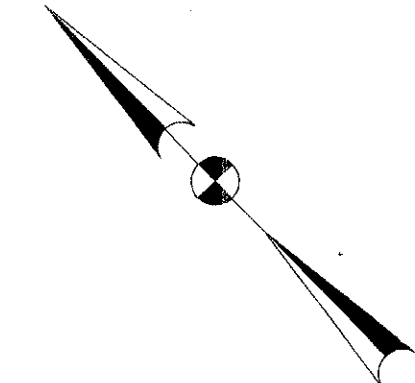


OTT-2-16.60

- BENCHMARKS**
1. AT STA. 960+78.50, 46' RIGHT OF CENTERLINE OF SURVEY, CUT "□" IN TOP OF SOUTHEAST WINGWALL, ELEVATION 580.20.
  2. AT STA. 971+01.00, 36.5' RIGHT OF CENTERLINE OF SURVEY, CUT "□" SOUTHEAST CORNER AT TOP OF CURB ON BRIDGE, ELEVATION 603.44.
  3. AT STA. 983+31.50, 55' RIGHT OF CENTERLINE OF SURVEY, CUT "□" TOP OF BOX CULVERT, SOUTHEAST CORNER, ELEVATION 583.26.



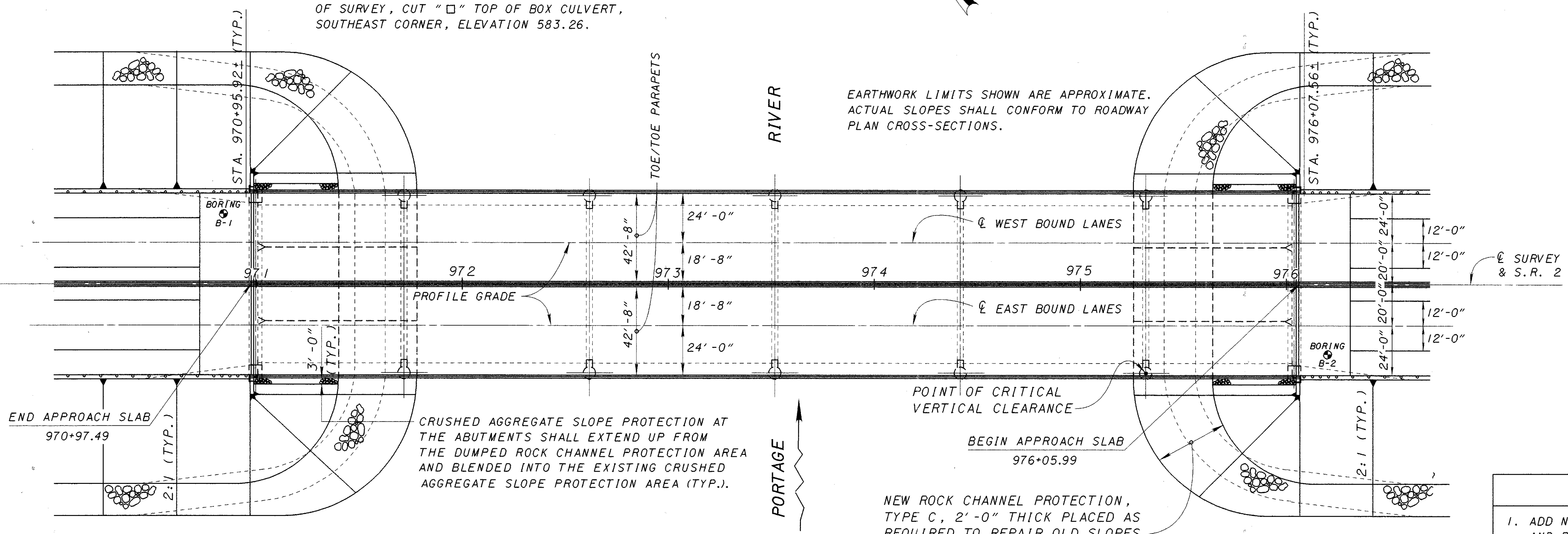
**EXISTING STRUCTURE**

TYPE: CONTINUOUS STEEL BEAM REINFORCED CONCRETE DECK AND SUBSTRUCTURE  
 SPANS: ±72'-0", ±90'-0", ±90'-0", ±90'-0", ±90'-0", ±72'-0" C/C OF BEARING  
 ROADWAY: 32'-0" F/F 2'-3" SAFETY CURBS EACH STRUCTURE  
 LOADING: CF400  
 SKEW: NONE  
 WEARING SURFACE: MONOLITHIC CONCRETE  
 APPROACH SLABS: AS-1-54 (25'-0" LONG)  
 ALIGNMENT: TANGENT  
 DATE BUILT: 1968  
 SFN: 6200338

**PROPOSED STRUCTURE**

TYPE: CONTINUOUS EXISTING AND NEW (A572) PAINTED STEEL BEAMS WITH NEW WIDENED COMPOSITE REINFORCED CONCRETE DECK AND WIDENED SUBSTRUCTURE  
 SPANS: ±72'-0", ±90'-0", ±90'-0", ±90'-0", ±90'-0", ±72'-0" C/C OF BEARING  
 ROADWAY: 42'-8" TOE TO TOE OF PARAPETS FOR EACH STRUCTURE  
 LOADING: HS20-44 CASE II AND THE ALTERNATE MILITARY LOADING  
 SKEW: NONE  
 WEARING SURFACE: MONOLITHIC CONCRETE  
 APPROACH SLABS: AS-1-81 (25'-0" LONG)  
 CROWN: 0.016

- PROPOSED WORK**
1. ADD NEW BEAMS, WIDEN PIERS, DECKS AND ABUTMENTS, AND REPLACE BACKWALLS.
  2. REMOVE AND REPLACE EXISTING BRIDGE DECKS.
  3. REPLACE EXISTING EXPANSION JOINTS WITH STRIP SEALS.
  4. STRENGTHEN BRIDGE BY WELDING SHEAR CONNECTORS TO THE BEAMS.
  5. JACK AND RESET CERTAIN BEARINGS.
  6. CONSTRUCT SAFETY SHAPE PARAPETS.
  7. REPLACE APPROACH SLABS.
  8. SEAL ABUTMENTS, PARAPETS AND DECK FASCIA.
  9. PAINT ALL STRUCTURAL STEEL.
  10. REPAIR DESIGNATED AREAS OF SPILL-THRU SLOPES WITH AGGREGATES.



EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO ROADWAY PLAN CROSS-SECTIONS.

**PLAN**

**VERTICAL CURVE DATA**

P.V.I. STATION = 973+51.74  
 P.V.I. ELEVATION = 616.20  
 V.C. LENGTH = 1600'  
 G1 = +3.0%  
 G2 = -3.0%

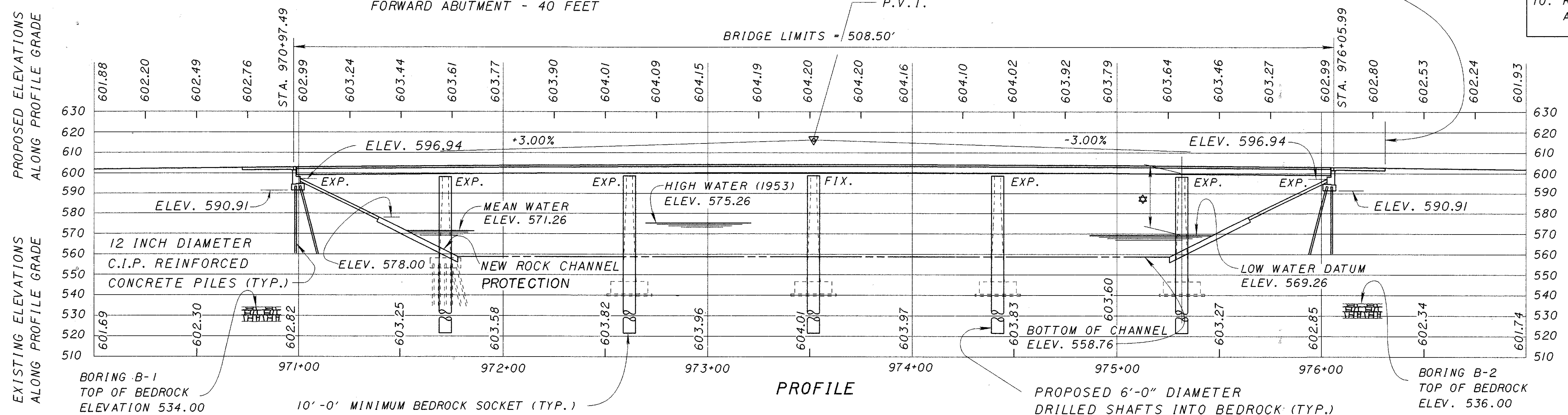
**DESIGN TRAFFIC:**

2016 ADT= 21,100  
 2016 ADTT= 4431

12 INCH DIAMETER CAST-IN-PLACE CONCRETE PILES ESTIMATED PAY LENGTH:  
 REAR ABUTMENT - 35 FEET  
 FORWARD ABUTMENT - 40 FEET

★ REQUIRED MINIMUM VERTICAL CLEARANCE = 30.00'  
 ACTUAL MINIMUM VERTICAL CLEARANCE = 30.08'

SEE ROADWAY PLANS FOR APPROACH PAVING TRANSITIONS TO APPROACH SLABS AND FOR DECK DRAINAGE INTERCEPT DETAILS OFF OF THE STRUCTURE (TYP.).



**PROFILE**

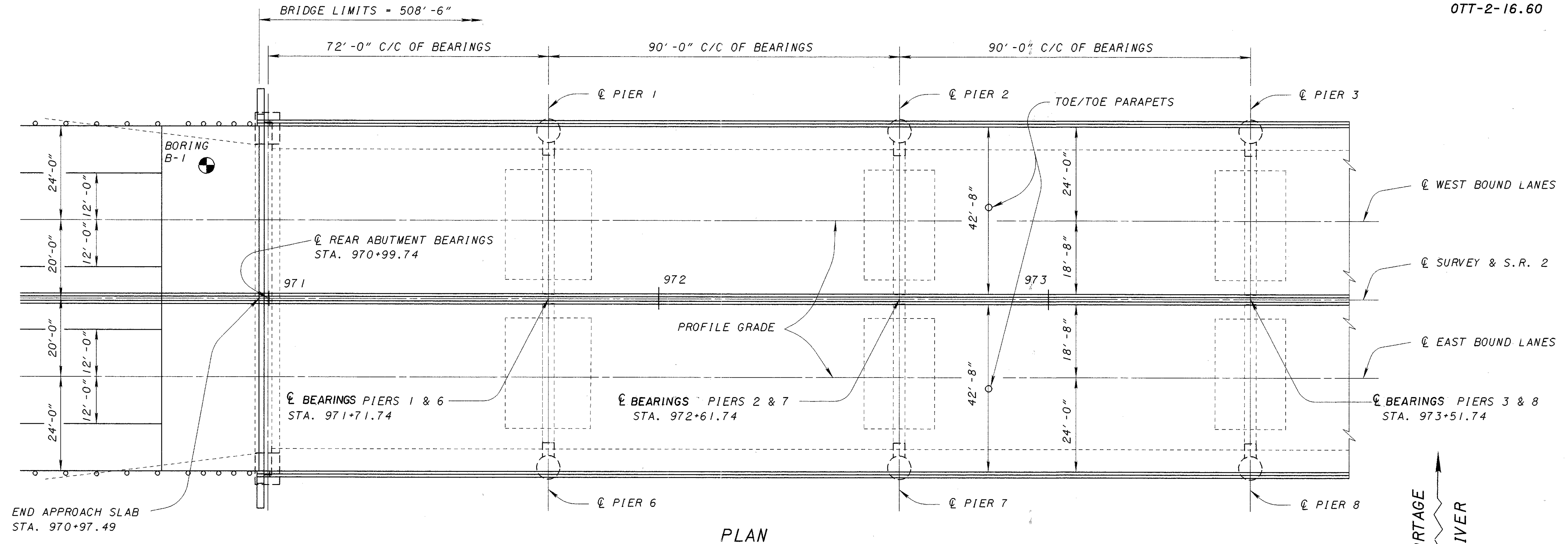
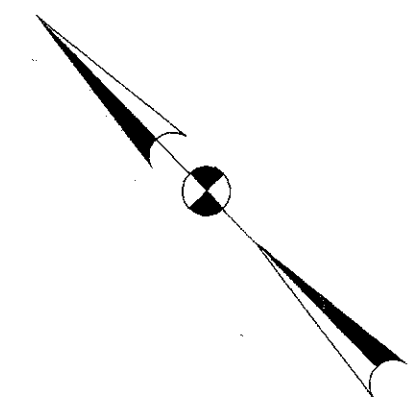
NOTE:  
 6'-6" DRILLED SHAFTS ABOVE BEDROCK (TYP.)  
 TOP OF DRILLED SHAFT ELEVATION 570.00 (TYP.)

STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN				1 / 25
<b>SITE PLAN</b>				
BRIDGE NO. OTT-2-1839 OVER PORTAGE RIVER				
OTTAWA COUNTY SFN 6200338			STA. 970+97.49 976+05.99	
DESIGNED AJM	DRAWN AJM	TRACED JS	CHECKED JS	REVIEWED BME 7/28/93

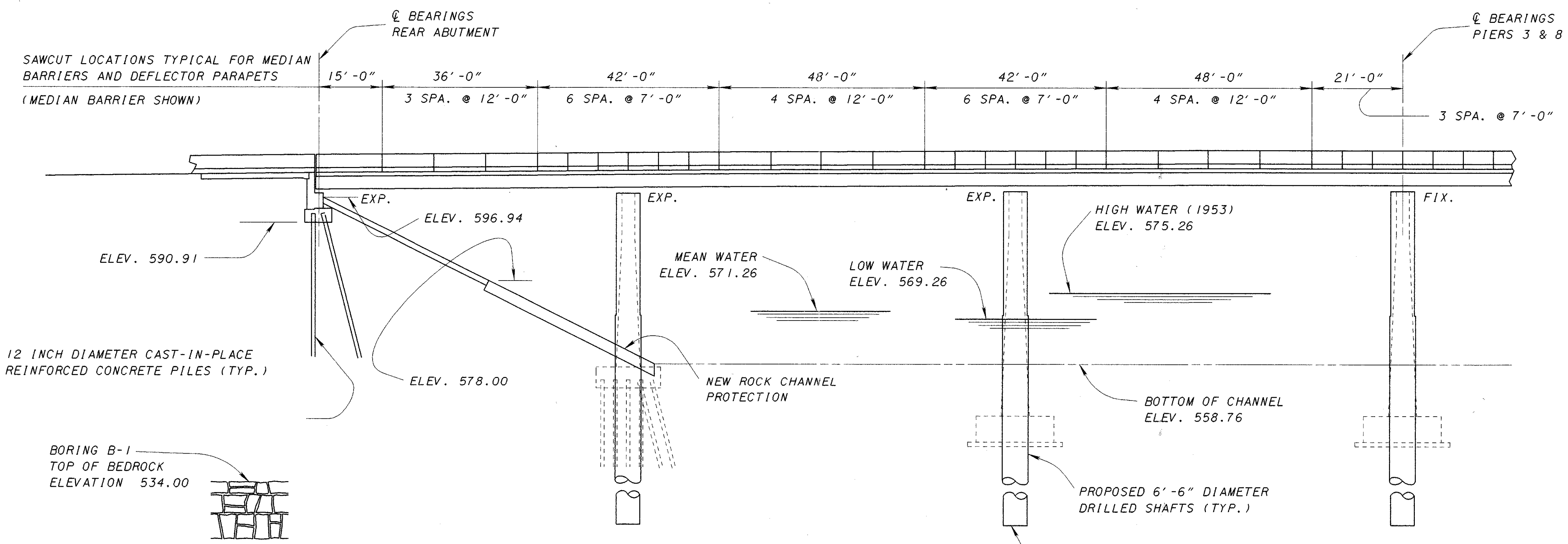
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
5	OHIO		

314  
367

OTT-2-16.60



PLAN



ELEVATION

PORTAGE RIVER

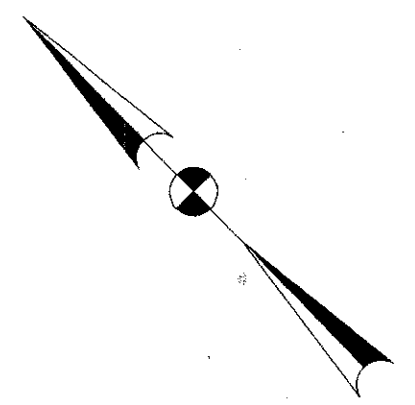
NOTE:  
FOR EMBANKMENT SLOPE PROTECTION  
DETAILS SEE SHEET 1/25

STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN						2/25
<b>GENERAL PLAN &amp; ELEVATION</b>						
BRIDGE NO. OTT-2-1839 OVER PORTAGE RIVER						
SFN 6200338						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JS	JS		REZA	LMW	7-8-94	

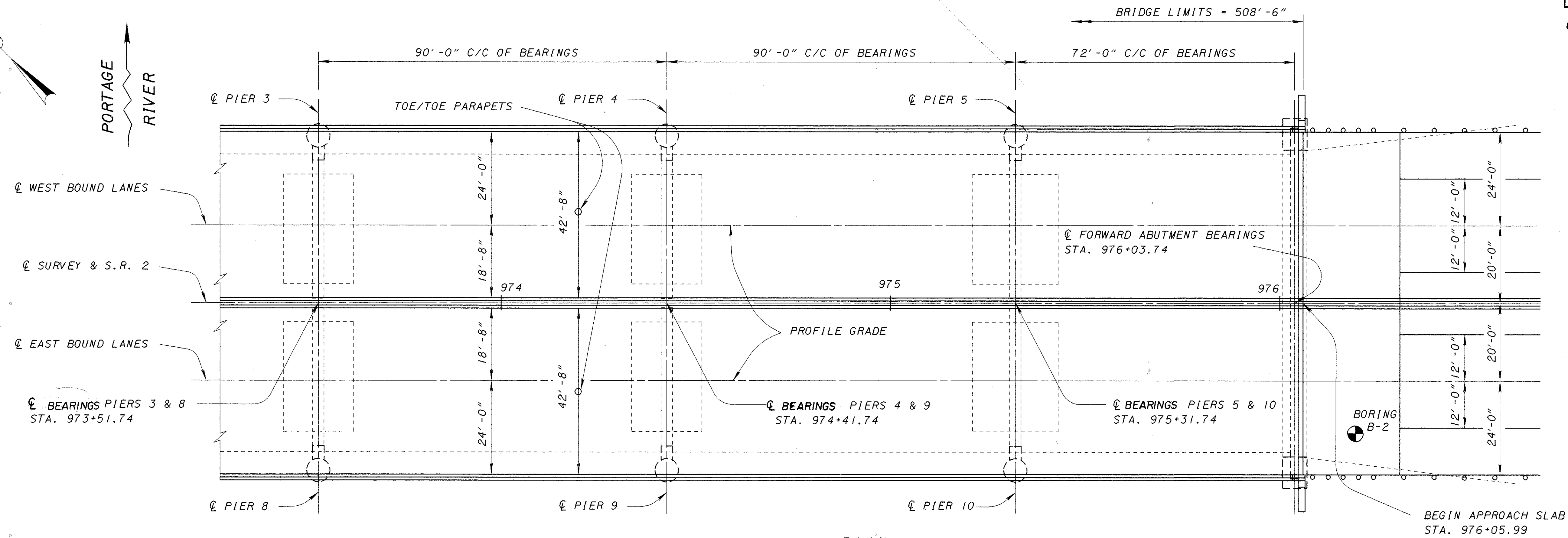
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
5	OHIO		

315  
367

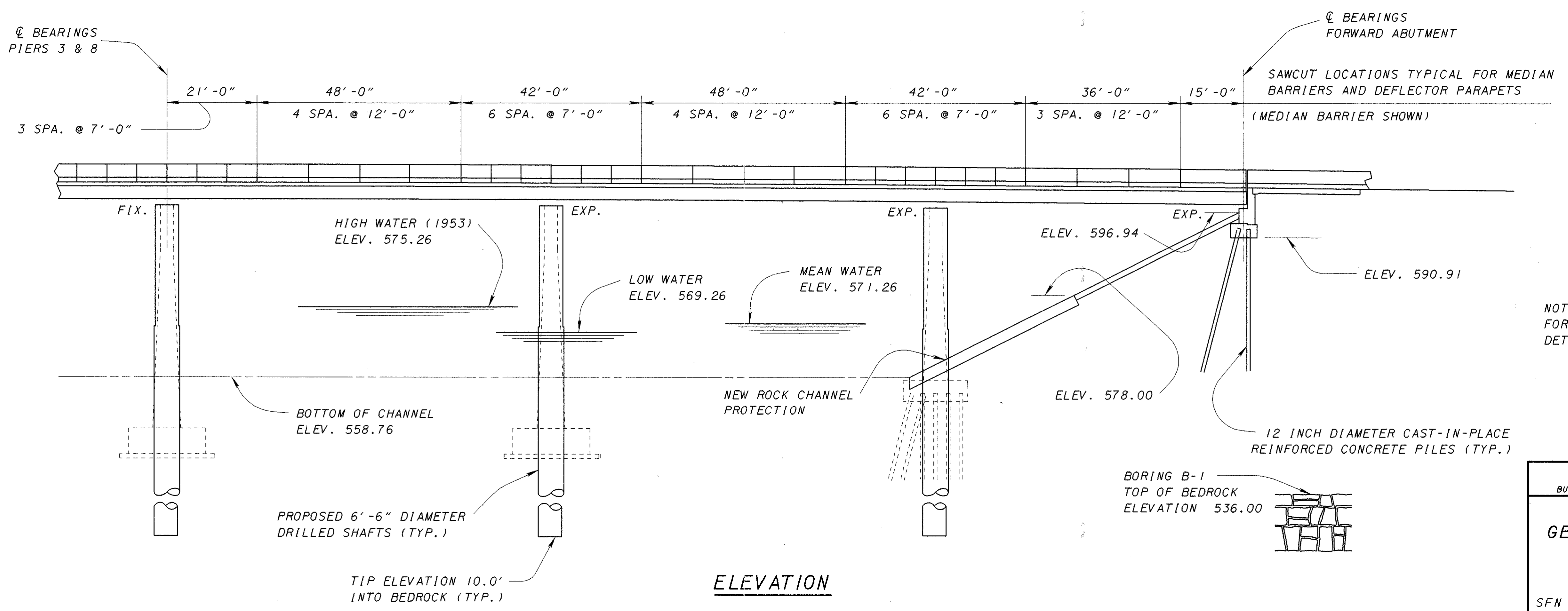
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PORTAGE RIVER



PLAN



ELEVATION

NOTE: FOR EMBANKMENT SLOPE PROTECTION DETAILS SEE SHEET 1/25

STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN					3 / 25
<b>GENERAL PLAN &amp; ELEVATION</b>					
BRIDGE NO. OTT-2-1839 OVER PORTAGE RIVER					
SFN 6200338					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
JS	JS		REZA	LMW	7-8-94



FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
5	OHIO		

316  
367

OTT-2-16.60

**STANDARD DRAWING AND SUPPLEMENTAL SPECIFICATIONS:**  
REFERENCE SHALL BE MADE TO STANDARD DRAWING(S):

AS-1-81 DATED 11-27-81  
RB-1-55 DATED (REVISED) 2-2-59  
SD-1-69 DATED 5-6-91  
EXJ-4-87 DATED (REVISED) 11-12-93

AND TO SUPPLEMENTAL SPECIFICATIONS(S):

910 DATED 7-17-95  
815 DATED 7-17-95

**DESIGN SPECIFICATIONS:**

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1992, INCLUDING THE 1993 INTERIM SPECIFICATIONS AND THE ODOT BRIDGE DESIGN MANUAL.

**DESIGN LOADING:**

HS20-44, CASE 11 AND THE ALTERNATE MILITARY LOADING.

