OLD MAIN STREET BRIDGE	OHIO	1
	FHWA REGION 5	22
	FEDERAL PROJECT	

CT CONSULTANTS, INC.

BID SET

OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK

CITY OF CONNEAUT
ASHTABULA COUNTY

DESIGN DESIGNATION

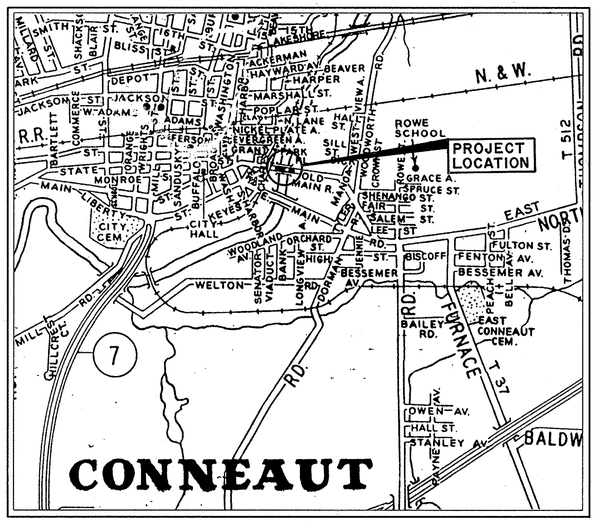
Current Year 1987
Design Year 2007 A.D.T.
D.H.V.
D .
T
V
LEGAL SPEED.....25 M.P.H.

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line
Fence Line (existing) (proposed)
Center Line 352 353
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 R/W
Property Line (in existing fence)
Railroad or
Guardrail (exist) (prop)
Manholes (exist) (adjst) (prop)
Catch Basins (exist) (adjst) (prop)

INDEX OF SHEETS



LOCATION MAP
SCALE IN FEET

Portion to be improved
State & Federal Routes
Other Roads

SCALES

Plan 0 20 40
Profile: Horizontal 0 20 40 ,Vertical 0 20 40
Cross Section: Horizontal ,Vertical

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
CALL 800–362–2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON–MEMBERS MUST BE CALLED DIRECT

1991 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 require the closing to traffic of the highway.

Approved _____
Date _____ Mayor

Approved _____
Date 8-21-91 Safety Service Director

Approved _____
Date _____

Approved _____
Date 8/21/91 Engineer, City Of Conneaut

SUPPLEMENTAL SPECIFICATIONS		
No.	Date	
836	11/12/85	
849	12/24/85	
949	9/26/86	

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS					
AS–1–81	11/27/81				
DBR–2–73	4/10/73				
PSBD–1–81	6/20/89				
EXJ–3–82	8/1/84				
GR–1.1	5/6/91				
GR–1.2	5/6/91				
GR–2.1	5/6/91				
GR–4.1	5/6/91				
GR–4.2	5/6/91				
HL–1	9/6/73				

LINE DATA	
BEGIN PROJECT	STA 19+06.72
END PROJECT	STA 21+13.28
LENGTH OF PROJECT	206.56 LIN. FT. OR 0.039 MI.

Project:
Date of Letting _____ 19 __, Contract No. _____

Plan Prepared By:

CT Consultants, Inc.
Engineers • Architects • Planners
Willoughby • Mentor • North Canton • Columbus • Youngstown

John E. Alexandrou
JOHN E. ALEXANDROU, P.E. E-43788

STATE OF OHIO JOHN E. ALEXANDROU E-43788 REGISTERED PROFESSIONAL ENGINEER SEAL

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

4-9105 90-134 0011-22-36 4-910

CALC. BY		OLD MAIN STREET BRIDGE	OHIO
DATE			FHWA 5 REGION
CHKD. BY			2 / 22
DATE			

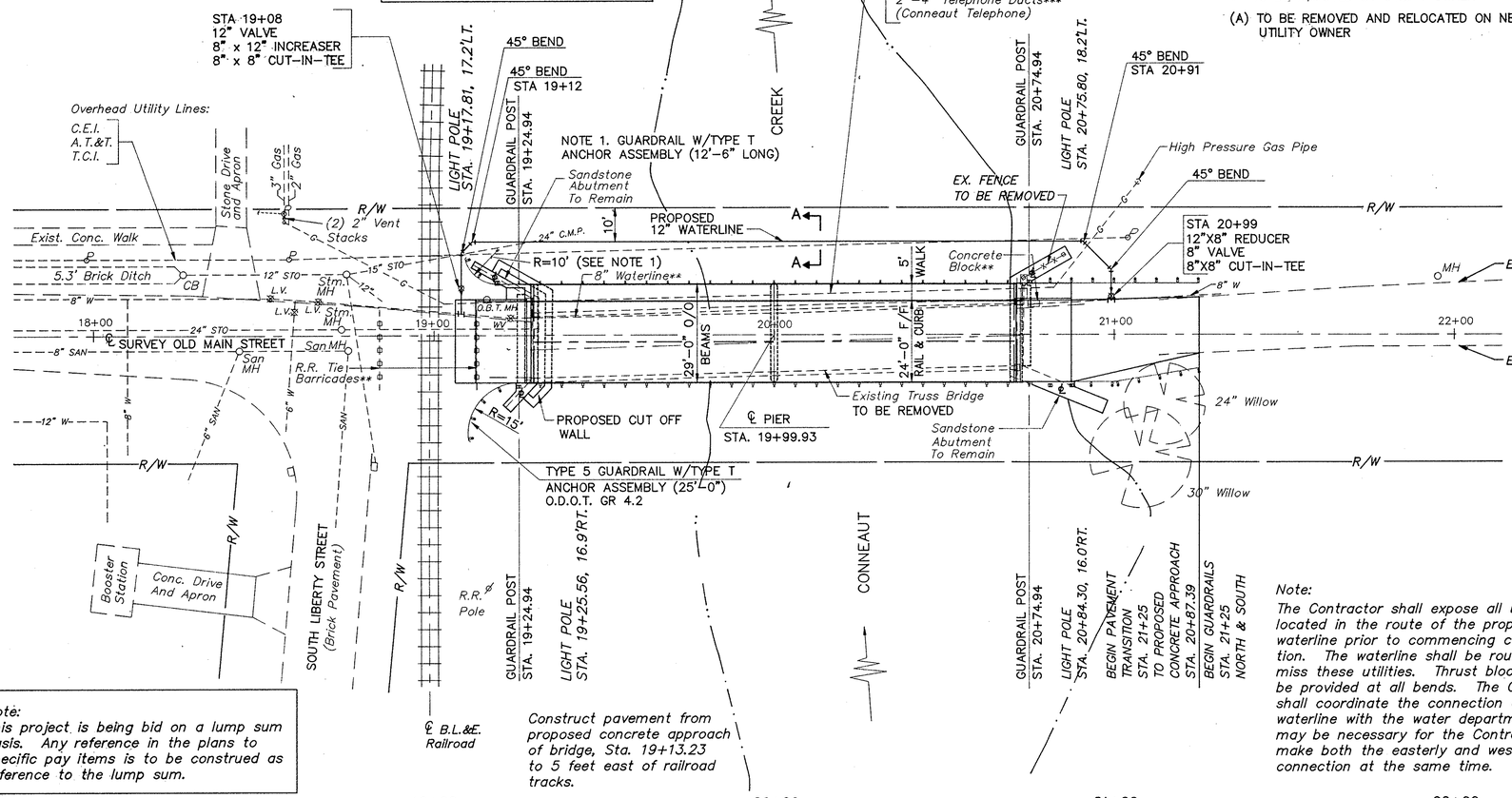
Bench Mark: USGS MON. #662 At N.W. Corner Of State St. (Set Vertical In S.E. Corner Of Building)
Elev. 661.24

Existing Utilities:
2" Gas Line (A)
3" Telephone Duct***
(Conneaut Telephone)
2 –4" Telephone Ducts***
(Conneaut Telephone)

** REMOVAL INCLUDED IN ITEM 202 – PORTIONS OF STRUCTURE REMOVED

*** TO BE REMOVED BY UTILITY OWNER

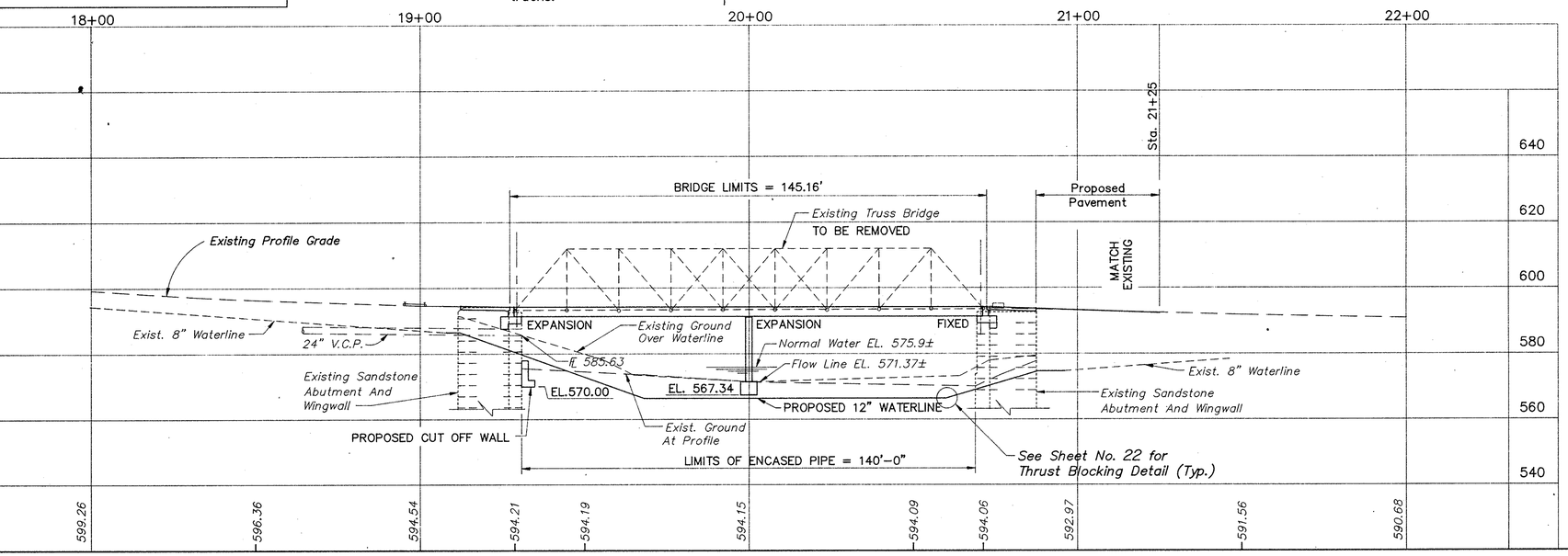
(A) TO BE REMOVED AND RELOCATED ON NEW STRUCTURE BY UTILITY OWNER

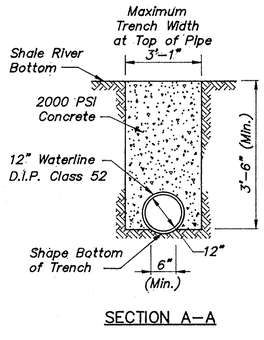


Note:
The Contractor shall expose all utilities located in the route of the proposed waterline prior to commencing construction. The waterline shall be routed to miss these utilities. Thrust blocks shall be provided at all bends. The Contractor shall coordinate the connection of the waterline with the water department. It may be necessary for the Contractor to make both the easterly and westerly connection at the same time.

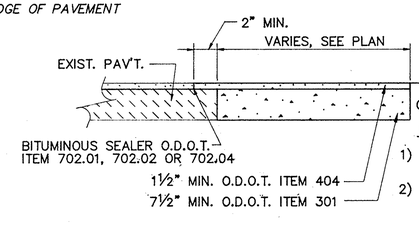
Note:
This project is being bid on a lump sum basis. Any reference in the plans to specific pay items is to be construed as reference to the lump sum.

Construct pavement from proposed concrete approach of bridge, Sta. 19+13.23 to 5 feet east of railroad tracks.





SECTION A–A



NOTE:
1) EXISTING SUBBASE MATERIAL (IF ANY) SHALL BE REPLACED, AS DIRECTED BY ENGINEER.
2) IN NO CASE SHALL THE THICKNESS OF THE OVERLAY BE LESS THAN EXISTING.

ASPHALT TRANSITION PAVEMENT

EXISTING STRUCTURE DATA
STRUCTURE FILE NO. : 0461253
TYPE: PRATT TRUSS
SPAN: 142.55' c/c BEARING
ROADWAY: 17'-8" F/F RAIL
LOADING:
WEARING SURFACE: ASPHALT CONCRETE
ALIGNMENT: TANGENT
SKEW: 0°
CONDITION: CRITICAL
DATE BUILT: 1904

PROPOSED STRUCTURE DATA
TYPE: TWO SPAN, PRESTRESSED CONCRETE BOX BEAM SUPERSTRUCTURE, WITH REINFORCED CONCRETE PIER AND REHABILITATED EXISTING STONE ABUTMENTS
SPAN: 70.10', 70.10'
ROADWAY: 24'-0" FACE RAIL TO FACE CURB W/ 5'-0" SIDEWALK
LOADING: HS20-44 & ALTERNATE MILITARY LOADING
WEARING SURFACE: 2½" ASPHALT CONCRETE (AC-20)
ALIGNMENT: TANGENT
APPROACH SLABS: 15'
SKEW: 0°

ROADWAY STRIPING

THE CONTRACTOR SHALL PROVIDE THE FOLLOWING ROADWAY STRIPING IN CONFORMANCE WITH O.D.O.T. SPECIFICATIONS FROM STA. 19+00 TO STA. 22+50

1) DOUBLE YELLOW CENTERLINE

2) WHITE EDGE OF PAVEMENT MARKINGS

NOTE:

CONTRACTOR TO COORDINATE WITH OWNER OF GASLINE TO SCHEDULE REMOVAL AND REPLACEMENT.

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Willoughby • Mentor • Columbus • North Canton • Youngstown

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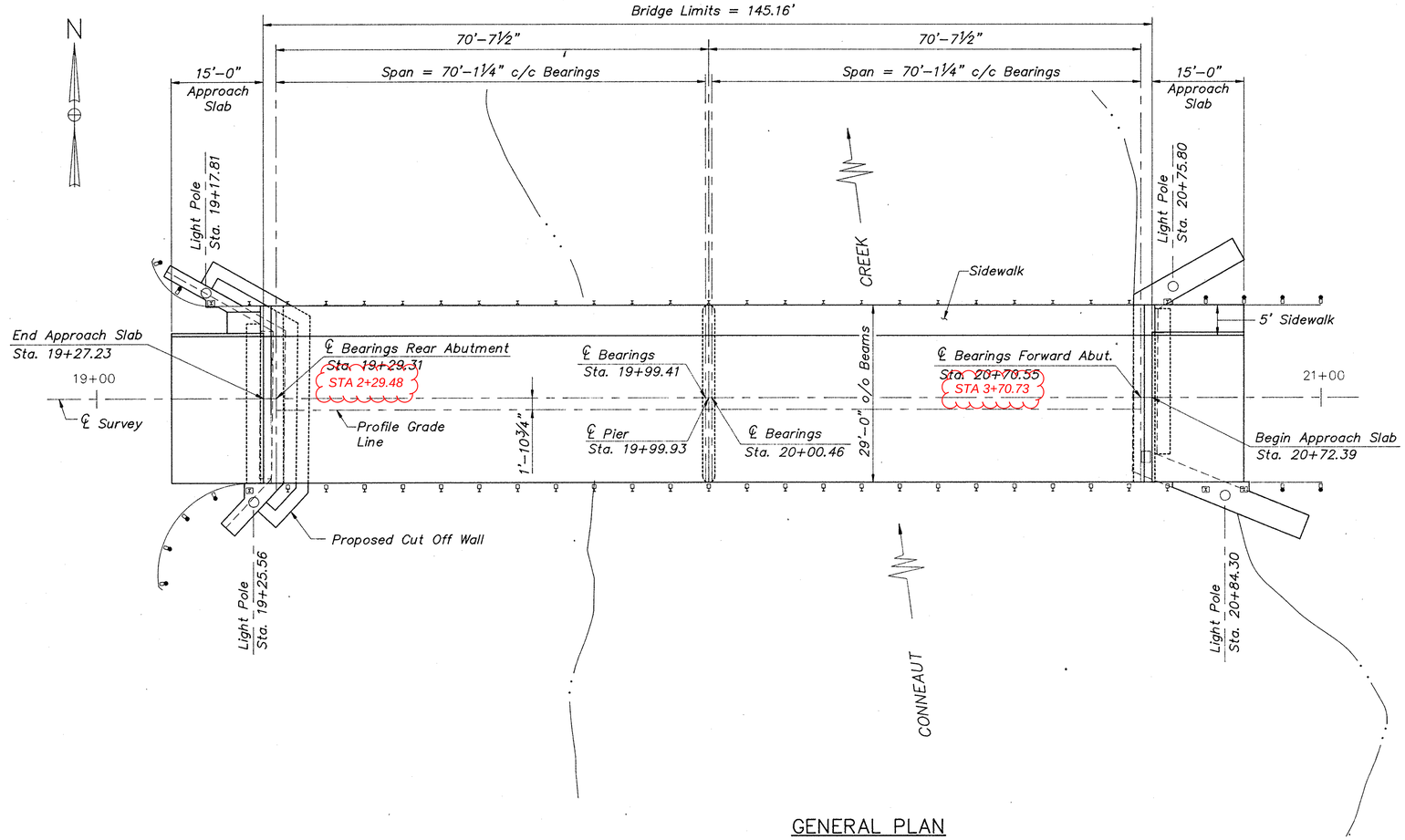
SITE PLAN
OLD MAIN STREET BRIDGE OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
J.P.R.	B.A.S.	B.A.S.	J.E.A.			

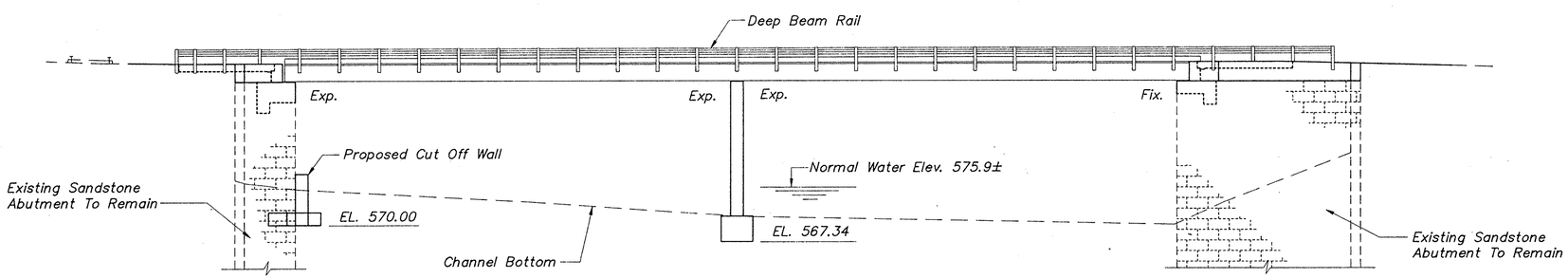
1 151 01-22-36

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA 5 REGION

3 / 22



GENERAL PLAN



GENERAL ELEVATION

LIGHTING SYSTEM

Light Post Assembly Including Anchor Bolts will be Supplied by the City. The Contractor will be Responsible for the Conduit, Wiring and Complete Installation of the Lighting System. The Contractor Shall Coordinate with the Utility Company to Determine Points of Connection. The Contractor Shall Also be Responsible for all Permit and Service Fees.

The LIght Posts Shall be Mounted on Top of the Wingwall Concrete Cap at the Locations Shown. See Standard Drawing HL-1 for Conduit Installation and Grounding Details.

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GENERAL PLAN & ELEVATION
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	D.A.S.	D.A.S.	J.E.A.		

0011-22-36

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS

AS-1-81	DATED	11/27/81	GR-1.1	DATED	5/6/91
DBR-2-73	DATED	4/10/73	GR-1.2	DATED	5/6/91
PSBD-1-81	DATED	6/20/89	GR-2.1	DATED	5/6/91
EXJ-3-82	DATED	8/1/84	GR-4.1	DATED	5/6/91
			GR-4.2	DATED	5/6/91

AND TO SUPPLEMENTAL SPECIFICATIONS

836 – CONCRETE CURING MEMBRANE DATED 11-12-85
849 – ELASTOMERIC COMPRESSION SEALS FOR STRUCTURAL STEEL JOINTS DATED 12-24-85
949 – PREFORMED POLYCHLOROPRENE ELASTOMERIC JOINT SEALS FOR STRUCTURAL STEEL JOINTS, DATED 9/26/86

UNDERGROUND UTILITIES

THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AT THE UTILITY AS REQUIRED BY SECTION 153.04 O.R.C.

UTILITY OWNERSHIP

THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT:

B.L. & E. (GAS LINE)
(ADDRESS AND PHONE NUMBER UNKNOWN)

THE CLEVELAND ELECTRIC ILLUMINATING CO.
P.O. BOX 668 (ROUTE 84)
ASHTABULA, OHIO 44004
PHONE: (216) 997-3131

THE CONNEAUT TELEPHONE COMPANY
224 STATE STREET
CONNEAUT, OHIO 44030
PHONE: (216) 593-1181

THE CITY OF CONNEAUT WATER DEPARTMENT
CLARK STREET
CONNEAUT, OHIO 44030
PHONE: (216) 593-4301

T.C.I. CABLEVISION OF OHIO, INC.
1635 EAST SIXTH STREET, EXT.
ASHTABULA, OHIO 44004
PHONE : (216) 998-2148

A.T. & T.
330 WEST WILSON BRIDGE ROAD
WORTHINGTON, OHIO 43085
PHONE: 1-800-222-0400

UTILITIES NOTIFICATION

AT LEAST TWO WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS IN AN AREA WHICH MAY INVOLVE UNDERGROUND UTILITY FACILITIES, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER, THE REQUESTED UTILITY PROTECTION SERVICE, AND THE OWNERS OF EACH UNDERGROUND UTILITY FACILITY SHOWN IN THESE PLANS.

THE OWNER OF THE UNDERGROUND UTILITY FACILITY SHALL WITHIN FORTY-EIGHT HOURS, EXCLUDING SATURDAY, SUNDAY AND LEGAL HOLIDAYS, AFTER NOTICE IS RECEIVED, STAKE, MARK OR OTHERWISE DESIGNATE THE LOCATION OF THE UNDERGROUND UTILITY FACILITIES IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE TOGETHER WITH THE APPROXIMATE DEPTH AT WHICH THEY WERE INSTALLED. THE MARKING OR LOCATING SHALL BE COORDINATED TO STAY APPROXIMATELY TWO WORKING DAYS AHEAD OF THE PLANNED CONSTRUCTION.

DETOUR

NO DETOUR WILL BE DESIGNATED DURING THE PROJECT.

ELEVATION DATUM

ALL ELEVATIONS REFER TO U.S.G.S. DATUM.

LOCATION OF GUARDRAIL

THE LOCATIONS OF GUARDRAIL RUNS, AS SHOWN IN THESE PLANS, ARE SUBJECT TO ADJUSTMENT PRIOR TO FINAL ACCEPTANCE. THE ENGINEER SHALL BE SATISFIED THAT ALL INSTALLATIONS SHALL AFFORD MAXIMUM PROTECTION FOR TRAFFIC.

PAVEMENT MARKINGS

THIS WORK SHALL CONSIST OF FURNISHING AND APPLYING PAVEMENT MARKINGS IN ACCORDANCE WITH ITEM 621 OF THE ODOT SPECIFICATIONS. FOUR-INCH (4") SOLID WHITE EDGE LINES AND A DOUBLE YELLOW CENTERLINE SHALL BE APPLIED FROM STATION 19+06.72 TO STATION 22+50 (THE WORK LIMITS).

621 EDGE LINES	0.07 MI.
621 DOUBLE CENTERLINE	0.07 MI.

DESIGN SPECIFICATIONS

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1989, INCLUDING 1990 AND 1991 INTERIM SPECIFICATIONS AND THE OHIO SUPPLEMENT TO THESE SPECIFICATIONS.

DESIGN DATA

DESIGN LOADING	– HS20-44 AND THE ALTERNATE MILITARY LOADING.
CONCRETE CLASS C	– UNIT STRESS 1,333 PSI SUBSTRUCTURE.
CONCRETE CLASS S	– UNIT STRESS 1,500 PSI SUPERSTRUCTURE
CONCRETE FOR PRESTRESSED CONCRETE BEAMS	– UNIT STRESS 2,200 PSI COMPRESSION. 444 PSI TENSION.
REINFORCING STEEL (ASTM A615, A616, A617)	– GRADE 60 UNIT STRESS 24,000 PSI GRADE 40 MAY BE USED IN PRESTRESSED BOX BEAMS.

PRESTRESSING STEEL (ASTM A416) – f's = 270,000 PSI
INITIAL STRESS – 0.70 f's

DECK PROTECTION – TYPE D WATERPROOFING AND ASPHALT CONCRETE OVERLAY, STEEL DRIP STRIP AND SEALING OF CONCRETE SURFACES.

REINFORCING STEEL

A. ALL BAR DIMENSIONS ARE GIVEN OUT TO OUT.
B. ALL BARS OF A SERIES SHALL VARY IN LENGTH BY A CONSTANT INCREMENT.
C. THE CLEAR DISTANCE BETWEEN REINFORCING STEEL AND FACE OF CONCRETE SHALL BE 2 INCHES, UNLESS OTHERWISE SHOWN ON THE PLANS. IN NO CASE SHALL CLEARANCES LESS THAN THE MINIMUM CLEARANCES GIVEN IN SECTION 509.04 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS BE USED.

ITEM 202 – PORTIONS OF STRUCTURE REMOVED

THIS ITEM SHALL CONSIST OF REMOVING THE FOLLOWING PORTIONS OF THE EXISTING BRIDGE:

1. SUBSTRUCTURE SANDSTONE
2. UTILITY LINES ON THE EXISTING SUPERSTRUCTURE

EXCAVATION NECESSARY TO REMOVE PORTIONS OF THE EXISTING STRUCTURE SHALL BE INCLUDED WITH THIS ITEM FOR PAYMENT.

THE EXISTING SUPERSTRUCTURE (STEEL TRUSS) WILL BE REMOVED AND SALVAGED BY THE OFFICE OF THE ASHTABULA COUNTY ENGINEER. THE GENERAL CONTRACTOR WILL COORDINATE WITH THE COUNTY ENGINEER THE TIMING OF THE REMOVAL. IN ORDER TO FACILITATE THIS REMOVAL THE FOLLOWING CONSTRUCTION SEQUENCE WILL BE USED:

1. THE GENERAL CONTRACTOR WILL CONSTRUCT AND PUT IN SERVICE THE PROPOSED WATER LINE AND REMOVE FROM THE EXISTING SUPERSTRUCTURE ALL THE EXISTING UTILITY LINES.

2. THE GENERAL CONTRACTOR WILL VACATE THE SITE FOR THREE (3) WEEKS TO ALLOW THE THE COUNTY ENGINEER TIME TO REMOVE AND SALVAGE THE STEEL TRUSS.

3. THE GENERAL CONTRACTOR RETURNS TO COMPLETE THE CONTRACTED WORK.

DISPOSAL OF REMOVED MATERIAL

ALL MATERIAL REMOVED FROM THE STRUCTURE, UNLESS OTHERWISE SPECIFIED, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED BY HIM FROM THE SITE. ANY MATERIAL FALLING INTO THE STREAM RESULTING FROM THE STRUCTURAL REMOVAL SHALL BE REMOVED PROMPTLY AND NOT ALLOWED TO ACCUMULATE IN THE WATER. THE CONTRACTOR SHALL SUBMIT DETAILS OF THE METHOD HE PROPOSES TO USE TO RETRIEVE SUCH FALLEN MATERIAL, TO THE ENGINEER, FOR APPROVAL.

UNDER NO CIRCUMSTANCES SHALL ANY REMOVED MATERIAL BE PERMITTED TO REMAIN ON THE PREMISES, RIGHT OF WAY OR STREETS PENDING DISPOSAL OF SAME OR FOR ANY OTHER PURPOSES, UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.

UTILITY LINES

ALL EXPENSE INVOLVED IN RELOCATING (INSTALLING) ANY AFFECTED UTILITY LINES SHALL BE BORNE BY THE OWNER(S). THE CONTRACTOR AND OWNER(S) ARE REQUESTED TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

PRESTRESSED BOX BEAM WIDTHS:

FABRICATOR MAY ALTER WIDTH OF BEAMS ON THE BRIDGE, IF THERE IS SOME ADVANTAGE IN DOING SO. HOWEVER, THE BRIDGE WIDTH MUST REMAIN THE SAME. BEARINGS SHALL BE REDESIGNED BY A PROFESSIONAL ENGINEER AT NO COST TO THE CITY AND REVISED PLANS MUST BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.5 AND 105.2.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE 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.

STRUCTURES

ITEM 517 – RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 1 POSTS AND BOLTS), AS PER PLAN.

GUARD RAIL ATTACHED TO SUPERSTRUCTURE IS PER STATE STANDARD DRAWING DBR-2-73, TYPE 1 POST. MODIFIED GUARD RAIL POSTS LOCATED ON TOP OF WING WALLS ARE DETAILED ON SHEET 15/16 IN THESE PLANS. MODIFIED POSTS, BASE PLATES, ANCHOR BOLTS, THE HANDRAIL, END TREATMENT AND ANCHORAGE HARDWARE SHALL CONFORM TO THE SAME MATERIAL AND GALVANIZING SPECIFICATIONS AS THE DEEP BEAM BRIDGE GUARDRAIL. THE MATERIAL AND INSTALLATION ARE INCLUDED FOR PAYMENT UNDER ITEM 517- RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 1 POSTS AND BOLTS), AS PER PLAN.

ITEM 517 – RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 POSTS AND BOLTS), AS PER PLAN.

GUARD RAIL ATTACHED TO SUPERSTRUCTURE IS PER STATE STANDARD DRAWING DBR-2-73, TYPE 2 POST. MODIFIED GUARD RAIL POSTS LOCATED ON TOP OF WING WALLS ARE DETAILED ON SHEET 15/16 IN THESE PLANS. MODIFIED POSTS, BASE PLATES, AND ANCHOR BOLTS AND THEIR INSTALLATION ARE INCLUDED FOR PAYMENT UNDER ITEM 517- RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 POSTS AND BOLTS), AS PER PLAN.

