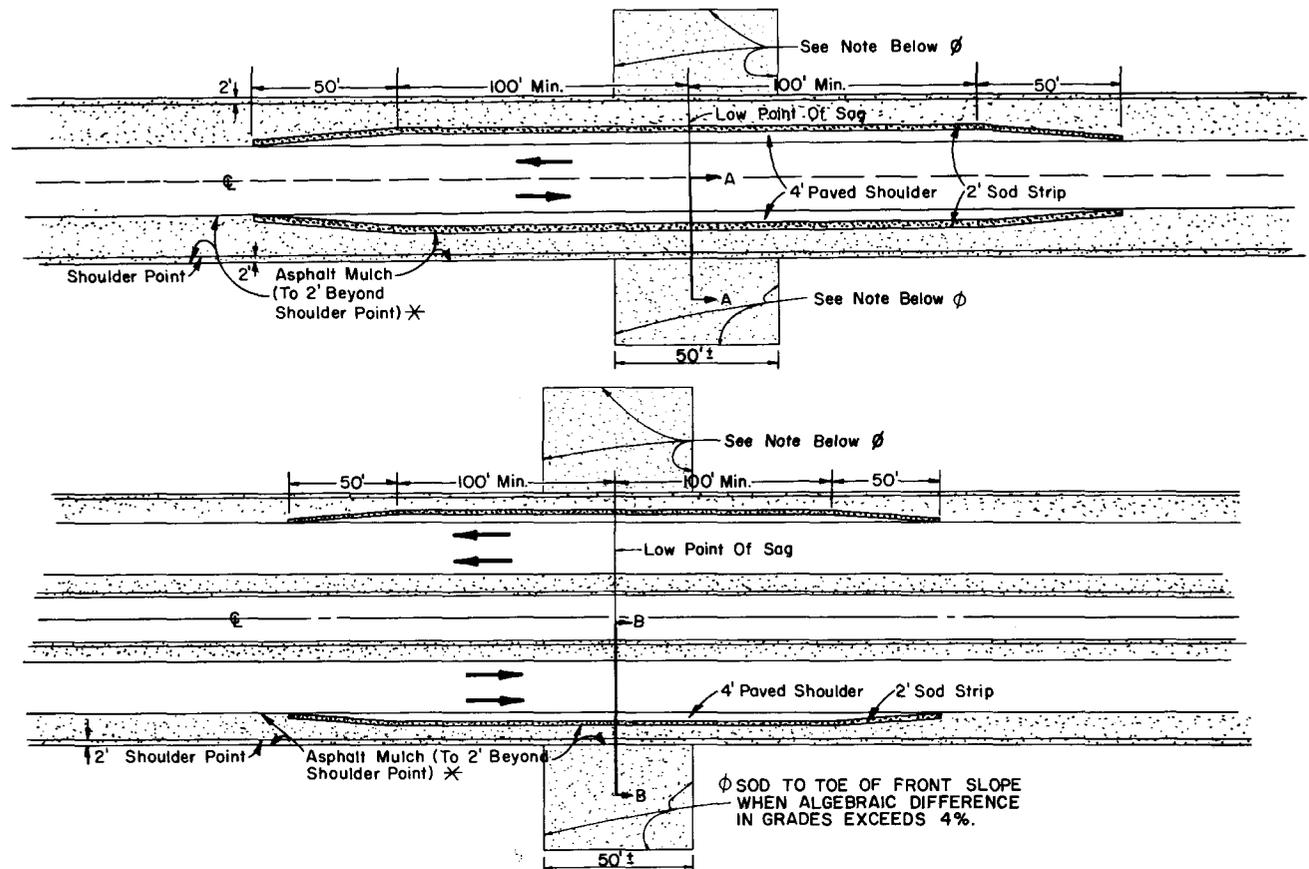
TYPES OF TEMPORARY DAMS

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

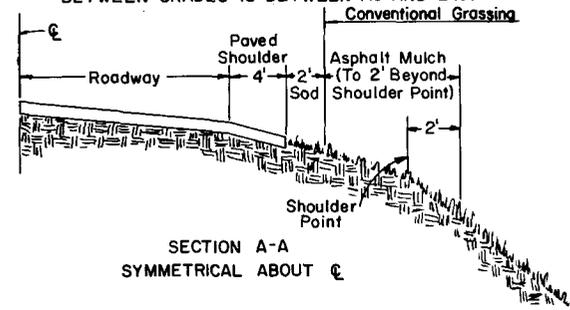
FHWA APPROVED: 3-13-75
 FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section
 EROSION CONTROL DEVICES
 BALED HAY OR STRAW

REVISIONS		INITIALS	DATES	Recommended for approval by <i>[Signature]</i> Deputy Design Engineer - Roadways Approved by <i>[Signature]</i> State Design Engineer
Dates	Descriptions	Designed by		
		Checked by	H.L.B. 6/74	
		Quantities by		
		Checked by		
		Supervised by	DCB	DRAWING NO. 1 OF 1 INDEX NO. GEC-05

TO BE USED AT SAG VERTICAL CURVES

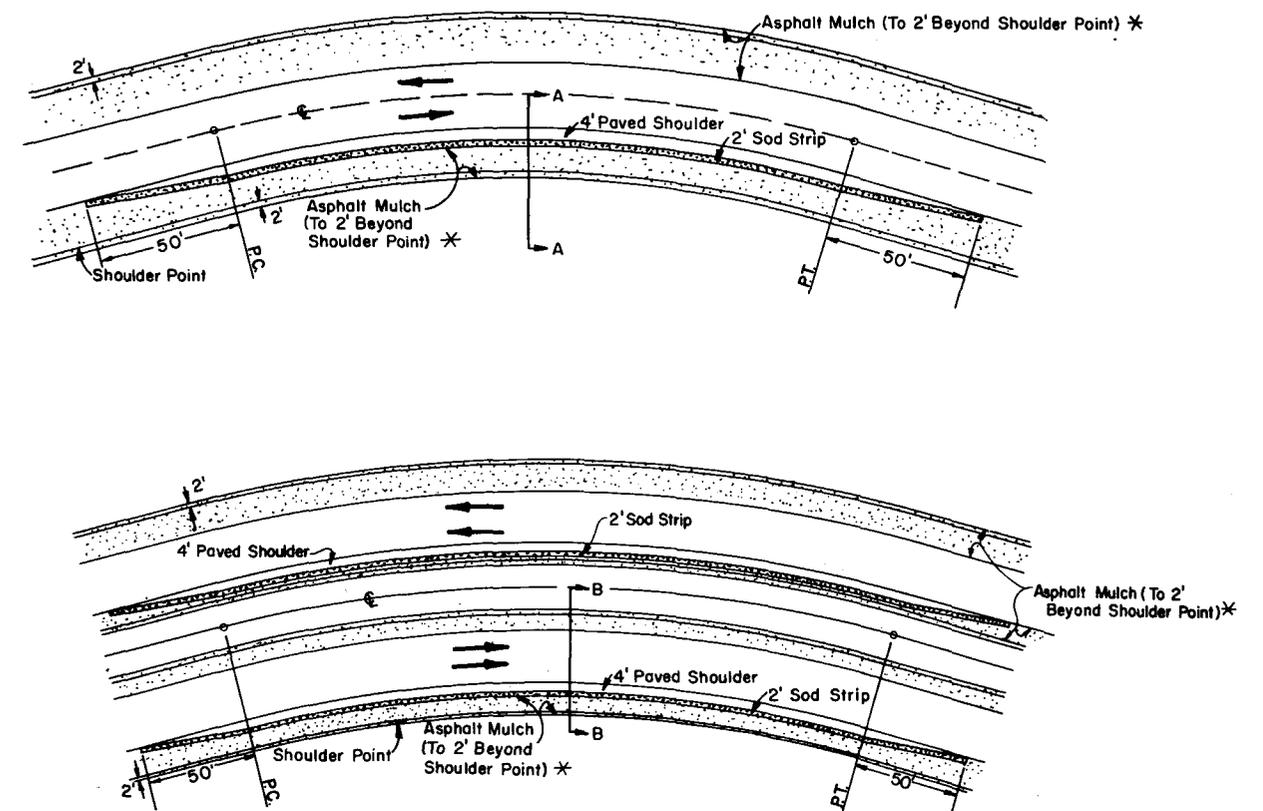


1. USE 4' PAVED SHOULDER AND 2' SOD STRIP WHEN NEGATIVE GRADE INTERSECTS POSITIVE GRADE AND ALGEBRAIC DIFFERENCE IN GRADES IS 2% OR GREATER.
2. USE ONLY 2' SOD STRIP WHEN NEGATIVE GRADE INTERSECTS POSITIVE GRADE AND ALGEBRAIC DIFFERENCE BETWEEN GRADES IS BETWEEN 1% AND 2%.



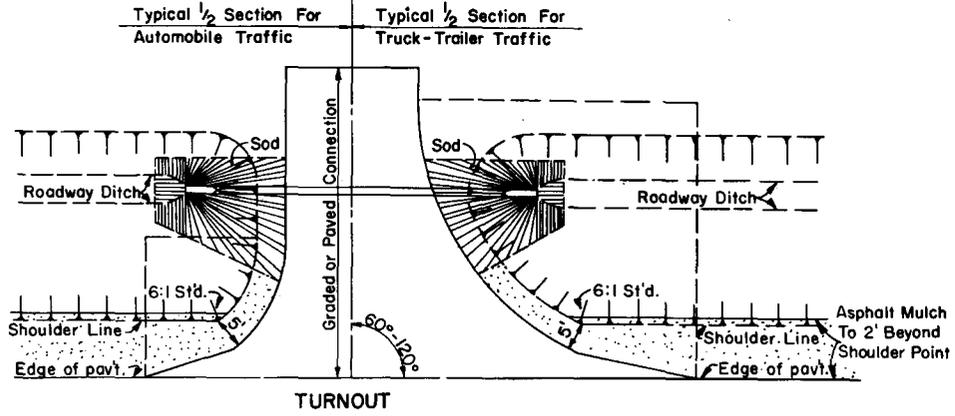
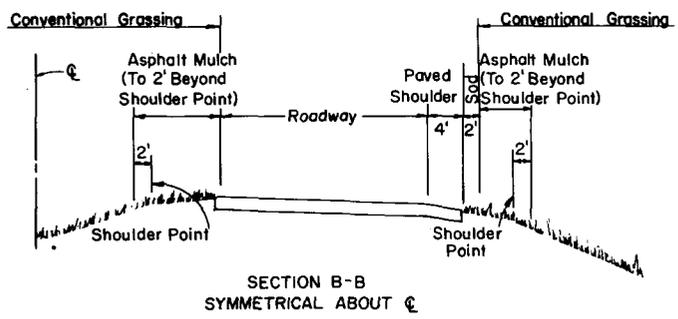
- NOTES:
- * 1. ASPHALT MULCH WILL EXTEND THROUGH THE ENTIRE LIMITS OF PROJECT. ASPHALT MULCH WILL NORMALLY NOT BE NECESSARY WHEN TOPSOIL OR MUCK BLANKET IS USED.
 - 2. FOR SODDING ADJACENT TO DITCHES SEE INDEX DPS-01.
 - 3. FOR SODDING AT HEADWALLS SEE SHEET 2 OF 2 ON INDEX GRC-01.
 - 4. ALL FRONT SLOPES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

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



FHWA. APPROVED: 11-21-75

FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

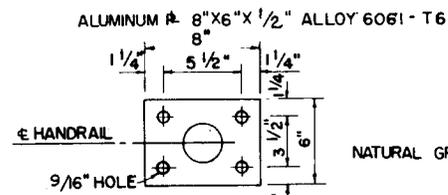
EROSION CONTROL DETAILS
FOR PERMANENT CONSTRUCTION

REVISIONS	INITIALS	DATES	APPROVED BY:
Dates	Descriptions	Designed by	
10-17-75	Added E and Sod to Sag Vertical Details	Checked by	
		Quantities by	
		Checked by	
		Supervised by	

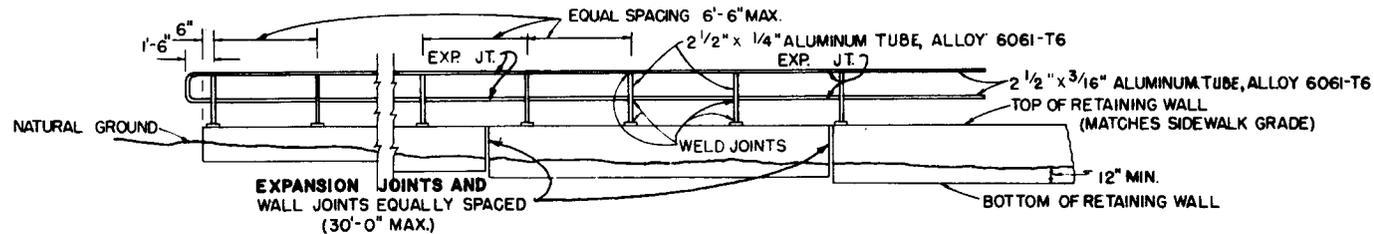
Approved by: *E.H. Hart*
Deputy Design Engineer - Roadways

DRAWING NO. 1 OF 1 INDEX NO. GEC-06

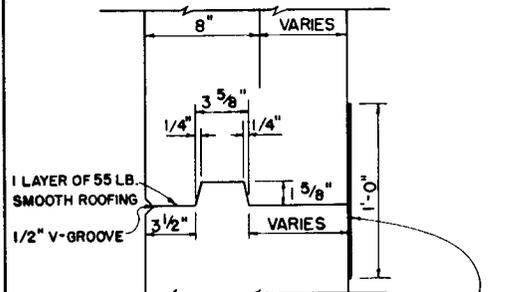
FED. ROAD DIST. No.	STATE	PROJECT No.	FISCAL YEAR	SHEET No.
1	FLA.			



BASE PLATE

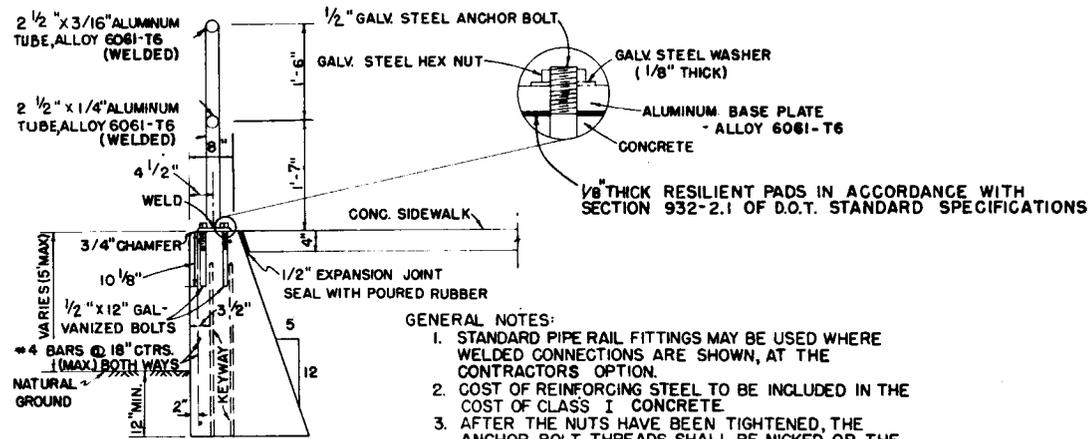


HANDRAIL ELEVATION



KEYWAY DETAIL

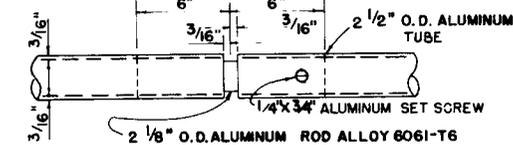
ALL WALL JOINTS TO BE EQUALLY SPACED WITH 30'-0" MAX. CENTERS. KEYWAY TO STOP 6" BELOW TOP OF WALL.



TYPICAL SECTION OF RETAINING WALL WITH PIPE HANDRAIL

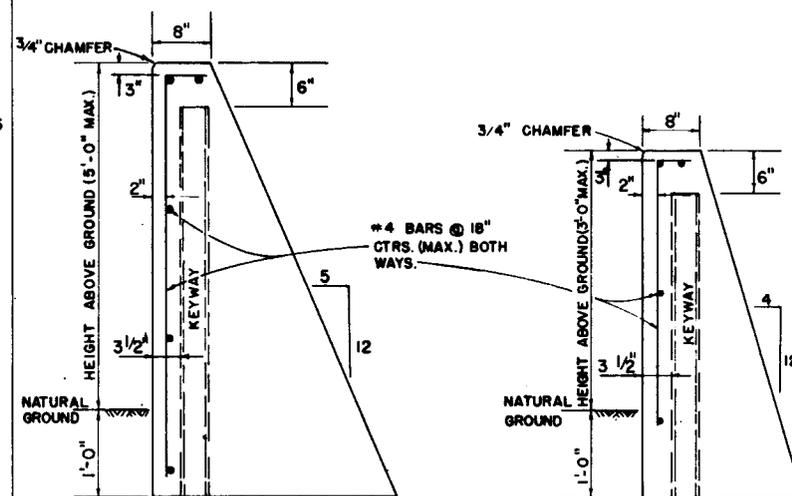
GENERAL NOTES:

1. STANDARD PIPE RAIL FITTINGS MAY BE USED WHERE WELDED CONNECTIONS ARE SHOWN, AT THE CONTRACTOR'S OPTION.
2. COST OF REINFORCING STEEL TO BE INCLUDED IN THE COST OF CLASS I CONCRETE.
3. AFTER THE NUTS HAVE BEEN TIGHTENED, THE ANCHOR BOLT THREADS SHALL BE NICKED OR THE NUT SHALL BE WELDED TO THE BOLT.
4. NUTS, WASHERS, AND BOLTS TO BE HOT DIP GALVANIZED TO CONFORM TO REQUIREMENTS OF ASTM SPEC. A-153.
5. WELD FILLER ALLOY 5556.



DETAIL OF EXPANSION JOINT FOR PIPE HANDRAIL

DETAIL OF ALUMINUM PIPE HANDRAIL ON GRAVITY WALL



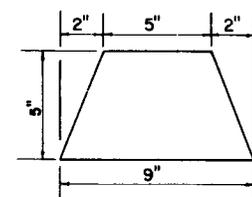
DETAIL OF GRAVITY WALL

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

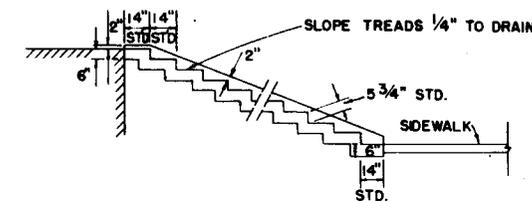
- GENERAL NOTES:**
1. COST OF REINFORCING STEEL TO BE INCLUDED IN THE COST OF CLASS I CONCRETE.
 2. QUANTITIES SHOWN ARE FOR ONE LINEAR FOOT OF WALL.

2- LAYERS OF 55# SMOOTH ROOFING (MOP ALL CONTACT SURFACES OF CONCRETE AND ROOFING WITH CUT-BACK ASPHALT. STOP ROOFING PAPER 6" BELOW TOP OF WALL.)

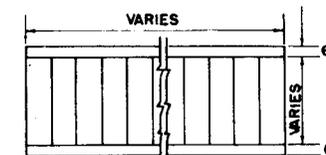
KEYWAY DETAIL



DETAIL OF ASPHALTIC CONCRETE CURB



SECTION



PLAN

DETAIL OF CONCRETE STEPS

NOTE: WIDTH OF TREADS AND RISERS SHOWN IS STANDARD AND MAY BE VARIED TO FIT EXISTING CONDITIONS AS DIRECTED BY THE ENGINEER.

FINMA APPROVED: 3-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
HIGHWAY PLANS GROUP

DETAILS FOR MUNICIPAL CONST.

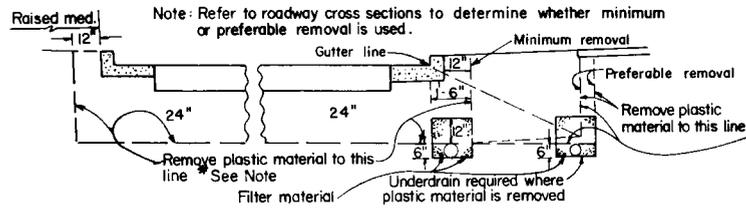
ROAD NO.	COUNTY	PROJECT NO.
Detailed by	COX	2-66
Checked by	R.H.C	2-68
Checked by		
Traced by	C.D.R.	2-2-68

REVISIONS	DATES	DESCRIPTIONS
3/68		Transferred detail to 8016-B galled all details as shown R.H.C.
3/75		Added C.I. Conc.
10-74		Changed Index N/E

RECOMMENDED FOR APPROVAL BY *[Signature]*
ENGINEER OF ROAD DESIGN

APPROVED BY

ASST. STATE HIGHWAY ENGINEER
DRAWING NO. 1 of 1
INDEX NO. GMC-01

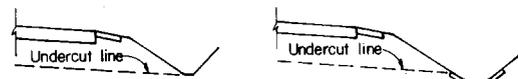


Note: Refer to roadway cross sections to determine whether minimum or preferable removal is used.

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.

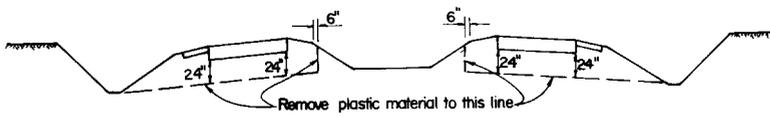
* NOTE: Where frequency of median breaks indicates that it is impractical to leave plastic material in the median, the designer may elect to indicate total removal of this material. If during construction it becomes apparent, due to normal required construction procedures, that it is impractical to leave 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.

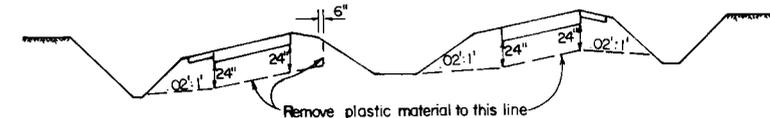


At locations where plastic material is being removed, the side ditches must be at least as deep as the undercut plane. Where paved side ditches are used in areas of removal of plastic material, the top of the ditch pavement must be no higher than the undercut plane.

MISCELLANEOUS DETAILS

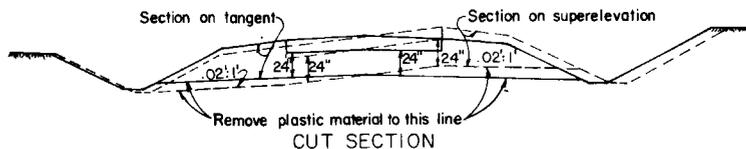


TYPICAL CUT SECTION ON TANGENT

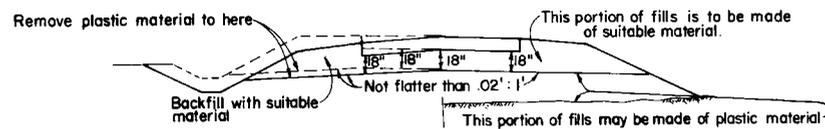


TYPICAL CUT SECTION ON SUPERELEVATION

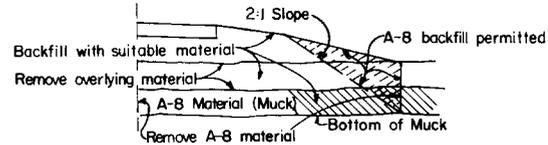
TYPICAL SECTIONS FOR REMOVAL OF PLASTIC MATERIAL ON INTERSTATE AND PRIMARY SYSTEM HAVING DEPRESSED MEDIAN



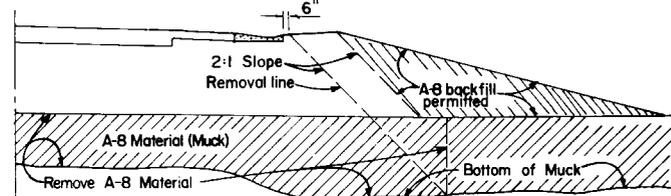
TYPICAL SECTION FOR REMOVAL OF PLASTIC MATERIAL ON MAJOR PRIMARY SYSTEM ROADS



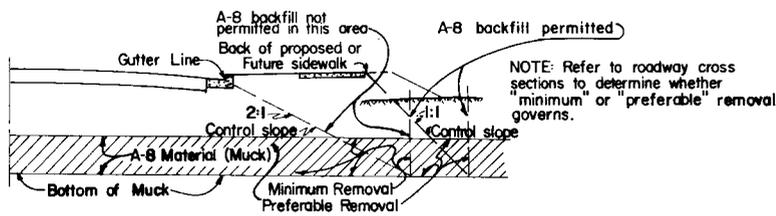
REMOVAL AND DISPOSAL OF PLASTIC MATERIAL FOR SECONDARY AND MINOR PRIMARY SYSTEM ROADS



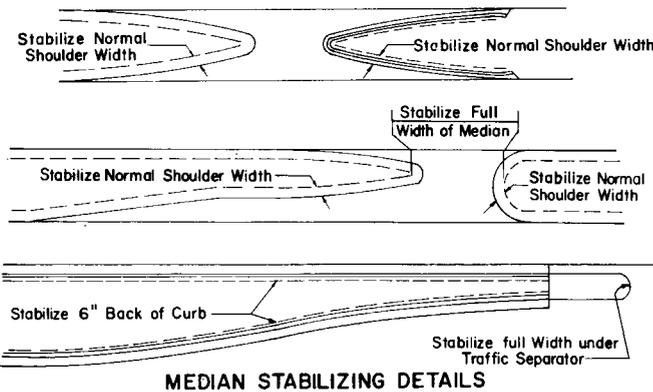
HALF SECTION SHOWING REMOVAL AND DISPOSAL OF A-8 MATERIAL IN RURAL CONSTRUCTION



HALF SECTION SHOWING MUCK REMOVAL WHERE SHOULDER GUTTER IS CONSTRUCTED



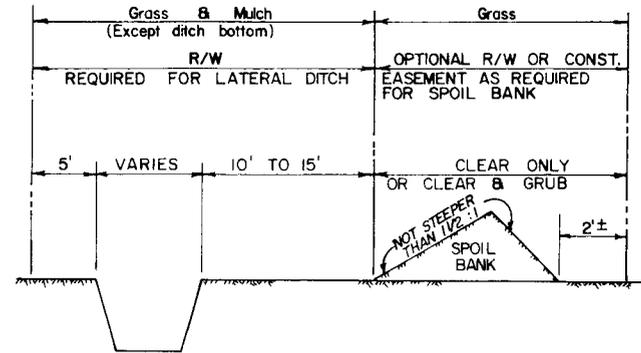
HALF SECTION SHOWING REMOVAL AND DISPOSAL OF A-8 MATERIAL IN MUNICIPAL CONSTRUCTION



MEDIAN STABILIZING DETAILS

GENERAL STABILIZING NOTES:

- (1) When typical section has curb or gutter in median stabilize 6" back of curb.
- (2) When typical section has shoulder with no curb or 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:

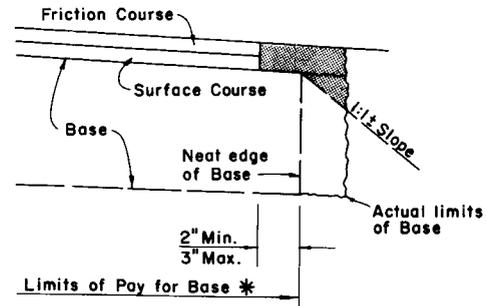
1. Where no spoil is anticipated or when a large ditch or Canal is involved and spoil is anticipated on both sides, R/W should be adjusted accordingly.
2. Clearing and Grubbing is to extend 200' beyond the end of the ditch if necessary.
3. The bottom width of Lateral Ditches is to be 2' wider than the span of the Structure they drain or as shown on Plans.
4. No Spoil Bank will be permitted within 300' of the C 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.



