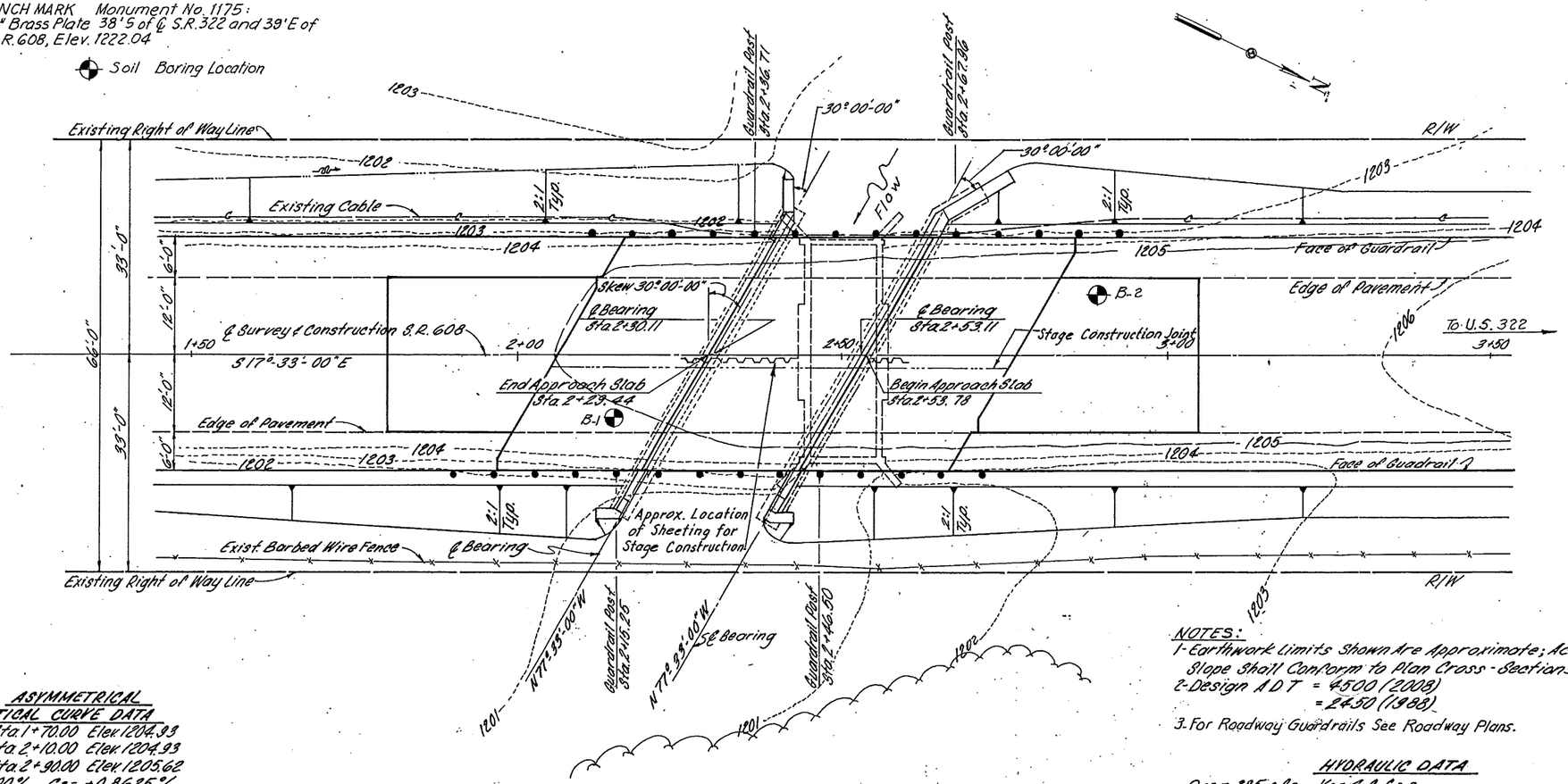
CALC. BY Z.D.S. DATE 2-90	GEAUGA COUNTY	OHIO	12
CHKD. BY N.S.S. DATE 2-90	GEA-608-7.10		21

1992

BENCH MARK Monument No. 1175:
2.5" Brass Plate 38' S of ℄ S.R. 322 and 39' E of ℄ S.R. 608, Elev. 1222.04

Soil Boring Location



ADTT > 2500 (Contract) → Box Beam No.

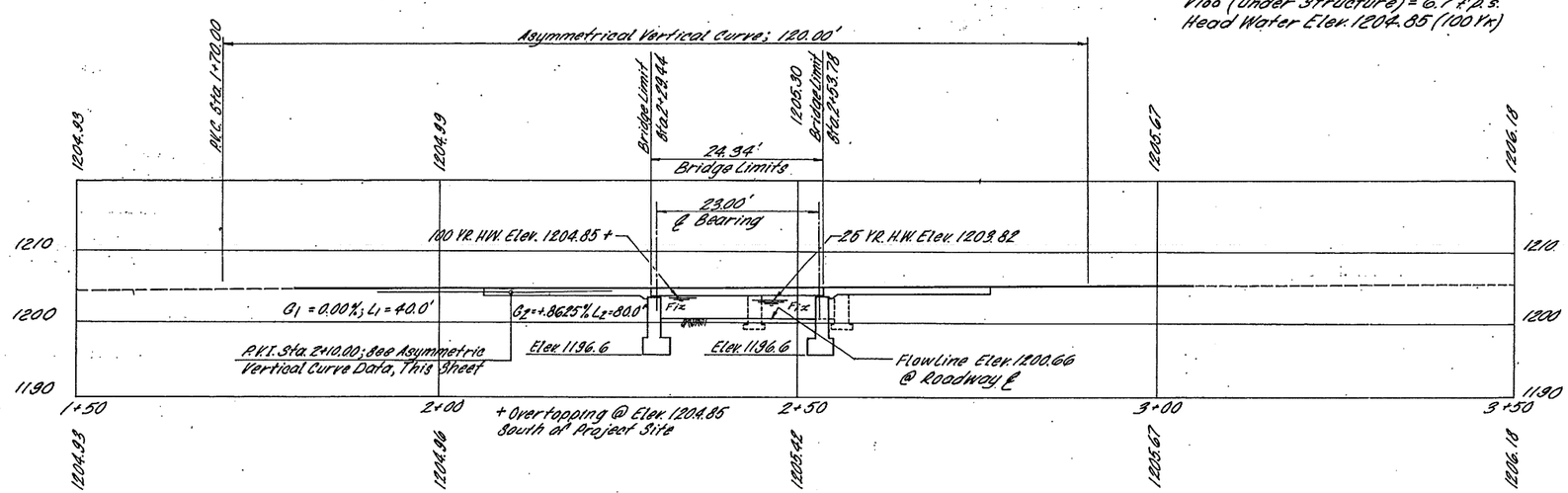
NOTES:
1- Earthwork Limits Shown Are Approximate; Actual Slope Shall Conform to Plan Cross-Sections.
2- Design ADT = 4500 (2008)
= 2450 (1988)
3. For Roadway Guardrails See Roadway Plans.

ASYMMETRICAL VERTICAL CURVE DATA
P.V.C. Sta 1+70.00 Elev 1204.93
P.V.I. Sta 2+10.00 Elev 1204.93
P.V.T. Sta 2+90.00 Elev 1205.62
G1 = 0.00% G2 = +0.8625%
L1 = 40.0', L2 = 80.0'
L = L1 + L2 = 120.00'

HYDRAULIC DATA
Q25 = 285 c.f.s., V25 = 4.9 f.p.s.
Head Water Elev. 1203.82 (25 Yr.) Drainage Area = 428 Acres
Stream Discharge @ 100 Yr. Storm = 409.25 c.f.s.
Discharge Through Opening Under Bridge = 386.5 c.f.s. (Q100)
Discharge Overtopping @ Elev. 1204.85 = 22.75 c.f.s.
V100 (Under Structure) = 6.7 f.p.s.
Head Water Elev. 1204.85 (100 Yr.)

EXISTING STRUCTURE *
Type: Concrete Slab Over Stone And Concrete Abutments.
Roadway Width: 29'-0" F/F of Railings.
Span: 10'-0" Face to Face of Stone Walls.
Skew: None
Load Capacity: Not Available; Unknown
Wearing Surface: Asphalt Concrete
Substructure: Stone & Conc. Abutments And Concrete Wingwalls.
Date Built: Not Available; Unknown
Structure File No.: 2802260
* All Data Were Obtained From Site Survey With The Exception of Structure File No.

PROPOSED STRUCTURE
Type: Single Span Prestressed Concrete Box Beam.
Span: 23'-0" Center of Bearings
Roadway Width: 36'-0" F/F of Railings
Design Loading: H.S.-20-44 And The Alternate Military
Skew: 30°-00'-00" Left Forward
Wearing Surface: 2 1/2" Asphalt Concrete
Approach Slabs: AS-1-81, 20'-0"
Alignment: Tangent
Crown: 3/16"/Ft.



CENTERLINE PROFILE ALONG ℄ SURVEY S.R. 608

REVIEWED BY BURGESS & NIPLE LTD.
S.A.N. 4-5-91

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

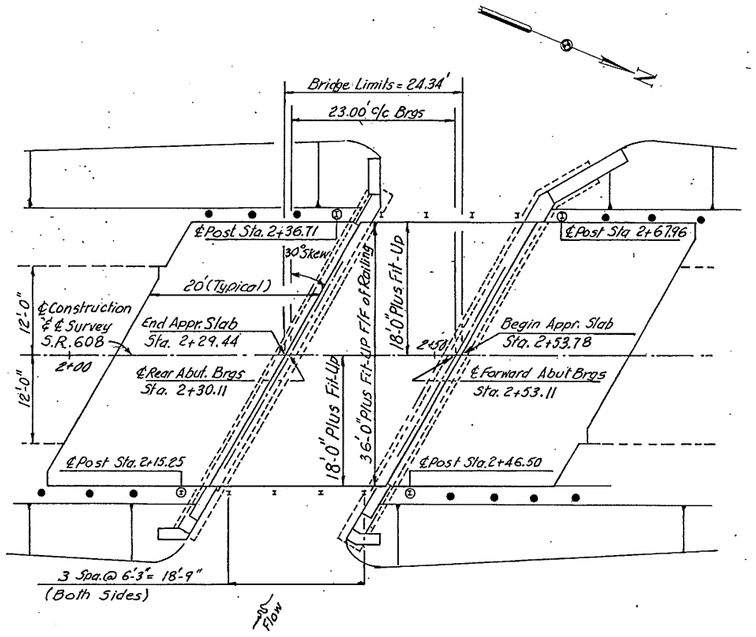
1 | 10

SITE PLAN

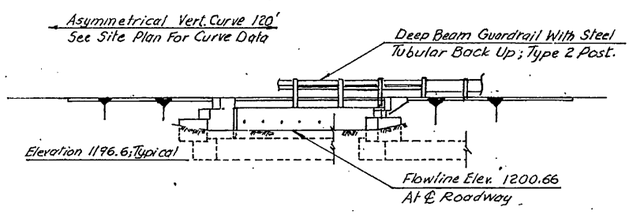
BRIDGE NO. GEA-608-0710
OLD STATE ROAD
OVER UNNAMED CREEK
GEAUGA COUNTY STA. 2+29.44 TO STA. 2+53.78

