HAM-74-2.30 HAM-50-5.34 HAM-562-1.79	OHIO	1 / 6
	FHWA REGION 5	
	FEDERAL PROJECT	

67/ Blue 1-6

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
HAM-74-2.30
HAM-50-5.34
HAM-562-1.79
TEN PARTS
HAMILTON COUNTY

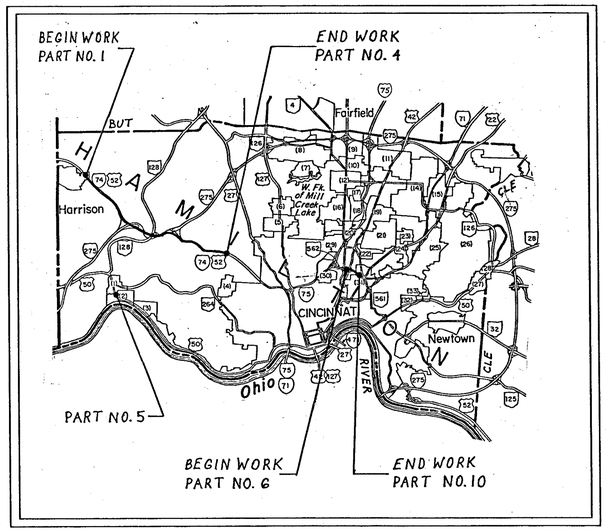
STATE FUNDING

VANDAL PROTECTION FENCE

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line
Fence Line (existing) 352 (proposed) 353
Center Line
Trees, Stumps, (to be removed)
Utility Poles: Telephone, Power, Light
Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA&RW
Existing Right of Way
Property Line (in existing fence)
Railroad or
Guardrail (existing) (proposed)

INDEX OF SHEETS



LOCATION MAP

LINE DATA

Project Length ..... 0.000 Lin.Ft. or 0.000 Mile
Work Length ..... 1909.77 Lin.Ft or 0.362 Mile

UNDERGROUND UTILITIES
TWO WORKING DAYS BEFORE YOU DIG Call 800-362-2764 (Toll Free) OHIO UTILITIES PROTECTION SERVICE NON-MEMBERS MUST BE CALLED DIRECTLY

SUPPLEMENTAL SPECIFICATIONS	
852	6-10-87
952	12-14-88

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS				
VPF-1-90 9-26-90				

1989 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway and that provisions for the maintenance and safety of traffic will be as set forth on the plans and estimates.

Approved L.H. Wallace
Date 9-14-90 District Deputy Director of Transportation

Approved B.D. Hamilton
Date 10-25-90 Engineer, Bureau of Bridges and Structural Design

Approved Theodore J. Stitt
Date 11/20/90 Chief Engineer, Planning and Design

Approved Bernard B. Hurst
Date 11/20/90 Director, Department of Transportation

Plan Prepared By:
OHIO DEPARTMENT OF TRANSPORTATION
DISTRICT 8 BRIDGE DEPT.

SEAL

Project HAM-74/50/562-2.30/5.34/1.79
Date of Letting _____ 19__ Contract No.____

LDPLNSHT

FHWA REGION	STATE	PROJECT	
5	OHIO		

2/6

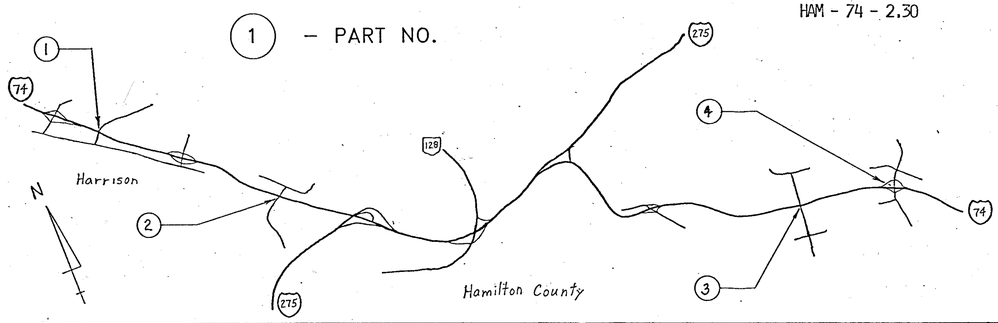
HAM-74-2.30
HAM-50-5.34
HAM-562-1.79

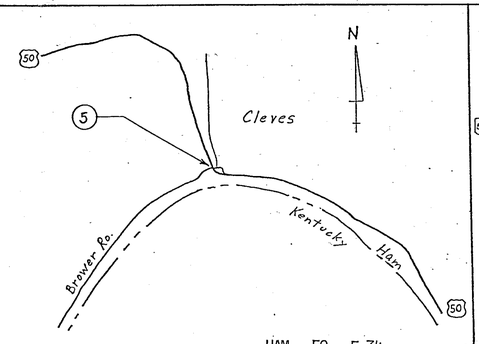
PART NO.	COUNTY	ROUTE	BRIDGE NO.	INTERSECTED ROUTE
1	HAM	74	0230	under West Road
2	HAM	74	0495	under Morgan Road
3	HAM	74	1335	under Race Road
4	HAM	74	1466	under North Bend Road
5	HAM	50	0534	under Brower Road
6 *	HAM	562	0179	under Section Avenue
7 *	HAM	22	0622	over S.R. 562
8 *	HAM	562	0227	under Wesley Avenue
9 *	HAM	562	0253	under Forest Avenue
10 *	HAM	562	0275	under Beech Street
	* LOCAL PARTICIPATION REQUIRED			

LOCATION MAP

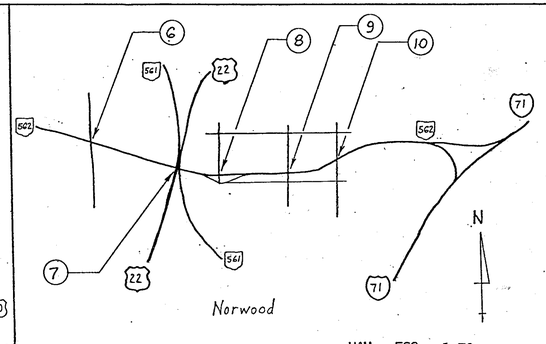
(1) – PART NO.

