Roy Story

STRUCTURES STANDARDS

JANUARY 1985

This document was promulgated at an annual cost of $2.36 per copy to provide standards and criteria for the design, construction and maintenance of highway transportation facilities by governmental agencies, consultants, contractors and the citizens of the State of Florida.

REVISED 11-28-84 INDEX NOS. 12931, 13857, 11460

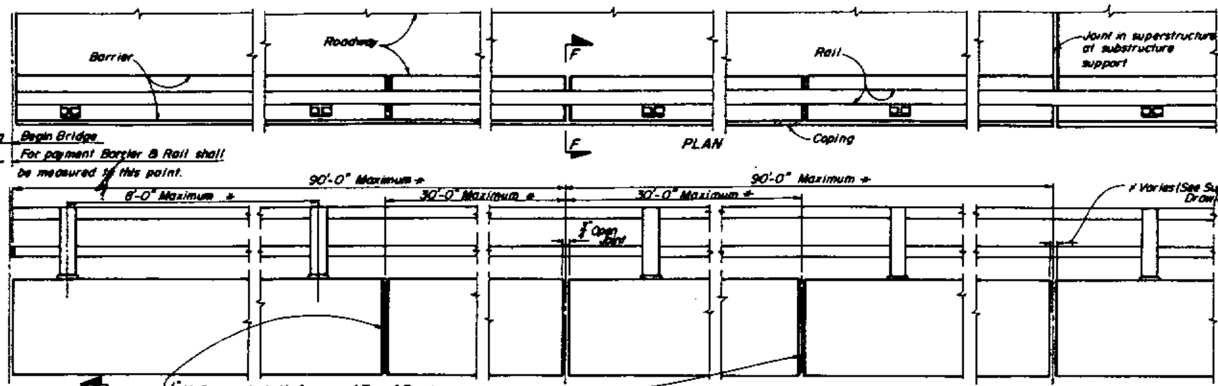
NOTE: For Barrier Transition at End Bents see Details below, this sheet

* NOTE: See Superstructure drawing for actual dimensions.

NOTE: There shall be a ¾" Min. Open Joint at all Substructure Supports.

NOTE: Concrete Wing post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure)

NOTE: Rail shall be continuous over a minimum of 3 posts before splicing.



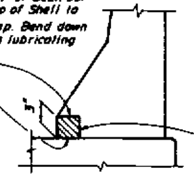
PLAN

ELEVATION

At substructure supports where Roadway Slab is continuous, the joint in Barrier shall be sealed as shown in Section F-F.

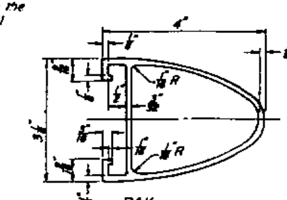
NOTE: All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive.

Provide extra 4" of Seal. Cut away all but top of Shell to provide end flap. Bend down and seal with a lubricating adhesive



SECTION F-F

Polychlorgorene Compression Seals used in ¾" Open Joints shall be 1" wide minimum.

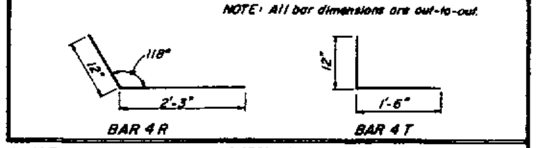


RAIL

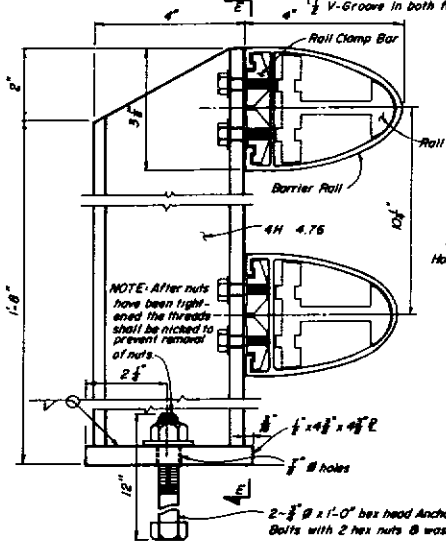
FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.			

BENDING DIAGRAM

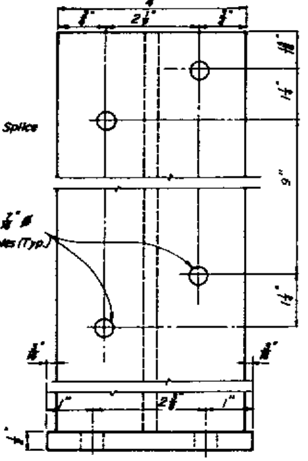
NOTE: All bar dimensions are out-to-out.



QUANTITIES: Class II Concrete = 0.07594 Cu.Yds. per linear ft. of Barrier (Based on Roadway Cross Slope of .02/ft.)
REINFORCING STEEL = 15.782 lbs. per linear ft. of Barrier.

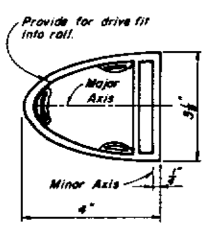


SECTION THRU RAIL

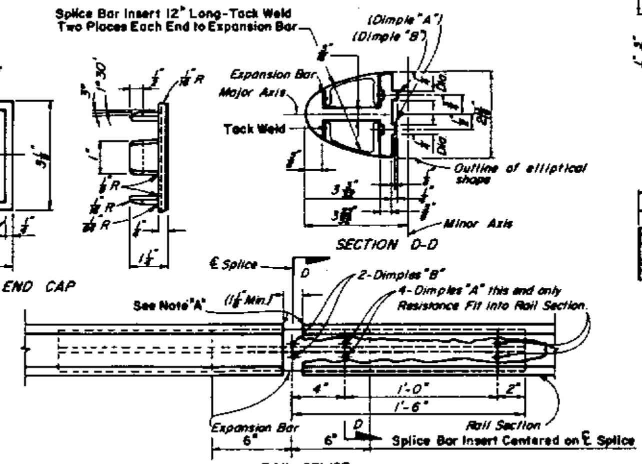


SECTION E-E

NOTE: At the option of the Contractor, the bottom nut shown in "Section Thru Rail" may be used in conjunction with top nut to secure Anchor Bolt to form work during pour.

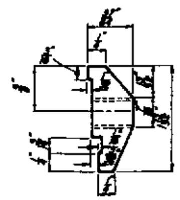


RAIL END CAP

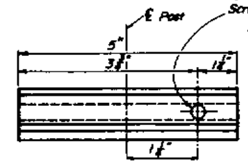


RAIL SPLICE

NOTE "A"-Rough Cut Ends and Edges of Aluminum Rails shall be Ground or Filed Smooth to Remove All Sharp Edges, Nicks or Burrs that would be Injurious to the Human Touch.



VIEW C-C



RAIL CLAMP BAR

REINFORCING STEEL NOTES

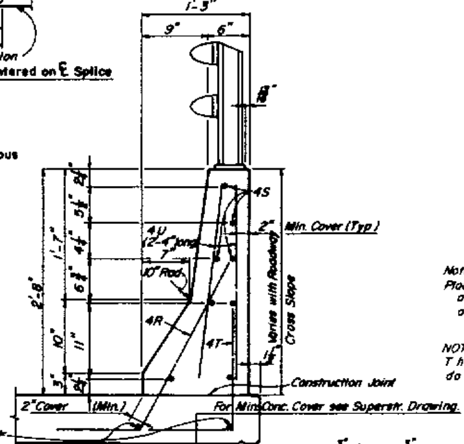
All Reinforcing Steel in Barrier shall be No.4's. Bars 4R, 4T & 4U to be spaced at 8" C.C. At all open joints, Bars 4R, 4T, 4U and the ends of bars 4S shall have 2" Min. cover. At all construction joints, bars 4S may be either continuous or spliced. All splices in bars 4S shall be 1'-4" minimum.

GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Rail, Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the markers shall be included in the Contract Unit Price for Concrete Barrier.

SPECIFICATIONS FOR BRIDGE RAIL

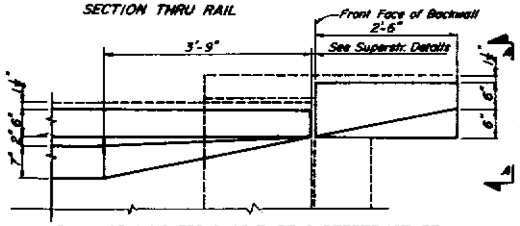
POST: Fabricated wrought aluminum A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5 with welding using filler wire 4043.
RAIL & RAIL SPLICE: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5
RAIL CLAMP BAR: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
ANCHOR BOLTS: Anchor Bolts shall be in accordance with A.S.T.M. A-36 or A-307 Anchor Bolts, nuts and washers shall be hot-dip galvanized in accordance with A.S.T.M. Designation A-153.
RAIL END CAP: A.S.T.M. B 26 sand cast aluminum alloy, S G 70A-F (Alum. Assoc. alloy designation A-356-F).
RAIL INSTALLATION: Rail Post shall be normal to Profile Grade. Posts shall be seated on ⅛" thick resilient pads in accordance with Article 932-2.1. The dimension shall be the same as the post base. Rail expansion joints shall occur in the panel between posts on either side of Bridge expansion joints. Rail expansion joints shall be similar to rail splices with provision for movement equal to 1.5 times the bridge joint opening.
SHOP DRAWINGS: Complete details and description of materials of the proposed bridge rail shall be submitted by the contractor for the Engineers approval prior to fabrication.



TYPICAL SECTION THRU BARRIER

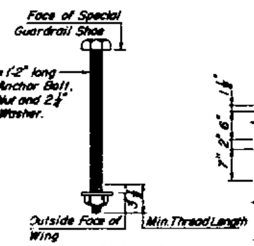
Note #
Place bottom slab longitudinal Reinforcing Steel at each position as shown to facilitate tying anchor bars in Concrete Handrail Barrier.

NOTE: The Longitudinal Reinforcing Steel shown in the slab of the Typical Section Thru Barrier shall be normal Longitudinal Slab Steel spaced as shown, do not add Reinforcing Steel for tie purposes.



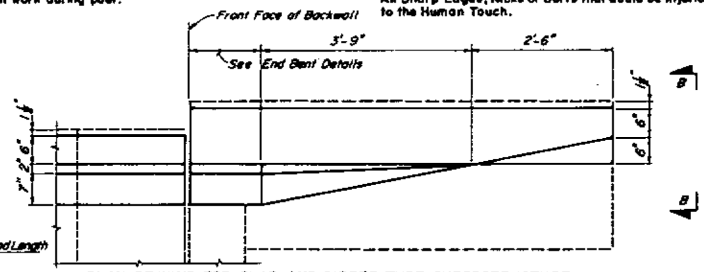
PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE

NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.

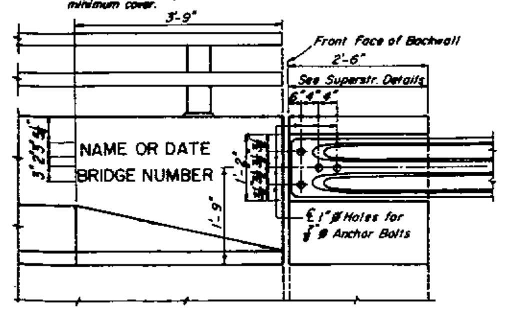


ANCHOR BOLT DETAIL

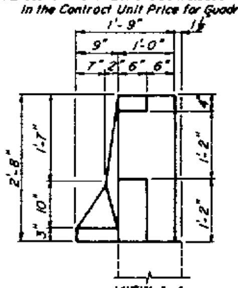
NOTE: Cost of Anchor Bolts to be included in the Contract Unit Price for Guardrail



PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE

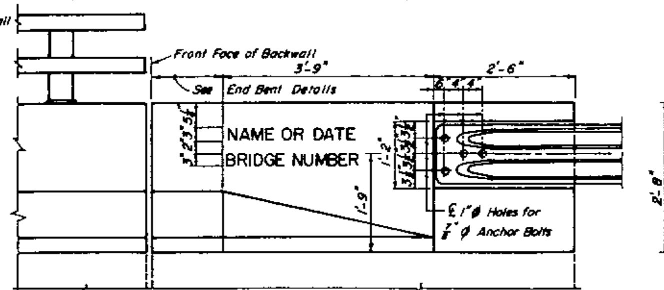


ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE



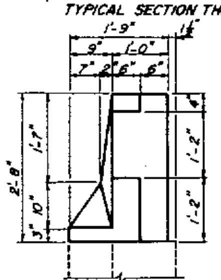
VIEW A-A

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

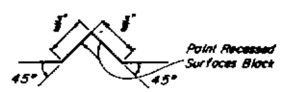


ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE

NOTE: For Guardrail Shoe see Road Design Standards Booklet.



VIEW B-B



SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by ⅜" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The date to be placed on the drivers left when approaching Bridge. The date shall be the Year the Bridge is constructed.

REVISIONS

Dates	Descriptions
3-2-81	Added Anchor Bar Tie Notes.
3-19-81	Added Splice Bar Insert & Note "A"
6-17-81	CHGD Splice Bar Dimension
8-21-81	Change Anchor Bolt Dim.
10-16-84	Rev. Dimension Section E-E
11-28-84	Guard Rail Anchor Bolt Location.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

BICYCLE BARRIER

ROAD NO.	COUNTY	PROJECT NO.