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ZDS	CWH	CWH	NSS	CAO		

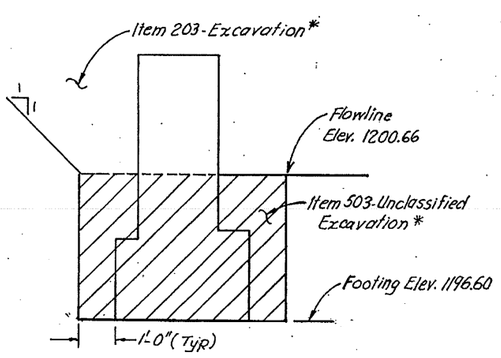
CALC. BY Z.D.S. DATE 7-90 / CHKD. BY T.M. DATE 7-90	GEAUGA COUNTY GEA-608-7.10	OHIO	13 / 21



GENERAL PLAN



ELEVATION



PAY LIMITS FOR EXCAVATION

* Deduct For Material To Be Removed Under Item 202-Structure Removed.

ESTIMATED QUANTITIES

ITEM	ITEM EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUTMENTS	SUPER STRUCTURE	GENERAL
202	11000	Lump		Structure Removed			Lump
403	20000	5	Cu. Yd.	Asphalt Concrete, AC-20		5	
404	20000	4	Cu. Yd.	Asphalt Concrete, AC-20		4	
503	11100	Lump		Cofferdams, Cribs and Sheeting			Lump
503	21100	97	Cu. Yd.	Unclassified Excavation	97		
509	11400	3515	lb.	Reinforcing Steel, Grade 60	3515		
509	15800	495	lb.	Epoxy Coated Reinforcing Steel, Grade 60	495		
511	45000	49	Cu. Yd.	Class C Concrete, Abutment Above Footing (Cantilevered			
				Wall, Without Backwall)	49		
511	46500	37	Cu. Yd.	Class C Concrete, Footing	37		
512	44400	3	Sq. Yd.	Type B Waterproofing	3		
512	55800	114	Sq. Yd.	Type D Waterproofing		114	
Special	51267500	8	Sq. Yd.	Sealing of Concrete Surface (See Proposal Note)		8	
Special	51267502	27	Sq. Yd.	Sealing of Concrete Surface (Epoxy) (See Proposal Note)	27		
515	53500	9	Each	Prestressed Concrete Box Beam			
				(B12-48, 24'-2" Long, See Proposal Note)		9	
516	13600	81	Sq. Ft.	1" Preformed Expansion Joint Filler		81	
516	31011	89	Lin. Ft.	2" Deep Joint Sealer As Per Plan		89	
Special	51631200	83	Lin. Ft.	Sawing And Sealing Bituminous Concrete Joints		83	
516	41200	6	Sq. Ft.	1/8" Preformed Bearing Pad, 711.21		6	
516	43100	36	Each	Elastomeric Bearing, With Internal Laminates Only (Neoprene)			
				(1" X 5" X 9")		36	
517	72300	62.50	Lin. Ft.	Railing (Deep Beam Rail With Steel Tubular			
				Back-Up And Type 2 Steel Posts and Anchor Bolts)		62.50	
518	21200	11	Cu. Yd.	Porous Backfill with filter fabric	11		
Special	51822200	36	Sq. Ft.	Steel Drip Strip		36	

Quantities Calculated By Z.D.S. 3-21-90
Quantities Checked By N.S.S. 3-28-90

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

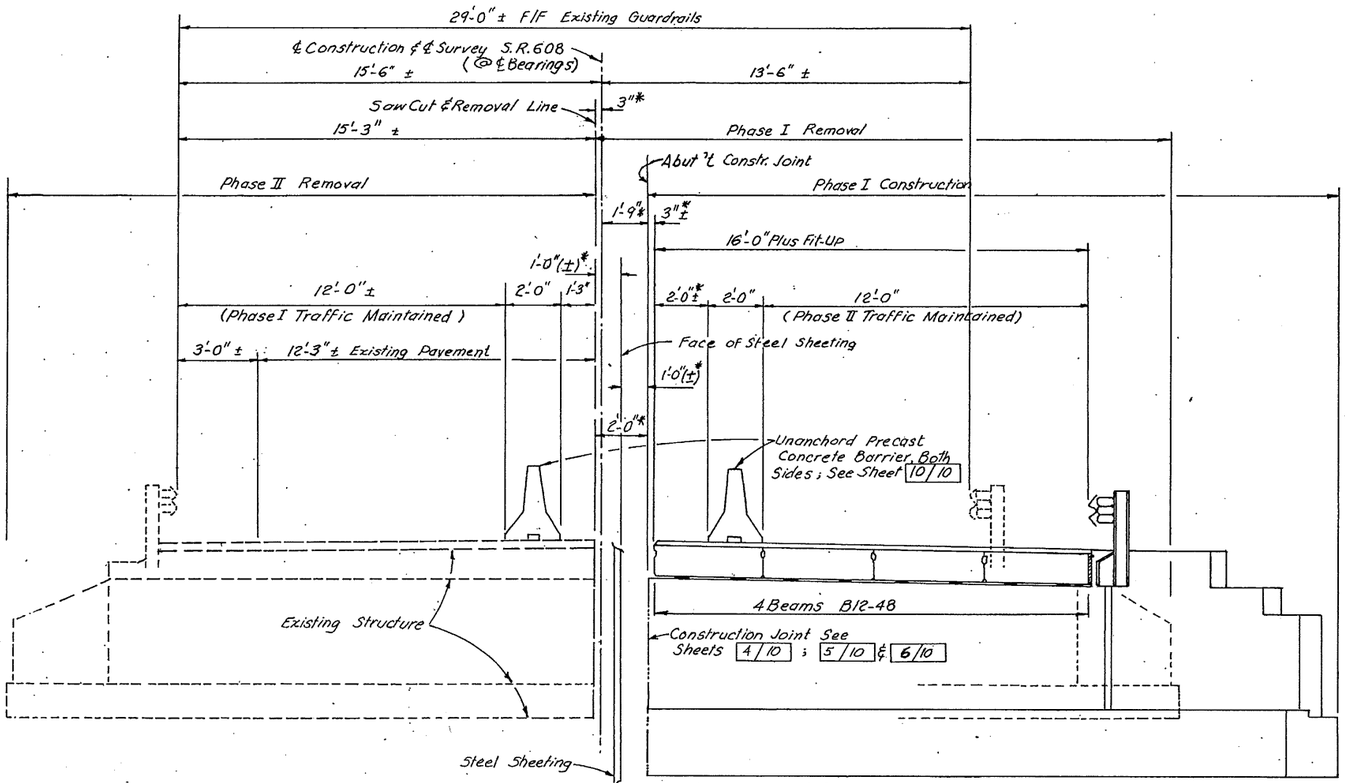
2 / 10

GENERAL PLAN & ELEVATION & ESTIMATED QUANTITIES

BRIDGE NO. GEA-608-0.10
OLD STATE ROAD
OVER UNNAMED CREEK
GEAUGA COUNTY STA. 2+29.44 TO STA. 2+53.78

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ZDS	CWH	CWH	NSS	CAD		

CALC. BY Z.D.S DATE 2-90	GEAUGA COUNTY	OHIO	14
CHKD. BY I.M. DATE 2-90	GEA-608-7.10		21



* Dimension at Centerline of Bearings of New Structure

CONSTRUCTION PHASES

(Looking Ahead, North)

GENERAL NOTES:

SEQUENCE OF CONSTRUCTION

REFERENCE IS MADE TO THE ROADWAY PLANS FOR ROADWAY WORK THAT WILL BE NEEDED FOR THIS CONSTRUCTION SEQUENCE.

1. INSTALL SIGNALIZATION, DIVERT NORTHBOUND TRAFFIC OFF THE RIGHT SIDE OF THE ROADWAY AND MAINTAIN TRAFFIC ON THE LEFT SIDE LANE (BOTH NORTH-AND SOUTH-BOUND TRAFFIC SERVED BY ONE LANE).
2. SET UNANCHORED PRECAST CONCRETE BARRIERS ALLOWING 12' FOR TRAFFIC ON THE LEFT SIDE OF THE ROADWAY.
3. SAW CUT THEN REMOVE THE SLAB OF THE EXISTING STRUCTURE ON THE RIGHT SIDE OF THE ROADWAY (PHASE 1 REMOVAL).
4. INSTALL SHEETING OUTSIDE THE LIMITS OF THE WATERWAY OPENING OF THE EXISTING STRUCTURE TO RETAIN EXISTING EARTH FILL, AS NECESSARY.
5. DIVERT STREAM FLOW INTO REMAINING WATERWAY OPENING. PROVIDE SUFFICIENT PROTECTION OF FOOTINGS AGAINST SCOUR. USE OF BULKHEAD AND A CLOSED CONDUIT MAY BECOME NECESSARY.
6. REMOVE THE RIGHT HALF OF THE EXISTING REAR ABUTMENT AND EXCAVATE THE AREA BETWEEN THE EXISTING AND PROPOSED REAR ABUTMENTS.
7. COMPLETE THE CONSTRUCTION OF THE ABUTMENTS, THER REMOVE THE BULKHEAD AND STREAM FLOW DIVERSION CONDUIT, THEN FINE GRADE BOTTOM OF CHANNEL.
8. INSTALL BEAMS AND COMPLETE THE RIGHT SIDE OF THE ROADWAY TO ACCEPT TRAFFIC, THEN DIVERT TRAFFIC TO THE NEW STRUCTURE.
9. MAINTAIN STREAM FLOW DURING THE REMOVAL AND EXCAVATION OF THE LEFT HAND SIDE OF THE STRUCTURE.
10. COMPLETE PHASE 11 REMOVAL AND COMPLETE CONSTRUCTION.

EMBANKMENT: BACKFILL SHALL NOT BE PLACED HIGHER THAN ONE THIRD THE OVERALL ABUTMENT HIGHT (INCL. FOOTINGS) PRIOR TO PLACING AND ANCHORING PRESTRESSED BEAMS.

