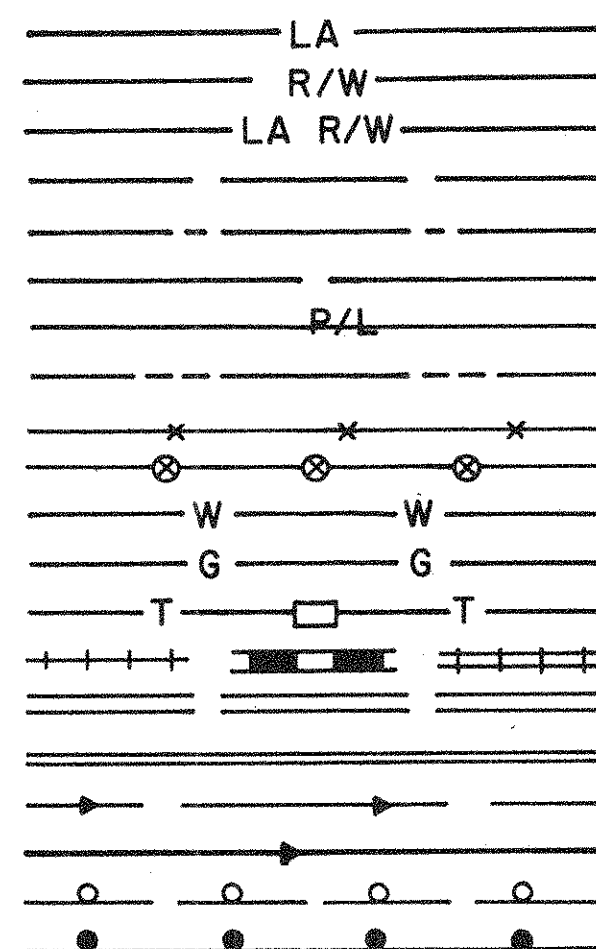


CONVENTIONAL SIGNS

LIMITED ACCESS  
PROPOSED R/W  
LIMITED ACCESS R/W  
PROPOSED EASEMENT  
CENTER LINE  
EXISTING R/W  
PROPERTY LINE  
CORPORATION LINE  
EXISTING FENCE  
PROPOSED FENCE  
WATER LINE  
GAS LINE  
UNDERGROUND TELEPHONE  
RAILROADS  
EXISTING RETAINING WALL  
PAVED SHOULDERS  
EXISTING SEWER  
PROPOSED SEWER  
EXISTING GUARD RAIL  
PROPOSED GUARD RAIL



VALVES  
EXISTING MANHOLES  
PROPOSED MANHOLES  
MANHOLES ADJUSTED TO GRADE  
MANHOLES REMOVED OR ABANDONED  
EXISTING INLETS OR CATCH BASINS  
PROPOSED INLET OR CATCH BASIN  
CATCH BASINS ADJUSTED TO GRADE  
CATCH BASINS REMOVED OR ABAND.

⊗ TREES AND STUMPS  
○ TREES AND STUMPS TO BE REMOVED  
● TELEPHONE OR TELEGRAPH POLE  
● LIGHT POLE  
⊗ POWER POLE  
⊗ WATER HYDRANT

INDEX OF SHEETS

TITLE SHEET \_\_\_\_\_ 1  
TYPICAL SECTIONS \_\_\_\_\_ 2  
GENERAL NOTES \_\_\_\_\_ 3  
CALCULATIONS \_\_\_\_\_ 4

GENERAL SUMMARY \_\_\_\_\_ 5  
PLAN AND PROFILE \_\_\_\_\_ 6  
CROSS SECTIONS \_\_\_\_\_ 7-8  
STRUCTURES OVER 20' SPAN \_\_\_\_\_ 9-18

LINE DATA

BEGIN PROJECT STA. 377+50  
END PROJECT STA. 378+95  
LENGTH OF PROJECT 145 LIN. FT. OR .027 MILES  
  
BEGIN WORK STA. 376+70  
END WORK STA. 379+60  
LENGTH OF WORK 290 LIN. FT. OR .055 MILES

PLANS COMPLETED BY:  
COLUMBUS ENGINEERING CONSULTANTS INCORPORATED  
CONSULTING CIVIL ENGINEERS  
950 MICHIGAN AVE.  
COLUMBUS, OHIO  
(614) 228-3500

UNDERGROUND UTILITIES  
  
TWO WORKING DAYS  
BEFORE YOU DIG  
CALL 800-362-2764 (TOLL FREE)  
OHIO UTILITIES PROTECTION SERVICE  
  
NON-MEMBERS  
MUST BE CALLED DIRECTLY

PLANS PREPARED BY  
  
L. THOMPSON CONSULTANTS, INC.  
1580 KING AVE. SUITE 103  
COLUMBUS, OHIO 43212  
  
STRUCTURE PLANS REVIEWED BY:  
Burgess & Niple, Limited  
Engineers and Architects

DESIGN DESIGNATION  
CURRENT A.D.T. (1992) = 1980  
DESIGN YEAR A.D.T. (2012) = 2760  
D.H.V. = 276  
D = 55 %  
T % TRUCKS = 4 %  
LEGAL SPEED = 55 MPH  
V (DESIGN SPEED) = 55 MPH  
FUNCTIONAL CLASSIFICATION MAJOR COLLECTOR  
DESIGN EXCEPTIONS REQUIRED: NONE

REGISTERED ENGINEER Jack Jany NO. 44907 DATE 10/31/91

PROJECT PER - 345 - 7.15  
DATE OF LETTING \_\_\_\_\_ CONTRACT NO. \_\_\_\_\_

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION

PER-345-7.15

CLAYTON TOWNSHIP  
PERRY COUNTY

F.H.W.A. REGION	STATE	PROJECT
5	OHIO	BRF - 881 (2)

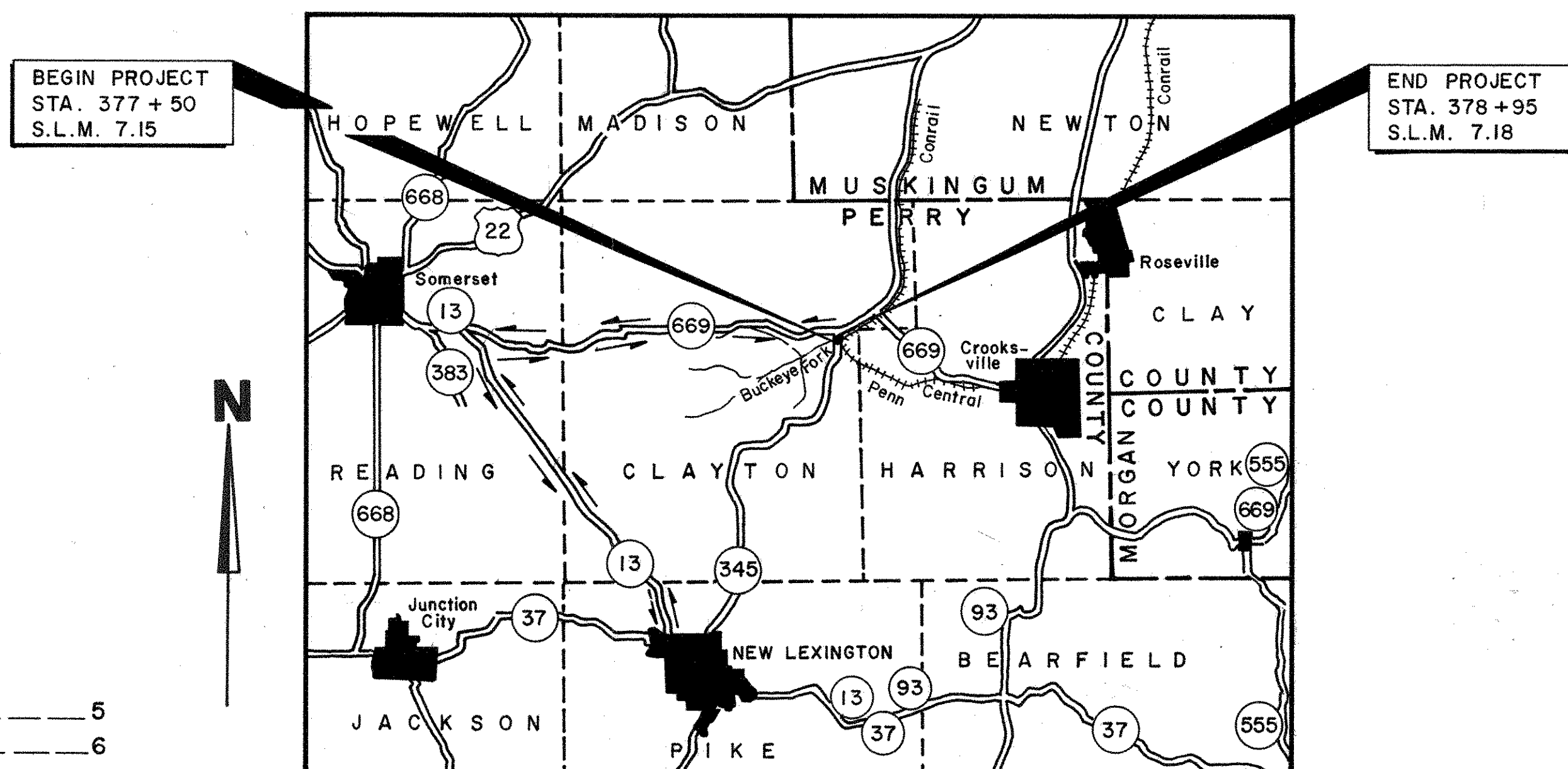
1  
18

PERRY COUNTY  
PER-345-7.15

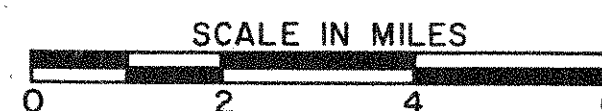
BRF - 881 ( 2 )

1993 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.

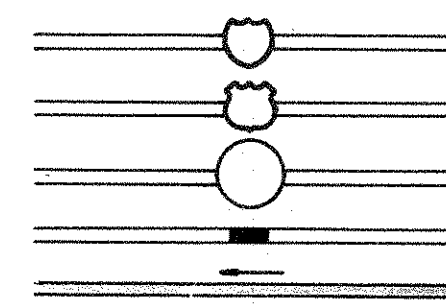
I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT DETOURS WILL BE PROVIDED AS INDICATED ON THIS SHEET.



DETOUR & LOCATION MAP



INTERSTATE  
U.S. ROUTE  
STATE ROUTE  
PORTION TO BE IMPROVED  
STATE DETOUR



SCALES

0 10 20 40

0 20 40

0 5 10

0 5 10

0 5 10

0 5 10

0 5 10

STANDARD CONSTRUCTION DRAWINGS

GR-1.1	5/6/91	AS-1-81	11/27/81	MT-105.10	7-1-92
GR-2.1	5/6/91			MT-105.11	7-1-92
GR-4.1	5/6/91			TC-41.10	8-29-84
GR-1.2	10/30/92	DBR-2-73	4/10/73	TC-41.20	3-26-79
MC-4	7/26/76			TC-52.10	4-3-79
MC-11	8/11/78	PSBD-1-81	6/20/89	TC-52.20	4-3-79
MT-99.10	11/14/86	EXJ-3-82	8/11/84		
MT-101.60	7/01/92				
BP-3.1	2/21/92				
GR-3.4	5/6/91				

SUPPLEMENTAL SPECIFICATIONS

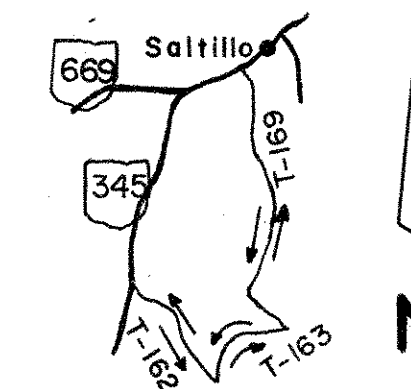
NUMBER	DATE	NUMBER	DATE
802	4/13/90		
820	3/18/92		
849	12/24/85		
931	3/18/92		
949	9/26/86		
944	3/18/92		

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

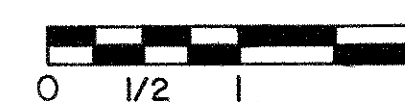
DIVISION ADMINISTRATOR

DATE



DESIGNATED LOCAL DETOUR ROUTE

SCALE: 1" = 1 MILE



# TYPICAL SECTION

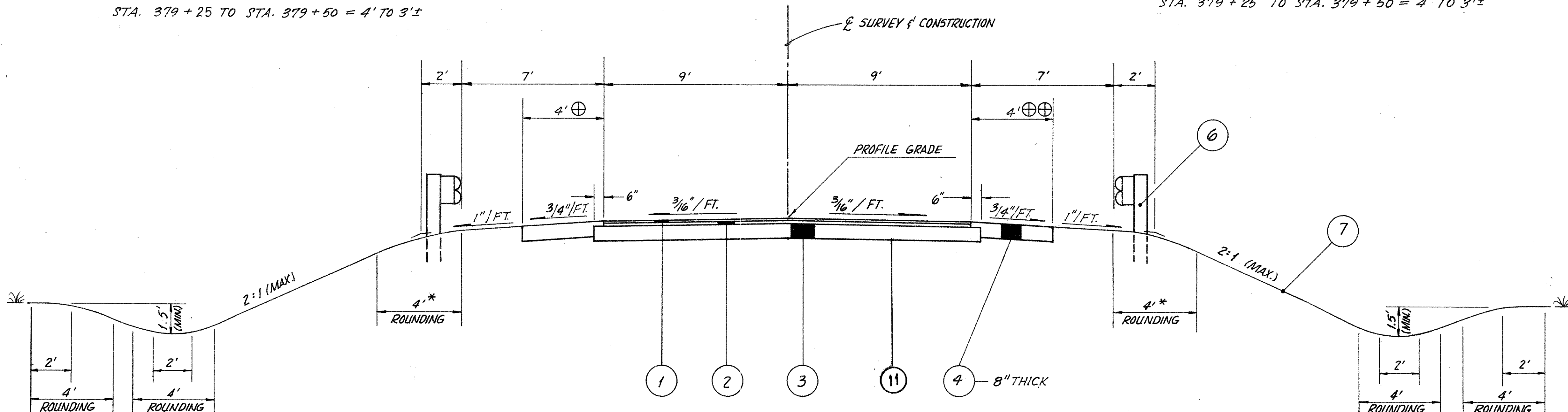
## TYPE 404 ON 301

### ⊕ SHOULDER WIDTH TRANSITION, LEFT

STA. 376 + 85 TO STA. 377 + 10 = 3'± TO 4'  
 STA. 377 + 10 TO STA. 377 + 71.78 = 4'  
 STA. 378 + 67.40 TO STA. 379 + 25 = 4'  
 STA. 379 + 25 TO STA. 379 + 50 = 4' TO 3'±

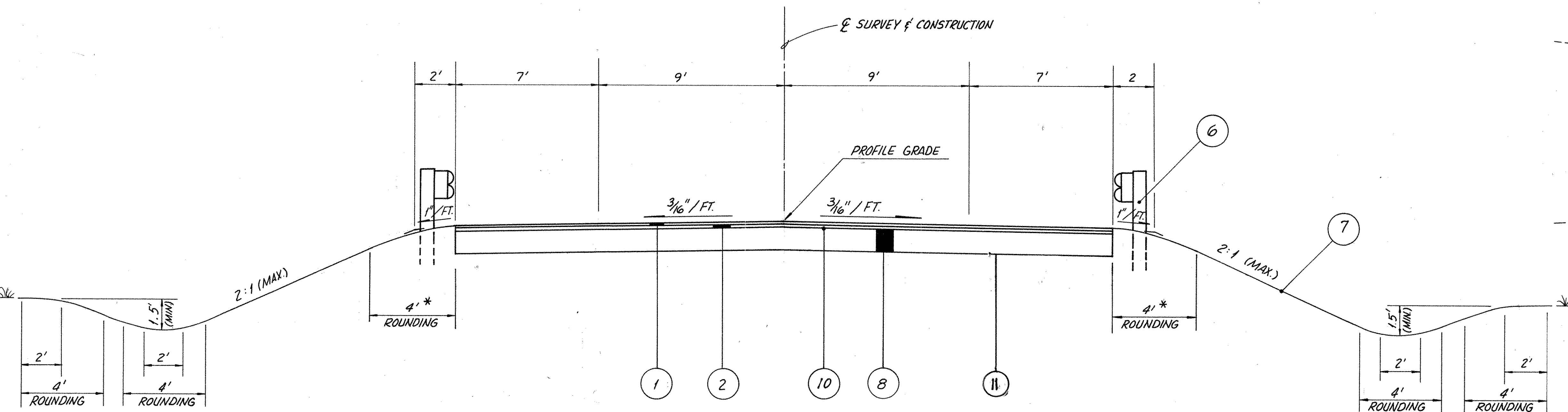
### ⊕⊕ SHOULDER WIDTH TRANSITION, RIGHT

STA. 376 + 85 TO STA. 377 + 10 = 3'± TO 4'  
 STA. 377 + 10 TO STA. 377 + 76.60 = 4'  
 STA. 378 + 72.22 TO STA. 379 + 25 = 4'  
 STA. 379 + 25 TO STA. 379 + 50 = 4' TO 3'±



### NORMAL SECTION

FROM STA. 377 + 50 TO STA. 377 + 74.19 = 24.19 FT.  
 FROM STA. 378 + 69.81 TO STA. 378 + 95 = 25.19 FT.  
 TOTAL = 49.38 FT.



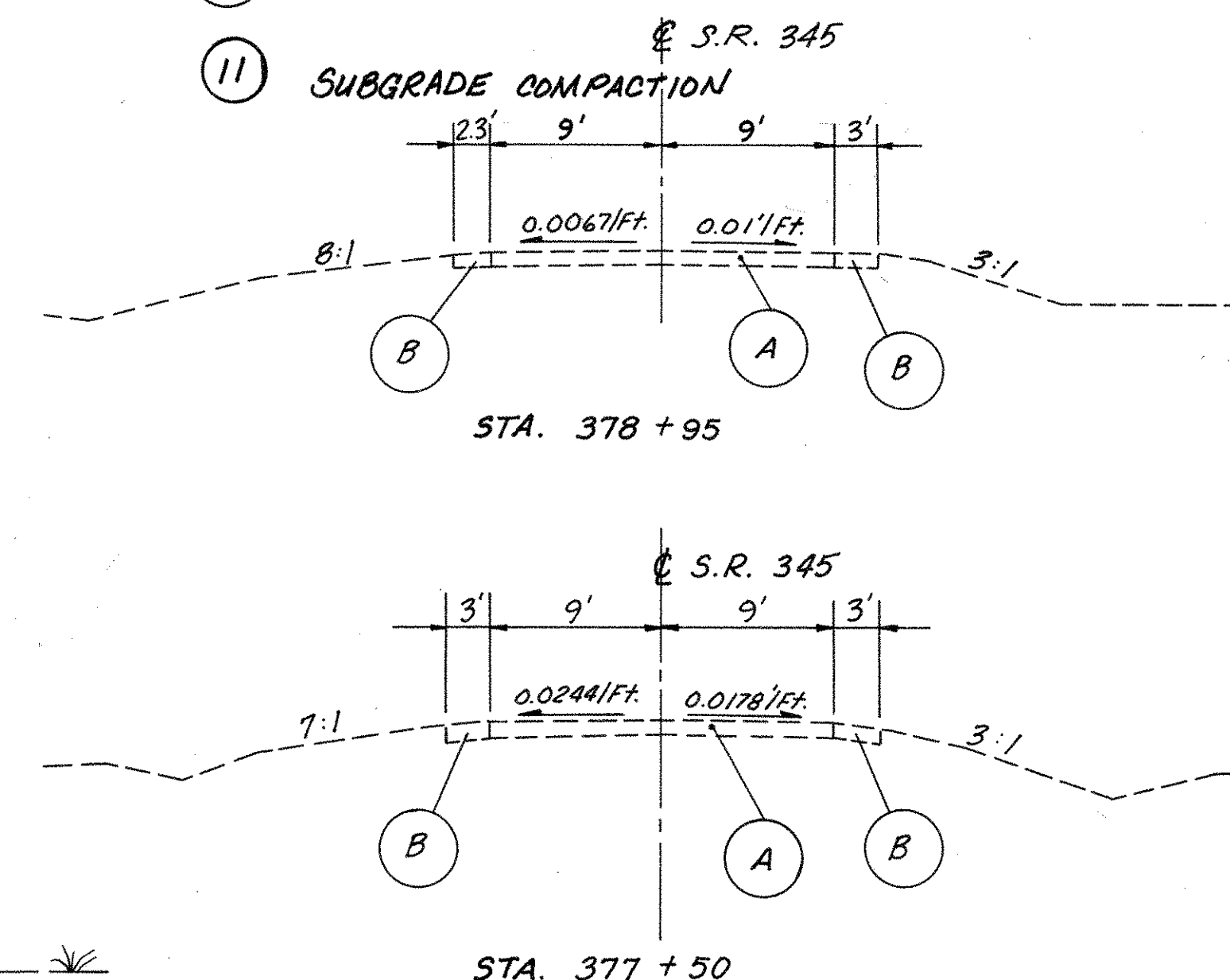
### APPROACH SLAB SECTION

FROM STA. 377 + 74.19 TO STA. 377 + 94.19 = 20 FT.  
 FROM STA. 378 + 49.81 TO STA. 378 + 69.81 = 20 FT.  
 TOTAL = 40 FT.