	Names	Dates
Designed by	CAC	1-79
Checked by	DEK	1-79
Quantities by		
Checked by		
Supervised by	SHN	

APPROVED BY [signature] Deputy Design Engineer, Structures

Drawing No. 1 of 1 — Index No. 12931

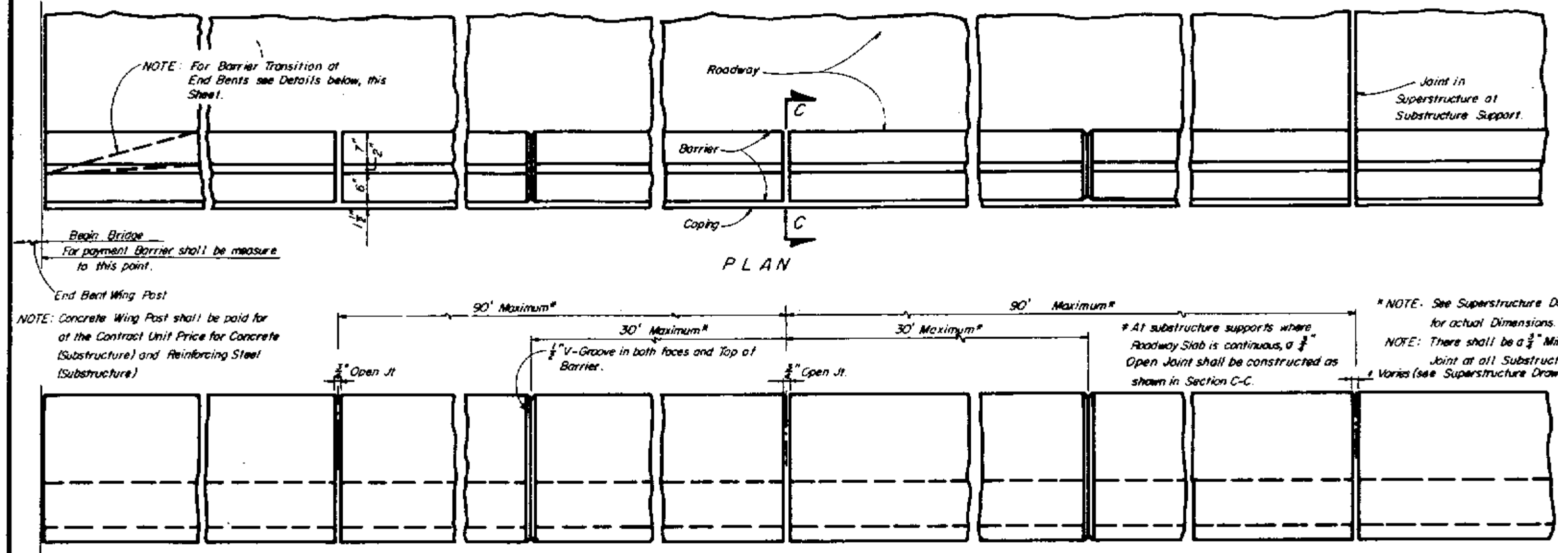
TABLE OF CONTENTS

INDEX	TITLE
	BEARING PADS
12037	COMPOSITE NEOPRENE BEARING PADS
	HANDRAIL
12067	ALUMINUM HANDRAIL (SIDEWALK)
13857	CONCRETE HANDRAIL BARRIER
11460	SIDEWALK BARRIER
12931	BICYCLE BARRIER
	PILES
3400	12", 14" AND 18" PRESTRESSED CONCRETE PILES
10289F	20", 24" AND 30" PRESTRESSED CONCRETE PILES
	REINFORCING STEEL
10587	STANDARD BAR BENDING DETAILS

NOTE : Numbers in parenthes in block with Index Number, When Shown, Indicates revision number.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

BRIDGE DESIGN STANDARDS



PLAN

NOTE: Concrete Wing Post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure)

* NOTE: See Superstructure Drawing for actual Dimensions.

NOTE: There shall be a ¾" Min. Open Joint at all Substructure Supports.

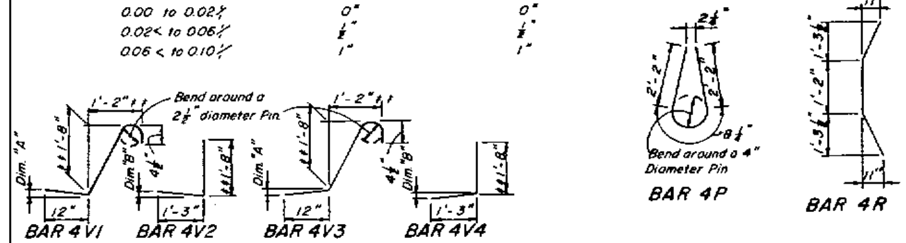
ELEVATION

NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.

BENDING DIAGRAMS

TABLE OF VARIABLE DIMENSIONS

RDWY X-SLOPE	DIM. "A" (Bars V1 & V3)	DIM. "B" (Bars V2 & V4)
0.00 to 0.02'	0"	0"
0.02< to 0.06'	½"	½"
0.06 < to 0.10'	1"	1"



NOTE. Bars 4V1 & 4V2 are for low side gutter. NOTE: Bars 4V3 & 4V4 are for high side gutter.

‡‡ Adjust length of Bars 4V as required for slab thickness. (Dimensions shown are based on a 7" slab, see Superstructure Drawings. For thicker slabs adjust the (1'-8" vertical and the 1'-2" horizontal) dimensions as follows; Add the amount that the slab depth exceeds 7" to the 1'-8" vertical dimension and add .45 of this excess to the 1'-2" horizontal dimension.

Example. 12" Slab
Excess = 12 - 7 = 5"
Vertical Dimension = [1'-8"] + [5"] = 2'-1"
Horizontal Dimension = [1'-2"] + [5 x .45] = 1'-4¼"

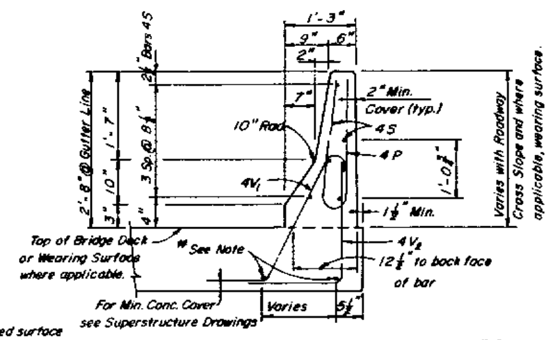
TYPICAL BARRIER QUANTITIES

NOTE: Quantities based on 7" slab and .02'/ft. Roadway Cross Slope.

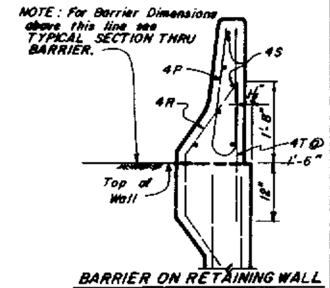
CLASS II CONCRETE: 0.07594 C.Y. per linear ft of Barrier
REINFORCING STEEL = 15.26 lbs. per linear ft. of Barrier for slab; 14.55 lbs. per linear ft. of Barrier for Wall.

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

NOTE: See sheet No. 1 of 5 Index No. 13356 for Retaining Wall Barrier Details.



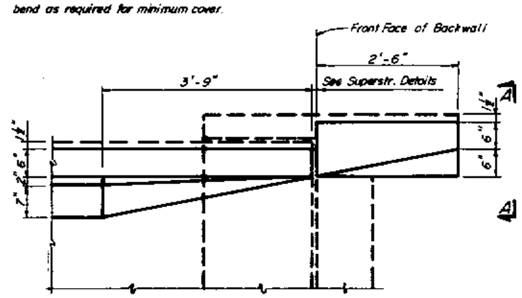
TYPICAL SECTION THRU BARRIER



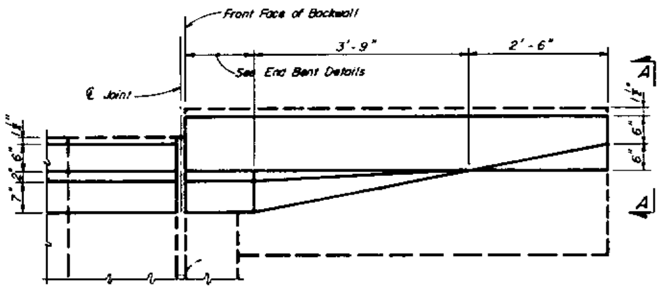
BARRIER ON RETAINING WALL

NOTE #: Place normal bottom slab longitudinal Reinforcing Steel at each position as shown above to facilitate tying anchor bars in Concrete Handrail Barrier. Do not add Reinforcing Steel for tie purposes. For Precast Slab Units place Bars 4V on top of the prestressed strands and tie.

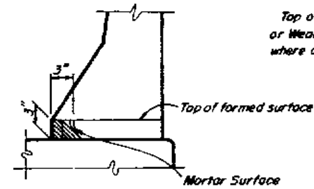
REINFORCING STEEL NOTES:
All Reinforcing Steel in Barrier shall be No. 4's. Bars 4P, 4R, & 4V shall be spaced at 8"c.c. At all open joints all reinforcing steel shall have 2" minimum cover.
At all construction joints Bars 4S may be either continuous or spliced.
All splices in Bars 4S shall be 1'-4" minimum.



PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE



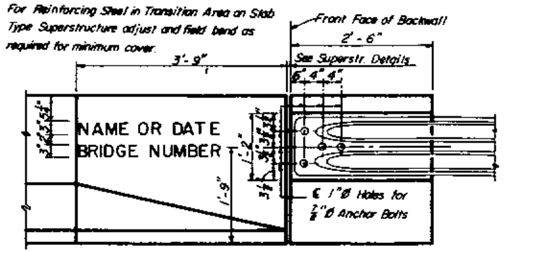
PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



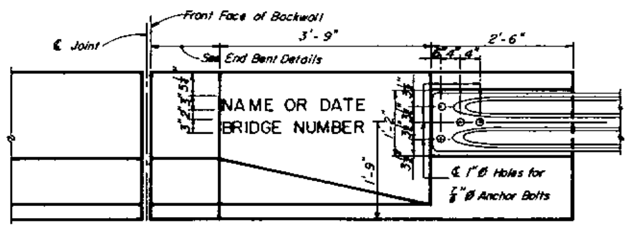
SECTION C-C

NOTE: When using fixed forms to construct the barrier the vertical face at the gutter-side shall be filled (3" above the roadway surface) either by forming or by filling the bottom 3" height of the opening for a width of 3" minimum, as shown above, with mortar in accordance with Article 400-15.1.
When barriers are slip-formed the opening shall be constructed for the limits described above for forming.

NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.



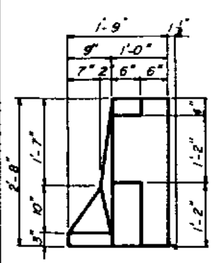
ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE



ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

NOTE: For Guardrail Shoe see Standard Drawing in Roadway Plans.

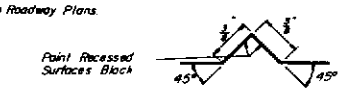


VIEW A-A

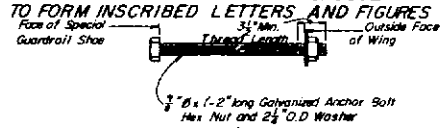
NOTES

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The Date to be placed on the drivers left when approaching Bridge. The Date shall be the Year the Bridge is constructed.

Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by ⅜" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

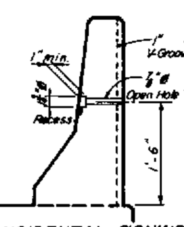


SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES



ANCHOR BOLT DETAIL

NOTE: Cost of Anchor Bolts to be Included in the Contract Unit Price for Guardrail.



HOLES FOR INCIDENTAL SIGNING

NOTE: Holes and grooves shall be placed on barrier type handrails of divided and undivided bridges as shown in the plans for designated type "C" single column, informational, guide, regulatory and warning sign locations (see signing plans) and at approximately 500' intervals along the right handrails of bridges between designated locations for future signs as directed by the Engineer. The cost of the extra holes and grooves shall be included in the contract unit price for Contract Handrail (Barrier). If Signing Plans are not available the Project Engineer should secure necessary information from the District Maintenance or Traffic Operations Office.

GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department Of Transportation and installed by the Contractor. The Cost of Installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.
SLIP-FORMING: At the option of the Contractor, Barrier Walls may be constructed by slip-forming subject to the following: the width may be increased a maximum of 2 inches provided that the front face at the base of each barrier infringes on the clear roadway width no more than ½" and that any additional materials required are at the expense of the Contractor. The shape of the Barrier on the Roadway Side shall not be altered.
SUPERELEVATED BRIDGES: At the Option of the Contractor, Handrail Barriers and End Bent wingwalls on Superelevated Bridges, may be constructed perpendicular to the roadway surface. The cost of modifications shall be at the Contractors expense.
ANCHOR BOLTS: Anchor Bolts, Nuts, and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-123.

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

REVISIONS	
Dates	Descriptions
11/28/84	Guard Rail Anchor Bolt Location

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

CONCRETE HANDRAIL BARRIER

ROAD NO.	COUNTY	PROJECT NO.

	Names	Dates
Designed by	LAC & SJR	4-83
Checked by	FWT/BD	10-83
Quantities by		
Lettered by		
Supervised by	RCB	

APPROVED BY
Deputy Design Engineer, Structures

Drawing No.	Index No.
1 of 1	13957

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

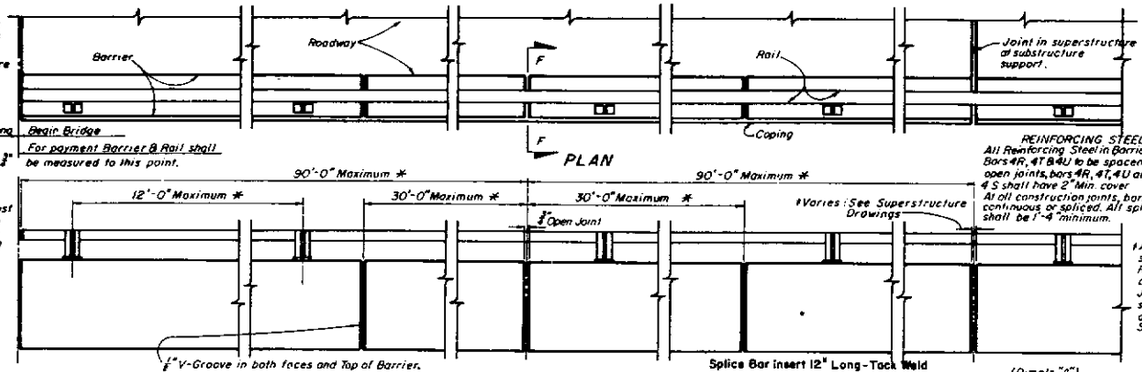
NOTE: For Barrier Transition at End Bents see Details below, this sheet.

* NOTE: See Superstructure Drawing for actual Dimensions.

NOTE: There shall be a ¾" Min. Open Joint at all Substructure Supports.

NOTE: Concrete Wing Post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure).

NOTE: Rail shall be continuous over a minimum of 3 Posts before splicing.



PLAN

ELEVATION

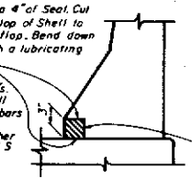
REINFORCING STEEL NOTES

All Reinforcing Steel in Barrier shall be No. 4's. Bars 4R, 4T & 4U to be spaced at 8" c.c. At all open joints, bars 4R, 4T, 4U and the ends of bars 4S shall have 2" Min. cover. At all construction joints, bars 4S may be either continuous or spliced. All splices in bars 4S shall be 1'-4" minimum.

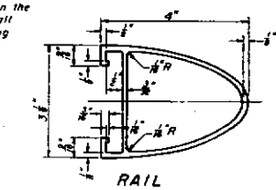
*At substructure supports where Roadway Slab is continuous, the Joint in Barrier shall be sealed as shown in Section F-F.

NOTE: All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive.

Provide extra 4" of Seal. Cut away all but top of Shell to provide end flap. Bend down and seal with a lubricating adhesive.



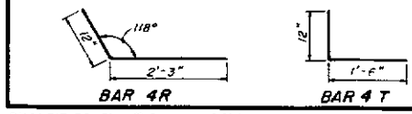
SECTION F-F



RAIL

BENDING DIAGRAM

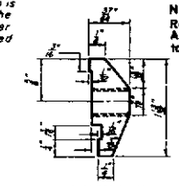
NOTE: All bar dimensions are out-to-out.



BAR 4R BAR 4T

QUANTITIES: Class II Concrete = 0.07594 Cu. Yds. per linear ft. of Barrier (Based on Roadway Cross Slope of .02 ft/ft.).
REINFORCING STEEL = 15.782 lbs. per linear ft. of Barrier.