HAM - 74 - 2.30





HAM - 50 - 5.34



HAM - 562 - 1.79

REVISED 4-20-91

PROPOSED WORK

1. See MAINTENANCE OF TRAFFIC notes.
2. Install appropriate vandal protection fence base plates as shown in the plans. (The existing aluminum rail shall be removed as required, stored for re-use, and reinstaled for BP-2 base plate installations.)
3. Install the remainder of the fencing as shown in the details. All work shall be performed to the satisfaction of the Project Engineer.

GENERAL NOTES

EXISTING STRUCTURE VERIFICATION: Details and dimensions shown on these plans pertaining to the existing structures have been obtained from plans of the existing structures and from field observations and measurements. Consequently, they are indicative of the existing structures and the proposed work but they shall be considered tentative and approximate. The Contractor is referred to CMS sections 102.05 and 105.02.

Contract bid prices shall be based upon a recognition of the uncertainties described above and upon a prebid examination of the existing structures by the Contractor. However, all project work shall be based upon actual details and dimensions which have been verified by the Contractor in the field. Plans of the existing structures are available for viewing at the ODOT District 8 office in Lebanon, Ohio.

REMOVAL AND REINSTALLATION OF EXISTING RAIL: When required by the plans, the existing aluminum railing tubing shall be removed, stored, and properly reinstalled so that the Vandal Protection Fence can be installed. Any portions of the existing railing that are damaged by the Contractor's work shall be replaced at the Contractor's expense. Damaged stainless steel cap screws shall be replaced in kind.

MAINTENANCE OF TRAFFIC: In addition to the Traffic Maintenance note on STD.DWG.NO.VPF-1-90, the following shall apply. The Contractor is referred to the latest edition of the Manual of Traffic Control for Construction and Maintenance Operations, Plate C-12, for the minimum requirements needed for work along the bridge curbs. All lanes of traffic on the bridge being given Vandal Protection Fence as well as all lanes below the bridge shall remain open at all times. Refer to Item 614 in the CMS for protection of vehicular and pedestrian traffic.

PROCEDURE AT CURVED PARAPETS:

1. The horizontal line rail shall be curved to match the existing radius at the centerline of the proposed fence posts.
2. The tension wire shall be securely attached to the top of the existing curved parapet between the proposed fence posts at three equally spaced points along an arc passing through the centerline of the posts.

GENERAL SUMMARY

PROJECT PARTICIPATION	LOCAL PARTICIPATION	PAGE	ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION
1499	1352	4	Special	607 39930	2851	Lin. Ft.	Vandal protection fence, 12 ft. curved, coated fabric
961	0	4	Special	607 39910	961	Lin. Ft.	Vandal protection fence 8 ft. straight, coated fabric
LUMP	LUMP		624	10000	LUMP		Mobilization
LUMP	LUMP		614	11000	LUMP		Maintaining Traffic

REVISED 4-20-91

LDPLNSHT

HAM-74-2.30
HAM-50-5.34
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FHWA REGION	STATE	PROJECT	
5	OHIO		

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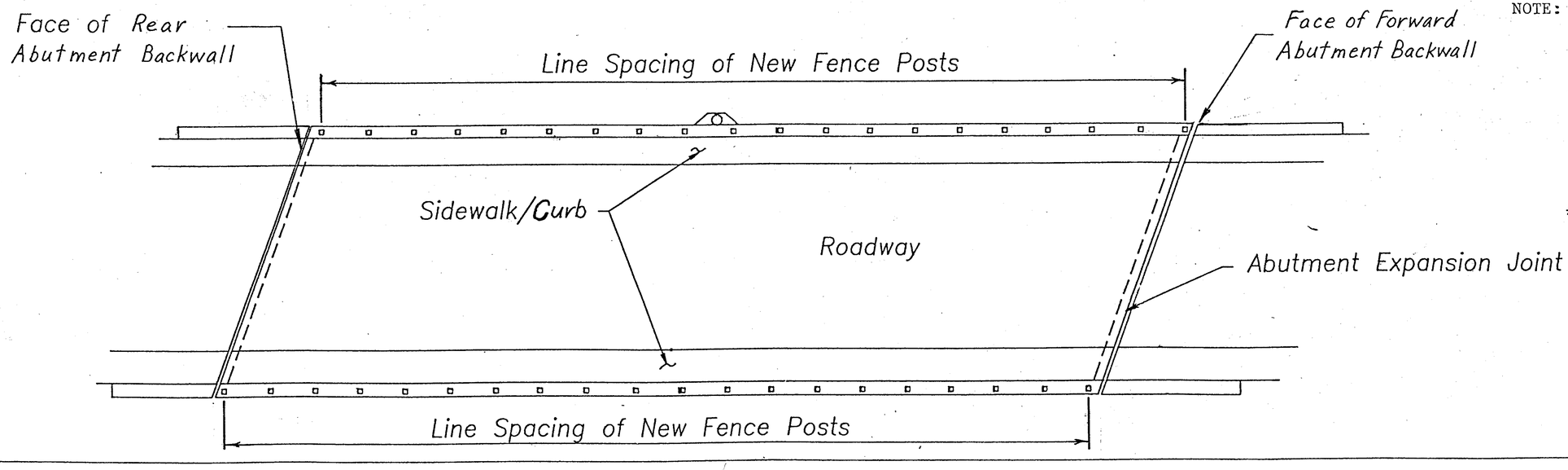
6

