WAY-302-10.08 ASD-302-9.32	OHIO FHWA REGION 5 FEDERAL PROJECT	1 34

BRS-485 (5) (6)

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
WAY-302-10.08
ASD-302-9.32
CHESTER TOWNSHIP, WAYNE COUNTY
ORANGE TOWNSHIP, ASHLAND COUNTY

DESIGN DESIGNATIONS

		WAY-302-10.08	ASD-302-9.32
1983 ADT	=	550	680
2003 ADT	=	820	960
DHV	=	80	95
D	=	50%	50%
T	=	8%	8%
V	=	40 M.P.H.	40 M.P.H.

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line or
Fence Line (existing) (proposed)
Center Line 352 353
Trees, Stumps, (to be removed)
Utility Poles: Telephone, Power, Light

Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA & RW
Existing Right of Way
Property Line (in existing fence)
Railroad or
Guardrail (existing) (proposed)

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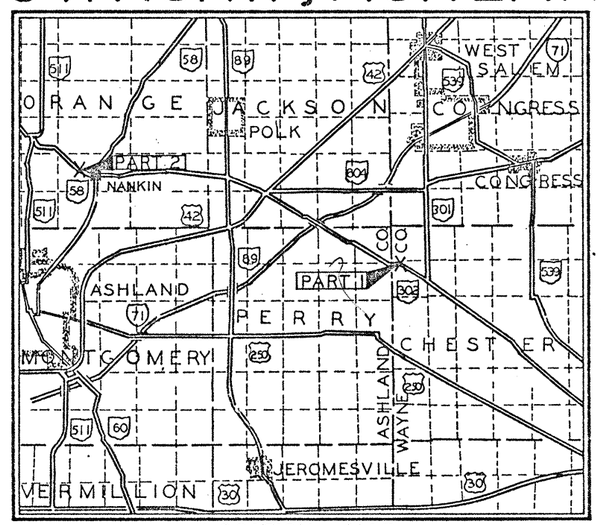
LINE DATA

	PROJECT	WORK
PART 1 (WAY-302-10.08)		
BEGIN	STA. 531+00	STA. 530+20
END	STA. 533+50	STA. 533+90
NET LENGTH	250.00 LIN. FT.	370.00 LIN. FT.
PART 2 (ASD-302-9.32)		
BEGIN	STA. 492+20	STA. 492+00
END	STA. 494+26.45	STA. 495+35
NET LENGTH	206.45 LIN. FT.	335.00 LIN. FT.
TOTAL PROJECT		
NET LENGTH	456.45 LIN. FT. OR 0.086 MILES	705.00 LIN. FT. OR 0.134 MILES

UNDERGROUND UTILITIES
48 HOURS
BEFORE YOU DIG
Call ··· 800-362-2764 (Toll free)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS MUST BE CALLED DIRECTLY



LOCATION MAP

SCALE IN MILES 0 2 4 6 8

Portion to be improved
State & Federal Routes
Other Roads

SCALES

Plan 0 20 40
Profile: Horizontal 0 20 40, Vertical 0 5 10
Cross Section: Horizontal 0 5 10, Vertical 0 5 10

1983 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT DETOURS WILL BE PROVIDED AS INDICATED ON THE PLANS.

Approved Gary W. Cross
Date 7/27/84 District Deputy Director of Transportation

Approved Walter J. Jestings PSE
Date 8-21-84 Engineer, Bureau of Bridges and Structural Design

Approved Wayne H. Kauble
Date 2-15-85 Chief Engineer, PLANNING & DESIGN

Approved Warren J. Smith
Date 2-15-85 Director, Department of Transportation

SUPPLEMENTAL SPECIFICATIONS		
803	5-27-83	
824	10-08-82	
836	3-12-75	
939	6-28-82	
847	10-17-83	
947	10-17-83	

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS					
BP-5	7-16-81	AS-1-81	11-27-81		
		DBR-2-73	4-10-73		
GR-1	2-05-82	CPP-2-73	4-10-73		
GR-2B	2-05-82	PSBD-1-81	9-18-81		
GR-3	2-05-82				
GR-4	2-05-82	TS-ICD-1-82	11-15-82		
GR-4A	1-30-84				
MC-4	7-26-76				

Plan Prepared By:
DISTRICT 3 DESIGN
(ROADWAY PLANS)
AND
SHAFFER, JOHNSTON, LICHTENWALTER, ASSOC.
(STRUCTURE PLANS)

SEAL

Project: WAY-302-10.08, ASD-302-9.32
Date of Letting _____ 19__, Contract No. _____

LD0300 Rev. 1-1-81

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

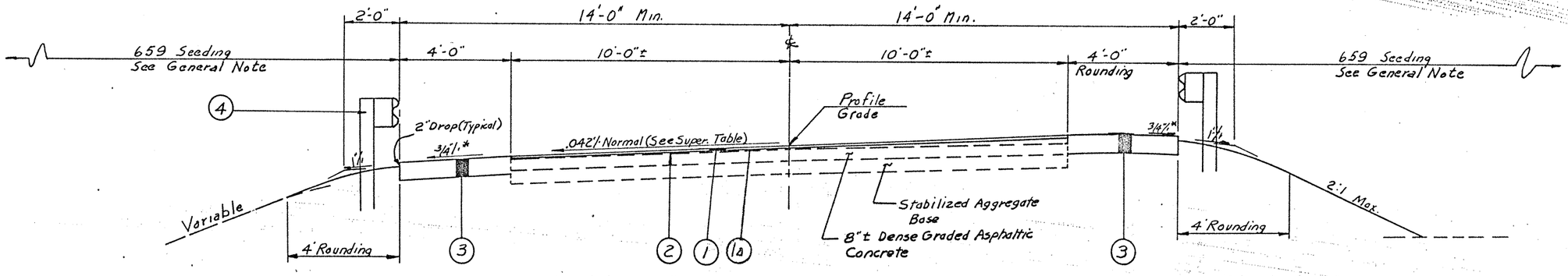
DIVISION ADMINISTRATOR DATE

FHWA REGION	STATE	PROJECT	
5	OHIO		

WAY-302-10.08
ASD-302-9.32

TYPICAL SECTIONS
TYPE 404

TYPICAL "A" PART 1 (WAY-302-10.10)

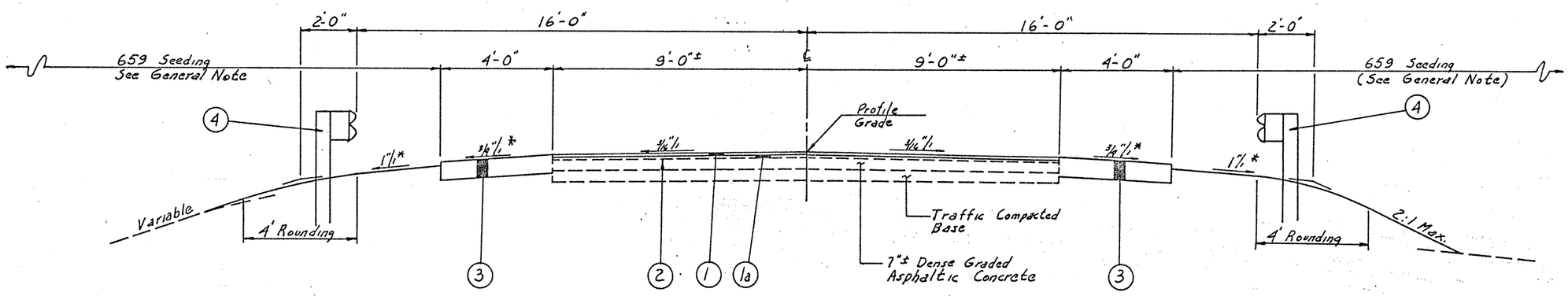


STA. 531+00 TO STA. 531+63.97 = 63.97 LIN. FT.
STA 532+71.05 TO STA. 531+50 = 78.95 LIN. FT.
TOTAL = 142.92 LIN. FT.

NOTE: All angles at change of slope shall have 2' rounding unless otherwise shown.

* Berm and Shoulders slopes shall transition to meet proposed approach slabs.

TYPICAL "B" PART 2 (ASD-302-9.32)



STA. 492+20 TO 492+98.45 = 78.45 LIN. FT.

LEGEND

1. 1 1/4" 404 Asphalt Concrete, AC-20
1a. Variable 403 Asphalt Concrete, AC-20
2. 407 Tack Coat and Cover Aggregate (See General Note)
3. 8" 304 Aggregate Base
4. 606 Guard Rail, Type 5

CALC. BY. RDD. 9/84.
CHK'D. BY PWS. 9/84.

FIELD OFFICE:

THE CONTRACTOR SHALL PROVIDE A SUITABLE FIELD OFFICE HAVING A MINIMUM OF 300 SQ. FT. OF FLOOR SPACE. PAYMENT SHALL BE AT THE LUMP SUM PRICE BID FOR ITEM 619, FIELD OFFICE.

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS:

THE ROUNDED CORNERS SHOWN ON THE TYPICAL SECTIONS, APPLY TO ALL CROSS SECTIONS EVEN THOUGH OTHERWISE SHOWN ON THESE PLANS.

ELEVATION DATUM:

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM.

CONTINGENCY QUANTITIES:

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK LISTED IN THE GENERAL SUMMARY FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED AT THE ENGINEER'S DISCRETION SHALL BE MADE A MATTER OF RECORD BY INCORPORATION INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

UNDERGROUND UTILITIES:

THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.64 OF THE OHIO REVISED CODE.

UTILITY NOTIFICATION:

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

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

UTILITY OWNERSHIP:

TELEPHONE: GENERAL TELEPHONE COMPANY OF OHIO
1534 S.R. 511 SOUTH
PARTS 1&2 P.O. BOX 9
ASHLAND, OHIO 44805
PHONE: (419) 289-6616

POWER: OHIO EDISON COMPANY
76 SOUTH MAIN STREET
PART 2 AKRON, OHIO 44308
PHONE: (216) 384-5244

GAS: COLUMBIA GAS TRANSMISSION CORP.
PART 2: P.O. BOX 1273
CHARLESTON W. VIRGINIA 25325
PHONE 304 357 2000

407 TACK COAT:

THE TACK COAT AND COVER AGGREGATE OPERATION SHALL BE DETERMINED AS PER SPECIFICATION 407.05. PLAN QUANTITIES INDICATE AVERAGE APPLICATION RATES OF 0.10 GALLONS PER SQUARE YARD OF TACK COAT AND 7 POUNDS PER SQUARE YARD OF COVER AGGREGATE FOR ESTIMATING PURPOSES ONLY.

CONNECTIONS TO EXISTING PIPE:

WHERE THE PLANS PROVIDE FOR PROPOSED CONDUIT TO BE CONNECTED TO, OR TO CROSS EITHER OVER OR UNDER AN EXISTING SEWER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE HE STARTS TO LAY THE PROPOSED CONDUIT.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT 603 CONDUIT ITEMS.

LOCATION OF GUARDRAIL:

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

REMOVAL OF TREES AND STUMPS:

ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS OF THIS PROJECT SHALL BE REMOVED UNDER THE LUMP SUM PRICE BID FOR ITEM 201 CLEARING AND GRUBBING, EXCEPT THAT THOSE TREES FOR WHICH PROTECTION AND PRESERVATION WORK IS INDICATED ELSEWHERE IN THESE PLANS SHALL NOT BE REMOVED.

THE FOLLOWING IS AN APPROXIMATE ESTIMATE OF THE NUMBER OF TREES AND STUMPS TO BE REMOVED:

SIZES	NO. TREES PART 1	NO. TREES PART 2	NO. STUMPS PART 1	NO. STUMPS PART 2
18"	3	0	0	0
30"	0	0	0	0
48"	0	0	0	0
60"	0	0	0	0

THE ABOVE ESTIMATE IS APPROXIMATE AND THE STATE OF OHIO RESERVES THE RIGHT TO ORDER THE REMOVAL OF ADDITIONAL TREES OR STUMPS OUTSIDE THE LIMITS OF CONSTRUCTION BUT WITHIN THE RIGHT-OF-WAY AND/OR EASEMENT LINES. PAYMENT FOR THE REMOVAL OF THESE ADDITIONAL TREES OR STUMPS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201 CLEARING AND GRUBBING.

SEEDING:

QUANTITIES FOR SEEDING, WHERE REQUIRED BY PLAN, ARE CALCULATED FOR THE SOIL AREAS BETWEEN TEN (10) FEET OUTSIDE THE WORK LIMITS, AS SHOWN ON THE CROSS SECTIONS, OR TO THE RIGHT-OF-WAY OR TEMPORARY LINES, IF SUCH LINE IS LESS THAN TEN (10) FEET FROM THE WORK LIMITS.

WATERING PERMANENT SEEDED AREAS:

THE FOLLOWING ESTIMATED QUANTITY IS TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH OF THE PERMANENT SEEDED AREAS AS PER 659.09:

ITEM 659 WATER 4 M-GAL.

EROSION CONTROL:

ITEM 601 IS PROVIDED IN THE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE WILL NOT BE REMOVED IN ORDER TO PLACE ANY OF THESE ITEMS.

THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES FOR THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

DUST CONTROL:

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN PROVIDED IN THE GENERAL SUMMARY TO BE USED FOR DUST CONTROL AS DIRECTED BY THE ENGINEER:

ITEM 616 WATER 10 M-GAL.

TEMPORARY STREAM CROSSING FORDS:

WHERE STREAM CROSSING FORDS ARE REQUIRED FOR EQUIPMENT CROSSINGS, THE FOLLOWING SHALL APPLY TO THE CONTRACTORS' OPERATIONS:

THE CROSSING SHALL CONSIST OF CLEAN NON-TOXIC GRANULAR OR ROCK MATERIAL, PROPERLY MAINTAINED TO PREVENT EROSION WITH PROVISIONS FOR CONVEYANCE OF ANTICIPATED HIGH FLOWS.

FURTHERMORE, IT SHALL FOLLOW PART 330.5 SPECIFIC CATEGORIES OR DISCHARGES-NATIONALLY PERMITTED, PARAGRAPH (A) (14) MINOR ROAD CROSSING FILLS--OF THE FEDERAL REGISTER--CORPS OF ENGINEERS INTERIM FINAL REGULATIONS PUBLISHED JULY 22, 1982.

ITEM 601 - ROCK CHANNEL PROTECTION WITH FILTER:

WHERE THIS ITEM IS CALLED FOR IN THE PLANS, THE QUANTITIES SHOWN ARE BASED ON THE DIMENSIONS OF THE ROCK ONLY AND DO NOT INCLUDE THE VOLUME OF A SIX INCH (6") STONE FILTER BED. THE COST OF THE FILTER (EITHER FABRIC OR STONE) SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "ITEM 601 -ROCK CHANNEL PROTECTION WITH FILTER". WHERE THE FABRIC FILTER OPTION IS USED THE THE FABRIC SHALL MEET THE REQUIREMENTS OF SUPPLEMENTAL SPEC. 939 TYPE B.

THE SURFACE TO RECEIVE THE FABRIC 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 DIRECTION OF FLOW AND SHALL BE LAID LOOSELY BUT WITHOUT WRINKLES AND CREASES. WHERE JOINTS ARE NECESSARY, STRIPS SHALL BE PLACED TO PROVIDE A TWELVE INCH (12") MINIMUM OVERLAP WITH THE UPSTREAM STRIP OVERLAPPING THE DOWNSTREAM STRIP. SECURING PINS WITH WASHERS SHALL BE PLACED AT TWO FOOT (2') MINIMUM INTERVALS ALONG JOINTS AND AT (2', 3', OR 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 1-1/2". PIN LENGTHS SHALL BE GREATER THAN OR EQUAL TO 18".

** 2' FOR FLOW DIRECTION SLOPES STEEPER THAN 3:1, 3' FOR SLOPES 3:1 TO 4:1 AND 5' FOR SLOPES LESS STEEP THAN 4:1.

614 MAINTAINING TRAFFIC:

THROUGH TRAFFIC ON S.R. 302 SHALL BE DETOURED ON BOTH PARTS OF THIS PROJECT AS SHOWN ON THE DETOUR MAPS, SHEET 6 . EACH DETOUR SHALL BE LIMITED TO THE TIME LIMIT SHOWN UNDER EACH DETOUR MAP. THE DETOURS SHALL NOT BE PUT INTO EFFECT PRIOR TO APRIL 15.

ACCESS TO ALL DRIVES WITHIN THE WORK LIMITS OF THIS PROJECT SHALL BE MAINTAINED AT ALL TIMES. THROUGH TRAFFIC SHALL BE MAINTAINED AT ALL TIMES ON TWP. ROADS 851 AND 964 ON PART 2 OF THIS PROJECT.

ALL DETOUR SIGNING WILL BE PROVIDED BY STATE FORCES. THE CONTRACTOR SHALL NOTIFY THE DISTRICT TRAFFIC ENGINEER TWO (2) WEEKS IN ADVANCE OF THE PLACEMENT OF THE DETOUR SIGNING.

614 WORK ZONE PAVEMENT MARKINGS

WAY-302-10.08
ASD-302-9.32

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND WHEN NECESSARY, REMOVE WORK ZONE RETROREFLECTIVE PAVEMENT MARKINGS ON EXISTING, RECONSTRUCTED, RESURFACED OR TEMPORARY ROADS WITHIN THE WORK LIMITS, IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE MARKINGS SHALL BE MAINTAINED IN GOOD CONDITION TO PROVIDE DAY AND NIGHT VISIBILITY. THE MARKINGS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER TO MAINTAIN REQUIRED VISUAL EFFECTIVENESS AND NIGHT VISIBILITY AT NO ADDITIONAL COST TO THE STATE.

THE CONTRACTOR SHALL, IN ADVANCE OF ANY SECTION OF ROADWAY LACKING OMUTCD FULL PATTERN STANDARD DIMENSION EDGE LINE OR CENTER LINE MARKINGS, ERECT A "NO EDGE LINES" (OW-167) SIGN OR "UNMARKED NO PASSING ZONES" (OW-168) SIGN OR BOTH AS MAY BE APPROPRIATE. THESE SIGNS SHALL BE IN PLACE PRIOR TO EXPOSING THE ROADWAY TO TRAFFIC. THESE SIGNS SHALL BE REPEATED EVERY 1 TO 2 MILES AND AT OTHER LOCATIONS AS NECESSARY. THESE SIGNS SHALL BE REMOVED WHEN THEY NO LONGER APPLY. THE COST FOR FURNISHING AND ERECTING AND SUBSEQUENTLY REMOVING THESE SIGNS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC, UNLESS SPECIFICALLY ITEMIZED.

TEMPORARY PAVEMENT MARKING MATERIALS

UNLESS OTHERWISE INDICATED ON THE PLANS, TEMPORARY PAVEMENT MARKINGS MAY BE EITHER 621.02 PAINT OR 947.03 TYPE B OR C PREFORMED MATERIAL. *Where pavement markings are not liable to be tracked, either conventional or fast-drying paint may be used for 621.02.*

PAINT

PAINTED MARKINGS SHALL BE IN ACCORDANCE WITH 621 EXCEPT THAT THE INCREASE OF 25 PERCENT IN THE APPLICATION RATE FOR NEW BITUMINOUS PAVEMENT AND PARAGRAPH 621.14 SHALL NOT APPLY.

TYPE B AND TYPE C PREFORMED MATERIAL

PREFORMED MATERIAL SHALL COMPLY WITH 947.03 EXCEPT THAT NO PREFORMED MATERIAL CONTAINING METAL SHALL BE PLACED ON ANY SURFACE UNLESS IT WILL BE REMOVED LATER BY THE CONTRACTOR. TEMPORARY PAVEMENT MARKINGS OF 947.03 PREFORMED MATERIAL SHALL BE REMOVED PRIOR TO PLACEMENT OF 621 OR 847 SURFACE COURSE MARKINGS AT THAT LOCATION. PREFORMED MATERIAL SHALL BE APPLIED IN ACCORDANCE WITH 847 EXCEPT AS MODIFIED HEREIN.

PLACEMENT

TEMPORARY MARKINGS SHALL BE COMPLETE AND IN PLACE ON ALL PAVEMENT PRIOR TO EXPOSING IT TO TRAFFIC. WHEN TEMPORARY MARKINGS CONFLICT WITH THE TRAFFIC PATTERN, THEY SHALL BE REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH 621.134.

TEMPORARY MARKING CLASSES

CLASS I MARKINGS

CLASS I MARKINGS SHALL BE APPLIED TO THE FULL DIMENSIONS AS DEFINED IN 621 WITH THE FOLLOWING ADDITIONS OR EXCEPTIONS:

1) LANE LINES SHALL BE 4-INCHES IN WIDTH.
2) TRANSVERSE LINES SHALL BE 8-INCHES IN WIDTH.
3) STOP LINES SHALL BE 12-INCHES IN WIDTH.
4) CROSS WALK LINES SHALL BE 8-INCHES IN WIDTH.

CLASS II MARKINGS

CLASS II MARKINGS (ABBREVIATED) SHALL BE DEFINED AS FOLLOWS:

CENTER LINES SHALL CONSIST OF SINGLE, YELLOW 4-INCH WIDE BY A MINIMUM OF 48-INCH LONG DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

LANE LINES SHALL CONSIST OF WHITE 4-INCH WIDE BY A MINIMUM OF 48-INCH LONG DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

GORE MARKINGS SHALL BE TWO CONTINUOUS, WHITE 4-INCH LINES PLACED AT THE THEORETICAL GORE OF AN EXIT RAMP OR DIVERGING ROADWAYS.

THE PAINT APPLICATION RATE SHALL BE NOT LESS THAN 1.6 GALLONS PER MILE FOR LANE LINE AND CENTER LINE AND 16 GALLONS PER MILE FOR GORE MARKINGS.

CONFLICTING EXISTING MARKINGS

THE CONTRACTOR SHALL, PRIOR TO PLACING TEMPORARY MARKINGS, REMOVE ALL CONFLICTING EXISTING MARKINGS VISIBLE TO THE TRAVELING PUBLIC DURING DAYLIGHT OR NIGHTTIME HOURS IN ACCORDANCE WITH 621.134. THE COST FOR REMOVAL OF CONFLICTING MARKINGS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SPECIFICALLY ITEMIZED.

THE CONTRACTOR SHALL ALSO REMOVE THE PRISMATIC RETRO-REFLECTOR WITHIN ANY RAISED PAVEMENT MARKER (RPM) WHICH IS IN CONFLICT WITH THE TEMPORARY PAVEMENT MARKINGS. WHEN THE TEMPORARY PAVEMENT MARKINGS ARE REMOVED AND THE RPM IS NO LONGER IN CONFLICT, THE CONTRACTOR SHALL THOROUGHLY CLEAN THE RECESSED REFLECTOR ATTACHMENT AREA OF THE CASTING AND INSTALL A NEW PRISMATIC RETRO-REFLECTOR OF THE SAME KIND AND COLOR. THE COST FOR THIS WORK SHALL BE INCIDENTAL TO THE VARIOUS PAY ITEMS.

INTERIM MARKINGS

WITHIN 21 CALENDAR DAYS AFTER OPENING ANY LENGTH OF PAVEMENT TO TRAFFIC, THE 621 OR 847 PAVEMENT MARKINGS CALLED FOR IN THE PLANS OR EQUIVALENT 614 CLASS I, PAINT MARKINGS SHALL BE APPLIED. THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO PLACE AND MAINTAIN 614 CLASS I PAINT MARKINGS AS PART OF THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC.

FOR EACH CALENDAR DAY BEYOND 21 DAYS THAT THIS WORK SHALL REMAIN UNCOMPLETED, THE PROVISIONS OF 108.07 WILL BE INVOKED, EXCEPT THAT BETWEEN NOVEMBER 15 AND APRIL 15 WEATHER CONDITIONS SHALL NOT BE AN ACCEPTABLE REASON FOR EXTENSION.

METHOD OF MEASUREMENT

TEMPORARY PAVEMENT MARKINGS WILL BE MEASURED COMPLETE IN PLACE, BY CLASS AND MATERIAL, IN THE UNITS DESIGNATED. LINE QUANTITIES WILL BE THE LENGTH OF THE COMPLETED STRIPE, INCLUDING GAPS, INTERSECTIONS, AND OTHER SECTIONS OF PAVEMENT NOT NORMALLY MARKED, IN ACCORDANCE WITH 621.15.

TEMPORARY PAVEMENT MARKINGS WILL INCLUDE THE LAYOUT, APPLICATION AND REMOVAL OF THE MARKINGS, WHEN REQUIRED.

BASIS OF PAYMENT

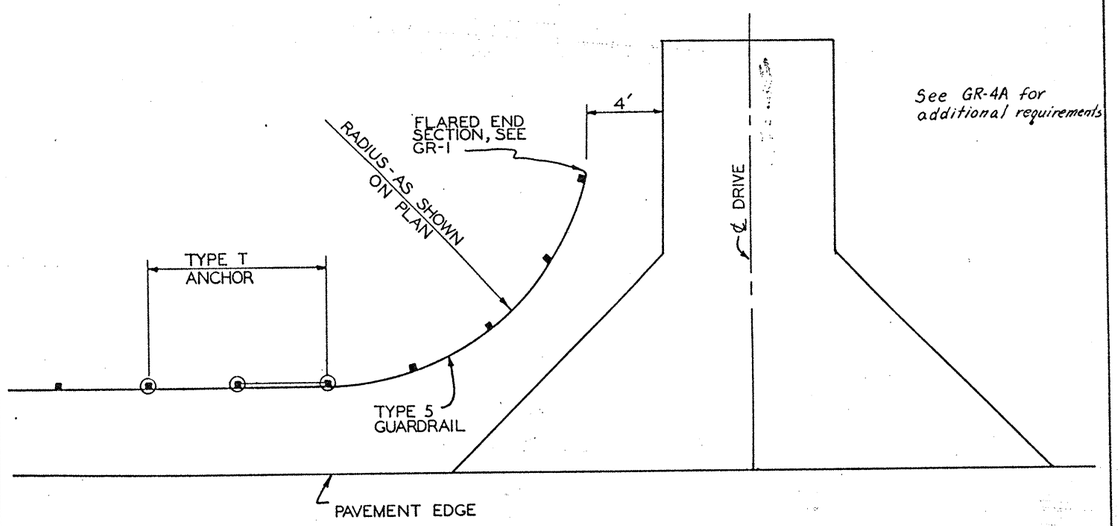
PAYMENT FOR ACCEPTED QUANTITIES COMPLETE IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND NECESSARY REMOVAL OF THE MARKINGS.

ITEM	UNIT	DESCRIPTION	QUANTITY PART 1	QUANTITY PART 2
614	MILES	TEMPORARY LANE LINES, CLASS ____, *		
614	MILES	TEMPORARY CENTER LINES, CLASS II, *	0.05	0.05
614	LIN. FT.	TEMPORARY CHANNELIZING LINES, CLASS I, *		
614	MILES	TEMPORARY EDGE LINES, CLASS I, *		
614	LIN. FT.	TEMPORARY GORE MARKINGS, CLASS II, *		
614	LIN. FT.	TEMPORARY STOP LINES, CLASS I, *		
614	LIN. FT.	TEMPORARY CROSSWALK LINES, CLASS I, *		
614	EACH	TEMPORARY LANE ARROWS, CLASS I, *		
614	EACH	TEMPORARY RAILROAD SYMBOL MARKINGS, CLASS I, *		
614	EACH	TEMPORARY WORD "ONLY" ON PAVEMENT, 72-INCH, CLASS I, *		
614	LIN. FT.	TEMPORARY TRANSVERSE LINES, CLASS I, *		
614	LIN. FT.	TEMPORARY DOTTED LINES, CLASS I, *		

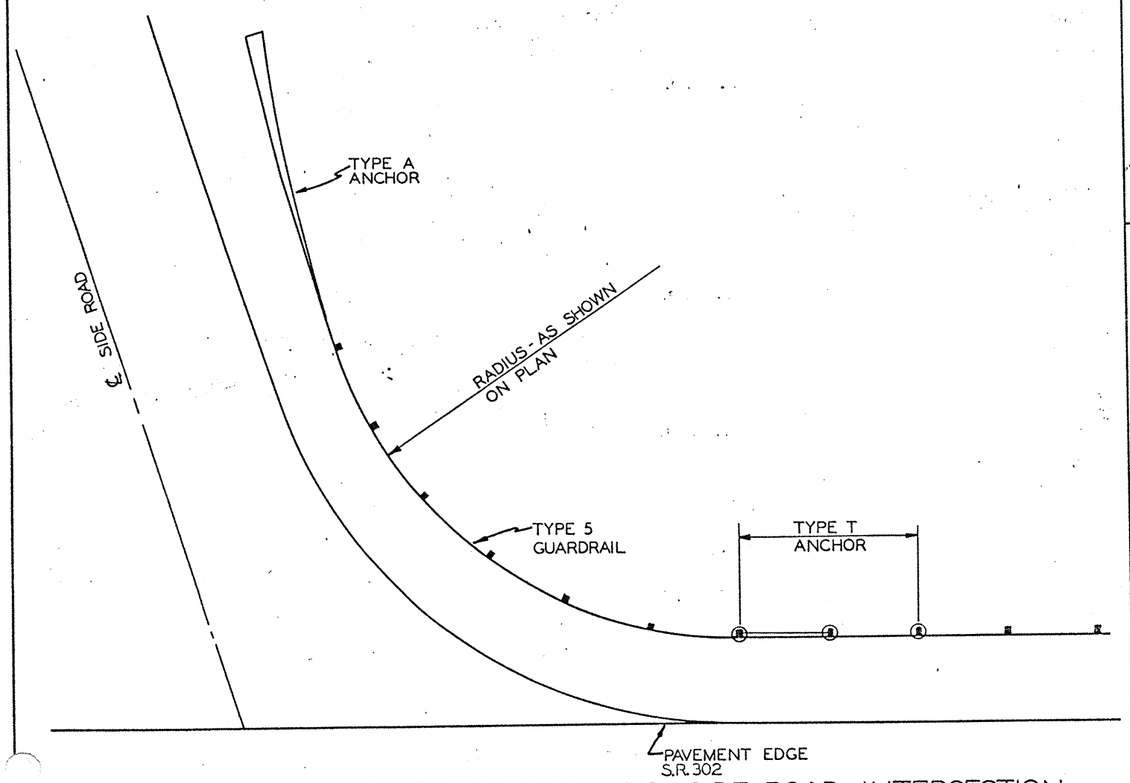
*621 PAINT, 947.03 TYPE B OR 947.03 TYPE C

A quantity of 0.10 miles of Temporary Center Lines, Class II has been carried to the General Summary for use on the completed 404 surface course and bridge deck surfaces. The road shall not be opened to traffic without either the permanent or temporary pavement markings in place.

WAY-302-10.08
ASD-302-9.32

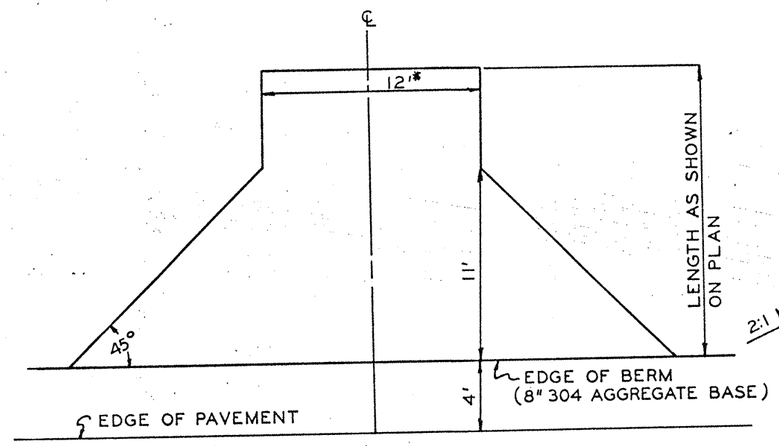


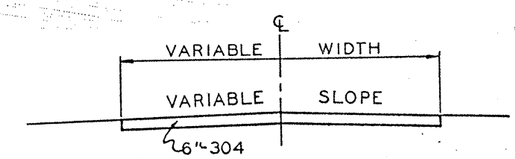
DETAIL FOR RADIUS GUARDRAIL AT DRIVE



DETAIL FOR RADIUS GUARDRAIL TO SIDE ROAD INTERSECTION

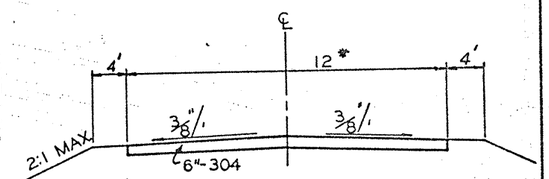
TYPICAL FIELD DRIVE PLAN





FLARED TYPICAL SECTION

* UNLESS OTHERWISE SHOWN



TYPICAL SECTION

FIELD DRIVE DETAILS

SUPERELEVATION TABLE-PART I

STATION	LEFT EDGE OFFSET	LEFT EDGE ELEVATION	PROFILE GRADE	RIGHT EDGE OFFSET	RIGHT EDGE ELEVATION	
531+00	8.0'±	1067.12±	1067.58±	12.5'±	1067.82±	
+25	8.0'±	66.72	67.15	12.0'±	67.45	
+50	9.0'±	66.30	66.72	11.0'±	67.08	
+63.97	BK. 9.25±	66.16	66.56	BK. 10.75'±	66.96	ON APPROACH SLABS AND BRIDGE
	AH. 14'	65.93		AH. 14'	67.08	
+75	14'	65.91	66.50	14'	67.07	
+80	14'	↓	↓	14'	67.09	
532+00	14'			14'	↓	
+25	14'			14'		
+50	14'			14'		
+55	14'	65.91	66.50	14'	67.09	
+71.05	BK. 14'	66.16	66.75	BK. 14'	67.31	
	AH. 10'±	66.33		AH. 10'±	67.15	
+75	10'±	66.38	66.80	10'±	67.19	
533+00	10.5'±	67.44	67.85	10'±	68.17	
+25	11'±	69.08	69.60	10'±	69.84	
+50	11'±	1070.88±	1071.54±	9.5'±	1071.71±	

COMMERCIAL FERTILIZER CALCULATIONS

PART 1:

FROM SUMMARY: 659 SEEDING = 1819 SQ. YDS.

FERTILIZER = $\frac{1819 \times 9 \times 20}{1000 \times 2000}$ = 0.16 TONS

PART 2:

FROM SUMMARY: 659 SEEDING = 1277 SQ. YDS.

FERTILIZER = $\frac{1277 \times 9 \times 20}{1000 \times 2000}$ = 0.11 TONS

PAVEMENT MARKING CALCULATIONS

PART 1:

EDGE LINES, WHITE:
STA. 531+00 TO STA. 533+50, LT & RT: 250' X 2 ÷ 5280 = 0.09 MILES

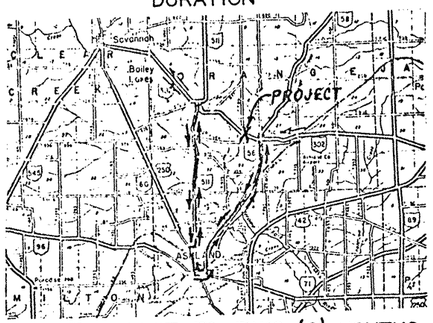
CENTER LINES, SOLID DOUBLE:
STA. 531+00 TO STA. 533+50: 250' ÷ 5280 = 0.05 MILES

PART 2:

EDGE LINES, WHITE:
STA. 492+00 TO STA. 494+70 LT & RT: 270' X 2 ÷ 5280 = 0.10 MILES

CENTER LINES, SOLID & BROKEN DOUBLE:
STA. 492+00 TO STA. 494+70: 270' ÷ 5280 = 0.05 MILES

PART 1 - LIMIT TO FIFTEEN (15) WEEKS DURATION



PART 2 - LIMIT TO TWO (2) MONTHS DURATION

DETOUR MAPS

DETOUR ROUTE ⇄ ⇄

GENERAL SUMMARY

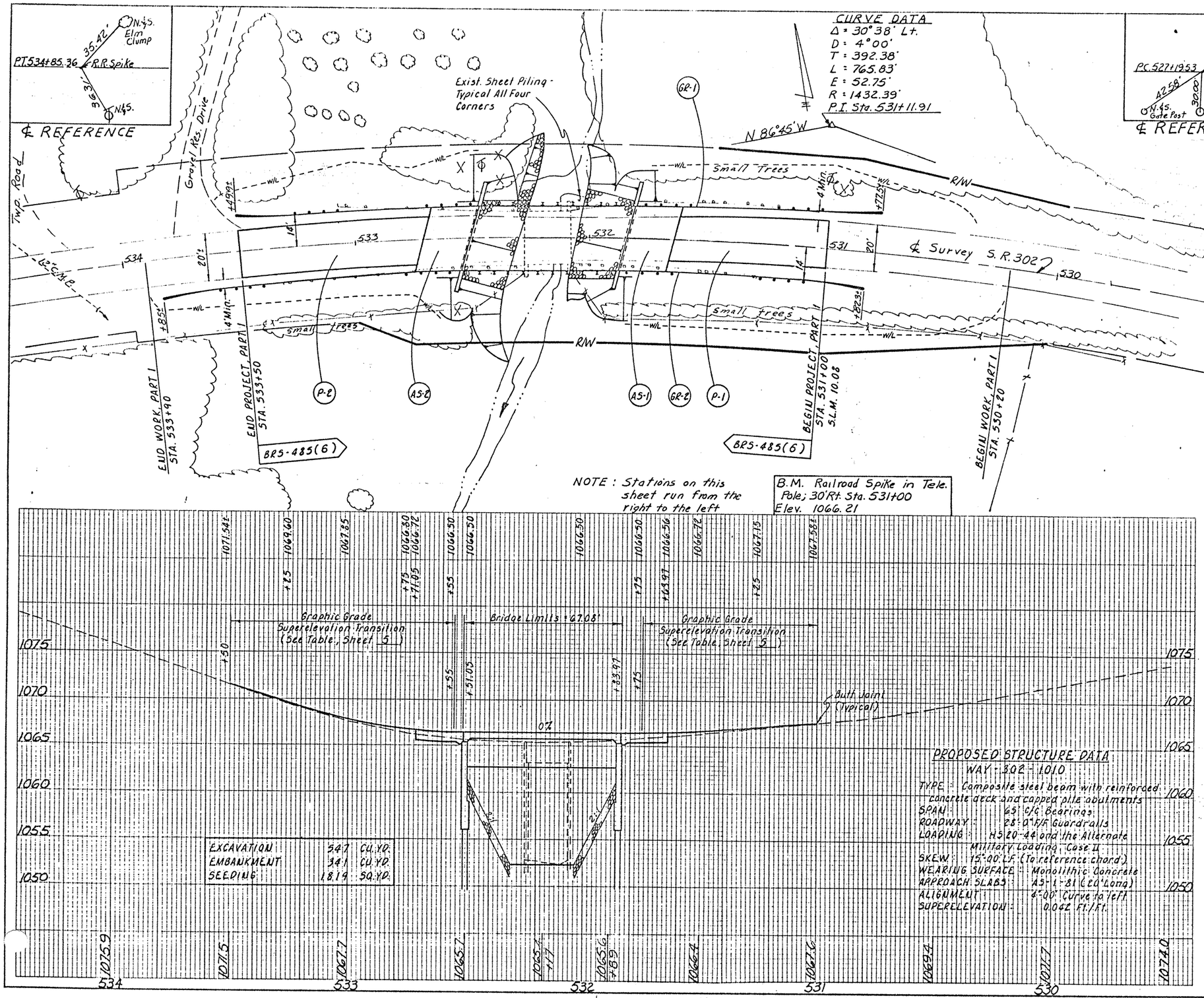
CAL'C. BY: TROY 6/84
CHK'D. BY: P.W.S. 8/84

FROM SHEET NUMBER PART 1 - BRS-485( ) 3	4	6	7	10		SUB TOTAL	FROM SHEET NUMBER PART 2 BRS-485( ) 3	4	6	12		SUB TOTAL	ITEM	PLAN TOTAL	UNIT	DESCRIPTION
																ROADWAY
LUMP						LUMP	LUMP					LUMP	201	LUMP		CLEARING AND GRUBBING
			98			98							202	98	SQ. YD.	WEARING COURSE REMOVED
										70		70	202	70	SQ. YD.	PAVEMENT REMOVED
			547			547				338		338	203	885	CU. YD.	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION
			341			341				90		90	203	431	CU. YD.	EMBANKMENT
			340.84			340.84				341.50		341.50	606	682.34	LIN. FT.	GUARDRAIL, TYPE 5
			4			4				3		3	606	7	EACH	ANCHOR ASSEMBLY, STANDARD TYPE A
										3		3	606	3	EACH	ANCHOR ASSEMBLY, STANDARD TYPE T
			4			4				4		4	606	8	EACH	BRIDGE TERMINAL ASSEMBLY, STANDARD TYPE B
			360			360				75		75	202	435	LIN. FT.	GUARD RAIL REMOVED
5						5	5					5	616	10	M-GAL	WATER
																EROSION CONTROL
			1819			1819				1277		1277	659	3096	SQ. YD.	SEEDING AND MULCHING
		0.16				0.16			0.11			0.11	659	0.27	TON	COMMERCIAL FERTILIZER
2						2	2					2	659	4	M-GAL	WATER
				97		97				137		137	601	234	CU. YD.	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER
																DRAINAGE
										12		12	603	12	LIN. FT.	12" CONDUIT, TYPE D
																TRAFFIC CONTROL
	0.05					0.05		0.05				0.05	614	0.10	MILES	TEMPORARY CENTERLINES, CLASS II
		0.09				0.09			0.10			0.10	621	0.19	MILES	EDGE LINES
		0.05				0.05			0.05			0.05	621	0.10	MILES	CENTER LINES
																PAVEMENT
			28			28				36		36	304	64	CU. YD.	AGGREGATE BASE
			15			15				19		19	403	34	CU. YD.	ASPHALT CONCRETE, AC 20
			11			11				16		16	404	27	CU. YD.	ASPHALT CONCRETE, AC-20
			32			32				39		39	407	71	GAL.	TACK COAT
			1			1				2		2	407	3	TON	COVER AGGREGATE
										107		107	611	107	SQ. YD.	REINFORCED CONCRETE APPROACH SLAB (T=12")
			124			124							611	124	SQ. YD.	REINFORCED CONCRETE APPROACH SLAB (T=13")
																STRUCTURES OVER 20 FEET
																WAY-302-1010 SEE SHEET 20
																ASD-302-0934 SEE SHEET 33
LUMP						LUMP	LUMP					LUMP	619	LUMP		FIELD OFFICE
						LUMP						LUMP	623	LUMP		CONSTRUCTION LAYOUT STAKES
						LUMP						LUMP	624	LUMP		MOBILIZATION
LUMP						LUMP	LUMP					LUMP	614	LUMP		MAINTAINING TRAFFIC

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

WAY-302-10.08
ASD-302-9.32
PART 1

Calc. by BDB 4/84
Chk'd. by P.W.S. 8/84



EXISTING BRIDGE DATA
WAY-302-1010

TYPE: Steel Beam - Timber Deck
SPAN: 20.0'± out to out
ROADWAY: 21.2'± F/F of Guardrail
SKEW: 0°
LOADING: S-14-46
SUB-STRUCTURE: Timber Bent
WEARING SURFACE: 6"± Asphalt
ALIGNMENT: 4° Curve to Left
CONDITION: Poor
DATE BUILT: 1934

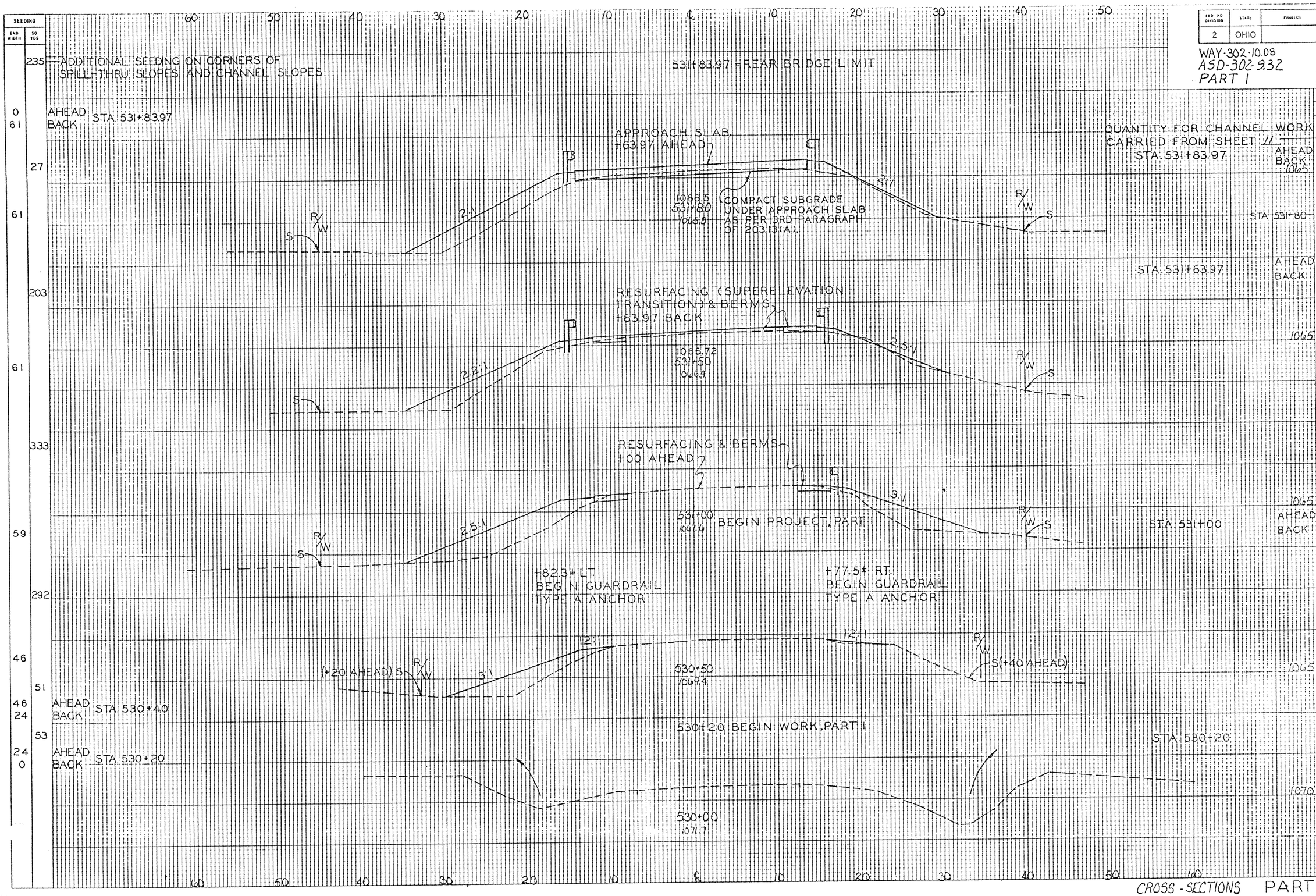
| Ref. No. | Station | | |

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

8
34

WAY-302-10.08
ASD-302-9.32
PART I

Calc. by B.C. 6/64
Chk'd by J.Z. 6/64



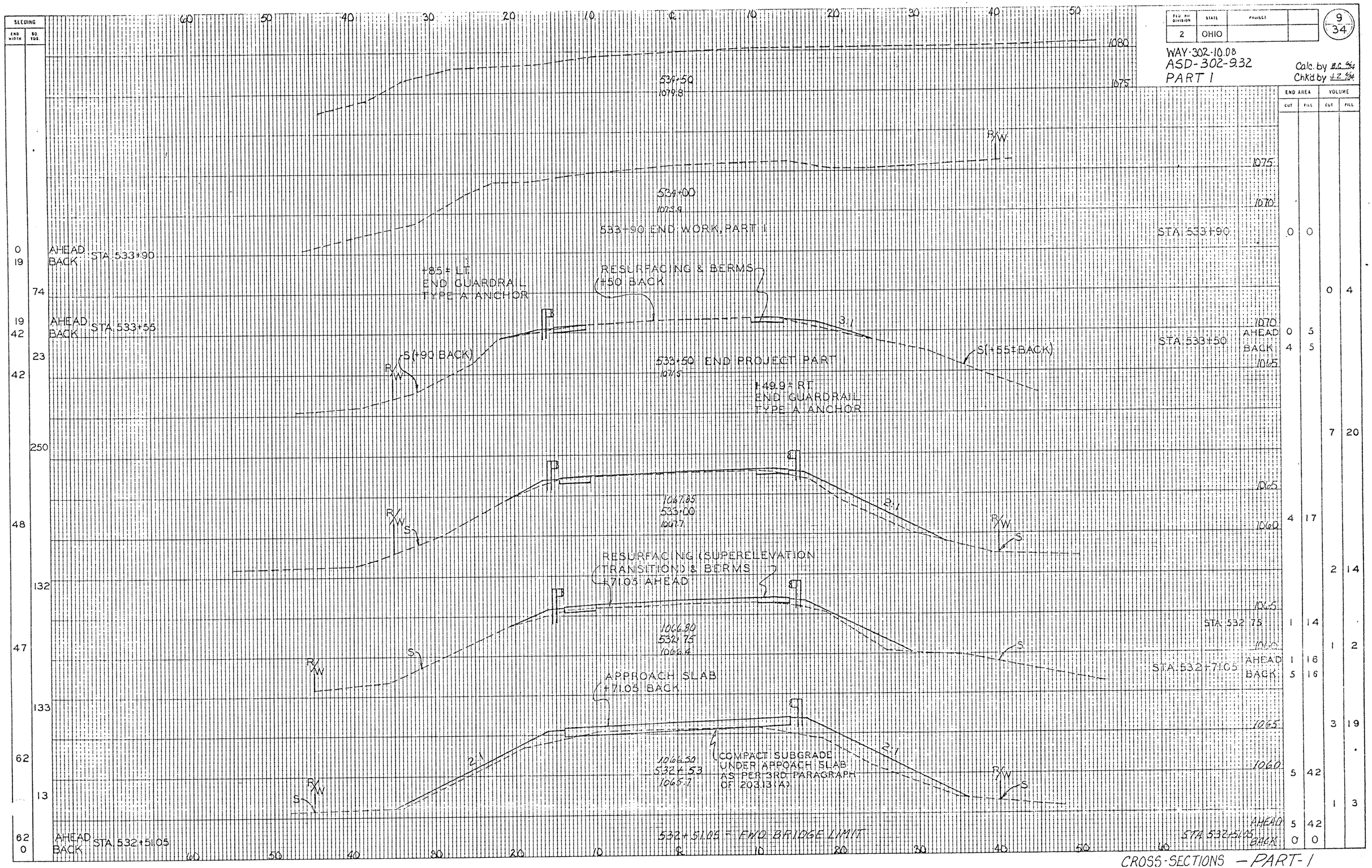
CROSS-SECTIONS PART I

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

9
34

WAY-302-10.08
ASD-302-9.32
PART I

Calc. by B.C. 5/64
Chkd. by J.Z. 5/64



		END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
0		0	0		
19				0	4
42		0	5		
23		4	5		
42				7	20
48		4	17		
132				2	14
47		1	14		
				1	2
		1	16		
		5	16		
133				3	19
62		5	42		
13				1	3
62		5	42		
0		0	0		

