

DESIGN DESIGNATION:
1985 ADT 660
2007 ADT 810
2007 ADTT 32

ESTIMATED DESIGN DISCHARGES:

DISCHARGE	ELEVATION	VELOCITY
Q ₁₀ = 800 cfs	771.2	6.3 fps
Q ₂₅ = 1080 cfs	772.3	6.8 fps
Q ₅₀ = 1290 cfs	772.7	7.2 fps
Q ₁₀₀ = 1520 cfs	773.3	7.5 fps

DRAINAGE AREA = 2.47 SQ. MI.

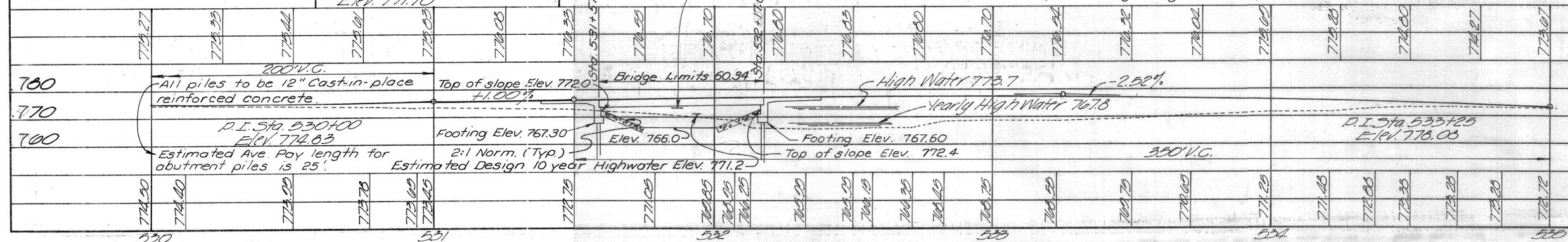
EXISTING STRUCTURE
TYPE: Steel Beam SEN 7104022
LENGTH: 51.3', DISPOSITION: To be removed
WIDTH: 17.0'
ALIGNMENT: Tangent
SKEW: 14° L.F.
WEARING COURSE: 3" Bituminous

PROPOSED STRUCTURE
TYPE: Prestressed Concrete box beams on Reinforced concrete abutments.
SPAN: 1 @ 59' 9/16" Bearings
ROADWAY: 32' 1/2" Guardrail
SKEW: 30° Lt Fwd.
LOADING: HS 20-44 and the Alternate Military Loading.
ALIGNMENT: Tangent
WEARING SURFACE: 2 1/2" min. Asphalt Conc.
APPROACH SLABS: AS-1-81 (25' long)
SUPERELEVATION: None

Earthwork limits shown are approximate. Actual slopes shall conform to plan cross-sections.

Fill to Elev. 774.0± and slope to drain.
Excavate through structure to Elev. 766.0.

BENCH MARK
□ Gut in Culvert Headwall (Middle)
Sta. 534+27
25.8 R.L.±
Elev. 771.10



STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

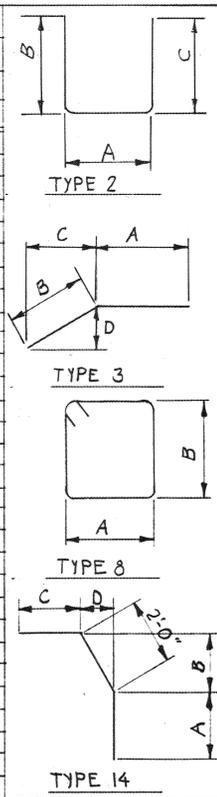
SITE PLAN

BRIDGE NO. ROS-138-1007
OVER SPERRY'S RUN

ROSS COUNTY
S.R. 138
STA. 531+57.33
532+17.67

PRESENT TOPOGRAPHY		PROPOSED WORK			
SURVEYED	DRAWN	DESIGNED	DRAWN	CHECKED	REVIEWED
D.M.W.	G.E.O.	MJR	MJR	DFT	FPK

REINFORCING STEEL LIST											
ABUTMENT											
MARK	NUMBER			LENGTH	WEIGHT	TYPE	DIMENSIONS				INC.
	REAR	FWD.	TOTAL				A	B	C	D	
A401	16	16	32	8'-9"	187	8	2'-5"	1'-9"			
A501	8	8	16	28'-5"	474	St.					
A502	78	78	156	6'-7"	1071	2	2'-8"	2'-1"	2'-1"		
A503	8	8	16	19'-9"	330	St.					
A504	26	26	52	12'-0"	651	2	1'-11"	5'-2"	5'-2"		
A505	26	26	52	5'-4"	289	2	0'-7"	2'-6"	2'-6"		
A506	4	4	8	20'-11"	175	St.					
A507	3	3	6	9'-1"	57	St.					
A508	6	6	12	11'-4"	142	St.					
A509	1	1	2	7'-6"	16	St.					
A510	1	1	2	5'-6"	11	St.					
A511	2	2	4	9'-9"	41	St.					
A512	2	2	4	4'-9"	20	St.					
A513	1	1	2	8'-3"	17	3	3'-9"	4'-6"	4'-1"	1'-10"	
A514	2	2	4	7'-10"	33	3	3'-4"	4'-6"	4'-7"	1'-10"	
A515	2	2	4	7'-8"	32	St.					
A516	5	5	10	16'-3"	169	2	1'-2"	7'-8"	7'-8"		
A517	2	2	4	10'-9"				4'-11"	4'-11"	9"	
	Series of 4	Series of 4	Series of 4	to 15'-3"	217	2	1'-2"	to 7'-2"	to 7'-2"		
A518	3	3	6	11'-3"	70	St.					
A519	1	1	2	6'-1"	13	St.					
A520	1	1	2	4'-1"	9	St.					
A521	1	1	2	6'-9"	14	3	2'-3"	4'-6"	4'-1"	1'-10"	
A801	8	8	16	28'-10"	1232	St.					
A802	8	8	16	20'-10"	890	St.					
D802	22	22	44	4'-10"	568	14	1'-5"	1'-5"	1'-5"	1'-5"	