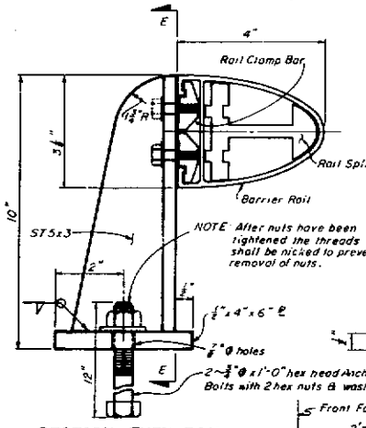
NOTE "A"-Rough Cut Ends and Edges of Aluminum Rails shall be Ground or Filed Smooth to Remove All Sharp Edges, Nicks or Burrs that would be injurious to the Human Touch.



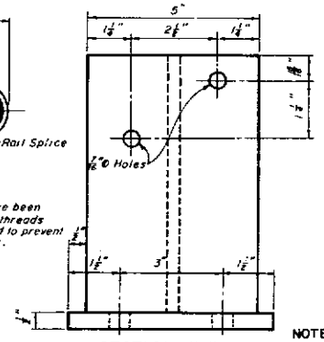
VIEW C-C

GENERAL NOTES

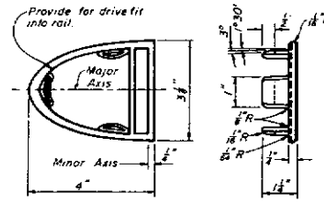
CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Rail, Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 psi. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.
ANCHOR BOLTS: Anchor Bolts, Nuts and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-123.



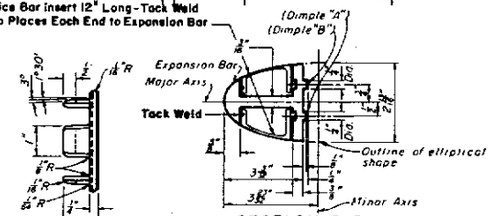
SECTION THRU RAIL



SECTION E-E

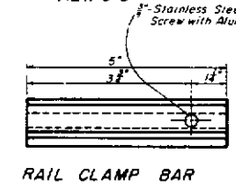


RAIL END CAP

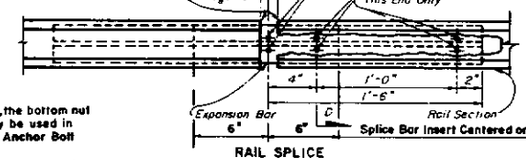


SECTION D-D

Splice Bar insert 12" Long-Tack Weld Two Places Each End to Expansion Bar



RAIL CLAMP BAR

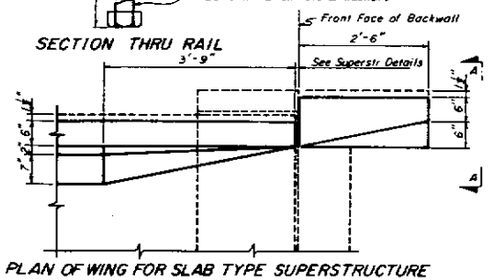


RAIL SPLICE

NOTE: At the option of the contractor, the bottom nut shown in "Section Thru Rail" may be used in conjunction with top nut to secure Anchor Bolt to form work during pour.

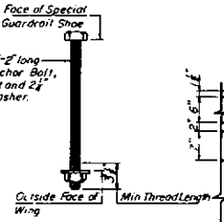
SPECIFICATIONS FOR BRIDGE RAIL

POST: Fabricated wrought aluminum A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5 with welding using filler wire 4043.
RAIL & RAIL SPLICE: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
RAIL CLAMP BAR: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
ANCHOR BOLTS: Anchor Bolts shall be in accordance with A.S.T.M. A-36 or A-307. Anchor Bolts, nuts and washers shall be hot-dip galvanized in accordance with A.S.T.M. Designation A-153.
RAIL END CAP: A.S.T.M. B 26 sand cast aluminum alloy, S G 70A-F (Alum. Assoc. alloy designation A-356-F).
RAIL INSTALLATION: Rail Post shall be normal to Profile Grade. Posts shall be seated on ⅛" thick resilient pads in accordance with Article 932-2.1. The dimension shall be the same as the post base. Rail expansion joints shall occur in the panel between posts on either side of Bridge expansion joints. Rail expansion joints shall be similar to rail splices with provision for movement equal to 1.5 times the bridge joint opening.
SHOP DRAWINGS: Complete details and description of materials of the proposed bridge rail shall be submitted by the contractor for the Engineers approval prior to fabrication.



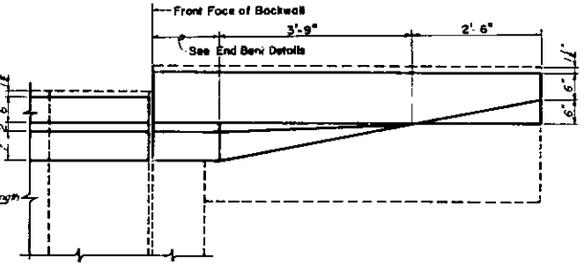
PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE

NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.

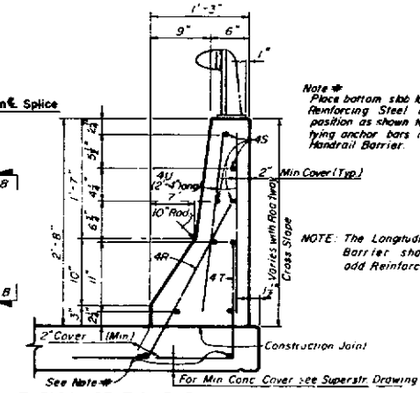


ANCHOR BOLT DETAIL

NOTE: Cost of Anchor Bolts to be included in the Contract Unit Price for Guardrail.



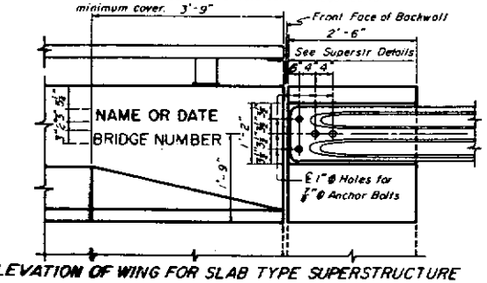
PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



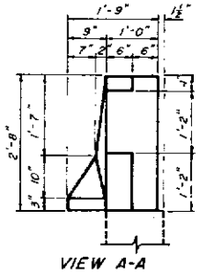
TYPICAL SECTION THRU BARRIER

NOTE: The Longitudinal Reinforcing Steel shown in Slab of Typical Section Thru Barrier shall be normal Longitudinal Slab Steel spaced as shown, do not add Reinforcing Steel for tie purposes.

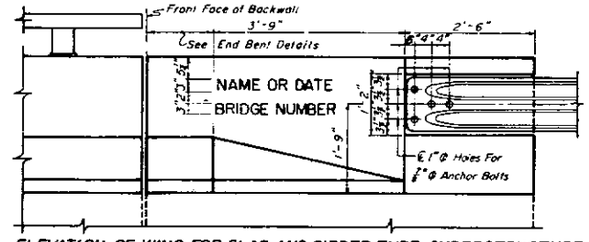
NOTE: At the option of the Contractor, Barrier Walls may be constructed by slip-forming subject to the following: the width may be increased a maximum of 2 inches provided that the front face at the base of each barrier infringes on the clear roadway width no more than ½" and that any additional materials required are at the expense of the Contractor. The shape of the Barrier on the Roadway side shall not be altered.



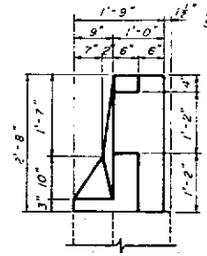
ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE



VIEW A-A



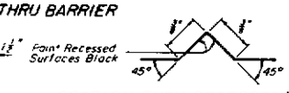
ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



VIEW B-B

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

NOTE: For Guardrail Shoe See Standard Drawing in Roadway Plans



SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

Block Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by ¼" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The date to be placed on the drivers left when approaching Bridge. The date shall be the Year the Bridge is constructed.

11/28/84 Guard Rail Anchor Location.

REVISIONS	
Date	Description
8/30/72	In reference to 1975 Supplement.
8 29 75	Bridge Number added to Wingwall
12 29 75	Change Anchor Bolt Detail
5 22 76	Revise Sheet Format & Delete Reference to 1975 Supplement
5-24-80	Added note to "Rail Splice"
7-17-80	Shop Drawing Note Added
10-21-81	Has Head on Anchor Bolt. ⊕ Change Anchor Bolt Dim.
5-7-82	Rev. Section E-E
7-7-83	Added Anchor Bar Tie Marks
3-19-84	Added Splice Bar Insert & Note "A"
10-17-84	CHANGE Spl. on Box Dimension

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

SIDEWALK BARRIER

ROAD NO.	COUNTY	PROJECT NO.

	Name	Date
Designed by	WHD	5-74
Checked by	JLM	5-74
Quantities by		
Checked by		
Supervised by	PB	

APPROVED BY: Deputy State Engineer, Structures

Drawing No. 1 of 1 | Index No. 11,460

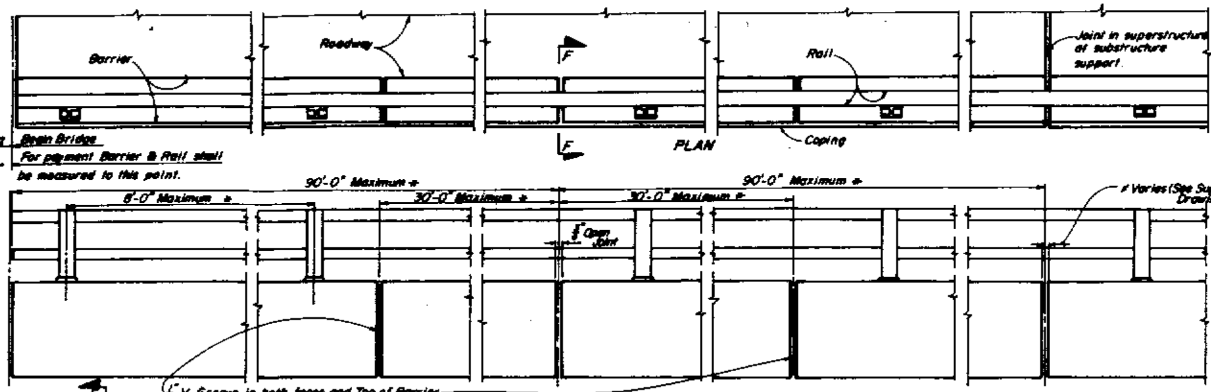
NOTE: For Barrier Transition at End Bents see Details below, this sheet

∗ NOTE: See Superstructure drawing for actual dimensions.

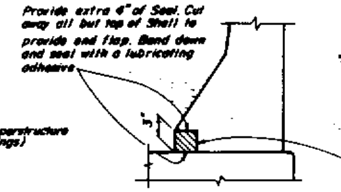
NOTE: There shall be a ¾" Min. Open Joint at all Substructure Supports.

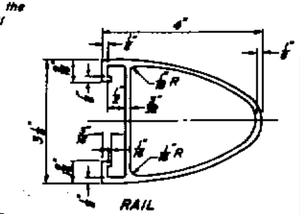
NOTE: Concrete Wing post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure)

NOTE: Rail shall be continuous over a minimum of 3 posts before splicing.



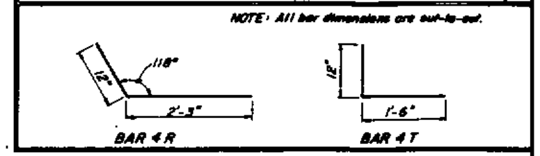
NOTE: All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive.





BENDING DIAGRAM

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



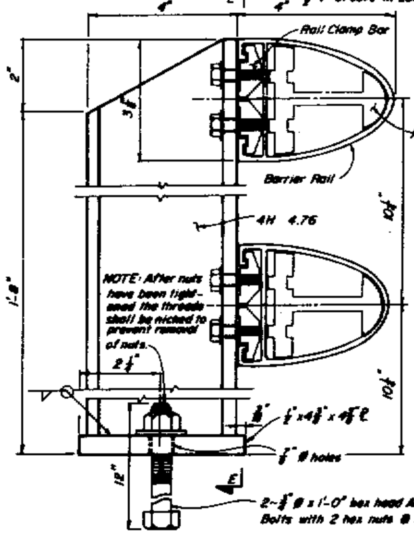
QUANTITIES: Class II Concrete = 0.07594 Cu.Yds. per linear ft. of Barrier (Based on Roadway Cross Slope of .02'/ft.)
REINFORCING STEEL = 15.782 lbs. per linear ft. of Barrier.

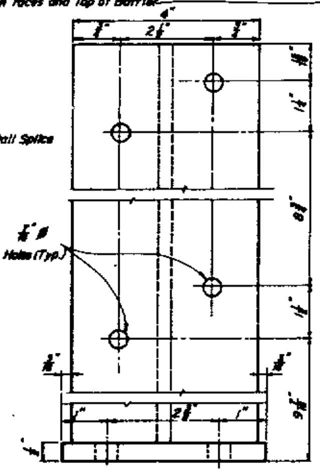
REINFORCING STEEL NOTES

All Reinforcing Steel in Barrier shall be No.4's. Bars 4R, 4T & 4U to be spaced at 8" C.C. At all open joints, Bars 4R, 4T, 4U and the ends of bars 4S shall have 2" Min. cover. At all construction joints, bars 4S may be either continuous or spliced. All splices in bars 4S shall be 1'-4" minimum.

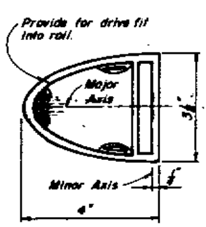
GENERAL NOTES

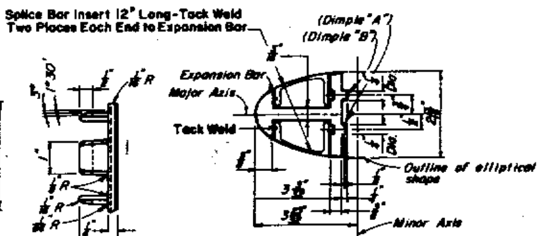
CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Rail, Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the markers shall be included in the Contract Unit Price for Concrete Barrier.

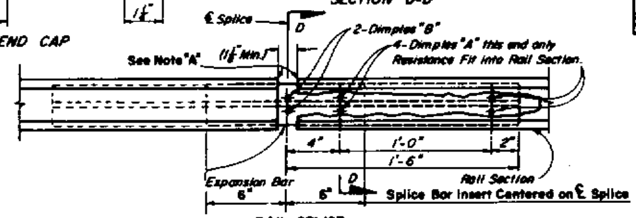




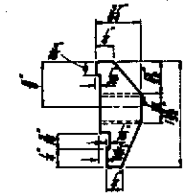
NOTE: At the option of the Contractor, the bottom nut shown in "Section Thru Rail" may be used in conjunction with top nut to secure Anchor Bolt to form work during pour.