GENERAL NOTES; CONTINUED

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

DBR-2-73 DATED 4-10-73

PSBD-1-81 DATED 6-20-89

AS-1-81 DATED 11-27-81

AND TO SUPPLEMENTAL SPECIFICATION(S):

836 DATED 11-12-85

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

DESIGN DATA

DESIGN LOADING - HS20-44 AND THE ALTERNATE MILITARY LOADING.

PRESTRESSED CONCRETE BEAMS:

REINFORCING STEEL ASTM A615, A616 OR A617.

GRADE 60 - UNIT STRESS 24,000 P.S.I.

GRADE 40 - UNIT STRESS 20,000 P.S.I.

CONCRETE UNIT STRESS = 2200 P.S.I. COMPRESSION

CONCRETE UNIT STRESS = 444 P.S.I. TENSION

MINIMUM CONCRETE COMPRESSIVE STRENGTH AT TIME OF INITIAL PRESTRESS F'_{ci} = 4,000 P.S.I.

MINIMUM CONCRETE COMPRESSIVE STRENGTH F'C = 5,500 P.S.I. AT 28 days.

PRESTRESSING STEEL:

ASTM A416 GRADE 270, 1/2" DIAMETER, SEVEN-WIRE, UNCOATED, STRESS-RELIEVED STRAND.

A'_s = 0.153 SQ.IN.

F'_s = 270,000 P.S.I.

INITIAL STRESS = 0.7 F'_s = 189,000 P.S.I.

STRESS AT RELEASE 0.63 F'_s = 170,100 P.S.I.

(ASSUMED AT SECTION OF MAXIMUM MONENT).

CONCRETE CLASS C - COMPRESSIVE STRENGTH 4000 P.S.I., FOR SUBSTRUCTURE

REINFORCING STEEL - ASTM A615, A616, A617 - GRADE 60 MINIMUM YIELD STRENGTH 60,000 P.S.I., FOR SUBSTRUCTURE.

DECK PROTECTION METHOD

TYPE D WATERPROOFING, ASPHALT CONCRETE WEARING SURFACE, STEEL DRIP STRIP, SEALING OF CONCRETE SURFACES.

ITEM SPECIAL - SEALING OF CONCRETE SURFACES: A CONCRETE SEALER SHALL BE APPLIED TO THE SURFACES SHOWN ON SHEETS 4/10, 5/10, 7/10. SEE THE PROPOSAL NOTE FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION PROCEDURES AND RATES AND MATERIAL REQUIREMENTS.

REMOVAL OF EXISTING STRUCTURE. WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC THE EXISTING STRUCTURE SHALL BE REMOVED AS INDICATED ON THE PLANS AND AS PER 202.03 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS. SUITABLE WASTE MASONRY MAY BE PLACED AS BANK PROTECTION AS DIRECTED BY THE ENGINEER.

SHIMS: 1/8" THICK PREFORMED BEARING PADS, PLAN AREA 5"x9", AS PER ITEM 516, SHALL BE PLACED UNDER THE BEARINGS WHERE REQUIRED FOR PROPER BEARING. THE NUMBER SUPPLIED SHALL BE 2 SHIMS PER BEAM.

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

FOUNDATION BEARING PRESSURE: ABUTMENT FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM BEARING PRESSURE OF ONE (1) TON PER SQ.FT.

ELASTOMERIC TEST PAD:

THE ELASTOMERIC BEARING MANUFACTURER SHALL SUPPLY A PLAIN ELASTOMERIC PAD FOR TESTING PURPOSES. THE PAD SHALL BE FURNISHED FROM THE SAME BATCH OF NEOPRENE THAT IS USED IN THE FABRICATION OF THE LAMINATED ELASTOMERIC BEARINGS AND THE FABRICATOR SHALL CERTIFY THE IDENTITY OF THE ELASTOMER. THE PAD SHALL HAVE A 1/2 INCH THICKNESS, AND SHALL HAVE MINIMUM LENGTH AND WIDTH DIMENSIONS OF 6 INCHES. PAYMENT FOR THE TEST PAD WILL BE INCLUDED IN THE PRICE BID FOR THE BEARINGS.

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

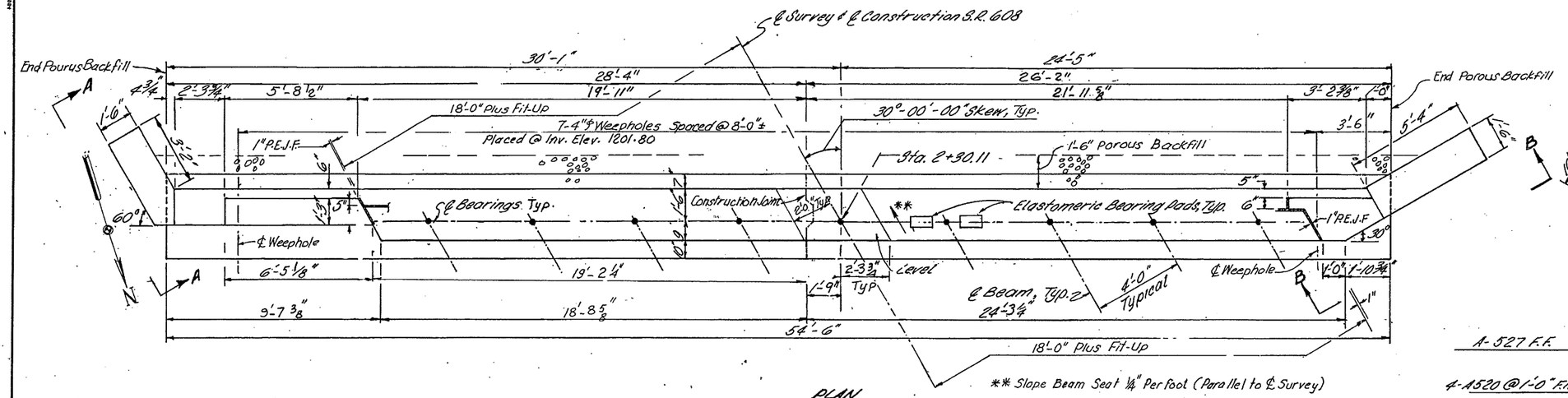
3/10

CONSTRUCTION PHASES & GENERAL NOTES

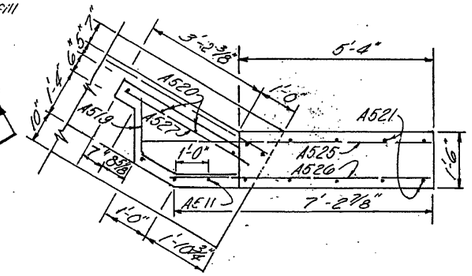
BRIDGE NO. GEA-608-0710
OLD STATE ROAD
OVER UNNAMED CREEK
GEAUGA COUNTY STA. 2+29.42 TO STA. 2+53.78

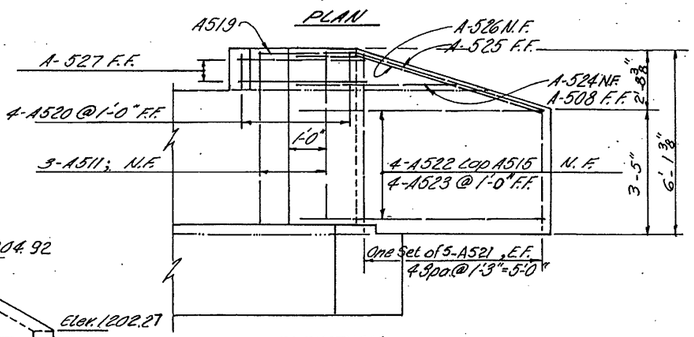
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ZDS	CWH	CWH	NSS	CAD		

CALC. BY ZDS DATE 7-90	GEAUGA COUNTY	OHIO	15
CHKD. BY FM DATE 7-90	GEA-608-7.10		21

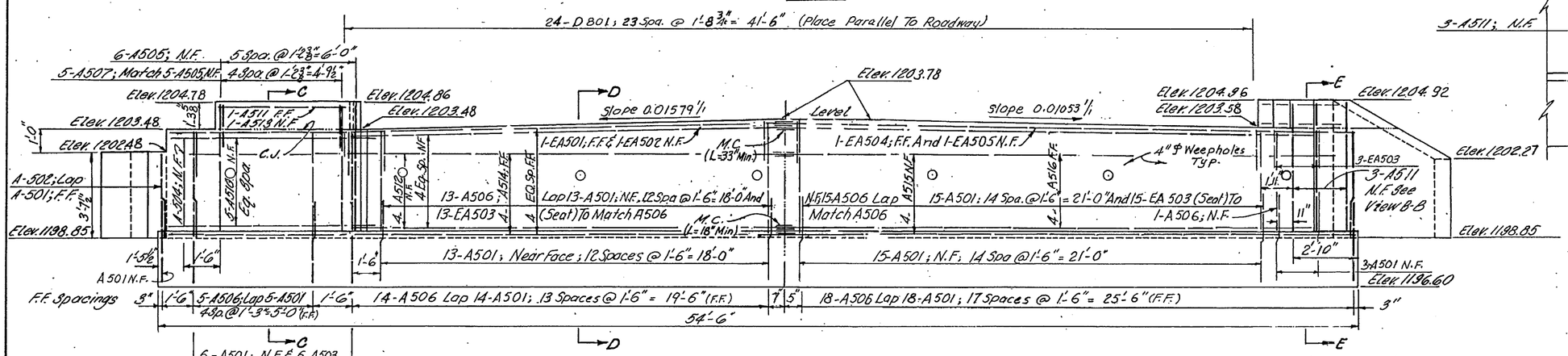


PLAN





ELEVATION
VIEW B-B



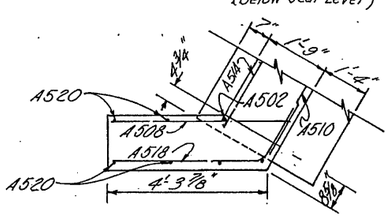
ELEVATION

POROUS BACKFILL; 1'-6" Thick, Shall Extend Up to the Plane of The Subgrade, To 1 Foot Below The Embankment Surface, and Laterally As shown On the Plan Views. Two Cubic Feet of Bagged No.3 Aggregate Shall be placed At Each Weephole. Geotextile Fabric Shall Conform With 712.09, Type A.