GENERAL NOTES

- REFERENCE:** Shall be made to Standard Drawings AS-1-81 dated 11-27-81 sheets 1 and 2, DBR-2-73 dated 4-10-73, PSBD-1-81 dated 9-18-81 sheets 1 thru 3.
- DESIGN SPECIFICATIONS:** This structure conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials 1983, including 1984-88 Interim Specifications and the Ohio "Supplement" to these specifications.
- DESIGN DATA:** Design loading HS20-44 and Alternate Military Loading, Concrete for substructure - Class C - Compression strength 4000 psi, Reinforcing steel - ASTM A615, A616 & A617 - Grade 60, minimum Yield Strength 60,000 psi. Reinforcing steel for Prestressed beams may be Grade 40, minimum Yield Strength 40,000 psi. Prestressing Strand - ASTM A416, f_s = 270,000 psi initial stress = 0.70 f_s, Deck protection method - Type D waterproofing, asphalt concrete overlay and corrosion inhibiting admixture. Conc. for Prestressed Beams Unit Stresses 2200 psi Comp. & 444 psi Ten.
- REMOVAL OF EXISTING STRUCTURE:** When no longer needed to maintain traffic, the existing structure shall be removed.
- EMBANKMENT CONSTRUCTION:** The embankments shall be constructed to the level of the subgrade for a minimum distance of 200 feet back of the abutments. Excavation may then be made for the abutments and piles may then be driven.
- PILE DESIGN LOADS:** The design load for the abutment piles is 34 tons per pile.
- PRECAST PRESTRESSED CONCRETE PILE ALTERNATE:** 12 inch precast prestressed concrete piles may be substituted for the 12 inch dia. Cast-in-place reinforced concrete piles shown on these plans. Drawings showing details of and specifications for prestressed concrete piles are available from the Director (Bureau of Bridges). If the prestressed pile alternate is chosen, the method of measurement and basis of payment shall be the same as for Cast-in-Place reinforced concrete piles per 507.
- REINFORCING STEEL SAMPLES:** Refer to CMS sections 106.03, 700, 709.01 thru 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling, Random samples shall be replaced in the structure by the additional steel spliced in accordance with 509.08.
- BEARING PAD SHIMS:** 1/8" thick preformed bearing pad shims plan area 6"x10" shall be placed on top of bearings where required for proper bearing. Refer to CMS section 711.21. The number supplied shall be 2 shims per beam. Shims not used shall become property of the state.
- ITEM SPECIAL SEALING OF CONCRETE SURFACES:** A concrete sealer, shall be applied to the concrete surfaces shown on sheet 6/7. See the Proposal for surface preparation requirements, application rates, material requirements and application procedures.
- UTILITY LINES:** All expense involved in relocating the 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.

ESTIMATED QUANTITIES - "BRS FUNDS"										
ITEM	TOTAL	UNIT	DESCRIPTION	ABUT.	SUPER.	GENERAL				
202	Lump	Sum	Structure removed							Lump
403	10	Cu. Yd.	Asphalt Concrete (AC-20)		10					
404	8	Cu. Yd.	Asphalt Concrete (AC-20)		8					
503	Lump	Sum	Unclassified Excavation	Lump						
505	Lump	Sum	Pile Driving Equipment Mobilization							Lump
507	400	Lin. Ft.	12" Dia. Cast-in-Place, Reinforced Concrete Piles	400						
509	6728	Lbs.	Reinforcing Steel, Grade 60	6728						
511	69	Cu. Yd.	Class C Concrete, Abutments	69						
512	229	Sq. Yd.	Type D Waterproofing		229					
515	8	Ea.	Prestressed Concrete Bridge Members, as per plan (See Proposal Note)		8					
516	166	Sq. Ft.	1" Preformed Expansion Joint Filler	166						
516	76	Lin. Ft.	2" Deep Joint Sealer, As Per Plan, 705.04	76						
516	32	Ea.	1"x6"x10" Laminated Elastomeric Bearings (50 Durometer)	32						
516	16	Ea.	1/8"x6"x10" Preformed Bearing Pads 711.21 (Shims)	16						
517	137.5	Lin. Ft.	Railing (Deep Beam Rail with Steel Tubular Back-Up & Type 2 Steel Posts & Bolts)*		137.5					
518	36	Cu. Yd.	Porous Backfill	36						
Special	92	Sq. Ft.	Steel Drip Strip		92					
Special	36	Sq. Yd.	Sealing of Concrete Surfaces (See Proposal Note)		36					
Special	76	Lin. Ft.	Sawing and Sealing Bituminous Joints	76						

* See Proposal Note

Reactions At Each Beam End

Dead Load = 33.4 kips
 Live Load = 25.0 kips
 Total Load = 58.4 kips ÷ 2 = 29.4 kips
 29.4 kips Maximum design load each bearing pad.