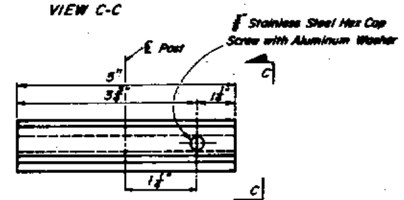






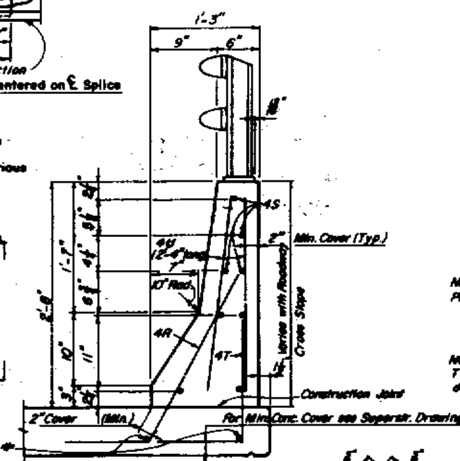
NOTE "A"-Rough Cut Ends and Edges of Aluminum Rails shall be Ground or Filed Smooth to Remove All Sharp Edges, Nicks or Burrs that would be injurious to the Human Touch.





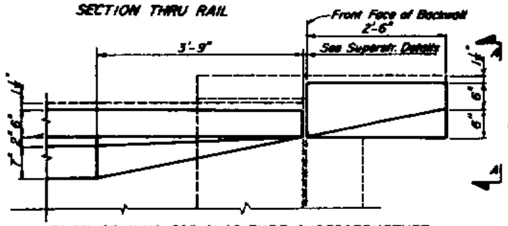
SPECIFICATIONS FOR BRIDGE RAIL

POST: Fabricated wrought aluminum A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5 with welding using filler wire 4043.
RAIL & RAIL SPLICE: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5
RAIL CLAMP BAR: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
ANCHOR BOLTS: Anchor Bolts shall be in accordance with A.S.T.M. A-36 or A-307. Anchor Bolts, nuts and washers shall be hot-dip galvanized in accordance with A.S.T.M. Designation A-153.
RAIL END CAP: A.S.T.M. B 26 sand cast aluminum alloy, S G 70A-F (Alum. Assoc. alloy designation A-356-F).
RAIL INSTALLATION: Rail Post shall be normal to Profile Grade. Posts shall be seated on ⅛" thick resilient pads in accordance with Article 932-2.1. The dimension shall be the same as the post base. Rail expansion joints shall occur in the panel between posts on either side of Bridge expansion joints. Rail expansion joints shall be similar to rail splices with provision for movement equal to 1.5 times the bridge joint opening.
SHOP DRAWINGS: Complete details and description of materials of the proposed bridge rail shall be submitted by the contractor for the Engineers approval prior to fabrication.

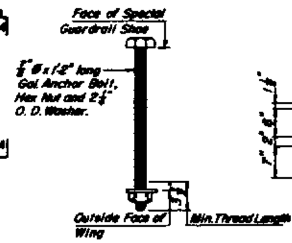


Note #
Place bottom slab longitudinal Reinforcing Steel at each position as shown to facilitate tying anchor bars in Concrete Handrail Barrier.

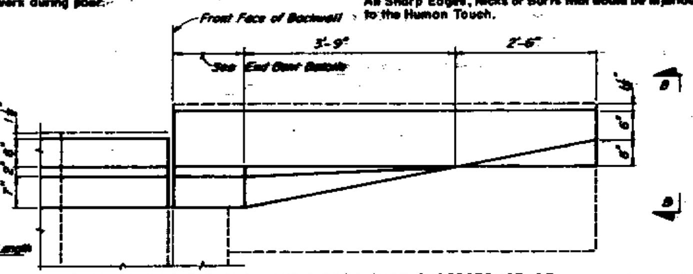
NOTE: The Longitudinal Reinforcing Steel shown in the slab of the Typical Section Thru Barrier shall be normal Longitudinal Slab Steel spaced as shown, do not add Reinforcing Steel for tie purposes.

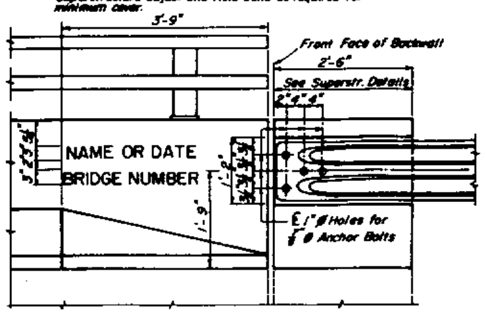


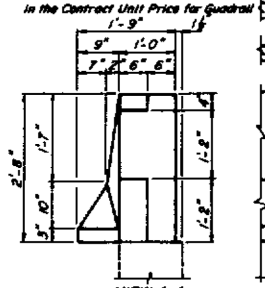
NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.



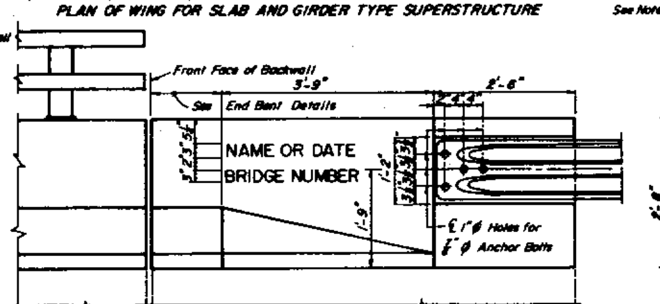
NOTE: Cost of Anchor Bolts to be included in the Contract Unit Price for Guardrail



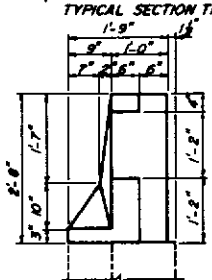


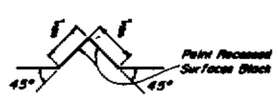


DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS



NOTE: For Guardrail Shoe see Road Design Standards Booklet.





SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by ¾" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The date to be placed on the drivers left when approaching Bridge. The date shall be the Year the Bridge is constructed.

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

REVISIONS	
Dates	Descriptions
8-2-81	Added Anchor Bar Tie Notes
12-10-84	Added Splice Bar Insert & Note "A"
12-17-84	Chgd Splice Bar Dimension
12-21-84	Change Anchor Bolt Size

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

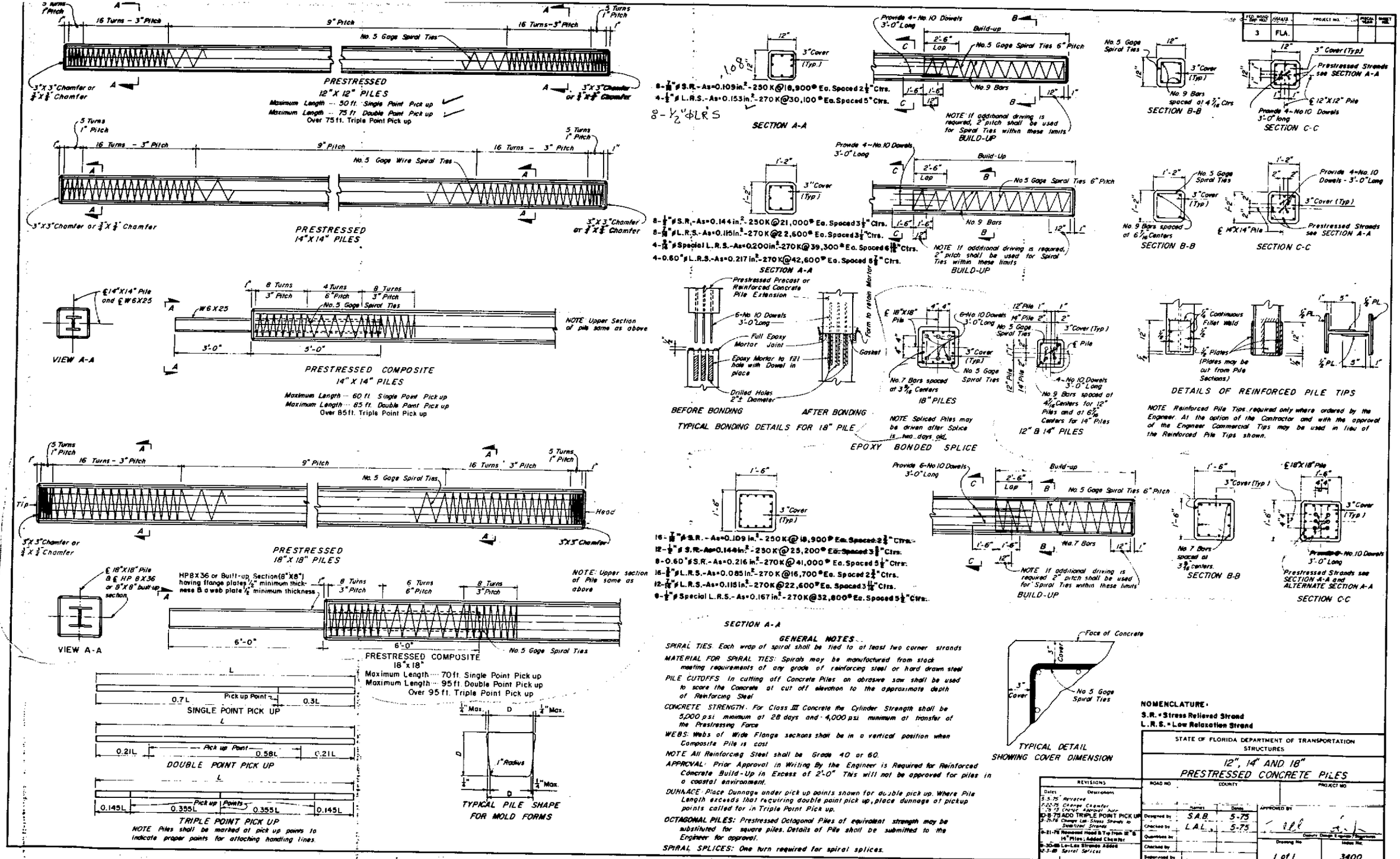
BICYCLE BARRIER

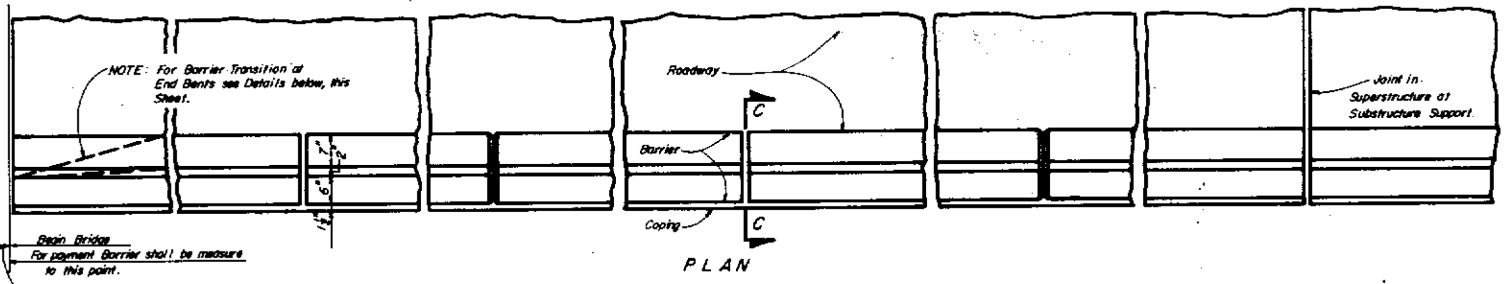
ROAD NO.	COUNTY	PROJECT NO.

	Names	Dates
Designed by	CAC	1-79
Checked by	DEK	1-79
Quantities by		
Checked by		
Supervised by	SHN	