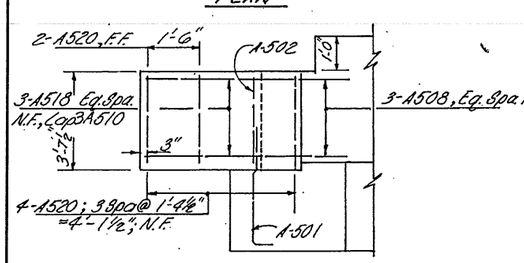
NOTE: Concrete Above the Level of the Beam Seat Shall Not be Placed Until After the Prestressed Beams Are Erected

LEGEND

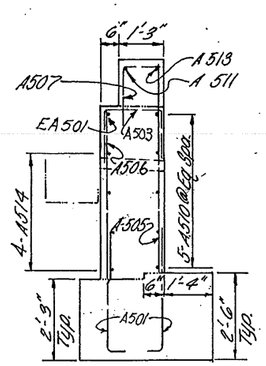
M.C.	INDICATEDS MECHANICAL CONNECTOR 508.09 SEE SHEET 8/10
—o—	INDICATES WINGWALL REBAR BEING DEVELOPED IN ABUTMENT STEM
N.F.	NEAR FACE
F.F.	FAR FACE
E.F.	EACH FACE (NEAR & FAR)
TYP.	TYPICAL
P.E.J.F.	PREFORMED EXPANSION JOINT FILLER
C.J.	CONSTRUCTION JOINT



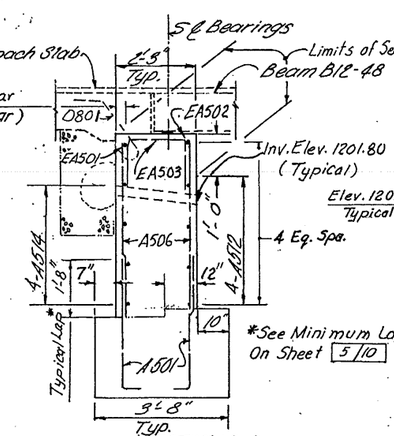
PLAN



ELEVATION
VIEW A-A



SECTION C-C



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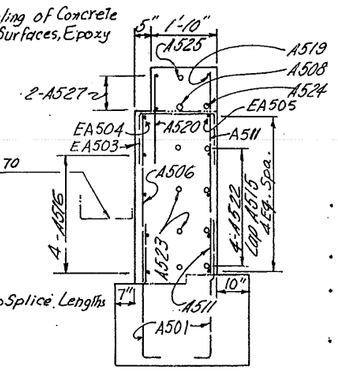


SECTION E-E

- FOR ELASTOMERIC BEARING DETAILS SEE SHEET 6/10
- FOR ANCHOR DOWEL DETAILS SEE SHEET 6/10
- FOR BARS D801 SEE STD DWG AS-1-81 SHEET NO. 1 OF 3 & SECTION D-D
- FOR VERTICAL CONSTRUCTION JOINT BETWEEN PHASES SEE SHEET 6/10
- FOR GENERAL NOTES SEE SHEET 3/10

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

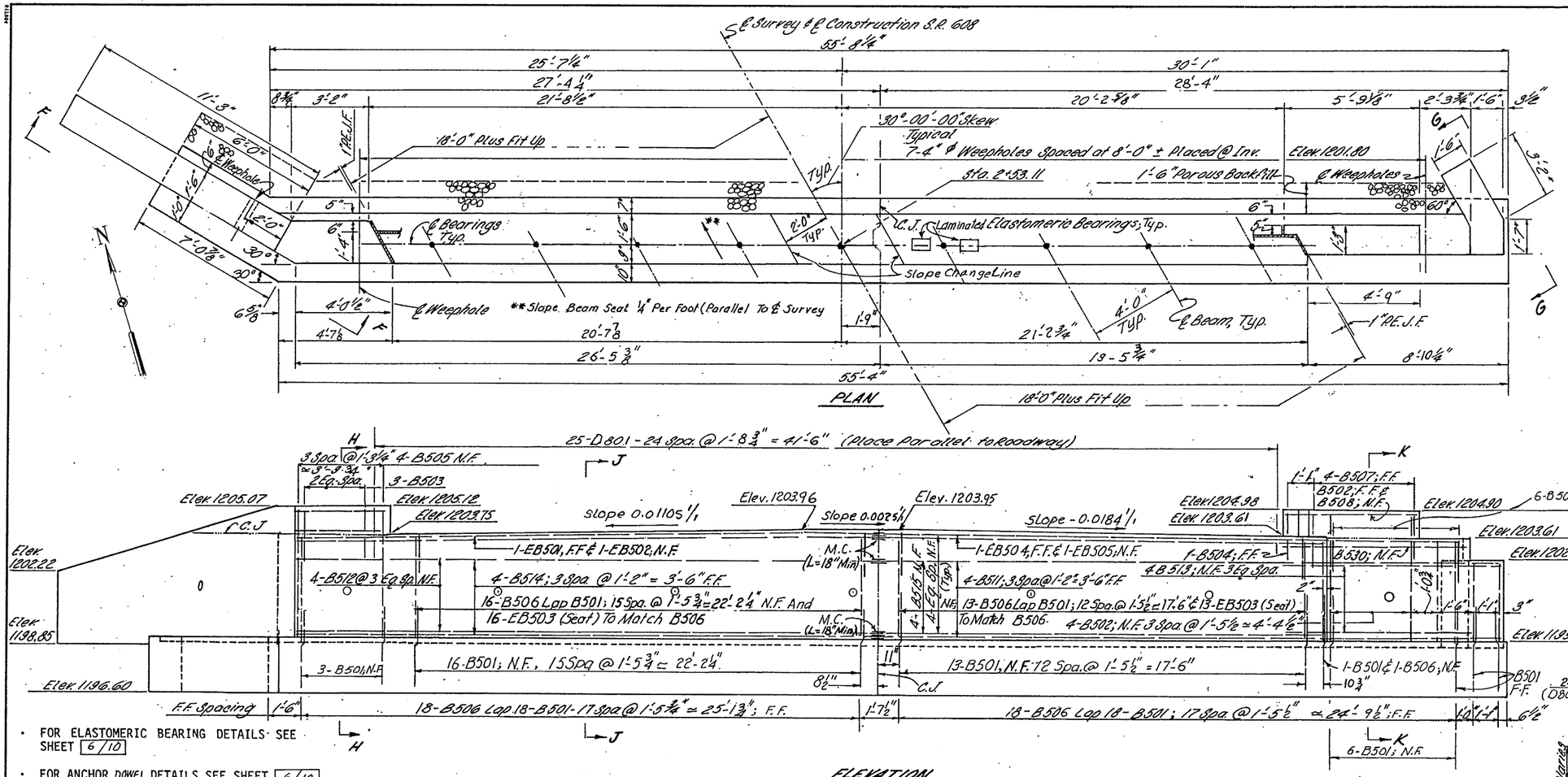
4/10

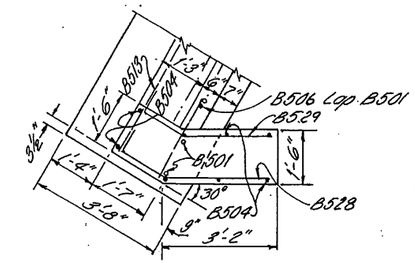
REAR ABUTMENT DETAILS

BRIDGE NO. GEA-608-0.710
OLD STATE ROAD
OVER UNNAMED CREEK
GEAUGA COUNTY. STA. 2+29.44 TO STA. 2+53.78

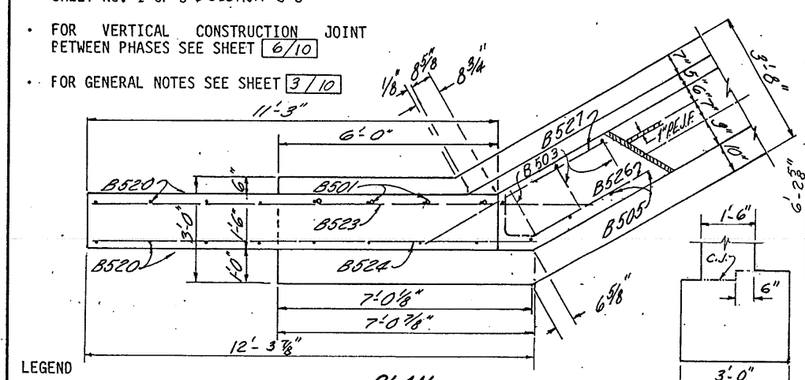
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ZDS	CWH	CWH	NSS	CAD		

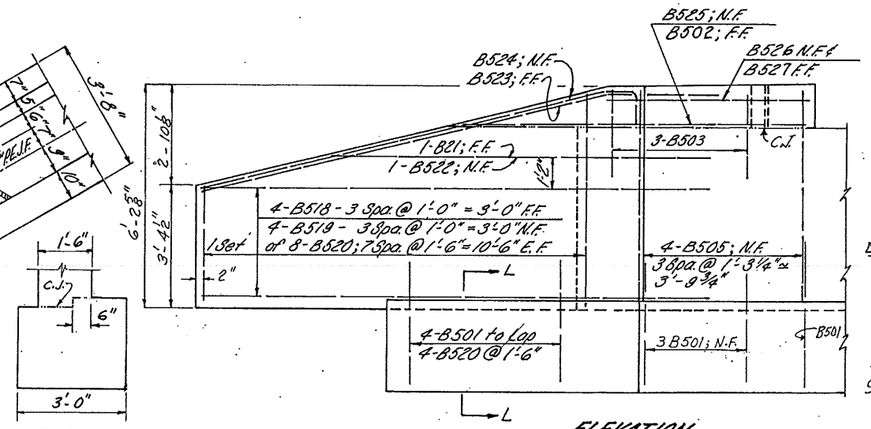
CALC. BY ZDS DATE 7-90	GEAUGA COUNTY	OHIO	16
CHKD. BY I.M. DATE 7-90	GEA-608-7.10		21

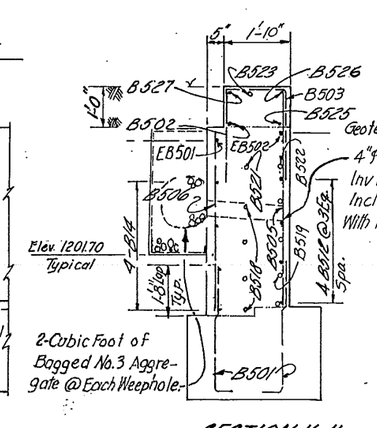


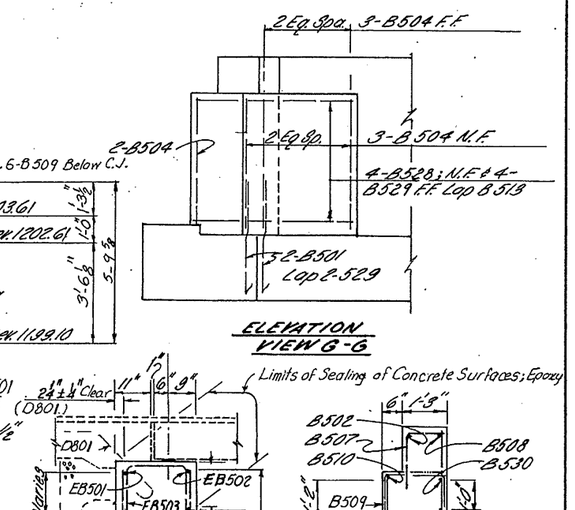


- FOR ELASTOMERIC BEARING DETAILS SEE SHEET 6/10
- FOR ANCHOR DOWEL DETAILS SEE SHEET 6/10
- FOR BARS D802 SEE STD. DWG AS-1-81 SHEET NO. 1 OF 3 & SECTION J-J
- FOR VERTICAL CONSTRUCTION JOINT BETWEEN PHASES SEE SHEET 6/10
- FOR GENERAL NOTES SEE SHEET 3/10