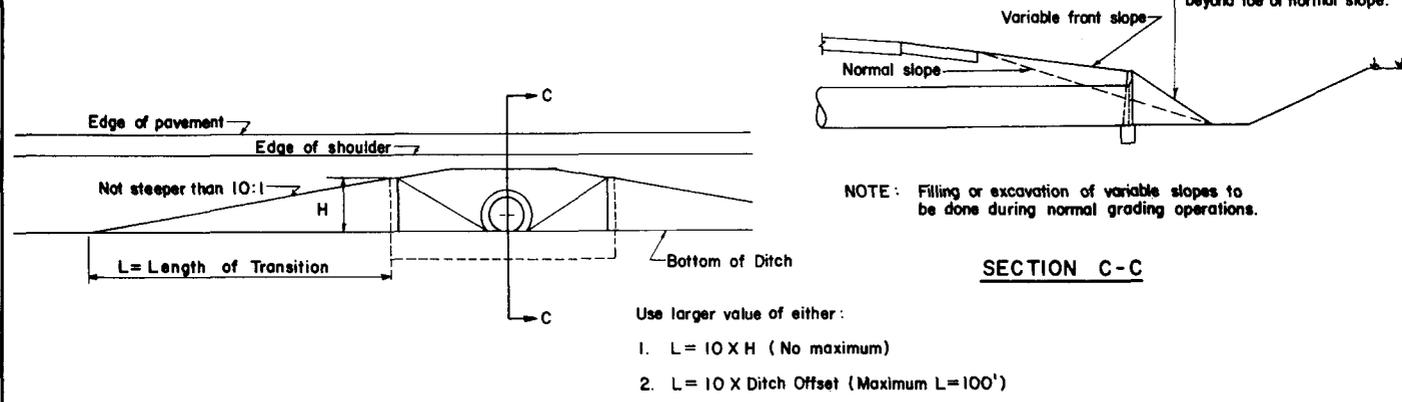
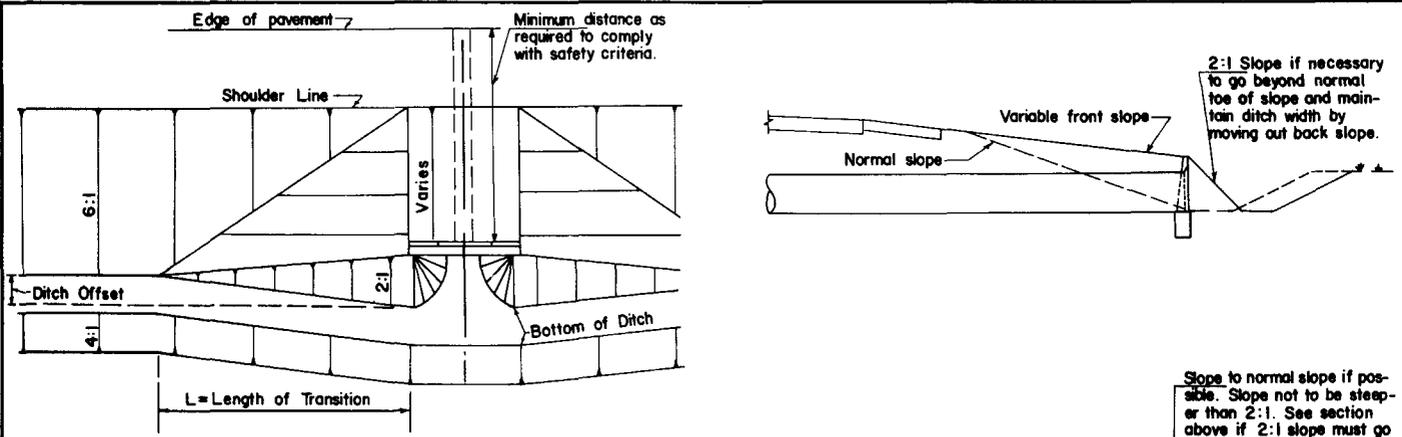
DETAIL FOR REMOVAL OF EXCESS BASE MATERIAL

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 All Changed			
8-76	Add Detail for Removal of Excess Base Material			
Designed by				
Checked by				
Quantity by				
Checked by				
Supervised by				

FHWA Approved: 7-7-75	
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY PLANS SECTION	
MISC. ROADWAY CONSTRUCTION DETAILS	
Approved by:	
Deputy Design Engineer - Roadways	
Drawing No.	1 of 2
Sheet No.	GRC-01-1

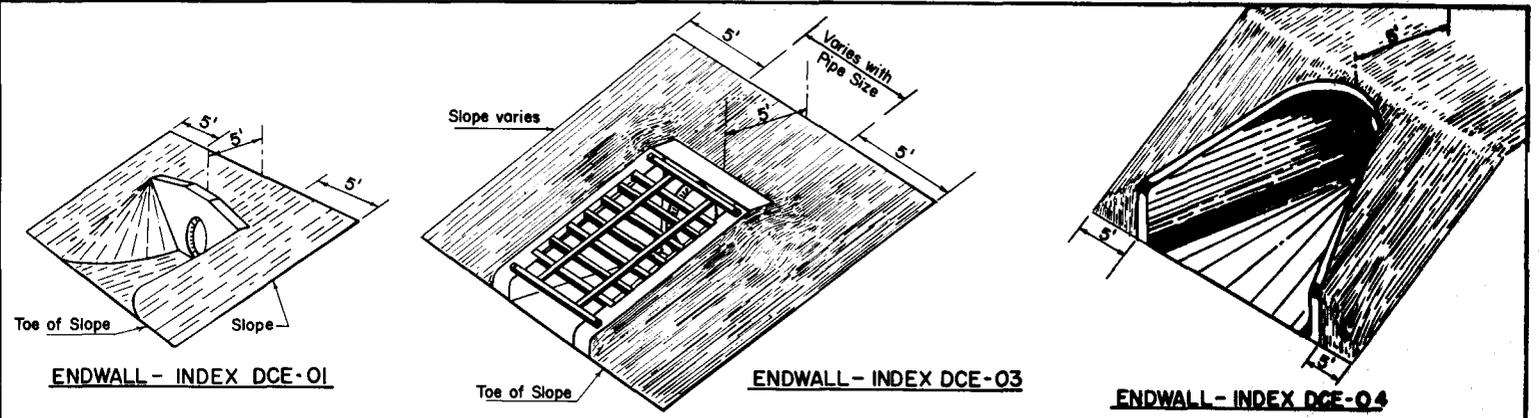


NOTE: Filling or excavation of variable slopes to be done during normal grading operations.

Use larger value of either:

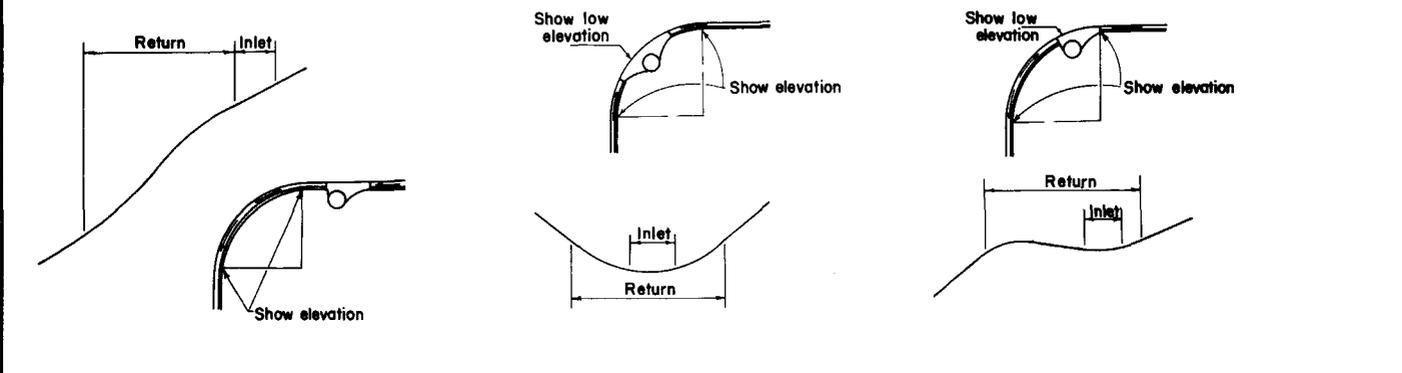
1. $L = 10 \times H$ (No maximum)
2. $L = 10 \times \text{Ditch Offset}$ (Maximum $L = 100'$)

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



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	
	1-PIPE	2-PIPE	3-PIPE	1-PIPE	2-PIPE	3-PIPE	1-PIPE	2-PIPE	3-PIPE				
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"													

Note: These quantities are for one pipe.



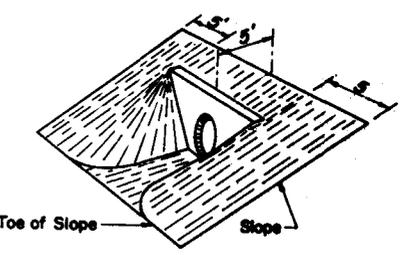
TYPICAL RETURN PROFILES INCLUDING DETAIL SHOWING LOCATION OF INLETS ON RETURN

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.

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.
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.

SOD QUANTITIES FOR PIPE CULVERT ENDWALLS

FHWA APPROVED: 7-7-75

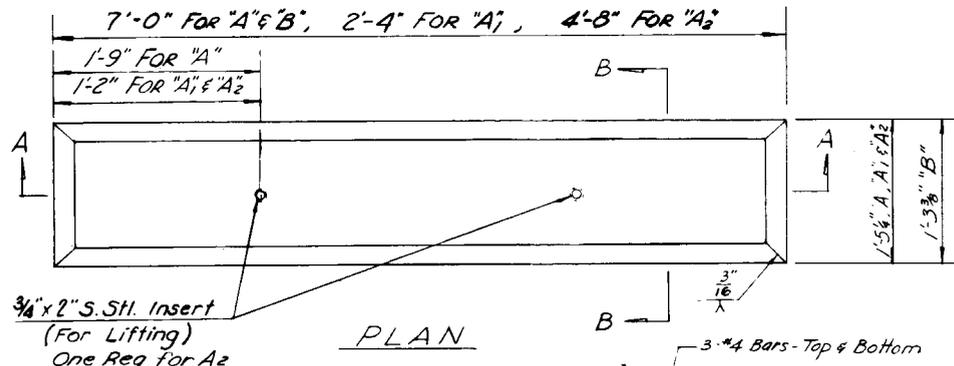
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

MISC. ROADWAY CONSTRUCTION DETAILS

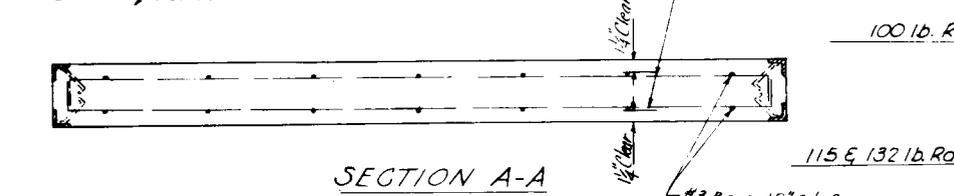
REVISIONS		INITIALS	DATES	Approved by:
Dates	Descriptions	Designed by		
9-74	Redrawn & Index N* Charged	Checked by		
		Quantities by		
		Checked by		
		Supervised by		

Deputy Design Engineer-Roadways

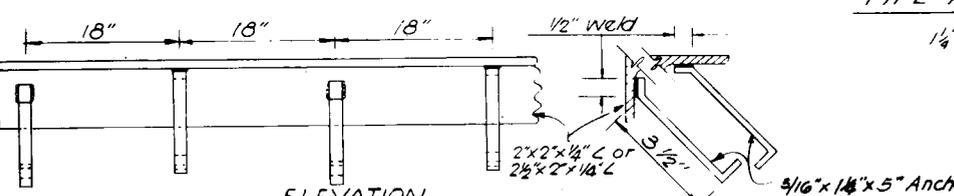
DRAWING NO. 2 OF 2 INDEX NO. GRC-01-1



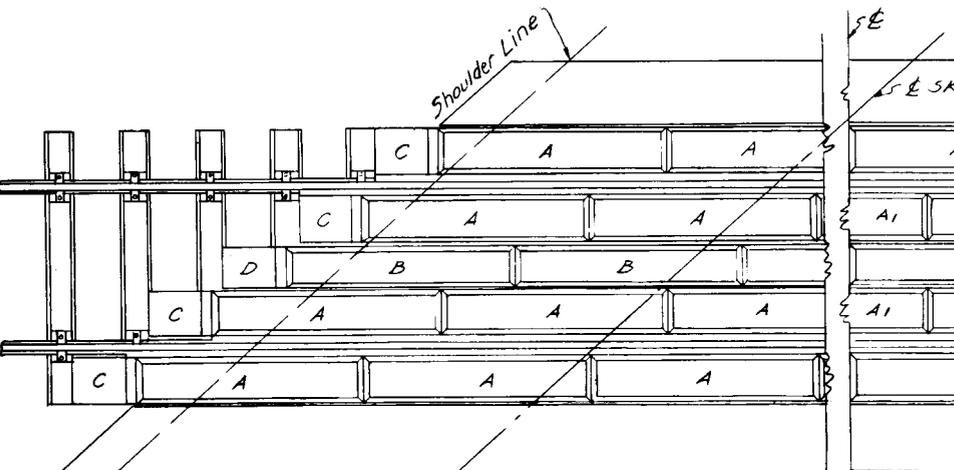
PLAN



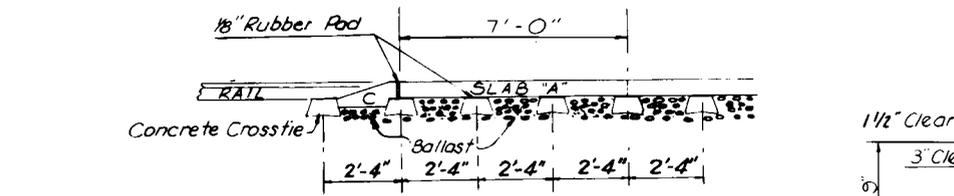
SECTION A-A



ELEVATION
DETAIL OF 5/16" x 1 1/4" x 5" ANCHORS
ANCHORS STAGGERED 18" C. TO C.
TWO ANCHORS EACH END ANGLE



PLAN OF SKEWED CROSSING

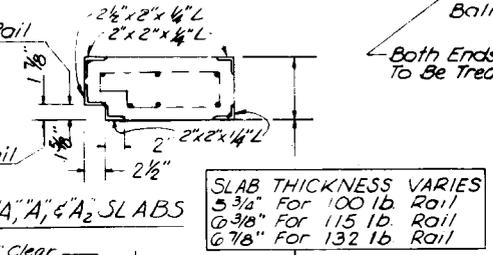


ELEVATION

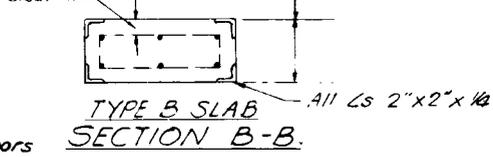


DETAIL

Reinforcing for Concrete Paving between Parallel Track Crossings
(Cost of Reinforcing to be included in cost of Class I Concrete, see note No. 6)



TYPE "A", "A1", & "A2" SLABS



TYPE B SLAB
SECTION B-B

SLAB THICKNESS VARIES
5 3/4" For 100 lb Rail
6 3/8" For 115 lb Rail
6 7/8" For 132 lb Rail

All Ls 2" x 2" x 1/4"

All long bars No. 4
All ties No. 3 @ 6" Ctr.

Varies 5 3/4" For 100 lb Rail
6 3/8" For 115 lb Rail
6 7/8" For 132 lb Rail

1/2" Chamfer

4 5/8"

5"

6"

2"

3" R.

1"

1/8" 4 5/8" 4 5/8" 4 5/8"

1'-4 3/8"

1'-6 5/8"

1'-11 1/4"

3"

1'-5 1/4" "C"

1'-3 3/8" "D"

1/2" Chamfer

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3" R.

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1'-11 1/4"

3"

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1'-3 3/8" "D"

1/2" Chamfer

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3" R.

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1'-4 3/8"

1'-6 5/8"

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1'-5 1/4" "C"

1'-3 3/8" "D"

1/2" Chamfer

4 5/8"

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3" R.

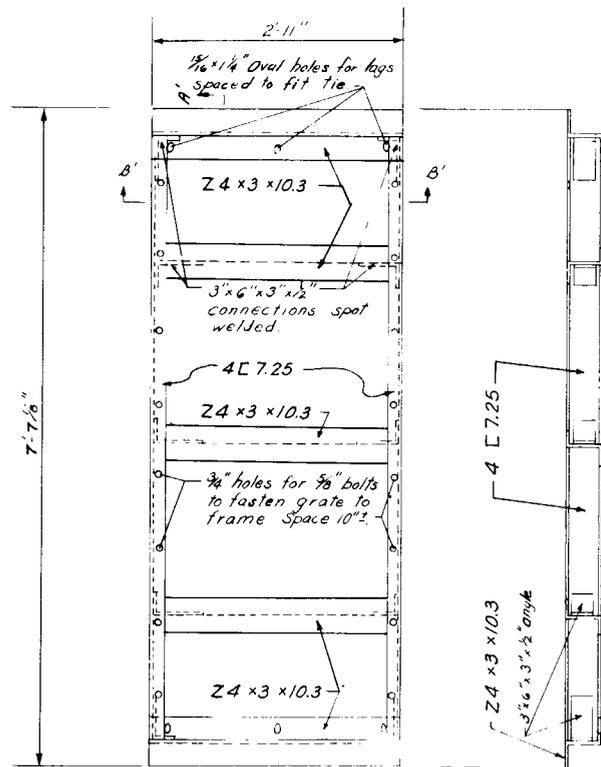
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1/8" 4 5/8" 4 5/8" 4 5/8"

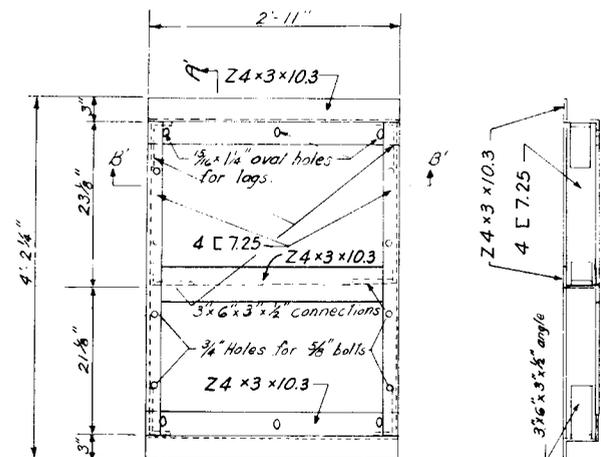
1'-4 3/8"

1'-6 5/8"

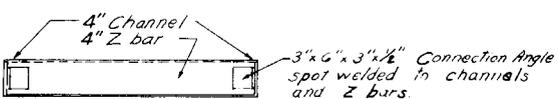
1'-11 1/4"



PLAN INTER-TRACK UNIT



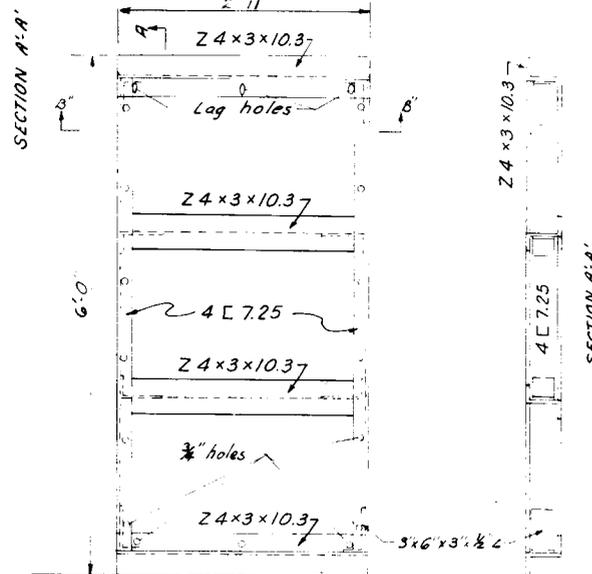
PLAN INTER-RAIL UNIT



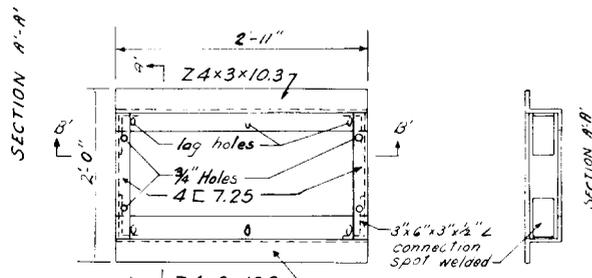
SECTION B-B'

FRAME DETAILS

Scale: 1"=1'



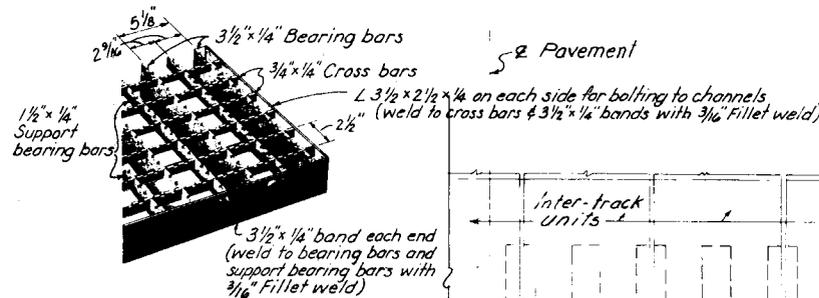
PLAN ALTERNATE OUTER-TRACK UNIT



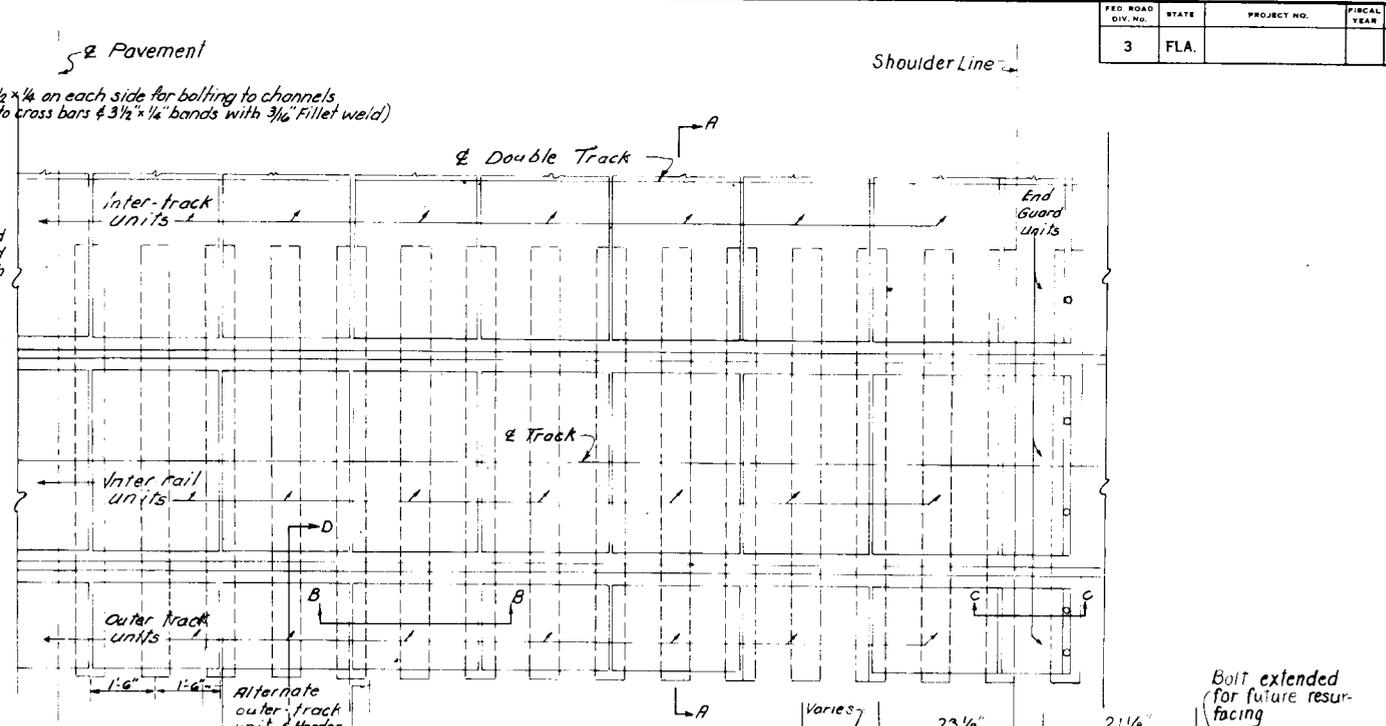
PLAN OUTER TRACK UNIT

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"x6 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).

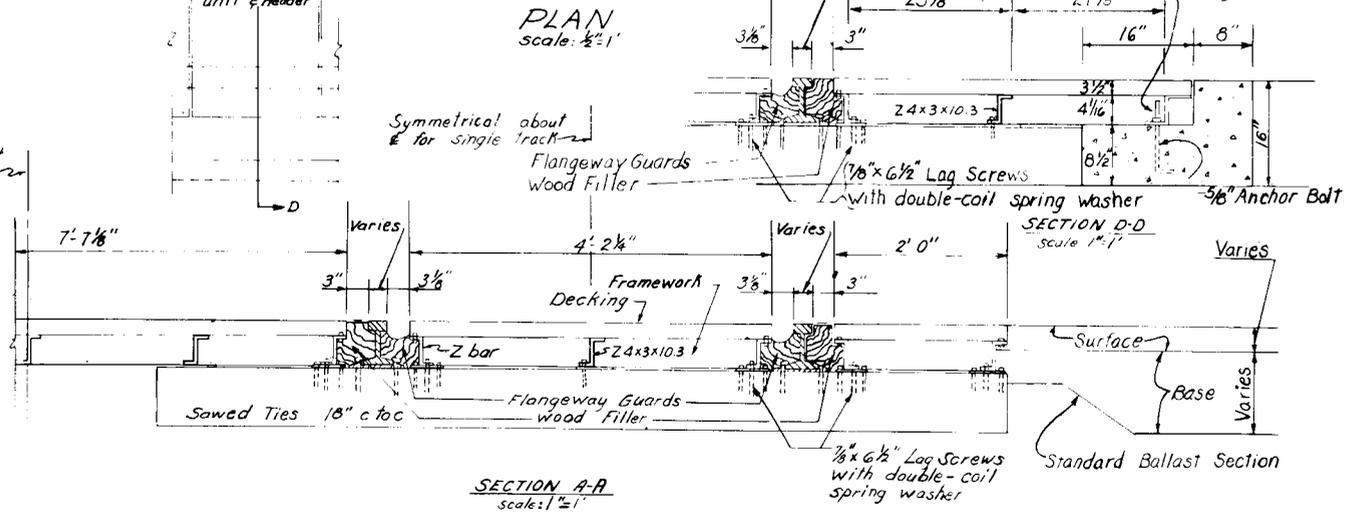


DECKING (14.81 LBS/S.F.)