APPROVED BY: [signature] Deputy Design Engineer, Structures

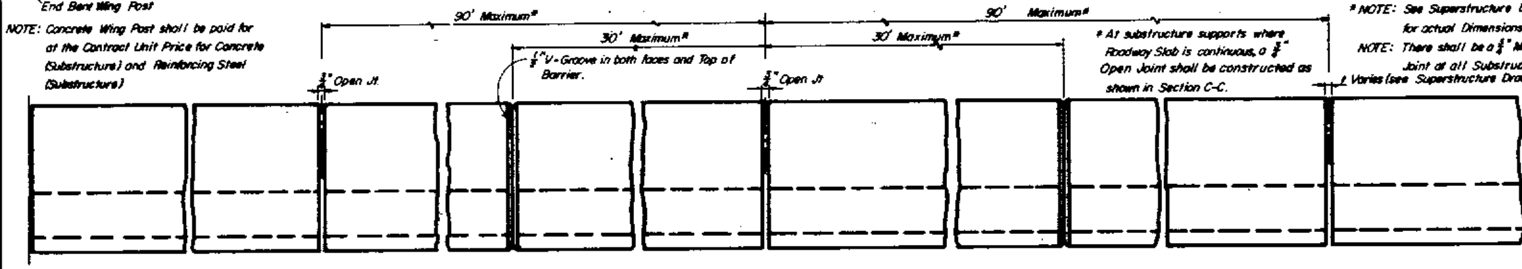
Drawing No.: 1 of 1
Index No.: 12931


PRESTRESSED 12"X 12" PILES
Maximum Length --- 50 ft. Single Point Pick up
Maximum Length --- 75 ft. Double Point Pick up
Over 75 ft. Triple Point Pick up
16 Turns - 3" Pitch
9" Pitch
No. 5 Gage Spiral Ties
5 Turns 1" Pitch
3"X 3" Chamfer or 3/4"X 3/4" Chamfer
PRESTRESSED 14"X 14" PILES
No. 5 Gage Wire Spiral Ties
VIEW A-A
PRESTRESSED COMPOSITE 14" X 14" PILES
Maximum Length --- 60 ft. Single Point Pick up
Maximum Length --- 85 ft. Double Point Pick up
Over 85 ft. Triple Point Pick up
8 Turns 3" Pitch
4 Turns 6" Pitch
8 Turns 3" Pitch
W6X25
NOTE Upper Section of pile same as above
PRESTRESSED 18"X 18" PILES
Tip
Head
VIEW A-A
HP8X36 or Built-up Section (8"X8") having flange plates 1/2" minimum thickness & a web plate 1/2" minimum thickness
6 Turns 6" Pitch
NOTE: Upper section of Pile same as above
PRESTRESSED COMPOSITE 18"x18"
Maximum Length --- 70 ft. Single Point Pick up
Maximum Length --- 95 ft. Double Point Pick up
Over 95 ft. Triple Point Pick up
SINGLE POINT PICK UP
Pick up Point
DOUBLE POINT PICK UP
TRIPLE POINT PICK UP
Pick up Points
NOTE Piles shall be marked at pick up points to indicate proper points for attaching handling lines.
TYPICAL PILE SHAPE FOR MOLD FORMS
SECTION A-A
8-1/2"ø S.R.-As=0.109 in.²-250K@18,900# Ea. Spaced 2 1/2" Ctrs.
4-1/2"ø L.R.S.-As=0.153 in.²-270K@30,100# Ea. Spaced 5" Ctrs.
8-1/2"ø L.R.S.
Provide 4-No. 10 Dowels 3'-0" Long
Build-up
No. 5 Gage Spiral Ties 6" Pitch
No. 9 Bars
NOTE If additional driving is required, 2" pitch shall be used for Spiral Ties within these limits
BUILD-UP
No. 5 Gage Spiral Ties
No. 9 Bars spaced at 4 7/16" Ctrs
SECTION B-B
Prestressed Strands see SECTION A-A
Provide 4-No. 10 Dowels 3'-0" long
SECTION C-C
8-1/2"ø S.R.-As=0.144 in.²-250K@21,000# Ea. Spaced 3 1/2" Ctrs.
8-9/16"ø L.R.S.-As=0.1515 in.²-270K@22,600# Ea. Spaced 3 1/2" Ctrs.
4-9/16"ø Special L.R.S.-As=0.2000 in.²-270K@39,300# Ea. Spaced 6 11/16" Ctrs.
4-0.60"ø L.R.S.-As=0.217 in.²-270K@42,600# Ea. Spaced 5 1/2" Ctrs.
No. 9 Bars spaced at 6 7/16" Centers
Provide 4-No. 10 Dowels - 3'-0" Long
Prestressed Strands see SECTION A-A
BEFORE BONDING
AFTER BONDING
TYPICAL BONDING DETAILS FOR 18" PILE
Prestressed Precast or Reinforced Concrete Pile Extension
6-No. 10 Dowels 3'-0" Long
Full Epoxy Mortar Joint
Epoxy Mortar to fill hole with Dowel in place
Drilled Holes 2" ± Diameter
Form to retain Mortar
Gasket
NOTE Spliced Piles may be driven after Splice is two days old.
EPOXY BONDED SPLICE
No. 7 Bars spaced at 3 9/16" Centers
18" PILES
No. 9 Bars spaced at 4 7/16" Centers for 12" Piles and at 6 7/16" Centers for 14" Piles
12" & 14" PILES
1/4" Continuous Fillet Weld
1/2" Plates (Plates may be cut from Pile Sections)
DETAILS OF REINFORCED PILE TIPS
NOTE Reinforced Pile Tips required only where ordered by the Engineer. At the option of the Contractor and with the approval of the Engineer Commercial Tips may be used in lieu of the Reinforced Pile Tips shown.
16-7/16"ø S.R.-As=0.109 in.²-250K@18,900# Ea. Spaced 2 1/2" Ctrs.
12-1/2"ø S.R.-As=0.144 in.²-250K@25,200# Ea. Spaced 3 1/2" Ctrs.
8-0.60"ø S.R.-As=0.216 in.²-270K@41,000# Ea. Spaced 5 1/2" Ctrs.
16-9/16"ø L.R.S.-As=0.085 in.²-270K@16,700# Ea. Spaced 2 3/4" Ctrs.
12-7/16"ø L.R.S.-As=0.115 in.²-270K@22,600# Ea. Spaced 3 11/16" Ctrs.
8-1/2"ø Special L.R.S.-As=0.167 in.²-270K@32,800# Ea. Spaced 5 1/2" Ctrs.
Provide 6-No. 10 Dowels 3'-0" Long
No. 7 Bars
No. 7 Bars spaced at 3 9/16" centers.
Provide 6-No. 10 Dowels 3'-0" Long
Prestressed Strands see SECTION A-A and ALTERNATE SECTION A-A
SECTION C-C
GENERAL NOTES
SPIRAL TIES: Each wrap of spiral shall be tied to at least two corner strands
MATERIAL FOR SPIRAL TIES: Spirals may be manufactured from stock meeting requirements of any grade of reinforcing steel or hard drawn steel
PILE CUTOFFS: In cutting off Concrete Piles an abrasive saw shall be used to score the Concrete at cut off elevation to the approximate depth of Reinforcing Steel
CONCRETE STRENGTH: For Class III Concrete the Cylinder Strength shall be 5,000 p.s.i. minimum at 28 days and 4,000 p.s.i. minimum at transfer of the Prestressing Force
WEBS: Webs of Wide Flange sections shall be in a vertical position when Composite Pile is cast
NOTE All Reinforcing Steel shall be Grade 40 or 60.
APPROVAL: Prior Approval in Writing By the Engineer is Required for Reinforced Concrete Build-Up in Excess of 2'-0" This will not be approved for piles in a coastal environment.
DUNNAGE: Place Dunnage under pick up points shown for double pick up. Where Pile Length exceeds that requiring double point pick up, place dunnage at pickup points called for in Triple Point Pick up.
OCTAGONAL PILES: Prestressed Octagonal Piles of equivalent strength may be substituted for square piles. Details of Pile shall be submitted to the Engineer for approval.
SPIRAL SPLICES: One turn required for spiral splices.
Face of Concrete
Cover
No. 5 Gage Spiral Ties
TYPICAL DETAIL SHOWING COVER DIMENSION
NOMENCLATURE:
S.R. = Stress Relieved Strand
L.R.S. = Low Relaxation Strand
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES
12", 14" AND 18" PRESTRESSED CONCRETE PILES
REVISIONS
Dates Descriptions
5-5-75 Revised
7-22-75 Change Chamfer
7-29-75 Change Approval Auth
10-8-75 ADD TRIPLE POINT PICK UP
9-21-76 Removed Head & Tip from 12"ø 14" Piles; Added Chamfer
9-30-80 Lo-Lax Strands Added
12-3-80 Spiral Splices
Designed by S.A.B. 5-75
Checked by L.A.L. 5-75
Drawing No. 1 of 1
Index No. 3400
3 FLA.



PLAN

NOTE: Concrete Wing Post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure)



* NOTE: See Superstructure Drawing for actual Dimensions.

NOTE: There shall be a ¾" Min. Open Joint at all Substructure Supports.

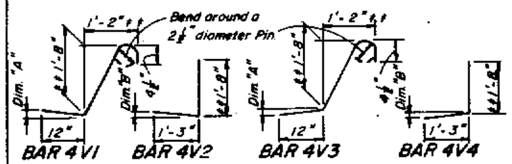
ELEVATION

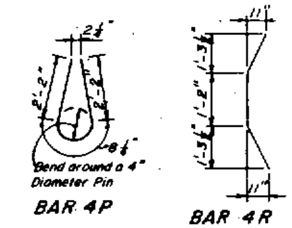
NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.

BENDING DIAGRAMS

TABLE OF VARIABLE DIMENSIONS

RDWY. X-SLOPE	DIM. "A" (Bars V1 & V3)	DIM. "B" (Bars V2 & V4)
0.00 to 0.02'	0"	0"
0.02< to 0.06'	½"	½"
0.06 < to 0.10'	1"	1"





NOTE: Bars 4V1 & 4V2 are for low side gutter. NOTE: Bars 4V3 & 4V4 are for high side gutter.

‡‡ Adjust length of Bars 4V as required for slab thickness. (Dimensions shown are based on a 7" slab, see Superstructure Drawings. For thicker slabs adjust the 1'-8" vertical and the 1'-2" horizontal dimensions as follows; Add the amount that the slab depth exceeds 7" to the 1'-8" vertical dimension and add .45 of this excess to the 1'-2" horizontal dimension.

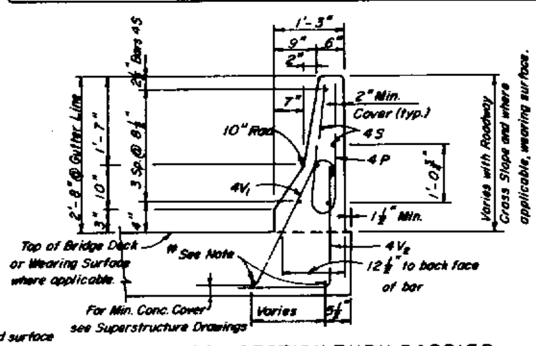
Example: 12" Slab
Excess = 12 - 7 = 5"
Vertical Dimension = [1'-8"] + [5"] = 2'-1"
Horizontal Dimension = [1'-2"] + [5 x .45] = 1'-4¼"

TYPICAL BARRIER QUANTITIES

NOTE: Quantities based on 7" slab and .02'/ft. Roadway Cross Slope.

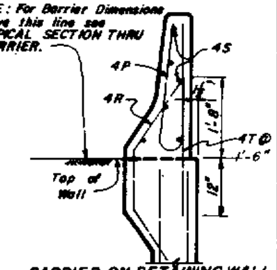
CLASS II CONCRETE: 0.07594 C.Y. per linear ft. of Barrier
REINFORCING STEEL = 15.26 lbs. per linear ft. of Barrier for slab; 14.55 lbs. per linear ft. of Barrier for Wall.

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



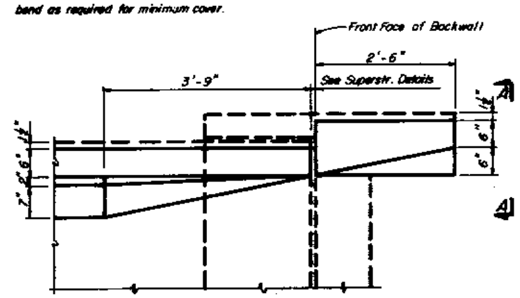
TYPICAL SECTION THRU BARRIER

NOTE: See sheet No. 1 of 5 Index No. 13356 for Retaining Wall Barrier Details.

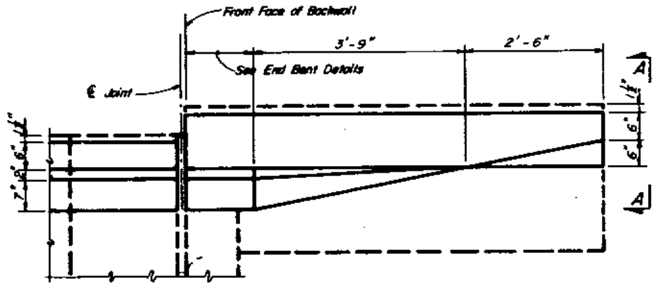


BARRIER ON RETAINING WALL

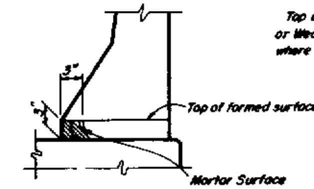
NOTE #: Place normal bottom slab longitudinal Reinforcing Steel at each position as shown above to facilitate tying anchor bars in Concrete Handrail Barrier. Do not add Reinforcing Steel for tie purposes. For Precast Slab Units place Bars 4V on top of the prestressed strands and tie.



PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE



PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



SECTION C-C

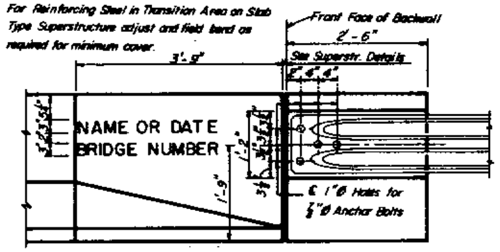
NOTE: When using fixed forms to construct the barrier the vertical face at the gutter-side shall be filled (3" above the roadway surface) either by forming or by filling the bottom 3" height of the opening for a width of 3" minimum, as shown above, with mortar in accordance with Article 400-15.1.

When barriers are slip-formed the opening shall be constructed for the limits described above for forming.

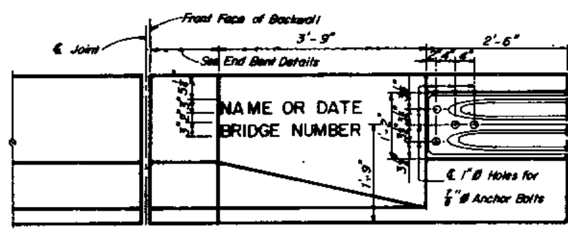
REINFORCING STEEL NOTES:

All Reinforcing Steel in Barrier shall be No. 4's. Bars 4P, 4R, & 4V shall be spaced at 8" c.c. At all open joints all reinforcing steel shall have 2" minimum cover.
At all construction joints Bars 4S may be either continuous or spliced.
All splices in Bars 4S shall be 1'-4" minimum.

NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.



ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE



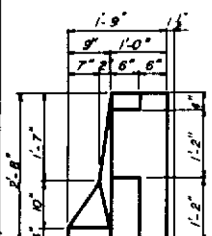
ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

NOTE: For Guardrail Shoe see Standard Drawing in Roadway Plans.

GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel ~~shall be Grade 60~~.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department Of Transportation and installed by the Contractor. The Cost of installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.
SLIP-FORMING: At the option of the Contractor, Barrier Walls may be constructed by slip-forming subject to the following: the width may be increased a maximum of 2 inches provided that the front face at the base of each barrier infringes on the clear roadway width no more than ½" and that any additional materials required are at the expense of the Contractor. The shape of the Barrier on the Roadway Side shall not be altered.
SUPERELEVATED BRIDGES: At the Option of the Contractor, Handrail Barriers and End Bent wingwalls on Superelevated Bridges, may be constructed perpendicular to the roadway surface. The cost of modifications shall be at the Contractors expense.
ANCHOR BOLTS: Anchor Bolts, Nuts, and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-123.



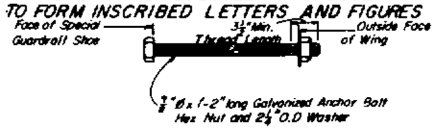
VIEW A-A

NOTES

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The Date to be placed on the drivers left when approaching Bridge. The Date shall be the Year the Bridge is constructed.

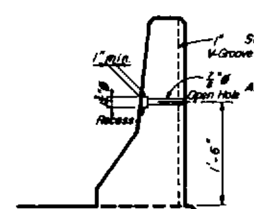
Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by ⅜" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES



ANCHOR BOLT DETAIL

NOTE: Cost of Anchor Bolts to be included in the Contract Unit Price for Guardrail.



HOLES FOR INCIDENTAL SIGNING

NOTE: Holes and grooves shall be placed on barrier type handrails of divided and undivided bridges as shown in the plans for designated type "C" single column, informational, guide, regulatory and warning sign locations (see signing plans) and at approximately 500' intervals along the right handrails of bridges between designated locations for future signs as directed by the Engineer. The cost of the extra holes and grooves shall be included in the contract unit price for Contract Handrail (Barrier). If Signing Plans are not available the Project Engineer should secure necessary information from the District Maintenance or Traffic Operations Office.

