FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

15/23

HIGHLAND COUNTY
HIG. 73-21.74

UTILITY OWNERS

Ohio Bell Telephone
3233 Woodman Dr.
Dayton, Ohio 45420
Telephone (513) 296-3610
Highland County Water
Merchants Nat'l. Bank Bldg.
Hillsboro, Ohio 45133
Telephone (513) 393-4281
South Central Power Co.
Box 250
Lancaster, Ohio 43130
Telephone (614) 653-4422

REMOVAL OF EXISTING STRUCTURE
When No Longer Needed To Maintain Traffic. The Existing Str. Shall Be Removed. Abutments Shall Be Removed To Elev. 797.0

EARTHWORK LIMITS Shown are approximate. Actual slopes shall conform to Plan Cross-Section.

EXISTING BRIDGE DATA

BRIDGE NO.	HIG.73-21.76
TYPE	Steel Beam
SPAN	55.35' C/C Brgs.
ROADWAY	20'-8½"
CONDITION	Very Poor
SKEW	0°
LOAD REDUCTION	25%
LOADING	S-10.1
ABUTMENTS	Stone & Conc.

WATER DATA

Normal Water Elev.-798.4
For 100 Year Storm
High Water Elev.-804.2
Quantity-2247 ft³/sec.
Velocity-5.1 ft/sec.
Drainage Area-45.9 Miles²
High Water Clearance-3.1'

BENCH MARK

Painted Box on top Wingwall on Forward Abutment 13' Rt.
Trav. Sta. 1149+48.5
Elevation = 809.66

BENCH MARK

R.R. Spike (West Root) in Twin 18" Syc. 110' Lt.
Trav. Sta. 1149+75
Elevation = 801.44

PROPOSED STRUCTURE

STR. No: HIG-73-2175
STR. TYPE: Precast Conc. Box Beams
SPAN: 2 Spans @ 48.75 Ea. (C/C Bearing)
LOADING: HS-20-44 & Alternate Military Loading
SKEW: 0° Rdwy Width = 32' (F/F Guardrail)
WEARING SURFACE: 2½" Min. Asp. Conc.
APPROACH SLAB: 20' (AS-1-81)
ALIGNMENT: Tangent
SUPERELEVATION: None
ABUTS: Capped Piles w/Spill Thru Slopes

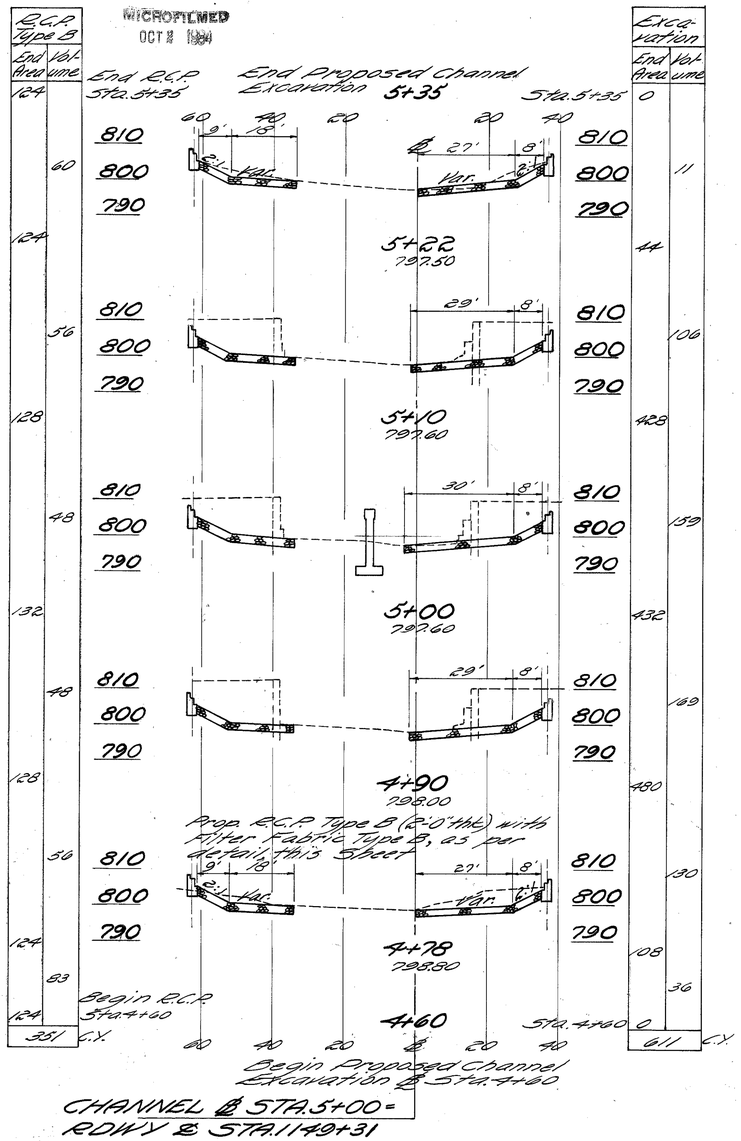
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
BUREAU OF BRIDGES

1/7

SITE PLAN

BRIDGE NO. HIG-73-2175
OVER ROCK LICK
HIGHLAND COUNTY S.R. 73
SEC. STA. 1148+68 to 1149+68
SCALE 1" = 20'

PRESENT TOPOGRAPHY		PROPOSED WORK			
SURVEYED	DRAWN	DESIGNED	DRAWN	CHECKED	REVIEWED
	Aerial & D.W.S. 5-82				

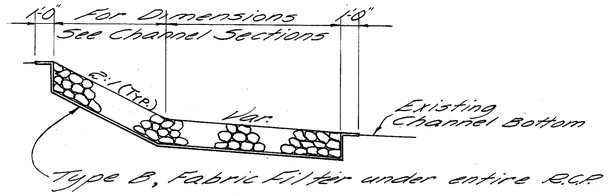


ITEM 601 ROCK CHANNEL PROTECTION TYPE B, WITH FABRIC FILTER

Where this item is called for on the plans, rock channel protection shall be constructed as per 601.08 with filter fabric placed on the excavated surface prior to placement of the rock. The filter fabric shall meet the requirements of supplemental specification 939 Type B.