ITEM SPECIAL – SEALING OF CONCRETE SURFACES

A CONCRETE SEALER SHALL BE APPLIED TO THE FASCIA BEAMS AND SIDEWALK AS SHOWN ON SHEETS 11/16 AND 14/16 . SEE PROPOSAL FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIAL REQUIREMENTS AND APPLICATION PROCEDURES.

LAMINATED ELASTOMERIC BEARINGS

THE LAMINATED ELASTOMERIC BEARING MANUFACTURER SHALL PROOF LOAD EACH LAMINATED ELASTOMERIC BEARING WITH A COMPRESSIVE LOAD EQUAL TO 1.5 TIMES THE MAXIMUM DESIGN LOAD AS PER ARTICLE 25.7, BEARING TESTS AND ACCEPTANCE CRITERIA, DIVISION II, CONSTRUCTION OF THE 1991 INTERIM SPECIFICATIONS FOR THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, FOURTEENTH EDITION, 1989. THE TESTING SHALL BE INCLUDED IN THE PRICE BID FOR THE BEARINGS. ACCEPTANCE OF THE BEARINGS SHALL BE ACCORDING TO LEVEL I ACCEPTANCE CRITERIA OF ARTICLE 25.7 AND 711.23 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS. THE MANUFACTURER SHALL FURNISH CERTIFIED TEST DATA.

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3/16

GENERAL NOTES
OLD MAIN STREET BRIDGE OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
J.E.A.	R.L.B.	R.L.B.	J.P.R.			

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA REGION 5

5/22

ESTIMATED QUANTITIES

ITEM		TOTAL	UNIT	DESCRIPTION	GENERAL	ABUT.	PIER	SUPER	AS PER PLAN REFERENCE SHT. NO.
		140	Lin. Ft.	Proposed 12" Waterline, Encased	140				
		55	Lin. Ft.	Proposed 12" Waterline	55				
202		Lump	Sum	Portions of Structure Removed, Over 20 Foot Span	Lump				
301		21	Cu. Yd.	Bituminous Aggregate Base	21				
403		20	Cu. Yd.	Asphalt Concrete, AC-20				20	
404		17	Cu. Yd.	Asphalt Concrete, AC-20	4			13	
503		Lump	Sum	Cofferdams, Cribs and Sheeting	Lump				
503		46	Cu. Yd.	Unclassified Excavation		46			
503		Lump	Sum	Unclassified Excavation, Including Rock and/or Shale, As Per Plan	Lump				
503		24	Cu. Yd.	Shale Excavation			24		
509		11,042	Pound	Reinforcing Steel, Grade 60		7,558	3,484		
509		3,444	Pound	Epoxy Coated Reinforcing Steel, Grade 60				3,444	
511		35	Cu. Yd.	Class S Concrete, Superstructure				35	
511		44	Cu. Yd.	Class C Concrete, Pier Above Footings			44		
511		79	Cu. Yd.	Class C Concrete, Abutment		79			
511		39	Cu. Yd.	Class C Concrete, Footing		15	24		
512		10	Sq. Yd.	Type A Waterproofing		10			
512		378	Sq. Yd.	Type D Waterproofing				378	
Special		218	Sq. Yd.	Sealing of Concrete Surfaces (Epoxy) (See Proposal Note)				218	
515		4	Each	Prestressed Concrete Box Beam (71'-1¼" Long), B33-36 (See Proposal Note)				4	
515		2	Each	Prestressed Concrete Composite Box Beam (71'-1¼" Long), CB33-36 (See Proposal Note)				2	
515		10	Each	Prestressed Concrete Box Beam (71'-1¼" Long), B33-48 (See Proposal Note)				10	
516		29	Lin. Ft.	Structural Steel Joint and Elastomeric Compression Seal				29	
516		24	Each	Elastomeric Bearing With Internal Laminates Only (Neoprene), 6"x12"x1¼"				24	
516		40	Each	Elastomeric Bearing With Internal Laminates Only (Neoprene), 5"x18"x1¼"				40	
516		82	Sq. Ft.	½" Preformed Expansion Joint Filler	19			63	
516		79	Sq. Ft.	1" Preformed Expansion Joint Filler, As Per Plan				79	13/16, 14/16
517		150	Lin. Ft.	Railing (Deep Beam Rail With Steel Tubular Backup And Type 1 Steel Posts And Anchor Bolts), As Per Plan				150	3/16, 11/16
517		150	Lin. Ft.	Railing (Deep Beam Rail With Steel Tubular Backup And Type 2 Steel Posts And Anchor Bolts), As Per Plan				150	3/16, 11/16
Special		113	Sq. Ft.	Steel Drip Strip				113	
606		125	Lin. Ft.	Guardrail, Type 5	125				
606		2	Each	Guardrail Anchor Assembly, Type T	2				
606		2	Each	Guardrail Anchor Assembly, Type A	2				
608		87	Sq. Ft.	4" Concrete Walk	87				
611		84	Sq. Yd.	Reinforced Concrete Approach Slabs (T=12")	84				
624		Lump	Sum	Mobilization	Lump				
625		147	Lin. Ft.	Conduit, As Per Plan * *		4		143	11/16

* * Item 625-Conduit, As Per Plan to be 100% Paid for by The Gas Utility Owner

Note:
This project is being bid as a lump sum. Items and quantities are supplied for reference only. The contractor shall perform his own quantity takeoff in preparing his bid for the Lump Sum Price.

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Engineers • Architects • Planners
Willoughby • Mentor • Columbus • North Canton • Youngstown

4/16

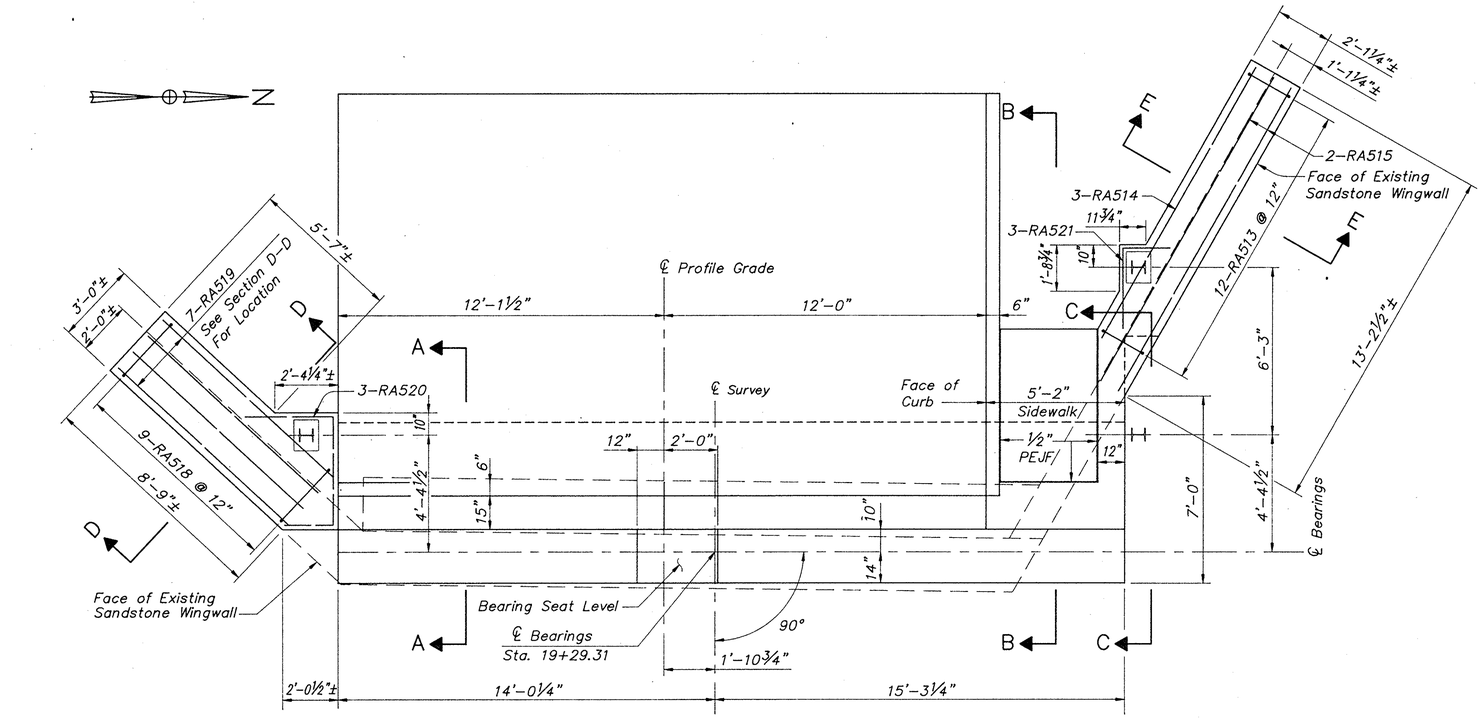
ESTIMATED QUANTITIES
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.P.R.		

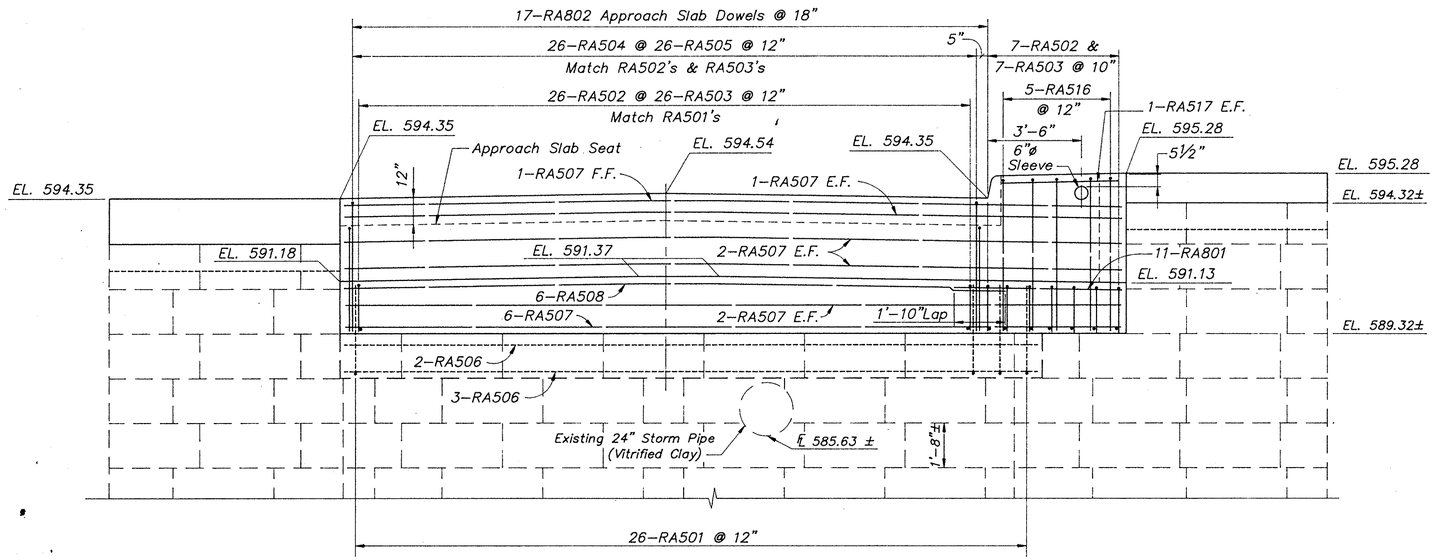
0111-22-36

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA REGION 5

6 / 22



PLAN



ELEVATION

Notes:

1) Cost of Removing And Disposing The Existing Sandstone Block Backwall To Facilitate Construction Is Included With Item 202 – Portions of Structure Removed.

2) See Sheet 16 / 16 For Reinforcing Steel Bar Schedule.

3) Bridge Seat Reinforcing: Reinforcing Steel in the Vicinty of the Bridge Seat Shall Be Accurately Placed to Avoid Interference with the Drilling of Anchor Bar Holes. For Location, See Sheet 12 / 16

4) Notation: E.F.–Each Face, EL.–Elevation, F.F.–Far Face

5) For Sections A–A, B–B, C–C, D–D and E–E, See Sheet 6 / 16

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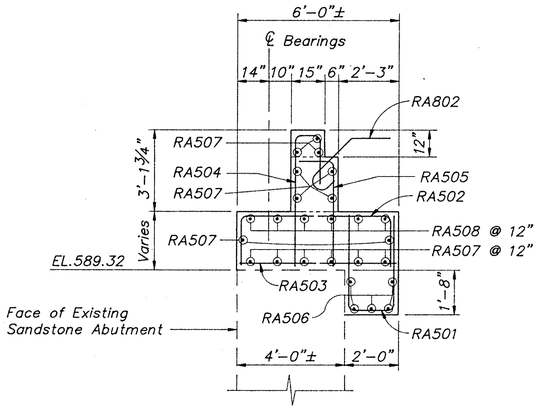
REAR ABUTMENT
OLD MAIN STREET BRIDGE OVER CONNEAUT CREEK
ASHTABULA COUNTY

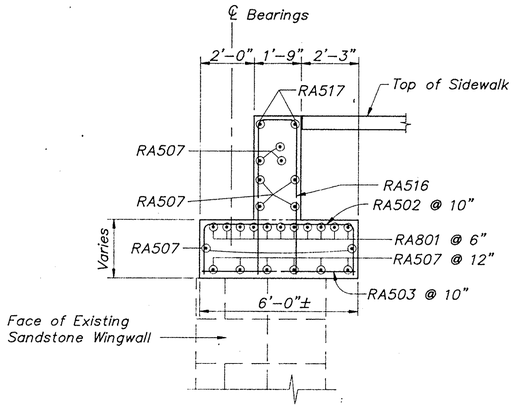
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.E.A.		

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA 5 REGION

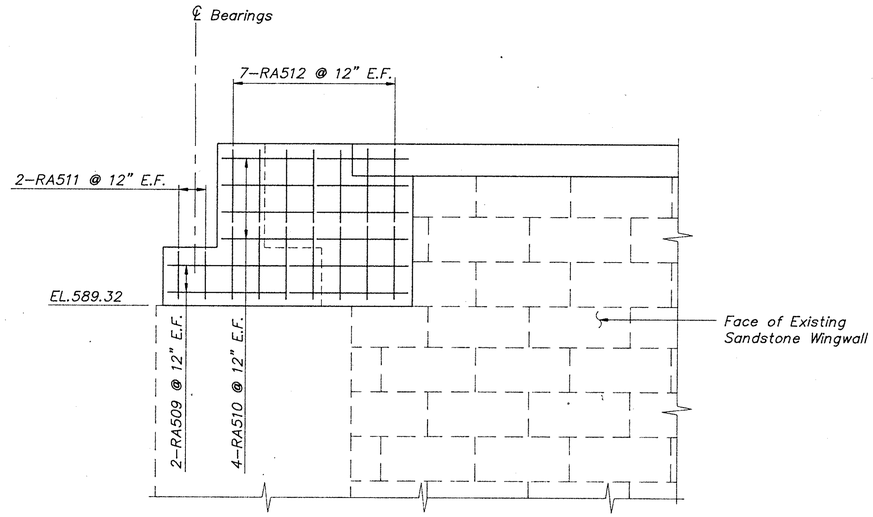
7 / 22



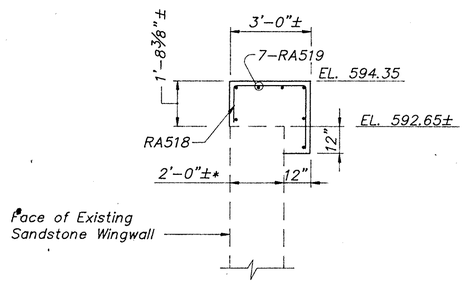
SECTION A–A



SECTION B–B

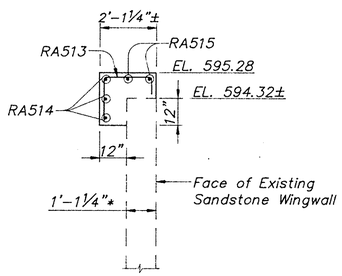


VIEW C–C



SECTION D–D

* Field Verify



SECTION E–E

* Field Verify

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REAR ABUTMENT DETAILS
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.L.B.	D.A.S.	D.A.S.	J.E.A.			

2134 6011-22-36

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA 5 REGION

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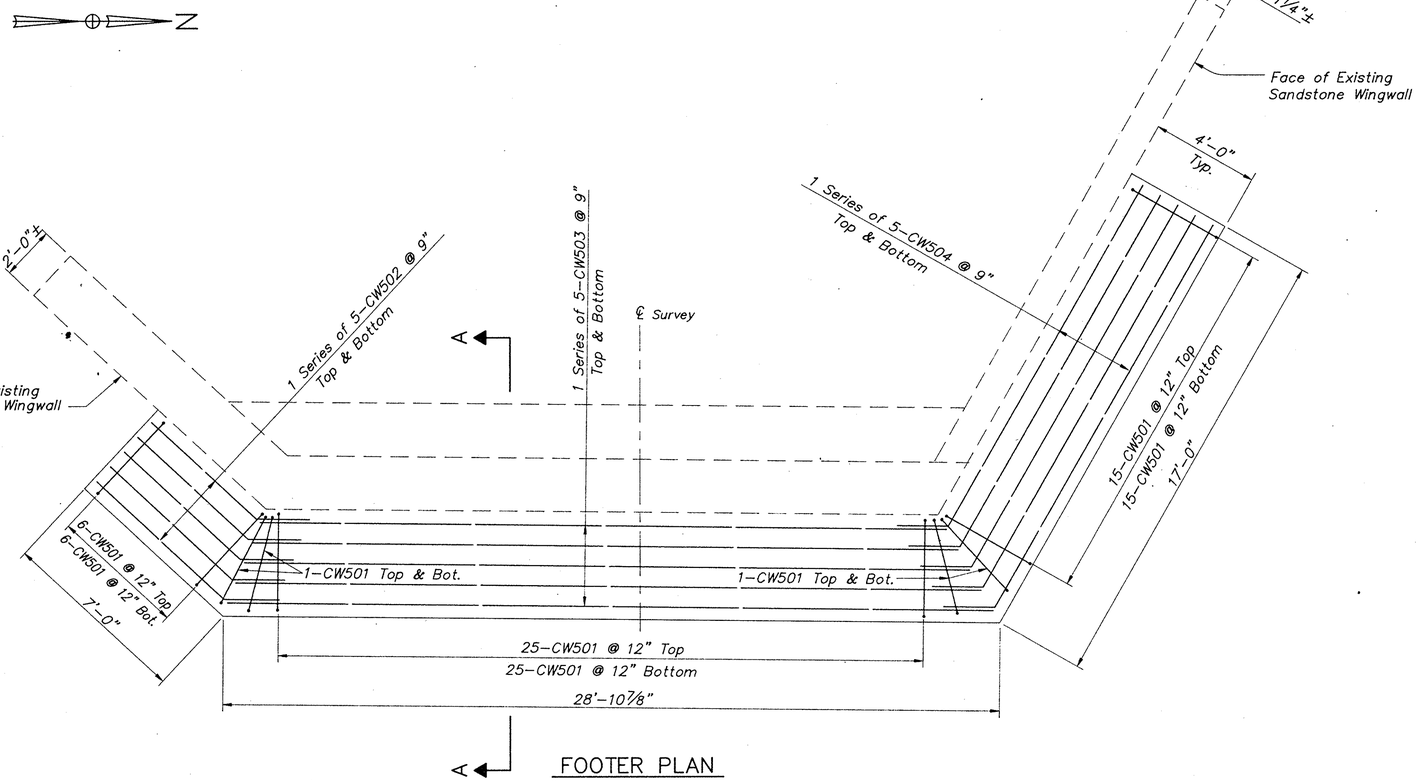
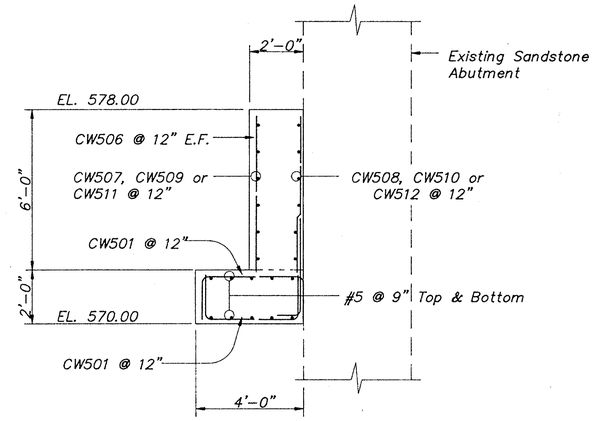
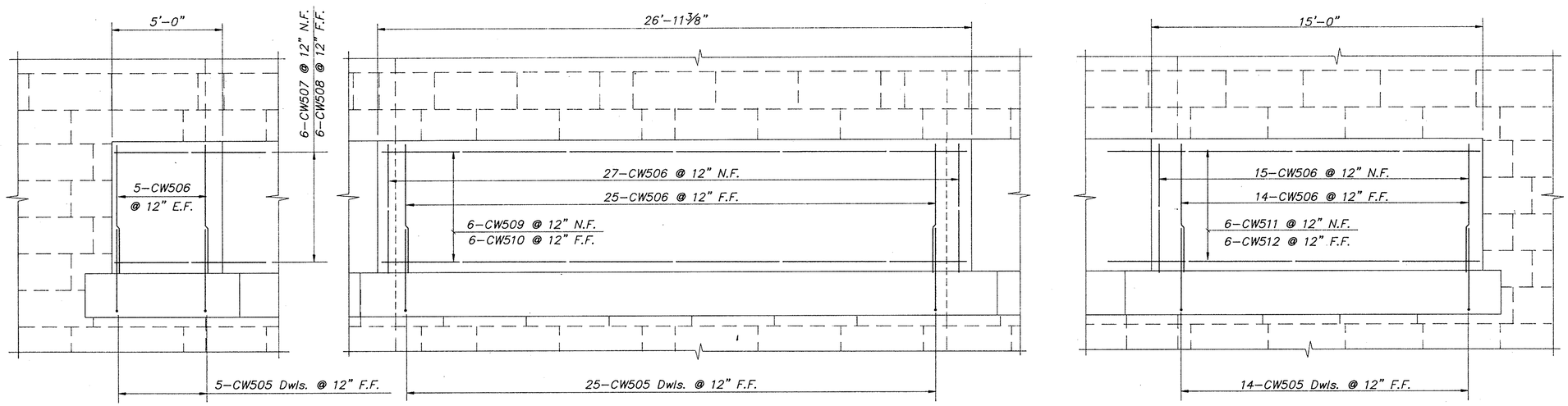


FOOTER PLAN



SECTION A–A
TYPICAL SECTION



ELEVATION

Notes:

1) Footing Concrete is Included with Item 511–Class C Concrete, Footing.

2) Wall Concrete is Included with Item 511–Class C Concrete, Abutment.

3) Excavation is Included with Item 503–Unclassified Excavation Including Rock and/or Shale, As Per Plan. Also Inculded under Item 503 is the Construction of a Temporary Cofferdam to Prevent Water from Flooding the Footing Excavation of the Cut Off Wall.

4) Notation: E.F.–Each Face, EL.–Elevation, F.F.–Far Face, N.F.–Near Face, Typ.–Typical

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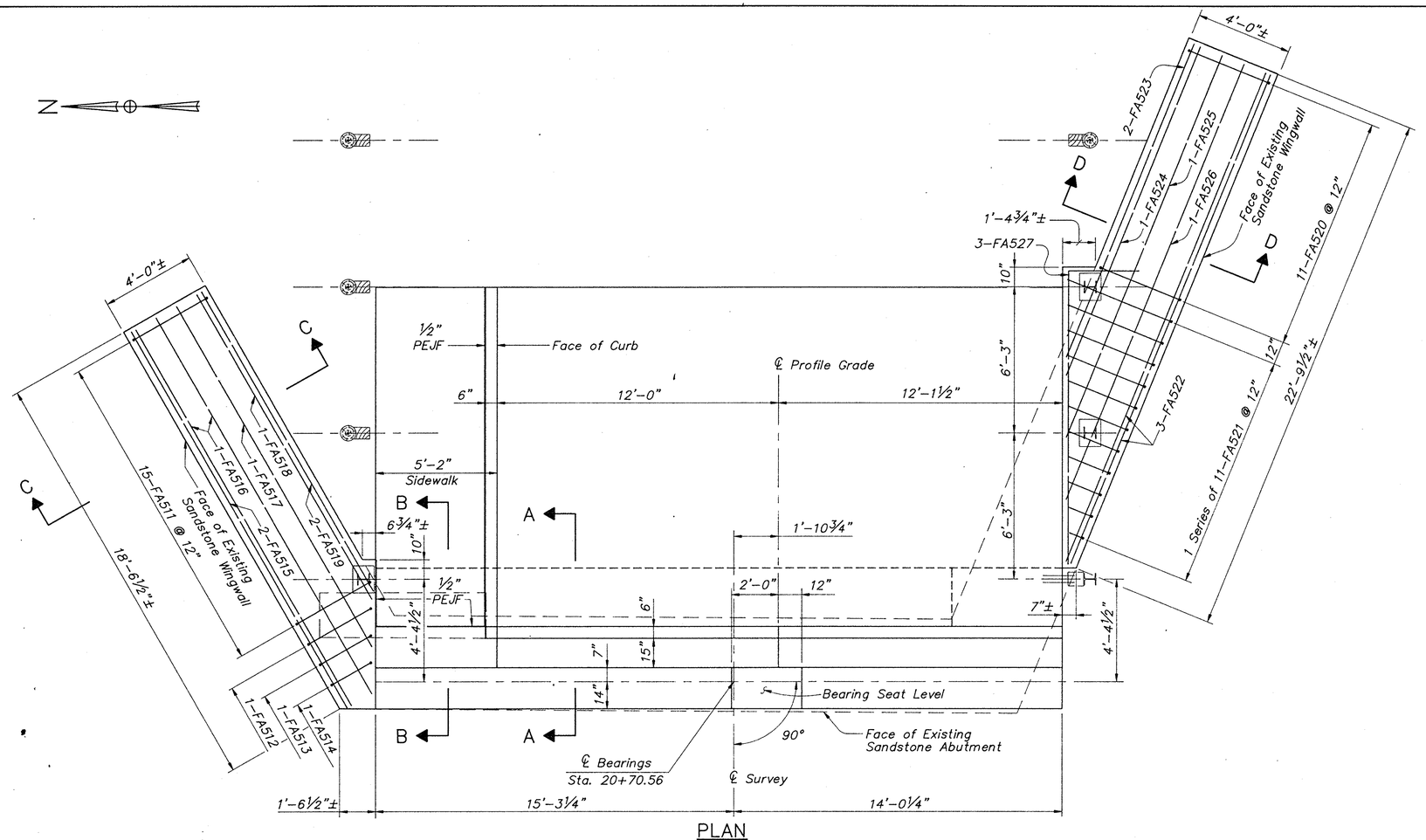
REAR ABUTMENT CUT OFF WALL
OLD MAIN STREET BRIDGE OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.E.A.		

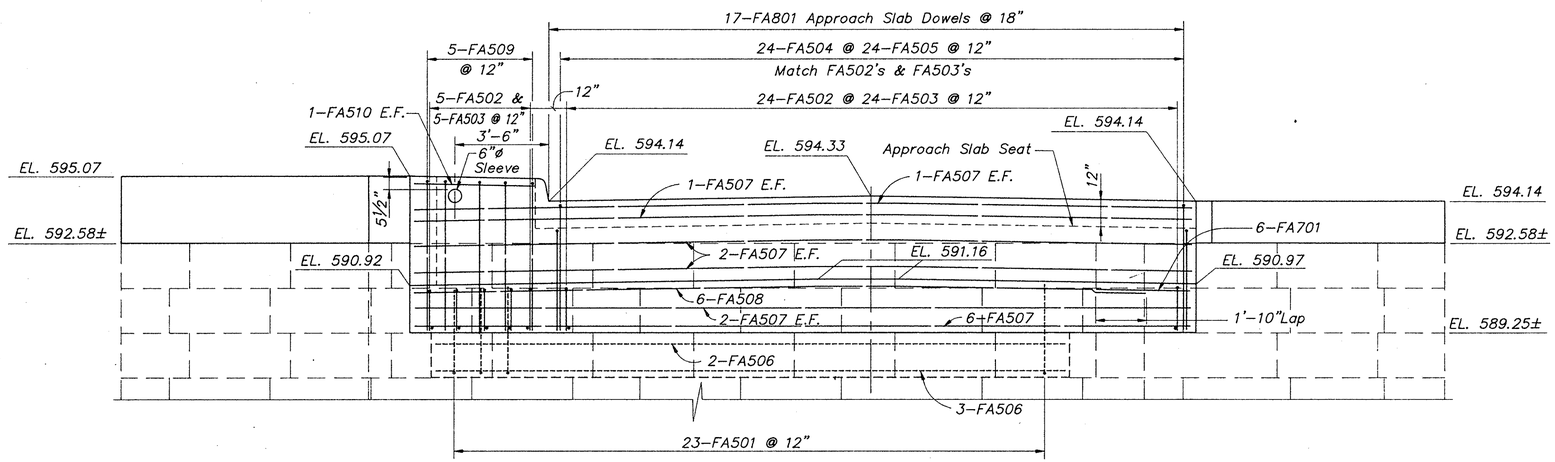
90 131 0011-22-36

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA 5 REGION

9 / 22



PLAN



ELEVATION

Notes:

1) *Cost of Removing And Disposing The Existing Sandstone Block Backwall To Facilitate Construction Is Included With Item 202 – Portions of Structures Removed*
2) *See Sheet 16 / 16 for Reinforcing Steel Bar Schedule*
3) *Bridge Seat Reinforcing: Reinforcing Steel in the Vicinity of the Bridge Seat Shall Be Accurately Placed to Avoid Interference with the Drilling of Anchor Bar Holes. For Location, See Sheet 12 / 16*
4) *Notation: E.F.–Each Face, EL.–Elevation*
5) *For Sections A–A, B–B, C–C and D–D See Sheet 9 / 16*

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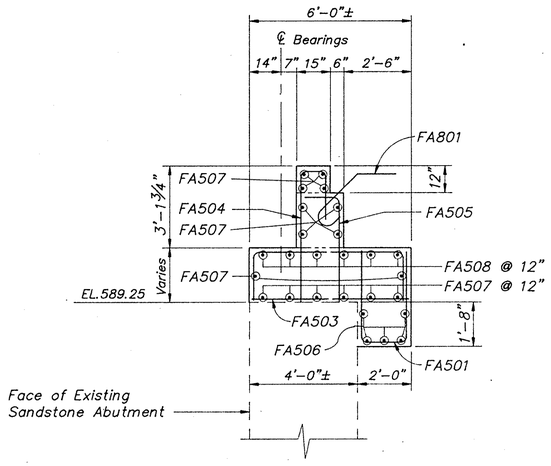
FORWARD ABUTMENT
OLD MAIN STREET BRIDGE OVER CONNEAUT CREEK
ASHTABULA COUNTY

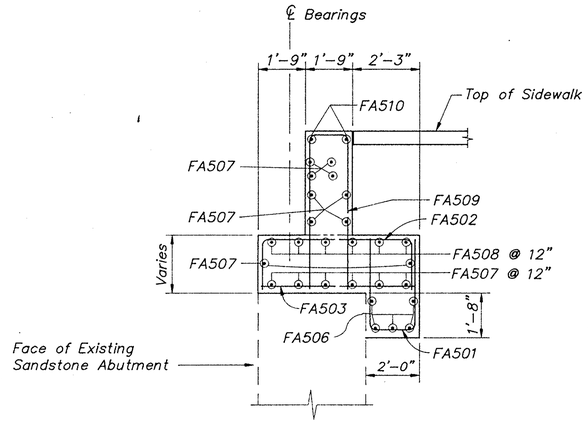
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.E.A.		