**DESIGN DATA:**

CONCRETE CLASS S - COMPRESSIVE STRENGTH 4500 P.S.I. (SUPERSTRUCTURE)

CONCRETE CLASS C - COMPRESSIVE STRENGTH 4000 P.S.I. (SUBSTRUCTURE)

REINFORCING STEEL - ASTM A615, A616 OR A617 - GRADE 60 MINIMUM YIELD STRENGTH 60,000 P.S.I. SPIRAL REINFORCEMENT MAY BE PLAIN BARS, ASTM A82 OR A615.

STRUCTURAL STEEL  
ASTM A572 - YIELD STRENGTH 50,000 P.S.I.

**DECK PROTECTION METHOD:**

EPOXY COATED REINFORCING STEEL.

2-1/2" CONCRETE COVER.

**MONOLITHIC WEARING SURFACE:**

MONOLITHIC WEARING SURFACE IS ASSUMED, FOR DESIGN PURPOSES, TO BE 1" THICK.

**ITEM 503, UNCLASSIFIED EXCAVATION**

UNCLASSIFIED EXCAVATION SHALL BE IN ACCORDANCE WITH 503 EXCEPT THAT BACKFILL MATERIAL BEHIND THE ABUTMENTS SHALL BE 203 GRANULAR MATERIAL PLACED IN LIFTS NOT TO EXCEED A THICKNESS OF SIX (6) INCHES.

**PILE DESIGN LOADS (SAFE BEARING CAPACITY):**

THE DESIGN LOAD FOR THE ABUTMENT PILES IS 25 TONS PER PILE.

**ITEM 202, PORTIONS OF STRUCTURE REMOVED, AS PER PLAN**

**DESCRIPTION:**

THIS WORK SHALL CONSIST OF THE REMOVAL OF CONCRETE DECKS INCLUDING SIDEWALKS, PARAPETS, RAILINGS, DECK JOINTS AND OTHER APPURTENANCES FROM STEEL SUPPORTING SYSTEMS (BEAMS, GIRDERS, CROSS FRAMES, ETC.). CARE SHALL BE TAKEN DURING DECK REMOVALS TO PROTECT PORTIONS OF SUCH SYSTEMS THAT ARE TO BE SALVAGED AND INCORPORATED INTO THE PROPOSED STRUCTURE. IN THIS RESPECT, THE USE OF EXPLOSIVES, HEADACHE BALLS AND/OR HOE RAM TYPE OF EQUIPMENT IS PROHIBITED.

**REMOVAL METHODS:**

CONCRETE MAY BE REMOVED BY CUTTING AND BY MEANS OF HAND OPERATED PNEUMATIC HAMMERS EMPLOYING POINTED OR BLUNTED CHISEL TYPE TOOLS. FOR REMOVALS ABOVE STEEL MEMBERS, A HAMMER HEAVIER THAN 35 POUNDS BUT NOT TO EXCEED 90 POUNDS MAY BE USED AT THE APPROVAL OF THE ENGINEER, TO ENSURE ADEQUATE DEPTH CONTROL AND TO PREVENT NICKING OR GOUGING THE PRIMARY STEEL MEMBERS.

**PROTECTION OF TRAFFIC:**

PRIOR TO DEMOLITION OF ANY PORTIONS OF THE EXISTING SUPERSTRUCTURE, THE CONTRACTOR SHALL SUBMIT HIS PLANS FOR THE PROTECTION OF TRAFFIC (VEHICULAR, PEDESTRIAN, BOAT, ETC.) ADJACENT TO AND/OR UNDER THE STRUCTURE TO THE DIRECTOR FOR APPROVAL. THESE PLANS SHALL INCLUDE PROVISIONS FOR ANY DEVICES AND STRUCTURES THAT MAY BE NECESSARY TO ENSURE SUCH PROTECTION. TEMPORARY VERTICAL CLEARANCES SPECIFIED ON THE PLANS OR IN THE PROPOSAL SHALL BE MAINTAINED AT ALL TIMES EXCEPT AS OTHERWISE APPROVED BY THE DIRECTOR.

**PROTECTION OF STEEL SUPPORT SYSTEMS:**

BEFORE DECK SLAB CUTTING IS PERMITTED, THE OUTLINE OF PRIMARY STEEL MEMBERS IN CONTACT WITH THE BOTTOM OF THE DECK SHALL BE DRAWN ON THE SURFACE OF DECK. SMALL DIAMETER PILOT HOLES SHALL BE DRILLED 2 INCHES OUTSIDE THESE LINES TO CONFIRM THE LOCATION OF FLANGE EDGES. DECK CUTS OVER OR WITHIN 2 INCHES OF FLANGE EDGES SHALL NOT EXTEND LOWER THAN THE BOTTOM LAYER OF DECK SLAB REINFORCING STEEL. CUTS MADE OUTSIDE 2 INCHES OF FLANGE EDGES MAY EXTEND THE FULL DEPTH OF THE DECK. DURING CUTTING OF THE DECK SLAB, CARE SHALL BE TAKEN NOT TO DAMAGE STEEL MEMBERS THAT ARE TO BE INCORPORATED INTO THE PROPOSED STRUCTURE.

**DECK REMOVALS:**

DUE TO THE POSSIBLE PRESENCE OF WELDED ATTACHMENTS TO EXISTING STRUCTURAL STEEL (FINISHING MACHINE, SCUPPER AND FORM SUPPORTS, ETC.), CARE SHALL BE TAKEN DURING DECK REMOVAL TO AVOID DAMAGING STRINGERS WHICH ARE TO REMAIN. STRINGERS DAMAGED BY THE CONTRACTOR'S REMOVAL OPERATIONS SHALL, AT NO COST TO THE PROJECT, BE REPLACED OR REPAIRED. PROPOSED REPAIRS, DEVELOPED BY A REGISTERED PROFESSIONAL ENGINEER, SHALL BE SUBMITTED IN WRITING FOR REVIEW AND APPROVAL BY THE DIRECTOR.

**EXTRANEOUS MEMBERS:**

EXISTING EXTRANEOUS MEMBERS (I.E., FINISHING MACHINE AND FORM SUPPORTS, ETC.), AND THE SUPPORT FOR SCUPPERS AND BULB ANGLES WHICH ARE TO BE REMOVED ATTACHED BY WELDED CONNECTIONS TO PORTIONS OF THE TOP FLANGES DESIGNATED "TENSION" SHALL BE REMOVED AND THE FLANGE SURFACES GROUND SMOOTH. GRINDING SHALL BE CAREFULLY DONE AND PARALLEL TO THE FLANGES.

**LOADING LIMITATIONS:**

NO PART OF THE STRUCTURE SHALL BE SUBJECTED TO UNIT STRESSES THAT EXCEED 136.5% OF THE ALLOWABLE UNIT STRESSES GIVEN IN THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES DUE EITHER TO DEMOLITION, ERECTION OR CONSTRUCTION METHODS, OR TO THE USE OR MOVEMENT OF DEMOLITION OR ERECTION EQUIPMENT ON OR ACROSS THE STRUCTURE. STRUCTURAL ANALYSIS COMPUTATIONS, BY A REGISTERED PROFESSIONAL ENGINEER, SHOWING THE ALLOWABLE STRESSES AND THE MAXIMUM STRESSES PRODUCED BY THE CONTRACTOR'S METHODS OR EQUIPMENT SHALL BE SUBMITTED TO THE DIRECTOR FOR REVIEW AND APPROVAL AT LEAST TWO WEEKS PRIOR TO THE START OF THE WORK.

**CUT LINE CONSTRUCTION JOINT PREPARATION:**

SAW CUT BOUNDARIES OF PROPOSED CONCRETE REMOVALS 1" DEEP. REMOVE CONCRETE TO A ROUGH SURFACE. WHERE PRACTICABLE, THE EXISTING REINFORCING STEEL WHERE REQUIRED IN THE PLANS SHALL BE LEFT IN PLACE. INSTALL DOWEL BARS IF SPECIFIED. PRIOR TO CONCRETE PLACEMENT ABRASIVELY CLEAN JOINT SURFACE AND EXPOSED REINFORCEMENT TO REMOVE LOOSE AND DISINTEGRATED CONCRETE AND LOOSE RUST. THEN, THE JOINT SURFACE AND EXPOSED REINFORCEMENT SHALL BE THOROUGHLY CLEANED OF ALL DIRT, DUST, OR OTHER FOREIGN MATERIAL BY THE USE OF WATER, AIR UNDER PRESSURE, OR OTHER METHODS THAT PRODUCE SATISFACTORY RESULTS. CONCRETE BONDING SURFACES SHALL BE WET WITHOUT FREE WATER AS CONCRETE IS PLACED.

**SUBSTRUCTURE CONCRETE REMOVAL:**

SUBSTRUCTURE CONCRETE REMOVAL SHALL BE BY MEANS OF APPROVED PNEUMATIC HAMMERS EMPLOYING POINTED AND BLUNT CHISEL TOOLS. HYDRAULIC HOE-RAM TYPE HAMMERS WILL NOT BE PERMITTED. THE WEIGHT OF THE HAMMER SHALL NOT BE MORE THAN 35 POUNDS FOR REMOVAL WITHIN 18-INCHES OF PORTIONS TO BE PRESERVED. OUTSIDE THE 18-INCH LIMIT, A HAMMER HEAVIER THAN 35 POUNDS, BUT NOT TO EXCEED 90 POUNDS, MAY BE USED AT THE APPROVAL OF THE ENGINEER. PNEUMATIC HAMMERS SHALL NOT BE PLACED IN DIRECT CONTACT WITH REINFORCING STEEL THAT IS TO BE RETAINED IN THE REBUILT STRUCTURE.

**PAYMENT:**

THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID, WHICH PRICE AND PAYMENT SHALL BE FULL COMPENSATION FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN CONFORMANCE WITH THESE REQUIREMENTS, WITH PERTINENT PROVISIONS OF 202, AND TO THE SATISFACTION OF THE ENGINEER.

**EXISTING STRUCTURE VERIFICATION:**

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05, 105.02 AND 513.02. ~~DELETE THE REFERENCE TO 513.02 IF STRUCTURAL STEEL IS NOT INVOLVED.~~

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.

EXISTING BRIDGE PLANS MAY BE INSPECTED IN THE BUREAU OF BRIDGES AND STRUCTURAL DESIGN IN COLUMBUS, OHIO OR AT THE ODOT DISTRICT OFFICE IN BOWLING GREEN, OHIO.

**REPLACEMENT OF EXISTING REINFORCING STEEL:**

ANY EXISTING REINFORCING BARS WHICH ARE TO BE INCORPORATED INTO THE NEW WORK AND WHICH ARE MADE UNUSABLE BY THE CONTRACTOR'S CONCRETE REMOVAL OPERATIONS SHALL BE REPLACED WITH NEW STEEL AT THIS COST. ANY EXISTING REINFORCING BARS DEEMED BY THE ENGINEER TO BE UNUSABLE BECAUSE OF CORROSION SHALL BE REPLACED WITH NEW STEEL. AN ALLOWANCE OF 100 POUNDS IS INCLUDED IN ITEM 509 FOR THIS PURPOSE, LISTED IN THE "GENERAL" COLUMN OF THE ESTIMATED QUANTITIES TABLE.

**INSPECTION OF STRUCTURAL STEEL:**

THE ENGINEER SHALL VISUALLY INSPECT ALL EXISTING BUTT-WELDED SPLICES AND/OR TOP FLANGE COVER PLATE FILLET WELDS TO ENSURE THAT THEY ARE FREE OF DEFECTS. THE DECK SLAB HAUNCH FORMS IMMEDIATELY ADJACENT TO SUCH WELDS SHALL NOT BE ERECTED UNTIL AFTER THE ENGINEER HAS COMPLETED THIS INSPECTION. THIS INSPECTION SHALL NOT TAKE PLACE UNTIL AFTER THE TOP FLANGES ARE CLEANED AS SPECIFIED IN 511.08, BUT IT SHALL BE DONE BEFORE THE DECK SLAB REINFORCEMENT IS INSTALLED. THE COST ASSOCIATED WITH THIS INSPECTION SHALL BE INCLUDED WITH ITEM 511, SUPERSTRUCTURE CONCRETE FOR PAYMENT.