\* 8' ROUNING REQUIRED WITHOUT GUARDRAIL

### LEGEND

- 1 ITEM 404 1 1/4" ASPHALT CONCRETE AC-20
- 2 ITEM 402 1 3/4" ASPHALT CONCRETE AC-20
- 3 ITEM 301 6" BITUMINOUS AGGREGATE BASE, AC-20
- 4 ITEM 304 AGGREGATE BASE, AS PER PLAN
- 5 NUMBER NOT USED
- 6 ITEM 606 GUARD RAIL, TYPE 5
- 7 ITEM 659 SEEDING & MULCHING
- 8 ITEM 611 REINFORCED CONCRETE APPROACH SLAB T = 13"
- A EXISTING PAVEMENT: 5" ASPHALT, 10" AGGREGATE BASE
- 9 NUMBER NOT USED
- 10 ITEM 407 TACK COAT
- B AGGREGATE SHOULDER
- 11 SUBGRADE COMPACTION



### EXISTING ADJOINING SECTION



# GENERAL NOTES

CALC. BY DATE CHKD. BY DATE	<i>K.E.D.</i> <i>10/9/89</i> <i>S.S.S.</i> <i>10/20/89</i>	PERRY COUNTY PER-345-7.15	OHIO FHWA REGION 5	<div>318</div>
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## ITEM 642-TRAFFIC PAINT

THE PERMANENT CENTERLINE PAINTING SHALL BE DOUBLE SOLID YELLOW BETWEEN STA. 376+70 AND STA. 379+60. THE EQUIVALENT SOLID LINE IS 0.110 MILE.

## 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.

## UNDERGROUND UTILITIES

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

## 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 ENGINEERS DISCRETION SHALL BE MADE A MATTER OF RECORD BY INCORPORATION INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

## LOCATION OF GUARDRAIL

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

## SEEDING

QUANTITIES FOR SEEDING SHALL BE BASED ON THE SOIL AREAS BETWEEN TEN (10) FEET OUTSIDE THE WORK LIMITS, AS SHOWN ON THE CROSS SECTIONS, OR TO THE RIGHT-OF-WAY LINE, IF SUCH LINE IS LESS THAN TEN (10) FEET FROM THE WORK LIMITS.

## WATERING PERMANENT SEEDED AREAS

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH AND TO CARE FOR THE PERMANENT SEED AREAS, AS PER 659.09:

659 WATER 30 M.GAL.

## TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

THE FOLLOWING ESTIMATED QUANTITY IS TO BE USED AS DIRECTED BY THE ENGINEER FOR EROSION AND SILTATION CONTROL MEASURES:

207 STRAW OR HAY BALES 50 EACH

## DUST CONTROL

THE FOLLOWING ESTIMATED AMOUNTS OF 616 CALCIUM CHLORIDE AND 616 WATER HAVE BEEN PROVIDED FOR DUST CONTROL AS DIRECTED BY THE ENGINEER:

616 CALCIUM CHLORIDE 0.5 TON  
616 WATER 1 M GAL.

## ITEM 304 AGGREGATE BASE, AS PER PLAN

MATERIALS FURNISHED FOR THIS ITEM SHALL EXCLUDE ALL SLAG EXCEPT GRANULATED SLAG OR CRUSHED AIR-COOLED BLAST FURNACE SLAG.

## 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 THIS ITEM. THE ENGINEER SHALL CHECK AND ADJUST QUANTITIES FOR THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

## DETOUR LIMITATIONS AND MAINTAINING TRAFFIC

TWO-WAY SHALL BE MAINTAINED AT ALL TIMES, EXCEPT FOR A SINGLE PERIOD NOT TO EXCEED 90 CONSECUTIVE CALENDAR DAYS, THROUGH TRAFFIC WILL BE DETOURED AS SHOWN ON THE TITLE SHEET MAP. UNTIL THE DETOUR IS PLACED INTO EFFECT TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES.

THE CONTRACTOR SHALL NOTIFY THE DISTRICT CONSTR. ENGINEER IN WRITING, WITH COPIES FOR THE DISTRICT TRAFFIC ENGINEER AND DISTRICT COMMUNICATIONS OFFICER, A MINIMUM OF TWENTY-ONE DAYS IN ADVANCE OF THE DATE THE DETOUR IS NEEDED. THE STATE OF OHIO WILL INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE THE DETOUR SIGNING.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC MAINTENANCE AT ALL TIMES IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 614, MAINTAINING TRAFFIC.

THE FIRST DAY THAT THE DETOUR IS IN EFFECT SHALL BE CONSIDERED THE STARTING DATE OF THE 90 DAY DETOUR LIMITATION. THE 90<sup>th</sup> DAY OF THE 90 DAY DETOUR LIMITATION SHALL BE CONSIDERED AS AN INTERIM COMPLETION DATE. ON OR BEFORE THE 90<sup>th</sup> DAY THE ROADWAY SHALL BE OPENED TO THE SAFE AND CONVENIENT USE OF THE TRAVELING PUBLIC. IF THE ROADWAY IS NOT OPENED BY THIS INTERIM COMPLETION DATE, LIQUIDATED DAMAGES SHALL BE ASSESSED AS PER SPECIFICATION 108.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATION BOOK.

EITHER PERMANENT OR TEMPORARY PAVEMENT MARKINGS MUST BE IN PLACE PRIOR TO OPENING THE ROADWAY TO TRAFFIC.

## CLEARING AND GRUBBING

ALTHOUGH THERE ARE NO TREES AND/OR STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE LIMITS OF THIS PROJECT, A LUMP SUM QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR ITEM 201, CLEARING AND GRUBBING. ALL PROVISIONS AS SET FORTH IN THE SPECIFICATIONS UNDER THIS ITEM SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

## TEMPORARY STREAM INVOLVEMENTS

WHERE STREAM INVOLVEMENTS ARE REQUIRED FOR EQUIPMENT CROSSINGS, ETC., THE FOLLOWING SHALL APPLY TO THE CONTRACTOR'S OPERATIONS. ALL MATERIALS PLACED IN THE STREAM AREA SHALL CONSIST OF CLEAN, NON-TOXIC, NON-ERODIBLE 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 OF DISCHARGES-NATIONALLY PERMITTED, PARAGRAPH (A)(14) MINOR ROAD CROSSING FILLS OF THE FEDERAL REGISTER-CORPS OF ENGINEERS INTERIM FINAL REGULATIONS PUBLISHED JULY 22, 1982.

FOR MORE GENERAL NOTES SEE SHEET 4

## UTILITY OWNERSHIP

THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT:

TELEPHONE: OHIO BELL TELEPHONE  
150 E. GAY STREET, RM 6F  
COLUMBUS, OHIO 43215  
(614) 223-8535

ELECTRIC: OHIO POWER COMPANY  
301 CLEVELAND AVENUE, S.W.  
CANTON, OHIO 44071  
(216) 456-8173

## ELEVATION

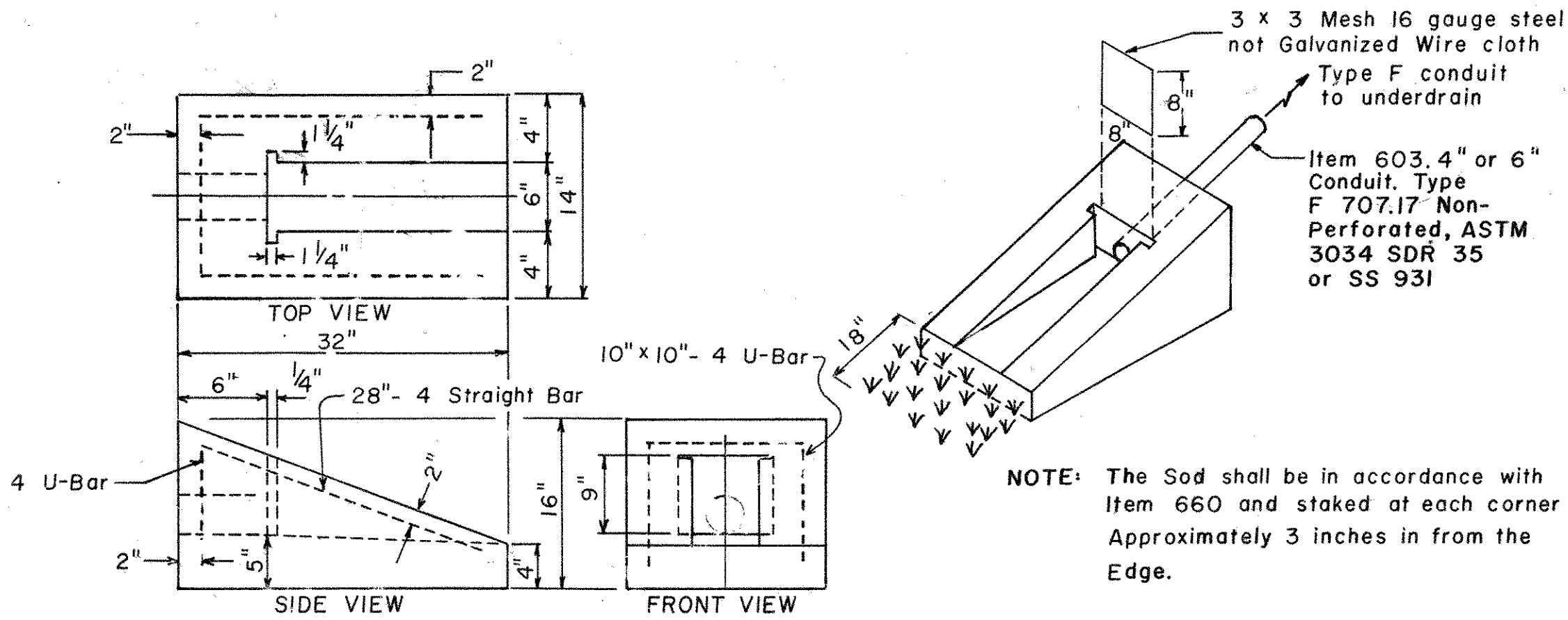
ALL ELEVATIONS ARE BASED ON USGS DATUM.

## ITEM 407 TACK COAT

THE TACK COAT OPERATION SHALL BE DETERMINED AS PER SPEC. 407.05. PLAN QUANTITIES INDICATED AN AVERAGE APPLICATION RATE OF .075 GALLONS PER SQUARE YARD OF TACK COAT FOR ESTIMATING PURPOSES ONLY.

## ITEM SPECIAL- PRECAST REINFORCED CONCRETE OUTLET

THE CONCRETE OUTLET SHALL MEET THE REQUIREMENTS OF ITEM 604 IN THE CONSTRUCTION & MATERIALS SPECIFICATIONS. PAYMENT SHALL BE MADE ON AN EACH BASIS. PAYMENT SHALL INCLUDE THE COST OF THE SOD & WIRE CLOTH.



THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER.

ITEM SPECIAL PRECAST REINFORCED CONCRETE OUTLET 4 EACH

CALCULATIONS

\* ASTM D-3034 SDR-35, SS 931 or SS 944  
PERFORATED PER 707.15

ITEM 301 - 6"BITUMINOUS AGGREGATE BASE

STA. 377+50 TO STA. 378+95  

$$[(49.38 \times 19) \times (6 \div 12)] \div 27 = 17.4 \text{ Cu. Yd.}$$

ITEM 304 - AGGREGATE BASE

STA. 376+85 TO STA. 379+50  

$$\{(100 \times 3.5) + (61.78 + 57.60 + 66.6 + 52.78) \times 4\} \times 8 / 12 \div 27 = 32.2 \text{ Cu. Yd.}$$

TOTAL = 32 Cu. Yd.

ITEM 402 - 1 3/4" ASPHALT CONCRETE

STA. 377+50 TO STA. 378+95  

$$\{[(49.38 \times 18) + (40 \times 32)] \times (1 3/4 \div 12)\} \div 27 = 11.7 \text{ Cu. Yd.}$$

ITEM 404 - 1 1/4" ASPHALT CONCRETE

STA. 377+50 TO STA. 378+95  

$$\{[(49.38 \times 18) + (40 \times 32)] \times (1 1/4 \div 12)\} \div 27 = 8.4 \text{ Cu. Yd.}$$

ITEM 203 EMBANKMENT USING GRANULAR MATERIAL, AS PER PLAN

TEST BORINGS INDICATE THAT SOFT AND WET SUBGRADE MAY BE ENCOUNTERED BETWEEN STA. 377+50 AND 378+95. A 3' UNDERCUT BELOW SUBGRADE MAY BE PROVIDED. GRANULAR BACKFILL MATERIAL MAY BE PROVIDED AS PER PLAN. FILTER FABRIC (ITEM 712.09, TYPE D) SHALL BE PLACED AT THE BOTTOM AND 2 FEET ON EACH SIDE OF THE EXCAVATION. AN 18" OVERLAP OF FABRIC EDGES, SECURED BY ANY MEANS SATISFACTORY TO THE ENGINEER SHALL BE PROVIDED. THE LOWER 18" OF GRANULAR MATERIAL SHALL BE PLACED BY END DUMPING. ITEM 712 FILTER FABRIC SHALL BE INCLUDED WITH ITEM 203 EMBANKMENT USING GRANULAR MATERIAL, AS PER PLAN. THE GRANULAR BACKFILL MATERIAL SHALL MEET THE REQUIREMENTS OF 203.02 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS. THE FOLLOWING ITEMS HAVE BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER:  
ITEM 203 EXCAVATION OF UNSUITABLE MATERIAL 234 CU. YD.  
ITEM 203 EMBANKMENT USING GRANULAR MATERIAL, AS PER PLAN 254 CU. YD.

ITEM 605 4" UNCLASSIFIED PIPE UNDERDRAIN, 707.17, AS PER PLAN\*

DRAINAGE OF THE GRANULAR MATERIAL SHALL BE PROVIDED BY A 4" 707.17 PERFORATED PLASTIC PIPE PLACED ALONG THE OUTSIDE EDGES OF THE EXCAVATION. THE PIPE SHALL BE PLACED ON THE FABRIC AND COVERED WITH A MINIMUM OF 6" OF NO.8 AGGREGATE BEFORE PLACEMENT OF ITEM 203 EMBANKMENT USING GRANULAR MATERIAL, AS PER PLAN. COST SHALL INCLUDE FURNISHING AND PLACING ALL MATERIALS, NO.8 AGGREGATE, BENDS AND BRANCHES, LABOR, TOOLS AND EQUIPMENT AND ANY OTHER INCIDENTALS NECESSARY TO COMPLETE THIS ITEM, AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR LINEAR FOOT UNDER ITEM 605 4" UNCLASSIFIED PIPE UNDERDRAIN, 707.17, AS PER PLAN. THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER:  
ITEM 605 4" UNCLASSIFIED PIPE UNDERDRAIN, 707.17, AS PER PLAN 170 LIN. FT.

ITEM 407 - TACK COAT

$$142.22 \text{ Sq. Yd} \times 0.075 \text{ Gal./Sq. Yd} = 10.66 \approx 11 \text{ Gal.}$$

ITEM 601 - ROCK CHANNEL PROTECTION  
TYPE C WITHOUT FILTER

Rear Abutment  

$$(434.5 \text{ Ft.}^2 \times 2 \text{ Ft.}) \div 27 = 32.2 \text{ Cu. Yd.}$$
*(By Planimeter using scale factor 1:1)*  
Forward Abutment  

$$(442.6 \text{ Ft.}^2 \times 2 \text{ Ft.}) \div 27 = 32.8 \text{ Cu. Yd.}$$
*(By Planimeter using scale factor 1:1)*

TOTAL = 65 Cu. Yd.

ITEM 203 - SUBGRADE COMPACTION

STA. 377+50 TO STA. 377+94.19  
STA. 378+49.81 TO STA. 378+95.00

$$[(18)(49.38) + (40)(32)] \div 9 = 2168.84 / 9 = 240.98 \text{ SQ. YD.}$$

TOTAL = 241 SQ. YD.

ITEM 611 - APPROACH SLAB

STA. 377+74.19 TO STA. 377+94.19 = 20 L.F.  

$$20 \text{ L.F} \times 32 \text{ L.F} \div 9 \text{ Sq. Ft. / Sq. Yd.} = 71.11 \text{ Sq. Yd.}$$
  
STA. 378+49.81 TO STA. 378+69.81 = 20 L.F.  

$$20 \text{ L.F} \times 32 \text{ L.F} \div 9 \text{ Sq. Ft. / Sq. Yd.} = 71.11 \text{ Sq. Yd.}$$
  
TOTAL = 142.11 ≈ 142 Sq. Yd.

ITEM 659 - COMMERCIAL FERTILIZER

$$1178 \text{ Sq. Yd.} \times 20 \text{ lbs. / 1000 Sq. Ft.} \times 9 \text{ Sq. Ft.} \times 1 \text{ Ton / 2000 lbs.} = 0.11 \text{ Ton}$$

ITEM 659 - AGRICULTURAL LIMING

$$1178 \text{ Sq. Yd.} \times 100 \text{ lbs. / 1000 Sq. Ft.} \times 9 \text{ Sq. Ft.} \times 1 \text{ Ton / 2000 lbs} = 0.53 \text{ Ton}$$

ITEM 642 - CENTER LINE

STA. 376+70 TO STA. 379+60 = 290 L. F.  
290 ÷ 5280 = 0.05 Mi.

ITEM 642 - EDGE LINE (WHITE)

STA. 376+70 TO STA. 379+60 = 290 L. F.  
2 (290 ÷ 5280) = 0.11 Mi.

ITEM 614 - TEMPORARY CENTER LINE

STA. 376+70 TO STA. 379+60 = 290 L. F.  
290 ÷ 5280 = 0.05 Mi.

DESIGNATED LOCAL DETOUR ROUTE

IN ADDITION TO THE OFFICIAL, SIGNED DETOUR ROUTE, A LOCAL ROUTE HAS BEEN DETERMINED TO BE THE SECONDARY, UNSIGNED DETOUR ROUTE OR "DESIGNATED LOCAL DETOUR ROUTE". THIS ROUTE IS SHOWN ON SHEET NO.1. DURING THE TIME THAT TRAFFIC IS DETOURED THE CONTRACTOR SHALL MAINTAIN 1.5 MILES OF TOWNSHIP ROAD 169 IN CLAYTON TOWNSHIP AND HARRISON TOWNSHIP, 0.6 MILE OF TOWNSHIP ROAD 163 IN CLAYTON TOWNSHIP AND HARRISON TOWNSHIP, AND 0.7 MILE OF TOWNSHIP ROAD 162 IN CLAYTON TOWNSHIP, IN A CONDITION WHICH IS REASONABLY SMOOTH AND FREE FROM HOLES, RUTS, RIDGES, BUMPS, DUST AND STANDING WATER. ONCE THE DETOUR IS REMOVED AND TRAFFIC RETURNED TO ITS NORMAL PATTERN, THE DESIGNATED LOCAL DETOUR ROUTE SHALL BE RESTORED TO A CONDITION THAT IS EQUIVALENT TO THAT WHICH EXISTED PRIOR TO ITS USE FOR THIS PURPOSE. ALL SUCH WORK SHALL BE PERFORMED WHEN AND AS DIRECTED BY THE ENGINEER. THE FOLLOWING ESTIMATED QUANTITIES ARE PROVIDED FOR USE AS DIRECTED BY THE ENGINEER TO MAINTAIN AND SUBSEQUENTLY RESTORE THE DESIGNATED LOCAL DETOUR ROUTE.