90124 CCH-22-36

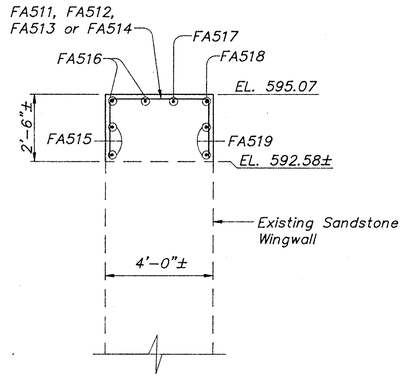
CALC. BY		OLD MAIN STREET BRIDGE	OHIO	10
DATE			FHWA REGION 5	22
CHKD. BY				
DATE				



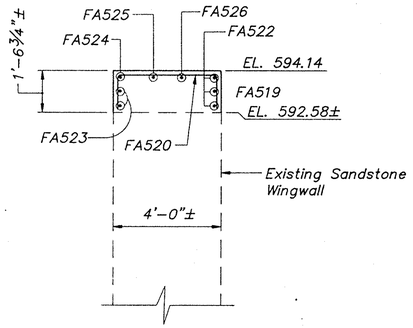
SECTION A–A



SECTION B–B



SECTION C–C



SECTION D–D

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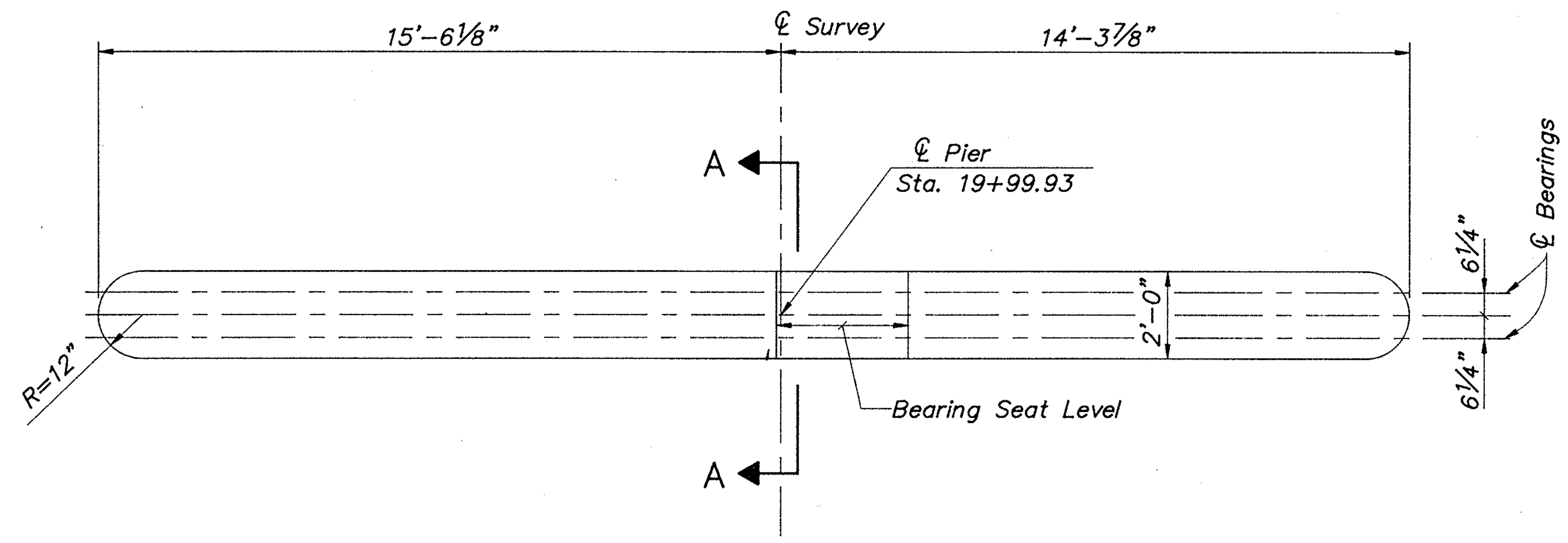
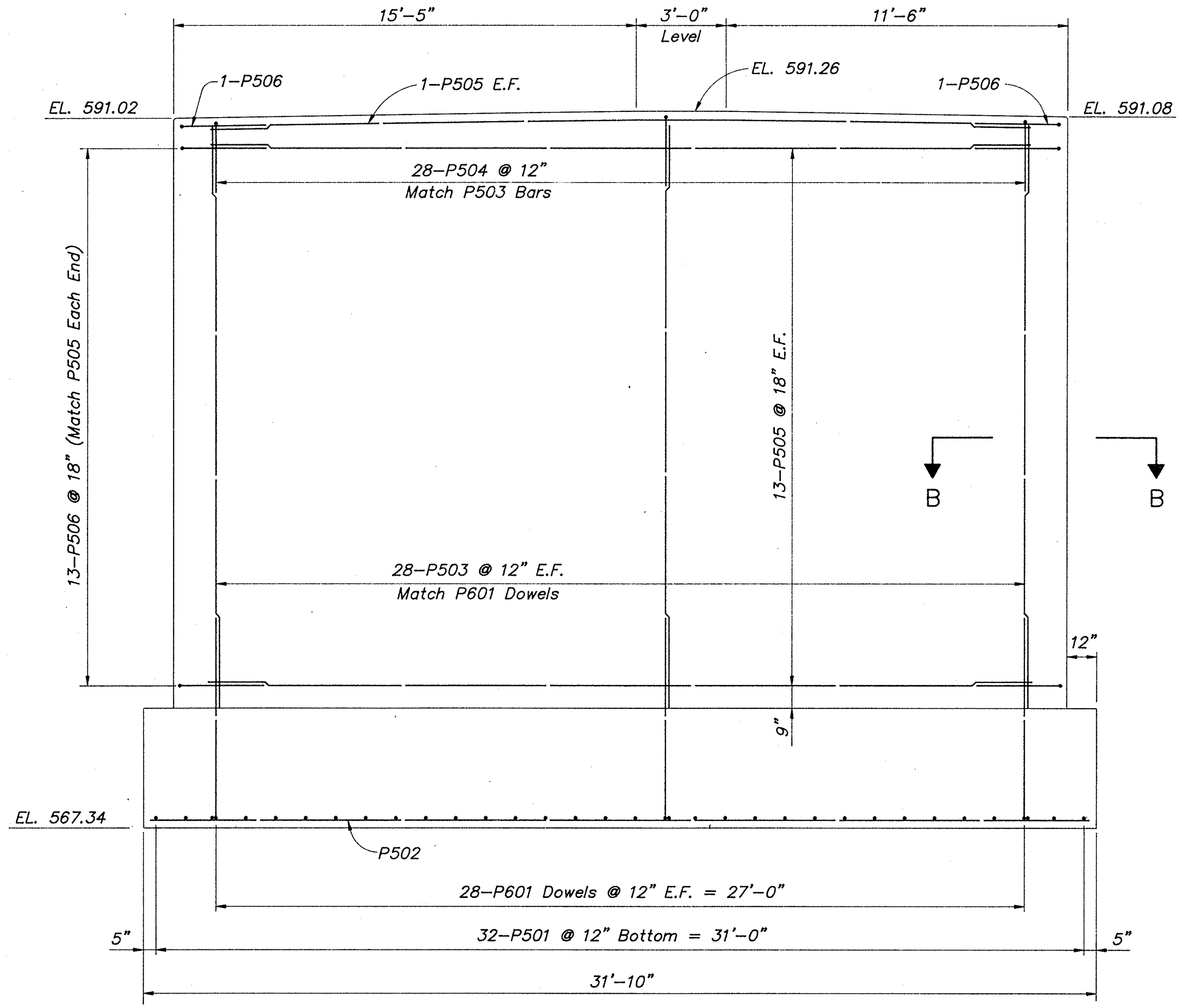
FORWARD ABUTMENT DETAILS
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	R.L.B. D.A.S.	R.L.B. D.A.S.	J.E.A.		

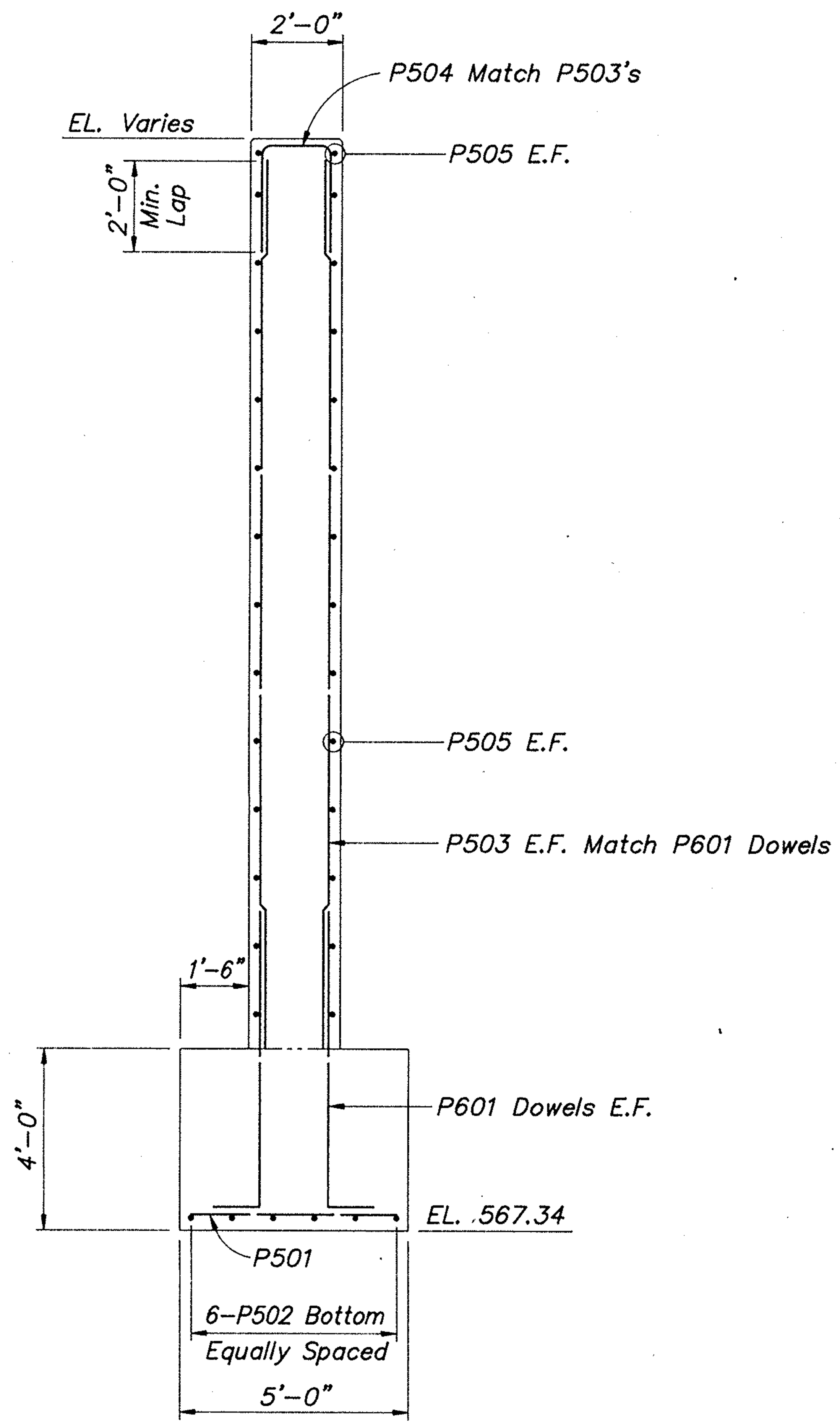
90134 0011-22-36



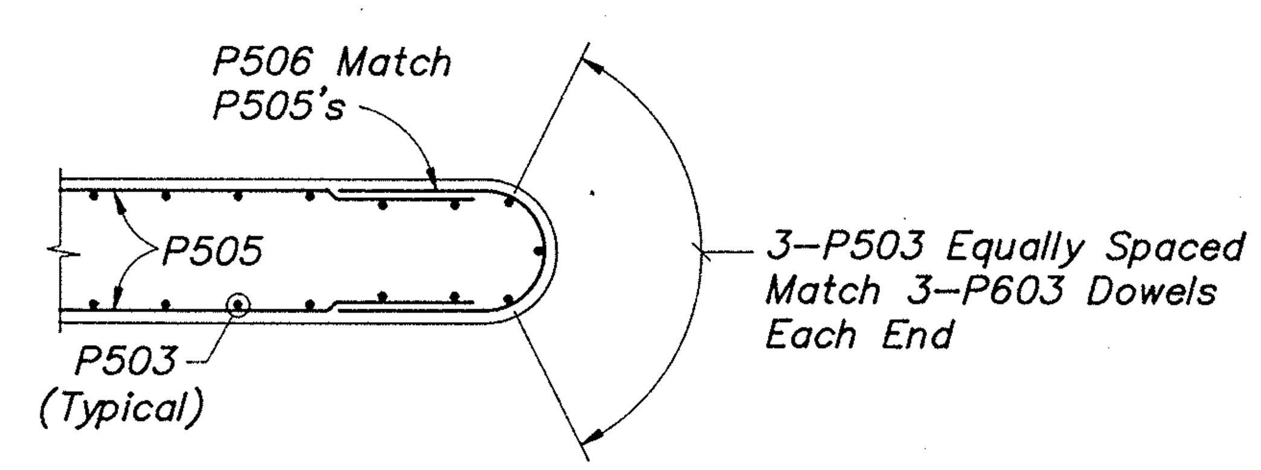


ELEVATION

Note: A Cofferdam Shall Be Constructed Adjacent to the Pier Footing Excavation to Prevent Water from Flooding the Excavation. Payment for this Cofferdam Shall Be Under Item 503—Cofferdams, Cribs and Sheeting.



SECTION A-A



SECTION B-B

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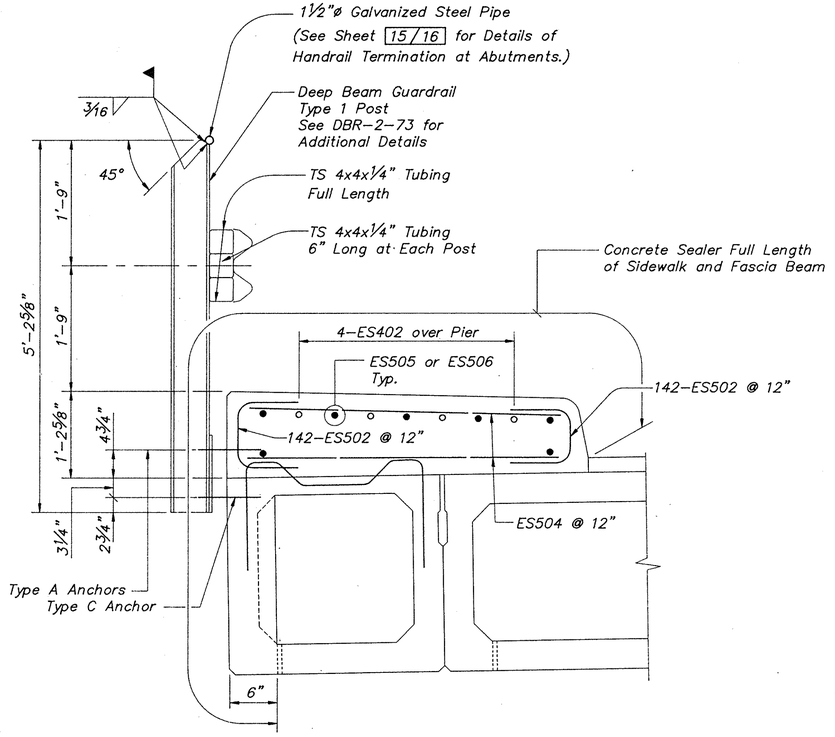
10/16

PIER
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

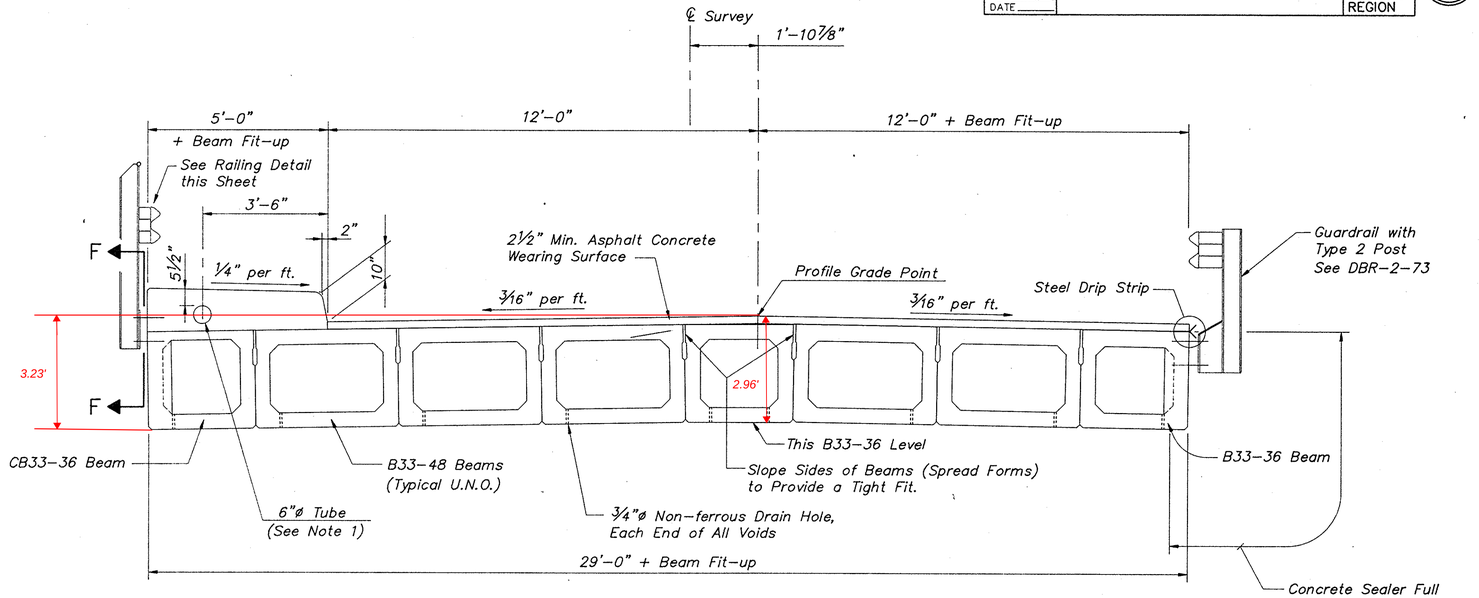
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.E.A.		

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA 5 REGION

12/22



SIDEWALK AND RAILING DETAIL

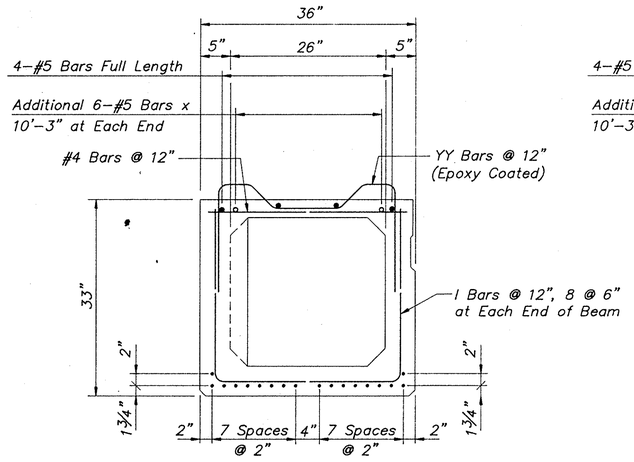


FULL ~~TRAN~~SVERSE SECTION

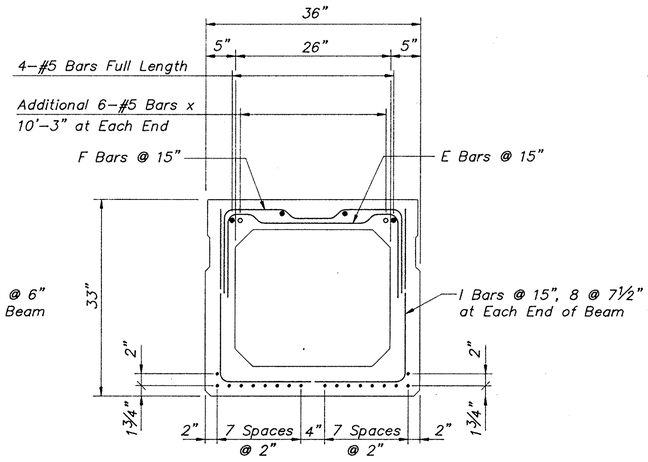
Notes:

1) Payment for the 6" Diameter Tube in the Sidewalk Slab Shall Be Under Item 625-Conduit, As Per Plan. The Tube Shall Run the Entire Length of the Superstructure Sidewalk. Tubes Shall Be Rigid Non-Metallic Material and Shall Be Installed with Water Tight Joints. Additionally the 6" Diameter Sleeves Cast in the Abutment Backwalls Shall Be Paid for Under Item 625.

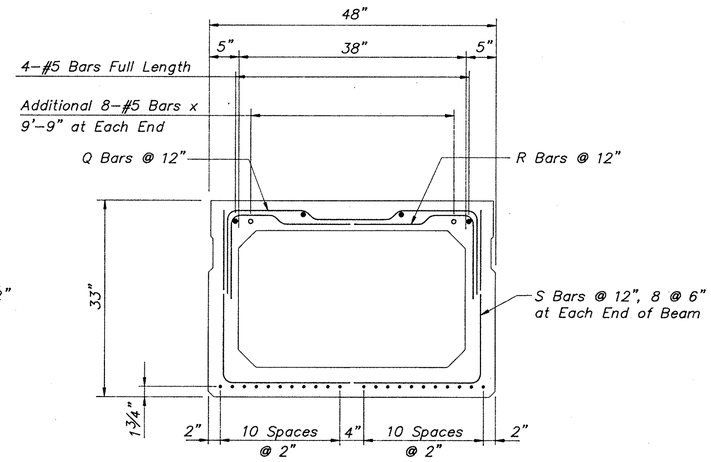
2) For Steel Drip Strip Details, See Sheet



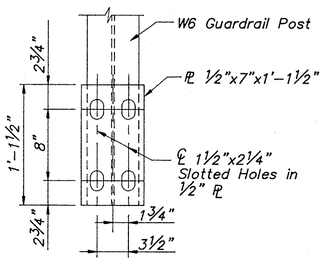
CB33-36 BEAM
(18 STRANDS)
For Additional Dimensions See PSBD-1-81, Sheet 4 of 4



B33-36 BEAM
(18 STRANDS)
For Additional Dimensions See PSBD-1-81, Sheet 3 of 4



B33-48 BEAM
(22 STRANDS)
For Additional Dimensions See PSBD-1-81, Sheet 3 of 4



VIEW F-F

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SUPERSTRUCTURE
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.E.A.		

0011-22-36

CALC. BY / DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY / DATE		FHWA REGION 5

13/22

℄ Rear Abutment Bearings (Expansion Anchor Dowels)

℄ Pier

℄ Forward Abutment Bearings (Fixed Anchor Dowels)

70'-7½"

70'-7½"

70'-1¼"

70'-1¼"

℄ Diaphragm

℄ Diaphragm

℄ Diaphragm

℄ Diaphragm

6"

23'-4½"

23'-4¼"

23'-4½"

23'-4½"

23'-4¼"

23'-4½"

6"

1'-6" (Typ.)

9" (Typ.)

9" (Typ.)

3" (Typ.)

6¼"

6¼"

℄ Expansion Bearing

℄ Expansion Bearing

2'-6" (Typical at Beam Ends)

N

1¼"x5"x18" Laminated Elastomeric Bearings for B33-48 Beams (40 Req'd.) See Detail A This Sheet

1¼"x5"x5" Expanded Polystryene (32 Req'd.) Include with Beams for Payment

1"ø Steel Tie Rods

Holes for 1"ø Tie Rods (Typ.) See PSBD-1-81

Sta. 19+29.31 ℄ Bearing

Sta. 19+99.93 ℄ Pier

Sta. 20+70.56 ℄ Bearing

℄ Survey

℄ Profile Grade

1'-10¾"

5-B33-48, 2-B33-36 and 1-CB33-36 Beams = 29'-0" + Beam Fit-up

24"

24"

18"

18"

A A B B C C

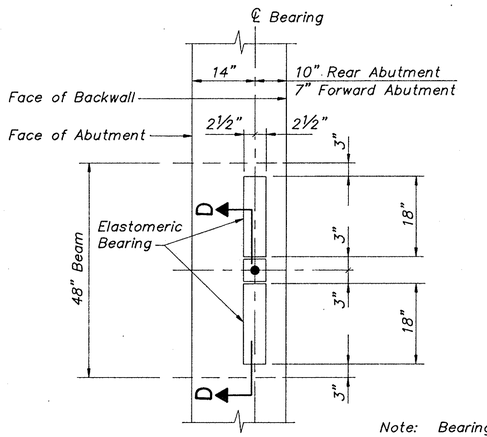
2"ø Holes for Anchor Dowels (Typ.) Include with Beams for Payment

1¼"x6"x12" Laminated Elastomeric Bearings for 36" Wide Beams (24 Req'd.) See Detail B This Sheet

1'-10½" 6'-3" 1'-10½"

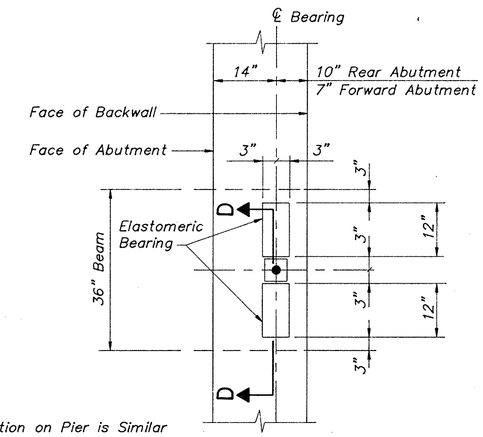
Typical Railing Post Spacing

PLAN

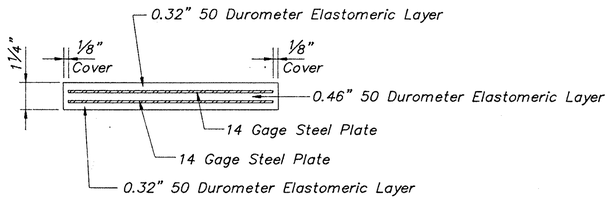


Note: Bearing Orientation on Pier is Similar

DETAIL "A"
LAMINATED ELASTOMERIC BEARING PAD
ORIENTATION FOR 48" BEAMS



DETAIL "B"
LAMINATED ELASTOMERIC BEARING PAD
ORIENTATION FOR 36" BEAMS



SECTION D-D

Bearing Reaction:
Dead Load = 17.7 Kips
Live load = 13.1 Kips
Max. Design Load = 30.2 Kips

NOTES:

Notation: Typ.-Typical

For Sections A-A, B-B and C-C See Sheet 14/16

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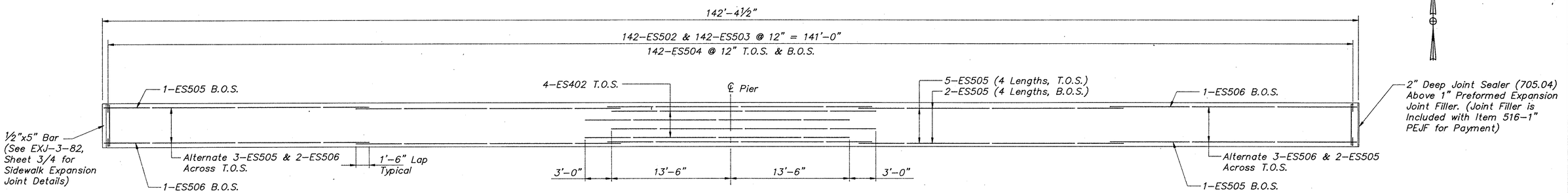
SUPERSTRUCTURE
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.E.A.			