The surface to receive the cloth shall be prepared to a relatively smooth surface free of obstruction and debris. The fabric shall be placed with the long dimension parallel to the centerline of the channel and shall be laid loosely but without wrinkles and creases. Where joints are necessary, strips shall be placed to provide a 12" minimum overlap with the upstream strip overlapping the downstream strip. Securing pins with washers shall be placed at 3' minimum intervals along joints and at 5' intervals elsewhere to prevent slippage of the fabric. The securing pins shall be 3/16" diameter of steel pointed at one end and fabricated with a head to retain a steel washer having an outside diameter not less than 1½". Pin lengths shall be greater than or equal to 18". For additional details see below.

Payment for all labor, equipment and material necessary to complete above described work shall be included in Item 601 Rock Channel protection Type B with Bedding.



Calc. By : D.B.B. 10-28-82
Checked By : D.W.S. 11-9-82

ESTIMATED QUANTITIES

203 Excavation, not including embankment construction — 611 C.Y.
601 Rock Channel Protection Type B, with Fabric Filter — 351 C.Y.

Above Quantities are carried to sheet no. 8 of 23.

PROPOSED CHANNEL SECTIONS @ STA. 1149+31

CALC. BY D.B.B. DATE 10-82
CHKD. BY D.W.S. DATE 11-82

OHIO
FHWA REGION 5

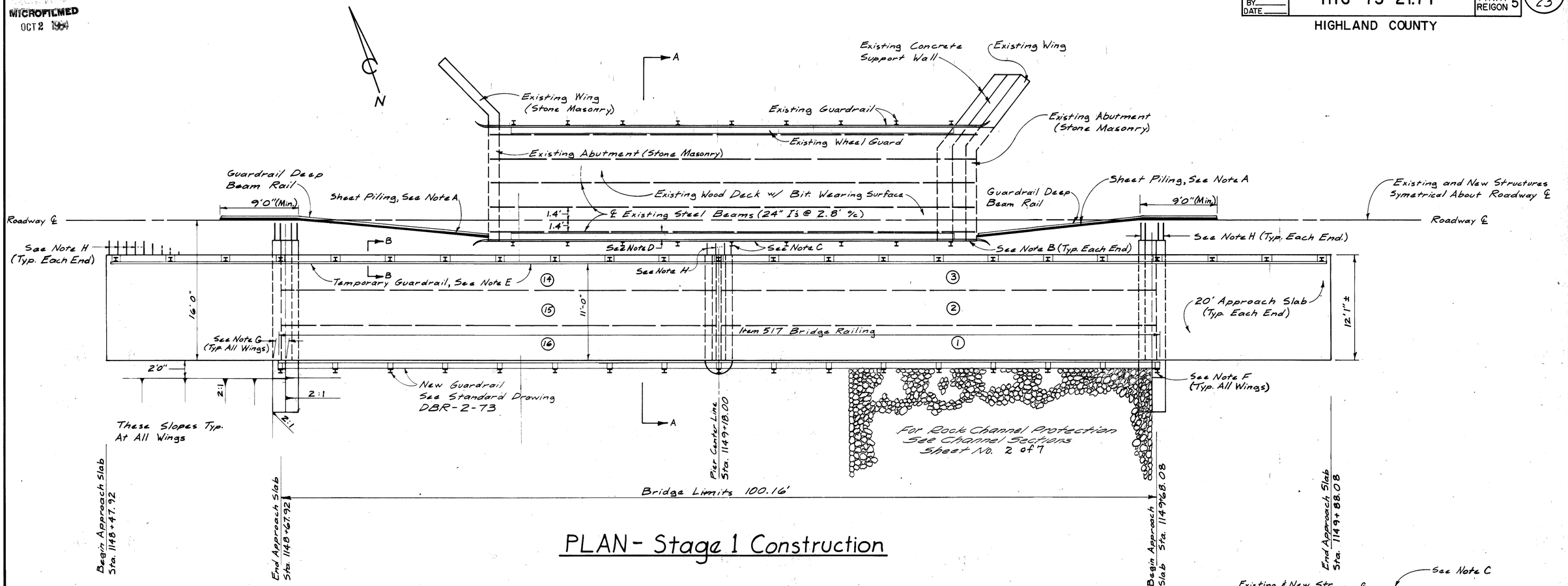
16
23

HIGHLAND COUNTY
HIG-73-21.74

2/7

PROPOSED CHANNEL SECTIONS
ROADWAY @ STA. 1149+31

CALC. BY DATE	HIG 73-21.74	OHIO	17
CHECKED BY DATE	HIGHLAND COUNTY	FHWA REIGON 5	23



PLAN - Stage 1 Construction

NOTES

NOTE A: Before Excavation for New Abutments and Slopes, sheet piling shall be placed. 31 feet± of sheet piling shall be placed at the rear abutment as shown, and 28 feet± of sheet piling shall be placed at the forward abutment as shown. The sheet piling shall be driven until it is 27" above the existing roadway and shall act as a temporary barriar along the excavation. When stage one of the new structure is complete and open to traffic the sheet piling shall be removed for stage two construction. A maximum 1:1 slope along the sheet piling shall be permitted. All sheet piling shall be 30 feet (minimum) long, and shall have a minimum section modulus of 12.0 in³ per foot of wall. The contractor shall be responsible for necessary closure between the sheet piling and the existing abutment to retain the soil. Deep beam guardrail shall be bolted to the face of the sheet piling as shown for the full length of the sheet piling.

NOTE B: Existing abutment walls shall be removed to the elevation specified up to 2.5' right of the bridge center line for stage one construction. Care shall be taken during its removal so that the structural soundness of the remaining portion is not damaged. As specified in Item 202.

NOTE C: Salvage existing guardrail from right side of bridge and weld and/or bolt it, including wheel guard, to the existing steel beam 1.4' right of the bridge center line, after deck has been removed. Include cost in item 202, structure removal, for payment.

NOTE D: Saw cut existing bridge deck 12" right of the existing steel beam which is 1.4' right of the center line for stage one construction.

NOTE E: Temporary guardrail posts shall be W6x85-27" long with a ¾"x10"x14" base plate. Mount on beam with 2-⅞"x12" (Min.) anchor bolts (right side of plate) and 2-⅞" coil anchors (left or beam face side of plate). See inlet mounted post details on standard drawing GR-1. See sheet 6 of 7 for guardrail location.