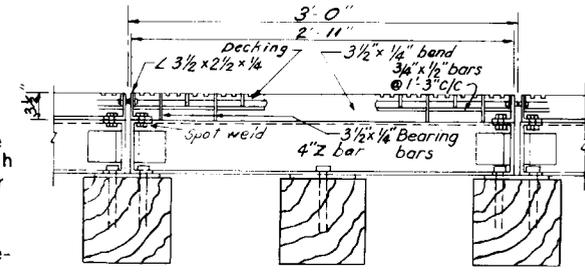


PLAN Scale: 1/2"=1'

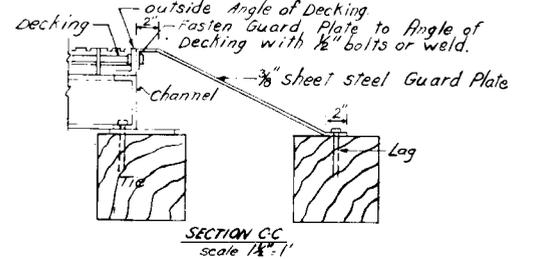
Symmetrical about center for double track



SECTION A-A Scale: 1"=1'



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



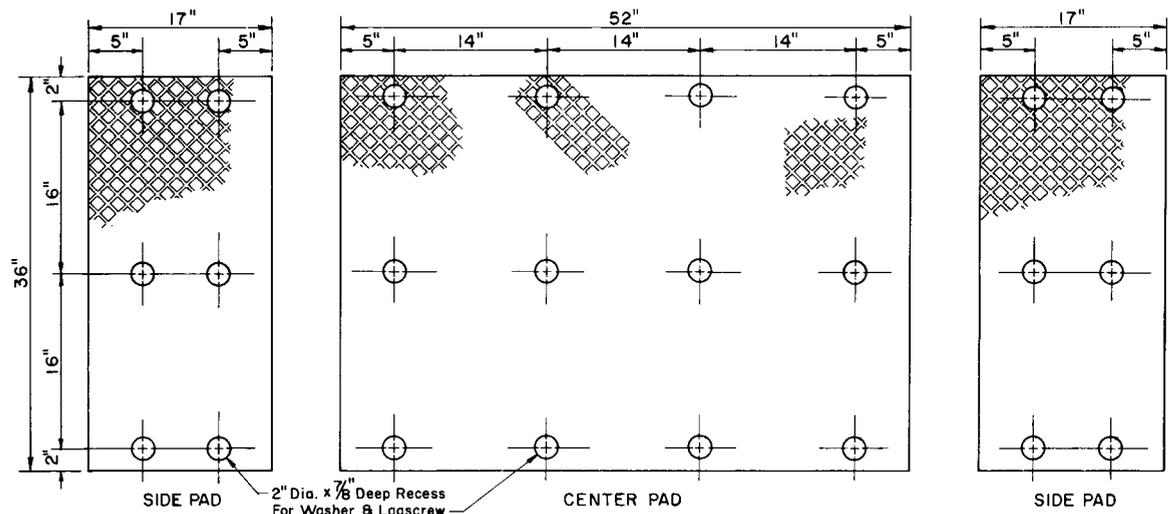
SECTION C-C Scale: 1 1/2"=1'

FHWA APPROVED: 3-20-75
FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
RAILROAD CROSSING TYPE "M"

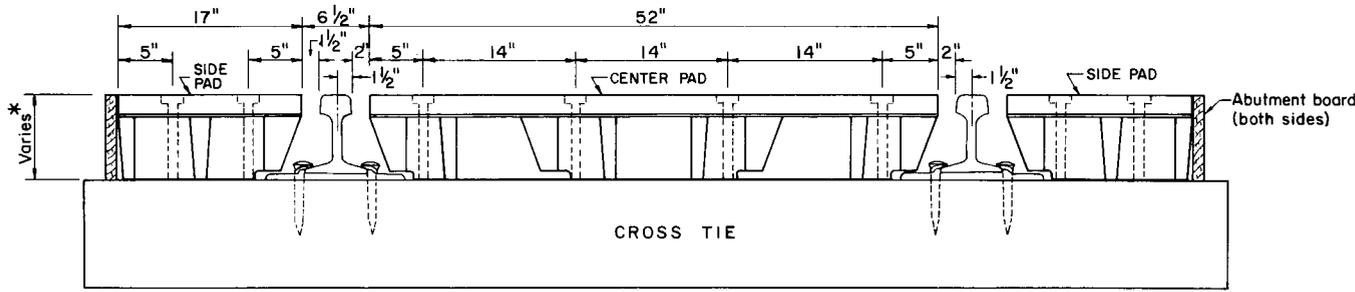
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
8/70	Changed type & thickness of LMF decking			
10-74	Changed Index N/S			

Detailed by	Names	Dates	Recommended For Approval by
Checked by			
Quantities by			
Checked by			
Traced by			

Drawing No.	Index No.
4 of 6	GRR-01

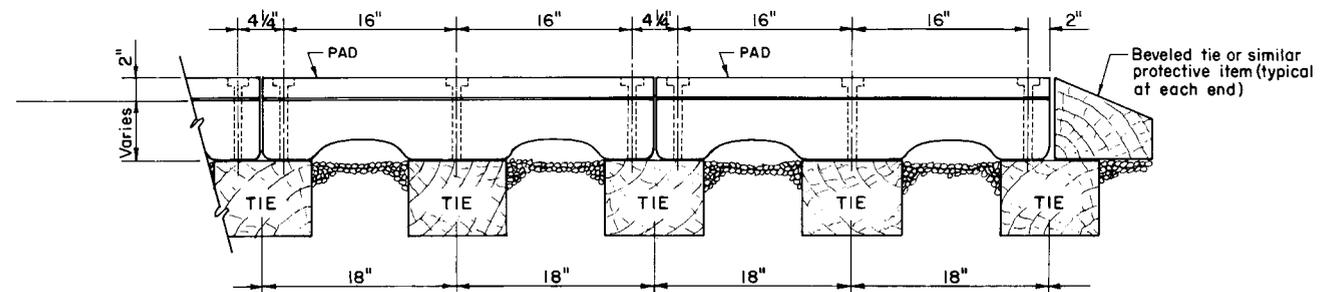


TOP VIEW



SECTION

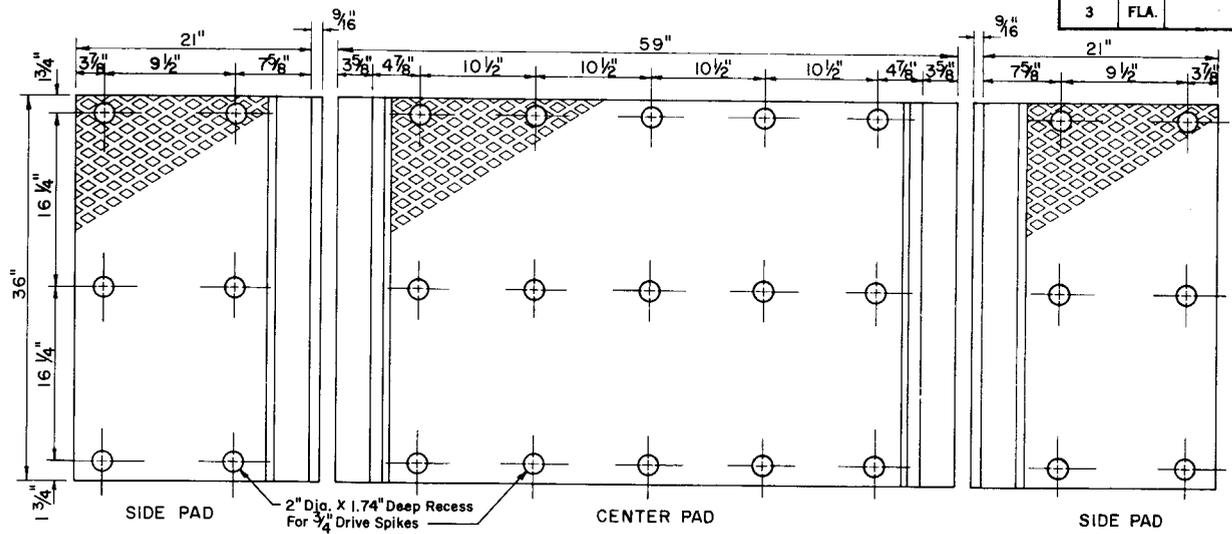
* O.A. Height 6 1/2" - Pads typical for 90-100 lb rails.
 O.A. Height 7 3/8" - Pads typical for 110-130 lb rails.
 O.A. Height 7 1/2" - Pads typical for 131, 133 or 136 lb rails.



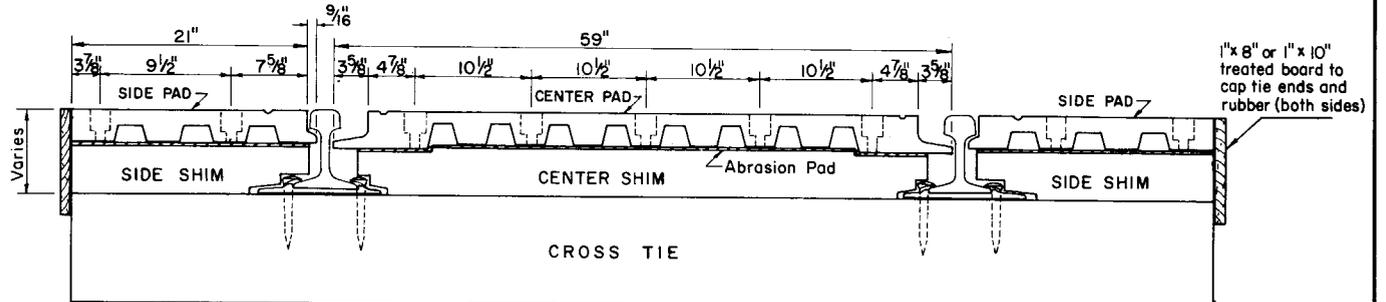
PARTIAL SECTION PARALLEL TO RAIL

CROSSING TYPE "P" (POLYETHYLENE)

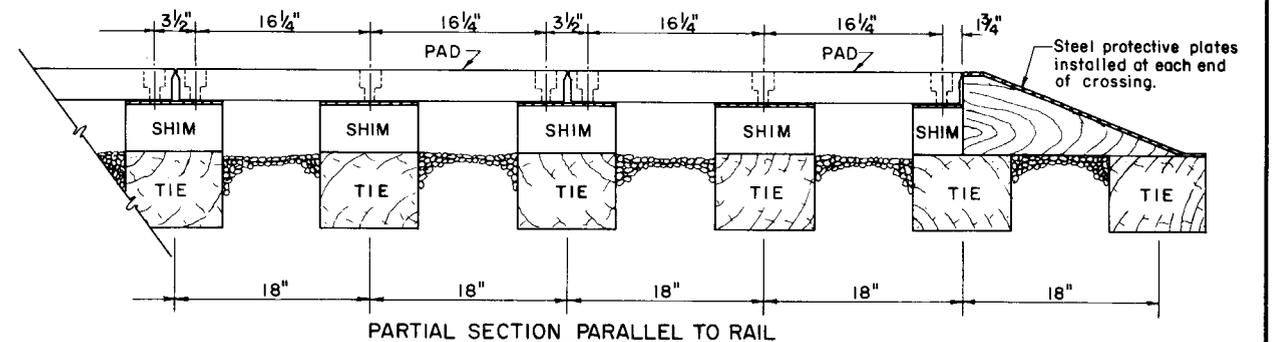
STOP ZONE	
Design Speed	Zone length - Distance from stop
45 MPH or less	250'
50 - 55	350'
60 - 65	500'
70	600'



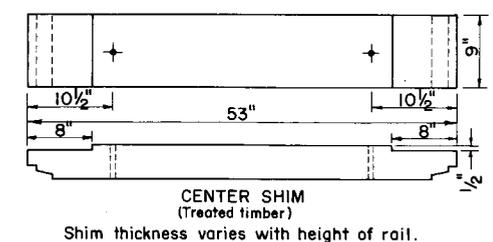
TOP VIEW



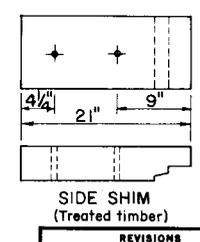
SECTION



PARTIAL SECTION PARALLEL TO RAIL



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



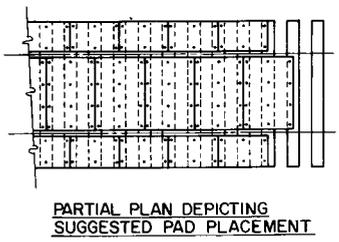
SIDE SHIM (Treated timber)

CROSSING TYPE "R" (RUBBER)

FHWA APPROVED: 10-11-78
 STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN SECTION

RAILROAD CROSSING TYPES "P" & "R"

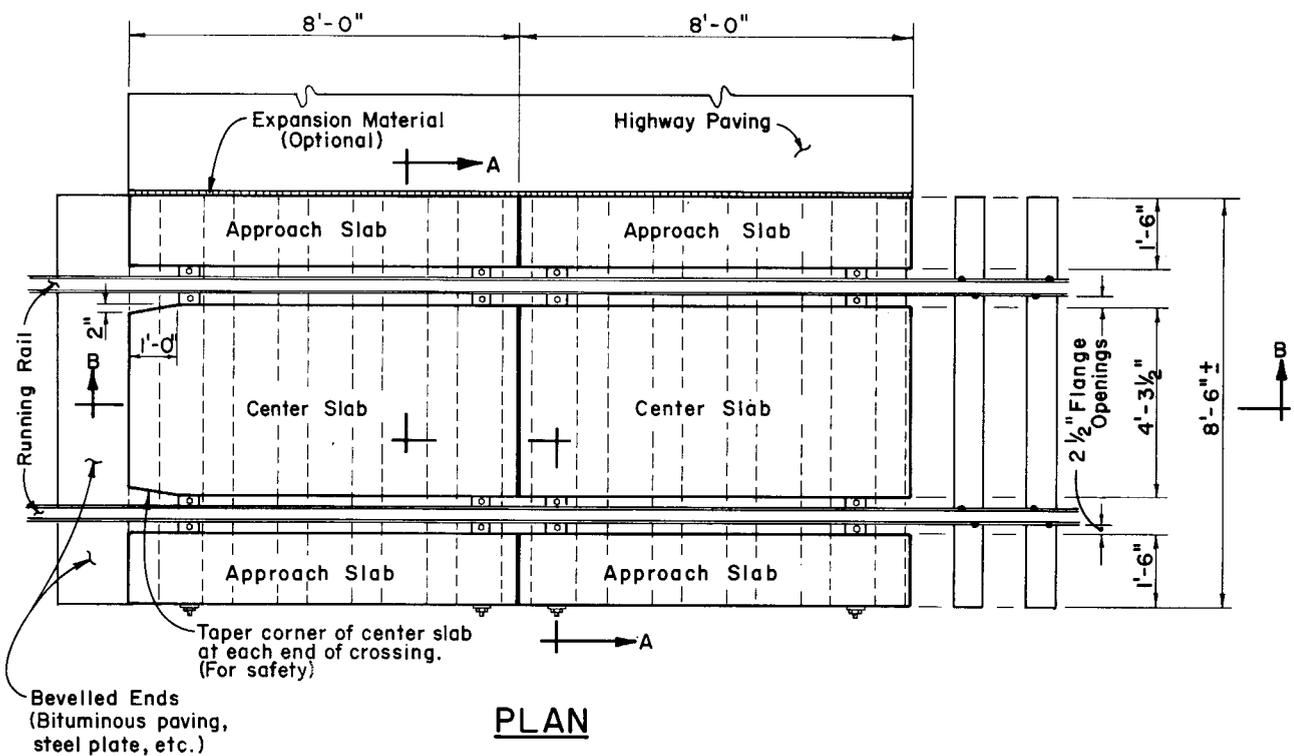
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
9-78	Revised General Notes			
DESIGNED BY		APPROVED BY		
Checked by GSB		E.H. Hart		
Quantity by		Deputy Design Engineer, Roadways		
Checked by		Drawing No. 5 of 6		Index No. GRR-01
Supervised by GSB				



PARTIAL PLAN DEPICTING SUGGESTED PAD PLACEMENT

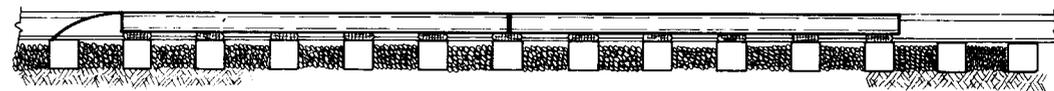
GENERAL NOTES

- The crossings shown on this sheet are **NOT** to be used for multiple track crossings within zones for an existing or scheduled future vehicular stop. Zone lengths are charted above.
- Crossings on this sheet may be used for single track crossings within the zones in the chart unless engineering or safety considerations dictate otherwise.
- Details shown are for straight track installations. Materials are also available for curved track installations.
- For additional details, materials required and installation procedures refer to the manufacturers specifications.

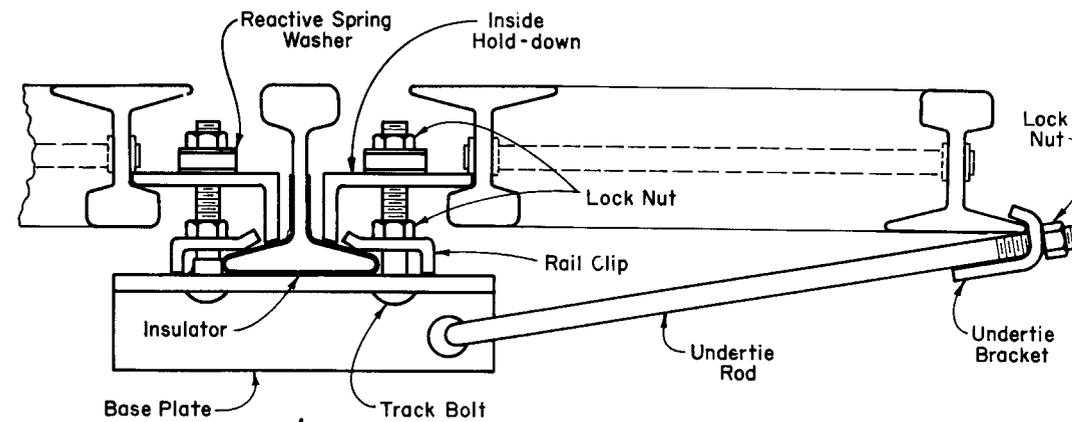


GENERAL NOTES

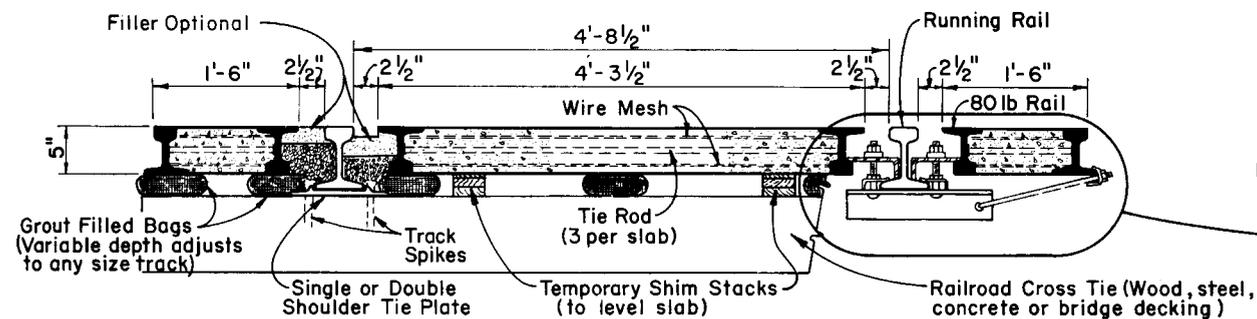
1. The reinforced concrete slabs are manufactured in 8'-0" sections, 5" in depth to fit all rail sections 5 1/4" in height or heavier. Slabs are interchangeable and relocateable.
2. Center slabs are one piece construction allowing for 2 1/2" flange opening. 80 lb. rail is used to encase, armor and reinforce 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.



SECTION B-B



TYPICAL BOTH SIDES

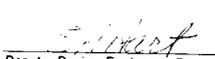


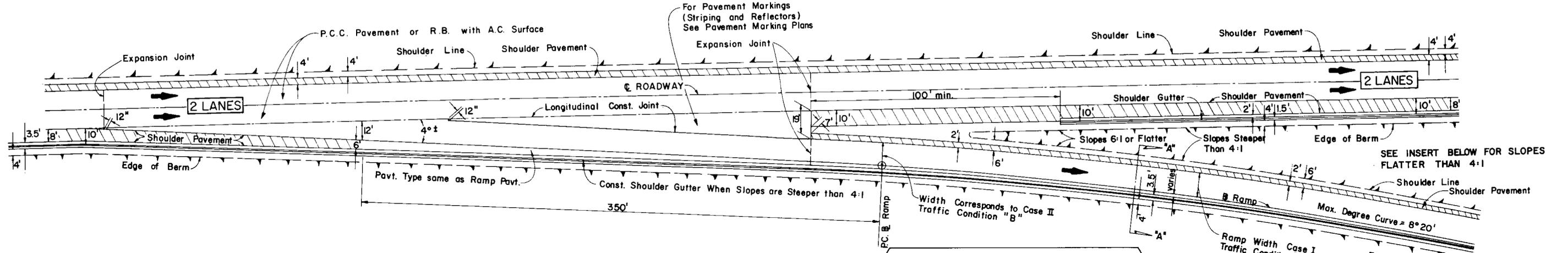
SECTION A-A

FHWA Approved: 5-3-77

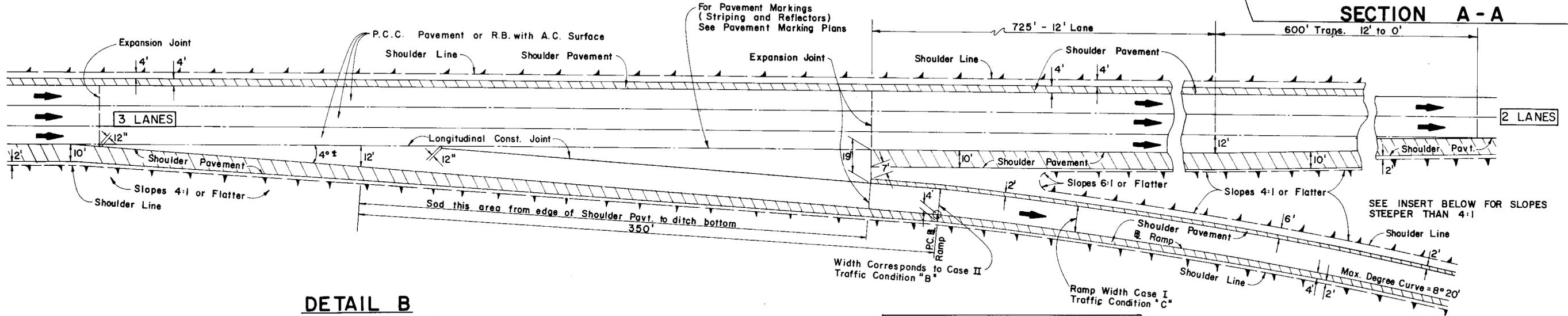
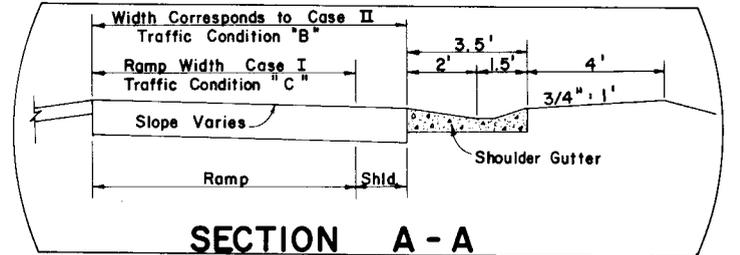
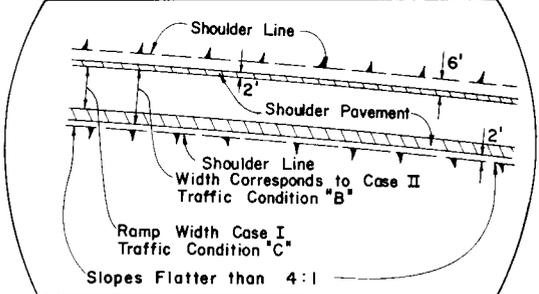
FLORIDA DEPARTMENT OF TRANSPORTATION
Road Design Section

RAILROAD CROSSING TYPE "T"

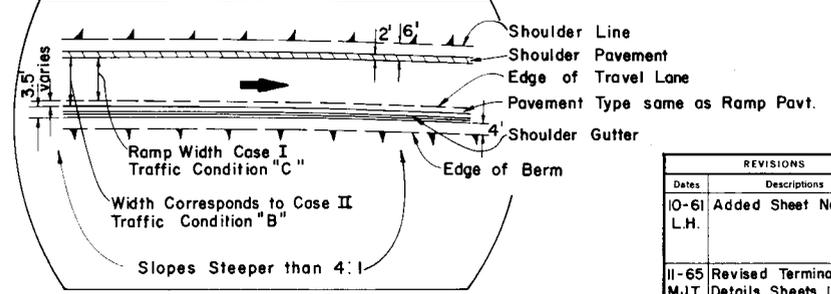
REVISIONS		INITIALS	DATES	Approved by:
Dates	Descriptions	Designed by		
		Checked by		 Deputy Design Engineer - Roadways
		Quantities by		
		Checked by		
		Supervised by		DRAWING NO. INDEX NO.
				6 of 6 GRR-01



DETAIL A
EXIT TERMINAL
TWO THRU LANES



DETAIL B
EXIT TERMINAL
TWO THRU LANES
THREE APPROACH LANES

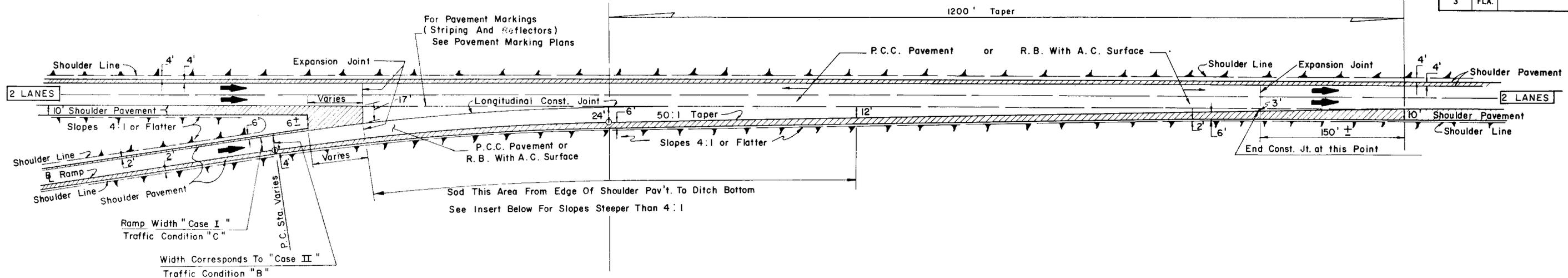


FHWA. APPROVED: 7-18-75
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

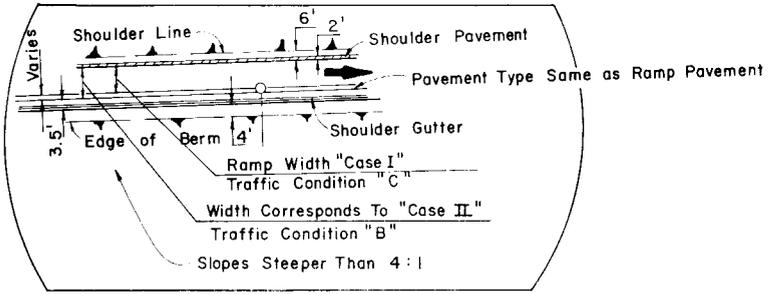
STANDARD DETAILS FOR RAMP TERMINALS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
10-61	Added Sheet No. 3			
L.H.				
		Names	Dates	APPROVED BY
		Designed by	H.F.W. 1-65	<i>E.H. Hart</i> Deputy Design Engineer, Roadways
		Checked by	E.H. 3-65	
		Quantities by		Drawing No.
		Checked by		Index No.
		Supervised by		1 of 4

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

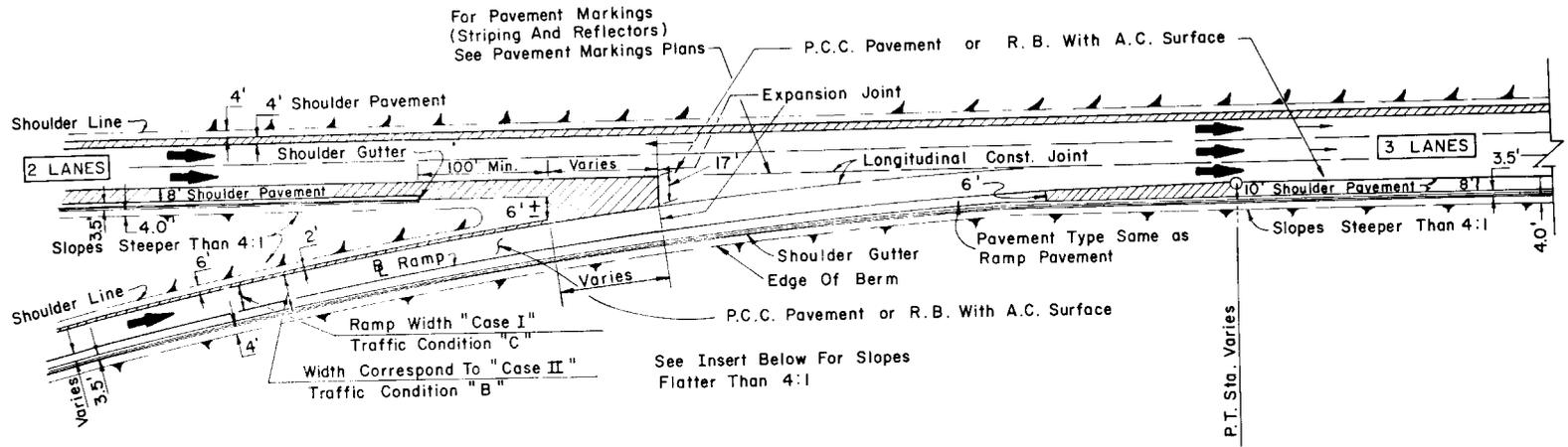


DETAIL C
ENTRANCE TERMINAL
TWO THRU LANES

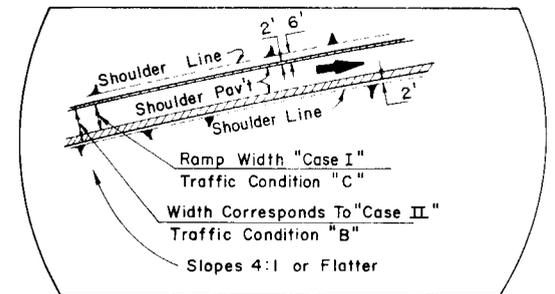


GENERAL NOTES

- 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).