ITEM	QUANTITY	DESCRIPTION
SPECIAL 203	30 HOURS	GRADER RENTAL
409	4200 GAL.	SEAL COAT BITUMINOUS MATERIAL 0.30 GAL. / SQ. YD.
409	4700 CU. YDS.	SEAL COAT COVER AGGREGATE NO.8
SPECIAL 690	1300 TONS	ROADWAY MISC. AGGREGATE BASE USING #57 STONE
SPECIAL 690	600 GAL.	ROADWAY MISC. MC-70 (DUST CONTROL)

NOTE: All quantities carried to General Summary Sht. No. 5



GENERAL SUMMARY

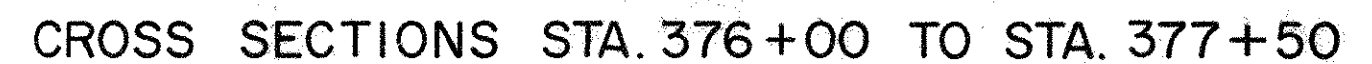
SHEET NUMBER								PARTICIPATION			ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
ITEM	2	3	4		6	7	8								
ROADWAY															
203			241								203	50000	241	S.Y.	SUBGRADE COMPACTION
201		LUMP									201	11000	LUMP		CLEARING & GRUBBING
					109						202	38000	109	L.F.	GUARDRAIL REMOVED
203					354						203	12000	354	C.Y.	EXCAVATION, NOT INCLUDING EMBANKMENT CONSTRUCTION
203			234								203	13100	234	C.Y.	EXCAVATION OF UNSUITABLE MATERIAL
203					111						203	20000	111	C.Y.	EMBANKMENT
606					300						606	13000	300	L.F.	GUARDRAIL, TYPE 5
606					4						606	25000	4	EACH	ANCHOR ASSEMBLY, TYPE A
606					4						606	35140	4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 4
203			254								203	21001	254	C.Y.	EMBANKMENT USING GRANULAR MATERIAL, AS PER PLAN (SEE SHEET 3)
616		0.5									616	20000	0.5	TON	CALCIUM CHLORIDE
616		1									616	10000	1	M. GAL.	WATER
EROSION CONTROL															
207		50									207	70000	50	EACH	STRAW OR HAY BALES
601			65								601	34200	65	C.Y.	ROCK CHANNEL PROTECTION TYPE C, WITHOUT FILTER
659					1178						659	10000	1178	S.Y.	SEEDING & MULCHING
659			0.11								659	20000	0.11	TON	COMMERCIAL FERTILIZER
659			0.53								659	30000	0.53	TON	AGRICULTURAL LIMING
659		3									659	35000	3	M. GAL.	WATER
DRAINAGE															
603					42						603	00406	42	L.F.	4" CONDUIT, TYPE F, 707.17 NON PERFORATED ASTM 3034 S.D.R. 35 OR S.S. 931 OR S.S. 944
604		4									SPECIAL	60436600	4	EACH	PRECAST REINFORCED CONCRETE OUTLET (SEE SHT. 3)
605			170								605	05201	170	L.F.	4" UNCLASS. PIPE UNDERDRAIN (707.17) AS PER PLAN (SEE SHEET 4)
PAVEMENT															
301			17								301	10002	17	C.Y.	BITUMINOUS AGGREGATE BASE, AC-20
304			32								304	20001	32	C.Y.	AGGREGATE BASE AS PER PLAN (See sheet 3)
402			12								402	20000	12	C.Y.	ASPHALT CONCRETE, AC-20
404			8								404	20000	8	C.Y.	ASPHALT CONCRETE, AC-20
407			11								407	10000	11	GAL.	TACK COAT
REINFORCED CONCRETE APPROACH SLAB, T = 13"															
611			142								611	15000	142	S.Y.	
MAINTENANCE OF TRAFFIC															
203			30								SPECIAL	20363000	30	hour	GRADER RENTAL
409			4200								409	20000	4200	GAL.	SEAL COAT BITUMINOUS MATERIAL
409			4700								409	12000	4700	CU.YD.	SEAL COAT COVER AGGREGATE NO.8
614			0.05								614	21400	0.05	MILE	TEMPORARY CENTERLINE, CLASS II
Spec.690			1300								SPECIAL	69098800	1300	TONS	ROADWAY MISC. AGGREGATE BASE USING #57 STONE
Spec.690			600								SPECIAL	69098900	600	GAL.	ROADWAY MISC. MC-70 (DUST CONTROL)
TRAFFIC CONTROL															
642			0.05								642	00290	0.05	MILE	CENTERLINE
642			0.11								642	00090	0.11	MILE	EDGE LINE
802					8						802	00100	8	EACH	BARRIER REFLECTOR, TYPE A
STRUCTURE OVER 20' SPAN															
FOR QUANTITIES OF PER-345-7.16 SEE SHT. NO. 11															
614											614	11000	LUMP		MAINTAINING TRAFFIC
619											619	15000	LUMP		FIELD OFFICE, TYPE A
623											623	10000	LUMP		CONSTRUCTION LAYOUT STAKES
624											624	10000	LUMP		MOBILIZATION



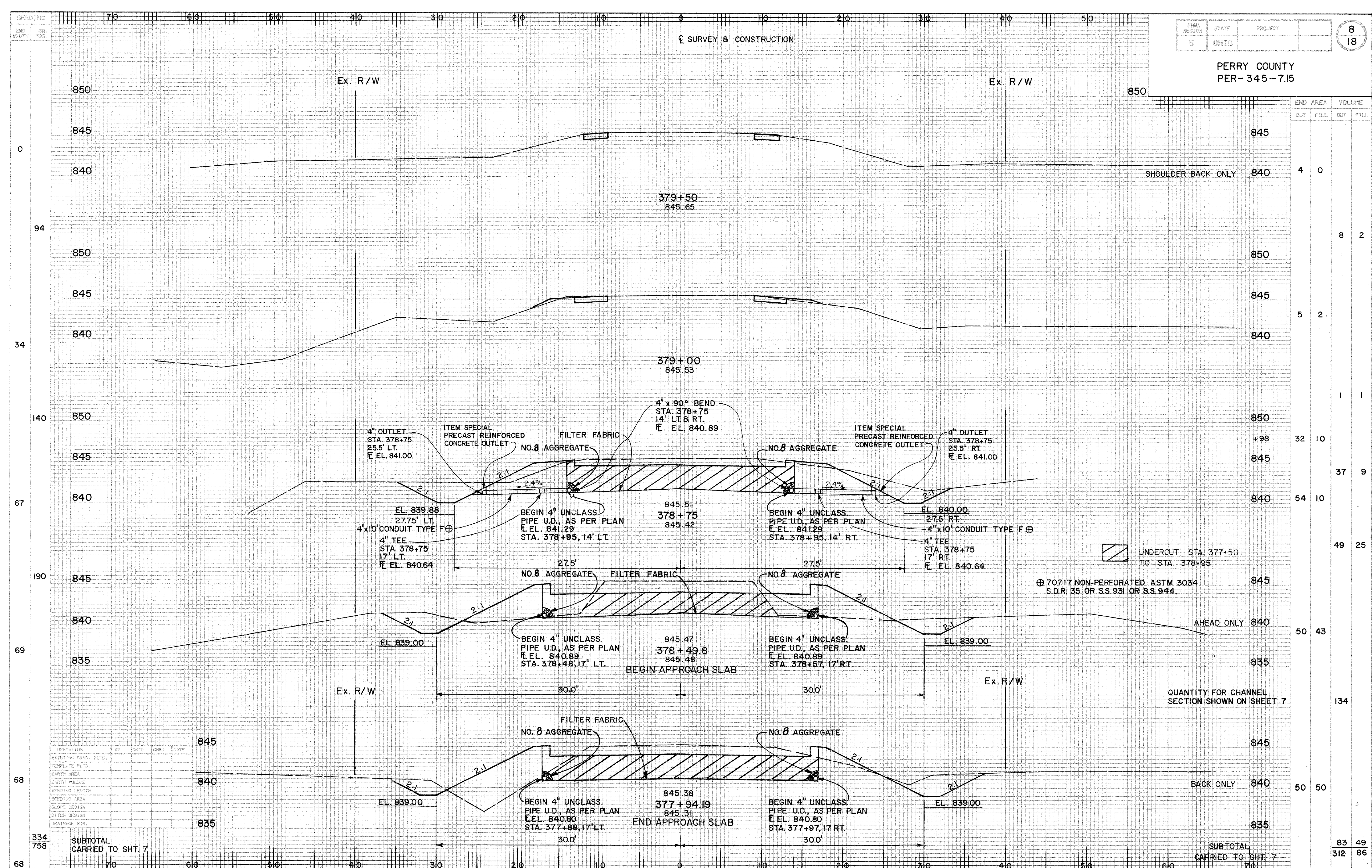




③









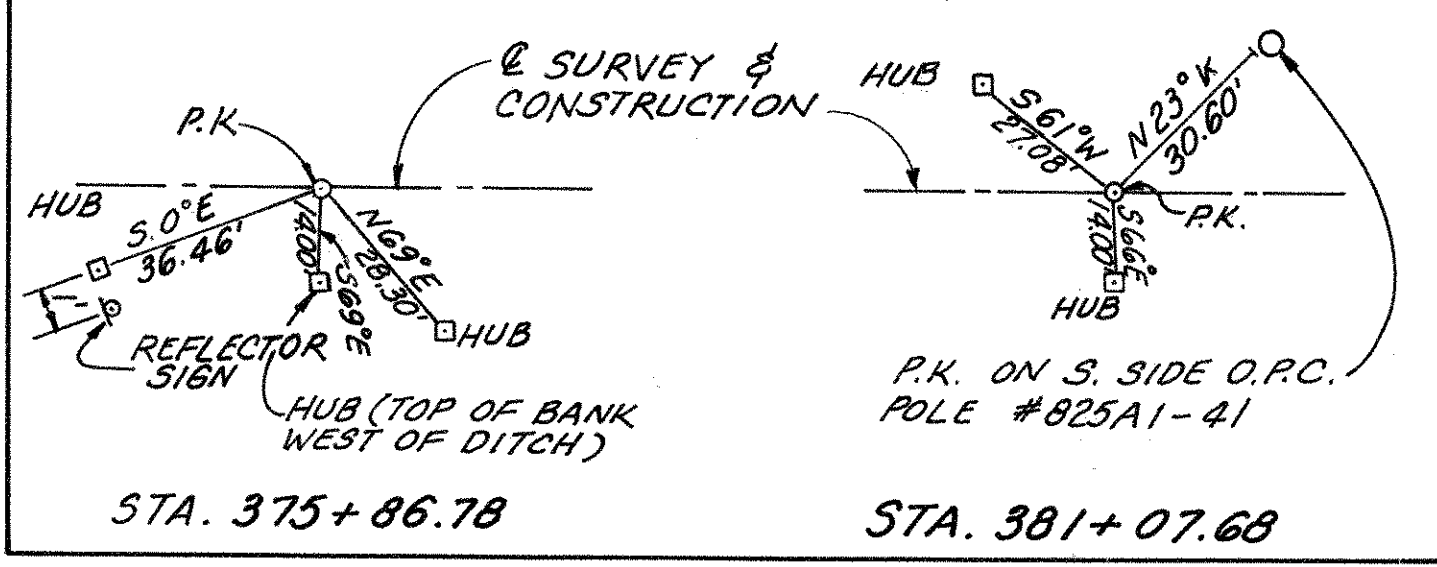
TRAFFIC DATA

CURRENT A.D.T. (1992) = 1980  
DESIGN YEAR A.D.T. (2012) = 2760

NOTE: EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

SOIL BORING LOCATION

REFERENCE POINTS



HYDRAULIC DATA

DRAINAGE AREA: 5.75 SQ. MI.  
EXISTING WATERWAY OPENING: 223 SQ. FT.  
PROPOSED WATERWAY OPENING: 300 SQ. FT.

Q<sub>25</sub> = 1426 C.F.S.    Q<sub>100</sub> = 2182 C.F.S.  
V<sub>25</sub> = 886 F.P.S.    V<sub>100</sub> = 10.44 F.P.S.  
HW<sub>25</sub> = 842.01    HW<sub>100</sub> = 843.75

NOTE: THE CALCULATIONS FOR THE QUANTITY OF EARTHWORK FOR THE CHANNEL WORK IS ON FILE AT THE DISTRICT 5 OFFICE.

EXISTING STRUCTURE

TYPE: TWO SPAN STEEL BEAM BRIDGE  
TYPE OF FLOOR: ASPHALT ON TIMBER DECK  
SPAN: 2 @ 23'-2"  
ROADWAY: 21'-6" F/F GUARDRAILS  
ALIGNMENT: TANGENT  
APPROACH SLAB: NONE  
DATE BUILT: 1934  
STRUCTURE FILE NO.: 6402674  
SKEW: REAR ABUT.-5° RT. FWD.  
FORWARD ABUT.-1° RT. FWD.  
CONDITION: POOR  
LOADING: 5-B-46, 5-37.7-46  
SUBSTRUCTURE: STONE, CONC, TIMBER ABUTMENT

PROPOSED STRUCTURE

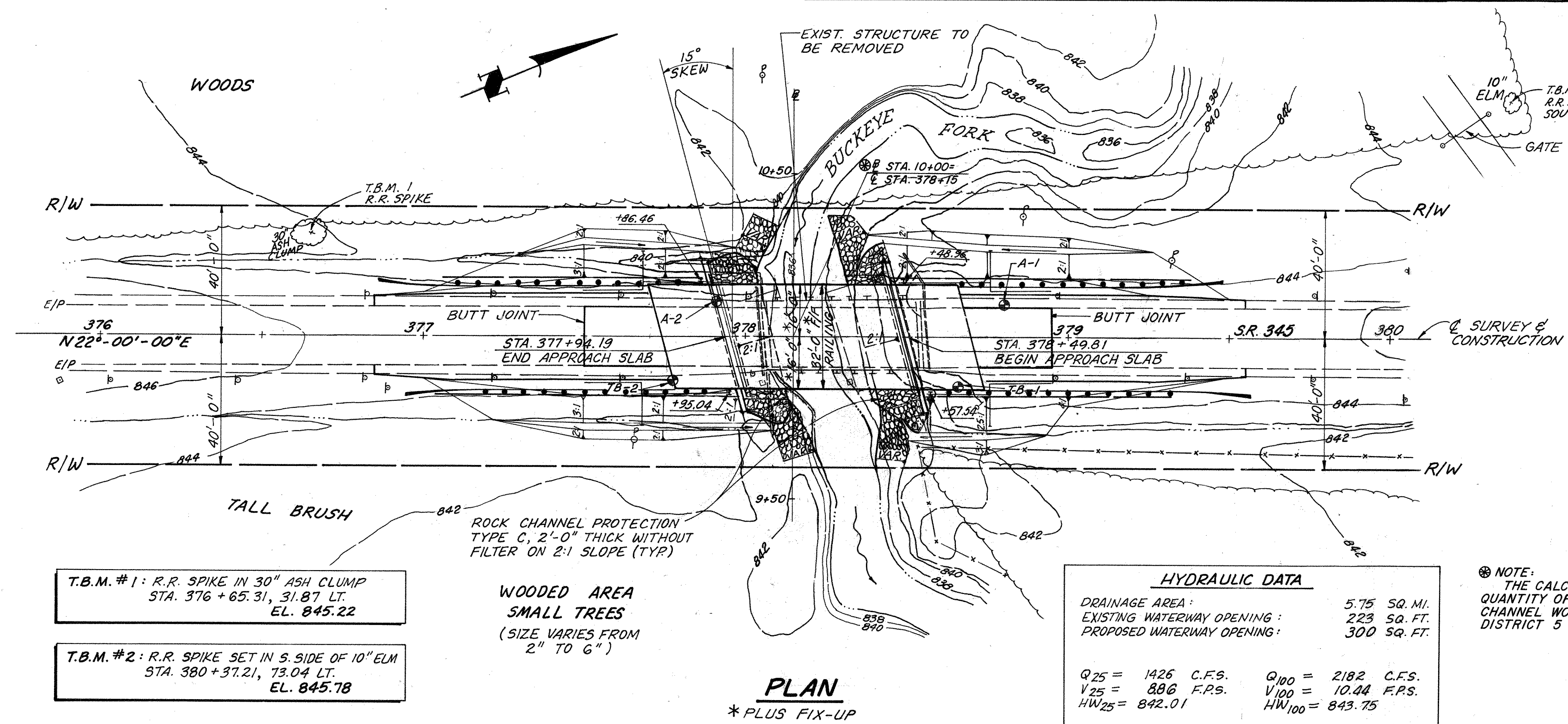
TYPE: SINGLE SPAN PRESTRESSED CONC. BOX BEAM ON DRILLED SHAFT ABUTS.  
SPAN: 52'-0" C/C BEARINGS  
ROADWAY: 32'-0" F/F GUARDRAILS  
LOADING: HS 20-44 & THE ALTERNATE MILITARY LOADING  
SKEW: 15° RT. FORWARD  
ALIGNMENT: TANGENT  
WEARING SURFACE: 2 1/2" (MIN.) ASPH. CONC.  
APPROACH SLAB: AS-1-81 (20' LONG)  
CROWN: 3 1/16"/FT.

