FRA-315-1.76
970385
224PGS
06-04-97
DIST. 06

LIMITED ACCESS

This improvement is especially designed for through traffic and has been declared a limited access highway or freeway by action of the Director, Department of Transportation, in accordance with the provisions of Section 5511.02 of the Revised Code of Ohio.

For Design Data See Sheet 2

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
FRA-315-1.76
(FORMERLY FRA-670-1.25-C-3)
CITY OF COLUMBUS
FRANKLIN COUNTY

NOTE: WHEREVER FRA-670-1.25-C-3 IS MENTIONED, FRA-315-1.76 IS MEANT.

OHIO | FHWA REGION 5 | FEDERAL PROJECT | 1 | 224

FRANKLIN COUNTY
FRA-670-1.25-C-3 PID:4350
STP-670-6(80)
NH-670-6(80)

1995 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.

FOR STATE OF OHIO

DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION — DATE 2/13/97

ENGINEER, BUREAU OF BRIDGES AND STRUCTURAL DESIGN — DATE

DEPUTY DIRECTOR ~~PLANNING AND DESIGN~~ PROJ. MGT. — DATE 2-28-97

DIRECTOR, DEPARTMENT OF TRANSPORTATION — DATE 2/28/97

FOR CITY OF COLUMBUS

Camilla P. Shepherd — STATE / FEDERAL PROJECTS ENGINEER — DATE 9-20-96

Robert Schmidt, P.E. — CITY ENGINEER — DATE 9/23/96

Thomas N. Merritt Jr. — DIRECTOR OF PUBLIC SERVICE — DATE 9/24/96

James P. Joyce, P.E. — DIRECTOR OF UTILITIES — DATE 9/27/96

Gary M. Estep — DIRECTOR OF RECREATION AND PARKS — DATE 10.9.96

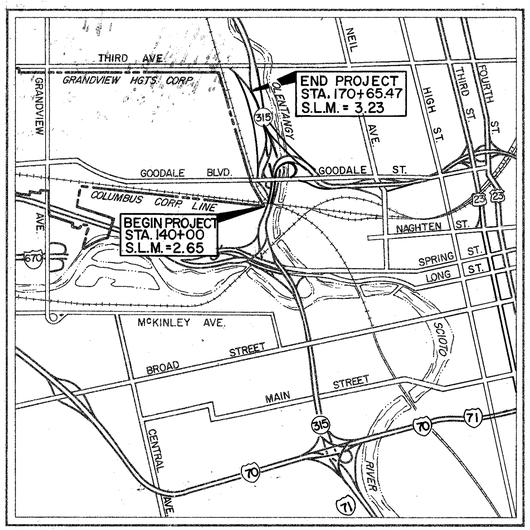
PLANS CERTIFIED BY:
NAME: Michaela Liebler DATE: 2/13/97
DISTRICT 6
OHIO DEPT. OF TRANSPORTATION

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line or
Fence Line (existing) —x— 352 —x— (proposed) 353 —x—
Center Line
Trees (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)

INDEX OF SHEETS
Sheets Not Used 20,80,106



LOCATION MAP

SCALE IN MILES
0 1/2 1

Portion to be improved
State & Federal Routes
Other Roads

SCALES
(IN FEET)

Plan: 0 50' 100'
Profile: Horizontal 0 50' 100' Vertical 0 5' 10'
Cross Section: Horizontal 0 10' 20' Vertical 0 10' 20'

LINE DATA

Begin Work	Sta. 140 +00.00
End Work	Sta. 171+80.00
Add for Work	1+00.00
Length of Work	3280 Lin. Ft. = 0.621 Miles
Begin Project	Sta. 140+00.00
End Project	Sta. 170+65.47
Length of Project	3065.47 Lin. Ft. = 0.581 Miles

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

Plan Prepared By:
JOHN E. FOSTER AND ASSOCIATES, INC.
555 BUTTLES AVENUE
COLUMBUS, OHIO 43215

Project: FRA-315-1.76
Date of Letting 19 , Contract No.

SUPPLEMENTAL SPECIFICATIONS

809	3-23-95			
810	3-23-95			
			849	6-14-95
802	3-23-95			

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

TC-35.10	8-29-84	TC-85.20	1-20-84
TC-51.11	1-20-84	BR-1-79	12-15-94
TC-81.10	1-20-84	AS-1-81	9-15-94
TC-82.10	8-29-84	EXJ-2-81	4-2-84
TC-83.10	3-18-92	EXJ-4-87	11-12-93
TC-83.20	1-20-84	SD-1-69	6-12-69
TC-84.20	1-20-84	BR-2-82	11-1-82
TC-85.10	1-20-84		

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-2.1	2-21-92	GR-1.1	5-6-91	CB-2-2A & B	5-1-79	TC-22.20	9-1-92	HL-20.14	5-1-87
BP-2.2	2-21-92	GR-2.1	5-6-91	CB-4	11-10-83	TC-31.21	9-1-92	HL-20.15	5-1-87
BP-2.3	2-21-92	GR-3A	2-5-82	CB-458A	5-1-79	TC-32.10	9-1-92	HL-50.21	5-1-87
BP-5.1	2-21-92	GR-4.2	5-6-91	CB-8	11-10-83	TC-32.11	9-1-92	HL-30.11	5-1-87
BP-6.1	2-21-92	GR-5.1	10-30-92	HW-1	6-1-65	TC-41.10	8-29-84	HL-30.22	5-1-87
		GR-4.4	2-21-92	HW-3	6-1-65	TC-41.20	6-21-94	HL-30.21	5-1-87
BP-1.1	2-21-92	MC-1	6-13-69	HW-4B	4-1-80	TC-42.10	8-19-77	HL-40.10	5-1-87
		MC-4	7-26-76	CB-6	5-1-79	TC-42.20	3-26-79	HL-60.31	5-1-87
I-3A&B	4-1-80	MC-7	10-15-76	TC-7.65	3-1-79			HL-30.32	5-1-87
		MC-9.3	10-30-92	TC-12.30	1-20-84	TC-52.10	4-3-79	HL-10.31	5-1-87
MH-1	12-18-84	MC-11	8-1-78	TC-21.10	9-1-92	TC-52.20	4-3-79	HL-20.21	5-1-87
MH-3	12-18-84	GR-1.2	10-30-92	TC-21.20	9-1-92			HL-20.22	5-1-87
		GR-4.3	2-21-92	TC-21.40	9-1-92	TC-72.20	2-26-82	HL-20.23	5-1-87

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR — DATE

PROJECT DESIGNATION	FORMER DESIGNATION
FRA-670-1.02	FRA-670-1.25-A1
FRA-33-14.65	FRA-670-1.25-A2
FRA-SOUDER AVENUE	FRA-670-1.25-A3
FRA-670/315-2.12/1.43 *	FRA-670-1.25-A4
FRA-670-3.17	FRA-670-1.25-B1
FRA-670-2.95	FRA-670-1.25-B2
FRA-670-2.61	FRA-670-1.25-B3
FRA-NATIONWIDE BLVD.	FRA-670-1.25-B4
FRA-OLENTANGY RIVER RD.	FRA-670-1.25-C1
FRA-315-2.39	FRA-670-1.25-C2
FRA-315-1.76 **	FRA-670-1.25-C3
FRA-315-0.49	FRA-670-1.25-D
FRA-315-0.93	FRA-670-1.25-A5

NOTE: * SLM 2.12 = STA. 444+64.59 ON IR 670
SLM 1.43 = STA. 122+00 ON S.R. 315

** SLM 2.48 = STA. 140+00 ON IR 670
SLM 1.88 = STA. 146+47 ON SR. 315

OHIO | FHWA & REGION 5 | FEDERAL PROJECT

2
224

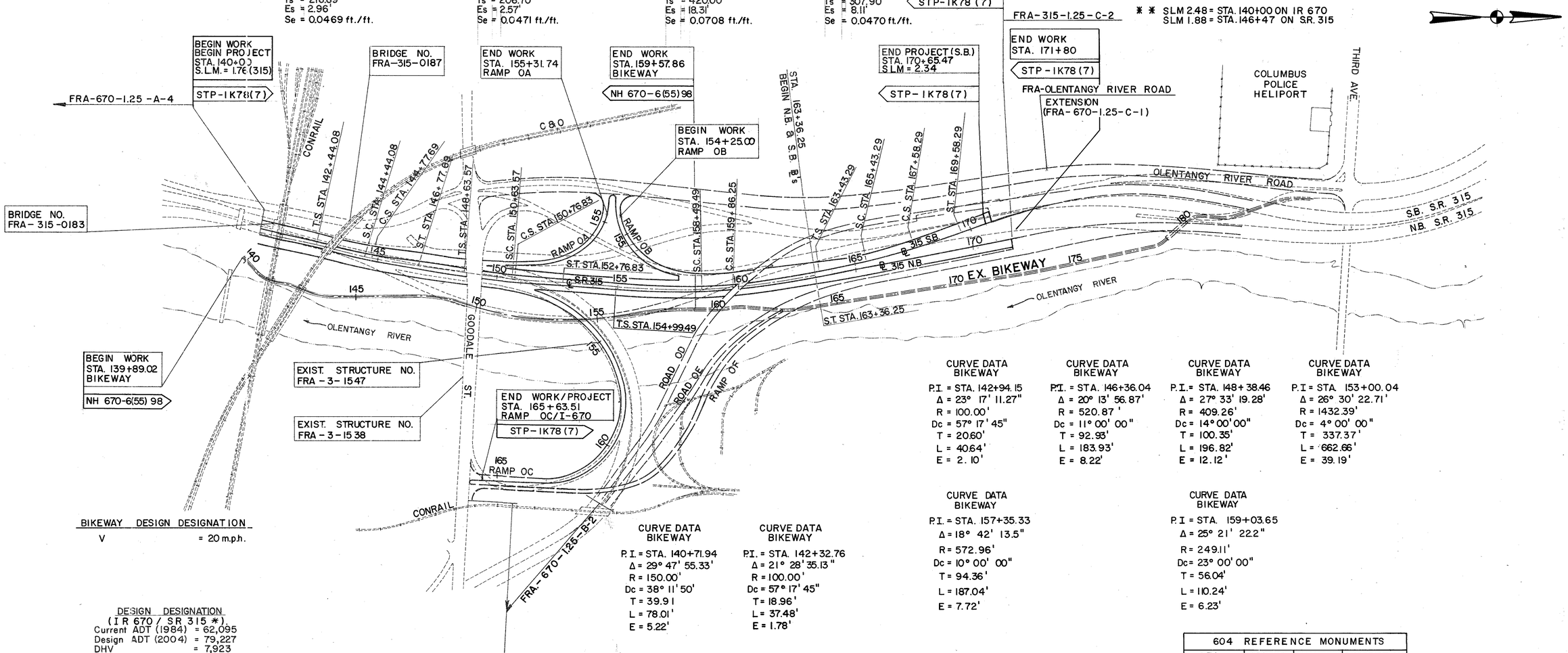
FRANKLIN COUNTY
FRA-670-1.25-C-3

CURVE DATA - S.R. 315
P.I. = STA. 144+60.97
Δ = 4° 40' 19.92"
Dc = 2° 00' 00"
Rc = 2864.79'
θs = 2° 00' 00"
Lc = 33.61'
Ls = 200.00
X = 199.98'
Y = 2.33'
L.T. = 133.34'
S.T. = 66.67'
Ts = 216.89'
Es = 2.96'
Se = 0.0469 ft./ft.

CURVE DATA - S.R. 315
P.I. = STA. 150+70.27
Δ = 4° 15' 55.08"
Dc = 2° 00' 00"
Rc = 2864.79'
θs = 2° 00' 00"
Lc = 13.26'
Ls = 200.00'
X = 199.98'
Y = 2.33'
L.T. = 133.34'
S.T. = 66.67'
Ts = 206.70'
Es = 2.57'
Se = 0.0471 ft./ft.

CURVE DATA - S.R. 315
P.I. = STA. 159+19.49
Δ = 14° 36' 10.46"
Dc = 3° 00' 00"
Rc = 1909.86'
θs = 5° 15' 00"
Lc = 136.76'
Ls = 350.00'
X = 349.71'
Y = 10.68'
L.T. = 233.46'
S.T. = 116.76'
Ts = 420.00'
Es = 18.31'
Se = 0.0708 ft./ft.

CURVE DATA - S.R. 315
P.I. = STA. 166+51.19
Δ = 8° 17' 59.96"
Dc = 2° 00' 00"
Rc = 2864.79'
θs = 2° 00' 00"
Lc = 215.00'
Ls = 200.00'
X = 199.98'
Y = 2.33'
L.T. = 133.34'
S.T. = 66.67'
Ts = 307.90'
Es = 8.11'
Se = 0.0470 ft./ft.



CURVE DATA BIKEWAY
P.I. = STA. 142+94.15
Δ = 23° 17' 11.27"
R = 100.00'
Dc = 57° 17' 45"
T = 20.60'
L = 40.64'
E = 2.10'

CURVE DATA BIKEWAY
P.I. = STA. 146+36.04
Δ = 20° 13' 56.87"
R = 520.87'
Dc = 11° 00' 00"
T = 92.93'
L = 183.93'
E = 8.22'

CURVE DATA BIKEWAY
P.I. = STA. 148+38.46
Δ = 27° 33' 19.28"
R = 409.26'
Dc = 14° 00' 00"
T = 100.35'
L = 196.82'
E = 12.12'

CURVE DATA BIKEWAY
P.I. = STA. 153+00.04
Δ = 26° 30' 22.71"
R = 1432.39'
Dc = 4° 00' 00"
T = 337.37'
L = 662.66'
E = 39.19'

CURVE DATA BIKEWAY
P.I. = STA. 157+35.33
Δ = 18° 42' 13.5"
R = 572.96'
Dc = 10° 00' 00"
T = 94.36'
L = 187.04'
E = 7.72'

CURVE DATA BIKEWAY
P.I. = STA. 159+03.65
Δ = 25° 21' 22.2"
R = 249.11'
Dc = 23° 00' 00"
T = 56.04'
L = 110.24'
E = 6.23'

CURVE DATA BIKEWAY
P.I. = STA. 140+71.94
Δ = 29° 47' 55.33'
R = 150.00'
Dc = 38° 11' 50'
T = 39.91
L = 78.01'
E = 5.22'

CURVE DATA BIKEWAY
P.I. = STA. 142+32.76
Δ = 21° 28' 35.13"
R = 100.00'
Dc = 57° 17' 45"
T = 18.96'
L = 37.48'
E = 1.78'

BIKEWAY DESIGN DESIGNATION	
V	= 20 m.p.h.

DESIGN DESIGNATION (I R 670 / SR 315 *)	
Current ADT (1984)	= 62,095
Design ADT (2004)	= 79,227
DHV	= 7,923
D	= 65%
T	= 10%
V	= 55 m.p.h.
Legal Speed	= 55 m.p.h.
Functional Class	= Urban Freeway / Expressway
Design Exceptions	= None

* Overlap at Begin Project Sta. 140+00

SCHEMATIC PLAN
SCALE IN FEET
0 200 400

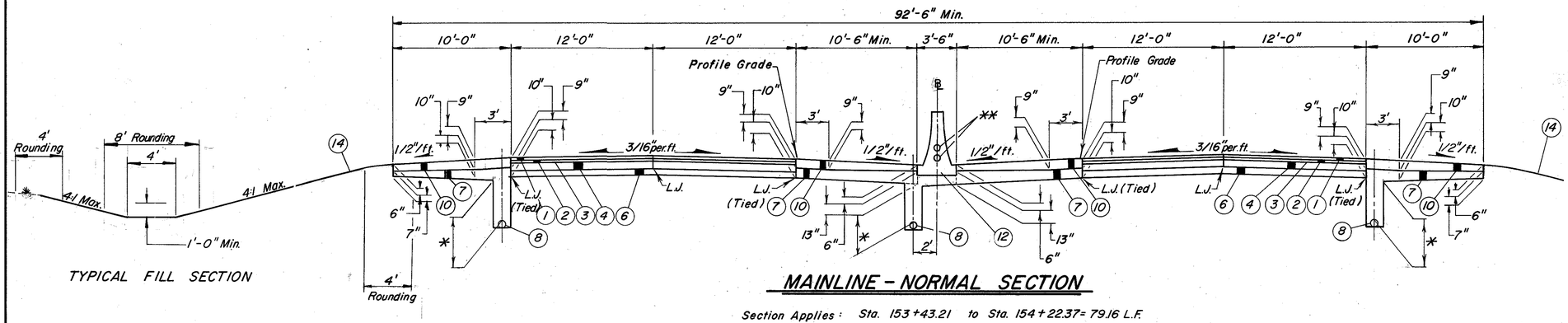
604 REFERENCE MONUMENTS			
STA.	OFFSET	QUANTITY	DESCRIPTION
S.R. 315 146+77.69	150 LT.	1 EA.	S.T.
RAMP OC 152+21.54	150 RT.	1 EA.	S.C.
RAMP OC 162+94.88	60 RT.	1 EA.	P.T.
S.R. 315 142+44.08	80 LT.	1 EA.	T.S.
TOTAL		4 EA.	

TYPICAL SECTIONS
TYPE 446 ON 305

OHIO	3
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

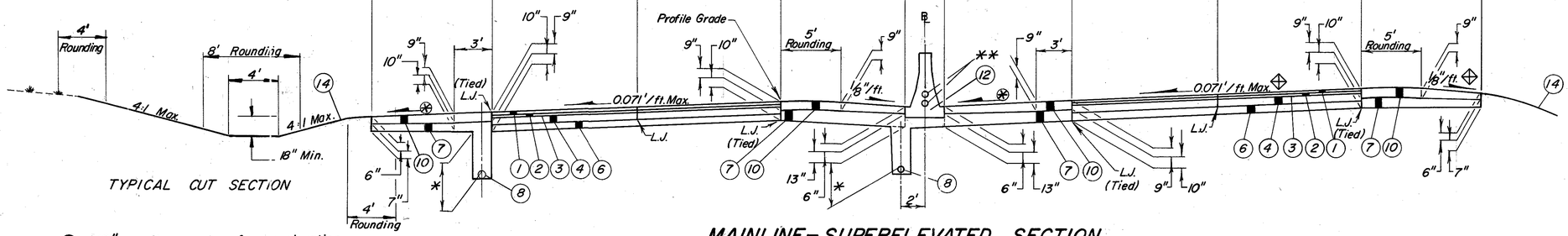
NOTE: WHEREVER 448 IS MENTIONED, 446 IS MEANT.
FOR SHOULDER AND DITCH GRADING, SEE SHT. 6



TYPICAL FILL SECTION

MAINLINE - NORMAL SECTION

Section Applies: Sta. 153+43.21 to Sta. 154+22.37 = 79.16 L.F.



TYPICAL CUT SECTION

MAINLINE - SUPERELEVATED SECTION

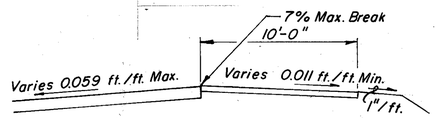
Section Applies: Sta. 150+63.57 to Sta 153+43.21 = 279.64 L.F.
Sta. 154+22.37 to Sta. 163+36.25 = 913.88 L.F.
1193.52 L.F.

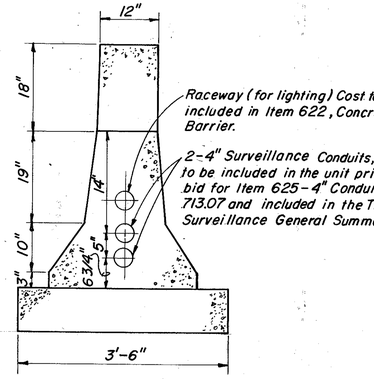
⊛ 1/2" per ft. or rate of superelevation, whichever is greater.
** See Traffic Control Plans
* Place Underdrains 50" deep in Cuts, 30" deep in Fills.
⊕ For pavement slopes less than .059 ft./ft., see Paved Shoulder Detail on this sheet.

LEGEND

(1)	Item 446	1¼" Asphalt Concrete Surface Course, Type 1, AC-20	(10)	Item 452	Plain Concrete Pavement, Thickness as shown
(2)	Item 446	1¾" Asphalt Concrete Intermediate Course, Type 2, AC-20	(11)	Not Used	
(3)	Item 407	Tack Coat, (See General Notes)	(12)	Item 622	Concrete Barrier, Type B 50
(4)	Item 305	10" Concrete Base, As Per Plan, (See General Notes)	(13)	Item 606	Guardrail, Type 5
(5)	Item 305	8" Concrete Base, As Per Plan, (See General Notes)	(14)	Item 659	Seeding and Mulching
(6)	Item 304	6" Aggregate Base, As per Plan, (See General Notes)	(15)	Item 408	Bituminous Prime Coat (at 0.40 Gal. per sq.yd.)
(7)	Item 304	Aggregate Base, Thickness as shown, As Per Plan, (See General Notes)	(16)	Item 404	2½" Asphalt Concrete, AC-20
(8)	Item 605	6" Pipe Underdrains	(17)	Item 611	Reinforced Concrete Approach Slab (t = 15")
(9)	Item 605	8" Aggregate Drains at 50' Intervals			

PAVED SHOULDER DETAIL



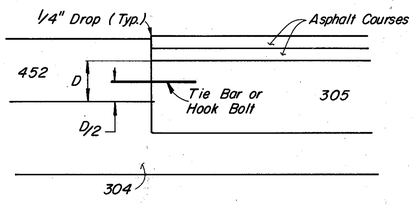


Raceway (for lighting) Cost to be included in Item 622, Concrete Barrier.

2-4" Surveillance Conduits, cost to be included in the unit price bid for Item 625-4" Conduit, 713.07 and included in the Traffic Surveillance General Summary.

CONCRETE BARRIER, TYPE-50

For Details Not Shown, See Standard Drawing MC-9.



TIE BAR DETAIL

NOTE: Along the Longitudinal Joint between the Mainline Concrete Base (Item 305) and the Concrete Shoulders (Item 452), and the Tie Bars or Hook Bolts should be placed so that the bars or bolts split the vertical interval where the base and shoulder abut, as per the Tie Bar Detail.

TYPICAL SECTIONS
TYPE 446 ON 305

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

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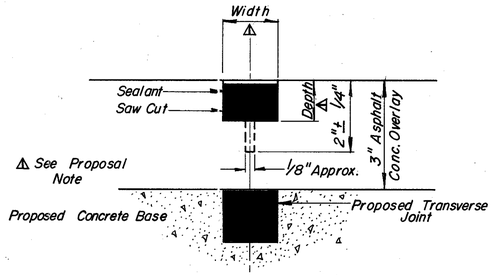
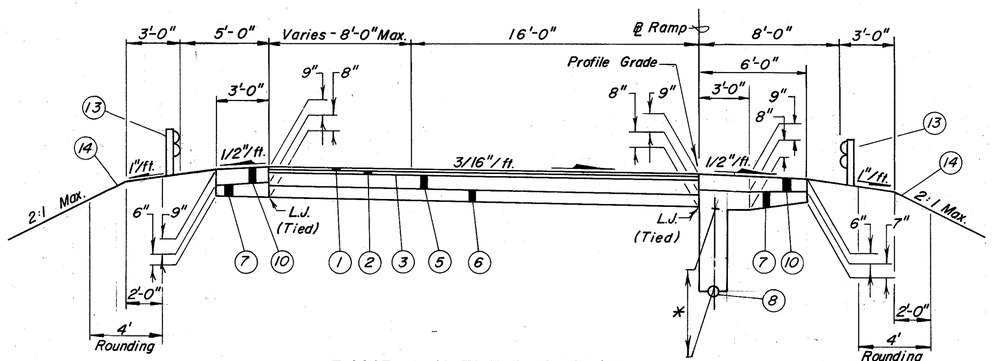
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

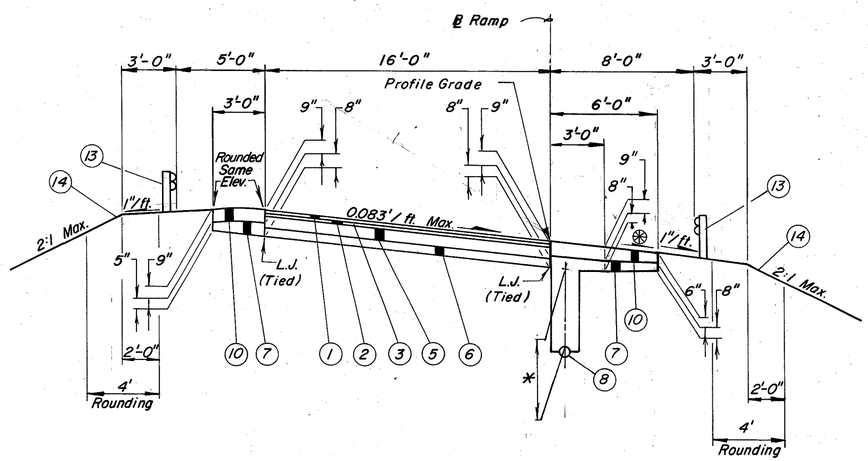


TRANSVERSE JOINT IN A BITUMINOUS OVERLAY



RAMP WIDENING SECTION

Section Applies : Ramp OC Sta. 162+65.88 to Sta. 165+63.51 = 297.63 L.F.



RAMP SUPERELEVATED SECTION

* Place Underdrain 50" Deep in Cuts, 30" Deep in Fills. Backfill with #8 or #9 Aggregate Only.

⊛ 1/2"/ft. or Rate of Superelevation, Whichever is Greater.

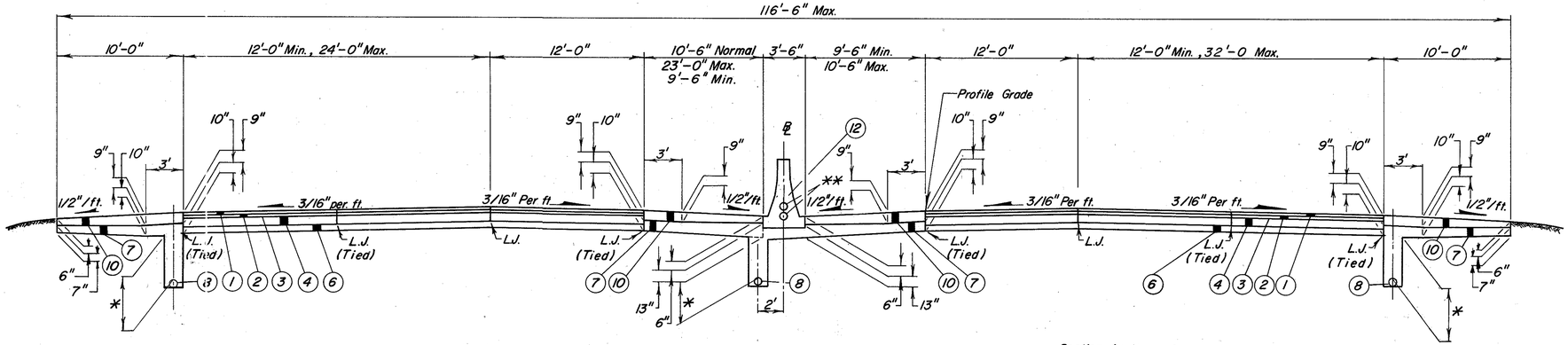
Section Applies : Ramp OA Sta. 150+63.57 to Sta. 155+31.74 = 468.17 L.F. (Opposite Hand)
Ramp OB Sta. 154+25.00 to Sta. 159+86.25 = 561.25 L.F. (Opposite Hand)
Ramp OC Sta. 150+21.54 to Sta. 162+65.88 = 1244.34 L.F.
2273.76 L.F.

NOTE : For Legend, See Sheet No. 3 or 5
For Shoulder and Ditch Grading, See Sheet No. 6

TYPICAL SECTIONS
TYPE 446 ON 305

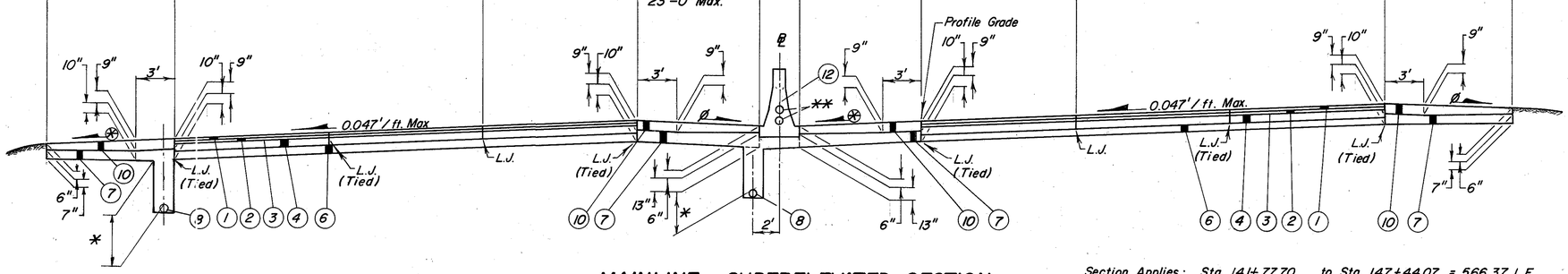
OHIO	5
FHWA REGION 5	
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



MAINLINE - NORMAL SECTION

Section Applies: Sta. 140+00 to Sta. 141+77.70 = 177.70 L.F.
Sta. 147+44.07 to Sta. 147+97.19 = 53.12 L.F.
230.82 L.F.



MAINLINE - SUPERELEVATED SECTION

Section Applies: Sta. 141+77.70 to Sta. 147+44.07 = 566.37 L.F.
Sta. 147+97.19 to Sta. 150+63.57 = 266.38 L.F.
832.75 L.F.

For shoulder and ditch grading, see Sheet No. 6

LEGEND

(1)	Item	446	1¼" Asphalt Concrete Surface Course, Type 1 AC-20
(2)	Item	446	1¾" Asphalt Concrete Intermediate Course, Type 2, AC-20
(3)	Item	407	Tack Coat, (see General Notes)
(4)	Item	305	10" Concrete Base, As Per Plan, (See General Notes)
(5)	Item	305	8" Concrete Base, As Per Plan, (See General Notes)
(6)	Item	304	6" Aggregate Base, As Per Plan, (See General Notes)
(7)	Item	304	Aggregate Base, Thickness as shown, As Per Plan, (See General Notes)
(8)	Item	605	6" Shallow Pipe Underdrains
(9)	Item	605	Aggregate Drains
(10)	Item	452	Plain Concrete Pavement, Dimension as shown
(11)	Not Used		
(12)	Item	622	Concrete Barrier, Type B 50
(13)	Item	606	Guardrail, Type 5
(14)	Item	659	Seeding and Mulching
(15)	Item	408	Bituminous Prime Coat (@ 0.40 gal. per sq. yd.)
(16)	Item	404	2 ½" Asphalt Concrete, AC-20
(17)	Item	611	Reinforced Concrete Approach Slab (t = 15")

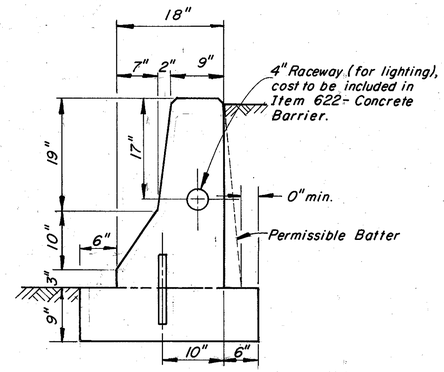
* Place Underdrains 50" Deep in Cuts, 30" Deep in Fills. Backfill with #8 or #9 Aggregate Only.

** See Traffic Control Plan

⊛ 1/2" per ft. or rate of superelevation, whichever is greater

Ø Varies: .023 ft./ft. min., 1/2" per ft. max. Break at E.P./Shoulder ≤ 7%

L.J. Longitudinal Joint



CONCRETE BARRIER TYPE D
STA. 140+00 TO STA. 143+27
For Details not shown, See Standard Drawing MC-9.3

TYPICAL SECTIONS

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

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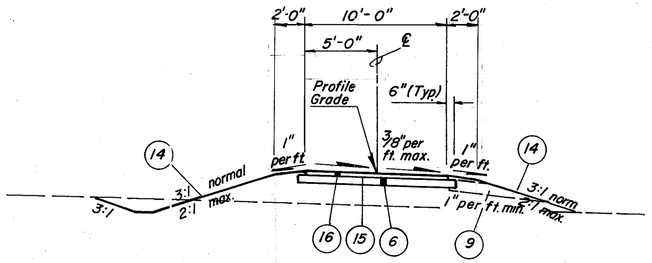
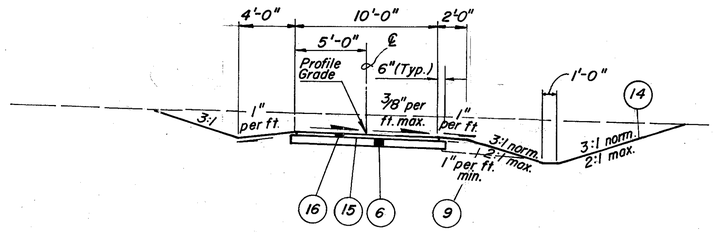
224

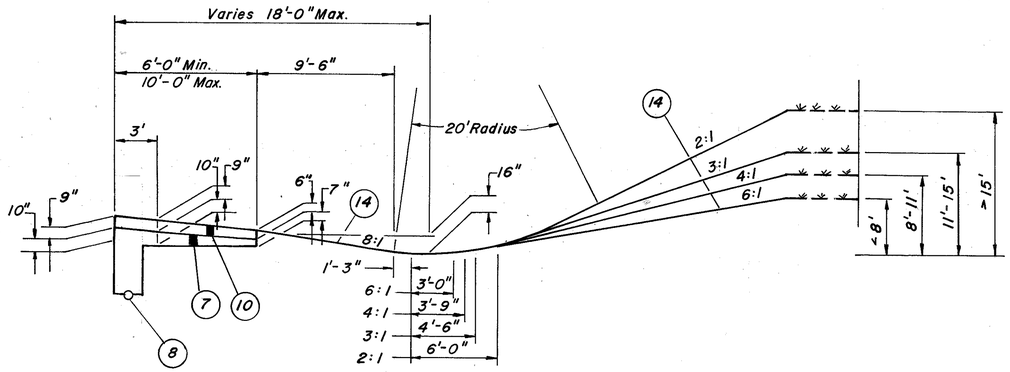
FRANKLIN COUNTY
FRA-670-1.25-C-3



TYPICAL SECTION - BIKEWAY ON FILL

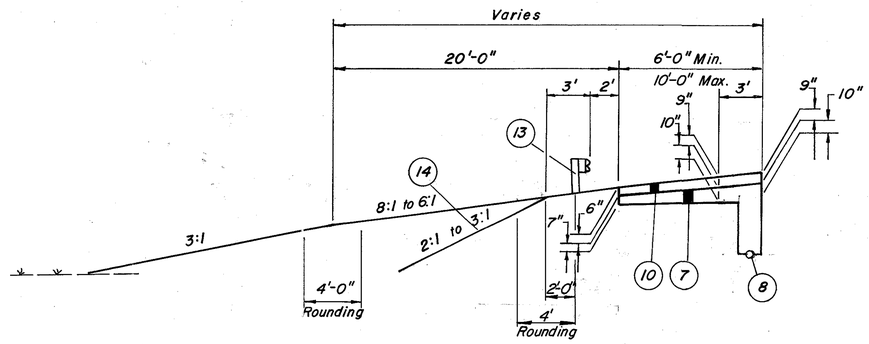


TYPICAL SECTION - BIKEWAY IN CUT



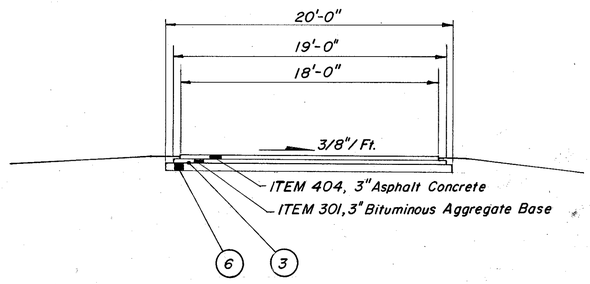
CUT SHOULDER SECTION AT RAMPS

The Concrete outlet shall meet the requirements of Item 604 in the Construction and Materials Specifications. Payment shall be made on an Each basis. Payment shall include the cost of the Sod and Wire Cloth.



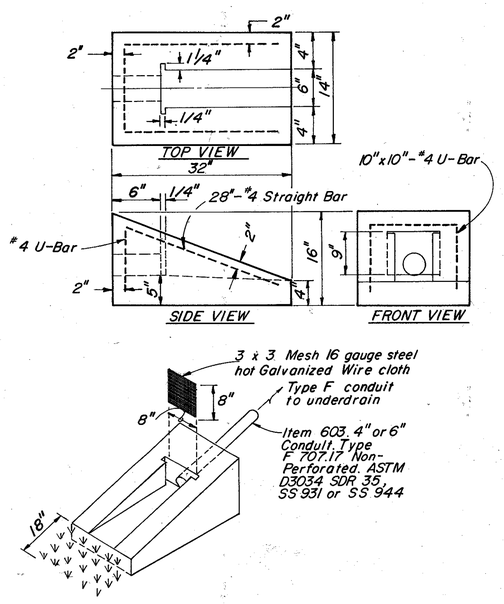
FILL SHOULDER SECTION AT RAMPS

NOTE For Legend, See Sheet No. 3 or 5



TYPICAL COMBINED BIKEWAY SECTION

SECTION APPLIES: Sta. 147+50 TO 159+10.20



NOTE: The Sod shall be in accordance with Item 660 and staked at each corner approximately 3 inches in from the edge.

ITEM SPECIAL - PRECAST REINFORCED CONCRETE OUTLET

TYPICAL SECTIONS
TYPE 446 ON 305

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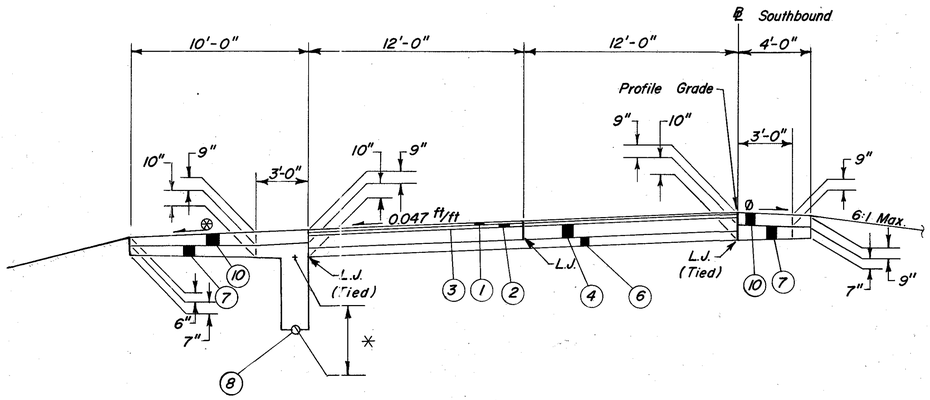
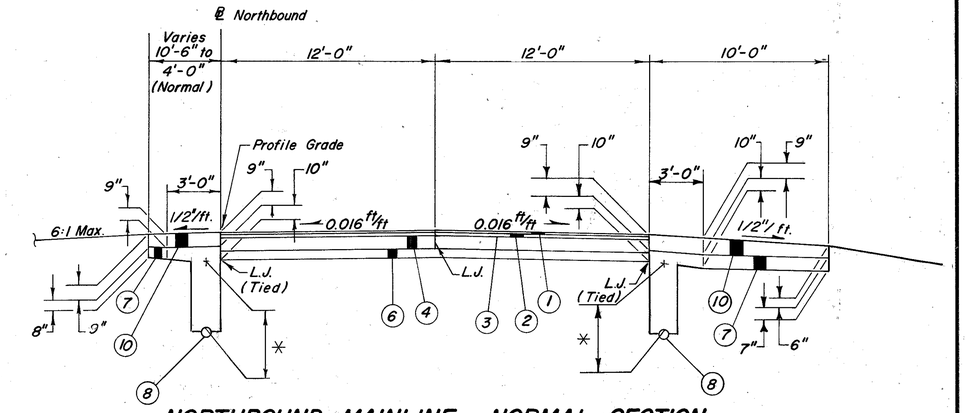


SOUTHBOUND MAINLINE - SUPERELEVATED SECTION

Section Applies:
Southbound Sta. 163+36.25 to Sta. 170+65.47 (0.047 ft/ft) = 729.22 L.F.



NORTHBOUND MAINLINE - NORMAL SECTION

Section Applies:
Northbound Sta. 163+36.25 to Sta. 171+55.38 = 819.13 L.F.

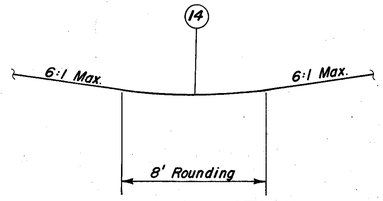
✳ Place underdrain 50" deep in cut, 30" in fill. Backfill with #8 or #9 Aggregate Only.

⊗ 1/2" per ft. or rate of superelevation, whichever is greater

Ø Varies: 1/8" per ft. min., 1/2" per ft. max. Break at E.P./shoulder ≤ 7 %

L.J. Longitudinal Joint

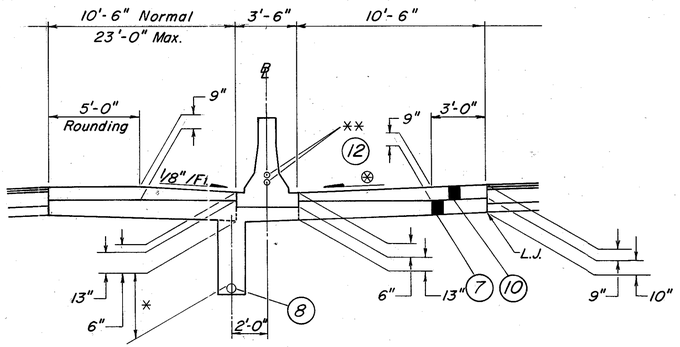
✳✳ See Traffic Control Plan



MEDIAN SECTION

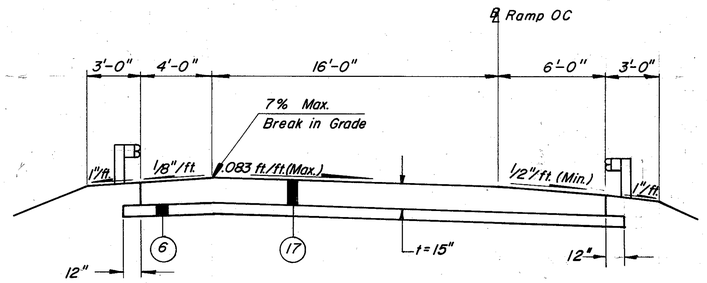
Section Applies:
Northbound Sta. 167+58.09 to Sta. 171+55.38 = 3 L.F.

NOTE : For Legend, See Sheet No. 3 or 5



MEDIAN SECTION WITH BARRIER

Section Applies:
Northbound Sta. 163+36.25 to Sta. 167+58.09



APPROACH SLAB SECTION

Section Applies: ROAD OC.: Sta. 152+86.97 to Sta. 153+11.97
Sta. 158+04.84 to Sta. 158+29.84

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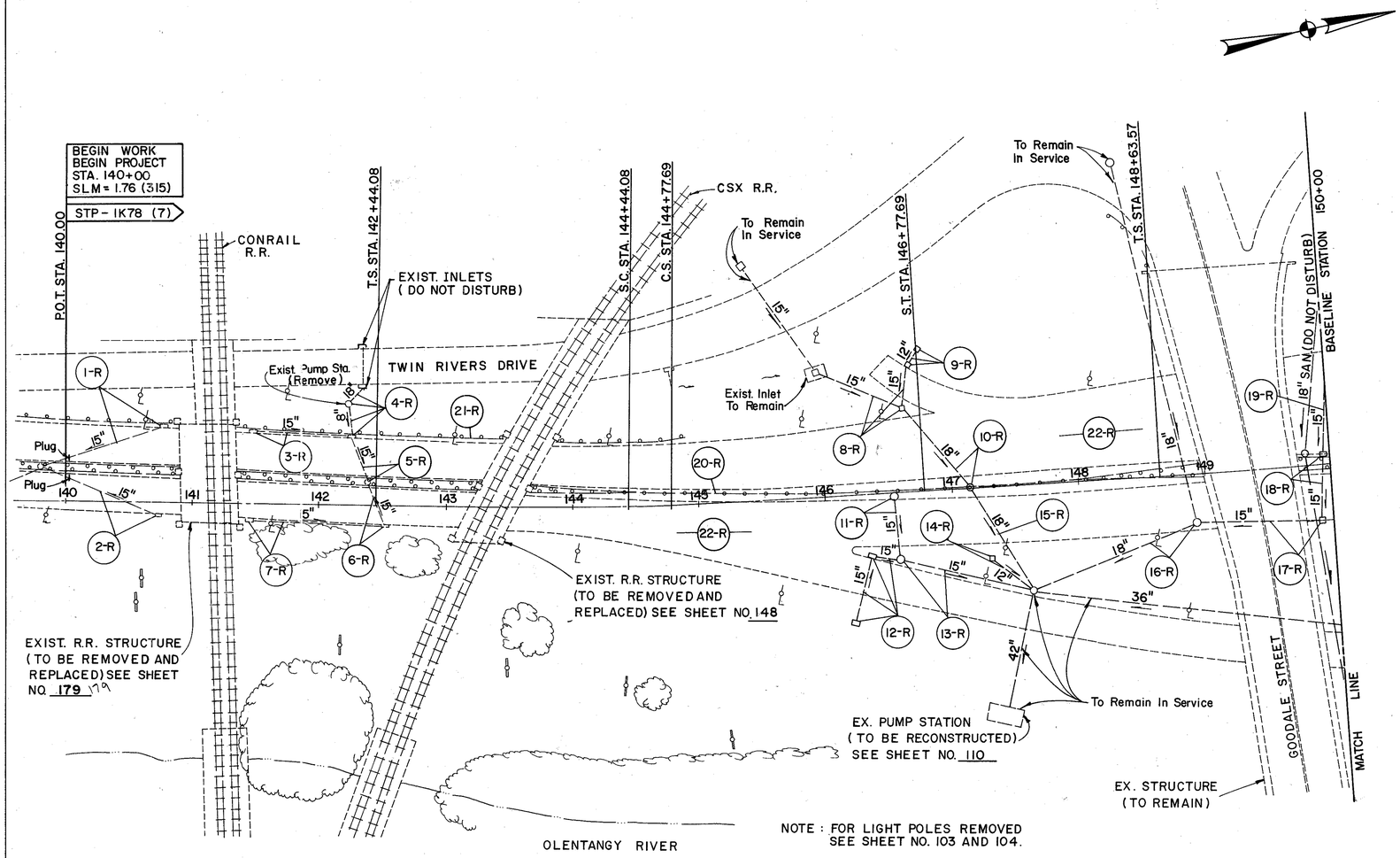

REFERENCE NO.	SIDE	STATION FROM	STATION TO	202 PIPE REMOVED 24" & UNDER	202 CATCH BASIN REMOVED	202 MANHOLE REMOVED	202 REMOVAL MISC.: PUMP STATION ST-27	202 GUARD RAIL REMOVED	202 PAVEMENT REMOVED
				LIN.FT.	EACH	EACH	LUMP	LIN. FT.	SQ. YD.
1-R	LT.	140+01	140+78	100	1				
2-R	RT.&LT.	140+01	140+73	100	1				
3-R	LT.	141+48	142+25	73	1				
4-R	LT.	142+23	142+25	44	1		LUMP		
5-R	LT.	142+25	142+38	38		1			
6-R	LT.&RT.	142+38	142+52	37	1				
7-R	RT.	141+45	142+52	105	1				
8-R	LT.	145+98	146+72	108	1				
9-R	LT.	146+72	146+79	14	2				
10-R	LT.	146+65	147+14	82		1			
11-R	RT.	146+55	146+58	50		1			
12-R	RT.	146+18	146+48	78	2				
13-R	RT.	146+48	147+59	103		1			
14-R	RT.	147+29	147+59	42	1				
15-R	RT.	147+14	147+59	95					
16-R	RT.	147+59	148+91	140		1			
17-R	RT.	148+91	149+90	100	1				
18-R	LT.&RT.	149+90	149+95	52	1				
19-R	LT.	149+95	150+00	57					
20-R	℄	140+00	150+00					1000	
21-R	LT.	140+00	144+88					488	
22-R	LT.&RT.	140+00	150+00						10,540
TOTALS				1418	14	5	LUMP	1488	10,540

REMOVAL ITEMS STA. 140+00 TO 150+00

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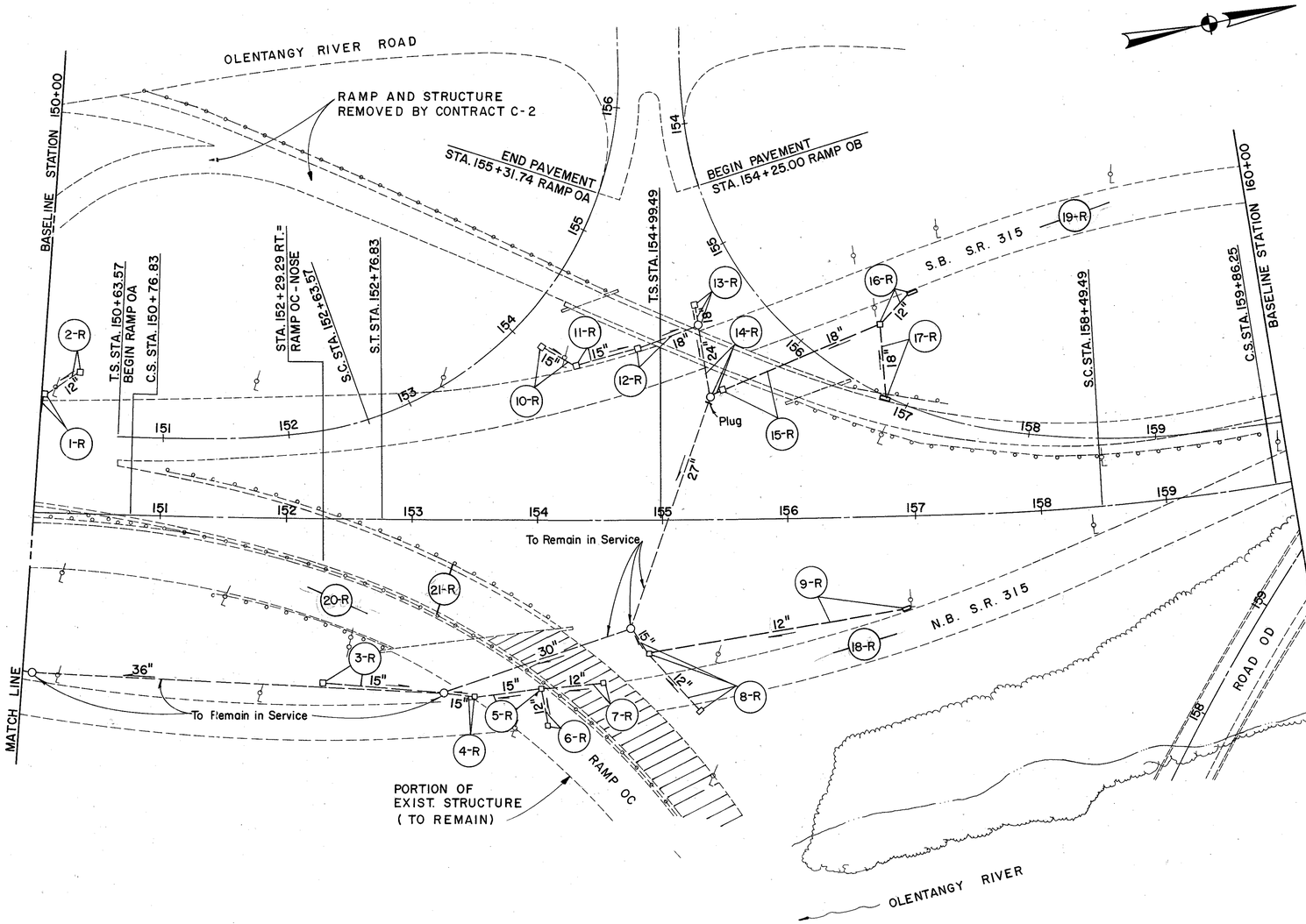

PORTION OF STRUCTURE TO BE REMOVED

REFERENCE NO.	SIDE	STATION FROM	STATION TO	202 PIPE REMOVED 24" & UNDER	CATCH BASIN REMOVED	MANHOLE REMOVED	GUARD-RAIL REMOVED, BARRIER DESIGN	GUARD-RAIL REMOVED	PAVEMENT REMOVED
				LIN. FT.	EACH	EACH	LIN. FT.	LIN. FT.	SQ. YD.
1-R	LT.	150+00	150+02	15	1				
2-R	LT.	150+02	150+35	33	1				
3-R	RT.	152+29	150+21	97	1				
4-R	RT.	153+21	153+48	24	1				
5-R	RT.	153+48	154+02	53	1				
6-R	RT.	154+02	154+07	30	1				
7-R	RT.	154+02	154+52	50	1				
8-R	RT.	154+74	155+28	87	2				
9-R	RT.	154+90	156+93	208	1				
10-R	LT.	154+04	154+33	30	1				
11-R	LT.	154+33	154+82	50	1				
12-R	LT.	154+82	155+30	52	1				
13-R	LT.	155+28	155+30	17	1	1			
14-R	LT.	155+30	155+40	68		1			
15-R	LT.	155+40	156+77	136	1				
16-R	LT.	156+77	157+02	35	2				
17-R	LT.	156+77	156+80	60	1				
18-R	RT.	150+00	160+00						3230
19-R	LT.	150+00	160+00						4230
20-R	RT.	150+00	153+50						3450
21-R	RT.	150+00	154+00				510	340	
TOTALS				1045	18	2	510	340	10,910

REMOVAL ITEMS STA. 150+00 TO 160+00

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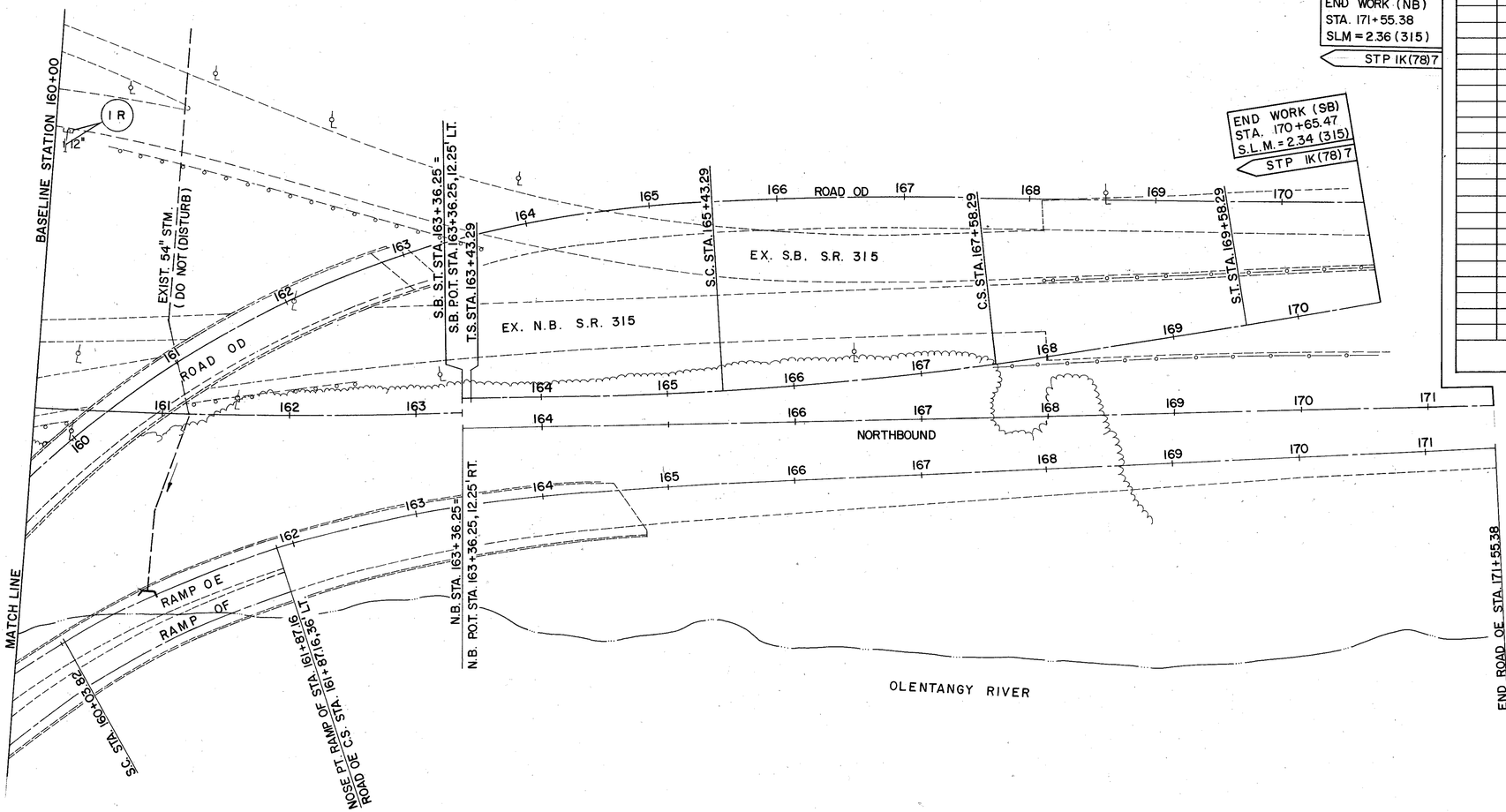
REFERENCE NO.	SIDE	STATION FROM	STATION TO	202 PIPE REMOVED 24" & UNDER	202 CATCH BASIN REMOVED				
				LIN. FT.	EA.				
1-R	LT.	160+14		17	1				
TOTALS				17	1				



REMOVAL ITEMS STA. 160+00 TO STA. 171+55.38

CALC BY	JSS
CHKD BY	WED

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

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STA. 140+00 – STA. 142+44.08 (Mainline Normal)

446	76' x 1.25"/12 x 244.08' x 1/27	= 71.57 Cu. Yd.
446	76' x 1.75"/12 x 244.08' x 1/27	= 100.19 Cu. Yd.
407	76' x 244.08' x 1/9 x 0.075	= 154.58 Gal.
305	76' x 244.08' x 1/9 (T=10")	= 2061.12 Sq. Yd.
304	76' x 6"/12 x 244.08' x 1/27	= 343.52 Cu. Yd.
304	[(2x[((7"+10")/2 x 1/12 x 7')+(10"/12 x 3')] + (10"/12 x6') + ((10" + 13")/2 x 1/12 x 18.5')] x 244.08 x 1/27	= 340.35 Cu. Yd.
452	2 x [(6"+9")/2 x 1/12 x 7'+9"/12 x 3'] + 2[9"/12 x 3'+(9"+6")/2 x 1/12 x 7.5'] x 244.08 x 1/27	= 245.26 Cu. Yd.
203	(124.5' + 120.4')/2 x 244.08' x 1/9	= 3320.84 Sq. Yd.
622	244.08' (TYPE B 50)	= 244.08 L.F.

STA. 142+44.08 – STA 146+77.69 (Mainline – Superelevation)

446	72' x 1.25"/12 x 433.61' x 1/27	= 120.45 Cu. Yd.
446	72' x 1.75"/12 x 433.61' x 1/27	= 168.63 Cu. Yd.
407	72' x 433.61 x 1/9 x 0.075	= 260.17 Gals.
305	72' x 433.61' x 1/9 (T=10")	= 3468.88 Sq. Yd.
304	72' x 6"/12 x 433.61' x 1/27	= 578.15 Cu. Yd.
304	[2 x [(7" x 10")/2 x1/12 x 7' + 10"/12 x 3'] + 10"/12 x 6' + (10" + 13")/2 x1/12 x 18.5'] x 433.61' x 1/27	= 604.65 Cu. Yd.
452	2 x [(6" + 9")/2 x 1/12 x 7' + 9"/12 x 3'] + 2[9"/12 x 3' + (9"+6")/2 x 1/12 x 7.5'] x 433.61' x 1/27	= 435.86 Cu. Yd.
622	433.61' (TYPE B 50)	= 433.61 L.F.
203	[120.4 + 116.5')/2 x 185.92'] + [116.5' x 113.57'] + [(116.5' + 119.85')/2 x 134.12'] x 1/9	= 5678.08 Sq. Yd.

STA. 146+77.69 – STA. 150+21.54 (Mainline–Normal)

446	80.2' x 1.25"/12 x 343.85' x 1/27	= 106.39 Cu. Yd.
446	80.2' x 1.75"/12 x 343.85' x 1/27	= 148.95 Cu. Yd.
407	80.2' x 343.85' x 1/9 x 0.075	= 229.81 Gal.
305	80.2' x 343.85' x 1/9 (T=10")	= 3064.09 Sq. Yd.
304	80.2' x 6"/12 x 343.85' x 1/27	= 510.68 Cu. Yd.
304	[2 x [(7"+10")/2 x 1/12 x 7'+10"/12 x 3']+10"/12 x 6'+(10"+13")/2 x 1/12 x 18.5'] x 343.85' x 1/27	= 479.48 Cu. Yd.
452	2 x [(6"+9")/2 x 1/12 x 7'+9"/12 x 3'] + 2[9"/12 x 3'+ (9"+6")/2 x 1/12 x 7.5'] x 343.85 x 1/27	= 345.44 Cu. Yd.
203	(119.85' + 128.45')/2 x 343.85' x 1/9	= 4743.22 Sq. Yd.
622	343.85' (TYPE B 50)	= 343.85 L.F.

STA. 150+21.54 – STA. 152+29.29 (Combined Area With OC)
AREA = 4586.51 Sq. Ft.

446	4586.51 x 1.25" x 1/12 x 1/27	= 17.69 Cu. Yd.
446	4586.51 x 1.75" x 1/12 x 1/27	= 24.77 Cu. Yd.
407	4586.51 x 1/9 x 0.075	= 38.22 Gal.
305	4586.51 x 1/9 (T=10")	= 509.61 Sq. Yd.
304	6" x 1/12 x 4586.51 x 1/27	= 84.94 Cu. Yd.
304	10"/12 x 3' + (10"+7")/2 x 1/12 x 7'x 207.75' x 1/27	= 57.39 Cu. Yd.
452	9"/12 x 3' + (9"+7")/2 x 1/12 x 7'x 207.75 x 1/27	= 53.22 Cu. Yd.
	AREA = 6512 Sq. Ft.	
203	6512 x 1/9	= 723.56 Sq. Yd.

STA. 150+21.54 – STA. 150+63.57 (Southbound)

446	72.47' x 1.25"/12 x 42.03' x 1/27	= 11.75 Cu. Yd.
446	72.47' x 1.75" /12 x 42.03 x 1/27	= 16.45 Cu. Yd.
407	72.47' x 42.03' x 1/9 x 0.075	= 25.38 Gal.
305	72.47' x 42.03' x 1/9 (T=10")	= 338.43 Sq. Yd.
304	72.47' x 6"/12 x 42.03' x 1/27	= 56.41 Cu. Yd.
304	8.5"/12 x 7' + 10"/12 x 3' + 10"/12 x 6' + 11.5"/12 x 18.5'x 42.03' x 1/27	= 46.99 Cu. Yd.
452	7.5"/12 x 7' + 9"/12 x 3' + 2 x [9"/12 x 3' + 7.5"/12 x 7.5'] x 42.03' x 1/27	= 31.91 Cu. Yd.
203	(70.20' + 71.25')/2 x 42.03' x 1/9	= 330.29 Sq.Yd.
622	42.03'	= 42.03 L.F.

STA. 150+63.57 – 159+86.25 (Mainline)

446	48' x 1.25"/12 x 922.68' x 1/27	= 170.87 Cu.Yd.
446	48' x 1.75"/12 x 922.68' x 1/27	= 239.21 Cu. Yd.
407	48' x 922.68' x 1/9 x 0.075	= 369.07 Gal.
305	48' x 922.68' x 1/9 (T=10")	= 4920.96 Cu. Yd.
304	48' x 6"/12 x 922.68'x 1/27	= 820.16 Cu. Yd.
304	1/27 x [(2 x [(7" +10")/2 x 1/12 x 7') + (10"/12 x 3')] +(10"/12 x 6') + ((10" + 13")/12 x 18.5')) x 668'] + [1/27 x [8.5"/12 x 7' + 10"/12 x 3' + 10"/12 x 6' + 11.5"/12 x 18.5'] x 254.68'	= 1,819.64 Cu.Yd.
452	2[7.5"/12 x 7' + 9"/12 x 3' + 9"/12 x 3' + 7.5"/12 x 7.5'] x 668' x 1/27 + [7.5"/12 x 7'+ 9"/12 x 3'] + 2[9"/12 x 3' + 7.5"/12 x 7.5'] x 254.68' x 1/27	= 864.46 Cu. Yd.
203	92.5 x 922.68' x 1/9	= 9483.10 Sq. Yd.
622	922.68' (TYPE B 50)	= 922.68 L.F.

STA. 157+31.57 – STA. 159+86.25 (Include pavement with OB)
Area = 5,149.01 Sq. Ft.

446	5149.01 x 1.25"/12 x 1/27	= 19.87 Cu. Yd.
446	5149.01 x 1.75"/12 x 1/27	= 27.81 Cu. Yd.
407	5149.01 x 1/9 x 0.075	= 42.91 Gal.
305	5149.01 x 10"/12 x 1/9 (T=10")	= 572.11 Cu. Yd.
304	5149.01 x 6"/12 x 1/27	= 95.35 Cu. Yd.
304	10"/12 x 3' + (10" +7")/2 x 1/12 x 7' x 245.41' x 1/27	= 67.79 Cu. Yd.
452	9"/12 x 3' + (9" + 7")/2 x 1/12 x 7' x 245.41' x 1/27	= 62.87 Cu. Yd.
	AREA = 4776 Sq. Ft.	
203	4776 x 1/9	= 530.67 Sq. Yd.

STA. 159+86.25 – STA. 163+36.25 (Mainline)

446	60' x 1.25"/12 x 350' x 1/27	= 81.02 Cu. Yd.
446	60' x 1.75"/12 x 350' x 1/27	= 113.43 Cu. Yd.
407	60' x 350 x 1/9 x 0.075	= 175.00 Gal.
305	60' x 350' x 1/9 (T=10")	= 2333.33 Sq. Yd.
304	[2 x (8.5"/12 x 7' + 10"/12 x 3') + 10"/12 x 6' + 11.5"/12 x 18.5'] x 350' x 1/27	= 488.00 Cu. Yd.
452	[2 x (7.5"/12 x 7' + 9"/12 x 3') + 2(9"/12x3' + 7.5"/12 x 7.5')] x 350' x 1/27	= 351.62 Cu. Yd.
622	350' (TYPE B 50)	= 350 L.F.
203	92.5' x 350' x 1/9	= 3597.22 Sq. Yd.

STA. 163+36.25 – STA. 164+31.57 (Mainline–Southbound)

446	36' x 1.25"/12 x 95.32' x 1/27	= 13.24 Cu. Yd.
446	36' x 1.75"/12 x 95.32' x 1/27	= 18.53 Cu. Yd.
407	36' x 95.32 x 1/9 x 0.075	= 28.60 Gal.
305	36' x 95.32 x 1/9 (T=10")	= 381.28 Sq. Yd.
304	36' x 6"/12 x 95.32' x 1/27	= 63.55 Cu. Yd.
304	[(7" + 10")/2 x 1/12 x 7' + 10"/12 x 3' + (7" + 10")/2 x 1/12 x 4'] x 95.32' x 1/27	= 36.33 Cu. Yd.
452	[7.5"/12 x 7' + 9"/12 x 3' + 9"/12 x 3' + 8.5"/12 x 1'] x 95.32 x 1/27	= 33.83 Cu. Yd.
203	(58.25' + 95.32') x 1/9	= 616.93 Sq. Yd.

STA. 164+31.57 – STA. 165+31.57 (Mainline–Southbound)

446	30' x 1.25"/12 x 100' x 1/27	= 11.57 Cu. Yd.
446	30' x 1.75"/12 x 100' x 1/27	= 16.20 Cu. Yd.
407	30' x 100 x 1/9 x 0.075	= 25.00 Gal.
305	30' x 100 x 1/9 (T=10")	= 333.33 Sq. Yd.
304	30' x 6"/12 x 100' x 1/27	= 55.56 Cu. Yd.
304	[8.5"/12 x 7' + 10"/12 x 3' + 8.5"/12 x 4'] x 100' x 1/27	= 38.12 Cu. Yd.
452	[7.5"/12 x 7' + 9"/12 x 3' + 9"/12 x 3' + 8.5"/12 x 1'] x 100' x 1/27	= 35.49 Cu. Yd.
203	(58.25' + 46.25')/2 x 100 x 1/9	= 580.56 Sq. Yd.

STA. 165+31.57 – STA. 170+64.47 (Mainline Southbound)

446	24' x 1.25"/12 x 533.90' x 1/27	= 49.44 Cu. Yd.
446	24' x 1.75"/12 x 533.90' x 1/27	= 69.21 Cu. Yd.
407	24' x 533.90' x 1/9 x 0.075	= 106.78 Gal.
305	24' x 533.90' x 1/9 (T=10")	= 1423.73 Sq. Yd.
304	24" x 6"/12 x 533.90' x 1/27	= 237.29 Cu. Yd.
304	[(7"+10")/2 x 1/12 x 7'+10"/12 x 3' + (7" + 10")/2 x 1/12 x 4'] x 533.90 x 1/27	= 203.54 Cu. Yd.
452	[7.5"/12 x 7' + 9"/12 x 3' + 9"/12 x 3' + 8.5"/12 x 1'] x 533.90' x 1/27	= 189.50 Cu. Yd.
203	38' x 533.90' x 1/9	= 2254.24 Sq. Yd.

STA. 163+36.25 – STA. 167+03.37 (Southbound additional shoulder – one side)

304	(20' + 6')/2 x 7"/12 x 367.12' x 1/27	= 103.11 Cu. Yd.
452	(20' + 6')/2 x 8"/12 x 367.12' x 1/27	= 117.84 Cu. Yd.
203	20' x 1/2 x 367.12' x 1/9	= 407.91 Sq. Yd.

STA. 163+36.25 – STA. 167+58.09 (Northbound Mainline)

446	24' x 1.25"/12 x 421.84' x 1/27	= 39.06 Cu. Yd.
446	24' x 1.75"/12 x 421.84' x 1/27	= 54.68 Cu. Yd.
407	24' x 421.84 x 1/9 x 0.075	= 84.37 Gal.
305	24' x 421.84' x 1/9 (T=10")	= 1124.91 Sq. Yd.
304	24' x 6"/12 x 421.84' x 1/27	= 187.48 Cu. Yd.
304	[(8" + 10")/2 x 1/12 x 7.5' + 10"/12 x 3'+ 10"/12 x 3' + (10" + 7")/2 x 1/12 x 7'] x 421.84' x 1/27	= 243.47 Cu. Yd.
452	[(8" + 9")/2 x 1/12 x 7.5' + 9"/12 x 3' + 9"/12 x 3' + (9" + 6")/2 x 1/12 x 7'] x 421.84' x 1/27	= 221.66 Cu. Yd.
203	46.25' x 421.84 x 1/9	= 2167.79 Sq. Yd.
622	421.84' (TYPE B 50)	= 421.84 L.F.

STA. 167+58.09 – STA. 169+20.50 (Northbound – Mainline)

448	24' x 1.25"/12 x 162.5' x 1/27	= 15.05 Cu. Yd.
448	24' x 1.75"/12 x 162.5' x 1/27	= 21.06 Cu. Yd.
407	24' x 162.5' x 1/9 x 0.075	= 32.50 Gal.
305	24' x 162.5' x 1/9 (T=10")	= 433.33 Sq. Yd.
304	24' x 6"/12 x 162.5' x 1/27	= 72.22 Cu. Yd.
304	[(8" + 10")/2 x 1/12 x (7.5' + 1')/2 + [10"/12 x 3'] x 2 + (10" + 7")/2 x 1/12 x 7'] x 162.5' x 1/27	= 79.12 Cu. Yd.
452	(9" + 8")/2 x 1/12 x (7.5 + 1')/2 + [9"/12 x 3'] x 2 + (9" + 6")/2 x 1/12 x 7'] x 162.5' x 1/27	= 71.57 Cu. Yd.
203	(46.25' + 39.75')/2 x 162.50 x 1/9	= 776.39 Sq. Yd.

STA. 169+20.59 – STA. 171+55.38 (Northbound Mainline)

446	24' x 1.25"/12 x 234.79' x 1/27	= 21.74 Cu. Yd.
446	24' x 1.75"/12 x 234.79' x 1/27	= 30.44 Cu. Yd.
407	24' x 234.79' x 1/9 x 0.075	= 46.96 Gal.
305	24' x 234.79' x 1/9 (T=10")	= 626.11 Sq. Yd.
304	24' x 6"/12 x 234.79' x 1/27	= 104.35 Cu. Yd.
304	[(7' + 1')/2 x (7" + 10")/2 x 1/12 + [10"/12 x 3'] x 2 + 1' x (10" + 8")/2 x 1/12] x 234.79' x 1/27	= 74.63 Cu. Yd.
452	[(7' + 1')/2 x (9" + 6")/2 x 1/12 + [10"/12 x 3'] x 2 + 1' x (9" + 8")/2 x 1/12] x 234.79' x 1/27	= 67.76 Cu. Yd.
203	(39.75' + 36')/2 x 234.79' x 1/9	= 988.07 Cu. Yd.

STA. 165+75 –STA. 169+20.59 (Northbound–Additional shoulder one side)

304	9'/2 x 7"/12 x 345.59' x 1/27	= 33.60 Cu. Yd.
452	9'/2 x 7"/12 x 345.59 x 1/27	= 33.60 Cu. Yd.
203	9'/2 x 345.59 x 1/9	= 172.80 Sq. Yd.

STA. 150+63.57 – STA. 152+47.29 (Ramp OA)

446	16' x 1.25"/12 x 183.72' x 1/27	= 11.34 Cu. Yd.
446	16' x 1.75"/12 x 183.72' x 1/27	= 15.88 Cu. Yd.
407	16' x 183.72' x 1/9 x 0.075	= 24.50 Gal.
305	16' x 183.72' x 1/9 (T=8")	= 326.61 Sq. Yd.
304	16' x 6"/12 x 183.72' x 1/27	= 54.44 Cu. Yd.
304	758.55 Sq. Ft. x 7.4"/12 x 1/27	= 17.32 Cu. Yd.
452	758.55 Sq. Ft. x 8.625"/12 x 1/27	= 20.19 Cu. Yd.
203	[(26' + 22')/2 x 100.13 x 1/9] + [13' x 1/2 x 183.72 x 1/9]	= 399.70 Sq. Yd.

STA. 152+47.29 – STA. 155+31.74 (Ramp OA)

446	16' x 1.25"/12 x 284.45' x 1/27	= 17.56 Cu. Yd.
446	16' x 1.75"/12 x 284.45' x 1/27	= 24.58 Cu. Yd.
407	16' x 284.45' x 1/9 x 0.075	= 37.93 Gal
305	16' x 284.45' x 1/9 (T=8")	= 505.69 Sq. Yd.
304	16' x 6"/12 x 284.45' x 1/27	= 84.28 Cu. Yd.
304	[(6" + 8")/2 x 1/12 x 3' + 8"/12 x 3' + (8" + 7")/2 x 1/12 x 3'] x 284.45' x 1/27	= 59.26 Cu. Yd.
452	[9"/12 x 3' + 9"/12 x 3' + (9" + 6")/2 x 1/12 x 3'] x 284.45' x 1/27	= 67.16 Cu. Yd.
203	25' x 248.45' x 1/9	= 690.14 Sq. Yd.

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STA. 154+25 – STA. 157+40.86 (Ramp OB)

446	16' x 1.25"/12 x 315.84' x 1/27	=	19.50 Cu. Yd.
446	16' x 1.75"/12 x 315.84' x 1/27	=	27.29 Cu. Yd.
407	16' x 315.84' x 1/9 x 0.075	=	42.11 Gal.
305	16' x 315.84' x 1/9 (T=8")	=	561.49 Sq. Yd.
304	16' x 6"/12 x 315.84' x 1/27	=	93.58 Cu. Yd.
304	[(6" + 8")/2 x 1/12 x 3' + 8"/12 x 3' + (8" + 7")/2 x 1/12 x 3'] x 315.84' x 1/27 + 4.32'*	=	70.12 Cu. Yd.
452	[9"/12 x 3' + 9"/12 x 3' + (9" + 6")/2 x 1/12 x 3'] x 315.84' x 1/27 + 3.70'*	=	78.27 Cu. Yd.
*Additional area for taper.		=	
203	[25' x 215.84' x 1/9] + [(25' + 29')/2 x 100.00 x 1/9]		300.00 Sq. Yd.

STA. 152+30.86 – STA. 162+62.88 (Ramp OC)

446	16' x 1.25"/12 x 1035.02' x 1/27	=	63.89 Cu. Yd.
446	16' x 1.75"/12 x 1035.02' x 1/27	=	89.45 Cu. Yd.
407	16' x 1035.02' x 1/9 x 0.075	=	138.00 Gal.
305	16' x 1035.02' x 1/9 (T=8")	=	1840.04 Sq. Yd.
304	16' x 6"/12 x 1035.02' x 1/27	=	306.67 Cu. Yd.
304	[(6" + 8")/2 x 1/12 x 3' + 8"/12 x 3' + (8" + 7")/2 x 1/12 x 3'] x 1035.02' x 1/27	=	215.63 Cu. Yd.
452	[9"/12 x 3' + 9"/12 x 3' + (9" + 6")/2 x 1/12 x 3'] x 1035.02' x 1/27	=	244.38 Cu. Yd.
203	[(29' + 25')/2 x 100.00 x 1/9] + [25' x 935.02' x 1/9]	=	2897.28 Sq. Yd.

STA. 162+65.88 – STA. 164+45.88 (Ramp OC)

446	20' x 1.25"/12 x 180' x 1/27	=	13.89 Cu. Yd.
446	20' x 1.75"/12 x 180' x 1/27	=	19.44 Cu. Yd.
407	20' x 180' x 1/9 x 0.075	=	30.00 Gal.
305	20' x 180' x 1/9 (T=8")	=	400.00 Sq. Yd.
304	20' x 8"/12 x 180' x 1/27	=	88.89 Cu. Yd.
304	[(6" + 8")/2 x 1/12 x 3' + 8"/12 x 3' + (8" + 7")/2 x 1/12 x 3'] x 180' x 1/27	=	37.50 Cu. Yd.
452	[9"/12 x 3' + 9"/12 x 3' + (9" + 6")/2 x 1/12 x 3'] x 180' x 1/27	=	42.50 Cu. Yd.
203	(25' + 33')/2 x 180' x 1/9	=	580.00 Sq. Yd.

STA. 164+45.88 – STA. 165+63.51 (Ramp OC)

446	24' x 1.25"/12 x 117.63' x 1/27	=	10.89 Cu. Yd.
446	24' x 1.75"/12 x 117.63' x 1/27	=	15.25 Cu. Yd.
407	24' x 117.63' x 1/9 x 0.0075	=	23.53 Gals.
305	24' x 117.63 x 1/9 (T=8")	=	313.68 Sq. Yd.
304	24' x 6"/12 x 117.63' x 1/27	=	52.28 Cu. Yd.
304	[(6" + 8")/2 x 1/12 x 3' + 8"/12 x 3 + (8" + 7")/2 x 1/12 x 3'] x 117.63' x 1/27	=	24.51 Cu. Yd.
452	[9"/12 x 3' + 9"/12 x 3' + (9" + 6")/2 x 1/12 x 3'] x 117.63' x 1/27	=	27.77 Cu. Yd.
203	33' x 117.63 x 1/9	=	431.31 Sq. Yd.

STA. 139+89.02 – STA. 147+00.00 (Bikeway)

304	11' x 6"/12 x 710.98' x 1/27	=	144.83 Cu. Yd.
408	10' x .4 x 710.98' x 1/9	=	315.99 Gal
404	10' x 2.5"/12 x 710.98' x 1/27	=	54.86 Cu. Yd.
203	10' x 710.98 x 1/9	=	789.98 Sq. Yd.

STA. 147+00.00 – STA. 148+30.00 (Combined Bikeway)
A=4224 Sq. Ft. (Planimeter)

407	4224 x 1/9 x 0.075	=	35.20 Gal.
304	(6" x 1/12 x 4224 x 1/27) + 184.83 x 1/27	=	85.07 Cu. Yd.
404	3" x 1/12 x 4224 x 1/27	=	39.11 Cu. Yd.
301	[3" x 1/12 x 4224 + 184.83 x 6"/12] x 1/27	=	42.53 Cu. Yd.
304	[(24" x 8") – (3" x 6") – (12" + 2")] x 1/144 x 184.83 x 1/27	=	7.13 Cu. Yd.
203	4224 x 1/9	=	469.33 Sq. Yd.

STA. 148+30.00 – STA. 158+60.20 (Combined Bikeway)

407	18' x 1030.2' x 1/9 x 0.075	=	154.53 Gal.
304	20' x 6"/12 x 1030.2' x 1/27	=	381.56 Cu. Yd.
404	18' x 3"/12 x 1030.2' x 1/27	=	171.70 Cu. Yd.
301	19' x 3"/12 x 1030.2' x 1/27	=	181.24 Cu. Yd.
304	2 x [(24" x 8") – (3" x 6") – (12" x 2")] x 1/144 x 1030.2' x 1/27	=	
203	18' x 1030.20' x 1/9	=	2060.40 Sq. Yd.

STA. 158+60.20 – STA. 159+57.86 (Combined Bikeway)
A = 2,878.38 Sq. Ft.

407	2878.38 x 1/9 x 0.075	=	23.99 Gal.
304	2878.38 x 6"/12 x 1/27 + (211.75' x 1/27)	=	61.15 Cu. Yd.
404	2878.38 x 3"/12 x 1/27	=	26.65 Cu. Yd.
301	[3"/12 x 2878.38 x 1/27] + 211.75 x 6"/12 x 1/27	=	30.57 Cu. Yd.
304	[(24" x 8") – (3" x 6") – (12" x 2")] x 1/144 x 211.75 x 1/27	=	8.17 Cu. Yd.
203	2878.38 x 1/9	=	319.82 Sq. Yd.

STA. 140+00.00 – STA. 150+00.00 (Subgrade Stabilization)

203	50% x 94.5' x 2' x 1000 x 1/27	=	3500 Cu. Yd.

APPROACH SLABS FOR BRIDGE OC OVER OLENTANGY RIVER
Begin Approach Slab Sta. 152+86.97

W = 26' L = 25' Thickness = 15"

611	26' x 25' x 1/9	=	72.22 Sq. Yd.
304	28' x 25' x 6"/12 x 1/27	=	12.96 Cu. Yd.

Begin Approach Slab Sta. 158+04.84

W = 26' L = 25' Thickness = 15"

611	26' x 25' x 1/9	=	72.22 Sq. Yd.
304	28' x 25' x 6"/12 x 1/27	=	12.96 Cu. Yd.

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PAVEMENT QUANTITIES AND CALCULATIONS (CONTINUED)

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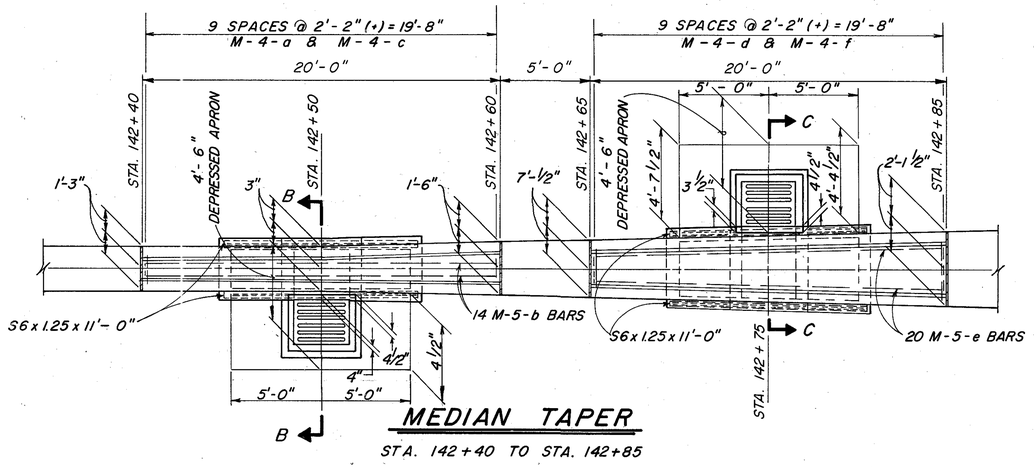
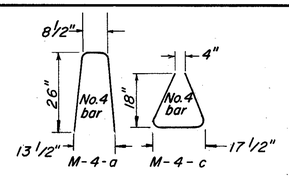
FRANKLIN COUNTY
FRA - 670 - 1.25 - C - 3



MEDIAN TAPER

STA. 142+40 TO STA. 142+85

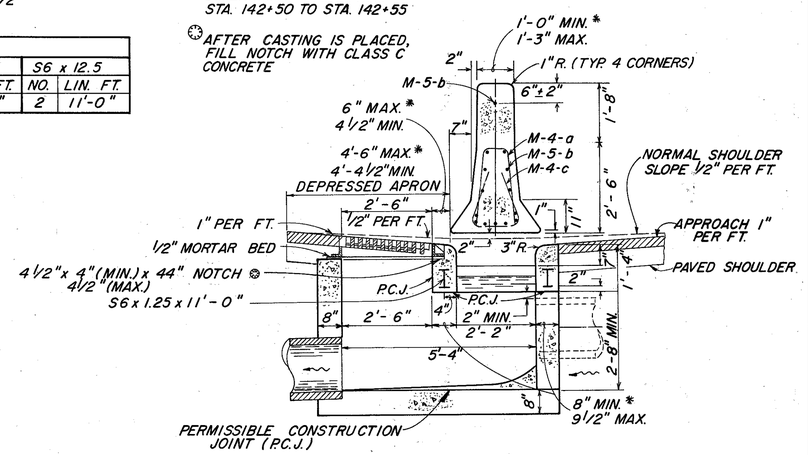
FOR DETAILS NOT SHOWN SEE STANDARD CONSTRUCTION DRAWING MC-9 AND I-3A AND B



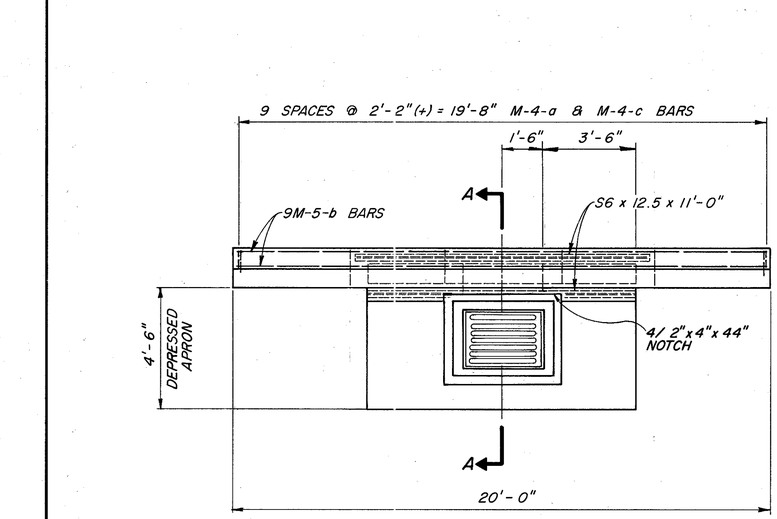
STEEL LIST							
M-4-a		M-5-b		M-4-c		S6 x 12.5	
NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.
10	5'-0"	14	19'-8"	10	4'-6"	2	11'-0"

* DIMENSIONS TAPER FROM STA. 142+50 TO STA. 142+55

AFTER CASTING IS PLACED, FILL NOTCH WITH CLASS C CONCRETE

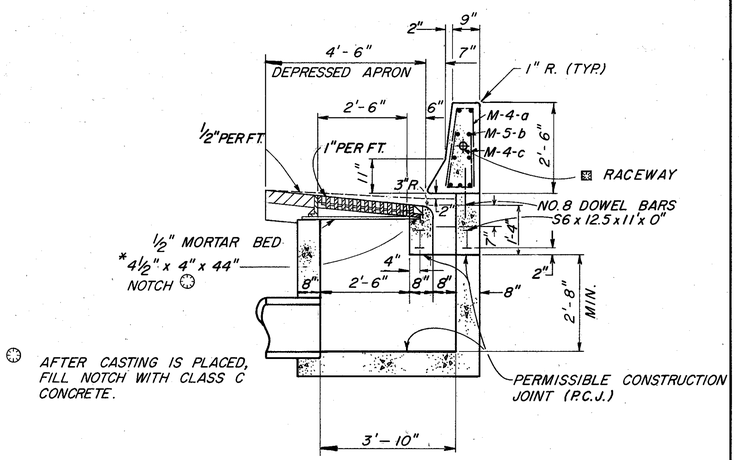


SECTION B-B



PLAN

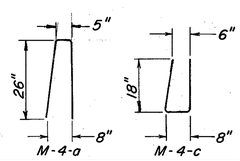
FOR DETAILS NOT SHOWN SEE STANDARD CONSTRUCTION DRAWING I-3A AND B



SECTION A-A

CONCRETE BARRIER INLET DETAIL AS PER PLAN NO. 2
STA. 140+75 RT. & STA. 142+00 RT.

NOTE: WHEN THE CONTRACTOR ERECTS THE TYPE D CONCRETE BARRIER NEXT TO THE RAILROAD BRIDGE ABUTMENTS, THE CONTRACTOR SHALL MATCH THE JOINTS AND WEEPHOLES OF THE CONCRETE BARRIER WITH THE ABUTMENTS.

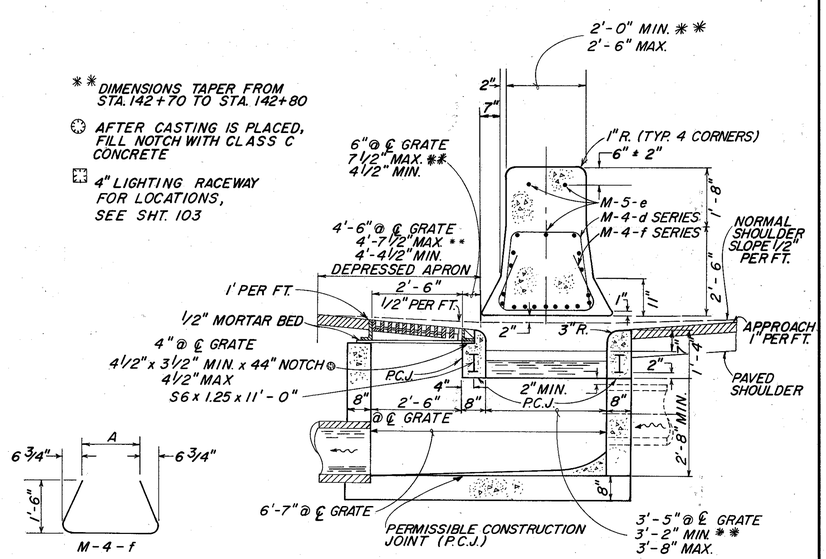


STEEL LIST							
M-4-a		M-5-b		M-4-c		S6 x 12.5	
NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.
10	4'-7"	9	19'-8"	10	3'-6"	2	11'-0"

** DIMENSIONS TAPER FROM STA. 142+70 TO STA. 142+80

AFTER CASTING IS PLACED, FILL NOTCH WITH CLASS C CONCRETE

4" LIGHTING RACEWAY FOR LOCATIONS, SEE SHT. 103



SECTION C-C

STEEL LIST			
BAR	QUANTITY	LIN. FT.	"A" DIMENSION
M-4-d	1 Series of 10	6'-0" TO 7'-0"	1'-8" TO 2'-8" INCREMENT 1¼"(+)
M-5-e	1 Series of 10	19'-8"	
M-4-f	20	5'-6" TO 6'-6"	1'-4" TO 2'-4" INCREMENT 1¼"(+)
S6 x 1.25	2	11'-0"	

MEDIAN AND INLET DETAILS

GENERAL NOTES

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SPILL MANAGEMENT The Contractor shall take all necessary precautions to prevent pollution to any streams or waterways as per 108.04.

DUST CONTROL The following quantities have been included in the General Summary for Project Dust Control.

Item 616 Calcium Chloride 50 Tons
Item 616 Water 500 M. Gallons

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 as obtained from the owner of the utility as required by Section 153.64 ORC.

UTILITY OWNERSHIP The following utilities and owners are located within the work limits of this project:

Electric:
Columbus and Southern Ohio Electric Co.
215 North Front Street
Columbus, Ohio 43215
(614) 464-7911

Telephone:
Ohio Bell Telephone Co.
150 East Gay Street, Rm.6C
Columbus, Ohio 43215
(614) 223-8535

Water:
City of Columbus, Division of Water
910 Dublin Road
Columbus, Ohio 43215
(614) 645-7677

Gas:
Columbia Gas of Ohio
939 West Goodale
Columbus, Ohio 43212
(614) 460-2079

Electric:
City of Columbus, Division of Electricity
910 Dublin Road
Columbus, Ohio 43215
(614) 645-7098

Sanitary Sewers:
City of Columbus
Division of Sewerage and Drainage
910 Dublin Road
Columbus, Ohio 43215
(614) 645-7175

Communication Cable:
Litel Telecommunications
c\o Jaytel, Inc.
2666 Lexington Avenue
Mansfield, Ohio 44904
(419) 884-0400

MCI
9073 Lytle Ferry Road
Waynesville, Ohio 45068
1-800-950-1626

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.

MONUMENTS Monuments shall be constructed in accordance with details shown on Standard Construction Drawing MC-1. For locations, see Sheet No. 2.

SEEDING Quantities for seeding are calculated for soil areas between the right-of-way fence lines, between the right-of-way lines in unfenced areas, and within the work limits for areas outside the right-of-way lines covered by work agreement or slope easement.

SEEDING AND MULCHING All slopes steeper than 3:1 shall be seeded with crown vetch (Coronilla Varia) at the rate specified under CMS 659.09. The cost of crown vetch shall be included in the cost per square yard for Item 659 Seeding and Mulching.

WATERING AND MOWING 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 seeded areas, as per 659.09:

659 Water 20 M Gal.
659 Mowing 103 M Sq. Ft.

EROSION CONTROL Items 601 and 660 are provided in the plans for erosion control. Rock of a stable nature will not be removed in order to place any of these items, and turf of a stable nature will not be removed in order to place 660. The Engineer shall check and nonperform quantities or adjust locations and quantities for these items where indicated by field conditions during construction. In addition, these items shall meet the requirements of 108.04, Limitation of Operations.

SANITARY FLOW INTO HIGHWAY DRAINAGE SYSTEMS This plan makes no provision for connecting nor shall the Engineer or Contractor connect any existing or new drainage into the highway drainage system when such drains carry flow from any plumbing fixtures, including floor drains and sink drains.

Existing pipe carrying flow which comes within the category outlined above, shall be plugged with Class C concrete in the right-of-way line. Payment for said plugging shall be included in the unit price bid for Item 203 Excavation.

COOPERATION BETWEEN CONTRACTORS The Contractor is advised of the presence of other construction contracts within the work limits or in the vicinity of this project. Contracts FRA-670-C-1, B-2, A-4 and/or C-2. A-4 may be going on concurrently with these projects and close cooperation between Contractors is required to ensure that traffic maintenance operations for each project are at all times compatible. Any conflicts will be resolved by the Engineer. See Project Designation Table on Sht. 2.

LOCATION OF GUARDRAIL The location 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.

GUARDRAIL REPLACEMENT No hazard shall be left unprotected except for the actual time necessary to remove, grade and reinstall guardrail in a continuous operation. The removal of all guardrail shall at all times be as directed by the Engineer. No guardrail shall be removed until the replacement material is on the site, ready for installation. Failure to comply with this requirement shall be deemed sufficient cause to order work suspended on this project until such time that the Engineer is assured of said compliance.

UNRECORDED SANITARY CONNECTIONS Any unrecorded active connection to a sanitary sewer encountered during construction shall be reconnected to existing sewer, as directed by the Engineer. The following estimated quantities have been included in the General Summary for the work noted above:

Item 603 - 100 Lin. Ft. 6" Conduit, Type C 706.01, 706.02, 706.08 with joints as per 706.11 or 706.12

Item 603 - 100 Lin. Ft. 6" Conduit, Type B 706.01 CL. 3, 706.02 or 706.08 with joints as per 706.11 or 706.12

None of the above materials shall be ordered by the Contractor until authorized by the Engineer.

CONNECTION 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.

LAW ENFORCEMENT OFFICER AND/OR ENFORCEMENT OFFICER WITH PATROL CAR The Contractor shall provide the services of a Law Enforcement Officer with or without patrol car per work area as required below. The work areas where these services shall be provided are at all signalized intersections while the signal is out of service and during installation and removal of barricades and detour signs on freeways. If the Contractor desires to use a Law Enforcement Officer outside of the areas described above, in lieu of a flagger, this shall be permitted; however, the cost of the Officer shall be borne by the Contractor. All patrol cars shall be equipped with standard top mounted flashing lights. The Contractor shall make arrangements for these services with the Deputy Chief, Service Subdivision, Columbus Police Department (614) 645-4795. The law Enforcement Officers are considered to be employed by the Contractor and the Contractor shall be responsible for their actions. Although they are employed by the Contractor, the Project Engineer shall have control over replacement.

Payment shall be made at the unit price bid for actual number of hours required for Item Special-Law Enforcement Officer or Item Special-Law Enforcement Officer with Patrol Car. The following estimated quantities have been established:

Item Special-Law Enforcement Officer.....50 hours
Item Special-Law Enforcement Officer with Patrol Car .....50 hours

In addition to the requirements above, the services of a Law Enforcement Officer with or without Patrol Car may be required by City Permit. The following estimated quantities have been provided for this work:

Item Special-Law Enforcement Officer.....50 hours *
Item Special-Law Enforcement Officer with Patrol Car.....50 hours *
* 100% City of Columbus Participation

TACK COAT The rate of application of tack coat shall be subject to adjustment as directed by the Engineer. Plan quantities indicate an average application rate of 0.075 gallons per square yard of tack coat For Estimating Purposes Only.

PAVEMENT JOINTS The Contractor's attention is directed to Section 401.15 of the State of Ohio, Department of Transportation Construction and Material Specification. Coating of the finished surface of longitudinal or transverse joint shall not be permitted.

REVIEW OF DRAINAGE FACILITIES Before any work is started on the projects and again before final acceptance by the State, representatives of the State and Contractor, along with local representatives, shall make an inspection of the existing sewers within the work limits which are to remain in service and which may be affected by the work. The condition of the existing conduits and their appurtenances shall be determined from field observations. Records of the inspections shall be kept in writing.

All existing sewers inspected initially by the above-mentioned parties shall be maintained and left in a condition reasonably comparable to that determined by the original inspection. Any change in the condition resulting from the Contractor's operations shall be corrected by the Contractor to the satisfaction of the Engineer.

Payment for all operations described above shall be included in the unit prices bid for the pertinent 603 conduit items of the contract.

CONDUIT STRENGTH REQUIREMENTS The design procedure used throughout this plan for structural design of conduit is the wide trench installation shown in the Concrete Pipe Design Manual available from the American Concrete Pipe Association. Any revision to the conduit provided in this plan must be selected by using this procedure.

CONTROL SURVEY NOTE The City of Columbus control monuments as referenced on these plans are set by Thomas Engineer & Surveying Company's report on control survey for Interstate 670 dated November, 1982, copies of which are available at the City of Columbus, Division of Engineering & Construction located at 109 North Front Street.

OPEN BURNING No open burning of debris will be permitted in connection with the project within permanent or temporary Right-of-Way.

CITY OF COLUMBUS STREET CLOSURE PERMIT Prior to the closure of any portion of a street, the Contractor shall apply for a permit at the Division of Engineering and Construction (Phone 645-7348). A copy of these plans and a plan of operations must be presented at the time of application. The permit will then be reviewed by the Division of Traffic and the Division of Police, and issued by the Division of Engineering and Construction. A copy of this permit shall be retained at the job at all times.

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GENERAL NOTES (CONTINUED)

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL The following estimated quantities are to be used as directed by the Engineer, for temporary erosion and sediment control measures:

207	Temporary Seeding and Mulching	9,160 Sq. Yd.
207	Straw or Hay Bales	289 Each
207	Temporary Slope Drains	600 Lin. Ft.
207	Temporary Benches, Dams and Sediment Basins	3,000 Cu. Yd
207	Filter Fabric Fence	2,200 Lin. Ft.
601	Type C Rock Channel Protection (without filter)	60 Cu. Yd.
659	Mowing	103 M Sq. Ft.
659	Commercial Fertilizer	2 Ton
659	Repair Seeding and Mulching	2,290 Sq. Yd.
659	Water	20 M. Gal.

ITEM 207 – TEMPORARY BENCHES, DAMS AND SEDIMENT BASINS The sediment basin quantities listed in the Temporary Erosion and Sediment Control Plan on Page 16 are the storage volumes required for the Sediment Basin. The Pay Quantity for each basin will be determined as the actual amount of excavation or embankment required to provide that storage volume.

ITEM 305 – CONCRETE BASE, AS PER PLAN The maximum joint spacing shall be 17 feet. Joints in the mainline pavement shall match the joints in the Item 452 Plain Concrete Shoulders.

CONTRACTION JOINTS IN THE SHOULDERS Dowel bars as shown on standard construction drawing BP-2.2 shall not be used in contraction joints in the shoulders.

CONTRACTION AND EXPANSION JOINTS Although specific locations of certain expansion and contraction joints have been detailed on this plan, no waiver of the specifications is intended. Provision of expansion joints at all major structures and the maximum spacing between contraction joints, shall in all cases, be in accordance with Standard Construction Drawings and the Specifications.

JOINT SEALERS All references to 705.01 or 705.02, appearing on standard drawings or on the plans, shall be considered to 705.04.

PRESSURE RELIEF JOINTS When pressure relief joints are specified, they shall extend across the concrete shoulders.

CONTRACTOR'S MAINTENANCE RESPONSIBILITY On this project, the Contractor's responsibility for maintenance of the existing pavement, per Item 614, shall be limited to those portions of the existing highway lying within the proposed work limits. Necessary upkeep of the adjoining pavements which are used for traffic maintenance but are outside of the right-of-way for the proposed highway relocation will be provided by others.

PROOF ROLLING An estimated quantity for this item has been provided in the General Summary for use as directed by the Engineer.

PRE-MARKING INSPECTION The Contractor shall notify the City of Columbus, Division of Traffic Engineering, at least two (2) working days prior to the placement of the pre-marking for permanent pavement marking so that a representative of the Division can be present to inspect the work and insure accuracy (Phone (614) 645-7790, Operations Section).

REMOVAL OF TREES OR 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 State of Ohio reserves the right to order the removal of additional trees of stumps outside of 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.

BENCHING OF FOUNDATION SLOPES Although cross sections of this plan indicate specific widths and depths of proposed benching of the embankment foundation in certain areas, no waiver of the specifications is intended, and all other sloped foundation areas shall be benched as set forth in 203.09. No additional payment will be made for benching required by the provisions of 203.09.

CONSTRUCTION NOISE Commitments for mitigating construction noise were made in the Environmental Impact Statement for the project. The following practices will be adhered to for this project.

1). The control of construction equipment noise levels at the source in accordance with OSHA standards.
2.) The control of hours of 11:00 pm and 6:00 am, except as indicated in the Maintenance of Traffic Plan.

ITEM 604 – INLETS, NO. 3B, AS PER PLAN NO. 1 AND NO. 2 All reinforcing steel listed in the steel list on the standard construction drawings shall be epoxy-coated in accordance with 509.10 of the CMS.

All costs of this coating shall be included in the cost of this item.

ITEM 413 – SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS, 705.04
An estimated quantity of 3100 L.F. of this shall be constructed per the detail as shown on Sheet No.4 and as directed by the Engineer.

COORDINATION WITH THE TRAFFIC MANAGEMENT PROGRAM The Contractor shall notify the traffic management program (TMP) of the expected maintenance of traffic on this project on a weekly basis. Updates on the anticipated maintenance of traffic for the following week should be relayed to the TMP coordinator (645-7395) each Friday morning.

SUBGRADE STABILIZATION The following estimated quantities are to be used as directed by the Engineer, for subgrade stabilization measures where a high water table is encountered in subgrade excavation and preparation:

203	Excavation Not Including Embankment Construction	3500 Cu. Yd
203	Embankment	3500 Cu. Yd

For quantity calculations, see Sheet No. 12

ITEM 304 AGGREGATE BASE, AS PER PLAN Materials furnished for this (these) item (s) shall exclude all slag except granulated slag or crushed air-cooled blast furnace slag. The maximum total percent passing the No. 200 Sieve for 304 Shall be 8 percent aS oppoSed to the 13 percent Shown in 304.02

~~ITEM 310 SUBBASE, AS PER PLAN Materials furnished for this (these) item (s) shall exclude all slag except granulated slag or crushed air-cooled blast furnace slag and shall exclude broken salvaged portland cement pavement.~~

ITEM 207 – FILTER FABRIC FENCE

MATERIALS

Filter fabric shall meet the requirements of Item 207.02.

CONSTRUCTION

The bottom of the fence shall be buried 6" below the ground. The fence shall be high enough to retain sediment laden water and adequately supported to prevent collapse or bursting. The ground elevation of the end elevations which shall be raised to prevent flow around the end of this fence.

MAINTENANCE

The filter fabric fence shall be maintained to be functional. This shall include removal of trapped sediment and required cleaning, repair, and/or replacement of the filter fabric.

PAYMENT

The cost of all materials, construction, maintenance and removal required shall be paid for under Item 207 Lin. Ft. Filter Fabric Fence.

ITEM SPECIAL – PUMP STATION REMOVED This item shall include the removal of all pumps, piping, switches, electrical service and other equipment. All equipment shall become the property of the Contractor, and shall be properly disposed of off site. The pump station (ST-27) is 17 ft. deep and 8 ft. inside diameter. Pump station walls shall be removed to a minimum of two feet below the grade of the surrounding area. The Contractor shall then backfill the pump station cavity as directed in 202.02. See Sheet 8 or 25 for location.

LIQUIDATED DAMAGES
Should the Contractor fail to meet any of these requirements, the Contractor shall be assessed liquidated damages in accordance with 108.07 of the Construction and Material Specifications.

Liquidated damages shall be assessed in accordance with Section 108.07 of the Construction and Material Specifications for each calender day that the roadway remains closed to traffic beyond the specified limit.

CONSTRUCTION INITIATION The Contractor will advise the District Comminications Officer at 614-363-1251 extension 261 or by fax at 614- 469-0235 seven (7) days prior to the start of construction activities. The project Engineer will provide assistance/clarification for any questions.

ITEM SPECIAL – IMPACT ATTENUATOR, (G.R.E.A.T. TYPE) This work shall consist of furnishing impact attenuators as required in the plans. This item shall include all related hardware, not separately specified, as required by the manufacturer to construct. complete and functional G.R.E.A.T. Impact Attenuator Systems. The attenuators shall be placed in accordance with the manufacturer's specifications and at the locations shown on the plans. The impact attenuator shall be manufactured by the Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, Illinois 60601: Telephone (312) 469-6750.

The nose cover of the attenuator shall be marked with three evenly spaced four (4) inch wide horizontal stripes of white reflective material meeting the requirements of the CMS 730.19 for a permanent installation.

Payment for the above work shall be made at the unit price bid for each Item Special, Impact Attenuator, (G.R.E.A.T. Type) and shall be considered full payment for furnishing, installing at the specified location, including all labor, tools, equipment and miscellaneous hardware and materials necessary to complete these items of work.

~~ITEM 606 ANCHOR ASSEMBLY, TYPE E This item shall consist of furnishing and installing an ET-2000, option "C", guardrail end terminal as manufactured by Syro Steel Company, 1170 N. State Street, Girard, Ohio 44420 (Telephone: 216-545-4373).~~

~~The anchor assembly shall be placed in accordance with the manufacturer's specifications and at the locations shown in the plans.~~

~~Payment for the above work shall be made at the unit bid price for Item 606, Each, Anchor Assembly, Type E. Payment shall include all labor, tools, equipment and materials necessary to construct the 25' long anchor assembly, including all related hardware, not separately specified, as required by the manufacturer to construct a complete and functional anchor assembly. This item shall also include payment over and above the cost of Standard Type 5 Guardrail for installing Type 1 Breakway Posts (as per Standard Construction Drawing GR-1.3) at the following locations: 1) at the point where the anchor assembly and the guardrail run meet; and 2) at the next three (3) post locations into the guardrail run.~~

TEMPORARY EROSION CONTROL PLAN

	OHIO	16
	FHWA REGION 5	224
	FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25 - C3

ITEM 207 TEMPORARY SEEDING AND MULCHING
PERMANENT SEEDING AREA = 45,793 SQ.YD.
20 % x 45,793 SQ.YD. = 9,159 SQ.YD.
TOTAL TO GENERAL NOTES = 9,160 SQ.YD.

ITEM 207 TEMPORARY SLOPE DRAINS
ESTIMATED QUANTITY = 600 LIN. FT.
TOTAL TO GENERAL NOTES = 600 LIN. FT.

ITEM 659 WATER
9,160 SQ.YD. x (9 SQ.FT. / 1 SQ.YD.)
x(240 GAL./1000 SQ. FT.) = 19.8 M. GAL.
TOTAL TO GENERAL NOTES = 20 M. GAL.

ITEM 659 REPAIR SEEDING AND MULCHING
5 % OF PERMANENT SEEDING AREA
5 % x 45,793 SQ.YD. = 2,290 SQ.YD.
TOTAL TO GENERAL NOTES = 2,290 SQ.YD.

ITEM 659 MOWING
25 % OF PERMANENT SEEDING AREA
25 % x 45,793 SQ.YD. x (9 SQ.FT. / 1 SQ.YD.)
= 103.0 M. SQ. FT.
TOTAL TO GENERAL NOTES = 103 M. SQ. FT.

ITEM 207 TEMPORARY BENCHES, DAMS, DIKES AND SEDIMENT BASINS
ESTIMATED QUANTITY 5 x 600 = 3000 CU. YD.
TOTAL TO GENERAL NOTES = 3000 CU. YD.

ITEM 601 ROCK CHANNEL PROTECTION, TYPE C WITHOUT FILTER
ESTIMATED QUANTITY = 60 CU. YD.
TOTAL TO GENERAL NOTES = 60 CU. YD

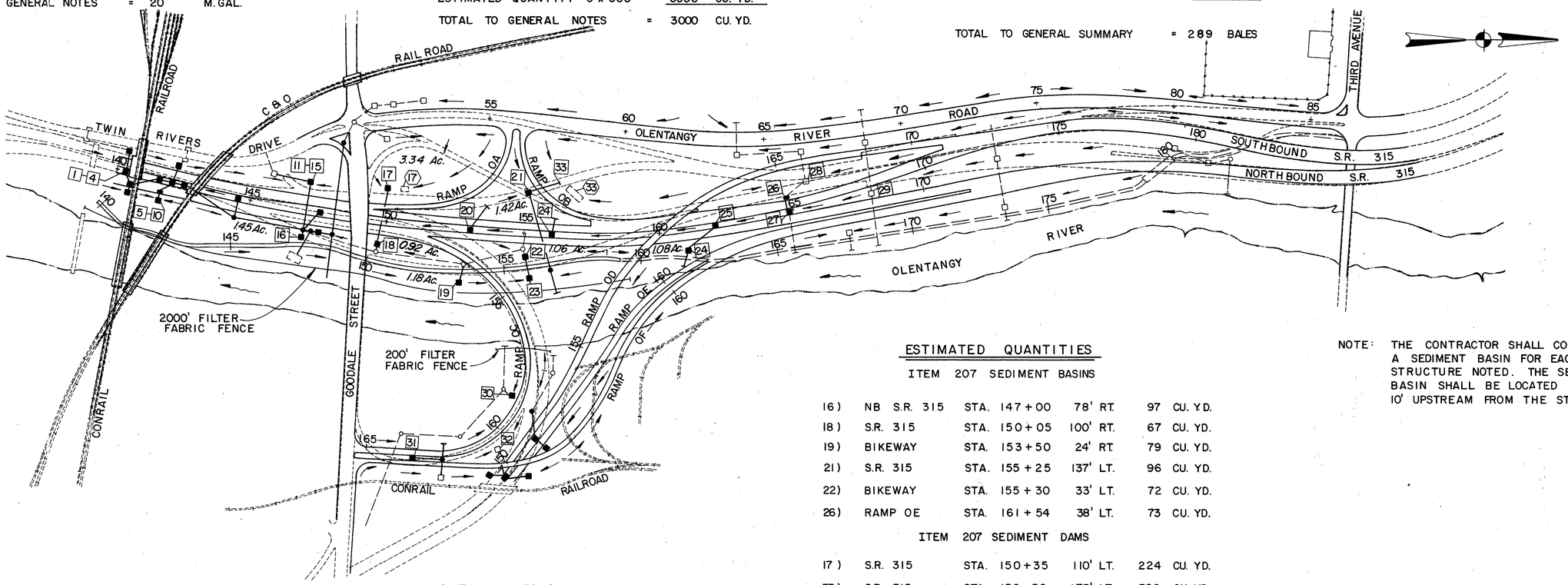
ITEM 207 FABRIC FILTER FENCE = 2200 LIN. FT.
TOTAL TO GENERAL SUMMARY = 2200 LIN. FT.

ITEM 207 STRAW OR HAY BALES
5 DITCH CHECKS x 5 BALES / DITCH CHECK
= 25 BALES
33 INLET FILTERS x 8 BALES / INLET FILTER
= 264 BALES
TOTAL TO GENERAL SUMMARY = 289 BALES

ITEM 659 COMMERCIAL FERTILIZER (12-12-12)
(A) TEMPORARY SEEDING AREA = 9,159 SQ.YD.
9,159 SQ.YD. x (9 SQ.FT./ 1 SQ. YD.)
x(10 LBS/1000 SQ. FT.) x (1 TON/
2000 LBS.) = 0.5 TONS

(B) PERMANENT SEEDING AREA = 45,793 SQ.YD.
45,793 SQ.YD. x (9 SQ.FT/ 1 SQ.YD.)
x(7.5 LBS. /1000 SQ.FT.) x (1 TON /
2000 LBS.) = 1.5 TONS

TOTAL TO GENERAL NOTES = 2.0 TONS



LEGEND

- 00 STRUCTURE NUMBER
- o SEDIMENT BASINS
- 00 SEDIMENT DAMS

NOTE: IN LIEU OF SEDIMENT DAMS OR LARGE SEDIMENT BASINS, A SERIES OF SMALL SEDIMENT BASINS MAY BE USED.

DITCH CHECKS

1)	S.R. 315	STA. 150+00	℄
2)	BIKEWAY	STA. 151+00	20' RT.
3)	S.R. 315	STA. 158+50	125' LT.
4)	S.R. 315	STA. 159+00	℄
5)	RAMP OC	STA. 162+00	20' RT.

ESTIMATED QUANTITIES

ITEM 207 SEDIMENT BASINS

16)	NB S.R. 315	STA. 147+00	78' RT.	97 CU. YD.
18)	S.R. 315	STA. 150+05	100' RT.	67 CU. YD.
19)	BIKEWAY	STA. 153+50	24' RT.	79 CU. YD.
21)	S.R. 315	STA. 155+25	137' LT.	96 CU. YD.
22)	BIKEWAY	STA. 155+30	33' LT.	72 CU. YD.
26)	RAMP OE	STA. 161+54	38' LT.	73 CU. YD.

ITEM 207 SEDIMENT DAMS

17)	S.R. 315	STA. 150+35	110' LT.	224 CU. YD.
33)	S.R. 315	STA. 156+50	175' LT.	380 CU. YD.

TOTAL TO GENERAL SUMMARY = 1088 CU. YD.

NOTE: THE CONTRACTOR SHALL CONSTRUCT A SEDIMENT BASIN FOR EACH STRUCTURE NOTED. THE SEDIMENT BASIN SHALL BE LOCATED A MIN. OF 10' UPSTREAM FROM THE STRUCTURE.

SUB–SUMMARY

CALC. BY JSS			
CHECK BY WED			

5	OHIO			

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224

FRANKLIN COUNTY
FRA–670–1.25–C–3

ITEM	SHEET NUMBER													PARTICIPATION			ITEM	ITEM EXT.	TOTAL QUANT.	UNIT	DESCRIPTION
	14	15	25	26	27	28	29	30	31	32	33	34	35	100% CITY	STP	NH					
																					ROADWAY
202										1000	1026				2026		202	23000	2026	SQ. YD.	PAVEMENT REMOVED
202											24				24		202	35100	24	LIN. FT.	PIPE REMOVED, 24" AND UNDER
202											1				1		202	58100	1	EACH	CATCH BASIN REMOVED
202											3				55928	3399	202	58200	3	EACH	INLET REMOVED
203			26227	10741	5970	1194	69	1542	7274	946	1965	2501	898		67081	12025	203	12000	59327	CU. YD.	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION
203				17492	13713	2033	8811	5782	4937	699	8614	7268	4757				203	20000	79106	CU. YD.	EMBANKMENT
606			350	350	700		137.5	225	200	550					2512.5		606	13000	2512.5	LIN. FT.	GUARDRAIL, TYPE 5
606			1					1		1					3		606	26000	3	EACH	ANCHOR ASSEMBLY, TYPE B
606			1				1	1	1						4		606	26500	4	EACH	ANCHOR ASSEMBLY, TYPE T
606									1						1		606	26100	1	EACH	ANCHOR ASSEMBLY, TYPE E
606										2					2		606	35000	2	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 1
607												1948	1824			3772	607	23000	3772	LIN. FT.	FENCE, TYPE CLT
607												1	1			2	607	61200	2	EACH	GATE, TYPE CLT (24' WIDE)
607												1				1	607	61200	1	EACH	GATE, TYPE CLT (4' WIDE)
622			600	1000	700		458								327		622	24000	327	LIN. FT.	CONCRETE BARRIER, TYPE D
622			327												2758		622	23404	2758	LIN. FT.	CONCRETE BARRIER, TYPE B–50
SPECIAL										1					1		SPECIAL 690	10200	1	EACH	IMPACT ATTENUATOR, G.R.E.A.T. TYPE
																					DRAINAGE
602				7.0	14.36						0.25				21.61		602	20000	21.61	CU. YD.	CONCRETE MASONRY
603	100				38				67						205		603	00900	205	LIN. FT.	6" CONDUIT, TYPE B, 706.01 OR 706.08
603	100														100		603	01100	100	LIN. FT.	6" CONDUIT, TYPE C, 706.01
603			179	30	28			52		10	31				380		603	01500	380	LIN. FT.	6" CONDUIT, TYPE F, 707.17 NON–PERFORATED ASTM D3034, SDR35, SS931 OR SS944
603				63											63		603	04400	63	LIN. FT.	12" CONDUIT, TYPE B, 706.02
603			14				10								24		603	04600	24	LIN. FT.	12" CONDUIT, TYPE C, 706.02
603			224	256	228						65				773		603	05900	773	LIN. FT.	15" CONDUIT, TYPE B, 706.02
603			35	110											145		603	06100	145	LIN. FT.	15" CONDUIT, TYPE C, 706.02
603			148	220			8								376		603	07400	376	LIN. FT.	18" CONDUIT, TYPE B, 706.02
603			22	109							36				167		603	07600	167	LIN. FT.	18" CONDUIT, TYPE C, 706.02
603			214												214		603	08900	214	LIN. FT.	21" CONDUIT, TYPE B, 706.02
603				100											100		603	10400	100	LIN. FT.	24" CONDUIT, TYPE B, 706.02
603				60											60		603	10600	60	LIN. FT.	24" CONDUIT, TYPE C, 706.02
603			188												188		603	11900	188	LIN. FT.	27" CONDUIT, TYPE B, 706.02
603				310	139										449		603	13400	449	LIN. FT.	30" CONDUIT, TYPE B,706.02 (1750 D–LOAD MIN.)
603																					
603			150	100	102										352		603	16600	352	LIN. FT.	36" CONDUIT, TYPE C, 706.02
603				74											74		603	19600	74	LIN. FT.	42" CONDUIT, TYPE C, 706.02
604											1				1		604	01200	1	EACH	CATCH BASIN, NO. 4
604							1								1		604	02000	1	EACH	CATCH BASIN, NO. 6
604			2	8											10		604	02800	10	EACH	CATCH BASIN, NO. 8
604				1											1		604	02906	1	EACH	CATCH BASIN, NO. 8A
604			2												2		604	04500	2	EACH	CATCH BASIN, NO. 2–2B
604			5	3	2		1								11		604	14601	11	EACH	INLET NO. 3B, AS PER PLAN NO. 1
604			2												2		604	14601	2	EACH	INLET NO. 3B, AS PER PLAN NO. 2
604			1	3	1		1								6		604	31500	6	EACH	MANHOLE, NO. 3
604				3											3		604	35500	3	EACH	MANHOLE RECONSTRUCTED TO GRADE
605								469	125	425					1019		605	11100	1019	LIN. FT.	6" SHALLOW PIPE UNDERDRAIN
605				705	780	765	855		436		663				4204		605	12200	4204	LIN. FT.	6" DEEP PIPE UNDERDRAIN
605			510	250											760		605	13300	760	LIN. FT.	6" UNCLASSIFIED PIPE UNDERDRAIN
																	605	31100	1000	LIN. FT.	AGGREGATE DRAIN
																					EROSION CONTROL
601											1.4				2		601	11000	2	SQ. YD.	RIPRAP USING 6" REINFORCED CONCRETE SLAB
601				1.11	9.99		2.22								13		601	32200	13	CU. YD.	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER
601		60													60		601	34200	60	CU. YD.	ROCK CHANNEL PROTECTION, TYPE C WITHOUT FILTER
659			4051	7093	5433	1199	1987	4171	3707	2416	6123	5129	4484		36180	9613	659	10000	45793	SQ. YD.	SEEDING AND MULCHING
659		2290													2290		659	14000	2290	SQ. YD.	REPAIR SEEDING AND MULCHING
659		2													2		659	20000	2	TON	COMMERCIAL FERTILIZER
659		20													20		659	35000	20	M. GAL.	WATER
659		103													103		659	40000	103	M. SQ.FT.	MOWING
660										64					64		660	20000	64	SQ. YD.	REINFORCED SODDING

GENERAL SUMMARY

CALC. BY JSS
CHECK BY WED

5	OHIO		

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224

FRANKLIN COUNTY
FRA-670-1.25-C-3

ITEM	SHEET NUMBER												PARTICIPATION			ITEM	ITEM EXT.	TOTAL QUANT.	UNIT	DESCRIPTION	REF. NO.
	2	8	9	10	11	12	15	16	17	22	32	110	100% CITY	STP	NH						
																				ROADWAY	
201															LUMP	201	11000	LUMP		CLEARING AND GRUBBING	
202		10540	10910						2026					23476		202	23000	23476	SQ.YD.	PAVEMENT REMOVED	
202												LUMP		LUMP		202	30204	LUMP		STEPS REMOVED	
202		1418	1045	17					24					2504		202	35100	2504	LIN. FT.	PIPE REMOVED, 24" AND UNDER	
202		1488	340											2338		202	38000	2338	LIN. FT.	GUARDRAIL REMOVED	
202			510											510		202	38300	510	LIN. FT.	GUARDRAIL REMOVED, BARRIER DESIGN	
202		5	2											7		202	58000	7	EACH	MANHOLE REMOVED	
202		14	18	1					1					34		202	58100	34	EACH	CATCH BASIN REMOVED	
202									3					3		202	58200	3	EACH	INLET REMOVED	
202		LUMP												LUMP		202	98000	LUMP		REMOVAL MISCELLANEOUS : PUMP STATION	15
202												LUMP	LUMP			202	98000	LUMP		REMOVAL MISCELLANEOUS : EXISTING FLUME	110
203							3500		59327					59428	3399	203	12000	62827	CU. YD.	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	
203							3500		79106					70351	12025	203	20000	82376	CU. YD.	EMBANKMENT	
203														20		203	45000	20	HR.	PROOF ROLLING	
203					36564	8746								41670	3640	203	50000	45310	SQ. YD.	SUBGRADE COMPACTION	
604	4													4		604	40500	4	EACH	REFERENCE MONUMENT	
606									2512.5					2512.5		606	13000	2512.5	LIN. FT.	GUARDRAIL, TYPE 5	
606									3					3		606	26000	3	EACH	ANCHOR ASSEMBLY, TYPE B	
606									4					4		606	26500	4	EACH	ANCHOR ASSEMBLY, TYPE T	
606									1					1		606	26100	1	EACH	ANCHOR ASSEMBLY, TYPE E (SEE PROPOSAL NOTE)	
606									2					2		606	35000	2	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 1	
607									3772					3772		607	23000	3772	LIN. FT.	FENCE, TYPE CLT	
607									2					2		607	61200	2	EACH	GATE, TYPE CLT (24' WIDTH)	
607									1					1		607	61200	1	EACH	GATE, TYPE CLT (4' WIDTH)	
SPECIAL									1					1		SPECIAL 690	10200	1	EACH	IMPACT ATTENUATOR, G.R.E.A.T. TYPE	15
																				EROSION CONTROL	
207							9160							9160		207	10000	9160	SQ. YD.	TEMPORARY SEEDING AND MULCHING	
207							400	2200						2600		207	30000	2600	LIN. FT.	FILTER FABRIC FENCE	
207							600							600		207	40000	600	LIN. FT.	TEMPORARY SLOPE DRAIN	
207							3000	1088						4088		207	50000	4088	CU. YD.	TEMPORARY BENCHES, DAMS AND SEDIMENT BASINS	
207							100	289						389		207	70000	389	EACH	STRAW OR HAY BALES	
601									2					2		601	11000	2	SQ. YD.	RIPRAP USING 6" REINFORCED CONCRETE SLAB	
601									13					13		601	32200	13	CU. YD.	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER	
601									60					60		601	34200	60	CU. YD.	ROCK CHANNEL PROTECTION, TYPE C WITHOUT FILTER	
659									45793					36180	9613	659	10000	45793	SQ. YD.	SEEDING AND MULCHING	
659									2290					2290		659	14000	2290	SQ. YD.	REPAIR SEEDING AND MULCHING	
659									2					2		659	20000	2	TON	COMMERCIAL FERTILIZER	
659									20					20		659	35000	20	M. GAL.	WATER	
659									103					103		659	40000	103	M. SQ.FT.	MOWING	
660									64					64		660	20000	64	SQ. YD.	REINFORCED SODDING	
																				PAVEMENT	
301						254									254	301	10002	254	CU. YD.	BITUMINOUS AGGREGATE BASE, AC-20	
304					6111	1712								9034	789	304	20001	9823	CU. YD.	AGGREGATE BASE, AS PER PLAN	15
305					1394	2554								3948		305	12001	3948	SQ. YD.	8" CONCRETE BASE, AS PER PLAN	15
305					20876	715								21592		305	14001	21592	SQ. YD.	10" CONCRETE BASE, AS PER PLAN	15
404						292									292	404	20000	292	CU. YD.	ASPHALT CONCRETE, AC-20	
407					1680	459								1927	212	407	10000	2139	GAL.	TACK COAT	
408						316									316	408	10000	316	GAL.	BITUMINOUS PRIME COAT	
446					1083	159								1242		446	01200	1242	CU. YD.	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, AC-20	
446					773	113								886		446	01400	886	CU. YD.	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, AC-20	
SPECIAL						1	3100							3100		413	14000	3100	LIN. FT.	SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS, 705.04	15
SPECIAL											50			50		SPECIAL 451	30000	50	LIN. FT.	PRESSURE RELIEF JOINT, TYPE A	15
452					3258	384								3642		452	16200	3642	SQ. YD.	6"-9" PLAIN CONCRETE PAVEMENT	
611						144								144		611	25000	144	SQ. YD.	REINFORCED CONCRETE APPROACH SLAB (T=15")	
622					2801									2758		622	23404	2758	LIN. FT.	CONCRETE BARRIER, TYPE B-50	
														327		622	24001	327	LIN. FT.	CONCRETE BARRIER, TYPE D, AS PER PLAN	5

File: C:\24SET\GEN-SUM.DWG 1 = 1.000
Date: 06-05-1998
Time: 14:49 Drawn by: A.G.

GENERAL SUMMARY (CONTINUED)

CALC. BY JSS
CHECK BY WED

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

FRANKLIN COUNTY
FRA-670-1.25-C-3

ITEM	SHEET NUMBER 14	SHEET NUMBER 17	SHEET NUMBER 110	PARTICIPATION 100%CITY	PARTICIPATION STP	PARTICIPATION NH	ITEM	ITEM EXT.	TOTAL QUANT.	UNIT	DESCRIPTION	REF. NO.
											DRAINAGE	
			64	64			601	25000	64	CU. YD.	DUMPED ROCK FILL, TYPE A	
602		21.61			21.61		602	20000	21.61	CU. YD.	CONCRETE MASONRY	
			33	33			602	20001	33	CU. YD.	CONCRETE MASONRY, AS PER PLAN	146&147
603		205			205		603	00900	205	LIN. FT.	6" CONDUIT, TYPE B, 706.01 OR 706.08	
603		100			100		603	01100	100	LIN. FT.	6" CONDUIT, TYPE C 706.01	
603		191			191		603	01500	191	LIN. FT.	6" CONDUIT, TYPE F, 707.17 NON-PERFORATED, ASTM D3034 SDR 35, SS931 OR SS944	
603		63			63		603	04400	63	LIN. FT.	12" CONDUIT, TYPE B, 706.02	
603		24			24		603	04600	24	LIN. FT.	12" CONDUIT, TYPE C, 706.02	
603		773			773		603	05900	773	LIN. FT.	15" CONDUIT, TYPE B, 706.02	
603		145			145		603	06100	145	LIN. FT.	15" CONDUIT, TYPE C, 706.02	
603		376			376		603	07400	376	LIN. FT.	18" CONDUIT, TYPE B, 706.02	
603		167			167		603	07600	167	LIN. FT.	18" CONDUIT, TYPE C, 706.02	
603		214			214		603	08900	214	LIN. FT.	21" CONDUIT, TYPE B, 706.02	
603		100			100		603	10400	100	LIN. FT.	24" CONDUIT, TYPE B, 706.02	
603		60			60		603	10600	60	LIN. FT.	24" CONDUIT, TYPE C, 706.02	
603		188			188		603	11900	188	LIN. FT.	27" CONDUIT, TYPE B, 706.02	
603		449			449		603	13400	449	LIN. FT.	30" CONDUIT, TYPE B, 706.02 (1750 D-LOAD MIN.)	
603		352			352		603	16600	352	LIN. FT.	36" CONDUIT, TYPE C, 706.02	
603		74			74		603	19600	74	LIN. FT.	42" CONDUIT, TYPE C, 706.02	
604		1			1		604	01200	1	EACH	CATCH BASIN, NO. 4	
604		1			1		604	02000	1	EACH	CATCH BASIN, NO. 6	
604		10			10		604	02800	10	EACH	CATCH BASIN, NO. 8	
604		1			1		604	02906	1	EACH	CATCH BASIN, NO. 8A	
604		2			2		604	04500	2	EACH	CATCH BASIN, NO. 2-2B	
					1		604	05701	1	EACH	CATCH BASIN, NO. 2-5, AS PER PLAN	144&145
604		11			11		604	14601	11	EACH	INLET NO. 3B, AS PER PLAN NO. 1	13 & 15
604		2			2		604	14601	2	EACH	INLET NO. 3B, AS PER PLAN NO. 2	13 & 15
604		6			6		604	31500	6	EACH	MANHOLE, NO. 3	
604		3			3		604	35500	3	EACH	MANHOLE RECONSTRUCTED TO GRADE	
			LUMP	LUMP			604	98200	LUMP		DRAINAGE STRUCTUTRE MISC: RENOVATE PUMP STATION ST-5	110&143
605		1019			1019		605	11100	1019	LIN. FT.	6" SHALLOW PIPE UNDERDRAIN	
605		4204			4204		605	12200	4204	LIN. FT.	6" DEEP PIPE UNDERDRAIN	
605		76			76		605	13300	76	LIN. FT.	6" UNCLASSIFIED PIPE UNDERDRAIN	
					1000		605	31100	1000	LIN. FT.	AGGREGATE DRAIN	
											MAINTENANCE OF TRAFFIC	
SPECIAL	100			50	50		614	11100	100	HR.	LAW ENFORCEMENT OFFICER WITH PATROL CAR	14
SPECIAL	100			50	50		SPECIAL	614 11200	100	HR.	LAW ENFORCEMENT OFFICER	14
											LIGHTING	
											FOR QUANTITIES SEE SHEET 102	
											TRAFFIC CONTROL	
											FOR QUANTITIES SEE SHEETS 83 & 84	
											STRUCTURES OVER 20' SPAN	
											FOR QUANTITIES OF BRIDGE FRA-315-(CSX) SEE SHEET 150	
											FOR QUANTITIES OF BRIDGE FRA-315- (CONRAIL) SEE SHEET 181	
											FOR QUANTITIES OF BRIDGE FRA-315- (RAMP OC) SEE SHEET 198	
											MUNICIPAL ELECTRIC LIGHT & POWER (MELP)	
											FOR QUANTITIES SEE SHEET 219	
614			LUMP				614	11000	LUMP		MAINTAINING TRAFFIC	
619			LUMP				619	15010	LUMP		FIELD OFFICE, TYPE B	
623			LUMP				623	10000	LUMP		CONSTRUCTION LAYOUT STAKES	
624			LUMP				624	10000	LUMP		MOBILIZATION	
					LUMP		SPECIAL	10000300	LUMP		PREMIUM ON RAILROADS PROTECTIVE PUBLIC LIABILITY AND PROPERTY DAMAGE LIABILITY INSURANCE (CSX)	
					LUMP		SPECIAL	10000300	LUMP		PREMIUM ON RAILROADS PROTECTIVE PUBLIC LIABILITY AND PROPERTY DAMAGE LIABILITY INSURANCE (CONRAIL)	

File: C:\249E1\GEN-SUM2.DWG 1 = 1.0000
Date: 08-15-1996
Time: 13:08 Drawn by : A.G.

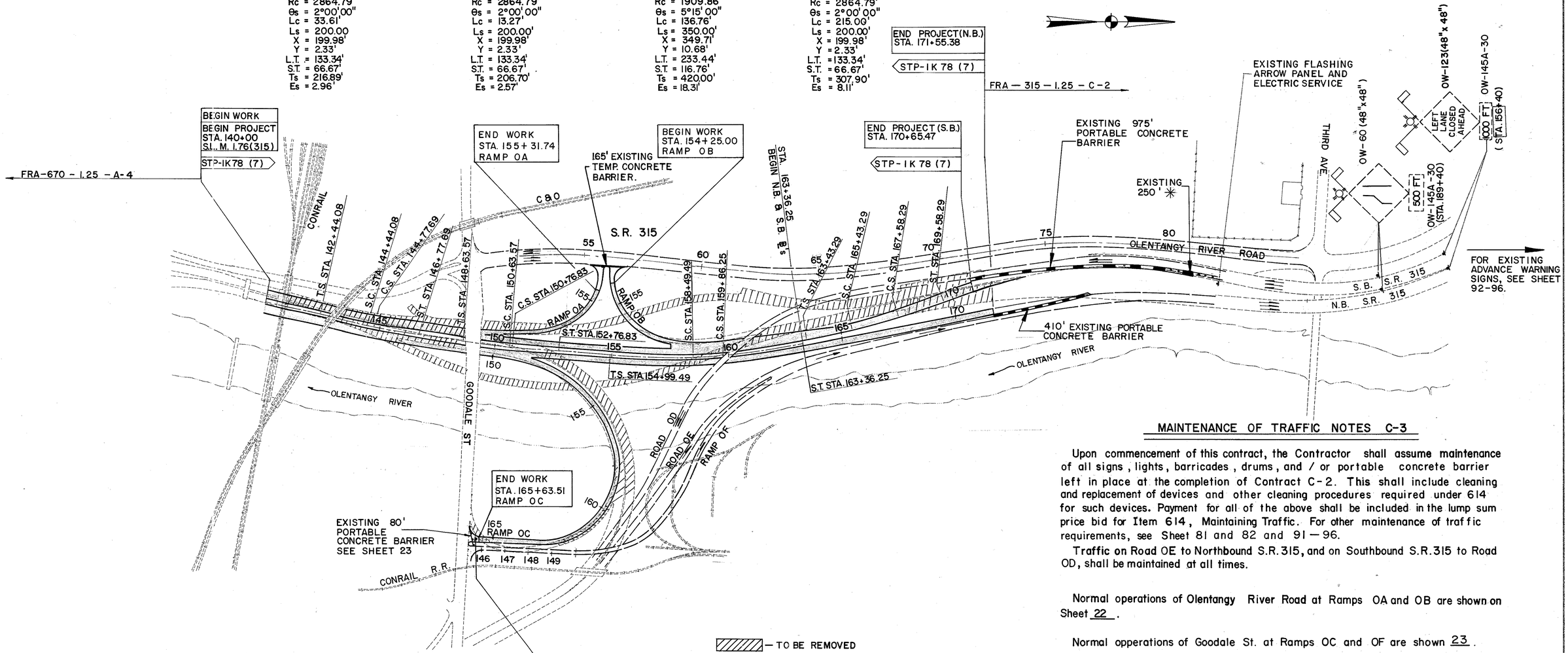
FRANKLIN COUNTY
FRA-670-1.25-C-3

CURVE DATA - S.R. 315
P.I. = STA. 140+60.97
Δ = 4°40' 19.92"
Dc = 2°00'00"
Rc = 2864.79'
θs = 2°00'00"
Lc = 33.61'
Ls = 200.00
X = 199.98'
Y = 2.33'
L.T. = 133.34'
S.T. = 66.67'
Ts = 216.89'
Es = 2.96'

CURVE DATA - S.R. 315
P.I. = STA. 150+70.27
Δ = 4°15' 55.08"
Dc = 2°00'00"
Rc = 2864.79'
θs = 2°00'00"
Lc = 13.27'
Ls = 200.00'
X = 199.98'
Y = 2.33'
L.T. = 133.34'
S.T. = 66.67'
Ts = 206.70'
Es = 2.57'

CURVE DATA - S.R. 315
P.I. = STA. 159+19.49
Δ = 14°36' 10.46"
Dc = 3°00'00"
Rc = 1909.86'
θs = 5°15'00"
Lc = 136.76'
Ls = 350.00'
X = 349.71'
Y = 10.68'
L.T. = 233.44'
S.T. = 116.76'
Ts = 420.00'
Es = 18.31'

CURVE DATA - S.R. 315
P.I. = STA. 166+51.19
Δ = 8°17'59.96"
Dc = 2°00'00"
Rc = 2864.79'
θs = 2°00'00"
Lc = 215.00'
Ls = 200.00'
X = 199.98'
Y = 2.33'
L.T. = 133.34'
S.T. = 66.67'
Ts = 307.90'
Es = 8.11'



FOR EXISTING ADVANCE WARNING SIGNS, SEE SHEET 92-96.

— TO BE REMOVED

— TO BE BUILT IN THIS CONTRACT

DESIGN DESIGNATION

Current ADT (1984)	=	62,095
Design ADT (2004)	=	79,227
DHV	=	7,923
D	=	65%
T	=	10%
V	=	60 m.p.h.

SCHEMATIC PLAN
SCALE IN FEET
0 200 400

MAINTENANCE OF TRAFFIC NOTES C-3

Upon commencement of this contract, the Contractor shall assume maintenance of all signs, lights, barricades, drums, and / or portable concrete barrier left in place at the completion of Contract C-2. This shall include cleaning and replacement of devices and other cleaning procedures required under 614 for such devices. Payment for all of the above shall be included in the lump sum price bid for Item 614, Maintaining Traffic. For other maintenance of traffic requirements, see Sheet 81 and 82 and 91 — 96.

Traffic on Road OE to Northbound S.R. 315, and on Southbound S.R. 315 to Road OD, shall be maintained at all times.

Normal operations of Olentangy River Road at Ramps OA and OB are shown on Sheet 22.

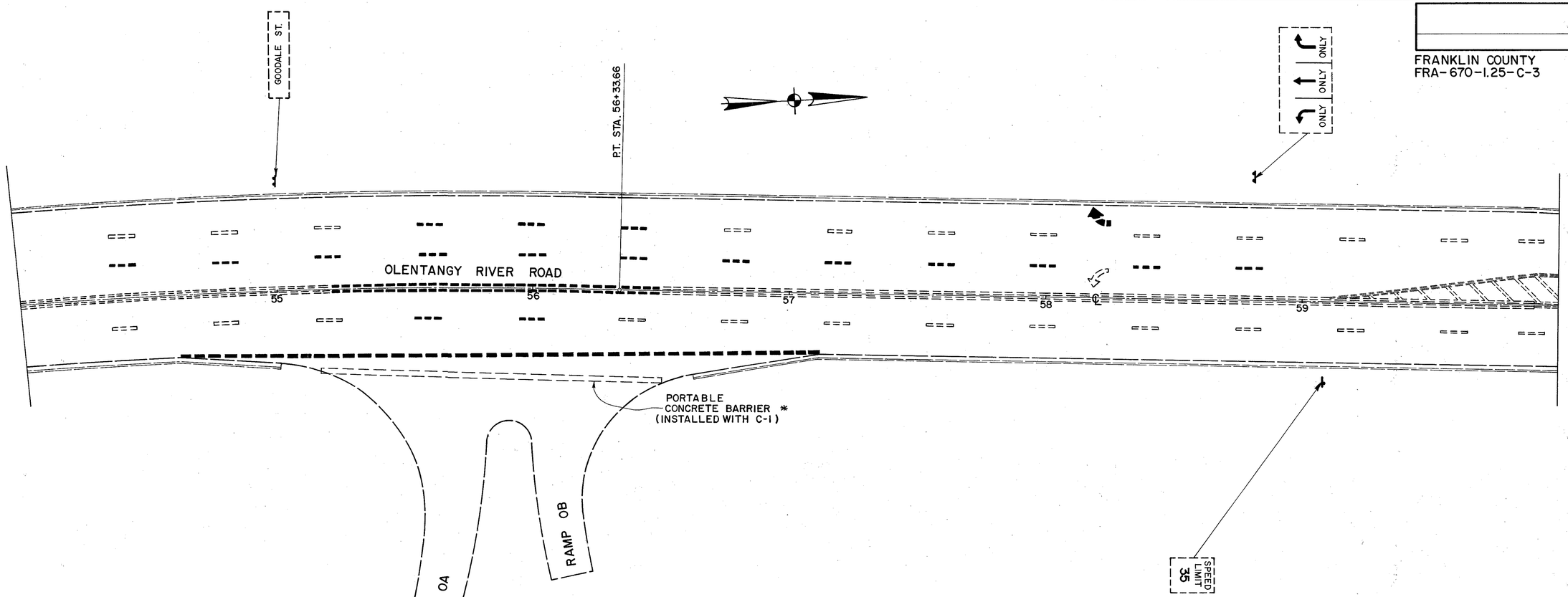
Normal opperations of Goodale St. at Ramps OC and OF are shown 23.

The Contractor shall be responsible for removal of all signs, lights, barricades, drums and/or portable concrete barrier left in place at the completion of Contract C-2. Removal of these items and opening of S.R. 315 shall be coordinated with the Contractor performing contract FRA-670-1.25-A-4. Payment shall be included in the lump sum price bid for Item 614, Maintaining Traffic.

⊛ Drums, lengths as shown.

MAINTENANCE OF TRAFFIC (C-3)

FRANKLIN COUNTY
FRA-670-1.25-C-3



EXISTING PAINTED MARKINGS *
EXISTING THERMOPLASTIC MARKINGS *
* THESE ITEMS TO BE MAINTAINED UNDER ITEM 614
SEE MAINTENANCE OF TRAFFIC NOTES ON SHEET 21.

SCALE IN FEET
0 20 40

MAINTENANCE OF TRAFFIC (C-3)

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

23
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

8'
16'
23'
16'
℄ RAMP OC (BUILT IN CONTRACT C-3)
165
N 03° 08' 08" E
℄ RAMP OF
147
146
N 03° 08' 08" E
+63.51, 58.00'RT.
50'R
+12.88, 50.10'RT.
+20.88, 100.10'RT.
+66.57, 27.5'LT.
RAMP OF
11.5'R
EX. SW
166
8'
EX. 80 L.F. PORTABLE CONCRETE BARRIER *
EX. SW
+89.94, 50.00'RT.
+01.73, 86.00'LT. (CONNECTOR)
CONRAIL RAILROAD
FRA-670-1.25-B-2
(FRA-670-2.95)
END WORK
STA. 110+01.73
ROAD CLOSED
R-75 (48"x30") (ON TYPE III BARRICADE)
12'
24'
107
℄ GOODALE STREET
S 86° 51' 52" E
108
109
10
11
12
STA. 166+44.88, RAMP OC =
STA. 109+02.24, GOODALE STREET
STA. 145+06.57, RAMP OF =
STA. 109+54.94, GOODALE STREET
Dc=7° 15'
℄ GOODALE/NATIONWIDE CONNECTOR
TANGENT BEARING = S 86° 55' 47" E
P.C. STA. 109+51.72
STA. 109+41.67 ℄ GOODALE STREET =
P.C. STA. 109+39.37, 0.24' RT.
GOODALE/NATIONWIDE CONN.
STA. 12+42.27, ℄ GOODALE ST. =
P.I. STA. 12+42.27

* The Contractor shall maintain this portable concrete barrier and barricade until Ramp OC is opened (see Maintenance Of Traffic on sheet 21)

20 0 20 40
SCALE IN FEET

C-3 MAINTENANCE OF TRAFFIC GOODALE STREET

OHIO | FHWA REGION 5 | FEDERAL PROJECT

FRANKLIN COUNTY
FRA-670-1.25-C 3

SCALE : 1" = 50'

LEGEND
HP = HIGH POINT
TC = TOP OF CASTING

OLENTANGY RIVER ROAD

GOODALE ST.

RAMP OA

RAMP OB

PLUG

S.R. 315 SOUTHBOUND

S.R. 315 NORTHBOUND

ROAD OD

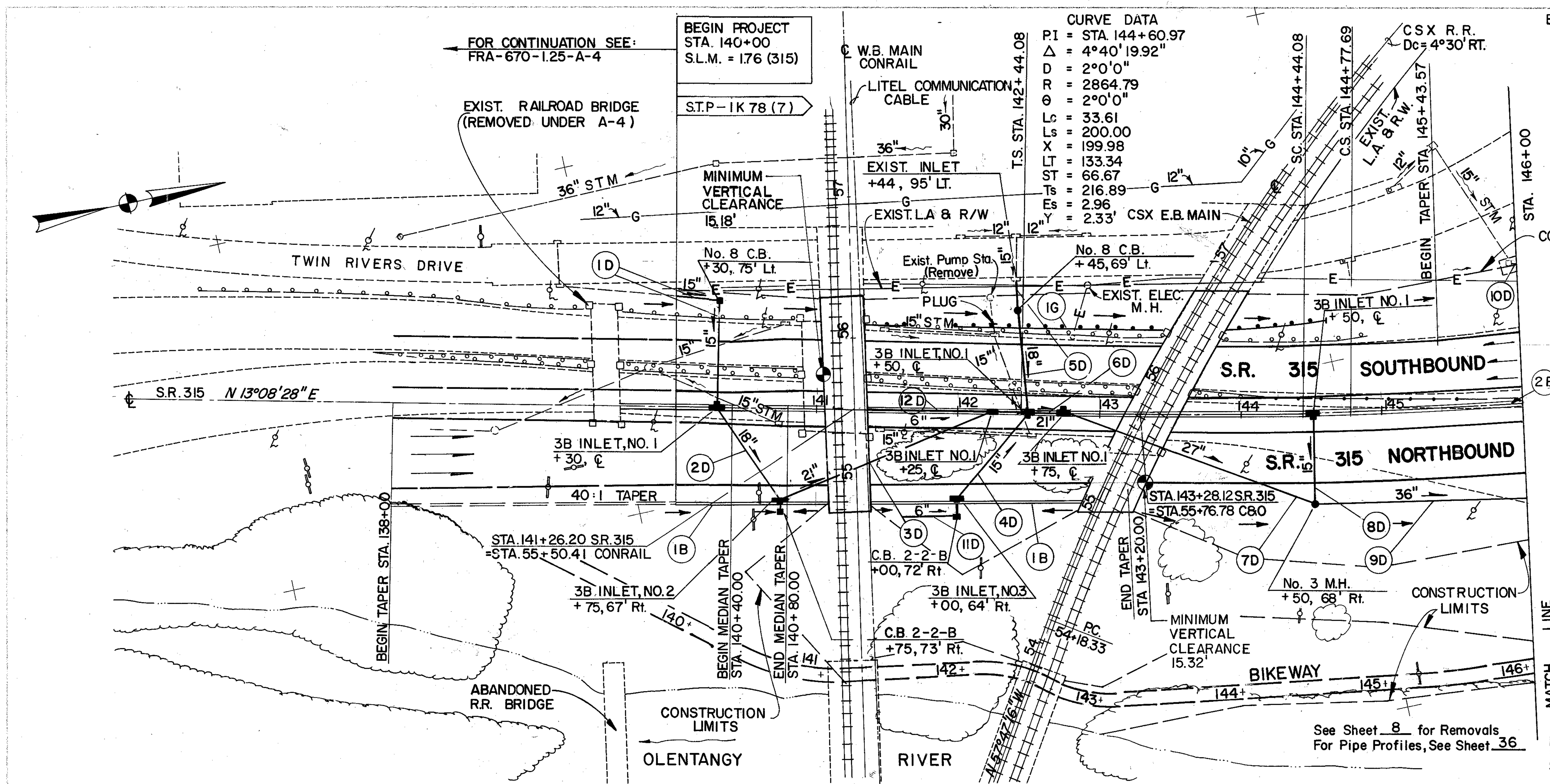
ROAD OE

MATCH LINE STA. 163+00

FOR PLAN AND PROFILE, SEE SH. 25-33
FOR CROSS SECTIONS, SEE SH. 40-73

GRADING PLAN STA. 150+00 TO STA. 170+00

B.M.-ALUM. PLUG IN CONCRETE MONUMENT, 400' W. OF CONRAIL RAILROAD BRIDGE OVER OLENTANGY R., 301' W. OF RAILROAD MILE MARKER #1, NEAR SW CORNER OF CONRAIL RAILROAD BRIDGE OVER TWIN RIVERS DR., 16.0' S. OF S. RAILROAD TRACKS, 11.5' W. OF A NAIL IN SW ABUT., 1' BELOW GROUND, WITH ACCESS THRU AN 8" FARM TILE WITH A CAST IRON LID. (COC 8-83) ELEV. = 725.281

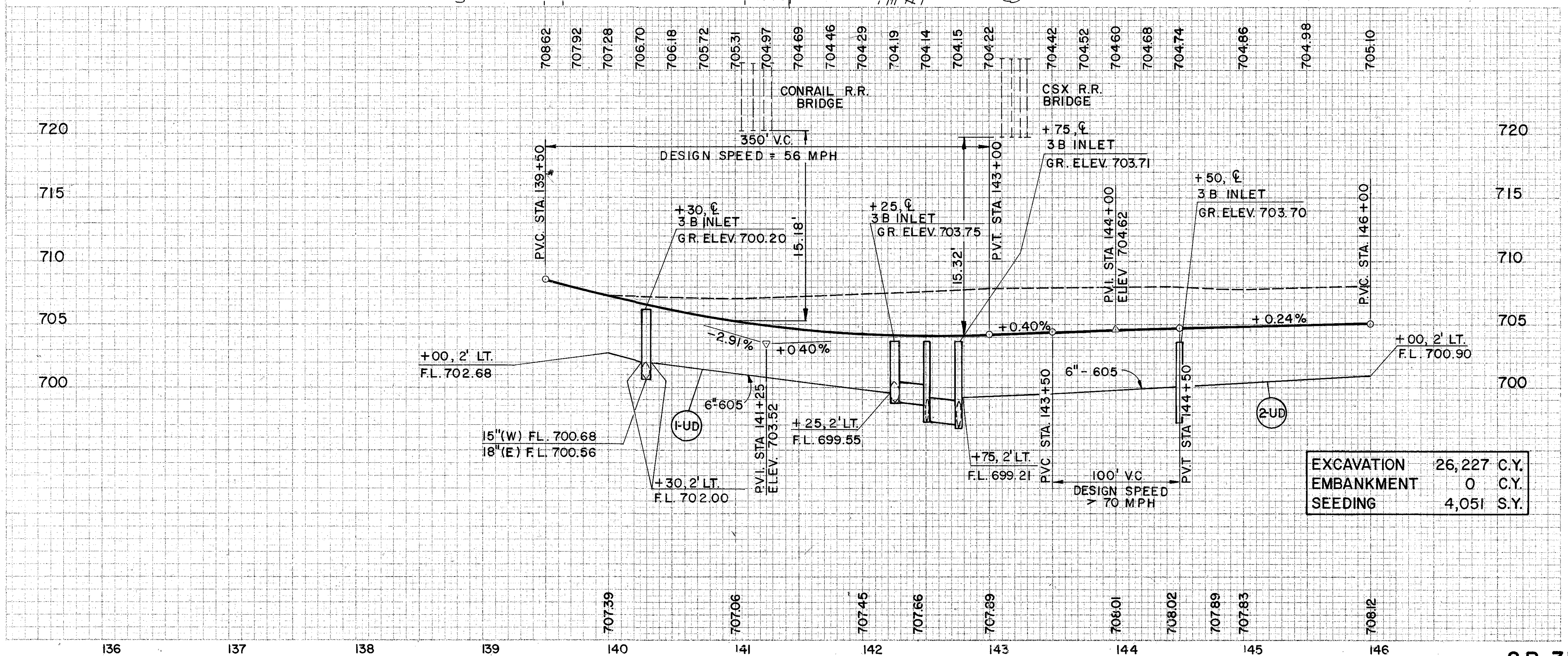


FOR CONCRETE BARRIER AND PAVEMENT DETAILS, SEE SHEET 74

FOR CONRAIL BRIDGE NO. FRA-315-0187 DATA, SEE SHEET 179

FOR CSX BRIDGE NO. FRA-315-0183 DATA, SEE SHEET 148

NOTE: FOR BIKEWAY PLAN AND PROFILE SEE SHEET 34.



EXCAVATION	26,227	C.Y.
EMBANKMENT	0	C.Y.
SEEDING	4,051	S.Y.

ESTIMATED QUANTITIES

Ref. No.	Station to Station	Side	See Sheet No.	622 Concrete Barrier, Type D (LIN.FT.)	606 Guardrail, Type 5 (LIN.FT.)	605 6" Unclassified Underdrain (LIN.FT.)	606 Anchor Assembly, Type B (EACH)	604 No. 3 Manhole (EACH)	604 Inlet No. 3B as per Plan No. 2 (EACH)	604 Inlet No. 3B as per Plan No. 1 (EACH)	604 No. 8 Catch Basin (EACH)	604 No. 2-2B Catch Basin (EACH)	606 Anchor Assembly, Type T (EACH)	622 Concrete Barrier, Type B-50 (LIN.FT.)	603 Conduit, Type B 706.02 27" (LIN.FT.)	603 Conduit, Type B 706.02 21"	603 Conduit, Type B 706.02 18"	603 Conduit, Type B 706.02 15"	603 Conduit, Type C 706.02 15" (LIN.FT.)	603 Conduit, Type C 706.02 12"	603 Conduit, Type C 706.02 18"	603 Conduit, Type C 706.02 36"	603 6" Conduit, Type F, 707.17 * (LIN.FT.)
1-D	140+00 TO 140+30	LT.&RT.	15							1	1							75	30				
2-D	140+30 TO 140+75	RT.	138&15						1			1					80			6			
3-D	140+75 TO 142+50	RT.	15							2						189							
4-D	142+00 TO 142+50	RT.	138&15						1			1						81		8			
5-D	142+25 TO 142+50	LT									1						68				22		
6-D	142+50 TO 142+75	℄	15							1						25							
7-D	142+75 TO 144+52	RT.						1							188								
8-D	144+50	RT.	15							1								68					
9-D	144+50 TO 146+00	RT.																				150	
10-D	145+94.80 TO 146+00	LT.																	5				
1-UD	140+00 TO 142+25	2' LT.				205																	20
2-UD	142+75 TO 146+00	2' LT.				305																	20
11-D	141+50 TO 142+00	RT																					50
12-D	141+36 TO 142+75	℄																					89
1-B	140+00 TO 143+27	RT.	5	327																			
2-B	140+00 TO 146+00	℄												600									
1-G	141+00 TO 144+75	LT.			350		1						1										
Totals				327	350	510	1	1	2	5	2	2	1	600	188	214	148	224	35	14	22	150	179

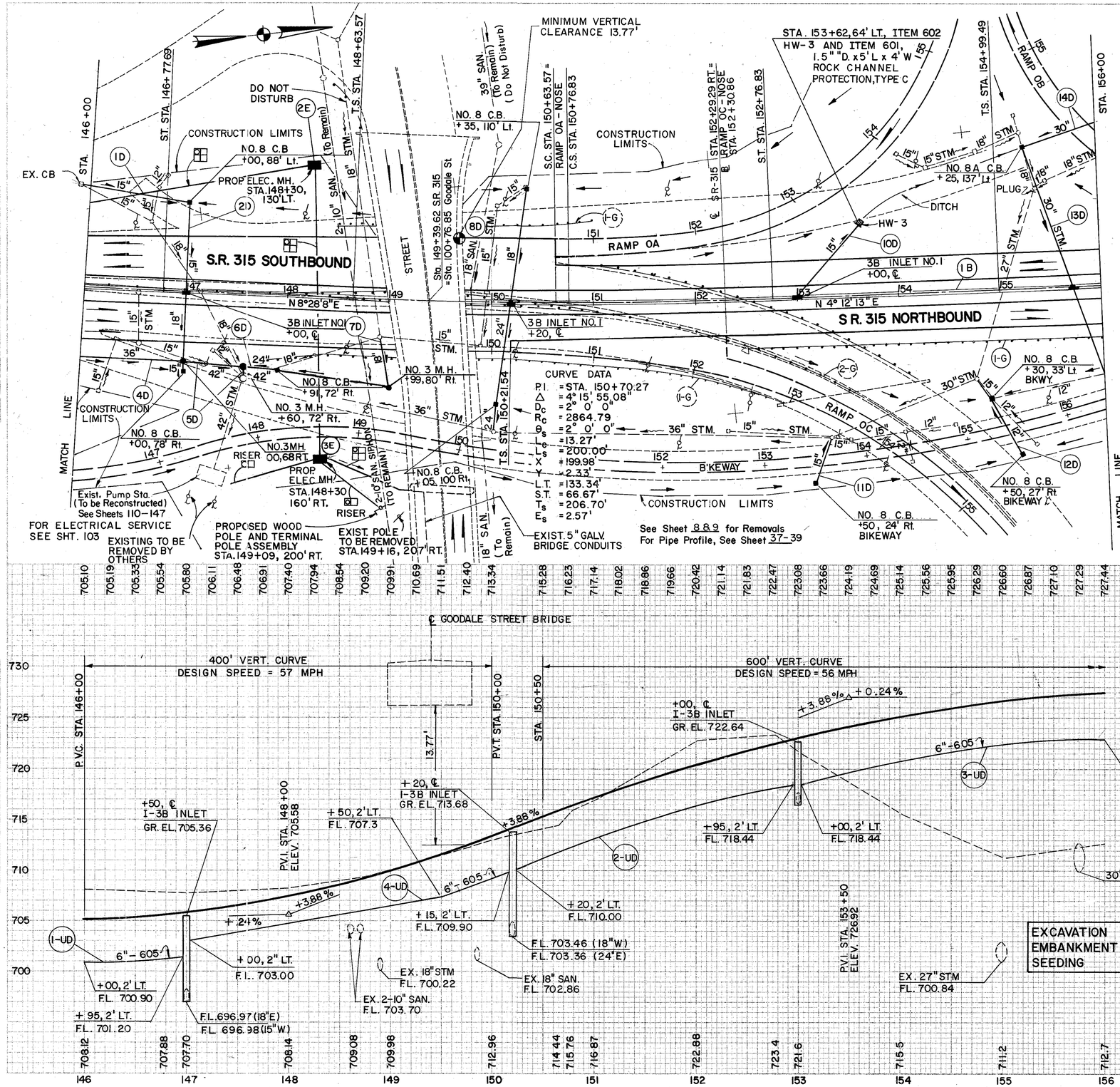
* NON-PERFORATED, ASTM D3034 SDR 35, SS 931 OR SS944

S.R. 315 PLAN AND PROFILE - STA.140+00 TO STA.146+00

FRANKLIN COUNTY
FRA-670-1.25-C-3

OHIO FHWA REGION 5 FEDERAL PROJECT

26
224



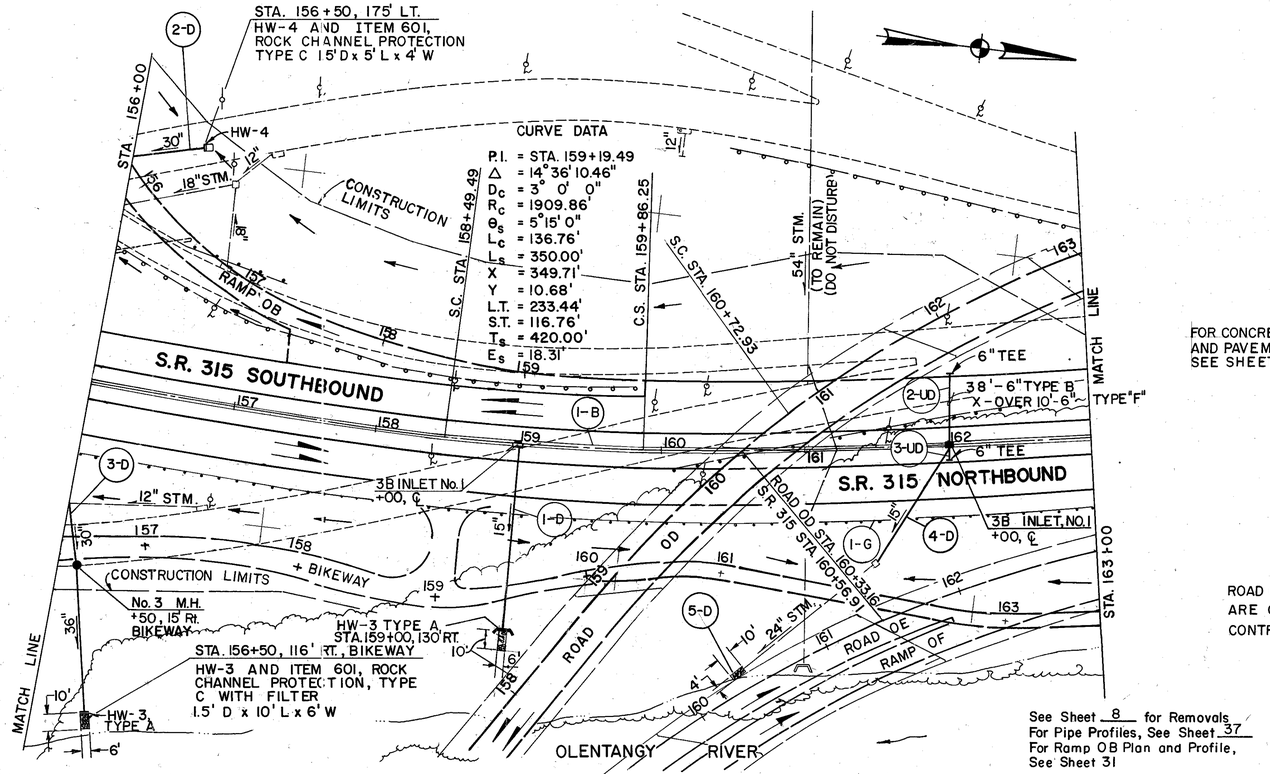
ESTIMATED QUANTITIES

Ref. No.	Station to Station (B)= BIKEPATH	Side	622 CONCRETE BARRIER TYPE B-50 LIN. FT.	603 CONDUIT TYPE C 706.02 15" LIN. FT.	603 CONDUIT TYPE C 706.02 18" LIN. FT.	603 CONDUIT TYPE C 706.02 24" LIN. FT.	603 CONDUIT TYPE C 706.02 36" LIN. FT.	603 CONDUIT TYPE C 706.02 42" LIN. FT.	603 CONDUIT TYPE B 706.02 12" LIN. FT.	603 CONDUIT TYPE B 706.02 15" LIN. FT.	603 CONDUIT TYPE B 706.02 18" LIN. FT.	603 CONDUIT TYPE B 706.02 1750 D-LOAD MIN. 30" LIN. FT.	604 No. 8 CATCH BASIN EACH	604 NO. 3 MAN-HOLE EACH	604 INLET NO.3B AS PER PLAN NO.1 EACH	604 MANHOLE RECONSTRUCT TO GRADE EACH	601 ROCK CHANNEL PROTECTION TYPE C W/ FILTER CU. YD.	602 CONCRETE MASONRY CU. YD.	604 No. 8A CATCH BASIN EACH	605 6" DEEP PIPE UNDERDRAIN LIN. FT.	603 6" CONDUIT, TYPE F, 707.17 LIN. FT.	605 6" UNCLASSIFIED PIPE UNDERDRAIN LIN. FT.	606 GUARD RAIL TYPE 5 LIN. FT.	See Sheet No.
1-D	146+00 TO 147+00	LT.	100											1	1										15
2-D	147+00	LT.&RT.	10											1	1										
4-D	146+00 TO 147+00	RT.					100							1											
5-D	147+00 TO 147+61.11	RT.						74						1	1										15
6-D	147+61 TO 147+91	RT.				31							2												
7-D	147+91 TO 148+97	RT.				109						46													
8-D	150+05 TO 150+35	LT.&RT.				29						110													
10-D	153+00	LT.									96														
11-D	153+50 BIKEPATH	LT.&RT.									48														
12-D	155+30 TO 155+50	(B)LT.&RT.							63		26														
13-D	155+25 TO 156+00	LT.											235												15
14-D	155+25 TO 156+00	LT.&RT.											75												
1-UD	146+00 TO 146+95	2' LT.																							
2-UD	150+20 TO 152+95	2' LT.																							
3-UD	153+00 TO 155+70	2' LT.																							
4-UD	147+00 TO 150+15	2' LT.																							
1-G	152+50 TO 156+00	RT.																							15
1-B	146+00 TO 156+00	℄	1000																						
	Totals		1000	110	109	60	100	74	63	256	220	310	310	8	3	3	3	7.00	1.11	1	705	30	250	350	

S.R. 315 PLAN AND PROFILE - STA. 146+00 TO STA. 156+00

OHIO | FHWA REGION 5 | FEDERAL PROJECT | 27 / 224

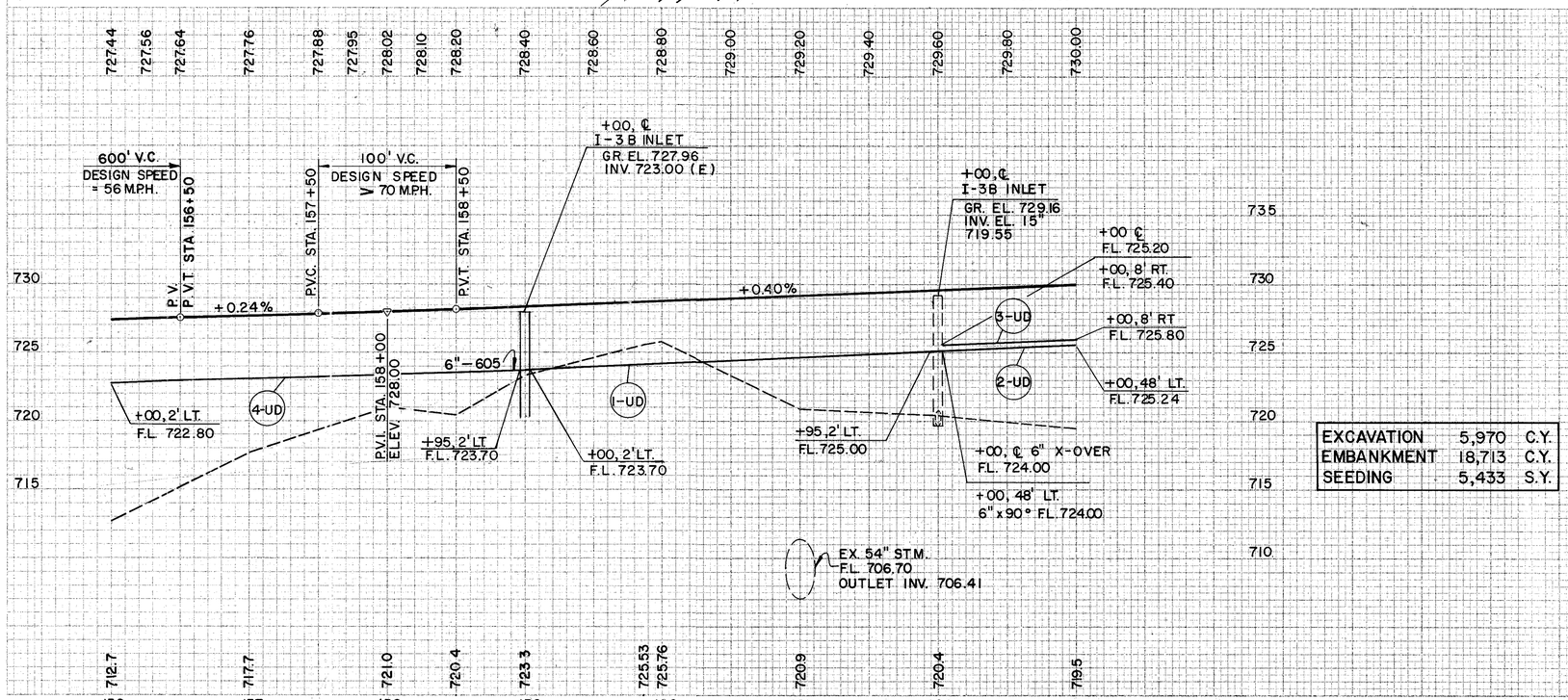
FRANKLIN COUNTY
FRA-670-1.25-C-3



FOR CONCRETE BARRIER AND PAVEMENT DETAILS SEE SHEET 77 & 78

ROAD OD AND OE AND RAMP OF ARE CONSTRUCTED UNDER CONTRACT FRA-315-2.39(C-2).

See Sheet 8 for Removals
For Pipe Profiles, See Sheet 37
For Ramp OB Plan and Profile, See Sheet 31



EXCAVATION	5,970 C.Y.
EMBANKMENT	18,713 C.Y.
SEEDING	5,433 S.Y.

ESTIMATED QUANTITIES

Ref. No.	Station to Station	Side	603 Conduit 706.02 Type B 1750 D-Load Min. 15" Lin.Ft.	603 Conduit 706.02 Type B 1750 D-Load Min. 30" 36" Lin.Ft.	603 Conduit 706.02 Type C Lin.Ft.	601 Rock Channel Protection Type C w/Filter Cu. Yd.	604 Inlet No. 3 B As Per Plan No. 1 Each	604 No. 3 Manhole Each	602 Concrete Masonry Cu. Yd.
1-D	159+00	RT	130			3.33			7.00
2-D	156+00 TO 156+50	LT		50		1.11	1		0.56
3-D	156+00 TO 156+50	RT		44	102	3.33		1	6.80
4-D	162+00	RT	98	45			1		
5-D	160+50	RT				2.22			
1-UD	159+00 TO 161+95	2' LT.							
2-UD	162+00 TO 163+00	48' LT.							
3-UD	162+00 TO 163+00	8' RT.							
4-UD	156+00 TO 159+00	2' LT.							
1-G	156+00 TO 163+00	12' RT.							
1-B	156+00 TO 163+00	℄							
Totals.			228	139	102	9.99	2	1	14.36

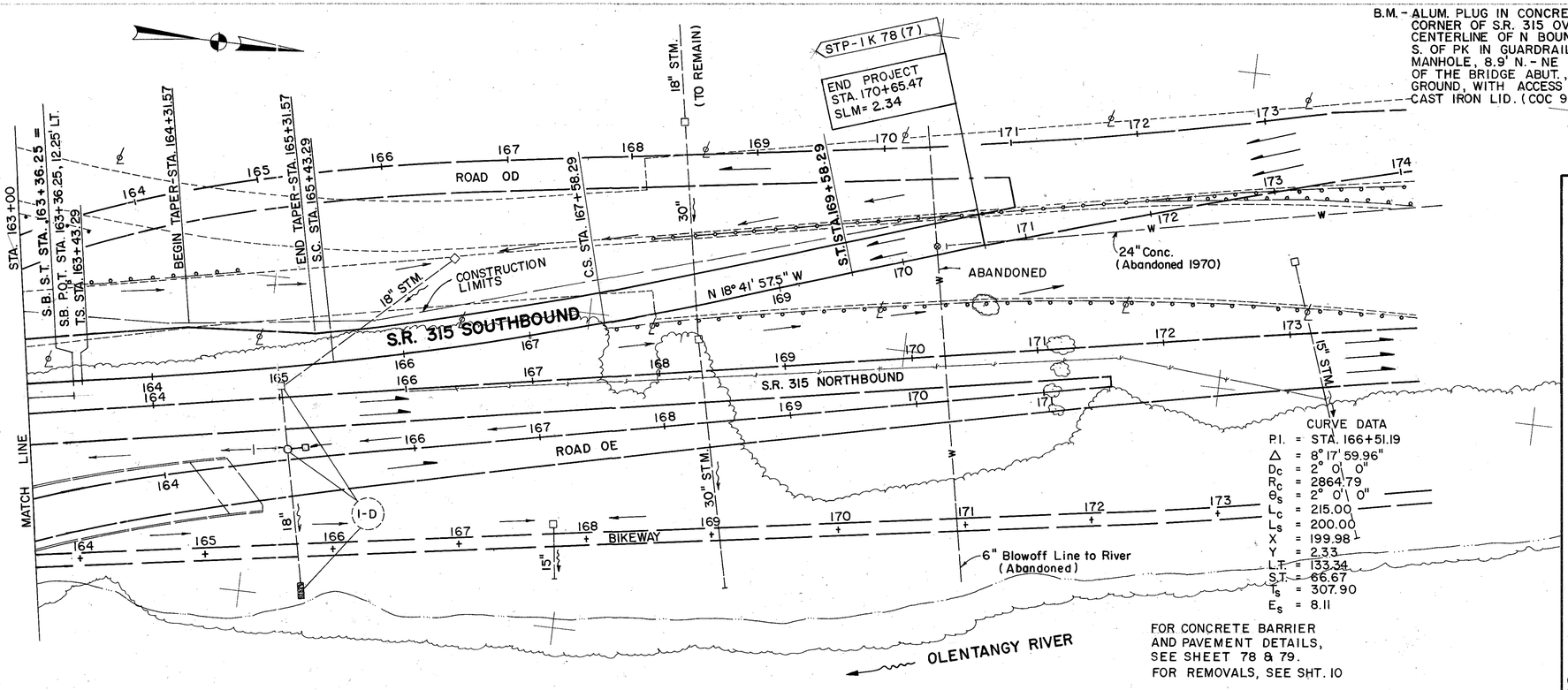
See Sheet No.	622 Concrete Barrier, Type B-50 Lin.Ft.	606 Guardrail, Type 5 Lin.Ft.	603 6"Conduit, Type F, 707.17 Lin.Ft.	603 6" Conduit Type B Lin.Ft.	605 6" Deep Pipe Underdrain Lin.Ft.
	700	700	10	38	285
			10		100
			8		100
					295
	700	700	28	38	780

S.R. 315 PLAN AND PROFILE - STA. 156+00 TO STA. 163+00

B.M. - ALUM. PLUG IN CONCRETE MONUMENT, IN THE NE CORNER OF S.R. 315 OVER 3RD AVE., 36' E. OF THE CENTERLINE OF N BOUND LANES OF S.R. 315, 26.9' S. OF PK IN GUARDRAIL POST, 165' SE OF A MANHOLE, 8.9' N.-NE OF A PK IN THE NE CORNER OF THE BRIDGE ABUT., E. OF GUARDRAIL, 1' BELOW GROUND, WITH ACCESS THRU 8" CLAY TILE WITH CAST IRON LID. (COC 9-83) ELEV. = 752.201

OHIO	28
FHWA REGION 5	224
FEDERAL PROJECT	

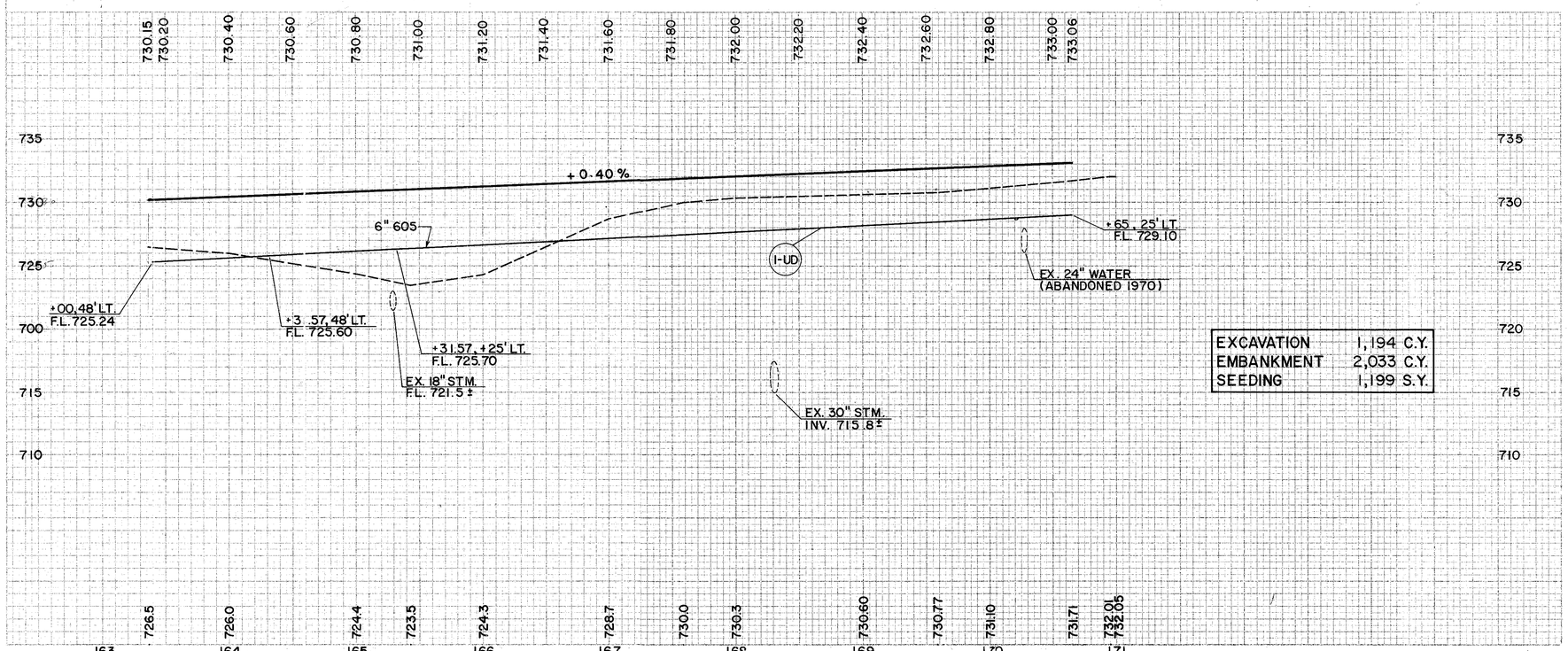
FRANKLIN COUNTY
FRA-670-1.25-C-3



CURVE DATA

P.I.	= STA. 166+51.19
Δ	= 8° 17' 59.96"
D_c	= 2° 0' 0"
R_c	= 2864.79
θ_s	= 2° 0' 0"
L_c	= 215.00
L_s	= 200.00
X	= 199.98
Y	= 2.33
L.T.	= 133.34
S.T.	= 66.67
I_s	= 307.90
E_s	= 8.11

FOR CONCRETE BARRIER AND PAVEMENT DETAILS, SEE SHEET 78 & 79.
FOR REMOVALS, SEE SHT. 10

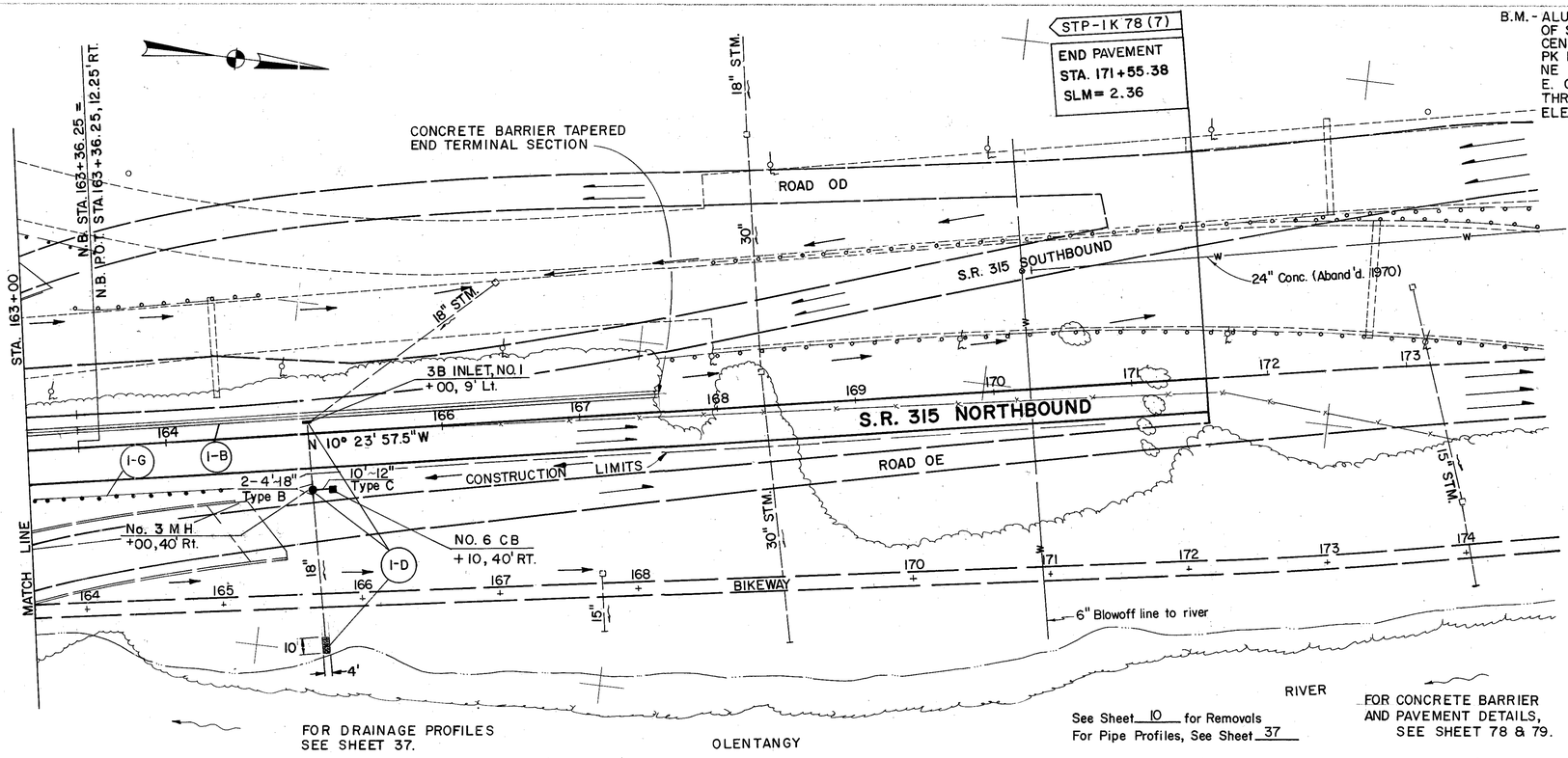


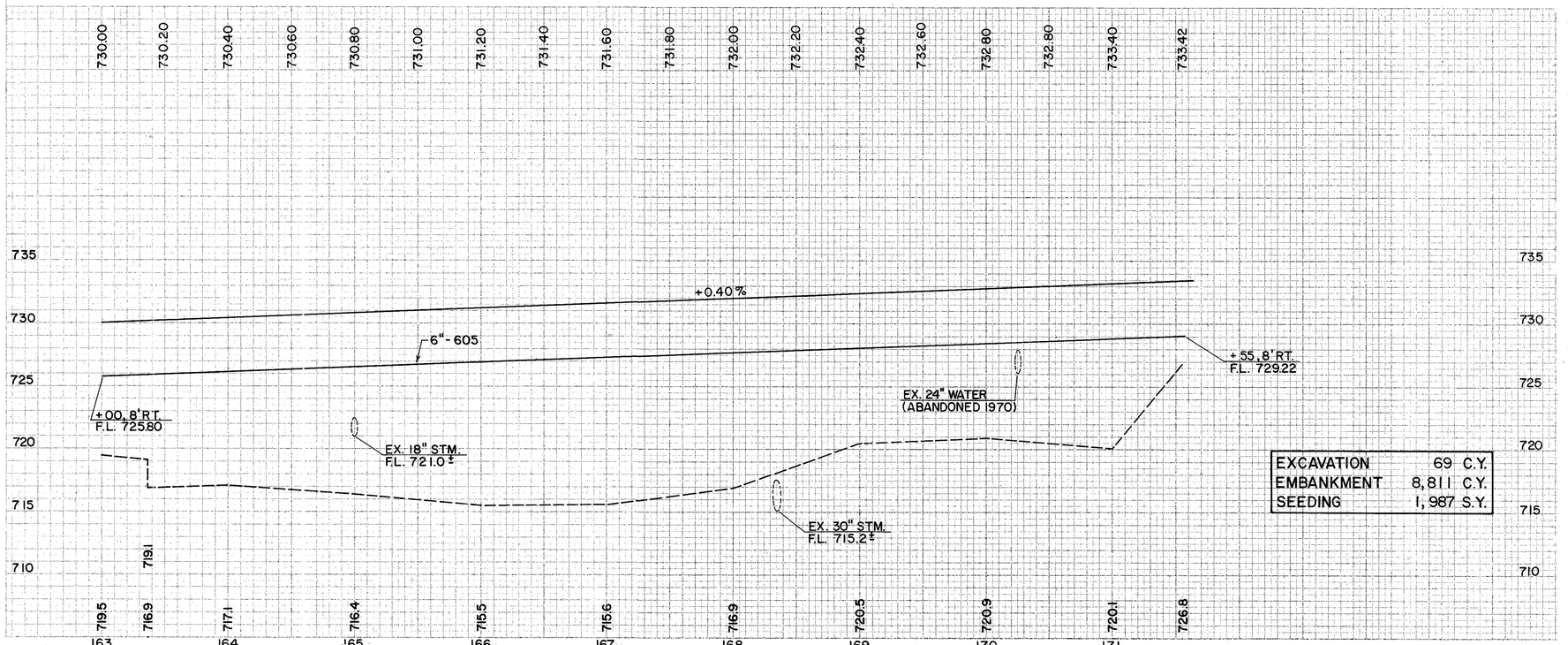
EXCAVATION	1,194 C.Y.
EMBANKMENT	2,033 C.Y.
SEEDING	1,199 S.Y.

ESTIMATED QUANTITIES

Ref No	Station to Station	Side	See Sheet No		Totals
605	6" Deep Pipe Underdrain	Lin.Ft.			765
I-UD	163+00 to 170+65	Lt.			

SOUTHBOUND PLAN AND PROFILE - STA. 163+00 TO STA. 170+65.47





EXCAVATION	69 C.Y.
EMBANKMENT	8,811 C.Y.
SEEDING	1,987 S.Y.

ESTIMATED QUANTITIES

Ref. No.	Station to Station	Side	603 Conduit Type B 18" Lin.Ft.	603 Conduit Type C 12" Lin.Ft.	601 Rock Channel Protection Type C w/Filter Cu. Yd.	604 No. 6 C.B. EACH	604 Inlet No. 3B As Per Plan No. 1 EACH	604 No. 3 MH EACH	606 Anchor Assembly, Type T EACH	606 Guardrail, Type 5 Lin.Ft.	605 6" Deep Pipe Underdrain Lin.Ft.	622 Concrete Barrier, Type B-50 Lin.Ft.
1D	165+00	LT & RT.	8	10	2.22	1	1	1				
1-UD	163+00 to 171+55	8' RT.							1	137.5	855	458
1-G	163+00 to 164+50	12' RT.										
1-B	163+00 to 167+58.09	℄										
Totals			8	10	2.22	1	1	1	1	137.5	855	458

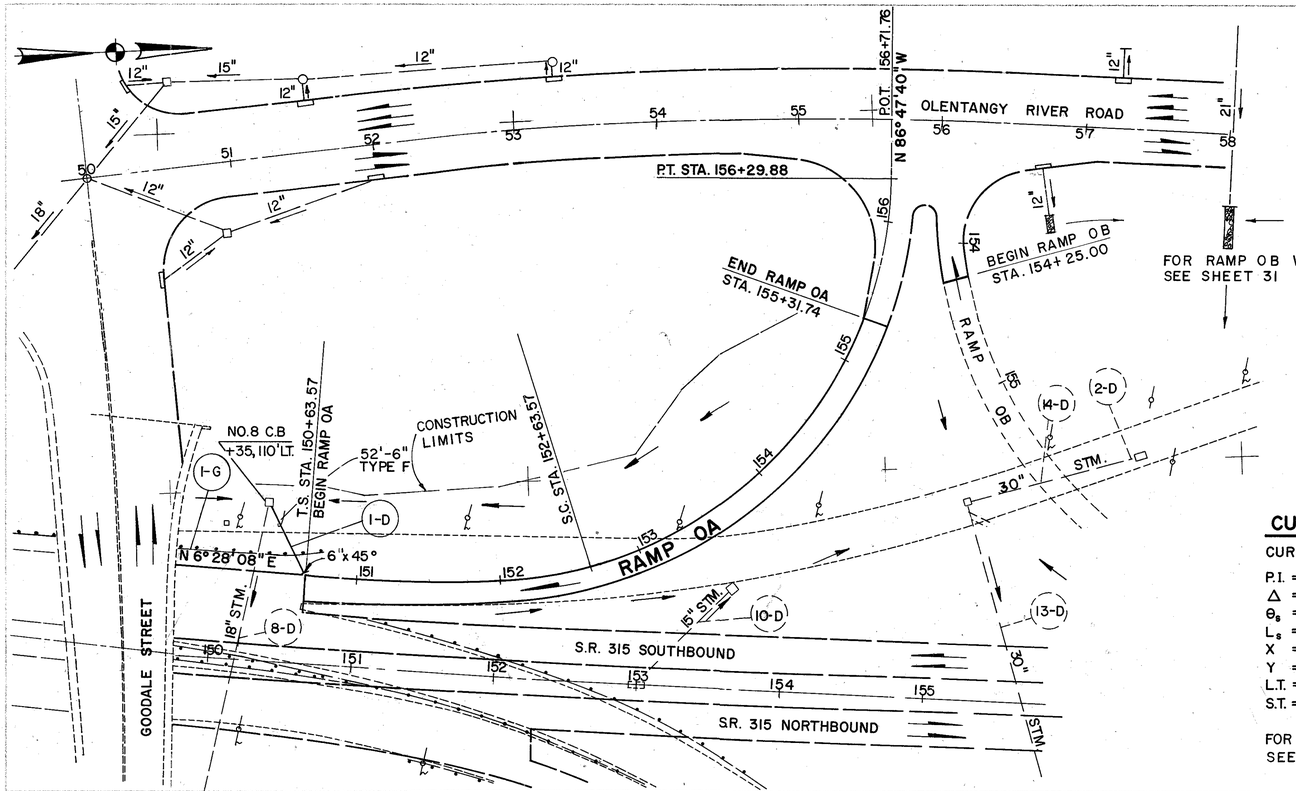
NORTHBOUND PLAN AND PROFILE - STA. 163+00 TO STA. 171+55.38

B.M. — ALUM. PLUG IN CONCRETE MONUMENT, 400' W. OF CONRAIL RAILROAD BRIDGE OVER OLENTANGY RIVER ROAD, 301' W. OF RAILROAD MILE MARKER #1, NEAR SW CORNER OF CONRAIL RAILROAD BRIDGE OVER TWIN RIVERS DR., 16.0' S. OF RAILROAD TRACKS, 11.5' W. OF A NAIL IN SW ABUT, 1' BELOW GROUND, WITH ACCESS THRU AN 8" FARM TILE WITH A CAST IRON LID. (COC 8-83)

ELEV. = 725.281'

	OHIO	30
	FHWA REGION 5	224
	FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

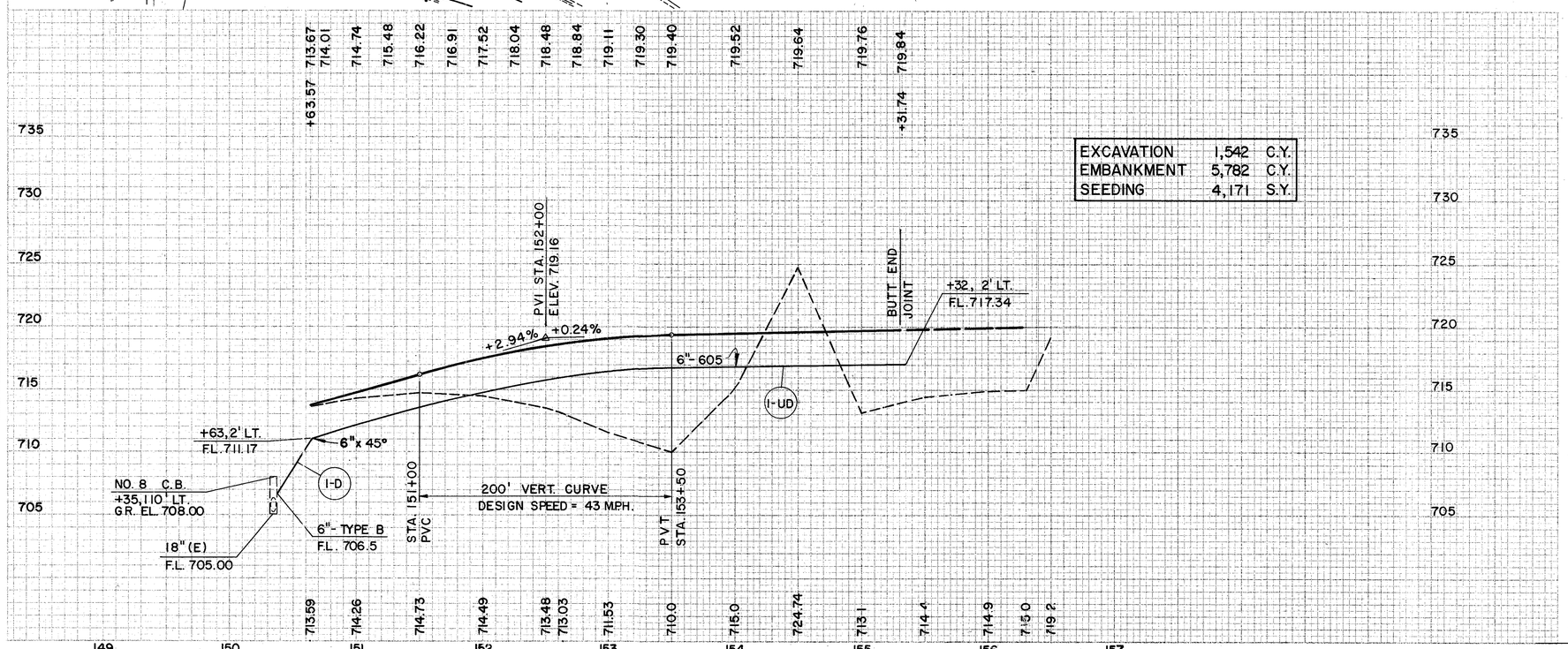


CURVE DATA RAMP OA

CURVE # 1A		CURVE # 2A	
P.I.	= 151+97.76	P.I.	= 154+76.57
Δ	= 20°00'00"	Δ	= 73°15'48"
θ_s	= 20°00'00"	D_c	= 20°00'00"
L_s	= 200.00'	R_c	= 286.48'
X	= 197.58'	L_c	= 366.32'
Y	= 23.07'	T	= 213.00'
L.T.	= 134.19'	E	= 70.51'
S.T.	= 67.45'		

FOR PAVEMENT DETAILS, SEE SHEET 76

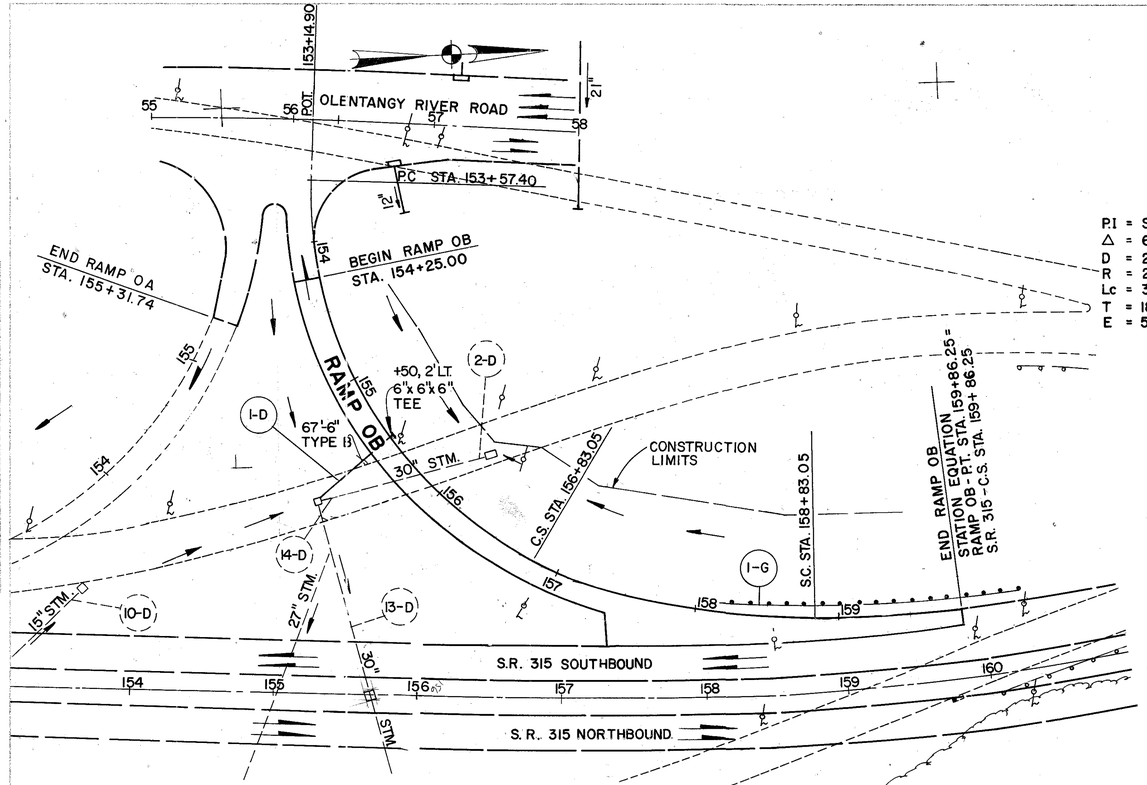
EXCAVATION	1,542	C.Y.
EMBANKMENT	5,782	C.Y.
SEEDING	4,171	S.Y.