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

CONCRETE HANDRAIL BARRIER

	Name	Date
Designed by	LPS & JTR	4-82
Checked by	FWT/RP	10-83
Quantities by		
Checked by		
Supervised by	RCB	

Approved by: Deputy Design Engineer, Structures

Drawing No.: 1 of 1 — Index No.: 13857

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

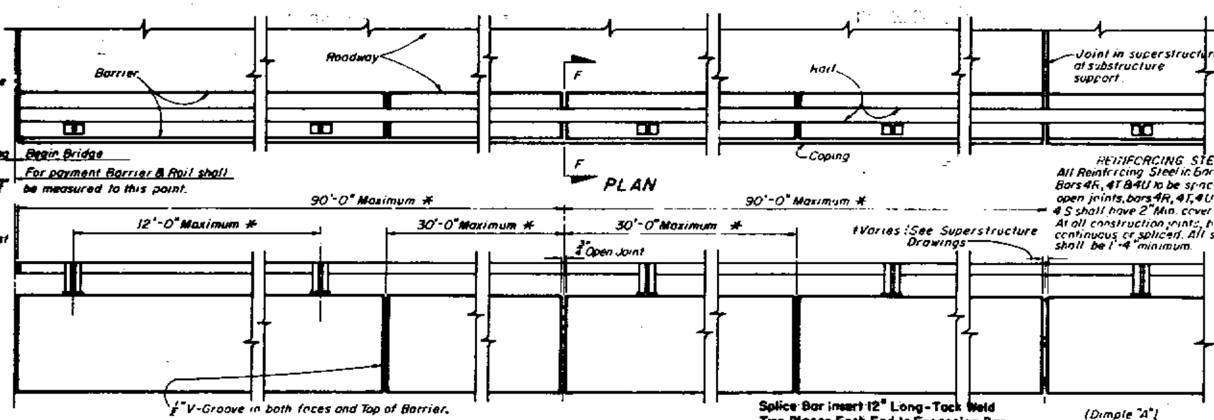
NOTE: For Barrier Transition at End Bents see Details below, this sheet.

* NOTE: See Superstructure Drawing for actual Dimensions.

NOTE: There shall be a 3/4" Min. Open Joint at all Substructure Supports.

NOTE: Concrete Wing Post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure).

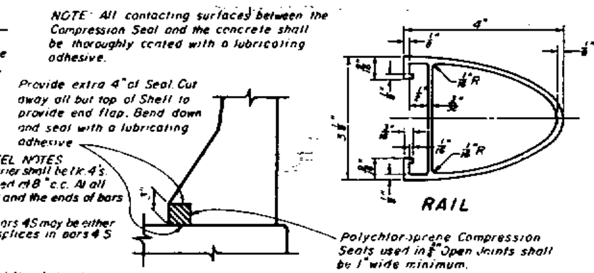
NOTE: Rail shall be continuous over a minimum of 3 Posts before splicing.



REINFORCING STEEL NOTES
All Reinforcing Steel in Barrier shall be No. 4's. Bars 4R, 4T & 4U to be spaced at 8" c.c. At all open joints, bars 4R, 4T, 4U and the ends of bars 4S shall have 2" Min. cover.
At all construction joints, bars 4S may be either continuous or spliced. All splices in bars 4S shall be 1'-4" minimum.

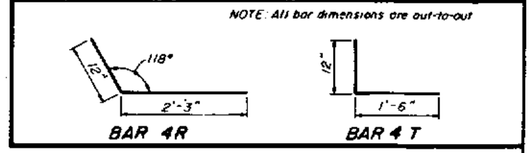
† At substructure supports where Roadway Slab is continuous, the Joint in Barrier shall be sealed as shown in Section F-F.

NOTE: All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive.

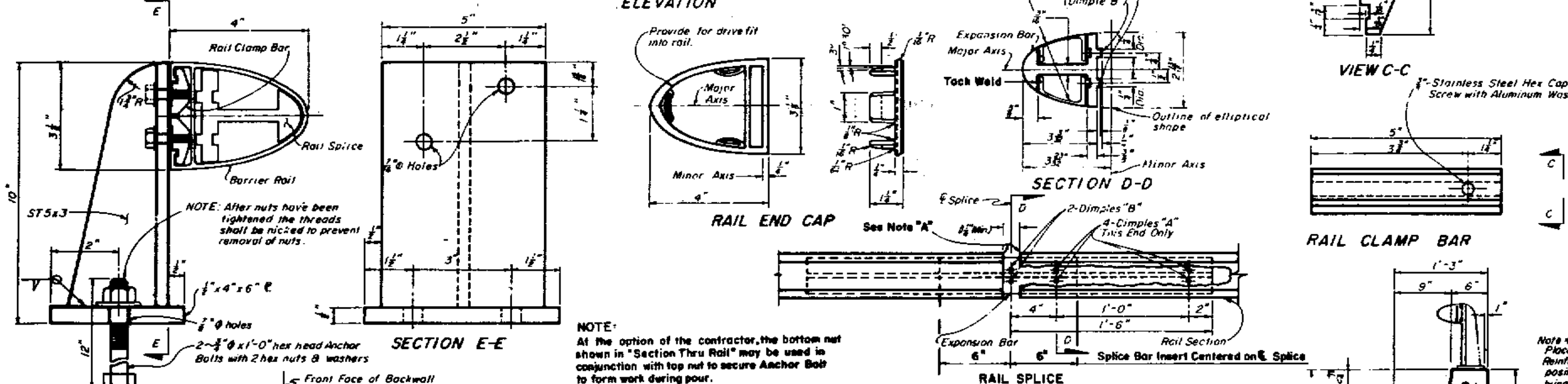


NOTE "A"-Rough Cut Ends and Edges of Aluminum Rails shall be Ground or Filed Smooth to Remove All Sharp Edges, Nicks or Burrs that would be Injurious to the Human Touch.

BENDING DIAGRAM



QUANTITIES: Class II Concrete = 0.07594 Cu. Yds. per linear ft. of Barrier (Based on Roadway Cross Slope of .02'/ft.).
REINFORCING STEEL = 15.782 lbs. per linear ft. of Barrier.



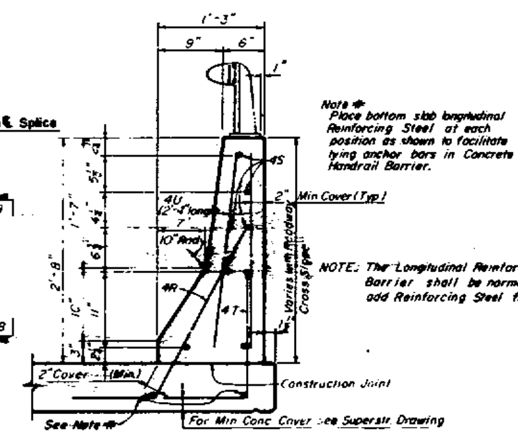
NOTE:
At the option of the contractor, the bottom nut shown in "Section Thru Rail" may be used in conjunction with top nut to secure Anchor Bolt to form work during pour.

GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Rail, Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.
ANCHOR BOLTS: Anchor Bolts, Nuts and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-123.

SPECIFICATIONS FOR BRIDGE RAIL

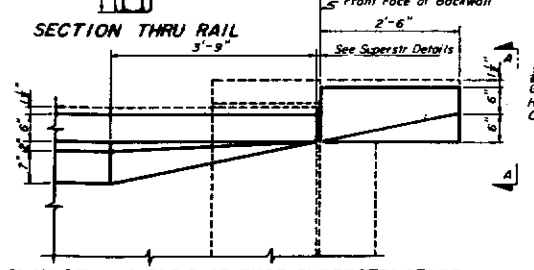
POST: Fabricated wrought aluminum A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5 with welding using filler wire 4043.
RAIL & RAIL SPLICE: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
RAIL CLAMP BAR: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
ANCHOR BOLTS: Anchor Bolts shall be in accordance with A.S.T.M. A-36 or A-307. Anchor Bolts, nuts and washers shall be hot-dip galvanized in accordance with A.S.T.M. Designation A-153.
RAIL END CAP: A.S.T.M. B 26 sand cast aluminum alloy, S G 70A-F (Alum. Assoc. alloy designation A-356-F).
RAIL INSTALLATION: Rail Post shall be normal to Profile Grade. Posts shall be seated on 1/8" thick resilient pads in accordance with Article 932-2.1. The dimension shall be the same as the post base. Rail expansion joints shall occur in the panel between posts on either side of Bridge expansion joints. Rail expansion joints shall be similar to rail splices with provision for movement equal to 1.5 times the bridge joint opening.
SHOP DRAWINGS: Complete details and description of materials of the proposed bridge rail shall be submitted by the contractor for the Engineers approval prior to fabrication.



Note #
Place bottom slab longitudinal Reinforcing Steel at each position as shown to facilitate tying anchor bars in Concrete Handrail Barrier.

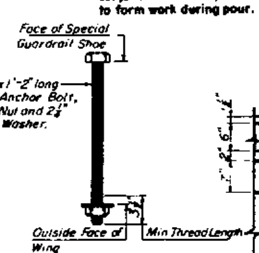
NOTE: The Longitudinal Reinforcing Steel shown in Slab of Typical Section Thru Barrier shall be normal Longitudinal Slab Steel spaced as shown, do not add Reinforcing Steel for tie purposes.

NOTE: At the option of the Contractor, Barrier Walls may be constructed by slip-forming subject to the following: the width may be increased a maximum of 2 inches provided that the front face at the base of each barrier infringes on the clear roadway width no more than 1/2" and that any additional materials required are at the expense of the Contractor. The shape of the Barrier on the Roadway side shall not be altered.



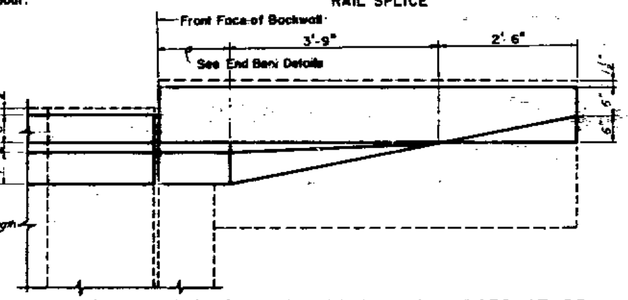
PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE

NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.

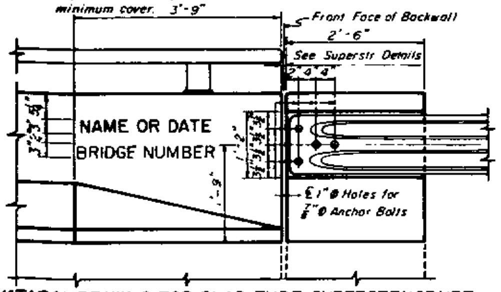


ANCHOR BOLT DETAIL

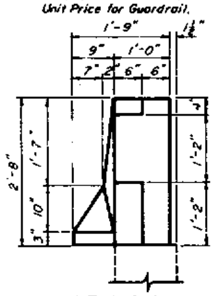
NOTE: Cost of Anchor Bolts to be included in the Contract Unit Price for Guardrail.



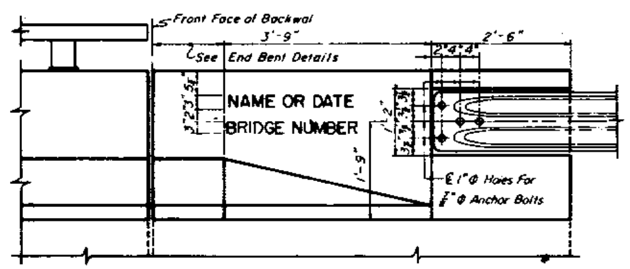
PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



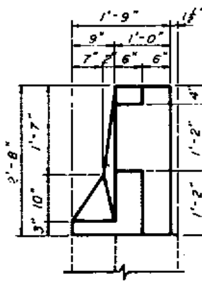
ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE



VIEW A-A



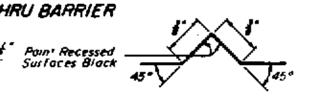
ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



VIEW B-B

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

NOTE: For Guardrail Shoe See Standard Drawing in Roadway Plans



SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by 3/4" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The date to be placed on the drivers left when approaching Bridge. The date shall be the Year the Bridge is constructed.

Date	Revisions
6-21-81	Hex Head on Anchor Bolt, & Change Anchor Bolt Dim.
5-7-82	Rev. Section E-E
3-2-81	Added Anchor Bar Tie Notes
5-19-81	Added Splice Bar Insert & Note "A"
6-17-81	CHGD Spl on Bar Dimension
6/30/75	In reference to 1975 Supplement.
8-29-75	Bridge Number added to Wingwall
[illegible]	Changed Anchor Bolt Length; Steel Revised & Deleted Reference to 1975 Supplement
5-21-80	Added note to "Rail Splice"
7-17-80	Slip-Forming Note Added

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

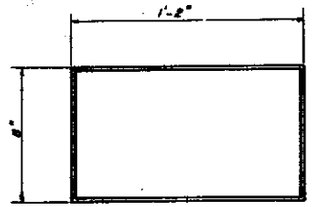
SIDEWALK BARRIER

ROAD NO.	COUNTY	PROJECT NO.

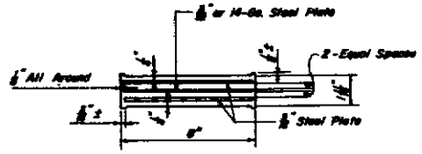
	Name	Date
Designed by	WHD	5-74
Checked by	JLM	5-74
Quantities by		
Checked by		
Supervised by	PB	

Approved by: [signature] Deputy State Engineer, Structures

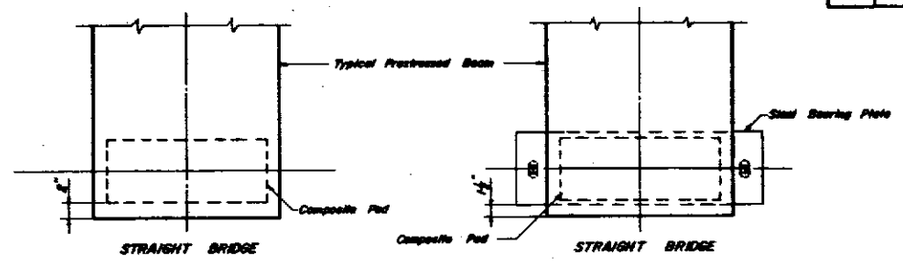
Drawing No. 1 of 1 — Index No. 11,460



PLAN



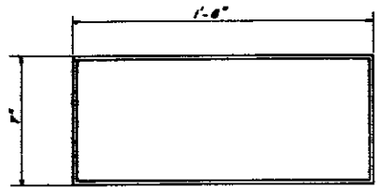
TYPICAL SECTION



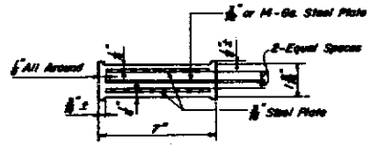
STRAIGHT BRIDGE

STRAIGHT BRIDGE

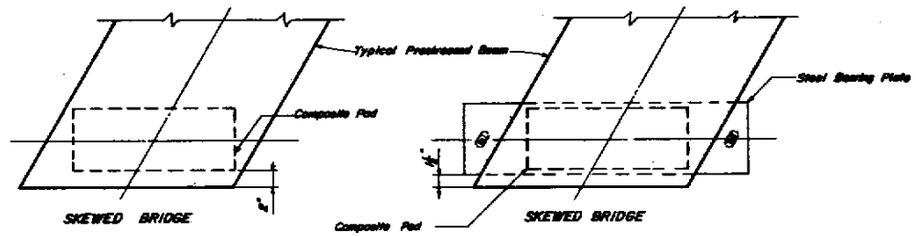
COMPOSITE PAD
For Type II Beams



PLAN



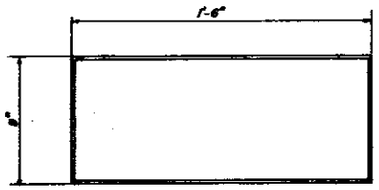
TYPICAL SECTION



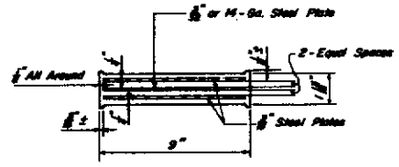
SKEWED BRIDGE

SKEWED BRIDGE

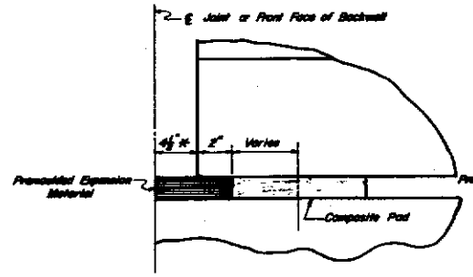
COMPOSITE PAD
For Type III Beams



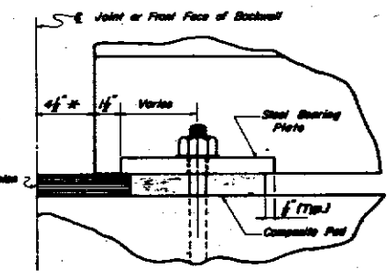
PLAN



TYPICAL SECTION



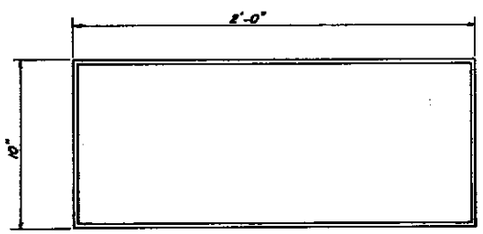
TYPICAL PAD DETAIL
INTERIOR BEAM



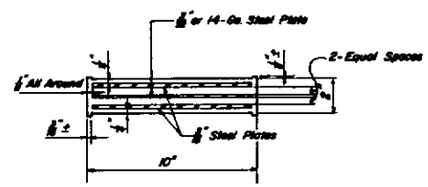
TYPICAL PAD DETAIL
EXTERIOR BEAM

* Unless otherwise noted on Beam Sheets.