NOTES (Cont.)

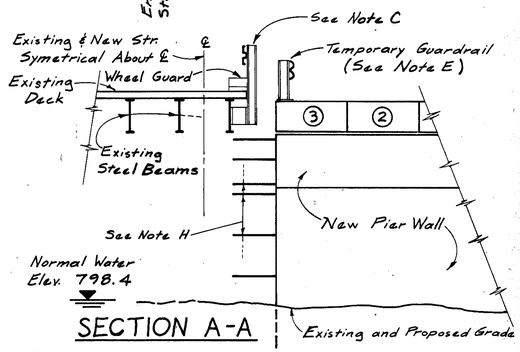
NOTE F: A guardrail post with a base plate shall be used on the wings. The post shall be attached with 4-⅞" Ø x 12" (Min.) anchor bolts set in the wing concrete. See standard drawing GR-1.

NOTE G: 1" P.E.J.F. and 1"x2" joint sealer type 705.01 or 705.02 between approach slab and wing, and beam and wing (Typ. all wings).

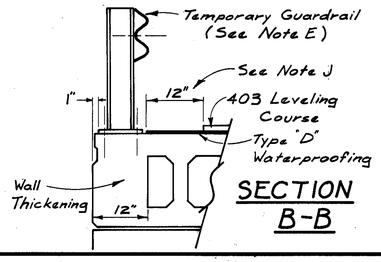
NOTE H: Lap length of transversa bars in approach slabs, piers, and abutments shall be 30 bar diameters, unless otherwise noted. Care shall be taken to protect lap bars during construction.

NOTE J: Type D Waterproofing shall be placed to the face of the temporary guardrail during stage one construction. The 403 leveling course shall be placed so as to leave 12 inches of exposed waterproofing. When the type D waterproofing is placed during stage two construction it shall be lapped 12 inches over the existing waterproofing. The temporary guardrail anchors shall be cut off flush with the beam surface before placement of stage two construction waterproofing. The 404 wearing course shall not be placed until the stage two construction 403 leveling course has been placed.

REMOVAL OF EXISTING STRUCTURE: When no longer needed to maintain traffic the existing structure shall be removed. Abutments shall be removed to elevation 797.0.



SECTION A-A



SECTION B-B

DESIGN ENTERPRISE, LTD. 3/7
CENTERVILLE OHIO

STAGE CONSTRUCTION
BRIDGE NO. HIG 73-2175
OVER ROCKLICK CREEK

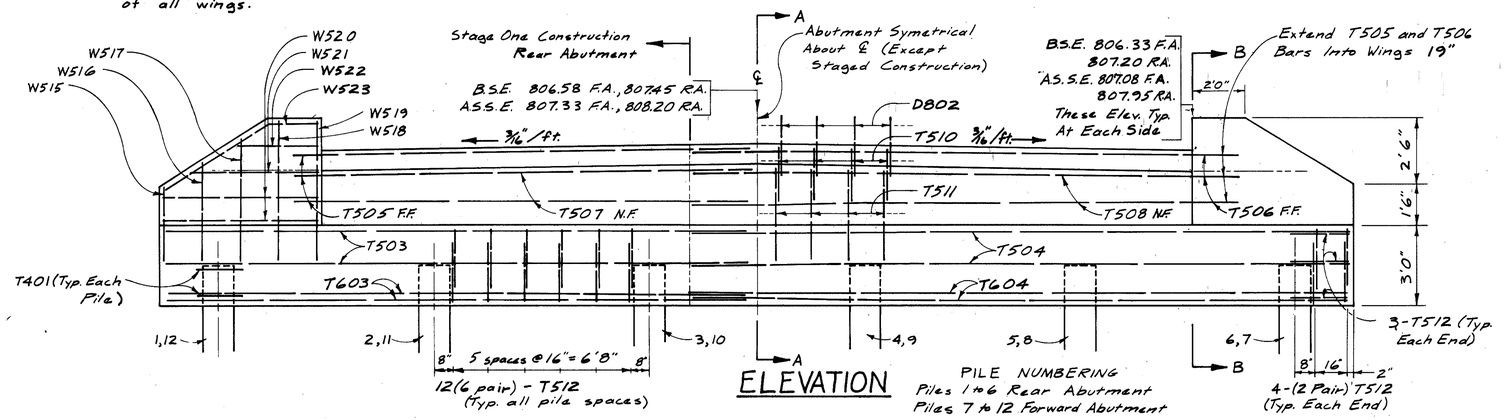
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
RAS			RAS		

REVISED:

CALC. BY			OHIO	18
DATE		HIG 73-21.74	FHWA REIGON 5	23
CHECKED BY				
DATE				

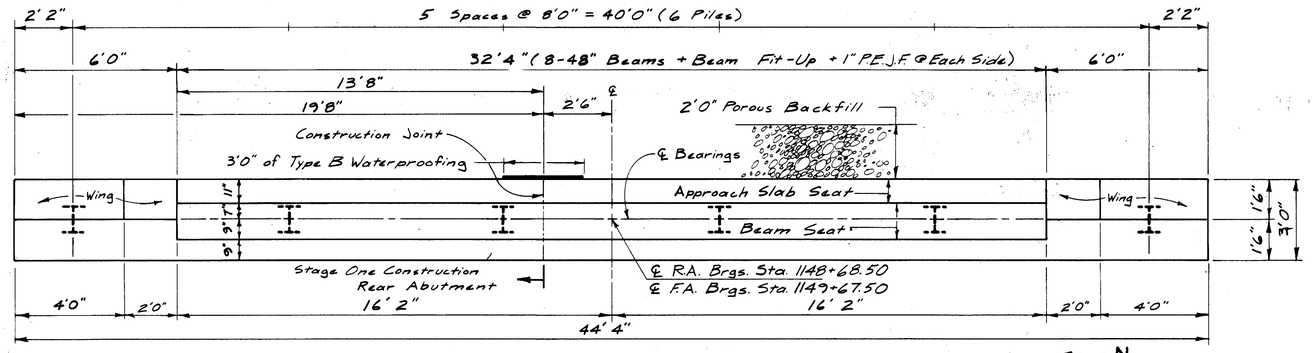
HIGHLAND COUNTY

NOTE: all wing reinforcing steel typical each face of all wings.