**ITEM 510 - DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT:**

THIS ITEM SHALL INCLUDE THE DRILLING OF HOLES INTO CONCRETE OR MASONRY AND THE FURNISHING AND PLACING OF GROUT INTO HOLES. NON SHRINKING EPOXY GROUT SHALL BE USED IN ACCORDANCE WITH SPECIFICATION 510 AND CMS 705.20. ANCHORING SHALL CONFORM TO SPECIFICATION 510 AND CMS 705.20. PAYMENT SHALL BE INCLUDED WITH ITEM 510.

**REINFORCED CONCRETE APPROACH SLABS:**

SEE THE ROADWAY PLAN NOTES FOR EPOXY COATED REINFORCING STEEL REQUIREMENTS.

**TRAFFIC MAINTENANCE AND PHASING:**

SEE ROADWAY PLAN NOTES AND TRAFFIC CONTROL SHEETS.

**ITEM 611 REINFORCED CONCRETE APPROACH SLAB(T= 15"), AS PER PLAN:**

THE REINFORCING STEEL FOR THE APPROACH SLABS OF THIS STRUCTURE SHALL BE EPOXY COATED IN CONFORMANCE WITH 509.

MATERIALS, LABOR AND INSTALLATION SHALL BE INCLUDED FOR PAYMENT IN THIS ITEM 611 REINFORCED CONCRETE APPROACH SLAB (T= 15"), AS PER PLAN.

**POROUS BACKFILL:**

POROUS BACKFILL WITH FILTER FABRIC, 2 FEET THICK, SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE, TO ONE FOOT BELOW THE EMBANKMENT SURFACE, AND LATERALLY TO THE ENDS OF THE WINGWALLS. GEOTEXTILE FABRIC SHALL CONFORM WITH 712.09, TYPE A. THE BOTTOM OF THE POROUS BACKFILL SHALL BE SLOPED (1 INCH PER FOOT MINIMUM) LATERALLY TO DRAIN. GEOTEXTILE FABRIC IS INCLUDED WITH POROUS BACKFILL FOR PAYMENT.

**ITEM SPECIAL, SEALING OF CONCRETE SURFACES:**

~~A CONCRETE SEALER SHALL BE APPLIED TO THE CONCRETE SURFACES AS SHOWN ON THESE PLANS. SEE PROPOSAL FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIAL REQUIREMENTS AND APPLICATION PROCEDURES.~~

**ITEM SPECIAL, SEALING OF CONCRETE SURFACES (EPOXY/URETHANE):**

A CONCRETE SEALER SHALL BE APPLIED TO THE CONCRETE SURFACES AS SHOWN ON THESE PLANS. SEE PROPOSAL FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIAL REQUIREMENTS AND APPLICATION PROCEDURES.

**ITEM 611 REINFORCED CONCRETE APPROACH SLAB(T=15"), AS PER PLAN:**

THE REINFORCING STEEL FOR THE APPROACH SLABS OF THIS STRUCTURE SHALL BE EPOXY COATED IN CONFORMANCE WITH 509.

MATERIALS, LABOR AND INSTALLATION SHALL BE INCLUDED FOR PAYMENT IN THIS ITEM 611 REINFORCED CONCRETE APPROACH SLAB (T=15"), AS PER PLAN.

**ITEM SPECIAL, WEATHER MONITORING SENSORS:**

THE EXISTING WEATHER MONITORING SENSORS AT STRUCTURE NO. OTT-2-1839 SHOULD BE DISCONNECTED PRIOR TO CONSTRUCTION. UPON COMPLETION OF THE STRUCTURE AND APPROACH WORK, NEW WEATHER MONITORING SENSORS SHALL BE INSTALLED BY:

SSI SURFACE SYSTEMS  
11612 LILBURN PARK RD.  
ST. LOUIS, MISSOURI 63146

PAYMENT FOR THE ABOVE MENTIONED LABOR AND MATERIALS SHALL BE INCLUDED IN THE PRICE BID FOR

ITEM SPECIAL, WEATHER MONITORING SENSORS LUMP SUM

STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN						4 / 25
<b>GENERAL NOTES</b>						
BRIDGE NO. OTT-2-1839 OVER PORTAGE RIVER						
SFN 6200338						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JS	JS		REZA	LMW	7-8-94	

OTT-2-16.60

**ESTIMATED QUANTITIES**

ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.
202	11201	LUMP	SUM	PORTIONS OF STRUCTURE REMOVED, AS PER PLAN	LUMP		LUMP	
503	21300	LUMP	SUM	UNCLASSIFIED EXCAVATION	LUMP			
505	11100	LUMP	SUM	PILE DRIVING EQUIPMENT MOBILIZATION				LUMP
507	22200	600	LF	12" CAST-IN-PLACE REINFORCED CONCRETE PILES	600			
SPECIAL	50794950	100	LF	DRILLED SHAFTS, 72" DIAMETER, INTO BEDROCK		100		
SPECIAL	50795000	350	LF	DRILLED SHAFTS, 78" DIAMETER, INTO BEDROCK		350		
				Misc.:				
509	15840	453298	LB	EPOXY COATED REINFORCING STEEL, GRADE 60	6163	97953	349082	100
510	10000	216	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	96	120		
511	41500	306	CY	CLASS C CONCRETE, PIER ABOVE FOOTINGS		306		
511	45701	75	CY	CLASS C CONCRETE, ABUTMENT, AS PER PLAN	75			
SPECIAL	51148000	1337	CY	HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE (DECK) (SEE PROPOSAL NOTE)			1337	
SPECIAL	51148020	212	CY	HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE (PARAPET) (SEE PROPOSAL NOTE)			212	
SPECIAL	51149000	LUMP	SUM	HIGH PERFORMANCE CONCRETE, TRIAL MIX (SEE PROPOSAL NOTE)			LUMP	
SPECIAL	51149010	LUMP	SUM	HIGH PERFORMANCE CONCRETE TESTING (SEE PROPOSAL NOTE)			LUMP	
SPECIAL	51181100	450	LF	CONCRETE, MISC.: CONCRETE PUMPING		450		
SPECIAL	51267510	2353	SY	SEALING OF CONCRETE SURFACES (EPOXY/URETHANE) (SEE PROPOSAL NOTE)	184	627	1542	
513	11400	271500	LB	STRUCTURAL STEEL, A572-50 AISC CATEGORY 1 (SEE PROPOSAL NOTE)			271500	
513	20000	11556	EACH	WELDED STUD SHEAR CONNECTOR			11556	
516	11211	181	LF	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL, AS PER PLAN (3") (SEE PROPOSAL NOTE)			181	
516	46000	2	EACH	BEARING DEVICE, BOLSTER				2
516	46200	12	EACH	BEARING DEVICE, ROCKER				12
516	46701	20	EACH	RESET BEARING, AS PER PLAN				20
518	21200	45	CY	POROUS BACKFILL WITH FILTER FABRIC	45			
601	20500	60	CY	CRUSHED AGGREGATE SLOPE PROTECTION	60			
SPECIAL	69098400	LUMP	SUM	ROADWAY, MISC.: WEATHER MONITORING SENSORS				LUMP
815	00100	LUMP	SUM	SURFACE PREPARATION OF EXISTING STEEL, SYSTEM OZEU				LUMP
815	00200	LUMP	SUM	FIELD PAINTING OF EXISTING STEEL, PRIME COAT, SYSTEM OZEU				LUMP
815	00300	LUMP	SUM	FIELD PAINTING OF EXISTING STEEL, INTERMEDIATE COAT, SYSTEM OZEU				LUMP
815	00400	LUMP	SUM	FIELD PAINTING OF EXISTING STEEL, FINISH COAT, SYSTEM OZEU				LUMP
815	00500	52	LF	CAULKING				52
815	00504	150	MNHR	GRINDING FINS, TEARS, SLIVERS				150
514	00610	271500	LB	FIELD PAINTING OF NEW STEEL, SYSTEM IZEU (SEE PROPOSAL NOTE)				271500

**DEFLECTION JOINTS FOR CONCRETE PARAPETS:**

THE JOINTS SHALL BE CONSTRUCTED BY SAWING 1 INCH DEEP ALONG THE PERIMETER OF THE PARAPET AS SOON AS THE SAW CAN BE OPERATED WITHOUT DAMAGING THE CONCRETE.

THE USE OF AN EDGE GUIDE, FENCE, OR JIG IS REQUIRED TO INSURE THAT THE CUT JOINT IS STRAIGHT, TRUE, AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 1/4 INCH.

THE PERIMETER OF THE DEFLECTION CONTROL JOINT SHALL BE SEALED WITH A CAULKING MATERIAL TO A MINIMUM DEPTH OF 1 INCH CONFORMING TO FEDERAL SPECIFICATIONS TT-S-00227E. THE BOTTOM ONE HALF INCH OF BOTH THE INSIDE AND OUTSIDE FACES OF THE PARAPET SHOULD BE LEFT UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

QUANTITIES OF CONCRETE, REINFORCING STEEL, DEFLECTION JOINT SAWCUTS, AND CAULKING MATERIAL FOR PARAPETS ARE INCLUDED WITH ITEM SPECIAL, HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE, (PARAPET).

**STATION EQUATION:**

STA. 969+00.00 THIS PLAN EQUALS STA. 119+48.26 ORIGINAL BRIDGE PLANS.

**VERTICAL EQUATION:**

ELEVATION 600.00 THIS PLAN EQUALS ELEVATION 601.24 ORIGINAL BRIDGE PLANS.

**ITEM 516, RESET BEARING, AS PER PLAN:**

AFTER THE DECK HAS BEEN REMOVED UNDER ITEM 202, CERTAIN EXPANSION BEARING ROCKERS SHALL BE VERTICALLY REALIGNED IN ACCORDANCE WITH 516.05 AND AS MAY BE DIRECTED BY THE ENGINEER. THE ENGINEER MAY DEEM IT NECESSARY TO HAVE OTHER BEARINGS REALIGNED IN ADDITION TO THOSE INDICATED ON THE PLANS. THE APPROXIMATE STEEL BEAM DEAD LOAD LIFTS ARE 5.0 TONS AT THE ABUTMENTS AND 15.0 TONS AT THE PIERS. THE INDIVIDUAL BEAM JACKING LIFT SHALL NOT EXCEED 1/4 INCH AT EACH BEARING.

PAYMENT WILL BE MADE AT THE UNIT PRICE BID FOR EACH, ITEM 516, RESET BEARING, AS PER PLAN WHICH SHALL INCLUDE ANY MATERIALS, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

FOR LIGHTING SUMMARY SEE SHEET 23/25.

**ITEM SPECIAL, HIGH PERFORMANCE CONCRETE:**

MIX DESIGN 4 SHALL BE USED FOR SUPERSTRUCTURE (DECK) AND SUPERSTRUCTURE (PARAPET) QUANTITIES. MIX DESIGN 2 SHALL BE USED FOR ABUTMENT AND PIER QUANTITIES.

STATE OF OHIO DEPARTMENT OF TRANSPORTATION DIVISION OF DESIGN AND CONSTRUCTION BUREAU OF BRIDGES						5 / 25
ESTIMATED QUANTITIES & BRIDGE NOTES BRIDGE NO. OTT-2-1839 OVER PORTAGE RIVER						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JS	JS		REZA	LMW	7-8-94	

/1/PD/OTTAWA/OTT2/OT2PTEQ.DGN



FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
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**DESCRIPTION**

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING DRILLED SHAFTS OF THE TYPE AND SIZE SPECIFIED IN THE PLANS. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND APPURTENANCES REQUIRED TO COMPLETE THE WORK AS SPECIFIED. THE LENGTH(S) OF THE DRILLED SHAFTS SHOWN IN THESE PLANS HAS BEEN ESTIMATED FROM AVAILABLE SUBSURFACE INFORMATION. THE CONTRACTOR IS EXPECTED TO FURNISH THE PROPOSED DRILLED SHAFTS AS PER THESE PLAN REQUIREMENTS, WITH THE UNDERSTANDING THAT THE ACTUAL LENGTH REQUIRED BASED ON CONDITIONS ENCOUNTERED DURING CONSTRUCTION MAY DIFFER FROM THE ESTIMATED LENGTH SHOWN IN THE PLANS.

THE LIMITS OF EACH DRILLED SHAFT SHALL BE DEFINED AT THE TOP BY THE PLAN ELEVATION AND AT THE BOTTOM BY THE ELEVATION OF THE BOTTOM OF THE BEDROCK SOCKET AS APPROVED BY THE ENGINEER.