BRIDGE NO.	BRIDGE CARRYING	OVER	EXISTING RAIL TYPE	CURB-WALK WIDTH	REMOVE & REINSTALL EX. RAIL	PROPOSED BASE PL. TYPE	PROPOSED POST TYPE	FENCE SIDE	LINE SPACING FOR FENCE POSTS	LENGTH L.F.	REMARKS
HAM-74-0230	West Rd.	IR 74	AR-1-57,TypeA	2'-3"	Yes	BP-2	PS-3	Northwest	1@7'-3", 24@8'-11"	221.25 *	
			AR-1-57,TypeA	2'-3"	Yes	BP-2	PS-3	Southwest	1@7'-3", 24@8'-11"	221.25 *	
HAM-74-0495	Morgan Rd.	IR-74	AR-1-57,TypeA	2'-3"	Yes	BP-2	PS-3	Northwest	1@7'-4", 28@9'-0"	259.33 *	
			AR-1-57,TypeA	2'-3"	Yes	BP-2	PS-3	Southwest	1@7'-4", 28@9'-0"	259.33 *	
HAM-74-1335	Race Rd.	IR-74	BR-1-65,Type2	4'-0"	No	BP-3	PS-1	West	1@6'-1", 31@7'-9"	246.33**	
			BR-1-65,Type2	4'-0"	No	BP-3	PS-1	East	1@6'-1", 31@7'-9"	246.33**	
HAM-74-1466	North Bend Rd.	IR-74	BR-1-65,Type2	5'-0"	No	BP-3	PS-1	West	1@6'-1", 31@8'-0", 1@7'-9"	261.83**	
			BR-1-65,Type2	5'-0"	No	BP-3	PS-1	East	1@6'-1", 31@8'-0", 1@7'-9"	261.83**	
HAM-50-0534	Brower Rd.	USR 50	AR-1-57,TypeC	5'-2"	Yes	BP-2	PS-1	North	1@7'-4", 26@9'-0"	241.33**	
			AR-1-57,TypeC	5'-2"	Yes	BP-2	PS-1	South	1@7'-4", 26@9'-0"	241.33**	
HAM-562-0179	Section Ave.	SR 562	BR-1-65,Type2	5'-1"	No	BP-3	PS-1	West	1@5'-10", 2@7'-6", 1@3'-7", 1@5'-10", 11@7'-6"	112.75**	
			BR-1-65,Type2	5'-1"	No	BP-3	PS-1	East	1@4'-8", 2@6'-4", 1@4'-3½", 1@5'-10", 11@7'-6"	109.96**	
HAM-22-0622	USR 22	SR-562	BR-1-65,Type2	10'-0"	No	BP-3	PS-1	West	1@3'-10 3/4", 1@5'-9", 12@7'-5"	98.65**	
			BR-1-65,Type2	6'-0"	No	BP-3	PS-1	East	1@4'-1 9/16", 1@5'-9", 9@7'-5", 1@9'-4", 1@7'-8½", 1@7'-3"	100.92 **	
HAM-562-0227	Wesley Ave.	SR 562	BR-1-65,Type2	5'-0"	No	BP-3	PS-1	East	1@5'-9½", 22@7'-5½"	169.87 **	1 Light Standard
			BR-1-65,Type2	2'-0"	No	BP-3	PS-1	West	1@5'-9½", 22@7'-5½"	169.87**	
HAM-562-0253	Forest Ave.	SR 562	BR-1-65,Type2	5'-0"	No	BP-3	PS-1	West	1@5'-10", 26@7'-6"	200.83**	
			BR-1-65,Type2	5'-0"	No	BP-3	PS-1	East	1@5'-10", 26@7'-6"	200.83**	
HAM-562-0275	Beech St.	SR 562	BR-1-65,Type2	5'-0"	No	BP-3	PS-1	West	1@6'-3½", 9@7'-2", 1@9'-5", 1@8'-3½", 1@6'-11"	95.33**	
			BR-1-65,Type2	5'-0"	No	BP-3	PS-1	East	1@5'-7", 12@7'-3"	92.58**	



NOTE:
1. For fence details including base plate types, post sections, and treatment at light standards, see Std. Dwg. No. VPF-1-90.
2. Spacing is measured along centerline of existing concrete railing.

* Denotes 8ft. straight, Coated Fabric

** Denotes 12ft. curved, Coated Fabric

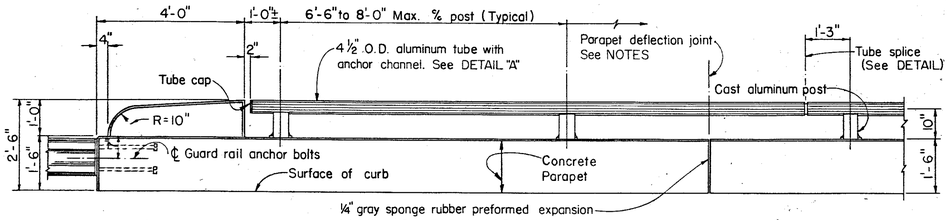
DISTRICT 8 /
Ohio Department of Transportation

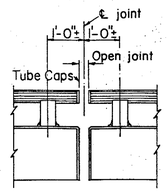
LINE SPACING OF NEW FENCE POSTS

DESIGNED	DRAWN	CHECKED	REVIEWED	REVISED

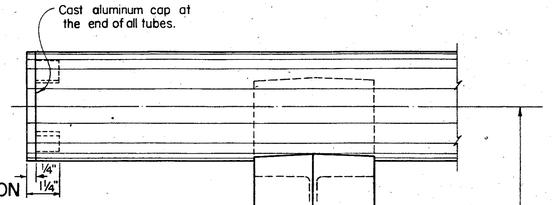
HAM-74-2.30
HAM-50-5.34
HAM-562-1.79

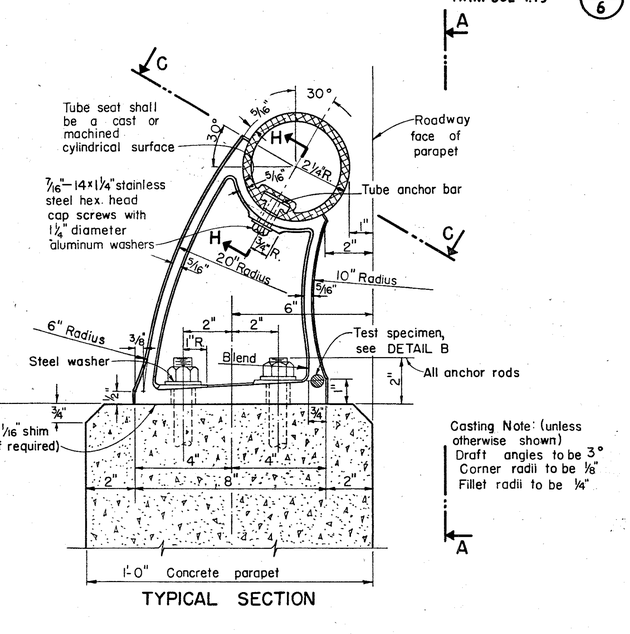
5/6





RAILING DETAIL AT DECK EXPANSION JOINT

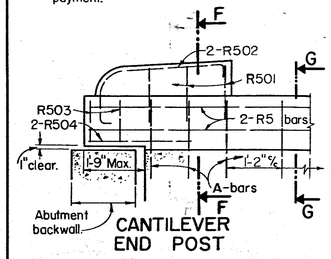




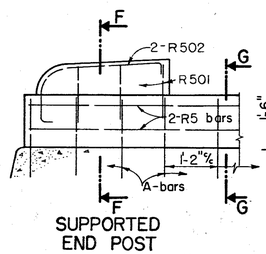
TYPICAL SECTION

Concrete above curb surface construction joint is included with Item 517 for payment.