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 1985 Interim Specifications for the "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, Thirteenth Edition, 1983. The testing shall be included in the price bid for the bearings. Acceptance of the bearing shall be according to Level 1 acceptance criteria of Article 25.7 and 711.23 of the Construction and Material Specifications. The manufacturer shall furnish certified test data.

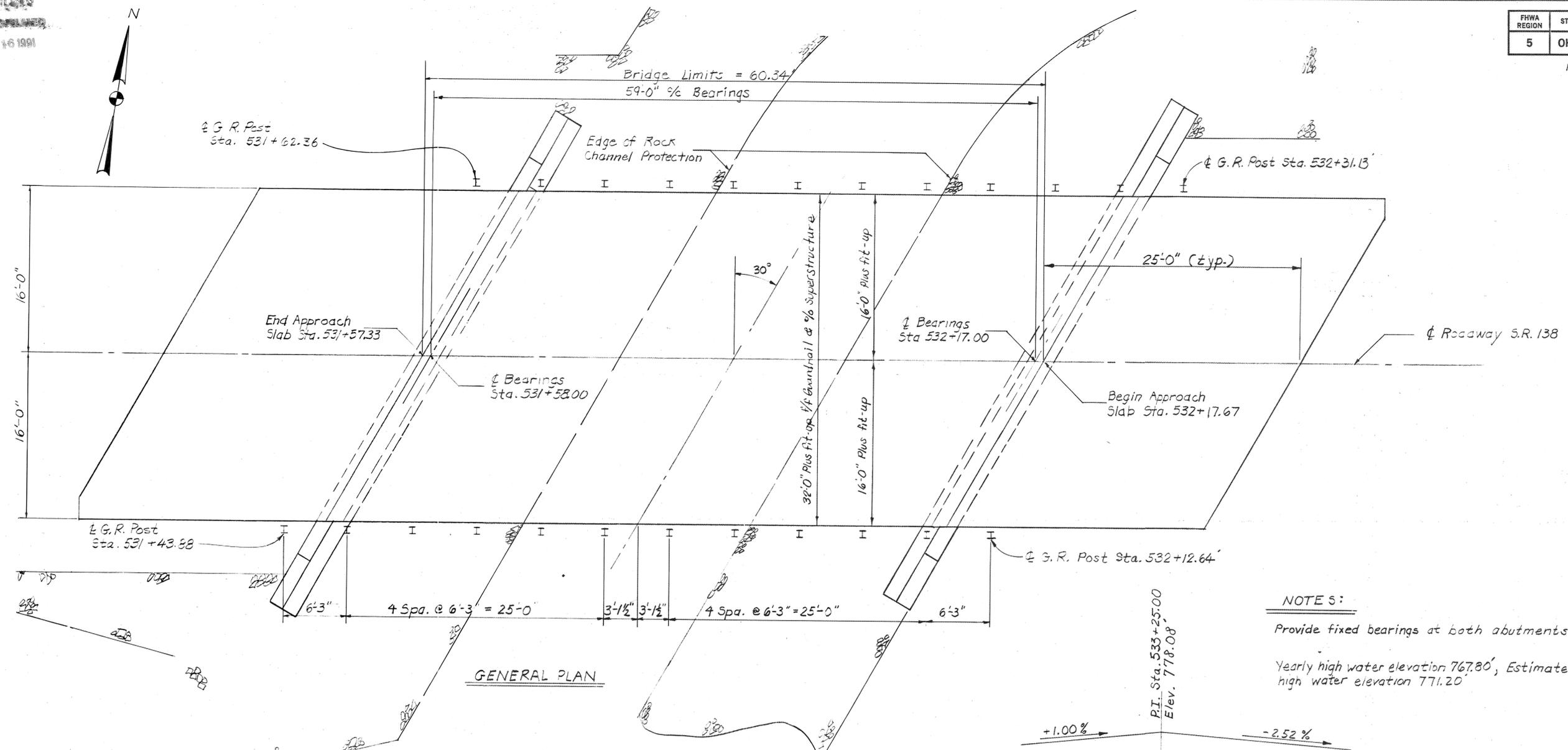
NON-SHRINKING MORTAR:

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.