LEGEND

M.C.	INDICATEDS MECHANICAL CONNECTOR 508.09 SEE SHEET 8/10	F.F.	FAR FACE
—o—	INDICATES WINGWALL REBAR BEING DEVELOPED IN ABUTMENT STEM	E.F.	EACH FACE (NEAR & FAR)
		TYP.	TYPICAL
N.F.	NEAR FACE	P.E.J.F.	PREFORMED EXPANSION JOINT FILLER
		C.J.	CONSTRUCTION JOINT

Minimum Lap Splice lengths: Shall Conform With those Specified by 509.08 of the C.M.S. Unless Otherwise Noted on the Plans. For No 5 Bars Lap Length = 16"

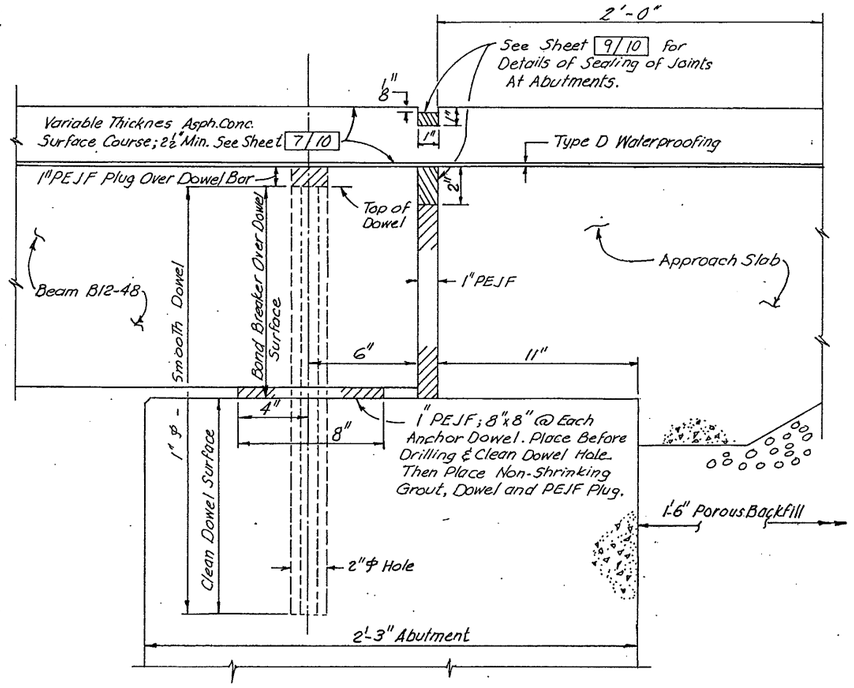
WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

5/10

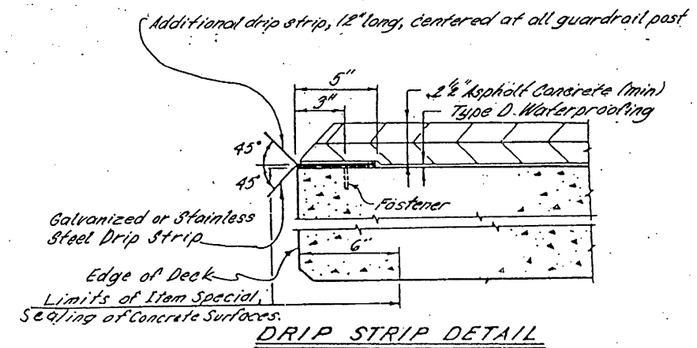
FORWARD ABUTMENT DETAILS

BRIDGE NO. GEA-608-0710
OLD STATE ROAD
OVER UNNAMED CREEK
GEAUGA COUNTY STA. 2+29.44 TO STA. 2+53.78

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ZDS	CWH	CWH	NSS	CAD		

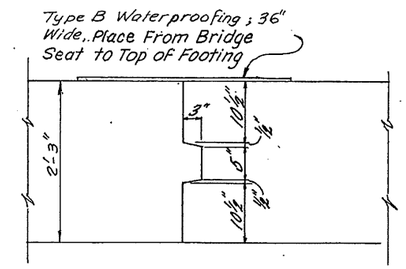


DETAIL OF FIXED ANCHOR DOWELS & SEALING OF JOINTS AT ABUTMENTS

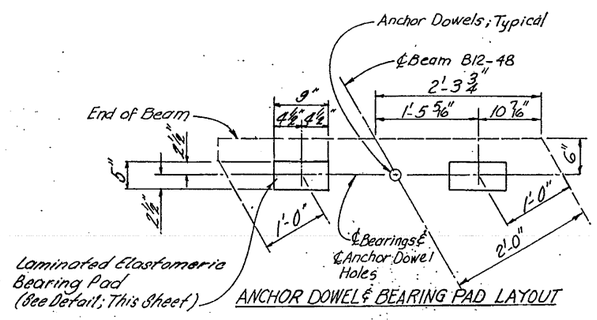


DRIP STRIP DETAIL

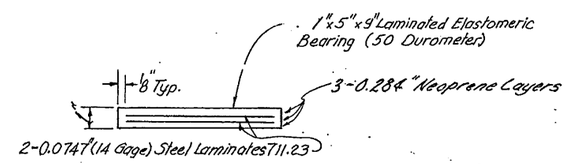
STEEL DRIP STRIP: PRIOR TO APPLYING DECK TYPE D WATERPROOFING, A BENT DRIP STRIP SHALL BE INSTALLED ALONG THE EDGES OF THE DECK AS SHOWN. THE STRIPS SHALL BE FASTENED AT 1'-6"C/C MAXIMUM WITH 1-1/4'X5/32"X1/4" FLAT HEAD DRIVE PIN AND WASHER (LENGTH X SHANK DIA. X HEAD DIA.) OR #10 GALVANIZED SCREWS AND 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"X0.105" 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.



ABUTMENT CONSTRUCTION JOINT DETAIL



ANCHOR DOWEL & BEARING PAD LAYOUT



LAMINATED ELASTOMERIC BEARING DETAIL

LAMINATED ELASTOMERIC BEARING: SHALL BE 50 DURO ELASTOMER, 1"X5"X9" WITH TWO, 14 GAGE STEEL LAMINATES AS DETAILED ON THIS SHEET. ALL THREE ELASTOMER LAYERS SHALL BE 0.284 INCHES THICK.

THE SERVICE LOAD REACTIONS PER BEARING SHALL BE AS FOLLOWS:

a. DEAD LOAD 5400 POUNDS

b. LIVE LOAD WITHOUT IMPACT 7500 POUNDS

THE ALLOWABLE TOLERANCES ARE AS FOLLOWS:

INDIVIDUAL ELASTOMER LAYER THICKNESS 0.284" (±0.056 INCHES)

PLAN DIMENSIONS 5"X9", (-0.00"+1/4" EACH)

TOTAL THICKNESS 1"(-0.00"+1/8")

EDGE COVER OF IMBEDDED STEEL 1/8" (-0.0"+1/8")

THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS, LABOR AND INCIDENTALS NECESSARY TO FURNISH AND INSTALL THE BEARINGS. PAYMENT SHALL BE MADE AT THE CONTRACT PRICE FOR ITEM 516, ELASTOMERIC BEARING PADS WITH INTERNAL LAMINATES ONLY, (1"X5"X9").

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

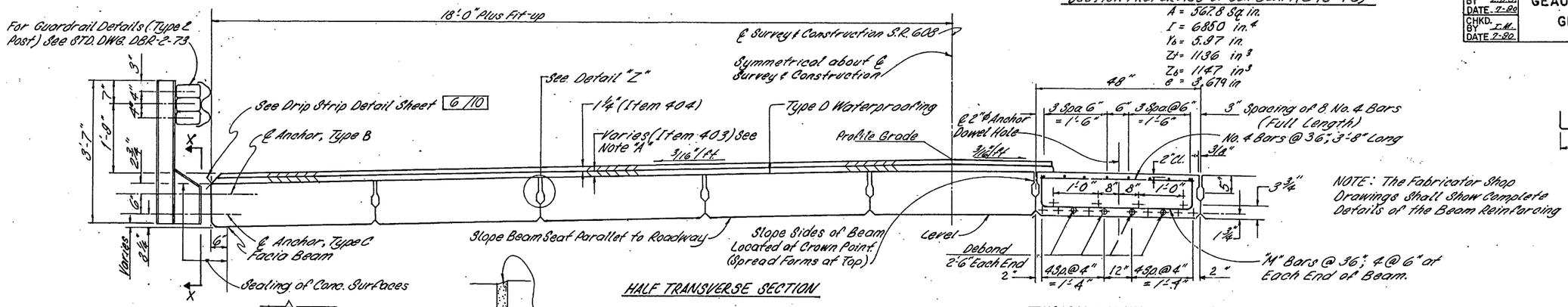
6/10

ABUTMENTS & DECK DETAILS

BRIDGE NO. GEA-608-0710
OLD STATE ROAD
OVER UNNAMED CREEK
GEAUGA COUNTY STA. 2+29.44 TO STA. 2+53.78

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ZDS	GWH	CWH	NSS	CAD		

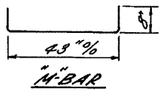
CALC. BY Z.D.S. DATE 7-80	GEAUGA COUNTY	OHIO	18
CHKD. BY I.M. DATE 7-80	GEA-608-7.10		21



HALF TRANSVERSE SECTION

SECTION PROPERTIES OF BOX BEAM (B 12-48)

A = 562.8 Sq. in.
I = 6850 in.⁴
Y_b = 5.97 in.
Z_t = 1136 in.³
Z_b = 1147 in.³
e = 3.679 in.