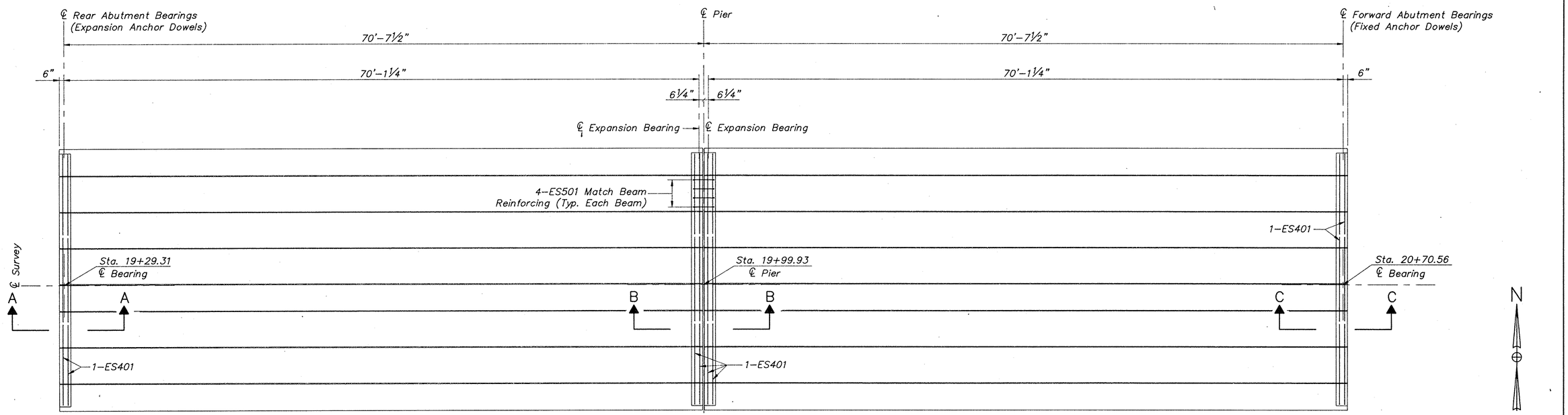
0011-22-36

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA 5 REGION

14/22



SIDEWALK PLAN



PLAN

NOTES:

Notation: Typ.-Typical

For Sections A-A, B-B and C-C
See Sheet 14/16

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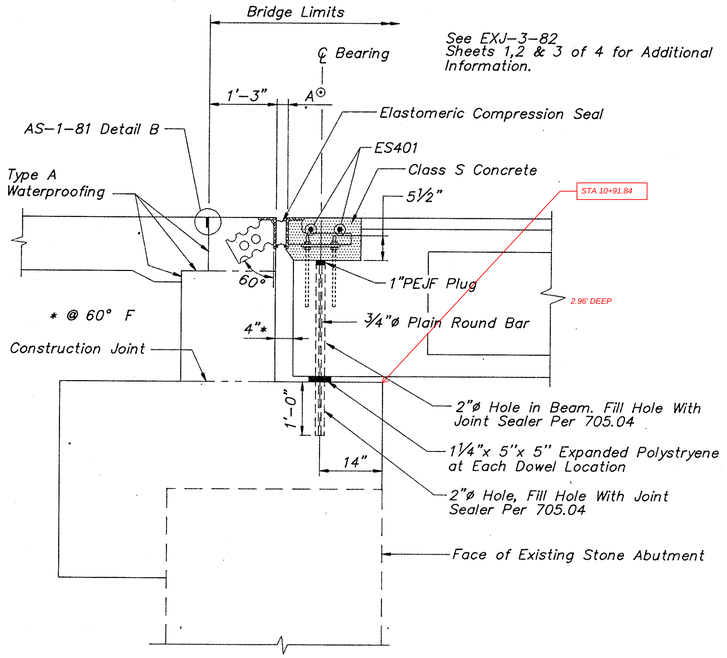
SUPERSTRUCTURE REINFORCING
OLD MAIN STREET BRIDGE OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.E.A.			

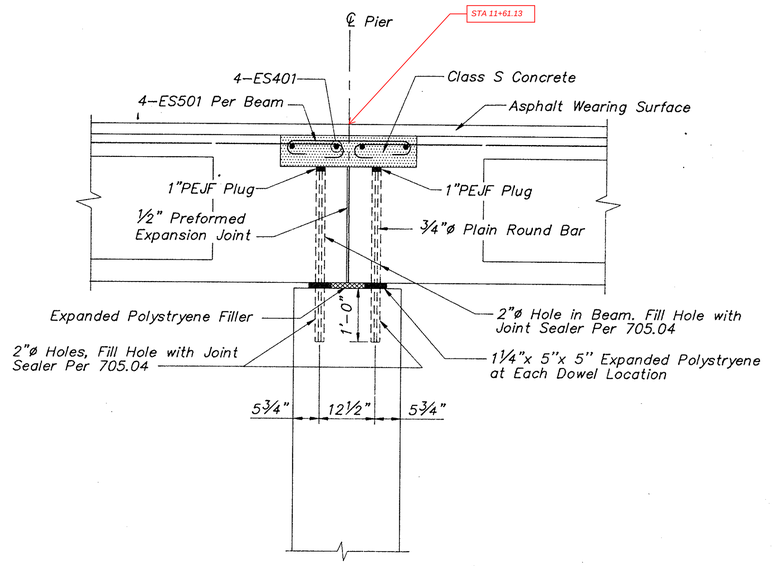
90 21 0014 22 36

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO
CHKD. BY DATE		FHWA REGION 5

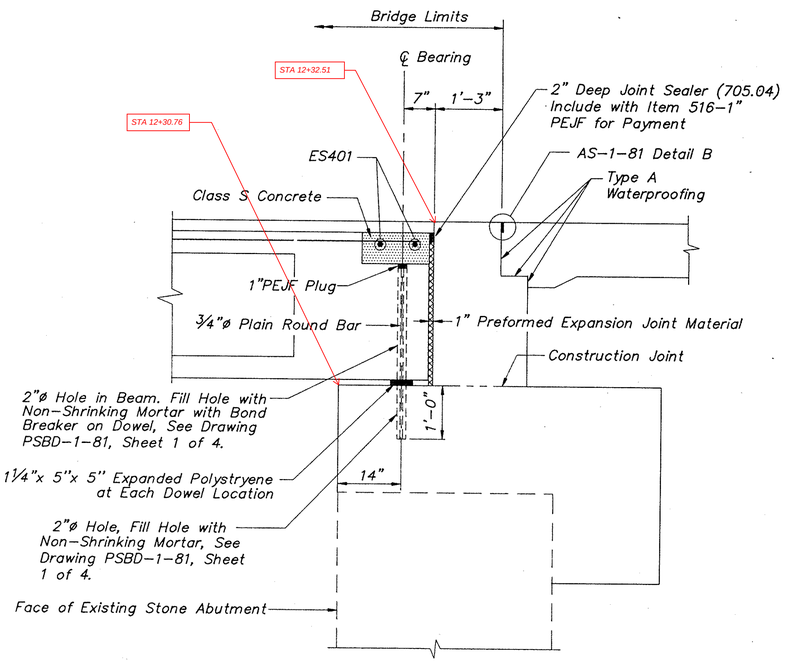
15/22



SECTION A–A
REAR ABUTMENT JOINT DETAIL
(EXPANSION BEARINGS)



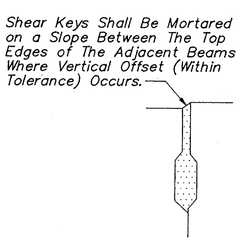
SECTION B–B
PIER JOINT DETAIL
(EXPANSION BEARINGS)



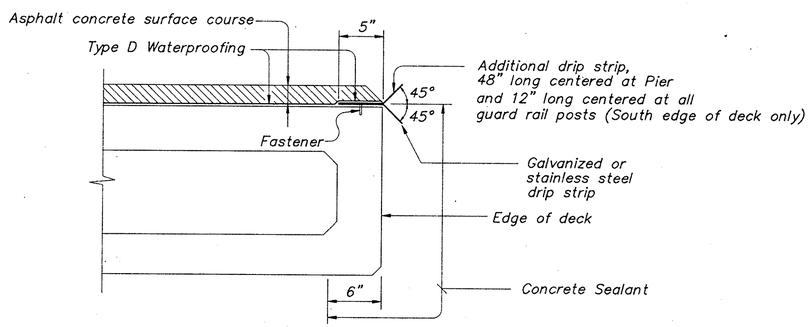
SECTION C–C
FORWARD ABUTMENT JOINT DETAIL
(FIXED BEARINGS)

Fixed Anchor Dowel Installation Procedure:

1. *Place Expanded Polystryene Grout Retainer.*
2. *Drill and Clean Dowel Hole.*
3. *Place Non-Shrinking Mortar, Dowel, and 1" Minimum Thickness PEJF Plug.*
4. *See Non-Shrinking Mortar Material Note on Drawing PSBD-1-81, Sheet 1 of 4.*



SHEAR KEY DETAIL



DRIP STRIP AND CONCRETE SEALANT DETAIL

DRIP STRIP: Prior to applying Type D waterproofing, a bent drip strip shall be installed along the south edge of the deck as shown. The strips shall be fastened at 1'-6" C/C maximum with 1-1/4"x 5/32"x 1/4" flat head drive pin and washer (Length x Shank Dia. x Head Dia.) or #10 galvanized screws and expansion anchors, subject to the approval of the Engineer. The strips shall be placed the full length of the deck, ending at the face of the abutment wingwall. Where splices are required a 3" (Min.) lap shall be used with a fastener through the lap. Steel for galvanized strips shall be 8"x 0.105" and shall meet the requirements of ASTM A568. Galvanizing shall be in accordance with 711.02. Stainless steel shall be 20 gauge ASTM A167, Type 304, mill finish. Payment shall be at the contract price bid for Item Special, Sq.Ft., Steel Drip Strip, which shall include all materials, labor, tools and incidentals necessary to complete the item.

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14/16

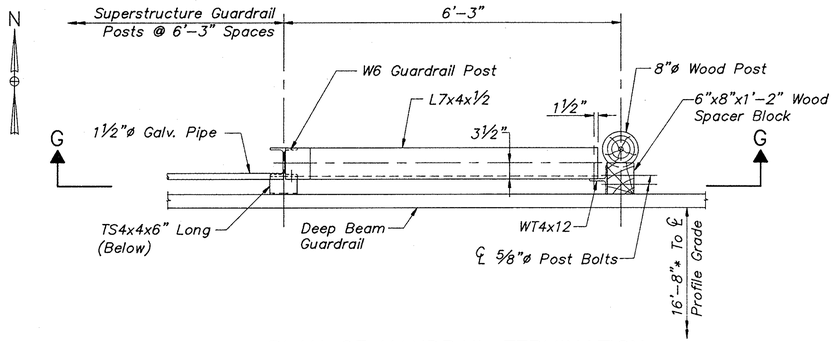
SUPERSTRUCTURE DETAILS
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.E.A.		

4/24

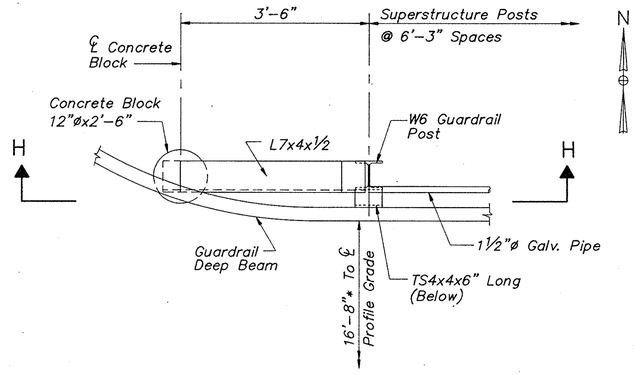
COII-22-36

CALC. BY		OLD MAIN STREET BRIDGE	OHIO
DATE			FHWA 5
CHKD. BY			REGION
DATE			



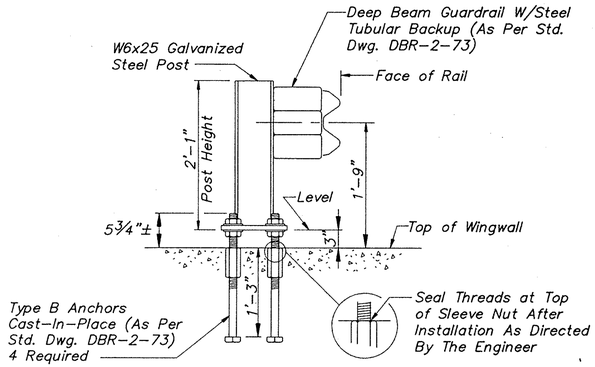
PLAN OF HANDRAIL TERMINATION AT FORWARD ABUTMENT

* Plus Beam Fit-up



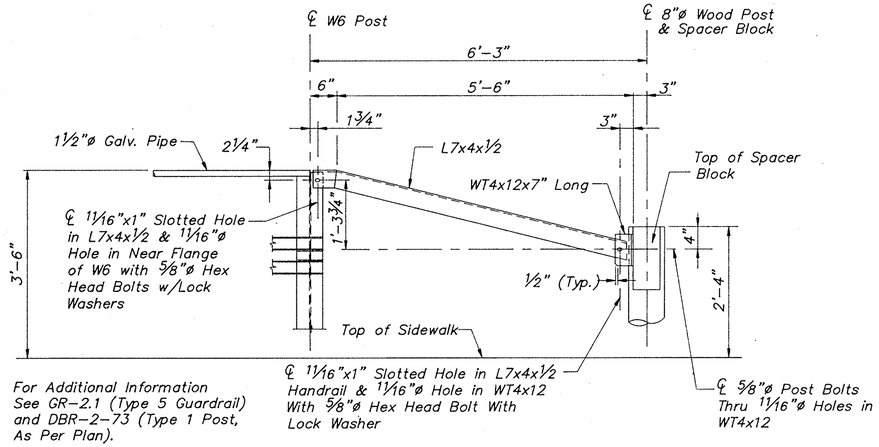
PLAN OF HANDRAIL TERMINATION AT REAR ABUTMENT

* Plus Beam Fit-up



SOUTH SIDE WINGWALL MOUNTED RAILPOST

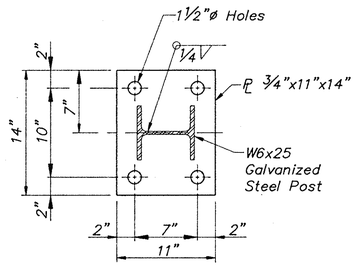
Steel Plates, Anchors, Nuts And Washers Shall Be Galvanized As Per 711.02. Cost of the Backwall Mounted Posts, Base Plates, Connections And Anchorage Shall Be Included With Item 517, Railing For Payment.



For Additional Information See GR-2.1 (Type 5 Guardrail) and DBR-2-73 (Type 1 Post, As Per Plan).

SECTION G-G

SECTION H-H



GUARDRAIL POST BASE PLATE

See Plan on Sheets 5/16 And 8/16 For Location And Orientation. (5 Required)

NORTH SIDE WINGWALL MOUNTED RAILPOST

Steel Plates, Anchors, Nuts And Washers Shall Be Galvanized As Per 711.02. Cost of the Backwall Mounted Posts, Base Plates, Connections And Anchorage Shall Be Included With Item 517, Railing For Payment.

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GUARDRAIL DETAILS
OLD MAIN STREET BRIDGE OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.L.B.	D.A.S.	D.A.S.	J.E.A.			

4134 0011-22-36

REINFORCING STEEL BAR SCHEDULE

CALC. BY DATE	OLD MAIN STREET BRIDGE	OHIO FHWA 5 REGION	17 / 22
CHKD. BY DATE			

REAR ABUTMENT

MARK	NO. REQUIRED		TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT (LBS)
RA501			26	7'–11"	6	1'–8"	3'–3"	3'–3"			215
RA502			31	8'–9"	6	5'–8"	1'–8"	1'–8"			283
RA503			31	5'–8"	STR						183
RA504			24	7'–0"	27	4'–6"	0'–11"	1'–10"			175
RA505			24	4'–10"	5	3'–6"	1'–5"				121
RA506			5	25'–0"	STR						130
RA507			15	29'–10"	STR						467
RA508			6	25'–5"	STR						159
RA509			4	8'–11"	STR						37
RA510			8	6'–11"	STR						58
RA511			4	1'–9"	STR						7
RA512			14	5'–7"	STR						82
RA513			12	3'–10"	27	1'–8"	1'–9"	8"			48
RA514			3	11'–7"	STR						36
RA515			2	13'–0"	STR						27
RA516			5	12'–6"	6	1'–5"	5'–8"	5'–8"			65
RA517			2	4'–4"	STR						9
RA518			9	6'–3"	27	2'–5"	2'–8"	1'–5"			59
RA519			7	8'–7"	STR						63
RA520			3	8'–9"	27	3'–3"	4'–0"	1'–9"			27
RA521			3	4'–8"	5	3'–0"	1'–9"				15
RA801			11	6'–3"	STR						184
RA802			17	4'–5"	8	1'–0"	2'–3"				200

TOTAL WEIGHT REAR ABUTMENT = 2,650

FORWARD ABUTMENT

MARK	NO. REQUIRED		TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT (LBS)
FA501			23	7'–7"	6	1'–8"	3'–1"	3'–1"			182
FA502			29	8'–7"	6	5'–8"	1'–7"	1'–7"			260
FA503			29	5'–8"	STR						171
FA504			24	6'–11"	27	4'–5"	11"	1'–10"			173
FA505			24	4'–9"	5	3'–5"	1'–5"				119
FA506			5	23'–6"	STR						123
FA507			16	29'–10"	STR						498
FA508			6	28'–2"	STR						176
FA509			5	12'–6"	6	1'–5"	5'–8"	5'–8"			65
FA510			2	4'–4"	STR						9
FA511			15	8'–1"	6	3'–8"	2'–4"	2'–4"			126
FA512			1	7'–5"	6	3'–0"	2'–4"	2'–4"			8
FA513			1	6'–11"	6	2'–6"	2'–4"	2'–4"			7
FA514			1	6'–4"	6	1'–11"	2'–4"	2'–4"			7
FA515			2	18'–3"	STR						38
FA516			2	18'–6"	STR						39
FA517			1	16'–9"	STR						17
FA518			1	15'–0"	STR						16
FA519			2	14'–7"	STR						30
FA520			11	6'–3"	6	3'–8"	1'–5"	1'–5"			72
FA521	1 Series of 11			6'–2" / 2'–0"	5	4'–10" / 8"	1'–5"	A Varies By 5"			47
FA522			3	22'–6"	STR						70
FA523			2	14'–5"	STR						30
FA524			1	15'–1"	STR						16
FA525			1	17'–4"	STR						18
FA526			1	20'–0"	STR						21
FA527			3	15'–5"	5	12'–6"	3'–0"				48
FA701			6	3'–6"	STR						43
FA801			17	4'–5"	8	1'–0"	2'–3"				201

TOTAL WEIGHT FORWARD ABUTMENT = 2,630

PIER

MARK	NO. REQUIRED		TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT (LBS)
P501			32	4'–6"	STR						150
P502			6	31'–4"	STR						196
P503			62	19'–6"	STR						1261
P504			28	5'–11"	6	1'–6"	2'–4"	2'–4"			173
P505			28	27'–6"	STR						803
P506			28	6'–8"	45	10"	2'–0"	2'–7⅜"	2'–0"		195
P601			62	7'–7"	5	6'–9"	12"				706

PIER TOTAL WEIGHT = 3,484

SUPERSTRUCTURE

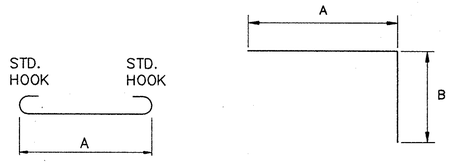
MARK	NO. REQUIRED		TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT (LBS)
ES401			8	28'–6"	STR						152
ES402			4	30'–0"	STR						80
ES501			32	3'–3"	1	2'–3"					108
ES502			142	2'–1"	6	8"	10"	10"			308
ES503			142	2'–3"	6	10"	10"	10"			333
ES504			284	4'–8"	STR						1,383
ES505			28	30'–0"	STR						876
ES506			7	27'–11"	STR						204

SUPERSTRUCTURE TOTAL WEIGHT = 3,444

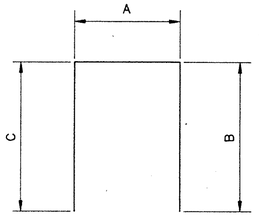
REAR ABUTMENT – CUT OFF WALL

MARK			TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT (LBS)
CW501			50	6'–7"	6	3'–8"	1'–7"	1'–7"			343
CW502	2 Series of 5			7'–5" / 8'–7"	9	2'–0"	5'–5" / 6'–7"	B Varies By 3½"		1'-1¼"	83
CW503	2 Series of 5			25'–6" / 28'–5"	STR	Varies By 8¾"					281
CW504	2 Series of 5			18'–6" / 20'–3"	9	2'–0"	16'–6" / 18'–3"	B Varies By 5¼"		6⅝"	202
CW505			44	4'–6"	5	3'–9"	10"				207
CW506			91	5'–10"	STR						553
CW507			6	6'–9"	9	2'–0"	4'–9"			1'–1¼"	42
CW508			6	6'–2"	9	2'–0"	4'–2"			1'–1¼"	39
CW509			6	26'–9"	STR						167
CW510			6	25'–3"	STR						158
CW511			6	16'–8"	9	2'–0"	14'–8"			6⅝"	104
CW512			6	15'–10"	9	2'–0"	13'–10"			6⅝"	99

TOTAL WEIGHT REAR ABUTMENT CUT OFF WALL = 2,278



TYPE 1 TYPE 5



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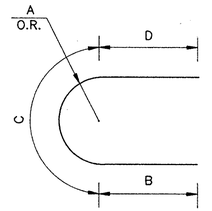

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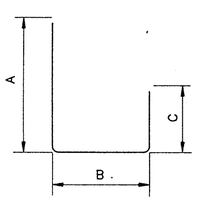
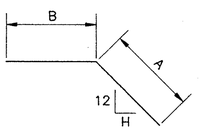
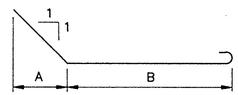


TYPE 27



TYPE 9



TYPE 8

Notes:
1. All Dimensions Are Out To Out Of Bars.
2. All Reinforcing Bars Prefixed With "E" Shall Be Epoxy Coated.

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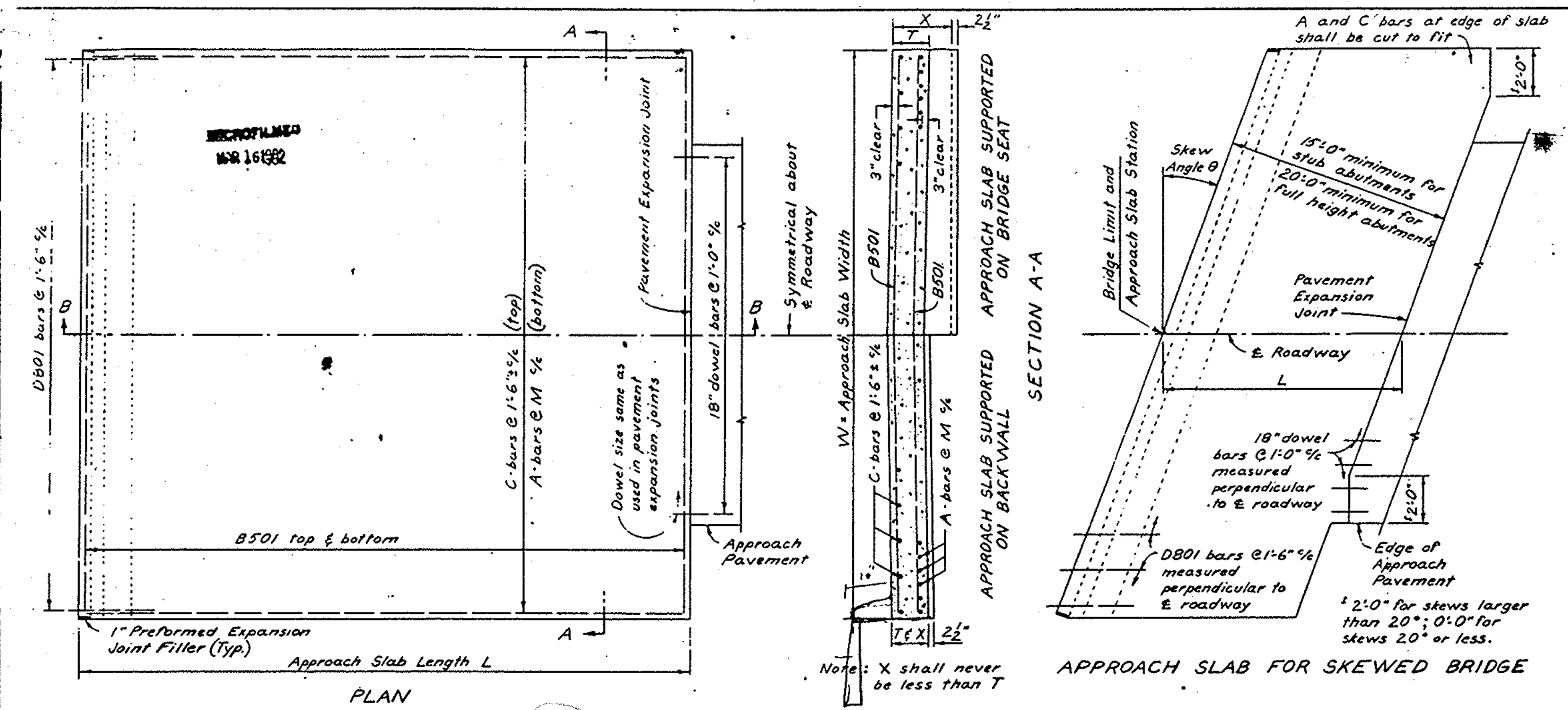
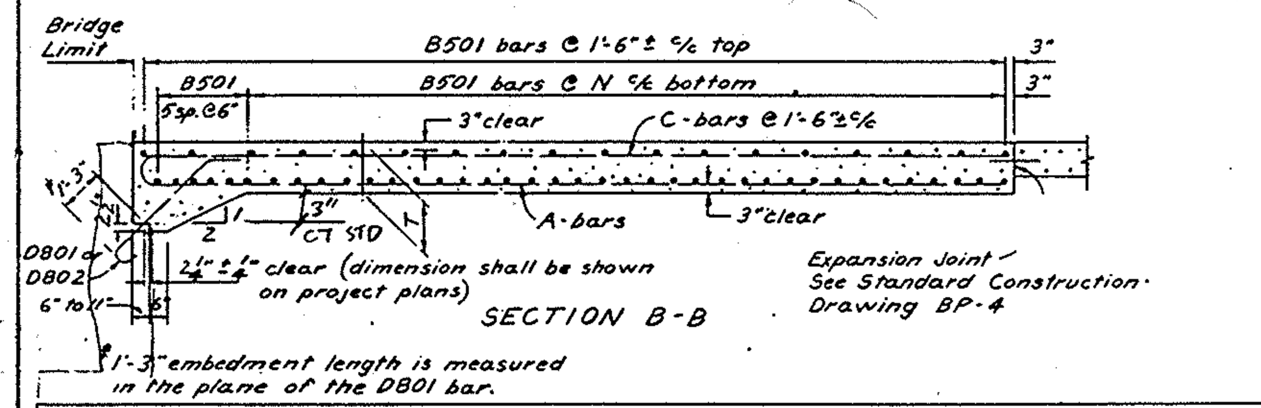
16 / 16

REINFORCING SCHEDULE
OLD MAIN STREET BRIDGE
OVER CONNEAUT CREEK
ASHTABULA COUNTY

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.L.B.	R.L.B.	R.L.B.	J.P.R.			

76781 OC11-22-36





GENERAL: This drawing provides design and general construction details. The project plans will show length, skew, curbs (if any), estimated quantity (sq. yds.), and special notes and details where necessary. For conditions other than those indicated hereon, the approach slab shall be adapted to fit the ends of the bridge and the approach pavement.

ANCHOR BARS D801 or D802 shall be detailed for the specific bridge and shall be included with Item 509 under abutments or superstructure for payment. D801 bars cannot be used as shown where approach slabs are supported on backwalls less than 14 inches thick. D802 bars shall be used on prestressed concrete box beam bridges where the approach slab is supported on an 11 inch thick backwall.

DESIGN SPECIFICATIONS: This standard drawing conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1977, including the 1978, 1979, 1980 and 1981 Interim Specifications and the Ohio "Supplement" to these specifications.

DESIGN DATA
Design Loading: HS20-44 and the Alternate Military Loading
Concrete Class C: compressive strength 4000 p.s.i.
Reinforcing Steel: ASTM A615, A616 or A617 - Grade 60 minimum yield strength 60,000 p.s.i.

REINFORCING STEEL: For skewed bridges the A and C bars shall be placed parallel to the center line of roadway and the B bars shall be placed parallel to the abutments.

PREFORMED EXPANSION JOINT FILLER AND SEALER at the corners and sides of the approach slab shall be included in the price bid per sq. yd. for the approach slab.

PREFORMED ELASTOMERIC JOINT SEALER shown at the bridge limit end of the approach slab shall be included in the price bid per sq. yd. for the approach slab.

LONGITUDINAL CONSTRUCTION JOINTS required for stage construction shall be as per 511.09

CURBS, BRIDGES WITH SIDEWALKS: For bridges constructed with raised sidewalks, deflector parapets or other types of construction which retain roadway surface drainage, the approach slabs shall either include integral curbs or be constructed in conjunction with bridge curbs. Curb height shall be transitioned uniformly between bridge curb height and approach curb height in a length as follows: Where wingwall extends beyond end of approach slab, use a minimum length of 10 ft. beyond end of wingwall. Where the approach slab extends beyond the end of wingwall, transition in this length. However, the transition length shall not be less than 10 ft. and the transition shall extend beyond the end of approach slab if necessary.

APPROACH SLAB WIDTH (W): Generally approach slabs shall be the same width as the bridge roadway.

LENGTH of approach slabs shall be shown on project plans.

CROWN shall conform to that of the approach pavement and bridge deck. If the rate of crown of the bridge deck differs from that of the approach pavement, a smooth transition shall be provided within the limits of the approach slab.

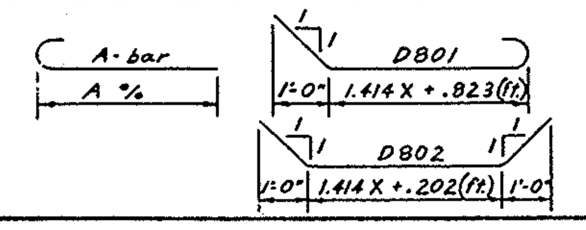
WEARING SURFACE: Generally approach slabs shall have an asphalt concrete wearing surface only when both the approach pavement surface and the bridge wearing surface are asphalt concrete.