DETAIL D
ENTRANCE TERMINAL
WITH ADDED LANE



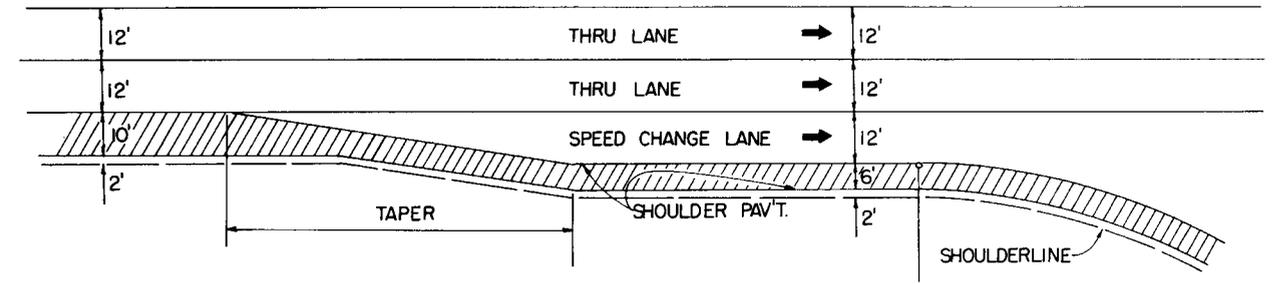
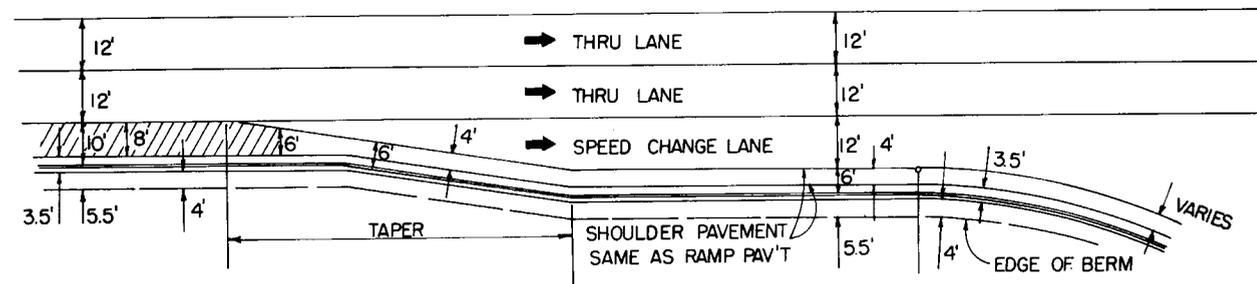
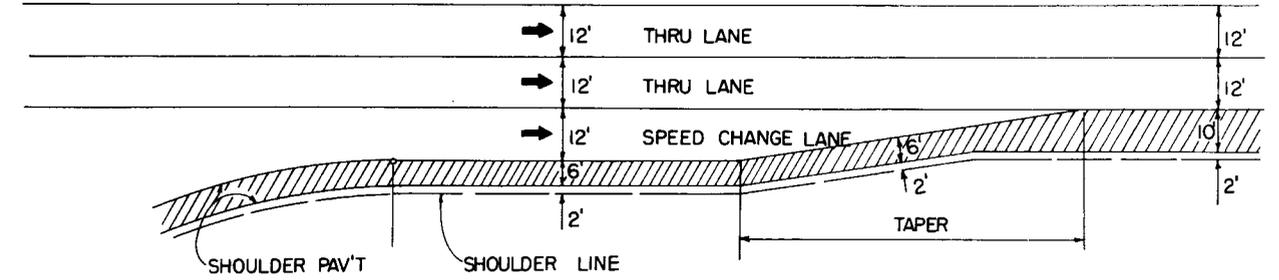
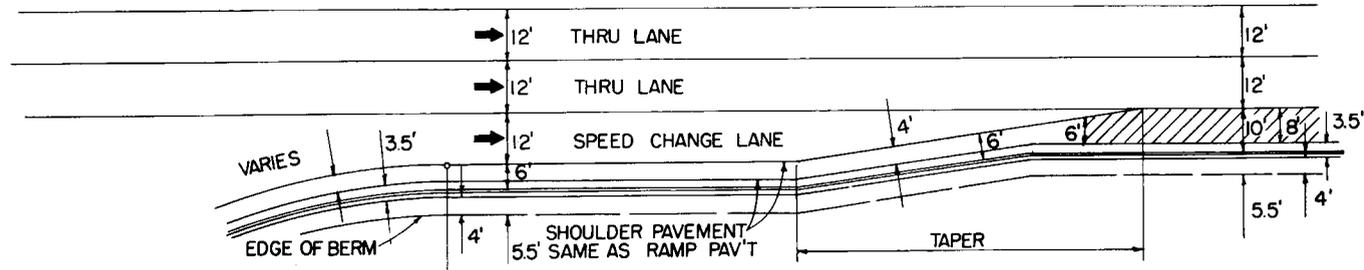
FHWA APPROVED: 7-18-75

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			
5-67	REVISED EXIT TERMINALS & 4' BERM (SH. 1)			
6-67	ADDED TYPE "E" CURB & GUTTER (SH. 1 & 3)			
9-67	REVISED DETAILS TO SHOW SHOULDER GUTTER			

Designed by	W. L. B.	Dates	1 - 65	APPROVED BY <i>E. H. Hart</i> Deputy Design Engineer, Roadways
Checked by	E. H.		3 - 65	
Quantities 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

FHWA APPROVED: 7-18-75

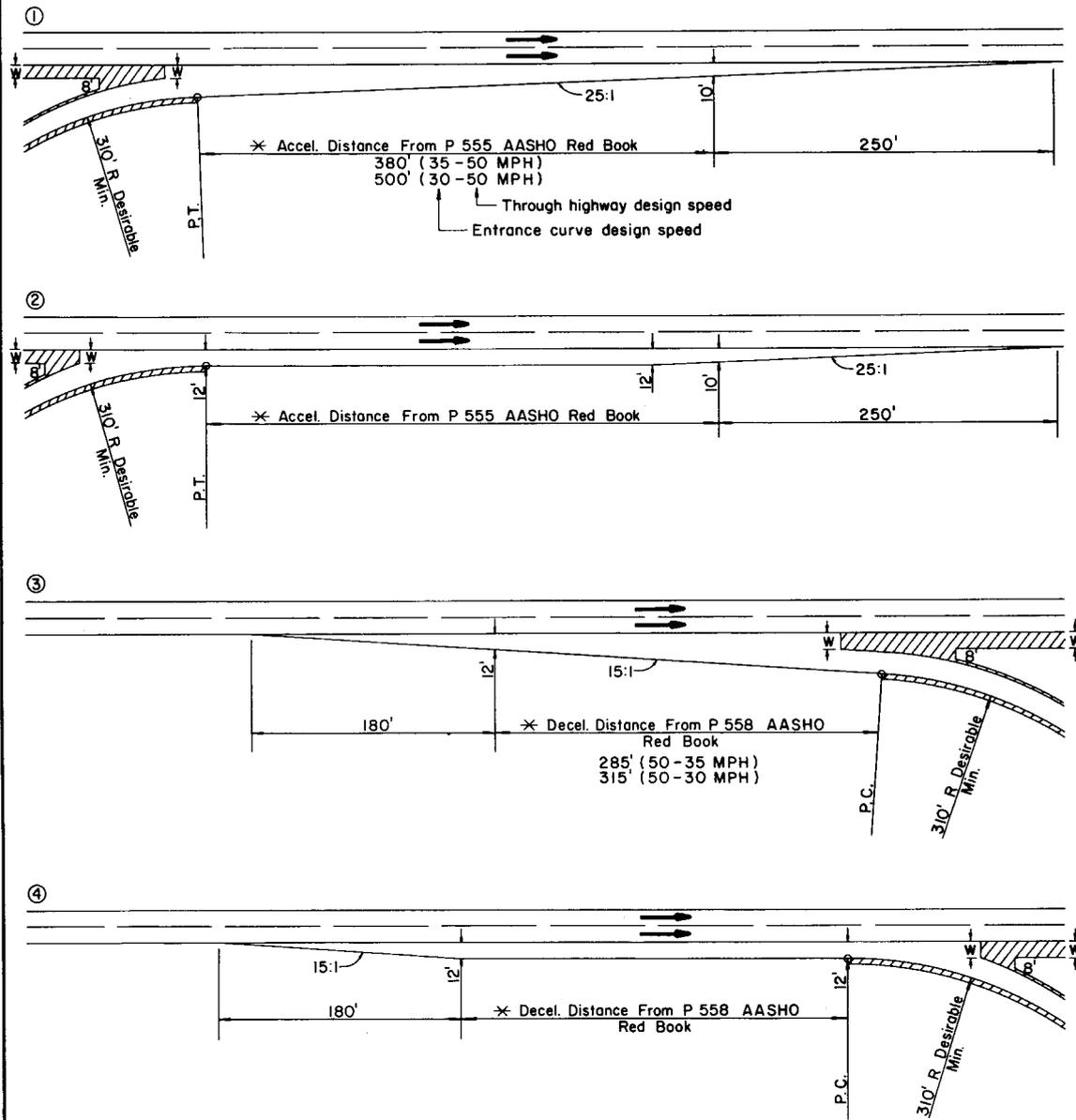
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

STANDARD DETAILS FOR RAMP TERMINALS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
RHC 2-68	REVISED EXIT & ENTRANCE TERMINAL			
R.H.C. 9-68	CHANGED CASE II CONC'D B' LINE TO EDGE OF PAV'T WHERE SHOULDER GUTTER IS INVOLVED			
10-74	CHANGED INDEX NO.			

Designed by	Checked by	Quantities by	Checked by	Supervised by

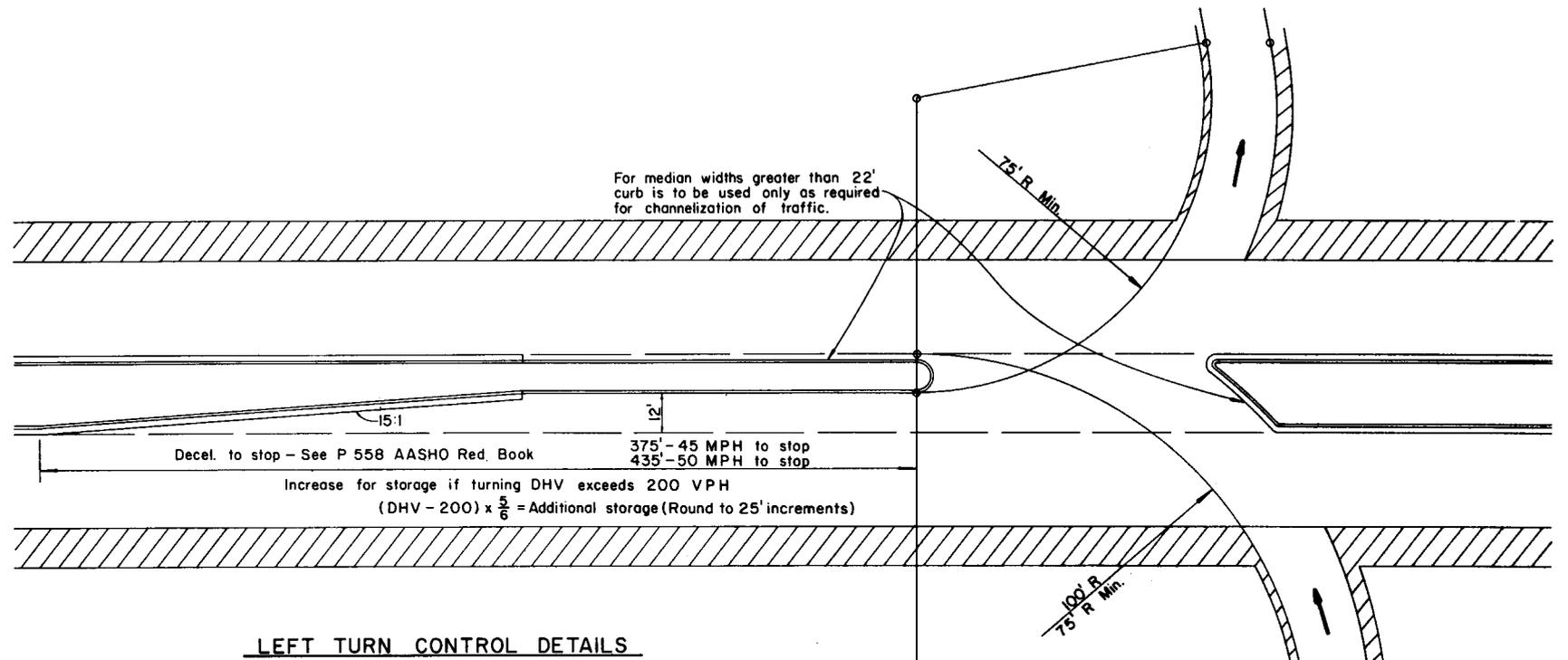
APPROVED BY	
<i>E.H. Hunt</i>	
Deputy Design Engineer, Roadways	
Drawing No.	Index No.
3 of 4	GRT-01



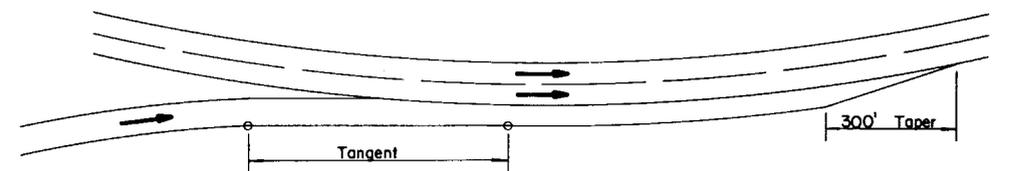
ENTRANCE AND EXIT RAMP TERMINAL DETAILS

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.



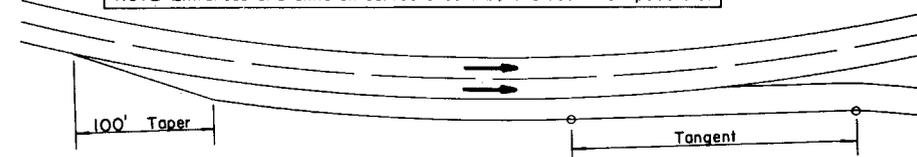
LEFT TURN CONTROL DETAILS



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

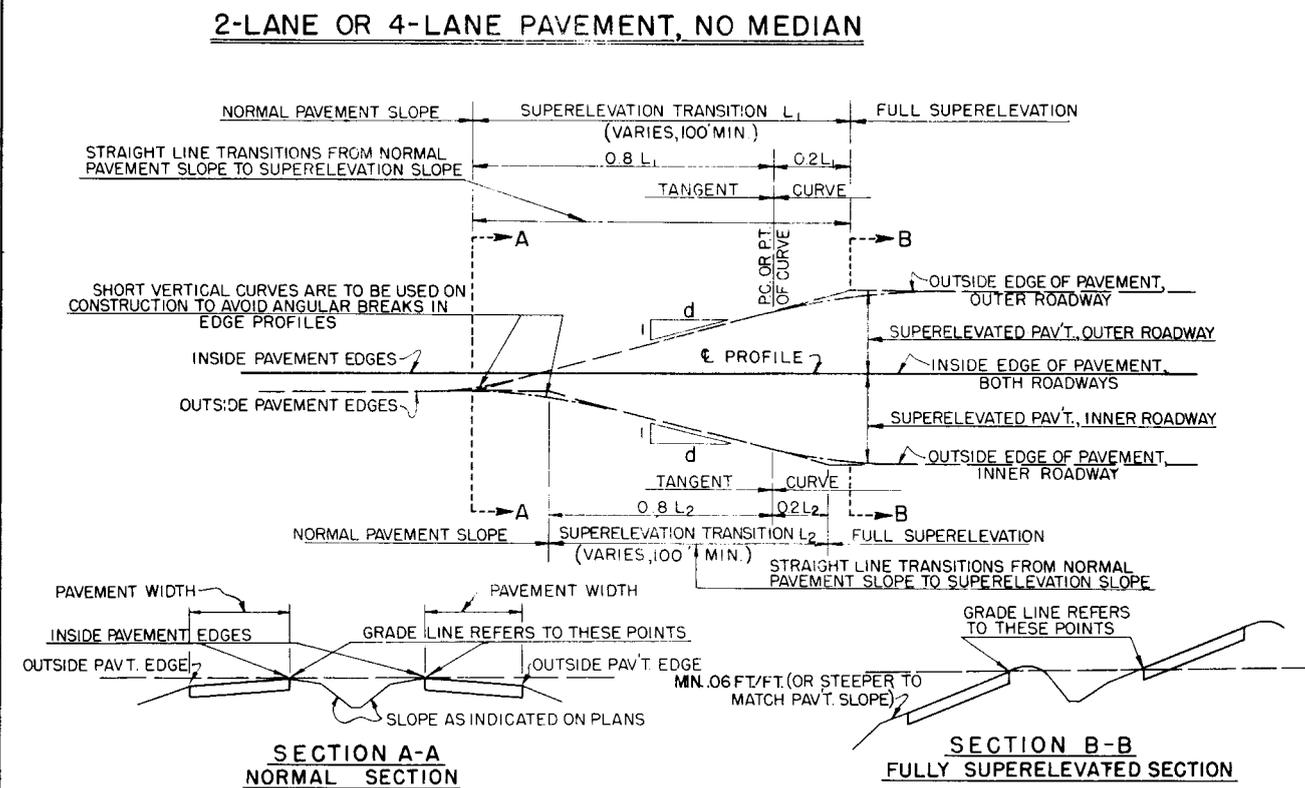
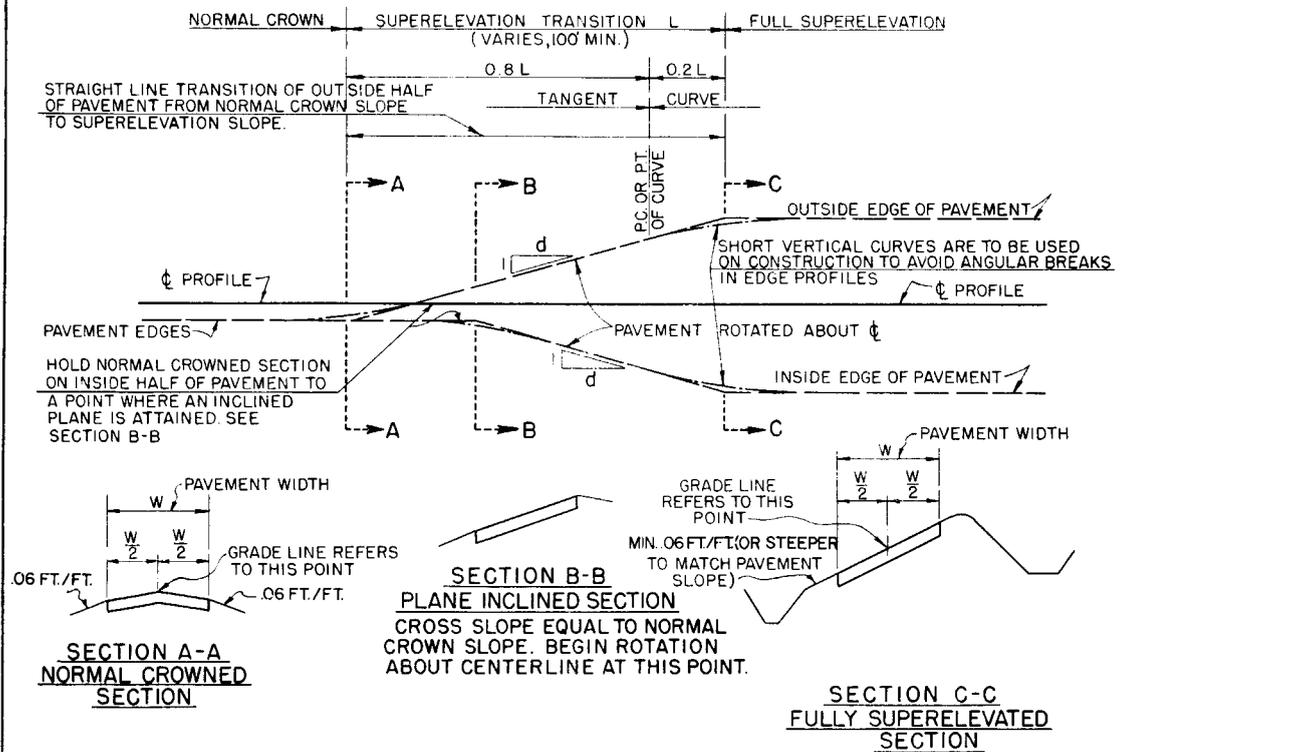
The details shown on this sheet apply to the cross road design of rural type, unsignalized interchanges.

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

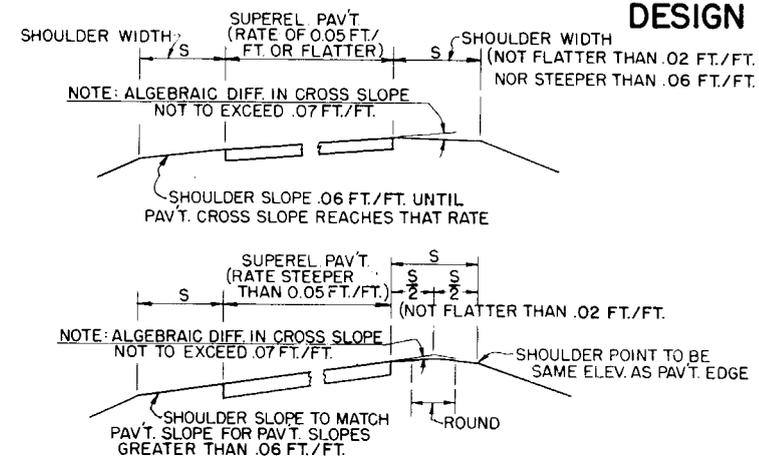
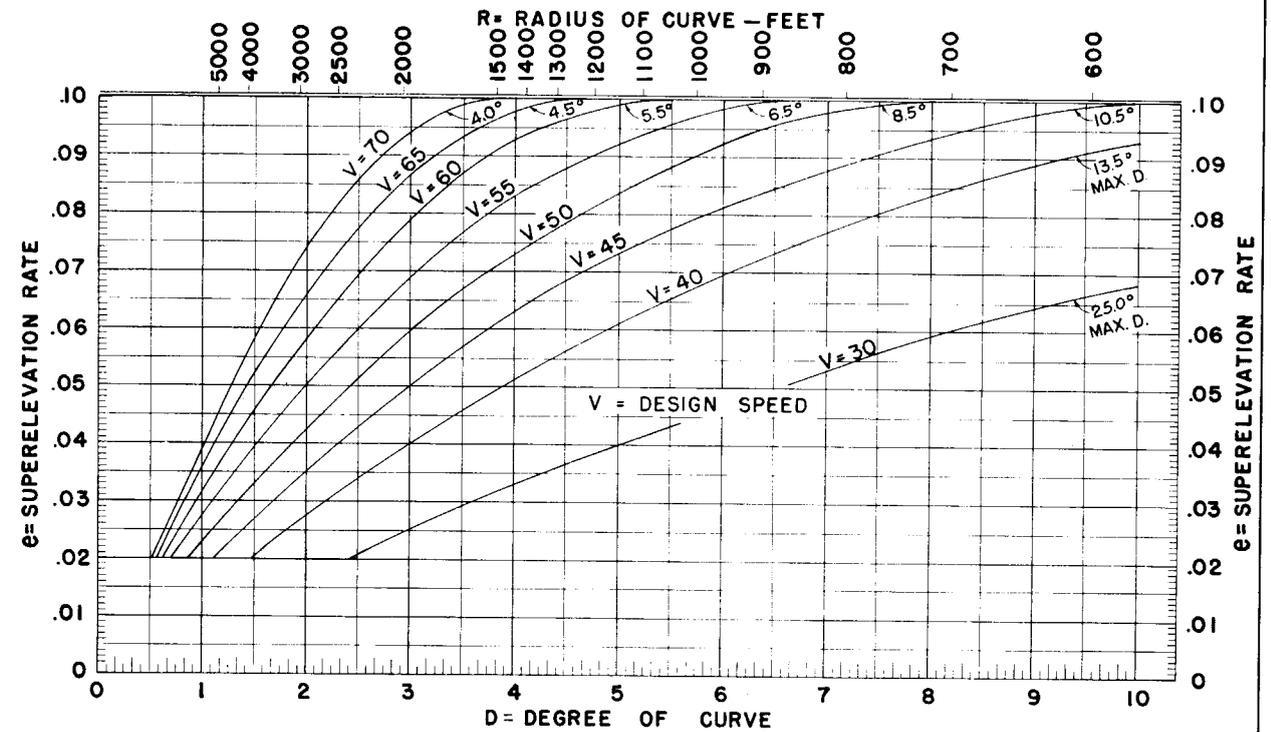
STANDARD DETAILS FOR RAMP TERMINALS

REVISIONS		INITIALS	DATES	Approved by:
Dates	Descriptions			
	Designed by			by: <i>E. H. Hunt</i> Deputy Design Engineer-Roadways
	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.

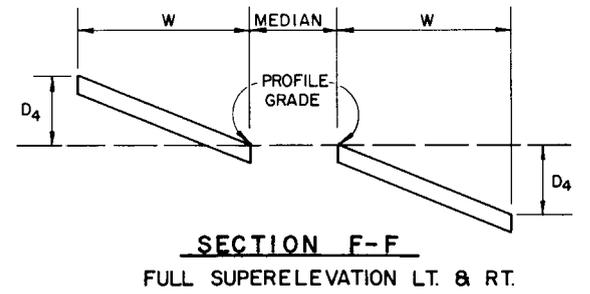
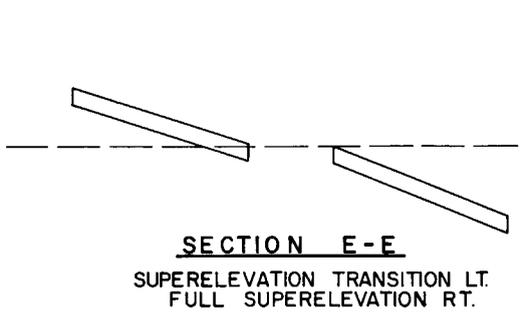
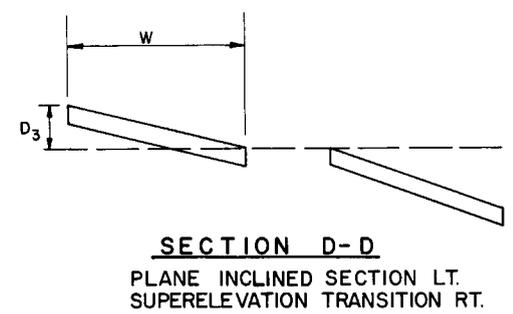
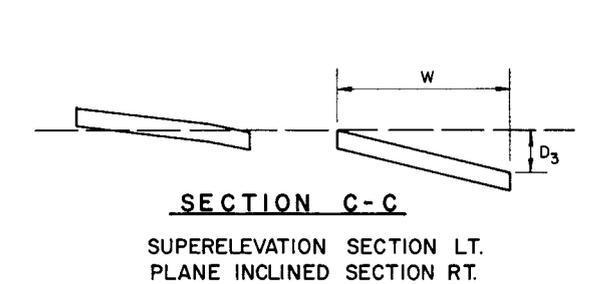
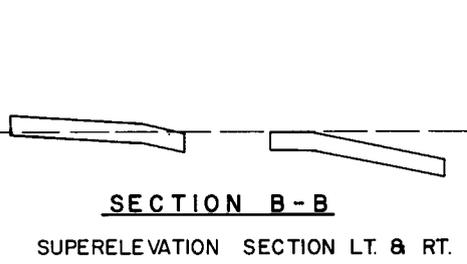
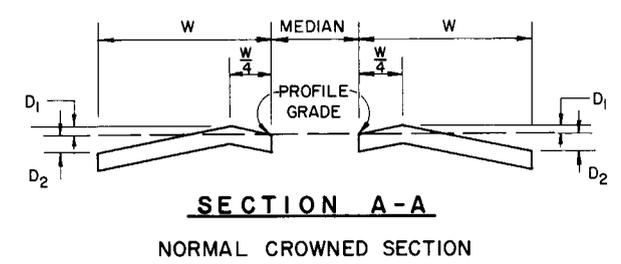
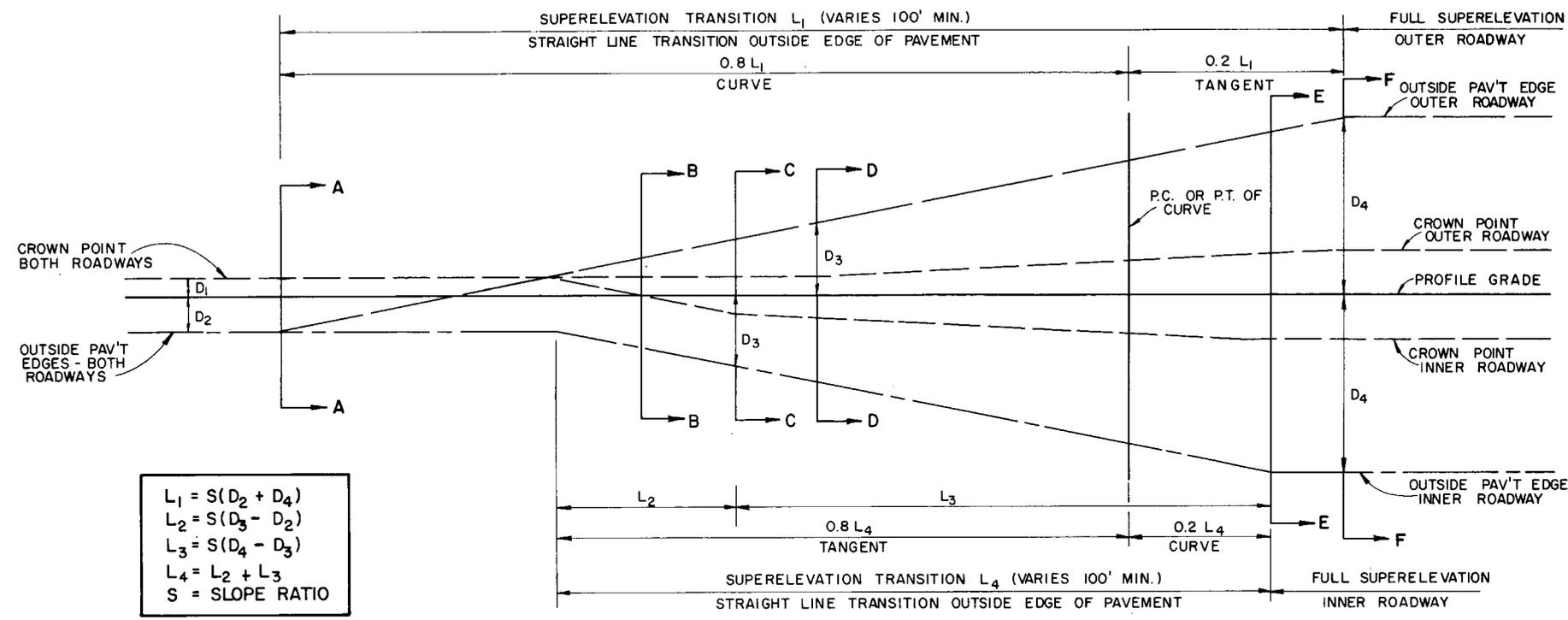