A CASING WILL BE NECESSARY FOR THE CONSTRUCTION OF EACH PIER DRILLED SHAFT AND THE CASINGS SHALL BE LEFT IN PLACE.

**CONTRACTOR QUALIFICATION**

THE CONTRACTOR SHALL SUBMIT INFORMATION TO THE ENGINEER TO DOCUMENT THAT HIS PERSONNEL IS EXPERIENCED IN THE CONSTRUCTION OF DRILLED SHAFTS OF THE TYPE AND SIZE SPECIFIED ON THE PLANS. THIS INFORMATION SHALL BE SUBMITTED AT THE PRECONSTRUCTION CONFERENCE. THE PROJECT ENGINEER IS REQUESTED TO INFORM BUREAU OF BRIDGES, ATTENTION: FOUNDATION ENGINEER (TEL.614-466-2399) OF THE DATES WHEN THE CONTRACTOR WILL BE CONSTRUCTING THE DRILLED SHAFTS.

**APPROVAL BEFORE DRILLED SHAFT CONSTRUCTION**

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A WRITTEN PLAN OF STEPS AND PROCEDURES HE PROPOSES TO FOLLOW WHEN DRIVING THE CASING, EXCAVATING INSIDE THE CASING, PLACING THE CONCRETE AND MONITORING THE CONCRETE PLACEMENT. A COPY OF THE PROCEDURE SHALL BE FAXED DIRECTLY TO THE BUREAU OF BRIDGES AND STRUCTURAL DESIGN (ATTN: FOUNDATION ENGINEER, FAX-614-752-4824).

**CASING**

THE CASING SHALL BE MADE OF STEEL, SHALL BE WATER TIGHT AND SHALL BE OF AMPLE STRENGTH TO WITHSTAND HANDLING STRESSES AND EXTERNAL SUBSURFACE PRESSURES. THE CASING SHALL BE SEATED INTO THE BEDROCK, THUS ATTEMPTING TO SEAL OUT INCOMING WATER. THE CASING LENGTH SHALL BE AS NECESSARY TO CONSTRUCT EACH DRILLED SHAFT. THE DIAMETER OF THE CASING SHALL BE NO LESS THAN THE DIAMETER OF THE DRILLED SHAFT BEING CONSTRUCTED.

THE DIAMETER OF THE FURNISHED CASING(S) SHALL BE LARGE ENOUGH TO ALLOW THE CONSTRUCTION OF A BEDROCK SOCKET WITH DIAMETER EQUAL TO OR GREATER THAN THE PLAN DIAMETER.

**EXCAVATION**

WHEN OBJECTS SUCH AS LARGE BOULDERS ARE ENCOUNTERED, THEY SHALL BE REMOVED. BLASTING METHODS MAY BE USED AND WHEN USED, SHALL BE CONDUCTED SO AS TO AVOID DISTURBANCE TO THE BEDROCK FORMATION BELOW AND OUTSIDE THE LIMITS OF THE PROPOSED DRILLED SHAFT EXCAVATION. THE DRILLED SHAFTS SHALL PENETRATE INTO BEDROCK TO A DEPTH THAT PROVIDES A BEDROCK SOCKET LENGTH THAT IS NOT LESS THAN THE BEDROCK SOCKET SHOWN IN THE PLANS. WHEN A CASING WHICH EXTENDS DOWN TO BEDROCK IS USED, THE BEDROCK SOCKET SHALL BE MEASURED FROM THE BOTTOM OF THE CASING TO THE BOTTOM OF THE DRILLED BEDROCK EXCAVATION. WHEN THE ENGINEER IS ASSURED THAT A PORTION OF THE METAL CASING IS EMBEDDED IN BEDROCK, UPON THE ENGINEER'S CONCURRENCE, THE EMBEDDED DISTANCE MAY BE INCLUDED AS PART OF THE BEDROCK SOCKET.

**DEWATERING**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING ANY INCOMING WATER TO THE EXTENT THAT THE SHAFT EXCAVATION IS MAINTAINED DRY ENOUGH FOR PERFORMANCE OF THE REQUIRED INSPECTION OPERATION. THE PREFERRED METHOD OF CONSTRUCTION IS TO PLACE THE CONCRETE IN A CLEAN, DRY EXCAVATION. THE CONTRACTOR IS EXPECTED TO MAKE A REASONABLE ATTEMPT TO SEAL WATER OUT OF THE DRILLED SHAFT EXCAVATION.

**BOTTOM CLEAN OUT**

THE BOTTOM OF THE DRILLED SHAFT EXCAVATION SHALL BE AS CLEAN AS PRACTICABLE (NO MORE THAN ONE INCH OF LOOSE MATERIAL ON THE BOTTOM). PRIOR TO CONCRETE PLACEMENT, DRILLING SPOILS THAT ADHERE TO THE VERTICAL SIDES OF THE BEDROCK SOCKETS ARE TO BE REMOVED.

**APPROVAL BEFORE CONCRETE PLACEMENT**

THE CONTRACTOR SHALL SUBMIT TO THE PROJECT ENGINEER FOR APPROVAL A WRITTEN PLAN OF STEPS AND PROCEDURES HE PROPOSES TO FOLLOW WHEN PLACING THE CONCRETE AND MONITORING THE CONCRETE PLACEMENT. CONCRETE SHALL NOT BE PLACED IN ANY DRILLED SHAFT EXCAVATION WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE DRILLED SHAFT EXCAVATION SHALL BE INSPECTED IMMEDIATELY BEFORE THE CONCRETE IS PLACED. A LIGHT POWERFUL ENOUGH TO THOROUGHLY INSPECT THE SIDES, BOTTOM AND REINFORCING STEEL CAGE OF THE DRILLED SHAFT IS REQUIRED.

**CONCRETE PLACEMENT**

THE CONCRETE FOR THE DRILLED SHAFT SHALL BE PLACED AS PER ITEM 511 EXCEPT AS MODIFIED BY THE PLANS. IF THE DRILLED SHAFT HAS A BEDROCK SOCKET, THE CONCRETE FOR THE BEDROCK SOCKET SHALL BE PLACED AGAINST THE IN-SITU BEDROCK. THE CONCRETE FOR THE DRILLED SHAFT SHALL BE PLACED PROMPTLY AFTER THE FINAL INSPECTION OF THE SHAFT. IF PRACTICABLE, THE CONCRETE SHALL BE PLACED IN A CLEAN DRY EXCAVATION, HOWEVER, NO MORE THAN 2 INCHES OF STANDING WATER WILL BE PERMITTED. THE DRY CONSTRUCTION METHOD CAN ONLY BE USED WHEN LESS THAN 12 INCHES OF WATER ACCUMULATES ABOVE THE BASE OF THE HOLE DURING A ONE HOUR PERIOD WHEN NO PUMPING IS PERMITTED. CARE SHALL BE TAKEN TO ENSURE THAT CONCRETE IS NOT BEING PLACED IN MOVING WATER. THE CONCRETE MAY BE PLACED IN A DRY DRILLED SHAFT EXCAVATION BY THE FREE FALL METHOD PROVIDED THE CONCRETE FALLS TO ITS FINAL POSITION THROUGH AIR WITHOUT STRIKING THE SIDES OF THE HOLE, THE REINFORCING STEEL CAGE OR ANY OTHER OBSTRUCTION. THE FREE FALL METHOD ALLOWS THE CONCRETE TO BE DROPPED FROM THE TOP THROUGH A CENTERING CHUTE TO THE CONCRETE'S FINAL POSITION. USE FREE FALL PLACEMENT WITH A 25 FOOT MAXIMUM HEIGHT OF FREE FALL. SUPPORT THE DROP CHUTE SO THAT THE MAXIMUM HEIGHT OF FREE FALL OF THE CONCRETE MEASURED FROM THE BOTTOM OF THE CHUTE IS 25 FEET.

IF THE ENGINEER DETERMINES THAT DEWATERING IS NOT PRACTICABLE THE ENGINEER SHALL REQUIRE THAT THE CONCRETE BE PLACED UNDER WATER BY MEANS OF A CONCRETE PUMP. PAYMENT FOR PUMPING THE CONCRETE WILL BE MADE UNDER ITEM SPECIAL "CONCRETE, MISC: CONCRETE PUMPING".

**TOLERANCES**

THE CONTRACTOR SHALL LOCATE AND CONSTRUCT THE TOP CENTER OF THE PIER DRILLED SHAFTS WITHIN A TWO-INCH RADIUS OF THE POSITION INDICATED BY THE PLANS. THE SHAFTS ARE TO BE INSTALLED VERTICALLY AND MUST BE WITHIN 1.0 PERCENT OF PLUMB FOR THE TOTAL LENGTH OF THE DRILLED SHAFT.

**REINFORCING STEEL**

ALL REINFORCING STEEL SHALL BE EPOXY COATED AND SHALL MEET THE REQUIREMENTS OF ITEM 509. THE REINFORCING STEEL SHALL BE GRADE 60. THE SPIRAL REINFORCING STEEL MAY BE PLAIN BARS ASTM A82 OR A615. THE REINFORCING STEEL CAGE SHALL BE COMPLETELY ASSEMBLED PRIOR TO PLACEMENT AND THE LENGTH SHALL BE AS NECESSARY TO CONSTRUCT EACH DRILLED SHAFT. SEE PLAN SHEETS FOR DETAILS OF REINFORCING STEEL. NOTE THAT THE LENGTHS PROVIDED IN THE REINFORCING STEEL LIST ARE ESTIMATED LENGTHS. THE REINFORCING STEEL SHALL BE PLACED AT PLAN LOCATION.

**CONCRETE**

CONCRETE FOR ALL DRILLED SHAFTS SHALL BE CLASS S CONCRETE AND SHALL BE IN ACCORDANCE WITH ITEM 511 EXCEPT AS MODIFIED AND SUPPLEMENTED HEREIN. THE REQUIRED SLUMP IS SIX (6) INCHES, PLUS OR MINUS ONE (1) INCH. THE MAXIMUM WATER TO CEMENT RATIO SHALL BE 0.50. IF CONCRETE IS PLACED UNDER WATER, THE REQUIREMENTS OF ADDING 10 PERCENT MORE CEMENT TO THE CONCRETE MIX SHALL BE WAIVED. THE MAXIMUM COARSE AGGREGATE SIZE SHALL BE NO. 8. THE TOP 3 TO 5 FEET OF CONCRETE IN THE DRILLED SHAFTS ARE REQUIRED TO BE VIBRATED. ONLY A MINIMAL VIBRATORY EFFORT IS NECESSARY. SPECIAL CARE SHALL BE TAKEN NOT TO OVER-VIBRATE THE DRILLED SHAFT CONCRETE. NOTE: IF THE CASING IS REMOVED USING A VIBRATORY HAMMER, NO OTHER VIBRATORY EFFORT IS NEEDED.

**SPACERS**

CONCRETE SPACERS OR OTHER APPROVED NONCORROSIVE SPACING DEVICES SHALL BE USED AT SUFFICIENT INTERVALS (NEAR THE BOTTOM AND AT INTERVALS NOT EXCEEDING 10 FEET) TO INSURE CONCENTRIC SPACING FOR THE ENTIRE CAGE LENGTH. SPACERS SHALL BE CONSTRUCTED OF APPROVED MATERIAL EQUAL IN QUALITY AND DURABILITY TO THE CONCRETE SPECIFIED FOR THE SHAFT. THE SPACERS SHALL HAVE ADEQUATE DIMENSIONS TO INSURE A MINIMUM 3 INCH ANNULAR SPACE BETWEEN THE OUTSIDE OF THE REINFORCING CAGE AND THE SIDE OF THE EXCAVATED HOLE. CYLINDRICAL CONCRETE FEET (BOTTOM SUPPORTS) SHALL BE PROVIDED TO INSURE THAT THE BOTTOM OF THE CAGE IS MAINTAINED THE PROPER DISTANCE ABOVE THE BASE.