COMPOSITE PAD
For Type IV Beams



PLAN



TYPICAL SECTION

COMPOSITE PAD
For Type V & VI Beams

GENERAL NOTES

Neoprene in all Bearing Pads shall have a Grade 50 durometer hardness.

Steel plates in composite pads shall conform to A.S.T.M. A-36 or A-245 Grade C or D, or A-570 Grade C or SAE 1010, SAE 1020.
Variations in pad dimensions will be allowed provided revised pads will meet the current specifications and are approved by the Engineer.

Bearing seat shall be finished parallel to the bottom of Beam.

Steel Bearing Plates, Anchor Bolts, Nuts and Washers shall be hot dip galvanized in accordance with A.S.T.M. Specification A-123. Payment for steel bearing plate assemblies shall be included in the Contract Unit Price for Prestressed Beams or Structural Steel. For location and details of Bearing Plates see Beam sheets.

REVISIONS	
Date	Descriptions

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

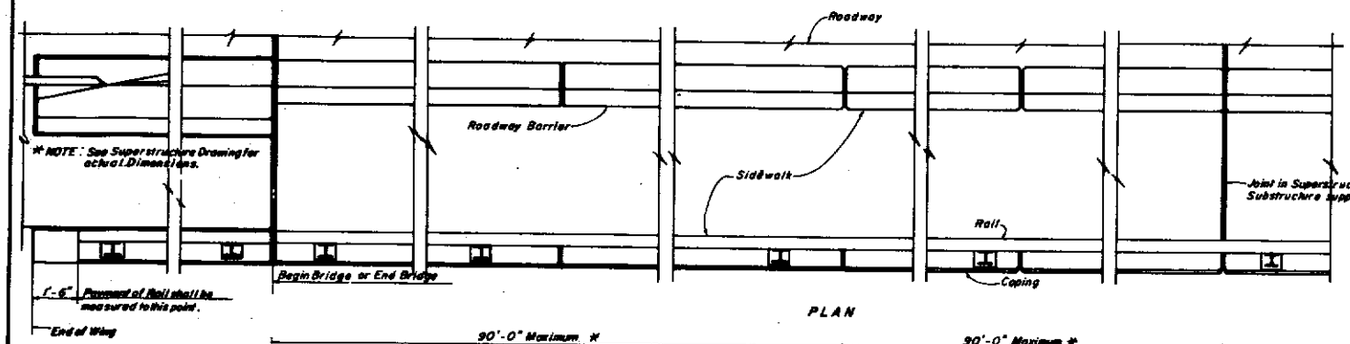
COMPOSITE NEOPRENE BEARING PADS

ROAD NO.	COUNTY	PROJECT NO.

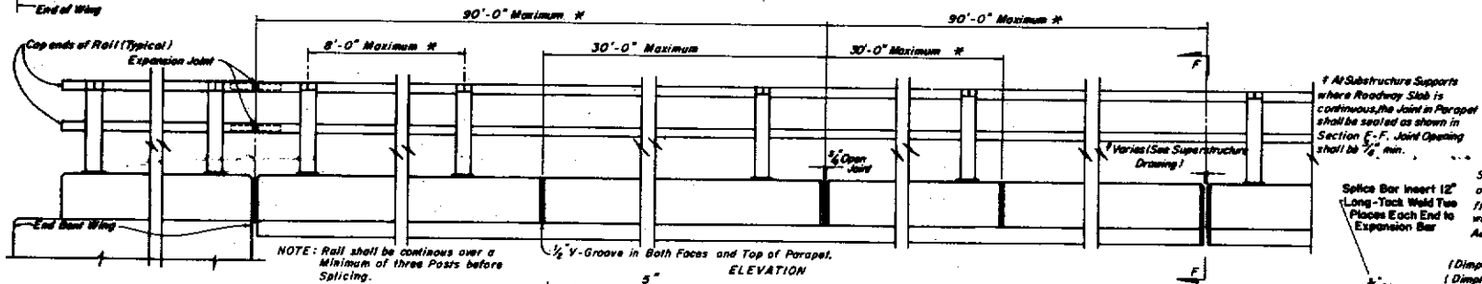
	Name	Date
Designed by	W E H	9-76
Checked by	D E K	9-76
Quantities by		
Checked by		
Submitted by	S H N	

APPROVED BY
T. Ball
Deputy Design Engineer
Drawing No. 1-01-1
Index No. 12037

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FINANCIAL NUMBER	SHEET NO.
3	FLA.			

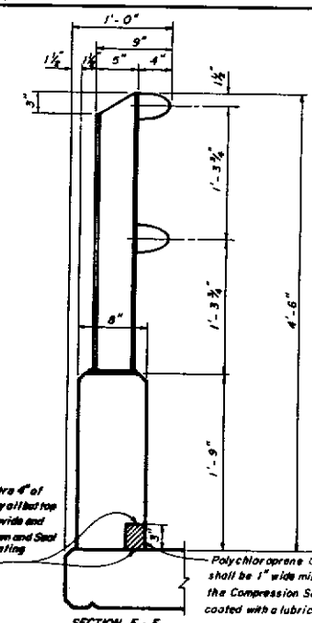


PLAN



ELEVATION

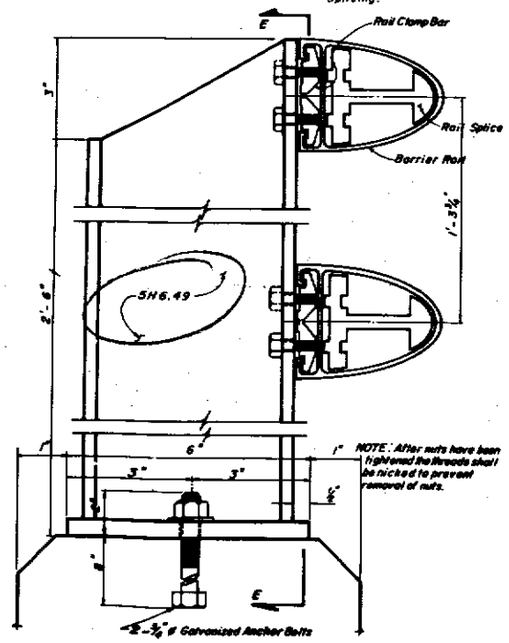
† At Substructure Supports where Roadway Slab is continuous, the Joint in Parapet shall be sealed as shown in Section E-F. Joint Opening shall be 3/4" min.



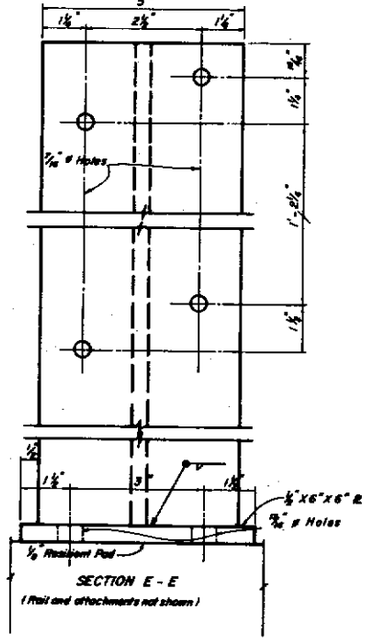
SECTION F - F

GENERAL NOTES

1. The cost of all materials in Parapet shall be included in Concrete (Superstructure) and Reinforcing Steel (Superstructure).
2. Aluminum Rail shall be paid for per linear foot and shall be measured along the centerline of the top surface of the Rail. Payment includes Anchor Bolts, Nuts, Resilient Pads, all incidental materials and labor required to complete the installation.
3. For details of Rail Alignment and Post Spacing see Superstructure and End Bent Details.

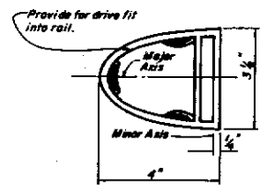


SECTION THRU RAIL

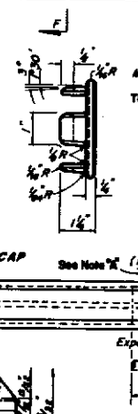


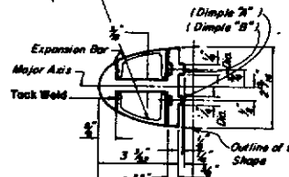
SECTION E - E
(Rail and attachments not shown)

NOTE: Where Aluminum comes in contact with Concrete or other metals, contacting surfaces shall be thoroughly coated with Aluminum Impregnated caulking compound.

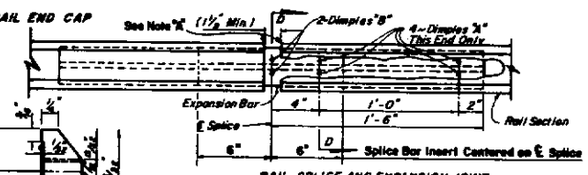


RAIL END CAP





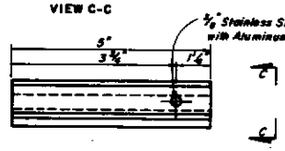
SECTION D-D



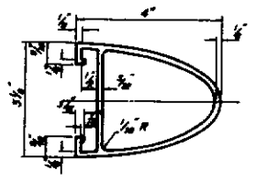
RAIL SPLICE AND EXPANSION JOINT

NOTE "A"-Rough Cut Ends and Edges of Aluminum Rails shall be Ground or Filed Smooth to Remove All Sharp Edges, Nicks or Burrs that would be Injurious to the Human Touch.

VIEW C-C



RAIL CLAMP BAR



RAIL

SPECIFICATIONS FOR BRIDGE RAIL

POST: Aluminum A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5 with welding using filler wire 4043.

RAIL & RAIL SPLICE: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.

RAIL CLAMP BAR: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.

ANCHOR BOLTS: Anchor Bolts shall be in accordance with A.S.T.M. A-36 or A-307. Anchor Bolts, nuts and washers shall be hot-dip galvanized in accordance with A.S.T.M. Designation A-153.

RAIL END CAP: A.S.T.M. B 26 sand cast aluminum alloy, S 670A-F (Alum. Assoc. alloy designation A-356-F).

RAIL INSTALLATION: Rail Post shall be normal to Profile Grade. Posts shall be seated on 1/8" thick resilient pads in accordance with Article 932-2.1. The dimension shall be the same as the post base. Rail expansion joints shall occur in the panel between post on either side of Bridge expansion joints. Rail expansion joints shall be similar to rail splices with provision for movement equal to 1.5 times the bridge joint opening.

SHOP DRAWINGS: Complete details and description of materials of the proposed bridge rail shall be submitted by the contractor for the Engineers approval prior to fabrication.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

ALUMINUM HANDRAIL (SIDEWALK)

REVISIONS	
Date	Descriptions
1-4-79	Change Curb from 9" to 7-9".
7-27-82	Added note to Rail Splice and Expansion Joint.
5-10-84	Added Splice Bar Insert & Note "A"
12-11-84	Added Splice Bar Dimension
5-7-92	Rev. Section E-E

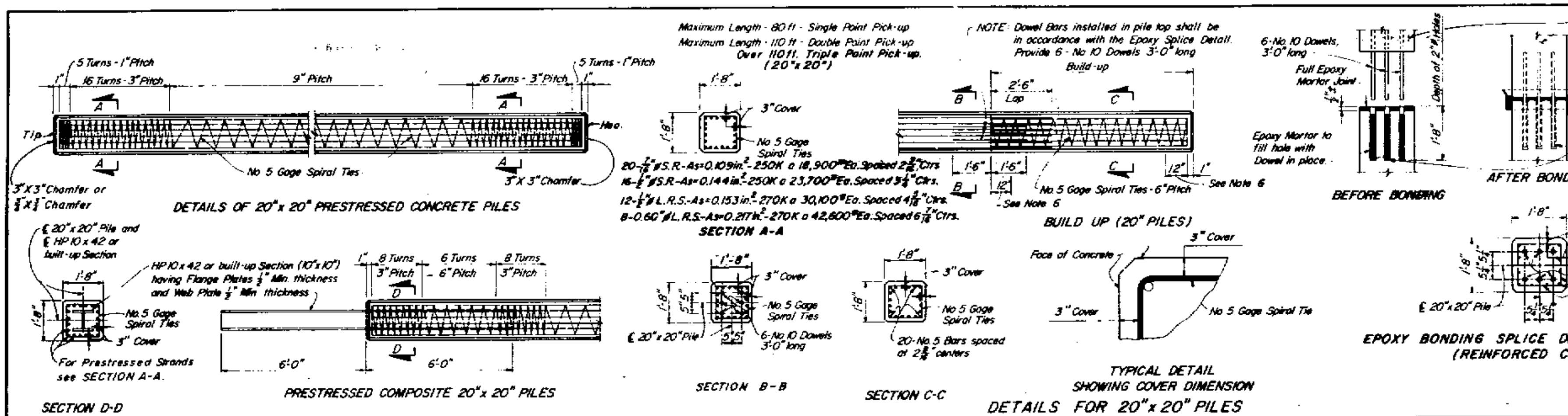
BRIDGE NO.	COUNTY	PROJECT NO.