SLOPE RATIOS FOR SUPERELEVATION TRANSITIONS				
DESIGN SPEED, M.P.H.	45-50	55-60	65-70	
1:d	1:200	1:225	1:250	2 Lane & 4 Lane
	1:160	1:180	1:200	6 Lane
	1:150	1:170	1:190	8 Lane

FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

SUPERELEVATION DETAILS

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
11-73 Changed all fractions to decimals 5-58 h.w. RETRACED 10-77 Added Sheet 2 10-67 ADDED NOTE N°5 5-75 Removed Gen Note #5 R.H.C. 10-74 Revised S.E. Chart & Changed Index No. M.J.T. CHART			
9-61 SUPER TRANS RATE REV TO CONFORM TO AASHTO L.H. 5-65 Re v for 1/4 Cross Slope hfw.			
Checked by Quantities by Traced by	Names Dates	Recommended For Approval by APPROVED BY State Engineer	Drawing No. 1 of 2 Index No. GSE-01-1



SUPERELEVATION DETAILS
8 LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN

FHWA APPROVED: 11-2-77

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY PLANS SECTION			
SUPERELEVATION DETAILS			
ROAD NO.	COUNTY	PROJECT NO.	
APPROVED BY		APPROVED BY	
Designed by	Names	Dates	 <small>Deputy Design Engineer, Roadways</small>
Checked by			
Checked by			
Supervised by	W. A. L.		
Drawing No.		Index No.	
2 of 2		GSE-01-1	

REVISIONS	DESCRIPTIONS

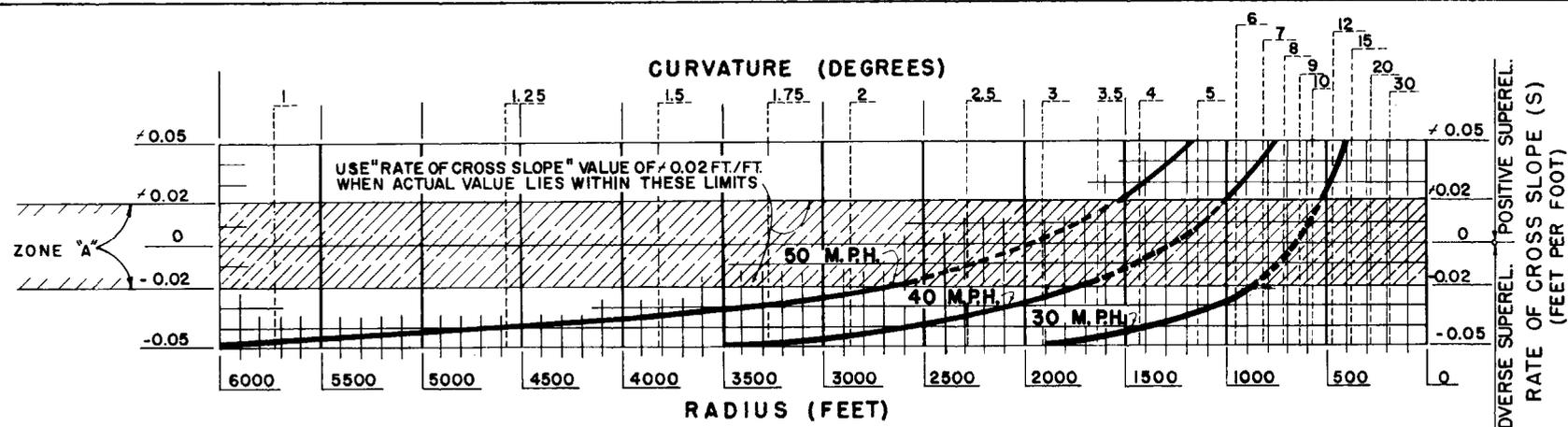
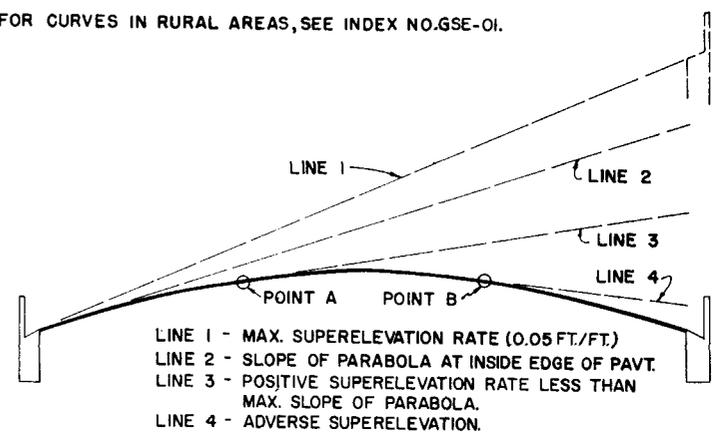
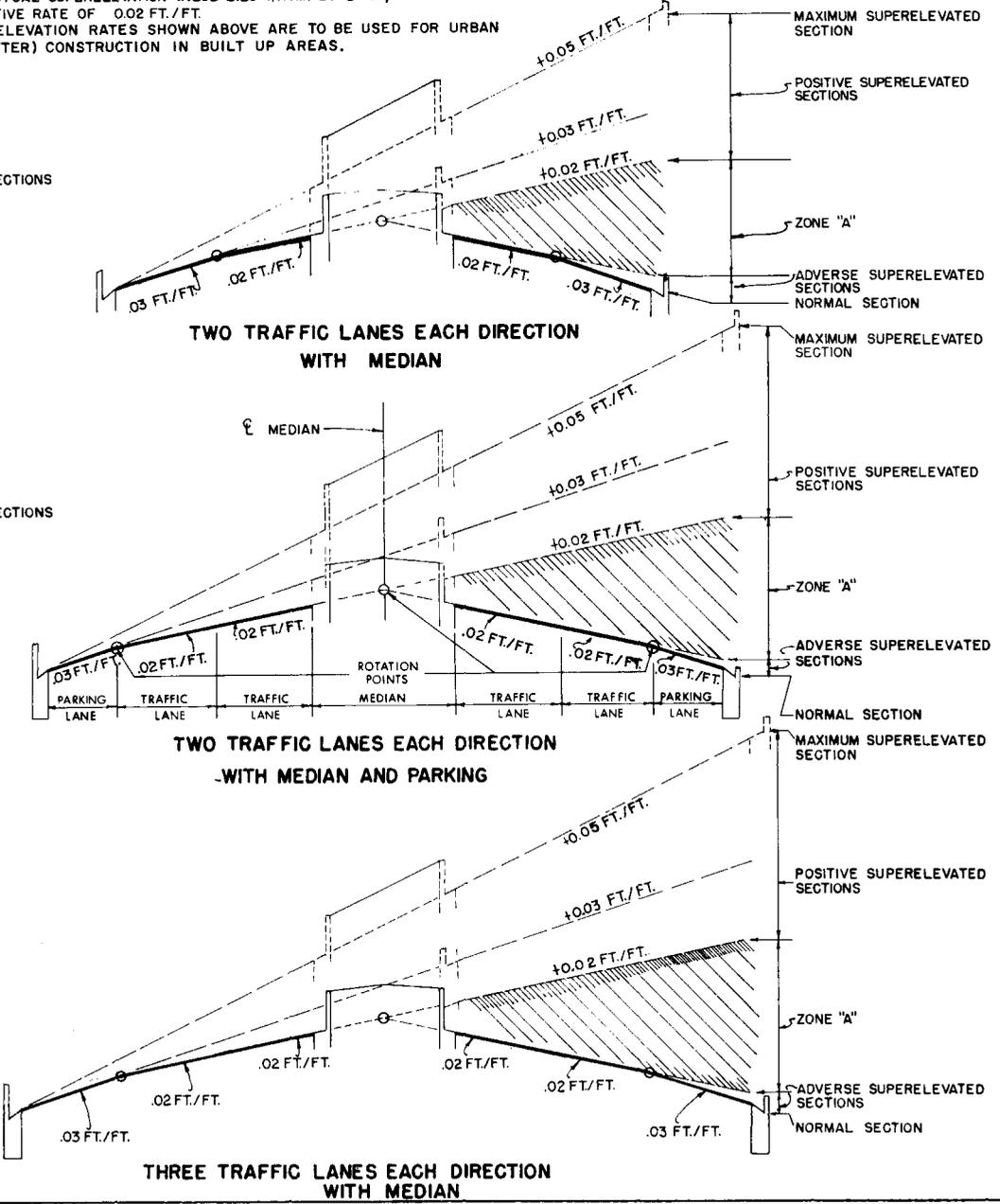
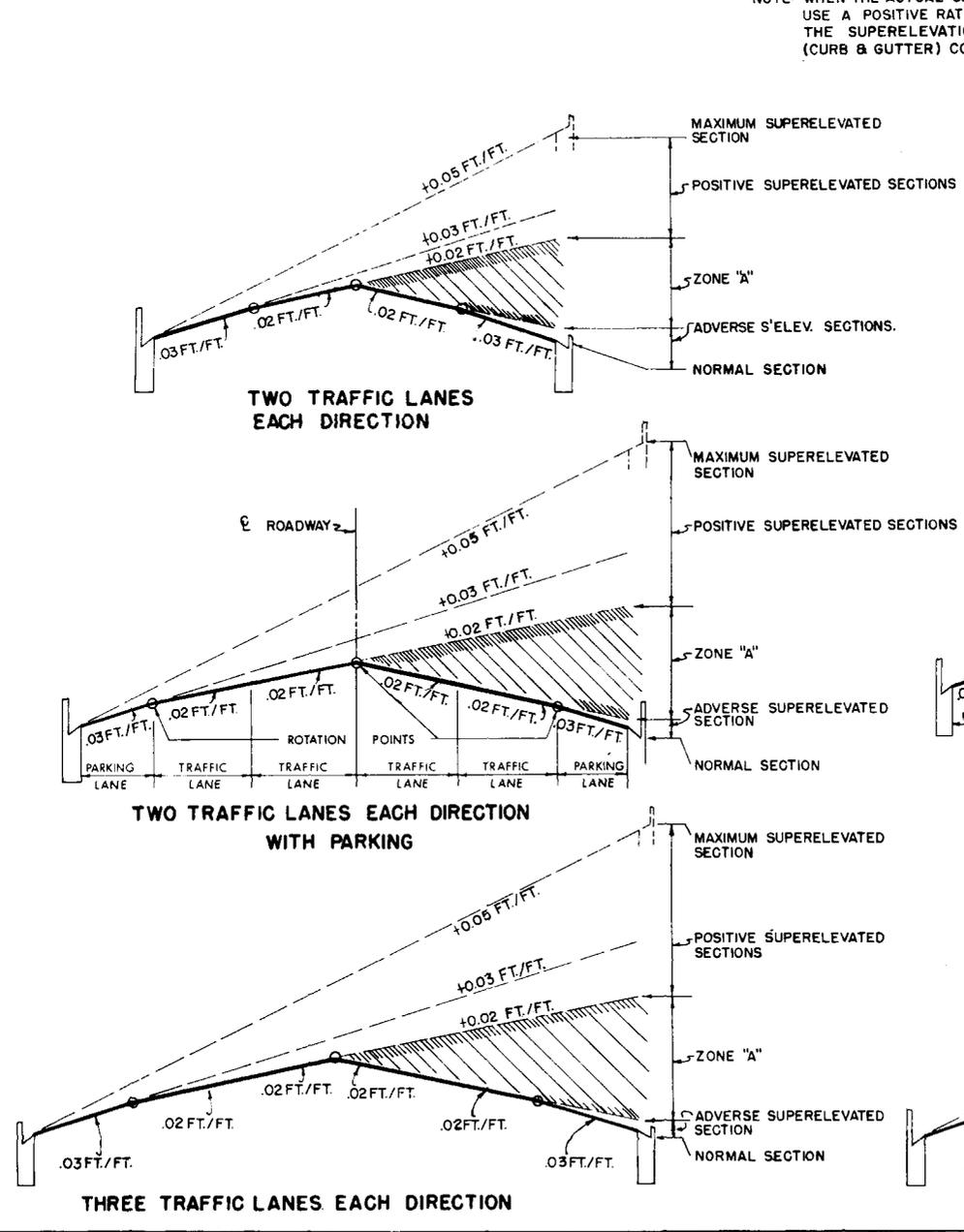


CHART SHOWING REMOVAL OF CROWN AND OR SUPERELEVATION NECESSARY FOR CURVATURE AT VARIOUS DESIGN SPEEDS

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.

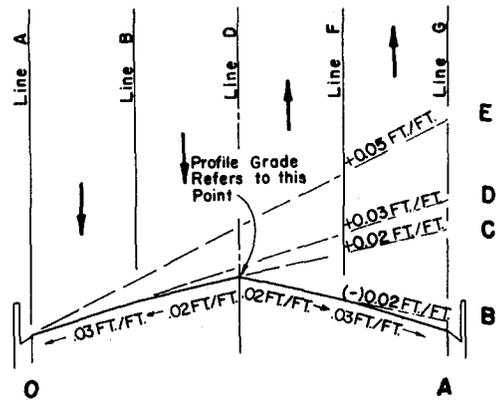


VALUES OBTAINED FROM THE CHART ARE ALSO APPLICABLE TO A PARABOLIC CROWN SECTION. WHEN THIS TYPE SECTION IS USED, SUPERELEVATION IS ESTABLISHED BY ROTATING A TANGENT ABOUT THE ARC OF THE PARABOLIC CROWN UNTIL THE DESIRED SLOPE IS ATTAINED (POINTS A & B ON SKETCH). THE NORMAL PARABOLIC CROWN WILL BE MAINTAINED OUTSIDE THE LIMITS OF THE PLANE THUS FORMED.

SUPERELEVATION OF PARABOLIC SECTION

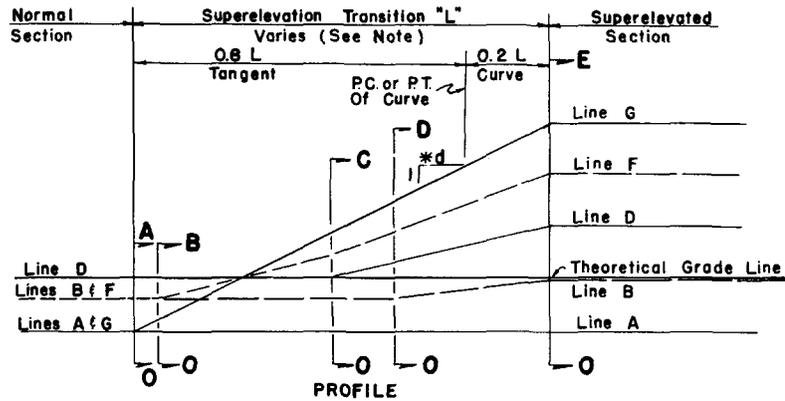
FHWA APPROVED: 5-20-77
FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
SUPERELEVATION DETAILS FOR MUNICIPAL CONSTRUCTION

REVISIONS		REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	Date	Description			
5-77	Added note under LMF S.E. Chart	3-67	REVISED FOR PLANE SECTION			
		1-73	Changed all fractions to decimals.	Names	Dates	Recommended For Approval by
		10-74	Changed Index N/R LMF Up dated pav't slope to current policy	Checked by	12-66	Engineer of Road Design
				Checked by		
				Traced by	1-67	1 OF 2 GSE-02-1

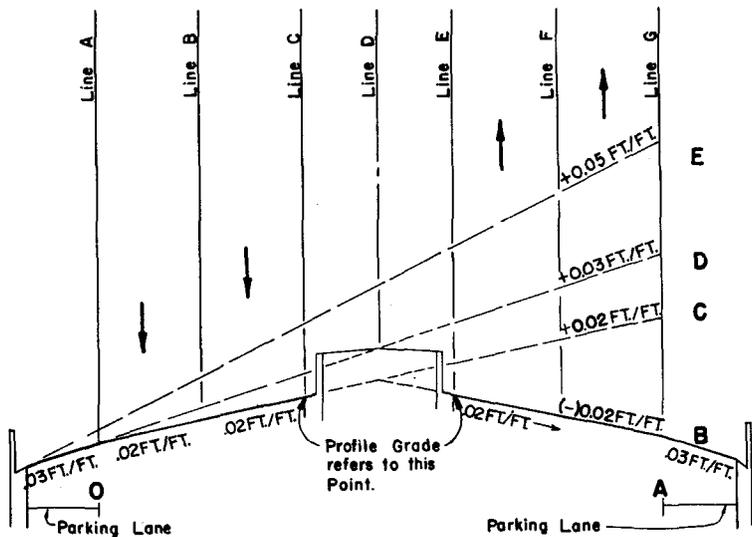


SECTION O-A TO O-E

DETAIL OF SUPERELEVATION TRANSITION FOR TWO TRAFFIC LANES EACH DIRECTION

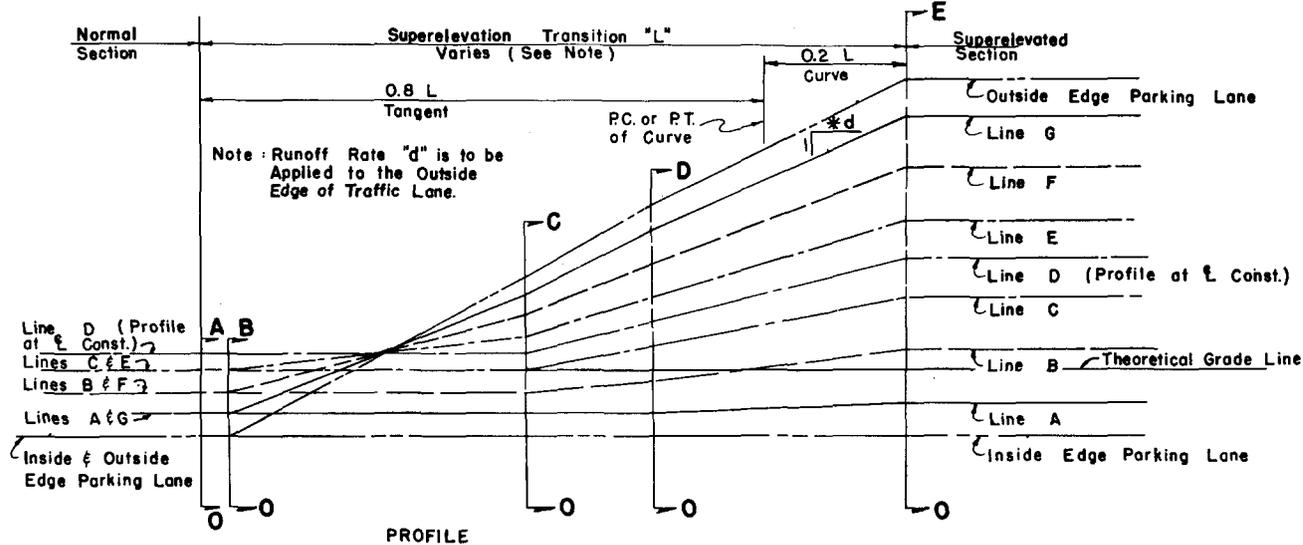


LINE	DESCRIPTION
A	INSIDE TRAFFIC LANE
B	INSIDE LANE LINE
C	INSIDE MEDIAN EDGE PAVEMENT
D	ℓ CONSTRUCTION
E	OUTSIDE MEDIAN EDGE PAVEMENT
F	OUTSIDE LANE LINE
G	OUTSIDE TRAFFIC LANE



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		
		e	e	e
0° 15'	22918'	NC	NC	NC
0° 30'	11459'	NC	NC	NC
0° 45'	7639'	NC	NC	RC
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		

e Max.=0.05

The superelevation 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.

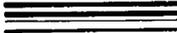
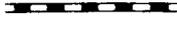
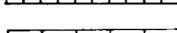
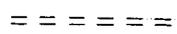
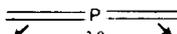
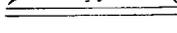
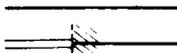
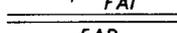
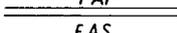
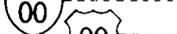
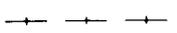
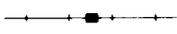
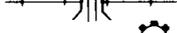
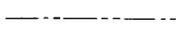
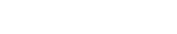
NOTE: THE SECTIONS AND PROFILES SHOWN ON THIS SHEET ARE EXAMPLES OF THE SUPERELEVATION TRANSITIONS. SIMILAR SCHEMES SHOULD BE USED FOR ROADWAYS HAVING DIFFERENT SECTION DESIGNS.

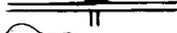
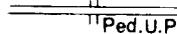
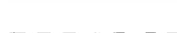
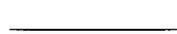
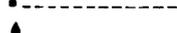
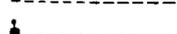
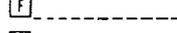
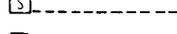
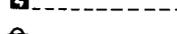
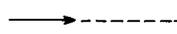
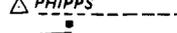
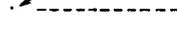
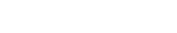
FHWA APPROVED: 5-20-77
FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
SUPERELEVATION DETAILS FOR MUNICIPAL CONSTRUCTION

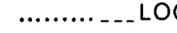
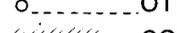
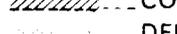
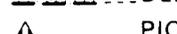
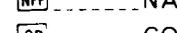
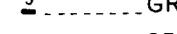
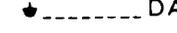
REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
1-75 Changed all fractions to decimals.			
10-74 Changed Index No. Up-dated part slope to current policy.			
5-77 Added S.E. chart for e Max 0.05			

Checked by	W.L.B.	2-66	APPROVED BY <i>[Signature]</i> Asst. State Highway Engineer
Checked by	R.L.O.	12-66	
Checked by	C.D.P.	1-67	Drawing No. 2 OF 2
			Index No. GSE-02-1

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 SHEETS AND PLAN SHEETS

REVISIONS		INITIALS	DATE	Recommended for approval by:
Dates	Descriptions			
4-75	Chgd Index No			
	Designed by			Revised by: <i>C. J. [Signature]</i>
	Checked by	C.O.R.	8-72	Deputy Design Engineer - Roadways
	Quantities by			Approved by:
	Checked by			State Design Engineer
	Supervised by	D.C.B.		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
	DEFINITION OF SKEW
	CONCRETE
	WOOD
	RATE OF SUPERELEVATION

UTILITY ADJUSTMENT SYMBOLS		
	EXISTING	PROPOSED
POWER POLE		
OVERHEAD POWER CABLE		
TELEPHONE POLE		
OVERHEAD TELEPHONE CABLE		
COMBINATION POLE		
GUY WIRE AND ANCHOR PIN		
BURIED POWER CABLE		
ELECTRIC DUCT		
BURIED TELEPHONE CABLE		
TELEPHONE DUCT		
TOWER		
LIGHT POLE		
GAS MAIN		
WATER MAIN		
SANITARY SEWER		
MANHOLE		
WATER METER		
VALVE		
FIRE HYDRANT		
UNDERGROUND CABLE TELEVISION		
OVERHEAD CABLE TELEVISION		

FHWA APPROVED: 7-7-75

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

STANDARD SYMBOLS FOR KEY SHEETS AND PLAN SHEETS

REVISIONS		INITIALS	DATE	Recommended for approval by:
Date	Description	Designed by		
4-75	Updated & New Index No.	Checked by	COR 8-72	
		Quantities by		Approved by:
		Checked by		
		Supervised by	D.C.B.	State Design Engineer
			2 of 3	Drawings No. Index No. GSS-01

STANDARD SYMBOLS FOR PLAN SHEETS

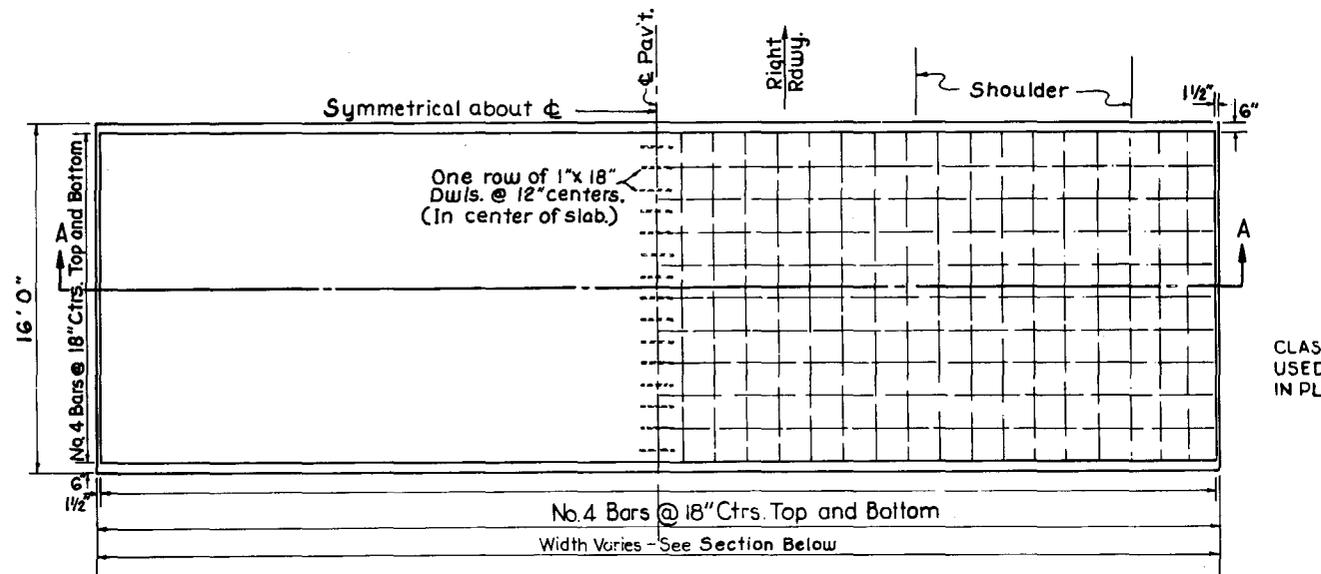
TRAFFIC SIGNALS SYMBOLS	EXISTING	PROPOSED
TRAFFIC SIGNAL HEAD (SPAN WIRE MOUNTED)		
TRAFFIC SIGNAL HEAD (PEDESTAL MOUNTED)		
TRAFFIC SIGNAL HEAD (MAST ARM MOUNTED)		
TRAFFIC SIGNAL POLE (CONCRETE, WOOD, METAL)		
VEHICLE DETECTOR (LOOP)		
SIGNAL CABLE (ON MESSENGER WIRE)	-----	
CONDUIT	-----	
VEHICLE DETECTOR (OTHERS)		
PEDESTRIAN DETECTOR (PUSHBUTTON)		
PEDESTRIAN SIGNAL HEAD (POLE OR PEDESTAL MOUNTED)		
CONTROLLER CABINET (BASE MOUNTED)		
CONTROLLER CABINET (POLE MOUNTED)		
WALK - DON'T WALK FLASH	W - DW	FL.
SIGNAL FACE NUMBER		
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

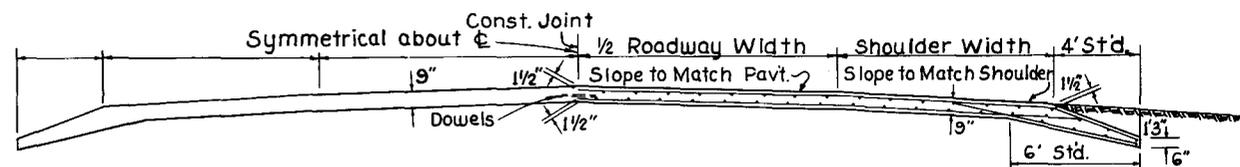
SIGNING AND PAVEMENT MARKING SYMBOLS	
PAVEMENT ARROW	
SINGLE SOLID LINE	
DOUBLE SOLID LINE	
SKIP LINE	
STOP BAR	
TRAFFIC SIGN (POST MOUNTED)	
TRAFFIC SIGN (OVERHEAD)	
SIGN NUMBER	
SIGN ITEM NUMBER	
TRAFFIC FLOW ARROW	

FHWA APPROVED: 7-7-75
 STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
 ROAD DESIGN SECTION
 STANDARD SYMBOLS FOR KEY SHEETS AND PLAN SHEETS

REVISIONS		INITIALS	DATE	Recommended for approval by:
DATE	DESCRIPTION	Designed by		
4-75	Up-dated & New Index No	Checked by	COR 8-77	Deputy Design Engineer - Roadways
		Quantities by		Approved by:
		Checked by		
		Supervised by	D.C.B.	State Design Engineer
		Drawing No.	3 of 3	Index No. GSS-01



PLAN

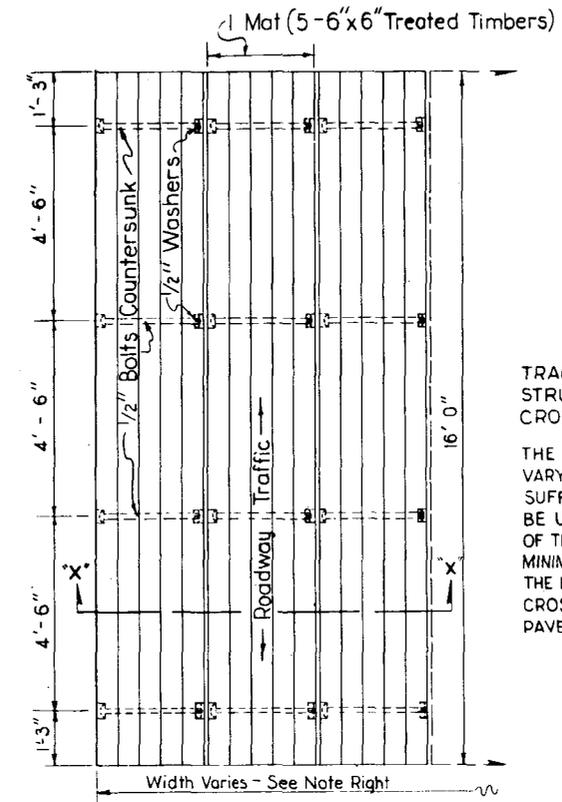


SECTION A-A

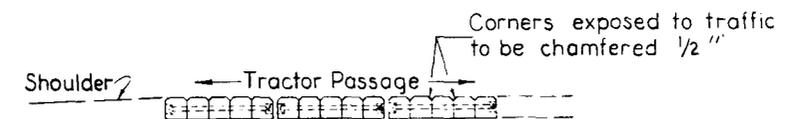
DETAIL OF TRACTOR CROSSING, TYPE "A"

REINFORCED CONCRETE

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



PLAN



SECTION X-X

DETAIL OF TRACTOR CROSSING, TYPE "B"

TREATED TIMBER

NOTE
TRACTOR CROSSING TO BE CONSTRUCTED TO MATCH PAVEMENT CROSS SLOPE.