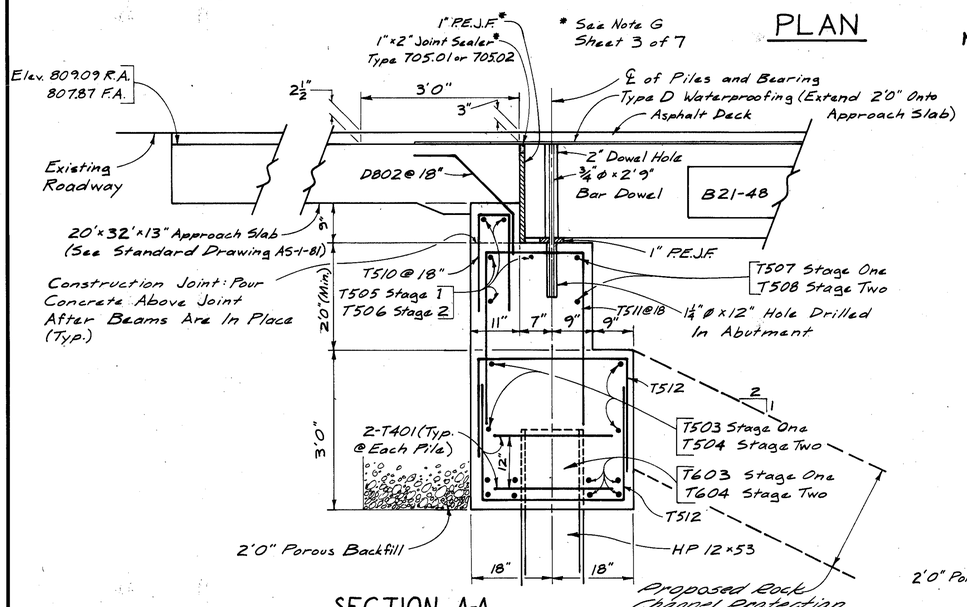
ELEVATION

PILE NUMBERING
Piles 1 to 6 Rear Abutment
Piles 7 to 12 Forward Abutment



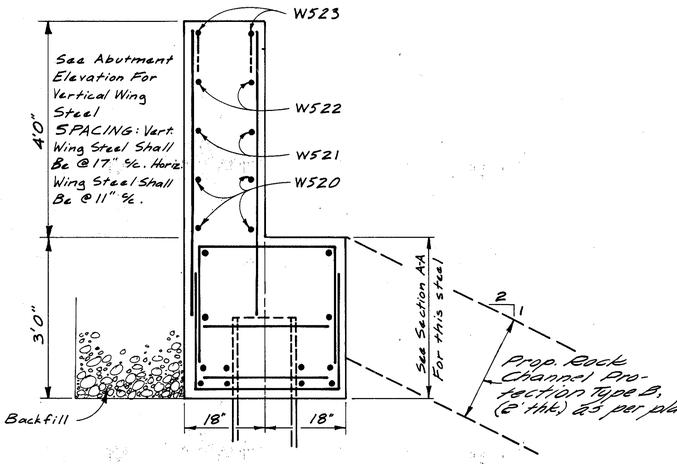
PLAN

N Rear Abutment
N Forward Abutment



SECTION A-A

SECTION B-B



KEY

F.A. - Forward Abutment
R.A. - Rear Abutment
B.S.E. - Beam Seat Elevation
A.S.S.E. - Approach Slab Seat Elevation
N.F. - Near Face
F.F. - Far Face

NOTES

POROUS BACKFILL, 2 ft. thick, shall extend up to the plane of the subgrade and laterally to the surface of the embankment slopes.

BRIDGE SEAT ELEVATIONS have been adjusted upward ⅛" at the abutments to compensate for the vertical deformation of the bearings.

BRIDGE SEAT REINFORCING: Reinforcing steel in the vicinity of the bridge seat shall be accurately placed to avoid interference with the drilling of anchor bar holes.

ABUTMENT CONCRETE above the beam seat construction joint shall not be placed until the beams have been erected.

TYPE "B" WATERPROOFING: Three feet of type "B" waterproofing shall be placed over the vertical construction joint in the abutment, and shall extend from the plane of the subgrade to the bottom of the footing.

PILES shall be driven to bedrock. The bearing capacity shall be considered by attaining refusal on hard bedrock. The design load is 40 tons per pile. The piles shall be HP 12x53 Steel-H Piles. The pile hammer shall not exceed 15,000 foot-pounds.

DESIGN ENTERPRISE, LTD. 4/7
CENTERVILLE OHIO

ABUTMENT DETAILS
BRIDGE NO. HIG 73-2175
OVER ROCKLICK CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
RAS	9.7.84		RAS		

REVISED:

CALC. BY / DATE	HIG 73-21.74	OHIO
CHECKED BY / DATE		FHWA REIGON 5

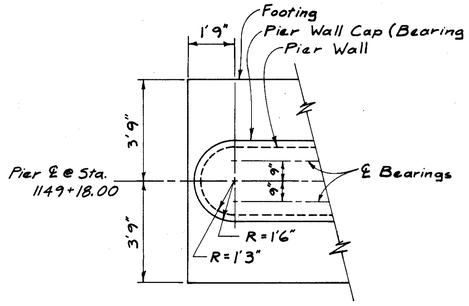
19/23

HIGHLAND COUNTY

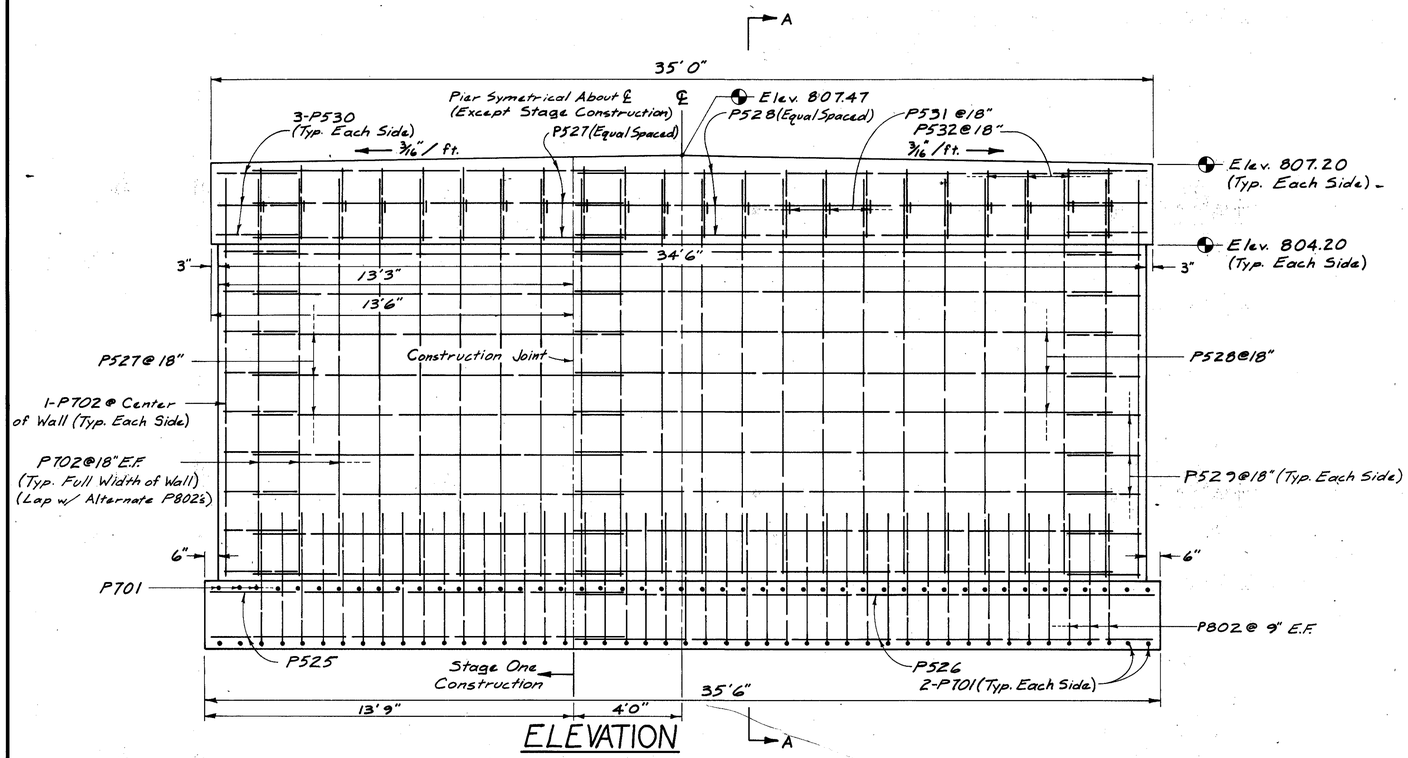
NOTES

BRIDGE SEAT REINFORCING: Reinforcing steel in the vicinity of the bridge seat shall be accurately placed to avoid interference with the drilling of anchor bar holes.
BRIDGE SEAT ELEVATIONS have not been adjusted to compensate for the vertical deformation of the bearings, which is less than 0.01 ft.

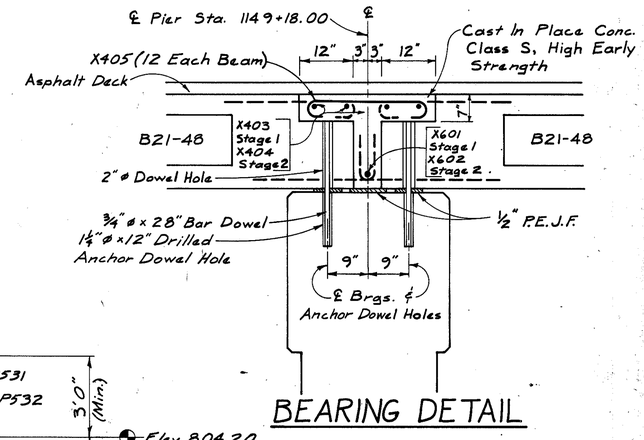
PIER FOOTING shall be keyed a minimum of 3 inches into bedrock or to the elevation shown on the plans, whichever is lower.
FOUNDATION BEARING: Pier footings are designed for a maximum bearing pressure 15 tons per square foot.



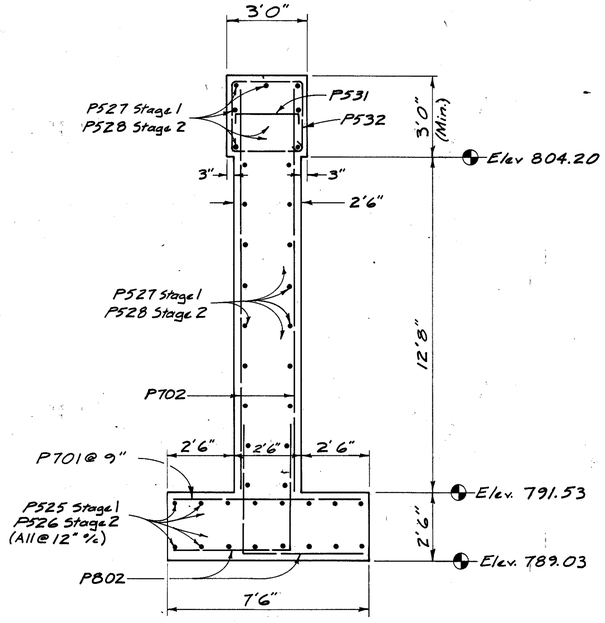
PIER END DETAIL
PLAN



ELEVATION



BEARING DETAIL



SECTION A-A

DESIGN ENTERPRISE, LTD. — CENTERVILLE OHIO — 5/7

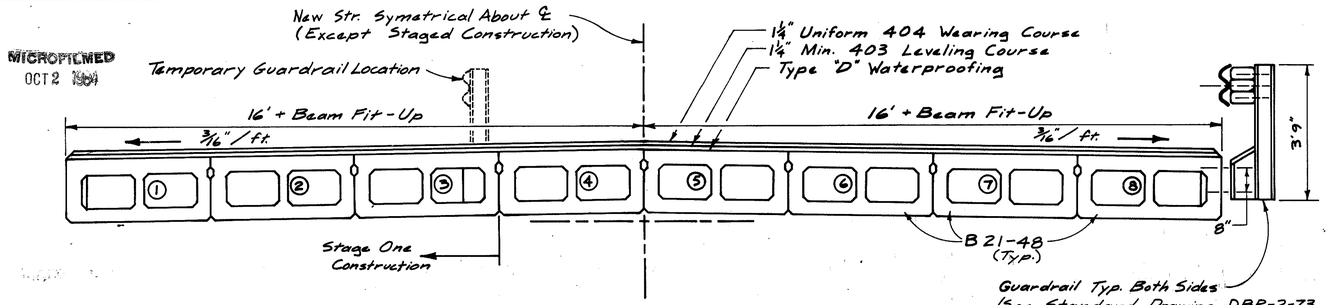
PIER DETAILS
BRIDGE NO. HIG 73-2175
OVER ROCKLICK CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
RAS			RAS		