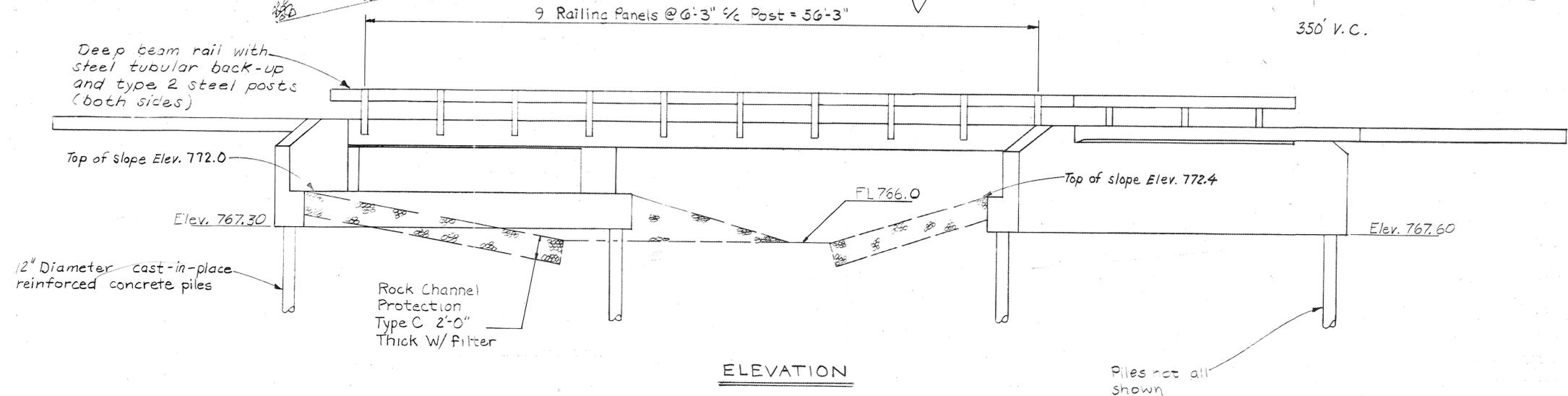
PREPARATION OF CONCRETE SURFACES IN CONTACT WITH NON-SHRINKING MORTAR: The keyway surfaces shall be given a medium sandblast at the plant within four days before the beams leave the plant. Before mortaring, the keyways shall be thoroughly clean of all dirt, dust and other foreign matter. The keyway surfaces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

EXISTING STEEL BEAMS shall be carefully dismantled and stored along the bridge R/W for disposition by State forces.

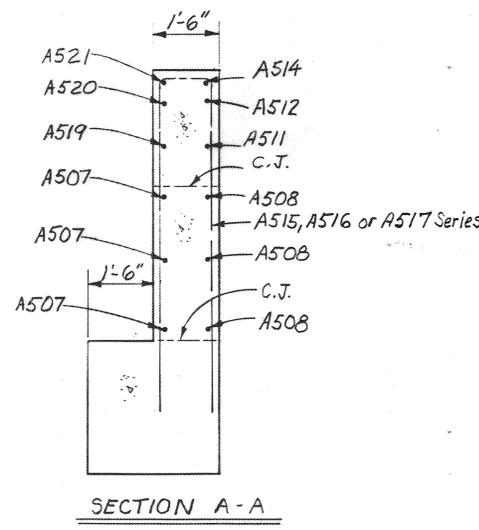
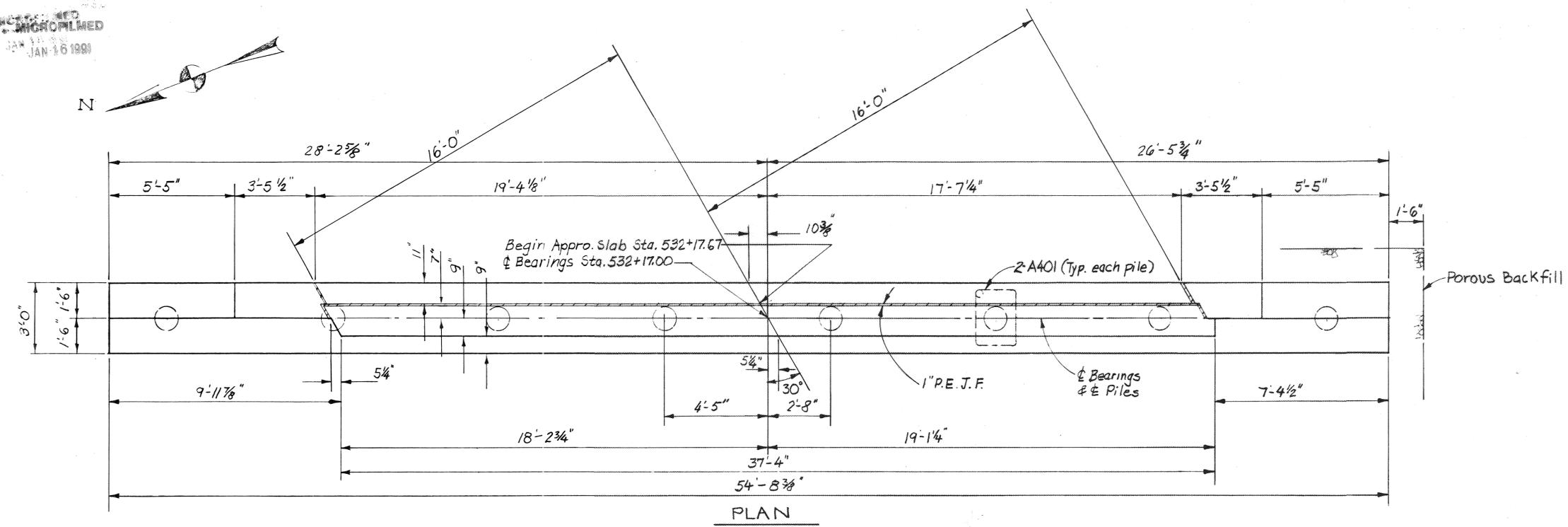
STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN						2/7
GENERAL NOTES ESTIMATED QUANTITIES & REINFORCING STEEL LIST BRIDGE No. ROS-138-1007 OVER SPERRY'S RUN						
DESIGNED JCR	DRAWN JCR	TRACED	CHECKED FFE 7-8-86	REVIEWED WTF	DATE 3-1-88	REVISED