ESTIMATED QUANTITIES

Ref. No.	Station to Station	Side	605 6" SHALLOW PIPE UNDERDRAIN LIN. FT.	606 GUARDRAIL TYPE 5 LIN. FT.	606 ANCHOR ASSEMBLEY TYPE B EACH	606 ANCHOR ASSEMBLEY TYPE T EACH	603 6" CONDUIT TYPE F LIN. FT.	See Sheet No.
1-UD	150+63 TO 155+32	2' LT.	469	225	1	1	52	
1-D	150+63	LT.					52	
1-G	148+50 TO 151+00	LT.				1		
Totals			469	225	1	1	52	

RAMP OA PLAN AND PROFILE - STA. 150+63.57 TO STA. 155+31.74



CURVE # 1B
P.I = STA. 155+40.36
Δ = 65° 7' 48.79"
D = 20° 0' 0"
R = 286.48
Lc = 325.65
T = 182.97
E = 53.44

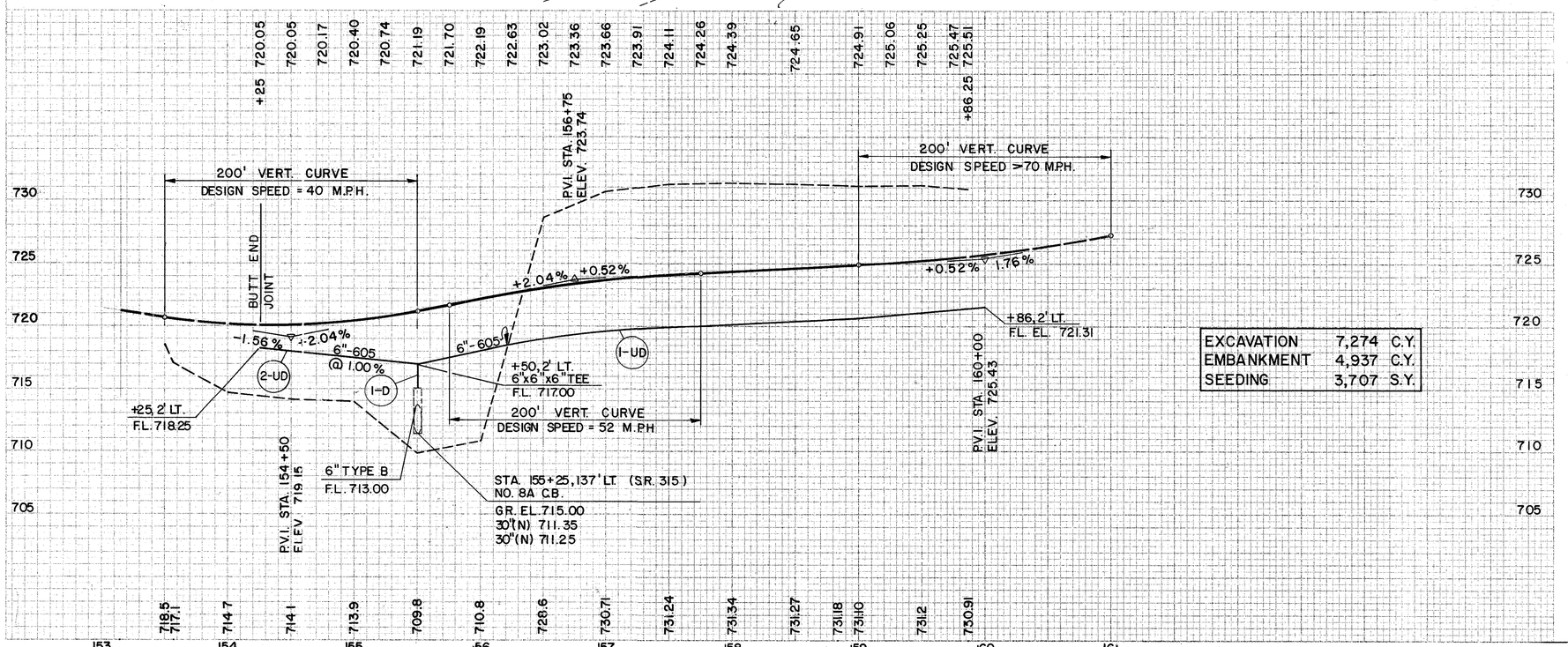
BM. – ALUM. PLUG IN CONCRETE MONUMENT, IN THE CORNER OF S.R. 315 OVERPASS OVER 3RD AVE., 36' E. OF THE CENTER LINE OF N. BOUND LANES OF S.R. 315, 26.9' S. OF PK IN GUARDRAIL POST, 165' SE OF A MANHOLE, 8.9' N-NE OF A PK IN THE NE CORNER OF THE BRIDGE ABUT., E. OF GUARDRAIL, 1' BELOW GROUND WITH ACCESS THRU 8" CLAY TILE WITH CAST IRON LID. (COC-8-83)

ELEV = 752.201

RAMP OB CURVE DATA

CURVE # 2B	CURVE # 3B
P.I = STA. 157+68.75	P.I. = STA. 159+34.72
Δ = 27° 0' 0"	Δ = 7° 13' 28.48"
θs = 27° 0' 0"	D = 7° 0' 0"
Ls = 200.00	R = 818.51
X = 190.76	Lc = 103.21
Y = 53.53	T = 51.67
L.T. = 117.91	E = 1.63
S.T. = 85.70	

FOR PAVEMENT DETAILS, SEE SHEET NO. 77



EXCAVATION	7,274	C.Y.
EMBANKMENT	4,937	C.Y.
SEEDING	3,707	S.Y.

ESTIMATED QUANTITIES

Ref. No.	Station to Station	Side	603 6" CONDUIT TYPE B LIN. FT.	606 GUARDRAIL TYPE 5 LIN. FT.	606 ANCHOR ASSEMBLY TYPE E EACH	606 ANCHOR ASSEMBLY, TYPE T EACH	605 6" UNCLASSIFIED UNDERDRAIN LIN. FT.	605 6" DEEP PIPE UNDERDRAIN LIN. FT.	See Sheet No.
1-UD	155+50 TO 159+86	2' LT.						436	
2-UD	154+25 TO 155+50	2' LT.							
1-D	155+50	LT & RT.	67				125		
1-G	158+00 TO 160+25	8' LT.		200	1	1			
Totals			67	200	1	1	125	436	

OHIO
FHWA REGION 5
FEDERAL PROJECT
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FRANKLIN COUNTY
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RAMP OB PLAN AND PROFILE - STA. 154+25 TO STA. 159+86.25

BM ALUMINUM PLUG IN CONCRETE MONUMENT AT INTERSECTION OF MICHIGAN AVE. AND BUTTLES AVE., 32.5 FT. E. OF C/L OF MICHIGAN AVE., 21.4 FT. S. OF C/L OF BUTTLES AVE., 30.4 FT. N.E. OF A FIRE HYDRANT, 18.8 FT. W. OF A 12 IN. SYCAMORE TREE 1 FT. BELOW GROUND, WITH ACCESS THRU A 8 IN CLAY TILE WITH A CAST IRON PIPE.
(COC 10-83) ELEV. 723.315

OHIO
FHWA REGION 5
FEDERAL PROJECT

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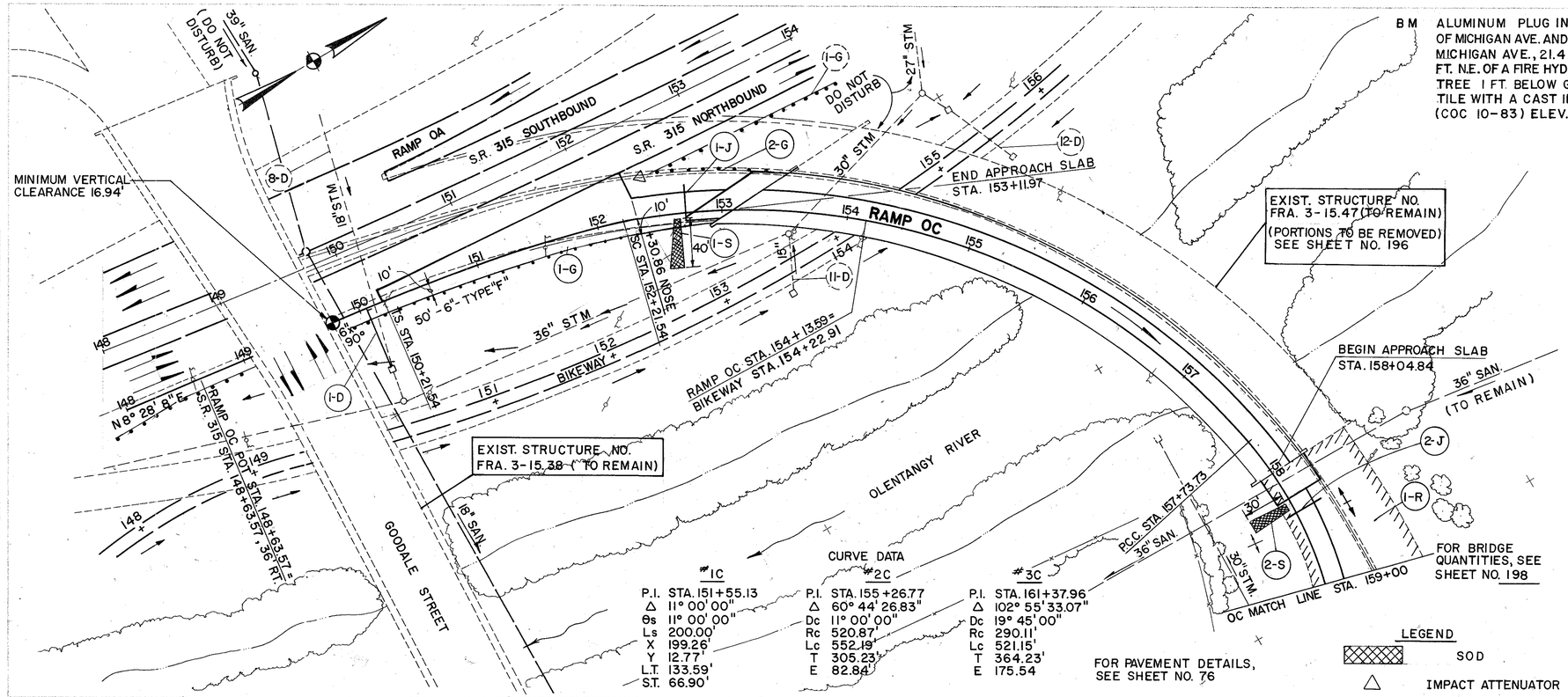
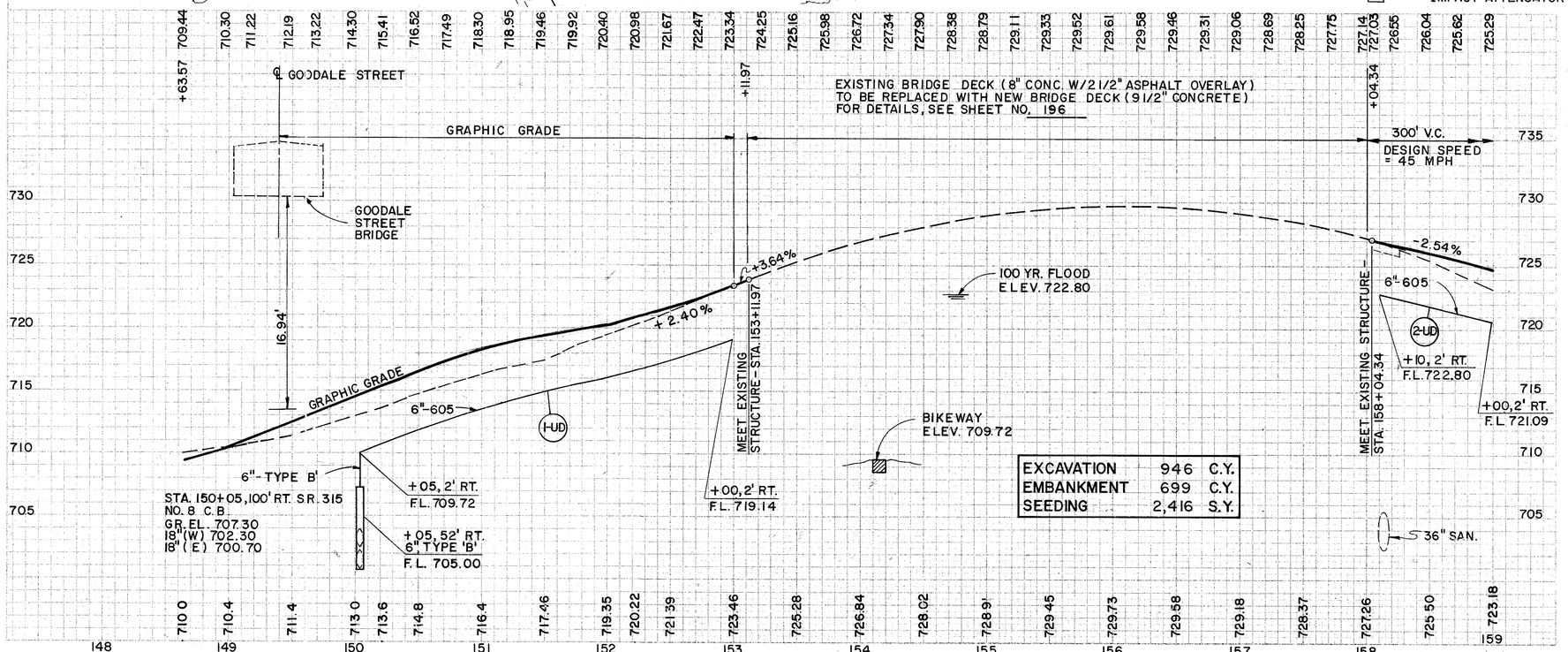
FRANKLIN COUNTY
FRA-670-1.25-C-3



CURVE DATA

#1C	#2C	#3C
P.I. STA. 151+55.13	P.I. STA. 155+26.77	P.I. STA. 161+37.96
Δ 11° 00' 00"	Δ 60° 44' 26.83"	Δ 102° 55' 33.07"
θs 11° 00' 00"	Dc 11° 00' 00"	Dc 19° 45' 00"
Ls 200.00'	Rc 520.87'	Rc 290.11'
X 199.26'	Lc 552.19'	Lc 521.15'
Y 12.77'	T 305.23'	T 364.23'
L.T. 133.59'	E 82.84'	E 175.54
S.T. 66.90'		



EXCAVATION	946	C.Y.
EMBANKMENT	699	C.Y.
SEEDING	2,416	S.Y.

ESTIMATED QUANTITIES

Ref. No.	Item	Unit	Station to Station	Side	202 PAVEMENT REMOVED SQ.YD.	SPECIAL PRESSURE RELIEF JOINT LIN.FT.	606 GUARDRAIL TYPE 5 LIN.FT.	606 BRIDGE TERMINAL ASSEMBLY TYPE 1 EACH	606 ANCHOR ASSEMBLY TYPE B EACH	603 6" CONDUIT TYPE F LIN.FT.	SPECIAL IMPACT ATTENUATOR G.R.E.A.T. TYPE EACH	605 6" DEEP PIPE UNDERDRAIN LIN.FT.	660 REINFORCED SODDING SQ.YD.	See Sheet No.
1-UD			150+05 TO 153+00	2' RT.								295		
2-UD			158+10 TO 159+00	2' RT.								90		
1-J			152+76	LT.		25								
2-J			158+40	LT.		25								
1-D			150+00	RT.						10		40		
1-R			158+04.84 TO 159+00	LT&RT.	1000									
1-S			152+68	RT.			475	1	1		1		37	
2-S			158+30	RT.			75	1	1		1		27	
1-G			147+93.5 TO 152+80	8'-10" RT.										
2-G			152+50 TO 153+37.5	21' LT.										
Totals					1000	50	550	2	1	10	1	425	64	

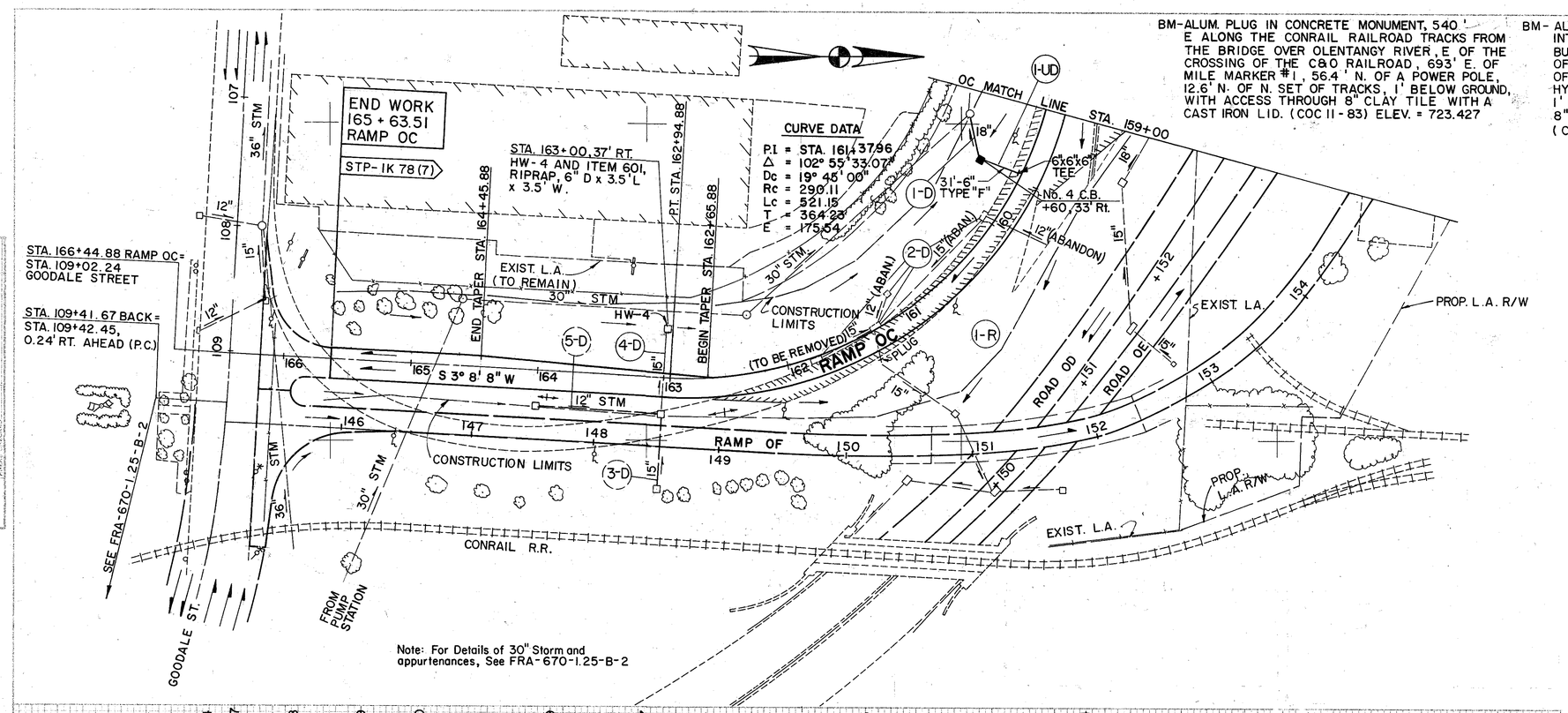
RAMP OC PLAN AND PROFILE STA. 148+63.57 TO STA. 159+00.00

BM- ALUM. PLUG IN CONCRETE MONUMENT, 540 ' E ALONG THE CONRAIL RAILROAD TRACKS FROM THE BRIDGE OVER OLENTANGY RIVER, E OF THE CROSSING OF THE C&O RAILROAD, 693' E. OF MILE MARKER #1, 56.4 ' N. OF A POWER POLE, 12.6' N. OF N. SET OF TRACKS, 1' BELOW GROUND, WITH ACCESS THROUGH 8" CLAY TILE WITH A CAST IRON LID. (COC 11-83) ELEV. = 723.427

BM- ALUM. PLUG IN CONCRETE MONUMENT AT INTERSECTION OF MICHIGAN AVE. AND BUTTLES AVE., 32.5' E. OF CENTERLINE OF MICHIGAN AVE., 21.4' S. OF CENTERLINE OF BUTTLES AVE., 30.4' NE OF A FIRE HYDRANT, 18.8' W OF A 12" SYCAMORE TREE 1' BELOW GROUND, WITH ACCESS THRU A 8" CLAY TILE WITH A CAST IRON LID. (COC-10-83) ELEV. = 723.315

OHIO | FHWA REGION 5 | FEDERAL PROJECT | 33 / 224

FRANKLIN COUNTY
FRA-670-1.25-C-3



Note: For Details of 30" Storm and appurtenances, See FRA-670-1.25-B-2

EXCAVATION	1,965 C.Y.
EMBANKMENT	8,614 C.Y.
SEEDING	6,123 S.Y.

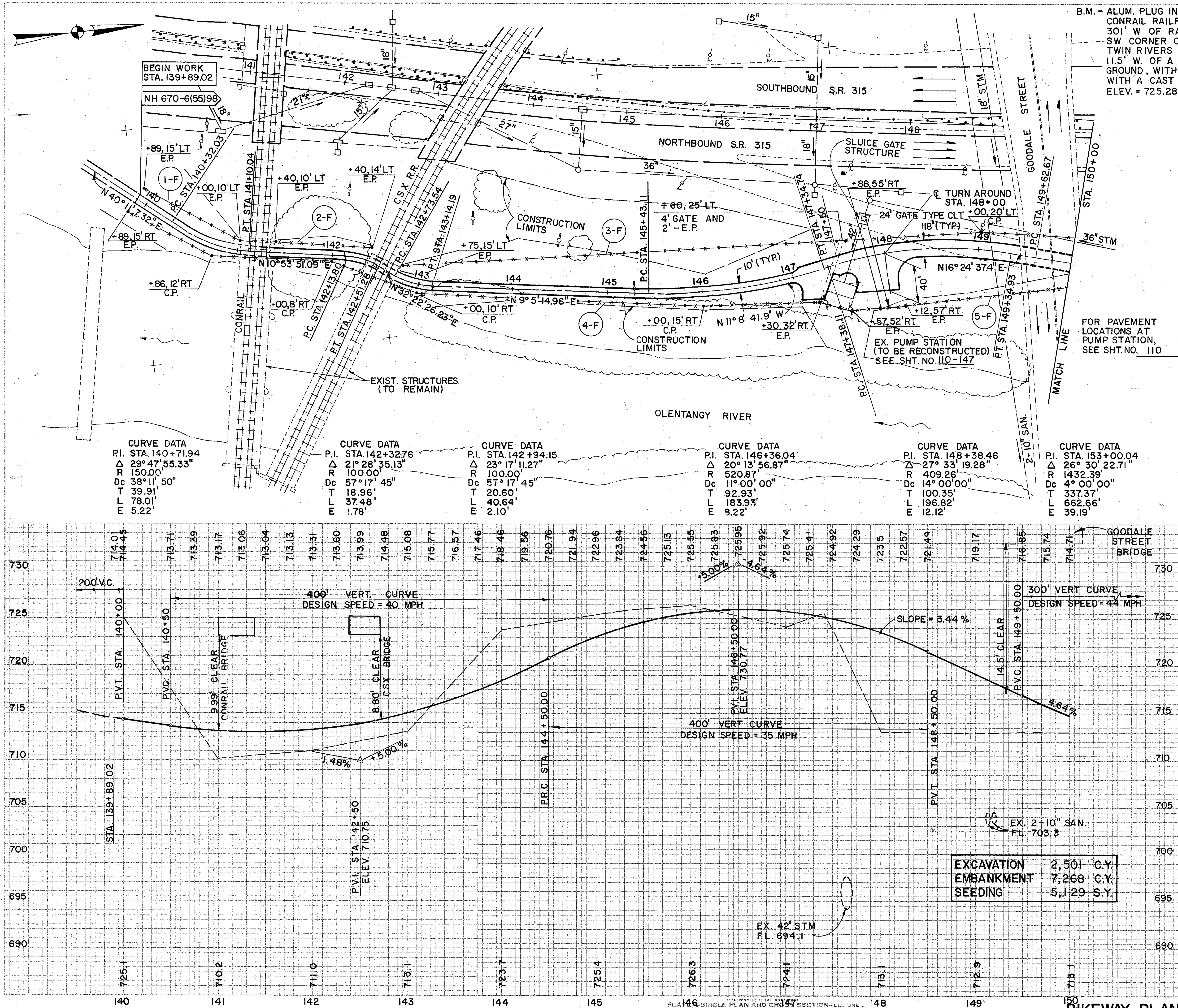
ESTIMATED QUANTITIES

Ref. No.	Station to Station	Side	202 Inlet Removed Each	202 Pipe Removed 24" & Under Lin.Ft.	601 Riprap using 6" Reinforced Concrete Slab Sq.Yd.	602 Concrete Masonry Cu.Yd.	603 Conduit Lin.Ft. Type F 6"	Type B 15"	Type C 18"	604 No. 4 Catch Basin Each	605 6" Deep Pipe Underdrain Lin.Ft.	202 Pavement Removed Sq.Yd.	See Sheet No.
1-D	159+19 to 159+75	Rt.							36	1			
2-D	159+95 to 161+83	Lt. & Rt.	1	24									
3-D	163+00	Lt. & Rt.	3		1.4	0.25		65			663	1026	
4-D													
5-D													
1-UD	159+00 to 165+63	2' Rt.					31						
1-R	159+00 to												
Totals			1	24	1.4	0.25	31	65	36	1	663	1026	

RAMP OC PLAN AND PROFILE - STA. 159+00 TO STA. 166+44.88

FRANKLIN COUNTY
FRA-670-1.25-C-3

B.M. - ALUM. PLUG IN CONCRETE MONUMENT, 400' W. OF CONRAIL RAILROAD BRIDGE OVER OLENTANGY R., 301' W OF RAILROAD MILE MARKER #1, NEAR SW CORNER OF CONRAIL RAILROAD BRIDGE OVER TWIN RIVERS DR., 16.0' S. OF S. RAILROAD TRACKS, 11.5' W. OF A NAIL IN SW ABUT., 1' BELOW GROUND, WITH ACCESS THRU AN 8" FARM TILE WITH A CAST IRON LID. (COC 8-83)
ELEV. = 725.281



CURVE DATA						
P.I.	STA. 140+71.94	STA. 142+32.76	STA. 142+94.15	STA. 146+36.04	STA. 148+38.46	STA. 153+00.04
Δ	29° 47' 55.33"	21° 28' 35.13"	23° 17' 11.27"	20° 13' 56.87"	27° 33' 19.28"	26° 30' 22.71"
R	150.00'	100.00'	100.00'	520.87'	409.26'	1432.39'
Dc	38° 11' 50"	57° 17' 45"	57° 17' 45"	11° 00' 00"	14° 00' 00"	4° 00' 00"
T	39.91'	18.96'	20.60'	92.93'	100.35'	337.37'
L	78.01'	37.48'	40.64'	183.93'	196.82'	662.66'
E	5.22'	1.78'	2.10'	9.22'	12.12'	39.19'

EXCAVATION	2,501	C.Y.
EMBANKMENT	7,268	C.Y.
SEEDING	5,129	S.Y.

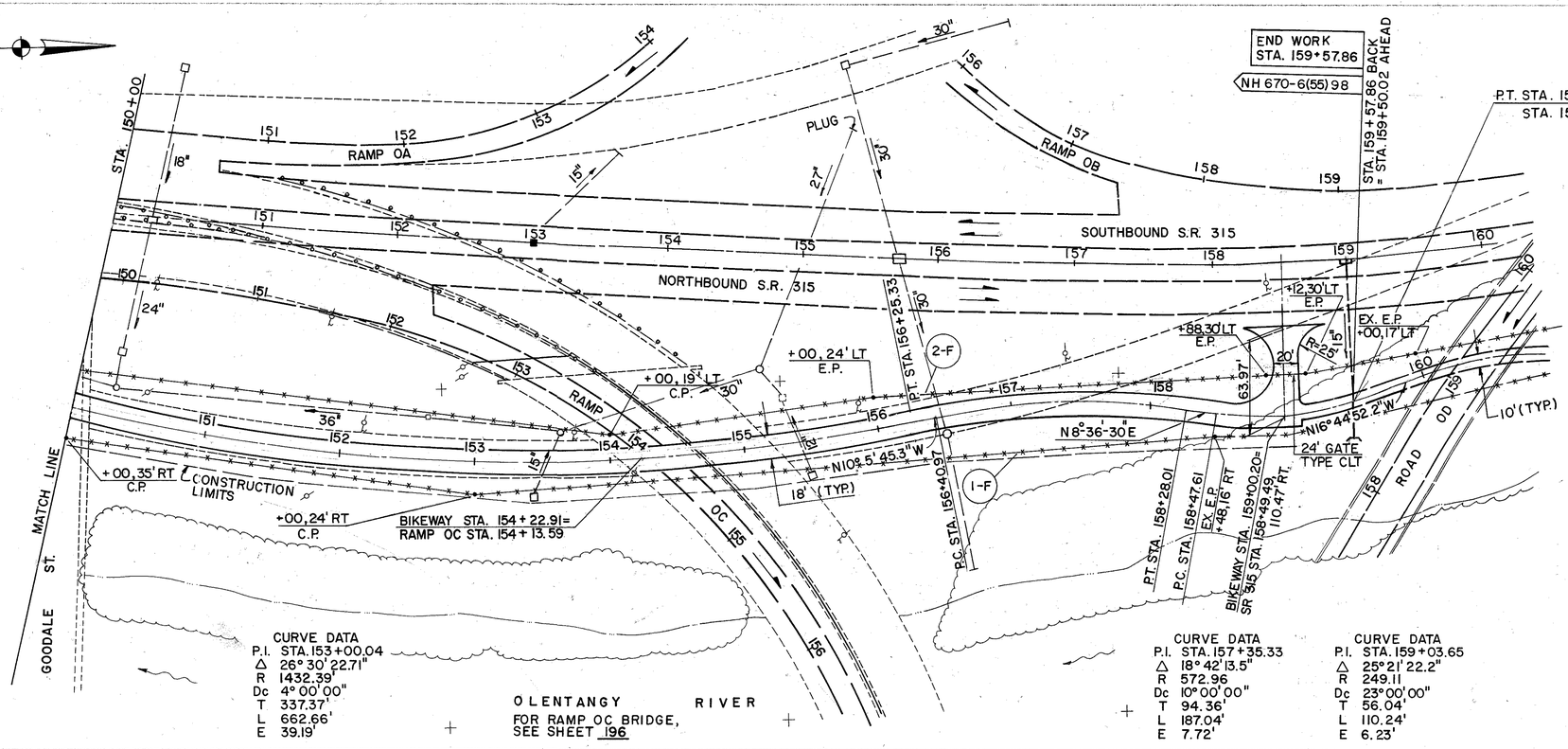
ESTIMATED QUANTITIES

Ref No.	Station to Station	Side	607 Fence Type CLT (Lin.Ft.)	607 Gate Type CLT (Each)
1-F	139+89 to 141+00	Lt.	111	
2-F	141+40 to 142+00	Lt.	101	
3-F	142+75 to 150+00	Lt.	725	
4-F	139+89 to 147+30	Rt.	741	
5-F	147+30 to 150+00	Rt.	270	2
Totals			1948	2

BIKEWAY PLAN AND PROFILE STA. 139+89.02 TO STA. 150+00.00

OHIO	35
FHWA REGION 5	224
FEDERAL PROJECT	

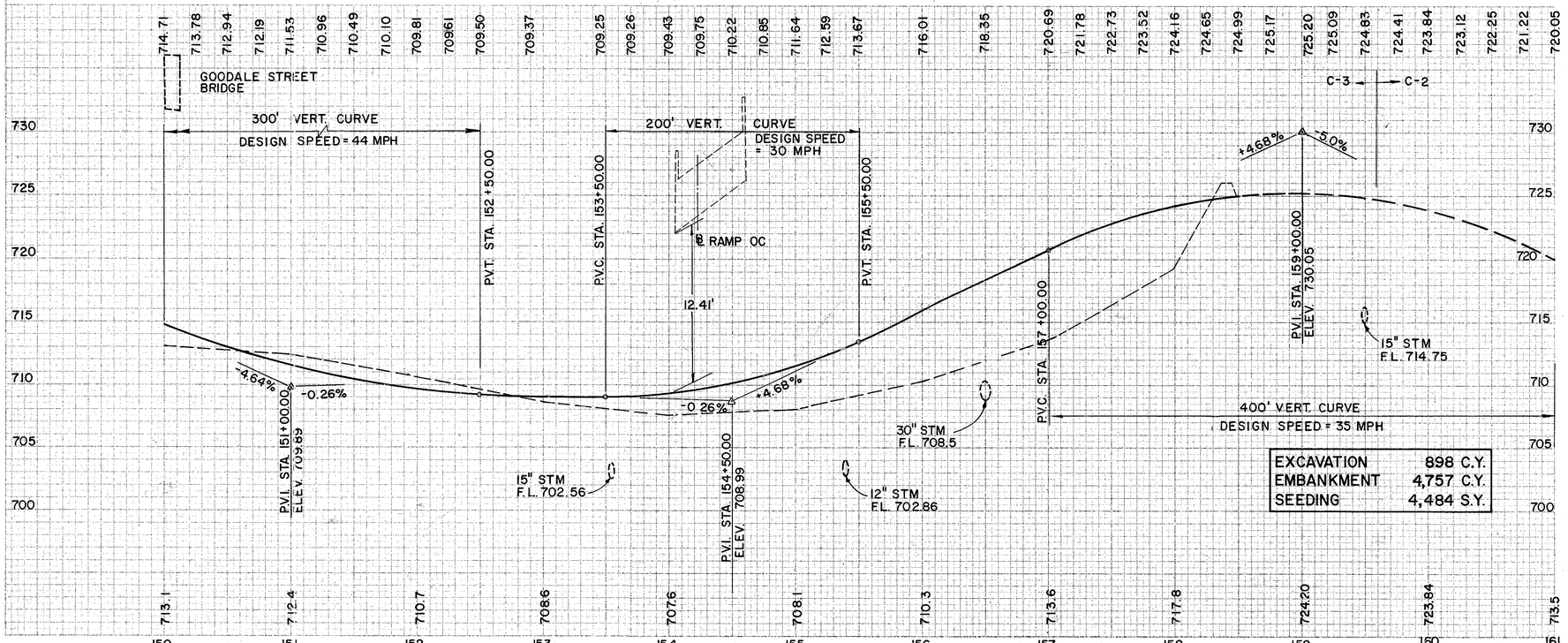
FRANKLIN COUNTY
FRA-670-1.25-C-3



CURVE DATA
P.I. STA. 153+00.04
Δ 26° 30' 22.71"
R 1432.39'
Dc 4° 00' 00"
T 337.37'
L 662.66'
E 39.19'

CURVE DATA
P.I. STA. 157+35.33
Δ 18° 42' 13.5"
R 572.96
Dc 10° 00' 00"
T 94.36'
L 187.04'
E 7.72'

CURVE DATA
P.I. STA. 159+03.65
Δ 25° 21' 22.2"
R 249.11
Dc 23° 00' 00"
T 56.04'
L 110.24'
E 6.23'



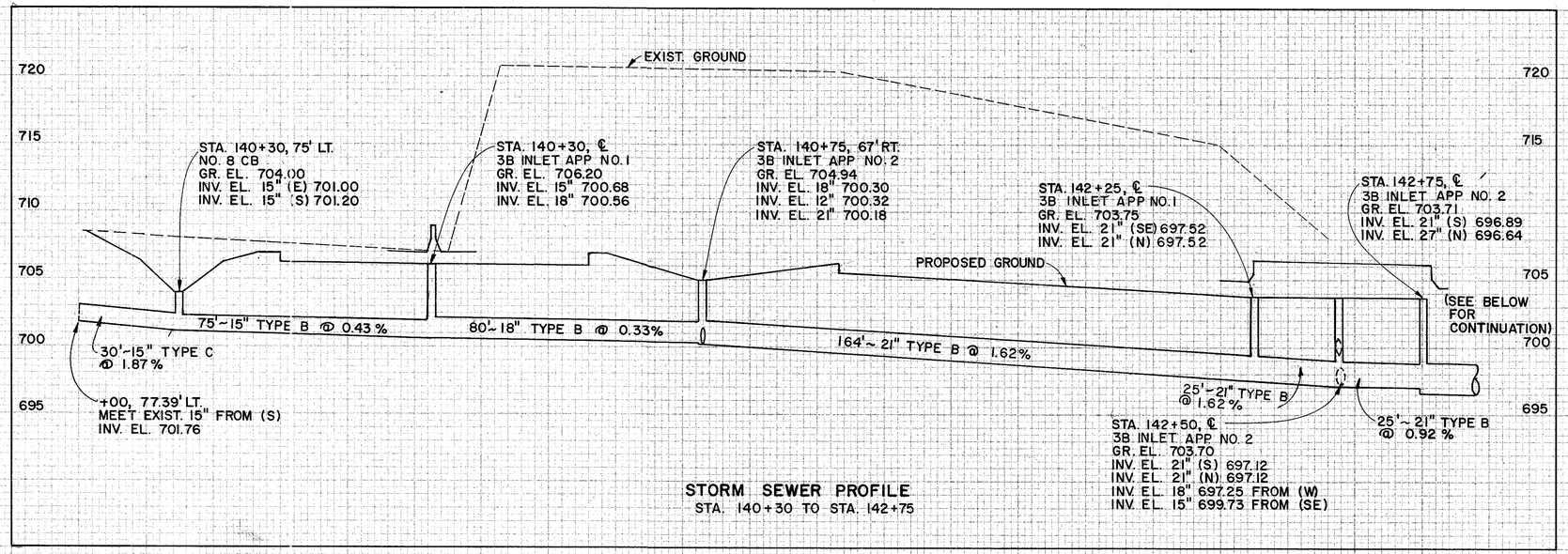
ESTIMATED QUANTITIES

Ref. No.	Station to Station	Side	See Sheet No.	607 Fence Type CLT	Lin. Ft.	607 Gates Type CLT	Each
1-F	150+00 to 158+48	RT.			848		1
2-F	150+00 to 160+00	LT.			976		
Totals					1824		1

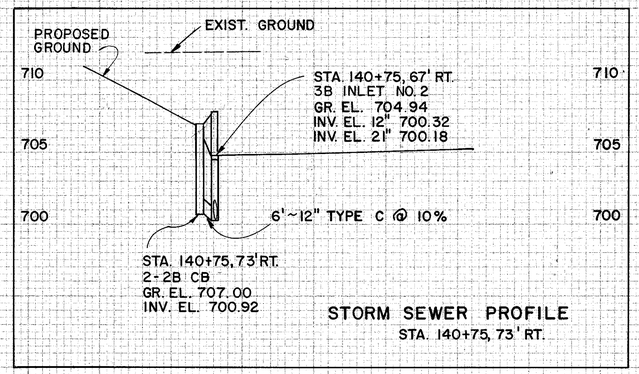
BIKEWAY PLAN AND PROFILE STA. 150+00.00 TO STA. 159+57.86

OHIO	36
FHWA REGION 5	224
FEDERAL PROJECT	

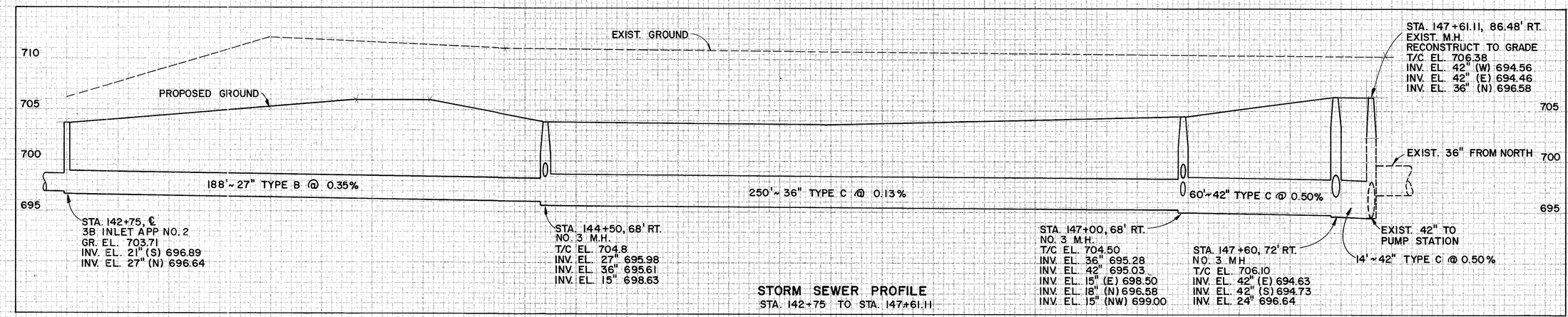
FRANKLIN COUNTY
FRA-670-1.25-C-3



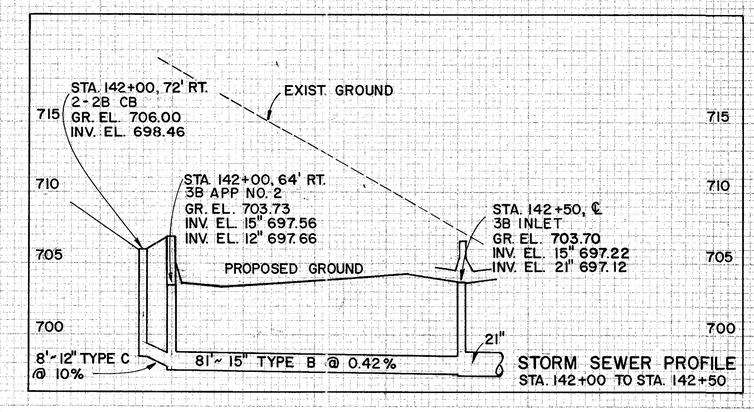
STORM SEWER PROFILE
STA. 140+30 TO STA. 142+75



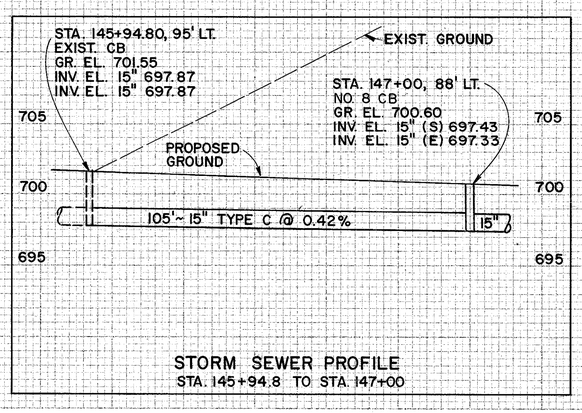
STORM SEWER PROFILE
STA. 140+75, 73' RT.



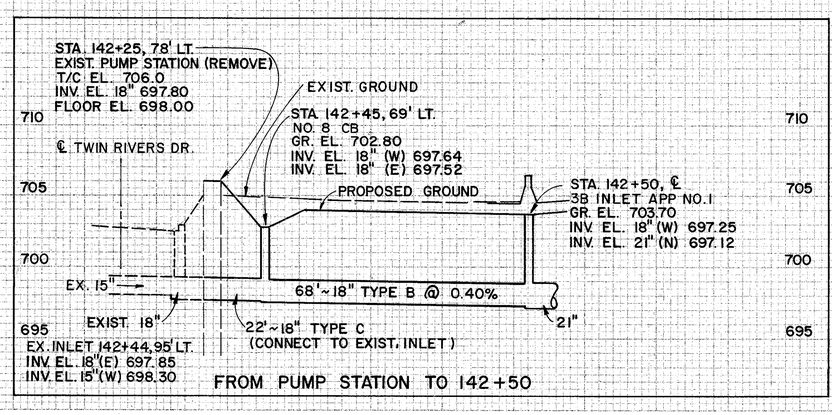
STORM SEWER PROFILE
STA. 142+75 TO STA. 147+61.11



STORM SEWER PROFILE
STA. 142+00 TO STA. 142+50



STORM SEWER PROFILE
STA. 145+94.8 TO STA. 147+00



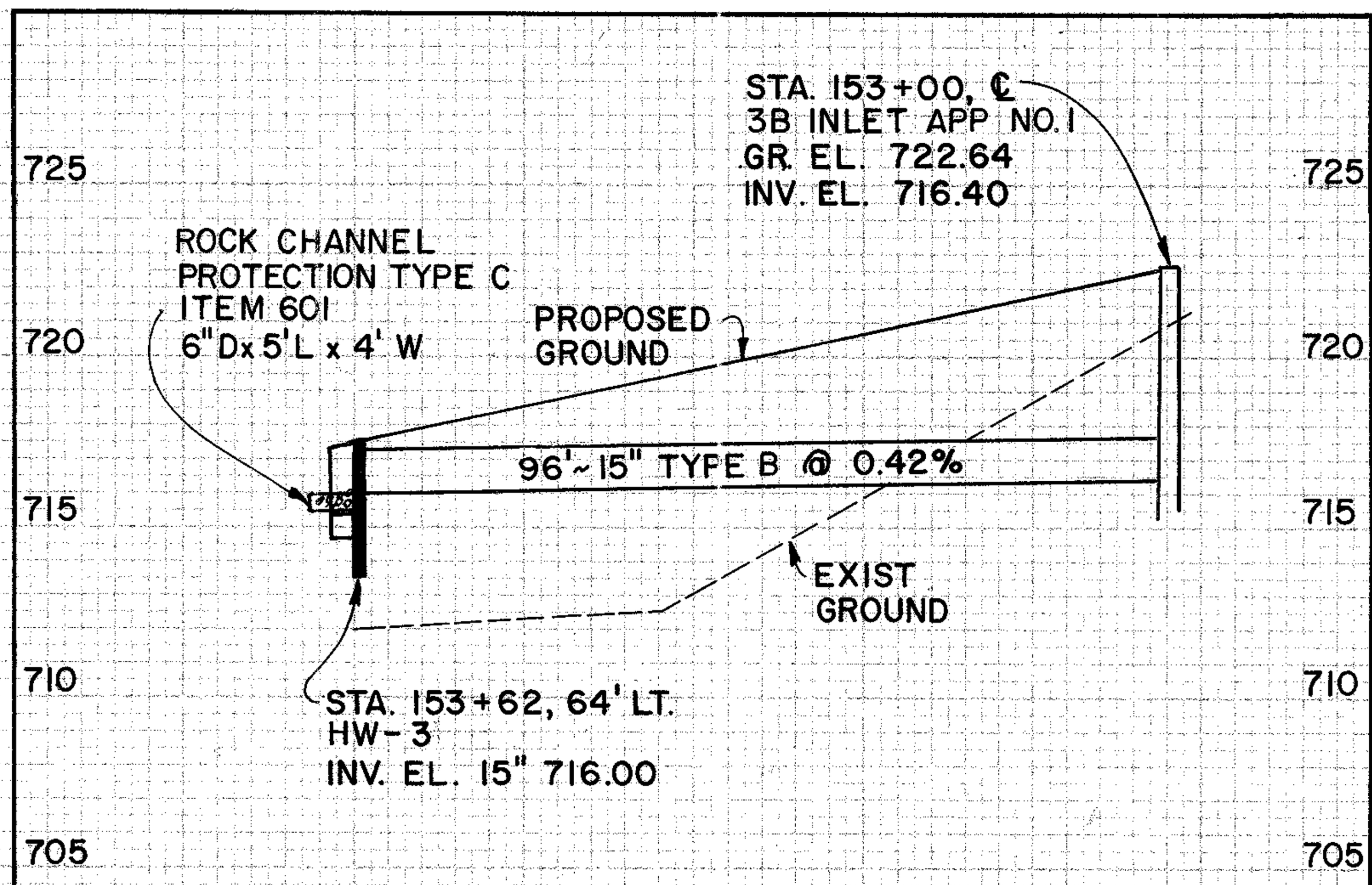
FROM PUMP STATION TO 142+50

HIGHWAY PLANS AS BUILT
PLATE 3-FULL CROSS SECTION-FULL LINE
TO FOLDING
PRINTED IN U.S.A.

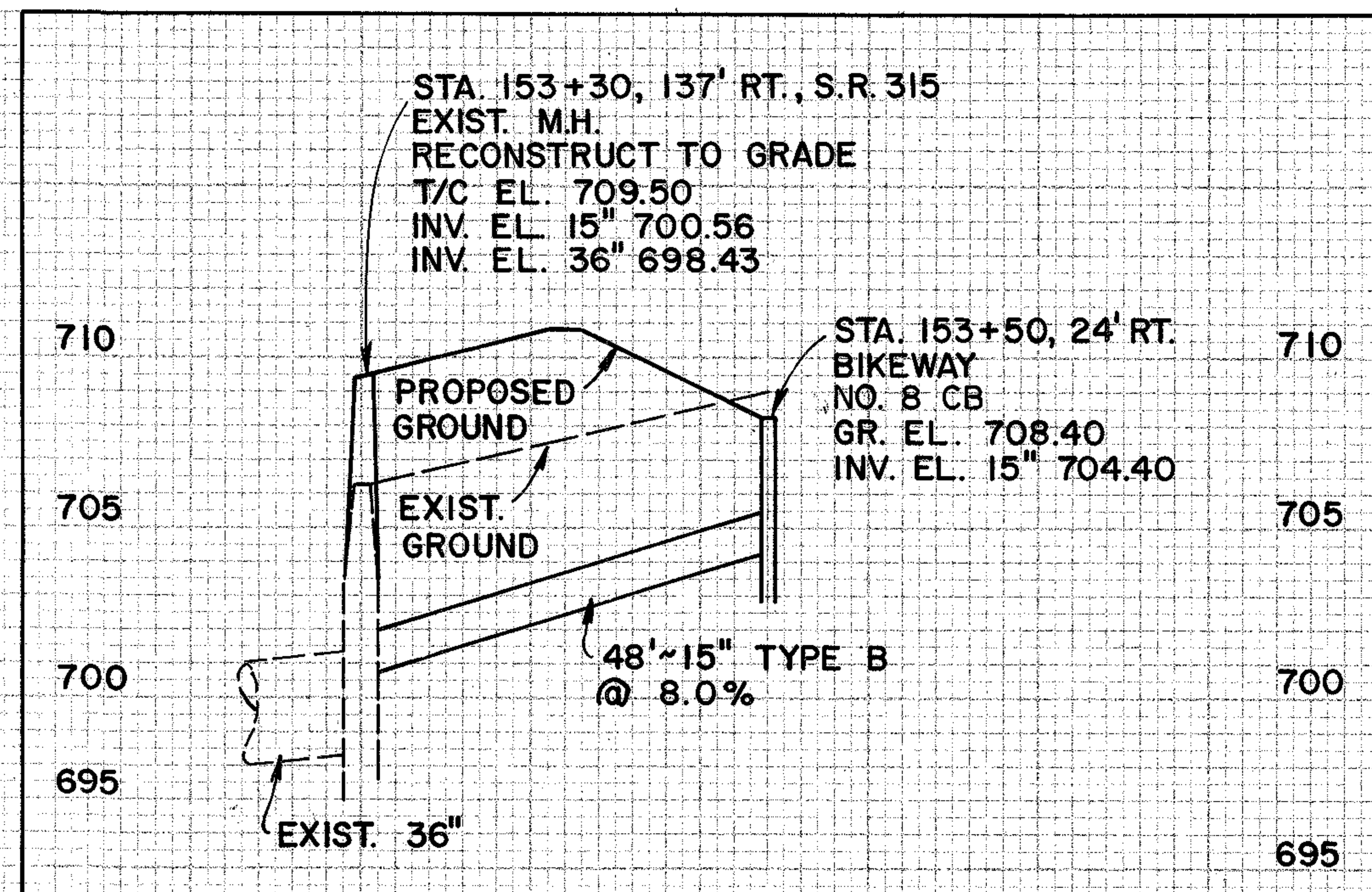
DRAINAGE PROFILES

OHIO	37
FHWA REGION 5	224
FEDERAL PROJECT	

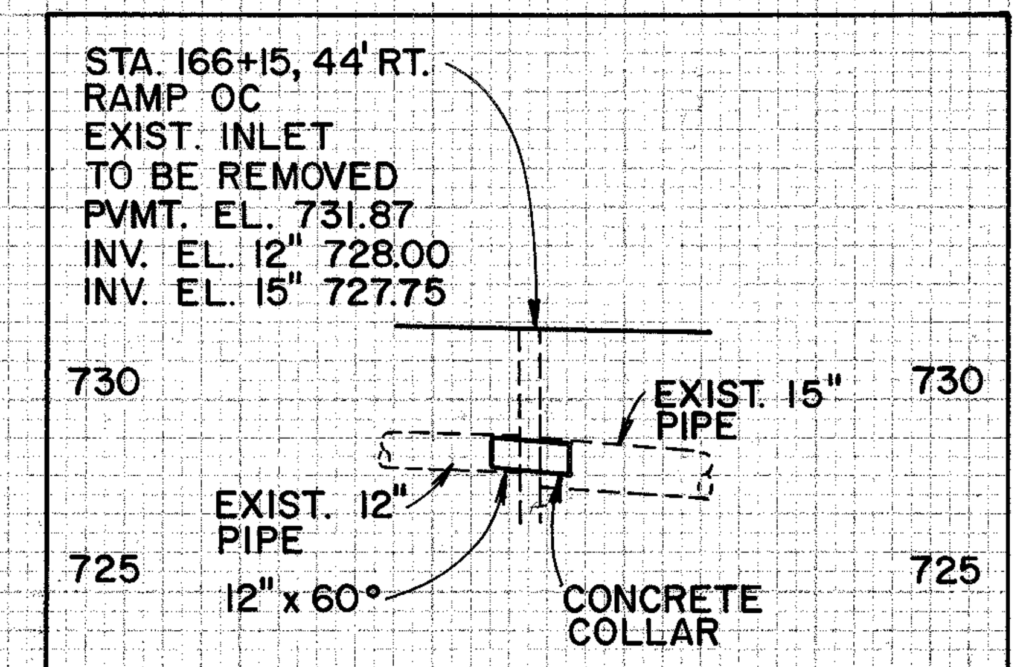
FRANKLIN COUNTY
FRA-670-1.25-C-3



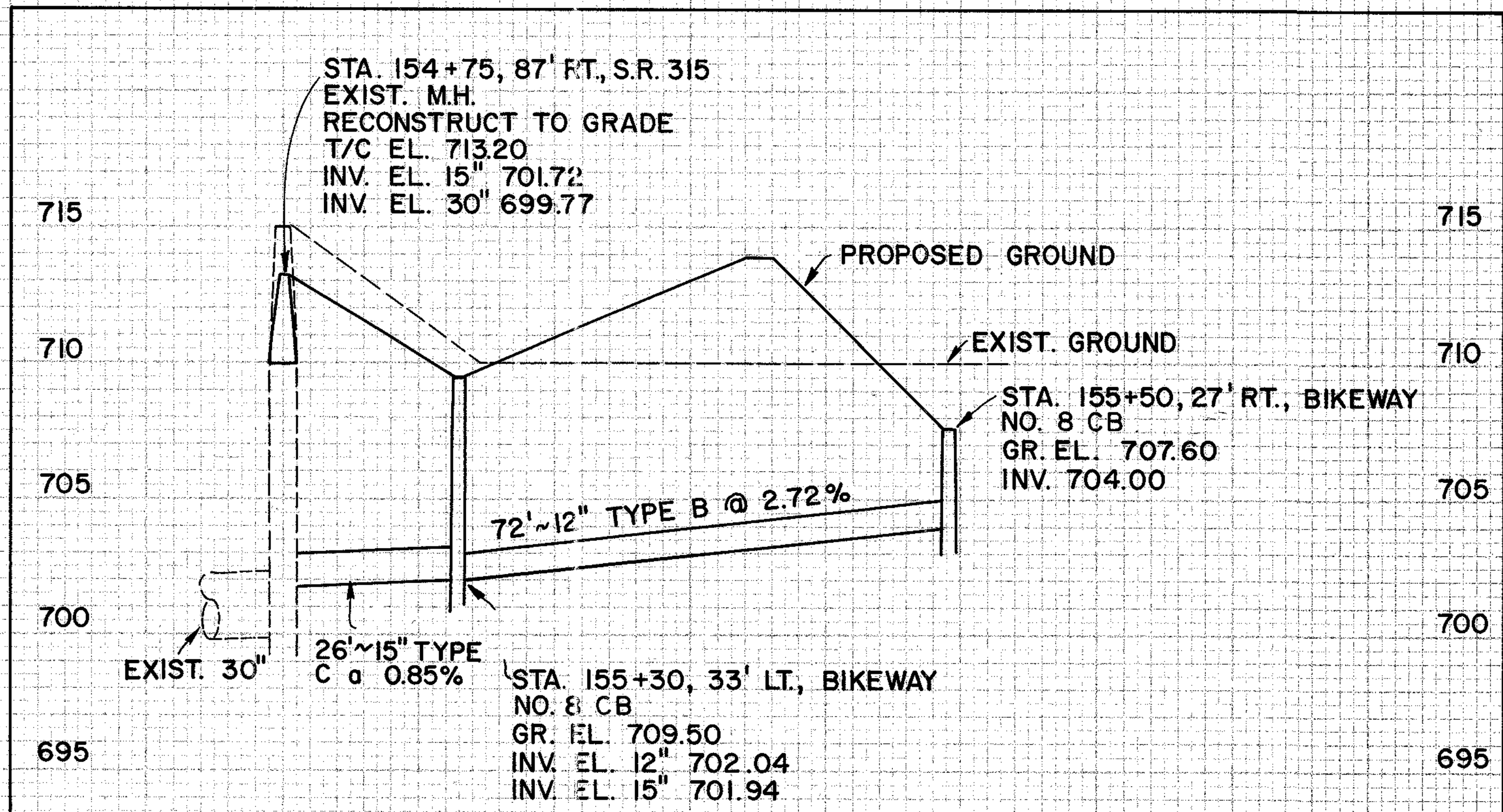
STORM SEWER PROFILE
STA. 153+00



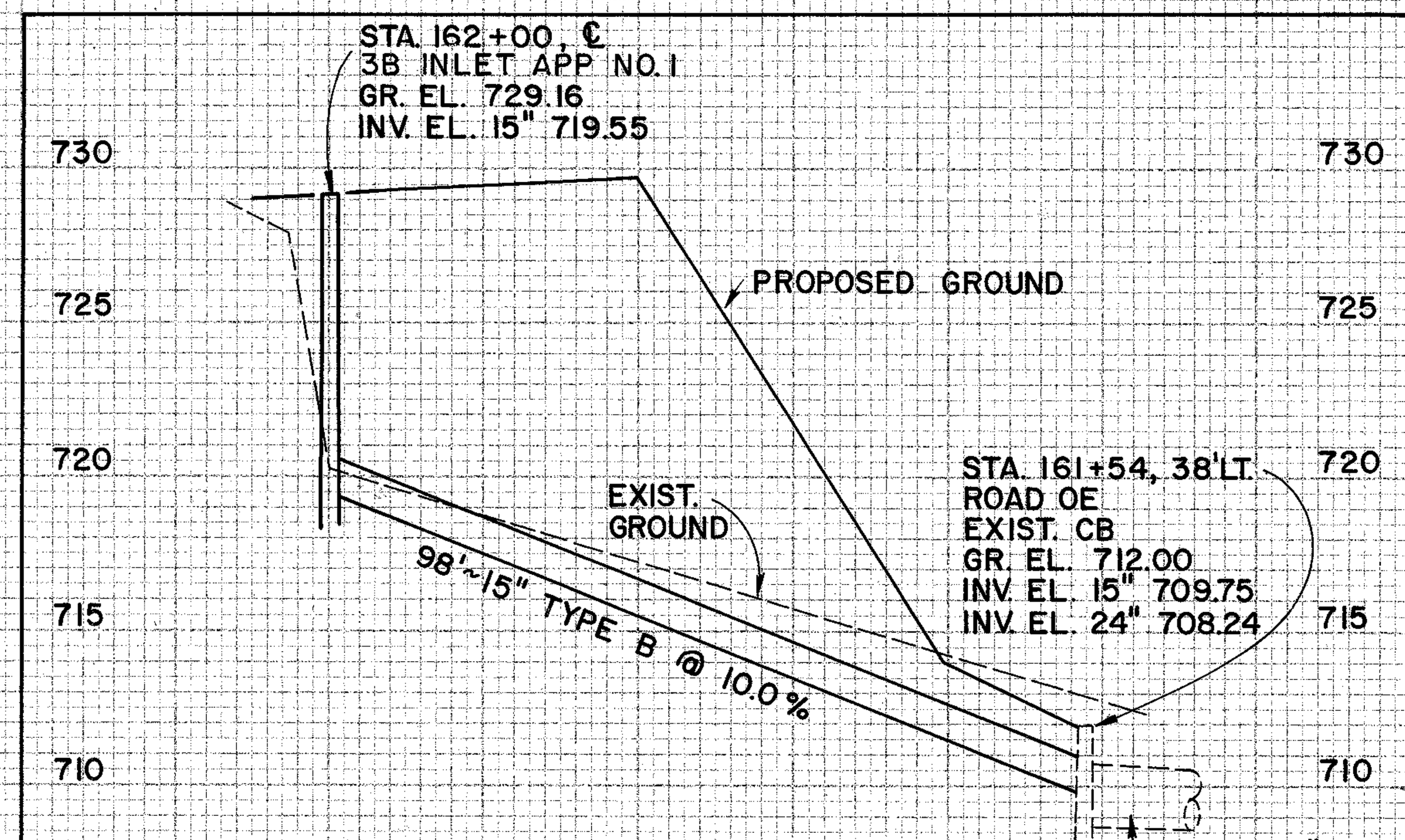
STORM SEWER PROFILE
STA. 153+50 BIKEWAY



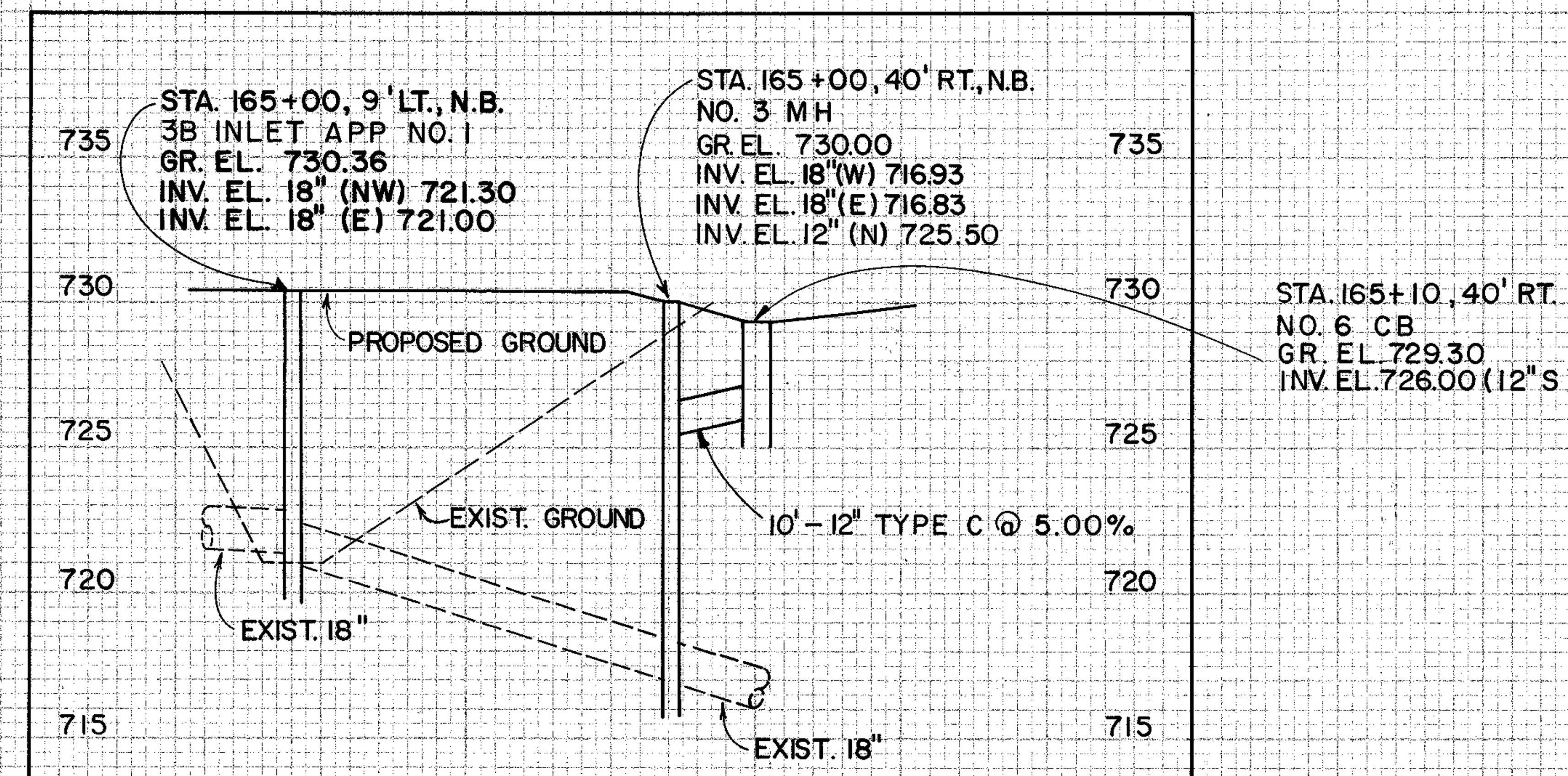
STORM SEWER PROFILE
STA. 166+15 RAMP OC



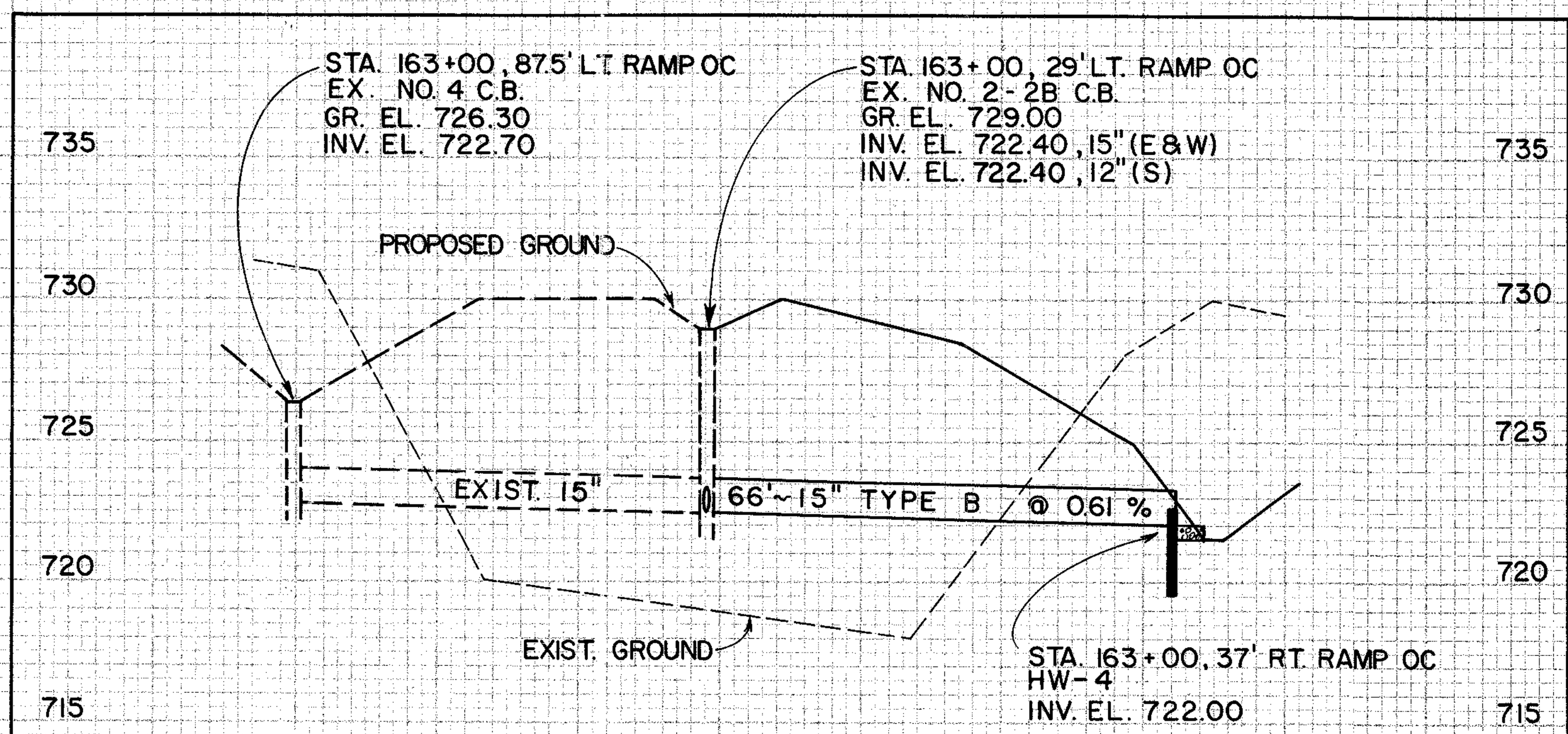
STORM SEWER PROFILE
STA. 155+50 BIKEWAY



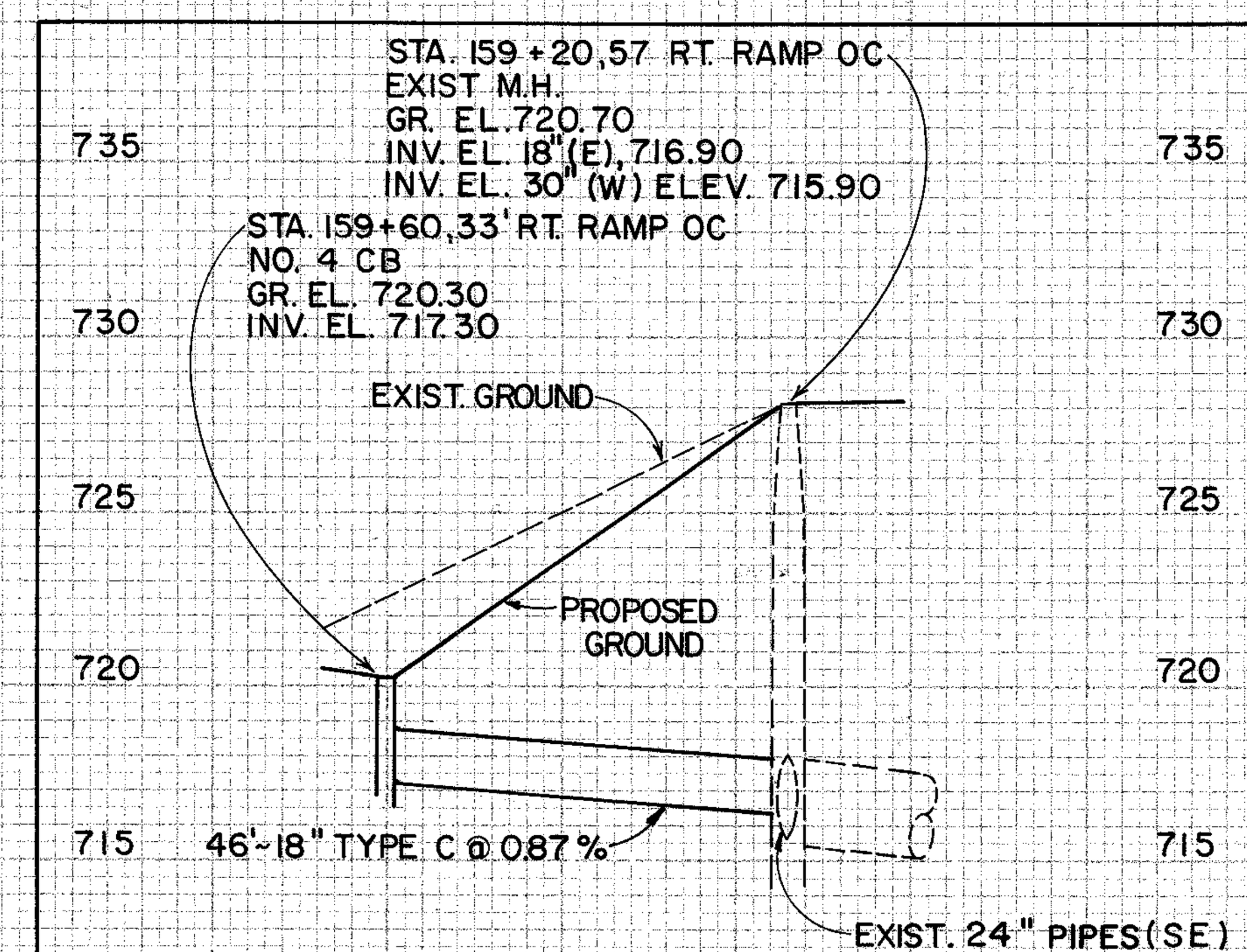
STORM SEWER PROFILE
STA. 162+00



STORM SEWER PROFILE
STA. 165+00 S.R. 315 N.B.



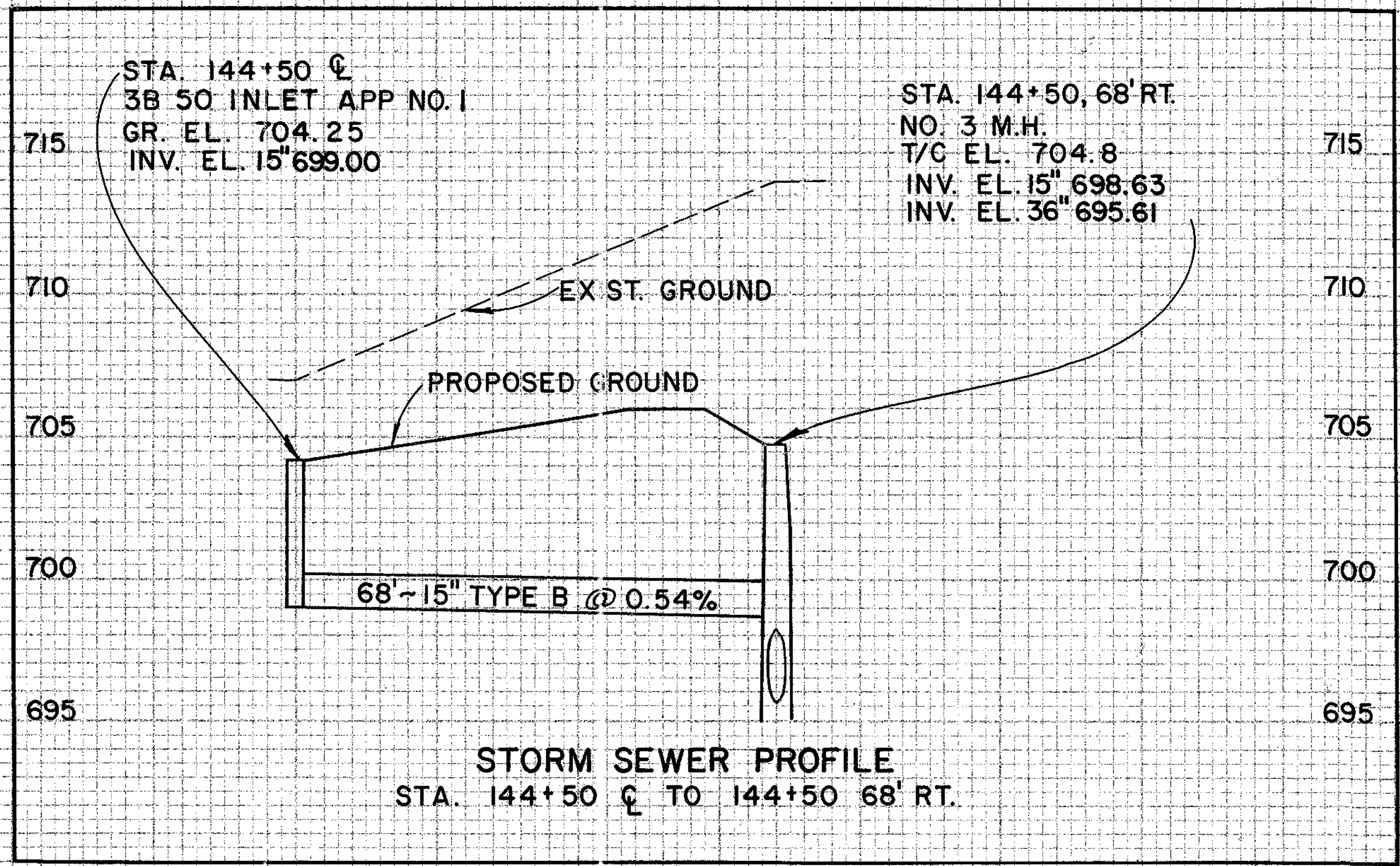
STORM SEWER PROFILE
STA. 163+00 RAMP OC

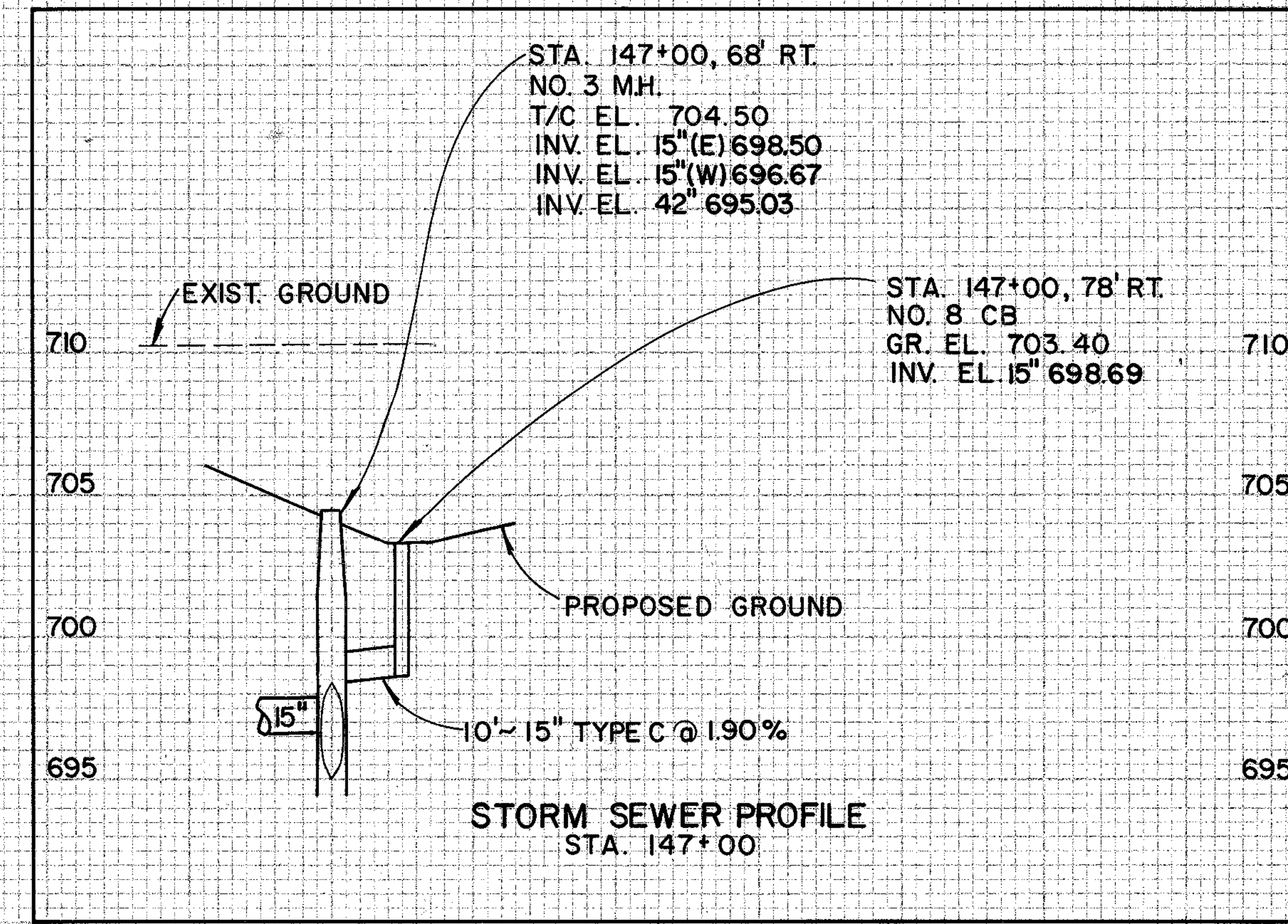


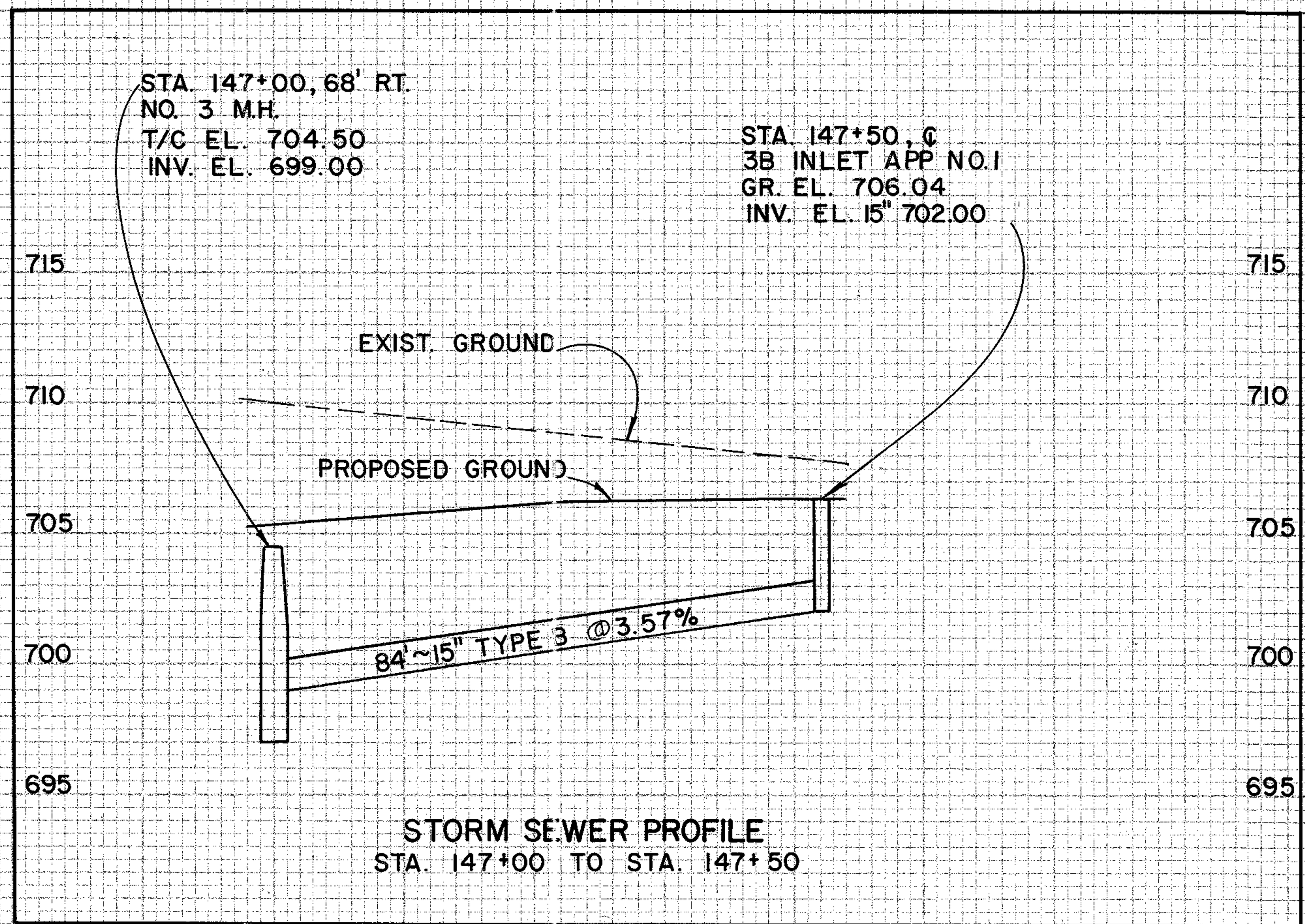
STORM SEWER PROFILE
STA. 159+20 TO STA. 159+60 RAMP OC

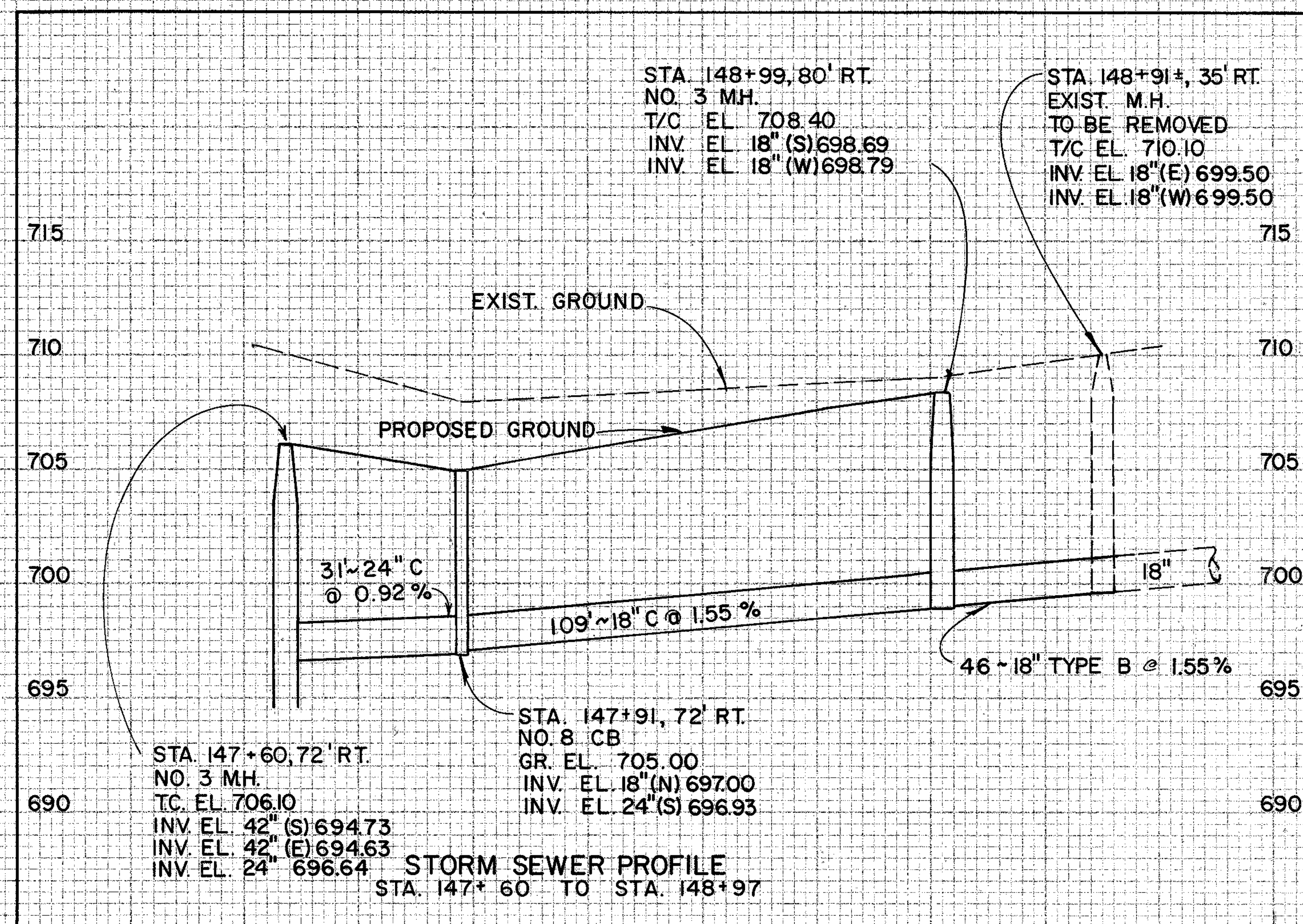
DRAINAGE PROFILES

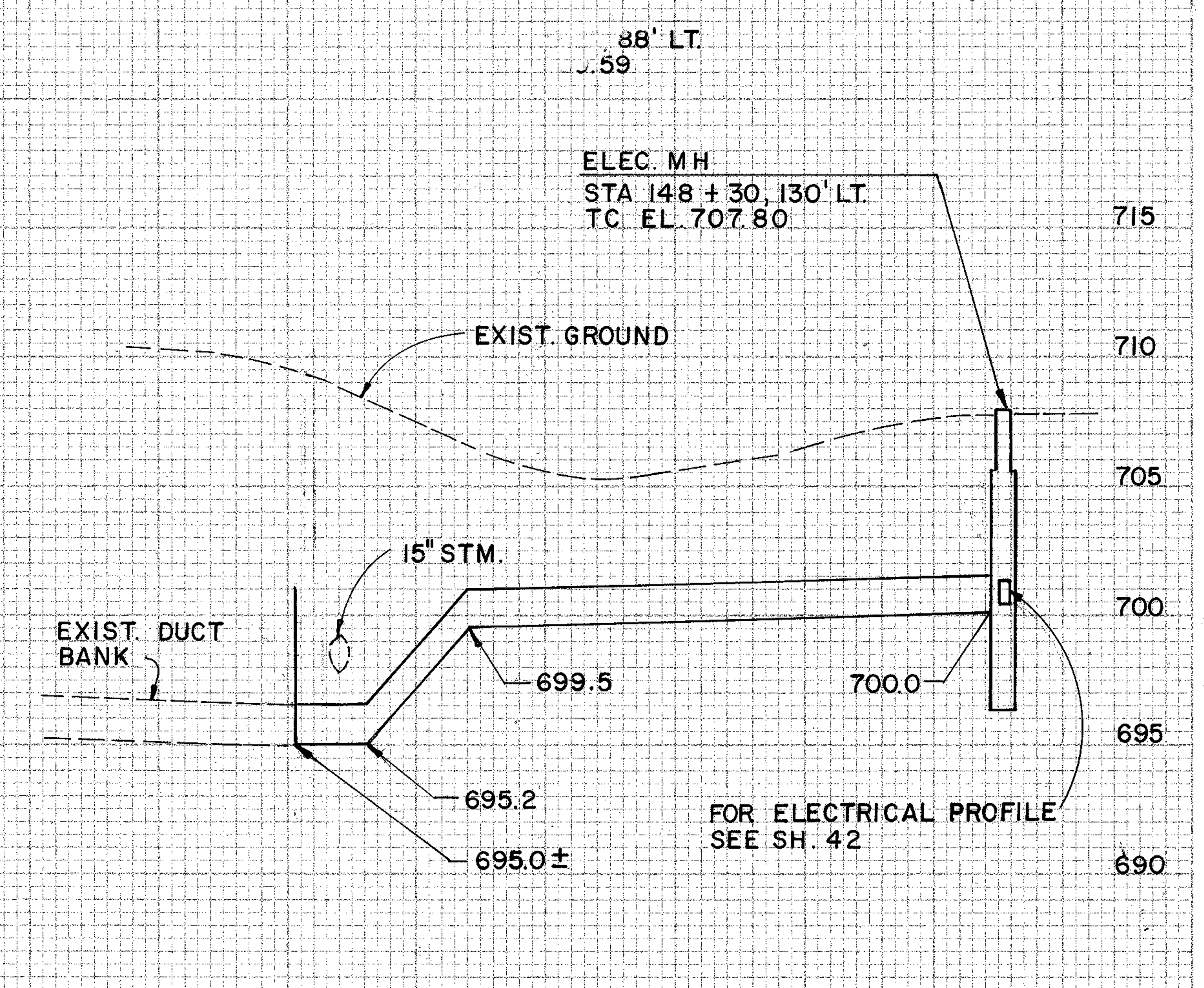
FRANKLIN COUNTY
FRA-670-1.25-C-3











ELECTRICAL SERVICE PROFILE

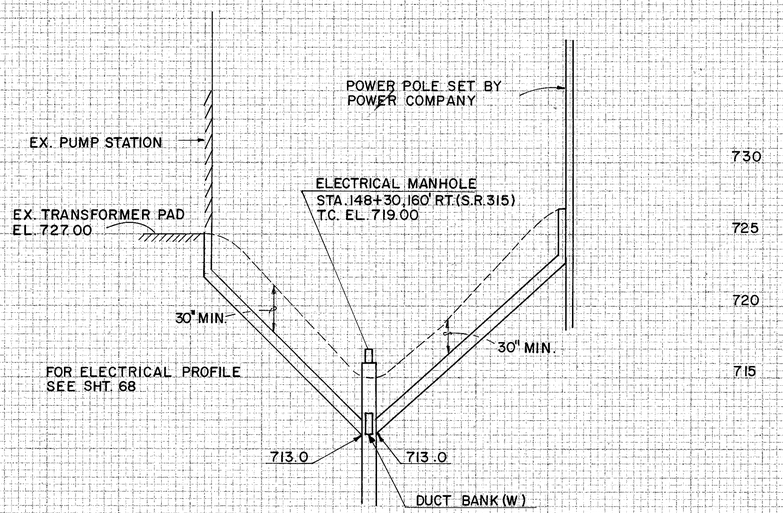
STA. 146+15 TO STA. 148+30

DRAINAGE PROFILES

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

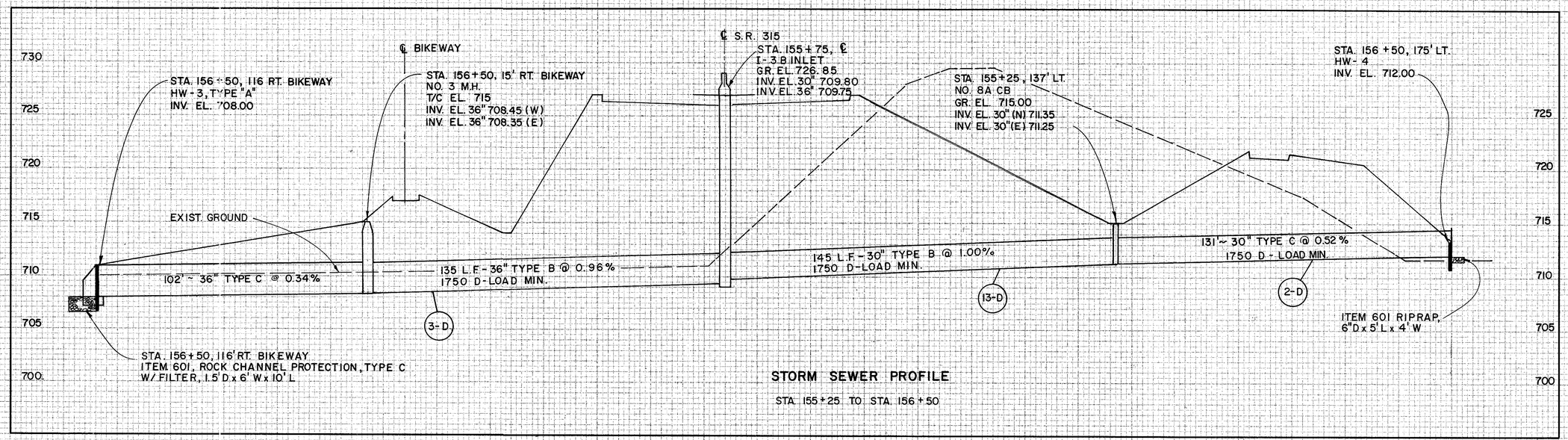
39
224

FRANKLIN COUNTY
FRA-670-1.25-C-3



ELECTRICL SERVICE PROFILE

STA. 148+30



STORM SEWER PROFILE

STA. 155+25 TO STA. 156+50

NORMAL FEDERAL AID SHEET
PLATE 3-FULL CROSS SECTION-FULL LINE
PRINTED IN U.S.A.

DRAINAGE PROFILES

OHIO FHWA REGION 5 FEDERAL PROJECT 40/224

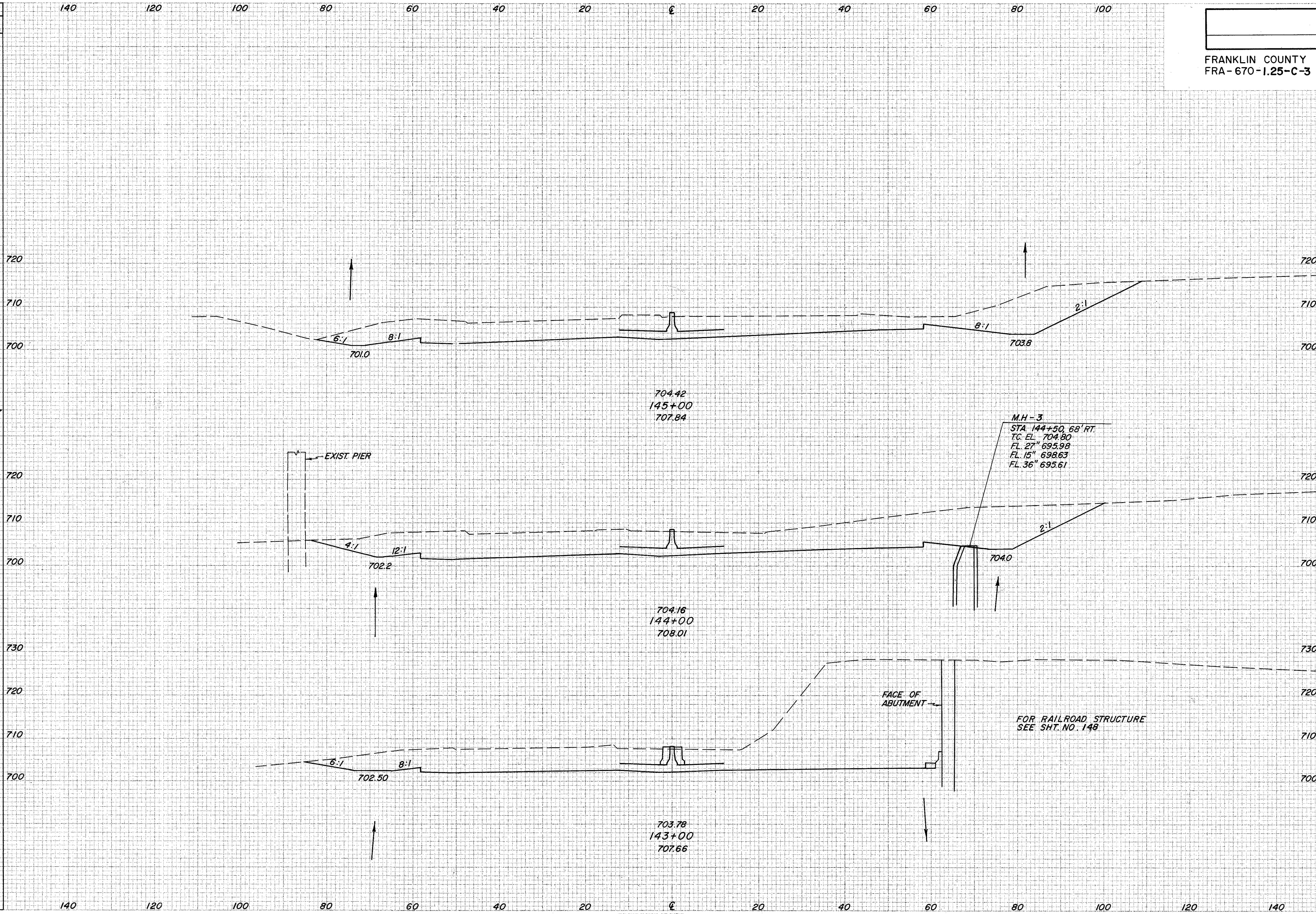
FRANKLIN COUNTY
FRA-670-1.25-C-3

PLATE 3-FULL CROSS SECTION-FULL LINE

S.R. 315 CROSS SECTIONS STA. 140+00 TO STA. 142+00

OHIO	41
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



SEEDING	
END WIDTH	SQ. YDS.
82	
	867
74	
	578
30	
	611

END AREA		VOLUME	
CUT	FILL	CUT	FILL
868	0		
		3454	0
997	0		
		4424	0
1392	0		
		5300	0

PLATE 3-FULL CROSS SECTION-FULL LINE

S.R. 315 CROSS SECTION STA. 143+00 TO STA. 145+00

OHIO	42
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
66	606	206	0	872	2
43	811	265	1	1787	2
103	1022	700	0	2539	0
81	906	671	0	2622	0
	4051 SHEET TOTAL			2850	0
		868	0		

EXIST. PIER COLUMNS
708.0
EX. 2-10" SAN.
EXIST. M.H. (TO BE REMOVED)
EXIST. 18" TO REMAIN IN PLACE
NO. 3 M.H.
STA. 148+99.80' RT.
GR. EL. 707.20
F.L. 18" 698.69 (S)
F.L. 18" 698.79 (W)
STA. 148+91±, 35' RT.
F.L. 699.50
707.0
SEE BIKEWAY SECTIONS STA. 149+00
℄ BIKEWAY
709.47
149+00
709.98
STA. 147+61.11, 86.48' RT
EXIST. M.H.
REMOVE
T/C EL. 706.38
FL. 694.56 42" (W)
FL. 694.46 42" (E)
FL. 696.58 36" (N)
SEE BIKEWAY SECTIONS STA. 148+00
ELECTRICAL MANHOLE
STA. 148+30, 130' LT.
T.C. 707.80
30" MIN.
704.6
705.0
715.0
FOR CONTINUATION OF DUCT BANK PROFILE SEE SHT. 68
700.0
DUCT BANK (S)
F.L. 700.0
FOR PROFILE SEE SHEET 38
18" STM.
EXIST. 42"
EXIST. 36"
TO PUMP STA.
706.96
148+00
708.14
M.H-3
STA. 147+00, 68' RT.
T.C. EL. 704.50
F.L. 42" 695.03
F.L. 15" (E) 698.50
F.L. 18" (W) 696.58
T-3B INLET APP. NO. 1
STA. 147+00, ℄
T.C. EL. 713.68
F.L. 18" (E) 696.86
F.L. 15" (W) 696.97
NO. 8 C.B.
STA. 147+00, 78' RT.
GR. EL. 703.40
F.L. 15" 698.69
NO. 8 C.B.
STA. 147+00, 88' LT.
GR. EL. 700.60
86 L.F. - 15" TYPE B @ 0.42%
64' L.F. - 18" TYPE B @ 0.44%
+00, 2' LT.
F.L. 696.97
+00, 2' RT.
F.L. 696.86
705.36
147+00
707.64
+00, 87' LT.
F.L. 697.33
+00, 66' RT.
F.L. 696.58
704.66
146+00
708.13
700.8
703.6

PLATE 3-FULL CROSS SECTION-FULL LINE
PRINTED IN U.S.A.

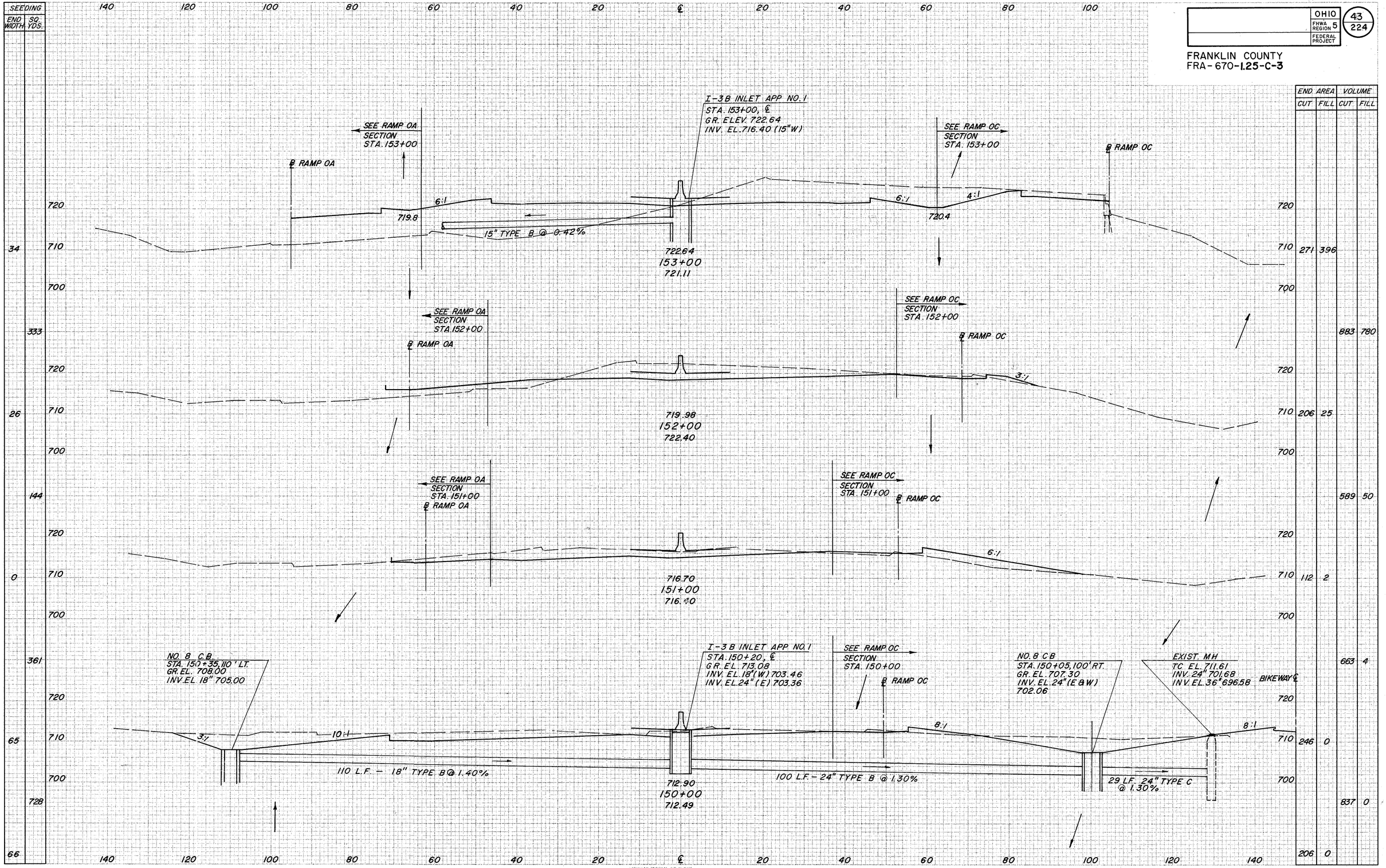
S.R. 315 CROSS SECTION STA. 146+00 TO STA. 149+00

OHIO
FHWA REGION 5
FEDERAL PROJECT
43
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.
34	271
333	883
26	206
144	589
0	112
361	663
65	246
728	837
66	206

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
	396		
			780
	25		
			50
2			
			4
0			
			0
0			



HIGHWAY TRAVEL AID SHEET
PLATE 3-FULL CROSS SECTION-FULL LINE
PRINTED IN U.S.A.

S.R. 315 CROSS SECTION STA. 150+00 TO STA. 153+00

OHIO | FHWA REGION 5 | FEDERAL PROJECT | 44 / 224

FRANKLIN COUNTY
FRA-670-I.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.
	7093
	1072
	1233
	783
78	
115	
107	
34	

SHEET TOTAL

SEE RAMP OB SECTION STA. 156+00

718.0

8:1 8:1 3:1

145 L.F.-30" TYPE B @ 1.00%
1750 D-LOAD MIN.

I-3B INLET APP NO. 1
STA. 155+75, ℄
GR. EL. 726.85
INV. 30" (W) 709.80
INV. 36" (E) 709.75

135 L.F.-30" TYPE B @ 1.00%
1750 D-LOAD MIN.

714.0

8:1 2:1

SEE BIKEWAY SECTION STA. 156+00

℄ BIKEWAY

727.00
156+00
712.22

See Ramp OB Section STA. 155+00

715.2

Ex. 27" STM. @ 0.92%

726.16
155+00
710.73

SEE BIKEWAY SECTION STA. 155+00

℄ BIKEWAY

2.5:1 2:1

SEE RAMP OA SECTION STA. 154+00

715.7

8:1 8:1 3:1

724.70
154+00
715.06

SEE BIKEWAY SECTION STA. 154+00

709.0

4:1

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
	1074		1749
131	155		
			243
0	240		
		913	651
493	111		
		1415	279

PLATE 3-FULL CROSS SECTION-FULL LINE

S.R. 315 CROSS SECTION STA. 154+00 TO STA. 156+00

S.R. 315 CROSS SECTION STA. 157+00 TO STA. 160+00

OHIO	46
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.
5433	
56	
939	
113	
1350	
130	
1267	
98	

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
		5970	18,713
61	850		
		546	3052
		234	798
		1261	2837
		447	734
		1931	2072
		596	385

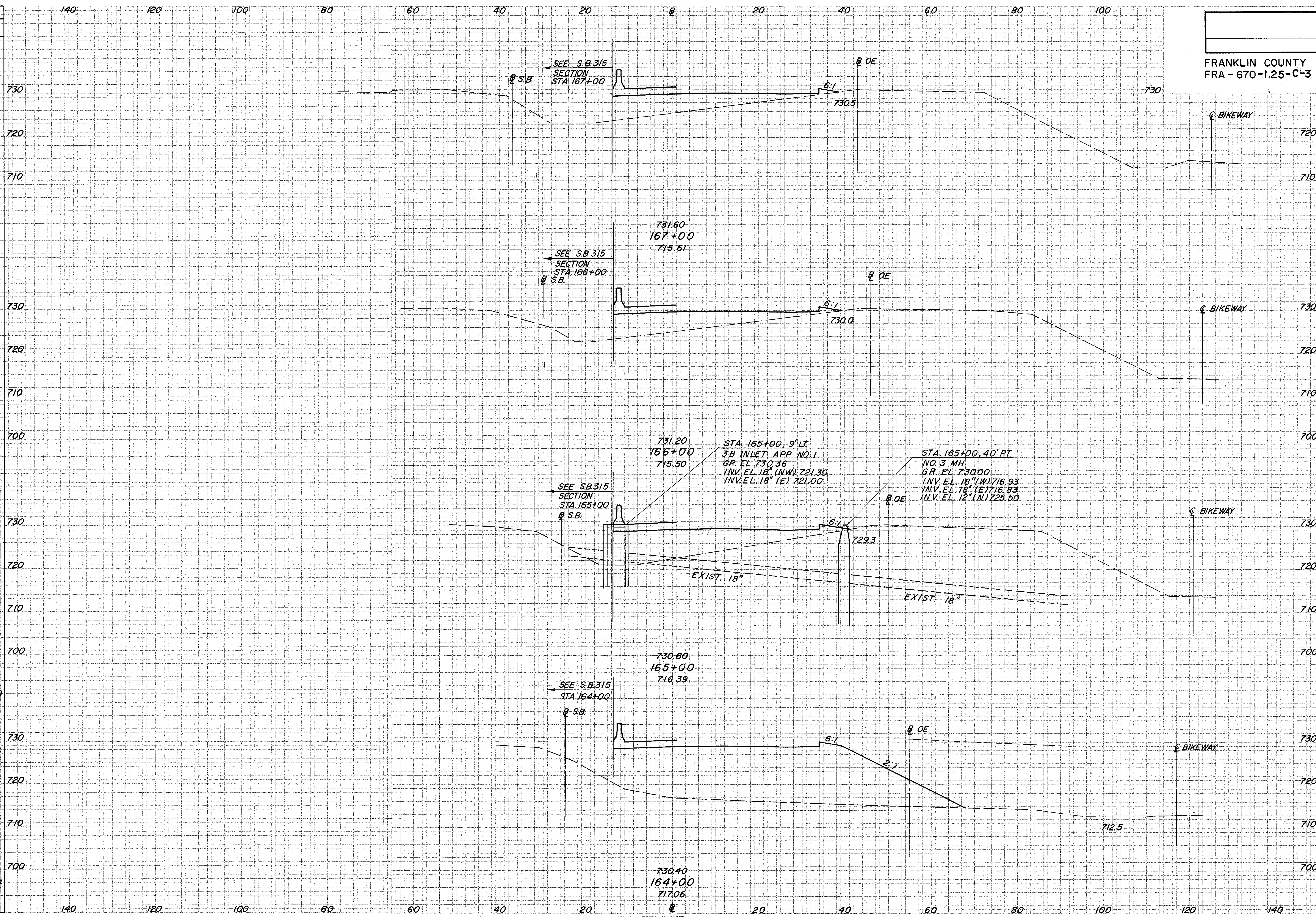
℄ ROAD OD
SHEET TOTAL
12:1
ROAD OD BRIDGE
729.56
163+00
719.51
℄ OE
SHEET TOTAL
2:1
℄ BIKEWAY
STA. 163+00
712.3
3 B INLET
STA. 162+00, ℄
GR. EL. 729.16
INV. EL. (15") 719.55
12:1
98'-15" TYPE C @ 10.00%
2:1
EX. CB-2-3
GR. EL. 712.00
℄ BIKEWAY
STA. 162+00
712.1
EXIST. 85'-24" @ 0.06%
15"
FL. 709.75
24" (E)
FL. 708.74
729.16
162+00
720.39
ROAD OD BRIDGE
EX. MH
STA. 161+06, 71' LT.
T.C. 725.20
EX. MH
STA. 161+30, 5' RT.
T.C. 729.70
EX. MH
T.C. 722.10
STA. 161+00, 72' RT.
℄ BIKEWAY
STA. 161+00
8:1
718.5
2:1
4:1
714.5
EX. 54" TYPE B STM. @ 0.40%
728.70
161+00
726.68

140 120 100 80 60 40 20 ℄ 20 40 60 80 100 120 140

S.R. 315 CROSS SECTION STA. 161+00 TO STA. 163+00

HIGHWAY FEDERAL AID SHEET
PLATE 3-FULL CROSS SECTION-FULL LINE
REPRODUCIBLE

FRANKLIN COUNTY
FRA - 670-1.25-C-3



SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
7		0	150		
	78			0	574
7		0	160		
	89			0	741
9		0	240		
	250			0	1944
36		0	810		
	444			0	2944
44		0	780		

N. B. S.R. 315 CROSS SECTION STA. 164+00 TO STA. 167+00

FRANKLIN COUNTY
FRA-670-1.25-C-3

PLATE 3-FULL CROSS SECTION-FULL LINE

N.B. S.R. 315 CROSS SECTION STA. 168+00 TO STA. 171+00

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

49
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING	
END WIDTH	SQ. YDS.
2	
22	
2	
22	
2	
78	
12	

140 120 100 80 60 40 20 ℄ 20 40 60 80 100

℄ OD

730
720
710

726.0

SEE N.B. SECTION STA. 167+00

℄ N.B.

℄ OE

731.60
167+00
728.70

EXIST. C.B-2-3
STA. 166+42, 72' LT.

725.5

SEE N.B. SECTION STA. 166+00

731.20
166+00
724.32

726.5

SEE N.B. SECTION STA. 165+00

730.80
165+00
724.40

727.7

SEE N.B. SECTION STA. 164+00

730.40
164+00
725.99

END AREA		VOLUME	
CUT	FILL	CUT	FILL
51	124		
		180	443
46	115		
		176	417
49	110		
		200	324
59	65		
		222	250
61	70		

BIKEWAY ℄

℄ BIKEWAY

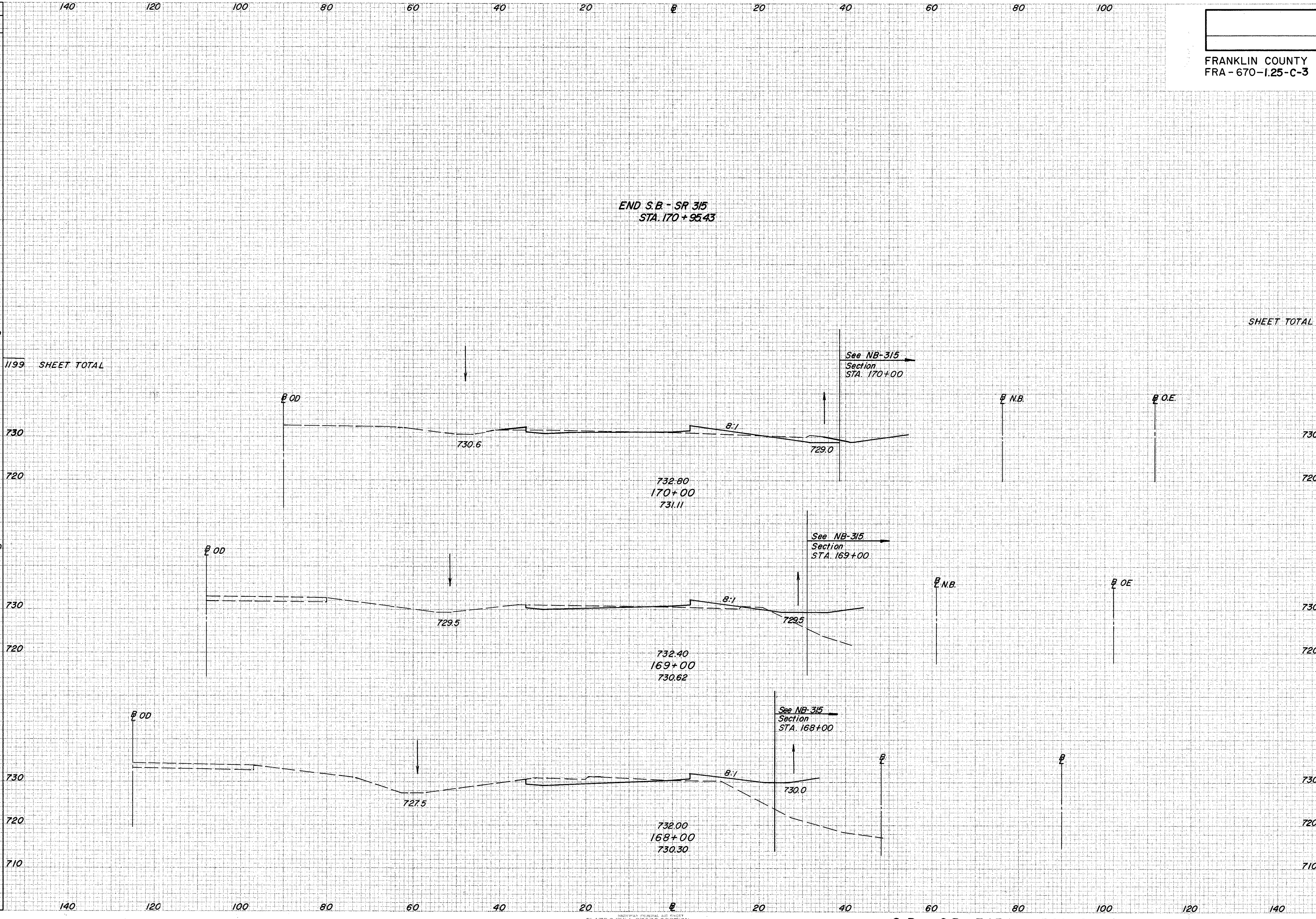
PLATE 3-FULL CROSS SECTION-FULL LINE

S.B.-S.R. 315 CROSS SECTION STA. 164+00 TO STA. 167+00

OHIO	50/224
FHWA REGION 5	
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING	
END WIDTH	SQ. YDS.
0	
	239
	1199 SHEET TOTAL
43	
	400
29	
	283
22	
	133



END AREA		VOLUME	
CUT	FILL	CUT	FILL
0	0		
SHEET TOTAL		1194	2033
		46	33
25	18		
		96	94
27	33		
		115	152
35	49		
		159	320
51	124		

FINAL SURVEY — NOTE BOOK NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

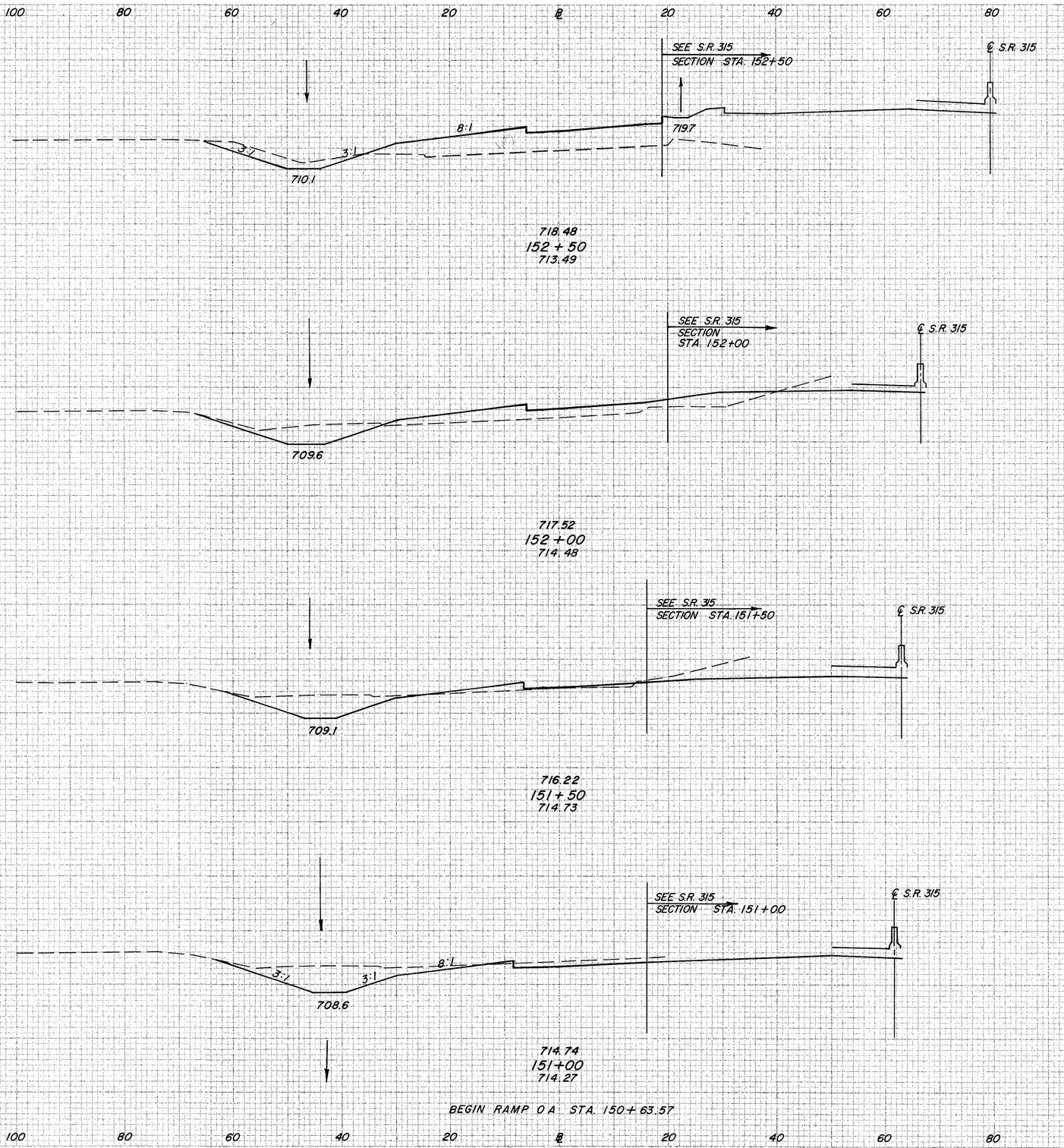
ORIGINAL SURVEY — NOTE BOOK NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

S.B. - S.R. 315 CROSS SECTION STA. 168+00 TO STA. 170+00

OHIO	51
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.	STA.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
		152+50				
63	358		35	189	97	259
66	347	152+00	70	91	130	102
59	325	151+50	70	19	216	20
58		151+00	163	3		

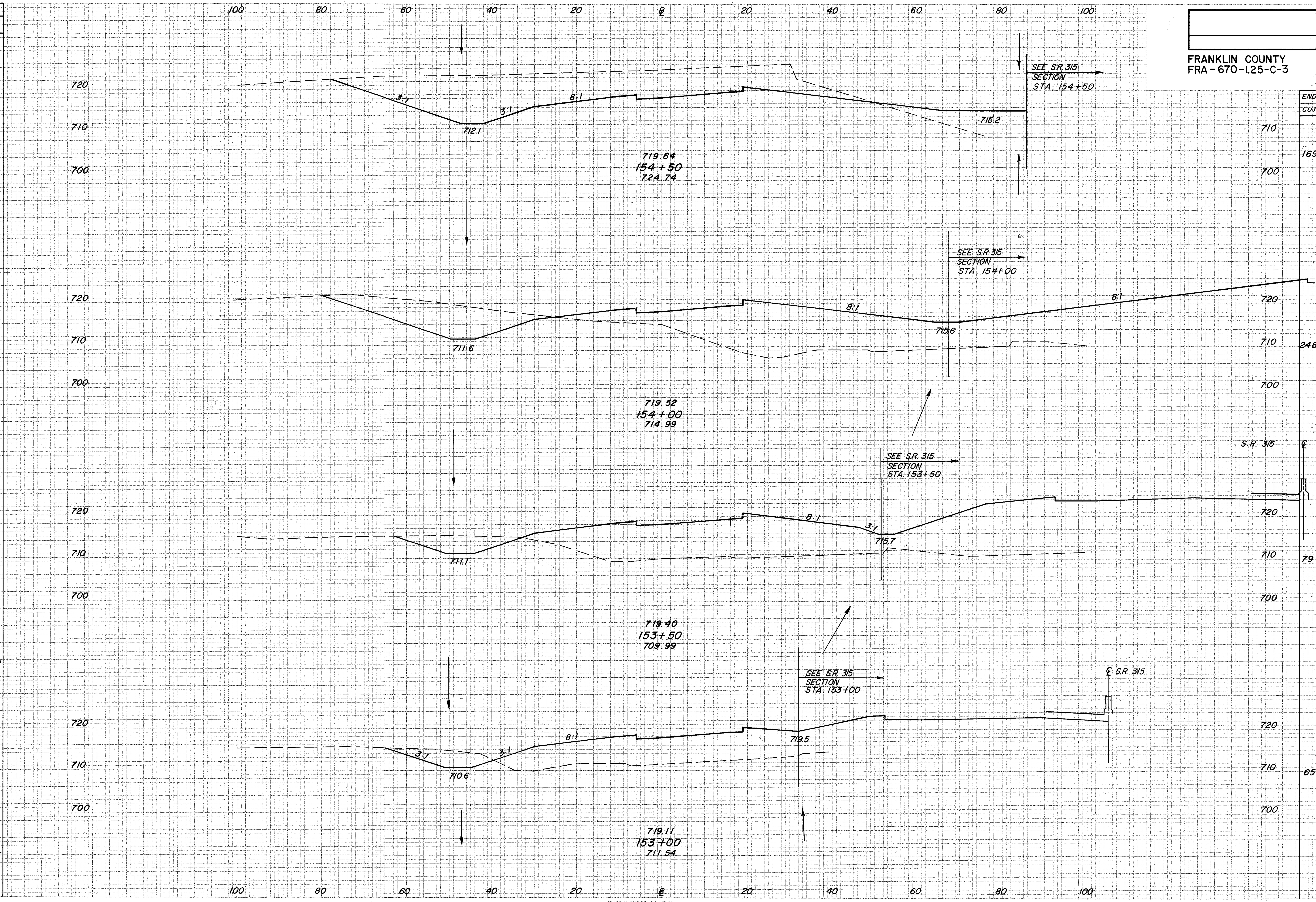


RAMP 0A CROSS SECTION STA. 151+00 TO STA. 152+50

PLATE 3-FULL CROSS SECTION-FULL LINE
THE TOLEDO EDISON COMPANY
TOLEDO, OHIO

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.
142	
	744
126	
	611
94	
	472
76	
	386



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
169	124		
		386	713
248	646		
		303	1159
79	606		
		133	954
65	424		
		93	568

PLATE 3-FULL CROSS SECTION-FULL LINE

RAMP OA CROSS SECTION STA. 153+00 TO STA. 154+50

OHIO	53/224
FHWA REGION 5	
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

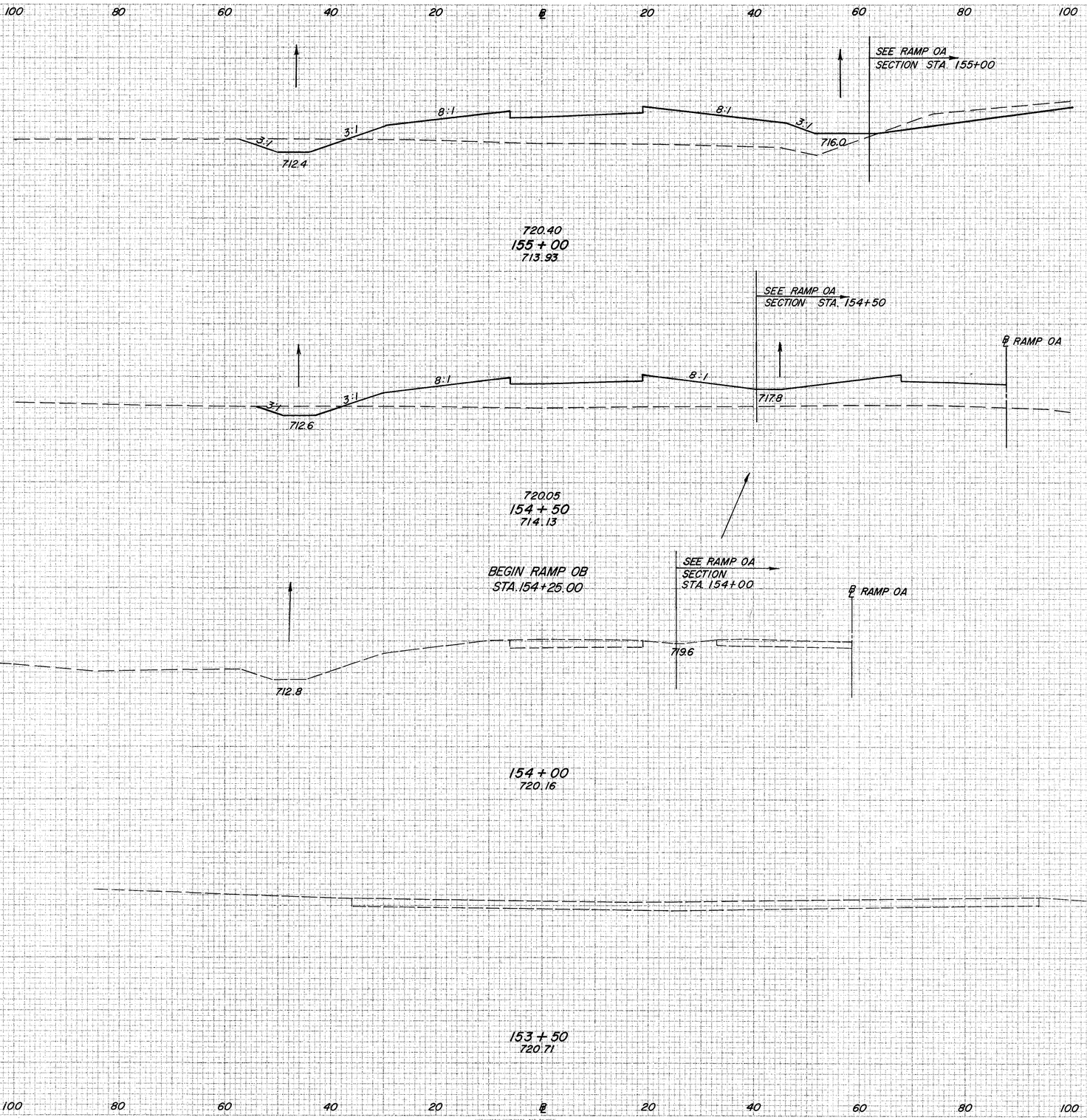
PLATE 3-FULL CROSS SECTION-FULL LINE

RAMP OA CROSS SECTION STA. 155+00 TO STA. 156+50

	OHIO	54
	FHWA REGION 5	224
	FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.		END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
		155+00				
95	467	154+50	26	436	40	695
73	203	154+25.00	17	315	16	292
0		154+00	0	0	0	0
		153+50	0	0	0	0

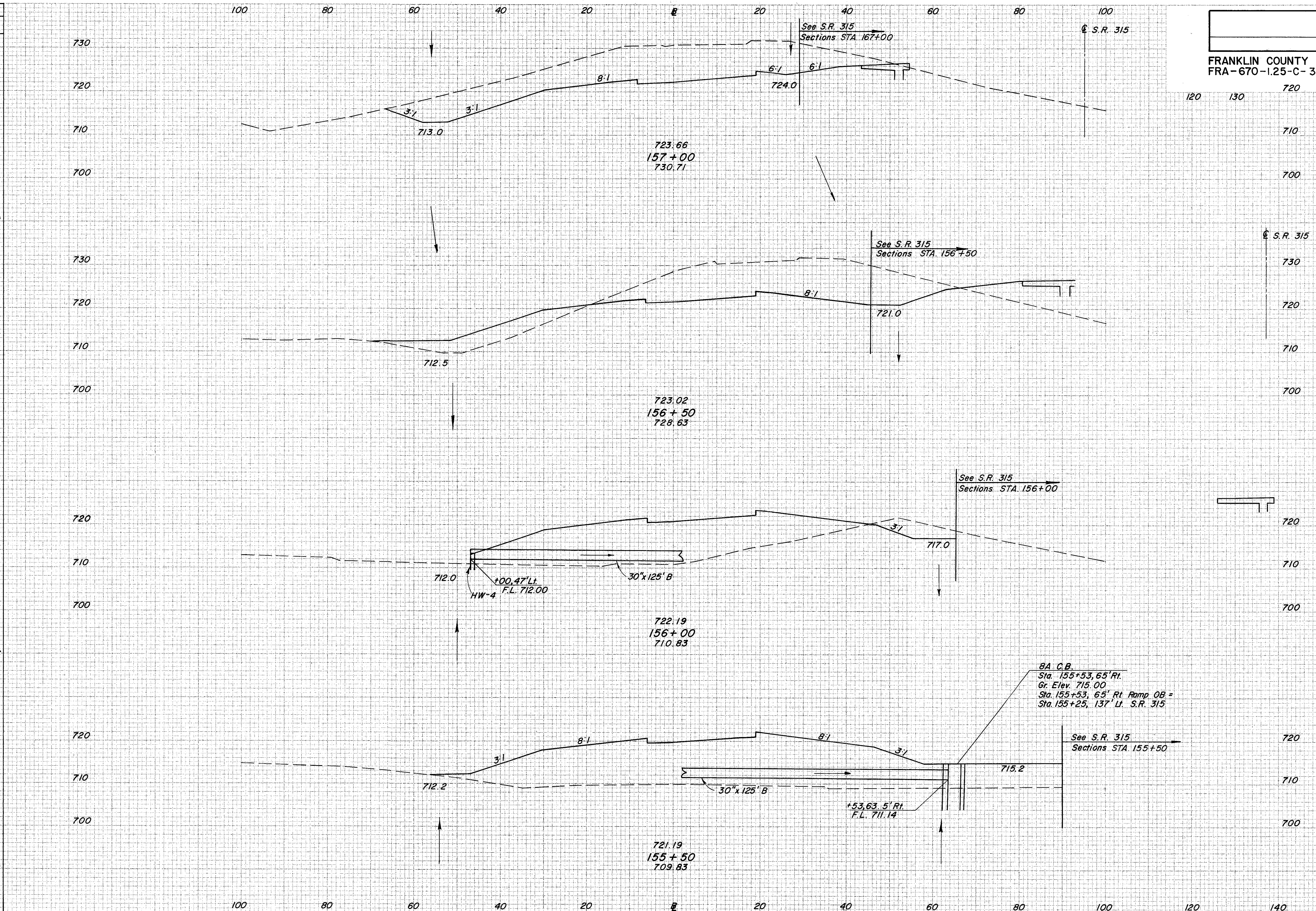


HIGHWAY FEDERAL AID SHEET
PLATE 3-FULL CROSS SECTION-FULL LINE
"PRISLOPE"
PRINTED IN U.S.A.

RAMP OB CROSS SECTION STA. 153+50 TO STA. 155+00

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING	
END WIDTH	SQ. YDS.
71	
	458
94	
	514
91	
	606
127	
	617



END AREA		VOLUME	
CUT	FILL	CUT	FILL
608	0		
		950	112
418	121		
		437	718
54	654		
		50	1661
0	1140		
		24	1459

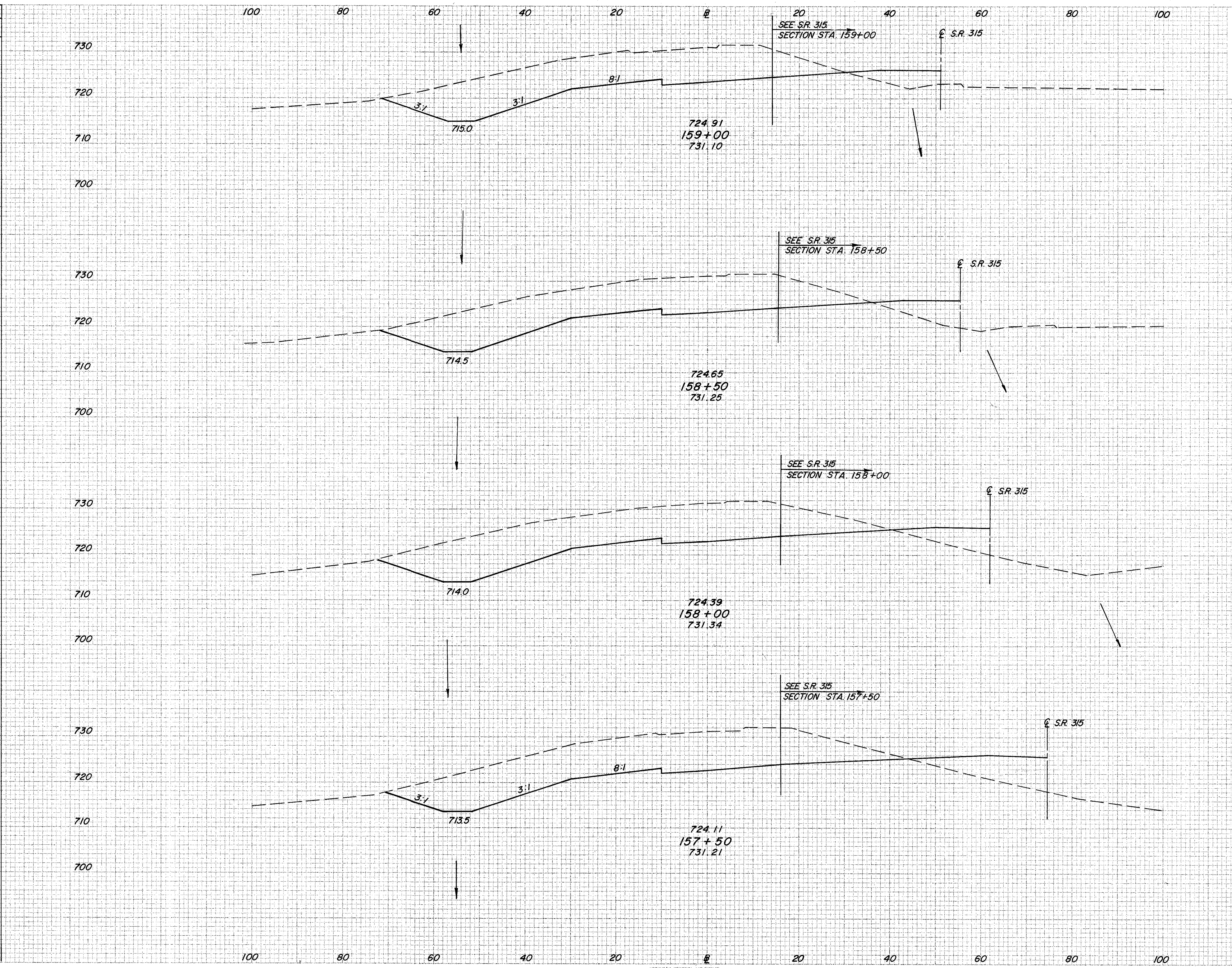
PLATE 3-FULL CROSS SECTION-FULL LINE

RAMP OB CROSS SECTION STA. 155+50 TO STA. 157+00

OHIO	FHWA REGION 5	FEDERAL PROJECT

56
224

FRANKLIN COUNTY
FRA-670-1.25-C-3



SEEDING END WIDTH	SEEDING SQ. YDS.
65	
	364
66	
	367
66	
	361
64	
	375

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
591	0		
		1115	0
613	0		
		1173	0
654	0		
		1214	0
657	0		
		1171	0

PLATE 3-FULL CROSS SECTION-FULL LINE

RAMP OB CROSS SECTION STA. 157+50 TO STA. 159+00

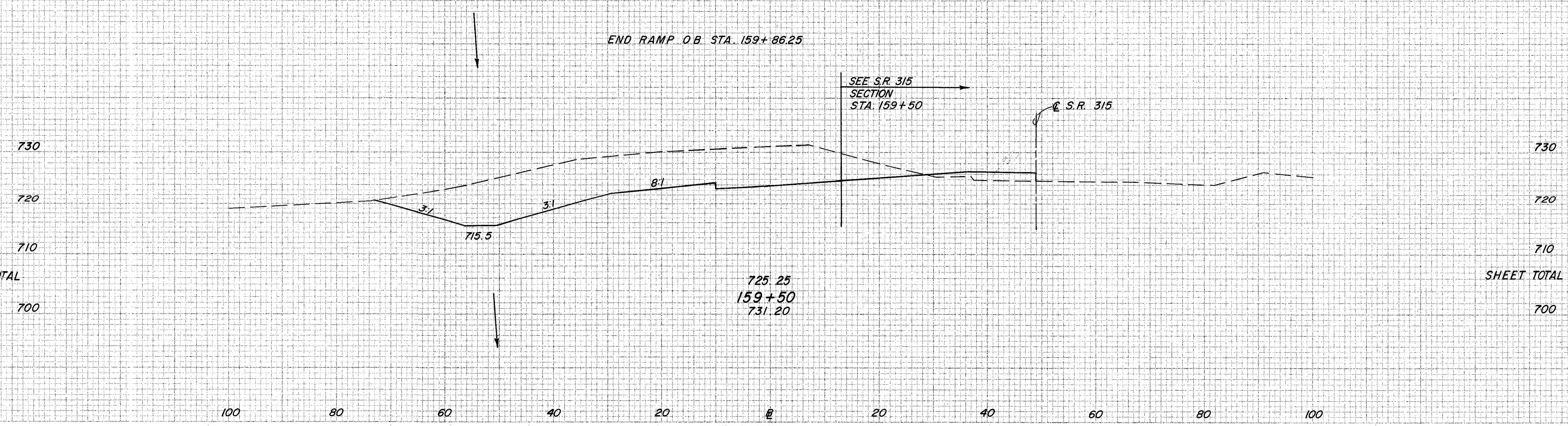
OHIO	57
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING	
END WIDTH	SQ. YDS.
67	
SHEET TOTAL	3707
	367

FINAL SURVEY — NOTE BOOK NO. — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK NO. — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY — DATE



END AREA		VOLUME	
CUT	FILL	CUT	FILL
580	0		
SHEET TOTAL		7274	4937
		1084	0
591	0		

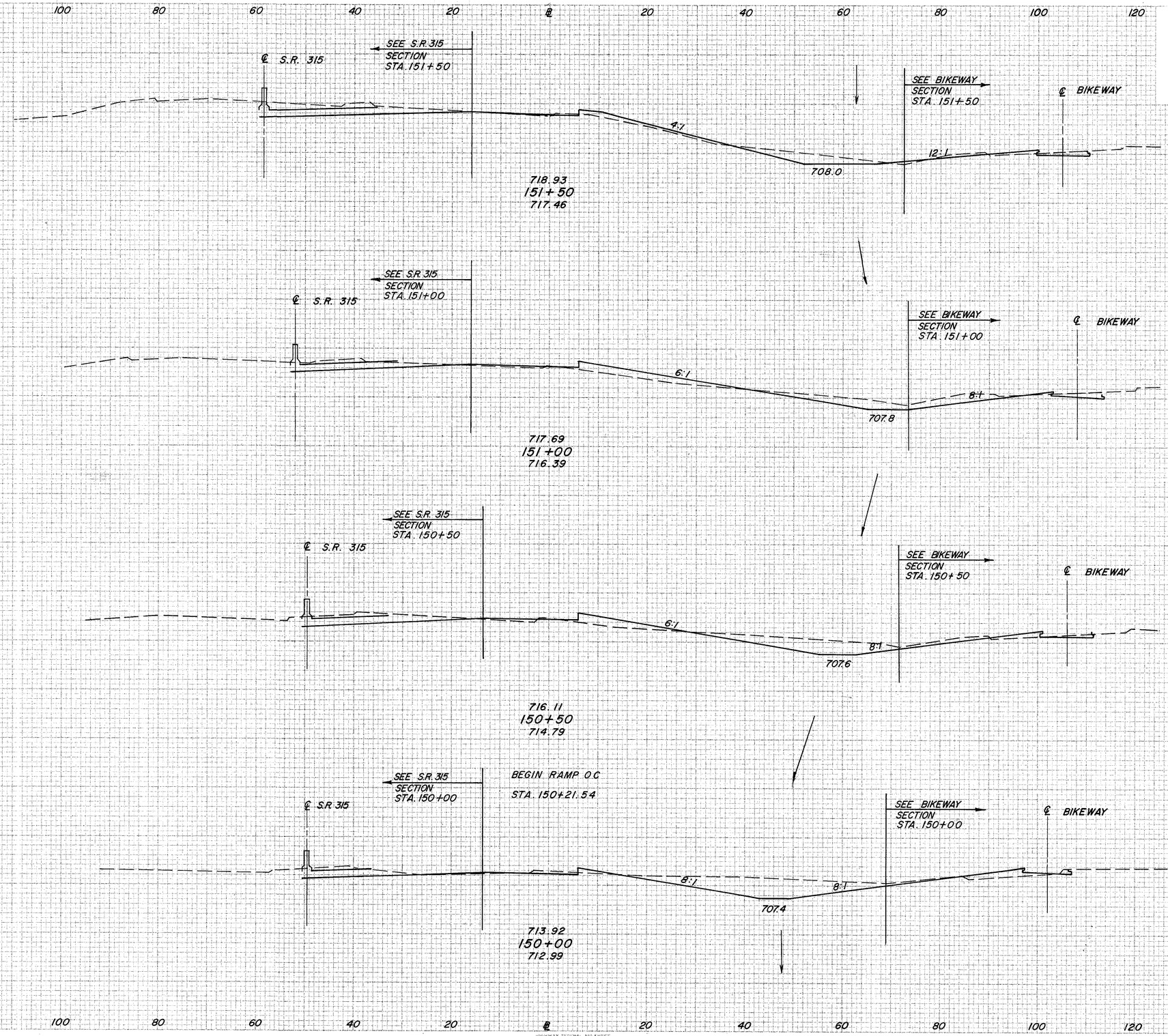
PLATE 3-FULL CROSS SECTION

RAMP OB CROSS SECTION STA. 159+50

OHIO	58
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
68	381	46	29	81	68
69	375	41	44	114	69
66	361	82	31	202	33
64		136	5		



RAMP OC CROSS SECTION STA. 150+00 TO STA. 151+50

PLATE 3-FULL CROSS SECTION-FULL LOAD

	OHIO	59
	FHWA REGION 5	224
	FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
0		0	0		
				95	41
167					
				103	44
60					
				132	55
308					
				40	15
51					
				44	25
197					
				8	12
20					
				50	28
244					

℄ S.R 315
℄ BIKEWAY STA. 153+50
2:1 10:1 8:1
708.8
725.16
153+50
725.48
SEE S.R 315 SECTION STA. 153+00
℄ S.R. 315
6:1 4:1
720.4
SEE BIKEWAY SECTION STA. 153+00
℄ BIKEWAY
2:1 8:1 8:1
708.6
723.34
153+00
723.46
℄ S.R. 315
SEE S.R. 315 SECTION STA. 152+50
6:1 6:1
721.0
3:1
SEE BIKEWAY SECTION STA. 152+50
℄ BIKEWAY
12:1
708.4
721.67
152+50
721.39
℄ S.R. 315
SEE S.R. 315 SECTION STA. 152+00
3:1
SEE BIKEWAY SECTION STA. 152+00
℄ BIKEWAY
12:1
708.2
720.25
152+00
719.35

120 100 80 60 40 20 ℄ 20 40 60 80 100 120

730 720 710 700

ORIGINAL SURVEY — SURVEYED, PLOTTED, NOTE REVISIONS, NO., DATE, BY

FINAL SURVEY — SURVEYED, PLOTTED, NOTE REVISIONS, NO., DATE, BY

HIGHWAY FEDERAL AID SERIES
PLATE 3-FULL CROSS SECTION-FULL LINE
SPTELFONE
PRINTED IN U.S.A.

RAMP OC CROSS SECTION STA. 152+00 TO STA. 153+50

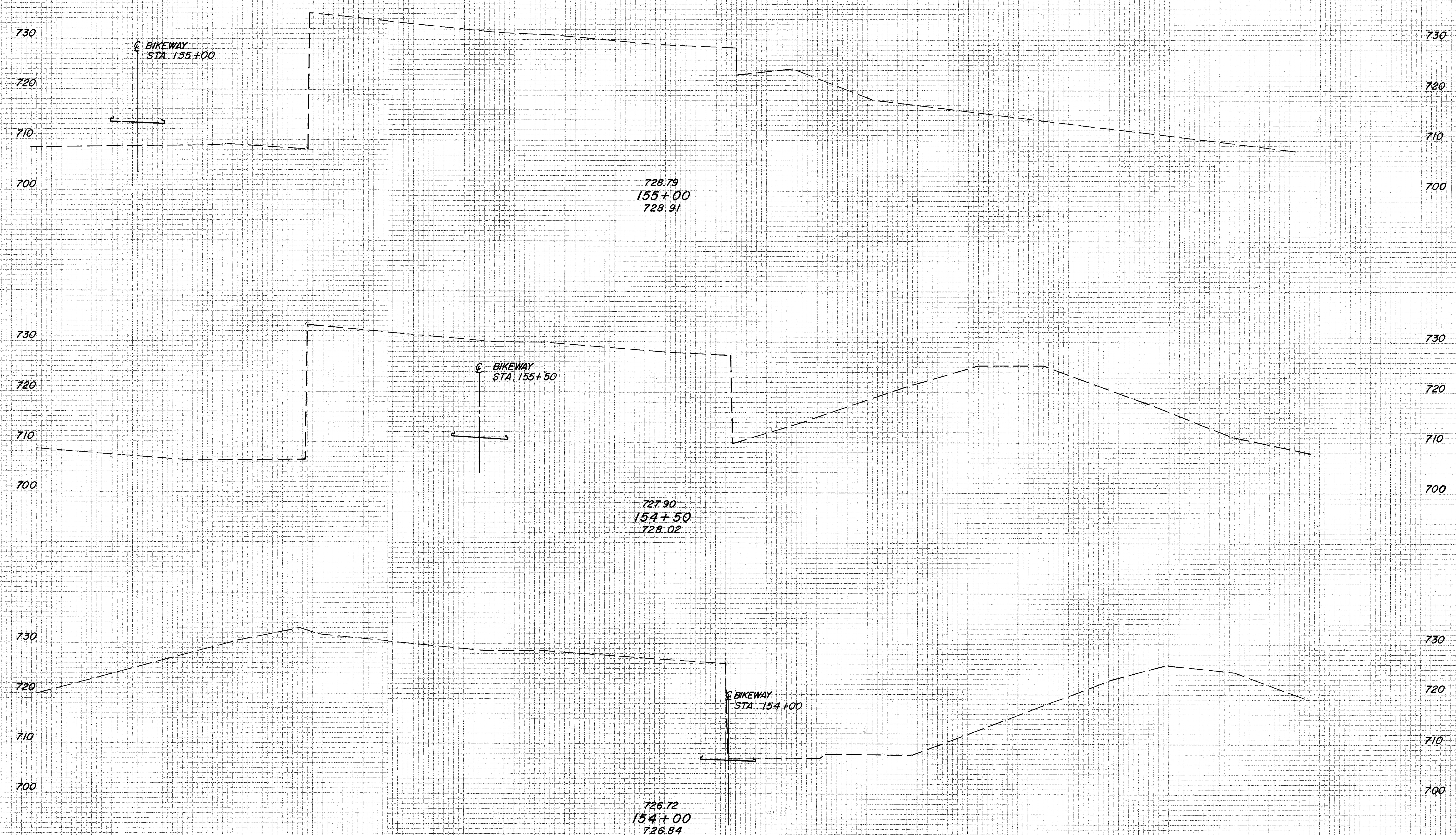
OHIO	60
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C - 3

SEEDING	
END WIDTH	SQ. YDS.
0	
	0
0	
	0
0	
	0

END AREA		VOLUME	
CUT	FILL	CUT	FILL
0	0		
		0	0
0	0		
		0	0
0	0		
		0	0

120 100 80 60 40 20 ℄ 20 40 60 80 100 120



120 100 80 60 40 20 ℄ 20 40 60 80 100 120

FINAL SURVEY

ORIGINAL SURVEY

PLATE 3-FULL CROSS SECTION FULL LINE

RAMP OC CROSS SECTION STA. 154+00 TO STA. 155+00

OHIO FHWA REGION 5 FEDERAL PROJECT

61 / 224

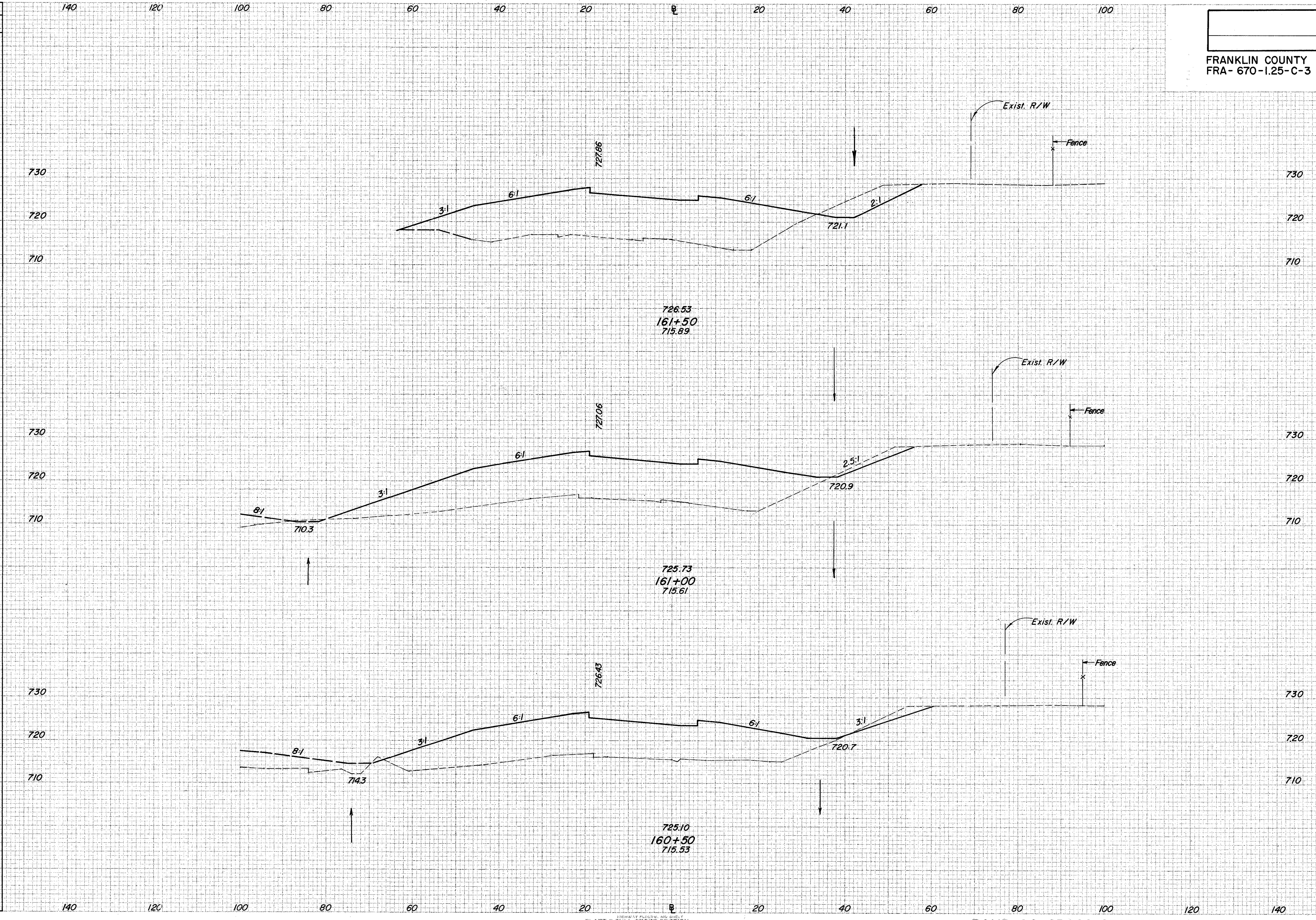
FRANKLIN COUNTY
FRA-670-1.25-C-3

PLATE 3-FULL CROSS SECTION-FULL LINE

RAMP OC CROSS SECTION STA. 158+50 TO STA. 160+00

OHIO	FHWA REGION 5	FEDERAL PROJECT	62/224

FRANKLIN COUNTY
FRA- 670-1.25-C-3



SEEDING	
END WIDTH	SQ. YDS.
104	
	625
121	
	644
111	
	614

END AREA		VOLUME	
CUT	FILL	CUT	FILL
68	782		
		86	1551
25	893		
		50	1515
29	743		
		63	743

PLATE 3-FULL CROSS SECTION

RAMP OC CROSS SECTION STA. 160+50 TO STA. 161+50

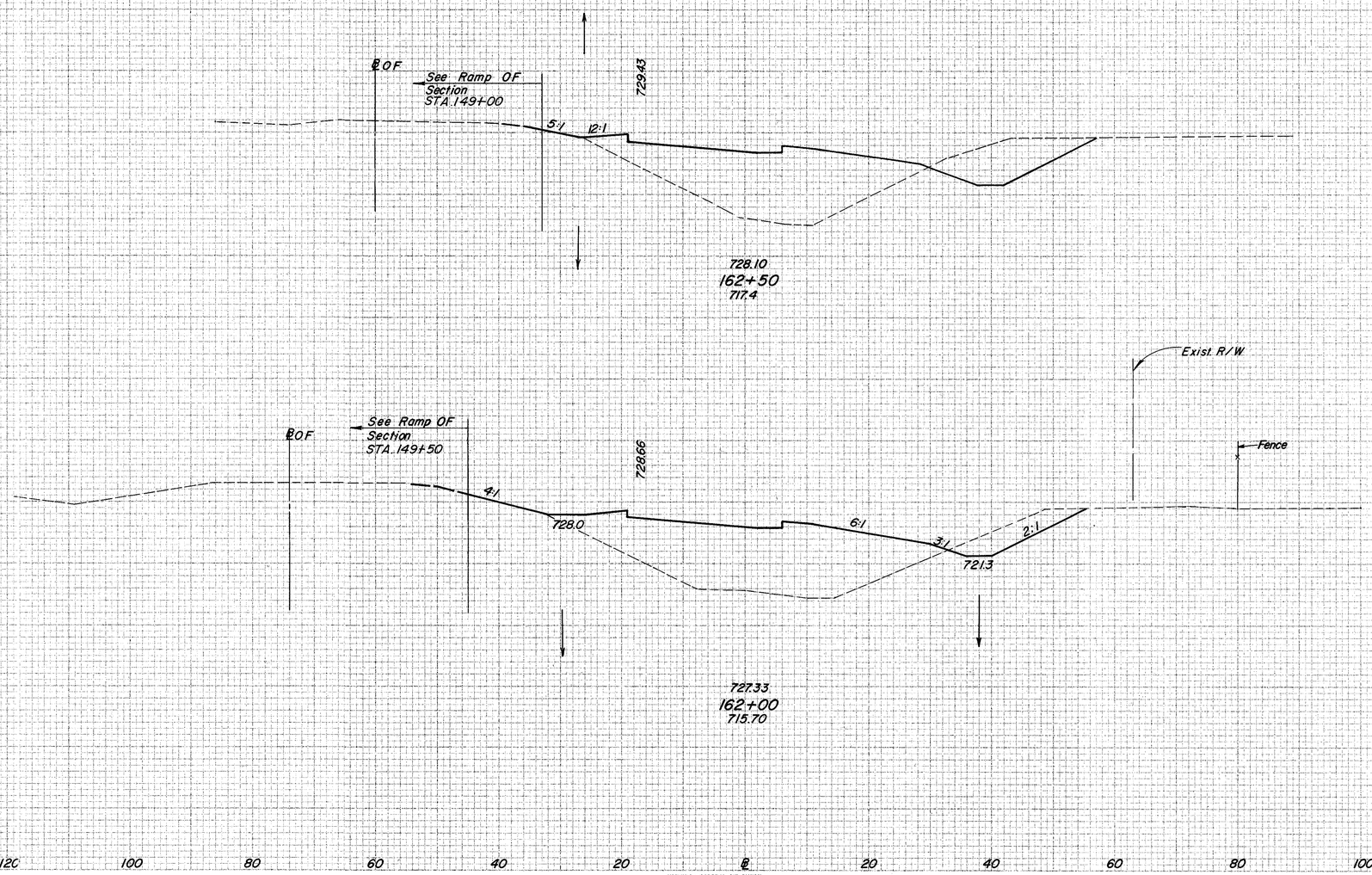
SEEDING	
END WIDTH	SQ. YDS.
70	417
80	511

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

63
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

END AREA		VOLUME	
CUT	FILL	CUT	FILL
109	414		
		171	845
76	499		
		133	1186



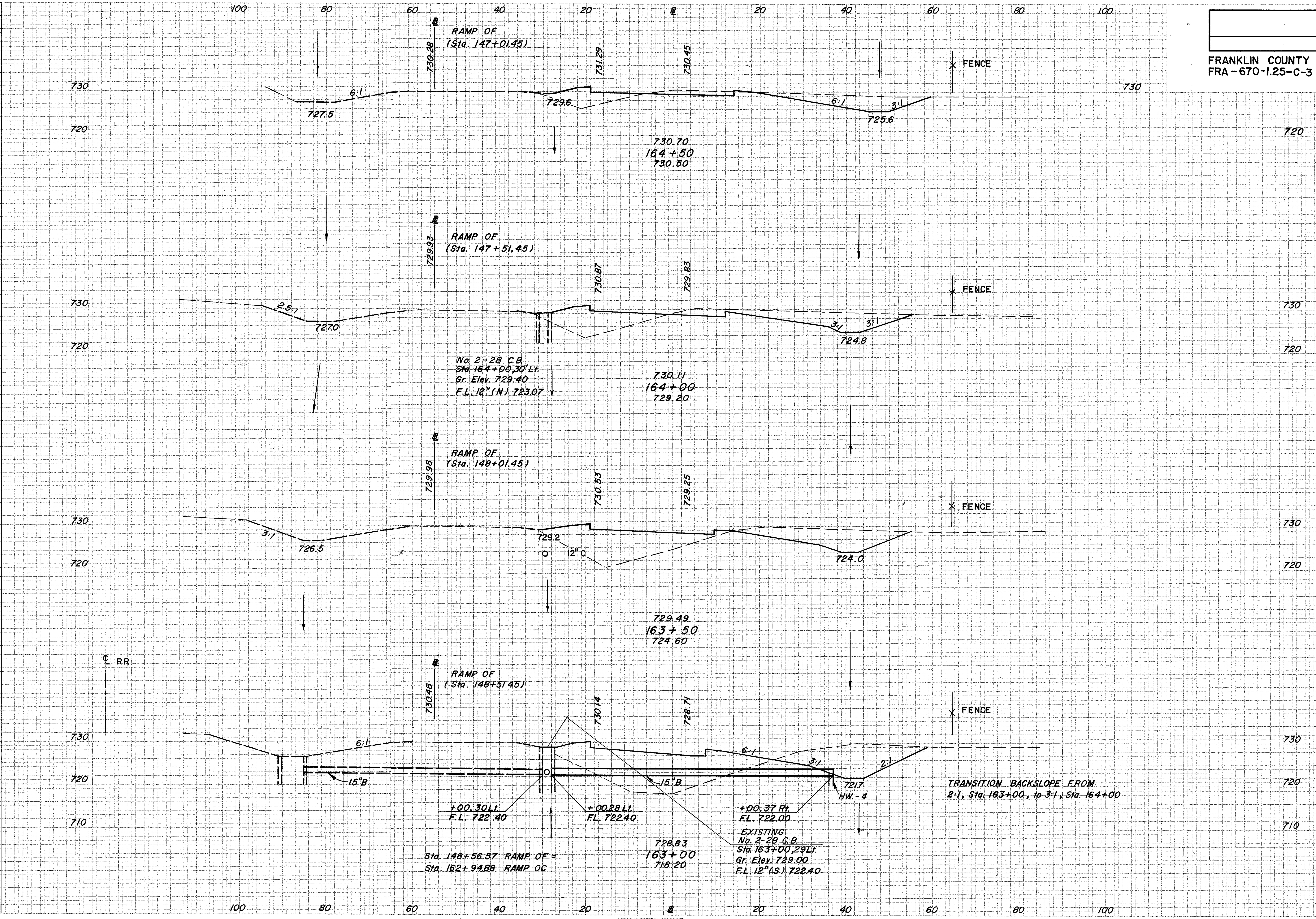
RAMP OC CROSS SECTION STA. 162+00 TO STA. 162+50

HIGHWAY PROGRAM AID SHEET
PLATE 3-FULL CROSS SECTION-FULL LINE
TELEDYNE
PRINTED IN U.S.A.

OHIO | FHWA REGION 5 | FEDERAL PROJECT | 64 / 224

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.
59	
	333
61	
	342
62	
	367
70	
	389



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
104	56		
		203	143
115	99		
		223	275
126	198		
		264	480
159	320		
		248	680

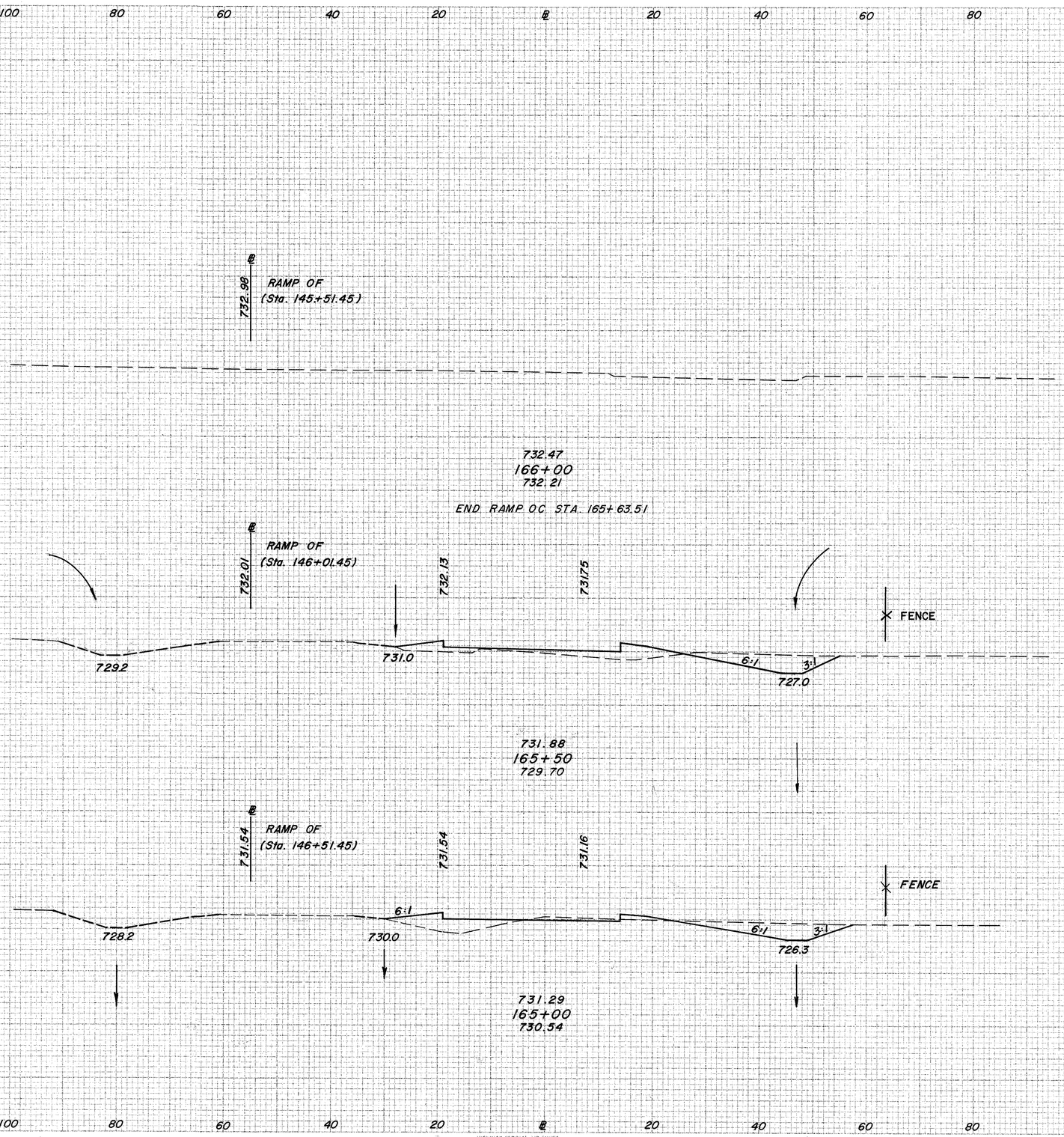
PLATE 3-FULL CROSS SECTION

RAMP OC CROSS SECTION STA. 163+00 TO STA. 164+50

SEEDING	
END WIDTH	SQ. YDS.
	6123 SHEET TOTAL
156	
56	
322	
60	
331	

OHIO | FHWA REGION 5 | FEDERAL PROJECT | 65 | 224

FRANKLIN COUNTY
FRA-670-1.25-C-3



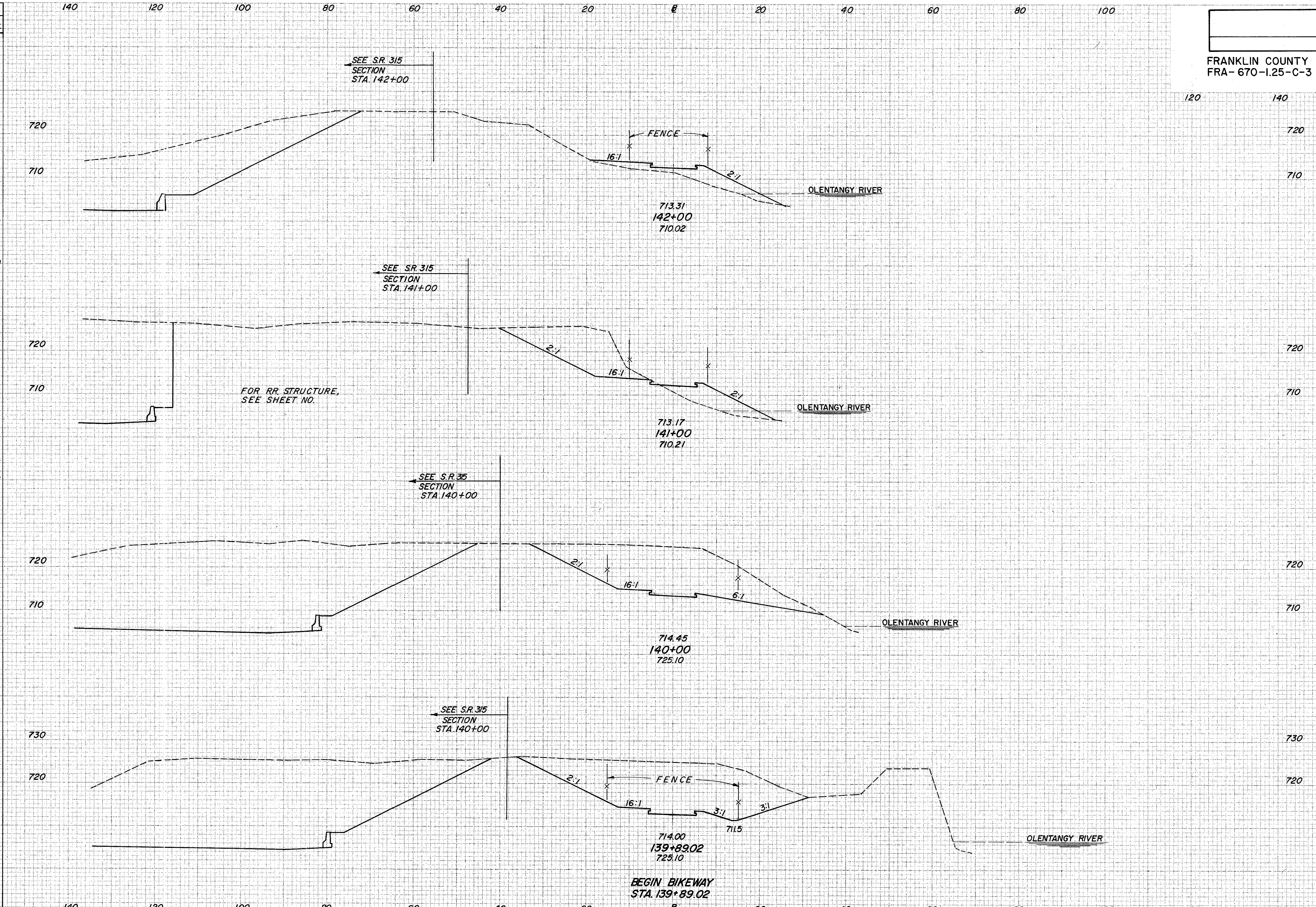
END AREA		VOLUME	
CUT	FILL	CUT	FILL
0	0		
		1965	8614
		69	53
75	57		
		128	104
63	55		
		155	103

SHEET TOTAL

HIGHWAY PERSONAL AID SHEET
PLATE 3-FULL CROSS SECTION-FULL LINE
"IN TELEGRAPH"
PRINTED IN U.S.A.

RAMP OC CROSS SECTION STA. 165+00 TO STA. 166+00

FRANKLIN COUNTY
FRA-670-1.25-C-3



Station	Seeding End Width	Seeding Sq. Yds.	End Area Cut	End Area Fill	Volume Cut	Volume Fill
142+00	33		0	85		
		439			363	294
141+00	46		196	74		
		617			1200	137
140+00	65		452	0		
		79			198	0
139+89.02	65		521	0		

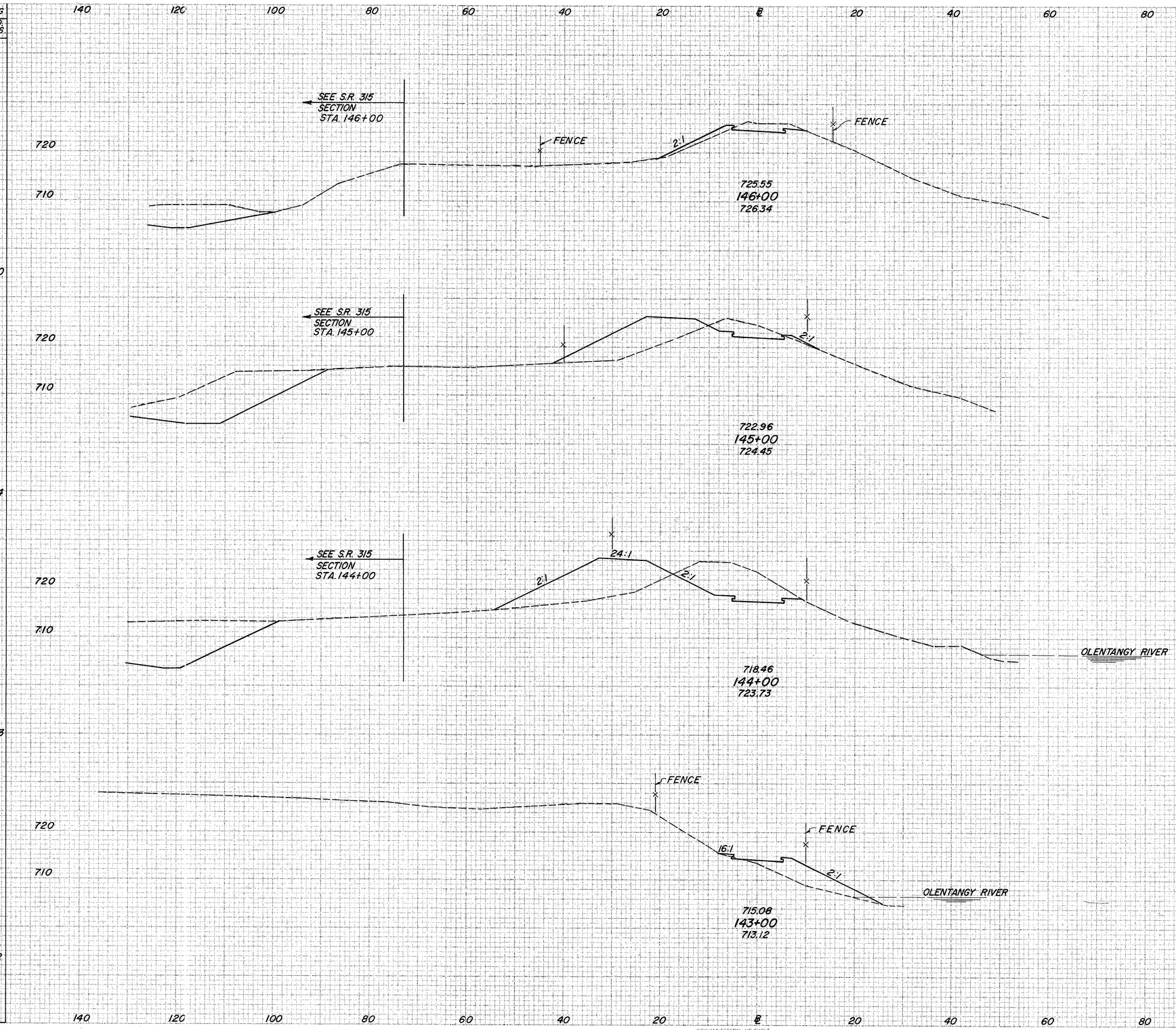
PLATE 3-FULL CROSS SECTION

BIKEWAY CROSS SECTION STA. 139+89.02 TO STA. 142+00

OHIO	67
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.
	27
	450
	54
	644
	62
	483
	25
	322



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
21	17		
		107	283
37	136		
		309	589
130	182		
		243	443
1	57		
		2	263

HIGHWAY FEDERAL AID SHEET
PLATE 3-FULL CROSS SECTION-FULL LINE
MICROFILMED
PRINTED IN U.S.A.