L. THOMPSON CONSULTANTS, INC. 1/10  
CONSULTING ENGINEERS  
COLUMBUS, OHIO 43215

SITE PLAN

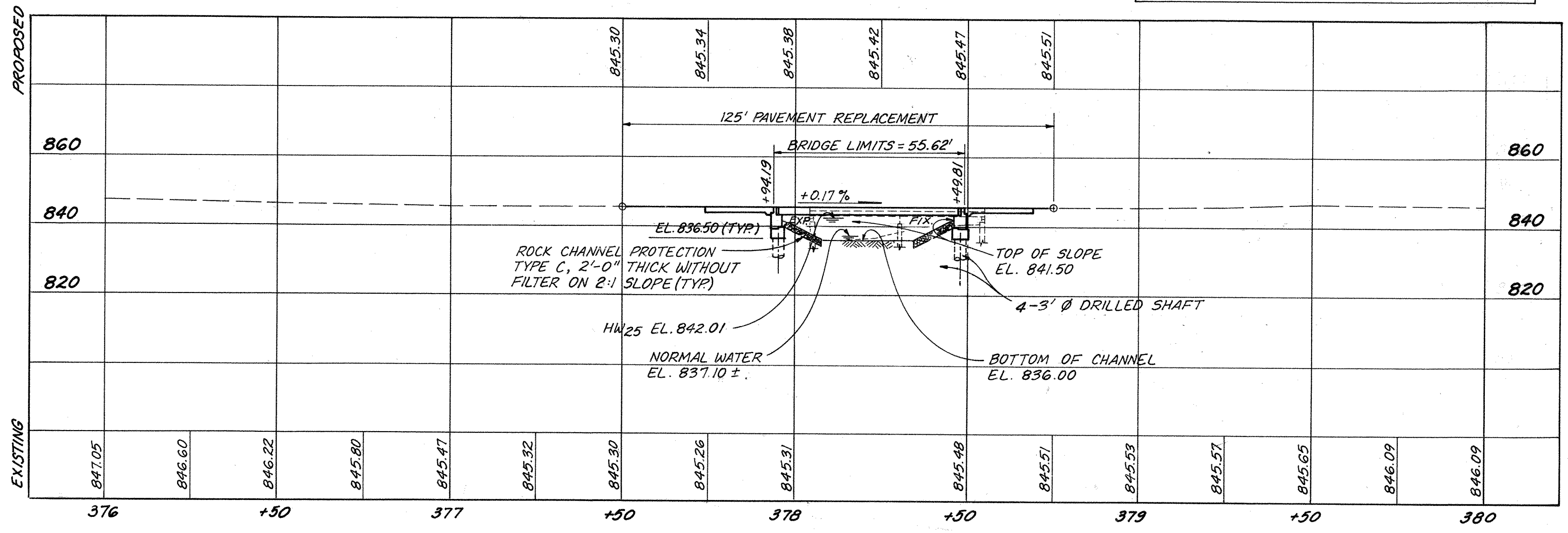
BRIDGE NO. PER-345-0716  
OVER BUCKEYE FORK  
PERRY COUNTY STA. 377+94.19 TO STA. 378+49.81

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
M.Q.	M.Q.	G.S. M.P.	J.J.	L.E.T.	4/3/89	



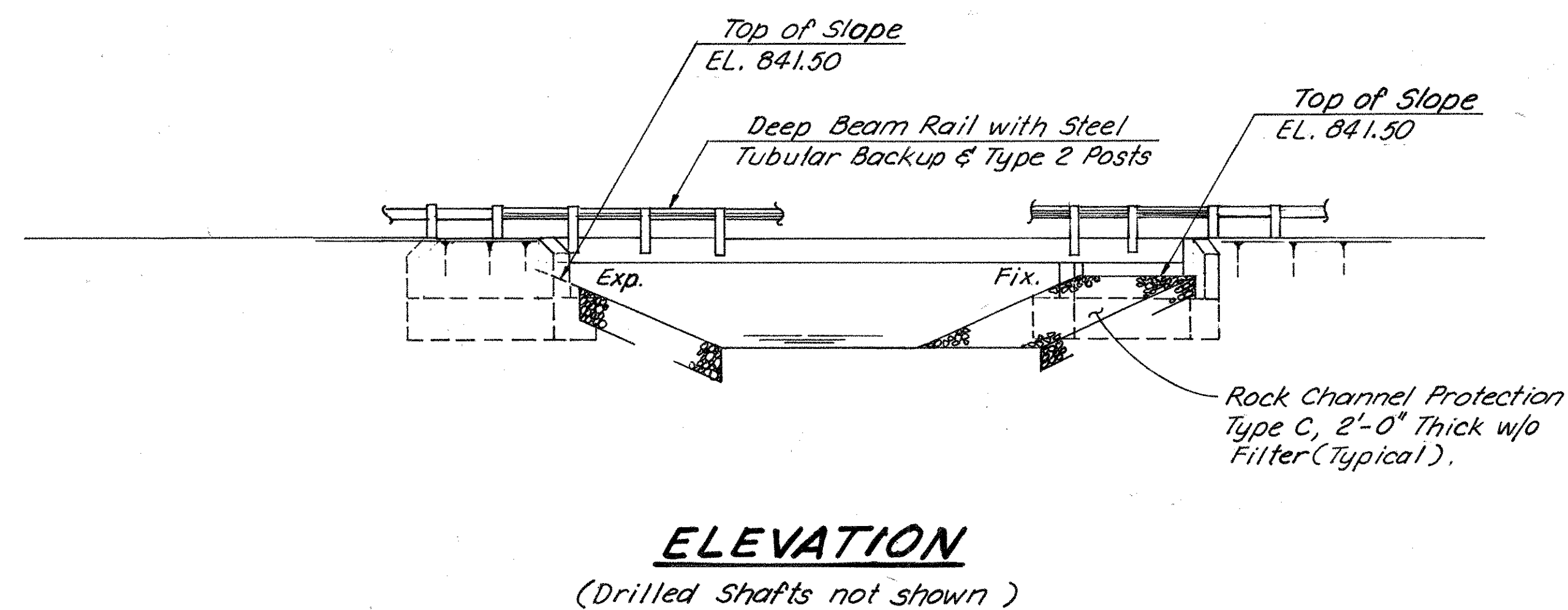
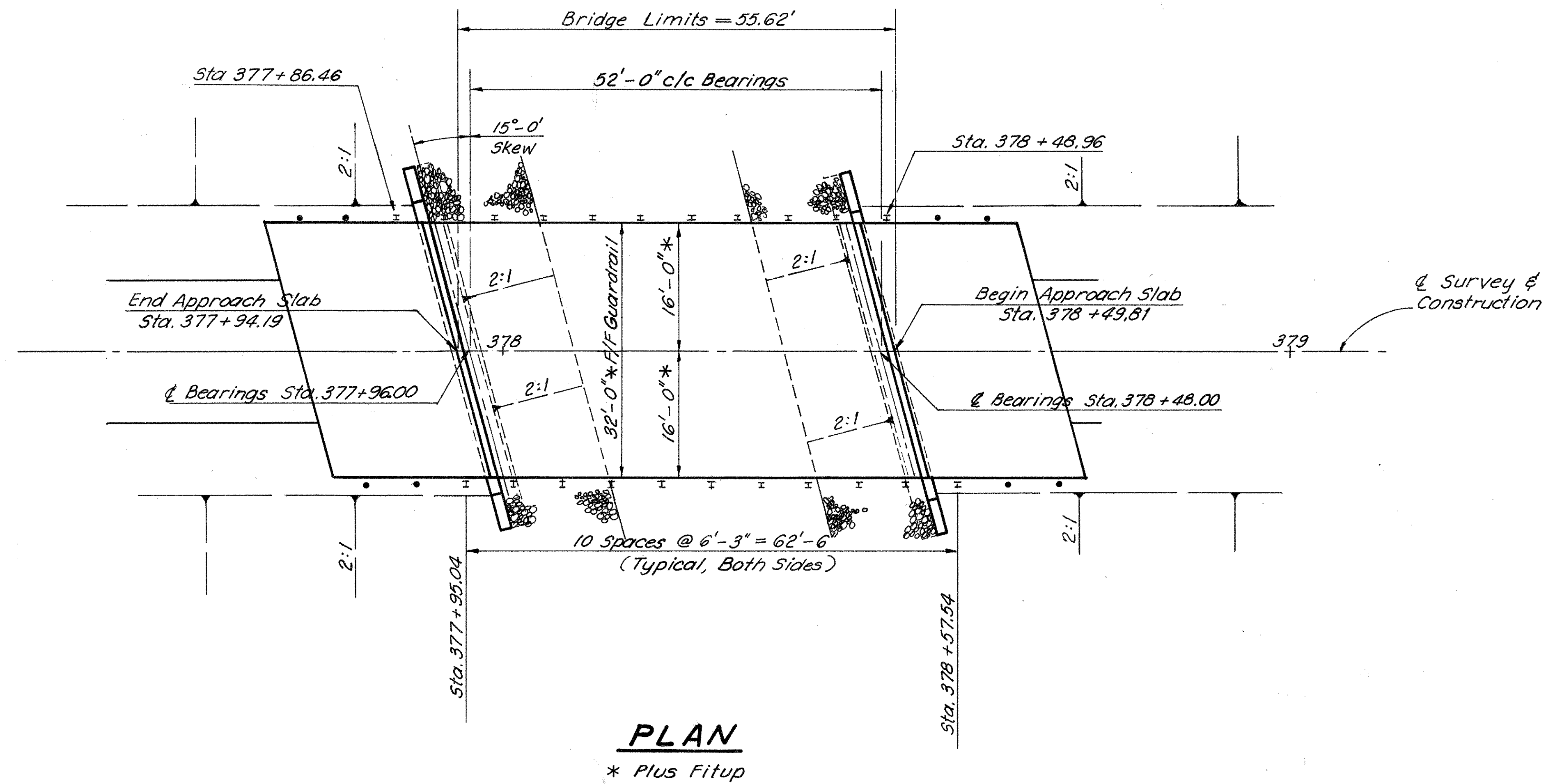
PLAN

\* PLUS FIX-UP



SECTION ON & SURVEY & CONSTRUCTION

REVIEWED BY BURGESS & NIPLE, LTD.  
MPB 6-27-90



L. THOMPSON CONSULTANTS, INC. CONSULTING ENGINEERS COLUMBUS, OHIO 43215		2/10				
<p align="center"><b>GENERAL PLAN &amp; ELEVATION</b></p> <p align="center">BRIDGE NO. <i>PER-345-0716</i> OVER <i>BUCKEYE FORK</i></p> <p align="center"><i>PERRY COUNTY</i> STA. <i>377+94.19</i> TO STA. <i>378+49.81</i></p>						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
<i>R.T.</i>	<i>R.T.</i>	<i>G.S.</i>	<i>J.J.</i>	<i>L.E.T.</i>	<i>6/89</i>	



# GENERAL NOTES

FHWA REGION	STATE	PROJECT	
5	OHIO		

11  
18

PERRY COUNTY  
PER-345-7.15

## REFERENCES

### STANDARD DRAWINGS

APPROACH SLABS	AS-1-81	DATED 11/27/81
DEEP BEAM BRIDGE GUARDRAIL WITH TUBULAR BACKUP	DBR-2-73	DATED 4/10/73
PRESTRESSED CONCRETE BOX BEAM	PSBD-1-81	DATED 6/20/89
COMPRESSION SEAL EXPANSION JOINTS AT ABUTMENTS FOR PRESTRESSED BOX BEAM STRUCTURES.	EXJ-3-82	DATED 8/01/84

### DESIGN SPECIFICATIONS

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

### SUPPLEMENTAL SPECIFICATIONS

PREFORMED POLYCHLOROPRENE JOINT SEALS	849	DATED 12/24/85
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### DESIGN DATA

DESIGN LOADING HS20-44 AND THE ALTERNATE MILITARY LOADING

#### DESIGN STRESSES:

CONCRETE CLASS S SUPERSTRUCTURE COMPRESSIVE STRENGTH  $f'_c=4500$  P.S.I.

CONCRETE CLASS C SUBSTRUCTURE COMPRESSIVE STRENGTH  $f'_c=4000$  P.S.I.

REINFORCING STEEL FOR ABUTMENTS ASTM A615, A616, OR A617, GRADE 60, MINIMUM YIELD STRENGTH 60,000 PSI.

CONCRETE FOR PRE-STRESSED BOX BEAMS MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS:  $f'_c = 5500$  PSI.  
MINIMUM COMPRESSIVE STRENGTH AT TIME OF INITIAL PRESTRESS:  $f'_c = 4000$  PSI.  
UNIT STRESS 2220 PSI COMPRESSION:  
444 PSI TENSION

PRESTRESSING STEEL ASTM A416 GRADE 270, 1/2" DIAMETER, SEVEN WIRE, UNCOATED, STRESS RELIEVED STRAND  
 $A_s = 0.153$  SQ. IN.,  $f'_s = 270,000$  PSI  
INITIAL STRESS 0.7  $f'_s = 189,000$  PSI  
STRESS AT RELEASE 0.63  $f'_s = 170,000$  PSI

REINFORCING STEEL FOR BOX BEAMS ASTM A615, A616, A617 - GRADE 40, MINIMUM YIELD STRENGTH 40,000 PSI, OR GRADE 60, MINIMUM YIELD STRENGTH 60,000 PSI.

### DECK PROTECTION METHOD

TYPE "D" WATERPROOFING AND ASPHALT CONCRETE OVERLAY; STEEL DRIP STRIP; AND SEALING OF CONCRETE SURFACES.

### EXISTING STRUCTURE TO BE REMOVED

WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC, THE EXISTING STRUCTURE SHALL BE REMOVED. SUITABLE WASTE MASONRY MAY BE PLACED AS BANK PROTECTION AS DIRECTED BY THE ENGINEER.

### ITEM SPECIAL - SEALING OF CONCRETE SURFACES

A CONCRETE SEALER SHALL BE APPLIED TO THE ABUTMENT CONCRETE SURFACES SHOWN ON SHEET 12/10 AND TO THE SUPERSTRUCTURE CONCRETE SURFACES SHOWN ON SHEET 5/10. SEE THE PROPOSAL FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIAL REQUIREMENTS AND APPLICATION PROCEDURES.

## EMBANKMENT CONSTRUCTION

THE EMBANKMENTS SHALL BE CONSTRUCTED TO THE LEVEL OF THE SUBGRADE. EXCAVATION MAY THEN BE MADE FOR THE ABUTMENTS AND THE DRILLED SHAFTS PLACED.

## 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.

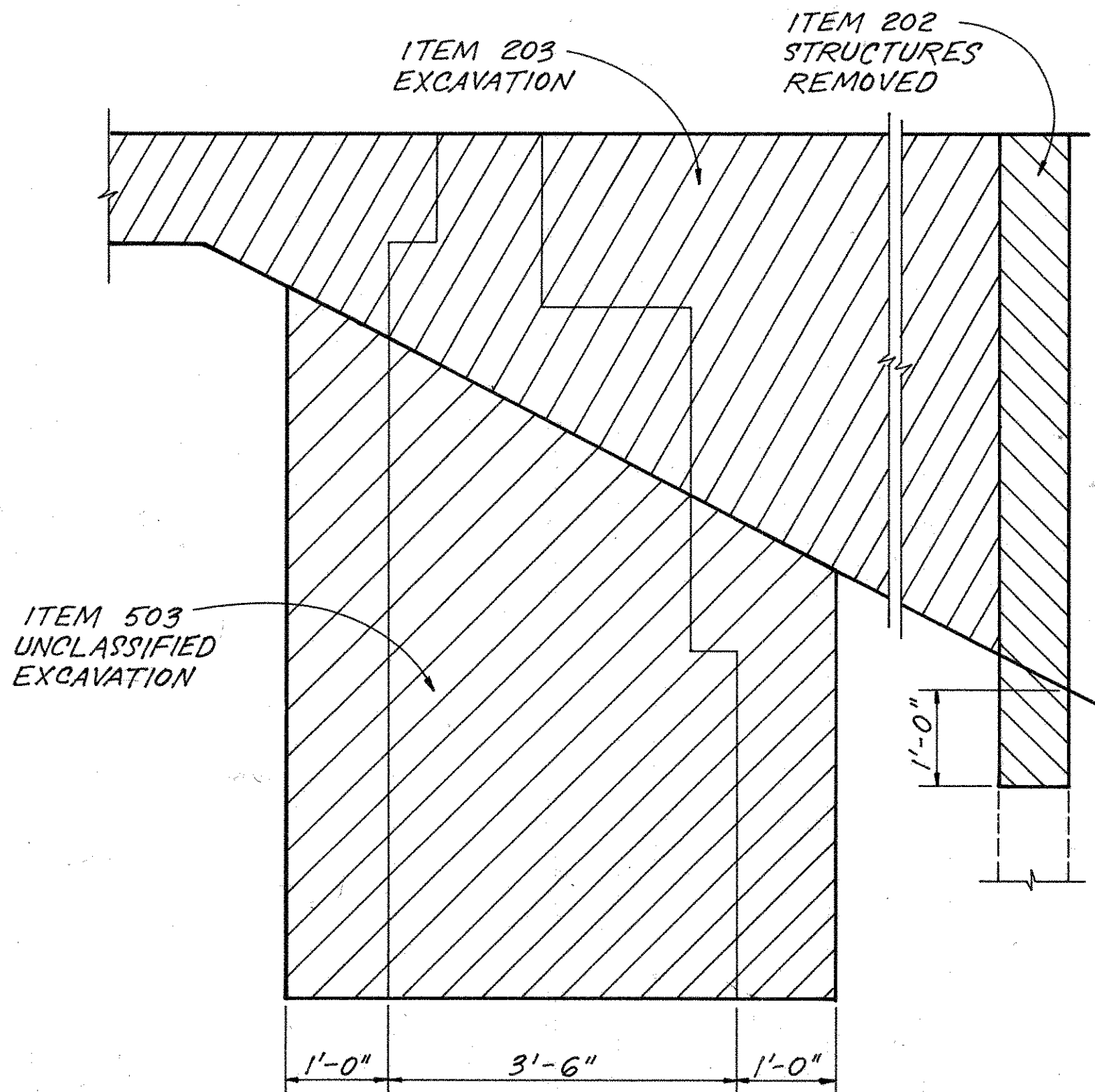
## REMOVALS OVER WATER

SPECIAL CARE SHALL BE TAKEN, WHILE REMOVING EXISTING STRUCTURE OVER WATER, TO NOT TO DROP ANY DEBRIS INTO WATER.

## REINFORCING BAR SPLICES

REINFORCING BAR SPLICE LENGTHS SHALL CONFORM TO THE MINIMUM LENGTHS SPECIFIED BY 509.08 OF THE C.M.S. UNLESS OTHERWISE NOTED ON THE PLANS.

BAR SIZE	LAP LENGTH
5	1'-8"
6	2'-0"
8	3'-3"



EXCAVATION DIAGRAM

QUANTITIES BY: JJ 6/89  
CHECKED BY: N.K.

## ESTIMATED QUANTITIES

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.
202	11002	LUMP		STRUCTURES REMOVED, OVER 20 FOOT SPAN	LUMP			LUMP
403	20000	10	C.Y.	ASPHALT CONCRETE, AC-20			10	
404	20000	7	C.Y.	ASPHALT CONCRETE, AC-20			7	
503	21300	LUMP		UNCLASSIFIED EXCAVATION	113			
503	11100	LUMP		COFFERDAMS, CRIBS, AND SHEETING				LUMP
509	11500	6107	LB.	REINFORCING STEEL, GRADE 60	6107			
509	15800	2773	LB.	EPOXY COATED REINFORCING STEEL, GRADE 60	2644		129	
511	34002	3	C.Y.	CLASS "S" CONCRETE, HIGH EARLY STRENGTH			3	
511	45100	37	C.Y.	CLASS "C" CONCRETE, ABUTMENT ABOVE FOOTING	37			
511	46500	43	C.Y.	CLASS "C" CONCRETE, FOOTING	43			
512	55800	181	S.Y.	TYPE "D" WATERPROOFING			181	
515	54100	8	EACH	PRESTRESSED CONCRETE BOX BEAM (52'-62' LENGTH) B21-48 *			8	
516	10500	71	L.F.	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC COMPRESSION SEAL			71	
516	41200	5	S.F.	1/8" PREFORMED BEARING PADS, 711.21			5	
516	43100	32	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES ONLY (NEOPRENE) 1"X6"X8"			32	
517	72300	125	L.F.	RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 STEEL POSTS AND ANCHOR BOLTS)			125	
518	21200	21	C.Y.	POROUS BACKFILL WITH FILTER FABRIC	21			
518	41100	95	L.F.	6" PERFORATED HELICAL CORRUGATED STEEL PIPE, 707.01	95			
518	41200	22	L.F.	6" NON-PERFORATED HELICAL CORRUGATED STEEL PIPE, INCLUDING SPECIALS, 707.01	22			
SPEC.	51822300	101	L.F.	STEEL DRIP STRIP			101	
SPEC.	51267502	19	S.Y.	SEALING OF CONCRETE SURFACES (EPOXY) *	19			
SPEC.	51267500	27	S.Y.	SEALING OF CONCRETE SURFACES *			27	
SPEC.	50794702	43	L.F.	DRILLED SHAFTS, 36" DIA., ABOVE BEDROCK	43			
SPEC.	50794704	64	L.F.	DRILLED SHAFTS, 36" DIA., INTO BEDROCK	64			