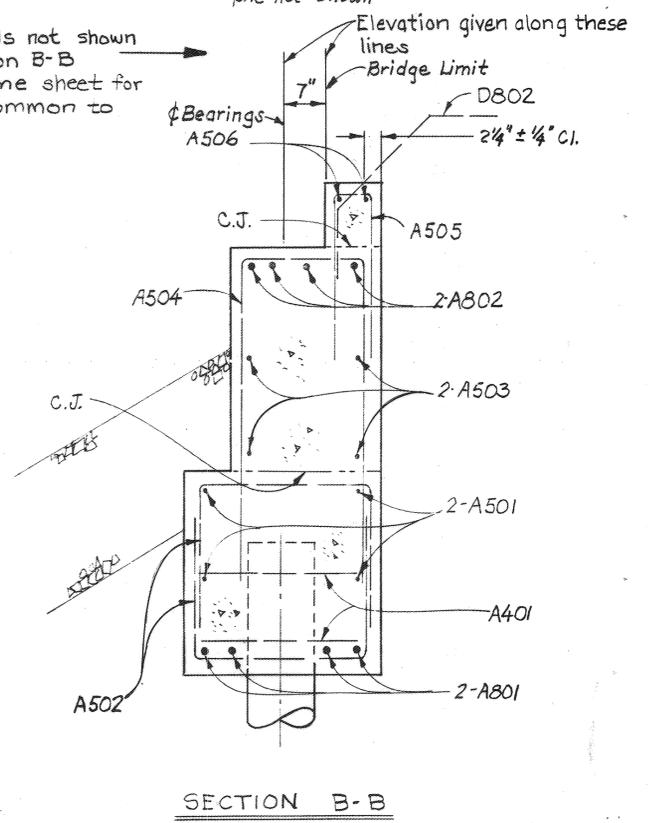
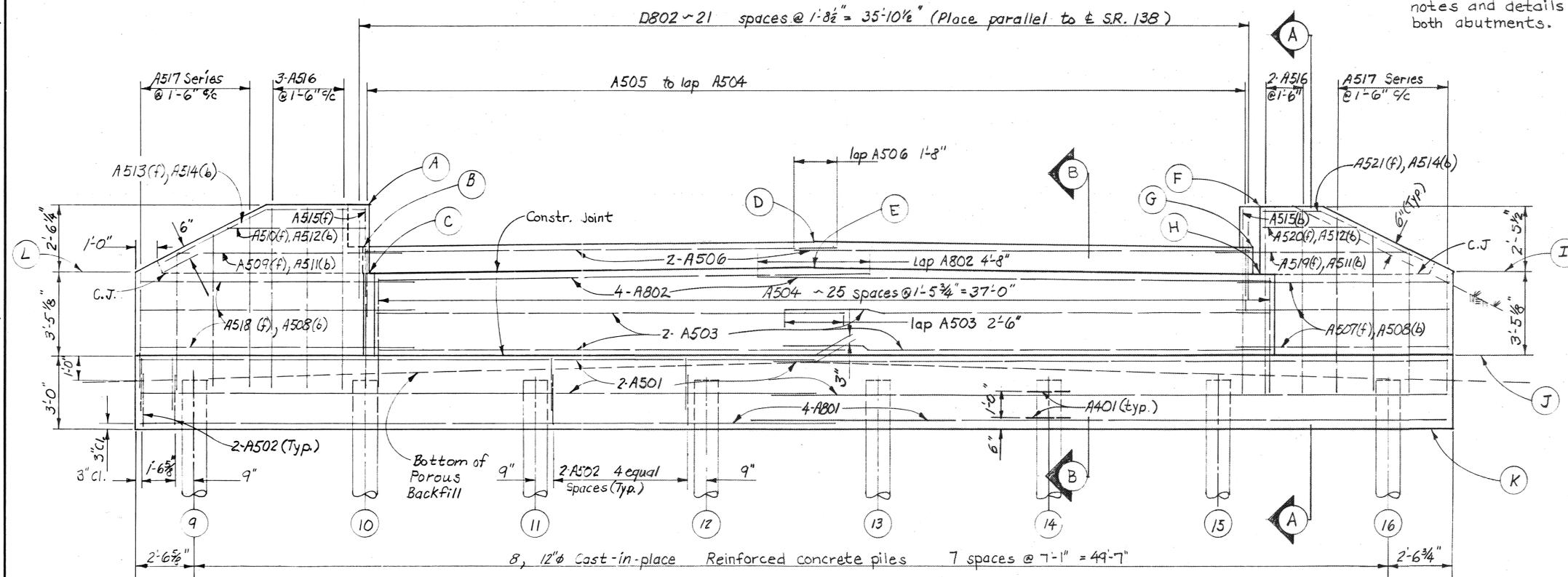
NOTE S:
Provide fixed bearings at both abutments.
Yearly high water elevation 767.80', Estimated 10 year high water elevation 771.20'



STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN						3/7
GENERAL PLAN AND ELEVATION						
BRIDGE NO. RO5-138-1007						
Over Sperry's Run						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JCR	JCR		FFE	WTF	3-1-88	



NOTE: For all dimensions and details not shown in this section, refer to section B-B sheet 4/7. Also see the same sheet for notes and details which are common to both abutments.



Elevations					
A	B	C	D	E	F
776.55'	775.03'	773.94'	775.26'	774.17'	776.49'
G	H	I	J	K	L
774.97'	773.88'	774.03'	770.60'	767.60'	774.03'

LEGEND:
N= North wing
S= South wing
f= front face
b= back face
P.E.J.F.= Preformed expansion joint filler
C.J.= Construction joint

STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN						5/7
FORWARD ABUTMENT DETAILS						
BRIDGE No. ROS-138-1007						
OVER						
SPERRY'S RUN						
DESIGNED JCR	DRAWN JCR	TRACED	CHECKED FFE	REVIEWED WTF	DATE 3-1-88	REVISED

REPRODUCTION
JAN 16 1991

FHWA REGION	STATE	PROJECT
5	OHIO	

38
42

ROS-138-9.98

NOTES

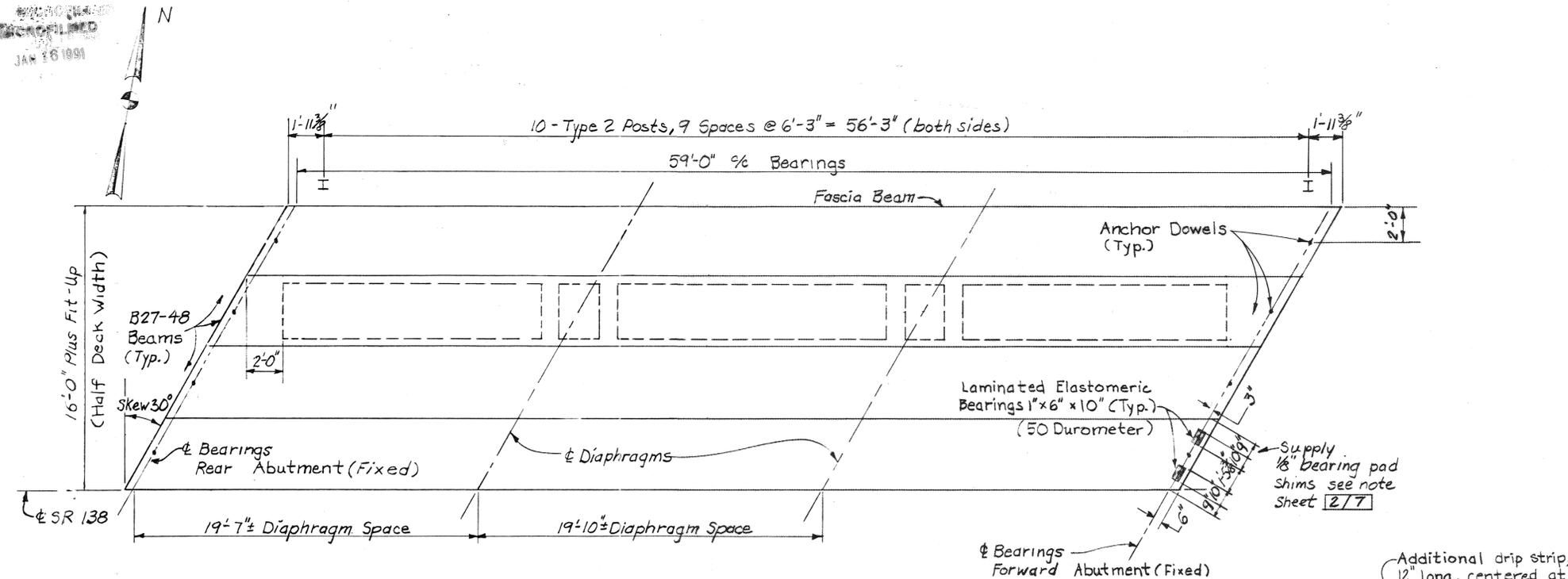
CAMBER: Calculated camber at time of paving, including allowance for camber growth due to creep is $1\frac{3}{8}$ ". Calculated deflections due to weight of surface course and railing is $\frac{1}{8}$ ". Camber of $\frac{1}{2}$ " at center of span is required for crest vertical curve. Net final camber of beams is $\frac{1}{4}$ ". This is $\frac{3}{4}$ " 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 $\frac{1}{4}$ " at center of span to 2 " at the ends of span.