EXPANSION JOINT details at the appoach pavement end of the approach slab are used only in conjunction with concrete pavement or concrete base course. Payment for the expansion joint, including dowel bars, preformed expansion joint filler and joint sealer, is included in the price bid per sq. yd. for the approach slab.

REINFORCING STEEL
(For one approach slab)

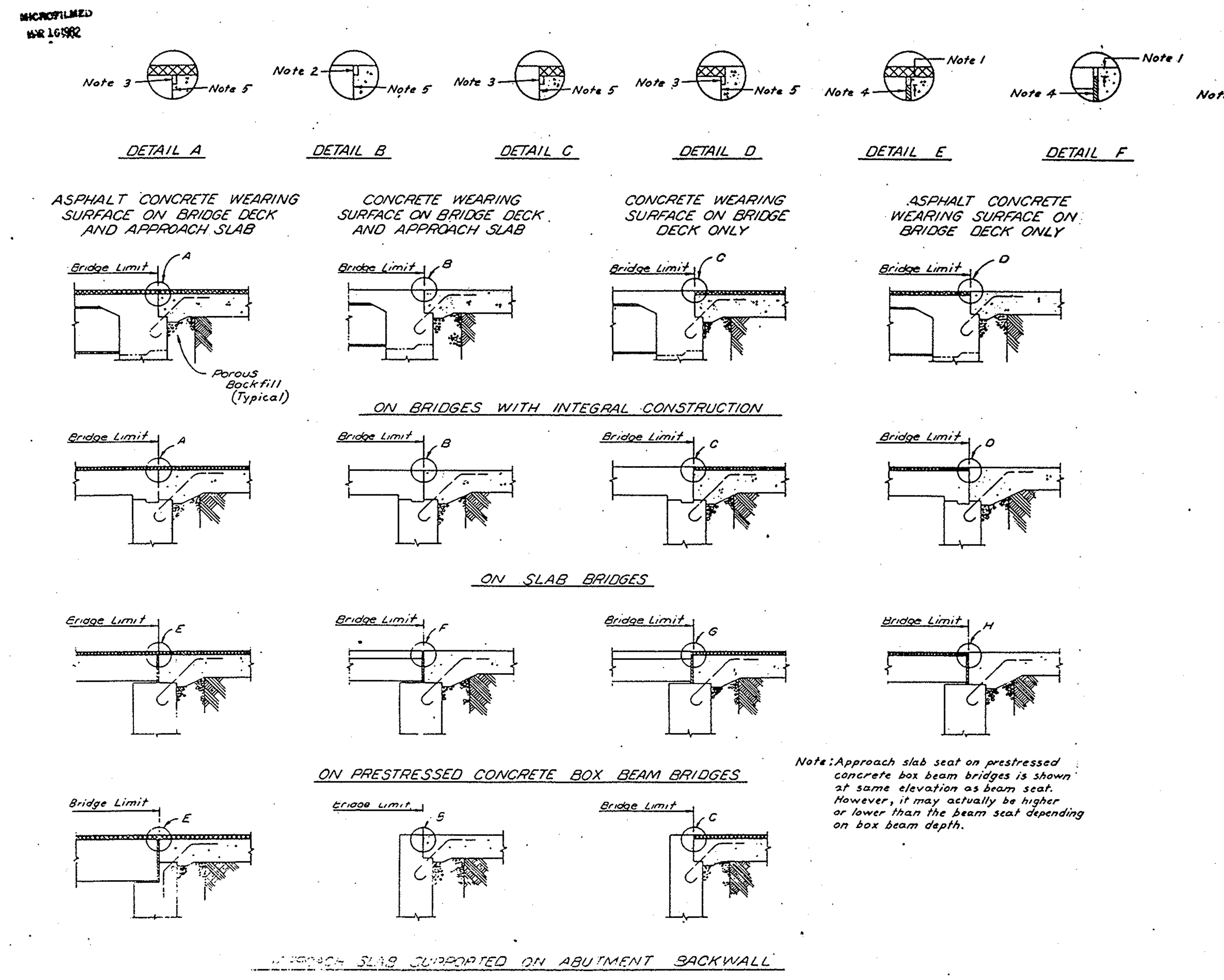
Length L	Thickness T	A-BARS Sp'c'g M	A-BARS Mark	A-BARS Length	A-BARS Dimension A	A-BARS No. Req'd	B501 (bottom) * Length	B501 (bottom) Sp'c'g N	B501 (bottom) No. Req'd	B501 (top) * Length	B501 (top) No. Req'd	C-BARS Mark	C-BARS Length	C-BARS No. Req'd	D801 or D802 No. Req'd
15'-0"	12"	10"	A1001	15'-11"	14'-6"	12[(W-0.5)/M]+1	(W-0.5) sec θ	9"	22	(W-0.5) sec θ	11	C501	14'-6"	12[(W-0.5)/18]+1	12[(W-0.5)/18]+1
20'-0"	13"	7½"	A1002	20'-11"	19'-6"			8"	31		14	C502	19'-6"		
25'-0"	15"	7"	A1003	25'-11"	24'-6"			8"	39		18	C503	24'-6"		
30'-0"	17"	6½"	A1004	30'-11"	29'-6"			8½"	44		21	C504	29'-6"		

W = Approach Slab Width, out-to-out, in feet
θ = Angle of Skew
M = A-bar spacing in inches
N = B-bar spacing in inches
X = Approach Slab Thickness at abutment end in feet.



* At the option of the contractor, the B501 bars may be lapped 1'-8" minimum at the centerline of roadway, or where required for longitudinal construction joints.

REVISIONS | STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN
STANDARD REINFORCED CONCRETE APPROACH SLABS
APPROVED: Robert B. Clingan, ENGINEER OF BRIDGES; DATE: 11-23-81; PREPARED FFE; CHECKED GSB; REVIEWED WJJ; DRWG. NO. AS-1-81; SHEET NO. 1 OF 3 SHEETS



Note 1: 2" joint sealer 705.01 or 705.02

Note 2: Preformed elastomeric joint sealer 705.11 (1¼" for ½" joint) depressed ⅛" below roadway, placed in ½" x 2¼" groove.

Note 3: Preformed elastomeric joint sealer 705.11 (1¼" for ½" joint) placed in ½" x 2⅛" groove.

Note 4: 1" preformed expansion joint filler.

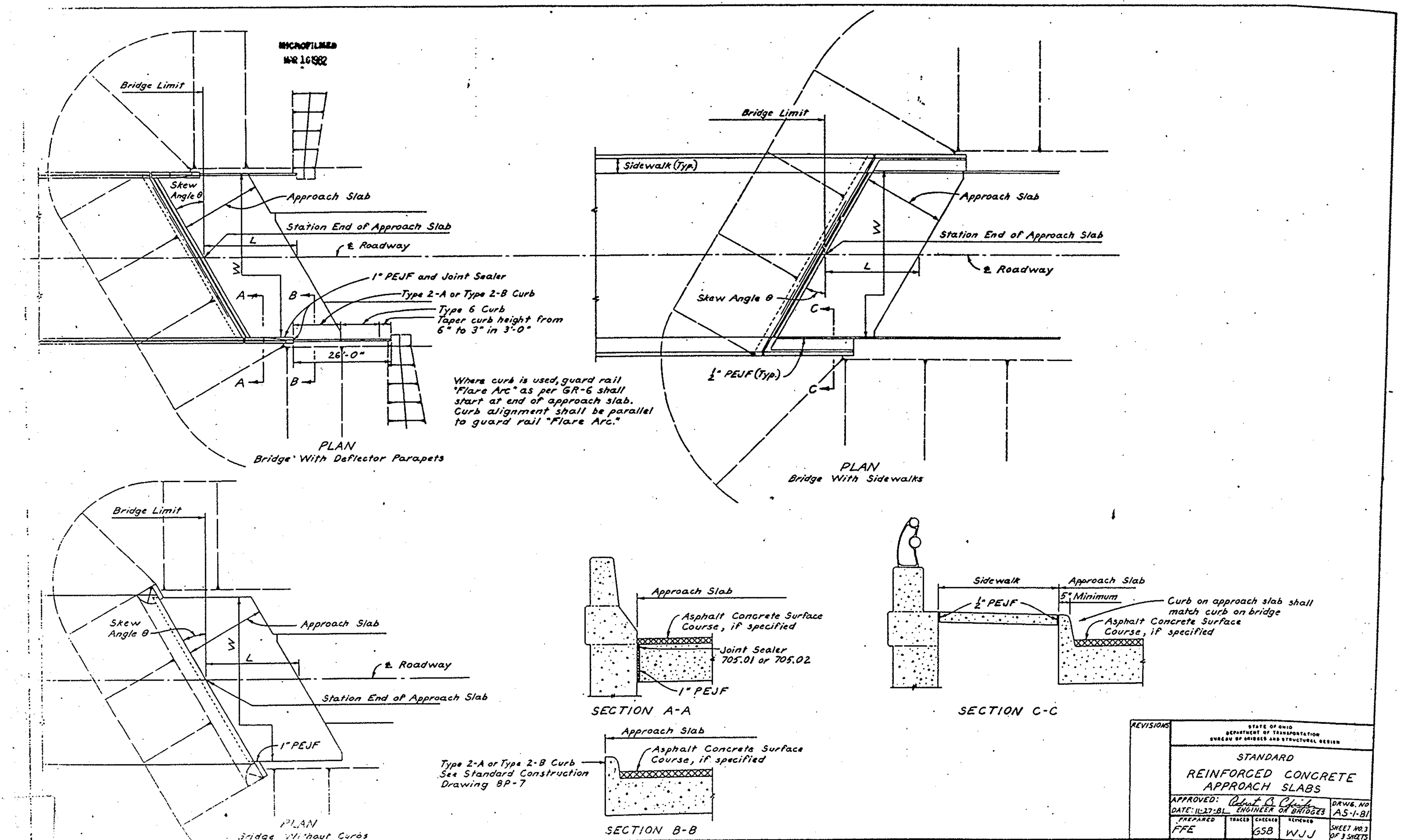
Note 5: Type A waterproofing.

Type A waterproofing shall not extend above the bottom of the groove into which the preformed elastomeric joint sealer is to be placed. It shall be applied to the entire area of the abutment or superstructure which comes into contact with the approach slab.

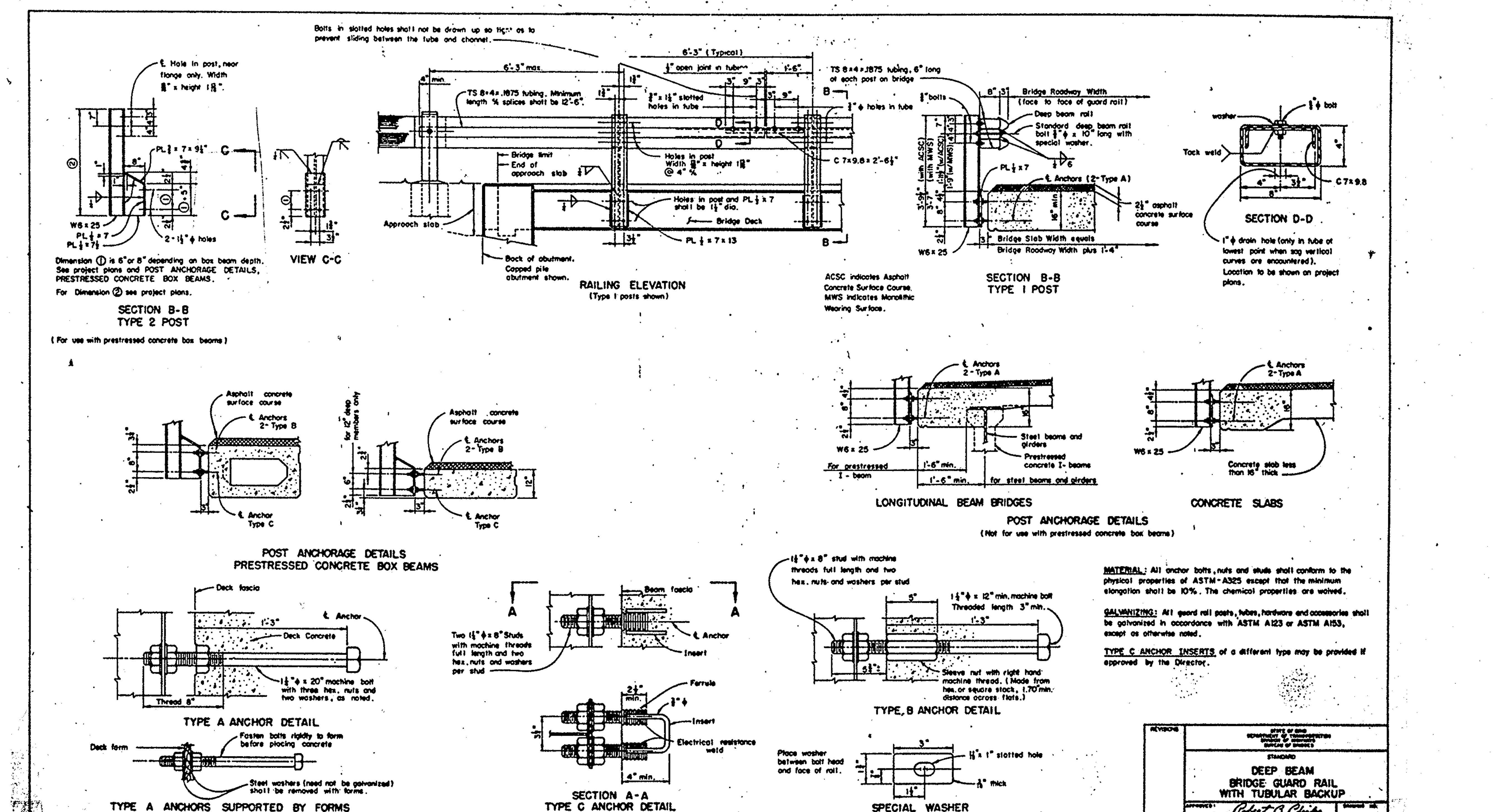
For prestressed concrete box beam bridges with asphalt concrete on both bridge deck and approach slab, the top of approach slab at the bridge end shall be constructed to the level of the top of the beams to facilitate waterproofing of the joint. The thickness of asphalt concrete at the approach end shall be the thickness of asphalt concrete used on the roadway pavement. The thickness of asphalt concrete shall vary uniformly, if necessary, in the length of the approach slab. The base shall be graded to permit the bottom of the approach slab to be parallel to the top.

For structures having asphalt concrete wearing surface on both bridge deck and approach slabs and where no deck expansion devices are provided, the deck membrane waterproofing shall extend beyond the bridge limits a distance of 2'-0".

REVISIONS | STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN
STANDARD REINFORCED CONCRETE APPROACH SLABS
APPROVED: Robert B. Clingan, ENGINEER OF BRIDGES; DATE: 11-23-81; PREPARED FFE; CHECKED GSB; REVIEWED WJJ; DRWG. NO. AS-1-81; SHEET NO. 2 OF 3 SHEETS



REVISIONS | STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN
STANDARD REINFORCED CONCRETE APPROACH SLABS
APPROVED: Robert B. Clingan, ENGINEER OF BRIDGES; DATE: 11-23-81; PREPARED FFE; CHECKED GSB; REVIEWED WJJ; DRWG. NO. AS-1-81; SHEET NO. 3 OF 3 SHEETS



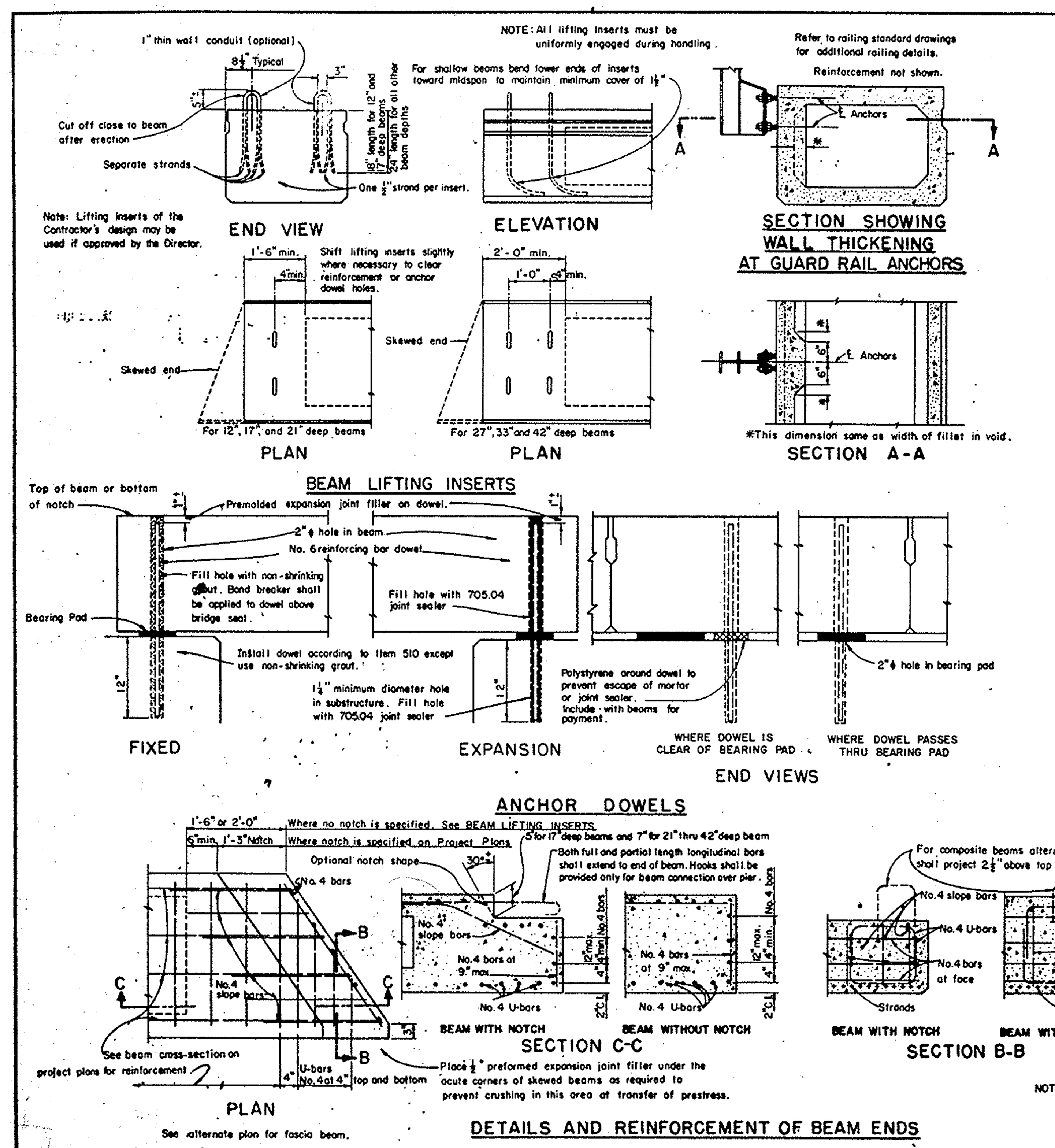
MATERIAL: All anchor bolts, nuts and studs shall conform to the physical properties of ASTM-A325 except that the minimum elongation shall be 10%. The chemical properties are waived.

GALVANIZING: All guard rail posts, tubes, hardware and accessories shall be galvanized in accordance with ASTM A123 or ASTM A153, except as otherwise noted.

TYPE C ANCHOR INSERTS of a different type may be provided if approved by the Director.

REVISIONS | STATE OF OHIO DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS BUREAU OF BRIDGES
STANDARD DEEP BEAM BRIDGE GUARD RAIL WITH TUBULAR BACKUP
APPROVED: Robert B. Clingan; DATE: 9/10/73; PREPARED INNES; TRACED TGC; CHECKED CPD; REVIEWED BFG FHR MFW; DBR-2-73

90134 0011-22-36



GENERAL: The project plans shall specify the details on this standard drawing which are to apply.

TRANSVERSE TIE RODS shall be 1" diameter steel rods of A36 steel, threaded both ends, and with nut and washer at each end. Threads may be cut or rolled. If rolled threads are used, minimum diameter of rod at root of threads shall be 0.838". Tension shall be applied by a torque of approximately 250 foot-pounds. After the tie rods are tightened the recesses in the facia beams shall be filled with non-shrinking mortar of the same color as the beam. One transverse tie rod will be permitted to tie a maximum of three beams together.

PRESTRESSING STRANDS: The project plans shall specify the number, location, size, and strength of prestressing strands, the required prestressing force and deflected or de-bonded strand data.

GALVANIZING: All anchor bolts, studs, inserts, tie rods, nuts and washers shall be galvanized per 711.

ANCHOR DOWELS: The beam ends to be anchored shall be indicated on the project plans. Anchor dowel holes and prestressing strands shall be located to avoid mutual interference. The lateral spacing of the holes in the beam shall be such that the anchor dowels either clear the elastomeric bearing pads or pass thru 2" ϕ holes in the pads. Holes in pads shall have 1" minimum clearance from edges of pads.

After tensioning of the transverse tie rods the dowel holes shall be drilled into the abutment or pier seat and dowels installed. Cost of anchor dowels and installation shall be included with item 515 for payment.

BEARING PADS: Size, hardness, and location of elastomeric bearing pads shall be shown on the project plans.

NOTCHES shall be provided in beam ends where shown on the project plans to eliminate an open joint over piers (see sheet 4 of 4) or to accommodate anchorage for end dams or expansion joints.

END OF BEAMS, against which concrete is not to be placed, shall be coated with a bituminous material.

DRIP GROOVES: on the underside of the fascia beam shall not be permitted.

MORTARING OF SHEAR KEYS: After the transverse tie rods have been tightened shear keys shall be filled with non-shrinking mortar. Before mortaring, the keyway surfaces shall be wetted, but no free water shall be allowed to remain in the keyways. Mortar shall be placed into the keyways in a manner that insures complete and solid filling. Mortar and labor to place mortar are included with item 515 for payment.

COMPOSITE BRIDGES: The following notes apply to composite bridges only:

CLEANING PRIOR TO PLACEMENT OF COMPOSITE SLAB: Before placement of the slab concrete, the tops of all beams shall be thoroughly cleaned of all dirt, dust and other foreign matter. The surface shall be flushed with clear water and shall be wet, without free water, when the concrete is placed.

SLAB PLACEMENT: On multi-span bridges with slab continuous over piers, construction joints perpendicular to the centerline of roadway may be placed near the center of a span. However, composite slab pours shall be as long as practicable. On multi-span bridges with joints at piers, composite slabs shall be placed between joints without additional construction joints.

NON-SHRINKING MORTAR: Mortar or grout for keyways between prestressed concrete box beams, for tie rod recesses and for anchor dowel holes shall be a non-shrinking non-metallic mortar having a minimum compressive strength at 28 days of 5000 p.s.i. according to the Corps of Engineers Specification CRD-C621-83 when prepared to a moderate fluidity (124-145% flow table flow). The mortar or grout shall also meet all other requirements of Specification CRD-C621-83. The mortar shall be prepared, placed and cured in accordance with the manufacturer's recommendations, against surfaces as specified below.

PREPARATION OF CONCRETE SURFACES IN CONTACT WITH NON-SHRINKING MORTAR: The keyway surfaces shall be given a medium sandblast at the plant within four days before the beams leave the plant. Before mortaring, the keyways shall be thoroughly cleaned of all dirt, dust and other foreign matter. The keyway surfaces shall be wetted, but no free water shall be allowed to remain in the keyways.

PROJECT PLANS: The project plans for each structure will include the following:

A beam layout plan showing span length, beam length, skew angle, fixed and expansion ends of beams, location of anchor dowels, size and location of elastomeric bearing pads, location of diaphram centerlines and locations of railing posts.

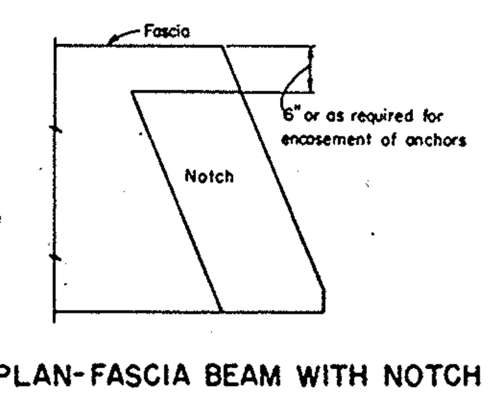
A transverse cross-section thru the deck.

A cross-section of the beam showing beam size, number and location of strands, debonded strands and longitudinal reinforcing steel.

Details at abutments and piers.

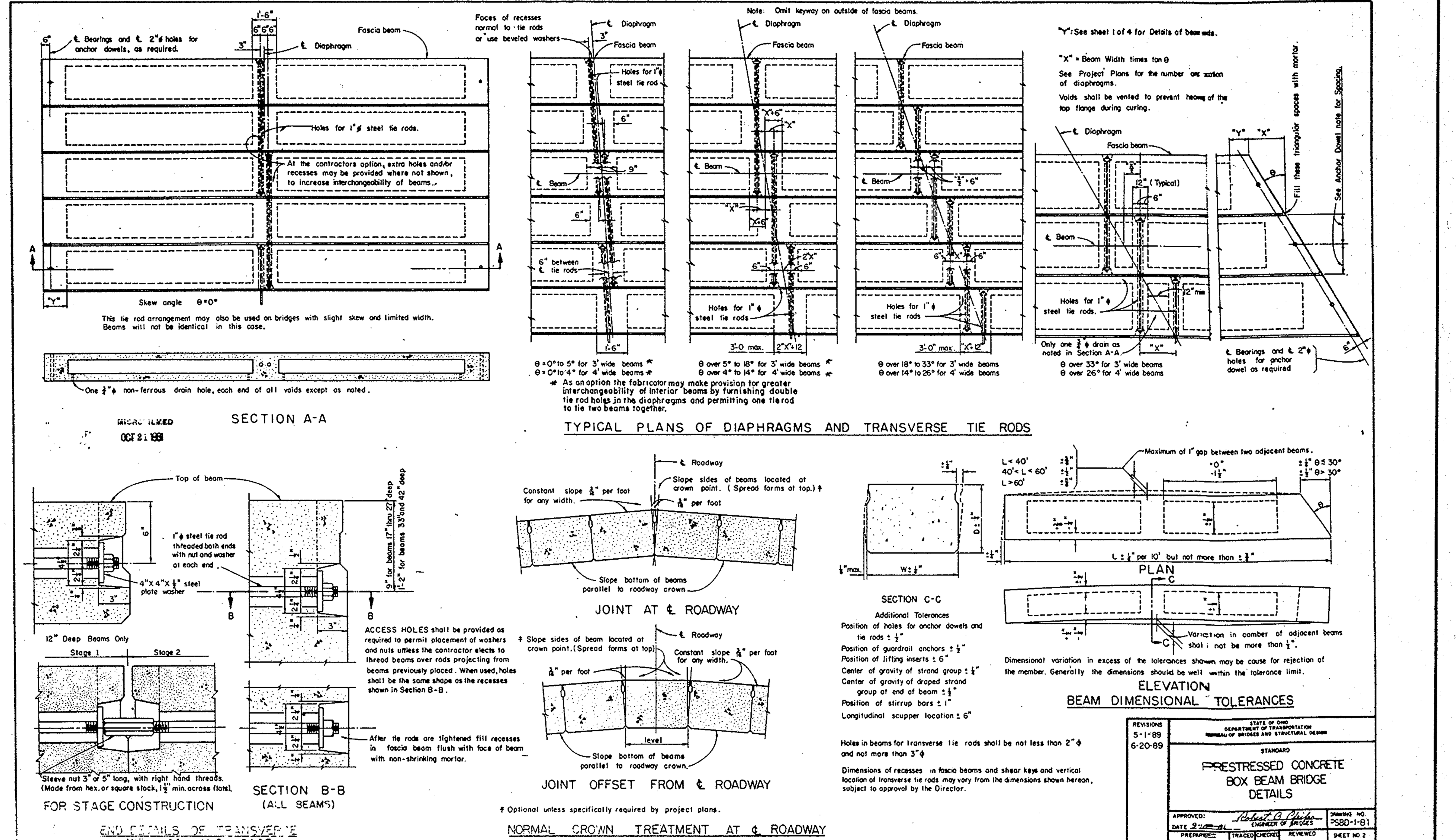
All other necessary details and information.

It is not intended that details shown on this standard drawing be repeated on the project plans except as may be required for clarity.

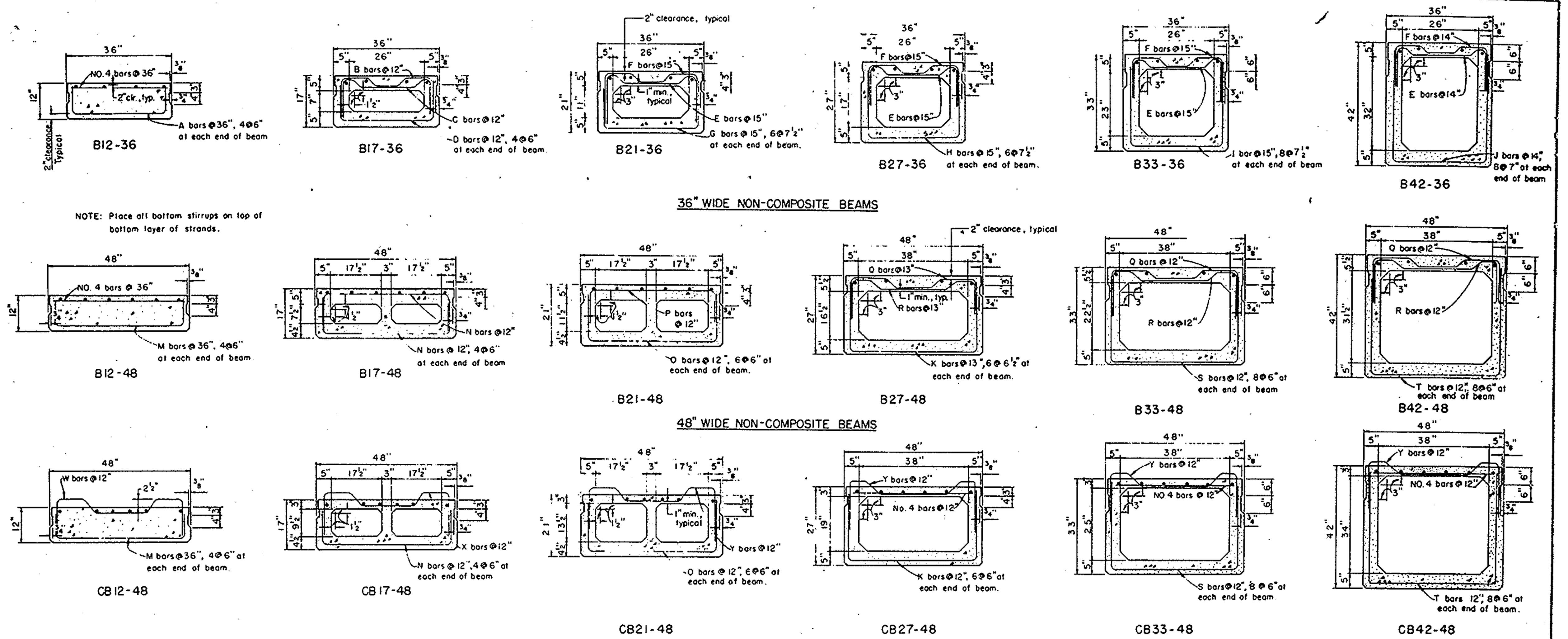


NOTE: The Fabricator's shop drawings shall show complete details of the beam reinforcing.