BIKEWAY CROSS SECTION STA. 143+00 TO STA. 146+00

OHIO	68
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
	5129 SHEET TOTAL			2501	7268
	34	0	36		
	511			0	611
	58	0	294		
	650			0	1256
	59	0	384		
	556			20	785
	41	11	40		
	378			59	106

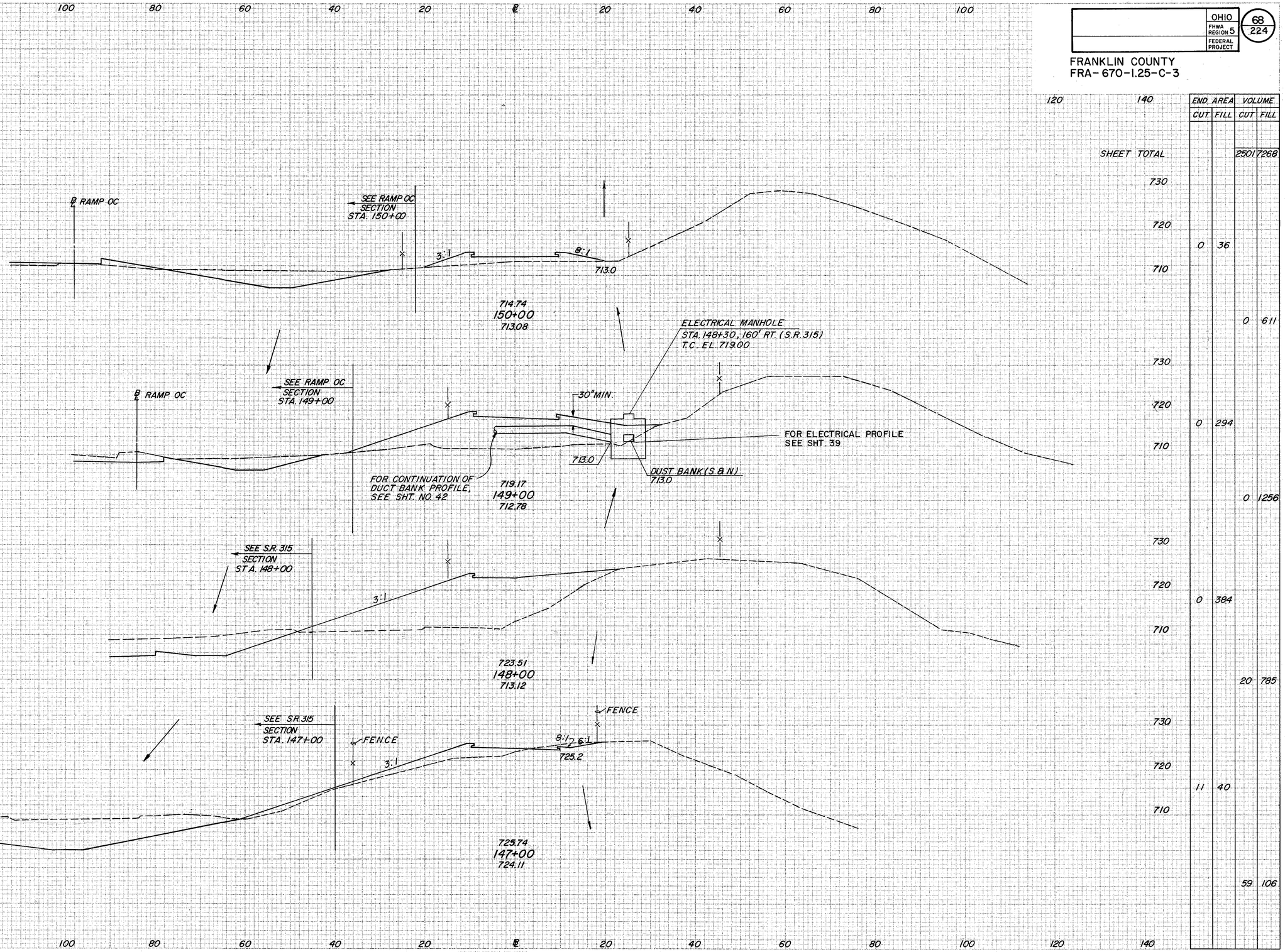


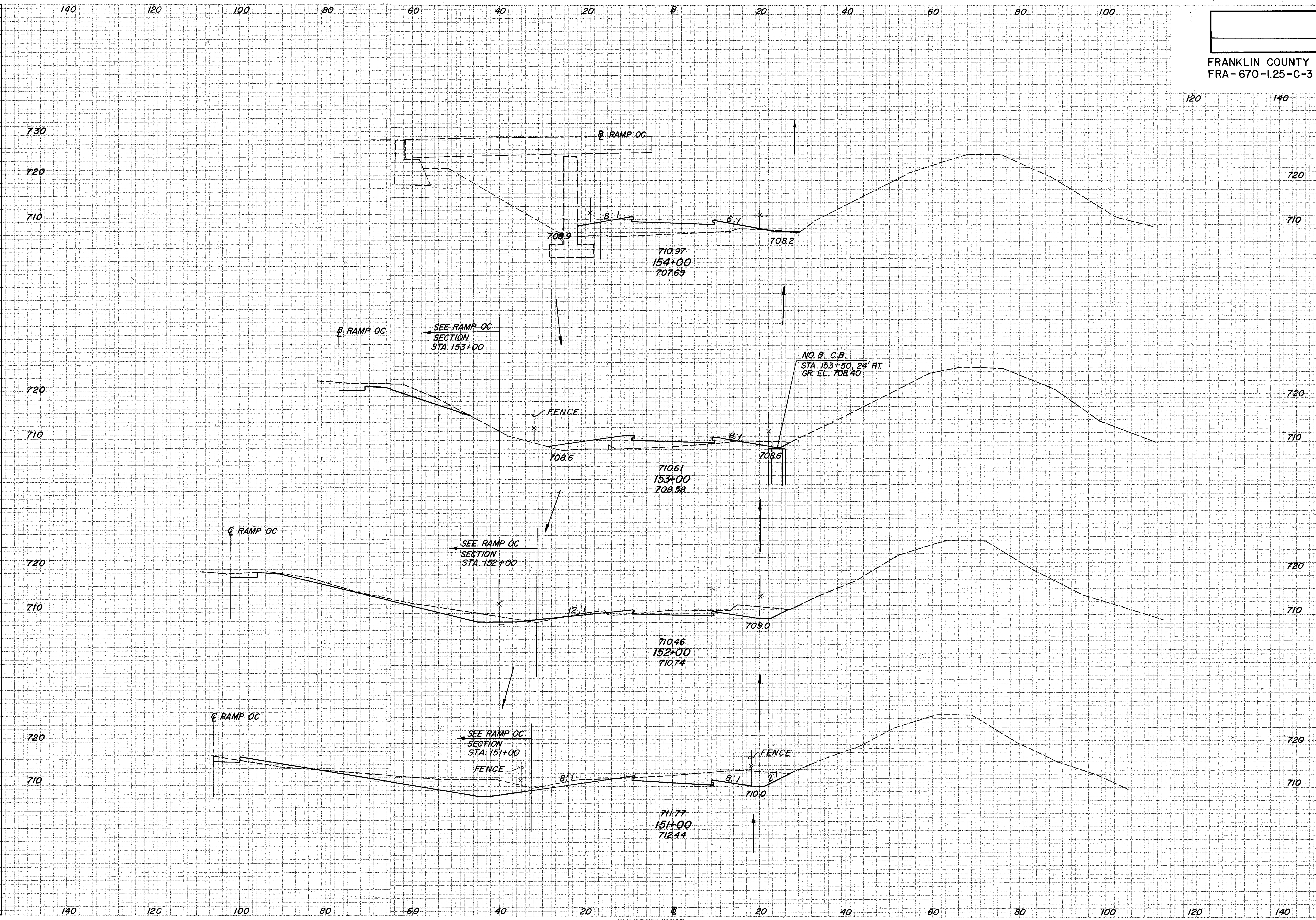
PLATE 3-FULL CROSS SECTION-FULL LINE

BIKEWAY CROSS SECTION STA. 147+00 TO STA. 150+00

OHIO	69
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING	
END WIDTH	SQ. YDS.
48	
	550
51	
	567
51	
	583
54	
	489



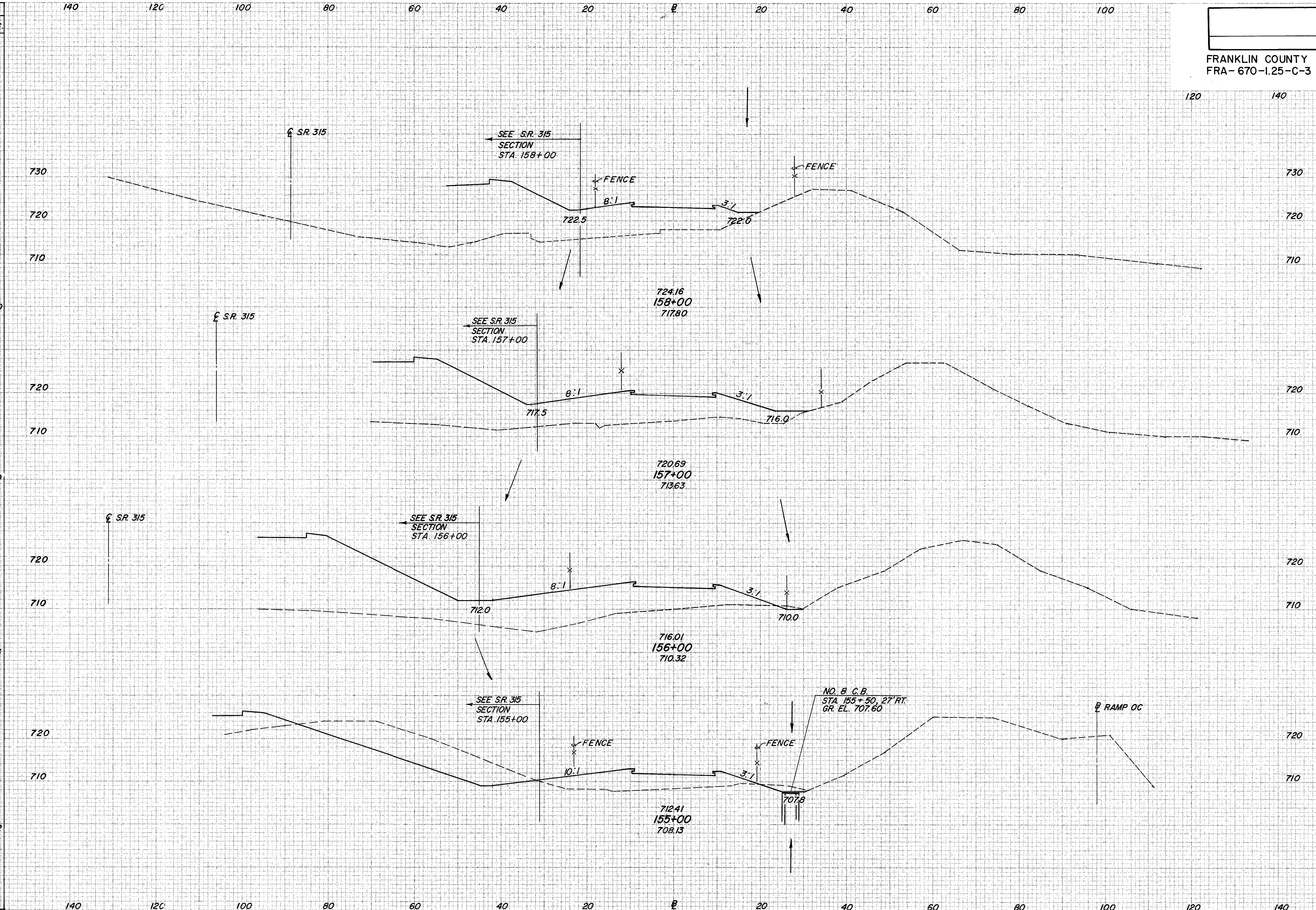
END AREA		VOLUME	
CUT	FILL	CUT	FILL
5	100		
		46	270
20	46		
		148	94
60	5		
		324	9
115	0		
		213	67
0	36		

BIKEWAY CROSS SECTION STA. 151+00 TO STA. 154+00

OHIO	70
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING	
END WIDTH	SQ. YDS.
34	
	500
56	
	689
68	
	603
55	
	572



END AREA		VOLUME	
CUT	FILL	CUT	FILL
0	224		
		0	987
0	309		
		17	1246
9	364		
		39	919
12	132		
		31	430

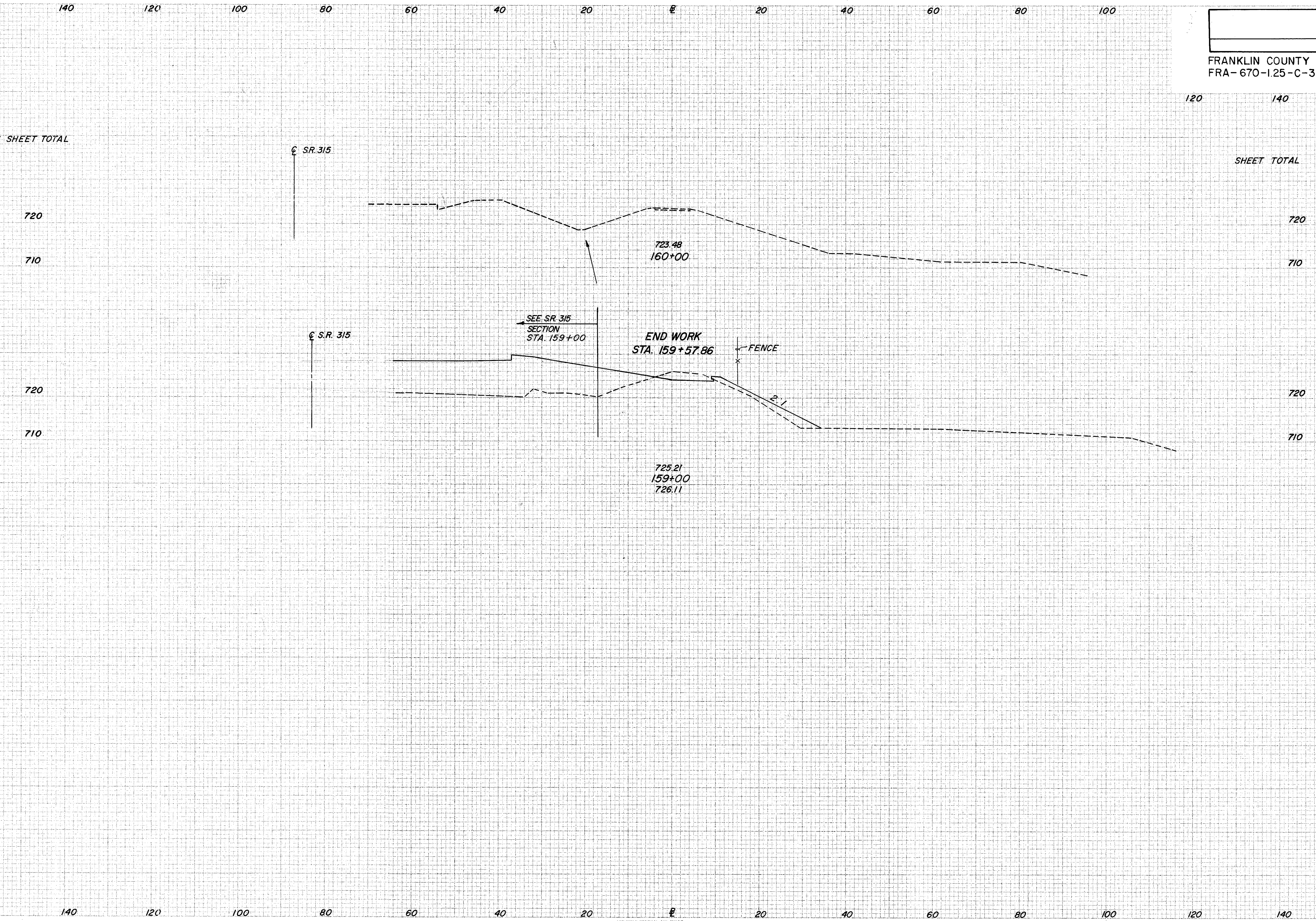
PLATE 3-FULL CROSS SECTION-FULL LINE

BIKEWAY CROSS SECTION STA. 155+00 TO STA. 158+00

OHIO | FHWA REGION 5 | FEDERAL PROJECT | 71 / 224

FRANKLIN COUNTY
FRA-670-1.25-C-3

SEEDING END WIDTH	SEEDING SQ. YDS.
	4484 SHEET TOTAL
0	
	94
	4
17	
	283



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
SHEET TOTAL		898	4757
0	0		
		31	176
		18	101
17	95		
		31	590

PLATE 3-FULL CROSS SECTION

BIKEWAY CROSS SECTION STA. 159+00 TO STA. 160+00

OHIO	
FHWA REGION	5
FEDERAL PROJECT	

72
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

PLATE 3 FULL CROSS SECTION

LIGHT TOWER CROSS SECTIONS C-3

OHIO	73
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C - 3

LIGHT TOWER CROSS SECTIONS C-3

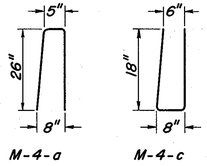
FRANKLIN COUNTY
FRA-670-1.25-C-3

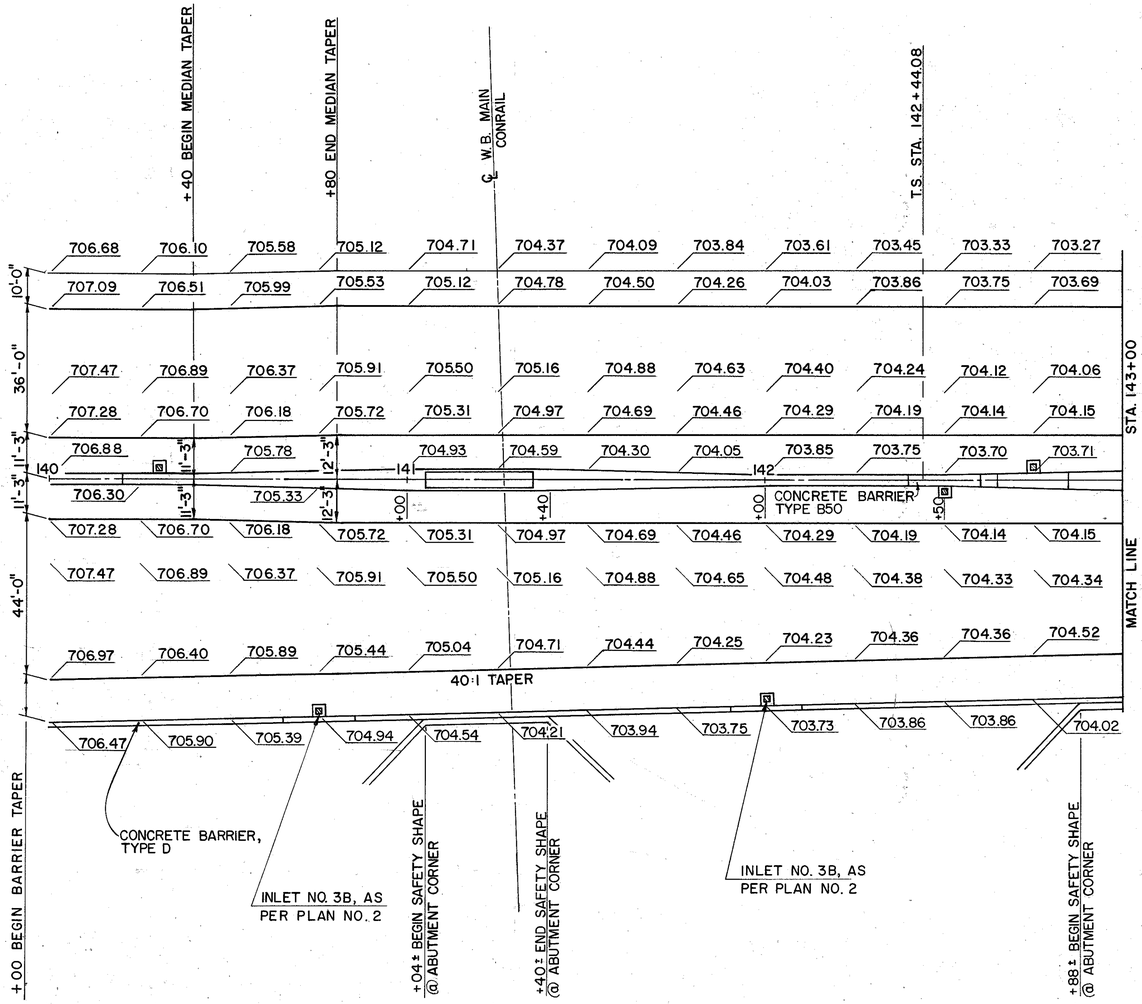
ITEM 622 TYPE B50 CONCRETE BARRIER		
FROM STA.	TO STA.	LIN. FT.
140+00	140+20	20
140+40	142+00	160*
142+00	142+40	40
142+60	142+65	5 *
142+85	144+20	135*
144+20	144+40	20
144+60	147+40	280
147+60	148+41	81
148+41	150+34	193*
150+34	150+40	6
150+60	152+90	230
153+10	155+90	280
156+10	158+90	280
159+10	159+86	76
159+86	161+60	174*
161+60	161+90	30
162+10	162+90 NBL	280
165+10 NBL	167+58 NBL	248
TOTALS		2538

* TAPER & WIDENED SECTION AT BRIDGE PIER

ITEM 622 TYPE D CONCRETE BARRIER		
FROM STA.	TO STA.	LIN. FT.
140+00	140+65	65
140+85	141+90	105
142+10	143+27	117
TOTALS		287

REINFORCING STEEL SCHEDULE							
M-4-a		M-5-b		M-4-c		S6x12.5	
NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.
10	4'-7"	9	19'-8"	10	3'-9"	2	11'-0"



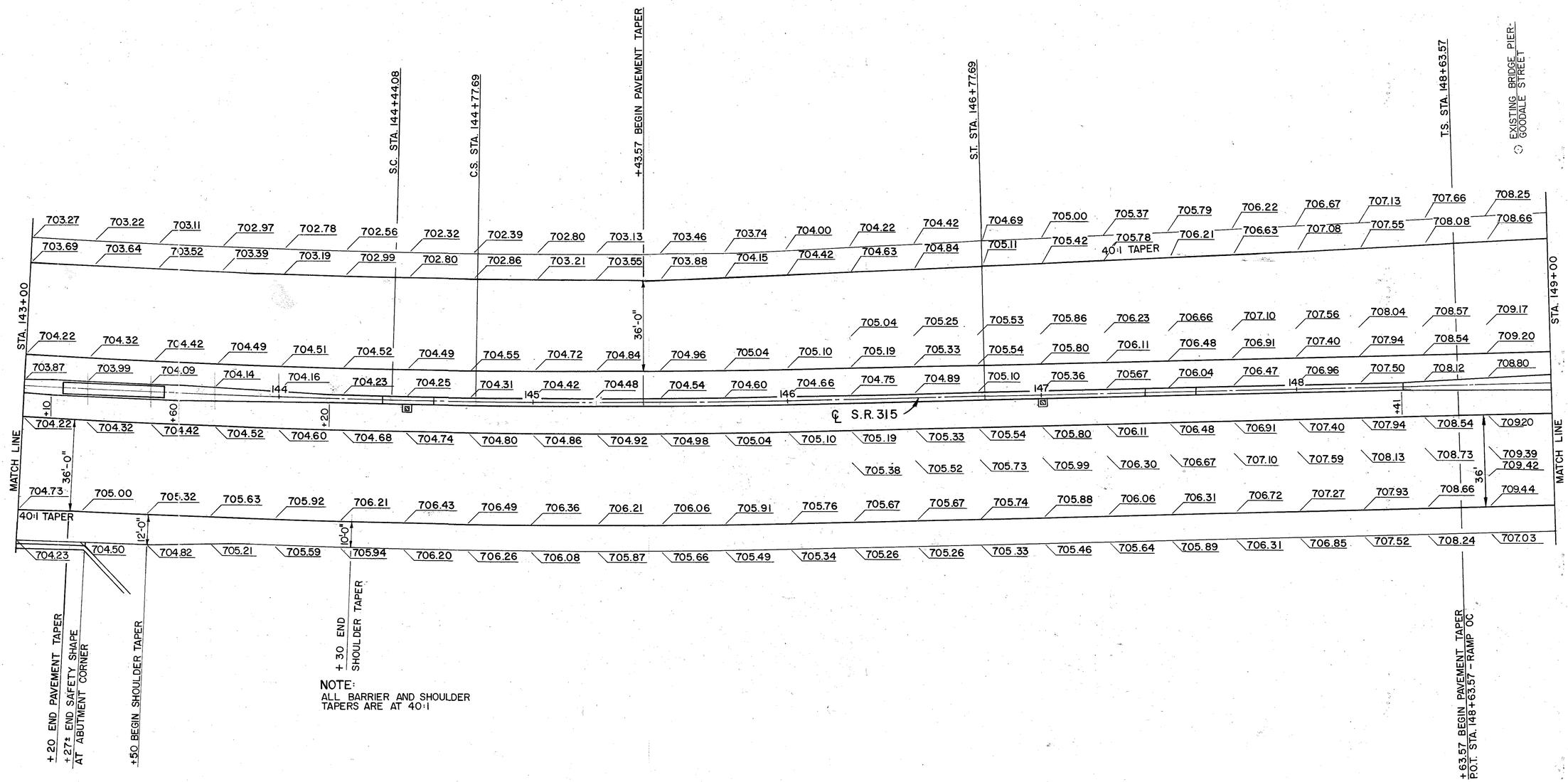


NOTE: WHEN THE CONTRACTOR ERECTS THE TYPE D CONCRETE BARRIER NEXT TO THE RAILROAD BRIDGE ABUTMENTS, THE CONTRACTOR SHALL MATCH THE JOINTS AND WEEPHOLES OF THE CONCRETE BARRIER WITH THE ABUTMENTS.

PAVEMENT DETAILS - STA. 140+00 TO STA. 143+00

OHIO	75
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

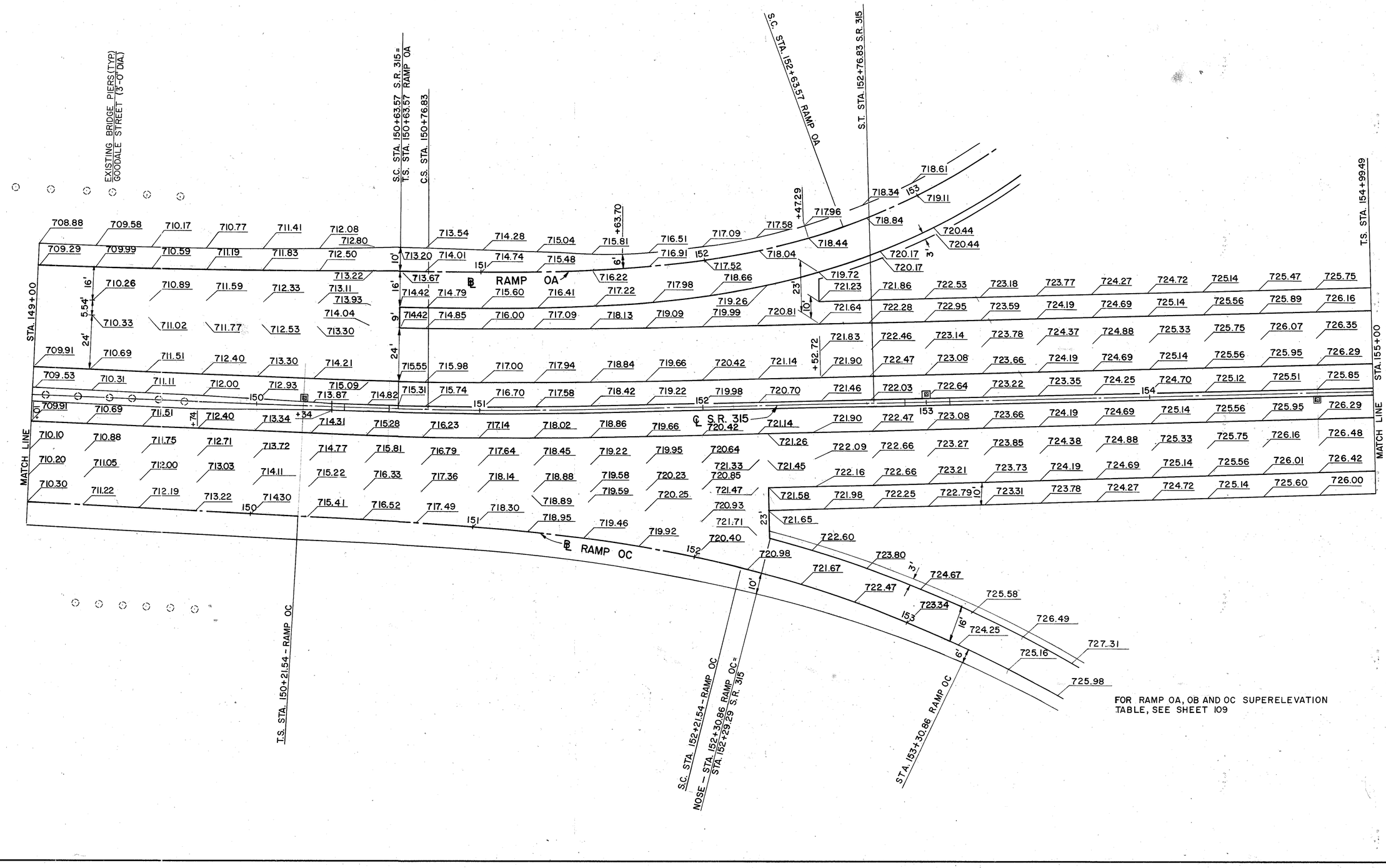


NOTE:
ALL BARRIER AND SHOULDER TAPERS ARE AT 40:1

PAVEMENT DETAILS – STA. 143+00 TO STA. 149+00

OHIO	76
FHWA REGION 5	224
FEDERAL PROJECT	

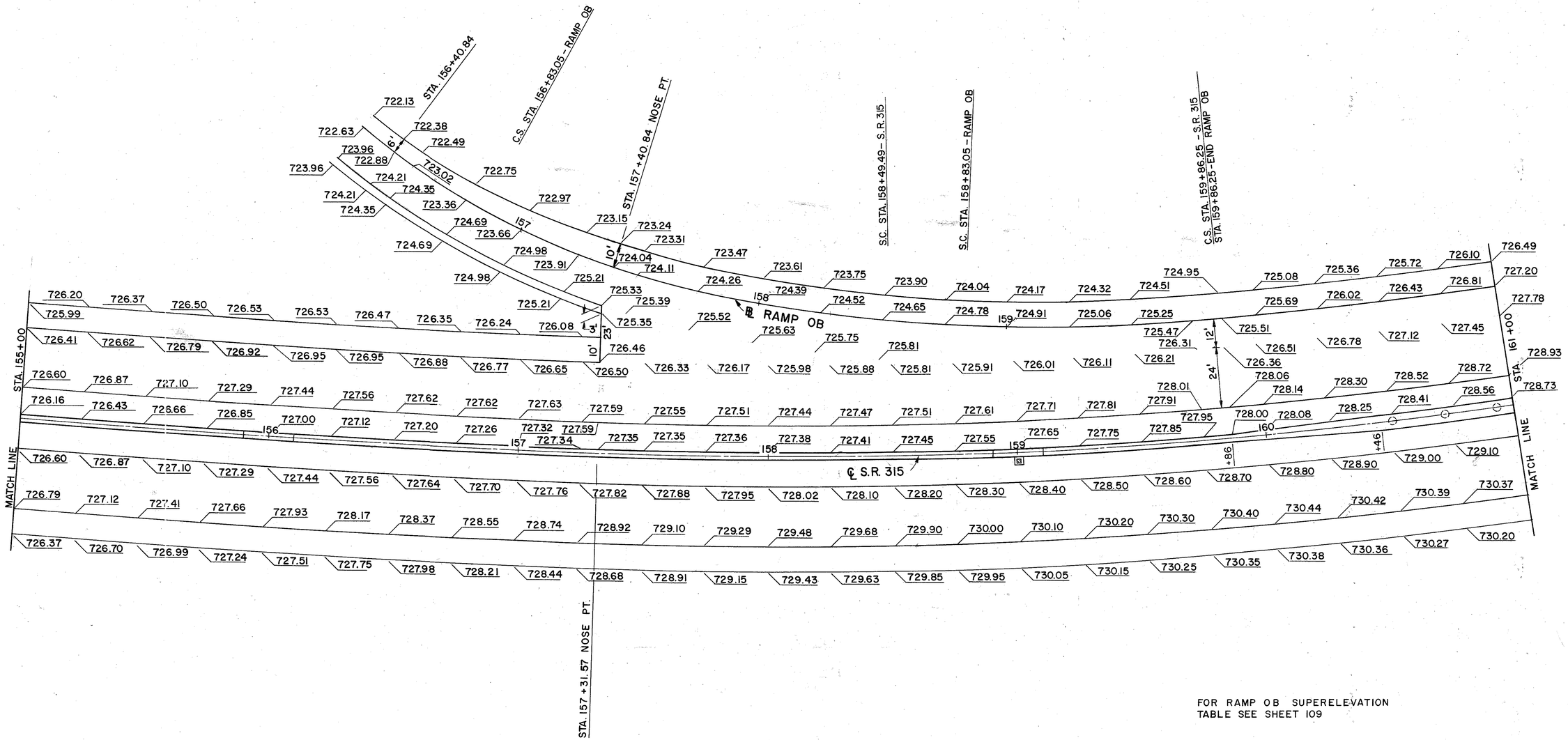
FRANKLIN COUNTY
FRA-670-1.25-C-3



PAVEMENT DETAILS - STA. 149+00 TO STA. 155+00

	OHIO	77
	FHWA REGION 5	224
	FEDERAL PROJECT	

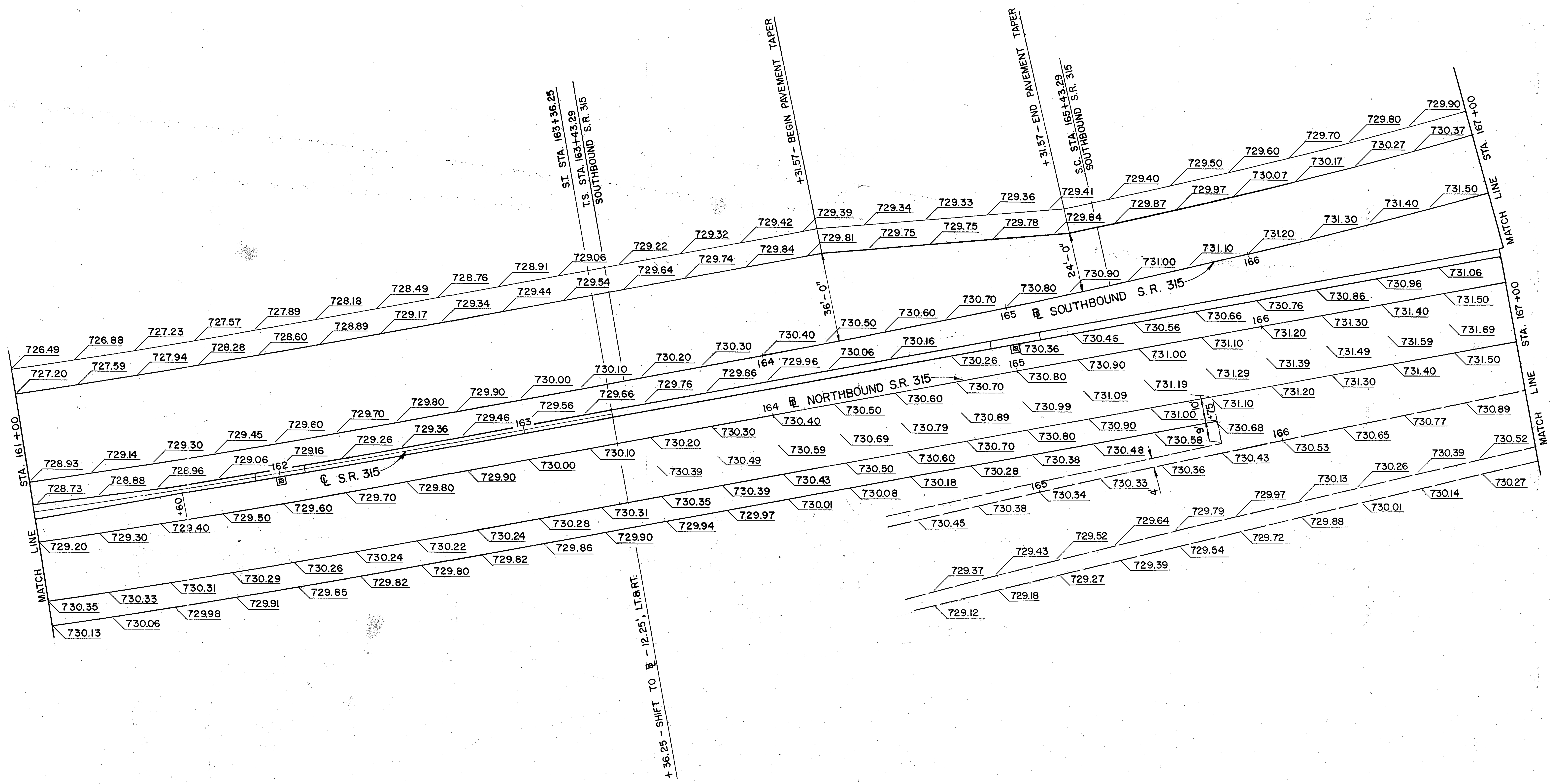
FRANKLIN COUNTY
FRA – 670-1.25-C-3



FOR RAMP OB SUPERELEVATION
TABLE SEE SHEET 109

PAVEMENT DETAILS – STA. 155+00 TO STA. 161+00

FRANKLIN COUNTY
FRA-670-1.25-C-3

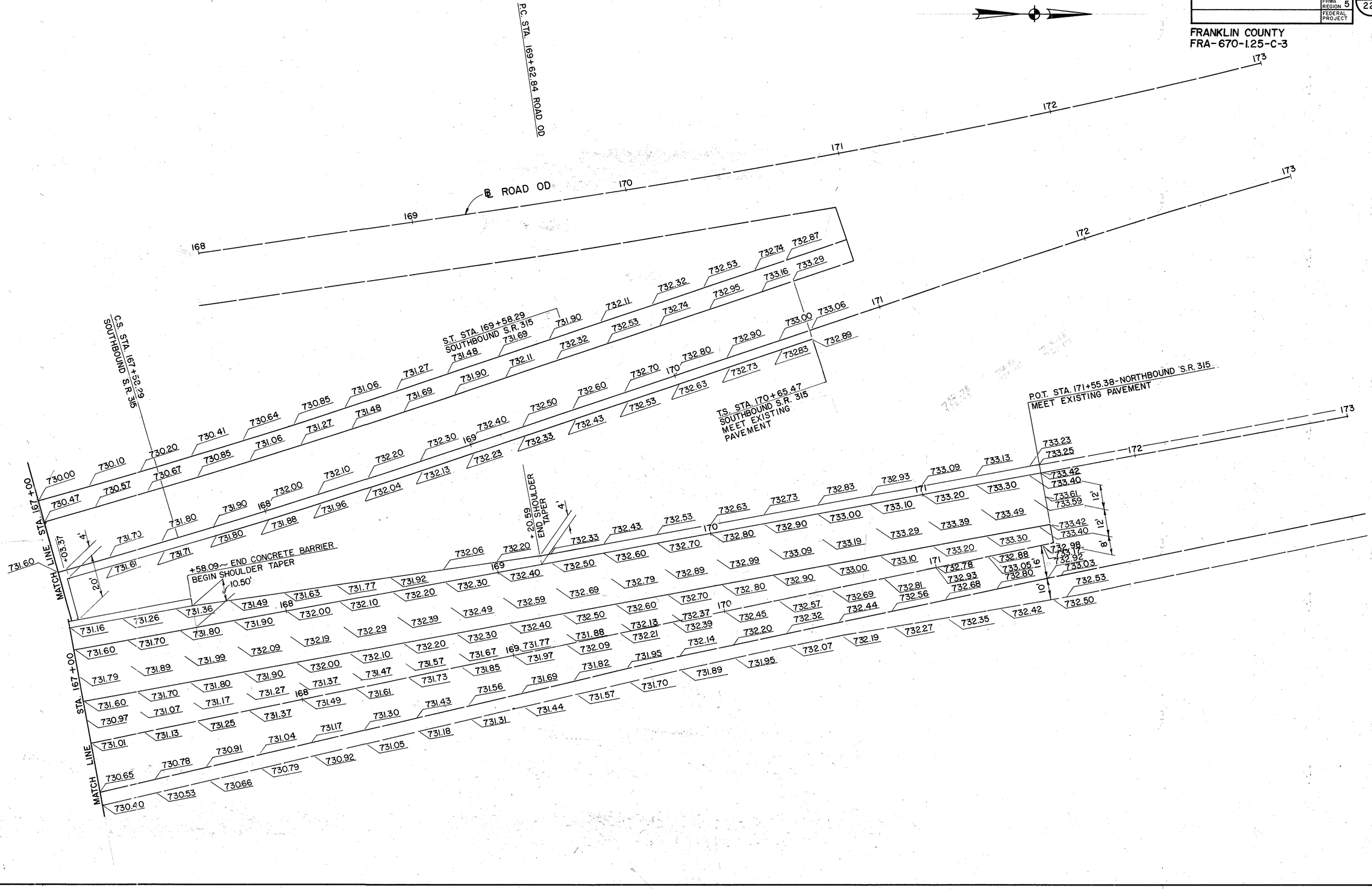


PAVEMENT DETAILS - STA. 161 + 00 TO STA. 167+00

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

79
224

FRANKLIN COUNTY
FRA-670-1.25-C-3



PAVEMENT DETAILS - STA. 167+00 TO STA. 173+00

GENERAL NOTES

OHIO
FHWA REGION 5
FEDERAL PROJECT
81
224
FRANKLIN COUNTY
FRA-670-1.25-C-3

GENERAL The current State of Ohio, Department of Transportation (ODOT), Construction and Material Specifications, including all supplements thereto, in force on the date of contract, shall govern all materials and workmanship involved in the improvements shown on these plans, except as such specifications are modified by the following specifications or by the construction details set forth herein.

OHIO UTILITIES PROTECTION SERVICE
Two (2) Working Days - Before You Dig
Call 1-800-362-2764 Toll Free
Non-Members Must Be Called Directly

WORK LIMITS The Contractor shall confine his activities to the project site under development, the existing right-of-ways, or the construction and permanent easements and shall not trespass upon other private property without the written consent of the owner.

MISCELLANEOUS WORK All items of work called for on the plans for which no specific method of payment is provided shall be performed by the Contractor and the cost of same shall be included in the price bid for the various related items.

FIELD TILE All field tile broken during excavation shall be replaced to original condition or connected either to the curb subdrain or the storm sewer system at the Contractor's expense.

SURPLUS EXCAVATION The Contractor shall dispose of all surplus excavation as directed by the Engineer.

NOTIFICATION TO THE CITY The Contractor shall notify in writing to ODOT, with copy to the Service Director of the City, of his intentions to proceed with work on this project. This notification shall occur not less than two (2) weeks nor more than three (3) weeks in advance of starting work.

The Contractor shall provide ODOT, with a copy to the Service Director of the City, with a weekly work schedule indicating the location and description of work to be performed, equipment and material to be used, and the approximate number of men to be working. This schedule shall be submitted on the Thursday preceding the week for which the schedule applies.

The Service Director of the City shall be notified three (3) days prior to the Contractor turning on newly installed signal equipment.

632 POWER SERVICE AS PER PLAN The Contractor shall install the power cable according to the plan, except that a meter base is not required and that a disconnect switch shall not be used when the controller cabinet is pole mounted. When the controller cabinet is attached to or installed beside a steel pole, the power cable shall be routed inside the pole. The Contractor shall be responsible for making the arrangements for the power hook-up at the intersections of Olentangy River Road with Goodale and Third Avenues with Columbus and Southern Ohio Electric Company. Power supplied shall be 120 volts.

632 AND 633 WORKING DRAWINGS In addition of the requirements of the 632.03 and 633.04, the Contractor shall submit one additional copy (total nine) of all shop drawings, catalog cuts, specifications, brochures , data sheets, etc., of all traffic signal equipment and signal controllers. The Contractor shall submit this additional copy directly to the City, attention Division of Traffic Engineering comments resulting from the Division of Traffic Engineering's review of this material should be forwarded directly to the Engineer of Construction, Ohio Department of Transportation.

632 PEDESTRIAN PUSHBUTTON, AS PER PLAN
The Contractor shall install two (2) pedestrian pushbutton signs for each pushbutton installation.

633 GUARANTEE The Contractor shall guarantee that the traffic control system installed as part of this contract shall operate satisfactorily for a period of 180 days following the completion of the 10 day performance test. In the event of unsatisfactory operation, the Contractor shall correct faulty installations, mark repairs, and replace defective parts with new parts of equal or better quality. Equipment, material and labor costs incurred in correcting an unsatisfactory operation shall be borne by the Contractor.

632 VEHICULAR SIGNAL HEADS BY TYPE, AS PER PLAN
Vehicular signal heads shall conform to 632.05 and shall be installed in conformance to Standard Construction Drawing TC-85.20 except that the 1 1/2 inch variable length drop pipe as shown on Standard Construction Drawing TC-85.20 shall not be used. All lenses shall be glass.

632 LOOP DETECTOR PAVEMENT CUTTING Loop detector pavement cutting shall comply with 632.10. The flexible sealant used to seal the slots shall be an epoxy resin compound.

633 CONTROLLER ACTUATED 8 PHASE SOLID STATE DIGITAL MICROPROCESSOR AS PER PLAN The overlap programming shall be by use of an interchangeable plug-in printed circuit board assembly as described in Section H of NEMA TS-1-1983. In addition to NEMA requirements, the conflict monitor shall also have extended monitoring.* The controller housing shall be keyed to the State Master. Payment for Item 633 Controller, Actuated, 8 Phase, Solid State Digital Microprocessor will be at the contract bid price per each complete and in place including all connections tested and accepted.
*In accordance with 733.04 part 3.

632 LOOP DETECTOR UNIT, DELAY AND EXTENSION TYPE, AS PER PLAN
In addition to the requirements of 632 and 732 , loop detector amplifiers shall have the following requirements or features:

The output device shall be a relay, and all contacts shall be included in the wiring harness.

The unit shall be self tuning.

The unit's electrical connection plugs or wiring harness shall allow ready replacement with a single channel amplifier as described in the final paragraph of 732.07.

632 PEDESTRIAN SIGNAL HEAD, AS PER PLAN The Contractor shall install only the pedestrian signal heads provided by the City of Columbus at the locations according to the plan. Payment shall be full compensation for all labor, materials, tools, equipment and other incidentials necessary for each item furnished, in place, all connections made and wiring completed, tested and accepted.

632 COMBINATION OVERHEAD SIGN SUPPORT, TYPE TC-9.30, DESIGN 3, AS PER PLAN In addition to the requirement of 632, the pole shall be extended to a total height of 28 feet.

MAINTENANCE OF TRAFFIC SIGNAL/FLASHER INSTALLATIONS The Contractor shall be responsible for maintaining traffic signal/flasher installations within the project under the following conditions:

A.) Existing signal/flasher installations which the plans require the Contractor to adjust, modify, add onto or remove, or which the Contractor actually adjusts, modifies or otherwise disturbs, the Contractor shall be responsible for the entire installation (at an intersection) from the time his operations first disturb the installation until the installation has been subsequently removed or modified and the work is accepted.

B.) The Contractor shall be responsible for new or reused signal/flasher installations or devices installed, and the maintenance of these from the time of installation until the work is accepted.

The Contractor shall correct as quickly as possible all outages or malfunctions. He shall provide the City and the Engineer such addresses and phone numbers where his maintenance forces can be contacted. The Contractor shall provide one or more persons to receive all calls and dispatch the necessary maintenance forces to correct outages. Such a person or persons may be used to perform other duties as long as prompt attention is given to these calls a person is readily available continously 24 hours a day, 7 days a week. All lamp outages, cable outages, electrical failures, equipment malfunctions and misaligned signal heads shall be corrected to the satisfaction of the Engineer, with the signal back in service within four hours the Contractor has been notified of the outage.

If poles and/or controls equipment are damaged and must be replaced, the Contractor shall make temporary repairs as necessary to bring the signal back into full operation within the allowed 8-hour period, and shall make permanent repairs or replacement as soon thereafter as possible.

None of the above shall be construed as collective or consecutive outage time periods at any one location. That is where more than one outage occurs at any one location, then the alloted time limit shall be for the worst single outage.

Where outages are the direct result of a vehicle accident the response of the Contractor shall be as outlined above. The Contractor shall be responsible for collection of any compensation for this work from those parties responsible for the damage.

Where the Contractor has failed to or cannot respond to an outage or signal equipment malfunction, at these locations within his responsibility within periods as specified above. The Engineer may invoke the provisions of section 105.15 and any subsequent billings to the State or the City of Columbus for police service and maintenance services by City forces shall be deducted from monies due, or to become due, to the Contractor in accordance with provisions of section 105.15.

The Contractor shall provide the maintenance service entirely with his forces or he may choose to enter into a cooperative understanding with the local maintaining agency to provide the maintenance in the following methods (or another method as may be agreed by the Contractor, local agency and the Engineer):

1.) 8:00 A.M. to 5:00 P.M. weekdays with the City providing coverage from 5:00 P.M. to 8:00 A.M. weekdays and weekends. At the Contractor's expense as previously provided herein.

2.) Complete City maintenance at the Contractor's expense, as previously provided herein.

The Contractor shall inform the Engineer, in writing of the maintenance method selected.

The Contractor shall be responsible for any damage to any traffic signal components required to be handled during the relocation of poles and revisions to the signal system.

When a traffic signal must be taken out of service by the Contractor due to construction procedures, this outage shall not exceed 4 hours and shall not include the hours of 7:00 A.M. to 7:00 P.M.. Any signalized intersection, where the signal is out of service due to construction procedures, or due to an outage or malfunction of equipment as described above shall be protected by the Contractor by the installation of temporary "STOP" signs.

TRAFFIC SIGNAL GENERAL NOTES

GENERAL NOTES (CONTINUED)

OHIO
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FRANKLIN COUNTY
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MAINTENANCE OF TRAFFIC SIGNAL/FLASHER INSTALLATIONS (CONTINUED) Any vehicular traffic signal head either new or existing which will be out of operation shall be covered in the manner described in 632.24.

All costs resulting from the above requirements shall be considered to be included in the lump sum price bid for item 614, Maintaining Traffic.

All equipment installed by the Contractor shall be maintained by the Contractor from the time it is installed until final acceptance is completed. However, the replacement of burned out signal bulbs will be done by the City when such burn outs are reported to the City.

Hours of work on or within five feet of any travelled portion of the roadway, shall be limited to 8:30 A.M. to 4:00 P.M. and 6:00 P.M. to 7:00 A.M. weekdays, or as approved by the Engineer.

The entire travelled portion of the roadway shall be open to traffic when the Contractor is not working.

For the purpose of erecting mast arm signal support, the Contractor may close an entire intersection or portion of roadway for a period not to exceed ten (10) minutes. Such closures must be shown to be necessary and must be approved by the Engineer and the City Service Director before closure is made. The Contractor at his expense shall provide a uniformed off-duty City Police Officer to direct traffic during such closures.

All temporary traffic control devices used on this project for maintaining traffic during construction shall conform to the applicable specifications of the Ohio Manual of Uniform Traffic Control Devices.

Advance warning signs shall be in place prior to beginning work. Special attention is directed to figures C-10 and C-18 of the Ohio Manual of Uniform Traffic Control Devices for the application of advance warning signs.

If at any time it becomes necessary to provide a uniformed off-duty police officer to safeguard the travelling public for reasons incidental to this project the cost of same shall be borne by the Contractor and included in the lump sum price bid for 614, Maintaining Traffic.

In the event new signals are damaged prior to acceptance, all damaged equipment shall be replaced by the Contractor to the satisfaction of the Engineer. The signal shall be back in service within eight hours after the Contractor's notification of the outage.

UTILITIES NOTIFICATION At least two (2) working days prior to commencing construction operations in an area which may involve underground utility facilities, the Contractor shall notify the project Engineer, the Registered Utility Protection Service and 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, after notice is received, 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.

632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION AS PER PLAN

This work shall consist of the removal of traffic signal heads, controller with cabinet, messenger wire, conduit risers, and all other portions of the existing traffic signal installation.

With the exception of items whose removal is necessary to permit the installation of the new signal equipment, no item shall be removed until the new installation is in full operation, unless otherwise directed by the engineer.

The contractor shall make arrangements with the Columbus and Southern Electric Company to disconnect the existing power service before the existing signal installations are removed.

Some of the removed items shall become the property of the contractor who shall properly dispose of them. Other removed items shall be stored on the project for salvage by the City of Columbus and shall remain the property of the City of Columbus. Poles shall be removed without burning, concrete shall be removed from the bottom of poles.

DESCRIPTION OF ITEMS TO BE REMOVED BY THE CONTRACTOR	ITEMS TO BE STORED FOR THE CITY OF COLUMBUS	ITEMS TO BE DISPOSED OF BY THE CONTRACTOR
ALL CONTROLLERS W/CABINET AND ACCESSORIES	X	
ALL SIGNAL HEADS	X	
MESSENGER WIRE AND SIGNAL CABLE		X
EXISTING STRAIN POLES	X	

GENERAL SUMMARY - TRAFFIC CONTROL

CALCULATED	KCW	1-6-89
CHECKED BY	WMH	1-6-89

FRANKLIN COUNTY
FRA-670-1.25-C-3

STP

ITEM	SHEET NUMBER 86	87	88	90	91	ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	REF. NO.
620		16				620	10300	16	Each	Delineators, Type C, Post Mounted	
620		33				620	15300	33	Each	Delineators, Type D, Post Mounted	
620		7				620	16000	7	Each	Delineators, Type D, Bracket Mounted	
630	59.9					630	00000	59.9	Cu. Yd.	Concrete for Anchor Base Foundation	
630	3.8					630	00100	3.8	Cu. Yd.	Concrete for Embedded Foundation	
630	147.5					630	03100	147.5	Lin. Ft.	Ground Mounted Support, No. 3	
630	198					630	04100	198	Lin. Ft.	Ground Mounted Support, No. 4	
630	232					630	06400	232	Lin. Ft	Ground Mounted Support, S4 x 7.7 Beam	
630	4					630	09000	4	Each	Breakaway Beam Connection	
630	2					630	36500	2	Each	Overhead Sign Support, Type TC-7.65, Design 6, 67'-0"	
630	1					630	37000	1	Each	Overhead Sign Support, Type TC-7.65, Design 6, 70'-0"	
630	1					630	37000	1	Each	Overhead Sign Support, Type TC-7.65, Design 6, 75'-0"	
630	282					630	80102	282	Sq. Ft.	Sign, Flat Sheet, Type G	
630	1516					630	80204	1516	Sq. Ft.	Sign, Extrusheet, Type G	
					5	630	81110	5	Sq. Ft.	Sign Erected, Flat Sheet, Type G	
630					13	630	85000	13	Each	Removal of Ground Mounted Sign and Storage	
630					1	630	86300	1	Each	Removal of Overhead Mounted Sign and Storage	
630					10	630	89900	10	Each	Removal of Overlay Sign	
					1	630	89902	1	Each	Removal of *Arrow Panel and Service * MISCELLANEOUS TRAFFIC CONTROL ITEM	
631	5					631	84000	5	Each	Sign Service	
631	10					631	84300	10	Each	Sign Wired	
631	5					631	85100	5	Each	Disconnect Switch with Enclosure, Type X	
631	9					631	87202	9	Each	Ballast, Type CMRI-175-480 Integral	
631	21					631	89200	21	Each	Mercury Vapor Luminare, Type TC-31.21 175 Watt Lamp	
642				.373		642	00290	.37	Mile	Center Line, 5"	
644				3.090		644	00100	3.09	Mile	Edge Line, 5"	
644				1.583		644	00200	1.58	Mile	Lane Line, 5"	
644				.107		644	00300	.11	Mile	Center Line, 5"	
644				1440		644	00400	1440	Lin. Ft.	Channelizing Line, 10"	
644				123		644	00500	123	Lin.Ft.	Stop Line, 20"	
644				484		644	00600	484	Lin.Ft.	Crosswalk Line, 10"	
644				270		644	00700	270	Lin.Ft.	Transverse Line, 20"	
644				9		644	01300	9	Each	Lane Arrow, 72"	
				3		644	01400	3	Each	Word on Pavement, 72"	
802				38		802	00100	38	Each	Barrier Reflector, Type A	
802				82		802	00200	82	Each	Barrier Reflector, Type B	
862			390			621	00100	390	Each	Raised Pavement Marker	

TRAFFIC CONTROL–GENERAL SUMMARY (CONTINUED)

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

84
224

FRANKLIN COUNTY
FRA–670–1.25–C–3

ITEM	SHEET NUMBER			PARTICIPATION			ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	REF. NO.
	86	85A	86A	NH	STP	100%CITY						
625			114			114	625	25300	114	LIN. FT.	CONDUIT, 1 1/2", 713.04	
625			686			686	625	25302	686	LIN. FT.	CONDUIT, 1 1/2", 713.07	
625			802			802	625	25500	802	LIN. FT.	CONDUIT, 3", 713.04	
625			5710			5710	625	25602	5710	LIN. FT.	CONDUIT, 4", 713.07	
625			1480			1480	625	29000	1480	LIN. FT.	TRENCH	
625			6			6	625	30700	6	EACH	PULL BOX, 713.08, 18"	
625			6			6	625	31600	6	EACH	PULL BOX, MISC.: HEAVY DUTY, 713.08, 32"	
625			4			4	625	31600	4	EACH	PULL BOX, MISC.: 18" MEDIAN PULL BOX	
625			2			2	625	31600	2	EACH	PULL BOX, MISC.: 36" MEDIAN PULL BOX	
625		305			305		625	25403	305	LIN. FT.	CONDUIT, 2", 713.07, AS PER PLAN	81
625		30			30		625	25503	30	LIN. FT.	CONDUIT, 3", 713.07, AS PER PLAN	81
625		327			327		625	29000	327	LIN. FT.	TRENCH	
625		3			3		625	30700	3	EACH	PULL BOX, 713.08, 18"	
625	5	5			10		625	32000	10	EACH	GROUND ROD	
		1			1		630	30801	1	EACH	COMBINATION OVERHEAD SIGN SUPPORT, TYPE TC–9–.30, DESIGN NO. 3 1 AS PER PLAN	81
632			524			524	632	27500	524	LIN. FT.	LOOP DETECTOR PAVEMENT CUTTING	
632			485			485	632	40500	485	LIN. FT.	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	
632			1378			1378	632	64900	1378	LIN. FT.	LOOP DETECTOR WIRE, TYPE E	
632			968			968	632	65200	968	LIN. FT.	LOOP DETECTOR LEAD-IN CABLE	
632			400			400	632	69500	400	LIN. FT.	SERVICE CABLE, 2 CONDUCTOR, NO. 16 AWG	
632			1			1	632	90400	1	EACH	RAMP METER SIGNAL DISPLAY	
632			1			1	632	90400	1	EACH	RAMP METER SIGN	
632												
632												
632		5			5		632	00301	5	EACH	VEHICULAR SIGNAL HEAD 3 SECTION, 12" LENS, 1 WAY, AS PER PLAN	81
632		1			1		632	00501	1	EACH	VEHICULAR SIGNAL HEAD 5 SECTION, 12" LENS, 1 WAY, AS PER PLAN	81
632		6			6		632	25000	6	EACH	COVERING OF VEHICULAR SIGNAL	
		6			6		632	90400	6	EACH	PEDISTRIAN SIGNAL HEAD, AS PER PLAN	81
632		4			4		632	26001	4	EACH	PEDISTRIAN PUSHBUTTON, AS PER PLAN	98
632		3			3		632	27104	3	EACH	LOOP DETECTOR UNIT, 2 CHANNEL, DELAY AND EXTENSION TYPE	
632												
632		4			4		632	90400	4	EACH	MICROLOOP SENSOR PROBE, (2 PROBE SET; 6'–50')	81
		342			342		632	27500	342	LIN FT	LOOP DETECTOR PAVEMENT CUTTING	
632		279			279		632	30200	279	LIN FT	MESSENGER WIRE 7 STRAND, 3/8" DIA. WITH ACCESSORIES	
632												
632		832			832		632	40200	832	LIN. FT.	SIGNAL CABLE, 2 CONDUCTOR NO. 14 AWG	
632		430			430		632	40300	430	LIN. FT.	SIGNAL CABLE, 3 CONDUCTOR NO. 14 AWG	
632		705			705		632	40500	705	LIN. FT.	SIGNAL CABLE, 5 CONDUCTOR NO. 14 AWG	
		282			282		632	40700	282	LIN. FT.	SIGNAL CABLE, 7 CONDUCTOR NO. 14 AWG	
632		910			910		632	64900	910	LIN. FT.	LOOP DETECTOR WIRE, TYPE E	
632												
632		1441			1441		632	65200	1441	LIN. FT.	LOOP DETECTOR LEAD–IN CABLE	
632		53			53		632	67200	53	LIN. FT.	POWER CABLE, 2 CONDUCTOR NO. 8 AWG	
632		1			1		632	70001	1	EACH	POWER SERVICE, AS PER PLAN	81
		7			7		632	71000	7	EACH	CABLE SUPPORT ASSEMBLY	
632		9.9			9.9		632	72000	9.9	CU. YD.	CONCRETE FOR ASSEMBLY BASE FOUNDATION	
632												
633		3			3		632	82500	3	EACH	STRAIN POLE TYPE TC –81.10 DESIGN NO. 5, 28 FEET	
		300			300		632	69700	300	LIN. FT.	SERVICE CABLE, 3 CONDUCTOR NO. 8 AWG	
633		1			1		633	38001	1	EACH	CONTROLLER, ACTUATED, 8 PHASE, SOLID STATE DIGITAL,	81
633											MICROPROCESSOR AS PER PLAN	
633		1.9			1.9		633	70000	1.9	CU.YD.	CONCRETE FOR CABINET FOUNDATION	
633		11			11		633	70500	11	SQ. FT.	CONTROLLER WORK PAD	
		1			1		633	99000	1	EACH	TRANSCEIVER INTERFACE	
			1			1	633	40100	1	EACH	RAMP METER CONTROLLER	

File: C:\249E1\SUR-SUM.DWG 1 = 1.0000
Date: 08-15-1996
Time: 15:06 Drawn by : A.G.

CALC. BY DATE	FRANKLIN COUNTY	OHIO
CHKD. BY DATE	FRA - 670 - 1.25 - C3	FHWA REGION
		FEDERAL PROJECT

0 20 40
10 30 50
SCALE IN FEET

L/A
℄
R/W

R/W

OLENTANGY RIVER ROAD

PROP. POLE DESIGN Nº5 W/PED SIGNAL AND PUSHBUTTON STA. 55+41, 43'L.

PROP. POLE DESIGN Nº5 W/PED SIGNAL AND PUSHBUTTON STA. 56+33, 44'L.

PROP. PULL BOX #1 STA. 56+86, 48'L.

PROP. PULL BOX #2 STA. 58+83, 40'L.

PROP. MICROLOOP STA. 58+83

R-73 PB

P4 S A B E F

P1 Y 2" CONDUIT 2-2C

P.B.1 2" CONDUIT 1-2C

P.B.2

55+27

53 54 55 56 57 58 59

56+83 57+25 57+67

L-1

M1 4.5' 4.5' 4.5'

M2 4.5' 4.5' 4.5'

C D 56+45 56+70

P.B.15

EX. CONDUIT

P.B.14

NOTE: DASH PB. 15, 14 AND 13 PLUS DASH CONDUIT BETWEEN AS THEY ARE EXISTING

2" CONDUIT U T P3

EX. CONDUIT

153+63 153+60

P.B.13 EX. CONDUIT 2-3" CONDUIT

W X P2 2-3" CONDUIT

2" CONDUIT 2-2C

L-3 L-2 L-4

P.B.3

PROP. MICROLOOP STA. 52+91

EX. PULL BOX #15 STA. 52+91, 31'R.

EX. PULL BOX #14 STA. 55+20, 37'R.

COMBINATION OVERHEAD SIGN SUPPORT TYPE TC-9.30 DESIGN Nº3, AS PER PLAN

℄ RAMP OA 156

℄ RAMP OB 154

PROP. PULL BOX #3 STA. 56+22.81'R.

PROP. POLE DESIGN Nº5 W/PED SIGNALS AND PUSHBUTTONS STA. 56+44, 46'R.

PROP. CONTROLLER STA. 56+52, 45'R.

EX. PULL BOX #13 STA. 56+52, 40'R.

STATE OF OHIO
DAVID JOHN LEPISTO
42680
REGISTERED PROFESSIONAL ENGINEER

BRUNING 44-132 62820

CALC. BY: DATE:	FRANKLIN COUNTY	OHIO
CHKD. BY: DATE:	FRA. 1-670-1.25-C-3	FHWA REGION 5
	STP-1K78(7)	FEDERAL PROJECT

85A 224

SIGNAL DISPLAY CHART

SIGNAL HEAD	ø1				ø2				ø3				FLASH
	R/W		CLEAR		R/W		CLEAR		R/W	CLEAR			
A	G	G	Y	R	R	R	R	R	G	Y	R		Y
B	G	G	Y	R	R	R	R	R	G ①	Y ①	R		Y
C	G	G	Y	R	R	R	R	R	R	R	R		Y
D	G	G	Y	R	R	R	R	R	R	R	R		Y
E	R	R	R	R	G	G	Y	R	R	R	R		R
F	R	R	R	R	G	G	Y	R	R	R	R		R
S-U	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW		DARK
Y-W	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW		DARK
T-X	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW		DARK

NOTE:

① STAYS GREEN IF ø1 IS NEXT

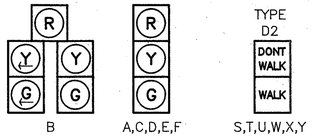
DETECTOR CHART

LOOP	SIZE	NUMBER OF TURNS	MODE	DELAY (SEC)	UNIT	CHANNEL	PHASE INPUT
L1	3'x3'x25'	2-4-2	PRESENCE	2	2	1	3
L2	3'x3'x30'	2-4-2	PRESENCE	5	1	1	2
L3	2.5'x2.5'x30'	2-4-2	PRESENCE		4	1	2
M1	MICROLOOP	——	PULSE		3	1	1
M2	MICROLOOP	——	PULSE		3	2	1

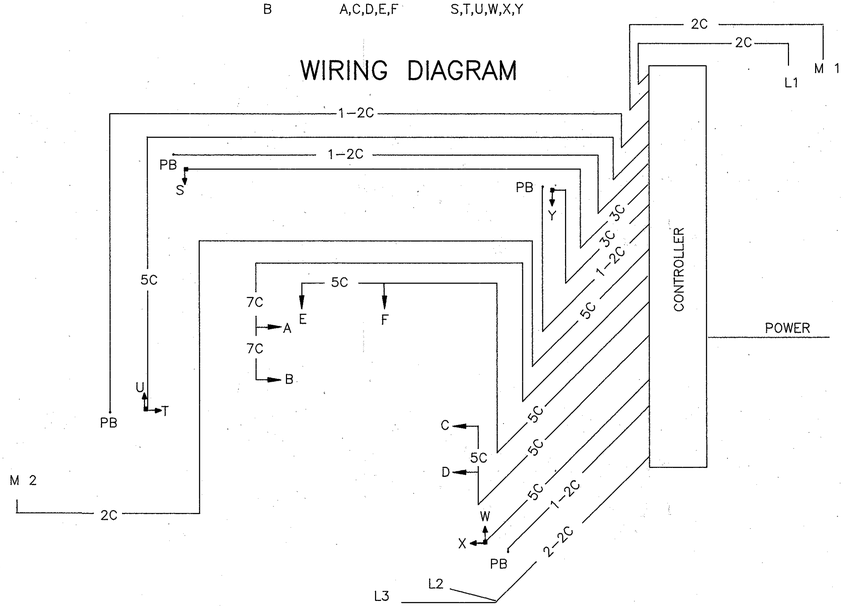
SIGNAL TIMING

FUNCTION	ø1	ø2	ø3
MINIMUM GREEN	20	10	8
PED WALK	7	7	
PED CLEARANCE	19	17.5	
GREEN EXTENSION	6	6	3
MAX I GREEN	54	24	30
MAX II GREEN	54	24	30
YELLOW CLEARANCE	4.0	4.0	3.6
ALL RED CLEARANCE	1.5	1.5	1
RECALL	PED	OFF	OFF
MEMORY	ON	OFF	OFF

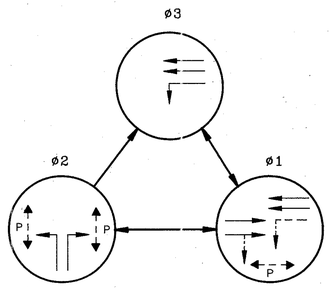
ALL 12" SIGNAL HEADS

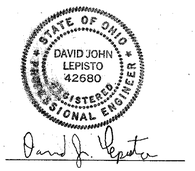


WIRING DIAGRAM



PHASING DIAGRAM





SUB-SUMMARY

ITEM	TOTAL	UNIT	DESCRIPTION
625	5	EACH	GROUND ROD
625	3	EACH	PULLBOX, 713.08, 18"
625	305	LIN FT	CONDUIT, 2" 713.07, AS PER PLAN
625	30	LIN FT	CONDUIT, 3" 713.07, AS PER PLAN
625	327	LIN FT	TRENCH
630	1	EACH	COMBINATION OVERHEAD SIGN SUPPORT, TYPE TC-9.30, DESIGN NO. 3, APP
632	5	EACH	VEHICULAR SIGNAL HEAD, 3 SECT., 12" LENS, 1-WAY, AS PER PLAN
632	1	EACH	VEHICULAR SIGNAL HEAD, 5 SECT., 12" LENS, 1-WAY, AS PER PLAN
632	6	EACH	PEDESTRIAN SIGNAL HEAD, AS PER PLAN
632	4	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	3	EACH	LOOP DETECTOR UNIT, 2 CHANNEL DELAY AND EXTENSION TYPE
632	4	EACH	MICROLOOP SENSOR PROBE (2 PROBE SET; 6'-50')
632	342	LIN FT	LOOP DETECTOR PAVEMENT CUTTING
632	7	EACH	CABLE SUPPORT ASSEMBLY
632	9.9	CU YD	CONCRETE FOR ANCHOR BASE FOUNDATIONS
632	3	EACH	STRAIN POLE TYPE TC-81.10 DESIGN NO. 5, 28 FEET
632	832	LIN FT	SIGNAL CABLE, 2 CONDUCTOR, NO. 14 AWG
632	705	LIN FT	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
632	282	LIN FT	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	910	LIN FT	LOOP DETECTOR WIRE, TYPE E
632	1441	LIN FT	LOOP DETECTOR LEAD-IN CABLE
632	279	LIN FT	MESSENGER WIRE 7 STRAND, 3/8" DIA., WITH ACCESSORIES
632	6	EACH	COVERING OF VEHICULAR SIGNAL HEADS
632	53	LIN FT	POWER CABLE, 2 CONDUCTOR, NO. 8 AWG
632	1	EACH	POWER SERVICE, AS PER PLAN
633	11	SQ FT	CONTROLLER WORK PAD
633	1.9	CU YD	CONCRETE FOR CONTROLLER FOUNDATION
633	1	EACH	CONTROLLER, ACTUATED, 8 PHASE
			SOLID STATE DIGITAL MICROPROCESSOR, AS PER PLAN
633	1	EACH	TRANSCEIVER INTERFACE,
632	300	LIN FT	SERVICE CABLE, 3 CONDUCTOR NO. 8 AWG
632	430	LIN FT	SIGNAL CABLE, 3 CONDUCTOR, NO. 14 AWG

OLENTANGY RIVER ROAD AND RAMPS

SUBSUMMARY - TRAFFIC CONTROL

CALCULATED	KCW 1-6-89
CHECKED BY	WMH 1-6-89

FRANKLIN COUNTY
FRA-670-1.25-C-3

86
224

Sheet No.	Location	Side	Offset	Size	Code	630 SIGNS Flatsheet Type G S.F	630 SIGNS Extrusheet Type G S.F	630 GROUND MOUNTED SUPPORTS No. 3 Posts L.F. Lt.	No. 3 Posts L.F. C	No. 3 Posts L.F. Rt.	No. 4 Posts L.F. Lt.	No. 4 Posts L.F. C	No. 4 Posts L.F. Rt.	S4 x 7.7 L.F. Lt.	S4 x 7.7 L.F. Rt.	Breakway Beam Connection Ea.	Concrete for Embedded Foundation C.Y.
			Ft.														
89	151+00	Lt.	40	48 x 48	W-50R	16		14.5		14.5							
	151+00	Rt.	65	48 x 60	W-97	20								17.5	17.5		.54
	152+23	Rt.	45	72 x 60	GF		30							16	16	2	.54
	155+00 R.O A	Lt.	18	30 x 30	R-15 B	6.25			12.5								
	156+00 R.O A	Rt.	22	48 x 60	R-38R	20					13.5		13.5				
	153+83 R.O B	Lt.	22	36 x 36	R-41 B	9						13					
	153+83 R.O B	Rt.	10	36 x 36	R-41 B	9						13					
	153+83 R.O B	Lt.	22	2-36 x 12	R43- L&R	6											
		Rt.	10	2-36 x 12	R43- L&R	6											
88	156+00 R.O B	Lt.	24	156 x 48	D-4B		52							14	14		.54
				156 x 24	D-4A		26										
				156 x 24	D-4D		26										
	157+33	Lt.	50	72 x 60	GF		30							16	16	2	.54
	158+70 R.O B	Lt.	20	48 x 60	W-97	20					15		15				
	171+50 N.B.	Rt.	40	48 x 48	W-50R	16					15		15				
89	54+80 O.R.R.	Lt.	41	24 x 12	M8	2						14					
				24 x 12	M-37	2											
				30 x 24	M-2-3	3											
				21 x 15	M-21	2.19											
	56+00 O.R.R.	Lt.	44	156 x 48	D-4B		52							14	14		.54
	56+46.5 O.R.R.	Lt.	42	48 x 30	R-31F	10		12		12							
	56+00 O.R.R.	Lt.	44	156 x 24	D-4A		26										
				156 x 24	D-4D		26										
90	164+45 R.O B	Rt.	20	30 x 36	R-31F	6.5			14.5								
	159+75 R.O C	Rt.	16	96 x 24	D-4D		16				14		14				
	161+90 R.O C	Rt.	14	48 x 48	W-47	16						15.5					
	162+60 R.O C	Rt.	13.5	30 x 36	R-31F	6.5			14.5								
	165+07 R.O C	Rt.	13.5	36 x 24	R-41A	6			13.5								
	165+07 R.O C	Lt.	28	36 x 24	R-41A	6			12.5								
	165+80 R.O C	Rt.	20	30 x 36	R-31F	6.5			14.5								
	165+88 R.O C	Rt.	24	36 x 36	R-41B	9						14.5					
	165+88 R.O C	Lt.	24	36 x 36	R-41B	9						13					
	145+65 R.O F	Lt.	24	36 x 48	R-38R	6.25			12.5								
	149+42 R.O F	Rt.	20	24 x 24	W-143	8								21.5	21.5		.54
				48 x 48	W-2	16											
	109+02 G'DALE	Rt.	34	24 x 12	1M-8	2								17	17		.54
				24 x 12	1M-37	2											
				24 x 24	M-5-24-2	4											
				21 x 15	1M-24	2.2											
				24 x 12	1M-8	2											
				24 x 12	1M-39	2											
				30 x 24	M-5-24-3	5											
				21 x 15	1M-24	2.2											
				60 x 18	D-11A	7.5											
89	58+89	Lt.	40	48 x 30	R-31F	10											
	TOTAL					282.09	284	14	7.5		19	8		23	2	4	3.78

Support Number	Location	Sign Designation	Sign Size	630 OVERHEAD SIGN SUPPORTS Extrusheet, Type G S.F.	TC-7.65 Design 6 Span 70'-0" Ea.	TC-7.65 Design 6 Span 67'-0" Ea.	TC-7.65 Design 6 Span 75'-0" Ea.	Sign Support and Strain Pole, as per plan	Concrete for Anchor Base Foundations C.Y.	631 Sign Service Ea.	631 Sign Wired Ea.	631 Disconnect Switch with Type X Enclosure Ea.	631 Ballast Type CMRI 175 Integral Ea.	631 Mercury Vapor Luminaire with 175 Watt Lamp Ea.	625 Ground Rod Ea.
1	140+89 N.B.	A	17' x 7'	119	1				14.2	1	1	1	1	2	1
		B	25' x 8.5'	212.5							1		1	3	
2	144+00 S.B.	A	17' x 7'	119		1			13.9	1	1	1	1	2	1
		B	16' x 7'	112							1		1	2	
3	148+50 N.B.	A	17' x 7'	119		1			13.0	1	1	1	1	2	1
		B	25' x 8.5'	212.5							1		1	3	
4	155+35 O.R.R.	A	2-8' x 4'	64				1 *	4.6	1	2	1	1	2	1
5	158+25 S.B.	A	13' x 7'	91			1		14.2		1		1	2	
		B	25' x 8'	183						1	1	1	1	3	1
	TOTAL			1232	1	2	1		59.9	5	10	5	9	21	5

* QUANTITY INCLUDED ON SHEET 85A

N.B. S.R. 315 NORTHBOUND
S.B. S.R. 315 SOUTHBOUND
O.R.R. OLENTANGY RIVER ROAD
R.O A RAMP OA
R.O B RAMP OB
R.O C RAMP OC
R.O F RAMP OF

SUBSUMMARY – TRAFFIC SURVEILLANCE

CALC. BY	
CHECK BY	

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

86A
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

REFERENCE NO.	STATION		625 CONDUIT, 1 1/2", 713.07	625 CONDUIT, 1 1/2", 713.04	625 CONDUIT, 3", 713.04	625 CONDUIT, 4", 713.07, TYPE DB	625 CONDUIT, 4", 713.07, TYPE EB	625 TRENCH	625 PULL BOX 713.08, 18"	625 PULL BOX, MISC.: HEAVY DUTY, 713.08, 32"	625 PULL BOX MISC.: 18" MEDIAN PULL BOX	625 PULL BOX MISC.: 36" MEDIAN PULL BOX	632 LOOP DETECTOR PAVEMENT CUTTING	632 SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	632 LOOP DETECTOR WIRE, TYPE E	632 LOOP DETECTOR LEAD-IN CABLE	632 SERVICE CABLE, 2 CONDUCTOR, NO. 6 AWG	632 SIGNALIZATION, MISC.: RAMP METER SIGN	632 SIGNALIZATION, MISC.: RAMP METER SIGNAL DISPLAY	633 CONTROLLER ITEM MISC.: RAMP METER CONTROLLER	SHEET NO.
	FROM	TO	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	EACH	EACH	EACH	EACH	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	EACH	EACH	EACH	
1–Z	140+00										1										
2–Z	140+00	142+67					534														87
3–Z	142+67										1										87
4–Z	142+67	148+50					1166														87
5–Z	148+50			44	252	60		156	1	3		1	192		520							87
6–Z	148+50	154+34					1168														87
7–Z	148+50	0A153+00	450					450													87
8–Z	0A153+00			20	32			32	2				152	60	376				1		87
9–Z	0A153+00	0A155+30	230					230						240		480	240				87
10–Z	0A155+30		6	10				16	1				52	25	136			1			87
11–Z	0A155+30	0A153+75			320			160						160		480	160				87
12–Z	0A153+75								1											1	87
13–Z	154+34										1										87
14–Z	154+34	156+00					332														87
15–Z	156+00	160+17					294														88
16–Z	160+17										1										88
17–Z	160+17	166+00					1166														88
18–Z	166+00			40	198	60		129	1	2		1	128		346							88
19–Z	166+00	167+58					316														88
20–Z	167+58									1											88
21–Z	167+58	170+65				614		307													88
	TOTAL		686	114	802	734	4976	1480	6	6	4	2	524	485	1378	960	400	1	1	1	

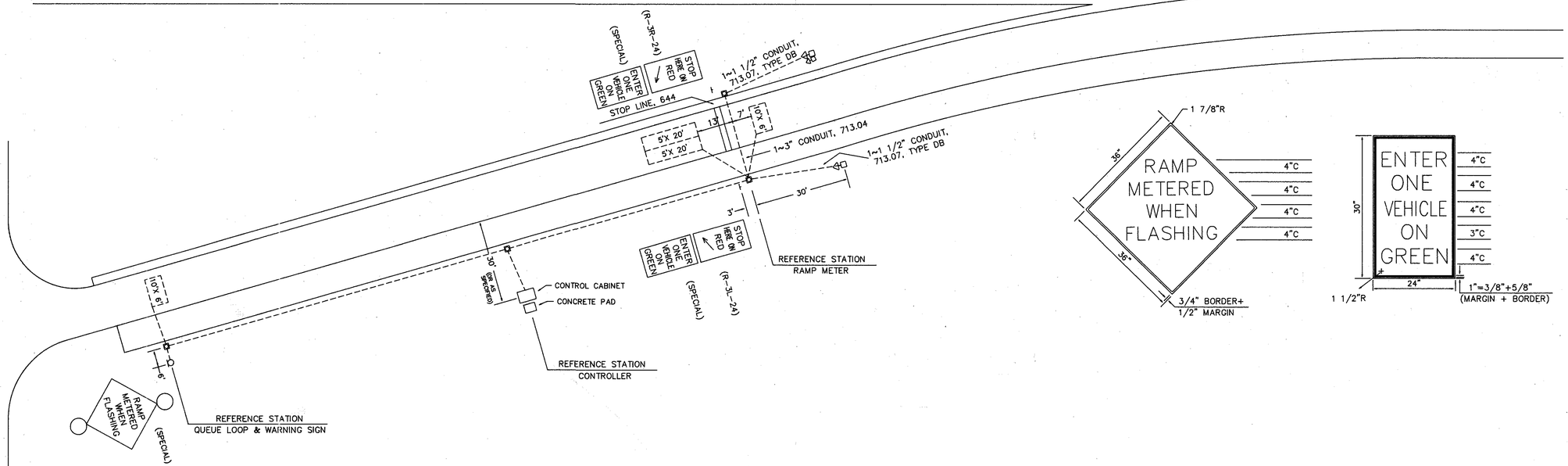
File: c:\ACAD\249E1\est-qun.DWG 1 = 1.0000
Date: 08-15-1996
Time: 09:53 Drawn by : BF

SUBSUMMARY – TRAFFIC SURVEILLANCE

FHWA REGION	STATE	PROJECT	
5	OHIO		

868
224

FRA-670-1.25 C-3
SURVEILLANCE LOOPS



ITEM 633 – RAMP METER CONTROLLER

CONTROL EQUIPMENT, CABINET AND CABINET ITEMS SHALL CONFORM TO TRAFFIC SIGNAL CONTROL EQUIPMENT SPECIFICATIONS, CURRENT EDITION, PUBLISHED BY THE CALIFORNIA BUSINESS, TRANSPORTATION & HOUSING AGENCY, DEPARTMENT OF TRANSPORTATION, P.O. BOX 942874, SACRAMENTO, CA 94274–0001. EACH RAMP METER CONTROLLER SHALL CONSIST OF ALL HARDWARE NEEDED TO BE FULLY FUNCTIONAL. AT A MINIMUM, THE FOLLOWING HARDWARE SHALL BE FURNISHED:

1 EA. MODEL 170 CONTROLLER
1 EA. MODEL 414 PROGRAM MODULE
2 EA. MODEL 200 SWITCH PACK
1 EA. MODEL 204 FLASHER UNIT
4 EA. MODEL 222 TWO CHAN LOOP DETECTORS
1 EA. MODEL 334 CABINET
1 EA. MODEL 208 MONITOR
1 EA. MODEL 206 POWER SUPPLY MODULE

THE RAMP METERING SOFTWARE SHALL BE FURNISHED BY THE CONTRACTOR. THE SOFTWARE SHALL BE CAPABLE OF OPERATING IN A TRAFFIC RESPONSIVE MODE. UPSTREAM MAINLINE LOOPS AND RAMP LOOPS SHALL BE MONITORED FOR FREEWAY AND RAMP TRAFFIC CONDITIONS. THE SOFTWARE SHALL BE CAPABLE OF SELECTING METERING RATES BASED UPON FREEWAY TRAFFIC FLOW. METERING RATES SHALL ALSO BE ADJUSTABLE ON THE BASIS OF RAMP QUEUES. THE RAMP METERING SOFTWARE SHALL BE CAPABLE OF ACTUATING THE RAMP METERING SIGN FLASHERS WHEN IN THE METERING MODE. THE RAMP METERING SOFTWARE SHALL BE OF THE TYPE USED BY CALTRANS, DISTRICT 7, WASHINGTON DOT IN SEATTLE, OR APPROVED EQUAL. THE RAMP METERING SOFTWARE MUST BE A FINISHED PRODUCT, CURRENTLY IN USE IN THE UNITED STATES OR CANADA. NO PROTOTYPES WILL BE ACCEPTED.

IN ADDITION TO THE HARDWARE DOCUMENTATION REQUIRED BY THE CALTRANS SPECIFICATIONS, FIVE (5) COPIES OF THE RAMP METERING SOFTWARE OPERATION MANUALS AND DOCUMENTATION SHALL BE FURNISHED SIX (6) WEEKS PRIOR TO DELIVERY OF THE CONTROLLER. ONE COPY OF THE HARDWARE AND SOFTWARE DOCUMENTATION SHALL BE FURNISHED TO THE ENGINEER. THE REMAINING COPIES SHALL BE MAILED TO:

CITY OF COLUMBUS
DIVISION OF TRAFFIC ENGINEERING
109 NORTH FRONT STREET
COLUMBUS, OH 43215
ATTN: FREEWAY ENGINEER

UPON RECEIPT OF THESE COPIES, THE CITY OF COLUMBUS WILL FURNISH THE ENGINEER WITH THE DATA NEEDED TO START UP THE SYSTEM.

THE CONTRACTOR SHALL FURNISH THE CITY OF COLUMBUS WITH AT LEAST FOUR HOURS OF TRAINING ON OPERATION OF THE SOFTWARE. THE TRAINING IS TO BE PRESENTED BY THE SOFTWARE SUPPLIER. A WORKING MODEL 170 CONTROLLER SHALL BE USED TO DEMONSTRATE THE SOFTWARE AND TO PROVIDE "HANDS ON" TRAINING. THE PRESENTATION SHALL COVER THE THEORY OF OPERATION, DATA BASE AND TABLE CREATION, TROUBLESHOOTING, MODIFICATION OF DATA BASE AND TABLES, AND PRESERVATION OF THE DATA BASE AND TABLES. THIS PRESENTATION SHALL BE MADE BETWEEN THE TIME OF THE DELIVERY OF THE MANUALS AND TURNING ON THE SYSTEM.

ITEM 632 – RAMP METER SIGNAL DISPLAY

THE FOUNDATION, TRANSFORMER BASE AND PEDESTAL SHAFT SHALL CONFORM TO STANDARD CONSTRUCTION DRAWING TC–83.20. SIGNAL HEADS SHALL BE 8", TWO SECTION, RED OVER GREEN, AND SHALL CONFORM TO 732.01. THE LOW MOUNTED SIGNAL HEAD SHALL BE MOUNTED AS SHOWN ON STANDARD CONSTRUCTION DRAWING TC–85.10.

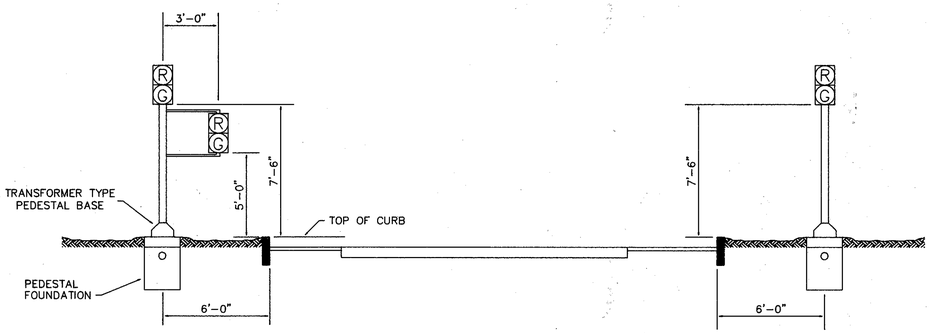
PAYMENT WILL BE MADE UNDER ITEM 632 – "RAMP METER", AND SHALL INCLUDE THE FOUNDATION EXCAVATION, FOUNDATION CONCRETE, ANCHOR BOLTS, TRANSFORMER BASE, PEDESTAL SHAFT, SIGNAL HEADS COMPLETE WITH BULBS, REFLECTORS AND LENSES, ATTACHING HARDWARE AND ALL OTHER ITEMS NECESSARY FOR A COMPLETE INSTALLATION. ELECTRICAL CABLE WILL BE PAID AS A SEPARATE ITEM.

ITEM 632 – RAMP METER SIGN

RAMP METER SIGN AND WARNING FLASHERS SHALL BE INSTALLED AS PER THE PTSWF SIGN DRAWING. THE SIGN COPY WILL BE REVISED TO READ "RAMP METERED WHEN FLASHING" AND THE RELAY ASSEMBLY AND FLASHER ARE NOT USED. THE SIGN FLASHERS WILL BE POWERED DIRECTLY FROM THE RAMP METER CONTROLLER.

PAYMENT WILL BE MADE UNDER ITEM 632 – "RAMP METER SIGN", AND SHALL INCLUDE THE FOUNDATION EXCAVATION, FOUNDATION CONCRETE, ANCHOR BOLTS, BREAKAWAY BASE, POLE, SIGN, SIGN BRACKETS, SIGN LUMINAIRE, FLASHERS, MOUNTING HARDWARE AND ALL OTHER ITEMS NECESSARY FOR A COMPLETE INSTALLATION.

ELECTRICAL CABLE WILL BE PAID AS A SEPARATE ITEM. A QUANTITY OF SIGNAL CABLE, 5 CONDUCTOR, #14 AWG IS PROVIDED FOR THE FLASHERS. LUMINARIE POWER IS TAKEN FROM THE NEAREST ACCESS TO THE STREET LIGHTING CIRCUIT. ALL OF THESE QUANTITIES ARE TO BE PAID UNDER THE APPROPRIATE ROADWAY LIGHTING ITEMS.



TYPICAL RAMP METER INSTALLATION

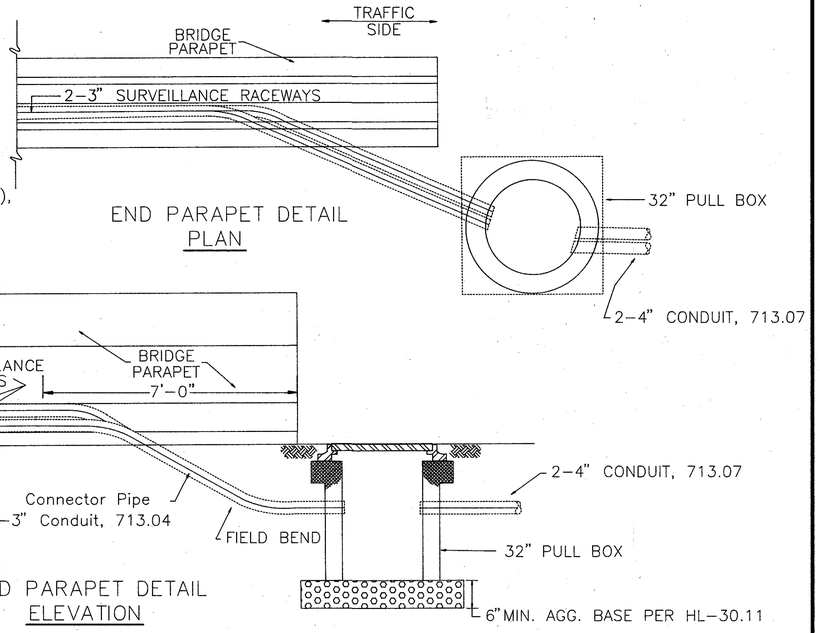
FHWA REGION	STATE	PROJECT	
5	OHIO		

86C 224

FRA-670-1.25 C-3

SURVEILLANCE LOOPS

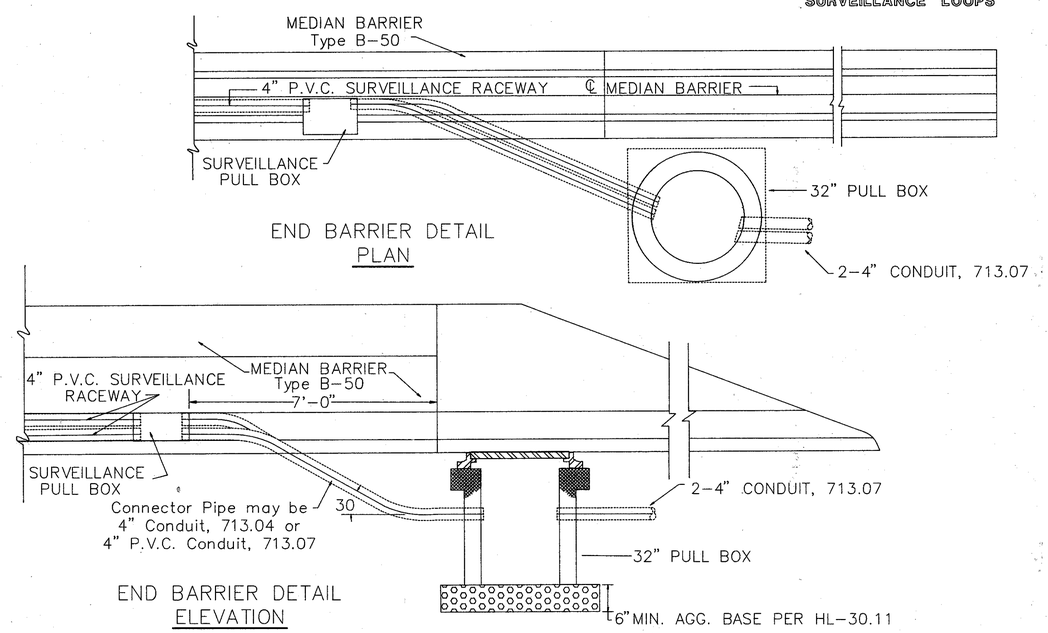
TYPICAL SURVEILLANCE CONDUIT TREATMENT AT END OF BRIDGE PARAPET



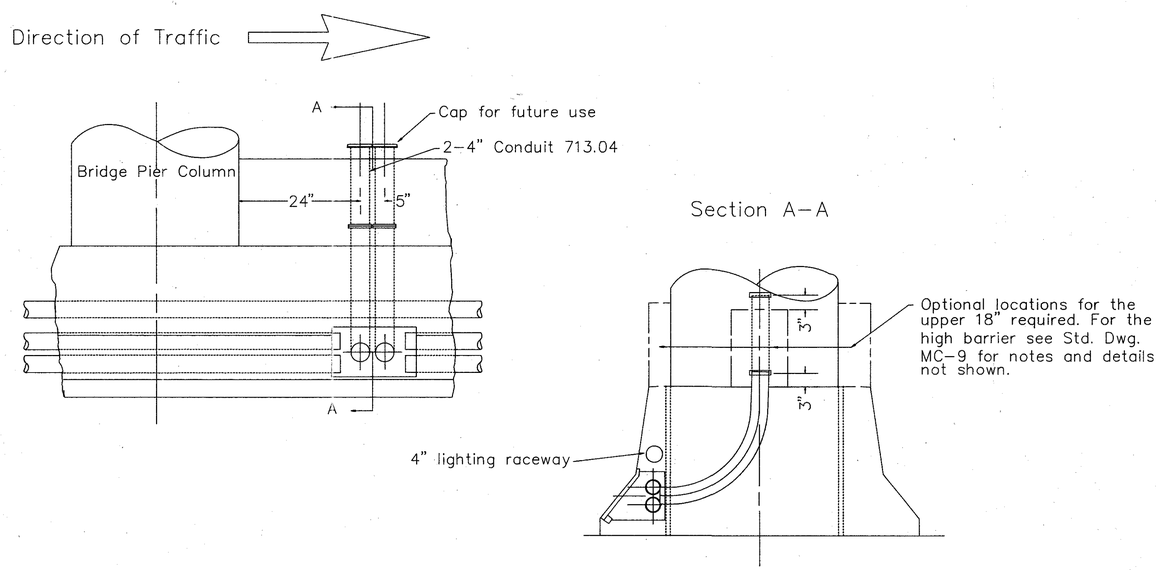
CONDUIT ON STRUCTURE

Expansion fittings for Conduit on Structure shall be OZ (type AX), Spring City (type AF), or Crouse-Hinds (type XJ-4) or approved equal. Each expansion fitting shall have a copper external Bonding Jumper.

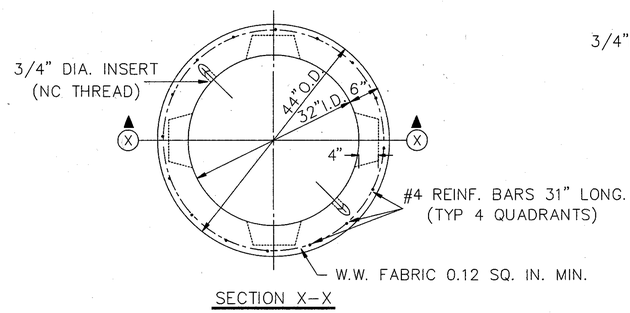
TYPICAL SURVEILLANCE CONDUIT TREATMENT AT END BARRIER WALL

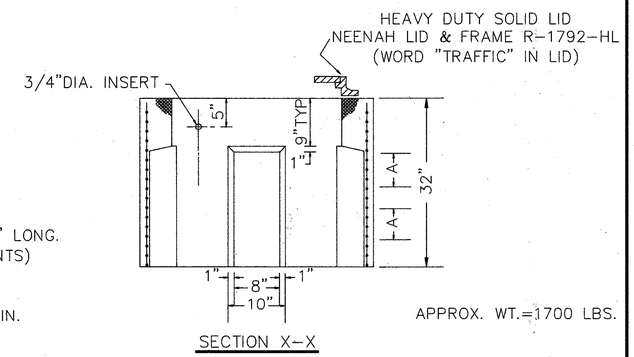


BRIDGE PIER RISER



ITEM SPECIAL 32" PULL BOX





APPROX. WT.=1700 LBS.

"A" Cut out 4 wires in the area of the reduced wall section. Also include the vertical wire for removal.

Concrete Comp. Strength-4000psi min. Design.

Concrete Air Entrainment to be 6% + 1 1/2%.

Coating of protective Acrylic is to be applied to the top 12" of the outside face and total inside face.

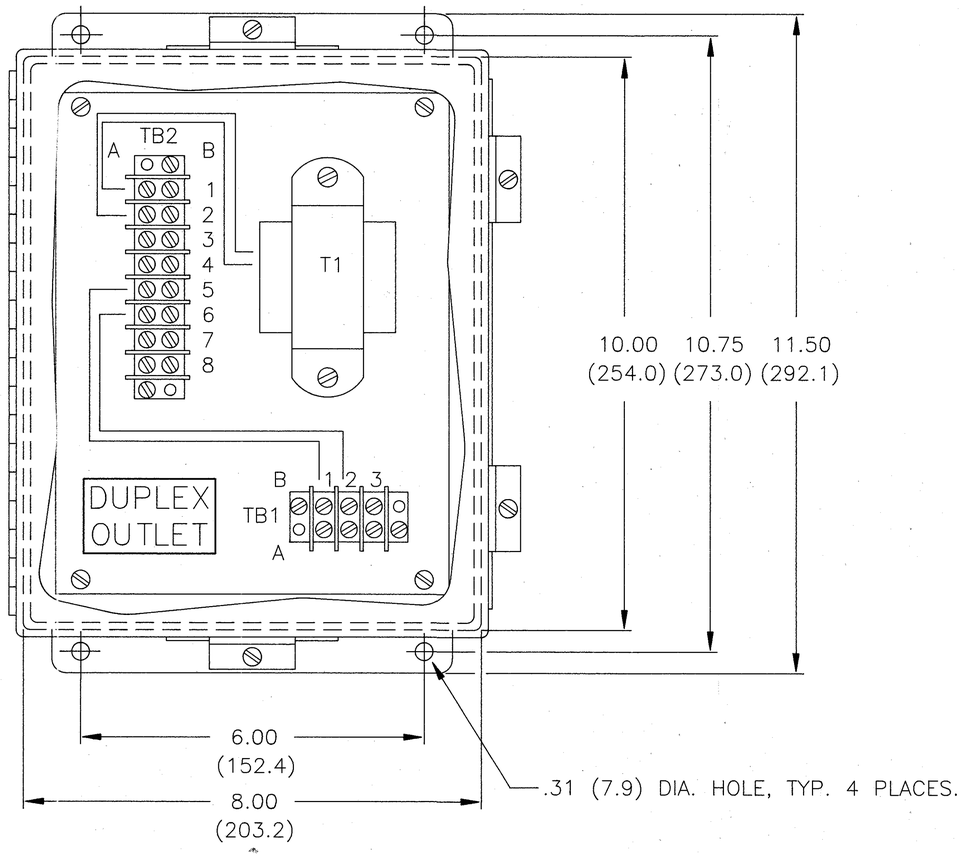
Lid Ring Load transfer is to be distributed by use of a preformed mostic joint material.

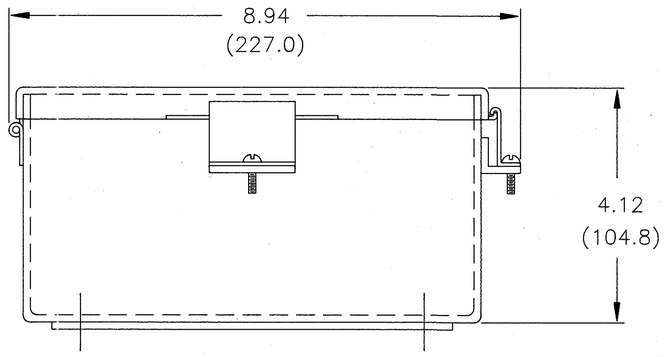
REV. 6-29-90

FHWA REGION	STATE	PROJECT	
5	OHIO		

86D
224

FRA-670-1.25 C-3
SURVEILLANCE LOOPS





NOTES:

1) ALL DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS.
2) SPECIFICATIONS: MATERIAL: STEEL
   FINISH: GREY
   WEIGHT: 10 lbs. (4.5 kgs.)
   NEMA RATING: NEMA 4 TYPE
3) CUSTOMER TO DRILL AND INSTALL CABLE FITTINGS PER SITE REQUIREMENTS.
4) CUSTOMER TO INSTALL BNC CONNECTORS AFTER COAXIAL CABLE HAS BEEN SLIPPED THRU CONDUIT FITTINGS. ATTACH COAXIAL CABLE TO PANEL WITH THE TIE WRAP SUPPLIED.

WIRING SCHEDULE

TB1

A	B	(SIDE FIELD WIRING)
1	1	AC HOT
2	2	AC NEUT
3	3	AC GND

} CUSTOMER SUPPLIED

TB2

	A	B	(SIDE FIELD WIRING)	
	1	1	BLK	24VAC
	2	2	BRN	24VAC
BLK	3	3	BLK	DATA −
RED	4	4	RED	DATA +
TB1−1	5	5	BLK	
TB1−2	6	6	BLU	120VAC
WHT	7	7	WHT	120VAC
SHIELD	8	8	BLK	

RG−6 { WHT, SHIELD

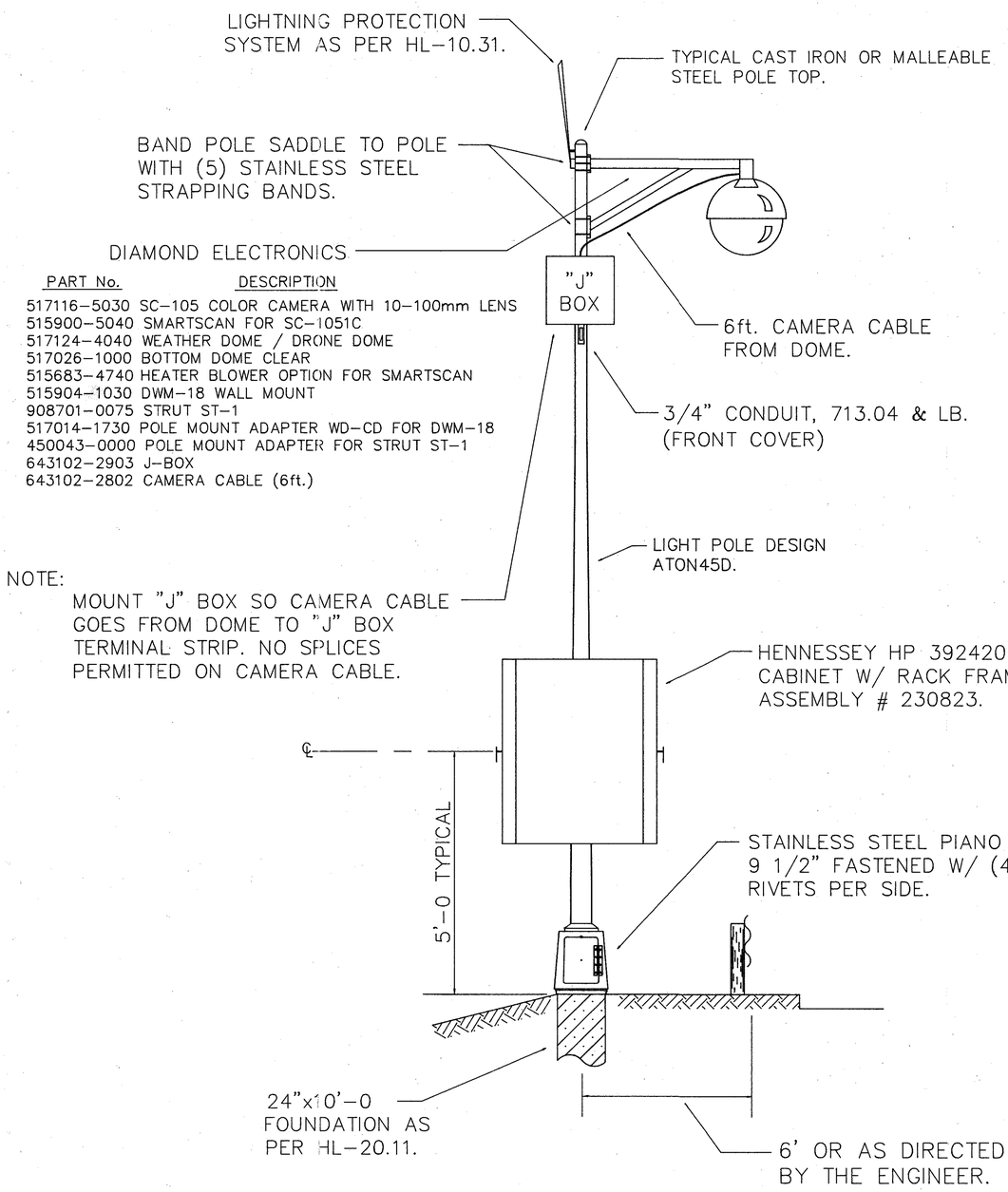
} CABLE FROM FASTSCAN DOME

NOTE:
ARCOR CABLE
RKA2V1−EXTRATUFF.

FHWA REGION	STATE	PROJECT	
5	OHIO		

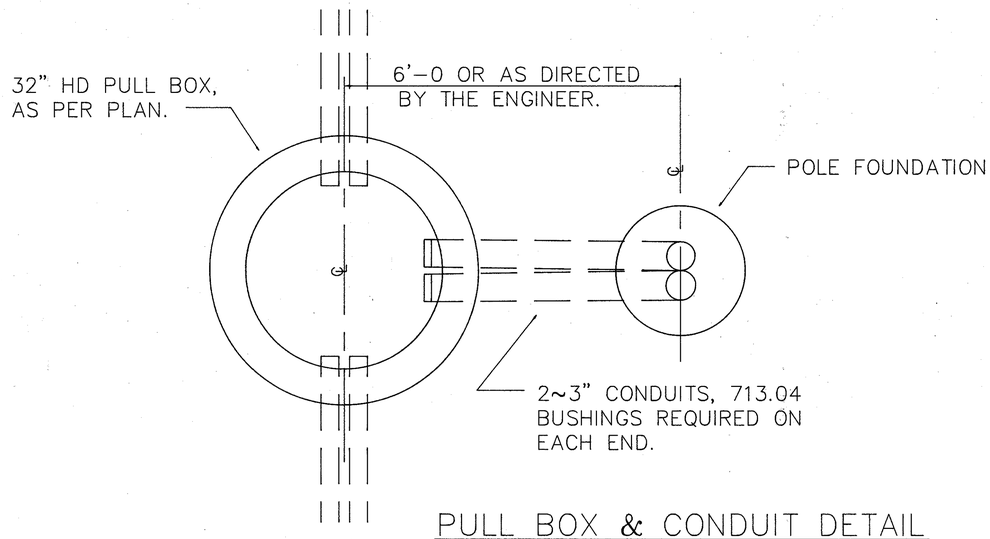
86E 224

FRA-670-1.25 C-3
SURVEILLANCE LOOPS

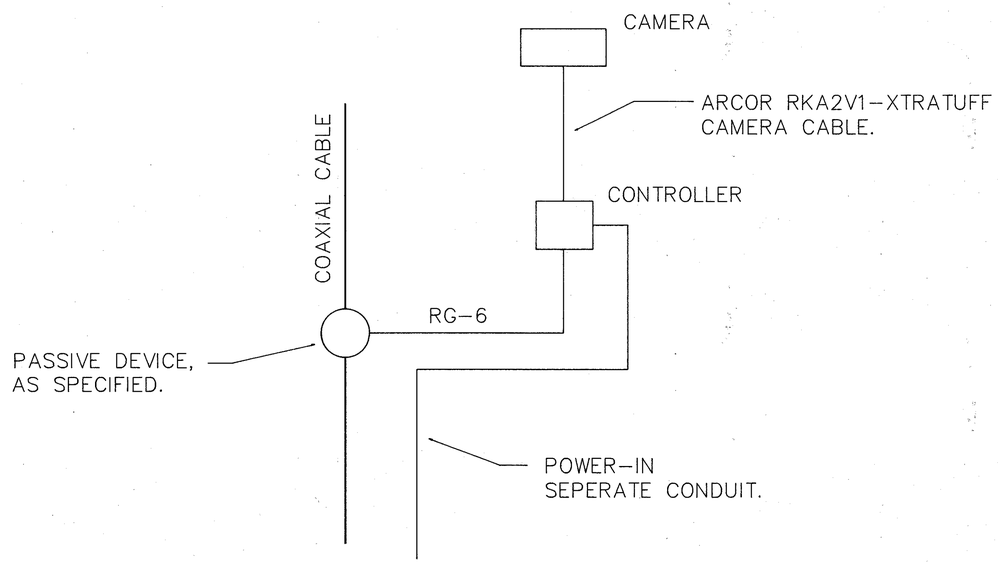


PART No.	DESCRIPTION
517116-5030	SC-105 COLOR CAMERA WITH 10-100mm LENS
515900-5040	SMARTSCAN FOR SC-1051C
517124-4040	WEATHER DOME / DRONE DOME
517026-1000	BOTTOM DOME CLEAR
515683-4740	HEATER BLOWER OPTION FOR SMARTSCAN
515904-1030	DWM-18 WALL MOUNT
908701-0075	STRUT ST-1
517014-1730	POLE MOUNT ADAPTER WD-CD FOR DWM-18
450043-0000	POLE MOUNT ADAPTER FOR STRUT ST-1
643102-2903	J-BOX
643102-2802	CAMERA CABLE (6ft.)

NOTE:
MOUNT "J" BOX SO CAMERA CABLE GOES FROM DOME TO "J" BOX TERMINAL STRIP. NO SPLICES PERMITTED ON CAMERA CABLE.



PULL BOX & CONDUIT DETAIL

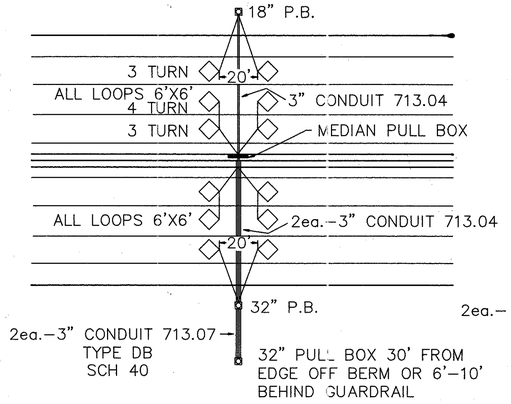


ELECTRICAL & COMMUNICATIONS DETAIL

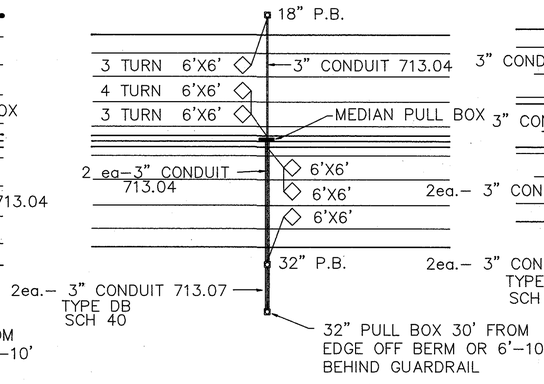
OHIO	86F
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25 C-3

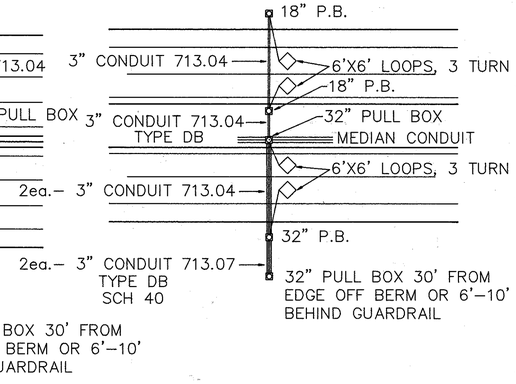
LOOP PLACEMENT



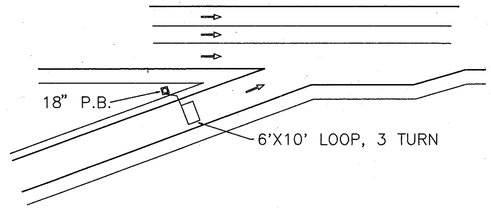
SPEED TRAP STATION



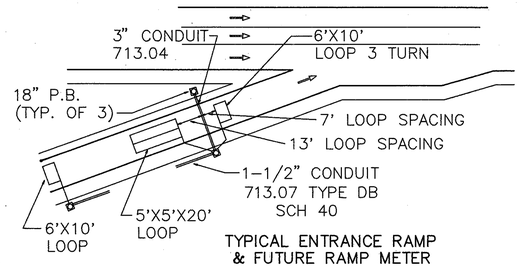
DETECTOR STATION



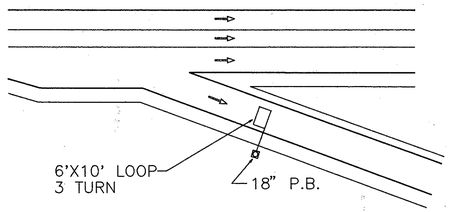
TYPICAL DETECTOR STATION
WITHOUT MEDIAN WALL



TYPICAL ENTRANCE RAMP

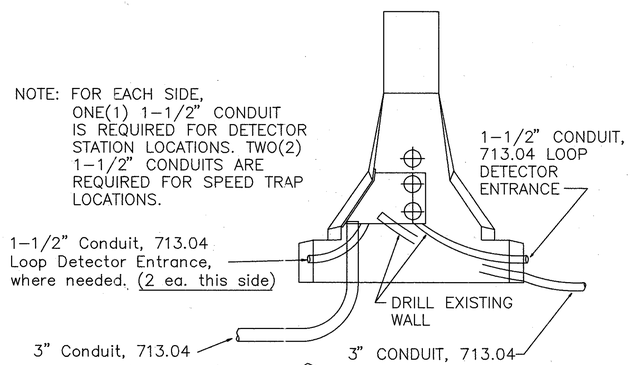


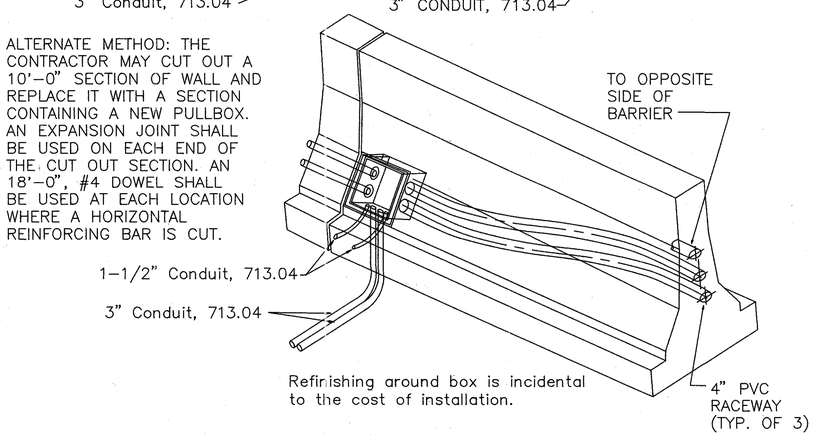
TYPICAL ENTRANCE RAMP
& FUTURE RAMP METER



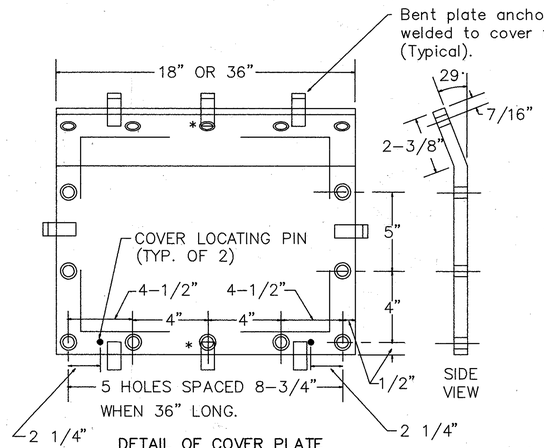
TYPICAL EXIT RAMP

SURVEILLANCE PULL BOX & CONDUIT MODIFICATIONS TO EXISTING MEDIAN PULL BOX





NEW SURVEILLANCE MEDIAN PULL BOX & CONDUIT

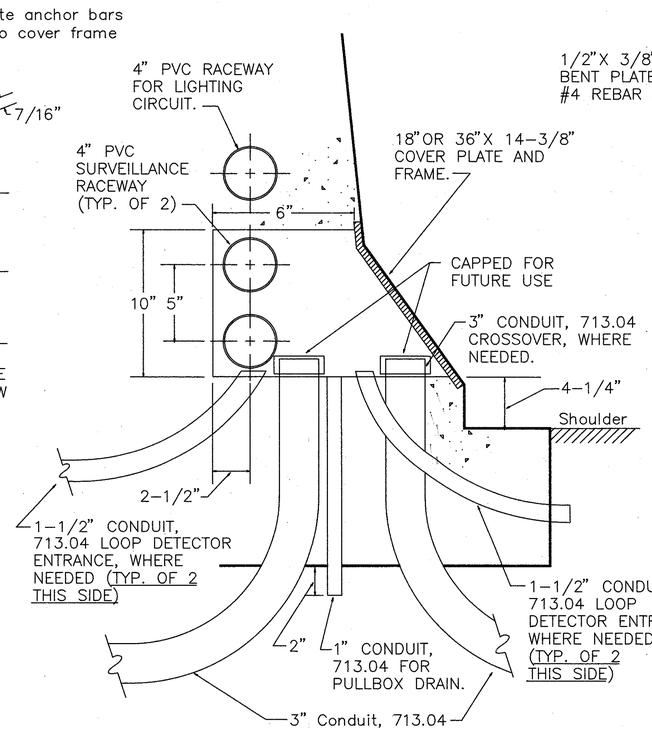


DETAIL OF COVER PLATE
FOR PULLBOX CAVITY

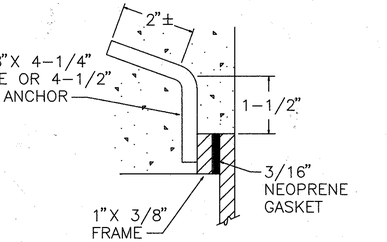
*NOTE:
When 36" long cover plate is used
locate 2 additional plate anchor
bars as shown.

ASSEMBLY NOTE:
COVER SHALL BE ORIENTED WITH THE
LOCATING PINS BEFORE DRILLING
COVER PLATE BOLT HOLES.

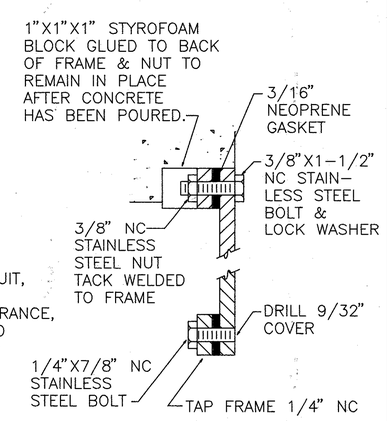
NOTE:
The pullbox cavity cover plate and
frame shall be hot dip galvanized
after all fabrication is finished,in
accordance with requirements of
ASTM A-123.



TYPICAL TRAFFIC SURVEILLANCE PULLBOX



FRAME ANCHOR DETAIL



COVER BOLT & LOCATION PIN DETAIL

246E1\SURVEY10
1=1 33.5,22.0 .66,.75
STA. B 12/21/92 MLF

SURVEILLANCE DETAILS & TYPICALS

OHIO	87
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

ITEM 620 - DELINEATORS					
SHEET	STATION TO STATION	Delineators, Type D, Post Mounted	Delineators, Type D, Bracket Mounted	Delineators, Type C, Post Mounted	
		Each	Each	Each	
87	151+00 to 156+00 (RAMP OA)	11@45'			
	154+00 to 156+00 (RAMP OB)	5@45'			
	152+45 to 153+00 (RAMP OC)	2@65'			
	140+00 to 156+00 (S.R. 315)			2x5@400'	
88	156+00 to 157+50 (RAMP OB)	3@45'			
	156+00 to 171+55			2x3@400'	
90	153+45 to 158+00 (RAMP OC)		7@65'		
	158+00 to 164+00 (RAMP OC)	12@50'			
TOTAL		33	7	16	

NOTE: LOCATE RAMP CONTROLLER CABINET BEHIND SIGNAL CONTROLLER CABINET. SEPERATE TO ALLOW ACCESS TO BACK DOOR OF RAMP CONTROLLER CABINET RAMP CONTROLLER CABINET USES SIGNAL POWER SOURCE AND SERVICE.

FOR OLENTANGY RIVER ROAD INTERSECTION SEE SHT. 85.

BEGIN WORK STA. 140+00
P.O.T. STA. 140+00
CONRAIL R.R.
T.S. STA. 142+44.08
C & O R.R.
BEGIN TAPER STA. 145+43.56
BEGIN WORK STA. 139+89.02
(LEVEL I) WEST 670 EXIT ONLY GG (16'x7') (STA. 144+00) SUPPORT #2
(LEVEL I) SOUTH 315 GG (17'x7')
(LEVEL I) NORTH 315 GG (17'x7') (STA. 140+89) SUPPORT #1
(LEVEL I) GOODALE ST. OLENTANGY RIVER RD. EXIT ONLY GB (25'x8.5')
2-4" RACEWAY BARRIER MEDIAN 267'
2-4" RACEWAY IN BARRIER MEDIAN, 583'
2-3" CONDUIT, 713.04, 58'
4 TURN
2-3" CONDUIT 713.04, 31'
2-3" CONDUIT 713.04, 37'
2-4" CONDUIT 713.07 TYPE DB, 30'
2-3" CONDUIT 713.04, 31'
1-1/2" CONDUIT 713.07, TYPE DB, 450'
2-4" RACEWAY IN MEDIAN, 584'
2-4" RACEWAY IN MEDIAN, 166'
S.C. STA. 144+44.08
C.S. STA. 144+77.69
S.T. STA. 146+77.69
BEGIN RAMP OC T.S. STA. 148+63.57 (LEVEL I)
(LEVEL I) NORTH 315 GG (17'x7') (STA. 148+50) SUPPORT #3
GOODALE STREET
(LEVEL I) GOODALE ST. OLENTANGY RIVER RD. EXIT ONLY GB (25'x8.5')
BIKEWAY
SCALE IN FEET 0 50 100

R-38R (48"x60") (STA. 156+00)
R-41B (36"x36") (STA. 153+83)
R-43L-36 ONE WAY
DO NOT ENTER
R-43R-36 ONE WAY
P.O.T. 156+71.76
P.O.T. 153+14.90
OLENTANGY RIVER ROAD
P.T. STA. 156+29.88
SEE NOTE
2-3" CONDUIT, 713.04, 160'
W-50R-(48"x48") (STA. 153+00)
PEDESTRIANS AND BICYCLES PROHIBITED R15B-30 (STA. 155+00)
BEGIN RAMP OA STA. 150+63.56
S.C. STA. 150+63.57
C.S. STA. 150+76.83
T.S. STA. 152+63.56
S.C. STA. 152+63.57
S.T. STA. 152+76.83
2-1-1/2" CONDUIT, 713.07, TYPE DB, 230'
RAMP OA
RAMP OB
T.S. STA. 154+99.49
MATCH LINE STA. 156+00
MATCHLINE STA. 153+00
MATCH LINE
MATCHLINE STA. 156+40.97
W-97 (48"x60") (STA. 151+00) M.P.H. 25 EXIT
EXIT GF (72"x60") (STA. 152+23)

TRAFFIC CONTROL STA. 140+00 to STA. 156+00

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

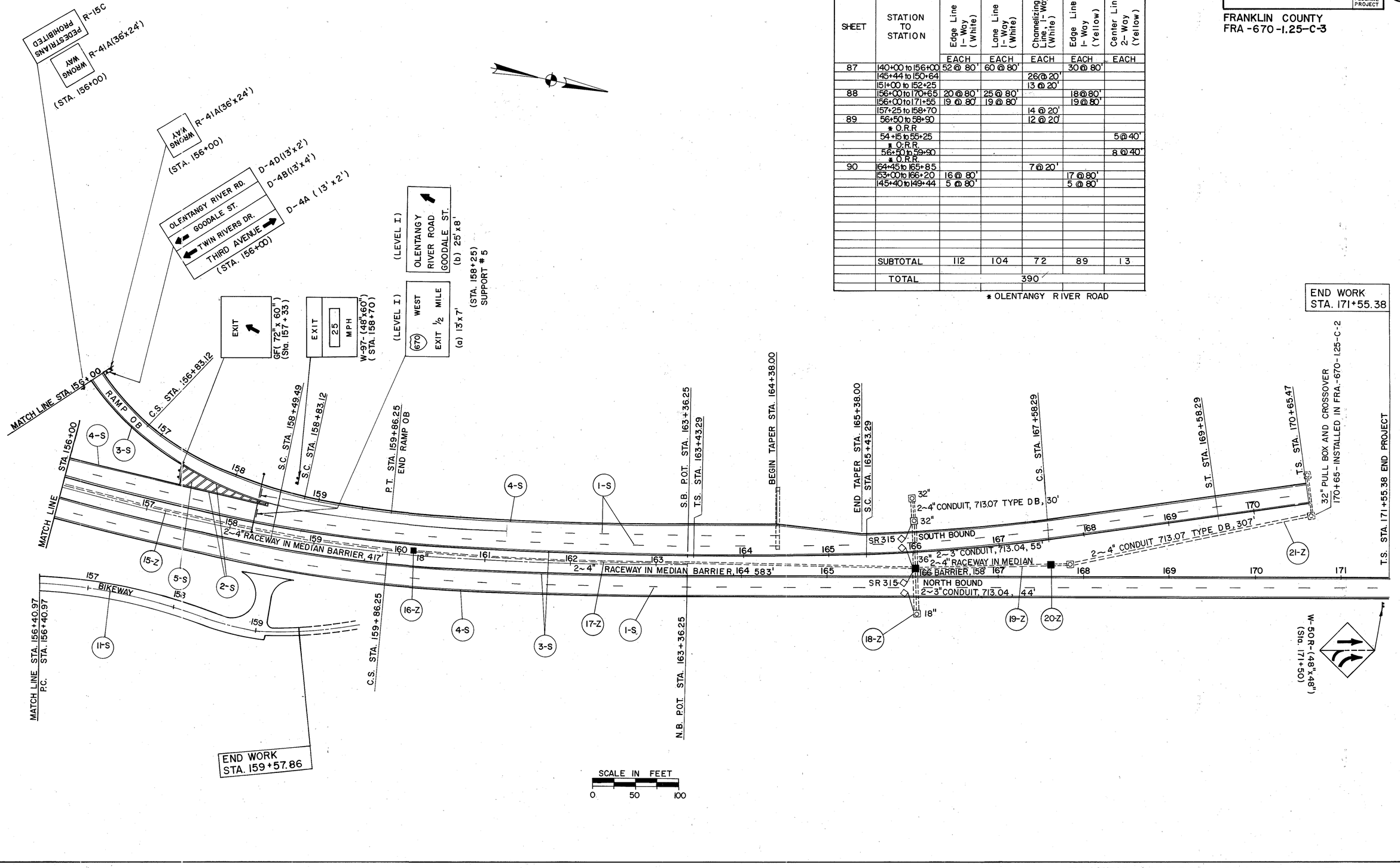
88
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

ITEM 862- RAISED PAVEMENT MARKERS						
SHEET	STATION TO STATION	Edge Line 1-Way (White)	Lane Line 1-Way (White)	Channelizing Line, 1-Way (White)	Edge Line 1-Way (Yellow)	Center Line 2-Way (Yellow)
		EACH	EACH	EACH	EACH	EACH
87	140+00 to 156+00	52 @ 80'	60 @ 80'		30 @ 80'	
	145+44 to 150+64			26 @ 20'		
	151+00 to 152+25			13 @ 20'		
88	156+00 to 170+65	20 @ 80'	25 @ 80'		18 @ 80'	
	156+00 to 171+55	19 @ 80'	19 @ 80'		19 @ 80'	
	157+25 to 158+70			14 @ 20'		
89	56+50 to 58+90			12 @ 20'		
	* O.R.R.					
	54+15 to 55+25					5 @ 40'
	* O.R.R.					
	56+50 to 59+90					8 @ 40'
	* O.R.R.					
90	164+45 to 165+85			7 @ 20'		
	153+00 to 166+20	16 @ 80'			17 @ 80'	
	145+40 to 149+44	5 @ 80'			5 @ 80'	
	SUBTOTAL	112	104	72	89	13
	TOTAL	390				

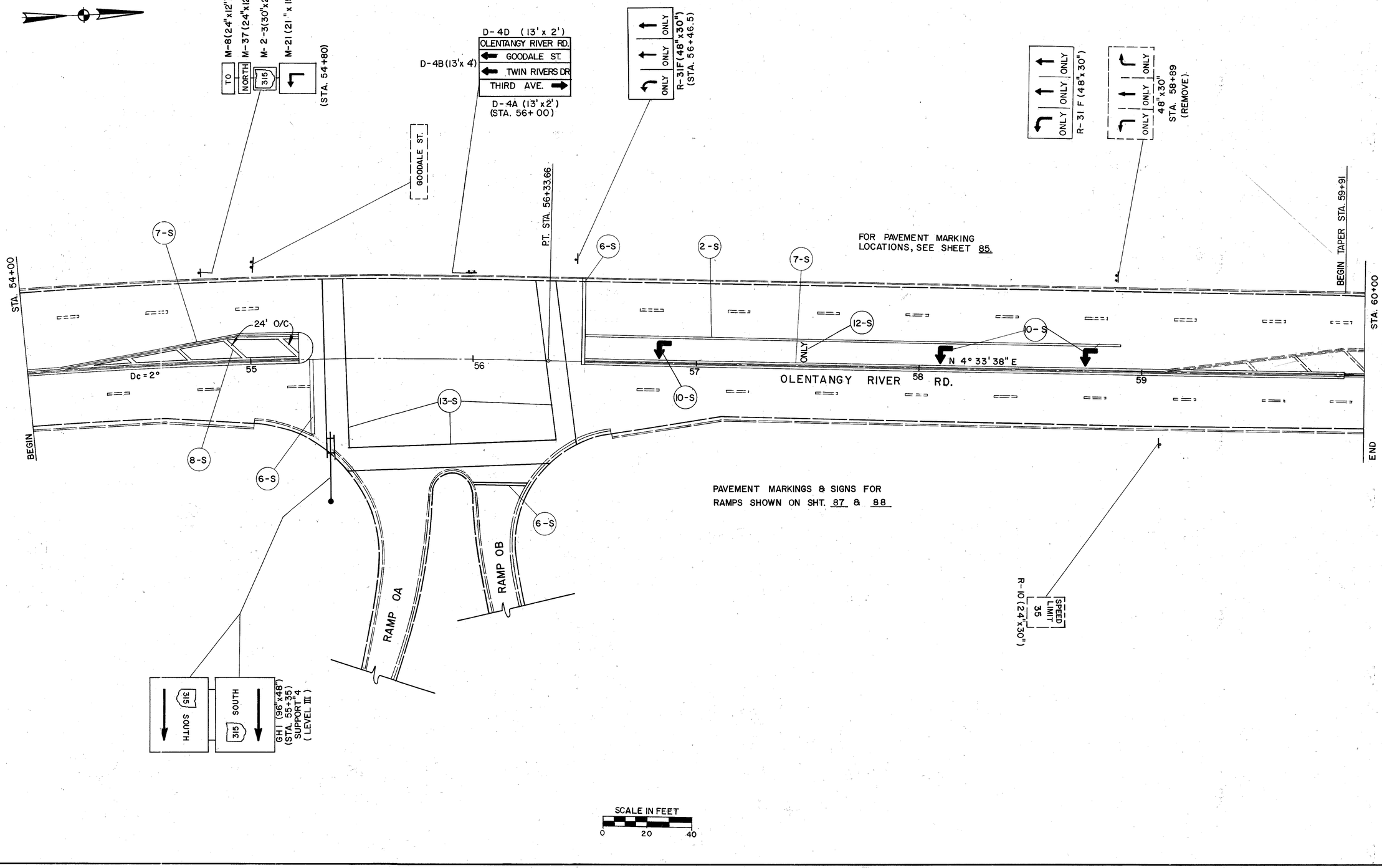
* OLENTANGY RIVER ROAD

END WORK
STA. 171+55.38



TRAFFIC CONTROL - STA. 156+00 TO 171+55.38

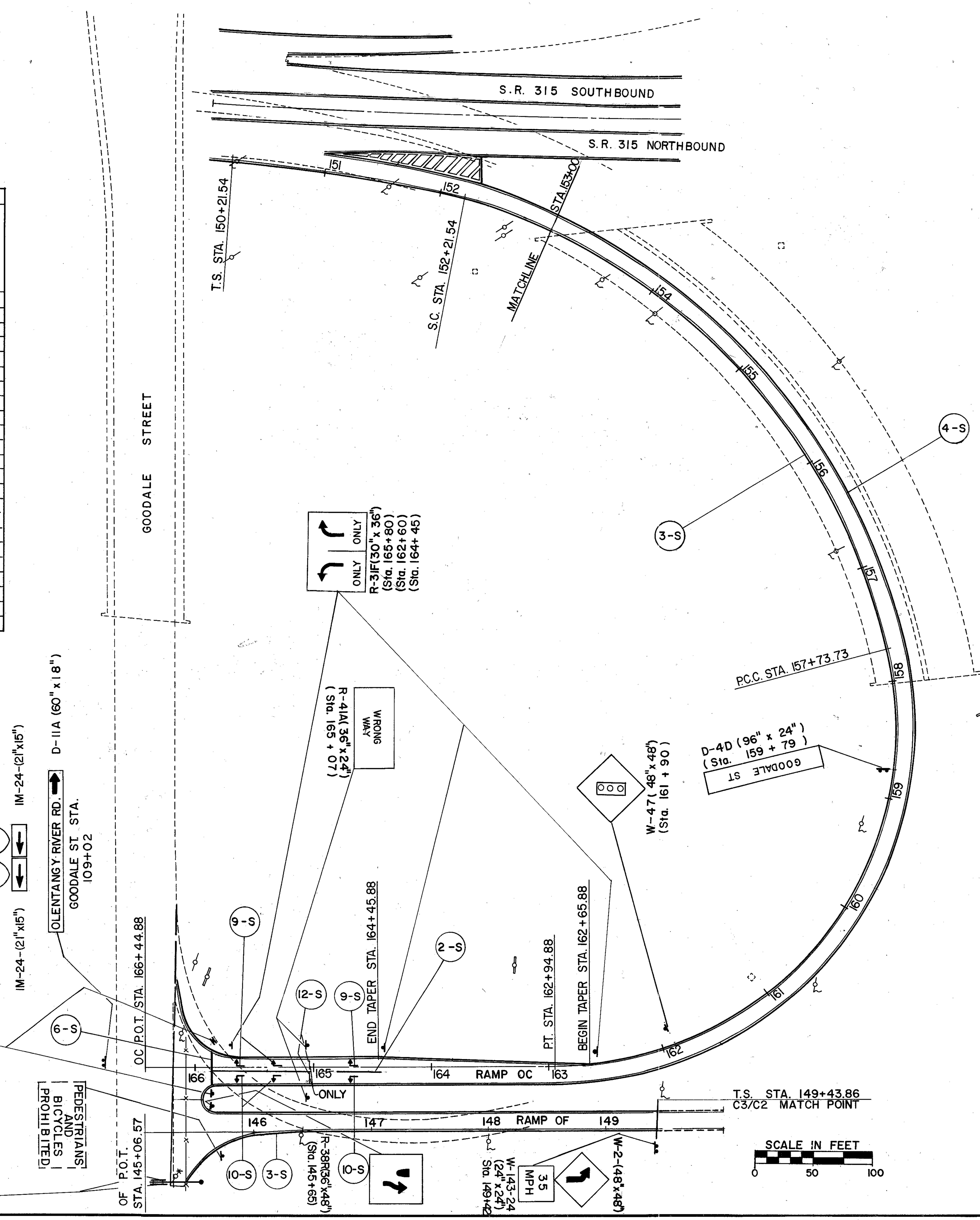
FRANKLIN COUNTY
FRA-670-1.25-C-3

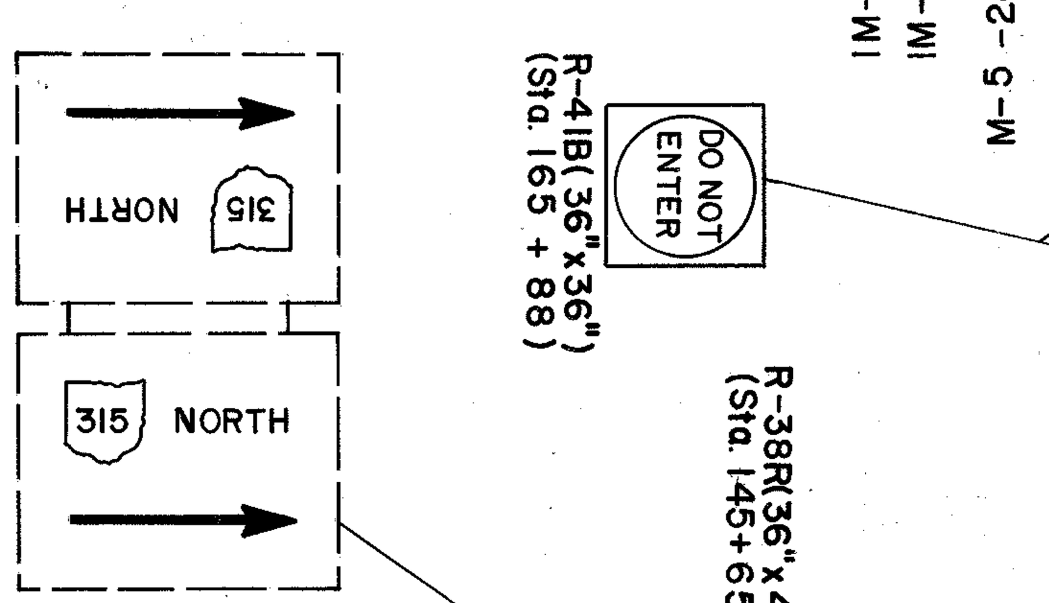


TRAFFIC CONTROL – STA. 54 + 00 TO STA. 60 + 00

FRANKLIN COUNTY
FRA-670-1.25-C-3

ITEM 802- BARRIER REFLECTOR					
SHEET	STATION TO STATION	Barrier Reflector, Type A (Each)	Barrier Reflector, Type B (Each)		
11	140+00 to 167+58.09		2 x 29		
25	140+00 to 143+27		4		
	141+00 to 144+75	4			
26	152+50 to 156+00	4			
27	156+00 to 163+00	6			
29	163+00 to 164+50	2			
30	148+50 to 151+00	3			
31	158+00 to 160+25	3			
32	147+93.5 to 152+80	12			
	152+50 to 153+37.5	4			
	152+87 to 158+30		2 x 10		
	TOTAL	38	82		





Sheet	Station to Station	644 1-S 5" Dashed Lane Lines (White)	644 2-S 10" Channelizing Line (White)	644 3-S 5" Edge Line (Yellow)	644 4-S 5" Edge Line (White)	644 5-S 20" Transverse Lines (White)	644 6-S 20" Stop Lines (White)	644 7-S 5" Center Lines (Yellow Double Solid)	644 8-S 20" Transverse Lines (Yellow)	644 9-S (arrow)	644 10-S (arrow)	642 11-S 5" Center Line (Single Dashed)	644 12-S Word on Pavement, 72"	644 13-S 10" Crosswalk Line
87	140+00 to 156+00	4800		2450	4160									
	145+44 to 150+64		520											
	151+00 to 152+25		260			120								
88	156+00 to 170+65.47	2005		1465	1600									
	156+00 to 171+55.38	1555		1555	1555									
	157+25 to 158+70		280			116								
89	54+15 to 55+25 ORR *							225	34					
	56+50 to 58+90 ORR *		240											
	56+50 to 59+90 ORR *							340						
	55+27 ORR *						33							
	56+50 ORR *						38							
	153+80 Ramp OB						24							
	56+84 to 58+74 ORR *										3		1	
90	165+07 Ramp OC												2	
	164+45 to 165+85 Ramp OC		140											
	153+00 to 166+20 Ramp OC			1375	1340									
	165+60, 164+65, 165+20 Ramp OC									3	3			
	145+40 to 149+43.86 Ramp OF			415	400									
	166+15 Ramp OC						28							
89	55+30 to 56+45 ORR *													484
87	139+89.02 to 156+40.97 Bikeway											1652		
88	156+40.97 to 159+57.86 Bikeway											317		
	Total Lin. Ft.	8360	1440	7260	9055	236	123	565	34	3	6	1967	3	484
	Total Miles	1.583			3.09			.107				.373		

* OLENTANGY RIVER ROAD

	OHIO
	FHWA 5 REGION
	FEDERAL PROJECT

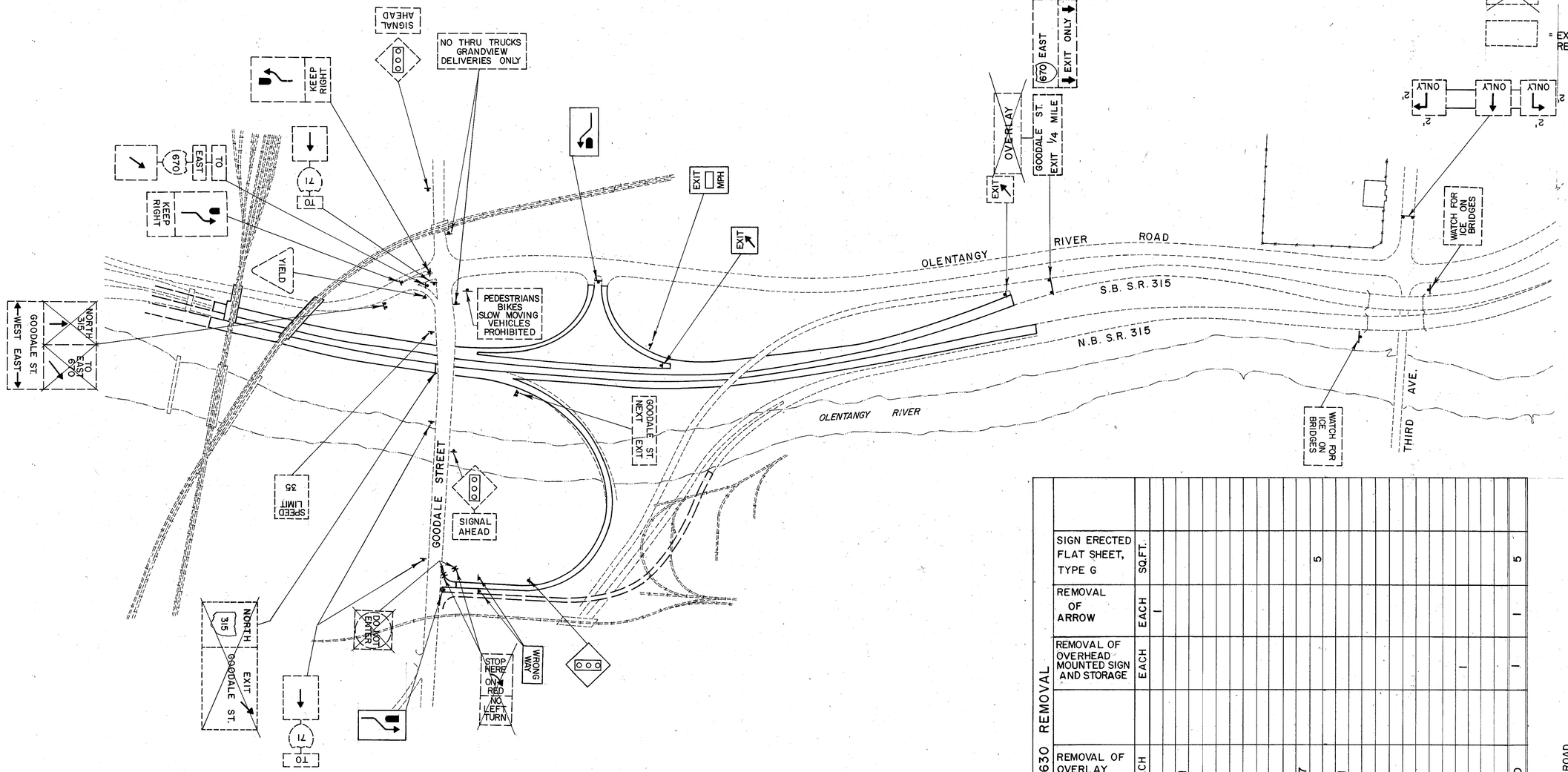
91
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

= NEW SIGN ERECTED IN THIS CONTRACT SEE SH. 87-90

= REMOVE

= EXISTING SIGN TO REMAIN.



ITEM 630 REMOVAL

SHEET	STATION OR LOCATION	REMOVAL OF GROUND MOUNTED SIGN AND STORAGE EACH	REMOVAL OF OVERLAY SIGN EACH		REMOVAL OF OVERHEAD MOUNTED SIGN AND STORAGE EACH	REMOVAL OF ARROW EACH	SIGN ERECTED FLAT SHEET, TYPE G SQ.FT.
92	180+60	2				1	
	43+00		1				
	45+08						5
	59+00	2					
93	86+30	2					
	64+20	2					
94	90+20	2					
95	LANE		7				
	FYFFE & LANE						
96	163+30		1				
91	GOODALE & RAMP OC	2					
	GOODALE & ORR*	1					
	SR. 315 @ GOODALE		1		1		
	TOTAL	13	10		1	1	5

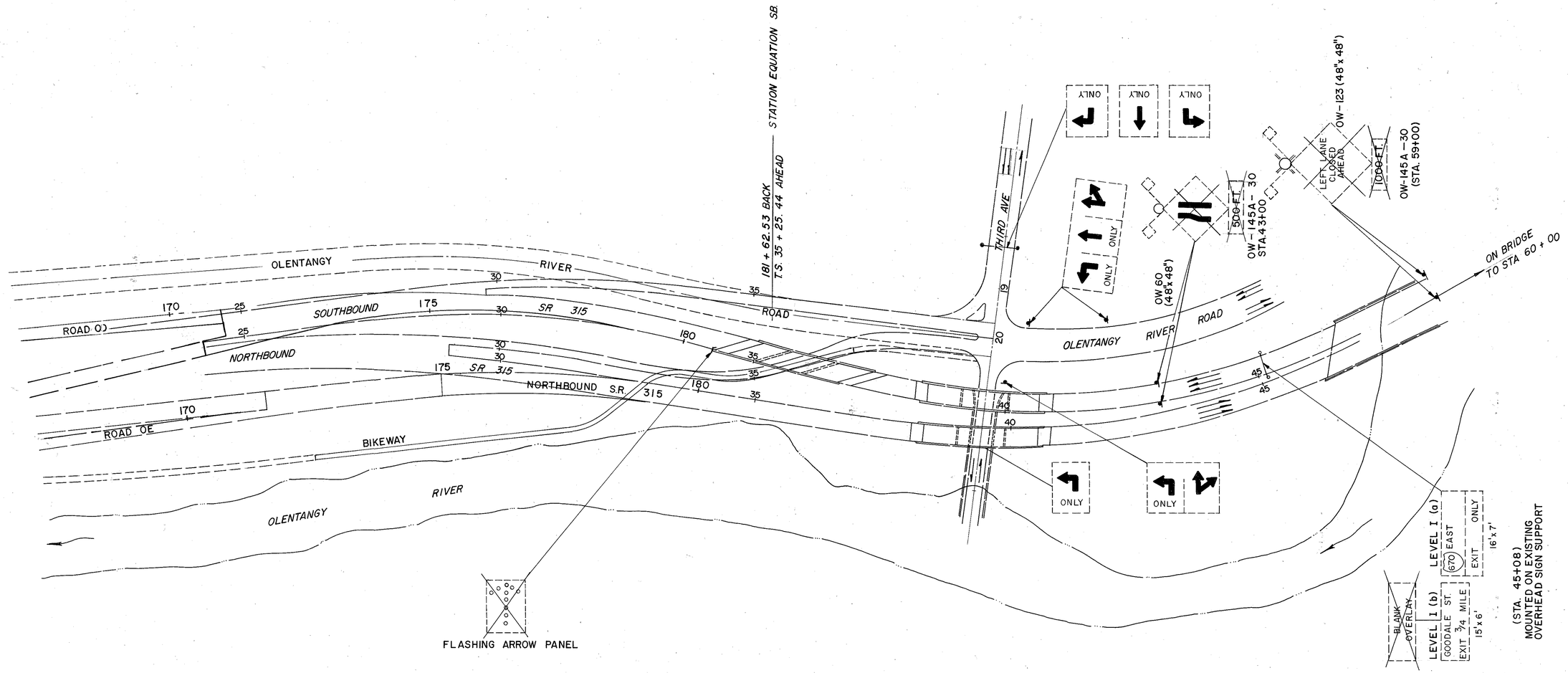
* — OLENTANGY RIVER ROAD

SIGN LEGEND STA. 140+00 TO STA. 171+00

OHIO
FHWA REGION 5
FEDERAL PROJECT

92
224

FRANKLIN COUNTY
FRA-670-1.25-C-3



SIGNS SHOWN THUS ARE TO BE REMOVED BY THE CONTRACTOR WHEN ALL WORK IS COMPLETE.

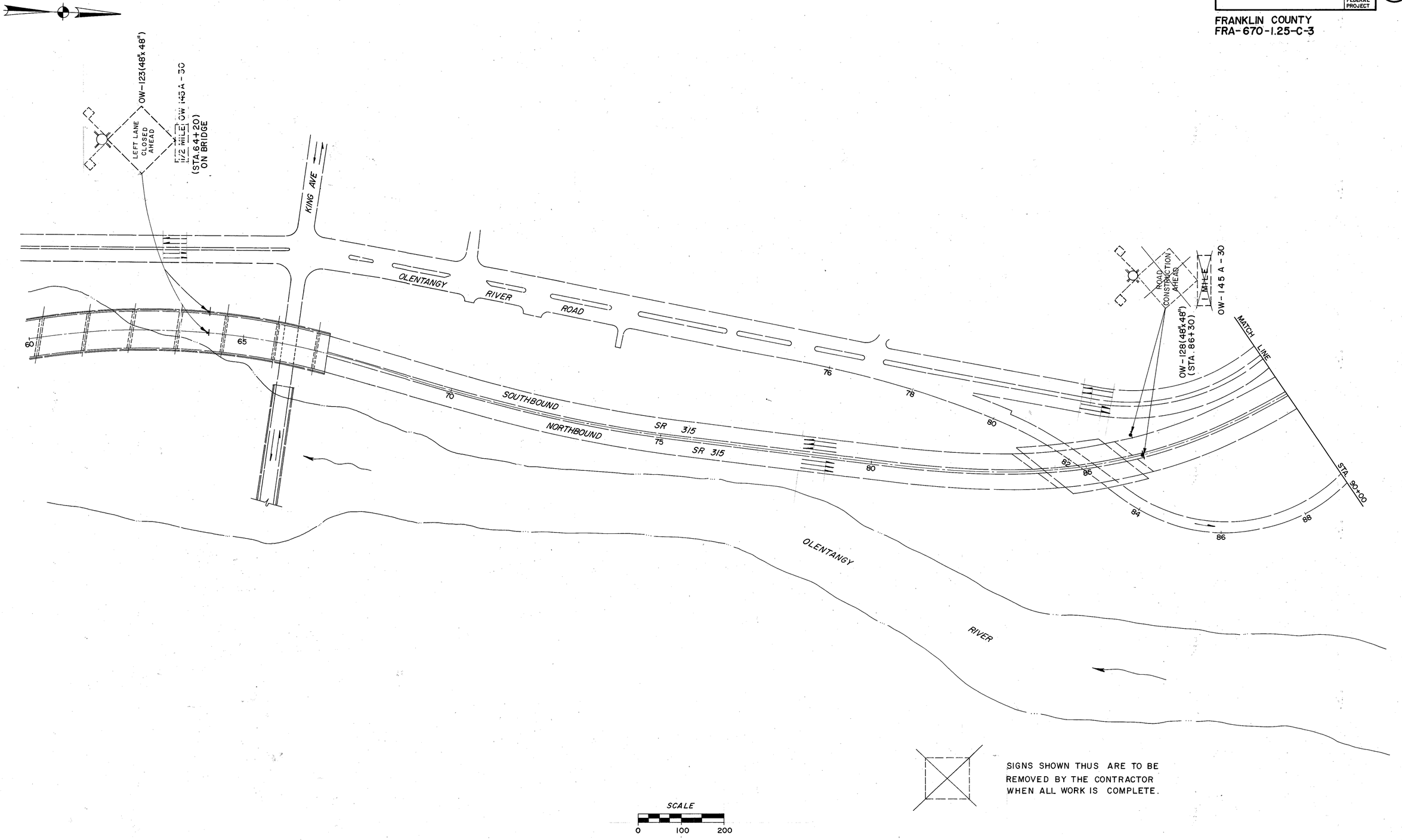
SCALE
0 100 200

SIGN LEGEND STA. 25+00 to 60+00

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

93
224

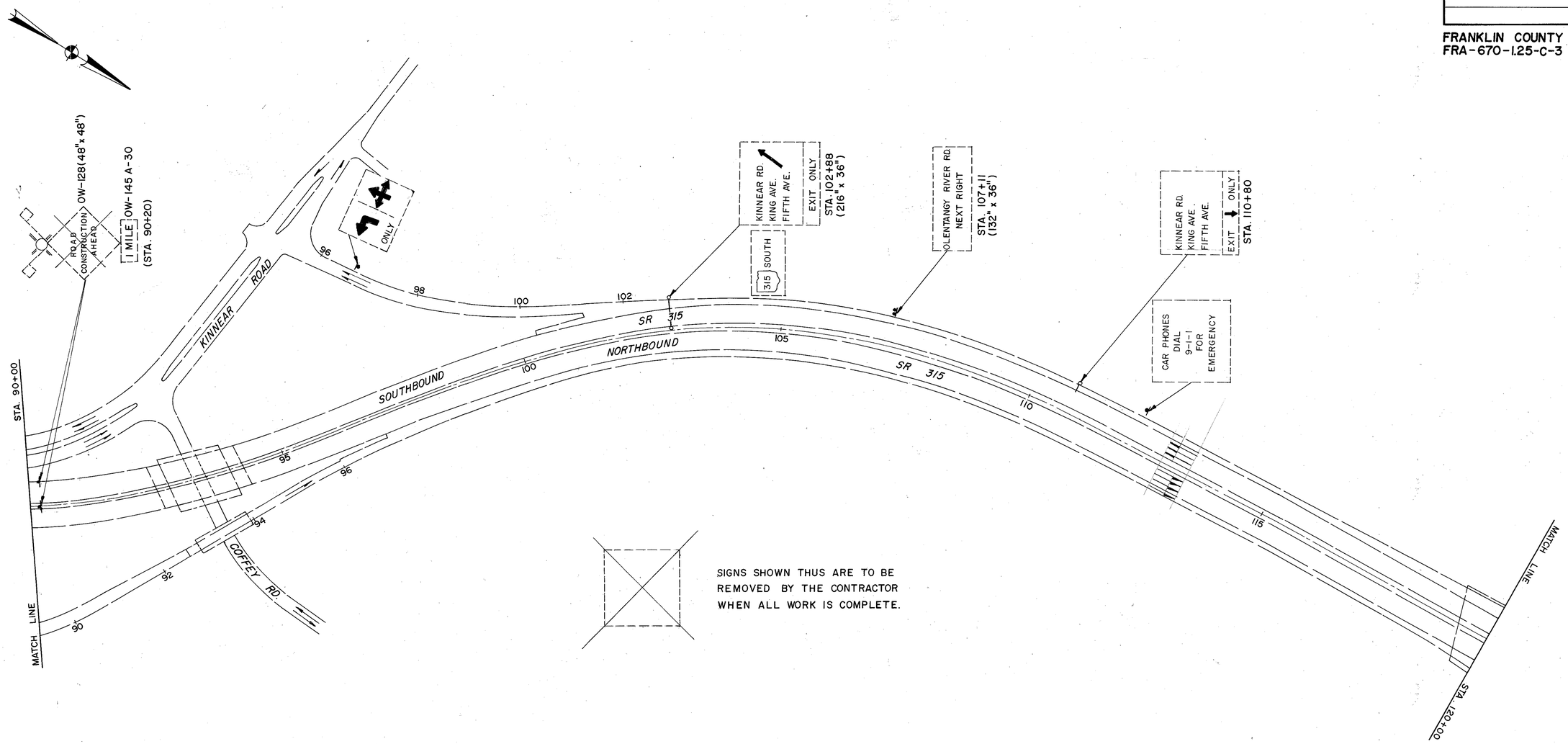
FRANKLIN COUNTY
FRA-670-1.25-C-3



SIGN LEGEND STA. 60+00 to 90+00

OHIO	94
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



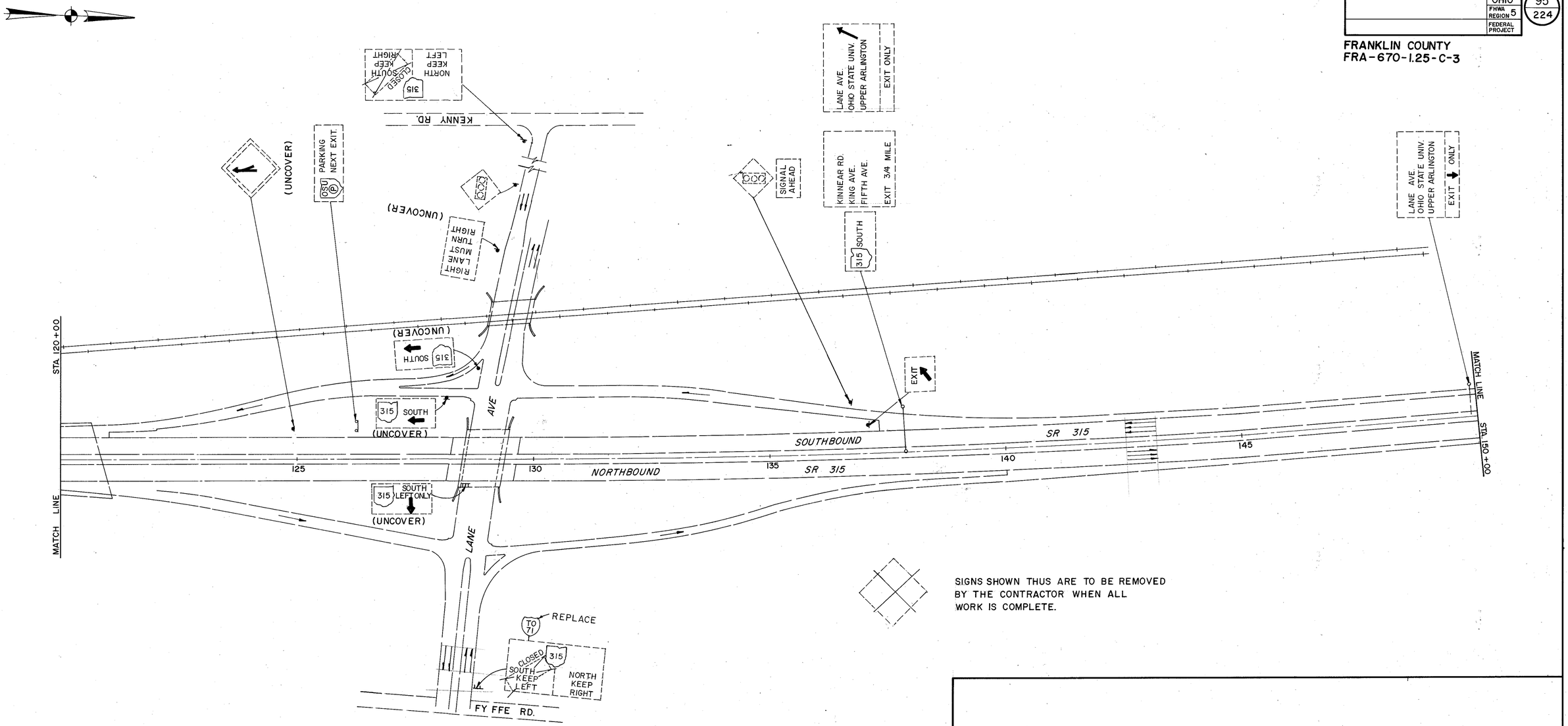
SIGNS SHOWN THUS ARE TO BE REMOVED BY THE CONTRACTOR WHEN ALL WORK IS COMPLETE.

SCALE
0 100 200

SIGN LEGEND STA. 90+00 to 120+00

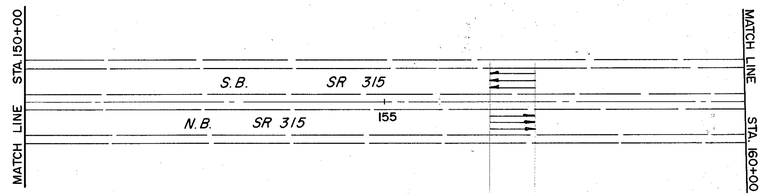
OHIO	95
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



SIGNS SHOWN THUS ARE TO BE REMOVED BY THE CONTRACTOR WHEN ALL WORK IS COMPLETE.

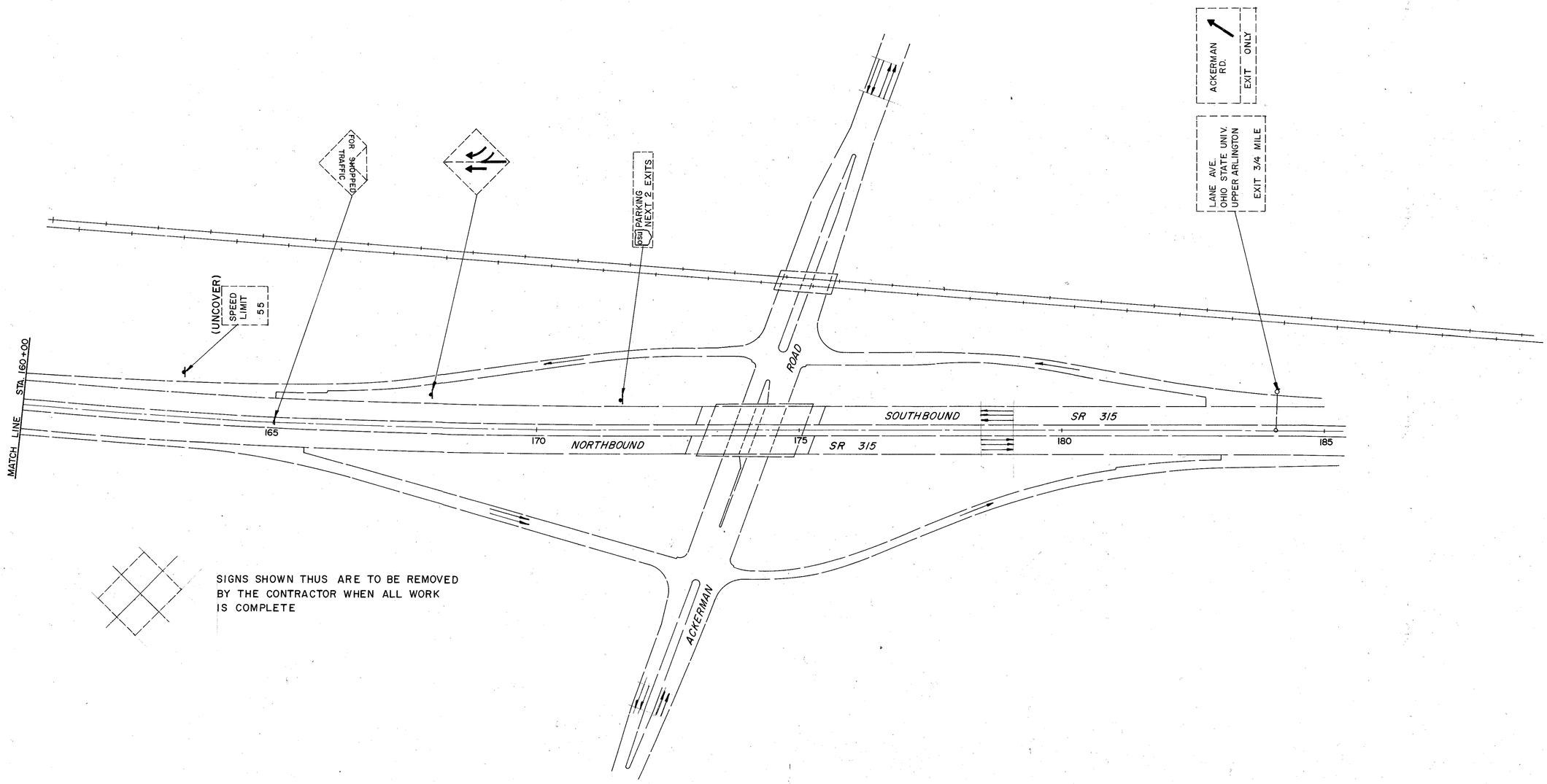
SCALE
0 100 200



SIGN LEGEND STA. 120+00 to 160+00

OHIO	96
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



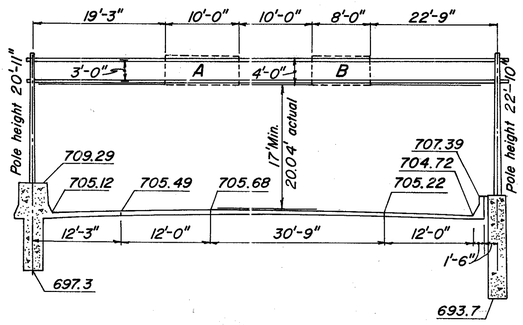
SIGNS SHOWN THUS ARE TO BE REMOVED BY THE CONTRACTOR WHEN ALL WORK IS COMPLETE

SCALE
0 100 200

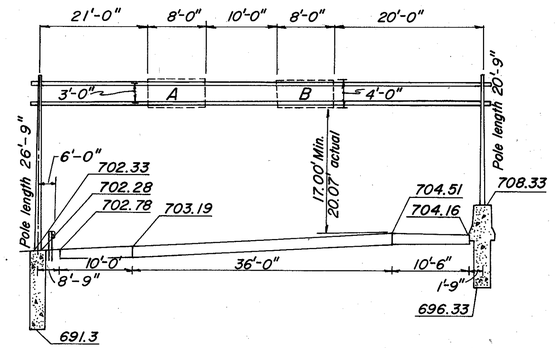
SIGN LEGEND STA. 160+00 to 185+00

FRANKLIN COUNTY
FRA-670-1.25-C-3

NO. 1
STA. 140+89 SR 315 (North bound)
No. TC-7.65 Design 6
Span 70'-0"

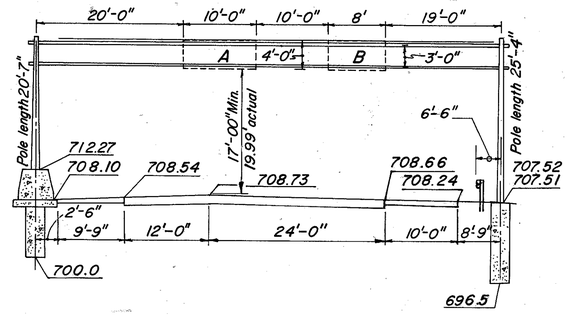


NO. 2
STA. 144+00 SR 315 (South bound)
No. TC-7.65 Design 6
Span 67'-0"



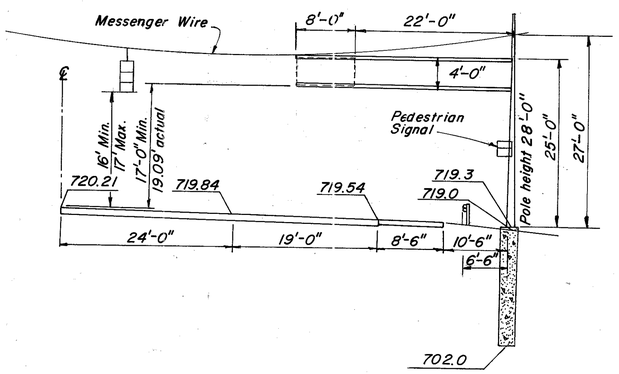
NOTE: Sign Details No. 2, 4 and 5 are drawn looking backwards instead of looking ahead.

NO. 3
STA. 148+50 SR 315 (North bound)
No. TC-7.65 Design 6
Span 67'-0"

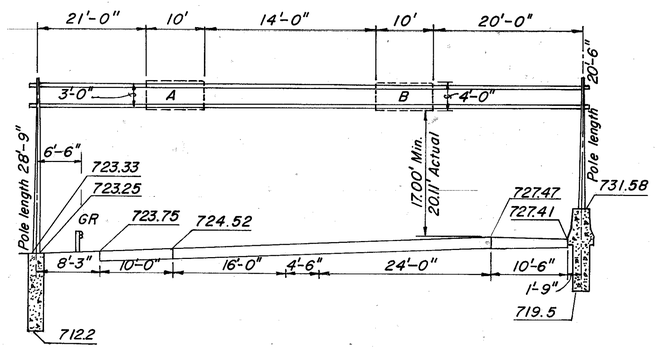


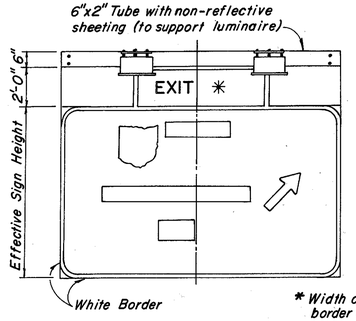
OVERHEAD LIGHTING DETAILS
FOR GUIDE SIGNS

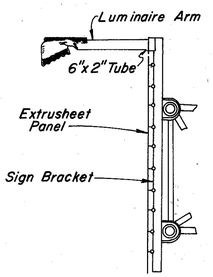
NO. 4
STA. 55+35 Olentangy River Road
Combination Overhead Sign
Support and Strain Pole.
No. TC-9.30 Design 3
Arm 30'-0"



NO. 5
STA. 158+25 SR 315 (South bound)
No. TC-7.65 Design 6
Span 75'-0"





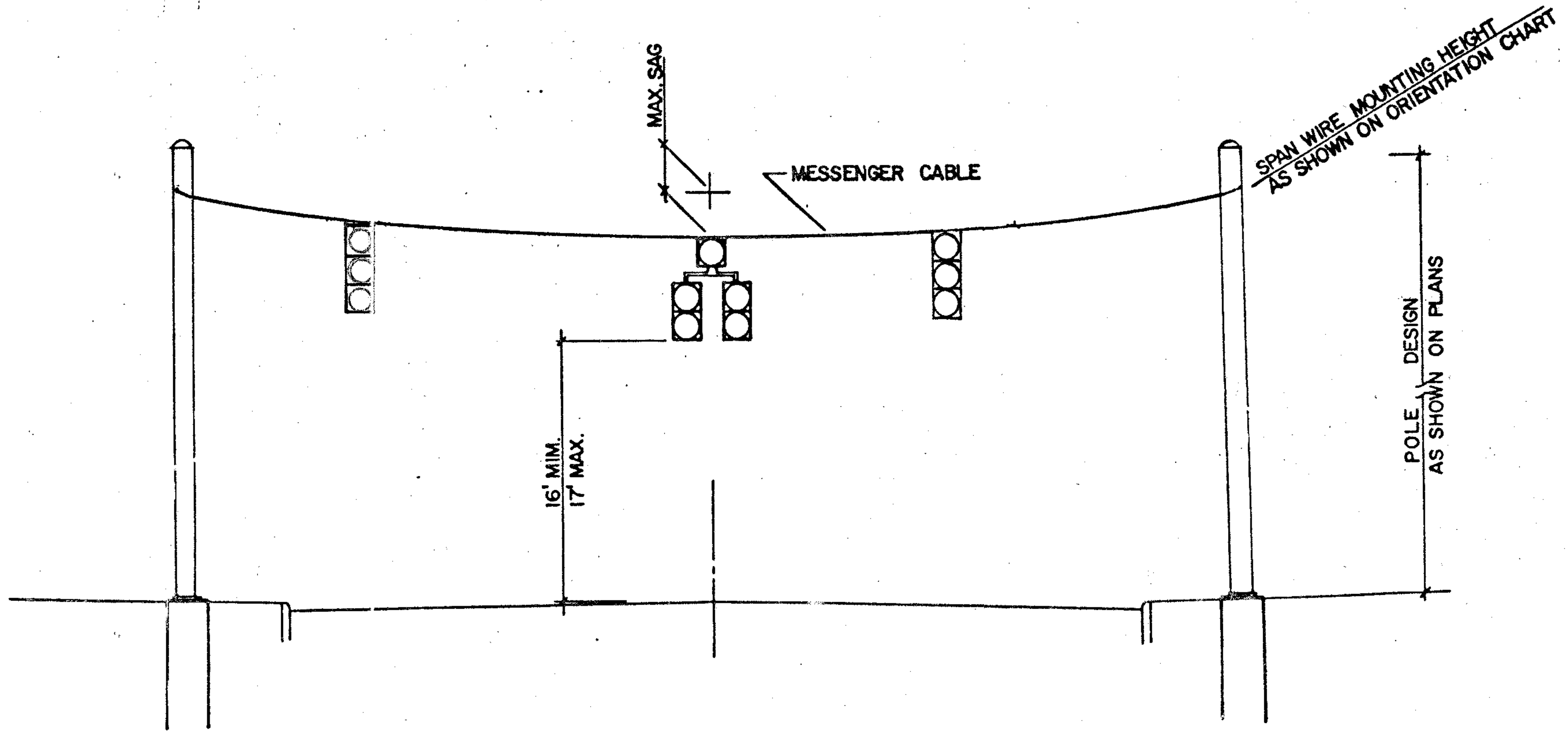


* Width of exit number panel within border is as per OMUTCD.

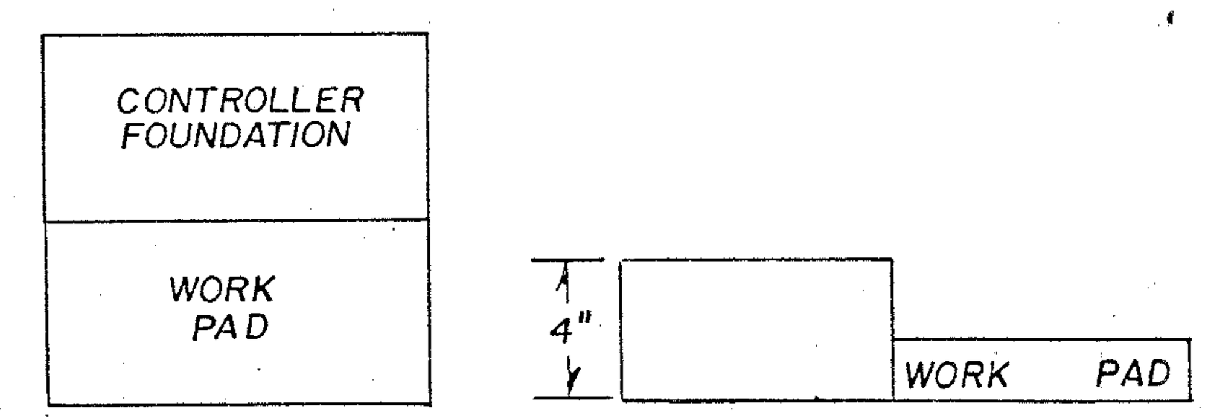
For details not shown see: Std. TC-31.21

Luminaire arm length based on overall sign height with max: 5'-9" arm for any sign 14'-0" high.

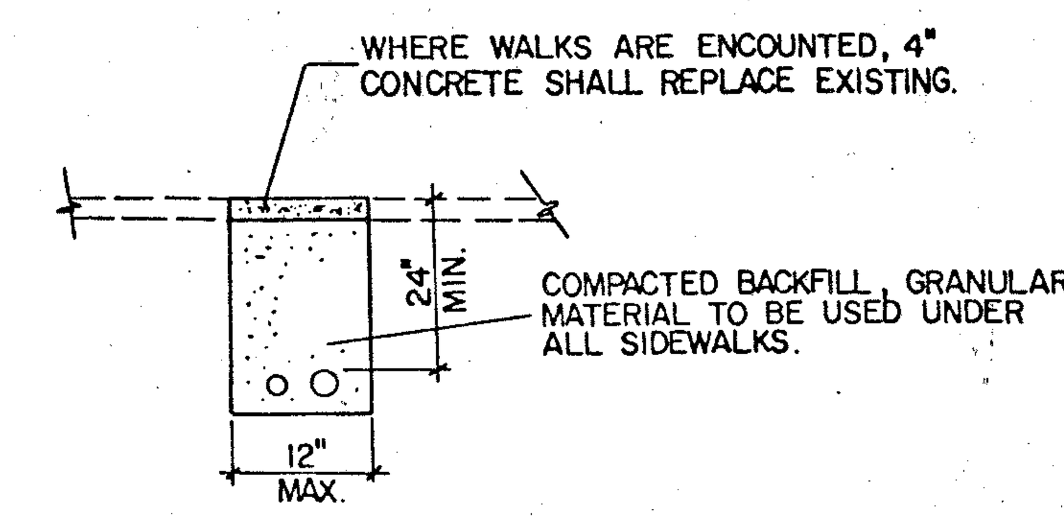
OVERHEAD SIGN SUPPORT DETAILS



TYPICAL SPAN ELEVATION



CONTROLLER FOUNDATION DETAIL



TYPICAL TRENCH DETAIL
TYPE-A

ORIENTATION ANGLES

INTERSECTION	ITEM	POLE TYPE TC-81.10 OR TC-9.30 DESIGN NO.	SPAN WIRE MOUNTING HEIGHT ∡ DEG	SPAN WIRE MOUNTING HEIGHT HEIGHT FEET	ANCHOR BASE AND BOLTS ANGLE	HANDHOLE ∡ DEG	CONDUIT ELLS IN FOUNDATION OR UNDER-GROUND ∡ DEG	CONDUIT ELLS SIZE INCHES	SIGNAL WEATHERHEAD BLIND HALF COUPLING ∡ DEG	SIGNAL WEATHERHEAD HEIGHT FEET	PED SIGNAL BRACKET ARM ∡ DEG	PED SIGNAL BRACKET ARM HEIGHT FEET	PED BUTTONS ∡ DEG	PED BUTTONS HEIGHT FEET	POWER WEATHERHEAD 2" BLIND HALF COUPLING ∡ DEG	POWER WEATHERHEAD HEIGHT FEET	CONTROLLER HINGE LOCATION
OLENTANGY RIVER ROAD AND	P1 TC-81.10	5-27"	81 178	25.7'	0-90	270	3	3"	129	24.7'	0	8'	90	3'-8"			
RAMPS OA & OB	P2 TC-81.10	5-27"	261	25.7'	0-90	90	123 345	3" 2-3"	295	24.7'	0 90	8'	225	3'-8"	345	24.7'	
	P3 TC-9.30	3	273	25.7'	0-90	90	220	3"	273	24.7'	90 180	8'	315	3'-8"			
	P4 TC-81.10	5-27"	1 94	25.7'	0-90	270	180	3"-CAP	47	24.7'	180	8'	90	3'-8"			
CONTROLLER					0-90		163 270	3"									NORTHEAST CORNER

NOTES

1.) THE BASELINE FOR ALL ANGLES IS PARALLEL TO THE CENTERLINE OF THE FIRST STREET LISTED. WHEN 0° BEING PARALLEL TO SAID CENTERLINE MEASURED IN A CLOCKWISE DIRECTION. (SEE EACH PLAN SHEET)

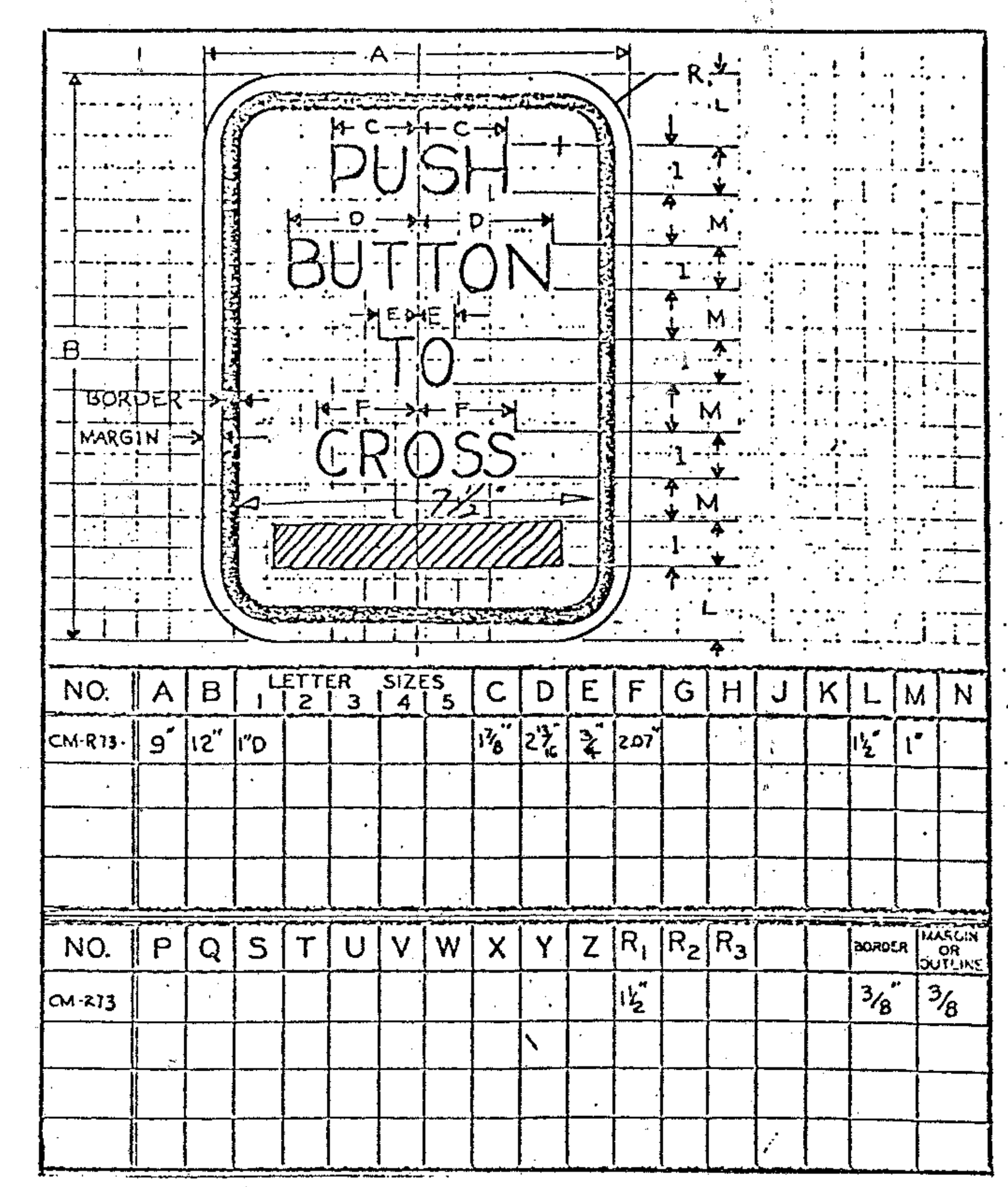
2.) TYPE OF PEDESTRIAN SIGNAL MOUNTING

A - THREADED BLIND HALF COUPLING
B - BANDED PIPE BRACKET
C - BANDED CLAMSHELL

3.) POLE HEIGHTS SHALL BE AS SHOWN ON TC-81.10 EXCEPT AS NOTED

4.) POLE FOUNDATIONS SHALL BE AS SHOWN ON TC-21.20

5.) ALL UNUSED CONDUIT ELLS SHALL BE CAPPED

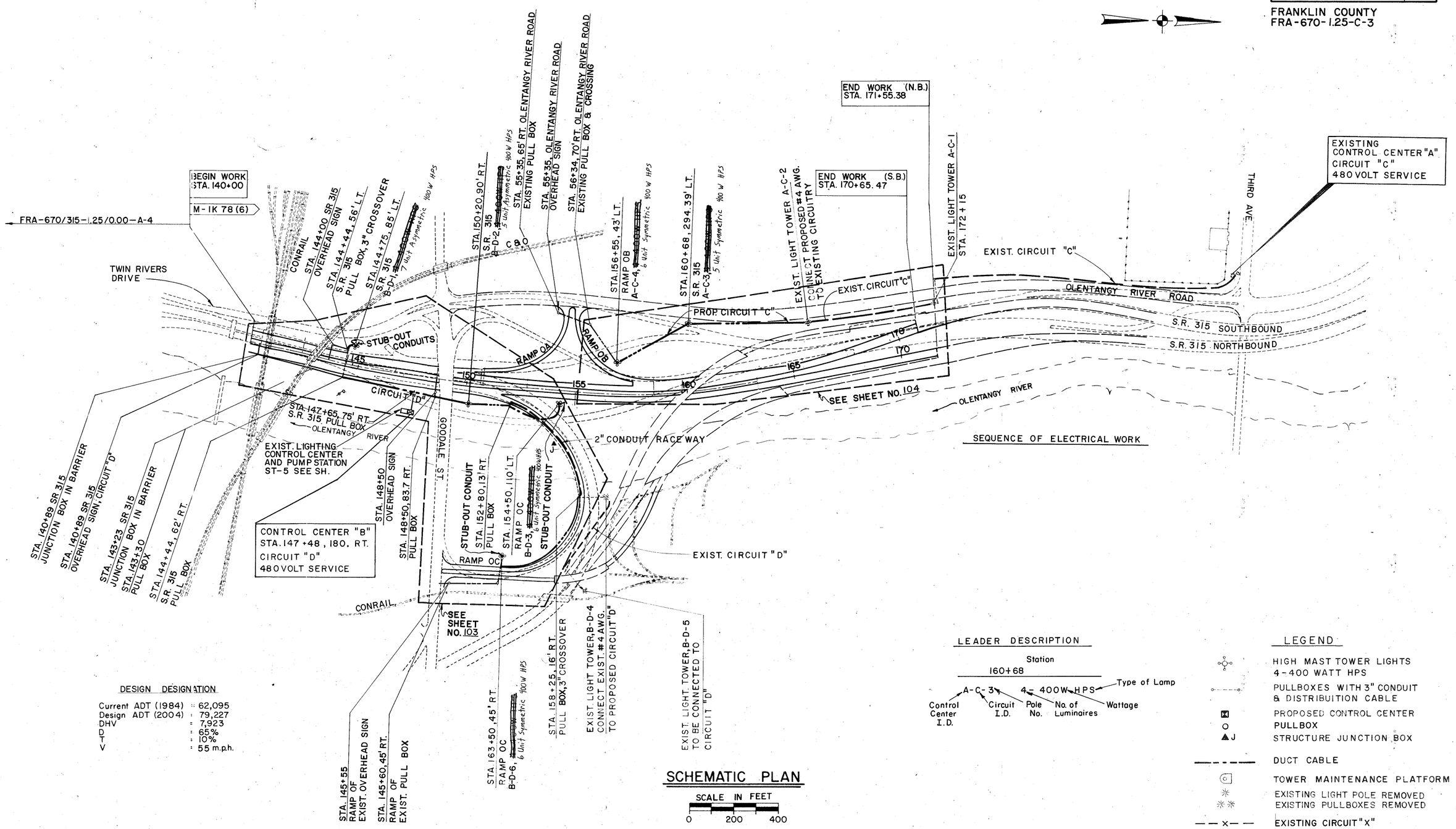


CM-R 73
9" x 12"

TYPICAL SIGN FOR PED. PUSHBUTTONS

STATE OF OHIO
DAVID JOHN LEPISTO
42680
REGISTERED PROFESSIONAL ENGINEER

FRANKLIN COUNTY
FRA-670-1.25-C-3



SCHEMATIC PLAN

SCALE IN FEET
0 200 400

DESIGN DESIGNATION

Current ADT (1984)	:	62,095
Design ADT (2004)	:	79,227
DHV	:	7,923
D	:	65%
T	:	10%
V	:	55 m.p.h.

LEADER DESCRIPTION

Station 160+68 — A-C-3 — 4 — 400W-HPS — Type of Lamp

- A-C-3: Control Center I.D.
- Circuit I.D.
- Pole No.
- 4: No. of Luminaires
- 400W-HPS: Wattage

LEGEND

- HIGH MAST TOWER LIGHTS 4-400 WATT HPS
- PULLBOXES WITH 3" CONDUIT & DISTRIBUITION CABLE
- PROPOSED CONTROL CENTER
- PULLBOX
- ▲J STRUCTURE JUNCTION BOX
- DUCT CABLE
- TOWER MAINTENANCE PLATFORM
- EXISTING LIGHT POLE REMOVED
- EXISTING PULLBOXES REMOVED
- EXISTING CIRCUIT "X"
- **HIGH MAST TOWER LIGHTS WITH CONDUIT STUB-OUT**

LIGHTING SCHEMATIC PLAN (C-3)

GENERAL NOTES

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

100
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

GENERAL NOTES – LIGHTING

625.03 – POWER SERVICE

THE POWER SUPPLYING AGENCIES FOR THIS PROJECT ARE:

CITY OF COLUMBUS
DIVISION OF ELECTRICITY (MELP)
910 DUBLIN ROAD
COLUMBUS, OHIO 43215
(614) 645-7758

COLUMBUS SOUTHERN POWER COMPANY
215 NORTH FRONT STREET
COLUMBUS, OHIO 43215
(614) 836-2570

IN ADDITION TO THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF ALL CHARGES MADE BY THE POWER COMPANY FOR THE ESTABLISHMENT OF ELECTRICAL SERVICE AT EACH POINT SPECIFIED IN THE PLANS.

ELECTRICAL ENERGY FROM EXISTING POWER SERVICES SHALL CONTINUE TO BE CHARGED TO THE MAINTAINING AGENCY. THE CONTRACTOR SHALL PAY ELECTRICAL ENERGY CHARGES FOR NEW POWER SERVICES ESTABLISHED BY THIS PROJECT. UPON *ACCEPTANCE OF THE LIGHTING WORK*, POWER SERVICE ELECTRICAL ENERGY ACCOUNTS SHALL BE TRANSFERRED TO THE MAINTAINING AGENCIES NOTED IN THE PLANS. THIS SHALL INCLUDE NEW POWER SERVICE ESTABLISHED BY THIS PROJECT AS WELL AS REASSIGNMENT OF EXISTING SERVICE DUE TO WORK PERFORMED BY THIS PROJECT. THE CITY OF COLUMBUS, DIVISION OF ELECTRICITY, IS THE MAINTAINING AGENCY.

713. 14 LAMPS

HIGH PRESSURE SODIUM LAMPS SHALL BE GENERAL ELECTRIC "LUCALOX", WESTINGHOUSE "CERAMALUX", SYLVANIA "LUMALUX", OR EQUAL APPROVED BY THE ENGINEER.

UNDERDRAINS FOR PULL BOXES

REFERENCE IS MADE TO STANDARD DRAWING HL 30.11 FOR DETAILS OF DRAINING PULL BOXES. UNDERDRAINS FOR PULL BOXES SHALL BE USED AS DIRECTED TH THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED APPROXIMATELY 20 FEET. AN ESTIMATED QUANTITY OF "50 LINEAR FEET OF ITEM 603, 4" CONDUIT TYPE E IS INCLUDED IN THE LIGHTING GENERAL SUMMARY FOR THIS PURPOSE.

PADLOCKS AND KEYS

PADLOCKS FURNISHED SHALL BE BRASS OR BRONZE, MASTER NO. 4BKA OR WILSON BOHONNAN 660A, OR EQUAL AS APPROVED BY THE ENGINEER AND SHALL BE KEYED IN ACCORDANCE WITH SPECIFICATION 631.08. PAYMENT SHALL BE INCLUDED IN THE BID FOR THE ITEM(S) BEING LOCKED.

LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN

THE ITEM OF WORK SHALL CONSIST OF REMOVING AN EXISTING LIGHT POLE INCLUDING THE BRACKET ARM(S) AND TRANSFORMER BASE (IF USED). ALL ITEMS REMOVED SHALL BE SEPARATED AND STORED ON SITE FOR REMOVAL BY CITY FORCES.

PAYMENT WILL BE MADE AT THE UNIT BID PRICE FOR EACH ITEM 202 – LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN, SHALL INCLUDE THE REMOVAL AND STORAGE OF THE LIGHT POLE AND ALL EQUIPMENT, LABOR AND MATERIALS NECESSARY TO COMPLETE THE WORK.

PULLBOX REMOVED, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF REMOVING AN EXISTING PULLBOX WHICH SHALL THEN BE PROPERLY DISPOSED OF. THE RESULTANT OPENING SHALL THEN BE BACKFILLED TO GRADE WITH SUITABLE COMPACTED SOIL AND RESTORED TO MATCH THE SURROUNDING AREA.

PAYMENT WILL BE MADE FOR EACH ITEM 202 – CONCRETE PULLBOX REMOVED, AS PER PLAN.

LUMINAIRE REMOVED FOR STORAGE, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF REMOVING AN EXISTING LUMINAIRE AND STORING ON THE PROJECT SITE FOR REMOVAL BY CITY FORCES.

PAYMENT WILL BE MADE FOR EACH ITEM 202 "LUMINAIRE REMOVED FOR STORAGE, AS PER PLAN."

ELECTRICAL SERVICE FOR ILLUMINATED SIGNS

THE PAY ITEMS IN THE LIGHTING GENERAL SUMMARY INCLUDE THE PULL BOX OR JUNCTION BOX ADJACENT TO EACH LIGHTED SIGN AND THE ELECTRICAL SERVICE CONNECTIONS LEADING INTO THE BOX, INCLUDING SPLICES OR CONNECTOR KITS IN THE PULL BOX OR JUNCTION BOX. QUANTITIES FOR ELECTRICAL SERVICE FROM THE CONNECTION IN THE PULL BOX OR JUNCTION BOX TO THE SIGN ARE INCLUDED IN THE TRAFFIC CONTROL GENERAL SUMMARY.

ITEM SPECIAL – DISCONNECT EXISTING CIRCUIT

THIS ITEM OF WORK SHALL CONSIST OF THE DISCONNECTION OF AN EXISTING LIGHT CIRCUIT AT A PULL BOX OR AT A LIGHT POLE.

DISCONNECTION AT A PULL BOX SHALL INVOLVE CUTTING THE EXISTING CIRCUIT AND REMOVING ALL SPLICE KITS. ANY CABLE THAT IS TO BE ABANDONED SHALL BE TERMINATED IN A MANNER SUCH THAT NO CABLE IS LEFT REMAINING IN THE PULL BOX.

DISCONNECTION AT A LIGHT POLE SHALL INVOLVE THE REMOVAL OF THAT PART OF CABLE THAT IS TO BE ABANDONED FROM THE POLE. THESE ENDS OF THE CONNECTOR KITS FROM WHICH THE ABANDONED CABLE IS REMOVED SHALL BE STUBBED AND TAPED.

ANY CABLE THAT IS TO BE REUSED IN A PULL BOX OR LIGHT POLE SHALL BE CUT IN A MANNER SO THAT THERE IS SUFFICIENT LENGTH OF CABLE LEFT FOR RECONNECTION. CABLE SPLICE KITS AND CONNECTOR KITS WILL BE PAID FOR RESPECTIVELY UNDER EACH ITEM 625.

PAYMENT WILL BE MADE AT THE UNIT BID PRICE FOR EACH ITEM SPECIAL "DISCONNECT EXISTING CIRCUIT" AND SHALL BE FULL COMPENSATION INCLUDING ALL LABOR, MATERIALS, AND INCIDENTIALS REQUIRED TO COMPLETE THE WORK.

HIGH MAST LUMINAIRES

THE LUMINAIRE ARRAYS AND ASSOCIATED ILLUMINATION TEST AREAS SPECIFIED IN SECTION 713.21 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS ARE HEREBY WAIVED FOR THIS PROJECT. INSTEAD, THE LUMINAIRES FOR TOWER LIGHTING SHALL MEET THE FOLLOWING REQUIREMENTS.

ASYMMETRIC, TYPE II OR III, LUMINAIRES FOR TOWER LIGHTING *WILL* BE HOLOPHANE "HMST" TEST *#46973*, ~~OR GENERAL ELECTRIC "HM" TEST #7349.~~

SYMMETRIC, TYPE V, LUMINAIRES FOR TOWER LIGHTING *WILL* BE HOLOPHANE "HMST" TEST #36383, ~~OR GENERAL ELECTRIC "HM" TEST #6289.~~

~~IN ADDITION, OTHER LUMINAIRES WILL BE CONSIDERED IF THE DESIGNED INTENSITY AND UNIFORMITY ARE PROVIDED USING THE DESIGNED POLE LOCATIONS AND THE DESIGNED NUMBER AND TYPE OF FIXTURES PER POLE.~~

PORTABLE POWER UNIT – 712.21

THE CONTRACTOR SHALL SUPPLY A PORTABLE POWER UNIT AS SPECIFIED IN THE O.D.O.T. CONSTRUCTION AND MATERIAL SPECIFICATIONS. A QUANTITY OF "1 EACH" OF ITEM 625, "PORTABLE POWER UNIT – 713.21" IS INCLUDED IN THE GENERAL SUMMARY FOR THIS PURPOSE.

~~LIGHT TOWER DETAILS~~

~~STANDARD DRAWING HL 10.31, AS OF 2/9/88, HAS BEEN REVISED AS FOLLOWS: THE TWO DIMENSIONS SHOWN AS A 4 3/4 INCHES BETWEEN THE CENTER LINES OF THE DRIVE SUPPORT TUBE AND THE WINCH INPUT SHAFT SHOULD READ 3 3/4 INCHES.~~

TOWER LIGHTNING PROTECTION SYSTEM

THIS ITEM SHALL CONSIST OF PROVIDING AND INSTALLING AN APPROVED TOWER LIGHTNING PROTECTION SYSTEM AS DETAILED IN THE STANDARD DRAWINGS FOR EACH TOWER ERECTED. THE COST OF ALL LABOR, MATERIALS, AND EQUIPMENT NEEDED TO INSTALL THIS PROTECTION SHALL BE INCLUDED IN THE UNIT BID PRICE FOR EACH ITEM 625, "LIGHT TOWER, 713.21."

~~HIGH MAST LIGHT TOWERS~~

~~THE MANUFACTURER SHALL SUBMIT A REPORT FROM AN INDEPENDENT TESTING LABORATORY TO SHOW THAT THE LUMINAIRES DO NOT RECEIVE MORE THAN THE SPECIFIED ACCELERATION LOAD. THE TESTING LABORATORY'S REPORT SHALL SPECIFY IN DETAIL THE MOUNTING LOCATIONS OF THE ACCELEROMETERS AND THE TEST PROCEDURES USED. IN ADDITION TO THIS REPORT O.D.O.T. RESERVES THE RIGHT TO CONDUCT FIELD MEASUREMENTS OF THOSE ACCELERATION LOADS AND TO ACCEPT ONLY THOSE DESIGNS IN WHICH THE TESTED INSTALLATIONS MEET THE SPECIFICATIONS.~~

~~THE TERMINAL BLOCK SHOWN ON THE STANDARD CONSTRUCTION DRAWINGS SHALL BE INCLUDED IN THE PRICE OF THE TOWER.~~

SAFETY NOTE

BECAUSE THE CONTRACTOR, AND THE CITY WILL BE MAINTAINING LIGHTING CIRCUITS IN THIS AREA, THE CONTRACTOR MUST FOLLOW THE CITY OF COLUMBUS, DIVISION OF ELECTRICITY'S SAFETY POLICY AND HOLD CARD SYSTEM. THE CONTRACTOR SHALL NOTIFY THE CITY OF COLUMBUS, DIVISION OF ELECTRICITY AT 645-7627 AND PRIOR TO PERFORMING ANY WORK ON ANY PART OF A LIGHTING CIRCUIT WHICH COULD AFFECT THEM. HE SHALL AGAIN CALL THE DIVISION OF ELECTRICITY THAT SAME DAY WHEN HE IS CLEAR OF THAT WORK. THE CONTROL CENTERS SHALL BE "TAGGED OFF" WHILE WORK IS BEING PERFORMED.

ITEM SPECIAL MAINTAIN EXISTING LIGHTING

EXISTING ROADWAYS WHICH ARE TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF THIS PROJECT AND WHICH ARE LIGHTED SHALL HAVE THE LIGHTING MAINTAINED AS DESCRIBED HEREIN.

BEFORE ANY WORK IS STARTED IN THE IMMEDIATE VICINITY OF ANY EXISTING LIGHTING CIRCUITS, REPRESENTATIVES OF THE STATE, THE MAINTAINING AGENCY, AND THE CONTRACTOR SHALL MAKE A VISUAL INSPECTION OF THE EXISTING ROADWAY LIGHTING CIRCUTS TO BE MAINTAINED. DURING THIS INSPECTION, A WRITTEN RECORD OF THE CONDITION OF THE EXISTING LIGHTING SHALL BE MADE BY THE STATE'S REPRESENTATIVE. THIS WRITTEN REPORT SHALL NOTE INDIVIDUAL LUMINAIRES WHICH ARE NOT IN WORKING ORDER,INDIVIDUAL POLES WHICH ARE NOT STANDING, AND INDIVIDUAL CIRCUITS WHICH ARE NOT IN WORKING ORDER. THE COMPLETED REPORT SHALL BE SIGNED BY THE REPRESENTATIVES OF THE STATE, THE MAINTAINING AGENCY, AND THE CONTRACTOR.

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GENERAL NOTES

F.H.W.A. REGION	STATE	PROJECT	
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ITEM SPECIAL – MAINTAIN EXISTING LIGHTING (CONT'D)

IF AS A RESULT OF THIS INSPECTION, IT IS DETERMINED THAT THE CONDITION OF THE EXISTING SYSTEM IS BELOW THAT REQUIRED FOR THE SAFETY OF THE TRAVELING PUBLIC, THEN THE MAINTAINING AGENCY SHALL MAKE REPAIRS NECESSARY TO RETURN THE SYSTEM TO AN ACCEPTABLE CONDITION. FOLLOWING THESE REPAIRS, THE SYSTEM SHALL AGAIN BE INSPECTED AND A REPORT MADE AND SIGNED AS OUTLINED HEREIN.