ASPHALT CONCRETE SURFACE COURSE: shall consist of a variable thickness of 403 and $\frac{1}{4}$ " thickness of 404. The 403 shall be placed in two operations. The first course shall be of $\frac{1}{4}$ " uniform thickness. The second course shall be feathered to place the surface parallel to and $\frac{1}{4}$ " below final pavement surface elevation.

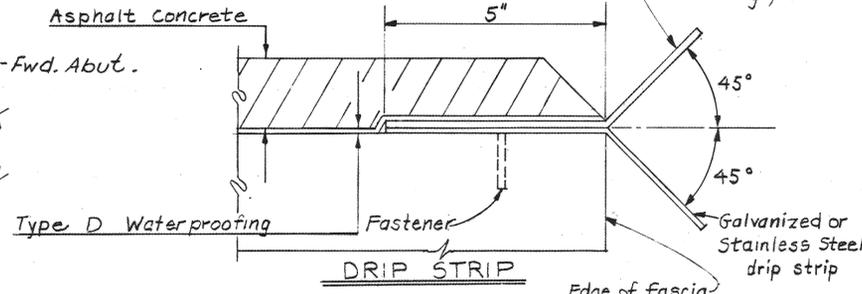
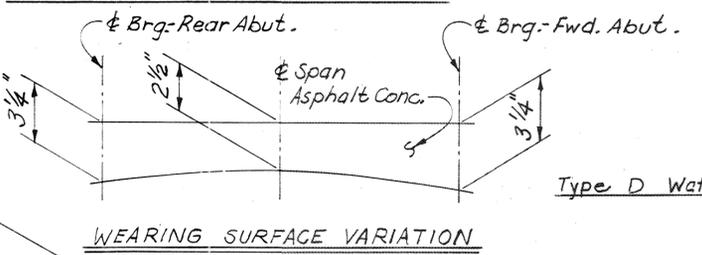
LAMINATED ELASTOMERIC BEARINGS: $1\frac{1}{2}$ "x 6 "x 10 " bearing shall have one 14 gage internal steel laminate with two equal layers of elastomer.

PRESTRESSING STRANDS: ASTM A416, grade 270, $\frac{1}{2}$ " diameter, seven-wire; uncoated, stress relieved, with 18 strands per beam, placed as shown below.

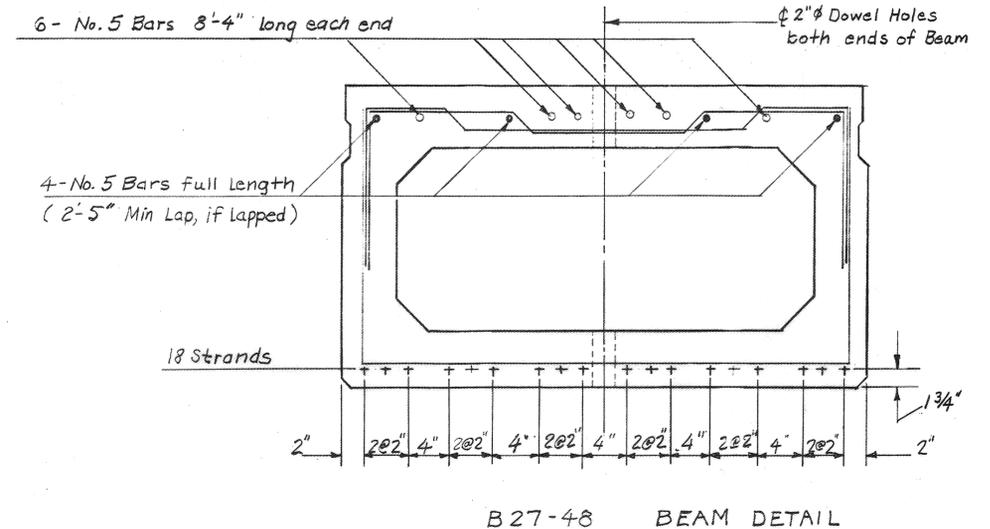
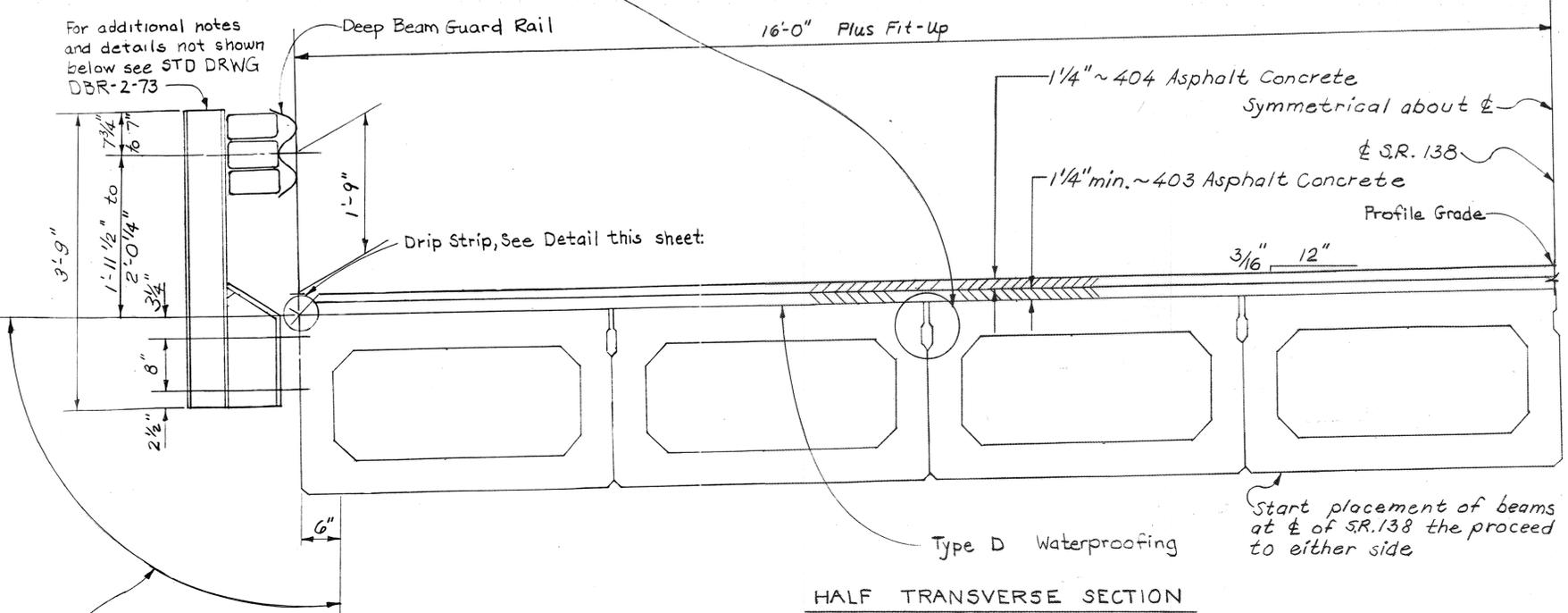
DRIP STRIP: Prior to applying Type D waterproofing, a bent drip strip shall be installed along the edges of the deck as shown. The strips shall be fastened at $1-6$ " ϕ C maximum with $\frac{1}{4}$ "x $5\frac{1}{2}$ "x $\frac{1}{4}$ " flat head drive pin and washer. (Length x Shank Dia. x Head Dia.) 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 strip 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 and incidentals necessary to complete the item.