REVISIONS 5-1-89 6-20-89
STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN
STANDARD
PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS
PSBD-1-81 SHEET NO. 1 OF 4 SHEETS



REVISIONS 5-1-89 6-20-89
STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN
STANDARD
PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS
PSBD-1-81 SHEET NO. 2 OF 4 SHEETS



Bent Reinforcing Bars						
Mark	Type	a	b	c	d	e
A	1	31"	8"			
B	2	31"	13"	10"	1½"	8"
C	2	31"	13"	4"	1½"	20"
D	1	31"	13"			
E	2	31"	14"	4"	1½"	20"
F	2	31"	14"	10"	1½"	8"
G	1	31"	17"			
H	1	31"	23"			
I	1	31"	29"			
J	1	31"	38"			
K	1	43"	23"			
M	1	43"	8"			
N	1	43"	13"			
O	1	43"	17"			
P	1	43"	14"			
Q	2	43"	14"	13"	2"	13"
R	2	43"	14"	7"	2"	25"
S	1	43"	29"			
T	1	43"	38"			
W	2	43"	12"	9"	4"	17"
X	2	43"	17"	9"	4"	17"
Y	2	43"	18"	9"	4"	17"
WW	2	31"	12"	6"	4"	11"
XX	2	31"	17"	6"	4"	11"
YY	2	31"	18"	6"	4"	11"

Bending Diagrams: Type 2; Type 1.

All bars in this table are No. 4 bars.

36" WIDE COMPOSITE BEAMS are shown on Sheet 4 of 4.

MINIMUM LONGITUDINAL REINFORCING STEEL

36" wide non-composite & composite beams: 4 - No.5 bars.
48" wide non-composite beams:
B12 thru B21, 6 - No.4 bars
B27 thru B42, 4 - No.5 bars
48" wide composite beams: 6 - No.4 bars

See project plans for any additional longitudinal reinforcing steel bars required.

FABRICATOR'S SHOP DRAWINGS shall show complete details of beam reinforcing.

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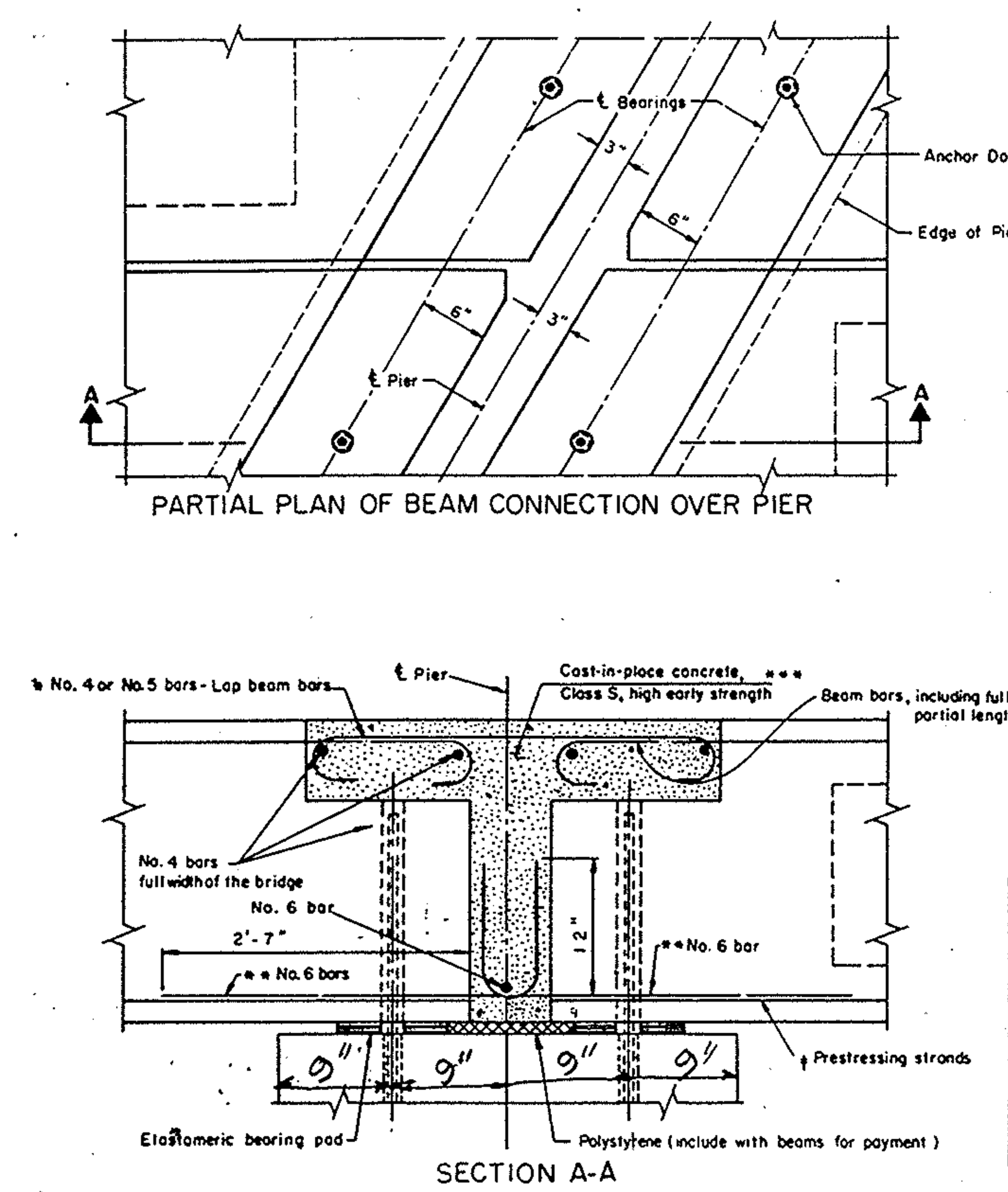
STANDARD
PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS
PSBD-1-81 SHEET NO. 3 OF 4 SHEETS



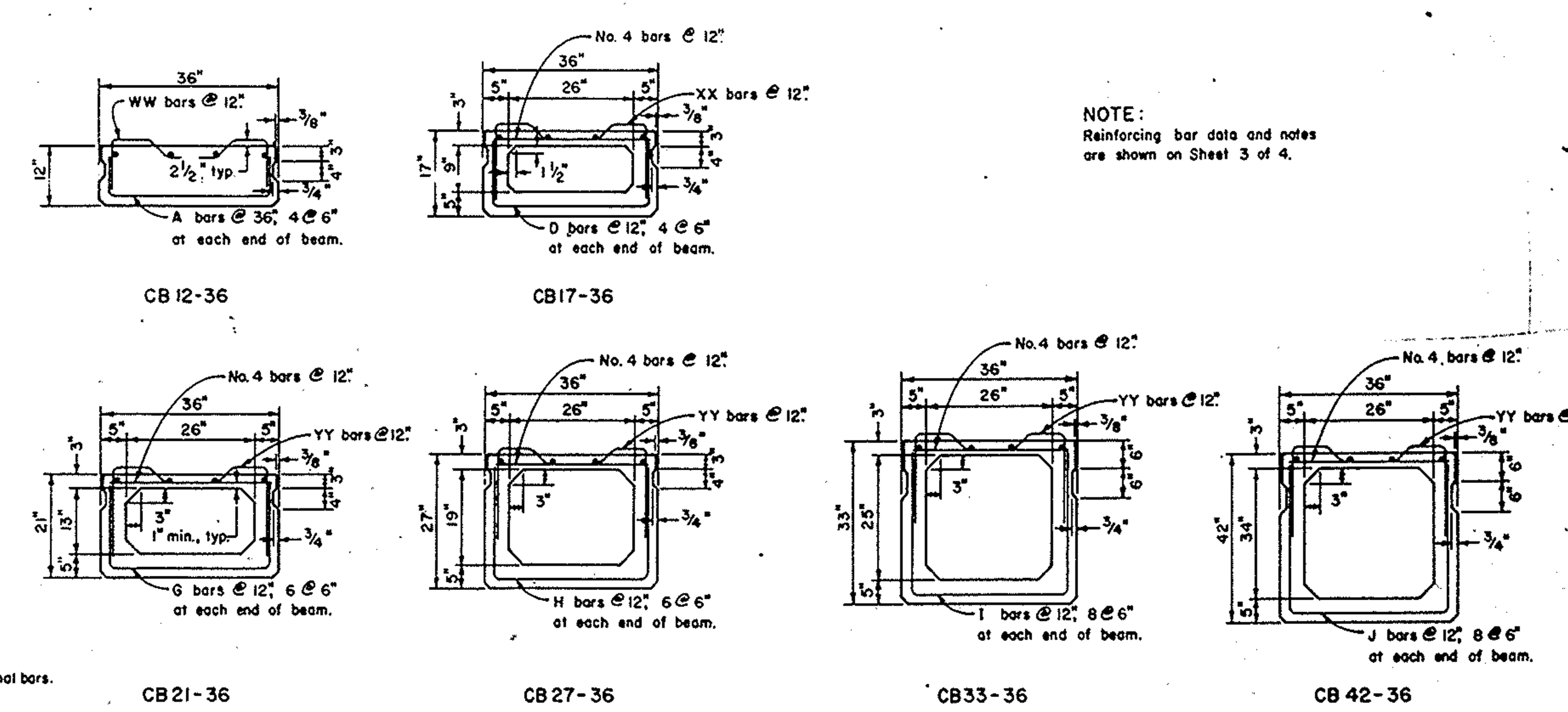
* Lap bars same size and number as beam bars. Hooks may be rotated from the vertical position to provide the required clearance.

** Provide 6 No. 6 bars each beam end in 48" wide beams and 4 No. 6 bars each beam end in 36" wide beams. No.6 bars shall be located on top of stirrups and shall be uniformly spaced across the beam.

† At the fabricator's option, strands may be extended and bent up in lieu of No.6 bars. 48" wide beams with a total of 12 or more strands shall have a minimum of 6 strands bent up. 48" wide beams with less than 12 strands total shall have approximately one half of the total number of strands bent up. 36" wide beams with a total of 8 or more strands shall have a minimum of 4 strands bent up. 36" wide beams with less than 8 strands total shall have approximately one half of the total number of strands bent up.

*** The high early strength requirement for the Class S concrete may be waived at the option of the Contractor.

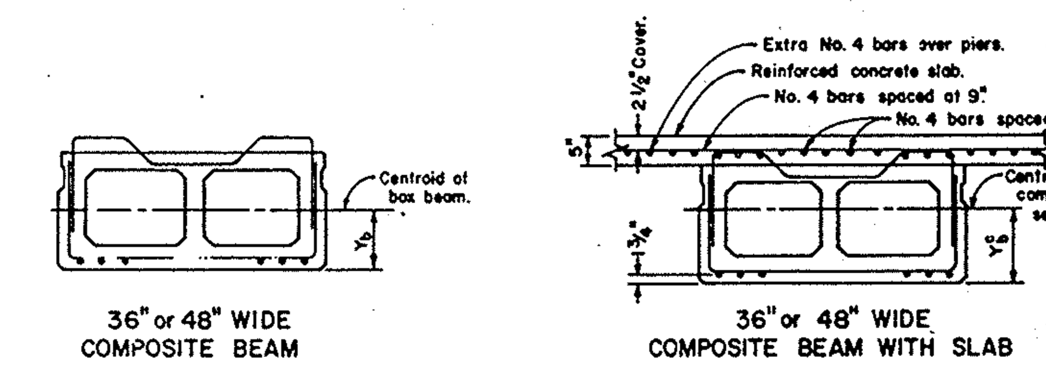
Note: The No. 6 bars or prestressing strands which are bent up shall be staggered in abutting beam ends to avoid interference.



NOTE: Reinforcing bar data and notes are shown on Sheet 3 of 4.

SECTION PROPERTIES							
		48" WIDE COMPOSITE BOX BEAM					
		CB12-48	CB17-48	CB21-48	CB27-48	CB33-48	CB42-48
Beam Only	A_b	567.8	484.3	536.3	583.8	638.5	728.5
	I_b	6,850	16,778	29,287	55,803	92,599	169,500
	Y_b	5.97	7.92	9.75	12.16	14.84	18.99
	Z_t	1,136	1,848	2,603	3,760	5,099	7,366
	Z_b	1,147	2,118	3,004	4,589	6,240	8,926
Composite Section	I_c	15,657	32,702	52,549	93,991	148,318	257,446
	Y_b^c	7.85	10.84	12.99	16.02	19.15	23.80
	Z_t^c	3,773	5,313	6,561	8,560	10,709	14,149
	Z_b^c	1,994	3,015	4,045	5,867	7,745	10,815

SECTION PROPERTIES							
		36" WIDE COMPOSITE BOX BEAM					
		CB12-36	CB17-36	CB21-36	CB27-36	CB33-36	CB42-36
Beam Only	A_b	423.9	374.3	427.9	487.9	542.6	632.6
	I_b	5,104	12,554	22,526	43,593	73,194	136,197
	Y_b	5.97	7.81	9.65	12.39	15.12	19.36
	Z_t	846	1,370	1,985	2,984	4,094	6,016
	Z_b	855	1,613	2,334	3,518	4,841	7,035
Composite Section	I_c	11,677	24,830	40,430	72,014	114,697	201,661
	Y_b^c	7.85	10.68	12.75	15.88	18.96	23.55
	Z_t^c	2,814	3,931	4,901	6,476	8,169	10,930
	Z_b^c	1,487	2,323	3,171	4,535	6,049	8,563



Section properties for composite sections are computed with a slab thickness of 4". Total thickness of slab is 5" which includes 1" monolithic wearing surface

Slab concrete is Class S concrete: f'_c = 4500 psi
Minimum beam concrete strength at 28 days: f'_c = 5500 psi

$$\frac{E_{slab}}{E_{beam}} = 0.90$$

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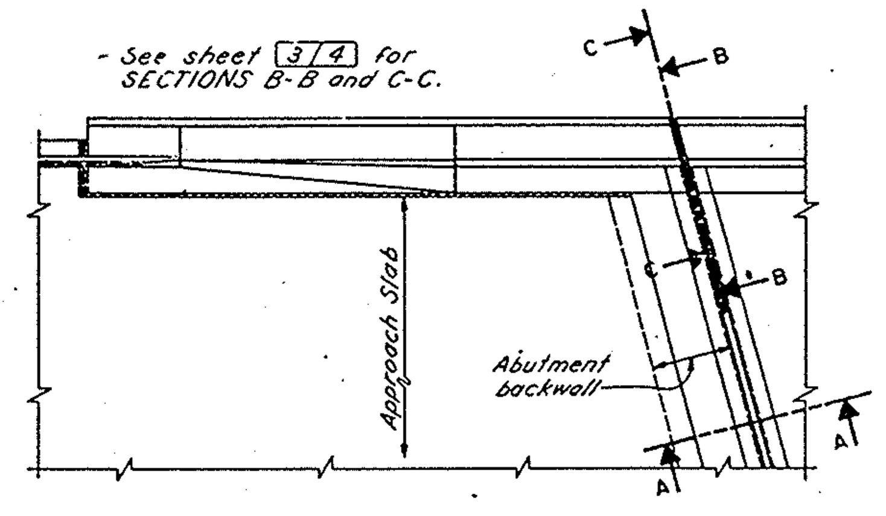
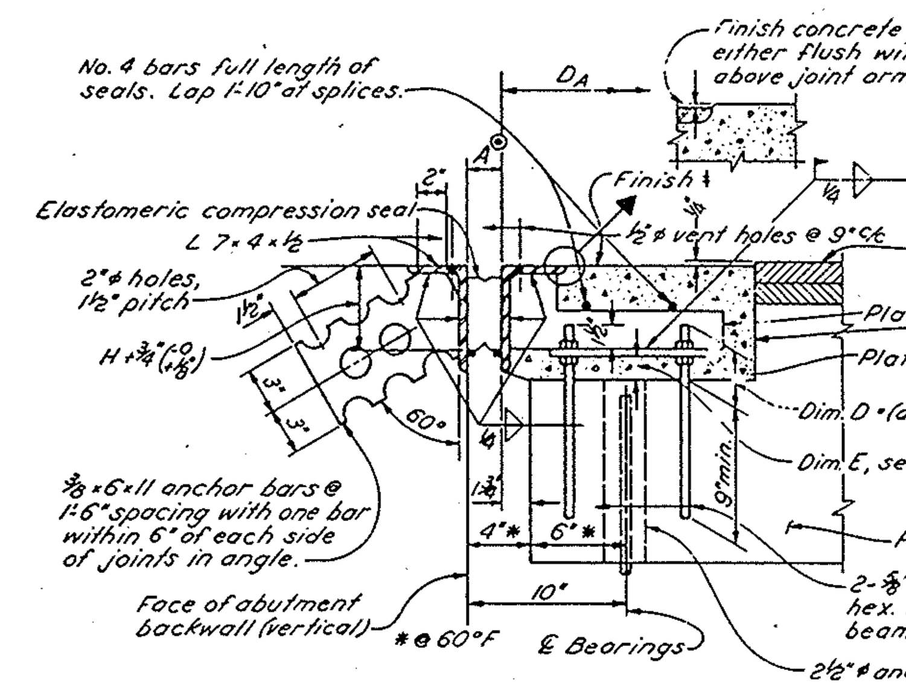
PSBD-1-81 SHEET NO. 4 OF 4 SHEETS

- See sheet [3/4] for SECTIONS B-B and C-C.

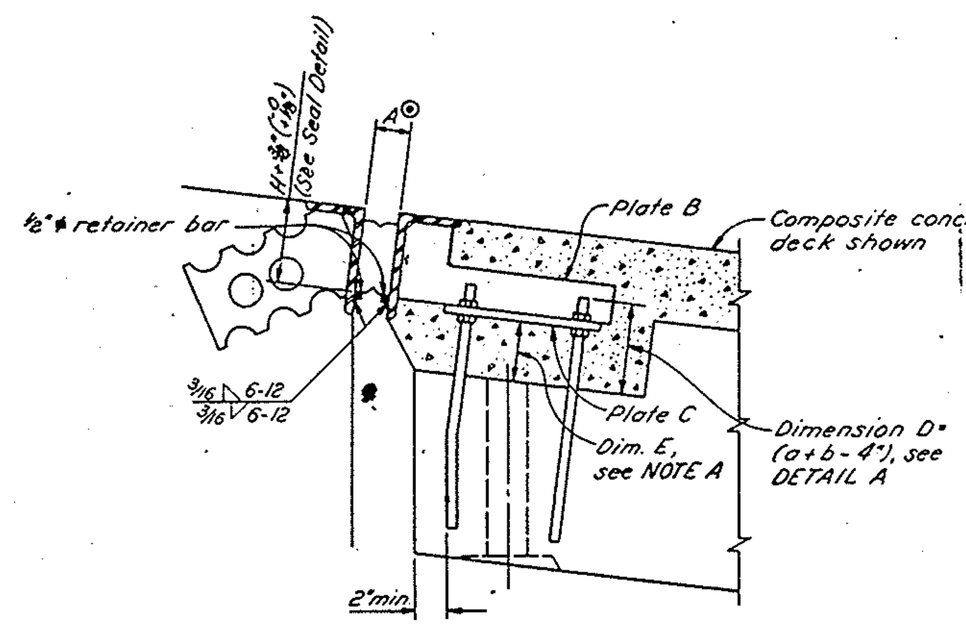


PART PLAN AT ABUTMENT
FOR BRIDGES WITH DEFLECTOR PARAPET RAILING



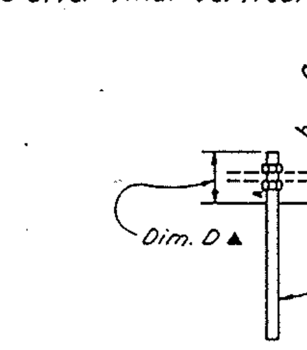
SECTION A-A
WITH ROADWAY GRADIENT OF 2% OR LESS

NOTE A:
If Dim. E is less than 3" a bed of non-shrinking grout shall be placed and compacted under each plate C after final vertical adjustment.



SECTION A-A
WITH ROADWAY GRADIENT GREATER THAN 2%

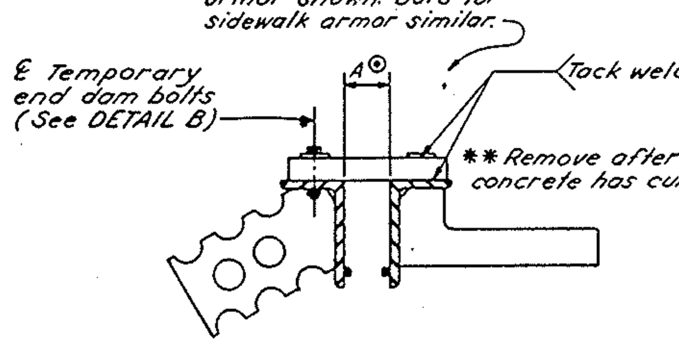
TRANSVERSE JOINTS in abutment armor angles shall be closely butted with a minimum of 6'-0" between joints. Superstructure armor angles shall be continuous full length of joint with a full penetration butt weld at each armor angle splice. Butt weld metal in contact with compression seal and retainer bar shall be ground flush.



a = Asphalt concrete wearing surface thickness (or composite slab thickness) at notch
b = 5" notch for 17" beams or 7" notch for 21" thru 42" beams.

▲ Dimension D shall be shown on Project Plans.

DETAIL A



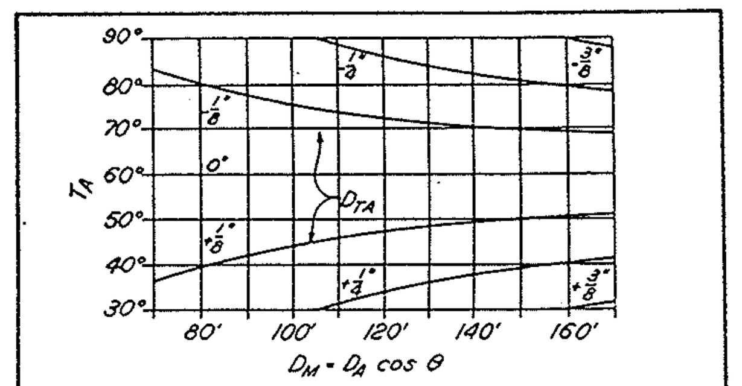
JOINT ARMOR ADJUSTMENT DETAIL

CONSTRUCTION PROCEDURE

1. Place backwall concrete during stable or rising ambient temperatures and conclude placement at or immediately before the day's peak ambient temperature.

⊙ 2. Not more than four hours prior to the day's peak ambient temperature, set abutment expansion joint width to dimension A which shall be determined as follows:
$A = 2\frac{1}{4}" \pm D_{TA}$, where
A = Joint width (inches) measured normal to joint
D_{TA} = Adjustment (inches) for a peak ambient temperature other than 60°F (see chart).

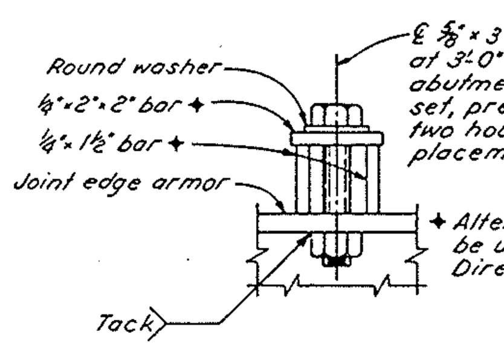
3. Loosen temporary end dam bolts after initial set of concrete, preferably not later than two hours after conclusion of concrete placement.



T_A = Anticipated peak ambient temperature (F°)
D_A = Actual distance to neutral expansion point of superstructure along centerline of roadway. See SECTION A-A on this sheet.
D_M = Modified distance for determining joint adjustment (feet).
θ = Skew angle of expansion joint.

DIMENSION "A" ADJUSTMENT D_{TA}

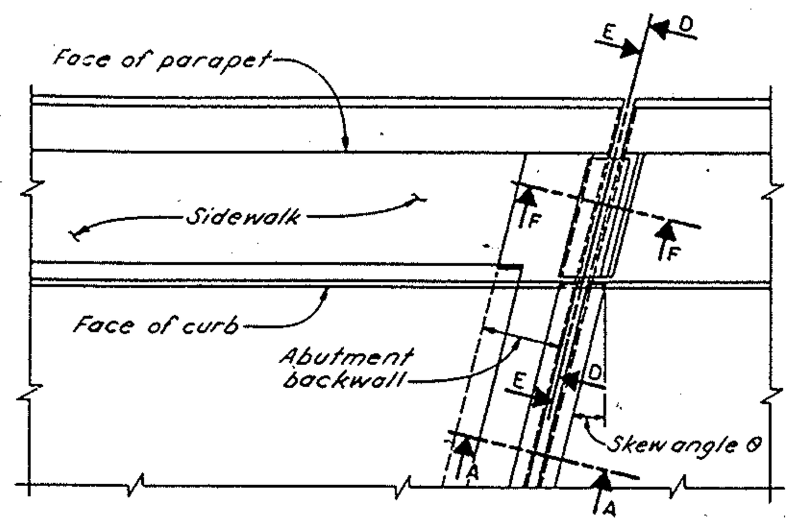
† 4. Surface texture on deck joints may be parallel with the joint for skewed bridges with asphalt concrete wearing surface.



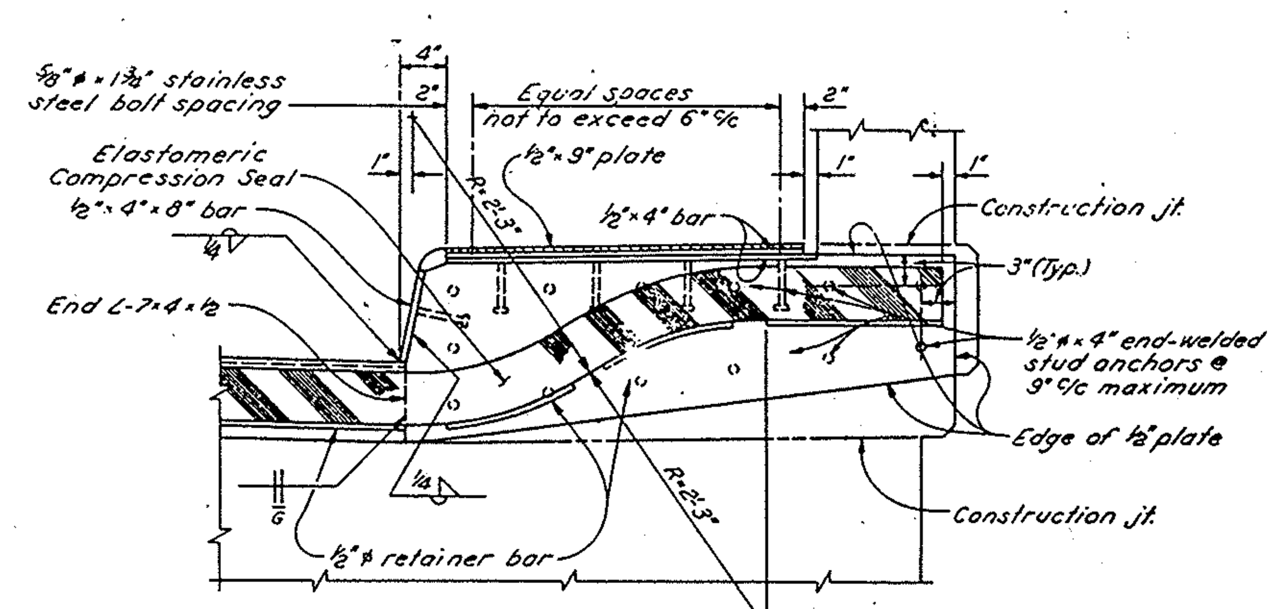
DETAIL B
TEMPORARY SUPPORT BARS

See sheet [3/4] for SECTIONS B-B and C-C, GENERAL NOTES and NOTES TO DESIGNER.