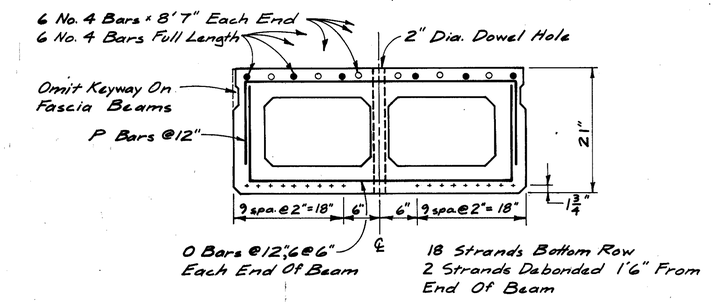
REVISED:

FHWA REGION	STATE	PROJECT	
5	OHIO	HIG 73-21.74	

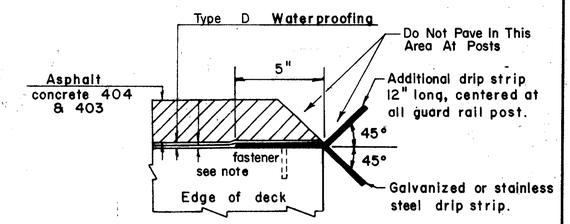
HIGHLAND COUNTY



SECTION A-A
TYPICAL SUPERSTRUCTURE SECTION



TYPICAL BEAM SECTION
B-21-48

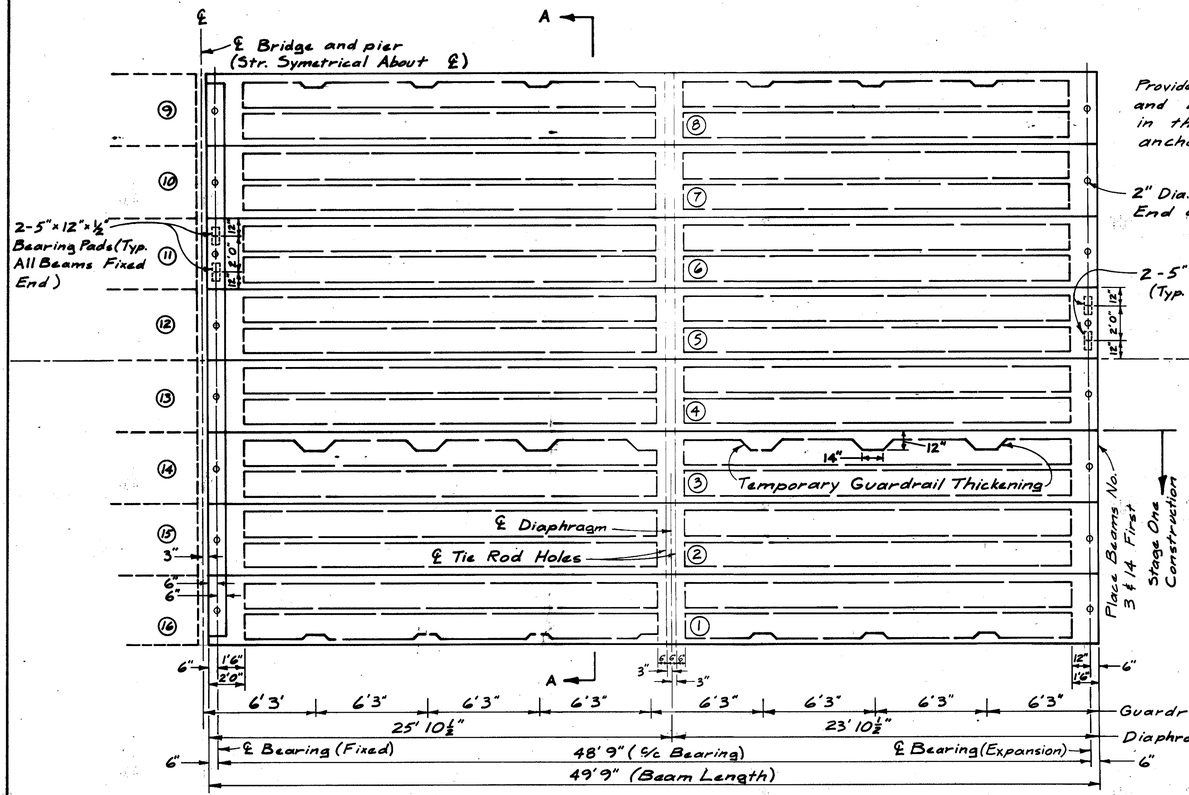


DRIP STRIP DETAIL

DRIP STRIP: PRIOR TO APPLYING DECKING 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" ℄ MAXIMUM WITH DRIVEN PINS‡ 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 ABUTMENT WINGWALL.

WHERE SPLICES ARE REQUIRED A 3" MIN. LAP SHALL BE USED WITH A FASTENER THROUGH THE LAP. STEEL FOR GALVANIZED STRIPS SHALL BE 8" X 0.105" AND SHALL MEET THE REQUIREMENTS OF ASTM A568. GALVANIZING SHALL BE IN ACCORDANCE WITH 711.02. STAINLESS STEEL SHALL BE 20 GAUGE ASTM A167, TYPE 304, MILL FINISH. PAYMENT SHALL BE AT THE CONTRACT PRICE BID FOR ITEM SPECIAL SQ. FT. STEEL DRIP STRIP, WHICH SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE ITEM.

‡ 1¼" x 5/32" x ¼" FLAT HEAD DRIVEN PIN & WASHER. (LENGTH x SHANK DIA. x HEAD DIA.)