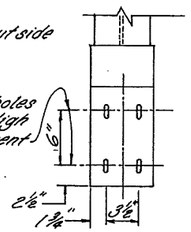


"M" BAR

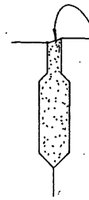
TYPICAL REINFORCING OF PRESTRESSED BOX BEAMS
+ Location of 14 - ½" ø Strands

OMIT KEYWAY on Outside of Fascia Beams.

Provide Slotted Holes 1½" Wide by 2¼" High for Post Adjustment



VIEW X-X

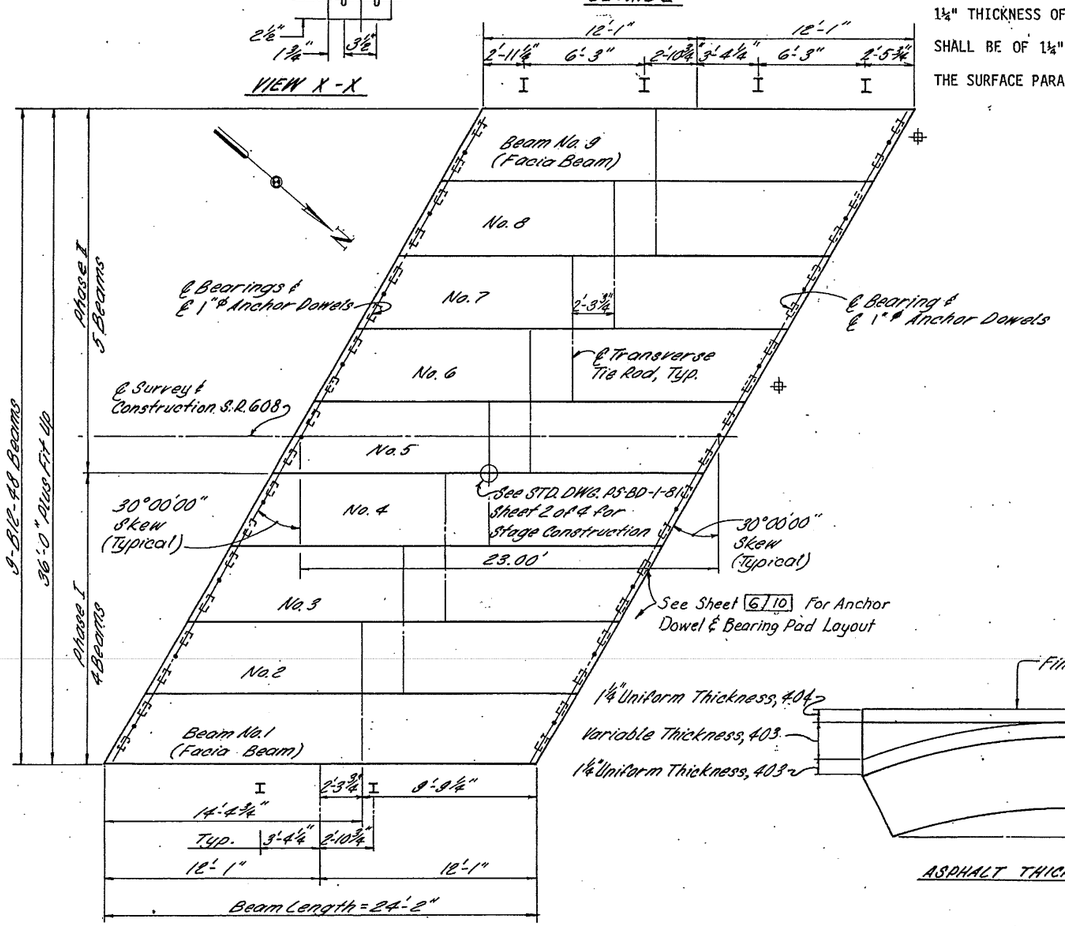


Shear keys Shall be Mortared on a Slope Between the Top Edges of the Adjacent Beams Where Vertical Offset (Within Tolerance) Occurs.

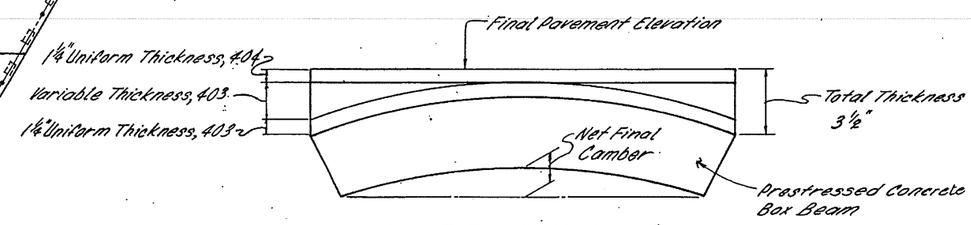
DETAIL Z

NOTE "A"

ASPHALT CONCRETE SURFACE COURSE SHALL CONSIST OF A VARIABLE THICKNESS OF 403 AND A 1¼" THICKNESS OF 404. THE 403 SHALL BE PLACED IN TWO OPERATIONS. THE FIRST COURSE SHALL BE OF 1¼" UNIFORM THICKNESS. THE SECOND COURSE SHALL BE FEATHERED TO PLACE THE SURFACE PARALLEL TO AND 1¼" BELOW FINAL PAVEMENT SURFACE ELEVATION.



PLAN OF DIAPHRAGM AND TRANSVERSE TIE RODS



ASPHALT THICKNESS DIAGRAM

CAMBER:

CALCULATED CAMBER AT TIME OF PAVING, INCLUDING ALLOWANCE FOR CAMBER GROWTH DUE TO CREEP IS 1"

CALCULATED DEFLECTION DUE TO WEIGHT OF SURFACE COURSE AND RAILING IS LESS THAN 1/16"; NEGLECTED.

NET FINAL CAMBER OF BEAMS IS 1". THIS IS 1" IN EXCESS OF THE AMOUNT REQUIRED TO PLACE THE TOP OF THE BEAM PARALLEL TO PROFILE GRADE. THIS EXCESS AMOUNT SHALL BE COMPENSATED FOR BY THICKENING THE 403 LEVELING COURSE FROM 1¼" AT CENTER OF SPANS TO 2¼" AT ENDS OF SPANS.

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

7/10

SUPERSTRUCTURE DETAILS

BRIDGE NO. GEA-608-0710
OLD STATE ROAD
OVER UNNAMED CREEK
GEAUGA COUNTY STA. 2+29.44 TO STA. 2+53.78

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
Z.D.S.	CWH	CWH	NSS	CAD		

CALC. BY ZDS DATE 2-90	GEAUGA COUNTY	OHIO	19
CHKD. BY C.W. DATE 2-90	GEA-608-7.10		21

REINFORCING STEEL LIST

MARK	NUMBER	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	A	B	C	D
REAR ABUTMENT									
A501	76	4'-4"	1		343	3'-8"	10½"		
A502	1	3'-7"	St.		4				
A503	6	4'-2"	10		35	1'-5"	1'-6"		
A504	1	4'-3"	St.		4				
A505	6	5'-6"	St.		34				
A506	66	4'-6"	St.		310				
A507	5	3'-6"	1		18	2'-8"	11"		
A508	4	4'-10"	St.		20				
A510	5	9'-8"	St.		50				
A511	4	5'-7"	St.		24				
A512	4	18'-7"*	St.		78				
A513	1	6'-4"	St.		7				
A514	4	28'-1"*	St.		117				
A515	4	24'-1.*	St.		100				
A516	4	25'-11"*	St.		108				
A518	3	6'-7"	2		21	2'-8"	4'-0"		
A519	1	5'-4"	3		6	2'-7½"	1'-0"	1'-10"	
A520	10	3'-4"	St.		35				
A521	23 at or 5	2'-10 to 5'-7"	St.	8½"	44				
A522	4	9'-6"	4		40	7'-01"	2'-5"		
A523	4	7'-11"	St.		33				
A524	1	3'-5"	4		4	10"	2'-7"		
A525	1	8'-7"	5		9	5'-10"	2'-9"		
A526	1	7'-8"	5		8	5'-10"	1'-1"		
A527	2	3'-10"	St.		8				
D802	24	3'-8"	9		295	1'-0"	2'-3"		
Subtotal Rear Abutment					1695				
REAR ABUTMENT EPOXY COATED									
EA501	1	27'-11"	St.		29				
EA502	1	18'-7"	St.		19				
EA503	31	4'-8"	10		151	1'-11"	1'-6"		
EA504	1	25'-11"	St.		27				
EA505	1	24'-1"	St.		25				
Subtotal Epoxy Rear Abutment					251				

MARK	NUMBER	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	A	B	C	D
FORWARD ABUTMENT									
B501	75	4'-4"	1		339	3'-8"	10½"		
B502	6	5'-4"	St.		33				
B503	3	5'-11"	10		19	1'-6"	2'-4"		
B504	9	3'-4"	St.		31				
B505	4	5'-10"	St.		24				
B506	66	4'-6"	St.		310				
B507	4	3'-6"	1		15	2'-8"	11"		
B508	1	4'-5"	St.		5				
B509	6	4'-2"	10		26	1'-5"	1'-6"		
B511	4	27'-9"*	St.		116				
B512	4	26'-11"*	St.		112				
B513	4	9'-11"	St.		41				
B514	4	27'-6"*	St.		115				
B515	4	19'-4"*	St.		80				
B518	4	18'-11"	St.		58				
B519	4	14'-7"	4		61	12'-2"	2'-5"		
B520	23 at or 8	3'-0 to 5'-9"	St.	4½"	79				
B521	1	10'-4"	St.		11				
B522	1	11'-0"	4		11	8'-7"	2'-5"		
B523	1	14'-2"	6		15	11'-4"	2'-10"		
B524	1	12'-10"	7		13	11'-4"	11"	8½"	
B525	1	8'-8"	4		9	4'-10"	3'-10"		
B526	1	5'-7"	8		6	3'-8"	10"	1'-2½"	
B527	1	5'-9"	4		5	2'-5"	2'-10"		
B528	4	4'-11"	8		21	3'-0"	1'-4"	8½"	
B529	4	4'-2"	8		17	2'-5"	1'-2"	8½"	
B530	1	8'-5"	St.		9				
D801	25	3'-8"	9		245	1'-0"	2'-3"		
Subtotal Forward Abutment					1820				
Total Plain Reinforcemel For Structure					3515				
FORWARD ABUTMENT EPOXY COATED									
EB501	1	27'-6"	St.		29				
EB502	1	26'-11"	St.		28				
EB503	29	4'-8"	10		141	1'-11"	1'-6"		
EB504	1	24'-8"	St.		26				
EB505	1	19'-4"	St.		20				
Subtotal Epoxy Forward Abutment					244				
Subtotal Epoxy For Structure					495				