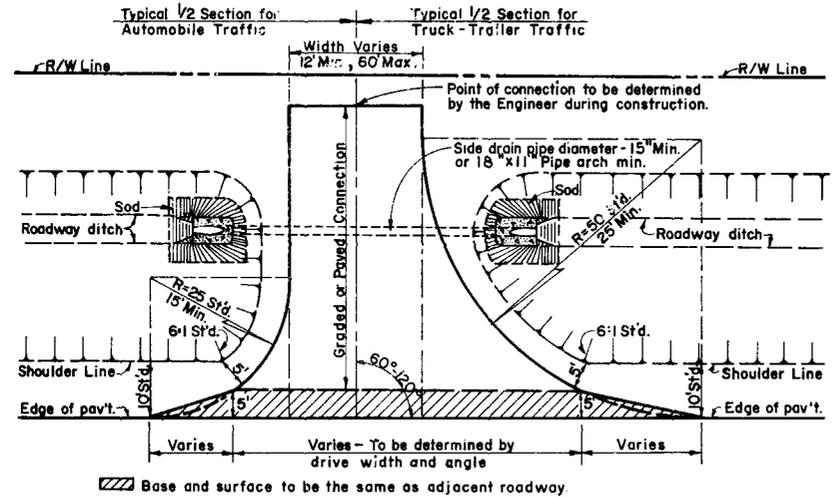
THE NUMBER OF MATS REQUIRED WILL VARY WITH THE PAVEMENT WIDTH. A SUFFICIENT NUMBER OF MATS WILL BE USED SO THAT THE OVERALL WIDTH OF THE TRACTOR CROSSING WILL BE A MINIMUM OF ONE FOOT GREATER THAN THE PAVEMENT WIDTH. THE TRACTOR CROSSING WILL BE CENTERED ON THE PAVEMENT CENTERLINE.

FHWA APPROVED: 3-20-75

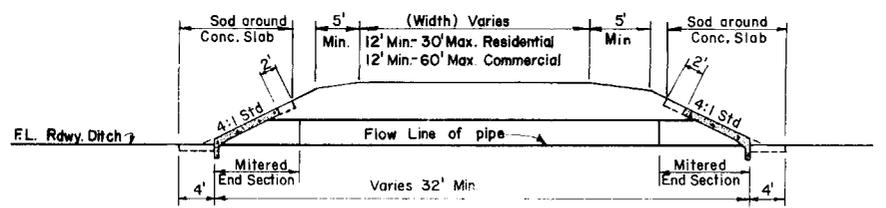
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

TRACTOR CROSSINGS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
9/2/66	Crossing Type "A" completely revised. G.C.P.			
3-73	Added Class I Conc.			
10-74	Changed Index No.			
Checked by		Names	Date	Recommended For Approval by
Checked by		L.H.	Jan '61	<i>C.H. Buntz</i> Engineer of Road Design
Checked by		C.D.D.	Jan '61	APPROVED BY
Checked by				<i>Blair A. Smith</i> Asst. State Highway Engineer
Traced by		Drawing No.	Index No.	
Traced by		1 of 1	GTC-01	

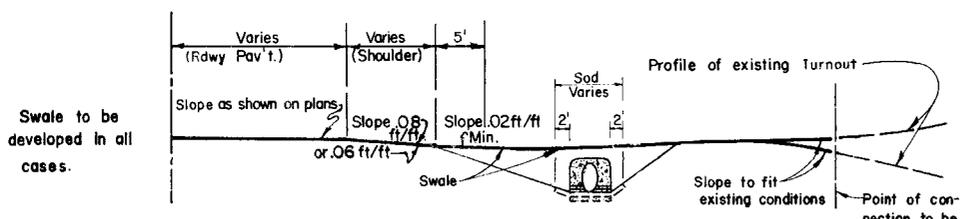


PLAN.



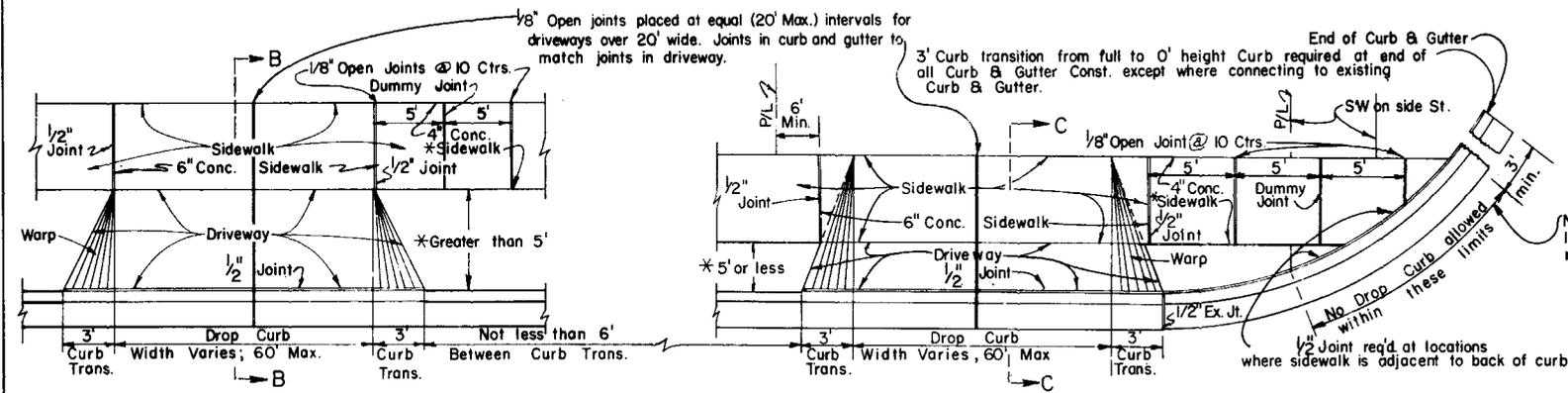
STANDARD SIDE DRAIN

NOTE: For details of Mitered End Section see Index No. DME-01.



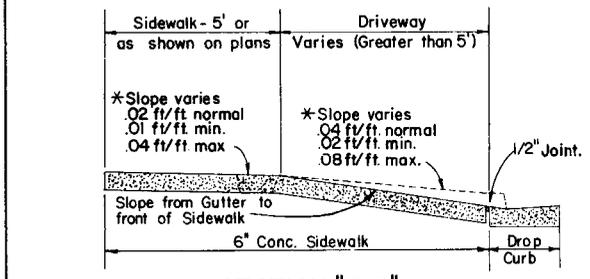
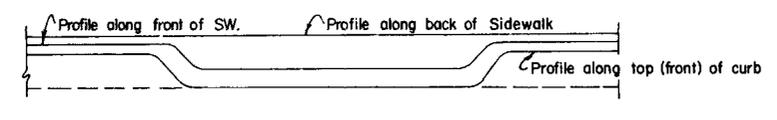
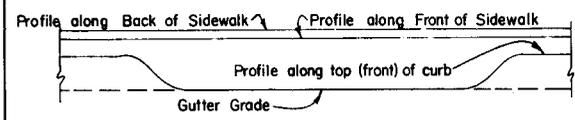
STANDARD PROFILE FOR TURNOUT

DETAILS OF TURNOUT CONSTRUCTION TO PRIVATE PROPERTY AND GRADED ROADS

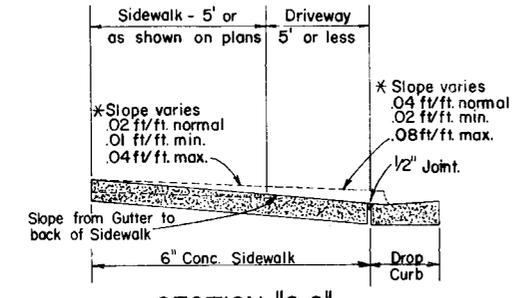


WHEN DISTANCE BETWEEN CURB & SIDEWALK IS GREATER THAN 5'

WHEN DISTANCE BETWEEN CURB & SIDEWALK IS 5' OR LESS



SECTION "B-B"



SECTION "C-C"

DETAIL OF SIDEWALK AND PAVED DRIVEWAY CONSTRUCTION

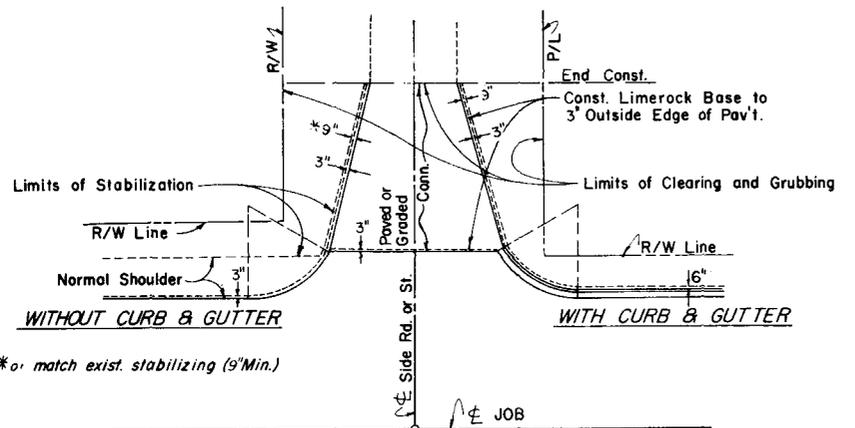
* Slopes can be adjusted within the ranges shown to improve ties to adjacent property and are to be transitioned to avoid distortion in sidewalk continuity.

GENERAL NOTES

GENERAL STABILIZING NOTES

- 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.
- 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.
- 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.
- 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.

- No Stabilizing will be required for Paved Turnouts to Private Property.
- 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.



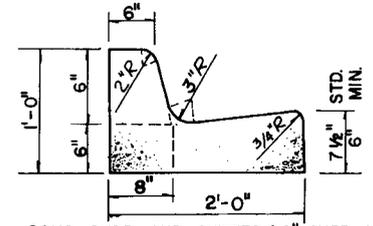
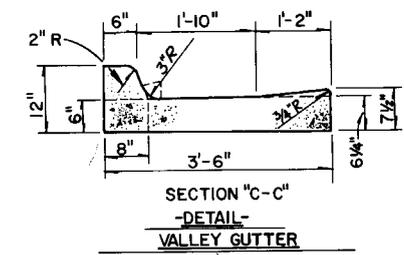
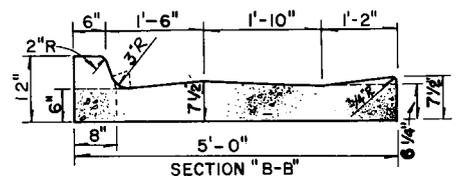
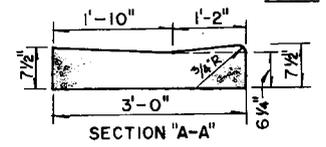
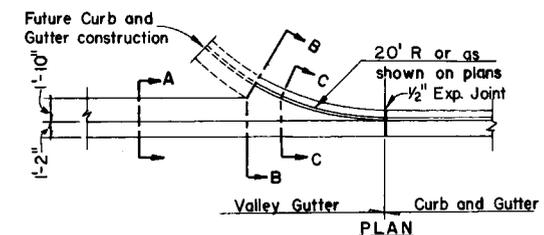
LIMITS OF CLEARING & GRUBBING AND STABILIZING AT INTERSECTIONS

FHWA APPROVED: 12-6-76

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION

TURNOUT DETAILS

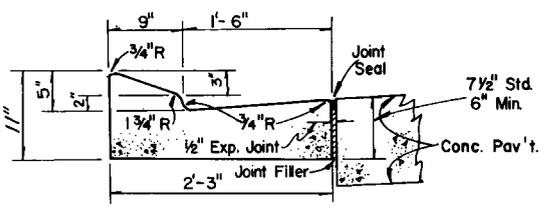
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Descriptions			
9/73	REDRAWN & NEW N ^o			
11/76	Changed end protection for Side Drain Pipe Changed limits of C&G and Stab. Rev. Gen. Notes 2 & 3.			
Designed by	Checked by	Quantity by	Checked by	Supervised by
APPROVED BY				Deputy Design Engineer - Roadways
Drawing No.				Index No.
1 of 1				GTO-01-1



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

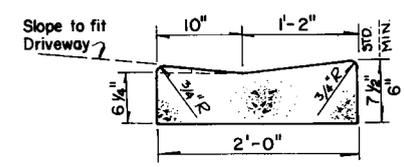
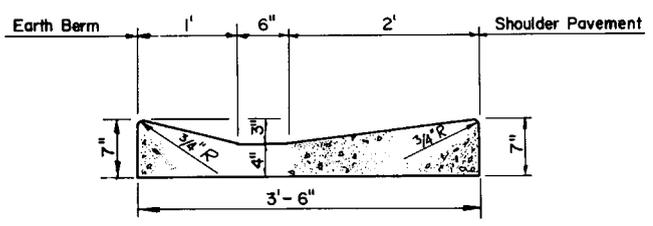
* Note "X": When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement and the thickness of the lip shall be 6", unless otherwise shown on plans.

TYPE F



TYPE E

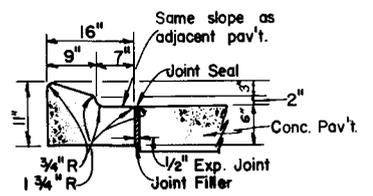
* See Note "X" above



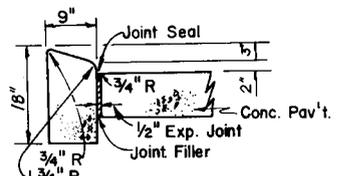
DETAIL DROP CURB

* See note "X" above.

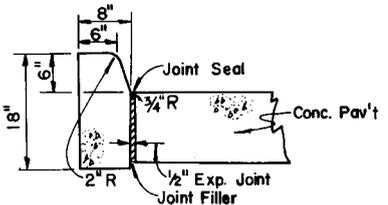
-CONCRETE CURB AND GUTTER DETAILS-



TYPE A



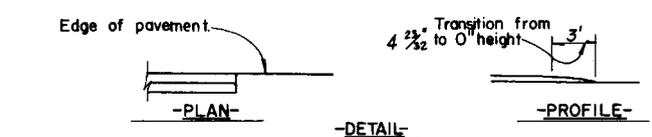
TYPE B



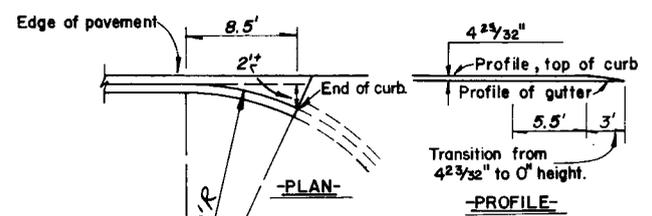
TYPE D

DETAILS OF CONCRETE CURB

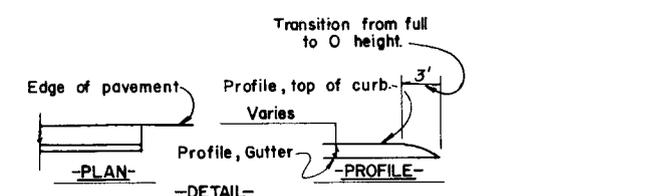
Note: When Curb or Curb and Gutter is constructed adjacent to Flexible Pavement, the 1/2" Expansion Joint shown above will not be used.



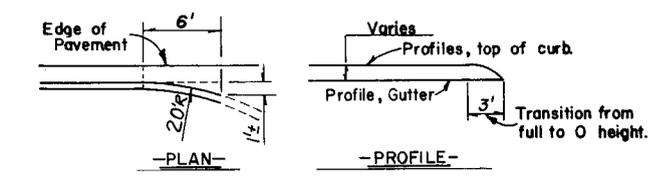
STANDARD END OF MEDIAN CURB (USE FOR TYPE A CURB ONLY)



SPECIAL END OF MEDIAN CURB (USE FOR TYPE A CURB ONLY)

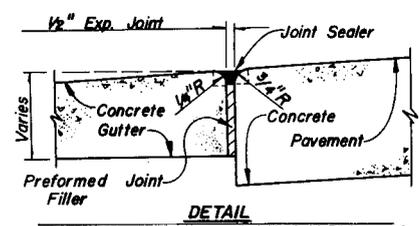


STANDARD END OF MEDIAN CURB AND GUTTER

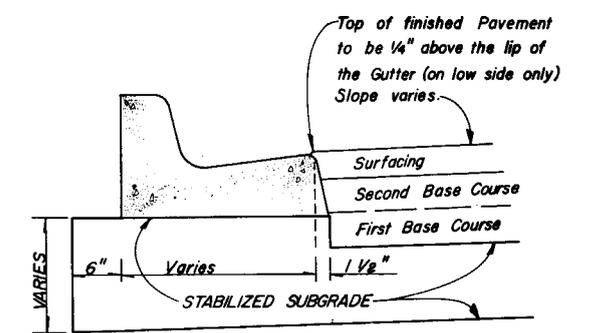


SPECIAL END OF MEDIAN CURB AND GUTTER

-MEDIAN CURB AND GUTTER ENDINGS-

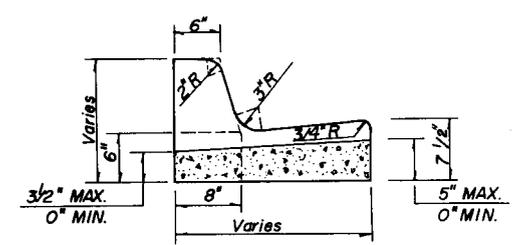


DETAIL EXPANSION JOINT BETWEEN GUTTER AND CONCRETE PAVEMENT



DETAIL 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.



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

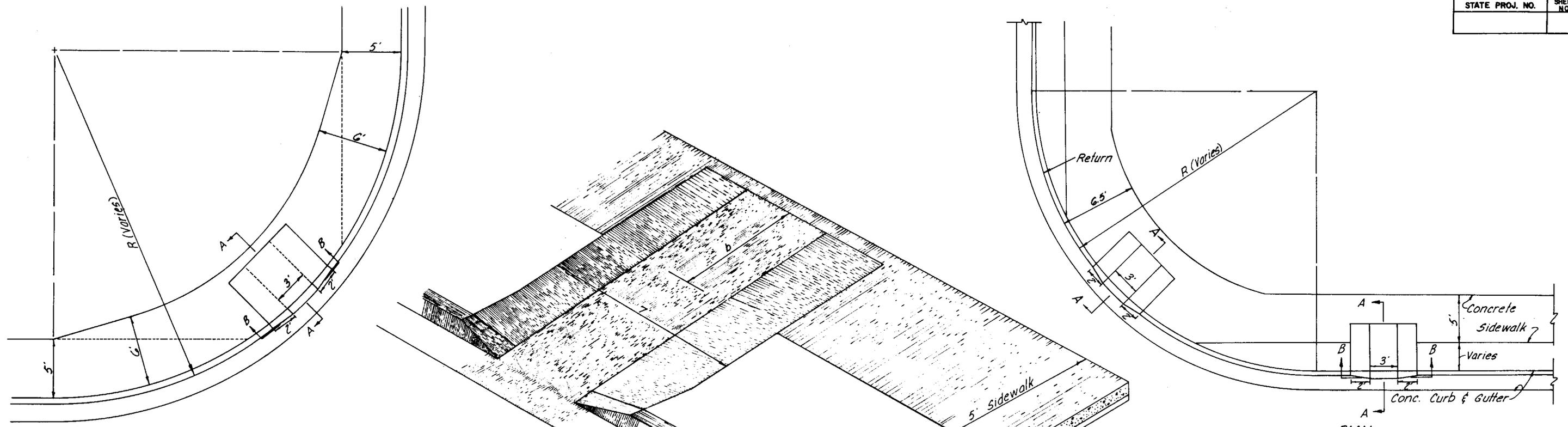
Note: Joint on Tangent sections and flat curves should match where Curb and Gutter is adjacent to P.C.C. Pavement.

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.

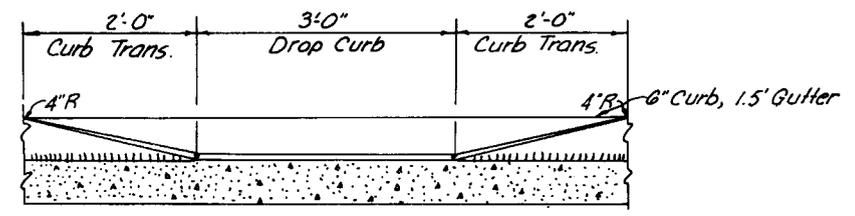
FHWA APPROVED: 7-7-75
FLORIDA DEPARTMENT OF TRANSPORTATION
 ROADWAY PLANS SECTION
CURB, CURB AND GUTTER

REVISIONS			INITIALS	DATES	Approved by: Deputy Design Engineer - Roadways	
Dates	Descriptions	Designed By				
6-73	Redrawn	Checked By				
10-74	Changed Index #	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

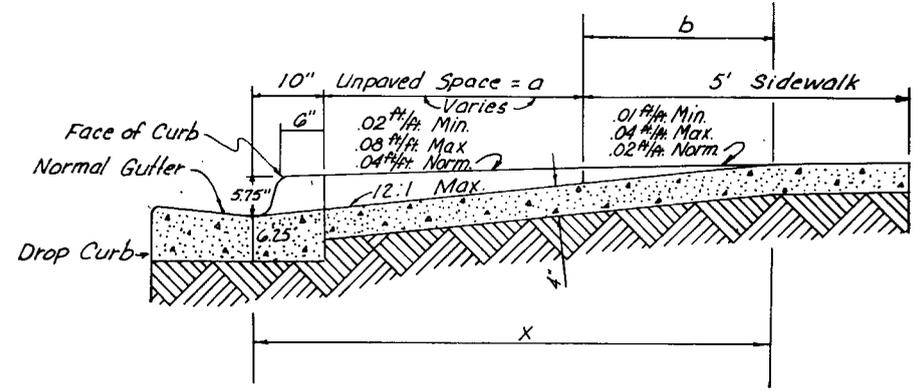


Section B-B

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.



Section A-A

**CURB CUT RAMP
 FACILITY FOR PHYSICALLY HANDICAPPED**

REVISIONS	
Date	Description
10-74	Changed Index No.