**INSPECTION**

AN INSPECTION RECORD CHART HAS BEEN INCLUDED WITH THE PLANS ON SHEET 7 OF 25 AND SHOULD BE COMPLETED BY THE ENGINEER. MEASUREMENTS SHOULD BE OBTAINED PRIOR TO PLACING CONCRETE. THE CONTRACTOR SHOULD PROVIDE ALL NECESSARY EQUIPMENT NEEDED TO OBTAIN MEASUREMENTS FOR COMPLETING THE CHART. THE CONTRACTOR SHALL ASSIST THE ENGINEER IN OBTAINING THESE MEASUREMENTS. WHEN THE INSPECTION RECORD CHART IS COMPLETED, THE PROJECT ENGINEER SHOULD SUBMIT A COPY TO THE BUREAU OF BRIDGES AND STRUCTURAL DESIGN: ATTENTION: FOUNDATION ENGINEER.

**METHOD OF MEASUREMENT**

THE TOTAL PAY LENGTH OF EACH DRILLED SHAFT SHALL BE THE COMPLETED AND ACCEPTED LENGTH MEASURED ALONG THE AXIS OF THE DRILLED SHAFT FROM THE BOTTOM OF THE BEDROCK SOCKET TO THE PROPOSED TOP ELEVATION, AS PER PLAN. THE REINFORCING STEEL THAT PROJECTS FROM THE DRILLED SHAFT INTO THE PIER COLUMN OR THE ABUTMENT FOOTING AS SPECIFIED BY THE PLANS IS INCLUDED WITH THE DRILLED SHAFT FOR PAYMENT BUT SHALL NOT BE INCLUDED IN THE MEASURED LENGTH OF THE DRILLED SHAFT.

THE TOTAL LENGTH OF EACH DRILLED SHAFT SHALL BE DIVIDED INTO TWO SEGMENTS. THE LENGTH OF THE LOWER SEGMENT IS THE LENGTH OF THE BEDROCK SOCKET AND THE LENGTH OF THE UPPER SEGMENT IS THE LENGTH OF THE DRILLED SHAFT ABOVE THE BEDROCK SOCKET.

**BASIS OF PAYMENT**

PAYMENT FOR FURNISHING AND INSTALLING DRILLED SHAFTS WILL BE MADE AT THE CONTRACT UNIT PRICE PER LINEAR FOOT OF ACCEPTED SHAFT LENGTH AS PER ITEM SPECIAL - "DRILLED SHAFTS, 6'-6" DIAMETER, ABOVE BEDROCK" AND ITEM SPECIAL - "DRILLED SHAFTS, 6'-0" DIAMETER, INTO BEDROCK", WHICH SHALL INCLUDE ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO COMPLETE THE ITEMS AS SPECIFIED.

**DESIGN PARAMETERS**

THE DESIGN LOAD TO BE SUPPORTED BY EACH DRILLED SHAFT IS ~~TONS AT THE ABUTMENT(S) AND~~ 365 TONS AT THE PIER(S), WHICH IS ASSUMED TO BE RESISTED BY SHAFT ADHESION WITHIN A PORTION OF THE BEDROCK SOCKET AND ALSO BY SHAFT END BEARING PRESSURE. THE ALLOWABLE BEDROCK SOCKET ADHESION IS 0.5 TON(S) PER SQUARE FOOT WHICH IS ASSUMED TO ACT ALONG THE ~~BOTTOM FEET OF THE BEDROCK SOCKET AT THE ABUTMENT AND~~ BOTTOM 4 FEET OF THE BEDROCK SOCKET AT THE PIERS. THE ALLOWABLE END BEARING PRESSURE IS 12 TONS PER SQUARE FOOT.

ITEM SPECIAL - CONCRETE, MISC: CONCRETE PUMPING

**DESCRIPTION**

THE DRILLED SHAFT EXCAVATION SHALL BE FILLED WITH WATER TO SUCH A DEPTH THAT ALL WATER MOTION HAS CEASED. THE CONCRETE SHALL THEN BE PLACED BY MEANS OF A CONCRETE PUMP. THE CONCRETE PUMP PIPE SHALL HAVE A DIAMETER THAT IS NOT LESS THAN 4 INCHES. THE CONCRETE PUMP EQUIPMENT SHALL BE SO ARRANGED THAT NO VIBRATIONS RESULT WHICH MIGHT DAMAGE FRESH CONCRETE. PIPES CARRYING CONCRETE FROM THE PUMP TO THE SHAFT SHOULD BE ARRANGED WITH A MINIMUM NUMBER OF BENDS. THE PIPE USED TO CONVEY THE CONCRETE TO THE BOTTOM OF THE DRILLED SHAFT EXCAVATION SHALL BE ANCHORED TO THE STEEL CASING TO PREVENT THE PIPE FROM UNDULATING DURING THE INITIAL PLACEMENT OF THE CONCRETE.

THE PUMPING EQUIPMENT SHALL BE SUITABLE IN KIND AND ADEQUATE IN CAPACITY FOR THE WORK REQUIRED. THE USE OF ALUMINUM PIPE AS A CONVEYANCE FOR THE CONCRETE WILL NOT BE PERMITTED. AN ADEQUATE QUANTITY OF GROUT, MORTAR OR CONCRETE WITH COARSE AGGREGATE OMITTED SHALL BE PUMPED THROUGH THE EQUIPMENT AHEAD OF THE SPECIFICATION CONCRETE TO PROVIDE LUBRICATION TO THE PUMPING SYSTEM. THE CONCRETE USED FOR LUBRICATION SHALL NOT BE PLACED IN THE SHAFT. THE LUBRICATION PROCESS WILL NOT BE REPEATED AS LONG AS THE PUMPING OPERATIONS ARE CONTINUOUS. THE OPERATION OF THE PUMP SHALL BE SUCH THAT A CONTINUOUS STREAM OF CONCRETE WITHOUT AIR POCKETS IS PRODUCED. IN ORDER TO PREVENT THE CONTAMINATION OF THE CONCRETE PLACED INITIALLY AT THE BOTTOM OF THE SHAFT, THE OUTLET END OF THE PUMPING PIPE SHALL BE SEALED WITH A DIAPHRAGM OR PLUG THAT IS FLUSHED OUT WHEN THE HYDROSTATIC PRESSURE FROM THE COLUMN OF CONCRETE EXCEEDS THAT OF THE WATER IN THE SHAFT. THE INITIAL RATE OF CONCRETE PLACEMENT MUST BE CAREFULLY CONTROLLED SO AS NOT TO LIFT OR DISPLACE THE CAGE OF REINFORCING STEEL. THE CONVEYING SYSTEM SHALL BE WATER TIGHT AND THE OUTLET END SHALL ALWAYS REMAIN WELL BELOW THE TOP OF THE FRESHLY PLACED CONCRETE. THE PREFERRED CONCRETE PLACEMENT PROCEDURE IS TO MAINTAIN THE OUTLET END OF THE PUMPING SYSTEM AT APPROXIMATELY 10 FEET BELOW THE TOP OF THE FRESH CONCRETE. WHEN THE CONCRETE REACHES THE TOP OF THE DRILLED SHAFT COLUMN ALL LAITANCE SHALL BE REMOVED.

**BASIS OF PAYMENT**

PAYMENT FOR PUMPING CONCRETE WILL BE MADE AT CONTRACT UNIT PRICE PER LINEAR FOOT OF ACCEPTED SHAFT LENGTH PUMPED AS PER ITEM SPECIAL - "CONCRETE, MISC: CONCRETE PUMPING".

STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN						6 / 25
<b>DRILLED SHAFT NOTES</b>						
BRIDGE NO. OTT-2-1839 OVER PORTAGE RIVER						
SFN 6200338						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JS	JS		REZA	LMW	7-8-94	

OTT-2-16.60

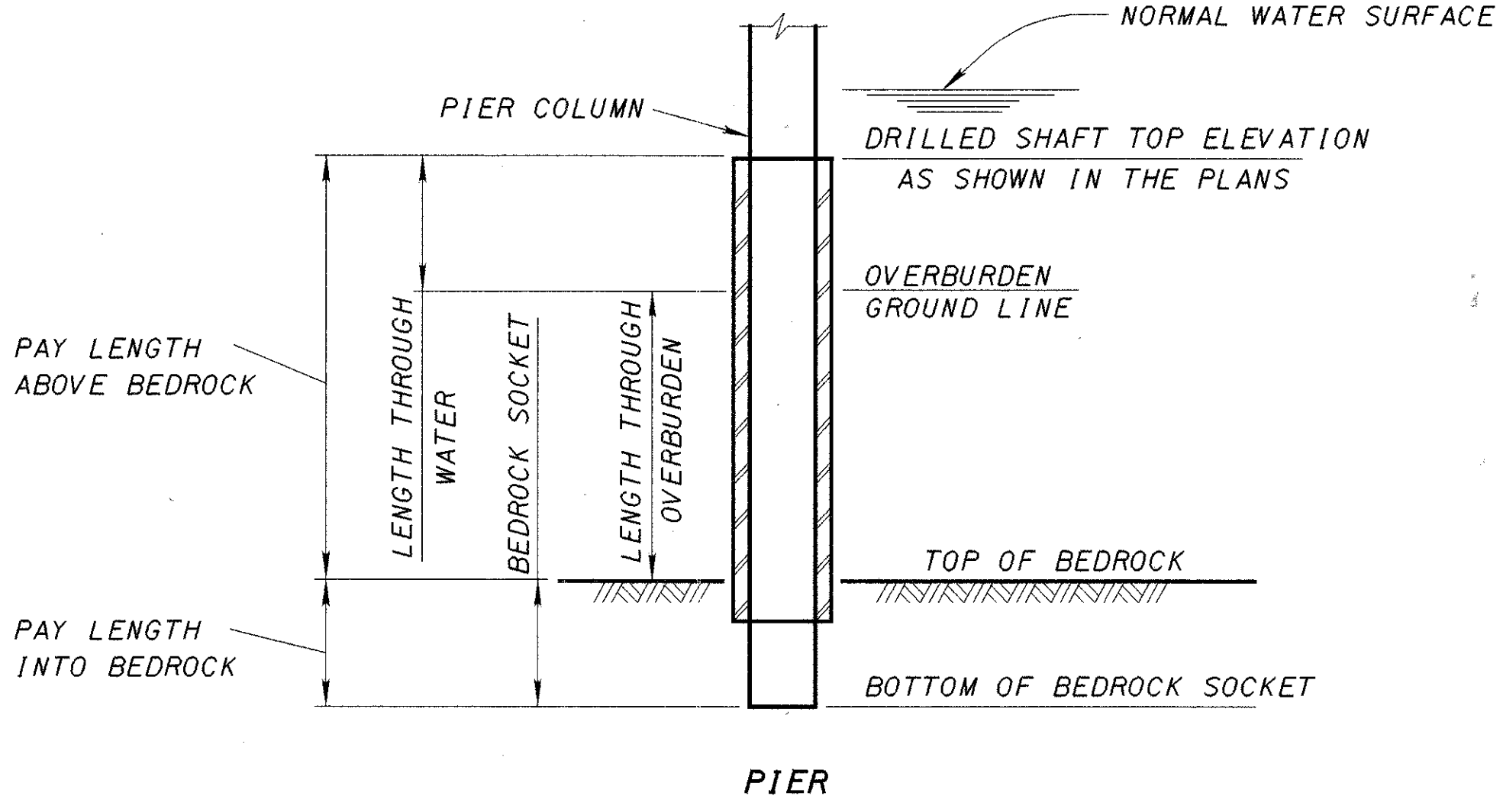
INSPECTION RECORD FOR DRILLED SHAFTS

PROJECT NO. _____	GENERAL CONTRACTOR _____ DRILLING CONTRACTOR _____ PROJECT ENGINEER _____	TYPE & MODEL OF DRILLING MACHINERY _____ MAX. CONTINUOUS TORQUE _____ FT.-LB. CROWD (MAX. CONTINUOUS DOWNWARD FORCE) _____ LBS.	TYPE OF CONCRETE PUMP _____ HOSE DIAMETER _____ INCHES CAPACITY _____ CU. FT./MIN.	COST PER LINEAL FOOT ABOVE THE BEDROCK SOCKET _____ IN BEDROCK SOCKET _____ TYPE OF ROCK _____
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PIER OR ABUT	SHAFT NO.	DATE AND TIME OF DRILLING		APPROX. ELEVATION OF TOP OF OVER BURDEN	LENGTH OF DRILLED SHAFTS ABOVE THE BEDROCK SOCKET				OBSTRUCTIONS ENCOUNTERED			LENGTH OF DRILLED SHAFTS IN BEDROCK SOCKET			STEEL CASING			REINFORCING STEEL				CONCRETE					TOLERANCES			PLAN SHAFT DIAMETER (INCH)	CONSTRUCTED SHAFT DIAMETER (INCH)																
		STARTED DATE	FINISHED DATE		THROUGH AIR (FEET)	THROUGH WATER (FEET)	THROUGH OVER BURDEN (FEET)	PAY LENGTH (FEET)	NUMBER	SIZE (INCH)	ELAPSED TIME FOR REMOVAL (HR.)	APPROX. ELEVATION OF TOP OF BEDROCK	ELEV. OF BOT. OF BEDROCK SOCKET	LENGTH OF BEDROCK SOCKET (FEET)	LENGTH (FEET)	CASING GAUGE	WAS CASING LEFT IN PLACE ?	VERTICAL		SPIRAL		SLUMP TEST RESULT (INCH)	CYLINDER STRENGTH F'c (P.S.I.)	AIR TEMP. (F)	TIME NEEDED TO PLACE CONCRETE (HR.)	QUANTITY (CU.YD.)	DEVIATION FROM PLUMB		DEVIATION OF COLUMN TOP CENTER FROM PLAN LOCATION HORIZONTALLY (INCH)																		
																		BAR SIZE NO.	NO. OF REBARS	BAR SIZE NO.	PITCH (INCH)						N-S (INCH)	E-W (INCH)																			