WHEN THE EXISTING SYSTEM IS IN AN ACCEPTABLE CONDITION, IT SHALL BE TURNED OVER TO THE CONTRACTOR WHO SHALL THEN BE REQUIRED TO MAINTAIN THE EXISTING LIGHTING TO THE CONDITION OUTLINED IN THIS REPORT WITH THE EXCEPTION OF KNOCKDOWNS DUE TO TRAFFIC ACCIDENTS.

REPLACEMENT OF KNOCKED DOWN UNITS SHALL BE DONE ONLY WHEN THE ENGINEER HAS DETERMINED THAT THE REPLACEMENT FO THE KNOCKED DOWN UNIT IS NECESSARY AND SHALL BE PAID SEPERATELY ON A UNIT BASIS.

BETTERMENTS SHALL BE COVERED IN ITEMS OF WORK PERTAINING TO THE CONSTRUCTION OF PERMANENT IMPROVEMENTS.

SHOULD THE CONTRACTOR DESIRE THE REMOVAL OF THE EXISTING LIGHTING BEFORE THE NEW LIGHTING IS OPERATIONAL, THE CONTRACTOR SHALL THEN BE RESPONSIBLE FOR ADEQUATE TEMORARY LIGHTING OF THAT PORTION OF THE EXISTING ROADWAY AFFECTED BY THE REMOVAL OF THE EXISTING LIGHTING.

PRIOR TO INSTALLING SUCH LIGHTING, THE CONTRACTOR SHALL PREPARE AND SUBMIT FOUR (4) SETS OF THE TEMPORARY LIGHTING PLAN TO THE DIRECTOR FOR REVIEW AND APPROVAL.

THIS PLAN SHALL SHOW LOCATION OF POLES, LENGTH OF BRACKET ARMS, STYLE OF LUMINAIRES, MOUNTING HEIGHT WIRING METHODS, AND OTHER PERTINENT INFORMATION. THE TEMPORARY LIGHTING SHALL PROVIDE AN AVERAGE INITIAL INTENSITY OF 1.2 FOOTCANDLES WITH AN AVERAGE TO MINIMUM UNIFORMITY NOT TO EXCEED 4.1. MOUNTING HEIGHT FOR TEMPORARY LUMINAIRES SHALL NOT BE LESS THAN 27 FEET AND MINIMUM OVERHEAD CONDUCTOR CLEARANCE SHALL BE 20 FEET. TEMPORARY OVERHEAD CONSTRUCTION SHALL NOT BE LESS THAN GRADE "A" FOR STRENGTH REQUIREMENT AS DEFINED BY THE NATIONAL ELECTRIC SAFETY CODE. WOOD POLES WITH OVERHEAD WIRING MAY BE USED. HOWEVER TEMPORARY LIGHTING SHALL MEET FEDERAL AND STATE SAFETY CRITERIA. IF BREAKAWAY POLES ARE USED TO MEET THESE CRITERIA, THEN UNDERGROUND WIRING SHALL BE USED. RECONDITIONED OR USED MATERIALS MAY BE FURNISHED FOR TEMPORARY LIGHTING

ALL MATERIALS NECESSARY TO COMPLETE THE TEMPORARY LIGHTING SHALL BE FURISHED AND INSTALLED BY THE CONTRACTOR. WHEN NO LONGER NEEDED, THE TEMPORARY LIGHTING INSTALLATION SHALL BE REMOVED AND PROPERLY DISPOSED OF BY THE CONTRACTOR.

THE MAINTAINING AGENCY WILL PAY FOR ELECTRICAL ENERGY CONSUMED BY EXISTING POWER SERVICES AND BY PROPOSED PERMANENT POWER SERVICES AFTER ACCEPTANCE. THE CONTRACTOR WILL PAY FOR ELECTRICAL ENERGY, INSTALLATION, REMOVAL, AND MAINTENANCE OF ANY TEMPORARY POWER SERVICES.

THE LUMP SUM PRICE BID FOR ITEM SPECIAL "MAINTAIN EXISTING LIGHTING" SHALL INCLUDE PAYMENT FOR ALL LABOR, EQUIPMENT, AND MATERIALS, AND INCIDENTALS NECESSARY TO MAINTAIN THE EXISTING LIGHTING AS SPECIFIED HEREIN.

THE UNIT PRICE BID FOR ITEM SPECIAL "REPLACEMENT OF EXISTING LIGHTING UNIT" SHALL BE FULL PAYMENT FOR THE REPLACEMENT OF AN EXISTING LIGHTING UNIT WHICH HAS BEEN KNOCKED DOWN AFTER THE AFORMENTIONED INSPECTION AND SHALL INCLUDE ALL LABOR EQUIPMENT MATERIALS AND INCIDENTALS NECESSARY TO PROVIDE A REPLACEMENT FOR SUCH UNIT.

LIGHT POLE FOUNDATION REMOVED, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF REMOVING AN EXISTING LIGHT POLE FOUNDATION TO A MINIMUM OF ONE FOOT BELOW FINISHED GRADE, BACKFILLING THE RESULTANT DEPRESSION WITH COMPACTED SOIL AND RESTORING THE DISTURBED AREA.

PAYMENT WILL BE MADE FOR EACH ITEM 202 "LIGHT POLE FOUNDATION REMOVED, AS PER PLAN."

SAFETY NOTE

THIS CONTRACT INVOLVES WORK ON LIGHTING CIRCUITS WHICH ARE MAINTAINED BY THE CITY OF COLUMBUS, DIVISION OF ELECTRICITY. THE CONTRACTOR SHALL CONFORM TO THE DIVISION OF ELECTRICITY'S EXISTING SAFETY POLICY. COPIES OF WHICH ARE AVAILABLE FROM THE DIVISION OF ELECTRICITY.

PROIR TO PERFORMING ANY WORK ON ANY PART OF A LIGHTING CIRCUIT WHICH COULD AFFECT THE DIVISION OF ELECTRICITY, THE CONTRACTOR SHALL NOTIFY THEM AT 645-7627. HE SHALL AGAIN CALL THE DIVISION OF ELECTRICITY THAT SAME DAY HE IS CLEAR OF THAT WORK.

UTILITIES NOTIFICATION

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

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LIGHTING SUBSUMMARY

CALCULATED	LK	2-24-87
CHECKED	JSS	2-26-87

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

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FRANKLIN COUNTY
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REFERENCE NO.	SIDE	FROM STATION	TO STATION	625 LIGHT TOWER BBBB 100' EA.	625 LIGHT TOWER BBBB 110' EA.	625 LIGHT TOWER FOUNDATION 36" x DEEP 20' EA.	25' EA.	30' EA.	625 LUMINAIRE, ASYMMETRIC 400 WATT HPS, 713.21, 480V EA.	625 PULL BOX, 713.08 18" EA.	625 GROUND ROD EA.	625 TRENCH, 24" DEEP LIN.FT.	625 CONDUIT 3" 713.04 LIN.FT.	625 1-1/2" DUCT CABLE WITH 2-#4 AWG 5000 VOLT CABLES LIN.FT.	625 NO. 4 AWG 5000 VOLT DISTRIBUTION CABLES LIN.FT.	625 CABLE SPLICING KIT EA.	625 STRUCTURE JUNCTION BOX 18"x8"x6" EA.	625 POWER SERVICE EA.	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE B EA.	202 LIGHT POLE REMOVED AS PER PLAN EA.	202 LUMINAIRE REMOVED AS PER PLAN EA.	202 LIGHT POLE FOUNDATION REMOVED, AS PER PLAN EA.	202 PULL BOX REMOVED, AS PER PLAN EA.	202 POWER SERVICE REMOVED, AS PER PLAN EA.	625 LUMINAIRE, SYMMETRIC, 400 WATT HPS, 713.21, 480V EA.	625 CONDUIT 2", 713.04 LIN.FT.	625 JUNCTION BOX EA.	625 DISCONNECT EXISTING CIRCUIT EA.	625 CONDUIT, CONCRETE ENCASED AS PER PLAN SIZE, 6" LIN.FT.	SPECIAL MANHOLE, FOR PRIMARY ELECTRIC 8'x13'x9'-2" CONC. EA.	625 CONDUIT 4", 713.04 LIN.FT.		
1L	LT./RT.	144+44								2		198	118	208	256	4		1																
2L	LT.	144+44	144+75	1		1			7		2	50		60																				
3L	RT.	144+75	150+20							1		585		595																				
4L	RT.	150+20	152+80 OC	1				1	5	1	2	255		265		2																		
5L	RT.	152+80 OC	154+50 OC	1		1					2	265		275												6								
6L	RT.	152+80 OC	158+25 OC							1					1080	2	1										555							
7L	LT./RT.	158+25 OC								1		135	90	145																				
8L	RT.	158+25 OC	163+50 OC	1			1				2	575		585					1						6								
9L	LT.	156+55 OB			1		1				2														6								
10L	LT.	156+55 OB	160+68	1				1			2	377		387											5								
11L	LT.	160+68	166+20 OD									540		550																				
12L	LT./RT.	139+50	156+00													2				39	39	33	20				2					SEE	SHT. 103	
13L	LT./RT.	156+00	163+50±																	10	10	10	5									SEE	SHT. 104	
14L	LT.	144+00	144+44							1		44		54		2																		
15L	RT.	148+90								1		20		30		2																		
16L	LT.	156+55 OB	55+35 ORP									280		290	230	2																		
17L	RT.	140+89	144+44							1		114		124	502	2											241	2					7	
18L		EXIST. TOWER	B-D-5																										1					
		STATIONS ON S.R. 315 UNLESS OTHERWISE NOTED																																
		TEMPORARY POWER SERVICE LOCATION																					1	1										
19L	LT	140+00																											1					
																	1	1	1															
1E	LT.	146+15	148+30																											860	2			
2E	LT./RT.	148+30																												1160	1			
3E	RT.	147+48	148+30																											180				
4E	RT.	148+30	149+00																											220				
		TOTAL		5	1	2	2	2	12	9	12	3438	208	3568	2068	18	1	1	1	49	49	43	25	1	23	796	2	4	2420	3	7			

LIGHTING SUBSUMMARY

LIGHTING GENERAL SUMMARY

CALC. BY	LK	2-24-87
CHECK BY	JSS	2-24-87

THIS PORTION OF THE PROJECT IS FUNDED AS STP FUNDING.

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

FRANKLIN COUNTY
FRA-670-1.25-C-3

ITEM	SHEET NUMBER		ITEM	ITEM EXT.	TOTAL QUANT.	UNIT	DESCRIPTION	REF. NO.
	100	101						
202		25	202	75301	25	EACH	PULL BOX REMOVED, AS PER PLAN	100
202		37	202	75401	37	EACH	LIGHT POLE REMOVED, AS PER PLAN	100
202		37	202	75501	37	EACH	LIGHT POLE FOUNDATION REMOVED, AS PER PLAN	100
202		37	202	75507	37	EACH	LUMINAIRE REMOVED, AS PER PLAN	100
202		1	202	75511	1	EACH	POWER SERVICE REMOVED, AS PER PLAN	100
603	50		603	00400	50	LIN. FT.	4" CONDUIT, TYPE E	
625		20	625	01500	20	EACH	CABLE SPLICING KIT	
625		3	625	13200	5	EACH	LIGHT TOWER, BBBB100	
625		1	625	13204	1	EACH	LIGHT TOWER, BBBB110	
625		2	625	13400	2	EACH	LIGHT TOWER, BBBBBB100	
625		2	625	15100	2	EACH	LIGHT TOWER FOUNDATION, 36" x 20' DEEP	
625		2	625	15200	2	EACH	LIGHT TOWER FOUNDATION, 36" x 25' DEEP	
625		2	625	15300	2	EACH	LIGHT TOWER FOUNDATION, 36" x 30' DEEP	
625		1	625	20000	1	EACH	PORTABLE POWER UNIT	
625		1	625	21100	1	EACH	LIGHT TOWER MAINTENANCE PLATFORM, TYPE B	
625		2068	625	23200	2068	LIN. FT.	NO. 4 AWG 5000 VOLT DISTRUBITION CABLE	
625		3480	625	24100	3480	LIN. FT.	1 1/2" DUCT CABLE WITH TWO NO. 4 AWG 5000 VOLT CABLES	
625		796	625	25400	796	LIN. FT.	CONDUIT 2", 713.04	
625		208	625	25500	208	LIN. FT.	CONDUIT 3", 713.04	
625		7	625	25600	7	LIN. FT.	CONDUIT 4", 713.04	
625		2420	625	25802	2420	LIN. FT.	CONDUIT, CONCRETE ENCASED, AS PER PLAN, SIZE: 5"	105
625		16	625	27000	12	EACH	LUMINAIRE, ASYMMETRIC, 400 WATT HPS, 713.21, 480 VOLT	
625		12	625	27200	23	EACH	LUMINAIRE, SYMMETRIC, 400 WATT HPS, 713.21, 480 VOLT	
625		3468	625	29002	3468	LIN. FT.	TRENCH, 24" DEEP	
625		2	625	29900	2	EACH	JUNCTION BOX	
625		1	625	29920	1	EACH	STRUCTURE JUNCTION BOX	
625		8	625	30700	9	EACH	PULL BOX, 713.08, 18"	
625		12	625	32000	12	EACH	GROUND ROD	
625		1	625	34000	1	EACH	POWER SERVICE	
625		LUMP	625	38000	LUMP	SUM	HIGH VOLTAGE TEST	
SPECIAL		LUMP	SPECIAL	625 40000	LUMP		MAINTAIN EXISTING LIGHTING	100
SPECIAL			SPECIAL	625 40010	1	EACH	REPLACEMENT OF EXISTING LIGHTING UNIT	
SPECIAL		4	SPECIAL	625 40020	4	EACH	DISCONNECT EXISTING CIRCUIT	100
SPECIAL		3	SPECIAL	625 98000	3	EACH	LIGHTING, MISC: MANHOLE FOR PRIMARY ELECTRIC, 8' x 13' x 9'-2" CONCRETE	106

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OHIO | FHWA REGION 5 | FEDERAL PROJECT

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STUB OUT CONDUIT

STA. 144+00 OVERHEAD SIGN, CIRCUIT "D"

STA. 144+10, 56' LT. PULL BOX

STA. 144+44, 56' LT. S.R. 315 CROSSOVER AND 3" PULL BOX

STA. 144+75, 85' LT. S.R. 315 7-400W HPS B-D-1

TWIN RIVERS DRIVE

S.R. 315 SOUTHBOUND LANES

S.R. 315 NORTHBOUND LANES

2 STUB OUT CONDUIT

CIRCUIT "D"

STA. 142+50

MATCH LINE

STA. 143+23 JUNCTION BOX IN BARRIER WALL AND RACEWAY SEE DETAIL SH. 105

STA. 143+30 PULL BOX

BIKEWAY

STA. 144+44, 62' RT. S.R. 315 PULL BOX

STA. 147+65, 75' RT. S.R. 315 PULL BOX

EXIST. PRIMARY SERIVE (TO BE REMOVED)

EXIST. PUMP STATION ST-5 (TO BE REHABBED SEE SH.)

STA. 148+90 OVERHEAD SIGN CIRCUIT "D"

STA. 148+50, 83.7 RT. PULL BOX

EXIST. CONTROL CENTER STA. 147+48, 180' RT. CIRCUIT "D" 480 VOLT SERVICE

STA. 150+20, 60' RT. S.R. 315 4-400W HPS B-D-2.5

STA. 152+80, 13' RT. PULL BOX

STA. 154+50, 110' LT. RAMP OC B-D-3, 6-400W HPS

RAMP OC

2" CONDUIT RACEWAY

STA. 158+25, 75' LT. RAMP OC PULL BOX

STA. 158+25, 16' RT. RAMP OC PULL BOX, 3" CROSSOVER

EXIST. LIGHT TOWER, B-D-4 CONNECT EXIST. #4 AWG. TO PROPOSED CIRCUIT "D"

SEE SAFETY NOTE, SH. 100. THE CONTRACTOR SHALL DISCONNECT THE EXISTING CIRCUIT TO THE EAST AT THIS LIGHT POLE. THE CIRCUIT TO THE WEST IS TO REMAIN OPERATIONAL. THIS IS TO BE PAID FOR UNDER ITEM SPECIAL DISCONNECT EXISTING CIRCUIT.

STA. 163+50, 45' RT. RAMP OC B-D-4, 6-400W HPS, TYPE B LIGHT, WITH MAINTENANCE PLATFORM

SEE DETAIL "A" SHEET NO. 105

STUB OUT CONDUIT

EXIST. LIGHT TOWER, B-D-5

SEE SAFETY NOTE, SH. 100. THE CONTRACTOR SHALL DISCONNECT THE CIRCUIT INORDER TO REMOVE THE POLE AND THEN RECONNECT AS NECESSARY TO MAKE THE REMAINING CIRCUIT OPERATIONAL. THIS IS TO BE PAID FOR UNDER ITEM SPECIAL - DISCONNECT EXISTING CIRCUIT.

STA. 166+44.88 RAMP OC = STA. 109+02.24 GOODALE ST.

STA. 145+60, 45' RT., RAMP OF EXIST. PULL BOX

STA. 145+55 RAMP OF EXIST. OVERHEAD SIGN, CIRCUIT "D"

THE EXISTING CONTROL CENTER FOR LIGHTING ALONG GOODALE STREET IS LOCATED NEAR MICHIGAN AVENUE AND GOODALE STREET (NORTHWEST.)

SEE SAFETY NOTE, SH. 100. THE CONTRACTOR SHALL DISCONNECT THE EXISTING OVERHEAD LIGHTING CIRCUIT AT THE FIRST LIGHT POLE SOUTH OF STA. 140+00. THIS WORK SHALL BE DONE ONLY AFTER THE PROJECT LIGHTING IS OPERATIONAL. THIS IS TO BE PAID FOR UNDER ITEM SPECIAL DISCONNECT EXISTING CURCUIT.

BEGIN WORK STA. 140+00

TWIN RIVERS DRIVE

S.R. 315 SB

S.R. 315 NB

MATCH LINE

STA. 142+50

STA. 140+89 JUNCTION BOX IN BARRIER WALL BEGIN 2" CONDUIT RACEWAY

STA. 140+89 OVERHEAD SIGN CIRCUIT "D"

OLENTANGY RIVER

GOODALE STREET

DO NOT DISTURB EXISTING LIGHTING BETWEEN THESE LIMITS

LIGHTING PLAN STA. 144+44 TO STA. 163+50

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MATCH LINE STA. 154+25 RAMP OB

STA. 156+49, 43' LT.
RAMP OB, PULL BOX

STA. 160+68, 294.39' LT. S.R. 315
A-C-3, 5-400W HPS

STA. 166+20, 30' LT. ROAD OD
EXIST. LIGHT TOWER, A-C-2
CONNECT PROPOSED #4 AWG.
TO EXISTING CIRCUITRY

TO CONTROL CENTER "A"

EXIST. CIRCUIT "C"

EXIST. LIGHT TOWER
A-C-1

C-1
CONDUIT

PROPOSED CIRCUIT "C"

STA 156+55, 43' LT. RAMP OB
A-C-A, 6-400W HPS

RAMP OB

ROAD OD

SOUTHBOUND S.R. 315

NORTHBOUND S.R. 315

ROAD OE

BIKEWAY

OLENTANGY RIVER

STA. 55+65.91 OLENTANGY RIVER ROAD=
STA. 156+71.76 RAMP OA

STA. 56+15.91 OLENTANGY RIVER ROAD=
STA. 153+14.90 RAMP OB

55+00 56+00 57+00 ℄ OLENTANGY RIVER ROAD

STA. 55+35
OVERHEAD SIGN
CIRCUIT "C"

STA. 55+35, 65' RT.
EXISTING PULL BOX
& 3" CROSSOVER

MATCH LINE

STA. 56+34, 70' RT.
EXISTING PULL BOX
(INSTALLED IN C-1)

STA. 154+25 RAMP OB

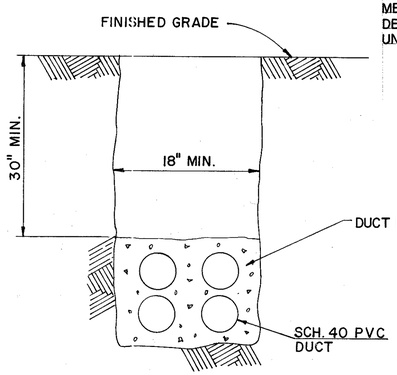
RAMP OA

RAMP OB

NOTE:
THE CONTRACTOR SHALL, AT THE END OF THE PROJECT REMOVE THE POWER SERVICE WITH THE EXISTING FLASHING ARROW PANEL NEAR STA. 180+40. THIS WORK SHALL BE PERFORMED ONLY AFTER S.R. 315 HAS BEEN FULLY OPENED TO TRAFFIC.

LIGHTING PLAN STA. 156+55 TO STA. 166+20

FRANKLIN COUNTY
FRA-670-1.25-C-3



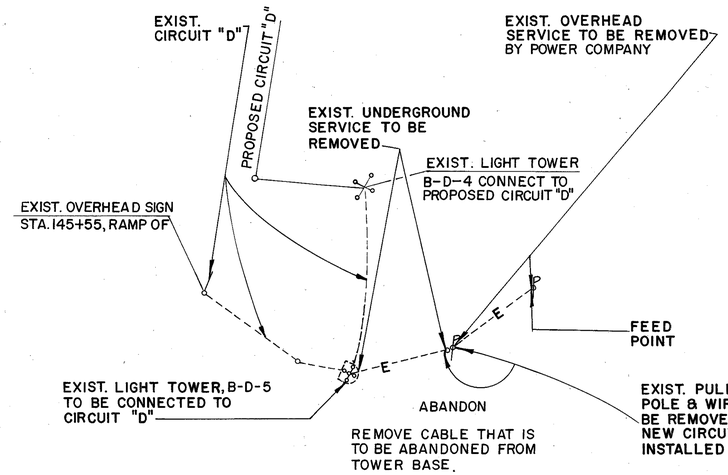
BACKFILL SHALL BE POWER TAMPED IN LAYERS NOT TO EXCEED 4" IN LOOSE MEASUREMENT COMPLYING WITH SOIL DENSITY COMPACTION REQUIREMENTS UNDER ITEM 203.12.

DUCT SPACING
2 DUCTS – SPACE 2 WIDE 0 HIGH
4 DUCTS – SPACE 2 WIDE 2 HIGH

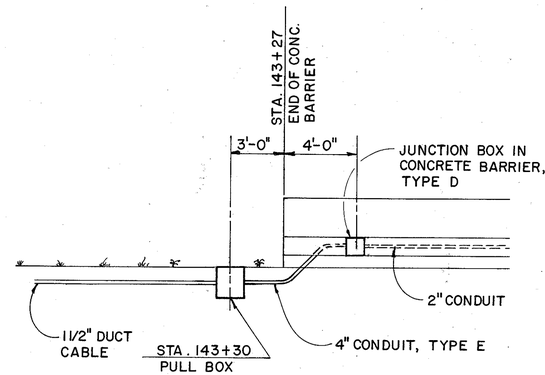
NOTE:
5" DUCTS ENCASED IN CONCRETE WITH 2" MINIMUM SEPARATION AND 3" MINIMUM CONCRETE ENVELOPE. MINIMUM COVER AS SHOWN IN PROFILE SPACERS 4'-0" ON CENTER.

TYPICAL TRENCH DETAIL

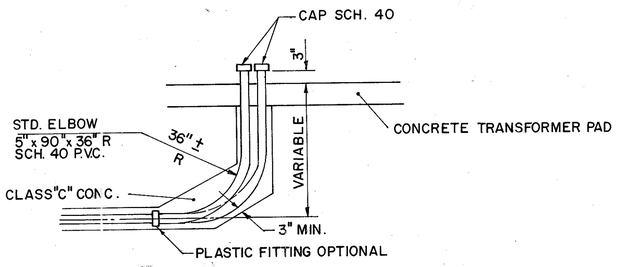
PAYMENT FOR THE CONDUIT, FITTINGS, TRENCH, AND CONCRETE ENCASEMENT IN PLACE, SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT FOR (L.F.) CONDUITS, CONCRETE ENCASED, AS PER PLAN, SIZE 5".



DETAIL "A"



DETAIL OF TRANSITION AT STA. 143+27



TRANSFORMER PAD RISER DETAIL

CONTROL CENTER DATA TABLE

POWER SERVICE LOCATION	POWER SERVICE	CONNECTED LOAD KVA	SERVICE ENTRANCE CONDUCTOR SIZE-AWG.	ENCLOSURE RATING AMPS.	CIRCUIT NUMBER	CIRCUIT LOAD AMPS.	CIRCUIT FUSE SIZE AMPS.	MAINTAINING AGENCY	REMARKS
Proposed B Sta 144+44	480 V, 2W Grounded Neutral	13.92	#2	60	D	29	40	ODOT	

POLE MOUNTING HEIGHTS & FOUNDATION SIZE				
LIGHT TOWERS			FOUNDATION	
LOCATION		MOUNTING HEIGHT	DEPTH	DIAMETER
163+45	RAMP OC	100'	25'	36"
156+55	RAMP OB	110'	25'	36"
160+68	S.R. 315	100'	30'	36"
144+75	S.R. 315	100'	20'	36"
150+20	S.R. 315	100'	30'	36"
154+50	RAMP OC	100'	20'	36"

315 NORTHBOUND

STATION	PROFILE ELEV.	SUPER ELEV.	DISTANCE	E/P ELEV.
140+00.00	707.28	–	45.00' RT.	706.97
140+25.00	706.70	–	44.30' RT.	706.40
140+50.00	706.18	–	43.59' RT.	705.89
140+75.00	705.72	–	42.89' RT.	705.44
141+00.00	705.31	–	42.19' RT.	705.04
140+25.00	704.97	–	41.48' RT.	704.71
141+50.00	704.69	–	40.78' RT.	704.44
141+75.00	704.46	–	40.08' RT.	704.25
142+00.00	704.29	–	39.38' RT.	704.23
142+25.00	704.19	–	38.67' RT.	704.36
(T.S.) 142+44.08	704.15	–	38.14' RT.	704.36
142+50.00	704.14	–	37.97' RT.	704.36
142+75.00	704.15	–	37.27' RT.	704.52
143+00.00	704.22	–	36.56' RT.	704.73
143+25.00	704.32	0.0189	36.00' RT.	705.00
143+50.00	704.42	0.0250	36.00' RT.	705.32
143+75.00	704.52	0.0308	36.00' RT.	705.63
144+00.00	704.60	0.0367	36.00' RT.	705.92
144+25.00	704.68	0.0425	36.00' RT.	705.21
144+44.08	704.73	0.0469	36.00' RT.	706.42
144+50.00	704.74	0.0469	36.00' RT.	706.43
144+75.00	704.80	0.0469	36.00' RT.	706.49
144+77.69	704.80	0.0469	36.00' RT.	706.49
145+00.00	704.86	0.0417	36.00' RT.	706.36
145+25.00	704.92	0.0358	36.00' RT.	706.21
145+50.00	704.98	0.0300	36.00' RT.	706.06
145+75.00	705.04	0.0242	36.00' RT.	705.91
146+00.00	705.10	0.0183	36.00' RT.	705.76
146+25.00	705.19	–	36.00' RT.	705.67
146+50.00	705.33	–	36.00' RT.	705.67
146+75.00	705.54	–	36.00' RT.	705.74
(S.T.) 146+77.69	705.57	–	36.00' RT.	705.76
147+00.00	705.80	–	36.00' RT.	705.88
147+25.00	706.11	–	36.00' RT.	706.06
147+50.00	706.48	–	36.00' RT.	706.31
147+75.00	706.91	–	36.00' RT.	706.72
148+00.00	707.40	–	36.00' RT.	707.27
148+25.00	707.94	–	36.00' RT.	707.93
148+50.00	708.54	–	36.00' RT.	708.66
(T.S.) 148+63.57	708.90	–	36.00' RT.	709.07
148+75.00	709.20	–	24.00' RT.	709.42
149+00.00	709.91	–	24.00' RT.	710.20
149+25.00	710.69	–	24.00' RT.	711.05
149+50.00	711.51	0.0204	24.00' RT.	712.00
149+75.00	712.40	0.0262	24.00' RT.	713.03
150+00.00	713.34	0.0321	24.00' RT.	714.11
150+25.00	714.31	0.0379	24.00' RT.	715.22
150+50.00	715.28	0.0438	24.00' RT.	716.33
(S.C.) 150+63.57	715.79	0.0458	24.00' RT.	716.89
150+75.00	716.23	0.0471	24.00' RT.	717.36
150+76.83	716.30	0.0467	24.00' RT.	717.42
151+00.00	717.14	0.0417	24.00' RT.	718.14
151+25.00	718.02	0.0358	24.00' RT.	718.88
151+50.00	718.86	0.0300	24.00' RT.	719.58
151+75.00	719.66	0.0238	24.00' RT.	720.23
152+00.00	720.42	0.0179	24.00' RT.	720.85
152+25.00	721.14	0.0183	24.00' RT.	721.58
152+50.00	721.90	–	24.00' RT.	722.16
152+75.00	722.47	–	24.00' RT.	722.66
(S.T.) 152+76.83	722.51	–	24.00' RT.	722.70
153+00.00	723.08	–	24.00' RT.	723.21
153+25.00	723.66	–	24.00' RT.	723.73
153+50.00	724.19	–	24.00' RT.	724.19
153+75.00	724.69	–	24.00' RT.	724.69
154+00.00	725.14	–	24.00' RT.	725.14
154+25.00	725.56	–	24.00' RT.	725.56
154+50.00	725.95	–	24.00' RT.	726.01
154+75.00	726.29	–	24.00' RT.	726.42
(T.S.) 154+99.49	726.59	–	24.00' RT.	726.78
155+00.00	726.60	–	24.00' RT.	726.79
155+25.00	726.87	–	24.00' RT.	727.12
155+50.00	727.10	–	24.00' RT.	727.41
155+75.00	727.29	–	24.00' RT.	727.66
156+00.00	727.44	0.0204	24.00' RT.	727.93
156+25.00	727.56	0.0254	24.00' RT.	728.17
156+50.00	727.64	0.0304	24.00' RT.	728.37
156+75.00	727.70	0.0354	24.00' RT.	728.55
157+00.00	727.76	0.0408	24.00' RT.	728.74
157+25.00	727.82	0.0458	24.00' RT.	728.92
157+50.00	727.88	0.0508	24.00' RT.	729.10
157+75.00	727.95	0.0558	24.00' RT.	729.29
158+00.00	728.02	0.0608	24.00' RT.	729.48
158+25.00	728.10	0.0658	24.00' RT.	729.68
(S.C.) 158+49.49	728.20	0.0708	24.00' RT.	729.90
158+50.00	728.20	0.0708	24.00' RT.	729.90
158+75.00	728.30	0.0708	24.00' RT.	730.00
159+00.00	728.40	0.0708	24.00' RT.	730.10
159+25.00	728.50	0.0708	24.00' RT.	730.20
159+50.00	728.60	0.0708	24.00' RT.	730.30
159+75.00	728.70	0.0708	24.00' RT.	730.40
(C.S.) 159+86.25	728.74	0.0708	24.00' RT.	730.42
160+00.00	728.80	0.0683	24.00' RT.	730.44
160+25.00	728.90	0.0633	24.00' RT.	730.42
160+50.00	729.00	0.0579	24.00' RT.	730.39
160+75.00	729.10	0.0529	24.00' RT.	730.37
161+00.00	729.20	0.0479	24.00' RT.	730.35
161+25.00	729.30	0.0429	24.00' RT.	730.33
161+50.00	729.40	0.0379	24.00' RT.	730.31
161+75.00	729.50	0.0329	24.00' RT.	730.29
162+00.00	729.60	0.0275	24.00' RT.	730.26
162+25.00	729.70	0.0225	24.00' RT.	730.24
162+50.00	729.80	0.0175	24.00' RT.	730.22
162+75.00	729.90	–	24.00' RT.	730.24
163+00.00	730.00	–	24.00' RT.	730.28
163+25.00	730.10	–	24.00' RT.	730.31
(S.T.) 163+36.25	730.14	–	24.00' RT.	730.33
163+50.00	730.20	–	24.00' RT.	730.35
163+75.00	730.30	–	24.00' RT.	730.39
164+00.00	730.40	–	24.00' RT.	730.43
164+25.00	730.50	–	24.00' RT.	730.50
164+50.00	730.60	–	24.00' RT.	730.60
164+75.00	730.70	–	24.00' RT.	730.70
165+00.00	730.80	–	24.00' RT.	730.80
165+25.00	730.90	–	24.00' RT.	730.90
165+50.00	731.00	–	24.00' RT.	731.00
165+75.00	731.10	–	24.00' RT.	731.10
166+00.00	731.20	–	24.00' RT.	731.20
166+25.00	731.30	–	24.00' RT.	731.30
166+50.00	731.40	–	24.00' RT.	731.40
166+75.00	731.50	–	24.00' RT.	731.50
167+00.00	731.60	–	24.00' RT.	731.60
167+25.00	731.70	–	24.00' RT.	731.70
167+50.00	731.80	–	24.00' RT.	731.80
167+75.00	731.90	–	24.00' RT.	731.90
168+00.00	732.00	–	24.00' RT.	732.00
168+25.00	732.10	–	24.00' RT.	732.10
168+50.00	732.20	–	24.00' RT.	732.20
168+75.00	732.30	–	24.00' RT.	732.30
169+00.00	732.40	–	24.00' RT.	732.40
169+25.00	732.50	–	24.00' RT.	732.50
169+50.00	732.60	–	24.00' RT.	732.60
169+75.00	732.70	–	24.00' RT.	732.70
170+00.00	732.80	–	24.00' RT.	732.80
170+25.00	732.90	–	24.00' RT.	732.90
170+50.00	733.00	–	24.00' RT.	733.00
170+75.00	733.10	–	24.00' RT.	733.10
171+00.00	733.20	–	24.00' RT.	733.20
171+25.00	733.30	–	24.00' RT.	733.30
171+50.00	733.40	–	24.00' RT.	733.40
171+55.38	733.42	–	24.00' RT.	733.42

OHIO
FHWA REGION 5
FEDERAL PROJECT

107
224

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SUPER ELEVATION TABLES

315 SOUTHBOUND

OHIO	108
FHWA REGION 5	224
FEDERAL PROJECT	

STATION	PROFILE ELEV.	SUPER ELEV.	DISTANCE	E/P ELEV.
140+00.00	707.28	–	36.00' LT.	707.09
140+25.00	706.70	–	36.00' LT.	706.51
140+50.00	706.18	–	36.00' LT.	705.99
140+75.00	705.72	–	36.00' LT.	705.53
141+00.00	705.31	–	36.00' LT.	705.12
140+25.00	704.97	–	36.00' LT.	704.78
141+50.00	704.69	–	36.00' LT.	704.50
141+75.00	704.46	–	36.00' LT.	704.26
142+00.00	704.29	–	36.00' LT.	704.03
142+25.00	704.19	–	36.00' LT.	703.86
(T.S.) 142+44.08	704.15	–	36.00' LT.	703.78
142+50.00	704.14	–	36.00' LT.	703.75
142+75.00	704.15	–	36.00' LT.	703.69
143+00.00	704.22	–	36.00' LT.	703.69
143+25.00	704.32	−0.0189	36.00' LT.	703.64
143+50.00	704.42	−0.0250	36.00' LT.	703.52
143+75.00	704.49	−0.0306	36.00' LT.	703.39
144+00.00	704.51	−0.0367	36.00' LT.	703.19
144+25.00	704.52	−0.0481	36.00' LT.	702.79
(S.C.) 144+44.08	704.49	−0.0469	36.00' LT.	702.80
144+50.00	704.49	−0.0469	36.00' LT.	702.80
144+75.00	704.55	−0.0469	36.00' LT.	702.86
(C.S.) 144+77.69	704.58	−0.0469	36.00' LT.	702.89
145+00.00	704.72	−0.0419	36.00' LT.	703.21
145+25.00	704.84	−0.0358	36.00' LT.	703.55
145+50.00	704.96	−0.0299	36.16' LT.	703.88
145+75.00	705.04	−0.0242	36.79' LT.	704.15
146+00.00	705.10	−0.0182	37.41' LT.	704.42
146+25.00	705.19	–	38.04' LT.	704.63
146+50.00	705.33	–	38.60' LT.	704.84
146+75.00	705.54	–	39.29' LT.	705.11
(S.T.) 146+77.69	705.57	–	39.36' LT.	705.14
147+00.00	705.80	–	39.91' LT.	705.42
147+25.00	706.11	–	40.54' LT.	705.78
147+50.00	706.48	–	41.16' LT.	706.21
147+75.00	706.91	–	41.79' LT.	706.63
148+00.00	707.40	–	42.41' LT.	707.08
148+25.00	707.94	–	43.04' LT.	707.55
148+50.00	708.54	–	43.66' LT.	708.08
(T.S.) 148+63.57	708.90	–	44.00' LT.	708.39
148+75.00	709.20	–	44.29' LT.	708.66
149+00.00	709.91	–	44.91' LT.	709.29
149+25.00	710.69	–	45.54' LT.	709.99
149+50.00	711.51	−0.0204	24.00' LT.	711.02
149+75.00	712.40	−0.0262	24.00' LT.	711.77
150+00.00	713.30	−0.0321	24.00' LT.	712.53
150+25.00	714.21	−0.0379	24.00' LT.	713.30
150+50.00	715.09	−0.0438	24.00' LT.	714.04
(S.C.) 150+63.57	715.55	−0.0471	24.00' LT.	714.42
150+75.00	715.98	−0.0471	24.00' LT.	714.85
(C.S.) 150+76.83	716.05	−0.0467	24.00' LT.	714.93
151+00.00	717.00	−0.0417	24.00' LT.	716.00
151+25.00	717.94	−0.0354	24.00' LT.	717.09
151+50.00	718.84	−0.0296	24.00' LT.	718.13
151+75.00	719.66	−0.0238	24.00' LT.	719.09
152+00.00	720.42	−0.0179	24.00' LT.	719.99
152+25.00	721.14	–	24.00' LT.	720.81
152+50.00	721.90	–	24.00' LT.	721.64
152+75.00	722.47	–	24.00' LT.	722.28
(T.S.) 152+76.83	722.51	–	24.00' LT.	722.33
153+00.00	723.08	–	24.00' LT.	722.95
153+25.00	723.66	–	24.00' LT.	723.59
153+50.00	724.19	–	24.00' LT.	724.19
153+75.00	724.69	–	24.00' LT.	724.69
154+00.00	725.14	–	24.00' LT.	725.14
154+25.00	725.56	–	24.00' LT.	725.56
154+50.00	725.95	–	24.00' LT.	725.89
154+75.00	726.29	–	24.00' LT.	726.16
155+00.00	726.60	–	24.00' LT.	726.41
155+25.00	726.87	–	24.00' LT.	726.62
155+50.00	727.10	–	24.00' LT.	726.79
155+75.00	727.29	−0.0154	24.00' LT.	726.92
156+00.00	727.44	−0.0204	24.00' LT.	726.95
156+25.00	727.56	−0.0254	24.00' LT.	726.95
156+50.00	727.62	−0.0308	24.00' LT.	726.88
156+75.00	727.62	−0.0354	24.00' LT.	726.77
157+00.00	727.63	−0.0408	24.00' LT.	726.65
157+25.00	727.59	−0.0454	24.00' LT.	726.50
157+50.00	727.55	−0.0508	24.00' LT.	726.33
157+75.00	727.51	−0.0558	24.00' LT.	726.17
158+00.00	727.44	−0.0608	24.00' LT.	725.98
158+25.00	727.47	−0.0662	24.00' LT.	725.88
(S.C.) 158+49.49	727.51	−0.0708	24.00' LT.	725.81
158+50.00	727.51	−0.0708	24.00' LT.	725.81
158+75.00	727.61	−0.0708	24.00' LT.	725.91
159+00.00	727.71	−0.0708	24.00' LT.	726.01
159+25.00	727.81	−0.0708	24.00' LT.	726.11
159+50.00	727.91	−0.0708	24.00' LT.	726.21
159+75.00	728.01	−0.0708	24.00' LT.	726.31
(C.S.) 159+86.25	728.06	−0.0708	24.00' LT.	726.36
160+00.00	728.14	−0.0679	24.00' LT.	726.51
160+25.00	728.30	−0.0633	24.00' LT.	726.78
160+50.00	728.52	−0.0583	24.00' LT.	727.12
160+75.00	728.72	−0.0529	24.00' LT.	727.45
161+00.00	728.93	−0.0481	36.00' LT.	727.20
161+25.00	729.14	−0.0431	36.00' LT.	727.59
161+50.00	729.30	−0.0378	36.00' LT.	727.94
161+75.00	729.45	−0.0325	36.00' LT.	728.28
162+00.00	729.60	−0.0278	36.00' LT.	728.60
162+25.00	729.70	−0.0225	36.00' LT.	728.89
162+50.00	729.80	−0.0175	36.00' LT.	729.17
162+75.00	729.90	−0.0156	36.00' LT.	729.34
163+00.00	730.00	−0.0156	36.00' LT.	729.44
163+25.00	730.10	−0.0156	36.00' LT.	729.54
(S.T.) 163+36.25	730.14	−0.0156	36.00' LT.	729.58
(T.S.) 163+43.29	730.17	−0.0156	36.00' LT.	729.61
163+50.00	730.20	−0.0156	36.00' LT.	729.64
163+75.00	730.30	−0.0156	36.00' LT.	729.74
164+00.00	730.40	−0.0156	36.00' LT.	729.84
164+25.00	730.50	−0.0192	36.00' LT.	729.81
164+50.00	730.60	−0.0252	33.79' LT.	729.75
164+75.00	730.70	−0.0309	30.79' LT.	729.75
165+00.00	730.80	−0.0367	27.79' LT.	729.78
165+25.00	730.90	−0.0428	24.79' LT.	729.84
165+50.00	731.00	−0.0471	24.00' LT.	729.87
165+75.00	731.10	−0.0471	24.00' LT.	729.97
166+00.00	731.20	−0.0471	24.00' LT.	730.07
166+25.00	731.30	−0.0471	24.00' LT.	730.17
166+50.00	731.40	−0.0471	24.00' LT.	730.27
166+75.00	731.50	−0.0471	24.00' LT.	730.37
167+00.00	731.60	−0.0471	24.00' LT.	730.47
167+25.00	731.70	−0.0471	24.00' LT.	730.57
167+50.00	731.80	−0.0471	24.00' LT.	730.67
(C.S.) 169+58.29	731.82	−0.0454	24.00' RT.	730.73
167+75.00	731.90	−0.0438	24.00' LT.	730.85
168+00.00	732.00	−0.0392	24.00' LT.	731.06
168+25.00	732.10	−0.0346	24.00' LT.	731.27
168+50.00	732.20	−0.0300	24.00' LT.	731.48
168+75.00	732.30	−0.0254	24.00' LT.	731.69
169+00.00	732.40	−0.0208	24.00' LT.	731.90
169+25.00	732.50	−0.0162	24.00' LT.	732.11
169+50.00	732.60	–	24.00' LT.	732.32
(S.T.) 169+58.29	732.62	–	24.00' RT.	732.39
169+75.00	732.70	–	24.00' RT.	732.53
170+00.00	732.80	–	24.00' RT.	732.74
170+25.00	732.90	–	24.00' RT.	732.95
170+50.00	733.00	–	24.00' RT.	733.16
170+65.48	733.06	–	24.00' RT.	733.29

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SUPER ELEVATION TABLES

RAMP OA

STATION	PROFILE ELEV.	SUPER ELEV.	DISTANCE	E/P ELEV.
150+63.57	713.67	0.0469	16' RT.	714.42
150+75.00	714.01	0.0488	16' RT.	714.79
151+00.00	714.74	0.0538	16' RT.	715.60
151+25.00	715.48	0.0581	16' RT.	716.41
151+50.00	716.22	0.0625	16' RT.	717.22
151+75.00	716.91	0.0669	16' RT.	717.98
152+00.00	717.52	0.0712	16' RT.	718.66
152+25.00	718.04	0.0762	16' RT.	719.26
152+50.00	718.48	0.0775	16' RT.	719.72
152+63.57	718.68	0.0800	16' RT.	719.96
152+75.00	718.84	0.0830	16' RT.	720.17
153+00.00	719.11	0.0830	16' RT.	720.44
153+25.00	719.30	0.0830	16' RT.	720.63
153+50.00	719.40	0.0830	16' RT.	720.73
153+75.00	719.46	0.0830	16' RT.	720.79
154+00.00	719.52	0.0830	16' RT.	720.85
154+25.00	719.58	0.0830	16' RT.	720.91
154+50.00	719.64	0.0830	16' RT.	720.97
154+75.00	719.70	0.0830	16' RT.	721.03
155+00.00	719.76	0.0694	16' RT.	720.87
155+25.00	719.82	0.0600	16' RT.	720.78
155+31.74	719.84	0.0575	16' RT.	720.76

RAMP OB

STATION	PROFILE ELEV.	SUPER ELEV.	DISTANCE	E/P ELEV.
154+25.00	720.05	0.0162	16' RT.	720.33
154+50.00	720.05	0.0262	16' RT.	720.47
154+75.00	720.17	0.0356	16' RT.	720.74
155+00.00	720.40	0.0444	16' RT.	721.11
155+25.00	720.74	0.0540	16' RT.	721.60
155+50.00	721.19	0.0637	16' RT.	722.21
155+75.00	721.70	0.0734	16' RT.	722.87
156+00.00	722.19	0.0830	16' RT.	723.52
156+25.00	722.63	0.0830	16' RT.	723.96
156+50.00	723.02	0.0830	16' RT.	724.35
156+75.00	723.36	0.0830	16' RT.	724.69
(C.S.) 156+83.05	723.43	0.0830	16' RT.	724.76
157+00.00	723.66	0.0830	16' RT.	724.98
157+25.00	723.91	0.0812	16' RT.	725.21
157+40.84	724.04	0.0806	16' RT.	725.33
157+50.00	724.11	0.0800	16' RT.	725.39
157+75.00	724.26	0.0788	16' RT.	725.52
158+00.00	724.39	0.0775	16' RT.	725.63
158+25.00	724.52	0.0769	16' RT.	725.75
158+50.00	724.65	0.0725	16' RT.	725.81
158+75.00	724.78	0.0694	16' RT.	725.89
(S.C.) 158+83.05	724.81	0.0688	16' RT.	725.91
159+00.00	724.91	0.0688	13.5' ±	726.01
159+25.00	725.06	0.0840	12.5' ±	726.11
159+50.00	725.25	0.0800	12' ±	726.21
159+75.00	725.47	0.0700	12' ±	726.31
159+86.25	725.51	0.0708	12' RT.	726.36

RAMP OC

STATION	PROFILE ELEV.	SUPER ELEV.	DISTANCE	E/P ELEV.
(T.S.) 150+21.54	715.26	0.0147	13' LT.	715.07
150+25.00	715.41	0.0146	13' LT.	715.22
150+50.00	716.52	0.0141	13.5' LT.	716.33
150+75.00	717.49	0.0093	14' LT.	717.36
151+00.00	718.30	0.0100	16' LT.	718.14
151+25.00	718.95	0.0038	16' LT.	718.89
151+50.00	719.46	0.0081	16' LT.	719.59
151+75.00	719.92	0.0206	16' LT.	720.25
152+00.00	720.40	0.0331	16' LT.	720.93
(S.C.) 152+21.54	720.90	0.0438	16' LT.	721.60
152+25.00	720.98	0.0456	16' LT.	721.71
152+30.86	721.14	0.0488	16' LT.	721.92
152+50.00	721.67	0.0581	16' LT.	722.60
152+75.00	722.47	0.0830	16' LT.	723.80
153+00.00	723.34	0.0830	16' LT.	724.67
153+25.00	724.25	0.0830	16' LT.	725.58
153+50.00	725.16	0.0830	16' LT.	726.49
153+75.00	725.98	0.0830	16' LT.	727.31
154+00.00	726.72	0.0830	16' LT.	728.05
154+25.00	727.34	0.0830	16' LT.	728.67
154+50.00	727.90	0.0830	16' LT.	729.23
154+75.00	728.38	0.0830	16' LT.	729.71
155+00.00	728.79	0.0830	16' LT.	730.12
155+25.00	729.11	0.0830	16' LT.	730.44
155+50.00	729.33	0.0830	16' LT.	730.66
155+75.00	729.52	0.0830	16' LT.	730.85
156+00.00	729.61	0.0830	16' LT.	730.94
156+25.00	729.58	0.0830	16' LT.	730.91
156+50.00	729.46	0.0830	16' LT.	730.79
156+75.00	729.31	0.0830	16' LT.	730.64
157+00.00	729.06	0.0830	16' LT.	730.39
157+25.00	728.69	0.0830	16' LT.	730.02
157+50.00	728.25	0.0830	16' LT.	729.58
(PC.C.) 157+73.73	727.77	0.0830	16' LT.	729.10
157+75.00	727.75	0.0830	16' LT.	729.08
158+00.00	727.14	0.0830	16' LT.	728.47
158+25.00	726.55	0.0830	16' LT.	727.88
158+50.00	726.04	0.0830	16' LT.	727.37
158+75.00	725.62	0.0830	16' LT.	726.95
159+00.00	725.29	0.0830	16' LT.	726.62
159+25.00	725.04	0.0830	16' LT.	726.37
159+50.00	724.88	0.0830	16' LT.	726.21
159+75.00	724.81	0.0830	16' LT.	726.14
160+00.00	724.82	0.0830	16' LT.	726.15
160+25.00	724.92	0.0830	16' LT.	726.25
160+50.00	725.10	0.0830	16' LT.	726.43
160+75.00	725.37	0.0830	16' LT.	726.70
161+00.00	725.73	0.0830	16' LT.	727.06
161+25.00	726.13	0.0830	16' LT.	727.46

RAMP OC

STATION	PROFILE ELEV.	SUPER ELEV.	DISTANCE	E/P ELEV.
161+50.00	726.53	0.0830	16' LT.	727.86
161+75.00	726.93	0.0830	16' LT.	728.26
162+00.00	727.33	0.0830	16' LT.	728.66
162+25.00	727.72	0.0830	16' LT.	729.05
162+50.00	728.10	0.0830	16' LT.	729.43
162+75.00	728.47	0.0830	16' LT.	729.80
(P.T.) 162+94.88	728.76	0.0830	16' LT.	730.09
163+00.00	728.83	0.0797	16' LT.	730.11
163+25.00	729.17	0.0637	16' LT.	730.19
163+50.00	729.49	0.0477	16' LT.	730.25
163+75.00	729.81	0.0316	16' LT.	730.31
164+00.00	730.11	0.0156	16' LT.	730.36
164+25.00	730.41	0.0156	16' LT.	730.66
164+50.00	730.70	0.0156	16' LT.	730.95
164+75.00	731.00	0.0156	16' LT.	731.25
165+00.00	731.29	0.0156	16' LT.	731.54
165+25.00	731.59	0.0156	16' LT.	731.84
165+50.00	731.88	0.0156	16' LT.	732.13
165+63.51	732.02	0.0156	16' LT.	732.27

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SUPER ELEVATION TABLES

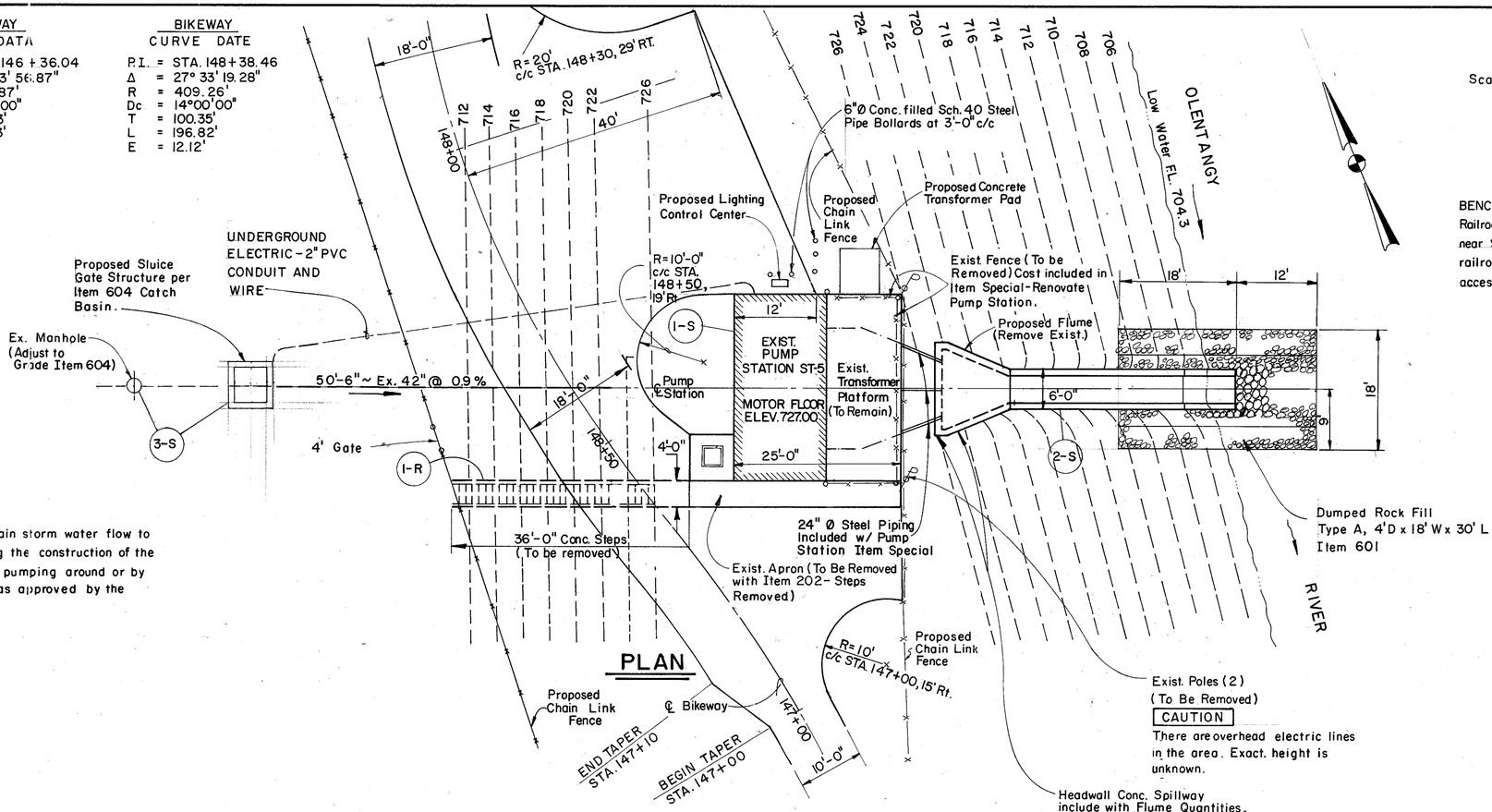
BIKEWAY CURVE DATA		BIKEWAY CURVE DATE	
P.I.	= STA. 146 + 36.04	P.I.	= STA. 148+38.46
Δ	= 20° 13' 56.87"	Δ	= 27° 33' 19.28"
R	= 520.87'	R	= 409.26'
Dc	= 11°00'00"	Dc	= 14°00'00"
T	= 92.93'	T	= 100.35'
L	= 183.93'	L	= 196.82'
E	= 8.22'	E	= 12.12'

LEGEND

EXISTING CONCRETE

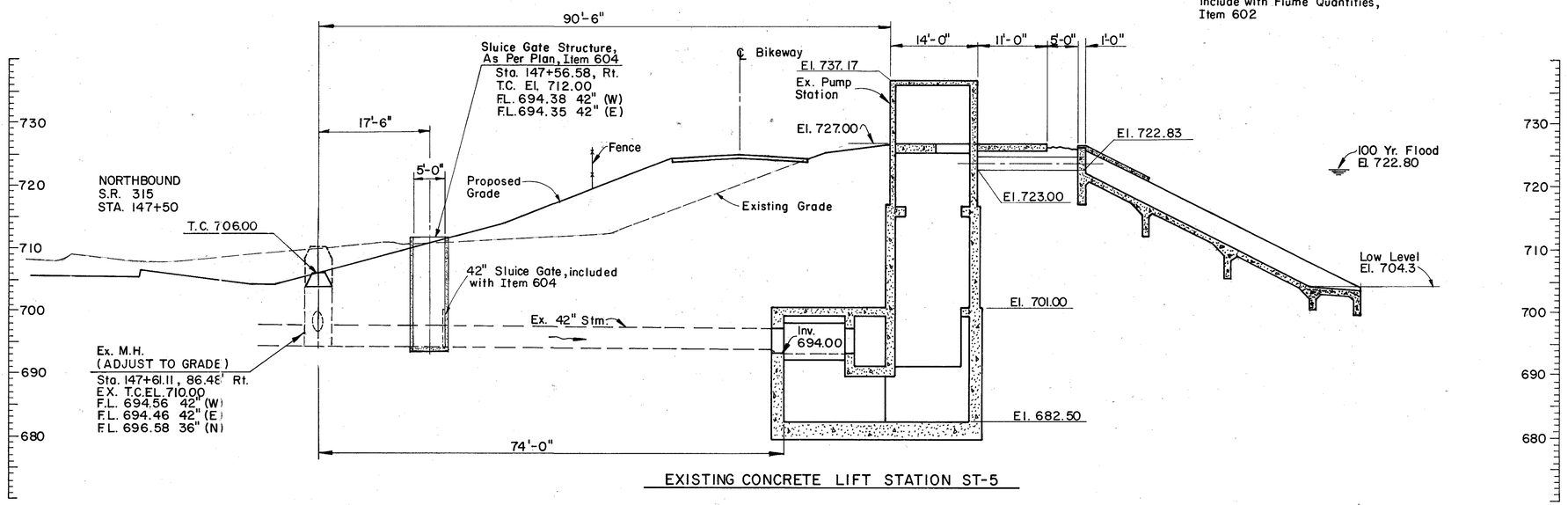
C/C = CENTER OF CURVE

NOTE:
The Contractor shall maintain storm water flow to to the pump station during the construction of the sluice gate structure by pumping around or by other acceptable method as approved by the Engineer.



PLAN

Scale : 1" = 10'



EXISTING CONCRETE LIFT STATION ST-5

PROFILE

Scale : 1" = 10'

FED.RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

110
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

BENCHMARK - Aluminum plug in concrete monumont, 400' W. of Conrail Railroad Bridge over Olentangy River, 301' W. of railroad mile marker #1, near S.W. cor. of Conrail Railroad Bridge over Twin Rivers Dr., 16.0' S. railroad tracks, 11.5' W. of a nail in S.W. abutment, 1' below ground with access thru an 8" farm tile with a cast iron lid. (COC #8-83) Elev. 725.28

ESTIMATED QUANTITIES

Ref. No.	Station to Station	Side	602 CONCRETE MASONRY, AS PER PLAN CU. YD.	604 CATCH BASIN NO. 2-5, AS PER PLAN EACH	601 DUMPED ROCK FILL, TYPE A CU. YD.	604 MANHOLE ADJUSTED TO GRADE EACH	202 REMOVAL MISC: EXIST FLUME EACH	202 STEPS REMOVED L.S.	SPECIAL RENOVATE PUMP STATION ST-5, AS PER PLAN L.S.
1-R	147+56.58	103' RT.						LUMP	
1-S	147+56.58	176' RT.							LUMP
2-S	147+56.58	209' RT.	33		64	1	1		
3-S	147+56.58	126' RT.		1		1			
TOTAL			33	1	64	1	1	LUMP	LUMP

PLAN AND PROFILE

GENERAL NOTES

DEMOLITIONS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required for demolitions, removal and disposal Work shown and specified.
2. Included, but not limited to, are demolition and removals of existing materials, equipment, or work necessary to install the new Work as shown and specified and to connect same with existing work in approved manner. Demolition includes structural concrete, foundations, equipment supports, metals, roofs, masonry, attachments, appurtenances, piping, electrical and mechanical equipment, paving, curbs, walks, fencing, and similar existing facilities.
3. Demolitions and removals which may be specified under other Sections shall conform to requirements of this Section.
4. OWNER reserves the right of ownership of any and all materials.

B. Related Work Specified Elsewhere:
1. Basic Electrical Requirements.

1.02 SUBMITTALS

A. Schedule: Submit for approval proposed methods, equipment, and operations sequence. Include coordination for shut-off, capping, temporary services, continuation of utility services, and other applicable items to ensure no interruption of OWNER's operations.

1.03 JOB CONDITIONS

A. Protection:
1. CONTRACTOR shall execute the demolition and removal Work to prevent damage or injury to structures, occupants thereof and adjacent features which might result from falling debris or other causes, and so as not to interfere with the use, and free and safe passage to and from, adjacent structures.
2. Closing or obstructing of roadways, sidewalks, and passageways adjacent to the Work by the placement or storage of materials will not be permitted, and all operations shall be conducted with a minimum interference to traffic on these ways.
3. CONTRACTOR shall erect and maintain barriers, lights, and other required protective devices.
4. CONTRACTOR shall repair damage done to facilities to remain, or to any property belonging to the OWNER or occupants of the facilities.

B. Scheduling:
1. CONTRACTOR shall carry out his operations so as to avoid interference with operations and work in the existing facilities and to other contractors working on site.

C. Notification:
1. At least 48 hours prior to commencement of a demolition or removal, CONTRACTOR shall notify the ENGINEER in writing of his proposed schedule therefor. OWNER, ENGINEER and CONTRACTOR shall jointly inspect the existing equipment and to identify mark those items which are to remain the property of the OWNER, and those items which are to be removed and reinstalled and/or modified. No removals shall be started without permission of the ENGINEER.

D. Explosives:
1. Do not bring explosives on site nor use explosives for demolition.

PART 2 – PRODUCTS

(Part 2 omitted this Section)

PART 3 – EXECUTION

3.01 GENERAL

A. All materials and equipment removed from existing work shall become the property of the CONTRACTOR, except for those which the OWNER has identified and marked to remain the property of the OWNER. All materials and equipment marked by the OWNER, ENGINEER and CONTRACTOR jointly to remain its property or to be reinstalled and/or modified shall be carefully removed by the CONTRACTOR so as not to be damaged, and then cleaned and stored on or adjacent to the site in a protected place specified by the ENGINEER or loaded onto trucks provided by the OWNER.

B. CONTRACTOR shall dispose of all demolition materials, equipment, debris and all other items not marked by the ENGINEER, OWNER and CONTRACTOR jointly, to remain the OWNER's property, off the site and in conformance with all existing applicable laws and regulations.

C. Surfaces of walls, floors, ceilings, or other areas which are exposed by any of the removals specified herein, and which will remain as architecturally finished surfaces, and which have holes, scar, chipped or other damaged surfaces revealed by the removal shall be repaired by the CONTRACTOR with the same or matching materials as the existing surface or as may be otherwise approved by the ENGINEER.

D. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
2. Clean adjacent structures, facilities, and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to conditions existing prior to the start of the Work.

E. Concrete Demolition:
1. Unless otherwise approved by ENGINEER, proceed with demolition from the top of the structure to the ground.
2 Demolish concrete and masonry in small sections.
3. Remove structures down to at least two feet below finished grade unless otherwise shown.

3.02 STRUCTURAL REMOVALS

A. CONTRACTOR shall remove structures to the lines and grades shown unless otherwise directed by the ENGINEER. Where no limits are shown, the limits shall be 4 inches outside the item to be installed. The removal of masonry beyond these limits shall be at the CONTRACTOR'S expense and these excess removals shall be reconstructed to the satisfaction of the ENGINEER with no additional compensation to the CONTRACTOR.

B. All concrete, concrete block, roofing materials, reinforcement, structural, equipment or miscellaneous metals, plaster, wire mesh and other items contained in or upon the structures shall be structures shall be removed and taken from the site unless otherwise approved and/or required by the ENGINEER. Demolished items shall not be used as backfill or embankments.

C. After removal of parts or all of masonry walls, slabs and like work which tie into new Work or existing work, the point of junction shall be neatly repaired so as to leave only finished edges and surface exposed.

D. Where new anchoring materials including bolts, nuts, hangers, welds and reinforcing steel are required to attach new Work to the existing work they shall be included under this Section, except where specified elsewhere.

3.03 MECHANICAL REMOVALS

A. Mechanical removals shall consist of dismantling and removing of existing piping, pumps, motors, equipment and other appurtenances as specified, shown, or required for the completion of the Work.

3.04 ELECTRICAL REMOVALS

A. Electrical removals shall consist of the removal of OWNER's distribution switchboards, control panels, moters, conduits and wires, poles, and overhead wiring, disconnect switches, panelboards, lighting fixtures, and miscellaneous electrical equipment all as shown, specified, or required to perform the Work.

B. All existing electrical equipment and fixtures to be removed shall be removed with such care as may be required to prevent unnecessary damage, to keep existing systems in operation, and to keep the integrity of the electrical grounding systems.

C. Distribution switchboards shall be removed or modified as shown. Switchboards to be removed shall be disconnected and dismantled, and all components shall be disposed of off the site or turned over to the OWNER according to the directions of the ENGINEER. Circuit breakers and other control equipment on modified switchboards that will no longer be used shall be removed unless otherwise shown or specified. All new openings cut into the modified switchhboard panels shall be cut square and dressed smooth to the dimensions required for the installation of the new equipment.

D. The CONTRACTOR shall coordinate the removal of the existing transformers with the City of Columbus, Division of Electricity (M.E.L.P.). M.E.L.P. will perform the removal of the existing transformers.

GENERAL NOTES

DEMOLITIONS (CONT.)

E. Motors shall be disconnected and removed where shown or specified. Motors not designated by the OWNERS identifing mark shall be removed from the site. Motors or other electrical gear shall bestored in enclosed, heated storage.

F. Conduits and wires shall be abandoned or removed where shown. All wires in abandoned conduits shall be removed, salvaged, and stored according to directions of the ENGINEER. Abandoned conduits concealed in floor or ceiling slabs, or in walls, shall be cut flush with the slab or wall at the point of entrance. The conduits shall be suitably plugged and the area repaired in a flush, smooth, approved manner. Exposed conduits and their supports shall be disassembled and removed from the site. Repair all areas of work to prevent rust spots on exposed surfaces.

G. Where shown or otherwise required, wiring in the underground duct system shall be removed. All such wiring shall be salvaged and stored according to directions of the ENGINEER. CONTRACTOR shall verify the function of all wiring before disconnecting and removing it. Ducts which are not to be reused shall be cut off flush where they enter building wall and floors, plugged watertight, patched and finished.

H. Where shown, or otherwise required, direct-burial cable that is not exposed through excavation shall be abandoned. Such cable shall be disconnected at both ends of the run. Where it enters a building or structure the cable shall be cut back to the point of entrance. All openings in buildings for entrance of abandoned conduit and/or direct-burial cable shall be patched and made watertight.

I. Panelboards and disconnect switchs where shown shall be removed and disposed of off the site or turned over to the OWNER according to directions of the ENGINEER. Where shown or specified, they shall be replaced with new panelboards and disconnect switches at the same or adjacent locations. All cutting and patching necessary for the removal and replacement of panelboards and disconnect switches shall be performed.

J. Lighting fixtures shall be removed or relocated as shown. Fixtures not relocated shall be removed from the site or turned over to the OWNER according to directions of the ENGINEER. Relocated fixtures shall be carefully removed from their present location and rehung where shown.

K. Wall switches, receptacles, starters,disconnect switches and other miscellaneous electrical equipment shall be removed and disposed of off the site as required or turned over to the OWNER according to directions of the ENGINEER. Care shall be taken in removing all equipment so as to minimize damage to architectural and structural members. Any damage incurred shall be repaired.

L. Electrical equipment, conduit, wire and devices appurtenant to removed electrically operated equipment which are not intended for reuse, reinstallation or relocation shall be removed where exposed and/or exposable by the CONTRACTOR, and shall be disposed of or turned over to the OWNER according to the directions of the ENGINEER.

3.05 ALTERATIONS AND CLOSURES

A. Alterations shall conform with all applicable Specifications, the Drawings, and the directions and approvals of the ENGINEER.

B. Where alterations require cutting or drilling into existing floors, walls, and roofs, the holes shall be repaired in an approved manner. CONTRACTOR shall repair such openings with the same or matching materials as the existing floor, wall, or roof or as otherwise approved by the ENGINEER. All repairs shall be smoothly finished unless otherwise approved by the ENGINEER.

C. Openings in existing concrete slabs, ceilings, masonry walls, floors, and partitions shall be closed and sealed as shown or otherwise directed by the ENGINEER. New Work shall be keyed into the existing in an acceptable manner. New reinforcing steel shall be welded to the existing reinforcing. Welding shall conform to AWS D12.1, Reinforcing Steel Welding Code. In general, the same or matching materials as the existing adjacent surface shall be used. The finished closure shall be smooth, tight, sealed, permanent closure acceptable to the ENGINEER.

D. Where existing electrically operated equipment is relocated, the power and control wiring and appurtenant devices shall be relocated to accommodate same. Installations and materials shall conform to requirements specified in Section Basic Electrical Requirements.

E. Electrical equipment, conduit, wire and fixtures shall be relocated as necessary to accommodate installation of new and relocated electrically operated equipment and to accommodate structural alterations to existing facilities such as floors, walls, ducting, equipment and piping.

3.06 CLEAN-UP

A. CONTRACTOR shall remove from the site all debris resulting from the demolition operations as it accumulates. Upon completion of the Work, all materials, equipment, waste, and debris of every sort shall be removed. The premises shall be left clean, neat and orderly.

GENERAL NOTES

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

113
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

FLASHING AND SHEET METAL

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of each type of flashing and sheet metal Work is indicated on drawings and by provisions of this Section. Types of Work specified herein are as follows:

1.Metal counterflashing and reglets.

B. Related Work Specified Elsewhere:

1.Joint sealers not specified herein.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

1.03 JOB CONDITIONS

A. Coordinate Work of this Section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of the Work and protection of materials and finishes.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Sheet Metal: Use the following at locations indicated, generally aluminum where exposed, zinc coated steel where concealed.

1. Aluminum: ASTM B 209, alloy 3003, temper H14, AA–C22A41 clear anodized finish; 0.032" minimum thickness (20 gage).

2. Zinc Coated Steel: Commercial quality with 0.20% copper, ASTM A 526 except ASTM A 527 for lock–forming, G90 hot dip galvanized, mill phosphatized where indicated for painting; 0.0359" minimum thickness (20 gage).

B. Miscellaneous Materials and Accessories:

1. Fasteners: Same metal as flashing/sheet metal, or other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

2. Bituminous Coating: SSPC–Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15 mil dry film thickness per coat.

3. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

4. Epoxy Seam Sealer: 2–part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior nonmoving joints including riveted joints.

5. Paper Slip Sheet: 5 lb rosin sized building paper.

6. Polyethylene Underlayment: 6 mil carbonated polyethylene film; FS L–P–512.

7. Reglets: Metal of the type and profile indicated, compatible with flashing material, noncorrosive.

8. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.

9. Roofing Cement: ASTM D 2822, asphaltic.

2.02 FABRICATED UNITS

A. General Metal Fabrication: Shop fabricate Work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA Architectural Sheet Metal Manual and other recognized industry practices. Fabricate for waterproof and weather resistant performance; with expansion provisions for running Work, sufficient to permanently prevent leakage, damage or deterioration of Work. Form Work to fit substrate. Comply with material manufacturer's instructions and recommendations for forming material. Form exposed sheet metal Work without excessive oil–canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

B. Seams: Fabricate nonmoving seams in sheet metal with flat–lock seams. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

C. Expansion Provisions: Where lapped or bayonet–type expansion provisions in Work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant concealed within joints.

D. Sealant Joints: Where movable, nonexpansion type joints are indicated or required for proper installation of elastomeric sealant, in compliance with SMACNA standards.

E. Separations: Provide for separation of metal from noncompatible metal or corrosive substrate by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

PART 3 – EXECUTION

3.01 INSTALLATION REQUIREMENT

A. Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA Architectural Sheet Metal Manual. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units. Conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

B. Where aluminum is to be installed directly on cementitious or wood substrate, install a slip sheet of red rosin paper and a course of polyethylene underlayment.

C. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance. Install counterflashing in reglets, either by snap–in seal arrangement, or by wedging in place for anchorage filling reglet with mastic.

D. Install counterflashing in reglets, either by snap–in seal arrangement, or by wedging in place for anchorage filling reglet with mastic.

E. Nail flanges of expansion joint units to curb nailers, at maximum spacing of 6". Fabricate seams at joints between units with minimum 3" overlap, to form a continuous waterproof system.

3.02 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substrate which might cause corrosion of metal or deterioration of finishes.

JOINT SEALERS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of each type and form of joint sealer is indicated on drawings and by provisions of this Section. Required applications for joint sealers include, but are not limited to, the following general locations [in both new Work and in rebuilt portions of existing work]:

1. All joints between reglets and flashing

2.Wherever necessary to make installations water–, air–, or weathertight, and to exclude dust and dirt.

B. Related Work Specified Elsewhere:

1. Flashing and Sheet Metal

1.02 QUALITY ASSURANCE

A. General Performance: Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product specifications, handling/installation/curing instructions, and performance tested data sheets for each sealer product required.

1.04 JOB CONDITIONS

A. Weather Conditions: Install elastomeric sealants when temperature is in lower third of temperature range recommended by manufacturer for installation.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. General: Manufacturers listed herein include those known to produce the indicated category of joint sealer material, either as nominally pure generic product or as an equivalent performance modification thereof or proprietary product.

B. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include:

1. Elastomeric Sealants:

a. Applied Polymers of America Inc.
b. Euclid Chemical Co.
c. Mameco International.
d. Pecora Corp.
e. Sika Chemical Corp.
f. Sonneborn Bldg Prod Div/ChmRex Inc.
g. Tremco Inc.

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2.02 SEALANT MATERIALS

A. General Sealant Requirements: Select materials for compatibility with joint surfaces and other indicated exposures, and select modulus of elasticity and hardness or grade recommended by manufacturer for each application.

B. Color: Provide colors to match or harmonize with color of adjacent surfaces.

C. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class, and uses.

D. Alternate Types: Generic types of sealant materials other than those specified above will be acceptable for the uses mentioned, provided the product is specifically recommended by the manufacturer for the particular use, and that it meets or exceeds performance requirements of referenced standards. Do not use a product at a location or for a purpose which manufacturer does not recommend.

PART 3 – EXECUTION

3.01 INSPECTION

A. Installer shall examine joint surface and conditions under which joint sealer Work is to be performed, and notify Contractor in writing of unsatisfactory conditions. Do not proceed with joint sealer Work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 JOINT PREPARATION

A. Clean joint surfaces immediately before installation of sealers. Remove dirt, insecure coatings, moisture and other substance which could interfere with bond of sealers. Etch concrete and masonry joint surfaces as recommended by sealer manufacturer.

C. Reconditioning Existing Surfaces: Where new sealer is required in existing work, remove all traces of existing sealer material without damaging surfaces.

3.03 INSTALLATION OF SEALANT

A. Comply with manufacturer's printed instructions, except where more stringent requirements are specified, or where manufacturer's technical representative directs otherwise.

B. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint surfaces equally on opposite sides. Fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

STEEL DOORS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Steel door(noted as hollow metal) is indicated on drawings.

B. Types/Sizes: Hinged door described herein is 3'–4" wide and 6'–11 1/4" high single door leaf. It is intended that this will be a standard or stock type.

C. Related Work Specified Elsewhere:

1. Finish hardware.

2. Painting.

1.02 QUALITY ASSURANCE

A. Industry Standard: Provide door complying with Steel Door Institute (S.D.I.) Recommended Specifications: Standard Steel Doors and Frames S.D. I. –100–85 and as herein specified.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's catalog, specifications and other data, showing fabrication and installation details, notes on core and face materials, metal thicknesses, hardware reinforcement, finish and accessories, sufficient for evaluation.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials cartoned or crated to provide protection during transit and job storage, and clearly identified.

B. Inspect materials upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new Work and acceptable to Engineer; otherwise, remove and replace damaged items as directed.

C. Store door at building site under cover. Place units on minimum 4" high wood blocking. If cardboard wrapped on door becomes wet, remove carton immediately.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Wherever possible, furnish standard products of one of the following S.D.I. members:

1. Amweld Building Products Div.
2. The Ceco Corp.
3. Curries Mfg Inc.
4. Dittco Products Inc.
5. Fenestra Corp.
6. The Kewanee Corp.
7. Mesker Industries Inc.
8. Republic Builders Products Corp.
9. Steelcraft Mfg Co.

2.02 MATERIALS

A. Steel Faces, Stiles, Rails and Frames: Cold or hot rolled sheets, prime quality, having a stretcher leveled degree of flatness. For exterior door, use either ASTM A 525 G 60 hot dip galvanized steel sheet, or ASTM A 591 Class A electrolytic zinc coated steel, and treat for paint adherence.

B. Core Materials: Manufacturer's standard materials, such as steel stiffeners or grids, treated kraft honeycomb, rigid polyurethane, rigid polystyrene, solid hydrous calcium silicate, and sound deadening mineral fiber or sprayed resin coating.

C. Shop Applied Primer: Rust inhibitive enamel or paint, either air drying or baking, suitable as a base for specified finish paints.

2.03 FABRICATION, GENERAL

A. Fabricate steel door unit to be rigid, neat in appearance and free from defects, warp or buckle. Comply with S.D.I. –100 requirements as follows:

1. Exterior Doors: Grade III (extra heavy–duty, 16 gage faces), Model 2 (flush composite construction).

B. Fabricate exposed faces of door, including stiles and rails of nonflush units, from only cold rolled steel.

C. Fabricate exterior door from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16 gage inverted steel channels.

D. Exposed Fasteners: Provide countersunk flat Phillips heads for exposed screws and bolts.

E. Thermal Rated (Insulating) Assemblies: At exterior locations provide doors which have been fabricated as thermal insulating door assemblies and tested in accordance with ASTM C 236, having thermal rating (U factor) of 0.24 Btu/hr/sq ft/øF or better.

F. Hardware Preparation: Prepare door to receive mortised and concealed finish hardware and applicable requirements of ANSI A115 series specifications for door preparation for hardware.

1. Locate finish hardware to match existing frame.

G. Shop Painting: Clean, treat, and paint exposed surfaces of steel door, including galvanized surfaces. Clean surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before applying paint. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

PART 3 – EXECUTION

3.01 INSTALLATION

A. General: Install steel door, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Door Installation:

1. Fit steel doors accurately in frames, within clearances specified in S.D.I.–100.

C. Hardware Installation:

1. Install finish hardware specified, in accordance with manufacturer's instructions and recommendations.

2. Set items level, plumb and true to line. Drill and countersink units which are not factory prepared for anchorage fasteners.

3.02 ADJUST AND CLEAN

A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air drying primer.

B. Final Adjustments: Check and readjust operating finish hardware items, leaving steel door and frame undamaged and in complete and proper operating condition.

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GENERAL NOTES

JOINT SEALERS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of each type and form of joint sealer is indicated on drawings and by provisions of this Section. Required applications for joint sealers include, but are not limited to, the following general locations [in both new Work and in rebuilt portions of existing work]:

1. All joints between reglets and flashing

2. Wherever necessary to make installations water–, air–, or weathertight, and to exclude dust and dirt.

B. Related Work Specified Elsewhere:

1. Flashing and Sheet Metal

1.02 QUALITY ASSURANCE

A. General Performance: Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product specifications, handling/installation/curing instructions, and performance tested data sheets for each sealer product required.

1.04 JOB CONDITIONS

A. Weather Conditions: Install elastomeric sealants when temperature is in lower third of temperature range recommended by manufacturer for installation.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. General: Manufacturers listed herein include those known to produce the indicated category of joint sealer material, either as nominally pure generic product or as an equivalent performance modification thereof or proprietary product.

B. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include:

1. Elastomeric Sealants:

a. Applied Polymers of America Inc.
b. Euclid Chemical Co.
c. Mameco International.
d. Pecora Corp.
e. Sika Chemical Corp.
f. Sonneborn Bldg Prod Div/ChmRex Inc.
g. Tremco Inc.

2.02 SEALANT MATERIALS

A. General Sealant Requirements: Select materials for compatibility with joint surfaces and other indicated exposures, and select modulus of elasticity and hardness or grade recommended by manufacturer for each application.

B. Color: Provide colors to match or harmonize with color of adjacent surfaces.

C. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class, and uses.

D. Alternate Types: Generic types of sealant materials other than those specified above will be acceptable for the uses mentioned, provided the product is specifically recommended by the manufacturer for the particular use, and that it meets or exceeds performance requirements of referenced standards. Do not use a product at a location or for a purpose which manufacturer does not recommend.

PART 3 – EXECUTION

3.01 INSPECTION

A. Installer shall examine joint surface and conditions under which joint sealer Work is to be performed, and notify Contractor in writing of unsatisfactory conditions. Do not proceed with joint sealer Work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 JOINT PREPARATION

A. Clean joint surfaces immediately before installation of sealers. Remove dirt, insecure coatings, moisture and other substance which could interfere with bond of sealers. Etch concrete and masonry joint surfaces as recommended by sealer manufacturer.

C. Reconditioning Existing Surfaces: Where new sealer is required in existing work, remove all traces of existing sealer material without damaging surfaces.

3.03 INSTALLATION OF SEALANT

A. Comply with manufacturer's printed instructions, except where more stringent requirements are specified, or where manufacturer's technical representative directs otherwise.

B. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint surfaces equally on opposite sides. Fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

ASPHALT BUILT–UP ROOFING SYSTEM

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of built–up roofing (BUR) system Work indicated on drawings and by provisions of this Section, and is defined to include roofing membrane, fiber cants, composition flashing and stripping, and roofing accessories integrally related to roof installation.

B. Type of BUR required for project is asphalt/glass–fiber felt roof membrane with aggregate surface.

C. Related Work Specified Elsewhere:

1. Flashing and Sheet Metal
2. Roof Drains

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide primary products, including each type of roofing sheet (felt), bitumen, and composition flashings, produced by a single manufacturer, which has produced that type product successfully for not less than 3 years. Provide secondary products only as recommended by manufacturer of primary products for use with roofing system specified.

B. Installer Qualifications: A single Installer (Roofer) shall perform the Work of this Section; and shall be a firm with not less than 5 years of successful experience in installation of built–up roofing systems similar to those required for this project and which is acceptable to or licensed by manufacturer of primary roofing materials.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical data, installation instructions and recommendations for each type of product required, substantiating that materials comply with requirements. For asphalt bitumen, provide label on each container or certification with each load of bulk bitumen, indicating flash point (FP), finished blowing temperature (FBT), softening point (SP) and equiviscous temperature (EVT).

B. Manufacturer's Certification, Bulk Bitumen: Submit manufacturer's certification indicating that bulk bituminous materials delivered to project comply with required standards. Include quantity, statistical and descriptive data for each product.

1.04 JOB CONDITIONS

A. Weather Conditions Limitations: Proceed with roofing work only when existing and forecasted weather conditions will permit Work to be performed in accordance with manufacturer's recommendations and warranty requirements.

1.05 PRODUCT HANDLING

A. Store and handle roofing felts in a manner which will ensure that there is no possibility of significant moisture pick–up. Store in a dry, well ventilated, weathertight place. Unless protected from weather or other moisture sources, do not leave unused felts on the roof overnight or when roofing work is not in progress. Store rolls of felt on end on pallets or other raised surface.

1.06 SPECIAL WARRANTY

A. Provide written warranty, signed by Manufacturer of primary roofing materials and installer, agreeing to replace/repair defective materials and workmanship, for a period of 10 years after date of Substantial Completion. Repairs and replacements required because of events beyond Contractor's/Installer's/Manufacturer's control shall be completed by Contractor/Installer and paid for by Owner.

PART 2 – PRODUCTS

2.01 BUILT–UP ROOF MEMBRANE

A. Deck/Asphalt/Glass Fiber/Aggregate Roofing:

1. General: Provide built–up asphalt roof system with glass fiber mats and aggregate surface (NRCA Design IAGA–BUR) for lay–up as follows.

a. Ply Felts: 3 plies of asphalt impregnated glass fiber mats, complying with ASTM D 2178, Type IV

b. Bitumen: Roofing asphalt, complying with ASTM D 312, Type II or III.

c. Surfacing Aggregate: Clean, water–worn opaque gravel.

2. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers whose BUR system may be incorporated in the Work include:

a. Celotex Corp/Jim Walter Co.
b. Manville Bldg Materials Group.
c. Owens–Corning Fiberglas Corp.

GENERAL NOTES

2.02 BUR EDGE/PENETRATION MATERIALS

A. Roofing Cement: Asphaltic cement; comply with ASTM D 4586.

B. Glass-Fiber Fabric: 1.5 lb sheet of woven glass fiber, impregnated with asphalt (ASTM D 1668).

C. Coated Felt: 26 lb sheet of asphalt-organic felt coated with asphalt both faces, No. 30 Coated Organic Felt.

D. Preformed Cants : Rigid insulation units matching roof insulation, or asphalt impregnated organic fiber insulation units, molded to form 3-1/2" x 3-1/2" x 45ø cant strips.

2.03 SHEET METAL ACCESSORY MATERIALS

A. Zinc Coated Steel: ASTM A 526, with 0.20% copper, G90 hot dip galvanized, mill phosphatized, 20 gage.

B. Aluminum: ASTM B 209, alloy 3003, temper H 14 unless harder temper required for forming and performance, AA-C22A41 clear anodized finish; 0.032" thick.

C. Solder for Sheet Metal: Except as otherwise recommended by metal manufacturer, provide 50/50 tin/lead type (ASTM B 32) for tinning and soldering joints; use rosin flux.

2.04 FABRICATED SHEET METAL ACCESSORIES

A. Work shall conform to details shown, to applicable fabrication requirements of SMACNA Architectural Sheet Metal Manual, and to installation details of NRCA Roofing and Waterproofing Manual.

B. Prefabricate units as indicated, or provide standard manufactured units complying with requirements and fabricated from galvanized steel where concealed, aluminum where exposed, unless indicated otherwise.

C. Provide 4" wide flanges for setting on BUR membrane with concealment by composition stripping.

D. Fabricate work with flat lock soldered joints and seam; except where joint movement is necessary provide 1" deep interlocking hooked flanges, filled with mastic sealant.

PART 3 - EXECUTION

3.01 INSPECTION OF SUBSTRATE

A. Examine substrate surfaces to receive built-up roofing system and associated Work and conditions under which roofing will be installed. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

B. For precast concrete deck, assure that surface is reasonably smooth, dry and clean, meeting requirements of roofing system components manufacturers. Perform additional Work as needed to assure satisfactory substrate surfaces.

C. Test concrete substrate for excessive moisture by pouring one pint of hot bitumen at 400ø F or at EVT on deck, at start of each day's Work. Do not proceed with roofing Work if test sample foams or can be easily (cleanly) stripped after cooling, indicating that substrate is too wet.

D. Make sure that required wood blocking and nailers are in place. Coordinate this Work with their installation.

3.02 GENERAL INSTALLATION REQUIREMENTS

A. Workmanship: Materials shall be securely installed in a watertight, neat and workmanlike manner. Workers shall be thoroughly experienced in the particular class of work upon which employed. Work shall conform to manufacturer's specifications and to requirements specified herein. Each substrate surface shall be clean and dry before substrate Work is started.

B. Equipment: Locate heating kettles and pumping equipment on the ground at a safe distance from buildings. Kettles will not be permitted on the roof. Guard against fires and provide suitable fire extinguishers conveniently located at the site. Competent operators of kettles and pumping equipment shall be in attendance at all times such equipment is in use. Materials shall be so located and dispersed as to prevent fire hazard. Equip kettles with thermometers to provide a continuous check on temperature of materials.

C. Protection: Use tarpaulins or other approved means to protect adjacent Work from spillage or dropping of roofing materials. Take care to prevent bitumen from running into and clogging drains.

D. Phased application is strictly prohibited. Coordinate the installation felts so that no areas are exposed to precipitation nor exposed overnight. Glaze coat installed ply sheet courses at end of each day's Work where final surfacing has not been installed.

E. Heating Asphalt:

1. Heat and apply asphalt in accordance with equiviscous temperature (EVT) method as recommended by NRCA. Do not raise temperature above minimum normal fluid-holding temperature necessary to attain EVT (+ 25øF at point of application more than one hour before application. Discard bitumen which has been held at temperature exceeding finished blowing temperature (FBT) for more than 3 hours.

2. Determine FP, FBT, and EVT of bitumen, either by information from bitumen producer or by suitable tests. Determine maximum fire-safe handling temperature and do not exceed that temperature in heating asphalt. In any case, do not heat asphalt to a temperature more than 25øF below FP. Keep kettle lid closed except when adding asphalt.

3. For aggregate surfaced pour coats of bitumen, limit application temperature to minimum required for proper embedment of aggregate and maximum which will permit retention of required coating weight.

F. Asphalt Mopping Weights: For interplay mopping and for other moppings, apply asphalt at rate of 25 lb (+ 25% on a total job average basis) per roof square (100 sq ft) between plies.

G. Substrate Joint Penetrations: Do not allow asphalt to enter building or damage insulation or other construction. Where mopping is applied directly to a substrate, tape joints.

H. Cutoffs: At end of each day's work, protect exposed edge of incomplete work, including ply sheets. Provide temporary covering of 2 plies of No. 15 roofing felt set in full mopping of hot asphalt; remove beginning of next day's Work.

3.03 INSTALLING ROOF MEMBRANE

A. Interply Sheets: Provide the number and type of ply sheets (felts) indicated, lapped (shingled) as required to form a continuous, uniform membrane with bitumen mopping between sheets so that ply sheet does not touch ply sheet. Mop base of membrane directly to deck. Broom or press each sheet into hot bitumen. Lay felts without wrinkles, buckles or kinks. Finish roofing system shall be free from pockets or blisters. Glaze coat top of ply sheet membrane with 10 lb mopping of same bitumen, integrally with operation of laying up membrane.

B. Edges and Penetrations:

1. Extend BUR membrane to 2" (nominal) above top edge of cant strip and terminate.

2. Provide a folded-back envelope at penetrations of BUR membrane where it is not turned up on a tapered strip, so as to provide positive protection against flow of bitumen into building. Extend base sheet to form envelope. Seal corners and other interruptions of envelope with large beads of roofing cement to provide positive protection against flow of bitumen.

C. Composition Flashing and Stripping:

1. Provide composition flashing at cant strips and other sloping and vertical surfaces, and at penetrations through roof. Provide one ply of No. 15 asphalt impregnated glass fabric and one ply of glass fiber reinforced flashing, each set in a continuous coating of roofing cement and extended onto deck 6" and 4", respectively. Provide forms of mechanical anchorage of composition flashing to vertical surfaces, as recommended by manufacturer of primary roofing materials. Except where concealed by elastic flashing, apply a heavy coating of roofing cement over composition flashing.

2. Provide composition stripping where metal flanges are set on roofing. Provide not less than one ply of glass fiber fabric and coating of roofing cement and extended onto the deck 6" and 4", respectively. Except where concealed by aggregate surfacing or elastic flashing, apply a heavy coating of roofing cement over composition stripping.

D. Roof Drains: Either of the following methods of drain flashing is approved:

1. Method A: Fill clamping ring base with a heavy coating of roofing cement. Extend BUR membrane into clamping ring or, where not feasible, provide two plies of glass fiber reinforced flashing mopped with Type III asphalt and extended into clamping ring. Extend flashings onto BUR 6" and 10", respectively. Before placing clamping ring set 2 plies of glass fabric in roofing cement and coat with roofing cement. Extend each fabric ply into clamping ring, and for distances of 14" and 16", respectively onto BUR.

2. Method B: Fill clamping ring base with a heavy coating of roofing cement. Set lead flashing sheet in a bed of roofing cement on completed BUR ply sheet courses, with lead sheet clamped in roof drain ring and extended 12" onto roofing. Cover lead sheet with composition stripping, with plies extended 4" to 6" beyond edges of lead sheet. Provide composition stripping of gravel stop rings, if any.

E. Counter Flashings and Accessories: Counter flashings, cap flashings, and miscellaneous sheet metal accessories to be coordinated with BUR work, are specified in other sections of these specifications. Allow for expansion of running metal flashing and edge trim which adjoins roofing. Do not seal or bond BUR membrane or composition flashing and stripping to metal flanges over 3'-0" in length.

F. Aggregate Surfacing: Promptly after completion of BUR membrane, edge treatment and set-on accessories in each substrate area of roofing, flood-coat surface with 60 lb per square of Type I or II asphalt. While each small area is hot and fluid, embed, per square, spread uniformly.

3.06 PROTECTION OF ROOFING

A. Installer shall restore deteriorated or defective Work found at time of final inspection. Repair or replace the roofing and associated Work to a condition free of damage and deterioration at date of Substantial Completion.

GENERAL NOTES

PAINTING

PART 1 GENERAL

1.01 – QUALITY ASSURANCE

A. GENERAL

1.The quality of workmanship shall be "type 1 – recommended," as set forth in the latest edition of the painting specifications of the painting and decorating contractors of america.
a.Surface preparation, priming and coats of paint specified are in additon to shop–priming and surface treatment specified under other sections of the work.
b.Paint all ferrous metal except those surfaces designated on the drawings not to be painted.

1.02 – JOB CONDITIONS

A. TEMPERATURE AND HUMIDITY

1. Apply water–base paints in ambient temperatures of 50–60 deg F.
2. Apply solvent–thinned paints in ambient temperatures of 45–95 deg F.
3. Do not apply paint in snow, rain, fog or mist or when the relative humidity exceeds 85% or to damp or wet surfaces.

1.03 – HANDLING, DELIVERY, STORAGE

A. Deliver paint in original unopened containers labeled.

B. Maintain containers used in starage, mixing, and application of paint in a clean condition, free of foreign materials and residue.

C. Keep containers tightly closed.

D. Remove waste materials, empty cans, and oily rags from the building at the end of each day.

1.04 – SPECIAL PRECAUTIONS

A. Work shall be done in strict accordance with the best established safety practices and the material manufacturer's recommendations. Do not allow high heat near paint.

PART 2 PRODUCTS

2.01 – MANUFACTURES AND TYPES

A. GENERAL

1.Do not use more than one manufacturer's products.

B. COATINGS

1. Pratt and Lambert
2. The Glidden Company
3. Pittsburgh Paint Company
4. Sherwin–Williams Company
5. Benjamin Moore

2.02 – COLORS

A. COATINGS

1. Colors shall be selected by the owner.

PART 3 EXECUTION

3.01 – COATING SCHEDULE

A. COATINGS

1. FERROUS METALS

oDoors, trim, door frames, structural steel, ladders, railing, grating and frames, louvers, miscellaneous metal items, electrical/mechanical equipment.

1.ALKYD, GLOSS

A. 1 coat PPG 6–208 Red or 6–212 White Rust control primer.

B. 2 coats PPG 6–274 series Alkyo gloss enamel.

2.Paint interior and exierior surfaces of doors and frames.

FINISH HARDWARE

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. STANDARDS

1. NBHA recommended locations for builders hardware.

PART 2 PRODUCTS

2.1 FINISH DOOR HARDWARE

A. Items specified manufacturers and approved substitutes.

ITEM SPECIFIC MFTR.	APPROVED SUBSTITUTES
ButtsHagar	Stanley/McKinney
LocksetsSchlage	Russwin/Corbin

PART 3 EXECUTION

3.1 HARWARE SCHEDULE

1 1/2 Pr. Butts	BB1193 4 1/2 x 4 1/2 NRP	32D	
1 Lockset	D70PD (Orbit)		26D

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SLUICE GATE

PART 1 GENERAL

1.01 – DESCRIPTION

A. SCOPE:

1. This standard covers wall thimble,vertically–mounted sluice gates designed for seating head. This standard also covers sluice gate activating mechanisms of the electric–motor type, together with standard accessories.

2. The electric–motor–activating lift mechanisms covered in this standard are those with controls to be mounted in a cabinet as part of the sluice gate operating stand.

I.02. – SUBMITTALS

The bidder shall furnish drawings and material specifications of the equipment he proposes to supply. The drawings shall be in sufficient detail for the owner to determine whether the proposed equipment meets specifications. The drawings shall show the dimensions of the gate opening.

PART 2 – PRODUCTS

2.02 – MATERIALS

A. Thimble, Frame, Guides,Slide, Pedestal, and Gear Housing Cast, Iron, ASTM A126, Class B or ASTM A48, Class 30.

B. Yoke– Cast Iron, ASTM A126, Class B or ASTM A48, Class 30 or Steel, ASTM A36.

C. Gears– Bronze, ASTM B148 (CA 952, CA 954, or CA 958) ASTM B584 (CA 865 or CA 867) or Steel AISI 8620 or AISI 4140.

D. Electric activated lift mechanism worm gears– AISI 8620.

E. Electric activated lift mechanism spur gears and helical gears– AISI 4140.

F. Electric activated lift mechanism shafting– AISI 1020 or 1018.

G. Bearings– Bronze, ASTM B148–9C (CA954) or ASTM B–150 (CA 623).

H. Wedges, thrust nut, stem couplings, and gate activator lift nut – Bronze, ASTM B584,(CA872).

I. Seating Faces and stem guide liners – Bronze, Alloys A or B (CA464 or CA482), ASTM B98 (CA651 or CA 655), ASTM B139 (CA 521, CA 524 or CA 544), or stainless steel, ASTM A267, type 302, or 304.

J. Stems – Bronze ASTM B124, ASTM B98 (CA 655) or stainless steel, ASTM A582, type 303, or ASTM A276, type 302 or 304.

K. Fasteners – Bronze, ASTM B98 (CA 651 or CA 655), (CA 614, CA 623, or CA 630), or stainless steel ASTM A 276, type 302 or 304, or ASTM A 582, type 303.

L. Flush Bottom Retainer Bar – Cast Iron ASTM A126, Class B; Stainless steel, ASTM A276, type 302 or 304, ASTM A582, type 303; Bronze ASTM B98, (CA 651 or 655), (CA 614, CA 623, or CA 630).

PART 3 GENERAL DESIGN

A. The frame shall be of cast iron. It shall be of ample section and cast in one piece.

B. The frame shall be designed for the maximum head indicated with a mimimum safety factor of five with respect to tensile, compressive, and shear strength. All surfaces forming joints or bearings shall be machined.

C. The frame shall be one of two types: (1) flat back or (2) flange back. Both types shall be machined on the rear face to bolt directly to the machined face of the wall thimble.

3.02 – SLIDES

A. The slide shall be made of cast iron, with strengthening ribs where required, and a reinforced section to receive the seating faces.

B. The slide shall be designed for the maximum head indicated with a minimum safety factor of five with respect to tensile, compressive and shear strength.

C. The slide shall have tongues on each side extending its full length, and these tongues shall be accurately machined on contact surfaces. Surfaces of the slide that come in contact with the seat facings and wedges shall be accurately machined. The maximum allowable clearance between the slide and the slide guide shall be 1/16 inch.

D. A thrust nut pocket shall be provided above the horizontal center line of the slide reinforced by ribs. The thrust nut pocket shall be drained.

3.03 – SEATING FACES

A. Seating faces shall be made of strips of rolled or extruded bronze. They shall be firmly secured in finished grooves in the frame and slide faces in such a way as to insure that they will remain in place, free from distortion and loosening during the life of the Sluice gate.

B. These faces shall be of ample section and so finished that the maximum clearance between the seating surfaces, with the slide in the closed postion, shall be 0.004 in.

3.04 – SEALS

A. Reslient seals for flush bottom gates shall be of natural or synthetic rubber.

1. Reclaimed rubber shall not be used.
2. Rubber compounds shall contain no more than 1.5 parts of wax per 100 parts of rubber hydrocarbon.
3. Rubber compounds shall be free of vegetable oils, vegetable–oil derivatives, animal fats, and animal oils.
4. Rubber seals shall be resistant to microbiological attack, copper poisioning and ozone attack.

B. The design of the seal should be as to provide tight shutoff required by PART 6.

C. Seals shall be mounted on the slide or the frame and shall be securely held in place with a retainer bar bolted to the frame or slide leaving an unobstructed flush invert.

3.05 – GUIDES

A. Guides shall be made of cast iron and bolted to the frame or cast integrally with it and shall be machined on all bearing and contact faces.

B. Guides shall be designed for the maximum head indicted with a safety factor of five for shear, compression and tension. The gudes shall be of such length as to support at least one–half of the vertical height of the slide when in the open postion.

C. Provision shall be made to prevent lateral movement of bolted–on guides. They shall be capable of taking the whole thrust produced by water pressure and wedging action with a safety factor of five. Wedges or wedge facings shall be securely attached to the guides at points where, in the closed positon, they will make full contact with the wedging surfaces on the slide.

3.06 – THRUST NUT

A. Each gate shall be provided with a thrust nut for connecting the stem to the slide. It shall be of ample design to take the thrust developed during gate operation under the maximum operating head condition loads with a safety factor of five, in opening and closing direction. On rising–stem gates, the thrust nut shall be threaded and keyed or threaded and pinned to the stem.

3.07 – WEDGING DEVICES

A. The sluice gate shall be equipped with adjustable side–wedging devices to provide contact between the slide and frame facings when the gate is in closed postion. All faces shall be accurately machined to give maximum contact and wedging action. Wedges shall be fully adjustable and so designed that they will remain in the fixed postion after adjustment.

3.08 – ASSEMBLY BOLTS, STUDS, NUTS AND ANCHOR BOLTS

A. All assembly bolts, studs, nuts, and anchor bolts shall be of such size and spacing as required to provide for the design forces with a safety factor of five. An adequate number of holes shall be provided in the flange on the back of the gate to prevent leakage under the design heads and to resist the shearing action caused by closing and opening forces.

3.09 – WALL THIMBLES

A. Wall thimbles shall be made of cast iron and shall be furnished by the gate manufacturer. The wall thimble shall provide a rigid mounting designed to prevent warping of the gate frame during installation.

B. The cross section of the thimble shall have the shape of the letter "F" or "E". The front, or mounting flange shall be machined and shall be drilled and tapped to the same template used for its particular gate frame. A ring shall be cast on the periphery of the wall thimble to form a water stop and anchor ring in the concrete. The gate shall be attached to the wall thimble with bolts or studs specified in PART 3.08.

C. To permit entrapped air to escape as the thimble is being encaed in concrete, holes shall be cast or drilled in each entrapment zone formed by the reinforcing ribs or the flange and water stops. The holes shall be 1 1/2 in. in diameter and no more than 2 ft. apart.

3.10 – STEMS AND STEM COUPLINGS

A. The operating stems shall be designed for a tensile strength to withstand stem design force not less than 1.25 times the output thrust of the unit in the stalled motor condition of electric motor driven lifts. The critical buckling load shall be determined using the Euler Column Formula, using C = 2.

$$P = C\pi^2 EA/(L/r)^2$$

P = Axial load on stem
C = Defines end restraint conditions
E = Modulus of elasticity
L = Length or span between support
r = Radius of gyration
A = Area of stem

B. The threads of the stem shall be machine cut or rolled and of the square or Acme type. The number of threads per inch shall be such as to work most effectively with the lift mechanism used.

C. Where stems are furnished in more than one piece, the different sections shall be joined together by solid couplings. The couplings shall be threaded and keyed or threaded and bolted, and shall be of greater strength than the stem.

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3.11 – STEM GUIDES

Bracket and floor mounted stem guides (including both the guide housing and the bracket) shall be so constructed that when properly spaced they will hold the stem in alignment and yet allow it enough play to permit easy operation. The inside diameter of the guide shall not be greater than 1/8 inch larger than the outside diameter of the stem. The guides shall be spaced in accordance with the manufacturer's recommendations for each stem size. The L/r ratio shall not be greter than 200. The guides shall be adjustable with respect to the bracket to provide proper concentric alignment with the stem, and shall be so designed that alignment will be maintained after adjustment. The guides shall be lined and provisions shall be made to hold the lining in place. Brackets shall be attached to the wall by sufficient anchor bolts to prevent twisting or sagging under load.

3.12 – PAINTING

A. Surfaces shall be cleaned by commercial sandblasting to base metal, dry and free of grease before painting in conformance with the paint manufacturer's instructions. After cleaning, the surfaces shall be primed by application of either one shop coat of zinc chromate or a coal tar coating suitable for use in potable water and applied in conformance with paint manufacturer's instructions. After painted surfaces are dry, the machined or bearing surfaces and the holes, both plain and threaded, shall be coated with a protective grease until installation.

B. The wall thimble shall have the above treatment except for those surfaces in contact with the concrete.

PART 4 – FABRICATION

4.01 – WORKMANSHIP

A. All parts in the sluice gate and accessories shall be accurately machined on mating and bearing surfaces. All like parts, except the bronze seating surfaces shall be interchangeable so that replacement parts can be furnished at any time and attached in the field with a minimum of fitting, chipping or remachining. All parts shall conform to the design dimensions and shall be free of defects of material and workmanship. All attaching bolt holes shall be drilled accurately to layout indicated on the drawings.

B. All castings shall be clean and sound without defects capable of impairing their functions.

C. The seating facings shall be machined to a finish of 63 micro-inch. The applicable standard is ANSI B46.1. All mating surfaces, such as guides-to-frame and frame-to-wall thimble, shall be machined flat.

4.02 – SHOP TESTING

A. Before final assembly, all seating and wedging surfaces shall be thoroughly cleaned of all foreign materials and final adjustments made. With the gate fully closed, the clearance between seating faces shall be checked with a 0.004 in, thickness gage. If this thickness gage can be inserted between seating faces, wedging devices must be readjusted or the gate slide or gate frame or both remachined, until insertion is no longer possible. In the event of remachining, clearances will again be checked as stated above.

B. After completion, all seating and wedging surfaces shall be thoroughly cleaned of all foreign materials and final adjustments made. The sluice gate shall then be shop operated from the fully closed to the fully open positon to verify that the assembly is workable.

PART 5 – INSTALLATION

It shall be the Contractor's responsibility to handle, store, and install the wall thimble, gate, operating mechanism, stem, stem guides,and accessories in accordance with the manufacturer's drawings and recommendations. Care shall be taken to avoid warping the gate frame and to maintain tolerances between seating faces. All gates, thimbles, stems, and operators shall be plumbed, shimmed and accurately aligned.

5.01 – HOLE PROTECTION

Tapped holes in thimbles shall be plugged for protection during concrete pouring and setting.

5.02 – SURFACE PROTECTION

During construction, the surface of the thimble and gate shall be covered or otherwise protected from concrete spillage, paint,oil and debris. Any damage that occurs to the thimble or gate in storage or handling shall be corrected prior to installation of the gate.

5.03 – THIMBLE

Thimbles shall be accurately positioned and supported to prevent shifting during the pouring of the surrounding concrete. Thimbles shall be carefully braced both horizontally and vertically to prevent distortion. Concrete shall be carefully poured to provide a good bond to the thimble without voids. Grout shall be forced into the air vent holes.

5.04 – SWITCH SETTING

After installation of gates with motor-operated lift mechanisms, torque switches shall be adjusted and limit switches set in accordance with the manufacturer's recommendations. The gate shall then be run through one complete cycle open-close-open or close-open-close.

5.05 – LIFT MECHANISM STORAGE

If electric lifting mechanisms are to be stored at the job site for one month or longer, provisions shall be made by the Contractor to energize the electrical enclosure strip heaters.

PART 6 – INSPECTION,SHIPMENT AND TESTING

6.01 – INSPECTION

A. All work done under this standard shall be subject to inspection and approval by the Engineer. Any sluice gate or part which does not conform to the requirements of this standard shall be made satisfactory or shall be rejected and replaced.

6.02 – FIELD LEAKAGE TEST

A field leakage test shall be performed by the Contractor after installation of the sluice gate. The manufacturer shall be notified of the test in sufficient time to enable him to have a representative present at that test. After all adjustments have been made and the mechanisms properly lubricated, the gate slide shall be run throught one complete cycle as a final check on proper operation before starting the leakage test. Seating heads shall be measured from the top surface of the water to the center of the gate. Under the design seating head, the leakage shall not exceed 0.1 gpm per foot of seating perimeter.

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FLOOR ACCESS HATCH COVERS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to provide hinged floor access hatch covers as shown and specified.
2. The types of floor access hatch covers include the following:
a. Aluminum covers with 12" galvanized curb (Type 1).
b. Aluminum covers with channel frame (Type 2).

B. Related Work Specified Elsewhere:
1. Painting.

1.02 QUALITY ASSURANCE

A. Manufacturer: All floor covers for the project shall be the product of a single manufacturer. Covers from more than one manufacturer will not be permitted.

1.03 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
1. Shop Drawings showing dimensional plans of all floor covers, quantity schedule, details of fabrication and erection, and anchorage.

1.04 GUARANTEE

A. CONTRACTOR shall furnish a written guarantee obtained from the manufacturer. Guarantee shall state the following:
1. Floor covers are to operate properly and be free of defects in material and workmanship for a period of five years from date of purchase.
2. Should any part fail to function, or break in normal use during this period, manufacturer shall furnish a new part no charge to OWNER.

PART 2 – PRODUCTS

2.01 MATERIALS AND FABRICATION

A. General:
1. Provide manufacturer's standard fabricated units, modified, if necessary, to comply with the requirements. Where standard units are not available for the sizes and types required, custom fabricate units to match manufacturer's similar units.
2. Fabricate each unit in the shop, complete with anchors, gaskets, hardware and accessory items as required.

B. Aluminum Covers with 12" Galvanized Curb:
1. Provide mill finish aluminum covers, with standard angle frame, designed to withstand loadings of 70 pounds per square foot.
2. Provide heavy duty hinges and stainless steel hardware.
3. Product and Manufacturer: Provide one of the following:
a. Double leaf door covers of sizes shown on the Drawings:
1) Type M by Milcor.
2) Type D by The Bilco Company.
3) Or equal.

C. Aluminum Covers with Channel Frame (Type 2):
1. Provide mill finish aluminum covers, with channel frame, designed to withstand loadings of 300 pounds per square foot.
2. Provide stainless steel hardware.
3. Channel frame shall be provided with 1–1/2" drainage coupling connection.
4. Provide schedule 80 PVC drain pipe connected to the drainage coupling and routed as shown on the Drawings. Provide suitable pipe supports to rigidly fasten the drain pipe to the structure.
5. Product and Manufacturer: Provide one of the following:
a. Double leaf door covers of sizes shown on the Drawings:
1) Type JD by the Bilco Company.
2) Type GT by the Babcock–Davis Hatchways, Inc.
3) Or equal.
b. Single leaf door covers of sizes shown on the Drawings:
1) Type J by the Bilco Co.
2) Type AM by the Babcock–Davis Hatchways, Inc.
3) Or equal.

D. Door leaves shall be checkered or diamond plate, or other approved non–slip surface.

E. Frames shall have anchor flanges or strap anchors.

F. Door shall have hold–open devices.

G. Door leaves 10 square feet and larger shall have torsion bars, springs or other approved means, for counterbalanced operation.

H. Covers shall have flush exterior locking device with removable handle, and interior turn handle.

I. All aluminum covers shall be mill finished, with bituminous coating applied to exterior of the frame.

J. Safety Post: Each floor access hatch cover in which a fixed access ladder is shown on the Drawing below the hatch shall be provided with a safety post manufactured of high–strength steel with telescoping tubular section that locks automatically when fully extended. Upward and downward movement shall be controlled by a stainless steel spring balancing mechanism. Safety post to be hot dip galvanized. Safety post shall be by The Bilco Company (Ladder Up), or equal.

K. Furnish Type 1 hatch covers for roof scuttles and Type 2 hatch covers for sidewalk doors unless specifically labelled otherwise.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install doors in accordance with approved Shop Drawings.

B. Set doors plumb, level and true to line or grade, without warp or rack, for anchoring under other Sections of these Specifications.

C. Protection of Aluminum from Dissimilar Materials: Paint in accordance with Section Painting.

D. Install Safety Post in accordance with the manufacturer's written instructions.

ELECTRICAL HEATING EQUIPMENT

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to provide electrical heating equipment complete with accessories as shown and specified.

1.02 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: Comply with applicable provisions of regulatory agencies below and others having jurisdiction
1. Underwriters Laboratories, Incorporated.

B. Reference Standards: Comply with applicable provisions and recommendation of the following, except as otherwise shown or specified.
1. Air Moving and Conditioning Association (AMCA).
2. American Society of Heating, Refrigeration, Air Conditioning Association (ASHRAE).
3. National Electrical Manufacturers Association (NEMA).
4. National Electrical Code.

1.03 SUBMITTALS

A. Shop Drawings: Submit for approval Shop Drawings showing the following:
1. Dimensions
2. Capacities.
3. Materials of Construction.
4. Finishes.
5. Manufacturers literature, illustrations, Specifications and engineering data.
6. Wiring diagrams.

B. Test Reports: Submit the following test certifications for approval.
1. UL Label.

C. Operation and Maintenance Data:
1. The CONTRACTOR shall furnish 6 copies of a hard cover bound operation and maintenance manual prepared by the manufacturers of all items of equipment furnished under this Section. The manual shall include maintenance instructions, copies of approved shop and installation drawings for all equipment and manufacturer's recommended lubricant and spare parts lists, also name and address of suppliers with telephone numbers and parts and repair agencies.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Store equipment inside and keep clean, dry and free from damage.

B. Handle to prevent damage during installation and storage.

PART 2 – PRODUCTS

2.01 GENERAL

A. Finish:
1. All exterior ferrous metal surfaces except stainless steel to be cleaned and painted with a rust inhibiting primer and manufacturer's standard finish paint. All aluminum surfaces to be anodized.

B. Spare Parts: Provide the manufacturer's recommended spare parts list for all components of the system.

C. Products and Manufacturers: Provide one of the following:
1. ITT Reznor, AEUHR–3–48.
2. Trane, UHEC.
3. Or equal.

2.2 DETAILS OF CONSTRUCTION

A. Blower Heater (EUH):
1. Description:
a. Corrosion resistant unit blower heater, with integral disconnect switch.
b. UL listed for wall ceiling mounting.
c. Monel fin tube heating elements.
d. Stainless steel hardware.
e. Enclosure: NEMA 4X.
2. Capacity: 12 KW, 480 volt, 3 phase and 60 Hz.
3. Accessories:
a. Ceiling mounting bracket.
b. Contactor, fused disconnect, surface mounted thermostat (40–80F range) and transformer in NEMA 4X enclosure.

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ELECTRICAL HEATING EQUIPMENT (CONT.)

2.3 TOOLS, SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide the manufacturer's recommended spare parts for all components of the system.

B. Provide two (2) sets of all special tools required for maintenance and operation.

PART 3 – EXECUTION

3.01 INSPECTION

A. Inspect units for damage prior to installation and correct if necessary as recommended by manufacturer.

3.02 INSTALLATION

A. Install units level, plumb, and true.

B. Install units in accordance with details on the Drawings and approved Shop Drawings.

3.03 CLEANING

A. Clean tar, cement or other dirt from units.

B. Remove debris and other waste material resulting from installation.

3.04 ADJUSTMENTS

A. Set air deflectors for proper air delivery, as applicable.

3.05 FINAL INSPECTION

A. Leave in proper operating condition.

MISCELLANEOUS METAL FABRICATIONS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to provide miscellaneous metal fabrications including surface preparation and prime painting, as shown and specified.
2. The extent of miscellaneous metal fabrications Work is shown on the Drawings and includes items fabricated from iron, steel and aluminum shapes, plates, bars, castings and extrusions, which are not a part of the structural steel or other metal systems.
3. The types of miscellaneous metal items include, but are not limited to the following:
   a. Ladders.
   b. Ladder safety cages.
   c. Shelf angles.
   d. Miscellaneous platforms, framing, cover plates, supports and brackets.
   e. Metal safety nosings.
   f. Water pump hoist.

B. Related Work Specified Elsewhere:
1. Painting.

1.02 QUALITY ASSURANCE

A. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown and specified:
1. ASTM A 36, Structural Steel.
2. ASTM A 123, Zinc (Hot–Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip.
3. ASTM A 153, Zinc Coating (Hot–Dip) on Iron and Steel Hardware.
4. ASTM A 240, Heat Resisting Chromium and Chromium–Nickel Stainless Steel Plate, Sheet, and Strip for Fusion–Welded Unfired Pressure Vessels.
5. ASTM A 320, Alloy Steel Bolting Material for Low Temperature Service.
6. ASTM A 386, Zinc Coating (Hot–Dip) on Assembled Steel Products.
7. ASTM B 209, Aluminum–Alloy Sheet and Plate.
8. ASTM B 211, Aluminum–Alloy Bars, Rods and Wire.
9. ASTM B 221, Aluminum–Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.
10. ANSI A14.3, Safety Requirements for Fixed Ladders.
11. AWS D1.1, Structural Welding Code.
12. AISI Standards for Stainless Steel.

B. Field Measurements: Take field measurements where required prior to preparation of Shop Drawings and fabrication to ensure proper fitting of the Work.

C. Shop Assembly: Preassemble items in the shop to the greatest extent possible, so as to minimize field splicing and assembly of units at the project site. Disassemble units only to the extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.03 SUBMITTALS

A. Samples: Submit for approval sets of representative samples of materials including nosings, rungs and other finished products as may be requested by the ENGINEER. Review will be for color, texture, style, and finish only. Compliance with all other requirements is exclusive responsibility of CONTRACTOR.

B. Shop Drawings: Submit for approval the following:
1. Shop Drawings for the fabrication and erection of all assemblies of miscellaneous metal Work. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items. Include setting drawings and templates for location and installation of miscellaneous metal items and anchorage devices.
2. Copies of manufacturer's specifications, load tables, dimension diagrams, anchor details, and installation instructions for products to be used in miscellaneous metal Work.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Stainless Steel Sheet and Plate: ASTM A 240.

B. Steel Plates, Shapes and Bars: ASTM A 36.

C. Aluminum:
1. Alloy and Temper: Provide alloy and temper as shown or specified, or as otherwise recommended by the aluminum producer or finisher.
2. Extruded Shapes and Tubes: ASTM B 221.
3. Plate and Sheet: ASTM B 209.
4. Bars, Rods and Wire: ASTM B 211.
5. Finish: Provide Architectural Class I anodized finish AA–M32C22A41 Clear as specified in the NAAMM Manual.

D. Stainless Steel Fasteners and Fittings: ASTM A 320.

E. Zinc Coated Hardware: ASTM A 153.

F. Surface Preparation and Prime Painting: All steel shall be primed in the shop. Surface preparation and prime painting are included herein but are specified in Section Painting.

2.02 MISCELLANEOUS METAL ITEMS

A. Aluminum Ladders:
1. Fabricate ladders for the locations shown, with dimensions, spacings, detail and anchorages as shown and specified. Comply with the requirements of ANSI A14.3, except as otherwise shown or specified.
   a. Unless otherwise shown, provide aluminum pipe, ASTM B 429, 554, 1.90–inch outside diameter, 0.065 inch wall thickness; side rails spaced 18 inches apart, minimum.
   b. Provide aluminum square rungs, spaced 12 inches on centers, maximum, non–slip surface on the top of each rung.
2. Fit rungs in centerline of side rails, plug weld and grind smooth on outer rail faces.
3. Support each ladder at top and bottom and at intermediate points spaced not more than 5 feet on centers. Use welded or bolted brackets, designed for adequate support and anchorage, and to hold the ladder clear of the wall surface with a minimum of 8 inches clearance from wall to centerline of rungs. Unless otherwise shown or approved, extend rails 42 inches above top rung, and return rails to wall or structure unless other secure handholds are provided. If the adjacent structure does not extend above the top rung, goose–neck the extended rails back to the structure to provide secure ladder access.

B. Aluminum Ladder Safety Cages and Safety Belt System for Ladders Over 20 Feet:
1. Fabricate ladder safety cages from flat bars, assembled by welding. Unless otherwise shown, provide 1/2–inch by 3–inch top, bottom and intermediate hoops spaced not more than 5 feet on centers; and 3/8–inch by 2–inch vertical bars, secured to each hoop. Space vertical bars approximately 9 inches on centers. Fasten assembled safety cage to ladder rails and adjacent construction as shown. Grind all welds, sharp edged and projections smooth.
2. Comply with the requirements of ANSI A14.3.
3. Provide vertical, safety rail and attached sliding, climbing belt system:
   a. Attach vertical, notched aluminum to ladder rungs.
   b. Sliding mechanism shall attach to vertical rail and consist of sleeves, safety latches and hooks.
   c. Three (3) adjustable belts for each location.
   d. Products and Manufacturer:
      1) SAF–T–CLIMB by North Consumer Safety Products, Div. of Siebe North, Inc.
      2) Or equal.

C. Shelf Angles:
1. Provide hot dipped galvanized steel shelf angles of sizes shown for attachment to concrete or masonry construction. Provide slotted holes to receive 3/4–inch bolts, spaced not more than 6 inches from each end and not more than 24 inches on centers, unless otherwise shown.

D. Miscellaneous Platforms, Framing, Cover Plates, Supports and Brackets:
1. Provide hot dipped galvanized miscellaneous metal platforms, framing, supports and other metal items required which are not a part of the structural steel framework and are required to complete the work.
2. Fabricate miscellaneous units to the sizes, shapes and profiles shown or, if not shown, of the required dimensions to receive adjacent grating, plates, tanks, doors, or other work to be retained by the framing. Except as otherwise shown, fabricate from structural shapes, plates, and bars, of all welded construction using mitered corners, welded brackets and splice plates and a minimum number of joints for field connection. Cut, drill and tap units to receive hardware and similar items to be anchored to the Work.

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MISCELLANEOUS METAL FABRICATIONS (CONT.)

E. Galvanizing:
1. All galvanizing of fabricated steel items to comply with the requirements of ASTM A 123.
2. All pipe supports including support beams, columns, saddles, hangers and angles, shelf angles, and miscellaneous framing and supports shall be hot dipped galvanized.

F. Shop Priming:
1. Comply with the general requirements of Section Painting.
2. Apply primer to surfaces to be painted. Primer to be as specified in Section Painting and to be the same primer included in the approved paint system.
3. CONTRACTOR shall coordinate primer and finish paint systems with paint manufacturer. No equipment shall be painted until paint systems under Section Painting have been submitted and approved.
4. CONTRACTOR shall field apply finish coat as specified in Section Painting unless otherwise specified.

G. Metal Safety Nosings:
1. Provide cast metal, abrasive non-skid type nosings 4 inches wide by full length of step between stringers, unless otherwise shown. Fabricate in thickness, profile, and surface pattern as shown. Equip each nosing with integral anchors for embedding in concrete fill material, spaced not more than 4 inches from each end and not more than 15 inches on centers. Provide aluminum nosings in locations as indicated on the Drawings.
2. Product and Manufacturer:
   a. Alumogrit Type 101 by Wooster Product Incorporated.
   b. Alumalun Style A by American Abrasive Metals Company.
   c. Or equal.

H. Water Pump Hoist:
1. Provide one(1) stationary davit style hoist to be removable for storage in pump station.
2. Davit/hoist to have hand crank and sufficient cable to reach bottom of inlet chamber.
3. Capacity to be at least 500lb. with below floor level base.
4. Product and Manufacturer:
   a. Thern, Inc.
   b. Purdy Co.
   c. Or equal.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Set miscellaneous metal fabrications accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Brace temporarily or anchor temporarily in formwork where fabrications are to be built into concrete, masonry or similar construction.

B. Anchor securely as shown or as required for the intended use, using concealed anchors wherever possible.

C. Fit exposed connections accurately together to form tight hairline joints. Weld steel connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind steel joints smooth and touch up paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

D. Protection of Aluminum from Dissimilar Materials: Using approved washers, strips or sheets of felt, and the coating system specified in Section Painting, protect all surfaces of aluminum from contact with dissimilar materials such as concrete, masonry, steel, nonferrous, metals, etc.

ANCHOR BOLTS, EXPANSION ANCHORS AND CONCRETE INSERTS

PART 1– GENERAL

1.01 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to provide anchor bolts, expansion

B. This Section includes all bolts, anchors and inserts required for the Work but not specified under other Sections.

C. The types of work using the bolts, anchors and inserts include, but are not limited to the following:
1. Rails.
2. Hangers and brackets.
3. Equipment.
4. Trash Rack
5. Electrical, Plumbing and HVAC Work.
6. Aluminum Ladders.

D. Related Work Specified Elsewhere:
1. Miscellaneous Metal Fabrications.
2. Aluminum Handrails and Railings.

1.02 QUALITY ASSURANCE

A. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown and specified.
1. ASTM A 307, Carbon steel Externally and Internally Threaded Standard Fastners.
2. ASTM A 320, Alloy-Steel Bolting Materials for Low-Temperature Service.
3. American Institute of Steel Construction, Structural Steel Detailing.

B. Expansion anchors and inserts shall be UL or FM approved.

1.03 SUBMITTALS

A. Samples: Submit for approval the following:
1. Representative samples of bolts, anchors and inserts as may be requested by the ENGINEER. His review will be for type and finish only. Compliance with all other requirements is exclusive responsibility of CONTRACTOR.

B. Shop Drawings: Submit for approval the following:
1. Setting drawings and templates for location and installation of anchorage devices.
2. Copies of manufacturer's specifications, load tables, dimension diagrams and installation instructions for the devices.

PART 2 – PRODUCTS

2.01 DESIGN CRITERIA

A. When the size, length or load carrying capacity of an anchor bolt, expansion anchor, or concrete insert is not shown on the Drawings, provide the size, length and capacity required to carry the design load times a minimum safety factor of four.

B. Determine design loads as follows:
1. For equipment anchors, use the design load recommended by the manufacturer and approved by the ENGINEER.
2. For pipe hangers and supports, use one half the total weight of pipe, fittings, valves, accessories and water contained in pipe, between the hanger or support in question and adjacent hangers and supports on both sides.
3. Allowances for vibration are included in safety factor specified above.

2.02 MATERIALS

A. Anchor Bolts:
1. "J" or "L" type:
   a. Material and thread specifications to comply with ASTM A307.
   b. Located and accurately set for the intended equipment.
   c. Protect threads and shank from damage through installation of equipment.
   d. Size as required for the intended equipment and according to the manufactures recommendations.
2. Other types, if shown on Drawings.
3. In buried, exterior or submerged locations, provide stainless steel bolts with material specifications complying with ASTM A320, AISI Type 304. Other AISI types may be used subject to ENGINEER'S approval.

B. Expansion Anchors:
1. Provide zinc plated anchors. Anchors shall be of the size required for the concrete strength specified. Provide stud type (male thread) or flush type (female thread), as required.
2. Product and Manufacturer: Provide anchors by one of the following:
   a. Molly Division of USM Corporation.
   b. Hilti, Incorporated.
   c. Or equal.
3. In buried, exterior, submerged or below grade locations, provide stainless steel anchors complying with ASTM A 320, AISI Type 303. Other AISI types may be used, subject to ENGINEER'S approval.

C. Concrete Inserts:
1. For piping, grating and floor plate, provide malleable iron inserts. Provide those recommended by the manufacturer for the required loading.
2. Finish shall be black.
3. Product and Manufacturer: Provide one of the following inserts:
   a. Figure 282 by ITT Grinnell.
   b. No. 380 by Hohmann and Barnard, Inc.
   c. Or equal.

D. Powder actuated fastners and other types of bolts and fastners not specified herein shall not be used unless approved by ENGINEER.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Drilling equipment used and installation of expansion anchors shall be in accordance with manufacturer's instructions.

B. Assure that embedded items are protected from damage and are not filled in with concrete.

C. Expansion anchors may be used for hanging or supporting pipe 2 inches diameter and smaller. Expansion anchors shall not be used for larger pipe unless otherwise shown or approved by the ENGINEER.

D. Use concrete inserts for pipe hangers and supports for the pipe size and loading recommended by the insert manufacturer.

E. Unless otherwise shown or approved by the ENGINEER conform to following for expansion anchors:
1. Minimum embedment depth in concrete: 5 diameter.
2. Minimum anchor spacing on centers: 10 diameters.
3. Minimum distance to edge of concrete: 5 diameters.
4. Increase dimensions above if required to develop the required anchor load capacity.

3.02 CLEANING

A. After embedding concrete is placed, remove protection and clean bolts and inserts.

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VERTICAL TURBINE PUMPS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope: CONTRACTOR shall furnish all labor, materials, equipment, and incidentals required to provide centrifugal pumps complete with motor, control equipment, and accessories as shown and specified.

B. Related Work Specified Elsewhere:
   1. Painting.
   2. Basic Electrical Requirements.

1.02 QUALITY ASSURANCE

A. Reference Standards:
   1. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
      a. National Electrical Code.
      b. Standards of National Electrical Manufacturers Association.
      c. Institute of Electrical and Electronic Engineers.
      d. American National Standards Institute.

B. Shop Tests:

   1. Pump casings shall be hydrostatically tested to twice the discharge head.
   2. Certified performance test every 1000 gram.

1.03 SUBMITTALS

A. Shop Drawings:
   1. Submit for approval the following:
      a. Manufacturer's literature, illustrations,specifications, and engineering data including: dimensions, materials, size, weight, performance data and curves showing overall pump efficiencies, flow rate, head, brake horsepower, motor horsepower, speed, and shut-off head.
      b. Shop Drawings Showing: Fabrication, assembly, installation, and wiring diagrams.
      c. Guarantee.
      d. A set of installation instructions shall be included with the pump at the time of shipment.
      e. Submit documentation from motor manufacturer substantiating high efficiency type motor as opposed to manufacturers standard efficiency motor.

B. Operation and Maintenance Data:
   1. The contractor shall furnish 6 copies of a hard cover bound operation and maintenance manual prepared by the manufacturers of all items of equipment furnished under this Section. The manual shall include maintenance instructions, copies of approved shop and installation drawings for all equipment and manufacturer's recommended lubricant and spare parts lists.

1.04 PRODUCT DELIVERY STORAGE AND HANDLING

A. Delivery of Materials:
   1. Pump shall come completely assembled and protected on wooden skids.
   2. Suction and discharge ports shall be protected against entry of foreign objects.

B. Storage of Material:
   1. Store unit in a clean, dry area, out of the weather.
   2. Cap all pipe connections.
   3. Unit shall remain on original skid until time of actual installation.
   4. Unit shall be tightly covered to protect against dirt, water, mechanical injury or chemical damage.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Product and Manufacturer: All pumps, motors, auxilliary equipment and parts shall be provided by one manufacture. All equipment shall be new and not refurbished. Provide one of the following.
   1. Fairbanks Morse, Model 8312.
   2. Crane Deming Pumps, Figure 4810-24.
   3. Peabody Floway, Model 24 MAL.
   4. Or equal.

B. Type:
   1. Single or double stage.

C. Pump shall have a capacity as follows:
   1. Efficiency of pump shall be above 80 percent. At instant of start-up, the turbine column will be empty to the water level of the pit.
   2. Operating with turbine column filled: 29.5 ft. min. plus velocity head.
   3. Last pump off: 36.5 ft. hd. plus Velocity hd.
   4. Pit pump down: 40ft. hd.
   5. Pump capacity shall be 12,000 GPM at 33.5 ft. hd. plus velocity hd.
   6. Non-overloading shall apply to the range at 29.5 to 36.5 ft plus Velocity head.

D. Pump to be factory hydrostatically tested in accordance with Hydraulic Institute standards.

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VERTICAL TURBINE PUMPS (CONT.)

2.02 DETAILS OF CONSTRUCTION

A. Materials and Construction:
1. Casing: Steel pipe, 24 inch column, 24 inch discharge, flanged.
2. Bowl Assembly Castings: Cast Iron.
3. Impeller: Bronze, dynamically balanced, min. 3" sphere ability.
4. Cap screws and washers: Type 316 Stainless Steel.
5. Shaft: Type 416 Stainless Steel
6. Shaft Bearing: Bronze.
7. Oil lubricated line shaft: 1 qt. 120V, 1 phase, solenoid oiler with 30 sec. prelube before pump starts.
8. Basket Strainer: Galvings Steel.
9. Dimensions to per drawing.
10. Seal Assembly:
   a. Carbon seal ring.
   b. Ceramic seat, 98% alumina oxide.
   c. Synthetic rubber bellows.
   d. Stainless steel spring.
11. Slinger Material: Neoprene.
12. Pump internal shall be capable of being serviced without disturbing piping connections.
13. Aluminum, brass or stainless steel nameplates giving the manufacturers model and serial number, rated capacity, head speed and all other pertinent data shall be attached to the pump.
14. Flanges: ANSI B 16.5, Class 150.
15. Pipe Mounting Arrangement: Vertical or horizontal.

B. Motors:
1. Vertical, open dripproof, high efficiency 150 HP, 460 VAC, 3 phase, 60HZ, sealed anti-friction type ball, roller or tapered bearings with a minimum B-10 life of 40,000 hours. Maximum RPM shall not exceed 900 RPM.
2. Motors shall be in accordance with all current applicable standards of NEMA, IEEE, AFBMA, NEC, and ANSI.
3. Motors shall be normal starting torque, normal starting kva/hp, normal slip, high efficiency, squirrel cage induction type.
4. Provide Class F insulation. Motors shall be capable of carrying nameplate full load current plus service factor continuously without injurious temperature rise in an ambient temperature of 40 C.
5. Motors shall be provided with a service factor of 1.15 minimum.
6. Motors shall be of sufficient size so that there will be no overload on the motor above rated nameplate horsepower under any condition of operation imposed by the driven equipment.
7. Locked rotor currents shall be as specified in NEMA standards.
8. Provide lubrication of non-hygroscopic grease or oil type.

2.03 TOOLS, SPARE PARTS AND MAINTENANCE MATERIALS

A. Each pump shall be furnished with the following:
1. Provide one Tension Nut.
2. Provide one set of gaskets.
3. Provide one shaft sleeve.

B. Two (2) sets of all special tools required for maintenance of operation.

C. Spare parts shall be packed in sturdy containers with clear indelible identification markings and shall be stored in a dry, warm location until transferred to the OWNER at the conclusion of the project.

2.04 PAINTING

A. Pump, motor, drive, frame, appurtenances, etc., shall receive two coats of the manufacturers standard finish paint prior to shipment.

B. Machined, polished and non-ferrous surfaces shall be coated with corrosion prevention compound.

C. Field painting is under Section Painting.

PART 3 - EXECUTION

3.01 INSPECTION

A. Inspect pump for damage prior to installation and correct if necessary as recommended by manufacturer.

3.02 INSTALLATION

A. Installation shall be in complete accordance with manufacturers instructions and recommendations.

B. Installation shall include furnishing and applying an initial supply of grease and oil, recommended by the manufacturer.

C. Check and align pump, motor and coupling, prior to initial operation.

D. Connect all piping, valves, and accessories as detailed on the Drawings and approved Shop Drawings.

3.03 START-UP ADJUSTMENT AND TESTING

A. Grease bearings if required prior to starting pump.

B. Check for proper rotation.

C. Adjust pump for proper flow.

D. Leave pump in working order.

E. Contractor shall verify that structures, pipes, and equipment are compatible.

F. Make adjustments required to place system in proper operating condition.

3.04 CLEANING

A. Clean dirt and marks and other debris from exterior of pump.

B. Remove debris and waste materials resulting from installation.

CENTRIFUGAL ROOF EXHAUST FANS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment, and incidentals required to provide centrifugal exhaust fans complete with accessories as shown and specified.

B. Related Work Specified Elsewhere:
1. Basic Electrical Requirments.

1.02 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: Comply with applicable provisions of regulatory agencies below and others having jurisdiction.
1. National Fire Protection Association.
2. Underwriters Laboratories, Incorporated.
3. National Electric Code.
4. National Electric Manufacturers Association.

B. Comply with the following applicable codes:
1. Ohio Basic Building Code.

C. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. Air Moving and Conditioning Association (AMCA) Standard: 210-74.

D. Source Quality Control: Perform the following tests and inspections at factory:
1. Fan wheels shall be statically and dynamically balanced.

1.03 SUBMITTALS

A. Shop Drawings:
1. Submit for approval Shop Drawings showing the following:
   a. Dimensions.
   b. Materials of construction.
   c. Mounting details.
   d. Performance Data - AMCA approved fan curves, for each model specified.
   e. Manufacturers literature, illustrations, specifications, and engineering data.

B. Test Reports: Submit the following test certifications for approval.
1. AMCA Label.
2. UL Label.

C. Operation and Maintenance Data:
1. Furnish 6 copies of a hard cover bound operation and maintenance manual prepared by the manufacturers of all items of equipment furnished under this Section. The manual shall include maintenance instruction, copies of approved shop and installation drawings for all equipment and manufacturer's recommended lubricant and spare parts lists.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery:
1. Fans shall come completely assembled.
2. Intake and discharge parts shall be protected against entry of foreign objects.

B. Storage and Handling:
1. Store units in a clean, dry area, out of the weather.
2. Unit shall remain in original crate or skid until time of actual installation.
3. Unit shall be tightly covered to protect against dirt, water, mechanical injury or chemical damage.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. Product and Manufacturers: Provide units as made by one of the followings:
1. Greenheck Fan Corporation, Model G.
2. Trane.
3. Or equal.

B. Capacity: 350 cfm at 0.250" S.P.

C. Construction:
1. Housing: 0.051 inch thick aluminum.
2. Fan Wheel: Aluminum backward curved.
3. The unit shall have a venturi shaped inlet cone and matching wheel cone to provide a low turbulence air intake.
4. A conduit chase shall be provided for running electrical wire through the curb cap into the power compartment.
5. The unit shall have an aluminum curb cap 0.051 inches thick with prepunched mounting holes and inlet cone constructed of one piece for weather tightness.
6. Motor Compartment Cover: 0.040 inch thick aluminum.

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D. Motors:
1. Suitably grounded and mounted on rubber in-shear vibration isolators.
2. Motors shall be in accordance with all current applicable standards of NEMA, IEEE, AFBMA, NEC, and ANSI.
3. Motors shall be permanently lubricated.
4. Thermal overload protection integral with motor.
5. Motors shall be isolated from the exhaust airstream.
6. Motors shall be of the shaded pole design.

E. Drive:
1. Direct through motor shaft.

F. Mounting:
1. Roof mounted on roof curb.

G. Dampers:
1. Gravity backdraft dampers mounted in roof curb.

H. Roof Curb:
1. Prefabricated.
2. Aluminum: 0.064 inches thick.
3. Insulation: 1-1/2-inches of rigid fiberglass.
4. Wooden nailing strips held in place by metal wrap-around.
5. Cant strips shall be formed into curb body.
6. Curb Height: 12 inches minimum.

I. Fan shall be UL listed.

J. Factory installed roof-mounted disconnect switch.

K. Fixed Speed Control:
1. 120 V ac, 1 phase and 60 Hz.
2. On/Off switch shall be wall mounted accessible from Pump/Control Room EL 727.00

L. Wire birdscreen shall be mounted to the unit discharge perimeter.

M. Coating:
1. All units shall have the following coating:
   a. Air dry epoxy phenolic (brown)
   b. 3 mil minimum thickness.
   c. Manufacturer: Heresite, or equal.
2. The coating shall be applied in accordance with the coating manufacturer's recommendations with reference to:
   a. The proper number of prime and finish coats.
   b. The specified dry film thickness.
3. After the coating is applied and the fans assembled, they shall be statically and dynamically balanced.
4. Coat entire unit interior and exterior including fan wheel, fan housing, roof curb and dampers.

N. OUTSIDE AIR LOUVER : American Warming model LE-50A. 4 In. deep extruded aluminum operable louver or approved equal. Furnish louver complete with aluminum frame and blades, vinyl gaskets, self-lubricating, heavy duty bearings and 1/2" mesh screen. Louver shall have anodized finish with one coat methacrylate lacquer and shall match color of building. Louver shall be 16" x 16" or of equal free area.

PART 3 - EXECUTION

3.01 INSTALLATIONS

A. Installation shall be in accordance with the manufacturer's instructions and recommendations.

B. Ductwork shall be supported independently of fan.

C. Check and align fan and motor.

3.01 START-UP ADJUSTMENT AND TESTING

A. Adjust fans for proper air flow.

B. Leave fans in working order.

3.03 CLEANING

A. Clean dirt and marks and other debris from exterior of fans.

B. Remove debris and waste material resulting from installation.

ALUMINUM HANDRAILS AND RAILINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals to provide aluminum handrails and railing systems as shown and specified. The Work also includes:
   a. Providing openings in and attachments to railings to accommodate the Work under this and other Sections and providing for the railings all items such as anchor bolts, fasteners, studs, pipe supports and all items required for which provision is not specifically included under other Sections.
   b. Providing openings in, and attachments to, railings to accommodate the work under other contracts, and assisting other contractors in building on or attaching to the railings all items such as anchor bolts, fasteners, studs and all items required, for which provision is not specifically included under other contracts.

B. Coordination:
1. Review installation procedures under other Section and coordinate the Work that must be installed with or attached to the railings.

1.02 QUALITY ASSURANCE

A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. ASTM B 26, Aluminum-Alloy Sand Castings.
2. ASTM B 210, Aluminum-Alloy Drawn Seamless Tubes.
3. ASTM B 221, Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.
4. ASTM B 241, Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
5. ASTM B 247, Aluminum-Alloy Die and Hand Forgings.
6. ASTM A 429, Aluminum-Alloy Extruded Structural Pipe and Tube.
7. AWS D10.7, Gas Shielded-Arc Welding of Aluminum and Aluminum Alloy Pipe.
8. The Aluminum Association, Aluminum Standards and Data; and Standards for Anodized Architectural Aluminum.
9. NAAMM, Metal Finishes Manual".
10. ANSI A12.1, Safety Requirements for Floor and Wall Openings, Railings, and Toeboards.
11. Ohio Basic Building Code.

B. Manufacturer of railing system shall guarantee, in writing, the availability of replacement parts and components for a period of not less than 5 years after completion of the Work.

1.03 SUBMITTALS

A. Samples, Handrails and Railings: Submit for approval the following:
1. Samples with specified metal finish, including typical bolted connections, not less than 6 inches long. Samples will be reviewed for texture and color only. Compliance with all other requirements is the exclusive responsibility of the CONTRACTOR.
2. Color Samples: Maximum range of clear anodized aluminum that will appear in the finished Work.

B. Shop Drawings: Submit for approval Shop Drawings for the fabrication and erection of aluminum handrails and railings. Include plans, elevations, and details of sections and connections. Show anchorage items.

C. Certification: Furnish certification by manufacturer that loading tests have been performed on the handrail, and it conforms to all applicable OSHA and ANSI requirements for load and deflection.

D. Finish: Furnish a written certificate confirming required coating film thickness, coating weight, sealing treatment and stain test.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Pack and ship all railing in individual plastic film to protect finish.

PART 2 - PRODUCTS

2.01 PERFORMANCE CRITERIA

A. CONTRACTOR shall provide a handrail and railing system that conforms to the Ohio Basic Building Code and OSHA, Part 1910.23, including the 200 pound loading requirement. In addition, the system shall conform to the following requirements of ANSI A12.1:
1. Completed railing to withstand a load of 25 pounds per linear foot applied in any direction at the top of the railing.
2. Intermediate rail to withstand a horizontal load of 20 pounds per linear foot.
3. All above loads are not additive.

2.02 MATERIALS

A. Aluminum Castings: ASTM B 26.

B. Aluminum Forgings: ASTM B 247.

C. Stainless Steel Chain: Type 304.

D. Extruded Aluminum Pipe and Tube: ASTM B 429 or B, Alloy 6063-T52, 1-1/2 inch diameter Schedule 40 for rails and posts.

E. Castings:
1. Provide high strength alloy brackets, flanges and fittings suitable for anodizing as specified.
2. Product and Manufacturer:
   a. Cast aluminum by J.G. Braun Company.
   b. Cast aluminum by Julius Blum & Company, Incorporated.
   c. Or equal.

F. Pipe Handrails and Railings:
1. Use a nonwelded pipe railing system with posts, top and intermediate rails, and flush joints.
2. Product and Manufacturer:
   a. Connectorail by Julius Blum & Company Incorporated.
   b. ReyonRail II by the Architectural and Building Products Division of Reynolds Metal Company.
   c. Or equal.

G. Aluminized Fabric: Use aluminized fabric to conform with the requirements of ASTM-491 and Type II chain link fabric specified by Federal Specification RR-F-191/1C.

2.03 FABRICATION

A. General: Form exposed Work true to line and level with accurate angles and surfaces and straight sharp edges. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing the Work.

B. Nonwelded Connections: Fabricate railing system in strict accordance with the recommendations of the manufacturer.

C. Toeboards: Provide aluminum toeboards around all openings to tanks, channels or basins, along all elevated walkways and platforms or where shown. Fabricate to the dimensions and details shown. Securely fasten toeboard in place with not more than 1/4-inch clearance above floor level. Unless otherwise specified, toeboards to meet requirements of OSHA Part 1910.23, Section (e). Provide manufacturer's standard toeboard detail which allows thermal movement without warping toeboard.

D. Brackets, Flanges, and Anchors: Provide brackets, flanges, floor cover flanges, dust cover caps for removable railing cast-in-place sleeves where railing is normally left uninstalled and anchors for railing posts and for handrail supports. Furnish inserts and sleeves as required for anchorage to concrete or masonry. Components shall be in accordance with manufacturer's recommendations.

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ALUMINUM HANDRAILS AND RAILINGS (CONT.)

E. Chain: Provide Type 304 stainless steel chain, snaps and eye bolts for chained openings in railing where shown on Drawings. Furnish inserts, anchors and miscellaneous hardware required for anchorage to concrete or masonry and for connection to railing. Components shall be in accordance with manufacturer's recommendations and OSHA requirements.

F. Finish: Anodize all aluminum railings including brackets and flanges. Furnish medium satin, etched, Architectural Class I anodized finish, AA-M32C22A41, Clear as specified in the NAAMM Manual.

PART 3 - EXECUTION

3.01 ASSEMBLY OF NONWELDED PIPE RAILING SYSTEM

A. Assemble systems in strict accordance with manufacturer's recommendations for installation and as shown.

3.02 INSTALLATION

A. Cutting, Fitting and Placement:
1. Perform cutting, drilling and fitting required for installation. Set the Work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
2. Fit exposed connections accurately together to form tight hairline joints. Field welding will not be permitted. Do not cut or abrade the surfaces of units which have been finished after fabrication, and are intended for field connections.
3. Permanent splice connections shall be made in accordance with manufacture's instructions.
4. Space posts on centers, 6 feet maximum, unless otherwise shown.
5. Adjust railings prior to securing in place, to ensure proper matching at butting joints and correct alignment throughout their length. plumb posts in each direction. Secure posts and rail ends to building construction as follows:
   a. Anchor posts in new concrete by means of sleeves set and anchored into the concrete. Provide closure secured to the bottom of the sleeve. Unless otherwise shown, after the posts have been inserted into the sleeves, fill the annular space between posts and sleeves solid with grout. Crown grout and slope it to drain away from posts.
   b. Anchor posts in existing concrete by core drilling holes. Drill not less than 1-inch greater than the outside diameter of post. Reinforcing steel shall not be cut by core drilling. Fill the annular space with grout and bevel as specified in "a." above.
   c. Anchor posts to stair stringers by mounting on flange of stringer channel using manufacturer's standard detail.
   d. Provide removable railing sections and sleeves as shown. Accurately locate sleeves to match post spacings.
   e. All posts set in concrete shall be provided with a floor cover flange
6. Secure handrails to walls with wall brackets and end fittings as shown. Drill wall plate portion of the bracket to receive one bolt, unless otherwise shown for concealed anchorage. Locate brackets as shown or, if not shown, at not more than 8 feet on centers. Provide flush-type wall return fittings with the same projection as that shown for wall brackets. Secure wall brackets and wall return fittings to building construction as follows:
   a. For concrete and solid masonry anchorage, use bolt anchor expansion shields and lag bolts.
   b. For hollow masonry anchorage, use toggle bolts have square heads.
7. Provide approved slip connections in top and bottom rails at each expansion joint.

B. Protection from Dissimilar Materials: Using asphaltic or zinc chromate paint, coat all surfaces of aluminum in contact with dissimilar materials such as concrete, masonry and steel. Coat posts 1/2-inch above slab, deck or walk.

3.04 REPAIR AND REPLACEMENT

A. In existing areas where existing aluminum handrail and railing is removed for installation of new work, replace and/or repair the rail to like new condition.

B. Remove and replace existing aluminized fabric as necessary to install new work. Replace or reinstall to like new condition.

3.05 CLEANING AND REPAIRING

A. Cleaning:
1. Remove protective plastic as recommended by manufacturer.
2. Remove all stains, dirt, grease or other substances by washing railings thoroughly using clean water and soap; rinse with clean water.
3. Do not use acid solution, steel wool or other harsh abrasive.
   a. If stain remains after washing, remove finish and restore in accordance with recommendations of the manufacturer.

B. Repair: Remove stained or otherwise defective Work and replace with material that meets specification requirement.

ROOF DRAINAGE SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope: CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to provide a complete roof drainage system including all roof drains, and roof drainage piping, fittings, and accessories from the roof drains to the limits shown.

1.02 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:
1. Building Codes: Comply with applicable requirements of all governing authorities and the following codes:
   a. Ohio Basic Building Code.

B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified or latest addition:
1. ANSI A21.10 Gray-Iron and Ductile-Iron Fittings, 2 in. through 48 in. for Water and Other Liquids (AWWA C110).
2. ANSI A112.5.1 Cast Iron Soil Pipe and Fittings, (ASTM A 74).
3. ANSI B1.1 Unified Inch Screw Threads (UN and UNR Thread Form).
4. ANSI B16.5 Steel Pipe Flanges, Flanged Valves, and Fittings.
5. ANSI B16.12 Cast-Iron Threaded Drainage Fittings.
6. ANSI B125.2 Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses, (ASTM A 120).
7. ASTM A 183 Heat-Treated Carbon Steel Track Bolts and Carbon Steel Nuts.

1.03 SUBMITTALS

A. Shop Drawings: Submit the following:
1. Manufacturer's literature, specifications and engineering data including: dimensions, size and materials of all roof drains.
2. Pipe and fittings.
3. Detailed 1/4 in. scale drawings showing materials and dimensions of the complete roof drainage system, in plan, and in section where necessary.

B. Record Drawings: During progress of the Work keep an up to date set of drawings showing field and Shop Drawing modifications. Immediately upon substantial completion of piping Work, submit cloth or mylar tracings showing the actual in-place installation of all piping and equipment installed under this Section, at a scale satisfactory to the CITY. The Drawings shall show all piping on plans and in sections, with all reference dimensions and elevations required for complete "record" drawings of the piping systems. Two paper prints shall also be furnished. The tracings shall be furnished not later than 30 days after completion of the Contract and prior to final payment.

1.04 JOB CONDITIONS

A. Protection: Properly plug or cap the open ends of all pipe upon completion of each day's work or other stopping point throughout construction. Equipment shall be tightly covered and protected against dirt, water, and chemical or mechanical injury.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cast Iron Pipe and Fittings:
1. Hub and Spigot: ANSI A112.5.1.
   a. Weight: Service.
   b. Joints:
      1. Caulked:
         a. Jute Packing: FS HH-P-117, Type I.
      2. Compression:
         a. Gasket: Rubber, ASTM C564.
         b. Lubricant: As recommended by pipe manufacturer.
2. Hubless Cast Iron: CISPI Standard No. 301.
   a. Weight: Service.
   b. Joints: CISPI Standard No. 310.

B. Roof Drains:
1. Products and Manufacturers: Provide one of the following:
   a. Jay R. Smith, Fig. 1015 R-C.
   b. Zurn Industries.
   c. Or equal.
2. Material: Cast iron body with adjustable extension and anodized aluminum, Poly-Dome, or Fortiflex dome strainer.
3. Accessories:
   a. Sump Receiver.
   b. Underdeck Clamp.
4. Outlet Connection: No-hub.

2.02 MATERIAL SELECTION

A. All exposed roof drainage piping within the interior of a building or run within a vent or shaft shall be no-hub cast iron.

B. All roof drainage piping located in or under concrete slabs on grade or underground shall be service weight hub and spigot cast iron pipe and shall be coated with two 6 mil coats of asphaltum or coal tar pitch.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation of roof drains shall be in accordance with manufacturer's instructions and recommendations.

BASIC ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.01 SCOPE

A. Furnish all materials, labor, tools, transportation, incidentals and appurtenances to complete in every detail and leave in working order all items of work called for herein or shown on the accompanying Drawings.

B. Include any minor items of work necessary to provide a complete and fully operational electrical system.

C. Coordinate electrical service with the power supply agency:

The Division of Electricity
City of Columbus
910 dublin Rd.
Columbus, Ohio 43215
(614) 645-7627 Dispatcher
(614) 645-7098 Engineer

1.02 WORK DESCRIBED ELSEWHERE

A. The Electrical Contractor for this work is referred to the Bidding Requirements, General Conditions, Special Conditions, Temporary Services, and pertinent Sections of Division 1 Specifications. These sections describe work which is a part of this Contract. The following General Provisions amplify and supplement these Sections of Division 1. In cases of conflicting requirements, the stipulations set forth in Division 1 supersede and must be satisfied by the Contractor.

1.03 GENERAL REQUIREMENTS

A. The Electrical Contractor must read the entire Specifications covering other branches of work. He is responsible for coordination of his work with work performed by other trades.

B. Consult all contract Drawings which may affect the location of any equipment or apparatus furnished under this work and make minor adjustments in location as necessary to secure coordination.

C. The layout shown on the Drawings is based on a particular make of equipment. If another make of equipment is used which requires modification or changes of any description from the Drawings or Specifications, Contractor shall be responsible (as a part of this work) for making all such modifications and changes, including those involving other trades, with the cost thereof included in his Bid. The Contractor is responsible for the dimensional correctness of all items of equipment he intends to utilize, and shall coordinate same with other trades, Drawings, etc., to avoid conflicts. In such case, Contractor shall submit Drawings and Specifications prior to starting work showing all such modifications and changes. His proposal shall be subject to the approval of the Engineer.

D. System layout is schematic and exact locations shall be determined by structural and other conditions. This shall not be construed to mean that the design of the system may be arbitrarily changed. The equipment layout is to fit into the building as constructed and shall be coordinated with the equipment included under other Divisions of work.

E. Contractor is to contact the Engineer immediately, in writing as a matter of record and clarification, if he notices any discrepancies or omissions in either the Drawings or the Specifications or if there are any questions regarding the meaning or intent thereof to execute the process for any "change order" that may be required because of such.

F. Submit all changes, other than minor adjustments, to the Engineer for approval before proceeding with the work.

G. The Contractor is required to visit the site and fully inform himself concerning dimensions, existing conditions and all other conditions affecting the scope of work. Failure to visit the site shall not relieve the Contractor from any responsibility in the performance of his work.

H. All workmanship is to be of the highest quality in accordance with the best practices of the trade and performed by craftsmen skilled in this particular work.

I. Contractor is to have a competent superintendent in charge of the work installed under this Contract at all times during established regular work hours. Superintendent is to be experieced in this type of work.

1.04 PERMITS, INSPECTIONS AND CODES

A. The Owner will file all Drawings, pay all fees and obtain all necessary permits relative to this work.

B. The Contractor will obtain all certificates of inspection relative to this work.

C. Completed installation shall conform with ALL applicable Federal, State and Local Laws, Codes and Ordinances including but not limited to the latest editions of the following:

1. Ohio Basic Building Code (OBBC) Ohio Department of Industrial Relations
2. Specific Construction Safety Requirements, State Industrial Commission
3. National Electrical Code (NFPA-70)
4. Life Safety Code NFPA 101
5. Occupational Safety and Health Act (OSHA) of 1971 and all amendments thereto
6. H.U.D.
7. Farmer's Home Administration
8. Uniform Building Code
9. Southern Building Code
10. B.O.C.A. (Ohio Department of Industrial Relations)
11. National Building Code

D. Nothing contained in the Drawings and Specifications shall be construed to conflict with these laws, codes and ordinances and they are hereby included in these Specifications.

1.05 DRAWINGS

A. Drawings are schematic and show approximate locations of electrical equipment. Exact locations should be coordinated by Contractor and verified in field. It shall be part of the Contractor's responsibility to check and verify the physical size of the specified equipment he intends to utilize.

B. Significant deviations from Drawings must be approved by the Engineer.

C. Engineer reserves the right to change the location of outlets and equipment (maximum 10 ft.) up to the time of roughing-in, without additional cost.

D. If a typical plan or detail is shown that requires a reversed installation on the job site, the Contractor shall be responsible for the reverse installation as part of this contract.

1.06 ELECTRICAL MOTORS

A. In general, motors will be furnished and installed under other Divisions of work as a factory installed item. Unless factory installed on the unit, all wiring, motor starters, safety disconnect switches or combination starter/disconnect switches (fused or nonfused as required) shall be furnished and installed by this Contractor.

1.07 DISCONNECT SWITCHES

A. In general, disconnect switches shall be installed in accordance with national and local codes. Disconnect switches that are installed at air conditioners, heat pumps, central cooling and other types of equipment shall be fused or non-fused in accordance with the equipment's nameplate requirements per N.E.C. 440-21 and 110-3(b).

1.08 SEQUENCING AND SCHEDULING

A. Construct work in sequencing under provisions of Division 1.

1.09 INSPECTION

A. Contractor arranges for and includes in his bid, inspection of this work by ONE of the following:

1. Local Code Authority
2. State Code Authority

1.10 GUARANTEE AND ONE YEAR SERVICE CONTRACT

A. Contractor is responsible for all defects, repairs and replacements in materials and workmanship for a period of one (1) year after final payment is approved by the Engineer.

B. Contractor shall furnish a one year service contract for major items of electrical equipment which require on-going maintenance. The cost of this one year service contract shall be included in Base Bid; see individual Specifications for items of equipment that require this maintenance contract.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Furnish new and undeteriorated materials of a quality not less than what is specified.

B. Contractor is to furnish and install only those brands of equipment mentioned specifically or accepted as substitutions.

2.02 EQUIPMENT SELECTION AND APPROVAL

A. The selection of materials and equipment to be furnished shall be governed by the following:

1. Where trade names, brands of manufacturer of equipment or materials are listed in the Specification, the exact equipment listed shall be used in the bid. Where more than one name is listed, Contractor may select any one of the several brands specified.

B. Within ten (10) days after the award of contracts, the Contractor must submit a list to the Engineer showing the names of manufacturers and subcontractors he intends to use, and shall include their addresses and telephones numbers.

PART 3 – EXECUTION

3.01 PROTECTION AND CLEANING

A. Protect all fixtures against damage from leaks or abuse and pay the cost of repair or replacement of fixtures or equipment made necessary by failure to provide suitable safeguards or protection.

B. After all equipment has been inspected and approved, thoroughly clean all equipment provided under this work.

C. After all fixtures have been installed, thoroughly clean all fixtures, remove all stickers visible after installation and/or as directed by the Engineer, remove foreign matter and leave every part in acceptable condition, clean and ready for use.

D. All scratches and chipped prime or finish coats on all electrical equipment are to be touched-up with matching paint. All dents in all electrical equipment are to be removed and the prime or finish coats touched-up. If damage is excessive, replacement may be required.

3.02 CUTTING AND PATCHING

A. Cut and patch as required to install new work. Patching must match existing surfaces in kind and finish.

B. Cut as necessary to install new equipment. Avoid cutting of concrete, masonry and other work by use of inserts and sleeves.

C. Give the General Contractor locations and sizes of all openings required for the installation of equipment before construction and walls are started. If it becomes necessary to cut into new work because of the failure of Contractor to notify the General Contractor, then the General Contractor shall do any necessary cutting and patching at this Contractor's expense.

D. Patching must match existing surfaces in kind and finish and shall be done by the General Contractor at this Contractor's expense.

3.03 EXCAVATION AND BACKFILL

A. Provide any trenching required to install underground utility service or wiring. Remove forms and debris before backfilling. Tamp and compact backfill in six (6") inch layers to bring level with existing grade.

Replace and patch surface to match existing sod, gravel, blacktop or concrete. See General Specification, Excavation and Backfill Section for the percentage of compaction of the backfill required. Failure to achieve this percentage will require removal of backfill installed and new backfill installed.

3.04 FOUNDATIONS AND SUPPORTS

A. Contractor is fully responsible for the installation of the concrete equipment pads and conduit encasement. All other concrete work is the responsibility of the General Contractor. Coordinate exact foundation, curb and pad sizes with General Contractor.

B. Install welded steel frames for equipment and auxiliary steel supports as necessary. Use black steel or channel iron coated with primer and finish coat; weatherproof with coating of bitumastic where supports are exposed to elements.

3.05 CONDUIT SLEEVES

A. Sleeves shall be installed in all walls and floors where conduits or raceways are to pass through.

B. Sleeves through fire rated construction shall be packed with calcium silicate, silicone "RTV" foam, or "3M" fire rated sealants, caulking, putty strips and sheets.

C. Where openings in floors and walls are required and sleeves were not installed, this Contractor shall be responsible for cutting all required openings with rotary type drill, or other method approved by the Engineer. Holes cut with pneumatic hammer will not be acceptable.

CONDUIT

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Rigid metal conduit and fittings.

B. Liquidtight flexible metal conduit and fittings.

C. Non-metallic conduit and fittings.

1.02 REFERENCES

A. ANSI C80.1 – Rigid Steel Conduit, Zinc-Coated.

B. ANSI C80.5 – Rigid Aluminum Conduit.

C. ANSI/NEMA FB 1 – Fittings and Supports for Conduit and Cable Assemblies.

D. FS WW-C-566 – Specification for Flexible Metal Conduit.

E. FS WW-C-581 – Specification for Galvanized Rigid Conduit.

F. NEMA TC 2 – Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).

G. NEMA TC 3 – PVC Fittings for Use with Rigid PVC Conduit and Tubing.

PART 2 – PRODUCTS

2.01 RIGID METAL CONDUIT (RMC) AND FITTINGS

A. Rigid Steel Conduit: ANSI C80.1.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; threaded type, material to match conduit. Connections to equipment to be done with double locking nuts and contain a PVC screw type insulating bushing.

C. Manufacturer: Allied Tube & Conduit; Triangle PWC Inc. or Wheatland Tube Co.

2.02 LIQUIDTIGHT FLEXIBLE CONDUIT AND FITTINGS

A. Conduit: Flexible metal conduit with PVC jacket.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1 with insulated throat.

C. Manufacturer: Alflex Corp.; Carol Cable Co., Inc. or Coleman Cable System Inc.

2.03 PLASTIC CONDUIT AND FITTINGS

A. Conduit: NEMA TC 2; Schedule 40 PVC.

B. Fittings and Conduit Bodies: NEMA TC 3.

C. Manufacturer: Carlon or Condux International.

2.04 ELECTRICAL PLASTIC TUBING AND FITTINGS

A. EPT: NEMA TC 2; PVC

B. Fittings and Conduit Bodies: NEMA TC 3.

2.05 CONDUIT SUPPORTS

A. Conduit Clamps, Straps, and Supports: Steel or malleable iron.

PART 3 – EXECUTION

3.01 CONDUIT SIZING, ARRANGEMENT, AND SUPPORT

A. Size conduit for Type THHN conductors; 3/4 inch minimum size.

B. Arrange conduit to maintain headroom and present a neat appearance. Conceal in all finished areas.

C. Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.

D. Maintain minimum 6 inch clearance between conduit and piping. Maintain 12 inch clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.

E. Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using galvanized straps, lay-in adjustable hangers, clevis hangers, or bolted split stamped galvanized hangers.

F. Group conduit in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps. Provide space for 25 percent additional conduit. Each rack is to be supported by a minimum of two supports.

G. Do not fasten conduit with wire, perforated pipe straps or use ceiling grid system. Remove all wire used for temporary conduit support during construction, before conductors are pulled. All conduits to be mounted to structure using rigid supports.

H. Support conduit at a maximum of 10 feet on center.

3.02 CONDUIT INSTALLATION

A. Cut conduit square using a saw or pipecutter; de-burr cut ends.

B. Bring conduit to the shoulder of fittings and couplings and fasten securely.

C. Use conduit hubs for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations.

D. Install no more than the equivalent of four 90-degree bends between boxes.

E. Use conduit bodies to make sharp changes in direction, as around beams.

F. Use hydraulic one-shot conduit bender or factory "LB" fittings w/gaskets elbows for bends in conduit larger than 2 inch size.

G. Avoid moisture traps where possible; where unavoidable, provide junction box with drain fitting at conduit low point.

H. Use suitable conduit caps to protect installed conduit against entrance of dirt and moisture.

I. Provide minimum of 130 lb. pull string in empty conduit, except sleeves and nipples.

J. Install expansion joints where conduit crosses building expansion joints. Exposed conduits rising from floor to have 3" high concrete curb.

K. Where conduit penetrates fire-rated walls and floors, provide pipe sleeve two sizes larger than conduit; pack void around conduit with oakum and fill ends of sleeve with fire-resistive compound.

L. Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket.

M. Maximum Size Conduit in Slabs Above Grade: 3/4 inch. Do not route conduits to cross each other in slabs above grade.

N. Use rigid factory elbows for bends in plastic conduit runs.

O. Wipe plastic conduit clean and dry before joining. Apply full even coat of cement to entire area that will be inserted into fitting.

3.03 CONDUIT INSTALLATION SCHEDULE

A. Underground installations more than 5 feet from foundation wall: Schedule 40 plastic conduit.

B. Installations in or under concrete slab, or underground within 5 feet of foundation wall: Rigid steel conduit.

C. Exposed Outdoor Locations: Rigid steel conduit.

D. Wet Interior Locations: Rigid aluminum conduit.

E. Dry Interior Locations: Rigid steel conduit.

UNDERGROUND CONDUITS WITH CONCRETE ENCASEMENT

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Provide concrete encased PVC Type EB ducts for underground raceway systems.

B. Provide fittings and support to form complete system.

C. Provide duct plug for each end of empty duct.

D. Provide end bells where ducts enter underground structures.

E. Provide concrete for underground raceway systems.

F. Provide reinforced concrete collar poured monolithically with underground conduit to take shear at joint of conduits.

G. Provide watertight concrete joints and connections.

H. Provide mortar tight forms for concrete.

I. Provide "Yellow Warning Tape" over all buried conduit to avoid damage of underground electrical installations during future excavation.

1.02 REFERENCES

A. American Concrete Institute (ACI)

1. Building Code Requirements for Reinforced Concrete, Including Commentary

B. American Society for Testing and Materials (ASTM)

1. C94 Ready Mixed Concrete

2. C143 Test Method for Slump of Portland Cement Concrete

3. C150 Portland Cement

4. C309 Liquid Membrane Forming Compounds for Curing Concrete

C. Construction and Materials Specification of State of Ohio Department of Transporation.

D. National Electrical Manufacturers Association (NEMA)

1. TC 6 PVC and ABS Plastic Utilities Duct for Underground Installation

2. TC 9 Fittings for ABS and PVC Plastic Utilities Duct for Underground Installation

3. TCB-2 User's Manual for the Installation of Underground Plastic Duct

1.03 DEFINITIONS

A. Underground conduit is defined as structure containing one or more ducts.

B. Duct is defined as single enclosed raceway for conductors or cables.

1.04 STORAGE

A. Store plastic ducts on flat dry surfaces.

1.05 PROTECTION

A. Protect plastic ducts from sunlight.

B. Protect duct entrance from debris with duct plugs.

PART 2 – PRODUCTS

2.01 SPACERS

A. Spacers shall be precast concrete or high impact polystyrene or high density polyethylene (not less than 0.96 specific gravity).

B. Spacers shall independently support each duct.

2.02 DUCT PLUGS

A. Plugs shall have weepholes or screens to allow water drainage.

2.03 MANUFACTURED BENDS

A. Ducts of less than three inches in diameter shall have minimum radii of eighteen inches.

B. Ducts of three inches or larger diameter shall have minimum radii of thirty-six inches.

2.04 CONCRETE

A. When providing concrete for encased buried conduit, use the following requirements for concrete strength, class, aggregate size and slump instead of these requirements listed in Section 03300.

B. Use Class 2500 Type I or IA cement (2500 psi strength in 28 days).

C. Concrete shall have 3/8 inch maximum sized aggregate and 7 inch slump plus or minus 1 inch.

PART 3 – EXECUTION

3.01 DUCT JOINTS

A. Stagger joints of ducts by rows and layers to maximize conduit strength.

3.02 SPACERS

A. Install spacers at maximum 5 foot intervals.

3.03 SLOPES

A. Slope underground conduits downward toward underground structures.

B. Slope underground conduits away from buildings.

C. Slopes shall have minimum pitch of 4 inches in 100 feet.

3.04 BENDS

A. Except at risers, accomplish changes in underground conduit run directions by long sweep bends having minimum curvature radius of 25 feet.

3.05 DEPTH

A. Measure depth from top of concrete encasement to grade.

B. Each concrete encased conduit shall have minimum depth of 24 inches below grade, unless noted otherwise on drawings.

3.06 NEW UNDERGROUND STRUCTURE

A. Construct underground conduit connecting to new underground structure so as to have flared section adjacent to structure to give shear strength.

B. Construct underground structure to allow for keying concrete encasement of underground conduit into structure wall.

3.07 EXISTING UNDERGROUND STRUCTURE

A. For underground conduit connections to existing underground structures, remove structure wall to required dimensions while preserving steel in structure wall.

B. Cut steel and extend steel into underground conduit encasement.

C. Chip out structure wall to form key for underground conduit concrete encasement.

3.08 CONCRETE SLAB

A. For underground conduit connections to concrete slab make an opening in slab to required dimensions and preserve steel in slab.

B. Cut steel and extend steel into underground conduit concrete encasement.

C. Chip out slab opening to form key underground conduit concrete encasement.

3.09 EXISTING UNDERGROUND CONDUIT

A. For underground conduit connections to existing concrete encased underground conduit, excavate existing underground conduit to maximum depth necessary.

B. Cut off underground conduit and remove loose concrete before installing new underground conduits.

3.10 UNDERGROUND CONDUIT JOINTS

A. Wherever construction joint is necessary in an underground circuit, fit concrete encasement of partially completed underground conduit with reinforcing steel extending minimum of 2 feet back into encasement and minimum of 2 feet beyond end of encasement.

B. Joints shall have one No. 4 bar in each corner, 3 inches from edge of encasement. Secure corner bars with 2 No. 3 bars, spaced approximately 1 foot apart, all around.

C. Restrain reinforcing assembly from moving during concrete pouring.

3.11 ANCHORING

A. Anchor ducts to prevent movement during concrete placement.

3.12 CONCRETE THICKNESS

A. Concrete encasement shall give at least 3 inches of cover on all conduit sides.

3.13 CONCRETE SURFACES

A. Do not install concrete on mud, dried earth, uncompacted fill, or frozen subgrade. Install concrete on firm and damp earth surfaces.

B. Remove oil from surfaces to be bonded to concrete.

C. Surfaces shall not have chips, sawdust, debris, water, ice, snow, oil, mortar, or other substances.

3.14 CONCRETE CONVEYING

A. Convey concrete from mixer to site by methods that shall prevent segregation or ingredient losses.

B. Drive wheeled equipment on runways. Runways shall be provided by the contractor.

3.15 CONCRETE PLACEMENT

A. Do not deposit concrete that has attained initial set or contained water for more than 1 hour.

B. If ready-mixed concrete is used, stamp on batch tickets time when mixing water is introduced into drum containing solids.

C. Secure and inspect embedded items before concrete pouring.

D. Immediately after depositing, compact concrete with mechanical vibrator, by hand spading or by hand tamping. Do not over vibrate concrete. Do not externally vibrate forms.

E. Do not install concrete against or upon hardened concrete, except when making a construction joint.

3.16 CONCRETE FINISHING

A. Exposed concrete surfaces shall not have rough spaces, open spaces, depressions, or projections.

B. Screed, float, and trowel surfaces to finish level with no deviation exceeding 1/8 inch in 10 feet. Finish surfaces to give roughened finish. Do not float or trowel initial set of concrete.

C. Do not add cements or water to screeded surface.

D. Round exposed concrete edges.

3.17 CONCRETE CURING

A. Concrete shall cure for at least 48 hours after depositing, before backfilling trench.

B. During curing period keep concrete wet.

C. Do not damage concrete surfaces with water or coverings.

D. Alternate curing method: use curing compound in accordance with manufacturer's printed instructions.

3.18 TEMPERATURE

A. Do no concrete work when concrete temperature may drop below 40 degrees F or rise above 90 degrees F during depositing or curing.

3.19 FORM MOVEMENT

A. Forms shall not move during concrete pouring.

3.20 FORM BULGING

A. Forms shall not bulge between supports during concrete pouring.

3.21 FORM SURFACES

A. Surfaces in contact with concrete shall not have irregularities or holes.

B. Coat surfaces with mineral oil before pouring concrete.

C. Surfaces in contact with concrete shall be cleaned before coating with mineral oil.

3.22 FORM REMOVALS

A. Do not remove forms for minimum of twelve hours.

B. Do not remove forms until concrete has attained sufficient strength to support its own weight and any other loads.

C. Remove forms without hammering or prying concrete.

D. Repair cavities and damages caused by form removal.

E. Wet formed surfaces immediately after form removals. Keep formed surfaces wet until patch and repair completion.

3.23 WOOD FORMS

A. Keep wood forms wet except plywood left in place during curing period.

WIRE AND CABLE

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Building wire.

B. Cable.

C. Wiring connections and terminations.

1.02 REFERENCES

A. NEMA WC 3 – Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

B. NEMA WC 5 – Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

1.03 SUBMITTALS

A. Submit shop drawings and product data under the provisions of Division 1.

B. Submit manufacturer's instructions.

PART 2 – PRODUCTS

2.01 BUILDING WIRE

A. Thermoplastic-insulated Building Wire: NEMA WC 5.

B. Feeders and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation, THHN.

C. Feeders and Branch Circuits 6 AWG and Smaller: Copper stranded conductor, 600 volt insulation, THHN.

D. Control Circuits: Copper, stranded conductor 600 volt insulation, THW.

PART 3 – EXECUTION

3.01 GENERAL WIRING METHODS

A. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring.

B. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet, and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.

C. Place an equal number of conductors for each phase of a circuit in same raceway or cable.

D. Splice only in junction or outlet boxes.

E. Neatly train and lace wiring inside boxes, equipment, and panelboards.

F. Make conductor lengths for parallel circuits equal.

3.02 WIRING INSTALLATION IN RACEWAYS

A. Pull all conductors into a raceway at the same time. Use UL listed wire pulling lubricate for pulling 4 AWG and larger wires.

B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

C. Completely and thoroughly swab raceway system before installing conductors.

3.03 WIRING CONNECTIONS AND TERMINATIONS

A. Splice only in accessible junction boxes.

B. Use solderless pressure connectors with insulating covers for copper wire splices and taps, 8 AWG and smaller. [For 10 AWG and smaller, use insulated spring wire connectors with plastic caps.]

C. Use split bolt connectors for copper wire splices and taps, 6 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.

D. Thoroughly clean wires before installing lugs and connectors.

E. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

F. Terminate spare conductors with electrical tape.

3.04 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division 1.

B. Inspect wire and cable for physical damage and proper connection.

C. Torque test conductor connections and terminations to manufacturer's recommended values.

D. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

3.05 WIRE AND CABLE INSTALLATION SCHEDULE

A. Concealed Interior Locations: Building wire in raceways.

B. Exposed Interior Locations: Building wire in raceways.

C. Wet or Damp Interior Locations: Building wire in raceway.

D. Exterior Locations: Building wire in raceways.

E. Underground Locations: Building wire in raceways.

BOXES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Wall and ceiling outlet boxes.

B. Floor boxes.

C. Pull and junction boxes.

1.02 RELATED SECTIONS

A. Conduit.

B. Wire and Cable.

C. Wiring Devices.

1.03 REFERENCES

A. ANSI/NEMA FB 1 – Fittings and Supports for Conduit and Cable Assemblies.

B. ANSI/NEMA OS 1 – Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

C. ANSI/NEMA OS 2 – Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.

D. ANSI/NFPA 70 – National Electrical Code.

E. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum).

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 1.

B. Accurately record actual locations and mounting heights of outlet, pull, and junction boxes.

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.06 PROJECT CONDITIONS

A. Verify exact measurements in field.

B. Verify locations of floor boxes and outlets prior to rough-in.

C. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Install at location required for box to serve intended purpose. Boxes may be relocated 25 feet in any direction prior to rough-in at no extra cost.

TRACKING # — 8850908 DATE — 8/5/92 CAD OPER. — TMV

PART 2 – PRODUCTS

2.01 OUTLET BOXES

A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel.

1. Luminary and Equipment Supporting Boxes: Rated for weight of equipmen supported; include 1/2 inch male fixture studs where required.

2. Concrete Ceiling Boxes: Concrete type.

B. Nonmetallic Outlet Boxes: ANSI/NEMA OS 2.

C. Cast Boxes: NEMA FB 1, Type FD cast feralloy. Provide gasketed cover by box manufacturer. Provide threaded hubs.

2.02 FLOOR BOXES

A. Floor Boxes: ANSI/NEMA OS 1, fully adjustable

B. Material: Formed steel.

C. Shape: Rectangular.

D. Conform to regulatory requirements for concrete–tight floor boxes.

2.03 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Surface–Mounted Cast Metal Box: NEMA 250, Type 4; flat–flanged, surface–mounted junction box.

1. Material: Cast aluminum.

2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

C. In–Ground Cast Metal Box: NEMA 250, Type 6, inside flanged, recessed cover box for flush mounting.

1. Material: Galvanized cast iron.

2. Cover: Nonskid cover with neoprene gasket and stainless steel cover screws.

3. Cover Legend: ELECTRIC.

D. Fiberglass Handholes: Die–molded fiberglass handholes.

1. Cable Entrance: Pre–cut 6 x 6 inch cable entrance at center bottom of each side.

2. Cover: Fiberglass weatherproof cover with nonskid finish.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

B. Install electrical boxes to maintain headroom and to present neat mechanical appearance.

C. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods under the provisions of Division 7.

D. Align adjacent wall–mounted outlet boxes for switches, thermostats, and similar devices with each other.

E. Use adjustable steel channel fasteners for hung ceiling outlet box.

F. Support boxes independently of conduit.

G. Use gang box where more than one device is mounted together. Do not use sectional box.

H. Use FS type cast outlet box in exposed locations exposed to the weather and wet locations.

3.02 INTERFACE WITH OTHER PRODUCTS

A. Position outlet boxes to locate luminaries as shown on electrical plan.

3.03 ADJUSTING

A. Install knockout closure in unused box opening.

WIRING DEVICES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Device plates and decorative box covers.

1.02 RELATED SECTIONS

A. Boxes.

1.03 REFERENCES

A. NEMA WD 1 – General Purpose Wiring Devices.

B. NEMA WD 6 – Wiring Device Configurations.

1.04 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

C. Manufacturer's Instructions:

1. Indicate application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements.

2. Include instructions for storage, handling, protection, examination, preparation, operation and installation of product.

3. All device colors to be selected and coordinated with the Engineer.

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 – PRODUCTS

2.01 WALL SWITCHES

A. Description: NEMA WD 1, general–duty, AC only general–use snap switch.

B. 20 AMP, 120–277 Volt Single Pole Switch:

1. Hubbell, Series 1221.
2. Pass & Seymour, Series 20AC1.
3. Leviton, Series 1221.

C. 20 AMP, 120–277 Volt Double Pole Switch:

1. Hubbell, Series 1222.
2. Pass & Seymour, Series 20AC2.
3. Leviton, Series 1222.

D. 20 AMP, 120–277 Volt Three–way Switch:

1. Hubbell, Series 1223.
2. Pass & Seymour, Series 20AC3.
3. Leviton, Series 1223.

E. 20 AMP, 120–277 Volt Four–way Switch:

1. Hubbell, Series 1224.
2. Pass & Seymour, Series 20AC4.
3. Leviton, Series 1224.

2.02 RECEPTACLES

A. 15 AMP, 120 Volt Single Convenience Receptacle:

1. Hubbell, Series 5261.
2. Pass & Seymour, Series 5261.
3. Leviton, Series 5261.

B. 15 AMP, 120 Volt Duplex Convenience Receptacle:

1. Hubbell, Series 5262.
2. Pass & Seymour, Series 5262.
3. Leviton, Series 5262.

C. 15 AMP, 120 Volt GFCI Receptacle:

1. Hubbell, Series GF–5262.
2. Pass & Seymour, Series 1591–S.
3. Leviton, Series 6598.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify conditions under provisions of Division 1.

B. Verify outlet boxes are installed at proper height.

C. Verify wall openings are neatly cut and will be completely covered by wall plates.

D. Verify floor boxes are adjusted properly.

E. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

F. Verify openings in access floor are in proper locations.

3.02 PREPARATION

A. Clean debris from outlet boxes.

3.03 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install devices plumb and level, and securely fastened.

C. Install switches with OFF position down.

D. Install receptacles with grounding pole on top.

E. Connect wiring devices by wrapping conductor around screw terminal.

F. Connect wiring device electrical grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.

DISTRIBUTION TRANSFORMERS

PART 1 – GENERAL

1.01 REFERENCES

A. ANSI/IEEE C57.12.90 – Test Code for Liquid–Immersed Distribution Power, and Regulating Transformers.

B. ASTM D877 – Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes.

C. NEMA 260 – Safety Labels for Padmounted Switchgear and Transformers Sited in Public Areas.

1.02 SUBMITTALS

A. Submit shop drawings under the provisions of Division 1.

B. Submit shop drawings indicating outline dimensions, connection and support points, weight, specified ratings and materials.

C. Submit product data under the provisions of Division 1.

D. Submit product data indicating standard model design tests and options.

E. Submit manufacturer's installation instructions under provisions of Division 1.

1.03 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Division 1.

B. Include procedures for cleaning unit, and replacing components.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in distribution transformers with 5 years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store and protect products under provisions of Division 1.

PART 2 – PRODUCTS

2.01 MANUFACTURERS – PAD MOUNTED TRANSFORMERS

A. Design and performance of the transformers shall be approved equal to the standard products of the Westinghouse Electric Corporation or General Electric Corporation, where those products conform to these specifications.

2.02 PADMOUNT TRANSFORMERS

A. The padmount transformer shall be 60 Hertz, 65 degrees Celsius Rise, oil immersed and self–cooled. The high voltage side shall be equipped with taps for de–energized operation. The high–voltage winding shall be rated at 95 KV BIL and the low–voltage winding shall be rated at 30 KV BIL. The padmount transformer shall conform to the following ratings:

1. 500 KVA.

2. Primary: 7.2/14.4 KV, three phase, delta, dual voltage.

3. Secondary: 480/277, three phase, wye.

B. Unit shall be constructed in accordance with ANSI Standard C57.12.26.

C. The transformer shall be furnished complete with oil (Non PCB) and all accessories suitable and ready for its intended use.

D. The transformer shall be painted olive green color, Munsell Number 7GY3.29/1.5 to blend in with surrounding landscapes, and shall meet EEI guidelines.

E. The transformer enclosure shall be so designed and constructed as to be tamper resistant. There shall be no exposed screws, bolts, or other fastening devices which are externally removable. There shall be no openings through which foreign objects such as sticks, rods, or wires might contact live parts. The construction shall limit the entry of water (other than flood water) into the compartment so as not to impair the operation of the transformer. The transformer enclosure shall utilize sealed-tank construction with a welded main cover. A bolted tamper-resistant hand-hole shall be provided in the tank cover on 3-phase units for access to internal connections. The enclosure shall also meet or exceed NEMA TR-P9-1977 and current ANSI standards, and shall conform to Western Underground Committee Guide 2.13 (Security for Padmounted Equipment Enclosure).

F. Full-height incoming and outgoing terminal sections shall be located side-by-side with the incoming line section on the left. To facilitate the making of the connections and to permit cable pulling, the terminal section hood and/or doors and roof shall be removable. The sill shall also be removable to permit sliding of the transformer unit on or off the pad without disturbing the cables or conduits. The terminal section hood and/or doors shall be suitable for padlocking.

G. The incoming line compartment shall enclose the high-voltage bushings and shall provide for incoming cable from below. The compartment shall have a hinged door with a fastening device which is accessible only through the low-voltage compartment, to make possible the use of a single padlock. The incoming line equipment shall be arranged for loop-feed and shall have dead-front construction. Equipment enclosed in the incoming line compartment shall include six (6) 200 amp bushing wells for loop-feed transformers in accordance with ANSI Standard C119.2.

H. The outgoing line compartment shall be arranged for cabling from below. The compartment door shall be hinged, have 3-point latching and shall be suitable for padlocking. Low voltage bushings shall be tinned, spade-type with 9/16" holes spaced on 1-3/4" centers, four holes per blade on 500 KVA and below and six (6) holes per blade on 750 KVA and above.

I. The transformer high voltage windings shall have three bayonet-type fuses, each provided in series with a current limiting fuse. The current limiting fuses shall be internal to the transformer tank, and shall isolate the faulted windings from the Distribution System. The current limiting fuses shall protect the transformer from overload conditions; and shall be oil-immersed, the drawout type, loadbreak design, and shall have an interrupting capacity of 3,500 amps.

J. The transformer shall be equipped with the following accessories:

1. A one-inch filling plug shall be located at the top of the front panel.
2. A one-inch drain valve and sampler shall be provided on 3-phase units, a plug shall be provided on a single phase units.
3. An instruction nameplate shall be furnished, and readable with cables in place. (WHere nameplate is mounted on a removable part, the manufacturer's name and transformer serial number shall be permanently affixed to a non-removable part).
4. A liquid-level indication gauge shall be provided on three-phase transformers, and on oil level plug on single-phase transformers.
5. Tapped holes shall be provided in both the low-voltage and high-voltage sections for tank grounding.
6. An automatic pressure relief device shall be provided.
7. The high voltage section shall be equipped with a tap-changer for de-energized operation only, and must be externally operable with a hot-stick and must require at least two operator actions to change taps. Taps shall be four 2-1/2% below rated voltage for all transformers.
8. Internal oil-immersed, load break switches for loop-feed operation with a continuous current rating of 200 amps on 500 KVA and below or 300 amps on 750 KVA and above shall be provided. The switch shall be three (3) two-position switches. The switches must be capable of switching the continuous rated current to permit sectionalizing of the loop. Make-and-latch and momentary ratings shall be 10,000 amps symmetrical. The switches controls shall be located in the primary compartment convenient for hot-stick operation. The switch shall provide for: (1) feed right, (2) feed left, (3) feed through, and (4) transformer off (with circuits tied through).

K. The successful bidder shall, upon execution of the Contract, furnish three (3) prints each of drawings including the following:

1. Outline drawing showing principle view and dimensions and including a descriptive table of the transformer fittings.
2. Nameplate drawing including wiring diagram.
3. Time-current characteristic curves for the fuses.

The successful bidder shall furnish an instruction book in triplicate for each item awarded, covering detailed instructions on the proper installation, operation and maintenance of the equipment. The instruction book shall also cover the identity of various parts and the ordering procedures for repair parts.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that area is ready to receive work.

B. Verify field measurements are as instructed by manufacturer.

C. Verify that required utilities are available, in proper location and ready for use.

D. Beginning of installation means installer accepts conditions.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install safety labels to NEMA 260.

3.03 FIELD QUALITY CONTROL

A. Test dielectric liquid to ASTM D877, using 25,000 volts minimum breakdown voltage, after installation and before energizing from system.

B. Test transformer to ANSI/IEEE C57.12.90, and C57.12.91.

PRIMARY GROUNDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provide grounding electrode systems to ground service entrances.

B. Provide minimum of 3 ground rods for each ground electrode system.

1.02 REFERENCES

A. Underwriters Laboratories, Incorporated (UL)

1. 467 Grounding and Bonding Equipment

1.03 SUBMITTALS

A. Upon project completion submit letter showing measured ground resistance of each grounding electrode system. Letter shall indicate locations of ground rods and soil conditions at time measurements were made.

PART 2 - PRODUCTS

2.01 CONDUCTORS

A. Grounding conductors shall be copper conductors.

2.02 ELECTRODES

A. Ground rods shall be 3/4 inch diameter by 10 feet copper-clad steel.

PART 3 - EXECUTION

3.01 GROUNDING ELECTRODE SYSTEM RESISTANCE

A. If grounding electode system resistance to earth exceeds 3 ohms measured not less than 48 hours after rainfall, expand grounding electrode system until resistance is below 3 ohms.

1. Expanding each grounding electrode system shall consist of driving more ground rods and bonding them to the grounding electrode system.
2. Do not use chemical treatments to lower resistance.

3.02 GROUND RODS

A. Drive ground rods full length into ground until 1 foot below grade.

B. Space ground rods a minimum of 10 feet apart center to center.

3.03 CONNECTIONS

A. Provide exothermic process welds for buried connections.

3.04 GROUNDING ELECTRODE SYSTEM RESISTANCE MEASUREMENTS

A. Accomplish measurements not less than 48 hours after rainfall.

B. Isolate each grounding electrode system from other grounds during test.

C. Do not accomplish measurements until Engineer is present at site.

DISCONNECT SWITCHES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Disconnect switches.

B. Fuses.

C. Enclosures.

1.02 REFERENCES

A. ANSI/UL 198C - High-Intensity Capacity Fuses; Current Limiting Types.

B. ANSI/UL 198E - Class R Fuses.

C. FS W-F-870 - Fuseholders (For Plug and Enclosed Cartridge Fuses).

D. FS W-S-865 - Switch, Box, (Enclosed), Surface-Mounted.

E. NEMA KS 1 - Enclosed Switches.

1.03 SUBMITTALS

A. Submit product data under provisions of Division 1.

B. Include outline drawings with dimensions, and equipment ratings for voltage, capacity, horsepower, and short circuit.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - DISCONNECT SWITCHES

A. Square D.

B. Westinghouse.

C. Siemens.

2.02 DISCONNECT SWITCHES

A. Fusible Switch Assemblies: NEMA KS 1; quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: Designed to accommodate Class R fuses.

B. Nonfusible Switch Assemblies: NEMA KS 1; Type HD; quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.

C. Enclosures: NEMA KS 1; Type 1 as indicated on Drawings.

2.03 ACCEPTABLE MANUFACTURERS - FUSES

A. Bussman.

B. Chase Shawmut.

2.04 FUSES

A. Fuses 600 Amperes and Less: ANSI/UL 198E, Class RK1; current limiting, time delay, one-time fuse.

B. Interrupting Rating: 200,000 rms amperes.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install disconnect switches where indicated on Drawings.

B. Install fuses in fusible disconnect switches.

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WIRED GROUND SYSTEM

PART 1 – GENERAL

1.01 SCOPE

A. Furnish and install a complete wired grounding system for electrical equipment and circuits as shown on the Drawings and described generally below.

1.02 REFERENCES

A. Underwriters Laboratories, Incorporated (UL)

1. 467 Grounding and Bonding Equipment

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.01 NEUTRAL GROUNDING SYSTEM

A. The system neutral ground originates at each transformer. Transformers are supplied with a Delta connection on the primary and with a wye connection on the secondary.

B. The secondary wye neutral point of each transformer shall be connected to the equipment ground conductor for connection to the ground system.

3.02 EQUIPMENT GROUNDING SYSTEM

A. The equipment ground is established at each secondary transformer winding at the same point that the system neutral originates.

B. The equipment ground conductor is distinct and separate from the system neutral ground conductor and shall not be used as a load current-carrying conductor.

C. The equipment ground conductor shall be electrically and mechanically continuous from the source of supply to the equipment to be grounded.

D. The armor of interlocked armor cable, wiring channels, cable trays, and all metallic conduit, including rigid, electrical metallic tubing and flexible conduits, shall be connected at each end to the equipment ground conductor utilizing a conduit grounding bushing. Switchgear, panelboards, and motor control panels shall be provided with an equipment ground bus (including lug or screw terminals) securely bonded to the enclosure. Junction boxes and other enclosures (sizes above 5" x 5") shall utilize an equipment ground bus or lug as required to securely bond the equipment ground conductor to the enclosure.

3.03 IMPORTANCE OF "GROUND" CONDUCTORS

A. The Contractor must recognize the importance of the white neutral conductor and the green equipment ground conductor in the distribution wiring external to the switchgear and connecting points inside the switchgear. FAILURE TO DO SO NULLIFIES THE DESIRED OPERATION OF THE CIRCUIT PROTECTIVE DEVICE.

B. White Neutral Conductor – Each conduit feeding line to neutral loads must contain both an equipment ground conductor and an insulated white neutral conductor.

3.04 GROUND CONDUCTORS

A. Ground conductors shall be as indicated on the drawings. If size is not indicated on the drawings, use NEC Article 250-95.

B. Install green insulated conductors for grounding conductors for sizes #6 and smaller. Install bare stranded conductor, with green tape, for sizes #4 A.W.G. and larger.

C. Where green insulation is not available for #6 or #8 AWG, black insulation shall be used and identified with green tape at each junction box or device enclosure.

MOTOR CONTROL

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Motor control centers.

1.02 REFERENCES

A. ANSI/NEMA ICS 6 – Enclosures for Industrial Controls and Systems.

B. FS W-C-375 – Circuit Breakers, Molded Case; Branch Circuit and Service.

C. FS W-P-115 – Power Distribution Panel.

D. NEMA AB 1 – Molded Case Circuit Breakers.

E. NEMA ICS 2 – Industrial Control Devices, Controllers, and Assemblies.

F. NEMA KS 1 – Enclosed Switches.

G. NEMA PB 1 – Panelboards.

H. NEMA PB 1.1 – Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

1.03 SUBMITTALS

A. Submit shop drawings and product data under provisions of Division 1.

B. Indicate on shop drawings, front and side views of motor control center enclosures with overall dimensions. Include conduit entrance locations and requirements; nameplate legends; size and number of bus bars per phase, neutral, and ground; electrical characteristics including voltage, frame size and trip ratings, withstand ratings, and time-current curves of all equipment and components.

C. Provide product data on motor starters and combination motor starters, relays, pilot devices, and switching and overcurrent protective devices.

D. Submit manufacturers' instructions under provisions of Division 1.

1.04 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Division 1.

B. Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 1.

B. Deliver in 60 inch maximum width shipping splits, individually wrapped for protection, and mounted on shipping skids.

C. Store and protect products under provisions of Division 1.

D. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

E. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to motor control center components, enclosure, and finish.

1.06 SPARE PARTS

A. Keys: Furnish two each to Owner.

B. Fuses: Furnish to Owner 3 spare fuses of each type and rating installed.

C. Fuse Pullers: Furnish one fuse puller to Owner.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS – MOTOR CONTROL CENTER

A. Allen-Bradley.

B. Square D.

C. Westinghouse.

2.03 MOTOR CONTROL CENTER RATINGS

A. Motor Control Centers: NEMA ICS 2; Class I, Type B.

B. Main Overcurrent Protection: Circuit Breaker.

C. Motor Starters: As scheduled.

D. Feeder Tap Units: Circuit Breakers.

E. Voltage Rating: 480 volts, three phase, three wire, 60 Hertz.

F. Horizontal Bussing: Copper, with a continuous current rating of 600 amperes. Include copper ground bus entire length of control center.