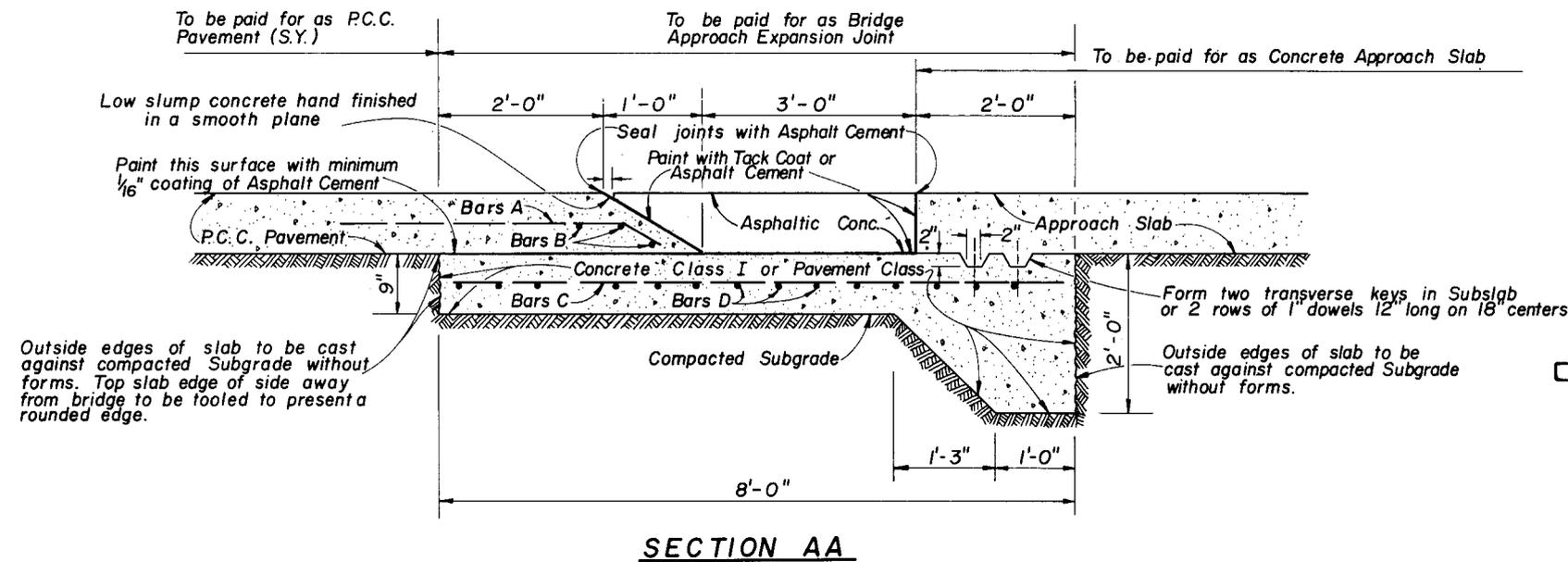
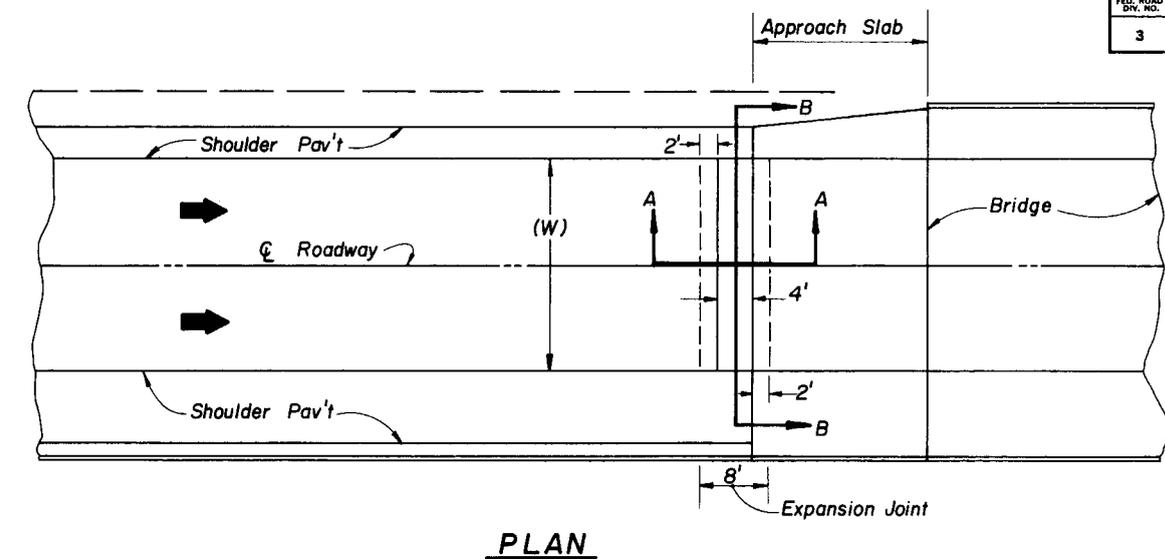
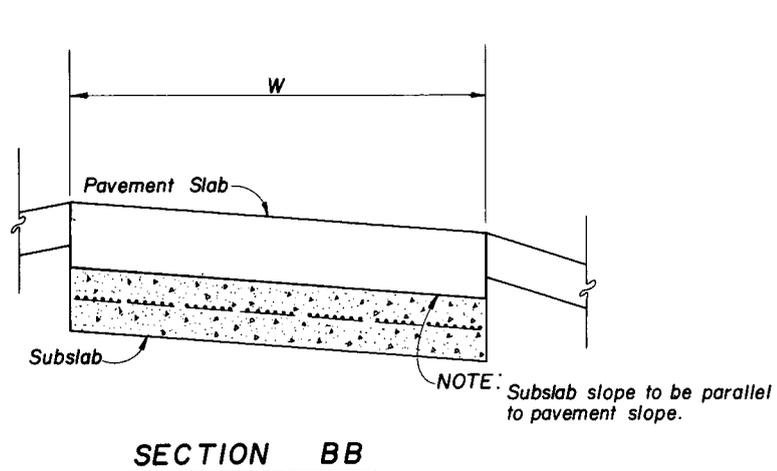
FHWA APPROVED: 8-20-75

FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section

**CURB CUT RAMP
 FOR PHYSICALLY HANDICAPPED**

Designed by	Checked by	Quantities by	Checked by	Supervised by	Recommended for approval by	Approved
	DCB			E.H.H.	E.H.H.	E.H.H.

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



Asphaltic Concrete placed and compacted in layers not to exceed 2" compacted thickness.

- 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 C of roadway and the C of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the C of the roadway pavement shall be determined.

FHWA APPROVED: 3-20-75

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

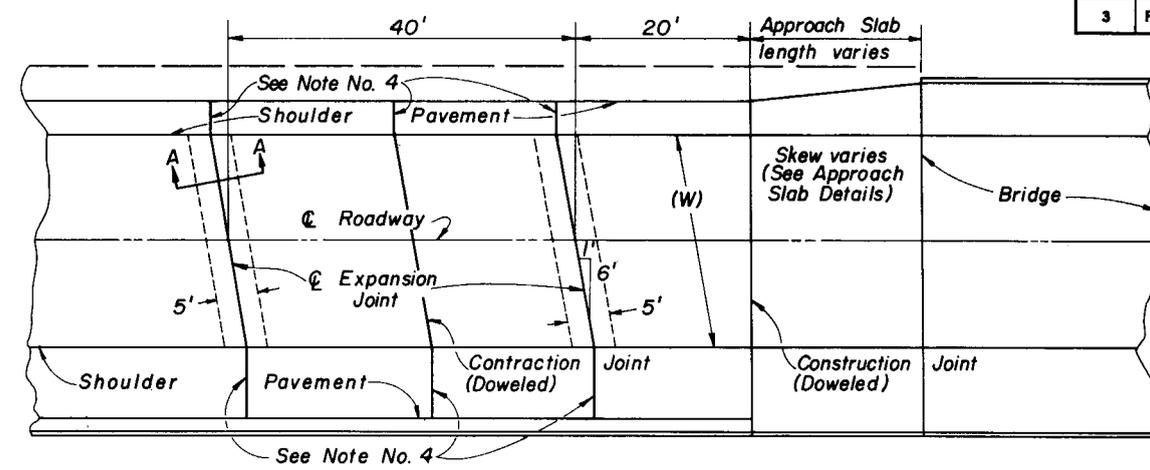
3'-6"
 Bars A
 0'-6"
 35°

	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

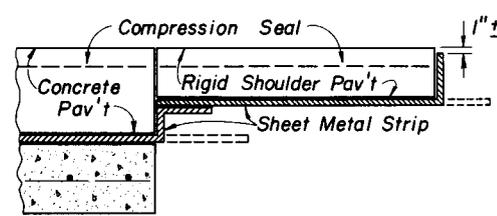
*NOTE: Beveled portion of pavement slab has been converted to equivalent design depth of main line pavement.

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
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	Retraced			

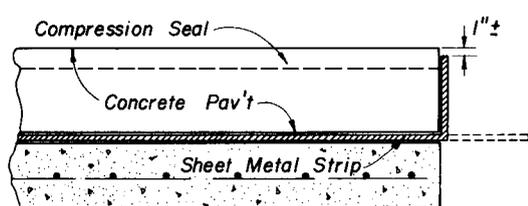
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN SECTION	
BRIDGE APPROACH EXPANSION JOINT FOR CONCRETE PAVEMENT	
Designed by	APPROVED BY
Checked by E.H.H.	4-65
Quantities by W.L.B.	4-65
Checked by E.H.H.	4-65
Supervised by h.f.w.	4-65
Drawing No.	Index No.
1 of 1	PEJ-01



PLAN



DETAIL SHOWING RIGID SHOULDER PAVEMENT



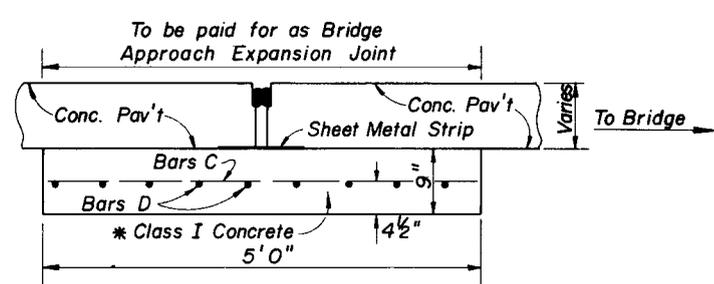
DETAIL SHOWING SHEET METAL STRIP

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

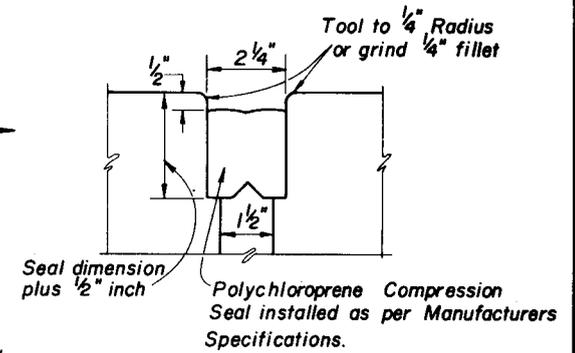
- Quantity of expansion joint to be determined by measurement along the entire length of the joint.
- For additional details see Index No. PJ-01.
- The centerline of roadway and the centerline of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the centerline of the roadway pavement shall be determined.
- 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.



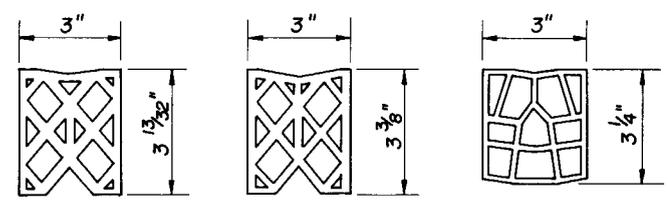
REINFORCING STEEL				
MK	Size	Spac.	No. Req.	Lgth.
C	5	6"	Varies	4'6"
D	5	6"	9	W-4"

* 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



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



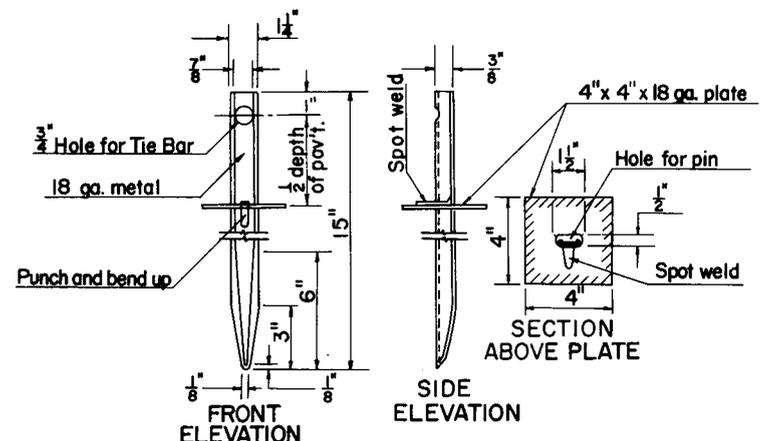
SECTION THRU SEALS

Either of the three Seals shown may be used.

FHWA. APPROVED: 8-16-77

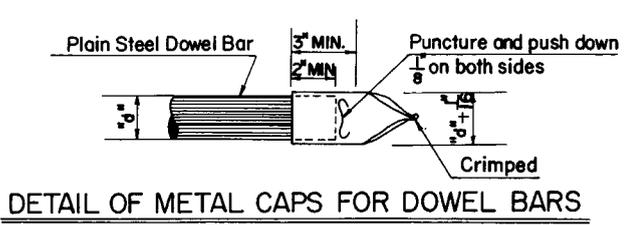
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN SECTION
BRIDGE APPROACH EXPANSION JOINT FOR CONCRETE PAVEMENT

ROAD NO.		COUNTY		PROJECT NO.	
JULY 77		S F A		6-75	
DESIGNED BY	Checked by	Names	Dates	APPROVED BY	
				E H Hart	
Checked by	Checked by	Drawing No.		Index No.	
		1 of 1		PEJ-02-1	

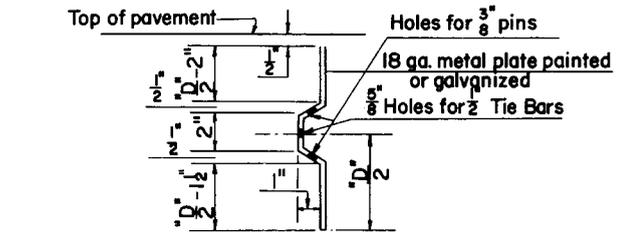


DETAIL OF CHAIR FOR TIE BARS

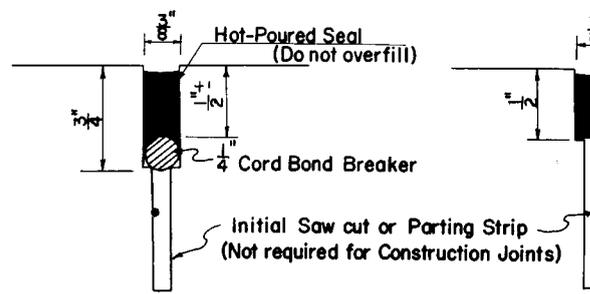
OTHER CHAIR OR SUPPORT MAY BE APPROVED BY THE ENGINEER



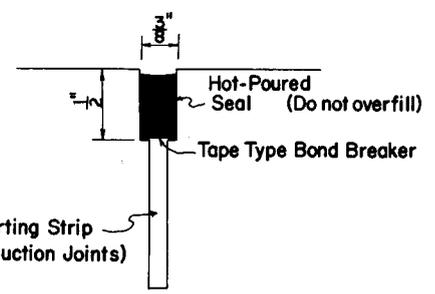
DETAIL OF METAL CAPS FOR DOWEL BARS



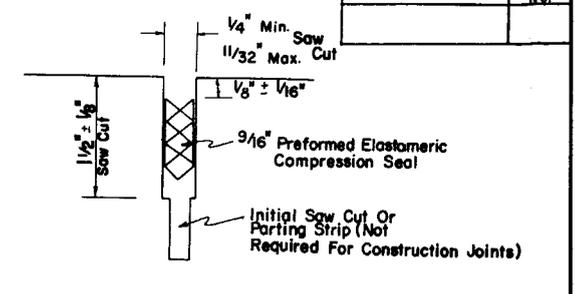
DETAIL OF DEFORMED METAL PLATE



HOT-POURED SEAL CORD TYPE BOND BREAKER

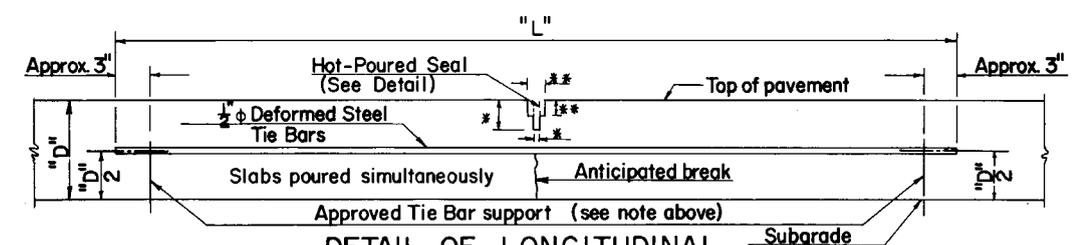


HOT-POURED SEAL TAPE TYPE BOND BREAKER



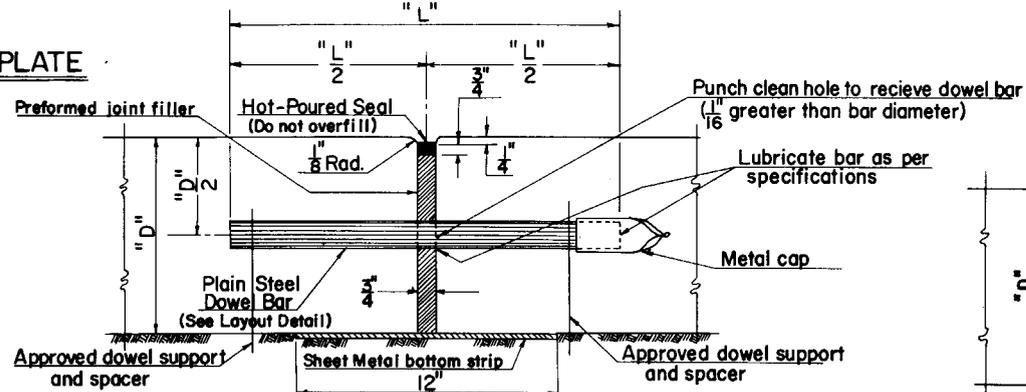
PREFORMED ELASTOMERIC COMPRESSION SEAL

JOINT SEALANT DETAILS



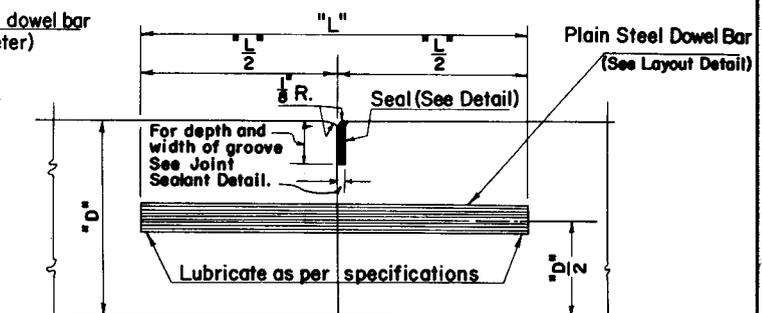
DETAIL OF LONGITUDINAL LANE-TIE JOINT

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

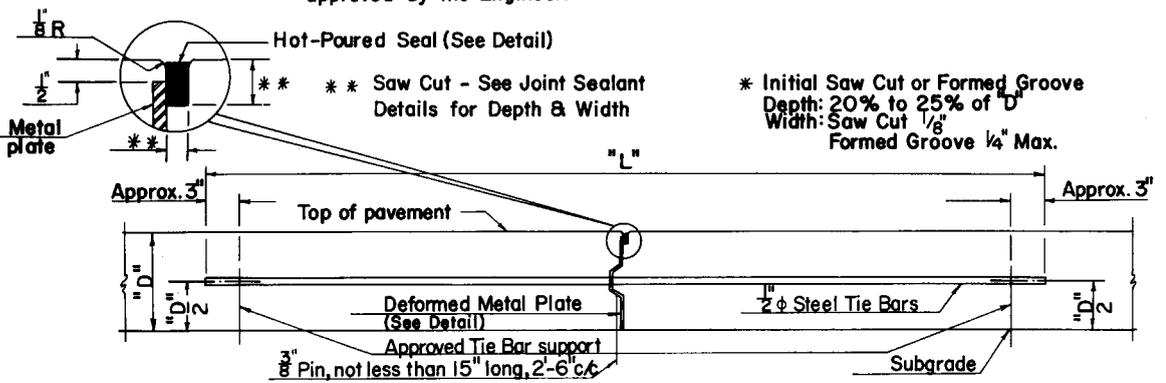


DETAIL OF TRANSVERSE EXPANSION JOINT

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

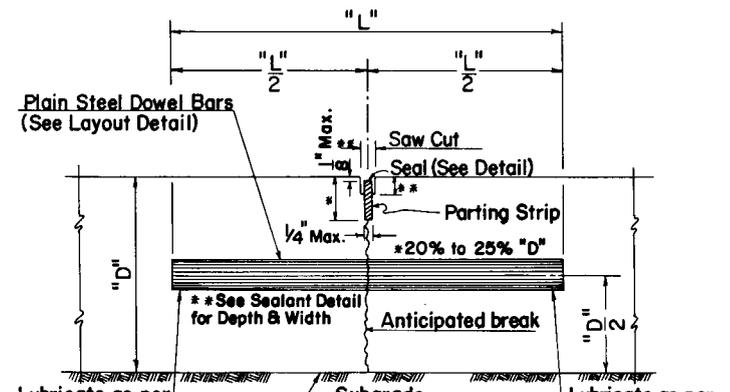


DETAIL OF BUTT CONSTRUCTION JOINT TO BE USED AT DISCONTINUANCES OF WORK

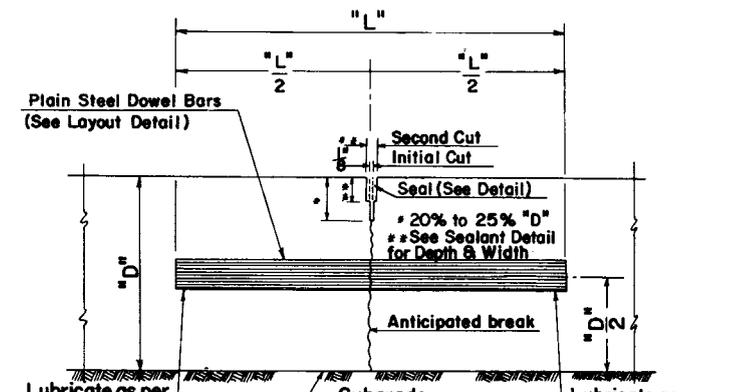


DETAIL OF LONGITUDINAL CONSTRUCTION JOINT

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.

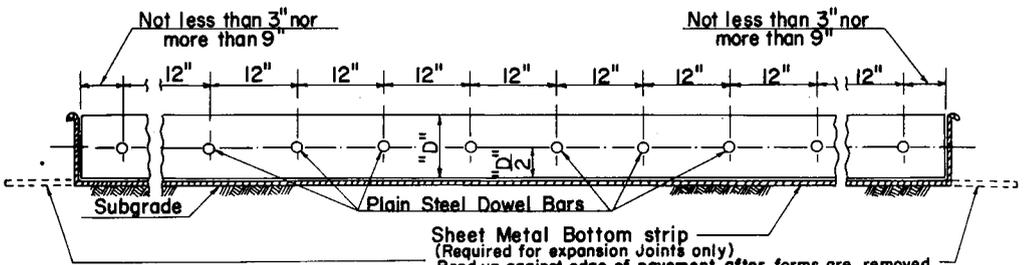


DETAIL OF TRANSVERSE CONTRACTION JOINT, VIBRO CAST METHOD



DETAIL OF TRANSVERSE CONTRACTION JOINT, SAWED 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.



DOWEL BAR LAYOUT

MAX. SPACING FOR 1/2" φ 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"

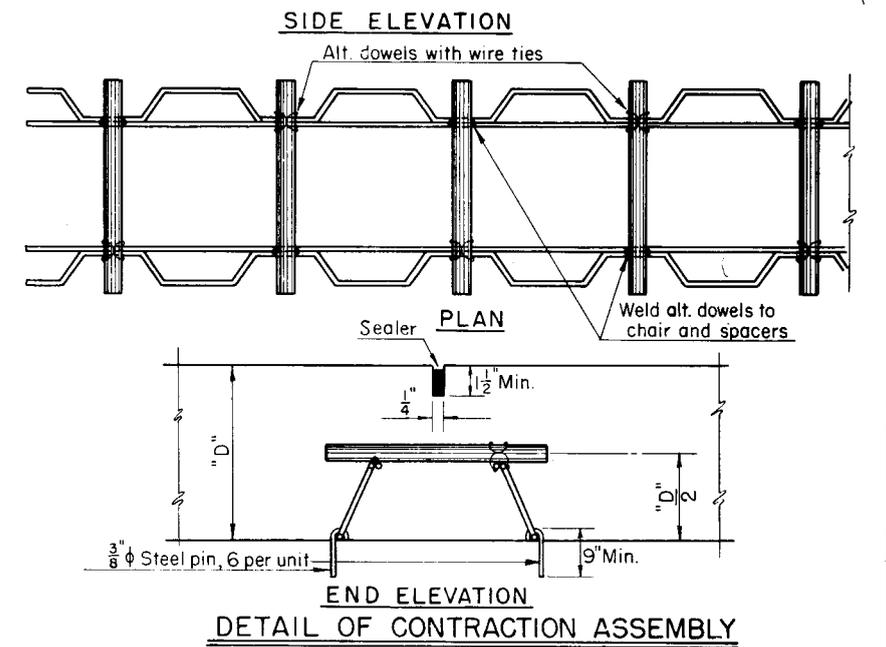
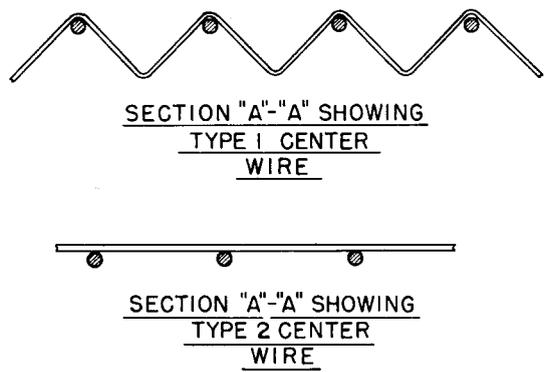
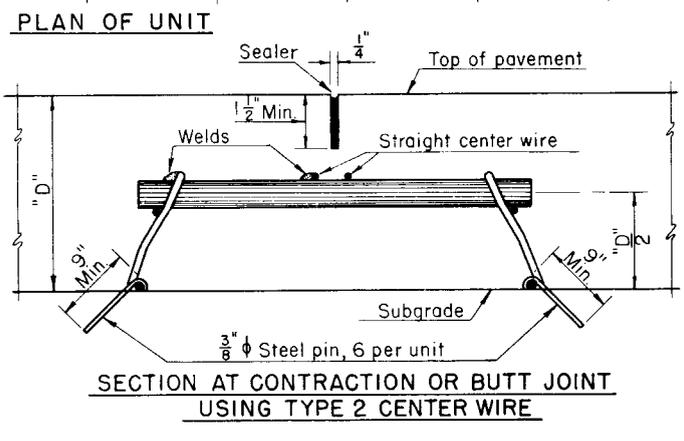
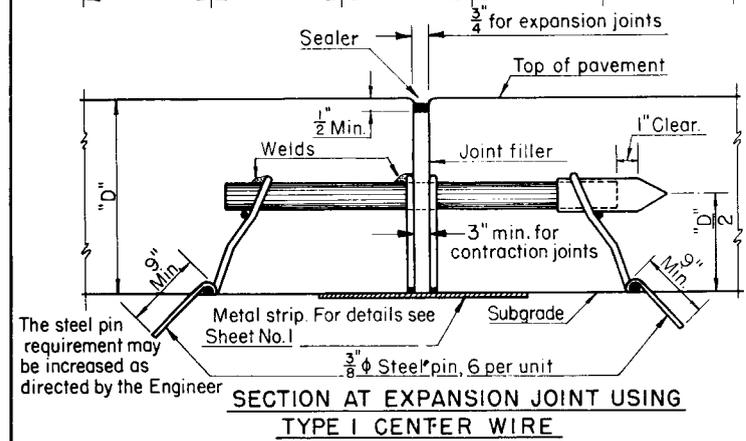
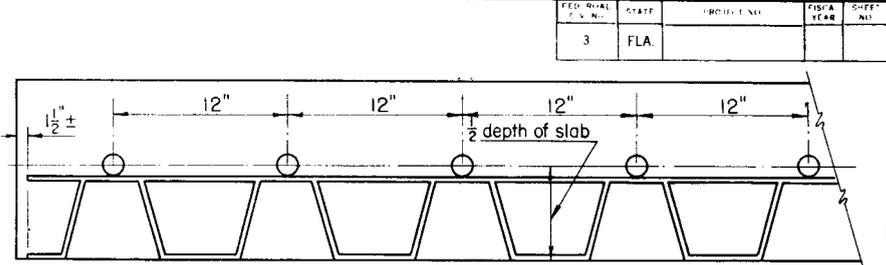
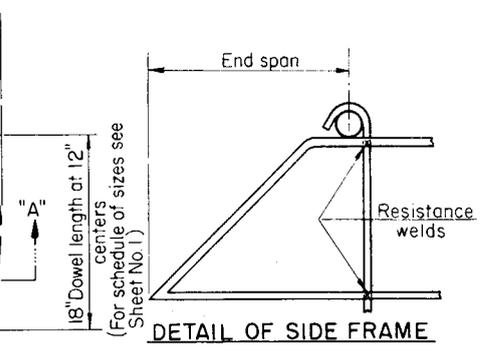
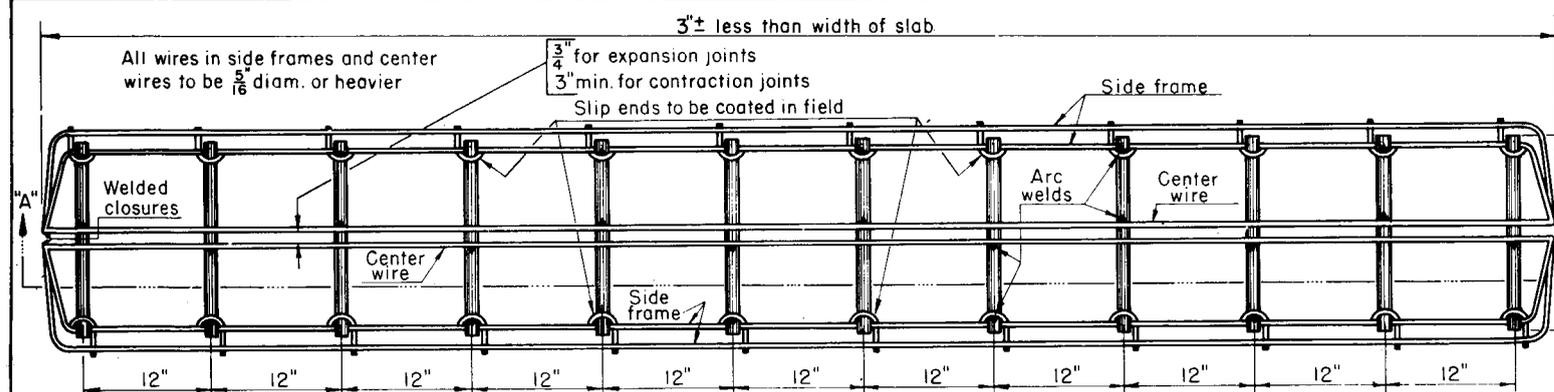
DOWEL REQUIREMENTS		
PAVEMENT THICKNESS ("D")	DOWEL dia. (inches)	DOWEL LENGTH "L" (inches)
6"	3/4"	18"
7"	1"	18"
8"	1"	18"
* 9"	1"	18"

* Provide 1 1/8" Diam. dowels at Expansion joints and Butt Construction joints.