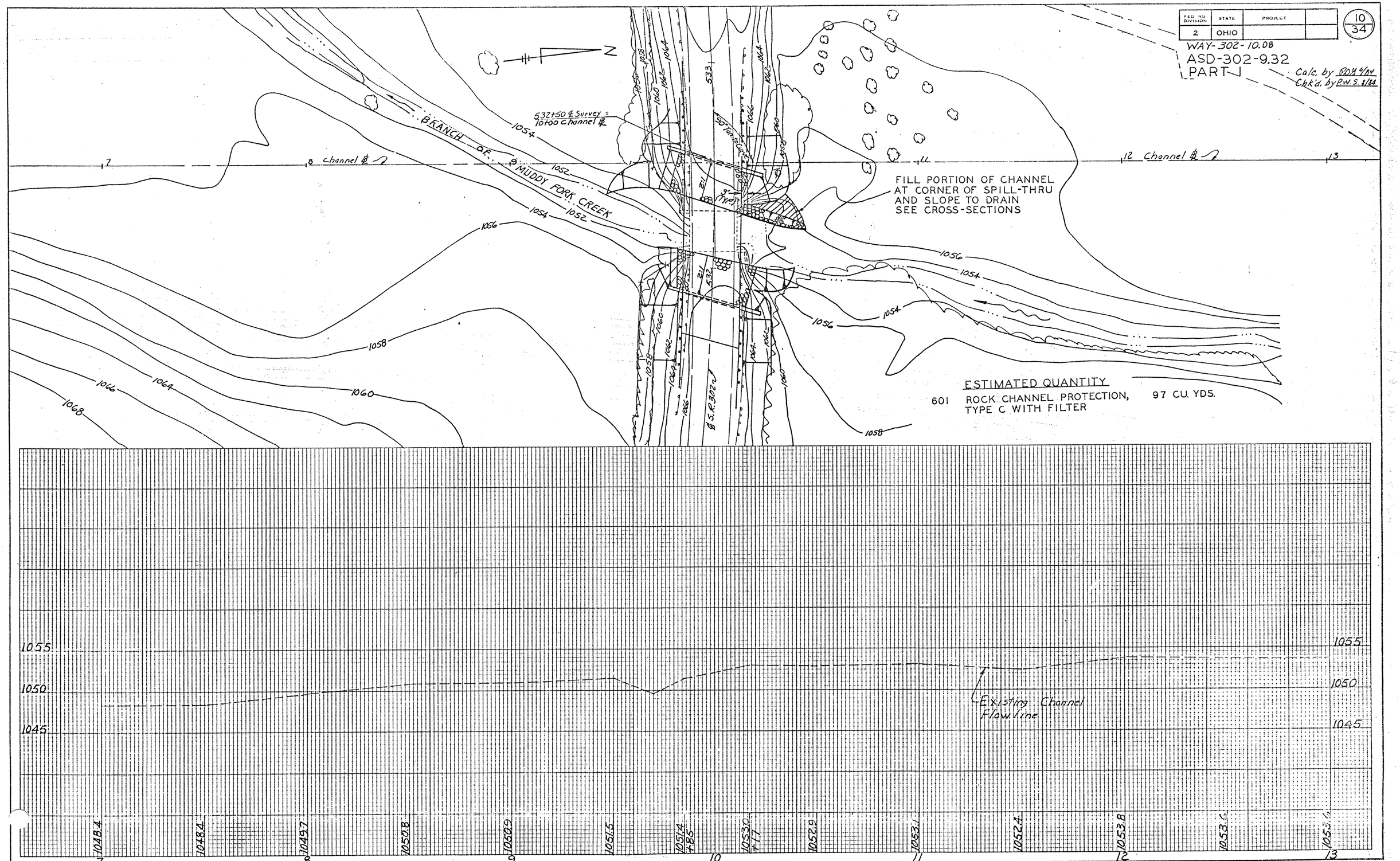
CROSS-SECTIONS — PART-I

FED. HIG. DIVISION	STATE	PROJECT	
2	OHIO		

10
34

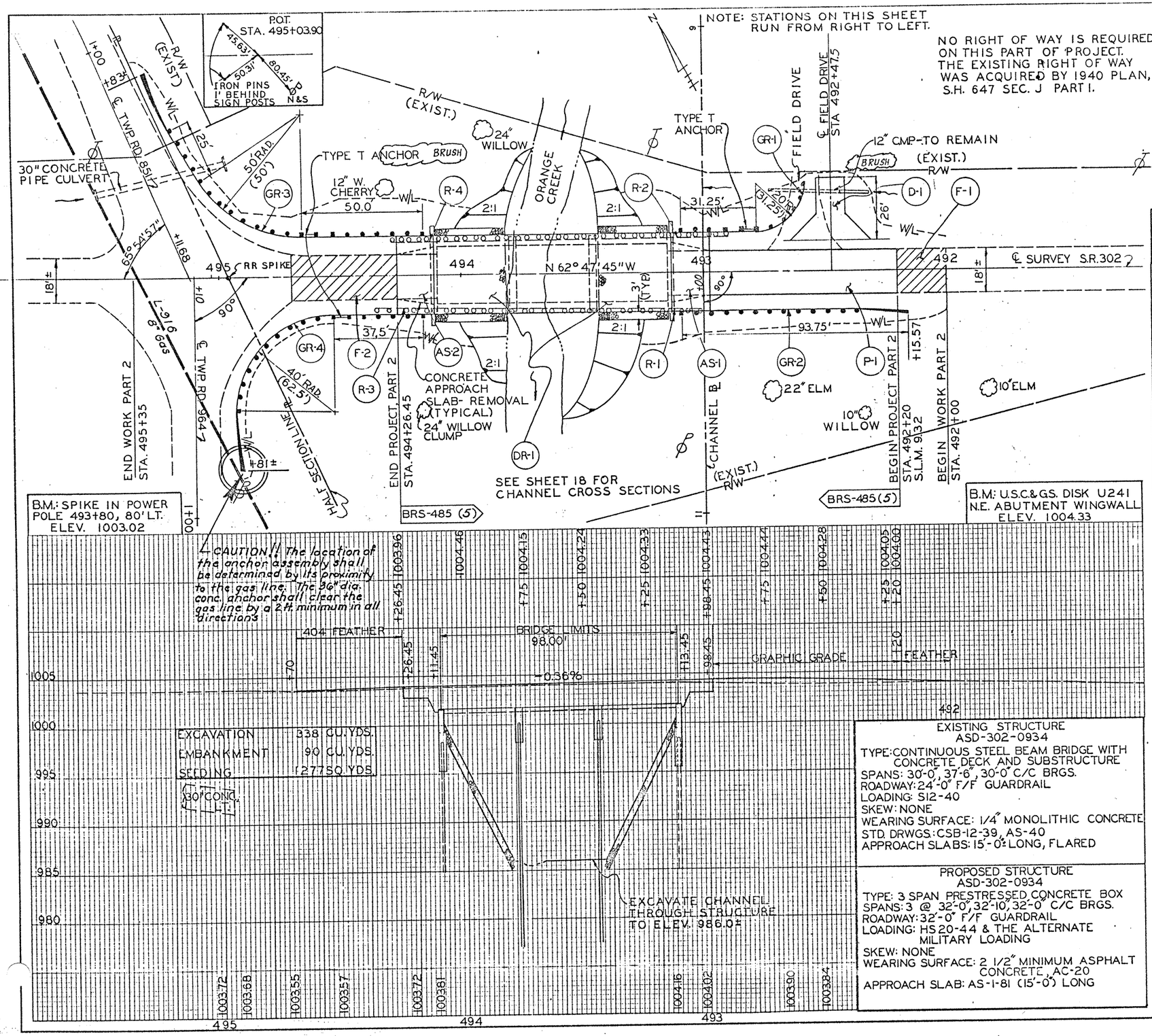
WAY-302-10.08
ASD-302-9.32
PART 1

Calc. by BDH 4/84
Chk'd. by RWS 8/84



CHANNEL DETAILS - PART 1

END AREA		VOLUME	
CUT	FILL	CUT	FILL



EXISTING STRUCTURE
ASD-302-0934
TYPE: CONTINUOUS STEEL BEAM BRIDGE WITH CONCRETE DECK AND SUBSTRUCTURE
SPANS: 30'-0", 37'-6", 30'-0" C/C BRGS.
ROADWAY: 24'-0" F/F GUARDRAIL
LOADING: S12-40
SKEW: NONE
WEARING SURFACE: 1/4" MONOLITHIC CONCRETE
STD. DRWGS.: CSB-12-39, AS-40
APPROACH SLABS: 15'-0" LONG, FLARED

PROPOSED STRUCTURE
ASD-302-0934
TYPE: 3 SPAN PRESTRESSED CONCRETE BOX
SPANS: 3 @ 32'-0", 32'-10", 32'-0" C/C BRGS.
ROADWAY: 32'-0" F/F GUARDRAIL
LOADING: HS 20-44 & THE ALTERNATE MILITARY LOADING
SKEW: NONE
WEARING SURFACE: 2 1/2" MINIMUM ASPHALT CONCRETE, AC-20
APPROACH SLAB: AS-1-81 (15'-0") LONG

REFERENCE NO.	STATION LIMITS FROM	TO	SIDE	606 GUARDRAIL, TYPE 5 (LIN.FT.)	606 ANCHOR ASSEMBLY, TYPE A (EACH)	606 BRIDGE TERMINAL ASSEMBLY, TYPE B (EACH)	611 REINFORCED CONC. APPROACH SLAB (T=12") (SQ.YD.)	404 ASPHALT CONCRETE (AC-20) 1 1/4" VAR. (CU.YD.)	407 TACK COAT @ 0.1 GAL. PER SQ.YD. (GAL.)	407 COVER AGGREGATE @ 7 LBS./SQ.YD. (TON)	601 ROCK CHANNEL PROTECTION TYPE C W/FILTER (CU.YD.)	606 ANCHOR ASSEMBLY TYPE T (EACH)	202 GUARDRAIL REMOVED (LIN.FT.)	202 PAVEMENT REMOVED * (SQ.YD.)	403 ASPHALT CONCRETE (AC-20), VAR. (CU.YD.)	603 12" CONDUIT, TYPE D (LIN.FT.)	304 AGGREGATE BASE 6" 8" (CU. YD.)
AS-1	492+98.45	493+13.45	LT&RT				53.3	1.9	5.3	0.2				35	1.9		
AS-2	494+11.45	494+26.45	LT&RT				53.3	1.9	5.3	0.2				35	1.9		
GR-1	492+57.5±	493+13.45	RT.	60.38													
GR-2	492+15.57	493+13.45	LT.	72.88													
GR-3	494+11.45	0+83±	RT.	116.62													
GR-4	494+11.45	0+81±	LT.	91.62													
F-1	492+00	492+20	LT&RT					1.7	4.0	0.1				4.0			
F-2	494+26.45	494+70	LT&RT					5.4	8.7	0.3				8.7			
R-1	493+00.20	493+15.20	LT														
R-2	492+93.20	493+15.20	RT														
R-3	494+09.20	494+31.20	LT														
R-4	494+09.20	494+25.20	RT														
D-1	492+47.5		RT.													8.0	
DR-1	SPILL-THRU SLOPES		LT&RT														
P-1	492+20	492+98.45	LT&RT				5.5	15.7	0.6						15.2	12	15.6
	TOTAL			341.50	3	4	106.6	16.4	39.0	1.4	137	3	75	70	19.0		36.3

*REMOVAL OF EXISTING APPROACH SLABS

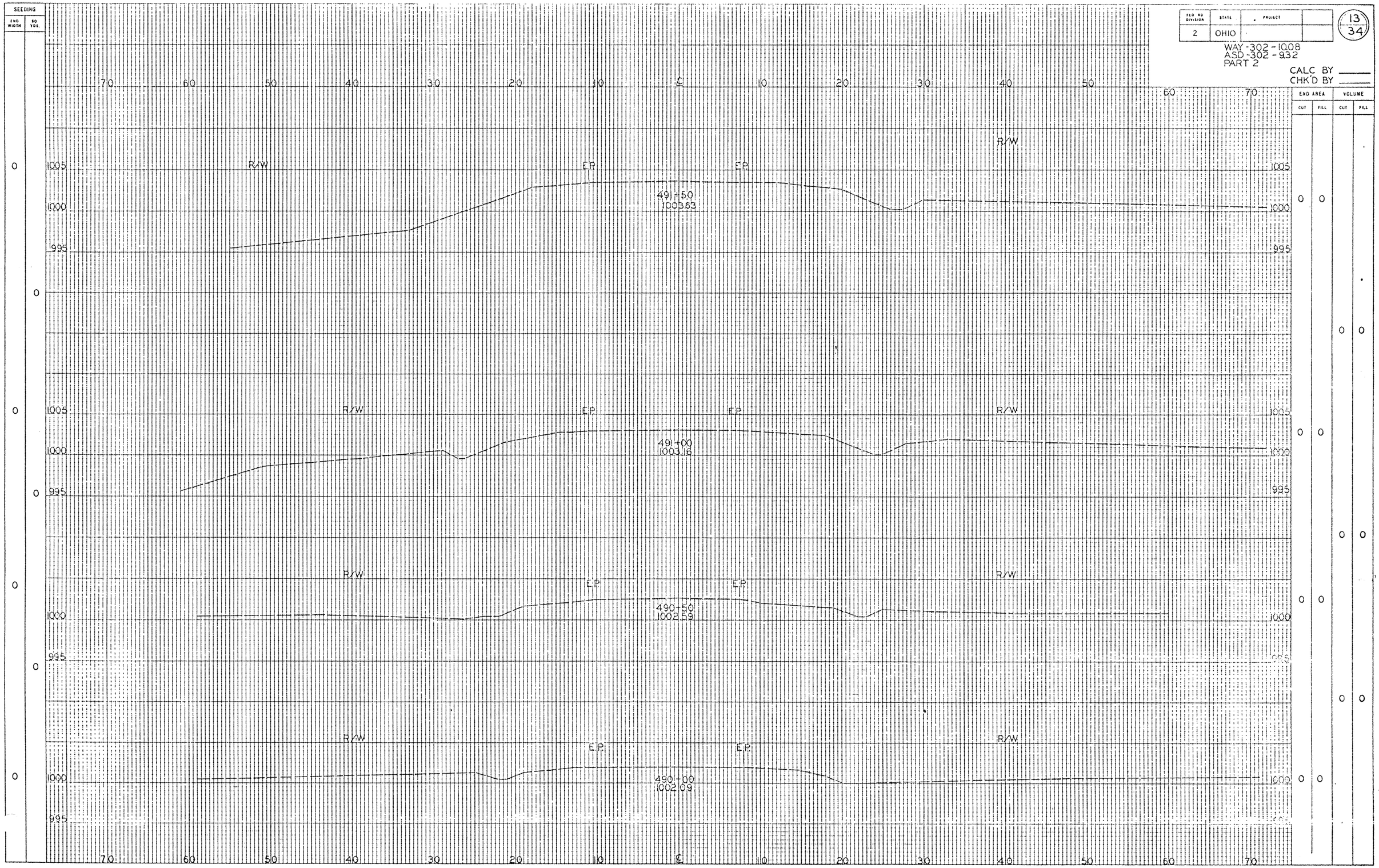
PLAN & PROFILE-PART 2

FED RD DIVISION	STATE	PROJECT	
2	OHIO		

13
34

WAY-302-10.08
ASD-302-9.32
PART 2

CALC BY _____
CHK'D BY _____



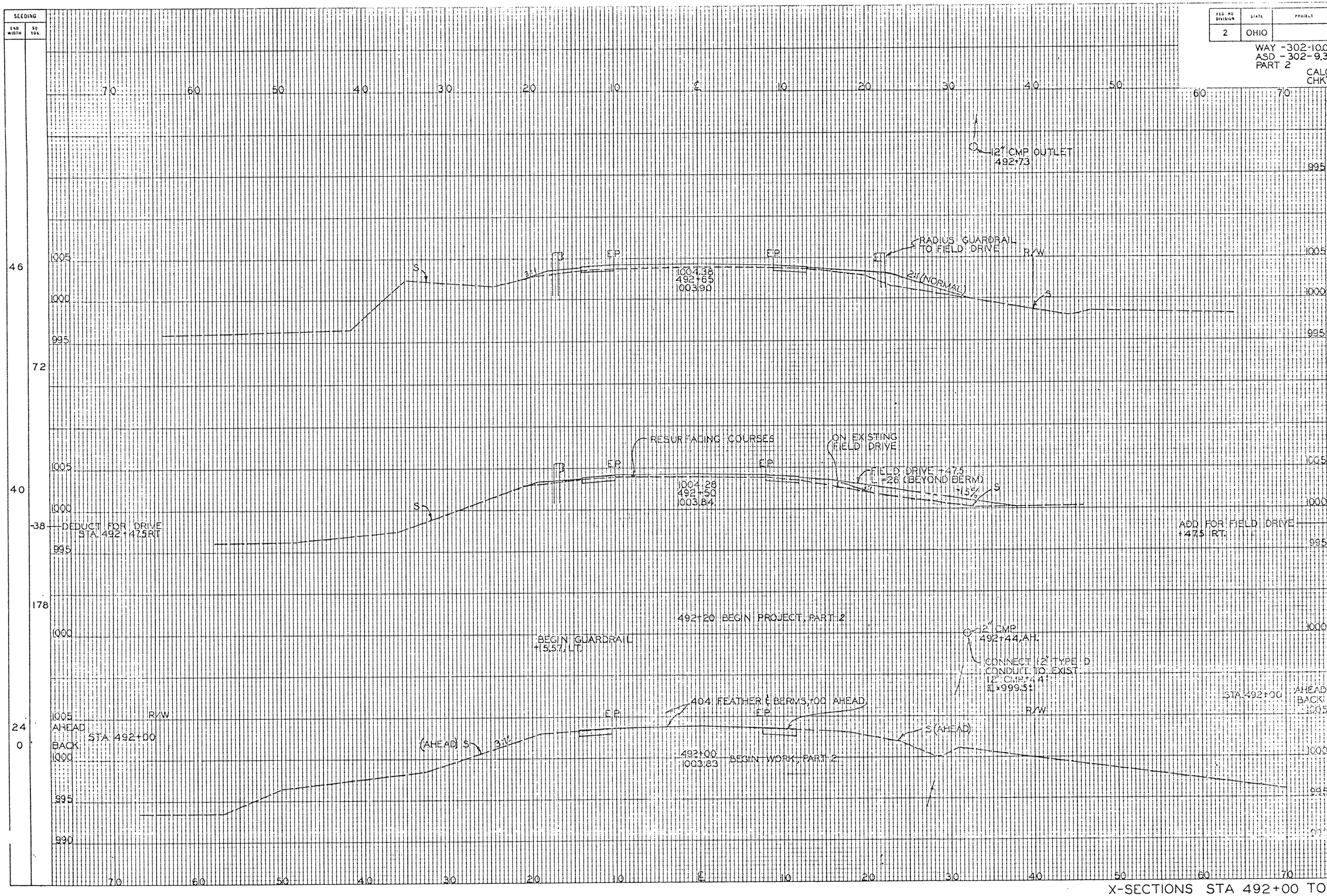
X-SECTIONS STA 490+00 TO 491+50

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

14
34

WAY -302-10.08
ASD -302-9.32
PART 2

CALC. BY B.C. 4/84
CHK'D. BY J.Z. 4/84



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
3	15		
		2	6
4	5		
		8	2
		8	5
5	0		
0	0		

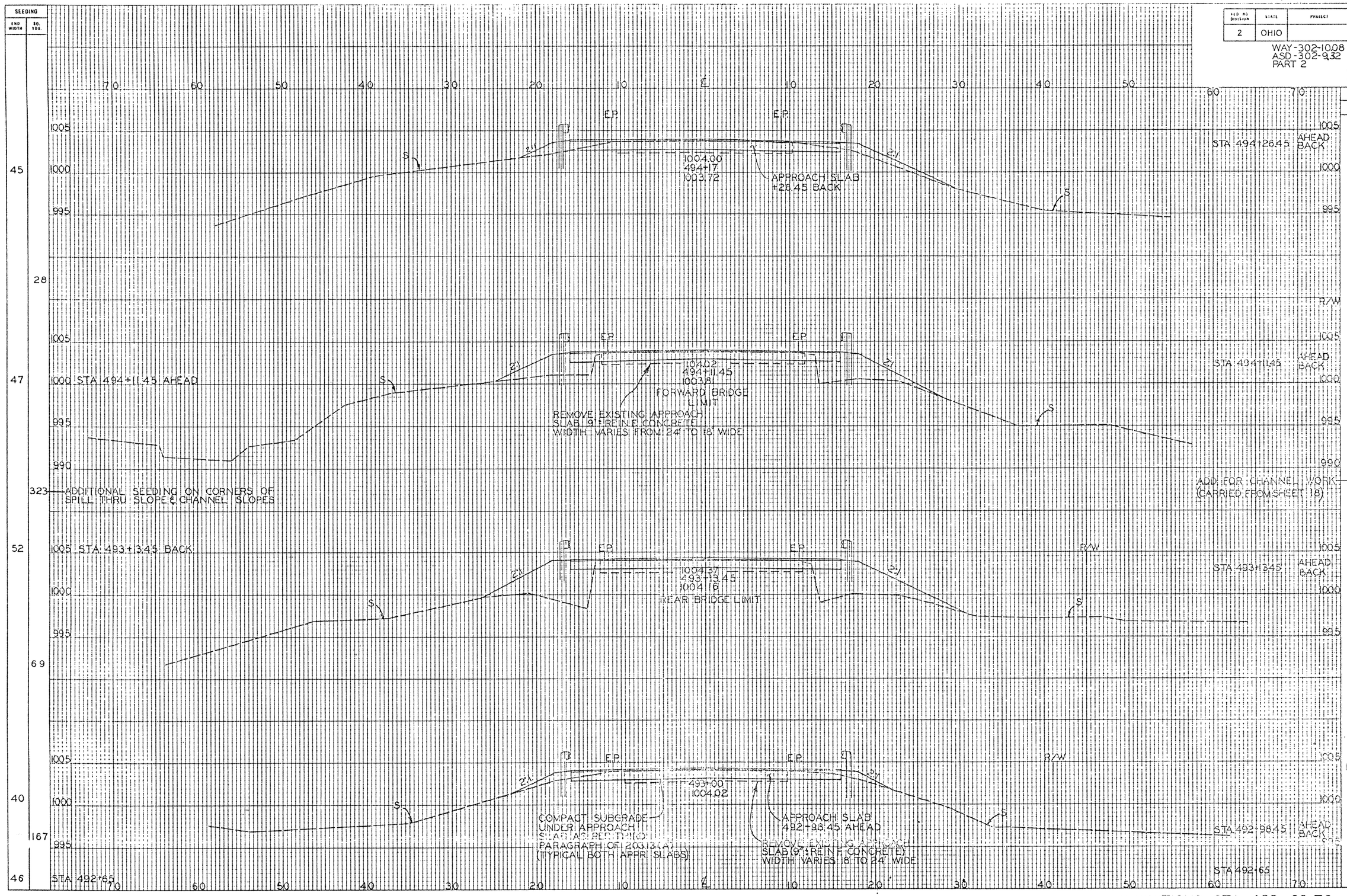
X-SECTIONS STA 492+00 TO 492+73

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

15
34

WAY-302-10.08
ASD-302-9.32
PART 2

CALC. BY B.C. 6/94
CHK'D. BY J.R. 6/94



	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
	3	13		
	7	18		
	7	18	2	6
			1	8
	2	57		
	0	0		
			303	2
	0	0		
	1	78		
			3	23
	10	16		
			1	1
	10	16		
	3	8		
			4	14
	3	15		

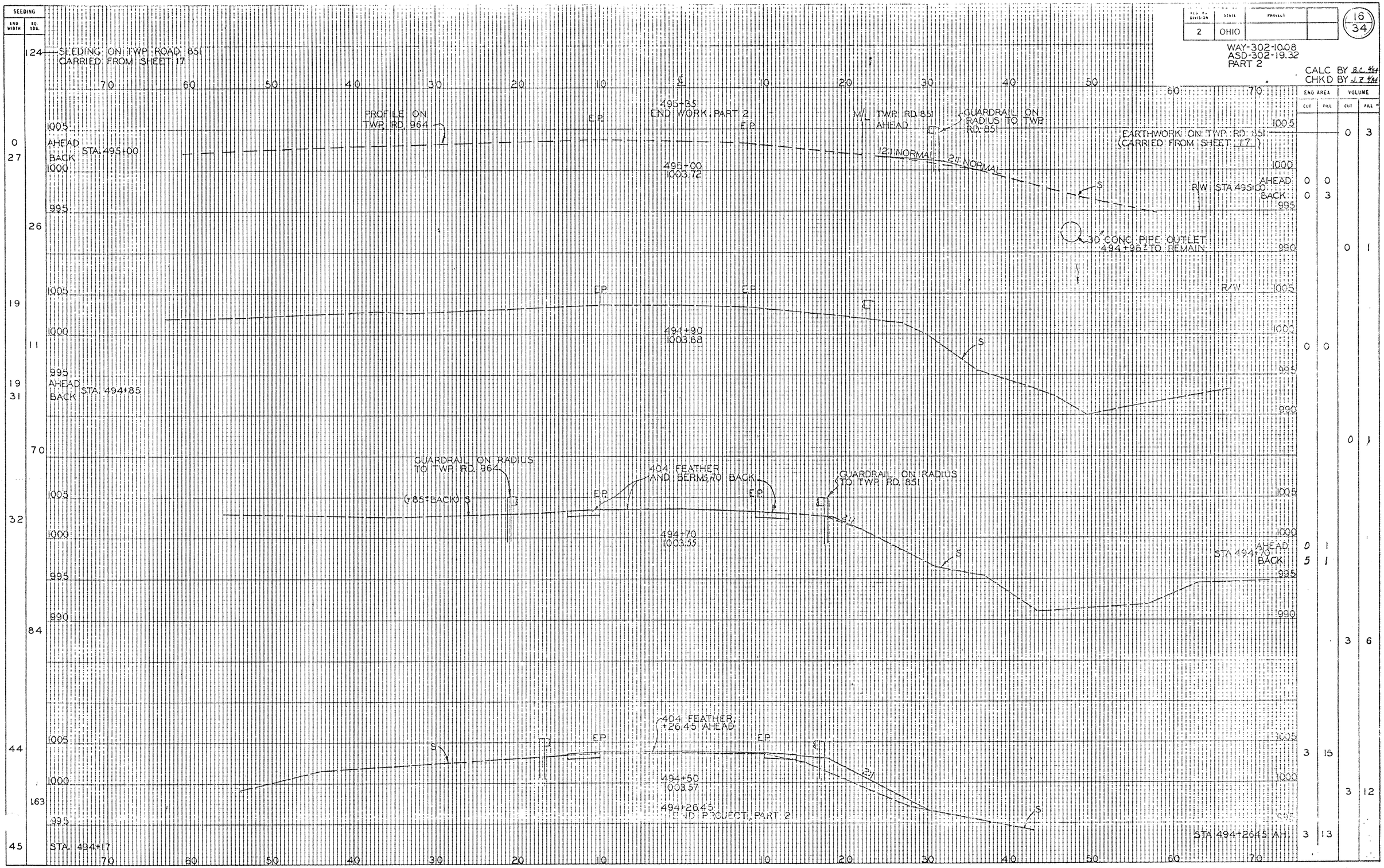
X-SECTIONS STA 493+00 TO 494+17

FED. AID DIVISION	STATE	PROJECT	
2	OHIO		

16/34

WAY-302-10.08
ASD-302-19.32
PART 2

CALC BY B.C. 4/64
CHKD BY J.Z. 4/64



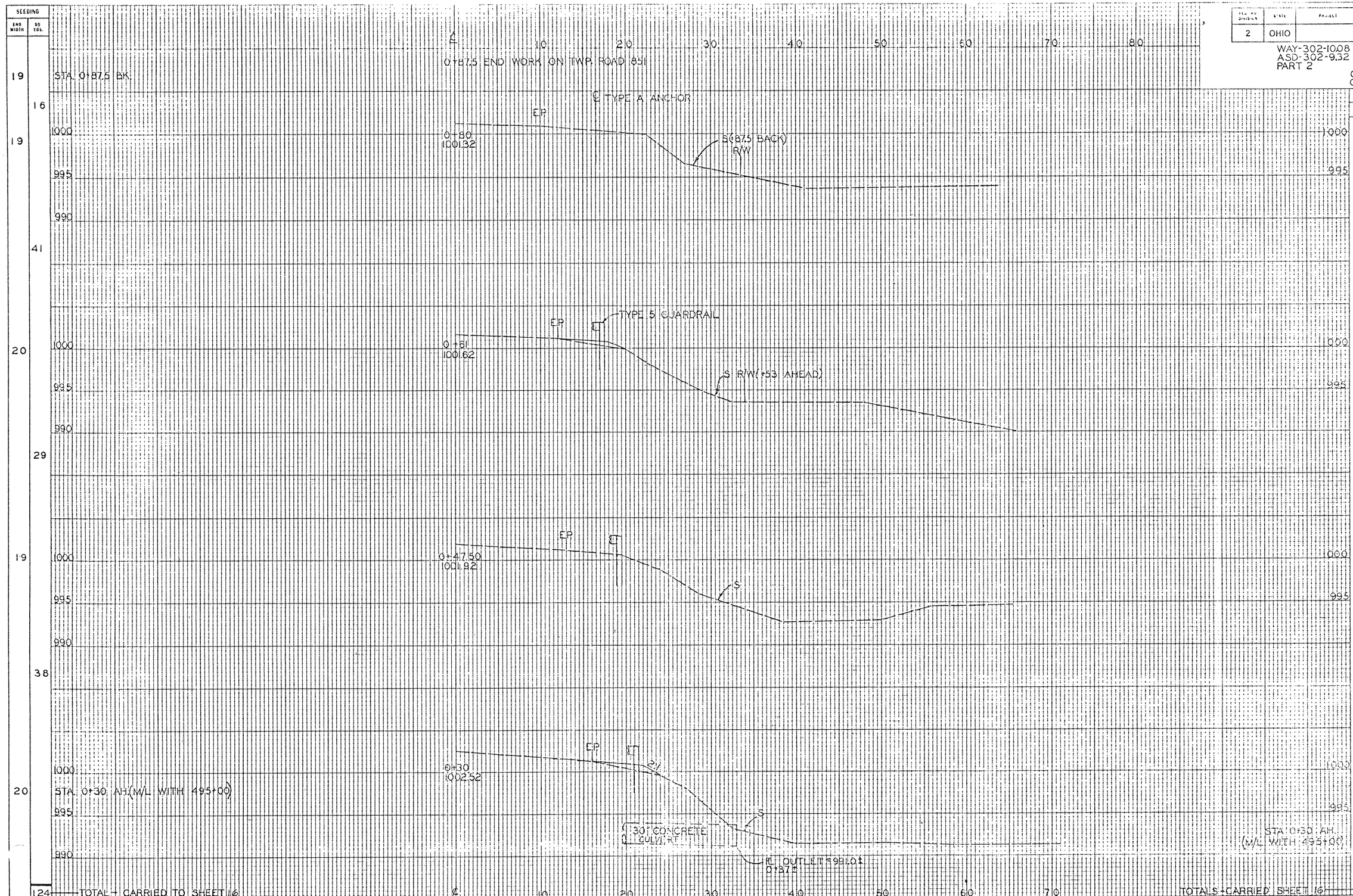
X-SECTIONS STA 494+50 TO 495+00

REGION DIVISION	STATE	PROJECT	
2	OHIO		

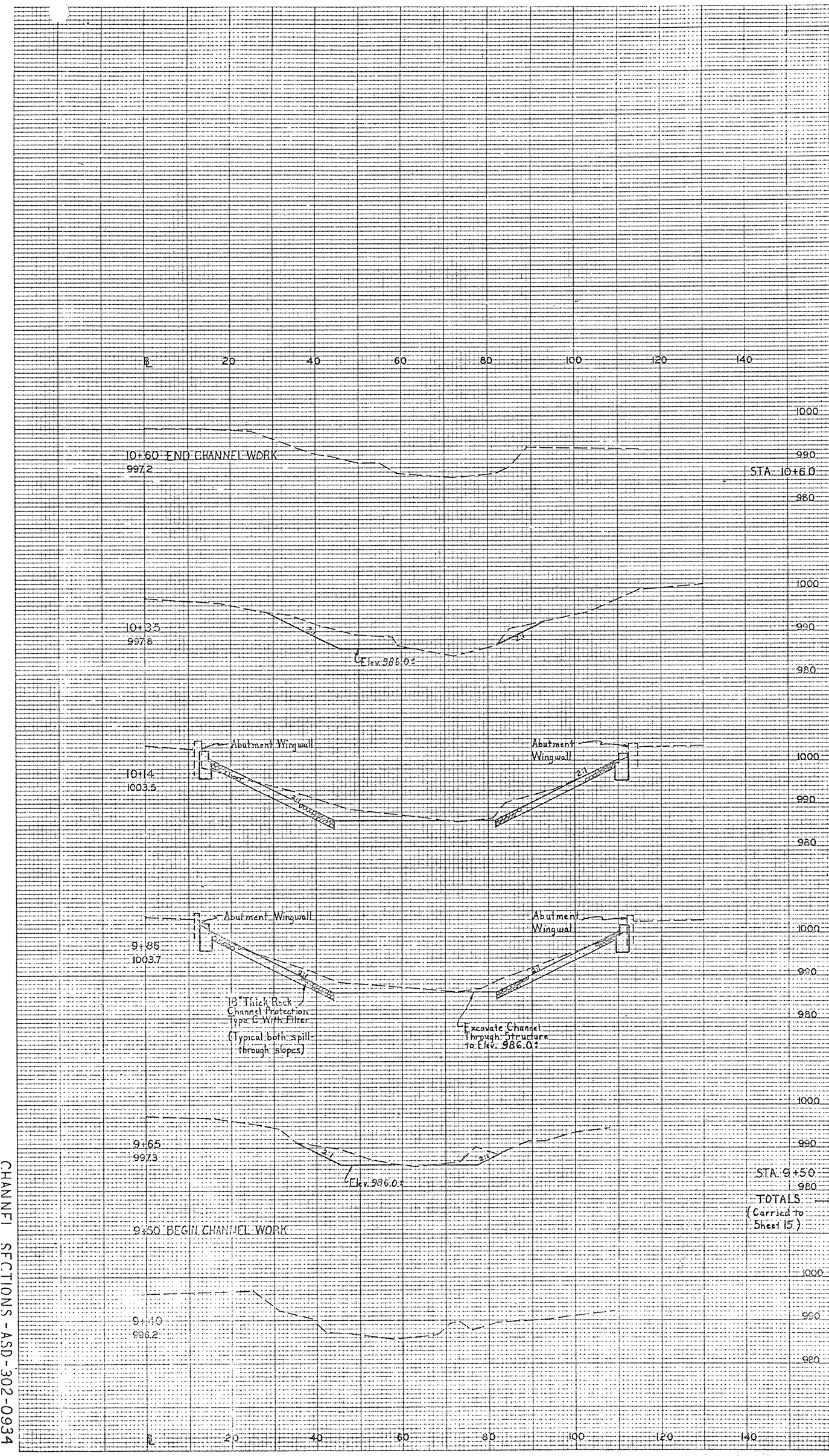
17
34

WAY-302-10.08
ASD-302-9.32
PART 2

CALC BY B.C. 4/94
CHK'D BY J.T. 4/94



TWP. RD. 851 X-SECTIONS STA. 0+30 TO 0+80



	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
STA. 10+60	0	0		
			44	0
	94	0		
			74	1
	96	1		
			104	1
	103	0		
			64	0
	61	0		
			17	0
STA. 9+50	0	0		
TOTALS (Carried to Sheet 15)			303	2

FED. RD. DIVISION 5 | STATE OHIO | PROJECT

WAY-302-1008
ASD-302-9.32
PART 2

Calculated by R.C. Fike
Checked by J.P. Fike

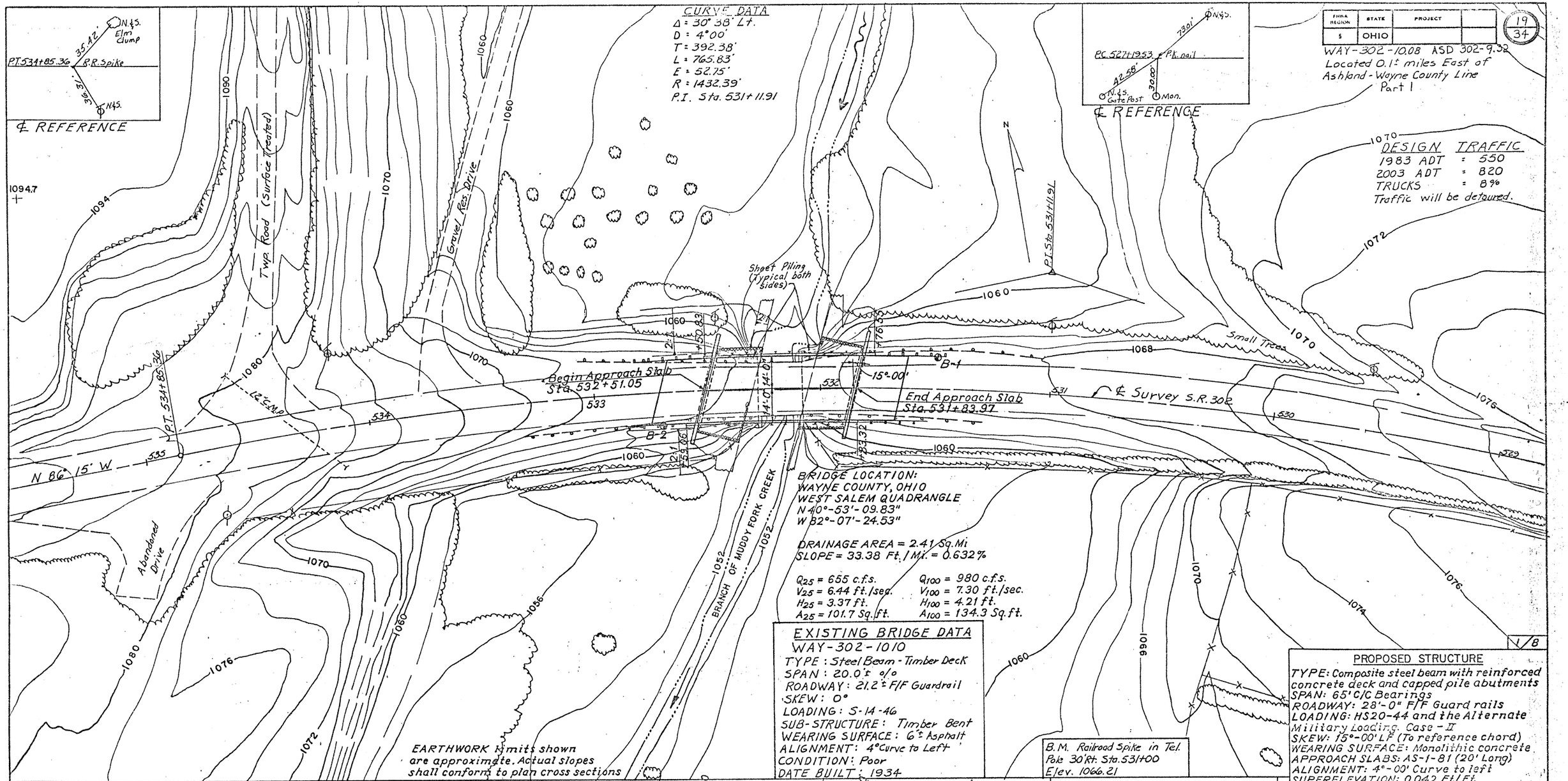
18/34

CHANNEL SECTIONS - ASD-302-0934

FHWA REGION	STATE	PROJECT	
5	OHIO		

19/34

WAY-302-10.08 ASD 302-9.52
Located 0.1± miles East of Ashland-Wayne County Line
Part 1



SHAFFER, JOHNSTON, LICHTENWALTER & ASSOCIATES, INC.
CONSULTING ENGINEERS - SURVEYORS
MANSFIELD OHIO WOOSTER

SITE PLAN
BRIDGE NO. WAY-302-1010
OVER BRANCH OF MUDDY FORK CREEK
WAYNE COUNTY S.R. 302

SCALE 1" = 20'
STA. 531+83.97
STA. 532+51.05

PRESENT TOPOGRAPHY		PROPOSED WORK			
SURVEYED	DRAWN	DESIGNED	DRAWN	CHECKED	REVIEWED
DISTRICT 3	AERIAL SURVEY	RAK 9-3-83	RDR 9-7-83	JH 9-7-83	9-7-83

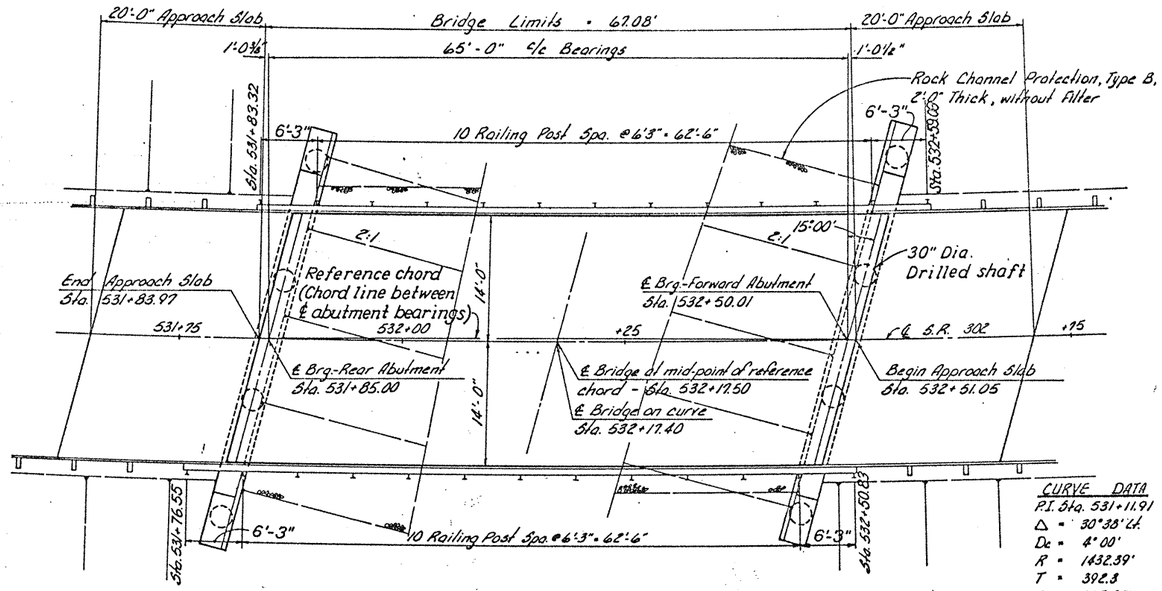
FHWA REGION	STATE	PROJECT	
5	OHIO		

20/34

QUANTITIES CALC. RAK 10-28-83

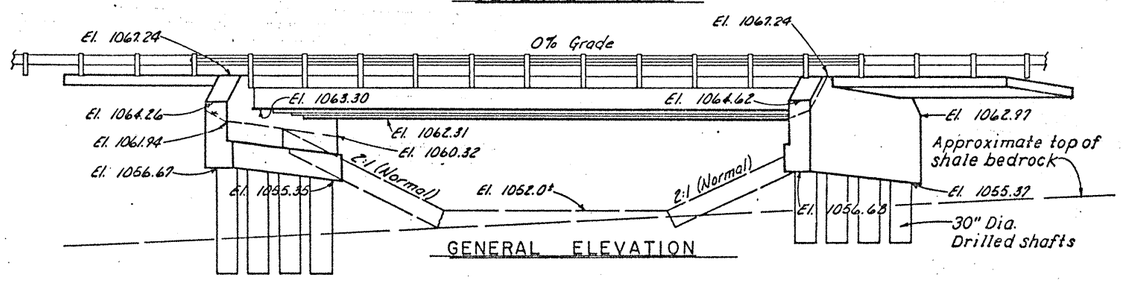
QUANTITIES CK'D. JH 5-29-84

WAY - 302 - 1008
ASD - 302 - 932
PART I



GENERAL PLAN

CURVE DATA
P.I. Sta. 531+11.91
Δ = 30°38' Lt.
Dc = 4°00'
R = 1432.39'
T = 392.3
L = 765.83'
E = 52.75'



GENERAL ELEVATION

ESTIMATED QUANTITIES - BRS-485(6)

ITEM	TOTAL	UNIT	DESCRIPTION	SUPER	ABUTS	GEN'L		
202	Lump	Lump	Structure Removed			Lump		
503	108	Cu. Yds.	Unclassified Excavation		108			
503	LUMP	LUMP	COFFERDAMS, CRIBS AND SHEETING			LUMP		
509	13,626	Lbs.	Reinforcing Steel, Grade 60	7877	5749			
511	79	Cu. Yds.	Class S Concrete, Superstructure, As Per Plan	79				
511	68	Cu. Yds.	Class C Concrete, Abutments		68			
513	47,200	Lbs.	Structural Steel, ASTM A588 (AISC Category 1)	47,200				
513	588	Each	Welded Stud Shear Connectors (See proposal note)	588				
516	84	Sq. Ft.	1/2" Preformed Expansion Joint Filler			84		
516	56	Sq. Ft.	1" Preformed Expansion Joint Filler			56		
516	84	Lin. Ft.	PVC Waterstop, as per plan			84		
Special	49	Sq. Yd.	Sealing of Concrete Surfaces (See proposal note)	49				
517	134.16	Lin. Ft.	Railing (Deep beam rail with steel tubular backup and type 2 steel posts and bolts)	134.16				
518	97	Lin. Ft.	6" Perforated Helical Corrugated Steel Pipe, 707.01		97			
518	59	Lin. Ft.	6" Non-Perforated, Helical Corrugated Steel Pipe, including specials, 707.01		59			
518	36	Cu. Yds.	Porous Backfill			36		
824	7695	Lbs.	Epoxy Coated Reinforcing Steel, Grade 60	7695				
Special	211	Sq. Ft.	Protection of Concrete Surfaces (See proposal note)		211			
Special	73	Lin. Ft.	30" Dia. Drilled Shafts		73			

GENERAL NOTES

REFERENCE shall be made to Standard Drawings
A5-1-81, Dated 11-27-81
DBR-2-73, Dated 4-10-73
TS-ICD-1-82, Dated 11-15-82

and to Supplemental Specifications
824 (Dated 10-8-82)
836 (Dated 3-12-75)

DESIGN SPECIFICATIONS: This structure conforms to "Design Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1977, including the 1978, 1979, 1980, 1981 and 1982 Interim specifications and the Ohio "Supplement" to these specifications.

DESIGN DATA
Design Loading - HS-20-44, case II and the Alternate Military loading
Concrete, Class S - unit stress 1500 P.S.I. (Superstructure)
Concrete, Class C - unit stress 1333 P.S.I. (Substructure)
Reinforcing Steel - ASTM A615, A616 or A617 - Grade 60 - unit stress 24,000 P.S.I.
Structural Steel - ASTM A588 - unit stress 27,000 P.S.I.
Deck Protection Method - epoxy coated reinforcing steel (top mat only)

MONOLITHIC WEARING SURFACE is assumed, for design purposes, to be 1" thick.

REMOVAL OF EXISTING STRUCTURE: When no longer needed to maintain traffic the existing structure shall be removed and shall become the property of the Contractor.

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.

ITEM SPECIAL, SEALING OF CONCRETE SURFACES: A concrete sealer, either silane or an expoxy sealer, shall be applied to the following concrete surfaces: The vertical edges of the deck and the underside of the deck extending beyond the exterior beams. See the proposal for surface preparation requirements, application rates, materials requirements and application procedures.

2/8

SHAFFER, JOHNSTON, LICHTENWALTER & ASSOCIATES, INC.
CONSULTING ENGINEERS - SURVEYORS
MANSFIELD OHIO WOOSTER

GENERAL PLAN, ELEVATION, NOTES AND ESTIMATED QUANTITIES
BRIDGE NO. WAY - 302- 1010
OVER BRANCH OF MUDDY FORK CREEK
WAYNE COUNTY S.R. 302
STA. 531+83.97 TO STA. 532+51.05

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RAK		AF	RAK	JH	5-29-84	

JOB NO EM - 944 SHEET OF

ITEM 511, CLASS S CONCRETE, *SUPERSTRUCTURE, AS PER PLAN:*

IN LIEU OF THE PROPORTIONING SPECIFIED IN 499.03 AND 511.02, THE FOLLOWING TABLE SHALL BE USED TO ESTABLISH THE QUANTITIES PER CUBIC YARD FOR CONCRETE, THE COARSE AGGREGATE SHALL BE LIMESTONE.

QUANTITIES PER CUBIC YARD (USING NO. 8 LIMESTONE)

FINE AGGREGATE (LB)	COARSE AGGREGATE (LB)	TOTAL (LB.)	CEMENT CONTENT (LB)	WATER-CEMENT RATIO
1555	1100	2655	715	0.40

AIR CONTENT - 8±2%

HIGH RANGE WATER REDUCER MAY BE USED AT THE OPTION OF THE CONTRACTOR. THE DOSAGE RATE WILL BE DETERMINED BY THE CONTRACTOR BASED ON MANUFACTURER'S RECOMMENDATION TO ACHIEVE THE DESIRED WORKABILITY LEVEL.

HIGH RANGE WATER REDUCER SHALL CONFORM TO 705.12, ASTM-C494 TYPE F AND SHALL NOT CONTAIN CALCIUM CHLORIDE.

THE CEMENT CONTENT SHALL BE MAINTAINED AND A MAXIMUM WATER-CEMENT RATIO OF 0.40 SHALL NOT BE EXCEEDED. THE SLUMP OF THE UNPLASTICIZED CONCRETE DELIVERED TO THE JOB SITE SHALL BE 1-1/2 ± 1/2 INCH. THE SUPER-PLASTICIZING ADMIXTURE SHALL BE ADDED AT THE JOB SITE AND MIXED A MINIMUM OF FIVE (5) MINUTES. AFTER THE SUPERPLASTICIZER HAS BEEN ADDED, THE SLUMP SHALL BE 6-1/2 ± 1/2 INCH. THE CONTRACTOR SHALL FURNISH A VOLUMETRIC DISPENSER FOR THE SUPERPLASTICIZER.

CONCRETE MIXTURES CONTAINING A HIGH RANGE WATER REDUCER SHALL MEET THE SAME REQUIREMENTS FOR ENTRAINED AIR CONTENT, MINIMUM STRENGTH, AND MAXIMUM WATER-CEMENT RATIO AS REQUIRED FOR THE RESPECTIVE GRADE OF CONCRETE WITHOUT A HIGH RANGE WATER REDUCER.

SAMPLING AND TESTING FOR ENTRAINED AIR CONTENT AND MINIMUM STRENGTH SHOULD BE TAKEN FROM THE CONCRETE THAT HAS BEEN TREATED WITH A HIGH RANGE WATER REDUCER.

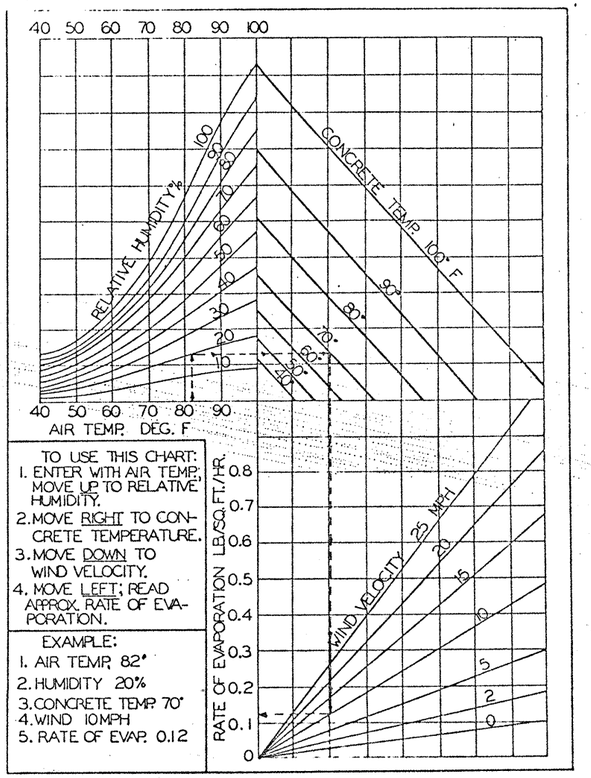
CURING SHALL BE IN ACCORDANCE WITH 511.14 TYPE A WATER CURING.

PLACEMENT:

PLACEMENT OF CONCRETE SHALL BE COMPLETED UNDER FAVORABLE ATMOSPHERIC CONDITIONS. FAVORABLE ATMOSPHERIC CONDITIONS EXIST WHEN THE SURFACE EVAPORATION RATE AS AFFECTED BY AMBIENT AIR TEMPERATURE, CONCRETE TEMPERATURE, RELATIVE HUMIDITY AND WIND VELOCITY IS 0.1 POUNDS PER SQUARE FOOT PER HOUR OR LESS. FIGURE (1) SHALL BE USED TO DETERMINE GRAPHICALLY THE SURFACE EVAPORATION RATE. FAVORABLE ATMOSPHERIC CONDITIONS MAY REQUIRE PLACEMENT DURING LATE EVENING (6:00 P.M. TO OFFICIAL SUNSET), NIGHT (OFFICIAL SUNSET OF OFFICIAL SUNRISE) OR EARLY MORNING (SUNRISE TO 8:00 A.M.).

IF PLACEMENT OF THE CLASS S, CONCRETE IS TO BE MADE AT NIGHT, THE CONTRACTOR SHALL SUBMIT A PLAN WHICH PROVIDES ADEQUATE LIGHTING FOR THE WORK AREA AT LEAST 15 CALENDAR DAYS IN ADVANCE AND RECEIVE WRITTEN APPROVAL FROM THE ENGINEER BEFORE PLACING THE CONCRETE. THE LIGHTS SHALL BE SO DIRECTED THAT THEY DO NOT AFFECT OR DISTRACT APPROACHING TRAFFIC.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER CUBIC YARD FOR ITEM 511 CLASS S CONCRETE, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE.



TO USE THIS CHART:
1. ENTER WITH AIR TEMP, MOVE UP TO RELATIVE HUMIDITY.
2. MOVE RIGHT TO CONCRETE TEMPERATURE.
3. MOVE DOWN TO WIND VELOCITY.
4. MOVE LEFT; READ APPROX. RATE OF EVAPORATION.

EXAMPLE:
1. AIR TEMP. 82°
2. HUMIDITY 20%
3. CONCRETE TEMP. 70°
4. WIND 10MPH
5. RATE OF EVAP. 0.12

314(85
145(85

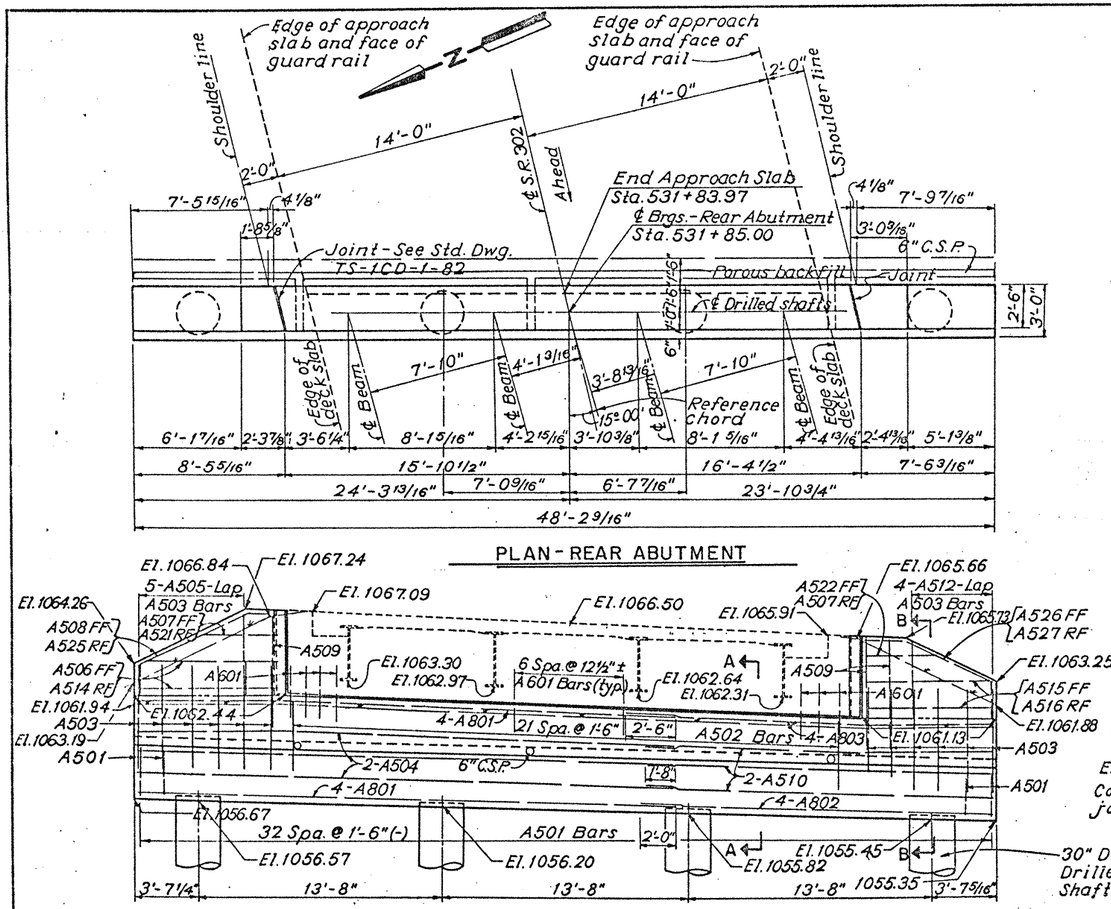
2A-8

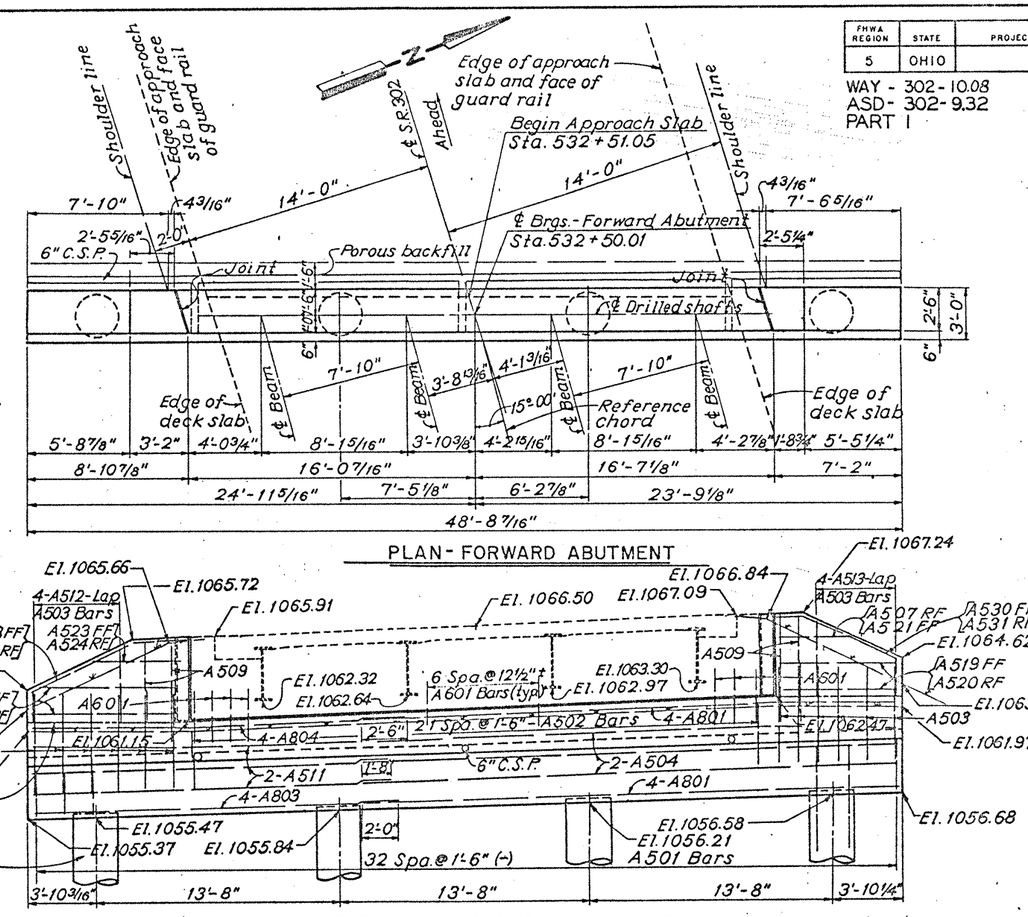
GENERAL NOTES
BRIDGE NO WAY-302-1010
OVER BRANCH OF MUDDY FORK CREEK

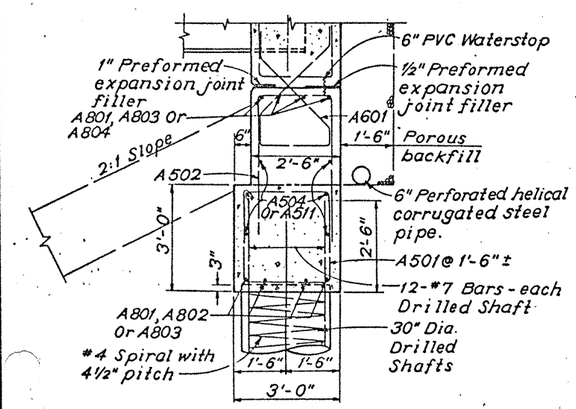
FHWA REGION	STATE	PROJECT	
5	OHIO		

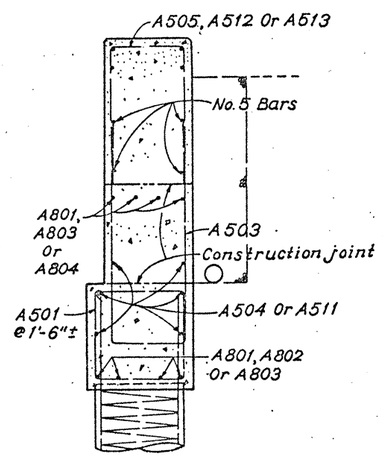
22/34

WAY - 302-10.08
ASD- 302-9.32
PART I



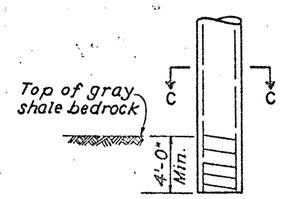




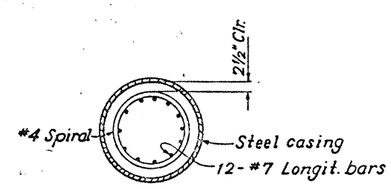


NOTATION:

FF - Front Face
RF - Rear Face



DRILLED SHAFT DETAIL



SECTION C-C

NOTES:

POROUS BACKFILL, 1'-6" thick, shall extend upward to the plane of the subgrade and laterally to the surface of the embankment slopes.

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SHAFFER, JOHNSTON, LICHTENWALTER & ASSOCIATES, INC.
CONSULTING ENGINEERS - SURVEYORS
MANSFIELD OHIO WOOSTER

ABUTMENTS

BRIDGE NO. WAY - 302-1010
OVER BRANCH OF MUDDY FORK CREEK
WAYNE COUNTY S.R. 302
STA. 531+83.97 TO STA. 532+51.05

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RAK	RDR	RR	RAK	JH	1-3-84	

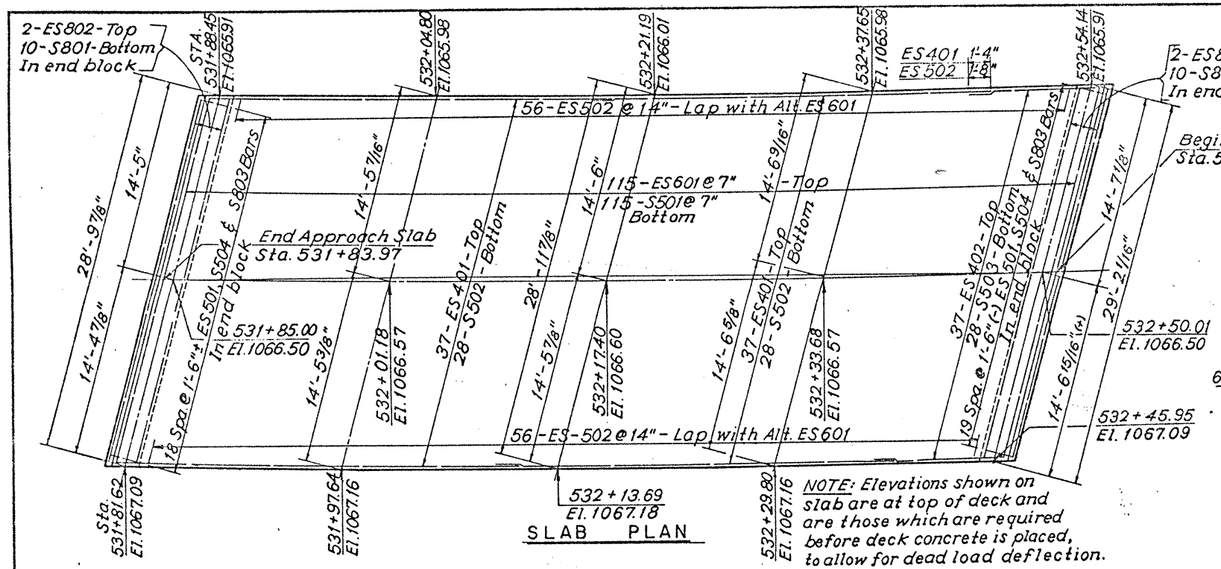
JOB NO EM-944 SHEET OF

BRUNING 33990

FHWA REGION	STATE	PROJECT	
5	OHIO		

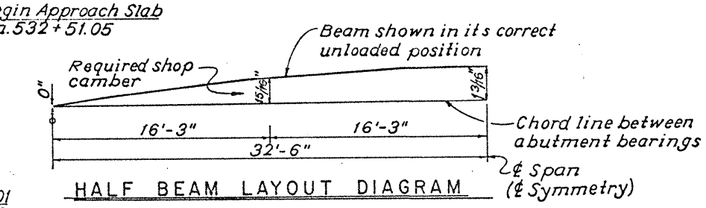
23/34

WAY - 302-10.08
ASD- 302-9.32
PART I

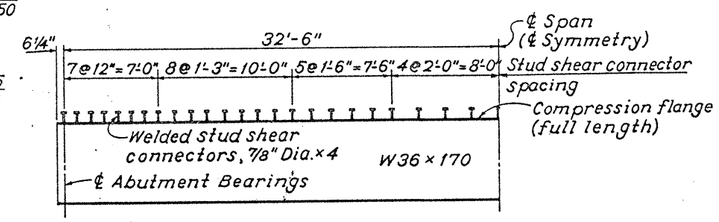


SLAB PLAN

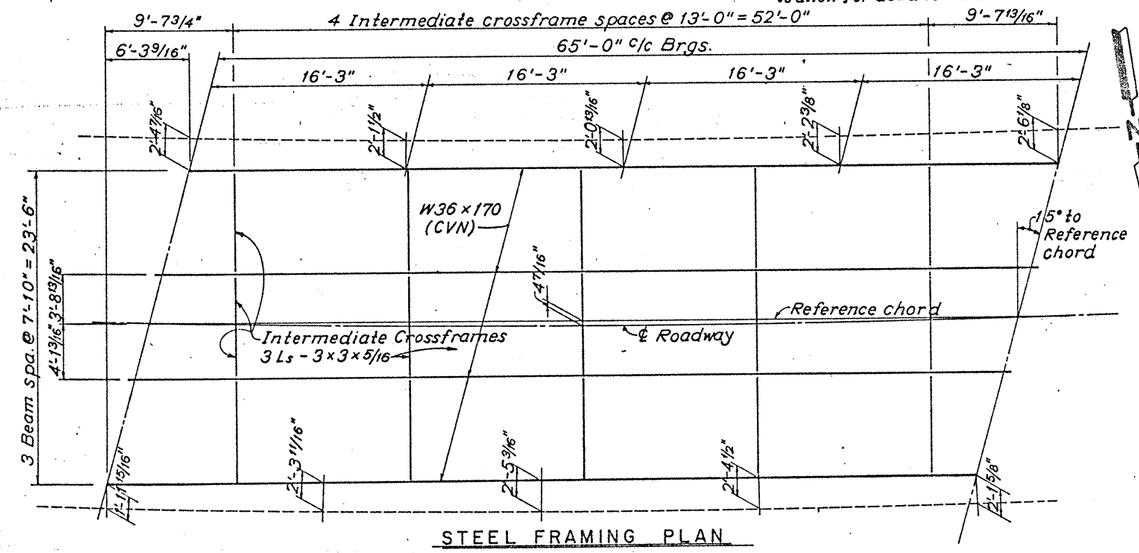
NOTE: Elevations shown on slab are at top of deck and are those which are required before deck concrete is placed, to allow for dead load deflection.



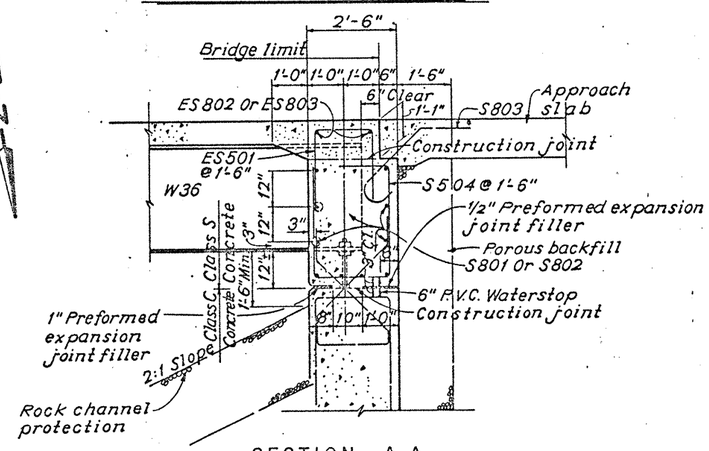
HALF BEAM LAYOUT DIAGRAM



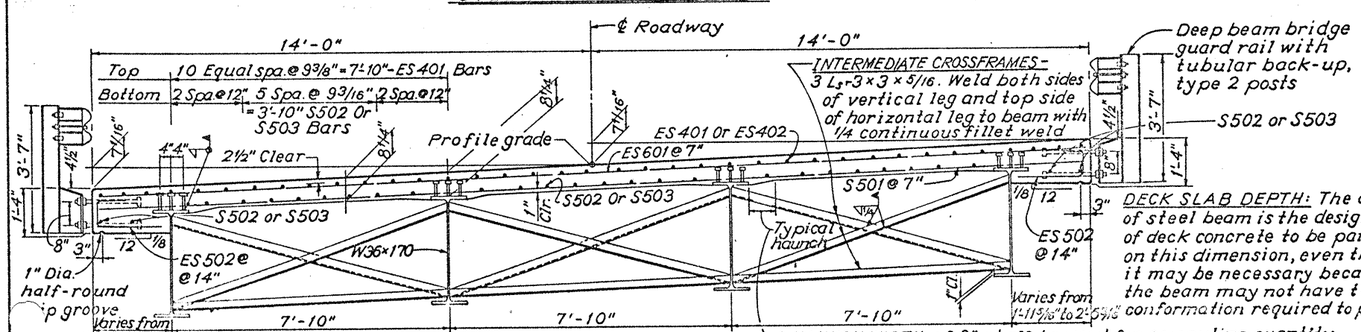
HALF BEAM ELEVATION



STEEL FRAMING PLAN



SECTION A-A



TRANSVERSE SECTION

A HAUNCH WIDTH of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" (Provided that the slope shall be not more than 1:4 for a haunch less than 9" width).

DECK SLAB DEPTH: The distance shown from top of deck slab to top of steel beam is the design dimension. The quantity of deck concrete to be paid for shall be based on on this dimension, even though deviation from it may be necessary because the top flange of the beam may not have the exact camber or conformation required to place it parallel to the finished grade.

CAMBER: Beams shall be cambered in accordance with the following:

DEFLECTION AND CAMBER		
SPAN POINT	¼, ¾	½
DEFLECTION DUE TO WEIGHT OF STEEL	3/16"	¼"
DEFLECTION DUE TO REMAINING DEAD LOAD	7/8"	1⅛"
ADJUSTMENT REQUIRED FOR HORIZONTAL CURVE	-⅛"	-3/16"
REQUIRED SHOP CAMBER	15/16"	13/16"

NOTES:

A588 STEEL is to be left unpainted. See CMS 513.221 for cleaning requirements.

INTEGRAL ABUTMENT DETAILS: See Std. Dwg. TS-ICD-1-82, Sheets 3, 4 and 5 of 5. 1¼" x 14" bolts, nuts and washers may be ASTM A307.

DEEP BEAM BRIDGE GUARD RAIL WITH TUBULAR BACKUP: See Std. Dwg. DBR-2-73

WELDED ATTACHMENT of supports for concrete deck finishing machine may be made to areas of the fascia stringer flanges designated "Compression". Attachments shall not be made to areas designated "Tension". Fillet welds to compression flanges shall be not closer than 1" from edge of flange, be not more than 2" long, and be not smaller than the minimum size required by AASHTO.
Where a shape or plate is designated (CVN) the material shall meet specified minimum notch toughness requirements as specified in 711.01 of CMS.

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SHAFFER, JOHNSTON, LICHTENWALTER & ASSOCIATES, INC.
CONSULTING ENGINEERS-SURVEYORS
MANSFIELD OHIO WOOSTER

SUPERSTRUCTURE

BRIDGE NO. WAY - 302 - 1010
OVER BRANCH OF MUDDY FORK CREEK
WAYNE COUNTY S.R. 302
STA. 531 + 83.97 TO STA. 532 + 51.05

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RAK	RDR	AF	RAK	JH	1-3-84	

JOB NO EM - 944 SHEET OF

BRUNING 33990

FHWA REGION	STATE	PROJECT	
5	OHIO		

24/34

WAY - 302 - 10.08, ASD - 302-9.32

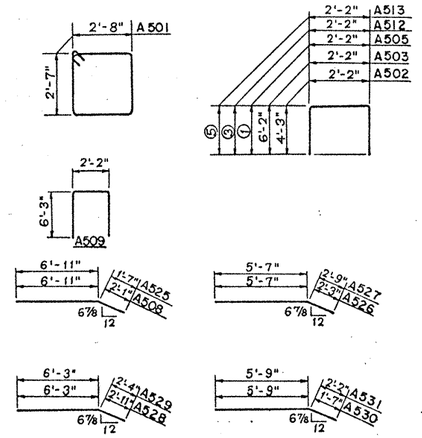
QUANTITIES CALC. RAK 10-22-83 PART I

QUANTITIES CKD. JH 1-3-84

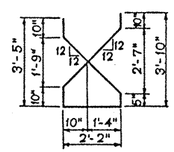
ABUTMENTS

MARK	NO.	LENGTH	WEIGHT	SHAPE	REAR ABUT.	FWD. ABUT.
A501	66	11'-0"	757	BT.	33	33
A502	44	10'-5"	478	BT.	22	22
A503	24	14'-3"	357	BT.	12	12
A504	12	30'-0"	375	S	6	6
A505	1 Series of 5	②	42	BT.	1 Series of 5	
A506	2	8'-0"	17	S	2	
A507	3	4'-7"	14	S	2	1
A508	1	9'-0"	9	BT.	1	
A509	7	14'-5"	105	BT.	3	4
A510	6	19'-6"	122	S	6	
A511	6	20'-0"	125	S		6
A512	2 Series of 4	④	66	BT.	1 Series of 4	1 Series of 4
A513	1 Series of 4	⑥	34	BT.		1 Series of 4
A514	2	7'-6"	16	S	2	
A515	2	7'-2"	15	S	2	
A516	2	7'-8"	16	S	2	
A517	2	8'-5"	18	S		2
A518	2	7'-10"	16	S		2
A519	2	6'-10"	14	S		2
A520	2	7'-4"	15	S		2
A521	2	4'-1"	9	S	1	1
A522	1	3'-11"	4	S	1	
A523	1	5'-1"	5	S		1
A524	1	4'-5"	5	S		1
A525	1	8'-6"	9	BT.	1	
A526	1	7'-10"	8	BT.	1	
A527	1	8'-4"	9	BT.	1	
A528	1	9'-2"	10	BT.		1
A529	1	8'-7"	9	BT.		1
A530	1	7'-4"	8	BT.		1
A531	1	7'-11"	8	BT.		1
A601	56	10'-9"	904	BT.	28	28
A801	16	30'-0"	1282	S	8	8
A802	4	19'-10"	212	S	4	
A803	8	20'-4"	434	S	4	4
A804	4	20'-10"	222	S		4
TOTAL WEIGHT			5749			

BENDING DIAGRAMS



① Varies from 1'-8" to 4'-6". Increment = 8½"
② Varies from 5'-3" to 10'-11". Increment = 1'-5"
③ Varies from 1'-11" to 4'-0½". Increment = 8½"
④ Varies from 5'-9" to 10'-0". Increment = 1'-5"
⑤ Varies from 2'-1" to 4'-1". Increment = 8"
⑥ Varies from 6'-1" to 10'-1". Increment = 1'-4"

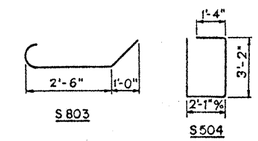


A601

REINFORCING STEEL - SUPERSTRUCTURE

MARK	NO.	LENGTH	WEIGHT	SHAPE
S501	115	28'-6"	3418	S
S502	56	30'-0"	1752	S
S503	28	10'-2"	297	S
S504	39	9'-4"	380	BT.
S801	10	28'-5"	759	S
S802	10	28'-9"	768	S
S803	39	4'-10"	503	BT.
TOTAL WEIGHT			7877	

BENDING DIAGRAMS



EPOXY COATED REINFORCING STEEL - SUPERSTRUCTURE

MARK	NO.	LENGTH	WEIGHT	SHAPE
ES401	74	30'-0"	1483	S
ES402	37	9'-6"	235	S
ES501	39	6'-5"	261	BT.
ES502	112	4'-2"	487	BT.
ES601	115	28'-6"	4923	S
ES801	2	28'-9"	154	S
ES802	2	28'-5"	152	S
TOTAL WEIGHT			7695	

BENDING DIAGRAMS

NOTE:

Refer to C.M.S. 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 additional steel spliced in accordance with 509.08.

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SHAFFER, JOHNSTON, LICHTENWALTER & ASSOCIATES, INC.
CONSULTING ENGINEERS - SURVEYORS
MANSFIELD OHIO WOOSTER

REINFORCING STEEL

BRIDGE NO. WAY - 302 - 1010
OVER BRANCH OF MUDDY FORK CREEK
WAYNE COUNTY S.R. 302
STA. 531 + 83.97 TO STA. 532 + 51.05

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RAK	RDR		RAK	JH	1-3-84	

JOB NO EM-944 SHEET OF

BRUNING 33950

ITEM SPECIAL - DRILLED SHAFTS

DESCRIPTION

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING DRILLED SHAFTS OF THE TYPE AND SIZE CALLED FOR BY THE PLANS. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, AND APPURTENANCES REQUIRED TO COMPLETE THE WORK AS SPECIFIED. THE LENGTHS OF THE DRILLED SHAFTS SHOWN IN THESE PLANS HAS BEEN ESTIMATED FROM THE AVAILABLE SUBSURFACE INFORMATION. THE CONTRACTOR IS EXPECTED TO FURNISH THE PROPOSED DRILLED SHAFTS AS PER THESE PLAN REQUIREMENTS WITH THE UNDERSTANDING THAT THE ESTIMATED LENGTH SHOWN ON THE PLANS MAY BE DIFFERENT FROM THE LENGTH DETERMINED TO BE NECESSARY AT THE TIME OF CONSTRUCTING THE DRILLED SHAFTS.

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.

A CASING WILL BE NECESSARY FOR EACH PIER DRILLED SHAFT AND THE CASINGS SHALL BE LEFT IN PLACE. A CASING MAY BE NECESSARY FOR EACH ABUTMENT DRILLED SHAFT. ABUTMENT DRILLED SHAFT CASINGS MAY BE REMOVED PROVIDED ALL PLAN REQUIREMENTS ARE SATISFIED.

CONTRACTOR QUALIFICATION

THE CONTRACTOR SHALL SUBMIT INFORMATION TO DOCUMENT THAT HIS PERSONNEL ARE EXPERIENCED IN THE CONSTRUCTION OF DRILLED SHAFTS OF THE TYPE AND SIZE DESCRIBED BY THE PLANS. THIS INFORMATION SHALL BE SUBMITTED AT THE PRECONSTRUCTION CONFERENCE.

DEVIATION FROM PLAN

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COSTS INVOLVED WHEN MAKING CORRECTIONS TO HIS UNAUTHORIZED DEVIATIONS FROM THE PLANS. THE DIRECTOR SHALL DECIDE WHEN CORRECTIONS ARE NECESSARY.

CASING

THE CASINGS SHALL BE MADE OF STEEL AND SHALL BE WATER TIGHT AND SHALL BE OF AMPLE STRENGTH TO WITHSTAND HANDLING STRESSES AND EXTERNAL SUBSURFACE PRESSURES. THE CASINGS SHALL BE SEATED INTO THE BEDROCK, THUS ATTEMPTING TO SEAL OFF INCOMING WATER, AND THE CASING LENGTH SHALL BE AS NECESSARY TO CONSTRUCT EACH DRILLED SHAFT.

EXCAVATION

EXCAVATION FOR THE DRILLED SHAFTS SHALL BE PERFORMED BY ROTARY DRILLING METHODS USING PRACTICAL METHODS AND MACHINERY ACCEPTABLE TO THE ENGINEER. WHEN OBJECTS SUCH AS LARGE BOULDERS ARE ENCOUNTERED, THEY SHALL BE REMOVED. BLASTING METHODS MAY BE USED ONLY AFTER RECEIVING PERMISSION FROM THE ENGINEER AND WHEN USED SHALL BE SO CONDUCTED AS TO AVOID DISTURBANCE OF THE BEDROCK FORMATION BELOW AND OUTSIDE THE LIMITS OF THE PROPOSED DRILLED SHAFT EXCAVATIONS. THE CONTRACTOR SHALL CARRY LIABILITY INSURANCE AND SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATION GOVERNING THE USE OF EXPLOSIVES. THE DRILLED SHAFTS SHALL PENETRATE INTO SOLID BEDROCK TO A DEPTH THAT PROVIDES A BEDROCK SOCKET LENGTH THAT IS NOT LESS THAN THE BEDROCK SOCKET LENGTH SHOWN IN THE PLANS. WHEN A CASING 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 SOLID BEDROCK, THE EMBEDDED DISTANCE MAY BE INCLUDED AS PART OF THE BEDROCK SOCKET UPON THE DIRECTOR'S CONCURRENCE.

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 CLEANOUT

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

PROOF TESTING

THE ENGINEER MAY REQUIRE THE BEDROCK BELOW THE BOTTOM OF THE BEDROCK SOCKET OF EVERY PIER DRILLED SHAFT TO BE CORED TO VERIFY THE INTEGRITY OF THE BEDROCK. MINIMUM REQUIREMENTS ARE ONE PROOF TEST AT ONE OF THE DRILLED SHAFTS AT EACH PIER LOCATION. THIS OPERATION SHALL BE IN ACCORDANCE WITH AND PAID FOR AS PER ITEM SPECIAL - PROOF TESTING.

APPROVAL BEFORE CONCRETE PLACEMENT

THE CONTRACTOR SHALL SUBMIT TO THE PROJECT ENGINEER A WRITTEN REPORT OF STEPS AND PROCEDURES THAT HE PROPOSES TO FOLLOW WHEN PLACING 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. NO CONCRETE SHALL BE PLACED DURING INCLEMENT WEATHER CONDITIONS WHICH PROHIBIT A THOROUGH INSPECTION.

CONCRETE PLACEMENT

THE CONCRETE FOR THE DRILLED SHAFTS SHALL BE PLACED AS PER 511 EXCEPT AS MODIFIED BY THE PLANS. THE CONCRETE PLACEMENT OPERATION SHOULD BE CONTINUOUS FROM START TO FINISH. THE CONCRETE FOR THE BEDROCK SOCKET SHALL BE PLACED AGAINST THE INSITU BEDROCK AND SHALL BE PLACED PROMPTLY AFTER THE FINAL INSPECTION OF THE SHAFT. IF PRACTICABLE, THE CONCRETE SHALL BE PLACED IN A CLEAN DRY EXCAVATION. CARE SHALL BE TAKEN TO ENSURE THAT CONCRETE IS NOT BEING PLACED IN MOVING WATER. THE CONCRETE CAN BE PLACED IN A DRY DRILLED SHAFT EXCAVATION BY THE FREE FALL METHOD PROVIDED THE CONCRETE FALLS TO IT'S 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.

IF THE ENGINEER DETERMINES THAT DEWATERING IS NOT PRACTICABLE, THE CONTRACTOR WILL BE GIVEN PERMISSION TO PLACE THE CONCRETE UNDER WATER. TO PLACE CONCRETE UNDER WATER, 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 PUMP. THE PUMP EQUIPMENT SHALL BE SO ARRANGED THAT NO VIBRATIONS RESULT WHICH MIGHT DAMAGE FRESHLY PLACED CONCRETE. PIPES CARRYING CONCRETE FROM THE PUMP TO THE SHAFT SHOULD BE LAID OUT 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 OR 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 15 FEET BELOW THE TOP OF THE FRESH CONCRETE. WHEN THE CONCRETE REACHES THE TOP OF THE DRILLED SHAFT COLUMN ALL LAITANCE SHALL BE REMOVED.

ALTERNATE CONSTRUCTION METHODS

THE CONTRACTOR MAY PROPOSE ALTERNATE CONSTRUCTION METHODS WHICH WILL BE APPROVED OR REJECTED BY THE DIRECTOR.

TOLERANCES

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

THE TOP CENTER OF THE ABUTMENT DRILLED SHAFTS SHALL BE LOCATED WITHIN A 3 INCH RADIUS OF THE POSITION INDICATED BY THE PLANS. THE ABUTMENT VERTICAL DRILLED SHAFTS ARE TO BE INSTALLED WITHIN 2.0 PERCENT OF PLUMB FOR THE TOTAL LENGTH OF THE DRILLED SHAFTS. THE ABUTMENT BATTERED DRILLED SHAFTS ARE TO BE INSTALLED WITHIN 5.0 PERCENT OF PLAN FOR THE TOTAL LENGTH OF THE DRILLED SHAFTS.

IF A DRILLED SHAFT(S) IS CONSTRUCTED OUTSIDE OF THE PLAN TOLERANCES, THE CONTRACTOR MAY BE SUBJECT TO REDUCED PAYMENT AS DETERMINED BY THE DIRECTOR.

CONCRETE

CONCRETE FOR ALL DRILLED SHAFTS SHALL BE CLASS S CONCRETE AND SHALL BE IN ACCORDANCE WITH 511, EXCEPT AS MODIFIED AND SUPPLEMENTED HEREIN. THE REQUIRED SLUMP IS SIX (6) INCHES, PLUS OR MINUS ONE-HALF INCH. THE MAXIMUM WATER TO CEMENT RATIO SHALL BE 0.50. IF CONCRETE IS PLACED UNDER WATER, THE REQUIREMENT OF ADDING 10 PERCENT MORE CEMENT TO THE CONCRETE MIX SHALL BE WAIVED. THE TOP 5 TO 10 FEET OF 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.

REINFORCING STEEL

REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF 509. THE REINFORCING STEEL SHALL BE GRADE 60. THE SPIRAL REINFORCING STEEL MAY BE PLAIN BARS ASTM A82 OR A615. THE REINFORCING STEEL SHALL BE COMPLETELY ASSEMBLED PRIOR TO PLACEMENT AND THE LENGTH SHALL BE AS NECESSARY TO CONSTRUCT EACH DRILLED SHAFT.

INSPECTION

THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUITABLE MEANS FOR ACCESS AND SAFE DESCENT INTO ALL DRILLED SHAFT EXCAVATIONS THAT ARE PROTECTED BY A CASING AND HAVE A DIAMETER THAT IS LARGE ENOUGH TO ALLOW A PERSON TO SAFELY ENTER AND PERFORM THE REQUIRED INSPECTION. ACCESS CAN BE PROVIDED BY A POSITIVE FORWARD AND REVERSE HYDRAULIC WINCH OR A POWER-UP AND POWER-DOWN HOIST ON A CRANE. THE METHOD CHOSEN FOR ENTERING AND LEAVING THE SHAFT SHALL BE CONVENIENT, SAFE AND NOT UNCOMFORTABLE FOR THE USER. THE CONTRACTOR SHALL ALSO PROVIDE PROTECTIVE CLOTHING FOR USE BY THOSE MAKING AN INSPECTION OF THE SHAFT.

SMALL DIAMETER AND/OR UNCASED DRILLED SHAFT EXCAVATIONS SHALL BE INSPECTED AS THOROUGHLY AS PRACTICABLE.

A CHART HAS BEEN INCLUDED WITH THE PLANS ON SHEET 8 OF 8 AND SHALL BE COMPLETED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT NEEDED TO OBTAIN THE MEASUREMENTS FOR COMPLETING THE CHART AND THE CONTRACTOR SHALL ASSIST THE ENGINEER IN OBTAINING THESE MEASUREMENTS. MEASUREMENTS SHALL BE OBTAINED PRIOR TO PLACING CONCRETE.

THE ENGINEER SHOULD OBTAIN PHOTOGRAPHS OF THE CONTRACTOR'S CONSTRUCTION PROCEDURES.

SAFETY PROVISIONS

THE CONTRACTOR SHALL HAVE AT THE JOB SITE ALL EQUIPMENT AND MATERIALS NEEDED TO PROVIDE SAFE CONSTRUCTION AND INSPECTION OF THE DRILLED SHAFTS AS REQUIRED BY CITY, STATE AND FEDERAL SAFETY REQUIREMENTS.

SAFETY PROVISIONS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE REQUIREMENTS SPECIFIED BY THE PLANS, SPECIAL PROVISIONS, AND PROPOSAL.

THE CONTRACTOR SHALL PROVIDE CONTINUOUS SURVEILLANCE OF ALL PERSONS IN THE PIER DRILLED SHAFT EXCAVATION. AT ALL TIMES WHEN A PERSON IS IN THE PIER DRILLED SHAFT EXCAVATION, PROVISION SHALL BE MADE FOR PUMPING FRESH AIR TO SAID PERSON. ALL LIGHTING SHALL BE WITH ELECTRIC LIGHTS. MECHANICAL EQUIPMENT USED INSIDE THE SHAFT SHALL BE OPERATED BY AIR OR ELECTRICITY. THE USE OF GASOLINE ENGINES OR OTHER TYPES OF EQUIPMENT PRODUCING FUMES THAT MAY ENTER THE EXCAVATION WILL NOT BE PERMITTED. THE CONTRACTOR SHALL PROVIDE GAS DETECTION AND OXYGEN ANALYZERS, AND SHALL TEST THE DRILLED-IN PIER COLUMN EXCAVATION ATMOSPHERE QUALITATIVELY THROUGHOUT THE COLUMNS ENTIRE LENGTH AND ASSURE THAT THE QUANTITIES OF GASES AND OXYGEN PRESENT ARE IN SAFE AMOUNT AND SAFE PROPORTIONS PRIOR TO PERMITTING ANY PERSON TO ENTER THE SHAFT.

METHOD OF MEASUREMENT

THE LENGTH OF EACH DRILLED SHAFT TO BE PAID FOR 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.

BASIS OF PAYMENT

PAYMENT FOR FURNISHING AND INSTALLING DRILLED SHAFTS WILL BE MADE AT THE CONTRACT UNIT PRICE PER LINEAR FOOT OF ACCEPTED SHAFTS AS PER ITEM SPECIAL DRILLED-SHAFTS, WHICH SHALL INCLUDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO COMPLETE THE ITEM AS SPECIFIED.

6/8

SHAFFER, JOHNSTON, LICHTENWALDER & ASSOCIATES, INC.
CONSULTING ENGINEERS - SURVEYORS
MANSFIELD OHIO WOOSTER

DRILLED SHAFT NOTES
BRIDGE NO. WAY - 302 - 1010
OVER BRANCH OF MUDDY FORK CREEK
WAYNE COUNTY S.R. 302
STA. 531 + 83.97 TO STA. 532 + 51.05

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RAK	RDR		RAK	JH	1-31-84	

JOB NO EM-944 SHEET OF

R.B.P.

FHWA REGION	STATE	PROJECT	
5	OHIO		

26/34

WAY-302-10.08
ASD-302-9.32
PART I

DESIGN PARAMETERS

THE DESIGN LOAD TO BE SUPPORTED BY EACH DRILLED SHAFT IS 62.3 TONS, WHICH IS ASSUMED TO BE RESISTED BY SHAFT ADHESION WITHIN A PORTION OF THE BEDROCK SOCKET AND ALSO BY SHAFT AND END BEARING PRESSURE. THE ALLOWABLE BEDROCK SOCKET ADHESION IS ONE TON PER SQUARE FOOT WHICH IS ASSUMED TO ACT ALONG THE BOTTOM TWO (2) FEET OF THE BEDROCK SOCKET. THE ALLOWABLE END BEARING PRESSURE IS 20 TONS PER SQUARE FOOT.

7/8

SHAFFER, JOHNSTON, LICHTENWALTER & ASSOCIATES, INC.
CONSULTING ENGINEERS - SURVEYORS
MANSFIELD OHIO WOOSTER

DRILLED SHAFT NOTES

BRIDGE NO. WAY - 302 - 1010
OVER BRANCH OF MUDDY FORK CREEK
WAYNE COUNTY S.R. 302
STA. 531 + 83.97 TO STA. 532 + 51.05

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RAK	RDR		RAK	JH	1-31-84	

JOB NO EM-944 SHEET OF

R.B.P.

FHWA REGION	STATE	PROJECT	
5	OHIO		

WAY-302-10.08
ASD-302-932, PART I

INSPECTION RECORD FOR DRILLED SHAFTS

BRIDGE NO. _____
LOCATION _____
PROJECT NO. _____

GENERAL CONTRACTOR _____
DRILLING CONTRACTOR _____
PROJECT ENGINEER _____

TYPE & MODEL OF DRILLING MACHINERY _____
MAX. CONTINUOUS TORQUE _____ FT.-LB.
CROWD (MAX. CONTINUOUS DOWNWARD FORCE) _____ LBS.

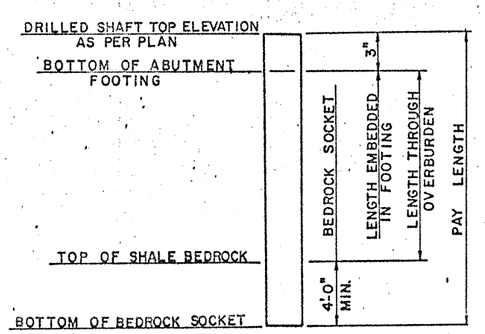
TYPE OF CONCRETE PUMP _____
HOSE DIAMETER _____ INCHES
CAPACITY _____ CU.FT./MIN.

COST PER LINEAL FOOT
ABUT. DRILLED SHAFTS _____

SUBSTRUCTURE		DATE AND TIME OF DRILLING		APPROX. ELEVATION OF TOP OF OVER BURDEN	UNDER-REAM BASE DIAMETER	LENGTH OF DRILLED SHAFTS				OBSTRUCTIONS ENCOUNTERED		UNDER REAMS			LENGTH OF CASING (FEET)	CASING GUAGE OR THICKNESS	REINFORCING STEEL				CONCRETE						TOLERENCES (INCH)			SHAFT DIA.	REMARKS
																	VERTICAL		SPIRAL								DEVIATION FROM PLUMB OR PLAN BATTER		DEVIATION OF COLUMN TOP CENTER FROM PLAN LOCATION HORIZONTALLY		
ABUT.	LOCATION OR NUMBER	STARTED	FINISHED			EMBEDDED IN FOOTING	THROUGH OVER BURDEN TO TOP OF UNDER-REAM		PAY LENGTH	NUMBER	SIZE. (INCH.)	APPROX. ELEVATION OF TOP OF UNDER-REAMS	APPROX. ELEV. OF BOTT. OF UNDER-REAMS	LENGTH OF UNDER-REAMS (FEET)			BAR SIZE NO	NO. OF REBARS	BAR SIZE NO.	PITCH (INCH)	SLUMP TEST RESULT (INCH)	CYLINDER STRENGTH f'_c (P.S.I.)	AIR TEMP (F)	TIME NEEDED TO PLACE CONCRETE (HR.)	QUANTITY (CU. YD.)		N-S	E-W			

PROJECT ENGINEER COMMENTS

METHOD OF CONSTRUCTION



NOTE:
"WHEN INSPECTION RECORD IS COMPLETE SUBMIT A COPY TO THE BUREAU OF BRIDGES"

8/8

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

DRILLED SHAFTS

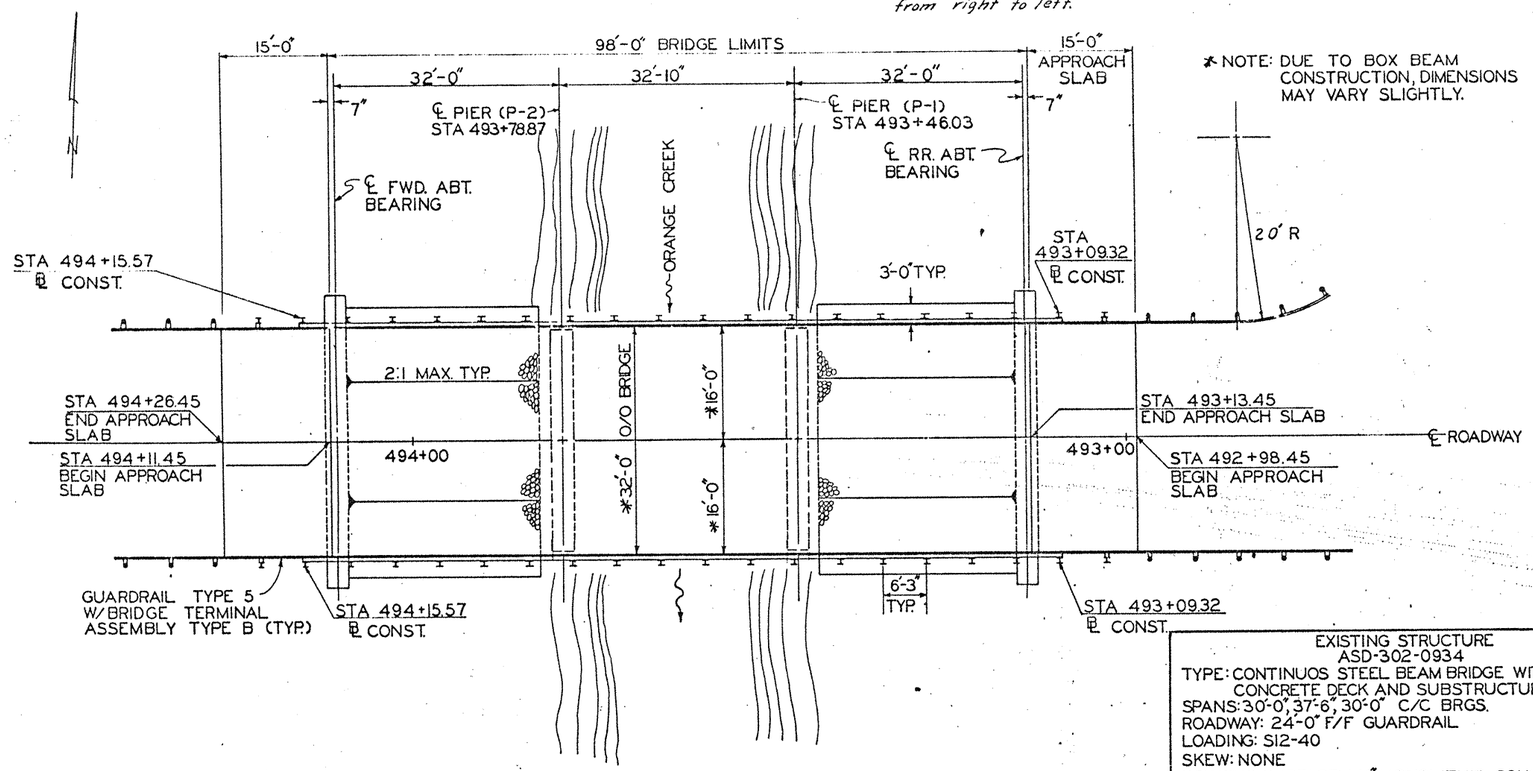
BRIDGE NO. WAY - 302-1010
OVER BRANCH OF MUDDY FORK CREEK
WAYNE COUNTY S.R. 302
STA. 531+83.97 TO STA. 532+51.05

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RLE	RLE	G.F.T.	CKT		8-20-81	

FHWA REGION	STATE	PROJECT	
5	OHIO		

WAY-302-10.08
ASD-302-9.32
PART 2

NOTE: Stations on this sheet run from right to left.

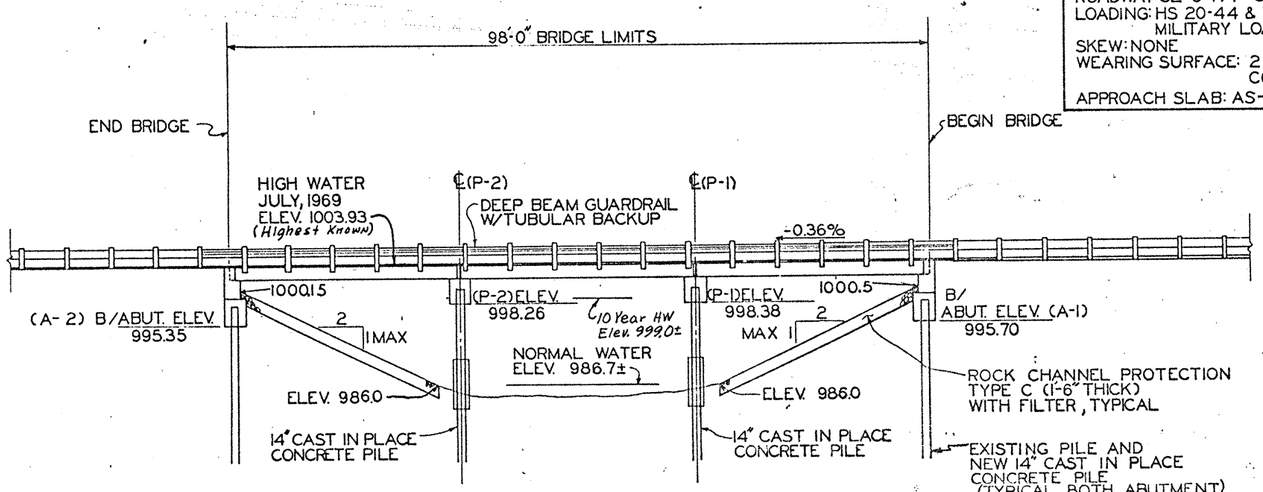


PLAN

* NOTE: DUE TO BOX BEAM CONSTRUCTION, DIMENSIONS MAY VARY SLIGHTLY.

EXISTING STRUCTURE
ASD-302-0934
TYPE: CONTINUOS STEEL BEAM BRIDGE WITH CONCRETE DECK AND SUBSTRUCTURE
SPANS: 30'-0", 37'-6", 30'-0" C/C BRGS.
ROADWAY: 24'-0" F/F GUARDRAIL
LOADING: S12-40
SKEW: NONE
WEARING SURFACE: 1/4" MONOLITHIC CONCRETE
STD DWGS: CSB-12-39, AS-40
APPROACH: SLABS: 15'-0" LONG, FLARED

PROPOSED STRUCTURE
ASD-302-0934
TYPE: 3 SPAN PRESTRESSED CONCRETE BOX
SPANS: 3 @ 32'-0", 32'-10", 32'-0", C/C BRGS.
ROADWAY: 32'-0" F/F GUARDRAIL
LOADING: HS 20-44 & THE ALTERNATE MILITARY LOADING
SKEW: NONE
WEARING SURFACE: 2 1/2" MINIMUM ASPHALT CONCRETE, AC-20
APPROACH SLAB: AS-1-81 (15'-0") LONG



ELEVATION

GENERAL NOTES:

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

AS-1-81, DATED 11-27-81
CPP-2-73, DATED 04-10-73
DBR-2-73, DATED 04-10-73
PSBD-1-81, DATED 09-18-81

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 1978, 1979, 1980, 1981 AND 1982 INTERIM SPECIFICATIONS AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS.

DESIGN DATA:

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

CONCRETE CLASS C - COMPRESSIVE STRENGTH 4,000 P.S.I.

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

CONCRETE FOR PRESTRESSED BEAMS - UNIT STRESS 2,200 P.S.I. COMPRESSION, 444 P.S.I. TENSION - PRESTRESSING STRAND A.S.T.M. A416 - F's = 270,000 P.S.I. - INITIAL STRESS = 0.70 F's.

REMOVAL OF STRUCTURE:

WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC THE EXISTING STRUCTURE SHALL BE REMOVED EXCEPT FOR EXISTING ABUTMENT PILING WHICH ARE TO REMAIN.

PILE DESIGN LOADS

THE DESIGN LOAD IS 40 TONS PER PILE FOR ABUTMENT PILES AND 40 TONS PER PILE FOR PIER PILES.

THE PILE HAMMER USED TO INSTALL THE CAST-IN-PLACE REINFORCED CONCRETE PILES SHALL HAVE A STATE'S ENERGY RATING OF NOT LESS THAN 15,000 FOOT-PDS. THIS REQUIREMENT DOES NOT RELIEVE THE CONTRACTOR FROM 108.05 WHICH STATES THAT THE CONTRACTOR IS TO PROVIDE SUFFICIENT EQUIPMENT FOR PROSECUTING THE REQUIRED WORK. REFER TO ODOT'S MANUAL OF PROCEDURES FOR STRUCTURES TO OBTAIN THE STATE'S ENERGY RATING.

PILE ENCASEMENT:

PIER PILE SHALL BE PROTECTED BY THE USE OF VITRIFIED CLAY PIPE PLACED OVER THE PILES AS PER STANDARD DRAWING CPP-2-73, DATED 04-10-73.

DECK PROTECTION METHOD:

TYPE D MODIFIED WATERPROOFING AND ASPHALT CONCRETE OVERLAY.

ASPHALT CONCRETE SURFACE COURSE:

SHALL CONSIST OF A VARIABLE THICKNESS 403 COURSE AND A 1-1/4" THICKNESS 404 COURSE. THE 403 SHALL BE PLACED IN TWO OPERATIONS. THE INITIAL COURSE SHALL BE A 1-1/4" UNIFORM THICKNESS AND THE SECOND COURSE SHALL BE FEATHERED TO PLACE THE SURFACE PARALLEL TO AND 1-1/4" BELOW FINAL PAVEMENT SURFACE ELEVATION.

NET CAMBER OF BEAMS IS 1"± (AVE.)

THIS IS IN EXCESS OF THE AMOUNT REQUIRED TO PLACE THE TOP OF THE BEAM PARALLEL TO PROFILE GRADE. THIS EXCESS AMOUNT SHALL BE COMPENSATED BY THICKENING THE 403 LEVELING COURSE FROM 1-1/4" AT CENTER OF SPANS TO 2-1/4" AT ENDS.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

1 / 6

GENERAL, PLAN, ELEVATION, & GENERAL NOTES
ASD-302-0934
OVER
ORANGE CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
NK	NK	DM	KW 5-24-84	RLC	5-6-84	

ITEM 512, TYPE "D" WATERPROOFING, AS PER PLAN

ITEM 512.07 SHALL BE MODIFIED SO THAT THE THREE COATS OF BITUMINOUS MATERIAL, 702.06 AND THE AC-20, 702.01 FOR FILLING JOINTS AND IRREGULARITIES IN THE SURFACE SHALL MEET THE FOLLOWING SPECIFICATIONS. THE BITUMINIOUS MATERIAL SHALL MEET 702.01 (AC-20) WITH THE ADDITION OF GRANULATED CRUMB RUBBER. THE GRANULATED CRUMB RUBBER SHALL BE 100 PERCENT VULCANIZED AND MEET THE FOLLOWING GRANULATED REQUIREMENTS.

SIEVE SIZE	PERCENT PASSING
NO. 8	100
NO.10	98-100
NO.30	0-10
NO.40	0-4

THE SIEVES SHALL COMPLY WITH THE REQUIREMENTS OF AASHTO M92 (ASTM E11).

THE GRANULATED RUBBER, IRRESPECTIVE OF DIAMETER, SHALL NOT BE GREATER THAN 1/2 INCH IN LENGTH AND CONTAIN NO MORE THAN TWO (2) PERCENT MOISTURE.

THE SPECIFIC GRAVITY OF THE RUBBER SHALL BE 1.15 PLUS OR MINUS 0.02 AND SHALL BE FREE OF EXCESS FABRIC (0.5 PERCENT BY WEIGHT), WIRE OR OTHER CONTAMINATING MATERIALS, EXCEPT THAT UP TO FOUR PERCENT CALCIUM CARBONATE MAY BE INCLUDED TO PREVENT THE RUBBER PARTICALS FROM STICKING TOGETHER.

GRANULATED CRUMB RUBBER SHALL BE ACCEPTED BY CERTIFICATION FROM THE RUBBER SUPPLIER IN ACCORDANCE WITH THE REQUIREMENTS OF 101.061.

THE PERCENTAGE OF CRUMB RUBBER SHALL BE 25 PLUS OR MINUS 4 PERCENT BY WEIGHT OF THE ASPHALT CEMENT.

AS AN ALTERNATIVE TO THE ABOVE, CRUMB RUBBER MAY BE PREMIXED AS PER ASTM-D-3405.

THE TEMPERATURE OF THE ASPHALT SHALL BE BETWEEN 350 DEG. F AND 425 DEG.F BEFORE ADDITION OF THE CRUMB VULCANIZED RUBBER. THE MATERIALS SHALL BE CAREFULLY COMBINED AND MIXED AND REACTED FOR A PERIOD OF TIME. THE TEMPERATURE OF THE ASPHALT RUBBER MIXTURE SHALL BE ABOVE 325 DEG. F. DURING THE REACTION PERIOD.

IF A JOB DELAY RESULTS AFTER THE FULL REACTION HAS OCCURED, THE ASPHALT-RUBBER MATERIAL MAY BE ALLOWED TO COOL AND BE SLOWLY REHEATED TO AN ACCEPTABLE SPRAYING TEMPERATURE JUST PRIOR TO APPLICATION. HOWEVER, BECAUSE OF THE POLYMER REVERSION THAT CAN OCCUR WHEN CRUMB RUBBER IS HELD AT PROLONGED HIGH TEMPERATURES THE ASPHALT-RUBBER MATERIAL SHALL NOT BE REHEATED TO TEMPERATURES ABOVE 325 DEG. F.

THE ASPHALT-RUBBER MIXING EQUIPMENT SHALL BE A HOT OIL, DOUBLE BOILER TAR KETTLE TYPE WITH MECHANICAL AGITATION CAPABLE OF COMBINING THE ASPHALT AND RUBBER INTO A HOMOGENIZED MIX.

INSTEAD OF 1/3 GAL. OF ASPHALT PER SQUARE YARD THE FINAL LAYER OF WATERPROOFING FABRIC SHALL BE COVERED WITH NOT LESS THAN 0.75 GAL./SQ. YD. OF BITUMINOUS MATERIAL.

IMMEDIATELY AFTER THE BITUMINOUS MATERIAL HAS BEEN SPRAYED ON THE BRIDGE, LIMESTONE (703.05 QUALITY) SHALL BE APPLIED AT THE RATE OF 40 LB./SQ. YD. WHEN PLACED, THE TEMPERATURE OF THE LIMESTONE SHALL BE ABOVE 275 DEG. F. THE LIMESTONE SHALL BE NO. 8 BEFORE HEATING IN THE ASPHALT PLANT. THE LIMESTONE SHALL BE RELATIVELY DUST FREE.

PAYMENT FOR ALL OF THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID PER SQUARE YARD FOR ITEM 512, TYPE"D" WATERPROOFING, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 518, POROUS BACKFILL, AS PER PLAN

THE POROUS BACKFILL SHALL BE CONSTRUCTED AS PER DETAILS ON SHEET NO. 29

THE FILTER FABRIC SHALL BE TYPE "B" AS PER SUPPLEMENTAL SPECIFICATION 939. DURING ALL PERIODS OF SHIPMENT AND STORAGE THE CLOTH SHALL BE WRAPPED IN A HEAVY DUTY PROTECTIVE COVERING TO PROJECT IT FROM DIRECT SUNLIGHT, MUD, DIRT, DUST, AND OTHER DEBRIS.

THE FILTER FABRIC SHALL BE CONTINUOUS. ALL JOINTS SHALL BE LAPPED AT A MINIMUM OF TWO (2) FEET. THE SUBSURFACE DRAIN SHALL SLOPE 1/2 INCH PER FOOT TO DRAIN. THE AGGREGATE SHALL BE NO.57 CRUSHED GRAVEL.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER CUBIC YARD FOR ITEM 518, POROUS BACKFILL AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

1A / 6

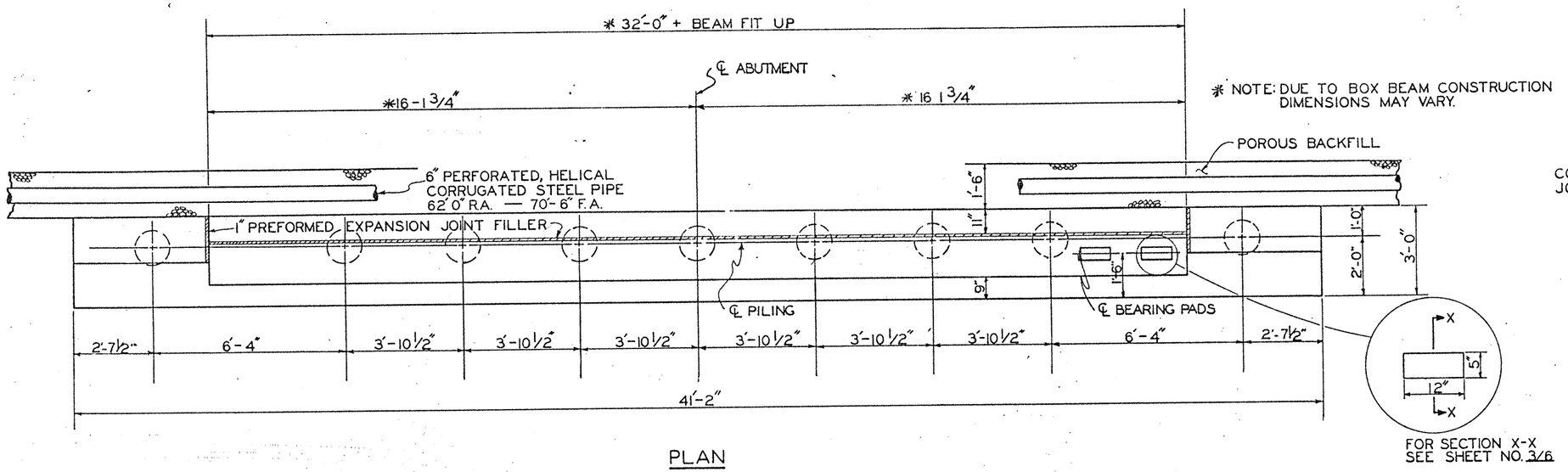
GENERAL NOTES

ASD-302-0934

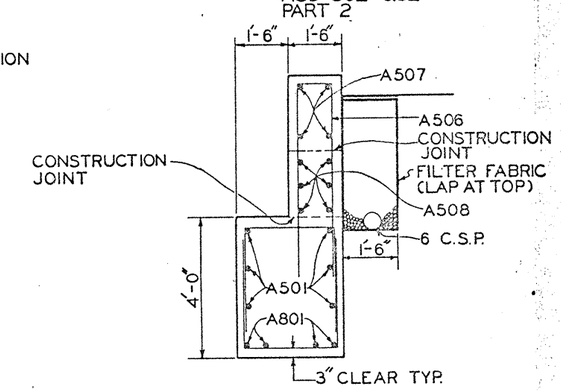
FHWA REGION	STATE	PROJECT	
5	OHIO		

29/34

WAY-302-10.08
ASD-302-9.32
PART 2



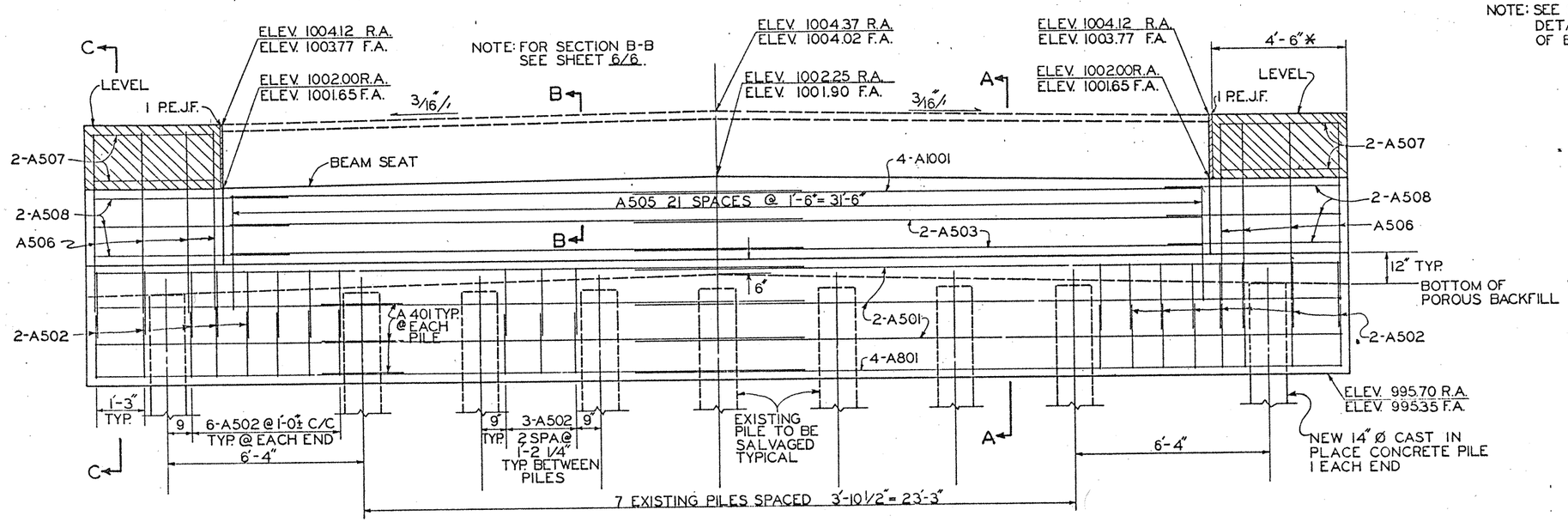
PLAN



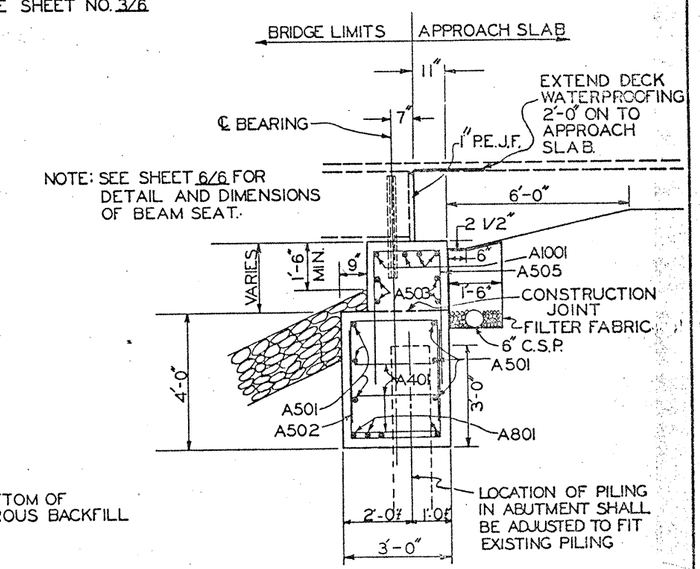
SECTION C-C

NOTE: POROUS BACKFILL SHALL EXTEND UPWARD TO THE PLANE OF THE SUBGRADE AND LATERALLY TO THE SURFACE OF THE EMBANKMENT. THE 6 C.S.P. SHALL EXTEND OUTWARD AND INTERSECT WITH SIDE SLOPE.

NOTE: SHADED AREAS INDICATE CONCRETE TO BE POURED AFTER THE BEAMS HAVE BEEN PLACED AND PRIOR TO POURING THE APPROACH SLABS.



ELEVATION



SECTION A-A

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

2/6

ABUTMENT DETAILS

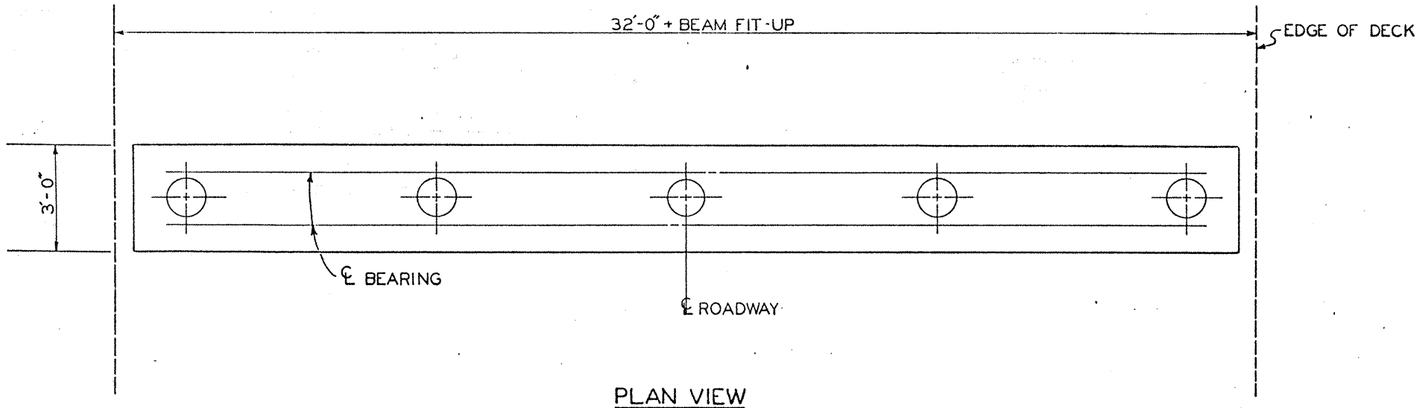
ASD-302-0934

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MA	DM	DM	KW 5-29-84	AEC	8-6-84	

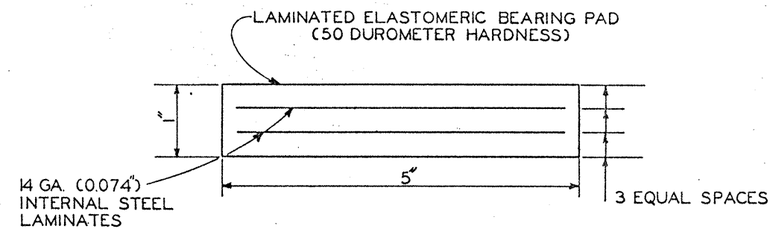
FHWA REGION	STATE	PROJECT	
5	OHIO		

30/34

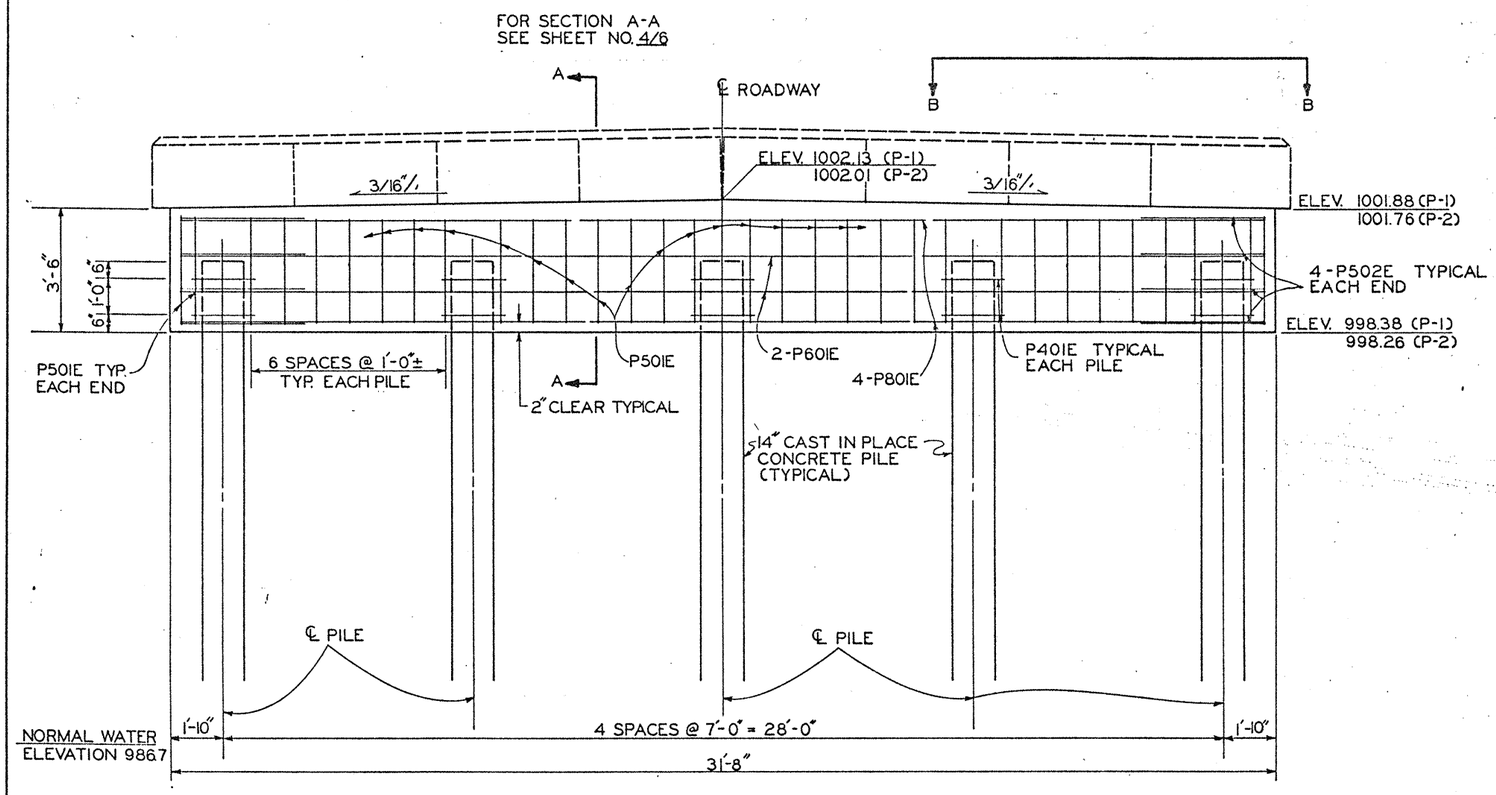
WAY-302-10.08
ASD-302-9.32
PART 2



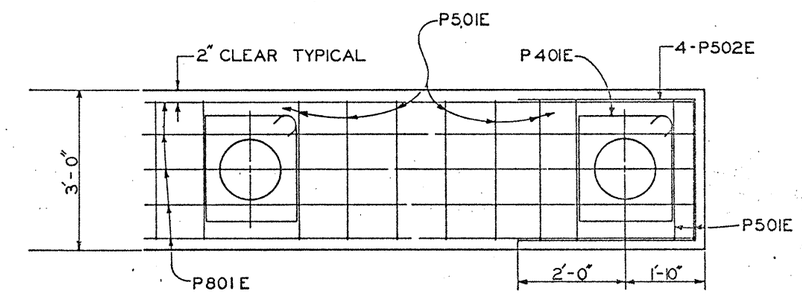
PLAN VIEW



SECTION X-X
BEARING PAD DETAIL



ELEVATION



SECTION B-B

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

3/6

PIER DETAILS

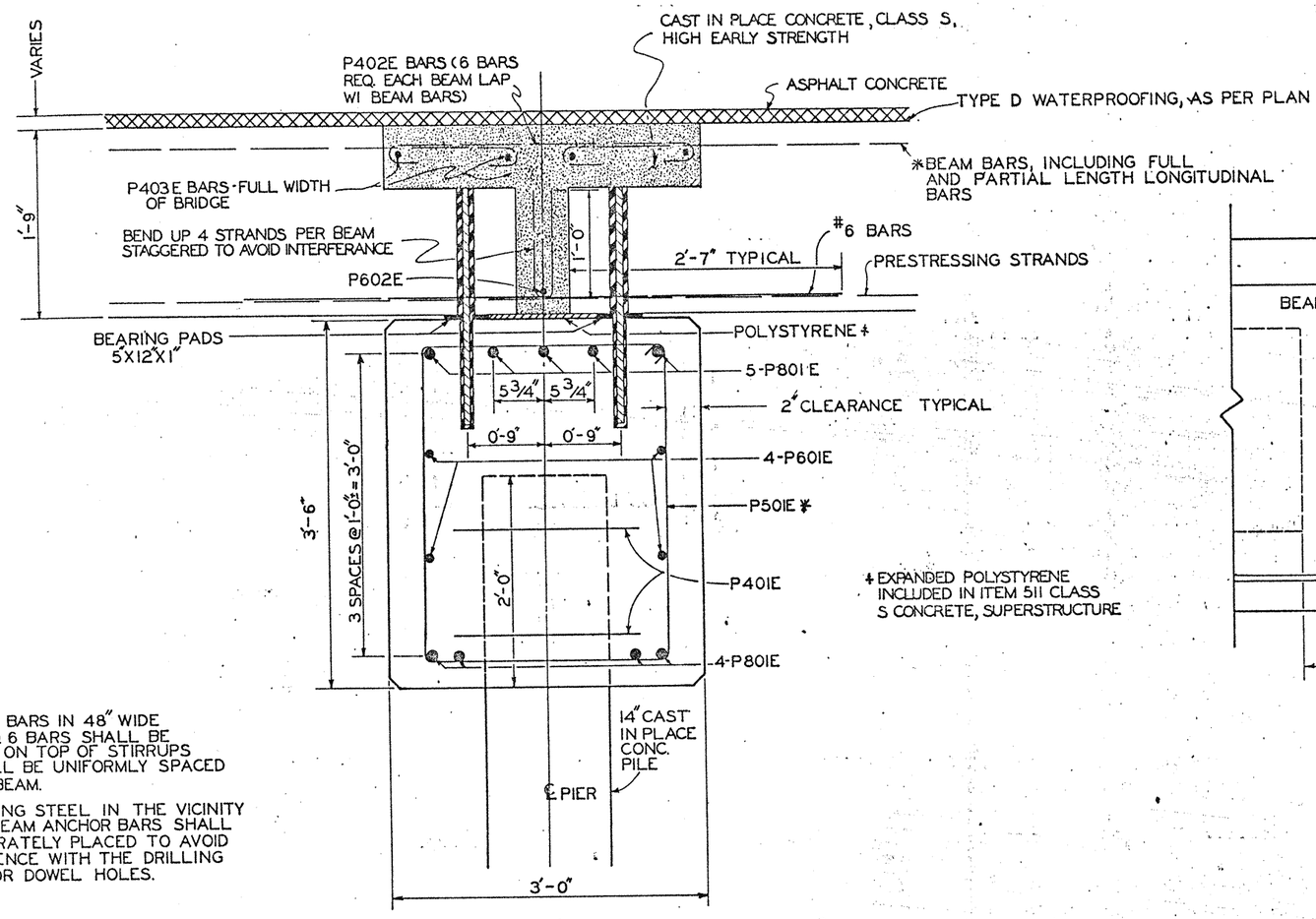
ASD-302-0934

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MJ	RDM	RDM	KW 5-24-84	ALL	8-6-84	

FHWA REGION	STATE	PROJECT	
5	OHIO		

31/34

WAY-302-10.08
ASD-302-9.32
PART 2



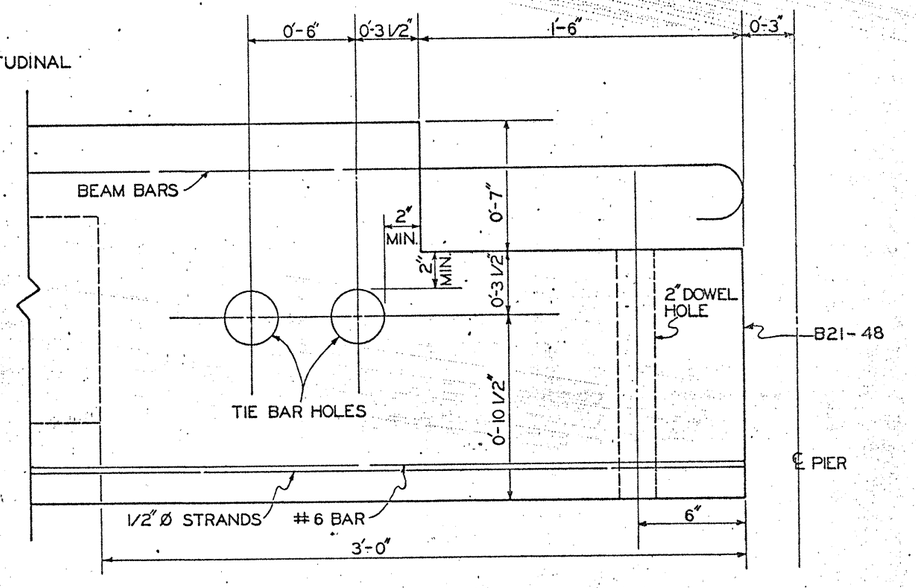
‡ EXPANDED POLYSTYRENE INCLUDED IN ITEM 511 CLASS S CONCRETE, SUPERSTRUCTURE

SECTION A-A

NOTES:

* USE 6-#6 BARS IN 48" WIDE BEAMS. NO. 6 BARS SHALL BE LOCATED ON TOP OF STIRRUPS AND SHALL BE UNIFORMLY SPACED ACROSS BEAM.

** REINFORCING STEEL IN THE VICINITY OF THE BEAM ANCHOR BARS SHALL BE ACCURATELY PLACED TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR DOWEL HOLES.



BEAM END DETAILS AT PIERS

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

PIER DETAILS

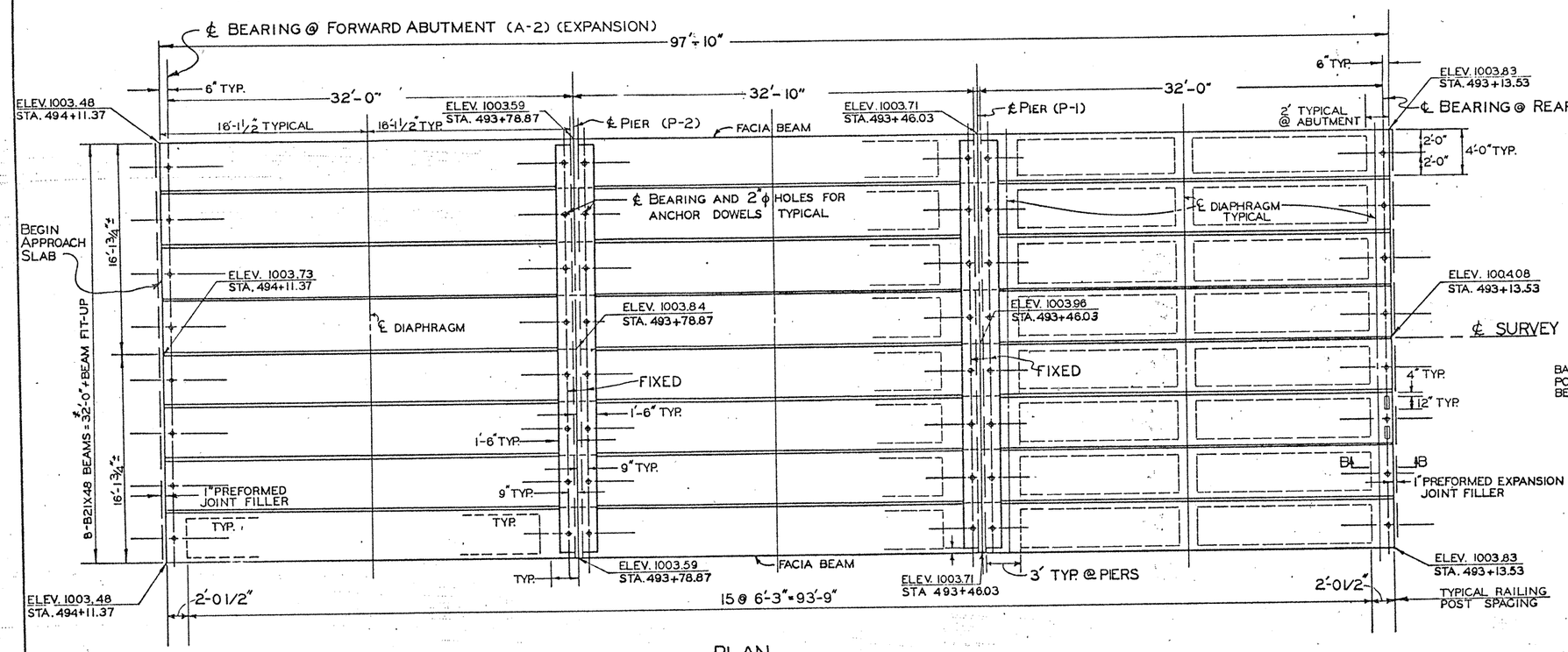
ASD-302-0934

DESIGNED	DRAWN	TRACED	CHECK	REVIEWED	DATE	REVISED
MJ	BM		XW 5-29-84	JCC	8-6-84	

FHWA REGION	STATE	PROJECT	
5	OHIO		

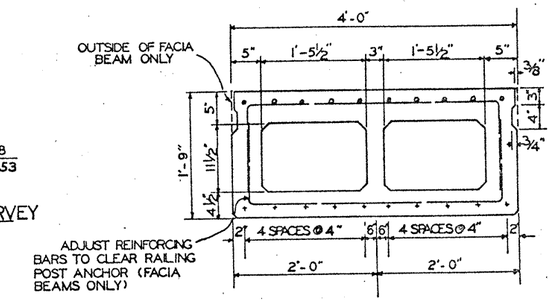
32/34

WAY-302-10.08
ASD-302-9.32
PART 2



PLAN

FOR BEAM END DETAIL AT PIERS SEE SHEET 4/6.

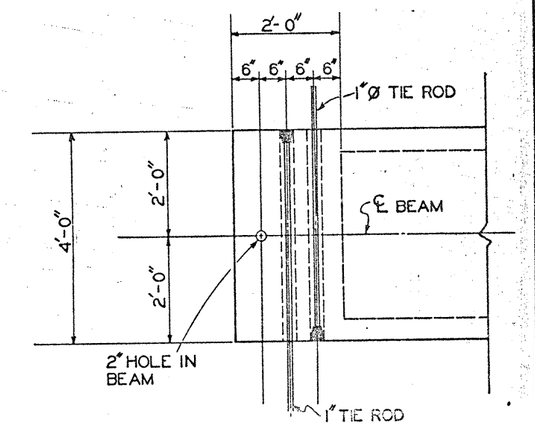


• = #4 BARS FULL LENGTH (EPOXY COATED)

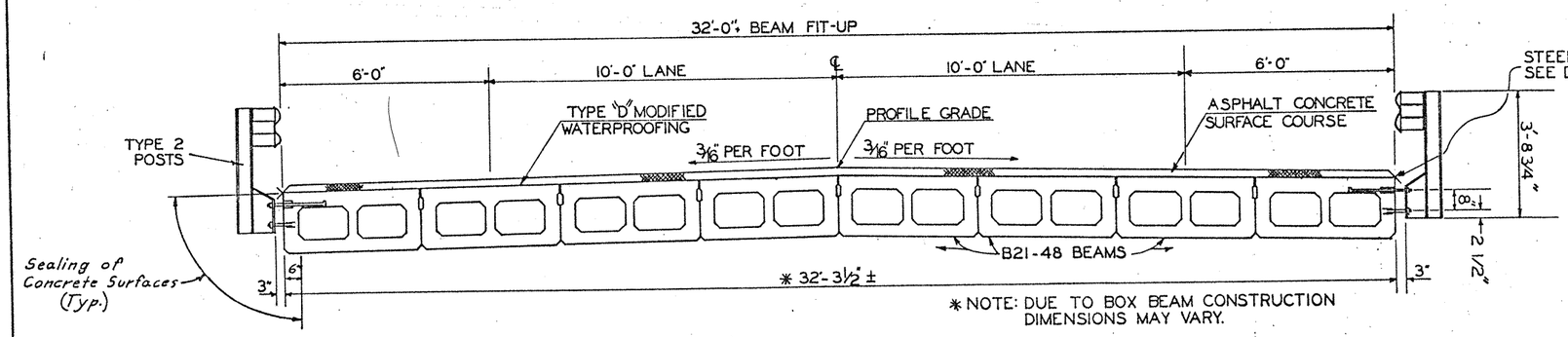
o = ADD 4 - #4 BARS 5'-7" LONG AT EACH END OF BEAM (EPOXY COATED)

+ = ½" ϕ 270K STRANDS

NOTE: SEE STD. DWG. PSBD-1-81, SEE SHEETS 1 AND 3 OF 4, FOR REINFORCING STEEL



BEAM END DETAIL AT ABUTMENTS



* NOTE: DUE TO BOX BEAM CONSTRUCTION DIMENSIONS MAY VARY.

TRANSVERSE SECTION

FOR SECTION B-B SEE SHEET 6/6.

NOTE: PRESTRESSING STRANDS SHALL BE 1/2" DIAMETER 270K SEVEN-WIRE, UNCOATED, STRESS RELIEVED STRANDS WITH AN INITIAL TENSION OF 28,900 LBS. PER STRAND, 10 STRANDS PER BEAM.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

5/6

SUPERSTRUCTURE DETAILS
ASD-302-0934

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
M.G.	DES	DES	XW 5-21-84	TEC	8-6-84	

FHWA REGION	STATE	PROJECT	
5	OHIO		

33
34

WAY-302-10.08
ASD-302-9.32
PART 2

ABUTMENT REINFORCING STEEL

MARK	REAR	FWD	NO.	LENGTH	TYPE	A	B	C	WEIGHT
A401	27	27	54	9'-10"	1	2'-8"	1'-9"		355
A501	12	12	24	21'-3"	STR.				532
A502	64	64	128	7'-11"	2	2'-7"	2'-6"	2'-7"	1123
A503	8	8	16	16'-10"	STR.				281
A505	22	22	44	9'-6"	2	3'-8"	1'-11"	3'-8"	436
A506	8	8	16	13'-1"	2	5'-10"	1'-2"	5'-10"	218
A507	8	8	16	4'-2"	STR.				70
A508	12	12	24	6'-5"	STR.				161
A801	8	8	16	22'-0"	STR.				940
A1001	8	8	16	18'-7"	STR.				1279
D801	22	22	44	6'-0"	3	3'-0"			705
								TOTAL	6100

PIER REINFORCING STEEL

MARK	REAR	FWD	NO.	LENGTH	TYPE	A	B	C	WEIGHT
P401E	10	10	20	8'-0"	1	2'-01/4"	1'-9"		107
P501E	32	32	64	12'-3"	1	3'-2"	2'-8"		818
P502E	8	8	16	9'-11"	2	3'-6"	2'-8"	3'-6"	165
P601E	4	4	8	30'-8"	STR.				376
P801E	9	9	18	31'-4"	STR.				1506
								TOTAL	2972

SUPERSTRUCTURE REINFORCING STEEL

MARK	REAR	FWD	NO.	LENGTH	TYPE	A	B	C	WEIGHT
P402E	48	48	96	4'-0"	4	2'-9"	0'-6"	0'-6"	257
P403E	4	4	8	30'-8"	STR.				164
P602E	1	1	2	30'-8"	STR.				92
								TOTAL	513

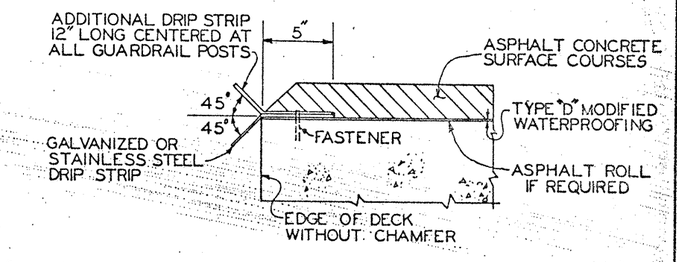
ESTIMATED QUANTITIES - BRS-485(5)

ITEM	TOTAL	UNIT	DESCRIPTION	SUPER	ABTS.	PIERS	GEN'L
202	LUMP	LUMP	STRUCTURE REMOVED				LUMP
403	17	CU.YD	ASPHALT CONCRETE AC-20	17			
404	13	CU.YD	ASPHALT CONCRETE AC-20	13			
503	LUMP	LUMP	UNCLASSIFIED EXCAVATION		LUMP		
505	LUMP	LUMP	PILE DRIVING EQUIPMENT MOBILIZATION				LUMP
507	560	LIN. FT.	14" CAST IN PLACE CONCRETE PILE (AS PER PLAN)		160	400	
509	6100	LBS.	REINFORCING STEEL GRADE 60		6100		
511	24	CU.YD	CLASS C, CONCRETE PIER CAP			24	
511	53	CU.YD	CLASS C, CONCRETE ABUTMENT		53		
511	6	CU.YD	CLASS S, CONCRETE SUPERSTRUCTURE (H.E.S.)	6			
512	363	SQ.YD	TYPE "D" WATERPROOFING, AS PER PLAN	363			
515	24	EACH	PRESTRESSED CONCRETE BOX BEAMS, B21-48 (32-3")	24			
516	96	EACH	5"X 12"X 1" *LAMINATED ELASTOMERIC BEARINGS*	96			
516	71	LIN. FT.	JOINT SEALER (705.02)		71		
516	118	SQ.FT.	1" PREFORMED EXPANSION JOINT FILLER		118		
516	20	SQ.FT.	1/8" PREFORMED BEARING PADS, 711.21	20			
517	196.00	LIN. FT.	RAILING (DEEP BEAM WITH STEEL TUBULAR BACK-UP TYPE 2 POSTS AND BOLTS	196.00			
518	133.00	LIN. FT.	6" *PERFORATED* HELICAL CORRUGATED STEEL PIPE 707.01				133.00
518	16	CU.YD.	POROUS BACKFILL, AS PER PLAN		16		
503	LUMP	LUMP	*COFFERDAMS, CRIBS AND SHEETING*				*LUMP*
824	3485	LBS.	EPOXY COATED REINFORCING STEEL, GRADE 60	513		2972	
SPECIAL	131	SQ.FT.	STEEL DRIP STRIP	131			
SPECIAL	*49*	*SQ.YD.*	*SEALING OF CONCRETE SURFACES (SEE PROPOSAL NOTE)*	*49*			

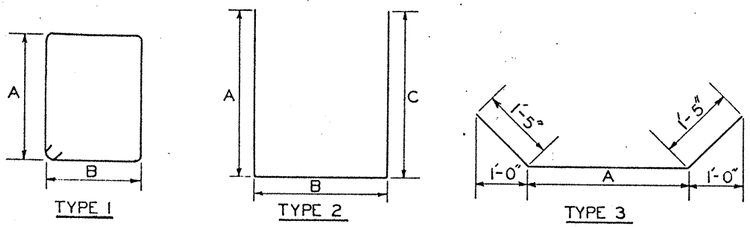
NOTE: 1/8" THICK PREFORMED PAD SHIMS, PLAN AREA 5"X 12" SHALL BE PLACED ON BEARINGS WHERE REQUIRED FOR PROPER BEARING. THE NUMBER SUPPLIED SHALL BE 2 SHIMS PER BEAM.

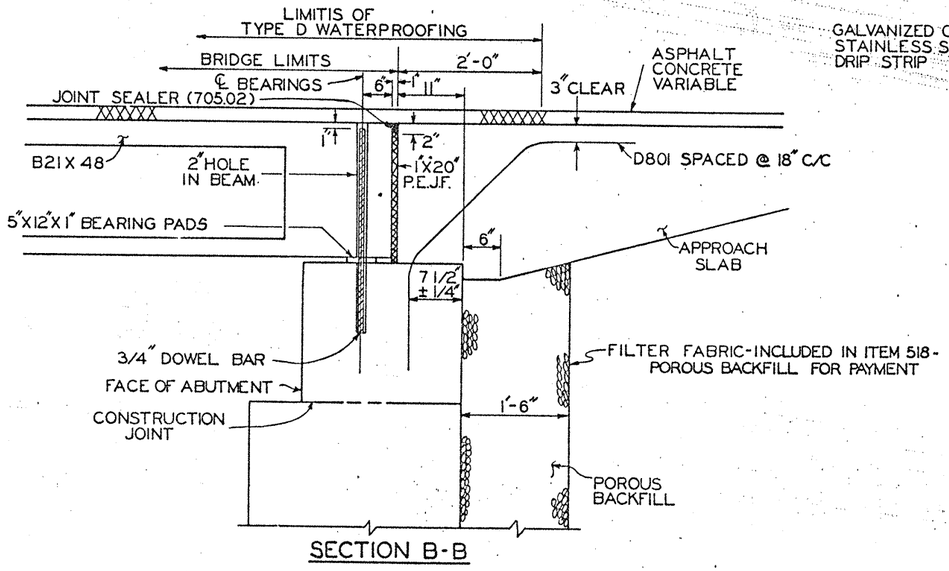
DRIP STRIP:

PRIOR TO APPLYING DECK 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 OR STEEL END DAM ANGLE. 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 GUAGE 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.

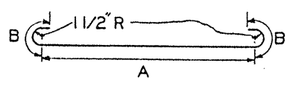


DRIP STRIP





SECTION B-B



TYPE 4

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT THREE

6/6

ESTIMATED

BRIDGE QUANTITIES

FOR ASD-302-0934

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MJ	DM	DM	KJ 5-27-04	JEC	8-6-04	

R.B.P.

STATE JOB NUMBER	FHWA REGION	STATE	PROJECT		
03929(0)	5	OHIO			

34 / 34

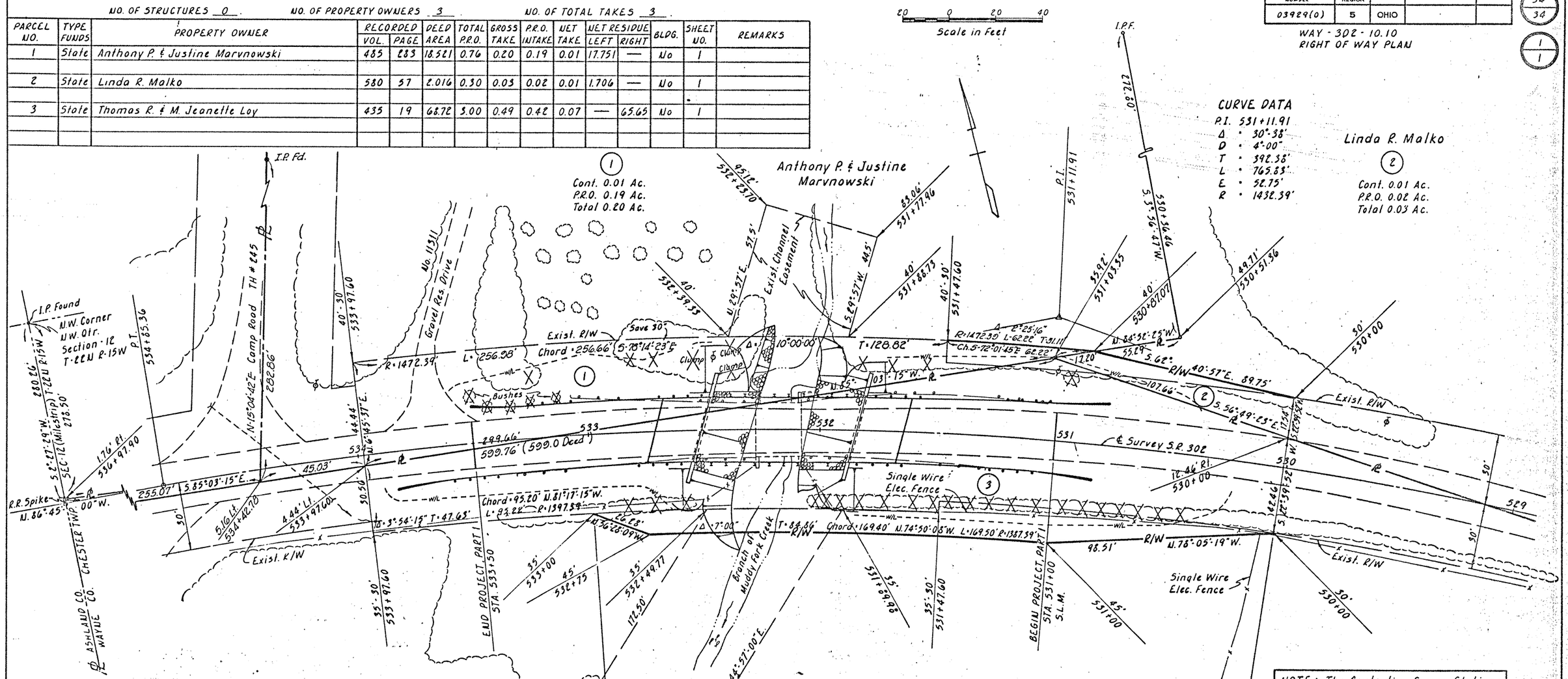
1 / 1

WAY - 302 - 10.10
RIGHT OF WAY PLAN

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

NO. OF STRUCTURES 0 . NO. OF PROPERTY OWNERS 3 . NO. OF TOTAL TAKES 3 .

PARCEL NO.	TYPE FUNDS	PROPERTY OWNER	RECORDED VOL.	RECORDED PAGE	DEED AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. INTAKE	NET TAKE	NET RESIDUE LEFT	NET RESIDUE RIGHT	BLDG.	SHEET NO.	REMARKS
1	State	Anthony P. & Justine Marvnowski	485	283	18.521	0.76	0.20	0.19	0.01	17.751	—	No	1	
2	State	Linda R. Malko	580	57	2.016	0.30	0.03	0.02	0.01	1.706	—	No	1	
3	State	Thomas R. & M. Jeanette Loy	435	19	68.72	3.00	0.49	0.42	0.07	—	65.65	No	1	



NOTE: The Centerline Survey Stations for the attached R/W Plan are running right to left.

UTILITY OWNER

TELEPHONE:
General Telephone Company of Ohio
1534 S.R. 511 South - P.O. Box 9
Ashland, Ohio 44805
Phone: (419) 289-6616

NOTE: Existing R/W Acquired from:
WAYNE CO.
S.H. 647 SEC. F
RIGHT OF WAY PLAN

TYPE FUNDS: STATE

PLAN COMPLETED: 7-3-84

REV. DATE	DESCRIPTION
7-16-84 P.W.S.	Trees revised Par 1, 2 & 3, drive revised Par. 1, fence defined Par. 3 and NOTE added about Ex. R/W

WAYNE COUNTY CHESTER TWP. N.W. QTR. SEC-12 TOWN-22N RANGE-15W (Mile Strip)

CALC. BY:	DATE:
CHK. BY:	DATE:

FHWA REGION	STATE	PROJECT	
5	OHIO	WAY-302-1010	

1/3

WAYNE COUNTY.

INTRODUCTION

THIS REPORT PRESENTS THE RESULTS OF A SOIL INVESTIGATION CONDUCTED AT THE SITE OF THE PROPOSED BRIDGE REPLACEMENT WAY-302-1010.

THE INVESTIGATION WAS MADE FOR DETERMINATION OF THE SUBSURFACE SOIL CONDITIONS AND ITS STRUCTURAL CHARACTERISTICS AND FOR EVALUATION OF HOW THOSE CONDITIONS WOULD INFLUENCE THE RETENTION OF THE BRIDGE ABUTMENT STRUCTURES.

FIELD INVESTIGATION AND LABORATORY TESTING

BETWEEN 9-12-83 & 12-14-83, TWO (2) SUBSURFACE SOIL EXPLORATORY BORINGS WITH SAMPLING WERE CONDUCTED AT THE PROPOSED CONSTRUCTION SITE. THE TEST BORINGS WERE PERFORMED USING A HEAVY TRUCK MOUNTED SOLID STEM CONTINUOUS ROTARY DRILL EQUIPPED WITH SPLIT BARREL SAMPLING EQUIPMENT. THE SAMPLINGS WERE CONDUCTED IN ACCORDANCE WITH ASTM D-1586, AS OUTLINED BELOW:

A. TWO INCH (2") SPLIT BARREL SAMPLES WERE TAKEN EVERY TWO FEET (2') FOR THE FIRST TWENTY FEET (20') AND 1 SAMPLE EVERY FIVE FEET (5') THEREAFTER OR AT CHANGE OF STRATA.

B. HAMMER BLOWS PER SIX INCH PENETRATION INTERVALS (0-6"; 6-12"; 12-18") WERE LOGGED WITH A 140 LB. HAMMER AT 30" DROP. STANDARD PENETRATION TEST RESULTS WERE ENTERED IN A DRILLERS LOG AND IDENTIFIED BY BORING NUMBER AND DEPTH.

C. "NX" ROCK CORING WAS PERFORMED ON EACH OF THE TEST BORINGS.

D. GROUNDWATER WAS NOTED AT ENCOUNTER AND ELEVATIONS WERE MEASURED AND RECORDED ON COMPLETION OF EACH TEST BORING WHEN APPROPRIATE.

E. IN THE LABORATORY ALL SAMPLES WERE EXAMINED AND VISUALLY CLASSIFIED BY A SOILS ENGINEER AND/OR TECHNICIAN. MOISTURE CONTENT, ATTERBERG LIMITS, AND GRAIN SIZE ANALYSIS WITH HYDROMETER WERE PERFORMED ON REPRESENTATIVE SAMPLES.

GEOLOGY

WAYNE COUNTY LIES IN THE ALLEGHENY PLATEAU PROVINCE. THE AREA IS A ROLLING UPLAND WITH BROAD FLAT VALLEYS AND RANGES IN ELEVATION FROM 837' TO 1320' ABOVE MEAN SEA LEVEL. THE SURFICIAL MATERIALS ARE GLACIAL IN ORIGIN AND CONSIST OF SILTY CLAYS, SAND, AND GRAVEL. THESE GLACIAL MATERIALS RANGE IN THICKNESS FROM ALMOST NOTHING IN THE HIGHER AREAS TO AS MUCH AS 150' IN THE STREAM VALLEYS. THE BEDROCK OF THIS AREA CONSISTS OF SHALES, SANDSTONES, AND COAL BEDS OF MISSISSIPPIAN AND PENNSYLVANIAN AGE.

LEGEND

- DRIVE SAMPLE AND/OR CORE BORING - PLAN VIEW.
- DRIVE SAMPLE AND/OR CORE BORING PLOTTED TO VERTICAL SCALE ONLY - PROFILE.
- FREE WATER OR WATER SEEPAGE.
- FIGURES BESIDE THE BORING LOG IN PROFILE INDICATE THE NUMBER OF BLOWS OF STANDARD PENETRATION TEST.
  - Y= NUMBER OF BLOWS FOR FIRST 6 INCHES.
  - Z= NUMBER OF BLOWS FOR SECOND 6 INCHES.
- AUGER SAMPLE.
- WATER ON ENCOUNTER IN BORINGS OR ON WATER SURFACE IN STREAM BED.
- WATER ON COMPLETION.
- ★ REPRESENT COMBINED PERCENTAGE OF SILT AND CLAY.

SOLAR TESTING LABORATORIES, INC.

BRIDGE FOUNDATION INVESTIGATION
FAST TRACK III BRIDGE PROGRAM
O.D.O.T. DISTRICT 3
WAY- 302-1010
OVER BRANCH OF MUDDY FORK CREEK

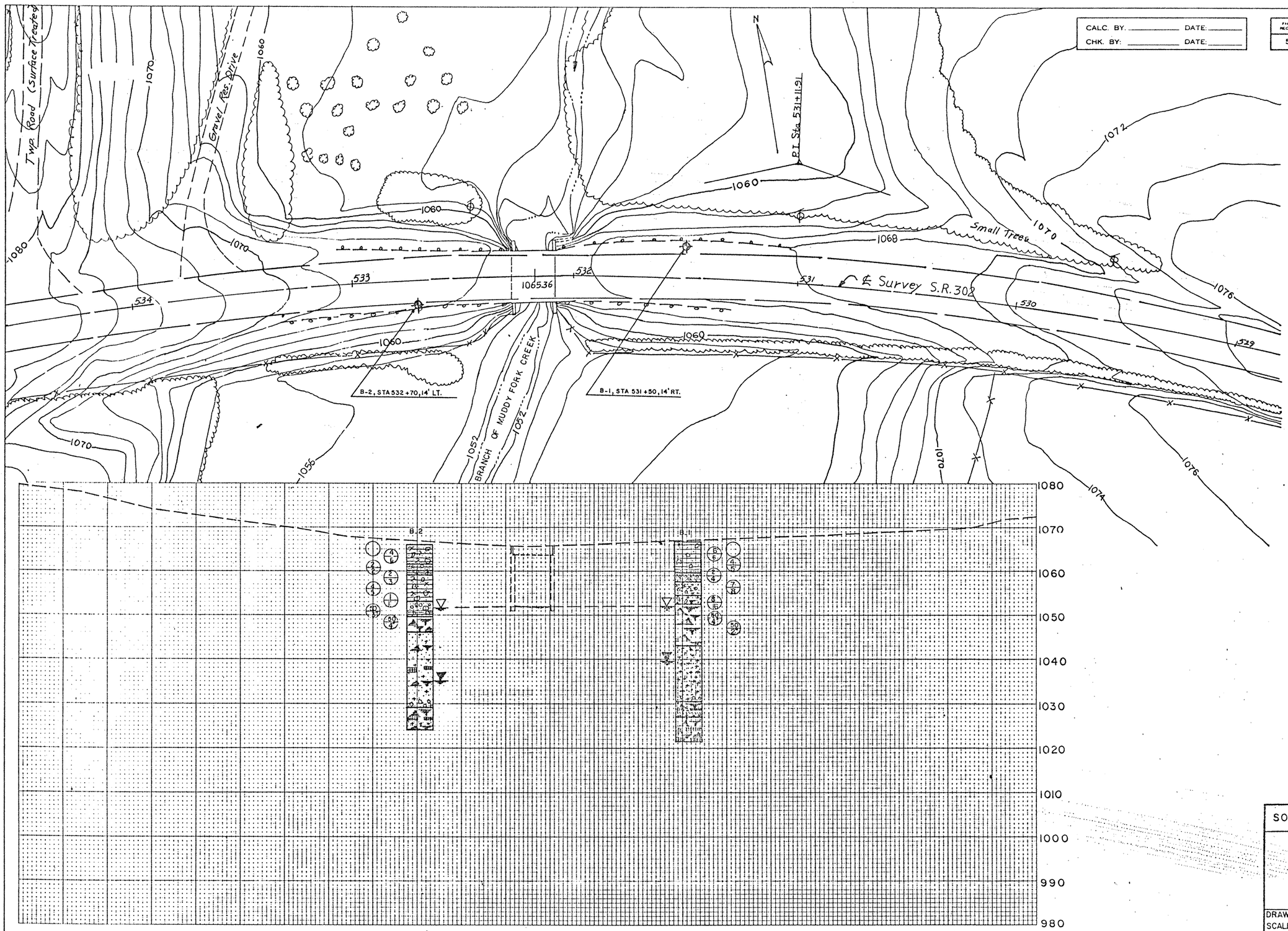
DRAWN BY GAZ	CHECKED BY	STL PROJECT NO.
SCALE 1"= 20'	DATE 12-29-83	A83305x10

CALC. BY.	DATE:
CHK. BY:	DATE:

FHWA REGION	STATE	PROJECT	
5	OHIO	WAY_302_1010	

WAYNE COUNTY

2/3



SOLAR TESTING LABORATORIES, INC.

BRIDGE FOUNDATION INVESTIGATION
FAST TRACK III BRIDGE PROGRAM
O.D.O.T. DISTRICT 3
WAY_302_1010
OVER BRANCH OF MUDDY FORK CREEK

DRAWN BY	CHECKED BY	STL PROJECT NO.
SCALE 1"= 20'	DATE 12-29-83	A83305x10

CALC. BY:	DATE:
CHK. BY:	DATE:

FHWA REGION	STATE	PROJECT	
5	OHIO	WAY-302-1010	

3 / 3

WAYNE COUNTY

SOLAR TESTING LABORATORIES, INC.

LABORATORY LOG OF BORING B-1 BORING DATE 12/14/83

OWNER O.D.O.T. DISTRICT 3 PROJECT WAY-302-1010

LOCATION STATION 531+50, 14' RT.

DRILLING METHOD SOLID STEM AUGER

SURFACE ELE. 1066.63' WATER ELE. 1052.13'

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-BARREL PENETRATION blows/6 in.	UNCONFINED COMPRESSIVE STRENGTH (Tons/ft.)	UNIT DRY WT. lbs./cu. ft.	PLASTIC LIMIT IN PERCENT	WATER CONTENT IN PERCENT	LIQUID LIMIT IN PERCENT	PHYSICAL CHARACTERISTICS: AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	SOIL CLASSIFICATION
	1	AS		FILL-STIFF BROWN SILTY CLAY TRACE SAND, FEW ROCK FRAGMENTS, TRACE FILL MATERIAL. (MOIST)	AUGER											
	2	SB			4-6-6											
5	3	SB			4-4-5											
	4	SB		LOOSE BROWN SAND & SILTY CLAY, TRACE GRAVEL. (MOIST)	4-2-4			N.P.	16.0	15.7	11.1	24.4	21.94	(42.	56)*	A-4a(0)
10	5	SB		MEDIUM DENSE MOTTLED BROWN & GRAY SAND, WITH INTERBEDDED MOTTLED BROWN & GRAY SILT, SOME GRAVEL, FEW ROCK FRAGMENTS, TRACE ORGANICS, IRON STAINS.	4-7-8			N.P.	17.0	17.3	36.3	6.76	22.74	(34.	20)*	A-2-4 (0)
	6	SB		MEDIUM DENSE BROWN SILTY SAND AND ROCK FRAGMENTS, LITTLE GRAVEL, FEW SANDSTONE FRAGMENTS, TRACE SHALE.	7-8-16				10.7		54.7	15.5	16.2	(13.	60)*	A-1-a (0)
15	7	SB		BROWN WEATHERED SHALE.	32-50/4"											
	8	SB			50/2"											
20				FINE GRAY SILTY SANDSTONE, FEW THIN DARK GRAY SHALE INTERLAYERS, FEW PYRITE NODULES.												
25				24.5' - 26' FEW INTERLAYERS OF MEDIUM - COARSE GRAY SANDSTONE (TRACE OF GRAVEL, TRACE OF PYRITE). 23.5' - 30.0' REC. = 69" (88.5%) RQD = 53.2% LONGEST = 12.25" SHORTEST = FRAGMENTS 30.0' - 35.0' REC. = 53.75" (89.6%) RQD = 62.9% LONGEST = 13.75" SHORTEST = 0.5"												
30																
35				DARK GRAY CLAY SHALE INTERBEDDED WITH SILTY SANDSTONE LITTLE SANDY SHALE, FEW SOFT SHALE AND CLAY INTERLAYERS. 35.0' - 40.0' REC. = 52.5" (87.5%) RQD = 40.8% LONGEST = 8.5" SHORTEST = FRAGMENTS												
40				DARK GRAY CLAY SHALE, FEW THIN INTERLAYERS OF SHALE FRAGMENTS AND CLAY. 40.0' - 45.0' REC. = 57.5" (95.6%) RQD = 47.5% LONGEST = 11.5" SHORTEST = FRAGMENTS												
45				END OF HOLE												
50																

SOLAR TESTING LABORATORIES, INC.

LABORATORY LOG OF BORING B-2 BORING DATE 12/14/83

OWNER O.D.O.T. DISTRICT 3 PROJECT WAY - 302 - 1010

LOCATION STATION 532+70, 14' LT.

DRILLING METHOD SOLID STEM AUGER

SURFACE ELE. 1065.86' WATER ELE. 1051.36'

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-BARREL PENETRATION blows/6 in.	UNCONFINED COMPRESSIVE STRENGTH (Tons/ft.)	UNIT DRY WT. lbs./cu. ft.	PLASTIC LIMIT IN PERCENT	WATER CONTENT IN PERCENT	LIQUID LIMIT IN PERCENT	PHYSICAL CHARACTERISTICS: AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	SOIL CLASSIFICATION
	1	AS		FILL-STIFF GRAYISH BROWN SILTY CLAY, LITTLE SAND, TRACE ORGANICS, ROCK FRAGMENTS, GLASS. (MOIST)	AUGER											
	2	SB			5-4-6			13.5	18.0	23.5	10.9	11.6	7.19	(70.	31)*	A-4a (7)
5	3			FILL-SOFT TO MEDIUM STIFF GRAYISH BROWN SILTY CLAY, SOME SAND, LITTLE ROCK FRAGMENTS, TRACE ORGANICS. (MOIST)	3-2-2			16.3	16.9	20.8	13.4	20.2	2.42	(63.	98)*	A-4a (6)
	4	SB		MEDIUM STIFF TO STIFF BROWN SILTY CLAY, LITTLE SAND, TRACE ORGANICS, LITTLE ROCK FRAGMENTS. (MOIST)	2-2-3			15.9	16.2	21.4	24.8	11.4	1.85	(61.	95)*	A-4a (5)
10	5	SB			3-4-5			15.7	16.2	24.6	13.9	5.68	16.79	(63.	63)*	A-4a (6)
	6	SB		VERY LOOSE BROWN AND GRAY GRAVELLY SAND, LITTLE SILTY CLAY, LITTLE ROCK FRAGMENTS (WET)	3-1-1						18.3	27.1	35.2	(19.	4)*	A-2-4 (0)
15	7	SB		GRAY WEATHERED SHALE. (MOIST)	50/3"											
20	8	SB		FINE GRAY SILTY SANDSTONE, FEW INTERLAYERS OF DARK GRAY SHALE, TRACE OF IRON STAINING, FEW INTERLAYERS OF DARK GRAY SHALE FRAGMENTS AND CLAY, FEW INCLINED AND VERTICAL FRACTURES, FEW FRACTURES CLAY-FILLED. INTERBEDS OF MEDIUM-COARSE	50/4"											
25				GRAY SANDSTONE, TRACES OF GRAVEL AND PYRITE (FROM 35' - 37'). 20.0' - 25.0' RUN REC. = 34" (54.7%) RQD = 6.7% LONGEST = 4.0" SHORTEST = FRAGMENTS 25.0' - 30.0' RUN REC. = 54" (90.0%) RQD = 27.5% LONGEST = 8.5" SHORTEST = FRAGMENTS 30.0' - 35.0' RUN REC. = 51" (85.0%) RQD = 25.8% LONGEST = 6.0" SHORTEST = FRAGMENTS												
30																
35				DARK GRAY CLAY SHALE, FEW INTERLAYERS OF CLAY, FEW INTERBEDS OF GRAY SILTY SANDSTONE. 35.0' - 42.0' RUN REC. = 72" (85.7%) RQD = 39.9% LONGEST = 6.75" SHORTEST = FRAGMENTS												
40																
45				END OF HOLE												
50																

SOLAR TESTING LABORATORIES, INC.

BRIDGE FOUNDATION INVESTIGATION

FAST TRACK III BRIDGE PROGRAM

O.D.O.T. DISTRICT 3

WAY-302-1010

OVER BRANCH OF MUDDY FORK CREEK

DRAWN BY	CHECKED BY	STL PROJECT NO.
SCALE 1" = 20'	DATE 12-29-83	A83305x10

TF - 119
600 - 6 - 73

GEOLOGY OF THE SITE

THE STRUCTURE SITE IS LOCATED IN THE HIGHLY DISSECTED GLACIATED PORTION OF THE ALLEGHENY PLATEAU REGION, ON THE BROAD FLOODPLAIN OF AND OVER ORANGE CREEK, IN AN AREA WHERE EXTREMELY DEEP GLACIAL AND ALLUVIAL DEPOSITS OVERLIE BEDROCK OF MISSISSIPPIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE BORINGS MADE BY MEANS OF A MECHANICALLY-POWERED HOLLOW STEM AUGER MOUNTED ON A MOBILE PLATFORM, PERFORMED ON MARCH 23, 1983.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE BORINGS ENCOUNTERED INTERVALS OF EXTREMELY LOOSE TO EXTREMELY DENSE UNSTRATIFIED BASIC SILTS, CLAYS, SAND AND GRAVEL MODIFIED WITH VARYING AMOUNTS OF EACH OTHER THAT GRADUALLY INCREASE (ERRATIC AT TIMES) IN DENSITY WITH INCREASE IN DEPTH. BORING B-1 (IN THE GENERAL VICINITY OF THE REAR ABUTMENT) PENETRATED TO A DEPTH OF 51.0 FEET, ELEVATION 944.5 FEET AND WAS TERMINATED AFTER PENETRATING IN EXCESS OF 16.0 FEET OF MATERIAL REQUIRING 26 OR MORE BLOWS PER FOOT IN THE STANDARD PENETRATION TEST. BORING B-2 (IN THE GENERAL VICINITY OF THE FORWARD ABUTMENT) PENETRATED TO A DEPTH OF 41.5 FEET, ELEVATION 956.5 FEET AND WAS TERMINATED AFTER PENETRATING IN EXCESS OF 11.5 FEET OF MATERIAL REQUIRING IN EXCESS OF 30 BLOWS PER FOOT IN THE STANDARD PENETRATION TEST. RUNNING SAND WAS ENCOUNTERED IN BORING B-2 AT 25.0-FOOT DEPTH, ELEVATION 973.0 FEET.

FREE WATER WAS OBSERVED AND MEASURED IN BORING B-1 AT 7.5-FOOT DEPTH, ELEVATION 988.0 FEET AND IN BORING B-2 AT 9.0-FOOT DEPTH, ELEVATION 989.0 FEET.

BEDROCK SURFACE WAS NOT ENCOUNTERED IN EITHER OF THE TEST BORINGS PERFORMED.

LEGEND

- Auger Boring Location - Plan View.
- Press and / or Drive Sample and / or Core Boring Location - Plan View.
- Drive Rod Penetration Resistance Sounding Location - Plan View.
- Capped Pile
- Footing
- Footing on Pile
- TR — Top of Rock
- Horizontal Bar on Boring Log Indicates the Depth the Sample Was Taken.
- X/Y/Z — Figures Beside the Boring Log In Profile Indicate the Number of Blows for Standard Penetration Test.
  - X = Number of Blows for First 6 Inches.
  - Y = Number of Blows for Second 6 Inches.
  - Z = Number of Blows for Third 6 inches.
- Drive Rod Penetration Resistance Sounding Log - Profile
- Casing
- Resistance "R" < 10,000 lbs.
- Resistance "R" > 10,000 lbs.
- Z — Indicates Final Measurement of Penetration, in Inches.
- W — Indicates Free Water Elevation.
- Indicates Static Water Elevation.

SYMBOLS OF ROCK TYPES

- Coal
- Weathered Mudstone or Claystone
- Mudstone or Claystone
- Weathered Sandstone
- Sandstone
- Leached Dolomite
- Dolomite
- Leached Limestone
- Limestone
- Boulders or Cobbles

GENERAL INFORMATION

Drive Rod Penetration Sounding Tests

Drive rod penetration resistance tests constitute driving a 1.315-inch diameter steel rod, with a 45° cone point, into the ground, using a 122-pound drop-hammer with a free fall of five feet. At one or two-foot depth intervals, a measurement is taken to determine the amount of penetration achieved in three hammer drops. This reading is converted to an empirical value for capacity "R", in thousands of pounds (which is a measure of both the point resistance and frictional resistance on the rod), by using charts prepared by the Ohio Department of Highways, Bureau of Bridges, on the basis of correlation study of rod penetration with past performance of pile driving. For interpretation, a graph is prepared by plotting the value "R" against the depth at which the reading was taken, and connecting the plotted points. The curve so obtained reflects the density of subsurface materials in a manner that can be readily compared with data from similar tests at other locations on the structure site. From this comparison, the overall uniformity of subsurface condition may be evaluated.

Drive Sample Borings - Drive-Press Sample Borings

Drive sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. sampler, at 2-1/2 and / or 5-foot depth intervals, driven by means of a 140 - pound drop-hammer with a free fall of 30 inches. The number of blows required to drive the sampler 18 inches is considered the standard penetration test.

Drive-press sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. drive sampler, and 3" O.D. thin-wall press sampler. The press sampler is advanced by continuous uniform pressure, applied by the drill rig.

The boring log sheets show a graphic plot of the information obtained, including depth and elevation of the sample, number of blows for the standard penetration tests in three 6-inch increments, depth of press samples, field sample number, sample description - based on laboratory tests and the Casagrande AC classification system - and gradation, plasticity, and moisture content determinations. Results of strength and consolidation testing, if performed, appear on separate enclosures.

At depths where materials are bouldery or gravelly to the extent that the sampler can not be driven, a wash sample is procured for visual classification, in order to determine the general character of the material. These samples are not considered sufficiently representative to warrant laboratory testing.

Particle Size Definitions

Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
	12"	3"	2.0mm (No. 10 sieve)	0.42mm (No. 40 sieve)	0.074mm (No. 200 sieve)	0.005mm

LOG OF BORING

Date Started 3-23-83
Date Completed 3-23-83
Boring No. B-1
Sampler Type SS Dia. 1 3/8"
Casing: Length _____ Dia. _____
Station & Offset 273+13, 65' LT. (REAR ABUTMENT)
Water Elev. 988.0'
Surface Elev. 995.5'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
995.5	0														
993.0	2														
	4	3/2/7			BROWN GRAVELLY SANDY SILT	1	18	19	22	23	18	26	6	19	A-4a
990.5	6														
		2/1/2			BROWN SILTY SAND	2	13	25	34	15	13	NP	NP	26	A-3a
988.0	8														
		2/1/1			BROWN SAND AND GRAVEL	3	-	-	-	-	-	-	-	23	VISUAL
985.5	10														
		2/1/3			BROWN AND GRAY SILT AND CLAY	4	0	1	1	70	28	37	14	32	A-6a
983.0	12														
		3/2/4			BROWN AND GRAY SILT AND CLAY	5	0	0	2	59	39	33	11	34	A-6a
980.5	14														
		2/2/4			GRAY WITH BROWN SANDY CLAY	6	6	10	14	30	40	37	17	27	A-6b
978.0	16														
		2/5/5			BROWN AND GRAY SANDY CLAY	7	10	12	19	33	26	29	12	21	A-6a
975.5	20														
		2/3/3			BROWN AND GRAY GRAVELLY SANDY CLAY	8	16	10	12	33	29	32	12	32	A-6a
	22														
	24														
970.5															
	26	6/6/9			BROWN SILTY SANDY GRAVEL	9	43	22	15	11	9	NP	NP	17	A-1-b
	28														
965.5	30														
		5/9/13			BROWN AND GRAY GRAVELLY SANDY SILT	10	17	21	14	24	24	24	7	16	A-4a
	32														
	34														
960.5															
	36	7/14/18			GRAY GRAVELLY SANDY SILT	11	22	19	19	19	21	20	5	20	A-4a
	38														
955.5	40														
		29/33			GRAY SAND	12	12	66	14	1	7	NP	NP	16	A-1-b
	42														
	44														
950.5															
	46	10/13/13			GRAY SILTY GRAVELLY SAND	13	28	30	19	13	10	NP	NP	12	A-1-b
	48														
945.5	50														
944.5		26/28			GRAY SILTY SAND	14	14	60	16	4	6	NP	NP	14	A-1-b

BOTTOM OF BORING

LOG OF BORING

ARTESIAN CONDITION ELEV. 973.0'

Date Started 3-23-83
Date Completed 3-23-83
Boring No. B-2
Sampler Type SS Dia. 1 3/8"
Casing: Length _____ Dia. _____
Station & Offset 274+34, 65' LT. (FORWARD ABUTMENT)
Water Elev. 989.0'
Surface Elev. 998.0'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
998.0	0														
995.5	2														
	4	P.S.			BROWN SILTY SAND	1	-	-	-	-	-	-	-	9	VISUAL
993.0	6														
		1/1/11			BROWN SILTY GRAVELLY SAND	2	24	12	31	21	12	NP	NP	10	A-2-4
990.5	8														
		3/3/3			BROWN SILTY GRAVELLY SAND	3	22	26	26	17	9	NP	NP	17	A-3a
988.0	10														
	12	1/1/1			BROWN AND GRAY CLAYEY SILT	4	0	1	19	50	30	26	7	27	A-4b
	14														
983.0															
	16	1/1/4			BROWN AND GRAY SANDY SILT	5	4	4	16	50	26	27	7	29	A-4b
	18														
978.0	20														
		6/16/16			BROWN AND GRAY SANDY SILT	6	5	6	11	36	42	29	10	17	A-4a
	22														
	24														
973.0															
	26	--			BROWN SILTY SAND SAND HEAVED UP 5' IN FLIGHT AUGER	7	2	30	56	6	6	NP	NP	19	A-3a
	28														
968.0	30														
		18/40			GRAY SILTY SANDY GRAVEL	8	50	21	13	11	5	NP	NP	10	A-1-b
	32														
	34														
963.0															
	36	9/19/31			BROWN WITH GRAY SILTY SANDY GRAVEL	9	44	11	11	26	8	20	4	18	A-2-4
	38														
958.0	40				BOTTOM OF BORING ELEV. 956.5' - 41.5'										
956.5		31/24/40			GRAY WITH BROWN SILTY GRAVELLY SAND	10	37	22	23	11	7	NP	NP	11	A-1-b

NOTE - ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1600 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

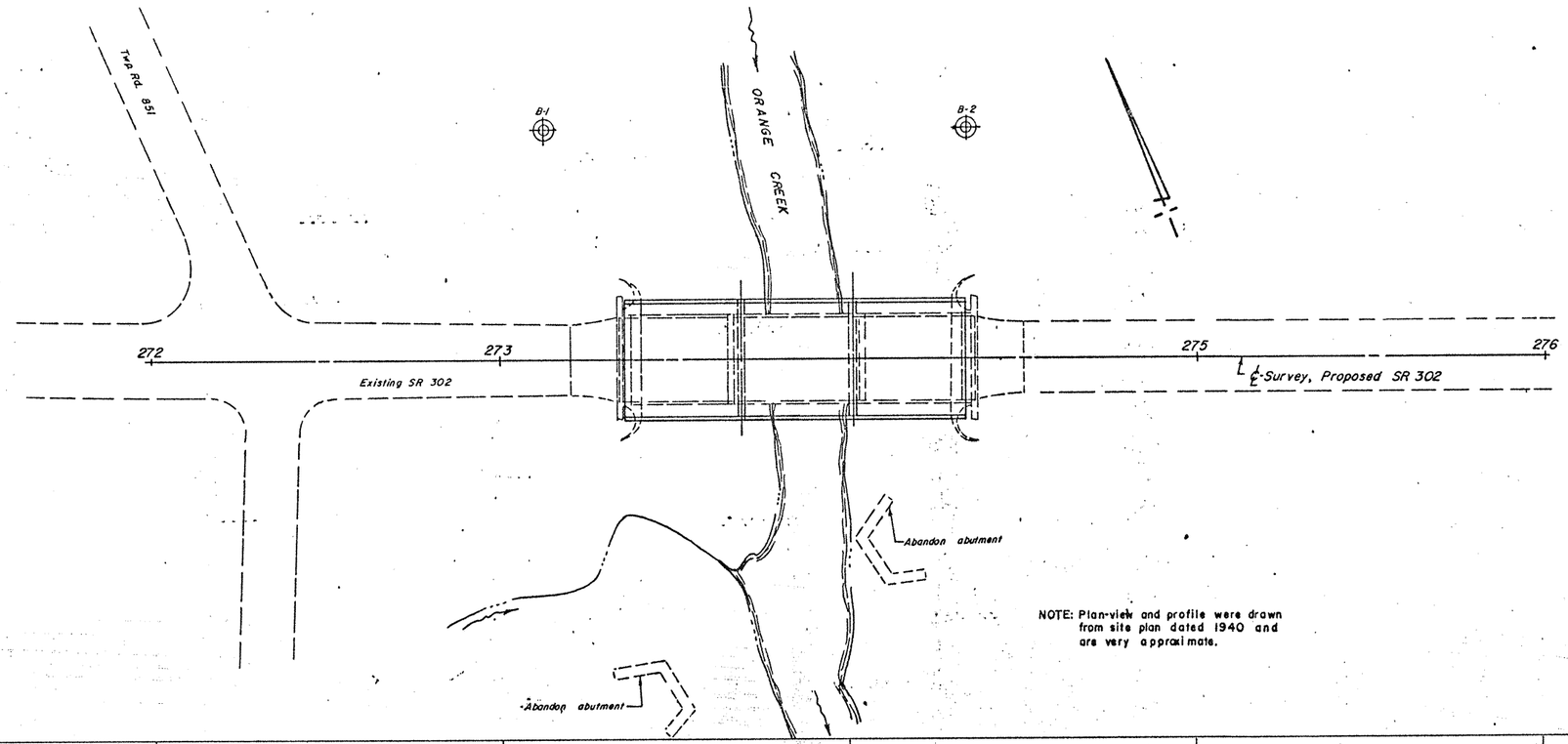
NOTE: Information shown by the subsurface investigation was performed solely for the use in establishing design controls for the project. The State of Ohio does not guarantee the accuracy of this data and it is not to be construed as a part of the plans governing construction of the project.

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS — TESTING LABORATORY
1600 WEST BROAD STREET, COLUMBUS, OHIO 43223

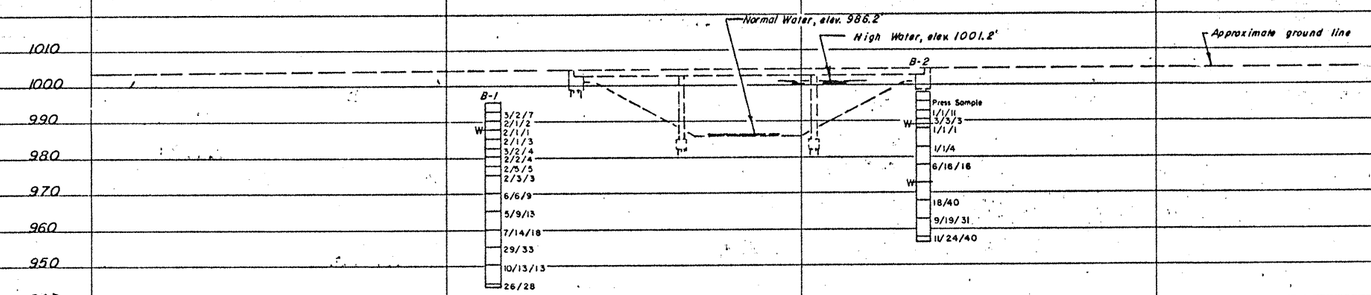
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ASD-302-0934
OVER ORANGE CREEK
SEC. ASD-302-9.34

CHECKED BY	REVIEWED BY	DATE
L. N. L.	R. D. R.	7/7/83

ASD-302-9.34



NOTE: Plan-view and profile were drawn from site plan dated 1940 and are very approximate.



SCALE: 1" = 20'

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-TESTING LABORATORY
1600 WEST BROAD STREET, COLUMBUS, OHIO 43223

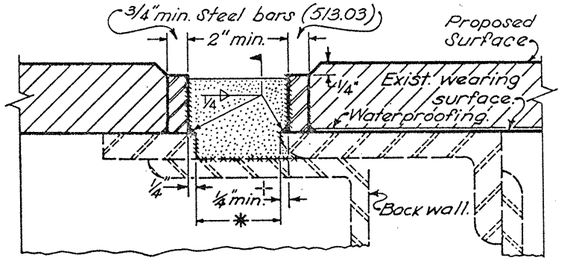
STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. ASD-302-0934
OVER ORANGE CREEK
SEC. ASD-302-9.34

PLAN AND PROFILE

DRAWN BY	CHECKED BY	REVIEWED BY	DATE
A. F.	L. N. L.	R. D. R.	7/7/83

RESURFACING

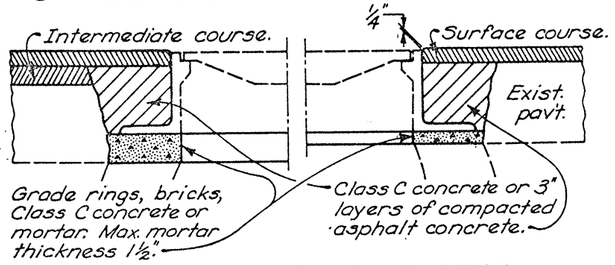
+ Increase as necessary to maintain 2" min. opening.
* Vertical extension of joints found to be closed to 1/2" or less may be non-performed as directed by the Engineer.



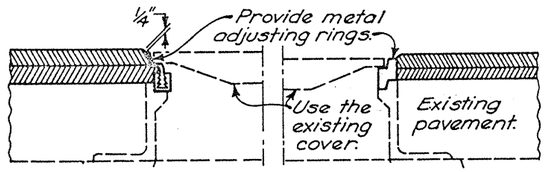
As a part of item 516, seal joint with a hot-applied bridge deck waterproofing material which also meets the requirements of 705.01. Sandblast vertical surfaces (⁞⁞) and wipe clean. Seal joint before rust forms. If rust forms, re-sandblast. Use bond breaker on the horizontal surface (⁞⁞⁞⁞⁞⁞⁞⁞).

MAINTENANCE OF TRAFFIC: Generally the bars shall be welded while the lane is closed for waterproofing or resurfacing. However, if traffic is routed over the bars before resurfacing, temporary ramps shall be constructed to the tops of the bars using 402 or 404 feathering at a max. slope of 6 ft/in. The ramps shall be removed prior to resurfacing. Payment for placing and removing the ramps shall be included in the lump sum bid for Item 614.

VERTICAL EXTENSION OF STRUCTURAL EXPANSION JOINTS



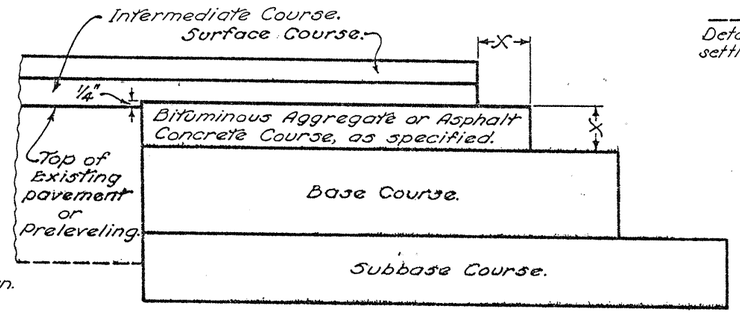
USING CONCRETE OR MORTAR



Metal adjusting rings shall fasten or tighten securely in the existing frame, or be welded permanently to the frame and be one piece or fabricated into one piece. Any installation unacceptable to the Engineer, including a poorly seated cover, shall be replaced by the Contractor at his expense.

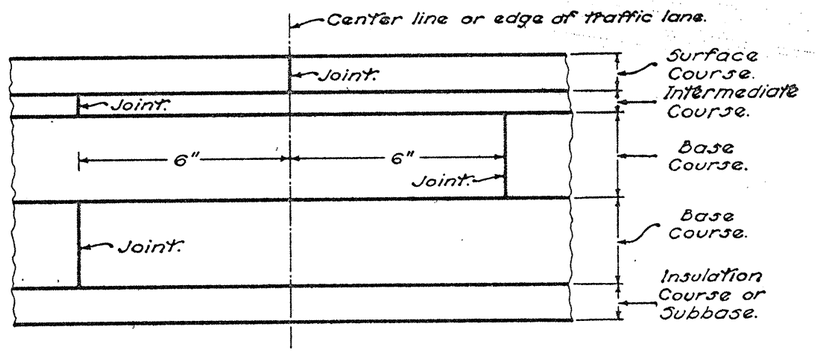
USING METAL ADJUSTING RINGS

MANHOLES ADJUSTED TO GRADE

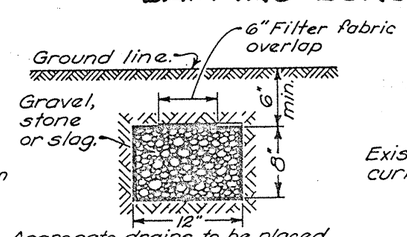


The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified, it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 1/4" above the preleveling.

COURSE DETAIL FOR WIDENING

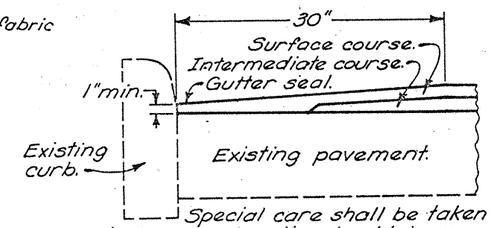


LAPPING LONGITUDINAL JOINTS



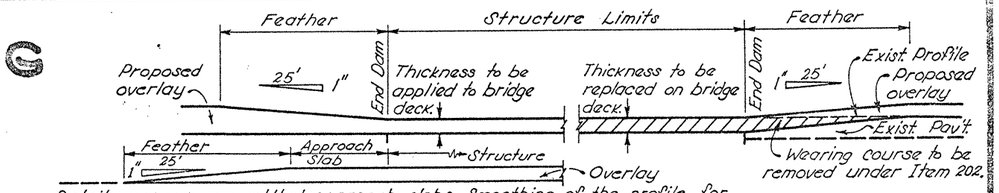
Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item.

AGGREGATE DRAIN



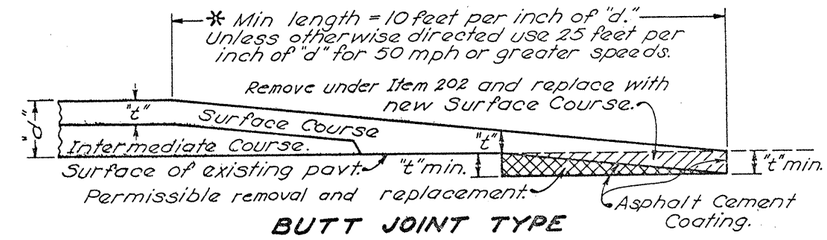
Special care shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

GUTTER FINISH

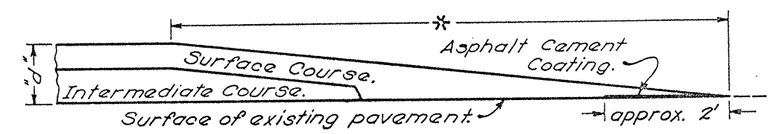


Details assume non-settled approach slabs. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES



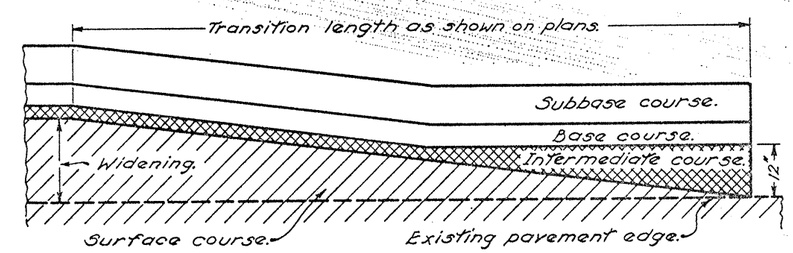
BUTT JOINT TYPE



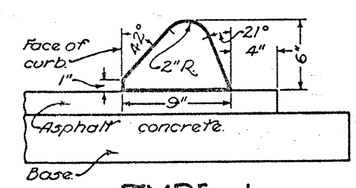
FEATHER EDGE TYPE

NOTE: Either butt or feather type may be used unless type is specified by the plan.

PLACING FEATHERED AREAS



MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



TYPE I ASPHALT CONCRETE CURB

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

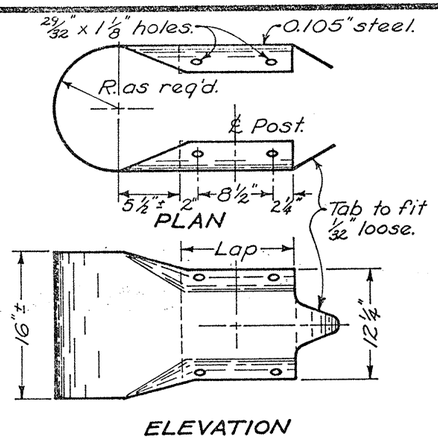
RESURFACING

DATE
6-1-65
1-1-71
6-1-72
6-11-75
4-16-79
7-16-81

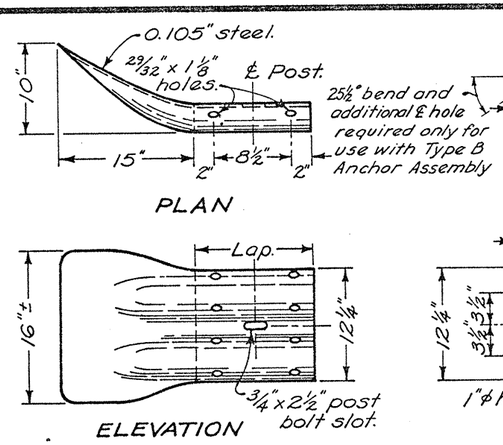
STANDARD CONSTRUCTION DRAWING BP-5

APPROVED [signature] ENGR., L.D.

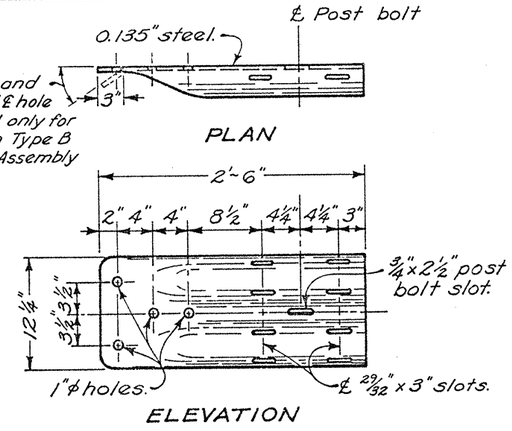
302-10.08
302-9.32
Wid-
Asp-
34



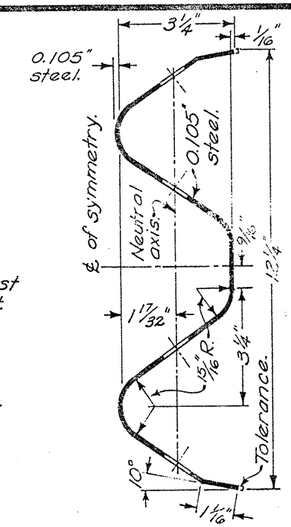
BUFFER END SECTION



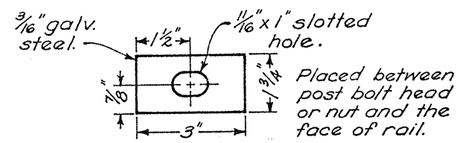
FLARED END SECTION



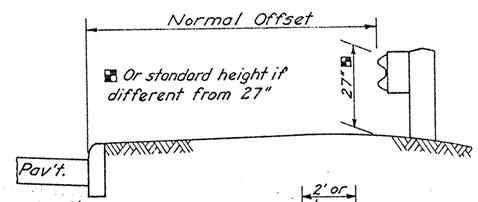
TERMINAL CONNECTOR

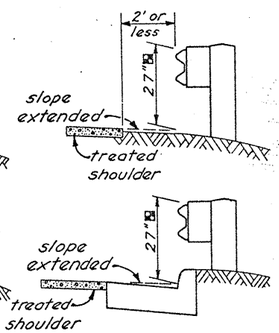


SECTION BEAM RAIL

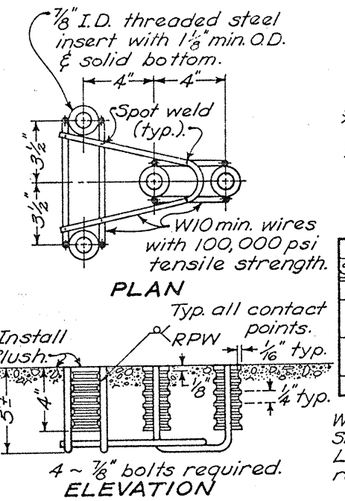


RECTANGULAR PLATE WASHER

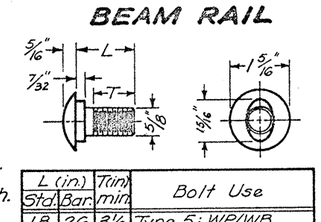




GUARDRAIL HEIGHT



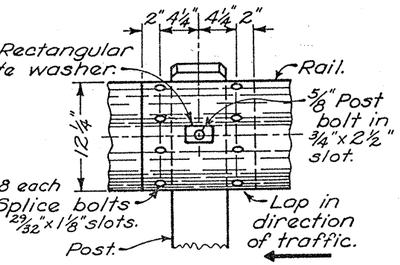
CONCRETE INSERT ANCHOR ASSEMBLY



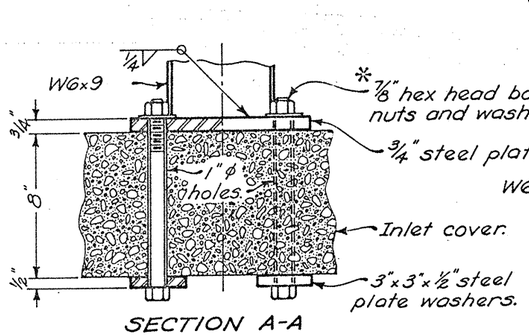
L (in.) Std.	L (in.) Bar.	T (in.) min.	Bolt Use
18	26	3 1/2	Type 5: WP/WB
10		2 1/2	Type 4: WP Type 5: SP/WB
2		1 1/2	Type 4: SP Type 5: SP/SB or WP/SB
1 1/4		Full	Splice bolt

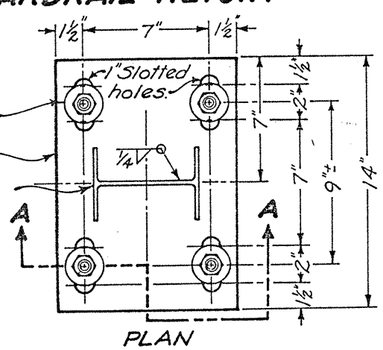
WP = wood post WB = wood block
SP = steel post SB = steel block
Longer bolt may be needed for round WP larger than 8" dia.

BUTTON HEAD BOLT
(For post and splice bolts)

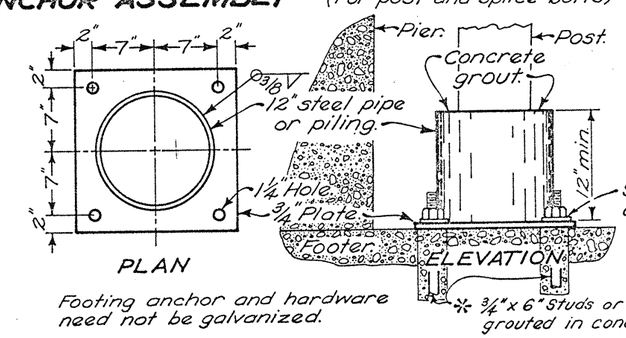


BEAM RAIL SPLICE





INLET MOUNTED POST



Footing anchor and hardware need not be galvanized.

FOOTING ANCHOR

NOTES

BEAM RAIL ELEMENTS shall be 12'-6" effective length, unless otherwise specified, with 3/4" x 2 1/2" post bolt slots on 6'-3" centers regardless of post spacing. Field punching or drilling of bolt holes or slots for irregularly spaced posts shall be according to 606.05.

BEAM RAIL SPLICE between two rail elements, or rail and terminal connector shall be lapped in the direction of traffic. The buffer or flared end sections shall lap on the traffic face. A 12" length of beam rail (Back-Up Plate), with a 3/4" dia. bolt hole or a 3/4" x 2 1/2" slot, shall be provided at posts not having a rail splice.

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

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

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

STEEL POSTS are specified as 9# or 15# but 8.5# and 15.5# sizes respectively may be used.

* **ANCHORS** conforming to 712.01, or anchors per FF-S-325 Group II, Type 4, Class 1 or 2 or Group VIII, Type 1 or 2 with proof load certification per 712.01, may be substituted with the same bolt diameter specified. If there is any question of deteriorated concrete, expansion anchors will not be allowed, as determined by the Engineer. Where self-drilling anchors are permitted and used for guardrail construction, the holes shall be drilled with the expansion shield (not by a drill bit) and the shield shall be installed flush with the concrete surface.

The Engineer shall visually inspect, after installation, all expansion anchors used in guardrail construction. The Engineer may require the Contractor to test load any expansion anchor to 1/4 the certified proof load in direct pull. The equipment and method used shall meet the approval of the Engineer. Each expansion anchor that fails to meet the test requirements shall be reset or removed and replaced with bolts extending through the concrete or grouted in place, as directed by the Engineer.

PROTECTIVE COATING: In lieu of the requirements of 710.10, expansion shields, anchors and insert anchor assemblies installed (embedded) in concrete may be coated according to good commercial practices. Any bolts screwed into these embedded devices shall meet 710.10.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

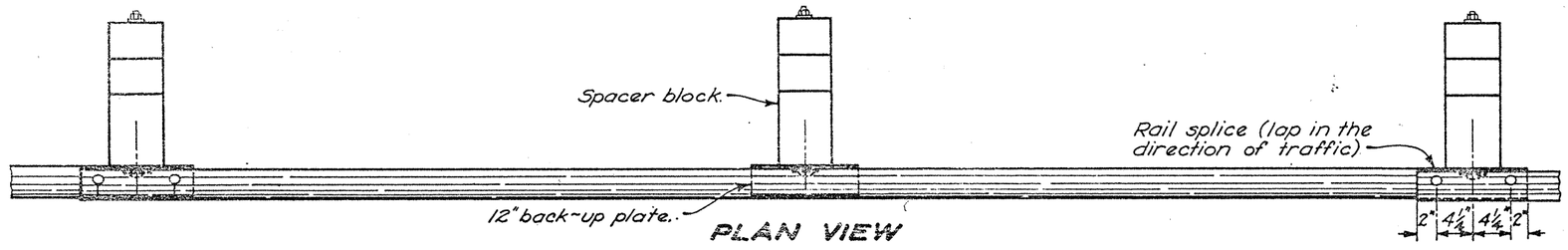
GUARDRAIL DETAILS

DATE 12-6-76 2-5-82

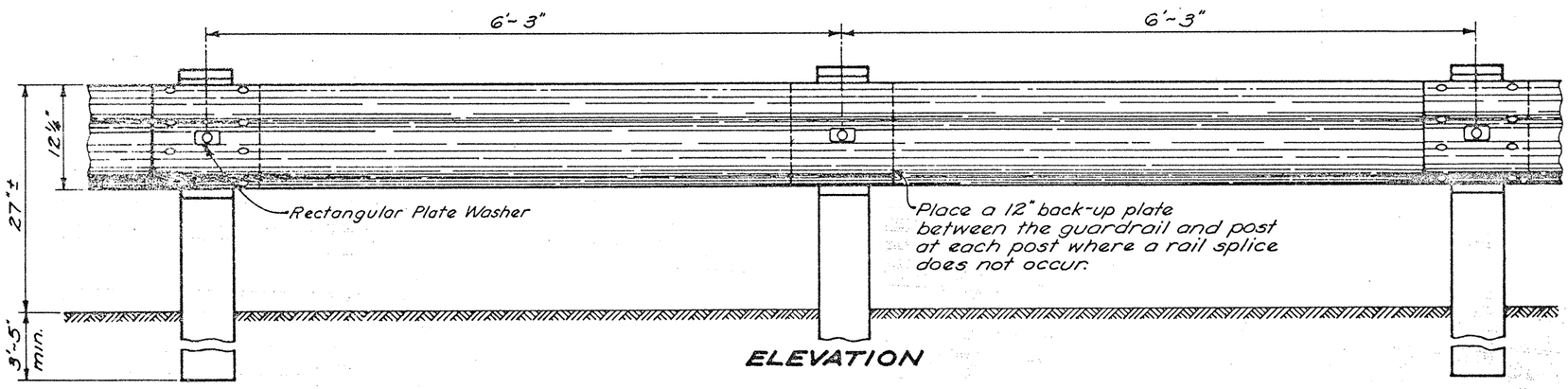
STANDARD CONSTRUCTION DRAWING

GR-1

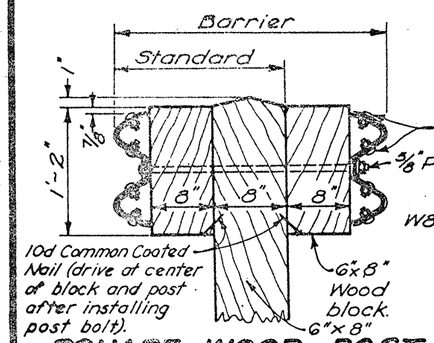
APPROVED [signature] ENGR., L. & D.



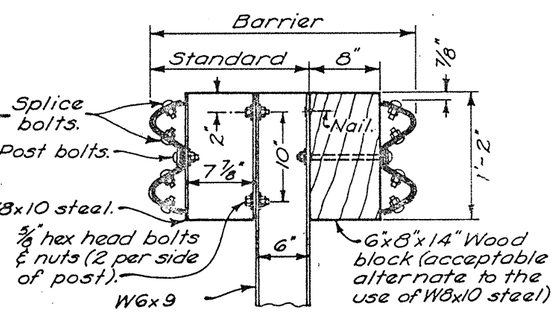
PLAN VIEW



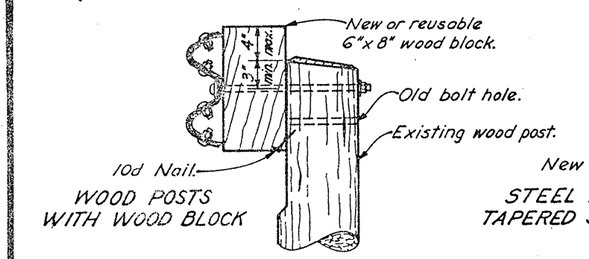
ELEVATION



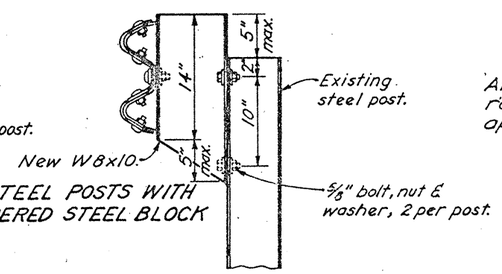
SQUARE WOOD POST



STEEL POST

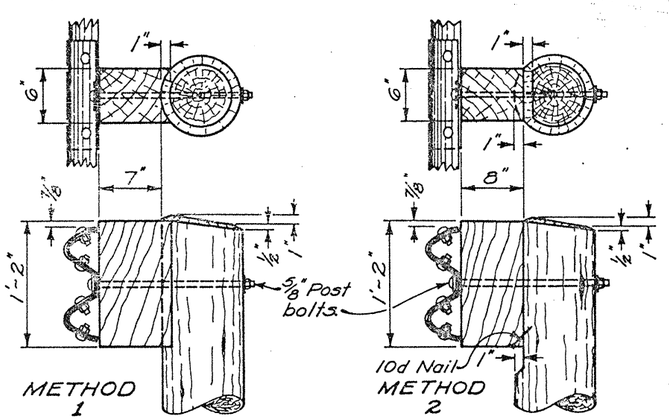


WOOD POSTS WITH WOOD BLOCK



STEEL POSTS WITH TAPERED STEEL BLOCK

RAISING EXISTING GUARDRAIL HEIGHT



Alternate methods of placing the spacer blocks on the round posts may be submitted for consideration and approval by the Engineer.

ROUND WOOD POSTS

NOTES

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

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

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

FOR DETAILS not shown see GR-1.

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

WASHERS: Place a rectangular plate washer between the face of rail and post bolt head or nut. All other washers indicated are standard galvanized steel of the appropriate size.

WELDED BEAM guardrail posts and spacer blocks may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A769, Class 1 using A36 steel with the following exceptions:

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

11. Ultrasonic inspection need not be performed on welded beams used for Item 606.

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

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

STEEL BEAM POSTS & BLOCKS

Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W 6x8.5	5.83"	3.94"	.194"	.170
Rolled W 6x9	5.90"	3.94"	.215"	.170
Rolled W 8x10	7.89"	3.94"	.205"	.170
Welded 6x8.5	6.10"	3.94"	.194"	.170
Welded 6x9	6.0"	3.94"	.215"	.170
Welded 8x10	8.0"	3.94"	.205"	.170

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

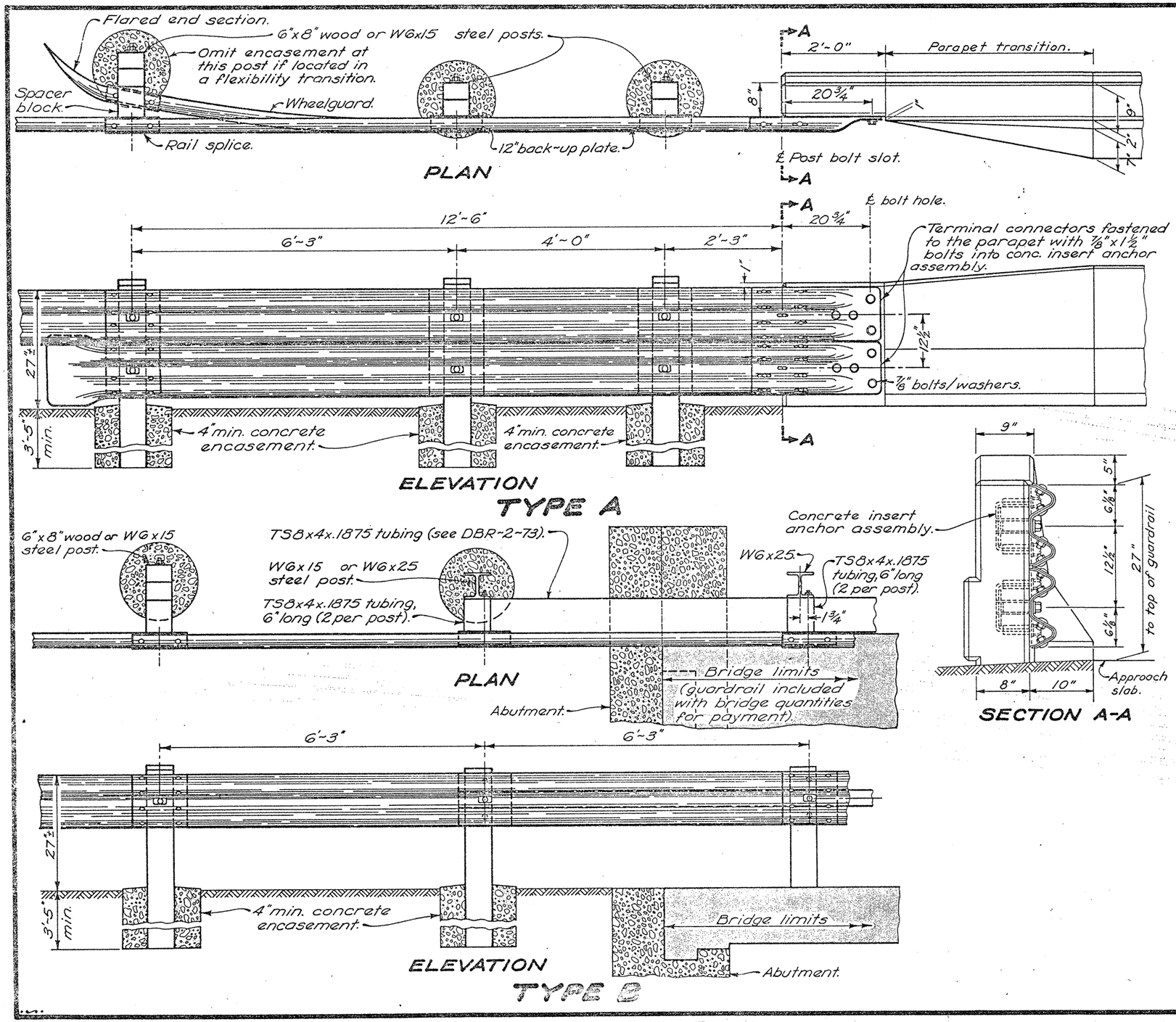
GUARDRAIL
TYPE 5

DATE
2-15-60
1-1-71
11-9-71
12-6-76
2-5-82

STANDARD CONSTRUCTION DRAWING

GR-2B

APPROVED _____ ENGR., L.&D.



NOTES

PAYMENT for item 606, each, Bridge terminal assembly, Type ___, shall include the additional cost in excess of normal guardrail cost, such as: additional or heavier posts, concrete encasement, wheelguard, terminal connector, and other hardware, etc.; except, the TS8x4 spacers and tubing outside the bridge limits, and the concrete insert anchor assemblies are included in the bridge rail or parapet cost.

TYPE A: The wheelguard shall be required on all uncurbed approach connections and on all uncurbed trailing connections on undivided highways. The wheelguard shall be omitted: on all curbed connections, on uncurbed trailing connections on divided or directional roadways, and all three posts shall have spacer blocks and concrete encasement.

TERMINAL CONNECTORS of Type A shall be fastened to existing (safety shape) parapets, not having concrete insert anchor assemblies, with four 7/8" dia hexhead bolts through the parapet with 3" x 3" x 1/2" plate washers and hex nuts on back of parapet.

POST TYPE shall be the same material type as used on approach guardrail for Type A and the outermost post of Type B.

FOR DETAILS not shown, see GR-1 and other Standard Construction Drawings pertaining to design of specific guardrail Type.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

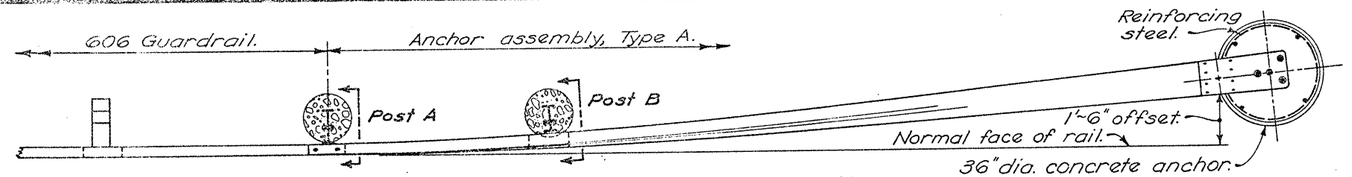
BRIDGE TERMINAL ASSEMBLIES

DATE
1-1-71
11-9-71
12-6-76
2-5-82

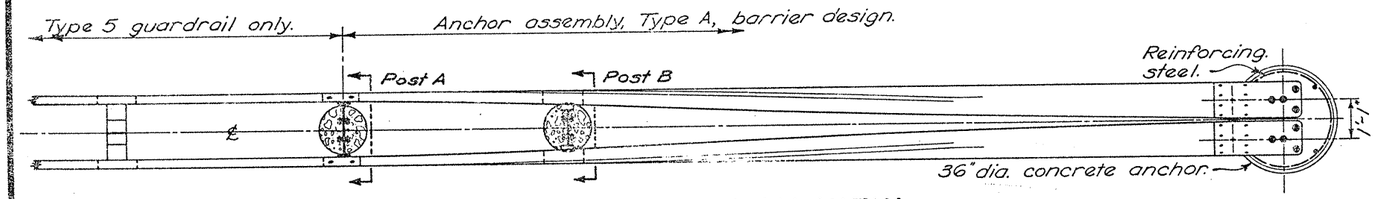
STANDARD CONSTRUCTION DRAWING

GR-3

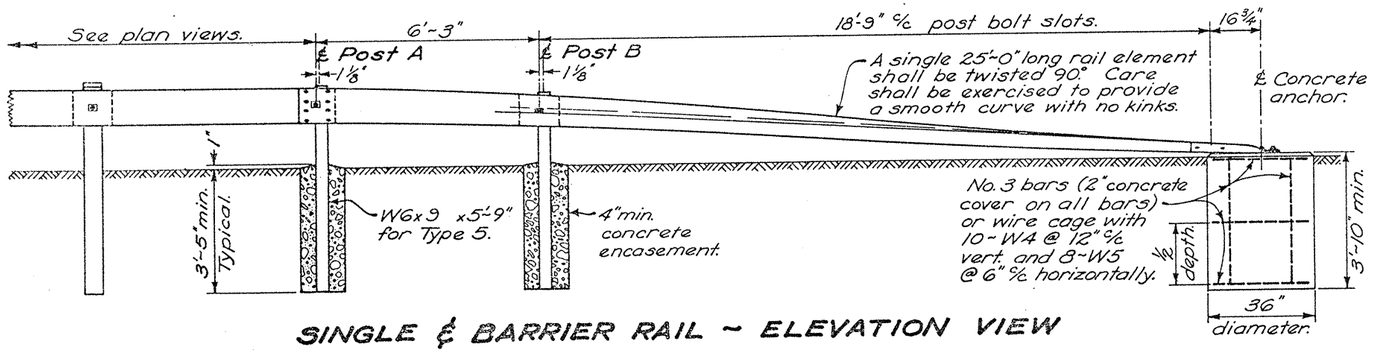
APPROVED _____ ENGR., L.&D.



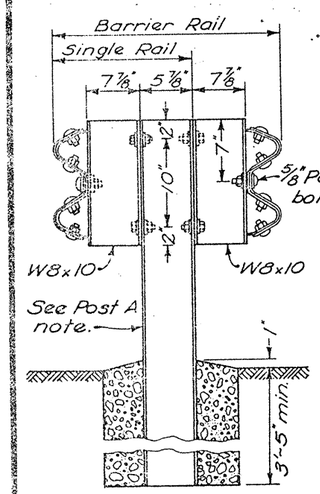
SINGLE RAIL ~ PLAN VIEW



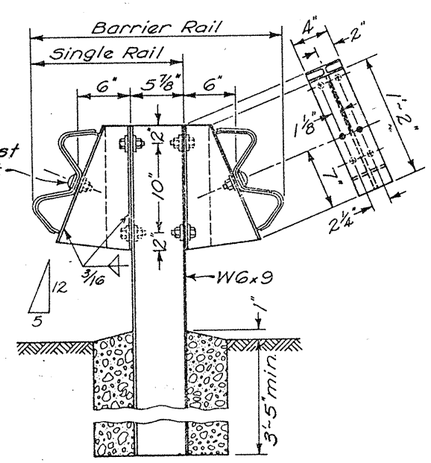
BARRIER RAIL ~ PLAN VIEW



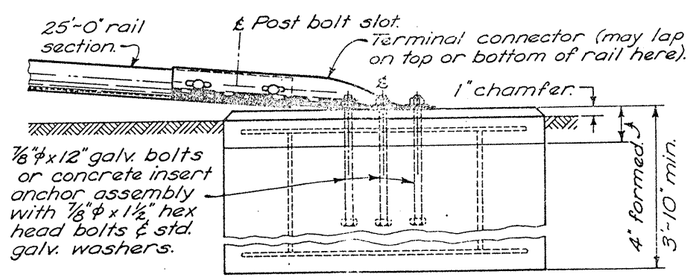
SINGLE ℄ BARRIER RAIL ~ ELEVATION VIEW



POST A



POST B



CONCRETE ANCHOR

NOTES

GENERAL: For details not shown, see GR-1 and other Standard Construction Drawings pertaining to specific guardrail type. All steel parts shall be galvanized.

ANCHOR ASSEMBLY TYPE A can be used at each free end of Type 4, 5 or 7 guardrail or barrier rail. It is primarily an approach end.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets shown on GR-5 and GR-6. Use of the 1'-6" offset will generally be limited to upgrading existing highways for safety or the construction or reconstruction of highways with design traffic less than 1000 ADT or design speeds less than 50 mph.

SPACERS for Post B shall be made of 3⁄16" steel plate 710.15, or two sections of W6x9 or W8x10 cut in the web (see dashed line) and welded together on both sides.

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

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

POST BOLT WASHERS: Place a rectangular plate washer between the face of rail and post bolt head.

All other washers indicated on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" square anchor at the contractor's option.

POST A: Rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 4 or 7 guardrail, Post A shall be a standard Type 4 or 7 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be ⅝"φ.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

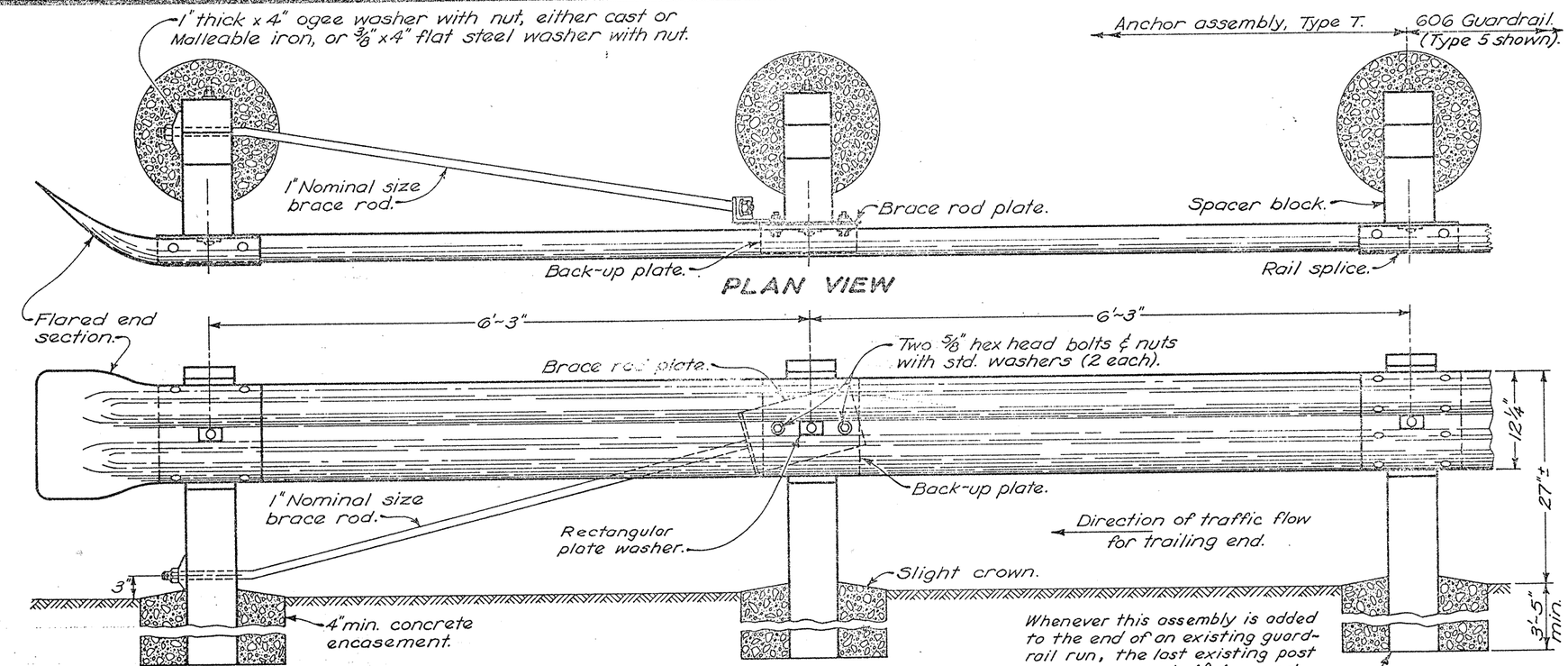
TYPE A
ANCHOR
ASSEMBLY

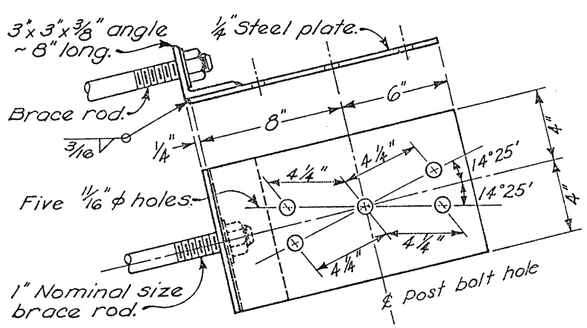
DATE
1-1-71
11-9-71
12-6-76
2-5-82

STANDARD CONSTRUCTION DRAWING

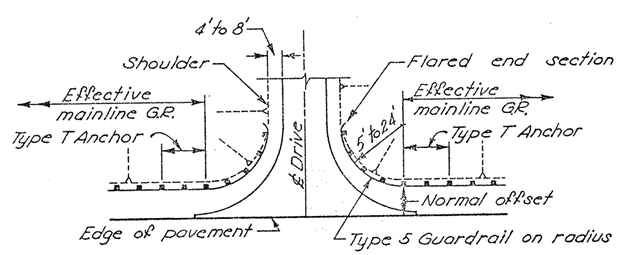
GR-4

APPROVED ENGR., L.&D.





BRACE ROD PLATE



DRIVEWAY OPENING

NOTES

FOR DETAILS not shown, see GR-1 and other Standard Construction Drawings pertaining to design of specific guardrail types.

WASHERS: Place a galvanized rectangular plate washer between the face of rail and post bolt head. All other washers indicated are standard galvanized steel of the appropriate size.

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

SPACER BLOCKS shall be omitted if the adjacent run of guardrail does not have spacer blocks. If necessary, spacer blocks may be notched in the field, in a manner satisfactory to the Engineer, to accommodate the installation of the brace rod plate 5/8" attachment bolts.

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

APPLICATION: Anchor assembly, Type T shall normally be installed at the trailing ends of roadside guardrail and tubular back-up bridge railing (see DBR-2-73) on directional roadways or ramps provided the assembly does not encroach upon the clear zone of any opposing traffic on an adjacent roadway. Whenever guardrail is to be turned back along a private drive, the Type T anchor assembly shall be located parallel to the mainline and just prior to curving the guardrail back along the driveway. The flared end section hardware piece shall be placed at the end of the driveway guardrail. The low end of the brace rod shall be closest to the driveway.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TYPE T ANCHOR ASSEMBLY

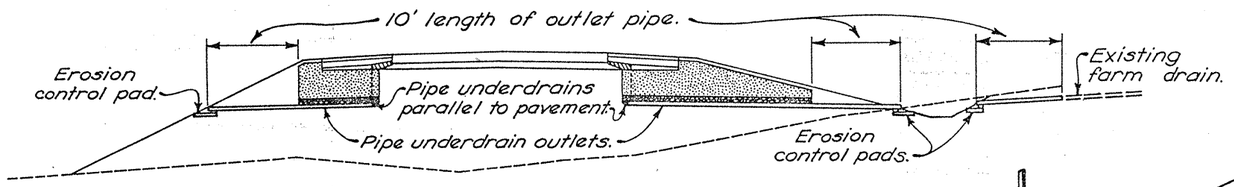
DATE
7-26-76
2-5-82
1-30-84

STANDARD CONSTRUCTION DRAWING

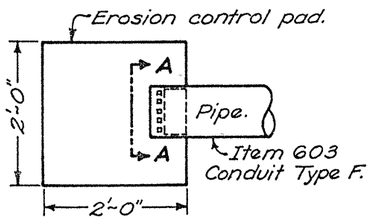
GR-4A

APPROVED _____ ENGR., L.&D.

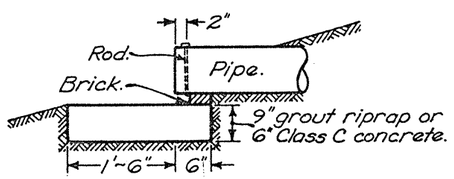
CONSTRUCTION METHODS



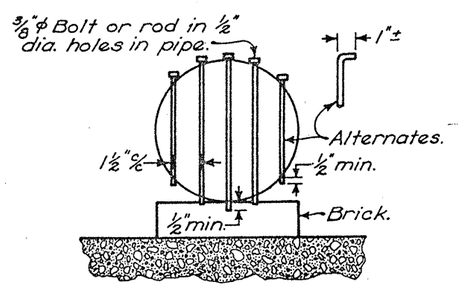
UNDERDRAIN OUTLET SECTION



PLAN



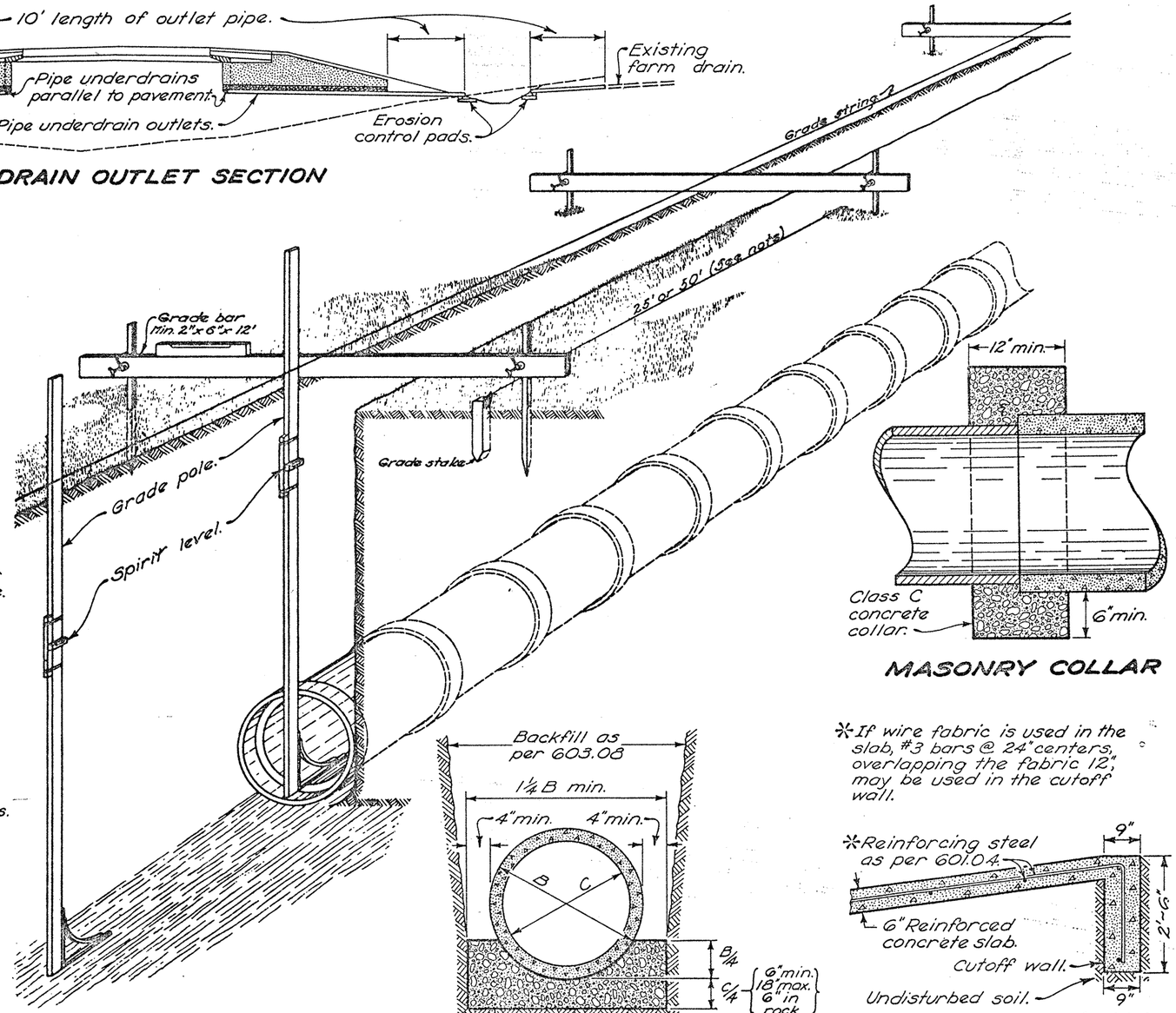
PROFILE



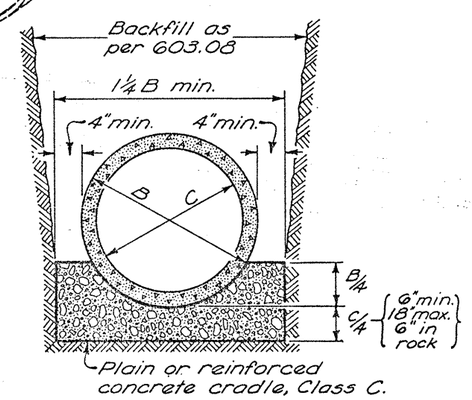
SECTION A-A

Conduit Size	4"	6"	8"	10"	12"	15"	18"
No. of Bolts	2	3	5	6	7	9	11

ANIMAL GUARD AND EROSION CONTROL PAD FOR OUTLET PIPE



LAYING PIPE



CONCRETE CRADLE
CLASS A BEDDING

MASONRY COLLAR

*If wire fabric is used in the slab, #3 bars @ 24" centers, overlapping the fabric 12", may be used in the cutoff wall.

RIPRAP CUTOFF WALL

Cutoff wall shall be included in the price bid for Item 601 Riprap-6" Reinforced Concrete Slab.

NOTES

GRADE STAKES shall be set at the following intervals:
For grades less than 0.70% ~25 ft.
For grades of 0.70% and over ~50 ft.

GRADE POLE shall be a straight pole dressed with corners rounded, size depending on length but approximately 1"x 2". The pole shall be equipped with a metal bracket on the bottom with a projecting length of 12". Notches shall be cut on the pole for the depth of the flowline below the grade string and for the depth of trench. A spirit level shall be used on the pole to determine when the pole is vertical.

ALTERNATE METHODS: The Engineer may approve other methods of determining alignment and gradient of pipe lines if the Contractor can demonstrate that the same degree of accuracy can be obtained as can be obtained by use of the method shown on this drawing.

MASONRY COLLARS: Where plans require that a pipe extension be joined to the end of an existing pipe with a butt joint, a collar shall be provided and the cost shall be included in the price bid for new conduit.

EROSION CONTROL PADS AND ANIMAL GUARDS shall be provided at the outlet end of all pipe underdrains and farm drains except when they outlet into a drainage structure.

The steel bolts or rods for the animal guard shall be galvanized per 710.10. In lieu of drilling or punching the 1/2" diameter holes into the pipe, a metal collar meeting all of the above requirements, may be clamped on the end of the pipe, if approved by the Engineer.

Payment for the erosion control pads and the animal guards shall be included in the price bid for Item 603 __" Conduit, Type F.

BUREAU OF ROADWAY DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

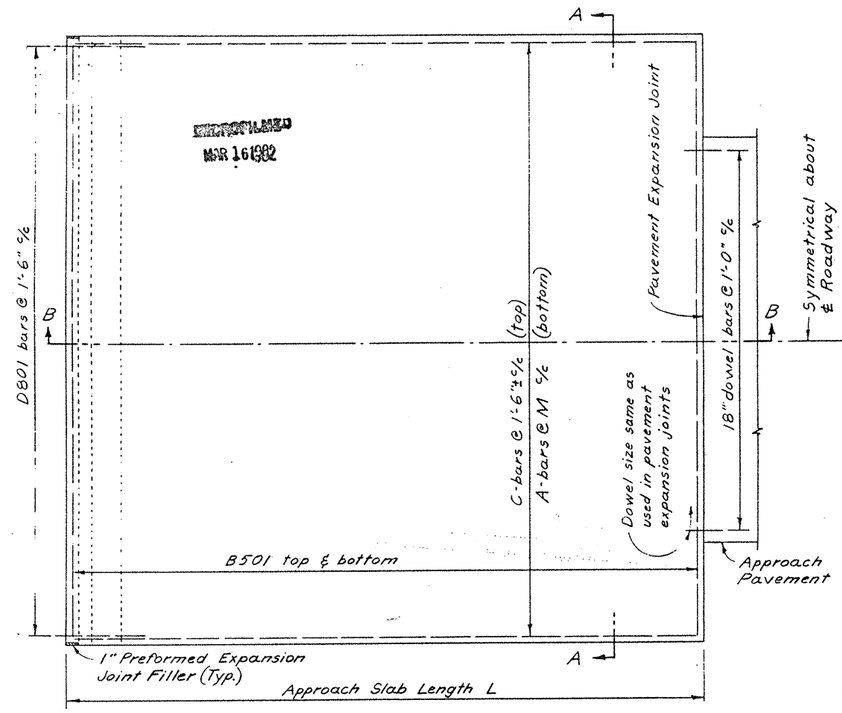
DRAINS AND SEWERS

DATE
6-1-65
6-13-69
7-26-76

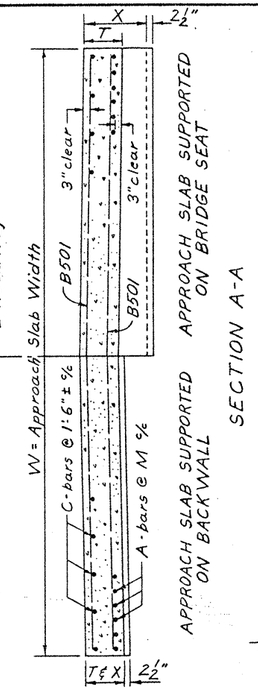
STANDARD CONSTRUCTION DRAWING

MC-4

APPROVED E. J. Schaefer ENGR., R.D.



PLAN

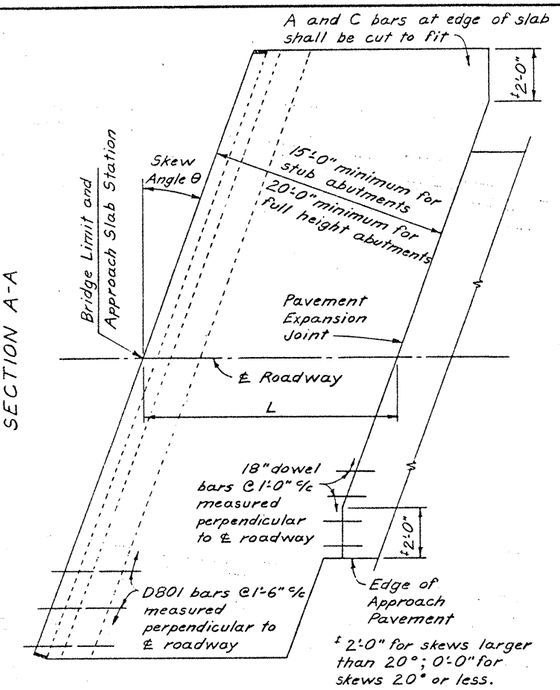


APPROACH SLAB SUPPORTED ON BRIDGE SEAT

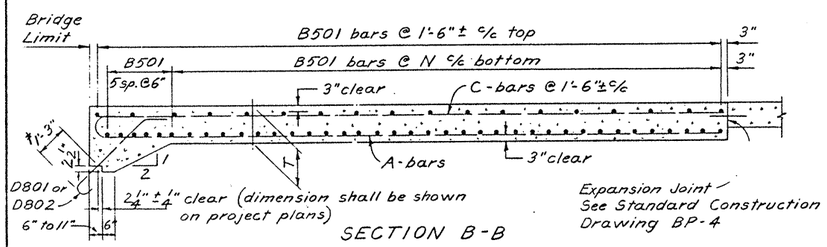
SECTION A-A

APPROACH SLAB SUPPORTED ON BACKWALL

Note: X shall never be less than T



APPROACH SLAB FOR SKEWED BRIDGE



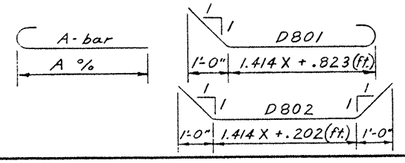
SECTION B-B

‡ 1'-3" embedment length is measured in the plane of the D801 bar.

REINFORCING STEEL
(For one approach slab)

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

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



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

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

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

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

DESIGN DATA
Design Loading: HS20-44 and the Alternate Military Loading

Concrete Class C: compressive strength 4000 p.s.i.

Reinforcing Steel: ASTM A615, A616 or A617 - Grade 60 minimum yield strength 60,000 p.s.i.

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

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

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

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

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

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

LENGTH of approach slabs shall be shown on project plans.

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

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

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

REVISIONS

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

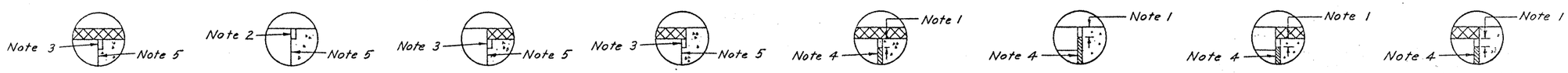
STANDARD
REINFORCED CONCRETE APPROACH SLABS

APPROVED: Robert J. Pfeifer ENGINEER OF BRIDGES
DATE: 11-27-81

DRWG. No. AS-1-81

PREPARED	TRACED	CHECKED	REVIEWED	SHEET NO. 1 OF 3 SHEETS
FFE		GSB	WJJ	

MICROFILMED
MAR 16 1982



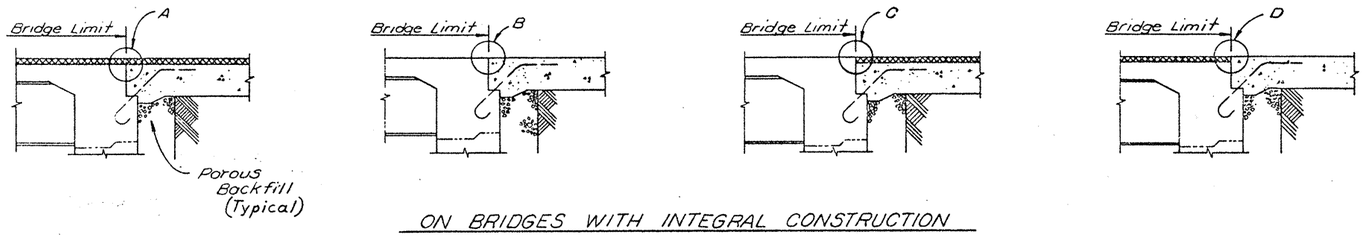
DETAIL A | DETAIL B | DETAIL C | DETAIL D | DETAIL E | DETAIL F | DETAIL G | DETAIL H

ASPHALT CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB

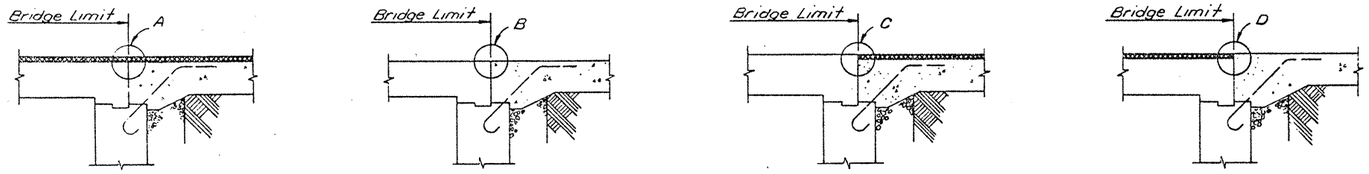
CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB

CONCRETE WEARING SURFACE ON BRIDGE DECK ONLY

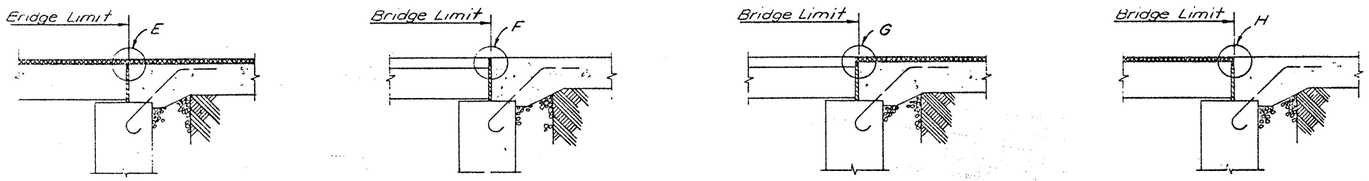
ASPHALT CONCRETE WEARING SURFACE ON BRIDGE DECK ONLY



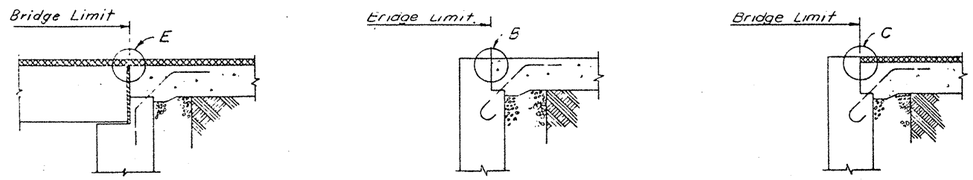
ON BRIDGES WITH INTEGRAL CONSTRUCTION



ON SLAB BRIDGES



ON PRESTRESSED CONCRETE BOX BEAM BRIDGES



APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

Note: Approach slab seat on prestressed concrete box beam bridges is shown at same elevation as beam seat. However, it may actually be higher or lower than the beam seat depending on box beam depth.

Note 1: 2" joint sealer 705.01 or 705.02

Note 2: Preformed elastomeric joint sealer 705.11 ($1\frac{1}{4}$" for $\frac{1}{2}$" joint) depressed $\frac{1}{8}$" below roadway, placed in $\frac{1}{2}$" x $2\frac{1}{4}$" groove.

Note 3: Preformed elastomeric joint sealer 705.11 ($1\frac{1}{4}$" for $\frac{1}{2}$" joint) placed in $\frac{1}{2}$" x $2\frac{1}{8}$" groove.

Note 4: 1" preformed expansion joint filler.

Note 5: Type A waterproofing.

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

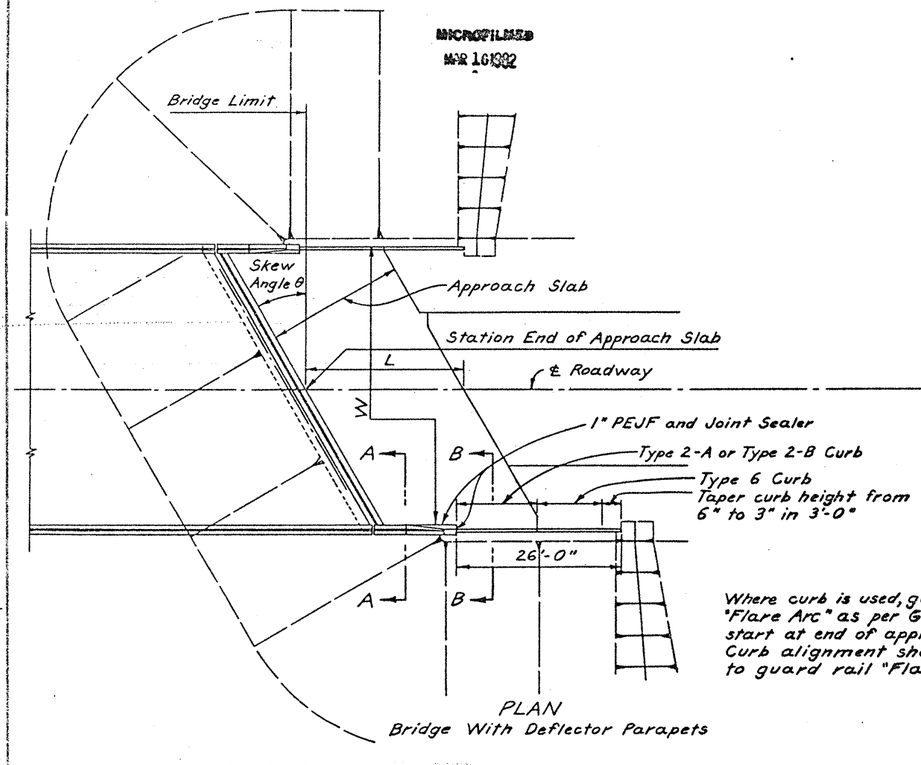
For prestressed concrete box beam bridges with asphalt concrete on both bridge deck and approach slab, the top of approach slab at the bridge end shall be constructed to the level of the top of the beams to facilitate waterproofing of the joint. The thickness of asphalt concrete at the approach end shall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

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

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN				
	STANDARD REINFORCED CONCRETE APPROACH SLABS				
	APPROVED: Robert B. Pfeifer DATE: 11-27-81 ENGINEER OF BRIDGES				DRWG. NO. AS-1-81
	PREPARED FFE	TRACED	CHECKED GSB	DESIGNED WJJ	SHEET NO. 2 OF 3 SHEETS

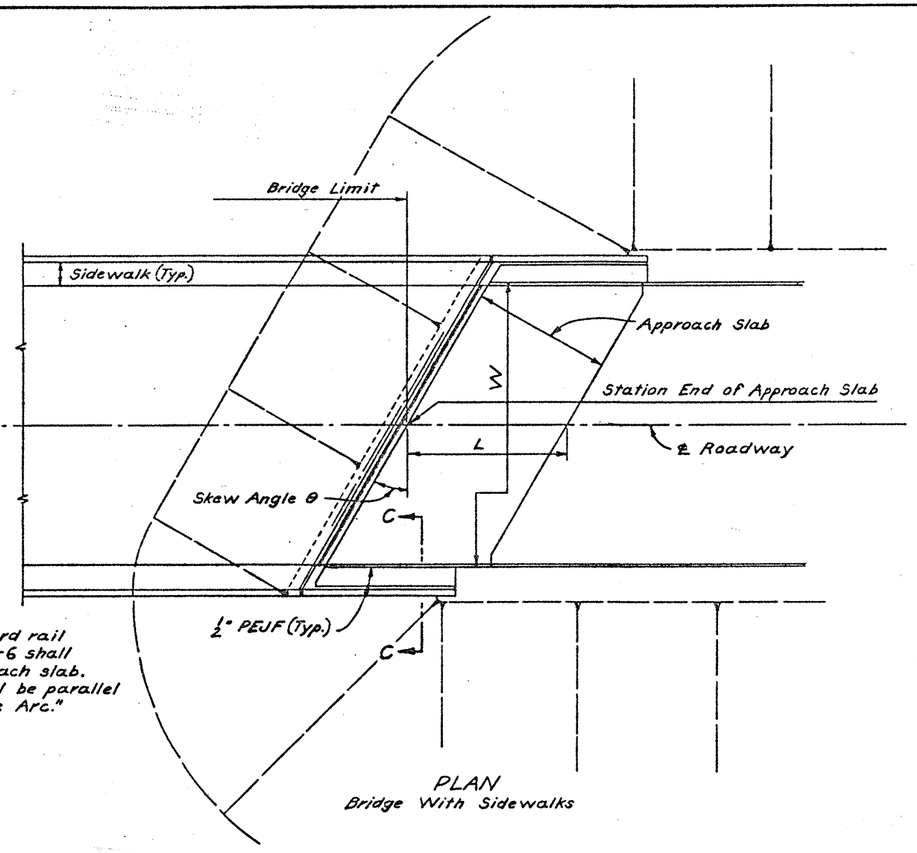
HILLS CO.—1000 #10—7156—7-78

MICROFILMED
MAR 16 1982

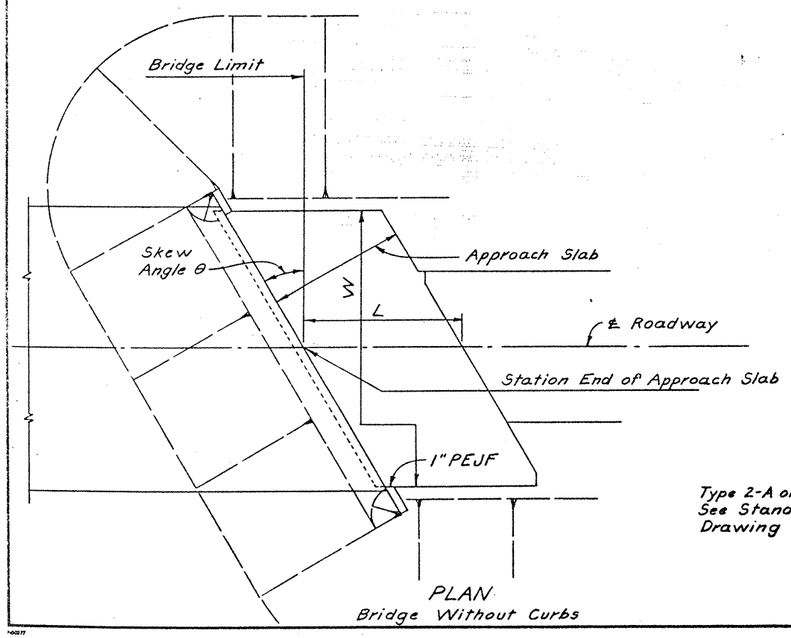


PLAN
Bridge With Deflector Parapets

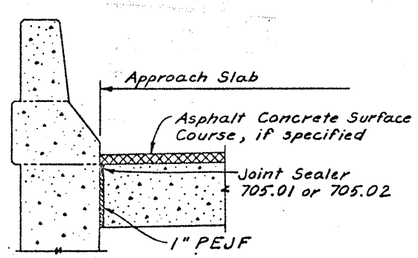
Where curb is used, guard rail "Flare Arc" as per GR-6 shall start at end of approach slab. Curb alignment shall be parallel to guard rail "Flare Arc."



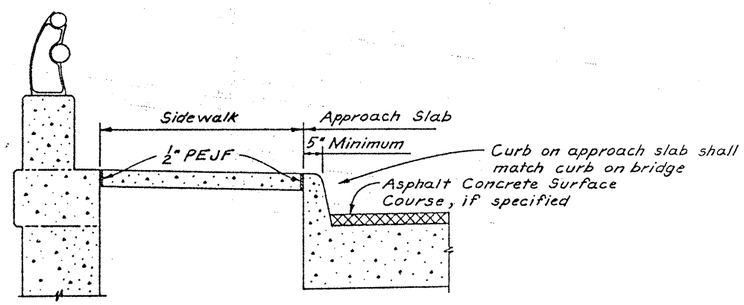
PLAN
Bridge With Sidewalks



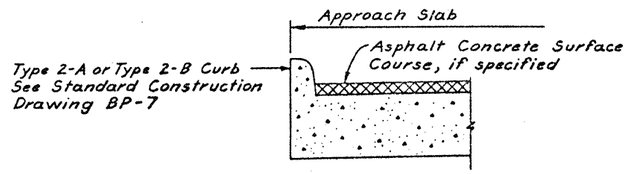
PLAN
Bridge Without Curbs



SECTION A-A

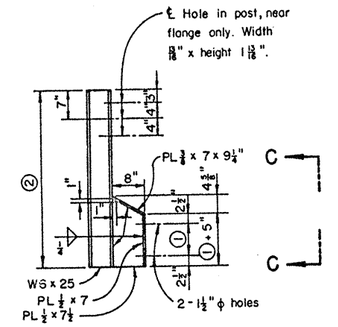


SECTION C-C



SECTION B-B

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN				
	STANDARD REINFORCED CONCRETE APPROACH SLABS				
	APPROVED: Robert B. Chaffin DATE: 11-27-81 ENGINEER OF BRIDGES				DRWG. NO. AS-1-81
	PREPARED FFE	TRACED	CHECKED GSB	REVIEWED WJJ	SHEET NO. 3 OF 3 SHEETS

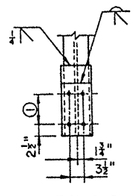


Dimension ① is 6" or 8" depending on box beam depth. See project plans and POST ANCHORAGE DETAILS, PRESTRESSED CONCRETE BOX BEAMS.

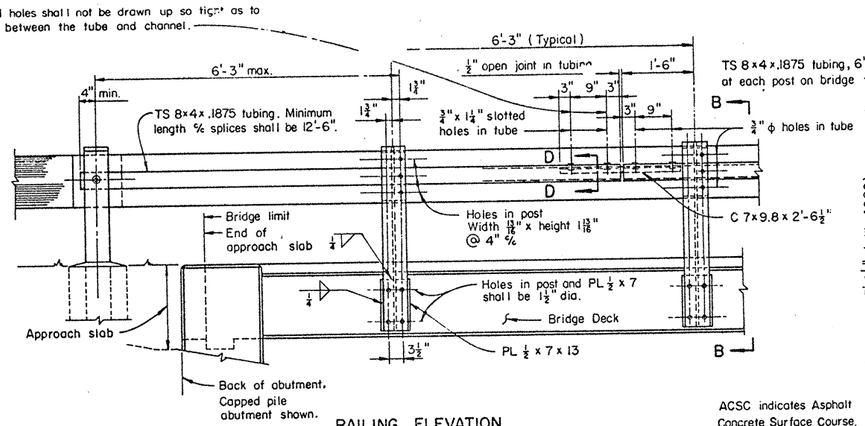
For Dimension ② see project plans.

SECTION B-B
TYPE 2 POST

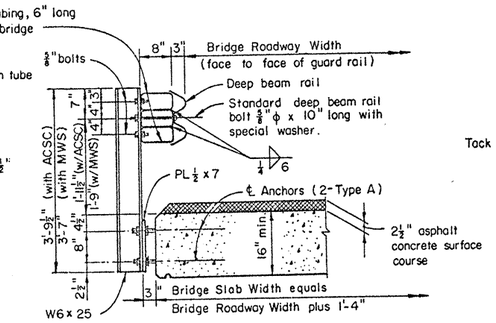
(For use with prestressed concrete box beams)



VIEW C-C

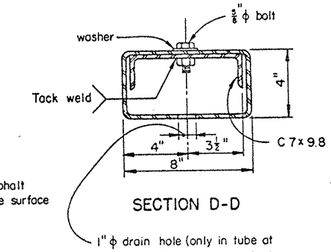


RAILING ELEVATION
(Type 1 posts shown)



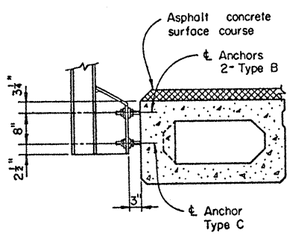
ACSC indicates Asphalt Concrete Surface Course.
MWS indicates Monolithic Wearing Surface.

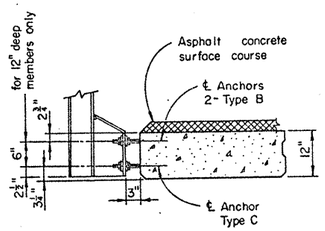
SECTION B-B
TYPE 1 POST



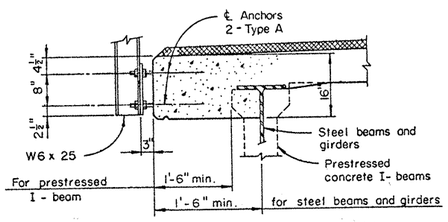
SECTION D-D

1" ϕ drain hole (only in tube at lowest point when sag vertical curves are encountered). Location to be shown on project plans.

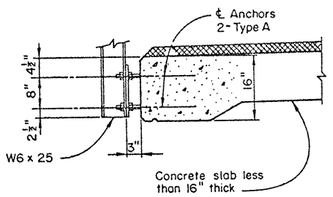




POST ANCHORAGE DETAILS
PRESTRESSED CONCRETE BOX BEAMS

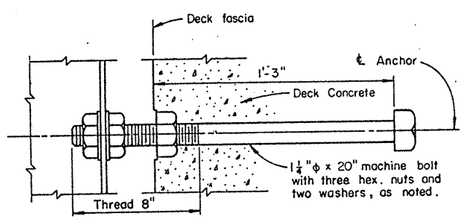


LONGITUDINAL BEAM BRIDGES

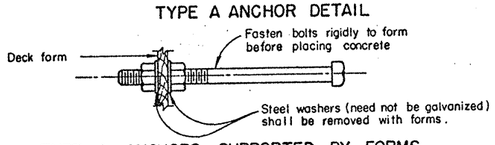


CONCRETE SLABS

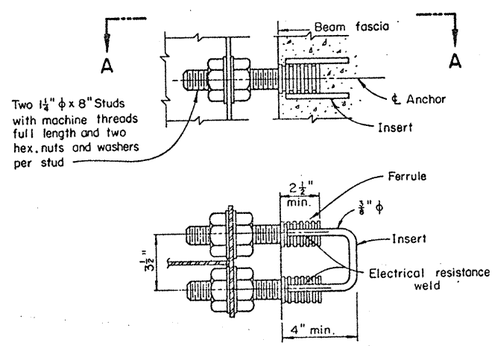
POST ANCHORAGE DETAILS
(Not for use with prestressed concrete box beams)



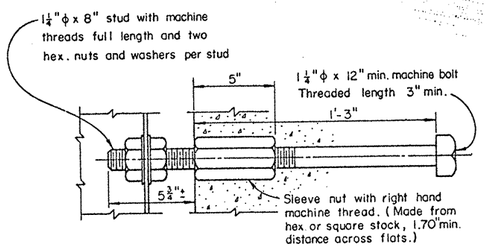
TYPE A ANCHOR DETAIL



TYPE A ANCHORS SUPPORTED BY FORMS

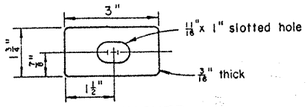


SECTION A-A
TYPE C ANCHOR DETAIL



TYPE B ANCHOR DETAIL

Place washer between bolt head and face of rail.



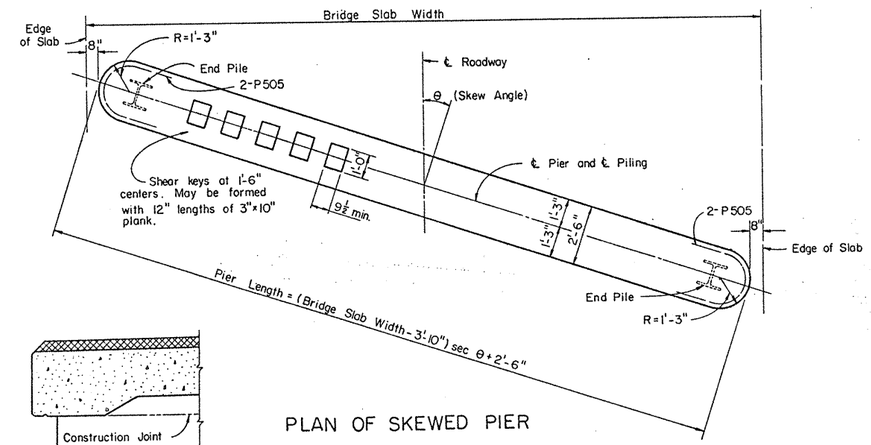
SPECIAL WASHER

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

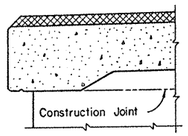
GALVANIZING: All guard rail posts, tubes, hardware and accessories shall be galvanized in accordance with ASTM A123 or ASTM A153, except as otherwise noted.

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

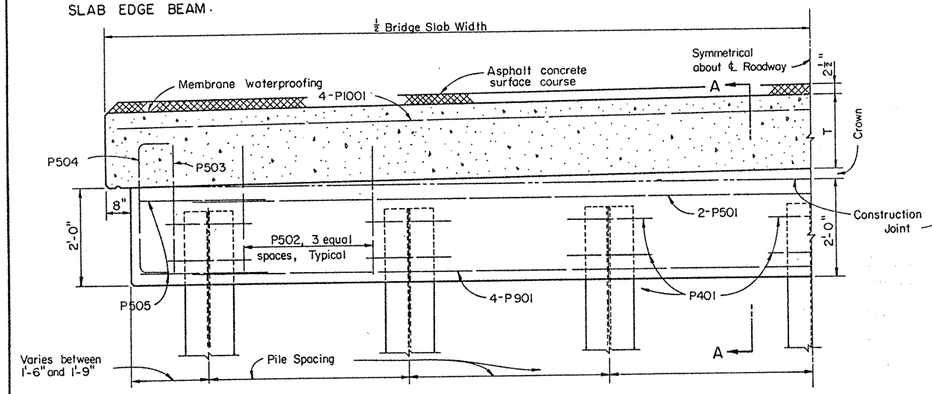
REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS BUREAU OF BRIDGES				
	STANDARD DEEP BEAM BRIDGE GUARD RAIL WITH TUBULAR BACKUP				
	APPROVED: Robert B. Chisler DATE: 4/10/73 ENGINEER OF BRIDGES				DRAWING NO.
	PREPARED	TRACED	CHECKED	REVIEWED	
	INNES	TGC	CPD	BFG FHR MFW	DBR-2-73



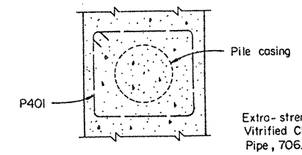
PLAN OF SKEWED PIER



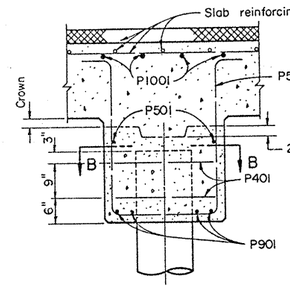
SLAB EDGE BEAM



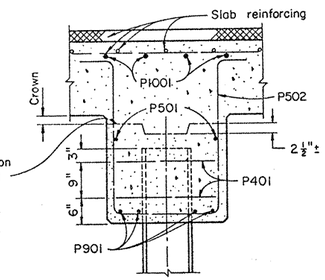
HALF ELEVATION



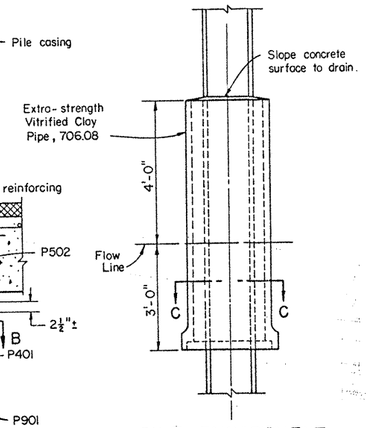
SECTION B-B



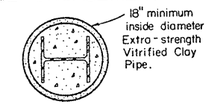
SECTION A-A
SHOWING 14" CAST-IN-PLACE CONCRETE PILE



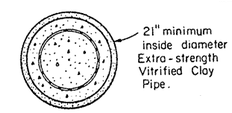
SECTION A-A
SHOWING STEEL PILE, HP12x53



PILE ENCASEMENT



SECTION C-C
SHOWING STEEL PILE, HP12x53



SECTION C-C
SHOWING 14" CAST-IN-PLACE CONCRETE PILE

After driving the pile, place the pipe into position, and fill with concrete. The concrete encasement may be placed in water as per 511, care being taken to remove all dirt between the pile and the pipe. The concrete and clay pipe shall be included with Piles for payment.

PILE DATA FOR ONE NON-SKEWED PIER

SPANS (in feet)	28' RDWY WIDTH			32' RDWY WIDTH			36' RDWY WIDTH			40' RDWY WIDTH			44' RDWY WIDTH		
	No. of Piles	Spacing Ft.-In.	Load Tons	No. of Piles	Spacing Ft.-In.	Load Tons	No. of Piles	Spacing Ft.-In.	Load Tons	No. of Piles	Spacing Ft.-In.	Load Tons	No. of Piles	Spacing Ft.-In	Load Tons
14 - 17.5 - 14	5	6-4	27	6	5-10	25	7	5-6	24	7	6-2	27	8	5-10	25
15 - 18.75 - 15	5	6-4	28	6	5-10	26	7	5-6	25	7	6-2	28	8	5-10	26
16 - 20 - 16	5	6-4	29	6	5-10	27	7	5-6	26	7	6-2	29	8	5-10	27
17 - 21.25 - 17	5	6-4	30	6	5-10	28	7	5-6	27	7	6-2	30	8	5-10	29
18 - 22.5 - 18	5	6-4	31	6	5-10	29	7	5-6	28	7	6-2	31	8	5-10	30
19 - 23.75 - 19	5	6-4	34	6	5-10	30	7	5-6	29	7	6-2	32	8	5-10	31
20 - 25 - 20	5	6-4	35	6	5-10	32	7	5-6	30	7	6-2	34	8	5-10	32
21 - 26.25 - 21	5	6-4	36	6	5-10	33	7	5-6	31	7	6-2	35	8	5-10	34
22 - 27.5 - 22	5	6-4	37	6	5-10	34	7	5-6	32	7	6-2	36	8	5-10	35
23 - 28.75 - 23	5	6-4	39	6	5-10	35	7	5-6	34	7	6-2	38	8	5-10	36
24 - 30 - 24	5	6-4	40	6	5-10	36	7	5-6	35	7	6-2	39	8	5-10	37
25 - 31.25 - 25	6	5-0	32	6	5-10	38	7	5-6	36	8	5-4	35	8	5-10	38
26 - 32.5 - 26	6	5-0	34	6	5-10	40	7	5-6	37	8	5-4	36	8	5-10	39
27 - 33.75 - 27	6	5-0	35	7	4-10	33	7	5-6	38	8	5-4	37	9	5-2	36
28 - 35 - 28	6	5-0	36	7	4-10	34	7	5-6	39	8	5-4	38	9	5-2	37
29 - 36.25 - 29	6	5-0	37	7	4-10	35	8	4-9	35	8	5-4	39	9	5-2	38
30 - 37.5 - 30	6	5-0	38	7	4-10	36	8	4-9	36	8	5-4	40	9	5-2	39
31 - 38.75 - 31	6	5-0	39	7	4-10	39	8	4-9	37	8	5-4	41	9	5-2	40
32 - 40 - 32	6	5-0	40	7	4-10	40	8	4-9	38	9	4-8	37	9	5-2	41
33 - 41.25 - 33	6	5-0	41	7	4-10	41	8	4-9	39	9	4-8	38	10	4-7	38
34 - 42.5 - 34	7	4-2	36	7	4-10	42	8	4-9	40	9	4-8	39	10	4-7	39
35 - 43.75 - 35	7	4-2	37	7	4-10	43	8	4-9	42	9	4-8	41	10	4-7	40
36 - 45 - 36	7	4-2	38	8	4-2	38	9	4-2	37	9	4-8	42	10	4-7	41
37 - 46.25 - 37	7	4-2	39	8	4-2	39	9	4-2	38	10	4-½	38	10	4-7	42
38 - 47.5 - 38	7	4-2	40	8	4-2	40	9	4-2	39	10	4-½	39	11	4-1	39
39 - 48.75 - 39	7	4-2	42	8	4-2	42	9	4-2	42	10	4-½	41	11	4-1	41
40 - 50 - 40	7	4-2	43	8	4-2	43	9	4-2	43	10	4-½	42	11	4-1	42
41 - 51.25 - 41	7	4-2	45	8	4-2	45	9	4-2	45	10	4-½	44	11	4-1	44
42 - 52.5 - 42	7	4-2	46	8	4-2	46	9	4-2	46	10	4-½	45	11	4-1	45
43 - 53.75 - 43	7	4-2	48	8	4-2	48	9	4-2	48	10	4-½	48	11	4-1	47
44 - 55 - 44	7	4-2	50	8	4-2	50	9	4-2	50	10	4-½	50	11	4-1	50
45 - 56.25 - 45	8	3-7	44	9	3-8	45	10	3-8	46	11	3-8	45	12	3-9	46
46 - 57.5 - 46	8	3-7	46	9	3-8	47	10	3-8	47	11	3-8	48	12	3-9	47

RDWY indicates Bridge Roadway Width (face to face of guard rail)

REINFORCING STEEL DATA FOR ONE NON-SKEWED PIER

Bridge Rdwy Width	P1001 Straight 4 req'd	P901 Straight 4 req'd	P501 Straight 2 req'd	P502 Bent 2Q+3'-2" 2 req'd	P503 Bent 2 req'd	P504 Bent 2 req'd	P505 Bent 6'-4"	P401 Bent 8'-0"
	* Length	* Length	* Length	Number	Length	Length	Number	Number
28'	28'-10"	25'-6"	25'-6"	(Number of Pile Spaces) x 4	2Q + 3'-0"	Q + 1'-0"	4 required	2 x Number of Piles
32'	32'-10"	29'-6"	29'-6"					
36'	36'-10"	33'-10"	33'-10"					
40'	40'-10"	37'-6"	37'-6"					
44'	44'-10"	41'-6"	41'-6"					

* Increase bar length for skewed Bridges.

GENERAL NOTES

DESIGN SPECIFICATIONS: This standard drawing conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway Officials, 1969, including the Ohio "Supplement" to these specifications.

DESIGN DATA

Design Loading - HS 20-44 and the Interstate Alternate Loading.
Concrete Class C - unit stress 1,333 p.s.i.
Reinforcing Steel - ASTM A615, A616 or A617, unit stress 20,000 p.s.i.
Bend tests shall be required for A616 as per AASHO M42-70.

PILE CASINGS: The casings of cast-in-place concrete piles shall be of the type that is left in place and is designed to resist both direct compression and bending. The portion above the proposed surface of the ground shall be of uniform diameter (not tapered) and shall have a thickness of metal not less than 0.179 inches.

PILE ENCASEMENT shall be furnished if so specified on the Project Plans.

FALSEWORK SUPPORT: Attachment of falsework support members to pier piles will be permitted, if the attachment is made to that portion of pile encased in the pier cap.

REINFORCING STEEL: The P1001, P901, and P501 bars, at the option of the Contractor, may be furnished in one length as shown hereon, or in pairs lapped at or near the centerline of the roadway. Determination of the pay quantity will be according to the number and length of bars

GENERAL NOTES (Continued)

as shown on the project plans. The P1001 bars shall be lapped 4'-10". The other bars shall be lapped 30 diameters.

DESIGN NOTES

GENERAL: This drawing provides design and general construction details and is intended to be used with Standard Drawing CS-2-73. The project plans for each structure will show stations, span lengths, roadway width, skew, curve and superelevation (if any), elevations, superstructure details, estimated quantities, reinforcing steel list and other necessary details and special notes.

LIMITS OF CAPPED PILE PIER. The pier design shown on this drawing should not be used if:

A. Sloped embankment would cause appreciable horizontal force against the pile bent.
B. Rock or other firm material would prevent driving piles at least ten feet below stream bed.
C. The length of piles, from ground line to bottom of cap would exceed fifteen feet.

PILE TYPE AND SIZE: The piles shall be specified on the project plans (usually as 14" diameter cast-in-place reinforced concrete, or as 12" steel).

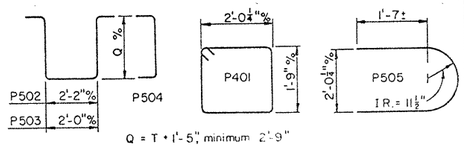
DESIGN NOTES (Continued)

PILE CAPACITY shall be as specified on the project plans. The required capacity, according to the formula in 507, Determination of Capacity, generally will be the design load listed in the table, except for steel piles that are to be driven to firm contact with rock or other hard material.

NUMBER AND SPACING OF PILES: In case of skew, the number of piles shall be the same as shown, but the tabulated spacing dimension shall be multiplied by the secant of the skew angle.

REINFORCING STEEL: The length of all straight horizontal bars shall be determined for each pier. Splices near the centerline of roadway should be used where necessary to avoid unreasonably long bars.

PILE ENCASEMENT: Piles driven in corrosive streams shall be protected by the use of Vitrified Clay Pipe placed over the piles as shown on this drawing. Where such protection is required, it shall be specified on the Project Plans.



REVISIONS

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BUREAU OF BRIDGES

STANDARD

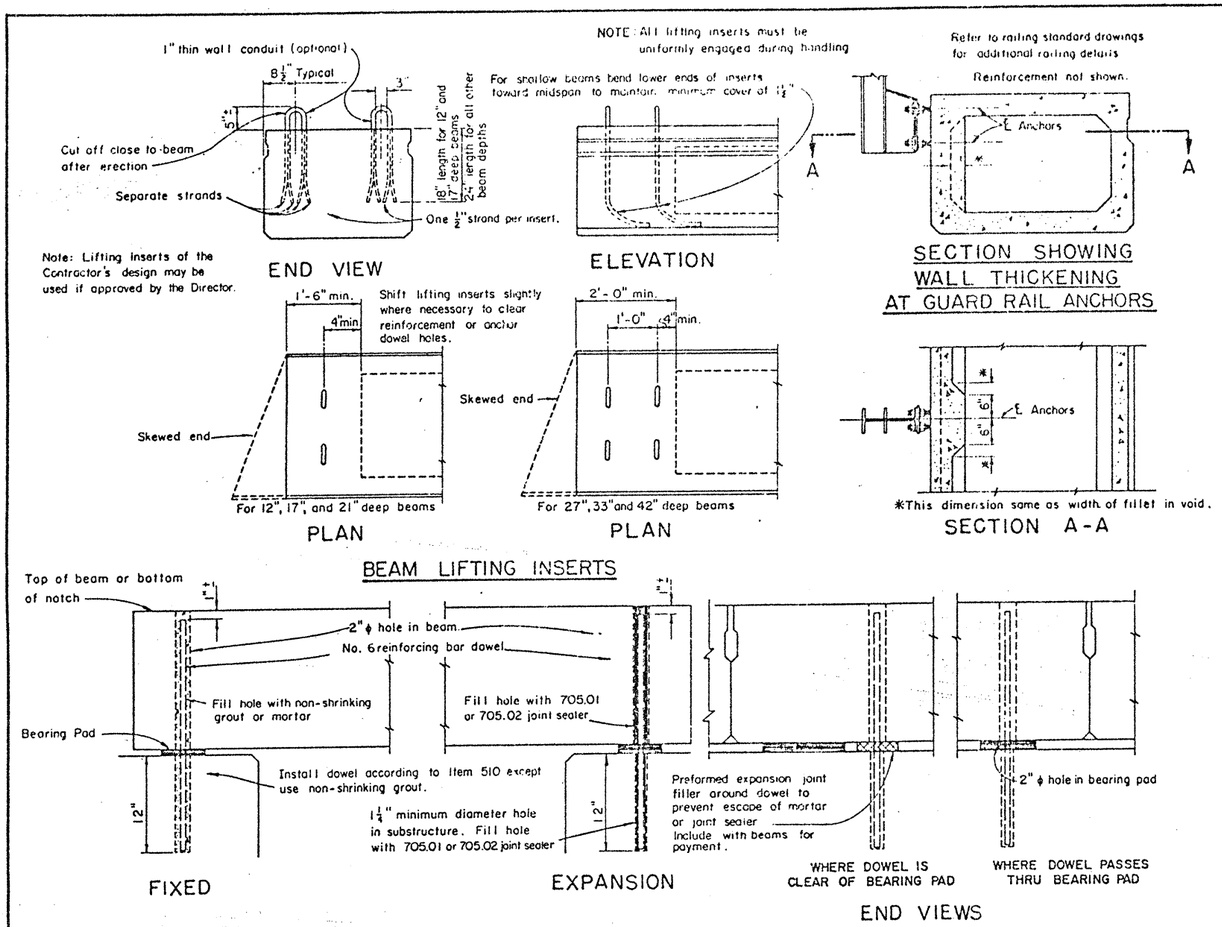
CAPPED PILE PIER

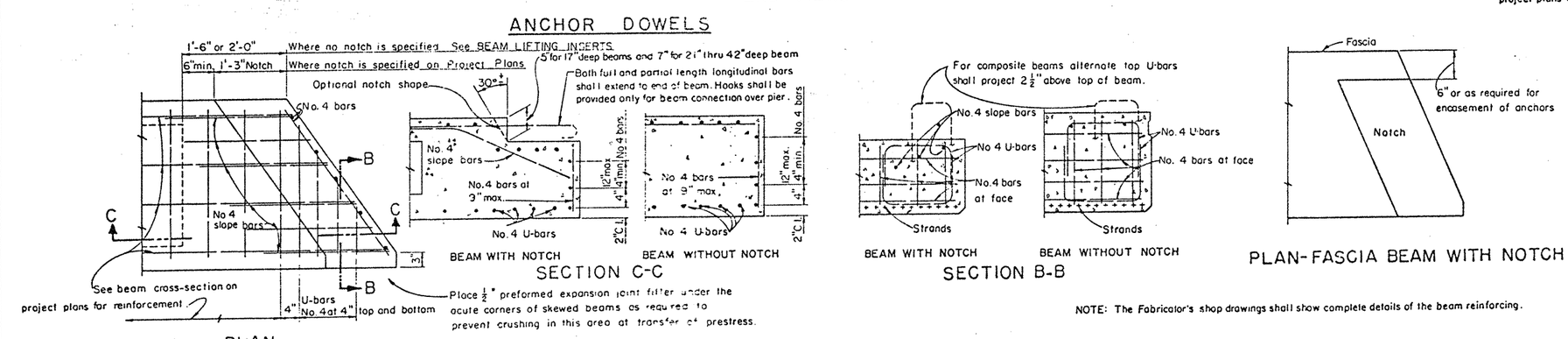
FOR CONTINUOUS SLAB BRIDGES WITHOUT CURBS WITH GUARD RAIL

DESIGN LOADING: HS 20-44 AND THE INTERSTATE ALTERNATE LOADING

APPROVED: Robert C. Fletcher
ENGINEER OF BRIDGES
DATE: 4/10/73

PREPARED	TRACED	CHECKED	REVIEWED	DRAWING NO.
CPD	TGC	WCK DWI	BFG MFW FHR	CPP-2-73





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

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

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

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

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

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

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

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

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

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

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

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

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

NON-SHRINKING MORTAR OR GROUT, shall be made with materials and proportions as follows:

2680 lbs. sand, 703.02, @ 6% moisture
9 bags cement, 701.05
40 gallons water, 499.02
9 lbs. expanding grouting aid admixture, Intraplast-N by Sika Chemical Corporation, or approved equal.

The cement, sand and water shall be mixed first, after which the admixture shall be added. Batch size shall be limited so placement can be completed within 30 minutes. Water shall not be added to increase flowability which has been decreased by delayed use of mortar.

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

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

A transverse cross-section thru the deck.

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

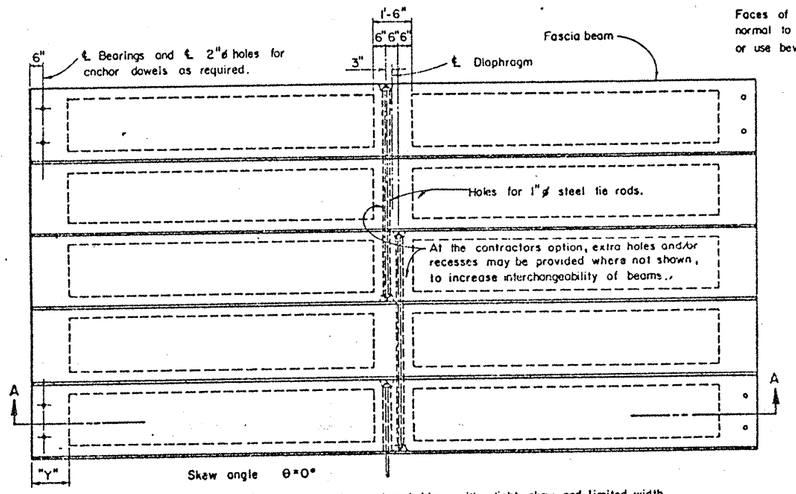
Details at abutments and piers.

All other necessary details and information.

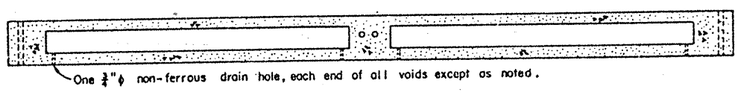
It is not intended that details shown on this standard drawing be repeated on the project plans except as may be required for clarity.

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

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN			
	STANDARD PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS			
	APPROVED DATE 2-19-81	ENGINEER OF BRIDGES		DRAWING NO PSBD-1-81
	PREPARED MRG	TRACED GJJ TGC	CHECKED FPE	REVIEWED WJJ	SHEET NO 1 OF 4 SHEETS



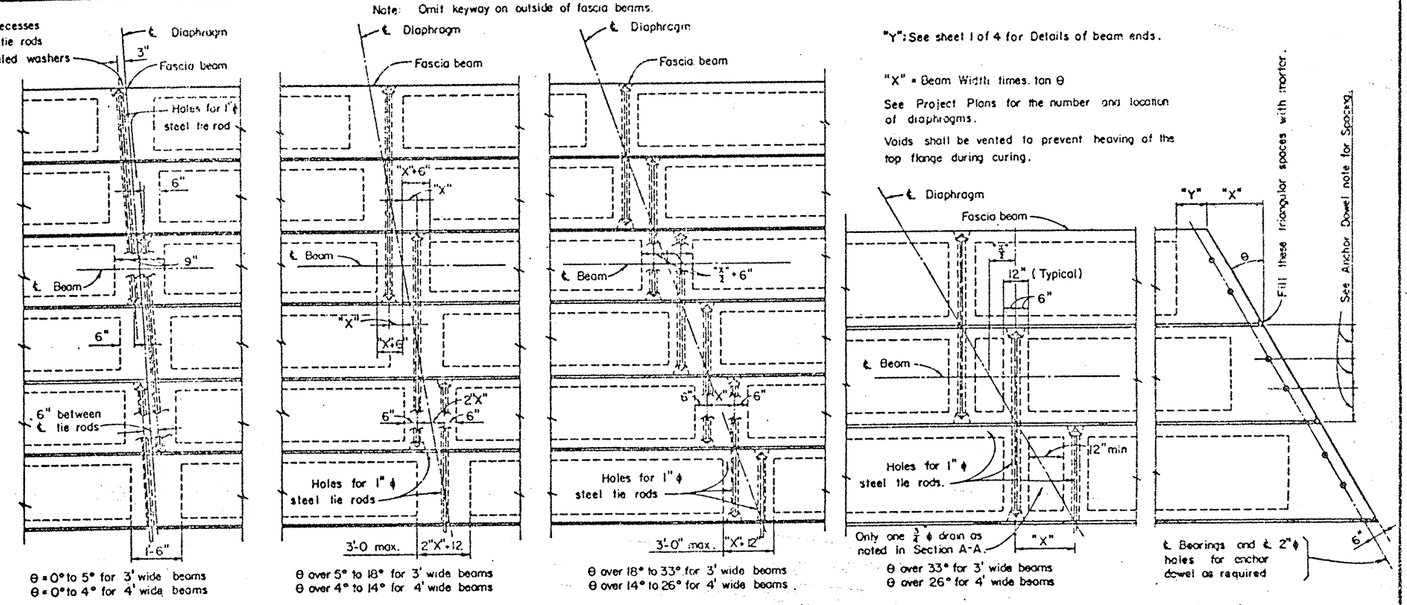
This tie rod arrangement may also be used on bridges with slight skew and limited width. Beams will not be identical in this case.



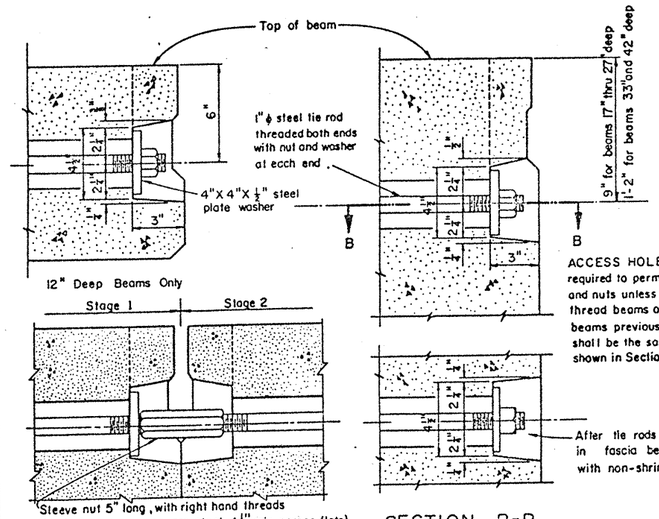
SECTION A-A

Faces of recesses normal to tie rods or use beveled washers

Note: Omit keyway on outside of fascia beams.



TYPICAL PLANS OF DIAPHRAGMS AND TRANSVERSE TIE RODS



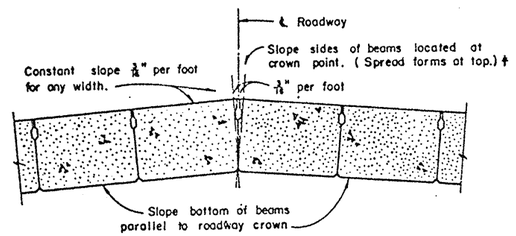
FOR STAGE CONSTRUCTION

END DETAILS OF TRANSVERSE TIE ROD ANCHORAGE

ACCESS HOLES shall be provided as required to permit placement of washers and nuts unless the contractor elects to thread beams over rods projecting from beams previously placed. When used, holes shall be the same shape as the recesses shown in Section B-B.

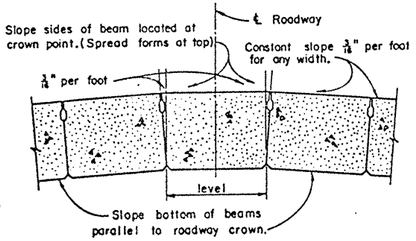
After tie rods are tightened fill recesses in fascia beam flush with face of beam with non-shrinking mortar.

SECTION B-B
(ALL BEAMS)



JOINT AT ℄ ROADWAY

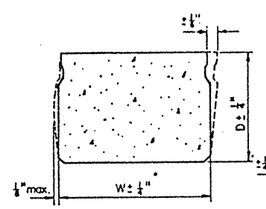
‡ Slope sides of beam located at crown point. (Spread forms at top)



JOINT OFFSET FROM ℄ ROADWAY

‡ Optional unless specifically required by project plans.

NORMAL CROWN TREATMENT AT ℄ ROADWAY



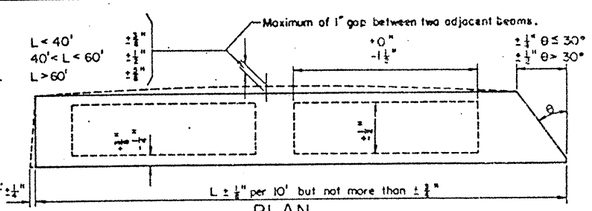
SECTION C-C

Additional Tolerances

Position of holes for anchor dowels and tie rods ± ½"
Position of guardrail anchors ± ½"
Position of lifting inserts ± 6"
Center of gravity of strand group ± ½"
Center of gravity of draped strand group at end of beam ± ½"
Position of stirrup bars ± 1"
Longitudinal scupper location ± 6"

Holes in beams for transverse tie rods shall be not less than 2"ϕ and not more than 3"ϕ

Dimensions of recessess in fascia beams and shear keys and vertical location of transverse tie rods may vary from the dimensions shown hereon, subject to approval by the Director.

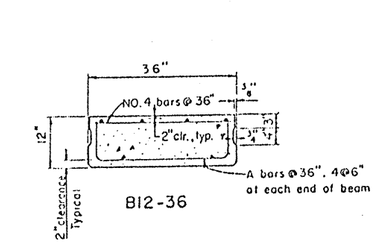


Dimensional variation in excess of the tolerances shown may be cause for rejection of the member. Generally the dimensions should be well within the tolerance limit.

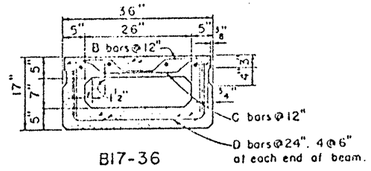
ELEVATION

BEAM DIMENSIONAL TOLERANCES

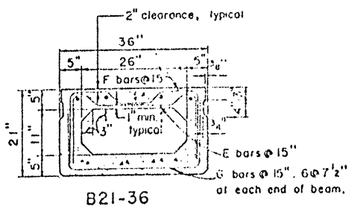
REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN			
	STANDARD PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS			
	APPROVED: Robert B. Gheslin ENGINEER OF BRIDGES DATE 9-18-81			DRAWING NO. PSBD-1-81
	PREPARED MRG	TRACED CFJ TGC	CHECKED PFE	REVIEWED WJJ	SHEET NO 2 OF 4 SHEETS



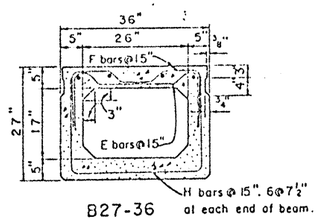
B12-36



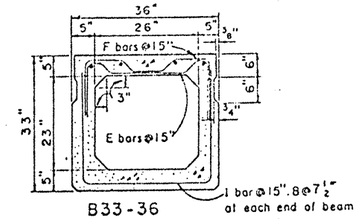
B17-36



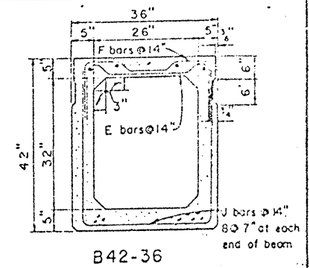
B21-36



B27-36



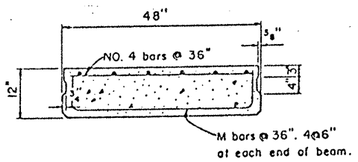
B33-36



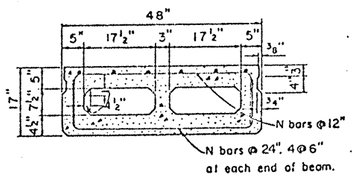
B42-36

36" WIDE NON-COMPOSITE BEAMS

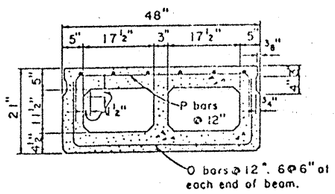
NOTE: Place all bottom stirrups on top of bottom layer of strands.



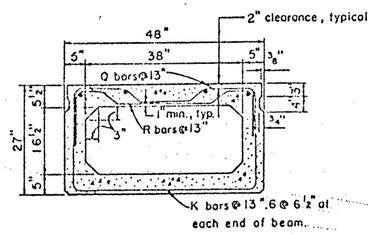
B12-48



B17-48



B21-48



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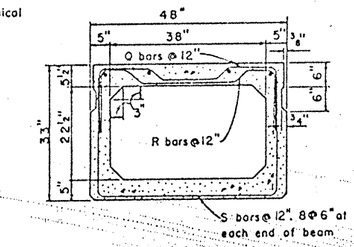

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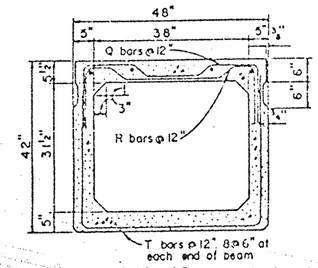
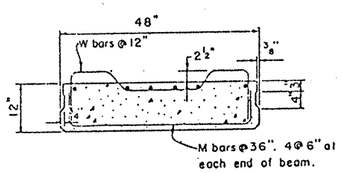
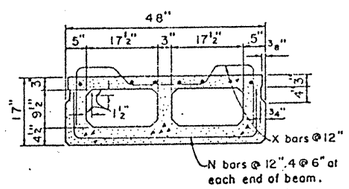


B42-48

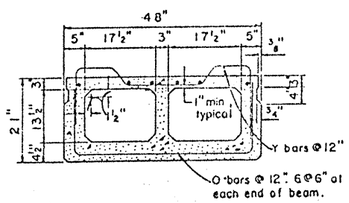
48" WIDE NON-COMPOSITE BEAMS



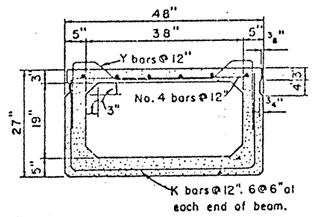
CB12-48



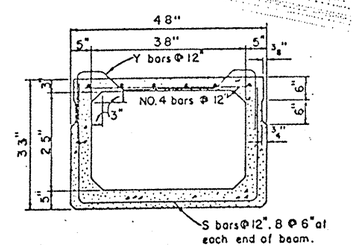
CB17-48



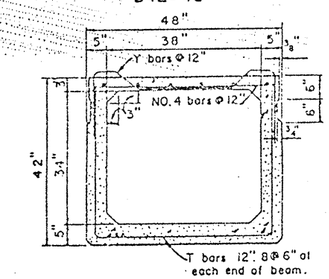
CB21-48



CB27-48



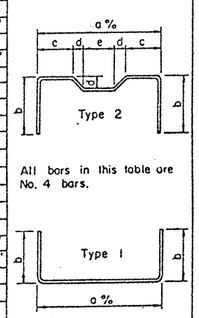
CB33-48



CB42-48

48" WIDE COMPOSITE BEAMS

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



All bars in this table are No. 4 bars.

MINIMUM LONGITUDINAL REINFORCING STEEL

36" wide non-composite beams: 4-No. 5 bars

48" wide non-composite beams:

B12 thru B21, 6-No. 4 bars

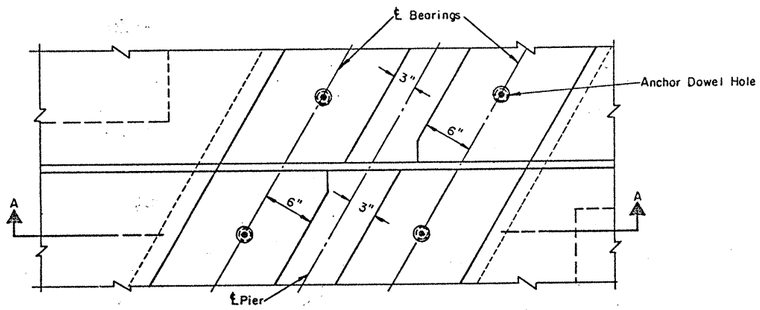
B27 thru B42, 4-No. 5 bars

48" wide composite beams: 6-No. 4 bars

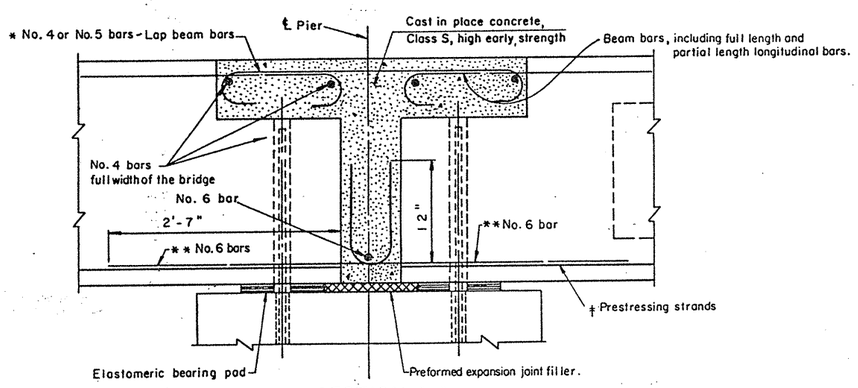
See project plans for any additional longitudinal reinforcing steel bars required.

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

REVISION	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN
	STANDARD PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS
	APPROVED Robert B. Chisholm DATE 9-15-81 ENGINEER OF BRIDGES — DRAWING NO. PS80-1-81
	PREPARED MRS — TRACED GFJ TBC — CHECKED FFE — REVIEWED WJJ — SHEET NO. 3 OF 4 SHEETS



PARTIAL PLAN OF BEAM CONNECTION OVER PIER



SECTION A-A

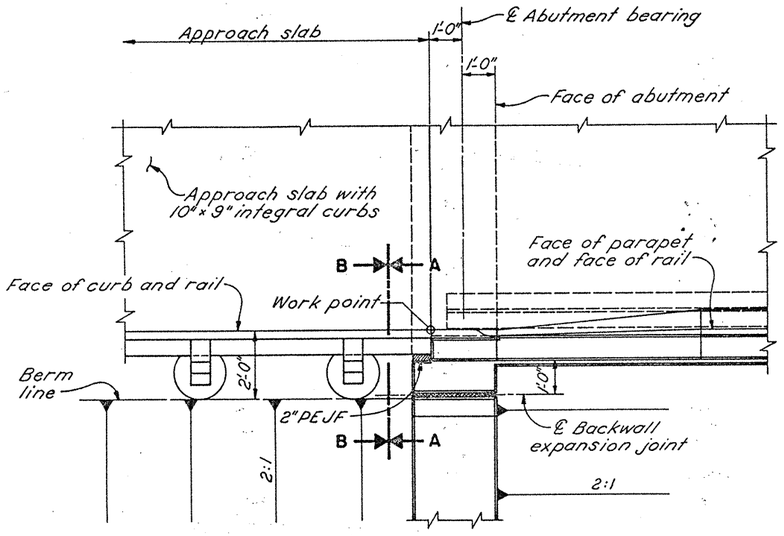
* Lap bars same size and number as beam bars. Hooks may be rotated from the vertical position to provide the required clearance.

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

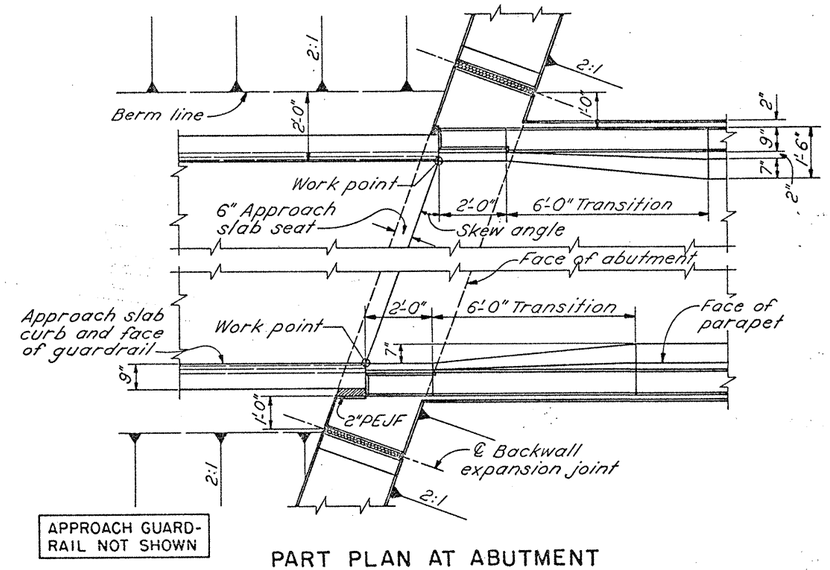
† At the fabricator's option, strands may be extended and bent up in lieu of No. 6 bars. 48" wide beams with a total of 12 or more strands shall have a minimum of 6 strands bent up. 48" wide beams with less than 12 strands total shall have approximately one half of the total number of strands bent up.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

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

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN				
	STANDARD PRESTRESSED CONCRETE BOX BEAM BRIDGE DETAILS				
	APPROVED: Robert A. Shaffer DATE 9-18-81 ENGINEER OF BRIDGES				DRAWING NO. PSBD-1-81
	PREPARED MRG	TRACED G.F.J	CHECKED FFE	REVIEWED WJJ	SHEET NO. 4 OF 4 SHEETS

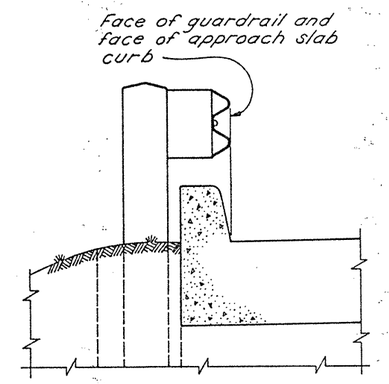


PART PLAN AT ABUTMENT
SQUARE STRUCTURE WITH
ROADWAY PARAPET RAILING

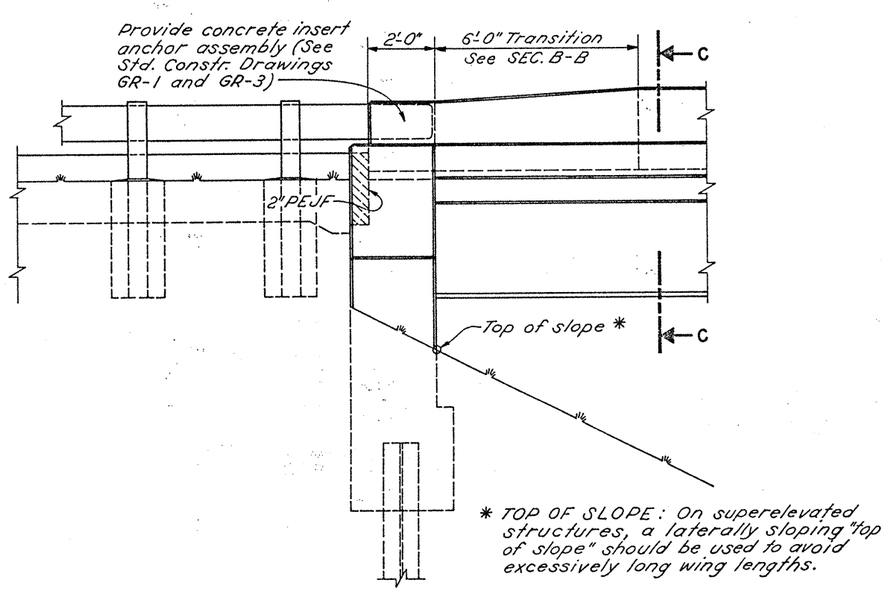


APPROACH GUARD-RAIL NOT SHOWN

PART PLAN AT ABUTMENT
SKEWED STRUCTURE WITH
ROADWAY PARAPET RAILING

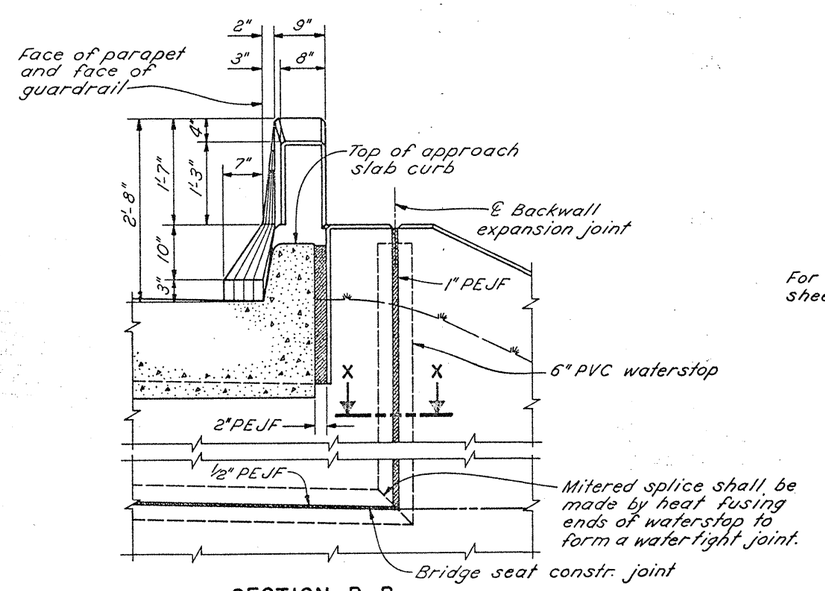


SECTION A-A



* TOP OF SLOPE: On superelevated structures, a laterally sloping "top of slope" should be used to avoid excessively long wing lengths.

ELEVATION



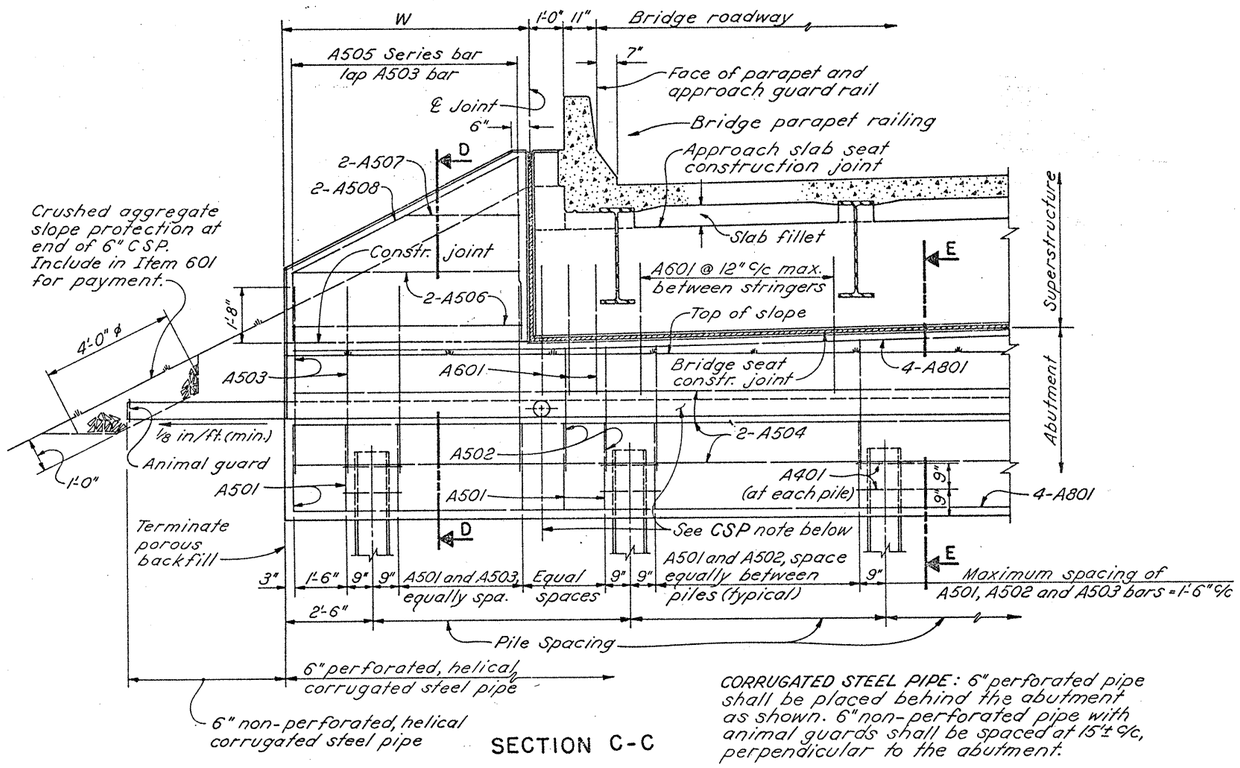
SECTION B-B

For SECTION C-C and SECTION X-X see sheet 2/5.

FOR BRIDGES WITH CONCRETE PARAPETS

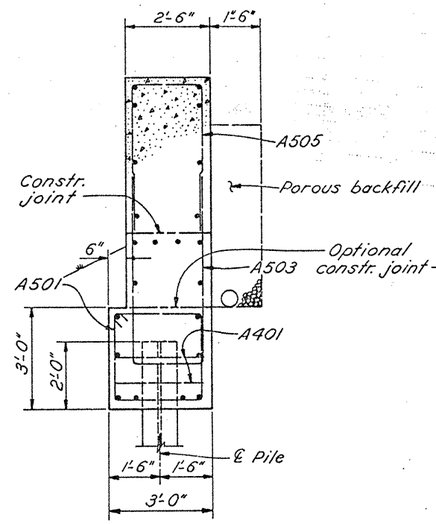
REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	1/5
	TENTATIVE STANDARD **INTEGRAL CONSTRUCTION DETAILS STEEL STRINGER STRUCTURES ON FLEXIBLE ABUTMENTS**	
	APPROVED: 11-15-82 DATE — Robert B. Pfeifer ENGINEER OF BRIDGES	DRAWING NO. TS-ICD-1-82

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED
MPB	AJM	—	RLD	WJJ. MPB.

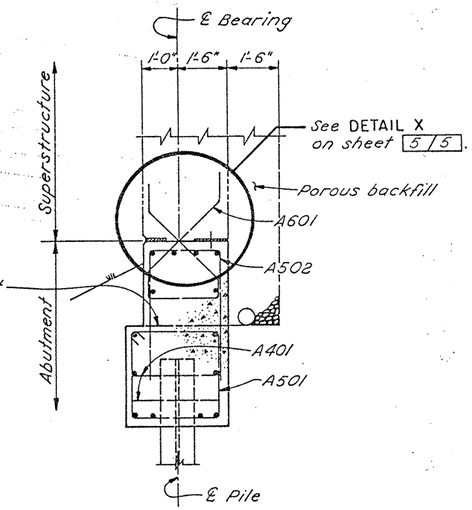


SECTION C-C

CORRUGATED STEEL PIPE: 6" perforated pipe shall be placed behind the abutment as shown. 6" non-perforated pipe with animal guards shall be spaced at 15'± c/c, perpendicular to the abutment.



SECTION D-D



SECTION E-E

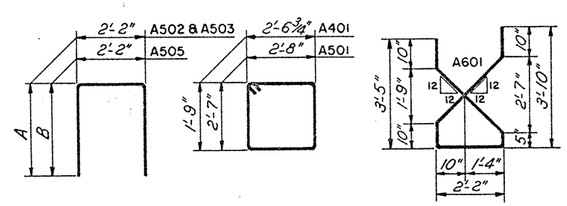
For location of SECTION C-C and SECTION X-X see sheet 1/5.

(1) For WATERSTOP note see sheet 5/5.

REINFORCING STEEL

MARK	LENGTH	SHAPE
A801	(1)	St.
A601	10'-9"	Bt.
A501	11'-0"	Bt.
A502	A	Bt.
A503	A	Bt.
A504	(1)	St.
A505	B	Bt.
A506	(2)	St.
A507	(2)	St.
A508	(2)	St.
A401	9'-0"	Bt.

BENDING DIAGRAMS

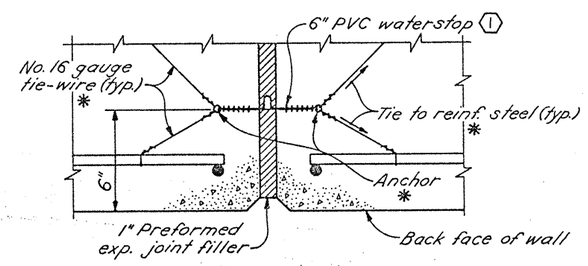


A - Length may vary with each individual structure.

B - Length and increment (series bar) may vary with each individual structure.

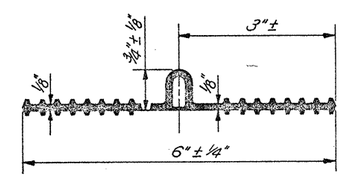
(1) - 1/2 (length of abutment - 4") + 1/2 bar lap.

(2) - Length is dependent upon dimension "W" (length of wingwall).



SECTION X-X

* For the first pour, the waterstop should be held securely in place by the use of split forms and tie-wires. For the second pour, secure the free end of waterstop in proper position with tie-wires. Alternate methods, as approved by the Engineer, may be used to insure the correct positioning of the waterstop.



WATERSTOP DETAIL

FOR BRIDGES WITH CONCRETE PARAPETS

REVISIONS

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

2/5

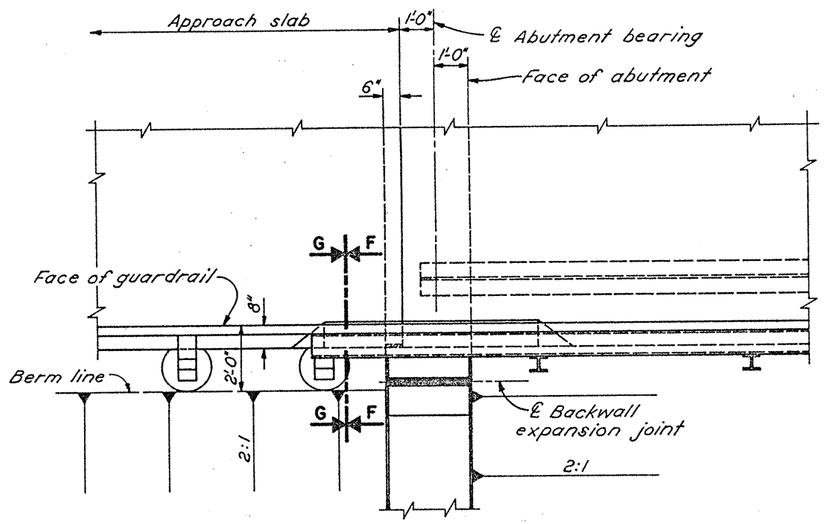
TENTATIVE STANDARD

INTEGRAL CONSTRUCTION DETAILS
STEEL STRINGER STRUCTURES
ON FLEXIBLE ABUTMENTS

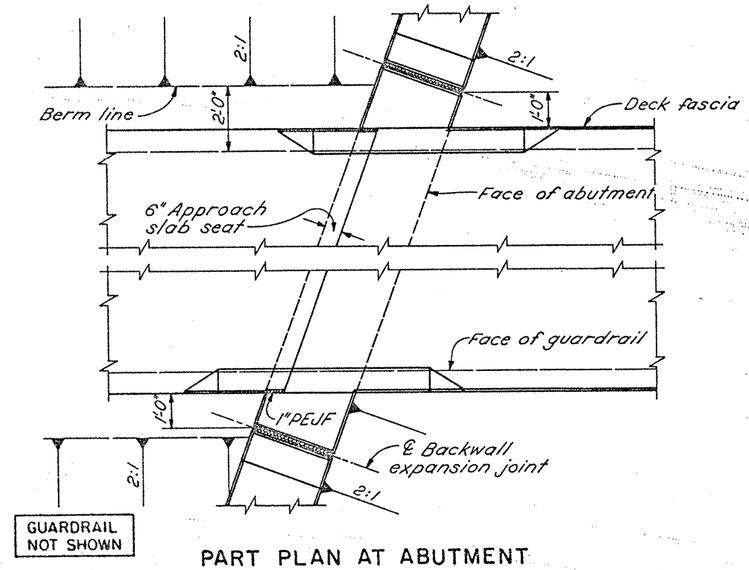
APPROVED: 11-15-82 DATE — Robert B. Chaffin ENGINEER OF BRIDGES

DRAWING NO. TS-ICD-1-82

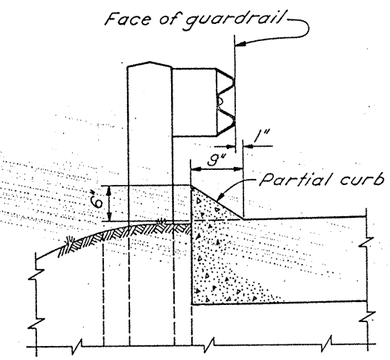
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED
M.P.B.	A.J.M.	—	R.L.D.	W.J.J. M.P.B.



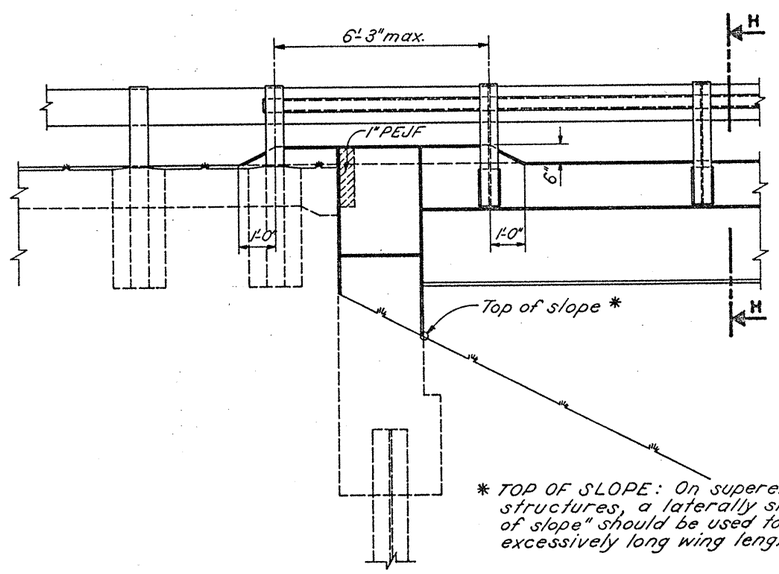
PART PLAN AT ABUTMENT
SQUARE STRUCTURE



PART PLAN AT ABUTMENT
SKEWED STRUCTURE

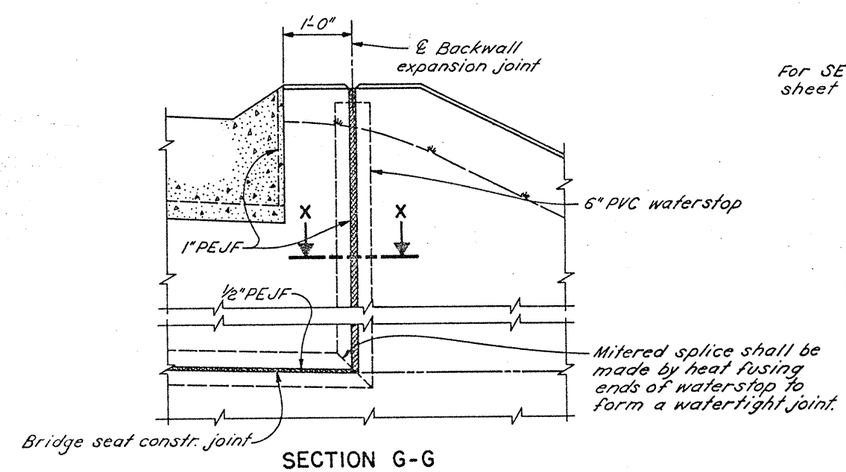


SECTION F-F



* TOP OF SLOPE: On superelevated structures, a laterally sloping "top of slope" should be used to avoid excessively long wing lengths.

ELEVATION

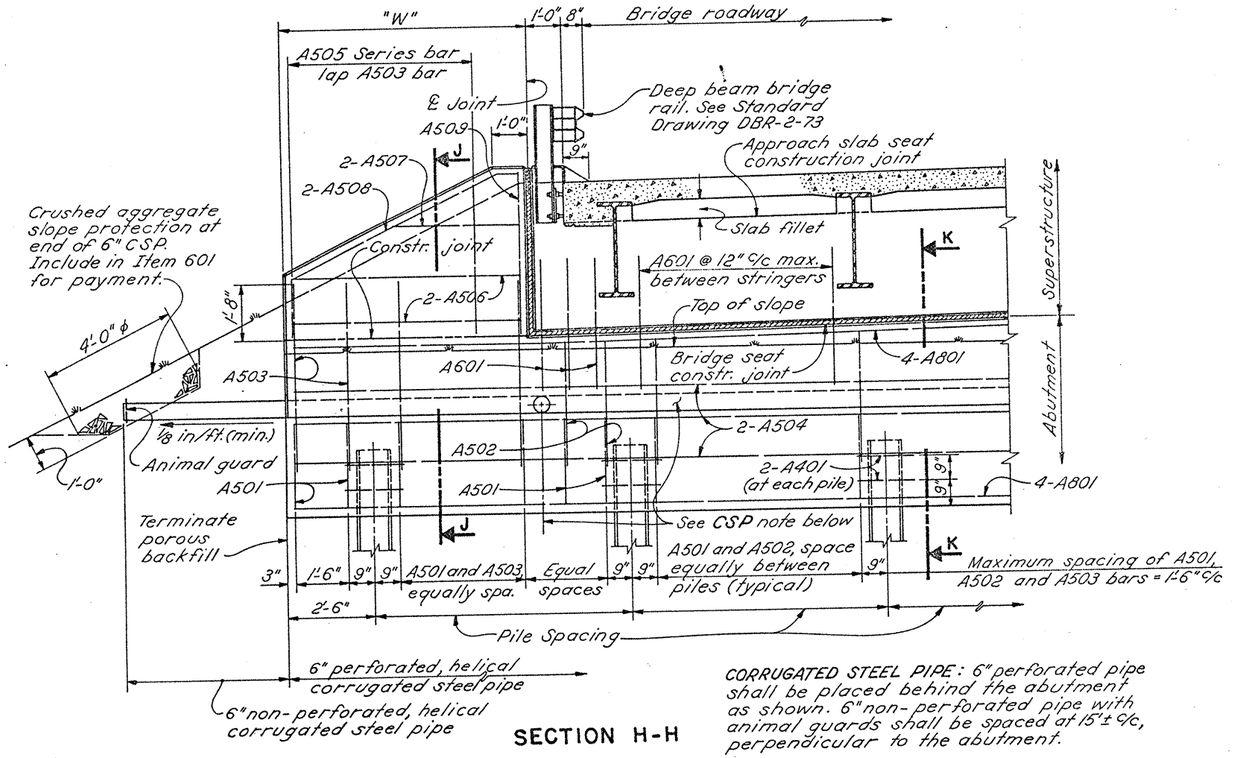


SECTION G-G

For SECTION H-H and SECTION X-X see sheet 4/5.

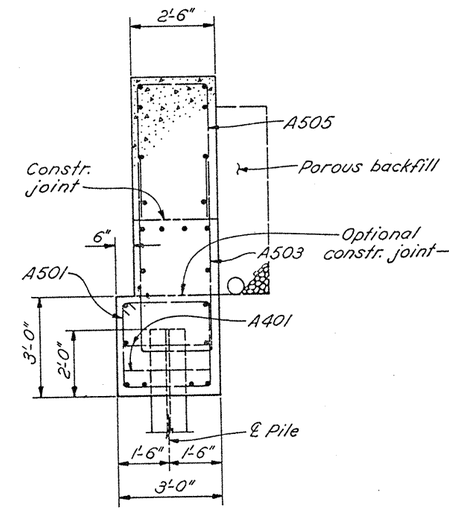
FOR BRIDGES WITH DEEP BEAM RAILING

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	3/5
	TENTATIVE STANDARD INTEGRAL CONSTRUCTION DETAILS STEEL STRINGER STRUCTURES ON FLEXIBLE ABUTMENTS	
	APPROVED: 11-15-82 (DATE) Robert B. Pfeifer (ENGINEER OF BRIDGES)	DRAWING NO. TS-ICD-1-82
	DESIGNED M.P.B. · DRAWN A.J.M. · TRACED — · CHECKED R.L.D. · REVIEWED W.J.J. M.P.B.	

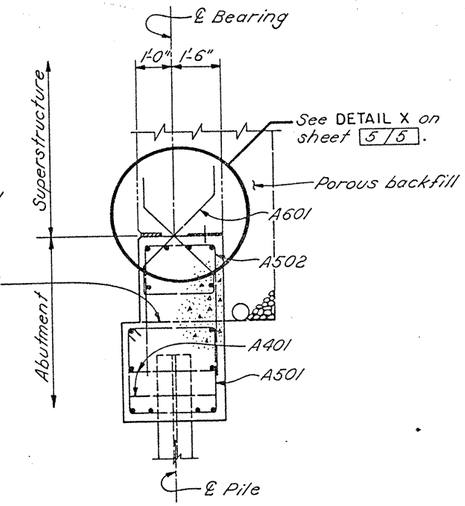


SECTION H-H

CORRUGATED STEEL PIPE: 6" perforated pipe shall be placed behind the abutment as shown. 6" non-perforated pipe with animal guards shall be spaced at 15'± c/c, perpendicular to the abutment.



SECTION J-J



SECTION K-K

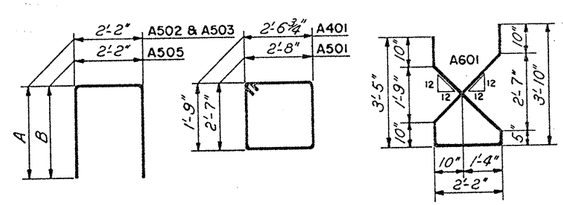
For location of SECTION H-H and SECTION X-X see sheet 3/5.

(1) For WATERSTOP note see sheet 5/5.

REINFORCING STEEL

MARK	LENGTH	SHAPE
A801	(1)	St.
A601	10'-9"	Bt.
A501	11'-0"	Bt.
A502	A	Bt.
A503	A	Bt.
A504	(1)	St.
A505	B	Bt.
A506	(2)	St.
A507	(2)	St.
A508	(2)	Bt.
A509	A	St.*
A401	9'-0"	Bt.

BENDING DIAGRAMS



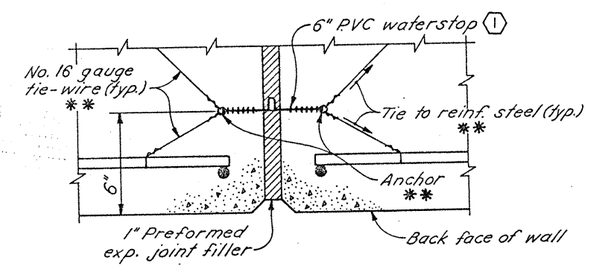
A - Length may vary with each individual structure.

B - Length and increment (series bar) may vary with each individual structure.

(1) - ½ (length of abutment - 4") + ½ bar lap.

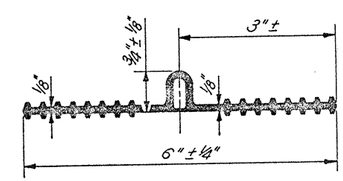
(2) - Length is dependent upon dimension "W" (length of wingwall).

* Bend in field



SECTION X-X

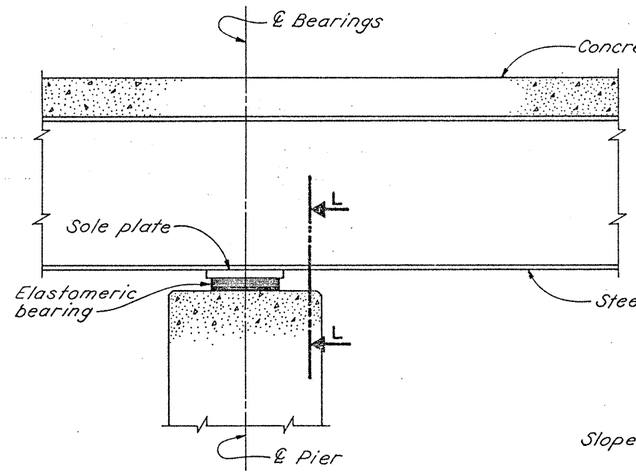
** For the first pour, the waterstop should be held securely in place by the use of split forms and tie-wires. For the second pour, secure the free end of waterstop in proper position with tie-wires. Alternate methods, as approved by the Engineer, may be used to insure the correct positioning of the waterstop.



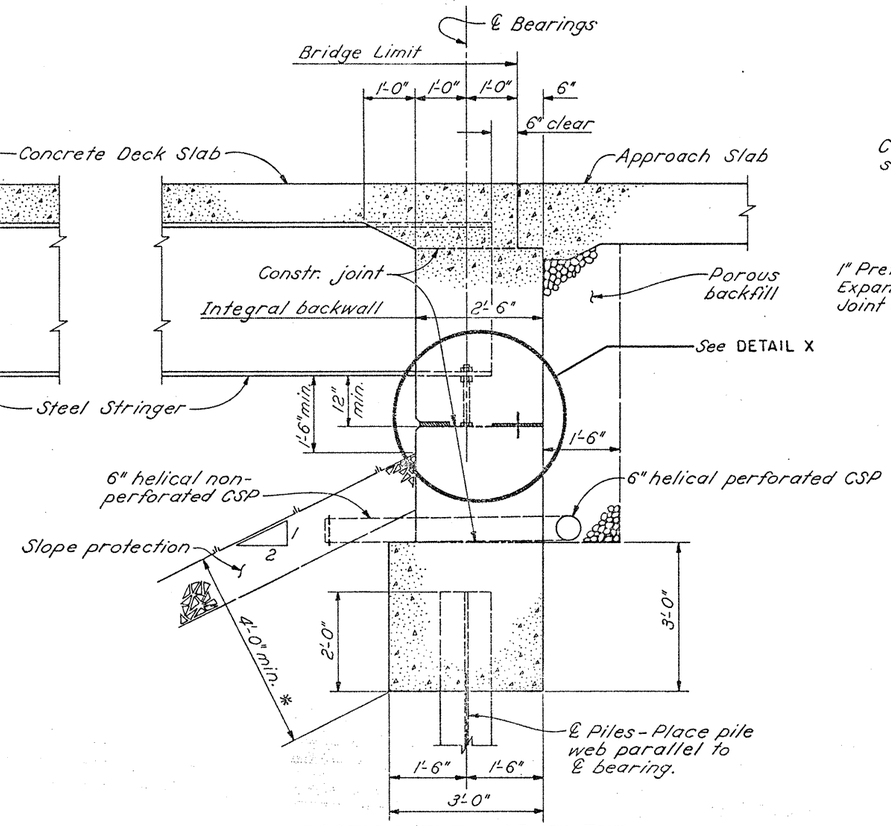
WATERSTOP DETAIL

FOR BRIDGES WITH DEEP BEAM RAILING

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	4/5
	TENTATIVE STANDARD INTEGRAL CONSTRUCTION DETAILS STEEL STRINGER STRUCTURES ON FLEXIBLE ABUTMENTS	
	APPROVED: 11-15-82 DATE — Robert B. Fisher ENGINEER OF BRIDGES	DRAWING NO. TS-ICD-1-82
	DESIGNED M.P.B. · DRAWN A.J.M. · TRACED — · CHECKED R.L.D. · REVIEWED W.J.J. M.P.B.	

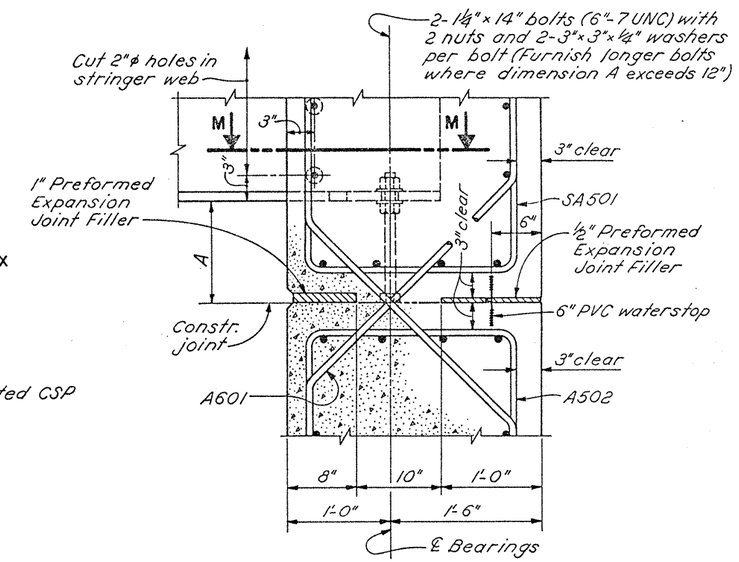


SECTION THRU PIER

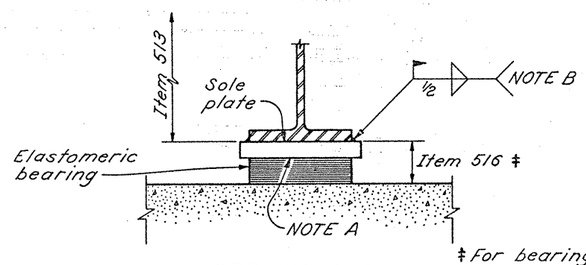


SECTION THRU ABUTMENT

* Clearance shown for crushed aggregate slope protection.



DETAIL X



SECTION L-L

‡ For bearing design details see structure plans.

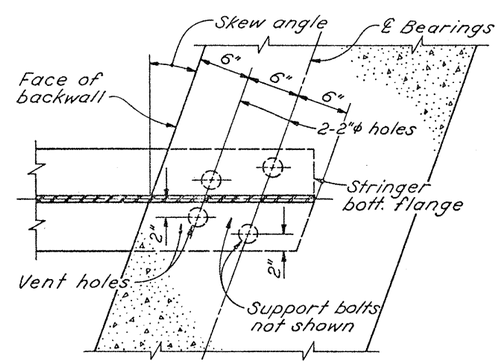
RECOMMENDED PIER BEARING

PIER BEARING NOTES

SOLE PLATE: Unless otherwise specified, sole plate material shall be the same as the attached structural steel and be similarly cleaned and coated.

NOTE A: Bearing parts shall be vulcanize bonded together under heat and pressure.

NOTE B: Pyrometric sticks or other temperature monitoring devices shall be used to limit steel surface temperature to less than 300°F. during welding. Quenching to accelerate cooling is not permitted.



SECTION M-M

ABUTMENT NOTES

LIMITATION: This design is intended for sites where the probability of settlement is remote, for symmetrical uncurved structures with skews not greater than 30° and sum of spans not greater than 300 feet. It may be used for unsymmetrical spans provided that expansion bearings are used at piers or that piers at fixed bearings are designed for the forces induced by unbalanced thermal movements. Where fixed, rigid piers are used, the maximum span shall be 150 feet.

BRIDGE SEAT CONSTRUCTION JOINT shall be straight between ends of backwall.

WATERSTOP: A 6" PVC waterstop shall be centered on the bridge seat construction joint and the backwall expansion joints to form a continuous waterproof seal. The waterstop shall be capable of accommodating 1½" of joint movement.

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN	5/5
	TENTATIVE STANDARD INTEGRAL CONSTRUCTION DETAILS STEEL STRINGER STRUCTURES ON FLEXIBLE ABUTMENTS	
	APPROVED: 11-15-82 DATE — Robert L. Stricker ENGINEER OF BRIDGES	DRAWING NO. TS-ICD-1-82
	DESIGNED MPB · DRAWN AJM · TRACED — · CHECKED RLD · REVIEWED WJJ. MPB.	