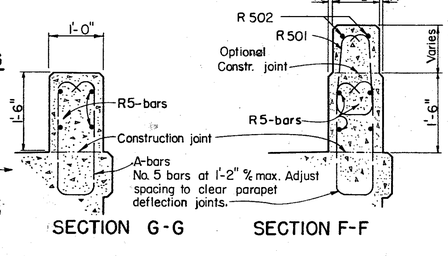
INSIDE ELEVATION OF RAILING



CANTILEVER END POST

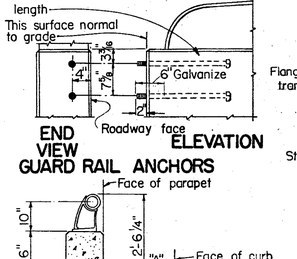


SUPPORTED END POST



SECTION G-G SECTION F-F

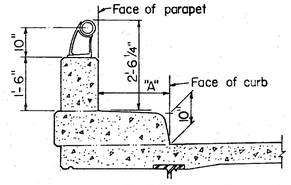
TYPICAL PARAPET AND END POST DETAILS



END VIEW GUARD RAIL ANCHORS

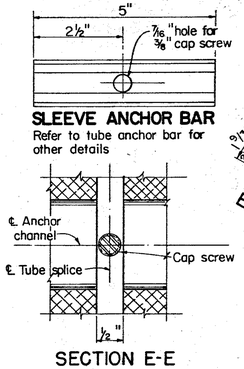
ELEVATION

VIEW A-A



PART DECK SECTION

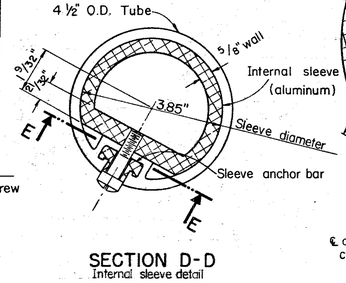
For "A" less than 3'-0"



SLEEVE ANCHOR BAR

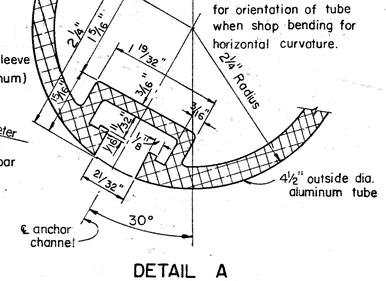
Refer to tube anchor bar for other details

SECTION E-E

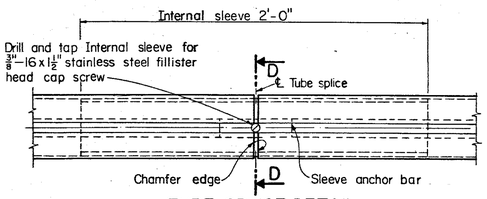


SECTION D-D

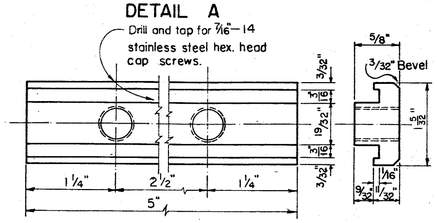
Internal sleeve detail



DETAIL A

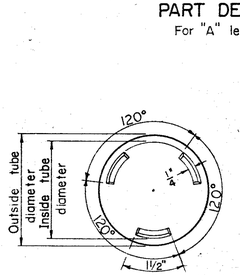


TUBE SPLICE DETAIL



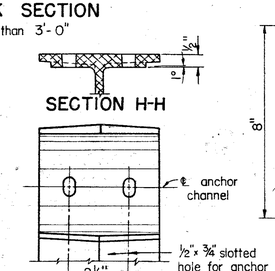
TUBE ANCHOR BAR DETAIL

(aluminum)



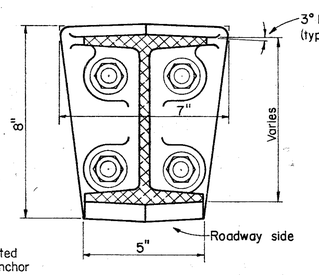
CAST TUBE CAP

Cap shall fit tight in tubes.

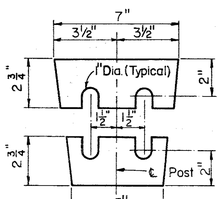


VIEW C-C

(Showing tube seat)

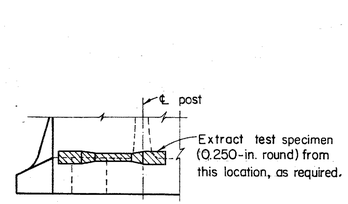


SECTION B-B



POST SHIM PLATES

(aluminum)

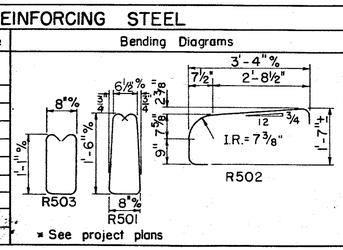


PART VIEW A-A
DETAIL B

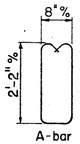
RAILING REINFORCING STEEL

Mark	Length	Weight	Shape
R501	4'-2"	Included with Item 517 for payment.	Bt.
R502	5'-4"		Bt.
R503	3'-5"		Bt.
R504	3'-0"		St.
R5bars	*		St.

Bending Diagrams



* See project plans



A-bar

A-bars are included with superstructure, abutments, or other parapet supporting elements, under Item 509, for payment. L=5'-7"

GENERAL: This drawing provides design and construction details. The project plans for each structure shall give necessary additional railing dimensions including parapet and tube panel lengths, reinforcing steel details, reinforcing steel list, estimated quantities, and any other pertinent information, including special notes and details.