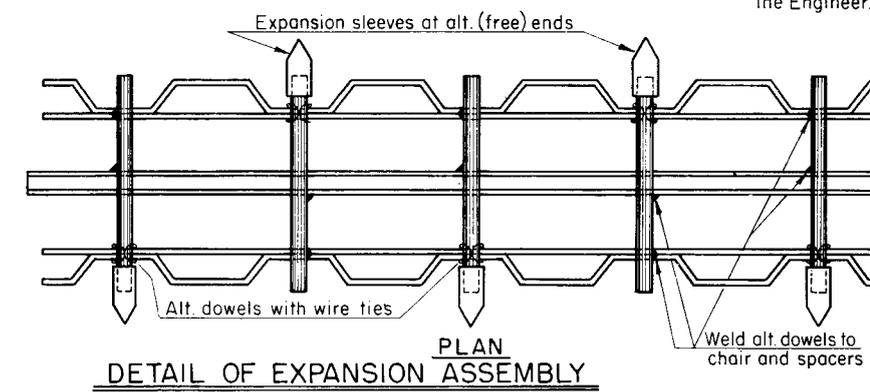
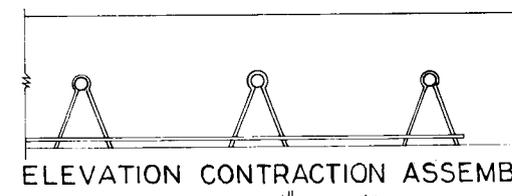
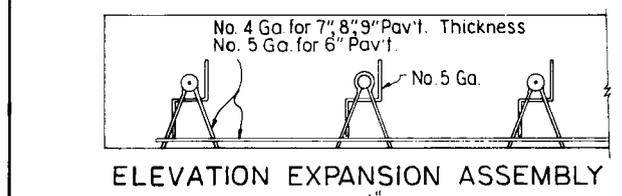
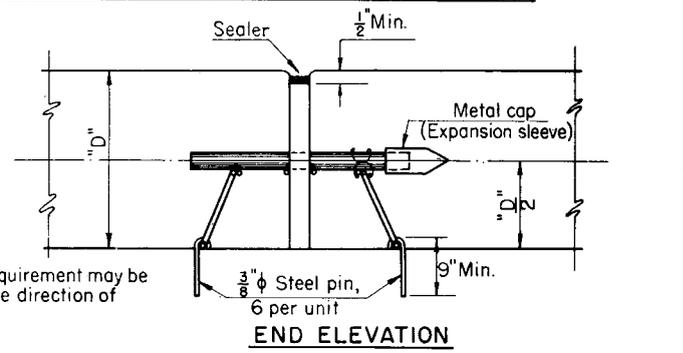
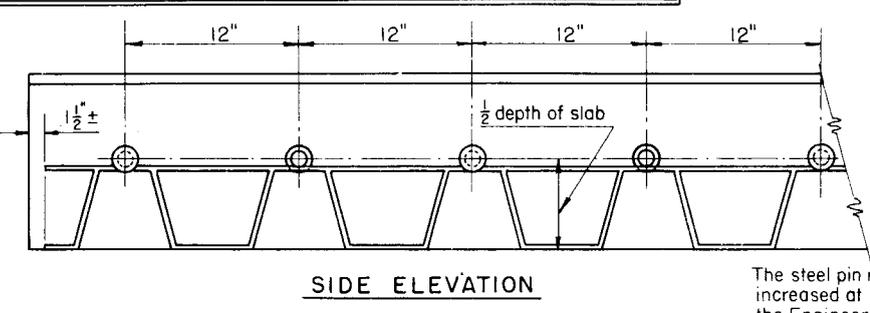
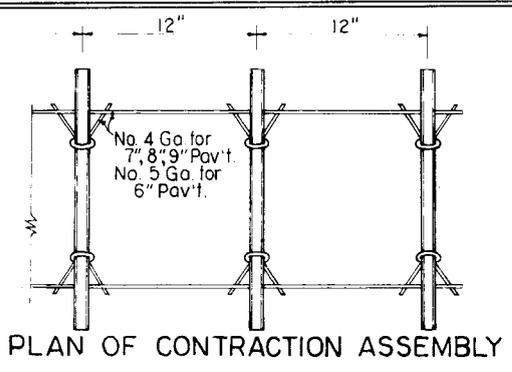
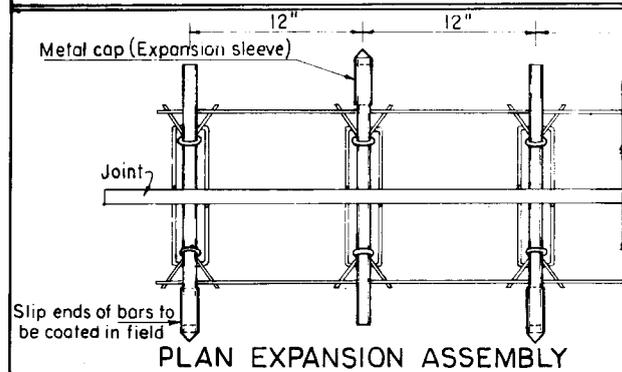
FHWA APPROVED: 3-20-75
 FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section
CONCRETE PAVEMENT JOINTS

REVISIONS		INITIALS	DATES	Recommended for approval by <i>[Signature]</i> Deputy Design Engineer - Roadways Approved by <i>[Signature]</i> State Design Engineer
Dates	Descriptions	Designed by	Checked by	
9-73	Changed Joint Details (See Drawn)			
8-5				
10-74	Changed Index # on all sheets			
		Supervised by	LMF	

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



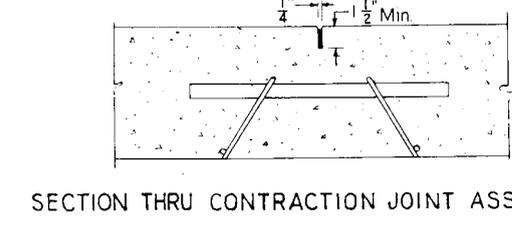
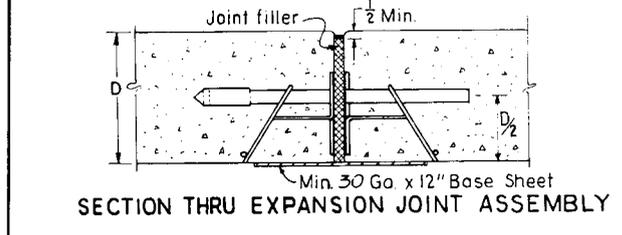
DETAILS OF BETHLEHEM DOWEL UNIT ALTERNATE



GENERAL NOTES

Any other dowel bar support or assembly (except a cantilever design) which meets the approval of the Engineer, may be used at the option of the Contractor.

For details not shown on this sheet refer to Sheet Nos. 1 & 3.



DETAIL OF EXPANSION ASSEMBLY

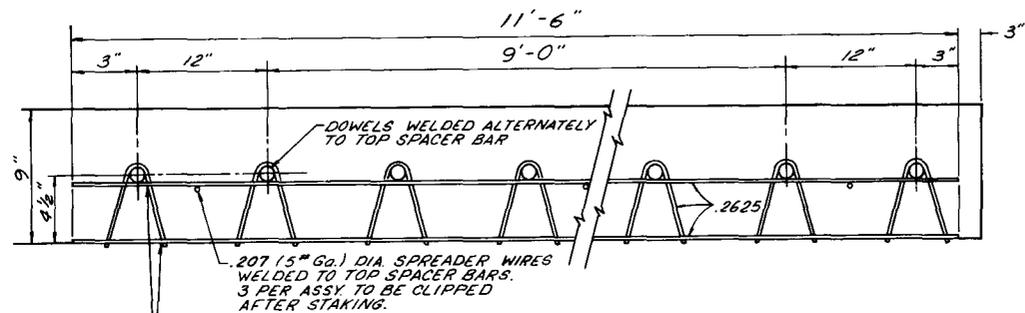
EXPANSION AND CONTRACTION JOINT DOWEL ASSEMBLY ALTERNATE

VIRGINIA STEEL CO., INC.

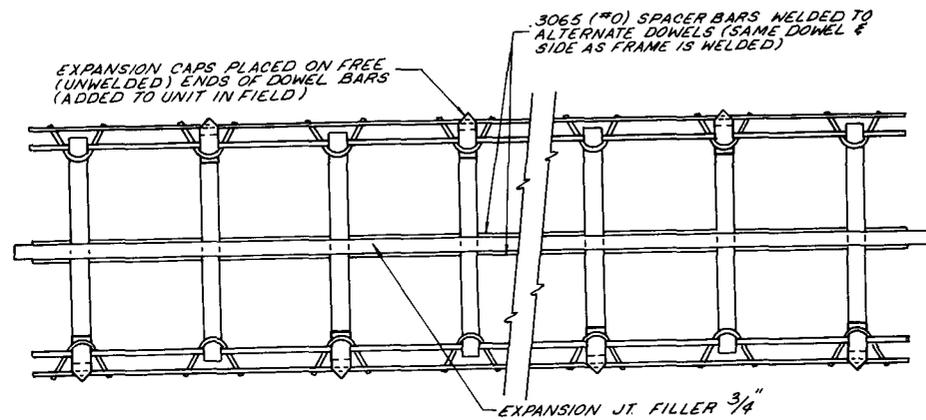
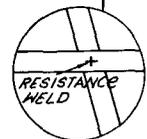
ALL ASSEMBLY BARS 5/16" φ PLAIN

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description			
02/69	Added Note re Keyway on the bar			
RHC	Approved by Engineer			
10/69	Changed Word or To And In Keyway Note			
GJF	Rev. Trans. Cont. 11/69			
6/71	Added 1/2 Seal Details			
LF	Added Sheet 3			

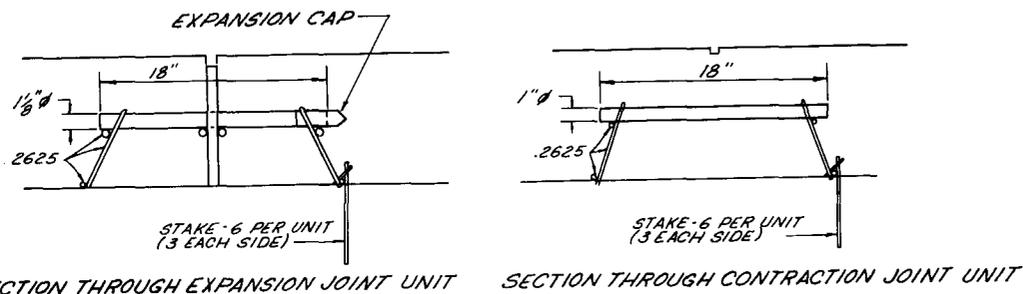
FHWA APPROVED: 3-20-75		FLORIDA DEPARTMENT OF TRANSPORTATION	
		ROADWAY PLANS SECTION	
CONCRETE PAVEMENT JOINTS			
Names	Dates	Recommended For Approval by	APPROVED BY
		Deputy Design Engineer - Roadways	<i>[Signature]</i>
Checked by			<i>[Signature]</i>
Quantities by			
Checked by			
Traced by	h.w.	8-57	Drawing No. 2 of 3
			Index No. PJ-01



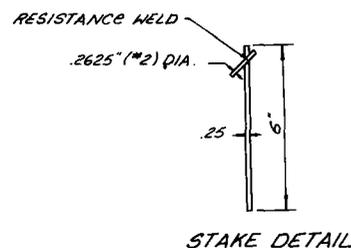
ELEVATION OF CONTRACTION & EXPANSION JOINT TYPE "B" UNIT



PLAN TYPE "B" UNIT



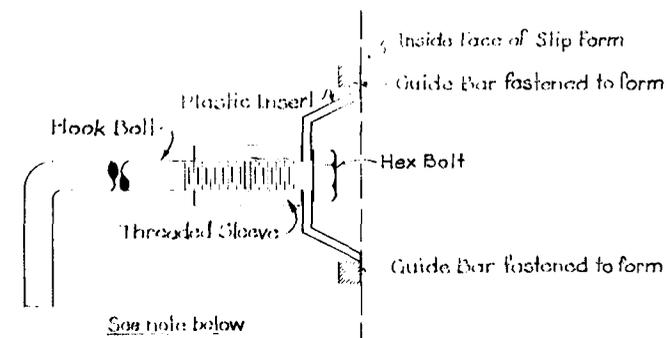
SECTION THROUGH EXPANSION JOINT UNIT SECTION THROUGH CONTRACTION JOINT UNIT



STAKE DETAIL

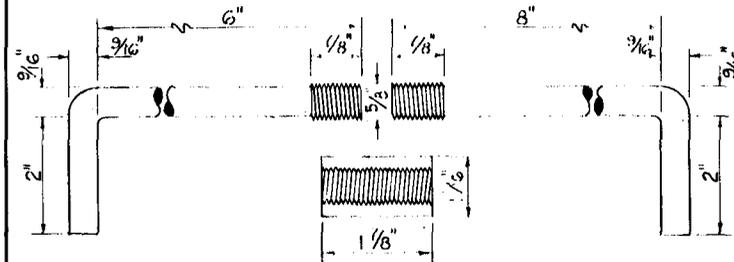
EXPANSION AND CONTRACTION JOINT DOWEL ASSEMBLY ALTERNATE

L & L STEEL COMPANY, INC.
Birmingham, Ala.



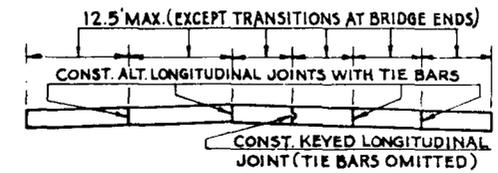
See note below

ALTERNATE KEYWAY AND TIE BAR

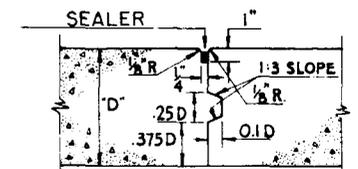


DETAIL FOR STEEL HOOK BOLT ASSEMBLY

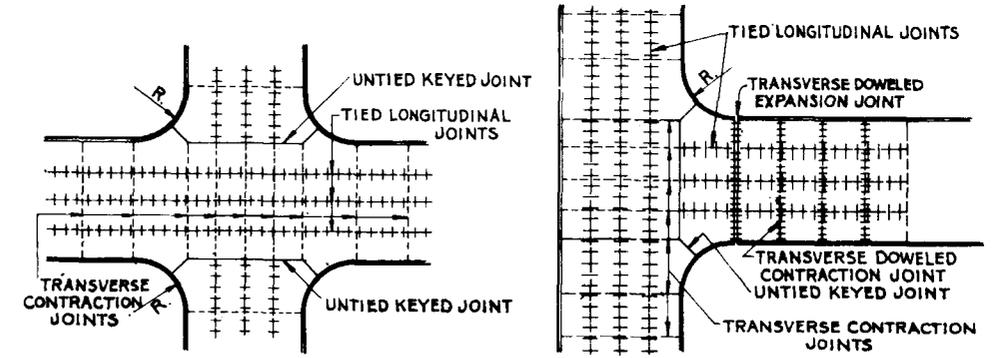
NOTE: After the concrete has set to the extent that the keyway will retain its shape, the hex bolt and plastic insert shall be removed. The remaining portion of the hook bolt assembly shall be installed immediately prior to placing of concrete in the adjacent lane.



TYPICAL SECTION FOR MULTI-LANE CONSTRUCTION



DETAIL OF KEYED JOINT



JOINT LAYOUT AT THRU INTERSECTION

JOINT LAYOUT AT "T" OR OFFSET INTERSECTION

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 1/2" PREFORMED EXPANSION JOINT MATERIAL.

DETAIL OF JOINT ARRANGEMENT

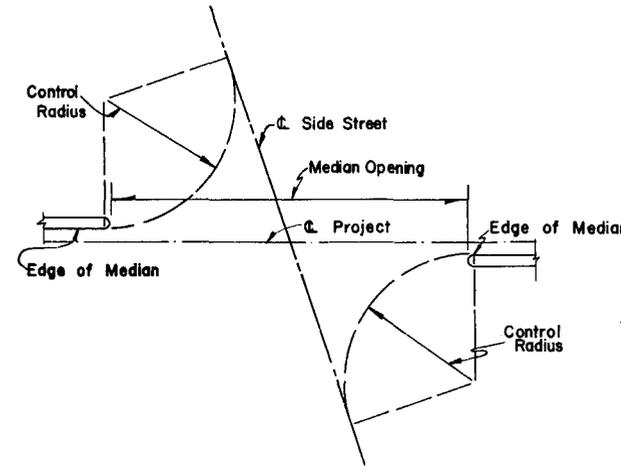
FHWA APPROVED: 3-20-75
FLORIDA DEPARTMENT OF TRANSPORTATION
ROADWAY PLANS SECTION

CONCRETE PAVEMENT JOINTS

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			
5-75	Added Joint Dowel Assembly Alternate			

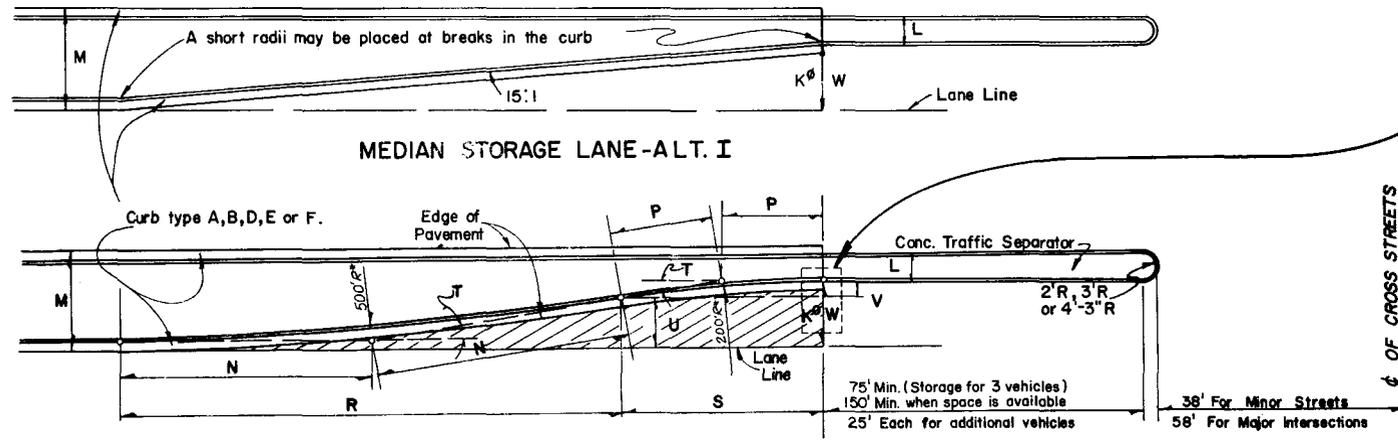
Names	Dates	Recommended For Approval by
Detailed by LMF	6-71	E.H. Hart Deputy Design Engineer - Roadways
Checked by		APPROVED BY [Signature] State Design Engineer
Quantities by		
Checked by		
Traced by		

Drawing No.	Index No.
3 of 3	PJ-01



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

METHOD OF DETERMINING MEDIAN OPENINGS AT SKEWED SIDE STREETS

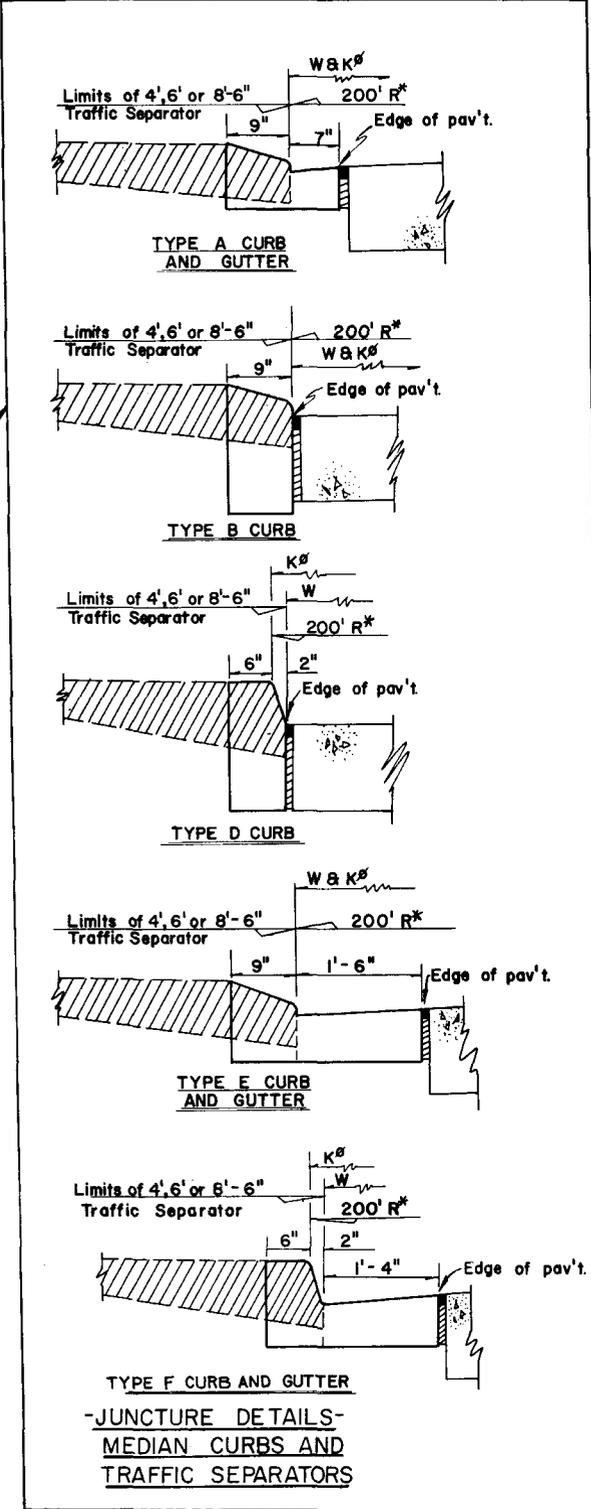


* Radii are measured from face of curb, regardless of curb type. These radii are minimums recommended for urban construction. For rural primary construction, the radii are to be in conformity with the design speed of the highway where practicable.
 # Dimensions K and W are identical except when median 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'-8"	11'-6"	622.0
		F	39.09'	15.63'	77.68'	31.07'	08° 56'	16.7"	7.57'	2.43'	10'-0"	10'-0"	395.2
4'	17'-6"	F	39.84'	15.94'	79.18'	31.67'	09° 06'	42.8"	7.81'	2.36'	10'-4"	10'-2"	418.6
		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
6'	17'-6"	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
		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
6'	19'-6"	D	45.50'	18.20'	90.26'	36.10'	10° 24'	00.1"	8.38'	3.12'	11'-8"	11'-6"	622.0
		F	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
		A	47.14'	18.86'	93.44'	37.38'	10° 46'	16.8"	9.39'	3.52'	12'-11"	12'-11"	690.2
8'-6"	22'-0"	B	49.34'	19.73'	97.72'	39.09'	10° 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.



-JUNCTION DETAILS-
 MEDIAN CURBS AND
 TRAFFIC SEPARATORS

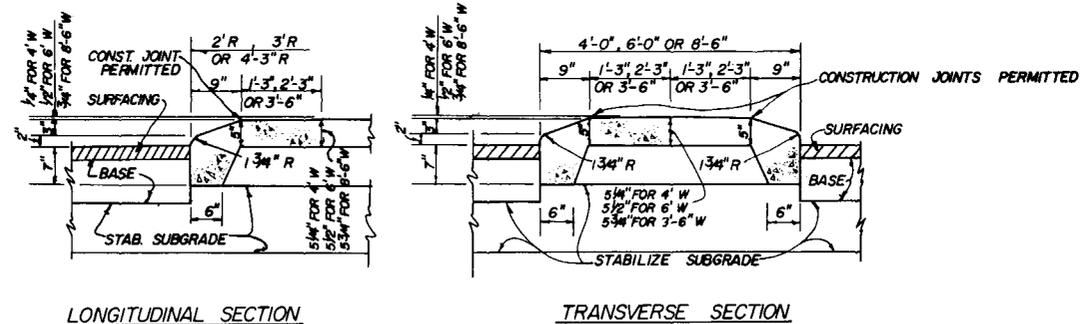
FHWA APPROVED: 7-7-75

FLORIDA DEPARTMENT OF TRANSPORTATION
 Road Design Section

MEDIAN STORAGE LANES

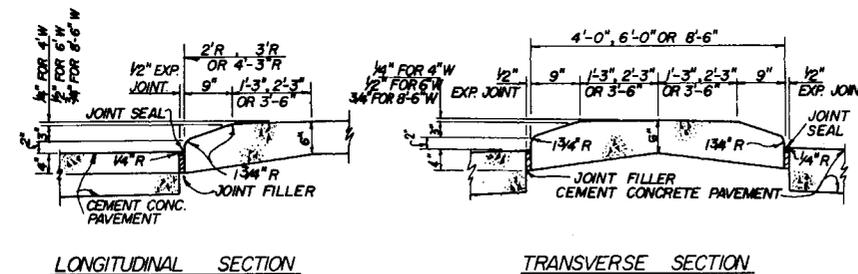
REVISIONS		INITIALS	DATES	Approved by:
Dates	Descriptions	Designed by		 Deputy Design Engineer-Roadways
6-73	Redrawn S.H.B.	Checked by		
10-74	Changed Index #1	Checked by		
		Supervised by		

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

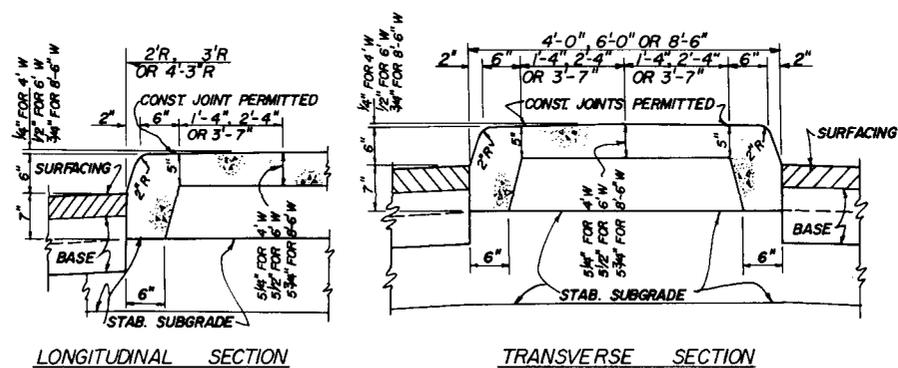


DETAILS OF TYPE I CONCRETE TRAFFIC SEPARATOR

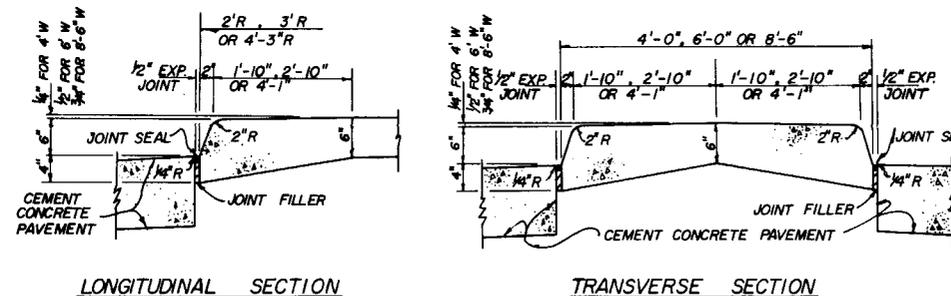
NOTE: STABILIZE FULL WIDTH OF TRAFFIC SEPARATOR.



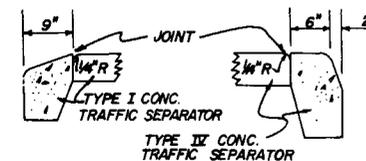
DETAILS OF TYPE II CONCRETE TRAFFIC SEPARATOR



DETAILS OF TYPE III CONCRETE TRAFFIC SEPARATOR



DETAILS OF TYPE IV CONCRETE TRAFFIC SEPARATOR



CONSTRUCTION JOINT DETAILS

NOTE: CONCRETE TRAFFIC SEPARATORS TYPE I AND TYPE III ARE TO BE USED WHEN ADJACENT PAVEMENT IS FLEXIBLE. CONCRETE TRAFFIC SEPARATORS TYPE II 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.B.G.		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: *E. H. Hout*
Deputy Design Engineer - Roadways

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