PROJECT ENGINEER COMMENTS

1. LOCATION AND EXTENT OF CAVITIES \_\_\_\_\_
2. PROCEDURES FOR CONTROLLING WATER \_\_\_\_\_
3. WERE UNEXPECTED SUBSURFACE CONDITIONS ENCOUNTERED \_\_\_\_\_
4. ANY SUGGESTIONS FOR IMPROVING THE PLANS \_\_\_\_\_



SUBMIT A COPY TO BUREAU OF BRIDGES  
ATTN: FOUNDATION ENGINEER

THIS SHEET IS TO BE USED ONLY FOR  
RECORDING "AS-BUILT" INFORMATION

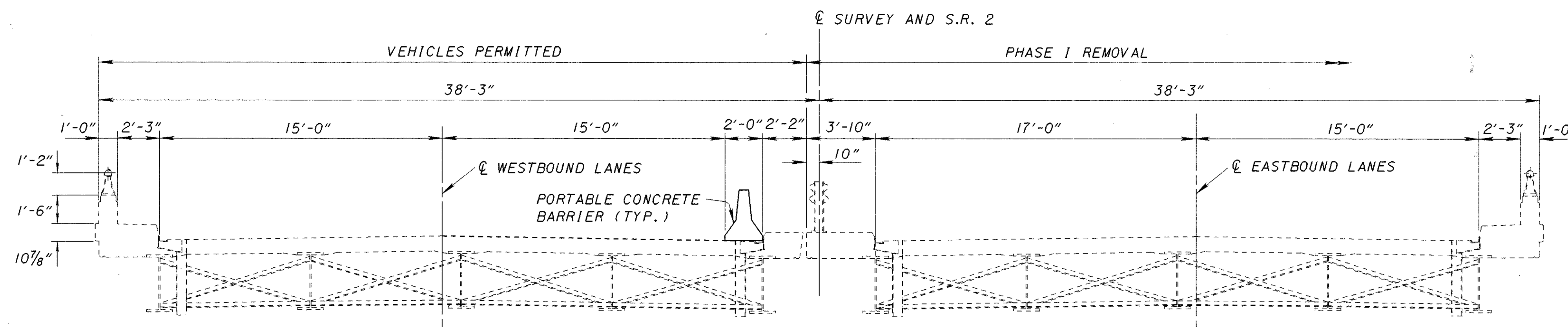
STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN					7 / 25	
<b>DRILLED SHAFTS INSPECTION RECORD</b>						
BRIDGE NO. OTT-2-1839 OVER PORTAGE RIVER						
SFN 6200338						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JS	JS		REZA	LMW	7-8-94	



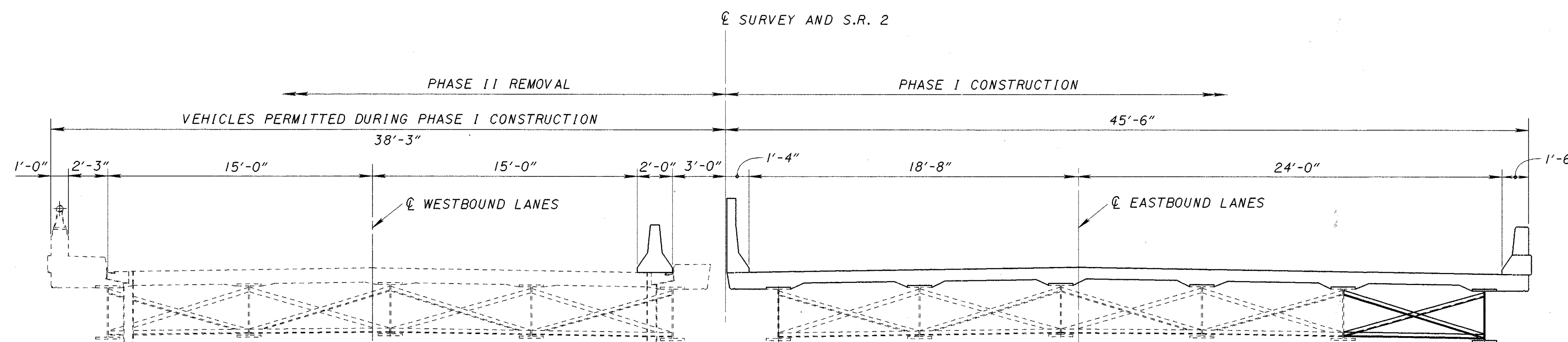
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
5	OHIO		

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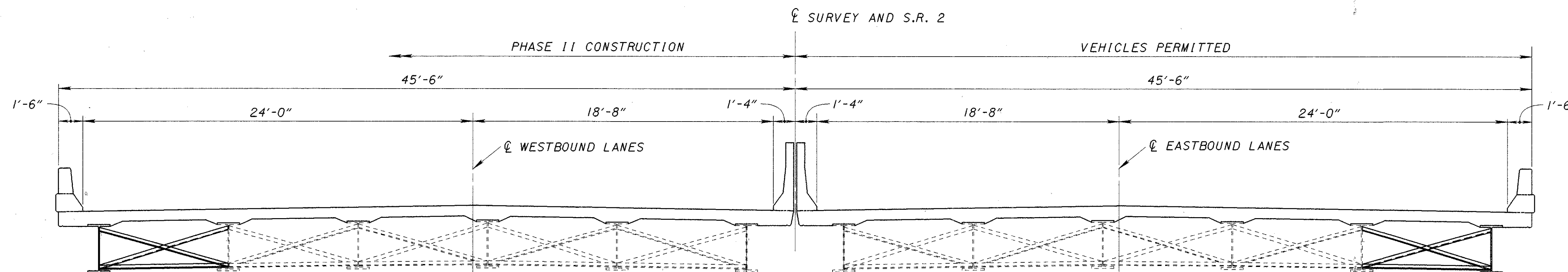
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TYPICAL EXISTING CROSS SECTION



PHASE I CONSTRUCTION CROSS SECTION



PHASE 2 CONSTRUCTION CROSS SECTION

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

8 / 25

PHASE CONSTRUCTION DETAILS

BRIDGE NO. OTT-2-1839  
OVER PORTAGE RIVER

SFN 6200338

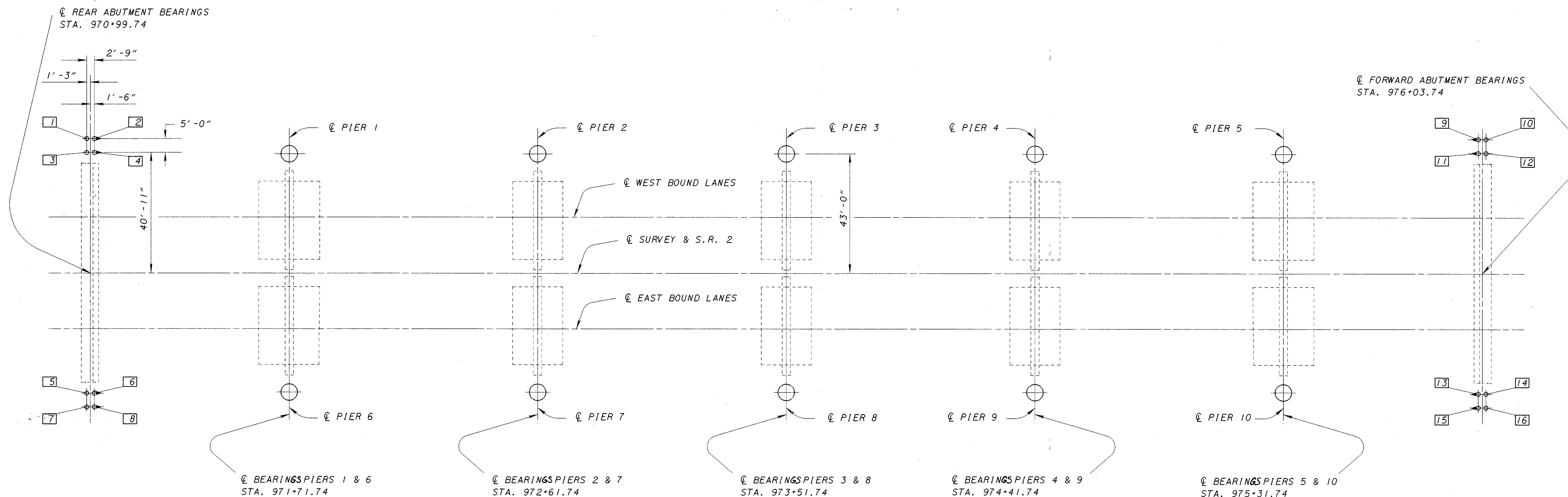
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
AJM	AJM		REZA	LMW	7-8-94	
JS	JS					



FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
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**PLAN**

(DIMENSIONS ARE TYPICAL FOR ALL ABUTMENTS AND PIERS)

**LEGEND**

- - INDICATES PILES TO BE DRIVEN VERTICALLY
- ◊ - INDICATES PILES TO BE DRIVEN ON 1 TO 4 BATTER IN THE DIRECTION OF ARROW
- - INDICATES LOCATION OF 6'-6" DIAMETER DRILLED SHAFTS
- - INDICATES PILE NUMBER AT REAR AND FORWARD ABUTMENTS

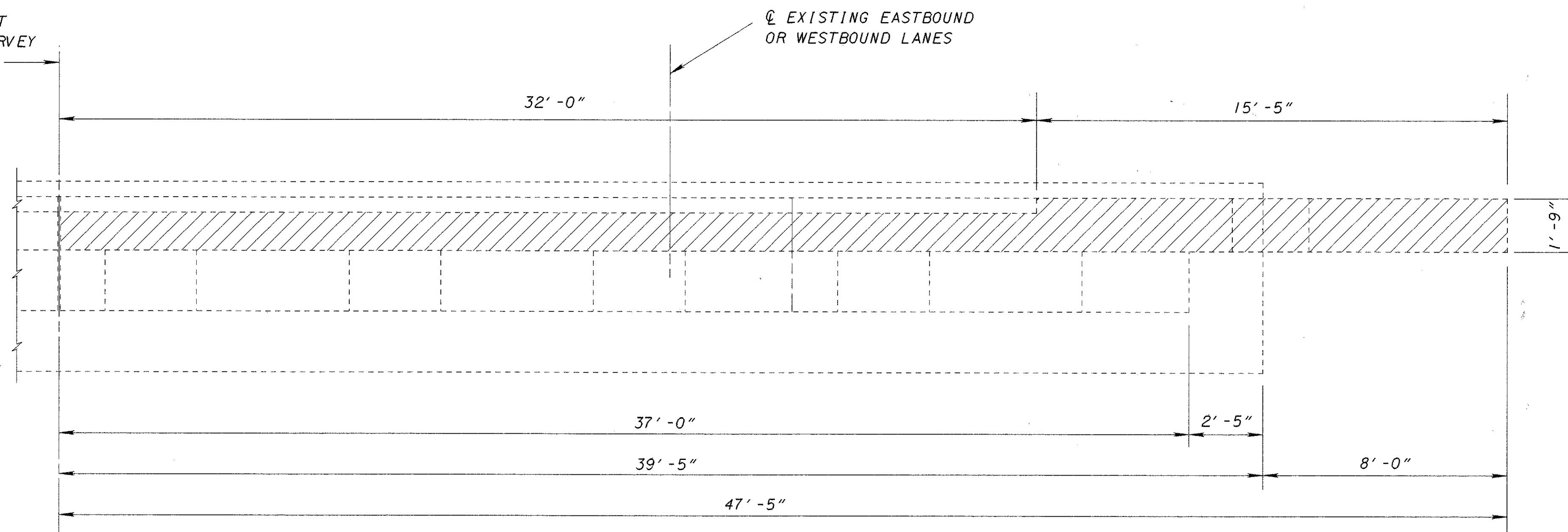
STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN						9 / 25
<b>DRILLED SHAFTS AND PILES LAYOUT PLAN</b>						
BRIDGE NO. OTT-2-1839 OVER PORTAGE RIVER						
SFN 6200338						
DESIGNED AJM JS	DRAWN AJM JS	TRACED	CHECKED REZA	REVIEWED LMW	DATE 7-8-94	REVISED