DESIGN SPECIFICATION: This standard drawing conforms to the requirements of the A.A.S.H.O. Specification, dated 1965.

DESIGN UNIT STRESSES as given in the A.S.C.E. paper No. 3341 were used in the design of the rail tubing. 35% of the unit stresses given in the paper were used in the design of the post

Basic unit stresses: Tubes = 21,000 psi
Post = 6,000 psi

TUBE SPLICES are to be located so that each tube segment shall be connected to not less than two posts nor more than three.

CONCRETE PARAPETS shall be placed in alternate sections by the use of bulkheads. Closing sections shall be placed after removal of bulkheads and after placement of sponge rubber. Rubber shall be flush with surface of concrete and exposed edges shall be free of mortar.

MATERIAL: Railing posts shall be permanent mold castings. All aluminum products shall conform to Section 711.20.

SHIMS shall be provided under railing post, where necessary, to provide for the vertical adustment of the post. Shims shall be of aluminum alloy, 1/16 inch thick, cut as shown. Where more adjustment of the post is required, for plumb alignment, than can be corrected by one shim, the post shall be removed and the concrete surface corrected by grinding.

FINISH: The outside surface of the post flanges and the tube caps shall be given a 40 grit finish.

ANCHORS: Post anchor rods, hexagonal nuts and flat washers shall be galvanized steel, with all galvanizing, except on the lower 6" of the anchor rods, meeting the requirements of Ohio Specification Section 711.02. Anchor rods, as fabricated, shall have the following minimum dimensions and mechanical properties.

Diameter at root of threads	0.620"
Straight portion of rod	1'-0" long
Hook at bottom	2½"-90° bend
Anchor tensile strength	21,000 lbs

Hexagonal nut shall develop the tensile strength of the anchor rod.

Cap screws shall be stainless steel, ASTM A276, type 410 with a minimum yield strength of 80,000 psi.

PARAPET DEFLECTION JOINTS shall be spaced at 16ft. centers maximum. For continuous structures three joints at 5 ft. centers shall be placed symmetrically about center line of piers. Joints shall clear rail posts anchor bolts by 8" minimum.

HORIZONTAL CURVATURE: This standard is applicable to structures having a railing curvature radius of 20 feet or more. For a radius less than 20 feet, the design shall be special. For structures on curvatures of 3° or less, the tubes may be furnished straight and forced into position in the field.

GUARD RAIL ANCHOR BOLTS included with Item 517 for payment.

REVISIONS
11-24-65
7-24-67

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

STANDARD

BRIDGE RAILING TYPE I

WITH CONCRETE PARAPETS

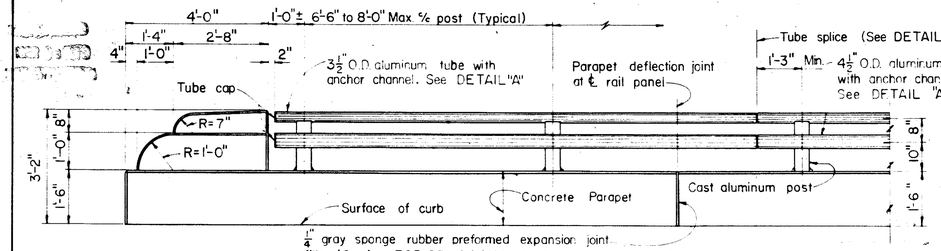
APPROVED
DATE 2-1-65
ENGINEER OF BRIDGES

DRAWING NUMBER
BR-1-65

PREPARED	TRACED	CHECKED	REVIEWED	SHEET NO.
MPB	JPH	JDR	HHH BFG CDB	1 OF 2 SHEETS

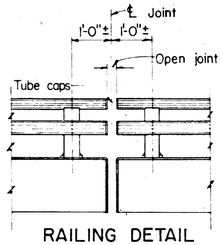
HAM-74-2.30
HAM-50-5.34
HAM-562-1.79

5A
6

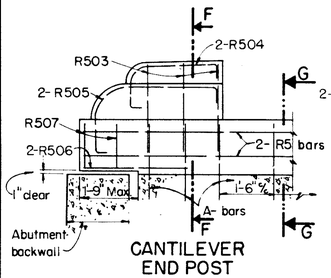


Concrete above curb surface construction joint is included with Item 517 for payment.