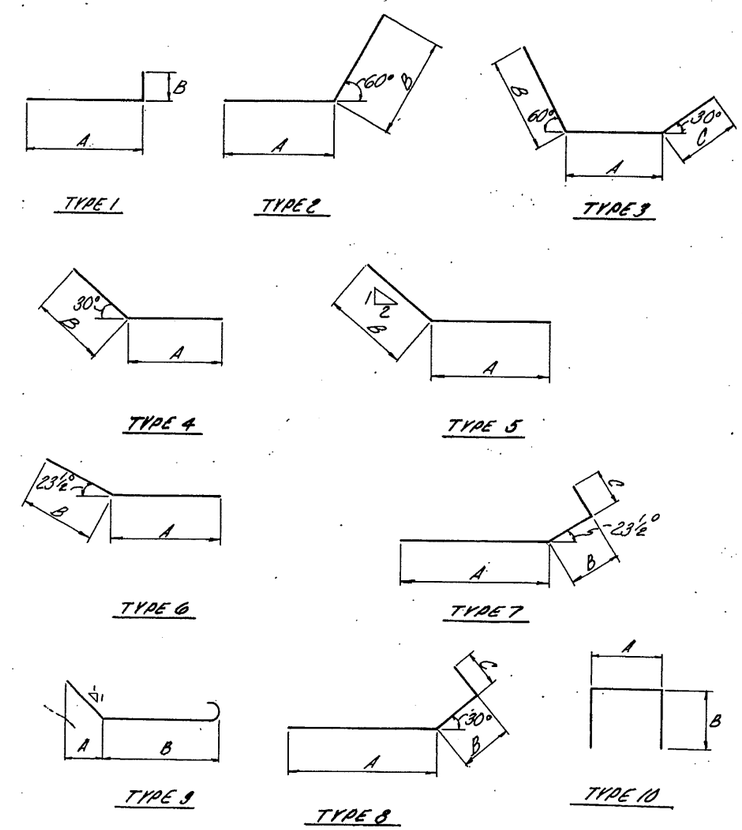
* MECHANICAL CONNECTORS: AN APPROVED TYPE OF MECHANICAL CONNECTOR FOR REINFORCING BARS SHALL BE PROVIDED. INSTALLATION OF CONNECTORS SHALL CONFORM WITH MANUFACTURER'S RECOMMENDED PROCEDURES. IF A DOWEL BAR SPLICE TYPE OF CONNECTOR IS FURNISHED, THE MINIMUM DOWEL BAR LENGTH TO BE INCLUDED WITH THE CONNECTOR SHALL BE AS GIVEN BY THE DIMENSION "L" SHOWN ON THE PLANS.

CONNECTORS AND DOWEL BARS USED WITH EPOXY COATED BARS SHALL BE EPOXY COATED. COATING FOR BOTH CONNECTORS AND BARS SHALL CONFORM TO THE SAME SPECIFICATIONS. COATINGS WHICH HAVE BEEN DAMAGED OR WHICH OTHERWISE DO NOT MEET SPECIFICATIONS WITH RESPECT TO COLOR, CONTINUITY AND UNIFORMITY MAY BE REPAIRED AS DIRECTED BY THE ENGINEER OR THEY SHALL BE REPLACED WITH MATERIAL WHICH MEETS THE SPECIFICATION.

CONNECTORS AND DOWEL BAR EXTENSIONS SHALL CONFORM WITH ITEM 509 AND BE INCLUDED IN THE BID PRICE PER POUND FOR ITEM 509.

E Prifix indicates Epoxy Coated
St. Indicates Straight bar
Quant By N.S.S 7-15-90, Check by CAD 7-20-90

BENDING DIAGRAM



WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

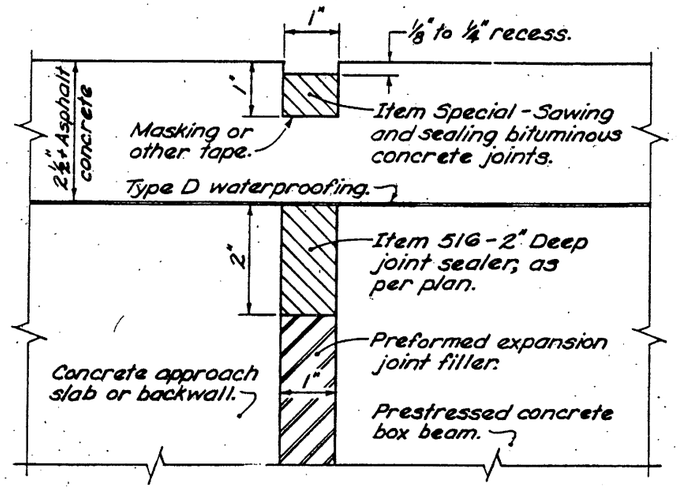
8/10

REINFORCING STEEL LIST & BENDING DIAGRAM

BRIDGE NO. GEA - 608 - 0710
OLD STATE ROAD
OVER UNNAMED CREEK

GEAUGA COUNTY. STA. 2+29.44 TO STA. 2+53.78

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ZDS	CWH	CWH	NSS	CAD		



SEALING OF JOINTS AT ABUTMENTS

ITEM SPECIAL - SAWING AND SEALING BITUMINOUS CONCRETE JOINTS

1) Description:

This work shall consist of cutting and sealing transverse joints on the new bituminous concrete overlay of box beam bridges. Bituminous concrete joints shall be constructed directly over, and in line with, the existing underlying transverse abutment joint of the box beams.

2) Materials:

The joint sealant shall meet the requirements of ASTM Specification D3405, Joint sealants, Hot-poured, for Concrete and Aspalt Pavements. Acceptable alternate materials are:

Roof-Flex 176, polyurethane, as produced by the Carboline Company, 350 Hanley Industrial Court, St. Louis, Missouri 63144 (Roger Zubal, 614-877-3406); a silicone sealant meeting Federal Specifications TT-S-001543A Class A (one-part silicone sealants) and TT-S-00230C Class A (one-component sealants), such as those manufactured by General Electric, Silicone Products Division, 6155 Rockside Rd., Rockside Square I, Independence, Ohio 44131 (John Fromholtz, 216-447-1750) or Dow Corning, 3737 Park East, Beachwood, Ohio 44122 (Robert Ruppel, 216-464-2330); or Sof-Seal, a cold-applied, low-modulus, two-component polymeric compound horizontal sealant as manufactured by W. R. Meadows, Inc., P.O. Box 543, Elgin, Illinois 60121 (Robert Cameron, 312-683-4500). Sealant will be accepted on the basis of the manufacturer's certification that it conforms to the requirements of these specifications.

3) Construction Details:

A) General: The contractor shall conduct his operation so that the cutting, cleaning and sealing of transverse joints is a continuous operation that will be performed as soon as practical after the paving, but no later than four (4) days after placement of the asphalt concrete surface course. Traffic shall not be allowed to knead together or damage the joint cut prior to sealing.

B) Cutting of Transverse Joints: The contractor shall saw or rout transverse joints to the dimensions shown in the details on this sheet. The cut joints shall lie directly above each box beam abutment joint. The joint location shall be marked on the new asphalt surface with a chalk line, or by some other acceptable method, before cutting. Details of the method for locating and accurately marking the proposed cuts shall be subject to the approval of the Engineer prior to starting any surfacing or paving operations.

The blade or blades shall be of such size that the full width and depth of the cut can be made with one pass. Dry or wet cutting will be allowed. Joints shall extend the full width of the bridge.

C) Cleaning Joints: Dry sawed joints shall be thoroughly cleaned with a sufficient amount of compressed air to remove any dirt, dust, or deleterious matter. Wet sawed joints shall be washed clean of all cuttings by flushing with a jet of water and with other tools as necessary. After flushing, the joint shall be blown out with compressed air. When the surfaces are thoroughly clean and dry, and just prior to placing the joint sealer, compressed air having a pressure of at least 90 p.s.i. shall be used to blow out the joint and remove all traces of dust.

In the event freshly cut joints become contaminated before they are sealed, they shall be recleaned of all foreign material by high pressure water jet.

D) Sealing Joints: The joint shall be thoroughly dried before the sealant is placed. After cleaning and drying, a bond-breaker (tape) shall be applied to the bottom of the groove.

Hot-poured joint sealant material shall be heated in a kettle or melter constructed as a double boiler, with the space between the inner and outer shells filled with oil or other heat transfer medium. Positive temperature control and mechanical agitation shall be provided. Heating must be in strict accordance with the manufacturer's recommendation. Joint sealer material shall never be kept heated at the pouring temperature for more than four (4) hours and shall never be reheated. Sealer left in the applicator at the end of a day's work shall be removed and discarded.

Hot-poured sealant shall be applied immediately through a nozzle, which must project into the sawed joint, filling from the bottom up. The seal shall completely fill the joint in such a manner that, after cooling, the level of the sealer will not be higher than 1/8" below the pavement surface. Any depression in the cooled seal greater than 3/16" shall be brought up to the specified limit by further addition of hot-poured sealant. Care shall be taken in the sealing of the joints so that the final appearance will present a neat fine line.

The cold applied sealant materials (polyurethane, silicone, and polymeric compounds) shall be installed as per manufacturers' recommendations, or as directed by the Engineer. The sealant shall be installed when the ambient temperature is 40 degrees F or higher. Traffic shall not be allowed on the joint for one hour after application of the sealant.

4) Method of Measurement:

The quantity to be paid for under this item will be the number of linear feet of joints sawed and sealed as per the above requirements.

5) Basis of Payment:

The unit price per linear foot for Item Special - "Sawing an sealing bituminous concrete joints" shall include the cost of all labor, materials, and equipment necessary to complete the work, including the furnishing and placing of the joint sealer material.

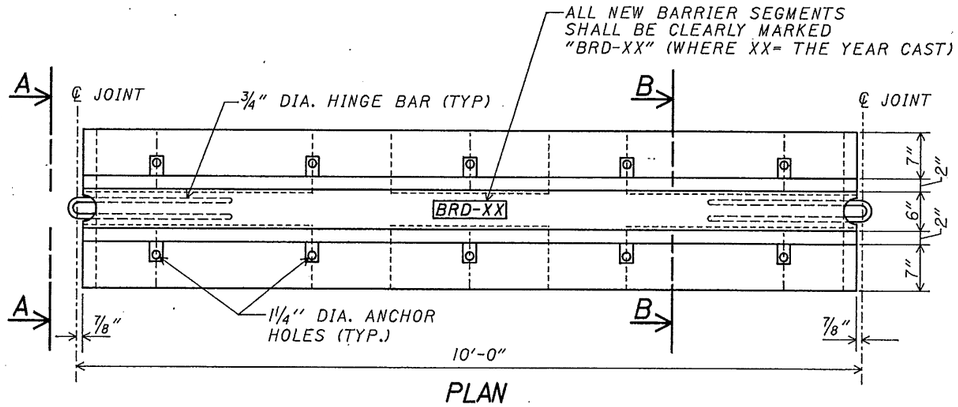
ITEM 516 - *JOINT SEALER, 705.04,* AS PER PLAN (2" DEEP)

This item shall meet the material (para. 2) and sealing (para. 3D) specifications of Item Special - Sawing and sealing bituminous concrete joints.