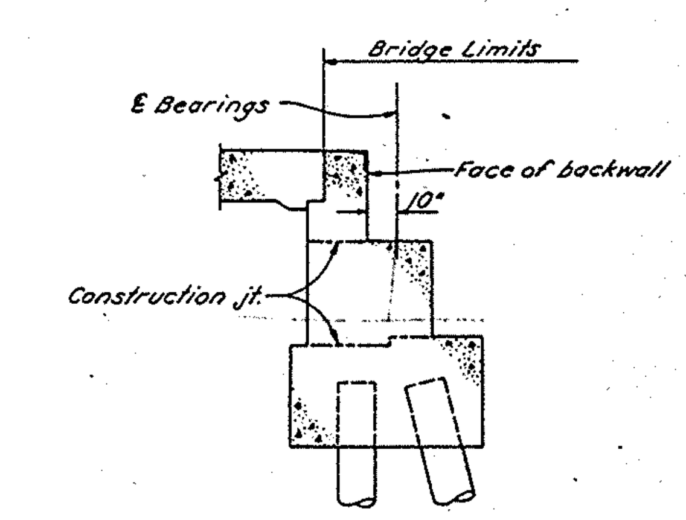
REVISIONS 8-1-84	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	1/4
	STANDARD COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES	
	APPROVED: 11-15-82 DATE — Robert B. Chiefer, ENGINEER OF BRIDGES	DRAWING NO. EXJ-3-82
	DESIGNED RLD, DRAWN RLD, TRACED AJM, CHECKED MPB, REVIEWED RLD	



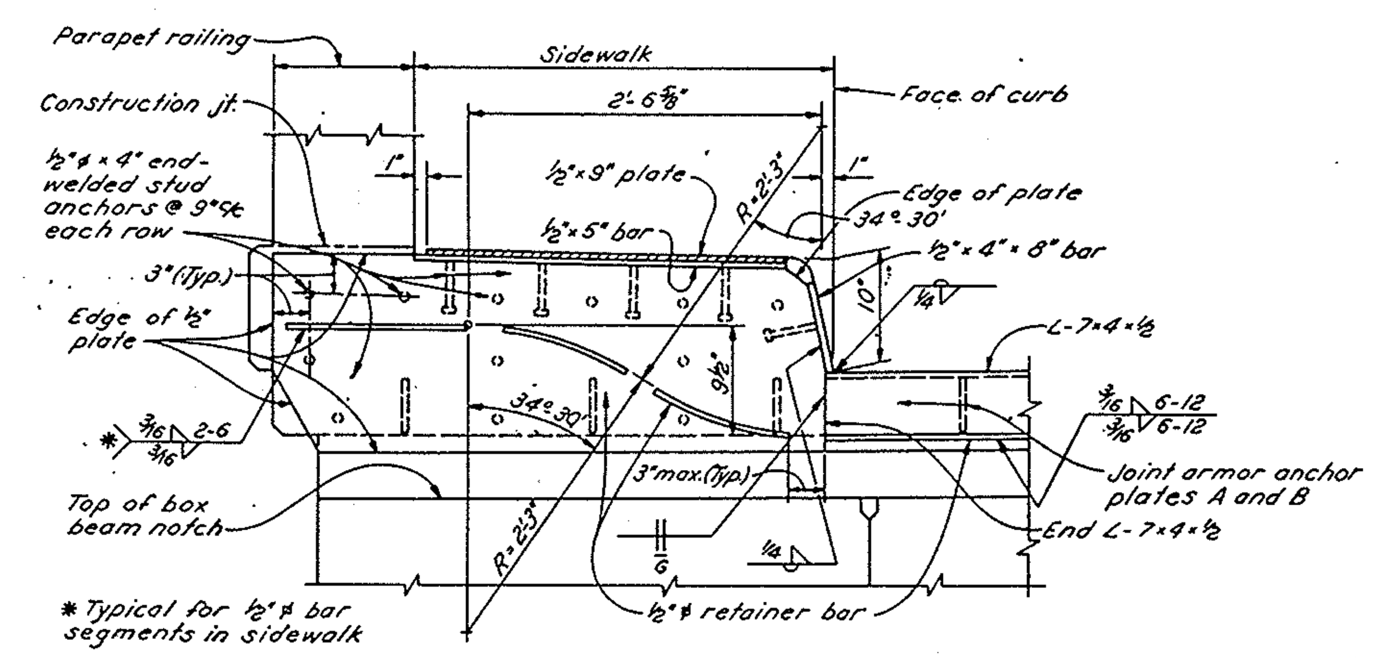
PART PLAN AT ABUTMENT
FOR BRIDGES WITH SIDEWALK PARAPET RAILING



SECTION D-D △
SEE SECTION E-E FOR OTHER DETAILS NOT SHOWN



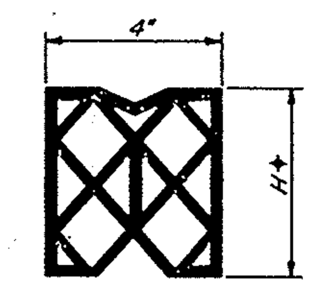
ABUTMENT TYPICAL SECTION



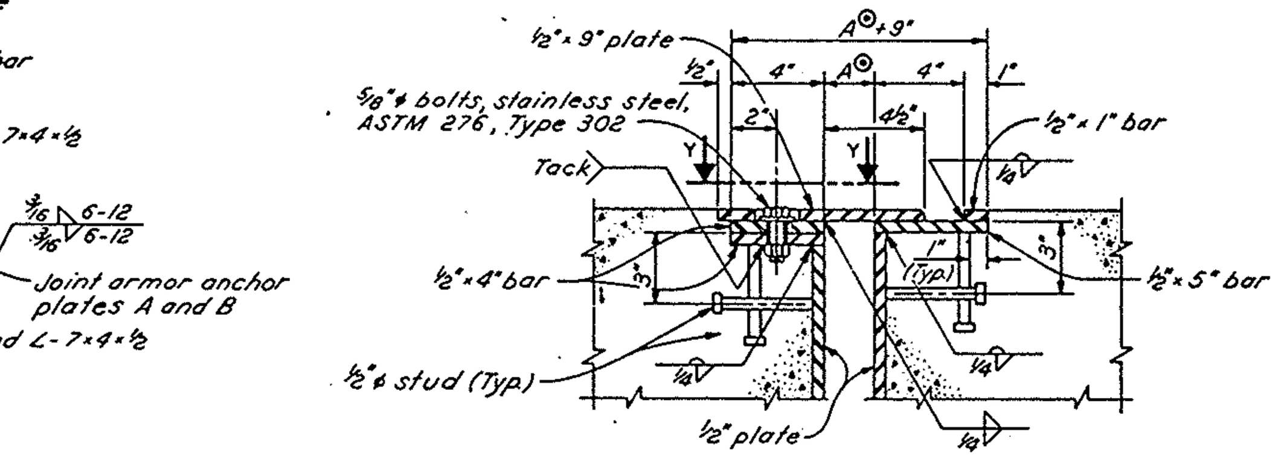
* Typical for ½"ϕ bar segments in sidewalk

NOTE:
Where ℄ fascia box beam is outside of curb line, joint armor anchor plates shall be welded to ½" plate.

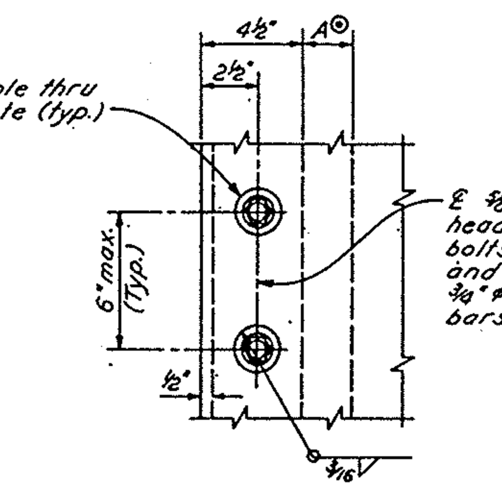
SECTION E-E △
SEAL NOT SHOWN



COMPRESSION SEAL DETAIL
D. S. BROWN'S CV4000, ACME'S J400, WATSON BOWMAN'S WD400, OR AN APPROVED ALTERNATE



SECTION F-F △



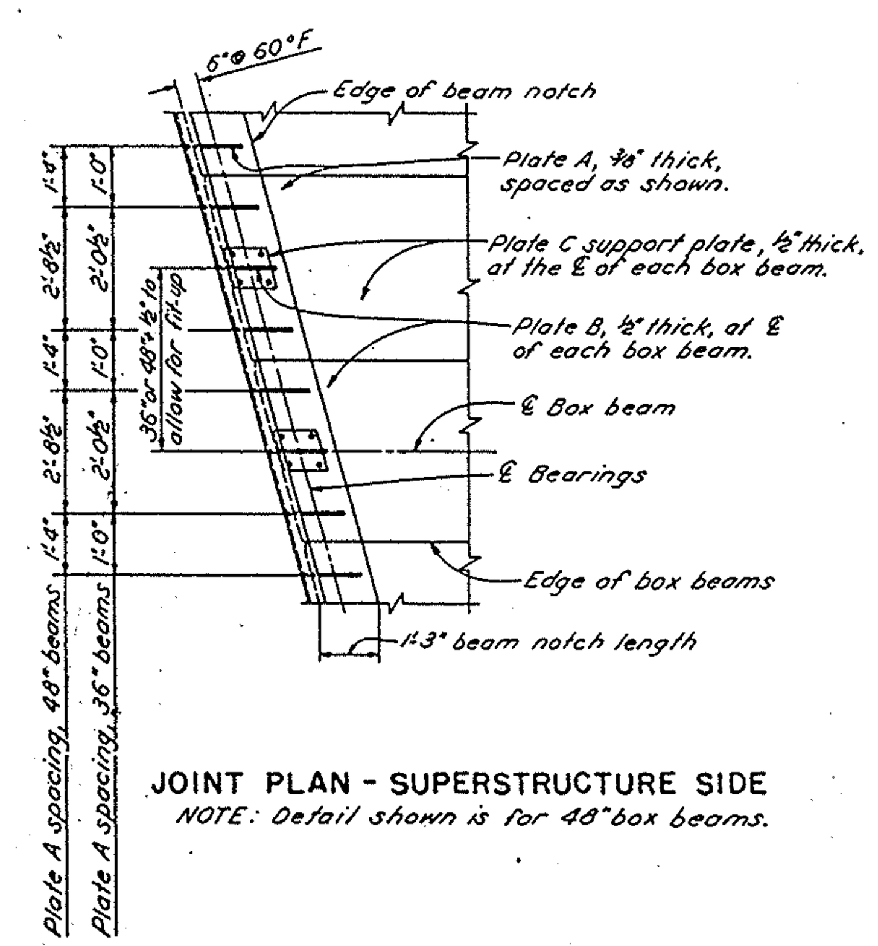
VIEW Y-Y

△ SIDEWALK AND PARAPET JOINT ARMOR ANCHORS:
In lieu of the ½"ϕ end-welded studs shown, alternate methods of anchoring the joint armor may be used, subject to approval by the Director.

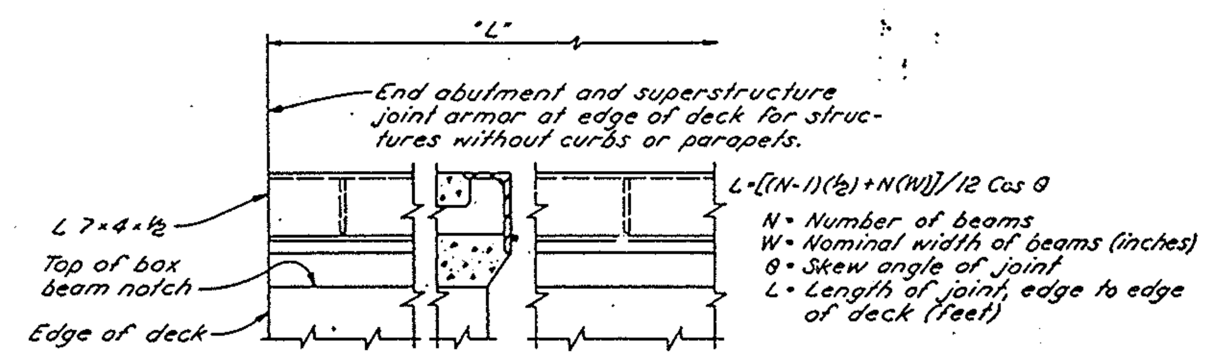
See sheet [1/4] for CONSTRUCTION PROCEDURE, SECTION A-A and additional details.

See sheet [3/4] for GENERAL NOTES and NOTES TO DESIGNER.

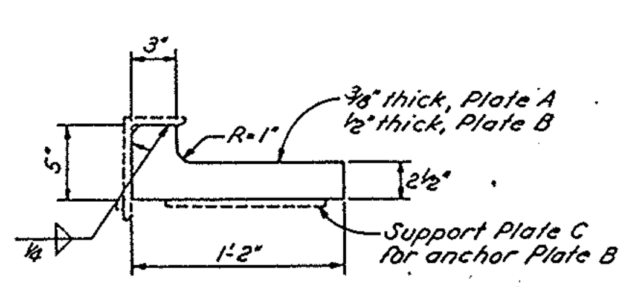
REVISIONS 8-1-84	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	2/4
	STANDARD COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES	
	APPROVED: 11-15-82 DATE — Robert B. Chiefer, ENGINEER OF BRIDGES	DRAWING NO. EXJ-3-82
	DESIGNED RLD, DRAWN RLD, TRACED AJM, CHECKED MPB, REVIEWED RLD	



JOINT PLAN - SUPERSTRUCTURE SIDE
NOTE: Detail shown is for 48" box beams.



PART ELEVATION FOR FULL WIDTH STRUCTURES
NOTE: Where the total width out to out of box beams is equal to the bridge roadway width, joint armor shall be of sufficient length to allow for fit-up of beams. See formula for length "L".



ARMOR ANCHOR PLATES
NOTE: For joint armor anchor spacing, a fit-up allowance of ½" per box beam shall be made.

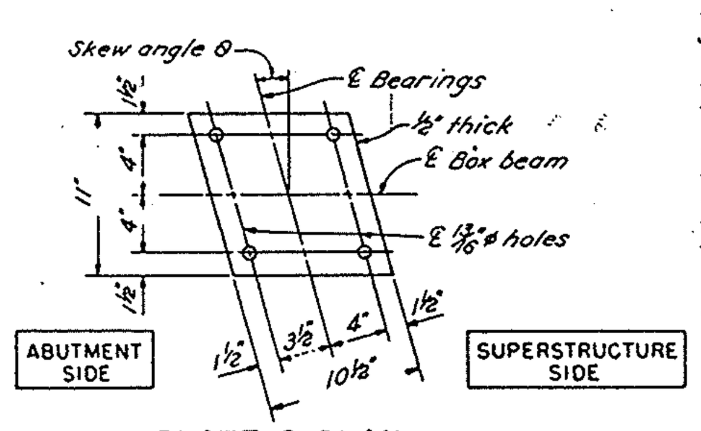
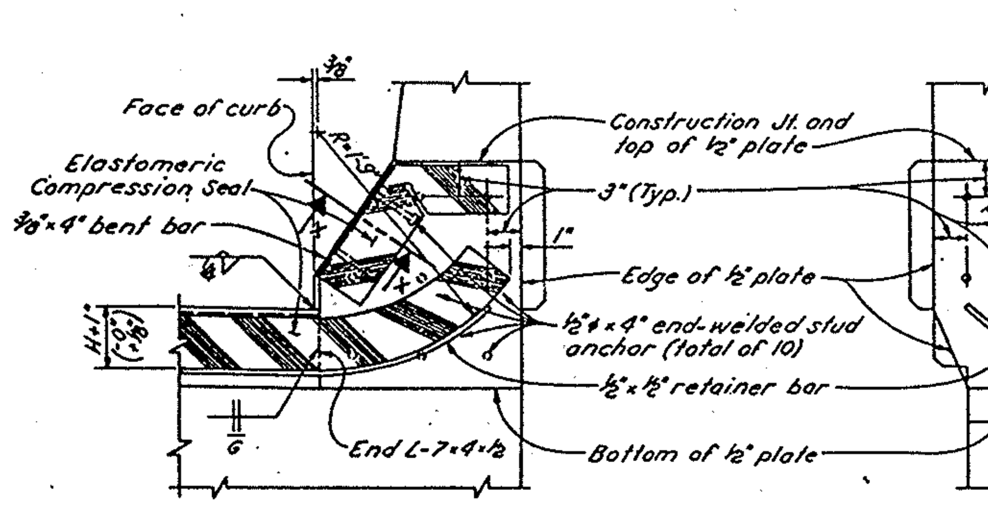
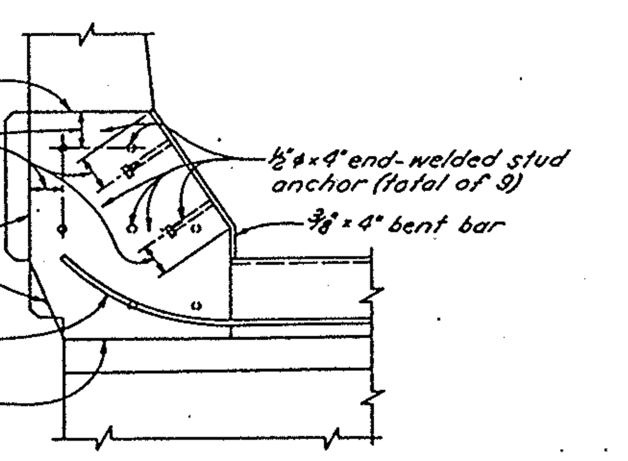


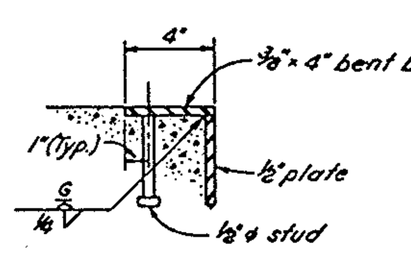
PLATE C PLAN



SECTION B-B △
(For location see sheet [1/4].)



SECTION C-C △
SEE SECTION B-B FOR ADDITIONAL DETAILS
(For location see sheet [1/4].)



SECTION X-X △

△ See SIDEWALK AND PARAPET JOINT ARMOR ANCHORS note on sheet [2/4].

GENERAL NOTES

REFERENCE shall be made to Supplemental Specification 849 for installation procedures, material requirements and manufacturing control.

MATERIALS: A588 or A36 unless otherwise indicated, with System B field paint on exposed steel surfaces. Field paint shall consist of two prime coats and one finish coat. Shop painting not required.

Non-shrinking mortar or grout, shall be made with materials and proportions as follows:
2680 lbs. sand, 703.02, @ 6% moisture
9 bags cement, 701.05
40 gallons water, 499.02
9 lbs. expanding grouting aid admixture, Intraplast-N by Sika Chemical Corporation, or approved equal.
The cement, sand and water shall be mixed first, after which the admixture shall be added. Batch size shall be limited so placement can be completed within 30 minutes. Water shall not be added to increase flowability which has been decreased by delayed use of mortar.

MEASUREMENT for pay purposes shall be based on the sealed length of joints measured horizontally along the joint centerlines. Payment per linear foot for Item 516, "Structural expansion joints including elastomeric compression seals", includes all labor, materials and equipment necessary to complete the joint in place including the joint armor, ½" steel plates, grout and anchoring devices including plates A and B. Plate C, ⅝" threaded rods cast into beam ends and nuts for rods shall be included with beams for payment.

Unless otherwise shown on the Project Plans, joint concrete for composite decks is included with superstructure concrete for payment; joint concrete for decks with bituminous wearing surfaces shall be paid for as Item 511, "Class S concrete, deck joints".

PRESTRESSED CONCRETE BOX BEAMS shall be modified as follows for compression seal installation:
1. Stirrup reinforcing steel in notched areas at ends of composite beams shall not project above the top of concrete.
2. Ends of fascia beams shall be notched full width of beams.
3. 12" deep beams require a special design.
4. Holes for anchor bars shall be 2½" diameter.

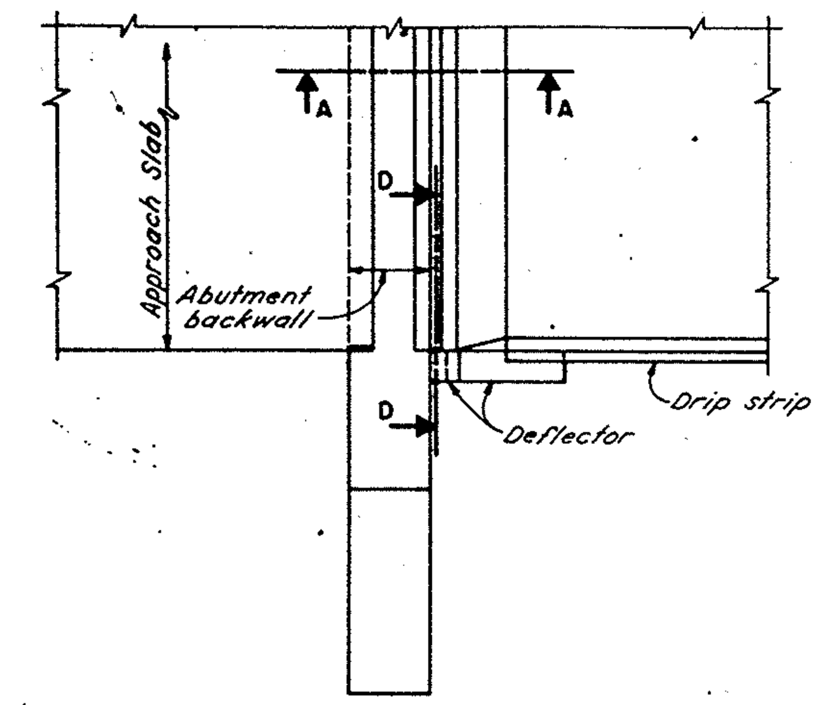
NOTES TO DESIGNER
DESIGN LIMITS: Generally, θ not greater than 15°; D_M (see chart on sheet [1/4]) not longer than 120 feet. This design is intended for structures with a free standing abutment similar to the abutment detail shown on sheet [2/4].

ANCHOR BAR HOLES in abutment seats shall be 2" diameter.

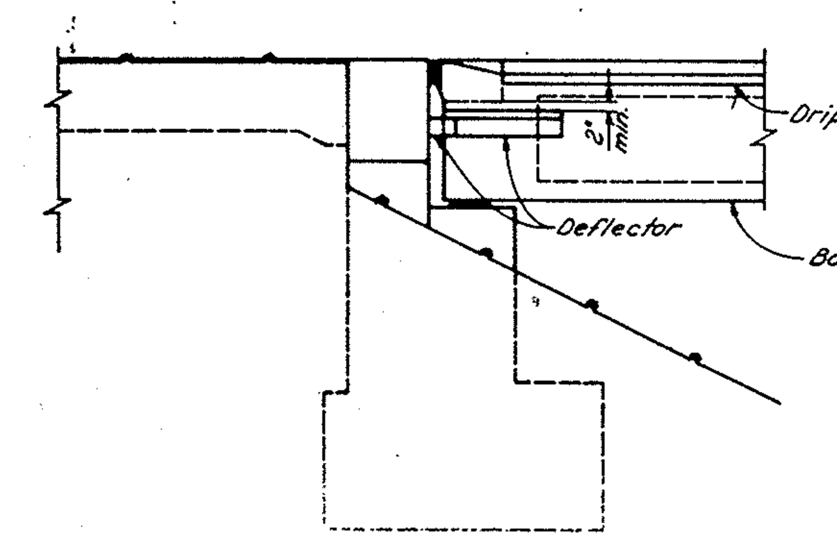
BEAM ENDS for structures on grades over 2% shall be made vertical.

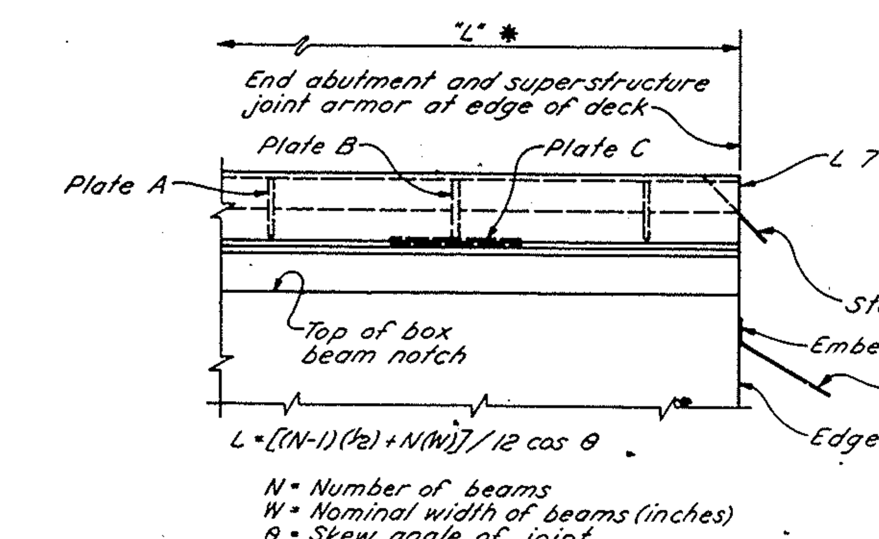
COMPRESSION SEAL at the fixed abutment shall be as shown where A = 2¼" at any ambient temperature.

REVISIONS 8-1-84	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	3/4
	STANDARD COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES	
	APPROVED: 11-15-82 DATE — Robert B. Chiefer, ENGINEER OF BRIDGES	DRAWING NO. EXJ-3-82
	DESIGNED RLD, DRAWN RLD, TRACED AJM, CHECKED MPB, REVIEWED RLD	



PART PLAN AT ABUTMENT
FOR FULL WIDTH STRUCTURES

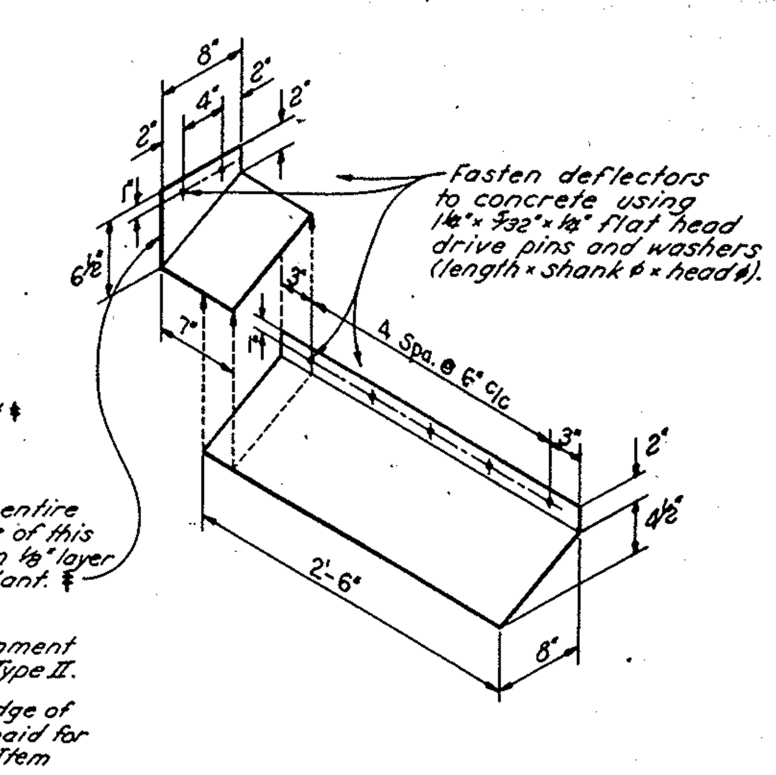




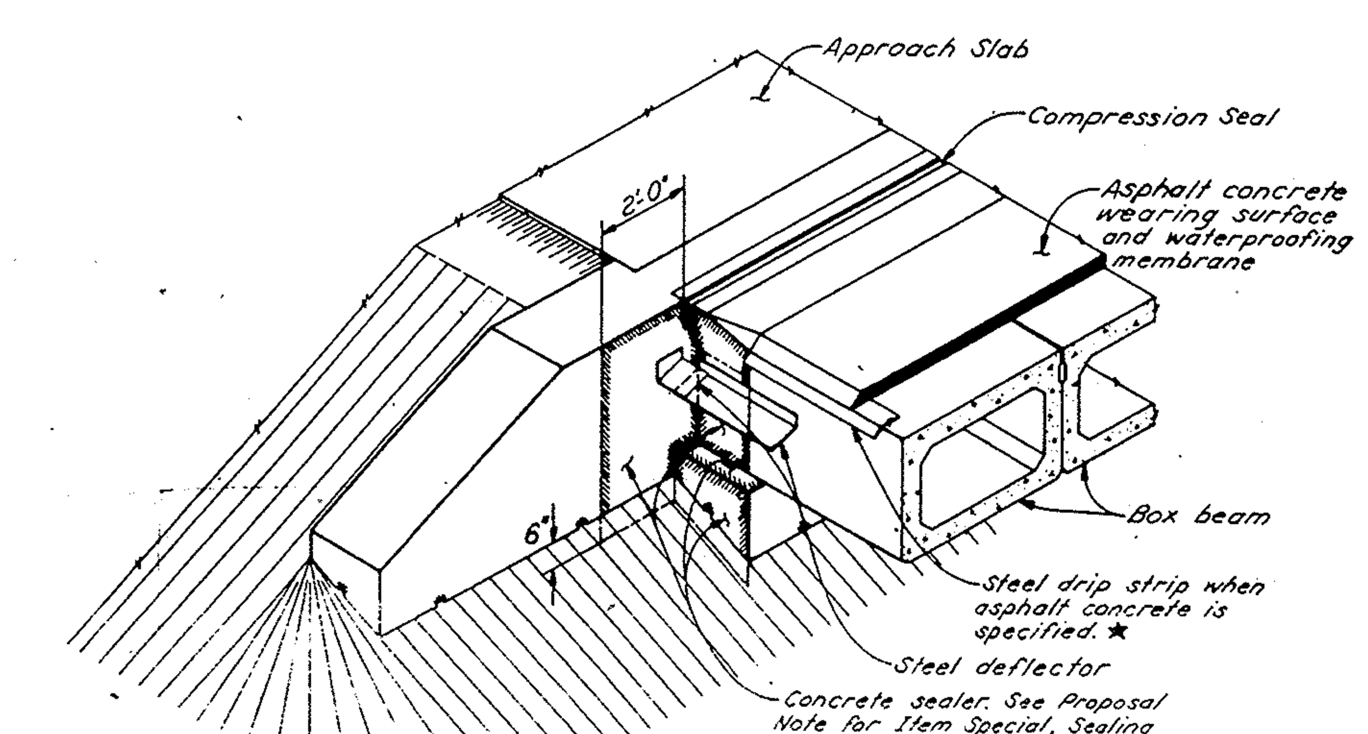
SECTION D-D
* NOTE: Joint armor shall be of sufficient length to allow for fit-up of beams. See formula for length "L".

ǂ Sealant shall meet Government Specification TT-S-0023C, Type II.

★ The steel drip strip on the edge of the fascia beam shall be paid for under a separate pay item, Item Special, "Steel drip strip."