\* SEE PROPOSAL NOTE

L. THOMPSON CONSULTANTS, INC.  
CONSULTING ENGINEERS  
COLUMBUS, OHIO 43215

3 / 10

## GENERAL NOTES AND ESTIMATED QUANTITIES BRIDGE NO. PER-345-0716

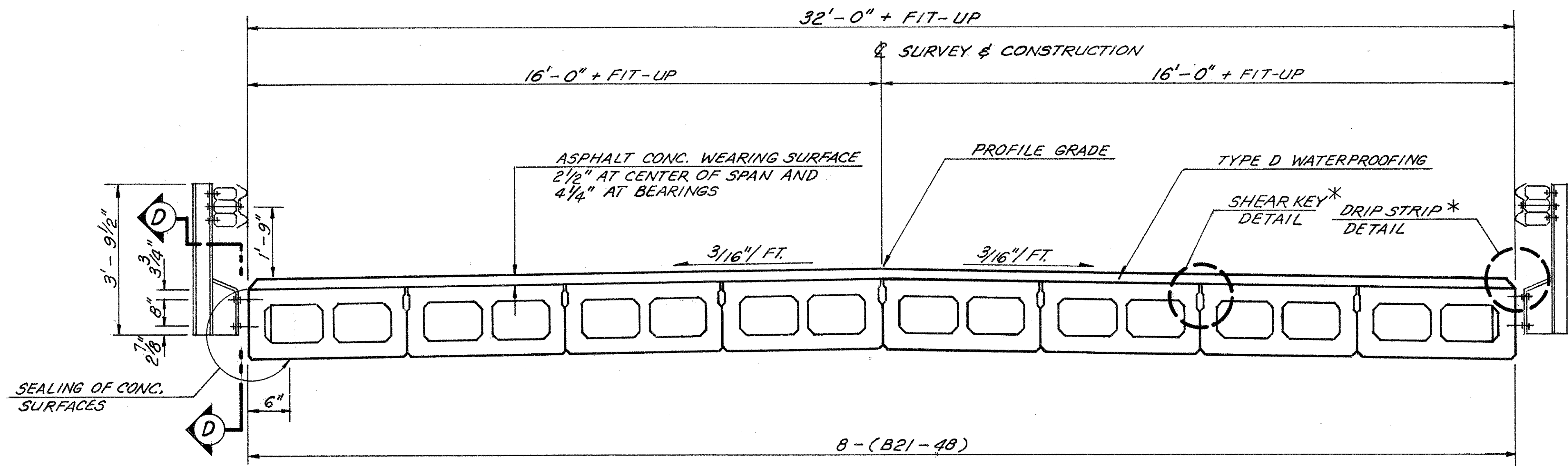
PERRY COUNTY STA. 377+94.19 TO  
STA. 378+49.81

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.T.	TB		J.J.	L.E.T.	6/89	



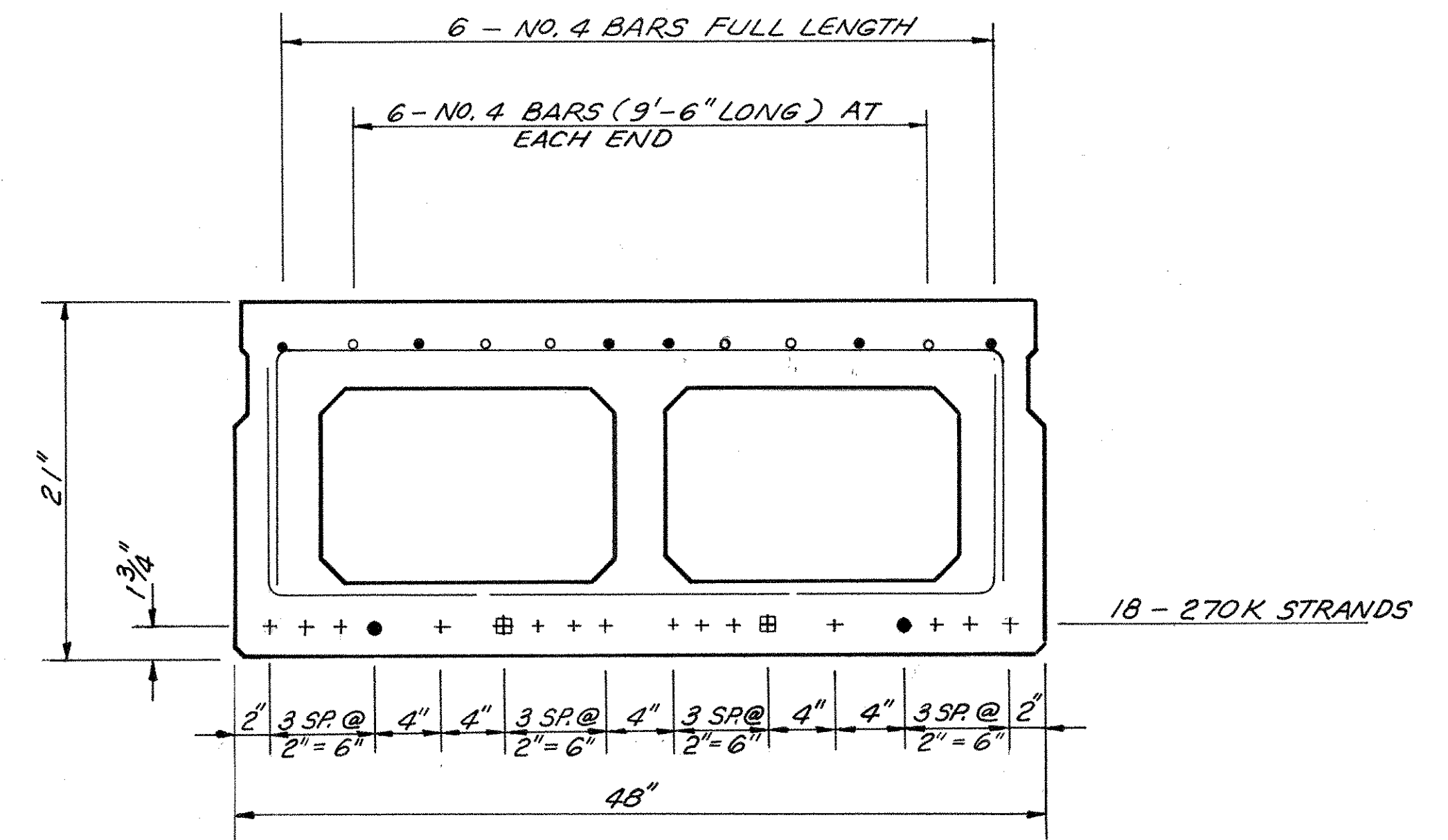






**TRANSVERSE SECTION**

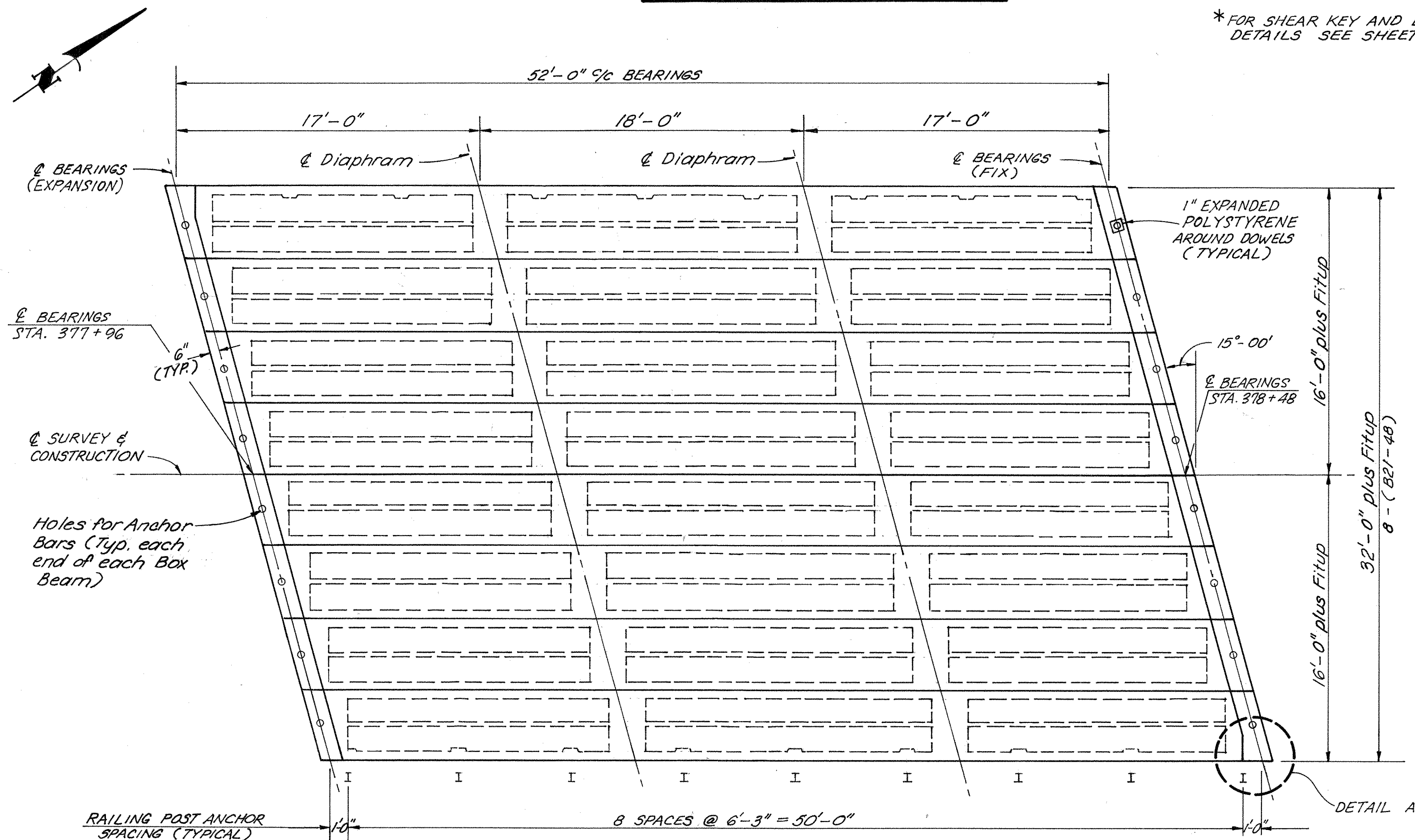
\*FOR SHEAR KEY AND DRIP STRIP DETAILS SEE SHEET 6/10



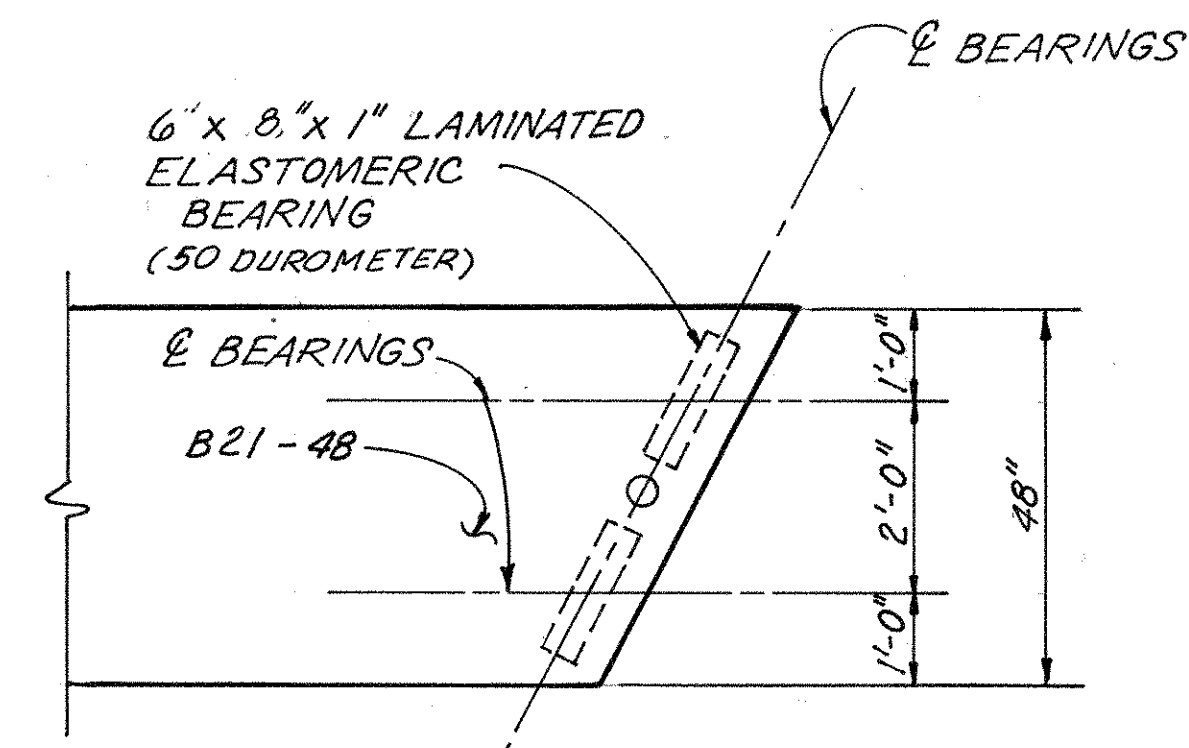
**B21-48**

DEBOND STRANDS MARKED AS:

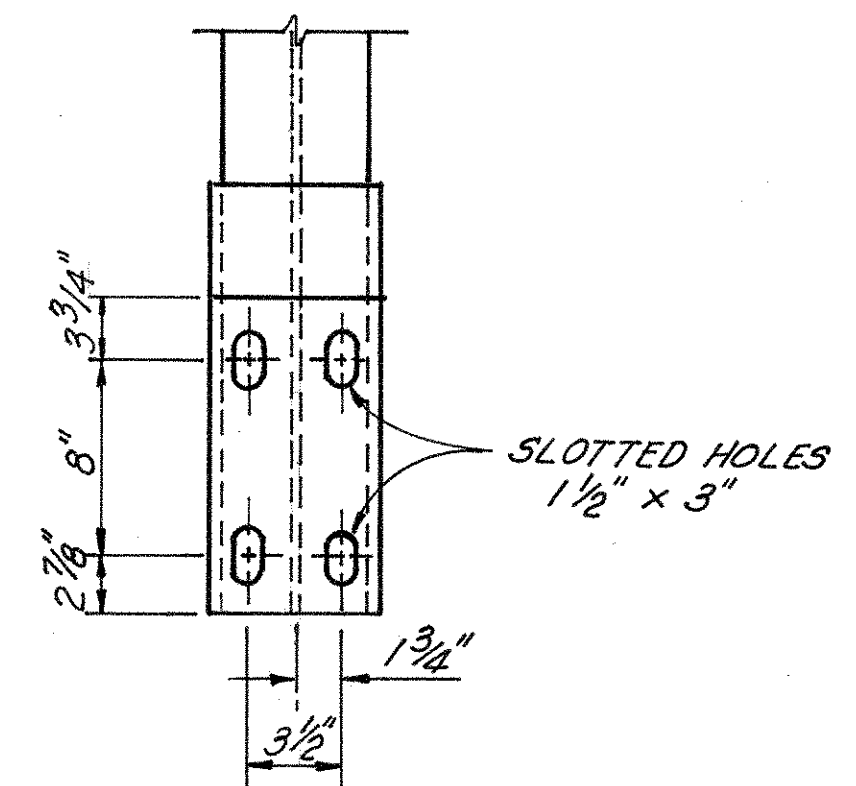
- FOR 1'-6"
- ⊞ FOR 2'-6"



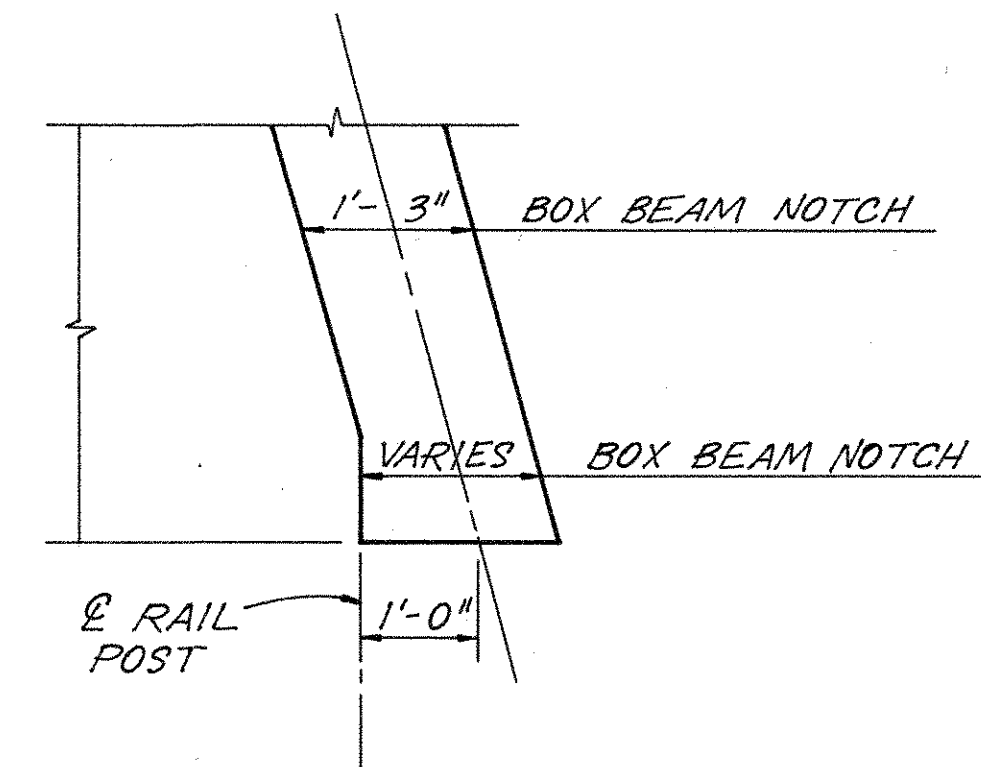
**FRAMING PLAN**



**BEARING DETAIL**  
SEE SHEET 6/10 FOR LAMINATED ELASTOMERIC BEARING DETAIL



**VIEW D-D**



**DETAIL A**

L. THOMPSON CONSULTANTS, INC. CONSULTING ENGINEERS COLUMBUS, OHIO 43215					5/10
<b>SUPERSTRUCTURE DETAILS</b>					
BRIDGE NO. PER-345-0716 OVER BUCKEYE FORK					
PERRY COUNTY STA. 377+94.19 TO STA. 378+49.81					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE REVISED
R.T.	R.T.	G.S.	J.J.	L.T.	6/89

PERRY COUNTY  
PER-345-7.15

NOTES

CALCULATED CAMBER AT THE TIME OF PAVING, INCLUDING ALLOWANCE FOR CAMBER GROWTH DUE TO CREEP, IS 2".

THE ESTIMATED DEFLECTION DUE TO THE RAILING AND WEARING SURFACE IS 1/4".

THE NET FINAL CAMBER OF THE BEAMS IS 1-3/4". THIS IS 1-3/4" IN EXCESS OF THE AMOUNT REQUIRED TO PLACE THE TOP OF THE BEAM PARALLEL TO PROFILE GRADE. THIS EXCESS SHALL BE COMPENSATED FOR BY THICKENING THE 403 LEVELING COURSE FROM 1-1/4" AT THE CENTER OF THE SPANS TO 3" AT THE SUPPORTS.

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

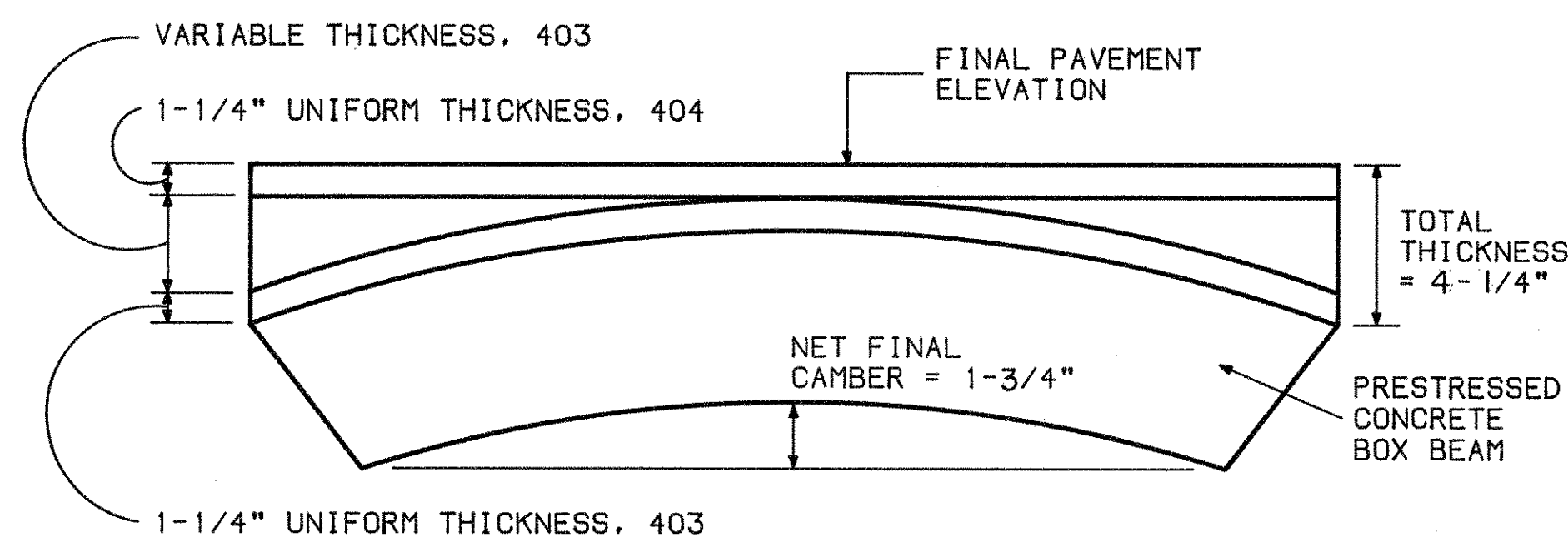
CONCRETE STRESSES:

MIN. CONCRETE STRENGTH AT 28 DAYS = 5500 P.S.I.  
MIN. CONCRETE STRENGTH AT THE TIME OF INITIAL PRESTRESS = 4000 P.S.I.