G. Vertical Bussing: NEMA ICS 2; copper.

H. Integrated Equipment Short Circuit Rating: 22,000 amperes rms symmetrical at 480 volts.

I. Configuration: Units front mounting only, accessible from the front only.

J. Enclosure: ANSI/NEMA ICS 6; Type 1.

K. Finish: Manufacturer's standard gray enamel.

L. Control Transformer: Provide standard size control transformers to provide 120 volt control source for each motor starter in motor control center.

M. Control: Provide control devices as shown on Drawings.

N. Front Elevation: As shown on drawings.

O. Overload: Provide overload heater elements in motor starters per actual motor nameplate FLA rating.

2.04 MOTOR CONTROL CENTER UNITS

A. Main Breaker

1. 600A, 3P circuit breaker
2. Top of leftmost section
3. Voltmeter switch and voltmeter

B. Lighting Panel

1. 240/120v, single phase, 3 wire
2. 40A main breaker
3. 16 1-pole spaces
4. 7.5 kva transformer

C. Sump Pump

1. Size 2 FVNR starter
2. 30A, 3P circuit breaker
3. Ground fault sensor and relay for personnel protection.
4. Push to test transformer type indicating lights: red "Running" light, green "Ready" light.

D. Unit Heater

1. 20A, 3P circuit breaker.

E. Pump #1, #2, and #3

1. 150 HP Solid State motor controller with isolation and bypass contactors.
2. 225A, 3P circuit breaker.
3. Elapsed time meter mounted in door.
4. Starts counter mounted in door.
5. Ammeter switch and ammeter mounted in door.
6. Hand-off-auto selector switch.
7. Push-to-test transformer type indicating lights: red "Running" light, green "Ready" light.

F. Pump #1, #2, and #3 Capacitor Banks

1. 100A, 3P contactor.
2. 100A, 3P circuit breaker.
3. Push-to-test transformer type indicating lights: red "Running" light, green "Ready" light.

G. SLUICE GATE

1. Size 1 FVR starter.
2. 20A, 3P circuit breaker.
3. "Start", "Close" and "Open" momentary pushbutton switches.
4. Push-to-test transformer type indicating lights: red "Closing" light, amber "Opening" light, green "Ready" light.

H. Pump Controls

1. Provide 30" wide by 42" high space with door for pump controls.
2. Mount front panel controls on door as shown on drawings.
3. Provide controls as described in the next section.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install motor control equipment in accordance with manufacturer's instructions.

B. Motor Starter Panelboard Installation: In conformance with NEMA PB 1.1.

C. Select and install heater elements in motor starters to match installed motor characteristics.

D. Motor Data: Provide neatly typed label inside each motor starter enclosure door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

PUMP CONTROLS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Pushbutton and selector switches.

B. Relays.

C. Time delay relays.

D. Pilot lights.

E. Pneumatic controls.

F. Air compressor system.

G. Control panel.

1.02 RELATED SECTIONS

A. Section 16480 – Motor Control.

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1.03 SUBMITTALS

A. Submit shop drawings under provisions of Division 1.

B. Submit product data under provisions of Division 1.

C. Submit product data for each component specified.

D. Submit manufacturer's installation instructions under provisions of Division 1.

1.04 PROJECT RECORD DOCUMENTS

A. Submit record documents under provisions of Division 1.

B. Accurately record actual locations of control equipment. Revise diagrams included in Drawings to reflect actual control device connections.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit operation data under provisions of Division 1.

B. Include instructions for adjusting and resetting time delay relays, timers, and counters.

C. Submit maintenance data under provisions of Division 1.

D. Include recommended preventive maintenance procedures and materials.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum five years experience.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Allen Bradley.

B. General Electric.

C. Square D.

D. Substitutions: Under provisions of Division 1.

2.02 CONTROL SWITCHES AND STATIONS

A. Contacts: As required.

B. Selector Switches Operators: Three or four position rotary selector switch.

D. Pushbutton Switch: Heavy duty oiltight type pushbutton.

2.03 CONTROL RELAYS

A. Contacts: As required.

B. Contact Ratings: 10A at 120VAC

C. Coil Voltage: 120 volts, 60 Hz, AC.

2.04 TIME DELAY RELAYS

A. Contacts: As required.

B. Contact Ratings: 10A at 120VAC.

C. Coil Voltage: 120 volts, 60 Hz, AC.

D. Time-Delay Relays: Solid-state time-delay relay.

2.05 PILOT LIGHTS

A. Provide push-to-test transformer type pilot lights.

B. Voltage: 120VAC, 60 HZ.

C. Color: As shown on drawings.

2.06 PNEUMATIC CONTROLS

A. Provide complete pneumatic controls system as described on drawings.

2.07 AIR COMPRESSOR SYSTEM

A. Provide duplex air compressor system as described on drawings.

2.08 CONTROL PANEL

A. Enclosure: Supply and install interior back panel in dedicated section of MCC. Mount all control devices excluding air compressor controls in this section.

B. Wiring Trough: Panduit Corp. or approved equal, sized for 25% fill.

C. Terminal Boards: AB 1492-FI or approved equal. Provide tubular screw type terminal blocks with pressure plates for all wiring into or out of the panel plus 20% spares.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install devices and equipment in accordance with manufacturer's instructions.

B. Provide control wiring that is neatly bundled with wire ties and run inside plastic wire troughs.

C. Install relays and time delay relays on relay mounting strip.

D. Make electrical wiring interconnections as shown on Drawings.

E. Identify all conductors with numbers matching the wiring diagrams for ease of proper connections and repairs. Standard, permanent labels shall be used.

F. Wiring diagrams shall be installed inside all control panels and shall be permanently mounted to such with "Plexiglass Covers" to protect the diagram from damage.

LUMINAIRES

PART 1 - GENERAL

1.01 SECTIONS INCLUDED

A. Luminaires and accessories.

B. Ballasts.

C. Lamps.

D. Luminaire accessories.

1.02 RELATED SECTIONS

A. Boxes.

1.03 REFERENCES

A. ANSI C78.379 - Electric Lamps - Incandescent and High-Intensity Discharge Reflector Lamps - Classification of Beam Patterns.

B. ANSI C82.1 - Ballasts for Fluorescent Lamp - Specifications.

C. ANSI C82.4 - Ballasts for High-Intensity-Discharge and Low Pressure Sodium Lamps (Multiple Supply Type.)

D. ANSI/NFPA 70 - National Electrical Code.

E. ANSI/NFPA 101 - Life Safety Code.

F. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.04 SUBMITTALS

A. Submit under provisions of Division 1.

B. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.

C. Product Data: Provide dimensions, ratings and performance data.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

E. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 1.

B. Accurately record actual locations of each luminaire.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division 1.

B. Maintenance Data: Include replacement parts list.

1.07 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years documented experience.

1.08 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Conform to requirements of NFPA 101.

C. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.09 EXTRA MATERIALS

A. Furnish under provisions of Division 1.

B. Provide two of each plastic lens.

C. Provide replacement lamp for each lamp installed.

D. Provide two of each ballast type.

PART 2 - PRODUCTS

2.01 LUMINAIRE TYPE CL1

A. Manufacturer

1. Lithonia
2. Keene
3. Metalux

B. Description: 2-lamp, fluorescent, wet location, high-impact acrylic diffuser. Lithonia Cat. #DV240AR120 or equivalent.

C. Lamps: F40.

D. Ceiling mount as high as possible.

2.02 LUMINAIRE TYPE W1

A. Manufacturer

1. Lithonia.
2. McGraw-Edison.
3. Hubbell.

B. Description: Outdoor, well-mounted, HPS. Lithonia Cat. #TWP70SR120.

C. Lamps: 70W HPS.

D. Mount as shown on Drawings.

2.03 BALLASTS

A. Fluorescent Ballast:

1. Advance.
2. Universal.
3. Substitutions: Under provisions of Division 1.
4. Description: ANSI C82, high power factor type electromagnetic ballast.
5. Provide ballast suitable for lamps specified.
6. Voltage: Match luminaire voltage.
7. Source Quality Control: Certify ballast design and construction by Certified Ballast Manufacturers, Inc.

B. High Intensity Discharge (HID) Ballast:

1. Advance.
2. Universal.
3. Substitutions: Under provisions of Division 1.
4. Description: ANSI C82.4, high power factor lamp ballast.
5. Provide ballast suitable for lamps specified.
6. Voltage: Match luminaire voltage.

2.04 LAMPS

A. High Intensity Discharge (HID) Lamp Manufacturers:

1. Sylvania.
2. G.E.
3. Phillips.
4. Substitutions: Under provisions of Division 1.

B. Provide lamp type specified for luminaire.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrate and supporting grids for luminaires.

B. Examine each luminaire to determine suitability for lamps specified.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install suspended luminaires using pendant supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.

C. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prohibit movement.

D. Install wall mounted luminaires at height as indicated on Drawings.

E. Install accessories furnished with each luminaire.

F. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

G. Bond products and metal accessories to branch circuit equipment grounding conductor.

H. Install specified lamps in each luminaire.

TRACKING # — 8850912 DATE: — 8/3/92 CAD OPER. — TWV

3.03 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.04 ADJUSTING

A. Adjust work under provisions of Division 1.

B. Aim and adjust luminaires as directed.

C. Relamp luminaires at Substantial Completion.

3.05 CLEANING

A. Clean work under provisions of Division 1.

B. Clean electrical parts to remove conductive and deleterious materials.

C. Remove dirt and debris from enclosure.

D. Clean photometric control surfaces as recommended by manufacturer.

E. Clean finished and touch up damage.

3.06 DEMONSTRATION

A. Provide systems demonstration under provisions of Division 1.

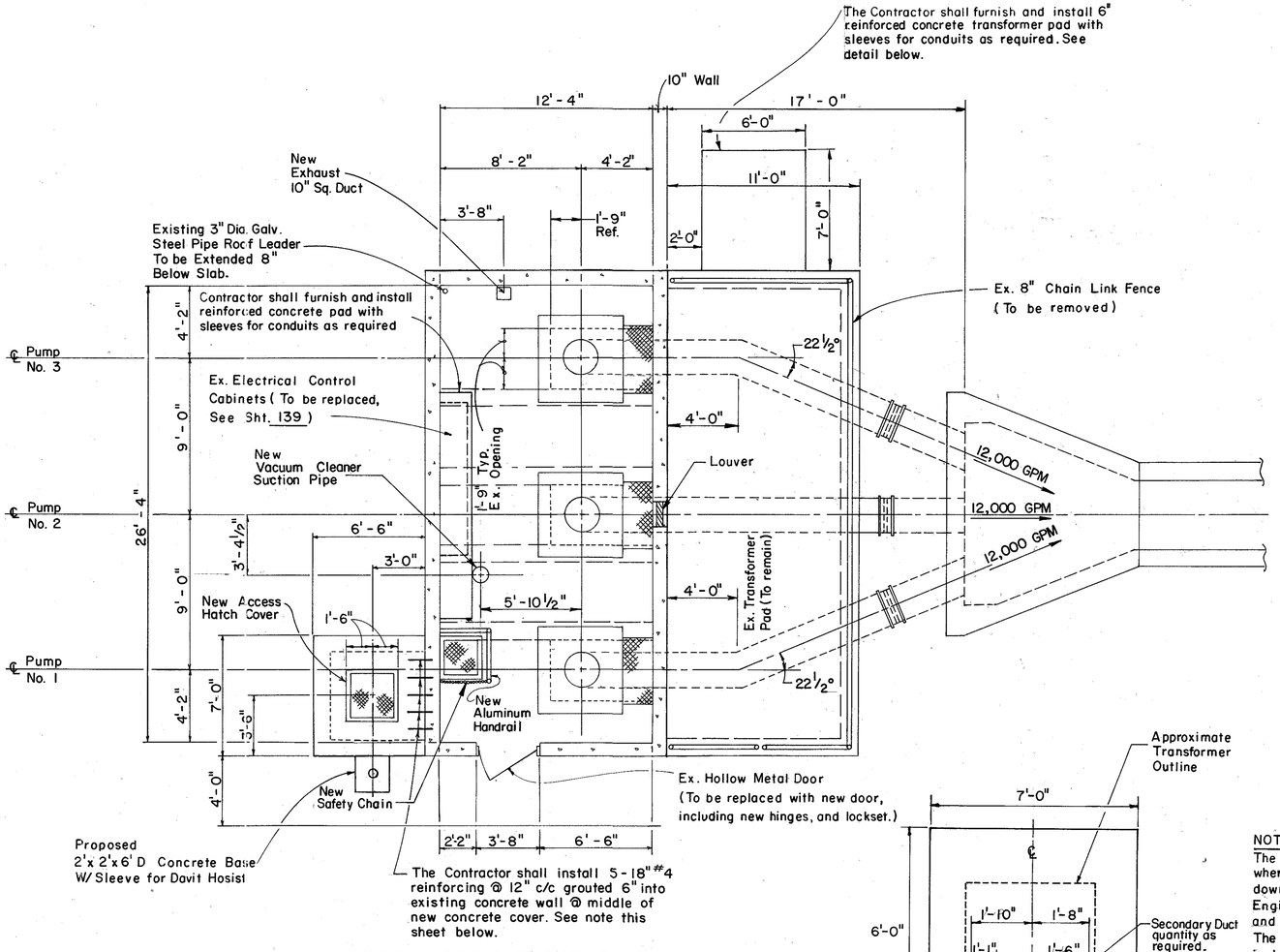
B. Provide minimum of two hours demonstration of luminaire operation.

TRACKING # — 9850903 DATE: — 9/8/93 CAD OPER. — TWV

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

135
224

FRANKLIN COUNTY
FRA - 670 - 1.25 - C - 3



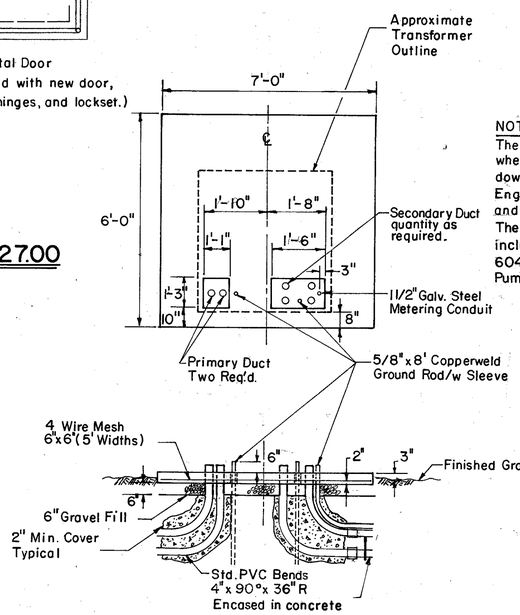
MOTOR ROOM FLOOR PLAN ELEV. ~ 727.00

SECTION B-B

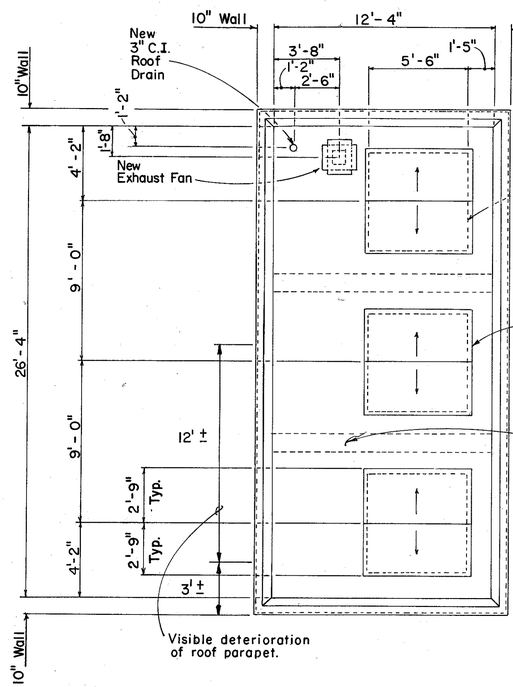
For new electrical panel and equipment locations, See Sheet 139

ADJUST ACCESS HATCH COVER

The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to adjust the access hatch cover to Elev. 725.00 as shown on sheet 135 & 137. The cost to complete this work shall be included in the lump sum price bid for Item 604 - Drainage Structure, Misc.: Renovate Pump Station ST-5.



TRANSFORMER PAD



NOTE:
The Contractor shall repair the roof parapet where shown by removing deteriorated concrete down to sound concrete and to the approval of the Engineer. The contractor shall then form and pour new concrete as required per Item 511. The cost to complete this work shall be included in the Lump Sum price bid for Item 604 - Drainage Structure, Misc.: Renovate Pump Station ST-5.

ROOF PLAN

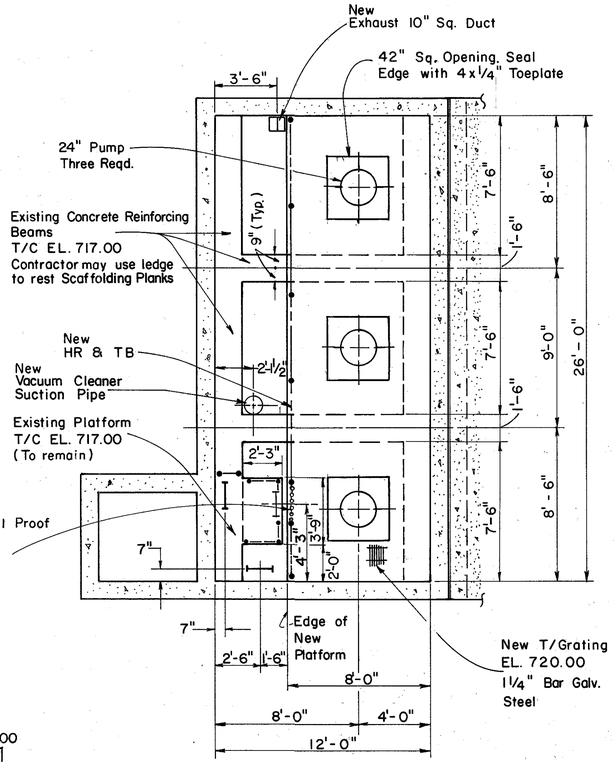
VIEW A-A

PUMP STATION ST-5 PLAN VIEW

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

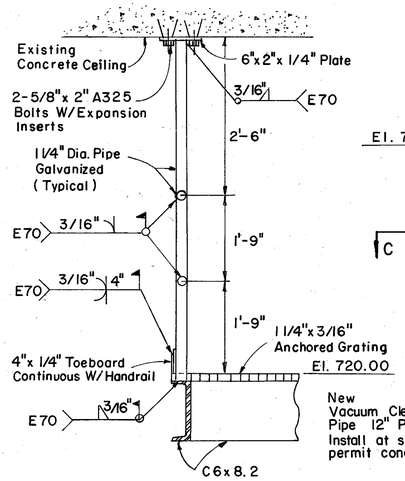
136
224

FRANKLIN COUNTY
FRA - 670 - 1.25 - C - 3



The Contractor shall field verify all measurements.

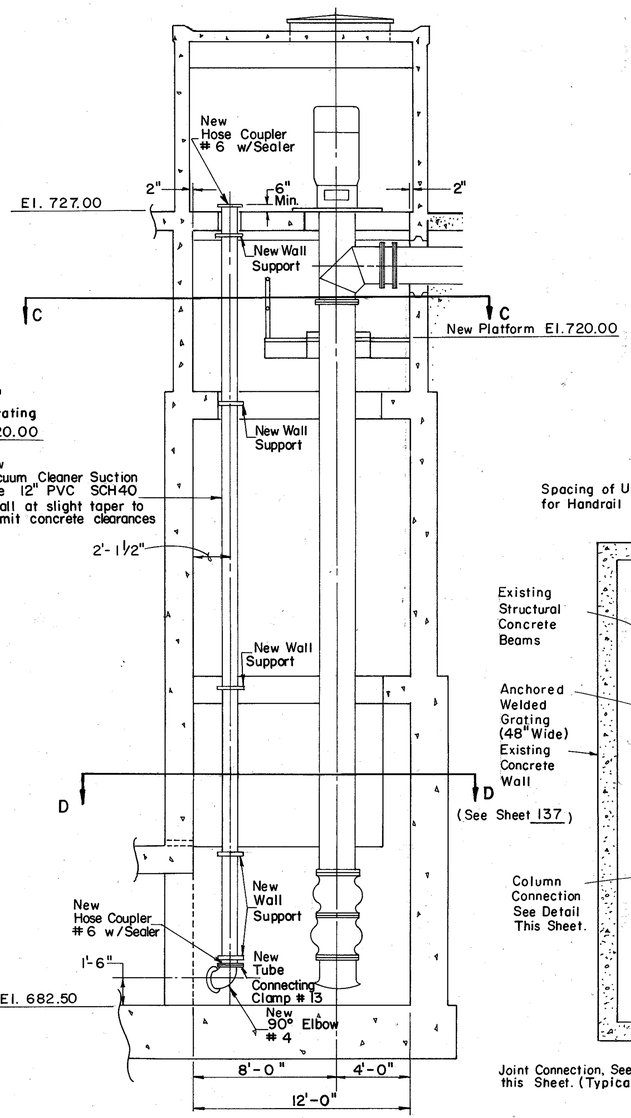
SECTION C-C



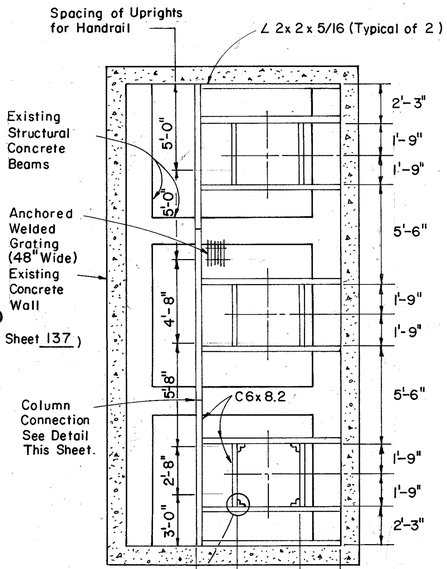
HANDRAIL MOUNTING DETAIL

Not to Scale

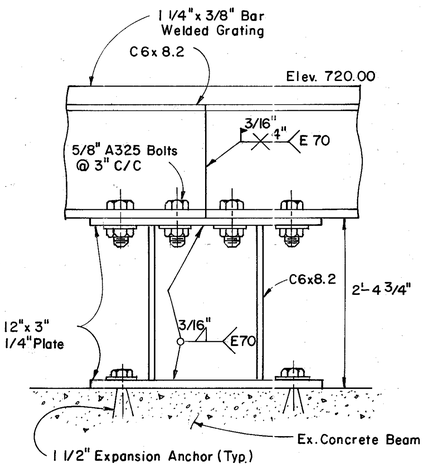
The Contractor shall field verify all measurements.



WET WELL CLEANING TUBE DETAIL

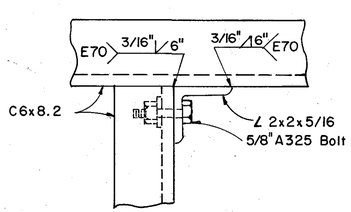


PLATFORM FRAMING PLAN

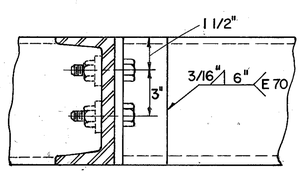


COLUMN CONNECTION

(Typical of 2 - Looking East)
Not to Scale



PLAN VIEW



SECTION

DETAIL A

JOINT CONNECTION

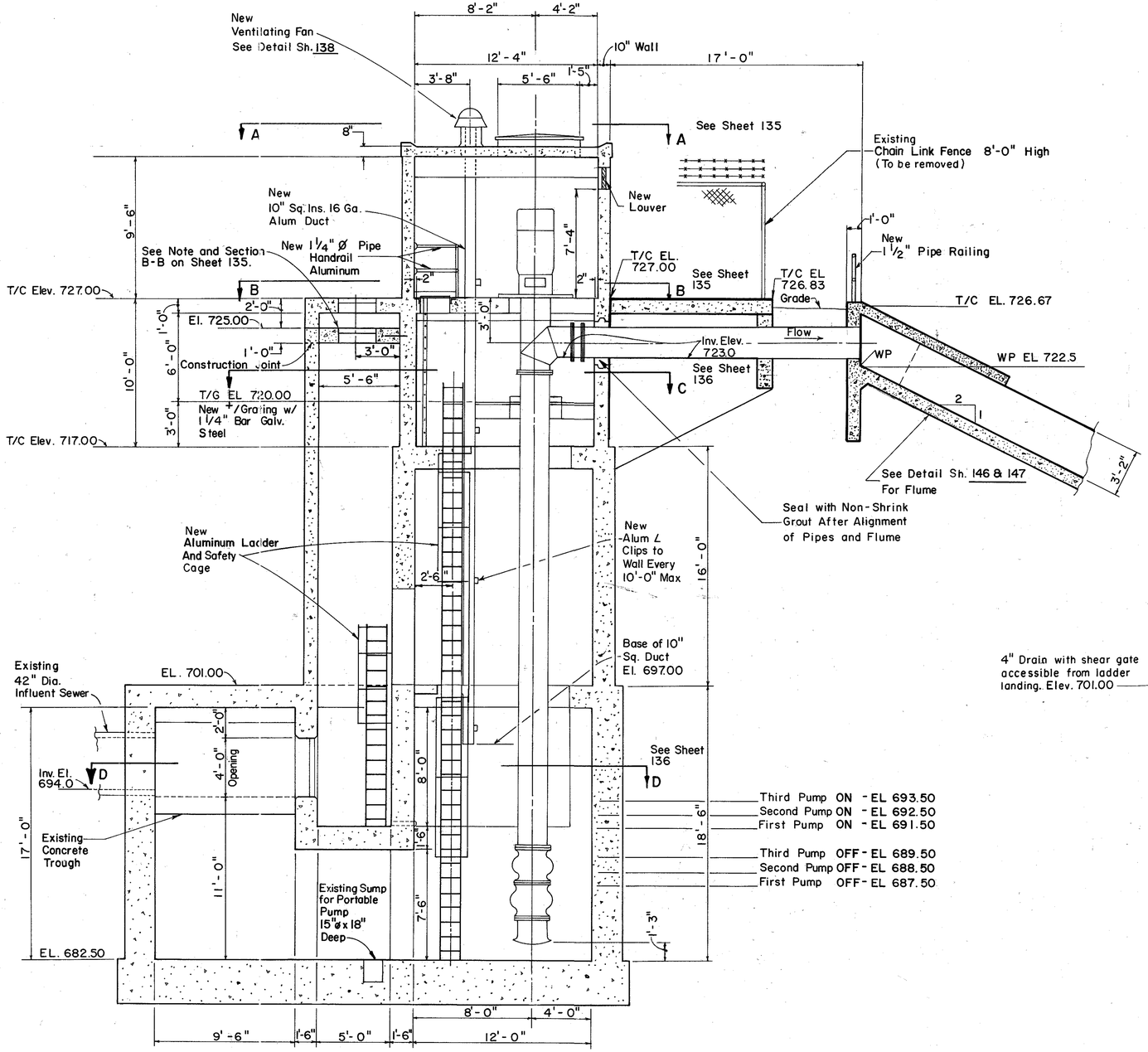
(Wall Connection Similar with Expansion Inserts installed in Concrete Wall)
Not to Scale

PUMP STATION ST-5 SECTIONS

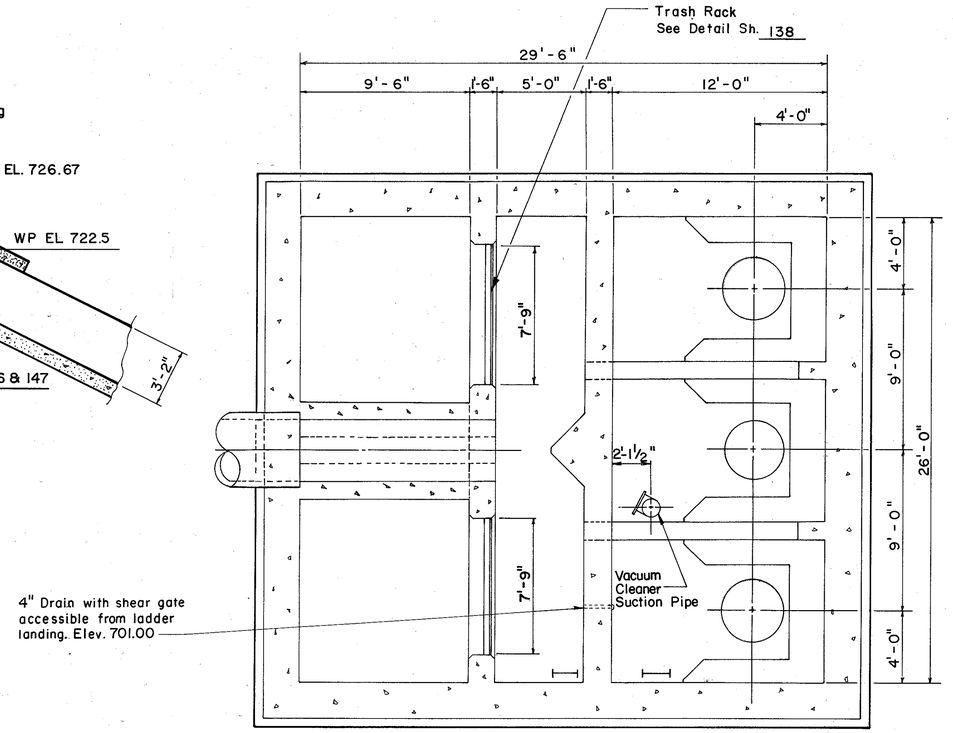
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

137
224

FRANKLIN COUNTY
FRA - 670-1.25-C-3



LONGITUDIAL SECTION



PLAN OF WET WELL & TRASH CHAMBER

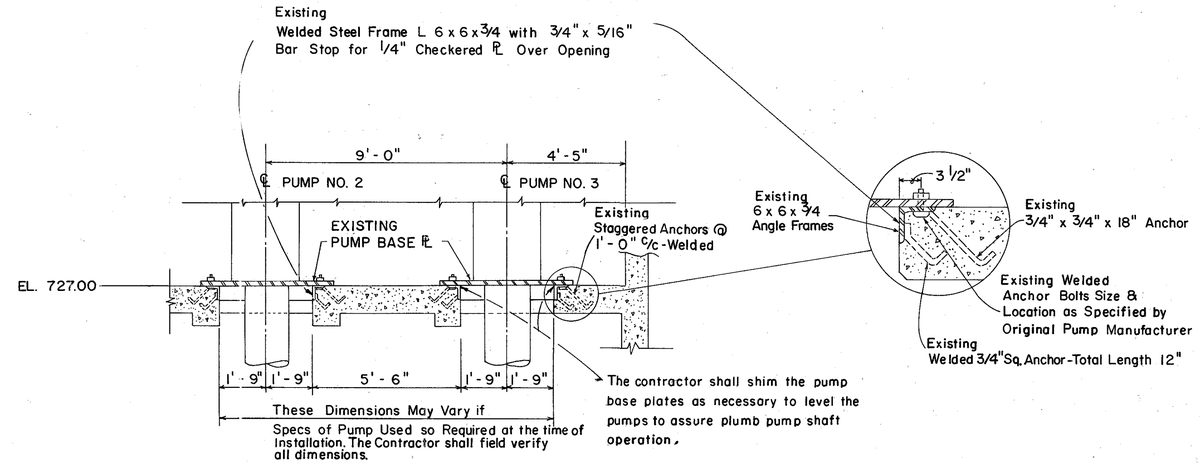
SECTION D-D

PUMP STATION ST-5 SECTIONS

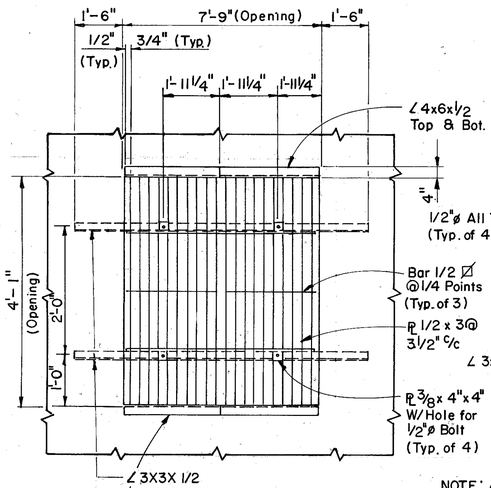
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

138
224

FRANKLIN COUNTY
FRA - 670 - 1.25 - C - 3



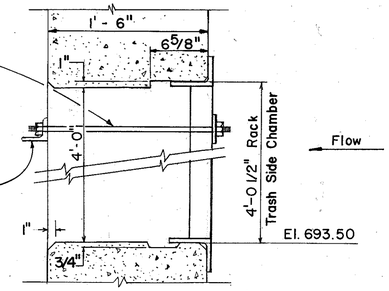
EXISTING FRAMING AROUND FLOOR OPENINGS FOR PUMPS



TRASH RACK

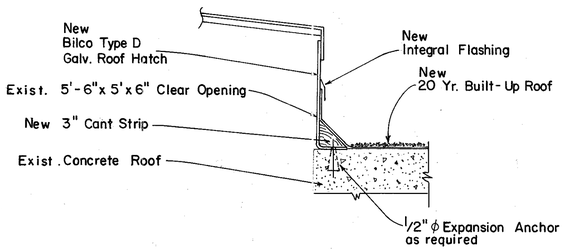
2 - REQUIRED

The contractor shall cut the ∠ 4x6x1/2 (Top & Bott.) where shown to ease handling of the rack thru the access opening at the top of the trash chamber.

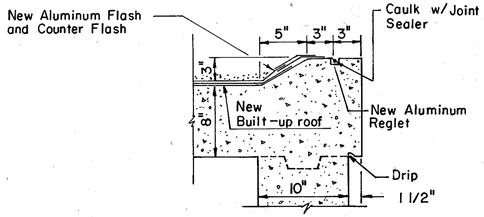


NOTE: All steel to be galvanized

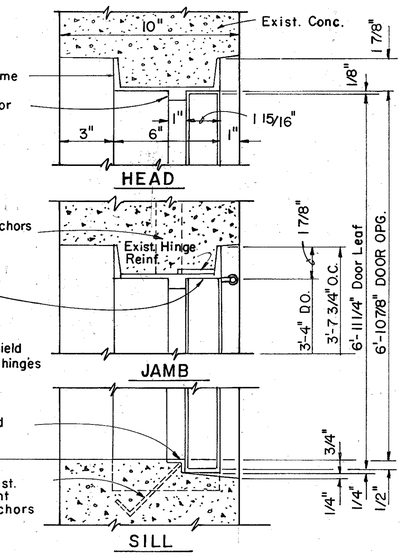
SECTION THRU TRASH RACK



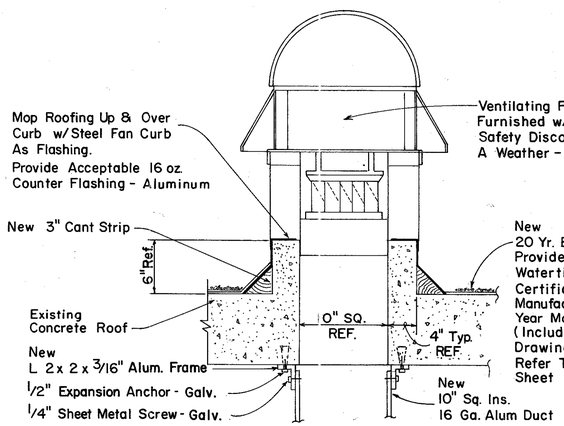
ROOF HATCH DETAIL



EAVE DETAIL

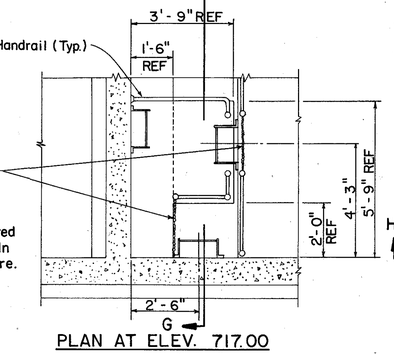


EXIST. DOOR DETAILS

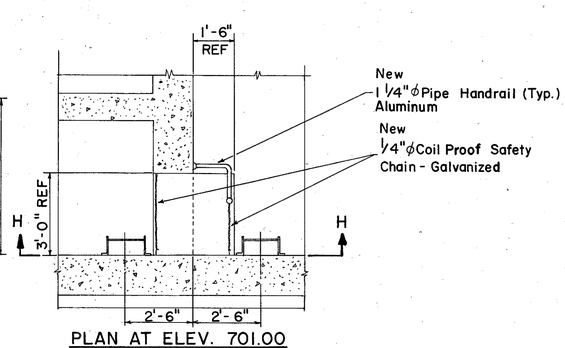


VENTILATING FAN DETAIL (A)

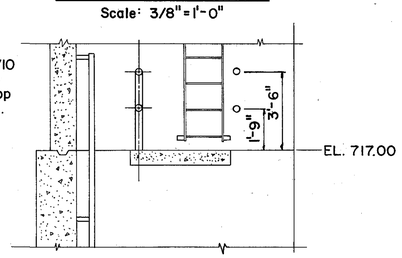
1 - REQUIRED



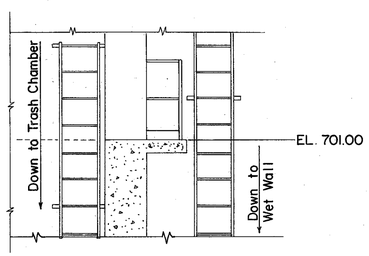
PLAN AT ELEV. 717.00
Scale: 3/8"=1'-0"



PLAN AT ELEV. 701.00

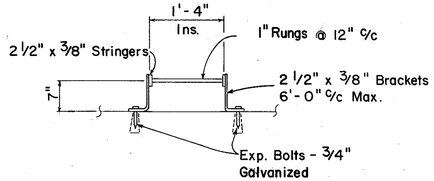


SECTION G-G



SECTION H-H

DETAILS OF LADDER LANDINGS



NEW LADDER DETAIL

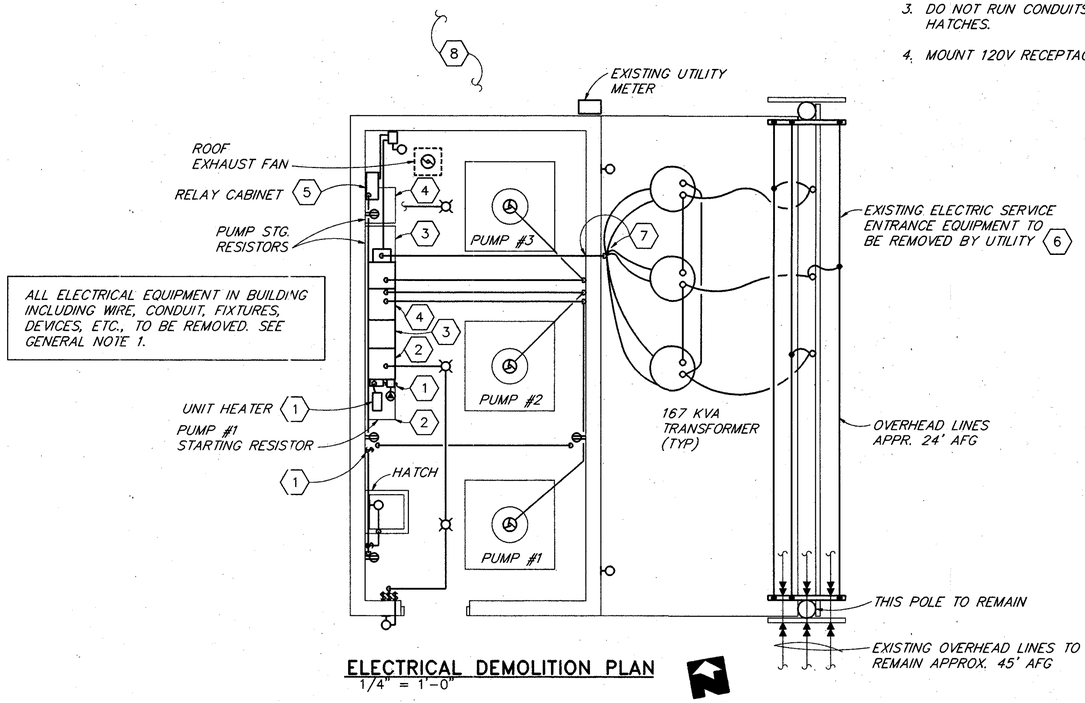
NOTE: Contractor to Patch Holes Whenever Existing Expansion Bolts are Removed. Do Not Reuse Existing Expansion Anchors or Expansion Anchor Holes. Ladder and Brackets to be Aluminum. All Dissimilar Metals to be Insulated to Prevent Electrolysis Corrosion.

PUMP STATION ST-5 DETAILS

FRANKLIN COUNTY
FRA-670-1.25-C-3

GENERAL NOTES

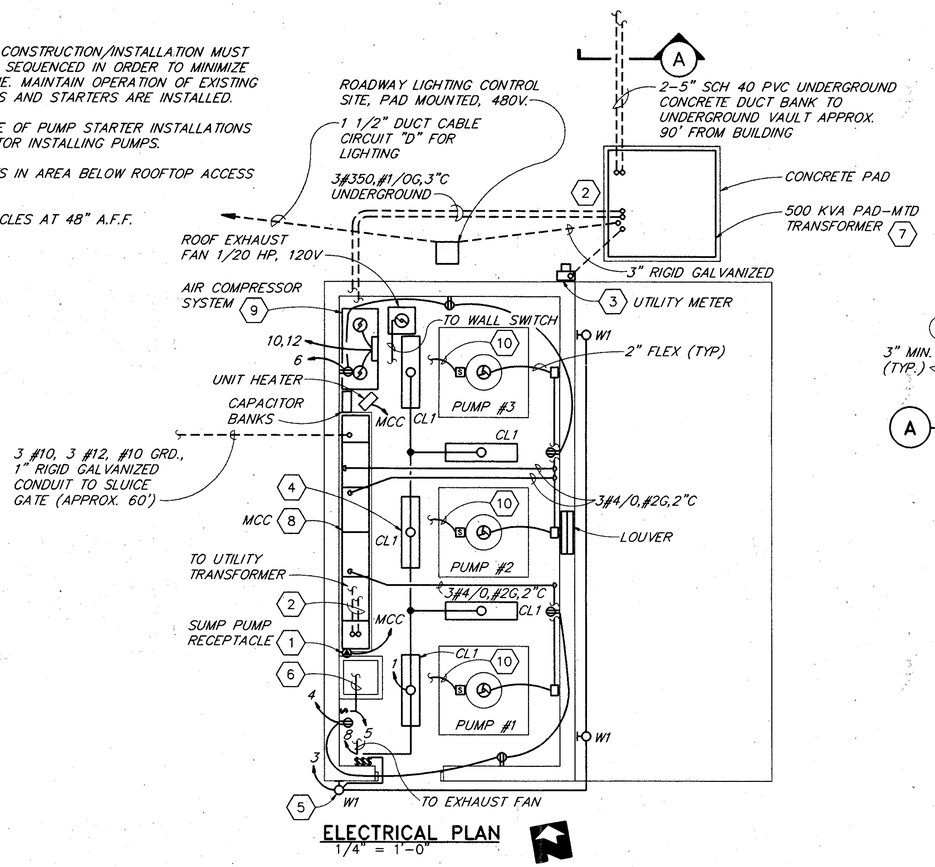
1. DEMOLITION AND NEW CONSTRUCTION/INSTALLATION MUST BE COORDINATED AND SEQUENCED IN ORDER TO MINIMIZE LIFT STATION DOWNTIME. MAINTAIN OPERATION OF EXISTING PUMPS AS NEW PUMPS AND STARTERS ARE INSTALLED.
2. COORDINATE SCHEDULE OF PUMP STARTER INSTALLATIONS WITH MECH. CONTRACTOR INSTALLING PUMPS.
3. DO NOT RUN CONDUITS IN AREA BELOW ROOFTOP ACCESS HATCHES.
4. MOUNT 120V RECEPTACLES AT 48" A.F.F.

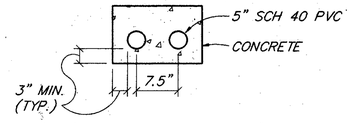


ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"

DEMOLITION NOTES

1. REMOVE ALL EQUIPMENT TO LEFT OF EXISTING MCC TO ALLOW FOR INSTALLATION OF MAIN INCOMING SECTION OF NEW MCC.
2. REMOVE PUMP #1 STARTER AND STARTING RESISTOR. COORDINATE SCHEDULE WITH MECH. CONTRACTOR REMOVING EXISTING PUMP #1.
3. REMOVE PUMP #2 STARTER AND STARTING RESISTOR. COORDINATE SCHEDULE WITH MECH. CONTRACTOR REMOVING EXISTING PUMP #2.
4. REMOVE PUMP #3 STARTER AND STARTING RESISTOR. COORDINATE SCHEDULE WITH MECH. CONTRACTOR REMOVING EXISTING PUMP #3.
5. CONTROL RELAY CABINET AND ASSOCIATED WIRING MAY BE REMOVED AFTER EXISTING PUMPS ARE REMOVED.
6. EXISTING ELECTRIC SERVICE TO BE REMOVED BY UTILITY: 3 TRANSFORMERS, OVERHEAD GRID, POLE AND ASSOCIATED HARDWARE AT NORTH END OF FENCE, CT'S, METERS, ALL WIRING AND EQUIPMENT ASSOCIATED WITH SERVICE ENTRANCE TO THIS FACILITY.
7. REMOVE CONDUIT, WEATHERHEAD AND ALL WIRING, COORDINATE WITH UTILITY. SEAL WALL PENETRATION MATCHING COLOR ON INTERIOR AND EXTERIOR SO CLOSELY AS POSSIBLE.
8. EXISTING ROADWAY LIGHTING CONTROLS TO BE DISCONNECTED AND RECONNECTED IN ACCORDANCE WITH LIGHTING PLANS, SEE SH. 99-106.





A DUCT BANK DETAIL
N.T.S.

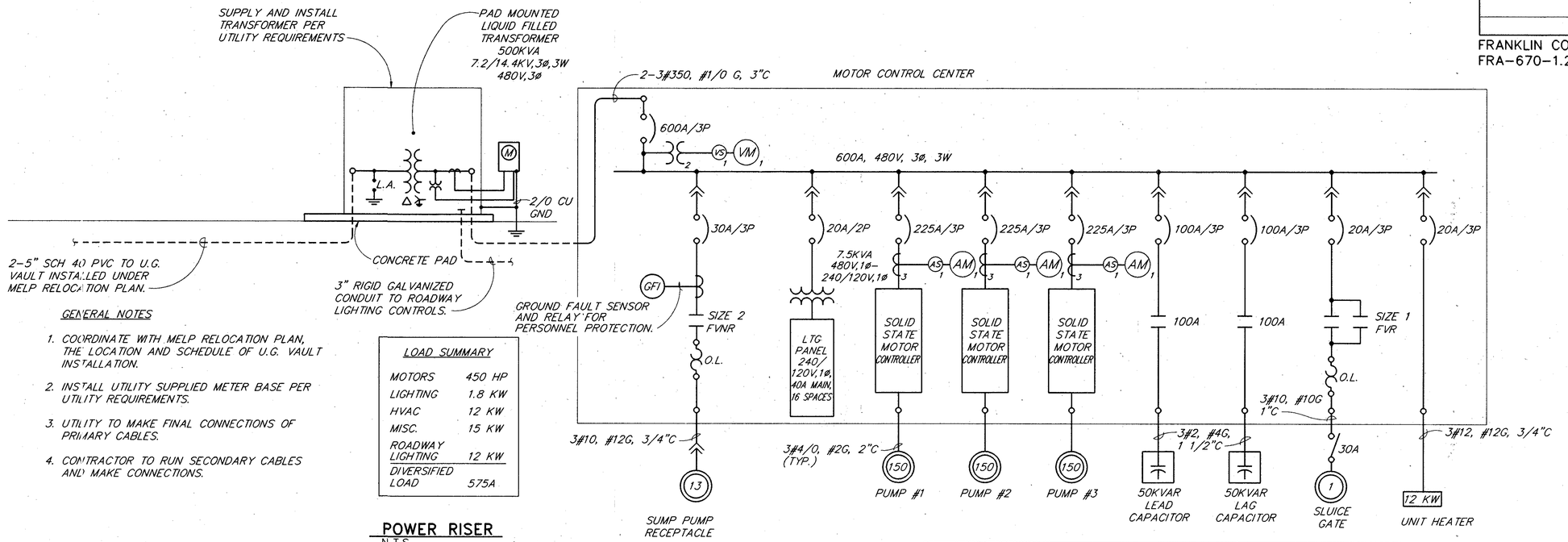
ELECTRICAL PLAN
1/4" = 1'-0"

CODED NOTES

1. SUPPLY AND INSTALL 480V, 3ø SUMP PUMP RECEPTACLE. COORDINATE EXACT TYPE WITH ACTUAL SUMP PUMP PLUG.
2. RUN 2 - 3" RIGID GALVANIZED CONDUIT FROM MCC, BELOW FLOOR, TO UTILITY TRANSFORMER. SEAL WALL PENETRATION WATERTIGHT.
3. CONTRACTOR TO INSTALL METER ENCLOSURE AND METERING TRANSFORMERS SUPPLIED BY UTILITY. CONTRACTOR TO RUN ONLY CONDUIT FROM TRANSFORMER TO METER BASE PER UTILITY REQUIREMENTS.
4. LIGHTING FIXTURE TYPE CL1. SUPPLY AND INSTALL 2-LAMP FLUORESCENT FIXTURE SUITABLE FOR WET LOCATIONS.
5. LIGHTING FIXTURE TYPE W1. SUPPLY AND INSTALL 250W, 120V, WALL-MOUNTED OUTDOOR VANDAL RESISTANT HIGH-PRESSURE SODIUM FIXTURE. INSTALL NEW BOXES AND SLEEVES IN EXISTING WALL PENETRATIONS.
6. RUN WIRE AND CONDUIT FROM LIGHT SWITCH TO TWO TYPE W1 FIXTURES BELOW, LOCATE FIXTURE FOR CONVENIENT LAMP CHANGE FROM LADDER.
7. CONTRACTOR TO SUPPLY AND INSTALL 500 KVA PAD-MTD. TRANSFORMER PER UTILITY REQUIREMENTS. CONTRACTOR SHALL RUN SECONDARY WIRE AND CONDUIT AS SHOWN. FOR CONDUIT AND PRIMARY CABLE LOCATION, SEE MELP RELOCATION PLAN.
8. MOTOR CONTROL CENTER. SEE SPECIFICATIONS FOR DETAILS. MCC TO CONTAIN LIGHTING PANEL WITH TRANSFORMER AND ALL PUMP CONTROLS. SEE SPECIFICATIONS FOR PUMP CONTROL DETAILS.
9. AIR COMPRESSOR SYSTEM SHOWN IN FINAL LOCATION. EXISTING CONTROLS LOCATED IN THIS AREA MUST REMAIN IN SERVICE, HENCE, AIR COMPRESSOR SYSTEM MUST BE TEMPORARILY LOCATED ELSEWHERE.
10. RUN 2 #14, 1 #14 G, 3/4" C FROM OILER SOLENOID TO MOTOR STARTER CIRCUITS.

TRACKING # — 88509001 DATE: — 12/15/92 CAD OPER. — TND

FRANKLIN COUNTY
FRA-670-1.25-C-3



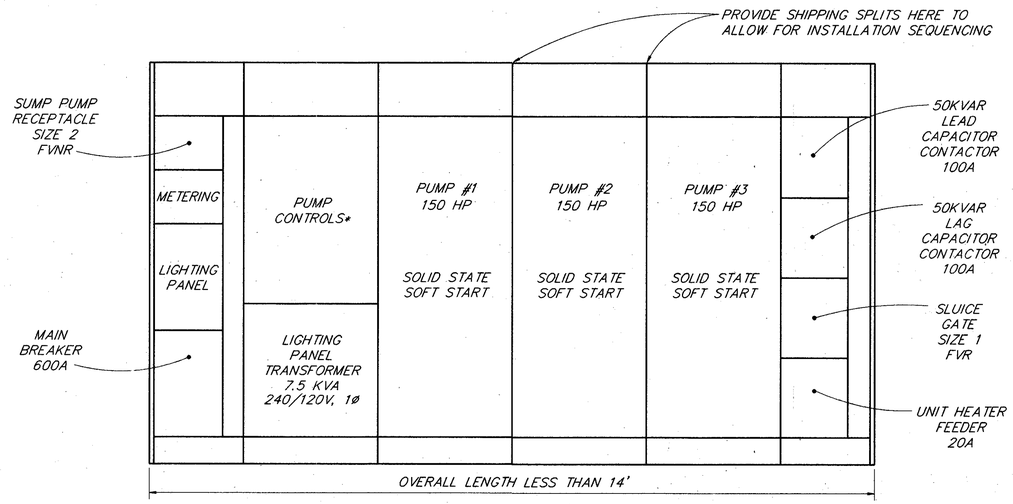
GENERAL NOTES

1. COORDINATE WITH MELP RELOCATION PLAN, THE LOCATION AND SCHEDULE OF U.G. VAULT INSTALLATION.
2. INSTALL UTILITY SUPPLIED METER BASE PER UTILITY REQUIREMENTS.
3. UTILITY TO MAKE FINAL CONNECTIONS OF PRIMARY CABLES.
4. CONTRACTOR TO RUN SECONDARY CABLES AND MAKE CONNECTIONS.

LOAD SUMMARY

MOTORS	450 HP
LIGHTING	1.8 KW
HVAC	12 KW
MISC.	15 KW
ROADWAY LIGHTING	12 KW
DIVERSIFIED LOAD	575A

POWER RISER
N.T.S.



* PROVIDE PUMP CONTROL PANEL AS SPECIFIED IN SPECIFICATIONS AND INSTALL IN MCC AS SHOWN. WIRE PER CONTROL DIAGRAMS.

MCC FRONT ELEVATION
3/4" = 1'-0"

MOTOR CONTROL CENTER (MCC)
CLASS I, TYPE B
480V, 3ø, 3W
HORIZONTAL BUS: COPPER, 600A

	DESCRIPTION	HP	NEMA SIZE	TYPE	120V CPT	VOLTS	PHASE	AMPS *	LOAD(KVA)*	BREAKER SIZE	FEEDER
	MAIN					480	3			600A/3P	
	SUMP PUMP	13	2	FVNR	STD	480	3	16	13	30A/3P	3#10,#12G,3/4"C
	LTG PNL XFMR					480	2	16	7.5	20A/2P	
	PUMP #1	150		RVSS	STD	480	3	180	150	225A/3P	3#4/0,#2G,2"C
	PUMP #2	150		RVSS	STD	480	3	180	150	225A/3P	3#4/0,#2G,2"C
	PUMP #3	150		RVSS	STD	480	3	180	150	225A/3P	3#4/0,#2G,2"C
	LEAD CAP				STD	480	3	60	50	100A/3P	3#2,#4G,1 1/2"C
	LAG CAP				STD	480	3	60	50	100A/3P	3#2,#4G,1 1/2"C
	SLUICE GATE	1	1	FVR	STD	480	3	1.8	1	100A/3P	3#10,3#12,#10G,1"C
	HEATER					480	3	15	12	20A/3P	3#12,#12G,3/4"C

* ESTIMATED

LIGHTING PANEL

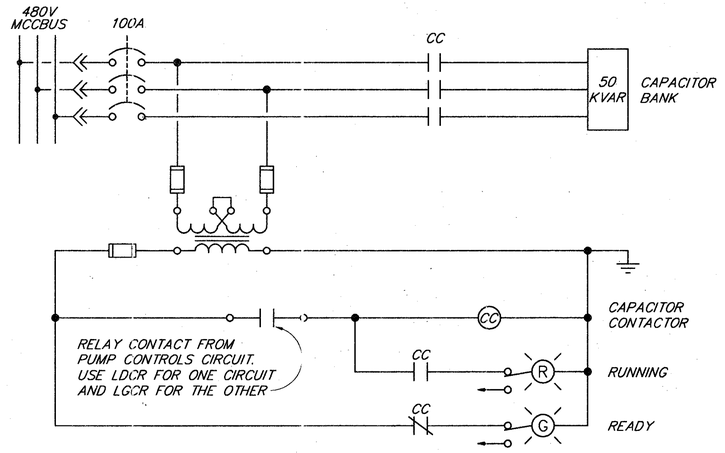
SERVICE:
240/120 V.
1 PH.
3 W.
60 Hz.
GRD. BUS: ____

LOC.: MCC

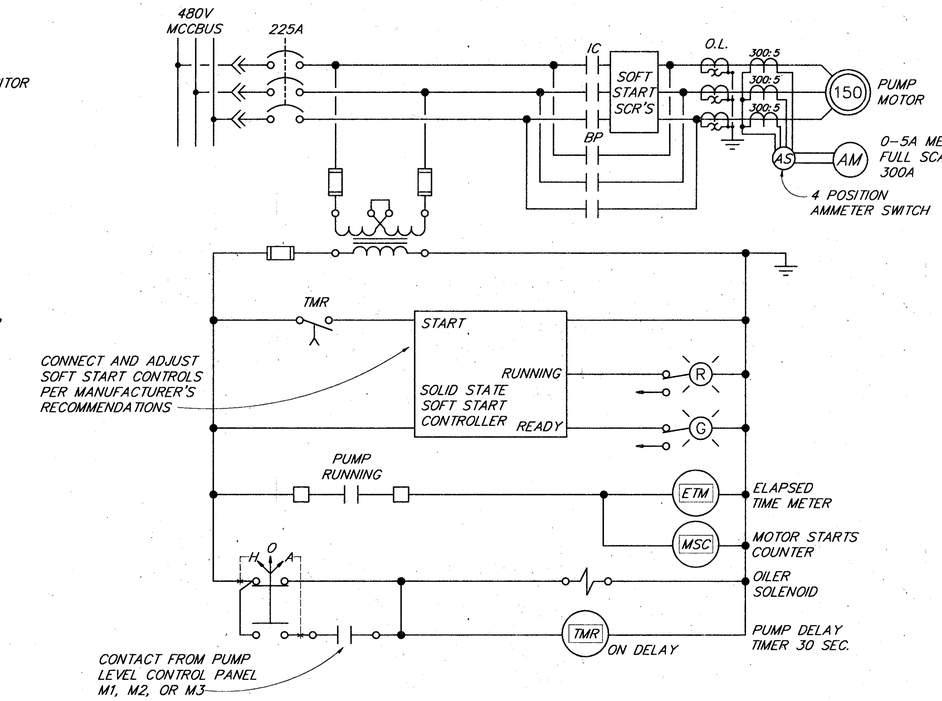
ALL LIGHTING CIRCUITS TO HAVE SWITCHING DUTY BREAKER
SPARE BREAKERS SHALL BE FURNISHED AND INSTALLED AS SHOWN.
* INDICATES LOCK-OUT
PANEL SHALL BE A 100 AMP. NQO TYPE PANEL FURNISHED W/40 AMP. M.C.B. THE PANEL SHALL BE FACTORY WIRED W/ BREAKERS LOCATED AS SHOWN.

MAINS:
40 AMP.
M.L.O.
YES M.C.B.
LOC.
NOTE: FURNISHED W/STD. FRONT COVER.

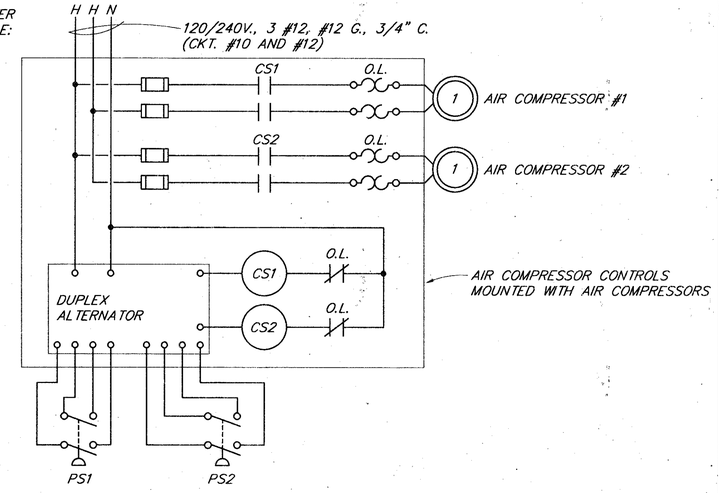
TOTAL WATTS	TRIP AMPS							TRIP AMPS	TOTAL WATTS	
	20/1	PUMP ROOM LTG	1	+	-	2	PUMP CONTROLS	10/1		
	20/1	OUTSIDE LIGHTING	3	-	+	4	RECEPTACLES	20/1		
	20/1	BELOW LIGHTING	5	+	-	6	RECEPTACLES	20/1		
	20/1	SPARE	7	-	+	8	EXHAUST FAN	20/1		*
	20/1	SPARE	9	+	-	10	AIR COMPRESSORS	20/2		
	20/1	SPARE	11	-	+	12				
	20/1	SPARE	13	+	-	14	SPARE	20/1		
	20/1	SPARE	15	-	+	16	SPARE	20/1		



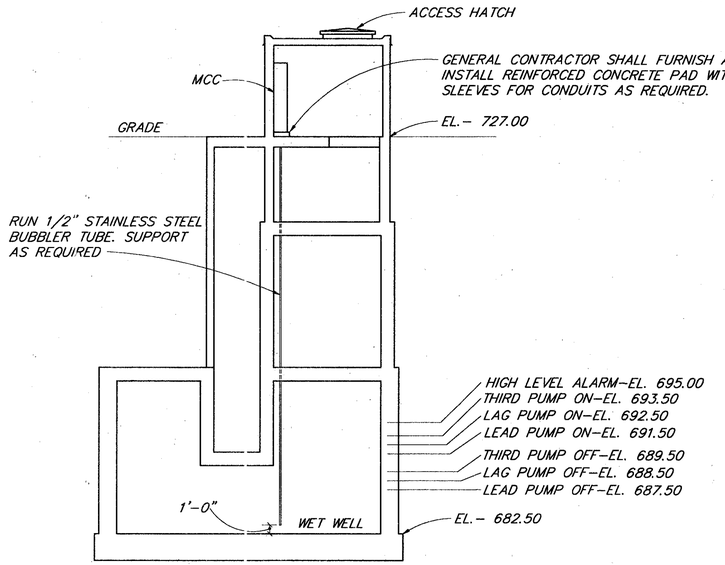
CAPACITOR CONTACTOR DIAGRAM
TYPICAL OF 2



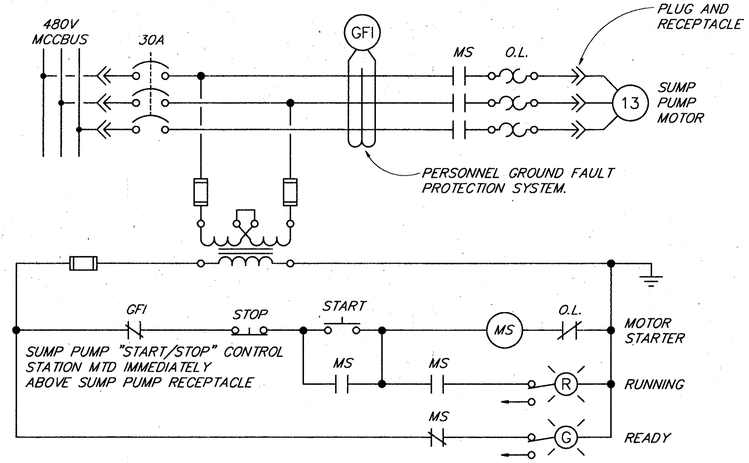
PUMP MOTOR STARTER DIAGRAM
TYPICAL OF 3



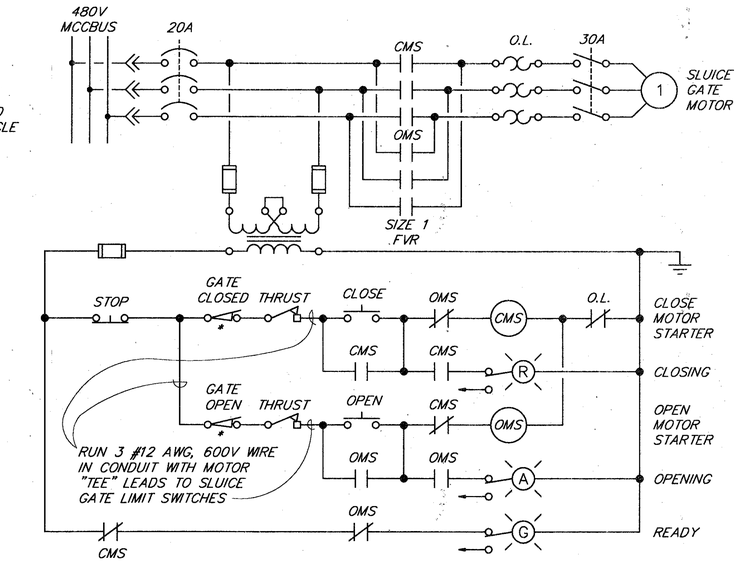
AIR COMPRESSOR CONTROL DIAGRAM



LEVEL CONTROL DETAIL
1/8" = 1'-0"



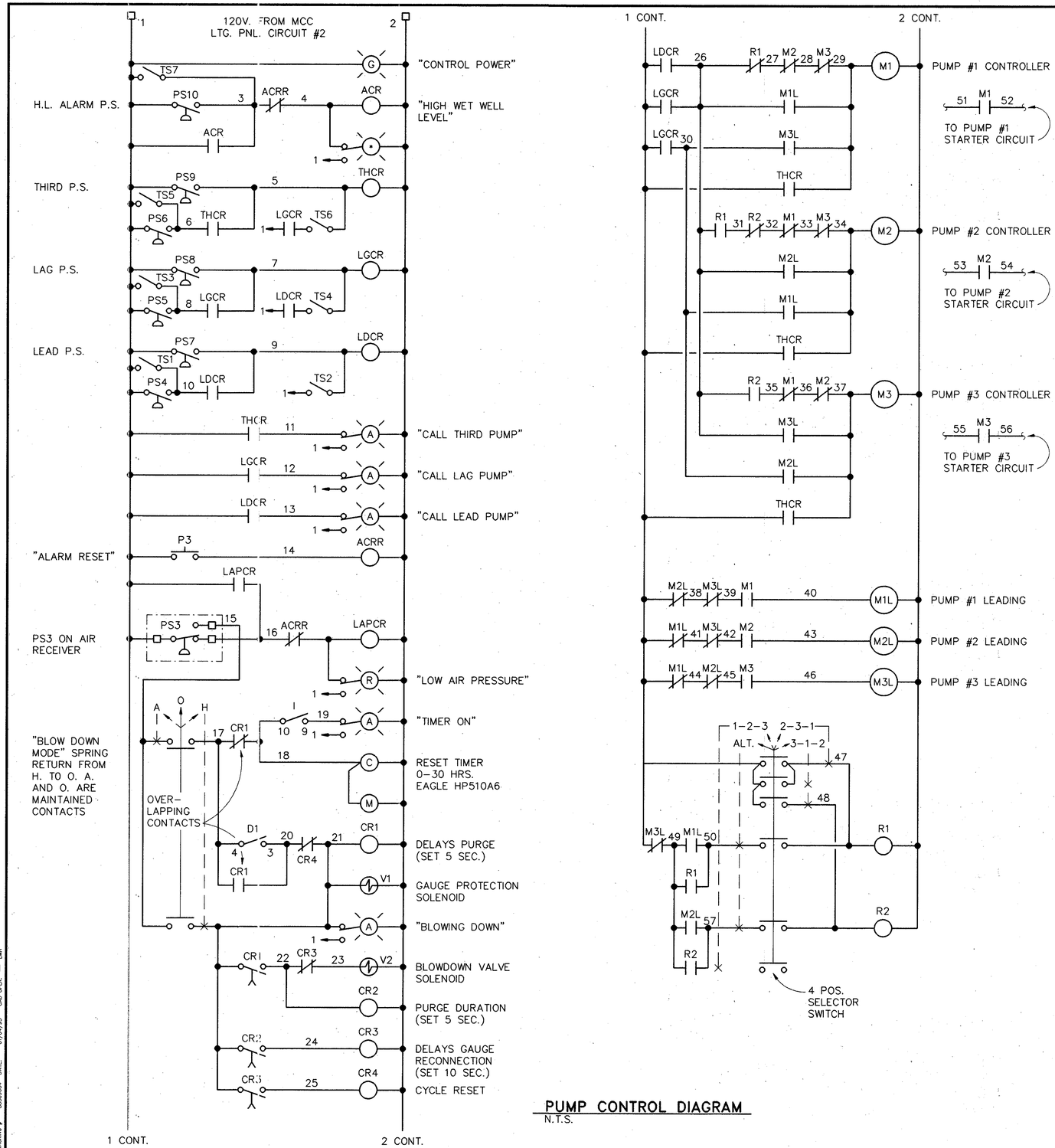
SUMP PUMP STARTER DIAGRAM



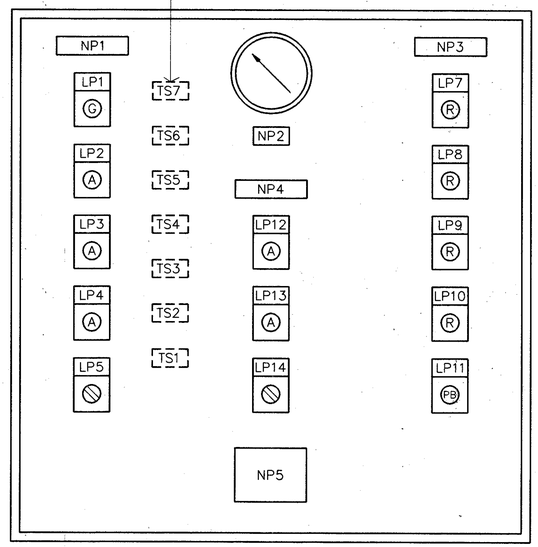
* LIMIT SWITCHES OPEN WHEN GATE IS FULLY IN POSITION.

SLUICE GATE STARTER DIAGRAM

TRACKING # — 88509003 DATE: — 8/31/92 CAD OPER: — TWV



PUMP CONTROL DIAGRAM
N.T.S.



NAMEPLATES (NP)	
DES.	ENGRAVING
1	PUMP CONTROL
2	WET WELL LEVEL (INCHES)
3	ALARM CONDITIONS
4	BLOW DOWN CONTROL
5	DANGER HAZARDOUS VOLTAGES ON EXPOSED TERMINALS INSIDE. CONTROL POWER DISCONNECT SWITCH DOES NOT DISCONNECT ALL SOURCES OF SUPPLY. TURN OFF PUMP NO. 1, 2 AND 3 IN MCC ALSO TO DE-ENERGIZE THIS PANEL.

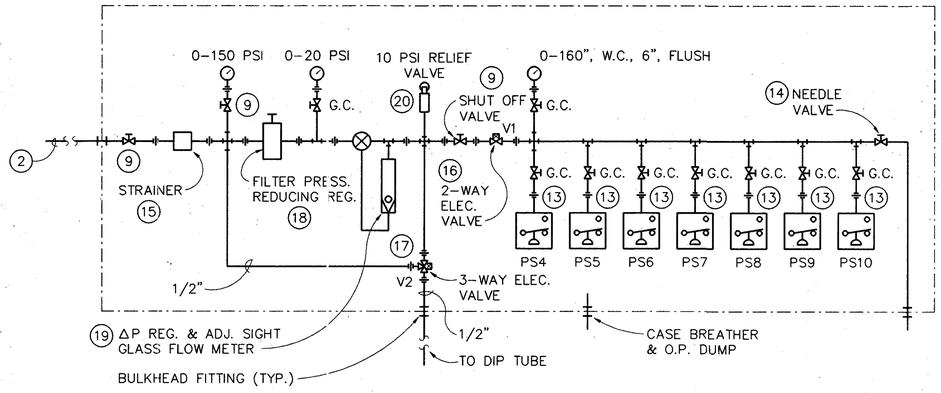
LEGEND PLATES (LP)	
DES.	ENGRAVING
1	CONTROL POWER
2	CALL THIRD PUMP
3	CALL LAG PUMP
4	CALL LEAD PUMP
5	PUMP SELECTOR SWITCH, ALT/1-2-3/2-3-1/3-1-2
6	
7	HIGH WET WELL LEVEL
8	LOW AIR PRESSURE
9	(BLANK - FOR FUTURE)
10	(BLANK - FOR FUTURE)
11	ALARM RESET
12	TIMER ON
13	BLOWING DOWN
14	BLOW DOWN MODE H-O-A

TOGGLE TEST SWITCHES LEGEND PLATES (TS)	
DES.	ENGRAVING
TS1	LEAD PUMP OFF TEST SWITCH
TS2	LEAD PUMP ON TEST SWITCH
TS3	LAG PUMP OFF TEST SWITCH
TS4	LAG PUMP ON TEST SWITCH
TS5	3RD PUMP OFF TEST SWITCH
TS6	3RD PUMP ON TEST SWITCH
TS7	ALARM CIRCUIT TEST SWITCH
	WARNING: DO NOT RUN PUMPS DRY
	TO BE OPERATED ONLY BY AUTHORIZED PERSONNEL

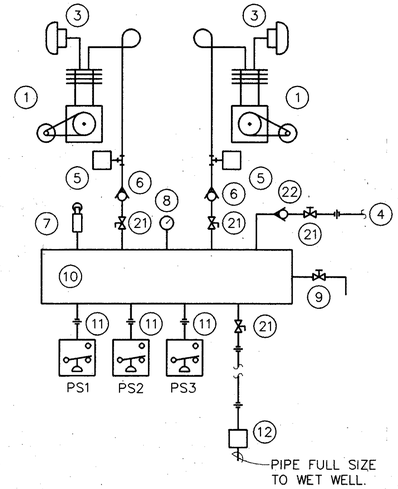
NOTE: LEGEND & NAME PLATES SHALL BE MOUNTED ON BACK PANEL. THEY SHALL BE AS NEAR ADJACENT TO THE SWITCH AS POSSIBLE FOR EASE OF IDENTIFICATION.

TRACING # — 8858504 DATE: — 01/24/23 CAD OPER. — LMH

PUMP STATION — PUMP CONTROLS DIAGRAM



PUMP CONTROL PANEL PNEUMATIC DIAGRAM
N.T.S.



COMPRESSED AIR SUPPLY SYSTEM FOR PUMP CONTROL PANEL
N.T.S.

NOTES: CONTROL PANEL

1. SUPPLY AIR COMPRESSOR, RECIPRICATING OIL–LESS AIR COMPRESSOR TO SUPPLY 3.30 CFM AT 100 PSIG, 125 PSIG CONTINUOUS DUTY RATED, 145 PSIG INTERMITTENT OPERATION. 1 HP. 240/60/1 OPEN DRIP PROOF BALL BEARING MOTOR WITH INTERNAL THERMAL PROTECTION 1725 RPM. SUPPLY AIR COMPRESSORS TO HAVE INTEGRAL AUTOMATIC ALTERNATION AND SAFETY RELIEF VALVE. SUPPLY AIR COMPRESSORS TO BE SUPPLIED WITH AIR COMPRESSOR PACKAGE AND MOUNTED ON COMPRESSOR VIBRATION MOUNTS.
2. 1/2" SUPPLY AIR LINE FROM COMPRESSED AIR SUPPLY SYSTEM.
3. FIFTY MICRON INLET AIR FILTER AND MUFFLER, SUPPLIED WITH AIR COMPRESSOR PACKAGE.
4. 1/2" SUPPLY AIR TO PUMP CONTROL PANEL.
5. AUTOMATIC UNLOADER SUPPLIED WITH AIR COMPRESSOR PACKAGE.
6. IN TANK TYPE CHECK VALVE WITH UNLOADER PORT SUPPLIED WITH AIR COMPRESSOR PACKAGE.
7. ASME SAFETY RELIEF VALVE, SIZED FOR COMPRESSED AIR PACKAGE CAPACITY SET TO RELIEVE AT 140 PSI SUPPLIED WITH AIR COMPRESSOR PACKAGE.
8. PRESSURE GAUGE 0–150 PSI, SUPPLIED WITH AIR COMPRESSOR PACKAGE.
9. LUNKENHEIMER FIGURE 123 GLOBE SCREWED TYPE N–M–D, NO 40 DISC. 1/2"
10. AIR RECEIVER 60 GALLON ASME NB STAMP RATED 250 PSI WORKING PRESSURE, SUPPLIED WITH AIR COMPRESSOR PACKAGE.
11. PS1, PS2 & PS3, A–B 836–C7A PRESSURE SWITCH.
12. AUTOMATIC TANK DRAIN – FLOAT TYPE SUPPLIED WITH AIR COMPRESSOR PACKAGE.
13. PS4, PS5, PS6, PS7, PS8, PS9 & PS10, A–B 836–C3A.
14. NEEDLE VALVE LUNKENHEIMER FIG. 906–BS.
15. 1/2" STRAINER ASCO CATALOG NO. 8600A14.
16. V1 ASCO 8210G34, CATALOG 32 FOR USE WITH NON LUBRICATED COMPRESSED AIR.
17. V2 ASCO 8300D9 CATALOG 32 FOR USE WITH NON LUBRICATED COMPRESSED AIR.
18. INTEGRAL FILTER–REGULATOR TO REGULATE FROM 100 PSIG SUPPLY TO 10 PSIG.
19. DWYER SERIES RATE MASTER FLOW METER. FLOW METER SHALL BE OF SIGHT GLASS TYPE WITH MANUAL ADJUSTMENT AND PRESSURE REGULATOR, REGULATOR TO REGULATE FROM 20 PSIG TO 2 PSIG.
20. ASME CODED AIR RELIEF VALVE, WATTS TYPE NO. 159.
21. MANUAL SHUT–OFF VALVE SUPPLIED WITH AIR COMPRESSOR PACKAGE.
22. 1/2" CHECK VALVE SUPPLIED WITH AIR COMPRESSOR PACKAGE.

PRESSURE SWITCH SCHEDULE

DES.	SETTING	DIFF.	FUNCTION
PS1	100 PSI	15 PSI	LEAD A/C
PS2	80 PSI	15 PSI	LAG A/C
PS3	36 PSI	6 PSI	LOW AIR PRESSURE ALARM
PS4	*2.2 PSI	0.4 PSI	LEAD PUMP OFF
PS5	*2.6 PSI	0.4 PSI	LAG PUMP OFF
PS6	*3.0 PSI	0.4 PSI	THIRD PUMP OFF
PS7	*3.9 PSI	0.4 PSI	LEAD PUMP ON
PS8	*4.3 PSI	0.4 PSI	LAG PUMP ON
PS9	*4.8 PSI	0.4 PSI	THIRD PUMP ON
PS10	*5.4 PSI	0.4 PSI	HI–LEVEL ALARM

* STARTING VALUE, FINAL SETTING TO BE FIELD DETERMINED

GENERAL NOTES:

1. ALL PIPING IN WET PIT TO BE 304 S.S.
2. ALL PRESSURE GAUGES TO BE SUITABLE FOR USE WITH NON–LUBRICATED COMPRESSED AIR AND SHALL BE OF LIKE KIND FROM ONE MANUFACTURER UNLESS NOTED OTHERWISE.
3. CONTRACTORS TO SUPPLY FITTINGS AS REQUIRED TO CONNECT FILTER REGULATOR, ΔP REGULATOR AND ADJUSTABLE SIGHT GLASS FLOW METER, SOLENOID VALVES, PRESSURE SWITCHES, ETC.

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

143
224

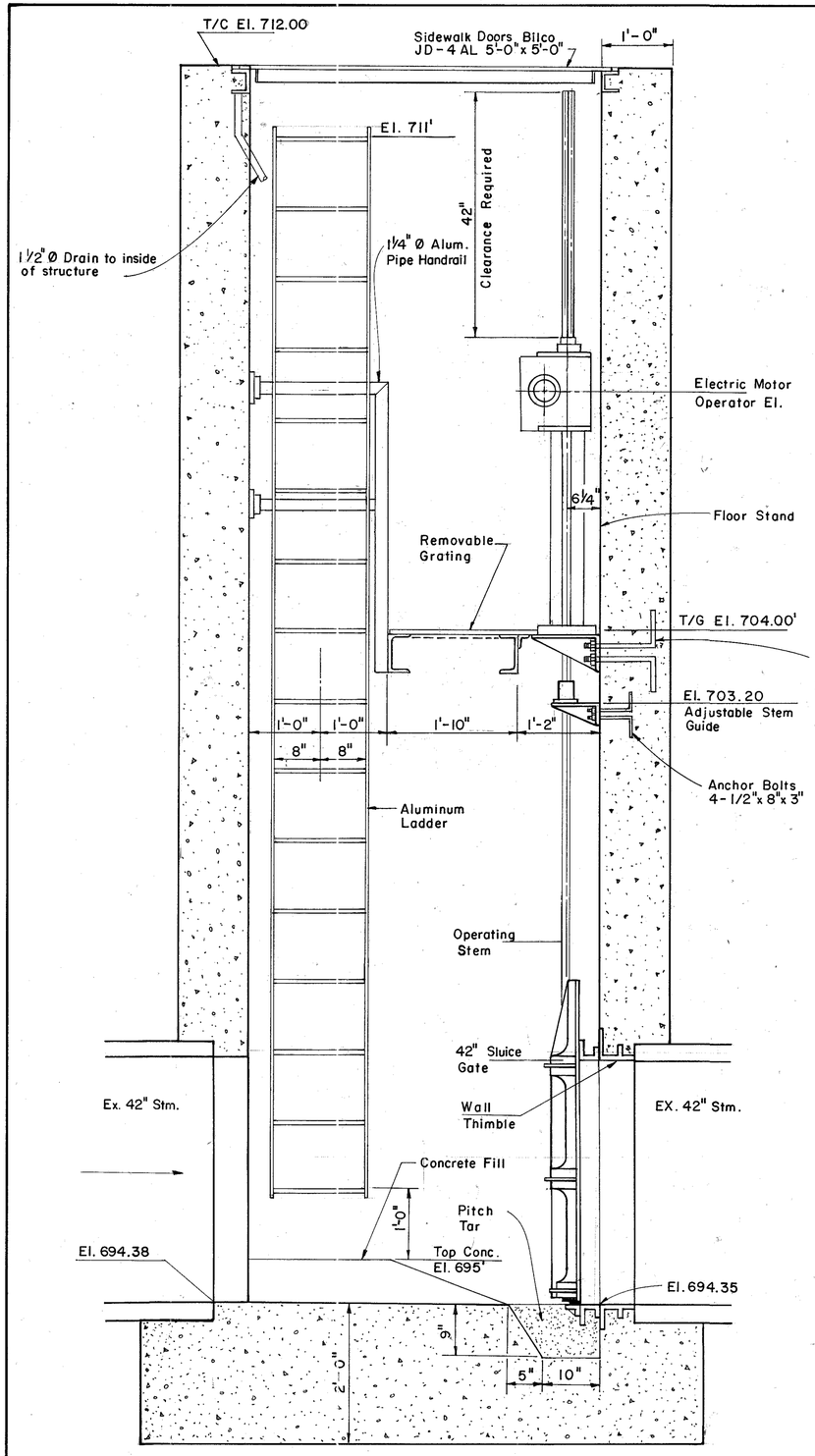
FRANKLIN COUNTY
FRA–670–1.25–C–3

TRACKING # — 88509000 DATE — 5/4/92 CAD OPER. — TWV

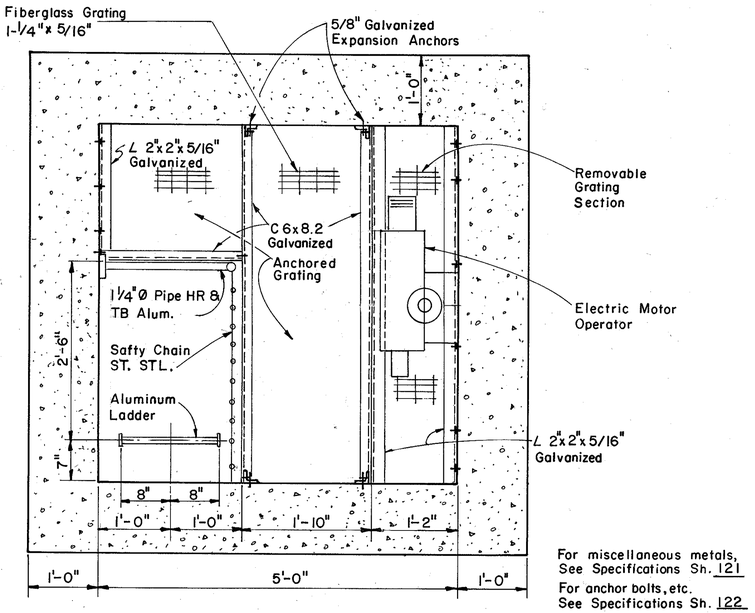
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

144
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

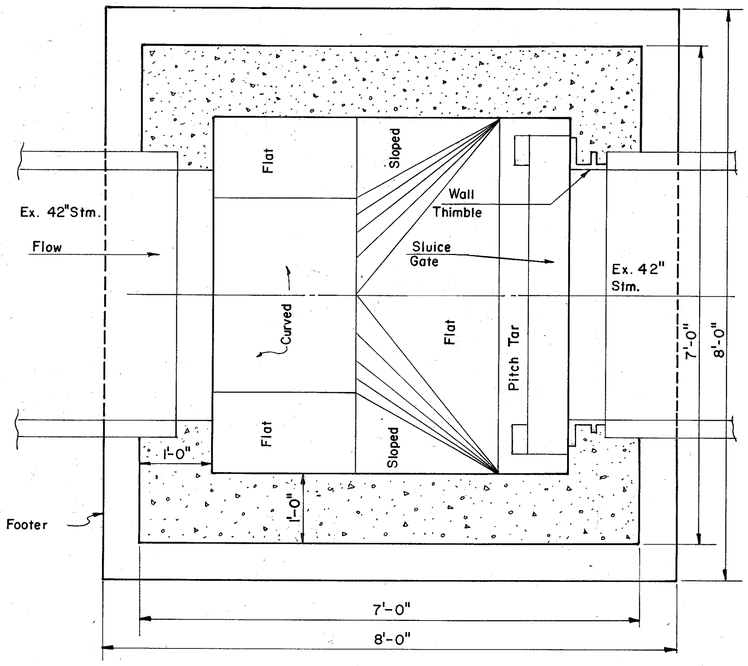


SECTION

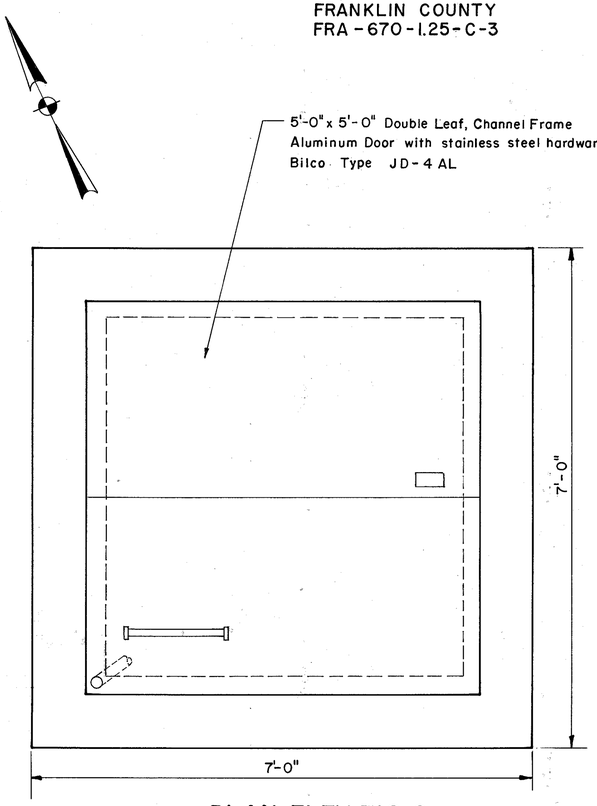


For miscellaneous metals, See Specifications Sh. 121
For anchor bolts, etc. See Specifications Sh. 122

PLAN ELEV. 704.0



PLAN ELEV. 695.0



PLAN ELEV. 712.0

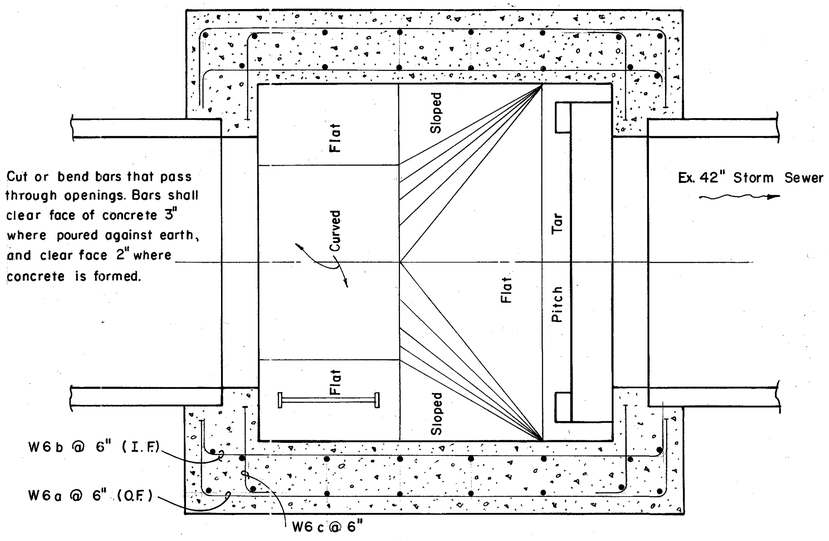
PUMP STATION ST-5 SLUICE GATE STRUCTURE — SECTIONS

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

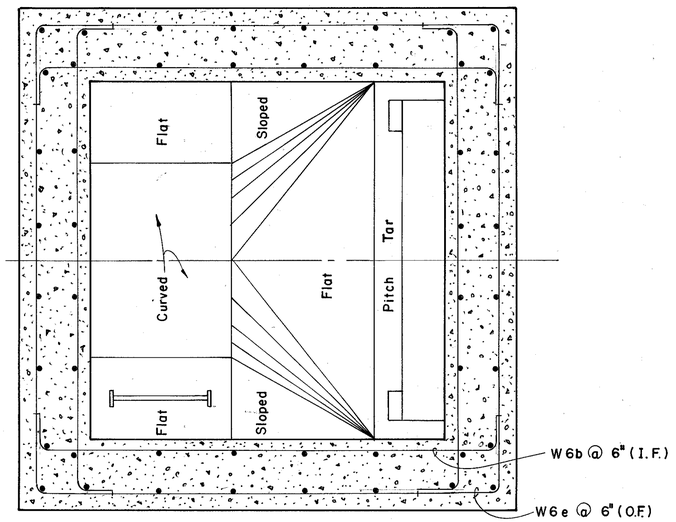
145
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

NOTE: Cut or bend bars that pass through openings. Bars shall clear face of concrete 3" where poured against earth, and clear face 2" where concrete is formed.



SECTIONAL PLAN - ELEV. 694.35 TO 698.00

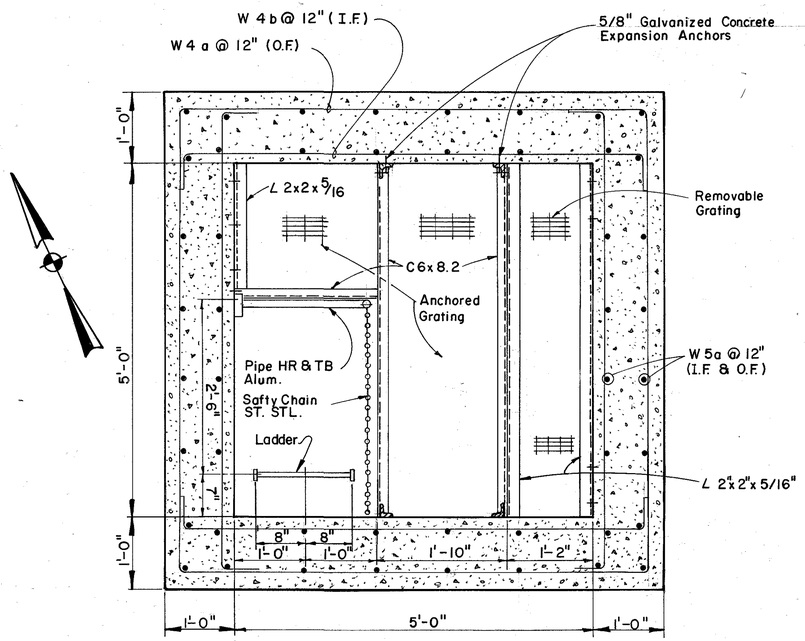


SECTIONAL PLAN - ELEV. 702.00 TO 698.00

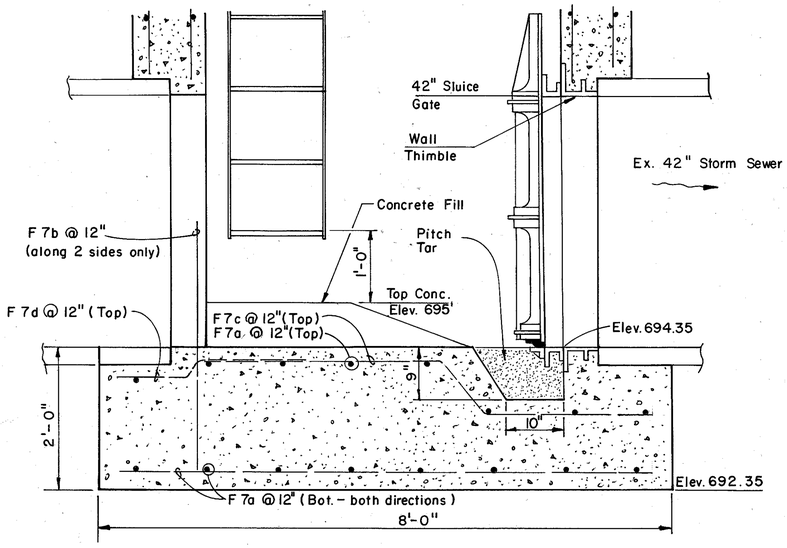
REINFORCING STEEL LIST

	NO. REQ'D	LENGTH	WEIGHT	SHAPE	DIMENSIONS a	b	c	d	e	BENDING DIAGRAM
W4a	42	7'-11"	223	B		6'-6"	1'-6"			
W4b	40	7'-3"	194	A		6"	6"	6'-6"		
W5a	48	17'-5"	873	STR.						
W6d	32	7'-3"	349	A		6"	6"	6'-6"		
W6e	32	7'-11"	381	B		6'-6"	1'-6"			
W6a	16	8'-3"	199	A		1'-0"	1'-0"	6'-6"		
W6b	16	7'-3"	175	A		6"	6"	6'-6"		
W6c	32	2'-8"	129	B		1'-6"	1'-3"			
F7a	16	7'-6"	246	STR.						
F7b	16	7'-4"	240	A		3'-6"	3'-6"	7"		
F7a	8	7'-6	123	STR.						
F7c	8	7'-6"	123	D	3'-5"	1'-0"	2'-5"	10"		
F7d	8	3'-1"	50	D	1'-6"	6"	1'-0"	4"		

ALL REINFORCEMENT IS #6



SECTIONAL PLAN - ELEV. 712.00 TO 702.00



SECTIONAL PLAN - FOOTER

PUMP STATION ST-5 SLUICE GATE STRUCTURE - SECTIONS

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

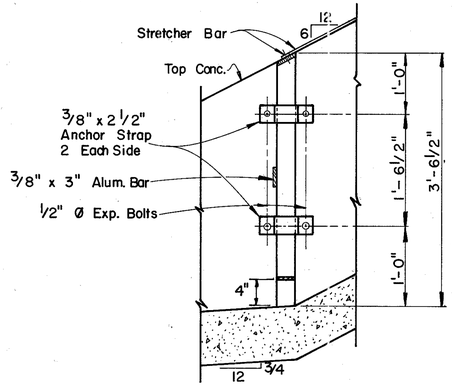
146
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

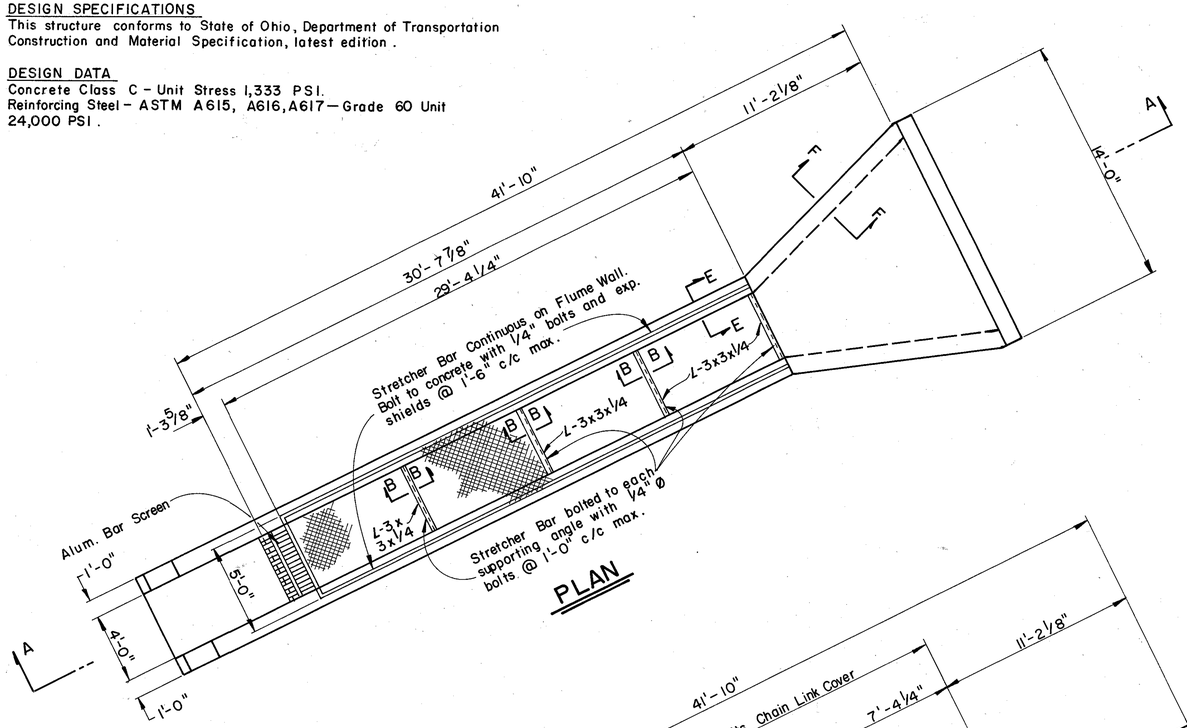
PLAN NOTES :

DESIGN SPECIFICATIONS
This structure conforms to State of Ohio, Department of Transportation Construction and Material Specification, latest edition .

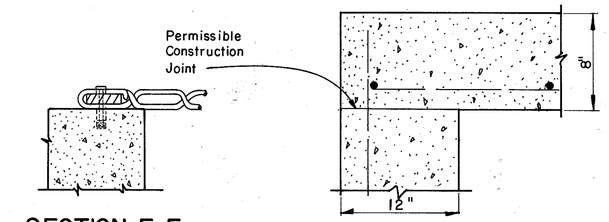
DESIGN DATA
Concrete Class C - Unit Stress 1,333 PSI.
Reinforcing Steel - ASTM A615, A616, A617 - Grade 60 Unit 24,000 PSI .



SECTION C-C

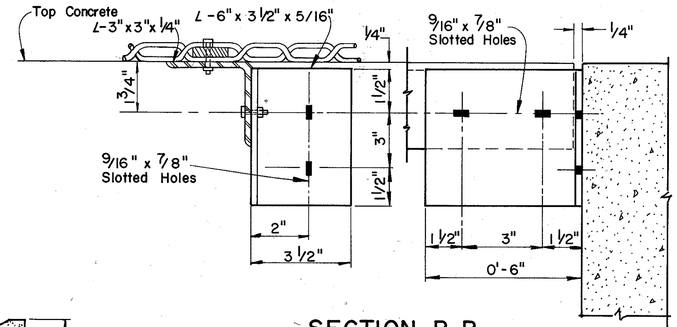


PLAN



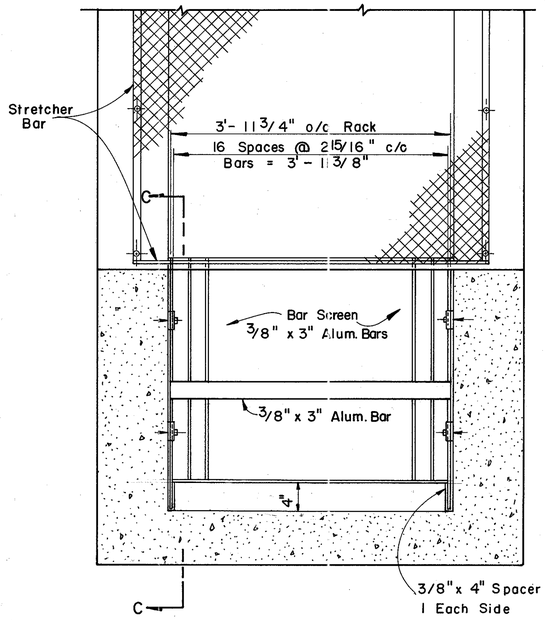
SECTION E-E

SECTION F-F

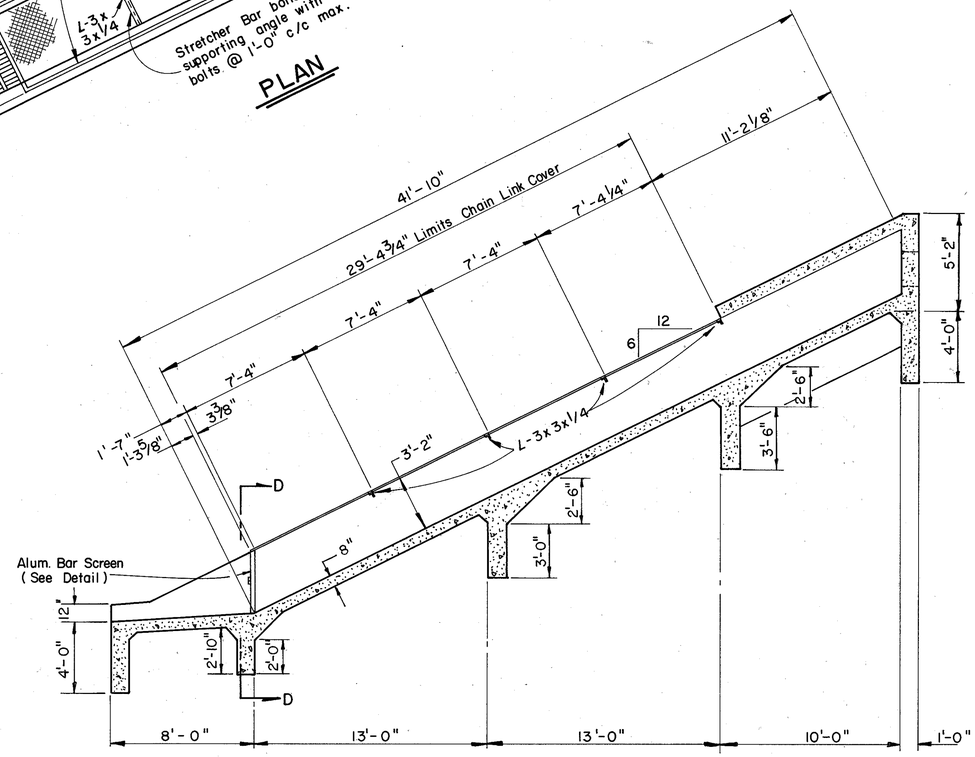


SECTION B-B

CONNECTION DETAILS

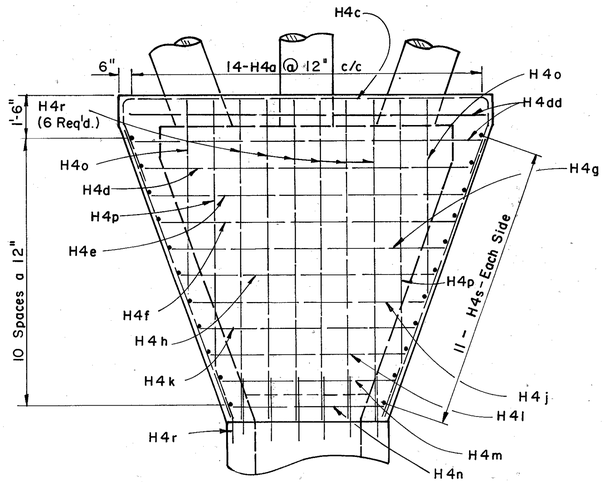


SECTION D-D



SECTION A-A

COVER FOR DISCHARGE FLUME



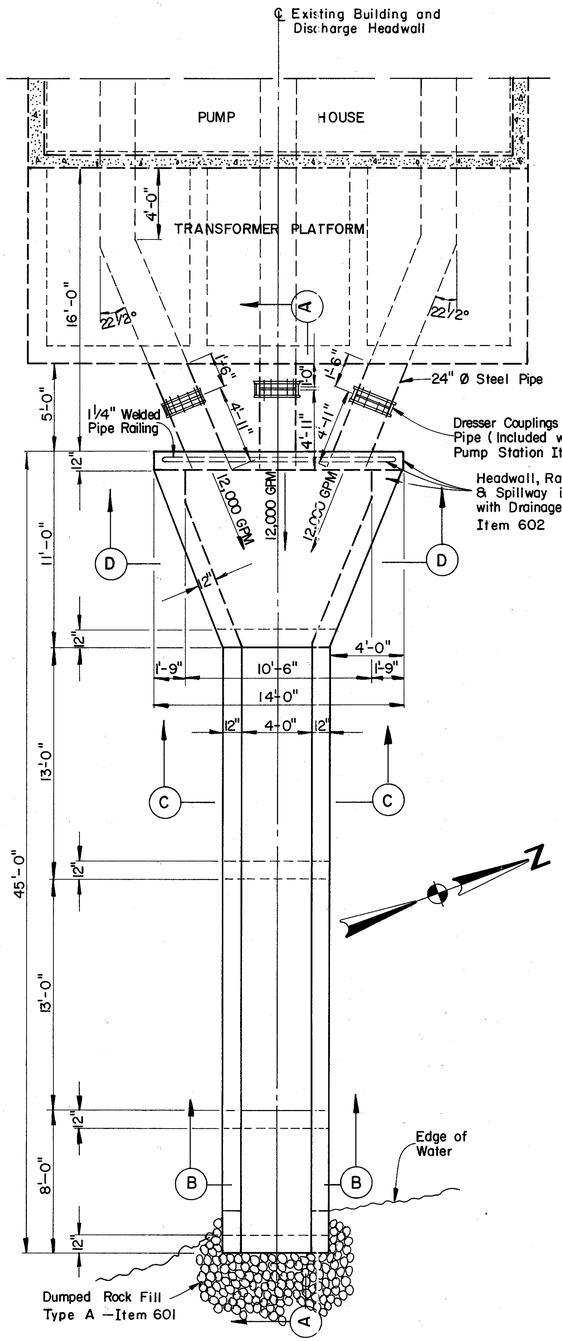
SECTION G-G

PUMP STATION ST-5 DISCHARGE FLUME SECTIONS

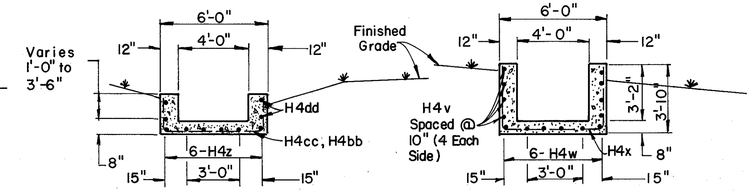
FED.RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

147
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

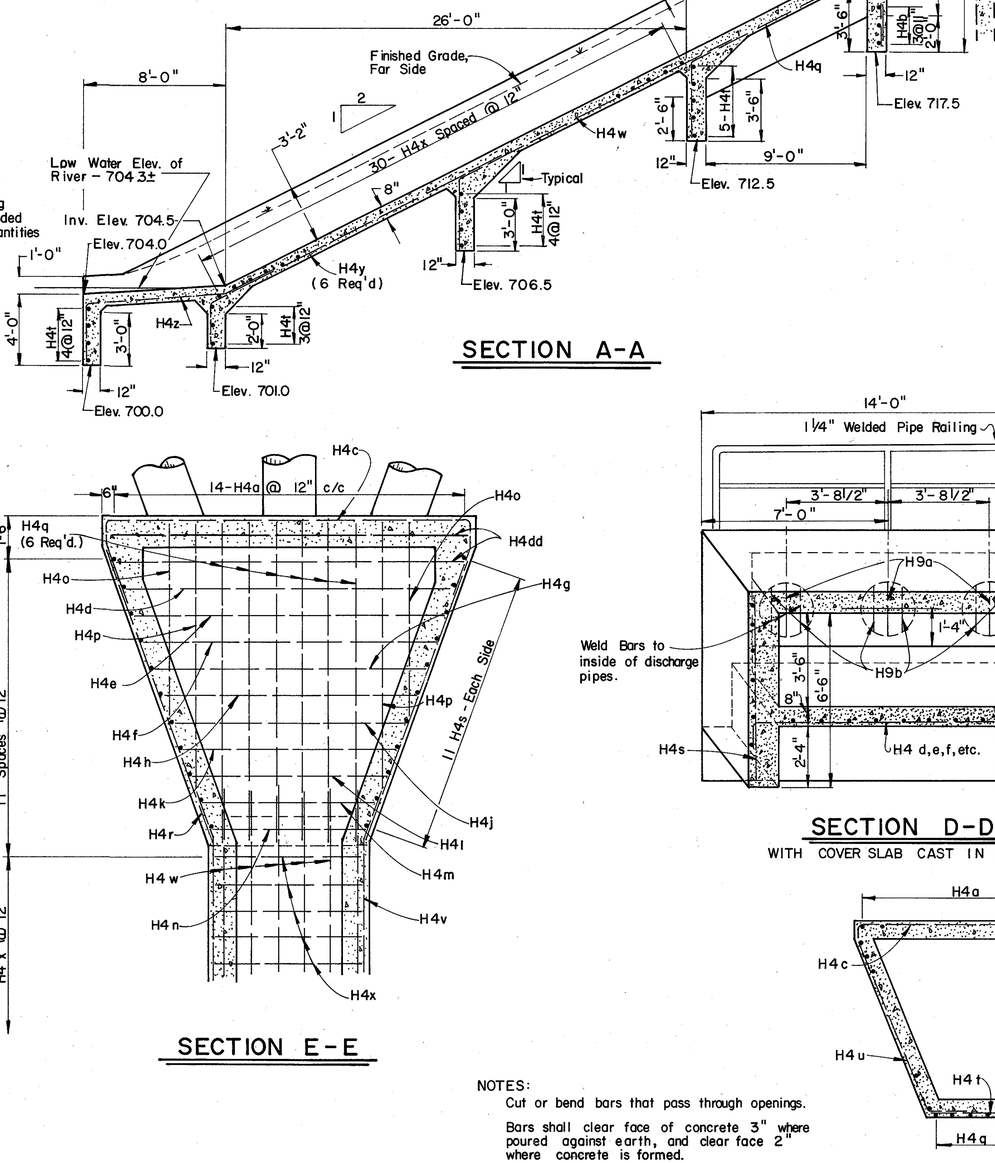


PLAN

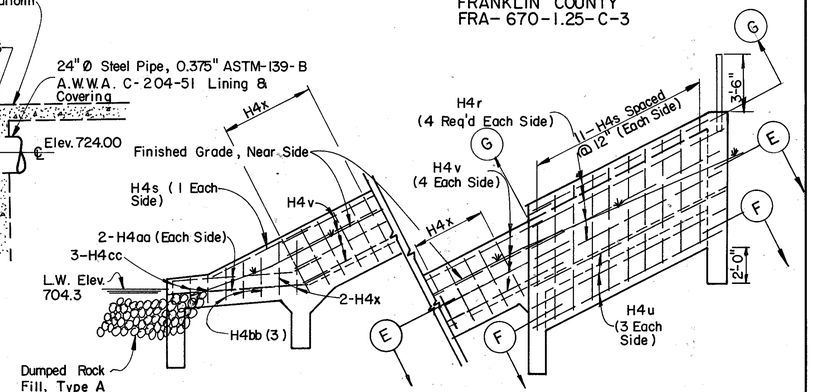


SECTION B-B

SECTION C-C



SECTION A-A



NORTH ELEVATION

SECTION E-E

SECTION D-D
WITH COVER SLAB CAST IN PLACE

SECTION F-F

NOTES:
Cut or bend bars that pass through openings.

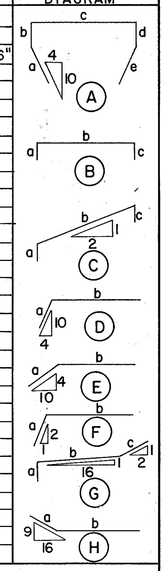
Bars shall clear face of concrete 3" where poured against earth, and clear face 2" where concrete is formed.

REINFORCING STEEL LIST

	NO. REQ'D	LENGTH	WEIGHT	SHAPE	DIMENSIONS a	b	c	d	e
H4a	14	8'-6"	79	Str.					
H4b	3	13'-6"	27	Str.					
H4c	6	17'-9"	72	A	1'-6"	9"	13'-6"	9"	1'-6"
H4d	2	13'-7"	18	B	8"	12'-4"	8"		
H4e	2	13'-0"	18	B	8"	11'-9"	8"		
H4f	2	12'-2"	16	B	8"	11'-0"	8"		
H4g	2	11'-5"	16	B	8"	10'-3"	8"		
H4h	2	10'-8"	14	B	8"	9'-6"	8"		
H4j	2	10'-0"	14	B	8"	8'-9"	8"		
H4k	2	9'-4"	12	B	8"	8'-1"	8"		
H4l	2	8'-7"	12	B	8"	7'-5"	8"		
H4m	2	7'-10"	10	B	8"	6'-8"	8"		
H4n	2	7'-2"	10	B	8"	6'-0"	8"		
H4o	4	8'-8"	24	C	8"	7'-6"	8"		
H4p	4	11'-2"	30	C	8"	9'-11"	8"		
H4q	6	16'-2"	65	C	4'-0"	11'-8"	8"		
H4r	14	11'-6"	161	Str.					
H4s	24	6'-8"	107	Str.					
H4t	16	5'-6"	59	Str.					
H4u	6	13'-0"	52	D	1'-6"	11'-6"			
H4v	8	31'-9"	170	E	1'-9"	30'-0"			
H4w	6	20'-9"	84	F	3'-9"	17'-0"			
H4x	30	12'-4"	268	B	3'-6"	5'-6"	3'-6"		
H4y	6	19'-9"	80	F	2'-3"	17'-6"			
H4z	6	12'-10"	51	G	3'-4"	7'-10"	1'-9"		
H4aa	4	8'-8"	23	H	1'-6"	7'-3"			
H4bb	3	9'-4"	19	B	2'-0"	5'-6"	2'-0"		
H4cc	3	7'-10"	16	B	1'-3"	5'-6"	1'-3"		
H4dd	4	14'-4"	18	B	8"	13'-1"	8"		
H9a	3	2'-6"	27	B	6"	2'-0"	6"		
H9b	6	2'-2"	41	B	6"	1'-8"	6"		

TOTAL WEIGHT 1613 LB.

BENDING DIAGRAM



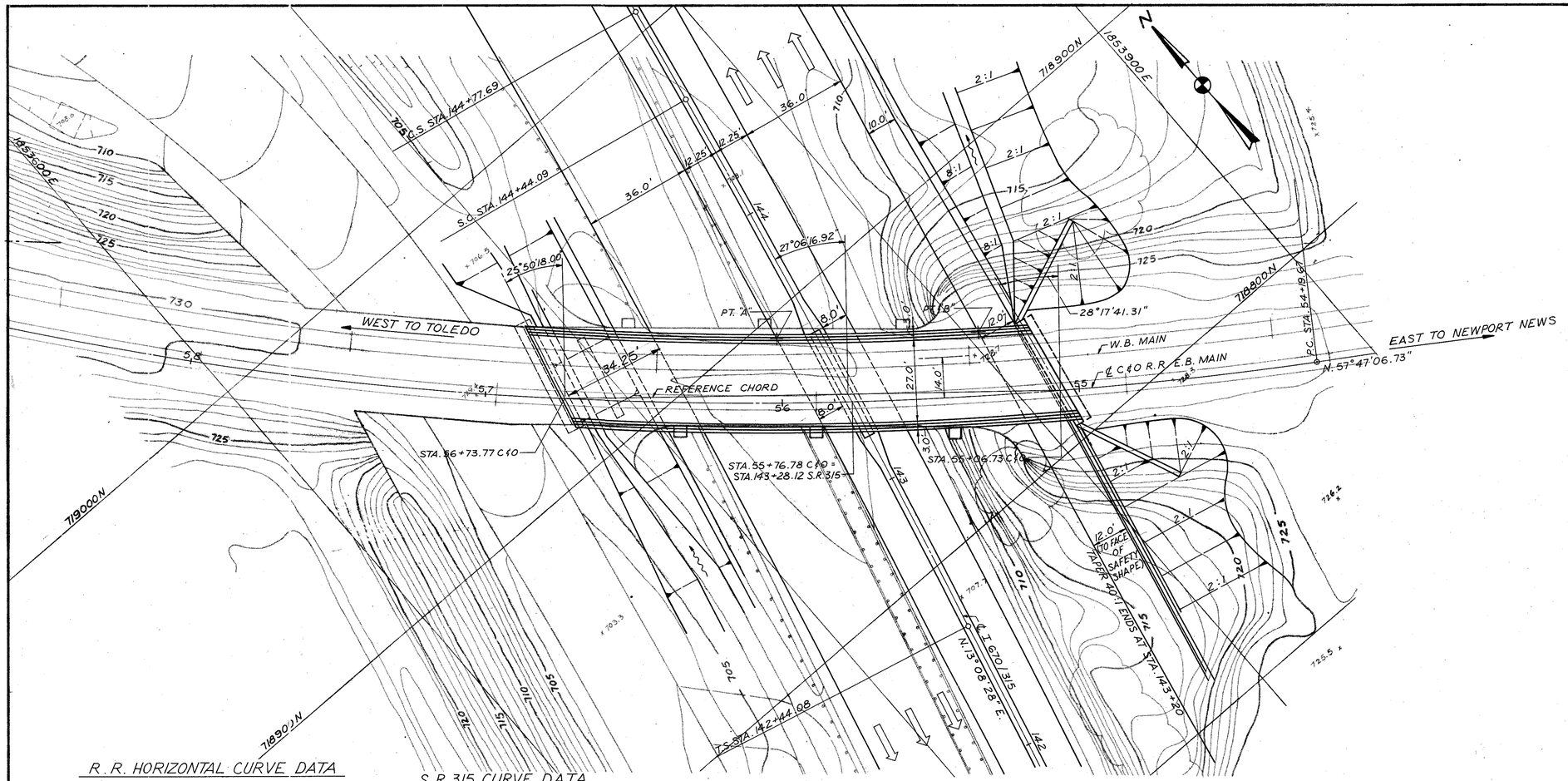
NOTES

1. All structural members to be Aluminum Alloy 6061-T6.
2. Chain Link Fencing to be 9 Ga. Aluminum Alloy 5052-5H and shall cover entire flume.
3. Stretcher Bar to be ¼" thick Aluminum Alloy 3003-H14.
4. Bolts for Stretcher Bars to be ¼" Ø Aluminum Alloy 2024-T4.
5. Bolts for structural members to be ½" Ø Monel.
6. Minimum connection between structural members to be 2 bolts.
7. Contractor shall field measure existing flume prior to fabrication of covers.

PUMP STATION ST-5 DISCHARGE FLUME DETAILS

OHIO	
FHWA REGION 5	148 / 224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



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

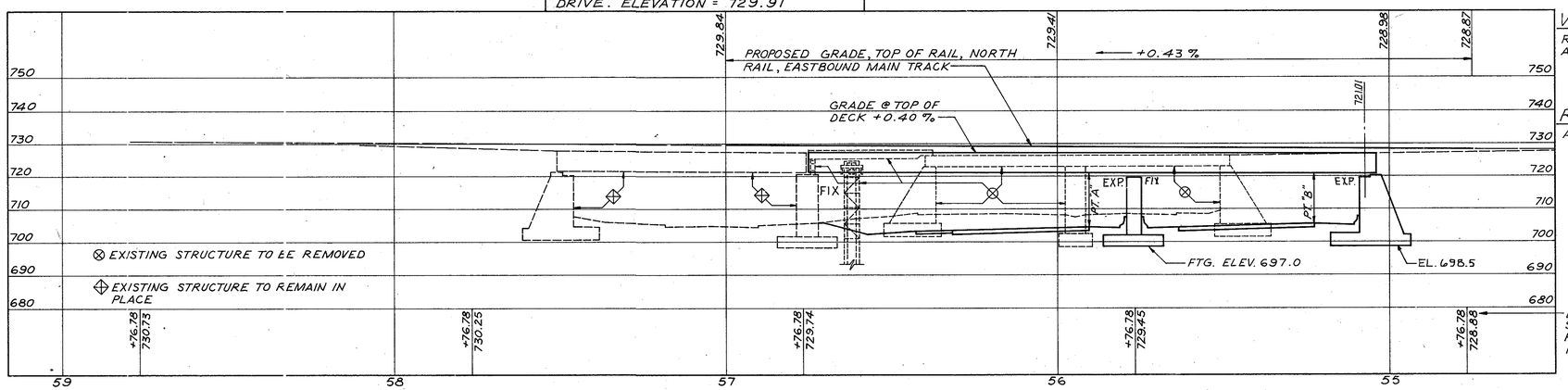
R.R. HORIZONTAL CURVE DATA

P.I. = STA. 59+66.78
Δ = 46° 29' 45.52"
Dc = 4° 30' (CHORD DEF.)
R = 1,273.567'
T = 547.11'
L = 1,033.24'

S.R.315 CURVE DATA

P.I. = STA. 144+60.97
Δ = 4°40'19.92"
Dc = 2°00'
Ls = 200.00'
Ts = 216.89'
R = 2,864.79'
Lc = 33.61'
Xc = 199.98'
Yc = 2.33'
E = 2.96'

BENCHMARK: TOP NORTHWEST CORNER OF CSX BRIDGE OVER TWIN RIVERS DRIVE. ELEVATION = 729.91



EXISTING RAIL ELEVATIONS SHOWN ARE FOR THE NORTH RAIL OF THE EASTBOUND MAIN TRACK.

VERTICAL CLEARANCE:

REQUIRED - 15.00'
ACTUAL - PT. "A" = 16.19'
PT. "B" = 15.32'

RAILROAD TRAFFIC:

A.D.T. 25 (1987)

EXISTING STRUCTURE (BRIDGE N° 11)

TYPE: SIMPLE SPAN STEEL BEAM BRIDGE WITH RIVETED FASCIA GIRDERS, REINFORCED CONCRETE SUBSTRUCTURES WITH LIMESTONE FACING.
SPANS: 43'-0", 43'-0" c/c BEARINGS
WIDTH: 35'-0½" o/o FASCIA GIRDERS
LOADING: COOPER E-72
ALIGNMENT: 4°30' CURVE, RIGHT
SKEW: 25° ± R.F.

(TO BE REMOVED)

PROPOSED

TYPE: TWO SIMPLE SPANS, WELDED STEEL DECK GIRDERS WITH STEEL FLOOR PLATE (ASTM 588 UNPAINTED), BALLASTED DECK AND REINFORCED CONCRETE SUBSTRUCTURES.
SPANS: 98.81', 70.05' c/c BEARINGS (MEASURED ON ℄ R.R. CURVE
WIDTH: 31.00' o/o CONCRETE PARAPETS WITH BRIDGE SIDEWALK RAILING (BR-2-82).
LOADING: COOPER E-80 WITH DIESEL IMPACT
SKEW: VARIES

ALIGNMENT: 4° 30' RAILROAD CURVE, RIGHT.
NO. OF TRACKS: TWO
SUPERELEVATION: 2 INCHES
CONSTRUCTION: ROLL-IN

JOHN E. FOSTER AND ASSOCIATES, INC. 1/17
555 Buttles Ave., Columbus, Ohio 43215

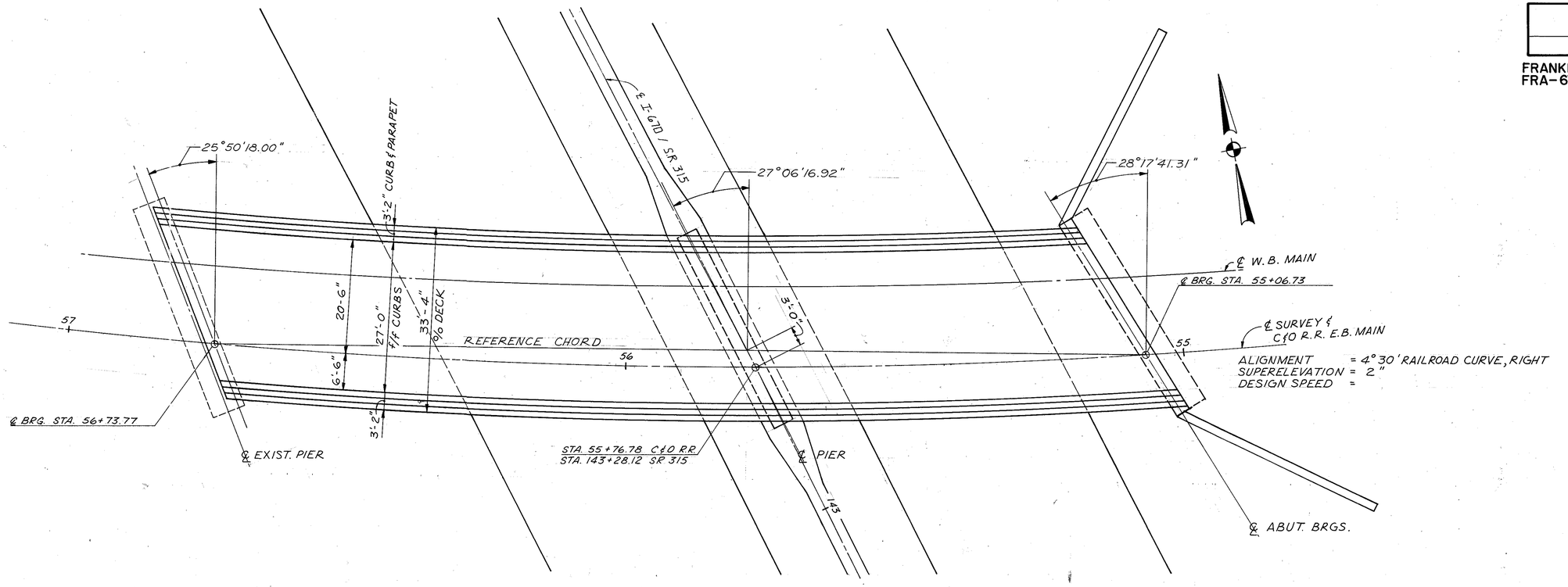
SITE PLAN

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

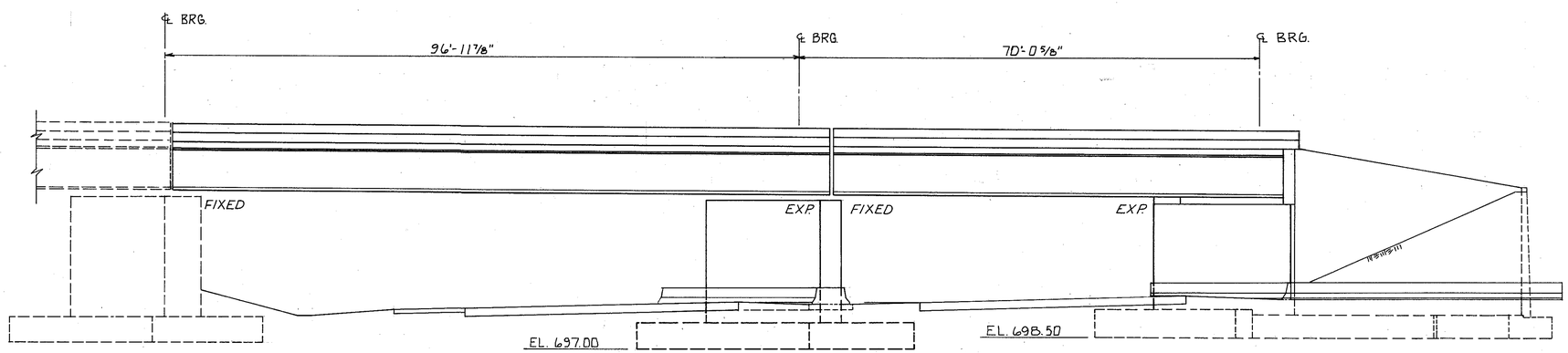
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
HWR	DMT	–	HSS	JSS		

OHIO	149
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



GENERAL PLAN



GENERAL ELEVATION

JOHN E. FOSTER AND ASSOCIATES, INC. 2/17
555 Buttles Ave., Columbus, Ohio 43215

GENERAL PLAN AND ELEVATION

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315 - 1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA.143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CEM	D.M.T.		HSS	JSS	12/91	

FRANKLIN COUNTY
FRA-315-1.25-C-3

ESTIMATED QUANTITIES

STP

ITEM	ITEM EXTENSION	TOTAL	UNIT	DESCRIPTION	SUPER-STRUCTURE	EAST ABUTMENT	PROPOSED PIER 1	EXISTING PIER	GENERAL
202	11200	LUMP		PORTIONS OF STRUCTURE REMOVED					
502	12301	LUMP		TEMPORARY STRUCTURE (RAILROAD), AS PER PLAN					
503	11100	LUMP		COFFERDAMS, CRIBS AND SHEETING					
503	21101	3,318	CU.YD.	UNCLASSIFIED EXCAVATION, AS PER PLAN		2,795	523		
509	15830	123,554	POUND	EPOXY COATED REINFORCING STEEL, GRADE 60	5,508	87,912	30,134		
511	31502	99	CU.YD.	CLASS S CONCRETE, SUPERSTRUCTURE	99				
511	40500	154	CU.YD.	CLASS C CONCRETE, PIER ABOVE FOOTINGS			154		
511	44100	262	CU.YD.	CLASS C CONCRETE, ABUTMENT NOT INCLUDING FOOTING		262			
511	46000	144	CU.YD.	CLASS C CONCRETE, WINGWALL, ABOVE FOOTING		144			
511	46500	543	CU.YD.	CLASS C CONCRETE, FOOTING		372	171		
512	33300	295	SQ.YD.	TYPE A WATERPROOFING		295			
SPECIAL	51256100	562	SQ.YD.	BUTYL RUBBER MEMBRANE WATERPROOFING	562				
SPECIAL	51267200	562	SQ.YD.	WATERPROOFING, MISC.: DECK WATERPROOFING	562				
SPECIAL	51267502	492	SQ.YD.	SEALING OF CONCRETE SURFACES (EPOXY)		177	138	177	
513	20000	1,380	EACH	WELDED STUD SHEAR CONNECTOR	1,380				
514	00620	42,229	SQ.FT.	FIELD PAINTING OF NEW STEEL, SYSTEM IZEU Φ	42,229				
516	10501	62	LIN. FT.	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC COMPRESSION SEAL, AS PER PLAN	62				
516	13200	17	SQ.FT.	1/2" PREFORMED EXPANSION JOINT FILLER		17			
516	13600	142	SQ.FT.	1" PREFORMED EXPANSION JOINT FILLER		142			
516	30500	172	LIN.FT.	PVC WATERSTOP		172			
516	46001	11	EACH	BEARING DEVICE, BOLSTER, AS PER PLAN			11		
516	46201	22	EACH	BEARING DEVICE, ROCKER, AS PER PLAN		11	11		
516	46900	11	EACH	BEARING DEVICE, MISC.: FIXED BEARING ASSEMBLY, FB-2				11	
517	71500	334	LIN.FT.	RAILING (CONCRETE PARAPET WITH DOUBLE PIPE RAIL)	334				
518	21200	179	CU.YD.	POROUS BACKFILL WITH FILTER FABRIC		179			
518	42301	54	LIN.FT.	8" NON-PERFORATED CORRUGATED STEEL PIPE, INCLUDING SPECIALS, 707.01, BITUMINOUS COATED, 707.05, AS PER PLAN		54			
518	62100	97	LIN.FT.	STRUCTURE DRAINAGE, MISC.: 6" STEEL PIPE, INCLUDING SPECIALS, BITUMINOUS COATED, 707.05, AS PER PLAN	58				39
518	62100	230	LIN.FT.	STRUCTURE DRAINAGE, MISC.: 8" PERFORATED CORRUGATED STEEL PIPE, INCLUDING SPECIALS, 707.01, BITUMINOUS COATED, 707.05, AS PER PLAN		150			80
518	62100	344	LIN.FT.	STRUCTURE DRAINAGE, MISC.: 8" HALF ROUND PERFORATED GALVANIZED STEEL PIPE WITH PAN AND SPECIALS, AS PER PLAN	344				
SPECIAL	53000200	LUMP		STRUCTURE, MISC.: ROLL-IN BENTS AND APPURTENANCES INCLUDING ROLL-IN OPERATION					
810	11200	1,023,831	POUND	STRUCTURAL STEEL, A588 (AISC CATEGORY III)	1,023,831				

Φ SEE PROPOSAL NOTE

GENERAL NOTES

SPECIFICATIONS:

DESIGN SPECIFICATIONS: EXCEPT FOR CONCRETE AND REINFORCED CONCRETE ITEMS, THIS STRUCTURE CONFORMS TO THE REQUIREMENTS OF THE "MANUAL FOR RAILWAY ENGINEERING" BY THE AMERICAN RAILWAY ENGINEERING ASSOCIATION, 19XX EDITION. DESIGN OF CONCRETE AND REINFORCED CONCRETE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", AASHTO, 1989 INCLUDONG THE 1990 INTERIM SPECIFICATIONS AND THE ODOT BRIDGE DESIGN MANUAL.

CONSTRUCTION SPECIFICATIONS AND MATERIAL SPECIFICATIONS: STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, DATED JANUARY 1, 1995.

DESIGN DATA

DESIGN LOADING – COOPER E-80 WITH DIESEL IMPACT
CONCRETE CLASS S – UNIT STRESS 5,000 psi (SUPERSTRUCTURE)
CONCRETE CLASS C – UNIT STRESS 4,000 psi (SUBSTRUCTURE)
STRUCTURAL STEEL – ASTM A588 – UNIT STRESS 27,000 psi
REINFORCING STEEL – ASTM A615 – UNIT STRESS 24,000 psi

DIMENSIONS

DIMENSIONS GIVEN ARE MEASURED HORIZONTALLY AND AT 60 DEGREES F UNLESS OTHERWISE NOTED.

REFERENCE DRAWINGS

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS BR-2-82. DATED 11/1/82.

FOUNDATION BEARING PRESSURE

ABUTMENT AND PIER FOOTINGS, AS DESIGNED, PRODUCE A MAXIMUM BEARING PRESSURE OF 3.0 TONS PER SQ. FT.

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND/OR FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO CMS SECTIONS 102.05, 105.02 AND 513.02.

GENERAL NOTES (CONT.)

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PREBID EXAMINATION OF THE EXISTING STRUCTURE BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

REMOVAL OF EXISTING STRUCTURE

WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC THE EXISTING STRUCTURE SHALL BE REMOVED AS DESCRIBED IN THE "CONSTRUCTION PROCEDURE" NOTES ON SHEET 3 OF 13.

PROTECTION OF TRAFFIC

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

ABUTMENT CONSTRUCTION CONSTRAINTS

ABUTMENT CONSTRUCTION SHALL BE AS SHOWN FOR PHASE 1 AND 2 ON SHEET 4 OF 17. EXCAVATION FOR PROPOSED ABUTMENT SHALL BE TO THE LIMITS SHOWN ON SHEET 13 OF 17 TO ACCOMMODATE TEMPORARY TRESTLE. BACKFILL BEHIND THE ABUTMENT SHALL INCLUDE 2'-0" THICK POROUS BACKFILL WITH FILTER FABRIC AS SHOWN ON SHEET 4 OF 17. ALL MATERIAL AND LABOR INCIDENTAL TO PERFORM THIS WORK SHALL BE INCLUDED IN PRICE BID FOR ITEM 503, UNCLASSIFIED EXCAVATION, AS PER PLAN.

DECK WATERPROOFING

THE DECK SHALL BE WATERPROOFED AS PER A.R.E.A. SPECIFICATIONS (CHAPTER 29, PART 2) USING 3/32" BUTYL RUBBER MEMBRANE CONFORMING TO THE REQUIREMENT OF ART 2.3.5 ON THE ENTIRE TOP OF UNDERLAYMENT AND BALLAST RETAINERS. UNDERLAYMENT SHALL BE 1 1/2" THICK MINIMUM, BITUMINOUS MASTIC CONFORMING TO ART 2.9.4.2.

ADHESIVE MUST BE APPLIED TO THE ENTIRE SURFACE TO BE WATERPROOFED. NO. 3 TONGUE AND GROOVE SPLICE SHOWN ON FIGURE 2 PAGE 29.2.15, SHALL BE USED FOR SPLICING BUTYL RUBBER MEMBRANE.

TWO LAYERS OF 1/2" THICK ASPHALTIC PANELS CONFORMING TO ART. 2.4.7 PLACED WITH STAGGERED JOINTS AND SET IN COMPATIBLE ADHESIVES, SHALL BE USED TO PROTECT BUTYL RUBBER MEMBRANE ON DECK AND BALLAST RETAINERS. BALLAST SHALL BE PLACED AS SOON AS FEASIBLE FOLLOWING PLACEMENT OF THE PANELS TO PREVENT DISTORTION FROM SUNLIGHT. EDGES AND PROTRUSIONS OF PANELS ARE TO BE COATED IN ACCORDANCE WITH ART 2.9.4.6.(A).

THE BUTYL RUBBER MEMBRANE SHALL BE AS SPECIFIED IN THR A.R.E.A. SPECIFICATIONS, CHAPTER 29, PART 2 AS PER ASTM D 297-61T, ASTM D 412-61T, ASTM D 624-54, ASTM D 676-59T, AND ASTM D 571-57T.

BASIS OF PAYMENT

THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS INCLUDING UNDERLAYMENT, ASPHALTIC PANELS AND INCIDENTALS NECESSARY TO FURNISH AND INSTALL WATERPROOFING OVER DECK AND CURB PLATES. PAYMENT SHALL BE MADE ON PER SQUARE YARD BASIS AT THE CONTRACT PRICE FOR ITEM SPECIAL "DECK WATERPROOFING".

PAYMENT FOR BUTYL RUBBER MEMBRANE SHALL BE MADE ON PER SQUARE YARD BASIS AT THE CONTRACT PRICE FOR ITEM SPECIAL "BUTYL RUBBER MEMBRANE WATERPROOFING".

ITEM SPECIAL – SEALING OF CONCRETE SURFACES (EPOXY)

EPOXY SEALER SHALL BE APPLIED TO THE CONCRETE SURFACES AS LISTED BELOW: (SEE THE PROPOSAL FOR SEALER MATERIAL SURFACE PREPARATION REQUIREMENTS AND APPLICATION RATE AND PROCEDURES).

1. BRIDGE SEAT AND ABUTMENT WALL FROM BRIDGE SEAT TO TOP OF SAFETY BARRIER SHAPE.
2. WINGWALL TOP AND FRONT FACE FROM TOP TO 1'-0" BELOW GROUND LINE.
3. PIER 1 – ALL SURFACES ABOVE MEDIAN SAFETY BARRIER.
4. PIER 2 – (EXISTING) – ALL SURFACES ABOVE GROUND LINE.

UTILITY LINES

THERE IS AN AERIAL LINE ALONG THE NORTH SIDE OF THE EXISTING BRIDGE.

ALL EXPENSES INVOLVED IN RELOCATING THE AFFECTED UTILITIES SHALL BE BORNE BY THE OWNERS. THE CONTRACTOR AND THE OWNERS ARE REQUESTED TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

JOHN E. FOSTER AND ASSOCIATES, INC. 3/17
555 Buttles Avenue, Columbus, Ohio 43215

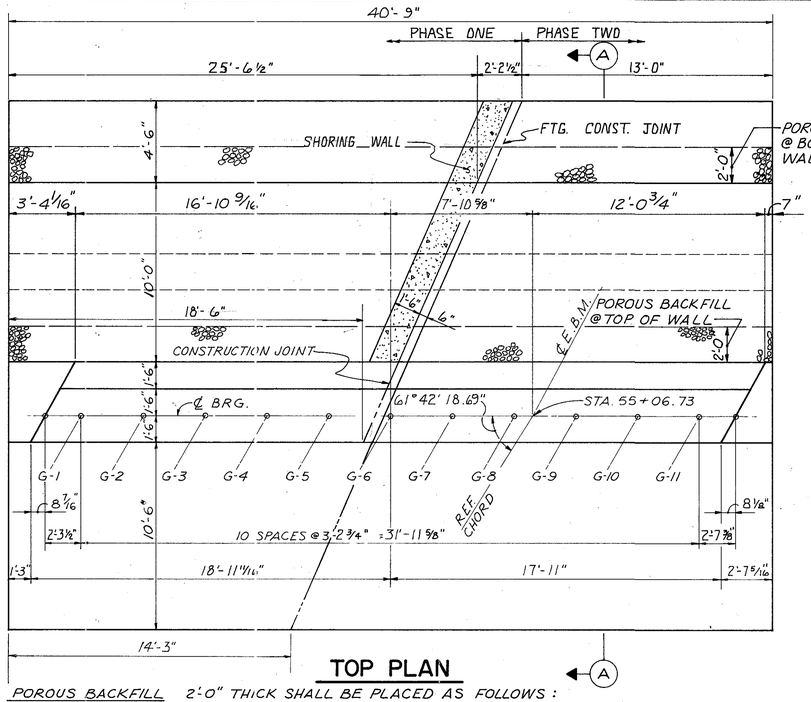
ESTIMATED QUANTITIES
AND GENERAL NOTES

BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

FRANKLIN COUNTY STA. 143+28.12

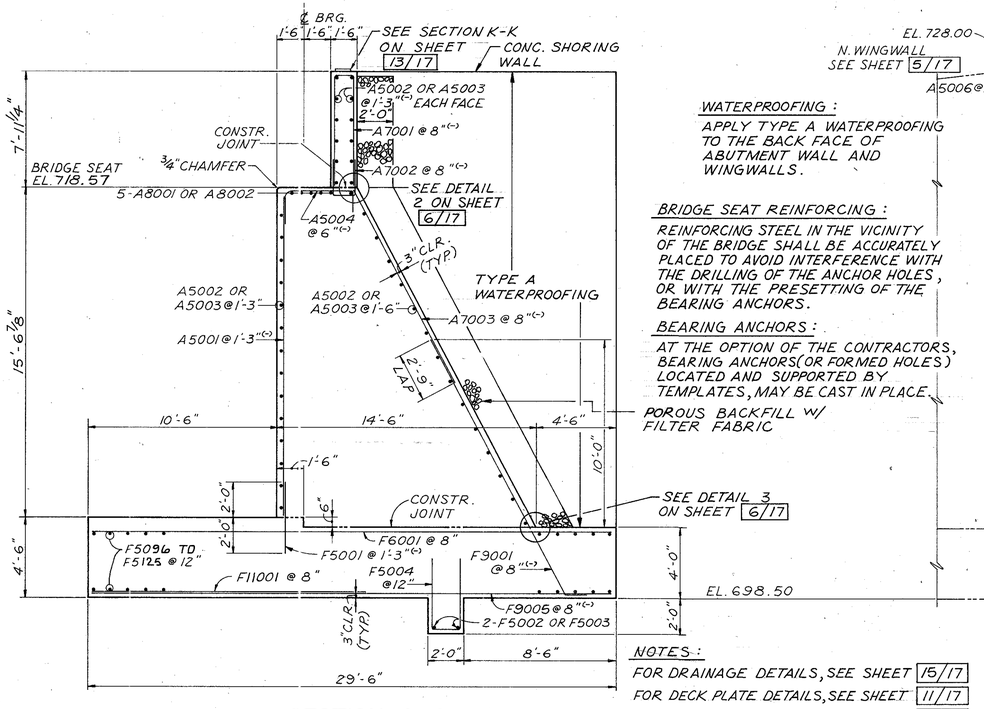
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
E.S.	T.H. /D.M.T.	–	C.E.M.	H.W.R.	9/90	

FRANKLIN COUNTY
FRA-670-1.25-C-3



TOP PLAN

POROUS BACKFILL W/ FILTER FABRIC: 2'-0" THICK SHALL BE PLACED AS FOLLOWS:
1. FROM TOP OF FOOTING TO 3" BELOW THE TOP OF BACKWALL.
2. FROM TOP OF FOOTING TO 2'± BELOW THE TOP OF WINGWALL.



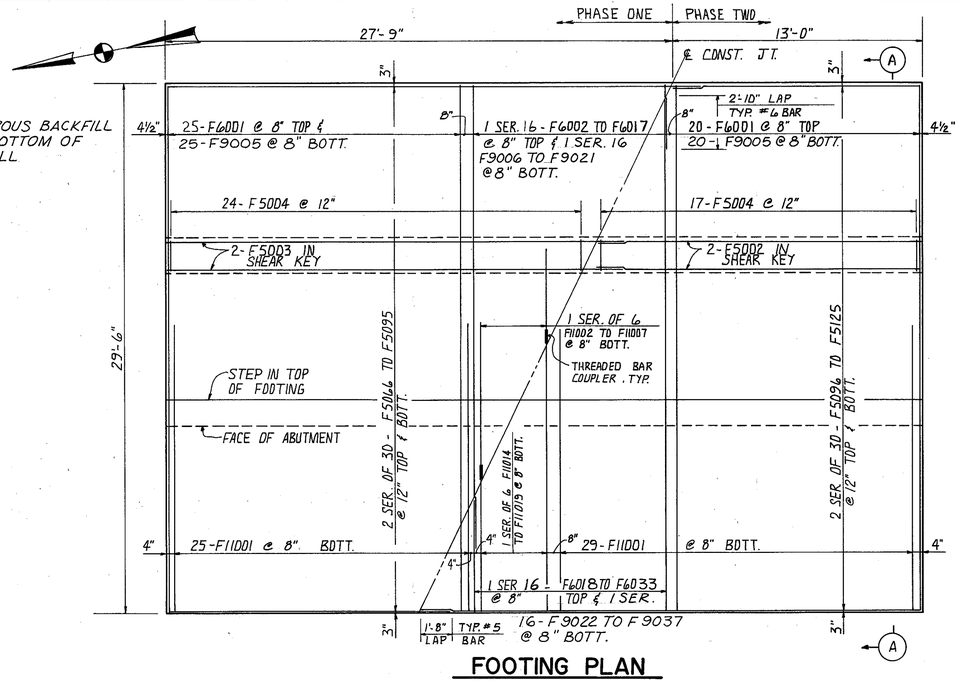
SECTION A-A

WATERPROOFING:
APPLY TYPE A WATERPROOFING TO THE BACK FACE OF ABUTMENT WALL AND WINGWALLS.

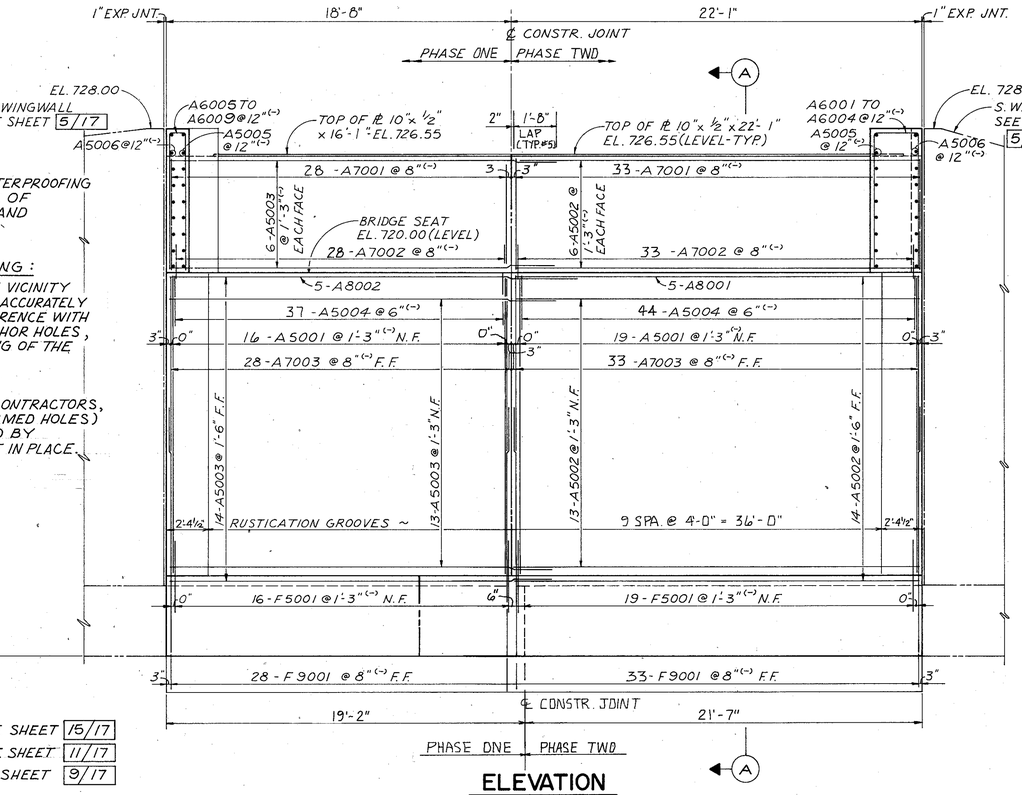
BRIDGE SEAT REINFORCING:
REINFORCING STEEL IN THE VICINITY OF THE BRIDGE SHALL BE ACCURATELY PLACED TO AVOID INTERFERENCE WITH THE DRILLING OF THE ANCHOR HOLES, OR WITH THE PRESETTING OF THE BEARING ANCHORS.

BEARING ANCHORS:
AT THE OPTION OF THE CONTRACTORS, BEARING ANCHORS (OR FORMED HOLES) LOCATED AND SUPPORTED BY TEMPLATES, MAY BE CAST IN PLACE.

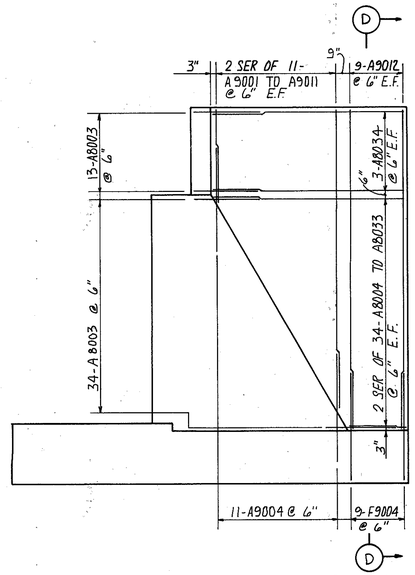
NOTES:
FOR DRAINAGE DETAILS, SEE SHEET 15/17
FOR DECK PLATE DETAILS, SEE SHEET 11/17
FOR BEARING DETAILS, SEE SHEET 9/17



FOOTING PLAN

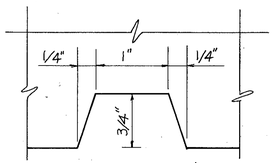


ELEVATION



SHORING WALL DETAIL

PVC:
1. THE 6" WATERSTOP SHALL BE USED AT ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS AS WELL AS EXPANSION JOINTS IN THE ABUTMENT WALL ABOVE FOOTING. THE JOINT BETWEEN WALL AND FOOTING WILL ALSO HAVE 6" PVC OVER ITS ENTIRE LENGTH INCLUDING WINGWALL.
2. MITERED SPLICES AT TEES AND ELLS SHALL BE MADE BY HEAT FUSING ENDS OF WATERSTOPS TO FORM A WATERTIGHT JOINT.



VERTICAL RUSTICATION GROOVE

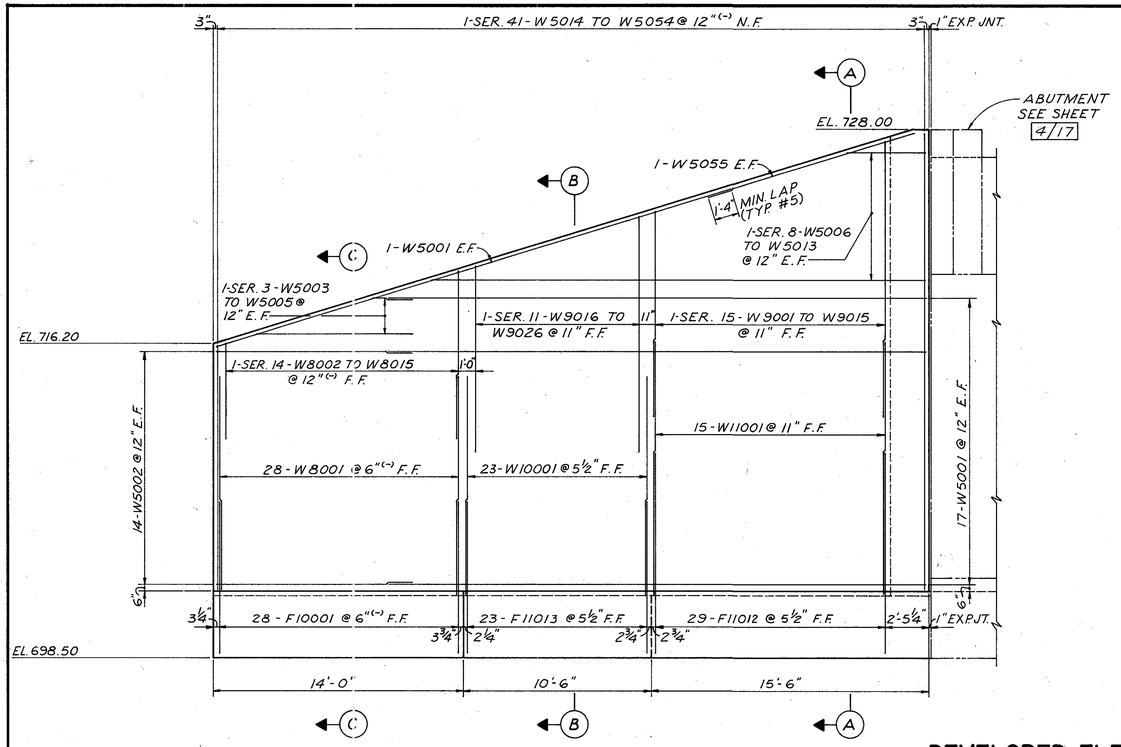
JOHN E. FOSTER AND ASSOCIATES, INC. 4/17
555 Buttles Ave., Columbus, Ohio 43215

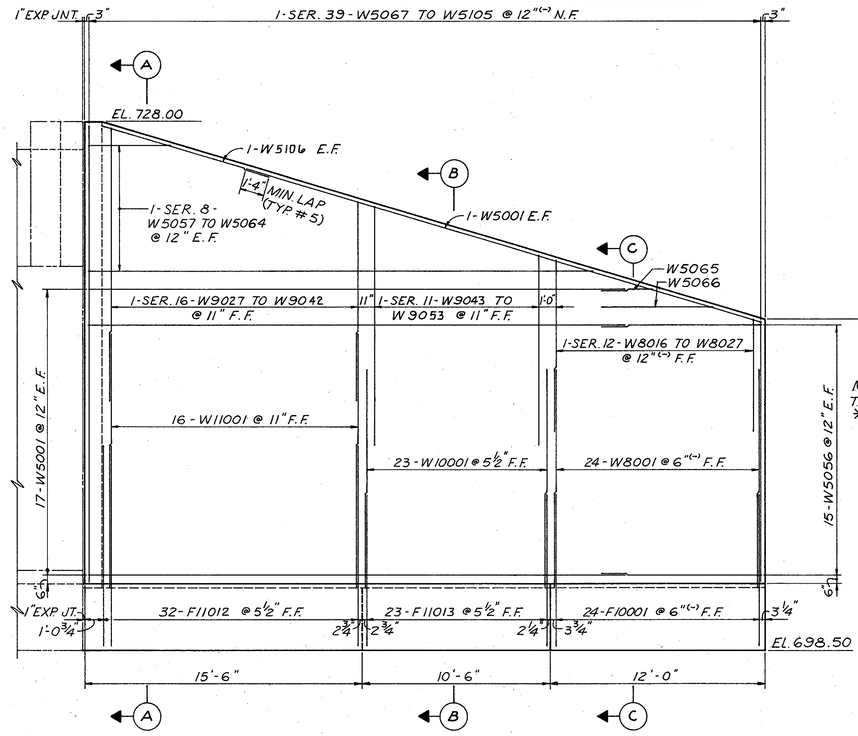
ABUTMENT PLAN ELEVATION & SECTION

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

FRANKLIN COUNTY — STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DFS	D.M.T.	—	CEM	JSS	12/91	

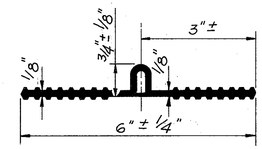




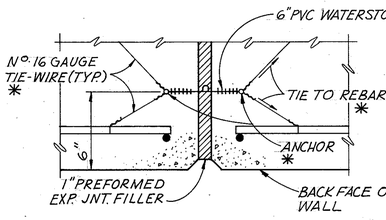
DEVELOPED ELEVATIONS

OHIO	152
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

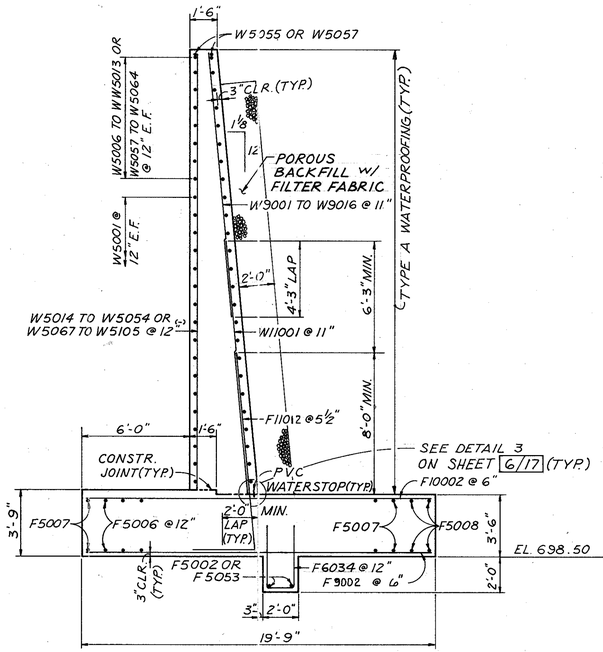


WATERSTOP DETAIL

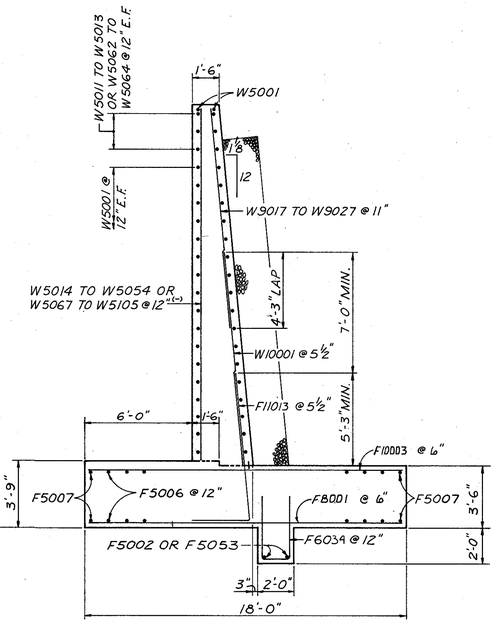


SECTION X-X

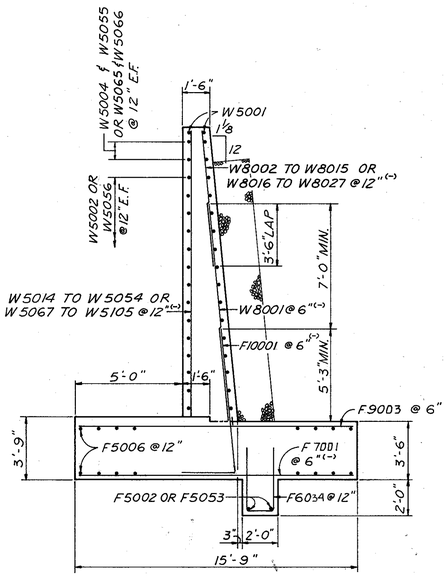
* FOR THE FIRST POUR, THE WATERSTOP SHOULD BE HELD SECURELY IN PLACE BY THE USE OF SPLIT FORMS AND TIE-WIRES. FOR THE SECOND POUR, SECURE THE FREE END OF WATERSTOP IN PROPER POSITION WITH TIE-WIRES. ALTERNATE METHODS, AS APPROVED BY THE ENGINEER, MAY BE USED TO INSURE THE CORRECT POSITIONING OF THE WATERSTOP.



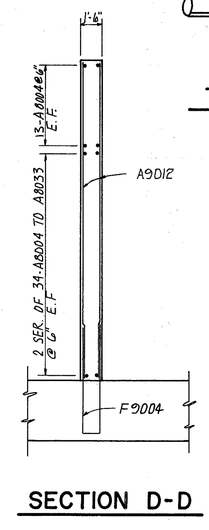
SECTION A-A



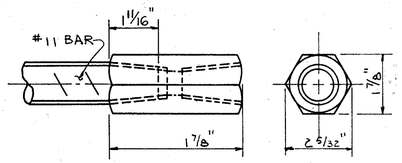
SECTION B-B



SECTION C-C



SECTION D-D



THREADED BAR COUPLER DETAIL

LENTON STD. COUPLER - A2 OR EQUAL

JOHN E. FOSTER AND ASSOCIATES, INC. 5/17
555 Buttles Ave., Columbus, Ohio 43215

WING WALL ELEVATIONS SECTIONS AND DETAILS

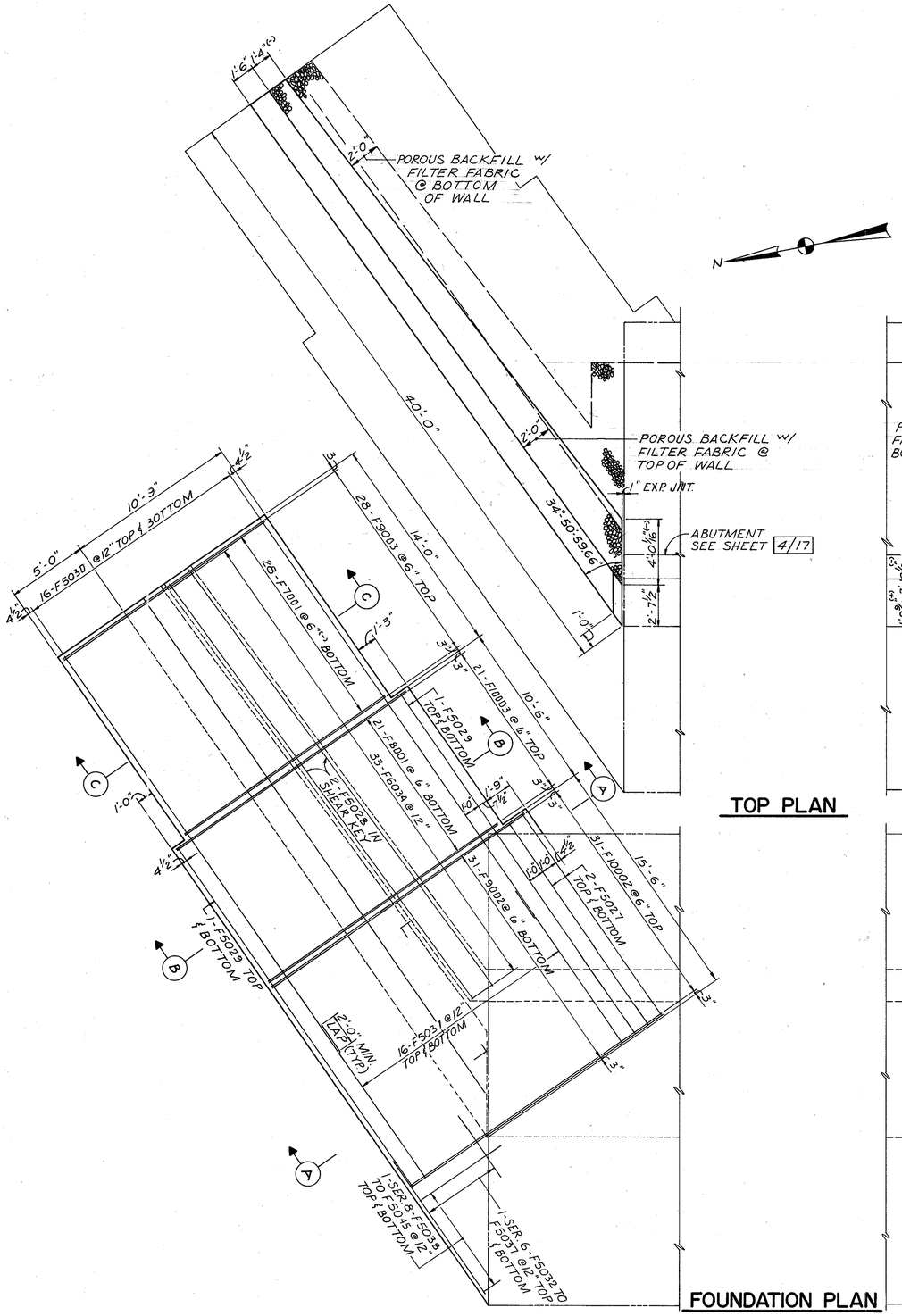
BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

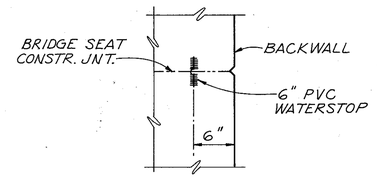
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DFS	DMT		LEM	JSS	12/91	

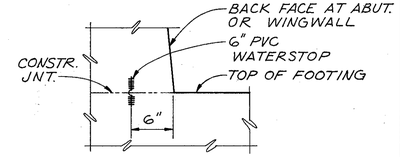
OHIO	153 / 224
FHWA REGION 5	
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3





DETAIL 2



DETAIL 3

JOHN E. FOSTER AND ASSOCIATES, INC. 6/17
555 Buttles Ave., Columbus, Ohio 43215

WING WALL FOUNDATION PLANS AND DETAILS

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

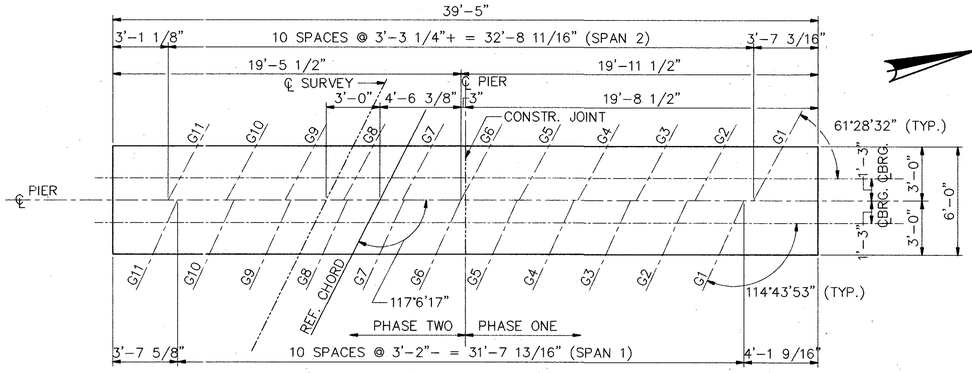
FRANKLIN COUNTY — STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DFS	DMT		CEM	JSS	12/91	

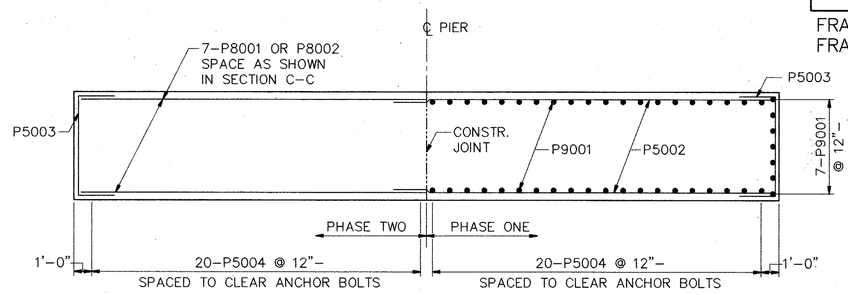
FRA-315-1.25-C-3	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

154
224

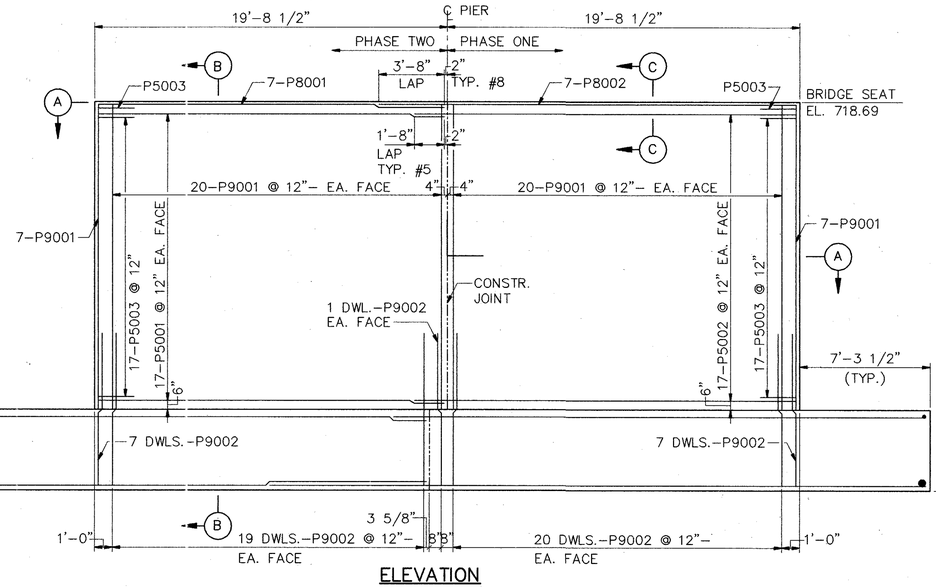
FRANKLIN COUNTY
FRA-315-1.25-C-3



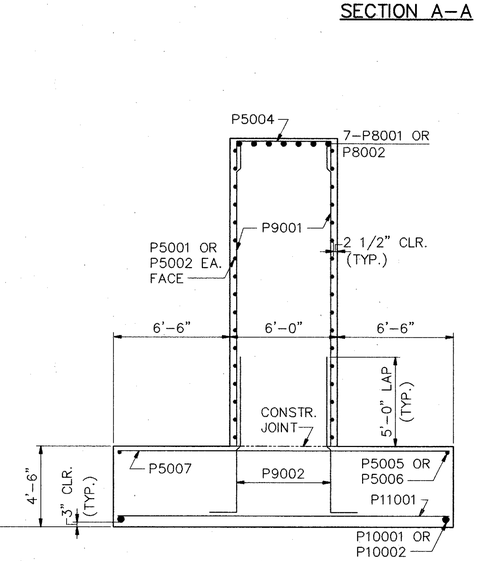
TOP PLAN



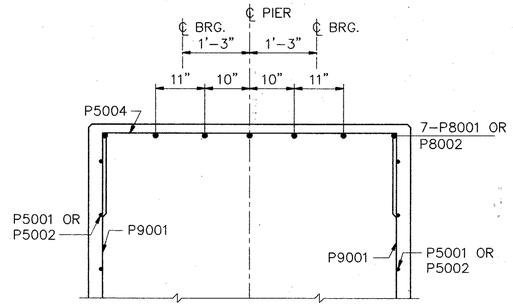
SECTION A-A



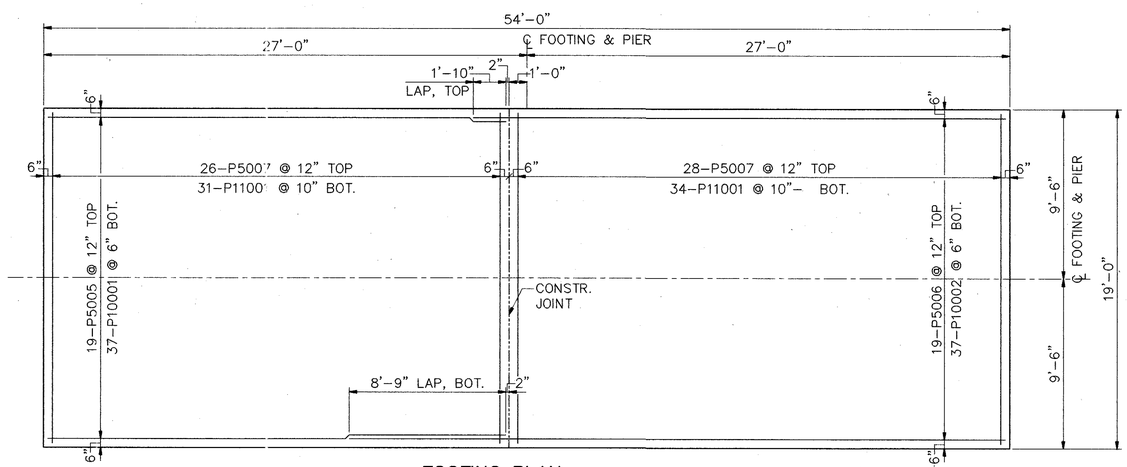
ELEVATION



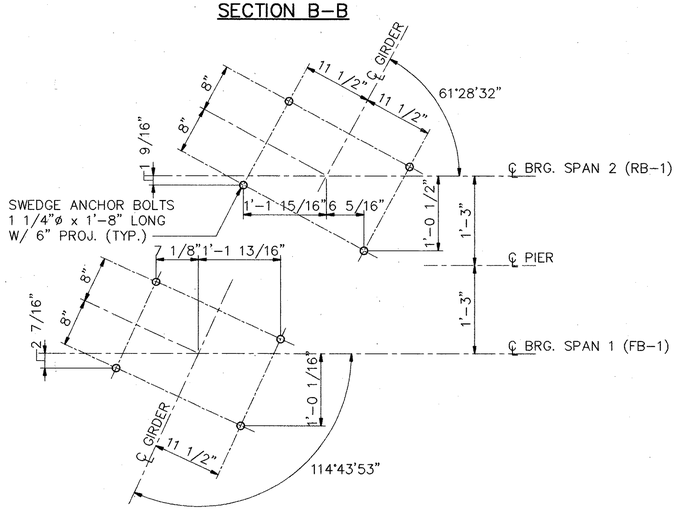
SECTION B-B



SECTION C-C



FOOTING PLAN



TYPICAL ANCHOR BOLT LAYOUT

NOTES:

1. BRIDGE SEAT REINFORCING:
   REINFORCING STEEL IN THE VICINITY OF THE BRIDGE SEAT SHALL BE ACCURATELY PLACED TO AVOID INTERFERENCE WITH THE DRILLING OF THE ANCHOR HOLES, OR WITH THE PRESETTING OF THE BEARING ANCHORS.
2. BEARING ANCHORS:
   AT THE OPTION OF THE CONTRACTOR, BEARING ANCHORS (OR FORMED HOLES) LOCATED AND SUPPORTED BY TEMPLATES, MAY BE CAST IN PLACE.

JOHN E. FOSTER AND ASSOCIATES, INC. 7/17
555 Buttles Avenue, Columbus, Ohio 43215

PIER DETAILS

BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
D.F.S.	C.E.M. /D.M.T.	–	C.E.M.	J.S.S.	12/91	

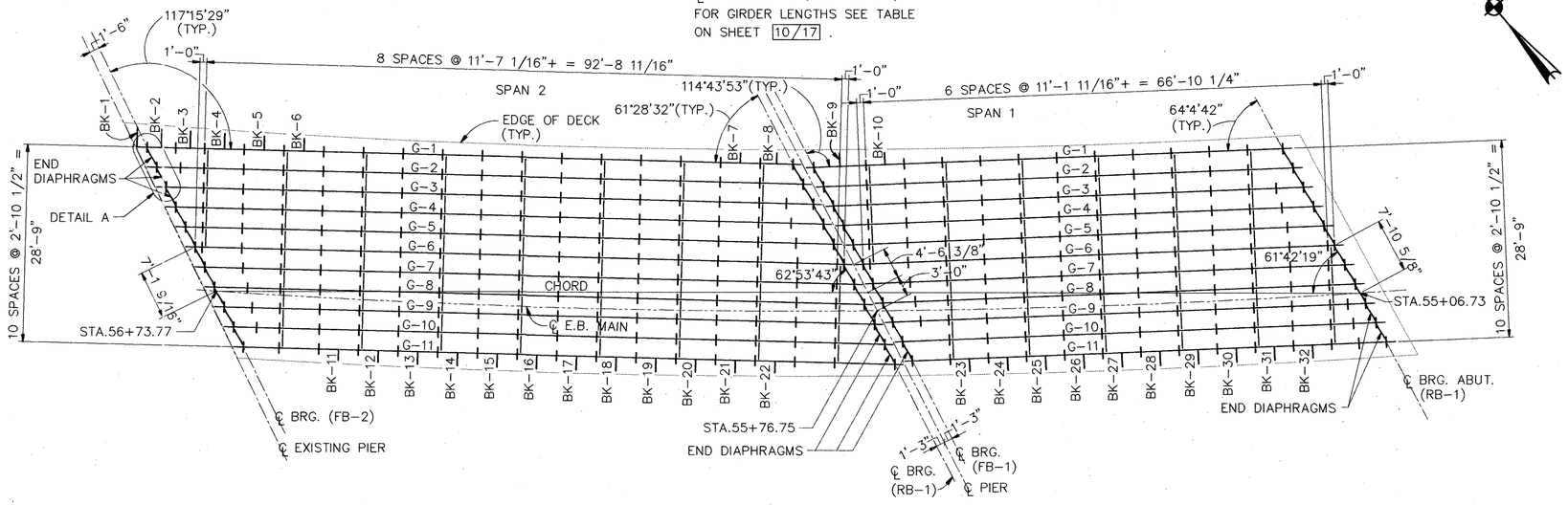
C:\PROJECTS\315\PIER
11/27/1998 - 15:14
PLOT1148

FRA-315-1.25-C-3	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

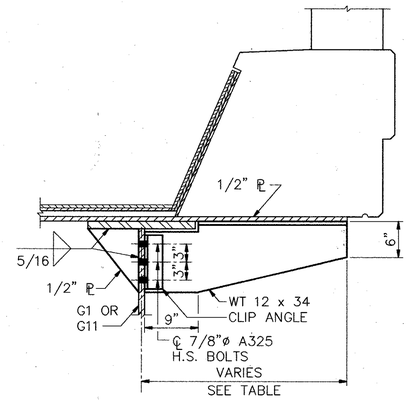
155
224

FRANKLIN COUNTY
FRA-315-1.25-C-3

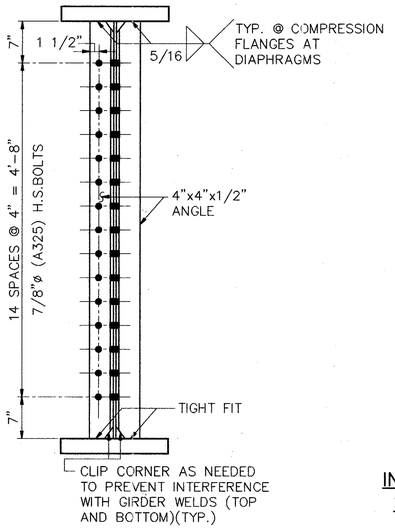
NOTE : DIAPHRAGM SPACING IS MEASURED ALONG ℄ OF GIRDER 6 (BOTH SPANS).
FOR GIRDER LENGTHS SEE TABLE ON SHEET 10/17 .



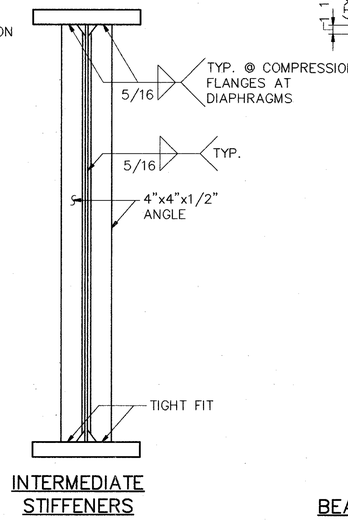
FRAMING PLAN



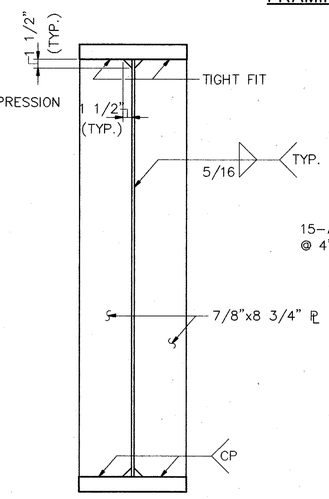
BRACKET DETAIL – BK



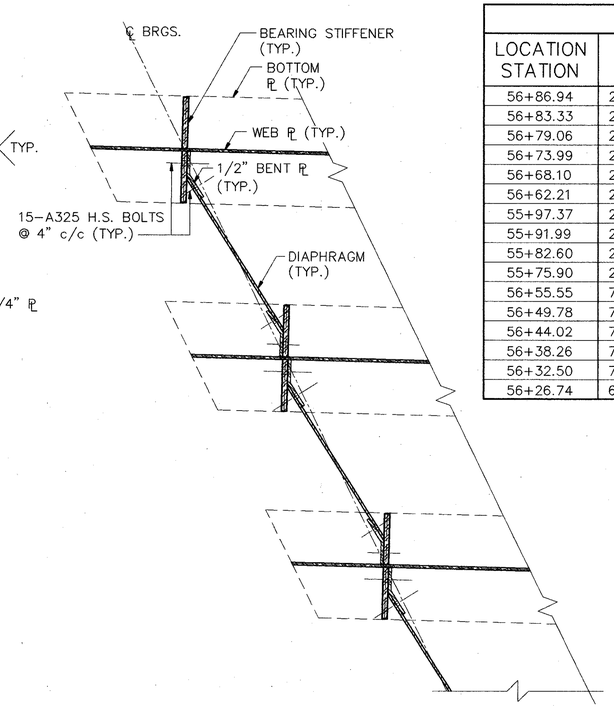
INTERMEDIATE STIFFENERS



INTERMEDIATE STIFFENERS



BEARING STIFFENERS



DETAIL A

FOR ADDITIONAL DETAILS SEE SHEET 10/17 .

DIMENSION TABLE

LOCATION STATION	OFFSET	BRACKET No.	DIM.	LOCATION STATION	OFFSET	BRACKET No.	DIM.
56+86.94	20'-1 5/8" RT.	BK-1	2'-10 7/16"	56+20.97	6'-11 3/4" LT.	BK-17	2'-0 1/4"
56+83.33	20'-3 3/4" RT.	BK-2	2'-8 5/16"	56+15.21	6'-11 7/8" LT.	BK-18	2'-0 1/16"
56+79.06	20'-6 1/8" RT.	BK-3	2'-6"	56+09.44	7'-0 1/2" LT.	BK-19	1'-11 9/16"
56+73.99	20'-8 5/8" RT.	BK-4	2'-3 3/8"	56+03.68	7'-1 1/4" LT.	BK-20	1'-10 3/4"
56+68.10	20'-11 3/8" RT.	BK-5	2'-0 11/16"	55+97.92	7'-2 3/8" LT.	BK-21	1'-9 9/16"
56+62.21	21'-1 3/4" RT.	BK-6	1'-10 5/16"	55+92.16	7'-3 7/8" LT.	BK-22	1'-8 1/8"
55+97.37	21'-6 1/2" RT.	BK-7	1'-5 1/2"	55+63.96	7'-2 1/4" LT.	BK-23	1'-9 13/16"
55+91.99	21'-5 1/8" RT.	BK-8	1'-6 7/8"	55+58.42	7'-1" LT.	BK-24	1'-11 1/16"
55+82.60	21'-0 5/8" RT.	BK-9	1'-11 3/8"	55+52.88	7'-0" LT.	BK-25	2'-0"
55+75.90	21'-3 1/4" RT.	BK-10	1'-8 3/4"	55+47.34	6'-11 3/8" LT.	BK-26	2'-0 5/8"
56+55.55	7'-5 1/8" LT.	BK-11	1'-6 7/8"	55+41.80	6'-11" LT.	BK-27	2'-1"
56+49.78	7'-3 3/8" LT.	BK-12	1'-8 9/16"	55+36.26	6'-10 7/8" LT.	BK-28	2'-1 1/8"
56+44.02	7'-2" LT.	BK-13	1'-9 15/16"	55+30.72	6'-11 1/8" LT.	BK-29	2'-0 7/8"
56+38.26	7'-1" LT.	BK-14	1'-11"	55+25.18	6'-11 5/8" LT.	BK-30	2'-0 3/8"
56+32.50	7'-0 1/4" LT.	BK-15	1'-11 3/4"	55+19.63	7'-0 1/2" LT.	BK-31	1'-11 9/16"
56+26.74	6'-11 7/8" LT.	BK-16	2'-0 3/16"	55+14.10	7'-1 1/2" LT.	BK-32	1'-10 1/2"

NOTE:
HIGH STRENGTH BOLTS SHALL BE 7/8" DIAMETER A325, GALVANIZED, UNLESS OTHERWISE NOTED.

JOHN E. FOSTER AND ASSOCIATES, INC. 8/17
555 Buttles Avenue, Columbus, Ohio 43215

FRAMING PLAN AND DETAILS
BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

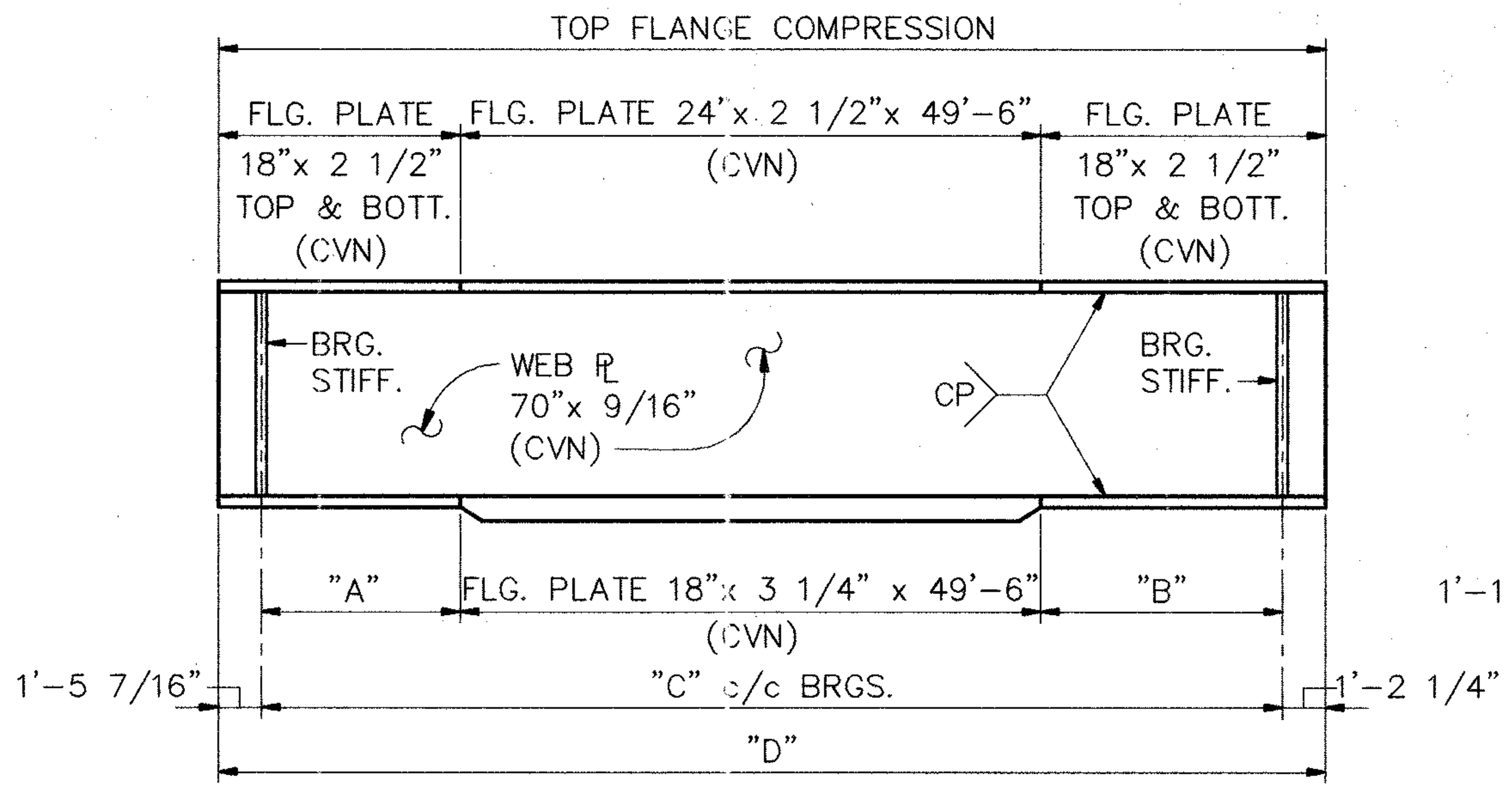
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
E.S.	D.M.T.	–	C.E.M.	J.S.S.	12/91	

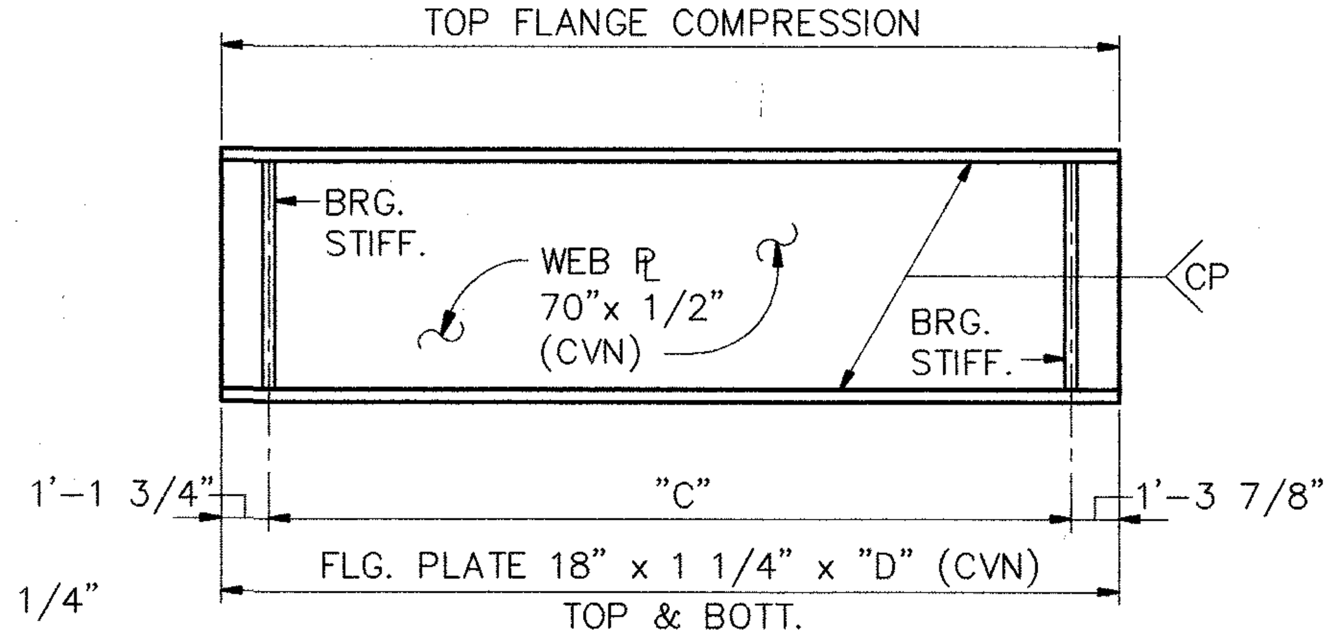
S:\PROJECTS\315 FRAMING
11/27/1996 - 16:11
PLOT: 1=120


FRA-315-1.25-C-3
OHIO
FHWA REGION 5
FEDERAL PROJECT
156
224
FRANKLIN COUNTY
FRA-315-1.25-C-3
TYPICAL TOP PLATE - tp
SECTION A - A
BASE PLATE
SECTION A-A
NOTES:
SPECIFICATIONS: A.R.E.A. SPECIFICATIONS FOR STEEL BRIDGES, DATED 1984.
MATERIAL: A.S.T.M. A36, EXCEPT AS NOTED. HIGH SRENGTH BOLTS ARE A.S.T.M. A325, TYPE 3.
FIXED BEARING ASSEMBLY - FB-1
ROCKER BEARING ASSEMBLY - RB-1
FIXED BEARING ASSEMBLY - FB-2
FIXED BEARING ASSEMBLY FB-1
ROCKER BEARING ASSEMBLY RB-1
NOTE:
1. THE 1/2" PREFORMED FABRIC BEARING PAD FOR FIXED BEARING AND ROCKER BEARING SHALL BE INCLUDED WITH THE FOLLOWING ITEMS:
ITEM 516, BEARING DEVICE, BOLSTER, AS PER PLAN.
ITEM 516, BEARING DEVICE, ROCKER, AS PER PLAN.
ITEM 516, BEARING DEVICE, MISC.: FIXED BEARING ASSEMBLY, FB-2.
DETAIL "A"
DETAIL "B"
DETAIL "C"
DETAIL "D"
TYPICAL ANCHOR BOLT DETAIL AT ABUTMENT
JOHN E. FOSTER AND ASSOCIATES, INC. 9/17
555 Buttles Avenue, Columbus, Ohio 43215
BEARING DETAILS
BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY
STA. 143+28.12
DESIGNED D.F.S.
DRAWN D.M.T.
TRACED -
CHECKED C.E.M.
REVIEWED J.S.S.
DATE 12/91
REVISED

FRANKLIN COUNTY
FRA-315-1.25-C-3

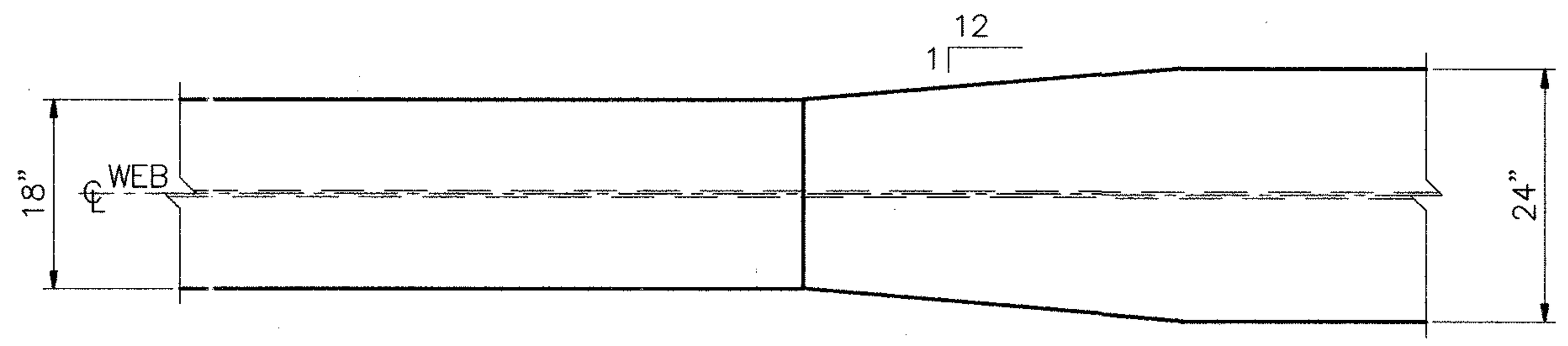


SPAN 2

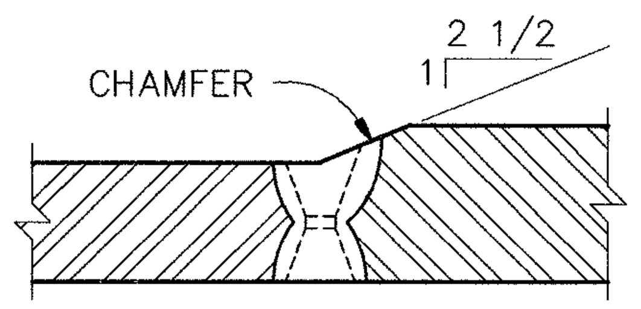


SPAN 1

GIRDER ELEVATIONS



FLANGE TRANSITION DETAIL
(SPAN 2)



FLANGE WELD DETAIL
(SPAN 2)

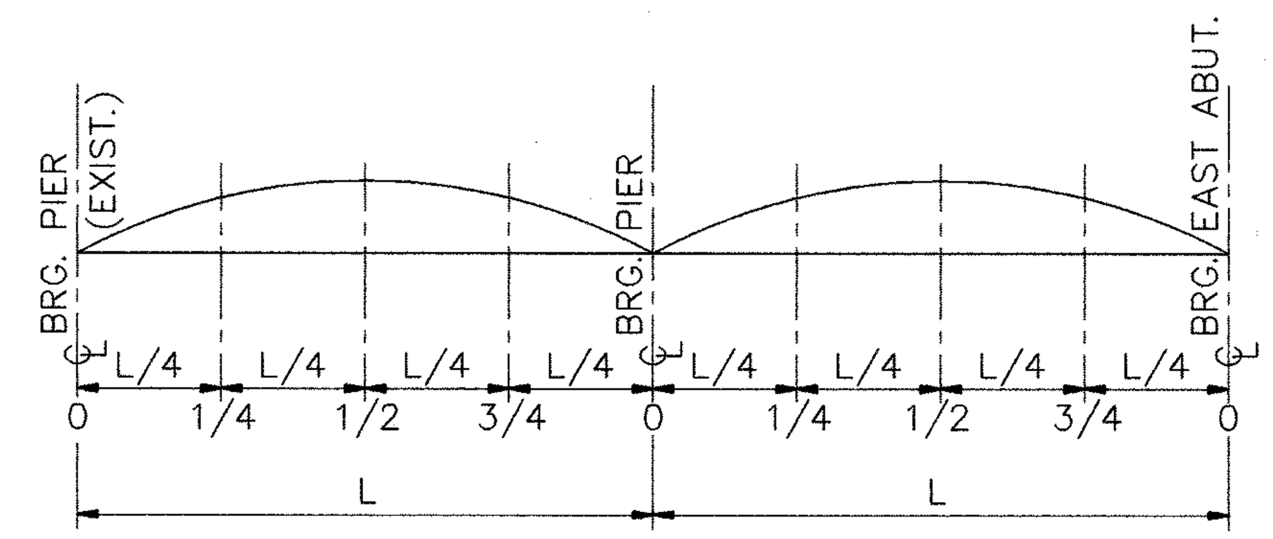
WELD SHALL CONFORM TO JOINT DETAILS B-U3a-S OR B-U7-S OF THE A.W.S. SPECIFICATIONS

GIRDER DIMENSION TABLE

GIRDER No.		DIMENSIONS A	B	C	D
SPAN 1	G-1			68'-5 7/8"	70'-11 1/2"
	G-2			68'-6 3/4"	71'-0 3/8"
	G-3			68'-7 5/8"	71'-1 1/4"
	G-4			68'-8 1/2"	71'-2 1/8"
	G-5			68'-9 3/8"	71'-3"
	G-6			68'-10 1/4"	71'-3 7/8"
	G-7			68'-11 1/8"	71'-4 3/4"
	G-8			69'-0"	71'-5 5/8"
	G-9			69'-0 7/8"	71'-6 1/2"
	G-10			69'-1 3/4"	71'-7 3/8"
	G-11			69'-2 11/16"	71'-8 5/16"
SPAN 2	G-1	22'-4 7/8"	22'-4 7/8"	94'-3 13/16"	96'-11 1/2"
	G-2	22'-5 3/8"	22'-5 3/8"	94'-4 3/4"	97'-0 7/16"
	G-3	22'-5 7/8"	22'-5 7/8"	94'-5 3/4"	97'-1 7/16"
	G-4	22'-6 3/8"	22'-6 3/8"	94'-6 3/4"	97'-2 7/16"
	G-5	22'-6 7/8"	22'-6 7/8"	94'-7 11/16"	97'-3 3/8"
	G-6	22'-7 5/16"	22'-7 5/16"	94'-8 11/16"	97'-4 3/8"
	G-7	22'-7 13/16"	22'-7 13/16"	94'-9 11/16"	97'-5 3/8"
	G-8	22'-8 5/16"	22'-8 5/16"	94'-10 5/8"	97'-6 5/16"
	G-9	22'-8 13/16"	22'-8 13/16"	94'-11 5/8"	97'-7 5/16"
	G-10	22'-9 5/16"	22'-9 5/16"	95'-0 9/16"	97'-8 1/4"
	G-11	22'-9 13/16"	22'-9 13/16"	95'-1 9/16"	97'-9 1/4"

DEFLECTION AND CAMBER TABLE

COMPONENTS \ LOCATION	SPAN 1 1/2 POINT	SPAN 2 1/4 POINT & 3/4 POINT	SPAN 2 1/2 POINT
DEFLECTION DUE TO WEIGHT OF STEEL	1/16"	1/8"	3/16"
DEFLECTION DUE TO REMAINING DEAD LOAD	1/4"	5/16"	7/16"
REQUIRED SHOP CAMBER	5/16"	7/16"	5/8"



CAMBER DIAGRAM

NOTE:
WHERE A SHAPE OR PLATE IS DESIGNATED (CVN) THE MATERIAL SHALL MEET SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 701.01.