	Name	Date
Designed by	W.L.D./J.F.L.	9/76
Checked by	R.D.S.	9/76
Quantities by		
Checked by		
Supervised by	P. BYRD	

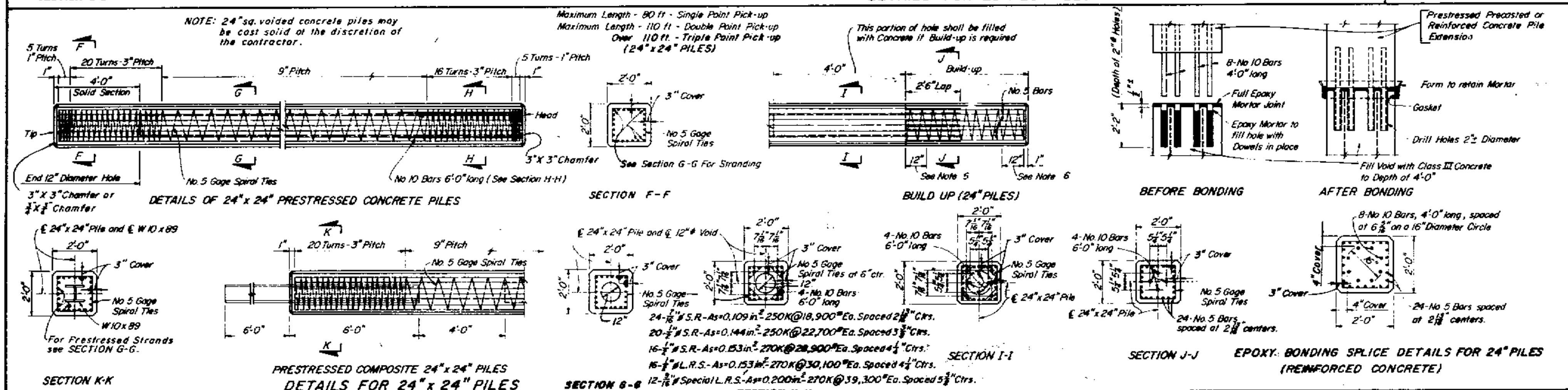
APPROVED BY T. [illegible]
Deputy Design Engineer, Structures

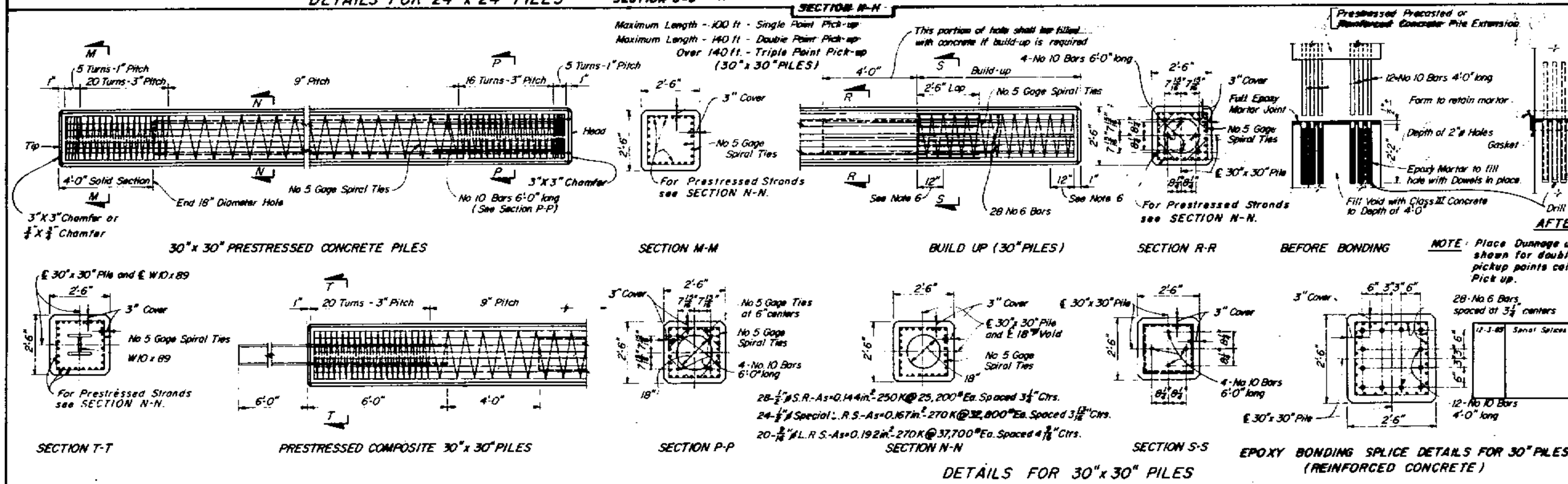
Drawing No. 1 of 1
Index No. 12087

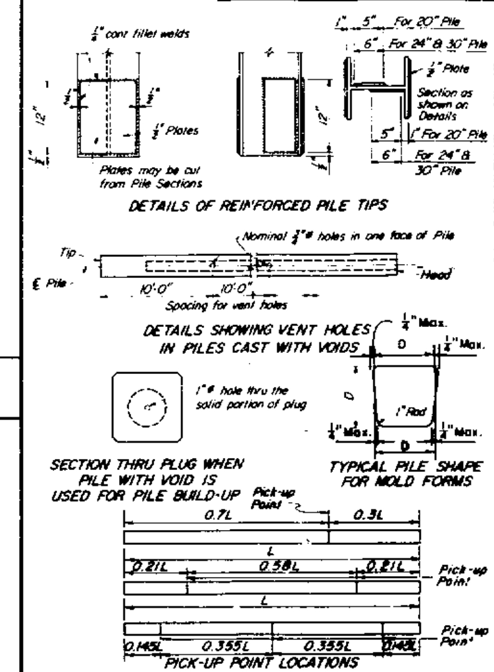
FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.			



NOMENCLATURE:
S.R. = Stress Relieved Strand
L.R.S. = Low Relaxation Strand







GENERAL NOTES

1. Prior Approval in Writing By the Engineer is Required for Reinforced Concrete Build-Ups in Excess of 2'-0". This will not be approved for piles in a coastal environment.

1A. SPIRAL SPLICES: One turn required for Spiral Splices.

2. SPIRAL TIES Each wrap of spirals shall be tied to at least two corner strands.
3. MATERIAL FOR SPIRAL TIES Spirals may be manufactured from stock meeting requirements of any grade of reinforcing steel, or hard drawn steel
4. PILE CUT OFF In cutting off concrete piles an abrasive saw shall be used to score the concrete at the cut off elevation to the approximate depth of the reinforcing steel
5. CONCRETE STRENGTH For Class III Concrete the Cylinder Strength shall be 5,000 p.s.i. minimum at 28 days and 4000 p.s.i minimum at transfer of the Prestressing Force.
6. ADDITIONAL DRIVING If additional driving is required, 2" Pitch shall be used for spiral ties within these limits
7. SPLICED PILES Spliced piles may be driven after splice is two days old
8. BUILD-UPS All build-ups shall be made with Class III Concrete
9. PICK-UP POINTS Piles shall be marked at Pick-up Points to indicate proper points for attaching handling lines
10. REINFORCED STEEL PILE TIPS Reinforced Pile Tips required only where ordered by the Engineer. At the option of the Contractor and with the approval of the Engineer, Commercial Tips may be used in lieu of the Reinforced Pile Tips shown
11. VOIDS Form material used to form the hollow cores may be left in place at the option of the Contractor. The form material shall be neutral with respect to the generation of products harmful to the physical and structural properties of the piles. The contractor shall retain responsibility for any detrimental effects resulting from the presence of the form material within the pile
12. WEBS Webs of Wide Flange sections shall be in a vertical position when Composite Pile is cast
13. REINFORCING STEEL: All Reinforcing Steel shall be Grade 40 or 60

REVISIONS

Dates	Descriptions
8-30-83	Lo-Lax Strands Added
7-2-75	Change Chamfer
7-22-75	Change Chamfer
7-28-75	Change NOTE No. 1
12-3-85	Spiral Splices
9-21-76	Change Lo-Stress Strands to Stabilized Strands
5-18-75	Added Lo-Stress Strands & Revise Build-up Title.
10-8-75	ADDED TRIPLE POINT PICKUP
9-17-70, 10-21-70	Cover added to General Notes. Dimension bar, strands and void location.
12-22-70, 1-28-71	Revised Webs of Wide Flange sections
11-17-71, 5-15-72	Added Note No 13. Revised Pile Cover to 3" Min.
8-16-72	Revised Build-Ups & added Note 8. Revised Strands
3-3-73	Revised class of concrete & [illegible]

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

20", 24" AND 30" PRESTRESSED CONCRETE PILES

ROAD NO.	COUNTY	PROJECT NO.

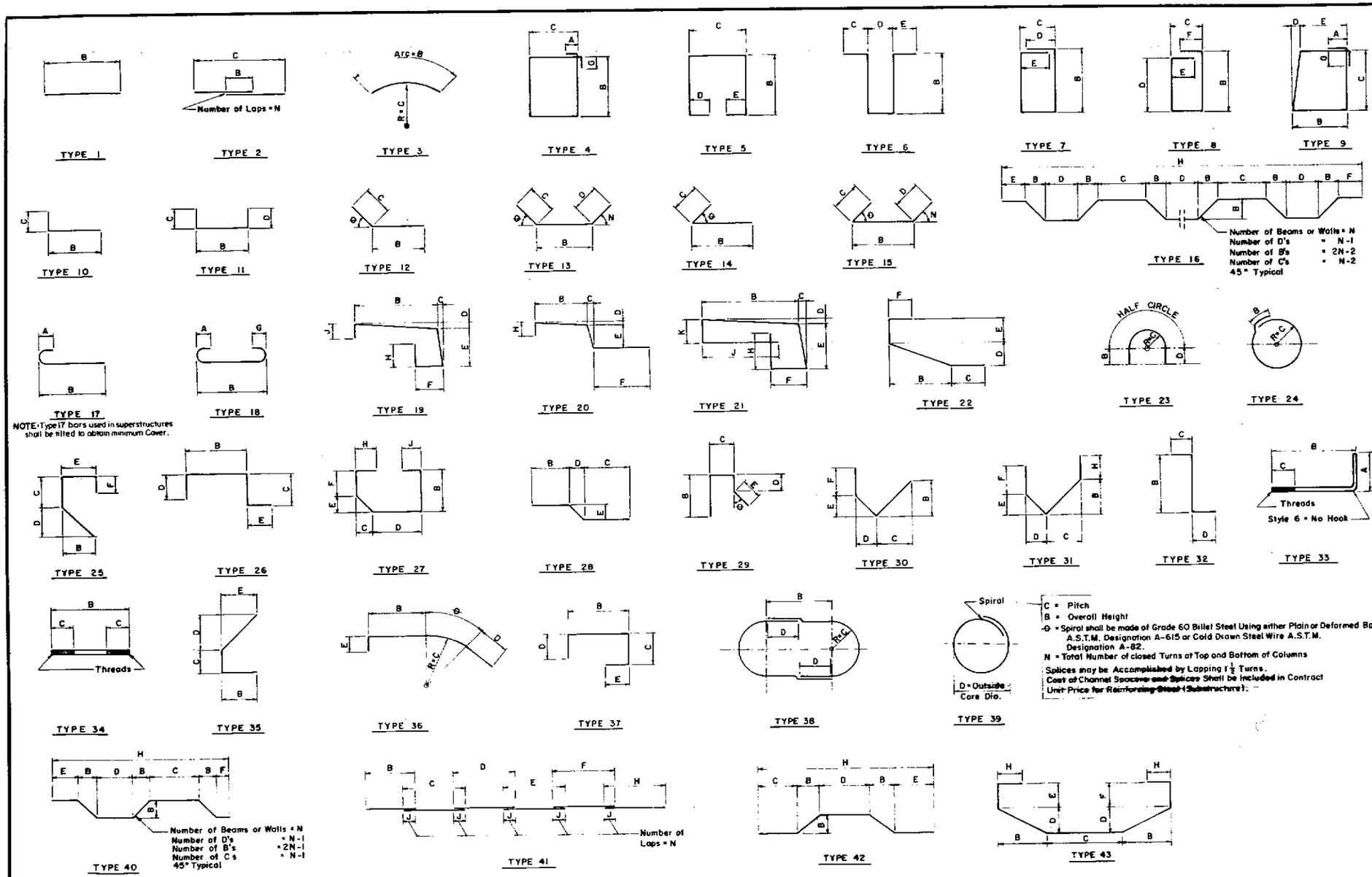
	Names	Dates
Designed by	HHJ	12-69
Checked by	PB	12-69
Quantities by		
Checked by		
Superseded by		

APPROVED BY: [signature] Deputy Design Engineer, Structures

Drawing No.: 1 of 1
Index No.: 10289 F

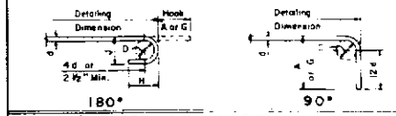
FEDERAL AID

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



NOTE: For Bar Dimensions See Reinforcing Bar List Sheet.

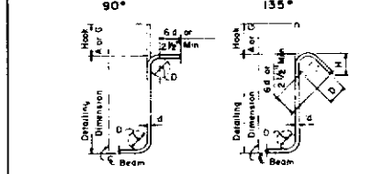
HOOK DETAILS



RECOMMENDED END HOOKS

All Grades
D = 6d for #3 through #8
D = 8d for #9, #10, and #11
D = 10d for #14 and #18

Bar Size	180° HOOKS		90° HOOKS
	A or G	J	A or G
#3	5	3	6
#4	6	4	8
#5	7	5	10
#6	8	6	1-0
#7	10	7	1-2
#8	11	8	1-4
#9	1-3	11 3/8	1-7
#10	1-5	1-1 1/4	1-10
#11	1-7	1-2 1/4	2-0
#14	2-3	1-9 3/8	2-7
#18	3-0	2-4 1/2	3-5
STYLE	1		3



STIRRUPS
(TIES SIMILAR)

RECOMMENDED STIRRUP & TIE HOOK DIMENSIONS

Bar Size	D (in.)	90° HOOK	135° HOOK	
		HOOK A or G	HOOK A or G	Approx. H
#3	1 1/2	4	4	2 1/2
#4	2	4 1/2	4 1/2	3
#5	2 1/2	6	5 1/2	3 3/4
#6	4 1/2	1-0	7 3/4	4 1/2
#7	5 1/4	1-2	9	5 1/4
#8	6	1-4	10 1/4	6
STYLE		4	5	

STYLE 6 = NO HOOK
Hook Styles Detailed on this Sheet are for illustration Only Actual Hook Style for any Particular Bar will be Shown Under A or G Heading on Reinforcing Bar List Sheet.
All Dimensions are Out To Out.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STANDARD BAR BENDING DETAILS

REVISIONS	
Dates	Descriptions
4-81	GENERAL REVIEW
5-10-82	REMOVED (and Welding)
4-19-84	Rev. Bar Type 38

ROAD NO.	COUNTY	PROJECT NO.

	Names	Dates
Designed by	M.B.	9-70
Checked by	C.W.B.	10-70
Quantities by		
Checked by		
Supervised by	L.B.A.	

APPROVED BY T. Ali
Deputy Design Engineer, Structures

Drawing No.	Index No.
1 of 1	10587

DIETZGEN CORP. 118-141