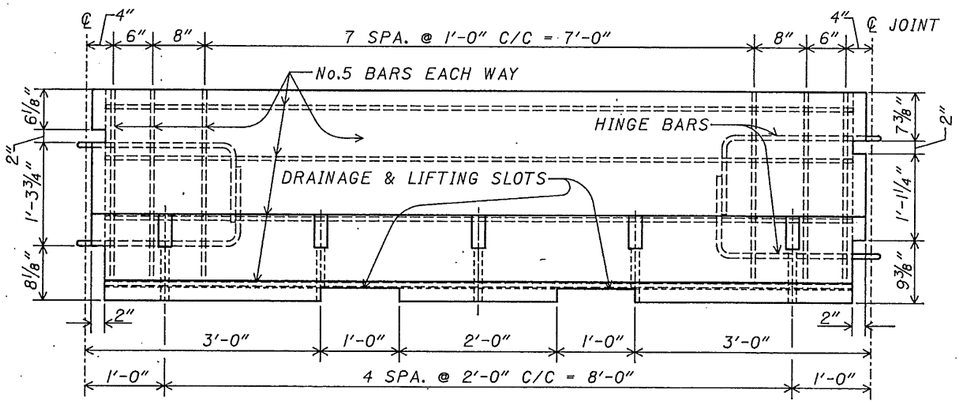
REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	9/10
2-8-84 3-10-87 4-14-87 6-16-87	ABUTMENT JOINTS IN BITUMINOUS CONCRETE, BOX BEAM BRIDGES BRIDGE NO.: GEA-608-0710	

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
JEB	MJB		WTF	WJJ	2-2-84

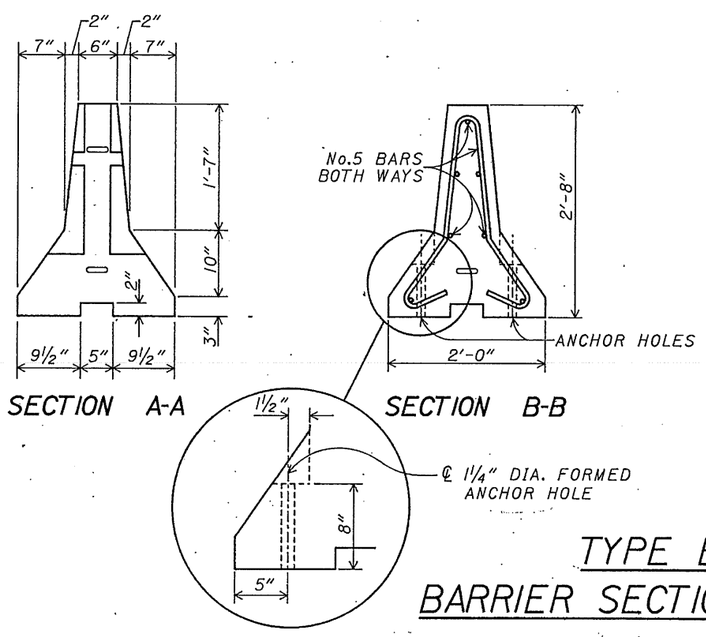
GEAUGA COUNTY GEA-608-7.10	OHIO	21/21
	FHWA REGION 5	
	FEDERAL PROJECT	



PLAN



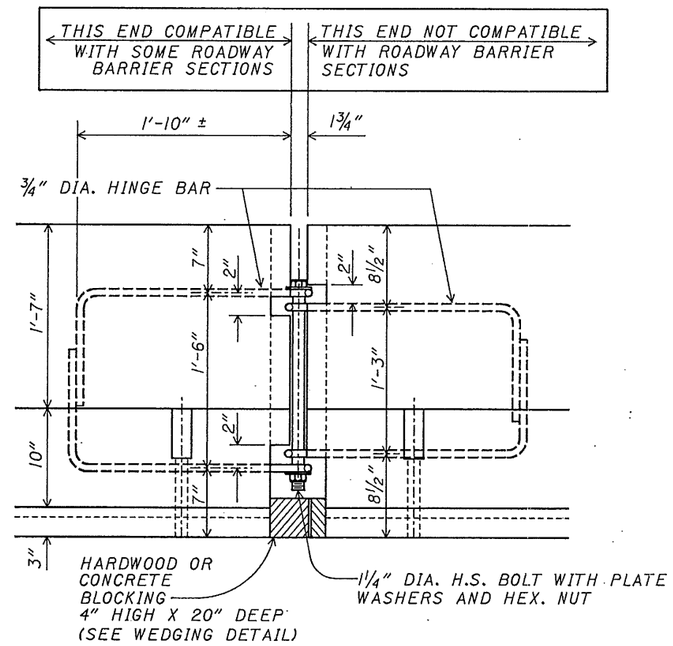
ELEVATION



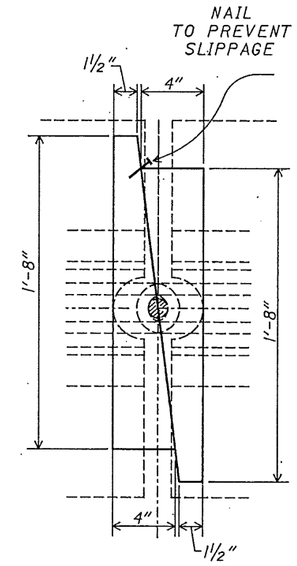
TYPE BRD BARRIER SECTIONS

MATERIAL REQUIREMENTS:

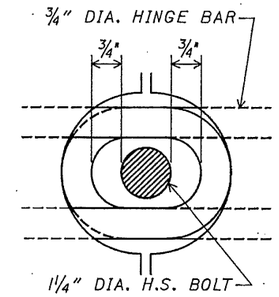
1. THE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. AND SHALL CONTAIN A CALCIUM NITRITE CORROSION INHIBITING ADMIXTURE. THE ADMIXTURE SHALL BE ADDED TO THE CONCRETE AT THE RATE OF 4.0 GALLONS PER CUBIC YARD OF CONCRETE AND SHALL BE ADDED AS AN AQUEOUS SOLUTION, SUCH AS W.R. GRACE'S DCI CORROSION INHIBITOR (30% SOLIDS) OR APPROVED EQUAL. THE WATER IN SUCH SOLUTION SHALL BE COUNTED AS MIXING WATER FOR THE PURPOSE OF DETERMINING THE WATER TO CEMENT RATIO OF THE CONCRETE. THE CALCIUM NITRITE MUST BE ADDED TO THE MIX IMMEDIATELY AFTER THE AIR-ENTRAINING AND RETARDING ADMIXTURES HAVE BEEN INTRODUCED TO THE BATCH.
2. ALL REINFORCING STEEL AND STEEL ROD CONNECTING LOOPS SHALL BE GRADE 60 REINFORCING STEEL WITH A MINIMUM YIELD STRENGTH OF 60,000 PSI.



DETAIL AT HINGED CONNECTION

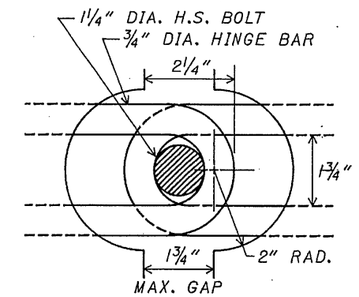


BARRIER WEDGING DETAIL (HARDWOOD)



INITIAL JOINT

BARRIER SEGMENTS SHOULD INITIALLY BE PLACED CLOSER TOGETHER SO THAT BOLTS CAN BE EASILY INSERTED THROUGH HINGE BAR LOOPS.



FINAL JOINT

BARRIER JOINTS MUST BE FULLY OPEN BEFORE OPENING IS BLOCKED WITH CONCRETE OR HARDWOOD.

CONCRETE BARRIER, TYPE BRD, ANCHORED

ALL ANCHORS SHALL BE 1" DIAMETER, HIGH STRENGTH, THRU BOLTS OR APPROVED RESIN ANCHORS. WHEN RESIN ANCHORS ARE USED, THEY MUST BE EMBEDDED A MINIMUM OF 6" INTO FIRM CONCRETE. THE NUMBER OF ANCHORS SHALL BE AS SHOWN BELOW AND SHALL BE PLACED SYMMETRICALLY ABOUT THE TRANSVERSE ℄ OF BARRIER SECTION ON THE ROADWAY SIDE OF THE BARRIER.

BRIDGE NO.	TRAFFIC CONTROL PHASE	NO. ANCHORS / 10' SECTION
GEA-608-0710	All	No Anchors On Structure

COMMON NOTES:

ALL PORTABLE CONCRETE BARRIERS ON STRUCTURES

BRIDGE DECK SURFACE PREPARATION

1. THE BRIDGE DECK SURFACE AREA ON WHICH THE PRECAST CONCRETE BARRIER SEGMENTS WILL REST SHALL BE CLEARED OF ALL LOOSE SAND, GRAVEL, DIRT AND DEBRIS.
2. ANY IRREGULARITIES IN THE BRIDGE DECK AREA, UNLESS JUDGED BY THE ENGINEER TO BE INCONSEQUENTIAL, SHALL BE LEVELED WITH GROUT AND/OR ASPHALT.
3. ASPHALT ROLL ROOFING SHALL BE PLACED ON THOSE BRIDGE DECK AREAS, AS JUDGED BY THE ENGINEER, TO HAVE A SURFACE ROUGHNESS WHICH WOULD INHIBIT FRICTION CONTACT BETWEEN BARRIER SEGMENTS AND DECK.

BOLTED JOINT CONNECTIONS

4. WHEN STANDARD MC-9A BARRIER SECTIONS OR TYPE BRD BARRIER SECTIONS ARE USED ON STRUCTURES, THEY SHALL BE BOLTED TOGETHER AND BLOCKED AS SHOWN ABOVE (BOLTING AND BLOCKING DIMENSIONS FOR MC-9A BARRIER MAY VARY FROM THOSE SHOWN).

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

10/10

PORTABLE CONCRETE BARRIERS
BRIDGE NO. GEA-608-0710
OLD STATE ROAD
OVER UNNAMED CREEK

GEAUGA CAUNTY STA. 2+29.44 TO STA. 2+53.78

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ODOT	ODOT			CAD		