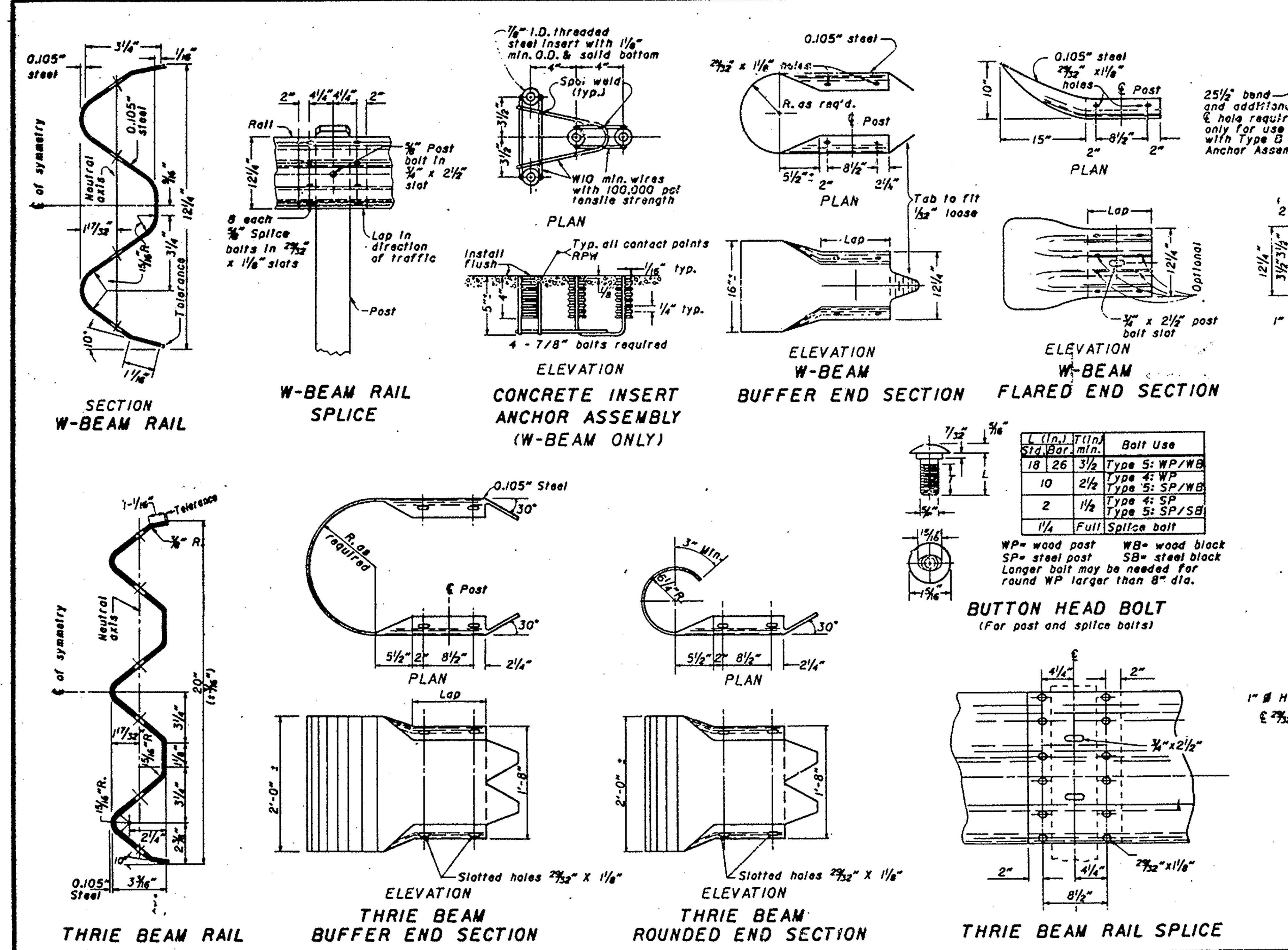


DEFLECTOR DETAILS
Deflectors shall be made from .105" thick steel meeting the requirements of ASTM A568 and shall be galvanized in accordance with 711.02.



CONCRETE PROTECTION AS DETAILED ON THIS SHEET (STEEL DEFLECTORS AT ABUTMENTS AND CONCRETE SEALER ON DESIGNATED SURFACES) SHALL BE PROVIDED IF CALLED FOR ON THE PROJECT PLANS AND SHALL BE INCLUDED WITH ITEM 516 FOR PAYMENT. IN THIS CASE THE PAY ITEM SHALL BE "STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS AND CONCRETE PROTECTION."

REVISIONS 8-1-84	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	4/4
	STANDARD COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES	
	APPROVED: 11-15-82 DATE — Robert B. Chiefer, ENGINEER OF BRIDGES	DRAWING NO. EXJ-3-82
	DESIGNED RLD, DRAWN RLD, TRACED AJM, CHECKED MPB, REVIEWED RLD	



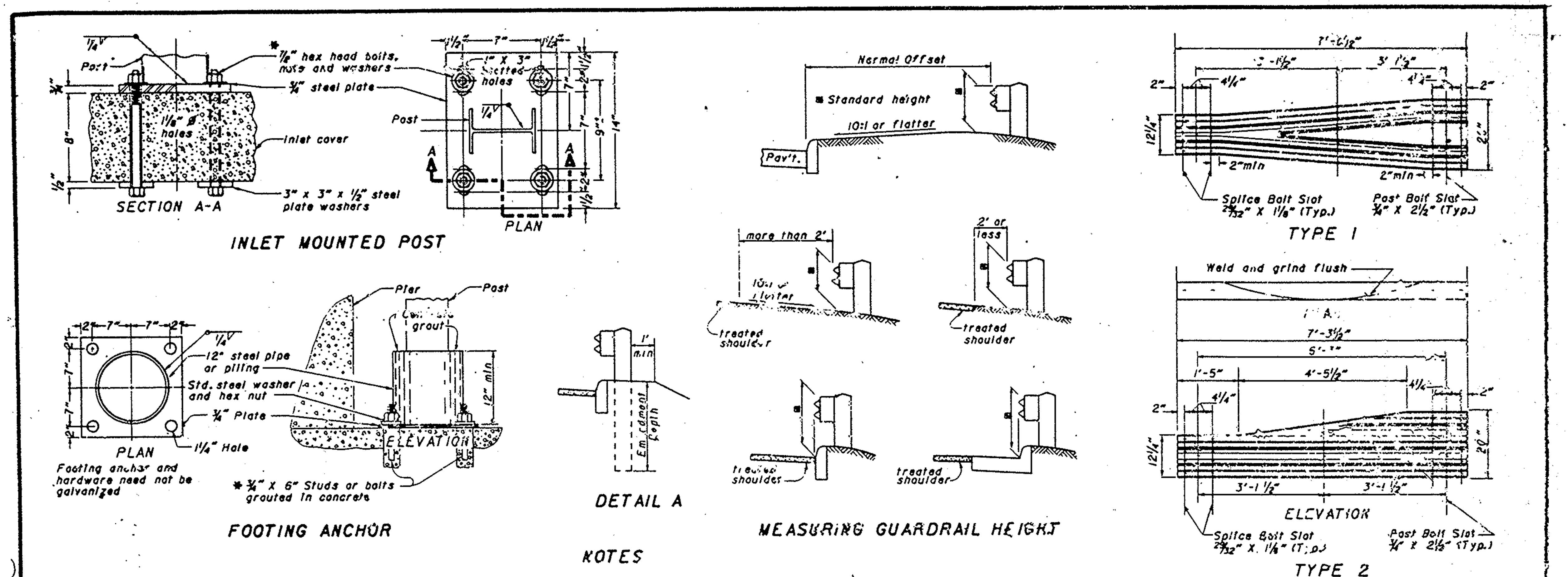
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

DATE 5-6-91

STANDARD CONSTRUCTION DRAWING GR-1.1

APPROVED D.K. Hulman ENGR., L. & D.



NOTES

BEAM RAIL ELEMENTS shall be 12'-6" effective length, unless otherwise specified, with ¾" x 2½" post bolt slots on 6'-3" centers regardless of post spacing. Field punching or drilling of bolt holes or slots for irregularly spaced posts shall be according to 606.05.

BEAM RAIL SPLICE between two rail elements, or rail and terminal connector shall be lapped in the direction of traffic. The buffer or flared end sections shall lap on the traffic face. A 12" length of beam rail (Back-up Plate), with a ¾" dia. bolt hole or a ¾" x 2½" slot, shall be provided at posts not having a rail splice.

EMBEDMENT DEPTH: Where less than 1' of graded shoulder width (10:1 or flatter) extends beyond posts (see Detail "A") longer posts shall be used so that a minimum of 5'-5" embedment depth is provided.

PROTECTIVE COATING: In lieu of the requirements of 710.06, expansion shields, anchors and insert anchor assemblies installed (embedded) in concrete shall be coated in accordance with ASTM A153 or Stainless Steel. Any bolts screwed into these embedded devices shall meet 710.06.

STEEL POST SIZES: The W6 x 8.5 posts may be used in lieu of the W6 x 9 which are shown on the various Standard Construction Drawings for guardrail.

SPECIAL POST MOUNTINGS: Inlet mounted posts are required for guardrail posts located on a drainage inlet. Footing anchors are required for guardrail posts located on footers with less than 3'-5" cover except that for footer cover of 2'-6" to 3'-5" the post may be installed by using a 4" minimum concrete encasement. The inlet mounted post may be used for footing anchors in runs with steel posts.

When standard post depth is not available due to a culvert, the guardrail posts directly over the culvert shall not be driven, but set in holes with a 4' minimum concrete encasement for the maximum post depth available.

Cost of the inlet mounted posts, footing anchors, and concrete encasement shall be included in the unit price bid for guardrail of the type required by the plan.

*** ANCHORS** conforming to 712.01 or anchors per FF-S-325 Group VIII, Type I with proof load certification per 712.01, may be substituted with the same bolt diameter specified.

Also, Partial Depth Resin-Bonded Anchoring Systems may be used. The anchor shall be galvanized and be the same diameter and strength as the bolts specified. 1¼" diameter anchor systems should resist an average ultimate tensile load of 43,700 pounds (⅞" diameter, 24,000 pounds). Test load data shall be submitted to verify manufacturers' recommended anchor, hole size, embedment depth, bonding medium, etc. to satisfy the load requirements.

If anchor bolts are located within a haunch with slopes flatter than 6:1 and through-bolting is used, beveled plate washers shall be used on the bottom. For haunches with slopes steeper than 6:1, partial depth resin-bonded anchors should be used.

If there is any question of deteriorated concrete, expansion anchors will not be allowed, as determined by the Engineer. Where self-drilling anchors are permitted and used for guardrail construction, the holes shall be drilled with the expansion shield (not by a drill bit) and the shield shall be installed flush with the concrete surface.

The Engineer shall visually inspect, after installation, all expansion anchors used in guardrail construction. The Engineer may require the Contractor to test load any expansion anchor to ¼ the certified proof load in direct pull. The equipment and method used shall meet the approval of the Engineer. Each expansion anchor that fails to meet the test requirements shall be reset or removed and replaced with bolts extending through the concrete or grouted in place, as directed by the Engineer.

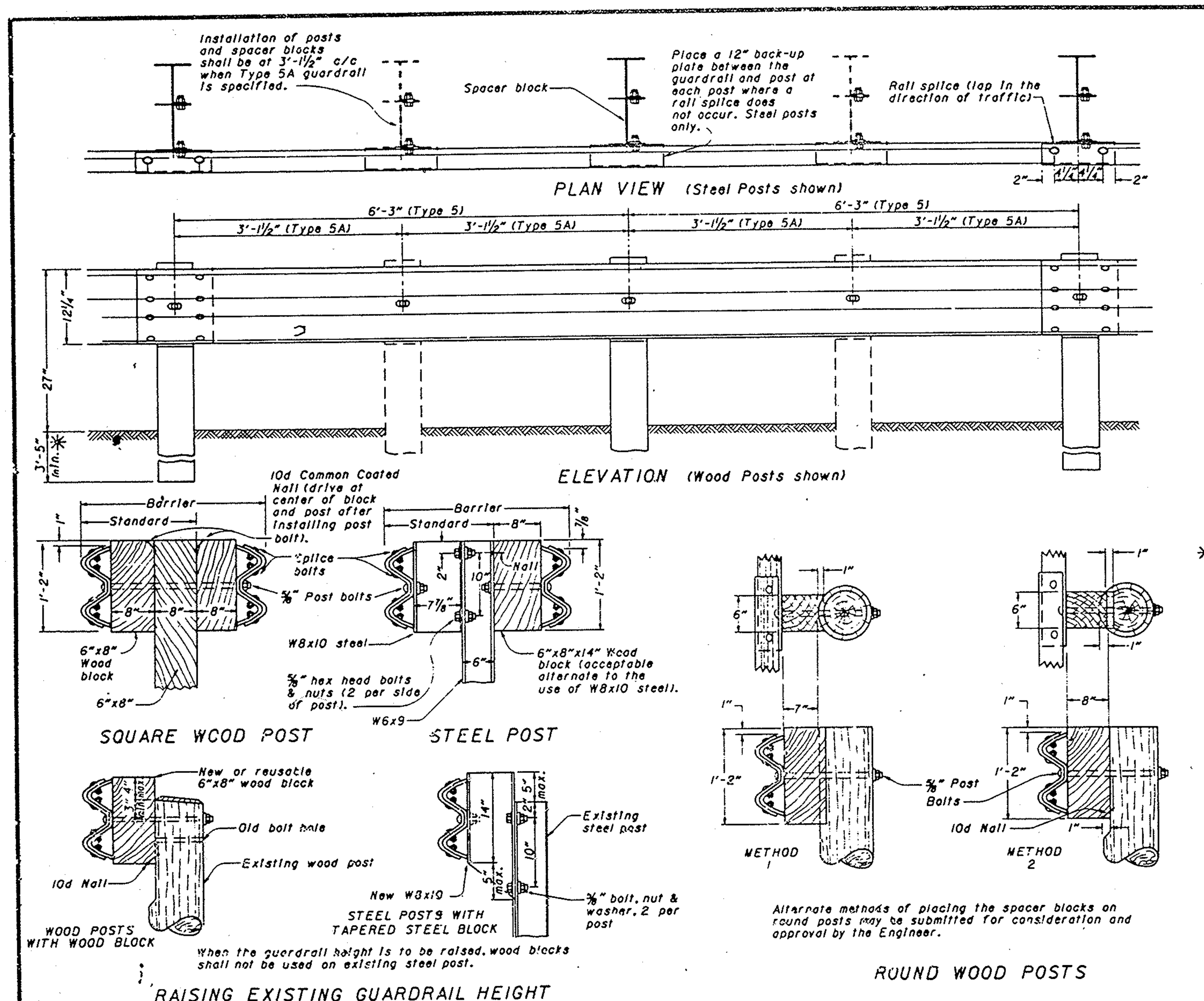
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

DATE 5-6-91

STANDARD CONSTRUCTION DRAWING GR-1.2

APPROVED D.K. Hulman ENGR., L. & D.



NOTES

POSTS: Post may be round (single rail only) or 6"x8" square-sawed pressure-treated wood or W6x9 galvanized steel. The same type post shall be used throughout the length of project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 8" plus or minus 1" in diameter at the top and not more than 3" larger at the butt with a uniform taper.

Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and spacer blocks shall be pressure-treated as per 710.14. Bolt holes shall be bored and tops of posts trimmed as shown, if required, after posts are set.

SPACER BLOCKS: When wood spacer blocks are used with the steel post, a 10d nail shall be driven through the hole in the adjacent flange to prevent blocks from turning.

WASHERS: All washers indicated are standard galvanized steel of the appropiate size.

WELDED BEAMS: Welded beam guardrail posts and spacer blocks may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A769, Class I using Grade 36 steel with the following exceptions:

7.2 Test reports of tensile properties for each lot shall accompany each shipment.

12. Beams which have imperfections repaired by welding shall not be accepted for use in Item 606.

13. Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

✳ FOR SPECIFIC POST embedment depth requirements see Std. Const. Dwg. GR-1.2.

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W 6x8.5	5.83"	3.94"	.194"	.170"
Rolled W 6x9	5.90"	3.94"	.215"	.170"
Rolled W 8x10	7.89"	3.94"	.205"	.170"
Welded 6x8.5	6.0"	3.94"	.194"	.170"
Welded 6x9	6.0"	3.94"	.215"	.170"
Welded 8x10	8.0"	3.94"	.205"	.170"

MISCELLANEOUS: For details not shown see Standard Construction Drawings GR-1.1 and GR-1.2.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

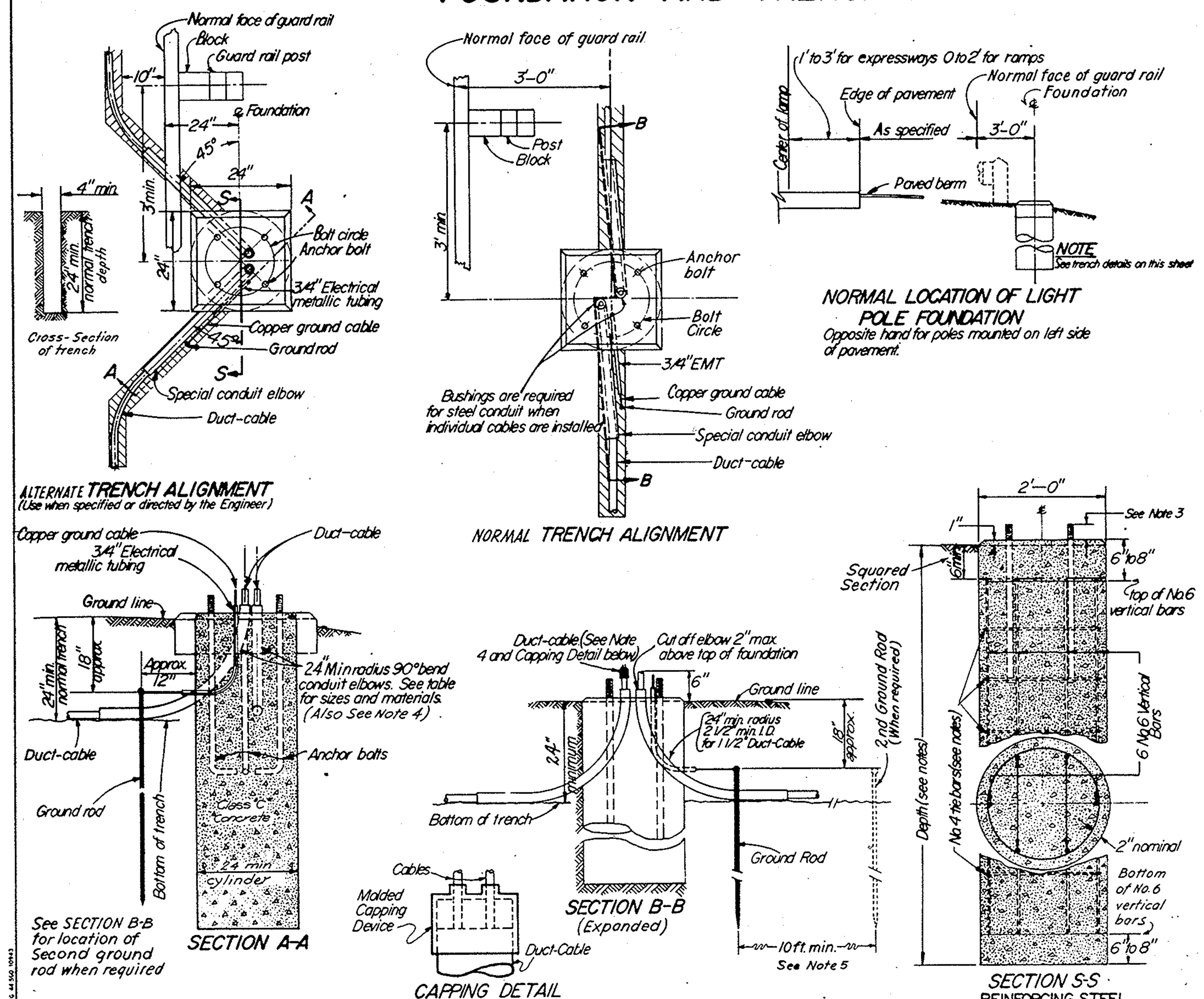
GUARDRAIL TYPE 5 & 5A

DATE 5-6-91

STANDARD CONSTRUCTION DRAWING GR-2.1

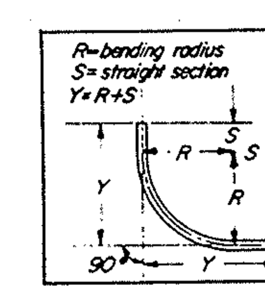
APPROVED D.K. Hulman ENGR., L. & D.

FOUNDATION AND TRENCH DETAILS



NOTES

1. FOUNDATION
   Minimum depths to be as follows:
   6 feet for poles having a mounting height less than 40ft
   8 feet for poles having a mounting height 40 ft. thru 44 ft.
   9 feet for poles having a mounting height 45 ft. thru 49 ft.
   10 feet for poles having a mounting height of 50ft. thru 55 ft.
   No. 4 Tie bars required as follows:
   4 No. 4 tie bars for 6ft. depth
   5 No. 4 tie bars for 8 and 9ft. depth
   6 No. 4 tie bars for 10 ft. depth
   Rotate bars to clear conduits.
2. COPPER GROUND CABLE:
   No. 4 AWG, stranded insulated copper ground cable shall be used. Exothermically weld cable to ground rod, run free end through ¾" EMT and connect as shown on HL-9, POLE WIRING.
   Use two coats of insulating varnish over exothermic weld and exposed conductor.
3. ANCHOR BOLT DATA:
   For anchor bolt data see HL-3, POLE BASE DETAILS.
4. CONDUIT:
   Where 2" or 3" diameter conduit terminates in a foundation the conduit elbows in the foundation shall be the same size as the conduit. The ends of conduit elbows containing distribution cable shall be closed as described in 625.13
   When the terminating conduit is steel the conduit elbows in the pole foundation shall also be steel.
   At the last light pole on a circuit the vacant conduit elbow in the light pole foundation shall be stubbed out and capped.
5. GROUND RODS:
   When a second ground rod is required it shall be installed in the cable trench as shown in SECTION B-B.
6. REINFORCING STEEL:
   Reinforcing steel may be assembled in cages by approved welding of bars.
   Subject to approval of the Engineer cages may be assembled in a spiral conformation.



SPECIAL CONDUIT ELBOWS 90° BENDS					
2", 2 1/2" & 3" 713.04			3"-713.05 or 713.06		
R	S	Y	R	S	Y
24"	11"	35"	24"	8"	32"
30"	11"	41"			
36"	11"	47"	36"	2"	38"
42"	12"	54"			
48"	12"	60"			

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING

FOUNDATION AND TRENCH DETAILS

DATE 11-1-65

STANDARD CONSTRUCTION DRAWING HL-1

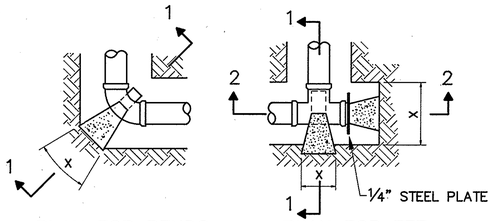
90134 0011-22-36

CALC. BY		OLD MAIN STREET BRIDGE	OHIO	22
CHKD. BY			FHWA REGION 5	22
DATE				

SIZING SCHEDULE

BEARING FACE (X Y) IN SQ. FT.
CONCRETE VOLUME IN CU. FT.

PIPE SIZE	22½° BEND SOIL BEARING CAPACITY			45° BEND SOIL BEARING CAPACITY		
	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.
4	1.40 / 0.14	0.46 / 0.09	0.26 / 0.06	2.70 / 0.12	0.90 / 0.06	0.54 / 0.06
6	2.80 / 1.15	0.93 / 0.10	0.56 / 0.07	5.50 / 0.15	1.83 / 0.10	1.10 / 0.07
8	4.80 / 0.20	1.60 / 0.13	0.96 / 0.09	9.60 / 0.23	3.20 / 0.15	1.92 / 0.09
10	7.90 / 0.53	2.63 / 0.34	1.96 / 0.22	15.70 / 0.34	5.23 / 0.20	3.14 / 0.13
12	11.30 / 0.62	3.76 / 0.40	2.26 / 0.26	22.30 / 0.75	7.43 / 0.49	4.46 / 0.32
14	15.30 / 0.74	5.10 / 0.48	3.06 / 0.31	30.20 / 0.98	10.06 / 0.64	6.04 / 0.42
16	19.80 / 1.17	6.60 / 0.76	3.96 / 0.49	39.10 / 1.21	13.03 / 0.79	7.82 / 0.51
	90° BEND SOIL BEARING CAPACITY			TEE OR DEAD END SOIL BEARING CAPACITY		
	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.	1000 P.S.F.	3000 P.S.F.	5000 P.S.F.
4	4.90 / 0.14	1.63 / 0.09	0.96 / 0.06	3.50 / 0.12	1.16 / 0.06	0.70 / 0.06
6	10.20 / 0.22	3.40 / 0.14	2.04 / 0.09	7.20 / 0.17	2.40 / 0.11	1.44 / 0.07
8	17.70 / 0.35	5.54 / 0.23	3.54 / 0.15	12.50 / 0.25	4.16 / 0.16	2.50 / 0.14
10	28.90 / 0.54	9.60 / 0.35	5.76 / 0.23	20.40 / 0.38	6.80 / 0.25	4.06 / 0.16
12	41.10 / 1.31	13.70 / 0.85	8.22 / 0.55	29.10 / 0.97	9.70 / 0.63	5.82 / 0.42
14	55.80 / 1.70	18.60 / 1.11	11.16 / 0.72	39.50 / 1.22	13.16 / 0.79	7.90 / 0.51
16	72.20 / 2.14	24.06 / 1.39	14.44 / 0.90	51.10 / 1.54	17.03 / 1.00	10.22 / 0.65

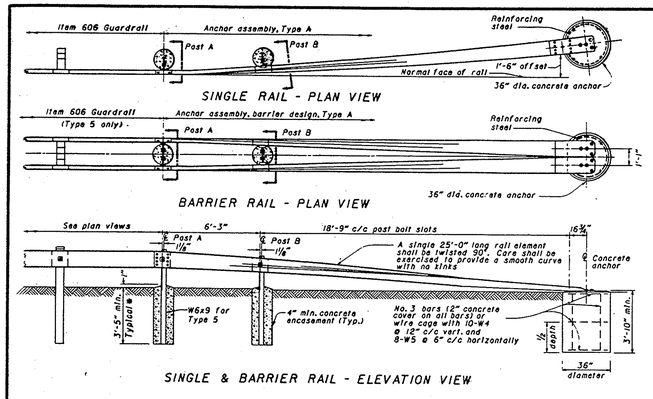


ALL CONCRETE BLOCKING MUST HAVE ITS ENTIRE FACE (X & Y) BEARING SURFACE AGAINST UNDISTURBED SOIL AND ALL VERTICAL NON-BEARING SURFACES SHALL BE FORMED SO AS TO KEEP CONCRETE FROM JOINTS. BLOCKING DESIGN BASED ON COMBINED WORKING PRESSURE PLUS WATER HAMMER OF 240 PSI AND FOR BEARING CAPACITY FOR SAND – 1000 PSF, SAND AND GRAVEL – 3000 PSF, SHALE – 5000 PSF.

11/88

THRUST BLOCKING DETAIL

SD-4-6



NOTES

GENERAL: For details not shown, see Std. Const. Dwgs. GR-1.1, GR-1.2 and other Standard Construction Drawings pertaining to specific guardrail type. All steel parts shall be galvanized.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets.

SPACERS for Post B shall be made of ⅞" steel plate as per 710.15, or two sections of W6 x 9 or W8 x 10 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to their posts with two ⅝" hexhead bolts and nuts with standard washers on both sides.

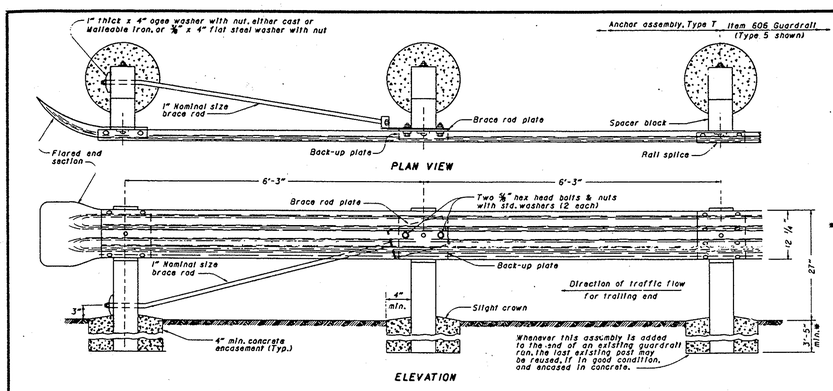
ALL WASHERS INDICATED on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 8'-6" square anchor at the contractor's option.

POST A: Rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 4 guardrail, Post A shall be a standard Type 4 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be ⅝" diameter.

* **FOR SINGLE RAIL INSTALLATIONS,** see Standard Construction Drawing GR-1.2 for additional post embedment details.

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
TYPE A ANCHOR ASSEMBLY	DATE 5-6-91
STANDARD CONSTRUCTION DRAWING GR-4.1	
APPROVED B.K. Hellman ENGR., L. & D.	



NOTES

FOR DETAILS not shown, see Std. Const. Dwgs. GR-1.1, GR-1.2 and other Standard Construction Drawings pertaining to design of specific guardrail types.

WASHERS: All washers indicated are standard galvanized steel of the appropriate size.

POSTS shall be the same as used on the adjacent guardrail, with 4 inch minimum concrete encasement.

SPACER BLOCKS may be notched in the field, in a manner satisfactory to the Engineer, to accommodate the installation of the brace rod plate ⅝" attachment bolts.

BRACE ROD assembly shall be galvanized and develop a tensile strength of at least 40,000 pounds.

* **FOR SPECIFIC POST** embedment depth requirements see Std. Const. Dwg. GR-1.2.

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
TYPE T ANCHOR ASSEMBLY	DATE 5-6-91
STANDARD CONSTRUCTION DRAWING GR-4.2	
APPROVED B.K. Hellman ENGR., L. & D.	

90134 0011-22-36