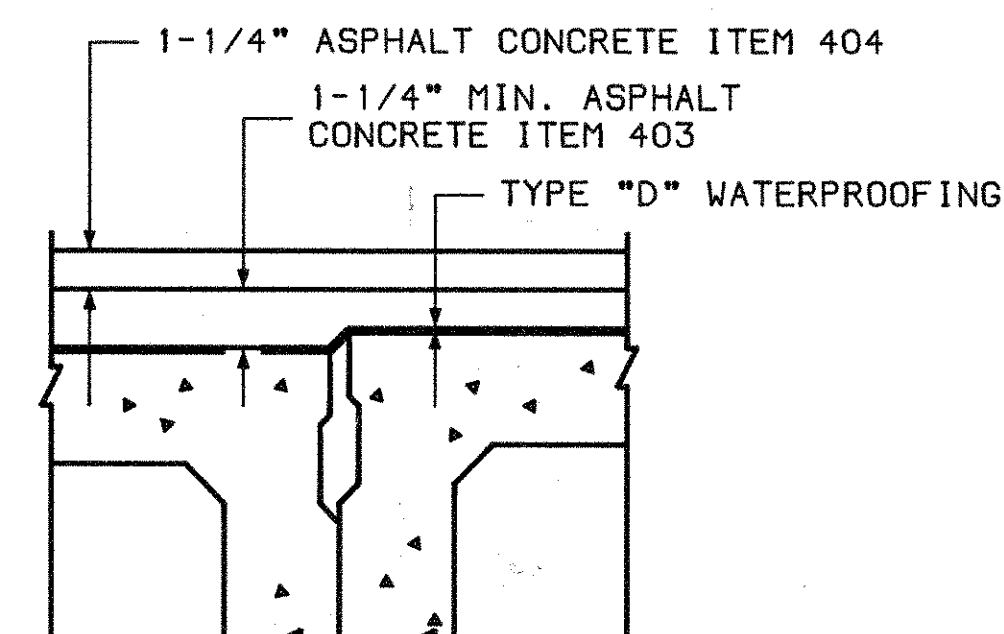
PRESTRESSING STRANDS:

PRESTRESSING STRANDS SHALL BE ASTM A416 GRADE 270, - 1/2" DIA., SEVEN WIRE UNCOATED, STRESS-RELIEVED STRAND.  $A_s = .153$  SQ. IN.  
INITIAL TENSION = 28,900 LBS. PER STRAND.  
TENSION AT RELEASE = 26,600 LBS. PER STRAND.  
FINAL TENSION = 21,700 LBS. PER STRAND (AFTER ALL LOSSES).

THE FABRICATOR SHALL SUBMIT SHOP DRAWINGS SHOWING COMPLETE DETAILS OF BEAM REINFORCING FOR APPROVAL.

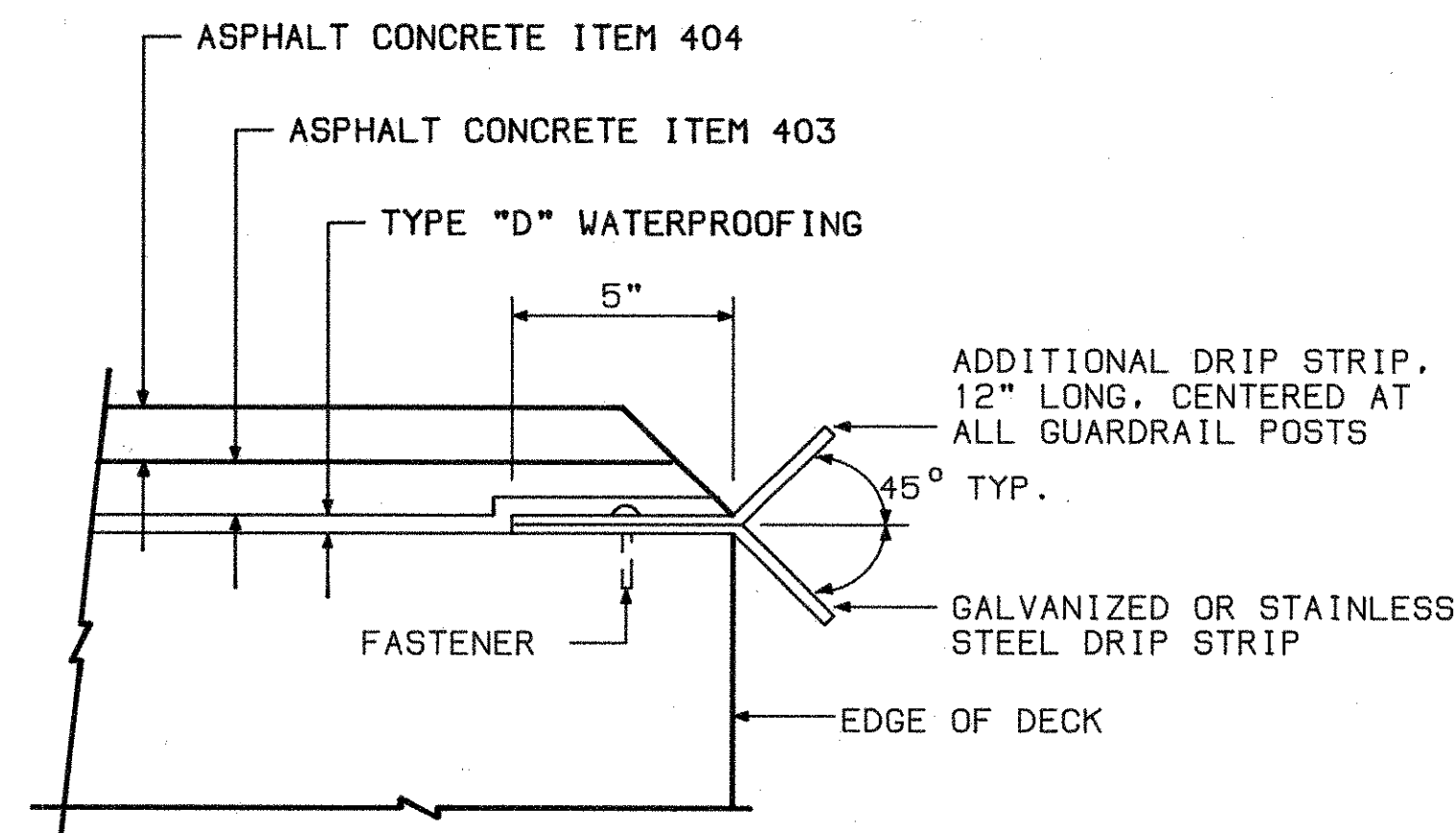


ASPHALT THICKNESS DIAGRAM



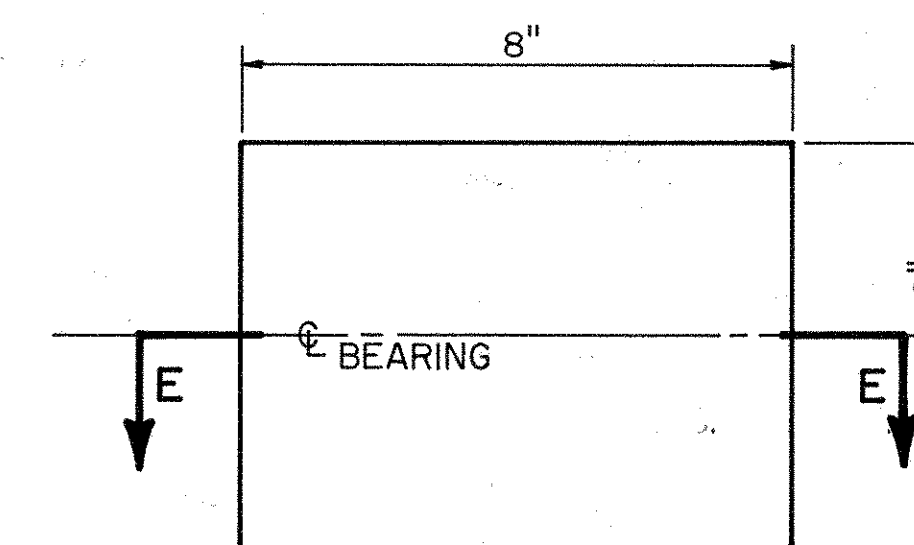
SHEAR KEY DETAIL

SHEAR KEY SHALL BE MORTARED TO A FINISHED PLANE BETWEEN THE TOP EDGES OF THE ADJACENT BEAMS WHERE VERTICAL OFFSET (WITHIN TOLERANCE) OCCURS.

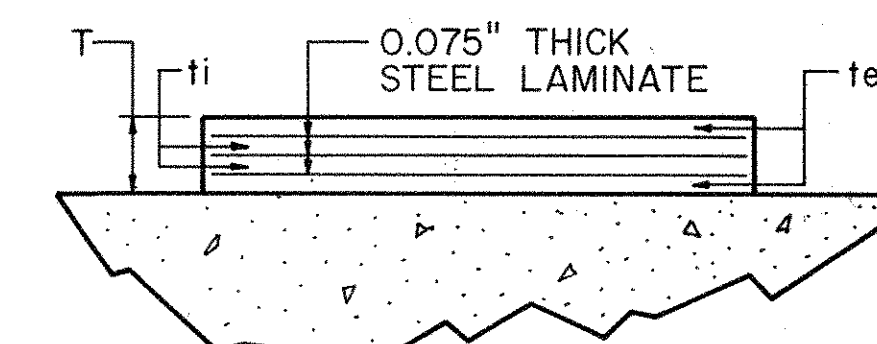


DRIP STRIP DETAIL

**DRIP STRIP:** PRIOR TO APPLYING TYPE D WATERPROOFING, A BENT DRIP STRIP SHALL BE INSTALLED ALONG THE EDGES OF THE DECK AS SHOWN. THE STRIPS SHALL BE FASTENED AT 1'-6" C/C (MAX.), WITH 1-1/4" x 5/32" x 1/4" FLAT HEAD DRIVE PIN AND WASHER, (LENGTH x SHANK DIA. x HEAD DIA.) OR #10 GALVANIZED SCREWS AND EXPANSION ANCHORS, SUBJECT TO THE APPROVAL OF THE ENGINEER. THE STRIPS SHALL BE PLACED THE FULL LENGTH OF THE DECK, ENDING AT THE FACE OF THE BOX BEAM NOTCH, WHERE SPLICES ARE REQUIRED, A 3" (MIN.) LAP SHALL BE USED WITH A FASTENER THROUGH THE LAP. STEEL FOR GALVANIZED STRIPS SHALL BE 8" x 0.105" AND SHALL MEET THE REQUIREMENTS OF ASTM A568. GALVANIZING SHALL BE IN ACCORDANCE WITH 711.02. STAINLESS STEEL SHALL BE 20 GAUGE ASTM A167, TYPE 304, MILL FINISH. THE FINAL PAY QUANTITY SHALL BE THE ACTUAL OVERALL LENGTH OF THE DRIP STRIP. ALL LAPS AND ADDITIONAL STRIPS AT POSTS SHALL NOT BE MEASURED FOR PAYMENT. PAYMENT SHALL BE AT THE CONTRACT PRICE BID FOR ITEM SPECIAL, LIN. FT., STEEL DRIP STRIP, WHICH SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THE ITEM.



PLAN



SECTION E-E

$t_i$  = THICKNESS OF INTERNAL ELASTOMER LAYERS = 0.23"  
 $t_e$  = THICKNESS OF EXTERNAL ELASTOMER LAYERS = 0.16"  
 $n$  = NUMBER OF INTERNAL LAMINATES = 2  
 $T$  = TOTAL THICKNESS = 1"

DEAD LOAD: 10.9 KPS  
LIVE LOAD: 7.8 KPS  
MAXIMUM DESIGN LOAD: 18.7 KPS

TOLERANCES:

INDIVIDUAL ELASTOMER LAYER THICKNESS: + 20% OF DESIGN VALUE (NOT TO EXCEED) + 1/8"

PLAN DIMENSIONS -0. + 1/4"  
DESIGN THICKNESS -0. + 1/8"  
EDGE COVER OF EMBEDDED LAMINATES -0. + 1/8"

NOTE:  
FOR ADDITIONAL NOTES SEE SHT. 3/10

LAMINATED ELASTOMERIC BEARING DETAILS

(50 DUROMETER)

L. THOMPSON CONSULTANTS, INC.  
CONSULTING ENGINEERS  
COLUMBUS, OHIO 43215

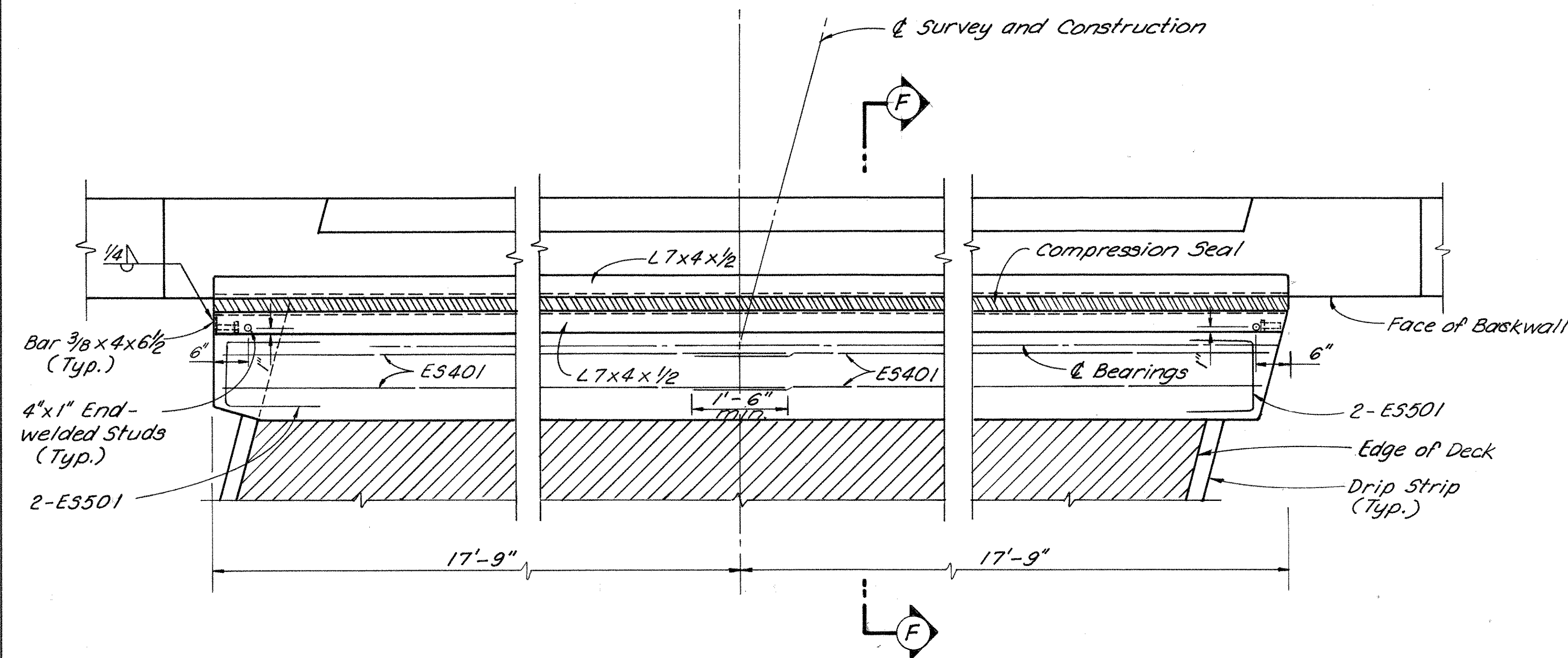
6/10

SUPERSTRUCTURE DETAILS  
BRIDGE NO. PER-345-0716

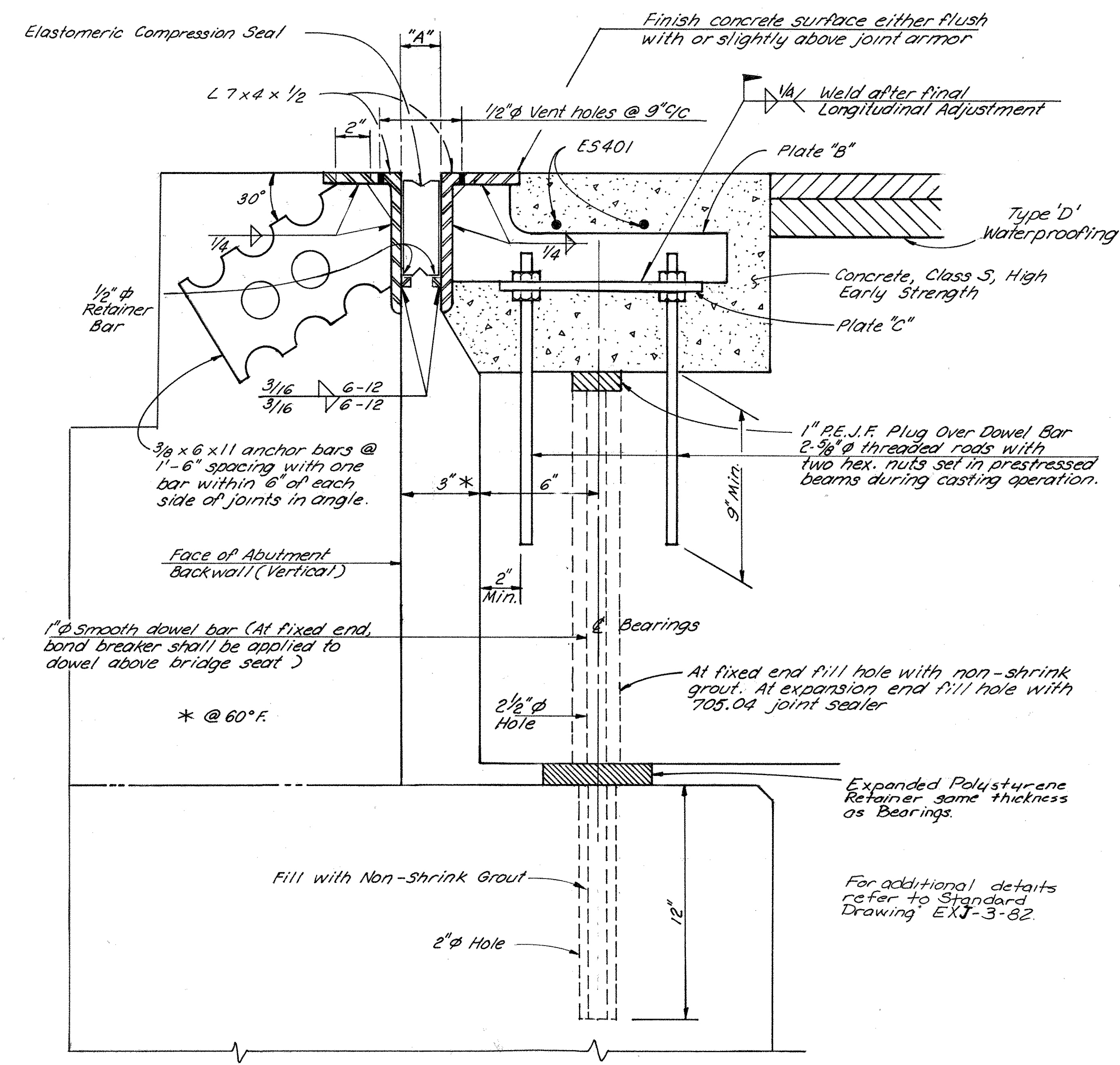
PERRY COUNTY STA. 377+94.19 TO  
STA. 378+49.81

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JJ	TB		RT	JJ	6/89	





**PLAN - STRUCTURAL EXPANSION JOINT**  
(Typical for Rear and Forward Abutments)



**SECTION F - F**

COMPRESSION SEAL D.S. Brown's C.Y. 4000, Watson Bowman & Acme's WD 400 or an approved alternate and shall be installed in one continuous piece after completion of end dam installation.