HALF-PLAN LAYOUT OF DECK



DETAIL A-A



PRESTRESSED BOX BEAM DETAILS: Refer to Standard Drawing PSBD-1-81 for the following details:

1. Beam lifting inserts
2. Details & reinforcing of beam ends
3. Anchor dowels
4. End details of transverse tie rod anchorage
5. Beam dimensional tolerances
6. Dimensions of beam section
7. Wall thickening at railing post anchors
8. Typical plans of diaphragms and transverse tie rods

STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN						
SUPERSTRUCTURE DETAILS						
BRIDGE No. ROS-138-1007 Over Sperry's Run						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JCR	JCR		FFE	WTF	3-1-88	

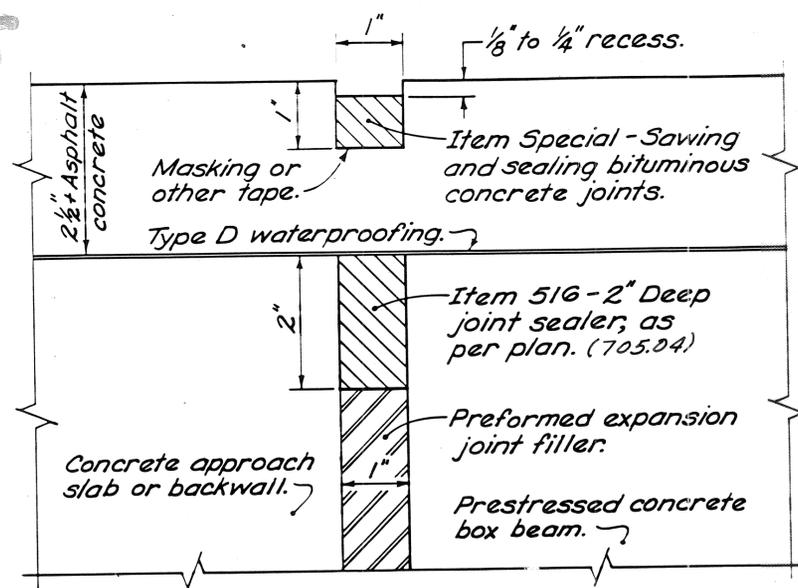
Shear Keys shall be Mortared on a slope between top edges of adjacent beams where vertical offset (within tolerance) occurs

For additional notes and details not shown below see STD DRWG DBR-2-73

Start placement of beams at ϕ of S.R.138 the proceed to either side

Sealing of Concrete Surfaces

ROS-138-9.98



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 Asphalt 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 and 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 - 2" DEEP JOINT SEALER, AS PER PLAN 705.04

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					7 / 7
2-8-84	ABUTMENT JOINTS IN BITUMINOUS CONCRETE, BOX BEAM BRIDGES BRIDGE NO. ROS-138-1007 OVER SPERRY'S RUN					DATE 2-2-84
3-10-87						
4-14-87						
6-16-87						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	
JEB	MJB		WTF	WJJ	2-2-84	