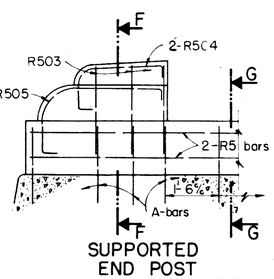
ELEVATION OF RAILING



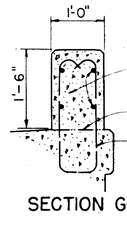
RAILING DETAIL AT DECK EXPANSION JOINT



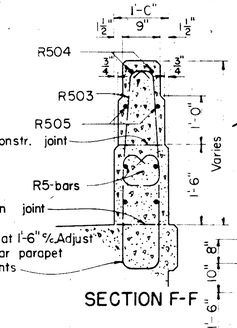
CANTILEVER END POST



SUPPORTED END POST

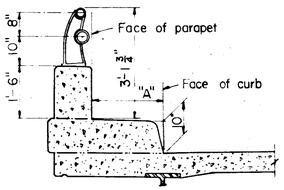


SECTION G-G

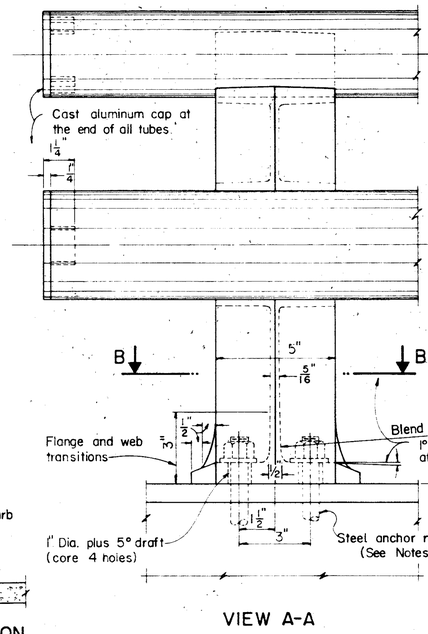


SECTION F-F

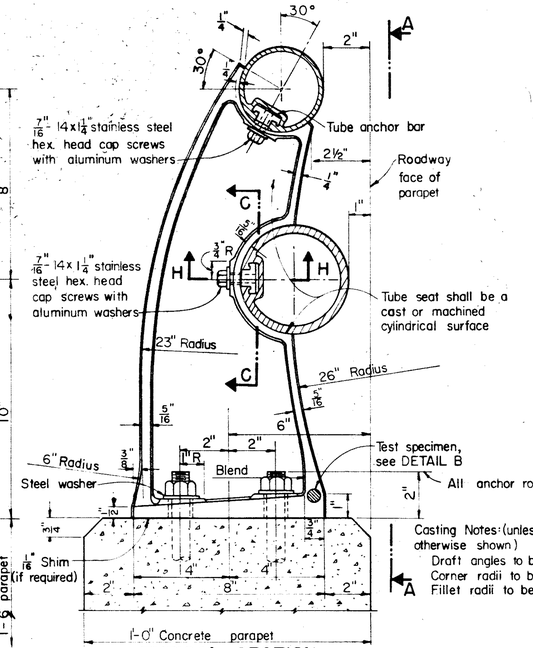
TYPICAL PARAPET AND END POST DETAILS



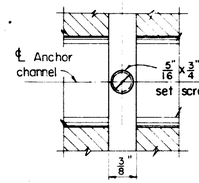
PART DECK SECTION
For values of "A", 3'-0" and larger



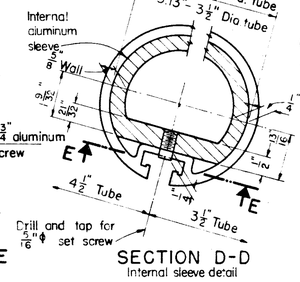
VIEW A-A



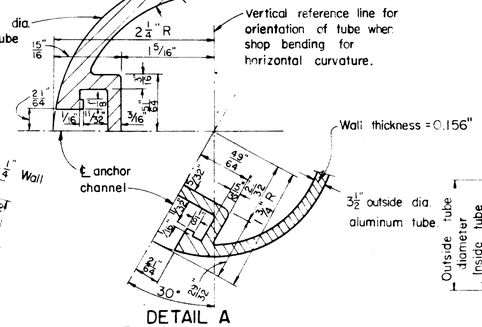
TYPICAL SECTION



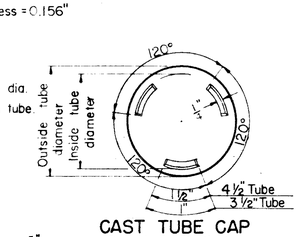
SECTION E-E



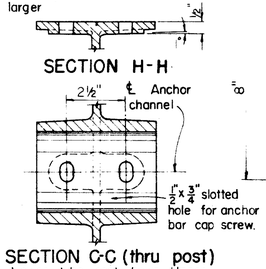
SECTION D-D
Internal sleeve detail



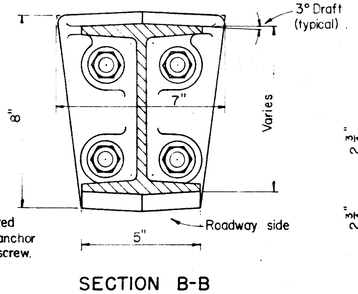
DETAIL A
Tubes symmetrical about ℄ anchor channel



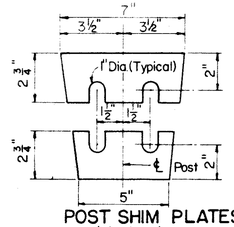
CAST TUBE CAP
Cap shall fit tight in tubes



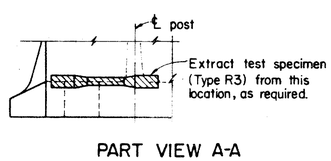
SECTION C-C (thru post)
Lower tube seat shown, Upper tube seat similar.



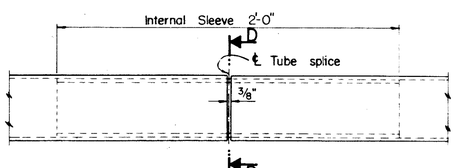
SECTION B-B



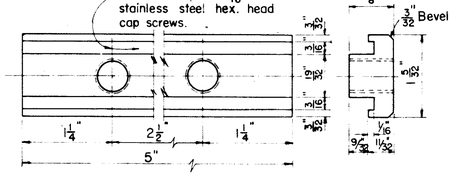
POST SHIM PLATES
(aluminum)



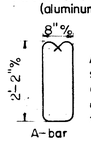
PART VIEW A-A
DETAIL B



TUBE SPLICE DETAIL



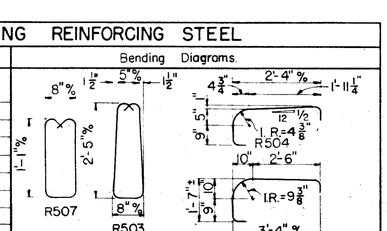
TUBE ANCHOR BAR DETAIL
(aluminum)



A-bars are included with superstructure, abutments, or other parapet supporting elements, under Item 509, for payment.

RAILING REINFORCING STEEL

Mark	Length	Weight	Shape	Bending Diagrams
R5-bar	*	Included with Item 517 for payment	St.	
R503	6'-1"		Bt.	
R504	4' 2"		Bt.	
R505	5'-5"		Bt.	
R506	3'-0"		St	
R507	3'-5"		Bt.	



*See Project Plans

GENERAL: This drawing provides design and construction details. The project plans for each structure shall give necessary additional railing dimensions including parapet and tube panel lengths, reinforcing steel details, reinforcing steel list, estimated quantities, and any other pertinent information, including special notes and details.

DESIGN SPECIFICATION: This standard drawing conforms to the requirements of the A.A.S.H.O. Interim Specification, I(64).

DESIGN UNIT STRESSES as given in the A.S.C.E. paper No.3341 were used in the design of the rail tubing, 35% of the unit stresses given in the paper were used in the design of the post.
Basic unit stresses: Tubes = 21,000 psi
Post = 6,000 psi

TUBE SPLICES are to be located so that each tube segment shall be connected to not less than two posts nor more than three.