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
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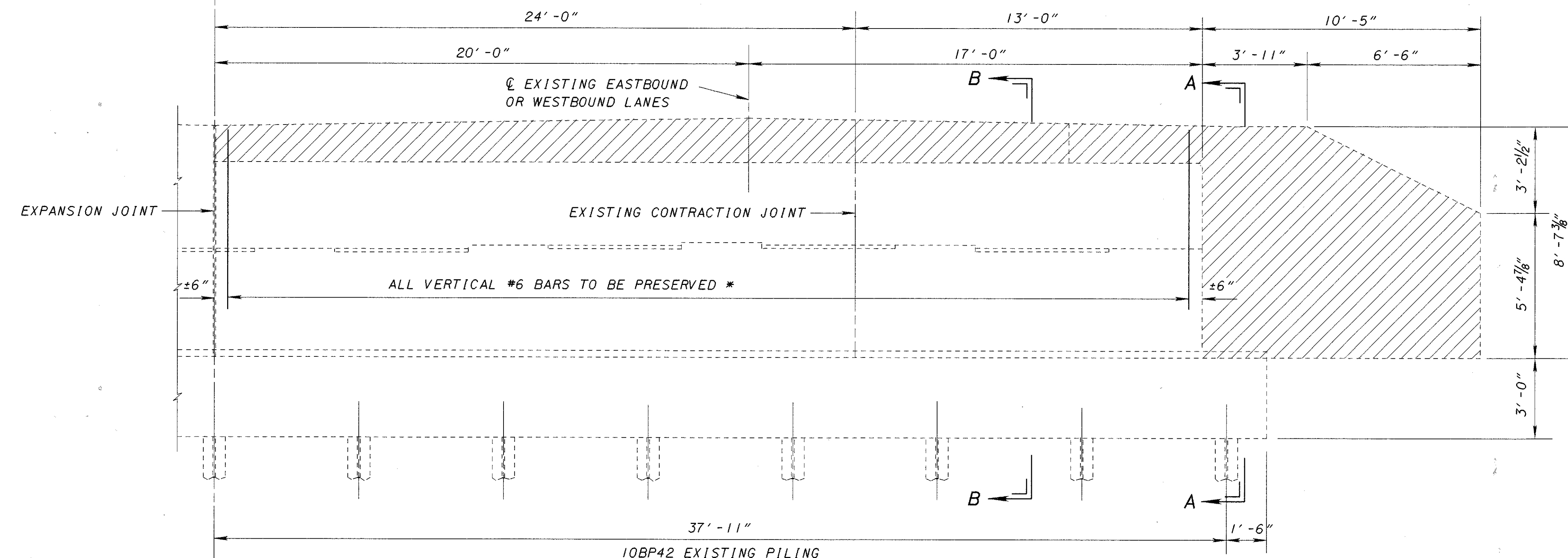
OTT-2-16.60

SYMMETRICAL ABOUT CENTERLINE OF SURVEY AND S.R. 2

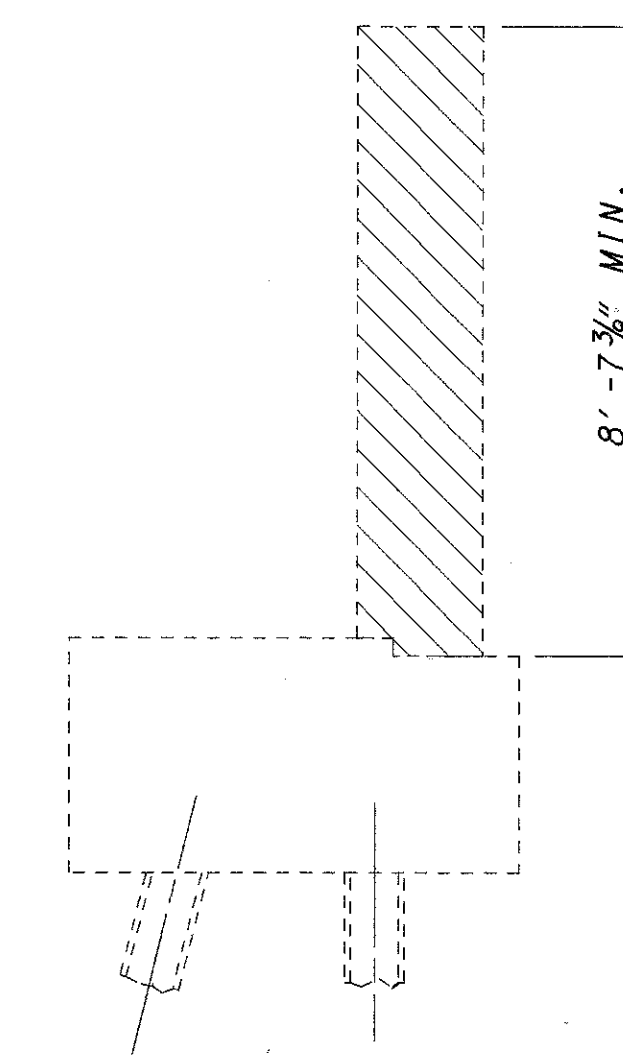
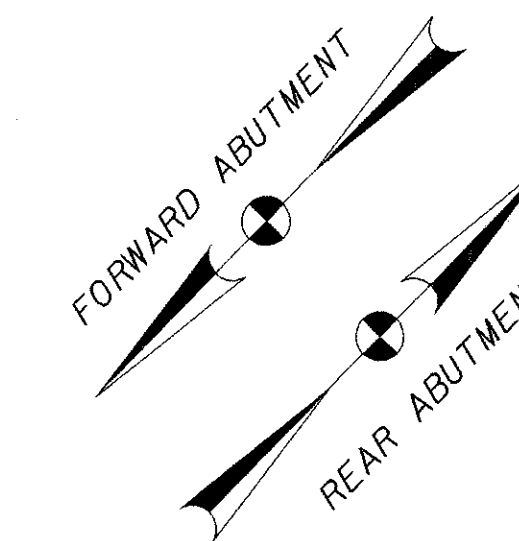


PLAN

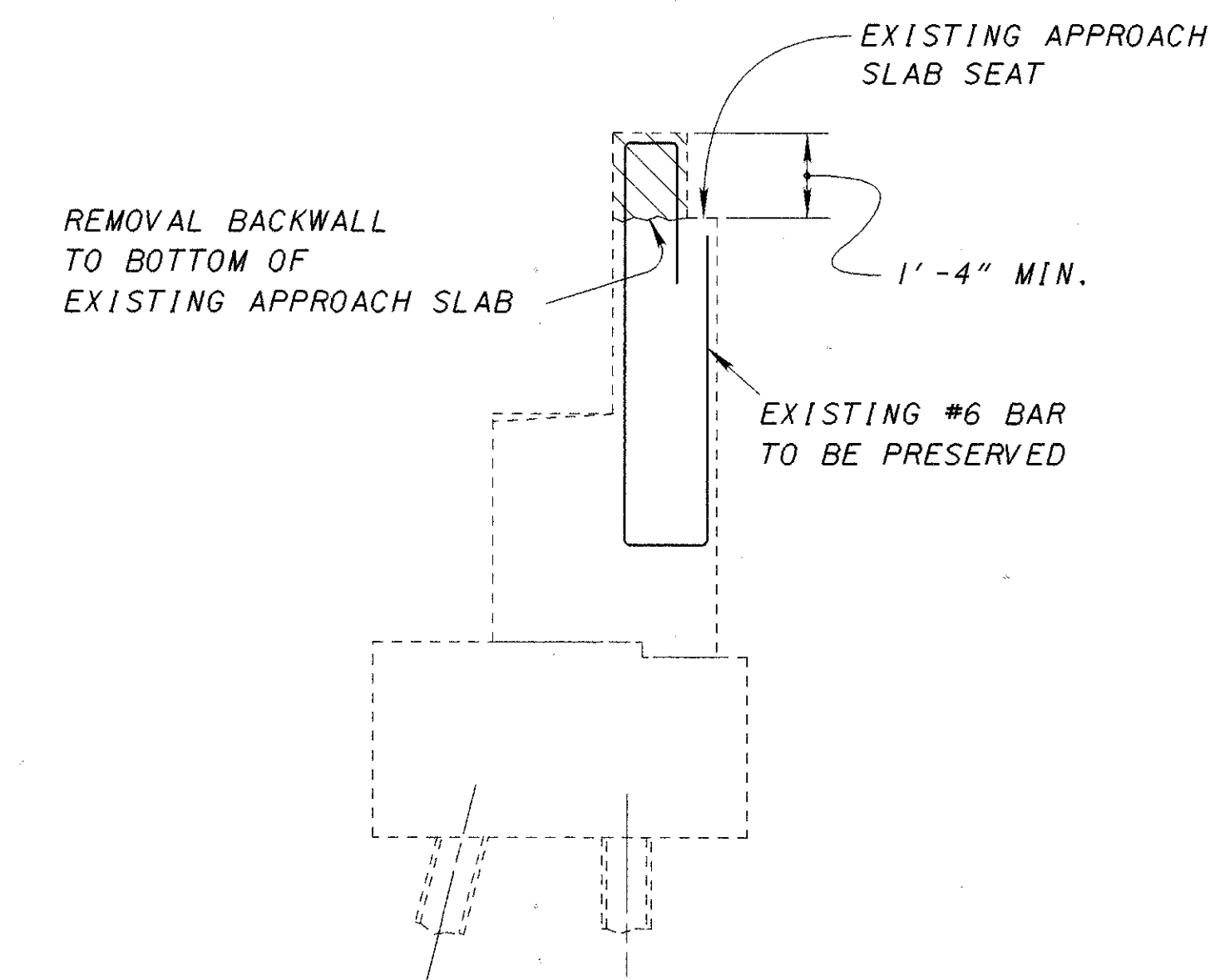
SYMMETRICAL ABOUT CENTERLINE OF SURVEY AND S.R. 2



ELEVATION



SECTION A-A



SECTION B-B

REMOVAL LIMITS

NOTES: THE SURFACE OF THE CONCRETE AT REMOVAL LINE SHALL BE CLEAN AND FREE OF LAITANCE AND SHALL BE TO A FULL AMPLITUDE OF 1/4".

\* INDICATES EXISTING VERTICAL REINFORCING STEEL THAT SHALL BE PRESERVED AND CLEANED. REINFORCING STEEL SHALL BE THOROUGHLY CLEANED BY SANDBLASTING FOLLOWED BY AN AIR BLAST (WHERE NECESSARY USE HAND TOOLS TO REMOVE SCALE).

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

10/25

EXISTING ABUTMENT REMOVAL

BRIDGE NO. OTT-2-1839  
OVER PORTAGE RIVER

SFN 6200338

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
AJM REZA	AJM REZA		JS	LMW	7-8-94	