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus, Ohio 43215

10/17

SUPERSTRUCTURE DETAILS
BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

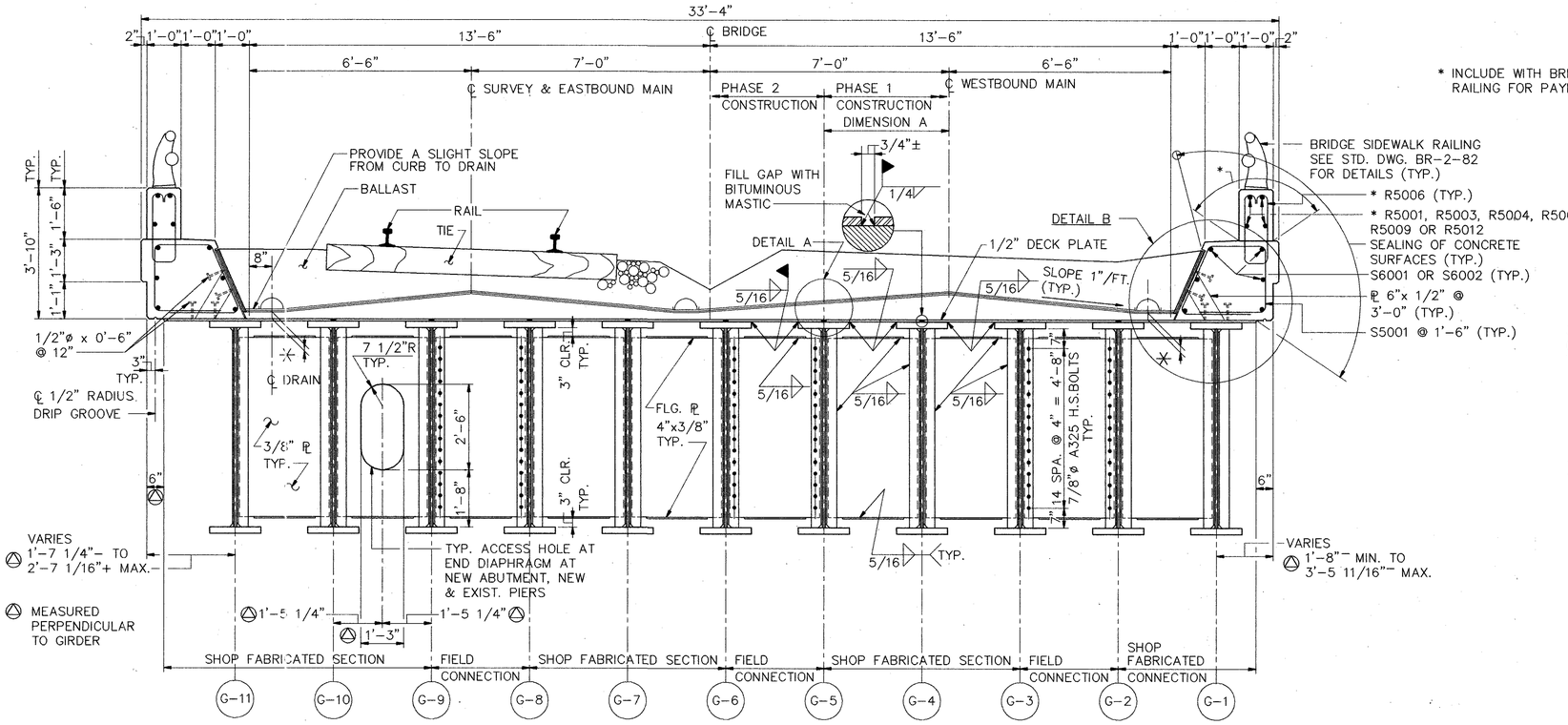
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
D.F.S.	G.R.M.	–	C.E.M.	J.S.S.	12/91	

FRA-315-1.25-C-3	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

158
224

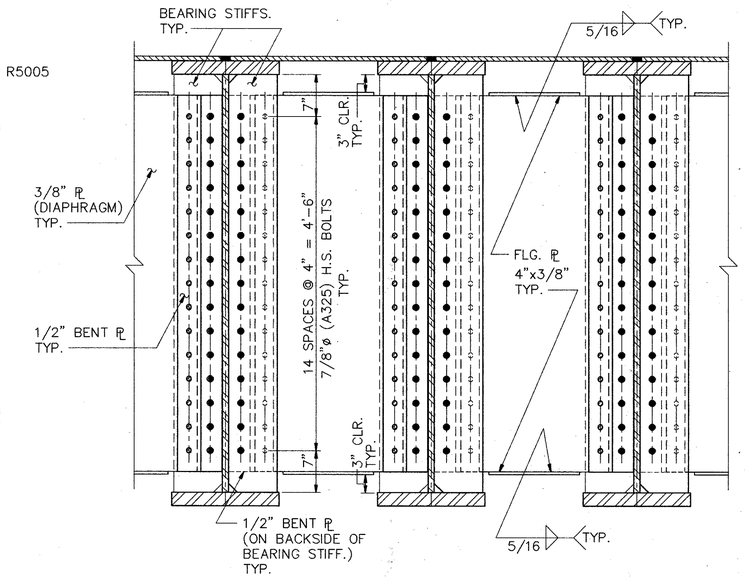
FRANKLIN COUNTY
FRA-315-1.25-C-3



TYPICAL CROSS SECTION

NOTE: ALL HORIZONTAL DIMENSIONS ARE RADIAL UNLESS OTHERWISE NOTED.

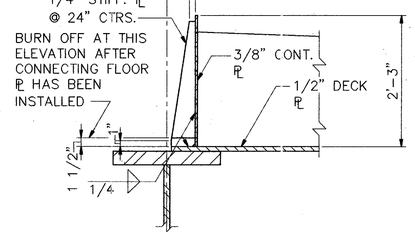
* INCLUDE WITH BRIDGE RAILING FOR PAYMENT



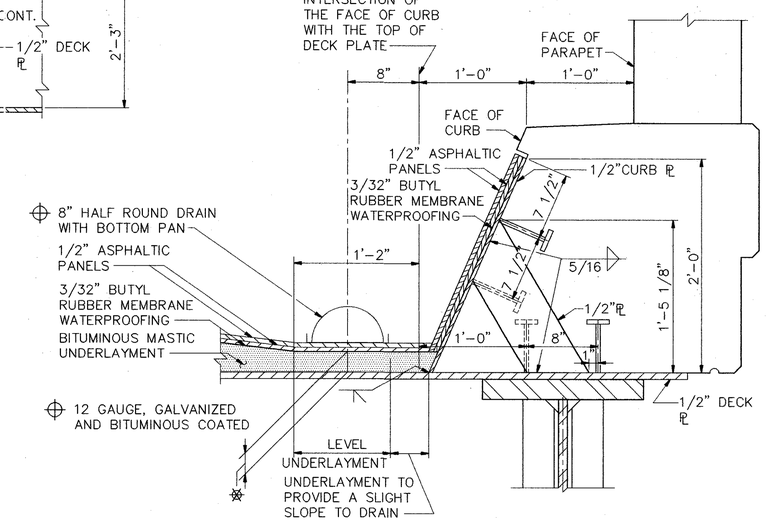
TYPICAL END DIAPHRAGM AT PIERS AND ABUTMENT

NOTES

1. FOR ADDITIONAL DETAILS SEE SHEET 8/17 .
2. HIGH STRENGTH BOLTS SHALL BE 7/8" DIAMETER A325, GALVANIZED, UNLESS OTHERWISE NOTED.



DETAIL A

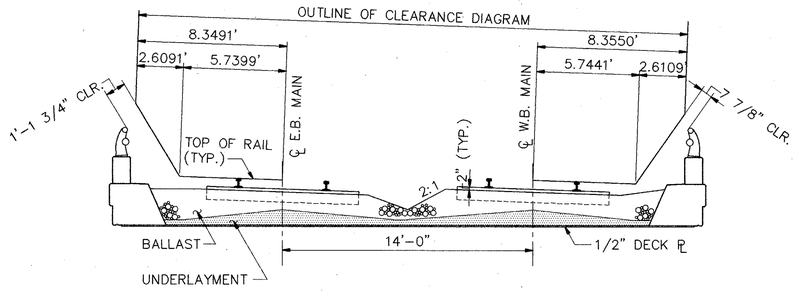


DETAIL B

NOTE: ✲ – VARIES, SEE SECTION AT GUTTER LINE, SHEET 13/17

DIMENSION TABLE	
LOCATION	DIMENSION A
STA.55+11.37	3'-11 1/8"
STA.55+37.49	3'-7 7/8"
STA.55+80.69	4'-4 5/8"
STA.55+83.56	4'-3 1/2"
SAT.56+21.81	3' 8 3/4"
STA.56+78.92	5'-0"

NOTE: DIMENSIONS ARE RADIAL



CLEARANCE DIAGRAM

JOHN E. FOSTER AND ASSOCIATES, INC. 11/17
555 Buttles Avenue, Columbus, Ohio 43215

CROSS SECTION & DETAILS

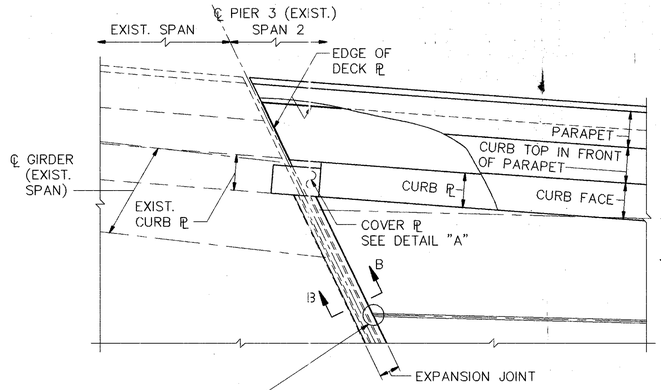
BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

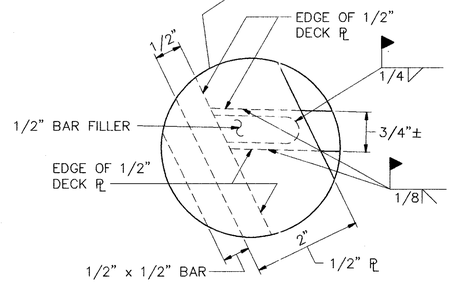
FRANKLIN COUNTY STA. 143+28.12

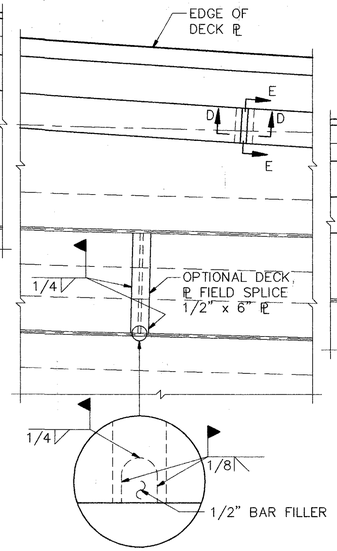
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
D.F.S.	D.M.T.	–	C.E.M.	J.S.S.	12/91	

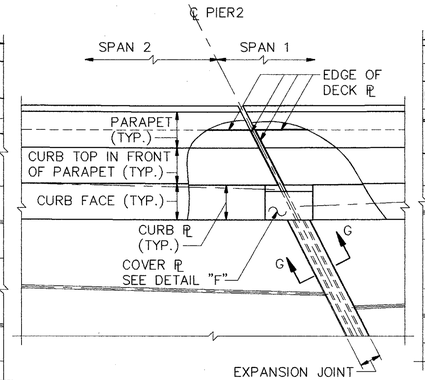
C:\PROJECTS\315\PROJECT
11/27/1996-13:53
PLOT: 1=24

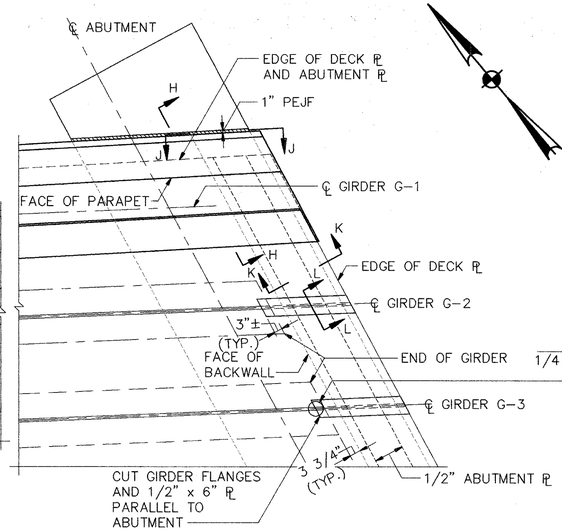
FRANKLIN COUNTY
FRA-315-1.25-C-3

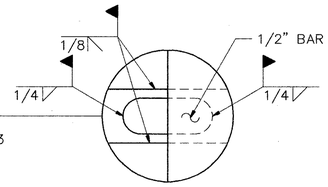




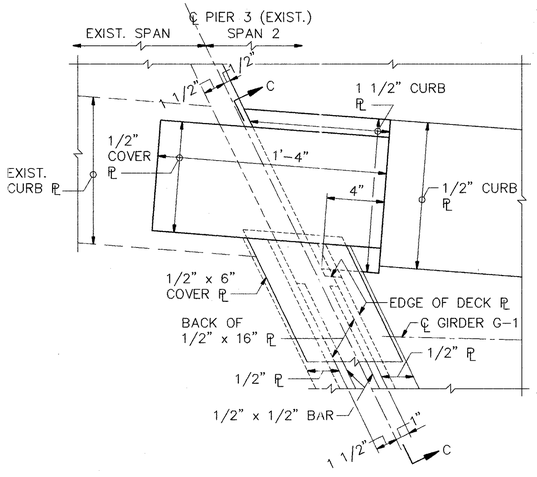




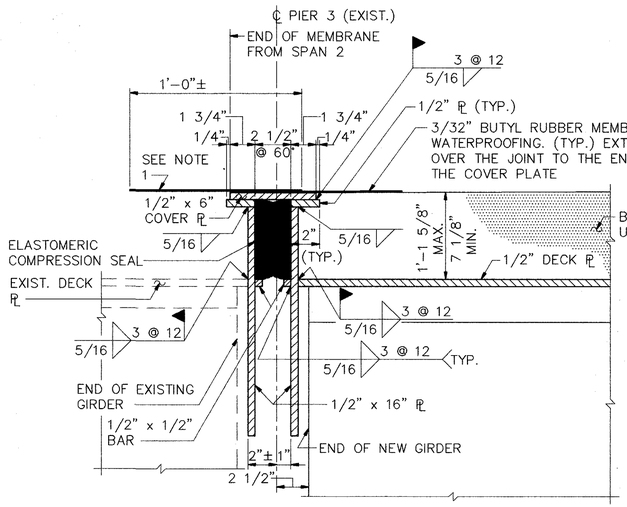




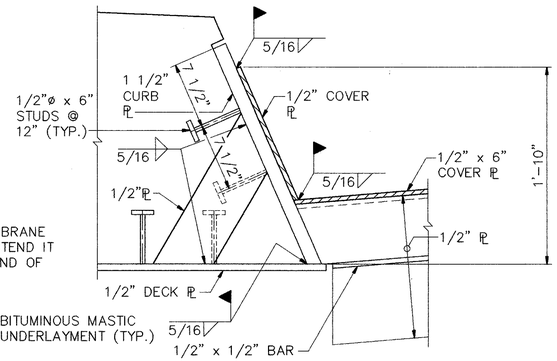
PARTIAL DECK PLATE DETAIL



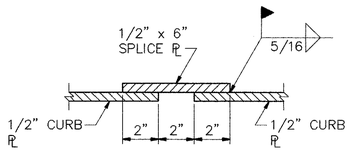
DETAIL "A"



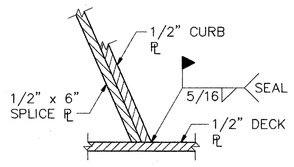
SECTION B – B



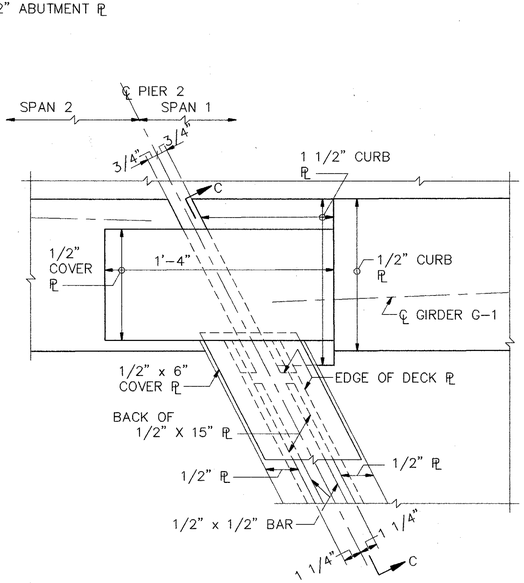
SECTION C – C



SECTION D – D



SECTION E – E



DETAIL "F"

NOTES:

1. THIS PIECE OF WATERPROOFING MEMBRANE TO LAP 5"± THE MEMBRANE FROM SPAN 2 OVER THE JOINT.
2. STAGE CONSTRUCTION WILL REQUIRE THE JOINT ARMOR SECTION BE FABRICATED IN TWO PARTS. THE ENDS OF 1/2" x 6" ℙ, 1/2" x 16" ℙ S AND 1/2" x 1/2" BARS OF THE PART FABRICATED FOR STAGE 2 CONSTRUCTION WILL ABUT AGAINST THE CORRESPONDING ENDS OF THE MEMBERS OF THE PART INSTALLED FOR STAGE 1 CONSTRUCTION. NO WELDING IS REQUIRED.
3. THE 1/2" x 6" COVER ℙ , 1/2" x 2" ℙ S, AND 1/2" x 16" ℙ S ARE ASTM A588 STEEL. INCLUDE WITH ITEM 516, STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC COMPRESSION SEAL, AS PER PLAN, FOR PAYMENT.
4. FOR JOINT OPENING TABLE SEE SHEET 13/17.
5. THE COMPRESSION SEAL GLAND IS TO BE CONTINUOUS WITHOUT JOINTS ACROSS THE TOTAL WIDTH OF THE STRUCTURE.
6. FOR REMAINING SECTIONS SEE SHEET 13/17.

JOHN E. FOSTER AND ASSOCIATES, INC. 12/17
555 Buttles Avenue, Columbus, Ohio 43215

SUPERSTRUCTURE DETAILS

BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

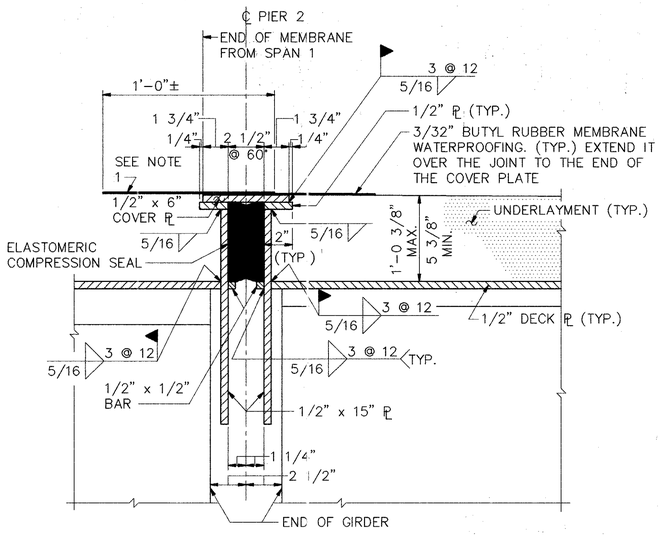
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
D.M.T.	D.M.T.	–	H.S.S.	J.S.S.	12/91	

FRA-315-1.25-C-3	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

160
224

FRANKLIN COUNTY
FRA-315-1.25-C-3



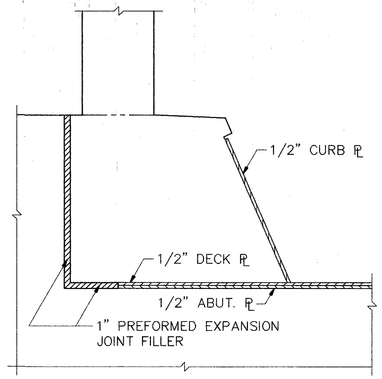
NOTES:

1. THIS PIECE OF WATERPROOFING MEMBRANE TO LAP 5"± THE MEMBRANE FROM SPAN 1 OVER THE JOINT.
2. STAGE CONSTRUCTION WILL REQUIRE THE JOINT ARMOR SECTION BE FABRICATED IN TWO PARTS. THE ENDS OF 1/2" x 6" ℄, 1/2" x 15" ℄ S AND 1/2" x 1/2" BARS OF THE PART FABRICATED FOR STAGE 2 CONSTRUCTION WILL ABUT AGAINST THE CORRESPONDING ENDS OF THE MEMBERS OF THE PART INSTALLED FOR STAGE 1 CONSTRUCTION. NO WELDING IS REQUIRED.
3. THE 1/2" x 6" COVER ℄ , 1/2" x 2" ℄ S, AND 1/2" x 15" ℄ S ARE ASTM A588 STEEL. INCLUDE WITH ITEM 516, STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC COMPRESSION SEAL, AS PER PLAN, FOR PAYMENT.
4. COMPRESSION SEAL GLAND IS TO BE CONTINUOUS WITHOUT JOINTS ACROSS THE TOTAL WIDTH OF THE STRUCTURE.

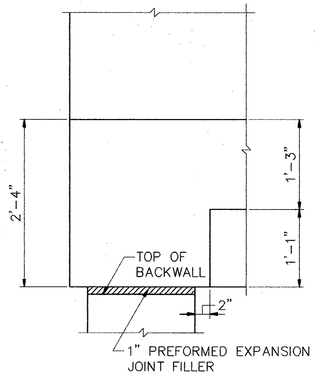
SECTION G – G

TEMPERATURE ADJUSTMENT TABLE							
SEAL SIZE	JOINT OPENING						
	30°F	40°F	50°F	60°F	70°F	80°F	90°F
5"	2 3/4"	2 5/8"	2 5/8"	2 1/2"	2 1/2"	2 3/8"	2 1/4"

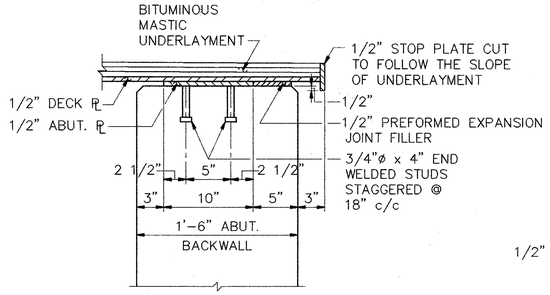
NOTE: FOR ADDITIONAL NOTES, DETAILS AND SPECIFICATIONS SEE STANDARD DRAWING EXJ-2-81, SHEETS 1 AND 2.



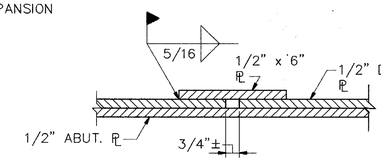
SECTION H – H



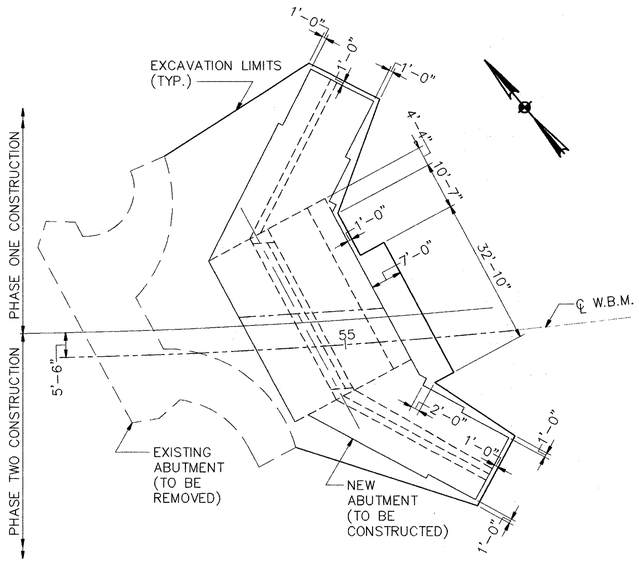
SECTION J – J



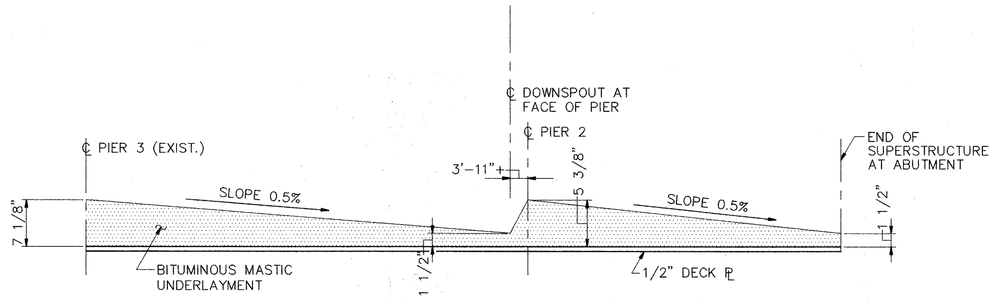
SECTION K – K



SECTION L – L



EXCAVATION LIMITS DIAGRAM



LONGITUDINAL SECTION AT GUTTER LINE
(MINIMUM THICKNESS OF UNDERLAYMENT)

JOHN E. FOSTER AND ASSOCIATES, INC. 13/17
555 Buttles Avenue, Columbus, Ohio 43215

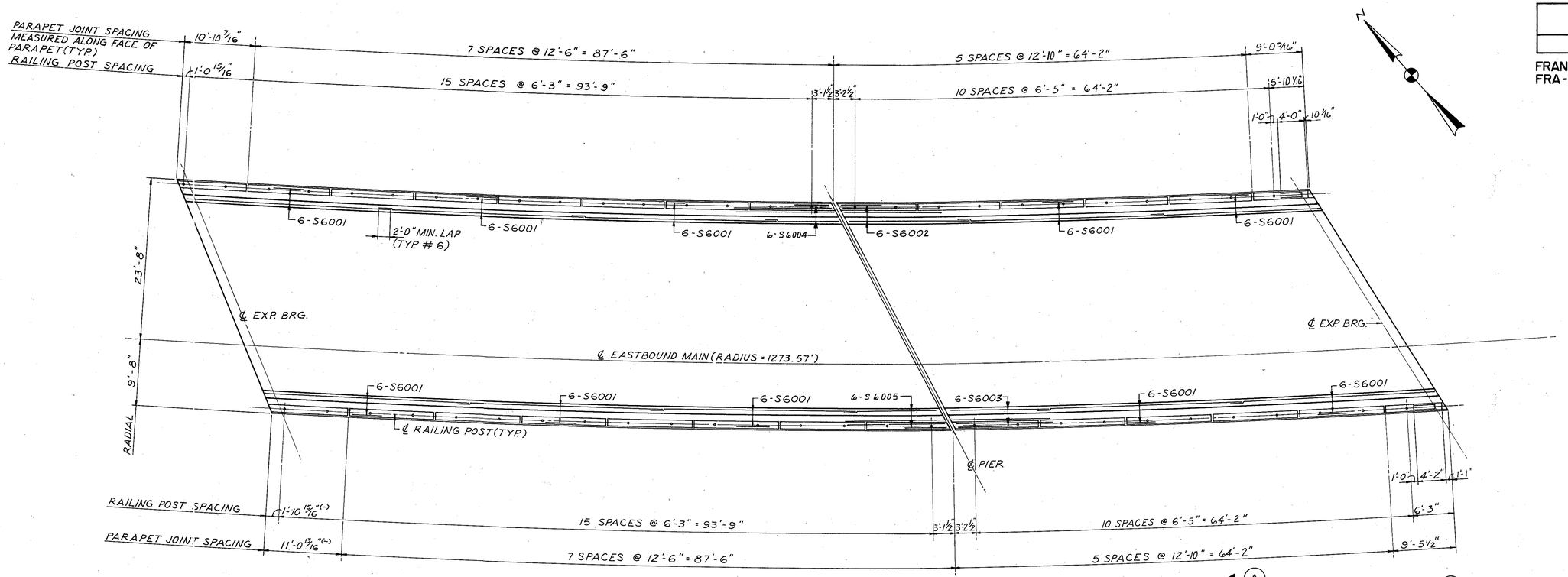
SUPERSTRUCTURE DETAILS
BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

FRANKLIN COUNTY STA. 143+28.12

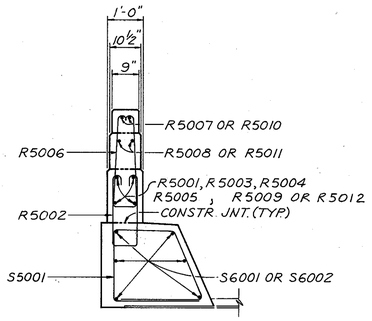
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
D.M.T.	D.M.T.	–	H.S.S.	J.S.S.	12/91	

	OHIO	161
	FHWA REGION 5	224
	FEDERAL PROJECT	

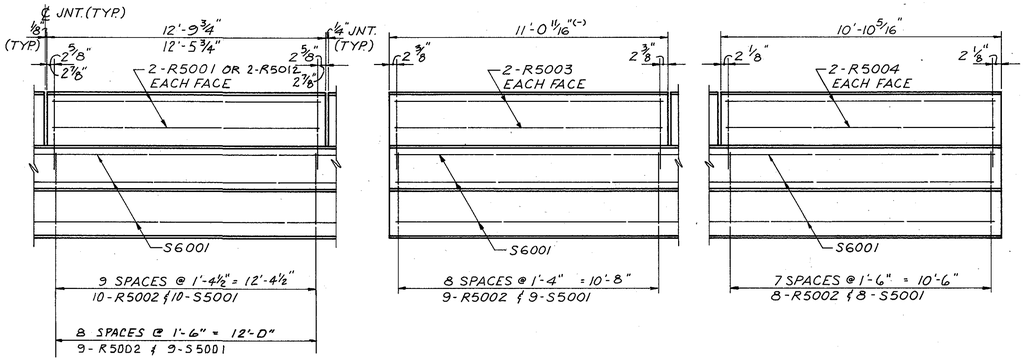
FRANKLIN COUNTY
FRA-670-1.25-C-3

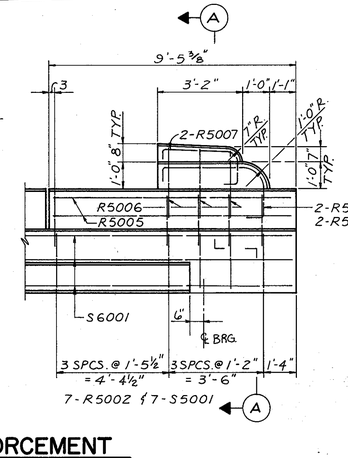


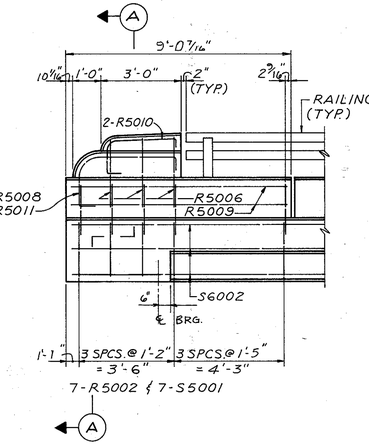
RAILING POST & PARAPET JOINT SPACING PLAN



SECTION A-A







ELEVATIONS - CURB & PARAPET REINFORCEMENT

JOHN E. FOSTER AND ASSOCIATES, INC. 14/17
555 Buttles Ave., Columbus, Ohio 43215

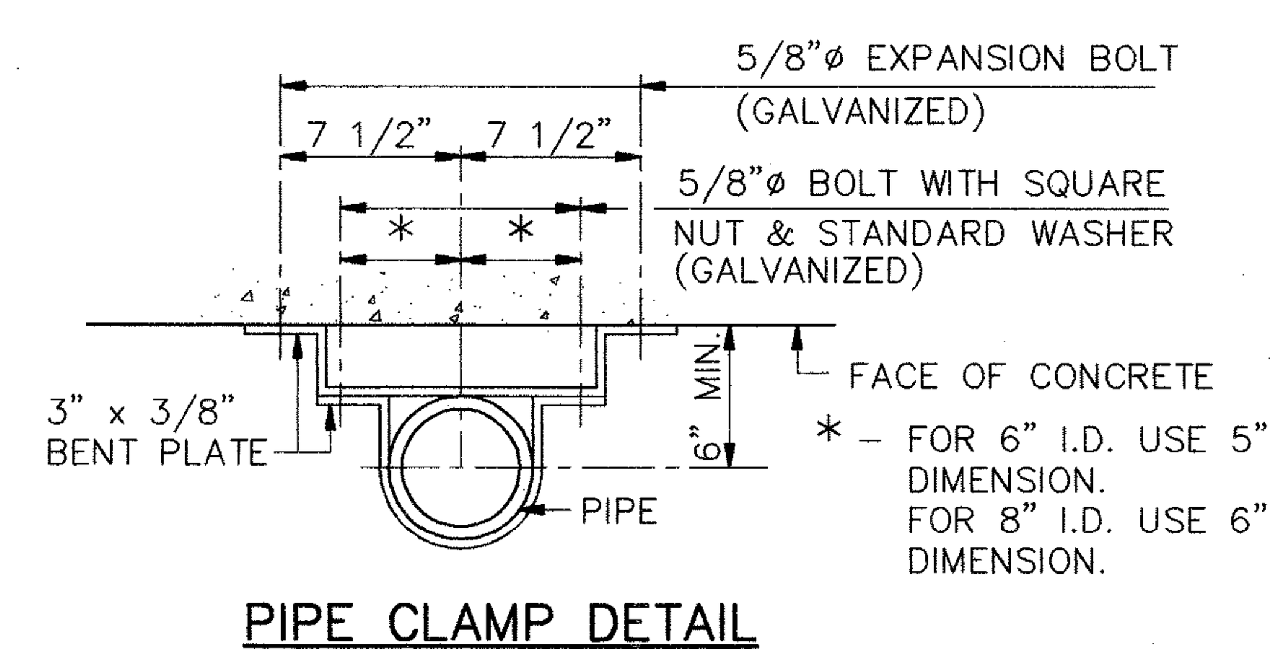
PARAPET PLAN ELEVATION AND DETAILS

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R. 315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DMT	DMT	—	CEM	JSS	12/91	

NOTES:

1. ALL PIPE SLOPES ARE TO BE 1/8" PER FOOT IN DIRECTION SHOWN UNLESS OTHERWISE NOTED.
2. ALL PIPE CONNECTIONS, BRACKETS, CLAMPS AND HANGERS ARE TO BE GALVANIZED.
3. ⊕ : TO BE PAID FOR UNDER ITEM 518, 6" STEEL PIPE.
   ⊠ : TO BE PAID FOR UNDER ITEM 518, 8" NON-PERFORATED C.S.P.
   △ : TO BE PAID FOR UNDER ITEM 518, 8" PERFORATED C.S.P.
   ⊕ : TO BE PAID FOR UNDER ITEM 518, 8" HALF ROUND PERFORATED GALVANIZED STEEL PIPE.



JOHN E. FOSTER AND ASSOCIATES, INC. 15/17
555 Buttles Avenue, Columbus, Ohio 43215

DRAINAGE DETAILS
BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

FRANKLIN COUNTY — STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
F.R.	E.S.	-	C.E.M.	J.S.S.	9/91	

REINFORCING STEEL SCHEDULE

ABUTMENT

MARK	NO.	LENGTH	TYPE	A	B	C	INCR.	WEIGHT
A5001	35	15'-4"	STR.					560
A5002	39	21'-4"	STR.					868
A5003	39	20'-8"	STR.					841
A5004	81	6'-9"	2	1'-6"	4'-0"			570
A5005	18	4'-6"	STR.					84
A5006	18	4'-2"	STR.					78
A6001 TO A6004	1 SER. OF 4	15'-10" TO 17'-2"	2	7'-8"	0'-10" TO 2'-2"		5 5/16"+	99
A6005 TO A6009	1 SER. OF 5	15'-11" TO 17'-11"	2	7'-8"	0'-11" TO 2'-11"		6"	127
A7001	61	10'-4"	2	4'-9"	1'-2"			1,288
A7002	61	9'-4"	2	4'-3"	1'-2"			1,163
A7003	61	11'-0"	STR.					1,372
A8001	5	21'-10"	STR.					291
A8002	5	21'-11"	STR.					293
A8003	47	10'-3"	2	4'-9"	1'-0"			1,286
A8004 TO A8033	1 SER. OF 34	4'-3" TO 14'-3"	STR.				3 5/8"+	840
A8034	26	14'-3"	STR.					989
A9001 TO A9011	2 SER. OF 11	6'-3" TO 22'-6"	STR.				1'-7 1/2"	1,075
A9012	18	23'-6"	STR.					1,438
W5001	72	30'-0"	STR.					2,253
W5002	28	11'-8"	STR.					341
W5003 TO W5005	2 SER. OF 3	3'-3" TO 8'-3"	STR.				2'-6"	36
W5006 TO W5013	2 SER. OF 8	4'-9" TO 27'-11"	STR.				3'-3 11/16"+	273
W5014 TO W5054	1 SER. OF 41	13'-8" TO 25'-5"	STR.				3 1/2"+	836
W5055	2	12'-9"	STR.					27
W5056	30	9'-4"	STR.					292
W5057 TO W5064	2 SER. OF 8	4'-11" TO 28'-8"	STR.				3'-4 11/16"+	280
W5065	2	4'-9"	STR.					10
W5066	2	8'-0"	STR.					17
W5067 TO W5105	1 SER. OF 39	14'-7" TO 23'-5"	STR.				2 3/4"+	773
W5106	2	9'-7"	STR.					20
W8001	52	12'-3"	STR.					1,701
W8002 TO W8015	1 SER. OF 14	5'-0" TO 9'-3"	STR.				3 7/8"+	266
W8016 TO W8027	1 SER. OF 12	6'-0" TO 9'-6"	STR.				4 1/16"+	232
W9001 TO W9015	1 SER. OF 15	11'-6" TO 15'-4"	STR.				3 1/4"+	684
W9016 TO W9026	1 SER. OF 11	10'-3" TO 13'-4"	STR.				3 11/16"+	441
W9027 TO W9042	1 SER. OF 16	11'-7" TO 15'-7"	STR.				3 3/16"+	739

REINFORCING STEEL SCHEDULE

ABUTMENT

MARK	NO.	LENGTH	TYPE	A	B	C	INCR.	WEIGHT
W9043 TO W9053	1 SER. OF 11	10'-7" TO 13'-3"	STR.				3 3/16"+	446
W10001	46	12'-3"	STR.					2,425
W11001	31	14'-3"	STR.					2,347
F5001	35	4'-0"	STR.					146
F5002	2	21'-3"	STR.					887
F5003	2	21'-5"	STR.					894
F5004	41	9'-3"	2	4'-0"	1'-6"			396
F5005 TO F5026 NOT USED								
F5027	8	15'-0"	STR.					125
F5028	2	32'-0"	STR.					67
F5029	8	25'-6"	STR.					213
F5030	64	30'-0"	STR.					2,003
F5031	32	11'-6"	STR.					384
F5032 TO F5037	2 SER. OF 6	5'-0" TO 20'-0"	STR.				3'-0"	156
F5038 TO F5045	2 SER. OF 8	1'-6" TO 6'-6"	STR.				8 9/16"+	67
F5046	32	9'-6"	STR.					317
F5047 TO F5050	2 SER. OF 4	1'-6" TO 3'-6"	STR.				8"	21
F5051 TO F5053	2 SER. OF 3	1'-6" TO 4'-6"	STR.				1'-6"	19
F5054 TO F5059	2 SER. OF 6	4'-6" TO 7'-9"	STR.				7 3/4"+	77
F5060 TO F5063	2 SER. OF 4	2'-0" TO 6'-0"	STR.				1'-4"	33
F5064	2	28'-0"	STR.					58
F5065	2	5'-9"	STR.					12
F5066 TO F5095	2 SER. OF 30	15'-8" TO 29'-2"	STR.				5 9/16"+	1,403
F5096 TO F5125	2 SER. OF 30	12'-9" TO 26'-3"	STR.				5 9/16"+	1,220
F6001	45	29'-0"	STR.					1,960
F6002 TO F6017	1 SER. OF 16	4'-2" TO 24'-6"	STR.				1'-4 1/4"+	344
F6018 TO F6033	1 SER. OF 16	5'-10" TO 27'-8"	STR.				1'-5 7/16"+	402
F6034	68	9'-2"	2	4'-0"	1'-6"			937
F7001	52	15'-3"	STR.					1,621
F8001	42	17'-6"	STR.					1,962
F9001	61	18'-3"	17	16'-6"	2'-0"	1'-9"		3,785
F9002	62	19'-3"	STR.					4,058
F9003	52	15'-3"	STR.					2,696
F9004	20	15'-5"	2	7'-6"	1'-0"			1,049
F9005	45	29'-0"	STR.					4,437
F9006 TO F9021	1 SER. OF 16	4'-2" TO 24'-6"	STR.				1'-4 1/4"+	780
F9022 TO F9037	1 SER. OF 16	5'-10" TO 27'-8"	STR.				1'-5 7/16"+	911

REINFORCING STEEL SCHEDULE

ABUTMENT

MARK	NO.	LENGTH	TYPE	A	B	C	INCR.	WEIGHT
F10001	52	9'-10"	16	8'-6"	1'-6"			2,200
F10002	62	19'-3"	STR.					5,136
F10003	42	17'-6"	STR.					3,163
F11001	54	16'-0"	STR.					4,590
F11002 TO F11007	1 SER. OF 6	4'-0" TO 8'-0"	STR.				9 9/16"+	191
F11008 TO F11011 NOT USED								–
F11012	61	20'-5"	16	17'-7"	2'-6"			6,618
F11013	46	18'-5"	16	15'-7"	2'-6"			4,502
F11014 TO F11019	1 SER. OF 6	8'-0" TO 15'-3"	STR.				1'-5 3/8"+	371
							TOTAL	87,912

REINFORCING STEEL SCHEDULE

SUPERSTRUCTURE

MARK	NO.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
S5001	257	9'-0"	11	1'-9"	1'-10"	1'-0"	2'-0"	2'-0"	2,412
S6001	56	30'-0"	STR.						2,523
S6002	6	17'-2"	STR.						155
S6003	6	17'-7"	STR.						158
S6004	6	14'-4"	STR.						129
S6005	6	14'-7"	STR.						131
▲ R5001	40	12'-5"	STR.						518
▲ R5002	257	5'-11"	12	0'-8"	2'-2"				1,587
▲ R5003	4	10'-8"	STR.						45
▲ R5004	4	10'-6"	STR.						44
▲ R5005	4	9'-1"	STR.						38
▲ R5006	6	6'-5"	13	0'-8"	2'-5"	0'-2"			40
▲ R5007	2	4'-8"	15	2'-5"	1'-0"	0'-9"	0'-5"	0'-5"	10
▲ R5008	2	5'-11"	14	3'-0"	0'-10"	1'-7"	0'-9"	1'-0"	12
▲ R5009	4	8'-8"	STR.						36
▲ R5010	2	4'-6"	15	2'-3"	1'-0"	0'-9"	0'-5"	0'-5"	9
▲ R5011	2	5'-9"	14	2'-10"	0'-10"	1'-7"	0'-9"	1'-0"	12
▲ R5012	56	12'-1"	STR.						706
							TOTAL		5,508

FRA-315-1.25-C-3 | OHIO | FHWA REGION 5 | FEDERAL PROJECT | 163/224

FRANKLIN COUNTY
FRA-315-1.25-C-3

NOTES

1. ALL BARS ARE TO BE EPOXY COATED.
2. REINFORCING BAR SPLICE LENGTHS SHALL CONFORM TO THE MINIMUM LENGTHS SPECIFIED IN 509.08 UNLESS OTHERWISE NOTED ON THE PLANS.
3. ALL BARS OF A GIVEN SERIES VARY BY A CONSTANT INCREMENT.
4. ▲ INCLUDED WITH BRIDGE RAILING FOR PAYMENT.

JOHN E. FOSTER AND ASSOCIATES, INC. 16/17
555 Buttles Avenue, Columbus, Ohio 43215

REINFORCING STEEL SCHEDULE

BRIDGE No. 11 @ MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.E.M.	C.E.M.	–	E.S.	J.S.S.	12/91	

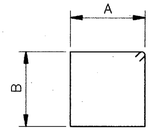
FRA-315-1.25-C-3	OHIO FHWA REGION 5 FEDERAL PROJECT	164 224

FRANKLIN COUNTY
FRA-315-1.25-C-3

REINFORCING STEEL SCHEDULE

PIER

MARK	NO.	LENGTH	TYPE	A	B	C	D	INCR.	WEIGHT
P5001	34	19'-4"	STR.						700
P5002	34	21'-4"	STR.						757
P5003	36	9'-5"	2	2'-0"	5'-8"				354
P5004	40	8'-5"	2	1'-6"	5'-8"				351
P5005	19	25'-7"	STR.						507
P5006	19	29'-9"	STR.						590
P5007	54	18'-6"	STR.						1,042
P8001	7	19'-4"	STR.						361
P8002	7	23'-4"	STR.						436
P9001	94	17'-0"	STR.						5,433
P9002	94	10'-4"	3	1'-6"	9'-2"				3,303
P10001	37	25'-7"	STR.						4,073
P10002	37	36'-8"	STR.						5,838
P11001	65	18'-6"	STR.						6,389
							TOTAL		30,134



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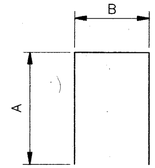

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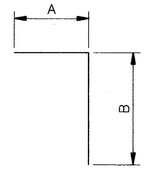

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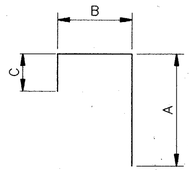

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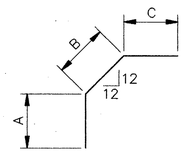

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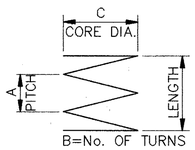

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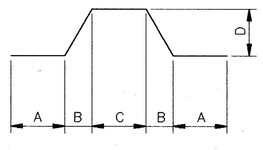

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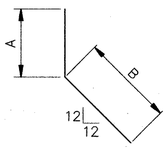

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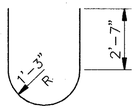

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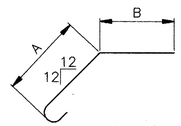

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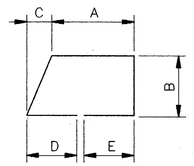

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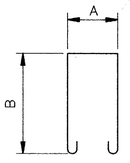

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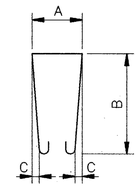

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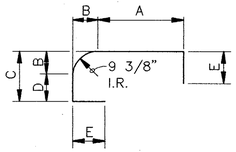

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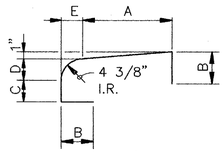

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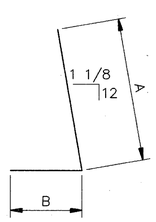

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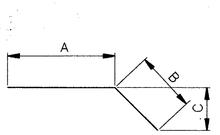


TYPE-17

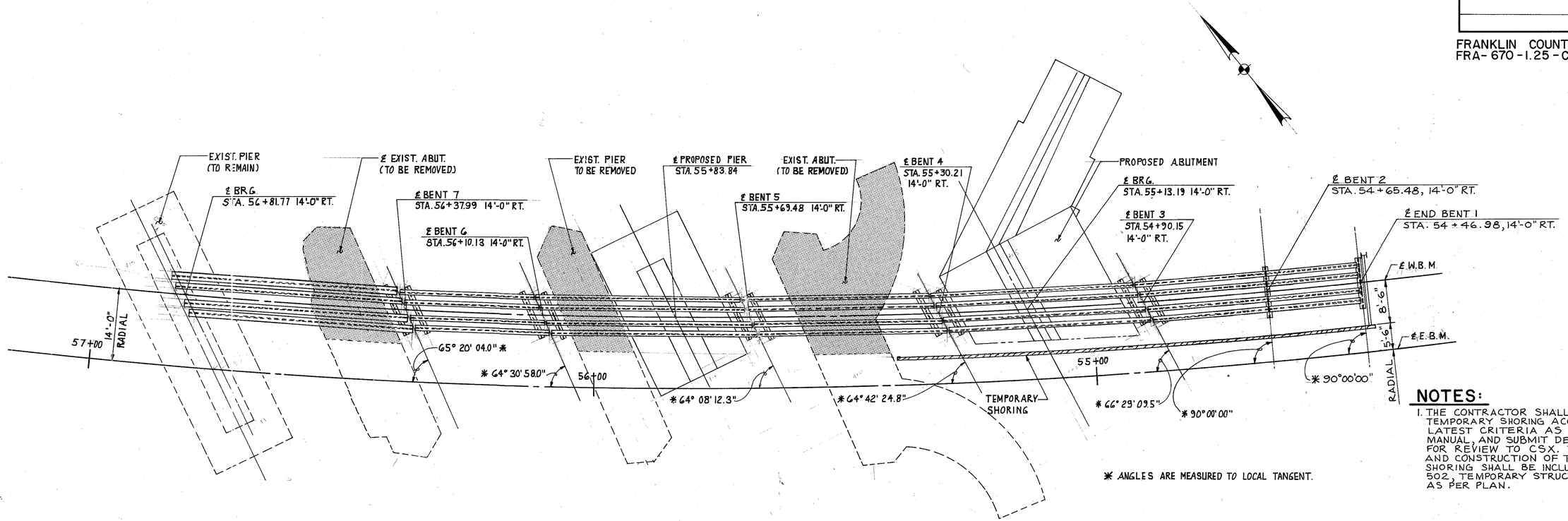
JOHN E. FOSTER AND ASSOCIATES, INC. 17/17 555 Buttles Avenue, Columbus, Ohio 43215						
REINFORCING STEEL SCHEDULE BRIDGE No. 11 @ MILEPOST CD 1.1 BRIDGE No. FRA-315-1.76 S.R.315 UNDER CSX FRANKLIN COUNTY STA. 143+28.12						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.E.M.	C.E.M.	–	E.S.	J.S.S.	12/91	

C:\PROJECTS\315\REBARS2
11/05/1998-11:02
jfoster
PLOT1:1=1

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

165
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

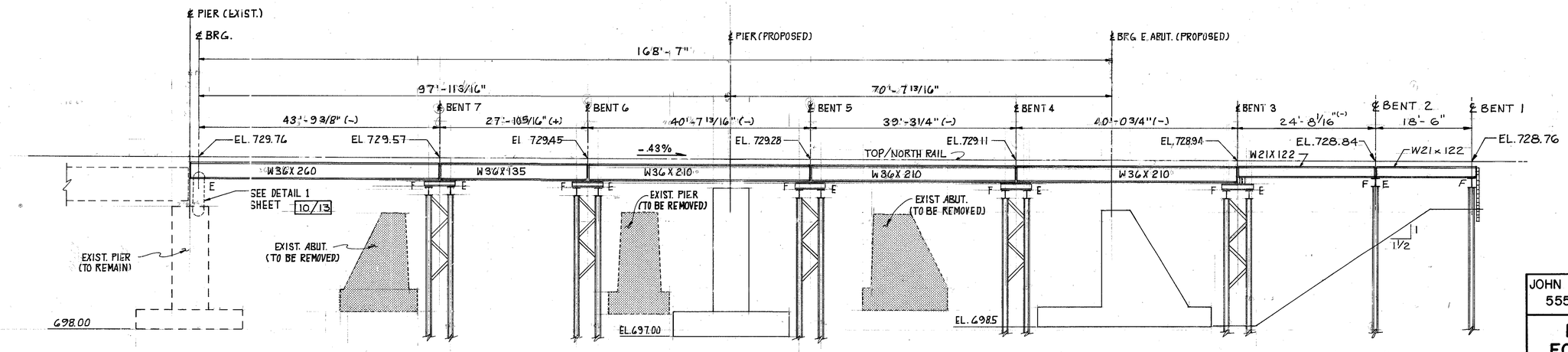


* ANGLES ARE MEASURED TO LOCAL TANGENT.

NOTES:

1. THE CONTRACTOR SHALL DESIGN THE TEMPORARY SHORING ACCORDING TO THE LATEST CRITERIA AS SET IN THE A.R.E.A. MANUAL, AND SUBMIT DESIGNS AND DETAILS FOR REVIEW TO CSX. THE COST OF DESIGN AND CONSTRUCTION OF THE TEMPORARY SHORING SHALL BE INCLUDED WITH ITEM 502, TEMPORARY STRUCTURE (RAILROAD), AS PER PLAN.

PLAN PHASE I



ELEVATION PHASE I
(ALONG ℄ W.B.M.)

JOHN E. FOSTER AND ASSOCIATES, INC. 1/13
555 Buttles Ave., Columbus, Ohio 43215

PLAN AND ELEVATION FOR TEMPORARY TRESTLE

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

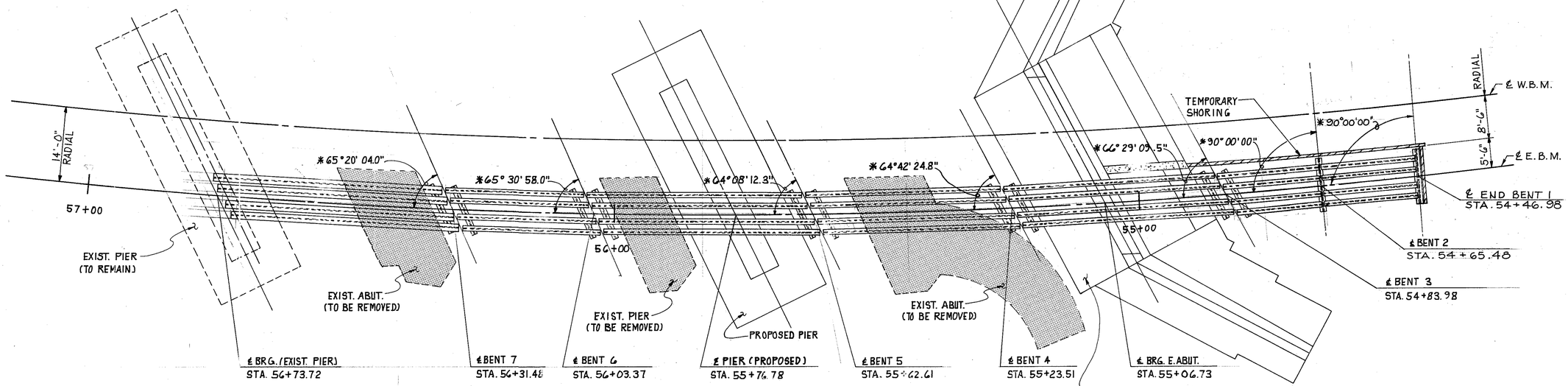
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	TH	ES	CEM	HWR		

315841

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

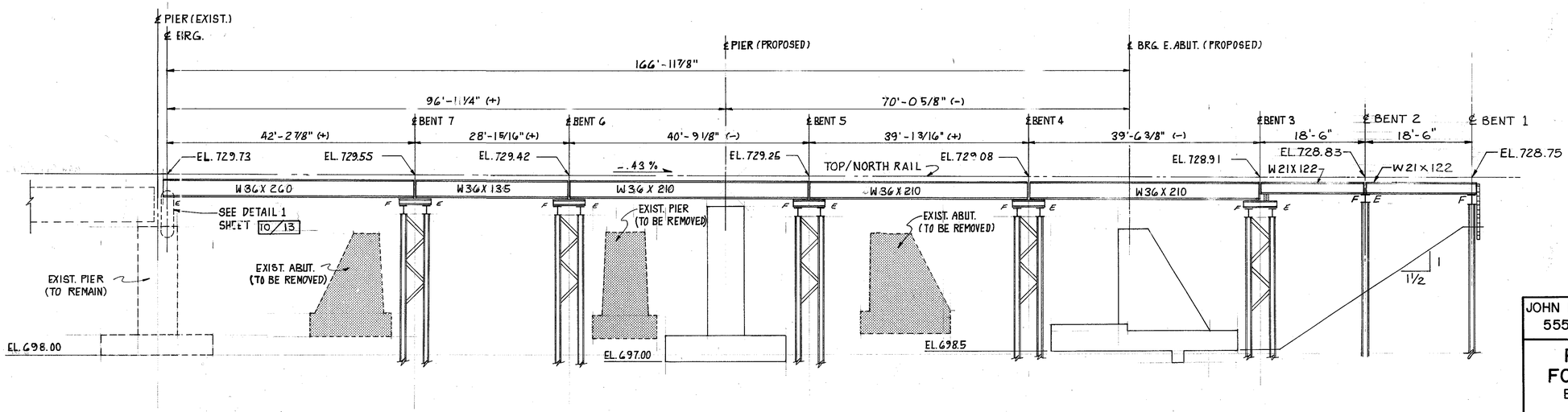
166
224

FRANKLIN COUNTY
FRA-670-315-C-3



PLAN PHASE II

* ANGLES ARE MEASURED TO LOCAL TANGENT.



ELEVATION PHASE II
(ALONG ℄ E.B.M.)

JOHN E. FOSTER AND ASSOCIATES, INC. 2/13
555 Buttles Ave., Columbus, Ohio 43215

PLAN AND ELEVATION FOR TEMPORARY TRESTLE

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	TH	ES	CEM	HWR		

CONSTRUCTION PROCEDURE

PHASE ONE:

THE RAILROAD COMPANY WILL
(1) A. FURNISH NECESSARY SIGNALS AND COMMUNICATIONS FOR CONDUCTING RAILROAD TRAFFIC THROUGH SITE.
B. CONSTRUCT SPECIAL TRACKWORK INCLUDING FROGS, SWITCHES, RAILS, FASTENINGS, TIES, BALLAST, SUBBALLAST AND SUBGRADE TO SWITCH ALL TRAFFIC TO THE E.B. MAIN.
C. CONSTRUCT TEMPORARY BALLAST RETAINER ADJACENT TO E.B. MAIN RAILS ON BRIDGE 11.
D. REMOVE RAILS FASTENINGS, TIES, AND BALLAST, FROM W.B. MAIN OF EXISTING BRIDGE 11 AND THE PORTION OF W.B. MAIN FROM STATION 54 + 58± TO STATION 56 + 82±.
E. REMOVE NORTHERLY PORTION OF BALLAST RETAINER OF BRIDGE 11 FROM STATION 55 + 55 ± TO STATION 56 + 82±.

THE CONTRACTOR SHALL
(2) A. REMOVE GIRDERS, DIAPHRAGMS, OTHER INCIDENTAL FRAMING, DECK DRAINAGE APPURTENANCES, AND BEARINGS FROM THE NORTHERLY SIDE OF BRIDGE 11 EXPOSED BY REMOVAL OF THE PORTION OF THE BALLAST RETAINER. ALL EXISTING STRUCTURAL STEEL SHALL BE CAREFULLY REMOVED AND STORED IN A MANNER AND IN A PLACE DIRECTED BY THE RAILROAD COMPANY.
B. REMOVE AND DISPOSE OF APPROXIMATELY THE TOP THREE FEET OF THE NORTHERLY PORTION OF THE EXISTING ABUTMENTS AT STATIONS 55 + 55± AND 56 + 43±.
C. EXCAVATE FOR CONSTRUCTION OF THE NORTHERLY PORTION OF NEW EASTERLY ABUTMENT AND DRIVE PILING AND CONSTRUCT THE TEMPORARY TRESTLE FOR THE W.B. MAIN FROM STATION 54 + 58± TO STATION 56 + 82.

ITEMS (2) A. THROUGH (2) C. SHALL BE COMPLETED IN NOT MORE THAN ___ DAYS.

THE RAILROAD COMPANY WILL
(3) A. INSTALL RAILS AND FASTENINGS ON THE TEMPORARY TRESTLE.
B. RE-OPEN THE W.B. MAIN TO THROUGH TRAFFIC.

THE CONTRACTOR SHALL
(4) A. REMOVE AND DISPOSE OF REMAINDER OF NORTHERLY PORTION OF EXISTING ABUTMENTS.
B. CONSTRUCT NORTHERLY PORTION OF NEW EASTERLY ABUTMENT. EXCAVATE FOR AND CONSTRUCT NORTHERLY PORTION OF PIER.
C. CONSTRUCT ROLL-IN AND JACKING BENTS NORTH OF STRUCTURE.
D. ERECT SUPERSTRUCTURE ON THE ROLL-IN BENTS AND CONSTRUCT MASONRY PLATES ON BRIDGE SEATS.
E. PLACE BALLAST ON SUPERSTRUCTURE WHILE BEING SUPPORTED BY THE ROLL-IN BENTS.

THE RAILROAD COMPANY WILL
(5) A. COMPLETE BALLAST PREPARATION ON NEW SUPERSTRUCTURE WHILE SUPPORTED ON ROLL-IN BENTS.
B. INSTALL TIES, FASTENINGS AND RAILS ON NEW SUPERSTRUCTURE WHILE SUPPORTED ON ROLL-IN BENTS.
C. CLOSE THE W.B. MAIN TO TRAFFIC. DIVERT W.B. TRAFFIC TO E.B. MAIN USING TRACKWORK, SIGNALS AND COMMUNICATIONS ESTABLISHED IN (1)A AND (1)B.
D. REMOVE RAILS, FASTENINGS AND TIES FROM THE TEMPORARY TRESTLE.

THE CONTRACTOR SHALL
(6) A. REMOVE TEMPORARY TRESTLE.
B. BACKFILL AND COMPACT BEHIND THE NORTHERLY PORTION OF NEW EASTERLY ABUTMENT TO THE TOP OF THE SUBBALLAST.
C. REMOVE SHEET PILING AND CONSTRUCT SR 315 GRADE LINE TO TEMPORARY LEVELS.
D. ROLL-IN AND JACK DOWN NEW SUPERSTRUCTURE.

ITEMS (6)A THROUGH (6)D SHALL BE COMPLETED IN NOT LESS THAN ___ DAYS.

THE RAILROAD COMPANY WILL
(7) A. INSTALL BALLAST, TIES, RAILS AND FASTENINGS TO CONNECT EXISTING TRACKS WITH NEW BRIDGE AND APPROACHES.
B. OPEN THE W.B. MAIN TO TRAFFIC.

THE CONTRACTOR SHALL
(8) A. COMPLETE NORTHERLY WINGWALLS AND CHEEKWALLS ON THE NORTHERLY PORTION OF THE NEW ABUTMENT.

PHASE TWO:

THE RAILROAD COMPANY WILL
(1) A. DIVERT ALL TRAFFIC TO THE W.B. MAIN USING SPECIAL TRACKWORK, SIGNALS AND COMMUNICATIONS FURNISHED IN PHASE ONE (1)A AND (1)B.
B. REMOVE RAILS, FASTENINGS, TIES, AND BALLAST FROM E.B. MAIN FROM STATION 54 + 58 ± TO STATION 56 + 74 ±.

THE CONTRACTOR SHALL
(2) A. REMOVE REMAINING PORTION OF BALLAST RETAINER FROM STATION 55 + 55 ± TO STATION 56 + 43±.
B. REMOVE GIRDERS, DIAPHRAGMS, OTHER INCIDENTAL FRAMING, DECK DRAINAGE APPURTENANCES, AND BEARINGS FROM THE SOUTHERLY SIDE OF BRIDGE 11. ALL EXISTING STRUCTURAL STEEL SHALL BE CAREFULLY REMOVED AND STORED IN A MANNER AND IN A PLACE DIRECTED BY THE RAILROAD COMPANY.
C. REMOVE AND DISPOSE OF APPROXIMATELY THE TOP THREE FEET OF THE SOUTHERLY PORTION OF THE EXISTING ABUTMENTS AT STATIONS 55 + 55± AND 56 + 46 ±.
D. EXCAVATE FOR CONSTRUCTION OF THE SOUTHERLY PORTION OF NEW EASTERLY ABUTMENT AND DRIVE PILING AND CONSTRUCT THE TEMPORARY TRESTLE FOR THE E.B. MAIN FROM STATION 54 + 58± TO STATION 56 + 74±.

ITEM (2)A THROUGH (2)D SHALL BE COMPLETED IN NOT MORE THAN ___ DAYS.

THE RAILROAD COMPANY WILL
(3) A. INSTALL RAILS AND FASTENINGS ON THE TEMPORARY TRESTLE.
B. RE-OPEN THE E.B. MAIN TO THROUGH TRAFFIC.

THE CONTRACTOR SHALL
(4) A. REMOVE AND DISPOSE OF REMAINDER OF EXISTING ABUTMENTS.
B. CONSTRUCT REMAINDER OF NEW EASTERLY ABUTMENT. EXCAVATE FOR AND CONSTRUCT REMAINDER OF PIER.
C. CONSTRUCT ROLL-IN AND JACKING BENTS SOUTH OF STRUCTURE.
D. ERECT SUPERSTRUCTURE ON THE ROLL-IN BENTS AND CONSTRUCT MASONRY PLATES ON BRIDGE SEATS.
E. PLACE BALLAST ON SUPERSTRUCTURE WHILE BEING SUPPORTED BY THE ROLL-IN BENTS.

THE RAILROAD COMPANY WILL
(5) A. COMPLETE BALLAST PREPARATION ON NEW SUPERSTRUCTURE WHILE SUPPORTED ON ROLL-IN BENTS.
B. INSTALL TIES, FASTENINGS AND RAIL ON NEW SUPERSTRUCTURE WHILE SUPPORTED ON ROLL-IN BENTS.
C. CLOSE THE E.B. MAIN TO TRAFFIC. DIVERT E.B. TRAFFIC TO W.B. MAIN USING TRACKWORK, SIGNALS AND COMMUNICATIONS ESTABLISHED IN PHASE ONE (1) A AND (1) B.
D. REMOVE RAILS, FASTENINGS AND TIES FROM THE TEMPORARY TRESTLE.

THE CONTRACTOR SHALL
(6) A. REMOVE TEMPORARY TRESTLE.
B. BACKFILL AND COMPACT BEHIND THE REMAINDER OF NEW EASTERLY ABUTMENT TO THE TOP OF THE SUBBALLAST.
C. REMOVE SHEET PILING AND CONSTRUCT SR 315 GRADE LINE TO TEMPORARY LEVELS.
D. ROLL-IN AND JACK DOWN NEW SUPERSTRUCTURE.

ITEMS (6)A THROUGH (6)D SHALL BE COMPLETED IN NOT LESS THAN ___ DAYS.

THE RAILROAD COMPANY WILL
(7) A. INSTALL BALLAST, TIES, RAILS AND FASTENINGS TO CONNECT EXISTING TRACKS WITH NEW BRIDGE AND APPROACHES.
B. OPEN THE E.B. MAIN TO TRAFFIC.

THE CONTRACTOR SHALL
(8) A. COMPLETE SOUTHERLY WINGWALLS AND CHEEKWALLS ON THE SOUTHERLY PORTION OF THE NEW ABUTMENT.

ROLL-IN CONSTRUCTION

CONTRACTOR SHALL SUBMIT IN WRITTEN FORM WITH HIS BID, PRELIMINARY PLANS FOR COMPLETING THE ROLL-IN PROCEDURE. THE PRELIMINARY PLANNING SHALL INDICATE A CLEAR UNDERSTANDING OF THE REQUIREMENTS OF THIS TYPE OF CONSTRUCTION AND PAST EXPERIENCE HE HAS WITH IT.

SUBSEQUENT TO CONTRACT AWARD, CONTRACTOR SHALL SUBMIT FOR APPROVAL DETAILS OF SEQUENCING, EQUIPMENT AND OPERATIONS FOR THE COMPLETION OF THE ROLL-IN PROCEDURES. THE DETAILS SHALL BE CHECKED AND SEALED BY AN ENGINEER REGISTERED IN THE STATE OF OHIO. DETAILS AND SEQUENCING SHALL DESCRIBE A THOROUGH AND COMPLETE OPERATION PLAN AND SPECIFY SAFETY PROCEDURES TO BE UTILIZED.

ALL MATERIALS AND PROCEDURES FOR THE ROLL-IN OPERATION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF A.R.E.A. SPECIFICATIONS.

ROLL-IN PROCEDURE SHALL NOT COMMENCE UNTIL THE ABOVE REQUIREMENTS HAVE BEEN MET.

	OHIO
	FHWA 5 REGION
	FEDERAL PROJECT

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FRANKLIN COUNTY
FRA-670-1.25-C-3

NOTES

1. THE CONTRACTOR SHALL SUBMIT THE DETAILS OF OPERATION AND PROCEDURE TO CSX FOR APPROVAL.

JOHN E. FOSTER AND ASSOCIATES, INC. 3/13
555 Buttles Ave., Columbus, Ohio 43215

CONSTRUCTION PROCEDURE

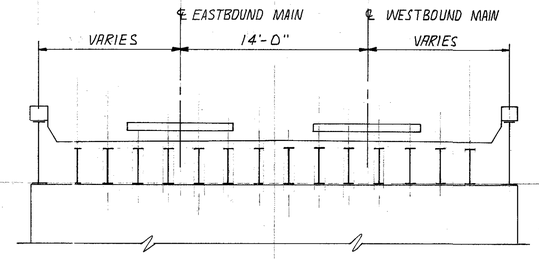
BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.E.M.	D.M.T.	–	H.S.S.		9/90	

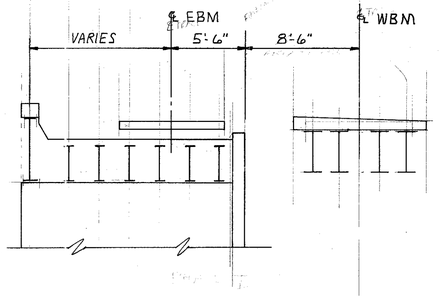
	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

168
224

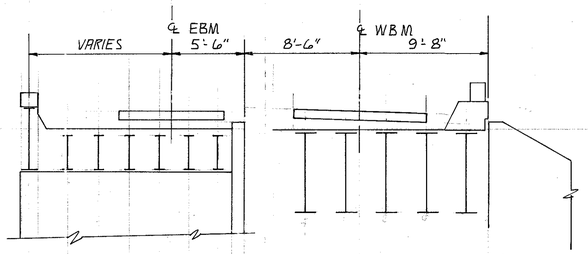
FRANKLIN COUNTY
FRA-670-1.25-C-3



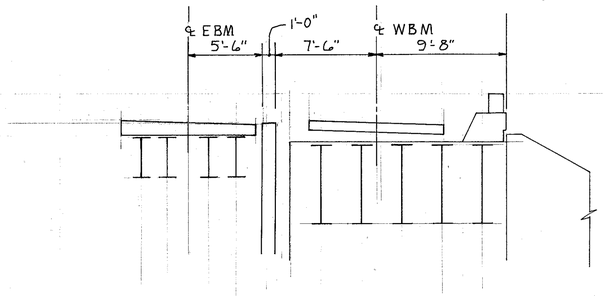
EXISTING STRUCTURE
(LOOKING UP STATION)



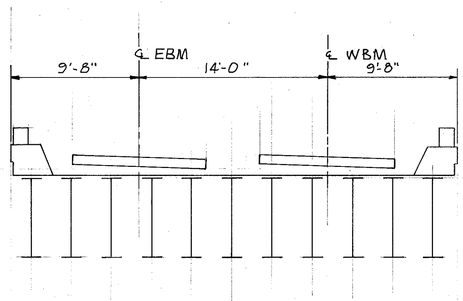
PHASE I
(LOOKING UP STATION)



PHASE IA
(LOOKING UP STATION)



PHASE II
(LOOKING UP STATION)



FINAL PROPOSED STRUCTURE
(LOOKING UP STATION)

JOHN E. FOSTER AND ASSOCIATES, INC. 4/13
555 Buttles Ave., Columbus, Ohio 43215

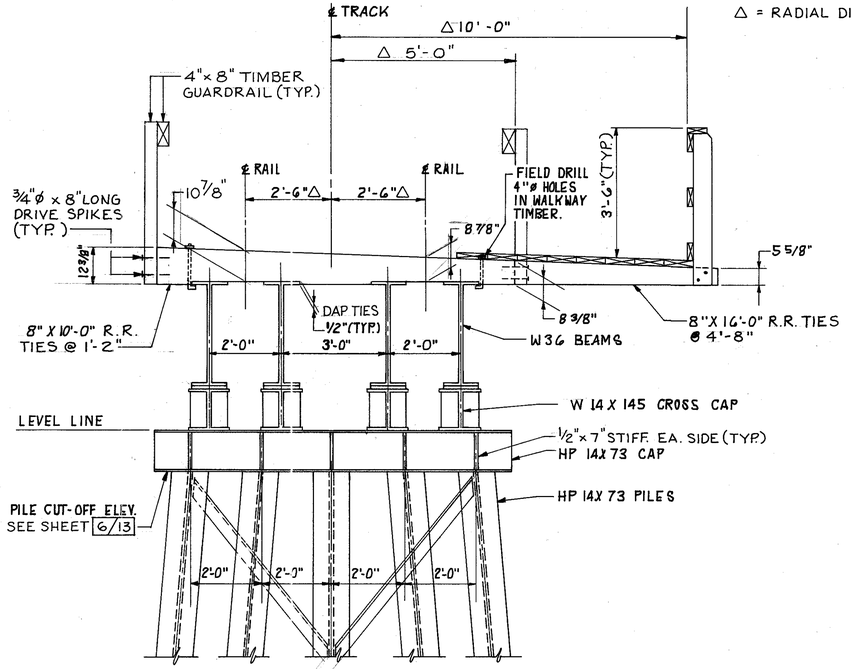
SEQUENCE OF CONSTRUCTION

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	TH	ES	CEM	HWR		

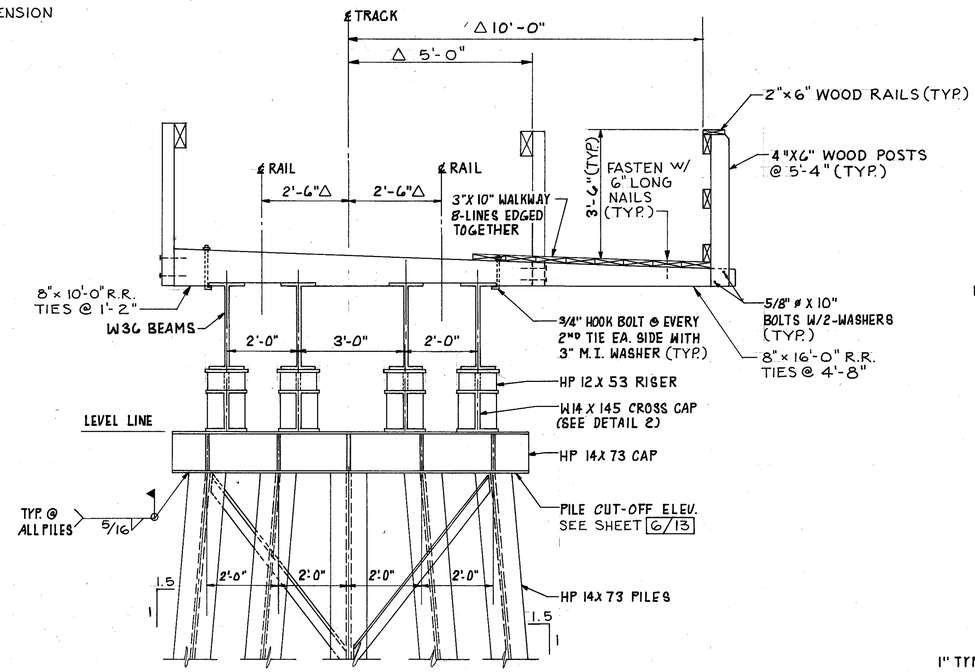
315841

FRANKLIN COUNTY
FRA-670-1.25-C-3

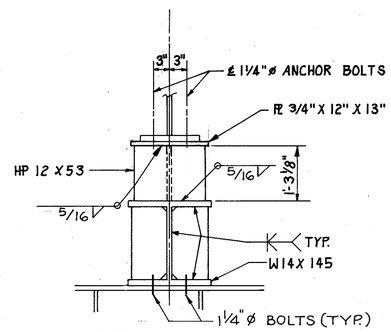


TYPICAL SECTION
(LOOKING AHEAD)

PHASE I, AS SHOWN
PHASE II, OPPOSITE HAND



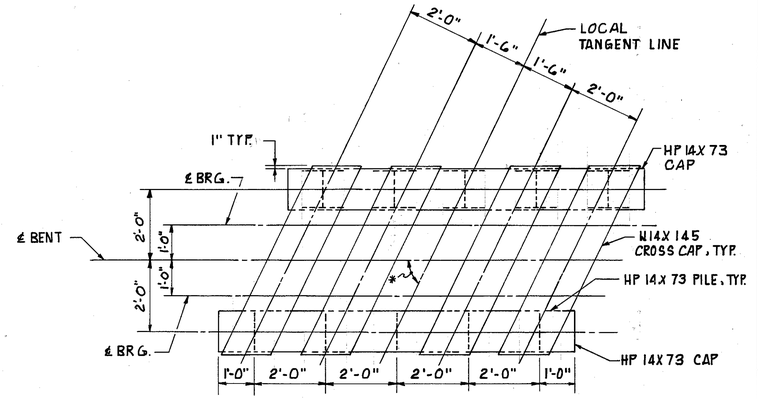
SECTION AT BENT 3
(LOOKING AHEAD)



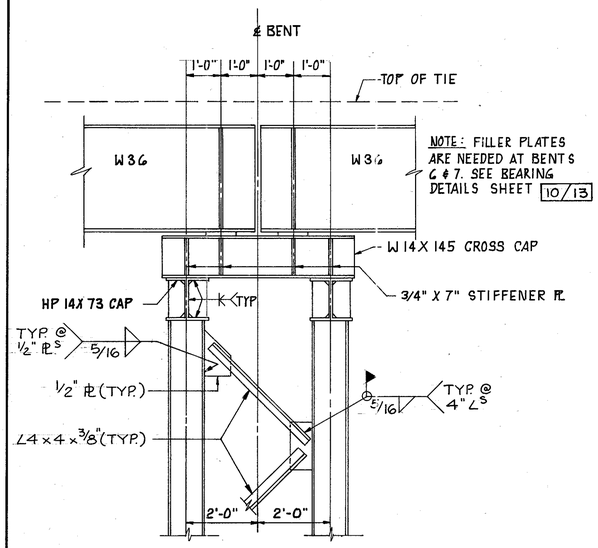
DETAIL 2

NOTES

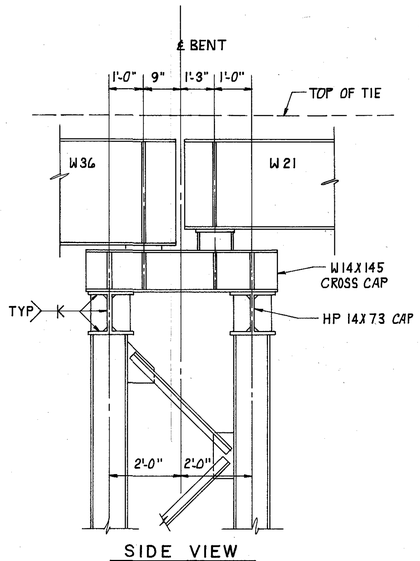
1. HP 14 x 73 PILE DESIGN LOAD = 60.75 KIPS. PAY LENGTH = 28 FEET.
2. HP 12 x 53 PILE DESIGN LOAD = 38.25 KIPS. PAY LENGTH = 23 FEET.



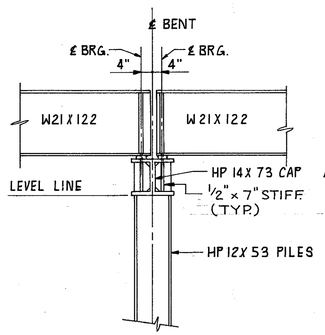
PLAN
(AT BENTS 4,5,6 & 7)



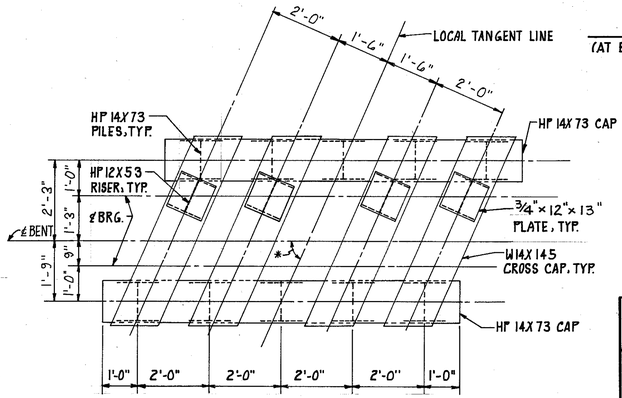
SIDE VIEW
(AT BENTS 4,5,6 & 7)



SIDE VIEW
(AT BENT 3)



SIDE VIEW
(AT BENT 2)



PLAN
(AT BENT 3)

✳ SKEW ANGLES		
BENT	EAST BOUND	WEST BOUND
3	66° 29' 09.5"	66° 12' 30.9"
4	64° 42' 24.8"	64° 24' 20.1"
5	64° 08' 12.3"	63° 49' 39.4"
6	64° 30' 58.0"	64° 12' 43.9"
7	65° 20' 04.0"	65° 02' 29.9"

NOTE: ANGLES ARE MEASURED TO LOCAL TANGENT.

JOHN E. FOSTER AND ASSOCIATES, INC. 5/13
555 Buttles Ave., Columbus, Ohio 43215

SECTIONS AND DETAILS FOR TEMPORARY TRESTLE

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R. 315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	ES	TH	CEM	HWR		

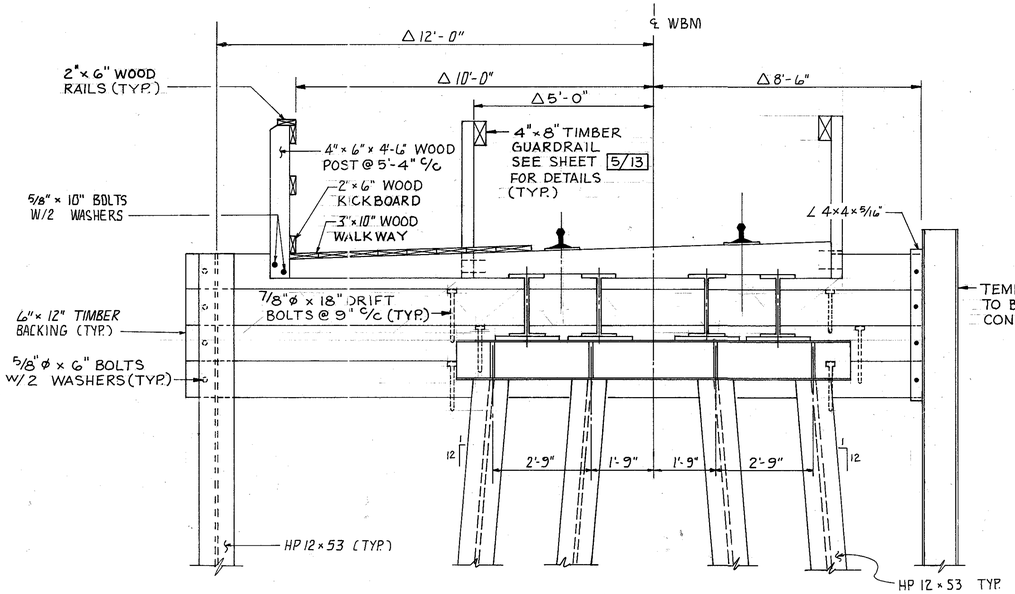
315841

△ = RADIAL DIMENSION

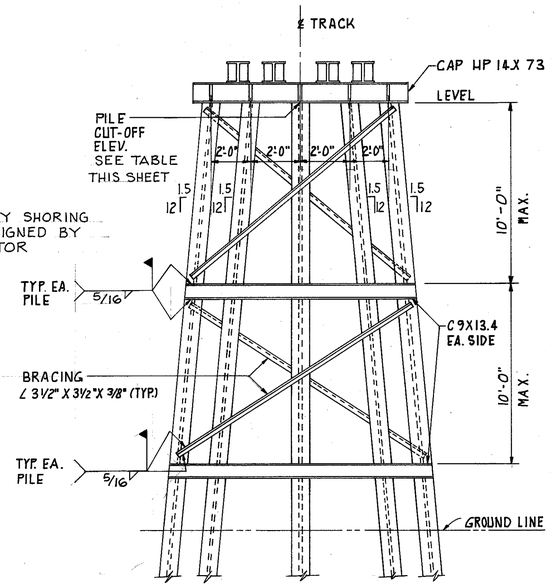
	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

170
224

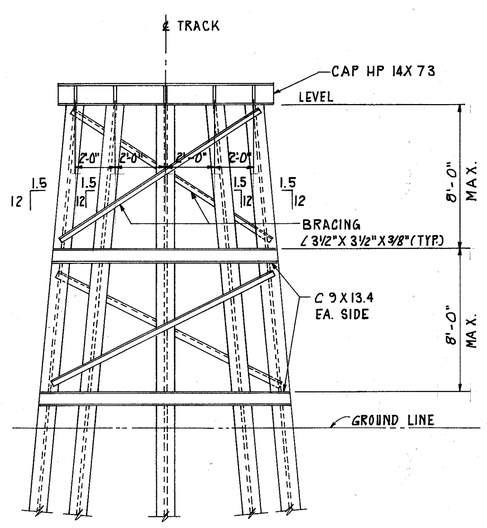
FRANKLIN COUNTY
FRA-670-1.25-C-3



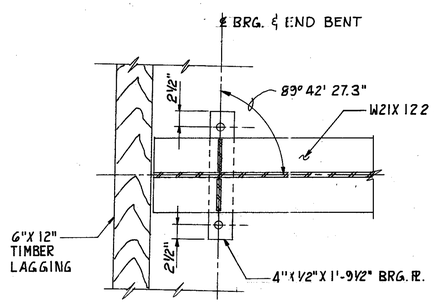
END BENT
(LOOKING BACK)



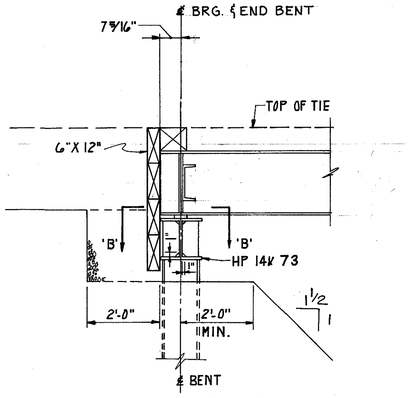
DOUBLE BENT
No. 3,4,5,6 & 7



SINGLE BENT
No. 2



SECTION 'B-B'



SECTION 'A-A'

EASTBOUND		
BENT No.	STA.	PILE CUT-OFF ELEVATION
1	54+57.98	724.36
2	54+70.98	724.42
3	54+83.98	721.98
4	55+23.51	722.15
5	55+62.61	722.32
6	56+03.37	722.50
7	56+31.48	722.66

WESTBOUND		
BENT No.	STA.	PILE CUT-OFF ELEVATION
1	54+57.98	724.36
2	54+70.98	724.42
3	54+90.15	722.01
4	55+30.21	722.18
5	55+69.48	722.35
6	56+10.13	722.53
7	56+37.99	722.69

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Ave., Columbus, Ohio 43215

6/13

BENT DETAILS FOR TEMPORARY TRESTLE

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

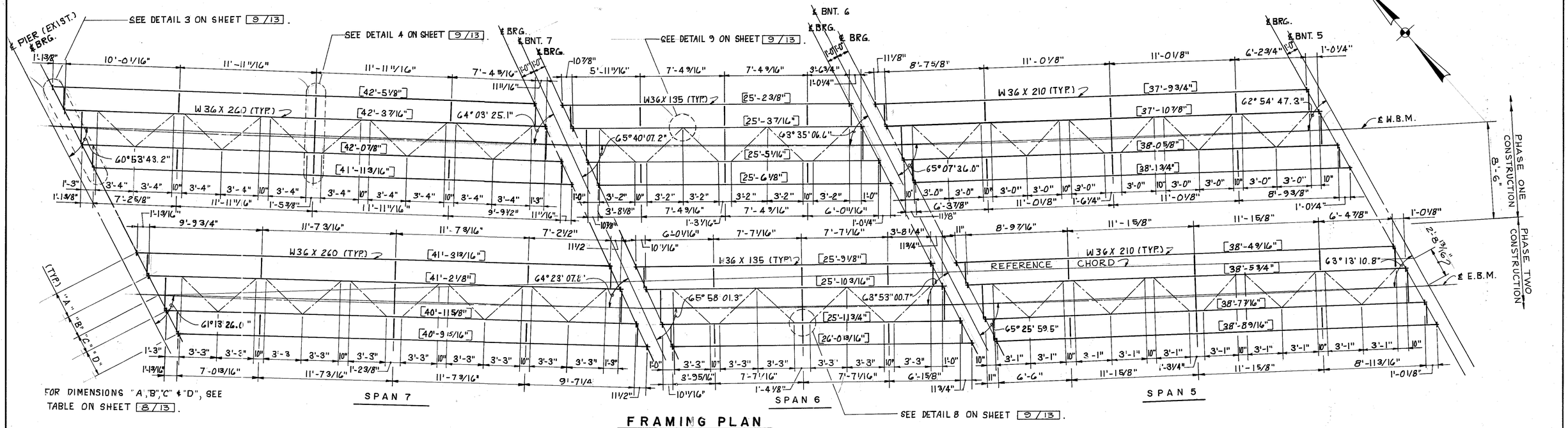
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	TH	ES	CEM	HWR		

315641

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

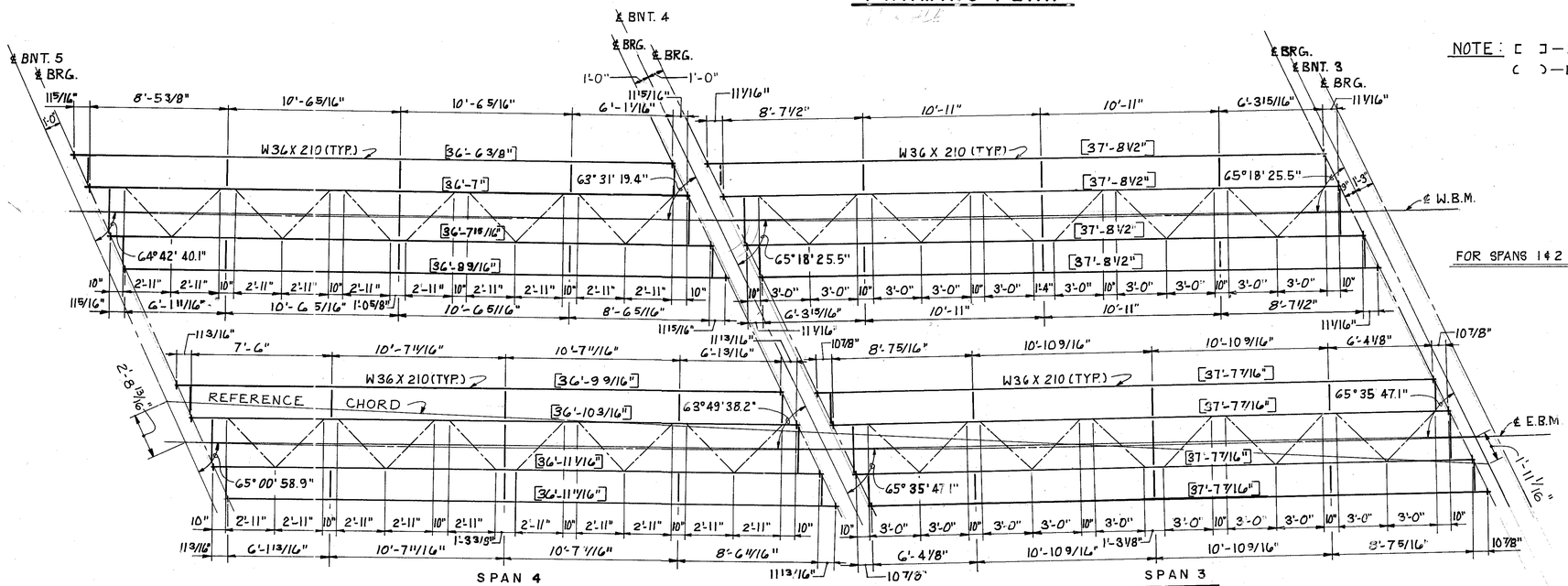
171
224

FRANKLIN COUNTY
FRA-670-1.25-C-3



FOR DIMENSIONS "A","B","C" & "D", SEE TABLE ON SHEET 8/13.

FRAMING PLAN



FRAMING PLAN

NOTE: [ ] — DIMENSION ℄ BRG TO ℄ BRG.
( ) — DIMENSION ℄ BENT TO ℄ BENT ALONG CHORD

NOTES

1. BEAMS ARE PARALLEL TO THE CHORD THAT EXTENDS FROM ℄ BRG. TO ℄ BENT FOR SPANS 1 AND 7 AND FROM ℄ BENT TO ℄ BENT FOR SPANS 2 THRU 6.
2. DIAPHRAGMS ARE PLACED PERPENDICULAR TO BEAMS.
3. ALL STRUCTURAL STEEL TO BE ASTM A572.
4. ALL STRUCTURAL WOOD MEMBERS ARE STRESS RATED

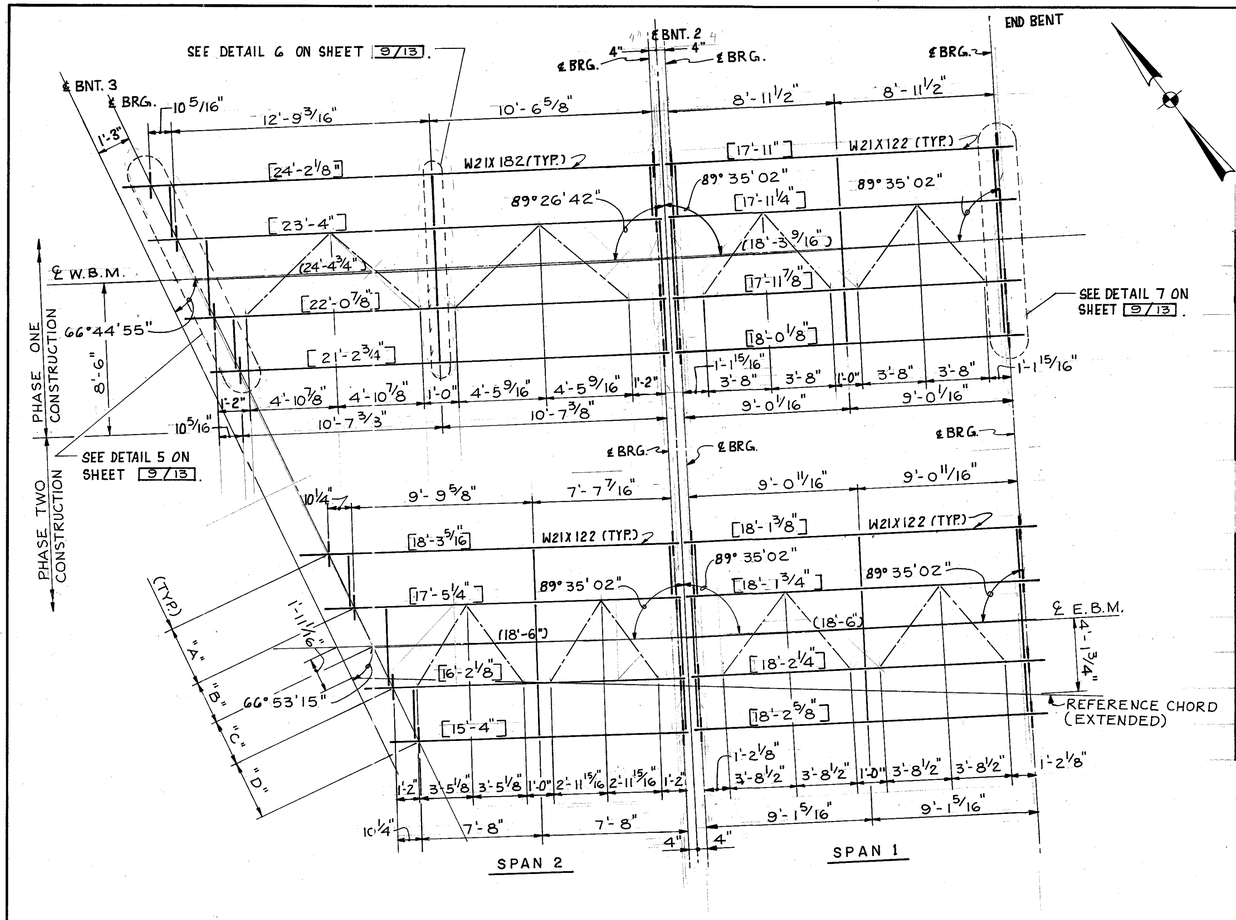
JOHN E. FOSTER AND ASSOCIATES, INC. 7/13
555 Buttles Ave., Columbus, Ohio 43215

FRAMING PLAN

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	TH	ES	CEM	HWR		

315841



FRAMING PLAN

NOTE: [ ] — DIMENSION ℄ BRG. TO ℄ BRG.
( ) — DIMENSION ℄ BENT TO ℄ BENT ALONG CHORD

NOTE: FOR BENTS 1 & 2, THE BEARING STIFFENERS ARE PLACED PARALLEL TO ℄ BRG.

OHIO	172
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

BEARING DIMENSIONS TABLE — WESTBOUND

DIMENSION	SPAN 7		SPAN 6		SPAN 5		SPAN 4		SPAN 3		SPAN 2		SPAN 1	
	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK
"A"	2'-3 7/16"	2'-2 11/16"	2'-2 5/16"	2'-2 13/16"	2'-2 7/16"	2'-2 15/16"	2'-2 9/16"	2'-2 13/16"	2'-2 7/16"	2'-2 7/16"	2'-2 1/8"	2'-0"	2'-0"	2'-0"
"B"	1'-8 5/8"	1'-8"	1'-7 3/4"	1'-8 1/8"	1'-7 13/16"	1'-8 3/16"	1'-7 15/16"	1'-8 1/8"	1'-7 13/16"	1'-7 13/16"	1'-7 5/8"	1'-6"	1'-6"	1'-6"
"C"	1'-8 5/8"	1'-8"	1'-7 3/4"	1'-8 1/8"	1'-7 13/16"	1'-8 3/16"	1'-7 15/16"	1'-8 1/8"	1'-7 13/16"	1'-7 13/16"	1'-7 5/8"	1'-6"	1'-6"	1'-6"
"D"	2'-3 7/16"	2'-2 11/16"	2'-2 5/16"	2'-2 13/16"	2'-2 7/16"	2'-2 15/16"	2'-2 9/16"	2'-2 13/16"	2'-2 7/16"	2'-2 7/16"	2'-2 1/8"	2'-0"	2'-0"	2'-0"

BEARING DIMENSIONS TABLE — EASTBOUND

DIMENSION	SPAN 7		SPAN 6		SPAN 5		SPAN 4		SPAN 3		SPAN 2		SPAN 1	
	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK
"A"	2'-3 3/8"	2'-2 5/8"	2'-2 1/4"	2'-2 3/4"	2'-2 3/8"	2'-2 7/8"	2'-2 1/2"	2'-2 3/4"	2'-2 3/8"	2'-2 3/8"	2'-2 1/8"	2'-0"	2'-0"	2'-0"
"B"	1'-8 9/16"	1'-7 15/16"	1'-7 11/16"	1'-8 1/16"	1'-7 13/16"	1'-8 3/16"	1'-7 7/8"	1'-8 1/16"	1'-7 3/4"	1'-7 3/4"	1'-7 9/16"	1'-6"	1'-6"	1'-6"
"C"	1'-8 9/16"	1'-7 15/16"	1'-7 11/16"	1'-8 1/16"	1'-7 13/16"	1'-8 3/16"	1'-7 7/8"	1'-8 1/16"	1'-7 3/4"	1'-7 3/4"	1'-7 9/16"	1'-6"	1'-6"	1'-6"
"D"	2'-3 3/8"	2'-2 1/8"	2'-2 1/4"	2'-2 3/4"	2'-2 3/8"	2'-2 7/8"	2'-2 1/2"	2'-2 3/4"	2'-2 3/8"	2'-2 3/8"	2'-2 1/8"	2'-0"	2'-0"	2'-0"

NOTE: DIMENSIONS ARE MEASURED ALONG ℄ BRG. AT THE INTERSECTION OF ℄ BRG. AND ℄ BEAM OR CHORD FOR EACH SPAN.

JOHN E. FOSTER AND ASSOCIATES, INC. 8/13
555 Buttles Ave., Columbus, Ohio 43215

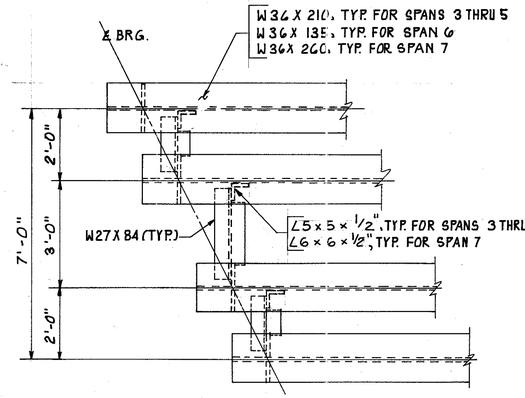
FRAMING PLAN

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R. 315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

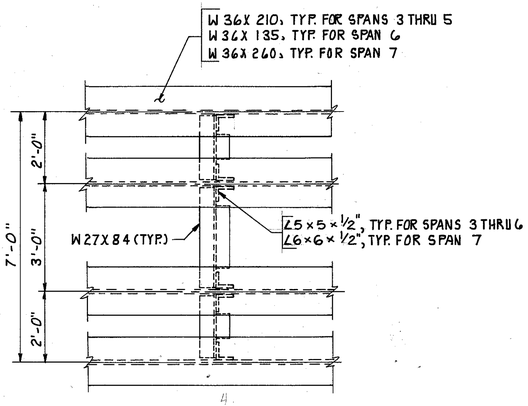
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	TH	ES	CEM	HWR		

315041

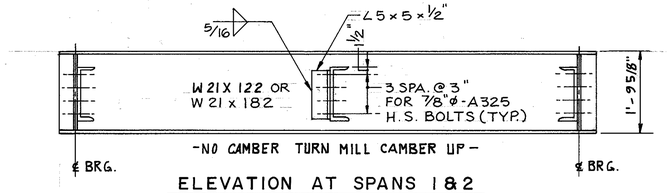
FRANKLIN COUNTY
FRA-670-1.25-C-3



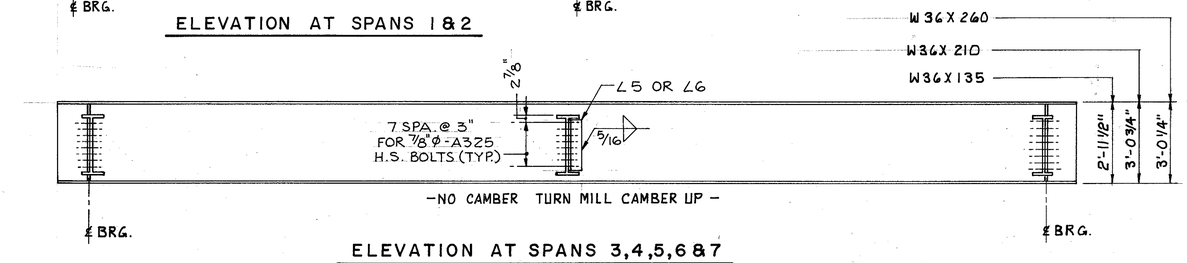
DETAIL 3



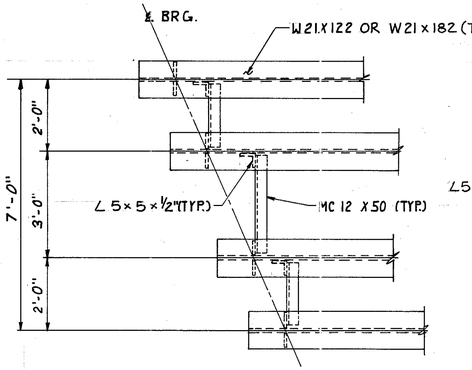
DETAIL 4



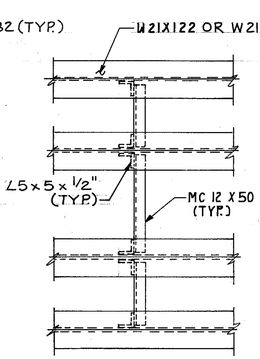
ELEVATION AT SPANS 1&2



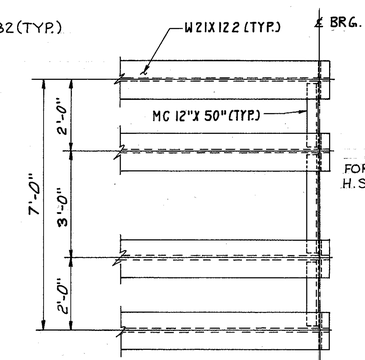
ELEVATION AT SPANS 3,4,5,6&7



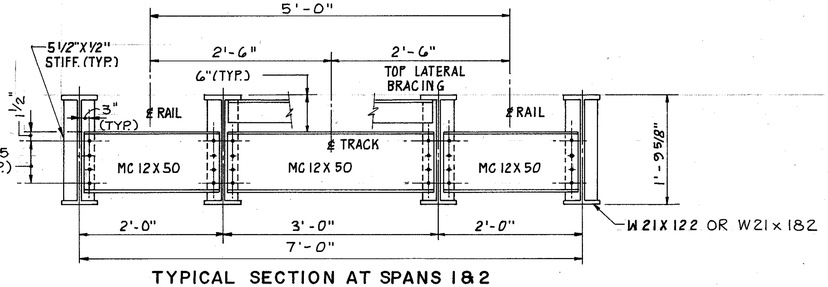
DETAIL 5



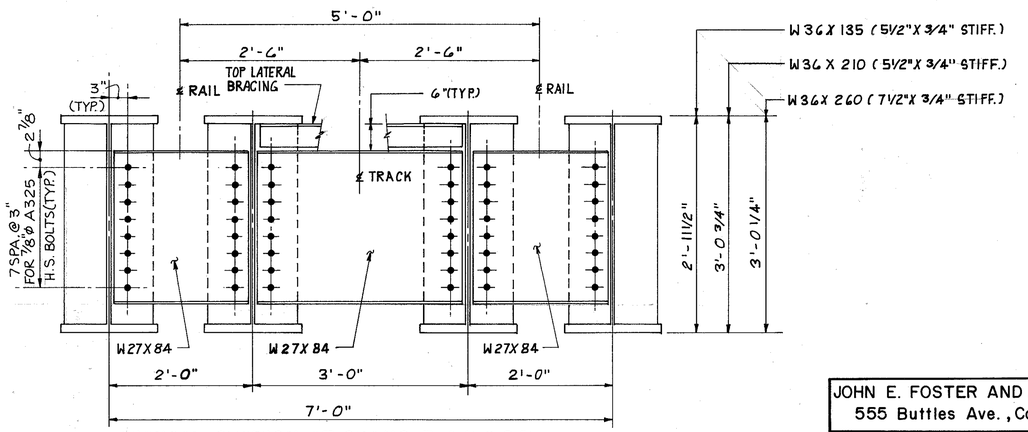
DETAIL 6



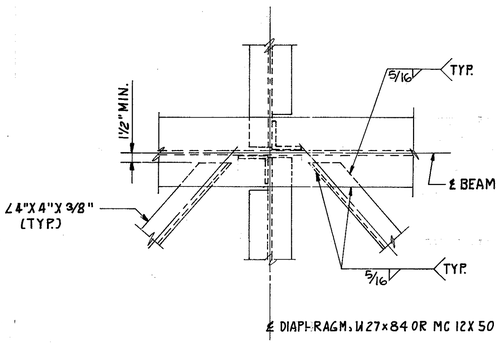
DETAIL 7



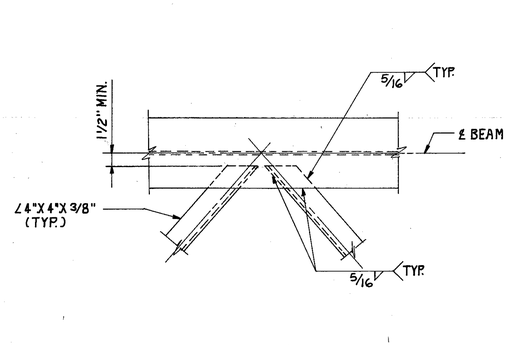
TYPICAL SECTION AT SPANS 1&2



TYPICAL SECTION AT SPANS 3,4,5,6&7



DETAIL 8



DETAIL 9

JOHN E. FOSTER AND ASSOCIATES, INC. 9/13
555 Buttles Ave., Columbus, Ohio 43215

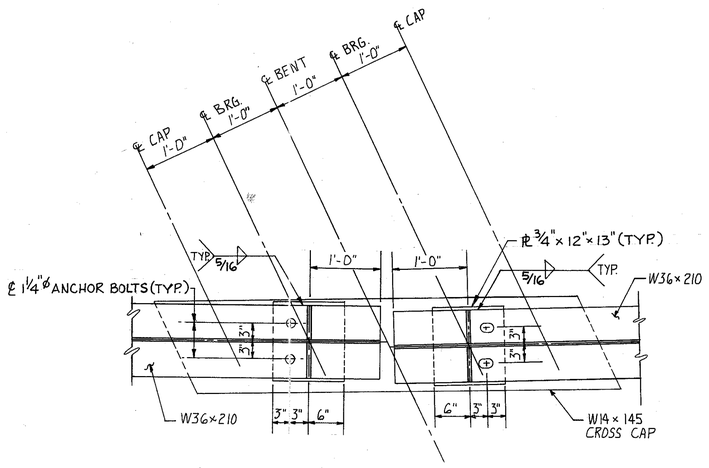
BEAM DETAILS FOR TEMPORARY TRESTLE

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

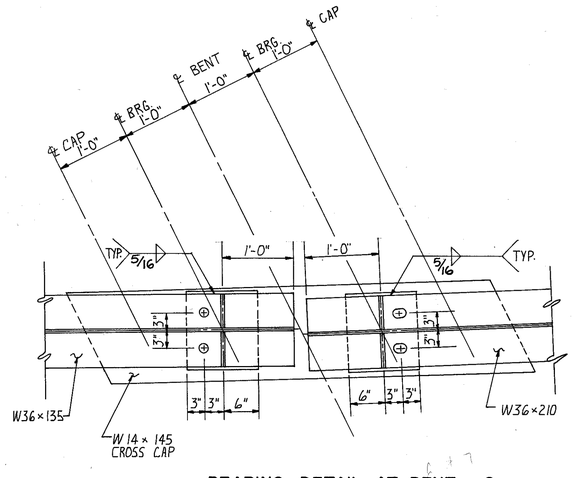
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	TH	ES	CEM	HWR		

31844

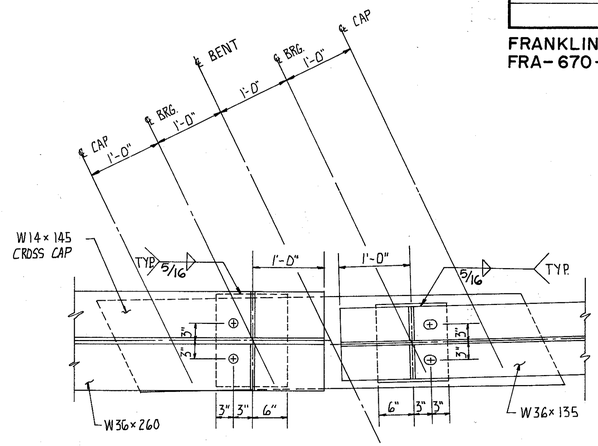
FRANKLIN COUNTY
FRA-670-1.25-C-3



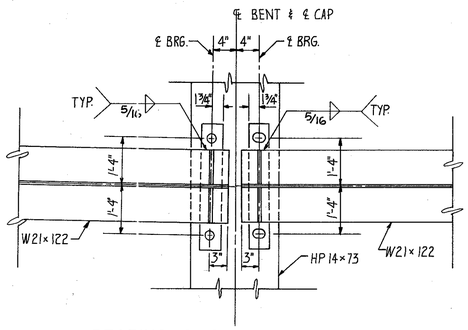
BEARING DETAIL AT BENTS 4 & 5



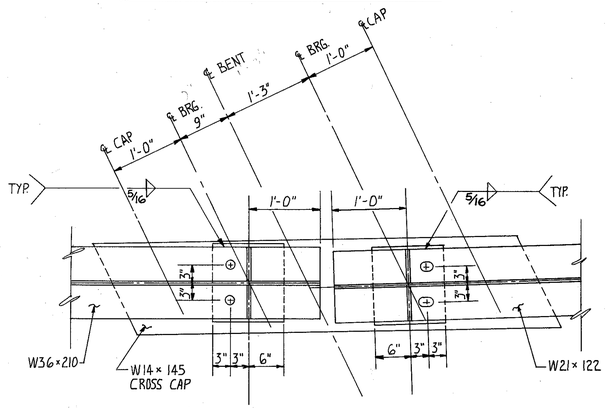
BEARING DETAIL AT BENT 6



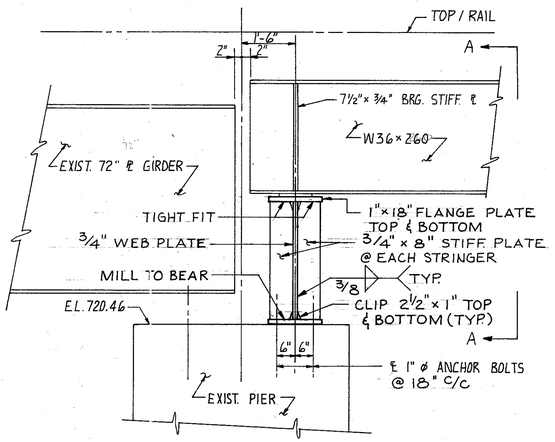
BEARING DETAIL AT BENT 7



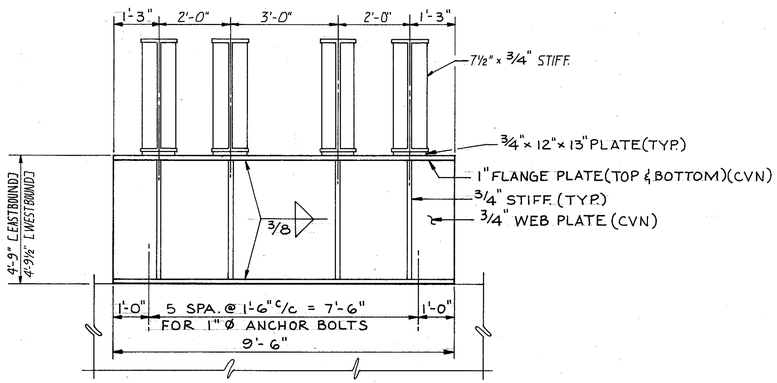
BEARING DETAIL AT BENT-2



BEARING DETAIL AT BENT-3



DETAIL 1



SECTION "A-A"

NOTES

1. ALL BEARINGS ARE MADE FROM ASTM A572 STEEL.
2. WHERE A SHAPE OR PLATE IS DESIGNATED (CVN) THE MATERIAL SHALL MEET SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 701.01.

JOHN E. FOSTER AND ASSOCIATES, INC. 10/13
555 Buttles Ave., Columbus, Ohio 43215

BEARING DETAILS

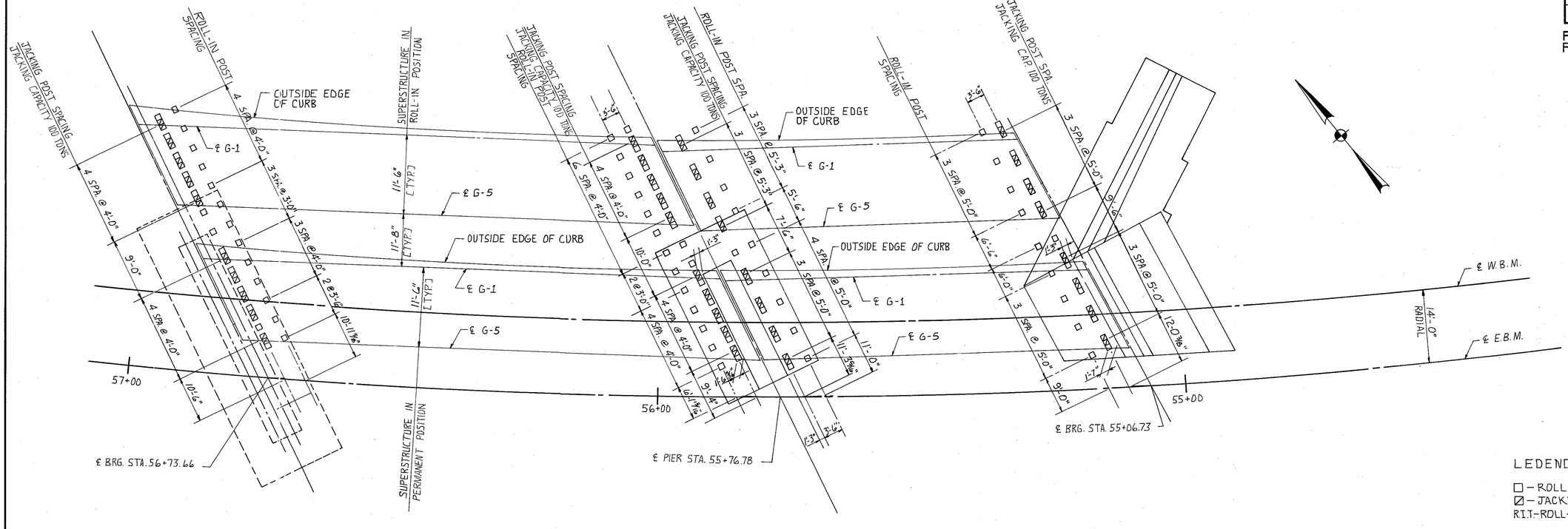
BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LKM	ES	TH	CEM	HWR		

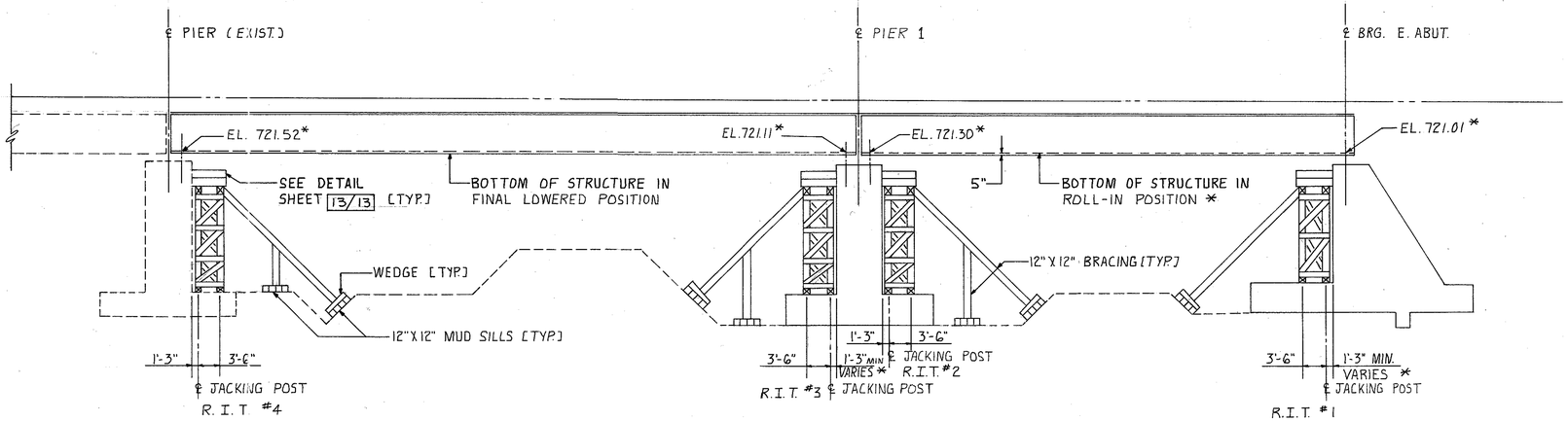
	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

175
224

FRANKLIN COUNTY
FRA-670-1.25-C-3



PLAN PHASE I



ELEVATION PHASE I

LEDEND:

□ – ROLL-IN POST
▨ – JACKING POST
R.I.T.–ROLL-IN TOWER

NOTE:

1- R.I.T. #1 & #2 ARE PARALLEL TO C.L. PIER 1.
2- R.I.T. #3 & #4 ARE PARALLEL TO C.L. EXIST. PIER.
3. 12"x 12" BRACING IS TO BE MADE FROM STRESS RATED TIMBER.

* – SHIM AS REQUIRED TO PROVIDE TIGHT FIT AGAINST SUBSTRUCTURE.

JOHN E. FOSTER AND ASSOCIATES, INC. 11/13
555 Buttles Ave., Columbus, Ohio 43215

ROLL IN BENT LOCATION PHASE I

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

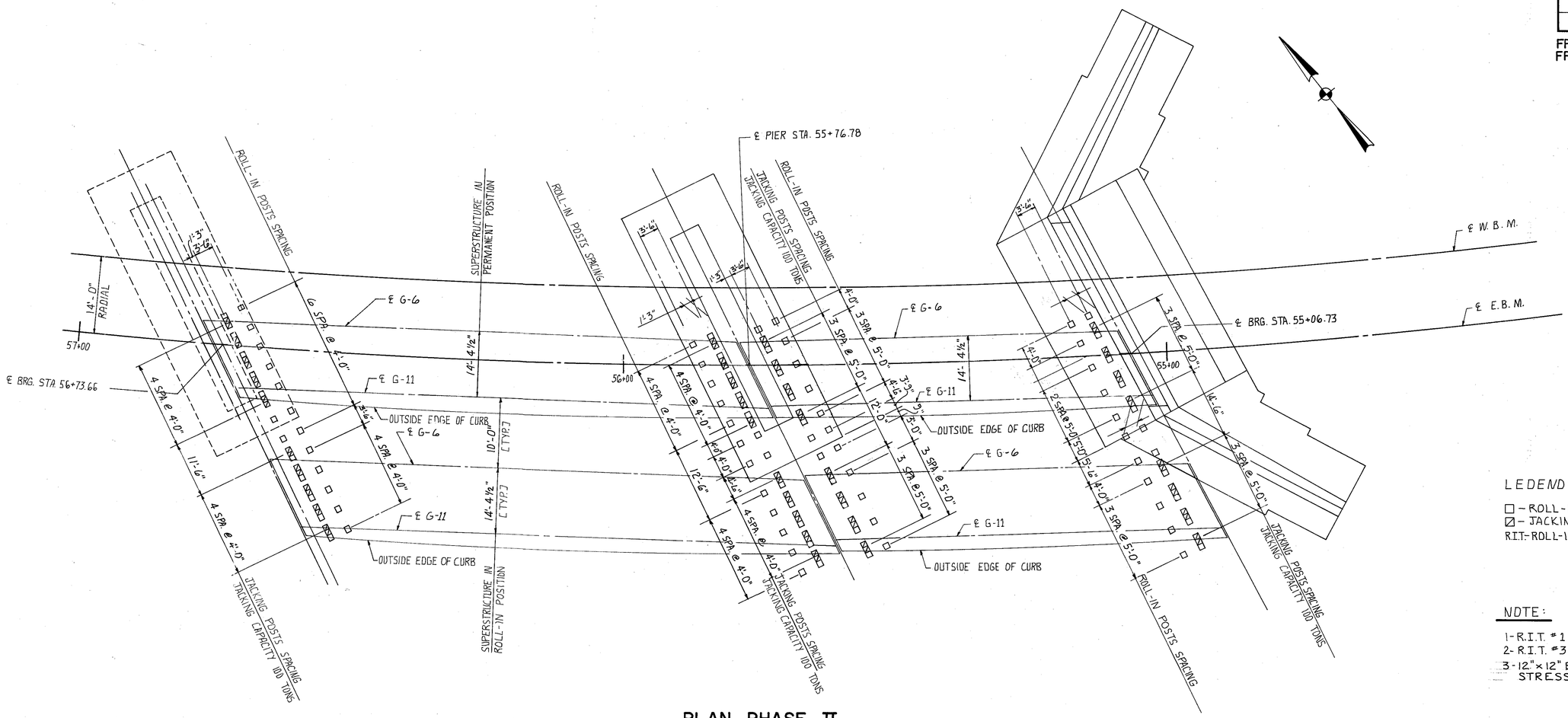
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
L.K.M.	E.S.	T.H	C.E.M.	J.S.S.	10/91	

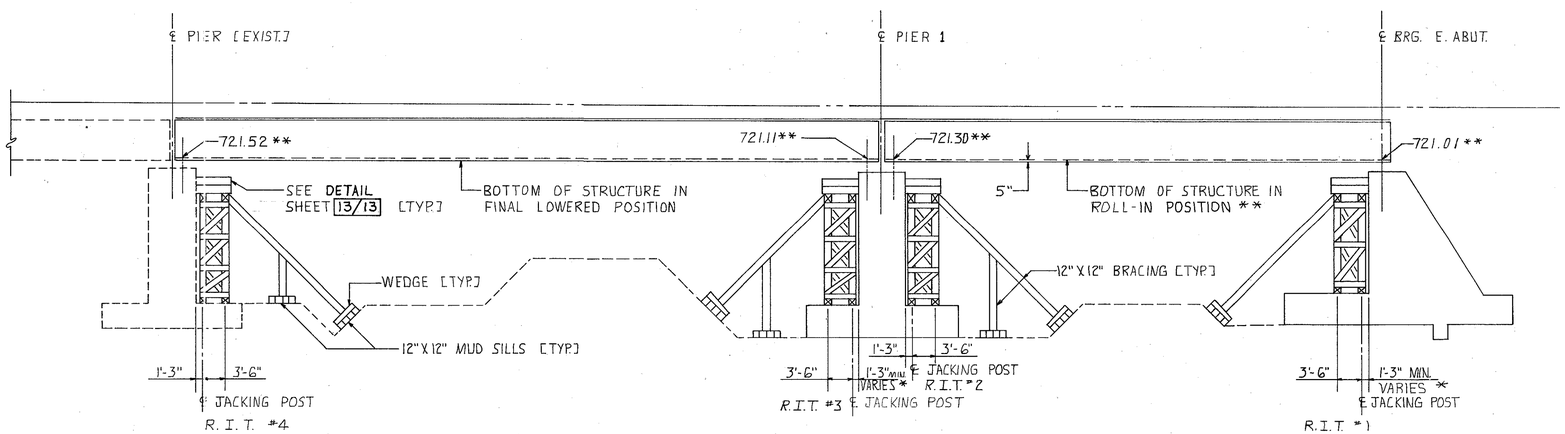
319841

OHIO	176
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



PLAN PHASE II



ELEVATION PHASE II

LEGEND:

□ - ROLL-IN POST
▨ - JACKING POST
R.I.T.-ROLL-IN TOWER

NOTE:

1-R.I.T. #1 & #2 ARE PARALLEL TO C.L. PIER 1.
2-R.I.T. #3 & #4 ARE PARALLEL TO C.L. EXIST. PIER.
3-12"×12" BRACING IS TO BE MADE FROM STRESS RATED TIMBER.

* - SHIM AS REQUIRED TO PROVIDE TIGHT FIT AGAINST SUBSTRUCTURE.

JOHN E. FOSTER AND ASSOCIATES, INC. 12/13
555 Buttles Ave., Columbus, Ohio 43215

ROLL IN BENT LOCATION PHASE II

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX

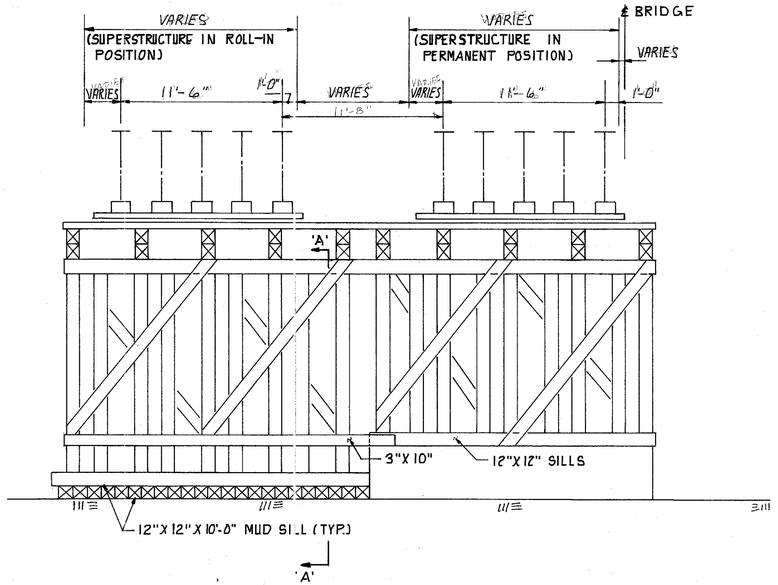
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
L.K.M.	E.S.	T.H	C.E.M.	J.S.S.	10/91	

OHIO	177
FHWA REGION 5	224
FEDERAL PROJECT	

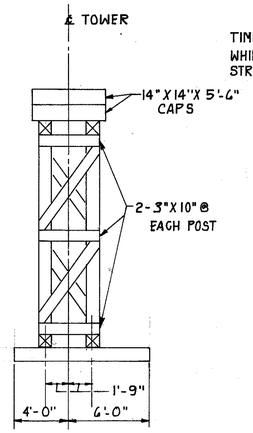
FRANKLIN COUNTY
FRA-670-1.25-C-3

NOTES: ALL POSTS SHOWN ON THIS DWG. ARE 12"X12"
ALL DIAGONAL BRACING IS 3"X10"
FOR LOCATION OF JACKING POSTS SEE PLAN ON SHEETS 11/13 & 12/13.

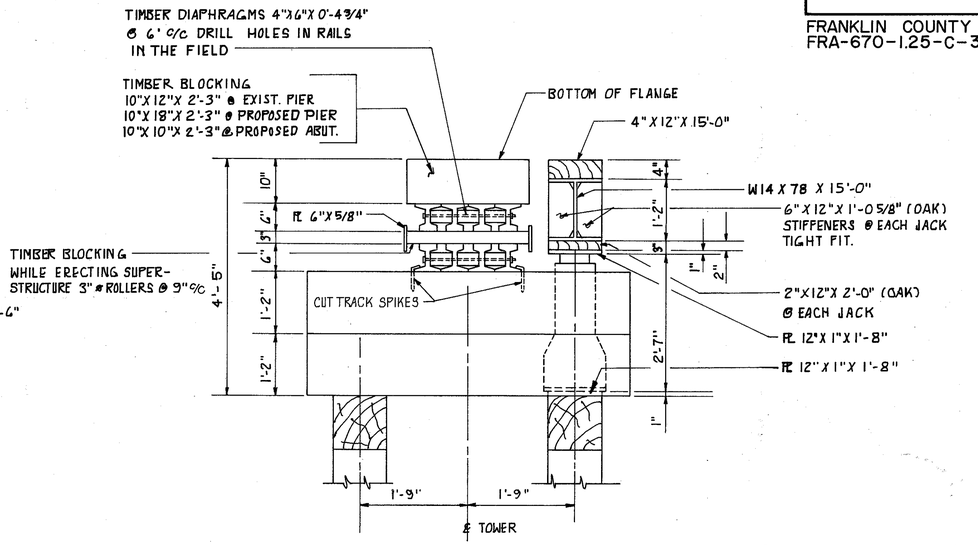


ROLL-IN TOWER No. 1 (PHASE I shown)

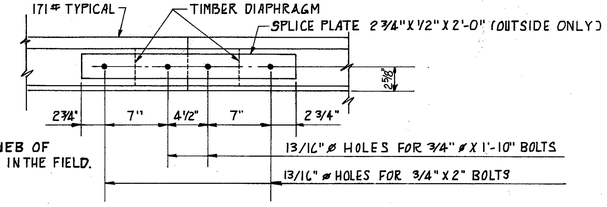
(PHASE II & ROLL-IN TOWER No. 2 SIM. SEE PLAN)



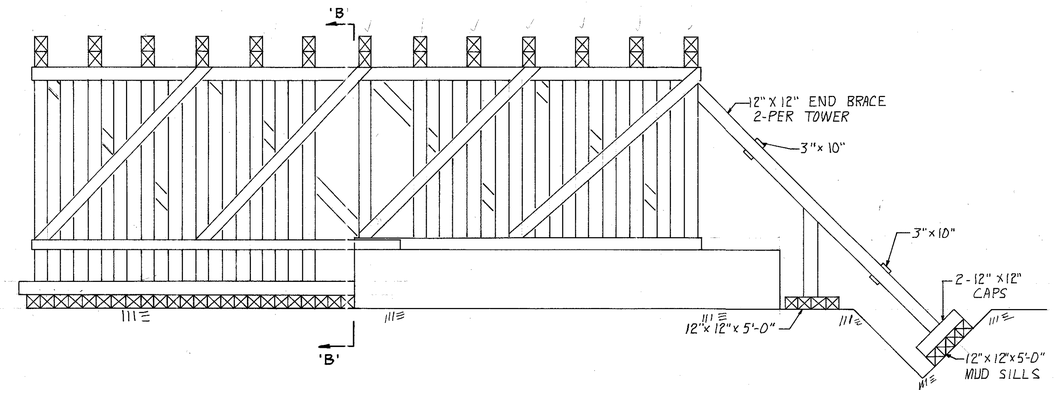
SECTION 'A-A'



DETAIL 2



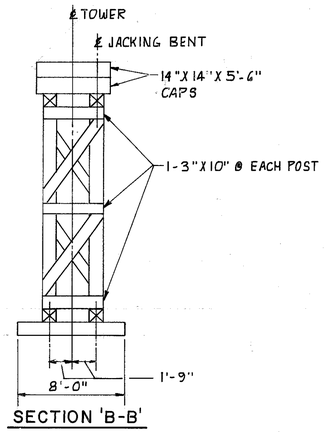
RAIL SPLICE DETAIL



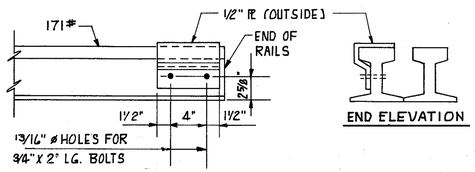
ROLL-IN TOWER No. 3 (PHASE I shown)

(PHASE II & ROLL-IN TOWER No. 4 SIM. SEE PLAN)

TYPICAL END BRACE AT EACH ROLL-IN TOWER



SECTION 'B-B'



STOP DETAIL

(TYPICAL FOR ALL ROLL-IN BENTS)

DECRIPTION OF HARDWARE

FASTEN CAPS AND SILLS WITH 3/4" ø DRIFT BOLTS.
FASTEN CAPS TO POSTS WITH 1-3/4" ø DRIFT BOLT PER POST.
FASTEN POSTS TO SILLS WITH 2-3/4" ø DRIFT BOLTS PER POST.
BOLT ALL BRACING TO POSTS WITH 3/4" ø BOLTS.
ALL 3/4" ø BOLTS TO HAVE SQUARE HEADS AND NUTS WITH 2"- O.G. WASHERS.
ALL DRIFT BOLTS TO HAVE BUTTON HEADS.

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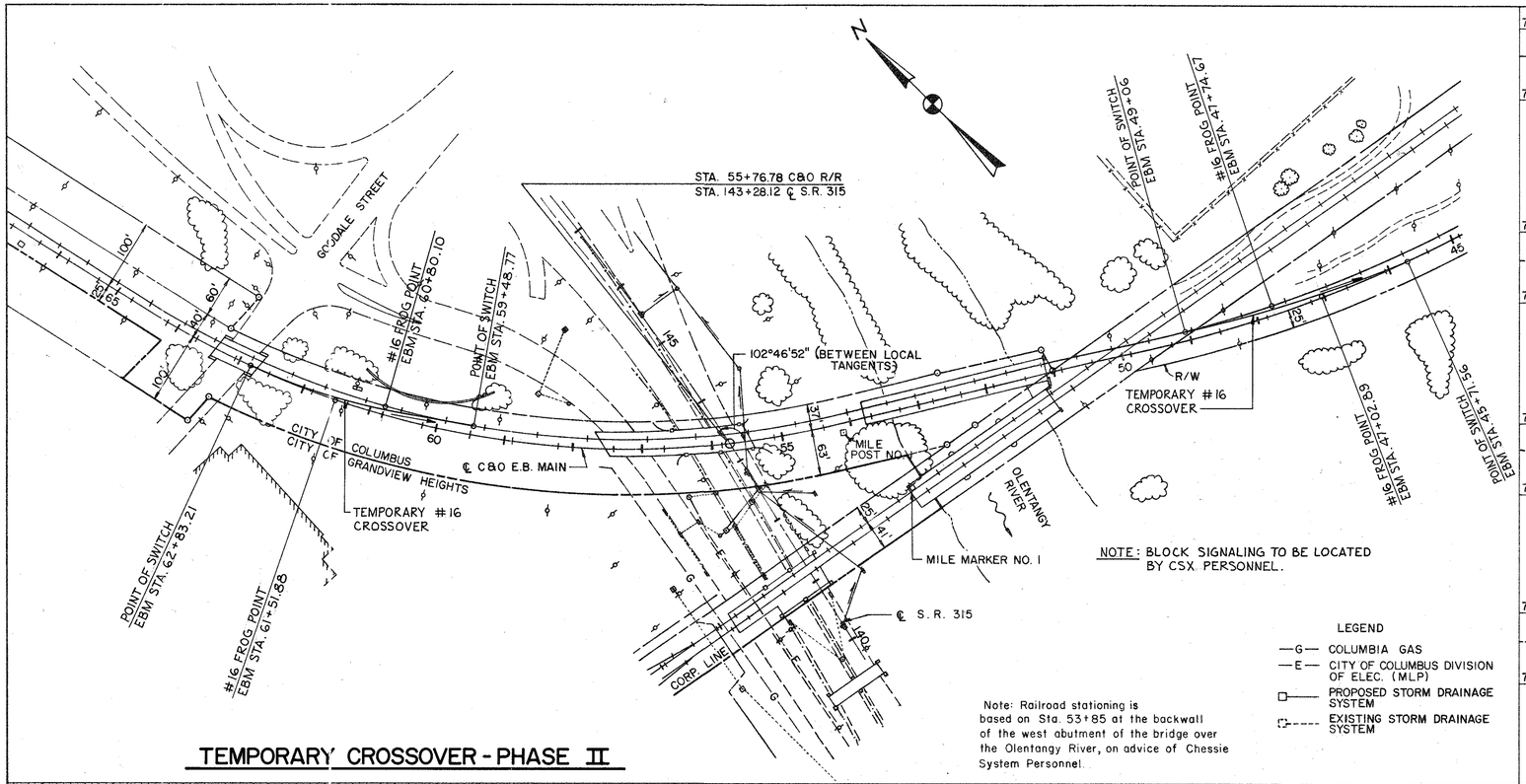
ROLL IN BENT DETAILS

BRIDGE No. 11 at MILEPOST CD 1.1
BRIDGE No. FRA-315-1.76
S.R.315 UNDER CSX
FRANKLIN COUNTY STA. 143+28.12

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CEM	ES	TH	DFS	JSS	10/91	

FRANKLIN COUNTY
FRA-670-1.25-C-3
178
224

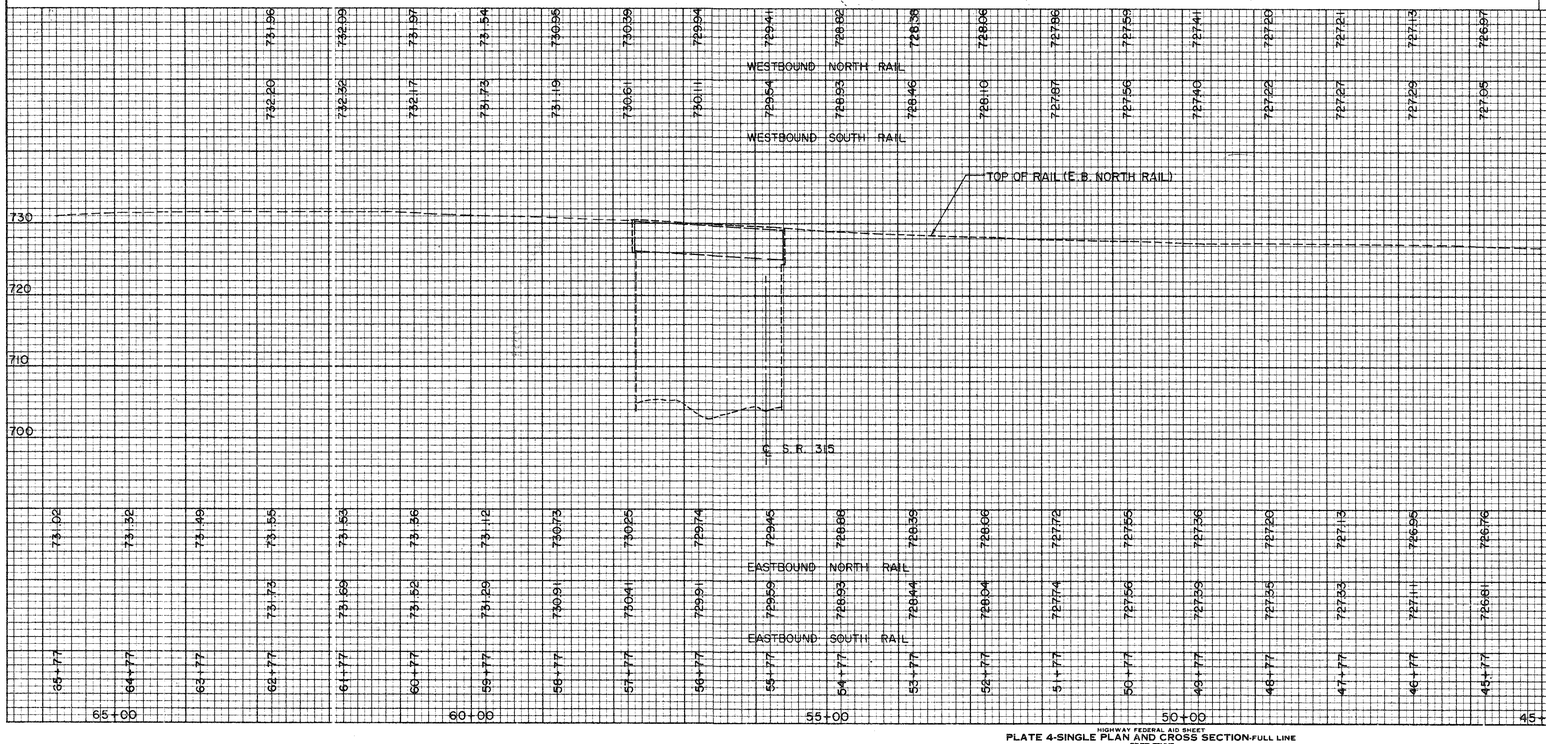


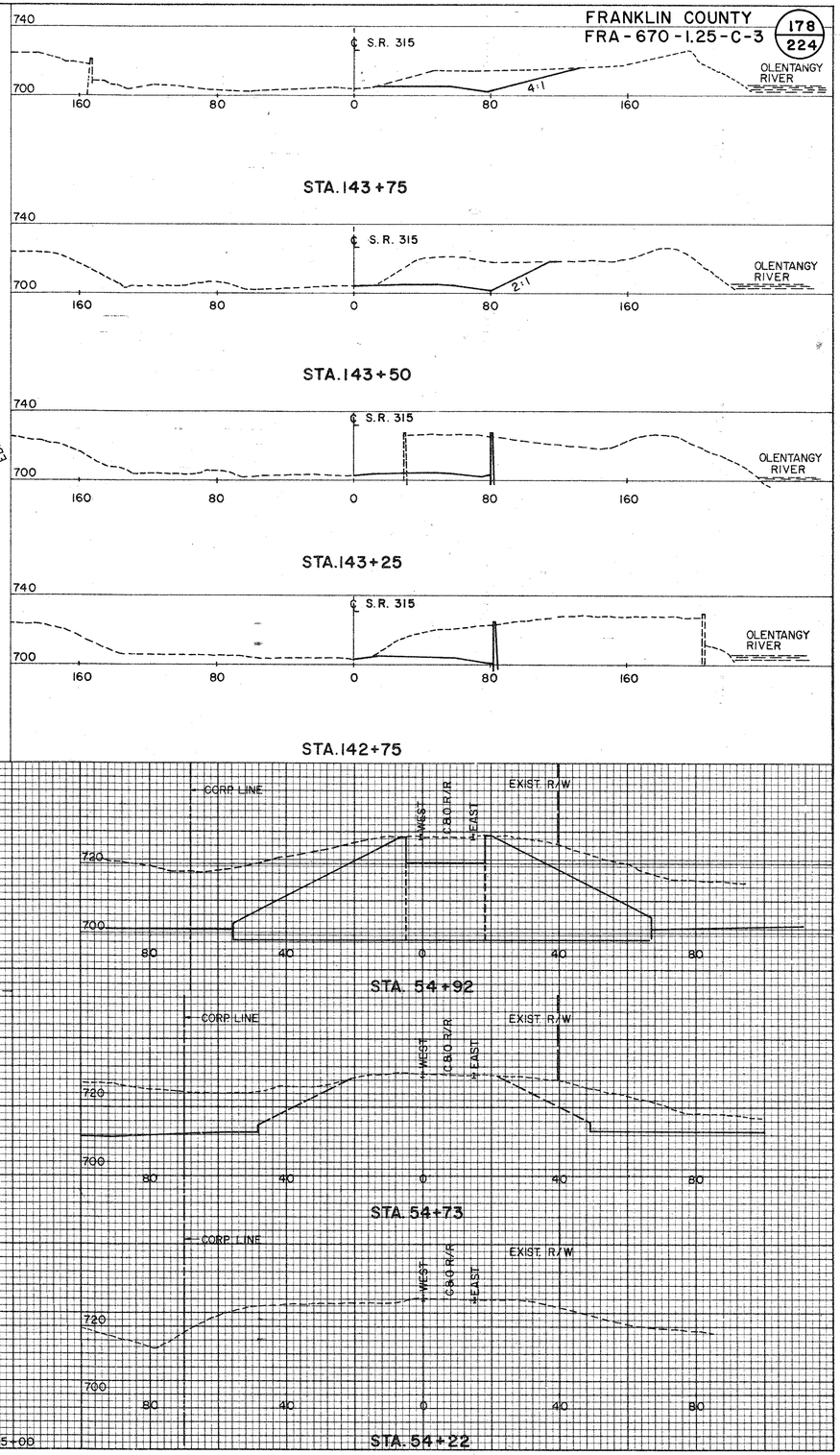
NOTE: BLOCK SIGNALING TO BE LOCATED BY CSX. PERSONNEL.

LEGEND
- —G— COLUMBIA GAS
- —E— CITY OF COLUMBUS DIVISION OF ELEC. (MLP)
- PROPOSED STORM DRAINAGE SYSTEM
- EXISTING STORM DRAINAGE SYSTEM

Note: Railroad stationing is based on Sta. 53+85 at the backwall of the west abutment of the bridge over the Olentangy River, on advice of Chessie System Personnel.

TEMPORARY CROSSOVER - PHASE II





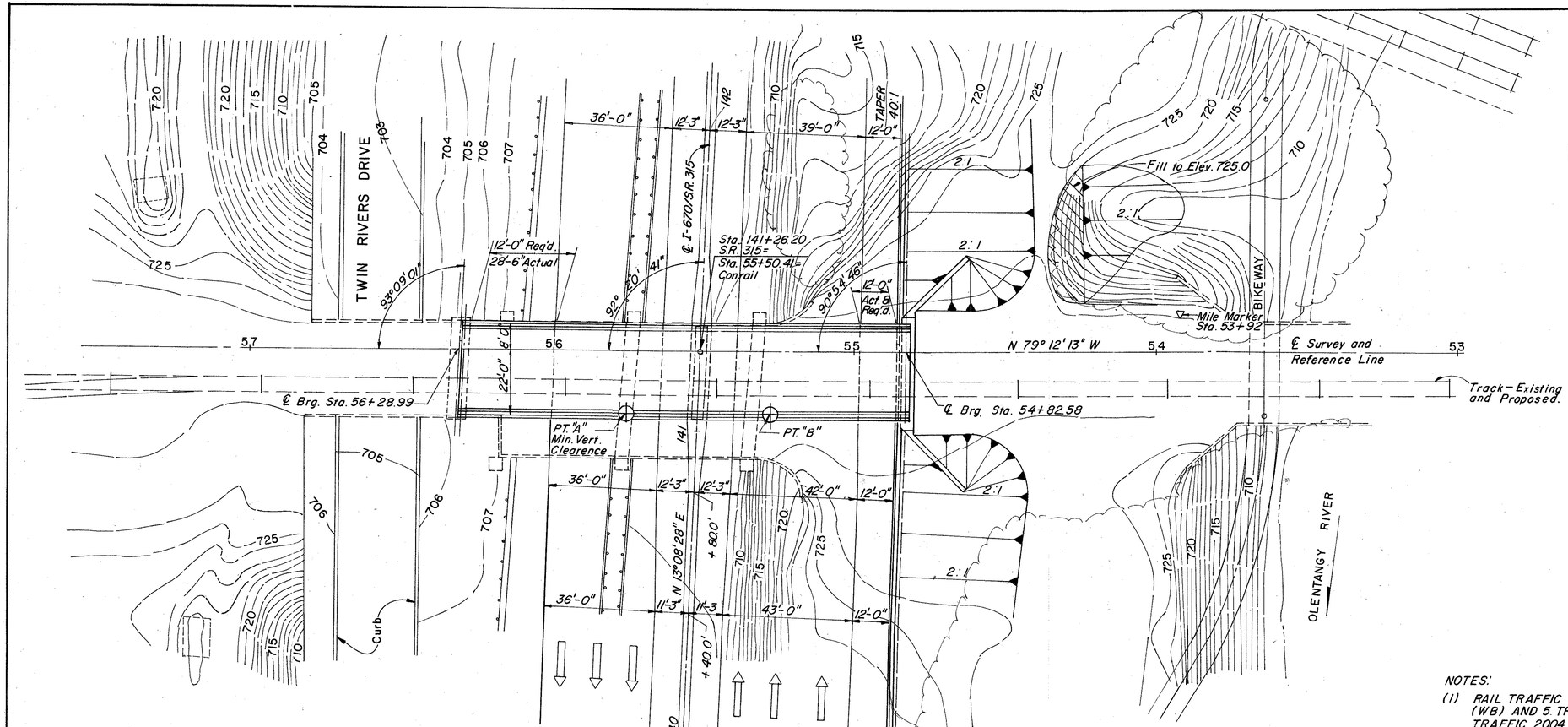
SR 315 UNDER CSX

HIGHWAY FEDERAL AID PROJECT
PLATE 4-SINGLE PLAN AND CROSS SECTION-FULL LINE
TELEDYNE
PRINTED IN U.S.A.

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

179
224

FRANKLIN COUNTY
FRA-670-1.25-C-3



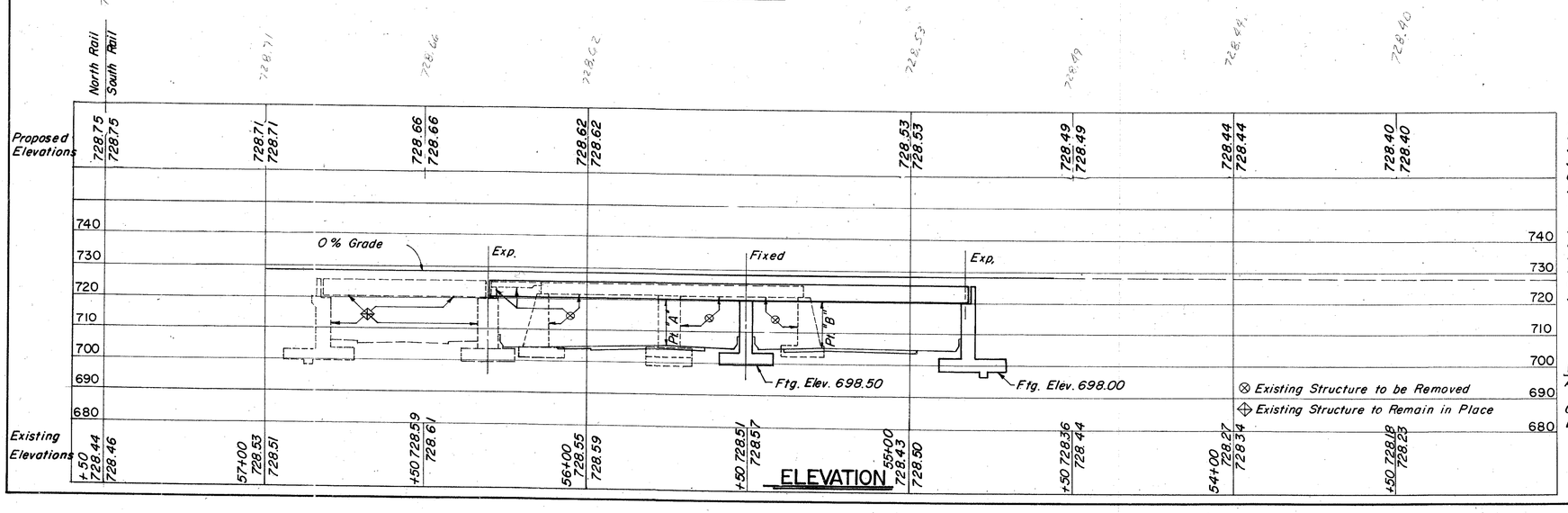
PLAN

B.M.-ALUM. PLUG IN CONCRETE MONUMENT, 400' W. OF CONRAIL RAILROAD BRIDGE OVER OLENTANGY R., 301' W. OF RAILROAD MILE MARKER 11, NEAR SW CORNER OF CONRAIL RAILROAD BRIDGE OVER TWIN RIVERS DR., 16.0' S. OF S. RAILROAD TRACKS, 11.5' W. OF A NAIL IN SW. ABUT., 1' BELOW GROUND, WITH ACCESS THRU AN 8" FARM TILE WITH A CAST IRON LID. (COC 8-83) ELEV. = 725.281

NOTES:

(1) RAIL TRAFFIC AVERAGES 5 TRAINS (WB) AND 5 TRAINS (EB) DAILY. TRAFFIC 2004 ADT. = 79,227

(2) EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO CROSS SECTIONS.



ELEVATION

PT. "A"
Elev. = 705.45
S.R. 315
STA. 141+03.21 = CONRAIL
STA. 55+74.68

PT. "B"
Elev. = 705.43
S.R. 315
STA. 141+05.19 = CONRAIL
STA. 55+26.14

VERTICAL CLEARANCE
ACTUAL - PT. "A" = 15.00
PT. "B" = 15.02
Calculated clearances based on Bottom of Girder Elev. 720.45

⊗ Existing Structure to be Removed
⊕ Existing Structure to Remain in Place

EXISTING STRUCTURE (UG BRIDGE NO. 103)

TYPE: Simple Span Encased Steel Beam Bridge with Riveted Fascia Girders, Reinforced Concrete Substructures with Limestone Facing.
SPANS: 40.25', 40.25' C/C Bearings
WIDTH: 46.17' % Fascia Girders
LOADING: Cooper E-72
ALIGNMENT: Tangent
SKEW: 4° 25' L.F.
(TO BE REMOVED)

PROPOSED STRUCTURE

TYPE: Two Cont. Spans, Welded Steel Girders with Steel Floor Plate (ASTM A572 PAINTED), Ballasted Deck and Reinforced Concrete Substructures.
SPANS: Over Twin River Drive (Existing) 78.58', 67.83' (Proposed). ℄c Bearing
WIDTH: 30.00' f/f Concrete Parapets with Bridge Sidewalk Railing (BR-2-82)
LOADING: Cooper E-80 with Diesel Impact
SKEW: Varies Between 0° 54' 46" L.F. and 3° 09' 01" L.F., See Plan
ALIGNMENT: Tangent
NO. OF TRACKS: One
CONSTRUCTION: Two Phase

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Ave., Columbus, Ohio 43215

1/15

SITE PLAN

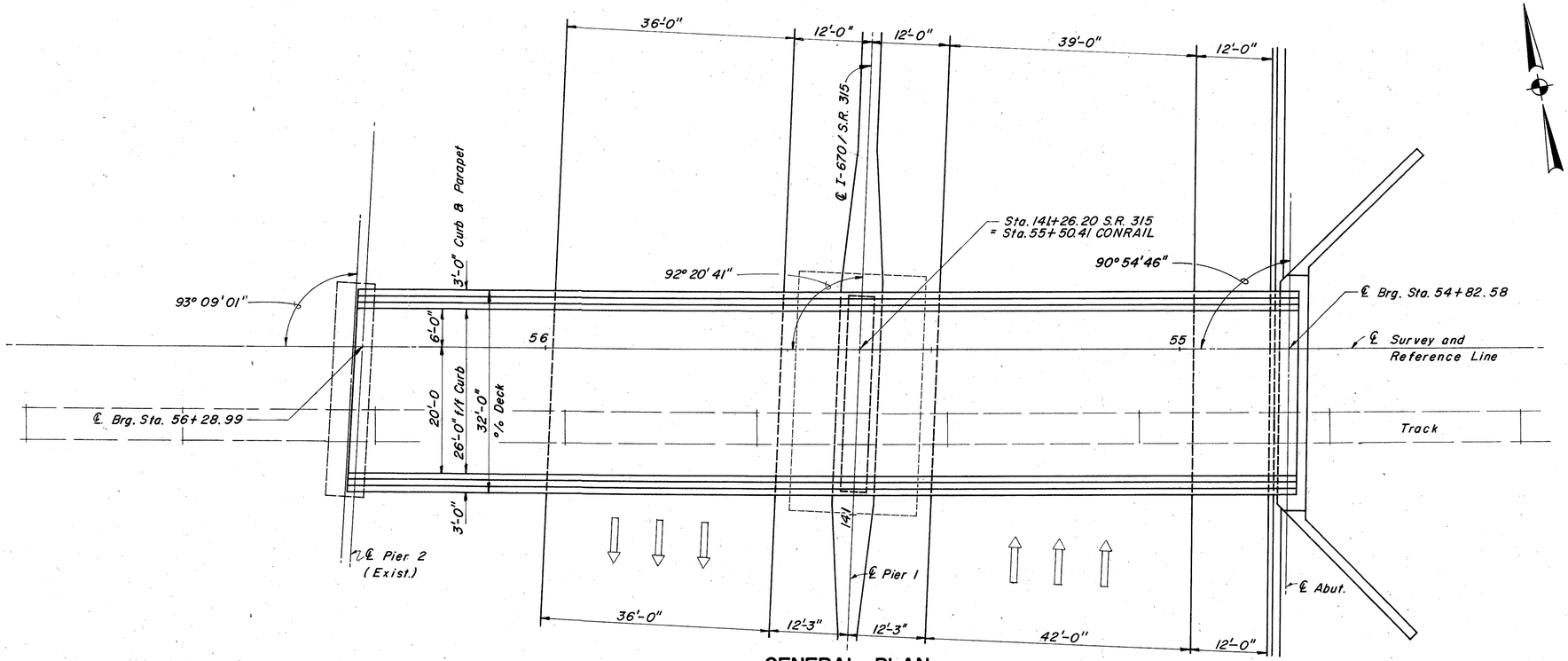
BRIDGE NO. FRA-315-0178
S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

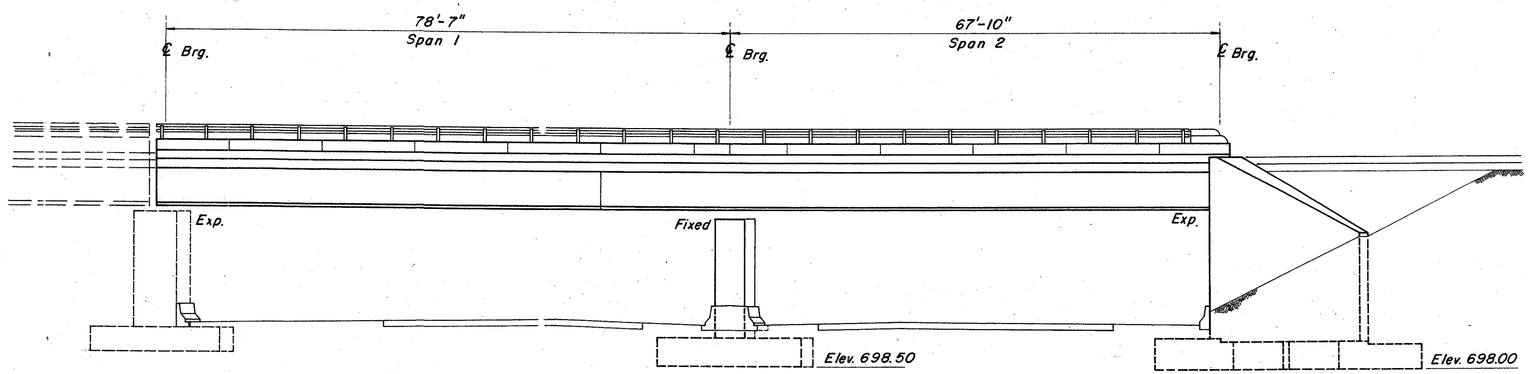
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DHS	DHS		HWR / HSS	J.S.S.	10/91	5/97

OHIO	180
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



GENERAL PLAN



ELEVATION

JOHN E. FOSTER AND ASSOCIATES, INC. 2/15
555 Buttles Ave., Columbus, Ohio 43215

GENERAL PLAN AND ELEVATION

BRIDGE No. FRA-315-0178
S.R.315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.E.M.	D.M.T.	—	H.S.S.	JSS	10/91	

FRANKLIN COUNTY
FRA-670-1.25-C-3

ESTIMATED QUANTITIES

ITEM	ITEM EXTENT	TOTAL	UNIT	DESCRIPTION	SUPER STRUCTURE	ABUTMENT	PIER	GENERAL
202	11001	LS	LUMP	STRUCTURE REMOVED, AS PER PLAN				LUMP
503	11100	LS	LUMP	COFFERDAMS, CRIBS AND SHEETING(SEE PROPOSAL NOTE)		3020	341	LUMP
503	21100	3361	CU. YD.	UNCLASSIFIED EXCAVATION				
509	15830	90309	POUND	EPOXY COATED REINFORCING STEEL, GRADE 60	5032	64020	21257	
511	34000	87	CU. YD.	CLASS S CONCRETE, SUPERSTRUCTURE	87			
511	40500	78	CU. YD.	CLASS C CONCRETE, PIER ABOVE FOOTINGS			78	
511	44100	267	CU. YD.	CLASS C CONCRETE, ABUTMENT NOT INCLUDING FOOTING		267		
511	46500	437	CU. YD.	CLASS C CONCRETE, FOOTING		312	125	
512	33300	219	SQ. YD.	TYPE A WATERPROOFING		219		
512	44400	46	SQ. YD.	TYPE B WATERPROOFING		46		
SPECIAL	51267200	512	SQ. YD.	WATERPROOFING, MISC: DECK WATERPROOFING, AS PER PLAN	512			
SPECIAL	51267502	446	SQ. YD.	SEALING OF CONCRETE SURFACES, EPOXY (SEE PROPOSAL NOTE)	156	187	103	
514	00620	31000	SQ. FT.	FIELD PAINTING OF NEW STRUCTURAL STEEL, IZEU, AS PER PLAN	31000			
516	10501	30	LIN. FT.	STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC COMPRESSION SEAL, AS PER PLAN	30			
516	13200	16	SQ. FT.	1/2" PREFORMED EXPANSION JOINT FILLER	16			
516	13600	125	SQ. FT.	1" PREFORMED EXPANSION JOINT FILLER	7	118		
516	30500	46	LIN. FT.	6" PVC WATERSTOP		46		
516	46900	20	EACH	BEARING DEVICE, MISC: SELF LUBRICATING BRONZE PLATE EXPANSION BEARING, AS PER PLAN	20			
517	71501	304	LIN. FT.	RAILING (CONCRETE PARAPET WITH DOUBLE PIPE RAIL), AS PER PLAN	304			
516	46900	10	EACH	BEARING DEVICE, MISC.: FIXED BEARING (SEE NOTE 7/15)				
518	21200	146	CU. YD.	POROUS BACKFILL WITH FILTER FABRIC		146		
SPECIAL	51862100	89	LIN. FT.	STRUCTURE DRAINAGE, MISC: 6" PERFORATED CORRUGATED STEEL PIPE INCLUDING SPECIALS, 707.01 BITUMINOUS COATED AS PER 707.05		89		
518	41201	87	LIN. FT.	6" NON-PERFORATED CORRUGATED STEEL PIPE INCLUDING SPECIALS, 707.01, AS PER PLAN		87		
SPECIAL	51862100	456	LIN. FT.	STRUCTURE DRAIANGE, MISC: 8" HALF ROUND PERFORATED GALVANIZED STEEL PIPE WITH PAN AND SPECIALS	456			
518	43300	57	LIN. FT.	6" PIPE DOWNSPOUT, INCLUDING SPECIALS	57			
810	11300	588000	POUND	STRUCTURAL STEEL, AISC CATEGORY III (ASTM A572)	588000			

GENERAL NOTES

DESIGN SPECIFICATIONS
Except for reinforced concrete, this structure conforms to the requirements of "Manual for Railway Engineering" of the American Railway Engineering Association, 1992 Edition. Design of reinforced concrete conforms to "Standard Specifications for Highway Bridges," AASHTO, 1992, including the 1993 and 1994 interim specifications, and the ODOT Bridge Design Manual.

DESIGN DATA
Design Loading – Cooper E 80 with Diesel Impact.
Concrete Class S – Unit stress 1500 p.s.i. for superstructure.
Concrete Class C – Unit stress 1333 p.s.i. for substructure.
Reinforcing Steel – ASTM A615, A616, A617 – Grade 60 – Unit stress 20,000 p.s.i.
Structural Steel – ASTM A588 – Unit stress 27000 p.s.i.

DIMENSIONS
Dimensions given are measured horizontally and at 60 degrees F unless otherwise noted.

REFERENCE DRAWINGS
Reference shall be made to standard drawings BR-2-82, dated 11-1-82, supplemental specification 810, dated 3-23-95, and supplemental specification 849, dated 6-14-95.

FOUNDATION BEARING PRESSURE
Abutment and Pier fottings, as designed, produce a maximum bearing pressure of 3.0 tons per sq. ft.

EXISTING STRUCTURE VERIFICATION
Details and dimensions shown on these plans pertaining to the existing structure have been obtained from plans of the existing structure and/or from field observations and measurements. Consequently, they are indicative of the existing structure and the proposed work but they shall be considered tentative and approximate. The Contractor is referred to CMS Sections 102.05, 105.02 and 513.02. Contract bid prices shall be based upon a recognition of the uncertainties described above and upon a pre-bid examination of the existing structure by the Contractor. However, all project work shall be based upon actual details and dimensions which have been verified by the Contractor in the field.

ITEM SPECIAL – Sealing of Concrete Surfaces
Epoxy sealer shall be applied to the concrete surfaces as listed below. (See the proposal for sealer material surface preparation requirements and application rate and procedures.)

1. Bridge seat and abutment wall from bridge seat to top of safety barrier shape.
2. Wingwall top and front face from top to 1'-0" below ground line.
3. Pier 1 – All surfaces above median safety barrier.
4. Pier 2 – (Exist.) All surfaces above ground line.

UTILITY LINES
All expenses involved in relocating the affected utilities shall be borne by the owners. The Contractor and the owners are requested to cooperate by arranging their work in such a manner that inconvenience to either will be held to a minimum.

FIELD PAINTING OF NEW STEEL:
All exposed steel surfaces shall be painted using IZEU paint system. Exposed surfaces protected by waterproofing (top of deck plate and faces of curb plates) shall not be painted. Payment for all materials, labor and incidentals shall made at contract unit price per square feet.

ITEM 517 – RAILING(CONCRETE PARAPET WITH DOUBLE PIPE RAIL), AS PER PLAN
This item shall be constructed in accordance with ODOT Std. Drwg. BR-2-82 except that the height of the railing shall be 3'-8" above the surface of the sidewalk in lieu of 3'-6" as shown in ODOT Std. Drwg. BR-2-82.

TIE BACK TESTING REQUIREMENTS
Tie back testing requirements for temporary shoring shall be in accordance with Conrail Pulbication "CE-6 Rev. 2-95" entitled "Specific Requirements of Consolidated Rail Corporation for work on its Right-of-Way". (See Proposal Note).

STRUCTURE REMOVED, AS PER PLAN
Existing superstructure and substructure shall be removed in two phases as per the details of sheets 12/15 and 15/15. Basis of payment for all removals shall be the contract lump sum price under Item 202.

DECK WATERPROOFING
The deck shall be waterproofed as per A.R.E.A. specifications (Chapter 29, Part 2) using 3/32" BUTYL Rubber membrane conforming to the requirement of art 2.3.5. Membrane shall be applied to the entire top of the deck plate between the curbs, as well as to the face of each curb plate. Deck shall then be overlayed with 1 1/2" minimum underlayment, bituminous mastic conforming to art. 2.9.4.2. Membrane must be fully bonded to entire surface being waterproofed.

Adhesive must be applied to the entire surface to be waterproofed.

No. 3 Tongue and Groove Splice shown on Figure 2, Page 29.2.15, shall be used for splicing BUTYL Rubber membrane.

Two layers of 1/2" thick asphaltic panels conforming to art. 2.4.7 placed with staggered joints and set in compatible adhesives shall be used to protect BUTYL Rubber membrane and underlayment on deck. Asphaltic panels shall also protect rubber membrane on curb plates. Ballast shall be placed as soon as feasible following placement of the panels to prevent distortion from sunlight. Edges and protrusions of panels are to be coated in accordance with art. 2.9.4.6(A).

Basis of payment: The unit bid price shall include all materials including underlayment and incidentals necessary to furnish and install waterproofing over deck and curb plates. Payment shall be made on per square yard basis at the contract price for Item Special "Waterproofing Misc.: Deck Waterproofing, As Per Plan."

3/15

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus, Ohio 43215

ESTIMATED QUANTITIES
AND GENERAL NOTES

BRIDGE NO. FRA-315-0178
SR 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
E.S.	T.H.		C.E.M.	H.W.R.	9/90	

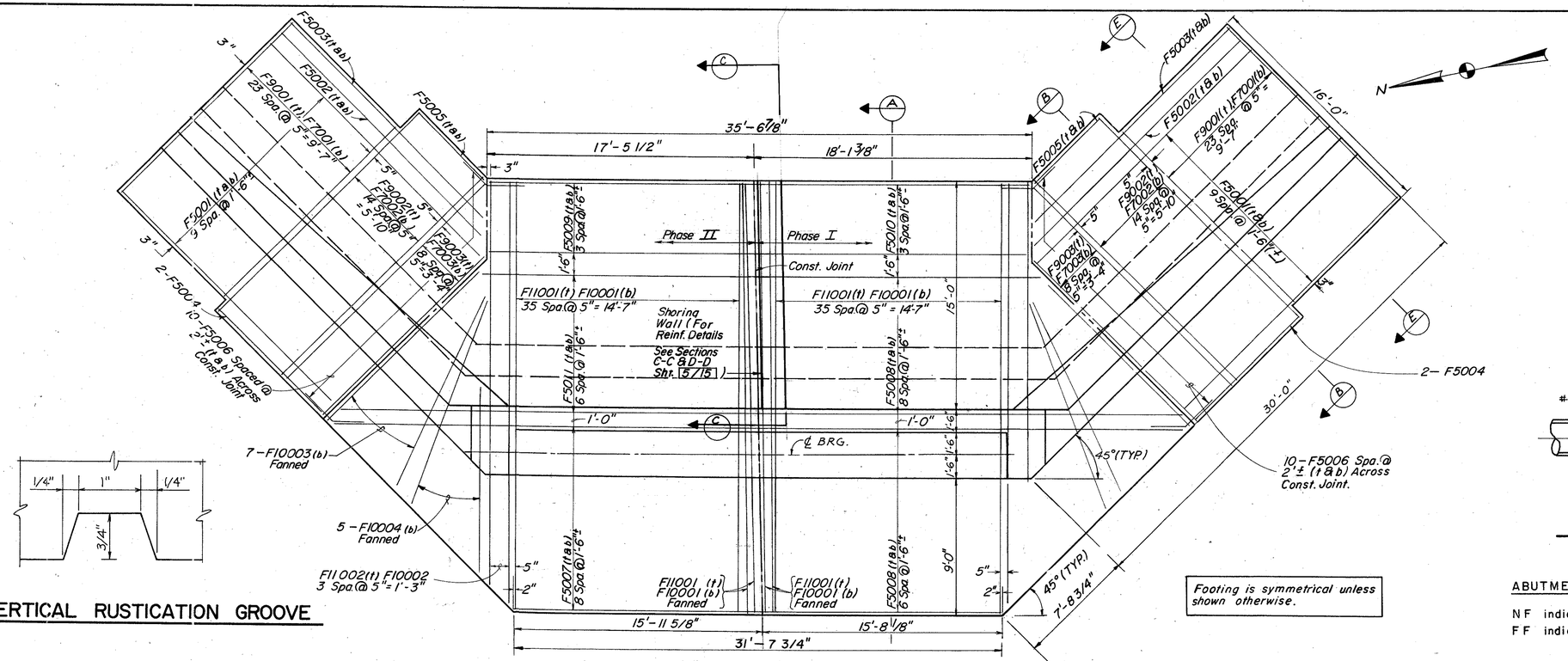
File: C:\249ET\steellst.DWG 1 = 1.000
Date: 02-19-1997
Time: 10:32 Drawn by : BF

OHIO	182
FHWA REGION 5	224
FEDERAL PROJECT	

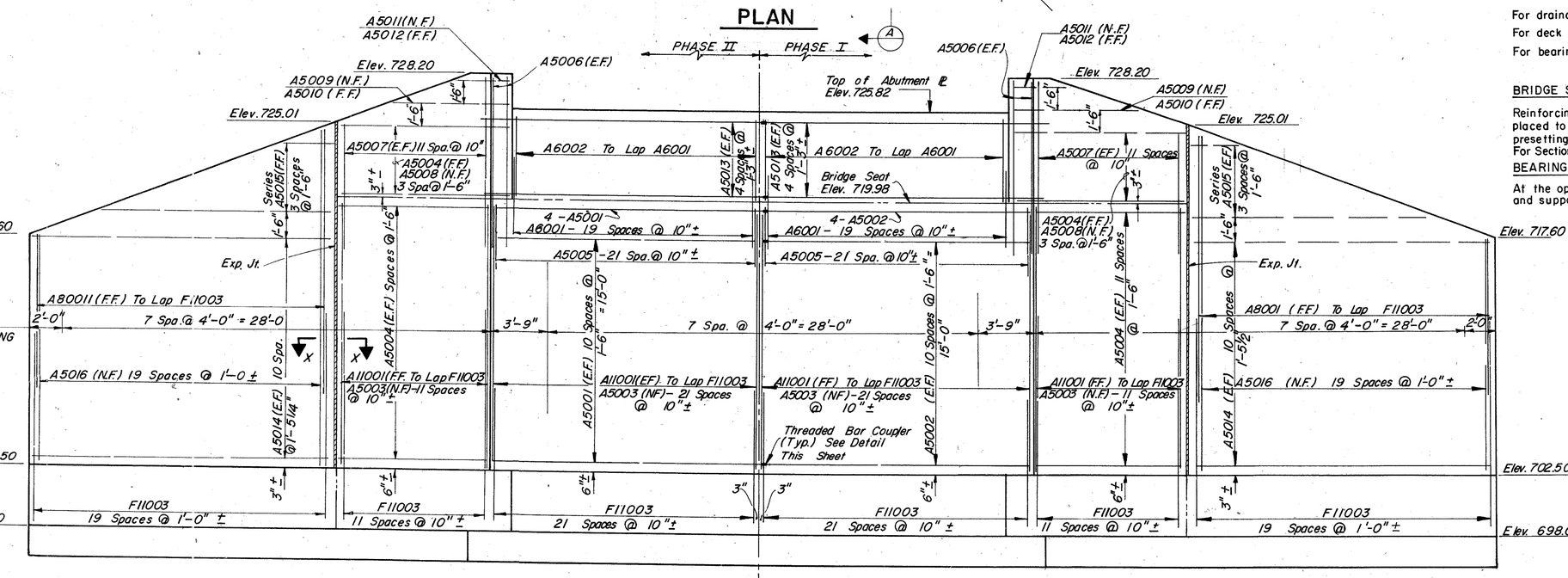
FRANKLIN COUNTY
FRA-670-1.25-C 3

NOTES:
POROUS BACKFILL – 2'-0" thick shall be placed as follows:
(1) From top of footing to 3" below the top of backwall.
(2) From top of footing to 2'± below the top of wingwall.

For Sections A-A, B-B, C-C, E-E, & X-X, See Sheet 5/15
For Additional Abutment Plan Detail See Sheet 4/15



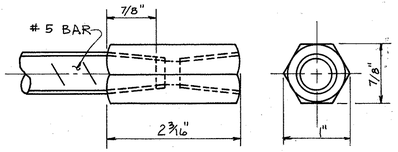
PLAN



DEVELOPED ELEVATION

VERTICAL RUSTICATION GROOVE

Footing is symmetrical unless shown otherwise.



THREADED BAR COUPLER DETAIL
LENTON STD. COUPLER – A2 OR EQUAL
(INCLUDE WITH ITEM 519 FOR PAYMENT)

ABUTMENT NOTES:

NF indicates near face
FF indicates far face

For drainage details, see sht. 11/15
For deck plate details, see sht. 10/15
For bearing details, see sht. 7/15

BRIDGE SEAT REINFORCING:

Reinforcing steel in the vicinity of the bridge seat shall be accurately placed to avoid interference with the drilling of the anchor holes, or with the presetting of the bearing anchors.
For Sections A-A, B-B, C-C, E-E & X-X SEE SHT. 5/15

BEARING ANCHORS:

At the option of the contractors, bearing anchors (or formed holes) located and supported by templates, may be cast in place.

WATERPROOFING:
Apply Type A Waterproofing to the back face of abutment wall and wingwalls.

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ABUTMENT DETAILS

BRIDGE No. FRA-315-0178
S.R. 315 UNDER CONRAIL

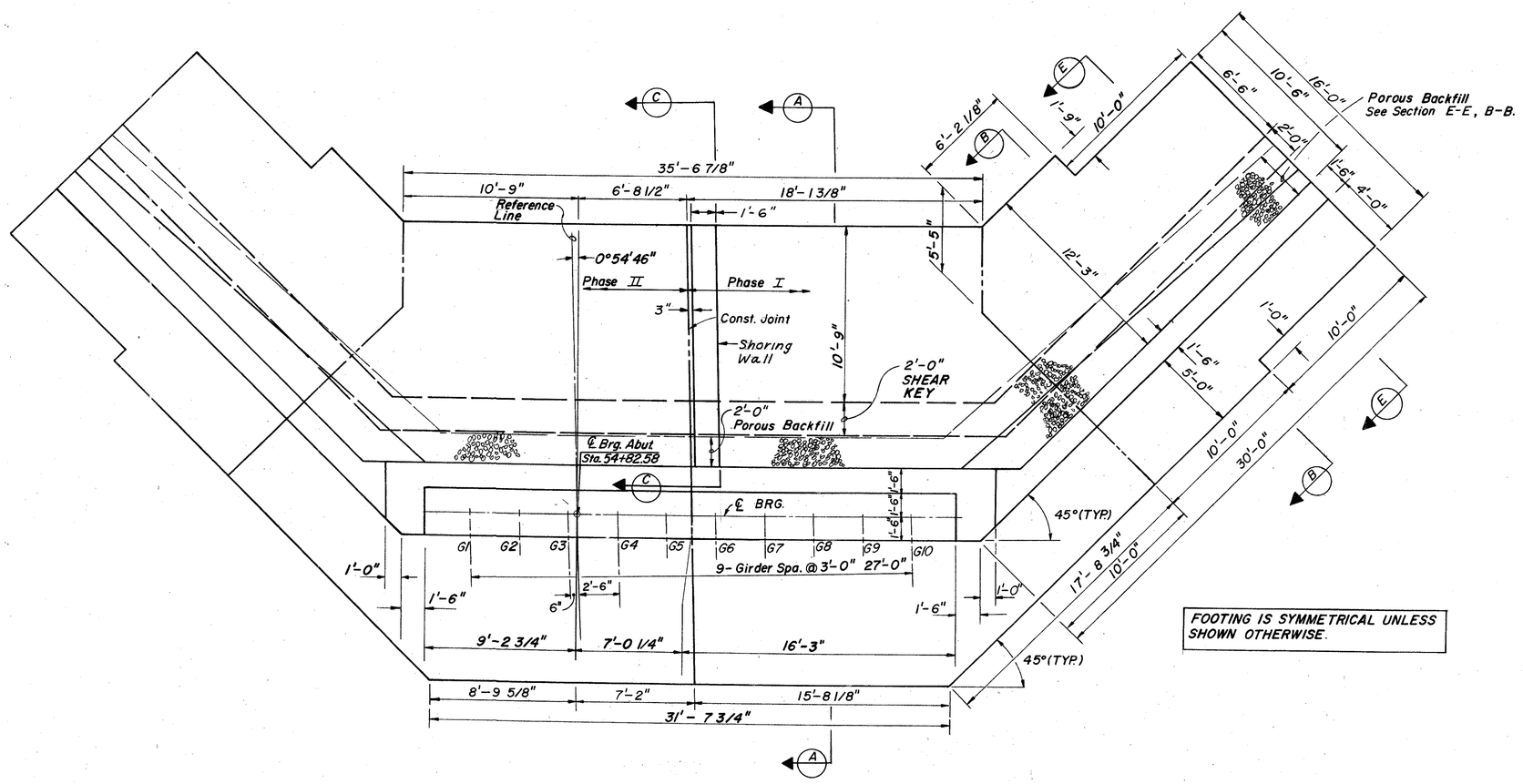
FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CEM	DMT		HSS	JSS	10/91	5/97

OHIO	
FHWA REGION 5	
FEDERAL PROJECT	

183
224

FRANKLIN COUNTY
FRA-670-1.25-C3



FOOTING IS SYMMETRICAL UNLESS SHOWN OTHERWISE.

NOTES:

For Sections A-A, B-B, C-C, E-E & X-X See Sht. 5/15

For Abutment Notes & Additional Details, See Sheet 4/15

PLAN

JOHN E. FOSTER AND ASSOCIATES, INC. 4A/15
555 Buttles Avenue, Columbus, Ohio 43215

ABUTMENT LAYOUT PLAN

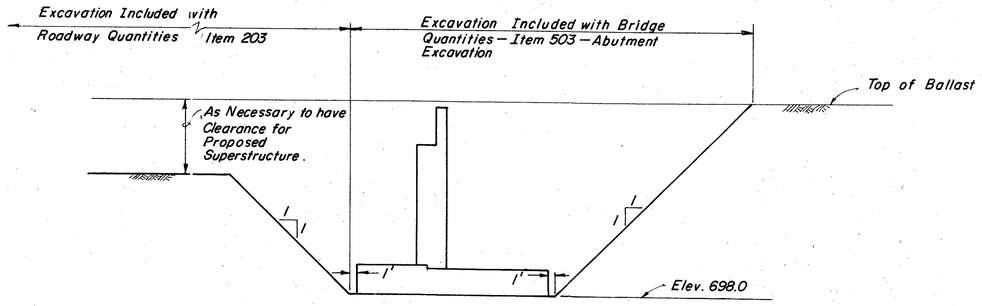
BRIDGE No. FRA-315-0178
S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY

STA. 141+26.20

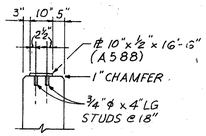
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.E.M	R.S.		A.S.B.	D.H.G	11/95	5/97

FRANKLIN COUNTY
FRA-670-1.25-C-3

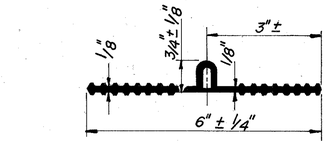


ABUTMENT EXCAVATION

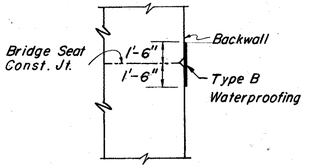
Excavation for Abutment Construction shall be made using 1:1 Slopes in front and back as shown in the Sketch Above. The Abutment shall be Backfilled and Compacted before Remaining Excavation (As Necessary) in front of the Abutment is made.



DETAIL 1



WATERSTOP DETAIL

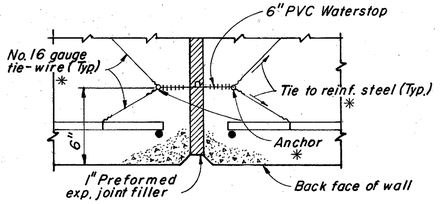


DETAIL 2

PVC NOTES

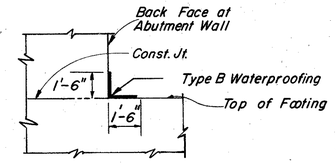
(1) The 6" Waterstop shall be used at all Horizontal and Vertical Construction Joints as well as Expansion Joints in the Abutment Wall above footing. The joint between wall and footing will also have 6" PVC over its entire length including wingwall.

(2) Mitered splices at tees and ells shall be made by heat fusing ends of waterstops to form a watertight joint.



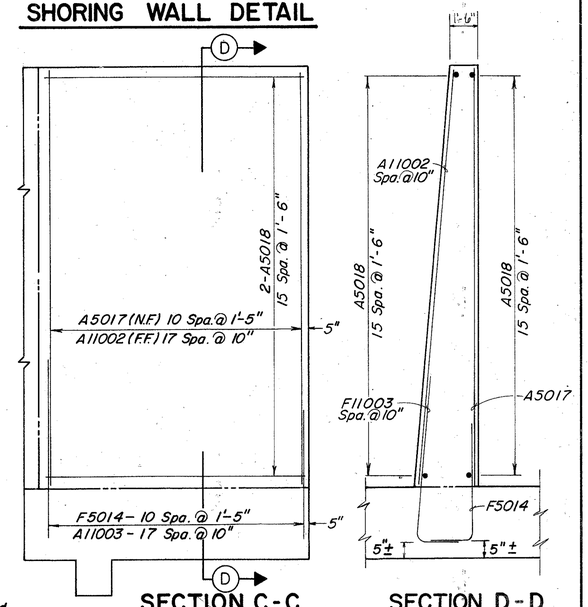
SECTION X-X

* 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.