Provide 10 1¼" x 20" Machine bolts (type A anchors) and 2 choil anchors (type C) for placement in the in-situ concrete for guardrail post anchors.

NOTES

REFER TO STANDARD DRAWING PSBD-1-81 FOR OTHER DETAILS

CALCULATED CAMBER AT TIME OF PAVING INCLUDING ALLOWANCE FOR CAMBER GROWTH DUE TO CREEP IS 1.55" THIS IS 1/2" IN EXCESS OF THAT REQUIRED FOR THE VERTICAL CURVE.

ITEM 403: 403 SHALL BE PLACED IN TWO COURSES. THE FIRST COURSE SHALL BE A WEDGE COURSE, 1/2" OVER THE BEAM ENDS & 0" AT MIDSPAN THE SECOND COURSE SHALL BE A LEVELING COURSE, A UNIFORM 1-1/4" THICK OVER ENTIRE SUPERSTRUCTURE.

DESIGN LOADING
HS20-44 AND THE ALTERNATE MILITARY LOADING
SUPERIMPOSED DEAD LOAD 270 LBS. PER LIN. FT.
DIAPHRAGM WEIGHT IS BASED ON 3'-0" LONG DIAPHRAGMS

CONCRETE
MIN. COMPRESSIVE STRENGTH AT 28 DAYS f'_c = 5500 PSI.
MIN. COMPRESSIVE AT TIME OF INITIAL PRESTRESS f'_{ci} = 4000 PSI.

REINFORCING STEEL
ASTM A615, A616 OR A617 UNIT STRESS = 20,000 PSI.

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 PSI.
INITIAL STRESS 0.7 f'_s = 189,000 PSI.
STRESS AT RELEASE 0.63 f_s = 170,000 p.s.i. (ASSUMED AT SECTION OF MAXIMUM MOMENT)

DESIGN ENTERPRISE, LTD.
CENTERVILLE OHIO

6/7

SUPERSTRUCTURE DETAILS
BRIDGE NO. HIG 73-2175
OVER ROCKLICK CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
RAS	J.L.H.		RAS		

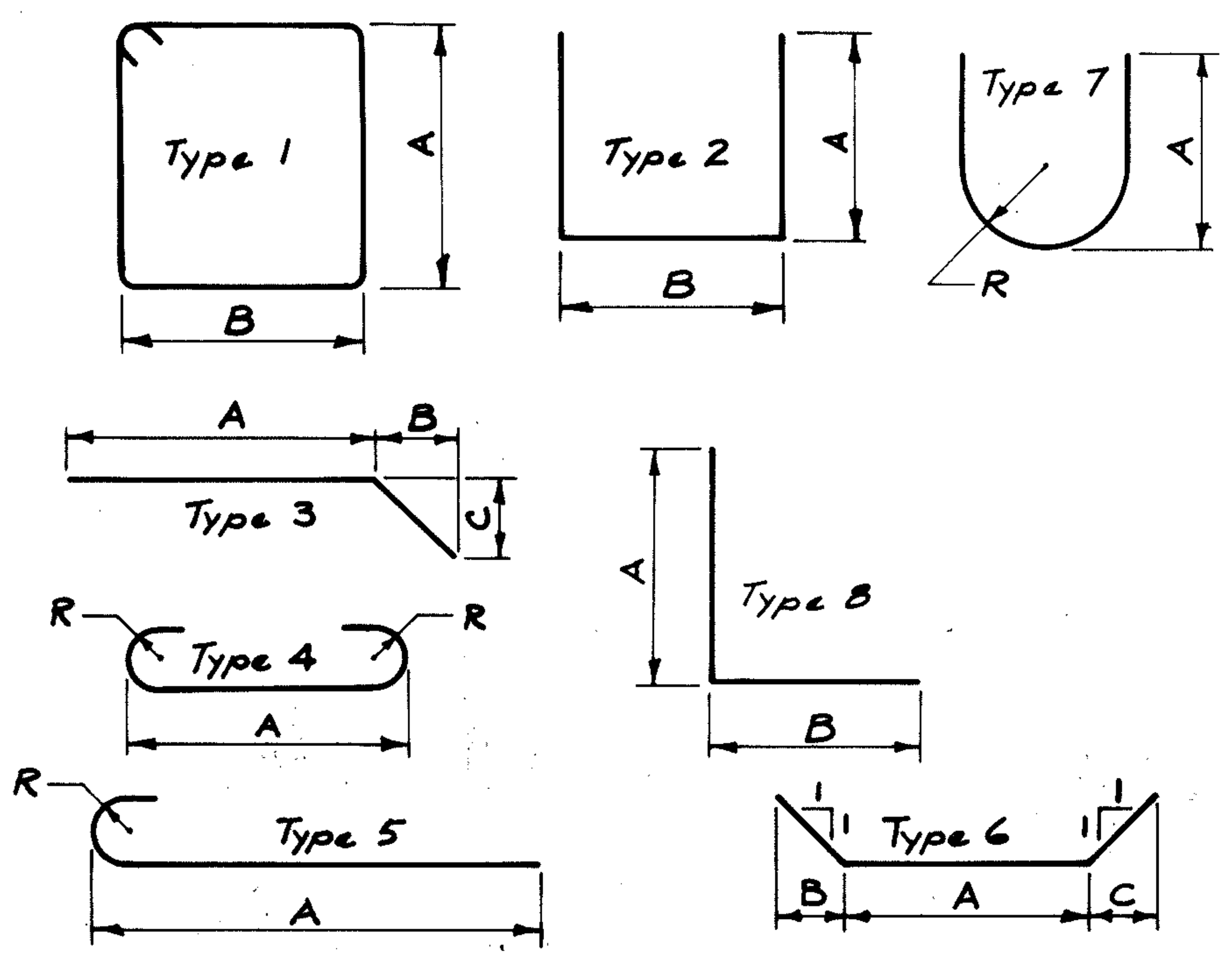
REVISED:

FHWA REGION	STATE	PROJECT		
5	OHIO	HIG 73-21.74		21/23

HIGHLAND COUNTY

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE, A700 IS A NO. 7 SIZE BAR AND A1014 IS A NO. 10 SIZE. BAR DIMENSIONS SHOWN ARE OUT TO OUT, UNLESS OTHERWISE INDICATED. "R" INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "STD" WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.