L. THOMPSON CONSULTANTS, INC. CONSULTING ENGINEERS COLUMBUS, OHIO 43215						7 / 10
<b>SUPERSTRUCTURE DETAILS</b>						
BRIDGE NO. PER-345-0716 OVER BUCKEYE FORK						
PERRY COUNTY STA. 377+94.19 TO STA. 378+49.81						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.T.	R.T.	G.S.	J.J.	L.T.	6/89	



DRILLED SHAFT NOTES

FHWA REGION	STATE	PROJECT	
5	OH10		



PERRY COUNTY  
PER-345-7.15

ITEM SPECIAL - DRILLED SHAFTS

DESCRIPTION

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

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

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

CASINGS

THE CASINGS SHALL BE MADE OF STEEL. 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 OUT INCOMING WATER. THE CASING LENGTH SHALL BE AS NECESSARY TO CONSTRUCT EACH DRILLED SHAFT.

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

EXCAVATION

WHEN OBJECTS SUCH AS LARGE BOULDERS ARE ENCOUNTERED,THEY SHALL BE REMOVED. BLASTING METHODS MAY BE USED,AND WHEN USED,SHALL BE CONDUCTED SO AS TO AVOID DISTURBANCE TO THE BEDROCK FORMATION BELOW AND OUTSIDE THE LIMITS OF THE PURPOSED DRILLED SHAFT EXCAVATONS. THE DRILLED SHAFTS SHALL PENETRATE INTO 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 WHICH EXTENDS DOWN TO BEDROCK IS USED,THE BEDROCK SOCKET SHALL BE MEASURED FROM THE BOTTOM OF THE CASING TO THE BOTTOM OF THE DRILLED BEDROCK EXCAVATION. WHEN THE ENGINEER IS ASSURED THAT A PORTION OF THE METAL CASING IS EMBEDDED IN BEDROCK,UPON THE ENGINEER'S CONCURRENCE,THE EMBEDDED DISTANCE MAY BE INCLUDED AS PART OF THE BEDROCK SOCKET.

DEWATERING

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING ANY INCOMING WATER TO THE EXTENT THAT THE SHAFT EXCAVATION IS MAINTAIN 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 IS PRACTICABLE (NO MORE THAN ONE INCH OF LOOSE MATERIAL ON THE BOTTOM) PRIOR TO CONCRETE PLACEMENT. DRILLING SPOILS THAT ADHERE TO THE VERTICAL SIDES OF THE BEDROCK SOCKETS ARE TO BE REMOVED.

APPROVAL BEFORE CONCRETE PLACEMENT

CONCRETE SHALL NOT BE PLACED IN ANY DRILLED SHAFT EXCAVATION WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE DRILLED SHAFT EXCAVATION SHALL BE INSPECTED IMMEDIATELY BEFORE THE CONCRETE IS PLACED. A LIGHT POWERFUL ENOUGH TO THOROUGHLY INSPECT THE SIDES,BOTTOM AND REINFORCING STEEL CAGE OF THE DRILLED SHAFT IS REQUIRED. CONCRETE SHALL NOT BE PLACED DURING INCLEMENT WEATHER CONDITIONS WHICH PREVENT 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 SHALL BE CONTINUOUS FROM THE 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,THE DRILLED SHAFT EXCAVATION SHALL BE FILLED WITH WATER TO SUCH A DEPTH THAT ALL WATER MOTION HAS CEASED. THE CONCRETE SHALL THEN BE PLACED BY MEANS OF A CONCRETE PUMP. THE CONCRETE PUMP PIPE SHALL HAVE A DIAMETER THAT IS NOT LESS THAN 4 INCHES. THE CONCRETE PUMP EQUIPMENT SHALL BE SO ARRANGED THAT NO VIBRATIONS RESULT WHICH MIGHT DAMAGE FRESH CONCRETE. PIPES CARRYING CONCRETE FROM THE PUMP TO THE SHAFT SHOULD BE ARRANGED WITH A MINIMUM NUMBER OF BENDS. THE PIPE USED TO CONVEY THE CONCRETE TO THE BOTTOM OF THE DRILLED SHAFT EXCAVATION SHALL BE ANCHORED TO THE STEEL CASING TO PREVENT THE PIPE FROM UNDULATING DURING THE INITIAL PLACEMENT OF THE CONCRETE.

THE PUMPING EQUIPMENT SHALL BE SUITABLE IN KIND AND ADEQUATE IN CAPACITY FOR THE WORK REQUIRED. THE USE OF ALUMINUM PIPE AS A CONVEYANCE FOR THE CONCRETE WILL NOT BE PERMITTED. AN ADEQUATE QUANTITY OF GROUT,MORTAR OR CONCRETE WITH COURSE AGGREATE OMITTED SHALL BE PUMPED THROUGH THE EQUIPMENT AHEAD OF THE SPECIFICATION CONCRETE TO PROVIDE LUBRICATION TO THE PUMPING SYSTEM. THE CONCRETE USED FOR THE 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 CONTAMINATION OF THE CONCRETE PLACED INITIALLY AT THE BOTTOM OF THE SHAFT. THE OUTLET END OF THE PUMPING PIPE SHALL BE SEALED WITH A DIAPHRAM 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.

TOLERANCES

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 SHAFT. THE ABUTMENT BATTER DRILLED SHAFTS ARE TO BE INSTALLED WITHIN 5.0 PERCENT OF PLAN FOR THE TOTAL LENGTH OF THE DRILLED SHAFTS.

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 OF 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 REQUIREMENTS OF ADDING 10 PERCENT MORE CEMENT TO THE CONCRETE MIX SHALL BE WAIVED. THE TOP TO FEET OF CONCRETE IN THE DRILLED SHAFTS ARE REQUIRED TO BE VIBRATED. ONLY A MINIMAL VIBRATORY EFFORT IS NECESSARY. SPECIAL CARE SHALL BE TAKEN NOT TO OVER-VIBRATE THE DRILLED SHAFT CONCRETE.

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 CAGE SHALL BE COMPLETELY ASSEMBLED PRIOR TO PLACEMENT AND THE LENGTH SHALL BE AS NECESSARY TO CONSTRUCT EACH DRILLED SHAFT. SEE PLAN SHEETS FOR DETAILS OF REINFORCING STEEL. NOTE THAT THE LENGTHS PROVIDED IN THE REINFORCING STEEL LIST ARE ESTIMATE LENGTHS. THE REINFORCING STEEL SHOULD BE PLACED AT PLAN LOCATION.

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 SAFTLY ENTER AND PERFORM THE REQUIRED INSPECTION. ACCESS MAY BE PROVIDED BY A POSITIVE FORWARD AND REVERSE HYDRAULIC WINCH OR POWER-UP AND POWER-DOWN HOIST ON A CRANE. THE METHOD CHOSEN FOR ENTERING OR LEAVING THE SHAFT SHALL BE CONVENIENT,SAFE AND NOT UNCOMFORTABLE FOR THE USER. THE CONTRACTOR SHALL ALSO PROVIDE PROTECTIVE CLOTHING FOR THOSE MAKING AN INSPECTION OF THE SHAFT.

AN INSPECTION RECORD CHART HAS BEEN INCLUDED WITH THE PLANS ON SHEET 9 OF 10 AND SHOULD BE COMPLETED BY THE ENGINEER. MEASUREMENTS SHOULD BE OBTAINED PRIOR TO PLACING CONCRETE. THE CONTRACTOR SHOULD PROVIDE ALL NECESSARY EQUIPMENT NEEDED TO OBTAIN MEASUREMENTS FOR COMPLETEING THE CHART. THE CONTRACTOR SHALL ASSIST THE ENGINEER IN OBTAINING THESE MEASUREMENTS. THE INSPECTION RECORD CHART IS COMPLETED,THE PROJECT ENGINEER SHOULD SUBMIT A COPY TO THE BUREAU OF BRIDGES: ATTENTION: FOUNDATION ENGINEER

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, PECIAL PROVISIONS,AND PROPOSAL.

THE CONTRACTOR SHALL PROVIDE CONTINUOUS SURVEILLANCE OF ALL PERSONS IN THE DRILLED SHAFT EXCAVATIONS. AT ALL TIMES WHEN A PERSON IS IN THE DRILLED SHAFT EXCAVATION,PROVISIONS SHALL BE MADE FOR PUMPING FRESH AIR TO SAID PERSON. ALL LIGHTING SHALL BE ELECTRICAL LIGHTS. MECHANICAL EQUIPMENT USED INSIDE THE SHAFTS 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 SHAFT EXCAVATION ATMOSPHERE QUALITATIVELY THROUGHOUT THE COLUMN'S ENTIRE LENGTH AND ASSURE THAT THE QUANTITIES OF GASES AND OXYGEN PRESENT ARE IN SAFE AMOUNT AND SAFE PROPORTION PRIOR TO PERMITTING ANY PERSON TO ENTER THE SHAFT.

METHOD OF MEASUREMENT

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

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

BASIS OF PAYMENT

PAYMENT FOR FURNISHING AND INSTALLING DRILLED SHAFTS WILL BE MADE AT THE CONTRACT UNIT PRICE PER LINEAR FOOT OF ACCEPTED SHAFT LENGTH AS PER ITEM SPECIAL "3'-0" DIAMETER DRILLED SHAFTS ABOVE THE BEDROCK SOCKET" AND ITEM SPECIAL "3'-0" DIAMETER DRILLED SHAFTS IN BEDROCK". WHICH SHALL INCLUDE ALL LABOR,MATERIALS,AND EQUIPMENT NECESSARY TO COMPLETE THE ITEMS AS SPECIFIED.

DESIGN PARAMETERS

THE CALCULATED DESIGN LOADING FOR AN ABUTMENT DRILLED SHAFT IS 66.0 TONS. THE ALLOWABLE DESIGN END BEARING PRESSURE IS 10.0 TONS PER SQUARE FOOT.

L. THOMPSON CONSULTANTS, INC. CONSULTING ENGINEERS COLUMBUS, OHIO 43215						
DRILLED SHAFT NOTES BRIDGE NO. PER-345-0716 OVER BUCKEYE FORK						8 / 10
PERRY COUNTY			STA. 377 + 94.19 TO STA. 378 + 49.81			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
S.S.S.	C.J.M.		J.J.	S.S.S.	5/90	



INSPECTION RECORD FOR DRILLED SHAFTS

FHWA REGION	STATE	PROJECT	
5	OHIO		

PERRY COUNTY  
PER-345-7.15

17  
18

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

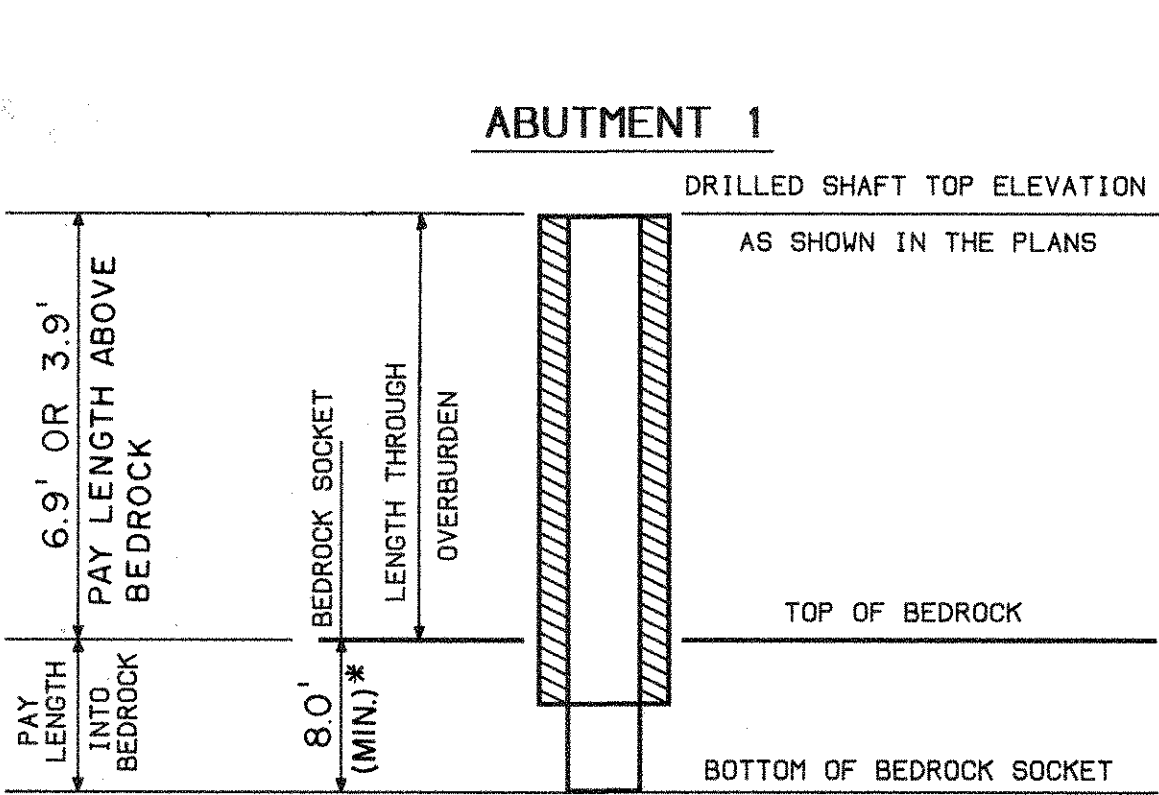
PROJECT ENGINEER COMMENTS

1. LOCATION AND EXTENT OF CAVITIES

2. PROCEDURES FOR CONTROLLING WATER

3. WERE UNEXPECTED SUBSURFACE CONDITIONS ENCOUNTERED

4. ANY SUGGESTIONS FOR IMPROVING THE PLANS



REFER TO SHEET 4/10 FOR ADDITIONAL INFORMATION

SUBMIT A COPY TO BUREAU OF BRIDGES  
ATTN: FOUNDATION ENGINEER

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

L. THOMPSON CONSULTANTS, INC. CONSULTING ENGINEERS COLUMBUS, OHIO 43215						9 / 10
DRILLED SHAFTS INSPECTION RECORD						
BRIDGE NO. PER-345-0716 OVER BUCKEYE FORK						
PERRY COUNTY				STA. 377 + 94.19 TO STA. 378 + 49.81		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SSS	CJM	J.J.		SSS	5/90	



REINFORCING STEEL LIST

CALC. R.T.  
BY  
DATE 7/89  
CHKD. J.J.  
BY  
DATE 7/89

PERRY COUNTY  
PER-345-7.15

OHIO  
FHWA REGION 5

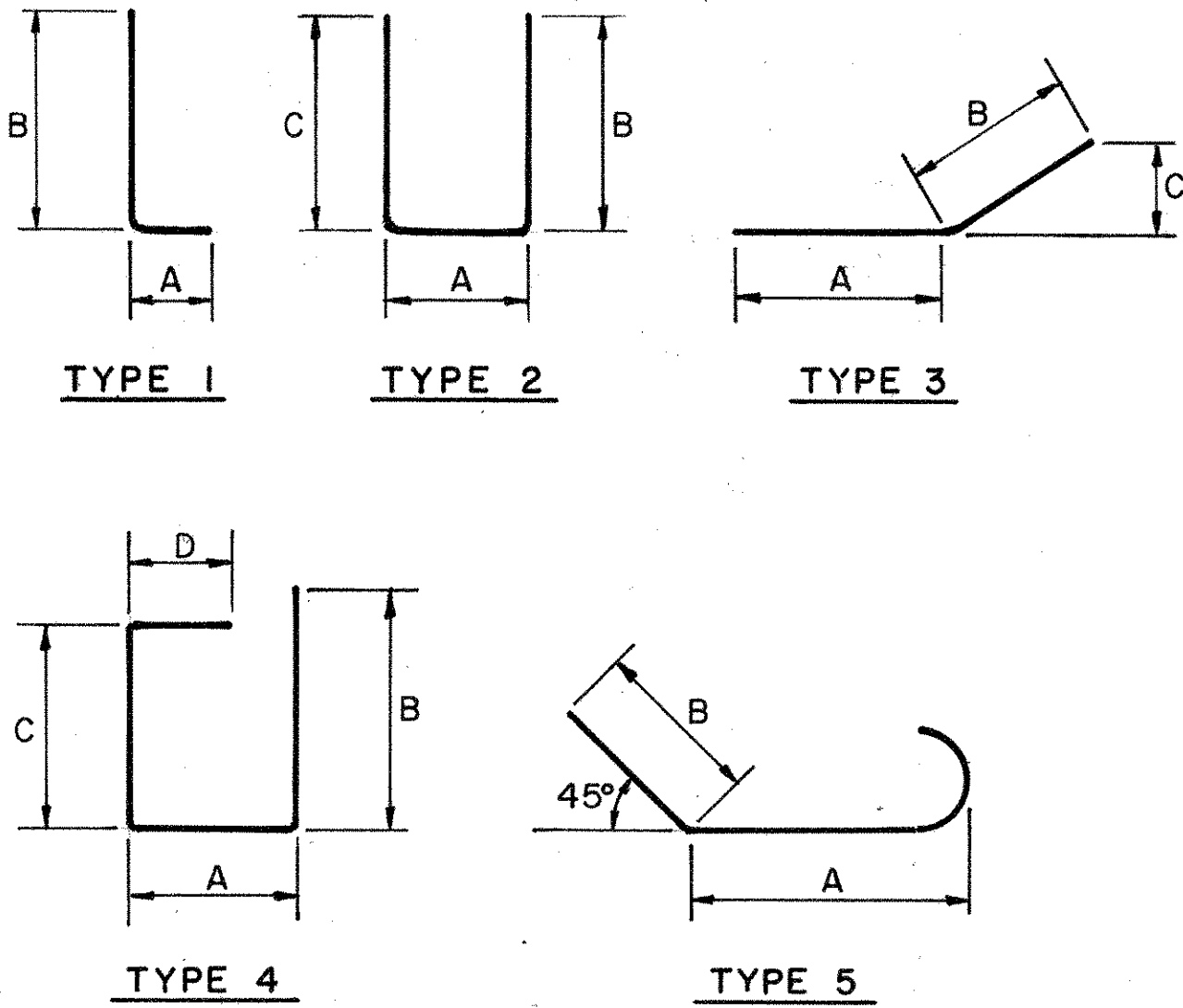
MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E	INCR.	REMARKS
ABUTMENTS											
A501	96	6-2	617	2	3-1	1-8	1-8				
A502	8	24-4	203	STR.							
A503	70	6-6	475	1	0-7½	6-0					
A504	12	7-9	97	STR.							
A505	16	17-5	291	STR.							
A506	12	9-0	113	STR.							
A601	96	11-3	1622	2	3-1	6-0	2-6				
A801	32	25'-2"	2151	STR.							
A802	44	4-7	538	5		1-5	2-4				
			6107	LBS.	ABUTMENTS (Epoxy Coated)						
EA510	46	5-9	276	2	2-8	1-8	1-8				
EA511	12	24-4	305	STR.							
EA512	4	20-3	84	STR.							
EA513	4	8-3	34	2	1-4	3-7	3-7				
EA514	6	7-11 to 6-1	44	2	1-4	3-5 to 2-6	3-5 to 2-6				2 Sets of 3 Each Vary B & C by 5½"
EA515	4	6-3	25	3	2-0	4-2	1-5				
EA516	4	8-3	34	2	1-4	3-7	3-7				
EA517	6	7-9 to 6-1	43	2	1-4	3-4 to 2-6	3-4 to 2-6				
EA518	4	6-11	29	3	2-6	4-6	1-5				
EA610	66	6-1	603	4	1-2	2-8	1-9	1-0			
EA611	66	3-10	380	2	0-8	1-9	1-9				
EA810	16	18-5	787	STR.							
			2644	Lbs.	Epoxy Coated						

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E	INCR.	REMARKS
SUPERSTRUCTURE (Epoxy & Coated)											
ES401	8	18-3	98	STR.							
ES501	8	3-8	31	2	0-11	1-6	1-6				
			129	Lbs.	Epoxy Coated						

MARK	NO.	LENGTH (HEIGHT)	WEIGHT	TYPE	REMARKS
SP401	4	20'-0"		BT.	WITH DRILLED SHAFTS FOR PAYMENT
SP402	4	15'-0"		BT.	
A803	48	23'-0"		S	
A804	48	18'-0"		S	
	SPIRALS - CORE DIAMETER 32"± PITCH 4 1/2" c/c OTHER DETAILS IN ACCORDANCE WITH C.R.S.I. STANDARD PRACTICE.				

LENGTH SHOWN IS APPROXIMATE. ACTUAL LENGTH DEPENDENT ON THE COMPLETED AND ACCEPTED LENGTH OF DRILLED SHAFT. SEE DRILLED SHAFT NOTES, SHEET 8/10.

BENDING DIAGRAM



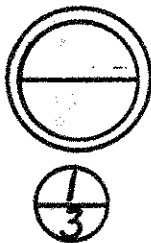
L. THOMPSON CONSULTANTS, INC.  
CONSULTING ENGINEERS  
COLUMBUS, OHIO 43215

10/10

REINFORCING STEEL LIST  
BRIDGE NO. PER-345-0716  
OVER BUCKEYE FORK  
PERRY COUNTY STA. 377+94.19 TO STA. 378+49.81

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.T.	R.T.	G.S.	J.J.	L.T.	7/17/89	





GENERAL INFORMATION

Drive Sample/Press Sample/Core Borings

Drive sample borings are made by means of a mechanically-powered rotary-type drilling machine, employing a 2" O.D., 1-3/8" I.D. split spoon sampling device, 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 sampling device 18 inches is considered the standard penetration test.

Drive/press sample borings are made by means of a mechanically-powered rotary-type drilling machine, employing a 2" O.D., 1-3/8" I.D. split spoon sampling device, and 3" O.D. thin wall press sampling device. The press sampler is advanced by continuous uniform pressure, applied by the drilling machine.

Core borings are made by means of a mechanically-powered rotary-type drilling machine, employing NQ core barrel with industrial diamond cutting head.

The boring log sheets display a graphic plot of the information obtained, including depth and elevation of the sample, type of sample, the standard penetration test readings in three 6-inch increments, depth and elevation of press samples, field number assigned to sample, sample description-based on laboratory tests utilizing the Casagrande AC classification system-and gradation, plasticity and moisture content determinations. Results of strength and consolidation testing, if performed on undisturbed samples, will appear graphically on separate enclosures. Rock samples are displayed on the log sheets including depth and elevation of the sample, amount of recovery and a visual classification based on type, color, degree of hardness, grain size, deterioration, bedding acid reaction and other qualifying factors.

At depths where materials are bouldery or gravelly to the extent that the sampler can not be utilized, a wash sample is procured and visually classified, in order to determine the general characteristics of the material. These samples are not considered sufficiently representative to warrant laboratory testing.

ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE SOIL PROFILE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATION, SOIL TESTS, AND BEDROCK BORINGS 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 THIS SUBGRADE PROFILE WAS OBTAINED SOLELY FOR 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.

GEOLOGY OF THE SITE

The structure site lies in the rolling Allegheny Plateau region of Ohio, within the broad, post Illinoian valley which confines Buckeye Fork Creek. Although unglaciated, the terminal moraine of the Illinoian ice sheet is located approximately three miles west. The soils represent both outwash and lacustrine deposits.

Bedrock encountered are Pennsylvanian age deposits of the Pottsville formation.

EXPLORATION

Two drive sample-core borings were drilled between February 18 and 20, 1989. Hollow stem augers were advanced, powered by a truck mounted, rotary drilling rig.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

Test borings indicate soft to stiff clayey silts, which grade to silty sands above the bedrock surface. A relatively flat rock surface was found at or near elevation 832 feet in both borings. Boring TB-2 (near the rear abutment) penetrated 12 feet into the bedrock, coring the last 10 feet. Boring B-1 (near the forward abutment) penetrated 16.5 feet into rock, also coring the final 10 feet.

Free water was observed and measured in boring B-2 at elevation 836.6 feet and in boring B-1 at elevation 834.5 feet.

SUPPLEMENTARY:

TWO AUGER BORINGS WERE DRILLED ON APRIL 4, 1989, TO FURTHER DETERMINE BEDROCK SURFACE TOPOGRAPHY IN THE AREA OF THE PROPOSED ABUTMENTS. BORING A-1 WAS DRILLED AT STATION 378 + 80, 10' LT. DRILLING BEGAN AT SURFACE ELEVATION 845.0 FEET. WEATHERED MUDSTONE WAS FOUND AT ELEVATION 831.0 FEET AND WAS PENETRATED 5 FEET. BORING A-2 WAS DRILLED AT STATION 377 + 90, 10.5' LT. THE SURFACE ELEVATION WAS DETERMINED AT ELEVATION 845.4 FEET AND MUDSTONE WAS ENCOUNTERED AT ELEVATION 832.4 FEET. ONE FOOT OF ROCK WAS PENETRATED.

ROCK TYPES

	COAL		WEATHERED SANDSTONE
	WEATHERED MUDSTONE		SANDSTONE
	MUDSTONE		LEACHED DOLOMITE
	WEATHERED SHALE		DOLOMITE
	SHALE		LEACHED LIMESTONE
	CLAYSTONE		LIMESTONE
	SILTSTONE		BOULDERS OR COBBLES

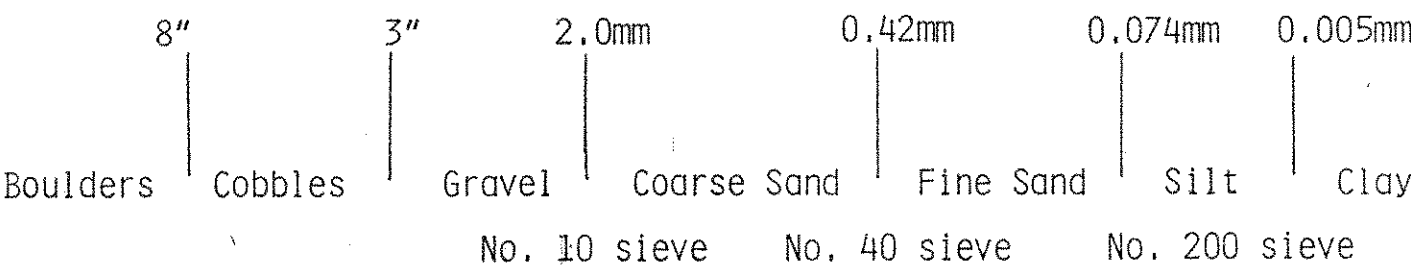
SOIL LEGEND

	GRAVEL AND/OR STONE FRAGMENTS
	GRAVEL AND/OR STONE FRAGMENTS WITH SAND
	FINE SAND
	COARSE AND FINE SAND
	GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT
	GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT AND CLAY
	SANDY SILT
	SILT
	ELASTIC SILT AND CLAY
	SILT AND CLAY
	SILTY CLAY
	ELASTIC CLAY
	CLAY

CLASSIFICATION

A-1-a
A-1-b
A-3
A-3a
A-2-4
A-2-5
A-2-6
A-2-7
A-4a
A-4b
A-5
A-6a
A-6b
A-7-5
A-7-6

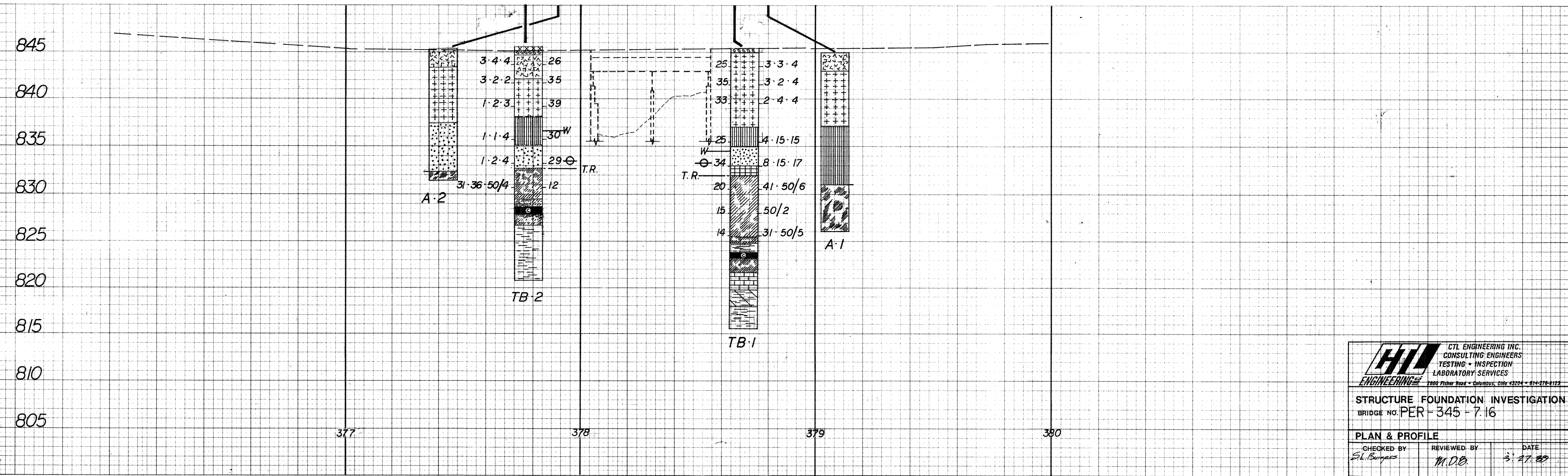
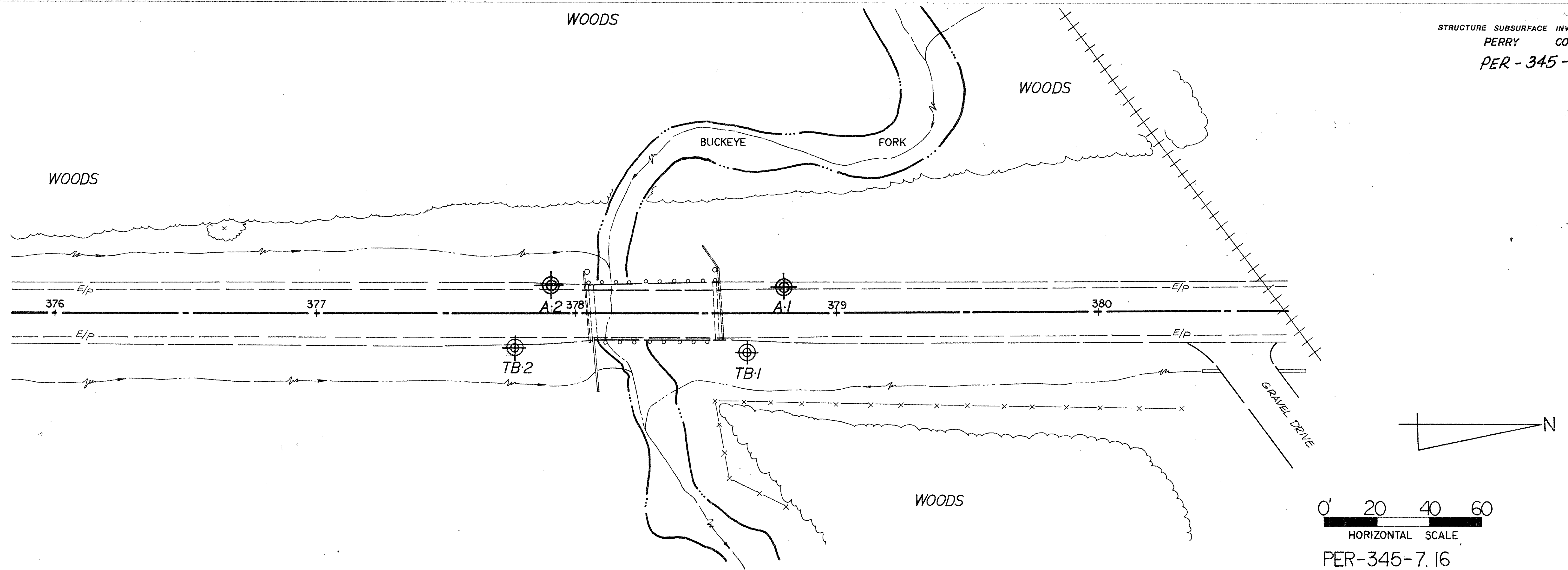
PARTICLE SIZE DEFINITIONS



LEGEND

	Auger Boring Location - Plan View.		Darkened area on Boring Log indicates the depth the Sample was taken.
	Press and/or Drive Sample and/or Core Boring Location - Plan View.		Figures beside the Boring Log in Profile indicate the Number of Blows for Standard Penetration Tests. X= No. of Blows for First 6 inches, Y=No. of Blows for 2nd 6 inches, Z=No. of Blows for 3rd 6 inches.
TR	Top of Rock		Indicates Free Water Elevation
	Capped Pile		Indicates Static Water Elevation
	Footing		Moisture Content of Non-Plastic Soil 25%
	Footing on Pile		





**CTL ENGINEERING INC.**  
 CONSULTING ENGINEERS  
 TESTING • INSPECTION  
 LABORATORY SERVICES

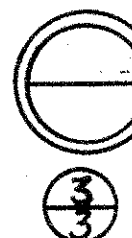
2860 Fisher Road • Columbus, Ohio 43204 • 614-278-4123

STRUCTURE FOUNDATION INVESTIGATION  
 BRIDGE NO. PER-345-7.16

PLAN & PROFILE

CHECKED BY <i>S.L. Burgess</i>	REVIEWED BY <i>M.D.B.</i>	DATE 3.27.89
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## LOG OF BORING

Date Started 2-20-89 Sampler Type S.S. Dia 1 3/8"  
Date Completed 2-20-89 Casing Length  
Boring No. B-2 Station & Offset 377 + 76 13' RT

Water Elev 836.6  
Surface Elev 845.6

Boring No.		B-2		Station & Offset		577 + 7.6		15 N											
Elev	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics										SHTL Class		
							% Agg	% C.S.	% F.S.	% Silt	% Clay	LL	Pl	WC					
842.1	0				ASPHALT	5"													
	2	3-4-4			BASE	10"													
	4	3-2-2			Brown, Clayey, SILT (FILL)	3.5'	S-1	1	14	18	48	19	33	20	26		A-6a		
	6	1-2-3			Brown, SILT		S-2									35		Visual	
832.6	8	1-2-3			Brown, SILT		S-3	0	1	20	63	16	28	4	39		A-4b		
	10	1-1-4			Brown, Sandy, SILT		S-4	8	31	18	28	15	29	7	30		A-4a		
	12	1-2-4			Brown, Gravelly, F/C SAND	13'	S-5	30	18	38	11	3	NP	NP	29		A-3a		
	14	31-36-50/4			Gray, MUDSTONE	Core #1 15-19' Core Loss 0%	S-6									12		Visual	
830.6	16		4.0	0.0	MUDSTONE, Dark Gray	Core #2 19-25' Core Loss 0%													
829.4	18				Massive, Friable	16.2'													
828.6	20				Shale, Dark gray, Limey, Massive, Hard	17.'													
827.8	22				Coal, Black, firm, fossiliferous	17.8'													
826.6	24				MUDSTONE, light gray, massive	19.'													
	26				friable, weathered														
	28		6.0	0.0	SHALE, Light to dark gray, limey, thinly														
	30				laminated, firm, slightly														
	32				weathered (Banded 22' - 25')														
820.6	34				BOTTOM OF BORING														

## LOG OF BORING

Date Started 2/18/89 Sampler Type S.S. Dia 1 3/8"  
Date Completed 2-18-89 Casing Length  
Boring No. B-1 Station & Offset 378 + 65.5, 15' RT

Water Elev 834.5  
Surface Elev 845.5

Boring No.		Station		Date		Sheet		Scale		SHTL						
Elev	Depth	Std. Pen. (N)	Rec. Ft.	Loss Ft.	Description	Sample No.	Physical Characteristics								Class	
	0				GRAVEL	6"	% Agg	% C.S.	% F.S.	% Silt	Clay	LL	PL	WC		
	2	3-3-4			Brown, Sandy, SILT	S-1									25	Visua
	4	3-2-4			Brown, SILT	S-2	0	0	20	64	16	30	4	35		A-4b
	6	2-4-4			Brown, SILT	S-3	0	4	18	65	13	28	5	33		A-4b
837.0	8					8.5'										
835.0	10	4-15-15			Gray, Sandy, SILT	10.5'	S-4	3	4	39	39	15	24	1	25	A-4a
	12	8-15-17			Brown and Gray, F/C SAND	12.5'	S-5	14	29	34	15	8	23	2	34	A-3a
833.0	14				Gray CLAY	13.5'										Visua
832.0	16	41-50/6			Gray, MUDSTONE		S-6								20	Visua
	18	50/2			Gray, MUDSTONE	Core #1 20'-24' Core Loss 10%	S-7								15	Visua
	20	31-50/5			Gray, MUDSTONE	Core #2 24'-30' Core Loss 3%	S-8								14	Visua
825.5	22		3.6	0.4	MUDSTONE Dark Gray, Friable, Laminated, weathered	20.7'										
824.8	24				Shale, dark Gray, Calcareous, firm											
823.8	26				Slightly weathered	21.7'										
823.1	28				Coal, bituminous, Shaley, Broken	22.4'										
821.6	30		5.8	0.2	Mudstone, Dark Gray, Laminated weathered, friable	23.9'										
819.7	32				Limestone, light to dark gray Shaley, firm, weathered	25.8'										
817.9	34				Clay Shale, Dark Gray,, Carbonaceous Laminated, Friable, weathered	27.6'										
815.5	36				Shale, light to dark gray, limey, laminated,											

## LOG OF BORING

Date Started 4-4-89 Sampler Type S.S. Dia 1 3/8"  
Date Completed 4-4-89 Casing Length  
Boring No. A-2 Station & Offset 377 + 90, 10.5' LT

Water Elev  
Surface Elev 845.4

Elev	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics										SHTL Class
							% Agg	% C.S.	% F.S.	% Silt	Clay	LL	PI	WC			
845.4	0				BROWN, SILT (FILL)												
845.4	2				2.0'												
	4																
	6																
837.4	8				8.0'												
	10																
	12																
832.4																	
831.4	14																
					TOP OF ROCK												
					GRAY, MUDSTONE												

## LOG OF BORING

Date Started 4-4-89 Sampler Type S.S. Dia 1 3/8"  
Date Completed 4-4-89 Casing Length  
Boring No. A-1 Station & Offset 378 + 80, 10' LT

Water Elev 837.0  
Surface Elev 845.0

Elev	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics										SHT
							% Agg	% C.S	% F.S	% Silt	Clay	LL	PI	WC	Cl		
845.0	0				BROWN, SILT (FILL)												
843.0	2																
	4																
	6				BROWN, SILT												
837.0	8																
	10																
	12				GRAY, SANDY SILT												
831.0	14				TOP OF ROCK												
	16																
	18				GRAY, WEATHERED MUDSTONE												
826.0																	
BOTTOM OF BORING																	



STRUCTURE FOUNDATION INVESTIGATION  
BRIDGE NO. PER-345-7.16

## BORING DATA

CHECKED BY S.L. Burgess  
REVIEWED BY M.D.B.  
DATE 5.17.89