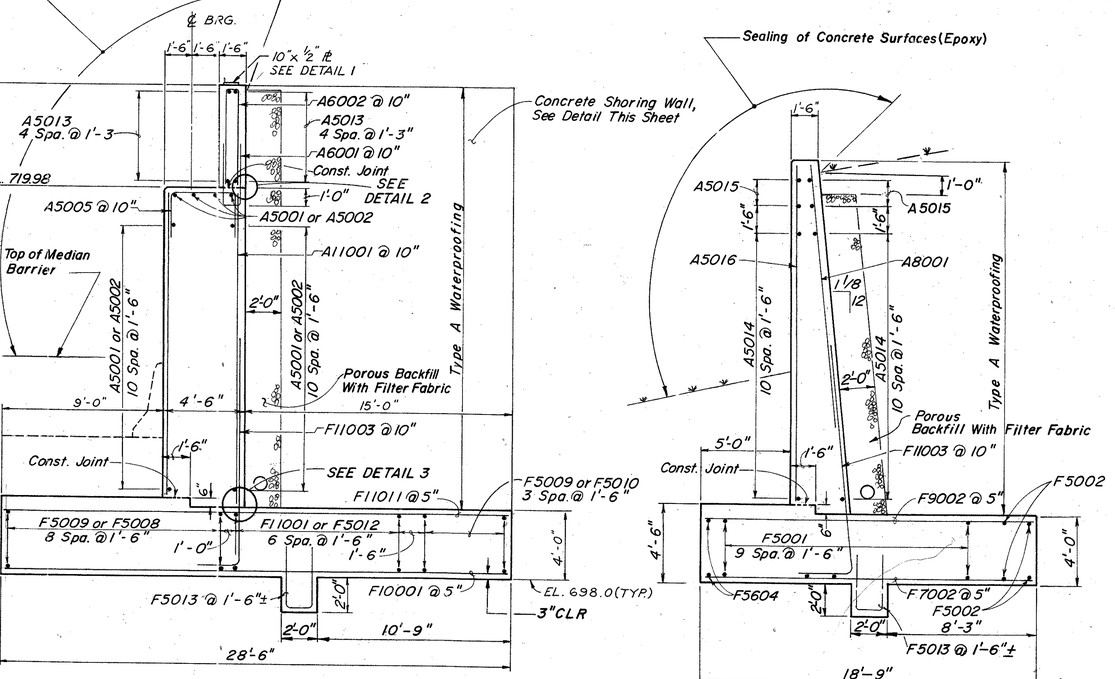
DETAIL 3

SHORING WALL DETAIL



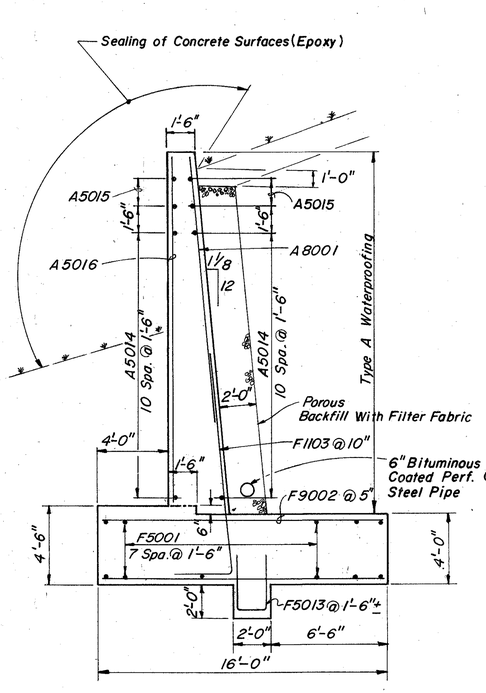
SECTION C-C

SECTION D-D



SECTION A-A

SECTION B-B



SECTION E-E

JOHN E. FOSTER AND ASSOCIATES, INC. 5/15
555 Buttles Ave., Columbus, Ohio 43215

ABUTMENT DETAILS

BRIDGE No. FRA-315-0178
S.R. 315 UNDER CONRAIL

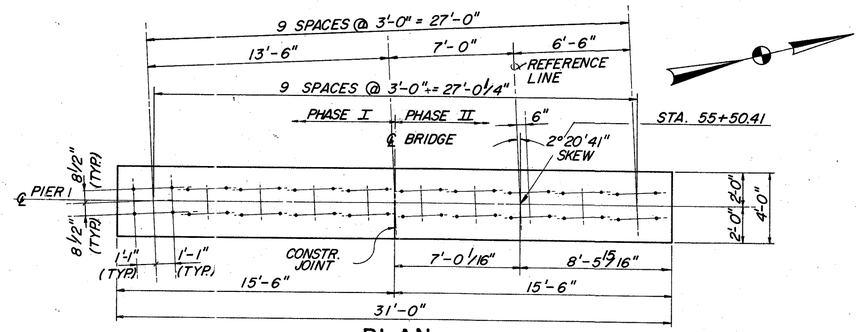
FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CEM	DMT	ES	DFS	JSS	10/91	

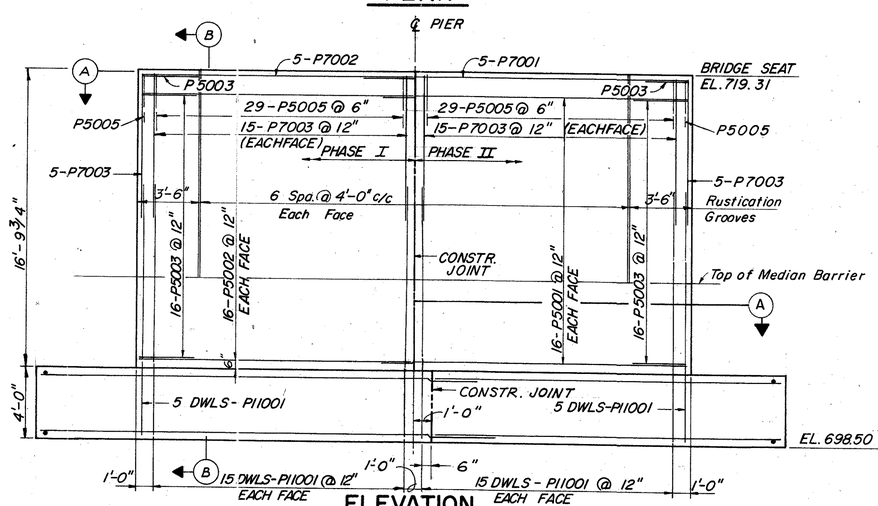
	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

185
224

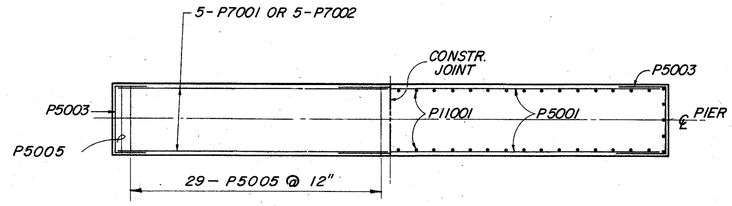
FRANKLIN COUNTY
FRA-670-1.25-C-3



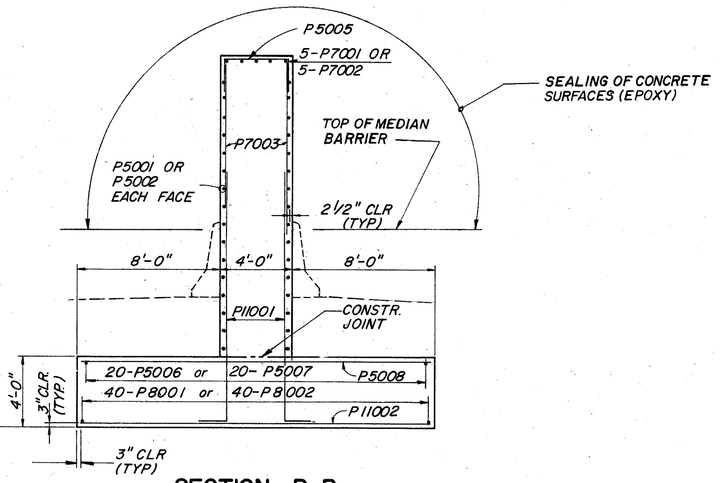
PLAN



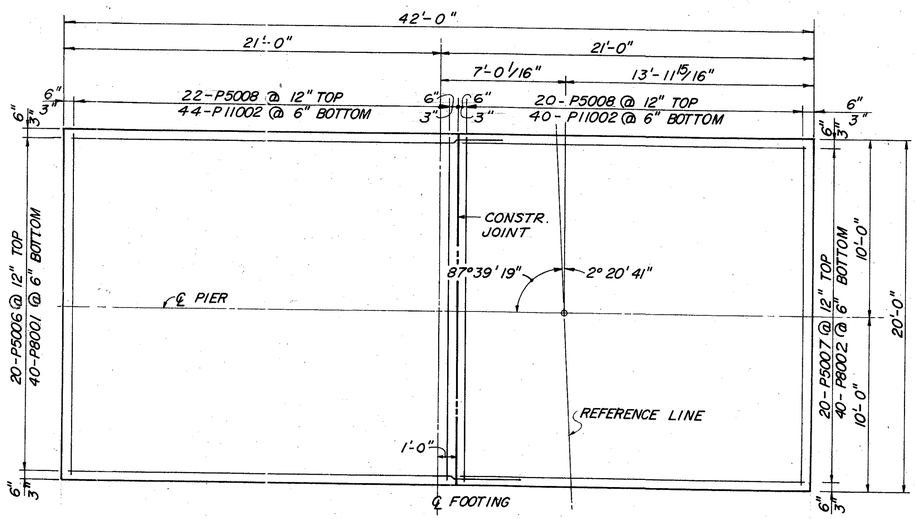
ELEVATION



SECTION A-A



SECTION B-B



FOOTING PLAN
(DOWELS NOT SHOWN)

BRIDGE SEAT REINFORCEMENT- PLACE REINFORCING BARS IN THE VICINITY OF BEARING SEAT TO AVOID INTERFERENCE WITH THE DRILLING OF THE BEARING ANCHOR HOLES OR THE PRE-SETTING OF BEARING ANCHORS.

BEARING ANCHORS- AT THE OPTION OF THE CONTRACTOR, BEARING ANCHORS (OR FORMED HOLES) LOCATED AND SUPPORTED BY TEMPLATES, MAY BE CAST IN PLACE.

FOR RUSTICATION GROOVE DETAIL, REFER TO SHT. 4/15

JOHN E. FOSTER AND ASSOCIATES, INC. 6/15
555 Buttles Ave., Columbus, Ohio 43215

PIER 1

BRIDGE No. FRA-315-0178
S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.E.M.	D.M.T.	–	H.S.S.	J.S.S.	10/91	5/97

	OHIO
	FHWA REGION 5
	FEDERAL PROJECT

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224

FRANKLIN COUNTY
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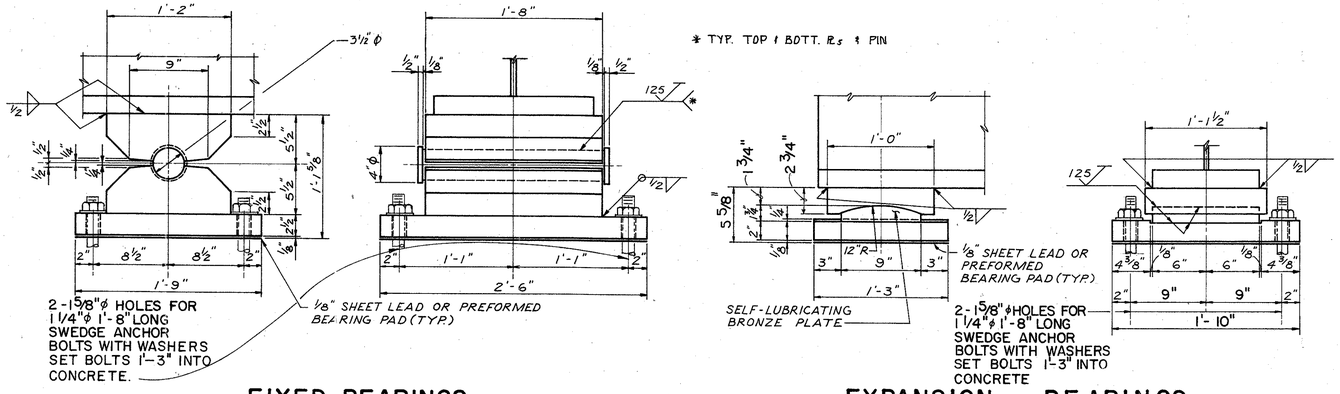
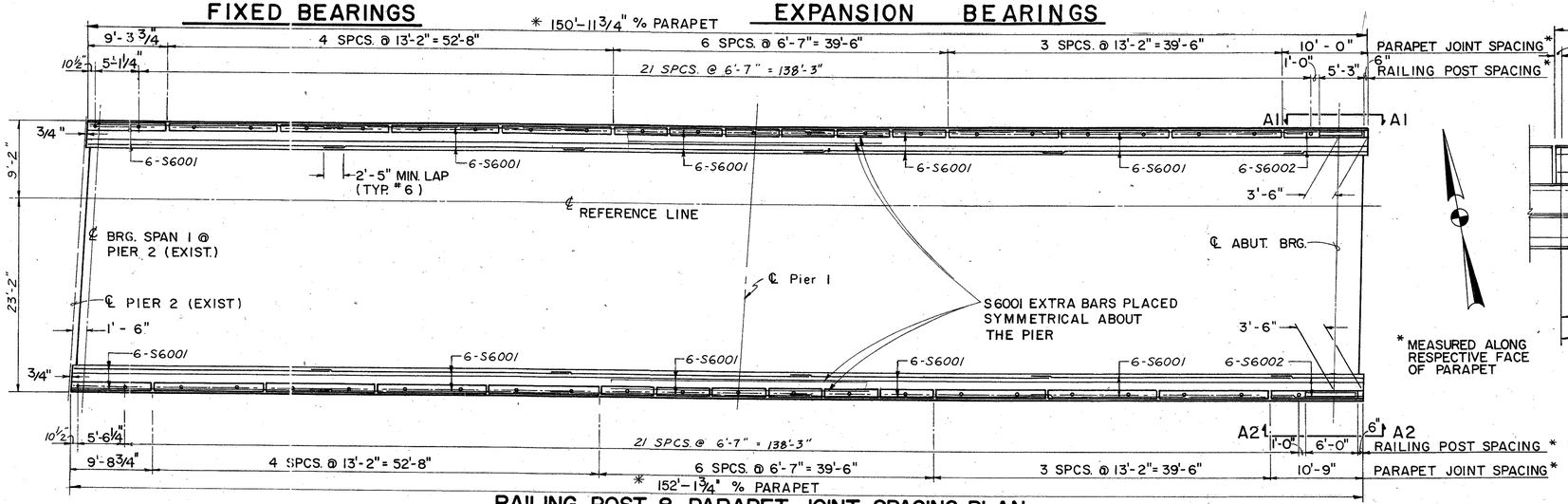


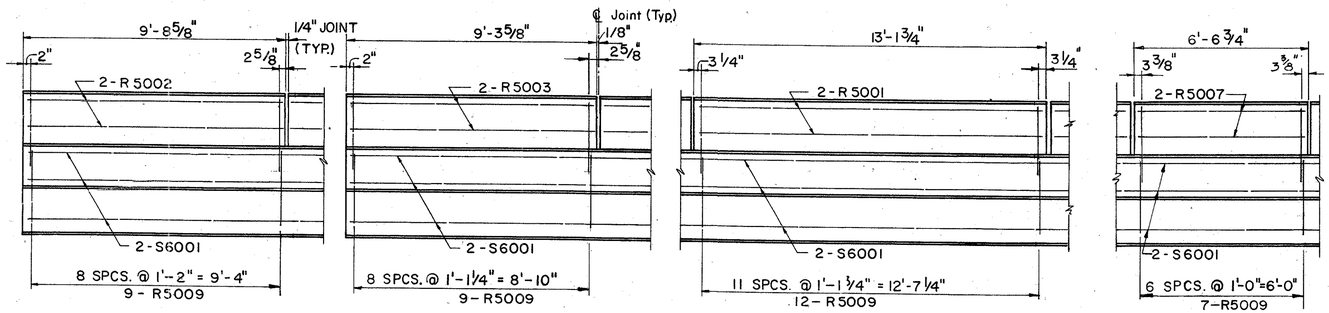
FIXED BEARINGS

EXPANSION BEARINGS

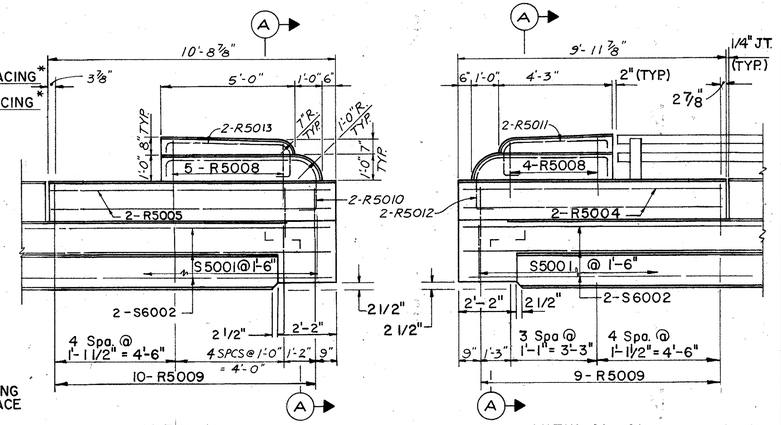


* MEASURED ALONG RESPECTIVE FACE OF PARAPET

RAILING POST & PARAPET JOINT SPACING PLAN



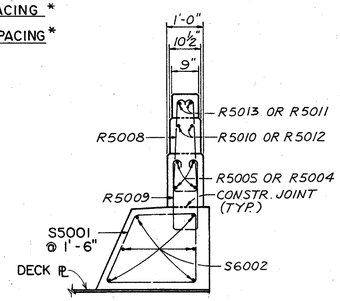
ELEVATIONS - CURB & PARAPET REINFORCEMENT



VIEW A2 - A2

VIEW A1 - A1

ELEVATIONS - CURB & PARAPET REINFORCEMENT



SECTION A-A

(SEE SECTION G - G, SHT. 10/15 FOR ADDITIONAL DETAILS)

ITEM 517 - RAILING: THIS ITEM INCLUDES ALL CONCRETE AND REINFORCING STEEL ABOVE CURB

JOHN E. FOSTER AND ASSOCIATES, INC. 7/15
555 Buttles Ave., Columbus, Ohio 43215

SUPERSTRUCTURE DETAILS

BRIDGE No. FRA-315-0178
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FRANKLIN COUNTY STA. 141+26.20

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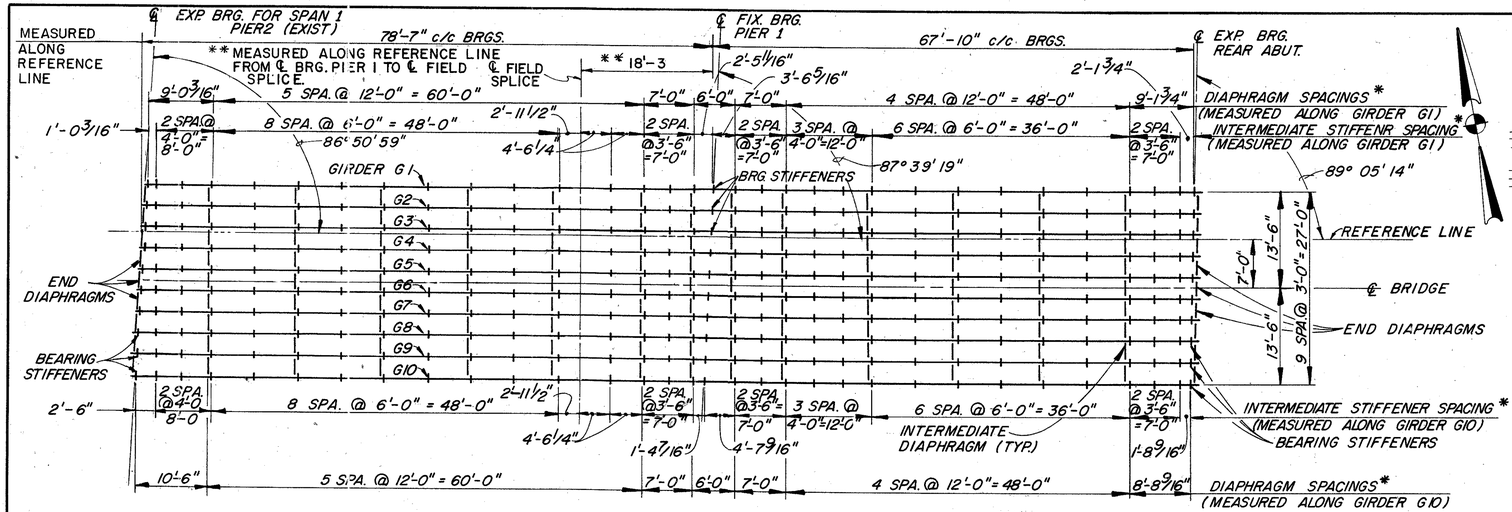
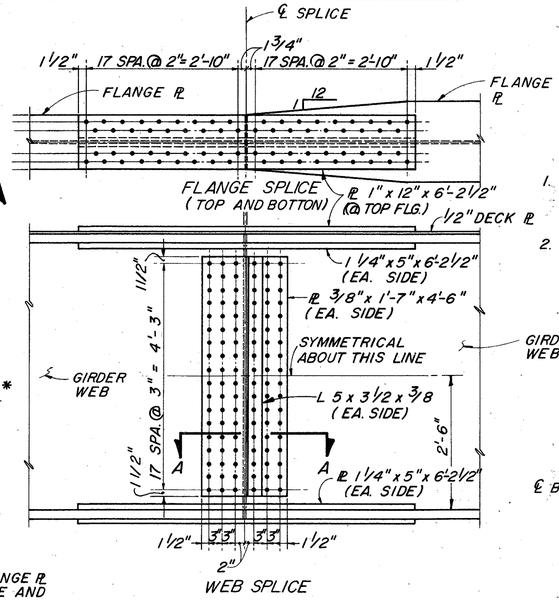
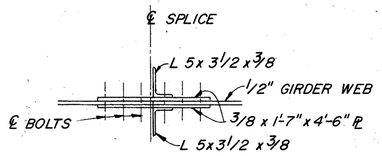
C.E.M. D.M.T.	D.M.T.	-	D.F.S.	J.S.S	11/91	





NOTES:
1. ALL SPLICE PLATES SHALL MEET THE SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.01 OF CMS
2. FIELD SPLICE BOLTS SHALL BE 1" ø A325, TYPE 3.

FIELD SPLICE DETAIL



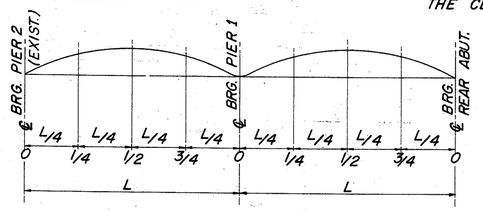
SECTION A-A

NOTE:
USE 3/8" x 4'-4" PL WITH 3/8" x 4" FLANGE PL AT TOP AND BOTT. FOR INTERMEDIATE AND END DIAPHRAGMS.
SEE TYPICAL CROSS SECTION SHT. 9/15 FOR ADDITIONAL DETAILS

DEFLECTION AND CAMBER

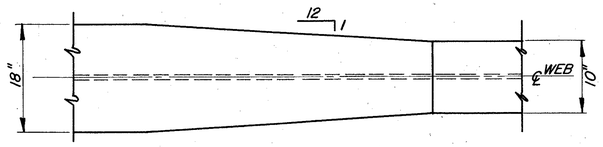
COMPONENTS / LOCATION		SPAN 1 1/4 PT.	SPAN 1 1/2 PT.	SPAN 1 3/4 PT.	SPAN 2 1/4 PT.	SPAN 2 1/2 PT.	SPAN 2 3/4 PT.
INTERIOR	DEFLECTIONS DUE TO WEIGHT OF STEEL	1/16"	1/16"	0"	0"	1/16"	1/16"
INTERIOR	DEFLECTIONS DUE TO REMAINING DEAD LOAD	3/16"	1/4"	1/8"	1/16"	1/8"	1/8"
INTERIOR	REQUIRED SHOP CAMBER	1/4"	5/16"	1/8"	1/16"	3/16"	3/16"
FASCIA	DEFLECTIONS DUE TO WEIGHT OF STEEL	1/16"	1/16"	1/32"	0"	1/16"	1/16
FASCIA	DEFLECTIONS DUE TO REMAINING DEAD LOAD	5/16"	3/8"	1/8"	1/16"	1/8"	1/8"
FASCIA	REQUIRED SHOP CAMBER	3/8"	7/16"	3/16"	1/16"	3/16"	3/16"

FRAMING PLAN



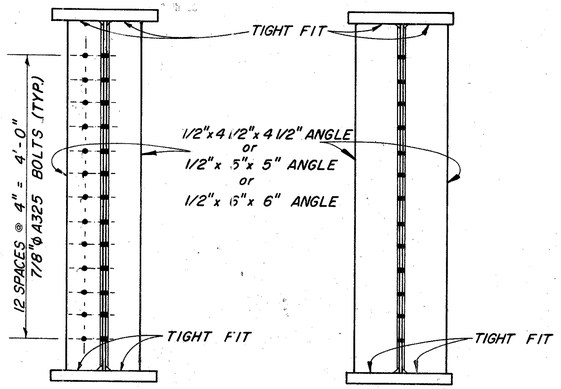
CAMBER DIAGRAM

* DIMENSION LINES POINT TO THE CENTER OF STIFFENERS



FLANGE TRANSITION DETAIL

(SPAN 2)

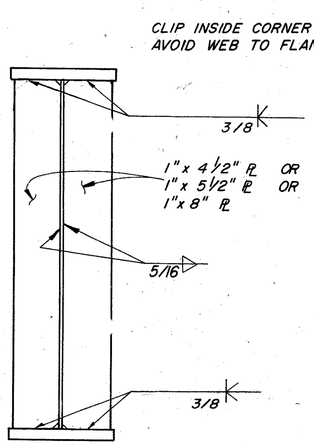


INTERMEDIATE STIFFENERS

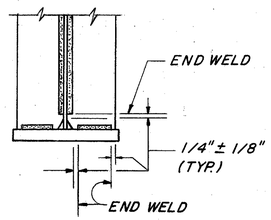
(AT DIAPHRAGM LOCATIONS)

INTERMEDIATE STIFFENERS

(AT LOCATIONS OTHER THAN DIAPHRAGMS)



BEARING STIFFENERS



WELD TERMINATION DETAIL

TYPICAL WHERE STIFFENERS OR CONNECTION PLATES ARE WELDED TO GIRDER FLANGE.

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FRANKLIN COUNTY
FRA-670-1.25-C3

JOHN E. FOSTER AND ASSOCIATES, INC. 8/15
555 Buttles Ave., Columbus, Ohio 43215

SUPERSTRUCTURE DETAILS

BRIDGE No. FRA-315-0178
S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CEM	DMT	ES	DFS	JSS	10/91	

GIRDER NO.	DIMENSIONS				
	A	B	C	D	E
GIRDER 1	61'-9 3/8"	56'-5"	78'-5 7/8"	67'-8"	148'-2 3/8"
GIRDER 2	61'-9 7/8"	56'-5 15/16"	78'-6 3/8"	67'-8 15/16"	148'-3 13/16"
GIRDER 3	61'-10 3/8"	56'-6 13/16"	78'-6 7/8"	67'-9 13/16"	148'-5 3/16"
GIRDER 4	61'-10 7/8"	56'-7 11/16"	78'-7 3/8"	67'-10 11/16"	148'-6 9/16"
GIRDER 5	61'-11 3/8"	56'-8 5/8"	78'-7 7/8"	67'-11 5/8"	148'-8"
GIRDER 6	61'-11 7/8"	56'-9 1/2"	78'-8 3/8"	68'-0 1/2"	148'-9 3/8"
GIRDER 7	62'-0 3/8"	56'-10 7/16"	78'-8 7/8"	68'-1 7/16"	148'-10 13/16"
GIRDER 8	62'-0 15/16"	56'-11 5/16"	78'-9 7/16"	68'-2 5/16"	149'-0 1/4"
GIRDER 9	62'-1 7/16"	57'-0 3/16"	78'-9 15/16"	68'-3 3/16"	149'-1 5/8"
GIRDER 10	62'-1 15/16"	57'-1 1/8"	78'-10 7/16"	68'-4 1/8"	149'-3 1/16"

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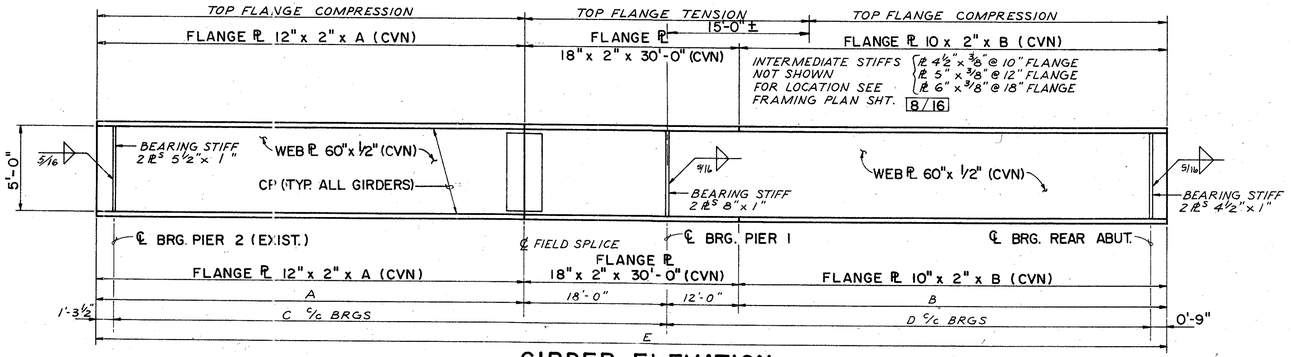
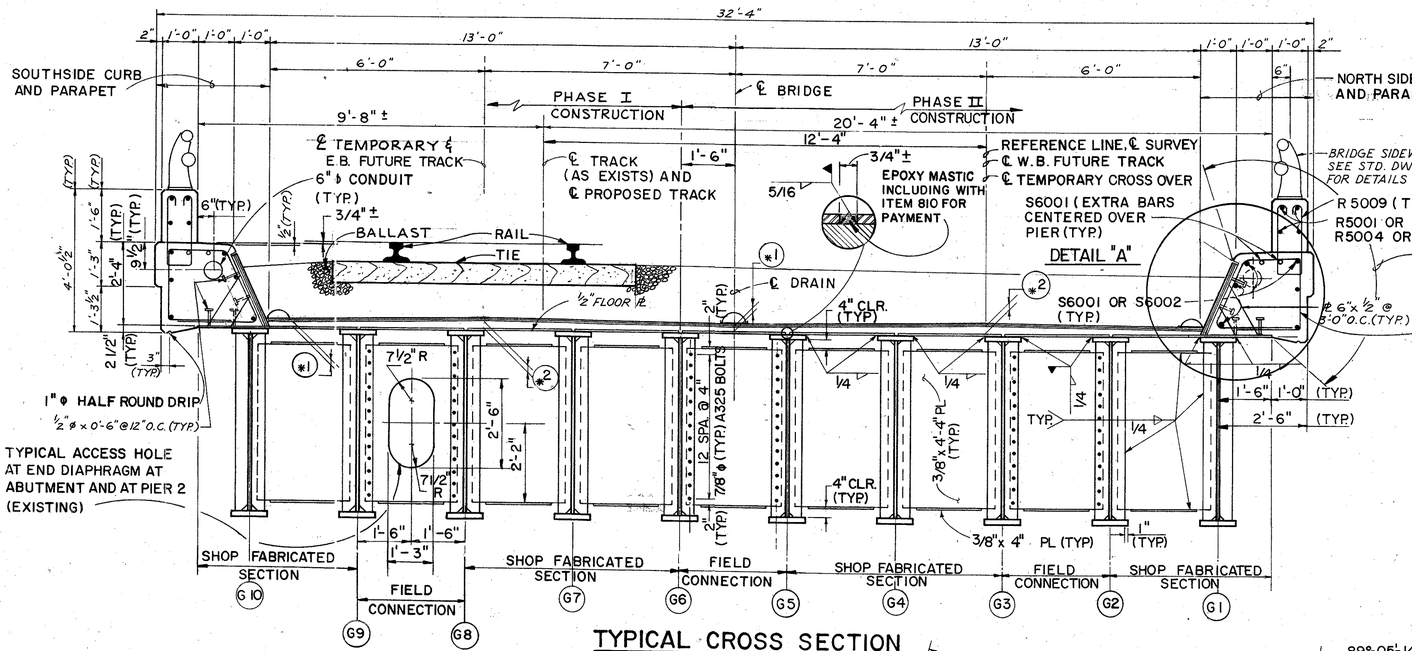
NOTE
WHEN A SHAPE OR PLATE IS DESIGNATED (CVN), THE MATERIAL SHALL MEET SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.01 OF CMS.

C.P. INDICATES A COMPLETE PENETRATION WELD. ALL WEB TO FLANGE WELDS SHALL BE COMPLETE PENETRATION.



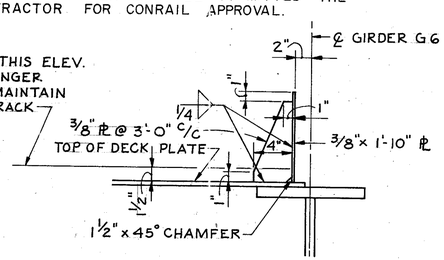
GIRDER ELEVATION



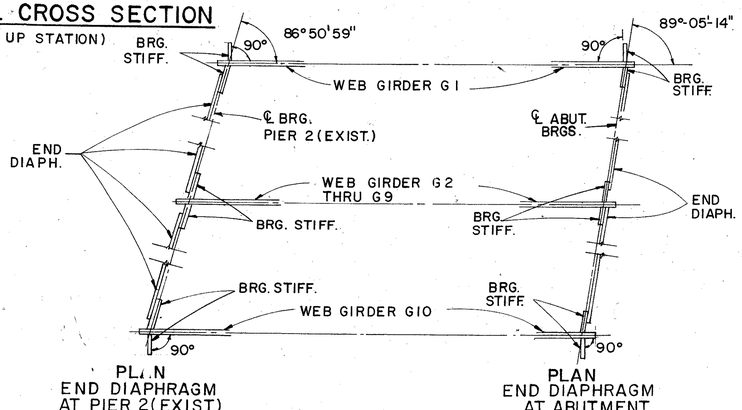
TYPICAL CROSS SECTION

(LOOKING UP STATION)

NOTE: THE REMOVAL PROCEDURE OF THE TEMPORARY BALLAST RETAINER MUST BE SUBMITTED THE CONTRACTOR FOR CONRAIL APPROVAL.

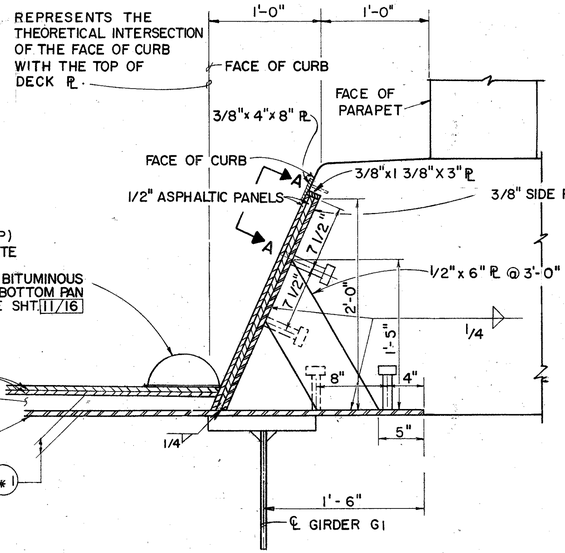


TEMPORARY BALLAST RETAINER FOR PHASE II CONSTRUCTION



PLAN
END DIAPHRAGM AT PIER 2 (EXIST.)

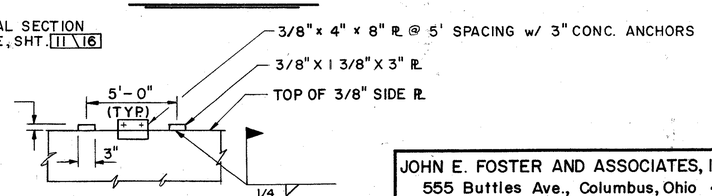
PLAN
END DIAPHRAGM AT ABUTMENT



NOTE
(*1) VARIES: SEE LONGITUDINAL SECTION AT GUTTER LINE, SHT. 11\16

(*2) = (*1) + 1"

DETAIL "A"



VIEW A-A

(SHOWING 3/8" x 1 3/8" x 3" PL CONNECTION TO 3/8" SIDE PL.)

JOHN E. FOSTER AND ASSOCIATES, INC. 9/15
555 Buttles Ave., Columbus, Ohio 43215

SUPERSTRUCTURE DETAILS

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S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

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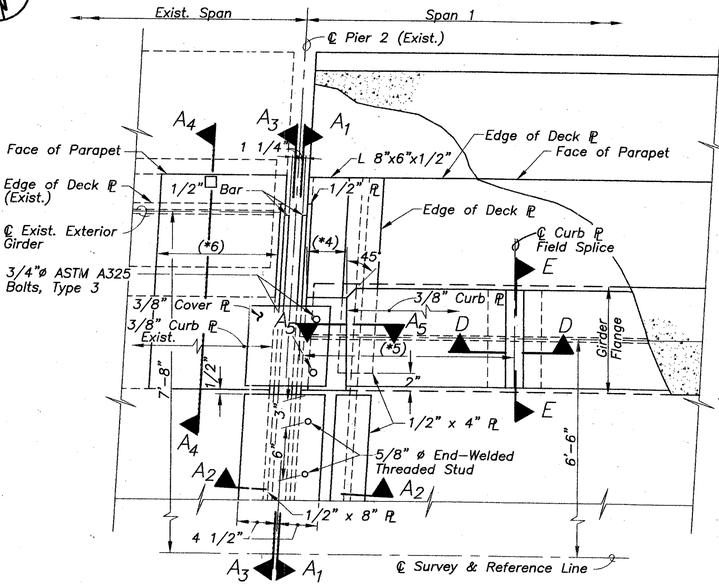
CEM	DMT	ES	DFS	JSS	11/91	5/97

OHIO	189
FHWA REGION 5	224
FEDERAL PROJECT	

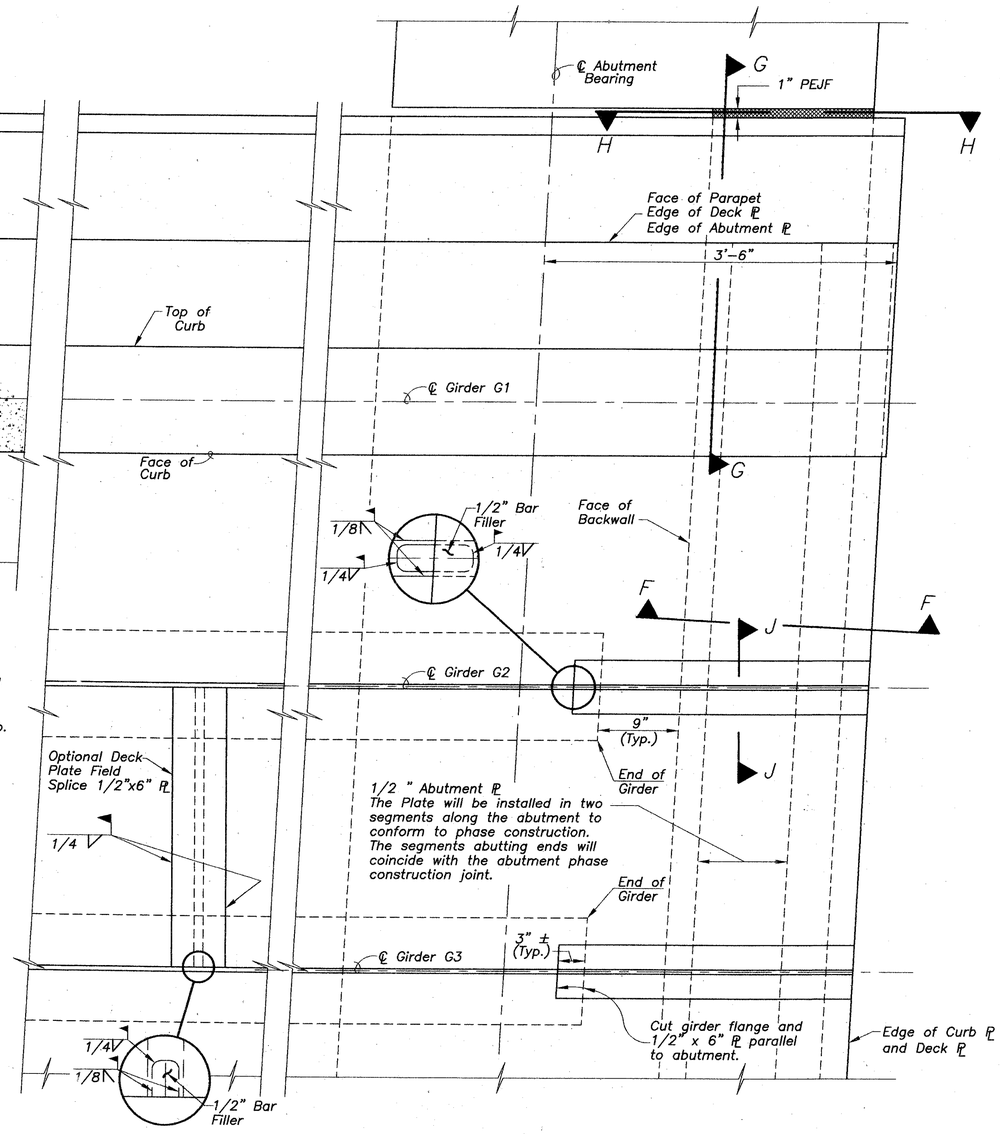
FRANKLIN COUNTY
FRA-670-1.25-C-3



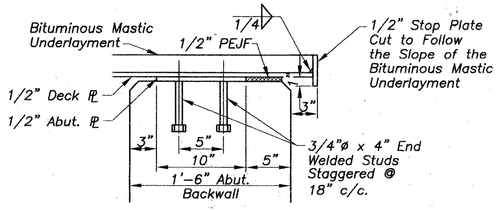
(*4) 1 3/8" Curb ℄ , 4 1/2" measured along Face of Curb.

(*5) 2'-0" Measured along Face of Curb.

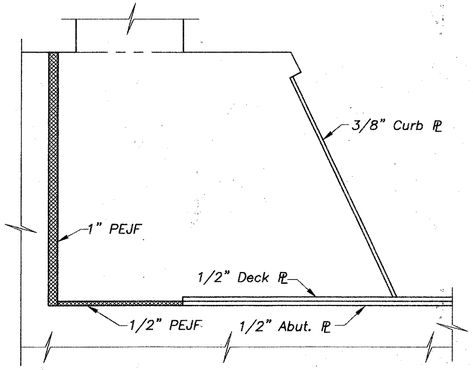
(*6) 1'-2"± Curb Concrete Replacement Limits



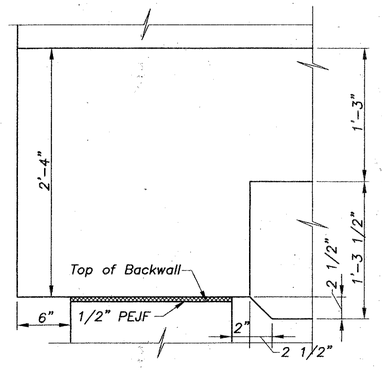
PARTIAL DECK PLATE DETAIL
(NORTH SIDE SHOWN)
(SOUTH SIDE SIMILAR)



SECTION F-F

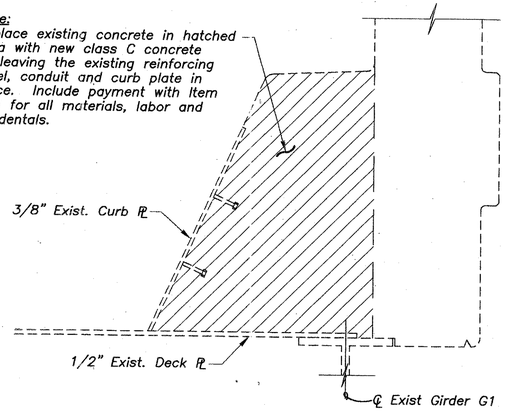


SECTION G-G

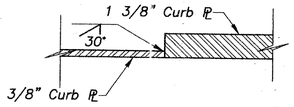


SECTION H-H

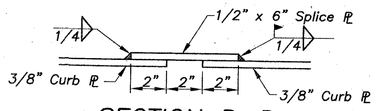
Note:
Replace existing concrete in hatched area with new class C concrete by leaving the existing reinforcing steel, conduit and curb plate in place. Include payment with Item 511 for all materials, labor and incidentals.



SECTION A4-A4



SECTION A5-A5



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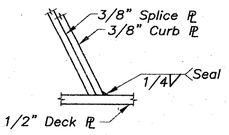

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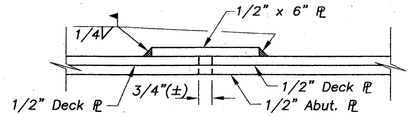


SECTION J-J

PLOTTED: VIEW = PLAN
XREF #1 = NONE
XREF #1 = NONE
PLOT SCALE = 3"=1'
P120C G:\DRAWING\FRA\315\315ET2.DWG MAY-16-1996

10/15

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus, Ohio 43215

SUPERSTRUCTURE DETAILS

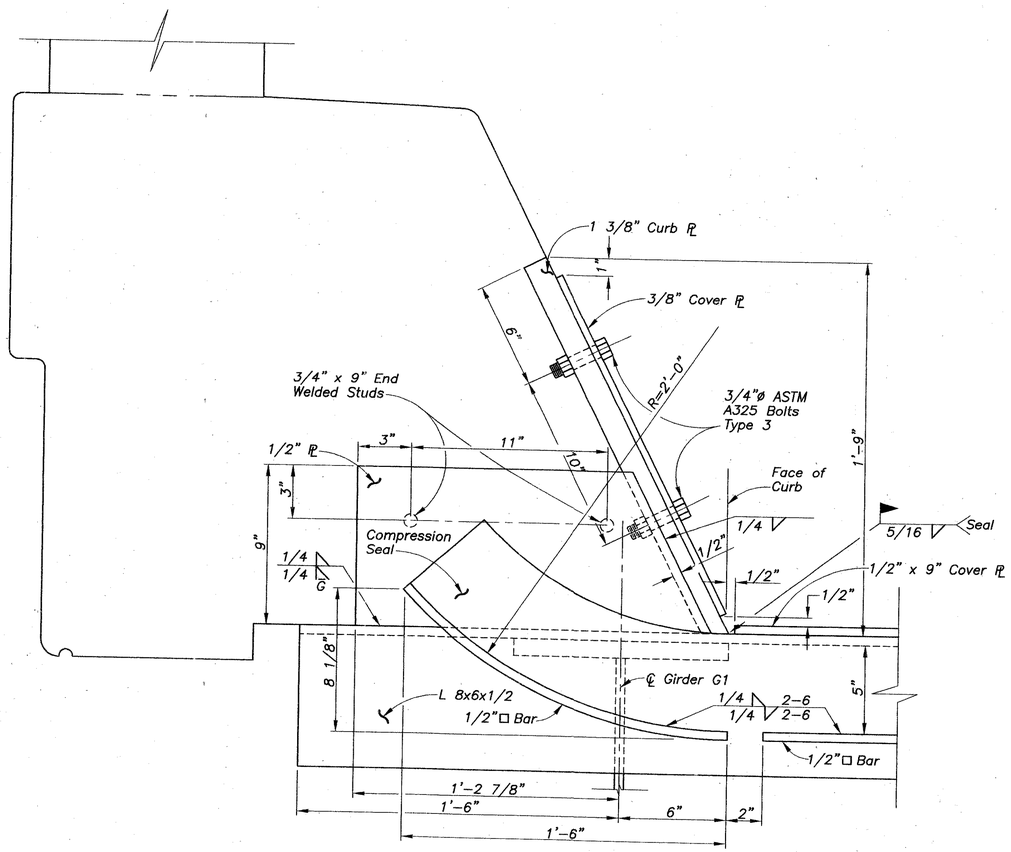
BRIDGE NO. FRA-315-0178
SR 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

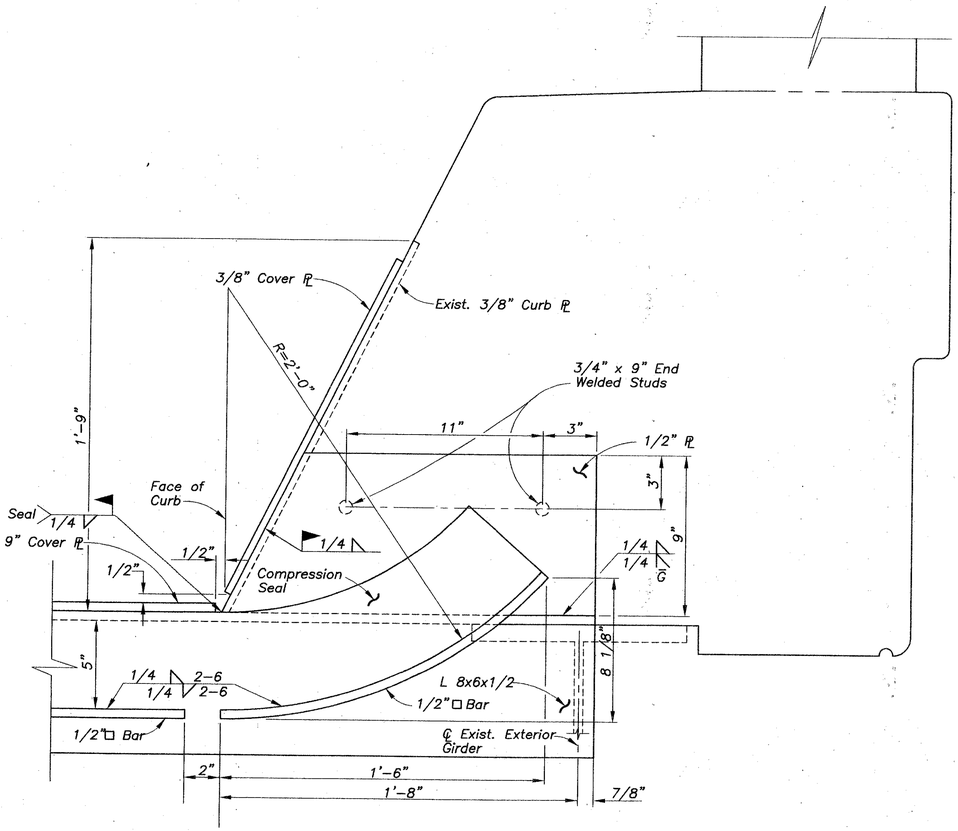
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ASB	CLH		BLG	GEA	1/96	

OHIO	189A
FHWA REGION 5	224
FEDERAL PROJECT	

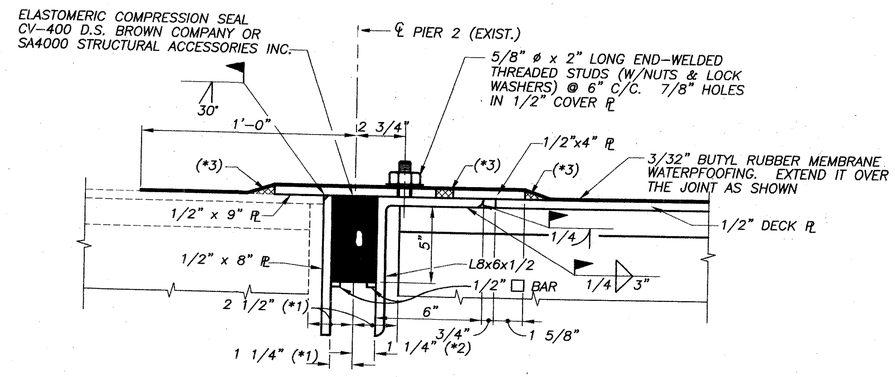
FRANKLIN COUNTY
FRA-670-1.25-C-3



SECTION A_1 – A_1



SECTION A_3 – A_3



SECTION A_2 – A_2

(*1) This dimension, to be field verified, is derived from the existing plan details

(*2) This 1 1/4" dimension is set for an assumed 65° temperature at the time of joint support angle (L8x6x1/2) installation. This dimension will be increased/decreased to account for the contraction/expansion of steel if temperature at installation is lower/higher than 65°. The adjustment will be 1/16" per 10° temperature division from the assumed installation temperature of 65°.

(*3) Epoxy mastic included with Item 810 for payment.

NOTES:
Stage construction will require the joint section be fabricated in two segments. The joints between the respective members of each segment shall have watertight, partial penetration butt welds completely around the outer periphery of the abutting surfaces. Welds which will be in contact with the seal gland shall be ground smooth. Compression seal, however, will be installed as one piece across the joint. Splices are not allowed.

All labor, materials and equipment necessary to complete the joint in place including joint supporting system (L8x6x1/2, 1/2"x8" PL retainers 1/2"x1/2"□ bars), compression seal, anchoring devices and temporary supports shall be paid under Item 516, Structural Expansion Joint, including Elastomeric Compression Seal, As Per Plan.

For location of sections A1–A1, A2–A2 & A3–A3, see sheet 10/15 .

10A/15

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus, Ohio 43215

SUPERSTRUCTURE DETAILS

BRIDGE NO. FRA-315-0178
SR 315 UNDER CONRAIL

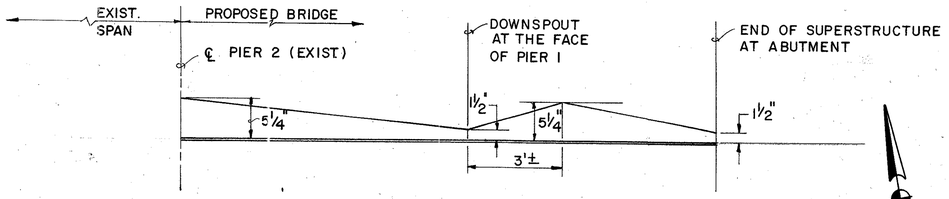
FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ASB	CLH		BLG	GEA	1/96	

PLOTTED VIEW = PLAN
XREF'S = NONE
XREF'S = NONE
PLOT SCALE = 3"=1'-0"
P120C G:\DRAWING\FRA315\3150ET01.DWG MAY-16-1996

OHIO	190
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



LONGITUDINAL SECTION AT GUTTER LINE

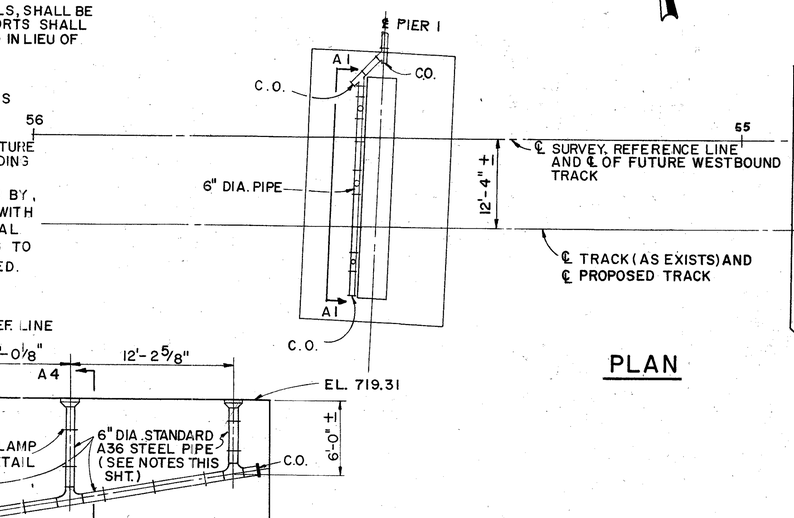
(MIN. THICKNESS OF BITUMENOUS MASTIC UNDERLAYMENT)

NOTE:

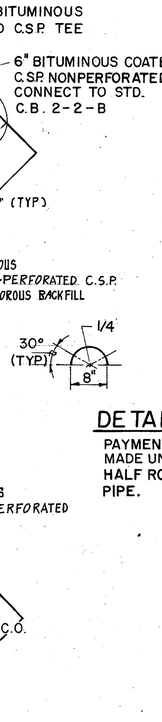
6" DIA. STANDARD PIPE, INCLUDING SPECIALS, SHALL BE GALV. STEEL 707.08. PIPE AND PIPE SUPPORTS SHALL BE ASTM A36, A572 STEEL MAY BE USED IN LIEU OF A36 STEEL.

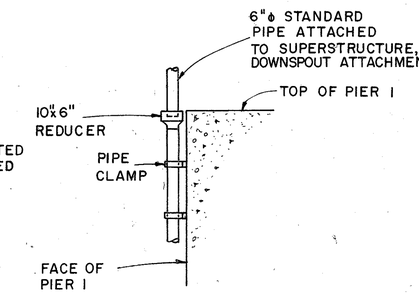
PIPE ATTACHMENT TO SUPERSTRUCTURE AS WELL AS TO SUBSTRUCTURE INCLUDING FITTINGS, SUPPORTS AND ACCESSORIES SHALL BE INCLUDED WITH ITEM 518, STRUCTURE DRAINAGE MISC., 6" DIA. GALV. PIPE, INCLUDING SPECIALS FOR PAYMENT.

JOINTS SHALL BE MADE BY WELDING OR BY THE USE OF A CLAMP TYPE COUPLING WITH A RING GASKET OR AN APPROVED EQUAL. STEEL SHALL BE GALVANIZED ACCORDING TO 711.02 AFTER ALL WELDING IS COMPLETED.

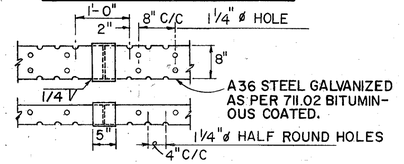


PLAN



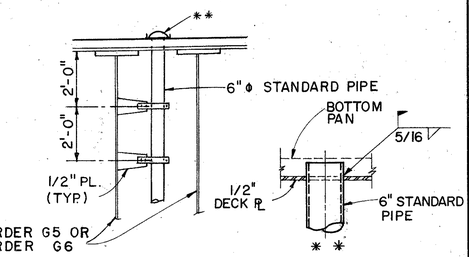


SECTION A4-A4



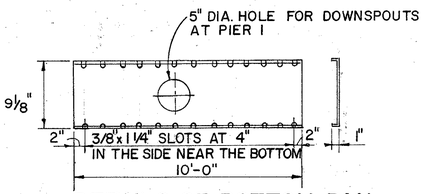
DETAIL OF HALF ROUND PIPE

PAYMENT FOR PIPE, PAN & ACCESSORIES TO BE MADE UNDER STRUCTURE DRAINAGE MISC.: 8" Ø HALF ROUND PERFORATED GALVANIZED STEEL PIPE.



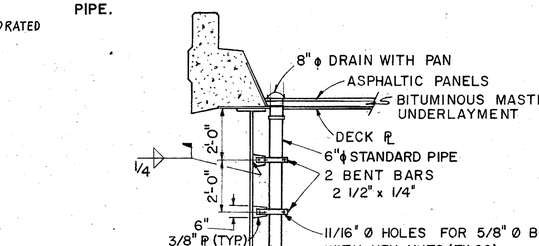
DOWNSPOUT AT PIER 1 ATTACHMENT TO SUPERSTRUCTURE AWAY FROM CURB

(SEE DOWNSPOUT ATTACHMENT TO SUPERSTRUCTURE NEAR CURB FOR OTHER DETAILS)

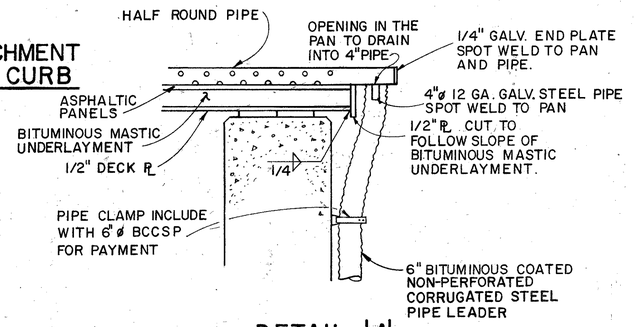


DETAILS OF BOTTOM PAN

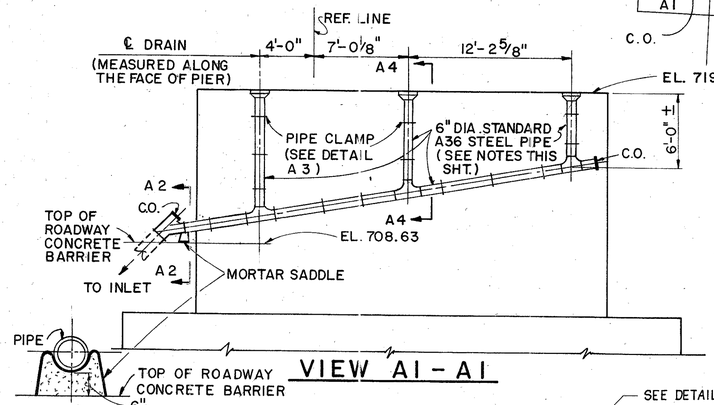
PAN SHALL BE A36 NO.12 GAGE GALV. (711.02) BITUMINOUS COATED.



DOWNSPOUT AT PIER 1 ATTACHMENT TO SUPERSTRUCTURE NEAR CURB

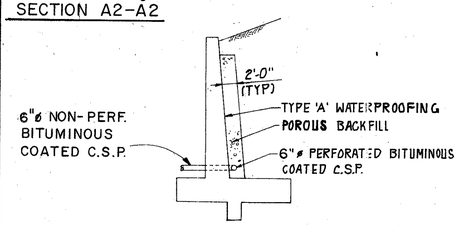


DETAIL 'A'

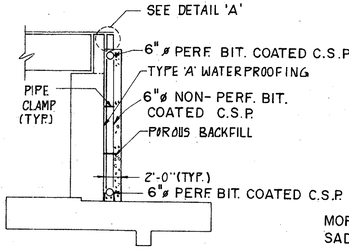


VIEW A1-A1

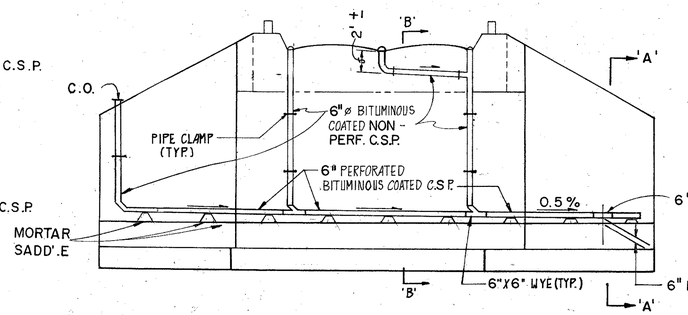
SECTION A2-A2



SECTION A-A

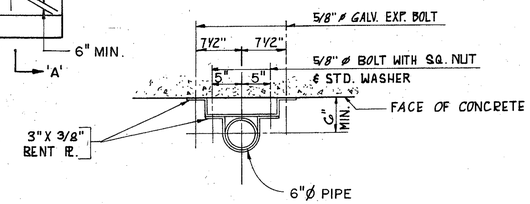


SECTION B-B



ABUTMENT ELEVATION

(LOOKING WEST)



DETAIL A3
PIPE CLAMP DETAIL

LEGEND

C.O. – CLEAN OUT
C.S.P. – CORRUGATED STEEL PIPE

JOHN E. FOSTER AND ASSOCIATES, INC. 11/15
555 Buttles Ave., Columbus, Ohio 43215

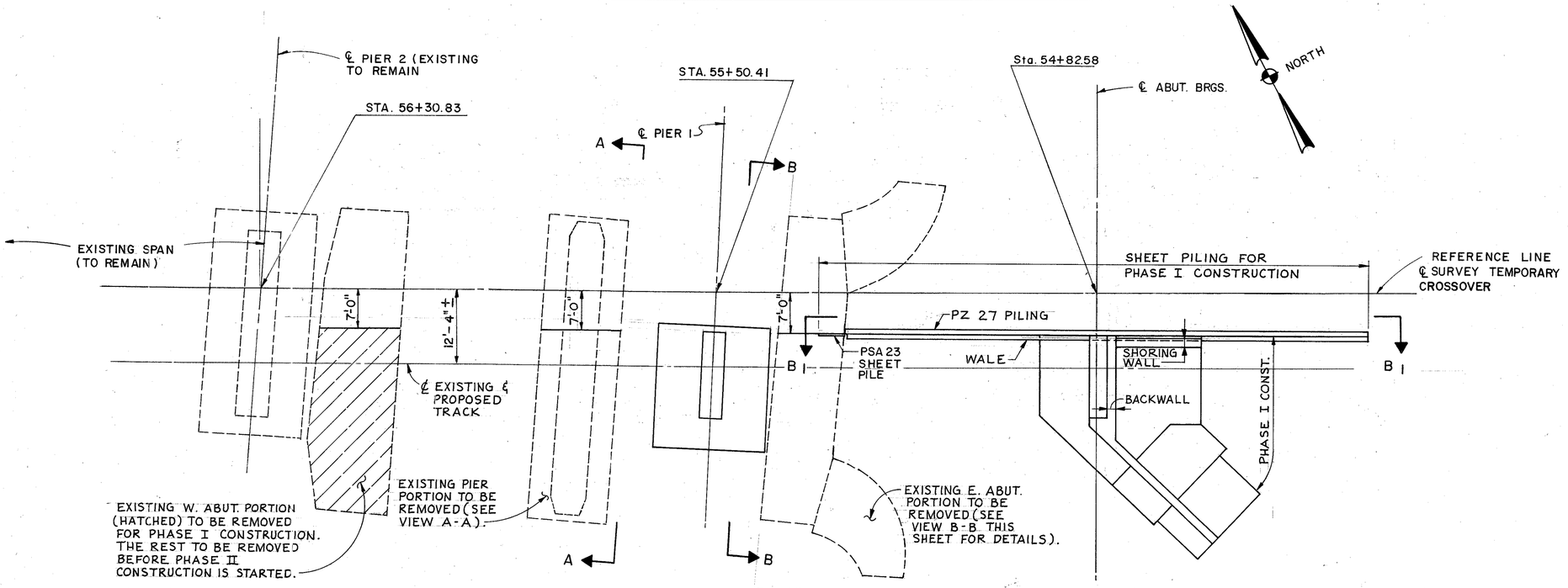
DRAINAGE DETAILS

BRIDGE No. FRA-315-0178
S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
FR	ES	TH	ES	HWR	9/90	

FRANKLIN COUNTY
FRA-670-1.25-C3



PLAN

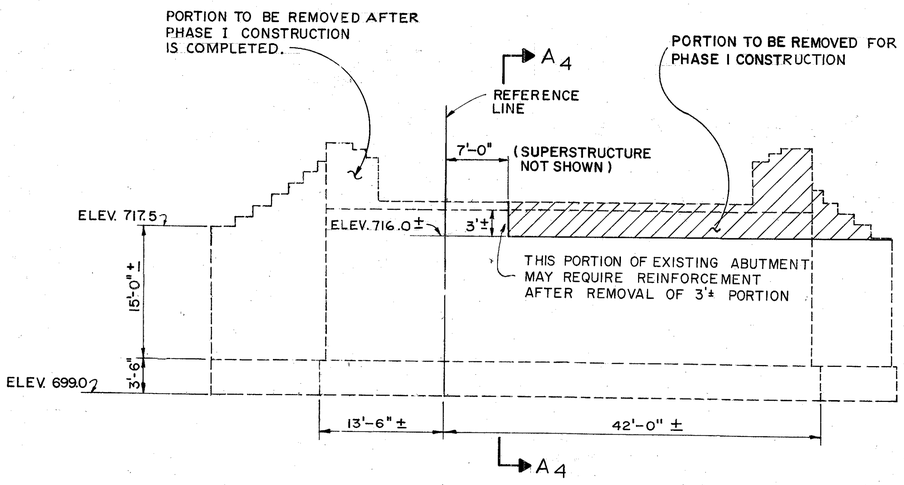
SHOWING PART REMOVAL OF EXISTING SUBSTRUCTURE AND PART CONSTRUCTION OF NEW SUBSTRUCTURE.

NOTE:

THE SHEET PILING DESIGN PROVIDED ON THESE PLANS IS BASED ON EMPLOYING TIEBACKS. THE CONTRACTOR SHALL USE WALE(S) OF A DESIGN TO SPREAD THE TIEBACK TENSILE FORCE OVER AN AREA LARGE ENOUGH TO PREVENT ANY LOCAL SHEET PILING FAILURE. THE WALE'S INTERFERENCE WITH THE VERTICAL REINFORCING BARS OF THE ABUTMENT PORTION TO BE CONSTRUCTED IN PHASE I SHALL BE AVOIDED BY DRILLING HOLES IN IT IN THE FIELD AS NECESSARY FOR REBARS TO RUN THROUGH IT. ANY DISPLACEMENT OF THE HORIZONTAL BARS SHALL BE KEPT TO THE MINIMUM. WHEN NO LONGER NEEDED ALL PARTS OF THE WALE(S) PROTRUDING OUT OF THE CONCRETE OF THE COMPLETED PHASE I CONSTRUCTION SHALL BE CUTOFF AND THE DEFECTIVE AREAS OF THE CONCRETE SURFACE RESULTED FROM THE CUTOFF SHALL BE CLEANED AND FINISHED WITH A MORTAR OF THE SAME PROPORTIONS AS USED IN THE CONCRETE, SEE C.M.S. ART. 511.15.

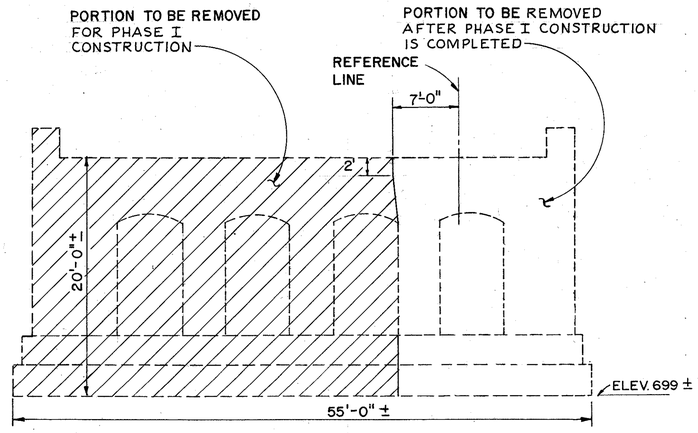
THE CONTRACTOR MAY USE ANY OTHER SHEET PILING DESIGN WITH THE APPROVAL OF THE ENGINEER & CONRAIL. SHEET PILING SHALL BE PAID ON A LUMP SUM BASIS UNDER ITEM 503 COFFERDAMS, CRIBS AND SHEETING.

THE SHEETING DESIGN SHOWN IS CONCEPTUAL. THE CONTRACTOR SHALL SUBMIT SHEETING DETAILS FOR CONRAIL APPROVAL IN ACCORDANCE WITH CE-6. ALL TEMPORARY SHORING SHALL BE SUBMITTED FOR CONRAIL APPROVAL.



VIEW B-B

EXISTING EAST ABUTMENT
(SHOWING REMOVAL SCHEME)



VIEW A-A

EXISTING PIER
(SHOWING REMOVAL SCHEME)

JOHN E. FOSTER AND ASSOCIATES, INC 12/15
555 Buttles Avenue, Columbus, Ohio 43215

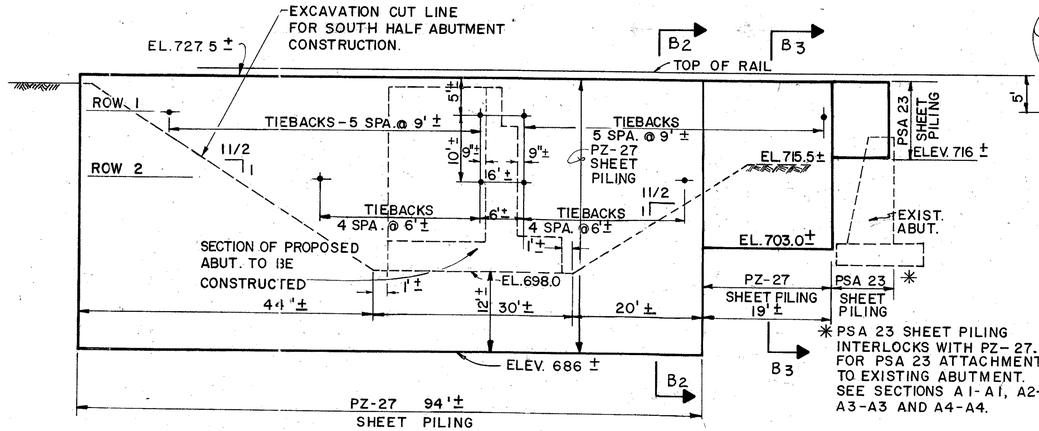
MISCELLANEOUS DETAILS

BRIDGE NO. FRA.-315-0178
S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
FR	ES	TH	ES	HWR	9/90	5/97

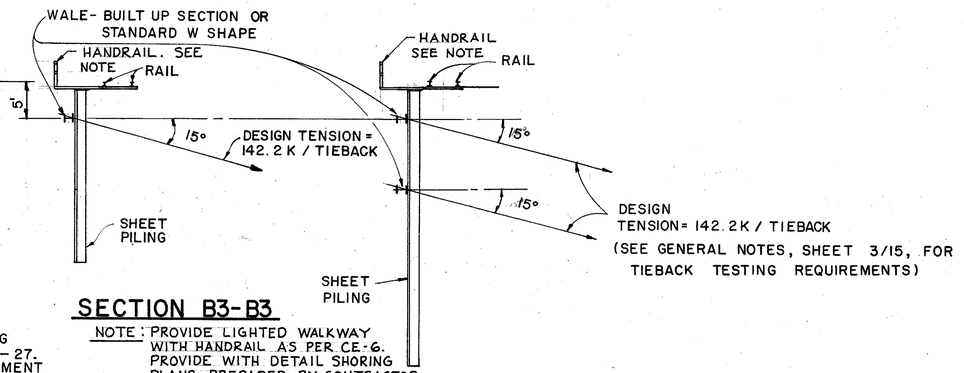
FRANKLIN COUNTY
FRA-670-1.25-C-3



SECTION B1-B1

(SHOWING SHEET PILING IN PLACE FOR OPERATING TRACK (ON NORTH SIDE) STABILITY WHILE THE SOUTH HALF OF THE BRIDGE IS CONSTRUCTED

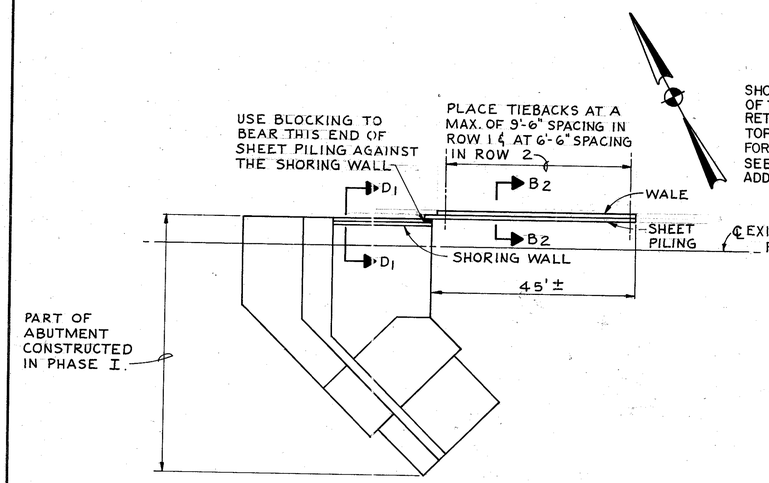
✳ PSA 23 SHEET PILING INTERLOCKS WITH PZ-27. FOR PSA 23 ATTACHMENT TO EXISTING ABUTMENT. SEE SECTIONS A1-A1, A2-A2, A3-A3 AND A4-A4.



SECTION B3-B3

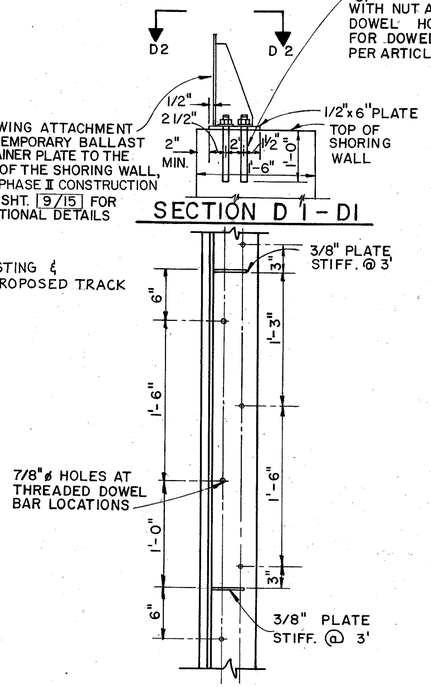
NOTE: PROVIDE LIGHTED WALKWAY WITH HANDRAIL AS PER CE-6. PROVIDE WITH DETAIL SHORING PLANS PREPARED BY CONTRACTOR AND SUBMITTED TO CONRAIL FOR APPROVAL.

SECTION B2-B2



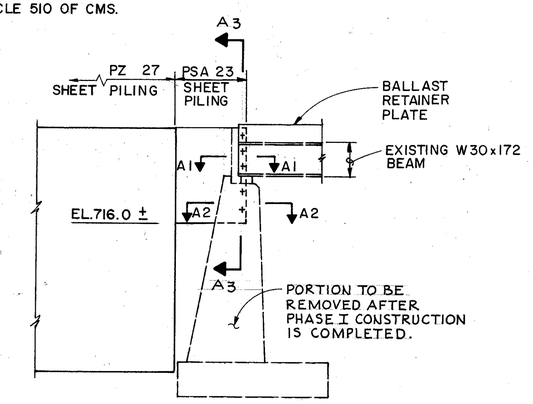
PLAN

SHEET PILING FOR PHASE II CONSTRUCTION

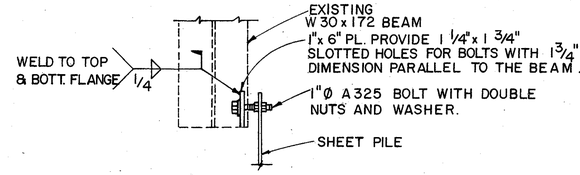


SECTION D1-D1

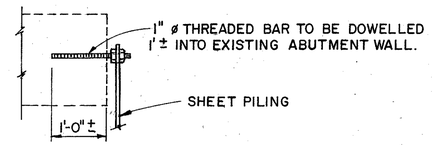
SECTION D2-D2



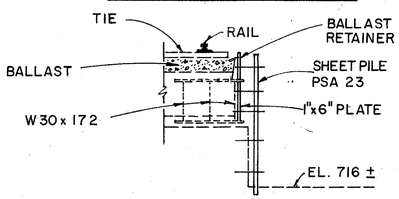
SECTION A4-A4



SECTION A1-A1



SECTION A2-A2



SECTION A3-A3

JOHN E. FOSTER AND ASSOCIATES, INC. 13/15
555 Buttles Avenue, Columbus, Ohio 43215

MISCELLANEOUS DETAILS

BRIDGE NO. FRA-315-0178
S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ASB	EA	EA	JSS			5/97

F.H.W.A. REGION	STATE	PROJECT		193/224
5	OHIO			

FRANKLIN COUNTY
FRA-315-C-3

REINFORCING STEEL SCHEDULE

SUPERSTRUCTURE

MARK	NO.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
S5001	202	9'-0"	11	1'-6"	1'-11"	11"	2"-0"	2'-0"	1896
S6001	64	30'-0"	STR						2884
S6002	12	14'-0"	STR						252
* R5001	56	12'-10"	STR						750
* R5002	4	9'-4"	STR						39
* R5003	4	8'-11"	STR						37
* R5004	4	9'-7"	STR						40
* R5005	4	10'-4"	STR						43
* R5007	48	6'-2"	STR						309
* R5008	9	6'-2"	13	0'-8"	2'-5"	0'-2"			58
* R5009	289	6'-0"	12	0'-8"	2'-4"				1708
* R5010	2	8'-0"	14	4'-10"	0'-10"	1'-7"	0'-9"	0'-9"	17
* R5011	2	6'-0"	15	3'-6"	0'-9"	0'-9"	0'-5"	0'-5"	13
* R5012	2	7'-3"	14	4'-1"	0'-10"	1'-7"	0'-9"	0'-9"	15
* R5013	2	6'-9"	15	4'-3"	0'-9"	0'-9"	0'-5"	0'-5"	14

* INCLUDED WITH ITEM 517 FOR PAYMENT

TOTAL 5032

REINFORCING STEEL SCHEDULE

ABUTMENT FOOTING

MARK	NO.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
F5001	40	19'-6"	STR						814
F5002	4	18'-6"	STR						78
F5003	4	17'-3"	STR						72
F5004	4	9'-6"	STR						40
F5005	4	5'-8"	STR						24
F5006	40	4'-11"	8	2'-6"	2'-6"				205
F5007	2 SER. OF 9	16'-0" TO 28'-0"	STR	VARIES BY 1'-6"					413
F5008	2 SER. OF 9	15'-5" TO 27'-5"	STR	VARIES BY 1'-6"					402
F5009	8	17'-6"	STR						146
F5010	8	17'-10"	STR						149
F5011	2 SER. OF 7	18'-2" TO 27'-2"	STR	VARIES BY 1'-6"					331
F5012	2 SER. OF 7	18'-4" TO 27'-4"	STR	VARIFS BY 1'-6"					333
F5013	58	7'-3"	2	3'-0"	1'-6"				439
F5014	11	6'-7"	3	5'-9"	1'-0"				76
F7001	48	15'-6"	STR						1521
F7002	30	18'-3"	STR						1119
F7003	2 SER. OF 9	14'-7" TO 17'-11"	STR	VARIES BY 5"					598
F9001	48	15'-6"	STR						2530
F9002	30	18'-3"	STR						1862
F9003	2 SER. OF 9	14'-7" TO 17'-11"	STR	VARIES BY 5"					995
F10001	76	28'-0"	STR						9157
F10002	2 SER. OF 4	26'-6" TO 27'-9"	STR	VARIES BY 5"					934
F10003	14	12'-6"	STR						753
F10004	10	14'-3"	STR						613
F11001	76	28'-0"	STR						11306
F11002	2 SER. OF 4	26'-6" TO 27'-9"	STR	VARIES BY 5"					1153
F11003	126	15'-5"	3	13'-9"	2'-0"				10323

TOTAL 46386

REINFORCING STEEL SCHEDULE

ABUTMENT ABOVE FOOTING

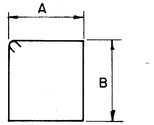
MARK	NO.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A11001	68	17'-6"	STR.						6322
A11002	18	23'-0"	STR.						2200
A8001	2 SER. OF 20	10'-6" TO 17'-7 1/2"	STR	VARIES BY 4 1/2"					1502
A6001	40	7'-6"	2	1'-1"	3'-4"				451
A6002	40	11'-6"	2	1'-1"	5'-4"				691
A5001	26	17'-9"	STR						481
A5002	26	17'-5"	STR						472
A5003	68	17'-0"	STR						1206
A5004	56	9'-9"	STR						569
A5005	44	7'-9"	2	2'-0"	4'-0"				356
A5006	8	10'-0"	STR						83
A5007	2 SER. OF 12	7'-6" TO 10'-2"	STR	VARIES BY 4"					221
A5008	8	10'-9"	8	9'-9"	1'-1"				90
A5009	2	7'-6"	8	6'-6"	1'-1"				16
A5010	2	5'-9"	STR						12
A5011	2	3'-1"	8	2'-1"	1'-1"				6
A5012	2	2'-2"	STR						5
A5013	20	17'-6"	STR						365
A5014	44	19'-6"	STR						895
A5015	4 SER. OF 4	4'-0" TO 16'-0"	STR	VARIES BY 4'-0"					167
A5016	2 SER. OF 202	15'-0" TO 1'-11 1/8"	STR	VARIES BY 4 3/8"					770
A5017	11	23'-6"	STR						270
A5018	32	14'-6"	STR						484

TOTAL 17634

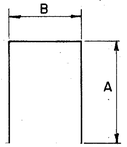
PIER REINFORCING STEEL SCHEDULE

MARK	NO.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
P5001	36	18'-9"	STR						704
P5002	36	20'-5"	STR						767
P5003	38	9'-5"	2	2'-0"	5'-8"				373
P5004	37	8'-5"	2	1'-6"	5'-8"				325
P5005	19	26'-10"	STR						532
P5006	19	28'-6"	STR						565
P5007	54	18'-6"	STR						1042
P6001	19	26'-10"	STR						766
P6002	19	28'-8"	STR						818
P8001	7	18'-9"	STR						350
P8002	7	22'-6"	STR						421
P9001	88	18'-0"	STR						5386
P9002	88	9'-9"	3	1'-6"	8'-6"				2917
P11001	64	18'-6"	STR						6291

TOTAL 21,257



TYPE-1



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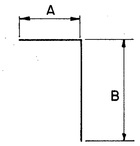

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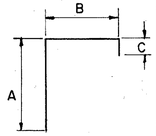

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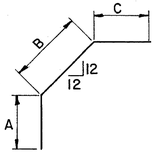

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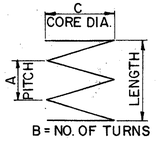

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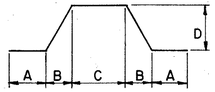

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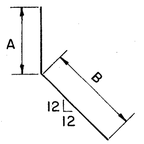

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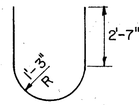

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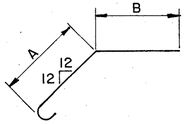

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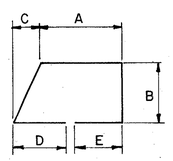

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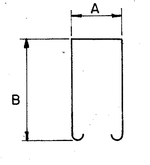
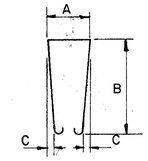


TYPE-12



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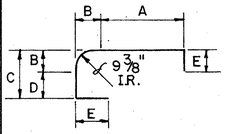

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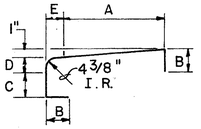


TYPE-15

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Ave. Columbus, Ohio 43215

14/15

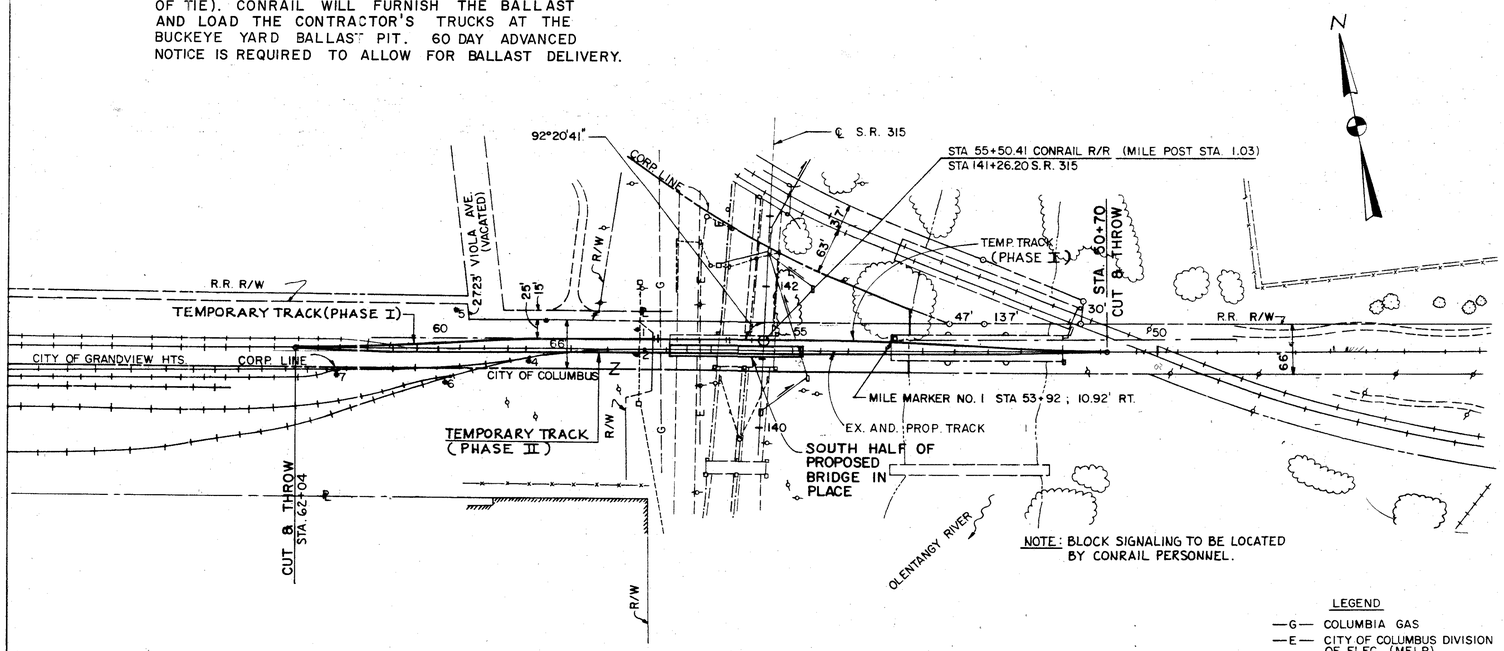
REINFORCING STEEL SCHEDULE

BRIDGE NO. FRA-315-0178
S.R. 315 UNDER CONRAIL

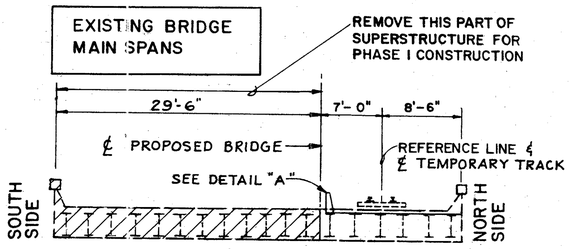
FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ASB	DLA	DLA	ES	JSS	12/91	

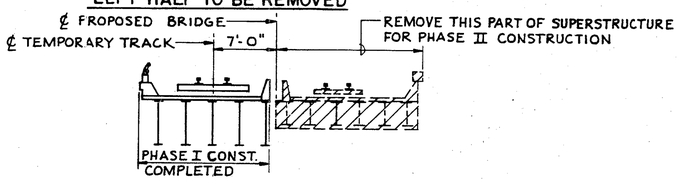
NOTE A: THE CONTRACTOR SHALL PLACE THE PRE-BALLAST PAD SECTION (BALLAST WITHIN 2" OF THE BOTTOM OF TIE). CONRAIL WILL FURNISH THE BALLAST AND LOAD THE CONTRACTOR'S TRUCKS AT THE BUCKEYE YARD BALLAST PIT. 60 DAY ADVANCED NOTICE IS REQUIRED TO ALLOW FOR BALLAST DELIVERY.



TEMPORARY CROSSOVER FOR PHASE I CONSTRUCTION

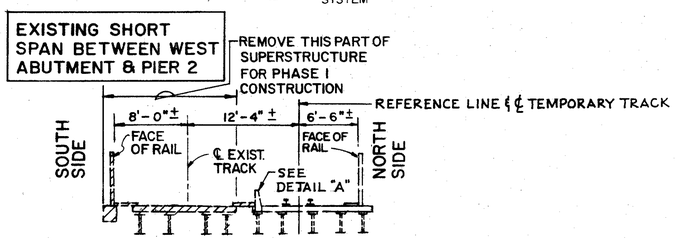


PHASE IA EXISTING TYPICAL CROSS SECTION SHOWING LEFT HALF TO BE REMOVED

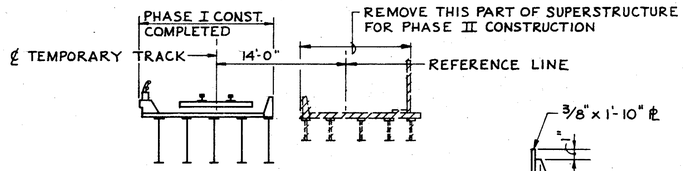


PHASE IB CROSS SECTION SHOWING THE NEWLY CONSTRUCTED LEFT HALF AND THE REMAINING PORTIONS OF EXISTING SUPER-STRUCTURE TO BE REMOVED FOR PHASE II CONSTRUCTION.

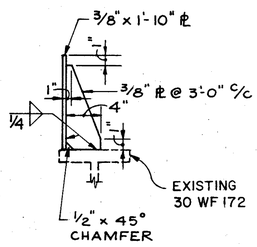
PHASE II CONSTRUCT THE RIGHT HALF OF THE PROPOSED SUPERSTRUCTURE AS PER TYPICAL CROSS SECTION SHEET 9/15



PHASE IA TYPICAL CROSS SECTION SHOWNG LEFT HALF TO BE REMOVED



PHASE IB CROSS SECTION SHOWING THE NEWLY CONSTRUCTED LEFT HALF AND THE REMAINING PORTIONS OF EXISTING SUPER-STRUCTURE TO BE REMOVED FOR PHASE II CONSTRUCTION.



SUPERSTRUCTURE PHASE REMOVAL AND RECONSTRCTION

FOR SUBSTRUCTURE PHASE REMOVAL, SEE SHEET 12/15
FOR SUBSTRUCTURE PHASE CONSTRUCTION, SEE SHEET 12/15

TEMPORARY BALLAST RETAINER DETAIL "A" FOR PHASE I CONSTRUCTION

OHIO | FHWA REGION 5 | FEDERAL PROJECT | 194 / 224

FRANKLIN COUNTY
FRA-670-1.25-C-3

MAINTENANCE OF TRAFFIC & CONSTRUCTION PROCEDURE:

NOTE: The term "Existing Bridge" used in here does not apply to the existing span over Dublin Road (To Remain).

PHASE I:

THE RAILROAD COMPANY WILL:

1. CONSTRUCT TEMPORARY TRACK WITH CROSSOVERS ON NORTHERLY PORTION OF EXISTING BRIDGE.
2. COMPLETE NECESSARY WORK TO DIVERT TRAFFIC ONTO THE TEMPORARY TRACK.

WITH TRAFFIC ON THE TEMPORARY TRACK ON THE NORTH SIDE, THE CONTRACTOR SHALL:

3. INSTALL BALLAST RETAINER ADJACENT TO THE SOUTH RAIL OF THE TRACK ON THE SUPERSTRUCTURE OF THE EXISTING BRIDGE.
4. INSTALL SHEET PILING WHILE ASSURING THE STABILITY OF THE SHEET PILING (BY INSTALLING TIEBACKS) SUPPORTING THE TEMPORARY TRACK.
5. REMOVE AND DISPOSE OF THE SOUTHERLY PORTION OF THE SUPERSTRUCTURE OF THE EXISTING BRIDGE. STRUCTURAL STEEL HOWEVER SHALL BE CAREFULLY REMOVED AND STORED IN A MANNER AND IN A PLACE AS DIRECTED BY THE RAILROAD COMPANY.
6. REMOVE AND DISPOSE OF THE SOUTHERLY PORTION OF THE EXISTING PIER AND WEST ABUTMENT.
7. REMOVE AND DISPOSE OF THE TOP OF THE SOUTHERLY PORTION OF THE EXISTING EAST ABUTMENT TO ELEV. 716.0±.
8. EXCAVATE AND CONSTRUCT SOUTHERLY PORTION OF PIER 1.
9. EXCAVATE AND CONSTRUCT SOUTHERLY PORTION OF ABUTMENT.
10. BACKFILL AND COMPACT BEHIND THE NEWLY CONSTRUCTED SOUTHERLY PORTION OF THE ABUTMENT TO THE TOP OF THE SUBBALLAST.
11. ERECT THE SUPERSTRUCTURE ON THE SOUTHERLY PORTION OF THE COMPLETED SUBSTRUCTURE. ERECT TEMPORARY BALLAST RETAINER ON THE TOP OF GIRDER G6, COMPLETE PAINTING, DRAINAGE AND WATERPROOFING DETAIL.

THE RAILROAD COMPANY WILL:

12. PLACE BALLAST ON THE COMPLETED SOUTHERLY PORTION OF THE SUPERSTRUCTURE AND EAST APPROACH. (SEE NOTE A; THIS SHEET)
13. CONSTRUCT TEMPORARY TRACK WITH CROSSOVERS.
14. COMPLETE THE NECESSARY WORK TO DIVERT TRAFFIC ONTO THE TEMPORARY TRACK.

PHASE II:

THE RAILROAD COMPANY WILL:

15. REMOVE TEMPORARY TRACK OFF THE NORTHERLY PORTION OF THE EXISTING SUPERSTRUCTURE AND EAST APPROACH AS NECESSARY FOR THE CONSTRUCTABILITY OF THE REMAINING PORTION OF THE ABUTMENT.

WITH TRAFFIC ON THE TEMPORARY TRACK ON THE SOUTH SIDE, THE CONTRACTOR SHALL:

16. REMOVE THE REMAINING PARTS OF THE EXISTING SUPERSTRUCTURE AND SUBSTRUCTURE.
17. EXCAVATE TO CONSTRUCT THE REMAINING PORTION OF THE ABUTMENT WHILE ASSURING THE STABILITY OF THE SHEET PILING (BY INSTALLING TIEBACKS) SUPPORTING THE TEMPORARY TRACK.
18. CONSTRUCT THE REMAINING PORTION OF THE ABUTMENT.
19. BACKFILL AND COMPACT BEHIND THE ABUTMENT PORTION (CONSTRUCTED IN STEP 18) TO THE TOP OF SUBBALLAST.
20. EXCAVATE AND CONSTRUCT THE REMAINING PORTION OF PIER 1.
21. CONSTRUCT THE REMAINING SUPERSTRUCTURE TO BE READY FOR PLACING BALLAST. (SEE NOTE A, THIS SHEET)

THE RAILROAD COMPANY WILL:

22. PLACE BALLAST, INSTALL TIES AND RAILS ON THE PORTIONS OF THE SUPERSTRUCTURE AND EAST APPROACH COMPLETED IN STEPS 19 THRU 21 TO COMPLETE THE WORK FOR THE FUTURE TRACK. (SEE NOTE A, THIS SHEET)
23. REINSTALL TEMPORARY CROSSOVER ON NORTHERLY PORTION OF NEW STRUCTURE.
24. MOVE TRAFFIC TO TEMPORARY TRACK ON NORTHERLY PORTION OF NEW STRUCTURE.
25. REMOVE TEMPORARY TRACK FROM SOUTHERLY SIDE OF NEW STRUCTURE.
26. INSTALL TIES AND RAILS ON THE SOUTHERLY PORTION OF NEW STRUCTURE AND EAST APPROACH TO COMPLETE THE WORK FOR THE PERMANENT TRACK.
27. REMOVE TEMPORARY CROSSOVER AND TRACK FROM THE NORTHERLY SIDE OF NEW STRUCTURE.
28. OPEN TRAFFIC ON THE PERMANENT SOUTHERLY TRACKS ON NEW STRUCTURE.

THE CONTRACTOR SHALL:

29. COMPLETE THE REMAINDER OF THE CONTRACTED WORK.

NOTE:
THE CONTRACTOR MAY ALTER ABOVE SUGGESTED CONSTRUCTION PROCEDURE AT THE APPROVAL OF THE ENGINEER.

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus, Ohio 43215

15 / 15

MISCELLANEOUS DETAILS

BRIDGE NO. FRA-315-0178
S.R. 315 UNDER CONRAIL

FRANKLIN COUNTY — STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DFS	DMT	—	CEM	JSS	12-91	5/97

FINAL SURVEY — DATE / BY / SURVEYED / PLOTTED / TEMPLATE / NOTE BOOK / AREAS / AREAS CHECKED / NO.

ORIGINAL SURVEY — DATE / BY / SURVEYED / PLOTTED / TEMPLATE / NOTE BOOK / AREAS / AREAS CHECKED / NO.

OHIO	195
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

℄ TEMP. TRACK A

PI = STA. 51+86.01
△ = 2° 07' 41.7", RT.
D_C = 1° 45' (RR DEF.)
R = 3274.17'
L_C = 114.85'
L_S = 31.00'
T_S = 116.01'
Ø = 0° 16' 16.5"
X = 31.00'
Y = 0.05'
LT = 20.67'
ST = 10.33'

℄ TEMP. TRACK A

PI = STA. 54+62.86
△ = 2° 07' 41.7", LT.
D_C = 1° 45' (RR DEF.)
R = 3274.17'
L_C = 114.85'
L_S = 31.00'
T_S = 116.01'
Ø = 0° 16' 16.5"
X = 31.00'
Y = 0.05'
LT = 20.67'
ST = 10.33'

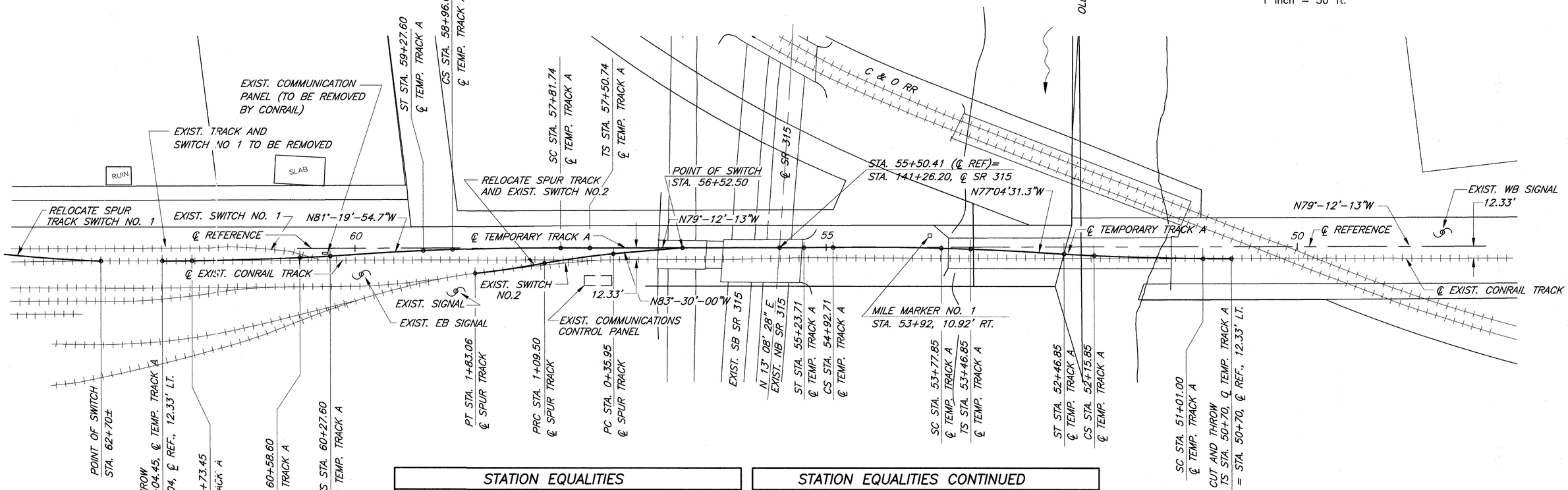
℄ TEMP. TRACK A

PI = STA. 58+66.75
△ = 2° 07' 41.7", LT.
D_C = 1° 45' (RR DEF.)
R = 3274.17'
L_C = 114.85'
L_S = 31.00'
T_S = 116.01'
Ø = 0° 16' 16.5"
X = 31.00'
Y = 0.05'
LT = 20.67'
ST = 10.33'

℄ TEMP. TRACK A

PI = STA. 61+43.61
△ = 2° 07' 41.7", RT.
D_C = 1° 45' (RR DEF.)
R = 3274.17'
L_C = 114.85'
L_S = 31.00'
T_S = 116.01'
Ø = 0° 16' 16.5"
X = 31.00'
Y = 0.05'
LT = 20.67'
ST = 10.33'

50 0 25 50 100
(IN FEET)
1 inch = 50 ft.



℄ SPUR TRACK

PI = STA. 0+72.75
△ = 4° 24' 41", LT.
R = 955.37'
D_C = 6° (RR DEF.)
L = 73.56'
T = 36.80
C = 73.54'

℄ SPUR TRACK

PI = STA. 1+46.30
△ = 4° 24' 41", RT.
R = 955.37'
D_C = 6° (RR DEF.)
L = 73.56'
T = 36.80
C = 73.54'

STATION EQUALITIES

℄ TEMP. TRACK A	℄ REFERENCE, OFFSET
TS STA. 50+70	STA. 50+70, 12.33' LT.
SC STA. 51+01	STA. 51+01, 12.28' LT.
CS STA. 52+15.85	STA. 52+15.82, 9.72' LT.
ST STA. 52+46.85	STA. 52+46.79, 8.39' LT.
TS STA. 53+46.85	STA. 53+46.69, 3.94' LT.
SC STA. 53+77.85	STA. 53+77.66, 2.61' LT.
CS STA. 54+92.71	STA. 54+92.48, 0.05' LT.
ST STA. 55+23.71	STA. 55+23.48, 0' LT.
TS STA. 57+50.74	STA. 57+50.52, 0' LT.
SC STA. 57+81.74	STA. 57+82.52, 0.05' LT.
CS STA. 58+96.60	STA. 58+96.34, 2.61' LT.
ST STA. 59+27.60	STA. 59+27.31, 3.94' LT.
TS STA. 60+27.60	STA. 60+27.21, 8.39' LT.
SC STA. 60+58.60	STA. 60+58.18, 9.72' LT.
CS STA. 61+73.45	STA. 61+73.00, 12.28' LT.
ST STA. 62+04.45	STA. 62+04.00, 12.33' LT.

STATION EQUALITIES CONTINUED

℄ SPUR TRACK	℄ REFERENCE, OFFSET
PC STA. 0+35.95	STA. 57+27.62, 4.07' LT.
PRC STA. 1+09.50	STA. 58+00.31, 15.20' LT
PT STA. 1+83.06	STA. 58+73.00, 26.33' LT.

NOTE: RAILROAD DEFINITION OF DEGREE OF CURVE USED FOR TEMPORARY TRACK GEOMETRY.

NOTE: EXISTING TOPOGRAPHY TAKEN FROM FIELD SURVEYS AND FRANKLIN COUNTY AUDITORS MAPPING.

NOTE: THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY TRACK SURVEY AND STAKEOUT WORK.

15A/15

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus, Ohio 43215

TEMPORARY TRACK A PLAN
(PHASE I)
BRIDGE NO. FRA-315-0178
SR 315 UNDER CONRAIL
FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DHG	BF		WED	GOD	1/97	5/97

File: D:\DONS-BUS\EXHIBIT.DWG 1 = 50.00
Date: 05-19-1997
Time: 11:41 Drawn by : BF

OHIO	195A
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3

℄ TEMP. TRACK B

PI = STA. 51+11.61
△ = 0° 31' 20.1", LT.
D_C = 1° 00' (RR DEF.)
R = 5729.65'
L_C = 21.23'
L_S = 31.00'
T_S = 41.61'
Ø = 0° 09' 18"
X = 31.00'
Y = 0.03'
LT = 20.67'
ST = 10.33'

℄ TEMP. TRACK B

PI = STA. 52+94.84
△ = 0° 31' 20.1", RT.
D_C = 1° 00' (RR DEF.)
R = 5729.65'
L_C = 21.23'
L_S = 31.00'
T_S = 41.61'
Ø = 0° 09' 18"
X = 31.00'
Y = 0.03'
LT = 20.67'
ST = 10.33'

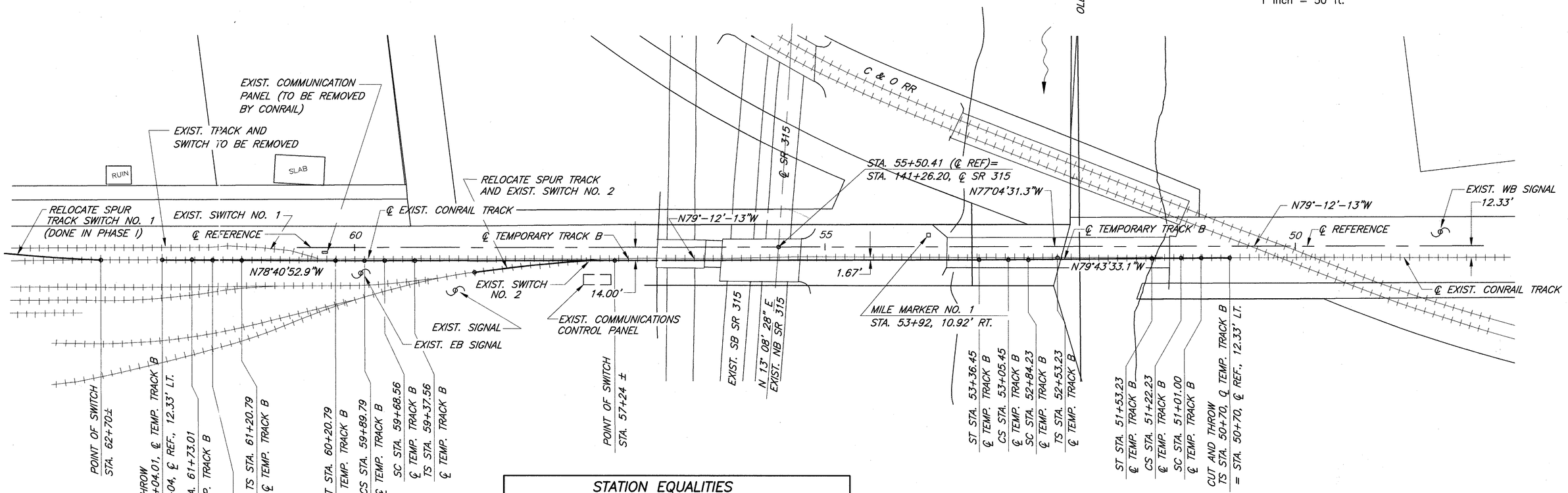
℄ TEMP. TRACK B

PI = STA. 59+79.17
△ = 0° 31' 20.1", RT.
D_C = 1° 00' (RR DEF.)
R = 5729.65'
L_C = 21.23'
L_S = 31.00'
T_S = 41.61'
Ø = 0° 09' 18"
X = 31.00'
Y = 0.03'
LT = 20.67'
ST = 10.33'

℄ TEMP. TRACK B

PI = STA. 61+62.40
△ = 0° 31' 20.1", LT.
D_C = 1° 00' (RR DEF.)
R = 5729.65'
L_C = 21.23'
L_S = 31.00'
T_S = 41.61'
Ø = 0° 09' 18"
X = 31.00'
Y = 0.03'
LT = 20.67'
ST = 10.33'

50 0 25 50 100
(IN FEET)
1 inch = 50 ft.



STATION EQUALITIES

℄ TEMP. TRACK B	℄ REFERENCE, OFFSET
TS STA. 50+70	STA. 50+70, 12.33' LT.
SC STA. 51+01	STA. 51+01, 12.36' LT.
CS STA. 51+22.23	STA. 51+22.23, 12.45' LT.
ST STA. 51+53.23	STA. 51+53.22, 12.71' LT.
TS STA. 52+53.23	STA. 52+53.22, 13.62' LT.
SC STA. 52+84.23	STA. 52+84.22, 13.88' LT.
CS STA. 53+05.45	STA. 53+05.44, 13.97' LT.
ST STA. 53+36.45	STA. 53+36.44, 14.00' LT.
TS STA. 59+37.56	STA. 59+37.56, 14.00' LT.
SC STA. 59+68.56	STA. 59+68.56, 13.97' LT.
CS STA. 59+89.79	STA. 59+89.78, 13.88' LT.
ST STA. 60+20.79	STA. 60+20.78, 13.62' LT.
TS STA. 61+20.79	STA. 61+20.78, 12.71' LT.
SC STA. 61+51.79	STA. 61+51.77, 12.45' LT.
CS STA. 61+73.01	STA. 61+73.00, 12.36' LT.
ST STA. 62+04.01	STA. 62+04.00, 12.33' LT.

NOTE: RAILROAD DEFINITION OF DEGREE OF CURVE USED FOR TEMPORARY TRACK GEOMETRY.

NOTE: THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY TRACK SURVEY AND STAKEOUT WORK.

15B/15

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus, Ohio 43215

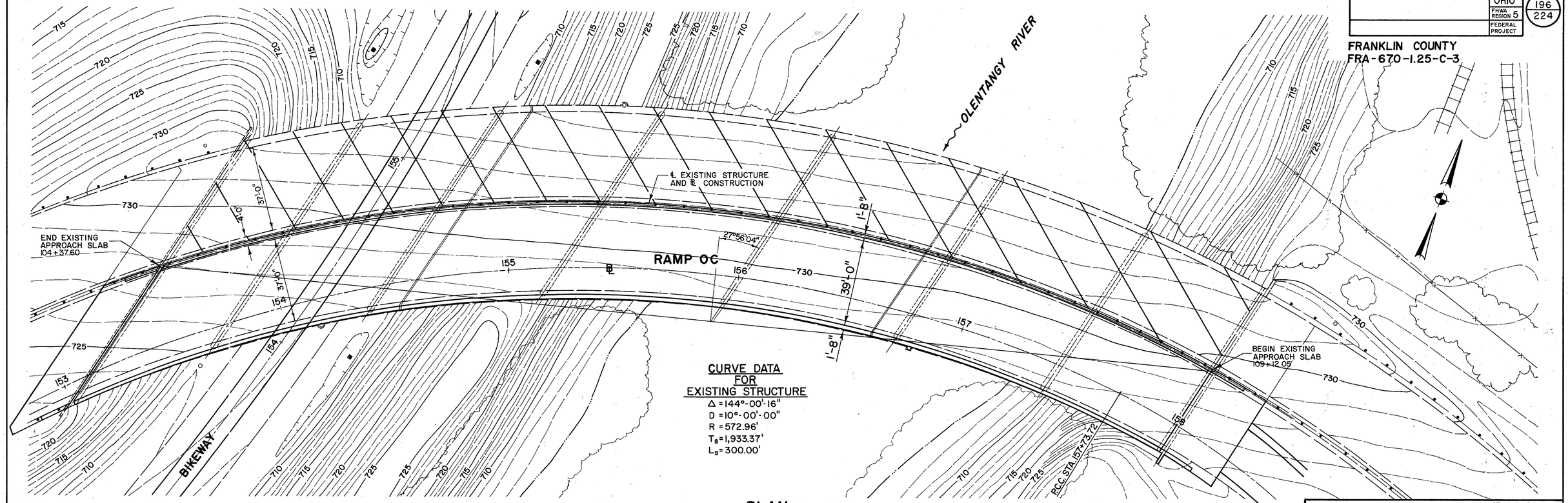
TEMPORARY TRACK B PLAN
(PHASE II)
BRIDGE NO. FRA-315-0178
SR 315 UNDER CONRAIL
FRANKLIN COUNTY STA. 141+26.20

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DHG	BF		WED	GOD	1/97	5/97

File: d:\DONS-BUS\EXHIBIT2.DWG 1 = 50.00
Date: 05-19-1997
Time: 10:05 Drawn by : BF

OHIO	196
FHWA REGION 5	224
FEDERAL PROJECT	

FRANKLIN COUNTY
FRA-670-1.25-C-3



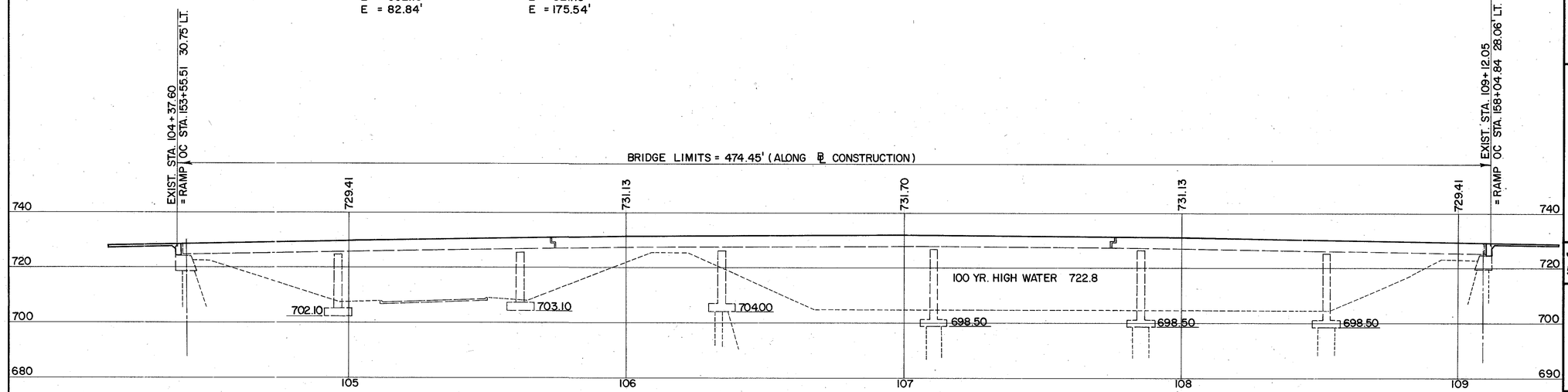
CURVE DATA
FOR
EXISTING STRUCTURE
Δ = 144°-00'-16"
D = 10°-00'-00"
R = 572.96'
T_s = 1,933.37'
L_s = 300.00'

PLAN

CURVE DATA - RAMP OC

P.I. = STA. 155+26.77
Δ = 60° 44' 27"
D = 11° 00' 00"
R = 520.87'
T = 305.23'
L = 552.19'
E = 82.84'

P.I. = STA. 161+37.96
Δ = 102° 55' 33"
D = 19° 45' 00"
R = 290.11'
T = 364.23'
L = 521.15'
E = 175.54'



PROFILE

EXISTING STRUCTURE (BUILT AS FRA-3-1547)

TYPE: Continuous steel beam with expansion hinges and reinforced concrete slab and substructure
SPANS: 54.38', 65.89', 72.69', 76.14', 74.83', 67.16' & 57.49' % brgs. along ℄ N.I.B.
ROADWAY: 78'-0" f/f, 1'-10" safety curbs with 4'-0" median, conc. parapet and aluminum railing
LOADING: CF-2000
WEARING SURFACE: 2½" Asphaltic concrete
ALIGNMENT: 10° Curve
SKEW: 27° 56' 04" L.F. with respect to reference chord
SUPERELEVATION: 0.08 ft/ft
APPROACH SLABS: 25' long

PROPOSED STRUCTURE

TYPE: New reinforced concrete deck on existing steel beams and substructures
SPANS: 54.38', 65.89', 72.69', 76.14', 74.83', 67.16', & 57.49' % Bearings along ℄ Construction
ROADWAY: 39'-0" f/f Parapets 42'-4" % Deck
LOADING: HS 20-44 Case II and Alternate Military Loading
WEARING SURFACE: Monolithic Concrete
ALIGNMENT: 10° Curve Rt. (℄ Construction)
SKEW: 27° 56' 04" L.F. with respect to reference chord
SUPERELEVATION: 0.08 ft./ft.
APPROACH SLABS: AS-1-81 (25' Long)

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue , Columbus, Ohio 43215

1/20

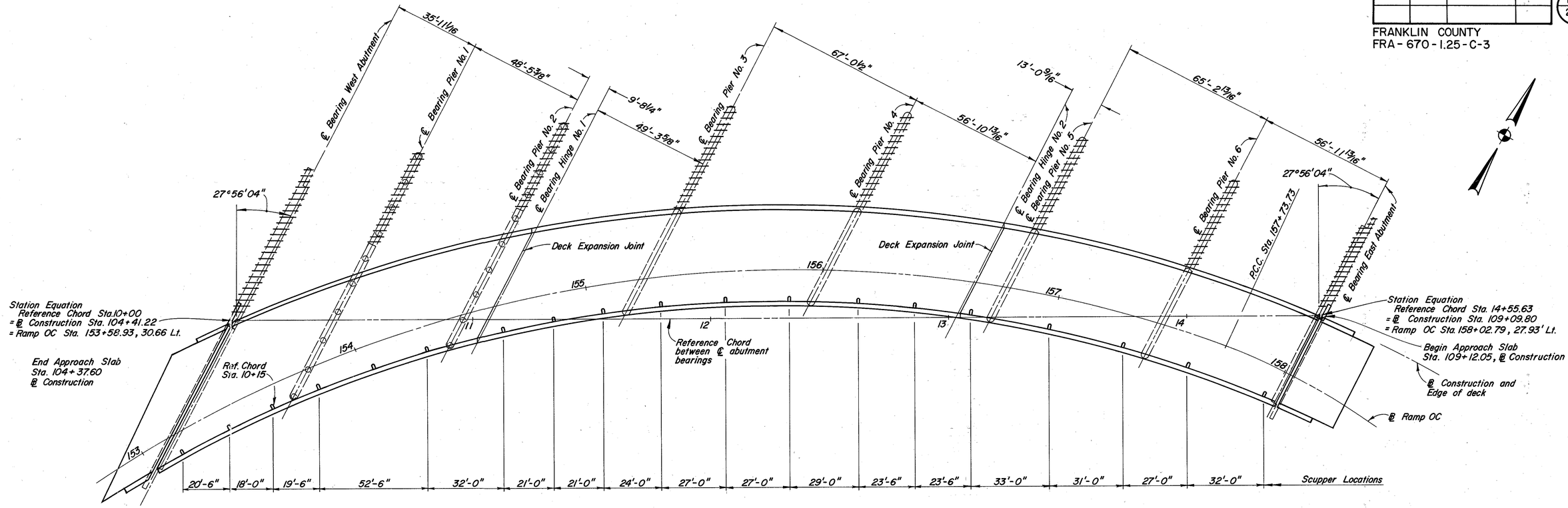
SITE PLAN

BRIDGE NO. FRA-315
RAMP OC OVER OLENTANGY RIVER

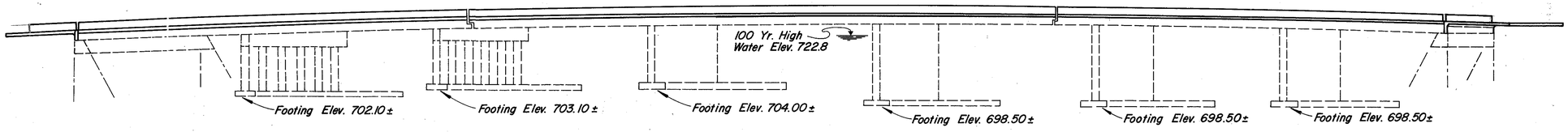
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	WEH	GAM	DPK	JSS	10/87	

SITE PLAN — BRIDGE

FRANKLIN COUNTY
FRA-670-1.25-C-3



PLAN



ELEVATION

NOTES: Scupper locations shown are approximate. Final locations shall be field determined. All scuppers must clear cross frames minimum of 6". Dimensions for scuppers are measured parallel to reference chord.

Approach slabs are 25'-0" long, measured along ℄ Construction.

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

2/20

GENERAL PLAN AND ELEVATION

BRIDGE NO. FRA-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	10/87	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C-3

GENERAL NOTES

~~REFERENCE: Shall be made to Standard Drawing(s): BR-1 dated 5-29-79, AS-1-81 dated 11-27-81, EXJ-2-81 dated 4-2-84(Rev) SD-1-69 dated 6-12-69, EXJ-1-87 dated , and to Supplemental Specification(s): 824 dated 10-8-82 and 836 dated 11-12-85.~~

DESIGN SPECIFICATIONS: This structure conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1983, including 1984, 1985 and 1986 Interim Specifications and the Ohio "Supplement" to these specifications.

DESIGN LOADING: Design Loading - HS20-44 Case 1 and the Alternate Military Loading.

DESIGN DATA: 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 - A36 - unit stress 20,000 p.s.i.

DECK PROTECTION METHOD: Epoxy coated reinforcing steel, top and bottom mat, and sealing of concrete surfaces as shown in the plan.

MONOLITHIC WEARING SURFACE: Monolithic wearing surface is assumed, for design purposes, to be 1" thick.

EXISTING STRUCTURE VERIFICATION: Details and dimensions shown on these plans pertaining to the existing structure have been obtained from plans of the existing structure and/or from field observations and measurements. Consequently, they are indicative of the existing structure and the proposed work, but shall be considered tentative and approximate. The Contractor is referred to CMS Sections 102.05, 105.02 and 513.02.

ITEM SPECIAL, SEALING OF CONCRETE SURFACES: A non-epoxy concrete sealer shall be applied to the parapet and deck fascia as shown on sheet 16/20. See the proposal for surface preparation requirements, application rates, material requirements and applicatior procedures.

CONTRACT BID PRICES: Contract bid prices shall be based upon a recognition of the uncertainties described above and upon a prebid examination of the existing structure by the Contractor. However, all project work shall be based upon actual details and dimensions which have been verified by the Contractor in the field.

REPLACEMENT OF EXISTING REINFORCEMENT STEEL: Any existing reinforcing bars which are to be incorporated into the new work and which are made unusable by the Contractor's concrete removal operations shall be replaced with new steel at his cost. Any existing reinforcing bars deemed by the Engineer to be unusable because of corrosion shall be replaced with new steel. An allowance of 500 pounds is included in Item 509 for this purpose.

REMOVAL OF EXISTING STRUCTURE: When no longer needed to maintain traffic, portions of the existing structure shall be removed. See demolition plans for extent of structure removed.

UTILITY LINES: All expense involved in relocating (installing) the affected utility lines shall be borne by the owner(s). The Contractor and Owner(s) are requested to cooperate by arranging their work in such a manner that inconvenience to either will be held to a minimum.

PROPOSED WORK:
1. Remove existing railing, deck, portions of superstructure, portions of abutments and portions of piers.
2. Modify abutments and piers.
3. Place reinforced concrete deck, backwalls and railing.

DECK PLACEMENT SEQUENCE: The center deck section between expansion joints shall be poured first, prior to placement of the adjoining end sections.

STP

ESTIMATED QUANTITES

EXT.	ITEM	TOTAL	UNIT	DESCRIPTION	ABUTMENT	PIERS	SUPER-STRUCTURE	GENERAL
11200	202	LUMP	LUMP	PORTIONS OF STRUCTURE REMOVED				LUMP
11100	503	LUMP	LUMP	COFFERDAMS, CRIBS AND SHEETING				LUMP
21100	503	45	CU.YD.	UNCLASSIFIED EXCAVATION	45			
11400	509	1054	LBS.	REINFORCING STEEL, GRADE 60		554		500
09950	510	130	EACH	DOWEL HOLES WITH CEMENT GROUT	16	114		
45700	511	57	CU.YD.	CLASS C CONCRETE, ABUTMENTS	57			
43200	511	8	CU.YD.	CLASS C CONCRETE, PIERS		8		
31502	511	740	CU.YD.	CLASS S CONCRETE, SUPERSTRUCTURE			740	
10500	516	115	LIN.FT.	STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS			115	
11210	516	100	LIN.FT.	STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC STRIP SEALS (3")			100	
21100	518	34	CU.YD.	POROUS BACKFILL	34			
41100	518	144	LIN.FT.	6" PERFORATED HELICAL CORRUGATED STEEL PIPE, 707.01	144			
	~~518~~		~~LIN.FT.~~	~~6" NON-PERFORATED HELICAL CORRUGATED STEEL PIPE INCLUDING SPECIALS, 707.01~~				
12200	518	19	EACH	SCUPPERS, INCLUDING SUPPORTS			19	
	509							
15830	~~824~~	180,500	LBS.	EPOXY COATED REINFORCING STEEL, GRADE 60	5328	175,172		
51267500	SPECIAL	988	SQ.YD.	SEALING OF CONCRETE SURFACES *	45		943	
							100	

* SEE PROPOSAL NOTE

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

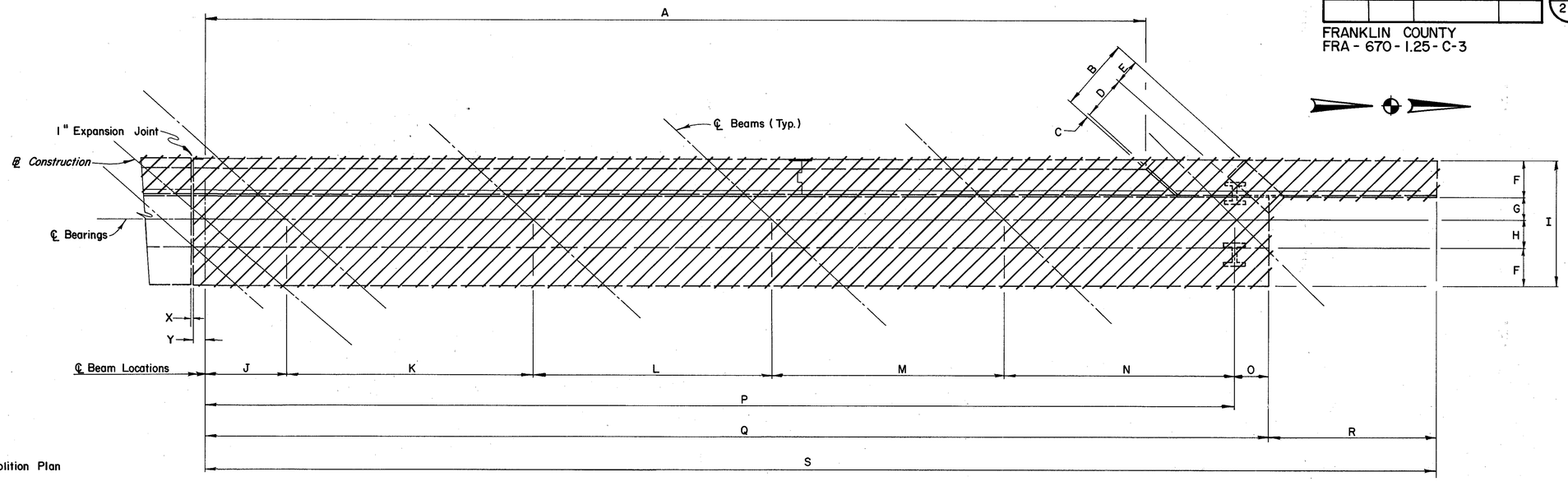
3/20

GENERAL NOTES/ ESTIMATED QUANTITIES

BRIDGE NO. FRA-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	10/87	

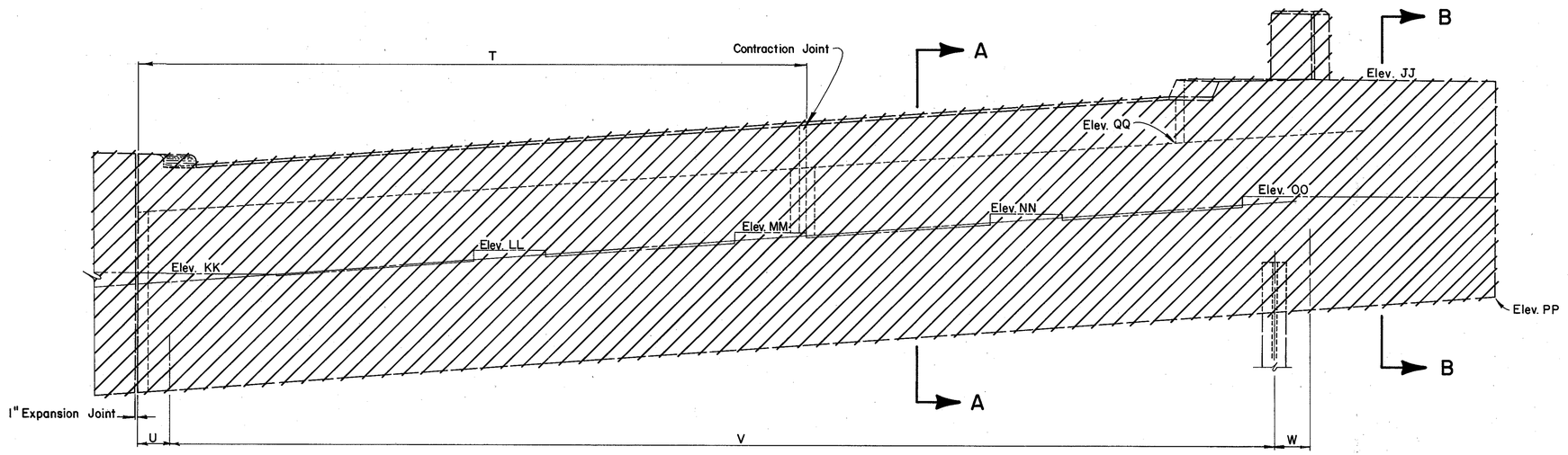
FRANKLIN COUNTY
FRA - 670 - 1.25 - C-3



PLAN

NOTES:

1. For continuation of West Abutment Demolition Plan see sheet 5/19.
2. For cross sections see sheet 7/19.
3. For additional details see Abutment Details, sheets 11/19 and 13/19.



ELEVATION

DIMENSIONS ±

Location	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
N. end of W. Abutment	57'-2 5/16"	3'-0"	2"	1'-10"	1'-0"	1'-9"	1'-0"	1'-3"	5'-9"	4'-6 7/16"	14'-9 7/16"	14'-5 7/16"	14'-1 7/8"	13'-10 11/16"	1'-6 1/8"	61'-9 7/8"	63'-4"	7'-6"	70'-10"	35'-8 1/2"	1'-7"	2-12 BP 53 - 9 Spa. @ 6'-9" C/c = 60'-9"	1'-7	1"	7"

ELEVATIONS ±

Location	JJ	KK	LL	MM	NN	OO	PP	QQ
N. end of W. Abutment	732.93	723.90	724.98	726.02	727.04	728.03	723.92	730.34

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

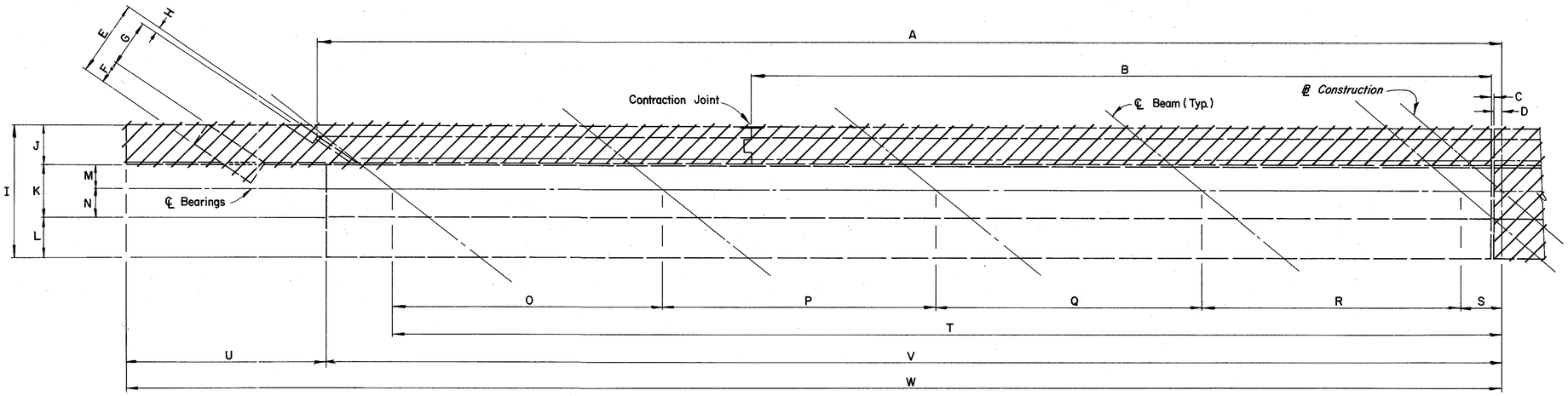
4/20

DEMOLITION PLAN NORTH END OF WEST ABUTMENT

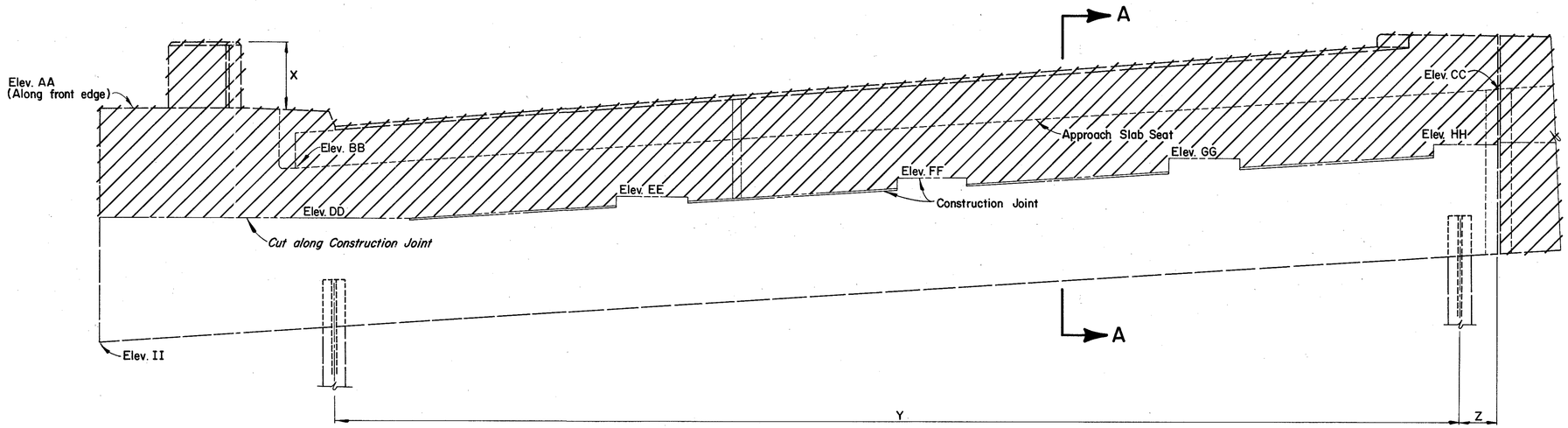
BRIDGE NO. FRA - 315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA.-670-1.25-C-3



PLAN



ELEVATION

DIMENSIONS ±																												
Location	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
S. end of W. Abutment	70'-0 1/8"	39'-7"	1"	7"	3'-0"	1'-0"	1'-10"	2"	5'-9"	1'-9"	2'-3"	1'-9"	1'-0"	1'-3"	16'-11 1/16"	16'-3 3/4"	15'-9 1/2"	15'-4 11/16"	2'-1 13/16"	66'-6 3/16"	10'-0"	69'-10"	79'-10"	2'-10 1/2"	2-12 BP 53-9 Spa. @ 7'-4" = 66'-0"	1'-7"

ELEVATIONS ±								
Location	AA	BB	CC	DD	EE	FF	GG	HH	II
S. end of W. Abutment	723.70	721.32	726.22	718.94	720.22	721.44	722.61	723.74	713.41

NOTES:
1. For continuation of West Abutment Demolition Plan, see sheet 4/19.
2. For cross-sections see sheet 7/19.
3. For additional details, see Abutment Details sheets 11/19 and 13/19.

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

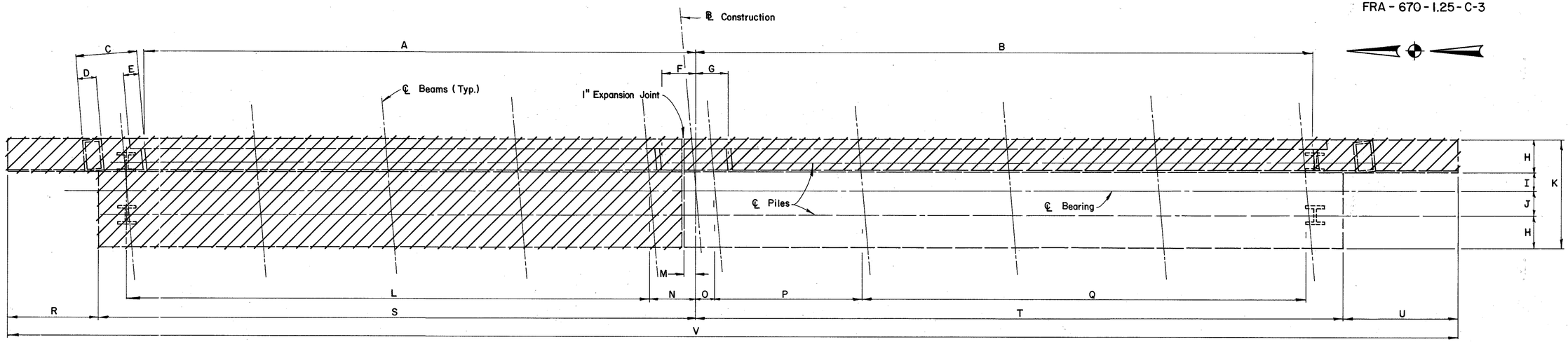
5/20

DEMOLITION PLAN SOUTH END OF WEST ABUTMENT

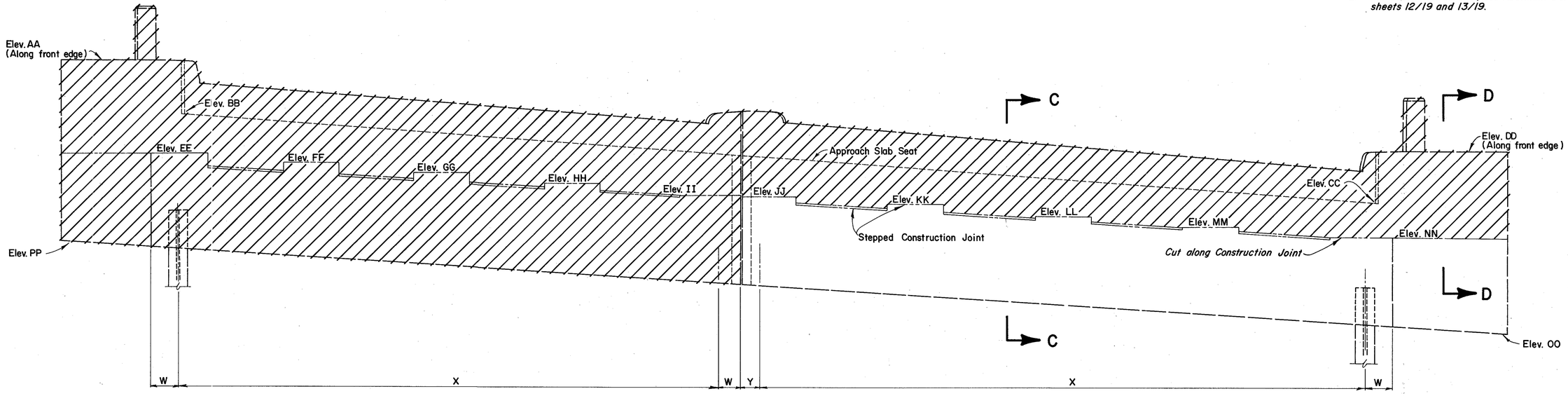
BRIDGE NO. FRA.-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C-3



PLAN



ELEVATIONS

NOTES:

1. *For cross-sections, see sheet 7/19.*
2. *For additional details, see Abutment Details sheets 12/19 and 13/19.*

DIMENSIONS ±																									
Location	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
E. Abutment	39'-3 5/16"	38'-11 5/16"	3'-0"	1'-0"	6"	2'-1 1/8"	1'-11 1/16"	1'-9"	1'-0"	1'-3"	5'-9"	4 Spa. @ 9'-5 5/16" = 37'-9 1/4"	8"	2'-10 3/16"	1'-4 1/8"	9'-5 5/16"	3 Spa. @ 9'-5 3/8" = 28'-4 1/8"	5'-2"	42'-3"	40'-10"	6'-4"	94'-7"	1'-6"	2-12 BP 53-7 Spa. @ 5'-6 c/c = 38'-6"	1'-7"

ELEVATIONS ±																
Location	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO	PP
E. Abutment	732.92	730.32	724.54	727.16	728.05	727.32	726.58	725.84	725.11	725.10	724.36	723.63	722.90	722.16	717.00	723.64

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

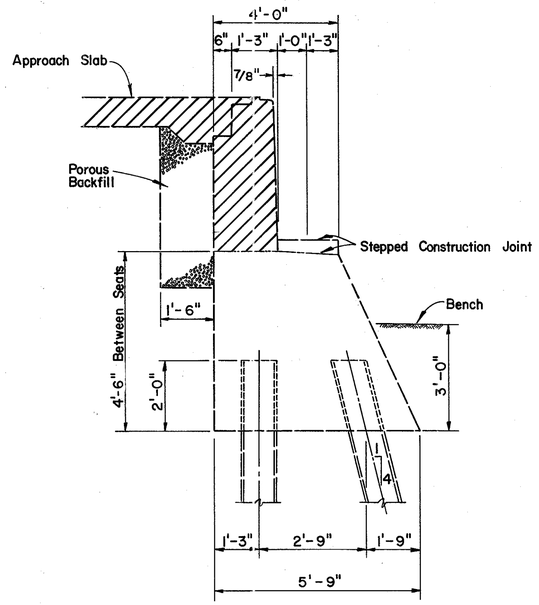
6/20

DEMOLITION PLAN
EAST ABUTMENT

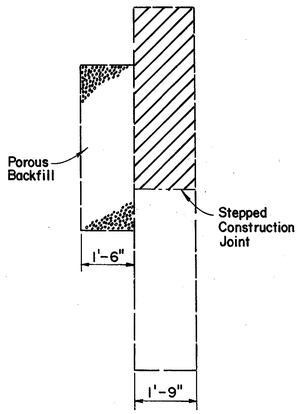
BRIDGE NO. FRA - 315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA-670-1.25-C-3

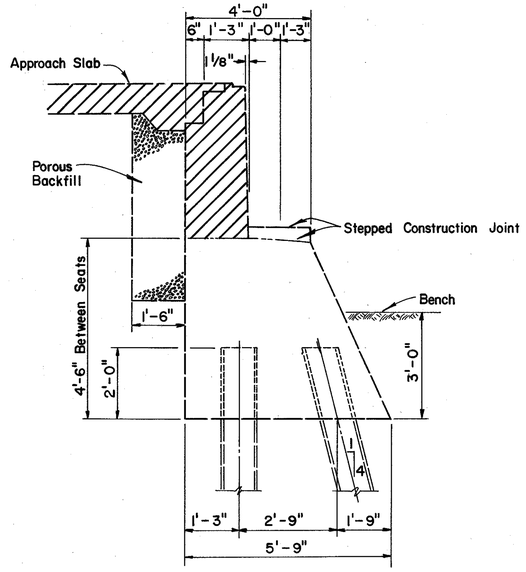


SECTION A-A

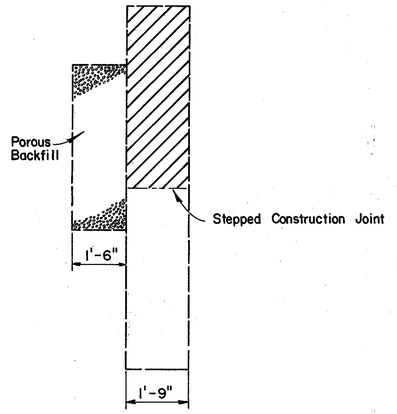


SECTION B-B

SECTIONS A & B FOR WEST ABUTMENT



SECTION C-C



SECTION D-D

SECTIONS C & D FOR EAST ABUTMENT

NOTES:

1. For location of sections see sheets 4/19 through 6/19.
2. For additional details see Abutment Details sheets 11/19 through 13/19.

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

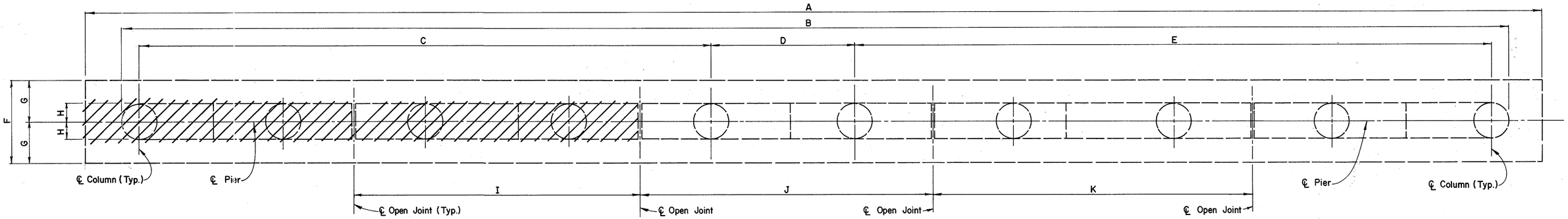
7/20

ABUTMENT DEMOLITION DETAILS

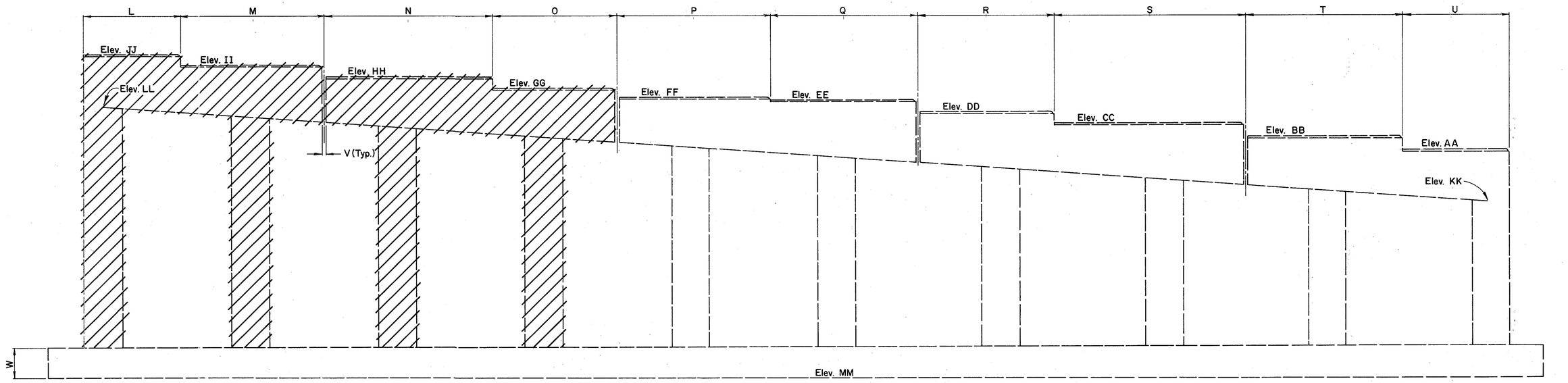
BRIDGE NO. FRA-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C-3



PLAN



ELEVATION

DIMENSIONS ±																							
Location	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Pier # 1	123'-10"	117'-10"	4 Spa @ 12'-2"= 48'-8"	12'-2"	4 Spa @ 13'-6"= 54'-0"	7'-0"	3'-6"	1'-6"	24'-4"	25'-0"	27'-0"	8'-0"	11'-9"	14'-0"	10'-4"	12'-9"	12'-3"	11'-3"	15'-9"	12'-11"	8'-10"	2"	2'-6"
Pier # 2	112'-0"	107'-0"	4 Spa @ 11'-0"= 44'-0"	12'-0"	4 Spa @ 12'-0"= 48'-0"	7'-0"	3'-6"	1'-6"	22'-0"	23'-6"	24'-0"	8'-0"	10'-0"	13'-9"	8'-3"	12'-6"	11'-0"	10'-4"	13'-8"	11'- 7"	7'-11"	2"	2'-6"

ELEVATIONS ±													
Location	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM
Pier # 1	720.96	722.05	723.10	724.12	725.11	725.23	726.19	727.14	728.06	728.98	716.64	724.71	702.10
Pier # 2	722.79	723.73	724.65	725.55	726.43	726.51	727.37	728.23	729.08	729.92	718.49	725.67	703.10

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

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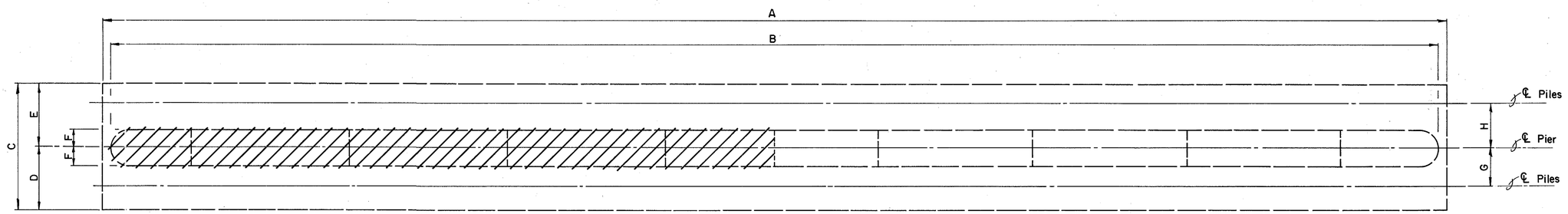
DEMOLITION PLAN
PIER # 1
PIER # 2

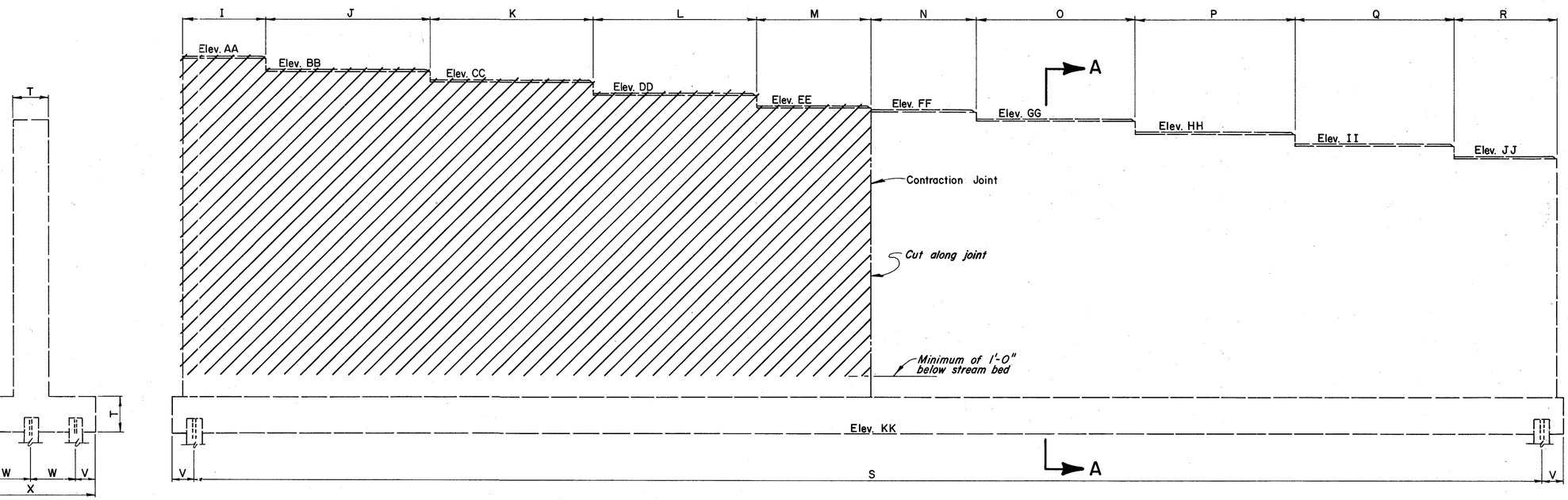
BRIDGE NO. FRA - 315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C-3



PLAN



SECTION A-A PIER # 3

ELEVATION

SECTION A-A PIER #4,5,6

DIMENSIONS ±																								
Location	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Pier # 3	97'-10½"	97'-0"	9'-0"	4'-6"	4'-6"	1'-3"	3'-0"	3'-0"	6'-0"	11'-6"	11'-6"	11'-6"	8'-0"	7'-6"	11'-3"	11'-3"	11'-3"	7'-3"	3-12 BP 53 - 23 Spa. @ 4'-1½" ℄c = 94'-10½"	2'-6"	1'-0"	1'-6"	3'-0"	9'-0"
Pier # 4	91'-4½"	90'-4"	9'-6"	4'-9"	4'-9"	1'-3"	3'-3"	3'-3"	6'-4"	10'-3"	10'-3"	10'-3"	8'-1"	6'-8"	10'-7"	10'-7"	10'-7"	6'-9"	2-12 BP 53 - 21 Spa. @ 4'-2½" ℄c = 88'-4½"	2'-6"	1'-0"	1'-6"	3'-3"	9'-6"
Pier # 5	87'- 2"	86'-4"	9'-6"	4'-9"	4'-9"	1'-3"	3'-3"	3'-3"	6'-7"	9'-10"	9'-10"	9'-10"	7'-1"	7'-1"	9'-10"	9'-10"	9'-10"	6'-7"	2-12 BP 53 - 20 Spa. @ 4'-2½" ℄c = 84'- 2"	2'-6"	1'-0"	1'-6"	3'-3"	9'-6"
Pier # 6	84'- 6½"	83'-10"	9'-3"	4'-7½"	4'-7½"	1'-3"	3'-1½"	3'-3½"	6'-3"	9'-6"	9'-6"	9'-6"	7'-2"	7'-2"	9'-6"	9'-6"	9'-6"	6'-3"	2-12 BP 53 - 19 Spa. @ 4'-3½" ℄c = 81'-6½"	2'-6"	1'-0"	1'-6"	3'-1½"	9'-3"

ELEVATIONS ±											
Location	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK
Pier # 3	730.46	729.68	728.90	728.11	727.31	727.28	726.48	725.67	724.86	724.03	704.00
Pier # 4	730.60	729.86	729.12	728.37	727.63	727.61	726.86	726.11	725.36	724.60	698.50
Pier # 5	730.06	729.33	728.60	727.88	727.15	727.15	726.42	725.69	724.97	724.24	698.50
Pier # 6	729.11	728.38	727.66	726.94	726.21	726.21	725.49	724.77	724.04	723.32	698.50

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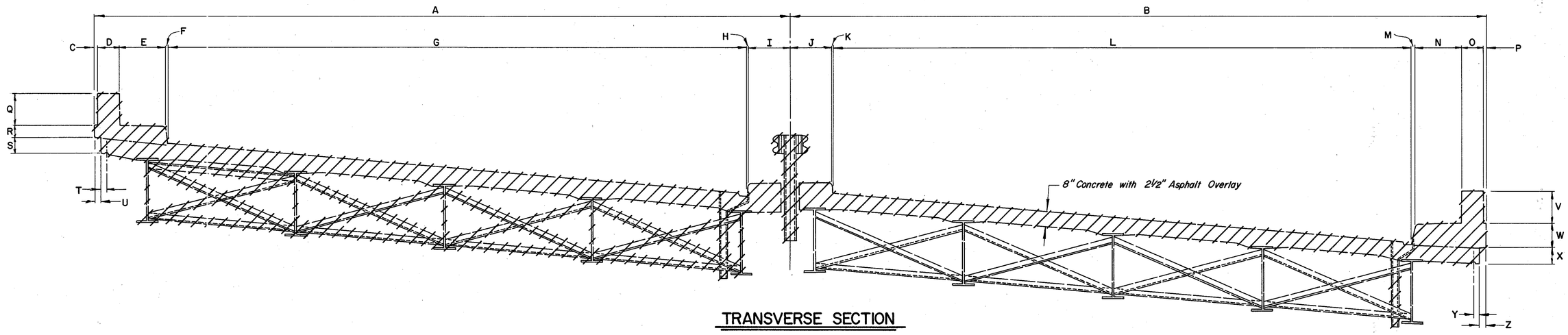
DEMOLITION PLAN
PIER # 3 PIER # 4
PIER # 5 PIER # 6

BRIDGE NO. FRA - 315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA.-670-1.25-C-3



TRANSVERSE SECTION

DIMENSIONS ±																											
Location	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Transverse Section	42'-2"	42'-2"	2"	1'-0"	1'-10"	2"	37'-0"	1"	1'-11"	1'-11"	1"	37'-0"	2"	1'-10"	1'-0"	2"	1'-6"	10"	8"	3"	4"	1'-6"	1'-4"	8"	3"	4"

NOTE: All beams are 36 WF 230,
All crossframes are 3 x 3 x 5/16 angles.

JOHN E. FOSTER AND ASSOCIATES, INC. 10/20
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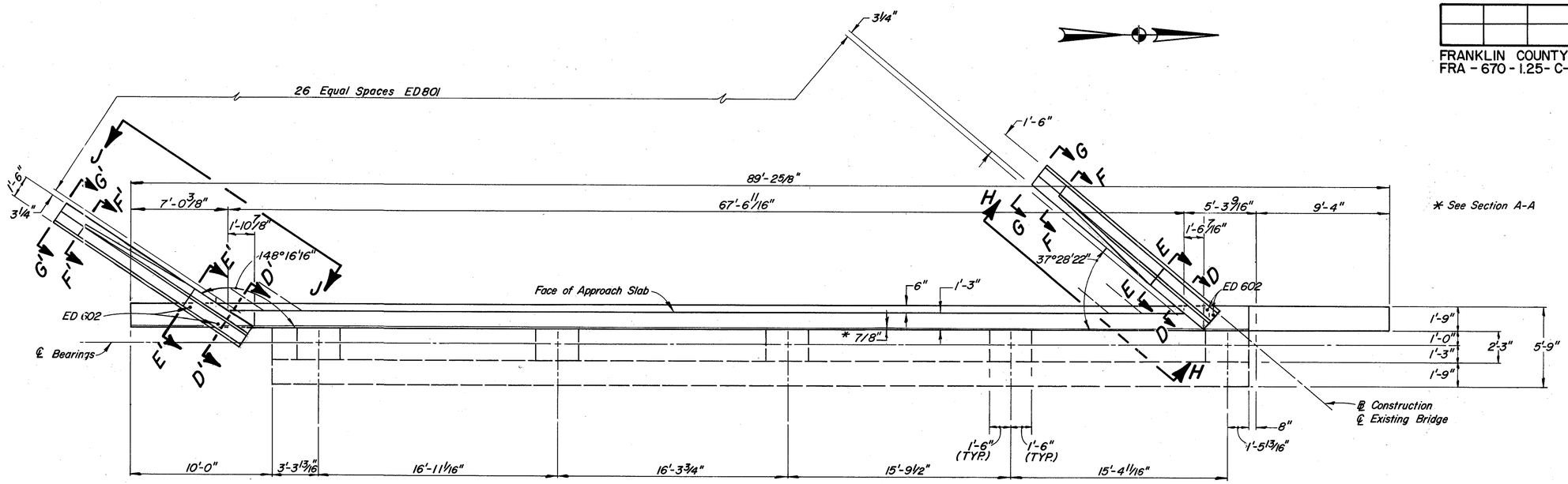
DEMOLITION PLAN
SUPERSTRUCTURE
DETAILS

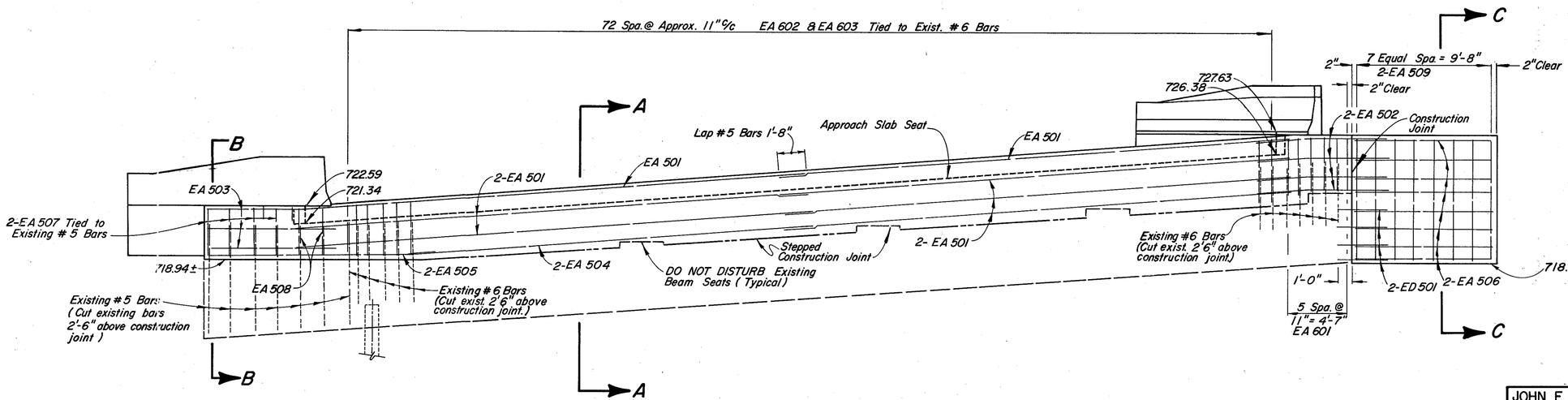
BRIDGE NO. FRA.-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C-3



WEST ABUTMENT PLAN



ELEVATION

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

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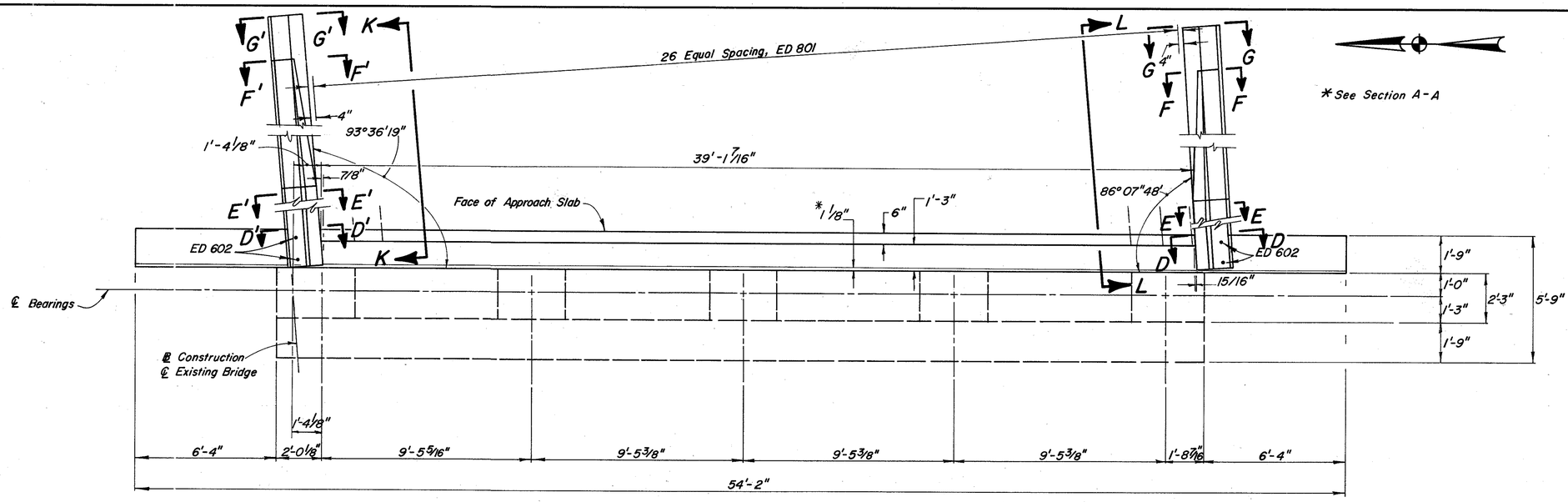
WEST ABUTMENT DETAILS

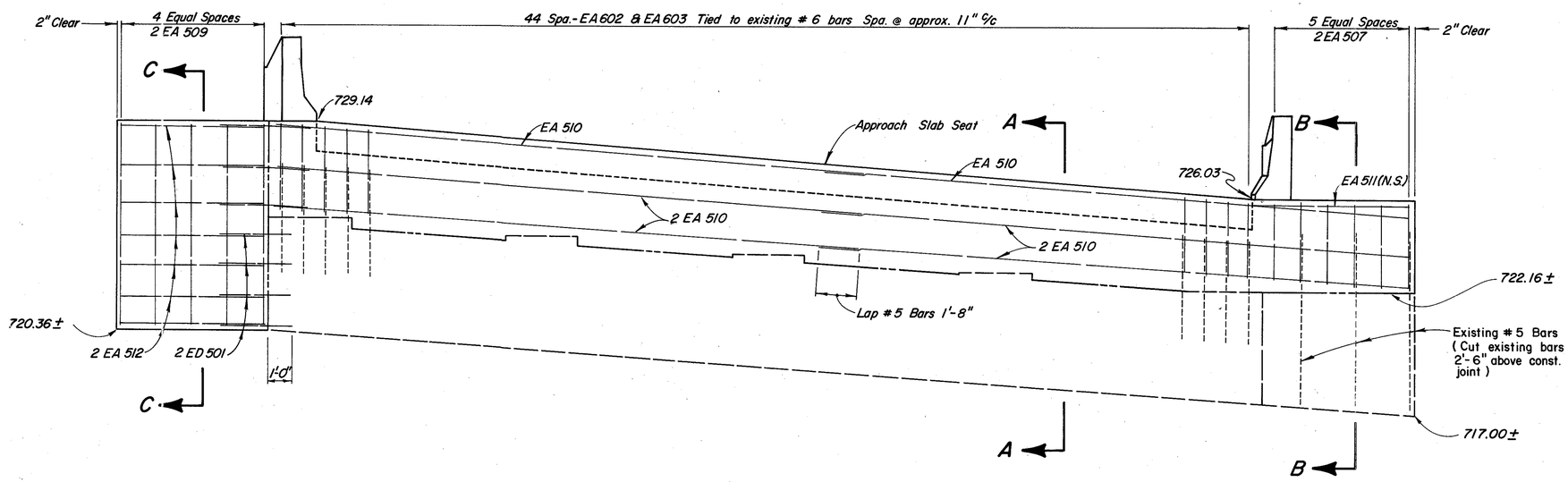
BRIDGE NO. FRA - 315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	10/87	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C-3



PLAN



ELEVATION

NOTE:
For sections A-A thru C-C see sheet 13/20
For sections D-D thru G-G and D'-D' thru G'-G' and views K-K and L-L see sheet 14/20.

JOHN E. FOSTER AND ASSOCIATES, INC.
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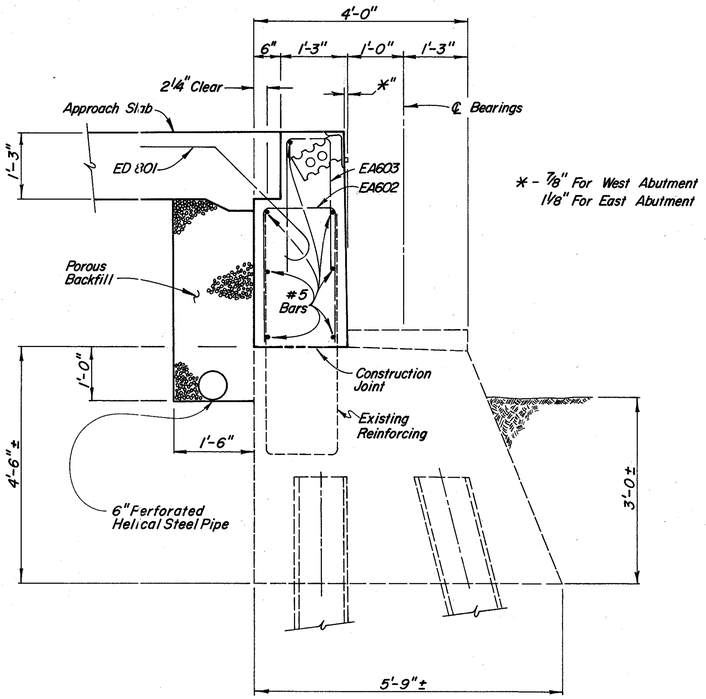
EAST ABUTMENT DETAILS

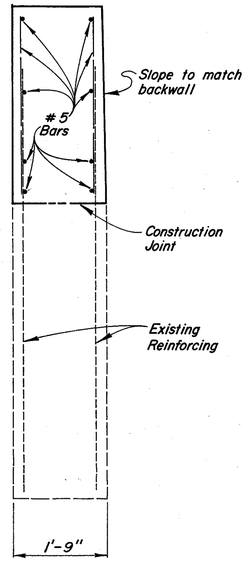
BRIDGE NO. FRA - 315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	10/87	

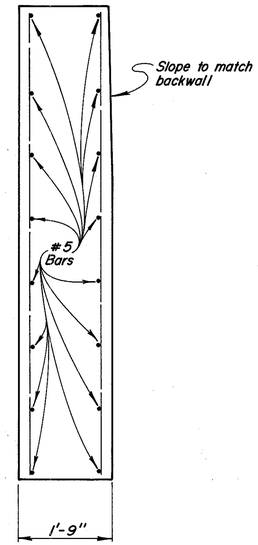
FRANKLIN COUNTY
FRA.-670-1.25-C-3



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:

1. All bars shall be placed with 2" clearance unless otherwise noted. For section locations, see sheets 11/20 and 12/20
2. Porous backfill, 1'-6" thick shall extend up to the plane of the subgrade and laterally to the ends of the wing walls.

JOHN E. FOSTER AND ASSOCIATES, INC.
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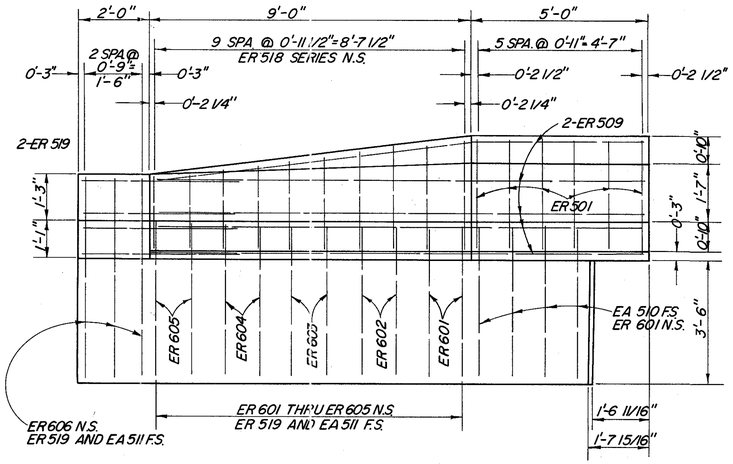
ABUTMENT DETAILS

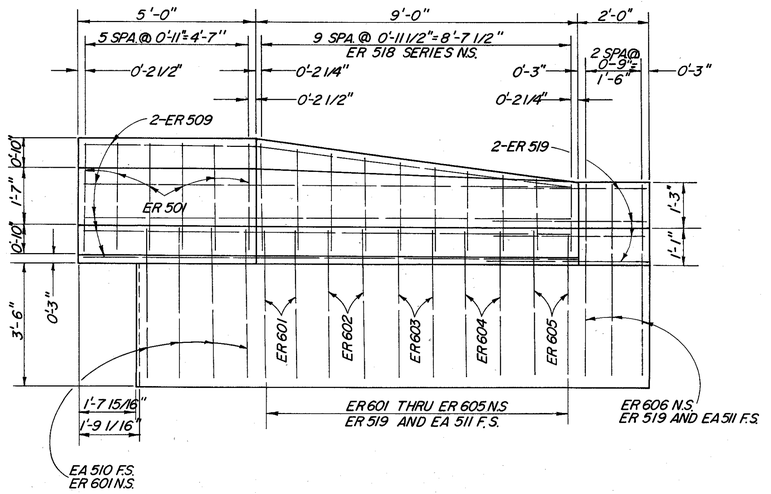
BRIDGE NO. FRA.-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	10/87	

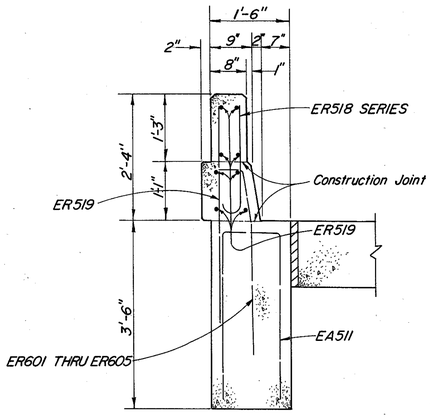
FRANKLIN COUNTY
FRA.-670-1.25-C-3



ELEVATION L-L
(SHOWN WITHOUT ABUTMENT)

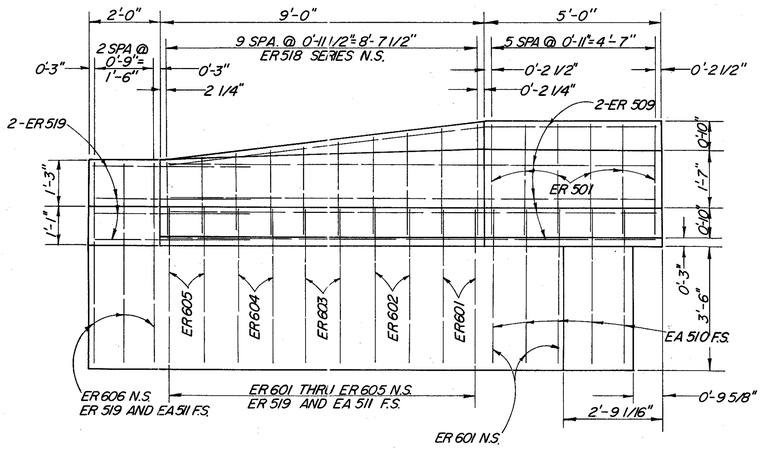


ELEVATION K-K
(SHOWN WITHOUT ABUTMENT)

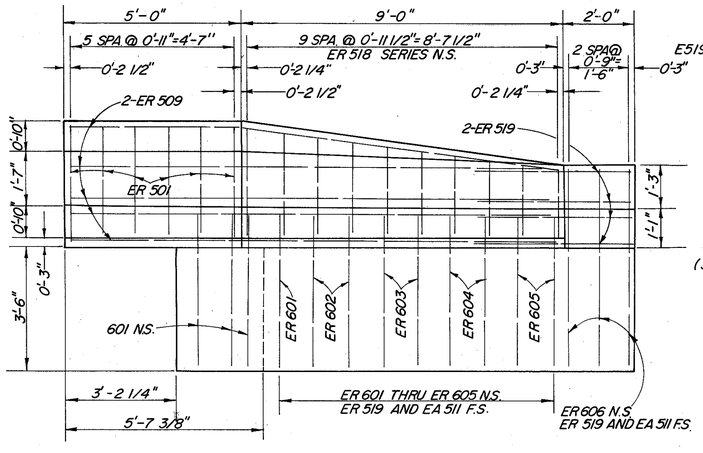


SECTION F-F
(SECTION F'-F' SAME BUT OPPOSITE HAND)

EAST ABUTMENT RAILING

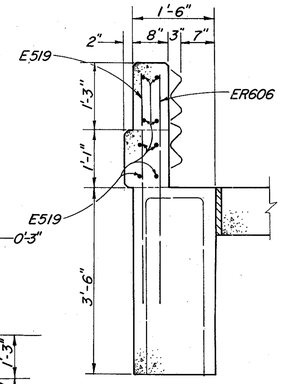


ELEVATION H-H
(SHOWN WITHOUT ABUTMENT)

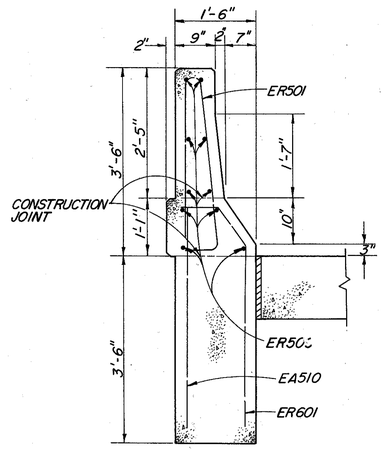


ELEVATION J-J
(SHOWN WITHOUT ABUTMENT)

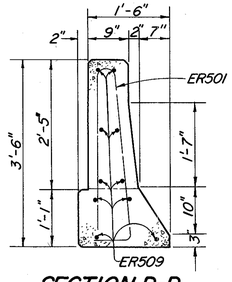
WEST ABUTMENT RAILING



SECTION G-G
(SECTION G'-G' SAME BUT OPPOSITE HAND)



SECTION E-E
(SECTION E'-E' SAME BUT OPPOSITE HAND)



SECTION D-D
(SECTION D'-D' SAME BUT OPPOSITE HAND)

JOHN E. FOSTER AND ASSOCIATES, INC.
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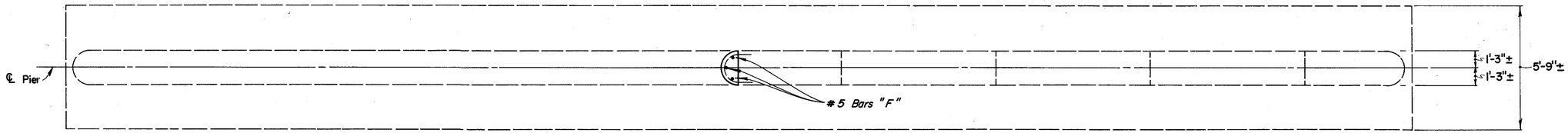
ABUTMENT DETAILS

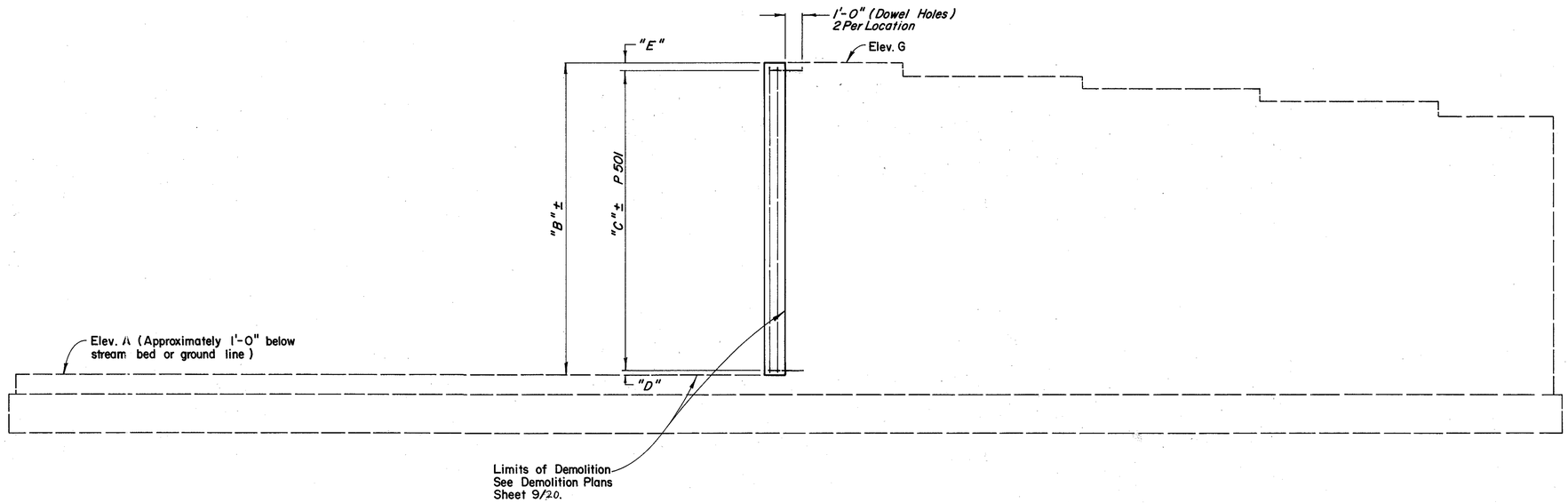
BRIDGE NO. FRA.-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	KAY	DPK	JSS	10/87	

FRANKLIN COUNTY
FRA.-670-1.25-C-3



PLAN



ELEVATION

DIMENSION OR ELEVATION TABLE							
Location	Elev. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F	Elev. G
Pier 3	718.00±	9'-3 3/8"±	6 Spa. @ 1'-5" = 8'-6"	3"	6 3/8"	P 502 8'-9"	727.28±
Pier 4	702.50±	25'-1 3/8"±	16 Spa. @ 1'-6" = 24'-0"	6"	7 3/8"	P 503 24'-6"	727.61±
Pier 5	702.50±	24'-7 3/4"±	16 Spa. @ 1'-5 3/4" = 23'-8"	4"	7 3/4"	P 504 24'-2"	727.15±
Pier 6	702.50±	23'-8 1/2"±	15 Spa. @ 1'-6" = 22'-6"	6"	8 1/2"	P 505 23'-2 1/2"	726.21±

NOTES:
1. Dowel holes shall be 1 1/8" ∅, drilled @ 10° from horizontal to aid in holding grout.

JOHN E. FOSTER AND ASSOCIATES, INC.
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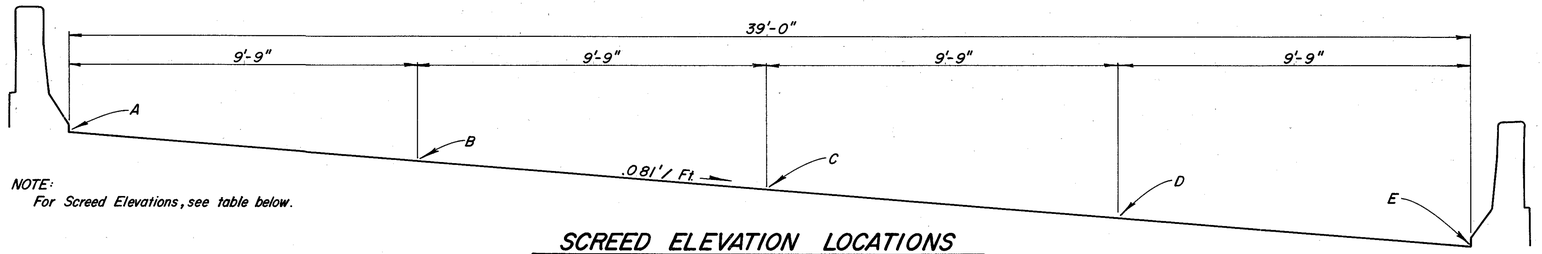
PIER DETAILS
PIER #3 PIER #4
PIER #5 PIER #6

BRIDGE NO. FRA.-315
RAMP OC OVER OLENTANGY RIVER

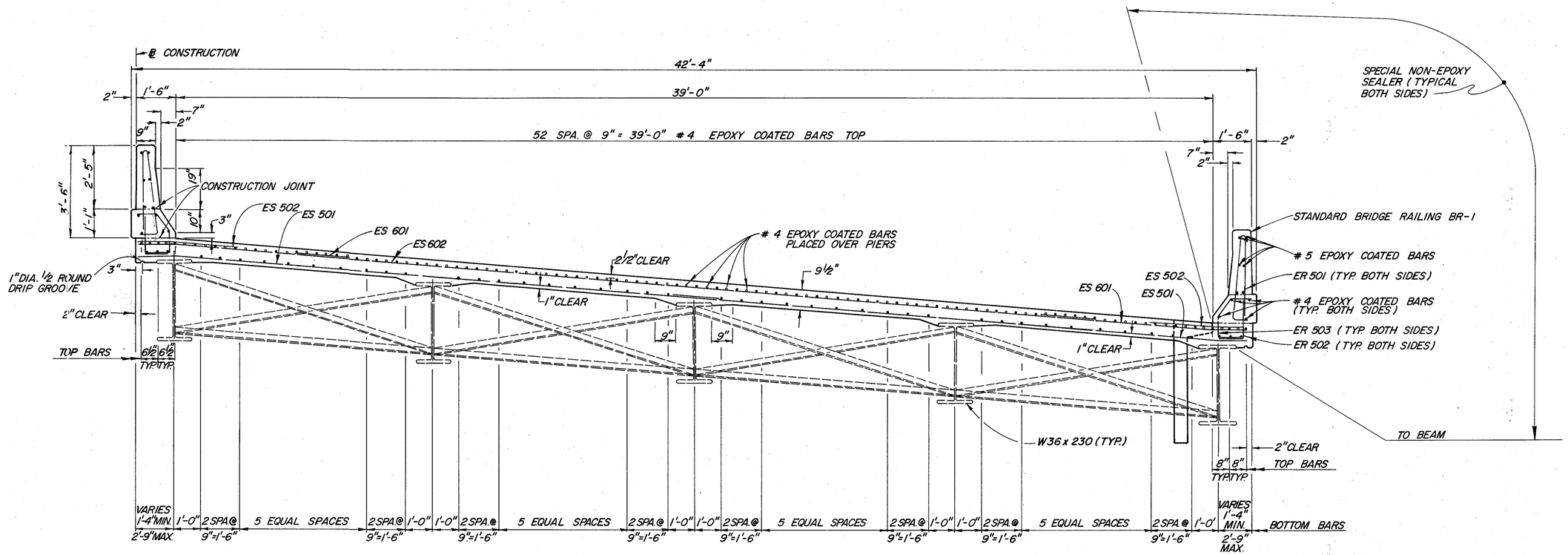
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA.-670-1.25-C-3



NOTE:
For Screed Elevations, see table below.

SCREED ELEVATION LOCATIONS



TRANSVERSE SECTION

NOTES:

SCUPPERS shall be in accordance with Std. Dwg. SD-1-69 except that scupper pipes shall extend 8" below the bottom of the beams instead of 2".

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 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.

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 no more than 1:4 for a haunch less than 9" width.

SCREED ELEVATIONS TABLE

℄ Construction Stations		103+75	104+00	104+25	104+50	104+75	105+00	105+25	105+50	105+75	106+00	106+25	106+50	106+75	107+00	107+25	107+50	107+75	108+00	108+25	108+50	108+75	109+00
LOCATIONS	A	725.58	726.48	727.30	728.05	728.73	729.33	729.87	730.33	730.73	731.05	731.30	731.48	731.58	731.62	731.58	731.48	731.30	731.05	730.73	730.33	729.87	729.33
		—	—	—	728.06	728.74	729.33	729.88	730.33	730.74	731.07	731.30	731.48	731.59	731.62	731.60	731.53	731.32	731.07	730.76	730.33	729.88	729.34
	B	724.80	725.70	726.52	727.27	727.95	728.55	729.09	729.55	729.95	730.27	730.52	730.70	730.80	730.84	730.80	730.70	730.52	730.27	729.95	729.55	729.09	728.55
		—	—	—	727.29	727.95	728.56	729.10	729.55	729.97	730.30	730.52	730.71	730.81	730.84	730.84	730.77	730.54	730.31	729.99	729.55	729.10	728.56
	C	724.02	724.92	725.74	726.49	727.17	727.77	728.31	728.77	729.17	729.49	729.74	729.92	730.02	730.06	730.02	729.92	729.74	729.49	729.17	728.77	728.31	727.77
		—	—	725.75	726.50	727.17	727.80	728.33	728.77	729.22	729.52	729.74	729.93	730.03	730.06	730.06	729.98	729.74	729.52	729.20	728.77	728.32	727.78
	D	723.24	724.14	724.96	725.71	726.39	726.99	727.53	727.99	728.39	728.71	728.96	729.14	729.24	729.28	729.24	729.14	728.96	728.71	728.39	727.99	727.53	726.99
		—	—	724.99	725.72	726.39	727.00	727.53	728.00	728.43	728.74	728.96	729.15	729.24	729.28	729.30	729.21	728.96	728.75	728.42	727.99	727.54	727.00
	E	722.46	723.36	724.18	724.93	725.61	726.21	726.75	727.21	727.61	727.93	728.18	728.36	728.46	728.50	728.46	728.36	728.18	727.93	727.61	727.21	726.75	726.21
		—	723.38	724.20	724.93	725.62	726.22	726.75	727.23	727.63	727.93	728.19	728.38	728.47	728.50	728.48	728.37	728.18	727.94	727.62	727.21	726.77	726.22

TABLE LEGEND: F | 000.00 Proposed Elevation / 000.00 Screed Elevation

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

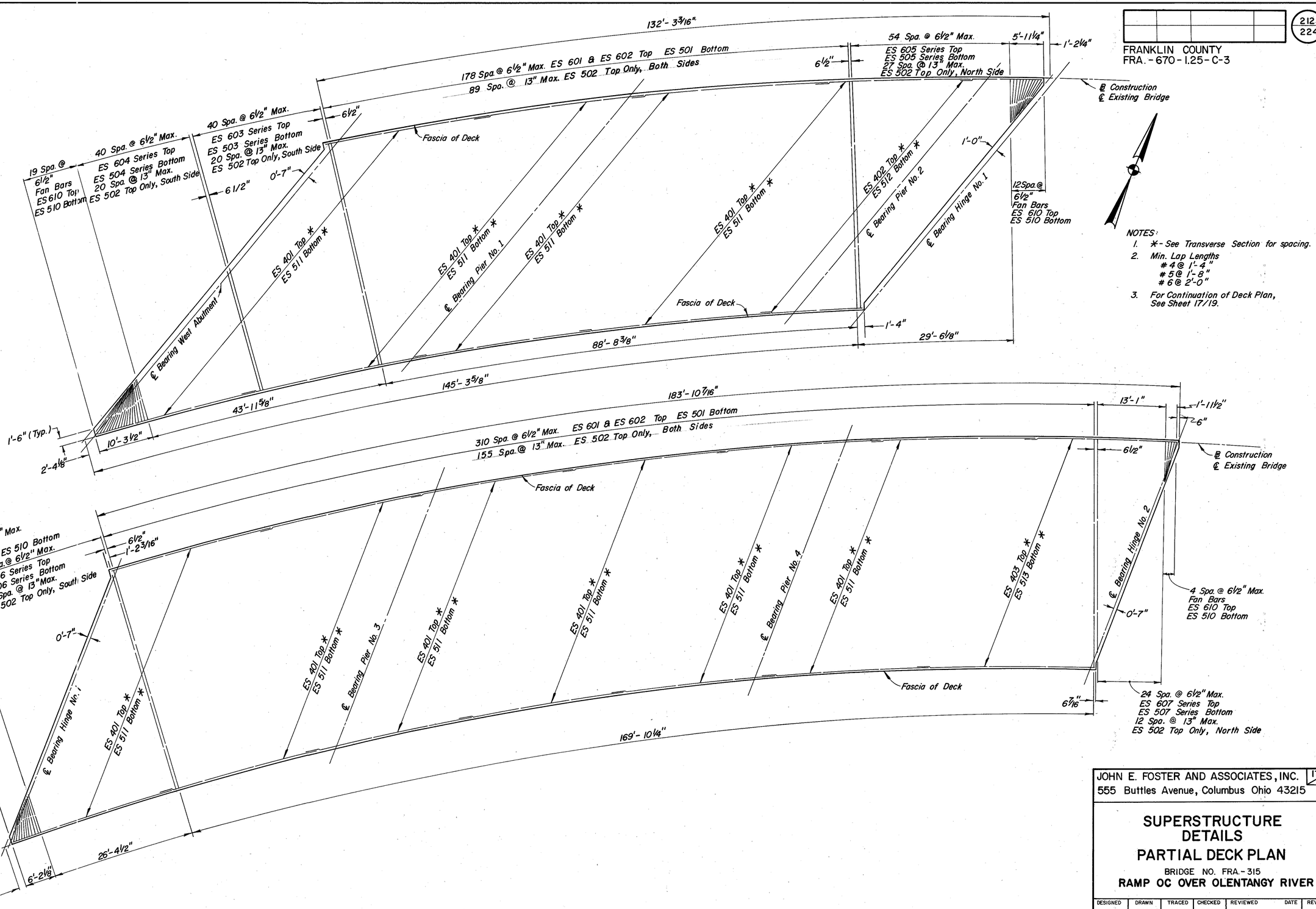
16/20

SUPERSTRUCTURE DETAILS

BRIDGE NO. FRA.-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA.-670-1.25-C-3



NOTES:

1. * - See Transverse Section for spacing.
2. Min. Lap Lengths
   # 4 @ 1'-4"
   # 5 @ 1'-8"
   # 6 @ 2'-0"
3. For Continuation of Deck Plan, See Sheet 17/19.

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

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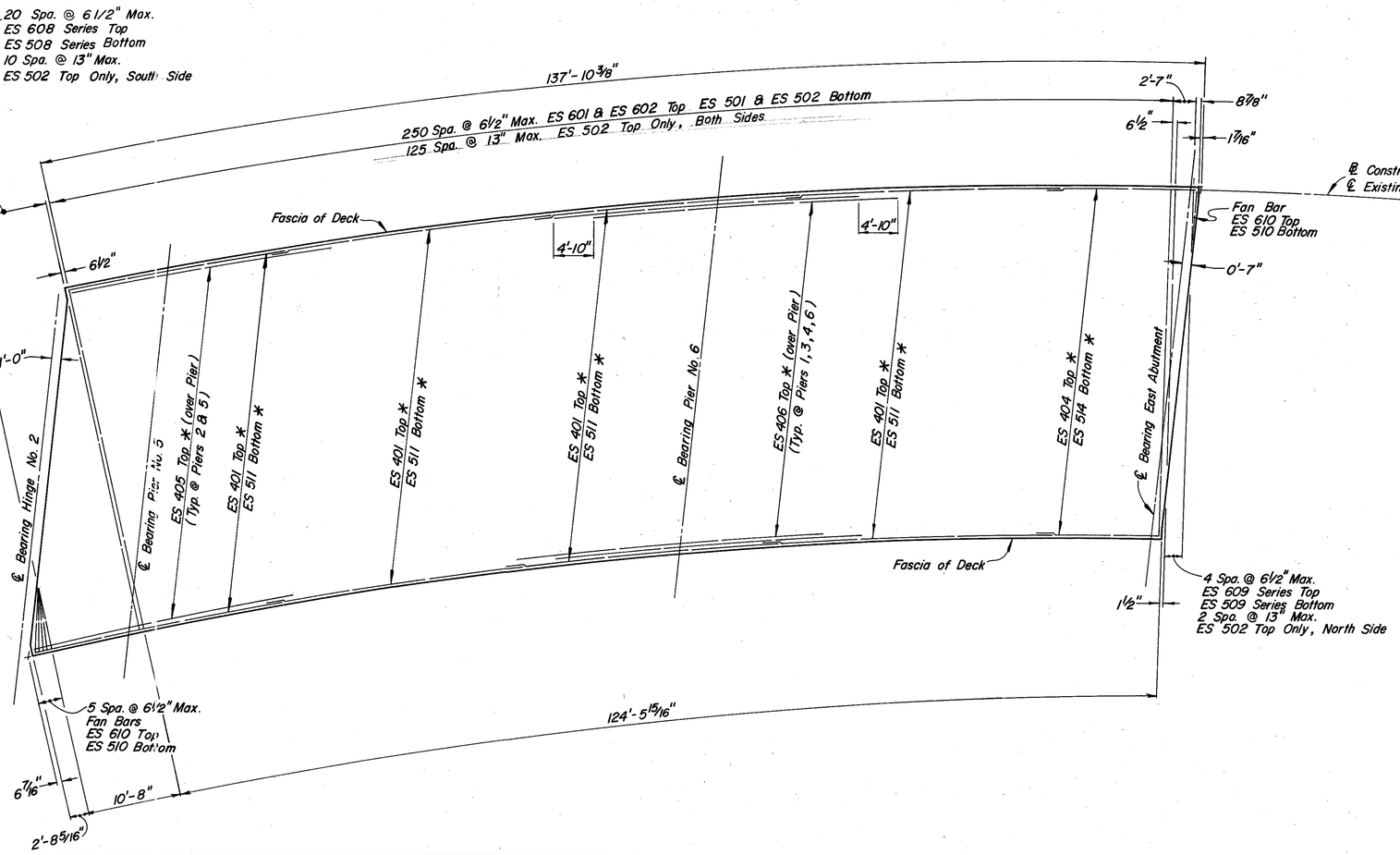
SUPERSTRUCTURE DETAILS

PARTIAL DECK PLAN

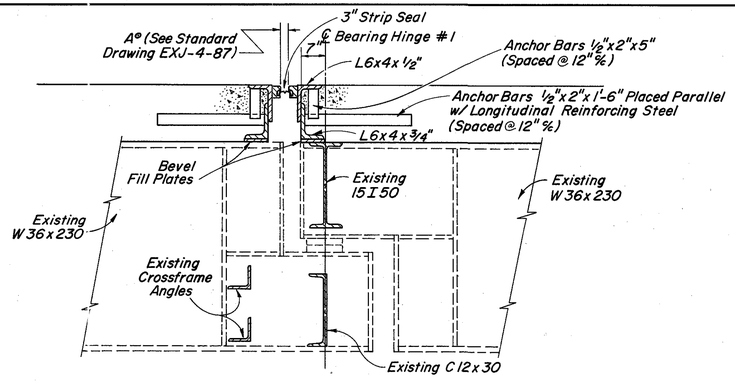
BRIDGE NO. FRA.-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	

FRANKLIN COUNTY
FRA - 670 - 1.25 - C-3



NOTES:
1. * - See Transverse Section for spacing.
2. For Continuation of Deck Plan, See Sheet 16/19.



ELEVATION

EXPANSION JOINT DETAIL AT HINGE #1

NOTES:
1. Expansion Joint at Hinge #2 is Similar to that Shown for Hinge #1 Except Opposite Hand.
2. For Details not Shown, See Standard Drawing: EXJ-4-87
3. Expansion Joints at Abutments shall be in accordance with Standard Drawing EXJ-2-81.

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

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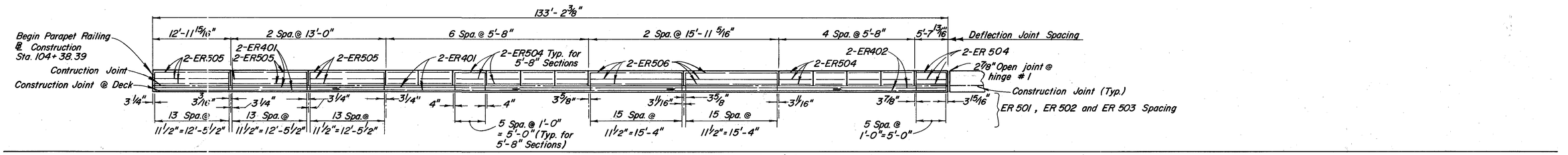
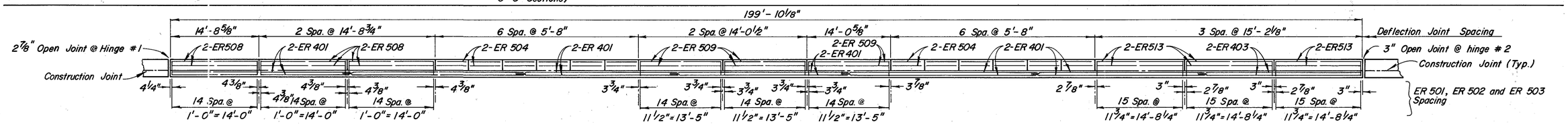
SUPERSTRUCTURE DETAILS
PARTIAL DECK PLAN

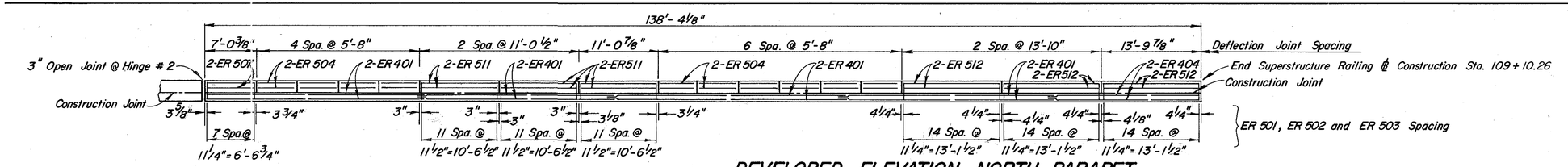
BRIDGE NO. FRA - 315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	10/87	

FRANKLIN COUNTY
FRA.-670-1.25-C-3

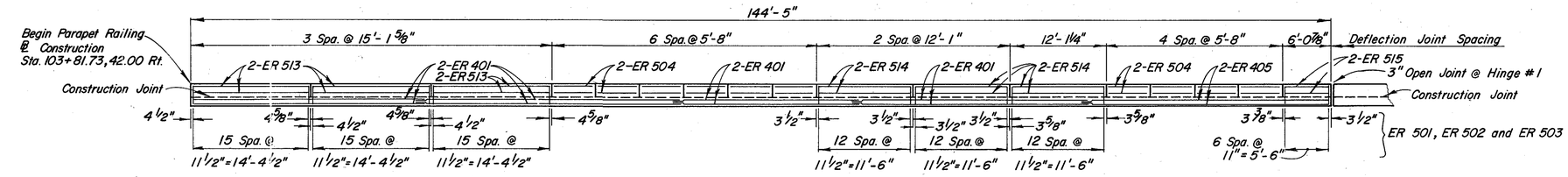


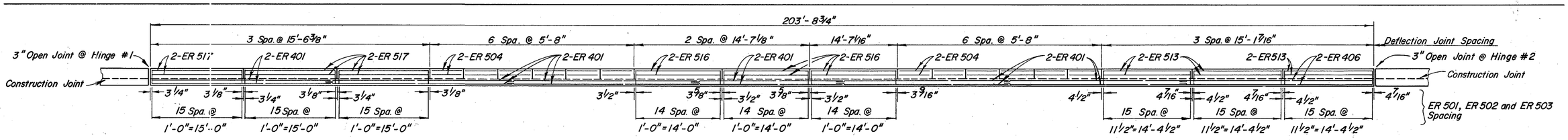


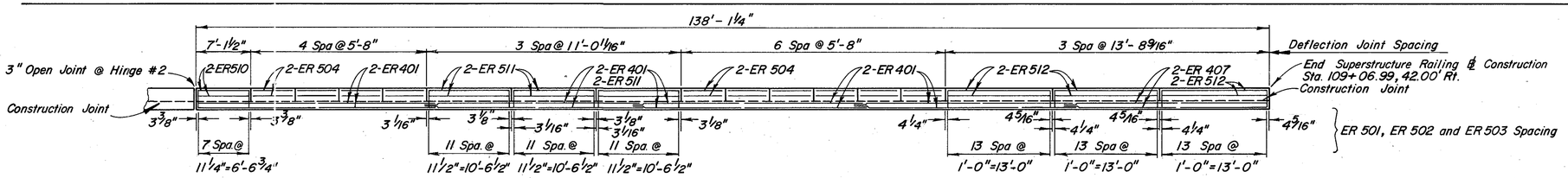


DEVELOPED ELEVATION NORTH PARAPET

DIMENSIONS ARE ALONG FASCIA OF DECK







DEVELOPED ELEVATION SOUTH PARAPET

DIMENSIONS ARE ALONG FASCIA OF DECK

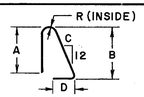
JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

19/20

SUPERSTRUCTURE DETAILS

BRIDGE NO. FRA.-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	9/87	



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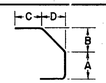
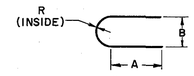


TYPE 2

TYPE 3



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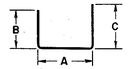

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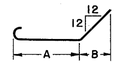
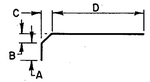


TYPE 6

ALL DIMENSIONS ARE OUT TO OUT UNLESS NOTED.



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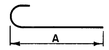

TYPE 8

215
224

FRANKLIN COUNTY
FRA - 670 - 1.25 - C - 3

BAR MARK	SUPERSTRUCTURE	ABUTMENTS	PIERS	TOTAL NO.	LENGTH	WEIGHT	SHAPE TYPE	DIMENSIONS A	B	C	D	R
				EPOXY COATED BARS								
ES 401	798			798	30'-0"	15992	STR.					
ES 402	57			57	28'-1"	1069	STR.					
ES 403	57			57	30'-5"	1158	STR.					
ES 404	57			57	22'-9 3/4"	869	STR.					
ES 405	112			112	32'-2"	2407	STR.					
ES 406	224			224	37'-8"	5636	STR.					
ES 501	1482			1482	21'-8"	33491	STR.					
ES 502	866			866	3'-9"	3387	STR.					
ES 503	1 SERIES OF 41			41	41'-0" TO	1392	STR.	INCREMENT			BARS	
SERIES					24'-1 1/2"			0'-5 1/16"				
ES 504	1 SERIES OF 41			41	24'-0" TO	679	STR.	INCREMENT			BARS	
SERIES					7'-9"			0'-4 7/8"				
ES 505	1 SERIES OF 55			55	41'-0" TO	1416	STR.	INCREMENT			BARS	
SERIES					8'-4 1/2"			0'- 7 1/4"				
ES 506	1 SERIES OF 49			49	40'-8" TO	1241	STR.	INCREMENT			BARS	
SERIES					7'-11"			0'-8 3/16"				
ES 507	1 SERIES OF 25			25	39'-6" TO	619	STR.	INCREMENT			BARS	
SERIES					8'-0"			1'-3 3/4"				
ES 508	1 SERIES OF 21			21	39'-3 1/2" TO	521	STR.	INCREMENT			BARS	
SERIES					8'-3"			1'-6 5/8"				
ES 509	1 SERIES OF 5			5	32'-3 3/4" TO	106	STR.	INCREMENT			BARS	
SERIES					8'-3"			6'-0 3/16"				
ES 510	53			53	7'-8"	424	STR.					
ES 511	644			644	30'-0"	20151	STR.					
ES 512	46			46	29'-5 1/2"	1413	STR.					
ES 513	46			46	32'-5"	1555	STR.					
ES 514	46			46	24'-1 3/4"	1158	STR.					
ES 601	1482			1482	7'-10"	17437	STR.					
ES 602	741			741	30'-0"	33389	STR.					
ES 603	1 SERIES OF 41			41	41'-0" TO	2005	STR.	INCREMENT			BARS	
SERIES					24'-1 1/2"			0'-5 1/16"				
ES 604	1 SERIES OF 41			41	24'-0" TO	978	STR.	INCREMENT			BARS	
SERIES					7'-9"			0'-4 7/8"				
ES 605	1 SERIES OF 55			55	41'-0" TO	2039	STR.	INCREMENT			BARS	
SERIES					8'-4 1/2"			0'-7 1/4"				
ES 606	1 SERIES OF 49			49	40'-8" TO	1788	STR.	INCREMENT			BARS	
SERIES					7'-11"			0'-8 3/16"				
ES 607	1 SERIES OF 25			25	39'-6" TO	892	STR.	INCREMENT			BARS	
SERIES					8'-0"			1'-3 3/4"				
ES 608	1 SERIES OF 21			21	39'-3 1/2" TO	750	STR.	INCREMENT			BARS	
SERIES					8'-3"			1'- 6 5/8'				
ES 609	1 SERIES OF 5			5	32'-3 3/4" TO	152	STR.	INCREMENT			BARS	
SERIES					8'-3"			6'-0 3/16"				
ES 610	53			53	7'-8"	610	STR.					

BAR MARK	SUPERSTRUCTURE	ABUTMENTS	PIERS	TOTAL NO.	LENGTH	WEIGHT	SHAPE TYPE	DIMENSIONS A	B	C	D	R
				EPOXY COATED BARS								
ER 401	112			112	30'-0"	2244	STR.					
ER 402	4			4	18'-1"	48	STR.					
ER 403	4			4	27'-4"	73	STR.					
ER 404	4			4	23'-2"	62	STR.					
ER 405	4			4	29'-3"	78	STR.					
ER 406	4			4	31'-3"	84	STR.					
ER 407	4			4	23'-0"	61	STR.					
ER 501	1009	24		1033	6'-11"	7452	1	3'-0"	3'-3"	0'-1 1/4"	0'-7 1/2"	1 3/8"
ER 502	1009			1009	3'-0 3/8"	3190	2	0'-9 1/2"	0'-8 1/2"	0'-9"	0'-6"	
ER 503	1009			1009	2'-3"	2368	3	1'-6"	0'-10 1/2"			
ER 504	262			262	5'-2"	1412	STR.					
ER 505	18			18	12'-6"	235	STR.					
ER 506	12			12	15'-5"	193	STR.					
ER 507	6			6	6'-6"	41	STR.					
ER 508	18			18	14'-2 1/2"	267	STR.					
ER 509	18	40		58	13'-6"	817	STR.					
ER 510	6			6	6'-7 1/2"	41	STR.					
ER 511	36			36	10'-6 1/2"	396	STR.					
ER 512	36			36	13'-3"	498	STR.					
ER 513	54			54	14'-8"	826	STR.					
ER 514	18			18	11'-7"	217	STR.					
ER 515	6			6	5'-7"	35	STR.					
ER 516	18			18	14'-1"	264	STR.					
ER 517	18			18	15'-0"	282	STR.					
ER 518		4 SERIES OF 10		40	3'-9 1/2" TO 2'-8"	135	8	3'-2 1/2" TO 2'-1"	INCREMENT BARS 1 1/2"			
ER 519		83		83	4'-7"	397	STR.					
ER 601		21		21	4'-7"	145	7	0'-7"	0'-2"	0'-8 1/2"	3'-5"	
ER 602		8		8	4'-7"	55	7	0'-7"	0'-3"	0'-8 1/2"	3'-5"	
ER 603		8		8	4'-9"	57	7	0'-8"	0'-4"	0'-8 1/2"	3'-5"	
ER 604		8		8	4'-9"	57	7	0'-8"	0'-5"	0'-8 1/2"	3'-5"	
ER 605		8		8	4'-11"	59	7	0'-9"	0'-6"	0'-8 1/2"	3'-5"	
ER 606		12		12	4'-3"	77	STR.					
E 501		12		12	34'-10"	436	STR.					
E 502		8		8	8'-9"	73	STR.					
E 503		6		6	9'-0"	56	STR.					
E 504		2		2	28'-0"	58	STR.					
E 505		2		2	16'-0"	33	STR.					
E 506		16		16	9'-8"	161	STR.					
E 507		20		20	3'-3"	68	STR.					
E 508		4		4	3'-0"	13	STR.					
E 509		26		26	8'-4"	226	STR.					
E 510		13		13	4'-2"	56	STR.					
E 511		51		51	6'-11"	368	5	1'-2"	3'-0"	3'-0"		
E 601		4		4	3'-6"	21	STR.					
E 602		73		73	6'-0"	658	5	1'-3"	2'-6"	2'-6"		
E 603		73		73	5'-7"	612	5	0'-10"	2'-6"	2'-6"		
E 501		16		16	3'-6"	58	STR.					
E 602		4		4	2'-8"	16	STR.					
E 801		54		54	4'-10"	697	6	2'-7"	1'-0"			
P 501			57	57	5'-0 3/4"	301	4	1'-0"	2'-0"			0'-11 3/8"
P 502			3	3	8'-9"	27	STR.					
P 503			3	3	24'-6"	77	STR.					
P 504			3	3	24'-2"	76	STR.					
P 505			3	3	23'-2 1/2"	73	STR.					

Refer to CMS sections 106.03, 700, 709.01 thru 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structure by the additional steel, spliced in accordance with 509.08.

JOHN E. FOSTER AND ASSOCIATES, INC.
555 Buttles Avenue, Columbus Ohio 43215

20/20

REINFORCING STEEL LIST

BRIDGE NO. FRA-315
RAMP OC OVER OLENTANGY RIVER

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JDH	GAM	GAM	DPK	JSS	10/87	

MELP GENERAL NOTES

GENERAL

THE POWER SUPPLYING AGENCY, DESIGNATED OWNER FOR THIS PORTION OF THE PROJECT IS:

CITY OF COLUMBUS, OHIO
DIVISION OF ELECTRICITY
910 DUBLIN AVENUE
COLUMBUS, OHIO 43215

ALL CONSTRUCTION WORK SHALL BE DONE IN A THOROUGH AND WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, AND CONSTRUCTION DRAWINGS. THE 1984 EDITION OF THE NATIONAL ELECTRICAL SAFETY CODE SHALL BE FOLLOWED EXCEPT WHERE LOCAL REGULATIONS ARE MORE STRINGENT, IN WHICH CASE, LOCAL REGULATION SHALL GOVERN.

OHIO DEPARTMENT OF TRANSPORTATION STANDARDS

COMPLY WITH STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIALS SPECIFICATIONS, DATED JANUARY 1, 1995, AS APPLICABLE TO THE MATERIALS OR CONSTRUCTION PROCESSES BEING PROVIDED.

NATIONAL ELECTRIC CODE AND UL LISTING

USE MATERIALS BEARING THE LISTING MARK OF THE UNDERWRITERS LABORATORIES OR SIMILAR NATIONALLY RECOGNIZED TESTING LABORATORY WHEREVER MATERIALS SUPPLIED ARE COVERED BY LISTING STANDARDS. INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL COST, NFPA STANDARD 70.

SEQUENCE OF CONSTRUCTION

THE CITY OF COLUMBUS, DIVISION OF ELECTRICITY "CONDUCTOR SAFETY POLICY" SHALL BE FOLLOWED.

1. INSTALL NEW (RISER) POLE AND ANCHOR, STA. 149+09, 200' RT. CONSTRUCT THE TERMINAL POLE ASSEMBLY. (MELP WILL TRANSFER THE EXISTING OVERHEAD PRIMARY WIRE TO THE NEW POLE). REMOVE THE OLD POLE AND DOWN GUYS.

   NOTE: THE DIVISION OF ELECTRICITY (MELP) REQUIRES THREE WEEKS PRIOR NOTICE FROM THE CONTRACTOR TO SCHEDULE ANY WORK. ANY SIGNIFICANT DELAY BY THE CONTRACTOR WILL REQUIRE AN ADDITIONAL THREE (3) WEEK NOTICE TO RESCHEDULE ANY WORK.

2. CONSTRUCT THE PROPOSED ELECTRIC MANHOLE, VAULT, UNDERGROUND CONDUIT, POLE RISER AND TRANSFORMER PAD OF THE TYPE AND NUMBER SPECIFIED. THE JOINING OF THE EXISTING CONDUIT TO THE NEW CONDUIT(TWO (2) LOCATIONS) SHALL HAVE A CONTINUOUS SMOOTH INTERIOR SURFACE SO THAT SUPPLY CABLE WILL NOT BE DAMAGED WHEN PULLED PAST A JOINT.
3. CLEAN ALL DUCTS, AND INSTALL PULLING WIRE IN ALL SPARE DUCTS, CAP SPARE DUCTS.
4. PULL 1, 15,000 VOLT 2/0 TRIPLEX POWER CABLE AND 1 – 2 CU., 600 VOLT 1/C POWER CABLE FROM THE ELECTRIC VAULT TO THE TRANSFORMER PAD. PULL 1, 15,000 VOLT 350 MCM TRIPLEX POWER CABLE AND 1 – 250 MCM, 600 VOLT 1/C POWER CABLE FROM THE ELECTRIC VAULT TO THE RISER POLE. LEAVE SUFFICIENT CABLE FOR CONNECTION TO THE OVERHEAD TERMINATORS. INSTALL CABLE RACKS PER DETAIL. SUFFICIENT CABLE SHALL BE LAID ALONG THE WALLS OF THE VAULT, PER THE MANHOLE CABLE PLACEMENT DETAIL.
5. TEST ALL CABLE PER THE MANUFACTURE'S RECOMMENDATIONS AND 625.22, ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS.
6. SET THE 15KV SWITCH IN THE VAULT. CONNECT THE POWER CABLES TO THE 4–WAY OIL SWITCH AND SPLICE THE NEUTRAL. THE CONTRACTOR SHALL PROVIDED ALL CONNECTORS FOR CONNECTION OF THE CABLES TO THE SWITCH AND THE PADMOUNT TRANSFORMER, AND FOR SPARE BUSHINGS. CONNECTOR COMPONENTS MUST BE SELECTED FOR THE TYPE AND SIZE OF CABLE TO BE USED, PER MANUFACTURERS SPECIFICATION. TEST ENTIRE SYSTEM. MELP TO ENERGIZE AFTER TEST COMPLETE.
7. THE CUTTING OFF ANY PRIMARY POWER WILL BE CONTROLLED BY MELP.

PRECAST CONCRETE ELECTRIC MANHOLE

A. MATERIAL
   THE PRECAST CONCRETE ELECTRIC MANHOLE SHALL MEET THE FOLLOWING SPECIFICATIONS:
   1. THE MANHOLE SHALL BE AS THAT MANUFACTURED BY NORWALK CONCRETE PRODUCTS INC. OR AN APPROVED EQUAL.
   2. THE MANHOLE SHALL BE MANUFACTURED IN ACCORDANCE WITH THE DIVISION OF ELECTRICITY DRAWING NO. 02E0025, TITLED "ELECTRIC MANHOLE – PRECAST CONCRETE".
   3. THE MANHOLE SHALL HAVE OVERALL DIMENSIONS OF 13'x 8' X 9' – 2".
   4. THE MANHOLE SHALL BE DESIGNED IN ACCORDANCE WITH AASHO STANDARD HS20 –44 FOR TRUCK LOADING.
   5. TOP OPENING SHALL BE 36" DIAMETER AT THE GEOMETRIC CENTER OF THE TOP SLAB.
   6. PULLING EYES SHALL BE PROVIDED ON THE OPPOSITE SIDE OF EACH DUCT OPENING. PULLING EYES SHALL BE AS THAT MANUFACTURED BY LINE MATERIAL CO. STYLE NO. DU2T3 OR APPROVED EQUAL.
   7. ALL THE CONCRETE USED IN CONSTRUCTION OF THE MANHOLE SHALL BE CLASS C.
   8. MANHOLE FRAME WITH SOLID LID, SIMILAR TO NEENAH FOUNDRY CO. R–1752, SHALL BE PROVIDED AND INSTALLED AT EACH MANHOLE. COVERS SHALL BE LETTERED 'MEL & P'.

B. INSTALLATION
   1. CONTRACTOR SHALL PROVIDE ALL EXCAVATION AND BACKFILL NECESSARY FOR MANHOLES, VAULTS AND UNDERGROUND CONDUIT DUCTS INSTALLATION.
   2. EXCAVATION FOR MANHOLE AND VAULTS SHALL EXTEND TO 6" BELOW BOTTOM OF MANHOLE OR VAULT BASE OR AS NECESSARY FOR PROPER INSTALLATION AND COMPLETION OF WORK.
   3. EXCAVATION FOR UNDERGROUND CONDUIT DUCTS SHALL EXTEND TO PROFILE OF LOWER SIDE OF THE CONDUIT ENCASEMENT. CONDUITS SHALL HAVE A MINIMUM OF 30" COVER. PROFILE BETWEEN MANHOLES AND/OR VAULTS SHALL BE SET SO THAT CONDUITS ARE LEVEL OR SLOPED TO ONE OF THE MANHOLES. WHERE CONDUITS ENTER MANHOLES AT A LOWER LEVEL THAN THE APPROACHING PROFILE OF THE CONDUIT, THE CONDUIT SHALL BE SLOPED DOWN TO THE MANHOLE OR VAULT WINDOW AT A RATE NOT EXCEEDING 30" FROM THE HORIZONTAL.
   4. AFTER MANHOLES AND VAULTS ARE SET AND CONDUITS ARE INSTALLED, BACKFILL SHALL BE BROUGHT TO PROPER LEVEL AND SHALL BE COMPACTED IN ACCORDANCE WITH ITEM 604 SECTION 604.04 OF ODOT 'CONSTRUCTION AND MATERIAL SPECIFICATIONS'. BACKFILL SHALL BE BROUGHT TO BOTTOM OF EXISTING PAVING BASE IN PAVED AREAS. FINISHED GRADE SHALL BE REPLACED IN KIND, I.E. SOD, GRAVEL, BLACKTOP, CONCRETE, ETC.
   5. WORK SHALL BE SO PLANNED THAT EXCAVATIONS ARE OPEN FOR A MINIMUM OF TIME. NO LOAD, OR BACKFILL SHALL BE APPLIED OR OTHER WORK CONDUCTED THAT WOULD DAMAGE NEW CONCRETE OR INTERFERE, WITH ITS CURING.
   6. OPEN TRENCHES IN OPEN AREAS SHALL BE BARRICADED AND PROPERLY PROTECTED.
   7. AFTER MANHOLE IS PLACED, MANHOLE COVER FRAME SHALL BE PLACED AND TOP ADJUSTED TO GROUND OR PAVING LEVEL, A 6" THICK CONCRETE OR BRICK ADJUSTING RING SHALL BE PROVIDED TO PROVIDE CONTINUOUS CLOSURE BETWEEN TOP SLAB OF MANHOLE AND MANHOLE COVER FRAME.

C. BASIS OF PAYMENT
   THE WORK INCLUDED IN THIS ITEM, INCLUDING EXCAVATION AND BACKFILL, SHALL BE PAID FOR AT THE CONTRACT PRICE, COMPLETE IN PLACE.

ITEM	UNIT	DESCRIPTION
SPECIAL	EACH	PRECAST ELECTRIC MANHOLE

15 KV, THREE CONDUCTOR, TRIPLEX POWER CABLE

ITEM SPECIAL, COPPER CONDUCTOR, 15 KV, UNGROUNDED, TRIPLEX CONDUCTOR POWER CABLE.

THE CABLE SHALL MEET THE REQUIREMENTS OF ICEA, S–66–524/NEMA WC7–1982, OR THE LATEST REVISION FOR TREE RETARDANT CROSS–LINKEDTHERMOSETTING POLYETHYLENE INSULATED WIRE AND CABLE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY, AND AEIC CS5–87, OR THE LATEST REVISION FOR SPECIFICATIONS FOR THERMOPLASTIC AND CROSS–LINKED POLYETHYLENE INSULATED SHIELDED POWER CABLES RATED 5 THROUGH 35KV, EXCEPT WHERE IT CONFLICTS WITH THE REQUIREMENTS OF THIS SPECIFICATION IN WHICH CASE THIS SPECIFICATION SHALL APPLY. THE CABLE SHALL CONSIST OF THREE SINGLE CONDUCTOR CABLES TWISTED TOGETHER WITHOUT FILLER OR BINDER, SO AS TO FORM THE EQUIVLENT OF A THREE CONDUCTOR CABLE. THE CABLE SHALL BE INSTALLED ON A SYSTEM ON WHICH THE CABLE WILL BE USED AT 60 HZ, 14,400 VOLTS, AC LINE–TO–LINE, AND ABLE TO BE INSTALLED IN UNDERGROUND DUCTS OR BY DIRECT BURIAL.

THE CABLE SHALL CONSIST OF A 350 MCM, 37 STRAND OR #2/0 AWG, 19 STRAND, CLASS B COPPER CONDUCTOR, COVERED WITH A SEMI–CONDUCTING TAPE SHIELD, POLYETHYLENE INSULATION, A SECOND SEMI–CONDUCTING SHIELD, A COPPER TAPE SHIELD, AND A PVC JACKET.

THE CONDUCTORS SHALL BE CLASS B CONCENTRIC–LAY COMPRESSED STRAND UNCOATED AND IN ACCORDANCE WITH ASTM B 8. THE CONDUCTORS SHALL BE STRAND FILLED WITH A TREE RETARDANT WATER STOP.

AN EXTRUDED SEMI–CONDUCTING CONDUCTOR SHIELD MEETING THE REQUIREMENTS OF ICEA SECTION C AND ICEA S–66–524, PARAGRAPH 2.7 SHALL BE PROVIDED. THEN THICKNESS OF THE STRAND SHIELD SHALL BE IN ACCORDANCE WITH AEIC CS5, TABLE C1. THE SHIELD SHALL BE BONDED TO THE INSULATION AND STRIP FREELY FROM THE CONDUCTOR.

THE INSULATION SHALL BE VIRGIN TREE RETARDANT CROSS–LINKED POLYETHYLENE AND SHALL MEET THE REQUIREMENTS OF ICEA S–66–524. INSULATION THICKNESS SHALL BE AS SPECIFIED IN TABLE B.1 COLUMN B, FOR 133% INSULATION LEVEL (INSULATION THICKNESS SHALL BE 0.220 INCHES). THE INSULATION SHALL BE SUITABLE FOR USE IN WET OR DRY LOCATIONS AT CONDUCTOR TEMPERATURES NOT TO EXCEED 90 DEGREES C FOR CONTINUOUS OPERATION, 130 DEGREES C FOR EMERGENCY OVERLOAD CONDITIONS AND 250 DEGREES C FOR SHORT–CIRCUIT CONDITIONS IN ACCORDANCE WITH AEIC CS5, SECTION A, AND ICEA S–66–524, PART 3. THE INSULATION COMPOUND SHALL BE EXTRA CLEAN AND STORED IN A CONTAMINATION FREE BULK HANDLING SYSTEM PRIOR TO CONVEYANCE AND USE IN THE EXTRUDER. THE INSULATION OF THE CABLE SHALL BE DEFORMATION TESTED IN ACCORDANCE WITH ASTM–D–2220.

A SEMI–CONDUCTING LAYER OF DEFORMATION RESISTANT SEMI–CONDUCTING THERMOPLASTIC MEETING THE REQUIREMENTS OF PARAGRAPH 4.1.1 OF ICEA S–66– 524, NEMA WC7 SHALL BE EXTRUDED OVER THE INSULATION TO SERVE AS AN ELECTROSTATIC SHIELD. THE SHIELD COMPOUND SHOULD BE COMPATIBLE WITH THE INSULATION AND LEGIBLY IDENTIFIED AS CONDUCTING. THE THICKNESS OF THE SHIELDING SHALL BE IN ACCORDANCE TABLE C2 IN AEIC CS5 (TABLE 7–2 IN ICEA S–66–524, NEMA WC7). THE SEMICONDUCTING SHIELDING SHALL BE FREE STRIPPING FROM THE INSULATION WITH A STRIP TENSION OF 6 TO 12 POUNDS PER 1/2 INCH STRIP WHEN TESTED IN ACCORDANCE WITH PARAGRAPH D.1 IN AEIC CS5.

A NEUTRAL OF COPPER TAPE SHALL BE WOUND OVER THE SEMI–CONDUCTING SHIELD LAYER. THE COPPER TAPE SHALL BE .004" THICK HELICALLY APPLIED BARE COPPER TAPE, 25% OVERLAPPED OVER THE INSULATION SHIELD IN ACCORDANCE WITH 4.1.1.2 OF ICEA S–66–524.

THE OUTER JACKET SHALL BE AN EXTRUDED JACKET OF BLACK PVC EXTRUDED SO AS TO COVER THE TAPE SHIELD. THE JACKET SHALL MEET THE REQUIREMENTS OF 4.3.1 OF ICEA S–66–524. THICKNESS OF THE JACKET SHALL BE .080 INCHES.

THE OUTSIDE SURFACE OF EACH CABLE SHALL BE DURABLY MARKED THROUGHOUT ITS LENGTH IN ACCORDANCE WITH AEIC CS5–87, PARAGRAPH H. THE MARKINGS SHALL BE PROMINENT ON THE ENTIRE LENGTH OF CABLE, AND NOT TO IMPAIR THE CHARACTERISTICS OF THE CABLE. THE CABLE IS TO BE MARKED EITHER PHASE A OR PHASE B OR PHASE C. THE "A" PHASE OF THE TRIPLEX CABLE SHALL ALSO BE SEQUENTIALLY MARKED IN 1 FOOT NUMERICAL INCREMENTS FOR INVENTORY PURPOSES. AN EQUAL AMOUNT OF CABLE FOR EACH PHASE SHALL BE SUPPLIED.

THE MAXIMUM OUTSIDE DIAMETER OF EACH INDIVIDUAL CONDUCTOR SHALL BE APPROXIMATELY 1.61 INCHES FOR THE 350 MCM CABLE, OR 1.33 INCHES FOR THE 2/0 AWG CABLE.

THE CABLE AMPACITY SHALL BE 395 AMPS FOR THE 350 MCM CABLE, OR 225 AMPS FOR THE 2/0 AWG CABLE, USING ICEA METHODS, 3 CABLES PER CONDUIT, 40 DEGREES C AMBIENT AND 90 DEGREES C CONDUCTOR TEMPERATURE.

THE CABLE SHALL BE AN APPROVED EQUAL TO GENERAL ELECTRIC CABLE SI–58796 OR HENDRIX TYPE HQ–200.

EACH LENGTH OF CABLE SHALL BE TESTED IN ACCORDANCE WITH AEIC C5.5 LATEST EDITION.

CERTIFIED COPIES OF TEST DATA SHALL BE PROVIDED AS REQUIRED BY PARAGRAPHS J2.1, J2.2, J2.3 OF AEIC NO. 5 SPECIFICATIONS.

THE BIDDER SHALL FURNISH, WITH HIS PROPOSAL, RESULTS OF THE LATEST QUALIFICATIONS TESTS AS DESCRIBED IN SECTION B OF THE AEIC C5.5 LATEST EDITION SPECIFICATIONS.

WATER TIGHT SEALS SHALL BE APPLIED TO ALL CABLE ENDS TO PREVENT THE ENTRANCE OF MOISTURE DURING TRANSIT, OUT–OF–DOOR STORAGE, OR INSTALLATION.

UNIT	DESCRIPTION
LIN. FT.	350 MCM, 15KV TRIPLEX POWER CABLE
LIN. FT.	2/0 AWG, 15KV TRIPLEX POWER CABLE

MELP GENERAL NOTES (CONT.)

CONCRETE ENCASED CONDUIT

A. MATERIAL

1. CONDUIT – THE NON-METALLIC CONDUIT SHALL BE SCH. 40 POLYVINYL CHLORIDE. IF SHALL BE DESIGNED TO FORM A SOUND, STRONG DUCT, FREE FROM DEFECTS. IT SHALL BE NON-MAGNETIC, RESISTANT TO CORROSIVE ACTION, UNAFFECTED BY ELECTROLYSIS AND SHALL NOT SOFTEN, DEFORM OR DETERIORATE WHEN EXPOSED TO THE MAXIMUM SAFE OPERATING TEMPERATURE OF CABLES. THE INSIDE SURFACE OF THE CONDUIT SHALL BE SMOOTH, AND ROUND AND SHALL HAVE A NOMINAL INSIDE DIAMETER. THE CONDUIT SHALL BE CARLON HEAVY WALL CONDUIT "PV-DUIT PLUS" CONDUIT OR AN APPROVED EQUAL.

2. COUPLINGS – THE COUPLINGS SHALL BE OF THE SAME MATERIAL AS THE CONDUIT, AND SHALL BE SUFFICIENTLY TIGHT TO PREVENT SILT OR CONCRETE FROM ENTERING THE CONDUIT.

3. SPACERS – PLASTIC BASE AND INTERMEDIATE TYPE FOR PVC CONDUIT.

B. CABLE INSTALLATION

EXTREME CARE SHALL BE GIVEN WHILE HANDLING AND INSTALLING THE CABLE. LOADING AND UNLOADING OF CABLE SHALL BE ACCOMPLISHED SO THAT EQUIPMENT USED DOES NOT CONTACT CABLE SURFACE OR THE PROTECTIVE WRAP. UNDER NO CIRCUMSTANCES WILL CABLE REELS THAT HAVE BEEN DRIPPED FROM THE DELIVERING VEHICLE TO THE GROUND BE USED. CABLE WITH MINOR PHYSICAL DAMAGE TO THE JACKET OR INSTALLATION WILL NOT BE PERMITTED TO BE INSTALLED.

BEFORE THE START OF CABLE INSULATION, THE DUCT TO BE OCCUPIED SHALL BE SELECTED THROUGHOUT THE ENTIRE LENGTH OF THE RUN. AS FAR AS POSSIBLE, THE SAME RELATIVE POSITION IN THE DUCT BANK SHALL BE MAINTAINED.

PORTIONS OF THIS JOB WILL INCLUDE INSTALLING NEW CABLE INTO AN EXISTING CONDUIT. THE EXISTING CONDUIT SYSTEM IS 4 INCH FIBER DUCT, 4 INCH METAL BRIDGE CONDUIT AND/OR 5 INCH PVC CONDUIT. CLEANING PROCEDURES FOR THE EXISTING CONDUIT TO BE THE SAME AS IT IS FOR THE NEW DUCT. WITH THE EXCEPTION THAT A SMALLER MANDREL AND WIRE BRUSH IS TO BE USED.

BEFORE ANY CABLES ARE PULLED INTO THE DUCTS, CABLE RACKS MUST BE INSTALLED. THE TOTAL AMOUNT OF RACKS AND HOOKS REQUIRED PER MANHOLE SHALL BE DETERMINED BY THE USE OF THE 'CABLE RACK' AND 'CABLE PLACEMENT' DETAIL DRAWINGS INCLUDED IN THIS PLAN. SUPPORTS SHALL BE PROVIDED TO MAINTAIN SUFFICIENT CLEARANCE BETWEEN CABLE.

THE PROPER CALCULATED PULLING TENSION AND THE PROPER SIZE AND TYPE OF RIGGING SHALL BE USED TO PULL IN CABLE. WHILE PULLING CABLE, SNATCH BLOCKS AND PULLING SLEEVES SHALL BE ADJUSTED PER PULL TO HOLD THE CABLE IN LINE WITH THE DUCT. THE PULLING ROPE SELECTED SHALL BE SIZED FOR THE TYPE OF CABLE BEING PULLED. THE ROPE SHALL NOT SAW INTO THE CONDUIT OR CAUSE HIGH TENSION OR JERKING OF THE CABLE.

TO PREVENT INJURY TO THE CABLE BY SCRAPING ON THE MANHOLE FRAME OR AT THE DUCT OPENING OR IN PASSING OVER OTHER CABLES A FEEDING TUBE IS TO BE USED. THE FEEDING TUBE SHALL HAVE THE PROPER FITTING TO CONNECT AT THE DUCT AND BE THE PROPER LENGTH TO FIT FROM THE MANHOLE OPENING TO THE DUCT. USE DUCT END-BELLS, CONDUIT BUSHINGS AND RACK SADDLES TO PREVENT ABRASION.

THE PULLING ROPE SHALL BE ATTACHED TO THE CABLE BY THE MEANS OF A WOVEN CABLE GRIP AND SWIVEL. THE BACK OF THE GRIP SHALL BE SECURELY FASTENED TO THE CABLE BY BANDING WITH STEEL STRAPPING. THE PULLING END OF THE CABLE SHALL BE CUT OFF WELL BEHIND THE AREA COVERED BY GRIP DUE TO DAMAGE CAUSED BY PULLING. THIS SHALL BE TAKEN IN CONSIDERATION WHEN PULLING IN SLACK.

THE REEL OF CABLE MUST BE PROPERLY PLACED AT THE PULLING END TO CAUSE MINIMUM FLEXING OF THE CABLE. IT SHOULD ALWAYS BE LOCATED ON THE SIDE OF THE MANHOLE TOWARD WHICH THE CABLE IS TO BE PULLED.

TO PROTECT THE CABLE FROM EXCESSIVE TENSION DURING PULLING-IN, THE CABLE IS TO BE LUBRICATED. A COATING ABOUT 1/16 INCH THICK, 6 TO 8 LB. PER 100 FOOT, OF THE PULLING COMPOUND "WIRE LUBE", "YELLOW", OR EQUAL IS TO BE USED.

CABLES SHALL BE PULLED SLOWLY AND STEADILY. DO NOT STOP ONCE THE PULL IS STARTED UNLESS ABSOLUTELY NECESSARY.

WHEN THE CABLE END HAS BEEN DRAWN UP TO THE MANHOLE RIGGING, THE FIRST PULLING OPERATION MUST STOP. TO OBTAIN THE ADDITIONAL SLACK IN THE CABLE, A BASKET CABLE GRIP IS TO BE USED. CARE MUST BE USED TO AVOID INJURING THE CABLE. PULL IN SUFFICIENT CABLE FOR THE TESTING PROCEDURES AND SO THE SPLICING CREW CAN TRAIN THE CABLE TO ITS FINAL RESTING AREA AS SHOWN ON THE "PRIMARY CABLE PLACEMENT" DRAWING.

DUE TO THE NUMBER OF CIRCUITS THAT HAVE TO BE PULLED INTO EACH MANHOLE, THE CONTRACTOR IS TO LAY THE CABLE ON SOME OF ITS CABLE SUPPORTS. NO ATTEMPT SHOULD BE MADE TO TRAIN THE CABLE INTO ITS FINAL POSITION. THIS WILL BE DONE BY THE SPLICING CREW.

THE END OF THE CABLE IS TO BE SEALED.

C. BASIS OF PAYMENT

THE ACCEPTED QUANTITIES OF SPECIFIC ITEMS OF ELECTRIC WORK AND EQUIPMENT MEASURED AS PROVIDED ABOVE WILL BE PAID FOR UNDER,

ITEM	UNIT	DESCRIPTION
625	LIN. FT.	CONDUITS 5" PVC SCH. 40
625	LIN. FT.	39" CONDUIT TRENCH WITH ENCASEMENT

THERE SHALL BE NOT CABLE SPLICES BETWEEN MANHOLES.

THE CONTRACTOR SHALL CONFORM TO THE DIVISION OF ELECTRICITY'S EXISTING SAFETY POLICY. COPY OF WHICH ARE AVAILABLE FROM THE DIVISION OF ELECTRICITY.

ELBOW STYLE CONNECTOR

A COMPLETE CONNECTOR ASSEMBLY SHALL BE PROVIDED FOR EACH SWITCH AND PADMOUNT TRANSFORMER CABLE BUSHING CONNECTION.

THEY SHALL BE 15KV, NON-LOADBREAK. THEY SHALL BE DESIGNED FOR USE ON THREE PHASE SYSTEMS AND HAVE A MINIMUM BIL OF 110KV. CONNECTOR COMPONENTS MUST BE SELECTED FOR THE TYPE AND SIZE OF CABLE TO BE USED.

CONNECTORS SHALL BE ELASTIMOLD OR BLACKBURN CO., OR APPROVED EQUAL.

ALL CONNECTIONS SHALL BE INSTALLED BY A MANUFACTURER REPRESENTATIVE.

AFTER FINAL CONNECTIONS HAVE BEEN MADE , THE CONTRACTOR IS TO TEST THE ENTIRE SYSTEM PER MANUFACTURES RECOMMENDED SPECIFICATIONS.

ALL COMPONENTS AND TEST PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.

15 KV PROTECTIVE CAPS

EACH SWITCH SHALL HAVE ALL SPARE CABLE ENTRANCE BUSHINGS PROTECTED BY A PROTECTIVE CAP. THE PROTECTIVE CAP SHALL BE DESIGNED TO INSULATE, ELECTRICALLY SHIELD AND MECHANICALLY SEAL LOADBREAK BUSHINGS.

CONNECTORS SHALL BE ELASTIMOLD OR BLACKBURN CO., OR APPROVED EQUAL.

600 VOLT XHHW POWER CABLE

ITEM SPECIAL, COPPER CONDUCTOR, 600 VOLT POWER CABLE.

THE CABLE SHALL BE SUITABLE FOR OPERATION AT 600 VOLT AND SHALL CONSIST OF A #2 AWG, 7 STRAND OR A 250 MCM, 37 STRAND COPPER CONDUCTOR. THE CABLE SHALL BE SUITABLE FOR INSTALLATION IN DRY LOCATIONS AT A CONDUCTOR TEMPERATURE NOT EXCEEDING 90 DEGREES C, OR WET LOCATIONS AT A CONDUCTOR TEMPERATURE NOT EXCEEDING 75 DEGREES C. THE CABLE SHALL BE ADAPTABLE FOR DUCT OR DIRECT BURIAL INSTALLATION.

THE INSULATION SHALL BE A EXTRUDED WALL OF LIGHT AND HEAT STABILIZED CHEMICALLY CROSS-LINKED, POLYETHYLENE WITH A THICKNESS OF .045 INCHES FOR THE #2 AWG POWER CABLE AND .065 INCHES FOR THE 250 MCM POWER CABLE.

THE APPROXIMATE OUTSIDE DIAMETER OF THE CABLE SHALL BE 0.40 INCHES FOR THE #2 AWG CABLE AND 0.73 INCHES FOR THE 250 MCM CABLE.

THE AMPACITY SHALL NOT BE LESS THAN 130 AMPS FOR #2 AWG CABLE AND 317 AMPS FOR THE 250 MCM CABLE, BASED UPON LATEST ICEA METHODS OF AMPACITY RATING FOR CONDUCTORS IN CONDUIT.

THE CABLE SHALL MEET ICEA S-66-524, NEMA PUBLICATION NO. WC-7 STANDARD FOR CROSS-LINKED – THERMOSETTING – POLYETHYLENE – INSULATED WIRE AND CABLE.

THE CABLE SHALL BE RATED FOR 90 DEGREES C NORMAL OPERATING TEMPERATURE, 130 DEGREES C EMERGENCY OVERLOAD AND 250 DEGREES C SHORT CIRCUIT CONDUCTOR TEMPERATURE.

THE OUTSIDE SURFACE OF EACH CABLE SHALL BE DURABLY MARKED THROUGHOUT ITS LENGTHY IN ACCORDANCE WITH AEIC CS5-87, PARAGRAPH H. THE MARKINGS SHALL BE PROMINENT ON THE ENTIRE LENGTH OF CABLE, AND NOT TO IMPAIR THE CHARACTERISTICS OF THE CABLE. THE CABLE IS TO BE SEQUENTIALLY MARKED IN 1 FOOT NUMERICAL INCREMENTS FOR INVENTORY PURPOSES.

THE CABLE SHALL BE GENERAL ELECTRIC SI-58053, OR APPROVED EQUAL.

UNIT	DESCRIPTION
LIN. FT.	#2 AWG, 600 VOLT POWER CABLE
LIN. FT.	250 MCM, 600 VOLT POWER CABLE

15 KV VAULT SWITCH

THE BASE BID SHALL INCLUDE THE NUMBER OF SWITCHES INDICATED AND LOCATED AS SHOWN ON THE DRAWINGS AND INSTALLED AS HEREIN SPECIFIED.

THIS SPECIFICATION GOVERNS THE REQUIREMENTS FOR MANUALLY OPERATED, LOAD INTERRUPTING 600 AMP, SF6 PUFFER STYLE SWITCHES FOR SUBSURFACE APPLICATION.

SWITCHES ARE TO BE DESIGNED, TESTED, AND BUILT PER APPLICABLE SECTIONS OF ANSI C37.71 AND IEC 265-1. CERTIFIED TEST REPORTS SHALL BE PROVIDED CONFORMING COMPLETE ANSI SERIES RESULTS. THE SWITCH ASSEMBLY ITSELF SHALL BE RATED 15 KV, WITH AN IMPULSE LEVEL (BIL) OF 110 KV, AN OPEN GAP (BIL) OF 137.5 KV, AN ASYMMETRICAL MOMENTARY AND FAULT CLOSE CAPABILITY OF 32 KA AND A CONTINUAL AND LOADBREAK OF 600 AMPS. SWITCHES TO BE SHIPPED FACTORY FILLED WITH SF6 GAS.

EACH SWITCH SHALL HAVE 4 OR 5 (AS SPECIFIED), 3-PHASE ENTRANCE WAYS. THE OPERATING SEQUENCE SHALL BE 2 WAY WITH A CLOSE-OPEN OPERATING SEQUENCE. FIVE (5) INCH PHASE SPACING SHALL BE PROVIDED. CABLE ENTRANCES SHALL BE FROM THE TOP, BE TESTED TO ANSI/IEEE 386 AND BE 600 AMP QUIK-CHANGE DISCONNECTABLE APPARATUS BUSHINGS. BUSHINGS ARE TO BE DESIGNED TO ACCEPT ELBOW STYLE CONNECTORS AND INCLUDE 5/8-11 ALUMINUM THREADED STUD.

ALL SWITCH COMPONENTS AND ENTRANCES SHALL BE ASSEMBLED IN A TOTALLY WELDED STAINLESS STEEL TANK. ENTRANCES SHALL BE INTERNALLY CONNECTED BY COPPER WIRE ROPES AND COPPER BUSS CAPABLE OF HANDLING MOMENTARY AND CONTINUOUS CURRENT DUTY. THE SWITCH SHALL CONTAIN NO ELECTRICALLY FLOATING METALLIC PARTS OR COMPONENTS. SWITCH CONTACTS SHALL BE TULIP-BAYONET DESIGN AND MADE OF PLATED, COPPER ALLOY WITH ARCING TIPS OF COPPER/TUNGSTEN ALLOY.

THE SWITCH SHALL COME WITH STAINLESS STEEL THREE-LINE DIAGRAM, NAMEPLATE, POSITION INDICATORS AND CABLE ENTRANCE PHASE AND ORIENTATION INDICATORS. ALL OTHER HARDWARE SHALL BE STAINLESS STEEL OR BRASS. TANK COATING TO BE LIGHT GRAY (ASA 70) VINYL PAINT WITH PRIMER, THREE MIL THICK MINIMUM.

THE SWITCH ALSO SHALL COME WITH A SF6 FILL VALVE, TWO WELDED LIFTING EYES, BOLTED-GASKETED ENTRANCE BUSHINGS, AND GAS PRESSURE GAUGE & FILL VALVE. OPERATING HANDLES SHALL BE FIX STYLE AND THE OPERATING MECHANISMS SHALL BE PADLOCKABLE WITH POSITION INDICATORS.

A STAINLESS STEEL OPEN MOUNTING CHANNEL SHALL BE SUPPLIED TO PROVIDE A 5 INCH CLEARANCE FROM THE FLOOR.

THE SWITCH SHALL HAVE GROUNDING PROVISIONS FOR ONE 1/2"-13 GROUND CONNECTION PER SWITCH WAY AND PROVISIONS FOR ONE 1/2"-13 TANK GROUND CONNECTION.

THE SWITCHES SHALL BE G&W ELECTRIC CO. CATALOG NUMBER VRAM44-376-40PI (4 WAY), VRAM55-376-40PI (5 WAY), OR ELECTRICAL EQUIPMENT INC. CATALOG NUMBER SGE-5440 (4 WAY), SGE-5550 (5 WAY), OR APPROVED EQUAL.

MELP GENERAL NOTES (CONT.)

MELP GENERAL NOTES (CONT.)

		PROJECT	
5	OHIO		

INSTALLATION -- 5" CONDUIT

THE CONDUIT SHALL BE INSTALLED AS DETAILED IN THE PLAN.

IF THE CONDUIT IS INSTALLED IN AN AREA TO BE PAVED UNDER THIS OR ANOTHER CONTRACT, BACKFILL SHALL BE APPROPRIATE FOR THE PAVING INDICATED. NO OTHER SURFACE RESTORATION WILL BE REQUIRED.

THE DEPTH OF BURIAL SHALL BE MINIMUM OF 30 INCHES FROM TOP OF THE TOP DUCT TO FINISHED (SURFACE) GRADE.

THE TRENCH SHALL BE DUG SO THAT ANY CURVE RADIUS WILL BE AS LARGE AS POSSIBLE. THE TRENCH SHALL BE DUG NO WIDER THAN NECESSARY TO ACCOMMODATE THE CONDUIT AND CONCRETE ENVELOPE AS INDICATED ON THE DETAILED DRAWINGS. THE BOTTOM OF THE TRENCH SHALL BE UNDISTURBED, TAMPED AND RELATIVELY SMOOTH EARTH. TRENCHES WHICH HAVE BEEN DUG TOO DEEP AT ANY POINT ARE TO BE PARTIALLY REFILLED AND TAMPED SOLID. THE SIDES OF THE TRENCH WILL BE TRIMMED SMOOTH TO PROVIDE FOR A UNIFORM SHEATH OF CONCRETE AROUND THE CONDUITS. THE SIDES OF THE EXCAVATION ARE TO BE SHORED WHERE NECESSARY TO MAINTAIN A UNIFORM TRENCH. EXCESS MATERIAL SHALL BE REMOVED FROM THE JOB SITE.

WHERE A CONDUIT CROSSES A SEWER OR WATER LINE, OR ANY OTHER UNDERGROUND STRUCTURE, THE CLEARANCE BETWEEN THEM WILL NEED TO BE LARGE ENOUGH TO PERMIT MAINTENANCE OF THE SYSTEM WITHOUT DAMAGE TO THE STRUCTURES. THE CLEARANCES WILL NEED TO BE DETERMINED BY THE UTILITIES INVOLVED. A SUITABLE SUPPORT ON EACH SIDE OF THE UNDERGROUND STRUCTURE WILL BE BUILT TO AVOID TRANSFERRING ANY DIRECT LOAD ONTO THAT STRUCTURE.

THE CONDUIT RUN SHALL BE AS STRAIGHT AS POSSIBLE. THE RADIUS OF ANY CURVE SHALL BE AS LARGE AS POSSIBLE TO FACILITATE THE PULLING IN OF CABLE. SCH 40, 5 DEGREE ANGLE COUPLINGS OR COMBINATIONS OF 5 DEGREE ANGLE COUPLINGS AND STRAIGHT SECTIONS OF DUCT ARE RECOMMENDED TO NEGOTIATE CURVES. ANY FIELD BENDING OF CONDUIT SHALL BE DONE WITH MANUFACTURER RECOMMENDED CONDUIT BENDING EQUIPMENT AND PROCEDURES.

PRECAST PLASTIC BASE AND INTERMEDIATE SPACERS WILL BE PLACED AT 5 FOOT INTERVALS THAT SHALL SEPARATE THE CONDUITS A MINIMUM OF 2 INCHES APART AND PROVIDE A 3 INCH MINIMUM OUTSIDE ENCASEMENT. BURRS ON THE END OF THE CONDUIT, AS THE RESULT OF SAWING, MUST BE REMOVED PRIOR TO COMPLETING A JOINT. JOINTS SHALL FORM A CONTINUOUS SMOOTH INTERIOR SURFACE BETWEEN DUCT SECTIONS SO THAT CABLE WILL NOT BE DAMAGED WHEN PULLED PAST THE JOINT. SURFACES TO BE JOINED WILL BE CLEAN AND FREE FROM DIRT, FOREIGN MATERIALS AND MOISTURE. THE JOINTS WILL BE SEALED WITH THE PROPER CEMENT SPECIFIED BY THE DUCT MANUFACTURER. DUCTS ARE TO BE TIED TOGETHER WITH HEAVY CORD AS TO SECURELY HOLD THE DUCTS IN PLACE. THE OPEN ENDS OF THE DUCT ARE TO BE CLOSED WITH TIGHT FITTING PLUGS TO PREVENT THE ENTRANCE OF MUD OR FOREIGN MATERIAL INTO THE DUCT. AFTER CONDUIT IS INSTALLED IT SHALL BE INSPECTED.

THE CONCRETE IS TO BE POURED AS SOON AS POSSIBLE AFTER CONDUITS HAVE BEEN PLACED. DUCTS ARE TO BE TIED DOWN TO HOLD THEM IN POSITION WHILE THE CONCRETE IS POURED. THE CONCRETE SHALL HAVE A SLUMP OF 4 TO 5 INCHES. THE CONCRETE DELIVERY CHUTE SHALL BE ADJUSTED SO THAT THE FALL OF THE CONCRETE INTO THE TRENCH IS MINIMAL. A SPLASH BOARD WILL BE USED TO DIVERT THE FLOW OF CONCRETE AWAY FROM THE TRENCH SIDES TO AVOID DISLODGING SOIL AND STONES. CONCRETE SHALL BE PLACED ALWAYS FROM ONE END OF THE DUCT SECTION TO THE OTHER END OF THE SECTION. CONTINUOUS SPADING IS TO BE DONE TO ENSURE A FLOW OF CONCRETE BETWEEN AND UNDER THE INDIVIDUAL DUCTS. A LONG FLAT TOOL OR SPATULA WILL BE WORKED CAREFULLY UP AND DOWN BETWEEN EACH VERTICAL LINE OF DUCTS TO ELIMINATE VOIDS. THE TOP OF THE CONCRETE IS THEN TO BE SMOOTHED.

AFTER THE CONCRETE HAS TAKEN ITS INITIAL SET THE TRENCH CAN BE BACKFILLED. A PIECE OF CAUTION BURIED ELECTRIC TAPE IS TO PLACED ABOVE THE DUCT DURING BACKFILLING.

AFTER THE DUCTS ARE INSTALLED A FLEXIBLE STEEL MANDREL NOT LESS THAN 12 INCHES LONG WITH A CROSS SECTION OF 4-3/4 INCHES (FITTED WITH A PULLING EYE AT EACH END) SHALL BE PULLED THROUGH EACH CONDUIT. BY WORKING THE MANDREL BACK AND FORTH, OBSTRUCTIONS SUCH AS CONCRETE WILL BE REMOVED. AFTER THE MANDREL HAS BEEN PULLED THRU, A STIFF 5 INCH CIRCULAR WIRE BRUSH AND A SWAB SHALL THEN BE PULLED THRU THE DUCT TO REMOVE ANY BITS OF CONCRETE, ETC.

A NO. 10 AWG COPPER-CLAD ALUMINUM-CLAD OR GALVANIZED PULLING WIRE SHALL BE INSTALLED IN ALL SPARE DUCT. ENDS OF THE CONDUIT SHALL BE SEALED IN AN APPROVED MANNER TO KEEP ALL MOISTURE AND FOREIGN MATTER OUT OF THE CONDUIT.

CABLE INSTALLATION

EXTREME CARE SHALL BE GIVEN WHILE HANDLING AND INSTALLING THE CABLE. LOADING AND UNLOADING OF CABLE SHALL BE ACCOMPLISHED SO THAT EQUIPMENT USED DOES NOT CONTACT CABLE SURFACE OR THE PROTECTIVE WRAP. UNDER NO CIRCUMSTANCES WILL CABLE REELS THAT HAVE BEEN DROPPED FROM THE DELIVERING VEHICLE TO THE GROUND BE USED. CABLE WITH MINOR PHYSICAL DAMAGE TO THE JACKET OR INSTALLATION WILL NOT BE PERMITTED TO BE INSTALLED.

BEFORE THE START OF CABLE INSULATION, THE DUCT TO BE OCCUPIED SHALL BE SELECTED THROUGHOUT THE ENTIRE LENGTH OF THE RUN. AS FAR AS POSSIBLE, THE SAME RELATIVE POSITION IN THE DUCT BANK SHALL BE MAINTAINED.

BEFORE ANY CABLES ARE PULLED INTO THE DUCTS, CABLE RACKS MUST BE INSTALLED. THE TOTAL AMOUNT OF RACKS AND HOOKS REQUIRED PER MANHOLE SHALL BE DETERMINED BY THE USE OF THE "CABLE RACK" AND "CABLE PLACEMENT" DETAIL DRAWINGS INCLUDED IN THIS PLAN. SUPPORTS SHALL BE PROVIDED TO MAINTAIN SUFFICIENT CLEARANCE BETWEEN CABLES.

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THE END OF THE CABLE IS TO BE SEALED.

MELP GENERAL NOTES (CONT.)

MELP GENERAL SUMMARY

Δ 625

*LIGHTING, MISC.:

CALC. BY JSS
CHECK BY WED

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

219
224

FRANKLIN COUNTY
FRA-670-1.25-C-3

ITEM	SHEET NUMBER	PARTICIPATION			ITEM	ITEM EXT.	TOTAL QUANT.	UNIT	DESCRIPTION	REF. NO.
	26	100%CITY	STP	NH						
									(MISC.:	
	2440	2440			625	25920	2440	LIN. FT.	CONDUIT SCH.40, 5"	
	60	60			625	25920	60	LIN. FT.	CONDUIT RIGID ALUMINUM RISER 5"	
	180	180			625	98100	180	LIN. FT.	*20" CONDUIT TRENCH W/ENCASEMENT	
	520	520			625	98100	520	LIN. FT.	*12" CONDUIT TRENCH W/ENCASEMENT	
	1	1			625	98100	1	LIN. FT.	*RISER POLE UNIT (MELP DWG.# 0250028)	
	1	1			625	98100	1	LIN. FT.	*TERMINAL POLE ASSEMBLY (MELP DWG.# 0350074)	
	2	2			625	32001	2	LIN. FT.	*5/8" GROUND ROD	
	120	120			SPECIAL	Δ 98100	120	LIN. FT.	*#2AWG, 600 VOLT POWER CABLE	
	160	160			SPECIAL	Δ 98100	160	LIN. FT.	*250 MCM 600 VOLT POWER CABLE	
	160	160			SPECIAL	Δ 98100	160	LIN. FT.	*350 MCM , 150KV TRIPLEX POWER CABLE	
	120	120			SPECIAL	Δ 98100	130	LIN. FT.	*2/0 AWG, 15KV TRIPLEX CABLE	
	1	1			SPECIAL	Δ 98000	1	EACH	*PRECAST ELECTRIC MANHOLE W/ CABLE RACKS (7PER MH) (MELP DETAIL 025044)	
	1	1			SPECIAL	Δ 98000	1	EACH	*PRECAST TRANSFORMER VAULT	
	1	1			SPECIAL	Δ 98000	1	EACH	*50' HIGH WOOD POLE CLASS 3	
	1	1			SPECIAL	Δ 98000	1	EACH	*15 KV VAULT SWITCH	
	1	1			SPECIAL	Δ 98000	1	EACH	*REMOVE WOOD POLE	

MANHOLE SCHEDULE

ELECTRIC VAULT	MH TYPE	VAULT INV.	NO. OF WINDOWS	WINDOW		CONDUIT, LIN. FT.		CABLE, LIN. FT.			
				SIZE & LOCATION	DIM A	2-5"	4-5"	15 KV. 2/0 TRIPLEX POWER CABLE	#2 AWG 600V POWER CABLE	15 KV. 350MCM TRIPLEX POWER CABLE	250 MCM 600V POWER CABLE
							230*				
2E	ELECTRIC	696.17	2	20"x20" S	3.83'						
STA. 148+30, 130' LT.	MH			20"x20" E							
							290				
3E	TRANSFORMER	709.17	4	20"x20" S	3.83'						
STA. 148+30, 160' RT.	VAULT			20"x13" S		100					
				20"x13" E		80		120	120		
				20"x20" N		100				160	160
TOTAL						280	520	120	120	160	160

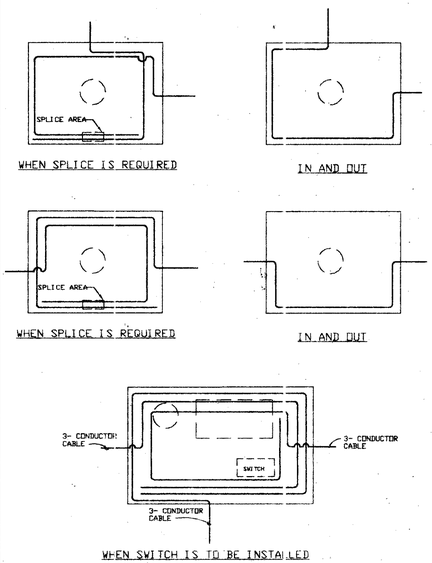
* THIS QUANTITY IS A CONTINGENCY ITEM TO BE USED AS DIRECTED BY THE ENGINEER BECAUSE THE EXACT LOCATION OF THE END OF THE EXISTING CONDUIT IS UNKNOWN.

DIMENSION "A" IS THE DISTANCE FROM THE INVERT OF THE VAULT TO THE BOTTOM OF THE WINDOW.

File: C:\249E1\GEN-MAN.DWG 1 = 1.0000
Date: 08-15-1996
Time: 14:48 Drawn by : A.G.

F.H.W.A. REGION	STATE	PROJECT	
5	OHIO		

220
224

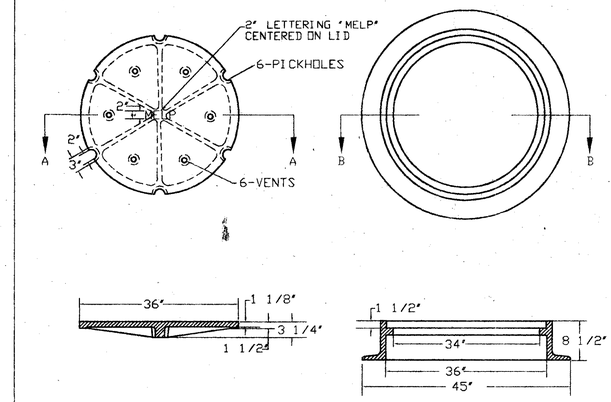


MELP — MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS, OHIO
DEPT. OF UTILITIES - DIVISION OF ELECTRICITY

MANHOLE & VAULT PRIMARY CABLE PLACEMENT

REVISIONS

SCALE	DRAWN	DRAWING NO.
NONE	BA 3/93	02S0057
C. D. NUMBER	APPROVED	SHEET 1 OF 1



SECTION A-A
MANHOLE COVER

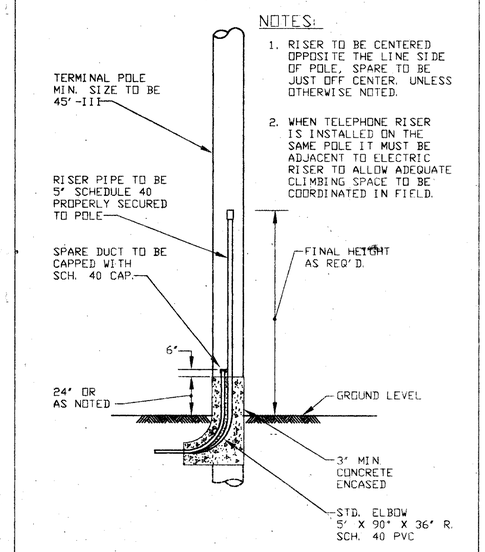
SECTION B-B
MANHOLE FRAME

ITEM	DESCRIPTION	PART NO.	NO. REQ.
1	MANHOLE LID & FRAME , NEENAH R-1752, OR EQUAL	58-15090	1

36" MANHOLE LID AND FRAME

2-23-90

MEL&P — MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS OHIO
DEPT. OF PUBLIC UTILITIES & AVIATION DIVISION OF ELECTRICITY
02S0055

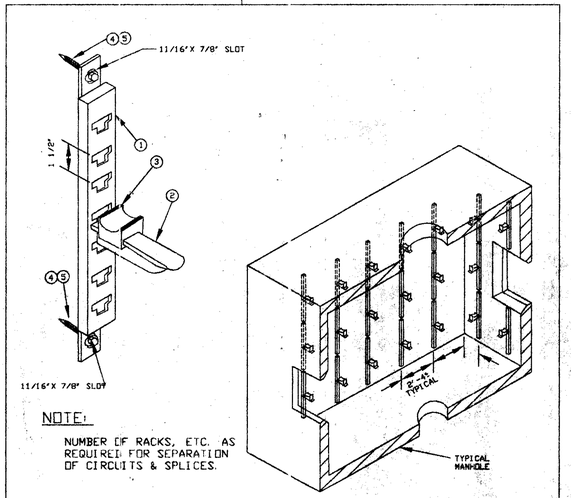


REVISIONS
REV. PREV. DWG. 7/79, DLG 6/87
REV. & REDRAWN 8/11/93 BA

MELP — MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS, OHIO
DEPT. OF UTILITIES - DIVISION OF ELECTRICITY

- RISER POLE DETAIL - PRIMARY

SCALE	DRAWN	DRAWING NO.
NONE	DM 6/87	02S0028
C. D. NUMBER NONE	APPROVED	SHEET OF

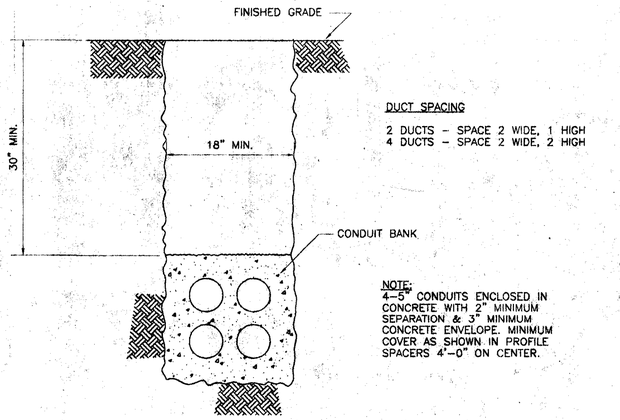


NOTE:
NUMBER OF RACKS, ETC. AS REQUIRED FOR SEPARATION OF CIRCUITS & SPLICES.

ITEM	DESCRIPTION	PART NO.	#REQ.
5	WASHER, ROUND, 1 3/8" OD, GALVANIZED 9/16" HOLE DIA.	02-76320	2
4	BOLT, ANCHOR, STUD BOLT(LEAD) 1/2"X4", 7/8"HOLE SIZE, EXPANSION, C.E.B. #1162	01-05340	2
3	INSULATOR, PORCELAIN, WHITE, 1 1/2" RADIUS LOCKING, MC GRAW-EDISON #DE-111U1	58-23100	AS REQ'D
2	HOOK, CABLE RACK(FEET) 10 1/8" LENGTH, STEEL, GALV, MC GRAW-EDISON #DUSS3	58-20095	AS REQ'D
1	RACK, CABLE, GALV., LENGTH AS REQUIRED		1

MANHOLE CABLE RACK - DETAIL

MEL&P — MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS, OHIO
DEPT. OF PUBLIC SERVICE DIV OF ELECTRICITY
02S0049

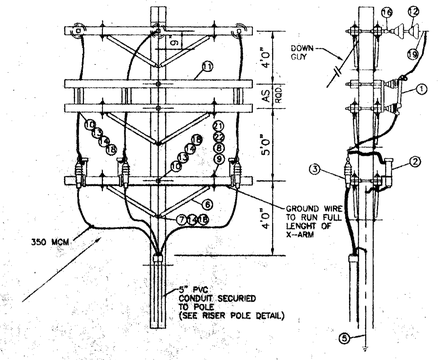


DUCT SPACING

2 DUCTS - SPACE 2 WIDE, 1 HIGH
4 DUCTS - SPACE 2 WIDE, 2 HIGH

NOTE:
4-5" CONDUITS ENCLOSED IN CONCRETE WITH 2" MINIMUM SEPARATION & 3" MINIMUM CONCRETE ENVELOPE. MINIMUM COVER AS SHOWN IN PROFILE SPACERS 4'-0" ON CENTER.

TYPICAL TRENCH DETAIL



ITEM	DESCRIPTION	#REQ.
1	SWITCH, CUTOUT WITH SOLID BLADE, 15KV	3
2	ARRESTER, LIGHTNING, 9KV	3
3	OUTDOOR TERMINATOR	3
4	CONNECTOR, COMPRESSION, AS REQ'D.	
5	POLE GROUNDING UNIT	1
6	BRACE, WOOD, 60° SPAN	12
7	BOLT, MACHINE, 5/8" x REQ'D LENGTH	3
8	BOLT, MACHINE, 1/2" x REQ'D LENGTH	12
9	WASHER, ROUND 1 3/8" DIA, 9/16" HOLE	24
10	WASHER, 2 1/4" x 2 1/4" x 3/16", 11/16" HOLE	40
11	CROSSARM 3 5/8" x 4 5/8" x 10'-0"	8
12	INSULATORS, SUSPENSION (BY MELP)	6
13	BOLT, DOUBLE ARMING, 5/8" x REQ'D LENGTH	12
14	NUT, SQUARE, 5/8"-11 UNC.	41
15	CONNECTORS, AS REQ'D.	
16	NUT, EYE, 5/8"	3
17	JUMPERS AND LEADS REQ'D.	
18	5/8" LOCKNUTS	27
19	DEAD END ASSEMBLY, PRIMARY (BY MELP)	3
21	1/2" LOCKNUTS	12
22	NUT, SQUARE, 1/2"	12

SCHEDULE

7.2KV, 3-PHASE TERMINAL POLE ASSEMBLY

MEL&P — MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS, OHIO
DEPT. OF PUBLIC UTILITIES DIV OF ELECTRICITY
03S0080
SPECIAL

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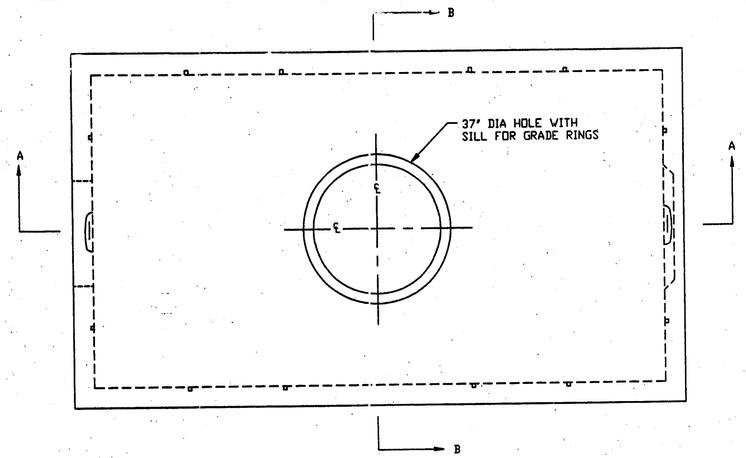
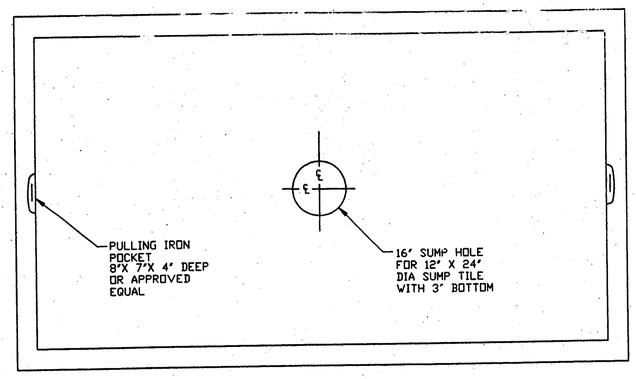
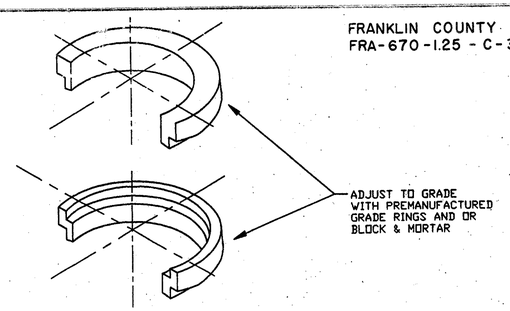
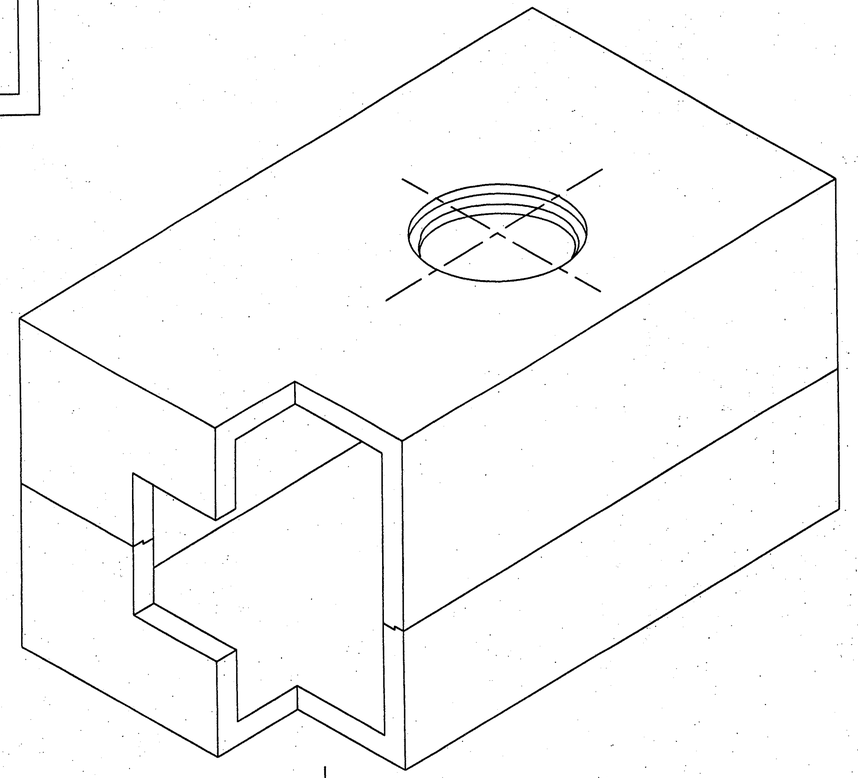
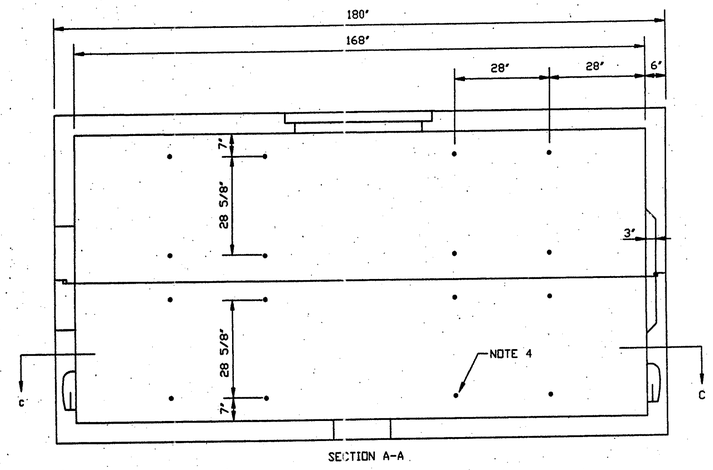




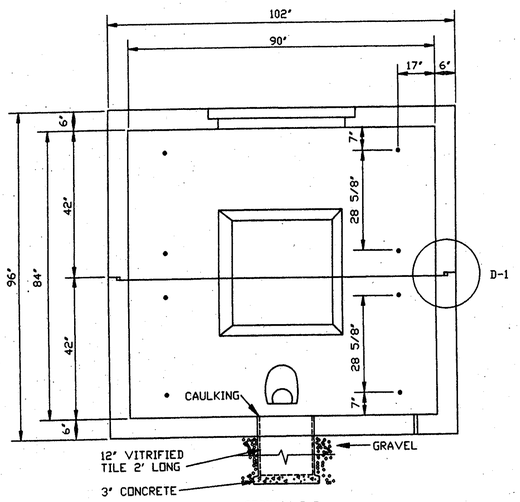
SECTION C-C



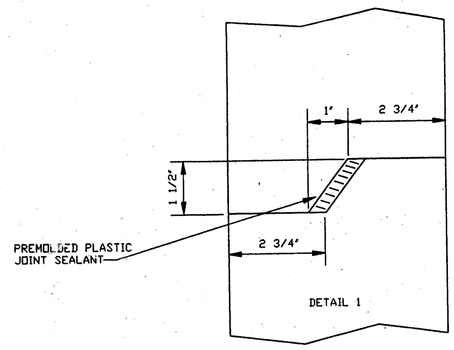




SECTION A-A



SECTION B-B

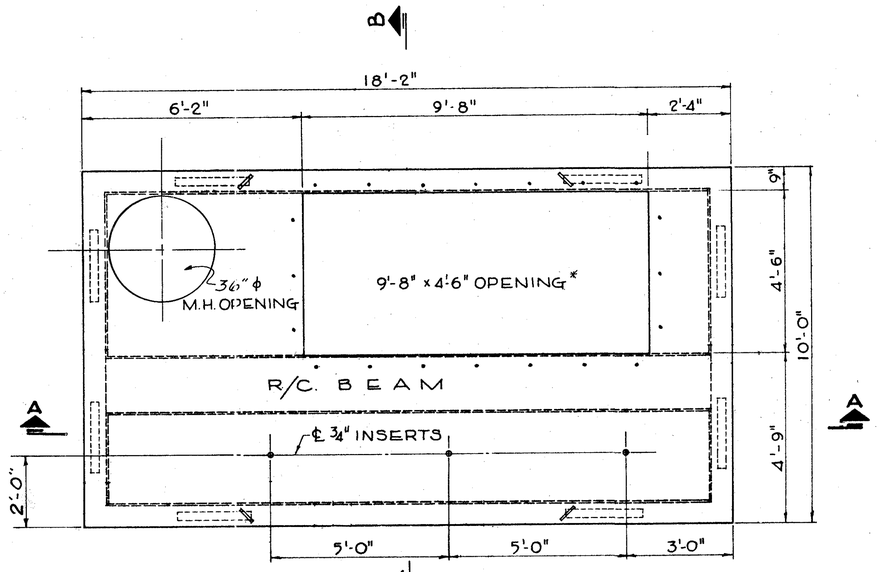


DETAIL 1

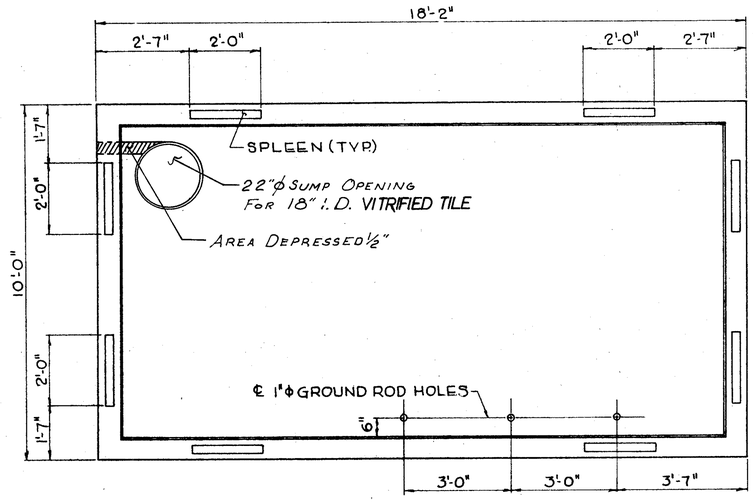
NOTES

1. REINFORCING FOR H-20 BRIDGE LOADING.
2. 5000 PSI CONCRETE - AIR 6% + 2% PER OHIO DEPARTMENT OF TRANSPORTATION STANDARD.
3. APPROXIMATE UNIT WEIGHTS - TOP HALF - 20700#
   BOTTOM HALF 21000#
4. 1/2-13 NC THREADED INSERTS (48 EACH) FOR ATTACHMENT OF CABLE RACK.
5. NON STANDARD PULLING IRONS AND KNOCKOUT SIZES AND LOCATIONS MUST BE SPECIFIED WHEN ORDERING MANHOLE.
6. SUPPLIER NORWALK CONCRETE INDUSTRIES NORWALK, OHIO 1-800-733-3624
7. WINDOW OR KNOCK-OUTS TO BE IN SIZES USING COMBINATIONS OF 12",18",24" OR 32".
8. WINDOW OR KNOCK-OUT LOCATIONS MAY VARY.
9. PULLING IRONS ARE TO BE OPPOSITE AND ONE FOOT BELOW EACH WINDOW. IN NO CASE SHOULD THE PULLING IRON BE CLOSER THAN SIX INCHES TO A JOINT.
10. LIVE LOAD DESIGN - AASHO HS-20-44

MEL·P MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS, OHIO
DEPT. OF UTILITIES - DIVISION OF ELECTRICITY



PLAN VIEW-TOP

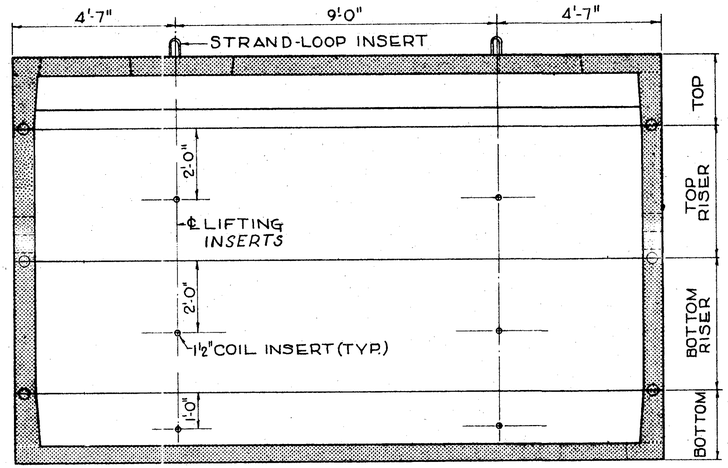


PLAN VIEW - BOTTOM

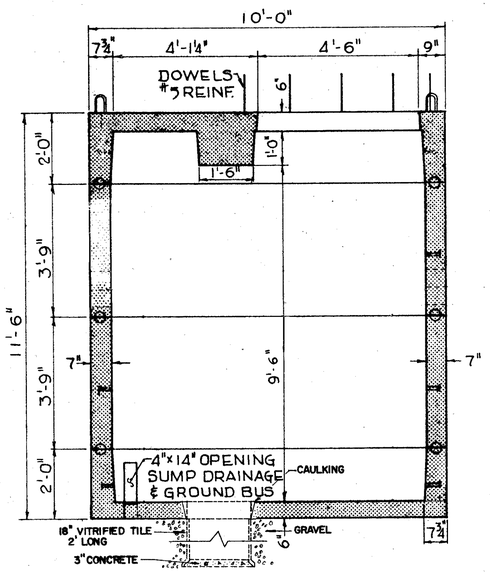
GENERAL NOTES

1.) DUCT OPENING SHALL BE PROVIDED AS SHOWN.

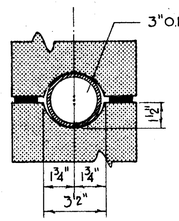
2.) PULLING EYES SHALL BE LINE MATERIAL CO. STYLE NO. DU 2T3 OR APPROVED EQUAL.



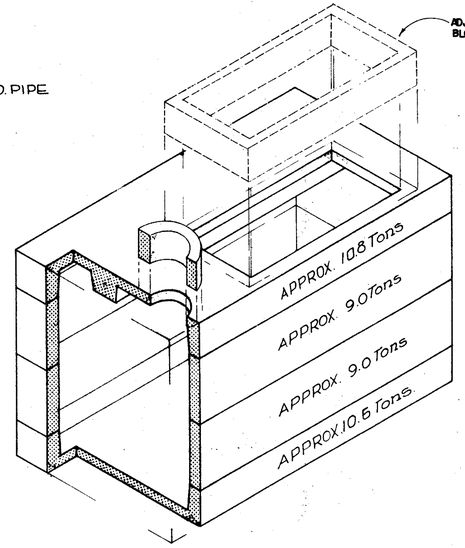
VAULT SECTION A-A



VAULT SECTION B-B

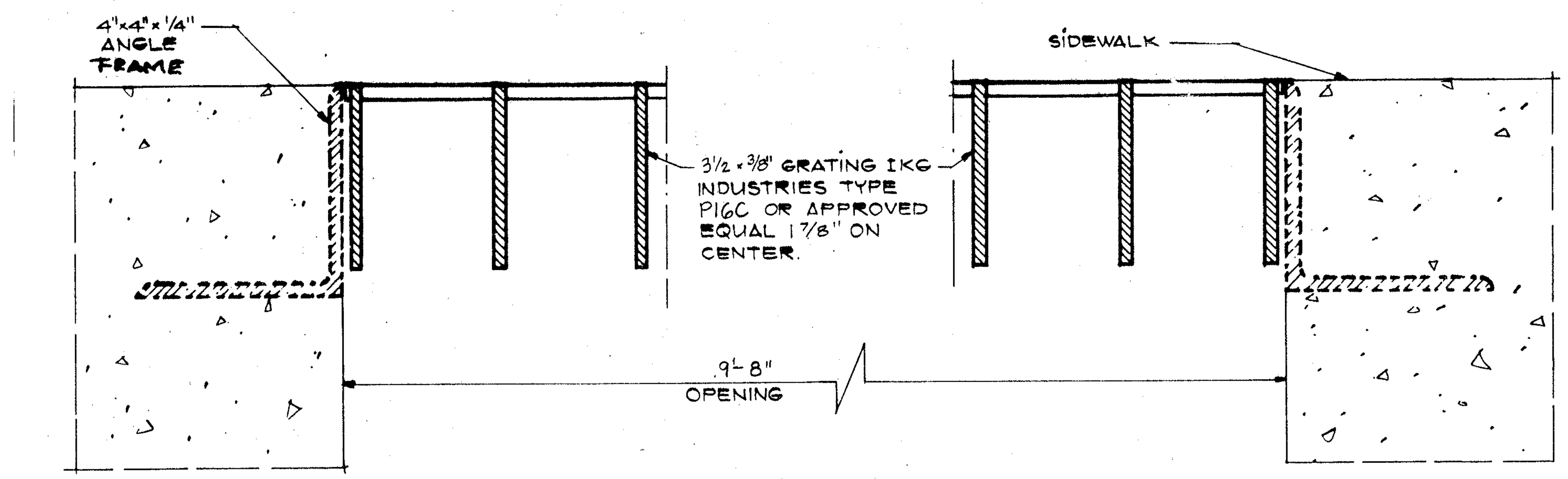


SPLEEN DETAIL

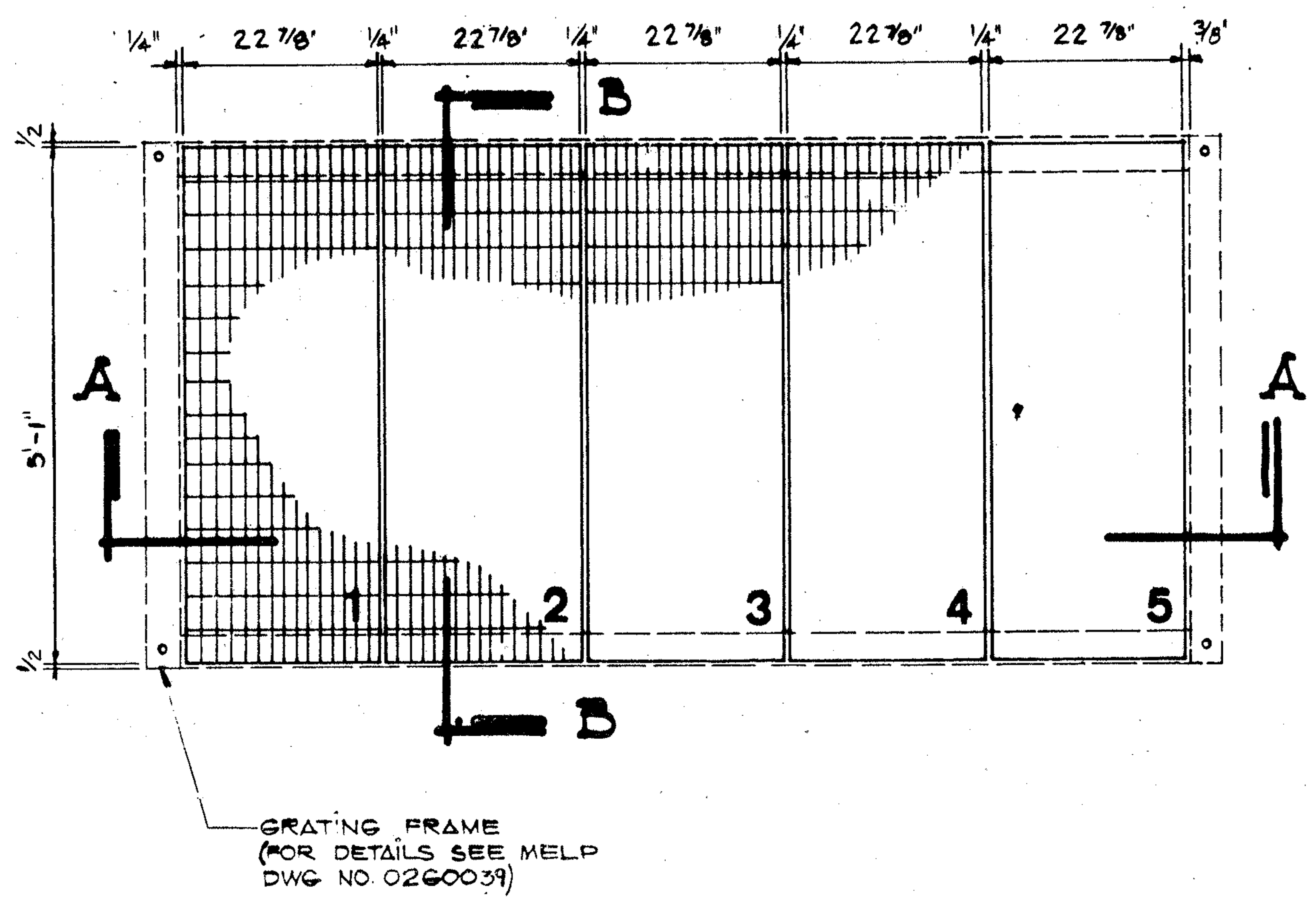


4/99 ALEX.

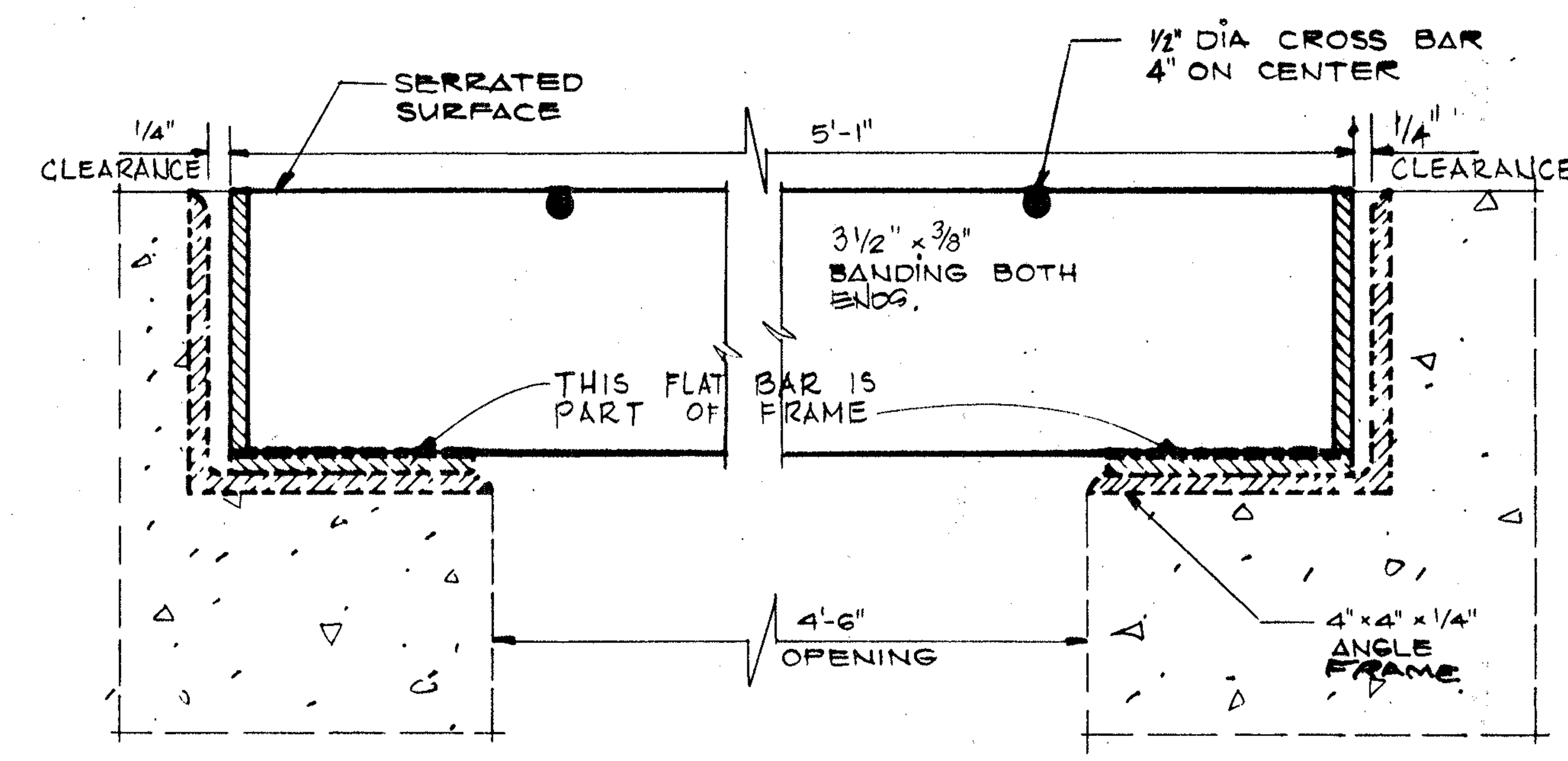
MEL·P MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS, OHIO
DEPT. OF PUBLIC SERVICE — DIV. OF ELECTRICITY



SECTION A-A
SCALE: 1/2" : 1'-0"



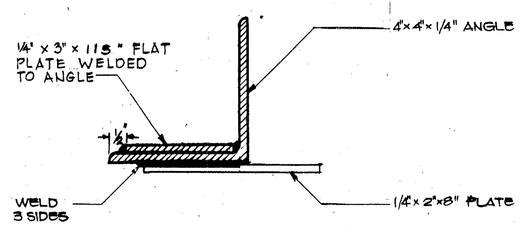
GRATING - PLAN VIEW
SCALE: 3/4" : 1'-0"



SECTION B-B
SCALE: 1/2" : 1'-0"

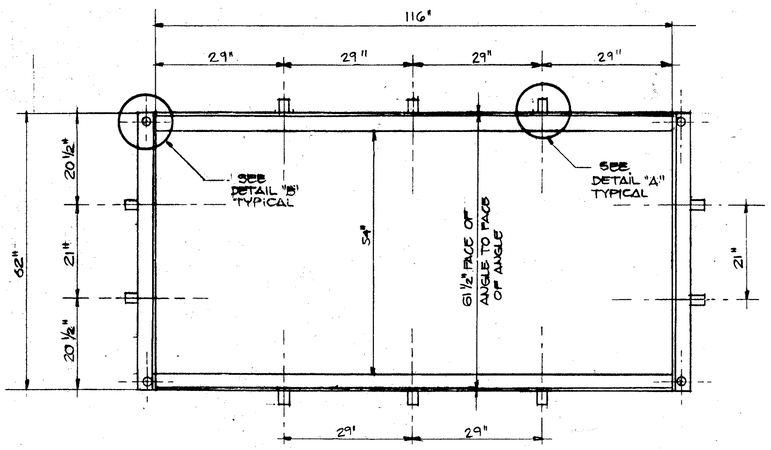
5-PIECE, WELDED-GALVANIZED STEEL

MEL·P MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS, OHIO
DEPT. OF PUBLIC SERVICE DIV. OF ELECTRICITY



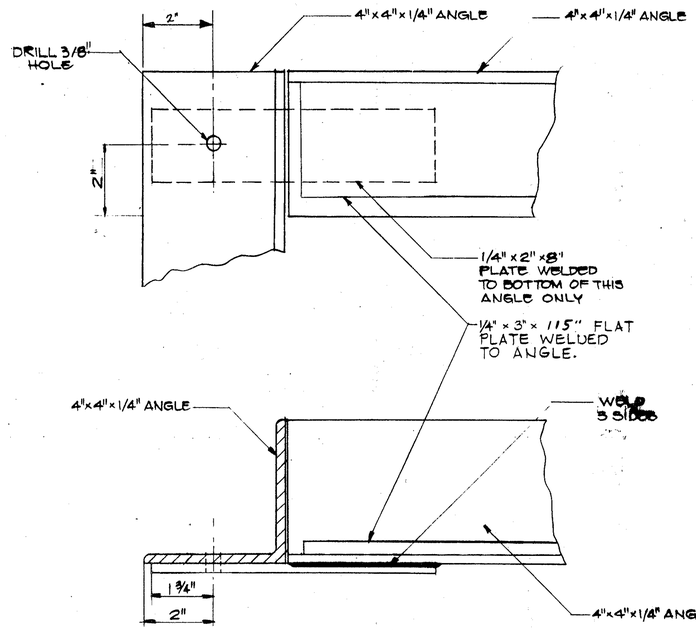
DETAIL "A"

SCALE 1/2" : 1'-0"



GRATING FRAME - PLAN VIEW

SCALE 3/4" : 1'-0"



DETAIL "B"

SCALE 1/2" : 1'-0"

For Grating See Drawing #02G0054 or #02G0041

GALVANIZED

MEP
MUNICIPAL ELECTRIC LIGHT & POWER SYSTEM
CITY OF COLUMBUS, OHIO

CITY of COLUMBUS	OHIO FHWA REGION
FRA-670-1.25- C-3	FEDERAL PROJECT

1/5

INTRODUCTION

THE PROJECT CONSISTS OF CONSTRUCTING PORTIONS OF A BIKEWAY, RAMP OA, RAMP OB, RAMP OC, RAMP OF AND SR 315. THE PROJECT IS PART OF THE OVERALL CONSTRUCTION CONTRACT DESIGNATED AS FRA-670-1.25, CONTRACT C-3.

GEOLOGY

THE ORIGINAL SITE SOIL HAS BEEN DEPOSITED BY ILLINOIAN AND WISCONSIN GLACIERS. SOILS ENCOUNTERED CONSIST OF CLAYEY SILT GLACIAL TILLS, AND SAND AND GRAVEL OUTWASH.

EXPLORATION

SEVENTEEN ENGINEERING TEST BORINGS, DESIGNATED AS BW-1, BW-2 AND BW-7, OA-1, OB-1, OC-1 AND OC-2, OF-2, S-1, S-2 AND S-4 THROUGH S-10 WERE DRILLED AT THE STATION AND OFFSET SHOWN ON THE BORING LOGS. THE TEST BORINGS WERE DRILLED WITH A TRUCK MOUNTED ROTARY DRILLING MACHINE UTILIZING CONTINUOUS FLIGHT AUGERS TO ADVANCE THE HOLE. STANDARD PENETRATION TESTS WERE PERFORMED AT 2.5 AND 5-FOOT INTERVALS TO OBTAIN REPRESENTATIVE SOIL SAMPLES FOR VISUAL EXAMINATION AND LABORATORY TESTING. ALL SAMPLES WERE VISUALLY CLASSIFIED AND TESTED FOR NATURAL MOISTURE CONTENT. SAMPLES SELECTED AS BEING REPRESENTATIVE OF THE SITE SOILS WERE TESTED FOR GRADATION AND ATTERBERG LIMITS.

INVESTIGATIONAL FINDINGS

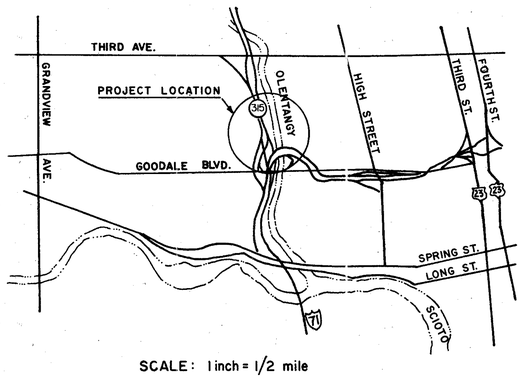
THE TEST DATA INDICATES THAT THE ORIGINAL SOILS ARE PRIMARILY COHESIVE OF THE A-4a CATEGORY WITH ZONES OF GRANULAR SOILS IN THE A-1-a TO A-3a CATEGORY. RANDOM FILL SOILS WERE ENCOUNTERED IN ALL BORINGS EXCEPT OA-1, OC-2, OF-2 AND S-1. CLASSIFICATION IS ACCORDING TO THE OHIO DEPARTMENT OF TRANSPORTATION SYSTEM.

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 PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

THE PURPOSE OF THIS SUBSURFACE INVESTIGATION IS TO DEVELOP SOILS INFORMATION FOR FOUNDATION DESIGN WHICH WILL LIMIT UNCERTAINTY AND ESTABLISH RISK POTENTIAL. THIS INVESTIGATION HAS BEEN PERFORMED SPECIFICALLY FOR FOUNDATION DESIGN PURPOSES AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION ESTIMATING OR BIDDING. INFORMATION SHOWN WAS OBTAINED FOR USE IN ESTABLISHING DESIGN CRITERIA FOR THE PROJECT. THE ACCURACY OF THE DATA PRESENTED IS NOT GUARANTEED BY THE STATE OF OHIO OR CONSULTANT AND IS NOT TO BE CONSTRUED AS PART OF THE PLANS GOVERNING CONSTRUCTION OF THE PROJECT.

LOCATION MAP

CITY of COLUMBUS
CONTRACT C-3



SCALE: 1 inch = 1/2 mile

LEGEND FOR PROJECT — AVERAGE RESULTS OF TESTS — 33 SAMPLES TESTED

ROTARY BORING — PLAN

ROTARY BORING — PROFILE — PLOTTED TO VERTICAL SCALE ONLY
— INDICATES MOISTURE CONTENT IN PERCENT
X — INDICATES NUMBER OF BLOWS FOR FIRST SIX INCHES
Y — INDICATES NUMBER OF BLOWS FOR SECOND SIX INCHES
Z — INDICATES NUMBER OF BLOWS FOR THIRD SIX INCHES

MOISTURE CONTENT ≥ LL-3

MOISTURE CONTENT OF A NON-PLASTIC SOIL > 25

w — INDICATES FREE WATER

SOIL SYMBOL and DESCRIPTION	HRB CLASS	OHIO CLASS	% AGG	% C. SAND	% F. SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT	SAMPLES TESTED
GRAVEL and/or STONE FRAGMENTS	A-1-a	A-1-a	68	12	8	8	4	—	—	9	3
GRAVEL and/or STONE FRAGMENTS with SAND	A-1-b	A-1-b	51	16	13	20		—	—	10	4
COARSE and FINE SAND	—	A-3a	—	—	—	—	—	—	—	—	—
SANDY SILT	A-4	A-4a	10	9	28	32	21	28	6	19	18
SILT	A-4	A-4b	1	2	15	55	27	30	7	21	1
SILT and CLAY	A-6	A-6a	5	4	17	42	32	35	12	25	6
SILTY CLAY	A-6	A-6b	4	4	7	48	37	39	17	21	1
TOPSOIL		VISUAL CLASSIFICATION									
RANDOM FILL	VISUAL CLASSIFICATION (may include one or more of the following soil, brick, wood, cinders, concrete, glass, etc.)										
CINDERS with or without SOIL		VISUAL CLASSIFICATION									

GENERAL INFORMATION

BORINGS ARE MADE BY MEANS OF A ROTARY TYPE DRILL RIG, EMPLOYING A 2-INCH O.D., 1-3/8-INCH 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 THE LAST 12 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

THE BORING LOG SHEET SHOWS 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, FIELD SAMPLE NUMBER, AND SAMPLE DESCRIPTION BASED ON LABORATORY TESTS AND THE OHIO DEPARTMENT OF TRANSPORTATION CLASSIFICATION SYSTEM. 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 CANNOT BE DRIVEN, A WASH SAMPLE IS PROCURED FOR VISUAL CLASSIFICATION, TO DETERMINE THE GENERAL CHARACTER OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

PROJECT INDEX

PROJECT	STATION FROM	STATION TO	PLAN SHEET	PROFILE SHEET	CUT MAX	FILL MAX
I-670/315 NB.	140+00	171+55.38	2 & 3	2 & 3	3.7	16.0
I-670/315 SB.	140+00	171+65.47	3	3	3.7	15.4
Ramp OA	150+63.57	155+31.74	2	2	5.1	9.4
Ramp OB	154+25.00	159+86.25	3	2	7.1	11.4
Ramp OC	148 63.57	166+44.88	2	4	1.5	9.9
Ramp OF	145+06.57	149+43.86	2	4	0.0	9.5
Bikeway	139+89.02	160+00	2 & 3	4	6.6	10.5

PARTICLE SIZE DEFINITION

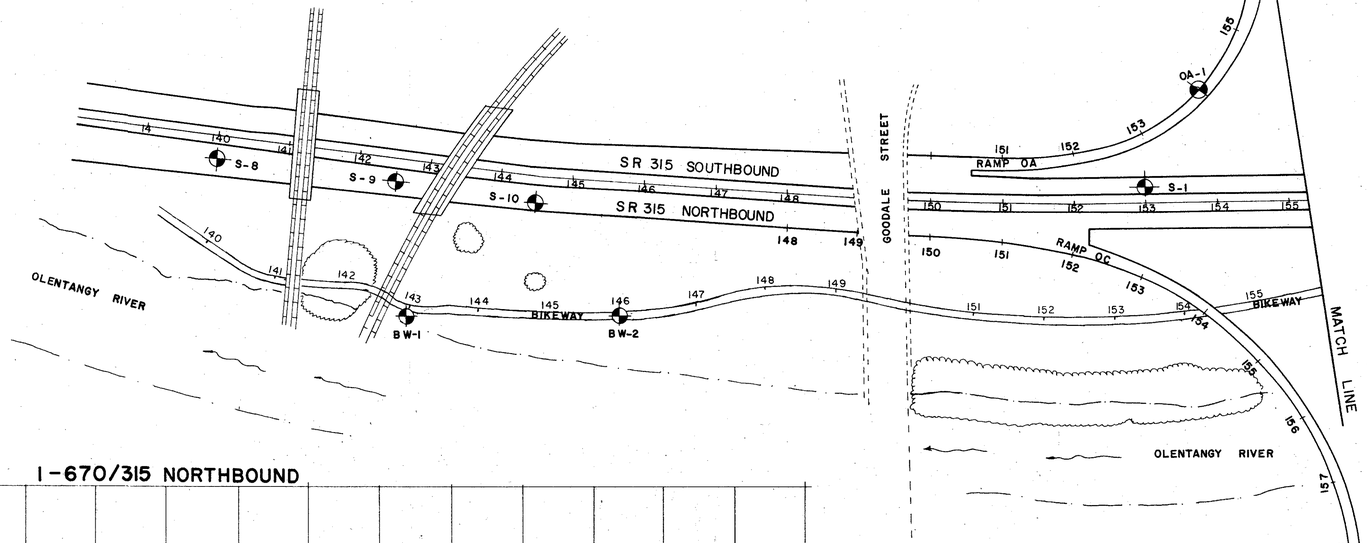
BOULDERS	COBBLES	GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY
8"	3"	2mm (NO.10)	42mm (NO.40)	.074mm (NO.200)	.005mm	

RESOURCE INTERNATIONAL INC.
281 ENTERPRISE DR.
COLUMBUS, OHIO 43081

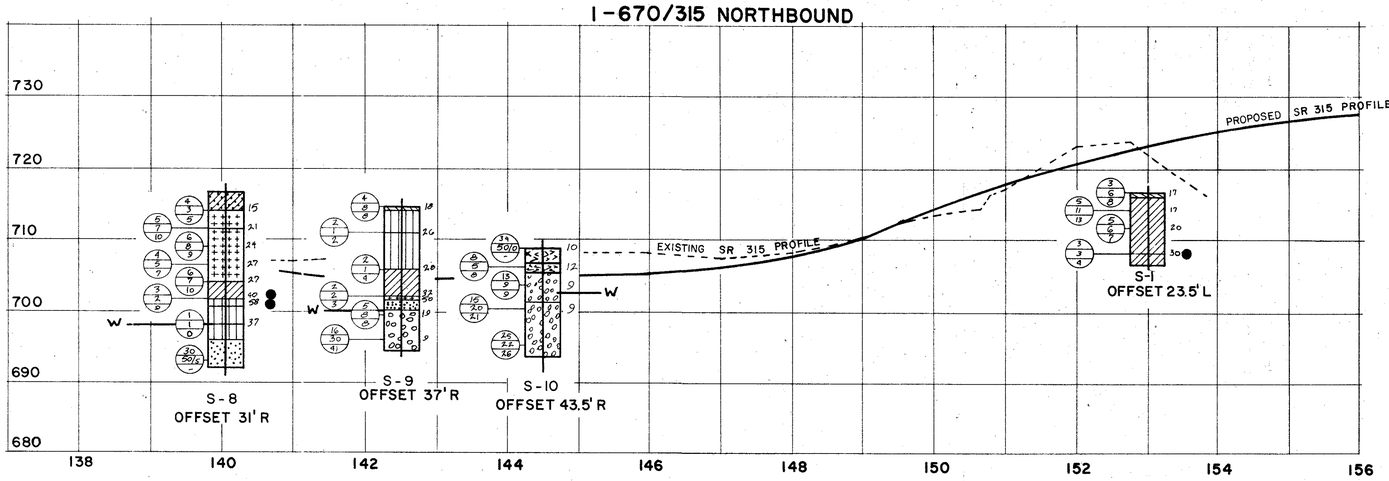
CITY of COLUMBUS
I-670
FRA. 670-1.25-C-3
SOIL PROFILE

DATE: 11-86 | DRAWN BY: S R | CHECKED BY: MK

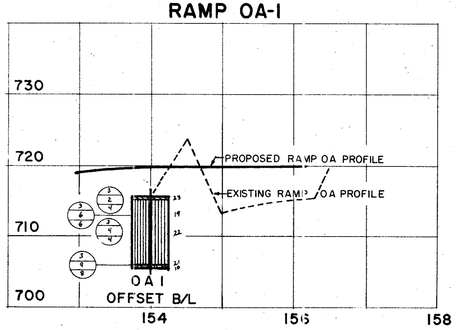
FRANKLIN COUNTY	OHIO
	FHWA REGION
FRA-670-1.25-C3	FEDERAL PROJECT



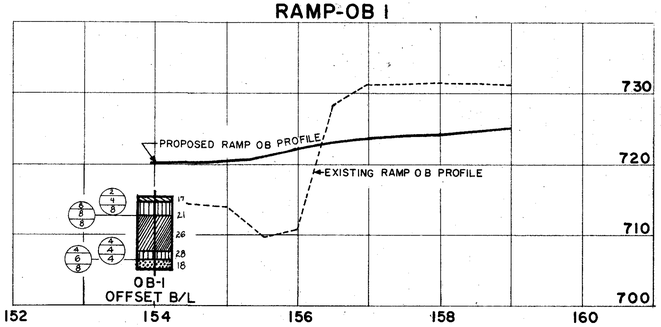
I-670/315 NORTHBOUND



RAMP OA-1



RAMP-OB 1



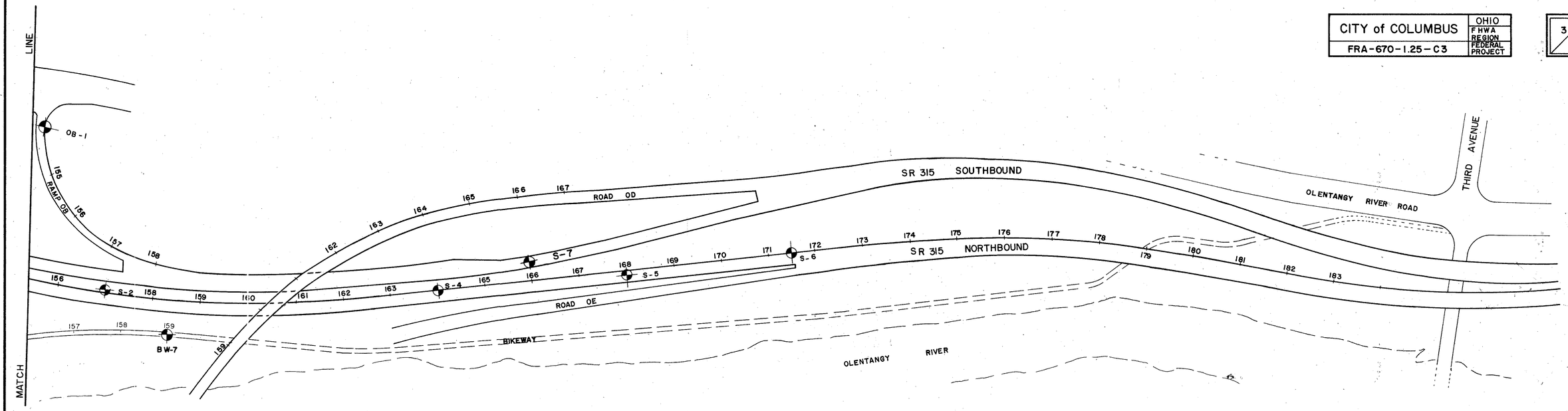
SCALES:
HORIZ. 0' 50' 100' 200'
VERT. 0' 5' 10' 20'

CITY OF COLUMBUS I-670 FRA. 670-1.25-C3 SOIL PROFILE			
DATE 11-86	DRAWN BY: KLL	CHECKED BY: JEG (AHK)	REVISED

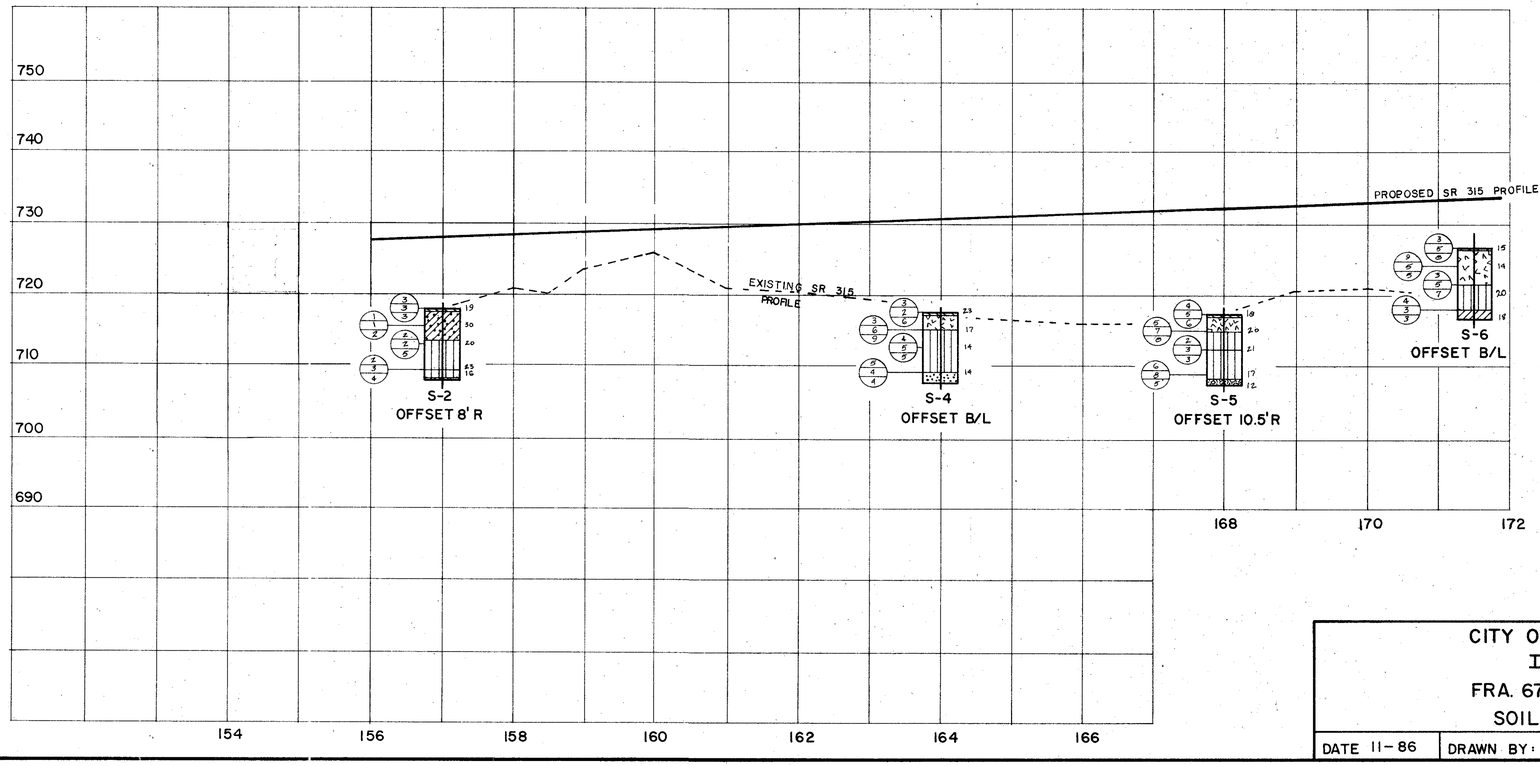
RESOURCE INTERNATIONAL
281 ENTERPRISE DR.
COLUMBUS, OHIO 43081
(614) 885-1959

CITY of COLUMBUS	OHIO
	FHWA REGION
FRA-670-1.25-C3	FEDERAL PROJECT

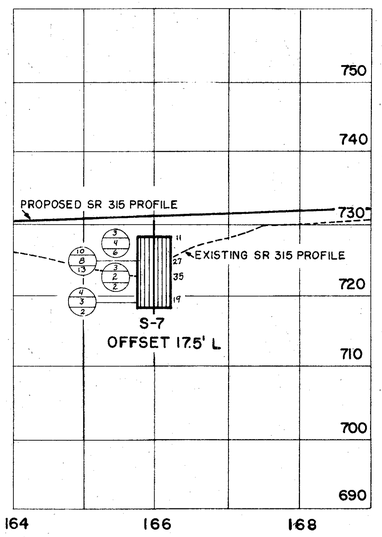
3/5



I-670/315 NORTHBOUND



I-670/315 SOUTHBOUND



HORIZ. 0' 50' 100' 200'

VERT. 0' 5' 10' 20'

CITY OF COLUMBUS
I-670
FRA. 670-1.25-C3
SOIL PROFILE

DATE 11-86	DRAWN BY: KLL	CHECKED BY: JEG AWR	REVISED

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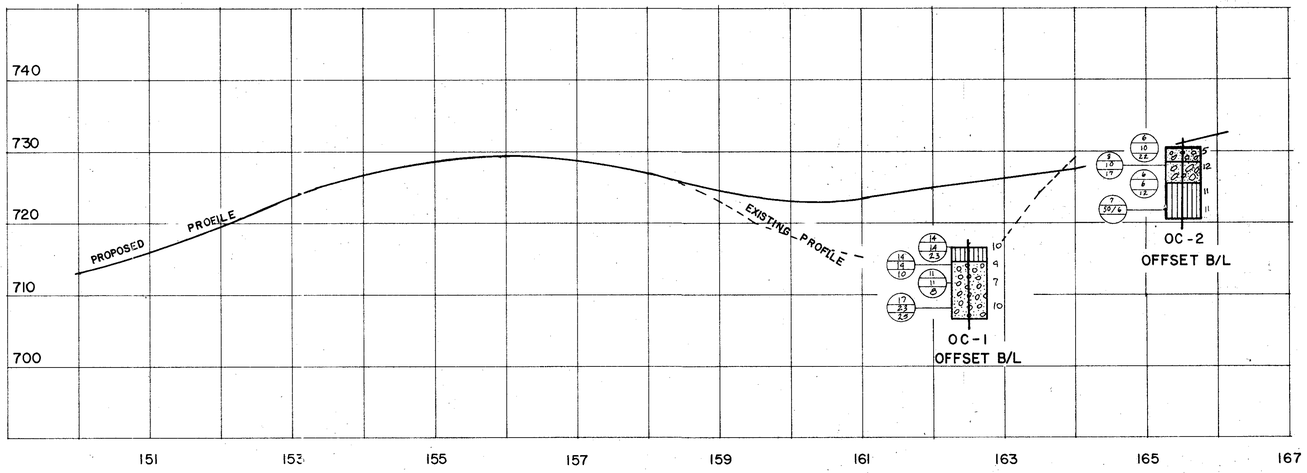

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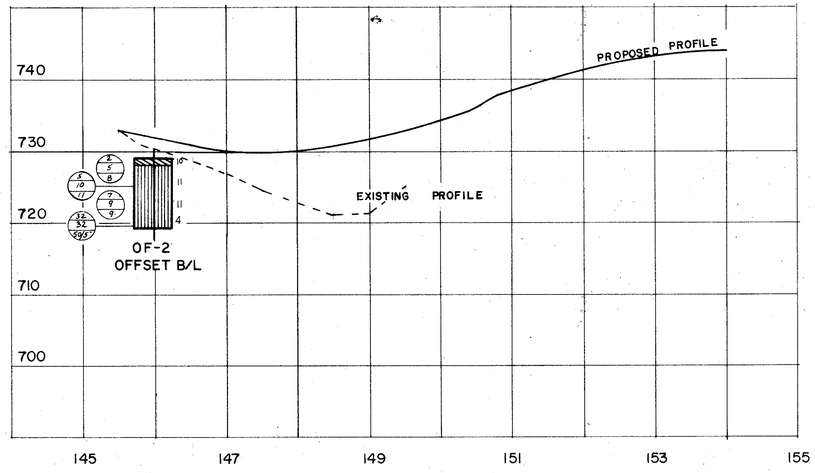

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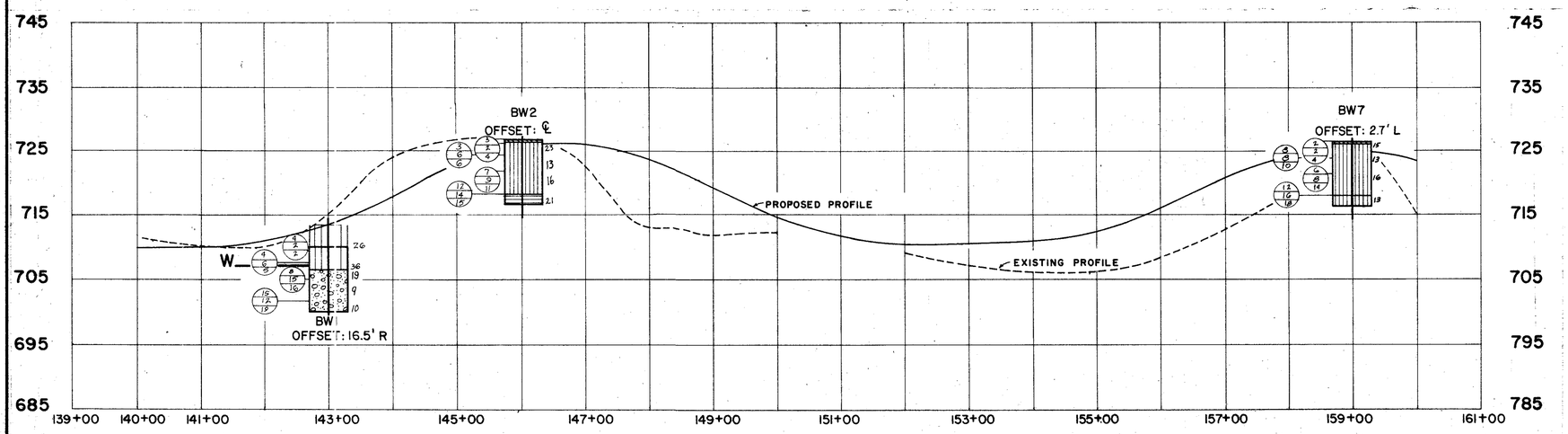


BIKEWAY

SCALE :

HORIZ. 0' 50' 100' 200'

VERT. 0' 5' 10' 20'

CITY OF COLUMBUS
I-670
FRA. 670-1.25-C3
SOIL PROFILE

DATE 1.1-86	DRAWN BY: KLL	CHECKED BY: ARC JEG	REVISED

RESOURCE INTERNATIONAL
281 ENTERPRISE DR.
COLUMBUS, OHIO 43081
(614) 885-1959

BORING NUMBER	STATION & OFFSET	DEPTH FROM	TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	ODOT CLASS.
S-1	153+00 23.5' LT.	0.0	0.8	TOPSOIL							17	VISUAL
		2.5	3.7	BROWN CLAYEY SILT, LITTLE FINE SAND							17	VISUAL
		5.0	6.3	0	0	16	50	34	34	12	20	A-6A
		8.5	4.7	2	15	33	25	25	33	11	30	A-6A
S-2	157+00 8' RT.	0.0	0.2	TOPSOIL								VISUAL
		0.2	1.5	BLACKISH BROWN CLAYEY SILT, SOME FINE TO COARSE SAND AND CINDERS (FILL)							19	VISUAL
		2.5	3.2	BLACKISH BROWN CLAYEY SILT, SOME FINE TO COARSE SAND AND CINDERS (FILL)							30	VISUAL
		5.0	6.5	0	0	24	46	30	32	9	20	A-4A
		8.5	9.8	-	-	-	-	-	30	10	23	A-4A
		9.8	10.0	BROWN AND GRAY FINE TO COARSE SAND, SOME TO LITTLE CLAYEY SILT								VISUAL
S-4	164+00 B/L	0.0	0.2	TOPSOIL								VISUAL
		0.2	0.5	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND SOME CINDERS AND BRICKS (FILL)							23	VISUAL
		2.5	3.5	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, TRACE FINE GRAVEL							17	VISUAL
		5.0	5.6	2	6	33	31	28	30	9	14	A-4A
		8.0	9.2	BROWN FINE TO COARSE SAND, LITTLE TO TRACE CLAYEY SILT							14	VISUAL
S-5	168+00 10.5' RT.	0.0	0.1	TOPSOIL								VISUAL
		0.1	0.8	BROWN CLAYEY SILT, SOME CINDERS, BRICK AND ROCK FRAGMENTS (FILL)							18	VISUAL
		2.5	3.5	BROWN CLAYEY SILT, SOME TO LITTLE FINE TO COARSE SAND							20	VISUAL
		5.0	6.5	0	0	30	43	27	29	8	21	A-4A
		8.5	9.0	BROWN CLAYEY SILT, SOME FINE SAND							17	VISUAL
		9.0	9.5	41	17	18	-24-				12	A-1-B
S-6	171+50 B/L	0.0	0.1	TOPSOIL								VISUAL
		0.1	0.8	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, LITTLE BRICK AND CINDERS (FILL)							15	VISUAL
		2.5	2.8	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, LITTLE BRICK AND CINDERS (FILL)							14	VISUAL
		5.0	5.6	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, LITTLE SHALE AND LIMESTONE FRAGMENTS (FILL)							20	VISUAL
		8.5	9.7	26	10	20	-44-		32	12	18	A-6A
S-7	166+00 17.5' LT.	0.0	0.7	22	17	16	27	18	21	5	11	A-4A
		2.5	3.3	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, SOME FINE GRAVEL (FILL)							27	VISUAL
		5.0	5.7	BROWN AND GRAY CLAYEY SILT, SOME FINE GRAVEL, SOME FINE TO COARSE SAND, LITTLE BRICK AND CINDERS							35	VISUAL
		8.5	9.2	33	14	15	-38-				19	A-4A
S-8	140+06 31' RT.	0.0	2.5	CINDERS AND BRICK (FILL)								VISUAL
		2.5	3.3	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, LITTLE FINE GRAVEL, TRACE ORGANICS							15	
		5.0	6.0	1	2	15	55	27	30	7	21	A-4B
		7.5	8.3	BROWN CLAYEY SILT, LITTLE FINE TO COARSE SAND, TRACE FINE GRAVEL							24	VISUAL
		10.0	10.5	BROWN CLAYEY SILT, LITTLE FINE TO COARSE SAND, TRACE FINE GRAVEL							27	VISUAL
		12.5	14.0	0	1	16	46	37	39	14	27	A-6A
		15.0	15.4	0	13	50	-37-		28	3	40	A-4A
		15.4	16.0	0	5	43	31	21	38	6	58	A-4A
		18.5	18.8	GRAY CLAYEY SILT AND FINE TO COARSE SAND							37	VISUAL
		23.5	24.1	GRAY FINE TO COARSE SAND, SOME FINE TO COARSE GRAVEL								VISUAL

BORING NUMBER	STATION & OFFSET	DEPTH FROM	TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	ODOT CLASS.
S-9	142+52 37' RT.	0.0	0.5	TOPSOIL							18	VISUAL
		3.5	3.8	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, SOME BRICK AND CINDERS (FILL)							26	VISUAL
		8.5	10.0	0	0	6	57	37	37	14	28	A-6A
		12.5	12.7	GRAY SILT, SOME FINE TO COARSE SAND, LITTLE TO TRACE ORGANICS							32	VISUAL
		12.7	13.5	GRAY FINE TO COARSE SAND, LITTLE TO TRACE SILT							50	VISUAL
		15.0	15.3	BROWN FINE TO COARSE GRAVEL, LITTLE FINE TO COARSE SAND, LITTLE SILT							19	VISUAL
		18.5	19.3	69	13	6	-12-				9	A-1-A
S-10	144+49 43.5' RT.	0.0	0.7	BROWN FINE TO COARSE CRUSHED LIMESTONE (FILL)							10	VISUAL
		2.5	3.7	BROWN FINE TO COARSE GRAVEL, SOME FINE TO SAND, LITTLE CLAYEY SILT, TRACE BRICK (FILL 2.0'-4.0')							12	VISUAL
		5.0	5.5	67	12	9	8	4			9	A-1-A
		8.5	9.6	70	9	9	8	4			9	A-1-A
		13.5	14.3	BROWN FINE TO COARSE GRAVEL, LITTLE FINE TO COARSE SAND, LITTLE CLAYEY SILT, TRACE ROCK FRAGMENTS								VISUAL
OA-1	154+00 B/L	0.0	0.2	TOPSOIL								VISUAL
		0.2	1.2	BROWN CLAYEY SILT, SOME TO LITTLE FINE TO COARSE SAND, TRACE ORGANICS							23	VISUAL
		2.5	3.6	1	1	16	48	34	33	9	19	A-4A
		5.0	6.3								22	VISUAL
		8.5	9.5	1	14	36	27	22	25	4	21	A-4A
		9.5	10.0	59	11	11	-19-				10	A-1-B
OB-1	154+00 B/L	0.0	0.5	TOPSOIL							-	VISUAL
		0.5	1.2	BROWN AND GRAY CLAYEY SILT, SOME FINE TO COARSE SAND AND GRAVEL, LITTLE CINDERS (FILL)							17	VISUAL
		2.5	3.8	BROWN CLAYEY SILT, TRACE FINE SAND							21	VISUAL
		5.0	6.5	0	0	9	52	39	33	11	26	A-6A
		8.5	9.5	3	4	48	27	18	25	3	28	A-4A
		9.5	9.8	BROWN AND GRAY FINE TO COARSE SAND, SOME GRAVEL							18	VISUAL
OC-1	162+50 B/L	0.0	1.1	-	-	-	-	-	26	4	10	A-4A
		2.5	3.5	BROWN FINE GRAVEL, SOME FINE TO COARSE SAND, SOME SILT							4	VISUAL
		5.0	6.3	44	21	13	22				7	A-1-B
		8.5	9.5	BROWN FINE GRAVEL, SOME FINE TO COARSE SAND, SOME SILT							10	VISUAL
OC-2	165+50 B/L	0.0	1.0	BROWN FINE TO COARSE SAND AND FINE TO COARSE GRAVEL, LITTLE SILT AND TOPSOIL								VISUAL
		2.5	3.8	11	15	24	31	19	20	4	11	A-4A
		5.0	6.5	BROWN CLAYEY SILT AND FINE TO COARSE SAND, LITTLE FINE GRAVEL								VISUAL
		8.5	9.5	24	19	19	27	11	18	4	11	A-4A
OF-2	146+00 B/L	0.0	1.0	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, LITTLE FINE GRAVEL							10	VISUAL
		2.5	4.0	14	16	19	-51-				11	A-4A
		5.0	5.8	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, LITTLE FINE GRAVEL							11	VISUAL
		8.5	9.5	BROWN AND GRAY CLAYEY SILT AND FINE TO COARSE SAND, TRACE FINE GRAVEL							4	VISUAL
BW-1	143+00 16.5' RT.	0.0	1.0	BLACK CLAYEY SILT, SOME FINE TO COARSE SAND, ORGANICS AND CINDERS (FILL)							26	VISUAL
		2.5	2.9	BLACK CLAYEY SILT, SOME FINE TO COARSE SAND, ORGANICS AND CINDERS (FILL)							36	VISUAL
		2.9	3.3	BROWN FINE TO COARSE GRAVEL, SOME FINE TO COARSE SAND, LITTLE SILT							19	VISUAL
		5.0	5.3	BROWN FINE TO COARSE GRAVEL, SOME FINE TO COARSE SAND, LITTLE SILT							9	VISUAL
		8.5	9.3	59	17	8	16				10	A-1-B

CITY of COLUMBUS | OHIO | FHWA REGION 5 | FEDERAL PROJECT

FRA-670-1.25-C3

5/5

BORING NUMBER	STATION & OFFSET	DEPTH FROM	TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	ODOT CLASS
BW-2	146+00 ℄	0.0	0.2	TOPSOIL								VISUAL
		0.2	0.5	-	-	- (CINDERS)			27	9	23	A-4A
		2.5	4.0	BROWN CLAYEY SILT, LITTLE FINE TO COARSE SAND, TRACE ROCK FRAGMENTS AND CINDERS (FILL)							13	VISUAL
		5.0	6.5	BROWN CLAYEY SILT, LITTLE FINE TO COARSE SAND, TRACE ROCK FRAGMENTS AND CINDERS (FILL)							16	VISUAL
		8.5	10.0	4	3	8	48	37	39	17	21	A-6B
BW-7	158+98.5 2.7' LT.	0.0	0.2	TOPSOIL							-	VISUAL
		0.2	1.1	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, LITTLE FINE GRAVEL, LITTLE BRICK AND CINDERS							15	VISUAL
		2.5	3.8	13	5	24	34	24	NP	NP	13	A-4A
		5.0	6.5	BROWN CLAYEY SILT, SOME FINE TO COARSE SAND, LITTLE FINE GRAVEL, LITTLE BRICK AND CINDERS							16	VISUAL
		8.5	9.8	33	9	16	24	18	31	9	13	A-4A

CITY of COLUMBUS
I-670
FRA.-670-1.25-C3
SOIL PROFILE

DATE 11-21-85 2-3-87 | DRAWN BY: JKH | CHECKED BY: AHE | REVISED

RESOURCE INTERNATIONAL INC.
281 ENTERPRISE DR.
COLUMBUS, OHIO 43081
(614) 885-1959

GENERAL INFORMATION

BORINGS ARE MADE BY MEANS OF A ROTARY TYPE DRILL RIG, EMPLOYING A 2-INCH O.D., 1-3/8 INCH 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 THE LAST 12 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

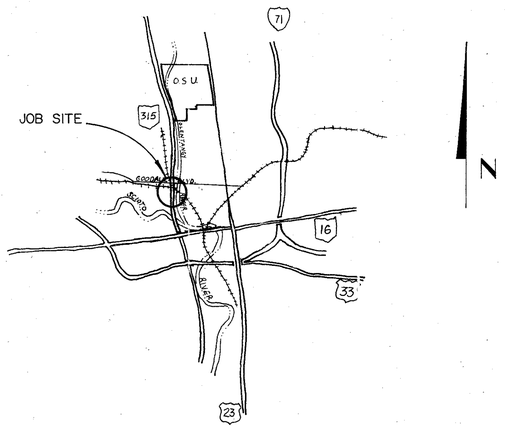
THE BORING LOG SHEET SHOWS GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TESTS IN THREE 6-INCH INCREMENTS, FIELD SAMPLE NUMBER, AND SAMPLE DESCRIPTION BASED ON LABORATORY TESTS AND THE OHIO DEPARTMENT OF TRANSPORTATION CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED, APPEAR ON SEPARATE ENCLOSURES.

AT DEPTH WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLE CANNOT BE DRIVEN, A WASH SAMPLE IS PROCURED FOR VISUAL CLASSIFICATION TO DETERMINE THE GENERAL CHARACTER OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

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 THE DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

THE PURPOSE OF THIS SUBSURFACE INVESTIGATION IS TO DEVELOP SOILS INFORMATION FOR FOUNDATION DESIGN WHICH WILL LIMIT UNCERTAINTY AND ESTABLISH RISK POTENTIAL. THIS INVESTIGATION HAS BEEN PERFORMED SPECIFICALLY FOR FOUNDATION DESIGN PURPOSES AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION ESTIMATING OR BIDDING. INFORMATION SHOWN WAS OBTAINED FOR USE IN ESTABLISHING DESIGN CRITERIA FOR THE PROJECT. THE ACCURACY OF THE DATA PRESENTED IS NOT GUARANTEED BY THE STATE OF OHIO OR CONSULTANT AND IS NOT TO BE CONSTRUED AS PART OF THE PLANS GOVERNING CONSTRUCTION OF THE PROJECT.

SITE LOCATION



LEGEND

ROTARY BORING — PLAN

ROTARY BORING — PROFILE— PLOTTED TO VERTICAL SCALE ONLY
— INDICATES MOISTURE CONTENT IN PERCENT
X — INDICATES NUMBER OF BLOWS FOR THE FIRST SIX INCHES
Y — INDICATES NUMBER OF BLOWS FOR THE SECOND SIX INCHES
Z — INDICATES NUMBER OF BLOWS FOR THE THIRD SIX INCHES

——w INDICATES FREE WATER

MOISTURE CONTENT ≥ LL-3

MOISTURE CONTENT OF A NON-PLASTIC SOIL > 25

SOIL TYPES

	OHIO CLASS
GRAVEL AND/OR STONE FRAGMENTS	A-1-a
GRAVEL AND/OR STONE FRAGMENTS WITH SAND	A-1-b
FINE SAND	A-3
COARSE AND FINE SAND	A-3a
GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, CLAY	A-2-6
GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT	A-2-4
SANDY SILT	A-4a
SILT	A-4b
ELASTIC SILT AND CLAY	A-5
SOD AND/OR TOPSOIL	VISUAL
BERM MATERIAL	VISUAL
CINDERS	VISUAL

	OHIO CLASS
SILT AND CLAY	A-6a
SILTY CLAY	A-6b
ELASTIC CLAY	A-7-5
CLAY	A-7-6
RANDOM FILL	VISUAL
WEATHERED SHALE	VISUAL
SHALE	VISUAL
SANDSTONE	VISUAL
LIMESTONE	VISUAL
VARIOUS OTHER MATERIALS	VISUAL
SILTSTONE	VISUAL

PARTICLE SIZE DEFINITION

BOULDERS	COBBLES	GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY
8"	3"	2 mm NO.10	.42 mm NO.40		.074 mm NO.200	.005 mm

RESOURCE INTERNATIONAL
281 ENTERPRISE DR.
COLUMBUS, OHIO 43081
(614) 885-1959

FRANKLIN COUNTY	OHIO FHWA REGION
FRA-670-1.25, C-3	FEDERAL PROJECT

I/4

INTRODUCTION

THE PROJECT CONSISTS OF THE CONSTRUCTION OF A NEW BRIDGE FOR THE CONRAIL RAILROAD OVER STATE ROUTE 315 IN COLUMBUS, OHIO. THE SITE IS LOCATED APPROXIMATELY 200 FEET WEST OF THE OLENTAGY RIVER NEAR STATION 141+00 OF SR 315. THE PROPOSED BRIDGE IS TO BE TWO SPAN CONTINUOUS WELDED STEEL DECK GIRDERS WITH STEEL FLOOR PLATE, BALLASTED DECK, AND REINFORCED CONCRETE SUBSTRUCTURES. THE PROJECT IS PART OF THE FRA-670-1.25 (C-3) CONSTRUCTION CONTRACT.

GEOLOGY

SOILS FOUND AT THE SITE EXHIBIT THE CHARACTERISTICS OF SAND AND GRAVEL OUTWASH DEPOSITED AND PRECOMPRESSED TO SOME DEGREE BY THE ILLINOIAN AND WISCONSIN GLACIERS. THE UPPER 20 TO 30 FEET OF THE ORIGINAL SOIL HAS LIKELY BEEN REDEPOSITED IN RECENT GEOLOGIC TIMES BY THE ADJACENT OLENTANGY RIVER. BEDROCK, ALTHOUGH NOT FOUND DURING THE EXPLORATION PROGRAM, IS LIKELY TO BE DEVONIAN AGE SHALES, AND LIMESTONES.

EXPLORATION

FOUR TEXT BORINGS, DESIGNATED SB-1 THROUGH SB-4 WERE DRILLED AT THE STATION AND OFFSET SHOWN ON THE BORING LOGS. THE TEST BORINGS WERE DRILLED WITH A TRUCK MOUNTED ROTARY DRILLING MACHINE UTILIZING HOLLOW STEM OR CONTINUOUS AUGERS AND TRICONE ROLLER BIT WITH DRILLING FLUID TO ADVANCE THE HOLE. STANDARD PENETRATION TESTS WERE PERFORMED AT 2 1/2 AND 5 FOOT INTERVALS TO OBTAIN REPRESENTATIVE SOIL SAMPLES FOR VISUAL EXAMINATION AND LABORATORY TESTING. ALL SAMPLES WERE VISUALLY CLASSIFIED AND TESTED FOR NATURAL MOISTURE CONTENT. SAMPLES SELECTED AS BEING REPRESENTATIVE OF THE SITE SOILS WERE TESTED FOR GRADATION AND ATTERBERG LIMITS.

INVESTIGATIONAL FINDINGS

THE TEST DATA INDICATES THAT THE ORIGINAL SOILS ARE PREDOMINANTLY GRANULAR SOILS IN THE A-1-A TO A-1-B CATEGORY WITH A ZONE OF A-2-4 SOILS ALSO NOTED. COHESIVE SOILS OF THE A-4A AND A-6A CATEGORIES WERE ALSO ENCOUNTERED AT THE SURFACE OF THE BORINGS. CLASSIFICATION IS ACCORDING TO THE OHIO DEPARTMENT OF TRANSPORTATION SYSTEM.

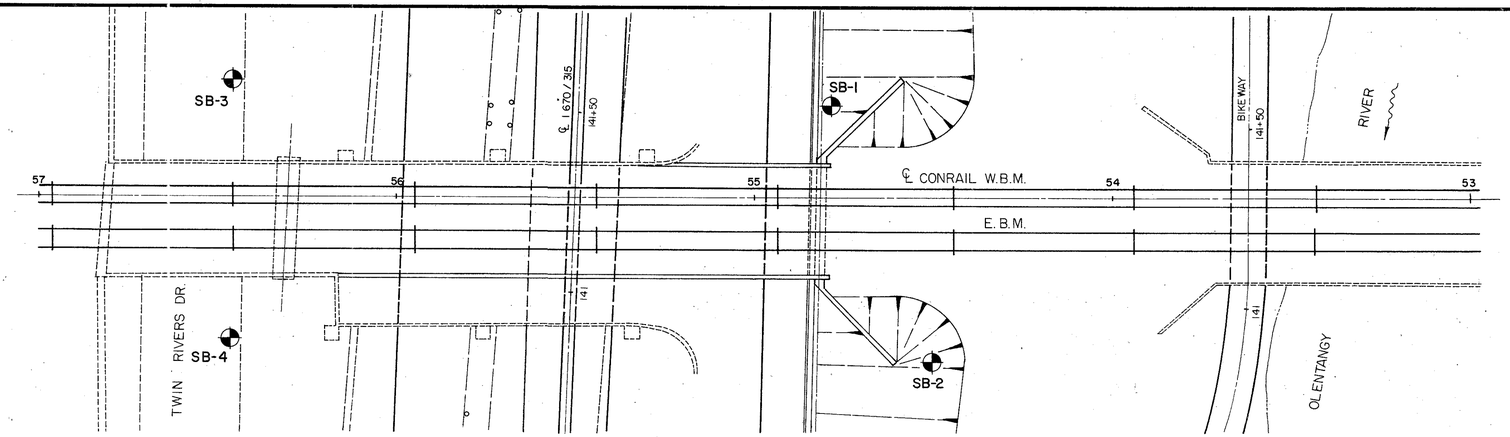
FRANKLIN COUNTY
FRA-670-1.25,C-3
STATE ROUTE 315 UNDER CONRAIL

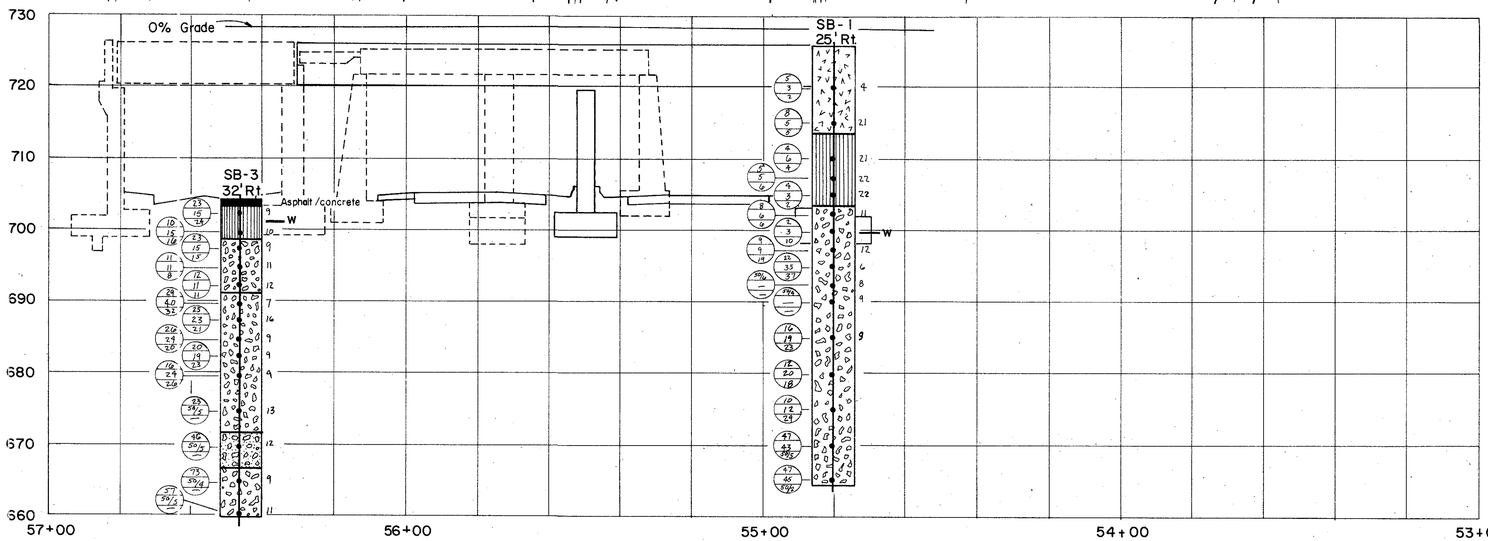
STRUCTURE FOUNDATION INVESTIGATION

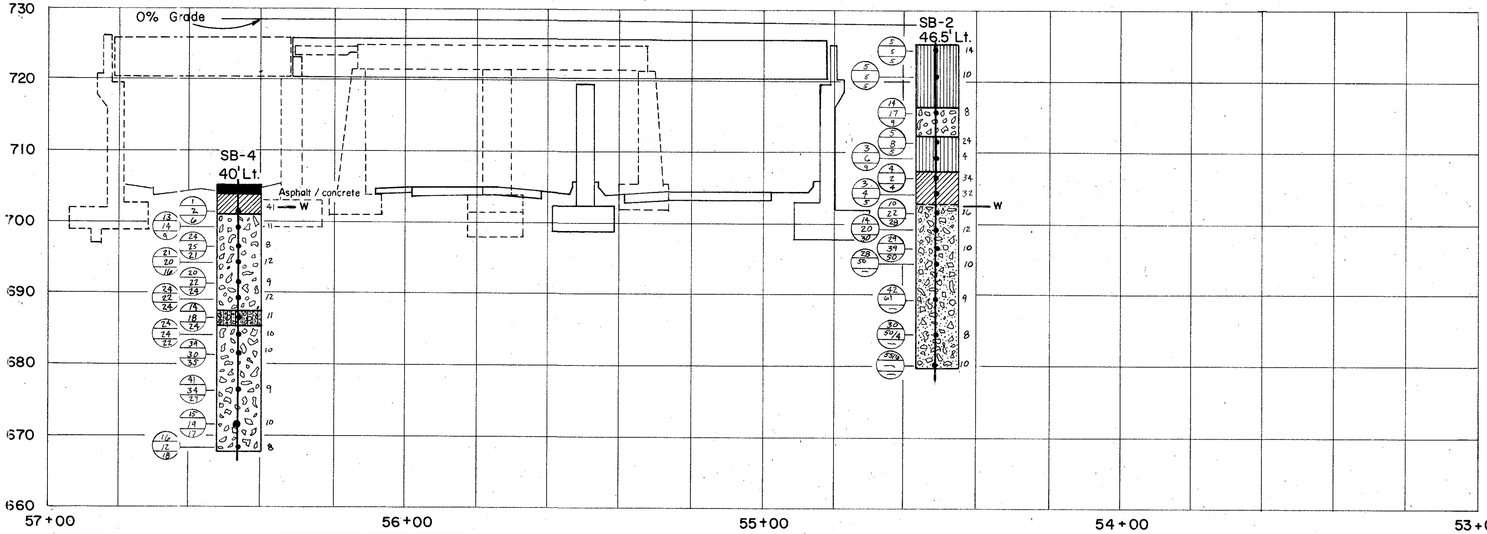
DATE: 9-14-87	DRAWN BY: J.K.H.	CHECKED BY:	REVISED:

FRANKLIN COUNTY	OHIO
	FHWA REGION
FRA-670-1.25,C-3	FEDERAL PROJECT

2/4







(ALONG ℄ CONRAIL W.B.M.)

HORIZ.
0 20 40 60 ft.

VERT.
0 10 20 30 ft.

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FRANKLIN COUNTY
FRA-670-1.25, C-3
STATE ROUTE 315 UNDER CONRAIL
STRUCTURE FOUNDATION INVESTIGATION

DATE: 9-11-87	DRAWN BY: J.K.H.	CHECKED BY: RK	REVISED:

FRANKLIN COUNTY	OHIO
	FHWA REGION
FRA-670-1.25, C-3	FEDERAL PROJECT

BORING LOG : SB-1 (Conrail over SR 315)
STATION AND OFFSET : 54+80 25 Ft. Rt.
SURFACE ELEVATION : 725.4 Feet
WATER ENCOUNTERED : 25.5 Feet.
DATE STARTED : 4-10-86
DATE FINISHED : 4-10-86
SAMPLER TYPE : 2S

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
	S-1	5 3 2		5	Slag, bricks. Fill.	4								
713.4	S-2	8 5 5		10		21								
	S-3	4 6 4		15	Brown clayey silt, some fine to coarse sand, little fine gravel.	21	29	8	19	11	13	37	20	A-4a
	S-4	5 5 6				22	25	7	-	-	-	-	-	A-4a
703.4	S-5	4 3 2		20	22.0	22								
	S-6	8 6 6				11								
	NR	2 3 10		25										
	S-8	9 9 19				12								
	S-9	22 35 37		30		6	-	-	77	9	5	-9-		A-1-a
	S-10	50/6				8								
	S-11	50/4		35	Brown fine to coarse gravel, little fine to coarse sand, trace silt.	9								
	S-12	16 19 23		40		9								
	S-13	12 20 18		45		-								
	S-14	10 12 29		50		-								
	S-15	47 43 50/5		55		-								
664.2	S-16	47 45 50/2		60	61.2	-								
					Bottom of boring at 61.2 feet.									
				65										
				70										
				75										

BORING LOG : SB-2 (Conrail over SR 315)
STATION AND OFFSET : 54+51.5 46.5 Ft. Lt.
SURFACE ELEVATION : 725.1 Feet
WATER ENCOUNTERED : 22.5 Feet
DATE STARTED : 4-12-86
DATE FINISHED : 4-12-86
SAMPLER TYPE : 2S

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
	S-1	5 5 5		5	Brown clayey silt, some fine to coarse sand and fine to coarse gravel, trace brick (fill).	14								
	S-2	5 5 5			8.5	10								
716.6	S-3	14 17 9		10	Brown fine to coarse gravel, some fine to coarse sand, little silt.	8	-	-	58	18	11	-13-		A-1-a
712.6	S-4	5 8 5			12.5	24								
	S-5	3 6 9		15	Brown clayey silt, some fine to coarse sand.	4								
707.6	S-6	4 2 4			17.5	34	39	12	0	4	13	54	29	A-6a
	S-7	3 4 5		20	Greenish gray clayey silt, little fine to coarse sand.	32								
703.1	S-8	10 22 28				16	-	-	49	18	15	-18-		A-1-b
	S-9	14 20 30		25	Brown fine gravel, some fine to coarse sand, little silt.	12								
	S-10	29 39 50				10	-	-	52	19	11	-18-		A-1-b
	S-11	28 50		30		10								
	S-12	42 61			Changing color from brown to gray.	9								
	S-13	30 50/4		35										
				40		8								
679.6	S-14	55/6		45	45.5	10								
					Bottom of boring at 45.5 feet.									
				50										
				55										
				60										
				65										
				70										
				75										

BORING LOG : SB-3 (Conrail over SR 315)
STATION AND OFFSET : 56+46.5 32 Ft. Rt.
SURFACE ELEVATION : 704.0 Feet
WATER ENCOUNTERED : 3.0 Feet
DATE STARTED : 3-15-86
DATE FINISHED : 3-17-86
SAMPLER TYPE : 2S

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
703.0	S-1	23 15 24		5	Asphalt layer (0'-0.3'), concrete layer (0.3-1.0'). 1.0	9								
	S-2	10 15 16			Brown clayey silt, some fine to coarse sand, trace fine gravel. (Possible fill). 5.5	10								
698.5	S-3	23 15 15		10		9	-	-	59	18	10	-13-		A-1-a
	S-4	11 11 8			Brown fine to coarse gravel, some fine to coarse sand, little clayey silt (cobbles).	11								
	S-5	12 11 11			13.0	12								
691.0	S-6	29 40 32		15		7	-	-	65	14	9	-12-		A-1-a
	S-7	25 23 21				16								
	S-8	26 24 20				9								
	S-9	20 19 23		20	Gray fine to coarse gravel, some fine to coarse sand, little clayey silt.	9	-	-	64	18	8	-10-		A-1-a
	S-10	16 24 26				9								
	S-11	23 50/5		25		13								
671.5					32.5									
	S-12	46 50/5		30	Gray fine gravel and fine to coarse sand, some clayey silt.	12	16	1	41	23	14	-22-		A-1-b
666.5	S-13	73 50/4			37.5	9								
				35	Gray fine to coarse gravel, some fine to coarse sand, little clayey silt.									
659.5	S-14	57 50/5		40										
					44.5	11	-	-	59	19	9	-13-		A-1-a
					Bottom of boring at 44.5 feet.									
				45										
				50										
				55										
				60										
				65										
				70										
				75										

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FRANKLIN COUNTY
FRA-670-1.25, C-3
STATE ROUTE 315 UNDER CONRAIL
STRUCTURE FOUNDATION INVESTIGATION

DATE 9-11-87 | DRAWN BY : J.K.H. | CHECKED BY : | REVISED

FRANKLIN COUNTY	OHIO FHWA REGION
FRA-670-1.25, C-3	FEDERAL PROJECT

BORING LOG : S3-4 (Conrail over SR 315)
STATION AND OFFSET : 56+47.2 40 Ft. Lt.
SURFACE ELEVATION : 705.0 Feet
WATER ENCOUNTERED : 3.0 Feet
DATE STARTED : 3-17-86
DATE FINISHED : 3-17-86
SAMPLER TYPE : 2S

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
704.0					Asphalt (0.3'). Concrete layer 1.0									
	S-1	1 2 6			Brown clayey silt, some fine to coarse sand, trace fine gravel. 4.0	41	50	13	1	15	13	54	17	A-6a
701.0	S-2	13 14 9		5	Brown and gray fine to coarse gravel, some fine to coarse sand, little clayey silt.	11	NP	NP	62	15	11	-12-		A-1-a
	S-3	24 25 21			10.0	8								
695.0	S-4	21 20 16		10		12								
	S-5	20 22 24			Brown fine to coarse gravel, little fine to coarse sand, trace silt.	9	-	-	80	7	5	-8-		A-1-a
	S-6	24 22 24		15	17.5	12								
687.5	S-7	14 18 24			Gray clayey silt some fine to coarse sand, little fine to coarse gravel, sand seams. 19.5	11								
685.5	S-8	24 24 22		20		10								
	S-9	39 30 35			Gray fine to coarse gravel, some fine to coarse sand, little silt.	10	-	-	58	21	9	-12-		A-1-a
	S-10	41 34 27		25		5								
	S-11	15 19 17				10								
667.5	S-12	16 12 18		30		8								
				35	37.5									
					Bottom of boring at 37.5 feet.									
				40										
				45										
				50										
				55										
				60										
				65										
				70										
				75										

BORING LOG : SB-5 (C & O Bridge over SR 315)
STATION AND OFFSET : 55+00 46.3 Ft. Rt.
SURFACE ELEVATION : 719.0 Feet
WATER ENCOUNTERED : 16.0 Feet
DATE STARTED : 4-7-86
DATE FINISHED : 4-8-86
SAMPLER TYPE : 2S

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
	S-1	7 9 8			Brown clayey silt, some fine to coarse sand, little fine to coarse gravel. (fill)	14								
712.0				5	7.0									
	S-2	4 4 5			Brown clayey silt, little fine to coarse sand.	21	29	7	0	1	10	55	34	A-4b
707.0				10	12.0									
	S-3	5 7 9				12	-	-	42	22	18	-18-		A-1-b
	S-4	6 13 9		15		9								
	S-5	5 3 4				14								
	S-6	7 15 19		20	Brown fine to coarse gravel, some fine to coarse sand, little silt. Boulder (22.0'-23.5').	11								
	S-7	16 28 50				14	-	-	52	22	11	-15-		A-1-a
	S-8	16 23 47		25		12								
691.0					28.0									
	S-9	17 26 22			Gray fine gravel and fine to coarse sand, little silt.	11								
	S-10	17 31 34		30	34.0	10	-	-	45	19	17	-19-		A-1-b
685.0	S-11	17 26 32			Gray fine to coarse sand, some silt.	17								
682.0				35	37.0									
	S-12	15 27 30			Gray fine to coarse sand, some fine to coarse gravel, some to little silt.	12	-	-	37	18	25	-20-		A-1-b
	S-13	20 30 30		40		7								
	S-14	50/2				3								
667.6	S-15	50/5		45	51.4	8								
					Bottom of boring at 51.4 feet.									
				50										
				55										
				60										
				65										
				70										
				75										

BORING LOG : SB-6 (C & O Bridge over SR 315)
STATION AND OFFSET : 54+75 37 Ft. Lt.
SURFACE ELEVATION : 718.5 Feet
WATER ENCOUNTERED : 19.5 Feet
DATE STARTED : 4-9-86
DATE FINISHED : 4-9-86
SAMPLER TYPE : 2S

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
717.0					Dark brown clayey silt, some fine to coarse sand, little fine to coarse gravel, cinders. (fill) 1.5									
	S-1	4 4 5		5	Brown clayey silt, some fine to coarse sand.	23								
	S-2	6 8 8			12.0	19	27	5	0	1	26	46	27	A-4a
706.5	S-3	3 3 4		10		23								
	S-4	3 6 9			Brown clayey silt, some fine to coarse sand, little fine gravel.	14	NP	NP	17	15	28	32	8	A-4a
702.5	S-5	4 12 13		15	16.0	11								
	NR	50/5			Brown clayey silt, some fine to coarse sand, little fine to coarse gravel, cobbles, boulders (19.8-20.8').									
	S-6	12 15 23		20		15								
694.0	S-7	17 50/5			24.5									
	S-8	15 50/5		25	Brown fine to coarse gravel and fine to coarse sand, trace silt. Cobbles.	14	-	-	54	30	7	-9-		A-1-a
690.5					29.5	10								
689.0	S-9	12 13 18		30	Gray fine to coarse sand, some fine gravel, trace silt. Cobbles.	14	-	-	28	55	11	-6-		A-1b
					36.0									
682.5	S-10	16 32 41		35	Gray fine to coarse sand, some silt, trace fine to coarse gravel.	12								
680.5					38.0									
	S-11	27 48 37		40	Gray fine to coarse sand, some fine to coarse gravel, trace clayey silt.	13								
	S-12	34 50/5				13								
667.6	S-13	38 50/5		45	50.9	8								
					Bottom fo boring at 50.9 feet.									
				50										
				55										
				60										
				65										
				70										
				75										

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FRANKLIN COUNTY
FRA-670-1.25, C-3
STATE ROUTE 315 UNDER CONRAIL
STRUCTURE FOUNDATION INVESTIGATION

DATE 9-11-87 | DRAWN BY : J.K.H. | CHECKED BY : | REVISED

GENERAL INFORMATION

BORINGS ARE MADE BY MEANS OF A ROTARY TYPE DRILL RIG, EMPLOYING A 2-INCH O.D., 1-3/8 INCH 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 THE LAST 12 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

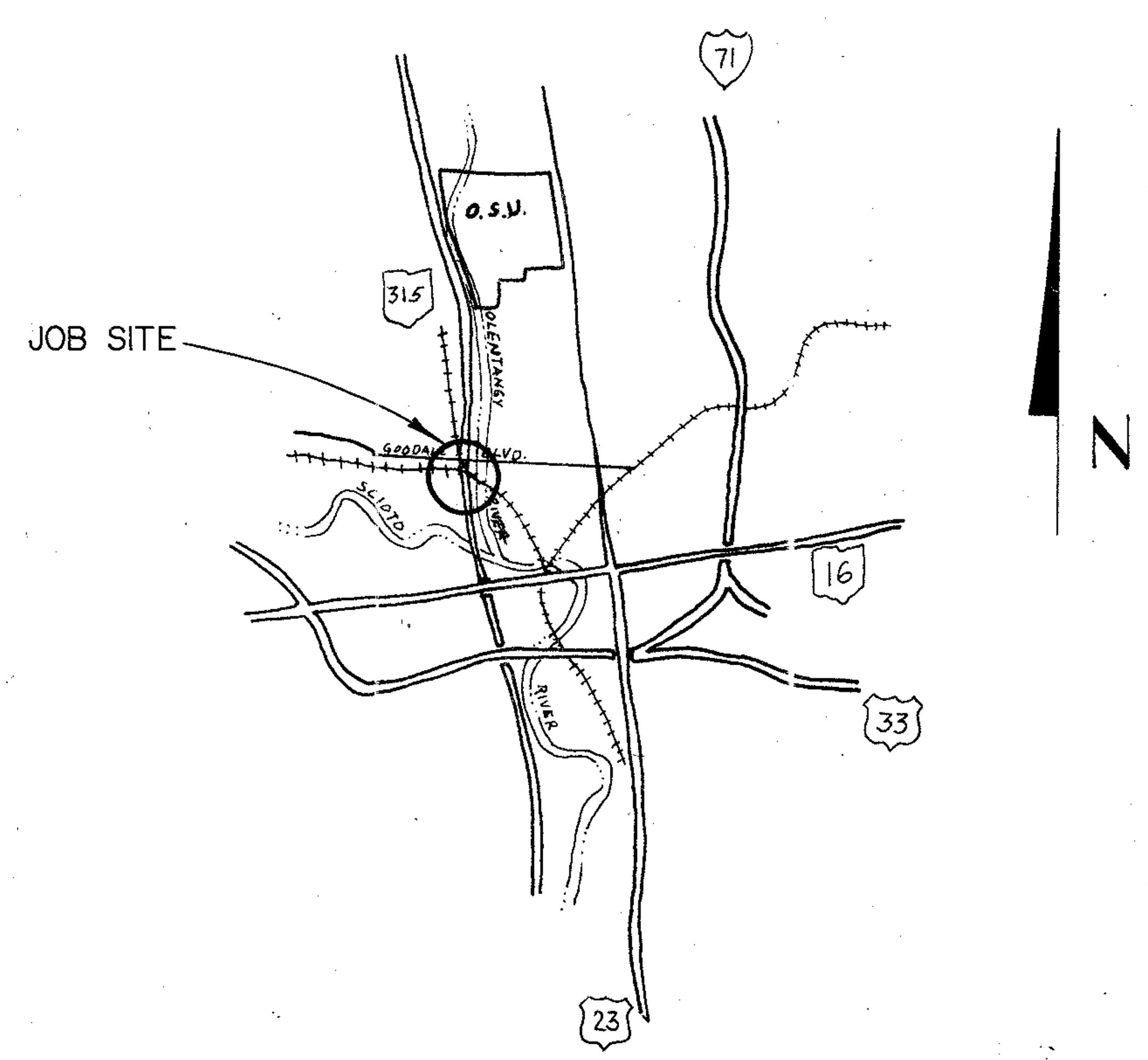
THE BORING LOG SHEET SHOWS GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, NUMBER OF BLOWS FOR THE STANDARD PENETRATION TESTS IN THREE 6-INCH INCREMENTS, FIELD SAMPLE NUMBER, AND SAMPLE DESCRIPTION BASED ON LABORATORY TESTS AND THE OHIO DEPARTMENT OF TRANSPORTATION CLASSIFICATION SYSTEM. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED, APPEAR ON SEPARATE ENCLOSURES.

AT DEPTH WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLE CANNOT BE DRIVEN, A WASH SAMPLE IS PROCURED FOR VISUAL CLASSIFICATION TO DETERMINE THE GENERAL CHARACTER OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

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 THE DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

THE PURPOSE OF THIS SUBSURFACE INVESTIGATION IS TO DEVELOP SOILS INFORMATION FOR FOUNDATION DESIGN WHICH WILL LIMIT UNCERTAINTY AND ESTABLISH RISK POTENTIAL. THIS INVESTIGATION HAS BEEN PERFORMED SPECIFICALLY FOR FOUNDATION DESIGN PURPOSES AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION ESTIMATING OR BIDDING. INFORMATION SHOWN WAS OBTAINED FOR USE IN ESTABLISHING DESIGN CRITERIA FOR THE PROJECT: THE ACCURACY OF THE DATA PRESENTED IS NOT GUARANTEED BY THE STATE OF OHIO OR CONSULTANT AND IS NOT TO BE CONSTRUED AS PART OF THE PLANS GOVERNING CONSTRUCTION OF THE PROJECT.

SITE LOCATION



0 1 2 3
SCALE OF MILES

LEGEND

ROTARY BORING — PLAN

ROTARY BORING — PROFILE — PLOTTED TO VERTICAL SCALE ONLY
— INDICATES MOISTURE CONTENT IN PERCENT
X — INDICATES NUMBER OF BLOWS FOR THE FIRST SIX INCHES
Y — INDICATES NUMBER OF BLOWS FOR THE SECOND SIX INCHES
Z — INDICATES NUMBER OF BLOWS FOR THE THIRD SIX INCHES

——— W INDICATES FREE WATER

MOISTURE CONTENT ≥ LL-3

MOISTURE CONTENT OF A NON-PLASTIC SOIL > 25

SOIL TYPES

	OHIO CLASS		OHIO CLASS
GRAVEL AND/OR STONE FRAGMENTS	A-1-a	SILT AND CLAY	A-6a
GRAVEL AND/OR STONE FRAGMENTS WITH SAND	A-1-b	SILTY CLAY	A-6b
FINE SAND	A-3	ELASTIC CLAY	A-7-5
COARSE AND FINE SAND	A-3a	CLAY	A-7-6
GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT, CLAY	A-2-6	RANDOM FILL	VISUAL
GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT	A-2-4	WEATHERED SHALE	VISUAL
SANDY SILT	A-4a	SHALE	VISUAL
SILT	A-4b	SANDSTONE	VISUAL
ELASTIC SILT AND CLAY	A-5	LIMESTONE	VISUAL
SOD AND/OR TOPSOIL	VISUAL	BOULDERY ZONE	VISUAL
BERM MATERIAL	VISUAL	SILTSTONE	VISUAL
CINDERS	VISUAL		

PARTICLE SIZE DEFINITION

BOULDERS	COBBLES	GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY
6"	3"	2 mm (NO.10)	.42 mm (NO.40)	.074 mm (NO.200)	.005 mm	

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FRANKLIN COUNTY	OHIO FHWA REGION
FRA-670-1.25, C-3	FEDERAL PROJECT

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INTRODUCTION

THE PROJECT CONSISTS OF CONSTRUCTING A NEW BRIDGE FOR THE C. AND O. RAILROAD OVER STATE ROUTE 315 IN COLUMBUS, OHIO. THE SITE IS LOCATED APPROXIMATELY 300 FEET WEST OF THE OLENTAGY RIVER NEAR STATION 143+50 OF SR 315. THE PROPOSED BRIDGE IS TO BE TWO SPAN CONTINUOUS WELDED STEEL DECK GIRDERS WITH STEEL FLOOR PLATE, BALLASTED DECK, AND REINFORCED CONCRETE SUBSTRUCTURES. THE PROJECT IS PART OF THE FRA-670-1.25 (C-3) CONSTRUCTION CONTRACT.

GEOLOGY

SOILS FOUND AT THE SITE EXHIBIT THE CHARACTERISTICS OF SAND AND GRAVEL OUTWASH DEPOSITED AND PRECOMPRESSED TO SOME DEGREE BY THE ILLINOIAN AND WISCONSIN GLACIERS. THE UPPER 10 TO 20 FEET OF THE ORIGINAL SOIL HAS LIKELY BEEN REDEPOSITED IN RECENT GEOLOGIC TIMES BY THE ADJACENT OLENTANGY RIVER. BEDROCK, ALTHOUGH NOT FOUND DURING THE EXPLORATION PROGRAM, IS LIKELY TO BE DEVONIAN AGE SHALES AND LIMESTONES.

EXPLORATION

FOUR TEXT BORINGS, DESIGNATED SB-5 THROUGH SB-8, WERE DRILLED AT THE STATION AND OFFSET SHOWN ON THE BORING LOGS. THE TEST BORINGS WERE DRILLED WITH A TRUCK MOUNTED ROTARY DRILLING MACHINE UTILIZING HOLLOW STEM OR CONTINUOUS AUGERS AND TRICONE ROLLER BIT WITH DRILLING FLUID TO ADVANCE THE HOLE. STANDARD PENETRATION TESTS WERE PERFORMED AT 2-1/2 AND 5 FOOT INTERVALS TO OBTAIN REPRESENTATIVE SOIL SAMPLES FOR VISUAL EXAMINATION AND LABORATORY TESTING. ALL SAMPLES WERE VISUALLY CLASSIFIED AND TESTED FOR NATURAL MOISTURE CONTENT. SAMPLES SELECTED AS BEING REPRESENTATIVE OF THE SITE SOILS WERE TESTED FOR GRADATION AND ATTERBERG LIMITS.

INVESTIGATIONAL FINDINGS

COHESIVE SOILS OF THE A-4A AND A-6A CATEGORIES WERE ENCOUNTERED AT THE SURFACE OF THE BORINGS. THE TEST DATA INDICATES THAT THE ORIGINAL SOILS ARE PREDOMINANTLY GRANULAR SOILS IN THE A-1-A TO A-1-B CATEGORY WITH ZONES OF A-4A AND A-3A SOILS ALSO NOTED. CLASSIFICATION IS ACCORDING TO THE OHIO DEPARTMENT OF TRANSPORTATION SYSTEM.

FRANKLIN COUNTY
FRA-670-1.25, C-3
STATE ROUTE 315 UNDER C. AND O. R.R.
STRUCTURE FOUNDATION INVESTIGATION

DATE: 9-16-87	DRAWN BY: G.S.M.	CHECKED BY:	REVISED:

FRANKLIN COUNTY	OHIO FHWA REGION
FRA-670-1.25,C-3	FEDERAL PROJECT

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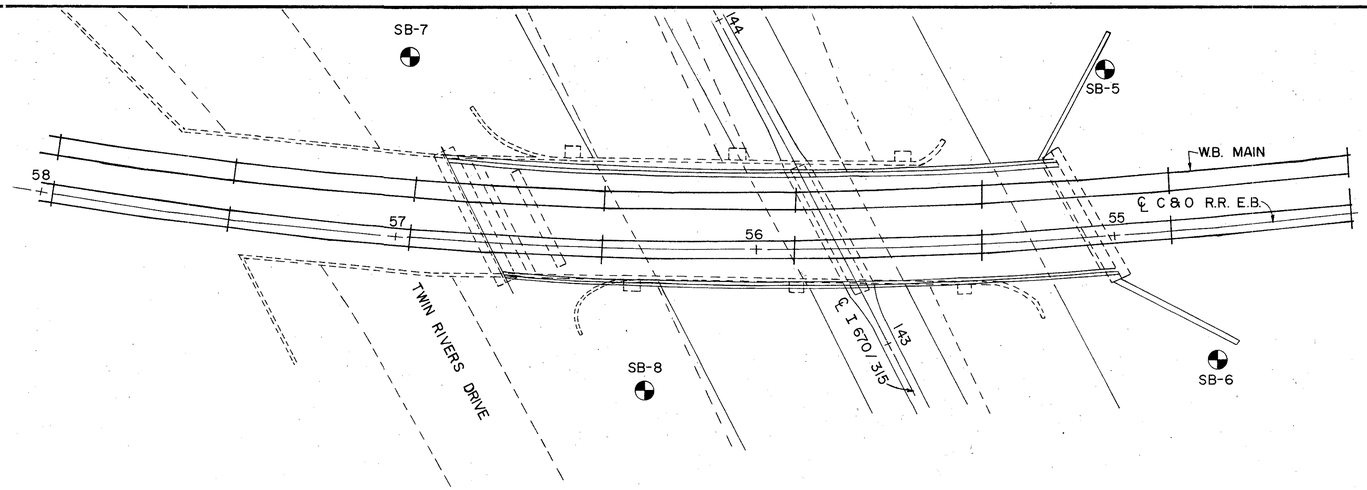
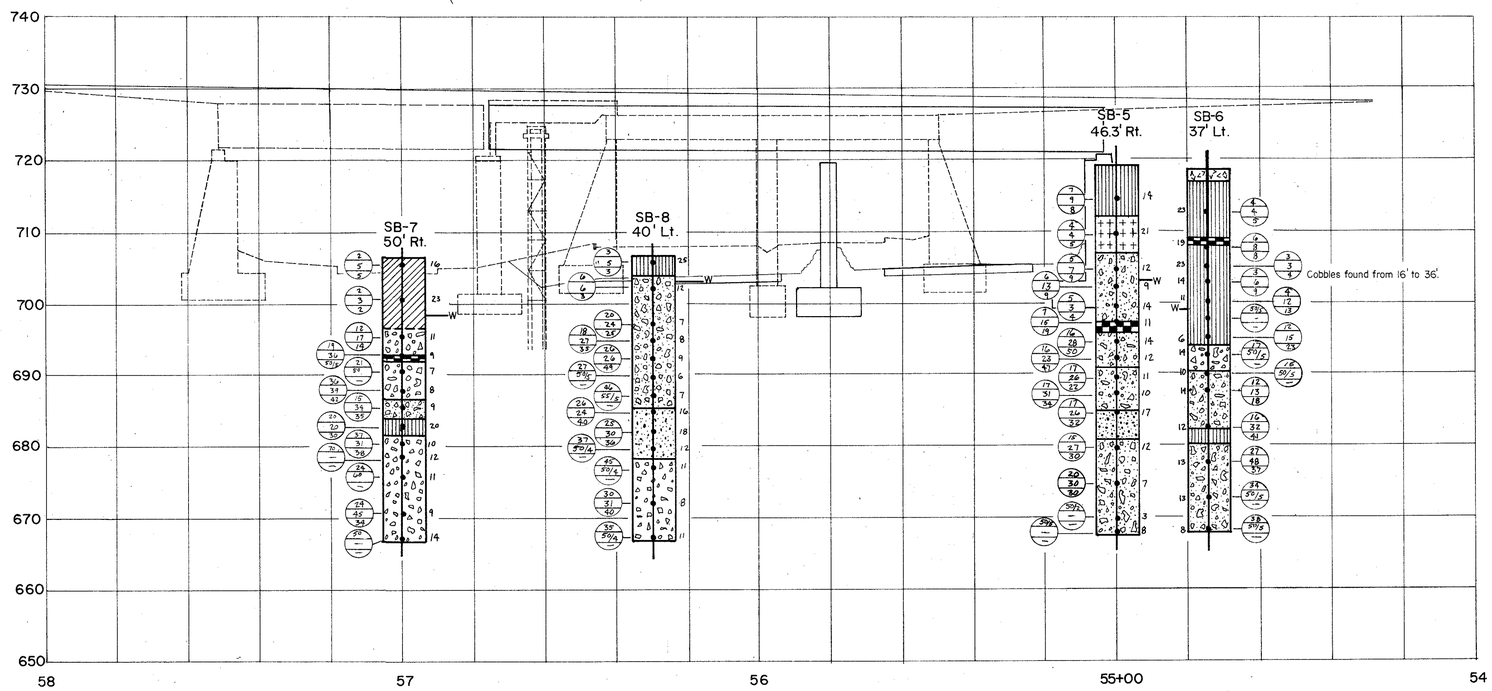
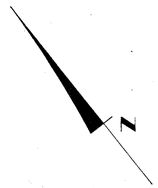
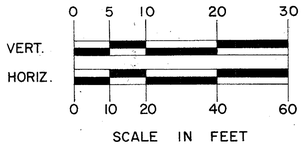




(ALONG ℄ C & O RR. E.B.)





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DATE: 9-14-87	DRAWN BY: G.S.M.	CHECKED BY:	REVISED:

FRANKLIN COUNTY	OHIO FHWA REGION
FRA-670-1.25, C-3	FEDERAL PROJECT

BORING LOG : SB-4 (Conrail over SR 315) DATE STARTED : 3-17-86
STATION AND OFFSET : 56+47.2 40 Ft. Lt. DATE FINISHED : 3-17-86
SURFACE ELEVATION : 705.0 Feet SAMPLER TYPE : 2S
WATER ENCOUNTERED : 3.0 Feet

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
704.0					Asphalt (0.3"). Concrete layer 1.0									
	S-1	1 2 6			Brown clayey silt, some fine to coarse sand, trace fine gravel. 4.0	41	50	13	1	15	13	54	17	A-6a
701.0	S-2	13 14 9		5	Brown and gray fine to coarse gravel, some fine to coarse sand, little clayey silt.	11	NP	NP	62	15	11	-12-		A-1-a
	S-3	24 25 21			10.0	8								
695.0	S-4	21 20 16		10		12								
	S-5	20 22 24			Brown fine to coarse gravel, little fine to coarse sand, trace silt.	9	-	-	80	7	5	-8-		A-1-a
	S-6	24 22 24		15	17.5	12								
687.5	S-7	14 18 24			Gray clayey silt, some fine to coarse sand, little fine to coarse gravel, sand seams. 19.5	11								
685.5	S-8	24 24 22		20		10								
	S-9	39 30 35			Gray fine to coarse gravel, some fine to coarse sand, little silt.	10	-	-	58	21	9	-12-		A-1-a
	S-10	41 34 27		25		5								
	S-11	15 19 17		30		10								
667.5	S-12	16 12 18			37.5	8								
				35	Bottom of boring at 37.5 feet.									
				40										
				45										
				50										
				55										
				60										
				65										
				70										
				75										

BORING LOG : SB-5 (C & O Bridge over SR 315) DATE STARTED : 4-7-86
STATION AND OFFSET : 55+00 46.3 Ft. Rt. DATE FINISHED : 4-8-86
SURFACE ELEVATION : 719.0 Feet SAMPLER TYPE : 2S
WATER ENCOUNTERED : 16.0 Feet

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
	S-1	7 9 8			Brown clayey silt, some fine to coarse sand, little fine to coarse gravel. (fill) 7.0	14								
712.0	S-2	4 4 5		5	Brown clayey silt, little fine to coarse sand.	21	29	7	0	1	10	55	34	A-4b
707.0	S-3	5 7 9		10	12.0	12	-	-	42	22	18	-18-		A-1-b
	S-4	6 13 9				9								
	S-5	5 3 4		15	Brown fine to coarse gravel, some fine to coarse sand, little silt. Boulder (22.0'-23.5').	14								
	S-6	7 15 19				11								
	S-7	16 28 50		20		14	-	-	52	22	11	-15-		A-1-a
	S-8	16 23 47			28.0	12								
691.0	S-9	17 26 22		25	Gray fine gravel and fine to coarse sand, little silt.	11								
	S-10	17 31 34			34.0	10	-	-	45	19	17	-19-		A-1-b
685.0	S-11	17 26 32		30	Gray fine to coarse sand, some silt.	17								
682.0	S-12	15 27 30			37.0	12	-	-	37	18	25	-20-		A-1-b
	S-13	20 30 30		35	Gray fine to coarse sand, some fine to coarse gravel, some to little silt.	7								
	S-14	50/2				3								
667.6	S-15	50/5		40	51.4	8								
					Bottom of boring at 51.4 feet.									
				45										
				50										
				55										
				60										
				65										
				70										
				75										

BORING LOG : SB-6 (C & O Bridge over SR 315) DATE STARTED : 4-9-86
STATION AND OFFSET : 54+75 37 Ft. Lt. DATE FINISHED : 4-9-86
SURFACE ELEVATION : 718.5 Feet SAMPLER TYPE : 2S
WATER ENCOUNTERED : 19.5 Feet

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
717.0					Dark brown clayey silt, some fine to coarse sand, little fine to coarse gravel, cinders. (fill) 1.5									
	S-1	4 4 5		5	Brown clayey silt, some fine to coarse sand.	23								
	S-2	6 8 8			12.0	19	27	5	0	1	26	46	27	A-4a
706.5	S-3	3 3 4		10		23								
	S-4	3 6 9			Brown clayey silt, some fine to coarse sand, little fine gravel.	14	NP	NP	17	15	28	32	8	A-4a
702.5	S-5	4 12 13		15	16.0	11								
	NR	50/5			Brown clayey silt, some fine to coarse sand, little fine to coarse gravel, cobbles, boulders (19.8-20.8').	15								
	S-6	12 15 23		20		14	-	-	54	30	7	-9-		A-1-a
694.0	S-7	17 50/5			24.5	10								
690.5	S-8	15 50/5		25	Brown fine to coarse gravel and fine to coarse sand, trace silt. Cobbles.	14	-	-	28	55	11	-6-		A-1b
689.0	S-9	12 13 18			29.5	12								
				30	Gray fine to coarse sand, some fine gravel, trace silt. Cobbles.	14	-	-						
682.5	S-10	16 32 41			36.0	12								
680.5				35	Gray fine to coarse sand, some silt, trace fine to coarse gravel.									
	S-11	27 48 37			38.0	13								
	S-12	34 50/5		40	Gray fine to coarse sand, some fine to coarse gravel, trace clayey silt.	13								
667.6	S-13	38 50/5			50.9	8								
				45	Bottom fo boring at 50.9 feet.									
				50										
				55										
				60										
				65										
				70										
				75										

RESOURCE INTERNATIONAL
281 ENTERPRISE DR.
COLUMBUS, OHIO 43081
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FRANKLIN COUNTY
FRA-670-1.25, C-3
STATE ROUTE 315 UNDER C. AND O. R.R.
STRUCTURE FOUNDATION INVESTIGATION

DATE 9-11-87 | DRAWN BY : J.K.H. | CHECKED BY : | REVISED

FRANKLIN COUNTY	OHIO FHWA REGION
FRA-670-1.25, C-3	FEDERAL PROJECT

BORING LOG : SB-7 (C & O Bridge over SR 315) DATE STARTED : 3-3-86
STATION AND OFFSET : 57+00/C & ORR 50 Ft. Rt. DATE FINISHED : 3-3-86
SURFACE ELEVATION : 706.3 Feet SAMPLER TYPE : 2S
WATER ENCOUNTERED : 8.0 Feet

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
	S-1	2 5 5				16								
	S-2	2 3 2		5	Brown clayey silt, some fine to coarse sand, little fine gravel, trace organics and brick.	23	32	11	13	13	20	32	22	A-6a
696.3	S-3	12 17 14		10	10.0	11								
692.4	S-4	19 36 50/5			Brown fine to coarse gravel, some fine to coarse sand, little to trace silt.	9	--	-	58	20	12	-10-		A-1-a
691.8	S-5	21 50		15	13.9 Boulder 14.5	7								
	S-6	36 39 42			Gray fine to coarse gravel, some fine to coarse sand, little to trace silt.	8								
686.3	S-7	15 34 35		20	20.0	9								
683.8	S-8	20 20 30			Gray fine to coarse sand and fine to coarse gravel, little to trace silt. 22.5	20								
681.3	S-9	37 31 38		25	Gray clayey silt, some fine to coarse sand. 25.0	10	-	-	56	16	20	-8-		A-1-a
	S-10	70				12								
	S-11	24 60		30		11								
	S-12	24 45 34		35	Gray fine to coarse gravel, some fine to coarse sand, trace silt.	9	-	-	66	23	6	-5-		
666.8	S-13	50		40	39.5	14								
					Bottom of boring at 39.5 feet.									

BORING LOG : SB-8 (C & O Bridge over SR 315) DATE STARTED : 3-18-86
STATION AND OFFSET : 56+30 40 Ft. Lt. DATE FINISHED : 3-18-86
SURFACE ELEVATION : 706.4 Feet SAMPLER TYPE : 2S
WATER ENCOUNTERED : 3.5 Feet

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS
703.9	S-1	3 5 3			Brown clayey silt, some fine to coarse sand. 2.5	25								
	S-2	6 6 3		5		12	-	-	53	16	13	-18-		A-1-b
	S-3	20 24 25		10	Gray brown fine gravel, some fine to coarse sand, little silt.	7								
	S-4	18 27 35				8								
	S-5	26 26 49		15		9	-	-	55	22	10	-13-		A-1-a
	S-6	27 50/5				6								
	S-7	46 55/5		20		7								
685.4	S-8	26 24 40			21.0	15								
	S-9	25 30 36		25	Gray fine to coarse sand, some silt, trace clay, trace fine gravel.	18	NP	NP	6	2	58	28	6	A-3a
678.4	S-10	37 50/4			28.0	12								
	S-11	45 50/4		30	Gray fine gravel, some fine to coarse sand, trace silt.	11								
	S-12	30 31 40		35		8	-	-	65	19	9	-7-		A-1-a
667.0	S-13	35 50/4		40	39.4	11								
					Bottom of boring at 39.4 feet.									

BORING LOG : DATE STARTED :
STATION AND OFFSET : DATE FINISHED :
SURFACE ELEVATION : SAMPLER TYPE :
WATER ENCOUNTERED :

ELEV.	SAMPLE NUMBER	BLOWS PER 6"	REC	DEPTH	SOIL DESCRIPTION	WC	ATT LIMITS LL	ATT LIMITS PI	PHYSICAL CHARACTERISTIC % AGG	% CS	% FS	% SI	% CL	ODOT CLASS

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DATE 9-11-87	DRAWN BY : J.K.H.	CHECKED BY : AH	REVISED