CONCRETE PARAPETS shall be placed in alternate sections by the use of bulkheads. Closing sections shall be placed after removal of bulkheads and after placement of sponge rubber. Rubber shall be flush with surface of concrete and exposed edges shall be free of mortar.

SHIMS shall be provided under railing post, where necessary to provide for the vertical adjustment of the post. Shims shall be of aluminum alloy, 1/8 inch thick, cut as shown. Where more adjustment of the post is required, for plumb alignment, than can be corrected by one shim, the post shall be removed and the concrete surface corrected by grinding.

FINISH: The outside surface of the post flanges and the tube caps shall be given a 40 grit finish.

ANCHORS: Post anchor rods, hexagonal nuts and flat washers shall be galvanized steel, with all galvanizing, except on the lower 6" of the anchor rods, meeting the requirements of Ohio Specification Section 711.02. Anchor rods, as fabricated, shall have the following minimum dimensions and mechanical properties.

Diameter at root of threads	0.620"
Straight portion of rod	1'-0" long
Hook at bottom	2½"-90° bend
Anchor tensile strength	21,000 lbs.

Hexagonal nut shall develop the tensile strength of the anchor rod.

Cap screws shall be stainless steel, ASTM A276, type 410 with a minimum yield strength of 80,000 psi.

MATERIAL: Railing posts shall be permanent mold castings. All aluminum products shall conform to Section 711.20.

HORIZONTAL CURVATURE: This standard is applicable to structures having a railing curvature radius of 20 feet or more. For a radius less than 20 feet, the design shall be special. For structures on curvatures of 3° or less, the tubes may be furnished straight and forced into position in the field.

REVISIONS
11-24-65

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

STANDARD
BRIDGE RAILING TYPE-2
WITH CONCRETE PARAPETS

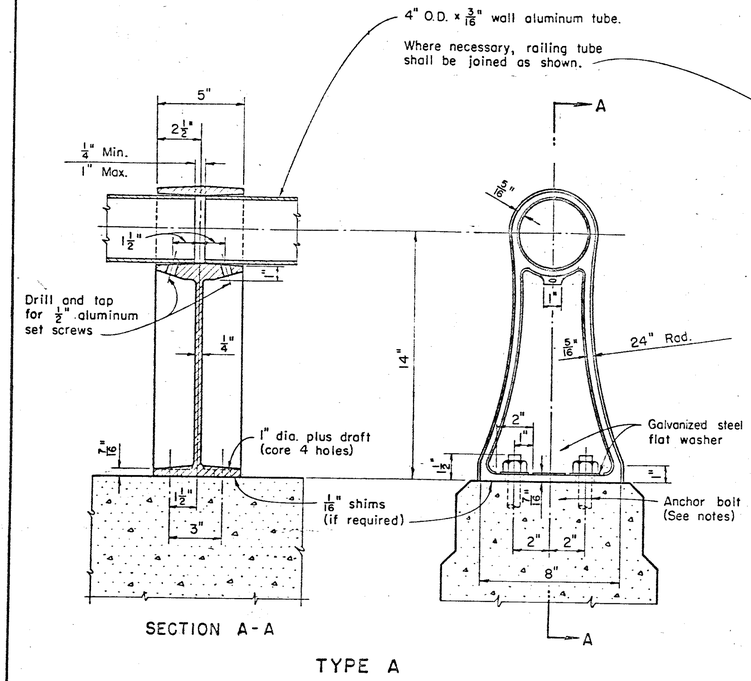
APPROVED: C. H. Wheeler, ENGINEER OF BRIDGES
DATE 2-1-65
DRAWING NUMBER BR-1-65

PREPARED	TRACED	CHECKED	REVIEWED	SHEET NO 2 OF 2 SHEETS
MPB	CAM	JDR	MHH BPG CDB	

FHWA REGION	STATE	PROJECT		
5	OHIO			

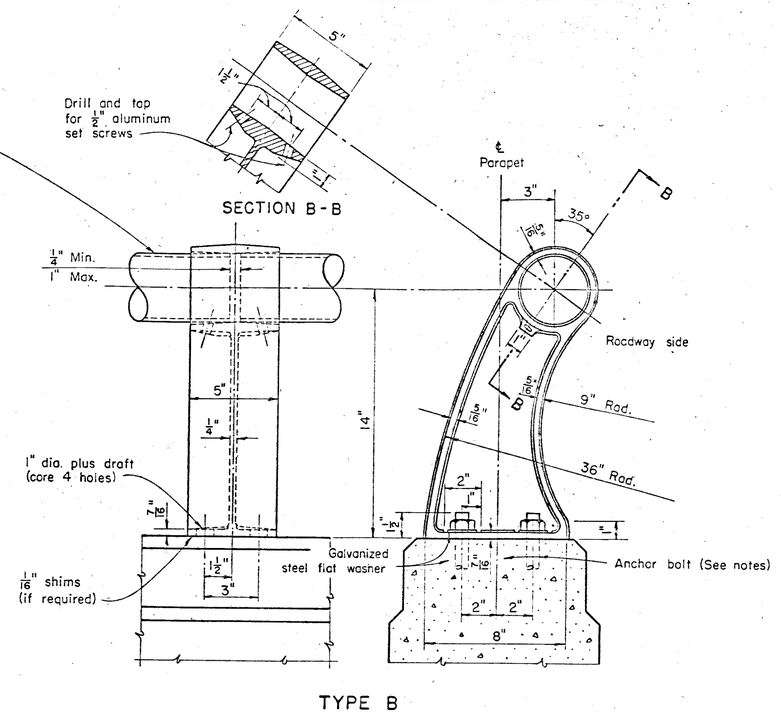
6/6

HAM-74-2.30
HAM-50-5.34
HAM-562-1.79

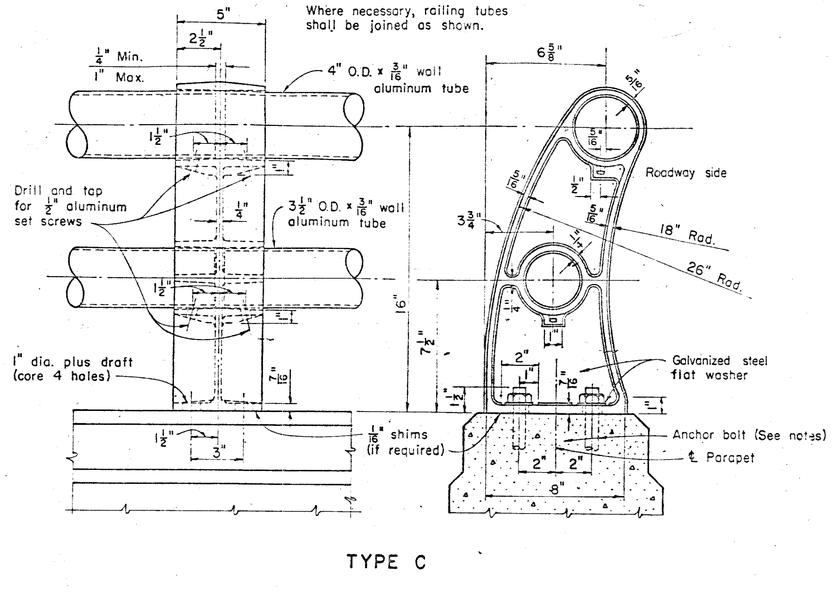


SECTION A-A

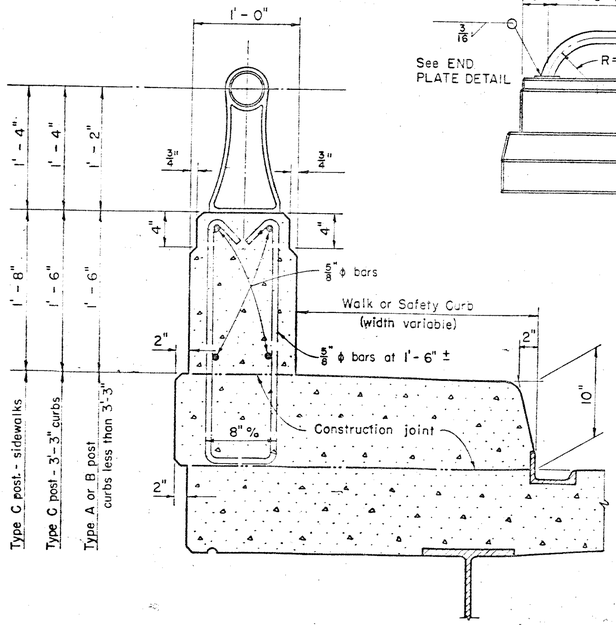
TYPE A



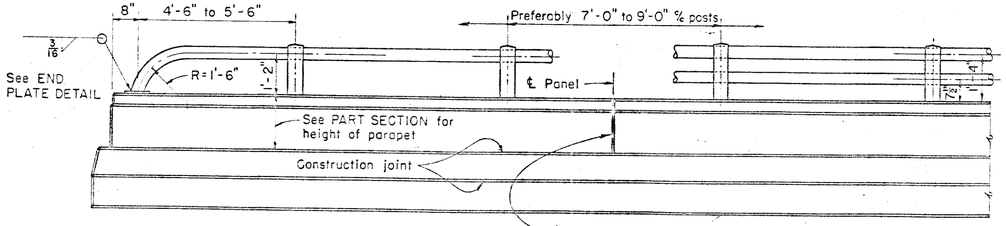
TYPE B



TYPE C

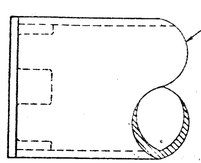


PART SECTION
(Type A post shown)

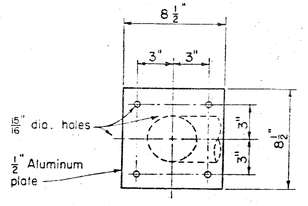


ELEVATION

TREATMENT OF PARAPET AND FASCIA



RAIL CAP DETAIL



END PLATE DETAIL

NOTES

GENERAL: This drawing provides design and construction details. The project plans for each structure will indicate the type of aluminum post (A, B or C), height of parapet, panel lengths, details at ends of railing, reinforcing steel details, reinforcing steel list, estimated quantities, and other necessary information including special notes and details.

In the determination of the type of railing posts to be specified, as well as the other details of the railing to be shown on the project plans, the the following criteria generally will govern:

Either Type A or Type B railing posts will be used for bridges with curbs less than 3'-3" in width. Type C posts will be used for bridges with safety curbs 3'-3" in width, with a parapet height of 1'-6", and may be used for sidewalk railing, with a parapet height of 1'-8". The cast aluminum posts shall conform to alloy SG 70 B and to the other requirements for cast posts and post bases for full-height railings as specified in Sec. M-7.19 Aluminum for Railings.

The railing tubes shall terminate with a cap (as detailed) at the ends unless they are curved downward to the concrete parapet as shown.

Rails will not be bent downward where either Type B or C posts are used.

Railing shall be in lengths of not less than two panels on abutments and at ends of superstructures and of not less than three panels elsewhere. On abutments, a 1/4" wall aluminum pipe may be substituted for the 3/16" wall aluminum tube, at the same price.

FINISH: The extreme outer surfaces of cast railing posts shall be given a 60 grit finish.

SHIMS shall be provided under the railing posts, where necessary, to assist in vertical aligning. They shall be of aluminum alloy, 2 3/8" x 1/16" x 8", and shall be slotted for anchor bolts to permit insertion after the posts are in place.

SET SCREWS shall be furnished with each casting and shall be included in the unit price bid per linear foot of railing.

ANCHOR BOLTS shall be galvanized steel, 1'-0" long plus a 2 1/2" 90° bend or a head at the bottom end, and shall have a minimum diameter of 0.62" at the root of the thread.

CONCRETE PARAPETS shall be placed in alternate sections by use of bulkheads. Closing sections shall be placed after removal of bulkheads and after placement of sponge rubber. Rubber shall be flush with surface of concrete and exposed edges shall be free of mortar.

REVISIONS
3 - 1 - 58
2 - 2 - 59
12 - 12 - 60
4 - 2 - 62

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

STANDARD

ALUMINUM RAILING WITH CONCRETE PARAPET

APPROVED: _____ ENGINEER OF BRIDGES
DATE: 4-9-57

PREPARED	TRACED	CHECKED	REVIEWED
DHO NEY JVP	JVP JCH	CSD DWI	BFG AJF WHR DHO

DRAWING NUMBER
AR-1-57