BENDING DIAGRAM



ESTIMATED QUANTITES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUTS.	PIER	GENERAL	AS BUILT
202	Lump	Sum	Structure Removed				Lump	
403	20.4	Cu. Yd.	Asphalt Concrete (AC-20)	20.4				
404	17.5	Cu. Yd.	Asphalt Concrete (AC-20)	17.5				
503	Lump	Sum	Temporary Sheet Piling (w/ Deep Beam Rail), Cofferdams, & Cribs				Lump	
503	785	Cu. Yd.	Unclassified Excavation, including rock or shale				785	
505	Lump	Sum	Test Pile				Lump	
507	187	Lin. Ft.	Steel Piles (HP 12×53)		187			
509	10,871	Lb.	Reinforcing Steel (Grade 60)	356	4,223	6,292		
511	123	Cu. Yd.	Class C Concrete		46.0	77.0		
511	2.5	Cu. Yd.	Class S Concrete	2.5				
512	3.8	Sq. Yd.	Type B Waterproofing		3.8			
512	382	Sq. Yd.	Type D Waterproofing	382				
515	16	Each	Prestressed Concrete Bridge Members	16				
516	117	Sq. Ft.	1" Preformed Expansion Joint Filler		117			
516	22	Sq. Ft.	½" Preformed Expansion Joint Filler			22		
516	32	Each	1"×5"×12", elastometric bearing pads		32			
516	32	Each	½"×5"×12", elastometric bearing pads			32		
516	71	Lin. Ft.	Joint Sealer, type 705.01 or 705.02	71				
517	200	Lin. Ft.	Bridge Railing (deep beam rail w/ steel tubular backup, & type 2 posts)	200				
518	38	Cu. Yd.	Porous Backfill		38			
Special	154	Sq. Ft.	Steel Drip Strip	154				

GENERAL NOTES

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS AS-1-81 (Modified)(11/27/81), DBR-2-73 (4/10/73), PSBD-1-81 (9/18/81), & GR-1 (2-5-82).

DESIGN SPECIFICATIONS THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1977 INCLUDING THE CURRENT INTERUMS TO 1982, & THE OHIO SUPPLEMENT TO THESE SPECIFICATIONS.

DESIGN DATA
DESIGN LOADING HS-20-44 AND THE ALTERNATE MILITARY LOADING
CONCRETE CLASS "C" COMP. STRENGTH = 4,000 psi
CONCRETE CLASS "S" COMP. STRENGTH = 4,500 p.s.i.
SEE SHEET 6 OF 7 FOR PRESTRESSED CONCRETE DESIGN DATA.
REINFORCING STEEL ASTM A615, A616 OR A617 GRADE 60
MINIMUM YIELD STRENGTH = 60,000 P.S.I.

REINFORCING STEEL SAMPLES: Refer to CMS sections 106.03, 700, 709.01 through 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel spliced in accordance with 509.08.

DECK PROTECTIVE METHOD: Type D Waterproofing and Asphalt Concrete Overlay with Steel Drip Strip.

REINFORCING STEEL LIST

PIER

MARK	TOTAL	LENGTH	WEIGHT	TYPE	A	B	C	D	R
P525	16	15'4"	256	STR.					
P526	16	21'5"	357	STR.					
P527	25	13'9"	359	STR.					
P528	25	19'10"	517	STR.					
P529	18	6'4"	119	7	2'7"				12"
P530	6	7'1"	44	7	2'10"				15"
P531	22	4'2"	96	2	10"	30"			
P532	22	10'8"	245	1	30"	30"			
P701	51	7'2"	747	STR.					
P702	46	14'7"	1371	STR.					
P802	86	9'6"	2181	8	4'10"	4'8"			
	TOTAL = 6,292 lbs.								

ABUTMENTS

MARK	FWD.	REAR	TOTAL	LENGTH	WEIGHT	TYPE	A	B	C	D	R
T401	12	12	24	9'4"	150	1	2'6¾"	1'9"			
T503	4	4	8	21'3"	177	STR.					
T504	4	4	8	24'4"	203	STR.					
T505	5	5	10	17'0"	177	STR.					
T506	5	5	10	20'1"	209	STR.					
T507	2	2	4	15'3"	64	STR.					
T508	2	2	4	18'4"	76	STR.					
T510	22	22	44	4'3"	195	2	1'10"	7"			
T511	22	22	44	8'5"	386	2	3'3"	1'11"			
T512	74	74	148	7'0"	1081	2	2'2"	2'8"			
W515	4	4	8	2'11"	24	STR.					
W516	4	4	8	3'10"	32	STR.					
W517	4	4	8	4'9"	40	STR.					
W518	4	4	8	5'5"	45	STR.					
W519	4	4	8	5'5"	45	STR.					
W520	8	8	16	5'8"	95	STR.					
W521	4	4	8	4'9"	40	STR.					
W522	4	4	8	3'3"	27	STR.					
W523	4	4	8	6'4"	53	3	4'7"	1'6"	11"		
T603	8	8	16	21'7"	519	STR.					
T604	8	8	16	24'4"	585	STR.					
				TOTAL = 4,223 lbs.			(Both Abutments)				

SUPERSTRUCTURE

MARK	APPROACH SLAB	PIER	FWD.	REAR	TOTAL	LENGTH	WEIGHT	TYPE	A	B	C	D	R
A1002	X		51	51	102	20'11"	9180	5	19'6"				4"
B501	X		45	45	90	13'7"	1275	STR.			(Stage One)		
B502	X		45	45	90	19'7"	1838	STR.			(Stage Two)		
C502	X		22	22	44	19'6"	895	STR.					
D801	X		22	22	44	4'7"	538	6	1'9"	1'0"	1'0"		
	Include w/ Approach Slab For Payment												
X403		X			4	13'3"	36	STR.					
X404		X			4	19'8"	53	STR.					
X405		X			96	3'4½"	216	4	2'2"				2"
X601		X			1	13'11"	21	STR.					
X602		X			1	19'8"	30	STR.					
					TOTAL =	356 lbs.							

DESIGN ENTERPRISE, LTD.
CENTERVILLE OHIO

7/7

GENERAL NOTES, ESTIMATED QUANTITIES
REINFORCING STEEL LIST
BRIDGE NO. HIG 73-2175
OVER ROCKLICK CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
RAS	g.L.H.		RAS		

REVISED: