



**CUY-90-14.90**

**PID 77332/85531**

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**APPENDIX EX-14**

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**CUY-071-1783 PID 0.214**

**(Reference Document)**

State of Ohio  
Department of Transportation  
Jolene M. Molitoris, Director

**Innerbelt Bridge  
Construction Contract Group 1 (CCG1)**

# STATE OF OHIO

## DEPARTMENT OF HIGHWAYS

# CUY-71-17.83 CUY-176-12.76

## CUYAHOGA COUNTY CITY OF CLEVELAND

### LIMITED ACCESS

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

Part 1 - For Part 2  
See CUY-80-9.08

# I-71-5(33)244 US-1463(2)

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

The right of way for this improvement will be provided by the State of Ohio.

I hereby approve these plans and declare that the making of this improvement will not require the closing of the highway to traffic and that provisions for the maintenance and safety of traffic will be as set forth on the plans and estimates.

Approved  
Date 1/25/65

*Louis L. Drasler*  
Director of Public Service, City of Cleveland

Approved  
Date 1-22-65

*Charles M. Yurick*  
Division Deputy Director

Approved  
Date 2-11-65

*R.V. Puckett*  
Engineer of Location and Design

Approved  
Date 2-11-65

*R.E. Shultz*  
Deputy Director of Design and Construction

Approved  
Date 2-2-65

*T.H. Bond*  
Deputy Director of Right of Way

Approved  
Date 2-25-65

*J. W. Wilson*  
Deputy Director of Planning and Programming

Approved  
Date 2-10-65

*C. H. Alwater*  
Engineer of Bridges

Approved  
Date \_\_\_\_\_

First Assistant Director

Approved  
Date 2/26/65

*R.E.M. White*  
Director of Highways

Sheet Nos. 345 and 346 revised 3-10-66  
Sheet No. 357A added 3-10-66  
Sheet Nos. 305 and 416 revised 6-2-65  
Sheet No. 467 revised 7-30-65  
Sheet Nos. 42 and 306-313 incl. revised 12-9-65  
Sheet Nos. 314-319 incl. deleted 12-9-65  
Sheet Nos. 307A and 309A added 12-9-65  
Sheets 553, 560, 579 & 582 revised 12-28-65 C.E.H.  
Sheets 17, 35, 613, 638 & 639 revised 2-18-66 C.E.H.  
Sheet No. 582 revised 3-25-66 C.E.H.

DEPARTMENT OF COMMERCE  
BUREAU OF PUBLIC ROADS

APPROVED

DIVISION ENGINEER

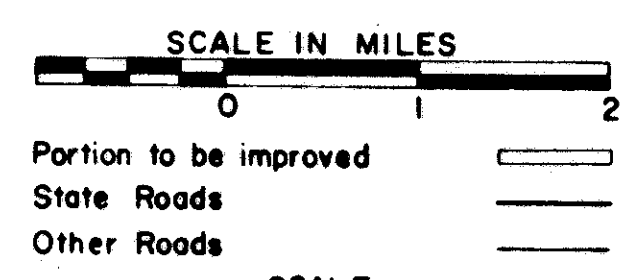
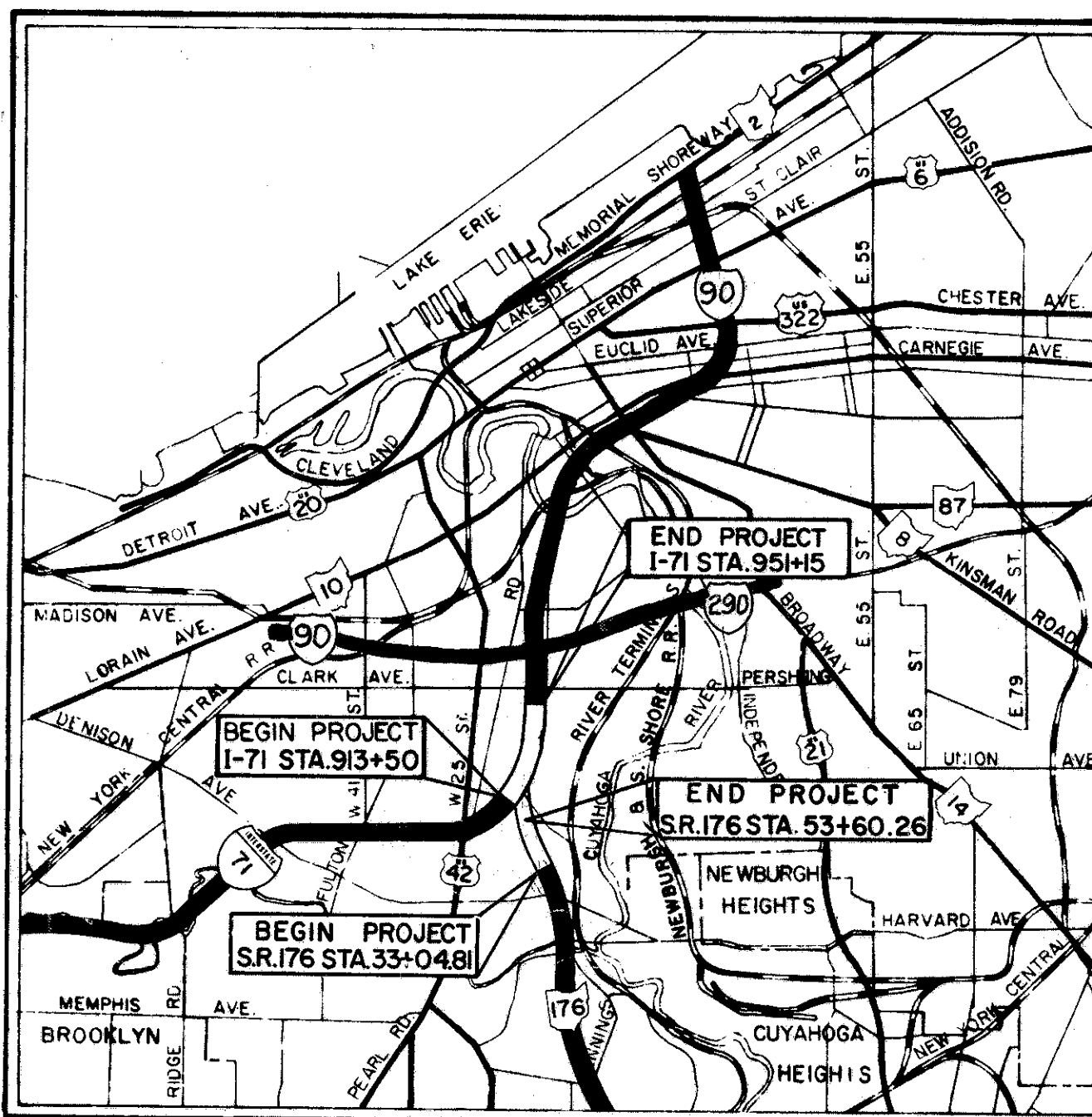
DATE

### CONVENTIONAL SIGNS

Property Line	---
Existing Right of Way	---
Limited Access Line	---
Right of Way Line	---
Temporary Right of Way	---
Center Line	---
Work Agreement Line	---
Fence Line	---
Guard Rail (Existing)	---
Guard Rail (Proposed)	---
Railroad	---
Power Poles	---
Telephone Poles	---
Power & Telephone Poles	---
Light Poles	---
Trees (Existing)	---
Water Line	---
Gas Line	---
Telephone Conduit	---
Sewer (Existing)	---
Oil Line	---
Electrical Tower	---
Fire Hydrant	---
Manhole (Sewer)	---
Manhole (Telephone)	---
Catch Basin or Inlet	---
Underground Elect. Conduit	---
Original Twp. Lot Line	---
Subdivision Line	---
Sublot Line	---

### INDEX OF SHEETS

TITLE	SHEET NOS.	TITLE	SHEET NOS.
SCHEMATIC PLAN	2-5	QUANTITY SUMMARIES (STRUCTURES)	307-308
TYPICAL SECTIONS	6-15	BR. NO. CUY-71-1847 (HNTB NO.18)	309-313
GENERAL NOTES	16-18	RETAINING WALL NO.80	314-319
QUANTITY CALCS	19-34	BR. NO. CUY-71-1826 (HNTB NO.19)	320-336
GENERAL SUMMARY	35-42	BR. NO. CUY-71-1794 (HNTB NO.20)	337-357
PAVEMENT PLANS	44-72	RETAINING WALL NO.82	358-364
PROFILE SHEETS	73-94	RETAINING WALL NO.83	365-369
MISC. DETAILS	95-97	BR. NO. CUY-71-1789(R)(HNTB NO.21)	370-455, 430A, 454A, 454B
CROSS SECTIONS	98-250	RETAINING WALLS NO.81, 81A, 81B	456-460, 460A
SCHEMATIC DRAINAGE PLAN	251	BR. NO. CUY-176-1279 (HNTB NO.23)	461-476, 476A
GENERAL NOTES (DRAINAGE)	252	RETAINING WALL NO.84	477-482
PIPE QUANTITIES	253-255	RETAINING WALL NO.87	483-490
DRAINAGE STR. QUANTITIES	256-257	RETAINING WALL NO.88	491-501
DRAINAGE PLAN SHEET	258-266	RETAINING WALL NO.89	502-508
STRUCTURE LOCATION DETAILS	267-268	RETAINING WALL NO.90	509-510
MISC. DRAINAGE DETAILS	269-273	WATERWORK PLANS	511-544
SEWER PROFILES	274-300	LANDSCAPING PLANS	545-553
OUTFALL SEWER	301-302	SIGNING PLANS	554-569
SPEC. UNDERDRAIN PROFILES	303-304	LIGHTING PLANS	570-590, 590A
SANITARY SEWER PROFILES	305	DETOUR ROAD PLANS	591-609
GENERAL NOTES (STRUCTURES)	306	SURVEY PLAT	610-611
		RIGHT OF WAY PLANS	612-646



### LINE DATA

CUY-71-17.83 (I-71-5(33)244)	
I-71 STA. 913+50.00 TO STA. 951+15.00	3,765.00 L.F.
NET LENGTH OF PROJECT	0.713 MILES
ADD FOR APPROACHES	
I-71 STA. 908+18.00 TO STA. 913+50.00	= 532.00 L.F.
I-71 STA. 951+15.00 TO STA. 955+15.00	= 400.00 L.F.
DETOUR ROAD STA 10+00 TO 121+32.8	= 11,132.80 L.F.
OUTFALL SEWER STA 0+00 TO 23+30	= 2,330.00 L.F.
NET LENGTH OF WORK	18,530.80 L.F. OR 3.439 MILES
CUY-176-12.76 (US-1463(2))	
S.R.176 STA. 33+04.81 TO STA. 53+60.26	= 2,055.45 L.F.
NET LENGTH OF PROJECT	= 0.389 MILES
ADD FOR APPROACHES	
S.R.176 STA. 25+23.00 TO STA. 33+04.81	= 781.81 L.F.
NET LENGTH OF WORK	= 2,837.26 L.F. = 0.537 MILES
TOTAL LENGTH OF PROJECT	= 5,820.45 L.F. = 1.102 MILES
TOTAL LENGTH OF WORK	20,997.06 L.F. = 3.976 MILES
Part 2 LENGTH OF PROJECT/WORK	3,808.00 L.F. = 1.100 MILE
TOTAL LENGTH OF PROJECT	11,628.45 L.F. = 2.202 MILES
TOTAL LENGTH OF WORK	26,805.06 L.F. = 5.076 MILES

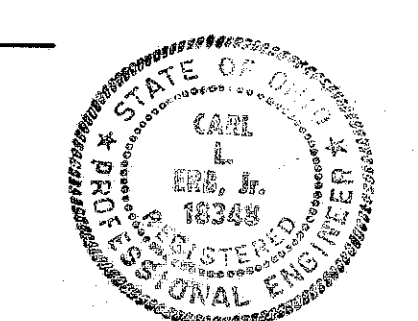
### SUPPLEMENTAL SPECIFICATIONS

NUMBER	DATE	NUMBER	DATE
S-407		S-407	12 21-62
I-129	Rev 4-28-61	CE-101.04	5-22-56
S-307	10-1-64	L-120	Rev 12-62
S-101	7-12-62	I-212	Rev 8-3-61
M-106.11	1-26-61	T-335	10-28-63
M-106.6 (C)	2-17-59	M-106.6(d)	Rev 4-1-58

PREPARED AND RECOMMENDED BY  
**HOWARD NEEDLES TAMMEN & BERGENDOFF**  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

DELETED - SHEET 43  
**H. G. SOURS**  
ASSOCIATE  
COLUMBUS

FILE NO. CUYAHOGA COUNTY CUY-71-17.83  
DATE OF LETTING CUY-176-12.76  
CONTRACT NO. 196





# GEOMETRICS TABLE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

3  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

LINE	CURVE	P. C.			P. I.			P. T.			Δ	D	R	T	L	E
		STATION	N CO-ORD	E CO-ORD	STATION	N CO-ORD	E CO-ORD	STATION	N CO-ORD	E CO-ORD						
N.B. Medina	1	910+45.18	653,801.34	220,330.30	915+06.69	654,081.58	220,696.98	919+38.10	654,523.17	220,831.09	35°43'01"	4°00'00"	1,432.39	461.50	892.92	72.52
	2	919+38.10	654,523.17	220,831.09	921+59.77	654,735.27	220,895.50	923+80.96	654,953.30	220,935.52	6°29'43"	1°28'00"	3,906.53	221.66	442.86	6.28
	3	937+20.73	656,271.07	221,177.33	944+47.79	656,986.20	221,308.55	951+70.50	657,713.24	221,302.52	10°52'24"	0°45'00"	7,639.42	727.07	1,449.78	34.52
S.B. Medina	4	910+65.79	653,824.84	220,248.56	915+72.64	654,165.45	220,623.90	920+56.64	654,647.35	220,780.96	29°43'32"	3°00'00"	1,909.86	506.84	990.85	66.11
	5	920+56.64	654,547.35	220,780.96	923+17.93	654,895.77	220,861.92	925+78.44	655,152.77	220,909.08	7°39'11"	1°28'00"	3,906.53	261.28	521.80	8.73
	6	940+84.03	656,631.47	221,192.63	947+84.78	657,320.72	221,319.10	954+78.61	658,020.13	221,275.74	13°56'45"	1°00'00"	5,729.58	700.76	1,394.59	42.69
S.B.O.R.	7	2+27.39	657,790.76	221,180.79	5+29.81	657,488.64	221,194.46	8+30.00	657,190.34	221,144.74	12°03'08"	2°00'00"	2,864.79	302.42	602.62	15.92
	8	32+30.74	654,822.27	220,750.04	36+22.27	654,436.06	220,685.67	39+61.14	654,143.57	220,945.96	51°07'42"	7°00'00"	818.51	391.53	730.40	88.83
14-SBOR	9	4+04.41	654,793.43	220,730.10	7+77.18	654,422.04	220,698.15	11+08.42	654,143.57	220,945.96	46°34'54"	6°37'00"	865.93	372.77	704.01	76.83
SBOR-M	10	0+00.00	657,656.85	221,219.71	3+45.72	657,311.13	221,219.18	6+90.58	656,968.04	221,176.59	6°59'15"	1°00'43"	5,662.58	345.72	690.58	10.54
	11	10+79.73	656,584.82	221,104.84	11+74.24	656,491.02	221,093.20	12+68.74	656,397.66	221,078.47	1°53'24"	1°00'00"	5,729.58	94.51	189.01	0.78
Lane J	12	0+00.00	654,141.89	220,469.27	1+49.25	654,021.31	220,381.31	2+97.15	653,924.34	220,267.85	13°22'19"	4°30'00"	1,273.24	149.25	297.15	8.72
N.B.O.R.	13	0+00.00	655,359.37	221,058.83	1+87.71	655,543.99	221,092.71	3+74.58	655,720.64	221,156.18	9°21'52"	2°30'00"	2,291.83	187.71	374.58	7.67
	14	6+79.92	656,008.00	221,259.42	12+04.74	656,501.90	221,436.87	17+18.04	657,026.64	221,427.71	20°45'45"	2°00'00"	2,864.79	524.82	1,038.12	47.68
Ramp J-14	15	0+36.75	655,326.65	221,046.73	1+75.24	655,462.87	221,071.72	3+13.25	655,594.05	221,116.11	8°17'42"	3°00'00"	1,909.86	138.49	276.50	5.02
	16	3+13.25	655,594.05	221,116.11	5+20.11	655,790.00	221,182.41	7+20.67	655,940.94	221,323.85	24°26'43"	6°00'00"	954.93	206.86	407.42	22.15
	17	11+98.84	656,289.87	221,650.80	13+65.21	656,411.27	221,764.56	15+14.88	656,577.61	221,761.34	44°14'42"	14°00'00"	409.26	166.37	316.04	32.52
Ramp A	18	12+41.14	656,320.74	221,679.73	13+52.97	656,402.34	221,756.19	14+64.34	656,494.82	221,819.06	8°55'41"	4°00'00"	1,432.39	111.83	223.20	4.36
	19	14+64.34	656,494.82	221,819.06	15+78.95	656,589.60	221,883.50	16+06.33	656,602.19	221,769.58	117°54'03"	83°02'14"	69.00	114.61	141.99	64.78
N.B.O.R. 14 (Left Edge)	20	0+00.00	655,871.22	221,210.28	0+59.81	655,927.51	221,230.50	1+19.60	655,982.66	221,253.63	2°59'24"	2°30'00"	2,291.83	59.81	119.60	0.78
	21	9+34.45	656,734.11	221,568.77	10+26.15	656,818.67	221,604.24	11+13.01	656,871.41	221,679.25	32°08'27"	18°00'00"	318.31	91.70	178.56	12.94
	22	9+57.85	656,761.88	221,563.07	10+49.65	656,846.44	221,598.54	11+36.41	656,899.18	221,673.55	32°08'27"	18°00'00"	318.31	91.70	178.56	12.94
J-N.B.O.R.	23	1+90.63	656,143.99	221,226.65	7+03.56	656,637.73	221,365.68	12+10.40	657,150.65	221,369.54	15°17'47"	1°30'00"	3,819.72	512.94	1,019.77	34.29
Rel. W. 14 St.	24	10+00.00	656,684.10	221,734.28	13+87.17	656,297.01	221,741.76	16+32.39	656,245.34	221,358.06	83°26'17"	13°11'38"	434.26	387.17	632.39	147.53
	25	18+38.88	656,217.79	221,153.42	21+51.44	656,176.08	220,843.65	23+63.68	655,864.30	220,821.42	78°15'07"	14°54'39"	384.26	312.57	524.80	111.07
Ramp 14-M (Left Edge)	26	2+39.84	655,334.74	220,789.00	3+04.86	655,269.61	220,787.11	3+70.01	655,204.70	220,781.53	3°15'24"	2°30'00"	2,291.83	65.15	130.27	0.93
	27	7+92.78	654,787.59	220,700.83	12+01.09	654,381.02	220,663.22	15+77.25	654,089.84	220,376.99	39°13'24"	5°00'00"	1,145.92	408.31	784.47	70.57
Lane M-J	28	2+70.62	654,884.43	220,872.04	7+79.42	654,383.98	220,780.21	12+17.23	654,003.88	221,118.45	52°03'49"	5°30'00"	1,041.74	508.81	946.61	117.62
N.B. Jennings	29	* See table below for curve data			58+95.63	654,420.71	220,843.89	63+61.93	654,947.28	220,940.51	50°05'01"	5°00'00"	1,145.92	535.37	1,001.67	118.89
	30	53+60.26	654,008.71	221,185.75	68+88.97	655,465.66	221,035.63	69+95.47	655,568.33	221,064.54	5°19'44"	2°30'00"	2,291.83	106.66	213.16	2.48
	31	67+82.31	655,360.76	221,016.38	79+15.83	656,454.24	221,314.01	84+22.67	656,967.16	221,317.87	15°17'47"	1°30'00"	3,819.72	512.93	1,019.77	34.29
	32	74+02.90	655,960.50	221,174.98												
S.B. Jennings	33	* See table below for curve data			2+19.14	653,276.64	221,678.94	4+25.32	653,057.73	221,688.97	34°01'31"	8°00'00"	716.20	219.14	425.32	32.77
	34	0+00.00	653,452.45	221,548.13	9+62.56	652,521.05	221,713.57	11+32.62	652,427.16	221,901.88	60°52'31"	16°00'00"	358.10	210.41	380.47	57.24
	35	7+52.15	652,731.24	221,703.94	20+15.04	652,033.43	222,691.58	21+85.74	651,821.88	222,700.13	61°11'14"	16°00'00"	358.10	211.72	382.42	57.91
Ramp JR-J	36	18+03.32	652,127.90	222,502.10												
	37	0+00.00	652,297.00	222,275.00	1+44.77	652,361.60	222,145.44	2+75.16	652,498.09	222,097.17	44°01'32"	16°00'00"	358.10	144.77	275.16	28.16
Ramp D-JN	38	7+45.60	652,941.62	221,940.33	9+99.50	653,180.99	221,855.69	12+51.32	653,396.02	221,720.70	12°38'35"	2°30'00"	2,291.83	253.89	505.72	14.02
	39	8+94.04	652,219.27	221,955.54	9+54.35	652,279.18	221,948.64	10+14.61	652,339.41	221,945.53	3°37'02"	3°00'00"	1,909.86	60.31	120.58	0.95
Ramp JN-D	40	0+00.00	652,702.72	221,829.67	1+29.51	652,573.65	221,840.23	2+58.62	652,444.33	221,833.26	7°45'31"	3°00'00"	1,909.86	129.51	258.62	4.39

Line	Curve	T.S.	S.C.	P.I.	C.S.	S.T.	Δ	Δ <sub>c</sub>	D <sub>c</sub>	θ <sub>s</sub>	R <sub>c</sub>	T <sub>s</sub>	L <sub>s</sub>	L <sub>c</sub>	E <sub>s</sub>
N.B. Jennings	*29	Sta. 35+95.04 N 652,451.88 E 221,893.83	Sta. 40+45.04 N 652,900.08 E 221,859.61	Sta. 43+19.58 N 653,176.21 E 221,876.55	Sta. 45+53.01 N 653,373.31 E 221,682.43	Sta. 50+03.01 N 653,733.78 E 221,413.89	38°19'08"	20°19'08"	4°00'00"	9°00'00"	1,432.39	724.54	450.00	507.97	90.22
S. B. Jennings	*33	Sta. 35+60.98 N 652,417.45 E 221,878.65	Sta. 40+10.98 N 652,865.65 E 221,844.43	Sta. 43+13.54 N 653,169.79 E 221,860.70	Sta. 45+68.45 N 653,381.01 E 221,641.26	Sta. 50+18.45 N 653,731.98 E 221,360.42	40°17'56"	22°17'56"	4°00'00"	9°00'00"	1,432.39	752.56	450.00	557.47	99.65

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE R.H.A. DATE 9-29-64 CONSULTING ENGINEERS  
TRCD R.L.O. DATE 9-29-64  
CKD R.P.P. DATE 10-26-64 KANSAS CITY CLEVELAND NEW YORK

# STRUCTURE DATA AND CONTROL POINTS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		



CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

TRAVERSE POINTS							
Point No.		Distance		Length		Coordinates	
C.R.G.S.	H.N.T.B.	From	To	Line No. 1		North	East
643	82						
	79	82	79	528.10	N 76°23'22" E	651,240.34	2,221,221.54
	80	79	80	1,097.57	N 0°04'51" E	651,364.61	2,221,734.82
	64	80	64	422.72	N 5°50'51" W	652,462.18	2,221,736.37
	65	64	65	1,031.13	N 68°18'28" W	652,882.71	2,221,693.30
	66	65	66	744.70	S 58°19'40" W	653,263.84	2,220,735.20
	67	66	67	1,078.64	S 78°50'48" W	652,872.82	2,220,101.41
260	68	67	68	842.09	S 3°50'19" W	652,664.18	2,219,043.14
						651,823.98	2,218,986.76
Line No. 2							
644	81					651,401.26	2,221,952.48
	78	81	78	397.28	S 68°35'06" E	651,256.20	2,222,322.34
	77	78	77	677.56	N 74°50'03" E	651,433.46	2,222,976.30
	76	77	76	818.95	N 8°56'04" W	652,242.47	2,222,849.11
	75	76	75	696.80	N 16°51'04" E	652,909.36	2,222,647.12
	63	75	63	1,008.83	N 55°35'34" W	653,479.42	2,221,814.79
	57	63	57	1,352.30	N 37°07'08" W	654,577.73	2,220,998.71
	58	57	58	242.23	S 79°14'10" W	654,512.49	2,220,760.74
	59	58	59	1,323.06	S 87°19'21" W	654,450.68	2,219,439.13
272	61	59	61	1,014.66	N 10°36'31" E	655,447.99	2,219,625.93
Line No. 3							
	57					654,557.73	2,220,998.71
	56	57	56	880.61	N 7°10'24" E	655,431.45	2,221,108.68
	55	56	55	1,195.45	N 31°06'56" E	656,454.91	2,221,726.44
	54	55	54	767.32	N 3°21'42" E	657,220.91	2,221,771.44
1079	28	54	28	858.78	N 1°23'19" W	658,079.44	2,221,750.63
Line No. 5							
272	61					655,447.99	2,219,625.93
	62	61	62	994.10	N 10°49'35" E	656,424.40	2,219,812.65
	27	62	27	1,638.55	N 10°42'07" E	658,034.45	2,220,116.93
	12	27	12	523.03	N 11°02'40" E	658,547.79	2,220,217.13
	11	12	11	448.35	N 10°34'43" E	658,988.52	2,220,299.44

**BRIDGE NO. 18**

TYPE: Continuous steel beam with reinforced concrete deck and substructure

SPANS: 78.5'+, 67.5'+, 78.0'+, 79.5'+, 48.0'

WALKWAY: 8'-0"

LOADING: 85 pounds per sq. ft.

SKREW: None, except 0°53'58" at West Abutment

WEARING SURFACE: 1" Monolithic concrete

APPROACH SLABS: None

ALIGNMENT: Tangent

**BRIDGE NO. 19**

TYPE: Continuous welded girder with reinforced concrete deck and substructure

SPANS: 56'-6", 86'-6", 84'-0", 89'-6", 105'-0", 100'-0" and 77'-0" measured along B Relocated West 14th

ROADWAY: 42'-0" curb/curb with one 5'-0" sidewalk, one 2'-0" Safety Curb, and a 2'-0" raised median

LOAD FREQUENCY: CF 2000(57)

SKREW: Varies

WEARING SURFACE: 1" Monolithic Concrete

APPROACH SLABS: AS-1-54 (25'-0" long)

ALIGNMENT: 13°11'38" Right, Tangent, 14°54'39" Left

**BRIDGE NO. 20**

TYPE: Simple span welded girder with reinforced concrete deck and substructure

SPAN: 140'-9 1/2" measured along B Southbound Outer Roadway

ROADWAY: Varies

LOAD FREQUENCY: CF 2000(57) Adequate for A.A.S.H.O. alternate loading

SKREW: Varies

WEARING SURFACE: 1" Monolithic concrete

APPROACH SLABS: AS-1-54 (25'-0" long)

ALIGNMENT: 7°00'00" Left S.B.O.R., 6°37'00" Left Ramp 14 S.B.O.R.

**BRIDGE NO. 21A**

TYPE: Continuous welded girder (Unit 1A) and continuous steel beam (Units 2A, 3A, 4AW, and 4AE) with reinforced concrete deck and substructure

SPANS: Unit 1A - 75'-0", 82'-0", 87'-0", 2 @ 121'-0", 95'-0" and 10'-0". cantilever; Unit 2A - 68'-6", 4 @ 78'-6" and 6'-0" cantilever; Unit 3A - 72'-6", 4 @ 78'-6", 78'-0" and 6'-6" cantilever; Unit 4AW - 72'-6", 2 @ 78'-6", 70'-0" and 56'-0"; Unit 4AE - 13'-5 1/8", 2 @ 79'-6 1/2", 70'-11 1/8", 70'-10 3/8" and 56'-6 1/8"

ROADWAY: Unit 1A - 64'-0" face to face of parapets; Unit 2A - 64'-0" face to face of parapets; Unit 3A - Varies face to face of parapets; Unit 4AW - 40'-0" face to face of parapets; Unit 4AE - Varies face to face of parapets, with 1'-0" safety curbs.

LOAD FREQUENCY: CF 2000(57) Adequate for A.A.S.H.O. alternate loading

SKREW: Unit 1A - Varies

Units 2A, 3A, 4AW and 4AE - None, with respect to B.N.B. I-71.

WEARING SURFACE: 1" Monolithic concrete

APPROACH SLABS: AS-1-54 (25' long)

ALIGNMENT: Units 1A, 2A, 3A and 4AW - 4°00'00" Curve left, 1°28'00" Curve left and tangent. Unit 4AE - 2°30'00" Curve right, tangent and 2°00'00" Curve left.

BENCHMARK ELEVATIONS		
B.M. No.	Elevation	Description
14	685.546	Top N.E. Flange Bolt S.E. Corner 15th and Clark
20	594.477	" " " Cut S.E. Corner Concrete Base S.E. Corner of Tower N.E. Corner W. 7th and Quigley Road
21	591.319	" " " N.W. Corner of Concrete @ N.W. Corner of Air Products and Chemicals Inc. fence
22	597.544	Top N.E. Flange Bolt Top F. Hyd. E. of Football Stand
24	590.291	" " " Cut in Concrete Base of S.W. Leg of Tower 125'+ S. of T. Point No. 37 East side of Quigley
25	584.917	Top N.E. Flange Bolt Top F. Hyd. N. side of 3rd and Quigley
26	583.410	Top N.E. Flange Bolt Top F. Hyd. in Cities Service Bulk Plant South side River 400'+ North of T.P. No. 44
35	686.006	Top N. Flange Bolt Top F. Hyd. N.W. Corner 14th and Holmden
36	650.468	Top N.E. Flange Bolt Top F. Hyd. 125'+ N.E. of A.S.J. Construction Company Drive @ 3311 Jennings
37	618.405	Top N.E. Flange Bolt Top F. Hyd. West side Jennings @ Employment Office of J and L Steel
38	687.039	Top N.E. Flange Bolt Top F. Hyd. S.W. Corner Aiken and 1st St. W. of Scranton
39	686.260	Top N.E. Flange Bolt Top F. Hyd. S.E. Corner Holmden and Scranton
44	592.938	Top N.E. Flange Bolt Top F. Hyd. West side 3551 Jennings
45	676.010	Top N.E. Flange Bolt Top F. Hyd. West side St. 150'+ North of Redman and W. 15th
46	605.679	Top N.E. Flange Bolt Top F. Hyd. S.E. Corner of Denison and Jennings
47	613.731	Top N.E. Flange Bolt Top F. Hyd. West side Jennings 225'+ North of T.P. 76
62	683.560	T.P. No. 28 and C.R.G.S. O.M. 1079 Stated Elevation 683.539
64	685.975	T.P. No. 61 and C.R.G.S. O.M. 272
65	686.819	T.P. No. 68 and C.R.G.S. O.M. 260
66	674.906	T.P. No. 81 and C.R.G.S. O.M. 644
67	681.540	T.P. No. 82 and C.R.G.S. O.M. 643

**BRIDGE NO. 21B**

TYPE: Continuous steel beam with reinforced concrete deck and substructure

SPANS: Unit 1B - 62'-0", 4 @ 78'-6" and 72'-6"; Unit 2B - 6'-0" cantilever, 78'-6 1/2", 78'-8 1/2", 78'-10 1/2", 78'-4 1/2", and 73'-4 1/2"; Unit 3BW - 6'-0" cantilever, 2 @ 78'-10 1/2" and 62'-3"; Unit 3BE - 6'-0" cantilever, 5 @ 75'-0" and 69'-0"; Unit 4BE - 6'-0" cantilever, 4 @ 75'-0" and 60'-0"

ROADWAY: Varies face to face of parapets with 1'-0" safety curbs

LOAD FREQUENCY: CF 2000(57) Adequate for A.A.S.H.O. alternate loading

SKREW: Units 1B, 2B and 3BW - None with respect to B.N.B. I-71; Units 3BE and 4BE - Varies

WEARING SURFACE: 1" Monolithic concrete

APPROACH SLABS: AS-1-54 (25' long)

ALIGNMENT: Units 1B, 2B and 3BW - 5°00'00" Curve right, tangent, 2°30'00" Curve right, tangent and 1°30'00" Curve left; Units 3BE and 4BE - 6°00'00" Curve right, tangent and 14°00'00" Curve left

**BRIDGE NO. 23**

TYPE: Continuous steel beam with reinforced concrete deck and substructure

SPANS: 53'-0", 66'-0 1/2", 53'-3 1/2" along B S.B. Jennings

ROADWAY: Southbound Jennings - Width Varies Northbound Jennings - Width Varies

LOAD FREQUENCY: CF 2000(57) Adequate for A.A.S.H.O. alternate loading

SKREW: Varies

WEARING SURFACE: 1" Monolithic concrete

APPROACH SLABS: AS-1-54 (25'-0" long)

ALIGNMENT: Tangent and spiral curve left

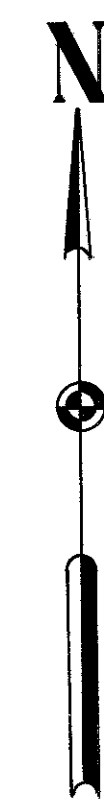
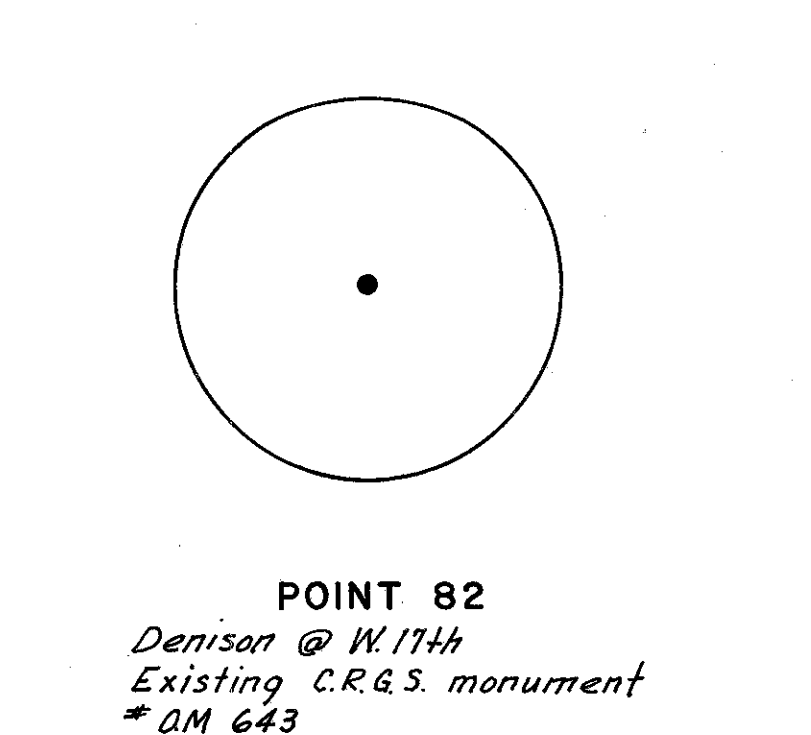
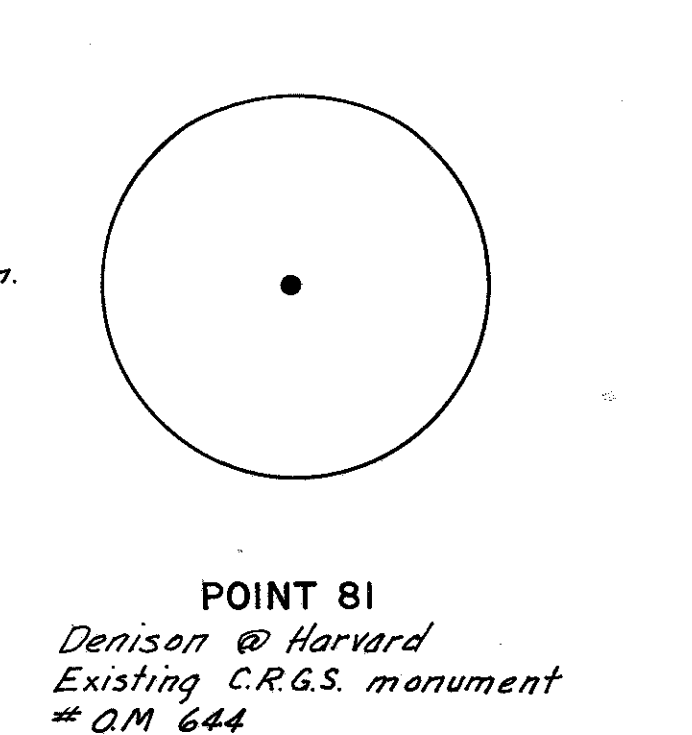
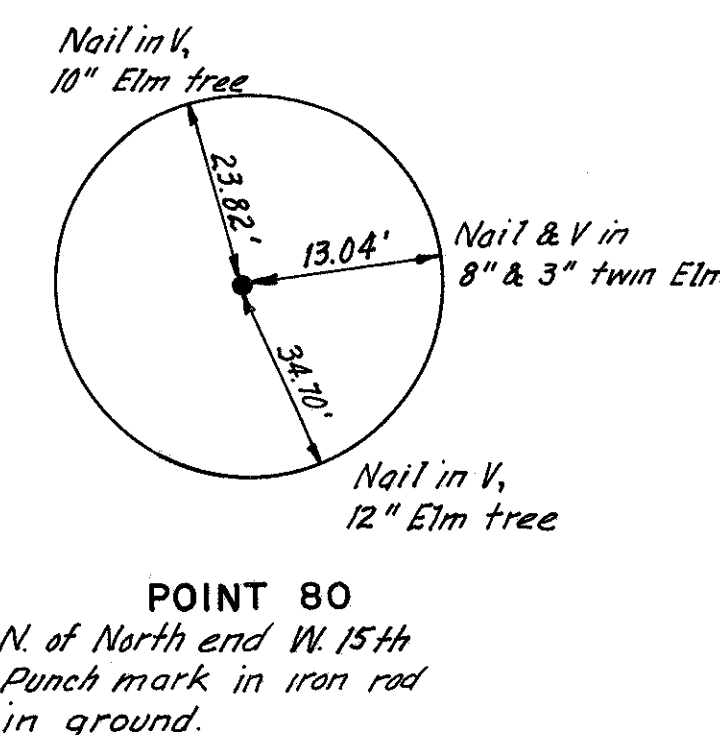
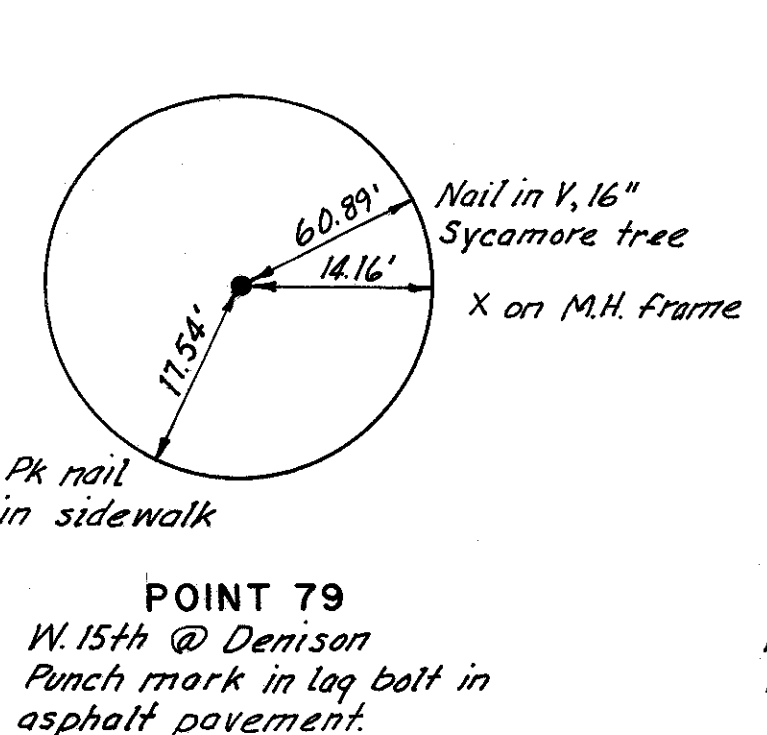
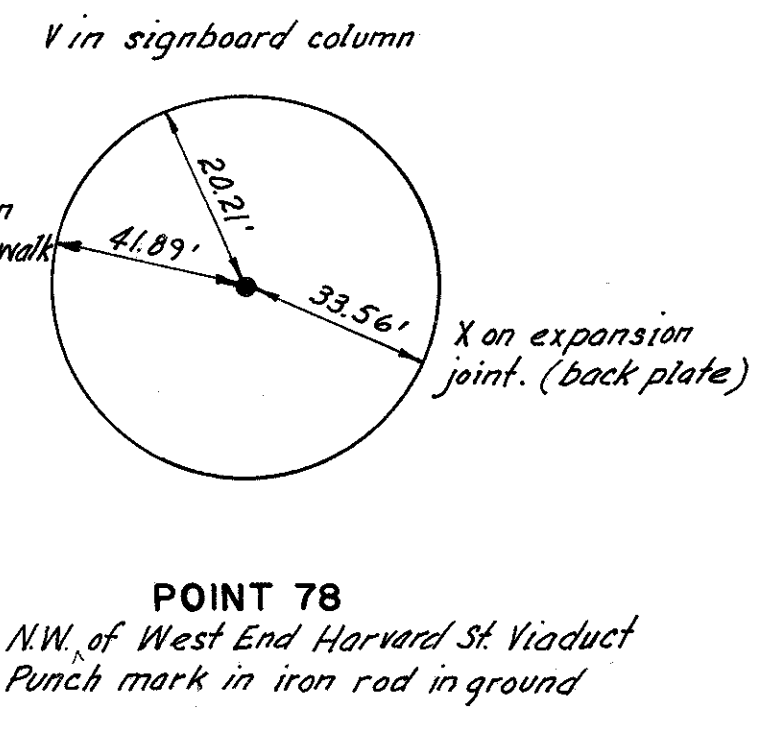
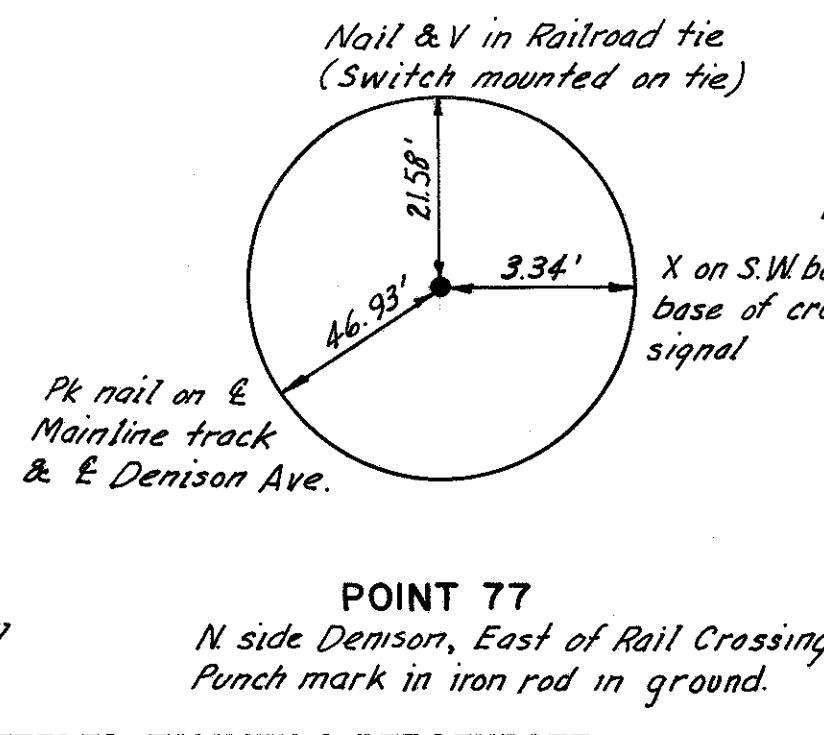
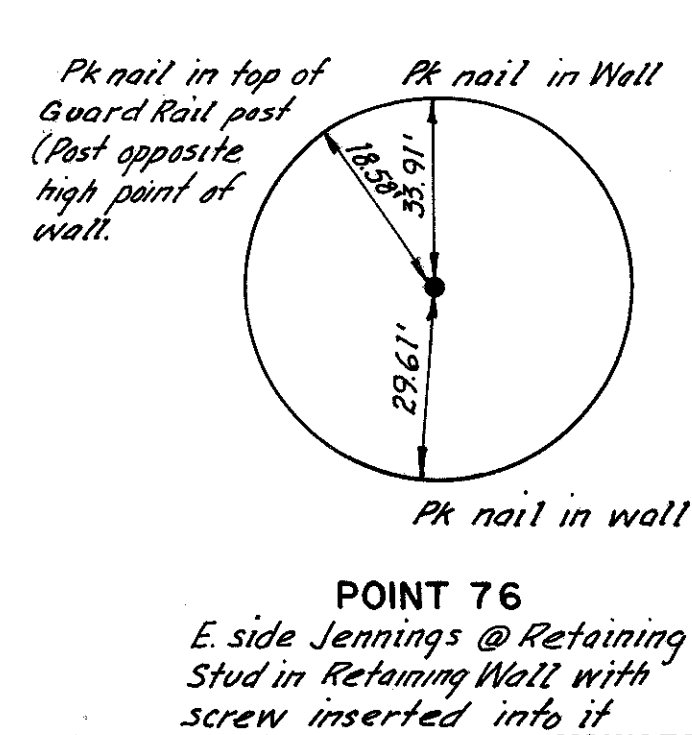
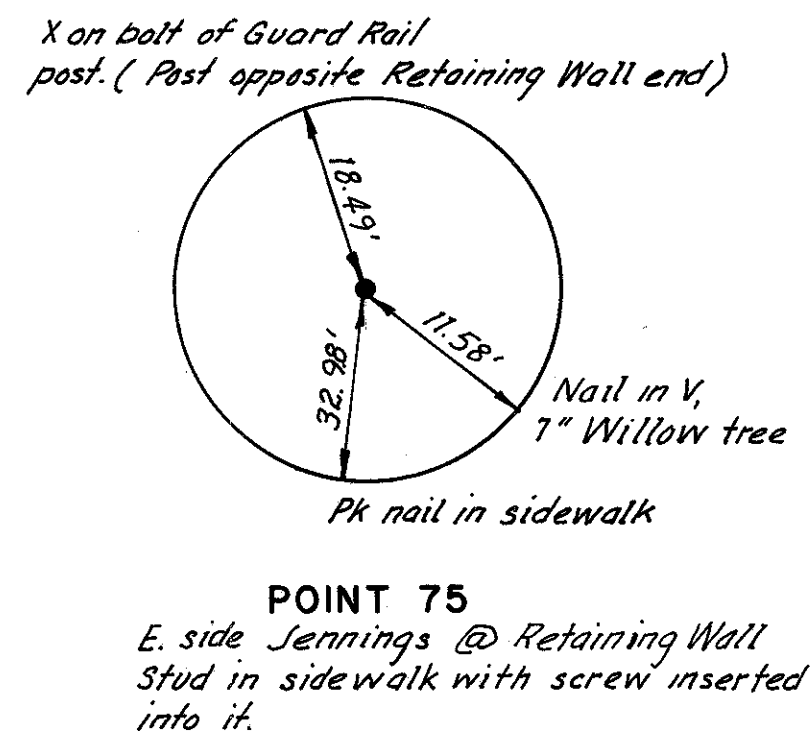
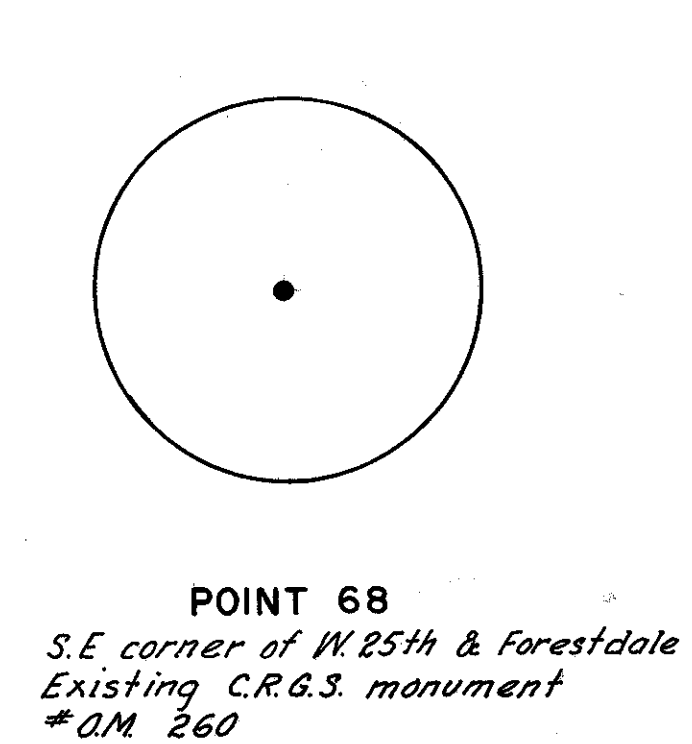
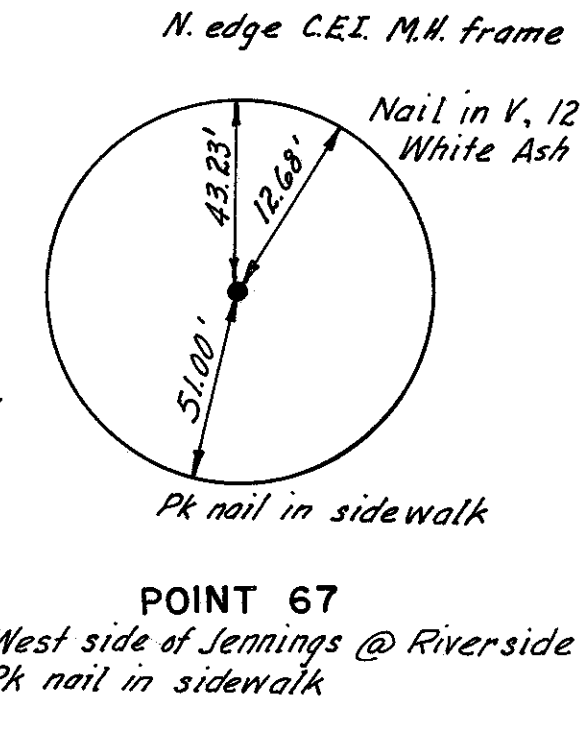
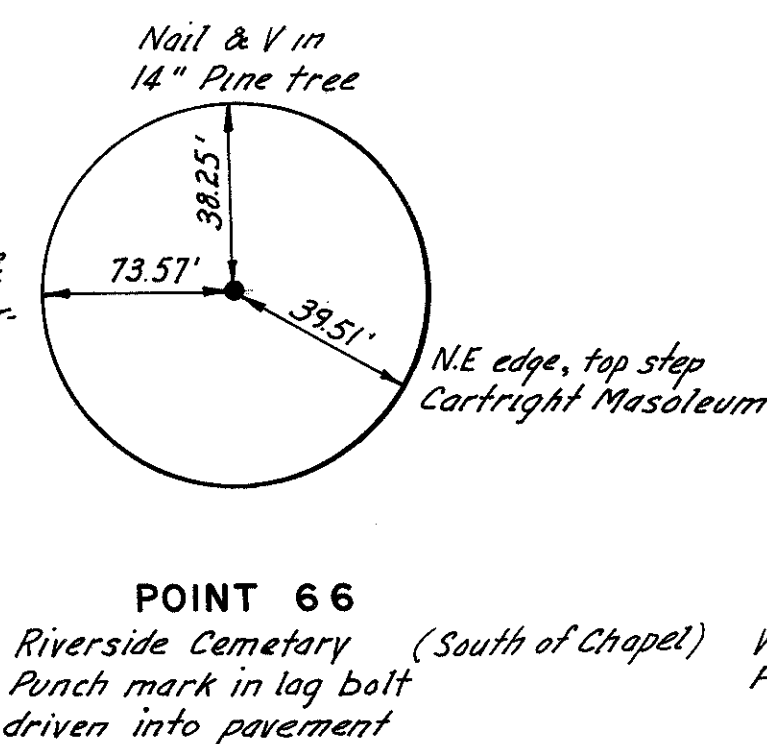
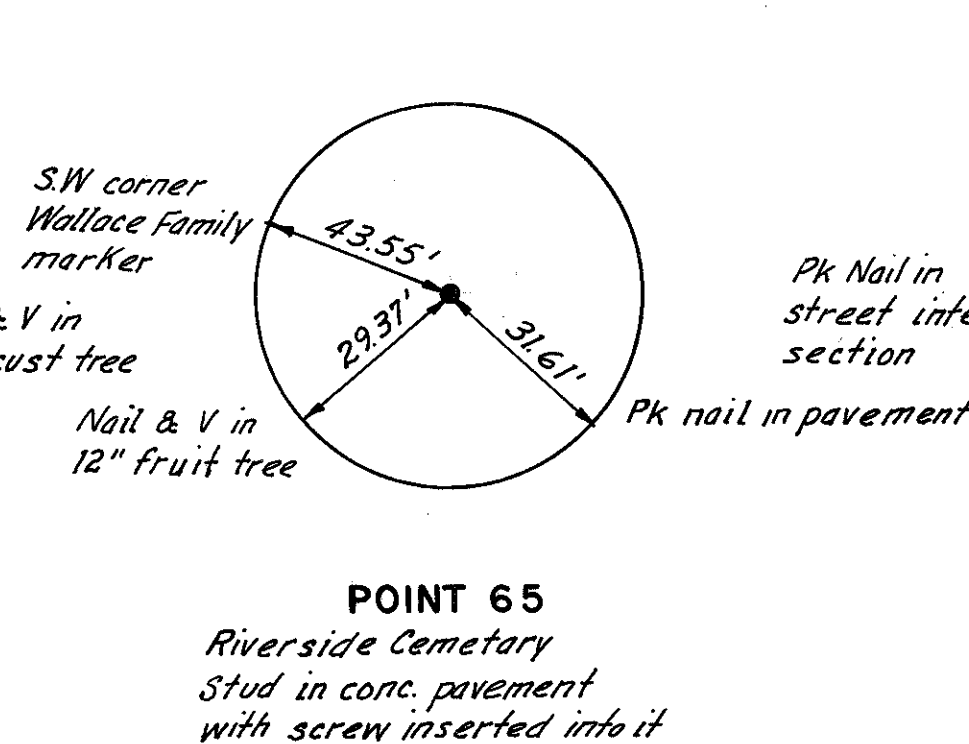
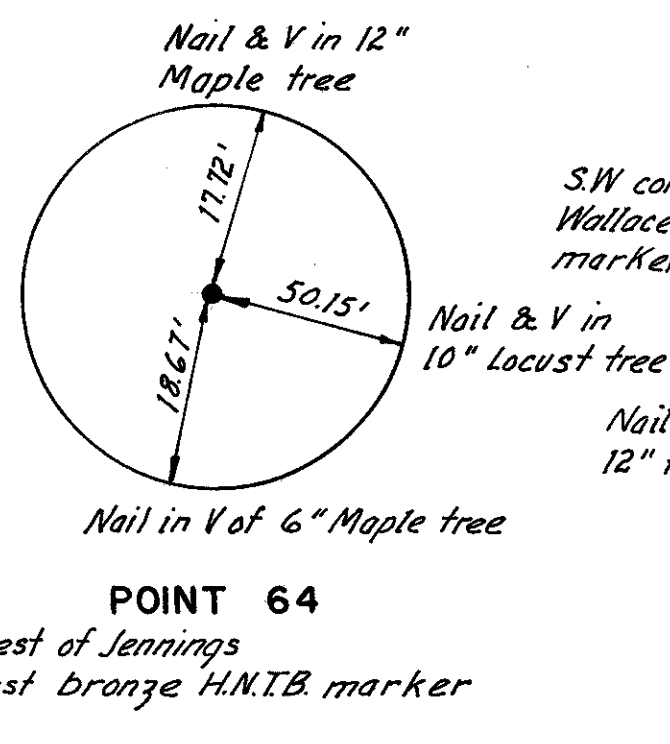
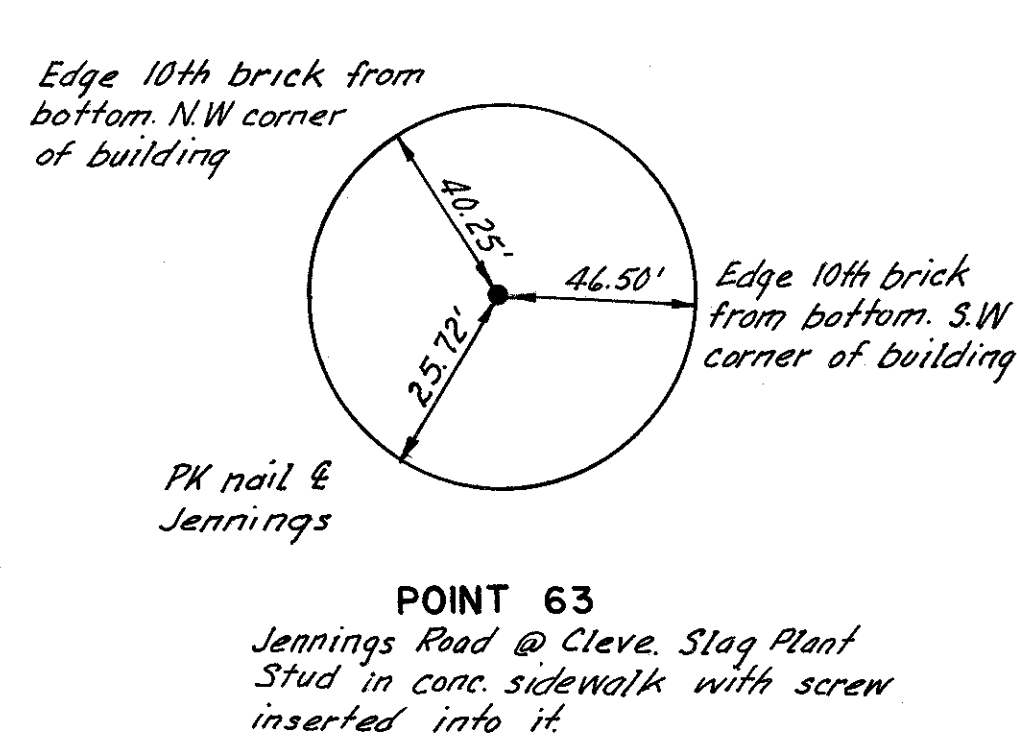
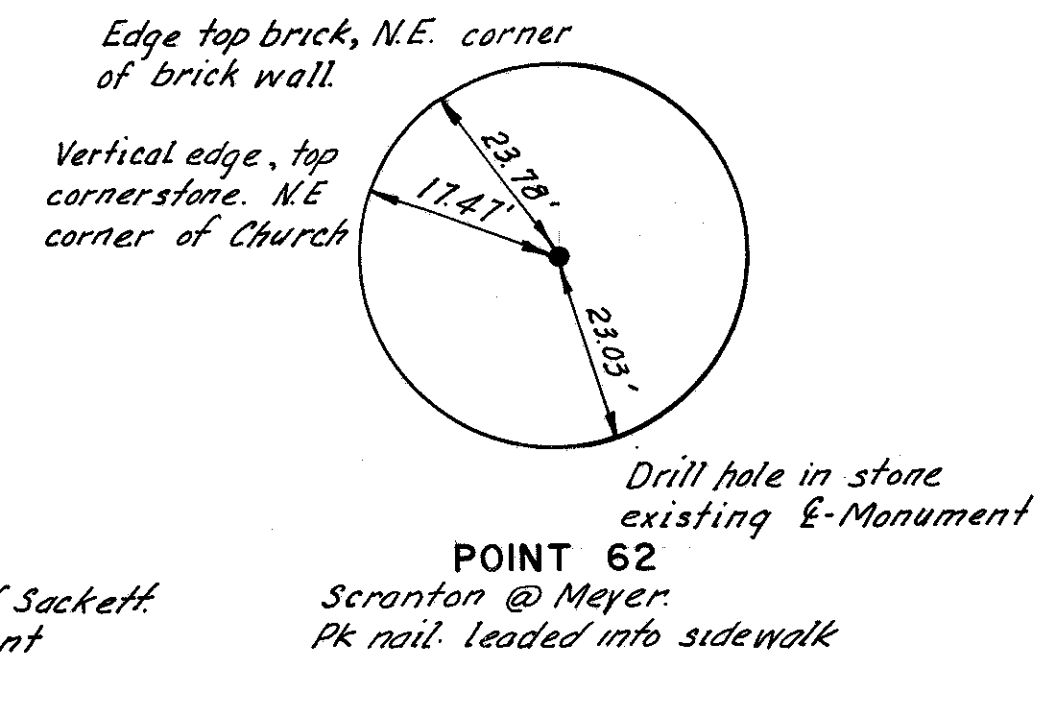
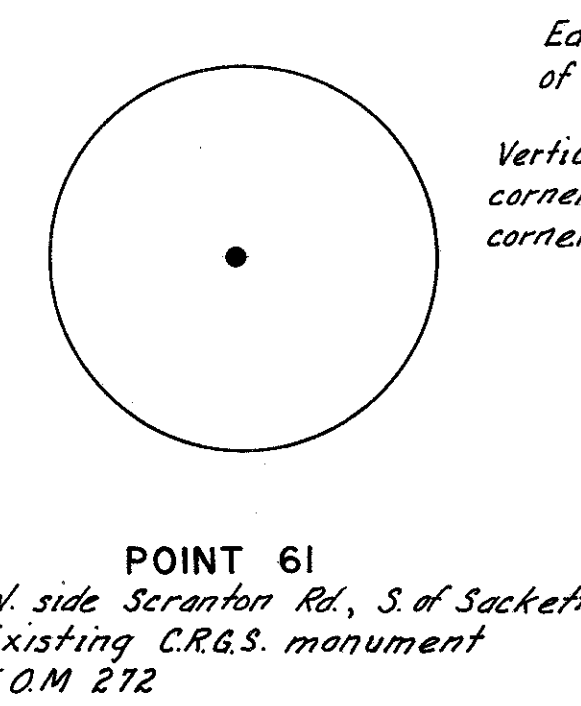
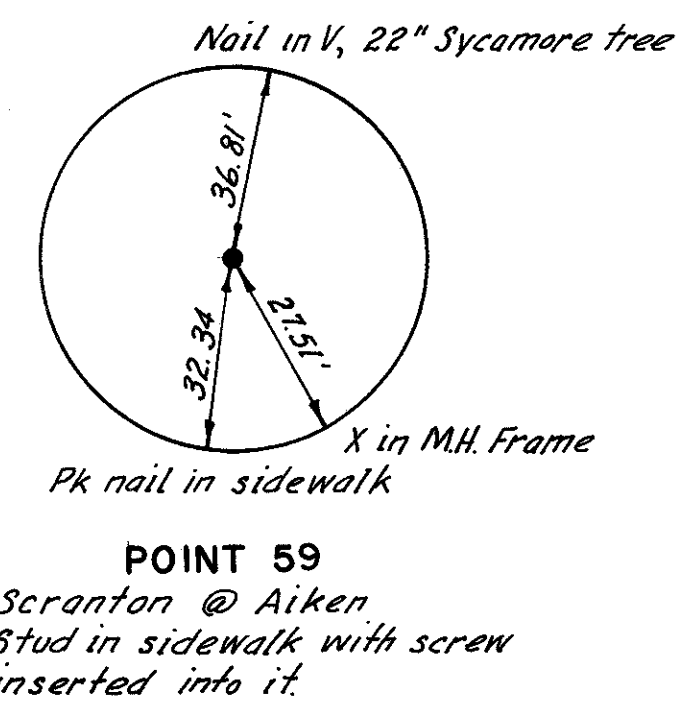
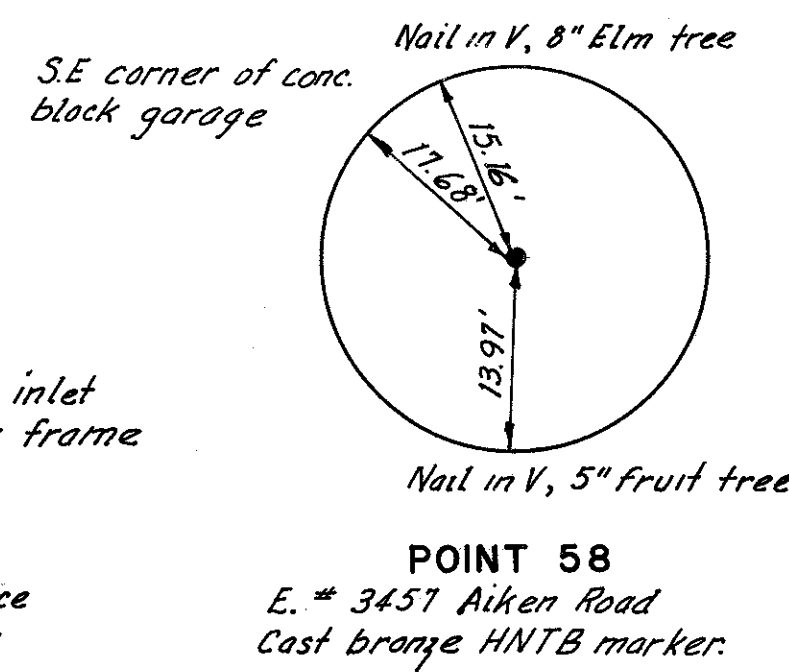
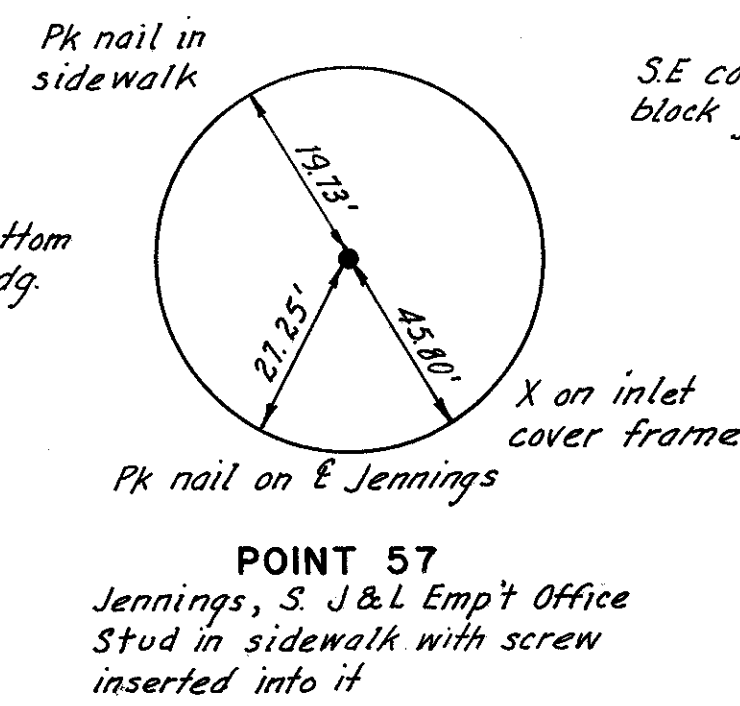
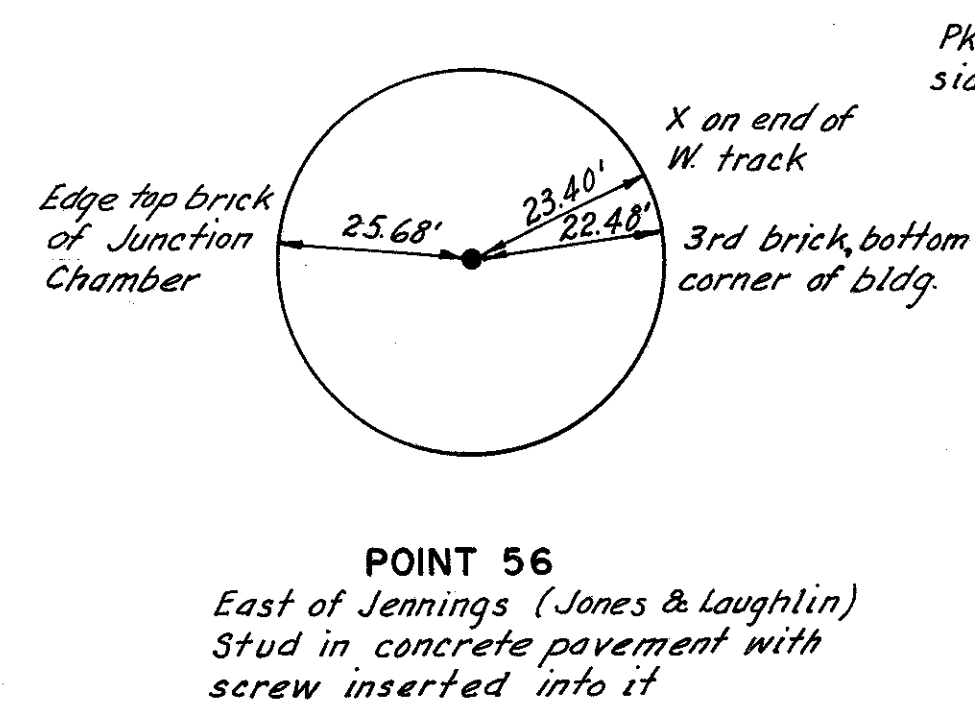
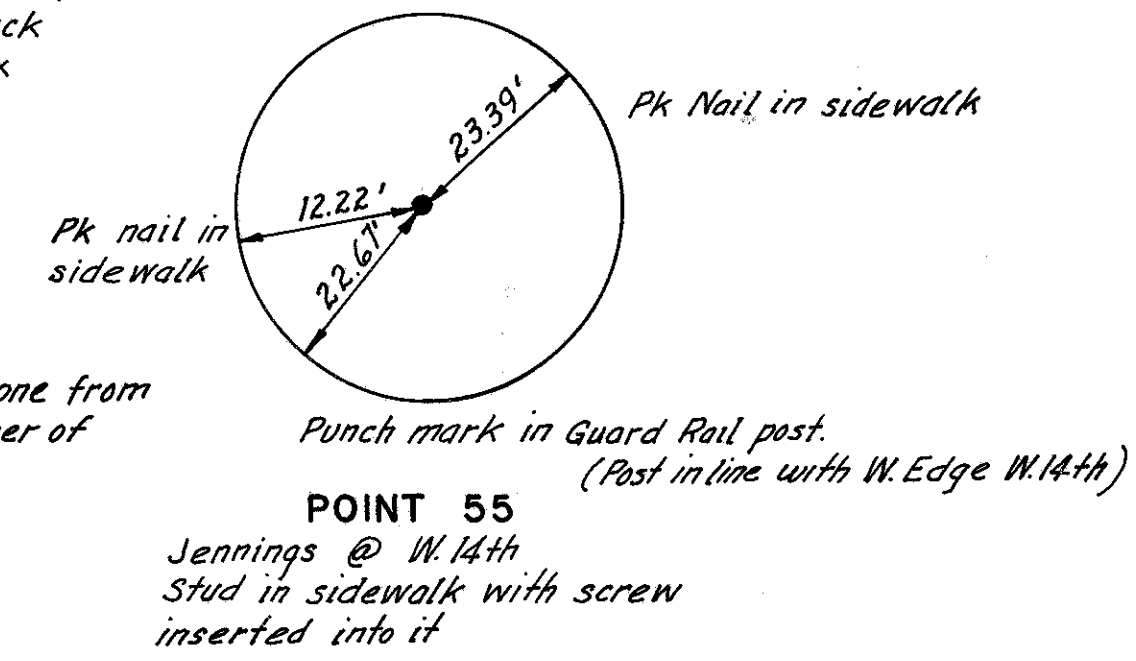
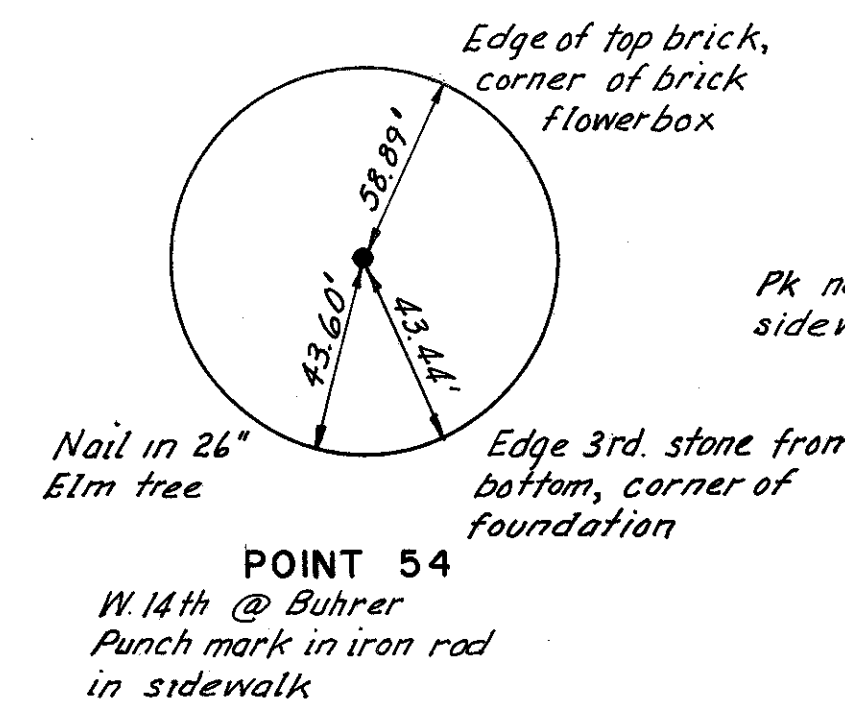
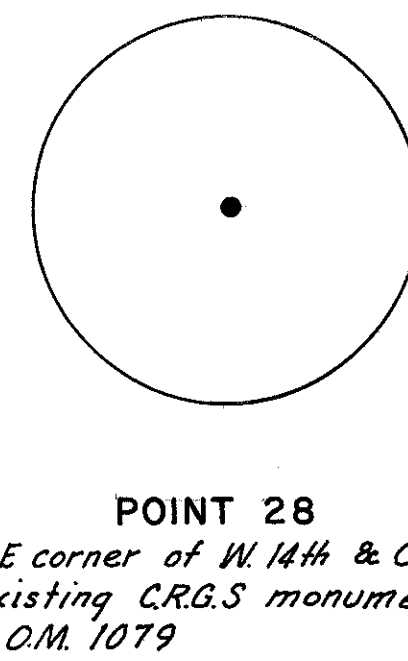
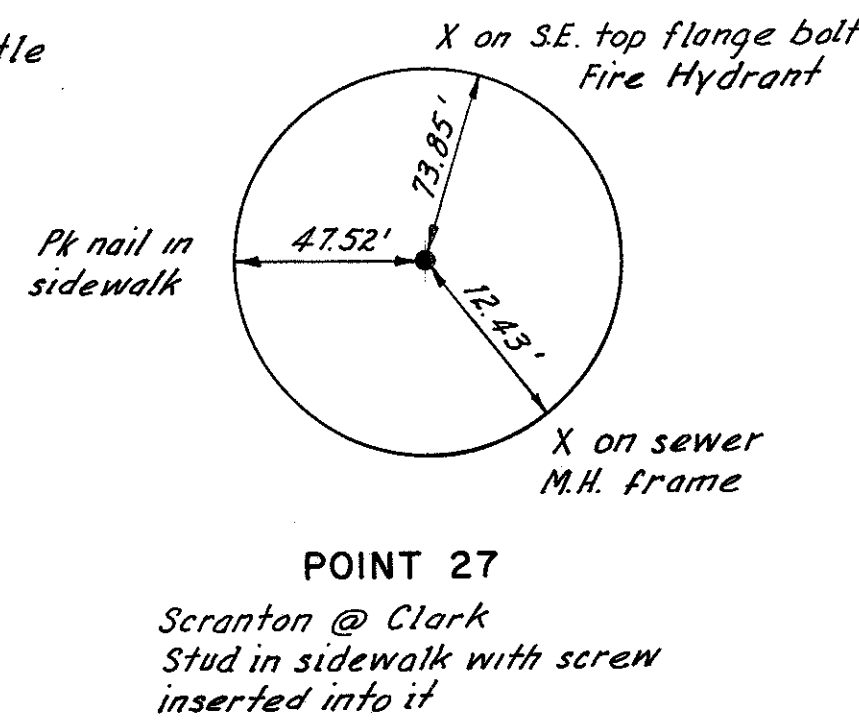
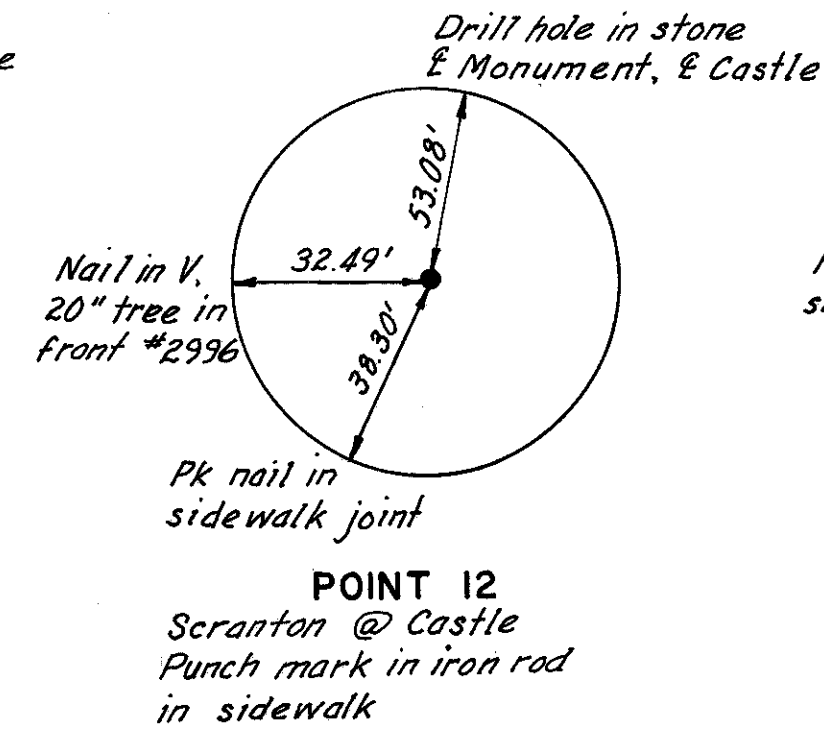
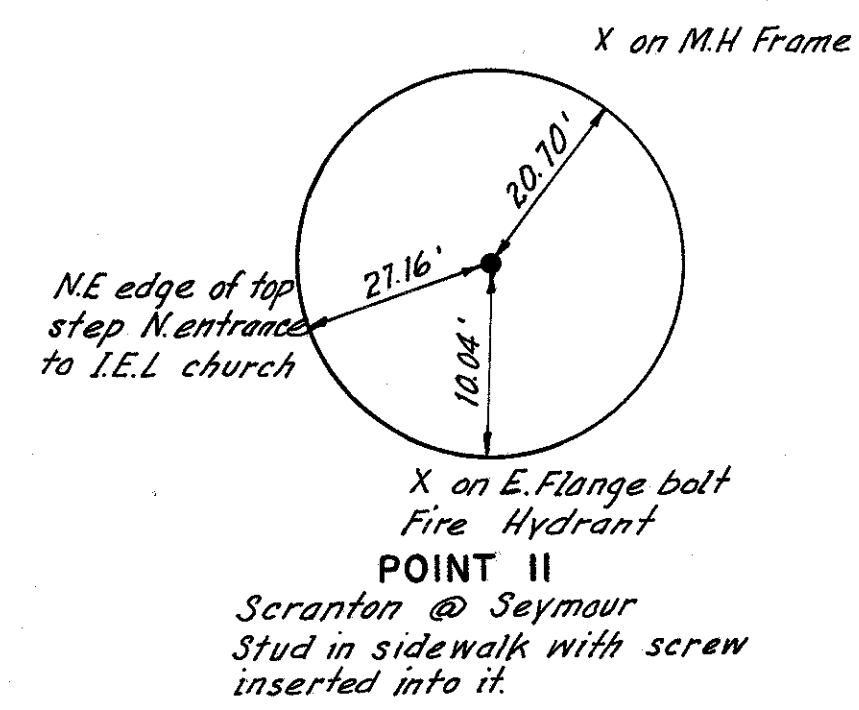
SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE D.R.N. DATE 11-2-64 CONSULTING ENGINEERS  
 TRCD. DATE \_\_\_\_\_  
 CKD. J.M. DATE 12-16-64 KANSAS CITY CLEVELAND NEW YORK

# TRAVERSE TIES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

5  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



MADE R.J.Z. DATE 12-11-64 TRACED DATE  
CHECKED DRK DATE 12-30-64 SCALE No Scale

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

# TYPICAL SECTIONS

## TYPE T-71

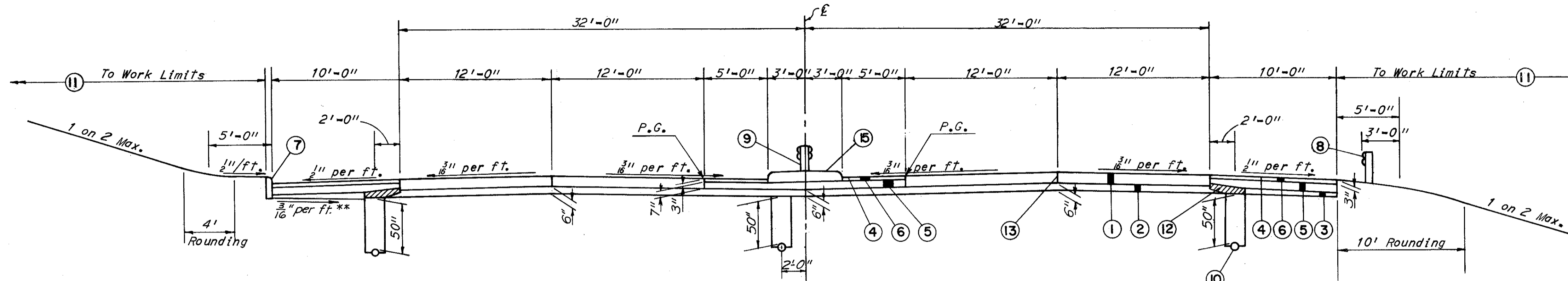
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2	OHIO	

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CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY-176-12.76

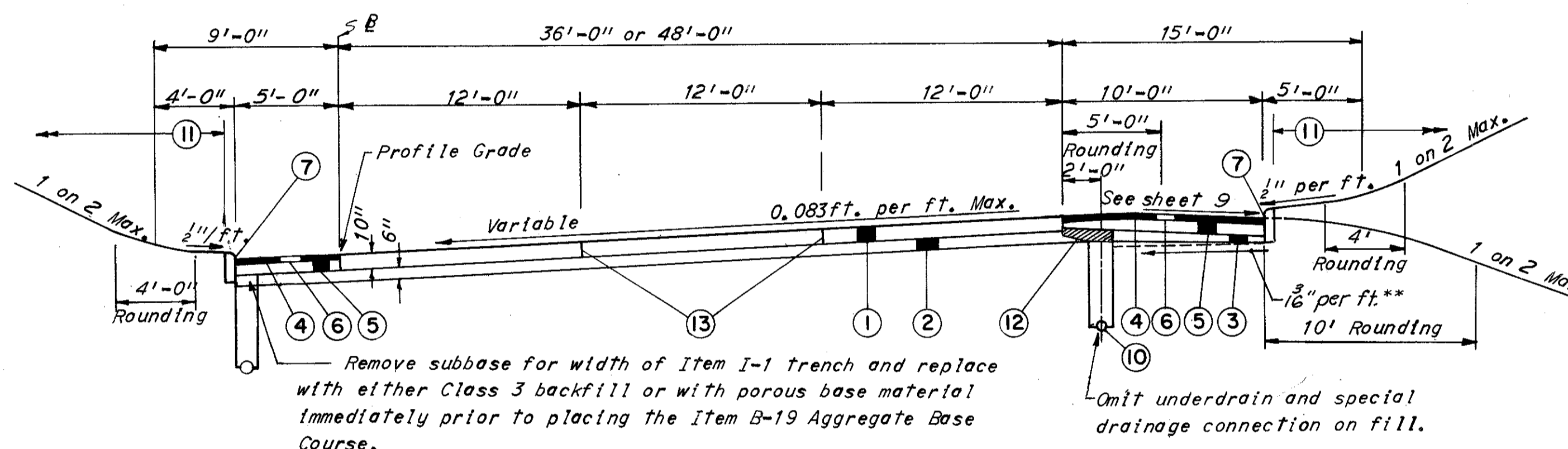
### LEGEND

- ① Item T-71 10" Reinforced Portland Cement Concrete Pavement
- ② Item I-22 Subbase, Grading "A" or "B", modified as per General Note
- ③ Item I-22 Subbase, Regular Grading
- ④ Item T-31 Bituminous Surface Treatment, using 0.008 Cu.Yd. No. 6 aggregate and 0.25 Gal. Bituminous material per Sq.Yd. (See note in proposal)
- ⑤ Item B-19 Aggregate Base Course
- ⑥ Item B-21 3" Waterproofed Aggregate Base Course (Type "A" T-35 or T-335 material may be used in construction of this course - see note in proposal) Thickness shown is "designed" thickness as described in Sec. B-21.01
- ⑦ Item I-12 Standard Type 6 Concrete Curb
- ⑧ Item I-15 Guard Rail, Steel Beam Standard Type (Deep)
- ⑨ Item I-15 Guard Rail, Steel Beam Barrier Type (Deep)
- ⑩ Item I-1 6" Pipe, Class I-3\*
- ⑪ Item L-9 Seeding and Protecting, as per plan
- ⑫ Item special drainage connection, using No. 6 aggregate (See note in proposal)
- ⑬ Standard Longitudinal Joint
- ⑭ Item I-14 Standard Type 1 Paved Gutter (Modified)
- ⑮ Item I-21 Concrete Median Pavement, as per plan (See Miscellaneous Details)

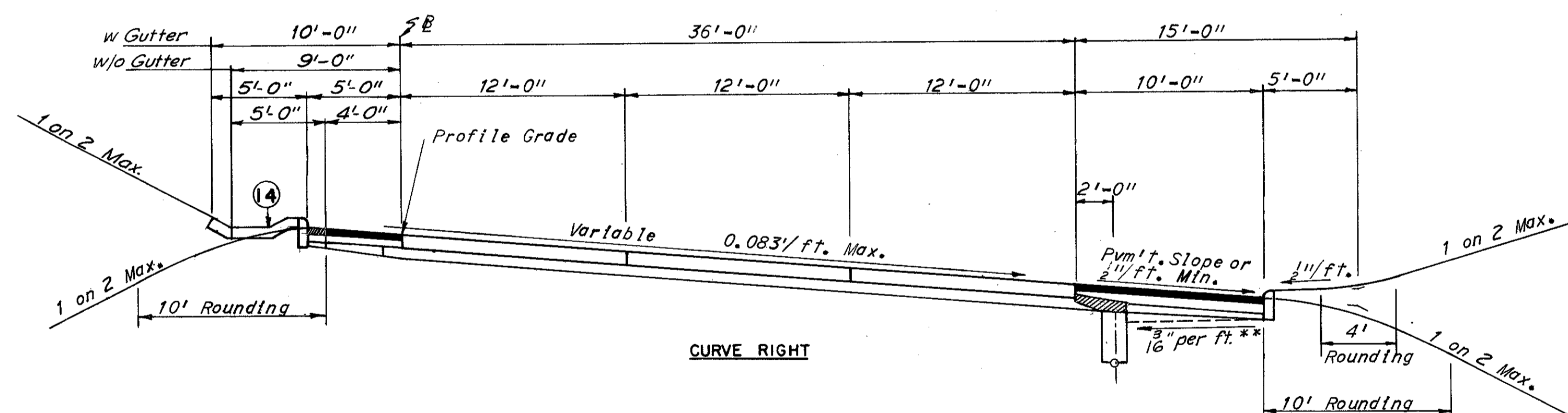


\*\* Note:  
When curb is shown on the plans to be used adjacent to the 10' wide paved shoulder, the bottom of the subbase (top of subgrade) shall slope toward the underdrain at  $\frac{3}{16}$ " per ft. minimum slope.

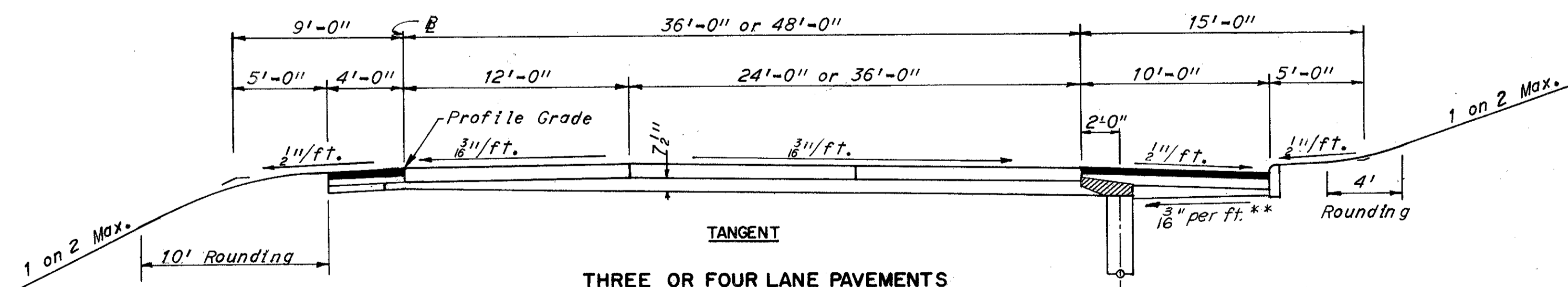
JENNINGS FREEWAY  
NORTHBOUND STA. 33+04.81 TO STA. 34+80.98  
SOUTHBOUND STA. 33+04.81 TO STA. 34+86.10



### CURVE LEFT



### CURVE RIGHT



### THREE OR FOUR LANE PAVEMENTS

S.B. MEDINA STA. 913+50.00 TO STA. 951+15.00†  
N.B. MEDINA STA. 913+00.00 TO STA. 917+10.96  
N.B. MEDINA STA. 946+05.02 TO STA. 951+13.98†  
S.B. OUTER ROADWAY STA. 40+58.80 TO STA. 41+80.16  
S.B. JENNINGS STA. 44+23.61 TO STA. 53+82.42  
N.B. JENNINGS STA. 44+40.56 TO STA. 63+72.74

Underdrains:  
\* 30" cover from bottom of subbase to crown of pipe in fill  
50" cover from bottom of subbase to crown of pipe in cut

Note:  
Sequence of operations - (1) Install pipe underdrain on right shoulder. Installation of shallow underdrain on left shoulder may be deferred until T-71 is placed, (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present, (3) Construct T-71, (4) Remove subbase and any contaminated backfill over drain and replace with No. 6 aggregate as shown by (12), (5) Complete shoulder construction.

Typical Sections are intended to show general roadway and pavement features only. For details see Paved Shoulder Details, Plan Sheets and Cross Section Sheets.

All Typical Sections are shown facing in the direction of traffic.

Unless otherwise noted, call-outs shown on the top section shall apply to all sections on this sheet.

†Note:  
Subbase thickness shall be increased to a total thickness of 18" in the following areas, in order to prevent frost heaving of anticipated frost susceptible soils.

S.B. Medina Sta. 915+25 to Sta. 921+00

S.B. Medina Sta. 950+00 to Sta. 951+15

N.B. Medina Sta. 950+00 to Sta. 951+14

Underdrain depth in this area shall be established from the bottom of the top 6 inch layer. Porous Backfill in the underdrain trench above the 6 inches of No. 6 or 6A aggregate over the pipe shall be composed of M-2.1 sand to prevent infiltration of the backfill by fine-grained soils.

The cost of providing the underdrains as described above shall be included in the unit price bid for Item I-1, 6" Pipe, Class I-3.

SCALE  $\frac{3}{16}" = 1'-0"$  HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE DRK DATE 7-21-64 CONSULTING ENGINEERS  
TRCD DATE 12-2-64  
CRD SDH DATE 12-2-64 KANSAS CITY CLEVELAND NEW YORK

# TYPICAL SECTIONS

## TYPE T-71

\* Note:  
 When curb is shown on the plans to be used adjacent to the 10' wide paved shoulder, the bottom of the subbase (top of subgrade) shall slope toward the underdrain at  $\frac{1}{16}$ " per ft. minimum slope.

### LEGEND

- ① Item T-71 9" Reinforced Portland Cement Concrete Pavement
- ② Item T-71 10" Reinforced Portland Cement Concrete Pavement
- ③ Item I-22 Subbase, Grading "A" or "B", modified as per General Note
- ④ Item I-22 Subbase, Regular Grading
- ⑤ Item T-31 Bituminous Surface Treatment, using 0.008 Cu. Yd. No. 6 aggregate and 0.25 Gal. Bituminous material per Sq. Yd. (See note in proposal)
- ⑥ Item B-19 Aggregate Base Course
- ⑦ Item B-21 Waterproofed Aggregate Base Course (Type "A" T-35 or T-335 material may be used in construction of this course - see note in proposal) Thickness shown is "designed" thickness as described in Sec. B-21.01
- ⑧ Item I-12 Standard Type 6 Concrete Curb
- ⑨ Item I-15 Guard Rail, Steel Beam Standard Type (Deep)
- ⑩ Item I-1 6" Pipe, Class I-3
- ⑪ Item L-9 Seeding and Protecting, as per plan
- ⑫ Item special drainage connection, using No. 6 aggregate (See note in proposal)
- ⑬ 50" from bottom at subbase to crown of pipe in cuts 30" from bottom at subbase to crown of pipe in fills
- ⑭ Standard Longitudinal Joint
- ⑮ Item I-12 Standard Type 2-A Curb

Note:  
 Sequence of operations - (1) Install pipe underdrain on right shoulder. Installation of shallow underdrain on left shoulder may be deferred until T-71 is placed, (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present, (3) Construct T-71, (4) Remove subbase and any contaminated backfill over drain and replace with No. 6 aggregate as shown by ⑫, (5) Complete shoulder construction.

Typical Sections are intended to show general roadway and pavement features only. For details see Paved Shoulder Details, Plan Sheets and Cross Section Sheets.

All Typical Sections are shown facing in the direction of traffic.

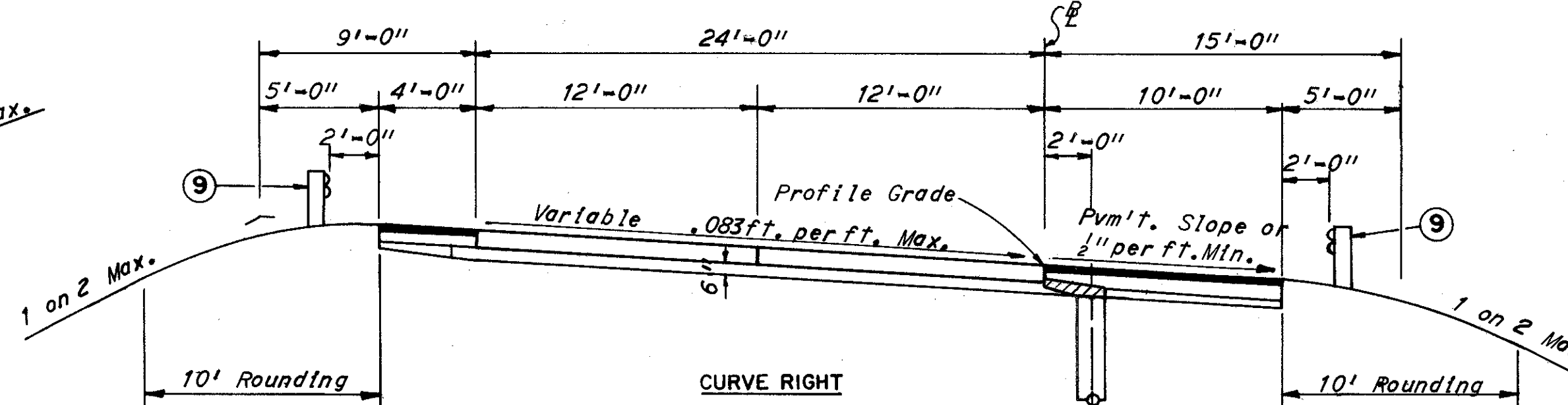
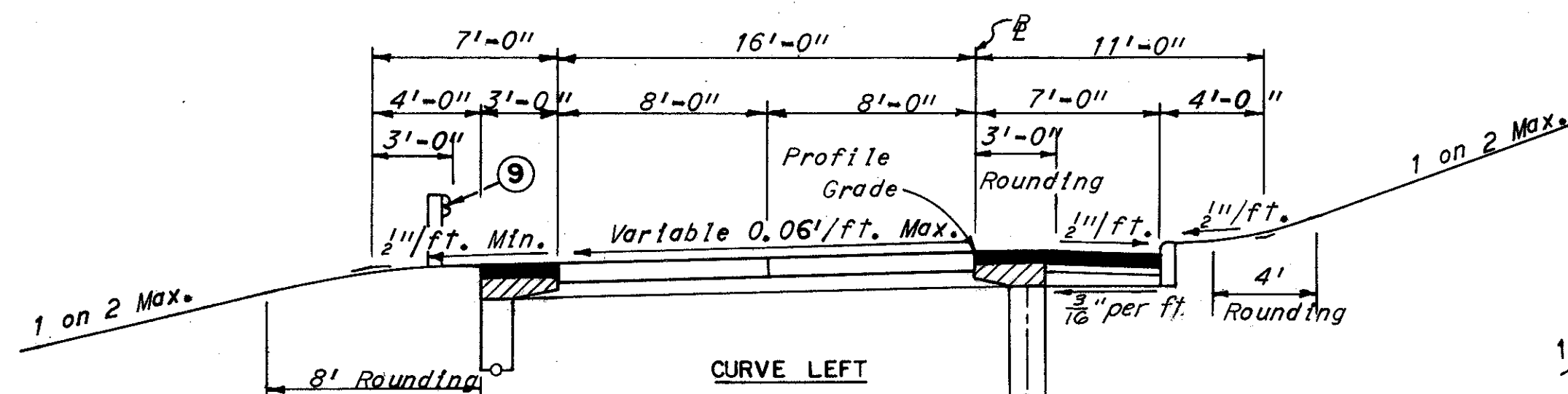
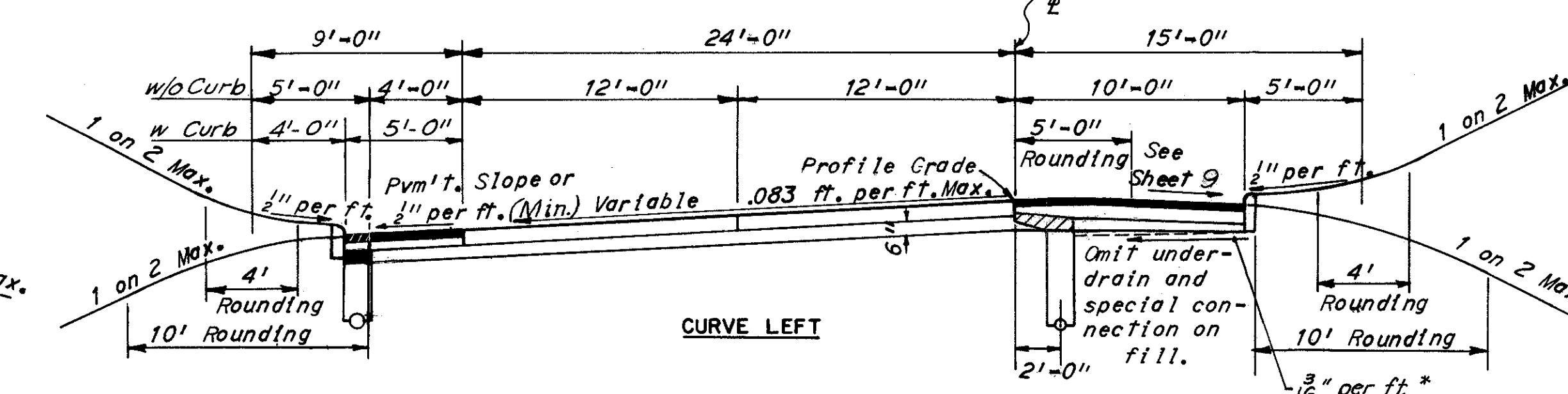
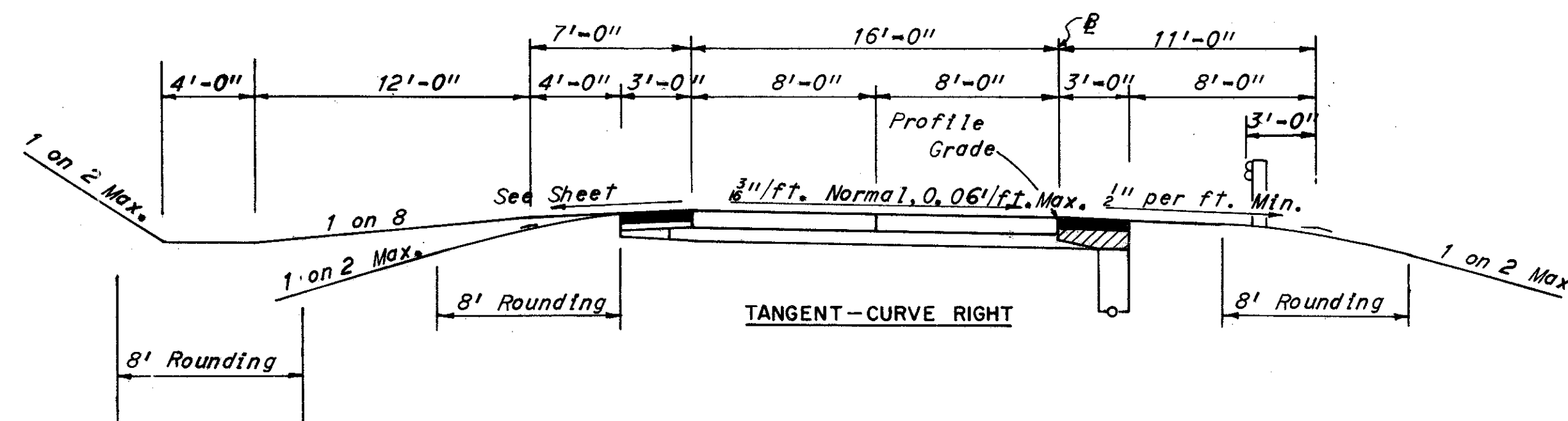
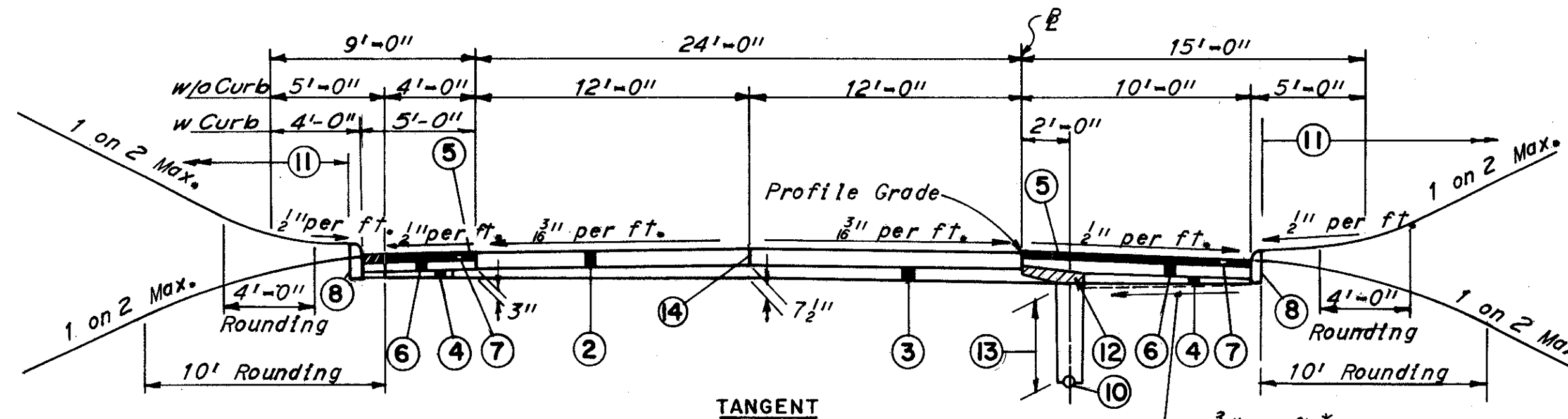
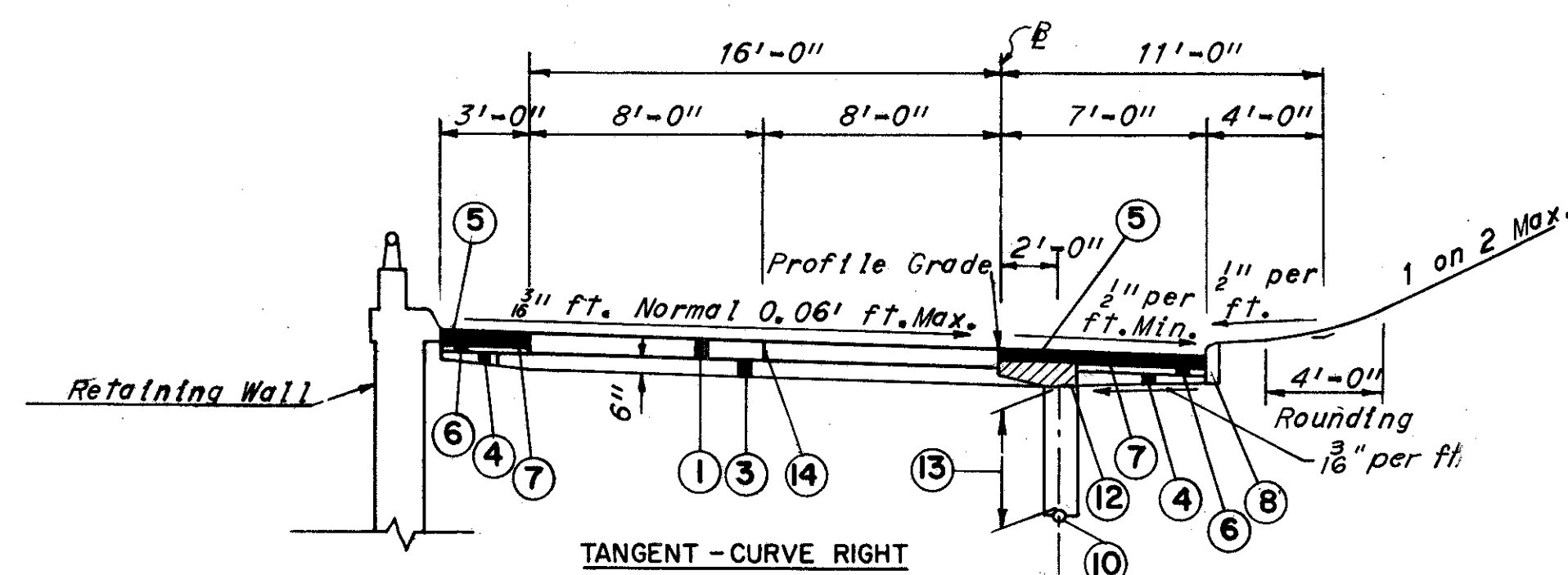
Unless otherwise noted, call-outs shown on the top section shall apply to all sections on this sheet.

Note:  
 Subbase thickness shall be increased to a total thickness of 18" in the following areas, in order to prevent frost heaving of anticipated frost susceptible soils.

S.B. Outer Roadway Sta. 3+61 to Sta. 4+75
N.B. Outer Roadway Sta. 22+25 to Sta. 23+48
S.B. Outer Roadway Sta. 35+50 to Sta. 38+30
N.B. Jennings Sta. 34+00 to Sta. 41+30
S.B. Jennings Sta. 34+00 to Sta. 41+30
Ramp JN-D Sta. 4+41 to Sta. 13+62
Ramp J-JR Sta. 5+00 to Sta. 12+25

Underdrain depth in this area shall be established from the bottom of the top 6 inch layer. Porous Backfill in the underdrain trench above the 6 inches of No. 6 or 6A aggregate over the pipe shall be composed of M-2.1 sand to prevent infiltration of the backfill by fine-grained soils.

The cost of providing the underdrains as described above shall be included in the unit price bid for Item I-1, 6" Pipe, Class I-3.

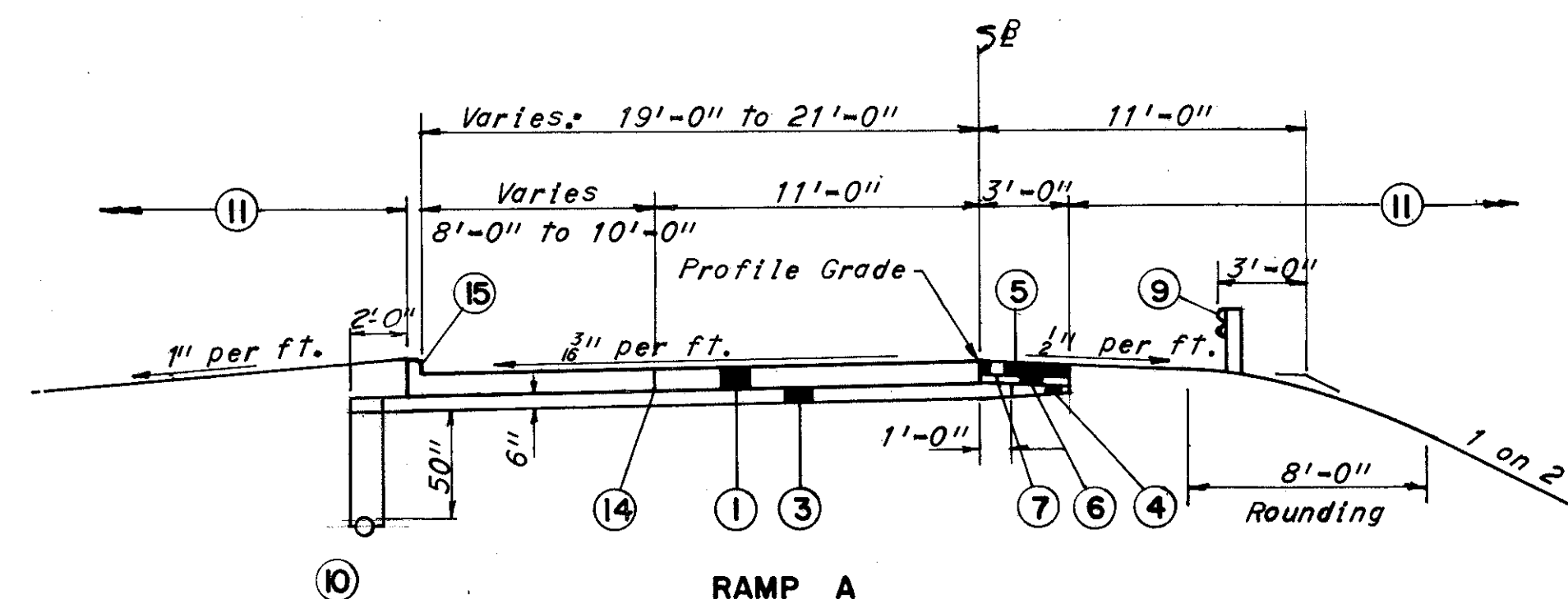


### SINGLE LANE PAVEMENTS

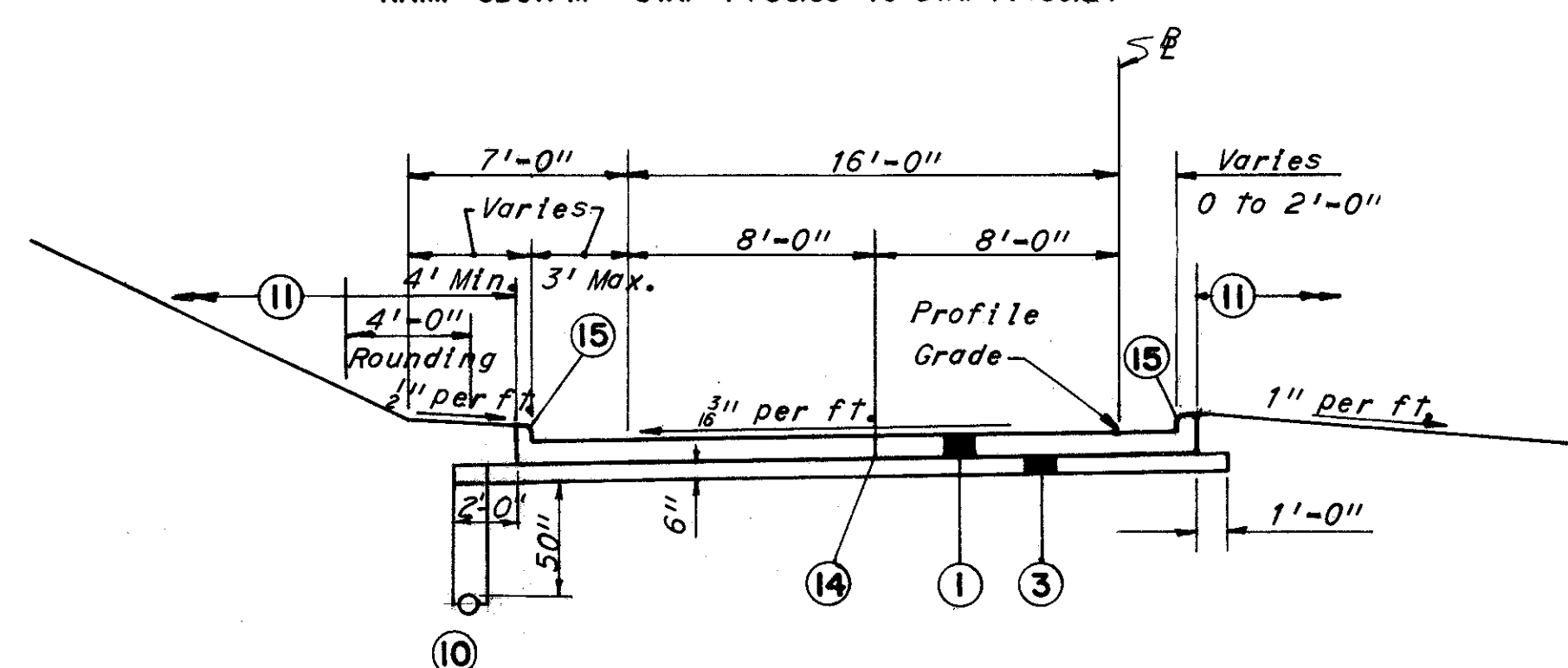
RAMP D-JN	STA. 0+00.00 TO STA. 10+14.61
RAMP JN-D	STA. 4+41.51 TO STA. 13+62.20
RAMP J-JR	STA. 2+47.64 TO STA. 12+24.62
LANE M-J	STA. 3+95.50 TO STA. 10+97.21
RAMP I4-M	STA. 0+00.00 TO STA. 15+77.25
RAMP NBOR-I4	STA. 4+39.57 TO STA. 11+75.01
N.B. JENNINGS	STA. 81+20.53 TO STA. 86+01.36
RAMP I4-SBOR	STA. 0+00.09 TO STA. 2+78.00

### TWO LANE PAVEMENTS

N.B. JENNINGS	STA. 34+80.98 TO STA. 34+94.03
N.B. JENNINGS	STA. 36+71.62 TO STA. 44+40.56
S.B. JENNINGS	STA. 34+86.10 TO STA. 35+05.23
S.B. JENNINGS	STA. 36+83.08 TO STA. 44+23.61
S.B. OUTER RD.	STA. 3+61.28 TO STA. 33+62.88
S.B. OUTER RD.	STA. 35+18.37 TO STA. 40+58.81
N.B. MEDINA	STA. 935+21.25 TO STA. 946+05.02
N.B. OUTER RD.	STA. 7+95.56 TO STA. 23+48.04
RAMP J-NBOR	STA. 0+42.59 TO STA. 10+89.24
RAMP SBOR-M	STA. 7+86.63 TO STA. 11+80.24



STA. 13+59.97 TO STA. 16+06.33



STA. 13+09.49 TO STA. 15+09.59



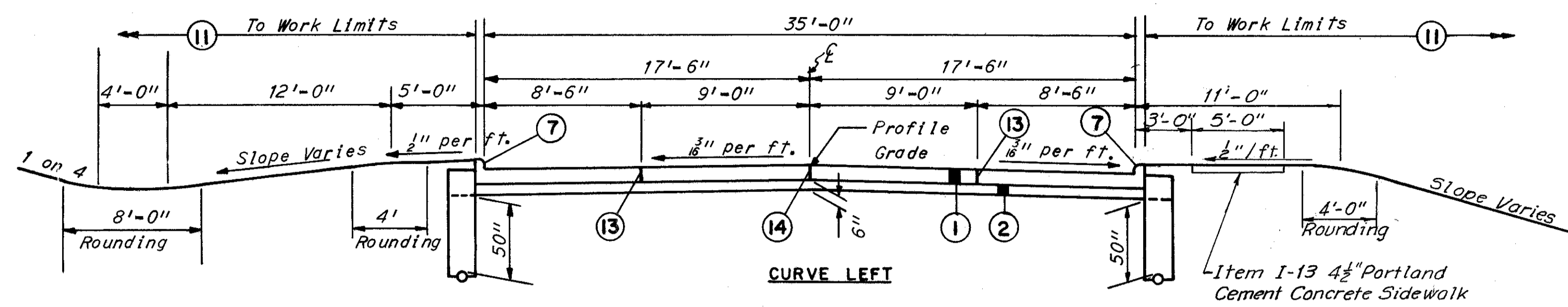
# TYPICAL SECTIONS

## TYPE T-71

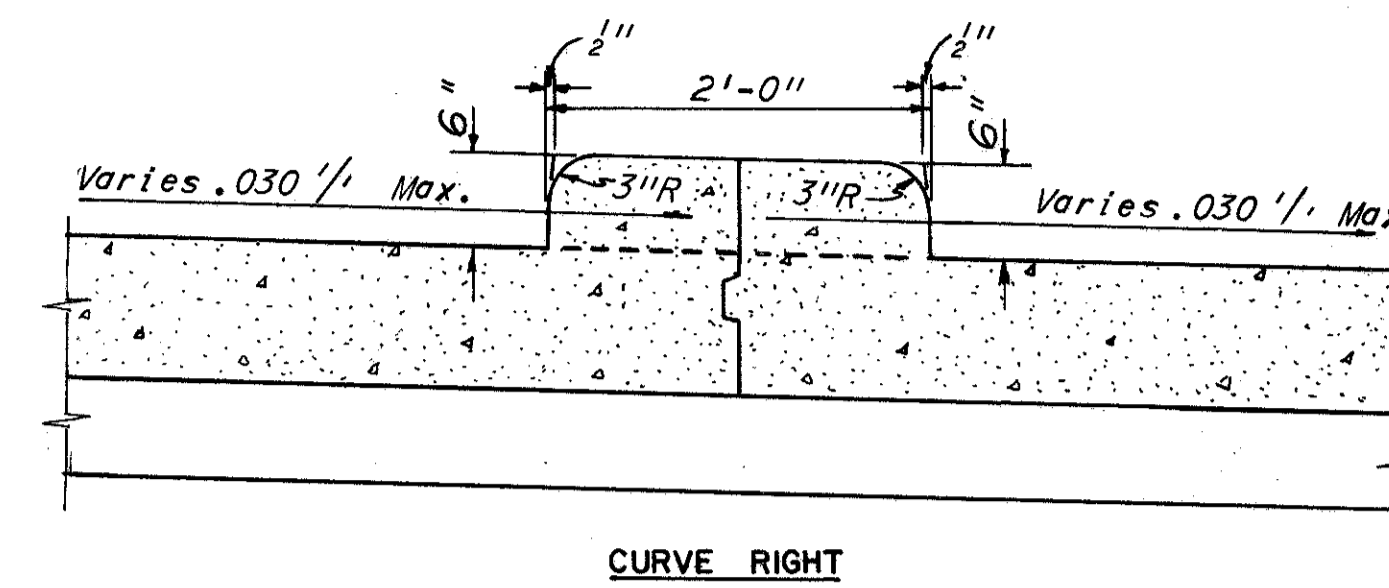
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

8  
646

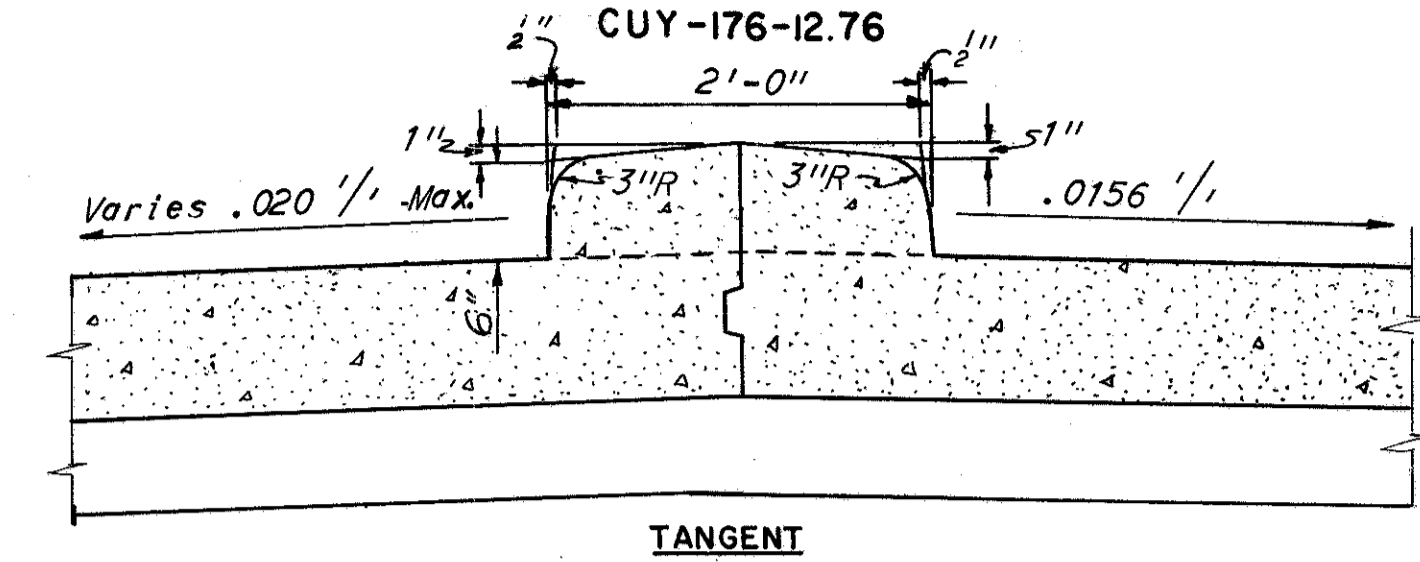
CUYAHOGA COUNTY  
CUY-71-17.83



RELOCATED JENNINGS RD.  
STA. 4+21.29 TO STA. 6+74.50



SPECIAL 6" CONCRETE MEDIAN



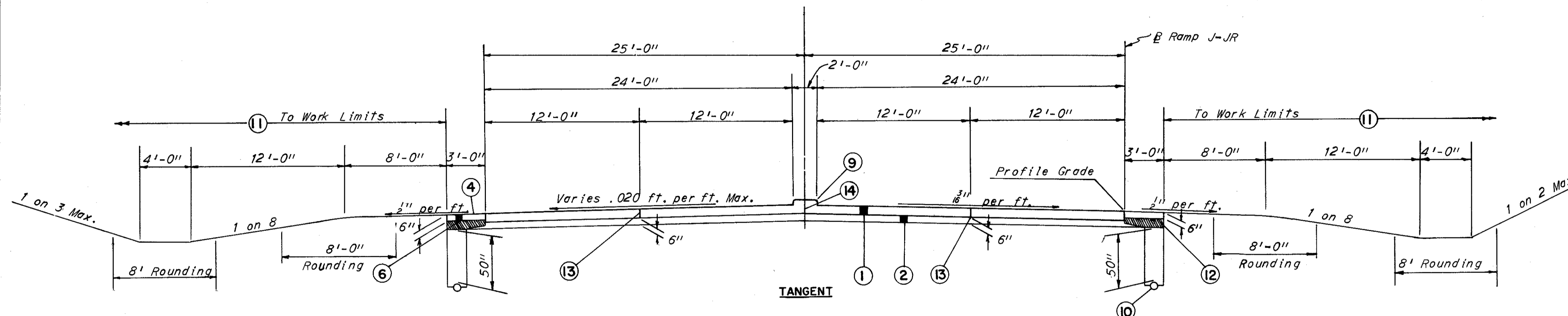
LEGEND

- ① Item T-71 9" Reinforced Portland Cement Concrete Pavement
- ② Item I-22 Subbase, Grading "A" or "B", modified as per General Note
- ③ Item I-22 Subbase, Regular Grading
- ④ Item T-31 Bituminous Surface Treatment, using 0.008 Cu.Yd. No. 6 aggregate and 0.25 Gal. Bituminous material per Sq.Yd. (See note in proposal)
- ⑤ Item B-19 Aggregate Base Course
- ⑥ Item B-21 6" Waterproofed Aggregate Base Course (Type "A" T-35 or T-335 material may be used in construction of this course - see note in proposal) Thickness shown is "designed" thickness as described in Sec. B-21.01
- ⑦ Item I-12 Standard Type 2-A Concrete Curb
- ⑧ Item I-15 Guard Rail, Steel Beam Standard Type (Deep)
- ⑨ Item I-21 Special 6" Concrete Median, as per plan
- ⑩ Item I-1 6" Pipe, Class I-3\*
- ⑪ Item L-9 Seeding and Protecting, as per plan
- ⑫ Item special drainage connection, using No. 6 aggregate (See note in proposal)
- ⑬ Standard Longitudinal Joint
- ⑭ Standard Longitudinal Key-Joint without Tie-Bars

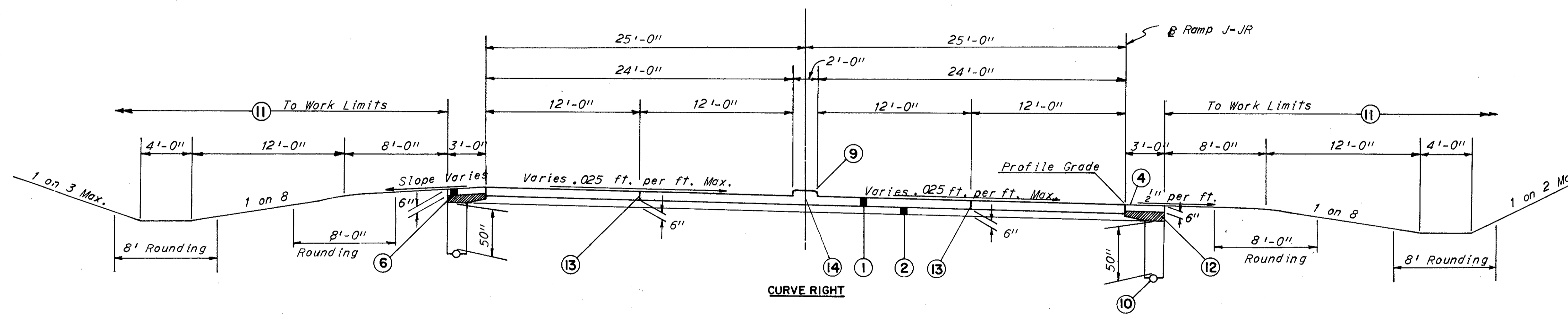
Underdrains:  
\* 30" cover from bottom of subbase to crown of pipe in fill  
50" cover from bottom of subbase to crown of pipe in cut

Note:  
Sequence of operations - (1) Install pipe underdrain, (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present, (3) Construct T-71, (4) Remove subbase and any contaminated backfill over drain and replace with No. 6 aggregate as shown by (12), (5) Complete shoulder construction.  
Typical Sections are intended to show general roadway and pavement features only. For details see Paved Shoulder Details, Plan Sheets and Cross Section Sheets.

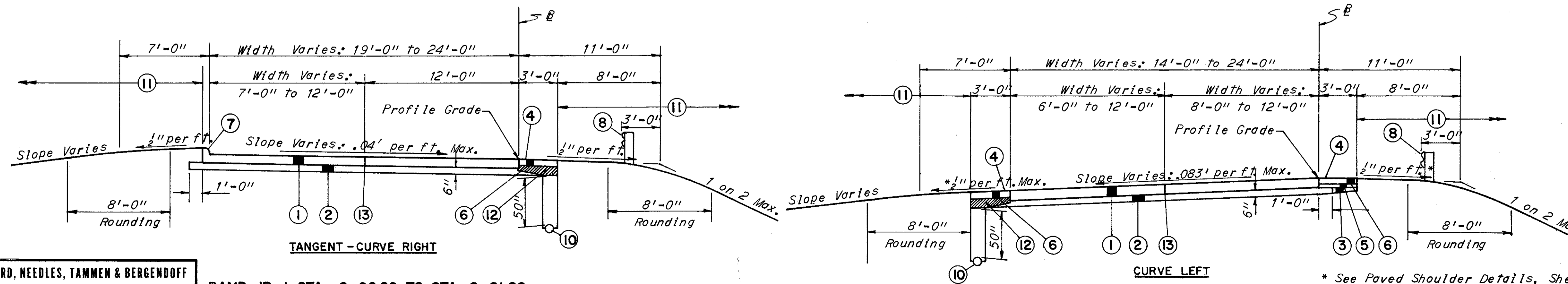
Note:  
Subbase thickness shall be increased to a total thickness of 18" in the following areas, in order to prevent frost heaving of anticipated frost susceptible soils.  
Ramp JR-J Sta. 0+00 to Sta. 9+00  
Ramp J-JR Sta. 12+25 to Sta. 22+55  
Underdrain depth on this area shall be established from the bottom of the top 6 inch layer. Porous Backfill in the underdrain trench above the 6 inches of No. 6 or 6A aggregate over the pipe shall be composed of M-2.1 sand to prevent infiltration of the backfill by fine-grained soils.  
The cost of providing the underdrains as described above shall be included in the unit price bid for Item I-1, 6" Pipe, Class I-3.



RAMP J-JR STA. 15+24.62 TO STA. 17+82.20



RAMP J-JR STA. 17+82.20 TO STA. 22+55.03



RAMP JR-J STA. 0+00.00 TO STA. 6+81.60  
RAMP J-JR STA. 12+24.62 TO STA. 15+24.62

RAMP JR-J STA. 6+81.60 TO STA. 11+35.82

SCALE 3/16" = 1'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE DRK. DATE 8-3-64 CONSULTING ENGINEERS  
TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
CKD. SDH. DATE 12-26-64

\* See Paved Shoulder Details, Sheet No. 10

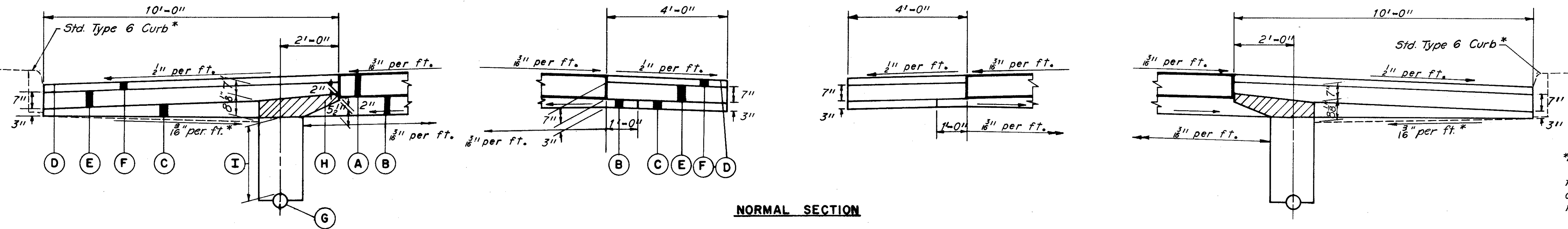
# TYPICAL SECTIONS

## TYPE T-71 PAVED SHOULDERS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

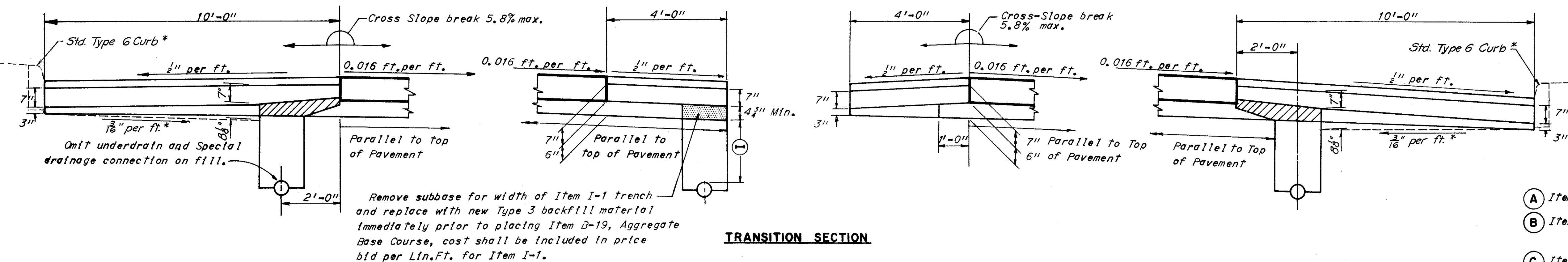
9  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

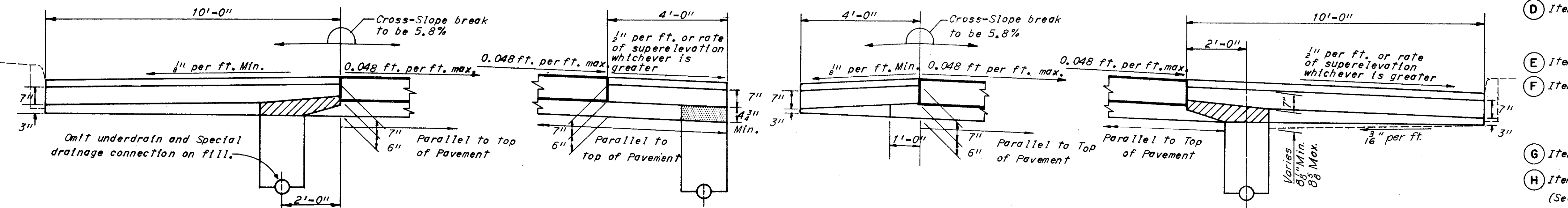


**NORMAL SECTION**

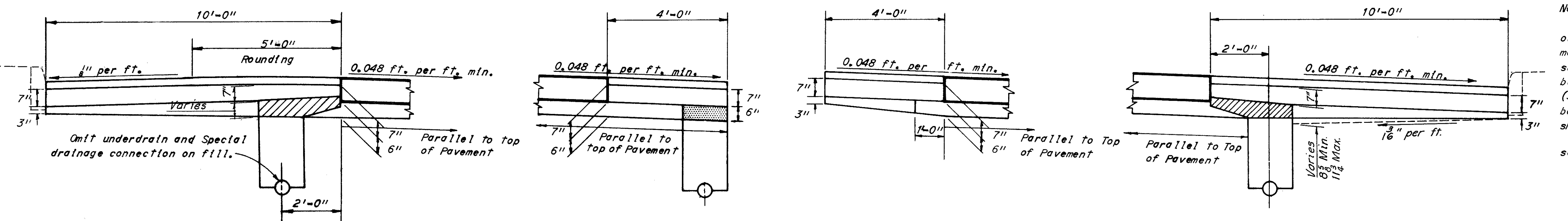
*\*Note:*  
When curb is shown on the plans to be used adjacent to the 10' wide paved shoulder the bottom of the subbase (top of subgrade) shall slope toward the underdrain at  $\frac{3}{16}$ " per ft. minimum slope.



**TRANSITION SECTION**



**SUPERELEVATION NOT MORE THAN 0.048 FT. PER FT.**



**SUPERELEVATION MORE THAN 0.048 FT. PER FT.**

**LEGEND**

- (A) Item T-71 10" Reinforced Portland Cement Concrete Pavement
- (B) Item I-22 Subbase, Grading "A" or "B", modified as per General Note
- (C) Item I-22 Subbase, Regular Grading
- (D) Item T-31 Bituminous Surface Treatment, using 0.008 Cu. Yd. No. 6 aggregate and 0.25 Gal. Bituminous material per Sq. Yd. (See note in proposal)
- (E) Item B-19 Aggregate Base Course
- (F) Item B-21 3" Waterproofed Aggregate Base Course (Type "A" T-35 or T-35 material may be used in construction of this course - see note in proposal) Thickness shown is "designed" thickness as described in Sec. B-21.01
- (G) Item I-1 6" Pipe, Class I-3
- (H) Item special drainage connection, using No. 6 aggregate (See note in proposal)
- (I) 30" cover from bottom of subbase to crown of pipe in fill  
50" cover from bottom of subbase to crown of pipe in cut

*Note:*  
Sequence of operations - (1) Install pipe underdrain on outside shoulder. Installation of shallow underdrain in median may be deferred until T-71 is placed, (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present, (3) Construct T-71, (4) Remove subbase and any contaminated backfill over drain and replace with No. 6 aggregate as shown by (H), (5) Complete shoulder construction.  
Unless otherwise noted, call-outs shown on top section shall apply to all sections on this sheet.

SCALE  $\frac{1}{2}'' = 1'$   
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE SDH DATE 2-3-64 CONSULTING ENGINEERS  
TRCD DATE 8-31-64 KANSAS CITY CLEVELAND NEW YORK  
CKD DRK DATE 8-31-64

# TYPICAL SECTIONS

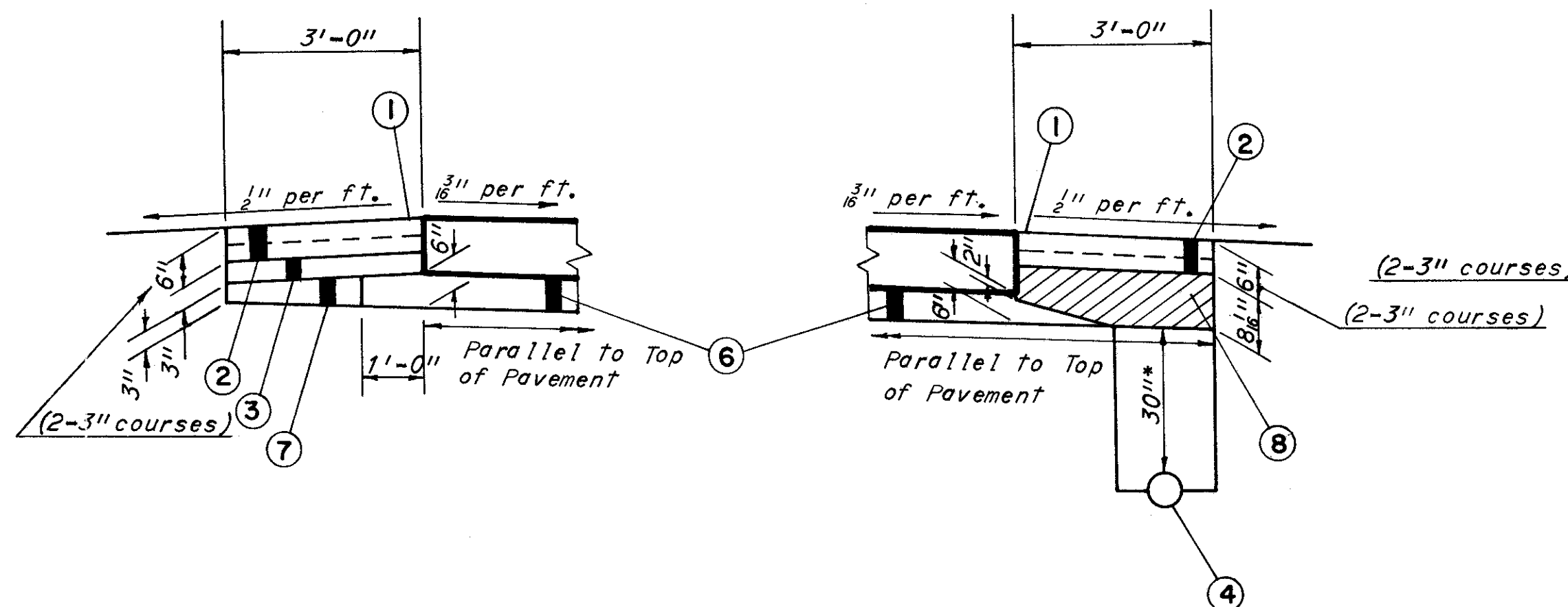
TYPE T-71

PAVED SHOULDERS

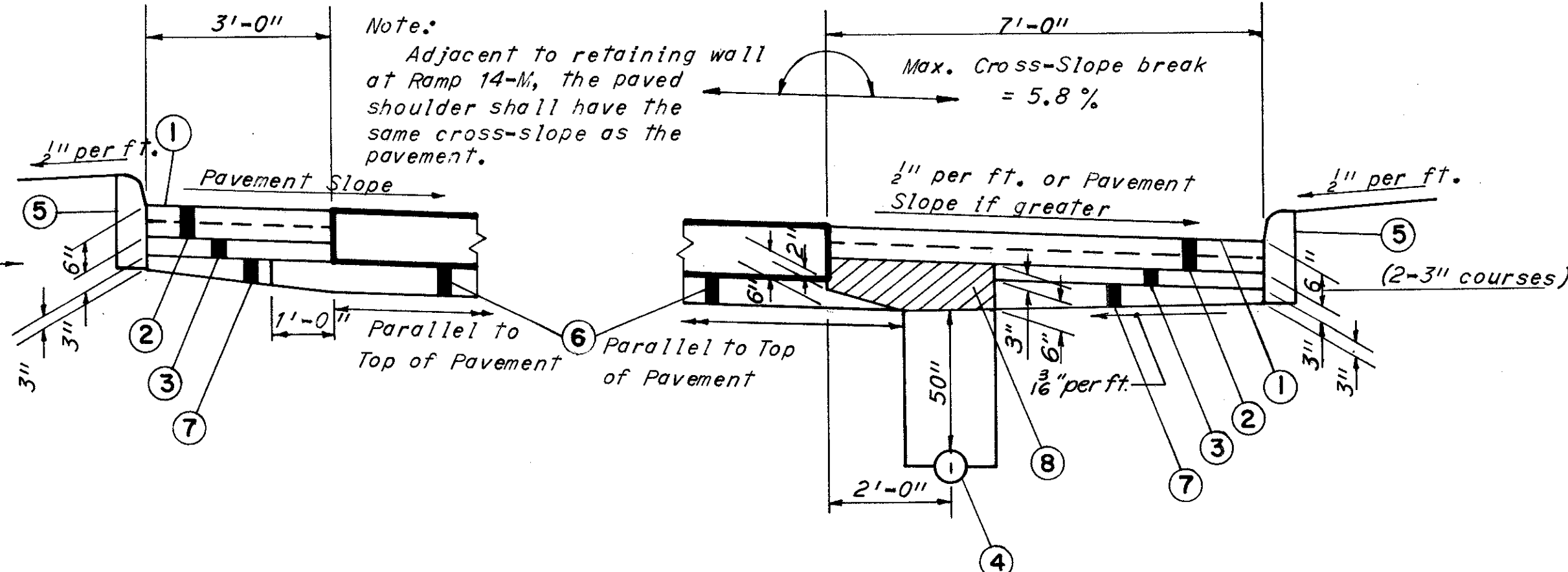
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

10  
646

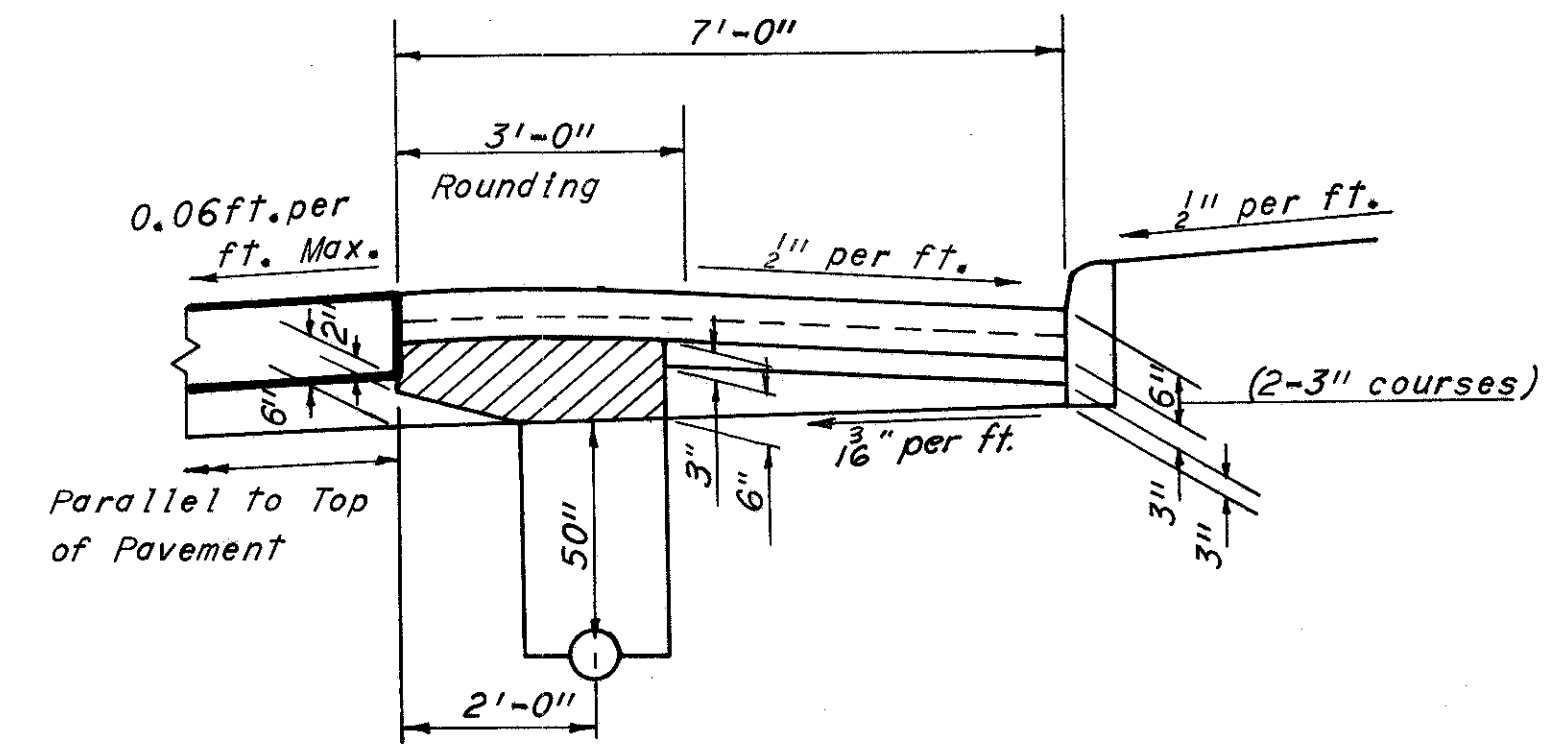
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



**NORMAL SECTION**

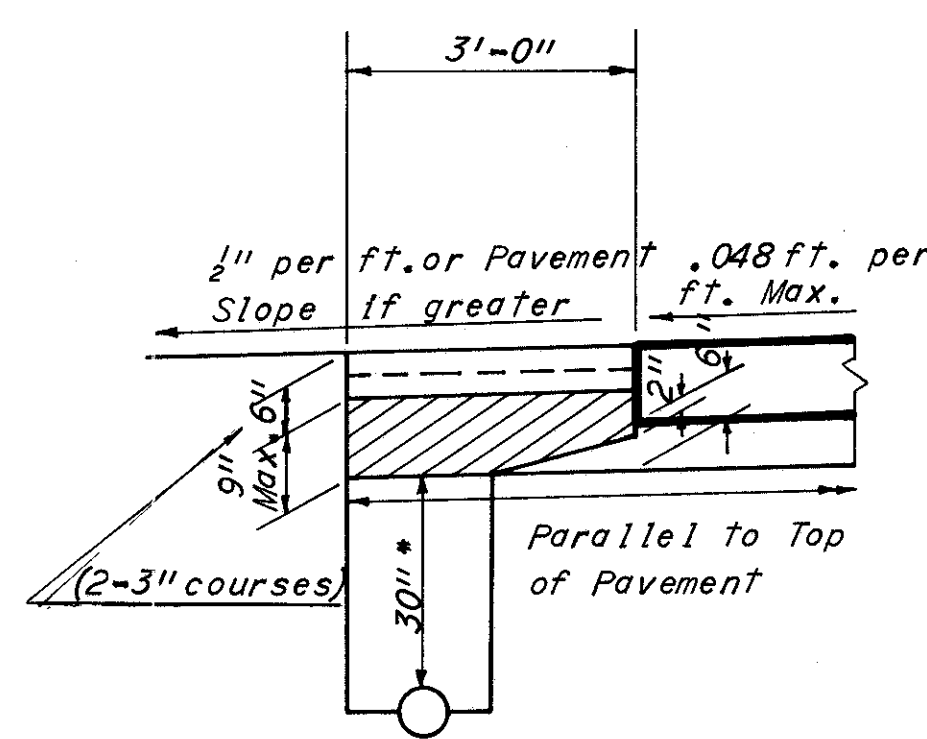


**CURBED SECTION**



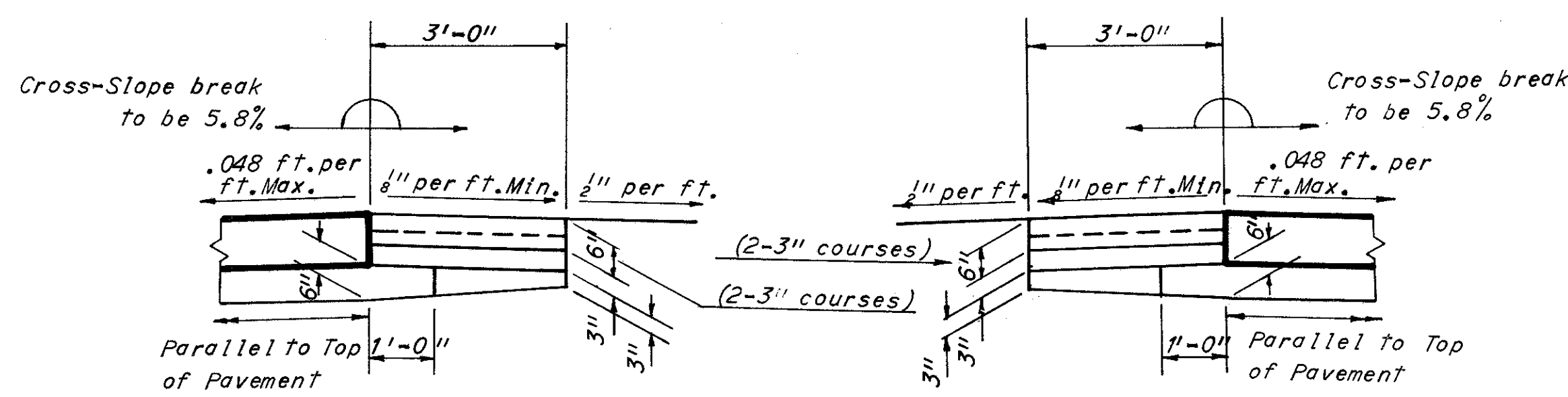
**CURBED SECTION - CURVE LEFT**

3' ROUNDING DETAIL



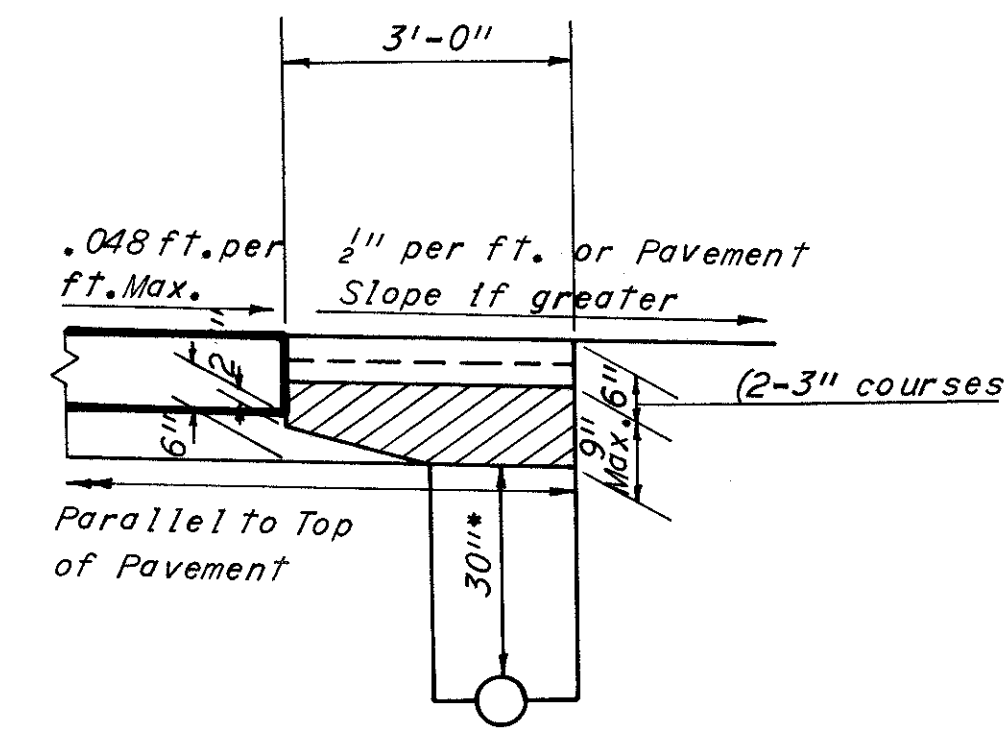
**CURVED LEFT OR TRANSITION SECTION**

SUPERELEVATION NOT MORE THAN 0.048 FT PER FT

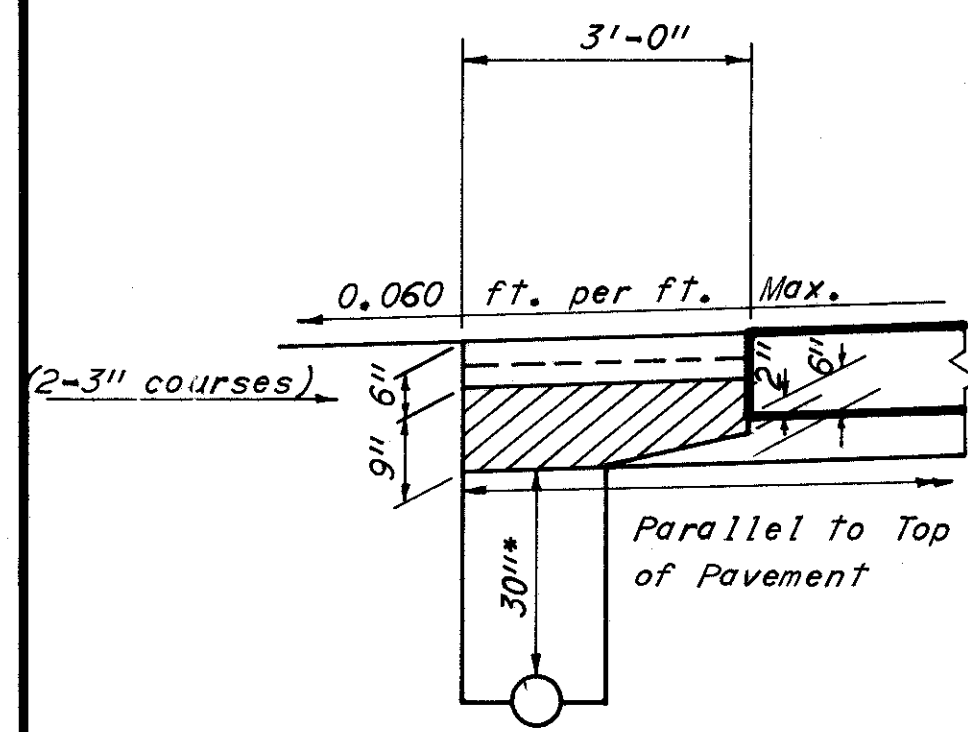


**CURVE RIGHT OR TRANSITION SECTION**

SUPERELEVATION NOT MORE THAN 0.048 FT PER FT

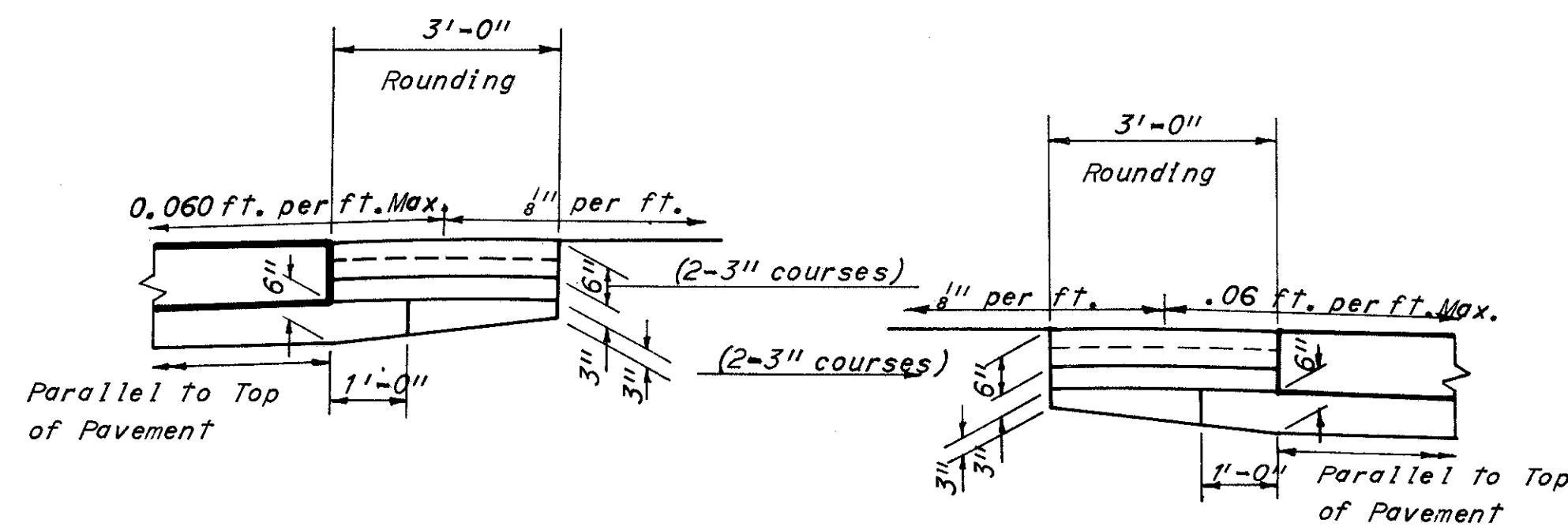


**CURBED SECTION - CURVE LEFT**



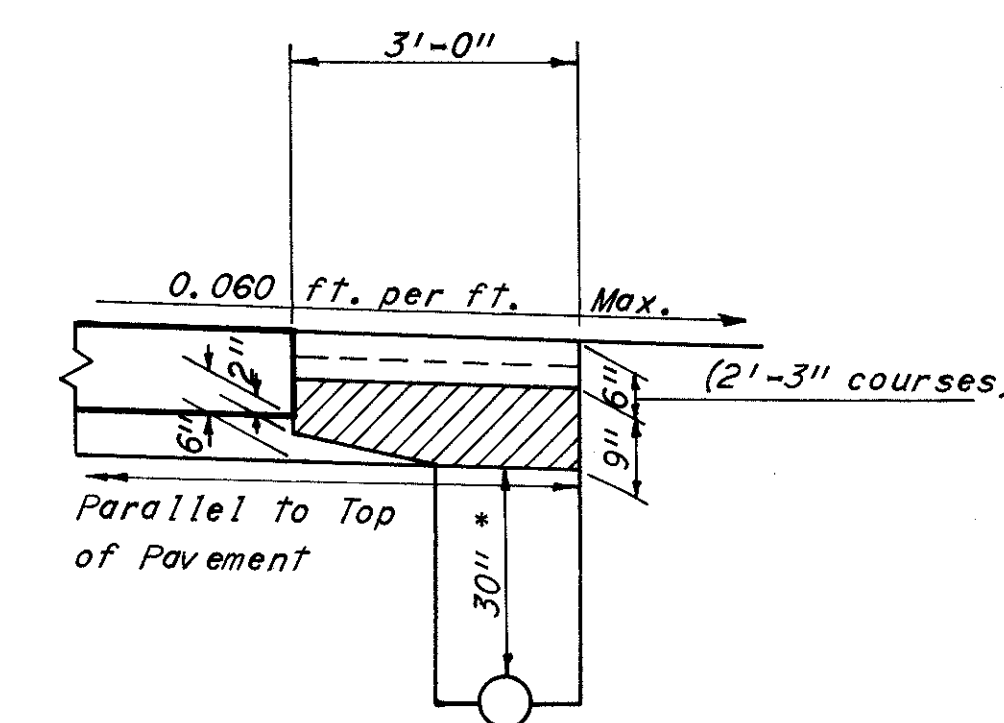
**CURVE LEFT**

SUPERELEVATION GREATER THAN 0.048 FT PER FT



**CURVE RIGHT**

SUPERELEVATION GREATER THAN 0.048 FT PER FT



**LEGEND**

- ① Item T-31 Bituminous Surface Treatment, using 0.008 Cu. Yd. No. 6 Aggregate per Sq. Yd. and 0.25 Gal. Bituminous Material per Sq. Yd. (See notes in proposal)
- ② Item B-21 Waterproofed Aggregate Base Course. Thickness shown is "designed" thickness as described in Sec. B-21.01. (Type "A" T-35 material may be used in construction of this course - see note in proposal)
- ③ Item B-19 Aggregate Base Course
- ④ Item I-1 6" Pipe, Class I-3
- ⑤ Item I-12 Standard Type 6 Concrete Curb
- ⑥ Item I-22 6" (Except as noted) Subbase, Grading "A" or "B" modified, as per General Note
- ⑦ Item I-22 Subbase, Regular Grading
- ⑧ Item special drainage connection, using No. 6 Aggregate (See note in proposal)

Note: Sequence of operations - (1) Install pipe underdrain, (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present, (3) Construct T-71, (4) Remove subbase and any contaminated backfill over drain and replace with No. 6 aggregate as shown by (8), (5) Complete shoulder construction. Unless otherwise noted, callouts shown on top sections shall apply to all sections on this sheet.

\* 30" cover from bottom of subbase to crown of pipe in fill  
50" cover from bottom of subbase to crown of pipe in cut

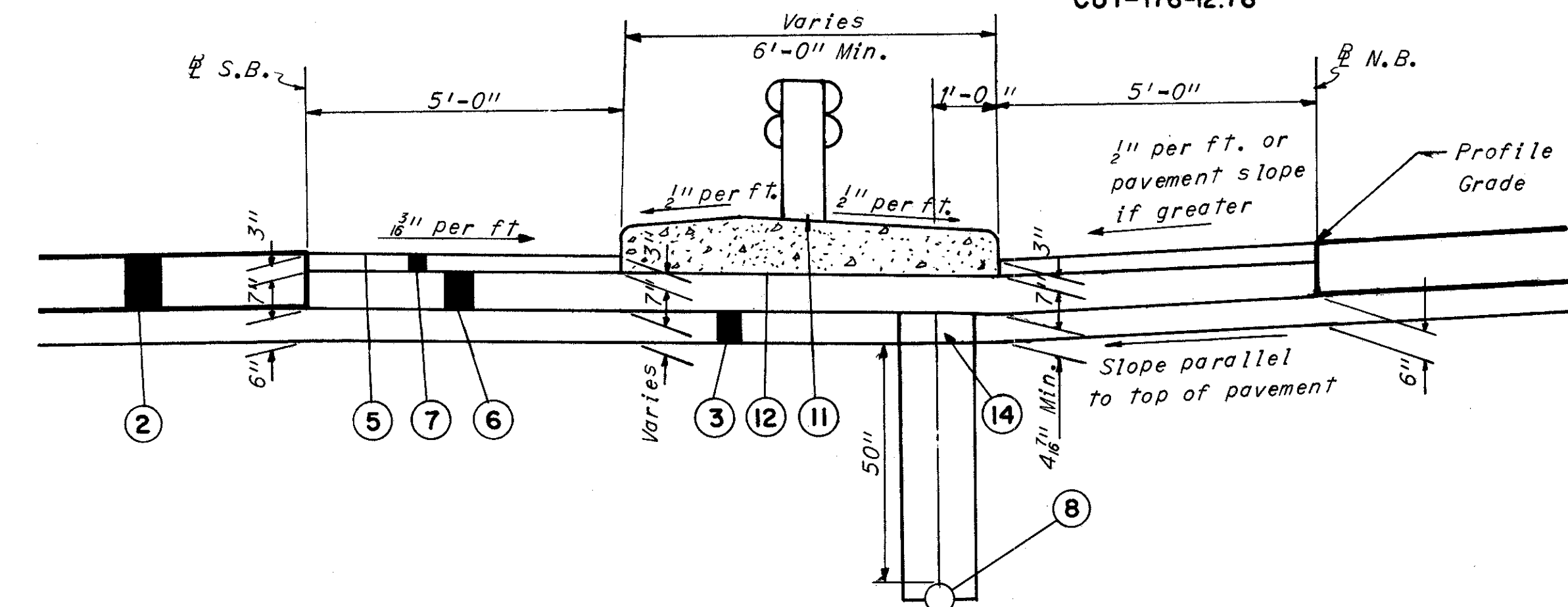
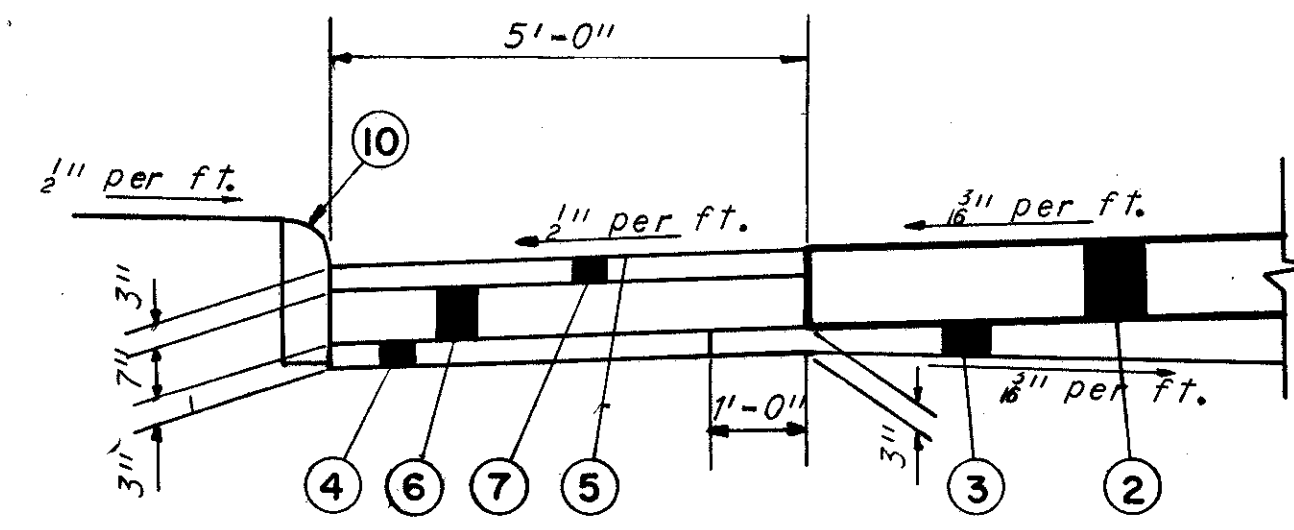
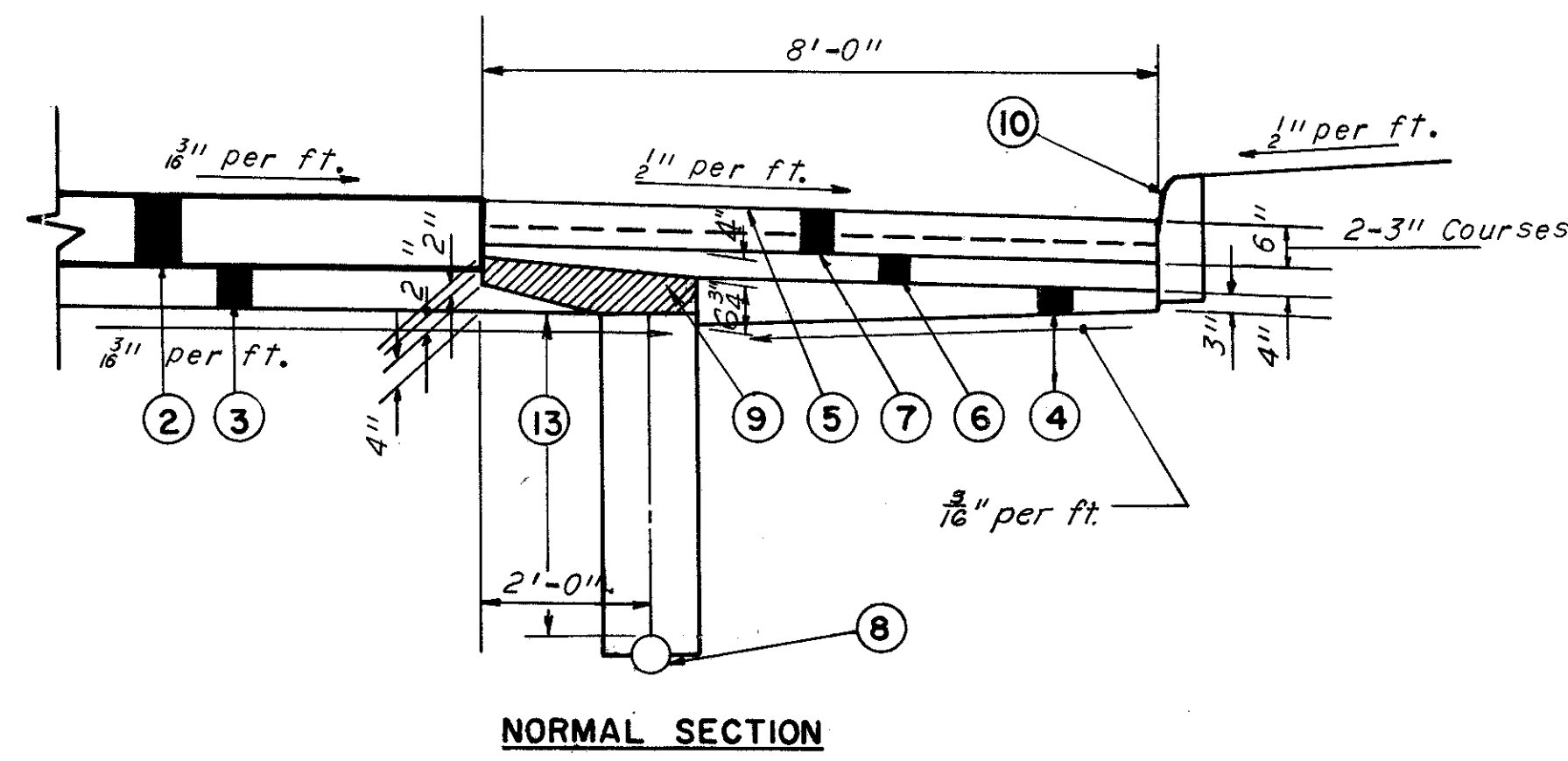
# TYPICAL SECTIONS

## TYPE T-71

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

11  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

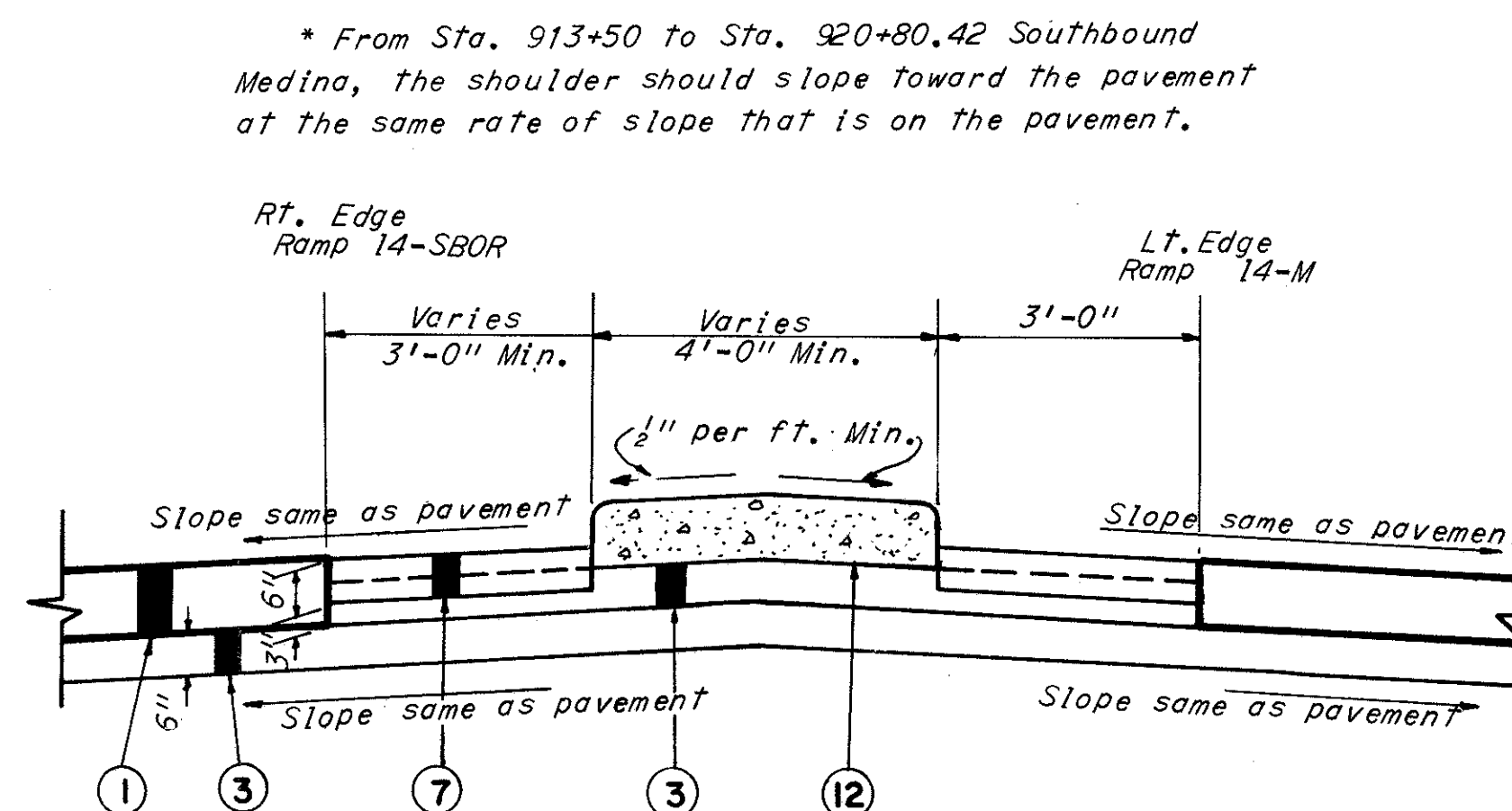
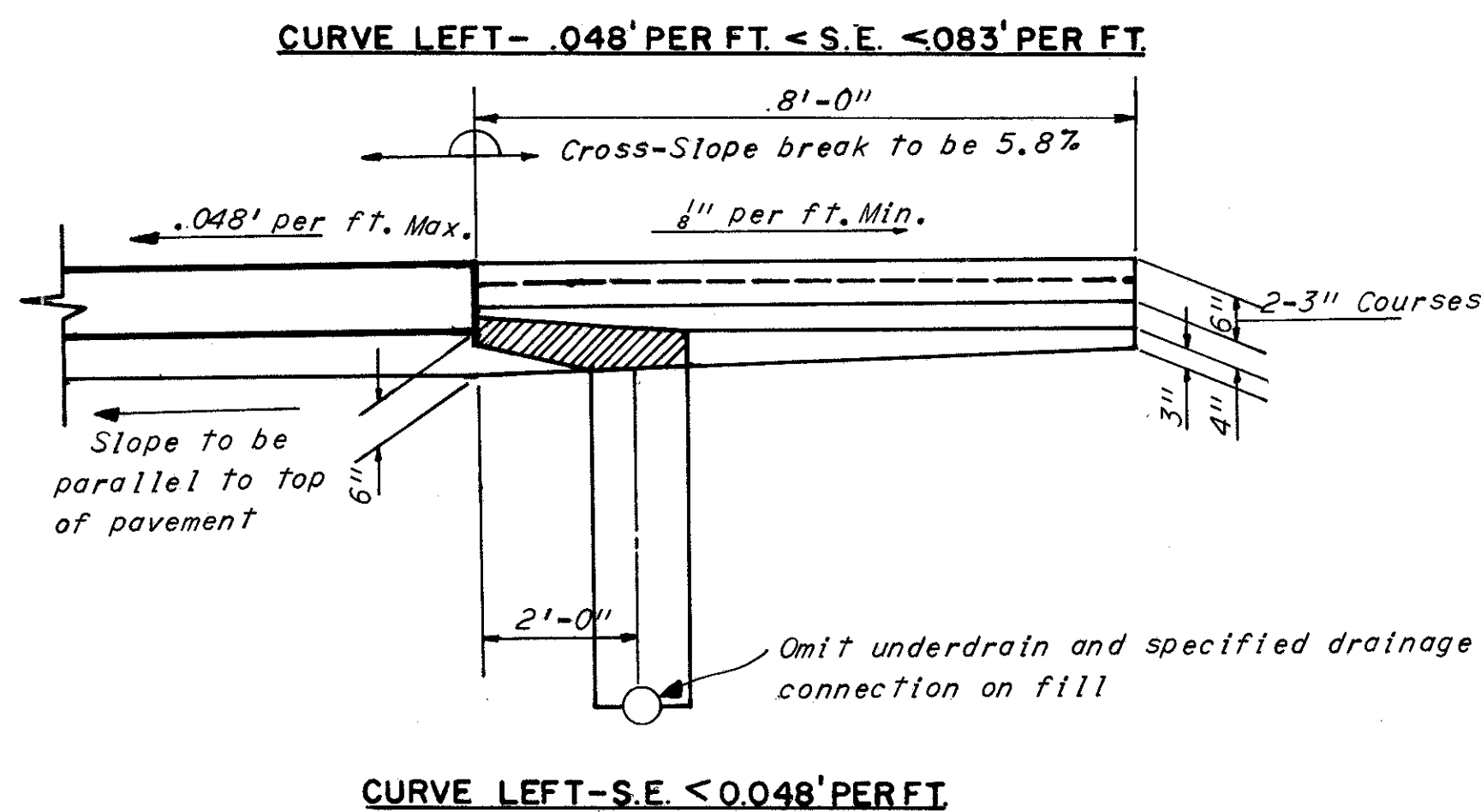
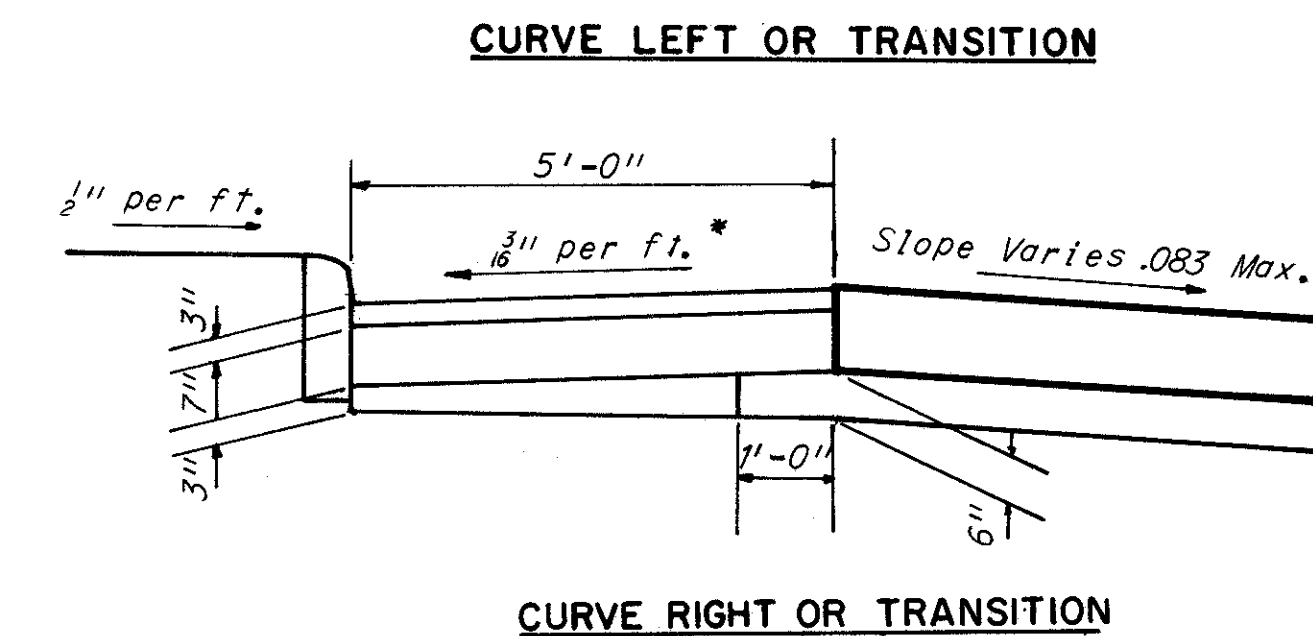
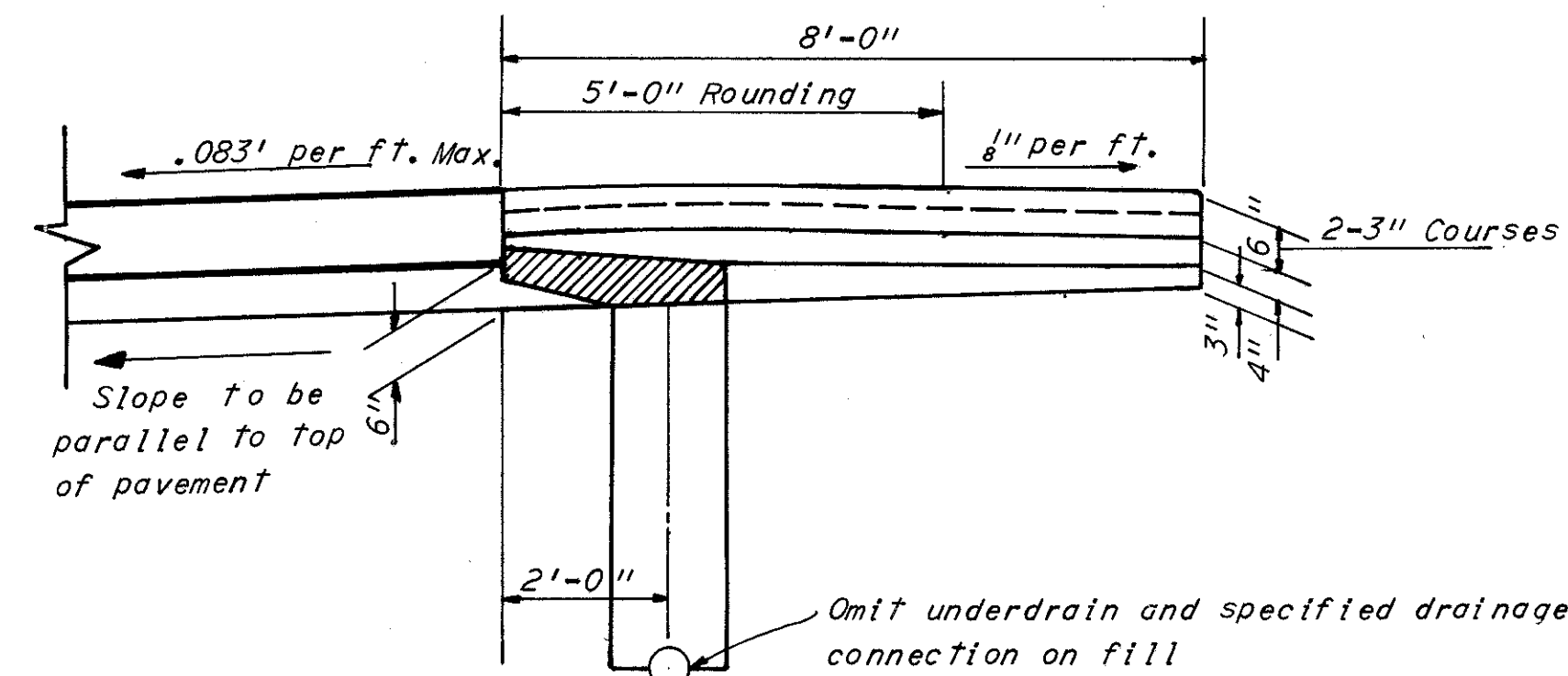
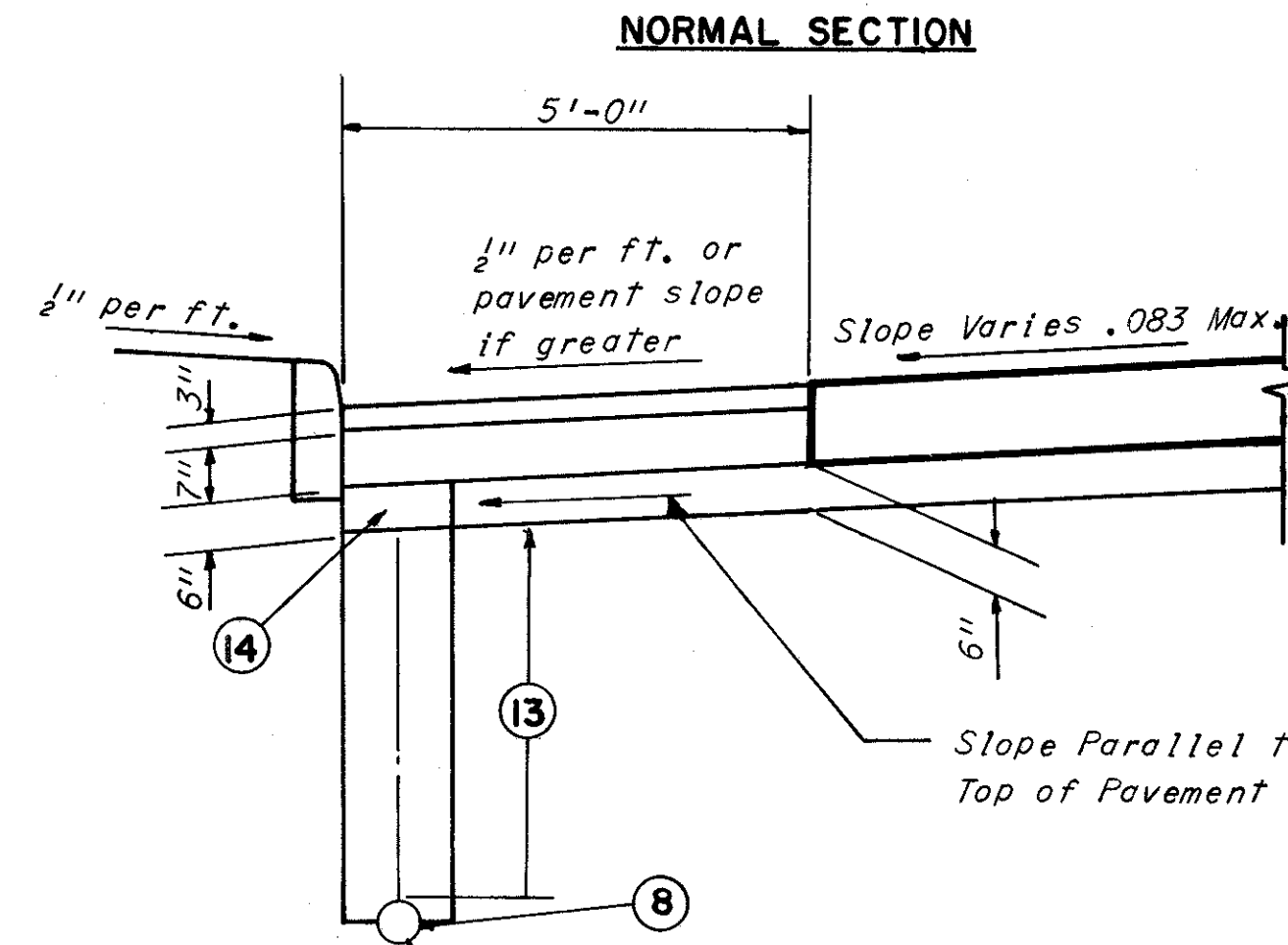
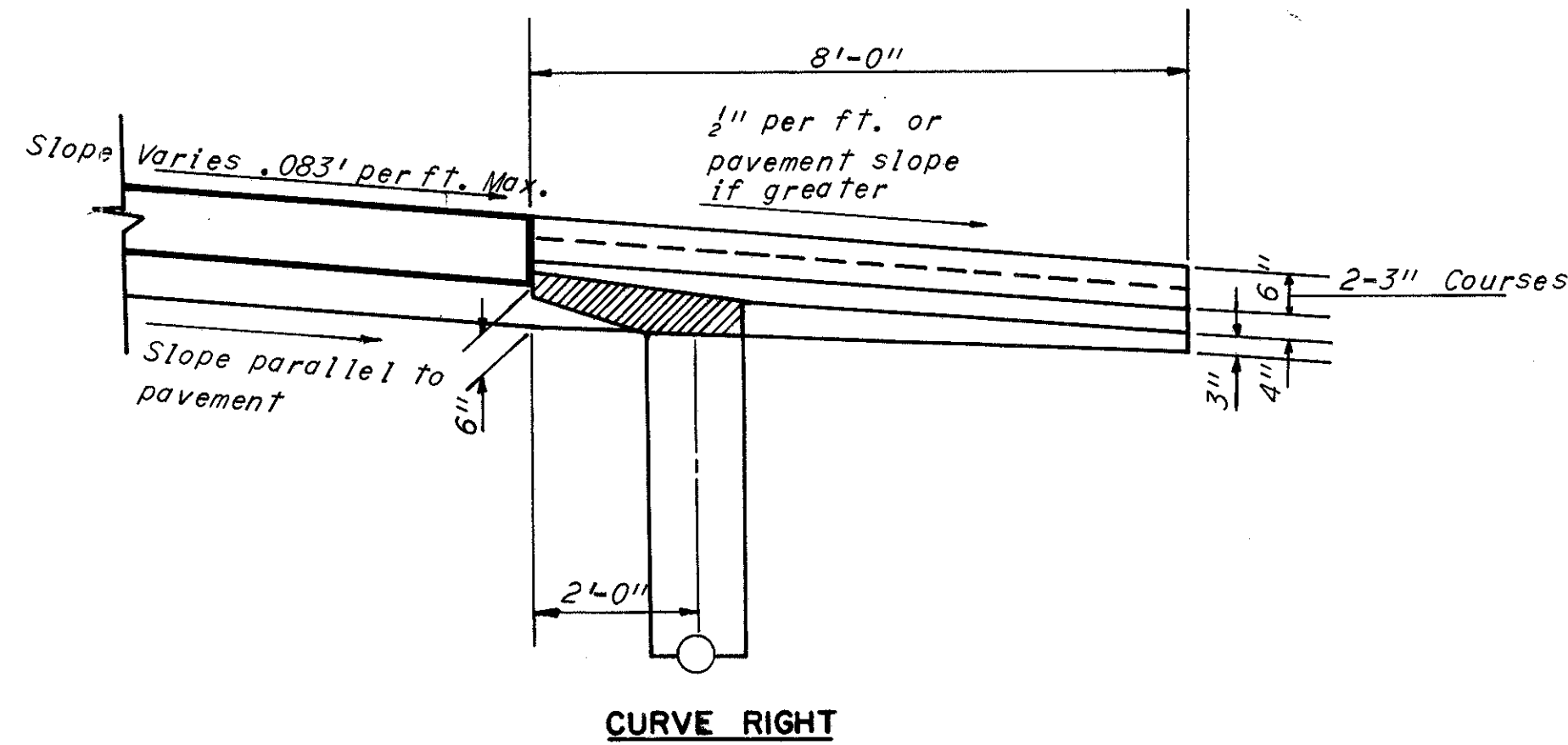


**LEGEND**

N.B. MEDINA STA. 948+00.00 TO STA. 951+13.98  
N.B. JENNINGS STA. 34+80.98 TO STA. 34+94.03  
N.B. JENNINGS STA. 36+71.62 TO STA. 40+00.00

- ① Item T-71 9" Reinforced Portland Cement Concrete Pavement
- ② Item T-71 10" Reinforced Portland Cement Concrete Pavement
- ③ Item I-22 Subbase, Grading "A" or "B", modified as per General Note
- ④ Item I-22 Subbase, Regular Grading
- ⑤ Item T-31 Bituminous Surface Treatment, using 0.008 Cu. Yd. No. 6 aggregate and 0.25 Gal. Bituminous material per Sq. Yd. (See note in proposal)
- ⑥ Item B-19 Aggregate Base Course
- ⑦ Item B-21 Waterproofed Aggregate Base Course (Type "A" T-35 or T-335 material may be used in construction of this course - see note in proposal) Thickness shown is "designed" thickness as described in Sec. B-21.01
- ⑧ Item I-1 6" Pipe, Class I-3
- ⑨ Item special drainage connection, using No. 6 aggregate (See note in proposal)
- ⑩ Item I-12 Standard Type 6 Concrete Curb
- ⑪ Item I-15 Guard Rail, Steel Beam Barrier Type (Deep)
- ⑫ Item I-21 Concrete Median Pavement, as per plan (See Miscellaneous Details)
- ⑬ 30" cover from bottom of subbase to crown in fill  
50" cover from bottom of subbase to crown in cut
- ⑭ Remove subbase for width of Item I-1 trench and replace with either Class 3 Backfill or with Porous Base material immediately prior to placing the Item B-19 Aggregate Base Course

**Note:**  
Sequence of operations - (1) Install pipe underdrain on right shoulder. Installation of shallow underdrain on left shoulder may be deferred until T-71 is placed, (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present, (3) Construct T-71, (4) Remove subbase and any contaminated backfill over drain and replace with No. 6 aggregate as shown by ⑨, (5) Complete shoulder construction.  
Unless otherwise noted, call-outs shown on the top section shall apply to all sections on this sheet.



RAMP 14-SBOR STA. 0+00.09 TO STA. 4+75.00  
RAMP 14-M STA. 3+79.99 TO STA. 8+54.00

SCALE 1/2" = 1'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE D.R.K. DATE 2-25-69 CONSULTING ENGINEERS  
TRCD. D.W.S. DATE 2-25-69  
CKD S.D.H. DATE 2-26-69 KANSAS CITY CLEVELAND NEW YORK

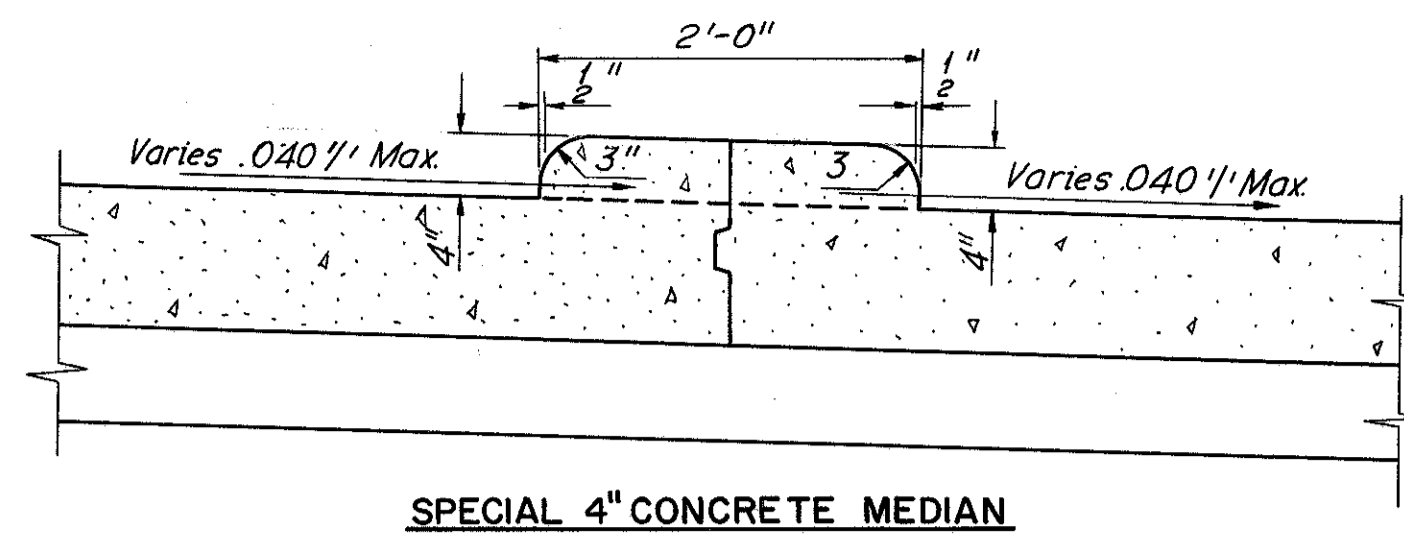
# TYPICAL SECTIONS

## TYPE T-71

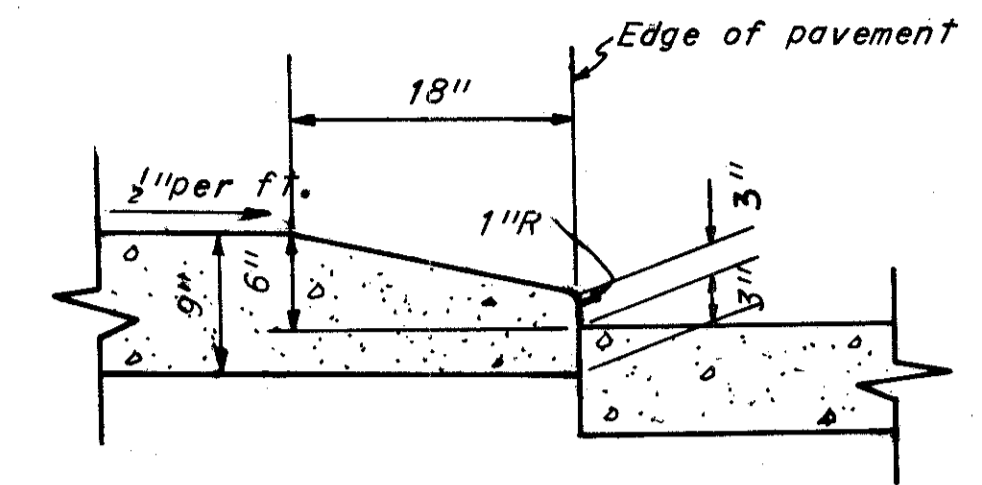
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

12  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

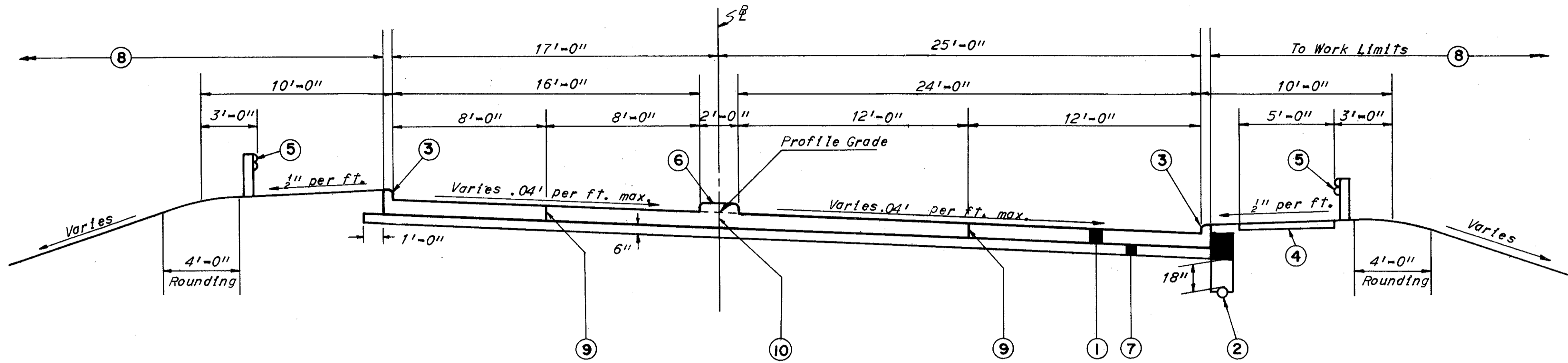


SPECIAL 4" CONCRETE MEDIAN

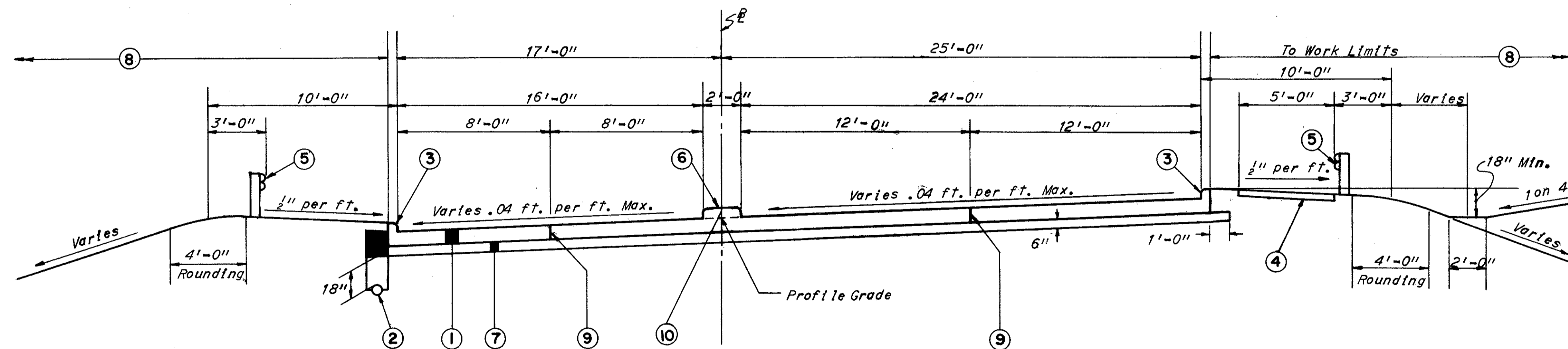


CONCRETE MEDIAN CURB DETAIL

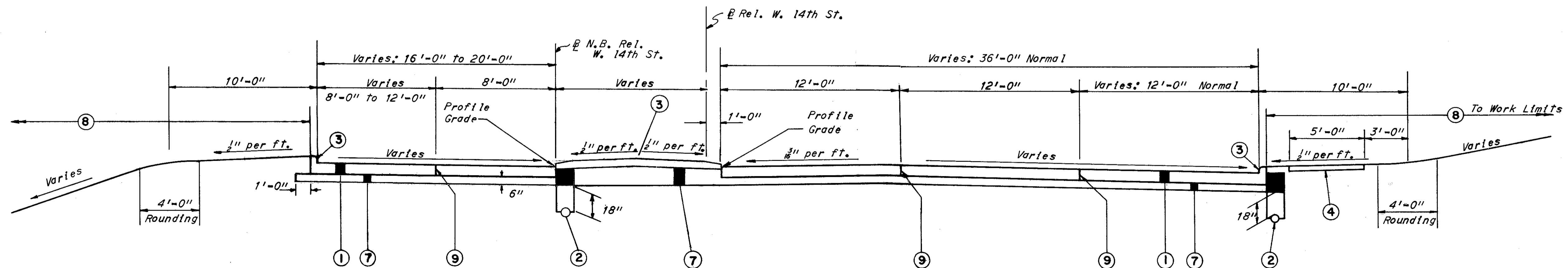
Scale: 1" = 1'



RELOCATED W. 14th ST. - CURVE RIGHT  
STA. 10+00.00 TO STA. 15.48.07



RELOCATED W. 14th ST. - CURVE LEFT  
STA. 21+52.66 TO STA. 23+63.68



RELOCATED W. 14th ST. - NORMAL SECTION  
STA. 23+63.68 TO STA. 26+50.44

### LEGEND

- ① Item T-71 9" Reinforced Portland Cement Concrete Pavement
- ② Item I-1 6" Pipe, Class I-3
- ③ Item I-21 Concrete Median, as per plan
- ④ Item I-13 4½" Portland Cement Concrete Sidewalk
- ⑤ Item I-15 Guard Rail, Steel Beam Standard Type (Deep)
- ⑥ Item I-21 Special 4" Concrete Median, as per plan
- ⑦ Item I-22 Subbase, Grading "A" or "B"
- ⑧ Item L-9 Seeding and Protecting, as per plan
- ⑨ Standard Longitudinal Joint
- ⑩ Standard Longitudinal Key Joint without Tie Bars

Note: Typical Sections are intended to show general roadway and pavement features only. For details see Pavement Plans, Profiles and Cross Section Sheets.

SCALE: 1" = 1'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
MADE FOR DATE 8-28-64  
TRCD DATE 8-28-64  
CKD DEC DATE 8-31-64 KANSAS CITY CLEVELAND NEW YORK

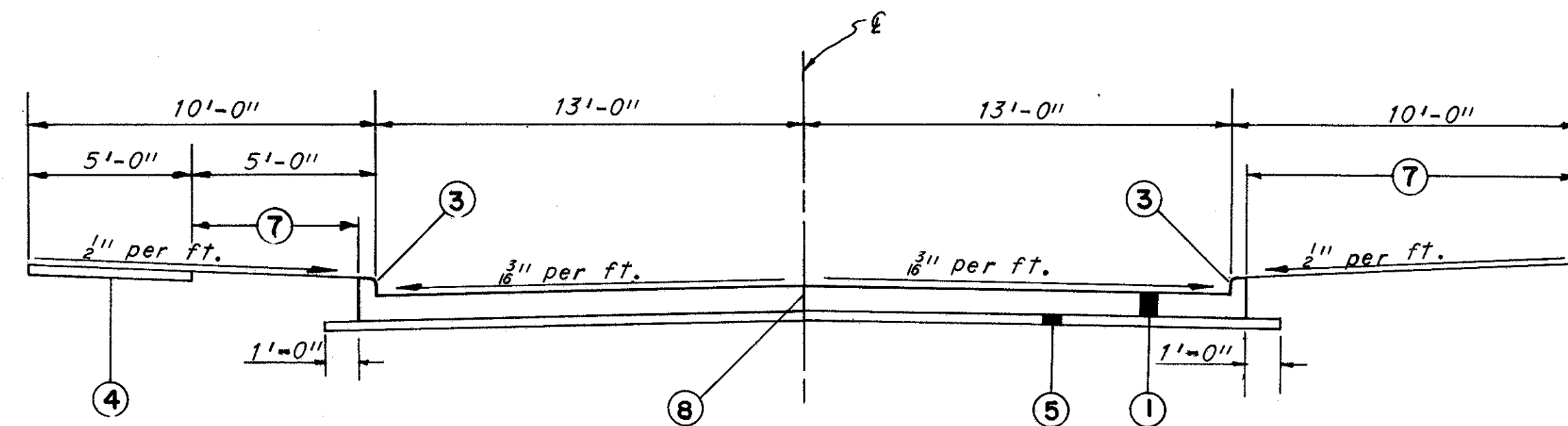
# TYPICAL SECTIONS

TYPE T-71

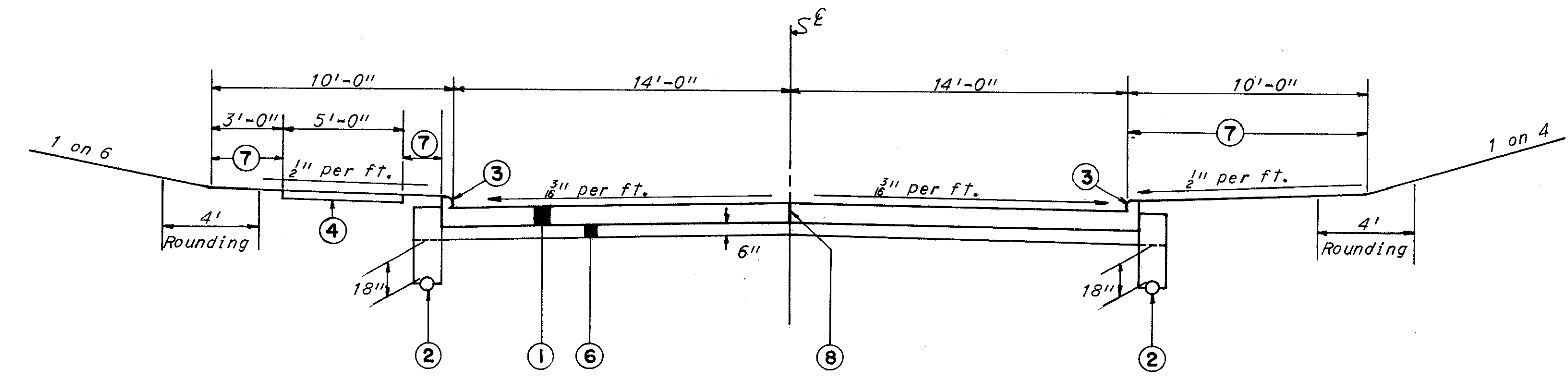
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

13  
646

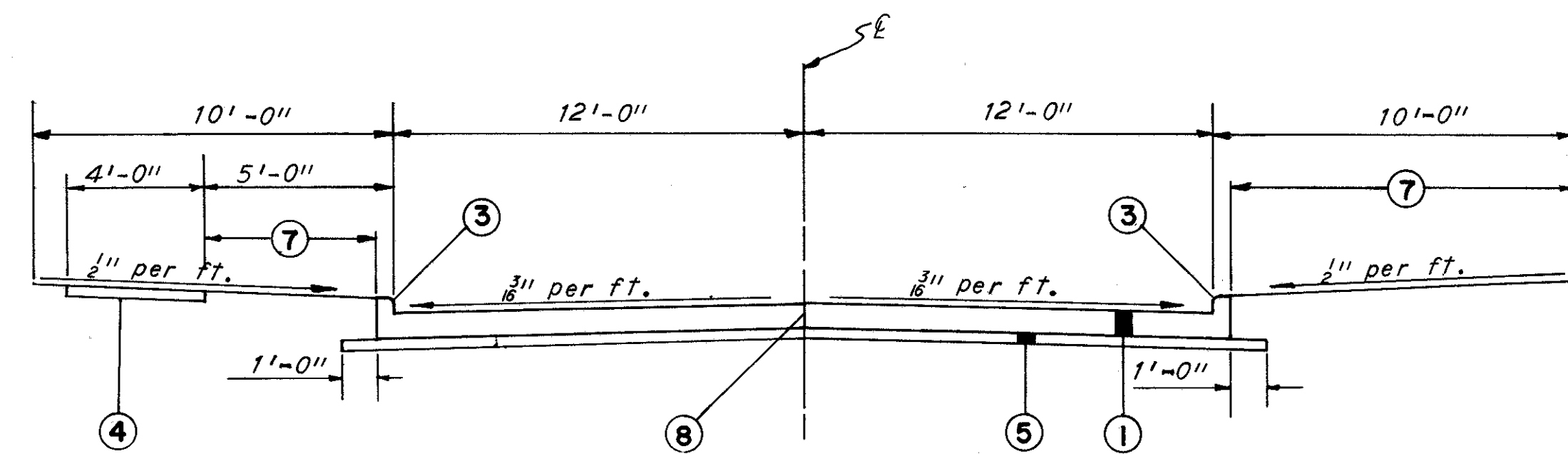
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



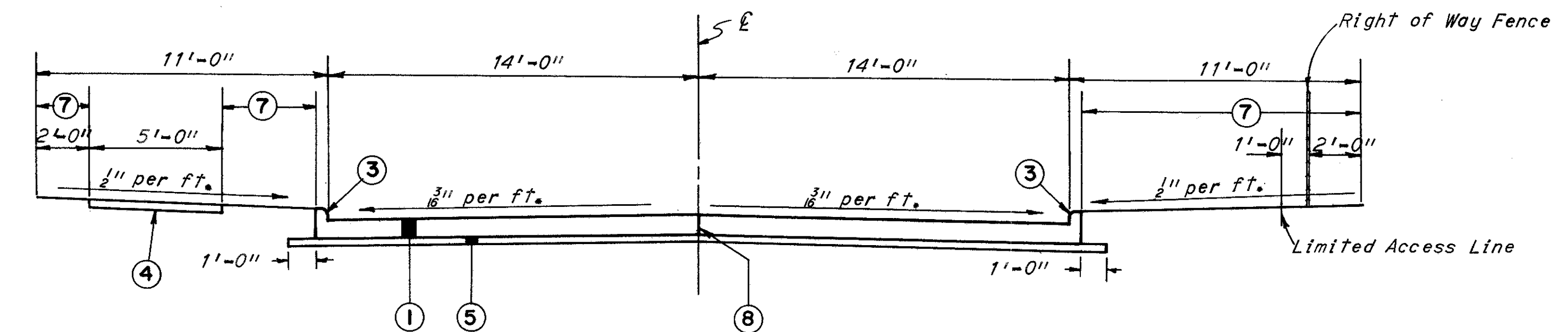
**RELOCATED WEST 14 TH ST**  
FROM HARVARD - DENISON VIADUCT TO DENISON AVE.  
STA. 10+00.00 TO STA. 12+06.65



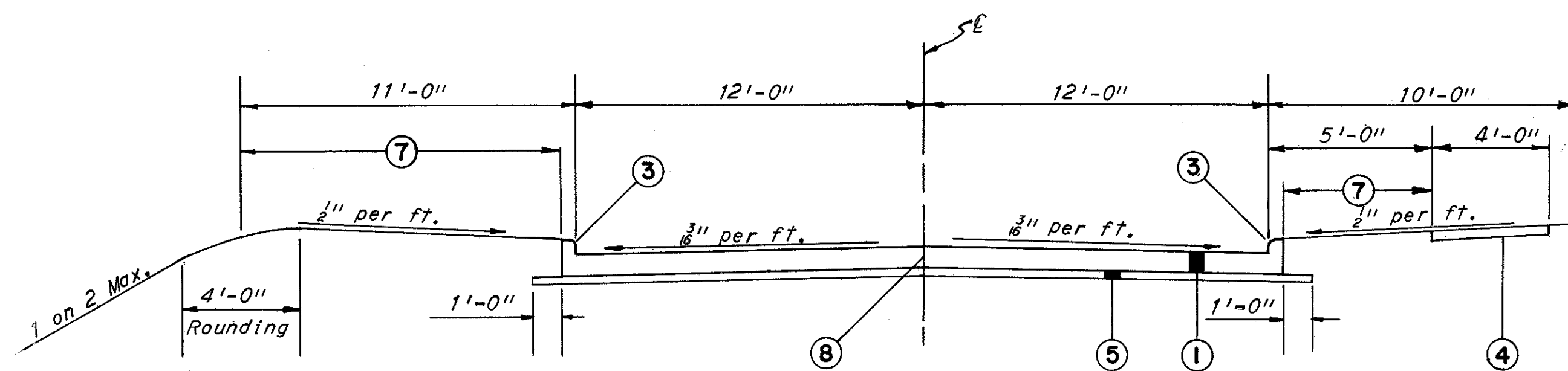
**VALENTINE AVE.**  
STA. 0+00.00 TO STA. 1+75.00



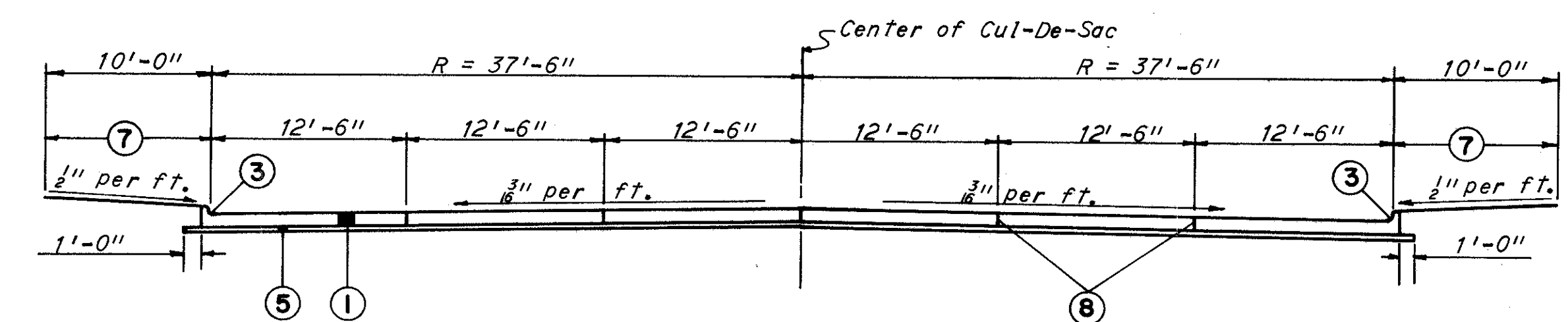
**RELOCATED WEST 15 TH ST**  
NORTH OF DENISON AVENUE  
STA. 0+00.00 TO STA. 2+78.85



**RELOCATED WEST 17TH ST. AND RELOCATED HOLMDEN AVE.**  
RELOCATED WEST 17TH ST. STA. 0+00.00 TO STA. 9+00±  
RELOCATED HOLMDEN AVE. STA. 0+00.00 TO STA. 3+81.25



**RELOCATED REDMAN AVE.**  
FROM WEST 14TH ST. TO WEST 13TH ST.  
STA. 0+00.00 TO STA. 4+35.30



**WEST 15TH ST. CUL-DE-SAC**  
NORTH OF DENISON AVE.  
Scale: 3/8" = 1'

**Note:**  
Typical Sections are intended to show general roadway and pavement features only. For details see Pavement Plans, Profiles and Cross-Section Sheets.

**LEGEND**

- ① Item T-71 9" Reinforced Portland Cement Concrete Pavement
- ② Item I-1 6" Pipe, Class I-3
- ③ Item I-12 Standard Type 2-A Concrete Curb
- ④ Item I-13 4 1/2" Portland Cement Concrete Sidewalk
- ⑤ Item I-22 4" Subbase
- ⑥ Item I-22 Subbase, Grading "A" or "B"
- ⑦ Item L-9 Seeding and Protecting, as per plan
- ⑧ Standard Longitudinal Joint

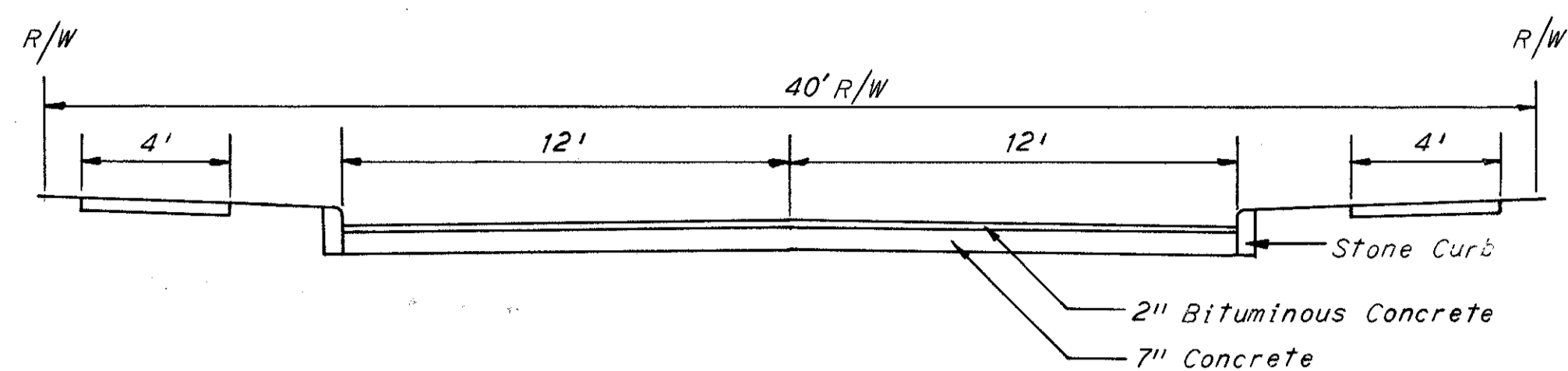
SCALE: 1/4" = 1' EXCEPT AS NOTED  
HOWARD, NEEDLES, TAMMEN & BERGENOFF  
CONSULTING ENGINEERS  
MADE H.L.D. DATE 8-3-64  
TRCD. DATE  
CKD. DRK. DATE 12-30-64  
KANSAS CITY CLEVELAND NEW YORK

# EXISTING TYPICAL SECTIONS

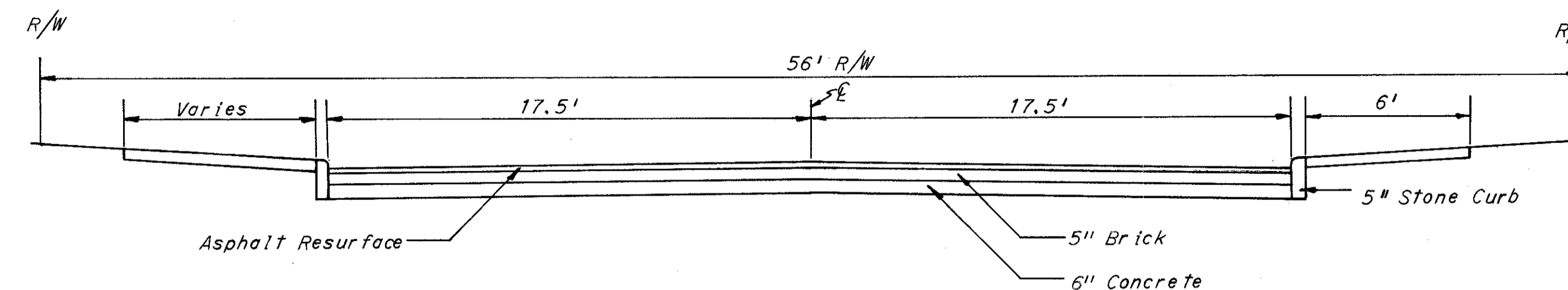
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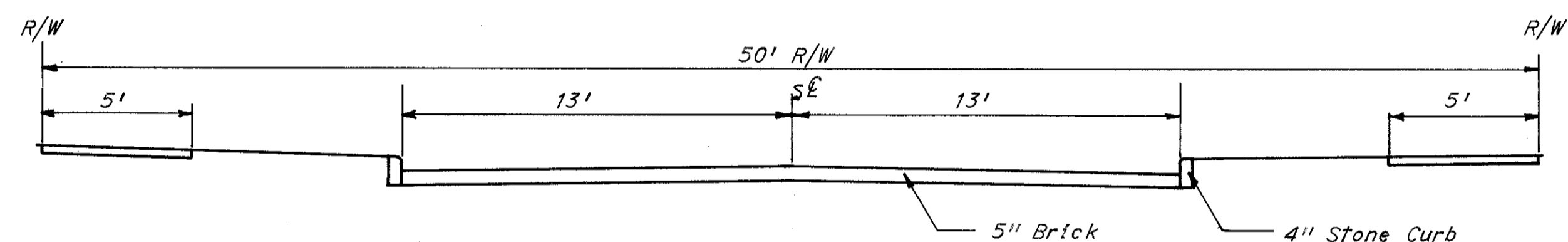
CUYAHOGA COUNTY  
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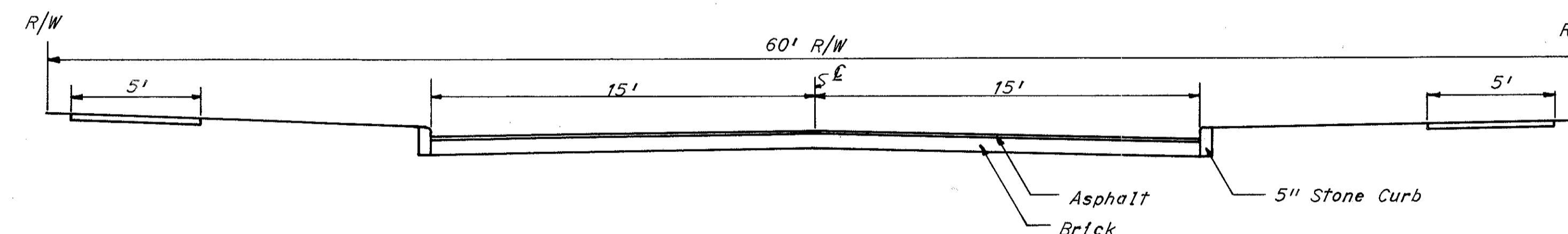
EXISTING WEST 13TH ST.  
EXISTING REDMEN AVE.



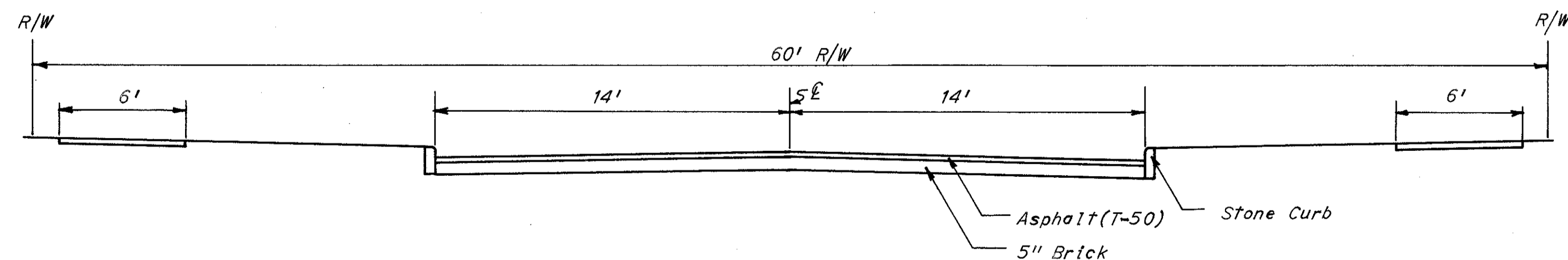
EXISTING DENISON AVE.



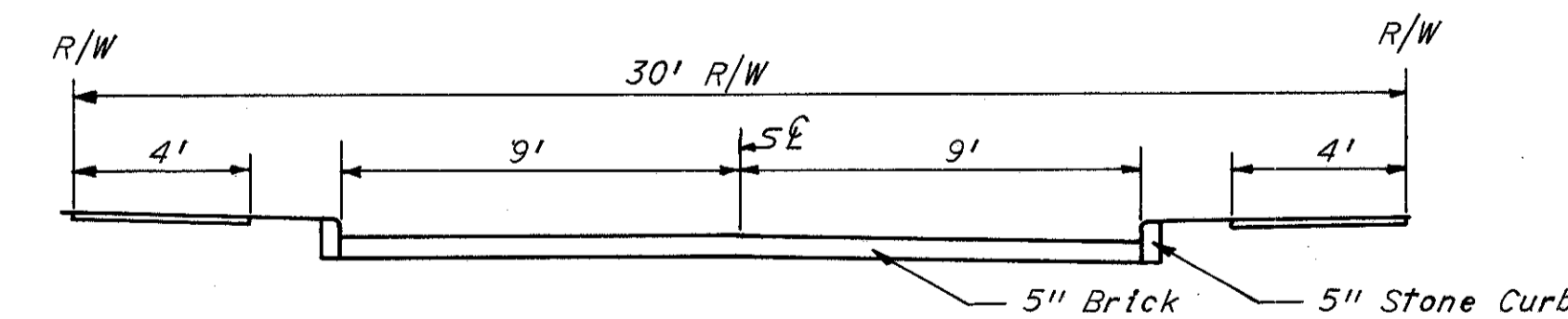
EXISTING WEST 15TH ST. (ROWLEY AVE. TO BRANCH AVE.)  
EXISTING EGLINDALE AVE.  
EXISTING TITUS AVE.



EXISTING HOLMDEN AVE.  
EXISTING BRAINARD AVE.



EXISTING WEST 17TH ST.  
(VALENTINE AVE. TO CORNING AVE.)



EXISTING ROWLEY AVE.

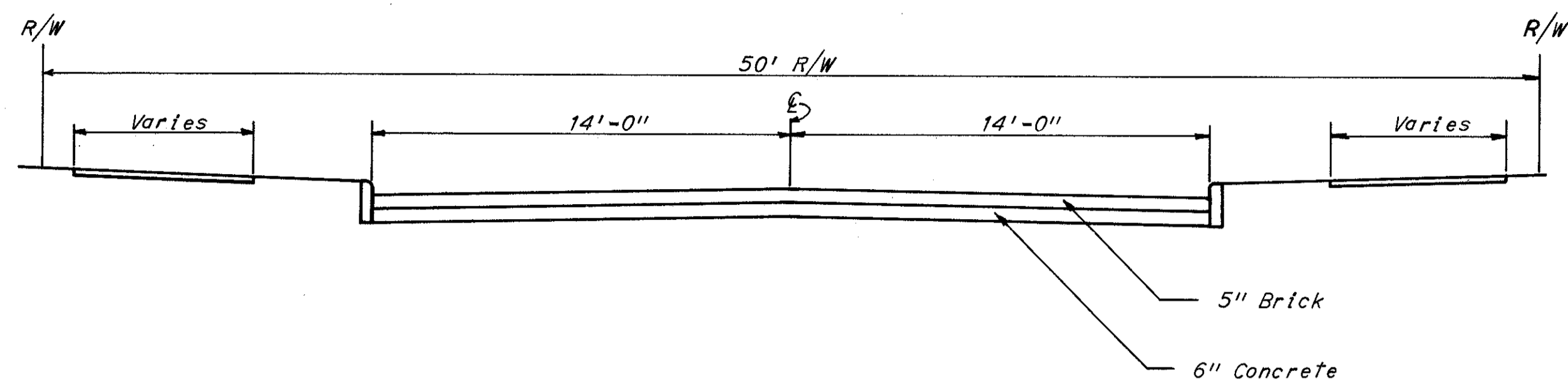
SCALE 1/4" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE REF. DATE 3/24/64 CONSULTING ENGINEERS  
TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
CKD. DRE. DATE 12-1-64

# EXISTING TYPICAL SECTIONS

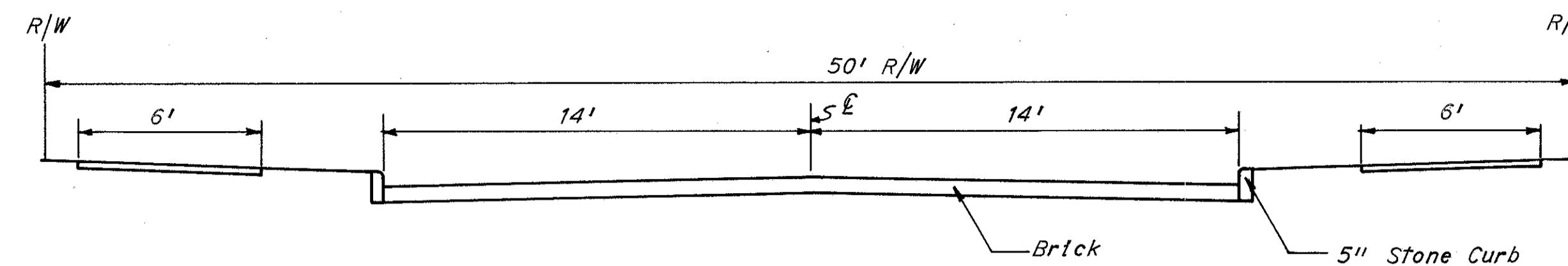
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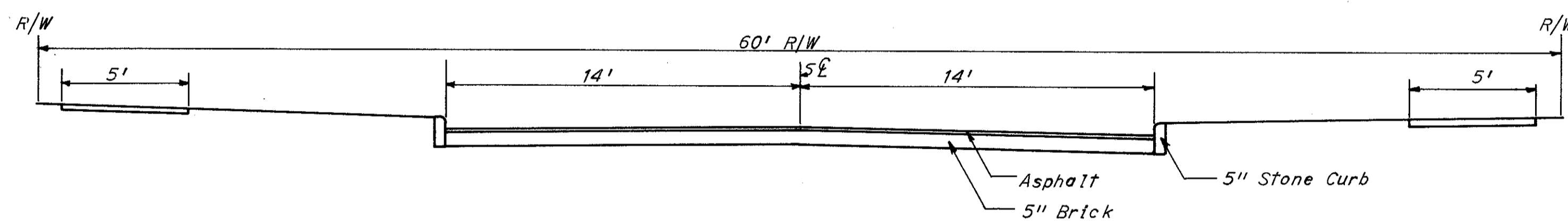
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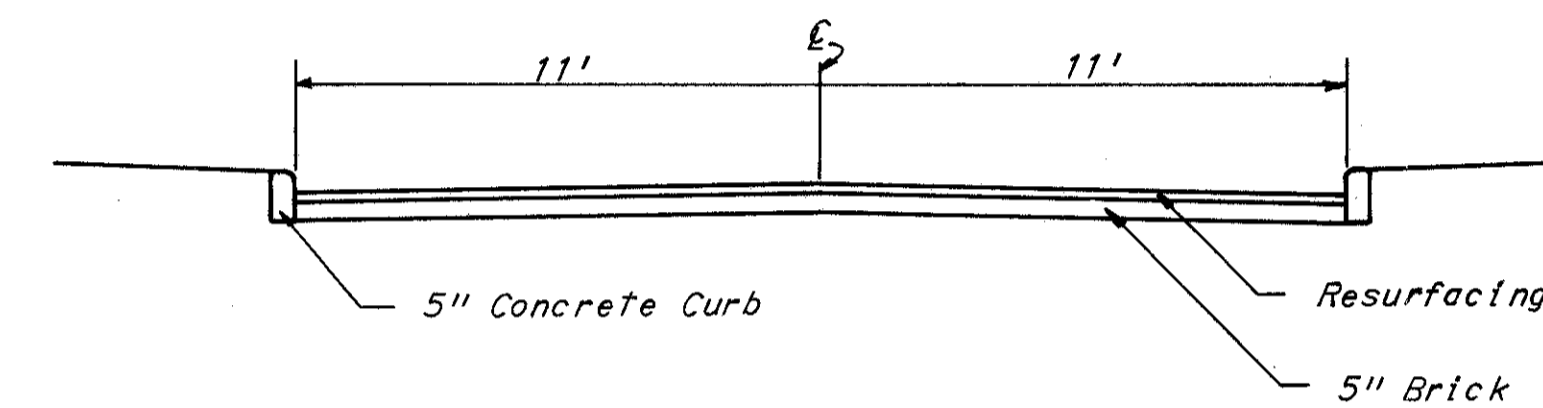
**EXISTING DENISON AVE.**  
 W. 14TH ST. TO A POINT 249' EAST



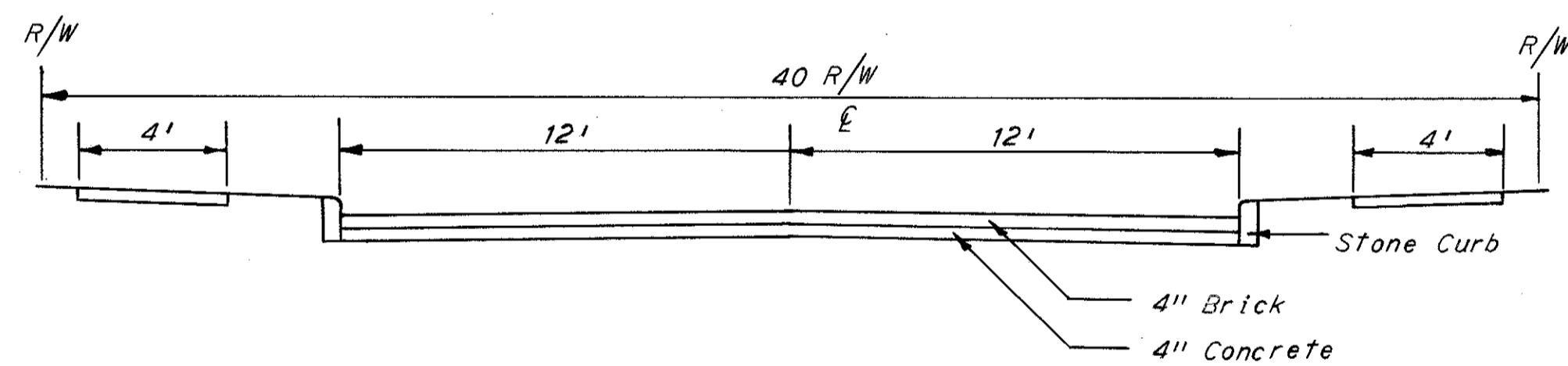
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**EXISTING AIKEN AVE.**



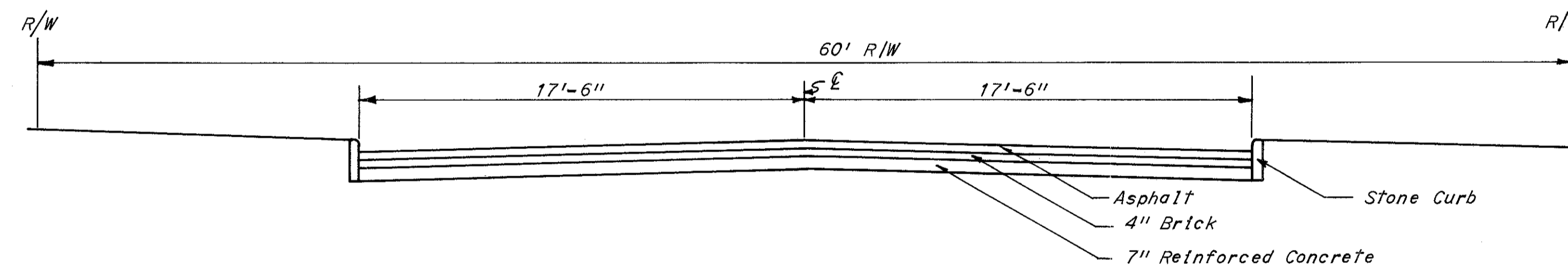
**EXISTING VIEW ROAD**



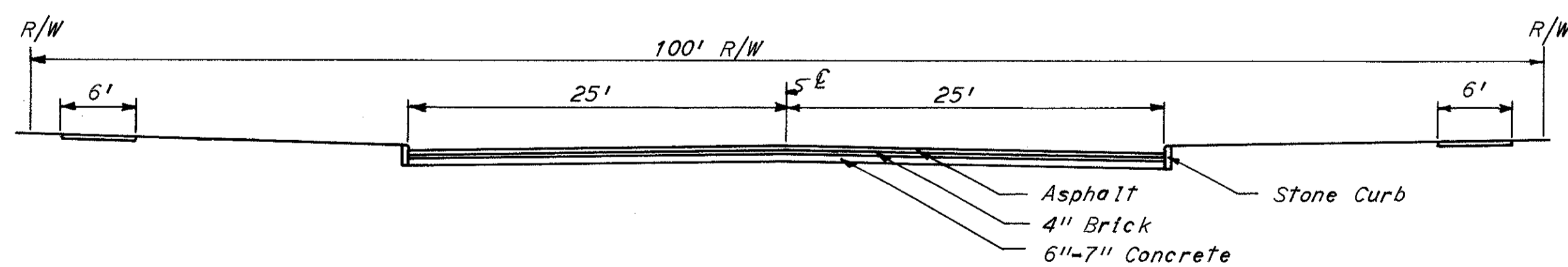
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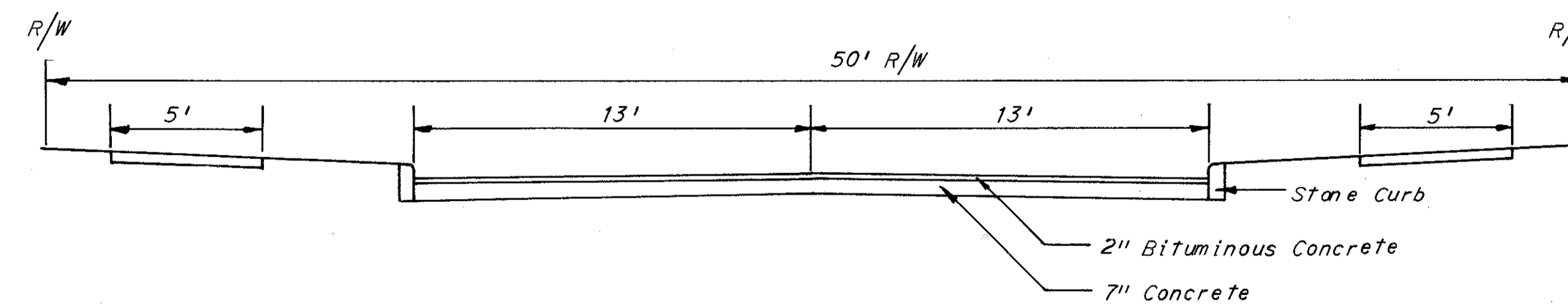
**EXISTING WEST 15TH ST.**



**EXISTING JENNINGS ROAD**



**EXISTING WEST 14TH ST.**  
 (JENNINGS RD. TO BUHRER AVE.)  
 Scale: 1/8" = 1'



**EXISTING WEST 14TH ST.**

Scale: 1/8" = 1'-0"  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 TRCD. DATE 1/21/64  
 CKD. DATE 12-1-64  
 KANSAS CITY CLEVELAND NEW YORK



# GENERAL NOTES

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## GENERAL

### SCOPE OF WORK

The principal items of work to be performed under this contract include the following:

1. Complete the construction of all items of Grading, Pavement Drainage and Lighting for the entire interchange and the Jennings Freeway.
2. Fill an existing dump area and an existing ravine in Riverside Cemetery.
3. Excavate the existing valley bluff existing west of Jennings Road and east of the proposed Jennings Freeway.
4. Construct the Jennings Road Detour Road.
5. Construct the Outfall Sewer from the Jennings Freeway to the Cuyahoga River.
6. The complete construction of the following bridges:
  - a. HNTB Br. No. 18 (CUY-71-1847) Buhler Avenue Pedestrian Overpass.
  - b. HNTB Br. No. 19 (CUY-71-1826) Relocated West 14th Street over Medina Freeway.
  - c. HNTB Br. No. 20 (CUY-71-1794 L) SBOR over Medina Freeway.
  - d. HNTB Br. No. 21A (CUY-71-1789 R) Medina Freeway over Northbound Jennings.
  - e. HNTB Br. No. 21B (CUY-71-1789 R) Northbound Jennings over J and L Co.
  - f. HNTB Br. No. 23 (CUY-176-1279) Jennings Freeway over Ramp J-JR.

### EMBANKMENT SETTLEMENT PERIOD

The construction of the embankment for Relocated West 14th Street is expected to consolidate the foundation material and cause some settlement. Because of this, the Contractor will be required to delay construction of pavements, retaining walls and bridge substructure units lying within the Relocated West 14th Street embankment area for a period (See Sh. 306) after completion of the embankment. Retaining walls and bridge substructure units specifically affected are enumerated within the structure general notes. Periodic reading of the settlement platforms and piezometer tubes shall be made by the Engineer to ascertain the feasibility of decreasing the waiting period. Any reduction of the waiting period will be at the discretion of the Director of Highways.

### DESIGN SPEED

The geometric design of the work to be performed under this contract on the roadway and structures to carry Interstate Highway traffic has been prepared for a speed of sixty (60) miles per hour.

### ELEVATION DATUM

All elevations shown on these plans are in feet above the Cleveland Regional Geodetic Survey Datum Plane.

### FIELD OFFICE

The field office required by Section S-0.01(b), shall provide a minimum of 500 square feet of floor space for the exclusive use of the Engineer until final acceptance of the work to be performed under the contract. The Contractor shall install a telephone in the field office and maintain it in service for the exclusive use of the Engineer during the same time period. The Contractor shall install wiring and outlets suitable for connection to office equipment and shall provide 110 volt alternating electric power as may be required by the Engineer until final acceptance. All costs for the telephone and electric power incurred by the Engineer and required by the work shall be included in the contract unit price bid for the various items of the work.

This field office shall be provided within 10 days after start of construction.

## GENERAL

### CENTERLINE REFERENCE MONUMENTS

Monuments shall be constructed of Class "C" concrete, cast-in-place in a circular hole eight (8) inches in diameter and forty-four (44) inches in depth. Top of concrete shall be finished at a depth of two (2) inches below ground level and the upper six (6) inch portion of the concrete shall be formed. One-half (1/2) inch steel rods six (6) inches long shall be embedded in the wet concrete as directed by the Engineer to mark the centerline and station.

### PRIVATE DRIVES

It may become necessary during the progress of construction under this contract for the Engineer to alter the location of private entrances to property adjacent to existing city streets. Should this occur, the Contractor shall accomplish the necessary changes as directed by the Engineer and will be compensated for additional costs incurred in accordance with Section G-4.03, Increased or Decreased Quantities.

### UTILITIES

Following is a list of the utilities within the limits of construction:

East Ohio Gas Company, 1717 E. 9th St., Cleveland, Ohio  
Cleveland Electric Illuminating Company, 55 Public Sq., Cleveland, Ohio  
Ohio Bell Telephone Company, 750 Huron Rd., Cleveland, Ohio  
City of Cleveland Water Department, City Hall, Cleveland, Ohio  
Municipal Light and Power Co., City Hall, Cleveland, Ohio  
City of Cleveland Police and Fire Communications System, City Hall, Cleveland, Ohio  
Laurel Pipe Line Co., P.O. Box 426, Camp Hill, Pennsylvania  
Sinclair Pipe Line Co., 341 Mt. Vernon Avenue, Marion, Ohio

### UNDERGROUND UTILITIES

The locations of the underground utilities shown on the plans have been obtained by diligent field checks and searches of available records. It is believed that they are essentially correct, but the State of Ohio makes no guarantee as to their accuracy or completeness.

### UTILITY ADJUSTMENT

Any or all work required for public or private utilities will be done by and at the expense of their respective owners, unless otherwise noted on these plans.

### FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS

The Contractor shall furnish, erect, maintain and subsequently remove Federal Aid Construction Identification signs at each of the following locations:

1. Denison Avenue, Left of Sta. 2+00
2. Denison Avenue, Left of Sta. 7+00
3. Jennings Road, Left of Sta. 2+65
4. West 14th Street, Right of Sta. 9+00

Sign details shall be as specified on Standard Drawing FACI-1, ("Code N-55 (1)-132(3)") and shall be erected in accordance with Standard Drawing FACI-2. Additional requirements shall be in accordance with notes in the proposal.

### ITEM E-1 ROADWAY EXCAVATION

If this contract is awarded on the basis of Items E-1, Roadway Excavation Method B, Modified as per plan, which are alternates to Items E-1 Roadway Excavation Method B, as per plan, the Contractor shall build the embankment on Part 2 (CUY-80-9.08) in accordance with Item E-1, Method B, to the lines shown on the plans. The work on Part 2 shall be completed by August 15, 1967.

In the event that it is determined to be in the public interest to award this contract on the basis of Items E-1 Roadway Excavation Method B, as per plan in lieu of the alternate items, the entire Part 2 will be non-performed.

## GENERAL

### ESTIMATED QUANTITIES

Specific locations and usage of estimated quantities set up in this plan to be used "as directed by the Engineer" shall be made a matter of record by incorporation into the final change order governing completion of the project.

### ADJACENT CONTRACT

The contract for construction of the adjacent projects may be let prior to or while construction under this contract is in progress. The Contractor for this project shall coordinate his operations with that of the Contractor for the adjacent project so as to complete both projects without undue delay or interference to the other Contractor.

### MAINTENANCE OF TRAFFIC

Where any of the work called for under this contract involves the closing of existing streets and/or the re-routing of traffic, the Contractor for this project shall prosecute to the fullest extent the work involved so as to reduce to a minimum the length of time that the roadway will be closed to traffic. No street or alley will be closed until necessary for construction as determined by the Project Engineer. The Contractor shall also be required to give the City of Cleveland Traffic Department a notice in writing ten (10) days in advance of any such closing of any existing street.

Jennings Road through traffic shall be re-routed around the construction area by building a detour road from existing Jennings Road through the Jones and Laughlin Company's steel mill to existing Quigley Road; thence along existing Quigley Road to Clark Avenue (including the Clark Avenue Ramp) and along West 3rd Street to Jefferson Avenue. During construction of the detour road, two-way traffic along existing Jennings Road, Quigley Road and West 3rd Street shall be maintained at all times. The connection of Ramp J-JR to existing Jennings Road shall not be made until some adequate provision for handling the detour road traffic can be made, either by re-routing through the construction area on completed ramps and lanes or some other method approved by the Engineer.

In order to maintain access to the residential areas between Denison and Redman Avenues, it will be necessary to do the work in that area in the following sequence:

1. Construct Relocated West 14th and West 15th Streets.
2. Construct the improvement at the corner of West 14th Street and Denison.
3. Construct Relocated Redman Avenue.

In addition to the above, Section G-4.05, "Maintenance of Local Traffic", will be in force during the entire life of the contract.

Attention is directed particularly to the need for providing adequate facilities to accommodate school children and other pedestrian traffic in the vicinity of the project. The Contractor shall provide and maintain such temporary boardwalks, cinder walks, handrails adjacent to excavation, etc., as may be necessary to accommodate in a reasonable and safe manner pedestrian traffic in the vicinity of the project.

It will be necessary to complete the Pedestrian Overpass at Buhler School prior to September 1, 1965.

The Medina Freeway facilities shall be opened to 2 way through traffic by October 31, 1966.

All of the above are included in the lump sum price bid for "Maintaining Traffic", except that the cost of the temporary detour road for Jennings Road shall be paid for as Item S-15, Temporary Run-Around Road, as per plan. See notes on Sheet 591.

### PROTECTION OF TRAFFIC

It is anticipated that portions of certain structures will be constructed while traffic is being maintained under them. The contractor shall safeguard the traveling public on the traveled lanes by providing approved nets, platforms, or other suitable protection. A minimum vertical clearance of 12'-6" shall be maintained at all times.

Payment for this protection shall be included in the lump sum price bid for Item I-3 Maintaining Traffic.

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## ROADWAY

## ROADWAY

## ROADWAY

### ITEM S.S. CE-101.04 COMPACTION USING HEAVY PNEUMATIC TIRED ROLLER

An estimated quantity for this item has been included in the General Summary for use, as directed by the Engineer, in proof rolling of all subgrade of Main Line, Ramps and Paved Shoulders except for areas where rock or shale is encountered. In lieu of the requirements of CE-101.04, a minimum of one coverage will be required to check the subgrade. Moisture content of the top 12" of subgrade shall not exceed optimum at the time of proof rolling. Tire pressures and total load shall be varied as directed by the Engineer within the limits provided in Supplemental Specification No. CE-101.04. Proof rolling will not be performed in areas where the subbase has been thickened to replace frost susceptible silts.

### FENCING

Chain Link Fence shall be placed to within limits as shown on the plans, to the line and grade directed by the Engineer. This location shall generally be one foot inside the right-of-way line unless shown otherwise on the plans.

### REMOVAL OF TREES AND STUMPS

Unless otherwise shown on the plans or directed by the Engineer, all trees and stumps lying within the construction limits of this project shall be removed under the lump sum price bid for Item E-9, Removal of Trees and Stumps.

The following is an approximate estimate of the number of trees to be removed.

Sizes	CUY-71-17.83	CUY-176-12.76
12"-18"	228	217
18"-24"	96	86
24"-30"	49	41
30"-36"	12	13
36"-42"	4	6
42"-48"	3	3
48"-54"	1	1

75% Hillside

The above estimate is approximate and the State of Ohio reserves the right at any time during the duration of the contract to order the removal of additional trees or stumps outside the limits of construction but within the right of way and or easement lines. Payment for the removal of these additional trees or stumps shall be included in the lump sum price bid for Item E-9.

### EXISTING GAS WELLS TO BE ABANDONED

The following list of gas wells are located within the path of the Jennings and Medina Freeway routes, or in close proximity thereto:

- 1400 Denison Avenue. In service gas well. Total depth 900', in pit, 5 3/4" casing. Located 102' north of Denison Avenue E and 39 west of West 14th Street E.
- 1422 Denison Avenue. History of gas wells on the premises or in the area. Unable to locate same.

The active gas wells shall be plugged by the Contractor before any other construction is started in the vicinity of the well. The well shall be filled solid from bottom to top and all work shall be done in accordance with the requirements of the State of Ohio Division of Mines. All work connected with plugging of the well must be performed under the supervision of a representative of the Division of Mines. The Contractor shall notify the Project Engineer and the Division of Mines at least 14 days in advance of the date on which he intends to begin work.

Payment for the above work shall be made at the contract unit price bid for each for "Item Special, Plugging Gas Well", which price and payment shall constitute full compensation for furnishing all material, labor, tools and equipment, and all incidentals necessary to complete this item.

Abandoned wells not in service shall be capped and vented as shown in the Miscellaneous Details. The following quantities have been included in the general summary to provide for the capping.

Item I-2 Masonry	5 Cu. Yds.
Item I-1 2" Pipe, Sec. M-6.9 Std. Wt. Galvanized with Type 4 Backfill, as per plan	50 Lin. Ft.

### EXISTING WELLS

Dug wells, cisterns, and septic tanks encountered within the right-of-way shall be filled with broken foundation masonry, rock or granular material placed as rock embankment, in accordance with Section E-1.08. Payment for such work shall be included in the price bid for Item E-1, Roadway Excavation.

Drilled well casing shall be removed to an elevation approximately three (3) feet below the finished roadway surface and covered with a precast concrete slab or a large rock. Prior to construction of the embankment the Contractor shall remove any masonry surrounding a well to three (3) feet below the finished roadway surface. Pumps and other appurtenances shall become the property of the Contractor and shall be disposed of by him. The cost of filling or capping of wells shall be included in the unit price bid for Item E-1, Roadway Excavation.

### ROUNDING OF CORNERS ON CROSS SECTIONS

The rounded corners shown on Standard Construction Drawing RI-1 as modified by the typical sections apply to all cross sections even though otherwise shown in these plans.

### CONSTRUCTION LAYOUT STAKES

See note in proposal describing the work included in this lump sum pay item.

### GUARD RAIL FLARES

Where proposed guard rail flares are constructed of rail elements which have not been fabricated exactly to fit the curvature on the plans, the two end posts of each flared section shall be encased in a minimum 4-inch thickness of Class "E" concrete for the full depth of post below the ground line. Payment for encasement, if required, shall be included in the unit price bid for the guard rail.

### GUARD RAIL ADJUSTMENT

The stationing of individual runs of guard rail shall be adjusted, if necessary, by the Engineer at the time of construction to accommodate the standard panel lengths furnished.

### FLARING GUARD RAIL AT BRIDGES

Guard rail on crossroads shall be flared to meet the bridge railing in such a manner that the change in alignment of the guard rail shall not exceed one in twenty (1:20).

### SCARIFICATION OF EXISTING FLEXIBLE PAVEMENT

Within the limits of construction where the existing flexible pavement will have less than six (6) inches of fill placed upon it the pavement shall be thoroughly scarified for its full depth, mixed with sufficient soil and properly recompact to insure the elimination of any planes of separation between it and the embankment placed thereon. Payment for scarification as described above shall be included in the unit price bid for Item E-1, Roadway Excavation.

### REMOVAL OF EXISTING RIGID PAVEMENT

Existing rigid type pavements shall be removed under Item E-8 when they are located less than three feet below the proposed pavement subgrade in proposed pavement areas or less than three feet below the proposed finished surface in areas outside the proposed pavement.

When existing rigid type pavements lie below the above limits, they shall not be removed. In lieu thereof, they shall be broken up in place into portions not to exceed one square foot in area prior to placement of the proposed embankment. Payment for this operation shall be included in the unit price bid for Roadway Excavation, Item E-1.

### NON-RIGID PAVEMENT REMOVAL

Removal and disposal of existing non-rigid pavement, unless otherwise indicated on these plans, shall be measured and paid for as Item E-1, Roadway Excavation.

### T-35 FOR MAINTAINING TRAFFIC

For description of this item see note in proposal. An estimated quantity of Asphaltic Concrete Surface Course or an approved Bituminous Premixed Surface Course for Maintaining Traffic has been entered in the General Summary under Roadway Quantities, Item T-35.

### SETTLEMENT PLATFORMS AND PIEZOMETERS

The performance of the Relocated West 14th Street embankment shall be observed closely during construction, with the aid of Settlement Platforms and Piezometers.

Settlement Platforms, installed on top of the 18" granular blanket, should be at the following approximate locations:

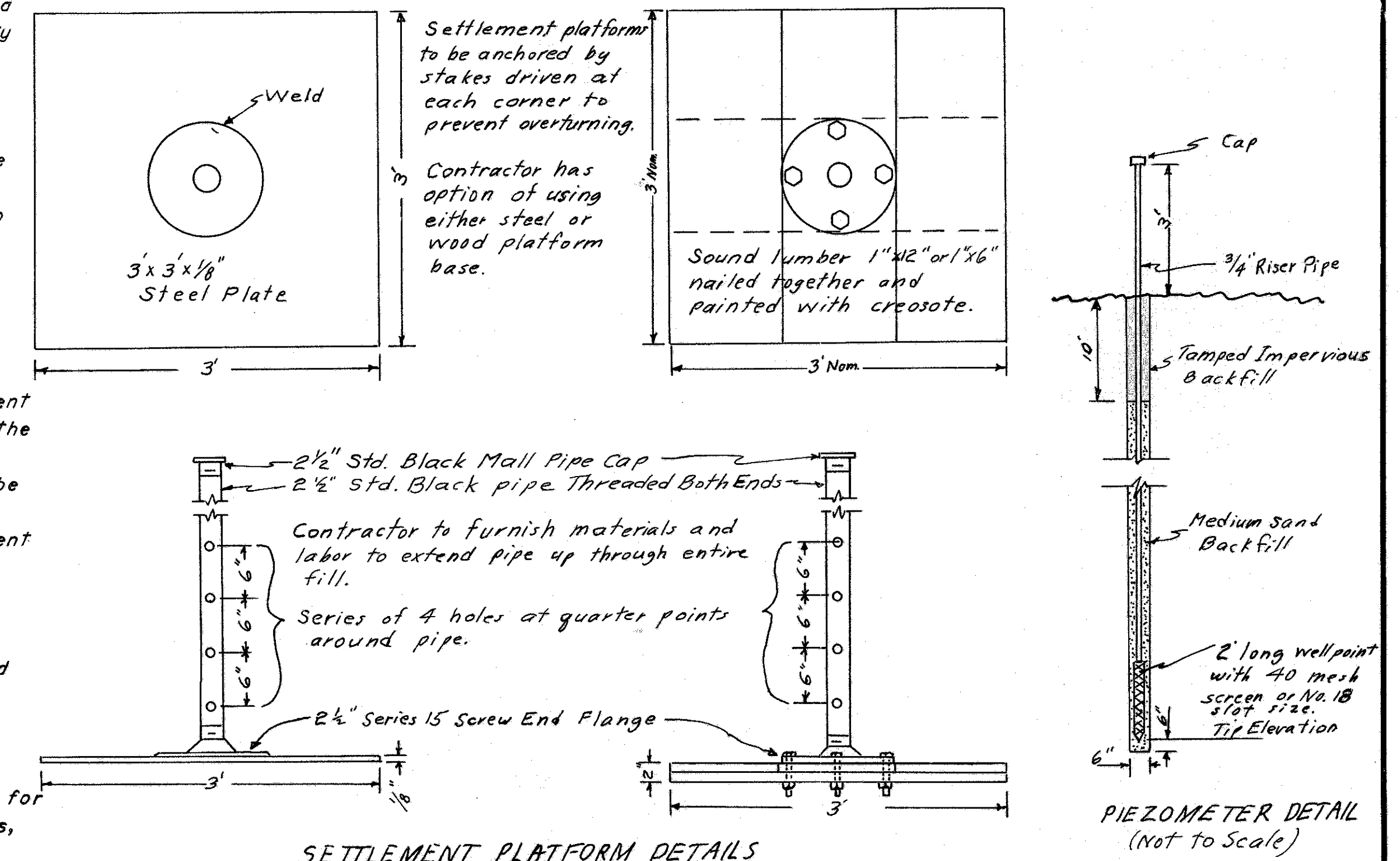
Platform No.	Location
S-3	Sta. 15+25 25' Lt. Rel. W. 14th St.
S-4	Sta. 16+70 102' Lt. Rel. W. 14th St.
S-5	Sta. 18+47 142' Lt. Rel. W. 14th St.
S-8	Sta. 15+90 E Rel. W. 14th St.
S-9	Sta. 14+55 25' Lt. Rel. W. 14th St.

Locations: Piezometers should be installed at the following

Piezometer No.	Location	Elev. of Tip
P-3	Sta. 15+15 25' Lt. Rel. W. 14th St.	575
P-4	Sta. 16+65 92' Lt. Rel. W. 14th St.	575
P-5	Sta. 18+45 130' Lt. Rel. W. 14th St.	602

The Contractor shall furnish all materials and labor necessary to install and maintain the gages.

All the measurements necessary for accurate recording of the data will be made by the Engineer. Payment for the Settlement Platforms and Piezometers shall be made at the unit price bid for each Item Special - Settlement Platform and Item Special Piezometer, which shall constitute full compensation for furnishing the labor and equipment necessary to install the devices, furnishing all the necessary materials, maintaining the usable condition of the devices and furnishing all the labor and equipment necessary to repair the gages if they are damaged during the life of the contract.



SCALE: HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE DRK DATE 11-2-64 CONSULTING ENGINEERS  
TRCD. DATE 12-30-64 KANSAS CITY CLEVELAND NEW YORK  
CKG. DATE 12-30-64

REV. 2-15-66 C.E.H.

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## ROADWAY

### PEAT EXCAVATION

The peat and soft inorganic material which falls beneath the lower portion of the Relocated West 14th Street embankment side slopes, in the valley generally below Elevation 600±, shall be totally excavated and replaced with granular material. Excavation shall include that material within the area determined by taking a 1 on 1 slope up from the intersection of a vertical line from toe of slope to bottom of soft material.

Payment for excavating the peat shall be made at the unit price bid per Cu.Yd. for Item E-1, Excavation. This unit price shall constitute full payment for removing this material, including disposing of it outside the right-of-way.

The Cu.Yds. to be paid for shall be measured as specified in Section E-1.11 of the Construction and Material Specifications.

Sufficient quantities of granular material occur in the excavation north of Brainard Avenue for the backfill and it shall be reserved for this purpose. The cost of the backfilling shall be included in the unit price bid for Item E-1, Excavation Method B. The granular material may be placed by end dumping up to the level of the existing ground.

### FILLS TO BE MADE IN RIVERSIDE CEMETERY

Two areas of Riverside Cemetery are to be filled with the waste from the Item E-1, Excavation. The areas directly west of the Jennings Freeway from Station 35+00 to Station 45+00 and along Willowdale Avenue just east of West 25th Street are to be filled and graded as shown in the plans. An estimated quantity is shown on each detail sheet and is included in the Earthwork Quantity Calculations.

Payment for making the fills shall be as provided under Item E-1, Excavation Method B of the Construction and Material Specifications. All sections of Item E-1 shall apply except that compaction requirements shall be limited to Condition I of Table I of Section E-1.08.

### GRANULAR EMBANKMENT

The Jennings Freeway from Station 42+00 to Station 45+00 will be built on an embankment to be constructed on the site of an old land fill. All of the existing trash under-lying the freeway shall be excavated, and then the entire embankment between these stations shall be built of granular material.

Sufficient quantities of granular material occur in the excavation north of Brainard Avenue for this work as well as for the work on the Relocated West 14th Street embankment. Any additional cost involved in reserving the necessary granular material from the excavation and transporting it to the proper place shall be included in the cost of the Item E-1, Excavation.

### ESTIMATED QUANTITIES

Quantities of the following items are estimated and are included for use only when and in amounts as directed by the Engineer. The provisions of Sec. G-4.03 do not apply to these items. The amounts of these items and their location shall be recorded as used, and payment will be included in the Final Payment Estimate.

ITEM T-10, TRAFFIC COMPACTED SURFACE COURSE	100 C.Y.
ITEM I-4, CALCIUM CHLORIDE, FOR DUST CONTROL	2 Tons
ITEM I-4, WATER, FOR DUST CONTROL	100 M.Gal.

### 18" GRANULAR BLANKET

An 18" Granular Blanket should be placed over natural ground beneath the Relocated West 14th Street Embankment following the scalping and benching of the existing hillside. The area to be covered is shown on the cross-section sheets.

Sufficient quantities of granular material occur in the excavation north of Brainard Avenue for the granular blanket. No Additional payment will be made for providing the granular blanket. Any additional cost involved in reserving the necessary granular material from the excavation shall be included in the cost of the Item E-1, Excavation.

## PAVEMENT

### SEQUENCE OF CONSTRUCTION OPERATIONS

Underdrains shall be installed and backfilled to subgrade elevation, immediately prior to construction of the subbase, except that, where subsurface conditions are such that improvement of an unstable subgrade can be accomplished through the drying action of deep underdrains, the Project Engineer may authorize or require the Contractor to delay the construction of the subbase as necessary.

The subbase shall then be constructed under the concrete pavement area and extended out to cover the porous backfill for the underdrain. Pavement shall then be constructed.

After the subbase in the shoulder area is in place and compacted as specified, and immediately prior to placing the aggregate base course, the material located above and within the underdrain trench shall be removed to the depth necessary to expose clean Type 3 backfill. The trench so excavated shall be backfilled with No. 6 aggregate as shown in the Typical Sections. If, after testing the subbase material for composition in the shoulder area, it is found that removal of contaminated material from the surface is necessary, such material shall be replaced with material meeting the requirements of Item B-19, Aggregate Base Course, at the expense of the Contractor.

Aggregate base course shall then be constructed and construction of the waterproofed aggregate base course shall follow immediately.

Payment for all of the above shall be included in the pertinent items affected.

### APPROACH SLABS

The approach slabs for the bridge shall be built according to the details shown on Standard Drawing AS-1-54 and Specification I-7, with the following addition. Longitudinal joints shall be sawed or impressed in the approach slab to align with the normal pavement joints for slabs over 24 feet in width. If the sawed joint is used, it shall have a depth of 1/4 inches and a minimum width of 1/4 inches. The impressed joint shall be made according to the detail shown on Standard Drawing LJ-1. The cost of providing the joints shall be included in the unit price bid for Item I-7, Reinforced Concrete Approach Slabs, T=13".

Where curbs or median pavement are provided on the proposed pavement, they shall be provided on the approach slabs, with necessary curb height transitions effected as shown on the plans or as directed by the Engineer.

### 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 Drawing T.J.

### 18" ITEM I-22 SUBBASE

Subbase thickness shall be increased to a total thickness of 18" in the following areas in order to prevent frost heaving of anticipated frost susceptible soils.

S.B. Medina	Sta. 915+25 to Sta. 921+00
S.B. Medina	Sta. 950+00 to Sta. 951+15
N.B. Medina	Sta. 950+00 to Sta. 951+14
S.B. Outer Roadway	Sta. 3+61 to Sta. 4+75
N.B. Outer Roadway	Sta. 22+25 to Sta. 23+48
S.B. Outer Roadway	Sta. 35+50 to Sta. 38+30
N.B. Jennings	Sta. 34+00 to Sta. 41+30
S.B. Jennings	Sta. 34+00 to Sta. 41+30
Ramp JN-D	Sta. 4+41 to Sta. 13+62
Ramp J-JR	Sta. 5+00 to Sta. 22+50
Ramp JR-J	Sta. 0+00 to Sta. 9+00

Underdrain depth in this area shall be established from the bottom of the top 6 inch layer of I-22. Porous backfill in the underdrain trench above the 6 inches of No. 6 or 6A aggregate over the pipe shall be composed of M-2.1 sand to prevent infiltration of the backfill by fine-grained soils.

The cost of providing the underdrains as described above shall be included in the unit price bid for Item I-1, 6" Pipe, Class I-3.

## PAVEMENT

### SUBBASE, ITEM I-22 GRADING A OR B, AS PER PLAN

Material for this item shall meet the requirements of Section I-22.02, Grading A or B, except that for both gradings the per cent passing the No. 200 sieve shall not exceed ten (10) after all operations of placing and compacting have been completed.

The Contractor shall place 6 inches of I-22 subbase under all bridge approach slabs and shall be compensated therefor at the unit price bid for Item I-22, Subbase.

For Drainage Notes, see Sheets 252  
For Waterwork Notes, see Sheets 512-510  
For Lighting Notes, see Sheets 570-572  
For Structure Notes, see Sheets 306  
For Landscaping Notes, see Sheets 545-546  
For Signing General Notes, see Sheets 559-560

The engineer will advise the contractor a minimum of one hundred and eighty (180) days prior to the project completion date if a separate traffic control device contractor is required to install or erect traffic control devices within contract work limits.

The contractor shall cooperate with and arrange a suitable work schedule, subject to the approval of the engineer, to permit a separate contractor to work and operate necessary equipment to carry out the provisions of his contract. The engineer shall notify the contractor a minimum of thirty (30) days prior to any scheduled work by the separate contractor.

Each contractor shall be held responsible for any damage by him, or his agents, to the work performed by the other contractor.

Compensation for the above cooperation, shall be incidental to the various pay items included within this construction project.

The separate contractor shall be interpreted to mean a contractor or others authorized by the director.

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

19  
646

CUYAHOGA COUNTY  
CUY.-71-17.83  
CUY.-176-12.76

ITEM E-8 REMOVAL AND DISPOSAL OF EXISTING PAVEMENT (DRIVEWAY APRONS)					
PROJECT CUY-71-17.83					
Location	Station	Side	Length Feet	Width Feet	Area (Sq. Yds.)
Brainard Avenue	4+55	Right	9	11	11.0
Brainard Avenue	4+95	Right	9	10	10.0
Brainard Avenue	5+62	Right	9	10	10.0
Brainard Avenue	5+64	Left	8	11	9.8
Brainard Avenue	6+00	Right	9	9	9.0
Brainard Avenue	7+40	Left	8	12	10.7
Brainard Avenue Gas Station	7+80-8+80	Right	100		380.0
Brainard Avenue	6+75	Right	9	12	12.0
West 17th St. at Valentine	5+20	Right	9	14	14.0
West 17th St. at Valentine	5+90	Right	9	9	9.0
West 17th St. at Valentine	7+00	Right	9	10	10.0
West 17th St. at Valentine	7+40	Right	9	9	9.0
West 17th St. at Valentine	7+45	Right	9	8	8.0
West 14th St.	8+92	Right	18	9	18.0
West 14th St.	9+72	Right	18	10	20.0
West 14th St.	10+12	Right	18	9	18.0
Brainard Avenue	0+95	Right	9	10	10.0
Brainard Avenue	1+65	Right	9	11	11.0
Brainard Avenue	1+75	Left	8	9	8.0
Brainard Avenue	2+00	Right	9	10	10.0
Brainard Avenue	2+45	Right	9	10	10.0
Brainard Avenue	2+85	Right	9	10	10.0
Brainard Avenue	3+25	Right	9	11	11.0
Brainard Avenue	3+57	Left	8	9	8.0
Brainard Avenue	3+62	Right	9	12	12.0
Brainard Avenue	4+05	Right	9	9	9.0
West 15th St.	0+92	Left	7	10	7.8
Buhrer Avenue	3+37	Right	4	10	4.4
Buhrer Avenue	3+90	Right	4	10	4.4
Buhrer Avenue	4+67	Left	3	12	4.0
Buhrer Avenue	4+90	Right	4	8	3.6
Buhrer Avenue	5+40	Right	4	12	5.3
Buhrer Avenue	5+70	Right	4	8	3.6
Buhrer Avenue	6+10	Left	3	10	3.3
Buhrer Avenue	6+40	Right	4	10	4.4
Buhrer Avenue	7+25	Right	4	10	4.4
Holmden Avenue	7+45	Right	8	10	8.9
Holmden Avenue	7+55	Left	8	13	11.6
Holmden Avenue	8+10	Right	8	10	8.9
Holmden Avenue	8+45	Left	8	9	8.0
Holmden Avenue	8+80	Right	8	10	8.9
Holmden Avenue	9+00	Left	8	18	16.0
Holmden Avenue	9+15	Right	8	8	7.1
Holmden Avenue	9+85	Right	8	8	7.1
Holmden Avenue	9+95	Left	8	10	8.9
Holmden Avenue	10+25	Left	8	10	8.9
Holmden Avenue	10+55	Left	8	10	8.9
Holmden Avenue	11+45	Left	8	10	8.9
Holmden Avenue	11+85	Left	8	10	8.9
Holmden Avenue	12+50	Left	8	10	8.9
Holmden Avenue	13+20	Right	8	10	8.9
Holmden Avenue	13+20	Left	8	9	8.0

ITEM E-8 REMOVAL AND DISPOSAL OF EXISTING PAVEMENT (DRIVEWAY APRONS)					
PROJECT CUY-71-17.83					
Location	Station	Side	Length Feet	Width Feet	Area (Sq. Yds.)
West 17th St. at Valentine	7+80	Right	9	10	10.0
West 17th St. at Valentine	9+25	Right	9	9	9.0
West 17th St. at Valentine	9+65	Right	9	10	10.0
West 17th St. at Aiken	0+60	Left	8	12	10.7
West 17th St. at Aiken	1+25	Left	8	12	10.7
West 17th St. at Aiken	2+10	Right	9	9	9.0
West 17th St. at Aiken	2+45	Right	10	10	11.0
West 17th St. at Aiken	2+82	Right	10	10	11.0
West 17th St. at Aiken	3+22	Right	10	9	10.0
West 17th St. at Aiken	3+60	Right	10	10	11.0
View Road	10+45	Left	10	10	11.0
View Road	10+90	Left	10	8	8.9
View Road	11+20	Left	10	8	8.9
View Road	11+60	Left	10	12	13.3
View Road	12+85	Left	10	10	11.0
Total CUY-71-17.83					1,005.0
PROJECT CUY-176-12.76					
Location	Station	Side	Length Feet	Width Feet	Area (Sq. Yds.)
West 15th St. at Redman	2+27	Right	3	15	5.0
West 15th St. at Redman	2+62	Right	3	12	4.0
West 15th St. at Redman	3+17	Right	3	26	8.7
West 15th St. at Redman	3+62	Right	3	13	4.3
West 15th St. at Redman	4+96	Right	3	10	3.3
West 15th St. at Redman	5+35	Right	3	10	3.3
West 15th St. at Redman	6+75	Right	3	10	3.3
West 15th St. at Redman	7+25	Right	3	15	5.0
West 15th St. at Redman	7+65	Right	3	8	2.7
West 15th St. at Redman	8+05	Right	3	12	4.0
West 15th St. at Redman	10+48	Right	10	20	22.2
West 14th St. at Redman	3+50	Left	5	14	7.8
West 14th St. at Redman	4+15	Left	5	11	6.1
West 14th St. at Redman	4+65	Left	5	10	5.6
West 14th St. at Redman	5+10	Left	5	10	5.6
West 14th St. at Redman	5+45	Left	5	10	5.6
West 14th St. at Redman	5+85	Left	5	12	6.7
West 14th St. at Redman	6+25	Left	5	10	5.6
West 14th St. at Redman	6+65	Left	5	10	5.6
West 14th St. at Redman	7+05	Left	5	10	5.6
West 14th St. at Redman	7+90	Left	5	10	5.6
West 14th St. at Redman	8+25	Left	5	12	6.7
West 14th St. at Redman	9+05	Left	5	10	5.6
Redman Avenue	0+75	Left	3	10	3.3
Redman Avenue	0+95	Right	3	10	3.3
Redman Avenue	1+15	Left	3	10	3.3
Redman Avenue	2+30	Left	3	11	3.7
Redman Avenue	2+90	Left	3	21	7.0
Redman Avenue	3+70	Left	3	9	3.0
Redman Avenue	4+10	Left	3	10	3.3
Redman Avenue	5+55	Right	3	12	4.0
Redman Avenue	6+60	Left	3	8	2.7
Redman Avenue	7+80	Left	3	7	2.3
Redman Avenue	8+60	Left	3	8	2.7
West 13th St. at Redman	8+47	Right	3	10	3.3
West 13th St. at Redman	8+52	Left	3	9	3.0
West 13th St. at Redman	9+05	Right	3	10	3.3
Total CUY-176-12.76					186.1
Grand Total					1,191.1

ITEM E-8 REMOVAL AND DISPOSAL OF EXISTING PAVEMENT				
PROJECT CUY-71-17.83				
Location	Station		Calculations	Area Sq. Yd.
	From	To		
Jennings Road	30+00	32+57	Planimeter	933.0
Jennings Road	19+19 Rel. W. 14th	12+36 Rel. W. 14th	Planimeter	3,319.4
View Road	8+37.69	14+86.02	648.33 x 28 ÷ 9	2,017.0
Titus Avenue	9+03.31	9+74	Planimeter	228.0
Eglindale Avenue	1+24.89	2+82.41	Planimeter	432.0
Aiken Avenue	5+14.54	6+54	Planimeter	442.1
West 17th Street	Eglindale Avenue	Aiken Avenue	Planimeter	1,193.3
Valentine Avenue	0+00	0+50	Planimeter	165.6
Holmden Avenue	7+17.65	14+50	732.35 x 30 ÷ 9	2,441.2
Holmden Avenue	14+50	West 14th St.	Planimeter	87.4
Holmden Center	13+36 SBOR	Holmden Ave. & Brainard Ave.	813 x 12 ÷ 9	1,086.0
Buhrer Avenue	3+88	8+00	412 x 28 ÷ 9	1,281.8
Rowley Avenue	8+26	12+10	384 x 18 ÷ 9	768.0
West 14th Street	11+64 Rel. W. 14th	10+00 Rel. W. 14th	Planimeter	952.9
West 14th Street	7+49.21 Right	8+98.50 Right	149.29 x 2 ÷ 9	33.2
West 15th Street	Rowley Avenue	951+14 N.B. Medina	Planimeter	175.6
Brainard Avenue	1+17	7+93	676 x 30 ÷ 9	2,253.3
Brainard Avenue	7+93	8+95	Planimeter	360.3
Total CUY-71-17.83				18,170.1
PROJECT CUY-176-12.76				
Location	Station		Calculations	Area Sq. Yd.
	From	To		
Har.-Den. Viaduct	1+12.44 Left	1+87.86 Left	75.42 x 2 ÷ 9	16.8
Har.-Den. Viaduct	2+32.54 Left	3+23.55 Left	91.01 x 2 ÷ 9	20.2
Har.-Den. Viaduct	3+23.55 Left	6+27.43 Left	Planimeter	1,204.4
Har.-Den. Viaduct	7+46.76 Left	8+22.76 Left	76.00 x 2 ÷ 9	16.9
Denison Avenue	1+93.59 Right	2+69.59 Right	76.00 x 2 ÷ 9	16.9
West 15th Street	0+96	1+00	Planimeter	13.3
West 15th Street	1+00	3+04	204 x 24 ÷ 9	544.0
West 15th Street	10+51	10+61.62	Planimeter	26.6
West 14th Street	9+20	9+88	Planimeter	196.4
West 13th Street	8+14.45	9+88	Planimeter	462.8
Redman Avenue	0+12	9+29	Planimeter	2,445.3
Jennings Road	2+64.96	6+74.50	409.54 x 35 ÷ 9	1,592.7
Total CUY-176-12.76				6,556.3
Grand Total				24,726.4

ITEM E-1 COMPACTED SUBGRADE			
PROJECT CUY-71-17.83		PROJECT CUY-176-12.76	
Location	Area Square Yds.	Location	Area Square Yds.
Area of 9" T-71	19,510	Area of 9" T-71	17,401
Area of 10" T-71	54,683	Area of 10" T-71	14,807
Area of Paved Shoulders	28,334	Area of Paved Shoulders	9,431
Area of Curbs	1,100	Area of Curbs	380
Area of Median Pave.	1,106	Area of Median Pavement	471
Area of Approach Slabs	1,011	Area of Approach Slabs	478
Total CUY-176-12.76		42,968	
Total CUY-71-17.83		105,744	
Grand Total		148,712	

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE S.D.H. DATE 11-30-64 CONSULTING ENGINEERS  
TRCD \_\_\_\_\_ DATE \_\_\_\_\_ KANSAS CITY CLEVELAND NEW YORK  
C.D. I.M. DATE 12-30-64

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

20  
646

CUYAHOGA COUNTY  
CUY- 71-17.83  
CUY- 176-12.76

ITEM E-8 REMOVAL AND DISPOSAL OF EXISTING SIDEWALKS						
PROJECT CUY-71-17.83						
Location	Station		Side	Length Feet	Width Feet	Area Sq. Ft.
	From	To				
View Road	9+24	9+76	Left	53	5	265
Titus Avenue	8+97	9+13	Right	16	5	80
View Road	9+57		Left	10	5	50
Titus Avenue	9+42	9+86	Left	45	5	225
View Road	10+47	14+18	Left	371	5	1,855
Titus Avenue	9+65		Left	7	7	49
View Road	11+58		Left	3	10	30
View Road	12+30		Left	3	10	30
View Road	12+68		Left	3	10	30
Eglindale Avenue	1+24	2+05	Right	81	5	405
View Road	13+40	14+86	Right	146	5	730
Eglindale Avenue	1+59	2+83	Left	124	5	620
West 17th Street	Eglindale Ave.	Aiken Ave.	Left	297	5	1,485
West 17th Street	Eglindale Ave.	Aiken Ave.	Right	403	5	2,015
West 17th Street	1+47		Right	14	3	42
West 17th Street	1+87		Right	11	3	33
West 17th Street	3+29		Right	10	4	40
Aiken Avenue	5+14	6+53	Right	133	5	665
Jennings Road	N.B. Jennings	N.B. Jennings	Right	253	5	1,265
Jennings Road	S.B. Medina	Ramp J-14	Right	847	5	4,235
Jennings Road	Ramp J-14	Ramp J-14	Right	75	6	450
West 17th Street	5+52	Valentine	Right	45	5	225
Brainard Avenue	1+14	7+64	Right	650	6	3,900
Brainard Avenue	1+24	8+96	Left	772	6	4,632
Brainard Avenue	1+51		Right	8	3	24
Brainard Avenue	1+86		Right	8	5	40
Brainard Avenue	3+13		Right	8	3	24
Brainard Avenue	4+71		Right	8	3	24
Brainard Avenue	5+19		Right	8	3	24
Brainard Avenue	5+41		Right	8	3	24
Brainard Avenue	5+81		Right	8	3	24
Brainard Avenue	6+16		Right	8	3	24
Brainard Avenue	6+51		Right	8	3	24
Brainard Avenue	7+48		Right	8	5	40
Brainard Avenue	1+55		Left	8	3	24
Brainard Avenue	3+01		Left	8	3	24
Brainard Avenue	3+35		Left	8	3	24
Brainard Avenue	3+80		Left	8	5	40
Brainard Avenue	4+15		Left	8	4	32
Brainard Avenue	4+70		Left	8	4	32
Brainard Avenue	4+90		Left	8	3	24
Brainard Avenue	5+30		Left	8	3	24
Brainard Avenue	5+80		Left	8	3	24
Brainard Avenue	6+63		Left	8	3	24
Brainard Avenue	7+00		Left	8	3	24
Holmden Avenue	7+17	14+73	Right	756	6	4,536
Holmden Avenue	7+17	14+73	Left	756	6	4,536
Holmden Avenue	8+40		Right	8	3	24
Holmden Avenue	8+63		Right	8	4	32
Holmden Avenue	9+62		Right	8	2	16
Holmden Avenue	10+08		Right	8	3	24
Holmden Avenue	11+20		Right	8	4	32
Holmden Avenue	13+44		Right	8	5	40
Holmden Avenue	7+83		Left	8	3	24
Holmden Avenue	9+35		Left	8	3	24
Holmden Avenue	9+75		Left	8	3	24
Holmden Avenue	10+82		Left	8	3	24
Holmden Avenue	12+15		Left	8	4	32
Holmden Avenue	12+91		Left	8	3	24
Holmden Avenue	13+34		Left	8	4	32
Holmden Avenue	13+64		Left	8	5	40
Buhrer Avenue	2+70	8+00	Right	530	6	3,180
Buhrer Avenue	3+95	7+90	Left	395	6	2,370
Buhrer Avenue	3+65		Right	4	3	12

ITEM E-8 REMOVAL AND DISPOSAL OF EXISTING SIDEWALKS						
PROJECT CUY-71-17.83						
Location	Station		Side	Length Feet	Width Feet	Area Sq. Ft.
	From	To				
Buhrer Avenue	5+21		Right	4	3	12
Buhrer Avenue	5+99		Right	4	3	12
Buhrer Avenue	6+82		Right	4	3	12
Rowley Avenue	8+26	12+10	Right	384	4	1,536
Rowley Avenue	8+26	10+05	Left	179	6-4	895
Rowley Avenue	10+40	12+10	Left	170	4	680
West 15th Street	0+14	1+25	Right	111	5	555
West 15th Street	0+14	1+25	Left	111	5	555
West 15th Street	0+41		Right	5	3	15
West 15th Street	0+71		Right	5	3	15
West 15th Street	1+05		Right	5	3	15
West 14th Street	7+69	7+76	Right	7	6	42
West 14th Street	8+07	11+17	Right	294	6	1,764
West 14th Street	9+03		Right	18	4	72
West 14th Street	9+51		Right	18	3	54
Total CUY-71-17.83						45,184
PROJECT CUY-176-12.76						
Redman Avenue	0+12	3+14	Right	302	4	1,208
Redman Avenue	3+40	6+36	Right	294	4	1,176
Redman Avenue	6+61	9+21	Right	260	4	1,040
Redman Avenue	0+12	9+21	Left	909	4	3,636
Redman Avenue	0+70		Right	3	3	9
Redman Avenue	1+67		Right	2	3	6
Redman Avenue	0+93		Left	3	3	9
West 13th Street	8+14	9+88	Left	170	4	680
West 13th Street	8+47	9+88	Right	137	4	548
West 14th Street	2+59	2+85	Right	21	5	105
West 14th Street	2+56	9+88	Left	728	5	3,640
West 14th Street	9+20	9+88	Right	64	5	320
West 15th Street	1+27	3+04	Left	177	4	608
West 15th Street	1+00	8+83	Right	783	4	3,132
Denison Avenue	1+12	2+38	Left	126	6	756
Denison Avenue	4+72	5+32	Left	63	6	378
Denison Avenue	2+65	3+30	Left	65	6	390
Exist. Denison Ave.	0+17	0+47	Left	30	5	150
Total CUY-176-12.76						17,791
Grand Total						62,975

ITEM E-11 WATER	
PROJECT CUY-71-17.83	
E-1 Embankment	1,014,294 Cu. Yd.
I-22 Subbase Grading "A" or "B"	15,032 Cu. Yd.
I-22 Subbase Regular Grading	3,140 Cu. Yd.
B-19 Aggregate Base Course	4,316 Cu. Yd.
Totals CUY-71-17.83 Total = 1,036,782 Cu. Yd.	
Water = 1,036,782 Cu. Yd. x 5 Gal. Cu. Yd. ÷ 1000 = 5,183.9 M. Gal.	
PROJECT CUY-176-12.76	
E-1 Embankment	550,108 Cu. Yd.
I-22 Subbase Grading "A" or "B"	11,917 Cu. Yd.
I-22 Subbase Regular Grading	1,560 Cu. Yd.
B-19 Aggregate Base Course	1,193 Cu. Yd.
Totals CUY-176-12.76 Total = 564,778 Cu. Yd.	
Water = 564,778 Cu. Yd. x 5 Gal. Cu. Yd. ÷ 100 = 2,823.9 M. Gal.	
Grand Total = 8,007.8 M. Gal.	

ITEM E-8 REMOVAL AND DISPOSAL OF EXISTING CURBS			
PROJECT CUY-71-17.83			
Location	Station		Length Lin. Ft.
	From	To	
Jennings Road	30+00 Left	31+71 Left	172
Jennings Road	30+00 Right	32+67 Right	270
Jennings Road	19+19 Rel. W. 14th St.	12+10 Rel. W. 14th St.	654
Jennings Road	19+19 Rel. W. 14th St.	11+00 Rel. W. 14th St.	840
View Road	8+37.69 Left	14+07 Left	490
View Road	8+37.69 Right	14+86 Right	646
Titus Avenue	9+03.31 Left	9+96 Left	91
Titus Avenue	9+03.31 Right	9+32 Right	41
Eglindale Avenue	1+24.89 Left	2+89 Left	163
Eglindale Avenue	1+24.89 Right	2+11 Right	106
Aiken Avenue	5+14.54 Left	6+56 Left	148
Aiken Avenue	5+14.54 Right	6+51 Right	144
West 17th Street	Eglindale Avenue Left	Aiken Avenue Left	291
West 17th Street	Eglindale Avenue Right	Aiken Avenue Right	389
Valentine Avenue	4+71.71 Hospital Ent. Rt.	0+50 Left	75
Valentine Avenue	5+51.80 West 17th St. Rt.	0+50 Right	50
Brainard Avenue	1+20 Left	9+00 Left	765
Brainard Avenue	1+15 Right	7+80 Right	665
Holmden Avenue	7+17.65 Left	14+74 Left	762
Holmden Avenue	7+17.65 Right	14+74 Right	743
Buhrer Avenue	2+70.65 Right	8+00 Right	529
Buhrer Avenue	3+88 Left	8+00 Left	412
Rowley Avenue	8+26	12+10 Left	332
Rowley Avenue	8+26	12+10 Right	384
West 14th Street	10+91 Left	10+00 Left	91
West 14th Street	11+06 Right	10+00 Right	106
West 14th Street	8+98.50 Left	8+17 Left	82
West 14th Street	7+63 Left	7+49 Left	14
West 15th Street (W. side)	Rowley Avenue	951+15 S.B. Medina	65
West 15th Street (E. side)	Rowley Avenue	951+15 S.B. Medina	65
Total CUY-71-17.83			9,585
PROJECT CUY-176-12.76			
Harvard-Denison Viaduct	1+12 Left	5+32 Left	416
Harvard-Denison Viaduct at the Traffic Island	5+50 Left		118
Harvard-Denison Viaduct	7+46 Left	8+23 Left	77
West 15th Street	0+92 Left	3+04 Left	223
West 15th Street	0+99 Right	10+63 Right	936
West 15th Street	10+51 Left	10+63 Left	12
West 14th Street	1+62 Right	2+29 Right	71
West 14th Street	2+55 Left	9+88 Left	706
West 14th Street	2+60 Right	2+89 Right	33
West 14th Street	9+45 Right	9+88 Right	44
West 13th Street	8+14 Left	9+88 Left	174
West 13th Street	8+14 Right	9+88 Right	174
Redman Avenue	0+12 Left	9+29 Left	917
Redman Avenue	0+12 Right	9+29 Right	867
Jennings Road	2+65 Left	6+75 Left	410
Jennings Road	2+65 Right	6+75 Right	410
Denison Avenue	0+47 Left	0+47 Left	25
Denison Avenue	0+20 Right	0+47 Right	27
Denison Avenue	1+93 Right	2+70 Right	77
Total CUY-176-12.76			5,717
Grand Total			15,302

ITEM L-6 ROADSIDE CLEANUP	
PROJECT CUY-176-12.76	
55,960 Sq. Ft. ÷ 1000 = 56 Units	

SCALE: \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE SDH DATE 11-20-64 CONSULTING ENGINEERS  
TRCD. DATE \_\_\_\_\_  
CKD. DATE 12-20-64 KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

21  
646

CUYAHOGA COUNTY  
CUY. 71-1783  
CUY. 176-12.76

ITEM B-19 AGGREGATE BASE COURSE						
PROJECT CUY-71-17.83						
Station		Length	Width	Thickness	Volume	Remarks
From	To	Feet	Feet	Inches	Cu. Yds.	
<b>Southbound Medina</b>						
913+50	919+55.42	606.21	5'	7"	65.4	Right Shoulder & Calculations
919+55.42	920+80.42	125	5'-10'	7"	20.3	Right Shoulder
914+54.68	915+54.68	100	8'-10'	4" Max.	10.3	Left Shoulder
915+54.68	920+56.64	491.18	10'	7" Max.	102.2	Left Shoulder & Calculations
920+56.64	925+78.44	516.32	10'	7" Max.	107.4	Left Shoulder & Calculations
925+78.44	934+75	896.56	4'	7"	77.4	Right Shoulder
925+78.44	929+50	371.56	10'	7" Max.	77.2	Left Shoulder
934+75	935+00	25	4'-5'	7"	2.4	Right Shoulder
935+00	940+84.03	584.03	5'	7"	63.1	Right Shoulder
940+84.03	951+15	1,031.42	5'	7"	111.4	Right Shoulder & Calculations
939+22.95	941+71		Varies	7" Max.	78.4	Nose Widening
941+71	951+15	937.24	10'	7" Max.	194.9	Left Shoulder & Calculations
948+00	951+15		Varies	7"	47.0	Under Median Pavement
<b>Northbound Medina</b>						
913+00	916+61	374.36	10'	7"	80.8	Right Shoulder & Calculations
913+00	917+12	411.42	4'	7"	35.5	Left Shoulder & Calculations
935+21.25	937+20.72	199.47	9'	7" Max.	37.2	Right Shoulder
935+21.25	937+20.72	199.47	5'	7"	21.5	Left Shoulder
937+20.72	940+28	308.43	9'	7" Max.	57.4	Right Shoulder & Calculations
940+28	940+53	25	9'-10'	7" Max.	4.9	Right Shoulder
940+53	943+58	306.16	10'	7" Max.	63.7	Right Shoulder & Calculations
937+20.72	951+13.98	1,392.80	5'	7"	150.4	Left Shoulder & Calculations
943+58	946+05.02		Varies	7" Max.	77.8	Nose Widening
946+05.02	948+49.72	244.70	8	4" Max.	22.2	Right Shoulder
948+49.72	950+49.72	200	8'-10'	4" Max.	20.6	Right Shoulder
950+49.72	951+13.98	64.60	10'	7" Max.	13.4	Right Shoulder & Calculations
<b>Northbound Jennings</b>						
53+60.26	63+72.74	976.25	10'	7" Max.	203.0	Right Shoulder & Calculations
53+60.26	63+72.74	1,014.25	4'	7"	87.6	Left Shoulder & Calculations
74+45.47	84+01.36	955.26	5'	7"	103.1	Left Shoulder & Calculations
84+01.36	85+01.36	100	5'-2'	7"	7.6	Left Shoulder
84+01.36	86+01.36	200	0'-5'	4" Max.	6.2	Right Shoulder
<b>Lane J</b>						
0+00	1+00	100	8'	4" Max.	9.1	Right Shoulder
<b>Southbound Outer Roadway</b>						
3+61.28	8+30	467.90	10'	7" Max.	97.3	Right Shoulder & Calculations
8+30	29+63	2,133	10'	7" Max.	443.6	Right Shoulder
29+63	31+35.33		Varies	7" Max.	55.4	Nose Widening
12+41.50	13+66.50	125	10'-5'	7"	20.2	Left Shoulder
13+66.50	32+48	1,881.50	5'	7"	203.1	Left Shoulder
34+76	35+76	100	6'-4'	7"	10.8	Left Shoulder
35+76	39+80	391.17	4'	7"	33.8	Left Shoulder & Calculations
39+80	40+58.81		Varies	7"	15.3	Nose Widening
39+61.14	41+80.17	219.03	10'	7" Max.	46.7	Right Shoulder
<b>Northbound Outer Roadway</b>						
7+93	15+20.02	720.29	5'	7"	77.8	Left Shoulder & Calculations
15+20.02	16+20.02	100	5'-2'	7"	7.6	Left Shoulder
10+74.41	17+18.04	644.75	10'	7" Max.	134.1	Right Shoulder & Calculations
17+18.04	23+48.04	630	10'	7" Max.	131.0	Right Shoulder
<b>Ramp J-NBOR</b>						
0+45	1+90.63	145.63	10'	7" Max.	30.8	Right Shoulder
1+90.63	8+09	623.06	10'	7" Max.	131.0	Right Shoulder & Calculations
8+09	10+89.24		Varies	7" Max.	87.5	Nose Widening
7+40.90	12+10.40	469.19	5'	7"	50.7	Left Shoulder & Calculations
12+10.40	17+16.38	505.98	5'	7"	54.6	Left Shoulder
<b>Ramp SBOR-M</b>						
0+00	6+90.58	690.88	5'	7"	74.6	Left Shoulder & Calculations
6+90.58	9+86.63	296.05	5'	7"	32.0	Left Shoulder
9+86.63	10+79.73	93.10	5'-2'	7"	7.0	Left Shoulder
8+86.63	21+53.00	1,266.37	10'	7" Max.	263.5	Right Shoulder

ITEM B-19 AGGREGATE BASE COURSE						
PROJECT CUY-71-17.83						
Station		Length	Width	Thickness	Volume	Remarks
From	To	Feet	Feet	Inches	Cu. Yds.	
<b>Ramp 14-SBOR</b>						
0+78	1+78	100	3'-2'	3"	2.3	Left Shoulder
0+00.09	4+04.41	404.32	3'	3"	11.2	Right Shoulder
4+04.41	5+47	143.00	3'-7'	3"	6.6	Right Shoulder & Calculations
6+80	9+43	264.21	8'	4" Max.	24.0	Right Shoulder & Calculations
9+43	11+08.42	166.18	8'	4" Max.	16.4	Right Shoulder & Calculations
0+00.09	4+75		Varies	6"	49.2	Under Median Pavement
<b>Ramp NBOR-14</b>						
2+65	3+57	92	10'-8'	4" Max.	9.5	Right Shoulder
3+57	4+39.57	82.57	8'	4" Max.	7.4	Right Shoulder
4+39.57	5+39.57	100	8'-3'	4" Max.	6.0	Right Shoulder
4+39.57	10+22.30	582.73	3'	3"	16.2	Left Shoulder
<b>Lane M-J</b>						
0+00	2+70.62	270.62	4'	7"	23.4	Left Shoulder
2+70.62	3+95.50	124.64	4'	7"	10.8	Left Shoulder & Calculations
3+95.50	4+95.50	99.83	4'-3'	7"	7.5	Left Shoulder & Calculations
4+95.50	5+70.50	76.46	10'-7'	3"	6.0	Right Shoulder & Calculations
5+70.50	7+72.21	205.49	7'	3"	13.3	Right Shoulder & Calculations
7+72.21	8+97.21	127.19	7'-2'	3"	5.3	Right Shoulder & Calculations
8+97.21	9+97.21	101.54	2'	3"	1.9	Right Shoulder & Calculations
8+97.21	10+97.21	199.66	3'-4'	7"	15.1	Left Shoulder & Calculations
10+97.21	12+17.23	119.79	4'	7"	10.3	Left Shoulder & Calculations
<b>Ramp 14-M</b>						
0+64	7+92.78	728.78	4.42'	3"	29.8	Right Shoulder
3+79.99	7+92.78	412.79	3'	3"	11.5	Left Shoulder
7+92.78	15+77.25	796.45	3'	3"	22.1	Left Shoulder & Calculations
7+92.78	15+77.25	781.19	4.42'	3"	32.0	Right Shoulder & Calculations
<b>Ramp A</b>						
13+08	14+64.34	156.34	8'-3'	3"	8.0	Right Shoulder
14+64.34	15+41	78.33	3'	3"	2.2	Right Shoulder & Calculations
<b>Total CUY-71-17.83</b>					<b>4,315.8</b>	
<b>PROJECT CUY-176-12.76</b>						
<b>Southbound Jennings</b>						
33+15.00	35+03.00	188.00	5'	7"	20.3	Right Shoulder
36+81.00	40+10.98	329.98	5'	7"	35.6	Right Shoulder
38+49.54	41+04.81	248.00	8'	4" Max.	22.5	Left Shoulder & Measure
41+04.81	42+04.81	100.00	8'-10'	4" Max.	10.3	Left Shoulder
40+10.98	45+68.45	558.64	5'	7"	60.3	Right Shoulder & Calculations
42+04.81	43+23.61	116.29	10'	7" Max.	24.2	Left Shoulder & Calculations
45+68.45	49+00.00	331.55	5'	7"	35.8	Right Shoulder
49+00.00	50+00.00	100.00	5'-4'	7"	9.7	Right Shoulder
46+81.45	50+18.45	337.00	10'	7" Max.	70.1	Left Shoulder
50+18.45	53+82.42	363.97	10'	7" Max.	75.7	Left Shoulder
50+00.00	53+82.42	382.42	4'	7"	33.0	Right Shoulder
<b>Northbound Jennings</b>						
33+15.00	34+98.00	183.00	11'	7"	43.5	Left Shoulder and Median
33+15.00	34+73.00	158.00	Varies	7" Max.	44.9	Nose Widening
36+74.00	38+00.00	126.00	11'	7"	29.9	Left Shoulder and Median
38+00.00	40+00.00	200.00	11'-16.5'	7"	59.4	Left Shoulder and Median
36+36.00	40+45.04	418.00	8'	4" Max.	37.9	Right Shoulder & Measure
40+45.04	42+17.00	176.38	8'	4" Max.	16.0	Right Shoulder & Calculations
40+00.00	40+45.04	45.00	5'	7"	4.9	Left Shoulder
40+45.04	45+53.01	507.08	5'	7"	54.7	Left Shoulder & Calculations
42+17.00	44+40.56		Varies	7" Max.	67.5	Nose Widening
45+53.01	50+03.01	450.00	5'	7"	48.6	Left Shoulder & Measure
45+53.01	48+14.00	267.00	8'	4"	26.3	Right Shoulder & Measure

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE R.B.H. DATE 11-12-64 CONSULTING ENGINEERS  
TRCD. DATE \_\_\_\_\_  
CKD. D.J.R. DATE 11-12-64 KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

22  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

ITEM B-19 AGGREGATE BASE COURSE						
PROJECT CUY-176-12.76						
Station		Length	Width	Thickness	Volume	Remarks
From	To	Feet	Feet	In.	Cu. Yds.	
<b>Northbound Jennings</b>						
48+14.00	48+94.00	80.00	8'-10'	4"	8.9	Right Shoulder
48+94.00	50+55.00	161.00	10'	7"	34.8	Right Shoulder
50+55.00	53+60.26	305.26	10'	7" Max.	63.5	Right Shoulder
50+03.01	50+55.00	51.99	5'	7"	5.6	Left Shoulder
50+55.00	51+55.00	100.00	5'-4'	7"	9.7	Left Shoulder
51+55.00	53+60.26	205.26	4'	7"	17.7	Left Shoulder
<b>Ramp J-JR</b>						
0+00.00	2+47.64	246.08	10'-8'	4" Max.	25.3	Right Shoulder & Calculations
2+47.64	3+46.64	100.00	5'-0'	3"	2.3	Right Shoulder
2+47.64	4+25.32	182.15	3'	3"	5.1	Left Shoulder & Calculations
4+25.32	6+90.00	264.68	3'	3"	7.4	Left Shoulder
6+90.00	7+52.15	62.15	3'	3"	1.7	Right Shoulder
7+52.15	11+32.62	382.06	3'	3"	10.6	Right Shoulder & Calculations
11+32.62	12+00.00	67.38	3'	3"	1.9	Right Shoulder
<b>Ramp JR-J</b>						
1+59.00	2+75.16	124.59	3'	3"	3.5	Left Shoulder & Calculations
2+75.16	7+45.60	470.44	3'	3"	13.1	Left Shoulder
7+45.60	9+35.87	188.61	3'	3"	5.2	Left Shoulder & Calculations
9+35.87	10+35.87	100.00	3'-2'	3"	2.3	Left Shoulder
9+35.87	11+35.87	200.48	0'-5'	3"	4.6	Right Shoulder & Calculations
11+35.87	12+51.32	115.68	8'	4"	11.4	Right Shoulder & Calculations
<b>Ramp JW-D</b>						
0+00.00	1+34.00	134.00	8'	4" Max.	12.1	Right Shoulder
3+05.00	11+00.00	795.00	4.42'	3"	32.5	Right Shoulder
11+00.00	11+75.00	75.00	4.42'-0'	3"	1.5	Right Shoulder
4+41.51	12+82.92	841.41	3'	3"	23.4	Left Shoulder
<b>Ramp D-JW</b>						
1+03.45	8+14.61	711.61	3'	3"	19.8	Left Shoulder
8+14.61	9+14.61	100.00	3'-2'	3"	2.3	Left Shoulder
1+19.00	8+94.04	775.04	4.42'	3"	31.7	Right Shoulder
8+94.04	9+91.00	96.72	4.42'	3"	4.0	Right Shoulder & Calculations
Total CUY-176-12.76					1,193.0	
Grand Total					5,508.8	

ITEM B-21 WATERPROOFED AGGREGATE BASE COURSE						
PROJECT CUY-71-17.83						
Station		Length	Width	Thickness	Volume	Remarks
From	To	Feet	Feet	Inches	Cu. Yds.	
<b>Southbound Medina</b>						
913+50	919+55.42	606.21	5'	3"	28.1	Right Shoulder & Calculations
919+55.42	920+80.42	125	5'-10'	3"	8.7	Right Shoulder
914+54.68	915+54.68	100	8'-10'	6"	16.7	Left Shoulder
915+54.68	920+56.64	491.18	10'	3"	45.5	Left Shoulder & Calculations
920+56.64	925+78.44	516.32	10'	3"	47.8	Left Shoulder & Calculations
925+78.44	934+75	896.56	4'	3"	33.2	Right Shoulder
925+78.44	929+50	371.56	10'	3"	34.4	Left Shoulder
934+75	935+00	25	4'-5'	3"	1.0	Right Shoulder
935+00	940+84.03	584.03	5'	3"	27.0	Right Shoulder
940+84.03	951+15	1,031.42	5'	3"	47.8	Right Shoulder & Calculations
939+22.95	941+71	941+71	Varies	3"	34.4	Nose Widening
941+71	951+15	937.24	10'	3"	86.8	Left Shoulder & Calculations
<b>Northbound Medina</b>						
913+00	916+61	374.36	10'	3"	34.7	Right Shoulder & Calculations
913+00	917+12	411.42	4'	3"	15.2	Left Shoulder & Calculations
935+21.25	937+20.72	199.47	9'	3"	16.6	Right Shoulder
935+21.25	937+20.72	199.47	5'	3"	9.2	Left Shoulder
937+20.72	940+28	308.43	9'	3"	25.7	Right Shoulder & Calculations
940+28	940+53	25	9'-10'	3"	2.2	Right Shoulder
940+53	943+58	306.16	10'	3"	28.3	Right Shoulder & Calculations
937+20.72	951+13.98	1,392.80	5'	3"	64.5	Left Shoulder & Calculations
943+58	946+05.02	946+05.02	Varies	3"	33.3	Nose Widening
946+05.02	948+49.72	244.70	8'	6"	36.2	Right Shoulder
948+49.72	950+49.72	200	8'-10'	6"	33.3	Right Shoulder
950+49.72	951+13.98	64.60	10'	3"	6.0	Right Shoulder & Calculations
<b>Northbound Jennings</b>						
53+60.26	63+72.74	976.25	10'	3"	90.4	Right Shoulder & Calculations
53+60.26	63+72.74	1,014.25	4'	3"	37.6	Left Shoulder & Calculations
74+45.47	84+01.36	955.26	5'	3"	44.2	Left Shoulder & Calculations
84+01.36	85+01.36	100	5'-2'	3"	3.2	Left Shoulder
81+40.77	84+01.36	261.78	3'	6"	14.5	Right Shoulder & Calculations
84+01.36	86+01.36	200	3'-8'	6"	20.4	Right Shoulder
<b>Lane J</b>						
0+00	1+00	100	8'	6"	14.8	Right Shoulder
<b>Southbound Outer Roadway</b>						
3+61.28	8+30	467.90	10'	3"	43.3	Right Shoulder & Calculations
8+30	29+63	2,133	10'	3"	197.5	Right Shoulder
29+63	31+35.33	31+35.33	Varies	3"	24.7	Nose Widening
12+41.50	13+66.50	125	10'-5'	3"	8.7	Left Shoulder
13+66.50	32+48	1,881.50	5'	3"	87.1	Left Shoulder
34+76	35+76	100	6'-4'	3"	4.6	Left Shoulder
35+76	39+80	391.17	4'	3"	14.5	Left Shoulder & Calculations
39+80	40+58.81	40+58.81	Varies	3"	6.6	Nose Widening
39+61.14	41+80.17	219.03	10'	3"	20.3	Right Shoulder
<b>Northbound Outer Roadway</b>						
7+93	15+20.02	720.29	5'	3"	33.3	Left Shoulder & Calculations
15+20.02	16+20.02	100	5'-2'	3"	3.2	Left Shoulder
10+74.41	17+18.04	644.75	10'	3"	59.7	Right Shoulder & Calculations
17+18.04	23+48.04	630	10'	3"	58.3	Right Shoulder
<b>Ramp J-NBOR</b>						
0+45	1+90.63	145.63	10'	3"	13.5	Right Shoulder
1+90.63	8+09	623.06	10'	3"	57.7	Right Shoulder & Calculations
8+09	10+89.24	10+89.24	Varies	3"	38.5	Nose Widening
7+40.90	12+10.40	469.19	5'	3"	21.7	Left Shoulder & Calculations
12+10.40	17+16.38	505.98	5'	3"	23.4	Left Shoulder
<b>Ramp SBOR-M</b>						
0+00	6+90.58	690.88	5'	3"	32.0	Left Shoulder & Calculations
6+90.58	9+86.63	296.05	5'	3"	13.7	Left Shoulder
9+86.63	10+79.73	93.10	5'-2'	3"	3.0	Left Shoulder
8+86.63	21+53.00	1,266.37	10'	3"	117.3	Right Shoulder

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE SDH DATE 11-20-64 CONSULTING ENGINEERS  
TRCD \_\_\_\_\_ DATE \_\_\_\_\_  
CKD JM DATE 12-30-64 KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

23  
646

CUYAHOGA COUNTY  
CUY. 71-17.83 CUY.176-12.76

ITEM B-21 WATERPROOFED AGGREGATE BASE COURSE						
PROJECT CUY-71-17.83						
Station		Length	Width	Thickness	Volume	Remarks
From	To	Feet	Feet	Inches	Cu. Yds.	
<b>Ramp 14-SBOR</b>						
0+00.09	4+04.41	404.32	3'	6"	22.5	Right Shoulder
4+04.41	5+47	143.00	3'-7'	6"	13.2	Right Shoulder & Calculations
0+00.09	0+78	77.91	3'	6"	4.3	Left Shoulder
0+78	1+78	100	3'-2'	6"	4.6	Left Shoulder
6+80	11+08.42	430.39	8'	6"	63.8	Right Shoulder & Calculations
<b>Ramp NBOR-14</b>						
2+65	3+57	92	10'-8'	6"	15.3	Right Shoulder
3+57	4+39.57	82.57	8'	6"	12.2	Right Shoulder
4+39.57	5+39.57	100	8'-3'	6"	10.2	Right Shoulder
4+39.57	10+22.30	582.73	3'	6"	32.4	Left Shoulder
5+39.57	9+25.45	385.88	3'	6"	21.4	Right Shoulder
<b>Lane M-J</b>						
0+00	2+70.62	270.62	4'	3"	10.0	Left Shoulder
2+70.62	3+95.50	124.64	4'	3"	4.6	Left Shoulder & Calculations
3+95.50	4+95.50	99.83	4'-3'	3"	3.2	Left Shoulder & Calculations
4+95.50	8+97.21	410.13	3'	6"	22.3	Left Shoulder & Calculations
4+95.50	5+70.50	76.46	10'-7'	6"	12.0	Right Shoulder & Calculations
5+70.50	7+72.21	205.49	7'	6"	26.6	Right Shoulder & Calculations
7+72.21	8+97.21	127.19	7'-2'	6"	10.6	Right Shoulder & Calculations
8+97.21	9+97.21	101.54	2'	6"	3.8	Right Shoulder & Calculations
8+97.21	10+97.21	199.66	3'-4'	3"	6.5	Left Shoulder & Calculations
10+97.21	12+17.23	119.79	4'	3"	4.4	Left Shoulder & Calculations
<b>Ramp 14-M</b>						
0+60	2+39.84	179.84	3'	6"	10.0	Left Shoulder
2+39.84	3+70.01	130.36	3'	6"	7.2	Left Shoulder & Calculations
3+70.01	3+79.99	9.98	3'	6"	0.6	Left Shoulder
0+64	7+92.78	728.78	7'	6"	94.5	Right Shoulder
3+79.99	7+92.78	412.79	3'	6"	22.9	Left Shoulder
7+92.78	15+77.25	796.45	3'	6"	44.2	Left Shoulder & Calculations
7+92.78	15+77.25	781.18	7'	6"	101.3	Right Shoulder & Calculations
<b>Ramp A</b>						
13+08	14+64.34	156.34	8'-3'	6"	15.9	Right Shoulder
14+64.34	15+41	78.33	3'	6"	4.4	Right Shoulder & Calculations
Total CUY-71-17.83		2429.2				
PROJECT CUY-176-12.76						
<b>Southbound Jennings</b>						
33+15.00	35+03.00	188.00	5'	3"	8.7	Right Shoulder
36+81.00	40+10.98	329.98	5'	3"	15.3	Right Shoulder
38+49.54	41+04.81	248.00	8'	6"	36.7	Left Shoulder & Measure
41+04.81	42+04.81	100.00	8'-10'	6"	16.7	Left Shoulder
40+10.98	45+68.45	558.64	5'	3"	25.9	Right Shoulder & Calculations
42+04.81	43+23.61	116.29	10'	3"	10.8	Left Shoulder & Calculations
45+68.45	49+00.00	331.55	5'	3"	15.3	Right Shoulder
49+00.00	50+00.00	100.00	5'-4'	3"	4.2	Right Shoulder
46+81.45	50+18.45	337.00	10'	3"	31.2	Left Shoulder
50+18.45	53+82.42	363.97	10'	3"	33.7	Left Shoulder
50+00.00	53+82.42	382.42	4'	3"	14.2	Right Shoulder

ITEM B-21 WATERPROOFED AGGREGATE BASE COURSE						
PROJECT CUY-176-12.76						
Station		Length	Width	Thickness	Volume	Remarks
From	To	Feet	Feet	In.	Cu. Yds.	
<b>Northbound Jennings</b>						
33+15.00	34+98.00	183.00	5'	3"	8.5	Left Shoulder
33+15.00	34+73.00	158.00	Varies	3"	19.8	Nose Widening
36+74.00	40+45.04	371.00	5'	3"	17.2	Left Shoulder
36+36.00	40+45.04	418.00	8'	6"	61.9	Right Shoulder & Measure
40+45.04	42+17.00	176.38	8'	6"	26.1	Right Shoulder & Calculations
40+45.04	45+53.01	507.08	5'	3"	23.5	Left Shoulder & Calculations
42+17.00	44+40.56		Varies	3"	29.2	Nose Widening
45+53.01	50+03.01	450.00	5'	3"	20.8	Left Shoulder & Measure
45+53.01	48+14.00	267.00	8'	6"	39.6	Right Shoulder & Measure
48+14.00	48+94.00	80.00	8'-10'	6"	13.3	Right Shoulder
48+94.00	50+55.00	161.00	10'	3"	14.9	Right Shoulder
50+55.00	53+60.26	305.26	10'	3"	28.3	Right Shoulder
50+03.01	50+55.00	51.99	5'	3"	2.4	Left Shoulder
50+55.00	51+55.00	100.00	5'-4'	3"	4.2	Left Shoulder
51+55.00	53+60.26	205.26	4'	3"	7.6	Left Shoulder
<b>Ramp J-JR</b>						
0+00.00	2+47.64	246.08	10'-8'	6"	41.0	Right Shoulder & Calculations
2+47.64	3+47.64	100.00	8'-3'	6"	10.2	Right Shoulder
3+47.64	4+25.32	77.68	3'	6"	4.3	Right Shoulder
2+47.64	4+25.32	182.15	3'	6"	10.1	Left Shoulder & Calculations
4+25.32	7+52.15	326.83	3'	6"	18.2	Left Shoulder
4+25.32	7+52.15	326.83	3'	6"	18.2	Right Shoulder
7+52.15	11+32.62	382.06	3'	6"	21.2	Right Shoulder
7+52.15	11+32.62	361.88	3'	6"	20.1	Left Shoulder & Calculations
11+32.62	12+24.62	92.00	3'	6"	5.1	Left Shoulder
11+32.62	18+03.32	670.70	3'	6"	37.3	Right Shoulder
15+24.62	18+03.32	278.70	3'	6"	15.5	Left Shoulder
18+03.32	19+69.12	189.64	3'	6"	10.5	Left Shoulder & Calculations
18+03.32	21+85.74	380.82	3'	6"	21.2	Right Shoulder & Calculations
21+85.74	22+46.03	60.29	3'	6"	3.3	Right Shoulder
<b>Ramp JR-J</b>						
0+00.00	2+75.16	274.01	3'	6"	15.2	Right Shoulder & Calculations
1+59.00	2+75.16	124.59	3'	6"	6.9	Left Shoulder & Calculations
2+75.16	7+45.60	470.44	3'	6"	26.1	Left Shoulder
2+75.16	7+45.60	470.44	3'	6"	26.1	Right Shoulder
7+45.60	9+35.87	190.39	3'	6"	10.6	Right Shoulder & Calculations
7+45.60	9+35.87	188.61	3'	6"	10.5	Left Shoulder & Calculations
9+35.87	10+35.87	100.00	3'-2'	6"	4.6	Left Shoulder
9+35.87	11+35.87	200.48	3'-8'	6"	20.4	Right Shoulder & Calculations
11+35.87	12+51.32	115.68	8'	6"	17.1	Right Shoulder & Calculations
<b>Ramp JN-D</b>						
0+00.00	1+34.00	134.00	8'	6"	19.9	Right Shoulder
3+05.00	11+00.00	795.00	7'	6"	103.1	Right Shoulder
11+00.00	11+75.00	75.00	7'-2'	6"	5.7	Deduct Widening
4+41.51	12+82.92	841.41	3'	6"	46.7	Left Shoulder
<b>Ramp D-JN</b>						
1+03.45	8+14.61	711.61	3'	6"	39.5	Left Shoulder
8+14.61	9+14.61	100.00	3'-2'	6"	4.6	Left Shoulder
1+19.00	8+94.04	775.04	7'	6"	100.5	Right Shoulder
8+94.04	9+91.00	96.72	7'	6"	12.5	Right Shoulder & Calculations
Total CUY-176-12.76		1,236.2				
Grand Total		3,683.4				

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE SDH DATE 11-20-64 CONSULTING ENGINEERS  
 TRCD. DATE \_\_\_\_\_  
 CND. IM DATE 2-20-64 KANSAS CITY CLEVELAND NEW YORK



# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

24  
646

CUYAHOGA COUNTY  
CUY.-71-17.83  
CUY-176-12.76

ITEM I-12 CONCRETE CURBS							
PROJECT CUY-71-17.83							
Station		Side	Std. Type 6	Std. Type 7	Std. Type 8	Std. Type 2-A	Remarks
From	To		Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	
<b>Southbound Medina</b>							
913+50	920+56.64	Right	709				£ Calculations
914+54.68	915+54.68	Left	100				£ Calculations
915+54.68	920+56.64	Left	490				£ Calculations
920+56.64	921+57	Right	100				£ Calculations
920+56.64	925+78.44	Left	516				£ Calculations
925+78.44	929+50	Left	372				£ Calculations
935+00	940+84.03	Right	584				£ Calculations
939+22.95	941+72	Left		249			£ Calculations
940+84.03	948+00	Right	717				£ Calculations
941+72	951+15	Left	945				£ Calculations
<b>Northbound Medina</b>							
937+33	948+00	Left	1,066				£ Calculations
946+05.02	951+13.98	Right	513				£ Measure
<b>Northbound Jennings</b>							
74+64	83+52	Left	887				£ Calculations
83+52	86+01.36	Left		249			£ Calculations
82+02	84+22.67	Right	222				£ Calculations
84+22.67	86+01.36	Right	178				£ Calculations
<b>Lane J</b>							
0+00	1+00	Right	100				
<b>Southbound Outer Roadway</b>							
3+61.28	8+30	Right	467				£ Calculations
8+30	29+63	Right	2,143				£ Calculations
12+41.50	20+75	Left	833				£ Calculations
<b>Northbound Outer Roadway</b>							
12+50	14+33	Left		181			£ Calculations
14+33	17+20.02	Left			287		£ Calculations
17+25	23+48.04	Right	623				£ Calculations
<b>Ramp J-NBOR</b>							
0+65	1+90.63	Right	126				£ Calculations
1+90.63	8+08	Right	633				£ Calculations
8+03	12+10.40	Left	407				£ Calculations
12+10.40	17+16.38	Left	506				£ Calculations
<b>Ramp SBOR-M</b>							
0+00	6+90.58	Left	691				£ Calculations
6+90.58	9+32	Left	241				£ Calculations
9+32	11+80.24	Left		248			£ Calculations
8+86.63	21+53	Right	1,266				£ Calculations
<b>Ramp 14-SBOR</b>							
0+78	1+06	Left		28			£ Measure
1+06	2+78	Left			172		£ Measure
4+75	5+56	Right	83				£ Measure
<b>Lane M-J</b>							
4+18	7+72.21	Right	363				£ Measure
7+72.21	10+19	Right		252			£ Measure
10+19	10+97.21	Right			79		£ Measure
<b>Ramp NBOR-14</b>							
4+67	5+40	Left	73				£ Measure
9+25.45	11+52.34	Right			227		£ Measure
10+22.30	11+85.63	Left			163		£ Measure
10+95.79	11+41.09	Left			140		Traffic Island
<b>Ramp 14-M</b>							
0+18	0+60	Left				42	£ Calculations
0+63	7+92.78	Right	730				£ Calculations
7+92.78	15+77.25	Right	780				£ Calculations
8+55	9+81	Left	129				£ Measure
<b>Relocated West 17th Street</b>							
0+00	9+01					1,859	Includes Intersection Quantities

ITEM I-12 CONCRETE CURBS							
PROJECT CUY-71-17.83							
Station		Side	Std. Type 6	Std. Type 7	Std. Type 8	Std. Type 2-A	Remarks
From	To		Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	
<b>Relocated West 14th Street</b>							
10+00	15+09	Right				479	£ Calculations
11+08	15+48	Left				464	£ Calculations, Includes Nose
21+51	22+70.40	Right				127	£ Calculations
22+70.40	24+62.06	Right				199	£ Calculations
22+26	23+63.68	Left				131	£ Calculations
24+62.06	25+72.07	Right				110	£ Calculations
<b>Northbound Relocated West 14th Street</b>							
23+63.68	26+00.70	Left				236	£ Measure
26+00.70	Ramp 14-M	Left				88	£ Measure
<b>Valentine Avenue</b>							
W. 17th St. 5+51.80	Rel. W. 14th 25+72.07	Left				203	
Hosp. Ent. 4+71.71	Ramp 14-M 0+63	Right				217	
<b>Ramp J-14</b>							
13+28	15+09.59	Left				174	£ Measure
13+80	15+18.83	Right				139	
15+49.22	16+21.88	Right				73	
<b>Ramp A</b>							
13+80	14+64.34	Left				84	
14+64.34	16+12.10	Left				99	£ Calculations Includes Nose
15+41	16+20.74	Right				80	
<b>Relocated Holden Avenue</b>							
0+00	3+67.25	Both				743	Includes Intersection Quantities
<b>West 17th Street</b>							
5+51.80	9+70	Right	418				
<b>West 14th Street</b>							
8+98.50	10+00	Right	102				
<b>Buhrer Avenue</b>							
3+48.65	3+88	Right	40				
3+88		Both	28				
<b>Total CUY-71-17.83</b>			<b>18,181</b>	<b>461</b>	<b>1,284</b>	<b>6,077</b>	
<b>PROJECT CUY-176-12.76</b>							
<b>Southbound Jennings</b>							
33+04.81	33+45	Left	40				
39+98	45+68.45	Right	573				£ Calculations
45+68.45	49+00	Right	333				£ Measure
46+70	53+25	Left	653				£ Measure
<b>Northbound Jennings</b>							
40+00	45+53.01	Left	551				£ Calculations
45+53.01	50+55	Left	502				£ Calculations
<b>Ramp J-JR</b>							
2+78	3+51	Left	73				
12+00	14+77	Left				277	
20+84.56	Belt Line Av. 0+54.57	Left				79	
Belt Line Av. 0+54.57	22+55.03	Left				124	
22+46.03	22+55.03	Right				9	
<b>Ramp JR-J</b>							
0+46	1+59	Left				121	£ Calculations
6+70	7+45.60	Left		76			£ Calculations
7+45.60	9+05	Left		158			£ Calculations
9+05	11+35.87	Left			229		£ Calculations
<b>Ramp JN-D</b>							
3+15	11+75	Right	860				
5+02	5+41.51	Left	40				
11+75	13+10.88	Right				136	
13+10.88	Den. Ave. 2+32.54	Right				65	
12+82.92	Den. Ave. 3+23.55	Left				59	

HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE S.D.L. DATE 11-22-64 CONSULTING ENGINEERS  
TRCD. DATE  
KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

25  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

ITEM 1-12 CONCRETE CURBS							
PROJECT CUY-176-12.76							
Station		Side	Std. Type 6 Lin. Ft.	Std. Type 7 Lin. Ft.	Std. Type 8 Lin. Ft.	Std. Type 2-A Lin. Ft.	Remarks
From	To						
<b>Ramp D-JN</b>							
Den. Ave. 5+04.25	1+03.45	Left				74	
Den. Ave. 6+29	1+19	Right				162	
1+19	9+67	Right	848				
5+00	8+49	Left		349			
8+49	10+04	Left			155		
<b>Relocated Jennings Road</b>							
4+71.29	6+74.50	Both				471	Includes Curb Term.
<b>Relocated Redman Avenue</b>							
0+00	4+35.30	Both				871	
<b>Relocated West 14th Street</b>							
10+18	11+94.65	Both				402	
<b>West 14th Street Radius</b>							
Den. Ave. 0+44.66	2+88.27	Both				132	
<b>Relocated West 15th Street</b>							
0+13	2+78.85	Both				539	Deduct Drive
<b>West 15th Street Cul-De-Sac</b>							
10+51.62		Both				274	
<b>West 14th Street</b>							
2+88.27	9+20	Left	632				
<b>West 15th Street</b>							
3+04	10+51.62	Right	748				
<b>Total CUY-176-12.76</b>			5,853	583	384	3,795	
<b>Grand Total</b>			24,034	1,044	1,668	9,872	

ITEM 1-22 SUBBASE GRADING "A" OR "B"							
PROJECT CUY-71-17.83							
Station		Length Feet	Width Feet	Thickness In.	Volume Cu. Yds.	Remarks	
From	To						
<b>Northbound Jennings</b>							
53+60.26	63+72.74	995.88	39.58	Max. 6"	729.9	Calculations	
74+45.47	81+40.77	695.30	Varies	6"	257.2	Widening	
81+40.77	82+40.77	100.20	26-24	6"	46.4	Calculations	
82+40.77	84+01.36	160.88	24	6"	71.5	Calculations	
84+01.36	85+01.36	100	24-19	6"	39.8		
85+01.36	86+01.36	100	19-17	6"	33.3		
81+40.77			Varies	10"	13.6	Under Nose Pavement	
<b>Lane M-J</b>							
0+00	3+95.50		Varies	6"	152.4		
3+95.50	4+95.50	101.08	30-29	6"	55.2	Calculations	
4+95.50	8+97.21	404.41	20	6"	149.8	Calculations	
8+97.21	9+97.21	100.66	21-19.5	6"	37.7	Calculations	
9+97.21	10+97.21	100.54	19.5-18	6"	34.9	Calculations	
10+97.21	12+17.23	120.48	16	6 to 7 1/2"	40.1	Calculations	
10+97.21	12+17.23		Varies	7 1/2"	6.0	Pavement Widening	
<b>Southbound Outer Roadway</b>							
3+61.28	4+75	114.14	26.58	18"	168.5	Calculations	
4+75	8+30.00	356.33	26.58	6"	175.4	Calculations	
8+30.00	11+41.50	311.50	26.58	6"	153.3		
11+41.50	12+41.50	100	36.58	6"	67.7		
12+41.50	31+35.33	1,893.83	27.58	Max. 7 1/2"	1,024.9		
31+35.33	32+28	92.67	25	6"	42.9		
32+28	33+62.88		Varies	6"	36.2		
35+18.37	35+76	78.52	30-28	18"	126.5	Calculations	
35+76	38+30	249.66	28	18"	388.4	Calculations	
38+30	39+61.14	128.90	28	6"	66.8	Calculations	
39+61.14	40+58.81	97.67	29	6"	52.5		
40+58.81	41+80.17	121.36	26.58	7 1/2"	74.7		
11+41.50			Varies	12"	24.2	Under Nose Pavement	
<b>Northbound Outer Roadway</b>							
7+95.56	9+06	111.02	29	6"	59.7	Calculations	
9+06	9+74.14	69.74	41	6"	51.6		
9+74.14	10+74.14	99.67	39	6"	72.0		
10+74.14	15+20.02	443.82	31.58	6"	259.6	Calculations	
15+20.02	16+20.02	99.55	31.58-30.58	6"	57.3		
16+20.02	17+20.02	99.57	30.58-28.58	6"	54.5		
17+20.02	22+25	504.98	26.58	7 1/2"	317.0		
22+25	23+48.04	123.04	26.58	19 1/2"	196.8		
17+20.02	20+88		Varies	7 1/2"	57.0		
<b>Ramp J-NBOR</b>							
0+42.57	1+90.63	148.06	26.58 Max.	6"	71.3		
1+90.63	7+40.90	552.18	26.58 Max.	6"	267.3	Calculations	
7+40.90	10+89.24	349.32	31.58	6"	204.3	Calculations	
7+40.90	8+40.90	100	2-0	6"	1.8	Nose Widening	
10+89.24	12+10.40	121.46	29	Max. 7 1/2"	52.8	Calculations	
12+10.40	14+57	246.60	29 Max.	Max. 7 1/2"	122.4		
14+57	15+92	135	27-23.56	Max. 7 1/2"	56.5		
15+92	17+16.38	124.38	23.56-20.39	Max. 19 1/2"	151.6		
<b>Ramp SBOR-M</b>							
0+00	1+14	114	13-14.7	18"	87.7		
1+14	1+35	21	14.7-15	6"	5.8		
1+35	4+08.19	272.73	15-27	6"	106.1	Calculations	
4+08.19	5+66	157.38	27-39	6"	96.2	Calculations	
5+66	6+90.58	124.19	37	6"	85.1	Calculations	
6+90.58	7+86.63	96.05	37	6"	65.8		
5+66.00	7+86.63	220.63	2-12	6"	28.6		
7+86.63	8+86.63	100.00	35	6"	64.8		
8+86.63	9+86.63	100.00	27.58	Max. 7 1/2"	54.1		
9+86.63	10+79.73	93.10	27.58-29.58	Max. 7 1/2"	53.4		
10+79.73	11+80.24	100.51	30.58-28.5	7 1/2"	68.8		
11+80.24	12+68.74	88.50	33.58-37.08	7 1/2"	78.5		
12+68.74	21+53.00	885.00	37.08-14.58	7 1/2"	529.2		

ITEM 1-22 SUBBASE GRADING "A" OR "B"							
PROJECT CUY-71-17.83							
Station		Length Feet	Width Feet	Thickness In.	Volume Cu. Yds.	Remarks	
From	To						
<b>Southbound Medina</b>							
913+50	915+25	173.40	37	Max. 6"	118.6	Calculations	
914+54.68	915+25		Varies	Max. 6"	12.2		
915+25	915+54.68		Varies	Max. 18"	7.7	Widening	
915+25	920+56.64	526.42	39.58	Max. 18"	115.3	Calculations	
920+56.64	920+80.42	23.66	39.58	Max. 18"	52.0	Calculations	
920+80.42	921+00	19.51	48.58	Max. 18"	52.7	Calculations	
921+00	921+80.42	80.13	48.58	Max. 6"	72.1	Calculations	
921+80.42	925+78.44	396.05	38.58	Max. 6"	283.0	Calculations	
925+78.44	929+50	371.56	51.58	Max. 7 1/2"	407.4		
929+50	939+22.95	972.95	37.00	Max. 7 1/2"	738.7		
939+22.95	940+84.03	161.08	39.58	Max. 7 1/2"	131.9		
940+84.03	950+00	912.97	39.58	Max. 6"	668.3	Calculations	
950+00	951+15	114.62	39.58	Max. 18"	252.0	Calculations	
921+80.42			Varies	Max. 12"	6.2	Under Nose Pavement	
<b>Northbound Medina</b>							
913+00	917+10.96	397.58	53.00	6"	390.2	Calculations	
935+21.25	937+20.72	199.47	27.58	Max. 7 1/2"	107.9		
937+20.72	946+05.02	885.55	31.58	6"	517.9	Calculations	
946+05.02	950+00	395.47	29	6"	212.4	Calculations	
950+00	950+49.72	49.78	29	18"	80.2	Calculations	
950+49.72	951+13.98	64.40	43.58	18"	155.9		
946+05.02	950+00		Varies	6"	140.5	Acceleration Lane	
950+00	950+49.72	49.72	Varies	18"	40.3	Acceleration Lane	
948+00	950+00		Varies	Varies	42.6	Under Median Pavement	
950+00	951+13.98		Varies	Varies	63.3	Under Median Pavement	

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE SDH DATE 11-30-64 CONSULTING ENGINEERS  
TRCD. DATE \_\_\_\_\_  
CKD IM DATE 12-30-64 KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

26  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

ITEM I-22 SUBBASE GRADING "A" OR "B"						
PROJECT CUY-71-17.83						
Station		Length	Width	Thickness	Volume	Remarks
From	To	Feet	Feet	In.	Cu. yds.	
<b>Ramp 14-SBOR</b>						
0+00.09	0+78.00	77.91	20	6"	28.9	Left Shoulder
0+78	1+78.00	100	18-16	6"	31.5	Left Shoulder
1+78.00	2+78.00	100	17-15	6"	29.6	
2+78.00	4+04.41	126.41	13	6"	30.4	
2+78.00	5+38		Varies	6"	50.3	Planimeter
6+75	9+75		Varies	18"	75.0	
9+43	11+08.42		Varies	6"	6.8	Widening
0+00.09	4+75		Varies	6"	85.6	Under Median Pavement and Shoulders
<b>Ramp NBOR-14</b>						
2+63	4+39.57	176.57	14.58	6"	47.7	
2+63	4+39.57		Varies	6"	24.0	Widening
4+39.57	5+39.57	100	21.58-20	6"	38.5	
5+39.57	9+34.45	394.88	20	6"	146.2	Includes Flare
9+34.45	11+41.09		Varies	6"	142.5	Includes Turnout
4+39.57			Varies	12"	7.5	Under Nose Pavement
<b>Lane J</b>						
0+00	1+00		Varies	6"	28.0	Deceleration Lane
<b>Ramp 14-M</b>						
0+00	0+60		Varies	6"	32.4	Includes Flareouts
0+60	3+79.99	319.99	16.58	6"	98.2	Right Lane
0+60	2+39.84	179.84	17	6"	56.6	Left Lane
2+39.84	3+70.01	129.77	17	6"	40.8	Calculations, Left Lane
3+70.01	3+79.99	9.98	17	6"	3.1	
1+24	3+79.99		Varies	6"	45.6	Center Lane
3+79.99	7+92.78	412.79	19.58	6"	148.6	
7+92.78	15+77.25	789.41	19.58	6"	284.2	Calculations
<b>Ramp J-14</b>						
13+09.49	15+09.59	194.12	16	6"	57.5	Calculations
13+09.59	15+09.59		Varies	6"	14.0	Widenings and Shoulders
15+09.59	16+21.88	112.29	12	6"	25.0	
15+09.59	16+21.88		Varies	6"	9.8	Widening and Curb
<b>Ramp A</b>						
13+08	13+59.97		Varies	6"	20.4	Nose Widening
13+59.97	14+64.34	103.54	24.5-27.5	6"	49.8	Calculations
14+64.34	15+41	65.74	27.5	6"	33.5	Calculations
15+41	16+06.33	55.79	27.5	6"	28.4	Includes Flareouts
16+06.33	16+20.74		Varies	6"	2.8	Planimeter
13+59.97			Varies	10"	4.2	Under Nose Pavement
<b>Relocated West 14th Street</b>						
10+00.00	11+08.22	106.67	39.67	6"	78.4	Calculations
11+08.22	15+48.07	433.28	45.17	6"	362.4	Calculations
21+52.7	22+70.40	123.96	45.17	6"	103.7	Calculations
22+70.40	23+63.68	94.19	43.67	6"	76.2	Calculations
23+63.68	24+62.06	98.38	24	6"	43.7	
22+70.40	24+62.06		Varies	6"	27.3	Widening
24+62.06	25+72.07	110.01	37.67	6"	76.7	
25+72.07	26+50.44	79.74	24	6"	35.4	
23+63.68	23+92.89	28.58	17.5	6"	9.3	N.B. Rel. W. 14th St.
23+92.89	26+00.70	207.81	17.5-21.5	6"	75.0	N.B. Rel. W. 14th St.
26+00.70	26+39.96	47.31	21.5	6"	18.8	N.B. Rel. W. 14th St.
26+39.96	Rel. W. 14th St.		Varies	6"	7.4	N.B. Rel. W. 14th St.
23+63.68	26+33.83		Varies	Varies	127.1	Under Median

ITEM I-22 SUBBASE GRADING "A" OR "B"						
PROJECT CUY-71-17.83						
Station		Length	Width	Thickness	Volume	Remarks
From	To	Feet	Feet	In.	Cu. yds.	
<b>Valentine Avenue</b>						
0+09	0+98.37	89.37	31.34	6"	51.9	
0+98.37	1+75	75	15.67	6"	21.8	
0+98.37	Rel. W. 14th St 25+72.07	119.62	13.67	6"	30.3	Left Turnoff
W. 17th St. 5+51.80	00+51.88		Varies	6"	6.3	
Hosp. Ent. 4+71.71	00+22.82		Varies	6"	1.9	
1+45.14	Ramp 14-M 00+42.28		Varies	6"	3.6	
0+98.37	Rel. W. 14th St. 25+72.07		Varies	6"	15.2	
1+41.27	1+73		Varies	12"	22.2	Traffic Island
<b>Total CUY-71-17.83</b>					15,032.4	
PROJECT CUY-176-12.76						
<b>Southbound Jennings</b>						
32+84.81	34+00.00	115.19	39	6"	83.2	
34+00.00	34+04.81	4.81	39	18"	10.4	
34+04.81	35+05.23	112.92	41	18"	257.2	
36+83.08	38+49.54	157.50	29	18"	253.8	
38+49.54	40+10.98	159.50	43.58	18"	386.2	
40+10.98	41+04.81	92.65	39.58	18"	203.4	Calculations
41+04.81	41+30	25.15	27.58	18"	38.5	Calculations
41+30	43+23.61	191.88	27.58	6"	98.0	Calculations
41+04.81	41+30		Varies	18"	14.6	Taper
41+30	42+04.81		Varies	6"	6.2	Taper
43+23.61	44+23.61	98.85	35	6"	64.1	Calculations
44+23.61	44+83.00	58.66	37	6"	40.2	Calculations
44+83.00	45+68.45	84.76	25	6"	39.2	Calculations
45+68.45	46+81.45	112.50	25	6"	52.1	
46+81.45	50+18.45	337.00	39.58	6"	247.0	
50+18.45	53+82.42	363.97	39.58	7 1/2"	298.2	
<b>Northbound Jennings</b>						
32+84.81	34+00.00	115.19	31.58	6"	67.4	
34+00.00	34+94.03	85.61	31.58	18"	150.2	
32+84.81	34+00.00	115.19	6	6"	12.8	Under Median Pavement
34+00.00	35+00.00	100.00	6	18"	33.3	Under Median Pavement
36+71.62	40+45.04	383.50	29	18"	617.9	
36+71.62	39+02	258.50	Varies	18"	258.7	Right Lane and Taper
39+02	41+30		Varies	18"	167.9	Acceleration Lane
41+30	43+80.98		Varies	6"	22.7	Acceleration Lane
40+45.04	41+30	85.52	29	18"	137.8	Calculations
41+30	44+40.56	312.62	29	6"	167.9	Calculations
44+40.56	45+53.01	113.20	29	6"	60.8	Calculations
45+53.01	48+14	263.50	50.5-44	6"	230.6	Measure
48+14	48+94	80.00	44-42	6"	63.7	
48+94	50+03.01	109.5	42	6"	85.2	Measure
50+03.01	53+60.26	357.25	39.58	6"	261.8	
36+77	38+00	123.00	6	6"	13.7	Under Median Pavement
38+00	40+00	200.00	6-11.5	6"	32.4	Under Median Pavement
<b>Ramp J-JR</b>						
0+00	2+47.64		Varies	6"	91.8	
2+47.64	3+47.64	101.19	21.58-19.58	6"	38.6	Calculations
3+47.64	4+25.32	78.55	20	6"	29.1	Calculations
4+25.32	5+00.00	74.68	20	6"	27.7	
5+00	7+52.15	252.15	20	18"	280.2	
7+52.15	11+32.62	371.97	20	18"	413.3	Calculations
11+32.62	12+24.62	92.00	20	18"	102.2	
12+24.62	15+24.62	300.00	23.5-28.5	18"	433.3	
15+24.62	18+03.32	278.70	56	18"	867.1	
18+03.32	19+69.12	177.37	56	18"	551.8	Calculations
19+69.12	21+00.00	139.47	53	18"	410.7	Calculations
21+00.00	21+85.74	89.93	38.0	18"	189.9	Calculations
21+85.74	22+55.03	69.29	39.67	18"	152.7	
21+00.00	21+85.74		Varies	18"	109.8	Beltline Intersection
2+47.64	2+77.64		Varies	12"	8.0	Under Median Pavement

SCALE: \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE SDH DATE 11-30-64 CONSULTING ENGINEERS  
TRCD DATE \_\_\_\_\_ KANSAS CITY CLEVELAND NEW YORK  
CKD IM DATE 12-30-64

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

27  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

ITEM I-22 SUBBASE GRADING "A" OR "B"						
PROJECT CUY-176-12.76						
Station		Length Feet	Width Feet	Thickness In.	Volume Cu. Yds.	Remarks
From	To					
<b>Ramp JR-J</b>						
0+00.00	1+59.00	164.44	28.5	18"	260.4	Calculations
1+59.00	2+75.16	120.05	28	18"	186.7	Calculations
2+75.16	5+35.82	260.66	28	18"	405.5	
5+35.82	7+45.60	209.78	28-23.81	18"	301.9	
7+45.60	9+00.00	153.85	23.81-20.72	18"	190.3	Calculations
9+00.00	9+35.87	35.76	20.72-20	6"	13.5	Calculations
9+35.87	10+35.87	99.67	20-18	6"	35.1	Calculations
10+35.87	11+35.87	99.66	19-17	6"	33.2	Calculations
11+35.87	12+51.32		Varies	6"	50.4	
<b>Ramp JN-D</b>						
0+00.00	1+37.00		Varies	18"	126.9	
3+08.00	4+41.51		Varies	18"	148.5	
4+41.51	5+41.51	100.00	21.58-19.58	18"	114.3	
5+41.51	11+00.00	558.49	19.58	18"	607.5	
11+00.00	11+75.00	75.00	19.58-25	18"	92.9	
11+75.00	12+82.92	107.92	26.67	18"	159.9	
12+82.92	13+47.00	64.08	26.67	18"	95.0	
12+91.92	Den. Ave. 3+23.55		Varies	18"	27.0	Left Radius
13+10.88	Den. Ave. 2+32.54		Varies	18"	22.2	Right Radius
4+41.51	5+01.51		Varies	12"	15.8	Under Median Pavement
<b>Ramp D-JN</b>						
0+25	1+19.00	94	16	6"	27.9	
Den. Ave. 5+04.25	00+94.45		Varies	6"	13.7	Left Radius
Den. Ave. 5+88.88	0+58.38		Varies	6"	6.9	Right Radius
1+19.00	8+14.61	695.61	19.58	6"	252.2	
8+14.61	9+14.61	100.00	19.58-17.58	6"	34.4	
9+14.61	9+98.00	84.00	18.58-16.58	6"	27.3	
<b>Relocated Jennings Road</b>						
4+71.29	6+74.50	203.21	38.34	18"	432.8	
Ramp J-JR 20+84.56	5+11.90		Varies	18"	23.4	Right Radius
Ramp J-JR 19+78.12	5+26.53		Varies	18"	27.9	Left Radius
<b>Total CUY-176-12.76</b>					<b>11,916.8</b>	
<b>Grand Total</b>					<b>26,949.2</b>	

ITEM I-22 SUBBASE REGULAR GRADING						
PROJECT CUY-71-17.83						
Station		Length Feet	Width Feet	Thickness In.	Volume Cu. Yd.	Remarks
From	To					
<b>Southbound Medina</b>						
913+50	915+25	175	4	5.4-3	9.1	Right Shoulder
914+54.68	915+25	70.32	5.42-6.88	Varies	5.4	Left Shoulder
915+25	919+55.42	430.42	4	17.4-15	86.1	Right Shoulder
919+55.42	920+80.42	125	4-9	Varies	10.2	Right Shoulder
915+25	920+56.64	519.87	7.42	22.68-15	224.3	Left Shoulder & Calculations
920+56.64	921+00	42.89	7.42	22.68-15	18.5	Left Shoulder & Calculations
921+00	925+78.44	473.26	7.42	8.12-3	60.3	Left Shoulder & Calculations
925+78.44	929+50	371.56	7.42	8.12-3	47.3	Left Shoulder
925+78.44	929+50	371.56	3	3	10.3	Right Shoulder
929+50	934+75	525	3	3	14.6	Right Shoulder
934+75	935+00	25	3-4	3	0.8	Right Shoulder Trans.
935+00	940+84.03	584.03	4	3	21.6	Right Shoulder
940+84.03	948+03	719	4	5.4-3	37.3	Right Shoulder
939+22.95	941+71		Varies	5.6 Ave.	70.7	Left Nose Widening
941+71	950+00	822.88	7.42	8.12-3	104.8	Left Shoulder & Calculations
950+00	951+15	114.15	7.42	20.12-15	49.9	Left Shoulder & Calculations

ITEM I-22 SUBBASE REGULAR GRADING						
PROJECT CUY-71-17.83						
Station		Length Feet	Width Feet	Thickness In.	Volume Cu. Yd.	Remarks
From	To					
<b>Northbound Medina</b>						
913+00	916+61	374.66	9	5.7-3	45.2	Right Shoulder & Calculations
935+21.25	937+20.72	199.47	6.42	7.4-3	20.6	Right Shoulder
935+21.25	937+20.72	199.47	4	5.4-3	10.3	Left Shoulder
937+20.72	940+28	308.48	6.42	6.3-3	28.4	Right Shoulder & Calculations
940+28	940+53	25	6.42-7.42	Varies	2.2	Right Shoulder
940+53	943+58	306.21	7.42	5.22-3	28.8	Right Shoulder & Calculations
943+58	946+05.02		Varies	4.5 Ave.	63.9	Nose Widening
946+05.02	948+49.72	244.70	5.42	6.75-3	20.0	Right Shoulder
948+49.72	950+00	150.28	5.42-6.92	Varies	19.4	Right Shoulder
950+00	950+49.72	49.72	6.92-7.42	Varies	8.5	Right Shoulder
950+49.72	951+13.98	64.60	7.42	20.12-15	26.0	Right Shoulder
<b>Lane M-J</b>						
0+00	3+95.50	395.26	3	5.26-3	15.1	Left Shoulder & Calculations
4+95.50	5+70.50	76.49	9-6	Varies	7.6	Right Shoulder & Calculations
5+70.50	7+72.21	205.61	6	5.57-3	16.3	Right Shoulder & Calculations
7+72.21	8+97.21	127.46	6-1	Varies	5.6	Right Shoulder & Calculations
<b>Southbound Outer Roadway</b>						
3+61.28	4+75	113.72	7.42	20.12-15	45.7	Right Shoulder
4+75	29+63	2,488	7.42	8.12-3	316.9	Right Shoulder
12+41.50	13+66.50	125	9-4	Varies	6.2	Left Shoulder
13+66.50	32+48	1,881.50	4	3	69.7	Left Shoulder
29+63	31+35.33		Varies	4.5 Ave.	36.7	Right Shoulder
39+61.14	41+00	138.86	9	5.7-3	16.8	Right Shoulder
41+00	41+80.17	80.17	7.42	6.34-3	8.6	Right Shoulder
39+80	40+58.81	78.81	10-0	4.5 Ave.	5.5	Nose Widening
<b>Northbound Jennings</b>						
53+60.26	63+72.74	975.14	7.42	5.22-3	91.7	Right Shoulder & Calculations
53+60.26	63+72.74	1,014.71	3	5.26-3	38.7	Left Shoulder & Calculations
84+01.36	86+01.36	200	0-5	Varies	6.7	Right Shoulder
<b>Ramp SBOR-M</b>						
0+00	1+14	114	4	17.4-15	22.8	Left Shoulder
1+14	6+90.58	576.88	4	5.4-3	29.9	Left Shoulder & Calculations
6+90.58	8+86.63	196.05	4	5.4-3	10.2	Left Shoulder
8+86.63	9+86.63	100	4	3	3.7	Left Shoulder
9+86.63	10+79.73	93.10	4-1	3	2.1	Left Shoulder
8+86.63	21+53	1,266.37	7.42	8.12-3	161.3	Right Shoulder
<b>Ramp J-NBOR</b>						
0+45	1+90.63	145.63	7.42	8.12-3	18.6	Right Shoulder
1+90.63	3+50	160.60	9	8.12-3	25.7	Right Shoulder & Calculations
3+50	8+09	462.60	7.42	8.12-3	58.9	Right Shoulder & Calculations
8+09	10+89.24		Varies	4.5 Ave.	59.7	Nose Widening
13+10	15+92	282	4	3	10.4	Left Shoulder
15+92	17+16.38	124.38	4	15	23.0	Left Shoulder
<b>Ramp 14-SBOR</b>						
0+00.09	4+04.41	404.32	2	5-3	10.0	Right Shoulder
0+78	1+78	100	2-1	Varies	2.8	Left Shoulder
4+04.41	5+50	145.59	2-6	Varies	7.5	Right Shoulder & Calculations
6+80	9+43	263	5.42	17.04-15	70.3	Right Shoulder
9+43	11+08.42	165.42	7	Varies	23.7	Right Shoulder
<b>Ramp NBOR-14</b>						
2+65	3+57	92	7.42-5.42	Varies	7.2	Right Shoulder
3+57	4+39.57	82.57	5.42	5.04-3	5.5	Right Shoulder
4+39.57	5+39.57	100	5.42-0	Varies	3.4	Right Shoulder
4+39.57	10+22.30	582.73	2	5-3	14.5	Left Shoulder
<b>Lane J</b>						
0+00	1+00	100	5.42	5.04-3	6.7	Right Shoulder

SCALE: \_\_\_\_\_  
MADE BY: SDH DATE: 11-20-64  
TRCD: \_\_\_\_\_ DATE: \_\_\_\_\_  
CKD: IM DATE: 12/30/64  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

28  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

ITEM I-22 SUBBASE REGULAR GRADING						
PROJECT CUY-71-17.83						
Station		Length Feet	Width Feet	Thickness In.	Volume Cu. Yd.	Remarks
From	To					
<b>Ramp 14-M</b>						
0+64	7+92.78	728.78	4.42	4.90-3	39.1	Right Shoulder
7+92.78	15+77.25	781.19	4.42	4.90-3	42.0	Right Shoulder & Calculations
8+54	15+77.25	734.61	2	5-3	18.2	Left Shoulder & Calculations
<b>Ramp A</b>						
13+08	14+64.34	156.34	7-2	Varies	9.2	Right Shoulder
14+64.34	15+41	78.88	2	5-3	2.0	Right Shoulder & Calculations
<b>Relocated West 17th Street</b>						
0+00	9+01	901	31	4	344.5	Use Curb Flares for Intersect. Curb Quantities
1+15.46	2+01.39		Varies	4	15.5	Titus Intersection
5+09.69	5+98.30		Varies	4	15.9	Eglindale Intersection
8+19.90	N. Edge Aiken		Varies	4	22.9	Aiken Intersection
<b>Relocated Holmden Avenue</b>						
0+00	0+52.32	52.32	33-31	4	20.6	
0+52.32	3+67.25	314.92	31	4	120.4	
3+42.25	Buhrer Ave.		Varies	4	2.4	Northwest Radius
3+42.25	Buhrer Ave.		Varies	4	2.4	Northeast Radius
<b>Northbound Outer Roadway</b>						
10+74.14	17+20.02	645.88	7.42	5.22-3	60.8	Right Shoulder
17+20.02	22+25	504.98	7.42	8.12-3	64.3	Right Shoulder
22+25	23+48.04	123.04	7.42	20.12-15	49.5	Right Shoulder
Total CUY-71-17.83					3,139.9	
PROJECT CUY-176-12.76						
Southbound Jennings						
38+49.54	41+04.81	248.00	5.42	17.04-15	66.4	Left Shoulder & Measurements
41+04.81	41+30.00	25.00	5.42-5.92	Varies	7.0	Left Shoulder
41+30.00	42+04.81	75.00	5.92-7.42	Varies	7.0	Left Shoulder
40+10.98	41+30.00	119.27	4	17.4-15	23.9	Right Shoulder & Calculations
41+30.00	45+68.45	439.37	4	5.4-3	22.8	Right Shoulder & Calculations
42+04.81	43+23.61	116.29	7.42	5.22-3	10.9	Left Shoulder & Calculations
45+68.45	49+00.00	331.55	4	5.4-3	17.2	Right Shoulder
49+00.00	50+00.00	100.00	4-3	Varies	4.5	Right Shoulder
46+81.45	50+18.45	337.00	7.42	5.22-3	31.7	Left Shoulder
50+18.45	53+25.00	306.55	7.42	8.1-3	39.1	Left Shoulder
53+25.00	53+82.42	57.42	7.42	6.34-3	6.2	Left Shoulder
50+00.00	53+82.42	382.42	3	5.26-3	14.6	Right Shoulder
Northbound Jennings						
32+84.81	33+15.00	30.00	18	4.5 Ave.	7.5	Right Shoulder
33+15.00	34+00.00	85.00	14.5 Ave.	10.5-3	51.2	Right Shoulder
34+00.00	34+73.00	73.00	11 Ave.	22.5-15	46.1	Right Shoulder
36+36.00	40+45.04	418.00	5.42	17.04-15	111.9	Right Shoulder & Measurements
40+45.04	41+30.00	87.16	5.42	17.04-15	23.3	Right Shoulder & Calculations
41+30.00	42+17.00	89.22	5.42	5.04-3	6.0	Right Shoulder & Calculations
42+17.00	43+13.00	96.00	16 Ave.	7.2-3	24.2	Nose Widening
43+13.00	44+40.56	127.60	12 Ave.	4.5 Ave.	21.3	Nose Widening
45+53.01	48+14.00	267.00	7	5.63-3	24.9	Right Shoulder & Measurements
48+14.00	48+94.00	80.00	7-9	Varies	8.5	Right Shoulder & Measurements
48+94.00	50+55.00	161.00	9	5.7-3	19.4	Right Shoulder & Measurements
50+55.00	53+60.26	305.26	7.42	6.34-3	32.7	Right Shoulder & Measurements
50+55.00	51+55.00	100.00	4-3	3	3.2	Left Shoulder
51+55.00	53+60.26	205.26	3	3	5.7	Left Shoulder

ITEM I-22 SUBBASE REGULAR GRADING						
PROJECT CUY-176-12.76						
Station		Length Feet	Width Feet	Thickness In.	Volume Cu. Yds.	Remarks
From	To					
<b>Ramp J-JR</b>						
0+00.00	2+47.64		7.42-5.42	Varies	19.2	Right Shoulder
2+47.64	3+47.64		5.42-0	Varies	3.4	Right Shoulder
2+47.64	4+25.32	182.15	2'	5'-3"	4.5	Left Shoulder & Calculations
4+25.32	5+00	74.68	2'	5'-3"	1.9	Left Shoulder
5+00	6+90	190.00	2'	17"-15"	18.8	Left Shoulder
6+90.00	7+52.15	62.15	2'	17"-15"	6.1	Right Shoulder
7+52.15	11+32.62	382.59	2'	17"-15"	37.8	Right Shoulder & Calculations
11+32.62	12+00.00	67.38	2'	17"-15"	6.7	Right Shoulder
<b>Ramp JR-J</b>						
1+59.00	2+75.16	124.59	2'	17"-15"	12.3	Left Shoulder & Calculations
2+75.16	7+45.60	470.44	2'	17"-15"	46.5	Left Shoulder
7+45.60	9+00	153.20	2'	17"-15"	15.1	Left Shoulder & Calculations
9+00	9+35.87	35.87	2'	5'-3"	0.9	Left Shoulder
9+35.87	10+35.87	100.00	2'-1'	Varies	1.8	Left Shoulder
9+35.87	11+35.87		0-5.42	Varies	6.7	Right Shoulder
11+35.87	12+51.32	115.68	7'	5.52"-3"	10.6	Right Shoulder & Calculations
<b>Ramp JN-D</b>						
0+00.00	1+34.00	134.00	5.42	5.04-3	9.0	Right Shoulder
3+05.00	4+41.00	136.00	4.42	4.9-3	7.3	Right Shoulder
4+41.00	11+00.00	659.00	4.42	16.9-15	143.3	Right Shoulder
11+00.00	11+75.00	75.00	4.42-0	Varies	8.6	Right Shoulder
4+41.51	12+82.92	841.41	2'	17"-15"	83.2	Left Shoulder
<b>Ramp D-JN</b>						
1+03.45	8+14.61	711.16	2	5-3	17.6	Left Shoulder
8+14.61	9+14.61	100.00	2-1	Varies	1.8	Left Shoulder
1+19.00	8+94.04	775.04	4.42	4.9-3	41.6	Right Shoulder
8+94.04	9+91.00	96.72	4.42	4.9-3	5.2	Right Shoulder & Calculations
<b>Relocated Redman Avenue</b>						
0+00.00	0+26.06	26.06	29	4	9.3	
0+26.06	1+26.79	100.73	29-27	4	34.8	
1+26.79	4+35.30	308.51	27	4	102.7	
<b>Relocated West 14th Street</b>						
10+18.00	11+94.65	176.65	29	4	63.2	Use Curb Flares for Intersect. Quantity
Den. Ave. 8+22.76	10+45.00		Varies	4	2.4	Right Radius
Den. Ave. 7+46.76	10+45.00		Varies	4	2.4	Left Radius
11+67.65	Exist. Den. 2+69.59		Varies	4	2.4	Right Radius
11+67.65	Exist. Den. 1+93.59		Varies	4	2.4	Left Radius
<b>Relocated West 15th Street</b>						
0+13.00	2+78.85	265.85	27	4	88.5	Use Curb Flares for Intersect. Quantity
Den. Ave. 1+12.44	0+33.47		Varies	4	1.7	Left Radius
Den. Ave. 1+87.86	0+48.06		Varies	4	3.5	Right Radius
<b>West 15th Street Cul-De-Sac</b>						
10+51.62			Varies	4	74.7	
<b>West 14th Street Radius</b>						
Den. Ave. 0+46.26	2+88.27	68.28	31-29	4	25.3	& Calculations
Total CUY-176-12.76					1,560.4	
Grand Total					4,700.3	

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE SDY DATE 11-20-64 CONSULTING ENGINEERS  
TRCD. DATE \_\_\_\_\_  
CKD. LM DATE 2-30-64 KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY. 71-17.83  
 CUY. 176-12.76

ITEM 1-21 PORTLAND CEMENT CONCRETE MEDIAN AS PER PLAN			
PROJECT CUY-71-17.83			
Station	Area Calculations Sq. Yd.		Remarks
From	To	(Conversion From Subbase Calcs.)	
<i>Southbound Medina</i>			
921+57	921+80.42	6.2 x 3 = 18.6	Nose Pavement
<i>Northbound Medina</i>			
948+00	951+13.98	2160 Sq. Ft. ÷ 9 = 240.0	Medina Pavement, Planimeter
<i>Northbound Jennings</i>			
81+40.77	82+03	13.6 x 12 x 3 ÷ 10 = 49.0	Nose Pavement
<i>Ramp 14-SBOR</i>			
0+00.09	4+75	2,670 Sq. Ft. ÷ 9 = 296.7	Median Pavement, Planimeter
<i>Ramp NBOR-14</i>			
4+39.57	4+67	7.5 x 3 = 22.5	Nose Pavement
<i>Southbound Outer Roadway</i>			
11+41.50	12+41.50	24.2 x 2 x 3 = 72.6	Nose Pavement
<i>Ramp A</i>			
13+59.97	13+78	4.2 x 12 x 3 ÷ 10 = 15.1	Nose Pavement
<i>Relocated West 14th Street</i>			
23+63.68	26+33.83	2,920 Sq. Ft. ÷ 9 = 324.4	Traffic Island, Planimeter
<i>Valentine Avenue</i>			
1+41.27	1+73	22.2 x 3 = 66.6	Traffic Island
Total CUY-71-17.83		1,105.5	
PROJECT CUY-176-12.76			
<i>Northbound Jennings</i>			
33+15	35+00	185 x 6 ÷ 9 = 123.3	Median Pavement
36+77	38+00	13.7 x 6 = 82.2	Median Pavement
38+00	40+00	32.4 x 6 = 194.4	Median Pavement
<i>Ramp J-JR</i>			
2+47.64	2+77.64	8.0 x 3 = 24.0	Nose Pavement
<i>Ramp JN-D</i>			
4+41.51	5+01.51	15.8 x 3 = 47.4	Nose Pavement
Total CUY-176-12.76		471.3	
Grand Total		1,576.8	

ITEM 1-21 SPECIAL 4" CONCRETE MEDIAN AS PER PLAN			
PROJECT CUY-71-17.83			
Station	Area Calculations Sq. Yd.		Remarks
From	To	(Conversion From Subbase Calcs.)	
<i>Relocated West 14th Street</i>			
11+37	15+48.07	411 x 2 ÷ 9 = 91.4	
21+52.66	23+63.68	211 x 2 ÷ 9 = 46.8	
Total CUY-71-17.83		138.2	

ITEM 1-21 SPECIAL 6" CONCRETE MEDIAN AS PER PLAN			
PROJECT CUY-176-12.76			
Station	Area Calculations Sq. Yd.		Remarks
From	To	(Conversion From Subbase Calcs.)	
<i>Ramp J-JR</i>			
14+76	15+24.62	140 Sq. Ft. ÷ 9 = 15.6	Planimeter
15+24.62	18+03.32	279 x 2 ÷ 9 = 62.0	
18+03.32	19+86	195 x 2 ÷ 9 = 43.3	£ Calculations
Total CUY-176-12.76		120.9	

ITEM 1-7 REINFORCED CONCRETE APPROACH SLAB (T=13")				
PROJECT CUY-71-17.83				
Station	Calculations		Area Sq. Yds.	
From	To			
<i>Northbound Medina</i>				
916+85.96	917+10.96	25 x 48 ÷ 9		133.3
935+21.25	935+46.25	25 x 24 ÷ 9		66.7
<i>Northbound Outer Roadway</i>				
7+95.56	8+20.56	25 x 24 ÷ 9		66.7
<i>Ramp J-NBOR</i>				
0+42.37	0+67.37	25 x 24.9 ÷ 9		69.2
<i>Ramp J-14</i>				
13+09.49	13+34.49	25 x 19 ÷ 9		52.8
<i>Relocated West 14th Street</i>				
15+23.07	15+48.07	25 x 42 ÷ 9		116.7
21+52.66	21+77.66	25 x 42 ÷ 9		116.7
<i>Ramp A</i>				
13+08	13+33	25 x 16 ÷ 9		44.4
<i>Ramp NBOR-14</i>				
2+63.33	2+88.33	25 x 15 ÷ 9		41.7
<i>Northbound Jennings</i>				
63+47.74	63+72.74	25 x 36 ÷ 9		100.0
<i>Southbound Outer Roadway</i>				
33+37.88	33+62.88	760 Sq. Ft. ÷ 9		84.4
35+18.37	35+43.37	25 x 24 ÷ 9		66.7
<i>Ramp 14-SBOR</i>				
5+15	5+40	25 x 12 ÷ 9		33.3
6+75	7+00	25 x 6.5 ÷ 9		18.1
Total CUY-71-17.83				1,010.7
PROJECT CUY-176-12.76				
<i>Southbound Jennings</i>				
34+80.23	35+05.23	25 x 36 ÷ 9		100.0
36+83.08	37+08.08	25 x 24 ÷ 9		66.7
<i>Northbound Jennings</i>				
34+69.03	34+94.03	25 x 24 ÷ 9		66.7
36+71.62	36+96.62	25 x 44.5 ÷ 9		123.6
<i>Ramp D-JN</i>				
9+67.43	9+92.43	25 x 14.6 ÷ 9		40.6
<i>Ramp JN-D</i>				
1+11	1+36	25 x 15 ÷ 9		41.7
3+08	3+33	25 x 14 ÷ 9		38.9
Total CUY-176-12.76				478.2
Grand Total				1,488.9

ITEM 1-9 SEEDING & PROTECTING				
PROJECT CUY-176-12.76				
Description of Area	Station	Area	Sq. Yds.	
	From	To		
<i>Relocated West 14th Street at Denison Avenue</i>				
	10+00	12+06	1,580	
<i>Relocated West 15th Street</i>				
	0+00	2+79	2,200	
<i>North from Denison Avenue to Sta. 33+05 N.B. Jennings</i>				
	25+25	33+05	21,350	
<i>Ramp J-JR</i>				
	13+00	22+55	18,550	
<i>Northbound Jennings</i>				
	33+05	40+00	19,700	
<i>Northbound Jennings</i>				
	40+00	45+00	10,980	
<i>Northbound Jennings</i>				
	45+00	53+60	13,600	
<i>Riverside Cemetery Fill at Willowdale Avenue</i>				
			27,400	
<i>Riverside Cemetery Fill (Adjacent to Jennings)</i>				
			61,000	
Total CUY-176-12.76			176,360	
PROJECT CUY-71-17.83				
<i>Northbound Jennings</i>				
	53+60	65+00	19,200	
<i>Southbound Medina</i>				
	913+50	922+00	23,950	
<i>Southbound Medina</i>				
	922+00	930+00	10,240	
<i>Southbound Medina</i>				
	930+00	935+00	18,300	
<i>Southbound Medina</i>				
	935+00	940+00	10,800	
<i>Southbound Medina</i>				
	940+00	945+00	16,200	
<i>Southbound Medina</i>				
	945+00	951+15	10,050	
<i>Relocated West 14th Street</i>				
	10+00	17+00	28,400	
Total CUY-71-17.83			137,140	
Grand Total			313,500	

ITEM 1-15 GUARD RAIL				
PROJECT CUY-71-17.83				
Station	Side	Standard Type (Deep) Lin. Ft.	Barrier Type (Deep) Lin. Ft.	
From	To			
<i>Southbound Medina</i>				
925+78.44	937+50	Right	1,172	
947+05	948+05	Right	100	
948+05	951+15	Right		310
947+00	948+25	Left	125	
935+87	937+12	Left	125	
<i>Northbound Medina</i>				
914+19	916+44	Right	225	
937+33	948+02	Left	1,069	
948+02	951+13.98	Left		312
946+42	947+17	Right	75	
<i>Southbound Outer Roadway</i>				
6+53	7+78	Right	125	
17+89	19+39	Right	150	
17+64	18+89	Left	125	
34+75	38+00	Left	325	
<i>Northbound Outer Roadway</i>				
18+77	19+52	Right	75	
<i>Northbound Jennings</i>				
53+60.26	63+59.93	Right	1,000	
59+12.50	63+59.93	Left	450.5	
75+83	77+08	Left	125	
<i>Ramp M-J</i>				
0+00	12+17.23	Left	1,217	
<i>Ramp 14-M</i>				
0+00	0+50	Left	75	
<i>Relocated West 14th Street</i>				
13+47	15+10	Right	150	
13+47	15+47	Left	213	
22+26	24+00	Left	163	
<i>Northbound Relocated West 14th Street</i>				
24+00	25+30	Left	131	
<i>Ramp SBOR-M</i>				
2+86	4+11	Left	125	
<i>Ramp J-NBOR</i>				
0+63	3+89	Right	326	
12+43	13+18	Left	75	
<i>Ramp A</i>				
13+22	15+72	Right	250	
<i>Ramp NBOR-14</i>				
2+83	4+58	Right	175	
<i>Brainard Avenue</i>				
1+15	1+22		25	
<i>Buhrer Avenue</i>				
3+90			25	
7+99			25	
<i>Rowley Avenue</i>				
8+25	8+28		25	
12+09			25	
<i>Relocated West 17th Street</i>				
5+26	6+24	Right	100	
8+50	9+12		62.5	
<i>Relocated Halmden Avenue</i>				
0+07	0+63		87.5	
Total CUY-71-17.83			8,541.5	622

ITEM 1-23 TRAFFIC DIVIDERS			
PROJECT CUY-71-17.83			
Station	Traffic Dividers	Remarks	
From	To	Ea.	
<i>Relocated West 14th Street</i>			
10+00	10+85	8	
PROJECT CUY-176-12.76			
<i>Ramp J-JR</i>			
20+74	21+01	4	
Grand Total		12	

SCALE: \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE SDH DATE 4-20-64 CONSULTING ENGINEERS  
 TRCD. DATE \_\_\_\_\_  
 CKD. JM DATE 2/20/64 KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

30  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176.12.76

ITEM I-15 GUARD RAIL					
PROJECT CUY-176-12.76					
<i>Southbound Jennings</i>					
37+37	39+00	Left	163		
33+25	38+00	Right		175	
36+77	38+00	Right			123
38+00	53+82.42	Right	1,582		
<i>Northbound Jennings</i>					
36+42	38+05	Right	163		
45+53.01	53+60.26	Right	807		
<i>Ramp JR-J</i>					
0+00	12+51.32	Right	1,251		
<i>Ramp J-JR</i>					
9+47	11+70	Left	263		
9+92	12+05	Right	213		
0+00	3+50	Right	350		
<i>Ramp D-JN</i>					
8+16	9+66	Right	150		
<i>Relocated Redman Avenue</i>					
0+46	1+46	Left	125		
3+78	4+20	Left	50		
Total CUY-176-12.76			5,117	298	
Grand Total			13,658.5	920*	

\*Note: For additional quantity see Sub-Summary of Signing Quantities, sheet 560

ITEM I-15 TEMPORARY GUARD RAIL AS PER PLAN			
PROJECT CUY-71-17.83			
Station	Temporary Guard Rail	Remarks	
From To	Lin. Ft.		
<i>Northbound Jennings</i>			
73+50	81+40.77	687.5	
<i>Northbound Outer Roadway</i>			
3+55	9+80	625	
<i>Ramp SBOR-M</i>			
11+80.24	Nose	32	
<i>Southbound Outer Roadway</i>			
31+35.33	Nose	37.5	
Total CUY-71-17.83			1,382
PROJECT CUY-176-17.83			
<i>Southbound Jennings</i>			
34+04.81	43+52	950	
Total CUY-176-12.76			950
Grand Total			2,332

T-31 BITUMINOUS SURFACE TREATMENT			
PROJECT CUY-176-12.76			
Area from B-21 Calc.	Bit. mat. @ 0.25 Gal/Sy	No. 6 aggregate @ 0.008 Cu./Sy	Remarks
Sy	Gal.	Cu. Yd.	
9,431.4	9,431.4 x 0.25 = 2358	9,431.4 x 0.008 = 76	
PROJECT CUY-71-17.83			
28,333.8	28,333.8 x 0.25 = 7084	28,333.8 x 0.008 = 227	
Grand Total			9,442 303

ITEM I-8 STANDARD MONUMENT BOX ASSEMBLIES			
PROJECT CUY-71-17.83			
Location	Station	Each	Remarks
Rel. W. 17th St.	1+79.31 £	1	
View Rd.	8+37.69 £	1	
Rel. W. 17th St.	5+72.26 £	1	
Rel. W. 17th St.	8+86.54 £	1	
Valentine Ave.	0+31.38 £	1	
Holmden Ave.	7+17.65 £	1	
Rel. Holmden Ave.	3+81.25 £	1	
Total CUY-71-17.83			7
PROJECT CUY-176-12.76			
Rel. Redman Ave.	4+35.30 £	1	
Rel. Redman Ave.	0+00.00 £	1	
Total CUY-176-12.76			2
Grand Total			9

ITEM I-8 MONUMENT BOX ASSEMBLIES ADJUSTED TO NEW GRADE			
PROJECT CUY-71-17.83			
Location	Station	Ea.	Remarks
Brainard Ave.	8+71.77 £	1	
Holmden Ave.	14+49 £	1	
Total CUY-71-17.83			2
PROJECT CUY-176-12.76			
Denison Ave.	0+00 £	1	
Denison Ave.	0+05.58 £	1	
Jennings Rd.	3+60.94, 6.87 Rt.	1	
Rel. Jennings Rd	5+41.25, 2.61 Lt.	1	
Total CUY-176-12.76			4
Grand Total			6

ITEM S-22 REMOVAL OF EXISTING STRUCTURES						
PROJECT CUY-71-(17.83)						
Station	Area	Av. Area	Length	Volume	Remarks	
From To	Sq. Ft.	Sq. Ft.	Lin. Ft.	Cy		
<i>Relocated West 14th Street</i>						
12+25	11.5				Remove entire structure.	
	12.5	12.0	5	2.2	Length shown is on £	
	25.6	19.1	40	28.3	of existing wall.	
13+30	8.9	17.3	20	12.8		
	9.5					
	19.4	14.5	16	8.6		
	10.3	14.9	10	5.5		
	10.3	10.3	120	45.8		
	21.8	16.1	40	23.9		
16+00	16+50	10.3	50	19.1		
16+50	18+00	16.4	129	78.4		
18+20		22.6				
	14.4	18.5	125	85.6		
	11.9	13.2	25	12.2		
	11.9	11.9	75	33.1		
<i>Relocated West 14th Street</i>						
13+65	22.4		110	91.3	Exist. stone conc. block wall.	
	22.4		59	48.9		
	24.8		10	9.2		
17+00	42.0		43	66.9		
Total Project CUY-71-(17.83)				571.8		

ITEM S-22 REMOVAL OF EXISTING STRUCTURES						
EXTRA HILLSIDE EXCAVATION						
Station	Area	Av. Area	Length	Volume	Remarks	
From To	Sq. Ft.	Sq. Ft.	Lin. Ft.	Cy		
<i>Existing Jennings Road</i>						
5+47	18.6				Remove entire structure	
5+59.52	19.5	19.1	12.52	8.9		
5+72.05	20.4	19.9	12.53	9.3		
5+84.58	21.8	21.1	12.53	9.8		
5+97.10	22.7	22.2	12.52	10.3		
6+09.63	28.3	25.5	12.53	11.8		
6+22.15	38.7	33.5	12.52	15.5		
6+34.68	45.9	42.3	12.53	19.6		
6+34.68	27.0				Remove structure 1 ft. below finished ground	
6+47.21	31.1	29.1	12.53	13.5		
6+59.73	32.3	31.7	12.52	14.7		
6+72.26	31.1	31.7	12.53	14.7		
6+84.78	27.3	29.3	12.52	13.6		
6+97.31	23.8	25.6	12.53	11.9		
7+09.84	20.5	22.2	12.53	10.6		
7+22.36	17.4	19.0	12.52	8.8		
7+34.89	16.5	17.0	12.53	7.9		
7+47.41	16.0	16.3	12.52	7.6		
7+59.94	16.0	16.0	12.53	7.4		
7+72.47	16.2	16.1	12.53	7.5		
7+85.00	18.6	17.4	12.53	8.1		
7+97.53	21.1	19.9	12.53	9.2		
8+10.06	26.2	23.7	12.53	11.0		
8+22.59	30.7	28.5	12.53	13.2		
<i>Tangent extended Ramp JR-J</i>						
0+1+75	30.7				Remove structure 1 ft. below finished ground.	
	32.7	31.7	25	29.4	Lengths shown on £	
	31.1	31.9	12.19	14.4	of exist. structure	
	28.8	30.0	25	27.8		
	26.6	27.7	25	25.6		
	24.5	25.6	25	23.7		
	23.1	23.8	25	22.0		
	23.8	23.5	25	21.8		
	27.9	25.9	25	24.0		
	25.2	26.6	25	24.6		
	23.1	24.2	25	22.4		
	21.1	22.1	25	20.5		
	19.5	20.3	25	18.8		
	20.2	19.9	25	18.4		
	27.0	23.6	25	21.9		
	34.3	30.6	25	28.3		
	33.0	33.7	8	10.0		
	32.6	32.8	17	20.7		
	28.8	30.7	25	28.4		
	20.8	24.8	25	23.0		
	14.2	17.5	25	16.2		
	9.3	11.8	25	10.9		
	9.3	9.3	605	208.4		
3+00	44.9	60	60	99.8	Ret. wall at Riverside Cemetery.	
	43.9	60	60	97.6	Remove entire structure.	
	40.3	60	60	89.6	Length shown is on £	
	57.6	60	60	127.8	of existing wall.	
	62.9	60	60	139.8		
	49.1	60	60	109.1		
	36.7	60	60	81.5		
	33.0	21	25.7			
<i>Existing Jennings Road</i>						
16+52	17+52	4.5	100	16.7	Ret. wall at proposed perimeter road.	
17+52	18+17	8.4	65	20.2	Remove 1 ft. below finished ground.	
18+17	19+30	8.4	113	35.2		
19+30	19+60	5.7	30	6.3		
19+60	19+70	3.4	10	1.3		
Total Extra Hillside Excavation				1,756.7		
Grand Total				2,328.5		

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE SDN DATE 11-20-64 CONSULTING ENGINEERS  
TRCD. DATE \_\_\_\_\_  
CKD. JM DATE 12-30-64 KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

31  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

ITEM T-71 10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT					
PROJECT CUY-71-17.83					
Station		Length	Width	Area	Remarks
From	To	Feet	Feet	Sq. Yds.	
<b>Southbound Medina</b>					
913+50.00	920+56.64	699.98	36	2,799.9	£ Calculations
920+56.64	925+78.44	519.40	36	2,077.6	£ Calculations
914+54.68	915+54.68		Varies	66.6	Deceleration Lane
925+78.44	929+50.00	371.56	48	1,981.6	
929+50.00	940+84.03	1,134.03	36	4,536.1	
940+84.03	951+15.00	1,027.73	36	4,110.9	£ Calculations
<b>Northbound Medina</b>					
913+00.00	916+85.96	372.64	48	1,987.4	£ Calculations
935+46.25	937+20.72	174.47	24	465.2	
937+20.72	950+49.72	1,331.09	24	3,549.6	£ Calculations
946+05.02	950+49.72	444.70	Varies	796.1	Acceleration Lane
950+49.72	951+13.98	64.41	36	257.6	
<b>Northbound Jennings</b>					
53+60.26	63+47.74	971.97	36	3,887.9	£ Calculations
74+70.47	81+40.77		Varies	1,156.6	
<b>Lane M-J</b>					
0+00	3+95.50		Varies	981.6	Deceleration Lane + I-71
10+97.21	12+17.23	120.71	12	161.0	£ Calculations
10+97.21	12+17.23		Varies	28.9	Widening
<b>Southbound Outer Roadway</b>					
3+61.28	8+30.00	470.68	24	1,255.2	£ Calculations
8+30.00	32+28.00	2,398.00	24	6,394.7	
11+41.50	12+41.50	100.00	10	111.1	Nose Widening
32+28.00	Approach Slab	Varies	Varies	148.0	Planimeter
35+43.37	39+61.14	429.51	24	1,145.4	£ Calculations
39+61.14	41+80.17	219.03	24	584.1	
<b>Northbound Outer Roadway</b>					
8+20.56	15+20.02	696.53	24	1,857.4	£ Calculations
15+20.02	17+18.04	197.19	25 Ave.	547.8	£ Calculations
9+06.00	10+74.14	Varies	Varies	201.7	Nose Widening
17+18.04	23+48.04	630.00	24	1,680.0	
16+20.02	20+88	Varies	Varies	295.6	Nose Widening
<b>Ramp J-NBOR</b>					
0+67.57	1+90.63	122.12	24	325.6	£ Calculations
1+90.63	12+10.40	1,022.97	24	2,727.9	£ Calculations
7+40.90	8+40.90	100.00	2-0	11.1	
12+10.49	14+57.00	246.60	24	657.6	
14+57.00	17+16.38	259.38	26-19.39	654.1	
<b>Ramp SBOR-M</b>					
0+00.00	4+08.00	407.57	12	543.4	£ Calculations
0+00.00	4+08.00		Varies	224.4	Planimeter
4+08.00	5+66.00	157.66	24	420.4	£ Calculations
4+08.00	5+66.00	158.00	2-14	140.4	Widening
5+66.00	6+90.58	124.18	36	496.7	£ Calculations
5+66.00	7+86.63	220.00	2-12	171.1	Widening
6+90.58	7+86.63	96.05	36	384.2	
7+86.63	9+86.63	200.00	24	533.3	
7+86.63	8+86.63	100.00	10	111.1	Nose Widening
9+86.63	10+79.73	93.10	24-26	258.6	
10+79.73	12+68.74	189.41	24	505.1	£ Calculations
10+79.73	11+80.24	100.51	4-2	33.5	
11+80.24	12+68.74	88.50	13-10.5	115.5	Widening
12+68.74	21+53	885.00	34.5-12	2,286.2	£ Calculations

ITEM T-71 10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT					
PROJECT CUY-71-17.83					
Station		Length	Width	Area	Remarks
From	To	Feet	Feet	Sq. Yd.	
<b>Ramp 14-SBOR</b>					
2+78.00	4+04.41	126.41	12	168.6	
2+78.00	5+15		Varies	258.7	Planimeter
6+97.00	11+08.42		Varies	88.9	Planimeter
9+43	11+08.42		Varies	22.2	Planimeter, Widening
<b>Ramp NBOR-14</b>					
2+88.33	4+39.57	152.55	12	203.4	
2+88.33	4+39.57		Varies	135.6	Widening
<b>Lane J</b>					
0+00	1+00		Varies	139.6	Deceleration Lane
<b>Total CUY-71-17.83</b>				54,682.8	
<b>PROJECT CUY-176-12.76</b>					
<b>Southbound Jennings</b>					
33+04.81	34+04.81	100.00	34	377.8	
34+04.81	34+80.23	88.28	36	353.1	
37+08.08	38+49.54	132.5	24	353.3	£ Measure
38+49.54	40+10.98	159.5	36	638.0	£ Measure
40+10.98	41+04.81	92.65	36	370.6	£ Calculations
41+04.81	43+23.61	216.97	24	578.6	£ Calculations
41+04.81	42+04.81		Varies	69.8	Deceleration Lane
43+23.61	44+23.61	98.81	34	373.3	£ Calculations
44+23.61	44+83.00	58.64	36	234.6	£ Calculations
44+83.00	45+68.45	84.73	24	225.9	£ Calculations
45+68.45	46+81.45	112.50	24	300.0	£ Measure
46+81.45	50+18.45	337.00	36	1,348.0	£ Measure
50+18.45	53+82.42	363.97	36	1,455.9	
<b>Northbound Jennings</b>					
33+04.81	34+69.03	155.79	24	415.4	
36+96.62	40+45.04	358.50	24	956.0	Left Lanes £ Measure
36+96.62	39+02		Varies	441.0	Right Lane and Taper
39+02	43+80.98		Varies	385.1	Acceleration Lane and
					2' Widening
40+45.04	45+53.01	512.23	24	1,365.9	£ Calculations
45+53.01	48+14	263.50	44.5-38	1,207.7	£ Measure
48+14	48+94	80.00	38-36	328.9	
48+94	50+03.01	109.5	36	438.0	£ Measure
50+03.01	53+60.26	357.25	36	1,429.0	
<b>Ramp JN-D</b>					
0+00	1+11.00		Varies	169.0	
3+33	4+41.51		Varies	221.7	
<b>Ramp J-JR</b>					
0+00	2+47.64		Varies	480.0	
<b>Ramp JR-J</b>					
11+35.87	12+51.32		Varies	290.0	
<b>Total CUY-176-12.76</b>				14,806.6	
<b>Grand Total</b>				69,489.4	

DRIVEWAY QUANTITIES									
PROJECT CUY-71-17.83									
Location	Station	Side	Type	Width Feet	T-70,6'	T-71,8'	E-1 (Cu. Yds.)		
					Sq. Yds.	Sq. Yds.	Exc.	Emb.	
Rel. West 17th St.	7+44.0	Left	Commercial	10		22.7	9	0	
Rel. Holmden Ave.	2+61.7	Left	Commercial	10		13.8	3	1	
<b>TOTAL CUY-71-17.83</b>							36.5	12	1
PROJECT CUY-176-12.76									
Rel. West 15th St.	1+22.0	Left	Commercial	24		82.2	40	0	
Rel. Redman Ave.	2+32.0	Right	Residential	10	17.3		6	0	
<b>TOTAL CUY-176-12.76</b>						17.3	82.2	46	0
<b>GRAND TOTAL</b>						17.3	118.7	58	1

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE SDH DATE 11-20-64 CONSULTING ENGINEERS  
TRCD. DATE \_\_\_\_\_  
CKD. JM DATE 12-20-64 KANSAS CITY CLEVELAND NEW YORK



# QUANTITY CALCULATIONS

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

ITEM T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT					
PROJECT CUY-71-17.83					
Station		Length Feet	Width Feet	Area Sq. Yds.	Remarks
From	To				
<b>Lane M-J</b>					
3+95.50	8+97.21	505.56	16	898.8	£ Calculations
3+95.50	4+95.50	100.00	10	111.1	
8+97.21	10+97.21	210.44	16-14	335.7	£ Calculations
<b>Ramp 14-SBOR</b>					
0+00.09	0+78.00	77.91	16	138.5	
0+78.00	2+78.00	200.00	16-14	333.3	
<b>Ramp 14-M</b>					
0+00	0+60.00		Varies	182.2	Include Flareouts
0+60.00	3+79.99	319.99	14	497.8	Right Lane
0+60.00	2+39.84	179.84	14	279.8	Left Lane
2+39.84	3+70.01	129.77	14	201.9	£ Calculations, Left Lane
3+70.01	3+79.99	9.98	14	15.5	Left Lane
1+24	3+79.99		Varies	273.3	Center Lane
3+79.99	7+92.78	412.79	16	733.8	
7+92.78	15+77.25	789.95	16	1,404.4	£ Calculations
<b>Ramp NBOR-14</b>					
4+39.57	5+39.57	100.00	18-16	188.9	
5+39.57	9+34.45	394.88	16	702.0	Includes Flare
9+34.45	11+41.09	Varies	Varies	804.4	Includes Turnout
<b>Ramp J-14</b>					
13+34.50	15+09.59	169.12	16	300.7	£ Calculations
13+34.50	15+09.59		Varies	54.1	Widenings and Under Curbs
15+09.59	16+21.88	112.29	12	149.7	
15+09.59	16+21.88		Varies	58.8	Widenings and Curb
<b>Ramp A</b>					
13+33	13+59.97		Varies	70.4	Nose Widening
13+59.97	14+64.34	103.64	21-24	259.1	£ Calculations
14+64.34	16+06.33	117.25	24	312.7	£ Calculations
16+06.33	16+20.74		Varies	16.9	Planimeter
13+79.97	16+12.10		Varies	12.5	Curbs and Flareout
<b>Relocated West 14th Street</b>					
10+00.00	11+08.22	106.67	38.5	456.3	£ Calculations
11+08.22	15+23.00	408.28	43	1,950.7	£ Calculations
21+77.70	22+70.40	98.96	43	472.8	£ Calculations
22+70.40	23+63.68	94.19	42.5	444.8	£ Calculations
23+63.68	24+62.06	98.38	24	262.4	
22+70.40	24+62.06		Varies	142.0	Widening and Curb
24+62.06	25+72.07	110.01	36.5	446.2	
25+72.07	26+50.44	78.37	24	212.6	
23+63.68	23+92.89	28.58	16.5	52.4	Northbound Relocated W. 14th, £ Calculations
23+92.89	26+00.70	207.81	16.5-20.5	427.2	Northbound Relocated W. 14th St.
26+00.70	26+39.96	47.31	20.5	107.8	Northbound Relocated W. 14th, £ Calculations
26+39.96	Rel. W. 14th St.		Varies	44.4	Northbound Relocated W. 14th St.
<b>Northbound Jennings</b>					
81+40.77	82+40.77	100.22	18-16	189.3	£ Calculations
82+40.77	84+01.36	160.93	16	286.1	£ Calculations
84+01.36	86+01.36	200.00	16-14	333.3	
<b>Relocated Hallden Avenue</b>					
0+00	0+52.32	52.32	31-29	174.4	
0+52.32	3+67.25	314.93	29	1,014.8	
3+42.25	Buhrer Ave.		Varies	17.1	Northwest Radius
3+42.25	Buhrer Ave.		Varies	17.1	Northeast Radius

ITEM T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT					
PROJECT CUY-71-17.83					
Station		Length Feet	Width Feet	Area Sq. Yds.	Remarks
From	To				
<b>Relocated West 17th Street</b>					
0+00.00	9+01	901.00	29	2,903.2	Use Curb Flares for Intersection
1+15.46	2+01.39		Varies	137.8	Curb Quantity
5+09.69	5+98.30		Varies	142.2	Titus Intersection
8+19.90	N. Edge Aiken		Varies	202.2	Eglindale Avenue Intersection Aiken Intersection
<b>Valentine Avenue</b>					
0+09	0+98.37	89.37	29	288.0	
0+98.37	1+75.00	75.00	14.5	120.8	
0+98.37	Rel. W. 14th 25+72.07	119.62	12.5	166.1	Left Turnoff
W. 17th St. 5+51.80	00+51.88		Varies	37.9	Left Radius
Hospital Ent. 4+71.71	00+22.82		Varies	11.6	Right Radius
1+45.14	Ramp 14-M 00+42.28		Varies	21.3	Right Radius
0+98.37	Rel. W. 14th 25+72.07		Varies	91.1	Planimeter
Total CUY-71-17.83				19,510.2	
PROJECT CUY-176-12.76					
<b>Ramp J-JR</b>					
2+47.64	3+47.64	101.19	18-16	191.1	£ Calculations
3+47.64	4+25.32	78.55	16	139.6	£ Calculations
4+25.32	7+52.15	326.83	16	581.0	
7+52.15	11+32.62	371.97	16	661.3	£ Calculations
11+32.62	12+24.82	92.00	16	163.6	
12+24.62	15+24.62	300.00	19.5-24.5	733.3	
15+24.62	18+03.32	278.70	50	1,548.3	
18+03.32	21+00.00	317.39	50	1,763.3	£ Calculations
21+00.00	21+85.74	89.93	35	349.7	£ Calculations
21+85.74	22+55.03	69.29	35.5	274.8	Includes Curb Flare
21+00.00	21+85.74		Varies	204.4	Belt Line Intersection
<b>Ramp JR-J</b>					
0+00.00	1+59	164.44	24.5	459.8	£ Calculations, Includes Median and Flare
1+59	2+75.16	120.05	24	320.1	£ Calculations
2+75.16	5+35.82	260.66	24	695.1	
5+35.82	7+45.60	209.78	24-19.81	510.5	
7+45.60	9+35.87	189.53	19.81-16	377.0	£ Calculations
9+35.87	10+35.87	99.67	16-14	166.1	£ Calculations
10+35.87	11+35.87	99.67	16-14	166.1	£ Calculations
<b>Ramp D-JN</b>					
0+25	8+14.61	789.61	16	1,403.8	
8+14.61	9+14.61	100.00	16-14	166.7	
9+14.61	9+67.43	57.70	16-14.86	98.9	£ Calculations
Den. Ave. 6+27.43	00+58.38		Varies	41.7	Right Radius and Flare
Den. Ave. 5+04.25	00+94.45		Varies	82.2	Left Radius and Flare
<b>Ramp JN-D</b>					
4+41.51	5+41.51	100.00	18-16	188.9	
5+41.51	11+00.00	558.49	16	992.9	
11+00.00	11+75.00	75.00	16-22	161.7	Includes Widening
11+75.00	13+47.00	172.00	24	466.2	Includes Type 2-A Curb
12+91.92	Den. Ave. 3+23.55		Varies	54.2	Left Radius and Flare
13+10.88	Den. Ave. 2+32.54		Varies	44.4	Right Radius

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE S.D.H. DATE 11-30-64 CONSULTING ENGINEERS  
TRCD. DATE \_\_\_\_\_  
CKD. I.M. DATE 2/30/64 KANSAS CITY CLEVELAND NEW YORK

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

33  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

ITEM T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT					
PROJECT CUY-176-12.76					
Station		Length Feet	Width Feet	Area Sq. Yds.	Remarks
From	To				
Relocated Jennings Road					
4+71.29	6+74.50	203.21	36	812.8	Use Curb Flares for Intersection Quantities
Ramp J-JR 20+84.56	5+11.90		Varies	46.7	Right Radius
Ramp J-JR 19+78.12	5+26.53		Varies	55.6	Left Radius and Flare
Relocated Redman Avenue					
0+00.00	0+26.06	26.06	27	78.2	
0+26.06	1+26.79	100.73	27-25	291.0	
1+26.79	4+35.30	308.51	25	857.0	
Relocated West 14th Street					
10+18.00	11+94.65	176.65	27	530.0	Use Curb Flares for Intersection Quantities
Den. Ave. 8+22.76	10+45.00		Varies	21.1	Right Radius
Den. Ave. 7+46.76	10+45.00		Varies	21.1	Left Radius
11+67.65	Exist. Den. 2+69.59		Varies	21.1	Right Radius
11+67.65	Exist. Den. 1+93.59		Varies	21.1	Left Radius
Relocated West 15th Street					
0+13.00	2+78.85	265.85	25	738.5	Use Curb Flares for Intersection Quantity
Den. Ave. 1+12.44	0+33.47		Varies	14.7	Left Radius
Den. Ave. 1+87.86	0+48.06		Varies	30.6	Right Radius
West 15th Street Cul-De-Sac					
10+51.62			Varies	642.2	
West 14th Street Radius					
Den. Ave. 0+46.26	2+88.27	68.28	29-27	212.4	£ Calculations
Total CUY-176-12.76				17,400.8	
Grand Total				36,911.0	

ITEM I-13 4 1/2" SIDEWALK					
PROJECT CUY-71-17.83					
Station		Length Feet	Width Feet	Area Sq. Ft.	Remarks
From	To				
Relocated West 14th Street					
7+63	15+09	660	6	3,960	£ Meas. Deduct Ramps
7+65		18	5	90	
21+51	25+72.07	439	5	2,195	£ Measurement
Valentine Avenue					
W. 17th St.	Rel. W. 14th 25+72.07	186	5	930	£ Measurement
Relocated West 17th Street					
0+89	1+24	45	5	225	Incl. Titus Ave.
1+80	5+20	360	5	1,800	Incl. Inter. Quant.
5+75	Aiken Ave. 5+14.54	304	5	1,520	£ Meas. Intersection Quantities
Relocated Holmden Avenue					
0+00	Buhrer Ave. 2+70.65	350	5	1,750	£ Meas. Inc. Intersections
Buhrer Avenue					
2+73.65		4	6	24	
Total CUY-71-17.83				12,494	
PROJECT CUY-176-12.76					
Ramp J-JR					
20+84.56	21+30	53	5	265	£ Measurement
Belt Line Ave. 0+40	22+55.03	108	3	324	£ Measurement
Relocated Jennings Road					
Ramp J-JR 20+84.56	6+74.50	246	5	1,230	£ Measurement
Relocated Redman Avenue					
0+00	4+35.30	357	4	1,428	£ Measurement
Relocated West 14th Street					
10+28	Exist. Den. 1+93.59	161	5	805	£ Measurement
Den. Ave. 7+46.76	Rel. W. 14th Den. Ave. 8+27	Varies	Varies	100	Planimeter
Rel. W. 14th		Varies	Varies	120	Planimeter
West 14th Street Radius					
Den. Ave. 0+46	Radius	19	5	95	£ Measurement
Radius	W. 14th St. 2+85	16	5	80	£ Measurement
Relocated West 15th Street					
Den. Ave. 1+12.44	0+33.47	Varies	Varies	220	Planimeter
0+33.47	2+78.85	220	4	880	£ Measurement
Denison Avenue					
1+87.68	2+32.54	Varies	Varies	486	Planimeter
3+23.55	3+29	Varies	Varies	76	Planimeter
4+75	5+04	48'	6'	288	£ Measurement
5+89	6+29	Varies	Varies	368	Planimeter
Total CUY-176-12.76				6,765	
Grand Total				19,259	

ITEM L-9 AGRICULTURAL LIMING MATERIAL
PROJECT CUY-71-17.83 - L-9 Seeding and Protection - 137,140 Sq. Yds. Tons of Lime = $9 \times 137,140 \div (1000 \times 2000) = 61.71$ Tons
PROJECT CUY-176-12.76 - L-9 Seeding and Protection - 176,360 Sq. Yds. Tons of Lime = $9 \times 176,360 \div (1000 \times 2000) = 79.36$ Tons
Grand Total = 141.07 Tons

ITEM L-9 COMMERCIAL FERTILIZER
PROJECT CUY-71-17.83 - L-9 Seeding and Protection - 137,140 Sq. Yds. Tons of Commercial Fertilizer = $9 \times 137,140 \div (1000 \times 2000) = 12.34$ Tons
PROJECT CUY-176-12.76 - L-9 Seeding and Protection - 176,360 Sq. Yds. Tons of Commercial Fertilizer = $9 \times 176,360 \div (1000 \times 2000) = 15.87$ Tons
Grand Total = 28.21 Tons

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE SDH DATE 4-20-64 CONSULTING ENGINEERS  
TRCD DATE \_\_\_\_\_ CLEVELAND NEW YORK  
CKD JM DATE 12-30-64 KANSAS CITY

# QUANTITY CALCULATIONS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

34  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

ITEM SPECIAL DRAINAGE CONNECTION USING NO. 6 AGGREGATE						
PROJECT CUY-71-17.83						
Station		Length	Width	X-Sectional	Volume	Remarks
From	To	Feet	Feet	Area Sq.Ft.	Cu. Yd.	
<b>Southbound Medina</b>						
914+54.68	915+54.68	100.00	2.58	Varies	4.3	Left Shoulder
915+54.68	920+56.64	492.16	2.58	1.18	21.5	Left Shoulder & Calculations
920+56.64	925+78.44	516.82	2.58	1.18	22.6	Left Shoulder & Calculations
925+78.44	929+50.00	371.56	2.58	1.37	18.9	Left Shoulder
939+22.95	940+84.03	161.08	2.58	1.37	8.2	Left Shoulder
940+84.03	951+15.00	1, 2 .	2.58	1.18	44.8	Left Shoulder & Calculations
<b>Northbound Medina</b>						
935+21.25	937+20.72	199.47	2.58	1.17	8.6	Right Shoulder
937+20.72	946+05.02	887.23	2.58	1.17	38.4	Right Shoulder & Calculations
946+05.02	948+49.72	247.00	2.58	1.16	10.6	Right Shoulder & Measurement
948+49.72	950+49.72	200.00	2.58	Varies	8.6	Right Shoulder
950+49.72	951+13.98	64.26	2.58	1.18	2.8	Right Shoulder
<b>Northbound Jennings</b>						
53+60.26	63+72.74	979.53	2.58	1.18	42.8	Right Shoulder & Calculations
81+40.77	86+01.36	460.59	3	1.81	30.9	Right Shoulder
<b>Lane J</b>						
0+00.00	1+00.00	100.00	2.58	1.16	4.3	Right Shoulder
<b>Southbound Outer Roadway</b>						
3+61.28	8+30.00	464.58	2.58	1.18	20.3	Right Shoulder & Calculations
8+30.00	12+41.50	411.50	2.58	1.37	20.9	Right Shoulder
12+41.50	31+35.33	1,893.83	2.58	1.37	96.1	Right Shoulder
41+00.00	41+80.17	80.17	2.58	1.37	4.1	Right Shoulder
<b>Northbound Outer Roadway</b>						
10+74.14	17+18.04	644.19	2.58	1.18	28.2	Right Shoulder & Calculations
17+18.04	23+48.04	630.00	2.58	1.37	32.0	Right Shoulder
<b>Ramp J-NBOR</b>						
0+45	1+90.63	145.63	2.58	1.18	6.4	Right Shoulder
1+90.63	10+89.24	904.56	2.58	1.18	39.5	Right Shoulder & Calculations
<b>Ramp SBOR-M</b>						
8+86.63	21+53.00	1,266.37	2.58	1.37	64.3	Right Shoulder
<b>Ramp 14-SBOR</b>						
6+85.00	9+75.00	290.43	2.58	1.16	12.5	Right Shoulder & Calculations
<b>Lane M-J</b>						
4+00.00	10+97.21	696.21	3	1.94	50.0	Left Shoulder & Calculations
<b>Ramp NBOR-14</b>						
2+65.00	4+39.57	174.57	2.58	1.16	7.5	Right Shoulder
4+39.57	9+25.45	485.88	3	1.81	32.6	Right Shoulder
<b>Ramp 14-M</b>						
0+63.00	7+92.78	729.78	2.58	1.16	31.4	Right Shoulder
7+92.78	15+77.25	783.59	2.58	1.16	33.7	Right Shoulder & Calculations
Total CUY-71-17.83					746.8	

ITEM SPECIAL DRAINAGE CONNECTION USING NO. 6 AGGREGATE						
PROJECT CUY-176-12.76						
Station		Length	Width	X-Sectional	Volume	Remarks
From	To	Feet	Feet	Area Sq.Ft.	Cu. Yds.	
<b>Southbound Jennings</b>						
38+49.54	40+10.98	158.00	2.58	1.16	6.8	Left Shoulder & Measurement
40+10.98	41+04.81	97.39	2.58	1.16	3.9	Left Shoulder & Calculations
41+04.81	42+04.81	97.82	2.58	Varies	4.2	Left Shoulder & Calculations
42+04.81	43+23.61	116.70	2.58	1.18	5.1	Left Shoulder & Calculations
46+81.45	50+18.45	335.50	2.58	1.18	14.7	Left Shoulder & Measurement
50+18.45	53+82.42	363.97	2.58	1.37	18.5	Left Shoulder
<b>Northbound Jennings</b>						
33+15.00	34+73.00	158.00	2.58	1.18	6.9	Right Shoulder
36+36.00	40+45.00	416.00	2.58	1.16	17.9	Right Shoulder & Measurement
40+45.00	43+00.00	260.57	2.58	1.16	11.2	Right Shoulder & Calculations
50+55.00	53+60.26	305.26	2.58	1.37	15.5	Right Shoulder
<b>Ramp J-JR</b>						
0+00.00	2+47.64	247.64	2.58	Varies	10.7	Right Shoulder
2+47.64	3+47.64	100.00	3	1.94	7.2	Right Shoulder
3+47.64	4+25.32	77.68	3	1.94	5.6	Right Shoulder & Calculations
4+25.32	6+90.00	264.68	3	1.81	17.7	Right Shoulder
6+90.00	7+52.15	62.15	3	1.81	4.2	Left Shoulder
7+52.15	11+32.62	361.88	3	1.94	26.0	Left Shoulder & Calculations
11+32.62	12+24.62	92.00	3	1.81	6.2	Left Shoulder
12+24.62	18+03.32	603.32	3	1.81	40.4	Right Shoulder
15+24.62	18+03.32	278.70	3	1.81	18.7	Left Shoulder
18+03.32	19+69.12	189.64	3	1.94	13.6	Left Shoulder & Calculations
<b>Ramp J-JR</b>						
18+03.32	21+85.74	380.82	3	1.94	27.4	Right Shoulder & Calculations
21+85.74	22+46.03	60.29	3	1.81	4.0	Right Shoulder
<b>Ramp JR-J</b>						
0+00.00	2+75.16	274.01	3	1.94	19.7	Right Shoulder & Calculations
2+75.16	7+45.60	470.44	3	1.81	31.5	Right Shoulder
7+45.60	11+35.87	390.43	3	1.94	28.0	Right Shoulder & Calculations
<b>Ramp JN-D</b>						
0+00.00	1+34.00	134.00	2.58	1.16	5.8	Right Shoulder
3+05.00	11+75.00	870.00	2.58	1.16	37.4	Right Shoulder
<b>Ramp D-JN</b>						
1+19.00	9+91.00	872.00	2.58	1.16	37.5	Right Shoulder
Total CUY-176-12.76					446.3	
Grand Total					1,193.1	

SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE SDH DATE 11-20-64 CONSULTING ENGINEERS  
TRCD \_\_\_\_\_ DATE \_\_\_\_\_  
CKD JM DATE 12-30-64 KANSAS CITY CLEVELAND NEW YORK

# GENERAL SUMMARY

## TYPE CODE 7221

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

TYPE CODE 0010		PROJECT CUY-176-12.76 US-1463(2)														PROJECT CUY-71-17.83 I-71-5(33)244														TOTAL QUANT.	UNIT	ITEM	DESCRIPTION									
Part 2 CUY-80-9.08	Sheet I-80-4(20)14	PLAN SHEET NUMBERS				DRAINAGE SHEET NOS.		RW SHTS.		QUANTITY	PLAN SHEET NUMBERS				DRAINAGE SHEET NOS.		RW SHTS.		QUANTITY																							
2	Total	17	18	19	20	29	30	31	33	38	560	6	8	9	10	11	12	2*	2	SUB-TOT.	17	18	19	20	29	30	31	33	38	560	6-7	12	13	14	15	16	1-2*	2	SUB-TOT.			
																																					862,329	862,329	862,329	Cu. Yds.	E-1	Roadway Excavation Method "B" as per plan (Hillside)
14,210	14,210							46			816077																	12	852,174	852,186	1,682,519	Cu. Yds.	E-1	Roadway Excavation, Method "B" as per plan (Hillside) (Alternate bid item)								
											42,968																									42,968	105,744	105,744	Sq. Yds.	E-1	Roadway Excavation, Method "B" modified as per plan (Alternate bid item)	
											6,556																									6,556	18,170	18,170	Sq. Yds.	E-8	Removal and Disposal of Existing Pavement	
											17,791																									17,791	45,184	45,184	Sq. Ft.	E-8	Removal and Disposal of Existing Sidewalk	
											5,717																									5,717	9,585	9,585	Lin. Ft.	E-8	Removal and Disposal of Existing Curb	
											186																									186	1,005	1,005	Sq. Yds.	E-8	Removal and Disposal of Existing Concrete Driveways and Aprons	
											Lump																									Lump	Lump	Lump	E-9	E-9	Removal of Trees and Stumps	
62	62																																				62	62	Each	E-9	Removal of Trees and Stumps	
2,600	2,600										2,824																									2,824	5,184	5,184	M. Gal.	E-11	Water	
																																							Lin. Ft.	E-12	Pipe Removed, 15" and under	
																																							Lin. Ft.	E-12	Pipe Removed, over 15"	
																																							Tons	I-4	Calcium Chloride for Dust Control	
																																							M. Gal.	I-4	Water for Dust Control	
																																							Each	I-8	Centerline Reference Monuments, as per plan	
																																							Each	I-8	Monument Assemblies	
																																							Each	I-8	Existing Monuments Boxes Adjusted to Grade	
																																							Lin. Ft.	I-15	Guard Rail, Steel Beam Barrier Type (Deep)	
																																							Lin. Ft.	I-15	Guard Rail, Steel Beam Standard Type (Deep)	
																																							Lin. Ft.	I-15	Temporary Guard Rail, as per plan	
																																							Lin. Ft.	I-26	5' Chain Link Fence	
																																							Lin. Ft.	I-26	8' Chain Link Fence, as per plan	
																																							Each	I-26	14' Chain Link Gates	
																																							Lin. Ft.	I-1	2" Pipe, Sec. M-6.9 Standard Wt. Galvanized with Type 4 Backfill, as per plan	
																																							Hours	S.S. CE 101.04	Compaction Using Heavy Pneumatic Tired Roller	
																																							Units	L-6	Roadside Cleanup	
65,751	65,751										176,360																									176,360	137,140	379,251	Sq. Yds.	L-9	Seeding and Protecting, as per plan	
5.92	5.9										159																								159	12.3	39.1	Tons	L-9	Commercial Fertilizer (12-12-12)		
29.59	29.6										794																								794	61.7	170.7	Tons	L-9	Agricultural Liming Material, as per plan		
																																							Sq. Yds.	L-10	Sodding	
																																							Sq. Yds.	L-10	Sodding for Special Berm and Slope Protection, as per plan	
																																							Sq. Yds.	L-120	Jute Matting	
																																							Lump	S-15	Temporary Run-Around Road, as per plan, Sta. 10+00 to Sta. 7+40	
																																							Lump	S-15	Removal of Temporary Run-Around Road	
																																							Cu. Yds.	S-22	Removal of Portion of Existing Structure	
																																							Cu. Yds.	T-10	Traffic Compacted Surface Course for Maintaining Traffic	
																																							Cu. Yds.	T-35	Asphaltic Concrete Surface Course, or on approved Bituminous Premixed Surface Course for Maintaining Traffic	
																																							Each	Special	Settlement Platforms	
																																							Each	Special	Piezometers	
																																							Acres	Special	Mowing Seeded and Sodded Areas	
																																							Each	Special	Plugging Gas Wells	
																																							Cu. Yds.	S-22	Removal of Portions of Existing Structure (Hillside)	
																																							Lump	S-15	Temporary Run-Around Road, as per plan, Sta. 7+40 to Sta. 12+33	
																																							Lump	I-3	Construction Layout Stakes	
																																							Lump	I-3	Maintaining Traffic	

\*Note:  
These Sheet Numbers refer to the Centerline Survey Plat.

MADE DRK DATE 12-30-64 TRACED DATE  
CHECKED IM DATE 1-4-65 SCALE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Rev. 2-18-66 C.E.H. 3-9-65  
3-3-65

# GENERAL SUMMARY

## LANDSCAPING

### TYPE CODE 7221

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

PROJECT CUY-176-12.76 US-1463(2)					PROJECT CUY-71-17.83 I-71-5(33)244					TOTAL QUANT.	SIZE	B & B SCHED.	PLAN SYMBOL	UNIT	ITEM	DESCRIPTION							
LANDSCAPING PLAN SHEET NUMBERS					LANDSCAPING PLAN SHEET NUMBERS											BOTANICAL NAME	COMMON NAME						
1	2	3	4	5	5	6	7	8	QUANTITY SUB-TOT.	QUANTITY SUB-TOT.													
<b>LARGE TREES</b>																							
	14	4	6					6	24	7					13	37	2'-2 1/2"	24"	F-PN	Each	L-14	<i>Fraxinus Pennsylvanica Lanceolata</i>	Green Ash
23	34	6	10	3			4	5	76	9	9	2'-2 1/2"	24"	PH-A	Each	L-14	<i>Phellodendron Amurense</i>					Cork Tree	
	7	5	2	3		16	10	4	11	17	41	117	2'-2 1/2"	24"	PL-A	Each	L-14	<i>Platanus Acerifolia</i>				London Planetree	
	7	2	4			3		5	9	13	17	34	6'-8"	18"	P-AL	Each	L-14	<i>Populus Alba</i>				White Poplar	
						6	18	58	6		88	101	6'-8"	18"	P-EU	Each	L-14	<i>Populus Canadensis Eugenei</i>				Carolina Poplar	
3	10	6	6	1			8	1	7	8	24	50	6'-8"	18"	S-A	Each	L-14	<i>Salix Alba</i>				White Willow	
	8	1	2			8	3	10	5	11	26	37	6'-8"	18"	S-E	Each	L-14	<i>Salix Elegantissima</i>				Thurlow Weeping Willow	
<b>SMALL TREES AND LARGE SHRUBS</b>																							
							13	3		16	16	5'-6"	16"	C-MA	Each	L-14	<i>Cornus Mas</i>					Cornelian Cherry	
3	25	5	13	2		3	3	8	48	14	62	6'-7"	18"	CR-C	Each	L-14	<i>Crataegus Crusgalli</i>					Cockspur Hawthorn	
	9		4	5			5	18	18	23	41	6'-7"	18"	CR-L	Each	L-14	<i>Crataegus Lavaliei</i>					Lovale Hawthorn	
	22	6	5			10	12	6	23	33	51	84	6'-7"	18"	CR-P	Each	L-14	<i>Crataegus Phaenopyrum</i>				Washington Hawthorn	
	14	4	9	7		17	7	5	12	34	41	75	5'-6"	16"	E-A	Each	L-14	<i>Eleagnus Angustifolia</i>				Russian Olive	
	7	2				5	3	9	16	9	33	42	6'-7"	18"	M-A	Each	L-14	<i>Malus Atrosanguinea</i>				Carmine Crab Apple	
	3	1	3			2	2	5	5	7	14	21	6'-7"	18"	M-BJ	Each	L-14	<i>Malus Baccata 'Jacki'</i>				Jack Crab Apple	
4	3	2	2			2		9	11	11	22	6'-7"	18"	M-D	Each	L-14	<i>Malus 'Dorothea'</i>				Dorothea Crab Apple		
4	7	2	2			3		3	15	6	21	6'-7"	18"	M-F	Each	L-14	<i>Malus Floribunda</i>				Japanese Flowering Crab Apple		
	8		5			2	12	3	13	17	30	6'-7"	18"	M-PG	Each	L-14	<i>Malus 'Prince Georges'</i>				Prince Georges Crab Apple		
			3						3		3	6'-7"	18"	M-PL	Each	L-14	<i>Malus Purpurea Lemoinei</i>				Lemoine Purple Crab Apple		
	7	5	7			2			19	2	21	6'-7"	18"	M-PA	Each	L-14	<i>Malus Purpurea Aldenhamensis</i>				Aldenham Purple Crab Apple		
<b>SHRUBS</b>																							
						359	1289	374		2,022	2,022	3'-4'	6' O.C.	C-R	Each	L-13	<i>Cornus Racemosa</i>					Gray Dogwood	
26						18	22	1,995	26	2,035	2,061	3'-4'	6' O.C.	C-ST	Each	L-13	<i>Cornus Stolonifera</i>					Red Osier Dogwood	
								763		763	763	18"-24"	3' O.C.	R-AL	Each	L-13	<i>Ribes Alpinum</i>					Alpine Currant	
	14								14		14	2'-3'	4' O.C.	R-MU	Each	L-13	<i>Rosa Multiflora</i>					Japanese Rose	
29						2,920	3,102		29	6,022	6,051	2'-3'	4' O.C.	R-VA	Each	L-13	<i>Rosa Virginiana</i>					Virginia Rose	
<b>VINES</b>																							
	625						2,373	470	625	2,843	3,468	18"-24"	3' O.C.	F-AD	Each	L-12	<i>Forsythia 'Arnold Dwarf'</i>					Arnold Dwarf Forsythia	
	20,450					12,411	1,170	8,599	3,282	20,450	25,462	45,912	2'-3' Sprd	3' O.C.	LY-C	Each	L-12	<i>Lycium Halimifolium</i>					Common Matrimony Vine
	5,295	5,455				1,390	4,977	582	5,130	10,750	12,079	22,829	2yr. No.1	3' O.C.	L-JH	Each	L-12	<i>Lonicera Japonica Halliana</i>					Halls Honeysuckle
	5,945		2,240			4,450		1,617	8,185	6,067	14,252	2yr. No.1	2' O.C.	PO-RE	Each	L-12	<i>Polygonum Reynoutria</i>					Dwarf Polygonum	
						310	552			862	862	15"-18"	4' O.C.	S-PN	Each	L-12	<i>Salix Purpurea Nana</i>					Dwarf Purple Osier Willow	

MADE IM DATE 12-30-64 TRACED DATE  
CHECKED DRK DATE 1-4-65 SCALE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK









# GENERAL SUMMARY

## TYPE CODE 7221

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

(A) PROJECT CUY-176-12.76 US-1463 (2)  
(B) PROJECT CUY-71-17.83 I-77-5(33)244

### DRAINAGE PLAN SHEET NUMBERS

DRAINAGE PLAN SHEET NUMBERS																COST PARTICIPATION		TOTAL QUANT.	UNIT	ITEM	DESCRIPTION
2	8A	9A	10A	11A	12B	13B	14B	15B	16B	CUY-176-12.76	CUY-71-17.83										
<b>DRAINAGE</b>																					
		5	9	2		3	13	28	11	11			82	Each	I-16	Catch Basins Abandoned					
			1	1			6	9	16	7			40	Each	I-16	Manholes Abandoned					
					Lump						Lump		Lump	S-24	Removal of Existing Structures						
<b>SANITARY CODE Y060</b>																					
	100										100		100	Lin.Ft.	I-1	6" Pipe, Class J-1, Sec. M-6.8(a) with compression joints					
											50		50	Lin.Ft.	I-1	8" Pipe, Class J-1, Sec. M-6.8(b) with compression joints					
			284								284		284	Lin.Ft.	I-1	18" Pipe, Class E-1, Sec. M-6.8(b) with compression joints					
											218		218	Lin.Ft.	I-1	12" Pipe, Class J-1, Sec. M-6.8(b) with compression joints					
		425	304								729		729	Lin.Ft.	I-1	21" Pipe, Class E-1, Sec. M-6.8(b) with compression joints					
		90									90		90	Lin.Ft.	I-1	21" Pipe, Class J-1, Sec. M-6.8(b) with compression joints, encased as per plan					
		5									5		5	Each	I-5	6" Pipe Special, Class J-1, Sec. M-6.8(a)					
											1		1	Each	I-5	12" Pipe Special, Class J-1, Sec. M-6.8(b)					
		1									1		1	Each	I-5	15" Pipe Special, Class J-1, Sec. M-6.8(a)					
			4						1	4			9	Each	I-8	Standard No. 1 Manhole, Modified as per plan					
		2									2		2	Each	I-8	Standard No. 2 Manhole without drop pipe, modified as per plan					
<b>BUILDING REMOVAL</b>																					
											Lump		Lump	Lump	E-10	Removal of metal office building, corrugated metal shed, metal shed, metal garage, frame and corrugated shed, metal repair garage, metal building (3 sided) Parcel 3043 AWL					
											Lump		Lump	Lump	E-10	Removal of 2 story brick maintenance building, one metal gas meter shed. Parcel 3061 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence. Parcel 3070 WL					
											Lump		Lump	Lump	E-10	Removal of 1 story black repair garage + gas station. Parcel 3071 WL					
											Lump		Lump	Lump	E-10	Removal of 2 story frame residence. Parcel 3072 WL					
											Lump		Lump	Lump	E-10	Removal of frame 2 car garage. Parcel 3085 WL					
											Lump		Lump	Lump	E-10	Removal of frame garage. Parcel 3086 WL					
											Lump		Lump	Lump	E-10	Removal of block 2 car garage. Parcel 3089 WL					
											Lump		Lump	Lump	E-10	Removal of 2 story frame residence. Parcel 3095 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence, concrete block garage, concrete block building. Parcel 3115 WL					
											Lump		Lump	Lump	E-10	Removal of 2 story frame residence. Parcel 3116 WL					
											Lump		Lump	Lump	E-10	Removal of 2 story frame residence. Parcel 3117 WD-WA					
											Lump		Lump	Lump	E-10	Removal of 1 1/2 story frame residence, frame garage. Parcel 3204 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence, frame 2 car garage. Parcel 3215 WL					
											Lump		Lump	Lump	E-10	Removal of 2 story frame residence. Parcel 3216 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence, frame 3 car garage. Parcel 3220 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence, frame 2 car garage and shed. Parcel 3221 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence, 1-story and 2 story brick building, frame barn and garage combined. Parcel 3225 WL & Parcel 3226 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence, frame 2 car garage. Parcel 3227 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence, two 2 story brick and frame residences, one shed. Parcel 3266 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence. Parcel 3263 WL					
											Lump		Lump	Lump	E-10	Removal of 2 1/2 story frame residence, frame 2 car garage. Parcel 3285 WL					
											Lump		Lump	Lump	E-10	Removal of frame garage. Parcel 3354 WL					
											Lump		Lump	Lump	E-10	Removal of 1 1/2 story frame residence, frame garage and shed. Parcel 3396 WL					

MADE DDS DATE 11-9-64 TRACED RDU DATE 11-9-64  
CHECKED RJT DATE 12-15-64 SCALE \_\_\_\_\_

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK



# GENERAL SUMMARY

TYPE CODE 7221

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

Revised see columns to the right.

PROJECT CUY-176-12.76			PROJECT CUY-71-17.83											CUY-71-17.83		TOTAL					
RETAINING WALL NO.	QUANTITY	SUB-TOT.	RETAINING WALL NO.											QUANTITY	TOTAL	UNIT	ITEM	DESCRIPTION	QUANTITY	QUANTITY	
89	88		90	87	84	83	82	81B	81A	81	80A	80	SUB-TOT.	QUANT.	SUB-TOT				QUANTITY		
					L.S.		L.S.						L.S.	L.S.	Lump Sum.	E-2	Cofferdams, Cribs and Sheeting	L.S.	L.S.		
8,278	6,449	14,727	232	1,684	5,881	4,887	9,297	1,028	506	1,614			812	4,312	30,253	44,980	Cu. Yds.	E-2	Unclassified Excavation	25,129	39,856
560	2,067	2,627		615		280	852						149	581	2,477	5,104	Cu. Yds.	S-1	Class "C" Concrete, Retaining Wall (Above Footing)	1,747	4,374
488	284	772	46	99	1,125	520	765	249	118	371					3,293	4,065	Cu. Yds.	S-1	Class "E" Concrete, Retaining Wall (Above Footing)	3,293	4,065
1,214	2,357	3,571	54	760	1,048	772	1,603	330	149	451			85	505	5,767	9,338	Cu. Yds.	S-1	Class "E" Concrete, Retaining Wall (Footing)	5,167	8,738
466	896	1,362	17	326	460	357	717	134	55	168			78	282	2,594	3,956	Lin. Ft.	S-3	Waterproofing, Premolded Sealing Strip	2,234	3,596
247,288	643,683	890,971	5,553	190,174	251,525	177,388	351,982	38,432	15,864	49,888			30,494	143,154	1,254,454	2,145,425	Pounds	S-4	Reinforcing Steel	1,089,806	1,971,777
261	631	892	14	607	364	281	682	252	105	254			162	553	3,274	4,166	Sq. Ft.	S-9	1" Premolded Expansion Joint Filler	2,559	3,451
						650.67	1147.67	447.67	207.67	487.67					2,941.35	2,941.35	Lin. Ft.	S-14	Railing, Type A (Aluminum Rails and Supports and Concrete Parapet)	2,941.35	2,941.35
	L.S.	L.S.		L.S.	L.S.	L.S.	L.S.						L.S.	L.S.	L.S.	L.S.	Lump Sum.	S-16	First Test Pile	L.S.	L.S.
	22,741	22,741			22,860	14,410	33,670						2,585	11,330	84,855	84,855	Lin. Ft.	S-18	12" # C.I.P. Reinforced Concrete Piles	70,940	70,940
				14,564											22,741	22,741	Lin. Ft.	S-18	Steel Bearing Piles (10BP42)		22,741
															14,564	14,564	Lin. Ft.	S-18	Steel Bearing Piles (12BP53)	14,564	14,564
714	1,327	2,041	9	523	781	554	1,145	126	49	194			91	423	3,895	5,936	Cu. Yds.	S-29	Porous Backfill	3,381	5,422
			119												119	119	Lin. Ft.	I-15	Guard Rail, Steel Beam Standard Type (Deep) Using Galv. Steel Posts & Bolts	119	119

Shaded area deleted

For Quantities  
See Sheet No.

SIGNING 559,560  
LIGHTING 582  
STRUCTURES OVER 20' SPAN  
CUY-71-1789R 308  
CUY-71-1847 307  
CUY-71-1826 307  
CUY-71-1794L 307  
CUY-176-1279 307

This sheet Revised 12-9-65

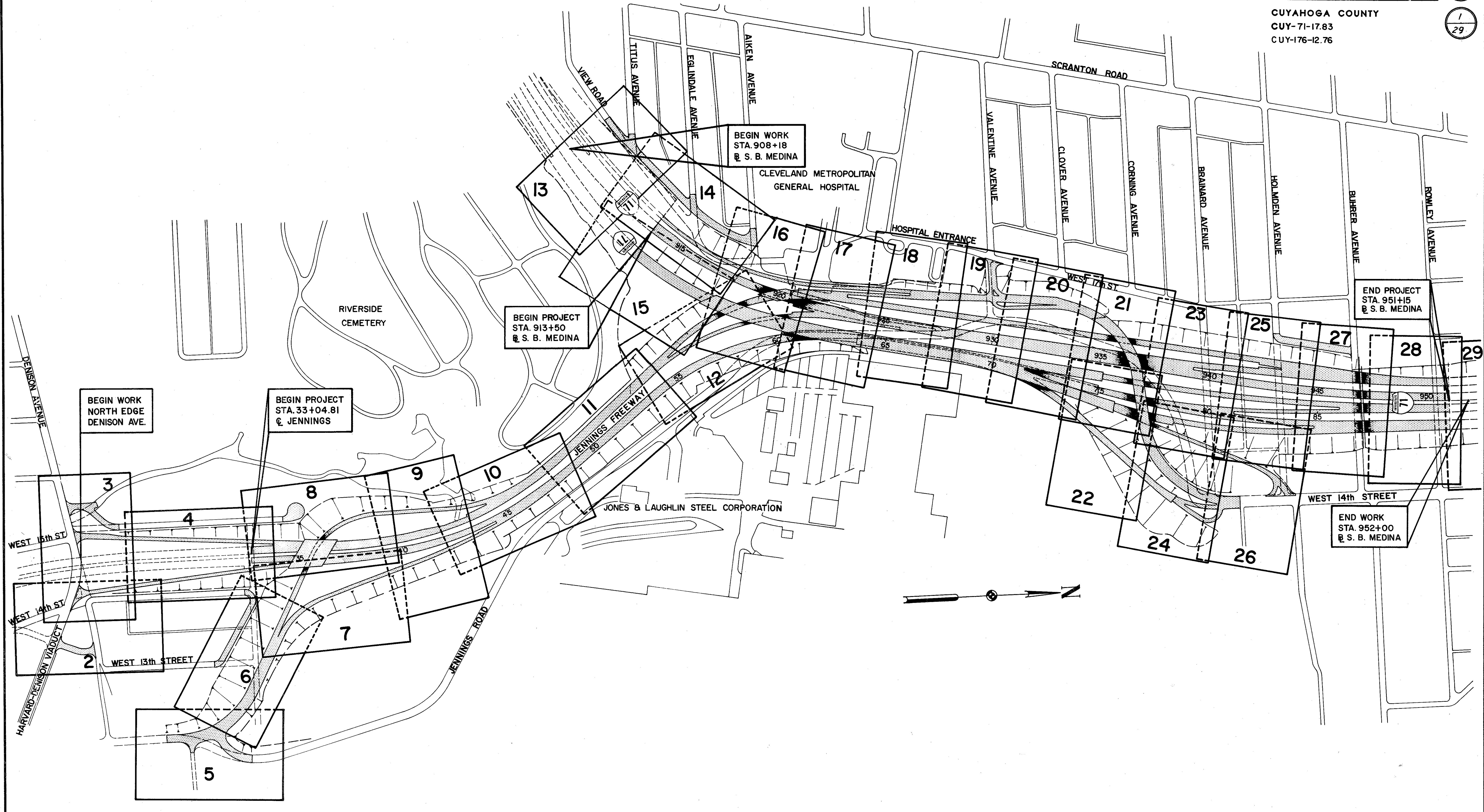
# SCHEMATIC PAVEMENT PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

44  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

1  
29



SCALE 1" = 200'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 MADE DATE \_\_\_\_\_  
 TRCD RJK DATE 4-13-64  
 KANSAS CITY CLEVELAND NEW YORK  
 CKD DATE \_\_\_\_\_

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

45  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

2  
29

**CURVE DATA REL. WEST 14th ST.**

PI. Sta. 11+32.35  
Δ = 30°13'24"  
R = 100.00'  
T = 27.00'  
L = 52.75'  
E = 3.58'

**CURVE DATA 25'R N.W. REL. WEST 14th ST.**

PI. Sta. 2+18.59  
Δ = 90°00'00"  
R = 25.00'  
T = 25.00'  
L = 39.27'  
E = 10.36'

**CURVE DATA 25'R SE. REL. WEST 14th ST.**

PI. Sta. 7+97.76 - 20'Lt. Denison  
Δ = 90°00'00"  
R = 25.00'  
T = 25.00'  
L = 39.27'  
E = 10.36'

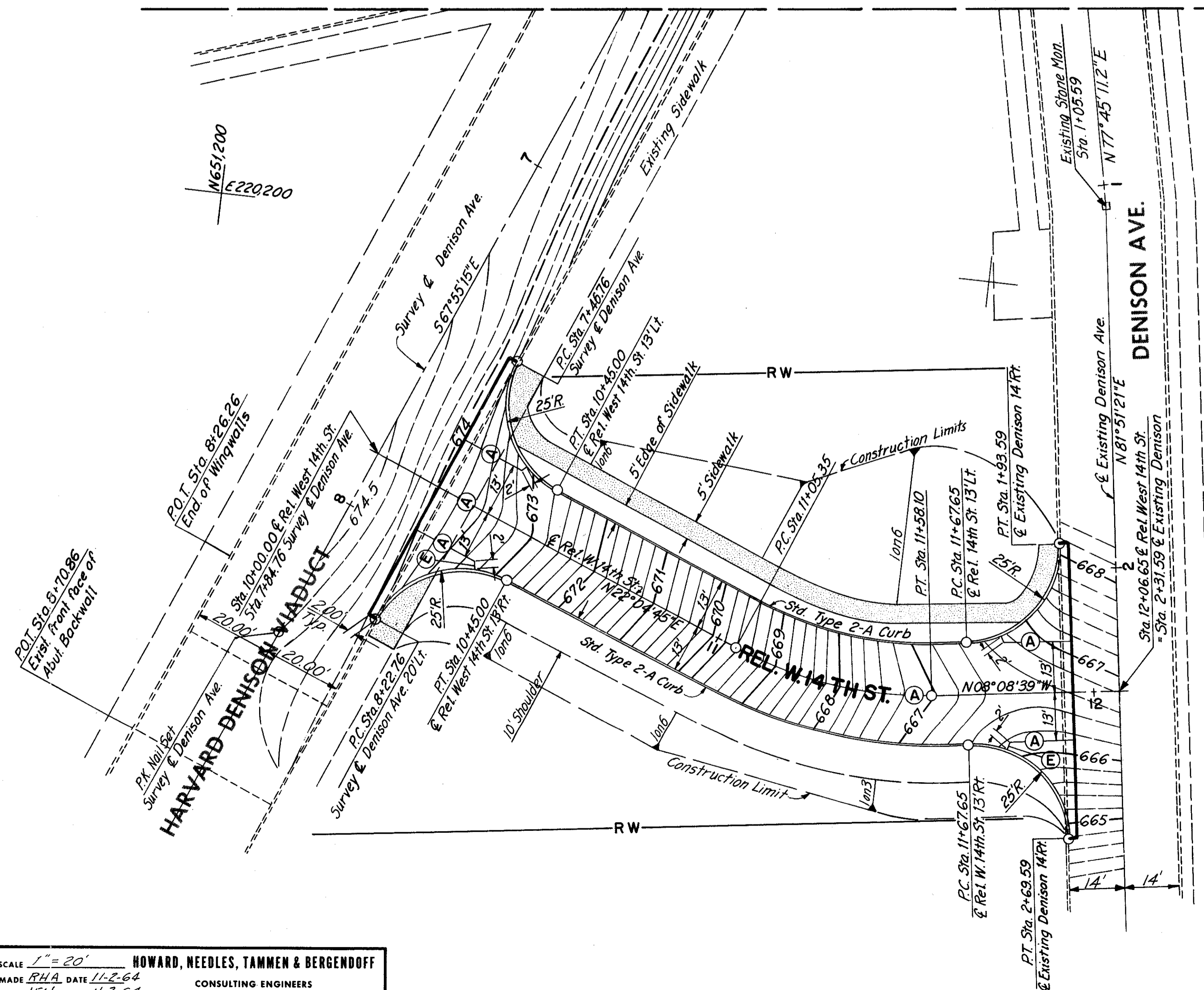
**CURVE DATA 25'R N.E. REL. WEST 14th ST.**

PI. Sta. 2+44.59  
Δ = 90°00'00"  
R = 25.00'  
T = 25.00'  
L = 39.27'  
E = 10.36'

**CURVE DATA 25'R S.W. REL. WEST 14th ST.**

PI. Sta. 7+71.76 - 20'Lt. Denison  
Δ = 90°00'00"  
R = 25.00'  
T = 25.00'  
L = 39.27'  
E = 10.36'

MATCH LINE SEE PAVEMENT PLAN 3

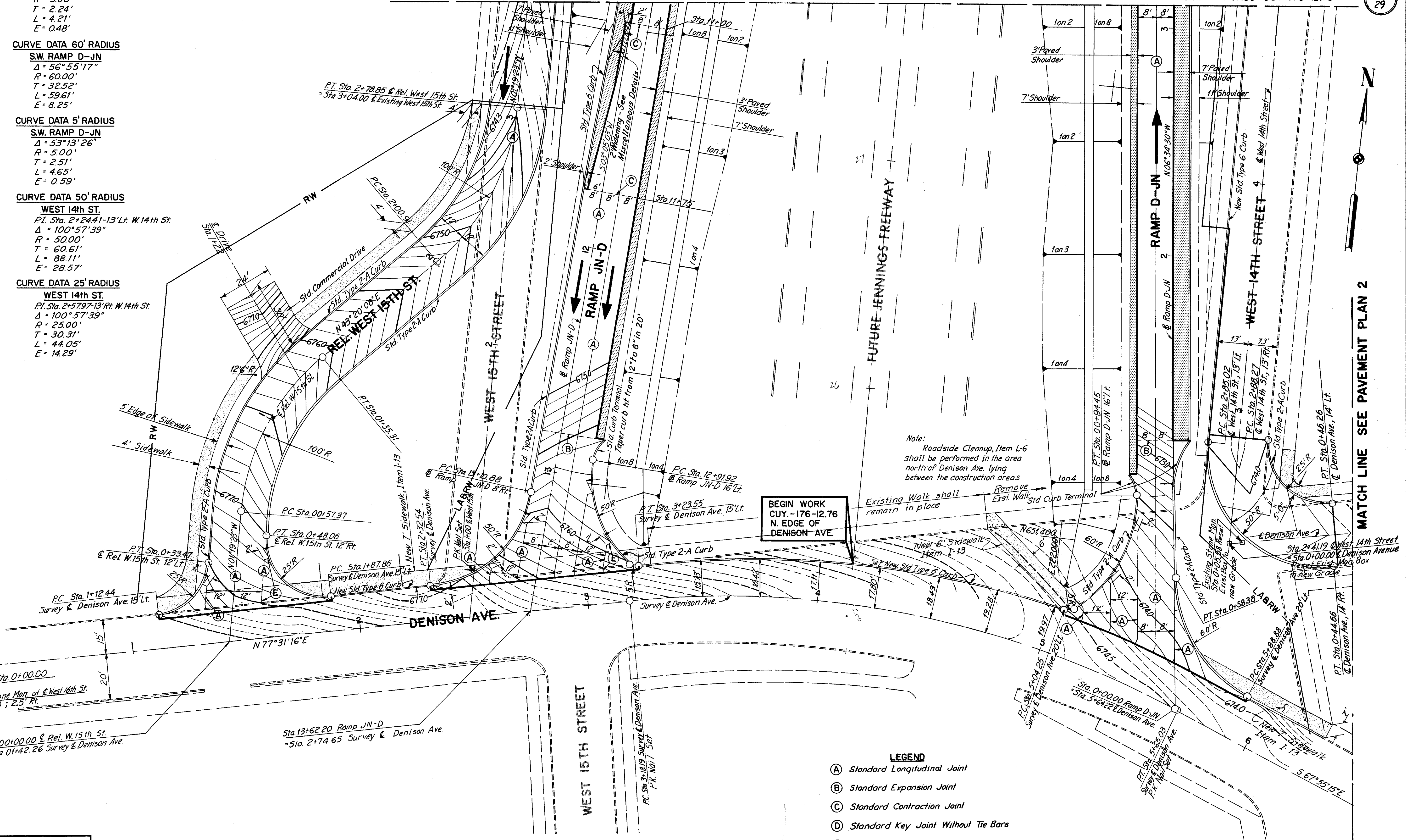


- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

SCALE 1" = 20'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE R.H.A. DATE 11-2-64 CONSULTING ENGINEERS  
TRCD JEN DATE 11-2-64 KANSAS CITY CLEVELAND NEW YORK  
CKD DRK DATE 11-9-64

MATCH LINE SEE PAVEMENT PLAN 4

- CURVE DATA**  
REL. WEST 15th ST.  
PI. Sta. 0+98.44  
 $\Delta = 44^\circ 39' 30''$   
 $R = 100.00'$   
 $T = 41.07'$   
 $L = 77.94'$   
 $E = 8.11'$
- CURVE DATA 5' RADIUS**  
S.E. RAMP JN-D  
 $\Delta = 48^\circ 11' 23''$   
 $R = 5.00'$   
 $T = 2.24'$   
 $L = 4.21'$   
 $E = 0.48'$
- CURVE DATA 60' RADIUS**  
S.W. RAMP D-JN  
 $\Delta = 56^\circ 55' 17''$   
 $R = 60.00'$   
 $T = 32.52'$   
 $L = 59.61'$   
 $E = 8.25'$
- CURVE DATA 5' RADIUS**  
S.W. RAMP D-JN  
 $\Delta = 53^\circ 13' 26''$   
 $R = 5.00'$   
 $T = 2.51'$   
 $L = 4.65'$   
 $E = 0.59'$
- CURVE DATA 25' RADIUS**  
S.W. REL. WEST 15th ST.  
PI. Sta. 0+12.92  
 $\Delta = 78^\circ 50' 39''$   
 $R = 25.00'$   
 $T = 20.55'$   
 $L = 34.40'$   
 $E = 7.36'$
- CURVE DATA 25' RADIUS**  
S.E. REL. WEST 15th ST.  
PI. Sta. 0+17.65  
 $\Delta = 101^\circ 09' 21''$   
 $R = 25.00'$   
 $T = 30.41'$   
 $L = 44.14'$   
 $E = 14.37'$
- CURVE DATA 60' RADIUS**  
S.E. RAMP D-JN  
PI. Sta. 0+22.79  
 $\Delta = 61^\circ 20' 45''$   
 $R = 60.00'$   
 $T = 35.59'$   
 $L = 64.24'$   
 $E = 9.58'$
- CURVE DATA**  
DENISON AVE. SURVEY &  
PI. Sta. 4+45.49  
 $\Delta = 34^\circ 33' 29''$   
 $D = 14^\circ 00' 00''$   
 $R = 409.26'$   
 $T = 127.30'$   
 $L = 246.84'$   
 $E = 19.34'$
- CURVE DATA 50' RADIUS**  
S.W. RAMP JN-D  
PI. Sta. 13+48.86  
 $\Delta = 74^\circ 26' 13''$   
 $R = 50.00'$   
 $T = 37.98'$   
 $L = 64.96'$   
 $E = 12.79'$
- CURVE DATA 50' RADIUS**  
S.E. RAMP JN-D  
PI. Sta. 13+19.28  
 $\Delta = 57^\circ 22' 24''$   
 $R = 50.00'$   
 $T = 27.36'$   
 $L = 50.07'$   
 $E = 7.00'$



Note:  
Roadside Cleanup, Item L-6 shall be performed in the area north of Denison Ave. lying between the construction areas

BEGIN WORK  
CUY.-176-12.76  
N. EDGE OF  
DENISON AVE.

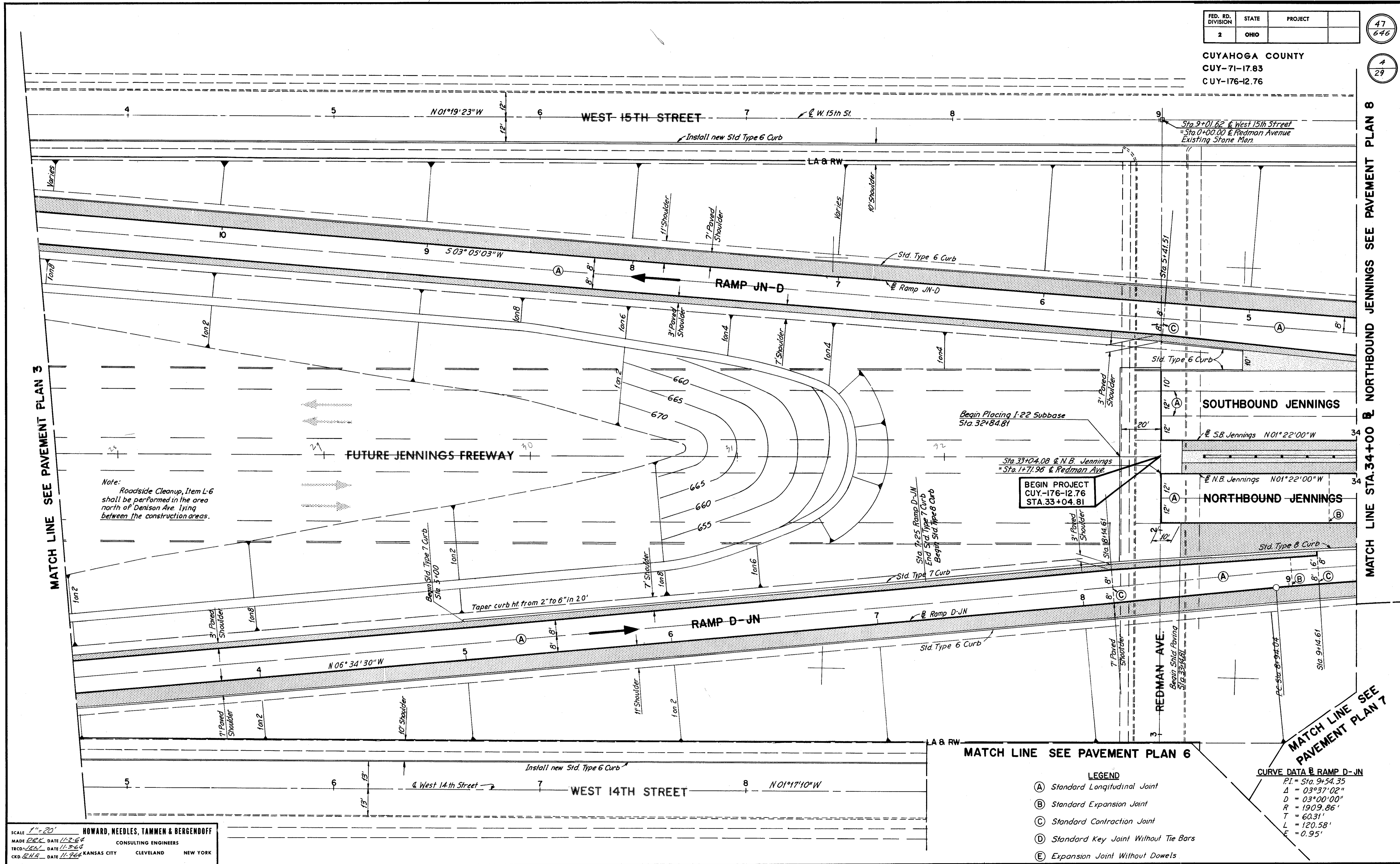
- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

47  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

4  
29



MATCH LINE SEE PAVEMENT PLAN 3

MATCH LINE STA. 34+00 @ NORTHBOUND JENNINGS SEE PAVEMENT PLAN 8

MATCH LINE SEE PAVEMENT PLAN 6

MATCH LINE SEE PAVEMENT PLAN 7

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

**CURVE DATA @ RAMP D-JN**

PI	= Sta. 9+54.35
Δ	= 03°37'02"
D	= 03°00'00"
R	= 1909.86'
T	= 60.31'
L	= 120.58'
E	= 0.95'

SCALE 1"=20'  
HOWARD, NEEDLES, TAMMEN & BERGENOFF  
CONSULTING ENGINEERS  
MADE DEK DATE 11-2-64  
TRCD-JEN DATE 11-3-64  
CKD-RHA DATE 11-9-64  
KANSAS CITY CLEVELAND NEW YORK

PAVEMENT PLAN 4

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

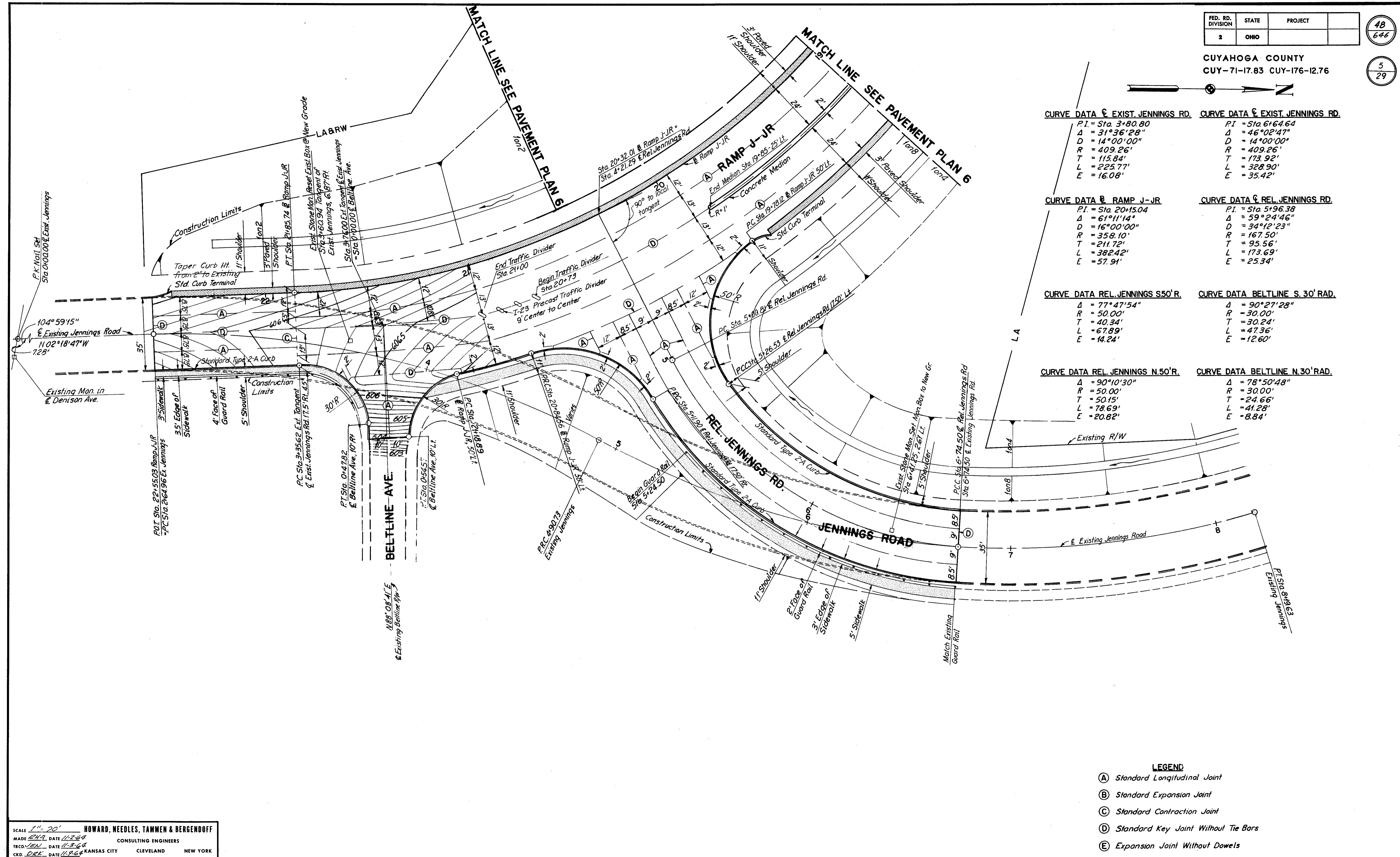
48  
646

CUYAHOGA COUNTY  
CUY-71-17.83 CUY-176-12.76

5  
29



CURVE DATA @ EXIST. JENNINGS RD.	CURVE DATA @ EXIST. JENNINGS RD.
P.I. = Sta. 3+80.80 Δ = 31°36'28" D = 14°00'00" R = 409.26' T = 115.84' L = 225.77' E = 16.08'	P.I. = Sta. 6+64.64 Δ = 46°02'47" D = 14°00'00" R = 409.26' T = 173.92' L = 328.90' E = 35.42'
CURVE DATA @ RAMP J-JR	CURVE DATA @ REL. JENNINGS RD.
P.I. = Sta. 20+15.04 Δ = 61°11'14" D = 16°00'00" R = 358.10' T = 211.72' L = 382.42' E = 57.91'	P.I. = Sta. 5+96.38 Δ = 59°24'46" D = 34°12'23" R = 167.50' T = 95.56' L = 173.69' E = 25.34'
CURVE DATA REL. JENNINGS S50°R.	CURVE DATA BELTLINE S. 30° RAD.
Δ = 77°47'54" R = 50.00' T = 40.34' L = 67.89' E = 14.24'	Δ = 90°27'28" R = 30.00' T = 30.24' L = 47.36' E = 12.60'
CURVE DATA REL. JENNINGS N.50°R.	CURVE DATA BELTLINE N. 30° RAD.
Δ = 90°10'30" R = 50.00' T = 50.15' L = 78.69' E = 20.82'	Δ = 78°50'48" R = 30.00' T = 24.66' L = 41.28' E = 8.84'



- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE BY DATE 11-2-64 CONSULTING ENGINEERS  
 TRCO-SEN DATE 11-3-64 KANSAS CITY CLEVELAND NEW YORK  
 CKD-DRE DATE 11-9-64



**CURVE DATA @ RAMP J-JR**  
 PI = Sta. 20+15.04  
 Δ = 16°11'14"  
 D = 16°00'00"  
 R = 358.10'  
 T = 211.72'  
 L = 382.42'  
 E = 57.91'

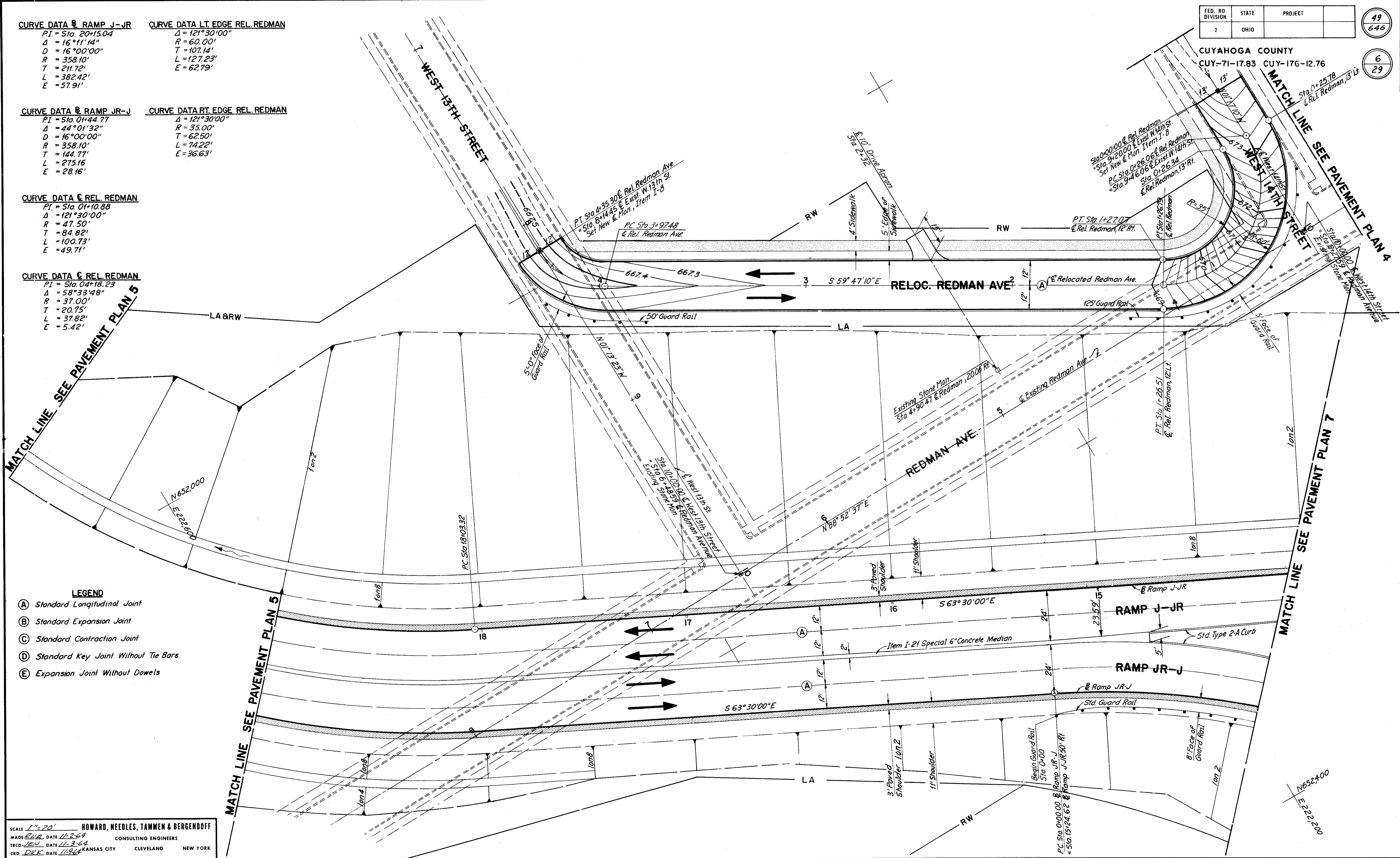
**CURVE DATA LT. EDGE REL. REDMAN**  
 Δ = 121°30'00"  
 R = 60.00'  
 T = 107.14'  
 L = 127.23'  
 E = 62.79'

**CURVE DATA @ RAMP JR-J**  
 PI = Sta. 01+44.77  
 Δ = 44°01'32"  
 D = 16°00'00"  
 R = 358.10'  
 T = 144.77'  
 L = 275.16'  
 E = 28.16'

**CURVE DATA RT. EDGE REL. REDMAN**  
 Δ = 121°30'00"  
 R = 35.00'  
 T = 62.50'  
 L = 74.22'  
 E = 36.63'

**CURVE DATA @ REL. REDMAN**  
 PI = Sta. 01+10.88  
 Δ = 121°30'00"  
 R = 47.50'  
 T = 84.82'  
 L = 100.73'  
 E = 49.71'

**CURVE DATA @ REL. REDMAN**  
 PI = Sta. 04+18.23  
 Δ = 58°33'48"  
 R = 37.00'  
 T = 20.75'  
 L = 37.82'  
 E = 5.42'



- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

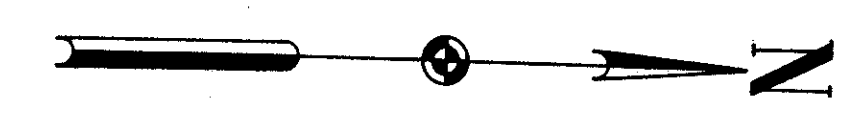
SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE IN OHIO DATE 11-2-64 CONSULTING ENGINEERS  
 TRCD. JEN. DATE 11-3-64 KANSAS CITY CLEVELAND NEW YORK  
 CRD. DBK. DATE 11-9-64

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

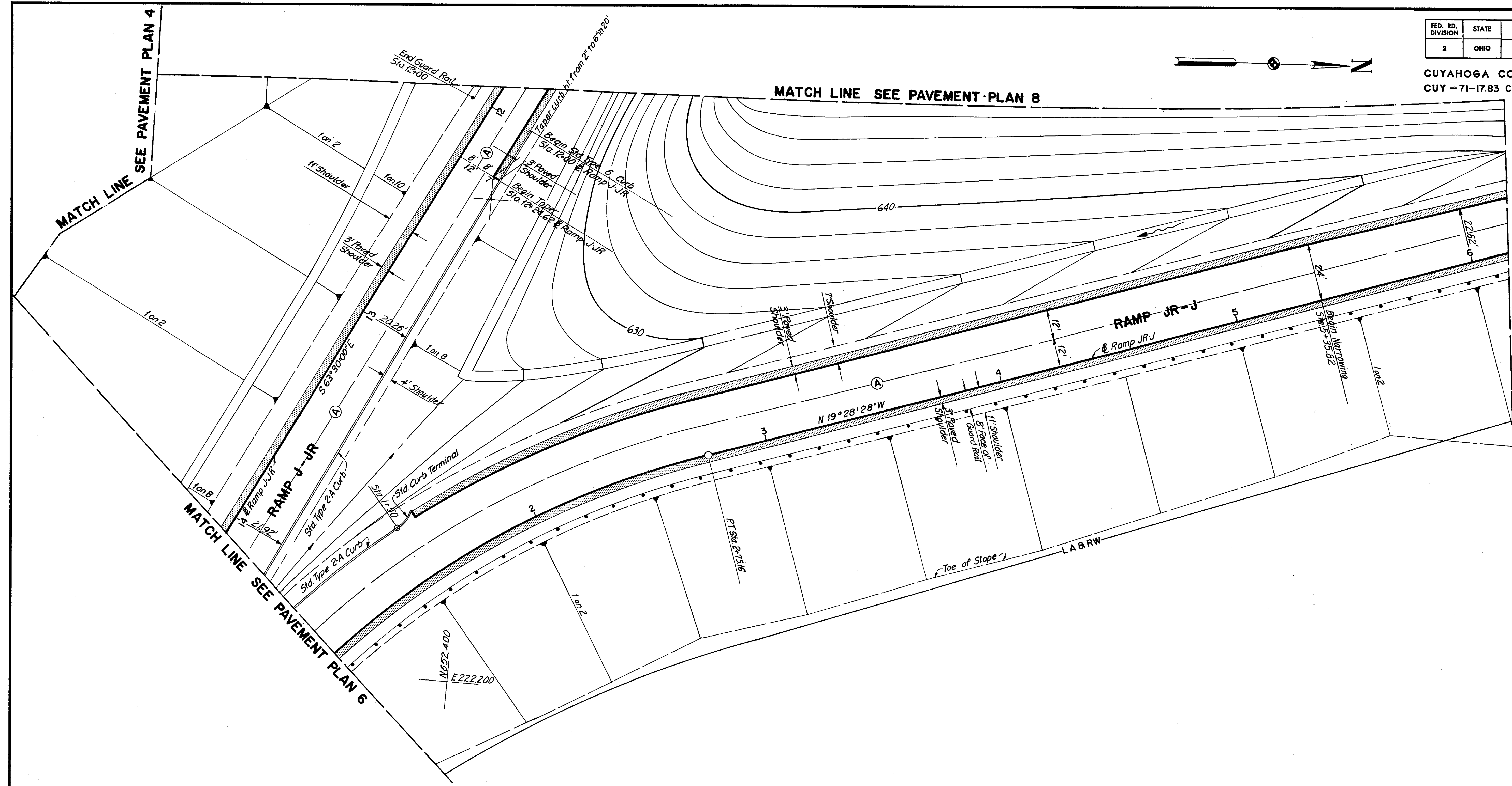
50  
646

CUYAHOGA COUNTY  
CUY-71-17.83 CUY-176-12.76

7  
29



MATCH LINE SEE PAVEMENT PLAN 8



**CURVE DATA @ RAMP JR-J**  
 P.I. Sta. 01+44.77  
 $\Delta = 44^{\circ} 01' 32''$   
 $D = 16^{\circ} 00' 00''$   
 $R = 358.10'$   
 $T = 144.77'$   
 $L = 275.16'$   
 $E = 28.16'$

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE BY DATE 11-2-64 CONSULTING ENGINEERS  
 TRCD. 150 DATE 11-2-64 KANSAS CITY CLEVELAND NEW YORK  
 CKD. DEK DATE 11-9-64

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

51  
646

8  
29

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

**CURVE DATA @ N.B. JENNINGS**  
 $\Delta c = 20^{\circ}19'08''$   
 $D_c = 04^{\circ}00'00''$   
 $R_c = 1432.39'$   
 $L_c = 507.97'$   
 $L_s = 450.00'$   
 $\theta_s = 09^{\circ}00'00''$   
 $PI. Sta. = 43.19.58'$   
 $\Delta = 38^{\circ}19'08''$   
 $T_s = 724.54'$   
 $E_s = 90.22'$

**CURVE DATA @ RAMP J-JR**  
 $PI. = Sta. 9+62.56$   
 $\Delta = 60^{\circ}52'31''$   
 $D = 16^{\circ}00'00''$   
 $R = 358.10'$   
 $T = 210.41'$   
 $L = 390.47'$   
 $E = 57.24'$

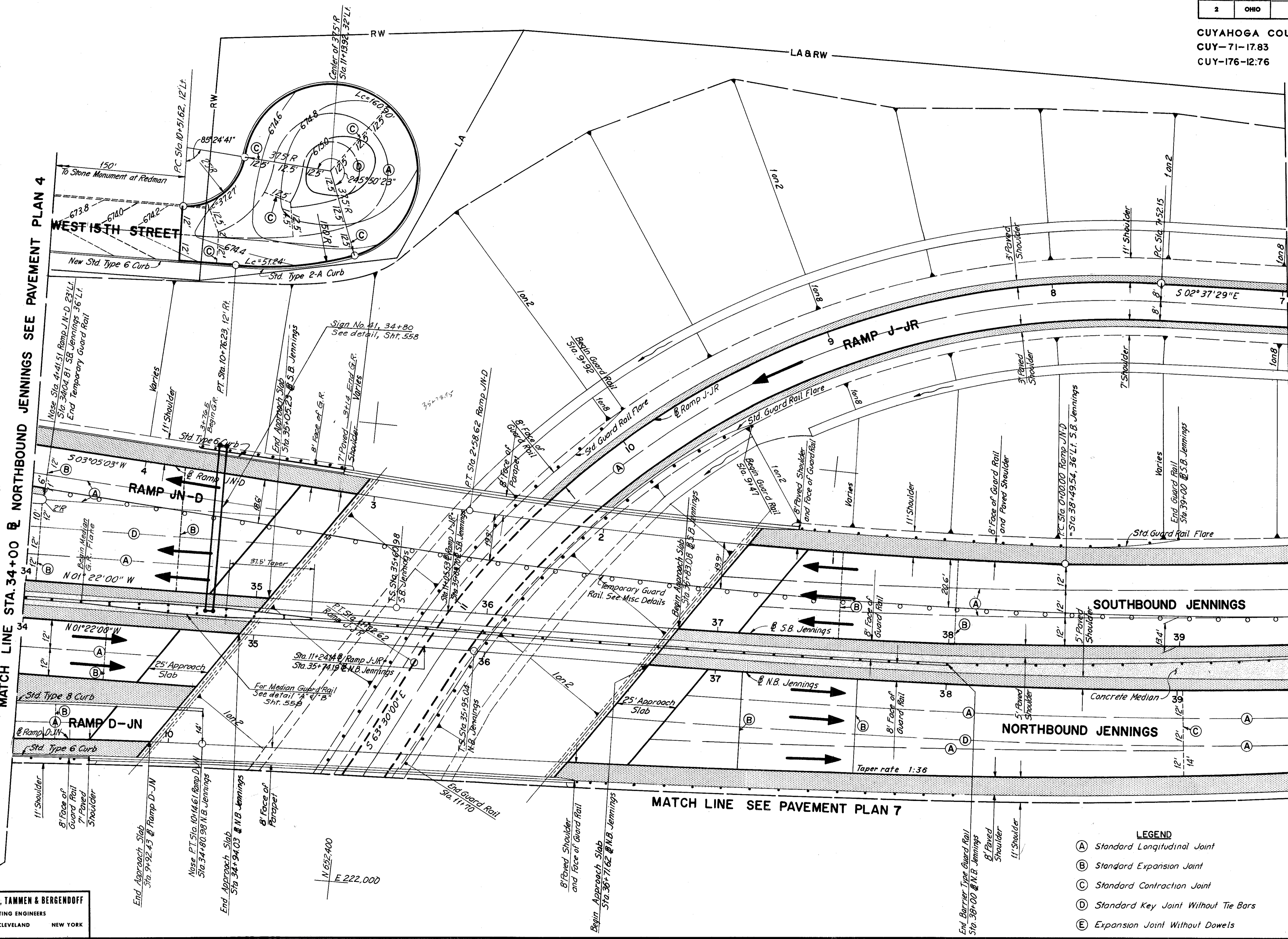
**CURVE DATA @ RAMP D-JN**  
 $PI. = Sta. 9+54.35$   
 $\Delta = 03^{\circ}37'02''$   
 $D = 03^{\circ}00'00''$   
 $R = 1909.86'$   
 $T = 60.31'$   
 $L = 120.58'$   
 $E = 0.95'$

**CURVE DATA @ RAMP JN-D**  
 $PI. = Sta. 0+29.51$   
 $\Delta = 07^{\circ}45'31''$   
 $D = 03^{\circ}00'00''$   
 $R = 1909.86'$   
 $T = 129.51'$   
 $L = 258.62'$   
 $E = 4.39'$

**CURVE DATA @ S.B. JENNINGS**  
 $\Delta c = 22^{\circ}17'56''$   
 $D_c = 04^{\circ}00'00''$   
 $R_c = 1432.39'$   
 $L_c = 557.47'$   
 $L_s = 450.00'$   
 $\theta_s = 09^{\circ}00'00''$   
 $PI. Sta. = 43+13.54$   
 $\Delta = 40^{\circ}17'56''$   
 $T_s = 752.56'$   
 $E_s = 99.65'$

MATCH LINE STA. 34+00 @ NORTHBOUND JENNINGS SEE PAVEMENT PLAN 4

MATCH LINE STA. 39+50 @ NORTHBOUND JENNINGS SEE PAVEMENT PLAN 9



SCALE 1"=20'  
**HOWARD, NEEDLES, TAMMEN & BERGENOFF**  
 MADE E.H.A. DATE 11-2-64 CONSULTING ENGINEERS  
 TRCD. J.G.M. DATE 11-3-64 KANSAS CITY CLEVELAND NEW YORK  
 CKD. D.R.K. DATE 11-2-64

MATCH LINE SEE PAVEMENT PLAN 7

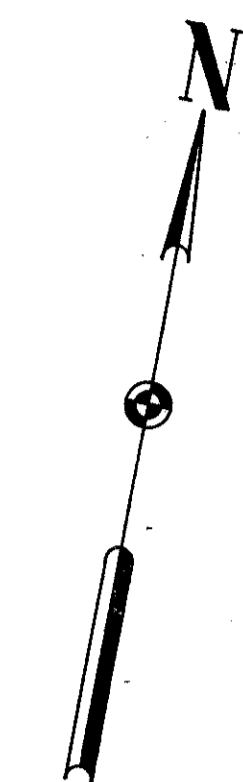
**LEGEND**  
 (A) Standard Longitudinal Joint  
 (B) Standard Expansion Joint  
 (C) Standard Contraction Joint  
 (D) Standard Key Joint Without Tie Bars  
 (E) Expansion Joint Without Dowels

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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646

9  
29

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



**CURVE DATA @ RAMP J-JR**

PI = Sta. 02+19.14  
Δ = 34°01'31"  
D = 08°00'00"  
R = 716.20'  
T = 219.14'  
L = 425.32'  
E = 32.77'

**CURVE DATA @ S.B. JENNINGS**

Δc = 22°17'56"  
Dc = 04°00'00"  
Rc = 1432.39'  
Lc = 557.47'  
Ls = 450.00'  
θs = 09°00'00"  
PI Sta. 43+13.54  
Δ = 40°17'56"  
Ts = 752.56'  
Es = 99.65'

**CURVE DATA @ N.B. JENNINGS**

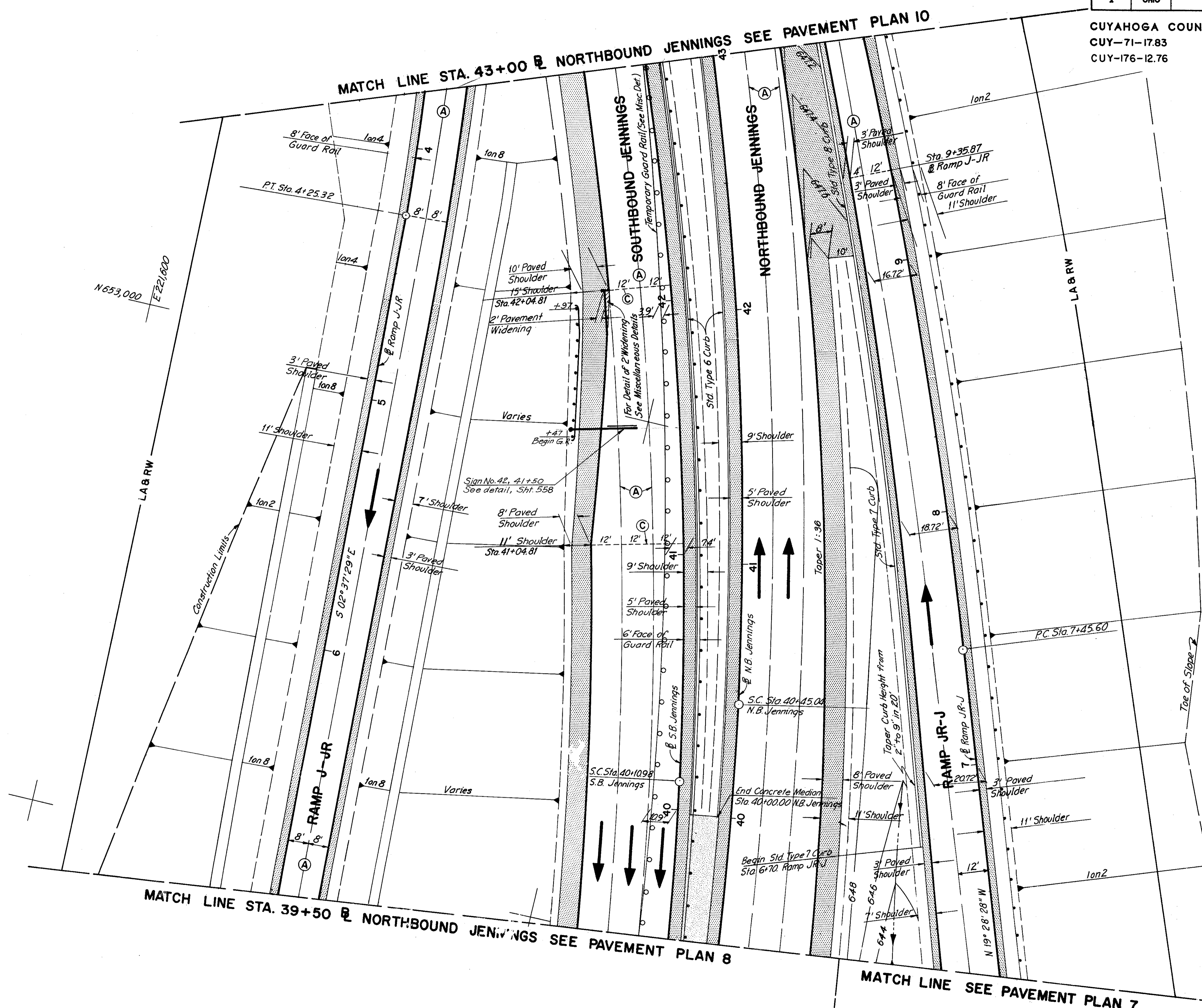
Δc = 20°19'08"  
Dc = 04°00'00"  
Rc = 1432.39'  
Lc = 507.97'  
Ls = 450.00'  
θs = 09°00'00"  
PI Sta. 43+19.58  
Δ = 38°19'08"  
Ts = 724.54'  
Es = 90.22'

**CURVE DATA @ RAMP JR-J**

PI = Sta. 09+99.50  
Δ = 12°38'35"  
D = 02°30'00"  
R = 2291.83'  
T = 253.89'  
L = 505.72'  
E = 14.02'

**LEGEND**

- (A) Standard Longitudinal Joint
- (B) Standard Expansion Joint
- (C) Standard Contraction Joint
- (D) Standard Key Joint Without Tie Bars
- (E) Expansion Joint Without Dowels



SCALE 1"=20'  
HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE E.H.A. DATE 11-2-64 CONSULTING ENGINEERS  
TRCD J.E.N. DATE 11-3-64  
CKD D.R.K. DATE 11-9-64 KANSAS CITY CLEVELAND NEW YORK

MATCH LINE SEE PAVEMENT PLAN 7

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

53  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

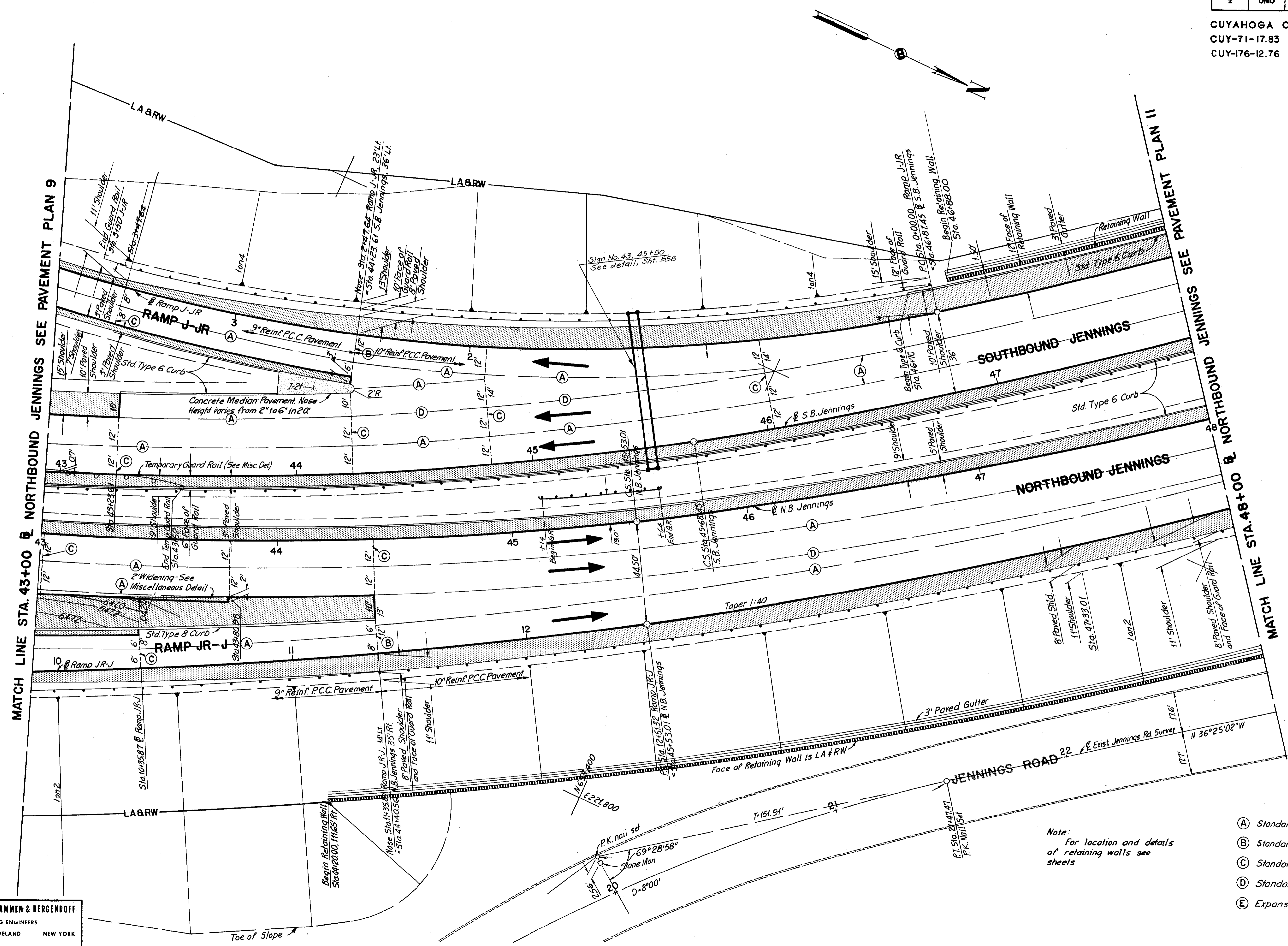
10  
29

**CURVE DATA @ RAMP J-JR**  
 P.I. = Sta. 02+19.14  
 Δ = 34°01'31"  
 D = 08°00'00"  
 R = 716.20'  
 T = 219.14'  
 L = 425.32'  
 E = 32.77'

**CURVE DATA @ RAMP JR-J**  
 P.I. = Sta. 09+99.50  
 Δ = 12°38'35"  
 D = 02°30'00"  
 R = 2291.83'  
 T = 253.89'  
 L = 505.72'  
 E = 14.02'

**CURVE DATA @ S.B. JENNINGS**  
 Δc = 22°17'56"  
 Dc = 04°00'00"  
 Rc = 1432.39'  
 Lc = 557.47'  
 Ls = 450.00'  
 θs = 09°00'00"  
 P.I. = Sta. 43+13.54  
 Δ = 40°17'56"  
 Ts = 752.56'  
 Es = 9965'

**CURVE DATA @ N.B. JENNINGS**  
 Δc = 20°19'08"  
 Dc = 04°00'00"  
 Rc = 1432.39'  
 Lc = 507.97'  
 Ls = 450.00'  
 θs = 09°00'00"  
 P.I. = Sta. 43+19.58  
 Δ = 38°19'08"  
 Ts = 724.54'  
 Es = 90.22'



SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE BY DATE 11-2-64 CONSULTING ENGINEERS  
 TRCD. JEN. DATE 11-3-64  
 CKD. DEE. DATE 11-9-64 KANSAS CITY CLEVELAND NEW YORK

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

Note:  
 For location and details  
 of retaining walls see  
 sheets

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

54  
646

11  
29

CUYAHOGA COUNTY  
CUY - 71-17.83  
CUY-176-12.76

END PROJECT CUY-176-12.76 STA. 53+82.42	BEGIN WORK CUY-71 17.83 STA. 41+80.17
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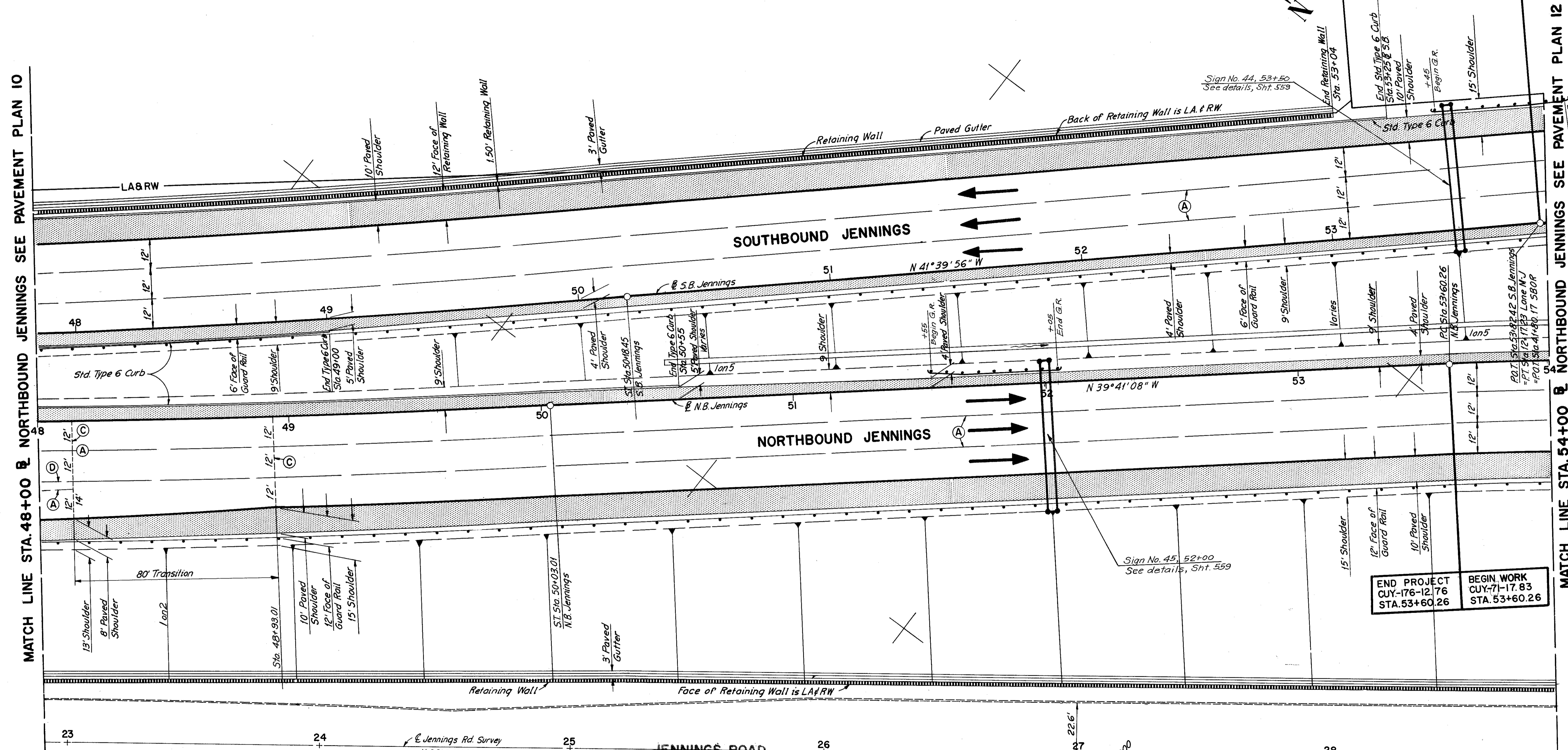
**CURVE DATA @ N.B. JENNINGS**  
 P.I. = Sta. 58+95.63  
 $\Delta = 50^{\circ}05'01''$   
 $D = 05^{\circ}00'00''$   
 $R = 1145.92'$   
 $T = 535.37'$   
 $L = 1001.67'$   
 $E = 118.89'$

**CURVE DATA @ N.B. JENNINGS**  
 $\Delta c = 20^{\circ}19'08''$   
 $Dc = 04^{\circ}00'00''$   
 $Rc = 1432.39'$   
 $Lc = 507.97'$   
 $Ls = 450.00'$   
 $\theta s = 09^{\circ}00'00''$   
 P.I. Sta. = 43+19.58  
 $\Delta = 38^{\circ}19'08''$   
 $Ts = 724.54'$   
 $Es = 90.22'$

**CURVE DATA @ S.B. JENNINGS**  
 $\Delta c = 22^{\circ}17'56''$   
 $Dc = 04^{\circ}00'00''$   
 $Rc = 1432.39'$   
 $Lc = 557.47'$   
 $Ls = 450.00'$   
 $\theta s = 09^{\circ}00'00''$   
 P.I. Sta. = 43+13.54  
 $\Delta = 40^{\circ}17'56''$   
 $Ts = 752.56'$   
 $Es = 99.65'$

MATCH LINE STA. 48+00 @ NORTHBOUND JENNINGS SEE PAVEMENT PLAN 10

MATCH LINE STA. 54+00 @ NORTHBOUND JENNINGS SEE PAVEMENT PLAN 12



END PROJECT CUY-176-12.76 STA. 53+60.26	BEGIN WORK CUY-71-17.83 STA. 53+60.26
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Note:  
For location and details  
of retaining walls see  
sheets

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

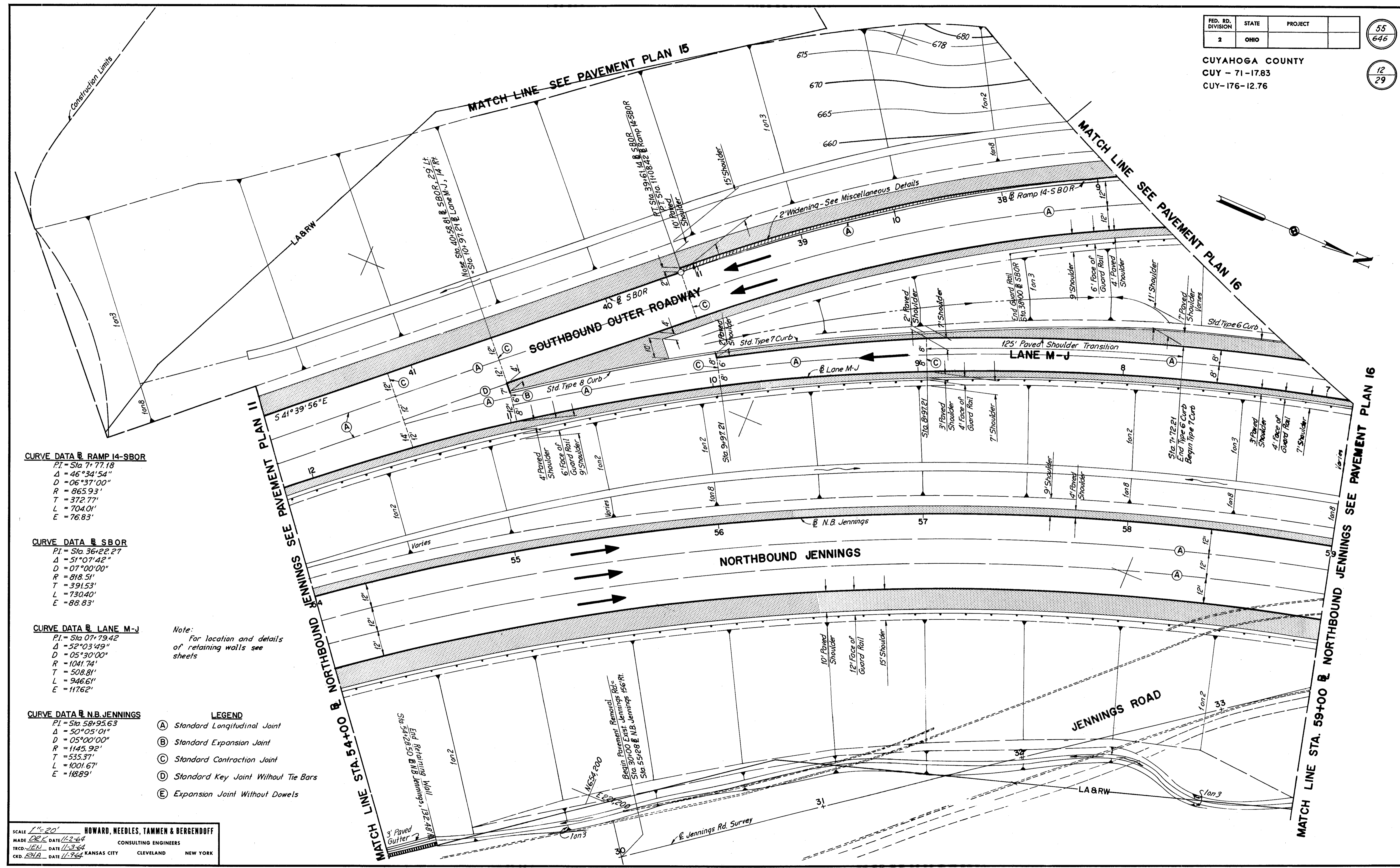
SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE R.H.A. DATE 11-2-64 CONSULTING ENGINEERS  
 TRCD. JEN. DATE 11-3-64 KANSAS CITY CLEVELAND NEW YORK  
 CKD. DRK. DATE 11-7-64

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

55  
646

CUYAHOGA COUNTY  
CUY - 71-17.83  
CUY-176-12.76

12  
29



**CURVE DATA @ RAMP 14-SBOR**  
 P.I. = Sta 7+77.18  
 $\Delta = 46^{\circ}34'54''$   
 $D = 06^{\circ}37'00''$   
 $R = 865.93'$   
 $T = 372.77'$   
 $L = 704.01'$   
 $E = 76.83'$

**CURVE DATA @ SBOR**  
 P.I. = Sta 36+22.27  
 $\Delta = 51^{\circ}07'42''$   
 $D = 07^{\circ}00'00''$   
 $R = 818.51'$   
 $T = 391.53'$   
 $L = 730.40'$   
 $E = 88.83'$

**CURVE DATA @ LANE M-J**  
 P.I. = Sta 07+79.42  
 $\Delta = 52^{\circ}03'49''$   
 $D = 05^{\circ}30'00''$   
 $R = 1041.74'$   
 $T = 508.81'$   
 $L = 946.61'$   
 $E = 117.62'$

**CURVE DATA @ N.B. JENNINGS**  
 P.I. = Sta 58+95.63  
 $\Delta = 50^{\circ}05'01''$   
 $D = 05^{\circ}00'00''$   
 $R = 1145.92'$   
 $T = 535.37'$   
 $L = 1001.67'$   
 $E = 188.89'$

Note:  
For location and details  
of retaining walls see  
sheets

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE D.E.L. DATE 11-2-64 CONSULTING ENGINEERS  
 TRCD JEN DATE 11-3-64 KANSAS CITY CLEVELAND NEW YORK  
 CKD RHA DATE 11-9-64

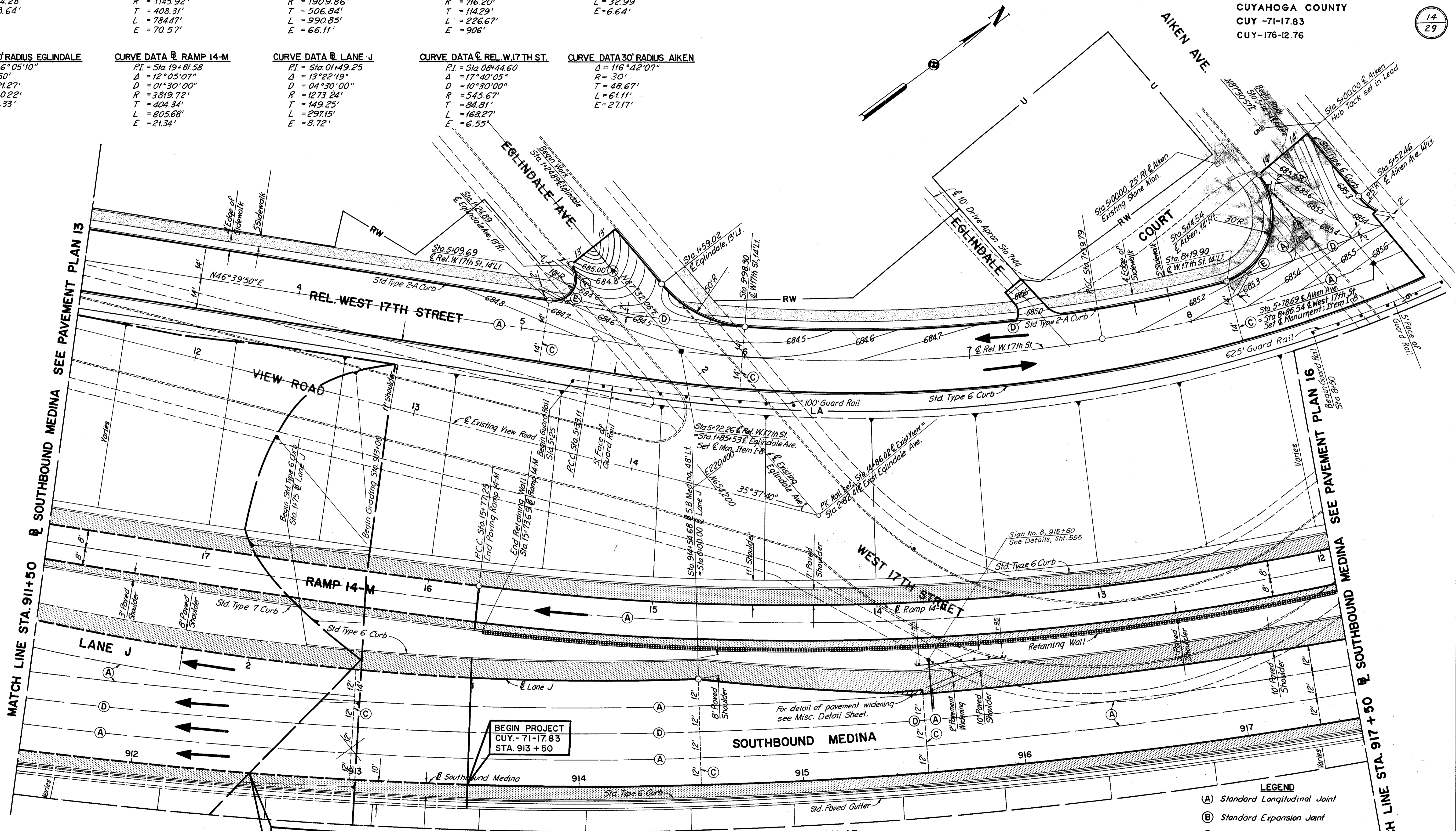




<b>CURVE DATA 10' RADIUS EGLINDALE</b> $\Delta = 139^{\circ}07'44''$ $R = 10'$ $T = 26.84'$ $L = 24.28'$ $E = 18.64'$	<b>CURVE DATA @ RAMP 14-M</b> $PI = Sta. 12+01.09$ $\Delta = 39^{\circ}13'24''$ $D = 05^{\circ}00'00''$ $R = 1145.92'$ $T = 408.31'$ $L = 784.47'$ $E = 70.57'$	<b>CURVE DATA @ S.B. MEDINA</b> $PI = Sta. 915+72.64$ $\Delta = 29^{\circ}43'32''$ $D = 03^{\circ}00'00''$ $R = 1909.86'$ $T = 506.84'$ $L = 990.85'$ $E = 66.11'$	<b>CURVE DATA @ REL. W. 17TH ST.</b> $PI = Sta. 06+47.40$ $\Delta = 18^{\circ}08'01''$ $D = 08^{\circ}00'00''$ $R = 716.20'$ $T = 114.29'$ $L = 226.67'$ $E = 90.6'$	<b>CURVE DATA 25' RADIUS AIKEN</b> $\Delta = 75^{\circ}36'42''$ $R = 25'$ $T = 15.33$ $L = 32.99$ $E = 6.64'$
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<b>CURVE DATA 50' RADIUS EGLINDALE</b> $\Delta = 46^{\circ}05'10''$ $R = 50'$ $T = 21.27'$ $L = 40.22'$ $E = 4.33'$	<b>CURVE DATA @ RAMP 14-M</b> $PI = Sta. 19+81.58$ $\Delta = 12^{\circ}05'07''$ $D = 01^{\circ}30'00''$ $R = 3819.72'$ $T = 404.34'$ $L = 805.63'$ $E = 21.34'$	<b>CURVE DATA @ LANE J</b> $PI = Sta. 01+49.25$ $\Delta = 13^{\circ}22'19''$ $D = 04^{\circ}30'00''$ $R = 1273.24'$ $T = 149.25'$ $L = 297.15'$ $E = 8.72'$	<b>CURVE DATA @ REL. W. 17TH ST.</b> $PI = Sta. 08+44.60$ $\Delta = 17^{\circ}40'05''$ $D = 10^{\circ}30'00''$ $R = 545.67'$ $T = 84.81'$ $L = 163.27'$ $E = 6.55'$	<b>CURVE DATA 30' RADIUS AIKEN</b> $\Delta = 116^{\circ}42'07''$ $R = 30'$ $T = 48.67'$ $L = 61.11'$ $E = 27.17'$
--	--	--	--	--

FED. RD. DIVISION 2	STATE OHIO	PROJECT CUY-71-17.83	57 646
CUYAHOGA COUNTY CUY-71-17.83 CUY-176-12.76			14 29



SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE *SEN* DATE 8-24-64 CONSULTING ENGINEERS  
 TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
 CKD. R.I.T. DATE 8-31-64

BEGIN WORK  
 CUY-71-17.83  
 STA. 912+50

BEGIN PROJECT  
 CUY-71-17.83  
 STA. 913+50

MATCH LINE SEE PAVEMENT PLAN 15

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

58  
696

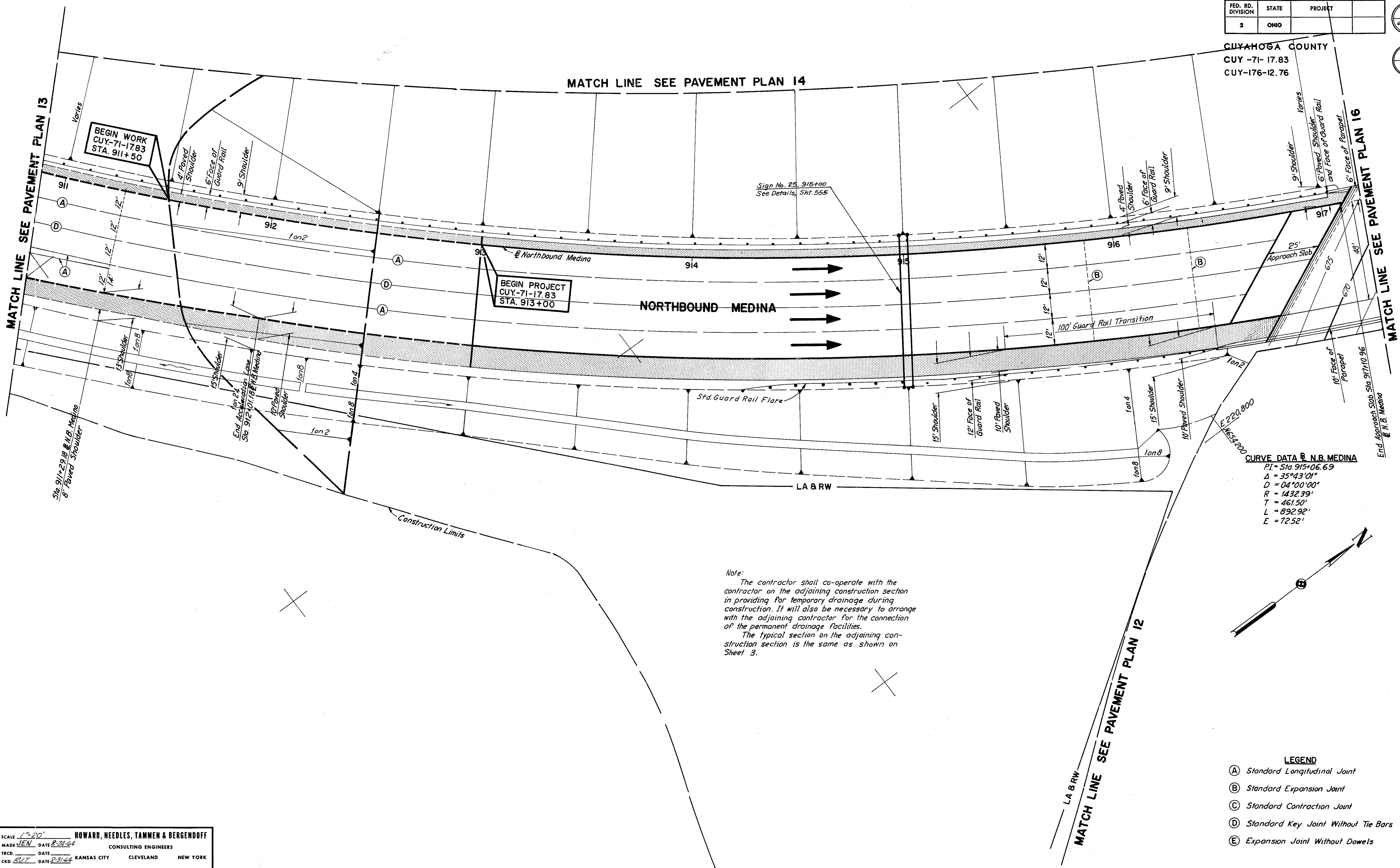
15  
29

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

MATCH LINE SEE PAVEMENT PLAN 14

MATCH LINE SEE PAVEMENT PLAN 13

MATCH LINE SEE PAVEMENT PLAN 16



BEGIN PROJECT  
CUY-71-17.83  
STA. 913+00

BEGIN WORK  
CUY-71-17.83  
STA. 911+50

**CURVE DATA @ N.B. MEDINA**  
 P.I. = Sta. 915+06.69  
 $\Delta = 35^{\circ}43'01''$   
 $D = 04^{\circ}00'00''$   
 $R = 1432.39'$   
 $T = 461.50'$   
 $L = 892.92'$   
 $E = 72.52'$

Note:  
 The contractor shall co-operate with the contractor on the adjoining construction section in providing for temporary drainage during construction. It will also be necessary to arrange with the adjoining contractor for the connection of the permanent drainage facilities.  
 The typical section on the adjoining construction section is the same as shown on Sheet 3.

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

SCALE 1"=20'  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE JEN DATE 8-24-64 CONSULTING ENGINEERS  
 TRCD. DATE  
 CKD. RUT DATE 8-31-64 KANSAS CITY CLEVELAND NEW YORK

**CURVE DATA @ RAMP 14-M**

P.I. Sta. 12+01.09  
 $\Delta = 39^\circ 13' 24''$   
 $D = 05^\circ 00' 00''$   
 $R = 1145.92'$   
 $T = 408.31'$   
 $L = 784.47'$   
 $E = 70.57'$

**CURVE DATA @ N.B. MEDINA**

P.I. Sta. 915+06.69  
 $\Delta = 35^\circ 43' 01''$   
 $D = 04^\circ 00' 00''$   
 $R = 1432.39'$   
 $T = 461.50'$   
 $L = 892.92'$   
 $E = 72.52'$

**CURVE DATA @ N.B. MEDINA**

P.I. Sta. 921+59.77  
 $\Delta = 06^\circ 29' 43''$   
 $D = 01^\circ 28' 00''$   
 $R = 3906.53'$   
 $T = 221.66'$   
 $L = 442.86'$   
 $E = 6.28'$

**CURVE DATA @ SBOR**

P.I. Sta. 36+22.27  
 $\Delta = 51^\circ 07' 42''$   
 $D = 07^\circ 00' 00''$   
 $R = 818.51'$   
 $T = 391.53'$   
 $L = 730.40'$   
 $E = 88.83'$

**CURVE DATA @ S.B. MEDINA**

P.I. Sta. 915+72.64  
 $\Delta = 29^\circ 43' 32''$   
 $D = 03^\circ 00' 00''$   
 $R = 1909.86'$   
 $T = 506.84'$   
 $L = 990.85'$   
 $E = 66.11'$

**CURVE DATA @ S.B. MEDINA**

P.I. Sta. 923+17.93  
 $\Delta = 07^\circ 39' 11''$   
 $D = 01^\circ 28' 00''$   
 $R = 3906.52'$   
 $T = 261.28'$   
 $L = 521.80'$   
 $E = 8.73'$

**CURVE DATA @ N.B. JENNINGS**

P.I. Sta. 58+95.63  
 $\Delta = 50^\circ 05' 01''$   
 $D = 05^\circ 00' 00''$   
 $R = 1145.92'$   
 $T = 535.37'$   
 $L = 1001.67'$   
 $E = 118.89'$

**CURVE DATA @ 14-SBOR**

P.I. Sta. 07+77.18  
 $\Delta = 46^\circ 34' 54''$   
 $D = 06^\circ 37' 00''$   
 $R = 865.93'$   
 $T = 372.77'$   
 $L = 704.01'$   
 $E = 76.83'$

**CURVE DATA @ LANE M-J**

P.I. = Sta. 07+79.42  
 $\Delta = 52^\circ 03' 49''$   
 $D = 05^\circ 30' 00''$   
 $R = 1041.74'$   
 $T = 508.81'$   
 $L = 946.61'$   
 $E = 117.62'$

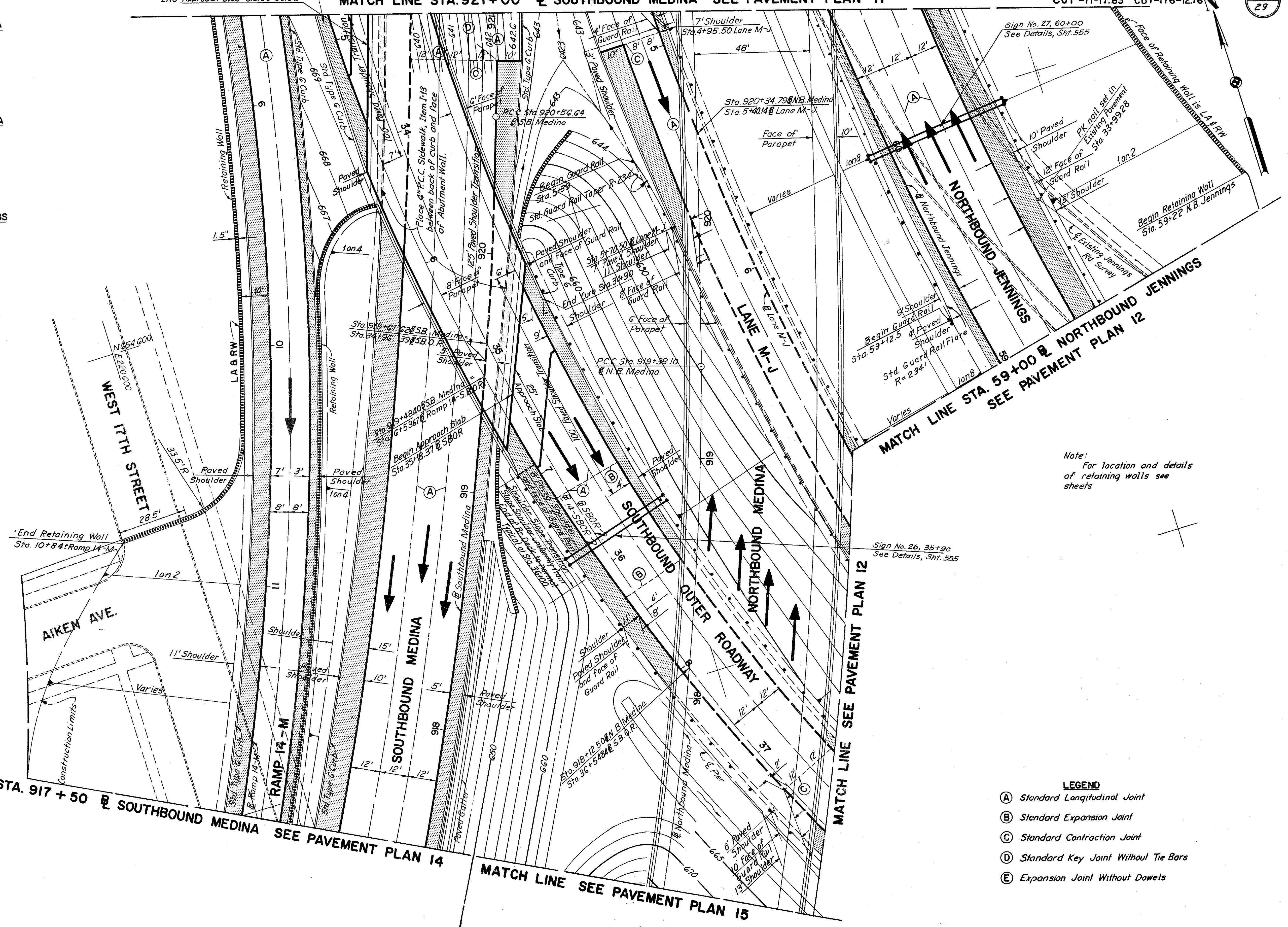
Note: Slope Paved Shoulder adjacent to Ramp 14-SBOR at same rate as pavement from Sta. 3+80 to beginning of bridge.

End Approach Slab Sta. 33+62.88 MATCH LINE STA. 921+00 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 17

MATCH LINE STA. 917+50 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 14

MATCH LINE SEE PAVEMENT PLAN 15

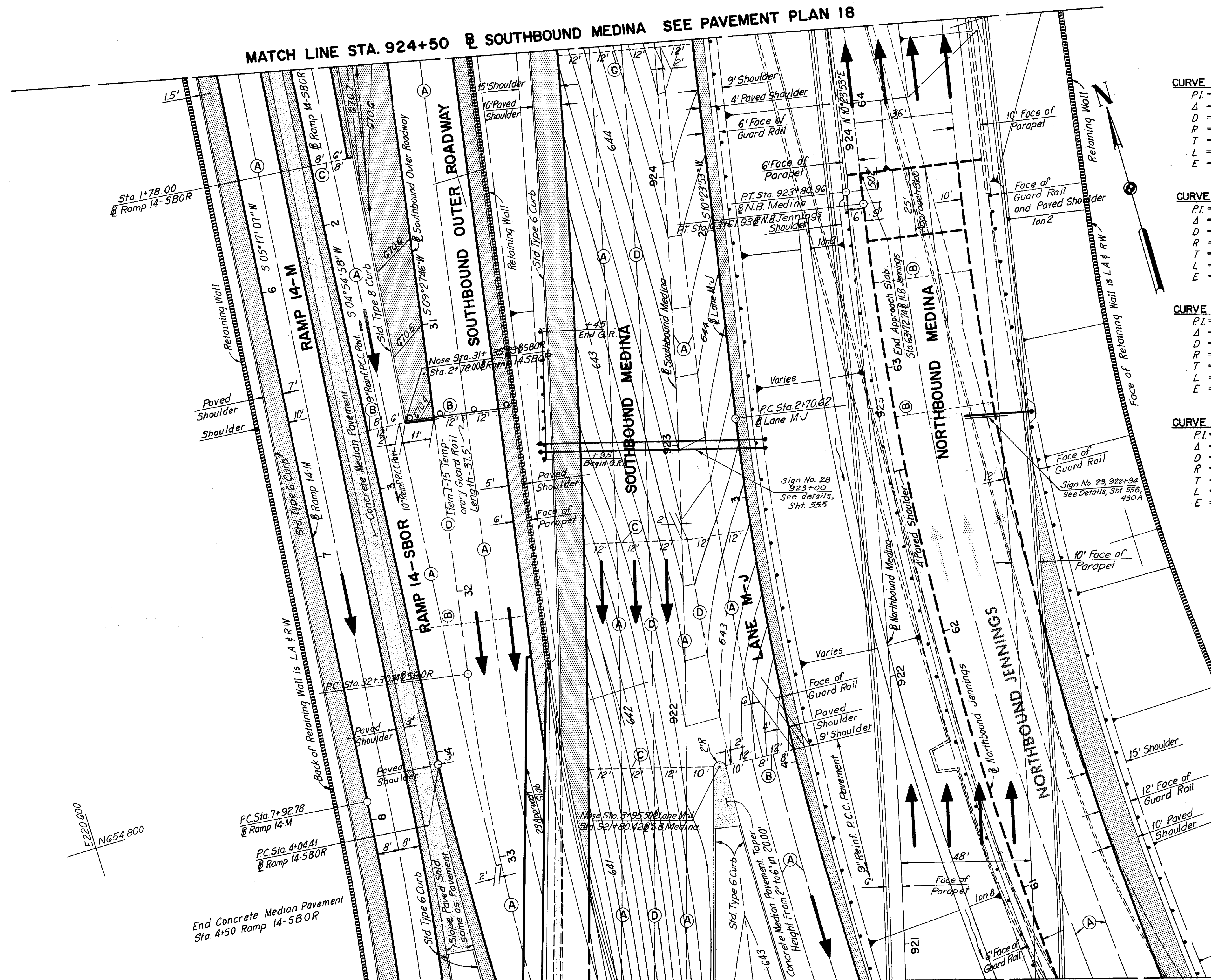
MATCH LINE SEE PAVEMENT PLAN 12



Note: For location and details of retaining walls see sheets

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

MATCH LINE STA. 924+50 SOUTHBOUND MEDINA SEE PAVEMENT PLAN 18



CURVE DATA @ RAMP 14-M	CURVE DATA @ RAMP 14-SBOR
PI = Sta. 12+01.09	PI = Sta. 07+77.18
Δ = 39°13'24"	Δ = 46°34'54"
D = 05°00'00"	D = 06°37'00"
R = 1145.92'	R = 865.93'
T = 408.31'	T = 372.77'
L = 784.47'	L = 704.01'
E = 70.57'	E = 76.83'

CURVE DATA @ SBOR	CURVE DATA @ S.B. MEDINA
PI = Sta. 36+22.27	PI = Sta. 923+17.93
Δ = 51°07'42"	Δ = 07°39'11"
D = 07°00'00"	D = 01°28'00"
R = 818.51'	R = 3906.52'
T = 391.53'	T = 261.28'
L = 730.40'	L = 521.80'
E = 88.83'	E = 8.73'

CURVE DATA @ LANE M-J	CURVE DATA @ N.B. MEDINA
PI = Sta. 07+79.42	PI = Sta. 921+59.77
Δ = 52°03'49"	Δ = 06°29'43"
D = 05°30'00"	D = 01°28'00"
R = 1041.74'	R = 3906.53'
T = 508.81'	T = 221.66'
L = 946.61'	L = 442.86'
E = 117.62'	E = 6.28'

CURVE DATA @ N.B. JENNINGS
PI = Sta. 58+95.63
Δ = 50°05'01"
D = 05°00'00"
R = 1145.92'
T = 535.37'
L = 1001.67'
E = 118.89'

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

Note:  
 For location and details  
 of retaining walls see  
 sheets

MATCH LINE STA. 921+00 SOUTHBOUND MEDINA SEE PAVEMENT PLAN 16

Note:  
 Place 4" P.C.C. Sidewalk, Item I-13  
 between back of Curb and Face of  
 Abutment Wall.

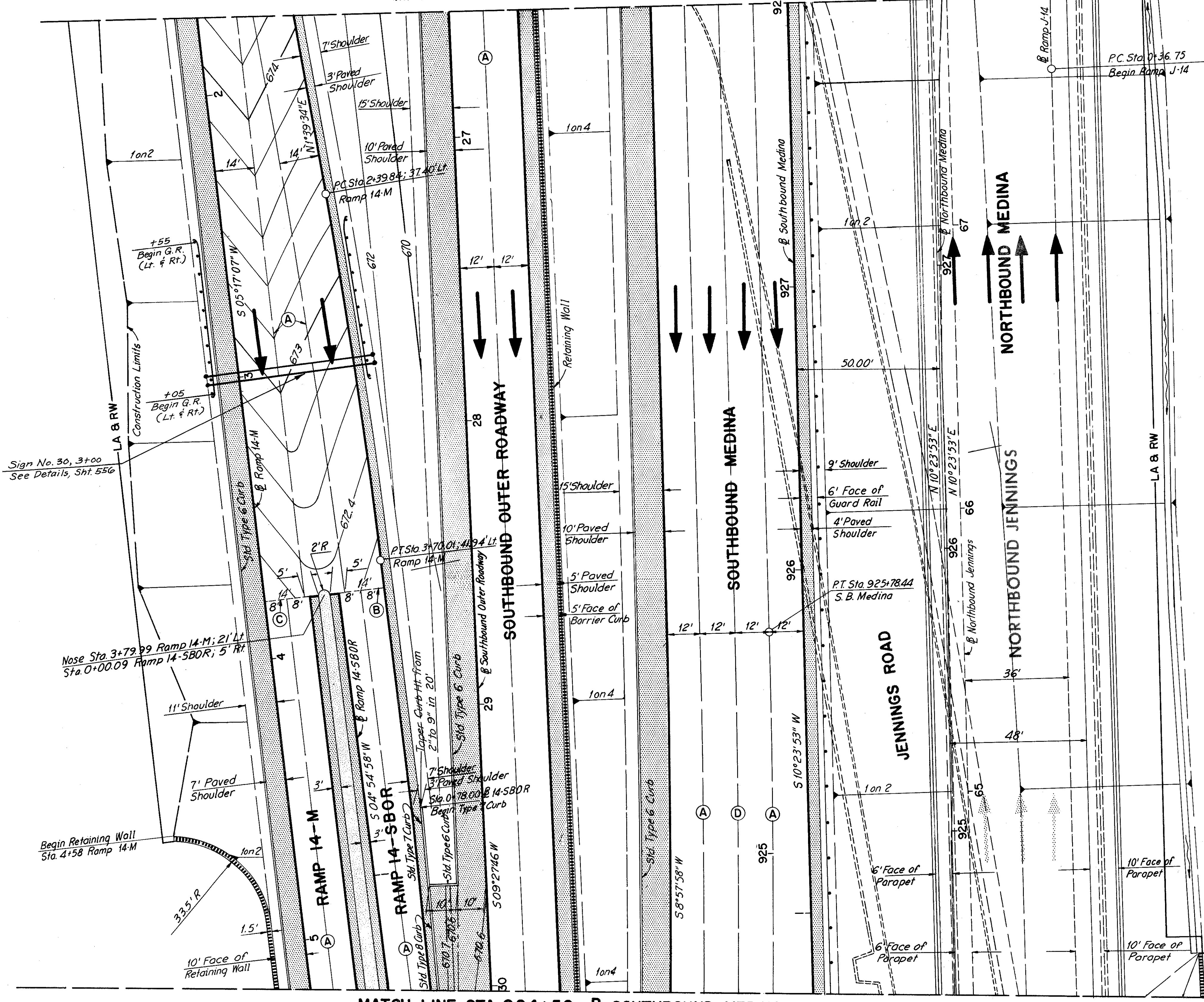
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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646

CUYAHOGA COUNTY  
CUY -71-17.83  
CUY-176-12.76

18  
29

MATCH LINE STA. 928+00 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 19

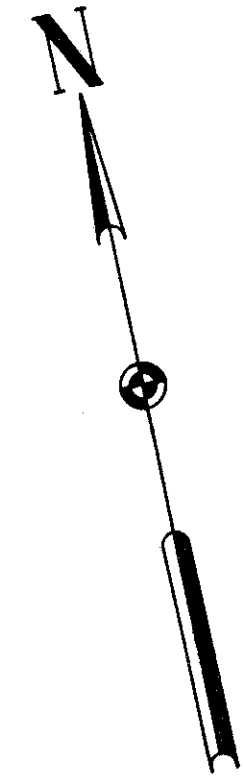


**CURVE DATA @ S.B. MEDINA**  
 P.I. = Sta. 923+17.93  
 $\Delta = 07^{\circ}39'11''$   
 $D = 01^{\circ}28'00''$   
 $R = 3906.52'$   
 $T = 261.28'$   
 $L = 521.80'$   
 $E = 8.73'$

**CURVE DATA @ RAMP J-14**  
 P.I. = Sta. 01+75.24  
 $\Delta = 08^{\circ}17'42''$   
 $D = 03^{\circ}00'00''$   
 $R = 1909.86'$   
 $T = 138.49'$   
 $L = 276.50'$   
 $E = 502.1'$

**CURVE DATA LT. EDGE RAMP 14-M**  
 P.I. = Sta. 3+04.86  
 $\Delta = 03^{\circ}15'24''$   
 $D = 02^{\circ}30'00''$   
 $R = 2291.83'$   
 $T = 65.15'$   
 $L = 130.27'$   
 $E = 0.93'$

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

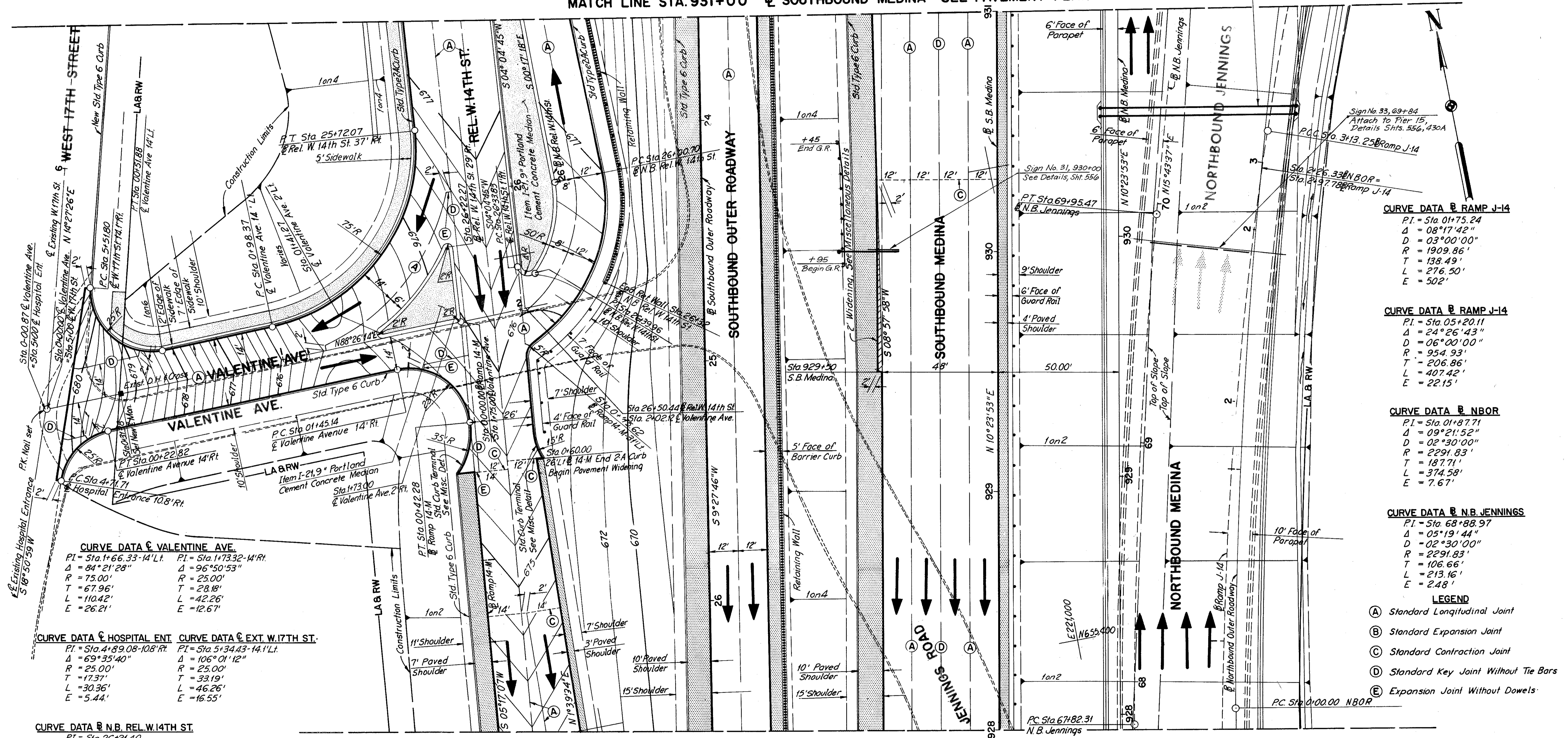


MATCH LINE STA. 924+50 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 17

SCALE 1"=20'  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE JEN. DATE 8/24/64 CONSULTING ENGINEERS  
 TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
 CKD. R.J.T. DATE 8/31/64

MATCH LINE STA. 931+00 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 20

Sign No. 32, 930+52  
See Details, Shrs. 556, 430A



**CURVE DATA @ RAMP J-14**  
 P.I. = Sta. 01+75.24  
 $\Delta = 08^{\circ}17'42''$   
 $D = 03^{\circ}00'00''$   
 $R = 1909.86'$   
 $T = 138.49'$   
 $L = 276.50'$   
 $E = 502'$

**CURVE DATA @ RAMP J-14**  
 P.I. = Sta. 05+20.11  
 $\Delta = 24^{\circ}26'43''$   
 $D = 06^{\circ}00'00''$   
 $R = 954.93'$   
 $T = 206.86'$   
 $L = 407.42'$   
 $E = 22.15'$

**CURVE DATA @ NBOR**  
 P.I. = Sta. 01+87.71  
 $\Delta = 09^{\circ}21'52''$   
 $D = 02^{\circ}30'00''$   
 $R = 2291.83'$   
 $T = 187.71'$   
 $L = 374.58'$   
 $E = 7.67'$

**CURVE DATA @ N.B. JENNINGS**  
 P.I. = Sta. 68+88.97  
 $\Delta = 05^{\circ}19'44''$   
 $D = 02^{\circ}30'00''$   
 $R = 2291.83'$   
 $T = 106.66'$   
 $L = 213.16'$   
 $E = 2.48'$

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

**CURVE DATA @ VALENTINE AVE.**  
 P.I. = Sta. 1+66.33-14'Lt. P.I. = Sta. 1+73.32-14'Rt.  
 $\Delta = 84^{\circ}21'28''$   $\Delta = 96^{\circ}50'53''$   
 $R = 75.00'$   $R = 25.00'$   
 $T = 67.96'$   $T = 28.18'$   
 $L = 110.42'$   $L = 42.26'$   
 $E = 26.21'$   $E = 12.67'$

**CURVE DATA @ HOSPITAL ENT. CURVE DATA @ EXT. W. 17TH ST.**  
 P.I. = Sta. 4+89.08-108'Rt. P.I. = Sta. 5+34.43-14'Lt.  
 $\Delta = 69^{\circ}35'40''$   $\Delta = 106^{\circ}01'12''$   
 $R = 25.00'$   $R = 25.00'$   
 $T = 17.37'$   $T = 33.19'$   
 $L = 30.36'$   $L = 46.26'$   
 $E = 5.44'$   $E = 16.55'$

**CURVE DATA @ N.B. REL. W. 14TH ST.**  
 P.I. = Sta. 26+21.40  
 $\Delta = 44^{\circ}59'16''$   
 $R = 50.00'$   
 $T = 20.70'$   
 $L = 39.26'$   
 $E = 4.12'$

MATCH LINE STA. 928+00 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 18

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

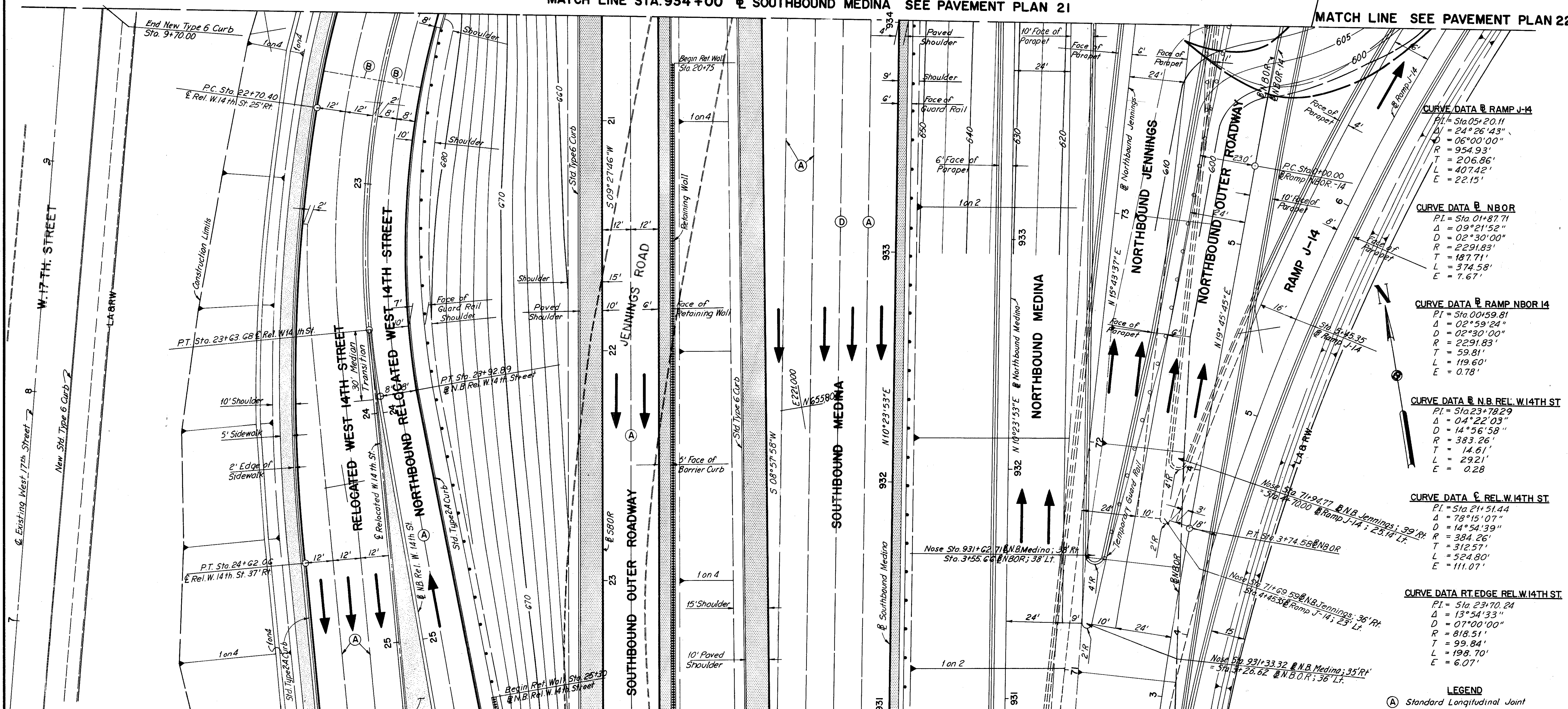
63  
646

CUYAHOGA COUNTY  
CUY -71-17.83  
CUY-176-12.76

20  
29

MATCH LINE STA. 934+00 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 21

MATCH LINE SEE PAVEMENT PLAN 22



**CURVE DATA @ RAMP J-14**

PI = Sta 05+20.11  
 $\Delta$  = 24° 26' 43"  
D = 06° 00' 00"  
R = 954.93'  
T = 206.86'  
L = 407.42'  
E = 22.15'

**CURVE DATA @ NBOR**

PI = Sta 01+87.71  
 $\Delta$  = 09° 21' 52"  
D = 02° 30' 00"  
R = 2291.83'  
T = 187.71'  
L = 374.58'  
E = 7.67'

**CURVE DATA @ RAMP NBOR 14**

PI = Sta 00+59.81  
 $\Delta$  = 02° 59' 24"  
D = 02° 30' 00"  
R = 2291.83'  
T = 59.81'  
L = 119.60'  
E = 0.78'

**CURVE DATA @ N.B. REL. W. 14TH ST**

PI = Sta 23+78.29  
 $\Delta$  = 04° 22' 03"  
D = 14° 56' 58"  
R = 383.26'  
T = 14.61'  
L = 29.21'  
E = 0.28

**CURVE DATA @ REL. W. 14TH ST**

PI = Sta 21+51.44  
 $\Delta$  = 78° 15' 07"  
D = 14° 54' 39"  
R = 382.26'  
T = 312.57'  
L = 524.80'  
E = 111.07'

**CURVE DATA RT. EDGE REL. W. 14TH ST**

PI = Sta 23+70.24  
 $\Delta$  = 13° 54' 33"  
D = 07° 00' 00"  
R = 818.51'  
T = 99.84'  
L = 198.70'  
E = 6.07'

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

Note: For location and details of retaining walls see sheets

MATCH LINE STA. 931+00 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 19

SCALE 1" = 20'  
**HOWARD, NEEDLES, TAMMEN & BERGENDOFF**  
MADE BY JEN DATE 8-24-64 CONSULTING ENGINEERS  
TRCD DATE 8-31-64 KANSAS CITY CLEVELAND NEW YORK  
CRD. REL. DATE 8-31-64

MATCH LINE STA. 937+50 **RELOCATED WEST 14TH STREET** SEE PAVEMENT PLAN 23

**CURVE DATA  $\odot$  REL. W.14TH ST.**  
 P.I. = Sta. 11+51.44  
 $\Delta$  = 78°15'07"  
 D = 14°54'39"  
 R = 384.26'  
 T = 512.57'  
 L = 524.80'  
 E = 111.07'

**CURVE DATA  $\oplus$  N.B. JENNINGS**  
 P.I. = Sta. 79+15.83  
 $\Delta$  = 15°17'47"  
 D = 01°30'00"  
 R = 3819.72'  
 T = 512.94'  
 L = 1019.77'  
 E = 34.29'

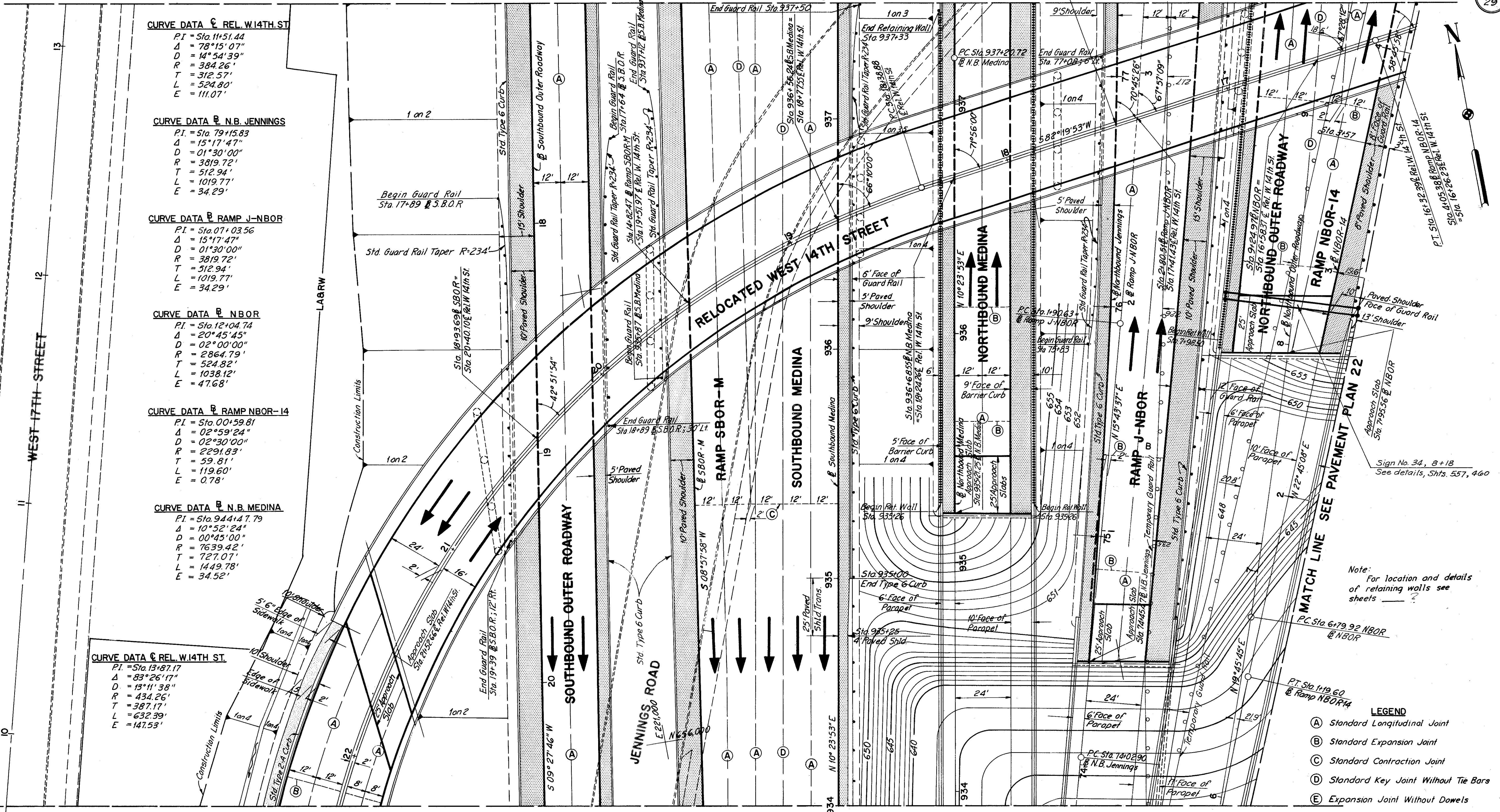
**CURVE DATA  $\oplus$  RAMP J-NBOR**  
 P.I. = Sta. 07+03.56  
 $\Delta$  = 15°17'47"  
 D = 01°30'00"  
 R = 3819.72'  
 T = 512.94'  
 L = 1019.77'  
 E = 34.29'

**CURVE DATA  $\oplus$  NBOR**  
 P.I. = Sta. 12+04.74  
 $\Delta$  = 20°45'45"  
 D = 02°00'00"  
 R = 2864.79'  
 T = 524.82'  
 L = 1038.12'  
 E = 47.68'

**CURVE DATA  $\oplus$  RAMP NBOR-14**  
 P.I. = Sta. 00+59.81  
 $\Delta$  = 02°59'24"  
 D = 02°30'00"  
 R = 2291.83'  
 T = 59.81'  
 L = 119.60'  
 E = 0.78'

**CURVE DATA  $\oplus$  N.B. MEDINA**  
 P.I. = Sta. 94+47.79  
 $\Delta$  = 10°52'24"  
 D = 00°45'00"  
 R = 7639.42'  
 T = 727.07'  
 L = 1449.78'  
 E = 34.52'

**CURVE DATA  $\odot$  REL. W.14TH ST.**  
 P.I. = Sta. 13+87.17  
 $\Delta$  = 83°26'17"  
 D = 13°11'38"  
 R = 434.26'  
 T = 387.17'  
 L = 632.39'  
 E = 147.53'



Note: For location and details of retaining walls see sheets \_\_\_\_\_

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

MATCH LINE STA. 934+00 **RELOCATED WEST 14TH STREET** SEE PAVEMENT PLAN 20

SCALE 1"=20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE BY JEN DATE 8-24-64 CONSULTING ENGINEERS  
 TRCD DATE 8-24-64 KANSAS CITY CLEVELAND NEW YORK  
 CRD DATE 8-21-64



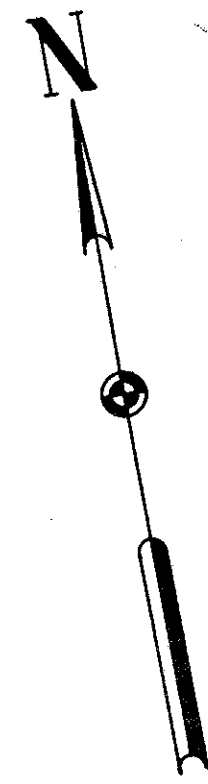
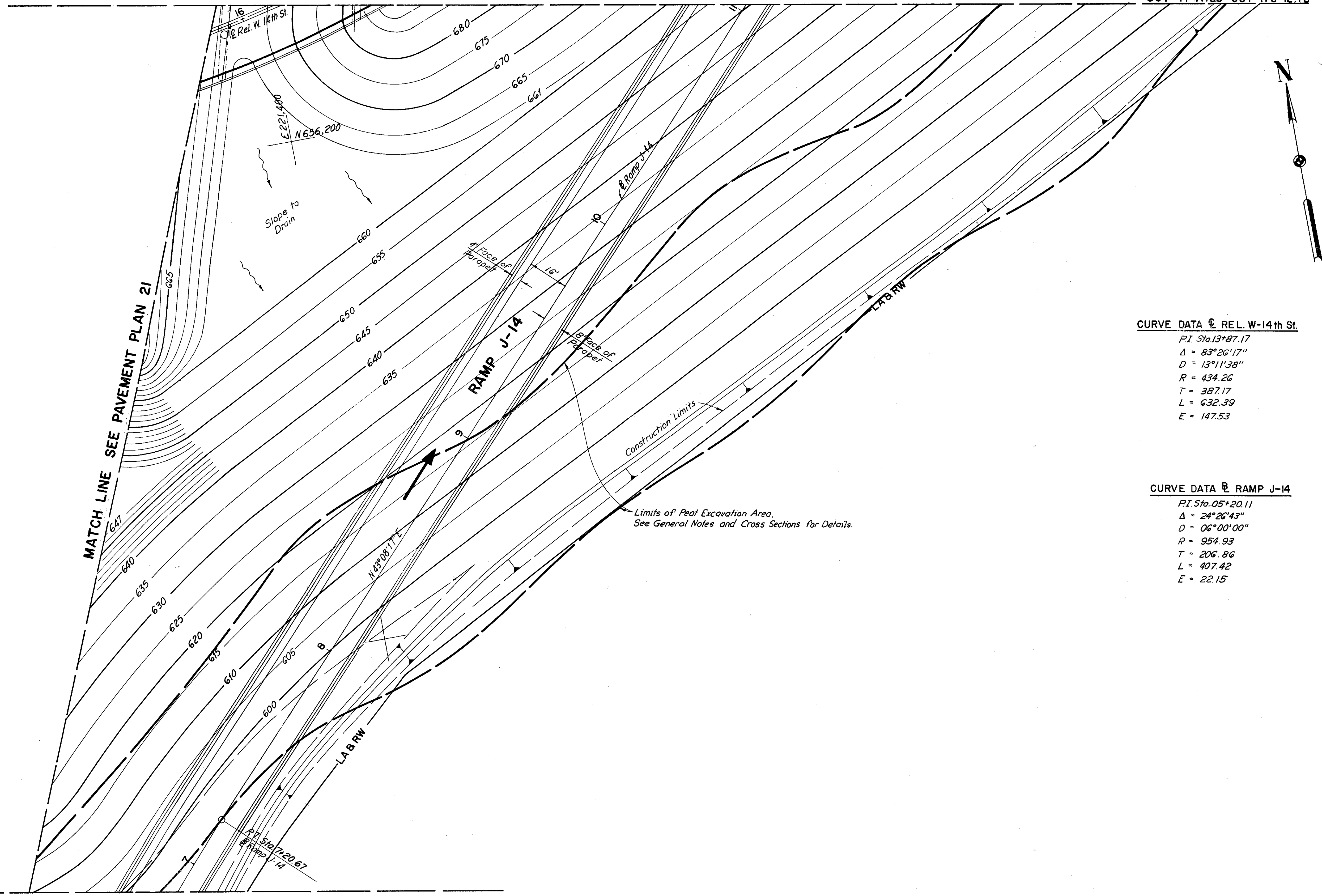
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

65  
646

CUYAHOGA COUNTY  
CUY-71-17.83 CUY-176-12.76

22  
29

MATCH LINE SEE PAVEMENT PLAN 24



**CURVE DATA @ REL. W-14th St.**  
 P.I. Sta. 13+87.17  
 $\Delta = 83^{\circ}26'17''$   
 $D = 13^{\circ}11'38''$   
 $R = 434.26$   
 $T = 387.17$   
 $L = 632.39$   
 $E = 147.53$

**CURVE DATA @ RAMP J-14**  
 P.I. Sta. 05+20.11  
 $\Delta = 24^{\circ}26'43''$   
 $D = 06^{\circ}00'00''$   
 $R = 954.93$   
 $T = 206.86$   
 $L = 407.42$   
 $E = 22.15$

MATCH LINE SEE PAVEMENT PLAN 20

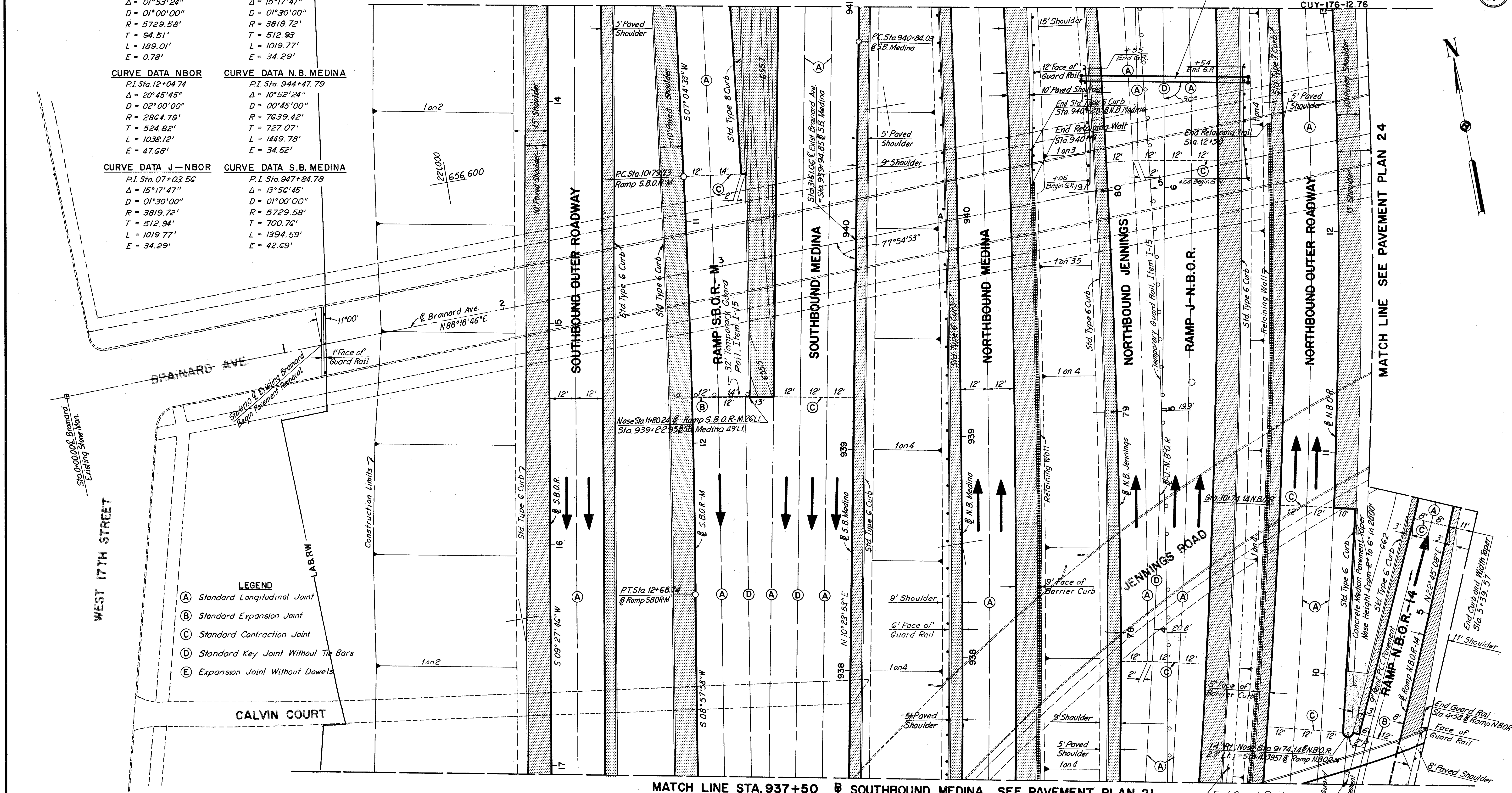
SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE BY DATE 8-24-64 CONSULTING ENGINEERS  
 TRCD. DATE  
 CKD. RJT. DATE 8-31-64 KANSAS CITY CLEVELAND NEW YORK

<b>CURVE DATA SBOR-M</b> P.I. Sta. 11+74.24 Δ = 01°53'24" D = 01°00'00" R = 5729.58' T = 94.51' L = 189.01' E = 0.78'	<b>CURVE DATA N.B. JENNINGS</b> P.I. Sta. 79+15.83 Δ = 15°17'47" D = 01°30'00" R = 3819.72' T = 512.93' L = 1019.77' E = 34.29'
<b>CURVE DATA NBOR</b> P.I. Sta. 12+04.74 Δ = 20°45'45" D = 02°00'00" R = 2864.79' T = 524.82' L = 1038.12' E = 47.69'	<b>CURVE DATA N.B. MEDINA</b> P.I. Sta. 944+47.79 Δ = 10°52'24" D = 00°45'00" R = 7639.42' T = 727.07' L = 1449.78' E = 34.52'
<b>CURVE DATA J-NBOR</b> P.I. Sta. 07+03.56 Δ = 15°17'47" D = 01°30'00" R = 3819.72' T = 512.94' L = 1019.77' E = 34.29'	<b>CURVE DATA S.B. MEDINA</b> P.I. Sta. 947+84.78 Δ = 13°56'45" D = 01°00'00" R = 5729.58' T = 700.76' L = 1394.59' E = 42.69'

MATCH LINE STA. 941+00 SOUTHBOUND MEDINA SEE PAVEMENT PLAN 25

Sign No. 35, 80+50  
See detail, Sht. 557

MATCH LINE SEE PAVEMENT PLAN 24

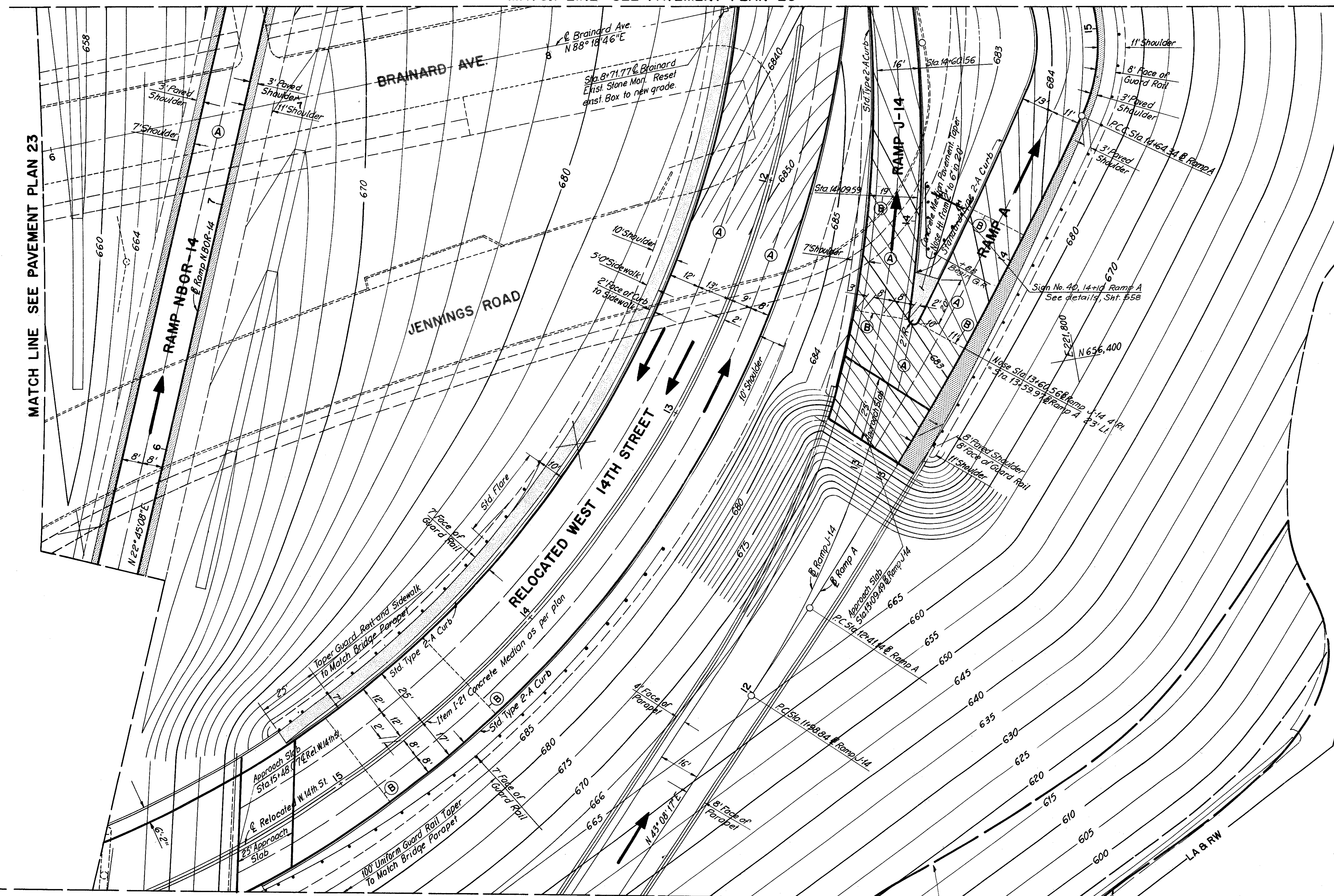


MATCH LINE STA. 937+50 SOUTHBOUND MEDINA SEE PAVEMENT PLAN 21

End Guard Rail  
Sta. 3+40 @ J-NBOR

SCALE 1" = 20'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE IN U.S.A. DATE 8-28-64  
TRCD DATE KANSAS CITY CLEVELAND NEW YORK  
CONSULTING ENGINEERS

MATCH LINE SEE PAVEMENT PLAN 26



MATCH LINE SEE PAVEMENT PLAN 23

MATCH LINE SEE PAVEMENT PLAN 22

**CURVE DATA @ RAMP J-14**  
 P.I. = Sta. 13+65.21  
 $\Delta = 44^{\circ}14'42''$   
 D = 14^{\circ}00'00"  
 R = 409.26'  
 T = 166.37'  
 L = 316.04'  
 E = 32.52'

**CURVE DATA @ RAMP A**  
 P.I. = Sta. 13+52.97  
 $\Delta = 08^{\circ}55'41''$   
 D = 04^{\circ}00'00"  
 R = 1432.39'  
 T = 111.83'  
 L = 223.20'  
 E = 4.36'

**CURVE DATA @ RAMP A**  
 P.I. = Sta. 15+78.95  
 $\Delta = 117^{\circ}54'03''$   
 R = 69.00'  
 T = 114.61'  
 L = 141.99'  
 E = 64.78'

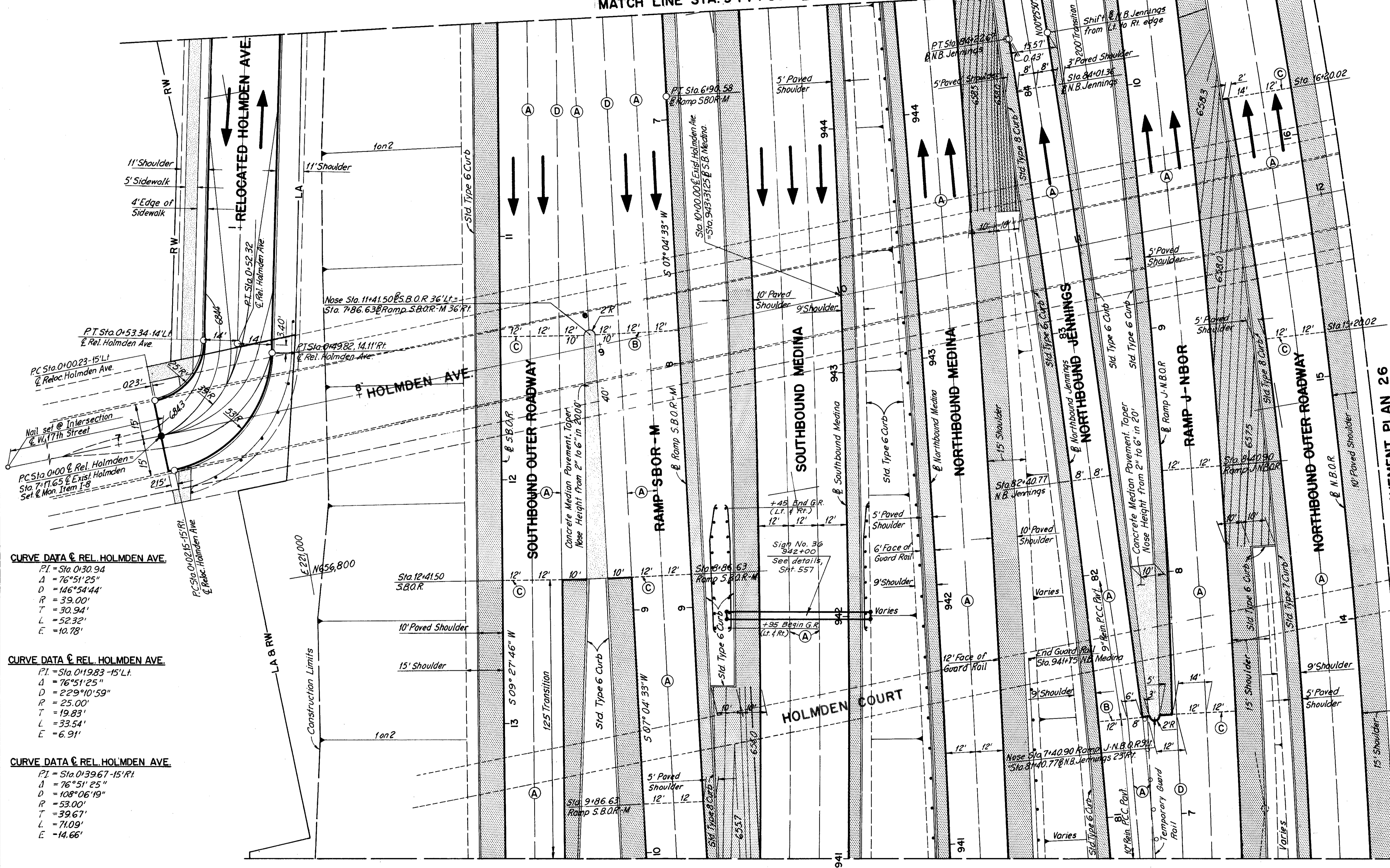
**CURVE DATA @ REL. W. 14TH ST.**  
 P.I. = Sta. 13+87.17  
 $\Delta = 83^{\circ}26'17''$   
 D = 13^{\circ}11'38"  
 R = 434.26'  
 T = 387.17'  
 L = 632.39'  
 E = 147.53'

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

SCALE 1"=20'  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE JEN DATE 8-31-64 CONSULTING ENGINEERS  
 TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
 CKD. RUT DATE 8-31-64

Limits of Peat Excavation Area  
 See General Notes and Cross-Sections.

MATCH LINE STA. 944+50 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 27



**CURVE DATA @ NBOR**  
 P.I. = Sta 12+04.74  
 Δ = 20°45'45"  
 D = 02°00'00"  
 R = 2864.79'  
 T = 524.82'  
 L = 1038.12'  
 E = 47.68'

**CURVE DATA @ J-NBOR**  
 P.I. = Sta 07+03.56  
 Δ = 15°17'47"  
 D = 01°30'00"  
 R = 3819.72'  
 T = 512.94'  
 L = 1019.77'  
 E = 34.29'

**CURVE DATA @ N.B. JENNINGS**  
 P.I. = Sta 79+15.83  
 Δ = 15°17'47"  
 D = 01°30'00"  
 R = 3819.72'  
 T = 512.94'  
 L = 1019.77'  
 E = 34.29'

**CURVE DATA @ N.B. MEDINA**  
 P.I. = Sta 944+47.79  
 Δ = 10°52'24"  
 D = 00°45'00"  
 R = 7639.42'  
 T = 727.07'  
 L = 1449.78'  
 E = 34.52'

**CURVE DATA @ S.B. MEDINA**  
 P.I. = Sta 947+84.78  
 Δ = 13°56'45"  
 D = 01°00'00"  
 R = 5729.58'  
 T = 700.76'  
 L = 1394.59'  
 E = 42.69'

**CURVE DATA @ SBOR-M**  
 P.I. = Sta 03+45.72  
 Δ = 06°59'15"  
 D = 01°00'43"  
 R = 5662.58'  
 T = 345.72'  
 L = 690.58'  
 E = 10.54'

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels

**CURVE DATA @ REL. HOLMDEN AVE.**  
 P.I. = Sta 0+30.94  
 Δ = 76°51'25"  
 D = 146°54'44"  
 R = 39.00'  
 T = 30.94'  
 L = 52.32'  
 E = 10.78'

**CURVE DATA @ REL. HOLMDEN AVE.**  
 P.I. = Sta 0+19.83-15' L.I.  
 Δ = 76°51'25"  
 D = 229°10'59"  
 R = 25.00'  
 T = 19.83'  
 L = 33.54'  
 E = 6.91'

**CURVE DATA @ REL. HOLMDEN AVE.**  
 P.I. = Sta 0+39.67-15' R.I.  
 Δ = 76°51'25"  
 D = 108°06'19"  
 R = 53.00'  
 T = 39.67'  
 L = 71.09'  
 E = 14.66'

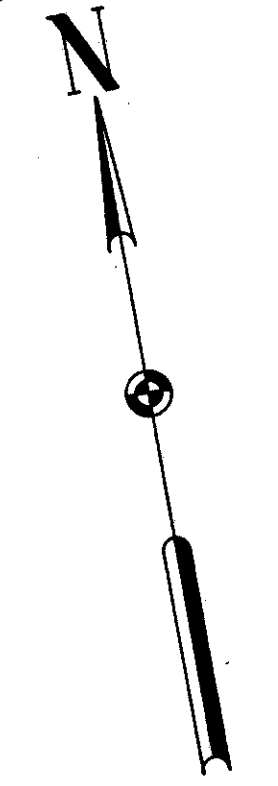
MATCH LINE STA. 941+00 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 23

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

69  
676

26  
29

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



MATCH LINE SEE PAVEMENT PLAN 27

MATCH LINE SEE PAVEMENT PLAN 25

MATCH LINE SEE PAVEMENT PLAN 24

**CURVE DATA LT. EDGE NBOR-14**

PI = Sta. 10+49.65  
 $\Delta = 32^{\circ}08'27''$   
 D = 18'00'00"  
 R = 318.31'  
 T = 91.70'  
 L = 178.56'  
 E = 12.94'

**CURVE DATA @ RAMP A**

PI = Sta. 15+78.95  
 $\Delta = 117^{\circ}54'03''$   
 R = 69.00'  
 T = 114.61'  
 L = 178.56'  
 E = 64.78'

**CURVE DATA @ RAMP A**

PI = Sta. 16+15.11  
 $\Delta = 82^{\circ}35'02''$   
 R = 10.00'  
 T = 8.78'  
 L = 14.41'  
 E = 331'

**CURVE DATA @ NBOR-14**

PI = Sta. 10+26.15  
 $\Delta = 32^{\circ}08'27''$   
 D = 18'00'00"  
 R = 318.31'  
 T = 91.70'  
 L = 178.56'  
 E = 12.94'

**CURVE DATA @ RAMP J-14**

PI = Sta. 13+65.21  
 $\Delta = 44^{\circ}14'42''$   
 D = 14'00'00"  
 R = 409.26'  
 T = 166.37'  
 L = 316.04'  
 E = 32.52'

**CURVE DATA RT TURN OUT NBOR-14**

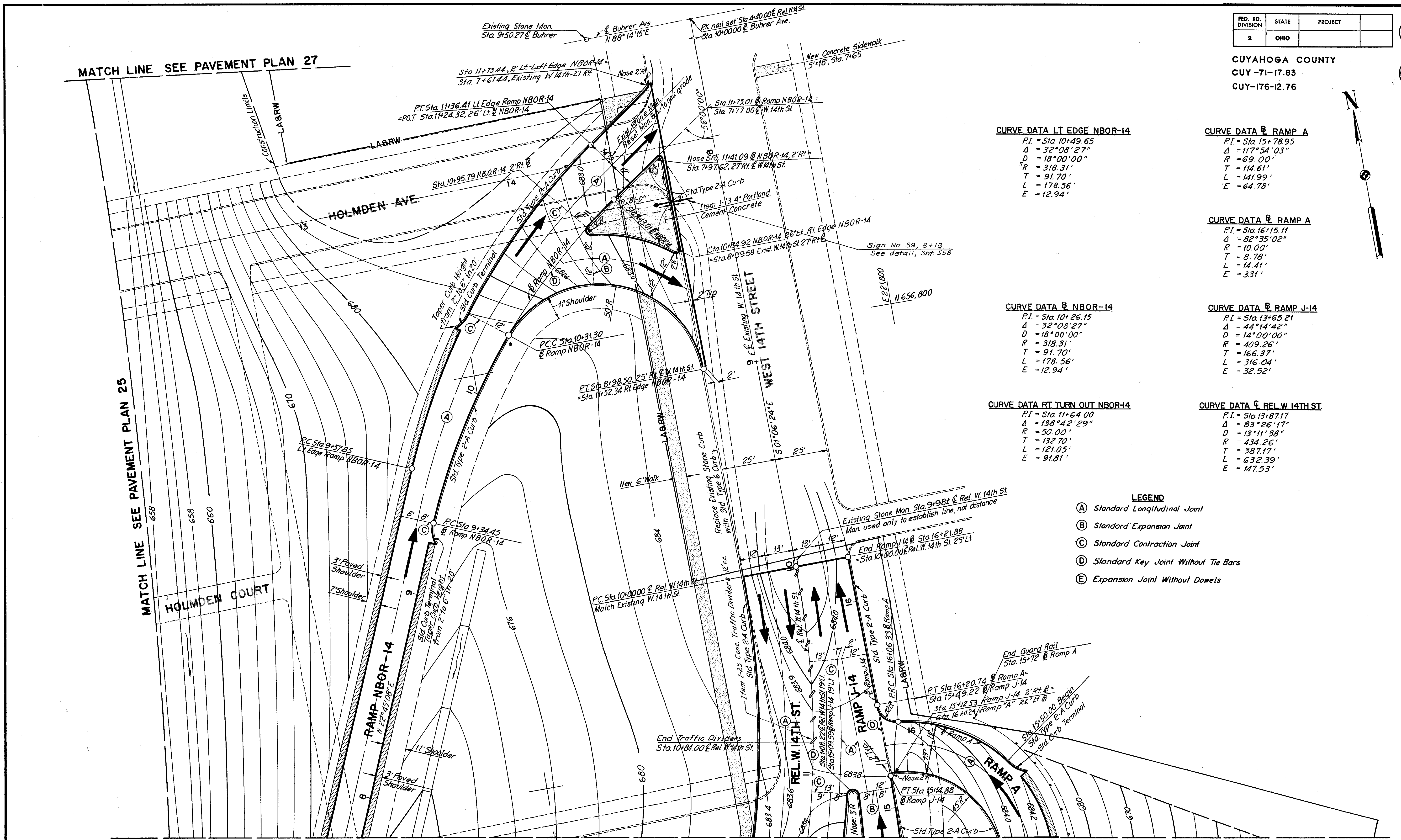
PI = Sta. 11+64.00  
 $\Delta = 138^{\circ}42'29''$   
 R = 50.00'  
 T = 132.70'  
 L = 121.05'  
 E = 91.81'

**CURVE DATA @ REL. W. 14TH ST.**

PI = Sta. 13+87.17  
 $\Delta = 83^{\circ}26'17''$   
 D = 13'11'38"  
 R = 434.26'  
 T = 387.17'  
 L = 632.39'  
 E = 147.53'

**LEGEND**

- (A) Standard Longitudinal Joint
- (B) Standard Expansion Joint
- (C) Standard Contraction Joint
- (D) Standard Key Joint Without Tie Bars
- (E) Expansion Joint Without Dowels



SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE BY JEN DATE 8-24-64 CONSULTING ENGINEERS  
 TRCD DATE 8-31-64 KANSAS CITY CLEVELAND NEW YORK  
 CRD. R.J.T. DATE 8-31-64

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

70  
696

CUYAHOGA COUNTY  
CUY -71-17.83  
CUY-176-12.76

27  
29

**CURVE DATA @ SBOR**

PI = Sta. 5+29.81  
Δ = 12°03'08"  
D = 02°00'00"  
R = 2864.79'  
T = 302.42'  
L = 602.62'  
E = 15.92'

**CURVE DATA @ NBOR**

PI = Sta. 12+04.74  
Δ = 20°45'45"  
D = 02°00'00"  
R = 2864.79'  
T = 524.82'  
L = 1038.12'  
E = 47.68'

**CURVE DATA @ SBOR-M**

PI = Sta. 03+45.72  
Δ = 06°59'15"  
D = 01°00'43"  
R = 5662.58'  
T = 345.72'  
L = 690.58'  
E = 10.54'

**CURVE DATA @ J-NBOR**

PI = Sta. 07+03.56  
Δ = 15°17'47"  
D = 01°30'00"  
R = 3819.72'  
T = 512.94'  
L = 1019.77'  
E = 34.29'

**CURVE DATA @ S.B. MEDINA**

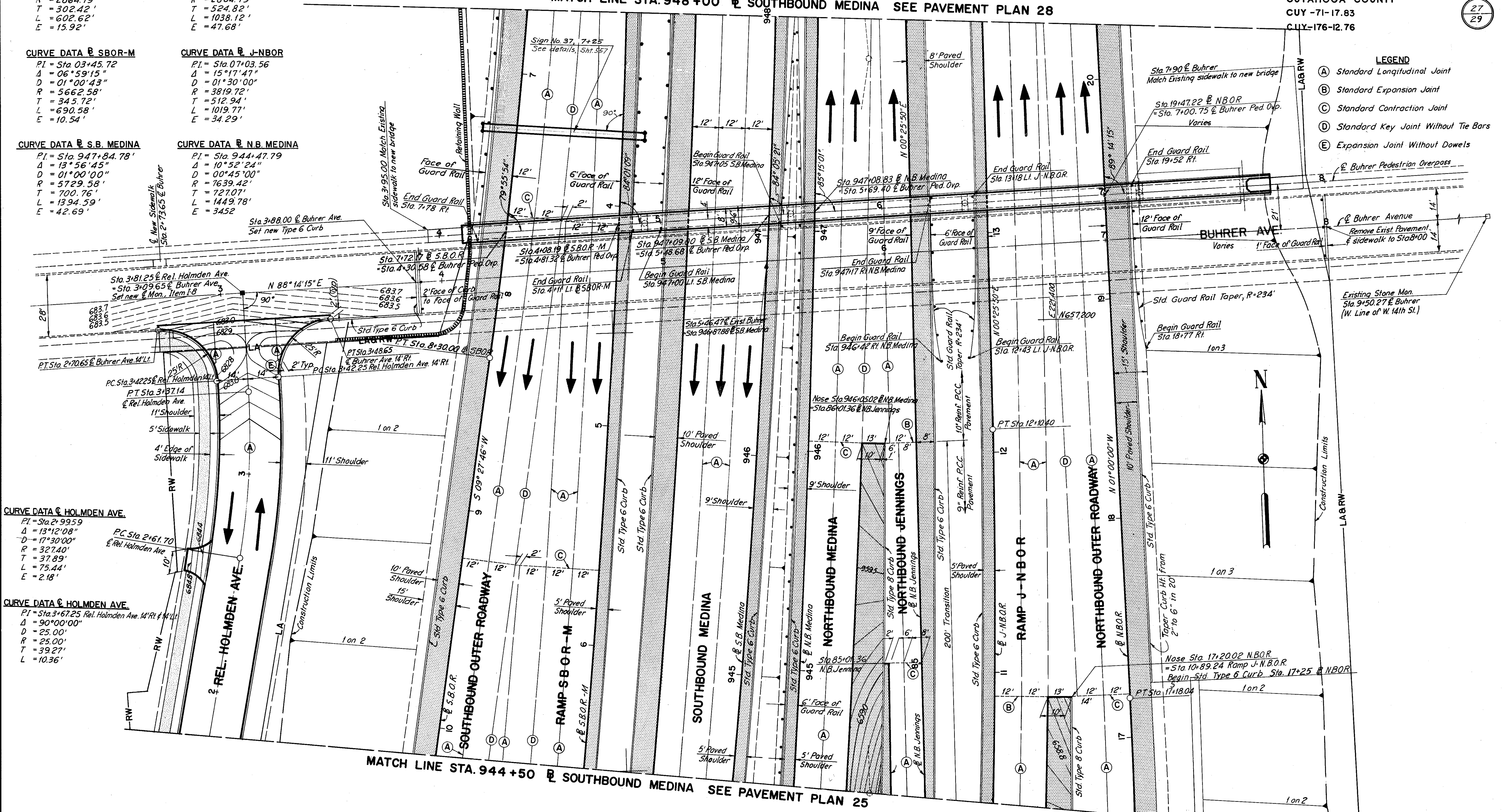
PI = Sta. 947+84.78'  
Δ = 13°56'45"  
D = 01°00'00"  
R = 5729.58'  
T = 700.76'  
L = 1394.59'  
E = 42.69'

**CURVE DATA @ N.B. MEDINA**

PI = Sta. 944+47.79  
Δ = 10°52'24"  
D = 00°45'00"  
R = 7639.42'  
T = 727.07'  
L = 1449.78'  
E = 34.52

MATCH LINE STA. 948+00 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 28

- LEGEND**
- (A) Standard Longitudinal Joint
  - (B) Standard Expansion Joint
  - (C) Standard Contraction Joint
  - (D) Standard Key Joint Without Tie Bars
  - (E) Expansion Joint Without Dowels



**CURVE DATA @ HOLMDEN AVE.**

PI = Sta. 2+99.59  
Δ = 13°12'08"  
D = 17°30'00"  
R = 327.40'  
T = 37.89'  
L = 75.44'  
E = 2.18'

**CURVE DATA @ HOLMDEN AVE.**

PI = Sta. 3+67.25 Rel. Holmden Ave. 14' R.I. f 14' L.I.  
Δ = 90°00'00"  
D = 25.00'  
R = 25.00'  
T = 39.27'  
L = 10.36'

MATCH LINE STA. 944+50 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 25

MATCH LINE SEE PAVEMENT PLAN 26

SCALE 1" = 20'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE IN U.S.A. DATE 8-24-64 CONSULTING ENGINEERS  
TRCD DATE 8-31-64 KANSAS CITY CLEVELAND NEW YORK

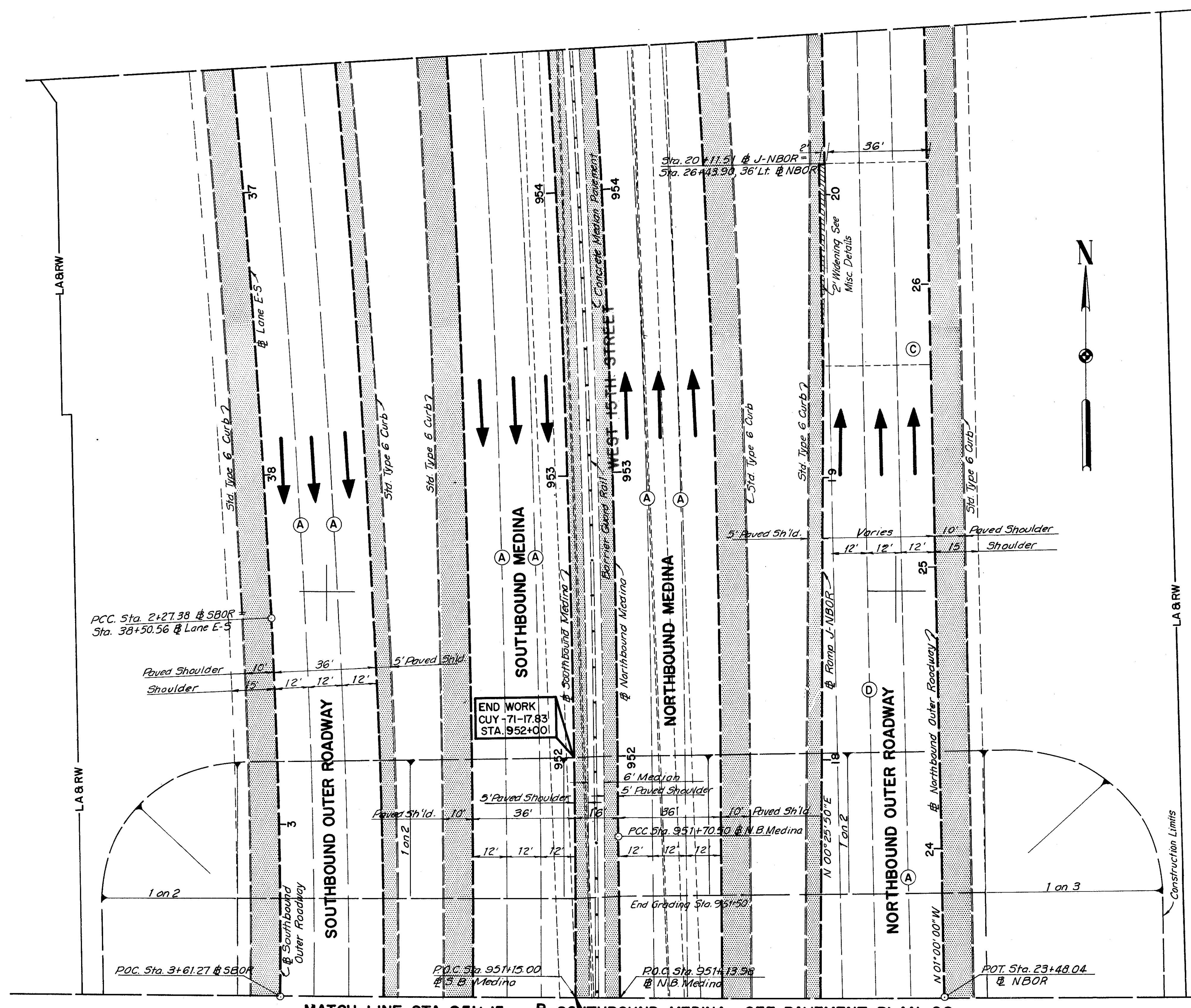


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

72  
646

29  
29

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



**CURVE DATA @ N.B. MEDINA**

PI = Sta. 944+47.79  
 $\Delta = 10^{\circ}52'24''$   
 $D = 00^{\circ}45'00''$   
 $R = 7639.42'$   
 $T = 727.07'$   
 $L = 1449.78'$   
 $E = 34.52'$

**CURVE DATA @ S.B. MEDINA**

PI = Sta. 947+84.78  
 $\Delta = 13^{\circ}56'45''$   
 $D = 01^{\circ}00'00''$   
 $R = 5729.58'$   
 $T = 700.76'$   
 $L = 1394.59'$   
 $E = 42.69'$

**CURVE DATA @ SBOR-M**

PI = Sta. 03+45.72  
 $\Delta = 06^{\circ}59'15''$   
 $D = 01^{\circ}00'43''$   
 $R = 5662.58'$   
 $T = 345.72'$   
 $L = 690.58'$   
 $E = 10.54'$

**CURVE DATA @ SBOR**

PI = Sta. 05+29.81  
 $\Delta = 12^{\circ}03'08''$   
 $D = 02^{\circ}00'00''$   
 $R = 2864.79'$   
 $T = 302.42'$   
 $L = 602.62'$   
 $E = 15.92'$

**LEGEND**

- (A) Standard Longitudinal Joint
- (B) Standard Expansion Joint
- (C) Standard Contraction Joint
- (D) Standard Key Joint Without Tie Bars
- (E) Expansion Joint Without Dowels

*Note:*  
 The contractor shall co-operate with the contractor on the adjoining construction section in providing for temporary drainage during construction. It will also be necessary to arrange with the adjoining contractor for the connection of the permanent drainage facilities. The Typical Section on the adjoining construction section is the same as shown on Sheet No. 3.

MATCH LINE STA. 951+15 @ SOUTHBOUND MEDINA SEE PAVEMENT PLAN 28

END PROJECT  
 CUY-71-17.83  
 STA. 951+15

SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE DRK. DATE 10-23-64 CONSULTING ENGINEERS  
 TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
 CKD. DATE

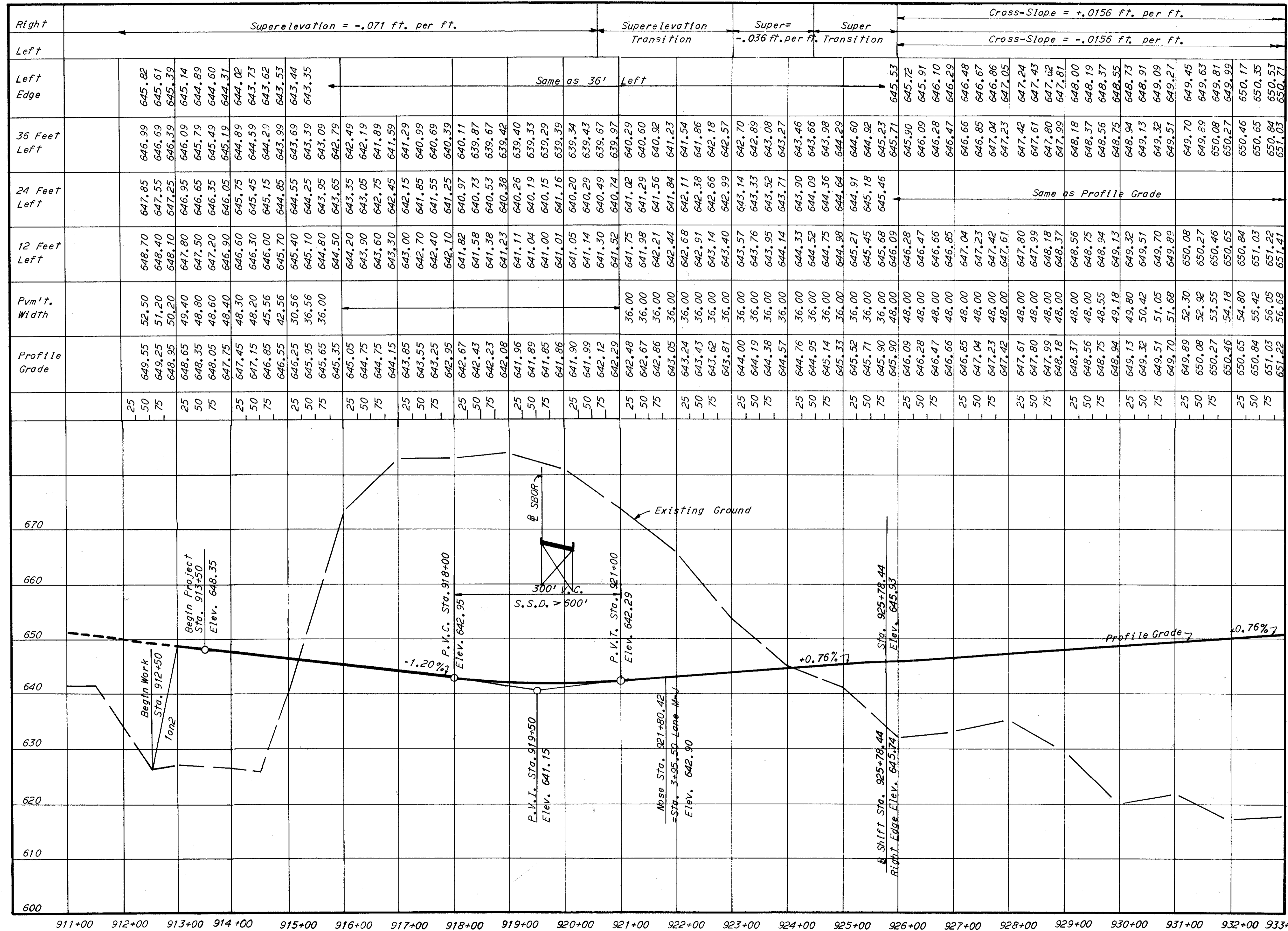


# PROFILE - SOUTHBOUND MEDINA

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

73  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

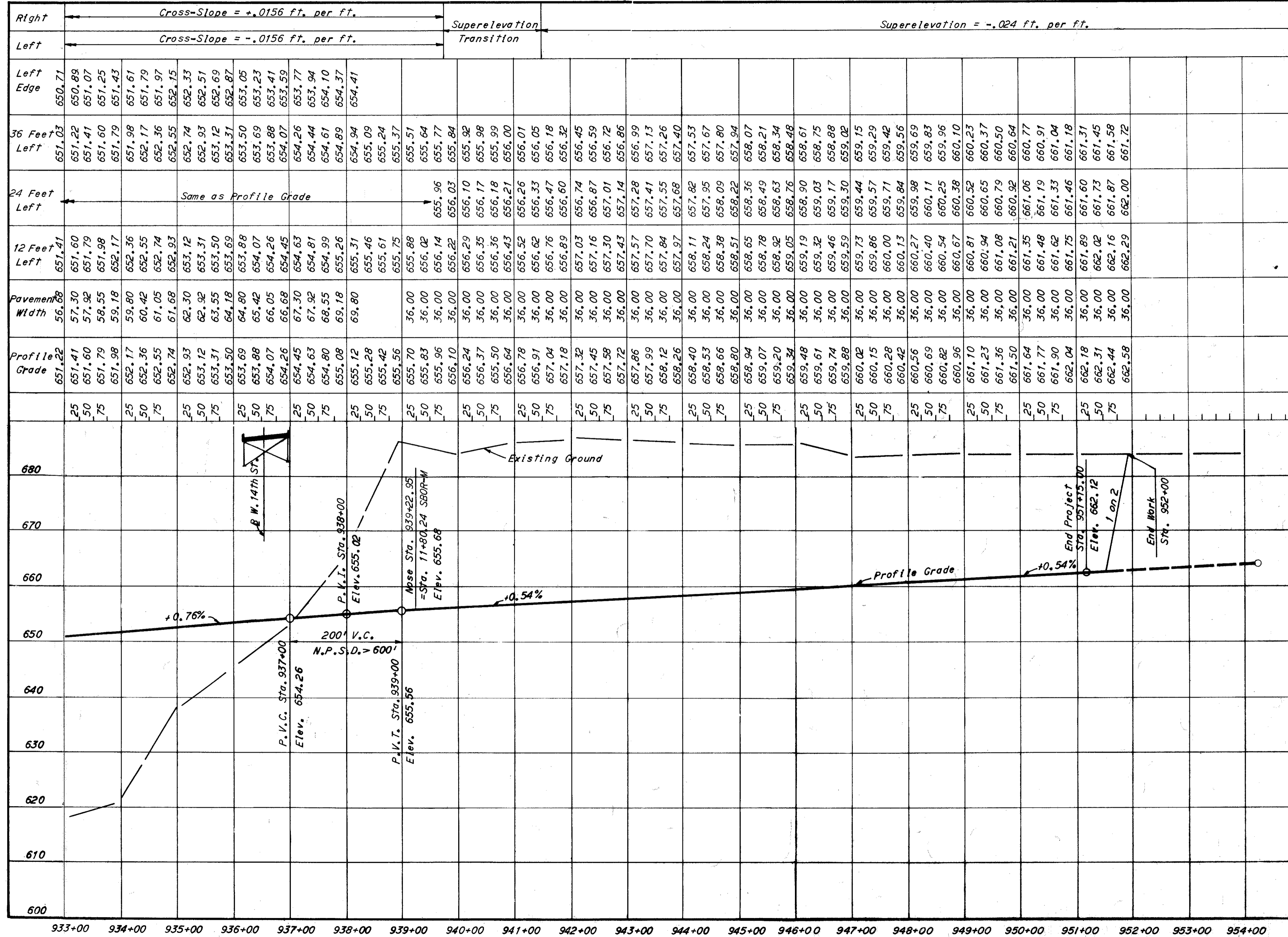


SCALE: Horizontal 1"=100'-Vertical 1"=10'  
MADE: HLD DATE: 4-23-64  
TRCD: DATE: KANSAS CITY CLEVELAND NEW YORK  
CKD: DRK DATE: 8-27-64

HOWARD, NEEDLES, TAMMEN & BERGENOFF  
CONSULTING ENGINEERS

# PROFILE - SOUTHBOUND MEDINA

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

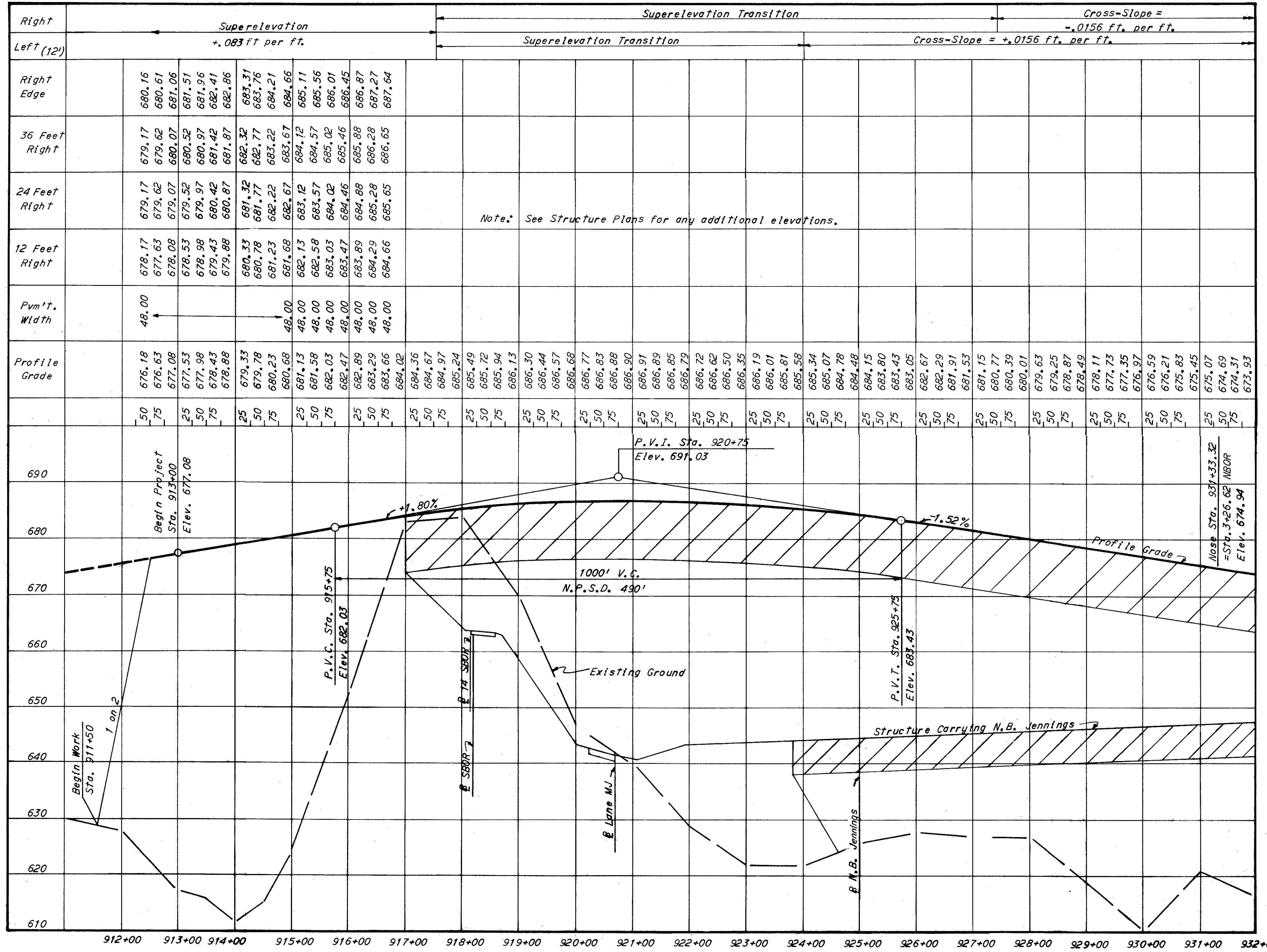


SCALE Horiz 1"=100'-Vert 1"=20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE H.L.D. DATE 4-23-64 CONSULTING ENGINEERS  
 TRCD. DATE \_\_\_\_\_  
 CKD. DRK. DATE 3-21-64 KANSAS CITY CLEVELAND NEW YORK

# PROFILE-NORTHBOUND MEDINA

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

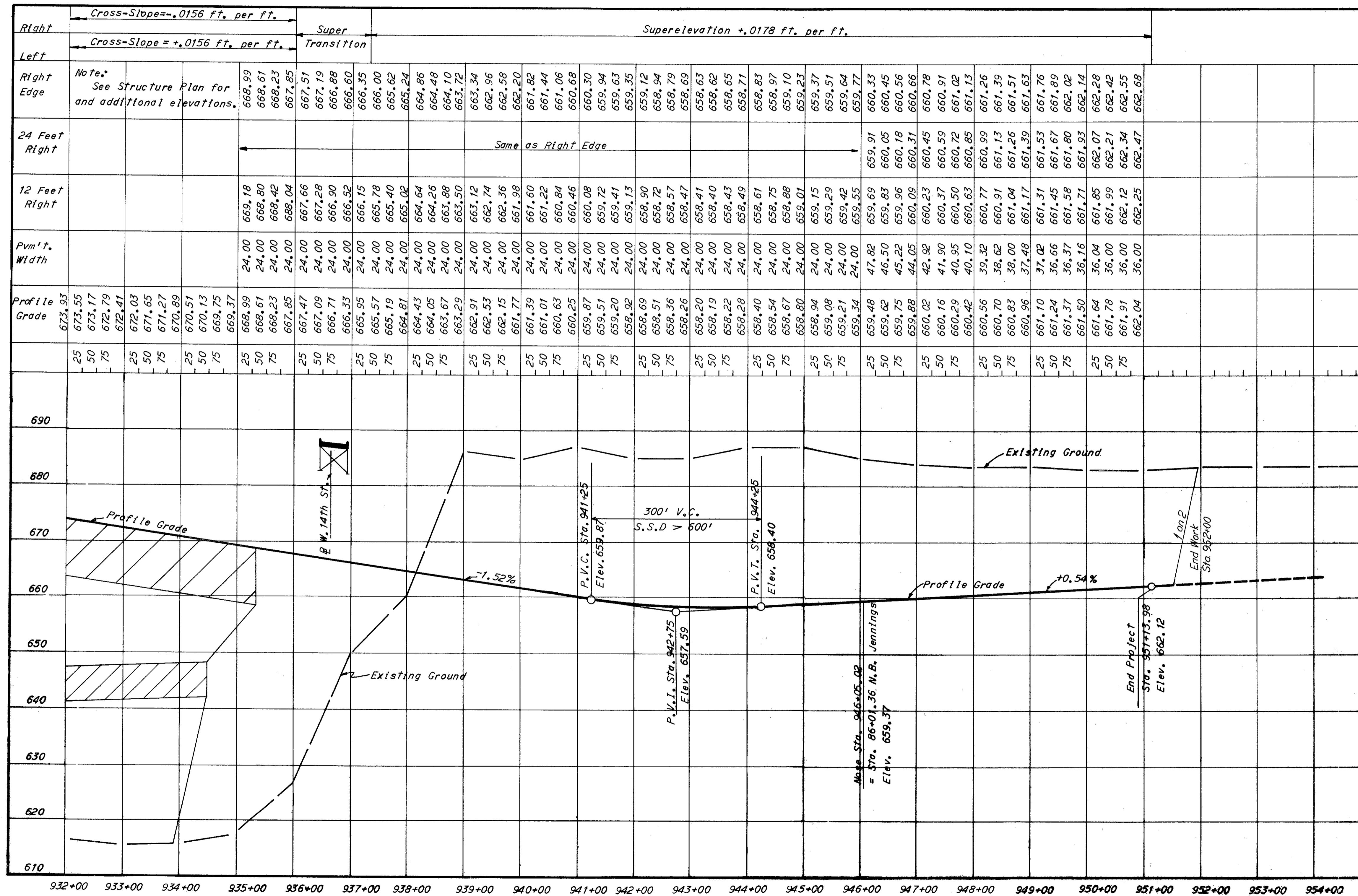


# PROFILE - NORTHBOUND MEDINA

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

76  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



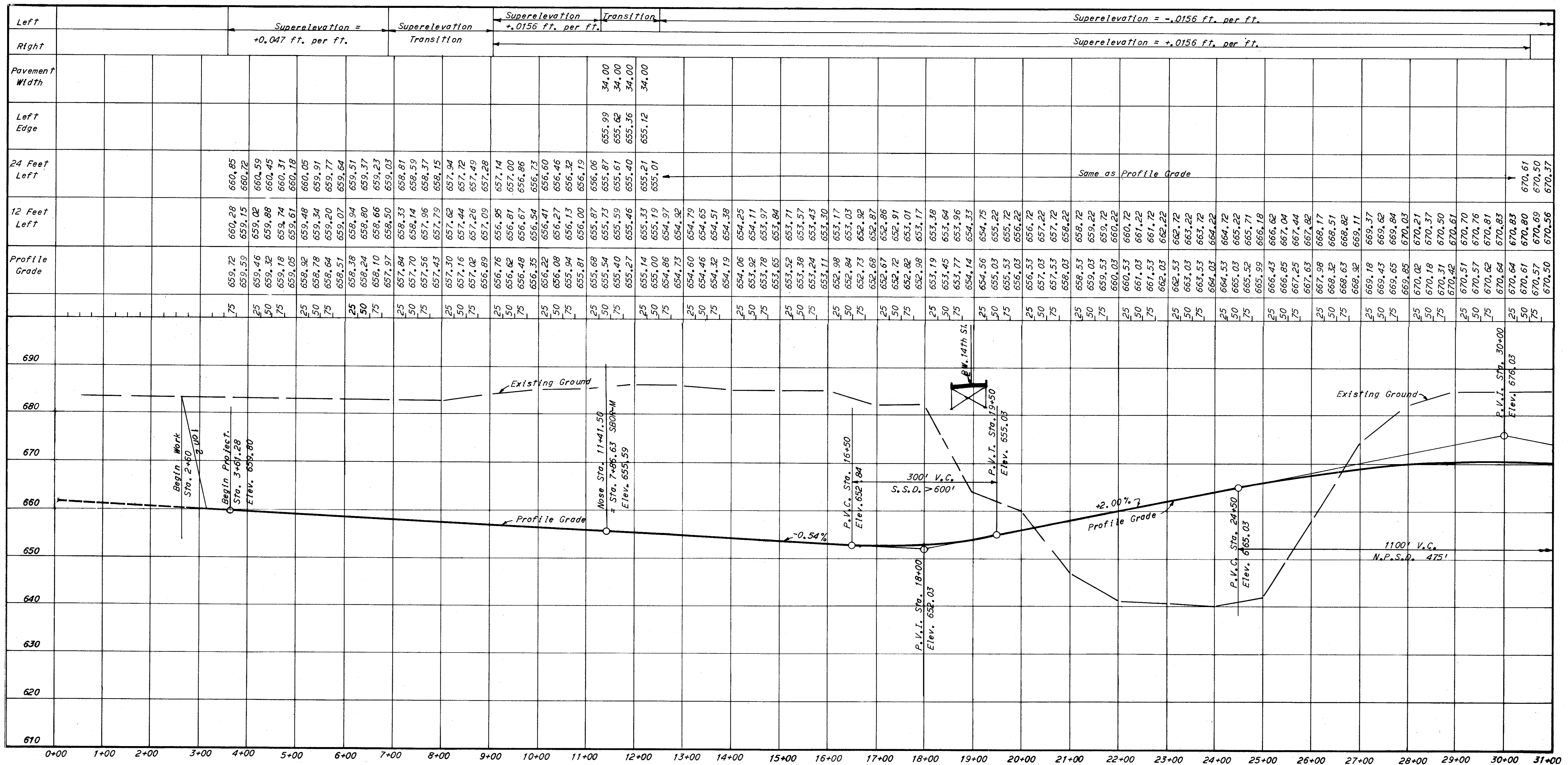
SCALE: Horiz. 1"=100' Vert. 1"=10'  
 MADE BY: H.L.D. DATE: 4-21-64  
 TRCD. DATE: CONSULTING ENGINEERS  
 CKD. DATE: KANSAS CITY CLEVELAND NEW YORK

# PROFILE - SOUTHBOUND OUTER ROADWAY

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

77  
646

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76



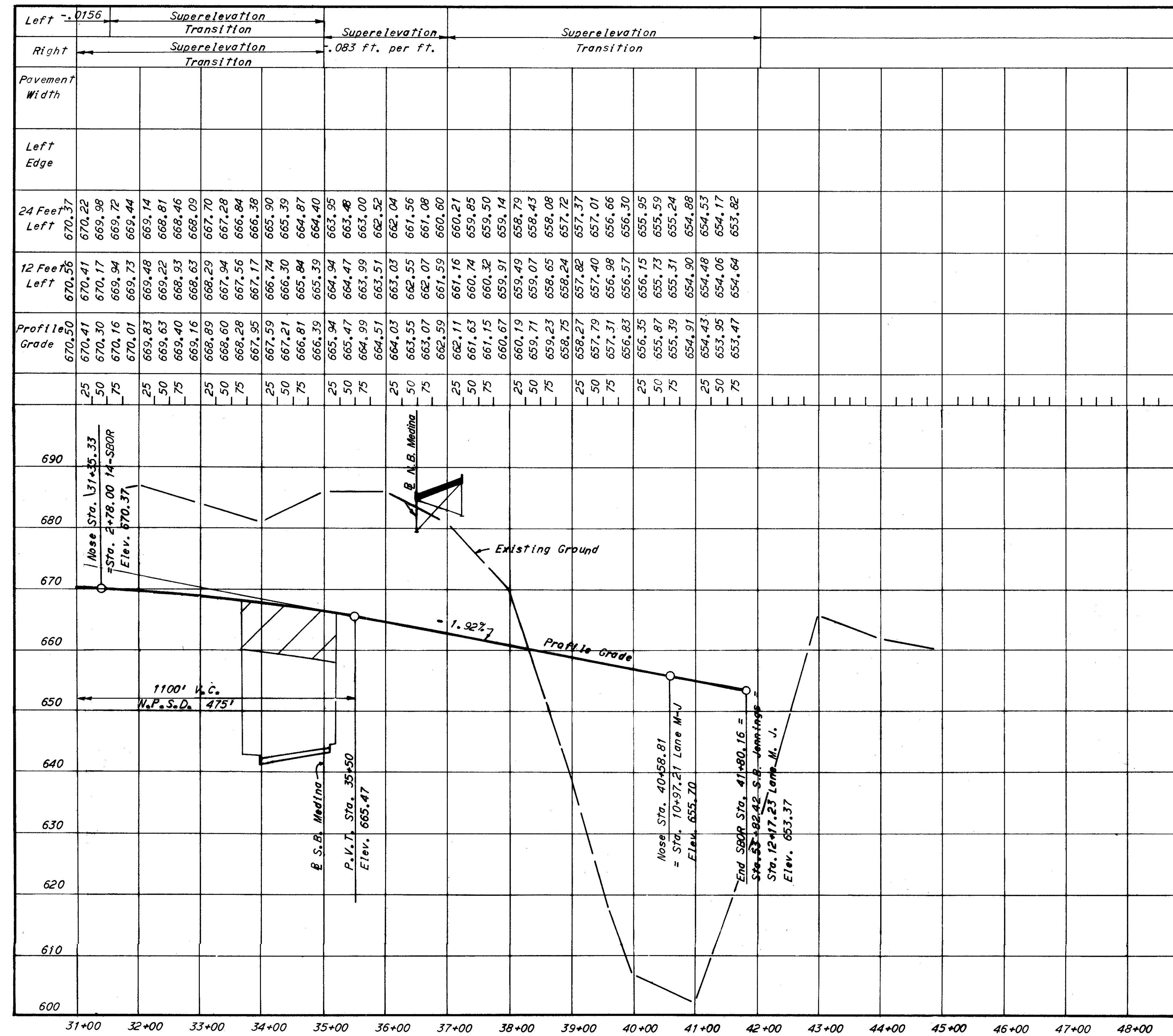
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MADE H.L.D. DATE 4-22-64  
HOWARD, NEEDLES, TAMMEN & BERGENOFF  
CONSULTING ENGINEERS  
TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
CKD. DATE

# PROFILE - SOUTHBOUND OUTER ROADWAY

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

70  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



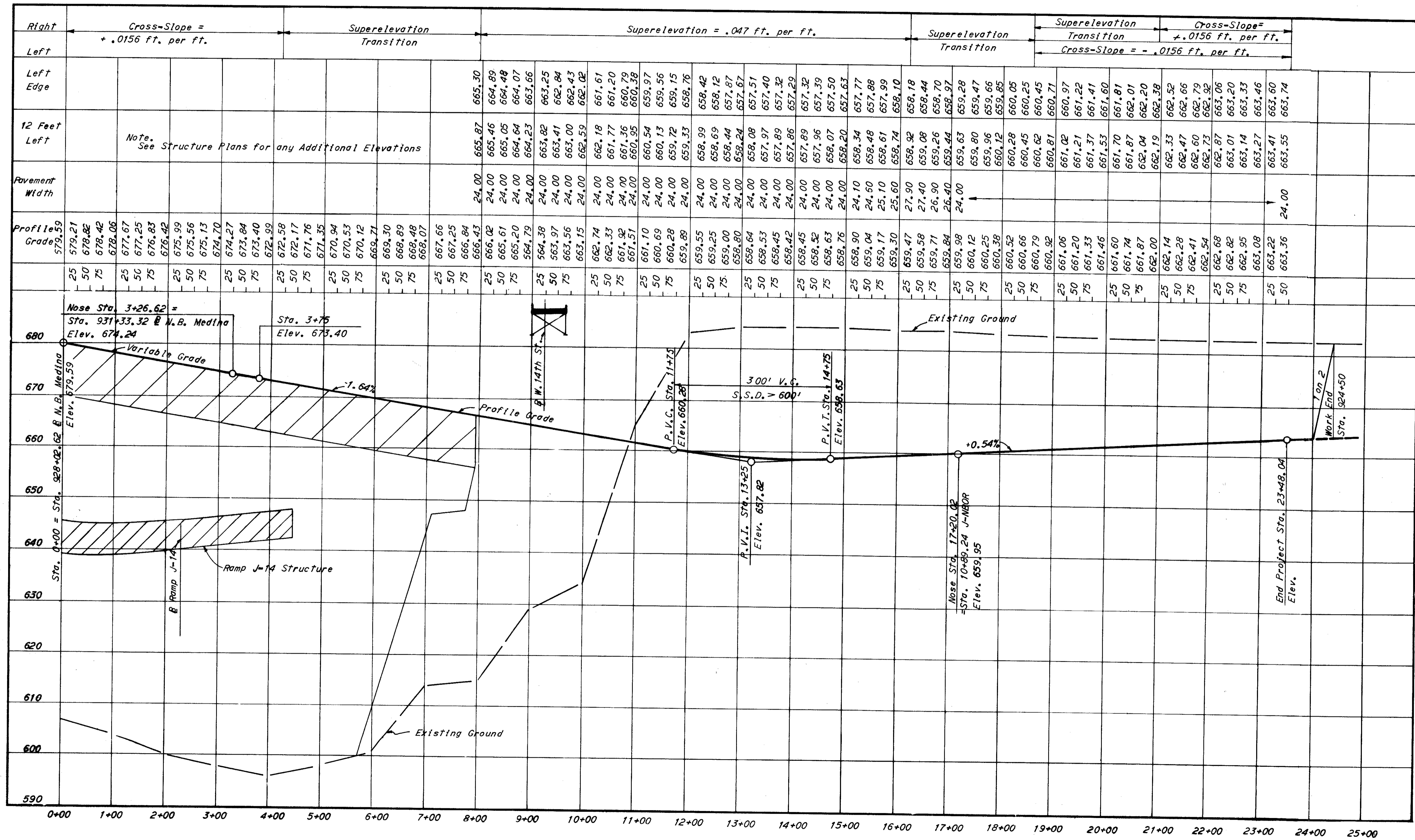
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 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 CONSULTING ENGINEERS  
 TRCD: \_\_\_\_\_ DATE: \_\_\_\_\_ KANSAS CITY CLEVELAND NEW YORK  
 CKD: \_\_\_\_\_ DATE: \_\_\_\_\_

# PROFILE - NORTHBOUND OUTER ROADWAY

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

79  
646

CUYAHOGA COUNTY  
 CUY- 71-17.83  
 CUY-176-12.76



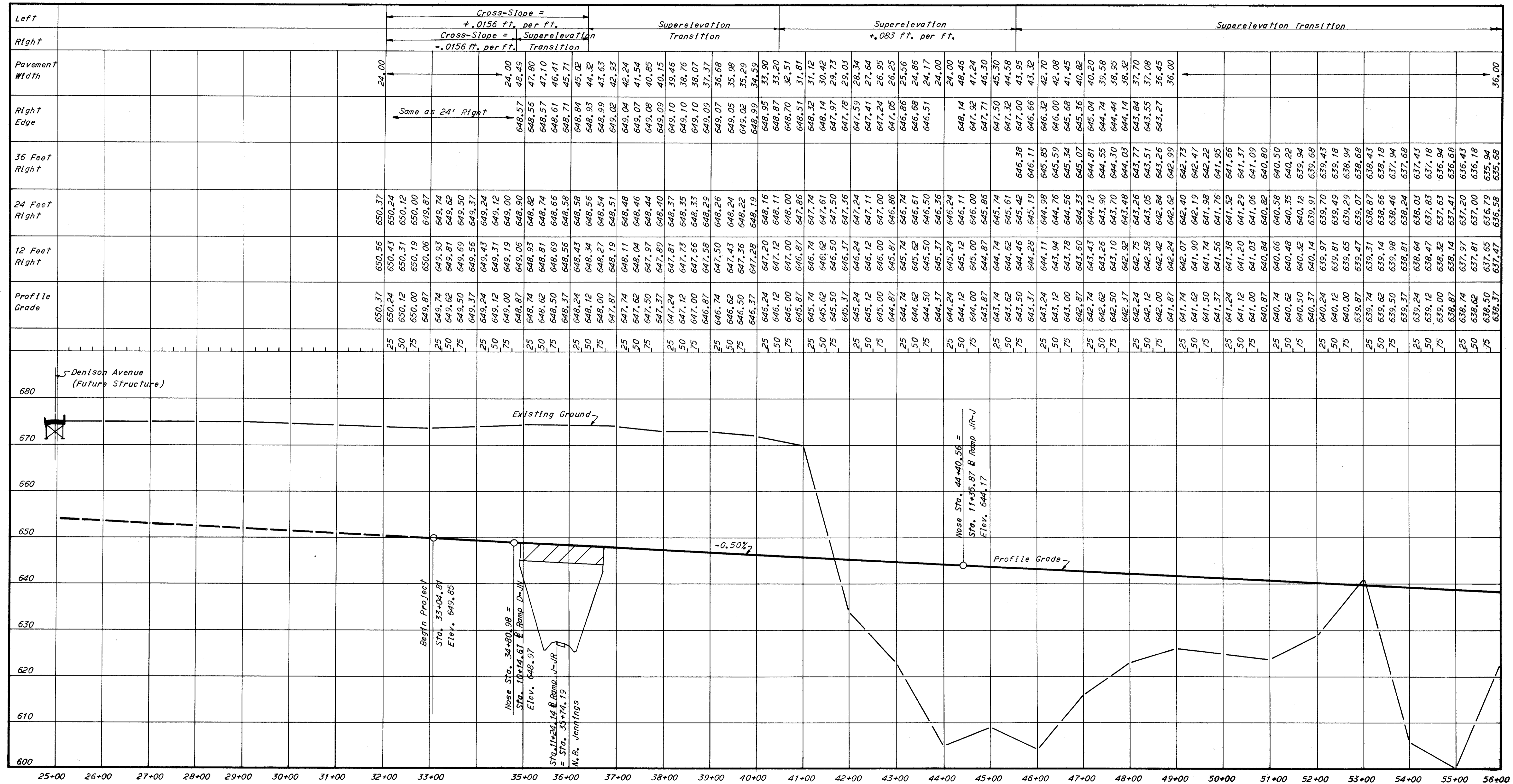
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 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 MADE H.L.D. DATE 4-16-64  
 CONSULTING ENGINEERS  
 TRCD: DATE KANSAS CITY CLEVELAND NEW YORK  
 CKD: DATE

# PROFILE - NORTHBOUND JENNINGS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

80  
646

CUYAHOGA COUNTY  
CUY



SCALE: Horiz. 1"=100' Vert. 1"=10'  
 MADE BY: HLD DATE: 4-23-64  
 TRCD: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CKD: \_\_\_\_\_ DATE: \_\_\_\_\_

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK



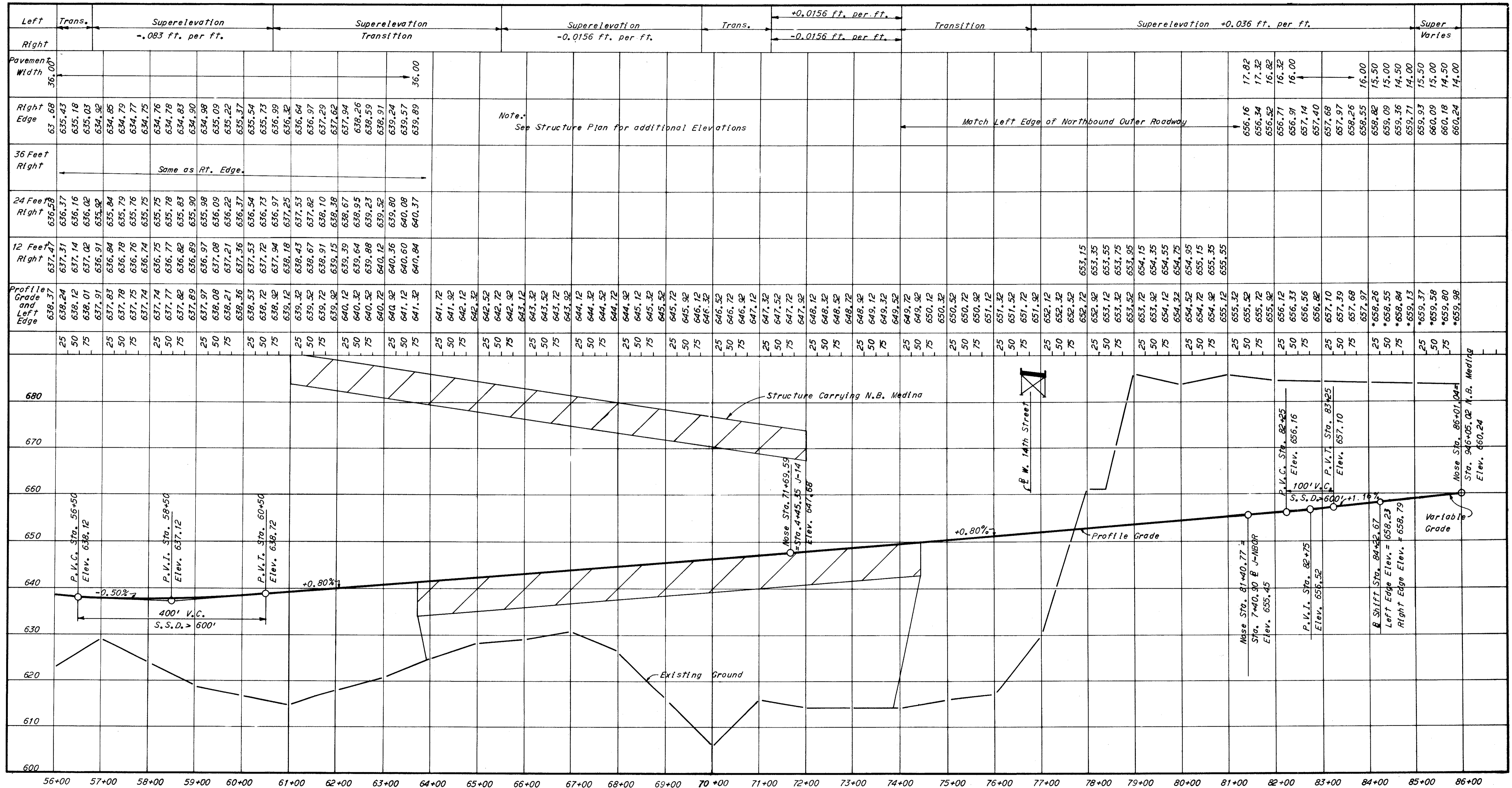
# PROFILE - NORTHBOUND JENNINGS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

81  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

Note:  
The  $E$  shifts from the left edge to the right edge at Sta. 84+22.67. Elevations marked with the asterisk (\*) are on the left edge.



Note:  
See Structure Plan for additional Elevations

Match Left Edge of Northbound Outer Roadway

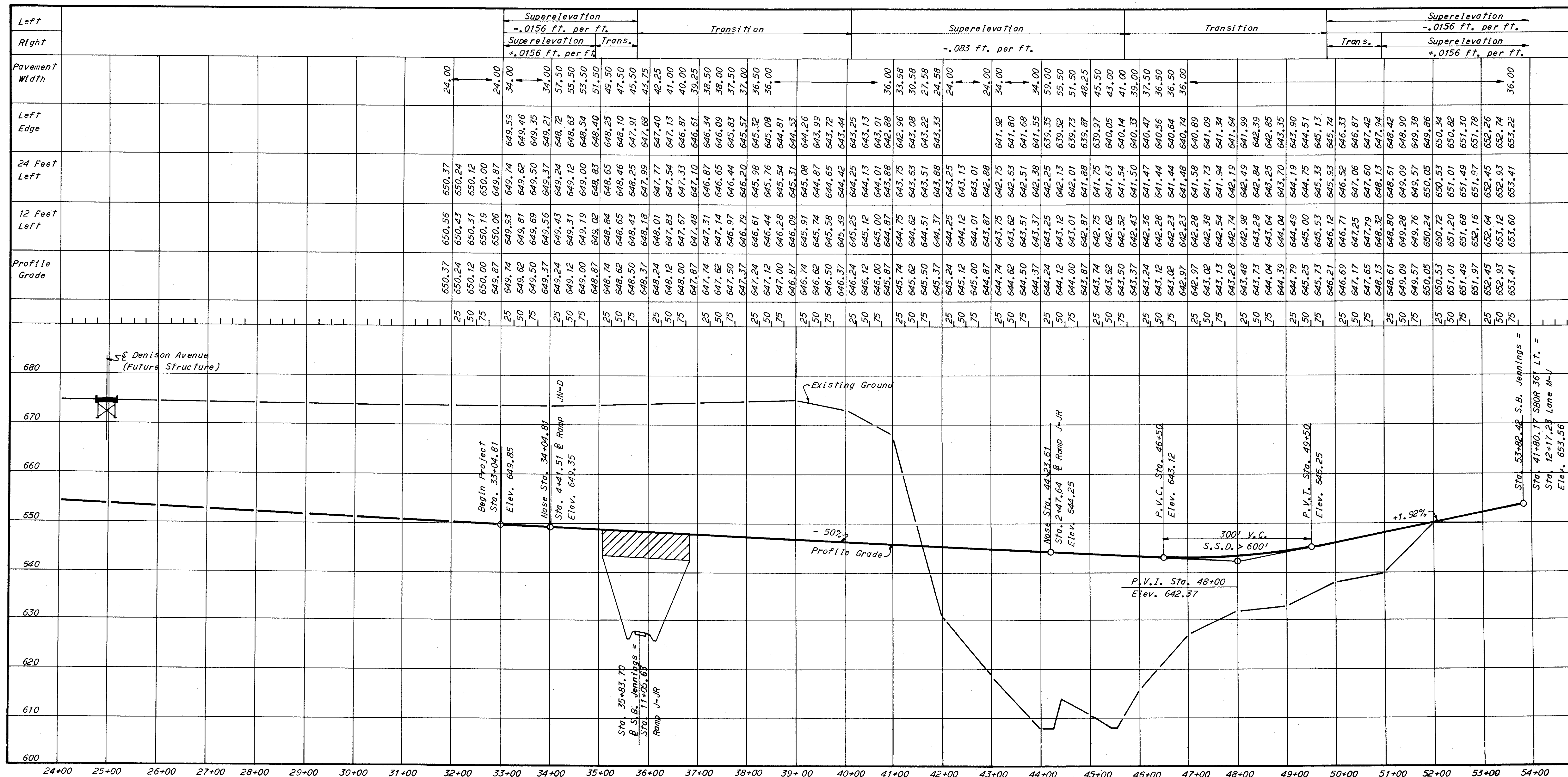
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TRCD: DATE: \_\_\_\_\_  
CKD: DATE: \_\_\_\_\_  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

# PROFILE SOUTHBOUND JENNINGS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

82  
646

CUYAHOGA COUNTY  
CUY



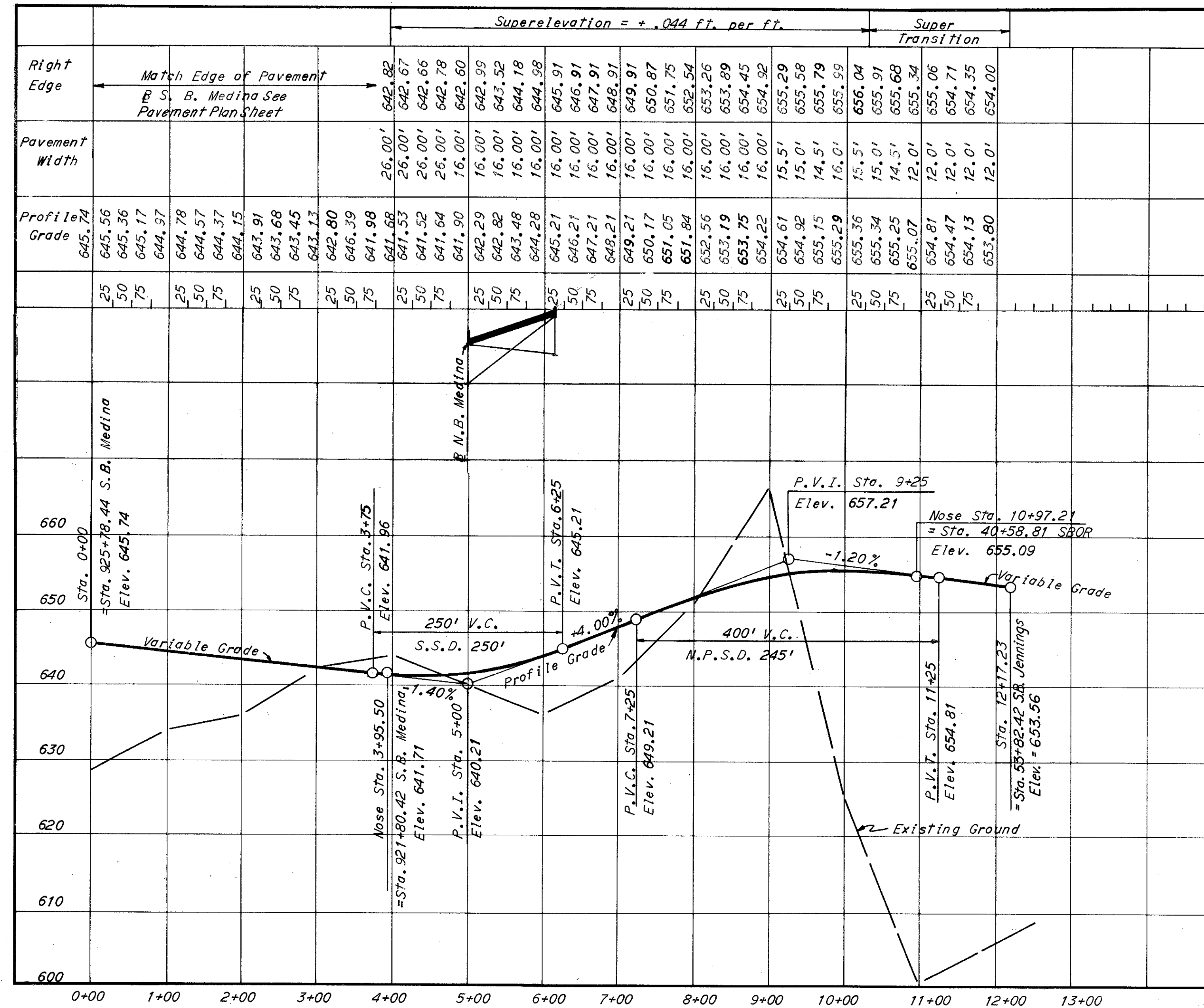
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 MADE BY: H.C. HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 TRCD. DATE: 5-18-64  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

# PROFILE - LANE M-J

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

83  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



Right Edge	Pavement Width	Profile Grade
645.74		645.74
645.56		645.56
645.36		645.36
645.17		645.17
644.97		644.97
644.78		644.78
644.57		644.57
644.37		644.37
644.15		644.15
643.91		643.91
643.68		643.68
643.45		643.45
643.13		643.13
642.80		642.80
646.39		646.39
641.98		641.98
641.68		641.68
641.53	26.00'	641.53
642.66	26.00'	642.66
642.78	26.00'	642.78
642.60	16.00'	642.60
642.99	16.00'	642.99
643.52	16.00'	643.52
644.18	16.00'	644.18
644.98	16.00'	644.98
645.91	16.00'	645.91
646.91	16.00'	646.91
647.91	16.00'	647.91
648.91	16.00'	648.91
649.91	16.00'	649.91
650.87	16.00'	650.87
651.75	16.00'	651.75
652.54	16.00'	652.54
653.26	16.00'	653.26
653.89	16.00'	653.89
654.45	16.00'	654.45
654.92	16.00'	654.92
655.29	15.5'	655.29
655.58	15.0'	655.58
655.79	14.5'	655.79
655.99	16.0'	655.99
656.04	15.5'	656.04
655.91	15.0'	655.91
655.68	14.5'	655.68
655.34	12.0'	655.34
655.06	12.0'	655.06
654.71	12.0'	654.71
654.35	12.0'	654.35
653.80	12.0'	653.80

SCALE Horiz. 1"=100' Vert. 1"=10' HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE H.L.D. DATE 4-15-64 CONSULTING ENGINEERS  
 TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
 CKD. DATE



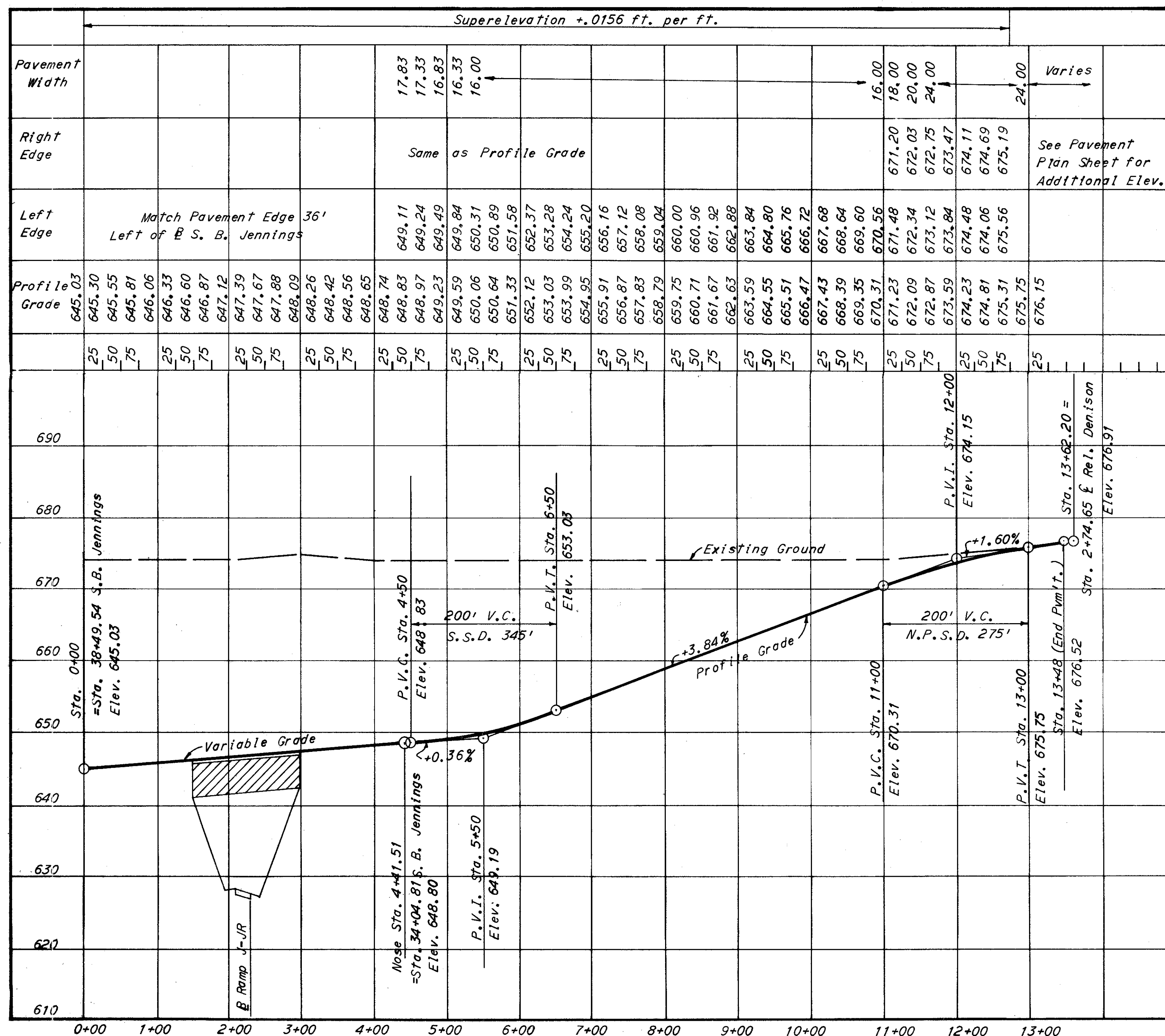


# PROFILE RAMPS JN-D, D-JN

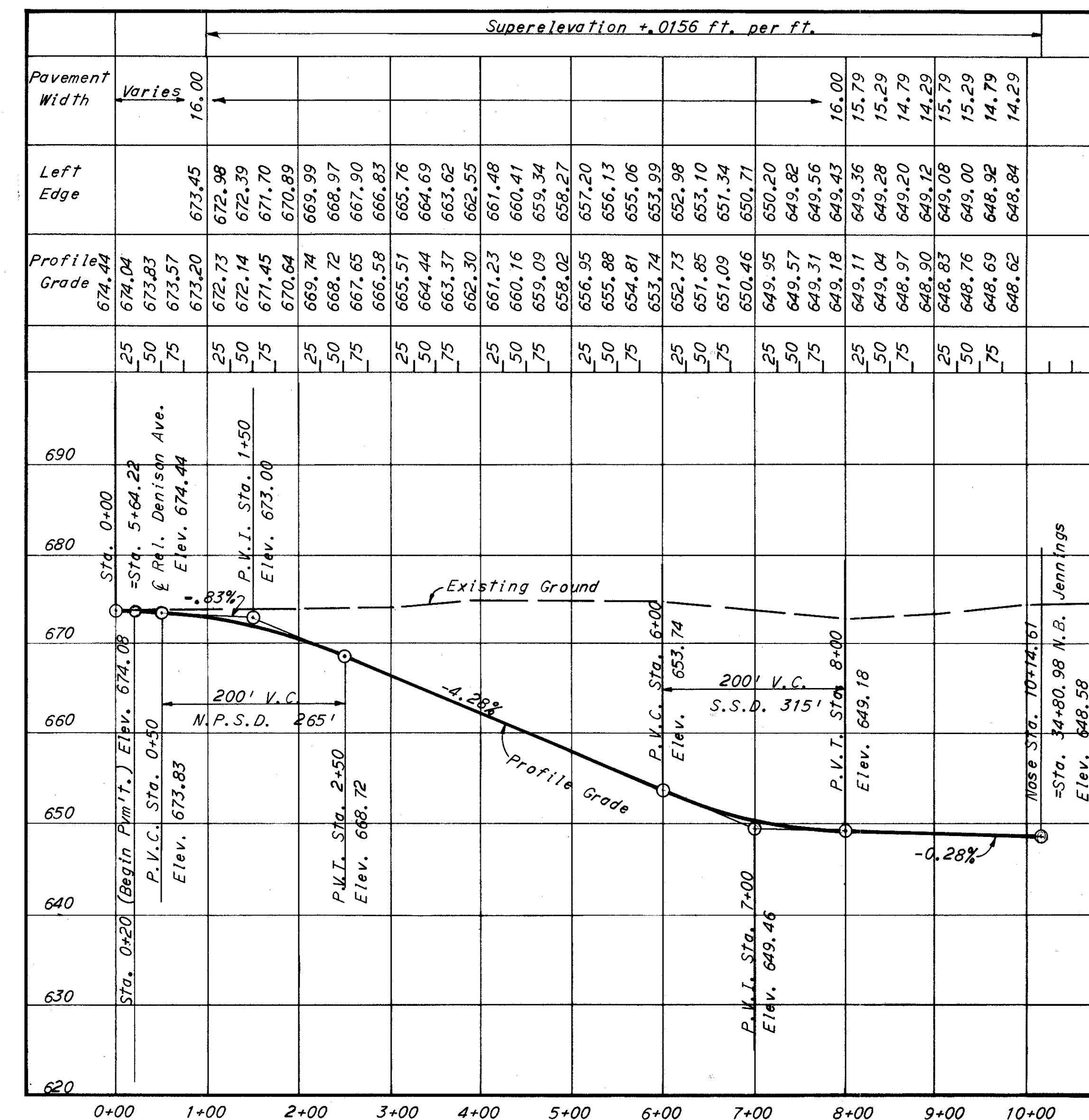
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

86  
646

CUYAHOGA COUNTY  
CUY.-71-17.83  
CUY.-176-12.76



RAMP JN-D



RAMP D-JN

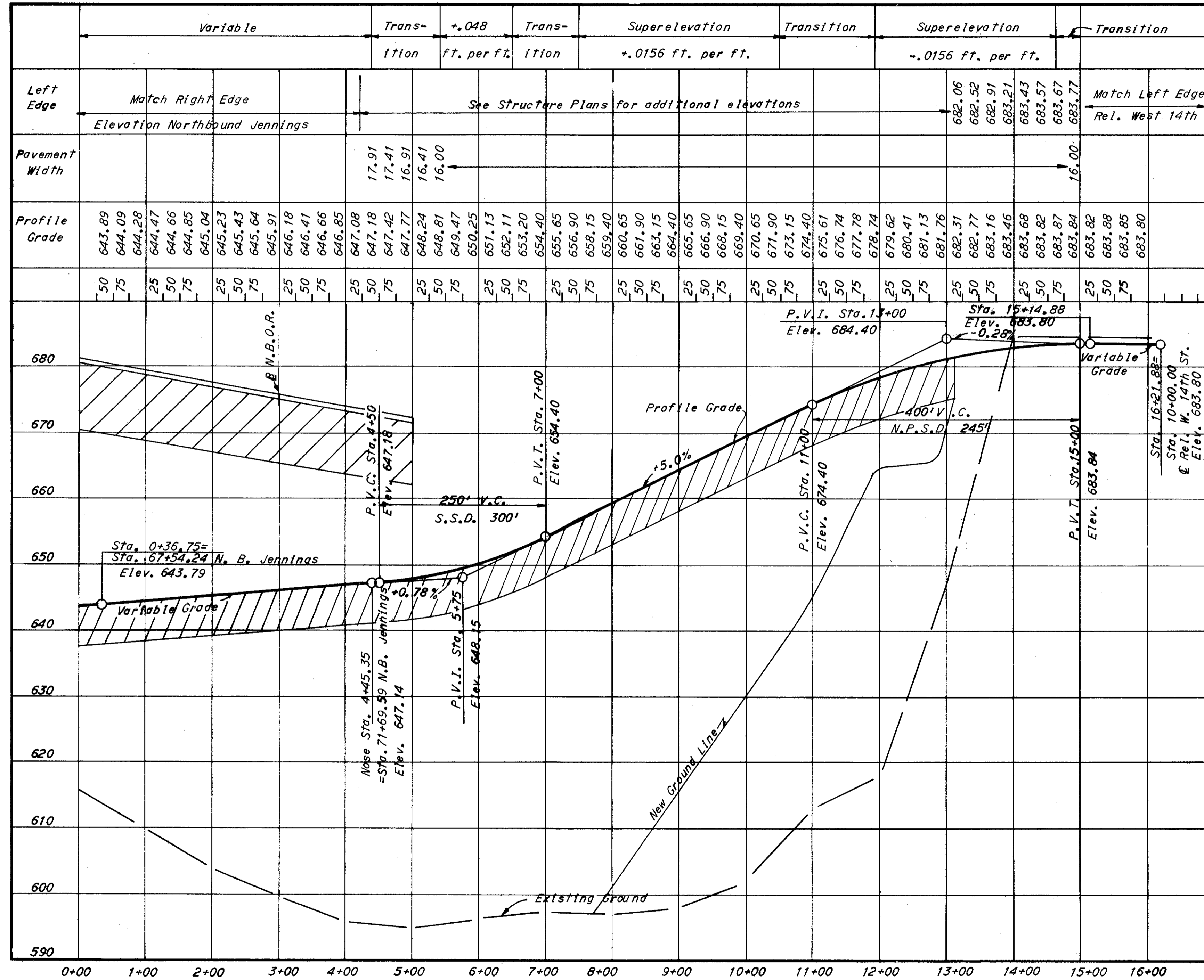
SCALE 1"=100' H, 1"=10' V HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE RHA DATE 2-25-64 CONSULTING ENGINEERS  
TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
CKD. DATE

# PROFILE - RAMP J-14

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

87  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



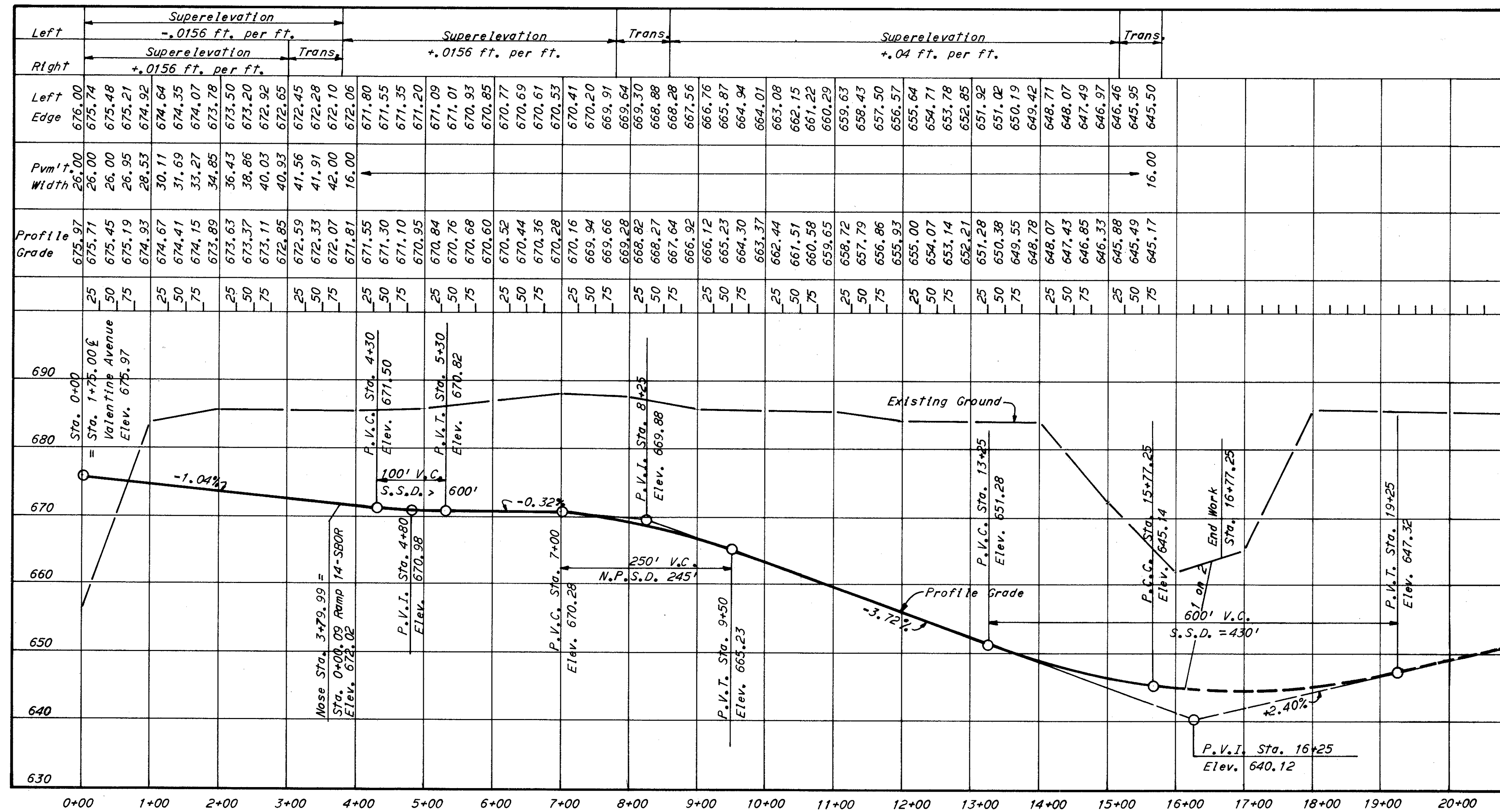
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 MADE 4/10 DATE 5-6-64  
 TRCD. DATE  
 CKD. DATE  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

# PROFILE RAMP 14-M

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

88  
646

CUYAHOGA COUNTY  
CUY.-71-17.83  
CUY.-176-12.76



SCALE 1"=100' H-1"=10' V. HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE 4/10 DATE 9-10-64 CONSULTING ENGINEERS  
 TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
 CKD. DATE



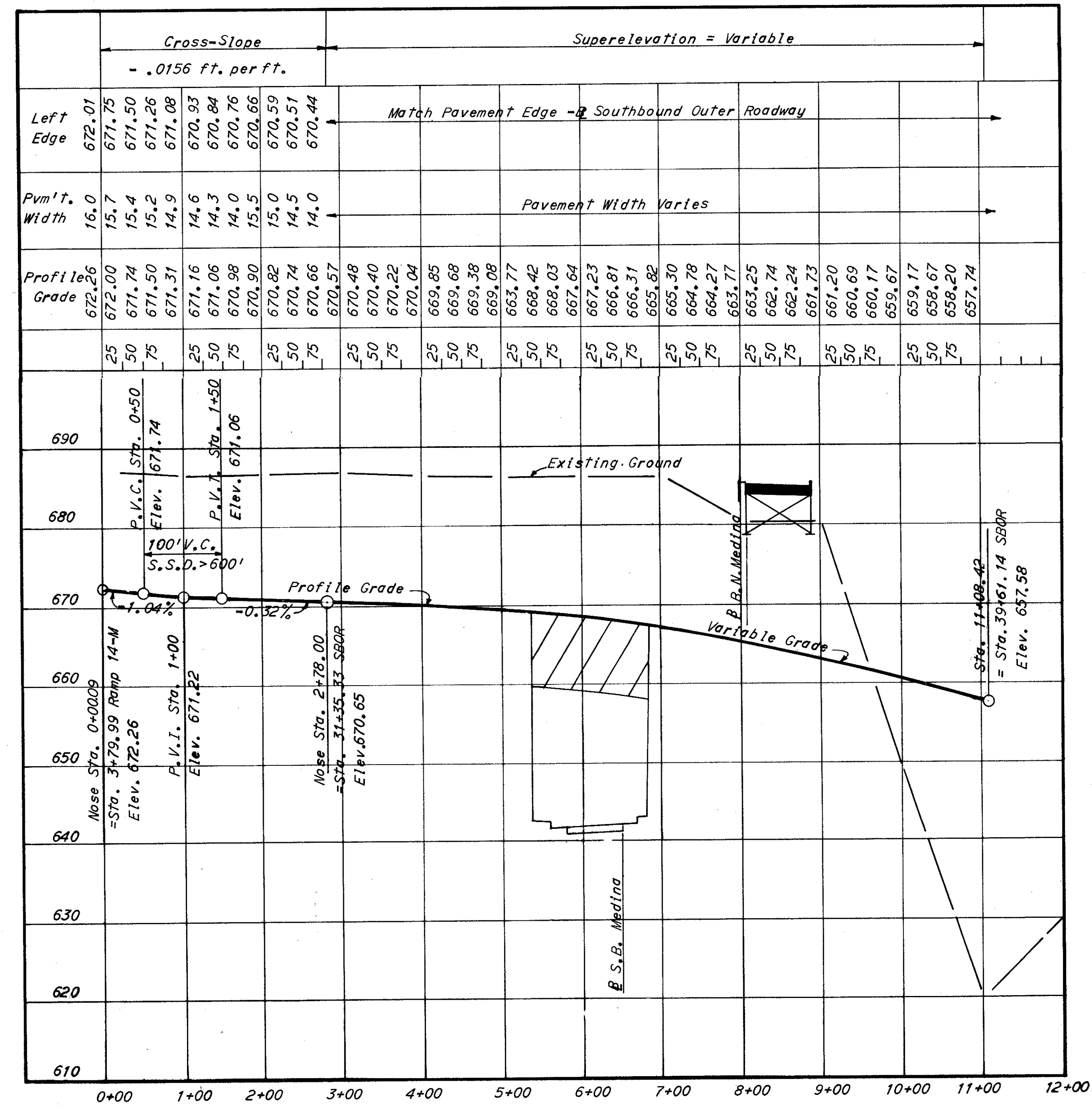


# PROFILE - RAMP 14 - SBOR

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

90  
646

CUYAHOGA COUNTY  
CUY - 71-17.83  
CUY-176-12.76



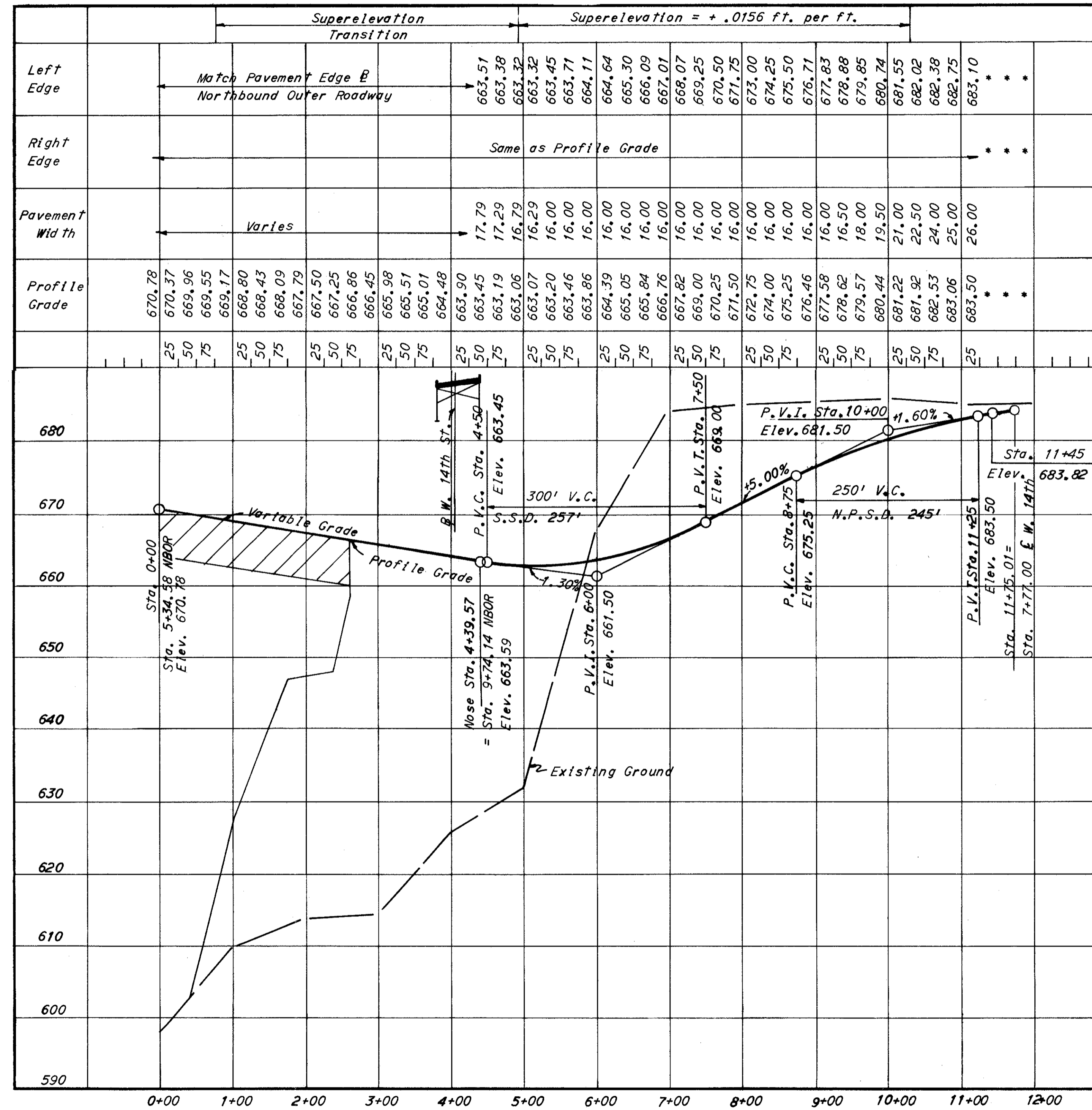
SCALE Horiz. 1"=100' Vert. 1"=10'  
MADE H.L.D. DATE 4-16-64  
HOWARD, NEEDLES, TAMMEN & BERGENOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

# PROFILE - RAMP NBOR-14

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

91  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



\* Note:  
 See Pavement Plan Sheet for  
 elevations in intersection with  
 West 14th Street.

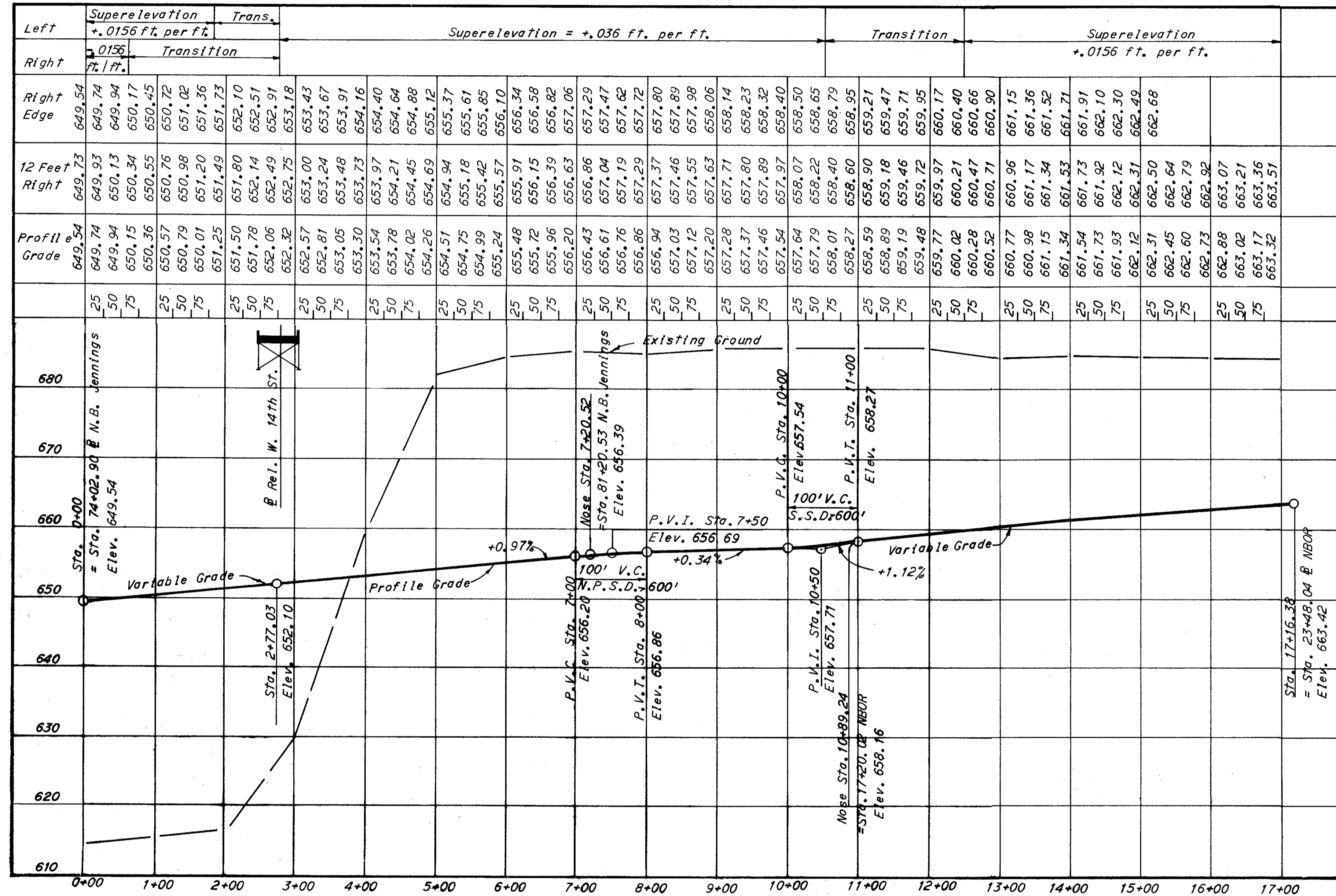
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 MADE H.L.D. DATE 8-17-64  
 TRCD. DATE \_\_\_\_\_  
 CKD. DATE \_\_\_\_\_  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

# PROFILE - RAMP J-NBOR

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

92  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



SCALE: Horiz. 1"=100' Vert. 1"=10'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE HLD. DATE 5-5-64 CONSULTING ENGINEERS  
 TRCD. DATE KANSAS CITY CLEVELAND NEW YORK  
 CKD. DATE



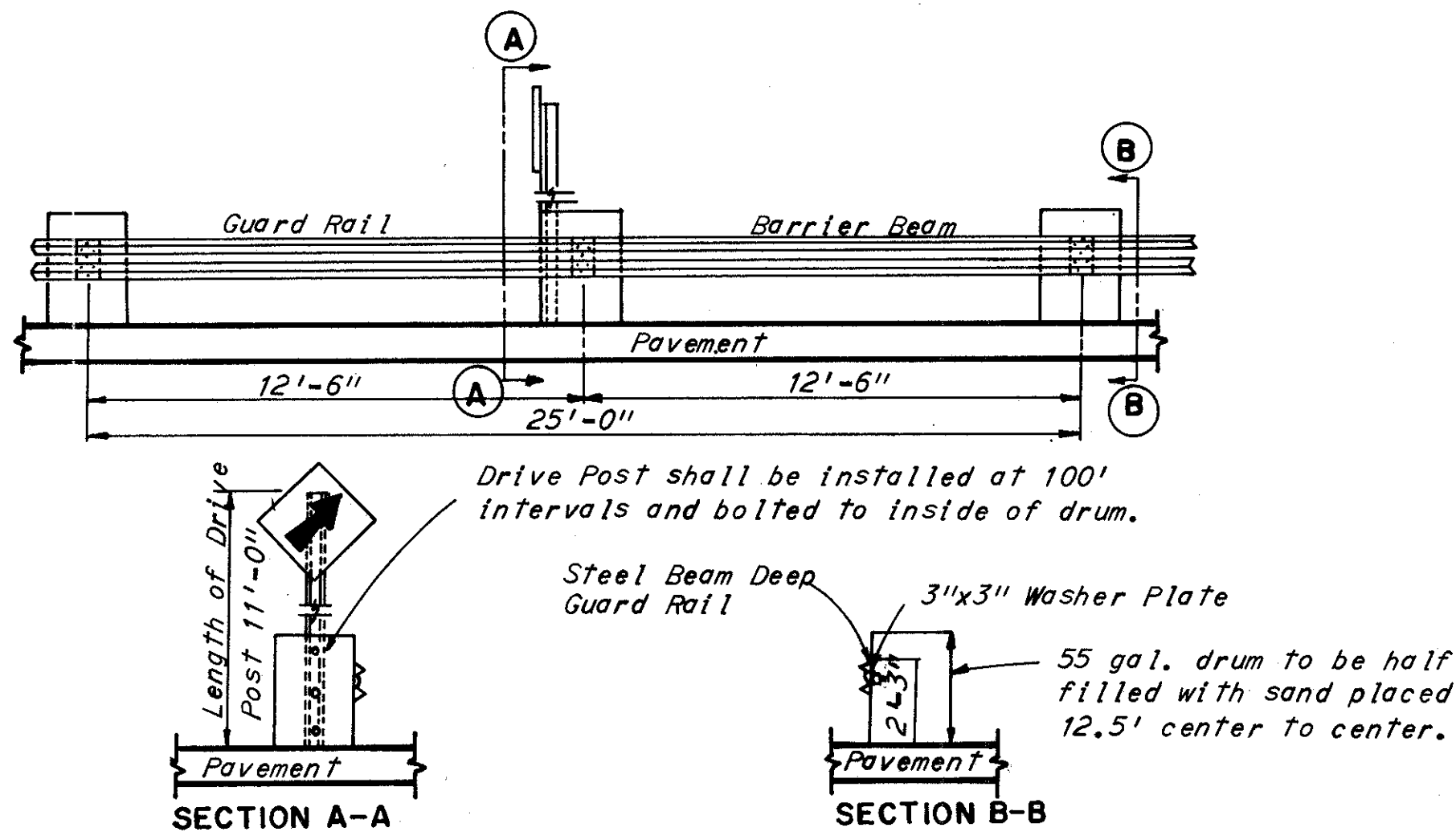


# MISCELLANEOUS DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

95  
646

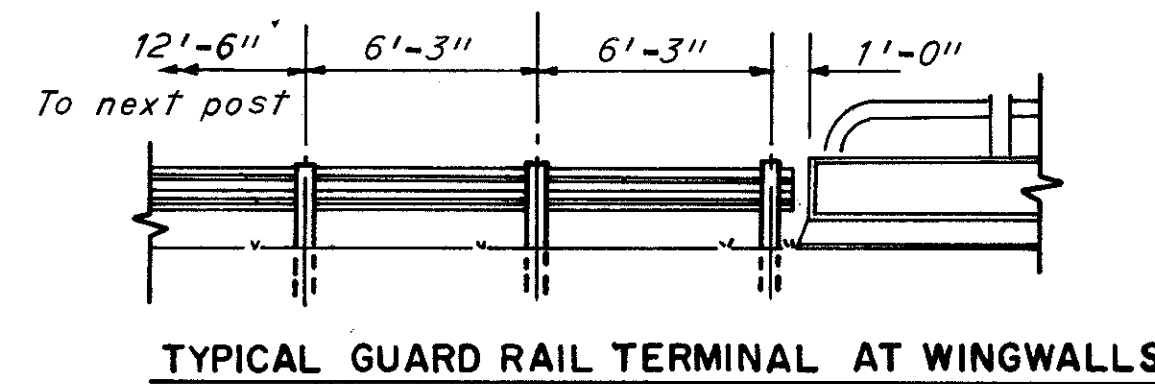
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



TYPICAL UNIT OF TEMPORARY GUARD RAIL ASSEMBLY

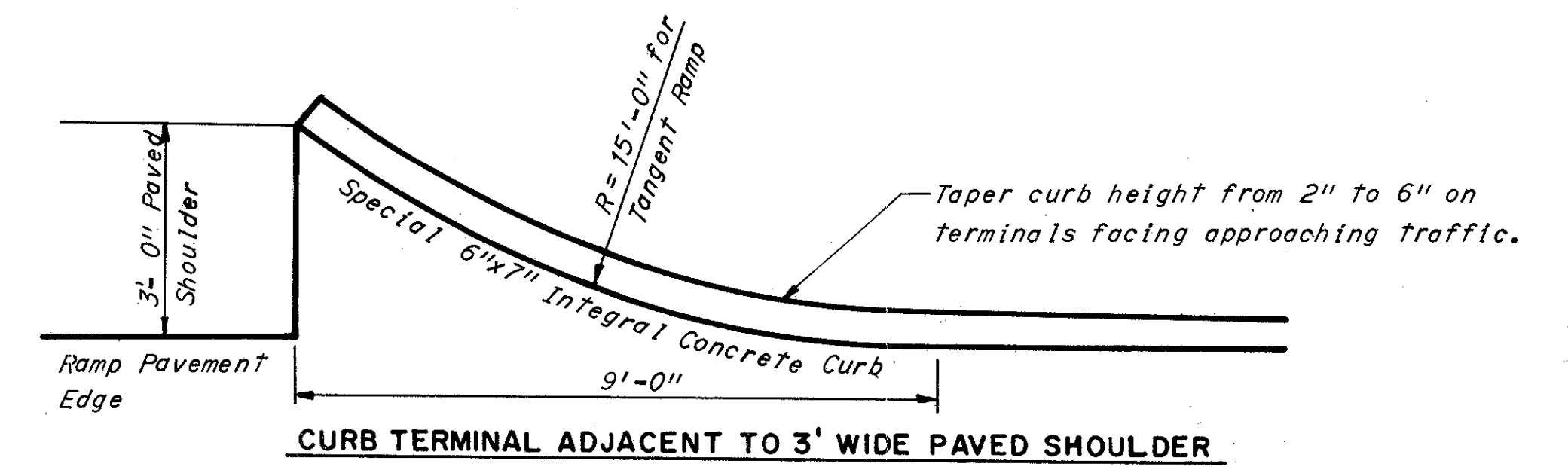
**Note.**

Item I-15 "Temporary Guard Rail as per plan" shall be constructed as shown above and cost shall include erection, painting and all materials and incidentals necessary to complete this item in accordance with Sec. I-15.  
Steel Beam Deep Guard Rail may be new or used as approved by the Engineer. Guard Rail element will be constructed as shown on Standard Construction Drawing I-15, No. 2-A, bolted to drums instead of posts as shown above.  
Drums shall be painted with yellow equipment enamel (Sec. M-9.13) in accordance with Sec. S-8.  
Drive Posts shall be in accordance with Supplemental Specification M-107.16.  
Signs will be furnished and installed by others.



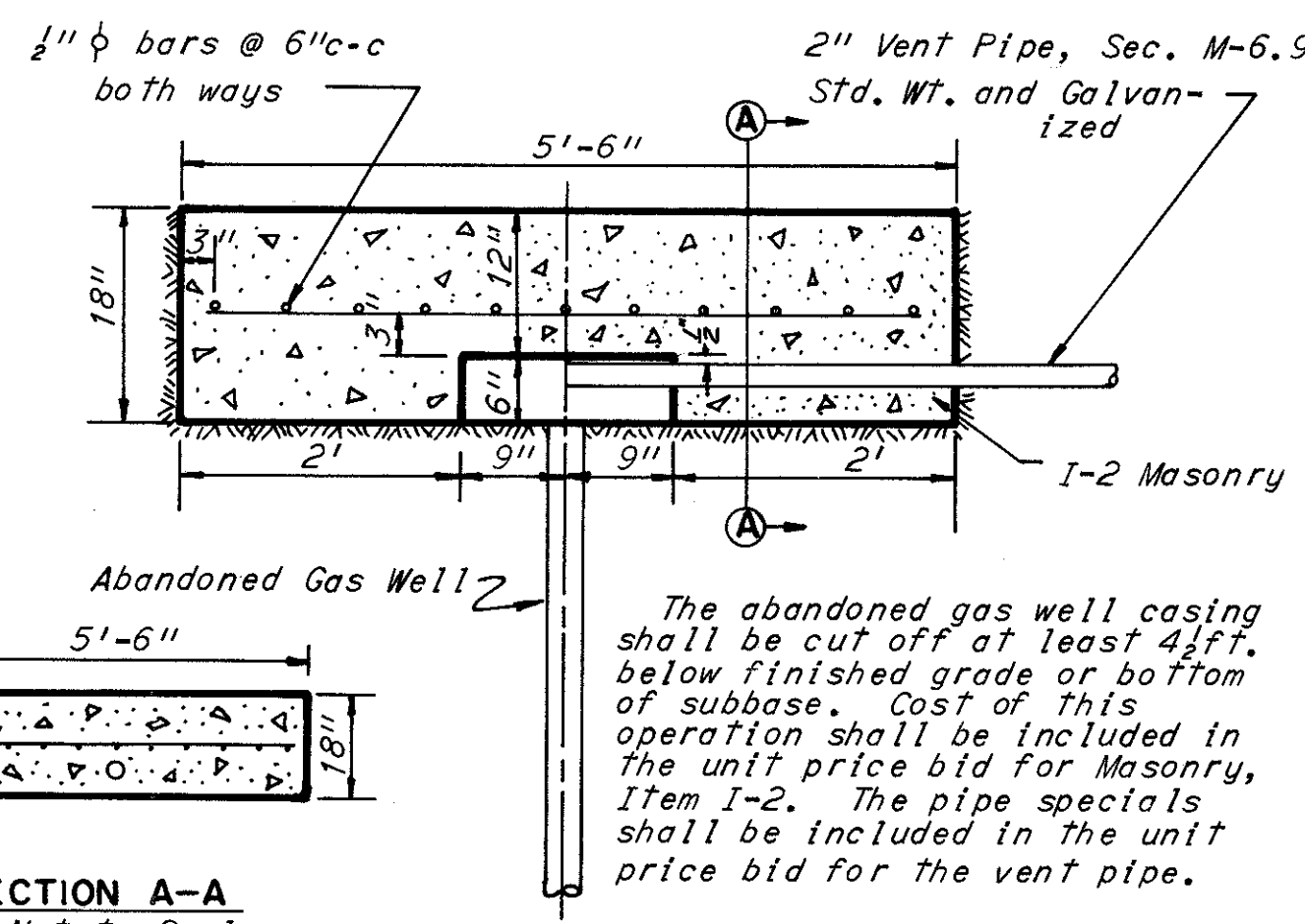
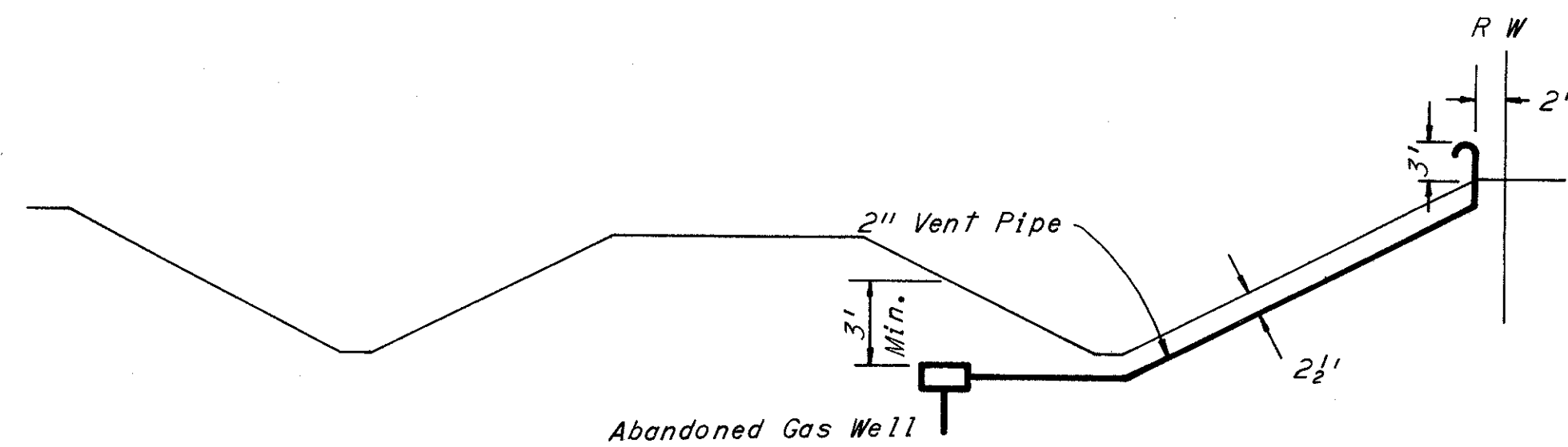
**Note.**

The cost of providing the additional post in the first span of guard rail at bridge wingwalls shall be included in the unit price bid for Item I-15, Guard Rail.  
The face of rail shall be installed flush with face of wingwall parapet.  
The standard terminal shall be omitted when Guard Rail terminates at parapet on bridge wingwalls.

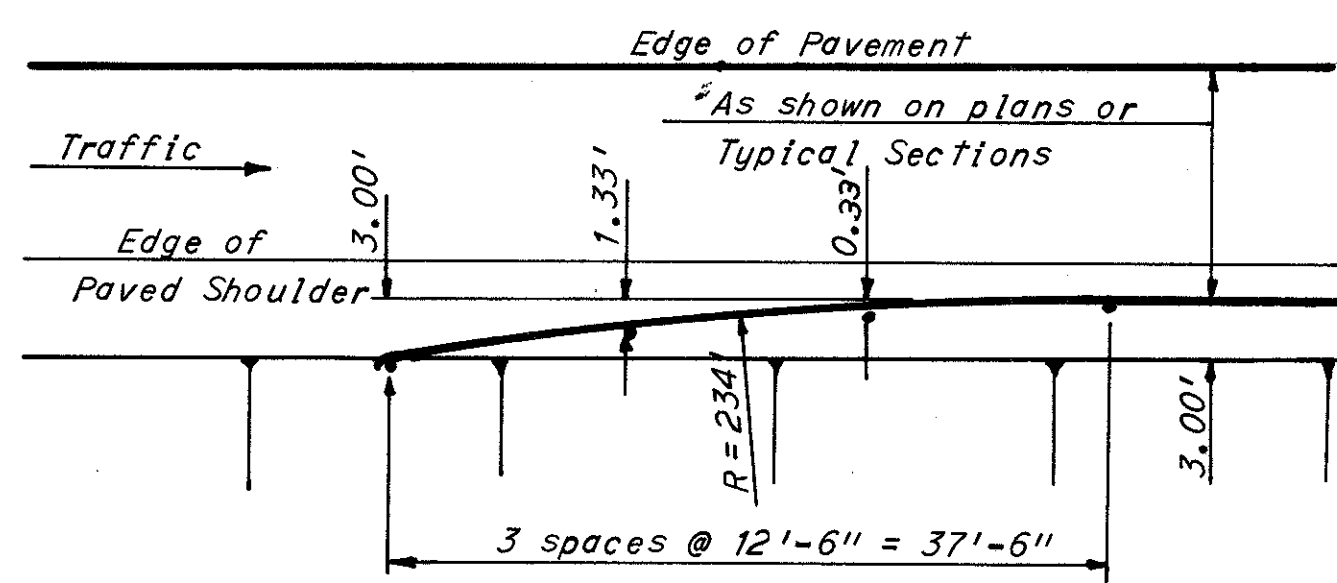


CURB TERMINAL ADJACENT TO 3' WIDE PAVED SHOULDER

Scale 1/2" = 1'-0"

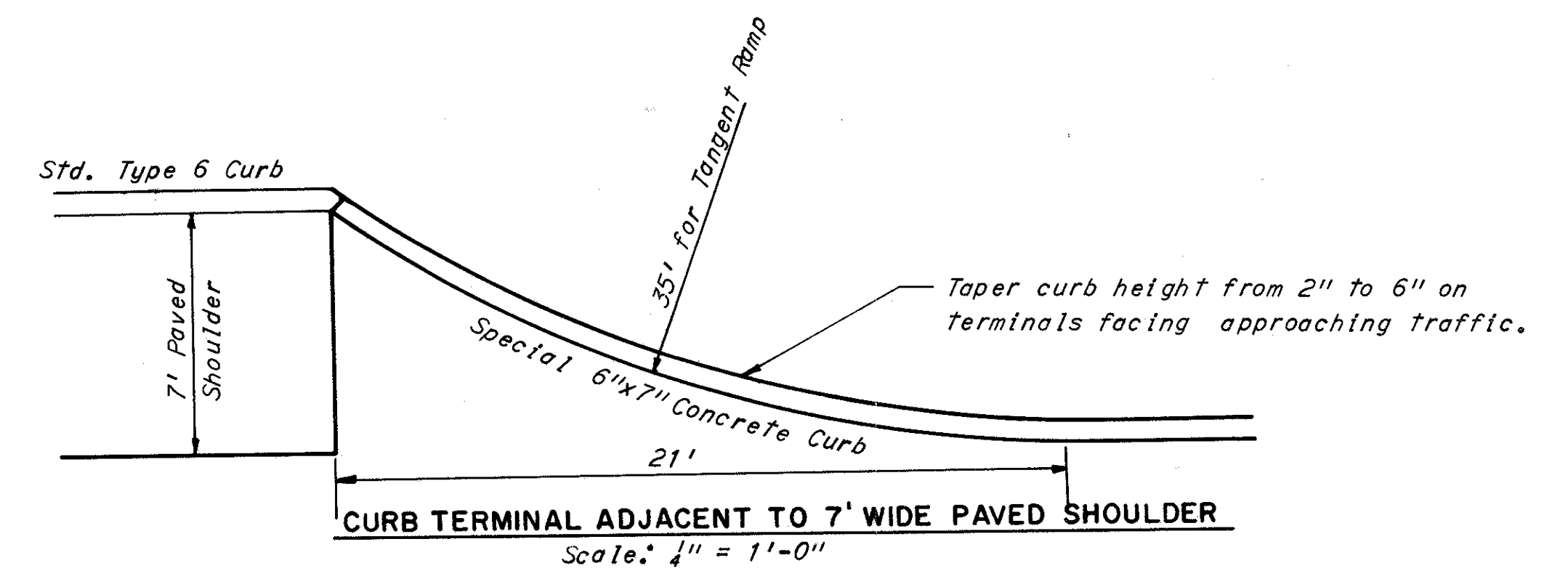


ABANDONED GAS WELL VENT DETAIL



TYPICAL GUARD RAIL FLARE

Scale: 1" = 10'



CURB TERMINAL ADJACENT TO 7' WIDE PAVED SHOULDER

Scale: 1/4" = 1'-0"

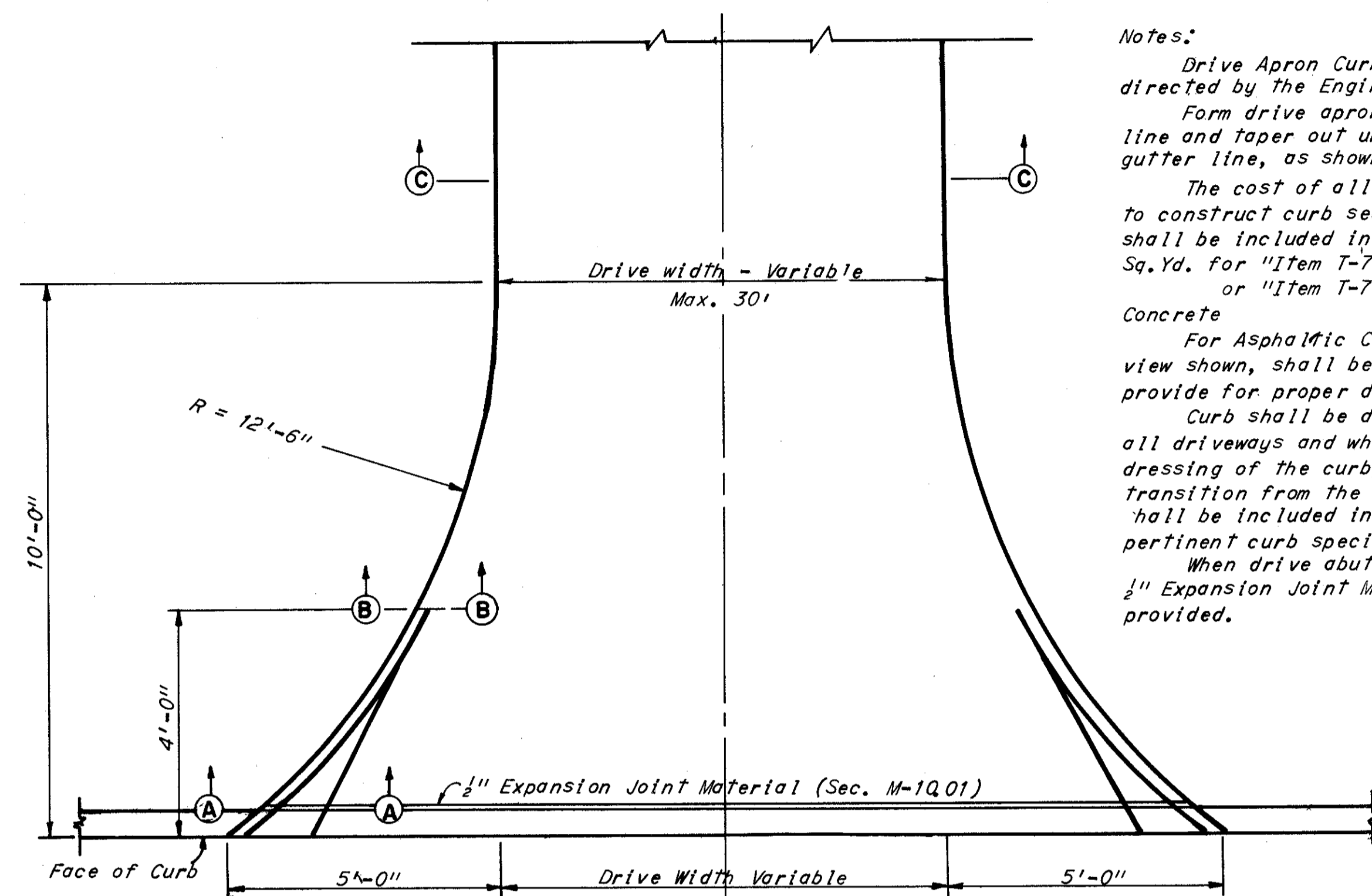
SCALE as shown HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE D.R.K. DATE 1/10/64 CONSULTING ENGINEERS  
TRCD. D.R.S. DATE 2/10/64  
CKD. D.V.K. DATE 2/20/64 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

96  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

# MISCELLANEOUS DETAILS



**Notes:**

Drive Apron Curb Section is to be placed where directed by the Engineer.

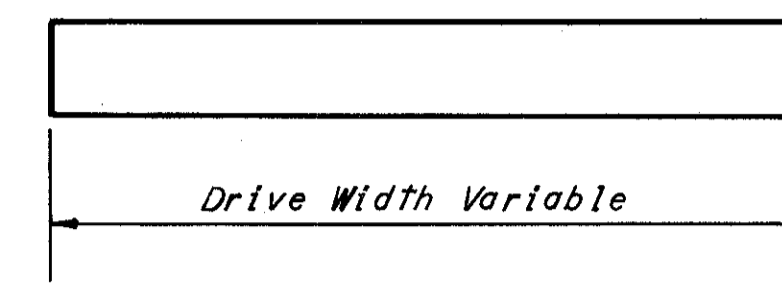
Form drive apron curb Sect. "A-A" behind curb line and taper out uniformly to no curb 4'-0" behind gutter line, as shown.

The cost of all labor and material necessary to construct curb section and thickened edge as shown, shall be included in the contract unit price bid per Sq. Yd. For "Item T-70, 6" Portland Cement Concrete or "Item T-71, 8" Reinforced Portland Cement Concrete

For Asphaltic Concrete and Slag drives, the plan view shown, shall be used. Shape drive section to provide for proper drainage, as directed by the Engineer.

Curb shall be dropped to provide a 2 1/2" gutter at all driveways and wherever directed by the Engineer. The dressing of the curb, necessary to effect a satisfactory transition from the normal curb height to a 2 1/2" height, shall be included in the contract unit price bid for the pertinent curb specified.

When drive abuts new or existing concrete sidewalk, 1/2" Expansion Joint Material (Sec. M-10.01) shall be provided.

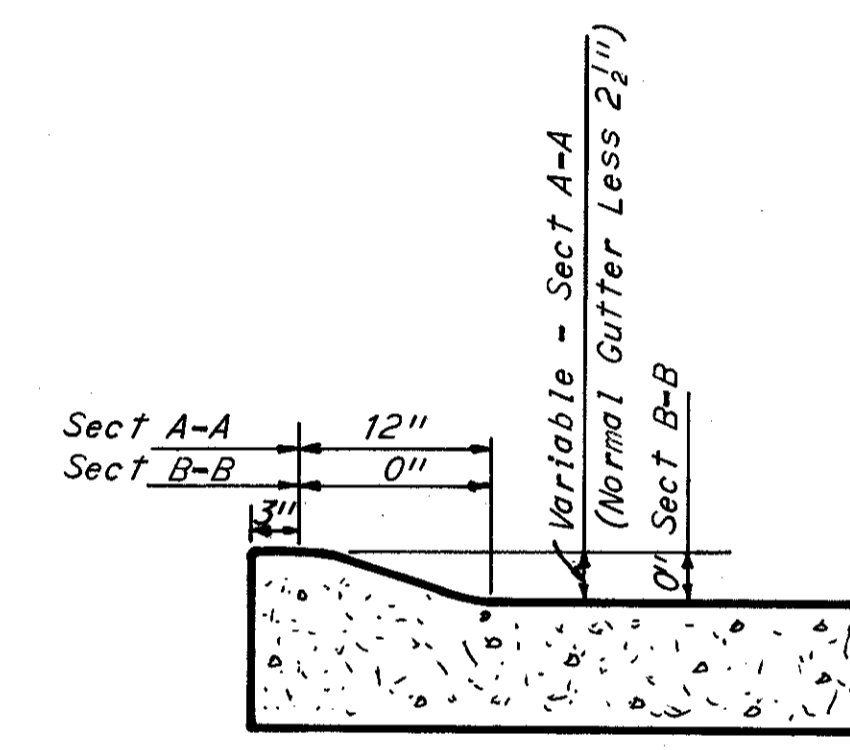


**SECTION C-C**  
No Scale

**Note**

Residence drives having an existing hard surface or existing aggregate surface shall be replaced with a pavement of similar type in so far as practicable, using one of the following designs for the portion beyond the flared apron

- (a) 6" Plain Portland Cement Concrete, Item T-70.
- (b) 5" B-19 surfaced with two 1" courses of Type "C" Asphaltic Concrete, Item T-35.
- (c) 8" B-19 Aggregate

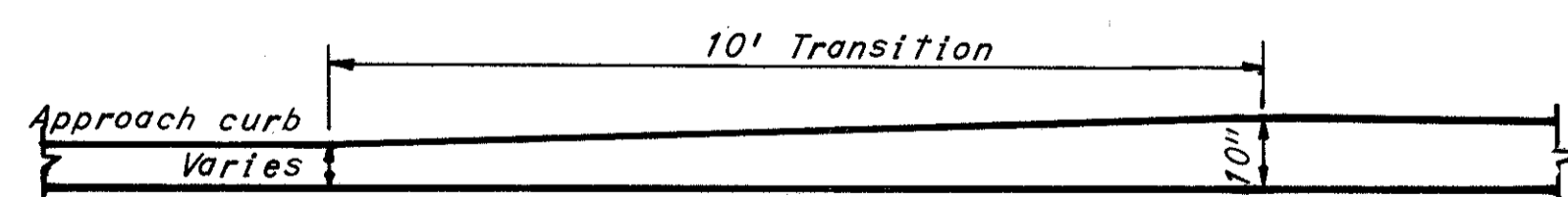


**APRON CURB DETAILS**  
**SECTION A-A & B-B**

**Note:**  
This Drive Detail applies to all driveways on this project.

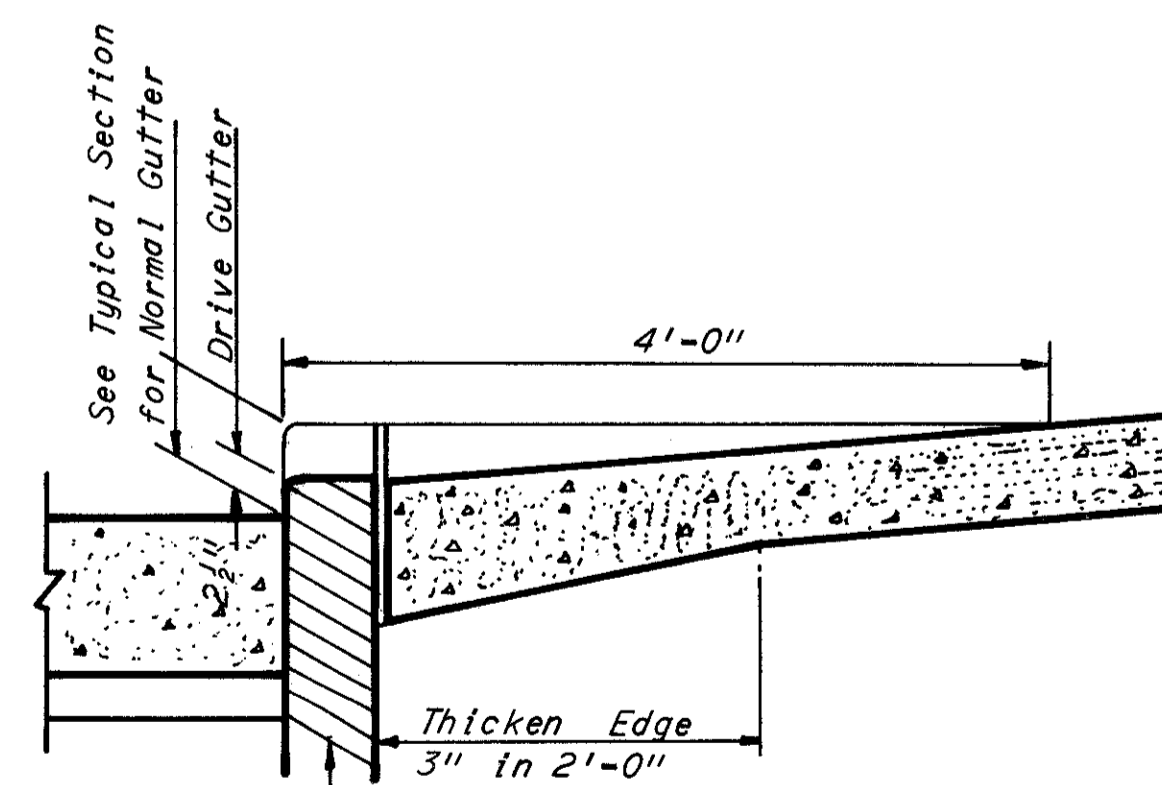
**CONCRETE DRIVE DETAIL**

Scale: 1/2" = 1'-0"



**CURB HEIGHT TRANSITION DETAIL**

Scale: 1/2" = 1'-0"



The flared portion of residence drives adjacent to bituminous paved shoulders shall be constructed of the same material and composition as used in the shoulder paving.

The flared portion of residence drives for which earth shoulders only are specified, shall be paved with either 6" Plain Portland Cement Concrete (Item T-70) or with two 1" courses of Type "C" Asphaltic Concrete (Item T-35) on 5" of B-19 Aggregate.

See Typical Section for Curb Specified. When drive abuts a pavement with no curb, the drive apron curb section shall be omitted.

**APRON CURB TRANSITION**

scale: 1/4" = 1'-0"

SCALE AS SHOWN HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE D.B.K. DATE 7 June 64 CONSULTING ENGINEERS  
TRCD D.V.S. DATE 9 June 64  
CKD D.W.K. DATE 12/30/64 KANSAS CITY CLEVELAND NEW YORK

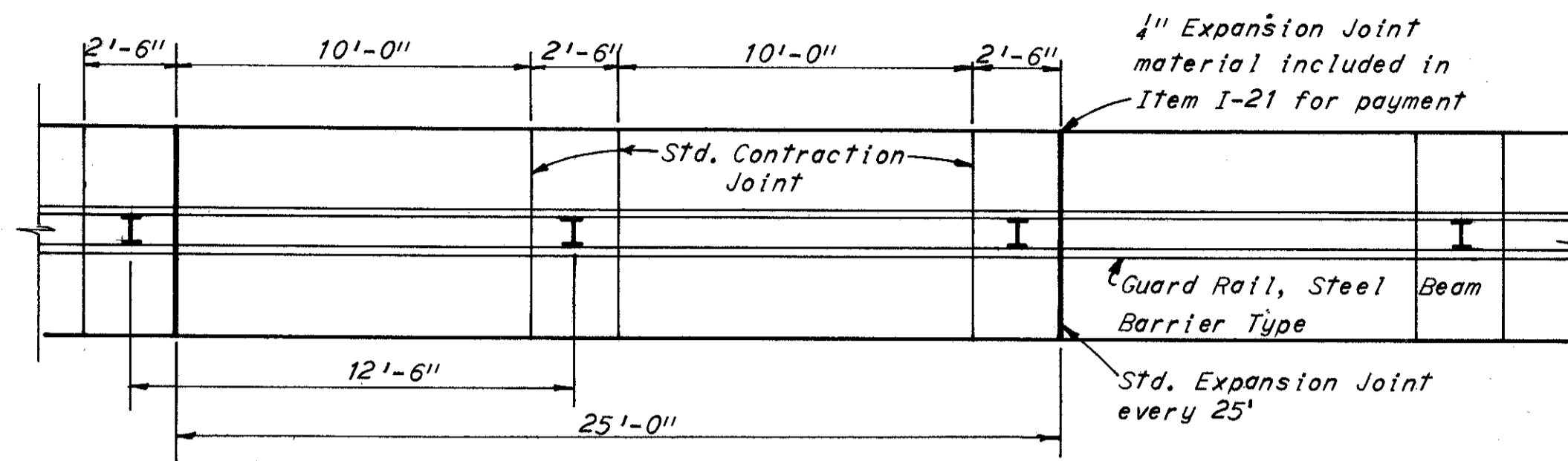


# MISCELLANEOUS DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

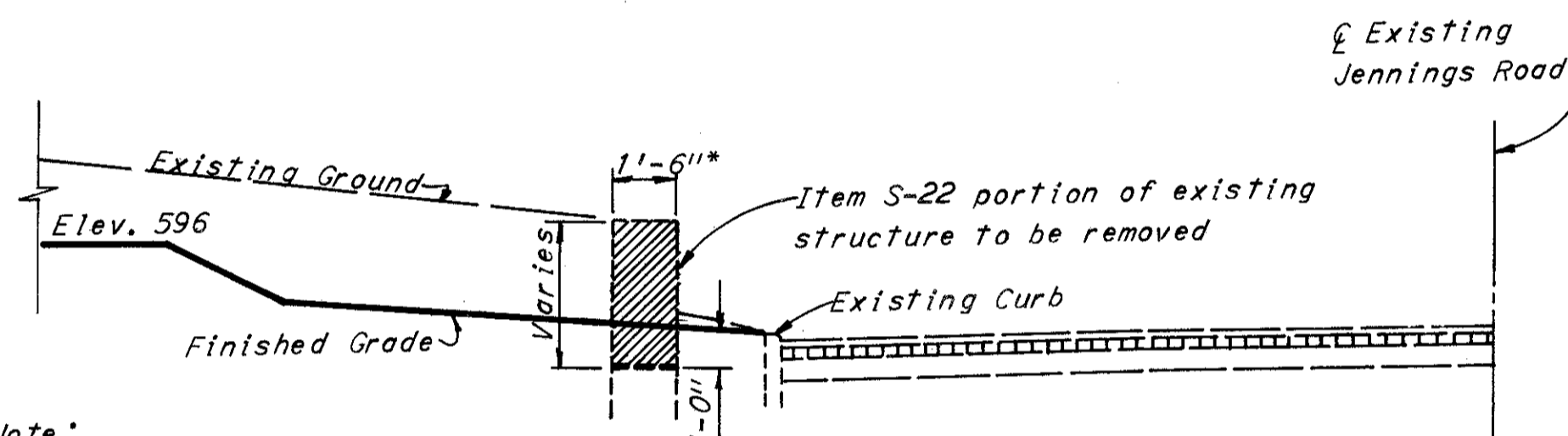
97  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



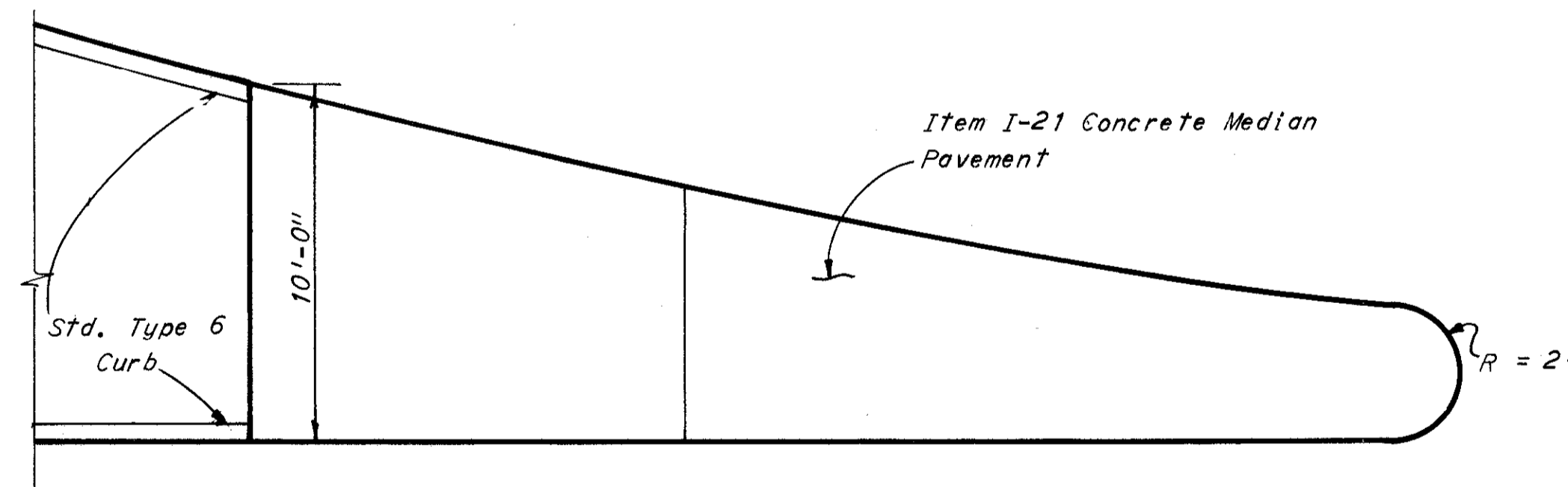
Note:  
 In lieu of spacing requirements of Standard Drawing I-21-23, expansion and contraction joints shall be provided in Item I-21, as shown above wherever guard rail is called for.

**BARRIER MEDIAN JOINT DETAIL**

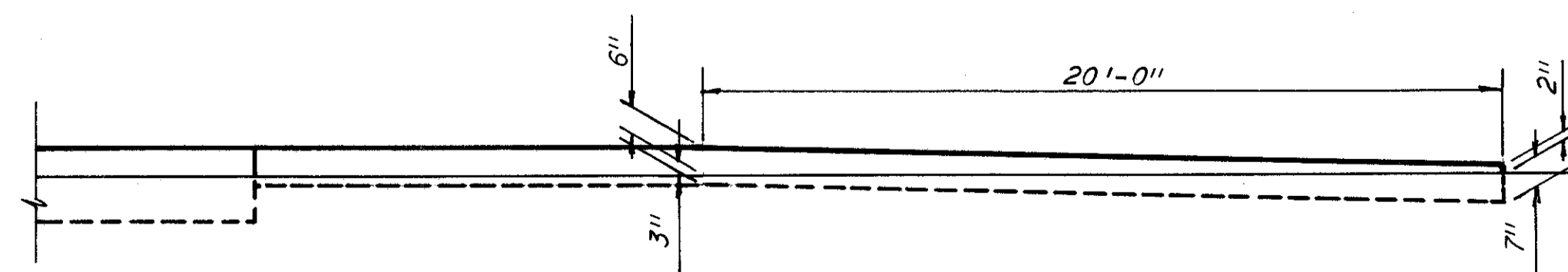


\*Note:  
 This dimension may vary slightly. 1'-6" is an approximate average width.

**DETAIL OF RETAINING WALL TO BE REMOVED**

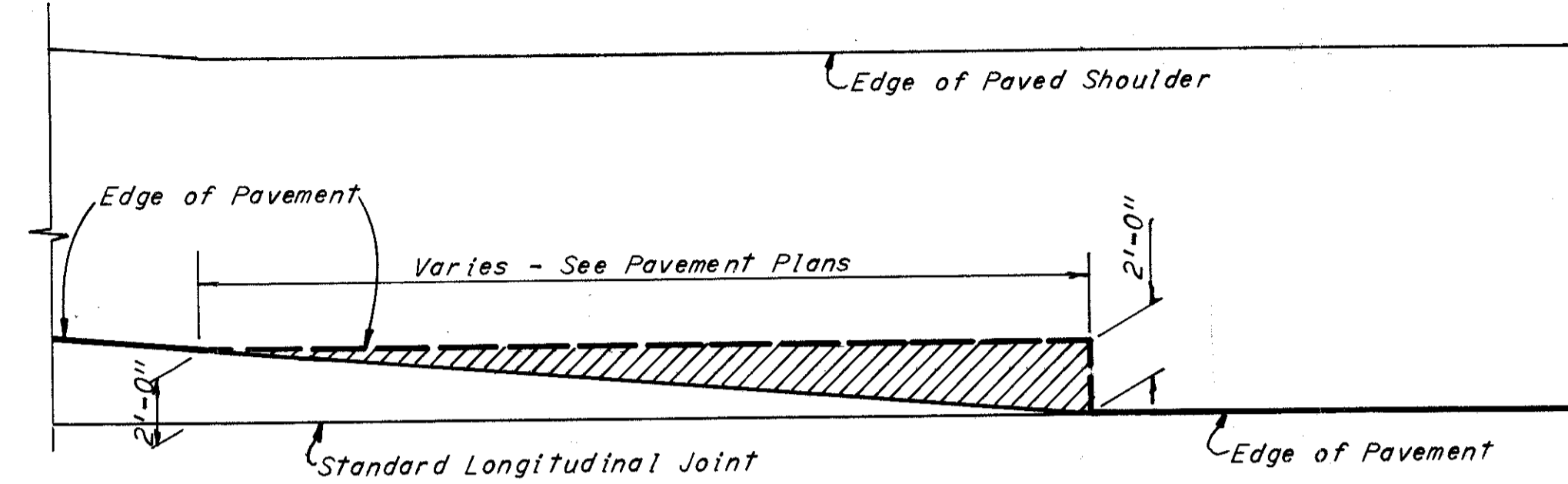


**PLAN**



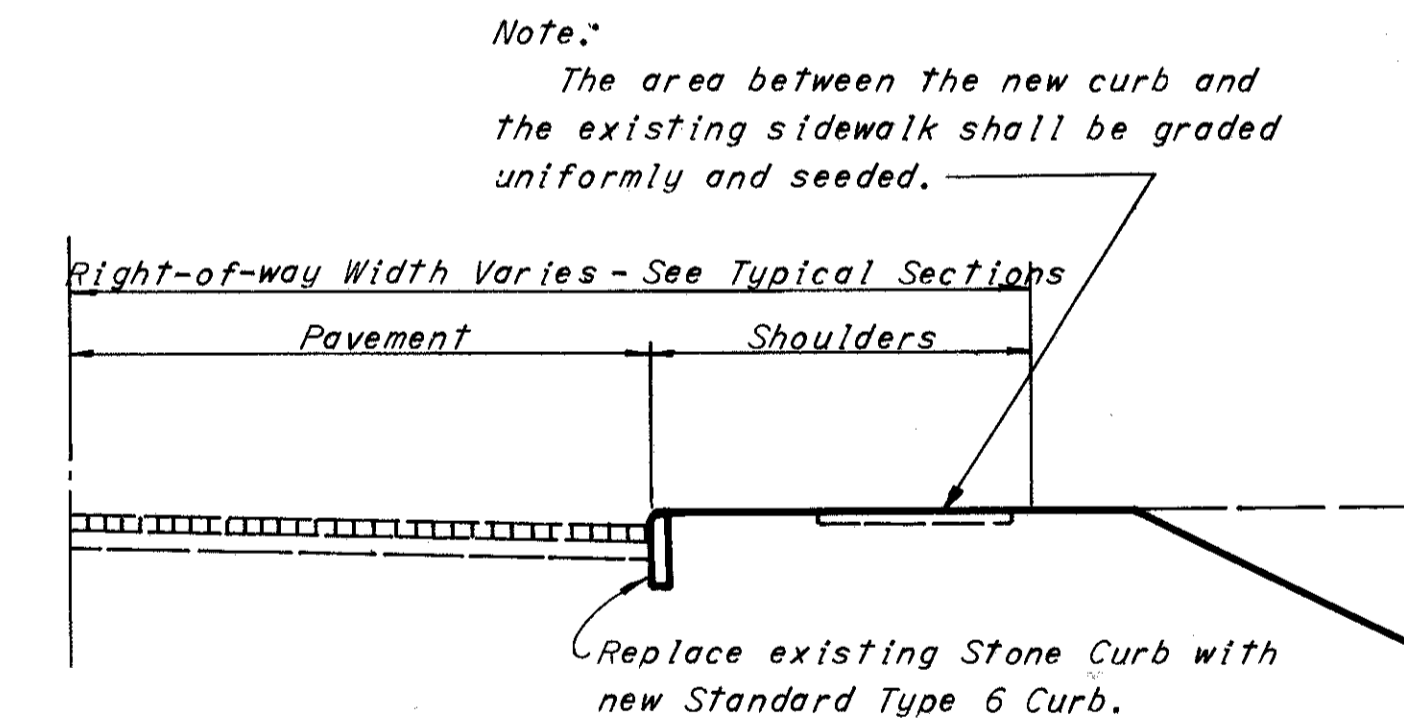
**ELEVATION**

**RAMP EXIT NOSE DETAIL**



Note:  
 The crosshatched area of pavement shown above shall be constructed to an elevation 1/2" lower than the adjacent pavement and surfaced with T-31 and No. 6 Aggregate. The cost of the surface treatment shall be paid for as T-31 and the T-71 shall be paid for as full depth T-71.

**PAVEMENT WIDENING UNDER SHOULDERS AT ACCEL.-DECEL. LANES**



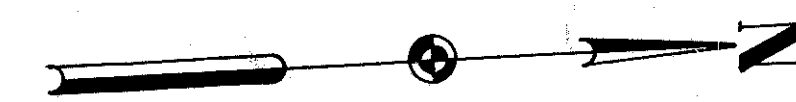
Note:  
 The drive aprons and the sidewalk within the existing right-of-way on the east side of West 15th Street and the west side of West 14th Street shall be removed and the area graded as shown above. Along the east side of West 17th Street the sidewalk shall be left in place. The cost of the grading and any backfilling required shall be included for payment with Item E-8 Removal and Disposal of Existing Driveways and Aprons.

**DETAIL FOR GRADING EXISTING SHOULDERS  
 W.14TH, W.15TH, AND W.17TH. STREETS**

SCALE 1/4" = 1'-0"  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE ORK DATE 11-3-64 CONSULTING ENGINEERS  
 TRCD. DATE 12-30-64 KANSAS CITY CLEVELAND NEW YORK  
 CKD. DATE 12-30-64

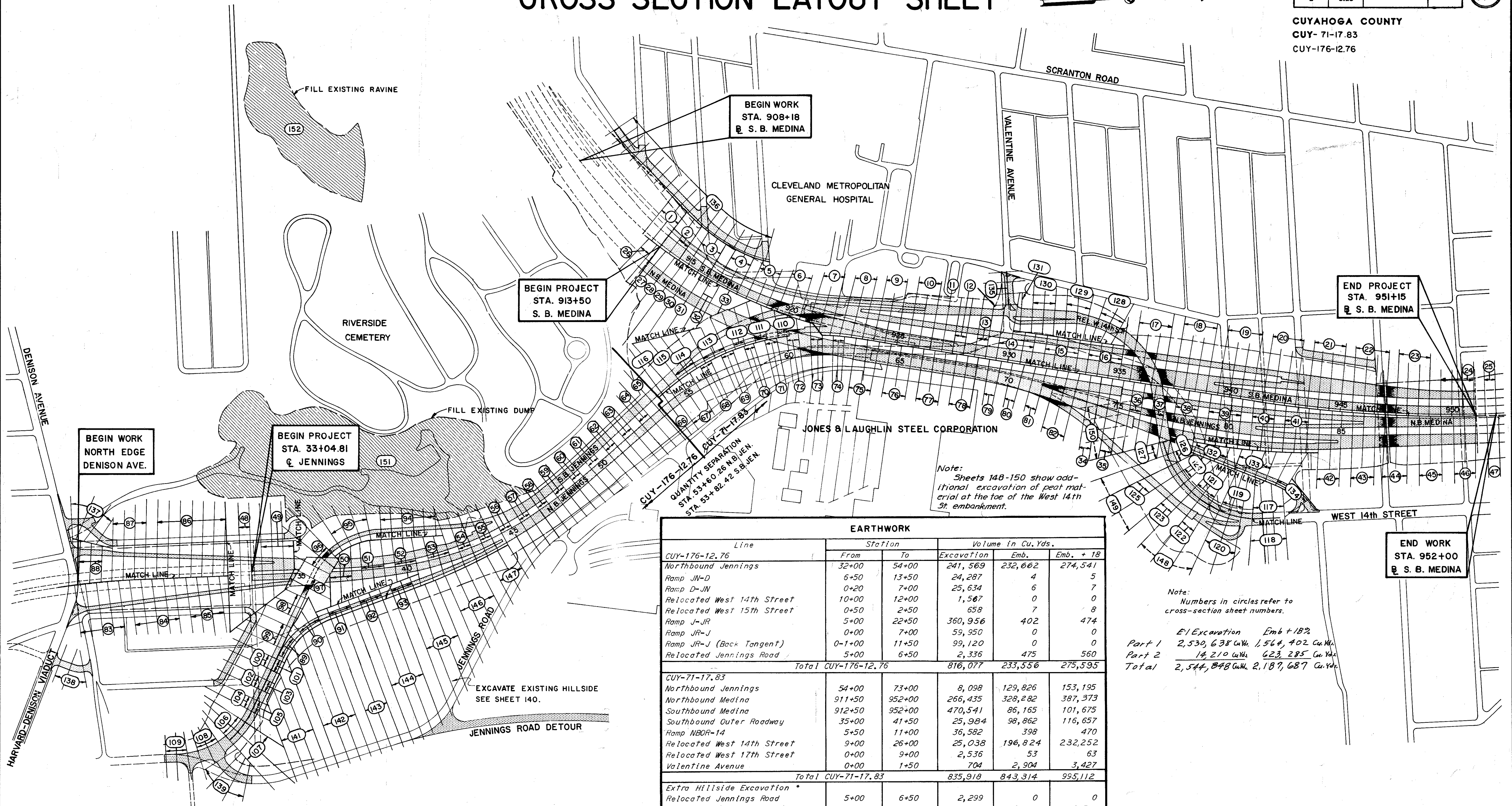
M-15

# CROSS SECTION LAYOUT SHEET



FED. RD. DIVISION	STATE	PROJECT	98 446
2	OHIO		

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



Note:  
 Sheets 148-150 show additional excavation of peat material at the toe of the West 14th St. embankment.

Note:  
 Numbers in circles refer to cross-section sheet numbers.  
 E1 Excavation Emb + 18%  
 Part 1 2,530,638 Cu.Yd. 1,564,402 Cu.Yd.  
 Part 2 14,210 Cu.Yd. 623,285 Cu.Yd.  
 Total 2,544,848 Cu.Yd. 2,187,687 Cu.Yd.

Line	Station		Volume in Cu.Yds.		
	From	To	Excavation	Emb.	Emb. + 18
<b>CUY-176-12.76</b>					
Northbound Jennings	32+00	54+00	241,569	232,662	274,541
Ramp JW-D	6+50	13+50	24,287	4	5
Ramp D-JW	0+20	7+00	25,634	6	7
Relocated West 14th Street	10+00	12+00	1,567	0	0
Relocated West 15th Street	0+50	2+50	658	7	8
Ramp J-JR	5+00	22+50	360,956	402	474
Ramp JR-J	0+00	7+00	59,950	0	0
Ramp JR-J (Back Tangent)	0-1+00	11+50	99,120	0	0
Relocated Jennings Road	5+00	6+50	2,336	475	560
Total CUY-176-12.76			816,077	233,556	275,595
<b>CUY-71-17.83</b>					
Northbound Jennings	54+00	73+00	8,098	129,826	153,195
Northbound Medina	911+50	952+00	266,435	328,282	387,373
Southbound Medina	912+50	952+00	470,541	86,165	101,675
Southbound Outer Roadway	35+00	41+50	25,984	98,862	116,657
Ramp NBOR-14	5+50	11+00	36,582	398	470
Relocated West 14th Street	9+00	26+00	25,038	196,824	232,252
Relocated West 17th Street	0+00	9+00	2,536	53	63
Valentine Avenue	0+00	1+50	704	2,904	3,427
Total CUY-71-17.83			835,918	843,314	995,112
<b>Extra Hillside Excavation *</b>					
Relocated Jennings Road	5+00	6+50	2,299	0	0
Ramp JR-J (Back Tangent)	0-1+00	11+50	825,656	8,062	9,513
Ramp J-JR	17+50	19+50	34,374	0	0
Total Hillside Excavation			862,329	8,062	9,513
Riverside Cemetery Fills (Estimated)				89,000	105,000
Riverside Cemetery Fills (Estimated)				135,600	160,000
Peat Excavation Area CUY-71-17.83			16,256	16,256	19,182
<b>Grand Total Earthwork Quantities</b>			<b>2,530,580</b>	<b>1,325,788</b>	<b>1,564,402</b>

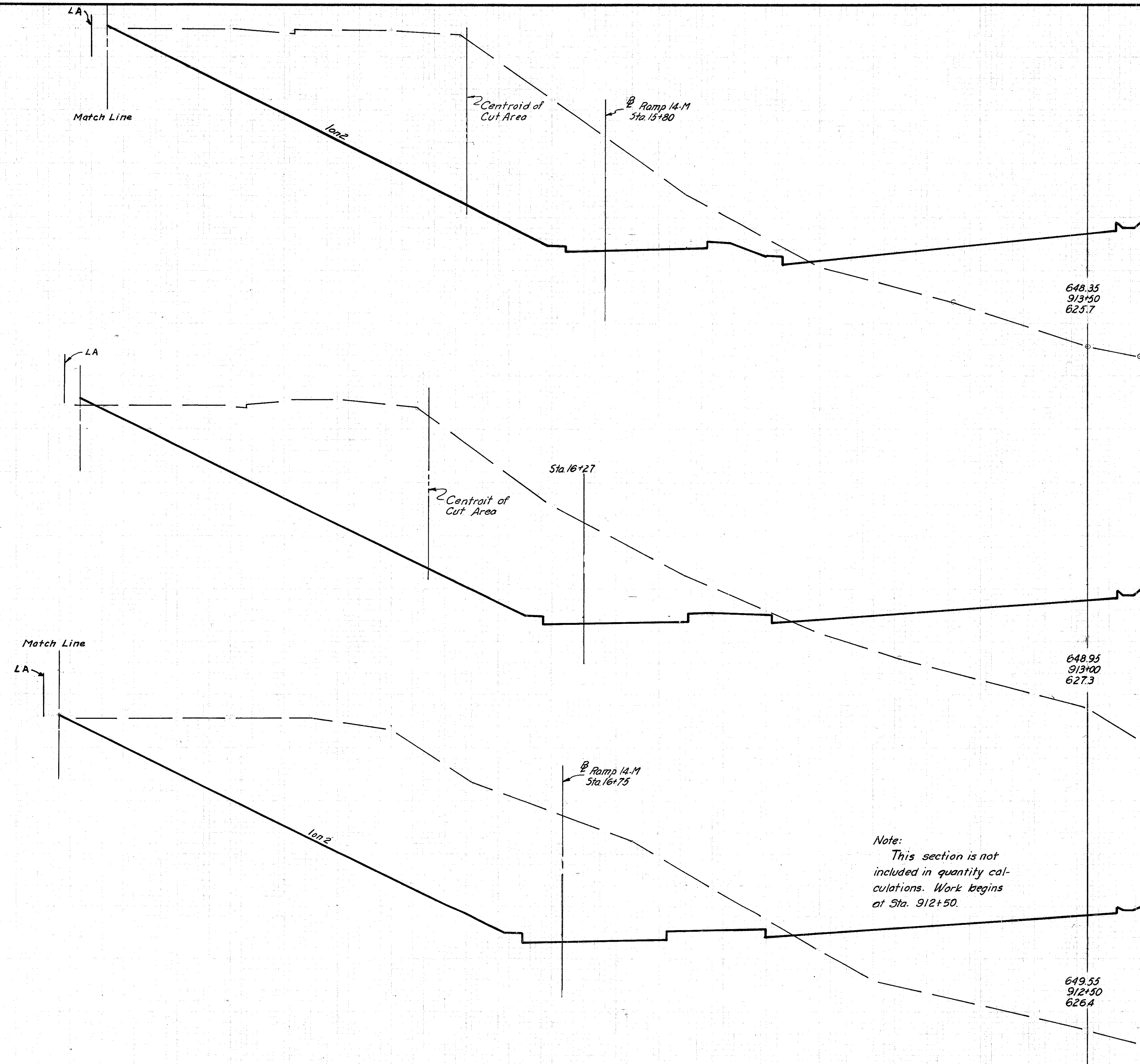
SCALE 1" = 200'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE I.L.C. DATE 6-2-64 CONSULTING ENGINEERS  
 TRCD. R.J.K. DATE 7-19-64 CLEVELAND  
 CRD. D.E.C. DATE 7-1-64 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

99  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

1  
152



640

648.35  
913+50  
623.7

2120 784

Sta. 16+27

Exc  $\frac{(2015 + 2120)47}{2(27)}$

3599 1521

640

648.95  
913+00  
627.3

2015 859

Ramp 14-M  
Sta. 16+75

Exc  $\frac{(0 + 2015)47}{2(27)}$

1754 795

Note:  
This section is not included in quantity calculations. Work begins at Sta. 912+50.

640

649.55  
912+50  
626.4

0 0

DATE: 11-16-64  
 DRAWN BY: RMB  
 CHECKED BY: JLB  
 11/16/64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

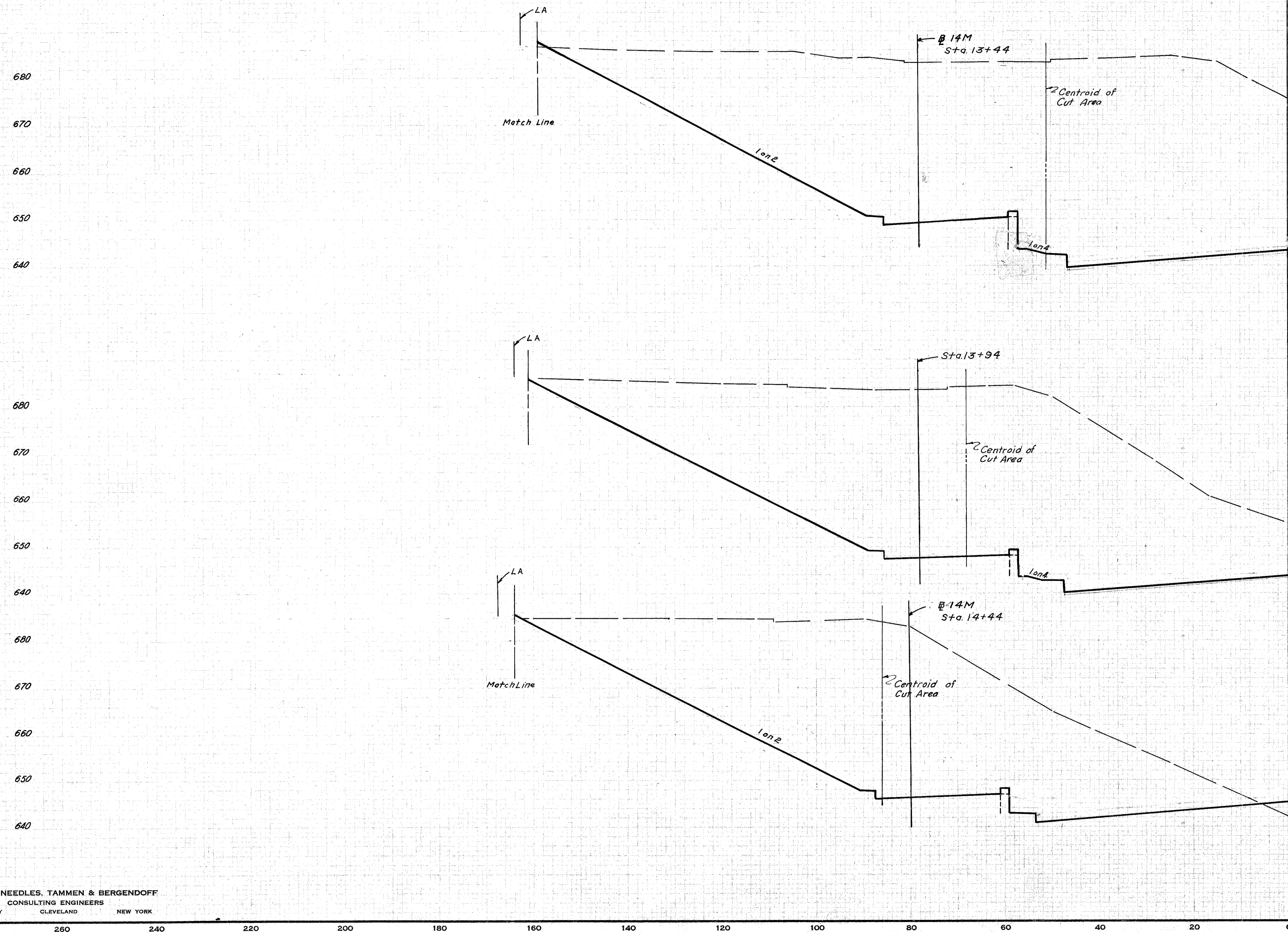
200 180 160 140 120 100 80 60 40 20 0

S. B. MEDINA STA. 912+50 TO STA. 913+50



CUYAHOGA COUNTY  
 CUY. 71-17.83  
 CUY. 176-12.76

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		4877	0
Exc. $\frac{(4001+4877)49}{2(27)}$			7899 0
		4001	0
Exc. $\frac{(3108+4001)47}{2(27)}$			6187 57
		3108	62
Exc. $\frac{(2298+3108)47}{2(27)}$			4705 562



2102-2-54 RBH 2-7-64  
 RBH 2-26-64 HLD 3-12-64  
 RLD 5-22-68

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

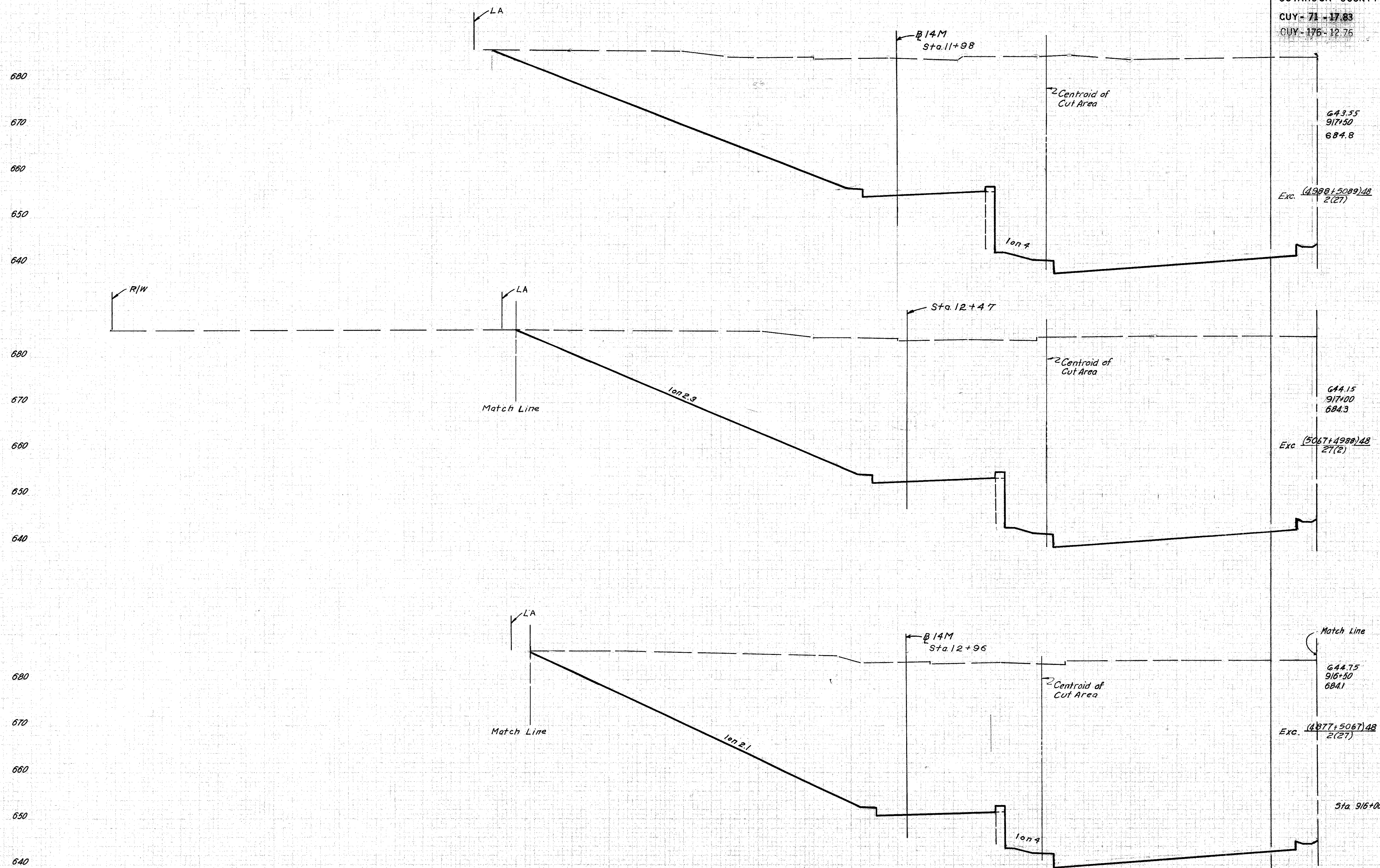
102  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

4  
152

EARTHWORK

END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



D102-10-RB1 2-7-64  
 RBW-264-1100 8-1-54  
 RJD 4-27-68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

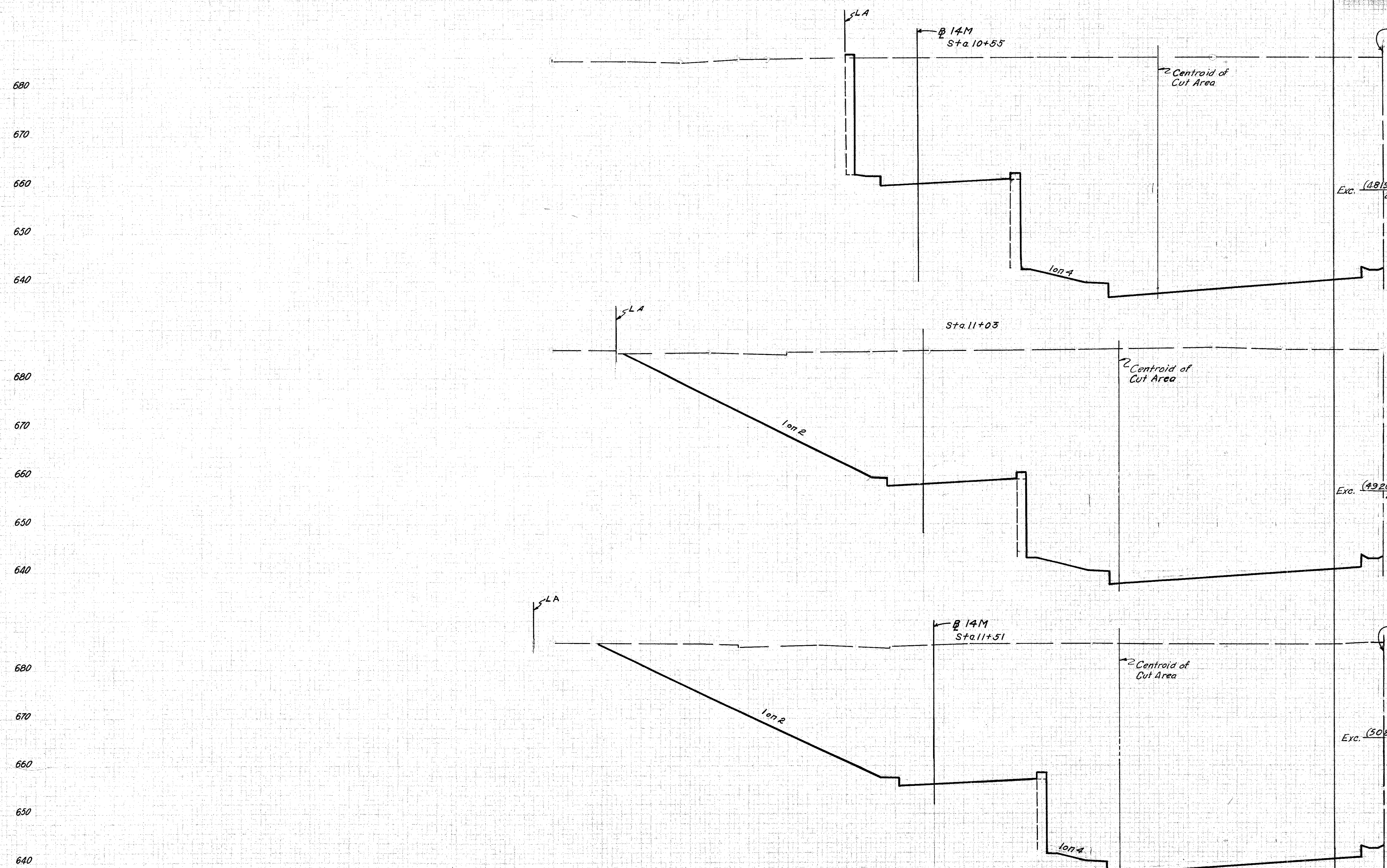
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

103  
646

CUYAHOGA COUNTY  
 CUY. 71 - 17.83  
 CUY. 176 - 12.76

5  
152

EARTHWORK				
END	AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
642.07 918+00 686.0	4365	0		
Exc. $(4819+4365)49$ 2(27)			8333	0
642.43 918+50 685.8	4819	0		
Exc. $(4920+4819)49$ 2(27)			8835	0
642.95 918+00 685.2	4920	0		
Exc. $(5089+4920)49$ 2(27)			9080	0
Sta. 917+50	5089	0		



D102-4-18 RBH 2-7-69  
 RBH 1-1-69 DLO 2-7-69  
 RBH 1-1-69 DJS 1-1-69  
 RBH 1-1-69 HED 2-21-69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

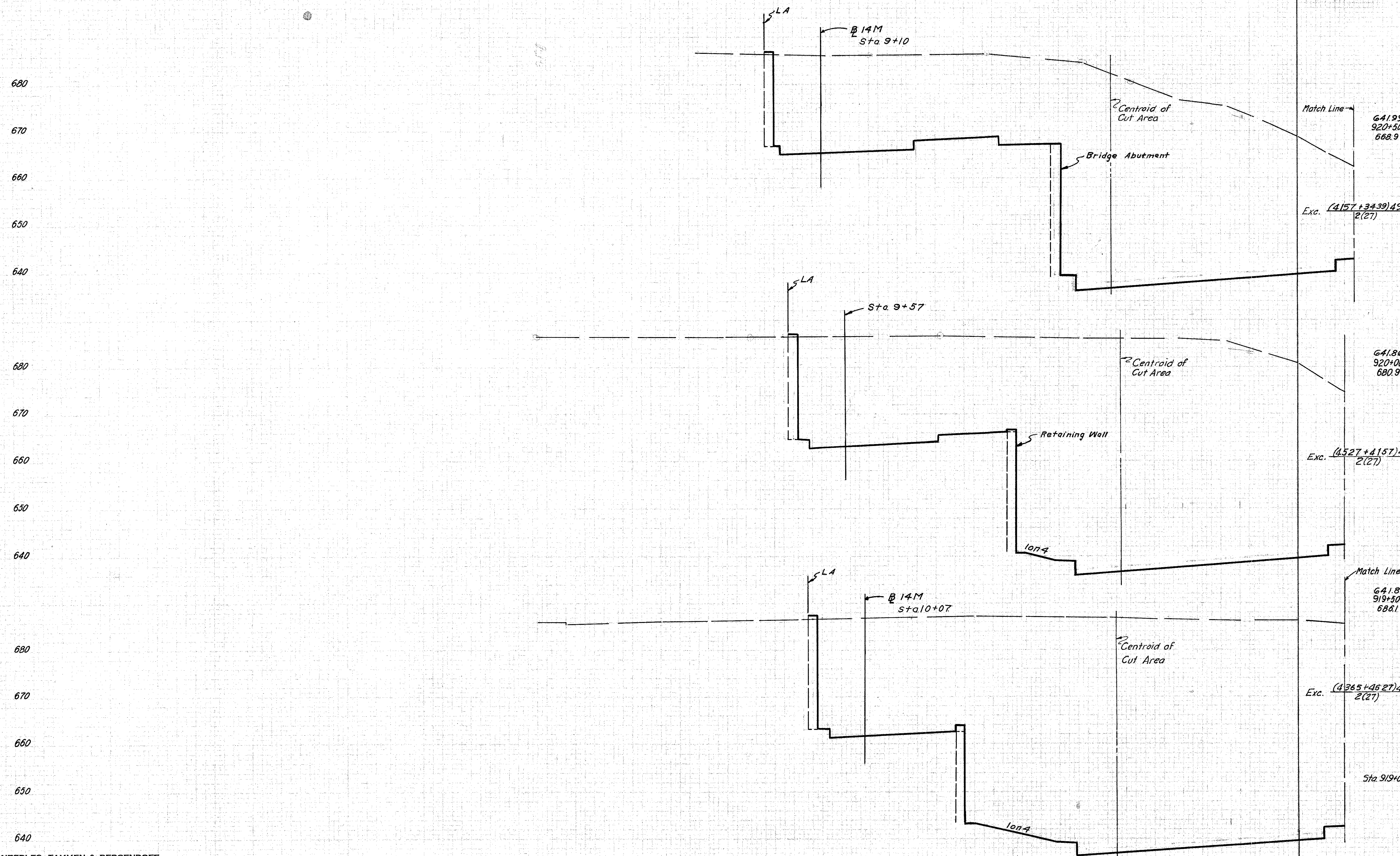
104  
46

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

6  
152

EARTHWORK

END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



Match Line	641.99 920+50 668.9	3439	0
Exc.	$\frac{(4157 + 3439)49}{2(27)}$		
			6893 0
Match Line	641.86 920+00 680.9	4157	0
Exc.	$\frac{(4527 + 4157)49}{2(27)}$		
			7880 0
Match Line	641.89 919+50 686.1	4527	0
Exc.	$\frac{(4365 + 4527)49}{2(27)}$		
			8068 0
Sta 919+00	4365	0	

D102-9-49 RBH 2-7-69  
 RBH 2-24 D10 5-7-69  
 D13 4-27-69  
 RD 4-27-69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

260 240 220 200 180 160 140 120 100 80 60 40 20 0

S. B. MEDINA STA. 919+50 TO STA. 920+50











FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

109  
646

CUYAHOGA COUNTY

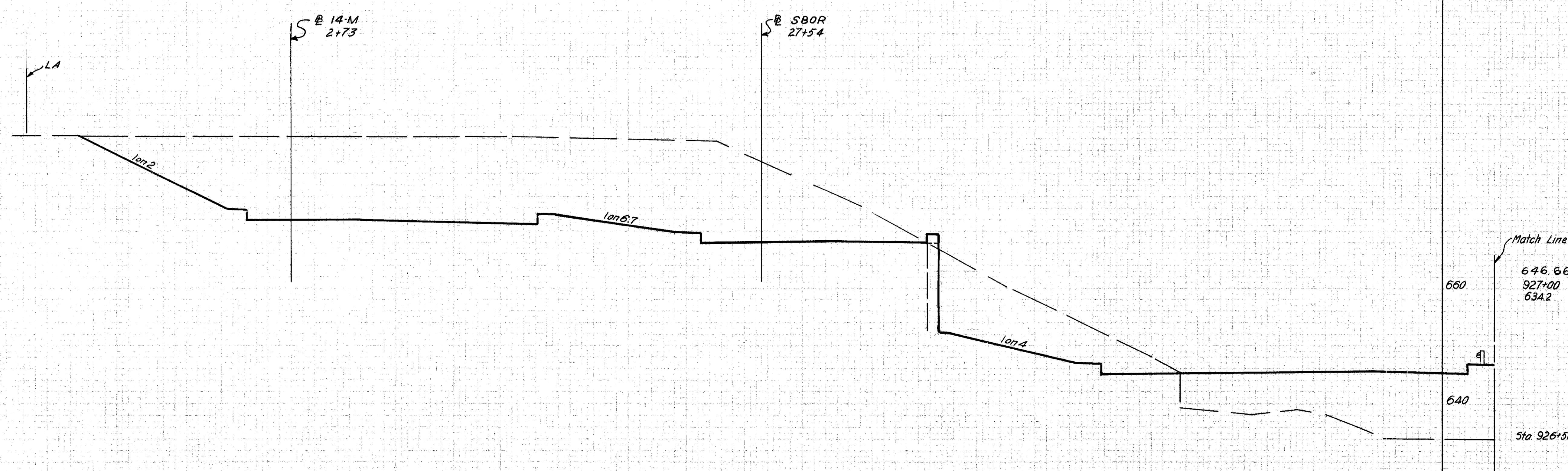
CUY-71-17.83

CUY-176-12.76

11  
152

EARTHWORK

END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



Match Line  
646.66  
927+00  
634.2

660 2069 492

4009 895

640  
Sta. 926+50  
2260 410

015 3549 HLD 94-53  
D10 47-44  
RDW 5-7-64  
H20 5-7-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

260 240 220 200 180 160 140 120 100 80 60 40 20 0

S.B. MEDINA STA. 927 + 00

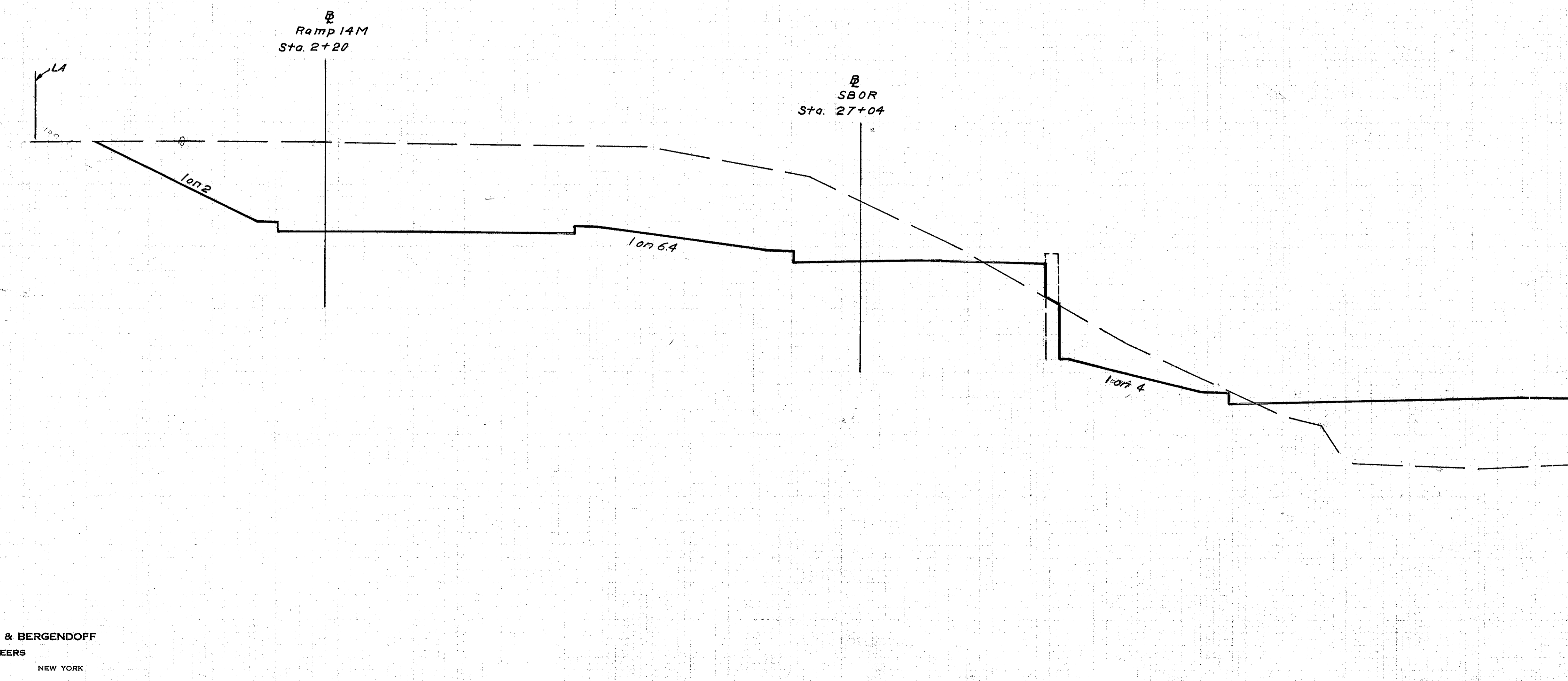
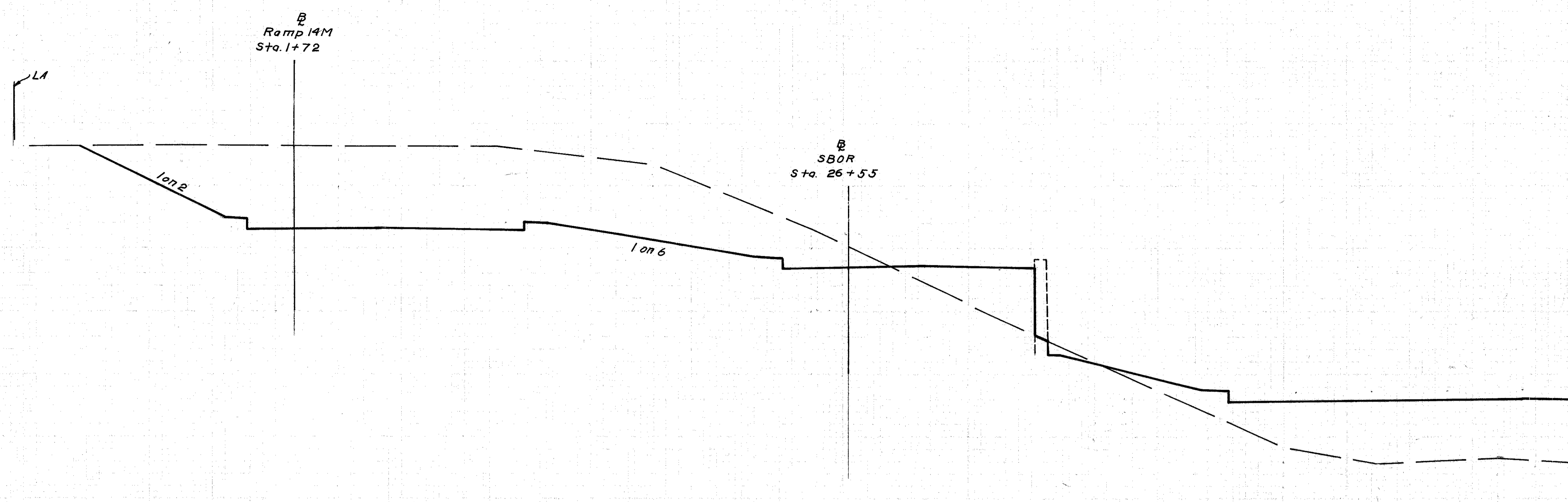
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

110  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

12  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		1270	780
			2750 1293
		1700	616
			3490 1026
		2069	492



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HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

260 240 220 200 180 160 140 120 100 80 60 40 20 0

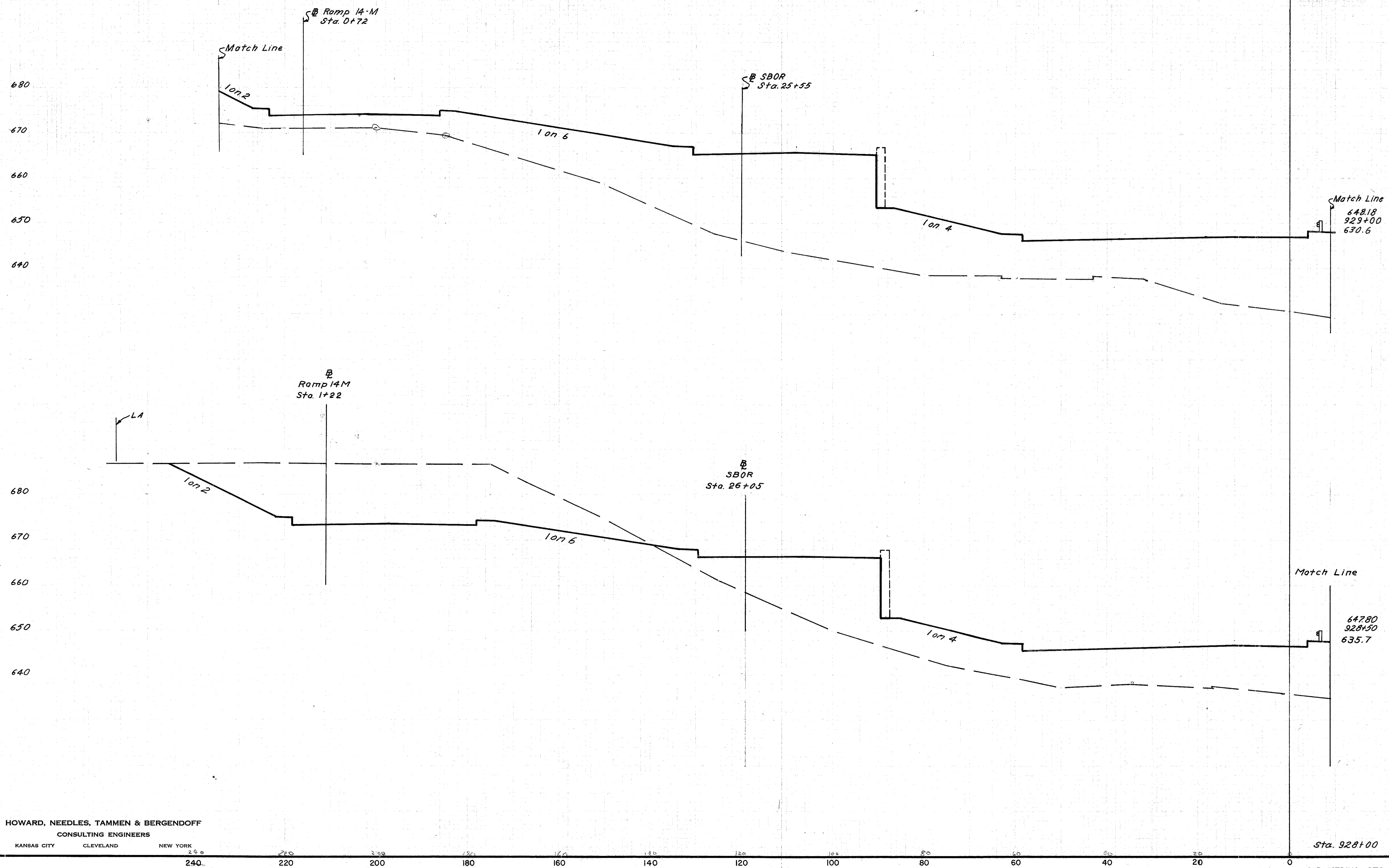
S. B. MEDINA STA. 927 + 50 TO STA. 928 + 00

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

111  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

13  
152



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
		0	2804
		917	3911
		2093	2037
		1270	780

DIS 6-10-64 HJD 6-18-64  
 RBH 6-11-64 DLO 6-15-64  
 TUS 6-18-64  
 RLD 6-22-64

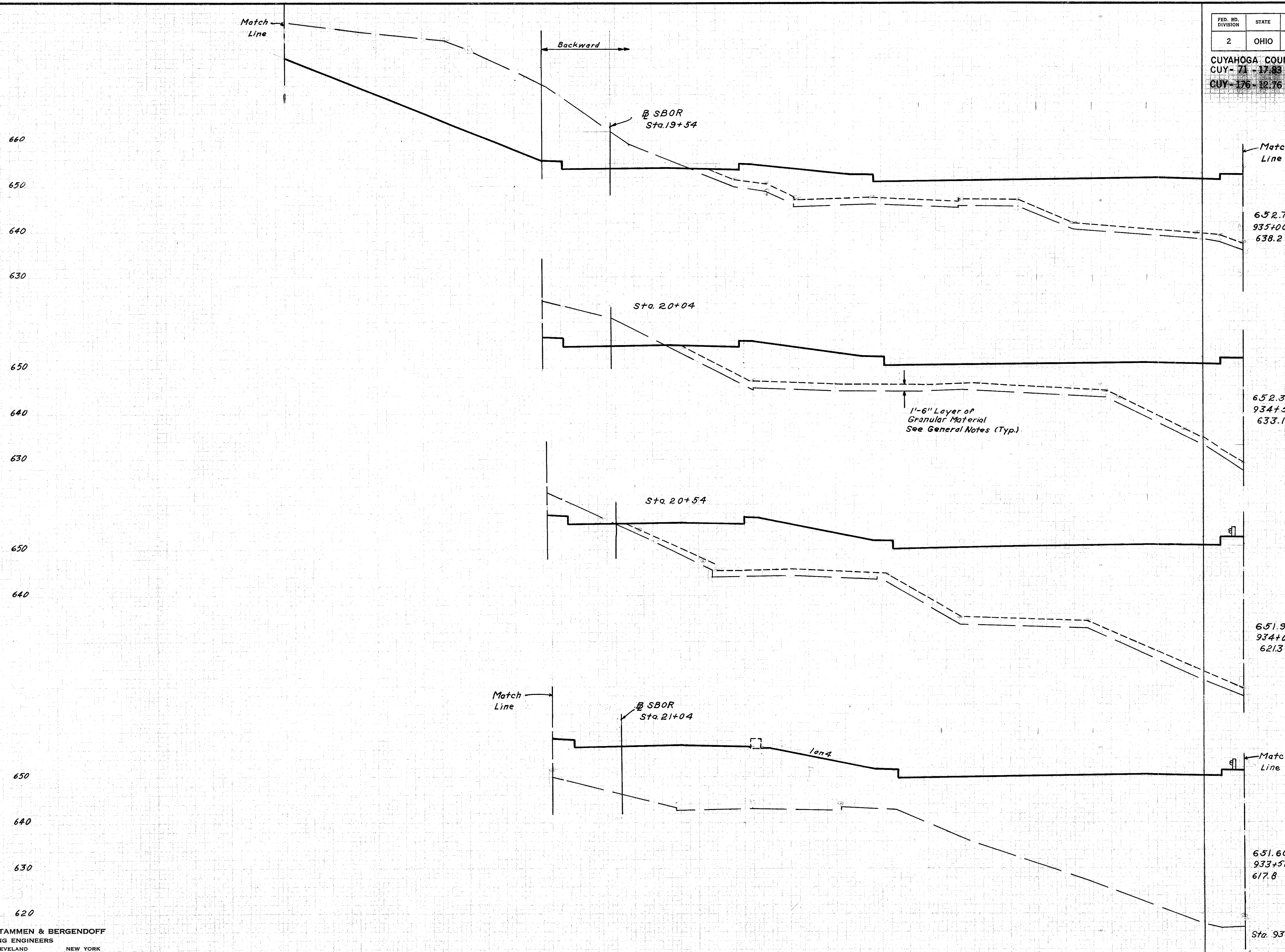
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

S.B. MEDINA STA 928+50 TO STA. 929+00









EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
652.74			
935+00 Frwd.	1060	930	
638.2 Bk	248	930	
		373	1875
652.36			
934+50	155	1095	
633.1			
		185	2954
651.98			
934+00	45	2095	
621.3			
		42	4283
651.60			
933+50	0	2530	
617.8			
		0	4968
Sta. 933+00	0	2835	

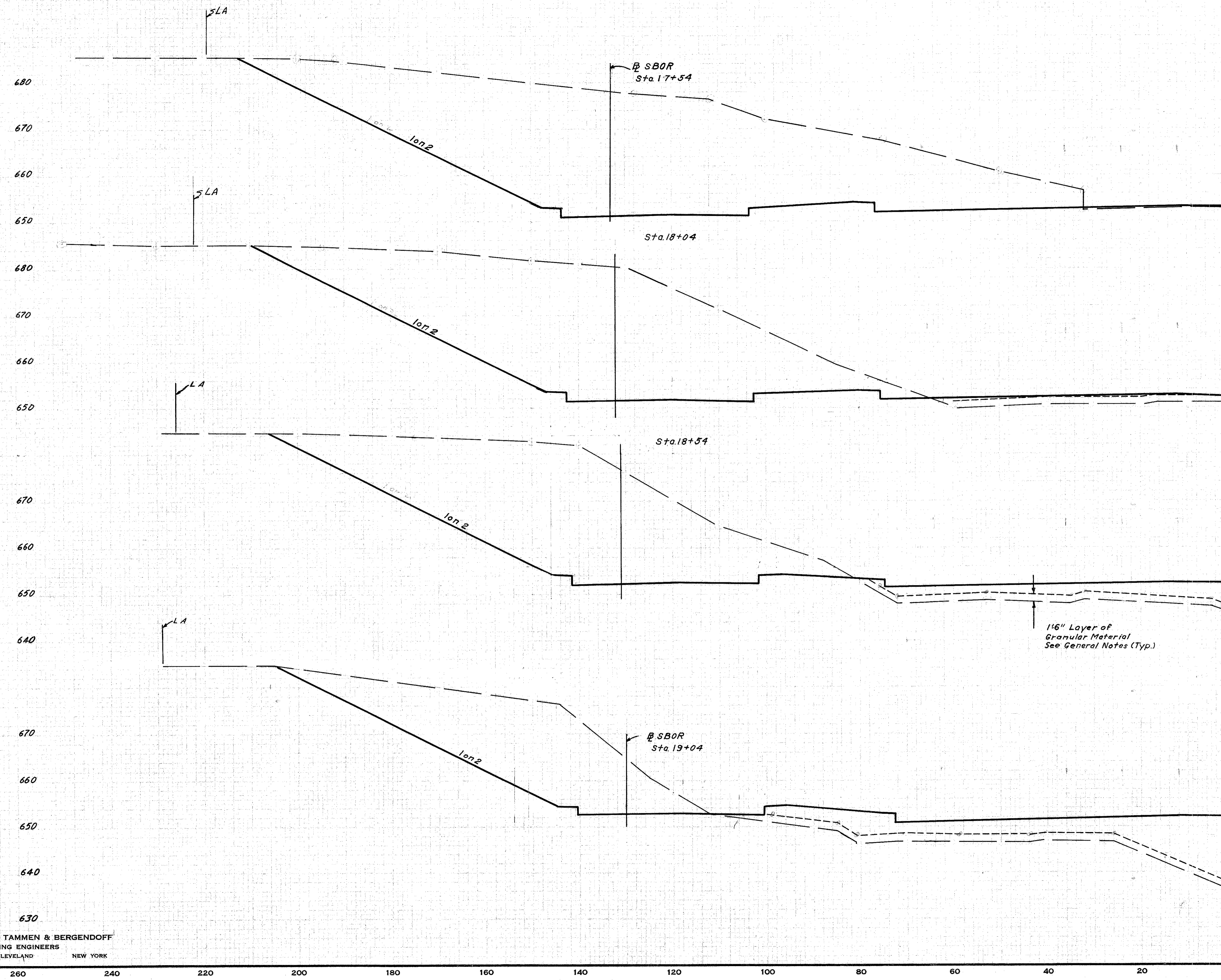
RBH 5-27-55 W.D. 2-18-64  
 K.B. 5-7-54 D.L. 4-8-55  
 D.J.S. 4-17-55  
 H.E. 4-20-64

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

115  
646

CUYAHOGA COUNTY  
 CUY-71-17-63  
 CUY-176-12-76

17  
152



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
654.26	937+00	2945	7
652.9			
		4820	136
653.88	936+50	2260	140
651.1			
		3801	495
653.50	936+00	1845	395
645.7			
		2653	1130
653.12	935+50	1020	825
635.6			
		1926	1625
Sta. 935+00		1060	930

11/12-13-64 VLD 2-18-64  
 11/12-14-64 D.L. 2-18-64  
 V 11/27-13-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

S.B. MEDINA STA. 935+50 TO STA. 937+00

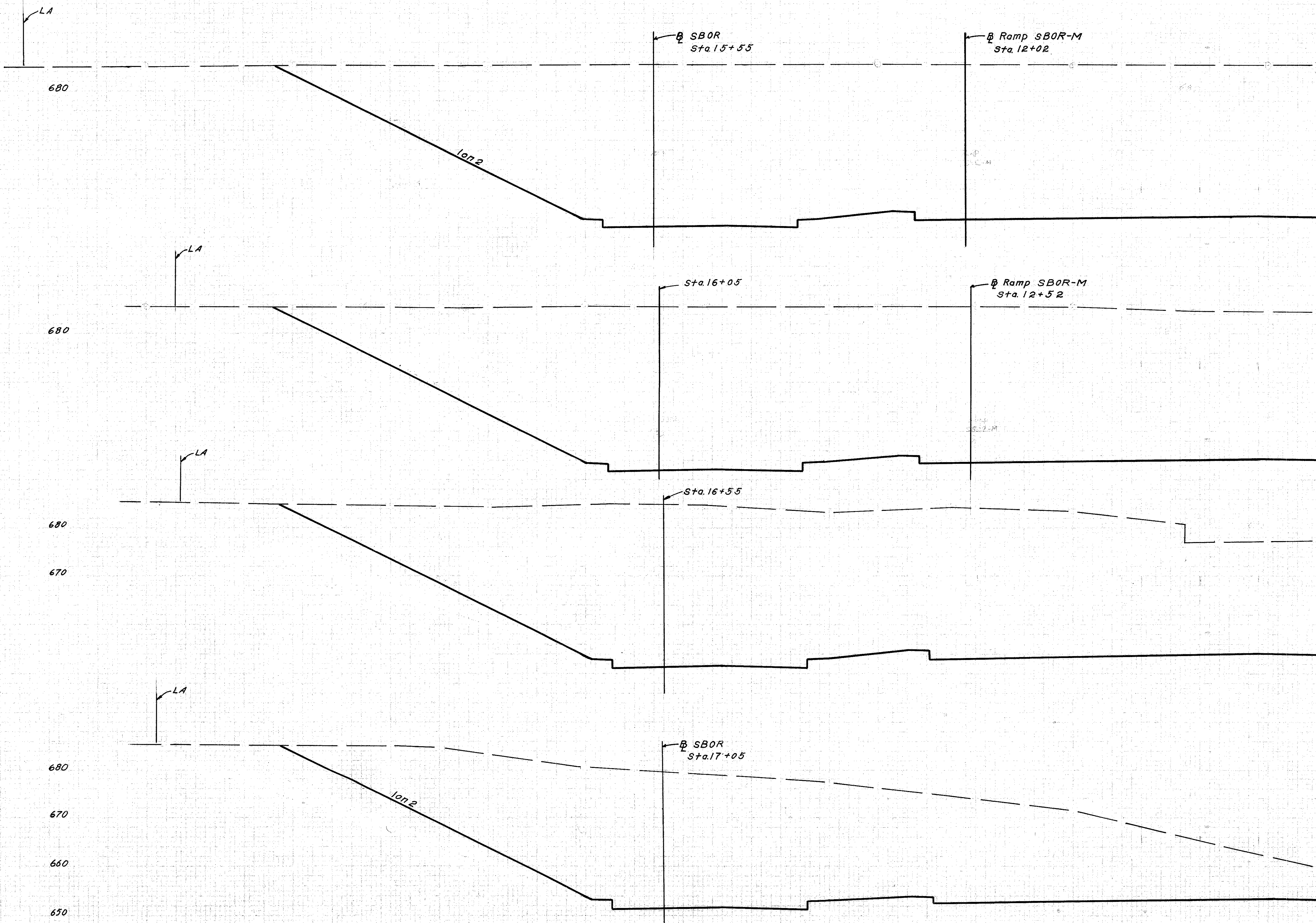
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

116  
646

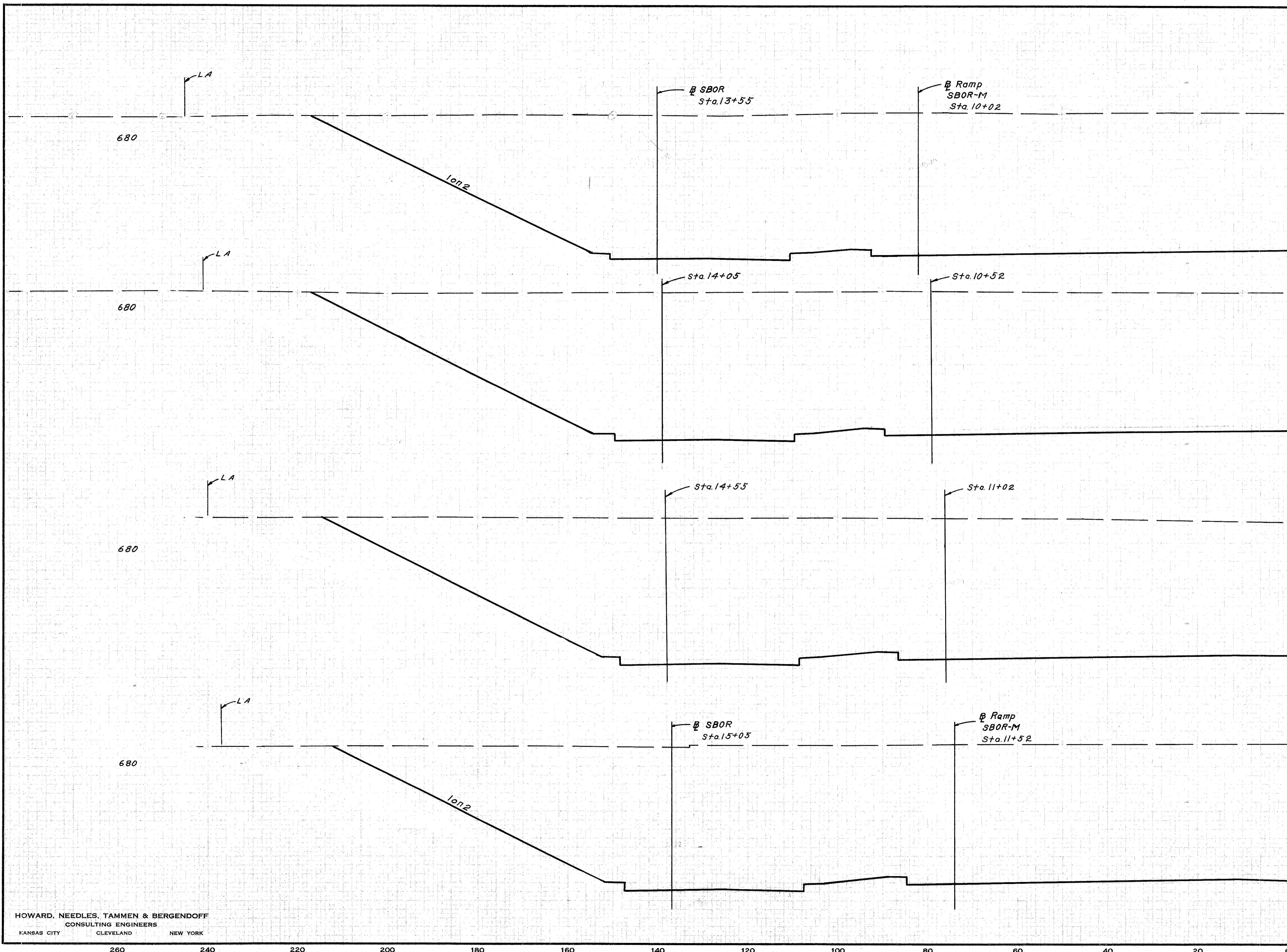
CUYAHOGA COUNTY  
CUY-71-17-83  
CUY-176-12.76  
Match Line

18  
152

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
655.56	939+00	6040	0
685.5			11230 0
655.28	938+50	6087	0
684.5			10837 0
655.08	938+00	5616	0
677.2			8877 0
654.63	937+50	3970	0
659.8			6403 6
Sta. 937+00	2945	7	



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EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
656.64	941+00	6117	0
686.2			11343 0
656.37	940+50	6133	0
685.9			11217 0
656.10	940+00	5980	0
684.6			11001 0
655.83	939+50	5900	0
685.1			11056 0
Sta. 939+00	6040	0	

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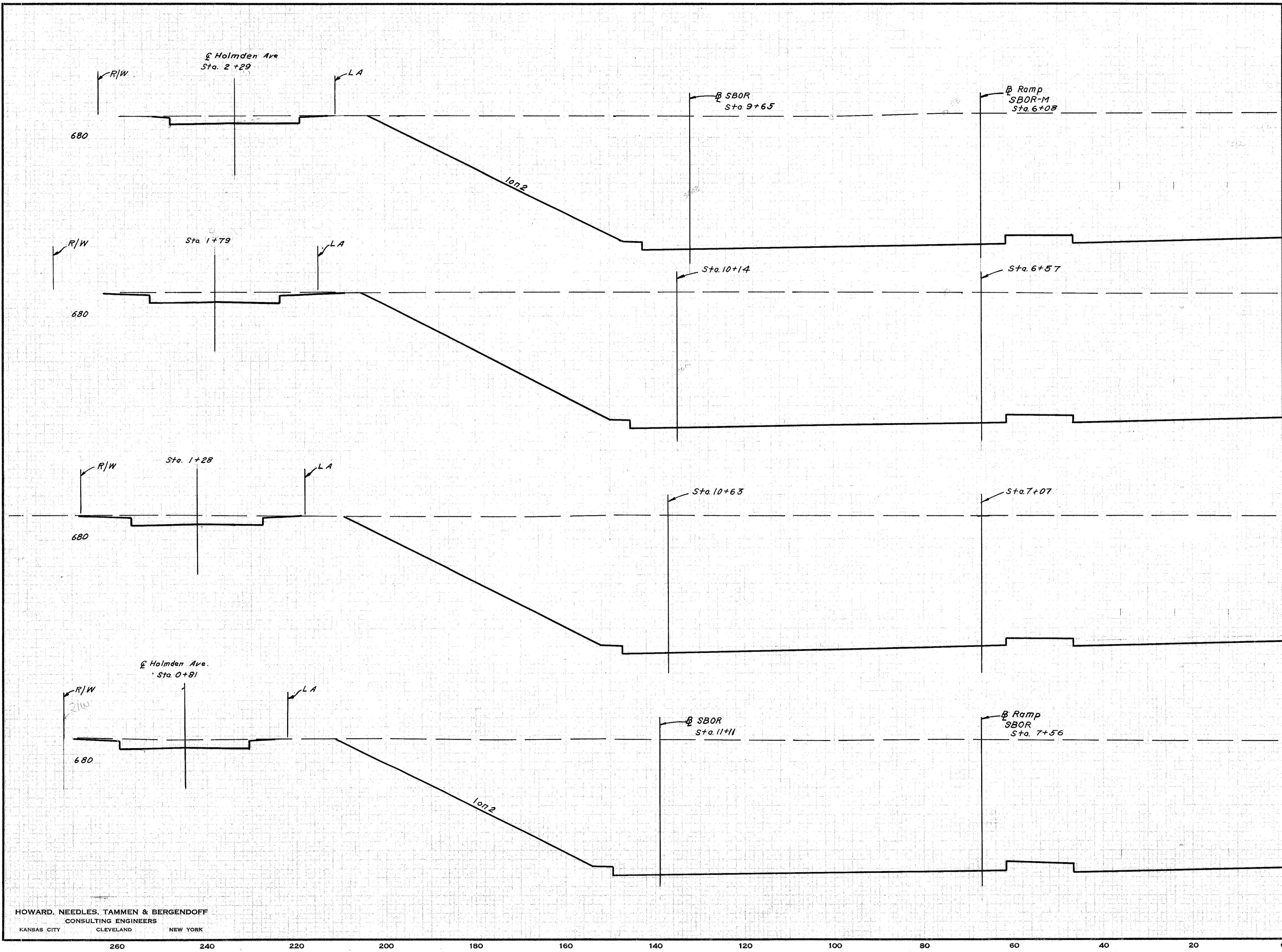


CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

Match Line

**EARTHWORK**

END STA.	AREA	VOLUME	
		EXC.	EMB.
658.80 945+00 685.3	5310	0	
			9928 0
658.53 944+50 685.0	5411	0	
			10167 0
658.26 944+00 685.1	5569	0	
			10385 0
657.99 943+50 684.6	5646	0	
			10403 23
Sta. 943+00	5588	25	



RBH-2-75-83 V.H.D. 9-11-54  
 D.L.O. 4-15-54  
 D.J.S. 5-1-54  
 H.D.S. 5-1-54

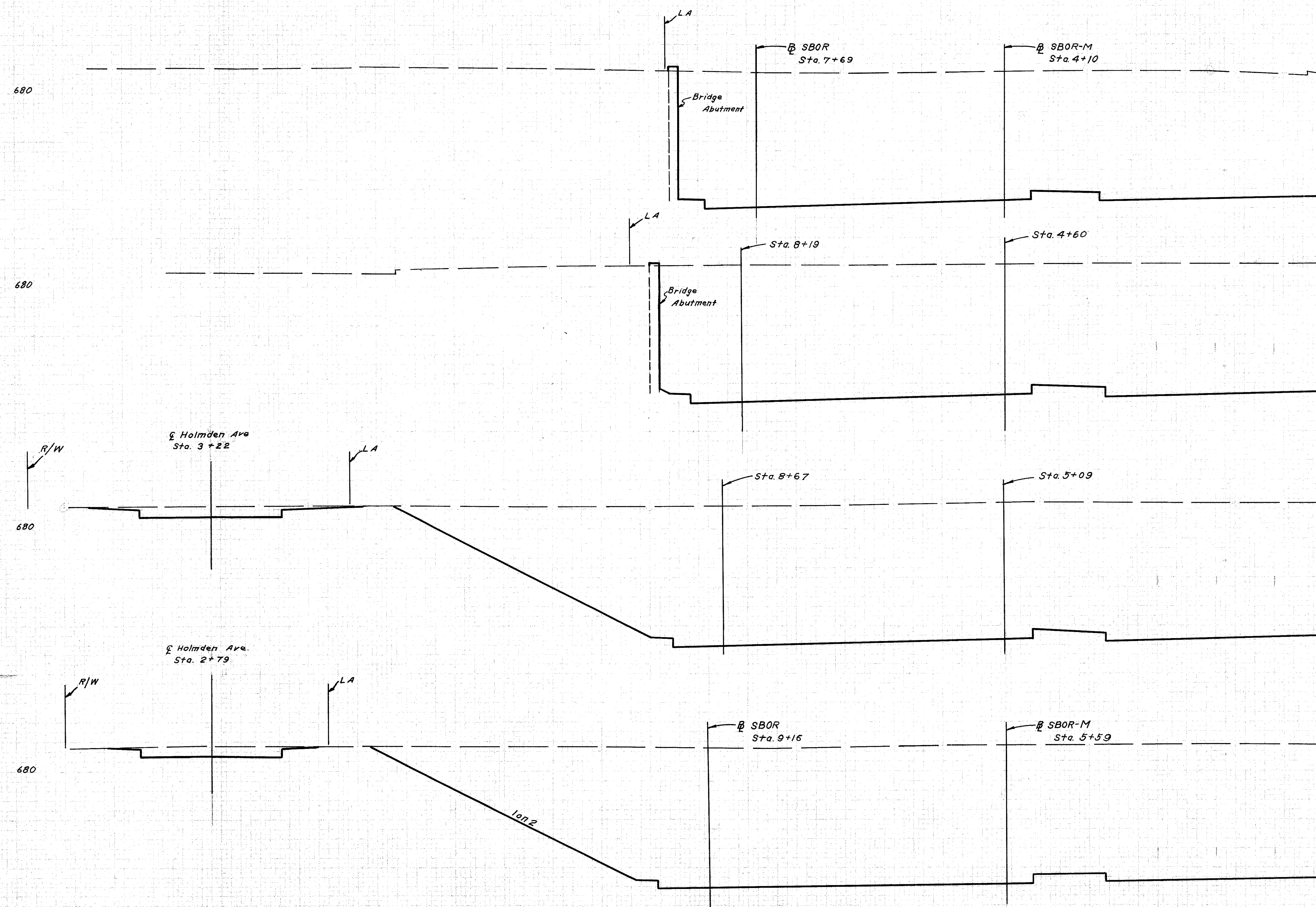
FED. RD. DIVISION	STATE	PROJECT
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120  
646

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152

CUYAHOG COUNTY  
CUY-71-17-83  
CUY-176-12-76  
Match Line

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
659.88	947+00	3803	0
683.7			7235 0
659.61	946+50	4010	0
684.9			8266 0
659.34	946+00	4917	0
685.1			9273 0
659.07	945+50	5097	0
685.3			9637 0
Sta. 945+00	5310	0	



RBH 15-14 W.D. 15-14  
 D.L. 0-4-14-14  
 RBH 14-14 D.L. 0-4-14-14  
 RBH 14-14 D.L. 0-4-14-14  
 RBH 14-14 D.L. 0-4-14-14

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

260 240 220 200 180 160 140 120 100 80 60 40 20 0

S.B. MEDINA STA. 945+50 TO STA. 947+00





CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

Match Line

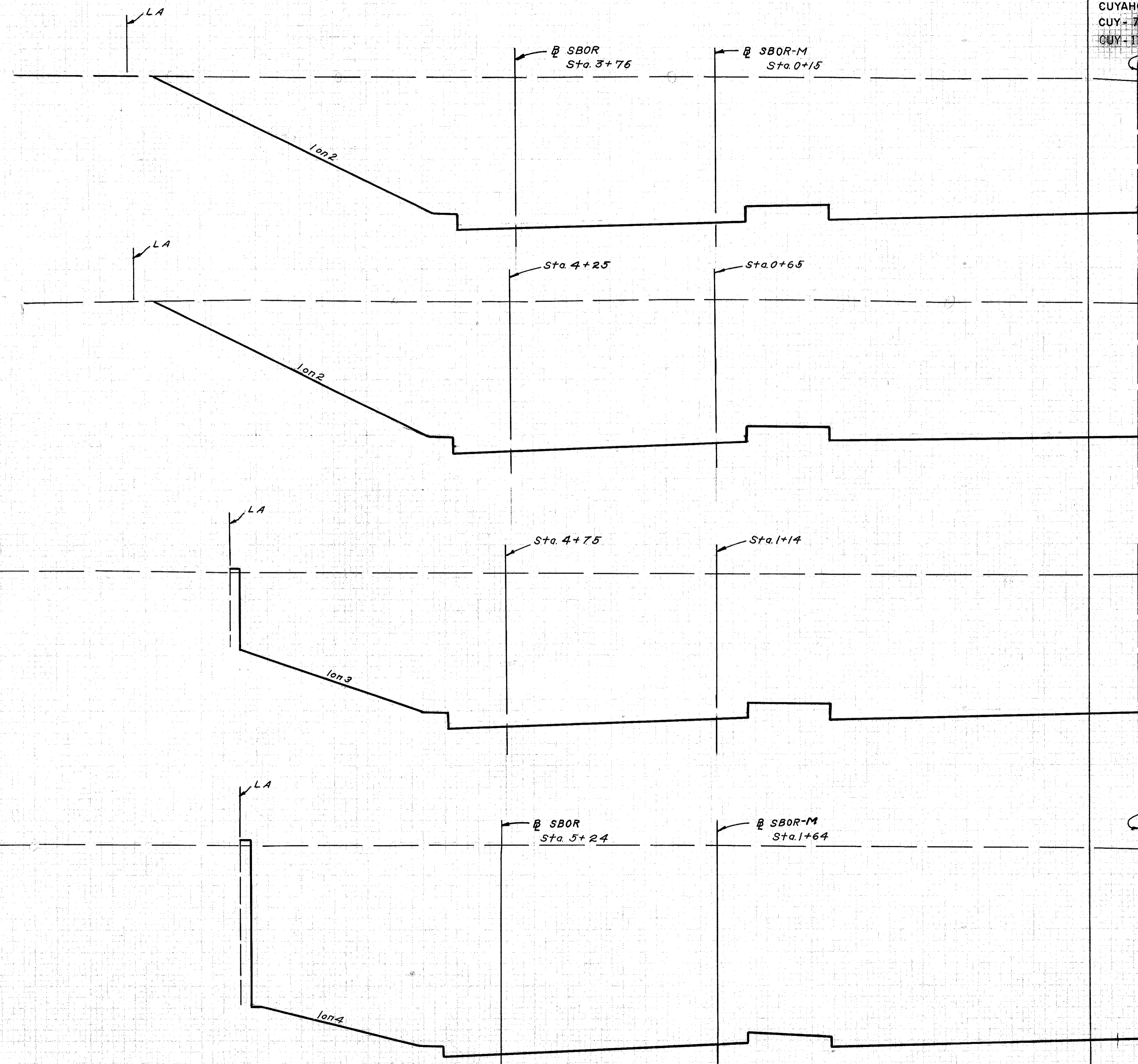
EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
662.04			
951+00	3828	0	
684.2			
			7074 0
661.77			
950+50	3813	0	
683.7			
			7104 0
661.50			
950+00	3859	0	
684.3			
			8831 0
661.23			
949+50	5678	0	
684.9			
			9029 0
Sta. 949+00	4073	0	

680

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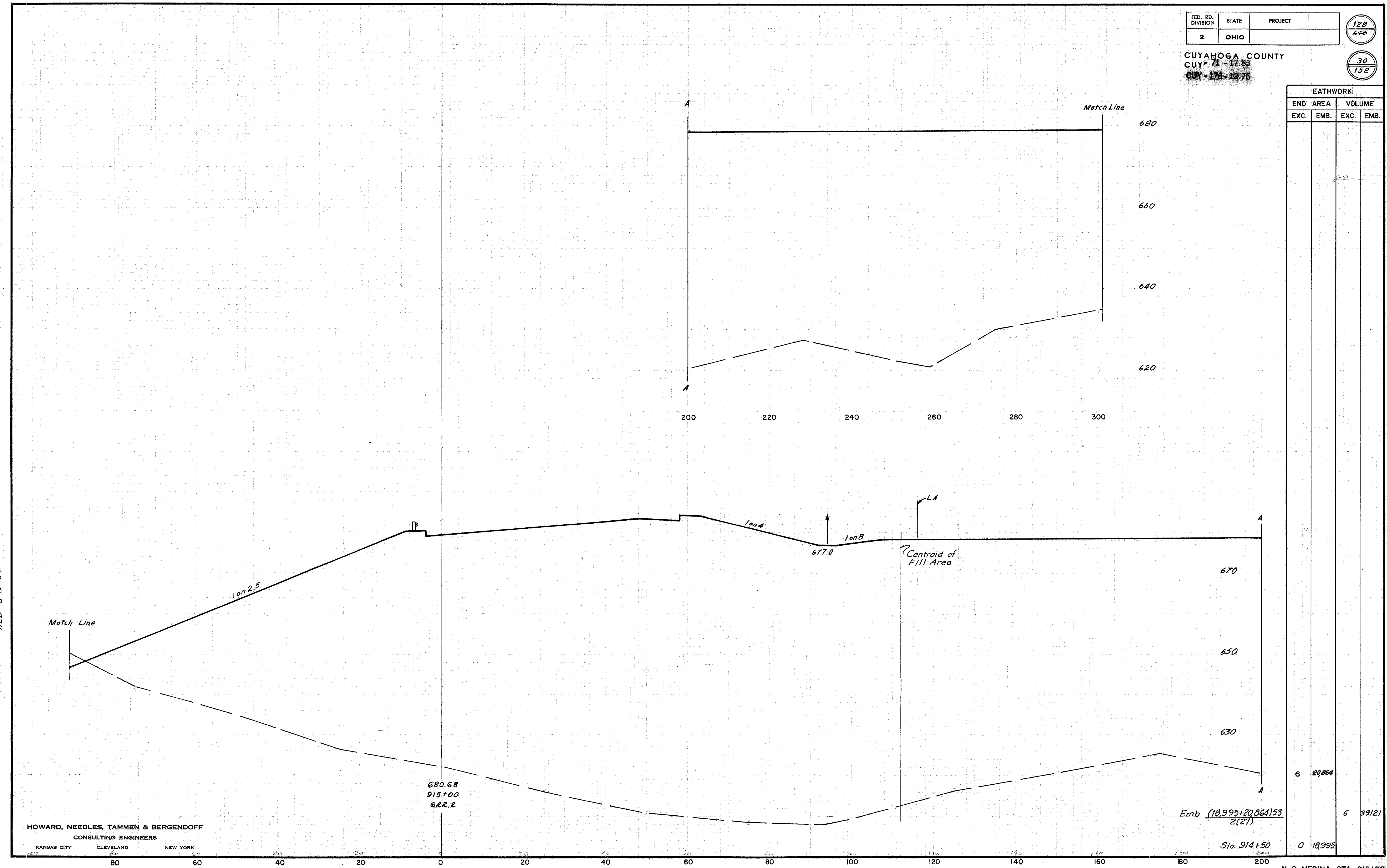
FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

EATHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
6	20864		
		6	39121
0	18995		



REV 7-27-59 D10 7-28-59  
 REV 7-27-59 D10 7-28-59  
 REV 7-27-59 D10 7-28-59  
 REV 7-27-59 D10 7-28-59  
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HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS

KANSAS CITY CLEVELAND NEW YORK

N. B. MEDINA STA. 915+00



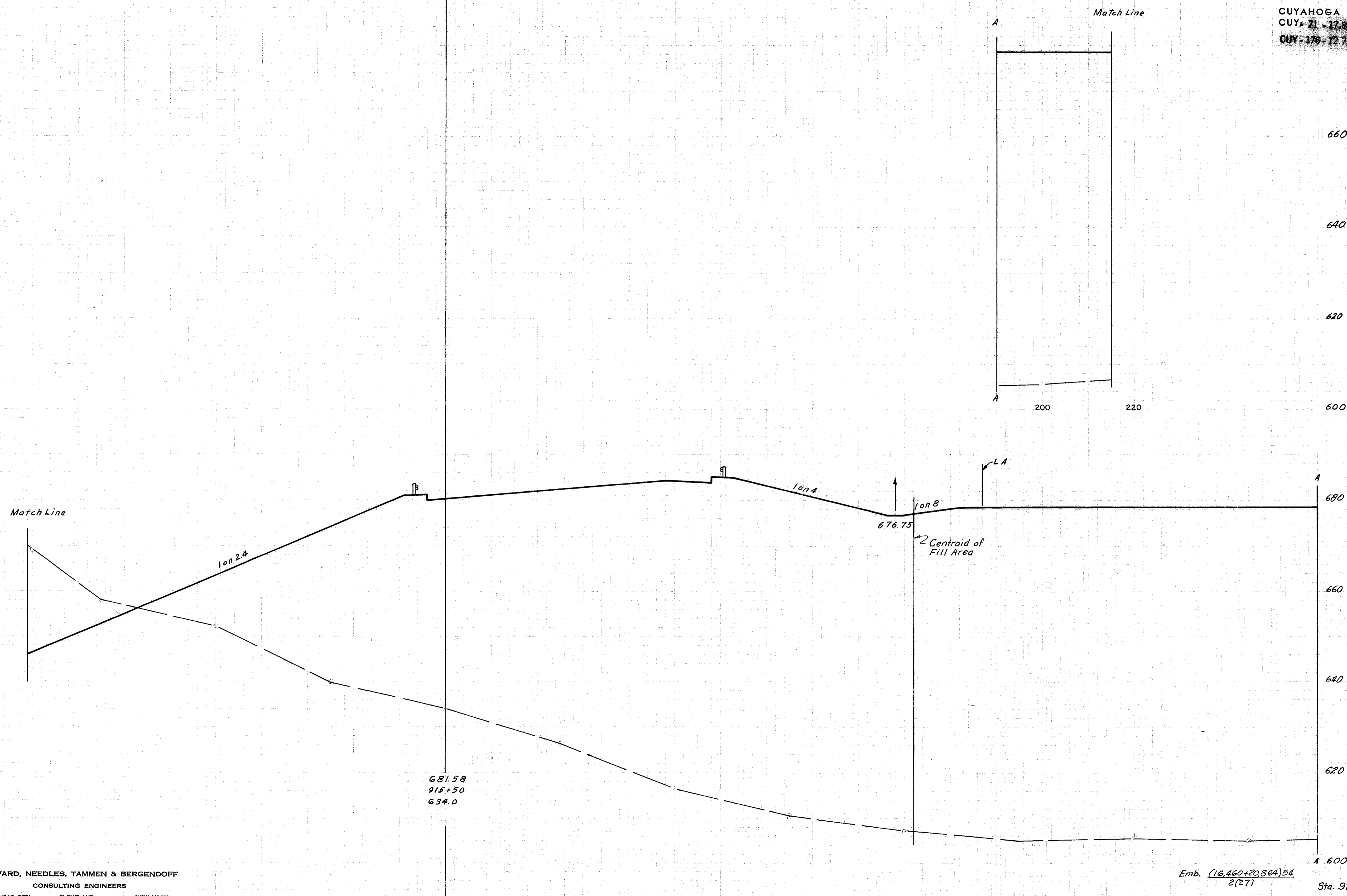
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129  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

31  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



RBM-23-69 210 7-29-69  
 DLO 7-23-69 RBM 7-26-69  
 DJS - 8-12-69  
 HLB 8-13-69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

Emb.  $\frac{(16,460 + 20,864) \cdot 54}{2(27)}$

254	16,460	241	37,324
6	20,864		

N.B. MEDINA. STA. 915+50

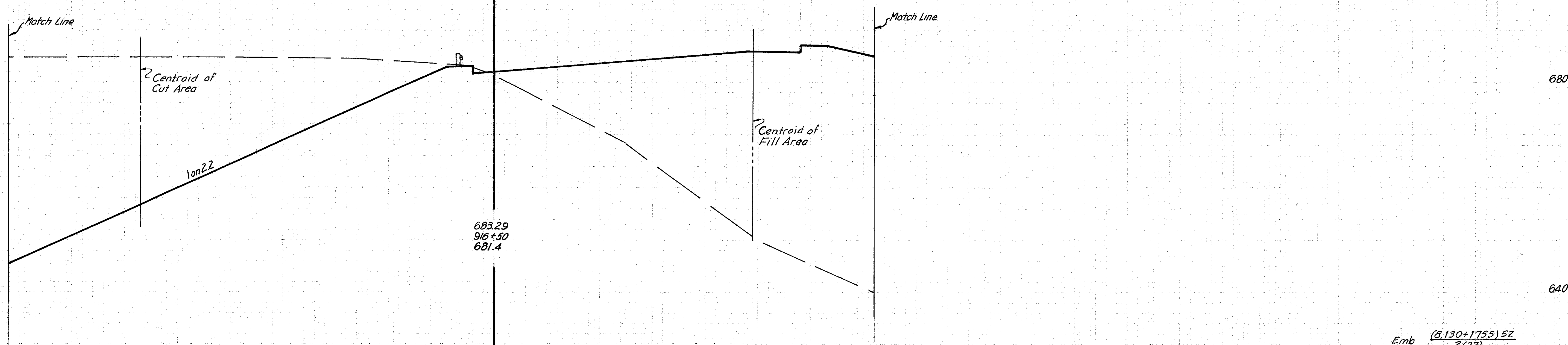
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

130  
696

CUYAHOGA COUNTY  
CUY. 71 - 17.83  
CUY. 176 - 12.76

92  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



683.29  
916+50  
681.4

680

1696 1755

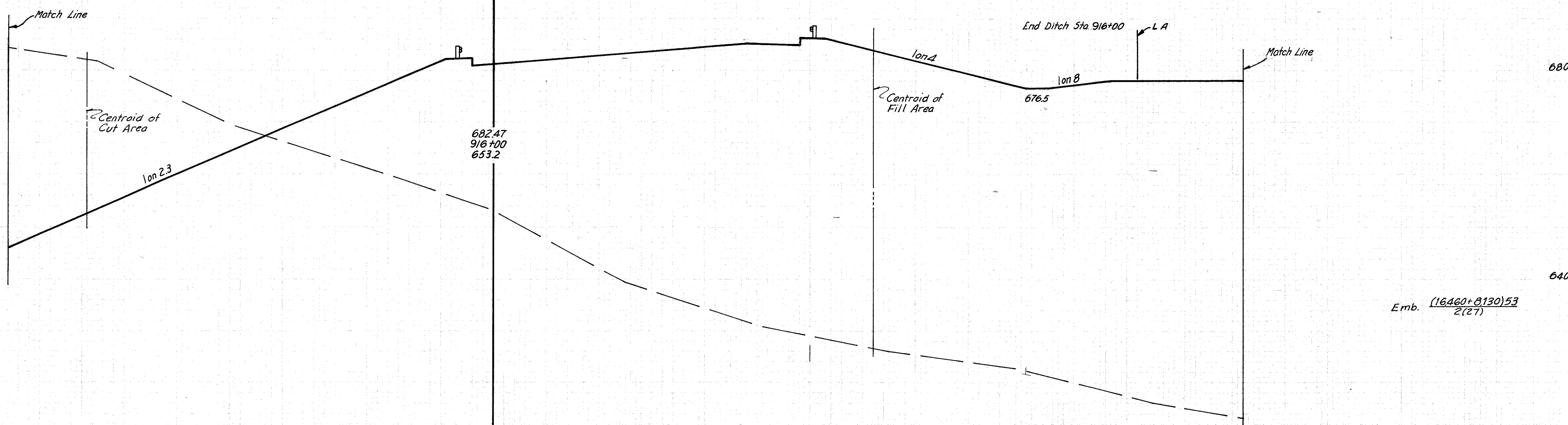
640

Emb  $\frac{(8130+1755)52}{2(27)}$

Exc.  $\frac{(998+1696)47}{2(27)}$

2345 9519

2107-24-64 RBH-28-64  
 2107-24-64 RBH-28-64  
 H.C.D.  
 S.O.S.  
 8-7-64  
 8-13-64



682.47  
916+00  
683.2

680

998 8130

640

Emb.  $\frac{(16460+8130)53}{2(27)}$

1159 24135

Sta. 915+50 254 16460

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

100 80 60 40 20 0 20 40 60 80 100 120 140 160

N.B. MEDINA STA. 916+00 TO STA. 916+50

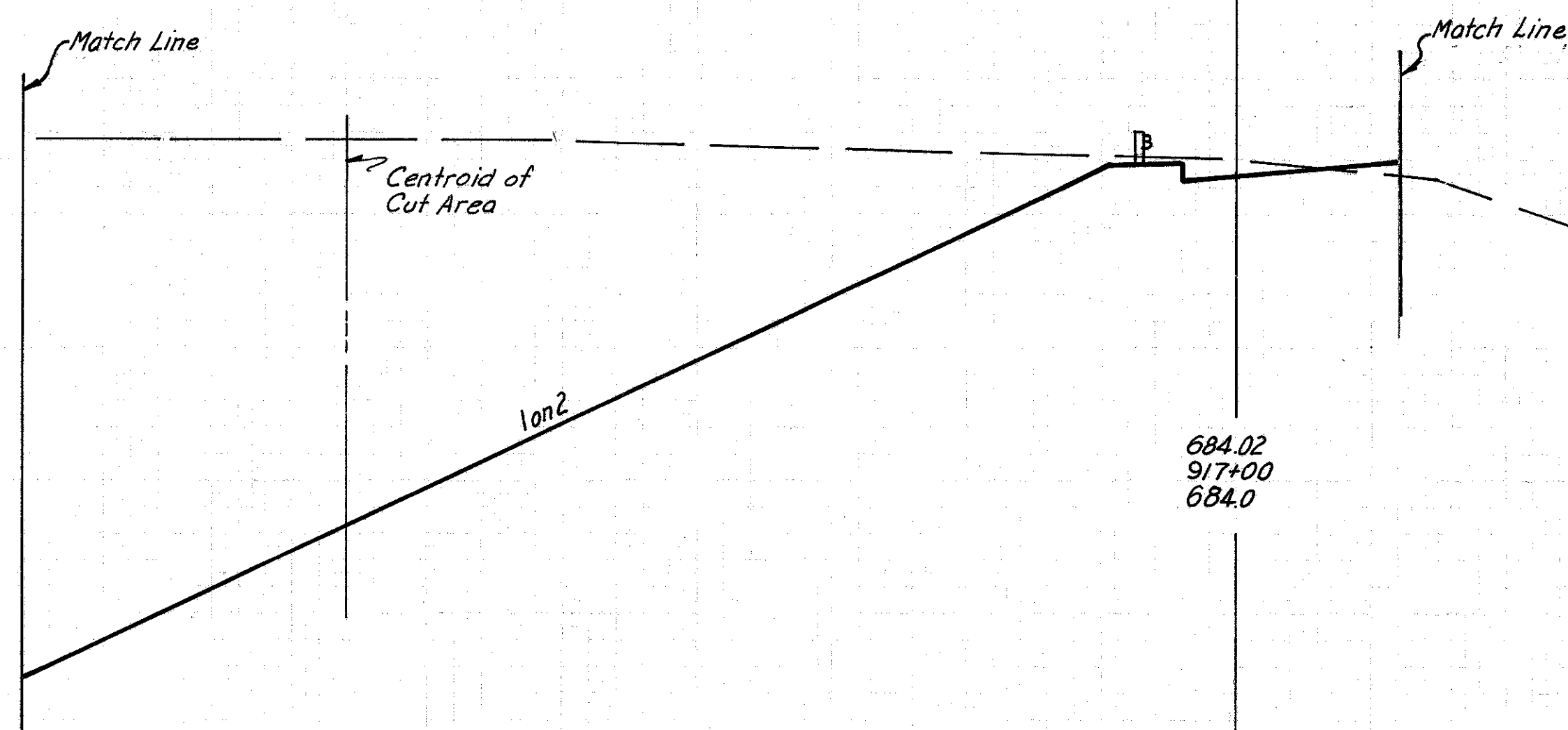
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

131  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

33  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		1664	2
Exc. $\frac{(1696+1664)47}{2(27)}$		2924	1627
		Sta. 916+50	1696 1755



680  
660

684.02  
917+00  
684.0

D10 7-27-64  
 D10 7-27-64  
 D10 7-27-64  
 D10 7-27-64  
 D10 7-27-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

100 80 60 40 20 0 20

N.B. MEDINA STA. 917+00

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

132  
646

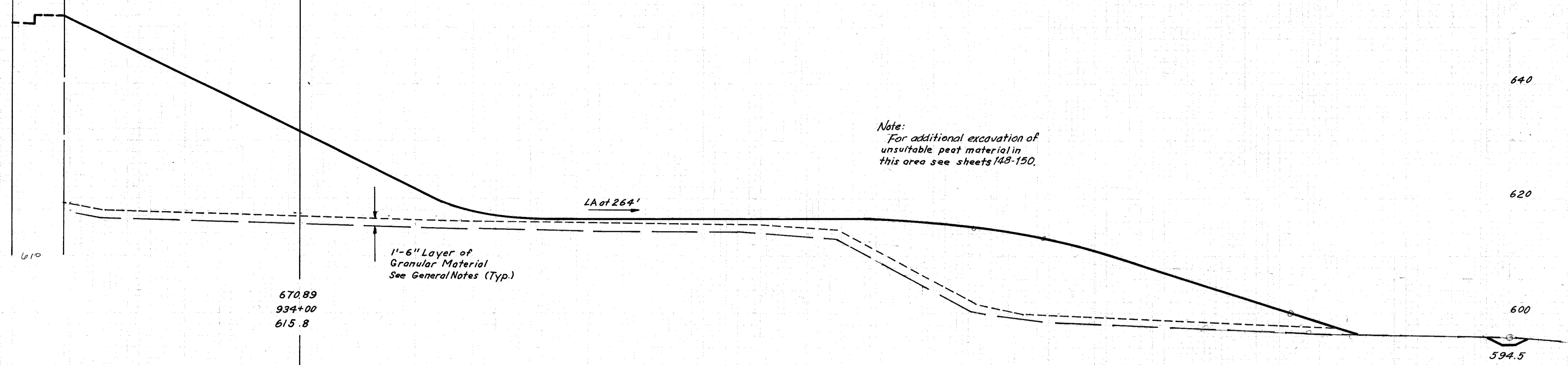
CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.78

34  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		6	2302
		27	3312
23	1275		

S.B. Medina  
 Sta. 934+06

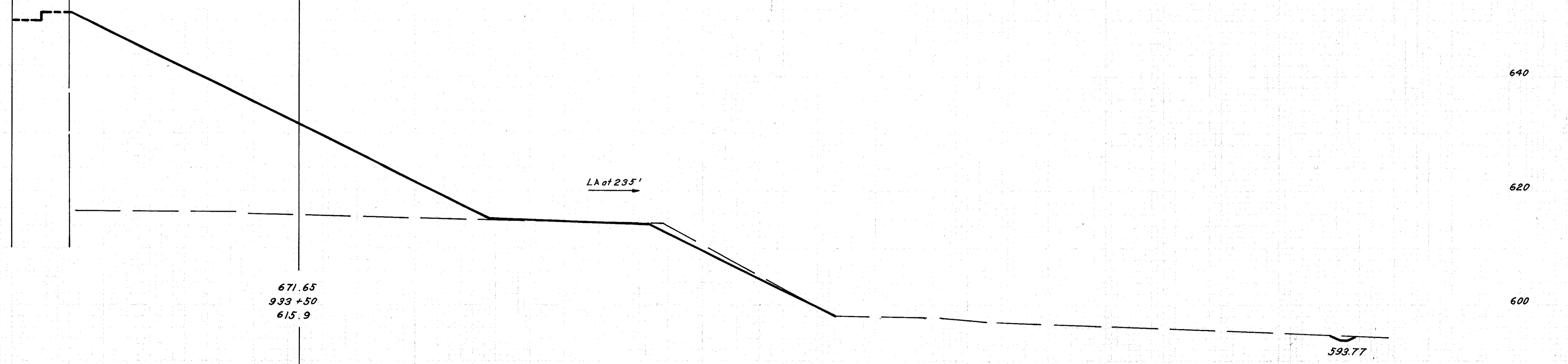
Match Line



Note:  
 For additional excavation of  
 unsuitable peat material in  
 this area see sheets 148-150.

S.B. Medina  
 Sta. 933+56

Match Line



DUST-JET HLD 7-19-54  
 REV. 8-11-54 DRK 8-1-54  
 DUST-JET HLD 10-2-54

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

40 20 0 20 40 60 80 100 120 140 160 180 200

N.B. MEDINA 933+50 STA. 934+00



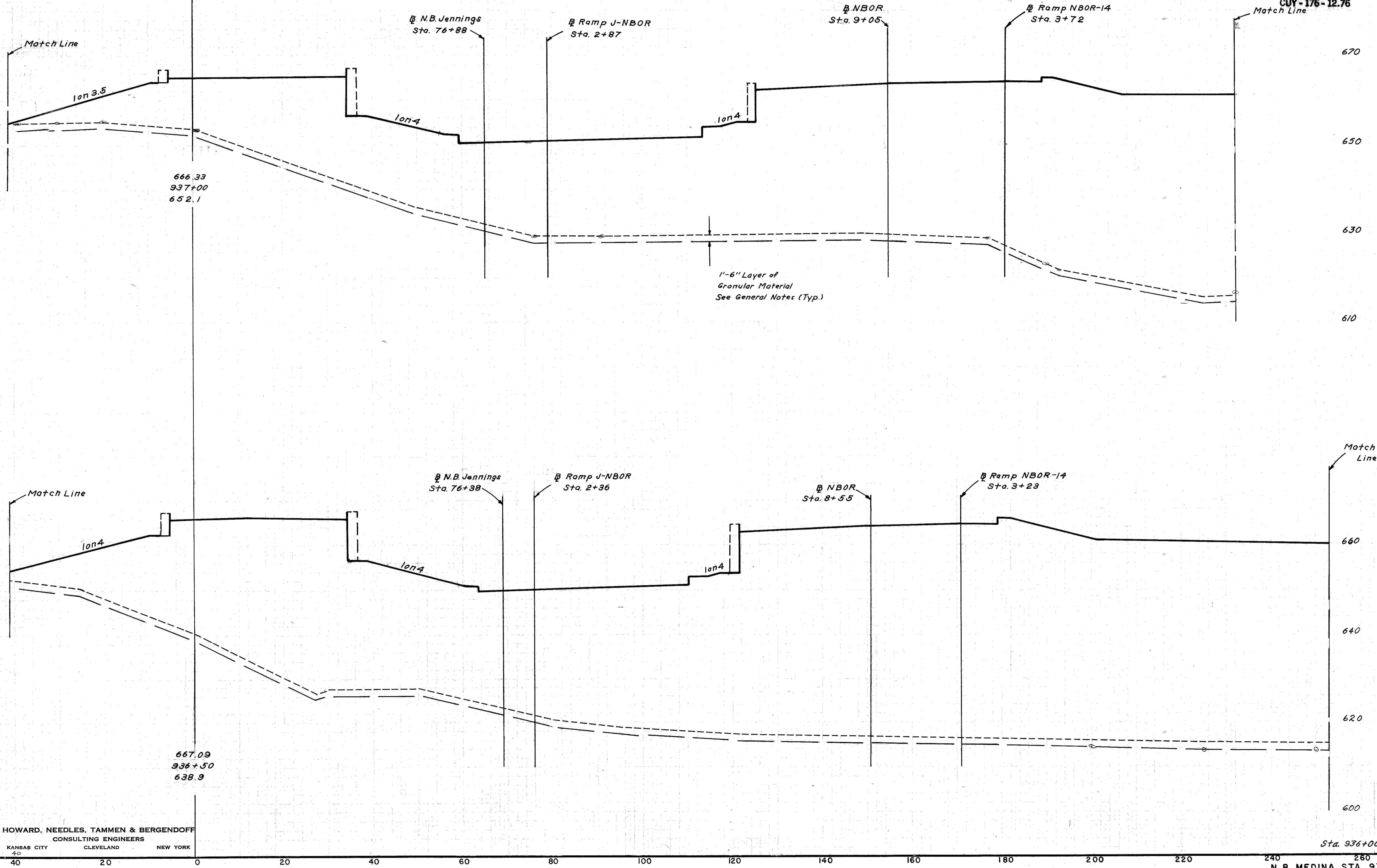


FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

135  
646

37  
152

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
0	7154		
		0	16610
0	10783		
		0	21158
0	12066		

REVISED 12-15-66 BY H.D.P. 2/11/68  
 RAMP-NBOR-14  
 D.J.S. 6-22-64  
 P.L.P. 6-22-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Sta. 936+00 N.B. MEDINA STA. 936+50 TO STA. 937+00

M-15

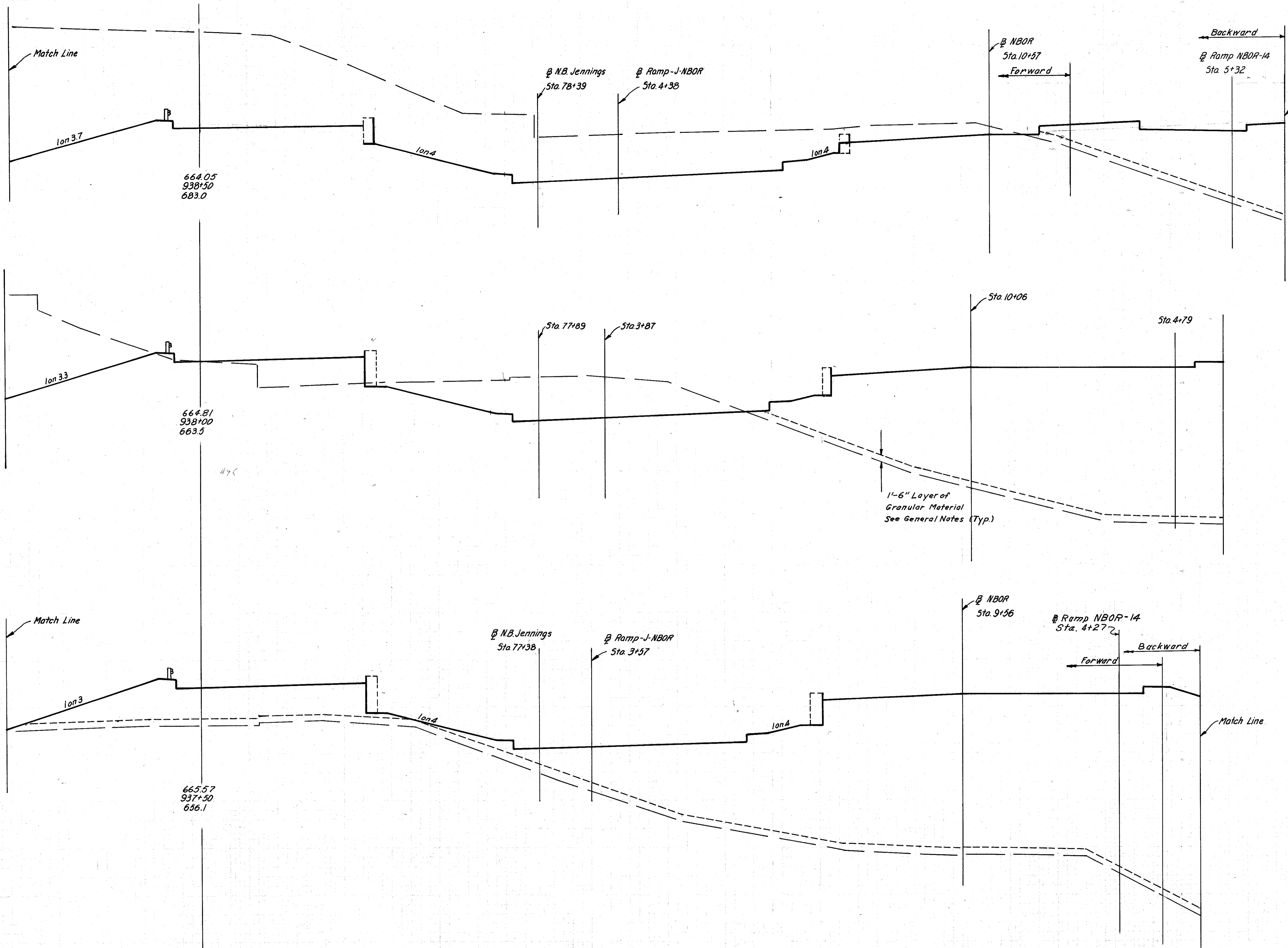
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

136  
646

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76

38  
152

	EARTHWORK			
	END AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
660			12	265
Spill Quantity				
Forward	2580	24		
Backward	2580	570		
640			3144	2797
660	815	2451		
640			755	6027
660				
640				
Forward	0	4058		
Backward	0	4420		
Sta. 937+00	0	7154		



REVISED 4-18-48 N.L.D. 84154  
 180110000  
 P.O. 3  
 H.E.D.  
 6-29-48

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Sta. 937+00 0 7154  
240  
N.B. MEDINA STA 937+50 TO STA 938+50

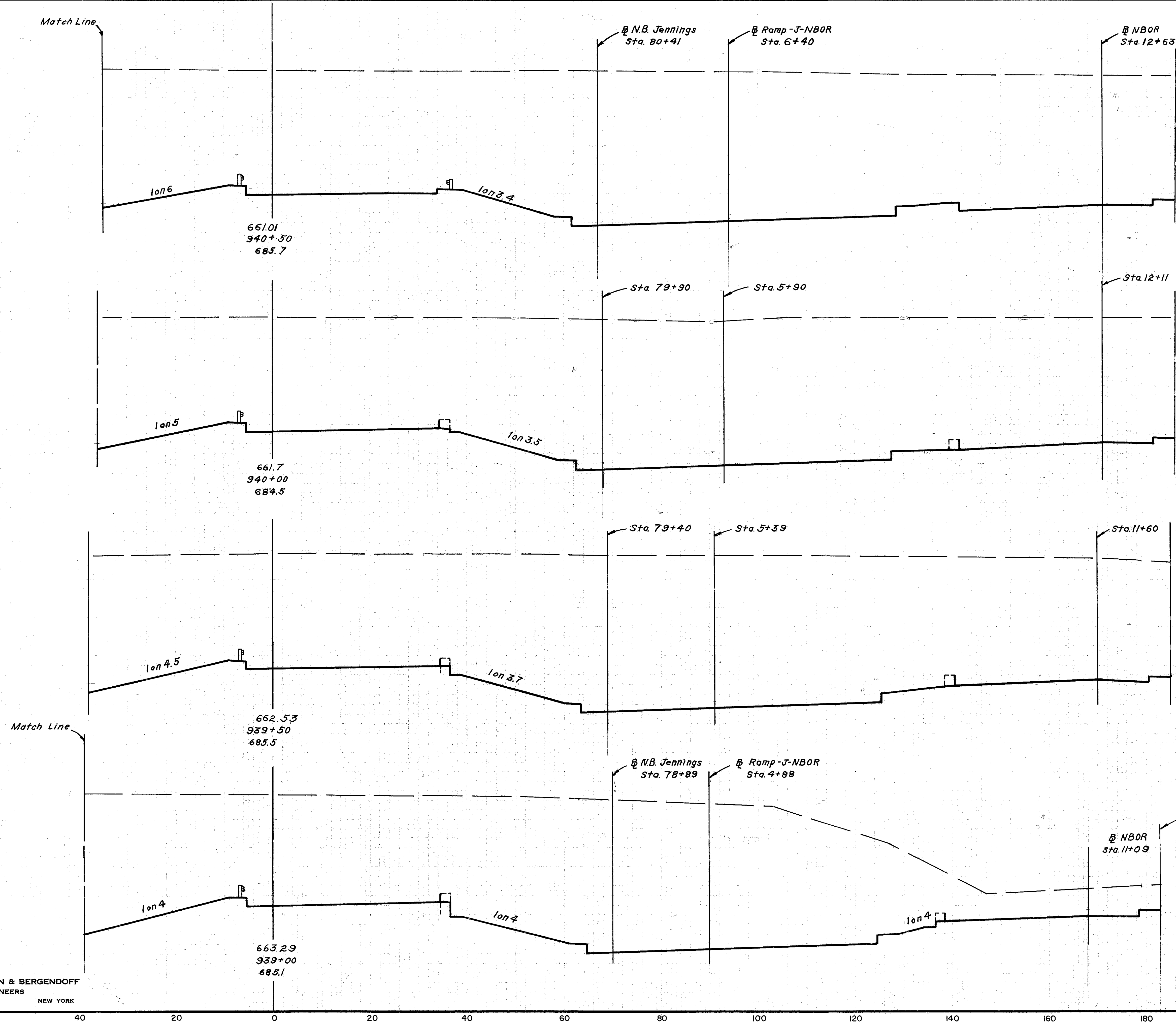


FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

137  
646

39  
152

CUYAHOGA COUNTY  
CUY = 71 - 17.83  
UY-176-12.76



END STA.	EARTHWORK		VOLUME	
	EXC.	EMB.	EXC.	EMB.
690	6155	0		
680			11211	0
690	5952	0		
680			11165	0
690	6105	0		
680			10084	0
670				
660	4785	0		
Sta. 938+50	2580	24	6820	22

RBH 2/20/04 W.D. 3/4/04  
 RMB 2/20/04 D.S. 3/4/04  
 V. NLO 5/1/04

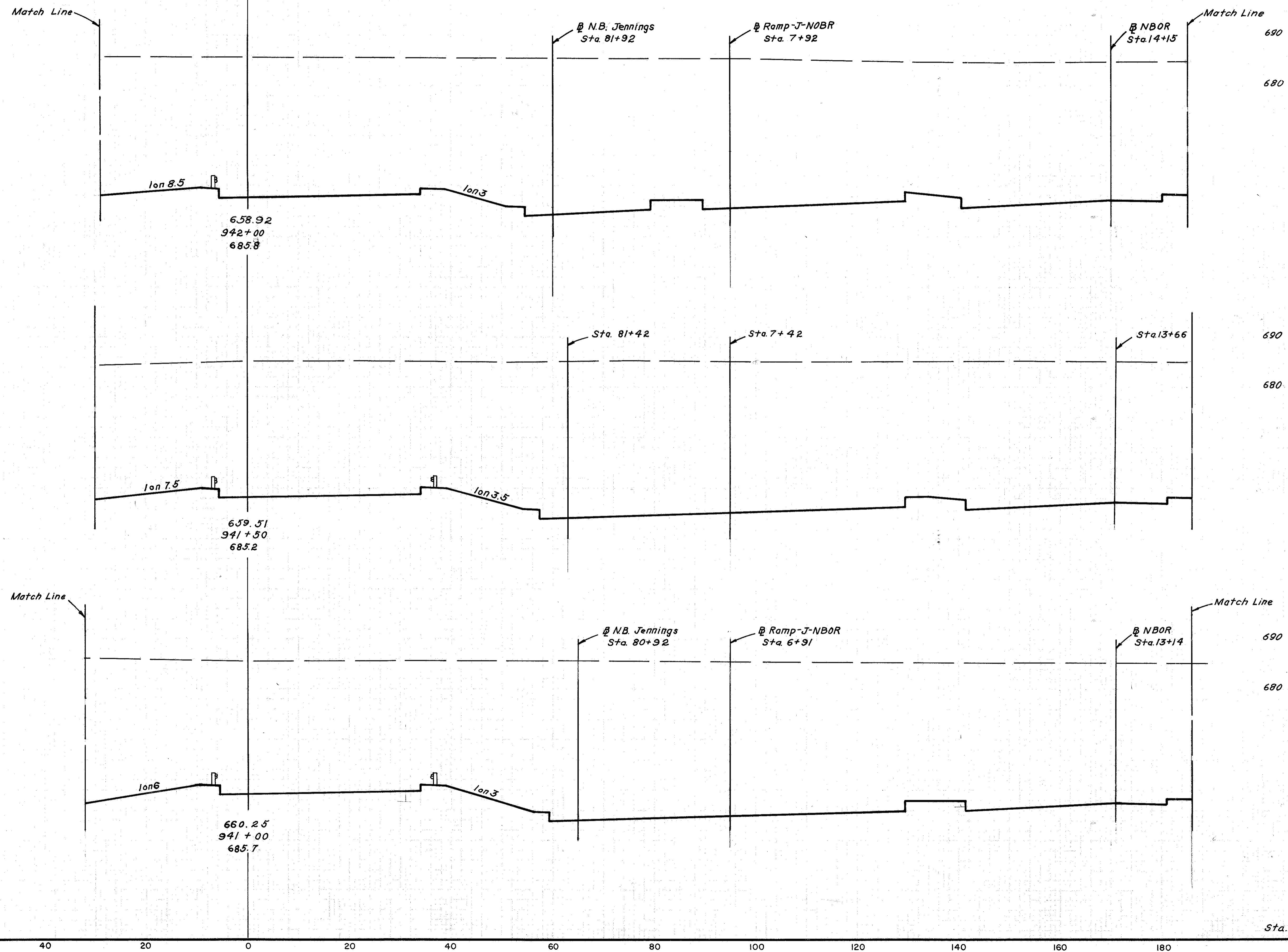
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

138  
646

40  
152

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		6040	0
			11177
		6070	0
			11253
		6122	0
			11368
		6155	0

REVISIONS  
 1. 10/3/64  
 2. 10/16/64  
 P.J.S. 1-28-67  
 -110-5-1-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

N.B. MEDINA STA. 941+00 TO STA. 942+00

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

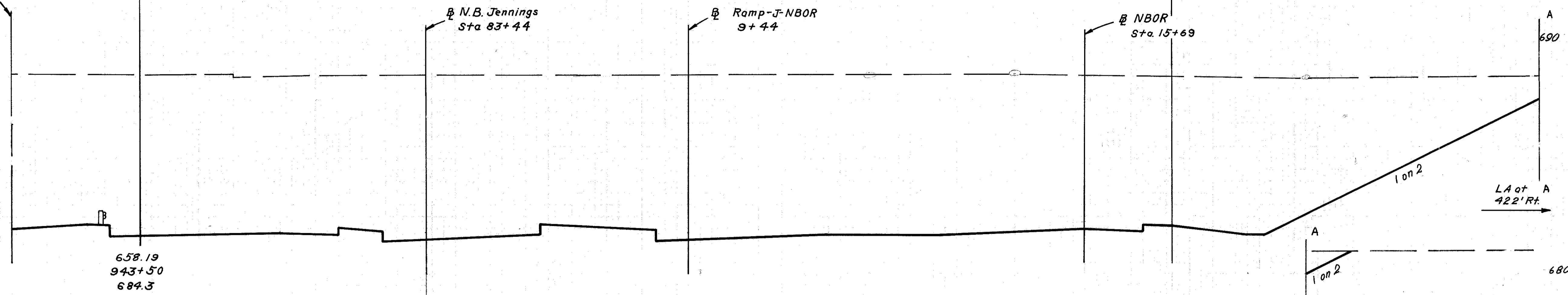
139  
646

41  
152

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76

EARTHWORK					
END STA.	AREA	VOLUME		EMB.	EMB.
EXC.	EMB.	EXC.	EMB.		
680	6739	0			
680	5664	0			
680			10606	0	
680	5790	0			
680			10899	0	
680	5980	0			
680			11130	0	
680	6040	0			

Match Line



658.19  
943+50  
684.3

Sta. 82+90

Sta. 8+94

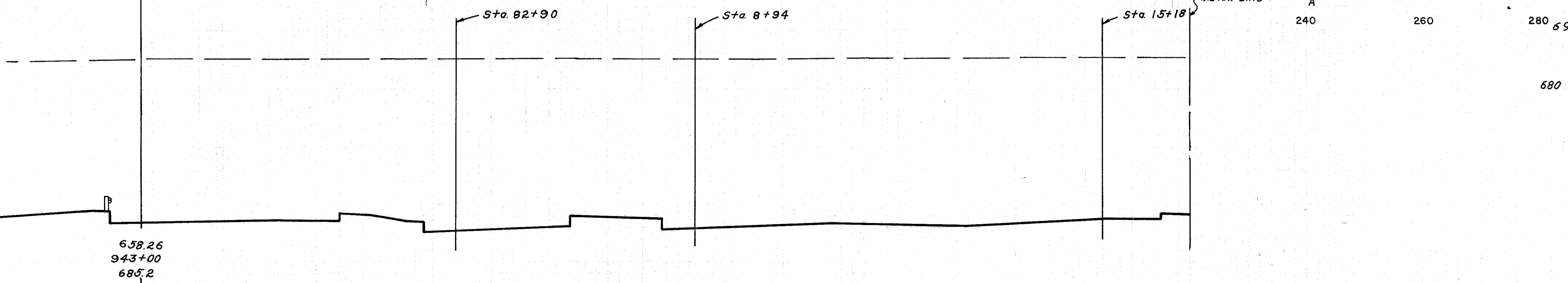
Sta. 15+18

Match Line

A  
1 on 2  
A  
240  
260  
280  
690

LA of A  
422' Rt.

680 Forward  
Backward



658.26  
943+00  
685.2

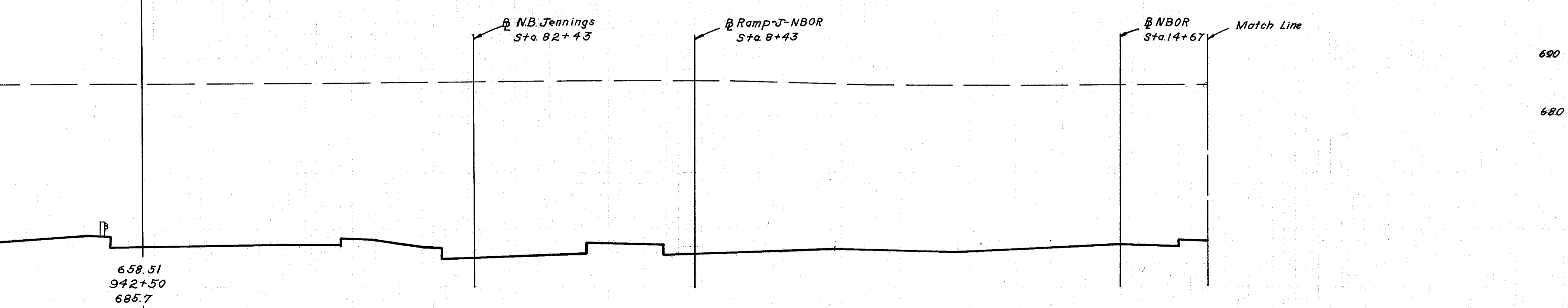
N.B. Jennings  
Sta. 82+43

Ramp-J-NBOR  
Sta. 8+43

NBOR  
Sta. 14+67

Match Line

690  
680



658.51  
942+50  
686.7

Sta. 942+00

6040 0

RDW 2-21-64, W.D.S. 4-1-64  
 RDW 2-21-64, W.D.S. 4-1-64  
 RDW 2-21-64, W.D.S. 4-1-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

40 20 0 20 40 60 80 100 120 140 160 180 200

N.B. MEDINA STA. 942+50 TO STA. 943+50

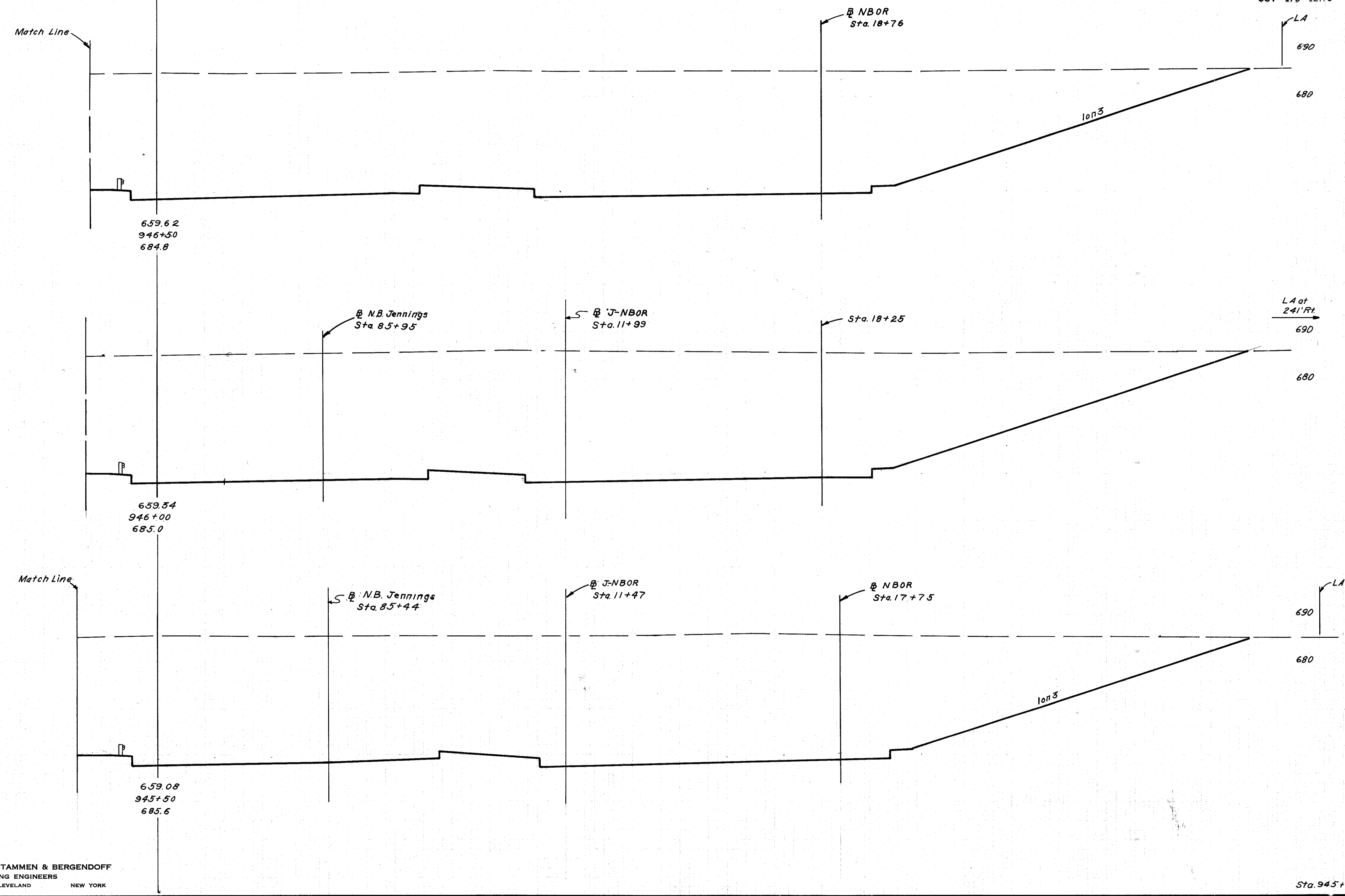


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

141  
676

43  
152

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
		5250	0
		5452	0
		5591	0
		6354	0
		9910	0
		10226	0
		11061	0

RBH 2-21-64  
 RBH 2-24-64  
 RBH 2-25-64  
 RBH 2-28-64  
 RBH 3-1-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

20 0 20 40 60 80 100 120 140 160 180 200 220

N.B. MEDINA STA. 945+50 TO STA. 946+50

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

142  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

44  
152

Match Line

B NBOR  
Sta. 20+29

LA

690  
680

1 on 3

660.42  
948+00  
648.9

4409

0

Sta. 19+78

LA

690  
680

8381

0

660.16  
947+50  
685.4

4642

0

B NBOR  
Sta. 19+27

LA

690  
680

8591

0

Match Line

659.88  
947+00  
683.9

4636

0

9155

0

Sta. 946+50

5250

0

P.M. 12-16-54  
 M.H. 12-16-54  
 D.J. 12-16-54  
 K.D. 12-16-54

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

20 0 20 40 60 80 100 120 140 160 180 200

N. B. MEDINA STA. 947+00 TO STA. 948+00

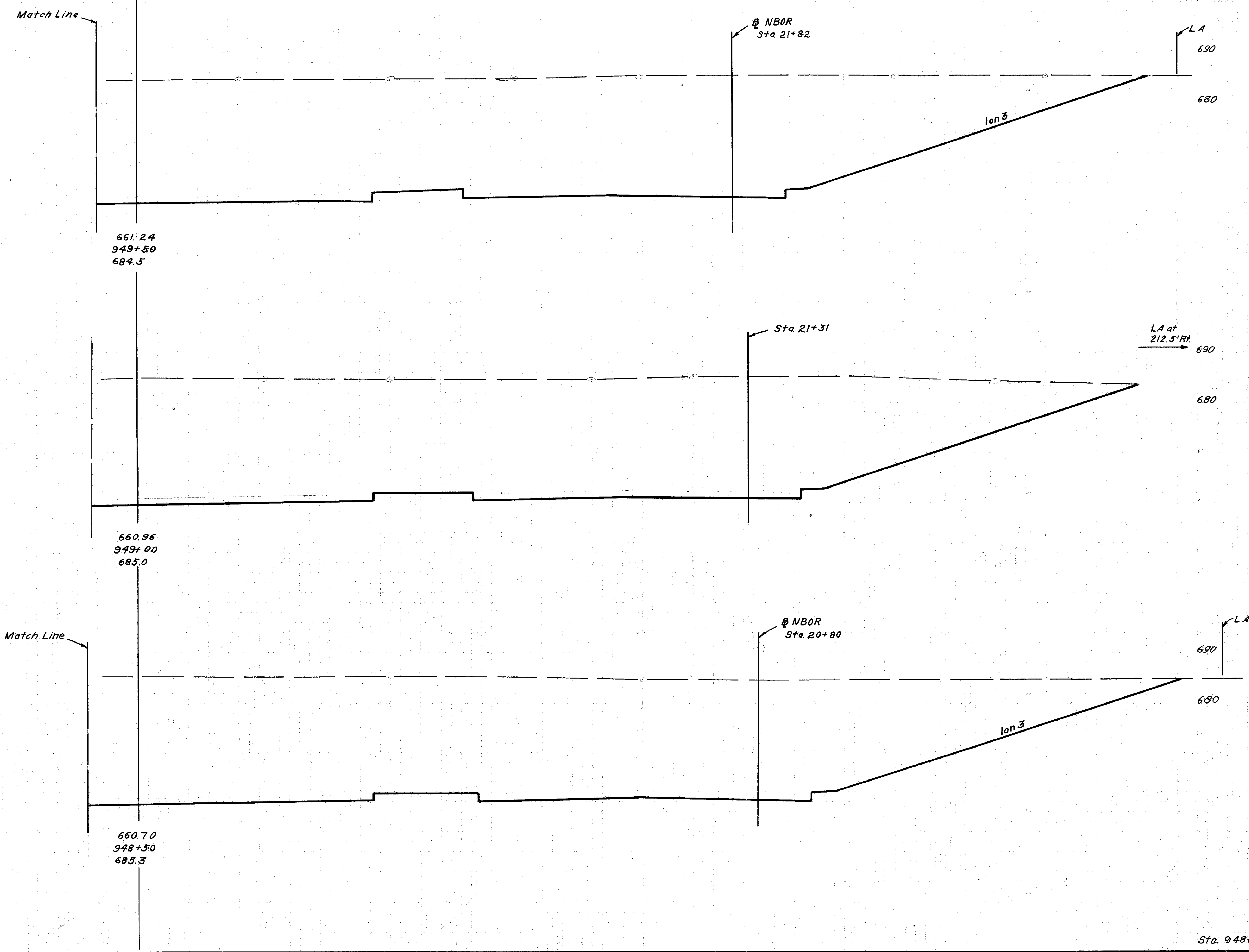
EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
4409	0		
		8381	0
4642	0		
		8591	0
4636	0		
		9155	0
5250	0		

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

143  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

45  
152



661.24  
949+50  
684.5

660.96  
949+00  
685.0

660.70  
948+50  
685.3

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
4100	0		
		7617	0
4126	0		
		7895	0
4400	0		
		8157	0
4409	0		

P1112-21-104  
 11/02/10/15  
 R1112-21-104  
 DIS 11/23/14  
 HLO 5-1-14

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

20 0 20 40 60 80 100 120 140 160 180

N.B. MEDINA STA. 948+50 TO STA. 949+50







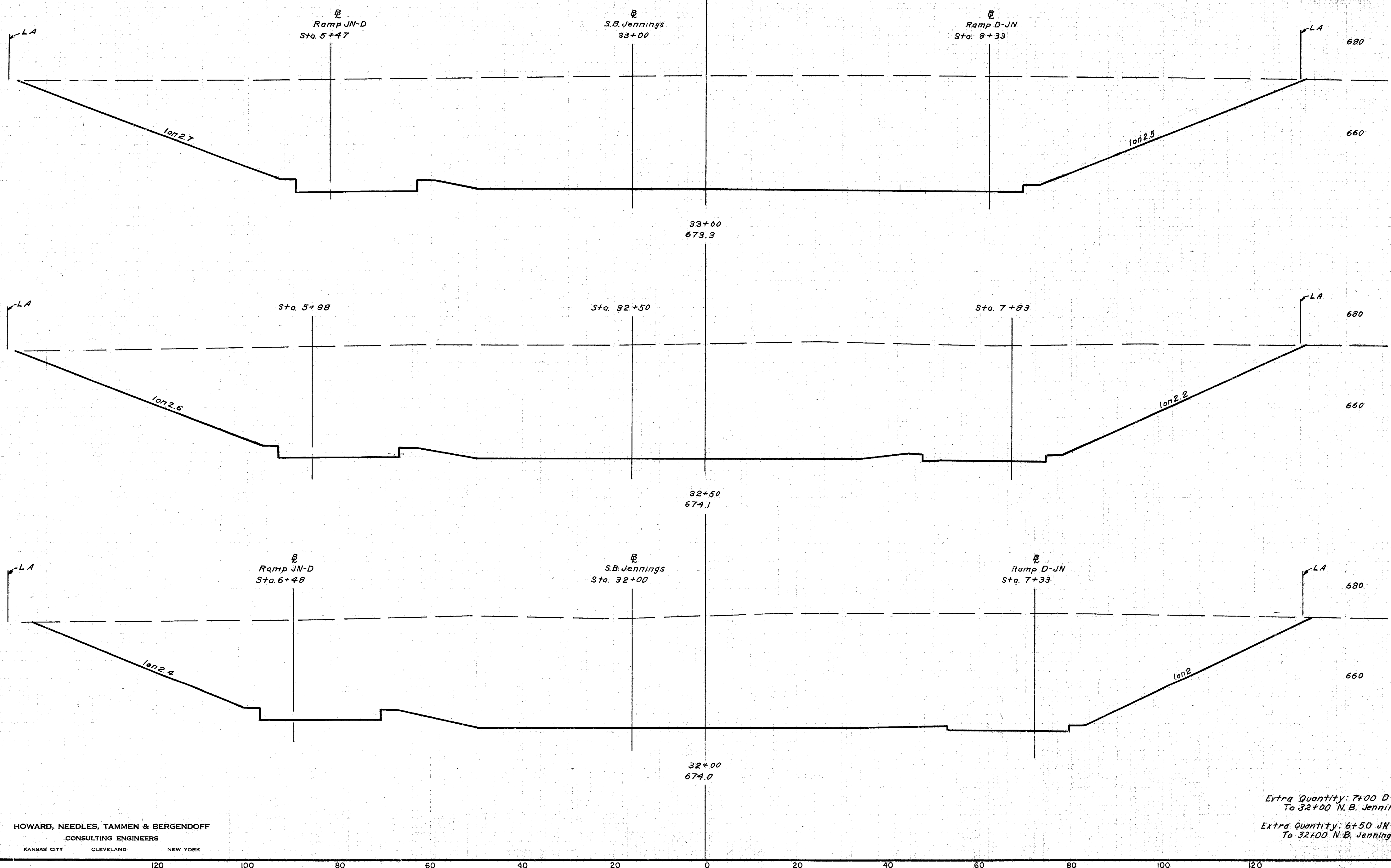
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

146  
646

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

48  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		5415	0
			10205
		5606	0
			10365
		5588	0
			3311
			464



OLO 6-28-48  
 DJS 6-29-48  
 RBN 6-29-48  
 DJS 6-24-49  
 DJS 6-24-49  
 DJS 6-25-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Extra Quantity: 7+00 D-JN  
To 32+00 N.B. Jennings  
Extra Quantity: 6+50 JN-D  
To 32+00 N.B. Jennings

N.B. JENNINGS STA. 32+00 TO STA. 33+00



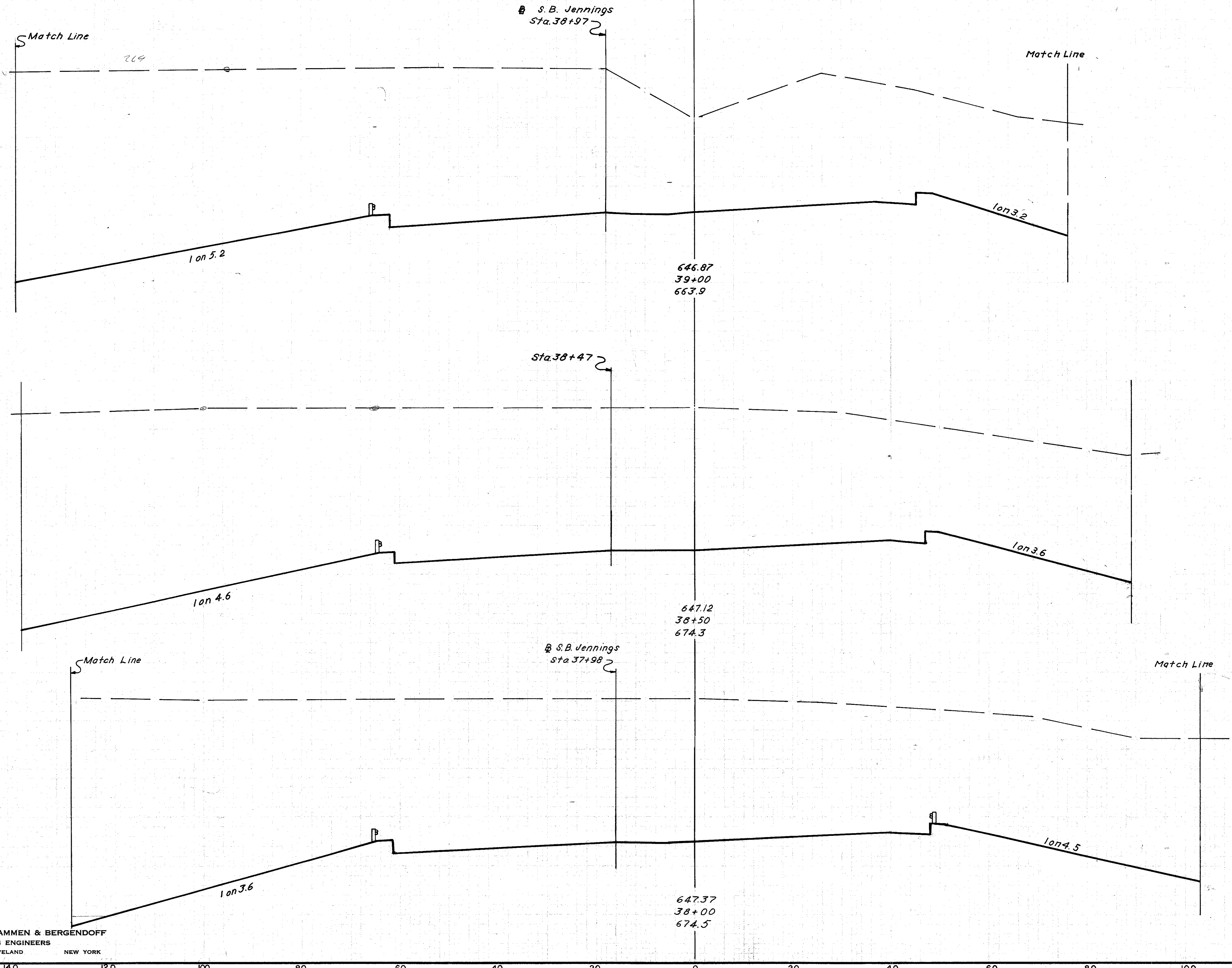


FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

149  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

51  
152



ELEVATION	EARTHWORK			
	END AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
670				
660				
650				
640				
630	6275	0		
670			12246	0
660				
650				
640				
630	6950	0		
670			13000	0
660				
650				
640				
630	7089	0		
630	6810	0	12870	0

D.S. 5-24-69  
 H.M. 5-24-69  
 W.L.D. 5-26-69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140  
N.B. JENNINGS STA. 38+00 TO STA. 39+00

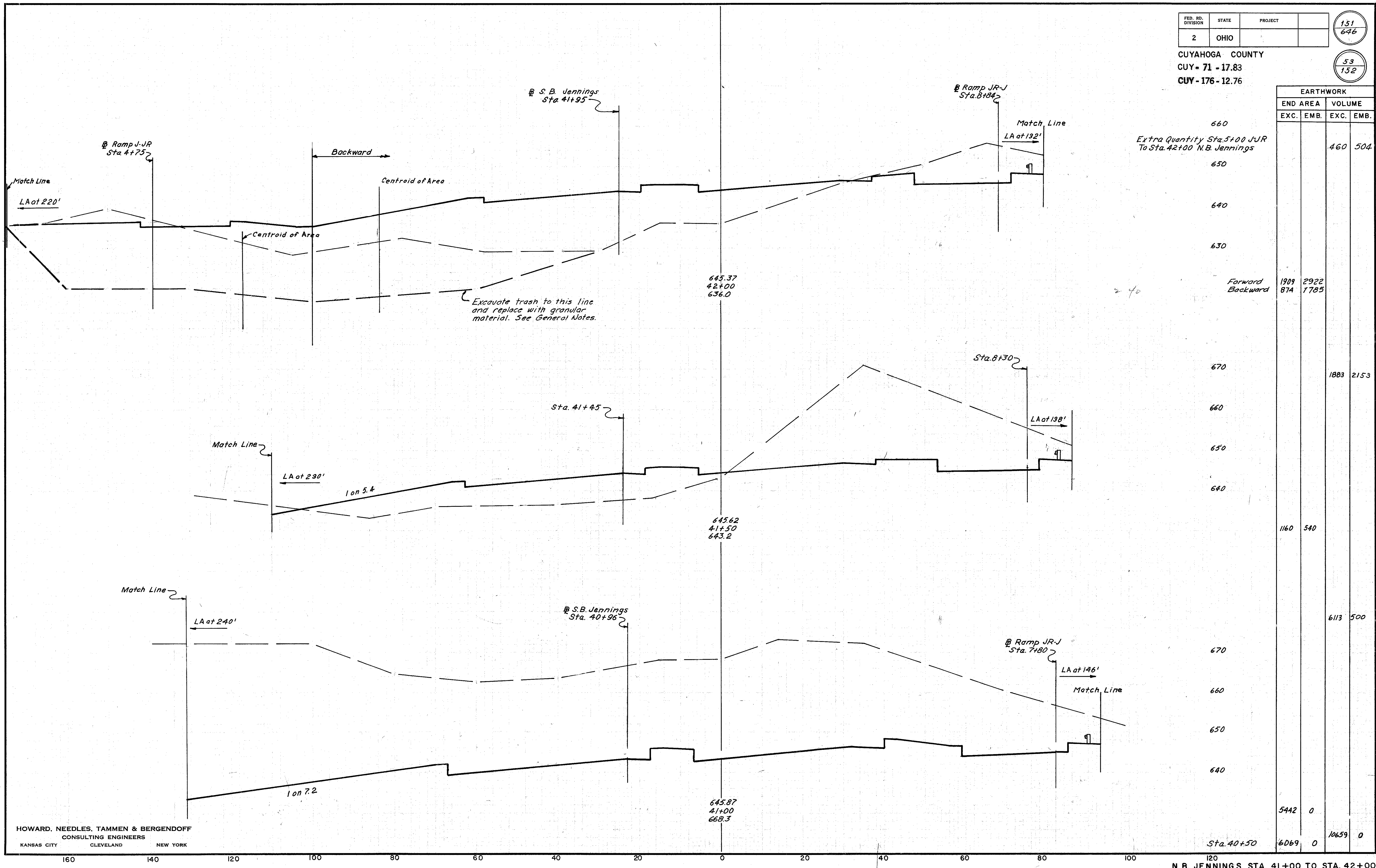


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

151  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

53  
152



660  
Extra Quantity Sta. 5+00 J-JR  
To Sta. 42+00 N.B. Jennings

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
			660
			650
			640
			630
1909	2922		645.37
874	1785		42+00
			636.0
			670
		1883	2153
			660
			650
			640
		1160	540
			670
			660
			650
			640
			645.87
			41+00
			668.3
			670
			660
			650
			640
5442	0		
			645.87
			41+00
			668.3
			670
			660
			650
			640
			645.87
			41+00
			668.3
			670
			660
			650
			640
			645.87
			41+00
			668.3
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			670
			660
			650
			640
			645.87
			41+00
			668.3
			670
			660
			650
			640
			645.87
			41+00
			668.3
			670
			660
			650
			640
			645.87
			41+00
			668.3
			670
			660
			650
			640
			645.87
			41+00
			668.3
			670
			660
			650









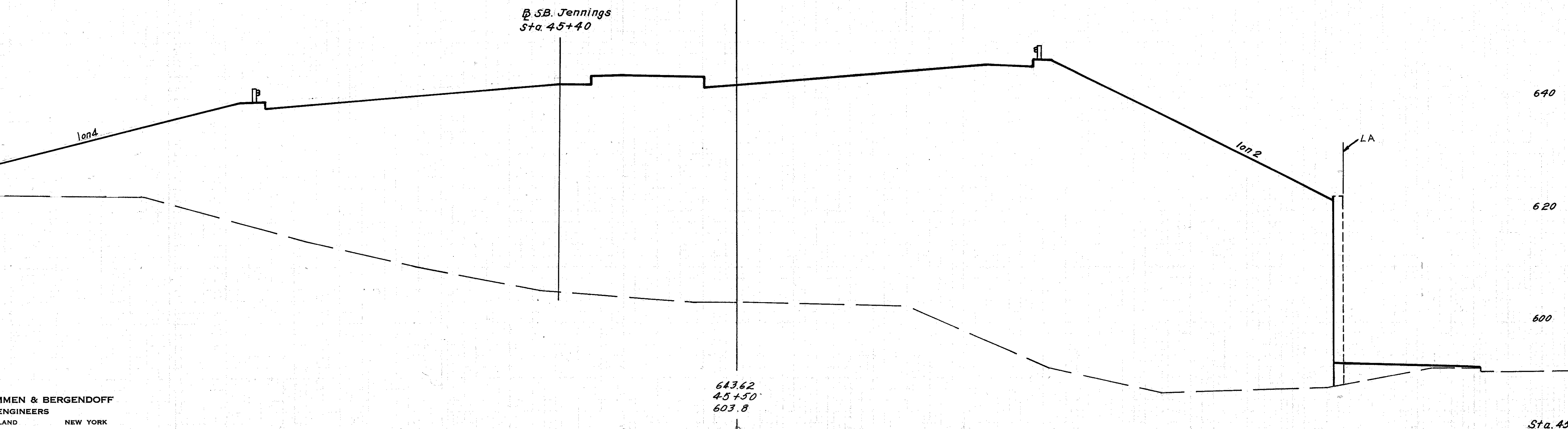
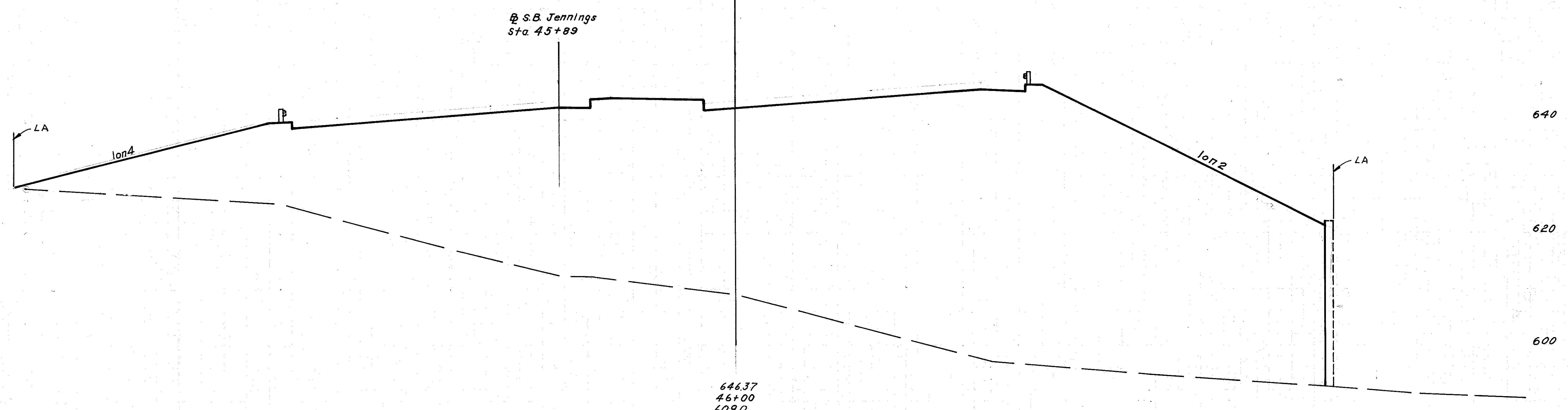
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

155  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

57  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
0	6482	0	13219
0	7793	1189	8462
		1101	15052



9-18-64  
 50% P.D. 110 5-1-64  
 0.5% 5-1-64  
 R.S.K.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

N.B. JENNINGS STA. 45+50 TO STA. 46+00



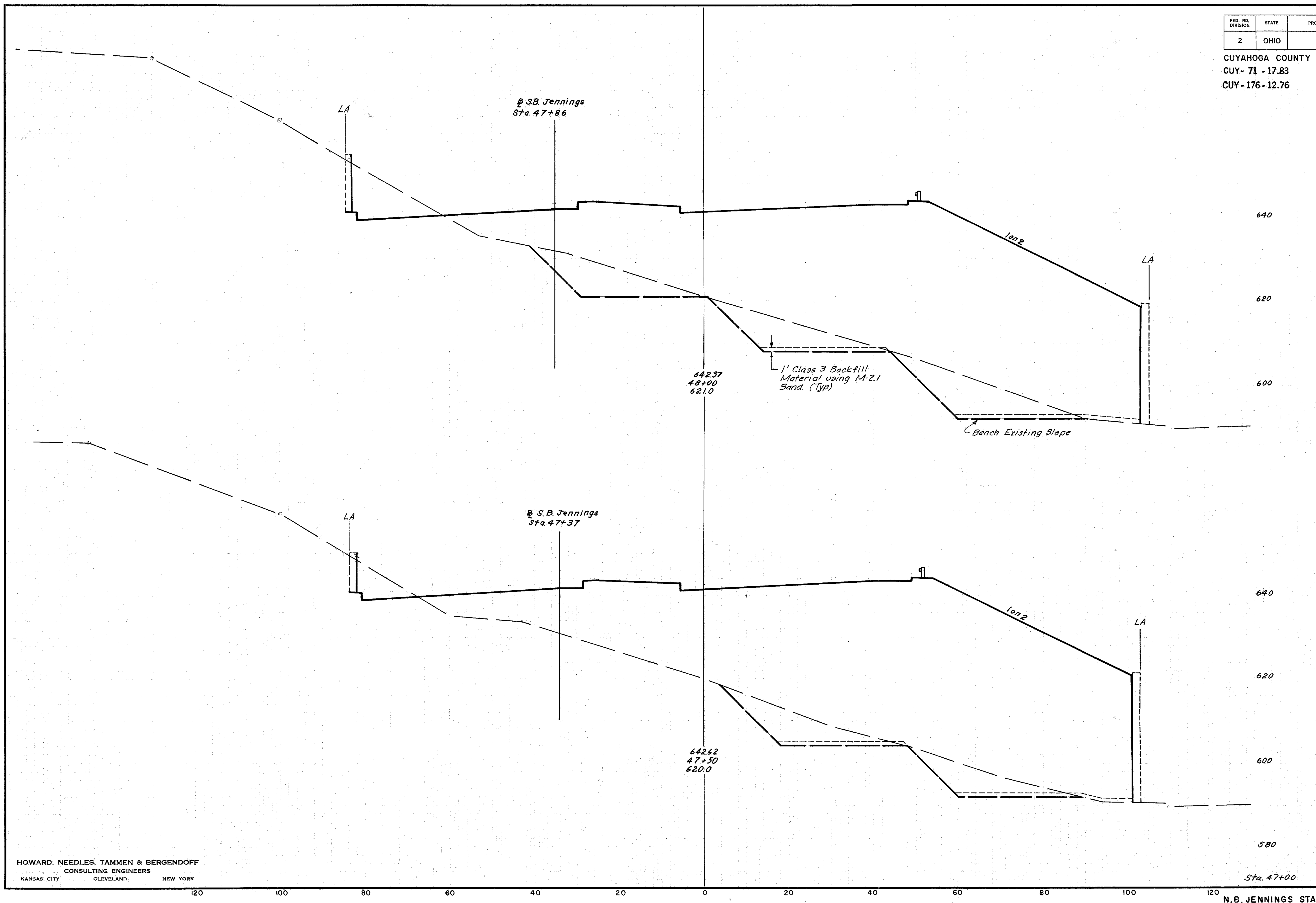
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

157  
646

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

59  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
818	4645		
			1151
			8581
425	4622		
			651
			9188
278	5300		



6-23-64  
 HLD  
 035 85264  
 035 85264  
 035 85264  
 035 85264

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

N.B. JENNINGS STA. 47+50 TO STA. 48+00

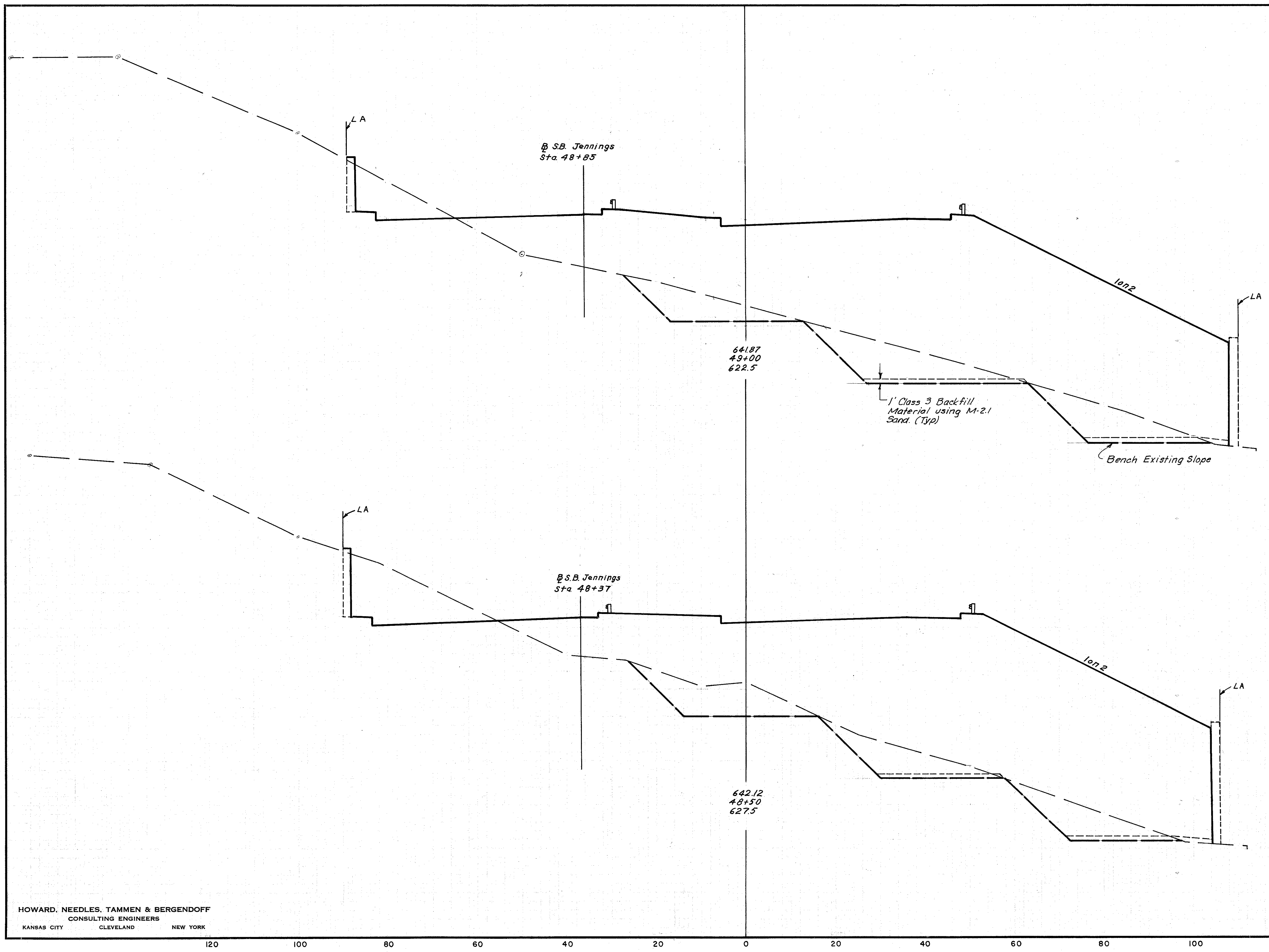
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

158  
646

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

60  
132

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		767	4345
			1499 7786
		852	4063
			1546 8064
		818	4645



DUS 5/14/64  
 DUS 5/22/64  
 MLD  
 F25-68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

N.B. JENNINGS STA. 48+50 TO STA. 49+00



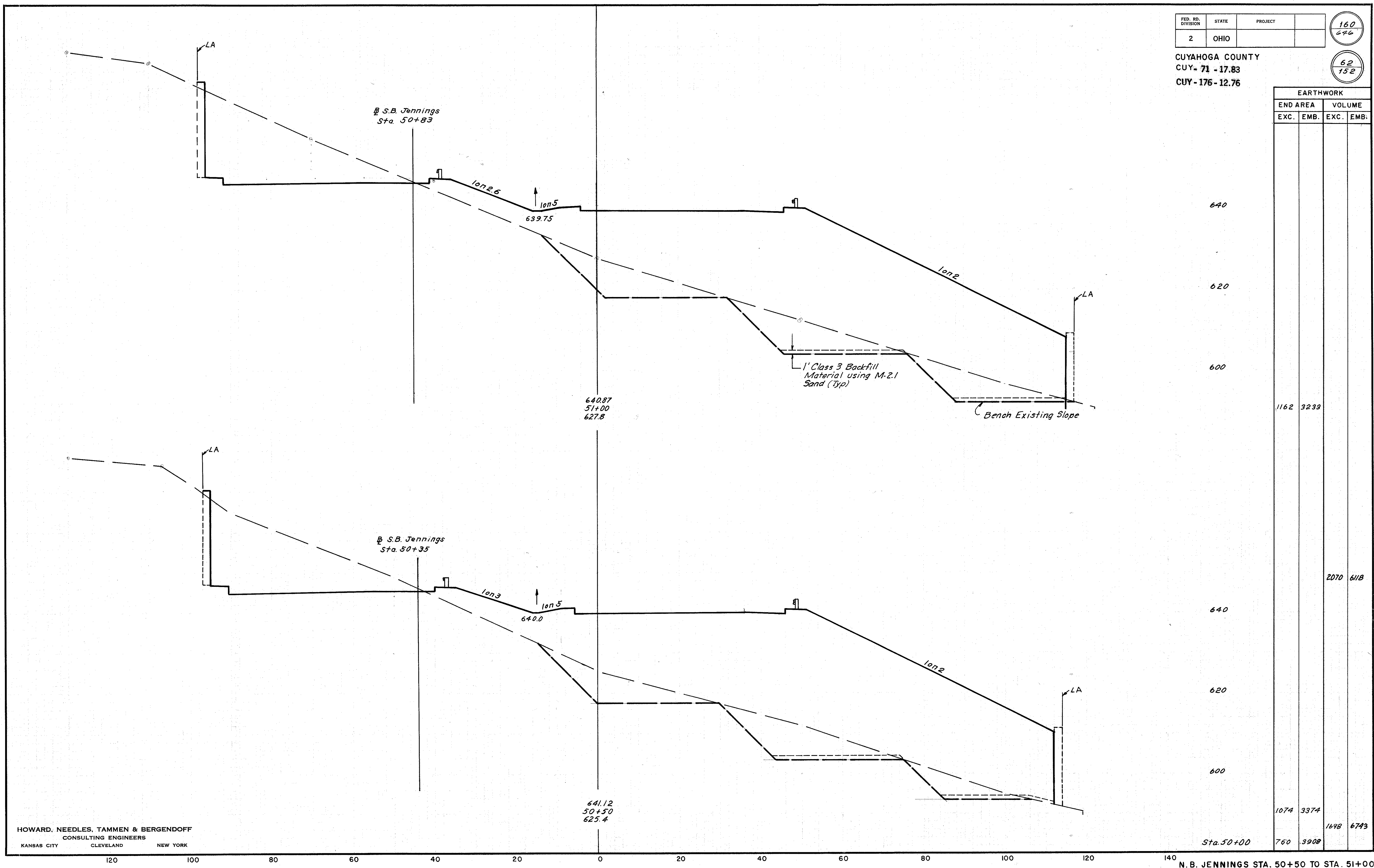
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

160  
676

62  
152

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
1162	3239		
		2070	6118
1074	3374		
		1698	6793
760	3908		



PLS. 5/18/64  
 D.S. 5/18/64  
 D.S. 5/18/64  
 HIO  
 5-24-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Sta. 50+00 N.B. JENNINGS STA. 50+50 TO STA. 51+00





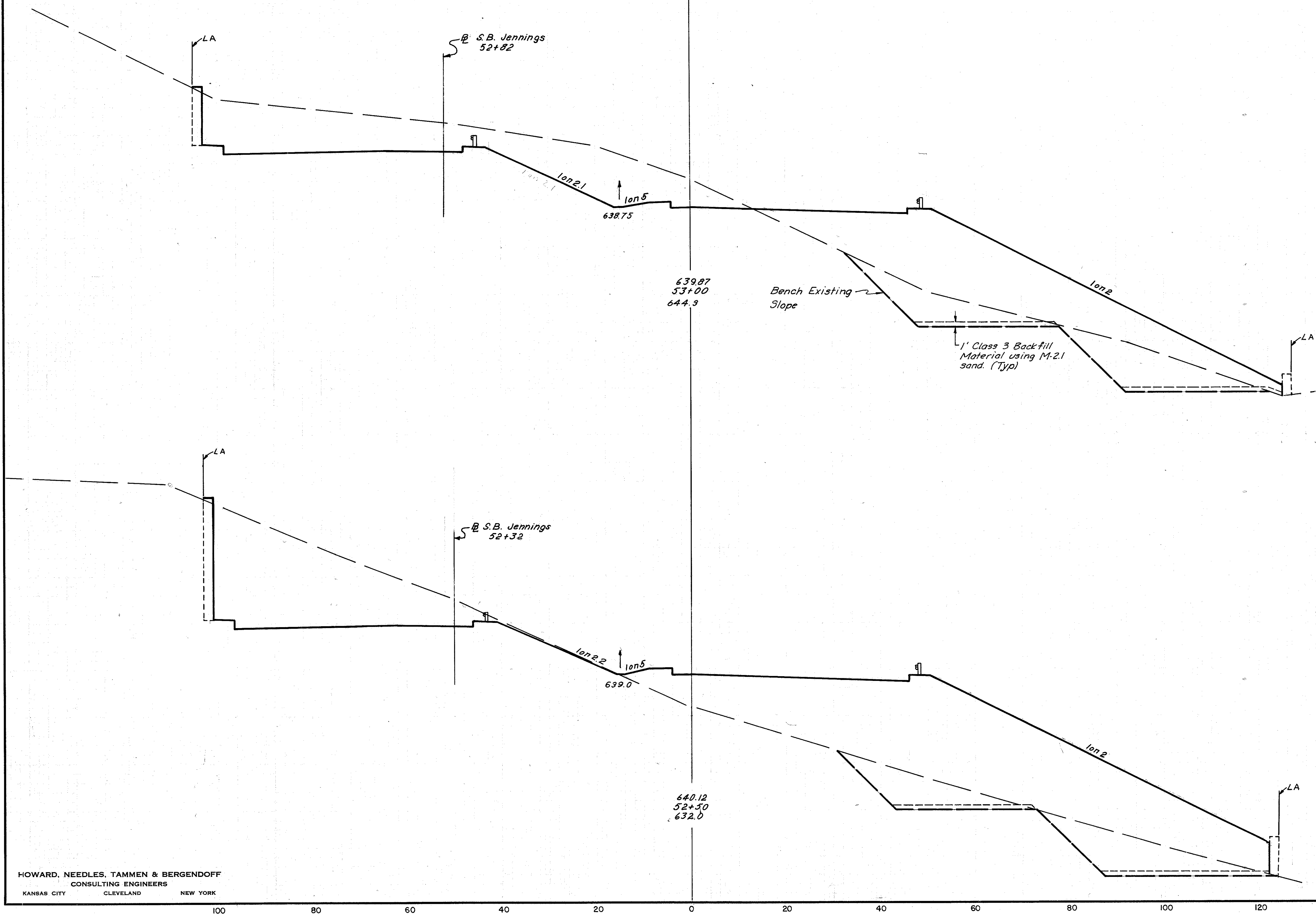
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

162  
646

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76

64  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		1323	1420
			2378
			3390
		1245	2241
			2296
			4798
		1235	2941



D25 5-14-64 WLO 5-18-64  
 WPH 4-2-64 D26 8-4-64  
 DUS 3-22-64 WLO 5-26-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

N.B. JENNINGS STA. 52+50 TO STA. 53+00



FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

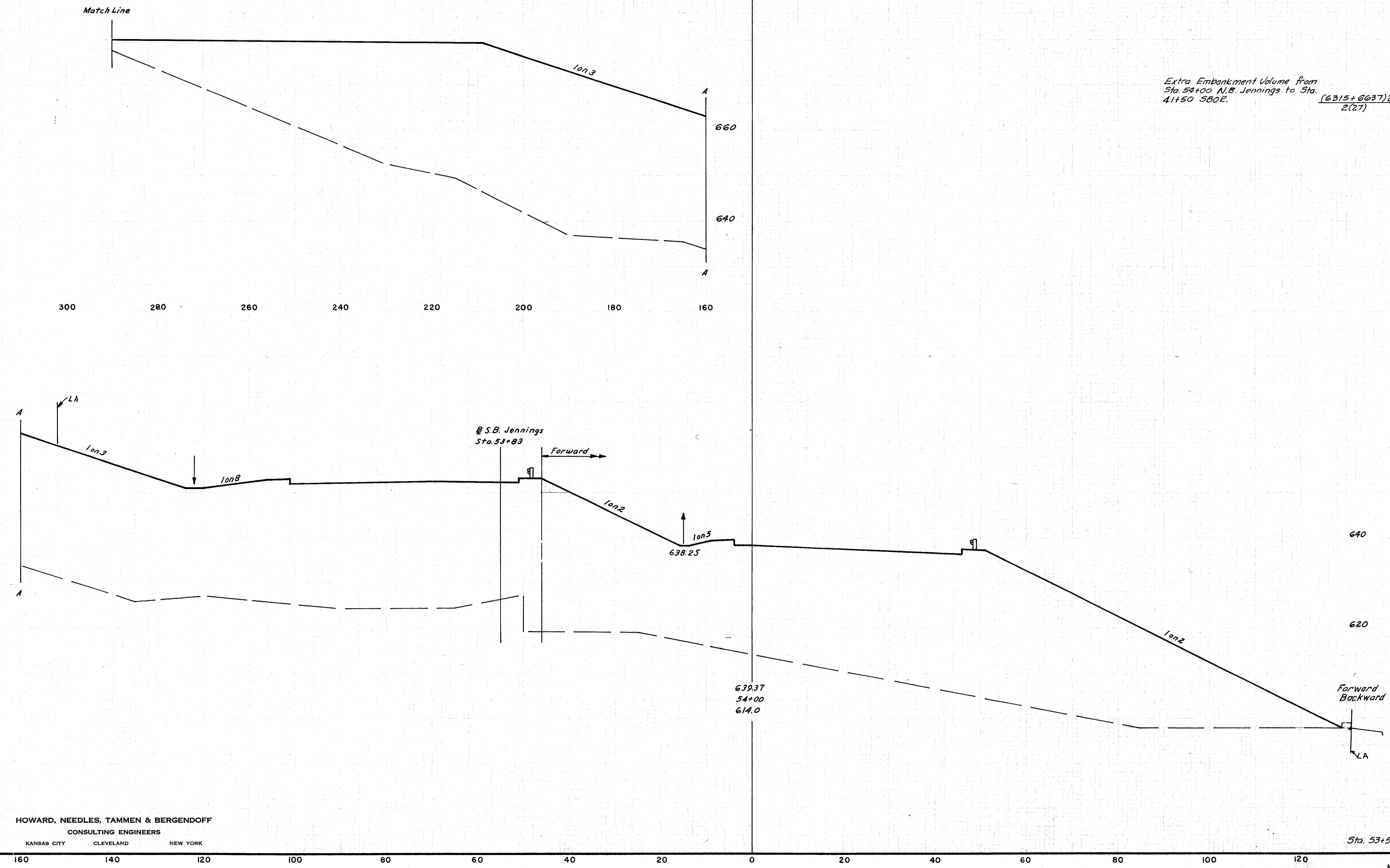
164  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

66  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
			5277
0	4,015		
0	10,330		
			12793
0	3,485		

Extra Embankment Volume from  
Sta. 54+00 N.B. Jennings to Sta.  
41+50 S80E.  $\frac{(6315+6637)22}{2(27)}$



RBA 8-2-68  
 RBA 8-3-68  
 RBA 8-3-68  
 DUS 8-27-64  
 B-7-CF

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

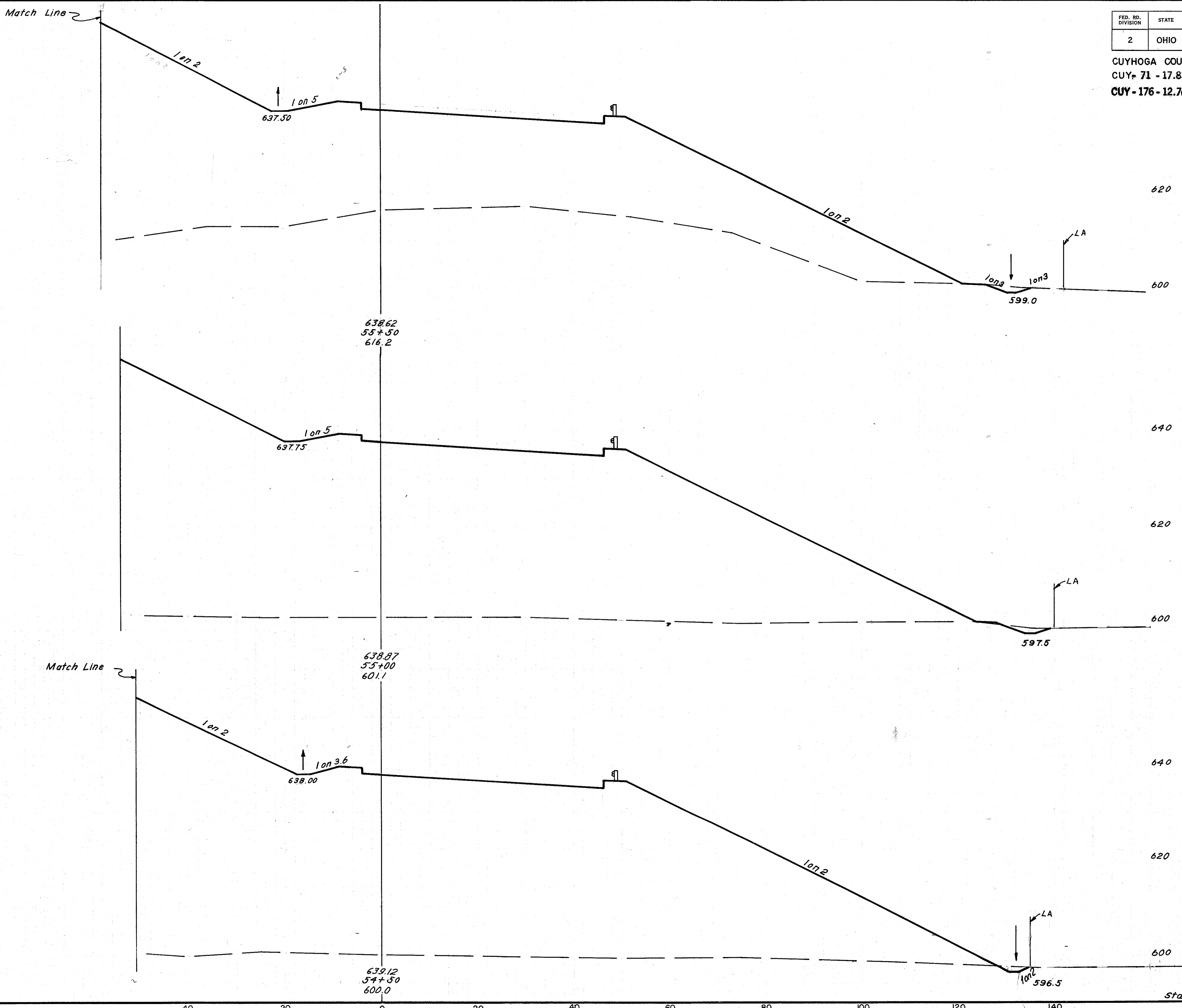
N.B. JENNINGS STA. 54+00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

165  
676

CUYHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

67  
152



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
6	3516		
		8	8281
3	5427		
		5	10084
2	5463		
0	4015	2	8777

524.3  
 494.5  
 471.5  
 458.5  
 445.5  
 432.5  
 419.5  
 406.5  
 393.5  
 380.5  
 367.5  
 354.5  
 341.5  
 328.5  
 315.5  
 302.5  
 289.5  
 276.5  
 263.5  
 250.5  
 237.5  
 224.5  
 211.5  
 198.5  
 185.5  
 172.5  
 159.5  
 146.5  
 133.5  
 120.5  
 107.5  
 94.5  
 81.5  
 68.5  
 55.5  
 42.5  
 29.5  
 16.5  
 3.5

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

N.B. JENNINGS STA. 54+50 TO STA. 55+50









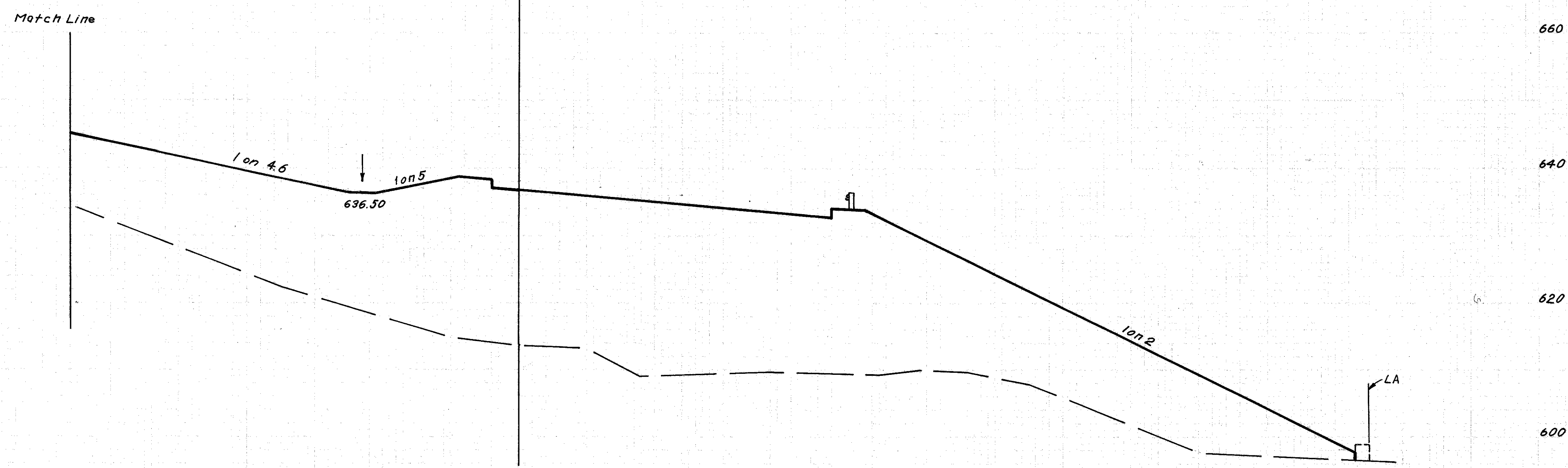
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

169  
646

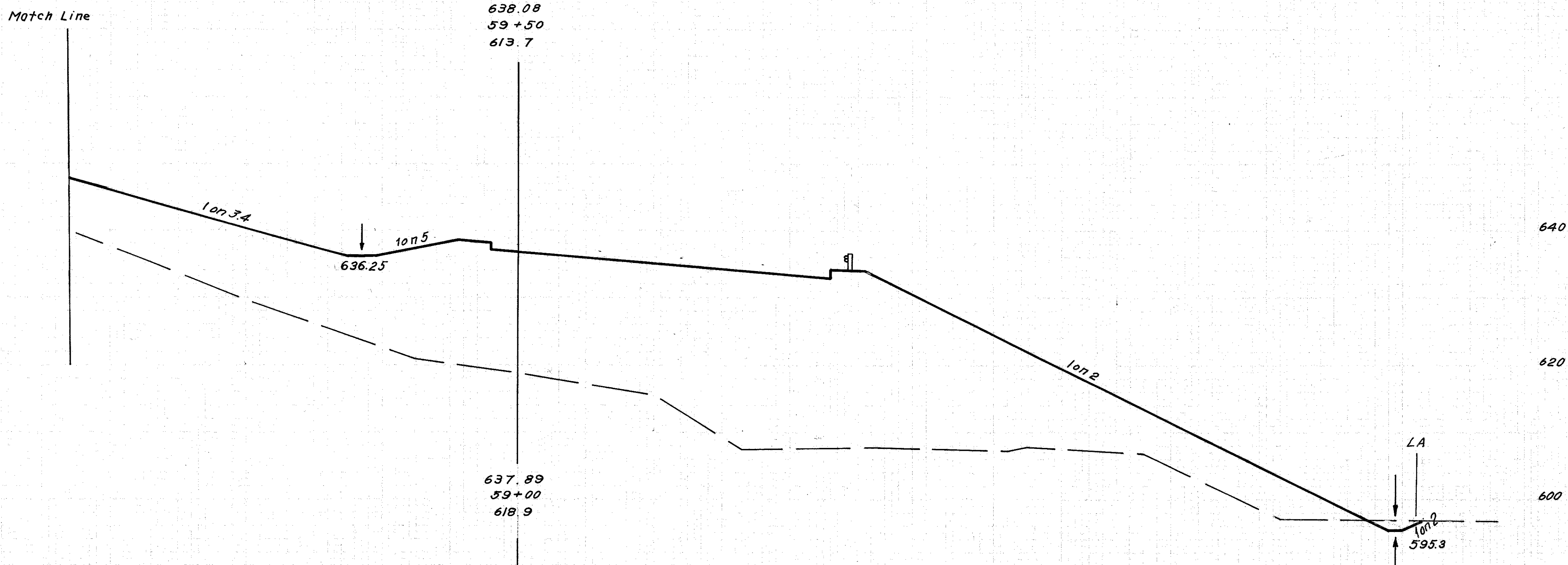
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

71  
132

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
			660
			640
			620
			600
0	3263		
		8	5605
			620
			600
9	2790		
		10	5000
2	2620		



638.08  
59+50  
613.7



637.89  
59+00  
618.9

LA  
595.3

Sta. 58+50

N.B. JENNINGS STA. 59+00 TO STA. 59+50

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

1885-1944 PUS 5-23-64  
010 5-18-64 ABM 5-23-64  
PUS 5-23-64  
HLD

80 60 40 20 0 20 40 60 80 100 120 140



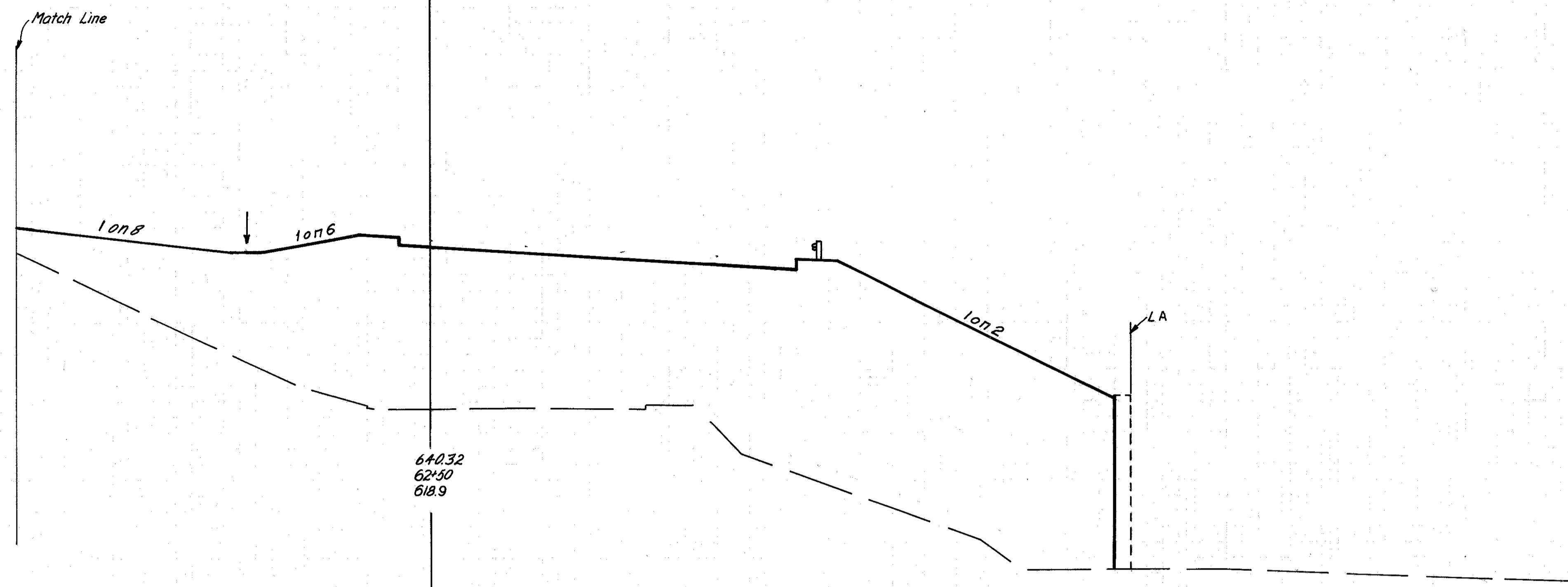


FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

172  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

74  
152



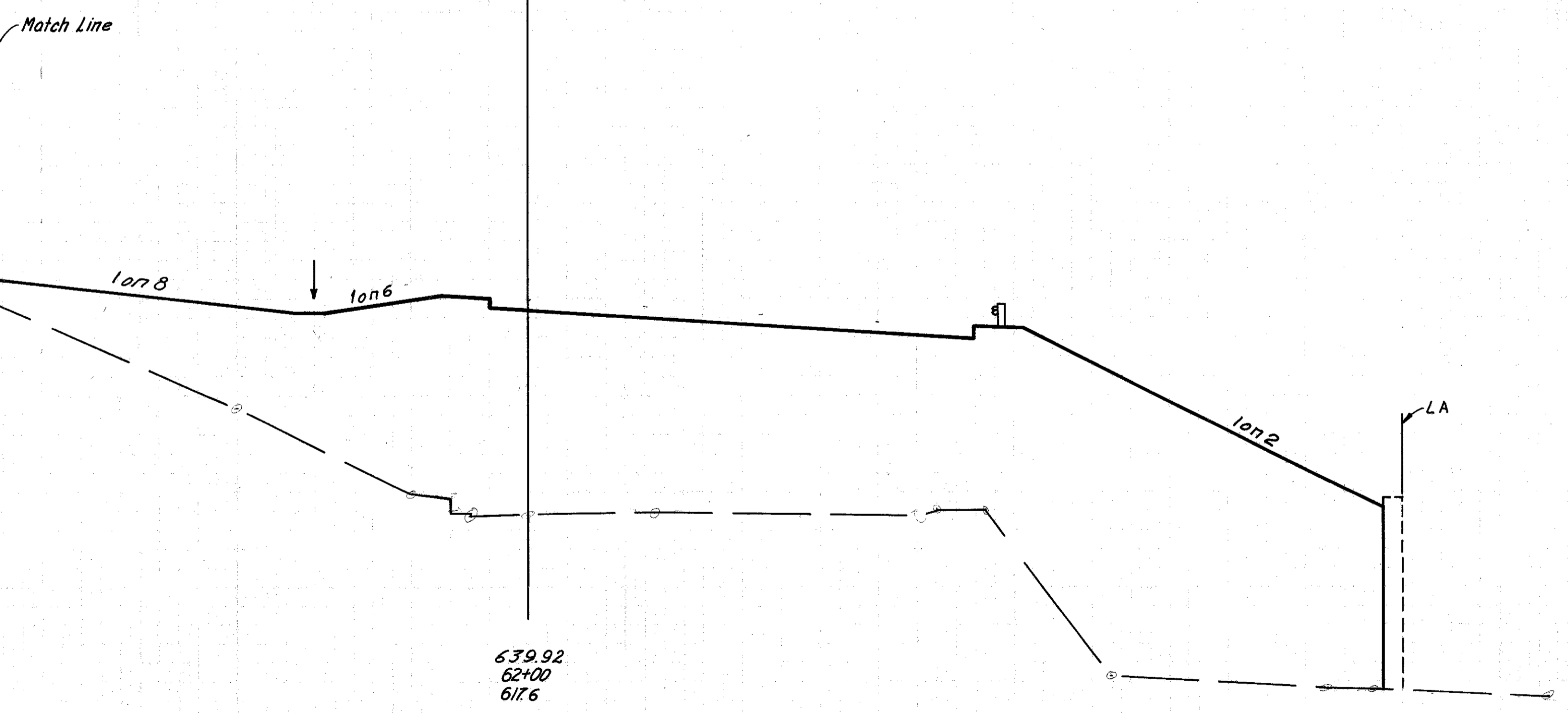
64+032  
62+50  
618.9

640

620

600

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
0	2665	0	4948
0	2658	0	4782
0	2506		



63+92  
62+00  
617.6

640

620

600

Sta. 61+50

RBH 12-7-64 N.H.D. 2-10-64  
 D.J.S. 3-22-64 HLD  
 6'-1" C.F.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

80 60 40 20 0 20 40 60 80 100 120 140

N.B. JENNINGS STA. 62+00 TO STA. 62+50



M-15

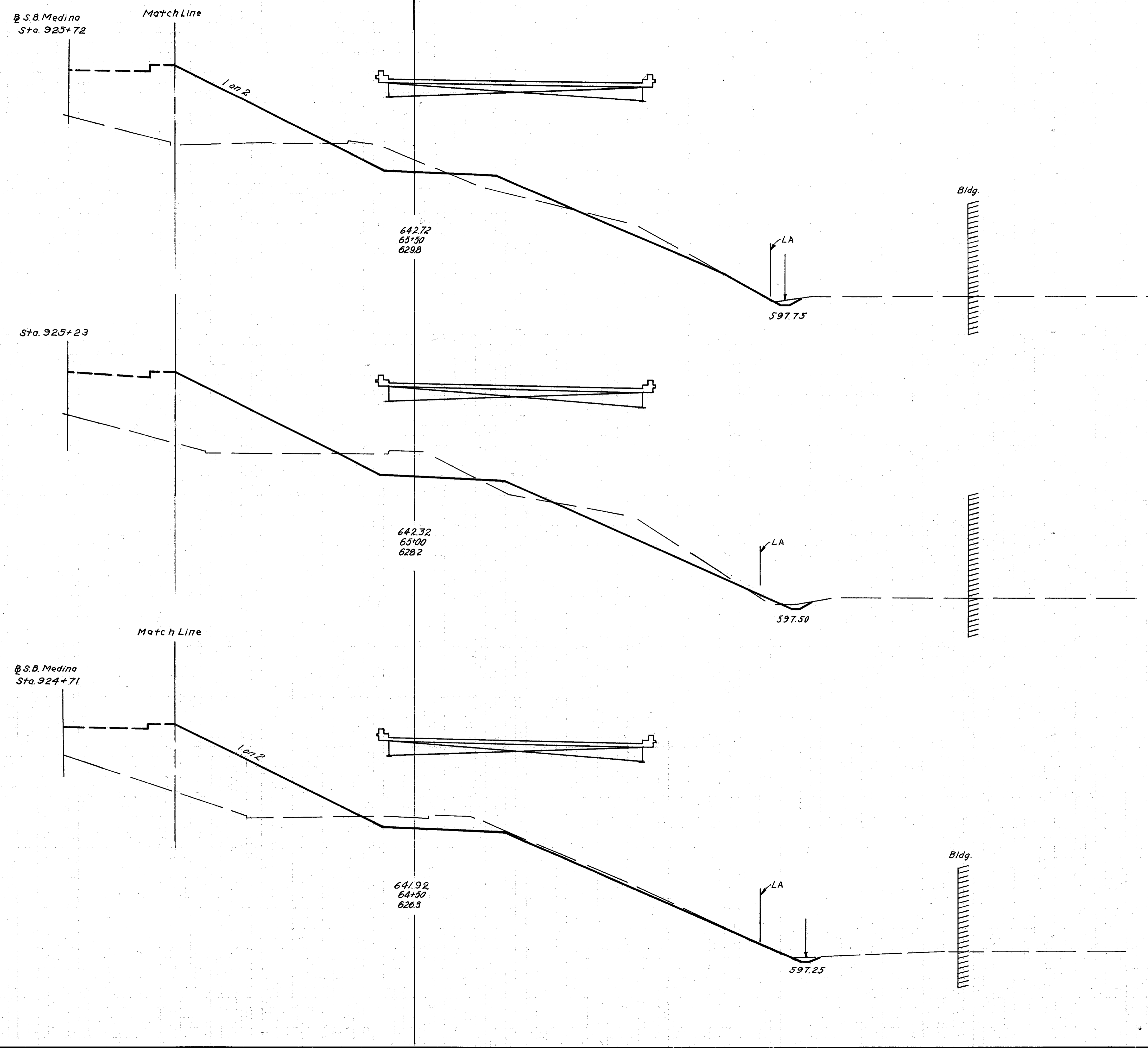
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

174  
646

76  
152

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.



620					
	93	269			
600					
			238	506	
630					
	164	278			
600					
			235	538	
630					
	90	303			
600					
			91	1183	
	8	975			

RBN 27-64 V. H.D. 2-9-67  
 SBN 4-27-64 DLO 5-20-64  
 D.S.S. 4-27-64  
 J.H.D.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

N.B. JENNINGS STA. 64+50 TO STA. 65+50

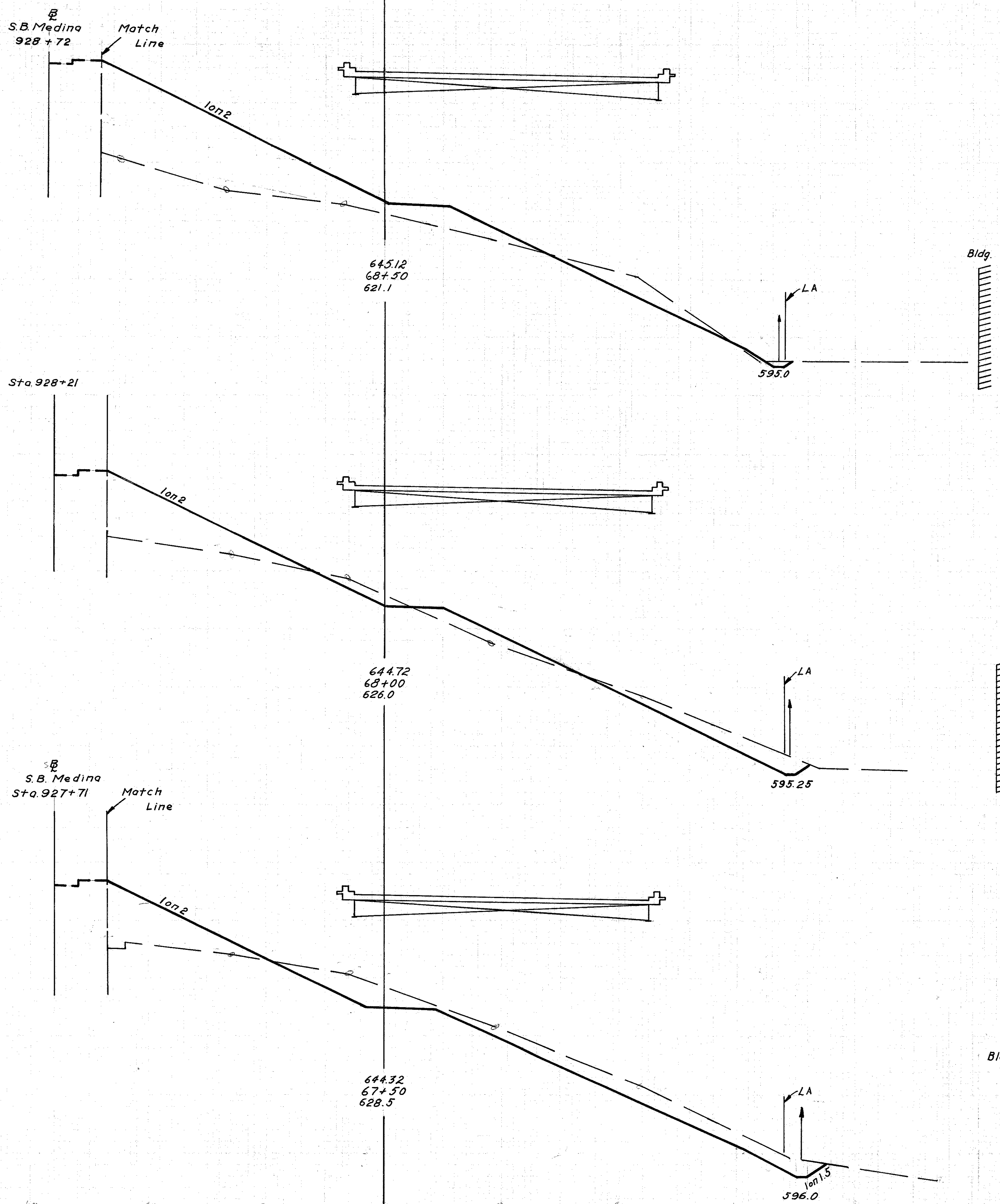


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

176  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

78  
152



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		64	529
			149
		97	220
			302
		229	148
			408
		212	140
			267

DUS-20-64 HLD 5-22-64  
 DIOB-15-64 RBH 2-17-64  
 OUS 6-22-64  
 9420 6-22-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK









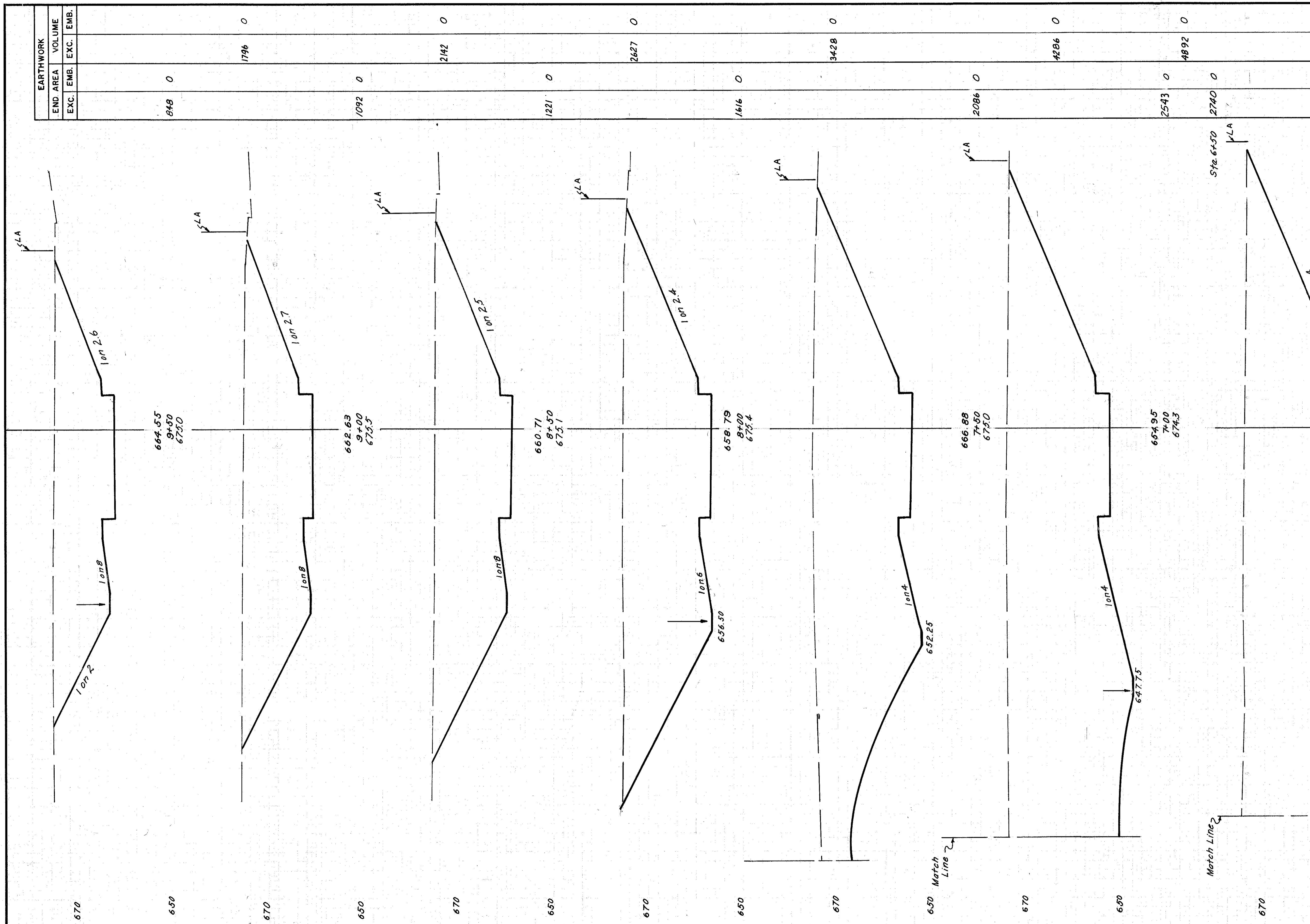








688 12-18-15 1110 6-20-64  
 180125-44 8220 8-11-64 5-16-64  
 805 6-22-64



FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY - 71 - 17.83  
 CUY - 176 - 12.76

184  
 646  
 86  
 132

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK









FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

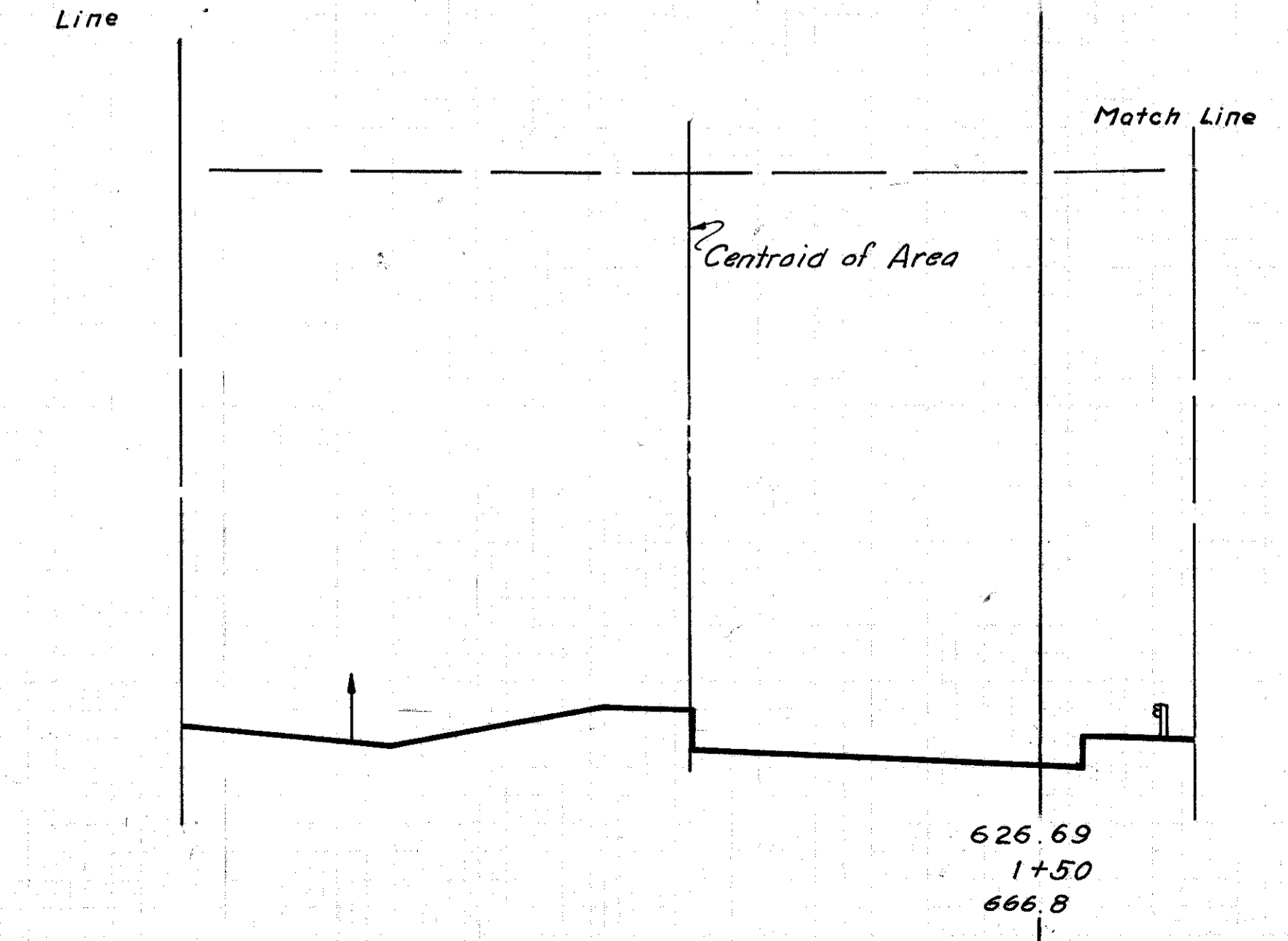
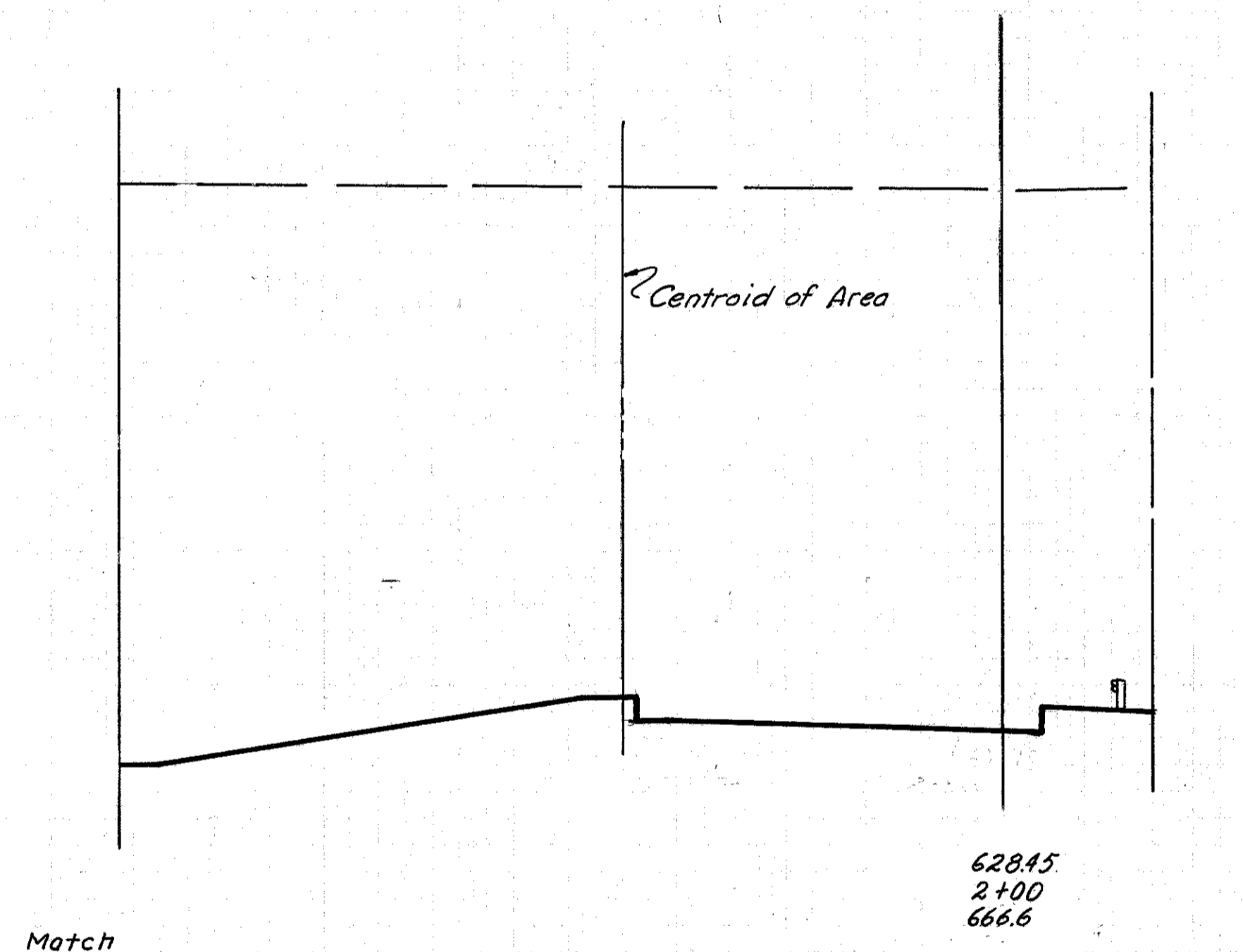
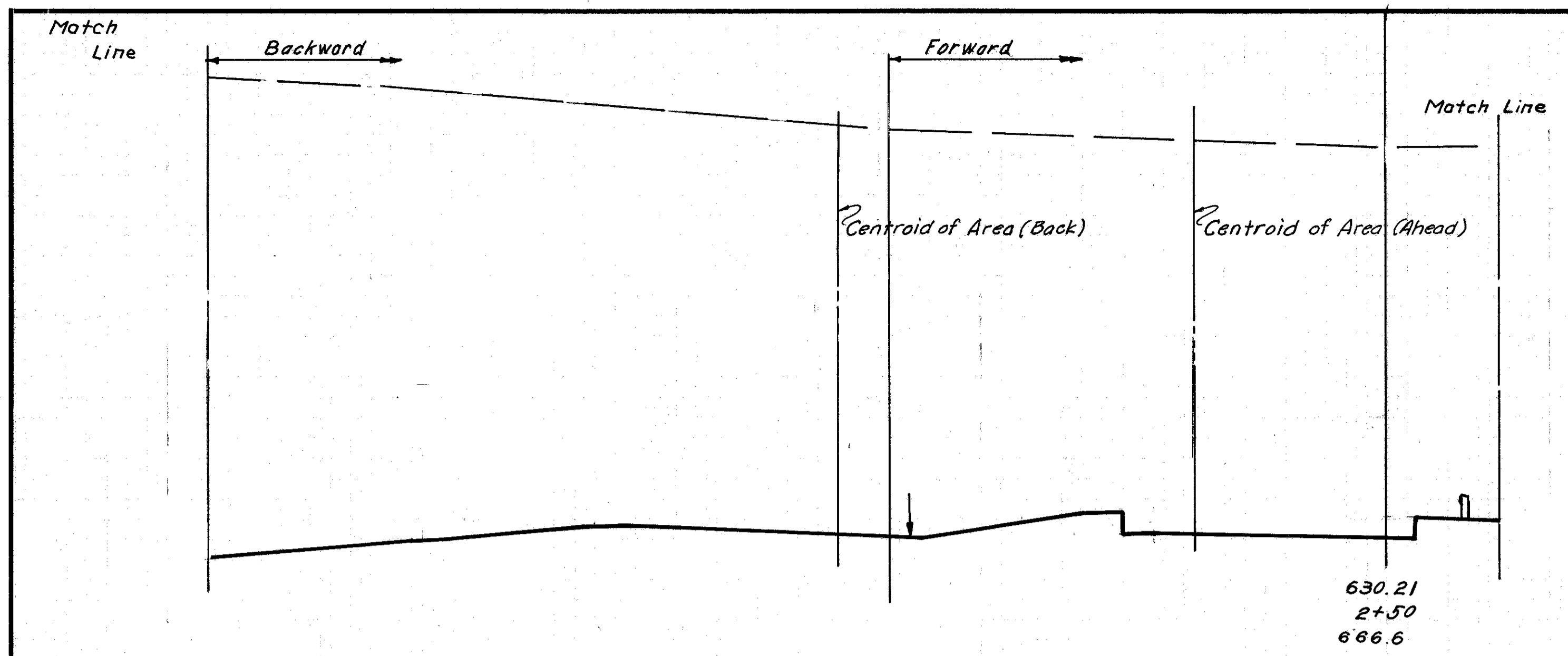
188  
676

CUYHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

90  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
			6001
			640
		Forward	2314 0
		Backward	5181 0
			660
		Exc. $\frac{(5181+3021)56}{2(27)}$	8505 0
			640
			620
			3021 0
			660
		Exc. $\frac{(2944+3021)53}{2(27)}$	5854 0
			640
			620
		Exc. $\frac{(2131+2916)53}{2(27)}$	2944 0
		Sta. 1+00	2159 0
			5008 0

Extra Volume - Sta. 2+50 JR-J  
to Sta. 36+50 N.B. Jennings



PLS 5-15-64 HQD 5-20-64  
 DUS 5-28-64 HLD 6-1-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK







DIVISION 110 5-18-64  
 FROM 4-21-64 TO 5-13-64  
 DIVISION 110 5-13-64  
 6-8-64

EARTHWORK		VOLUME	
END AREA	EXC.	EMB.	EXC.
	3512	0	6296
	3257	0	5688
	2886	0	3258
	632	0	731
	157	20	18

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY - 71 - 17.83  
 CUY - 176 - 12.76

192  
 646  
 94  
 132



632.76  
 7+00  
 674.3

633.60  
 6+50  
 673.8

634.44  
 6+00  
 673.7

635.28  
 5+50  
 643.7

636.12  
 5+00  
 638.0



DIS. 9-24-64 H.C. 5-17-64  
 P.L. 10-24-64 D.C. 5-8-64  
 P.L. 10-24-64 R.L.D. 5-0-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

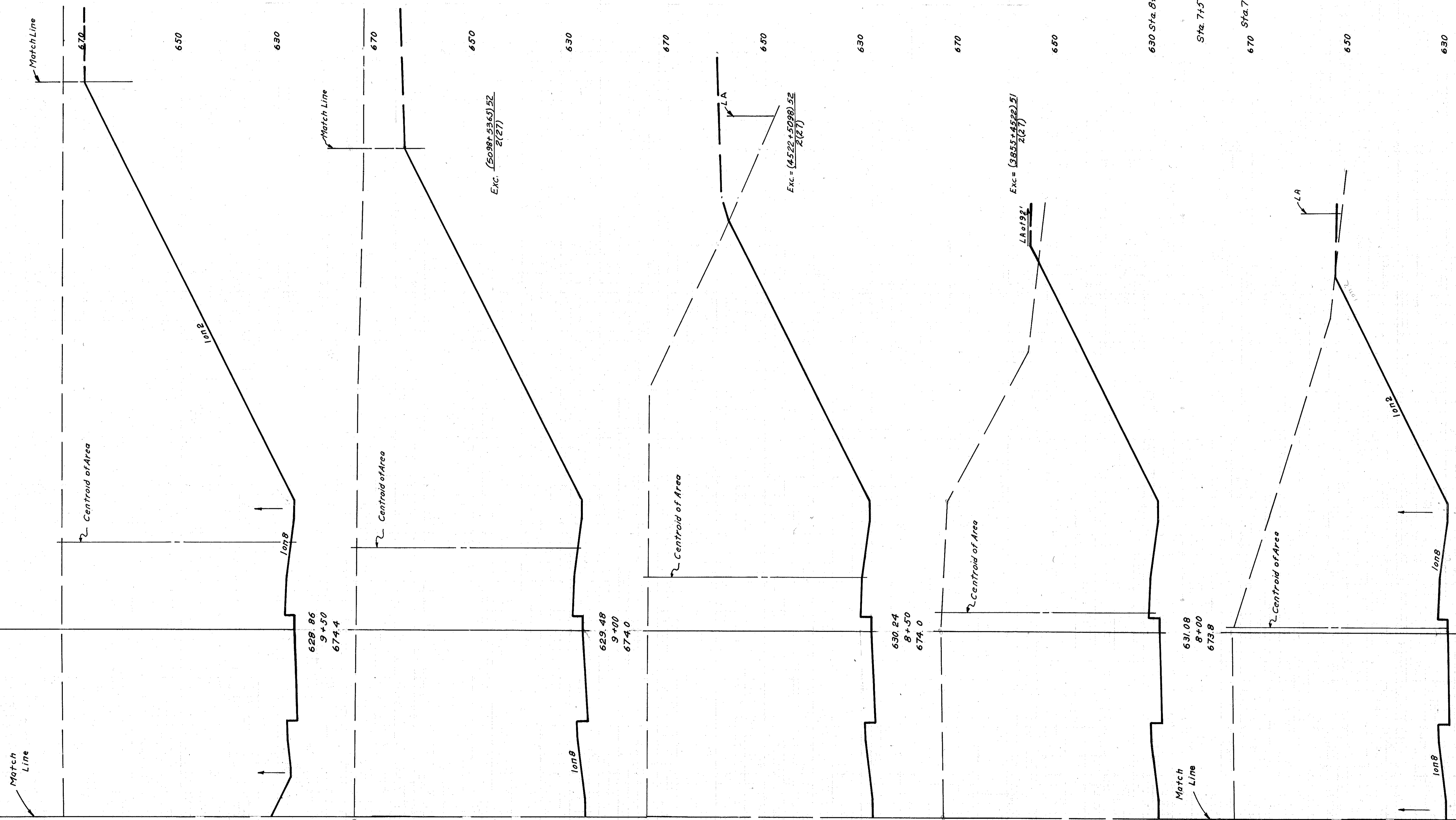
EARTHWORK	
END AREA	VOLUME
EXC.	EMB.
5365	0
5098	0
4522	0
3855	0
3365	0
3542	0
10075	0
9264	0
7912	0
6870	0
6581	0

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

193  
 646

95  
 152





FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

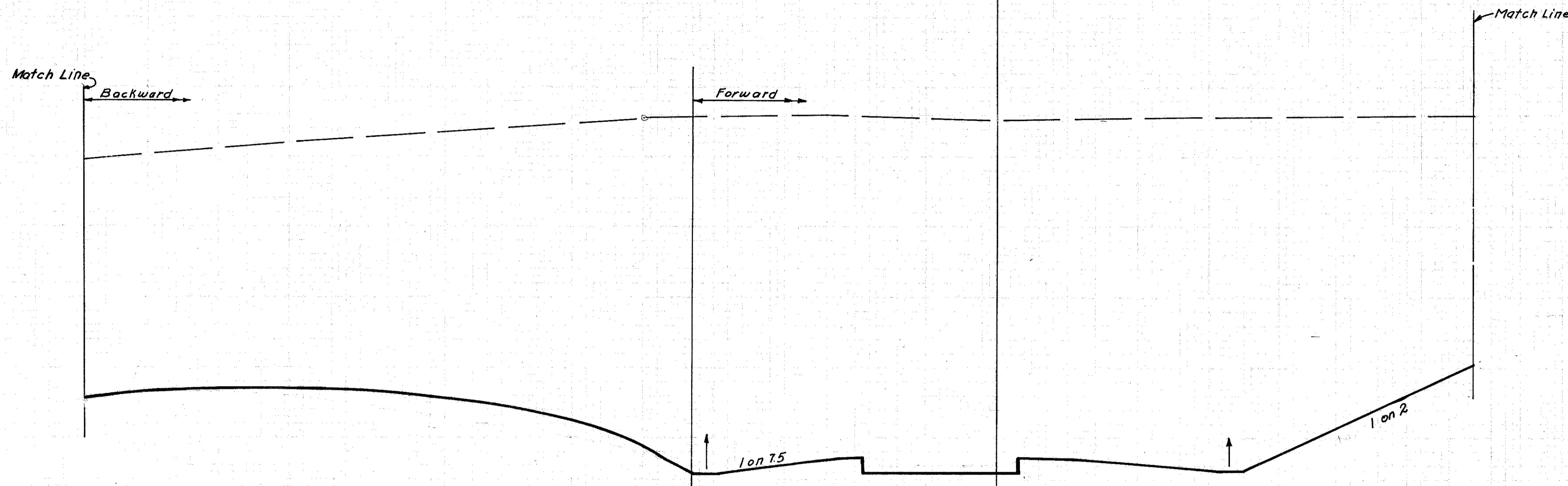
195  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

97  
152

EARTHWORK

END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



627.36  
12+00  
675.1

680

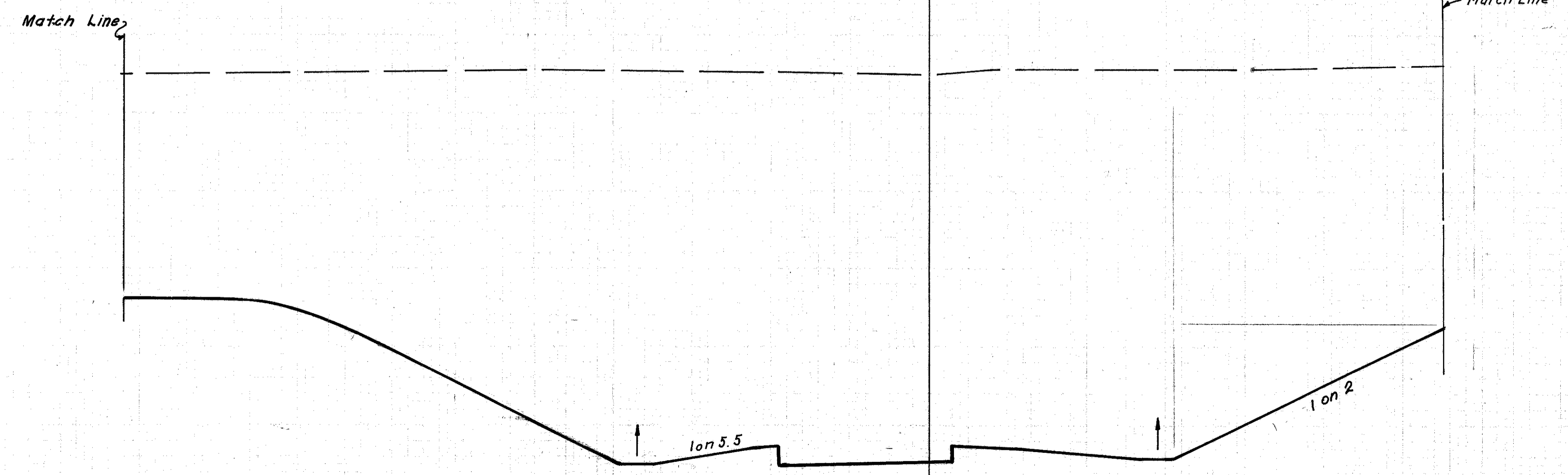
660

640

620

Forward 5469 0

Backward 8647 0



627.60  
11+50  
675.0

680

660

640

620

14663 0

7188 0

13417 0

Sta. 11+00 7301 0

DIS. 6-1-54 P. 10 4-3-54  
 R. H. 7-7-54  
 D. L. 8-1-54  
 R. S. C-22-54 5-1-54

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

120 100 80 60 40 20 0 20 40 60 80 100

RAMP J-JR STA. 11+50 TO STA. 12+00





















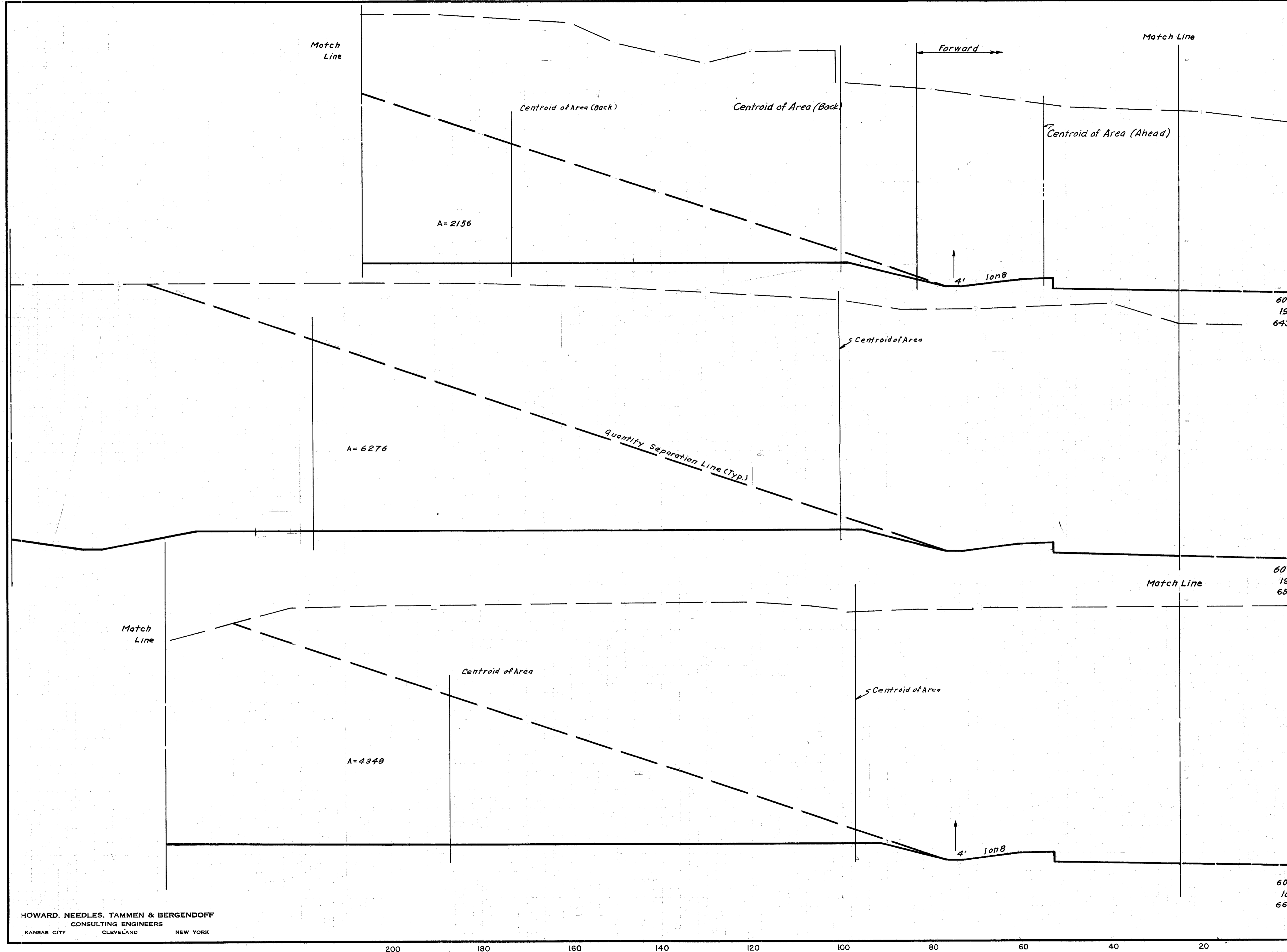
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

205  
646

107  
152

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



630				
610				
607.14	Forward	2364	0	
19+50	Backward	6272	0	
643.0				
650				
	Exc.	$\frac{(6272+7803)64}{2(27)}$		
630				16681 0
610				
607.92		7803	0	
19+00				
657.8				
650				
	Exc.	$\frac{(7584+7803)65}{2(27)}$		18521 0
630				
610				
609.12		7584	0	
18+50				
665.0				
	Exc.	$\frac{(6550+7584)62}{2(27)}$		16228 0
		6550	0	

H.M.D. 6-25-64 DIS 6-10-64  
 H.M.D. 6-25-64 DIS 6-10-64  
 DIS 6-10-64 R.P.D. 6-9-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

200 180 160 140 120 100 80 60 40 20 0

RAMP J-JR LEFT HALF STA. 18+50 TO STA. 19+50

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

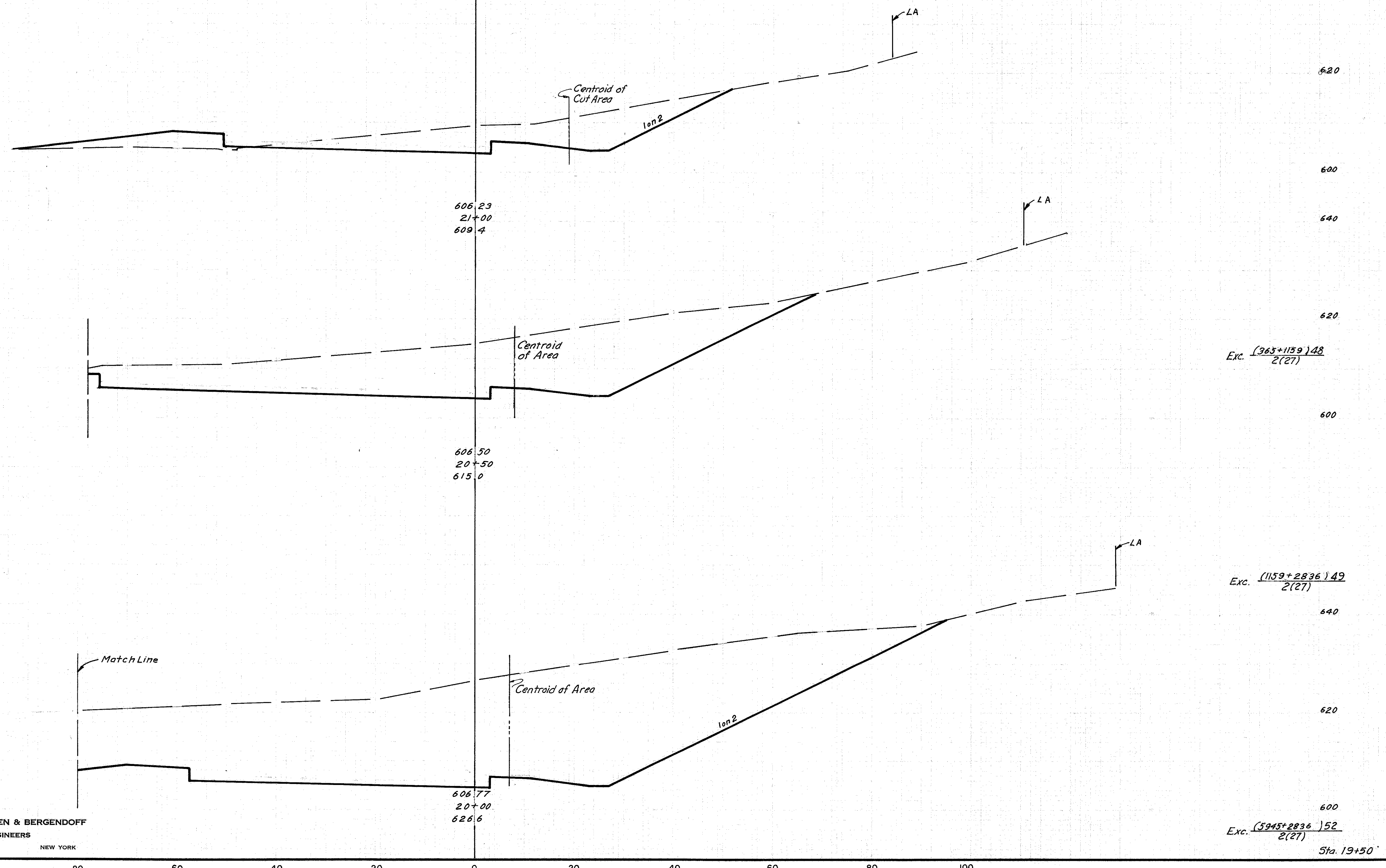
206  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

108  
152

EARTHWORK

END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



REVISIONS  
 DVS 8-21-69  
 DAK 9-20-69  
 R.S. 9-28-69  
 R.S. 10-1-69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

RAMP J-JR 20+00 TO STA. 21+00

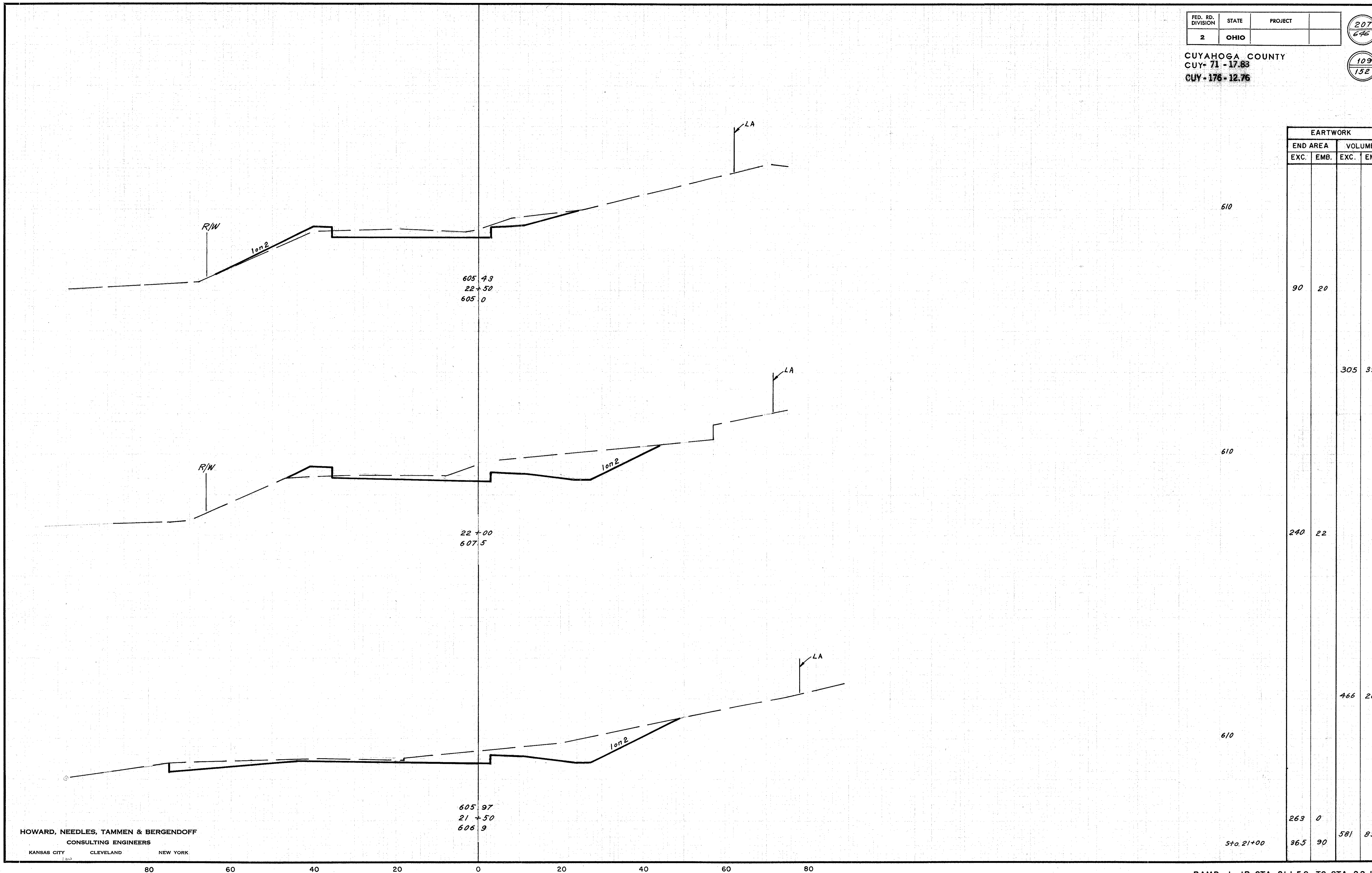
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

207  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

109  
152

EARTWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
90	20		
		305	39
240	22		
		466	20
263	0		
365	90	581	83



605 43  
22+50  
605 0

22+00  
607 5

605 97  
21+50  
606 9

RAMP-18-44 DJS 8-21-69  
 RAMP-18-44 DPK 8-20-69  
 DJS 7-29-69  
 RSK 10-1-69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

RAMP J-JR STA. 21+50 TO STA. 22+50

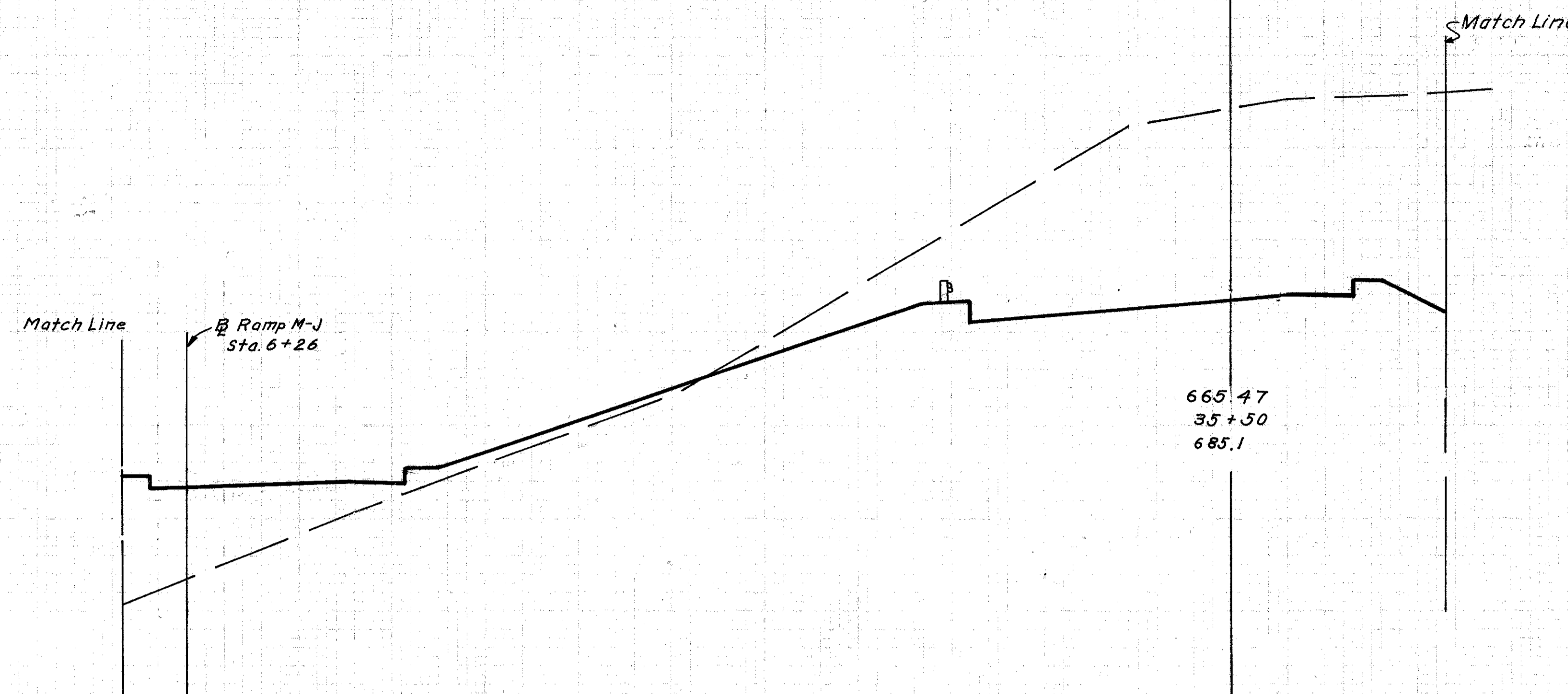
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

208  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

110  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



665.47  
 35+50  
 685.1

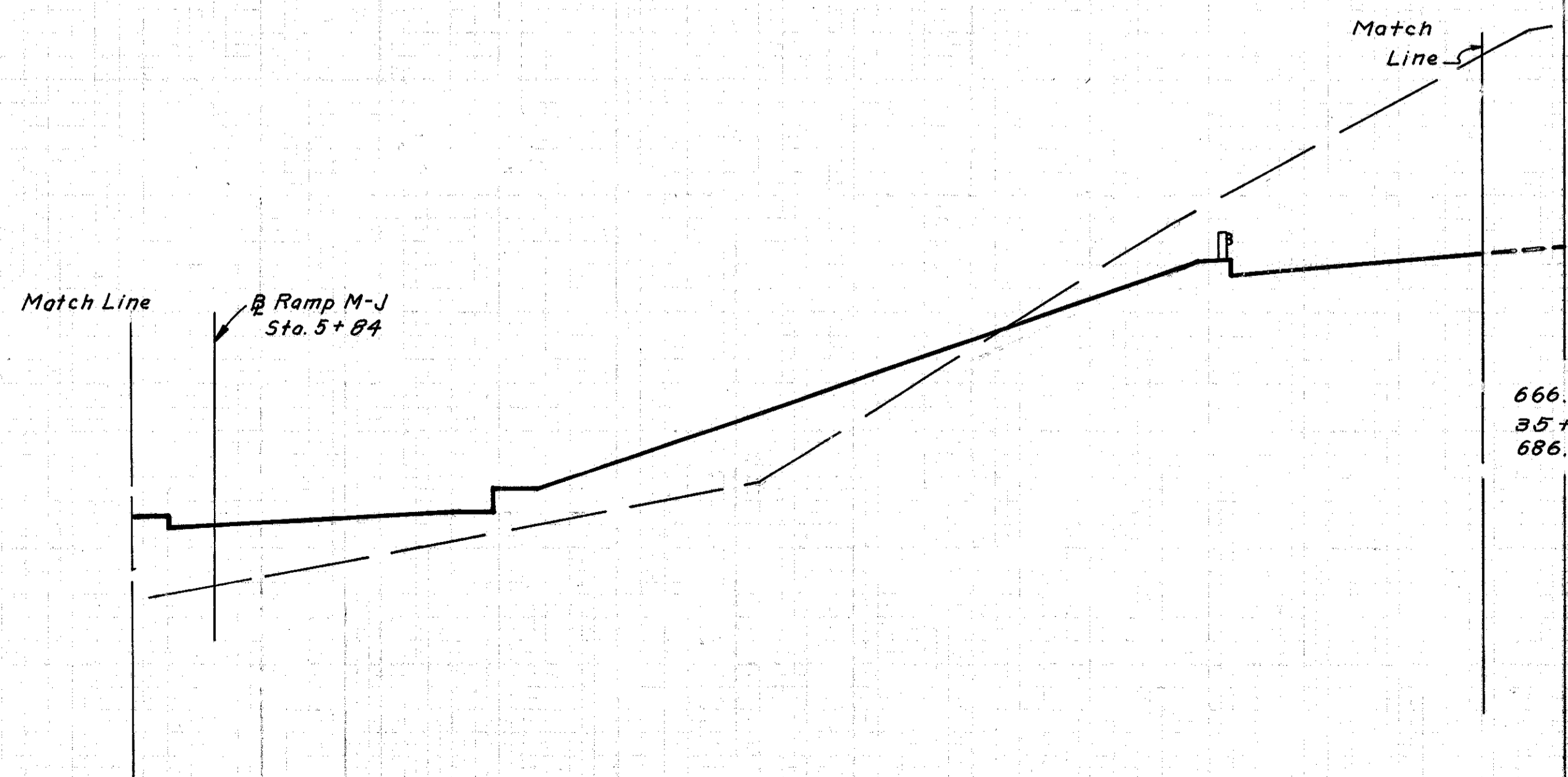
670

650

630

1085 240

1290 472



666.39  
 35+00  
 686.0

670

650

630

308 270

Spill Volume

1110 38

4/28/68 DJJ  
 5/12/68 DJJ  
 6/10/68 DJJ  
 6/22/68 DJJ  
 6/24/68 DJJ  
 6/25/68 DJJ

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

140 120 100 80 60 40 20 0 20 40 60

SBOR 35+00 TO STA. 35+50





FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

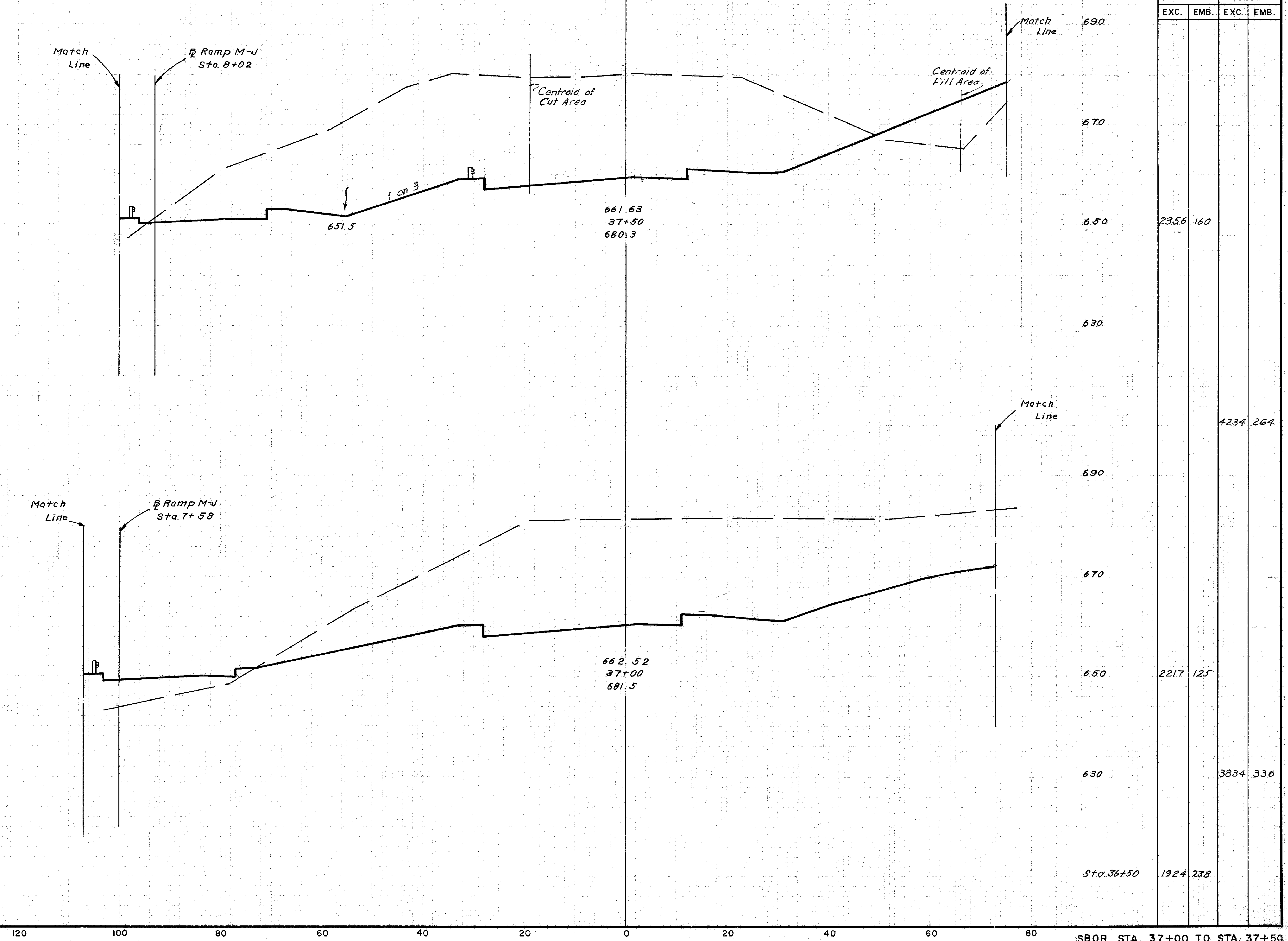
210  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

112  
152

EARTHWORK

END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



HDS 6-10-64  
 DJS 6-10-64  
 DLO 5-22-64  
 HLD 6-9-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

SBOR STA. 37+00 TO STA. 37+50

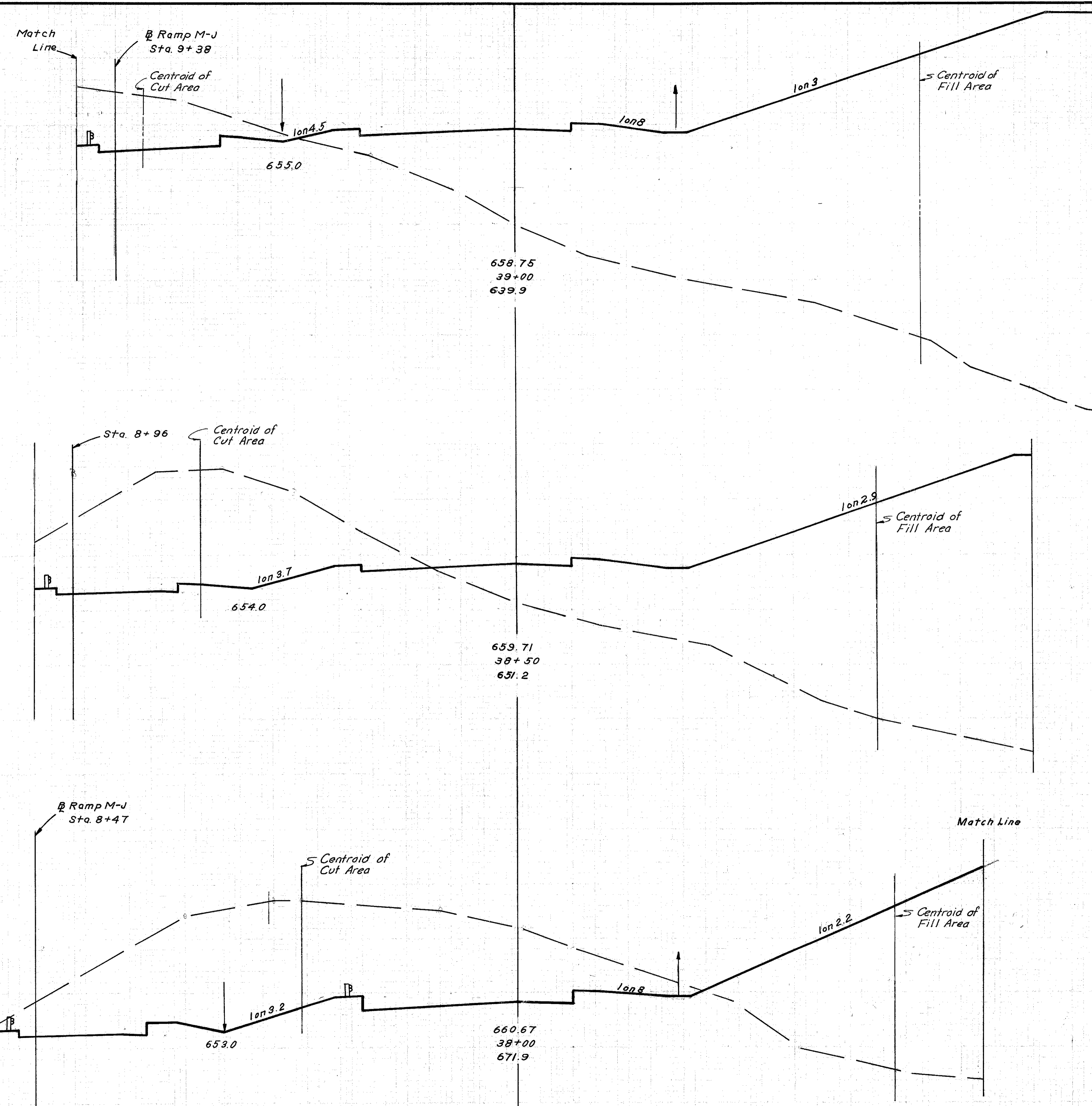
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		690	
		670	
		650	2356 160
		630	
		690	
		670	
		650	2217 125
		630	3834 336
		Sta. 36+50	1924 238
			4234 264

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

211  
646

113  
152

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



Station	EARTHWORK			
	END AREA		VOLUME	
	Exc.	Emb.	Exc.	Emb.
640				
620				
680				
660				
680				
660				
680				
660				
Sta. 37+50				

Exc  $\frac{(1000+270)47}{2(27)}$   
Emb  $\frac{(2597+4045)55}{2(27)}$

Exc.  $\frac{(1712+1000)50}{2(27)}$   
Emb  $\frac{(1152+2597)54}{2(27)}$

Exc.  $\frac{(2343+1712)52}{2(27)}$   
Emb  $\frac{(95+1152)54}{2(27)}$

H&N 5/15/69 DJS G-10-69  
 H&N 5/15/69 DJS G-1-69  
 DJS 5/15/69 HLD 2-5-69

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK



SBOR STA. 38+00 TO STA. 39+00

M-15

M-15

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY  
 CUY. 71-12.03  
 CUY. 170-12.76

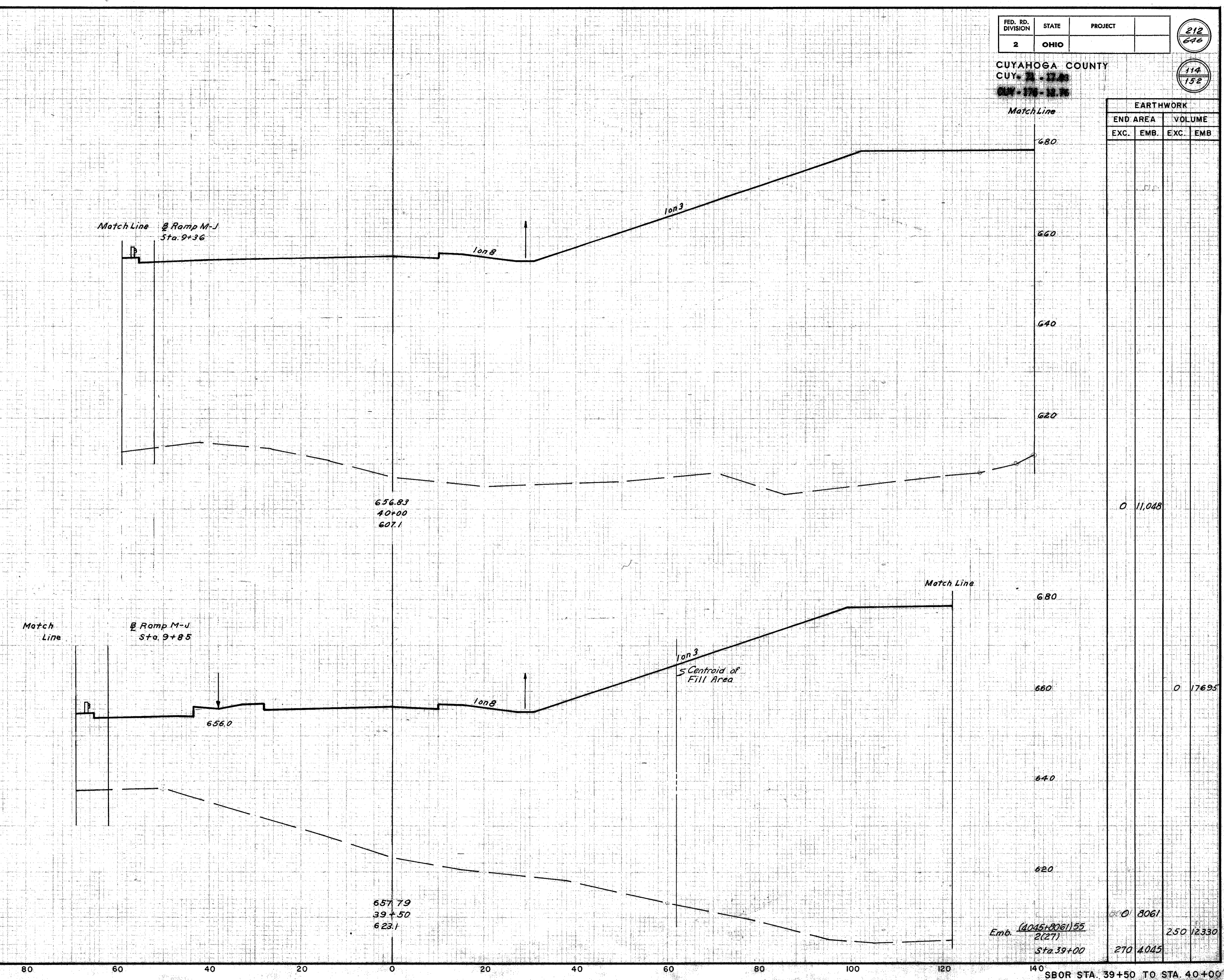
212  
646

114  
152

DJS 5-10-55  
 DJS 5-22-55  
 DJS 8-9-58

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		0	11,048
		0	17,695
640	8061	250	12,330
270	4,045		

Emb (4045+8061)/55  
 2(27)  
 Sta. 39+00

80 60 40 20 0 20 40 60 80 100 120 140 SBOR STA. 39+50 TO STA. 40+00

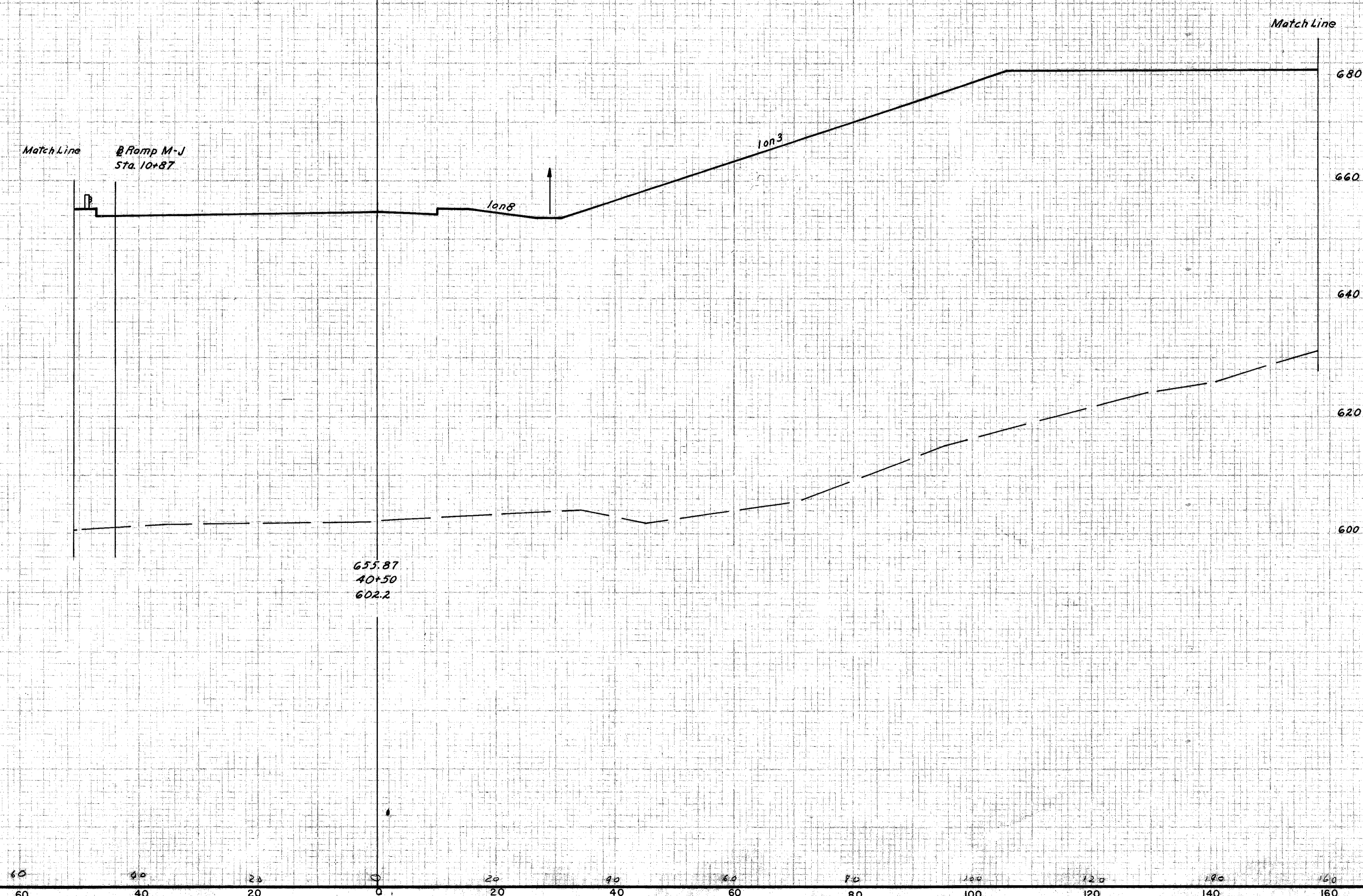
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

213  
646

CUYAHOGA COUNTY  
 CUY-71-17.50  
 CUY-175-12.75

115  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



0	11,485	0	20,865
0	11,048	0	11,048

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

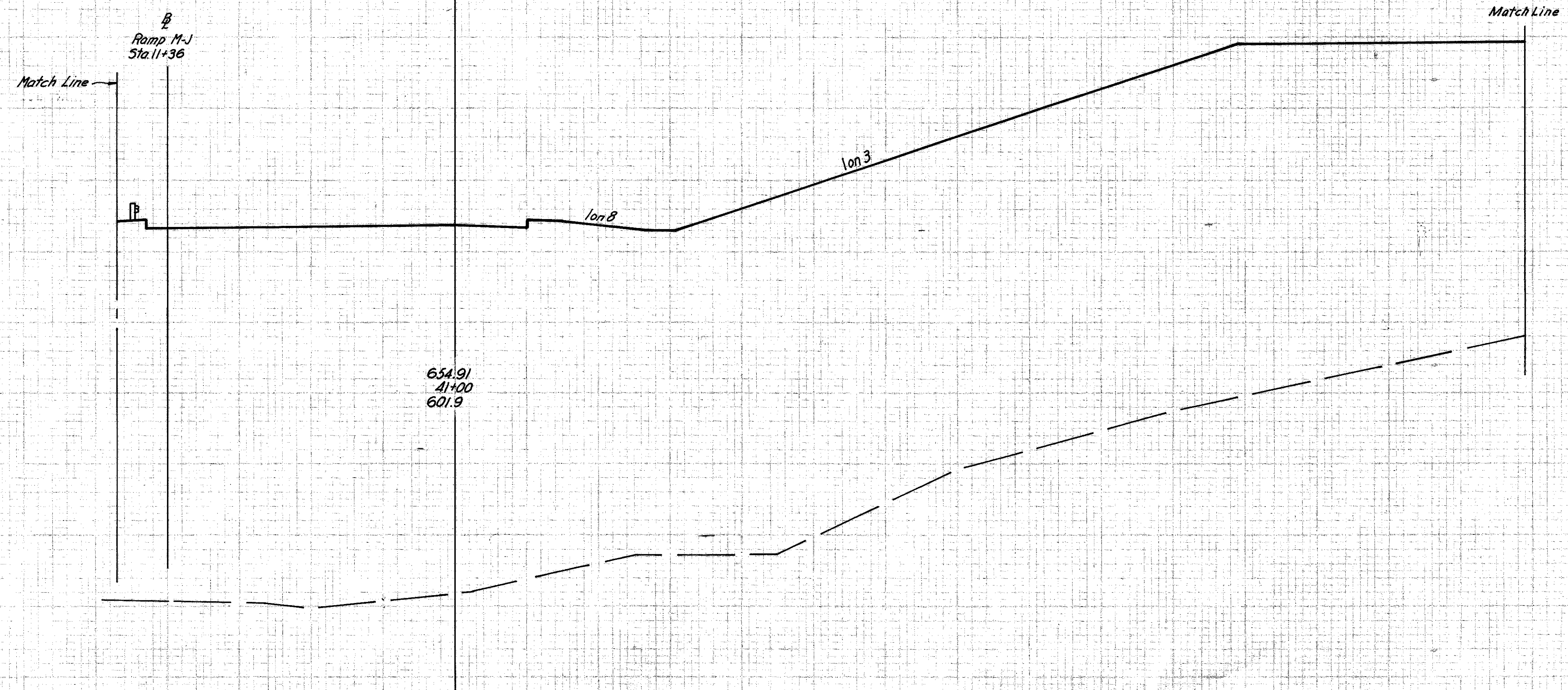
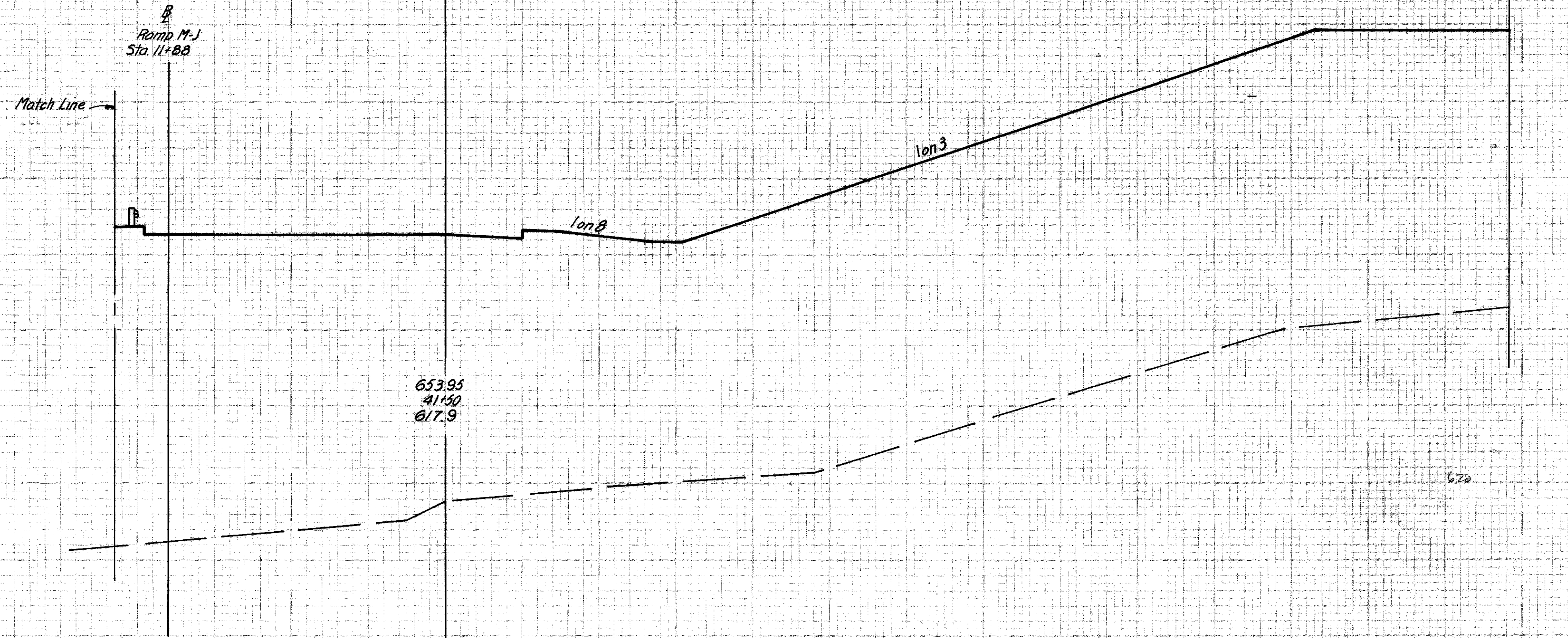
DWS-5-2-69 HAD 6-7-69  
 ABM-5-14-69 DLO-5-22-69  
 DWS  
 P. 1-14

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

214  
646

CUYAHOGA COUNTY  
CUY-71-17-30  
Cuy-71-17-30

116  
152



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
			0 6637
			0 15005
			0 9567
			0 19494
			0 11,485

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

PLOT NO. 11  
 DATE 8-1-54  
 DRAWN BY J. J. B. 8-1-54  
 CHECKED BY J. J. B. 8-1-54  
 H.C. - P.P. 69

SBOR STA. 41+00 TO STA. 41+50





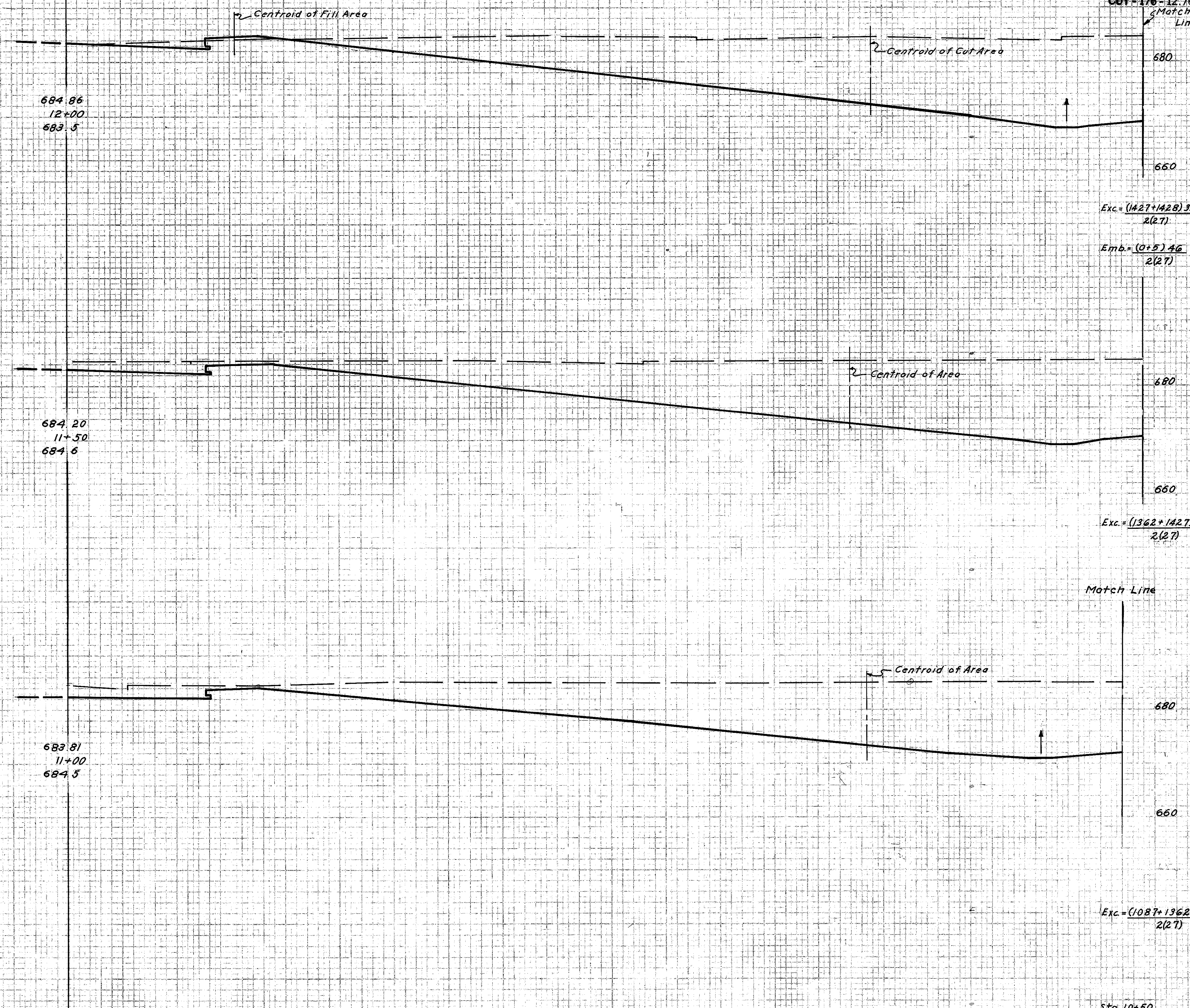


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

217  
646

119  
152

CUYAHOGA COUNTY  
 CUY - 71 - 17.83  
 CUY - 176 - 12.76



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
	1428	5	
			1850
	1427	0	
			1756
	1362	0	
			1451
	1087	0	

Exc. =  $\frac{(1427+1428) 35}{2(27)}$   
 Emb. =  $\frac{(0+5) 46}{2(27)}$

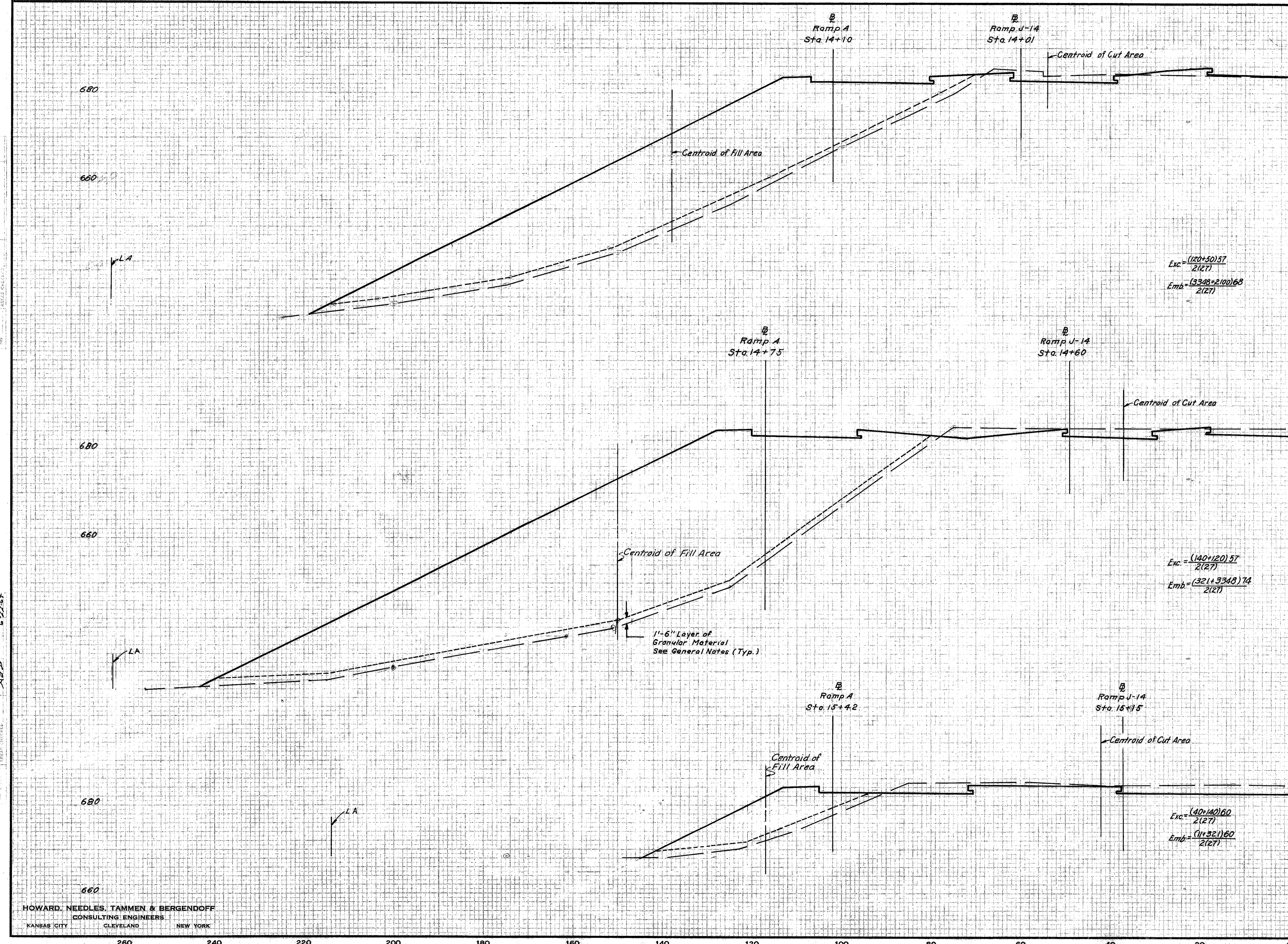
Exc. =  $\frac{(1362+1427) 34}{2(27)}$

Exc. =  $\frac{(1087+1362) 32}{2(27)}$

D.S. 11/15/61  
 R.M. 11/15/61  
 D.S. 11/15/61  
 D.S. 11/15/61  
 D.S. 11/15/61

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		12+00	
	50	683.5	
			179
			6860
		11+50	
	120	684.20	
		684.6	
			274
			5028
		11+00	
	140	683.80	
		684.5	
			200
			369
		Sta 10+50	
	40		
			11

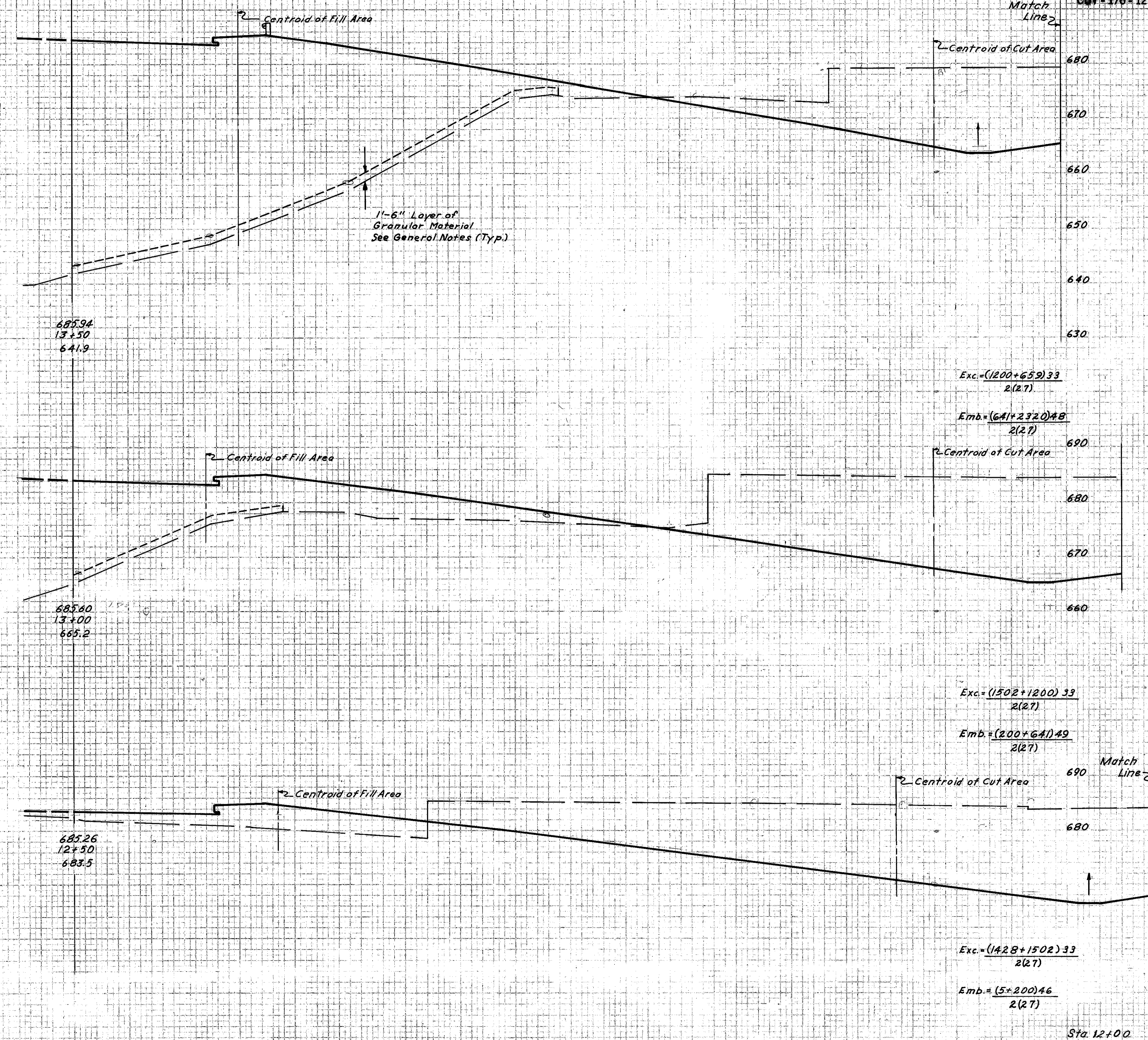


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

219  
646

121  
152

CUYAHOGA COUNTY  
CUY-71-17.83  
CNY-176-12.76



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		659	2320
			1136
		1200	641
			1651
		1502	200
			1790
		1428	5

685.94  
13+50  
641.9

$$Exc. = \frac{(1200 + 659) 33}{2(27)}$$

$$Emb. = \frac{(641 + 2320) 48}{2(27)}$$

685.80  
13+00  
665.2

$$Exc. = \frac{(1502 + 1200) 33}{2(27)}$$

$$Emb. = \frac{(200 + 641) 49}{2(27)}$$

685.26  
12+50  
683.5

$$Exc. = \frac{(1428 + 1502) 33}{2(27)}$$

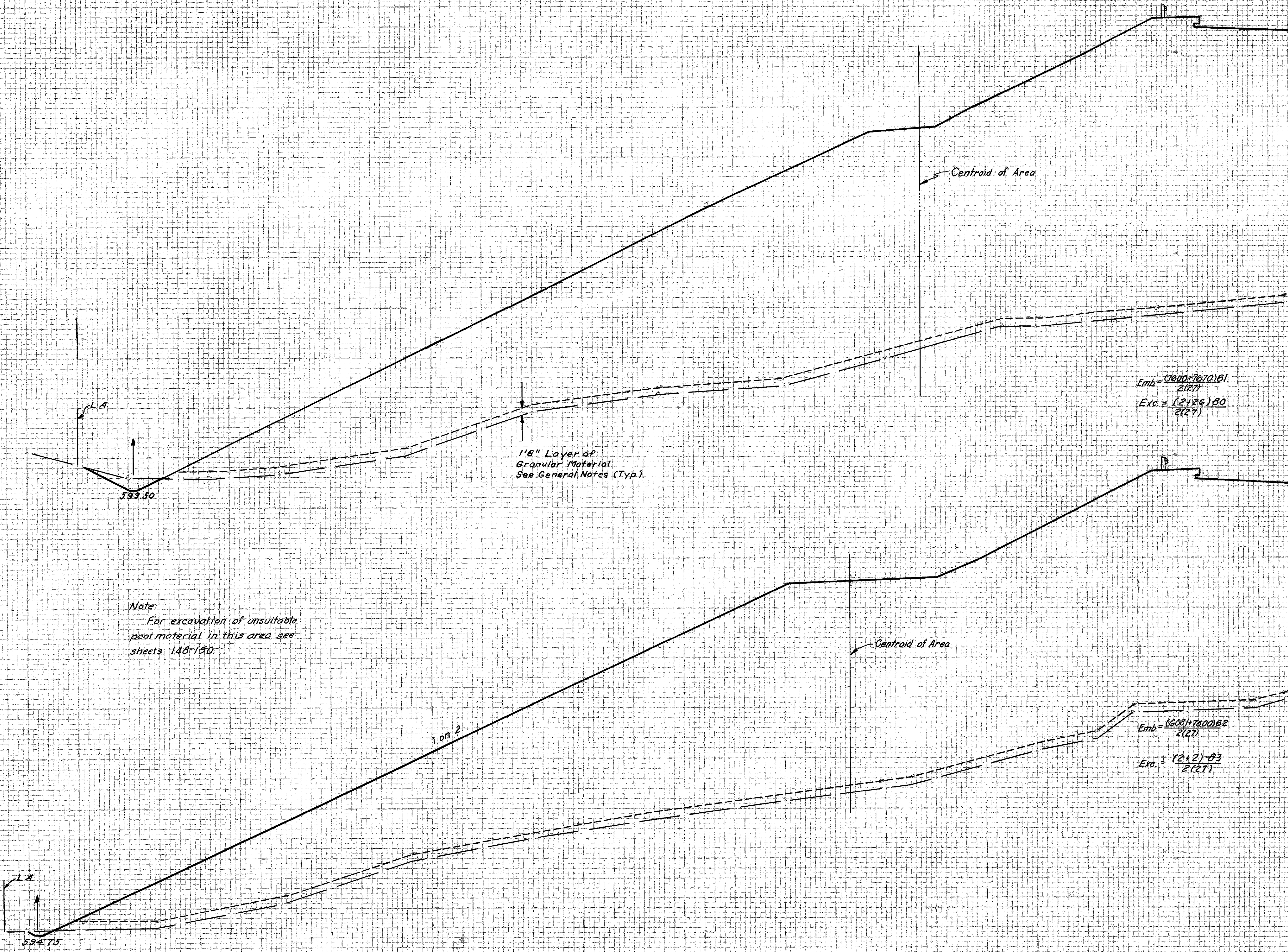
$$Emb. = \frac{(5 + 200) 46}{2(27)}$$

Sta. 12+00

FROM 2-17-66 NCD 2-15-64  
 RCH 6-5-64 RZD 6-9-64  
 DJS 6-22-64 S-11-64



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
670			
686.28 14+00	26	7670	
630.9			
650			
630			
		41	17249
670			
685.94 13+50	2	7600	
641.9			
650			
630			
		6	15708
Sta. 13+00	2	6081	



Note:  
For excavation of unsuitable  
peat material in this area see  
sheets 148-150.

$$Emb = \frac{(1600 + 7670) 61}{2(27)}$$

$$Exc. = \frac{(2126) 80}{2(27)}$$

$$Emb = \frac{(6081 + 7600) 62}{2(27)}$$

$$Exc. = \frac{(212) 83}{2(27)}$$

FINAL SURVEY PLOTTED  
DATE PLOTTED  
BY

ORIGINAL SURVEY PLOTTED  
DATE PLOTTED  
BY



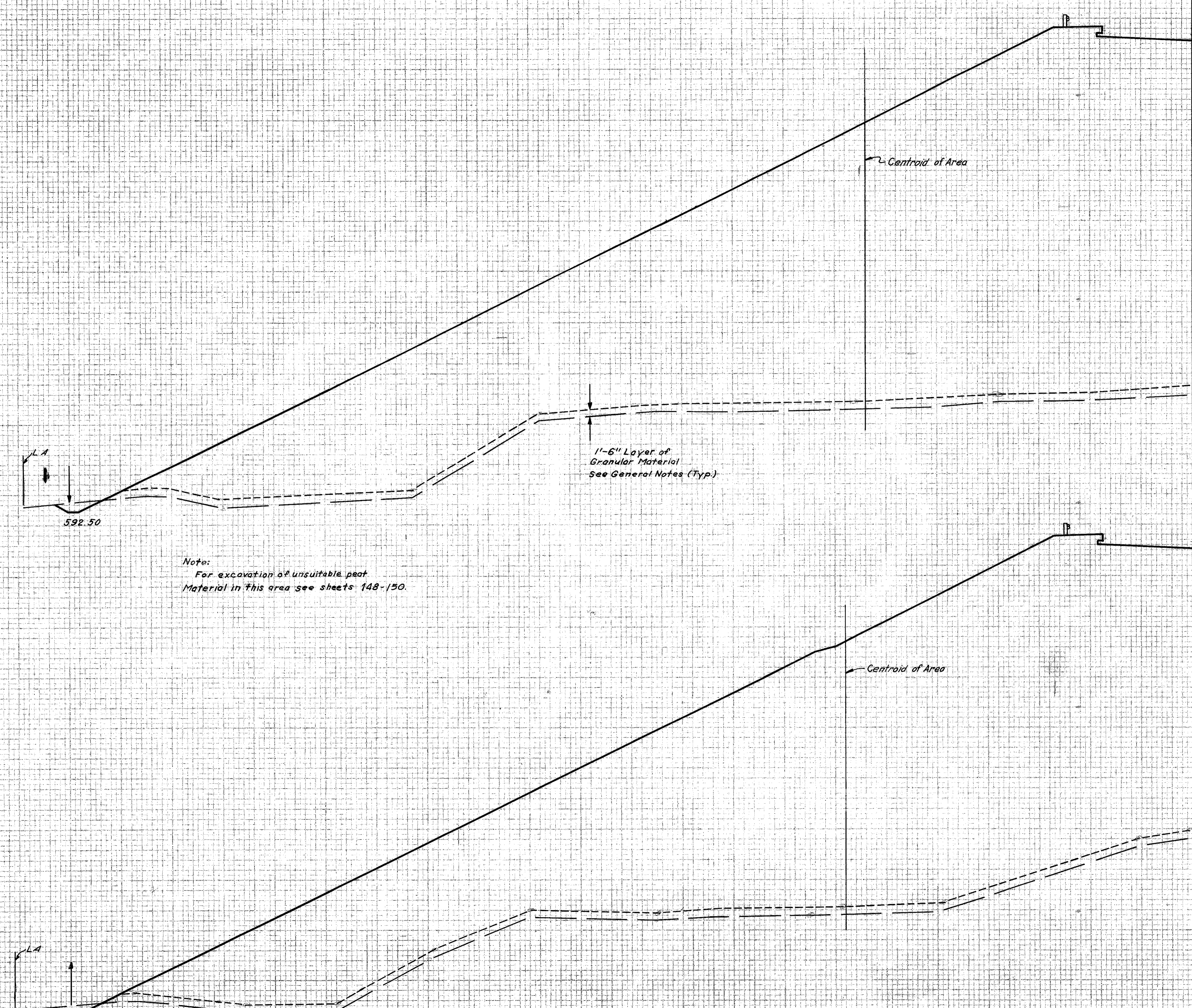
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

223  
646

125  
152

CUYAHOGA COUNTY  
CUY-11-11-68  
CUY-175-12-75

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



Note:  
For excavation of unsuitable peat  
Material in this area see sheets 148-150.

660  
686.96  
15+00  
615.9  
640  
Emb =  $\frac{(8140+8370) \cdot 20}{2(27)}$   
Exc =  $\frac{(12+20) \cdot 76}{2(27)}$

		20	8370		
				45	17,948

680  
660  
686.62  
14+50  
628.2  
640  
Emb =  $\frac{(7670+8140) \cdot 12}{2(27)}$   
Exc =  $\frac{(26+12) \cdot 76}{2(27)}$

		12	8140		
				53	17,274

Sta. 14+00

		26	7670		
--	--	----	------	--	--

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

SURVEY DISTRICT DVS 4-17-49 ALD  
 DATE BOOK 010 6-8-49  
 NO. 010 6-17-49 620-58  
 PLS. ONLY  
 SURVEY DISTRICT DVS 4-17-49 ALD  
 DATE BOOK 010 6-8-49  
 NO. 010 6-17-49 620-58

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

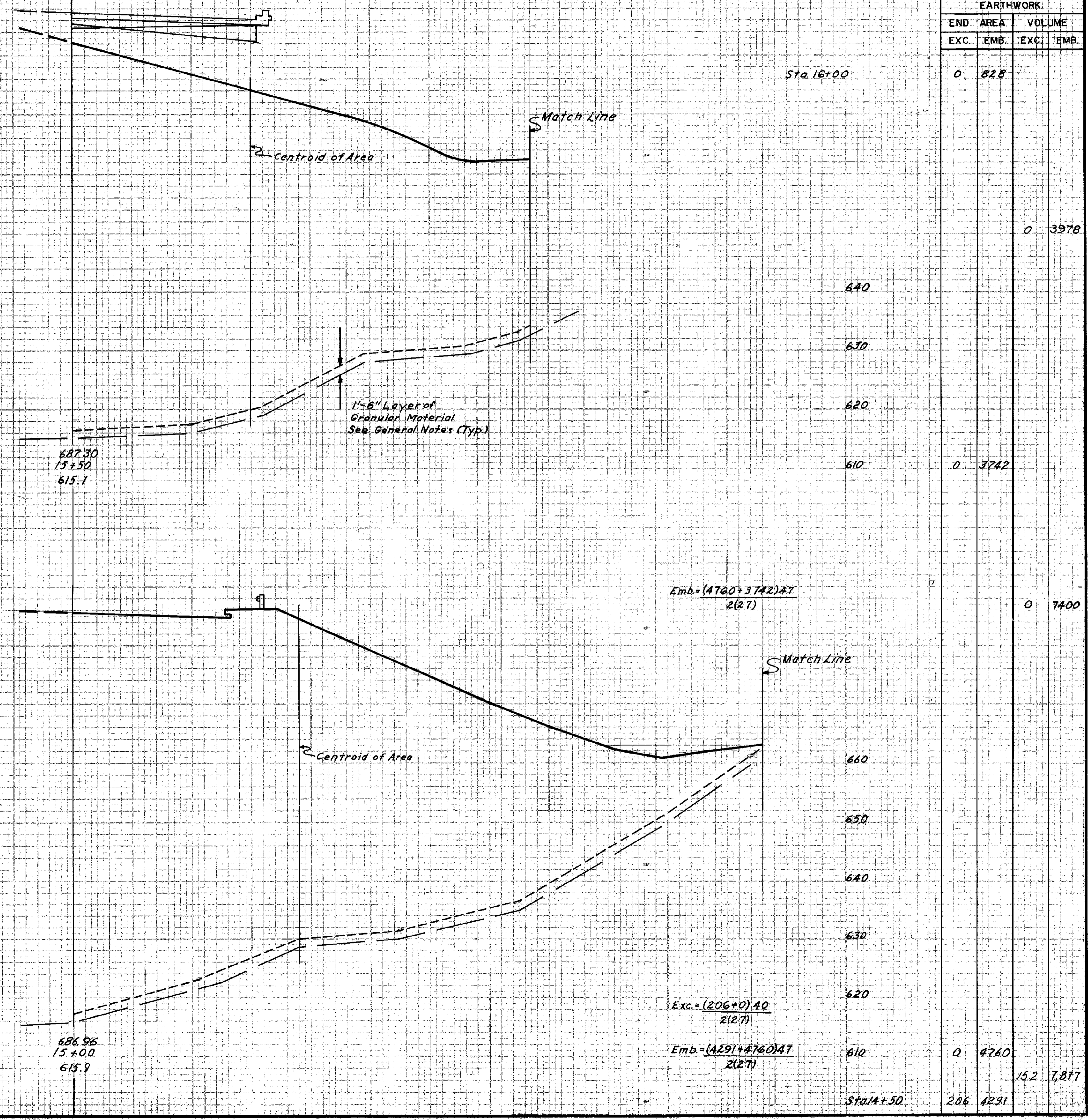
224  
646

126  
152

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

Note:  
For Sta. 16+00 Right Half  
See Sheet 127.

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

100% 5-17-64  
 90% 5-17-64  
 80% 5-17-64  
 70% 5-17-64  
 60% 5-17-64  
 50% 5-17-64  
 40% 5-17-64  
 30% 5-17-64  
 20% 5-17-64  
 10% 5-17-64  
 0% 5-17-64



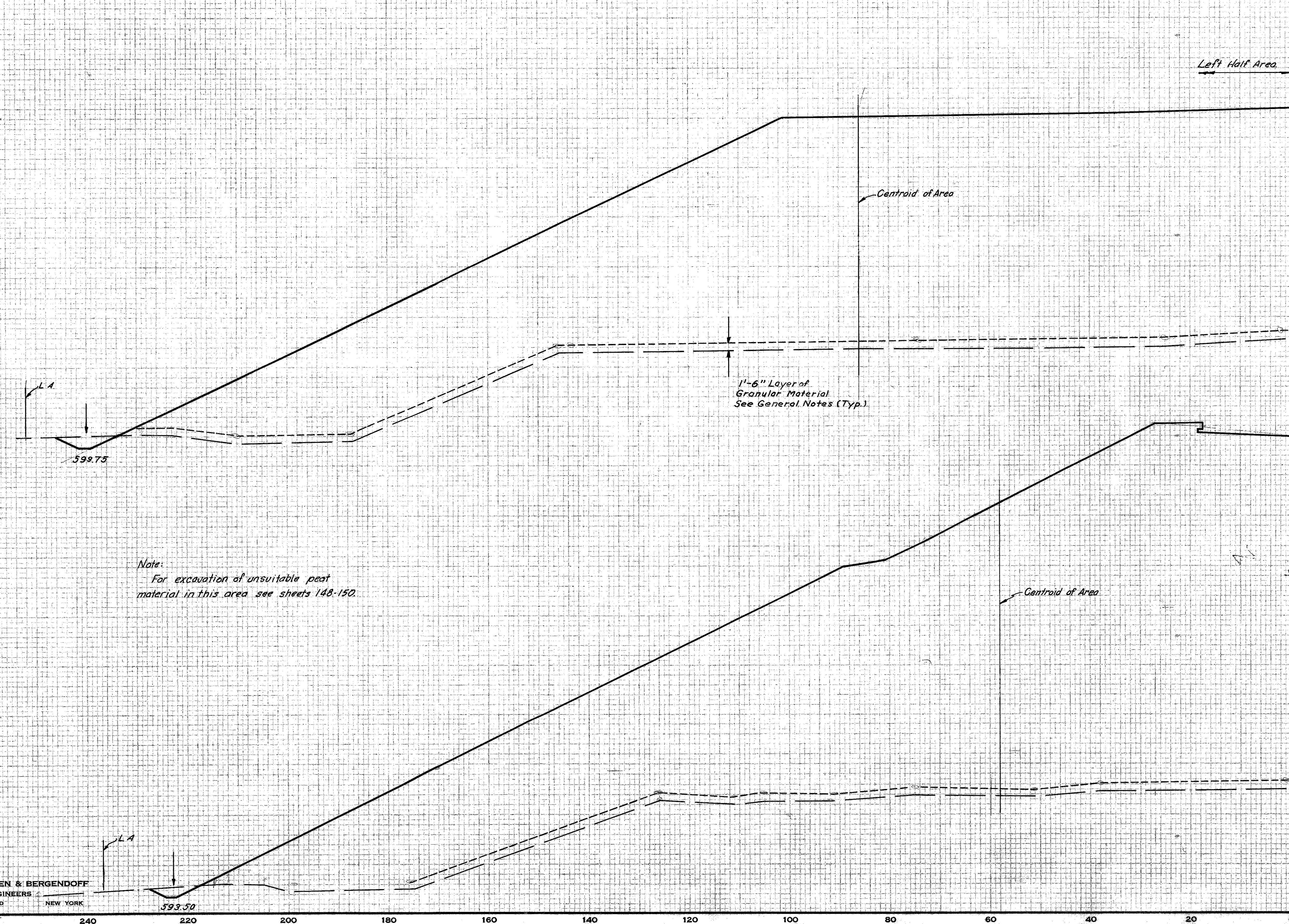
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

225  
646

CUYAHOGA COUNTY  
CUY-152-152  
CNY-152-152

127  
152

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
680			
Match Line			
660			
16+00	615.6	16	7950
640			
620			
Emb = $\frac{(8710+7950)65}{2(27)}$		44	20,054
Exa. = $\frac{(14+16)79}{2(27)}$			
680			
687.30	615.1	14	8770
660			
Emb = $\frac{(8370+8770)57}{2(27)}$		48	18,240
Exa. = $\frac{(20+14)76}{2(27)}$			
620			
Sta 15+00	657.0	20	8570



Note:  
For excavation of unsuitable peat material in this area see sheets 148-150.

1'-6" Layer of Granular Material. See General Notes (Typ.)

Centroid of Area

Centroid of Area

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

260 240 220 200 180 160 140 120 100 80 60 40 20 0  
RELOCATED WEST 14TH STREET LEFT HALF STA. 15+50 TO STA. 16+00

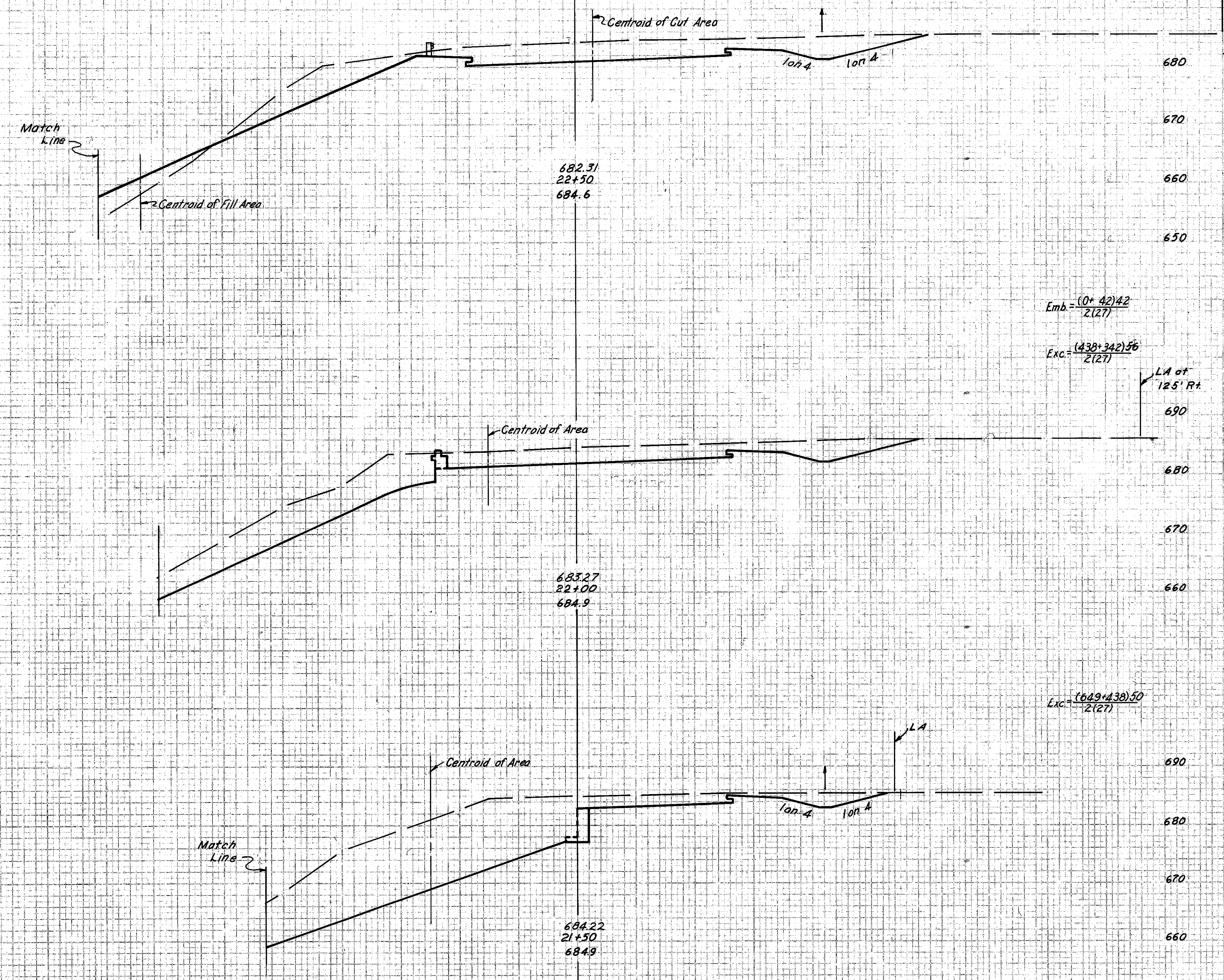
DATE: 10-1-61  
 DRAWN BY: R.M. 1-3-61  
 CHECKED BY: R.M. 6-22-61  
 SCALE: AS SHOWN  
 SHEET NO.: 152  
 PROJECT NO.: 152-152

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

226  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

128  
152



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
342	42		
			33
		809	
438	0		
			1006
649	0		
			4011

$$Emb = \frac{(0 + 42)42}{2(27)}$$

$$Exc = \frac{(438 + 342)56}{2(27)}$$

$$Exc = \frac{(649 + 438)50}{2(27)}$$

Spill Quantity

APPROVED: [Signature]  
 DATE: 6-11-67  
 BY: [Signature]  
 PROJECT: RELOCATED WEST 14TH STREET STA. 21+50 TO STA. 22+50  
 SHEET: 2 OF 2  
 DRAWN: [Signature]  
 CHECKED: [Signature]





FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

229  
646

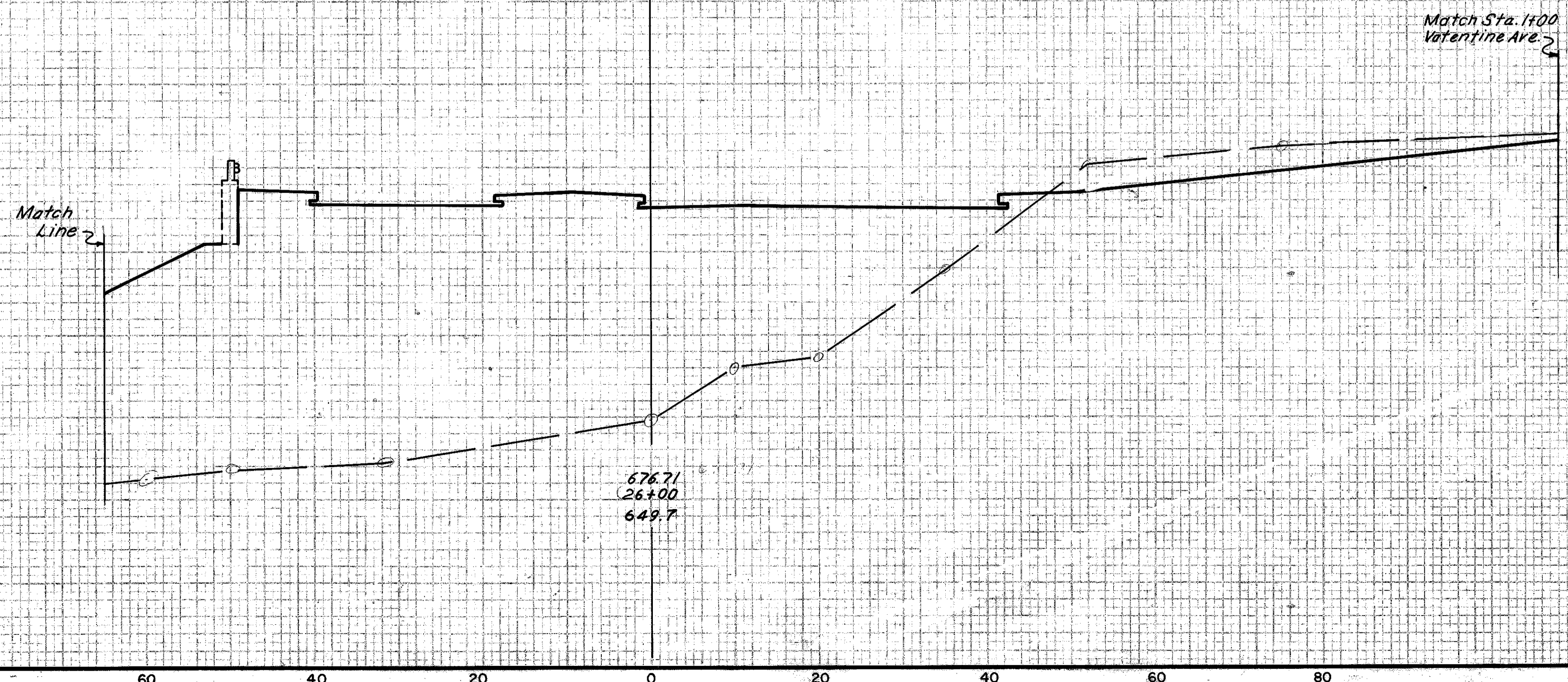
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

131  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.

Spill Volume

14 2791



640	15.3	2534
650		
660		
670		
680		
Sta. 25+50	135	2512

REVISION  
 DATE  
 BY  
 CHECKED  
 APPROVED  
 6-12-68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

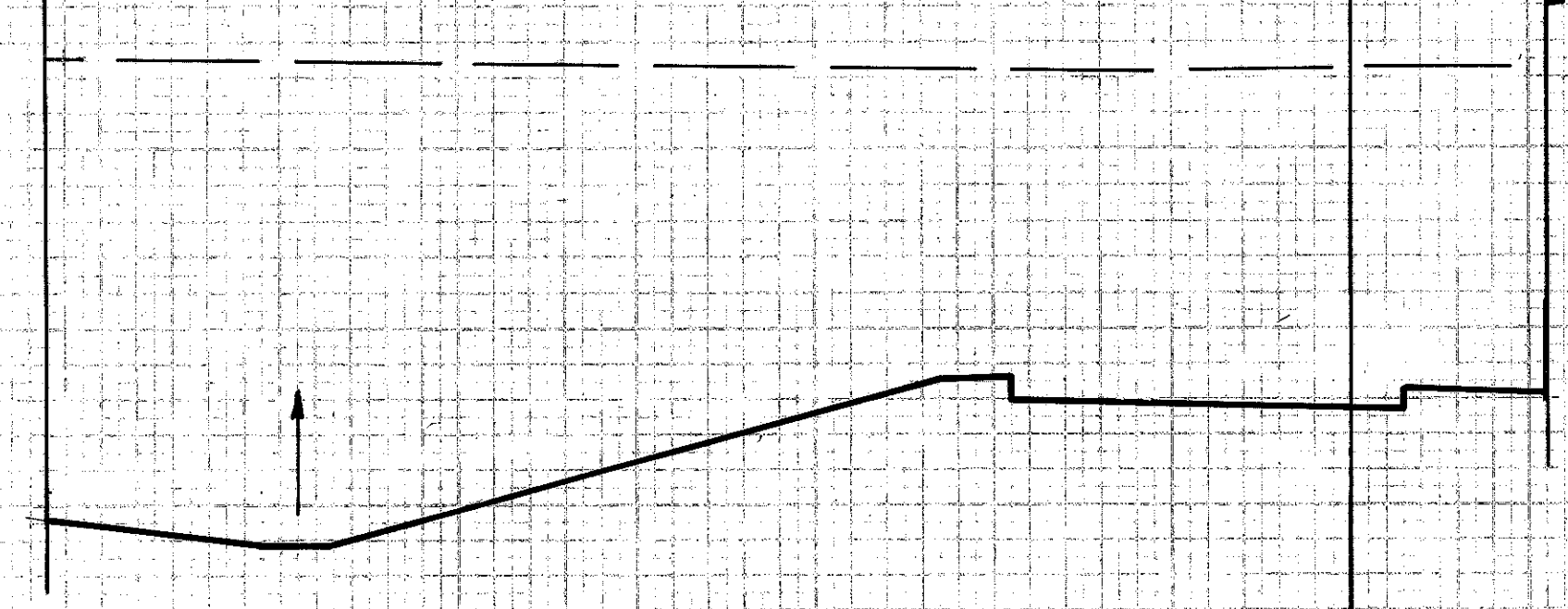
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

230  
646

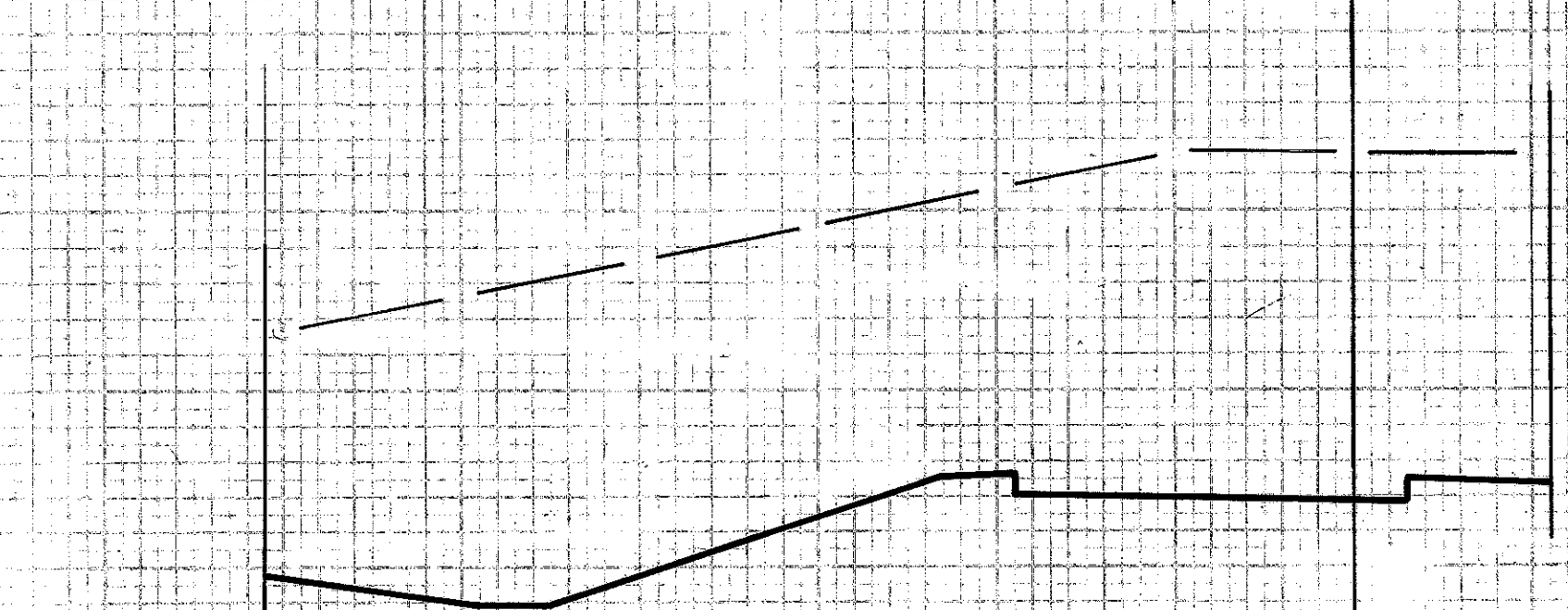
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

132  
152

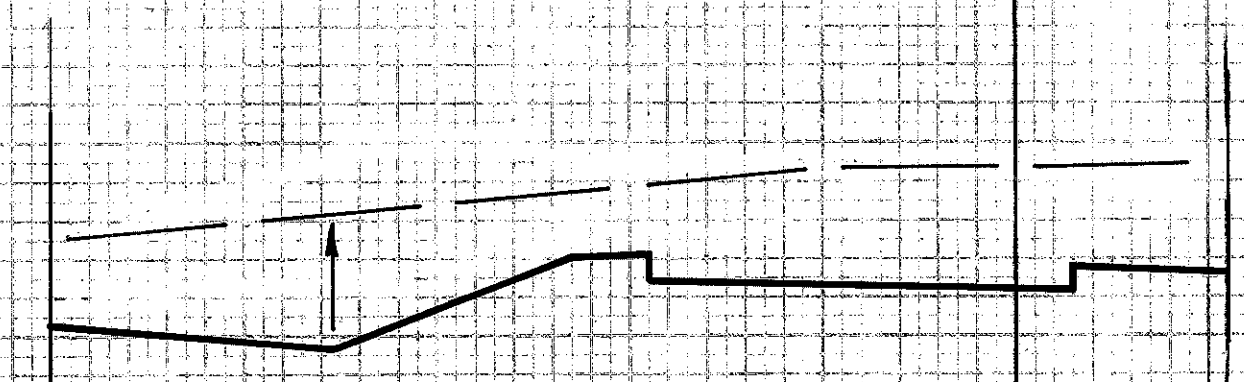
Match Line      Match Line



666.76  
7+00  
684.6

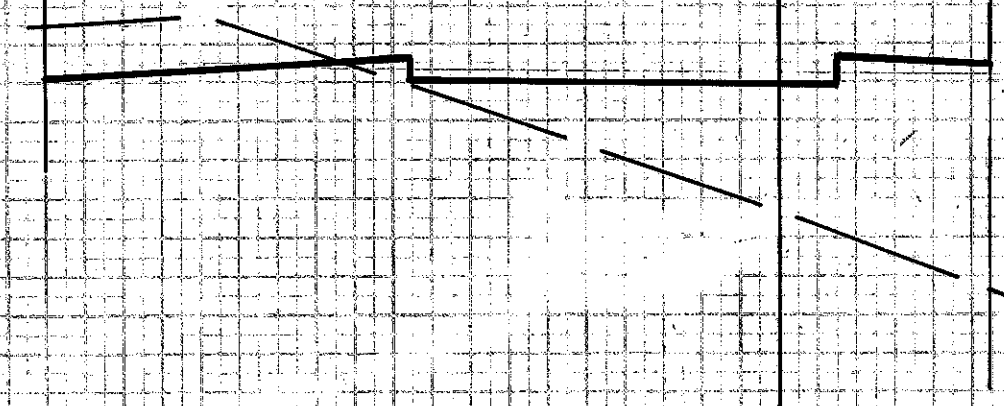


663.05  
6+50  
685.3



663.86  
6+00  
688.8

Match Line      Match Line



663.20  
5+50  
655.4

680

690

680

670

670

660

660

650

640

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
		1817	0
			2850
		1261	0
			1479
		336	0
			341
		52	171
			11

Additional Volume Sta. 5+32 to 5+50

11-340

40      20      0      20      40      60      80

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY      CLEVELAND      NEW YORK

RAMP NBOR-14 STA. 5+50 TO STA. 7+00

PROJ. NO. 230  
DIVISION 2  
STATE OHIO  
PROJECT  
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

DATE 6-17-59  
BY H. J. TAMMEN  
CHECKED BY H. J. TAMMEN  
APPROVED BY H. J. TAMMEN  
SCALE AS SHOWN

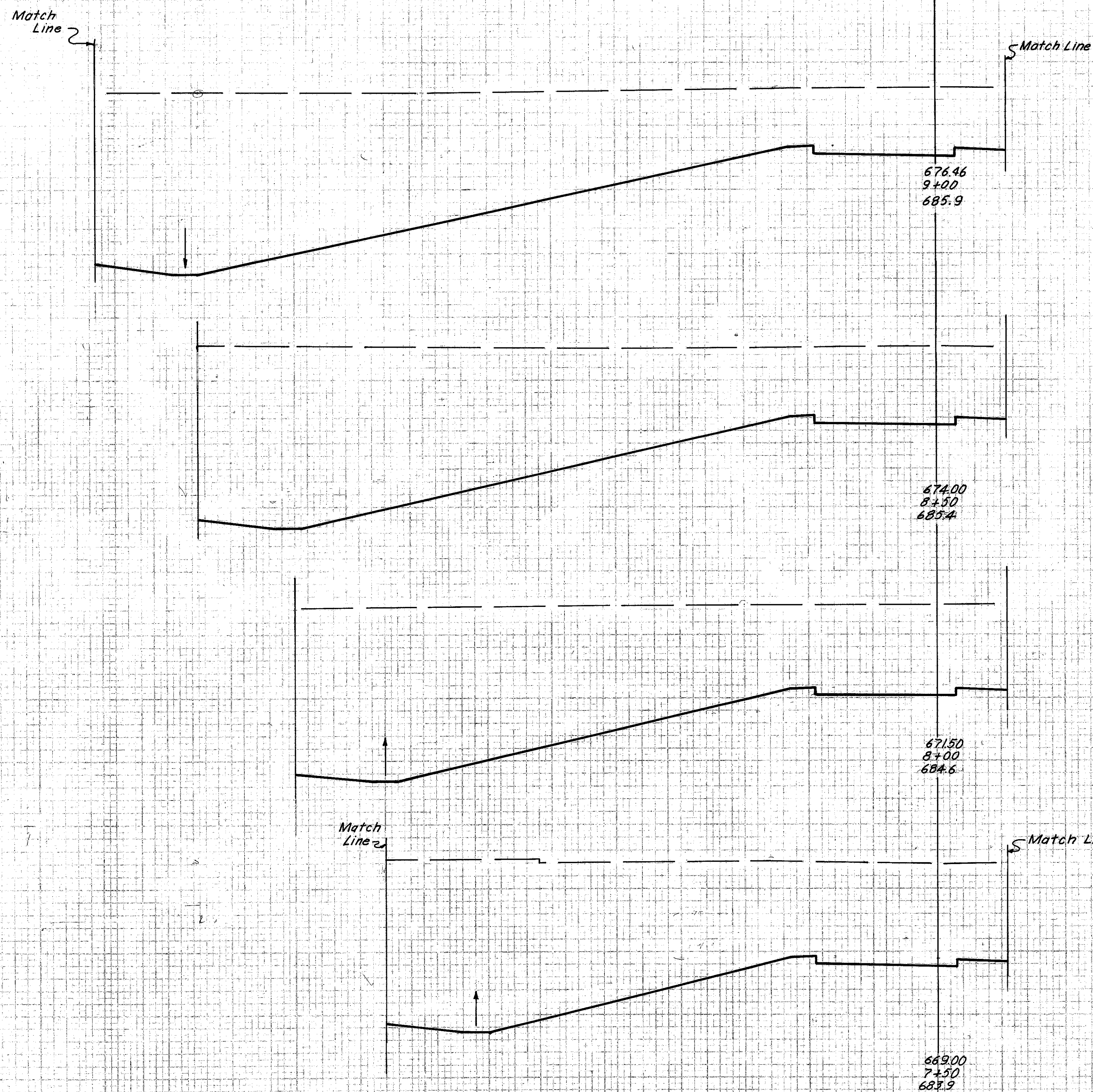
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

231  
646

193  
152

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



690			
680			
	2498	0	
690			4490
680			
	2351	0	
690			4166
680			
	2148	0	
690			
680			3813
	1970	0	
			3507
Sta. 7+00	1817	0	

PROJECT: RAMP NBOR-14 STA. 7+50 TO 9+00  
 DATE: 10-1-64  
 DRAWN BY: J. W. BROWN  
 CHECKED BY: J. W. BROWN  
 DIS. 6-11-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

140 120 100 80 60 40 20 0 20



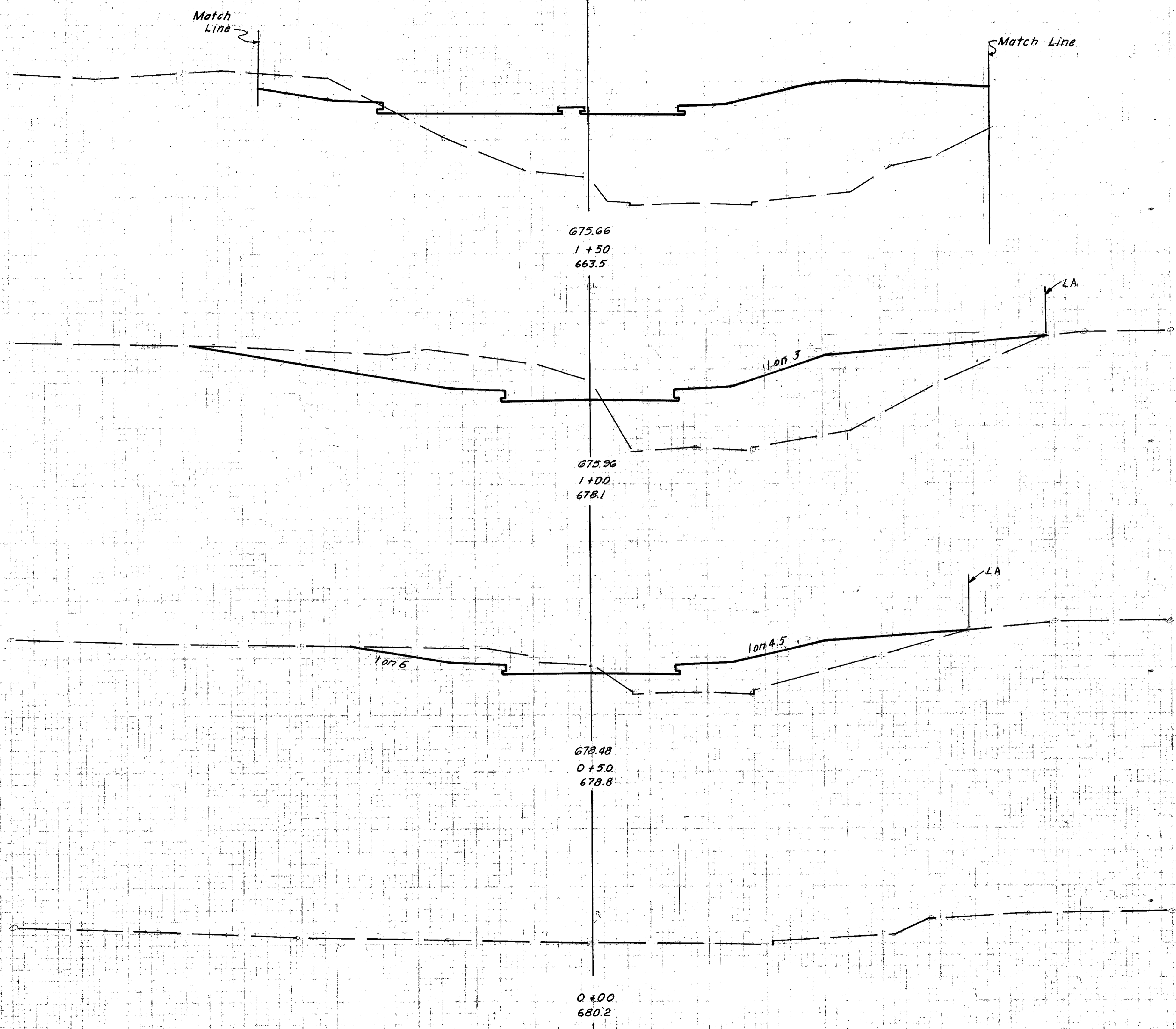


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

299  
646

CUYAHOGA COUNTY  
 CUY-176-12.76  
 CUY-176-12.76

135  
152



680  
670  
660  
690  
680  
670  
690  
680  
670  
690  
680  
670

EARTHWORK			
END	AERA	VOLUME	
EXC.	EMB.	EXC.	EMB.
60	1344		
266	660		302 1856
84	236		324 830
0	0		78 218

DATE: 6-12-68  
 DRAWN BY: J. W. H. / J. W. H.  
 CHECKED BY: J. W. H. / J. W. H.  
 PROJECT: 176-12.76  
 SHEET: 135 OF 152

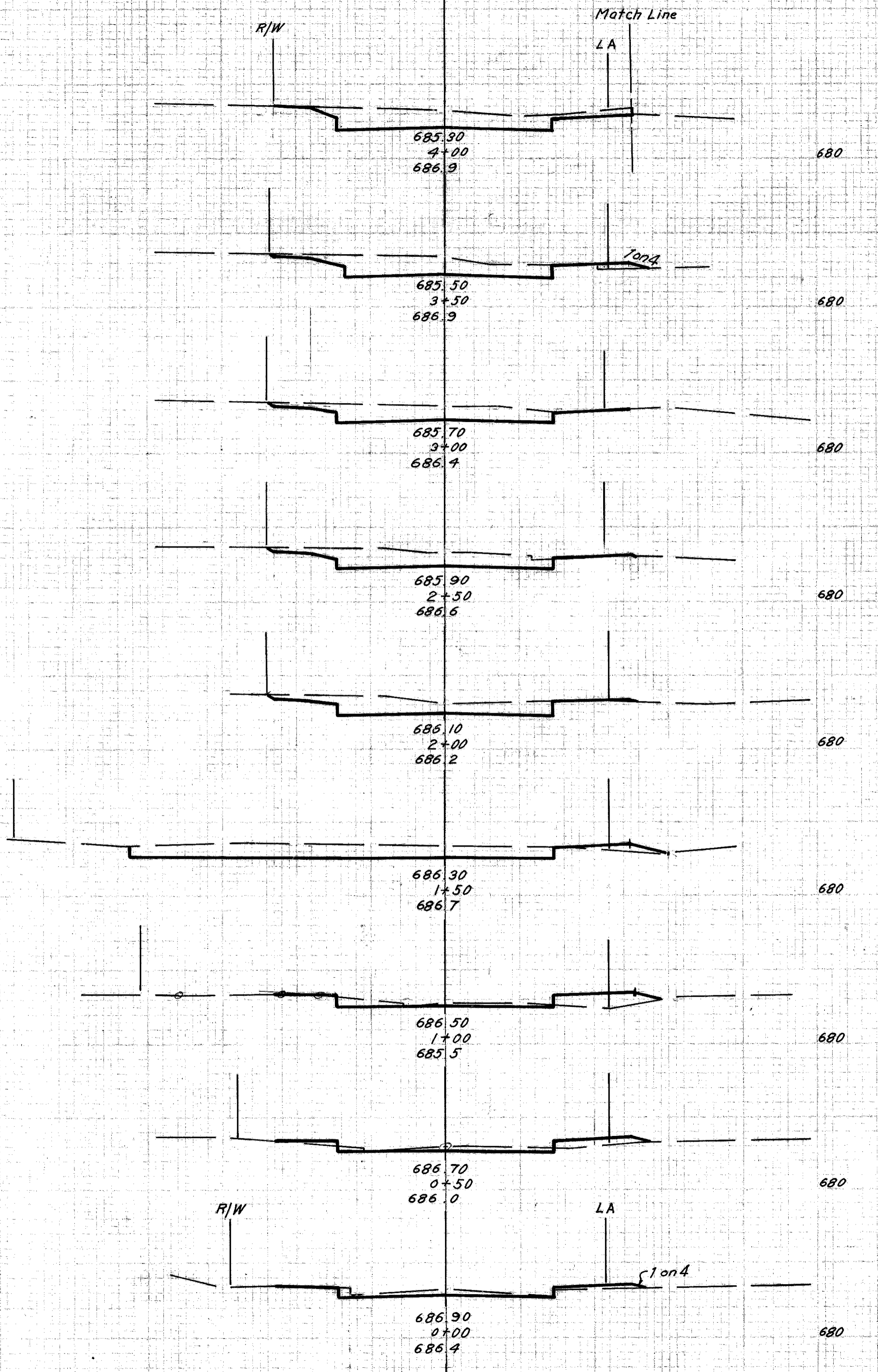
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

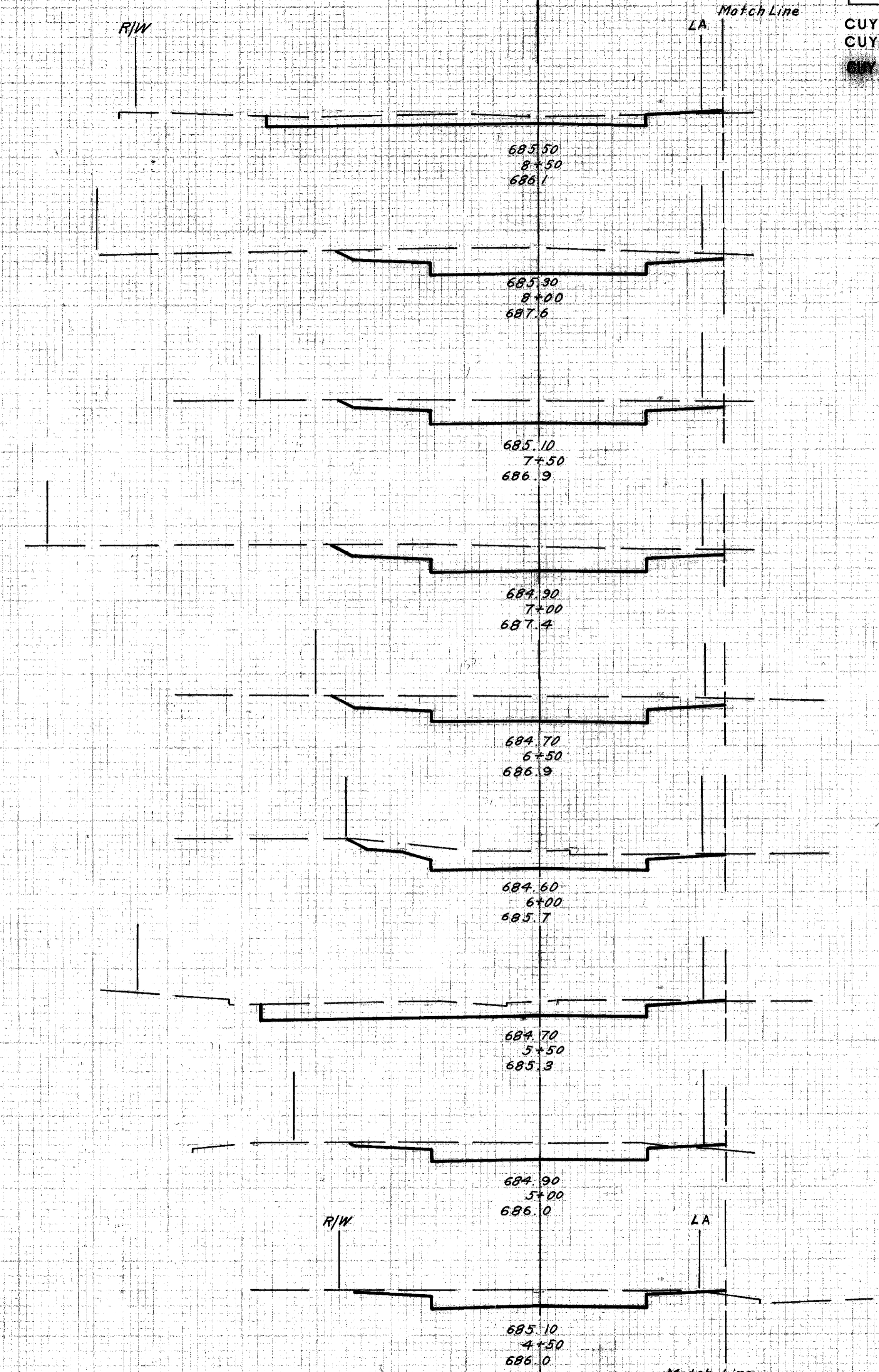
234  
646

136  
152

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-175-12.76



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
80	0		
		146	0
78	0		
		136	0
69	0		
		125	0
66	0		
		119	0
63	0		
		151	0
100	4		
		106	16
15	13		
		28	21
15	10		
		25	12
12	3		



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
67	0		
			184
132	0		
			229
115	0		
			227
130	0		
			245
135	0		
			205
86	0		
			177
105	0		
			163
72	0		
			131
70	0		
			139
80	0		

DWS 10-2-59 HAD 10-18-59  
 DAK 10-19-59  
 DJS 10-20-59  
 RJA 10-20-59

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

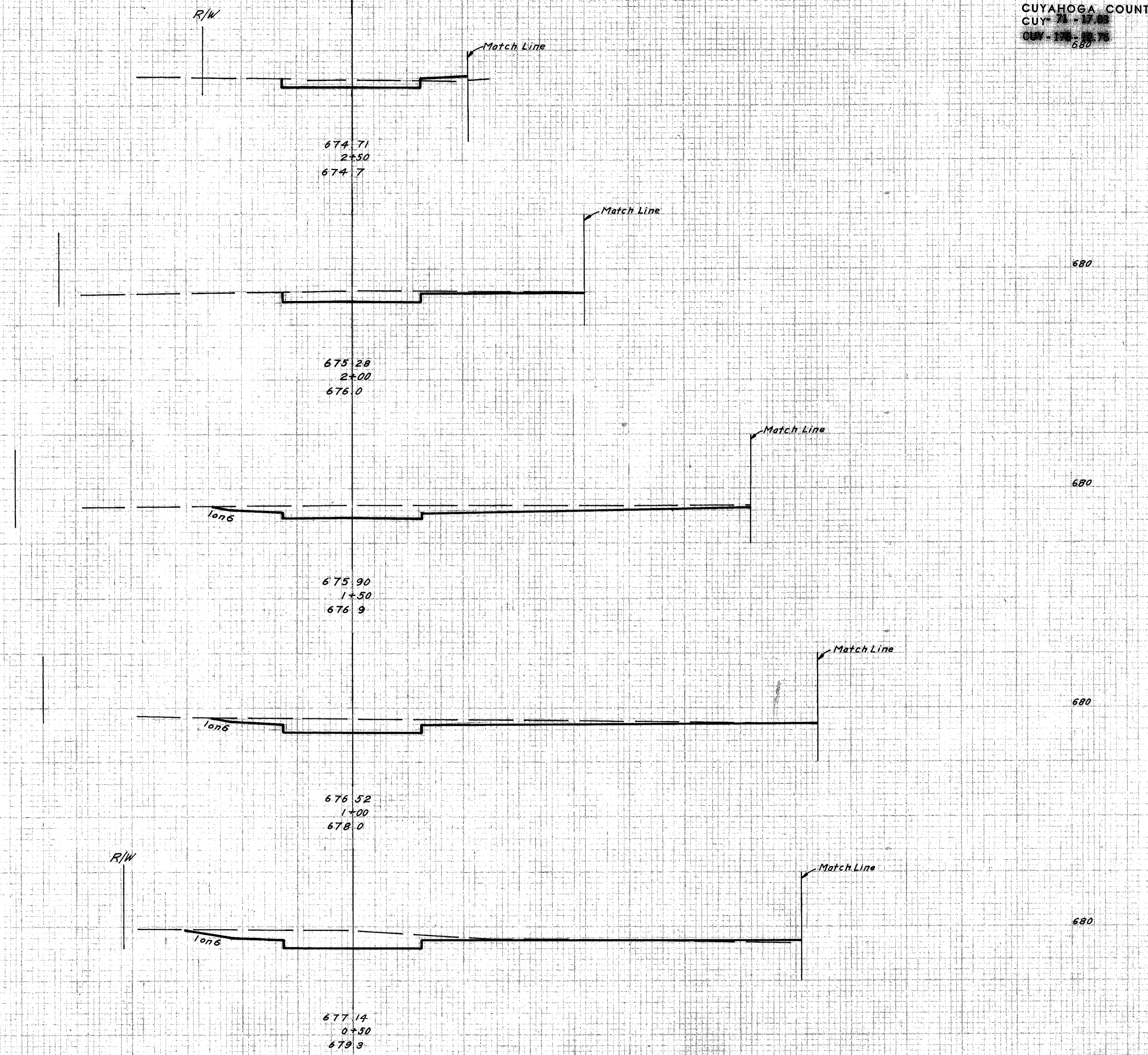
RELOCATED W. 17th STA. 0+00 TO STA. 8+50

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

235  
646

CUYAHOGA COUNTY  
 CUY - 71 - 17.85  
 CUY - 152 - 18.76

137  
152



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
32	8		
		82	7
57	0		
		168	0
125	0		
		216	0
108	0		
		192	0
99	0		

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

60 40 20 0 20 40 60 80 100

RELOCATED W. 15th STREET STA. 0+50 TO STA. 2

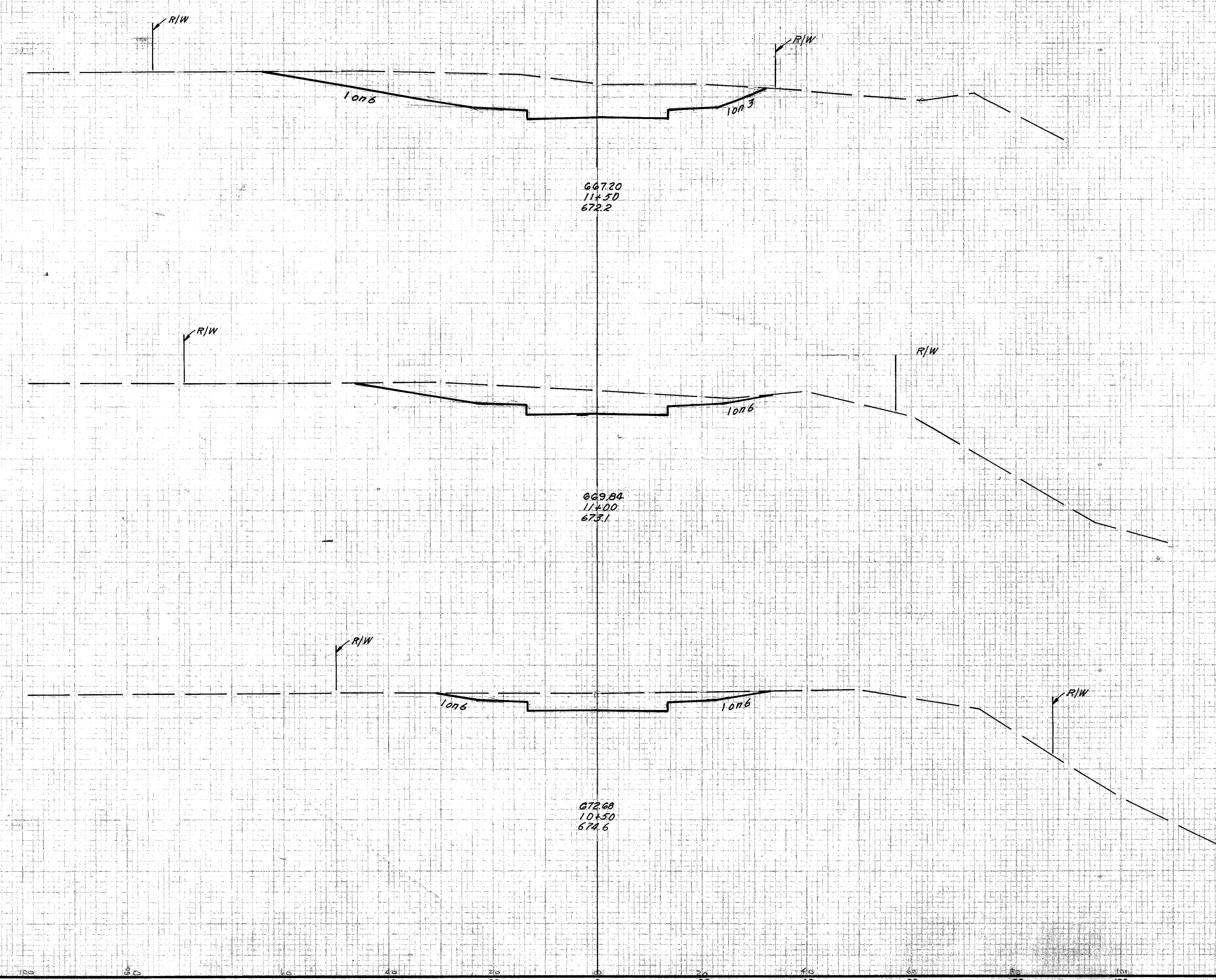
8849-9-81 DUS 3-5-59  
 DRK 9-6-59  
 RMB-549  
 RSK 10-7-59

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

236  
646

CUYAHOGA COUNTY  
CUY-1-13

138  
152



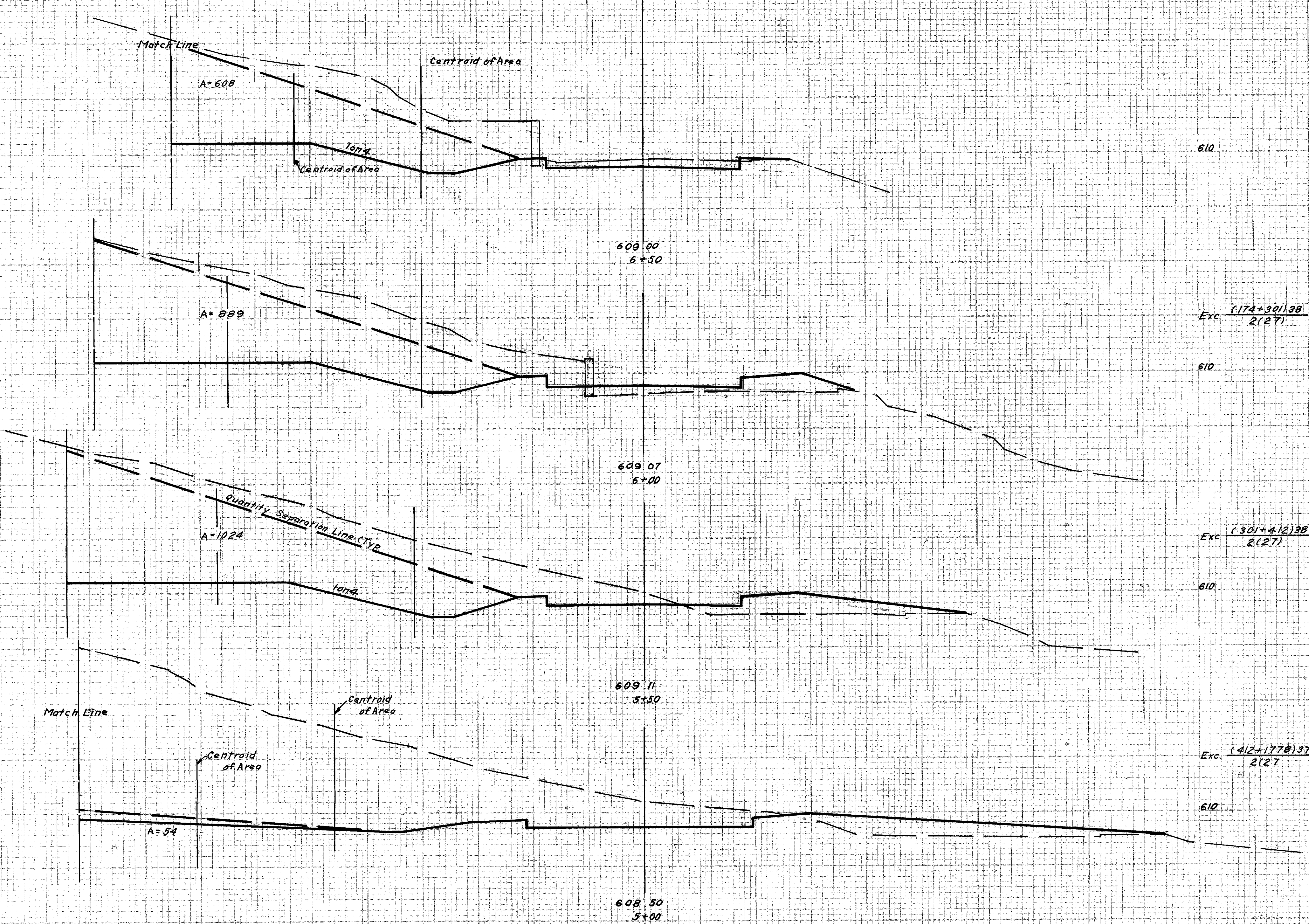
EARTHWORK				
END STA.	AREA	VOLUME		
EXC.	EMB.	EXC.	EMB.	
680				
Sta. 12+00	0	0		
			467	0
660				
	450	0		
			633	0
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FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

237  
64

CUYAHOGA COUNTY  
CUY-112-152

139  
152



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		174	50
Exc. $\frac{(174+301)38}{2(27)}$			
			334 74
		301	80
Exc. $\frac{(301+412)38}{2(27)}$			
			502 171
		412	105
Exc. $\frac{(412+1778)37}{2(27)}$			
			1500 230
		1778	143

PLS 9-30-59 H.A.D. 9-30-59  
 RMB:BT:4 D.L.O. 8-18-59  
 P.S. 10-25-59  
 RSR 10-25-59

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

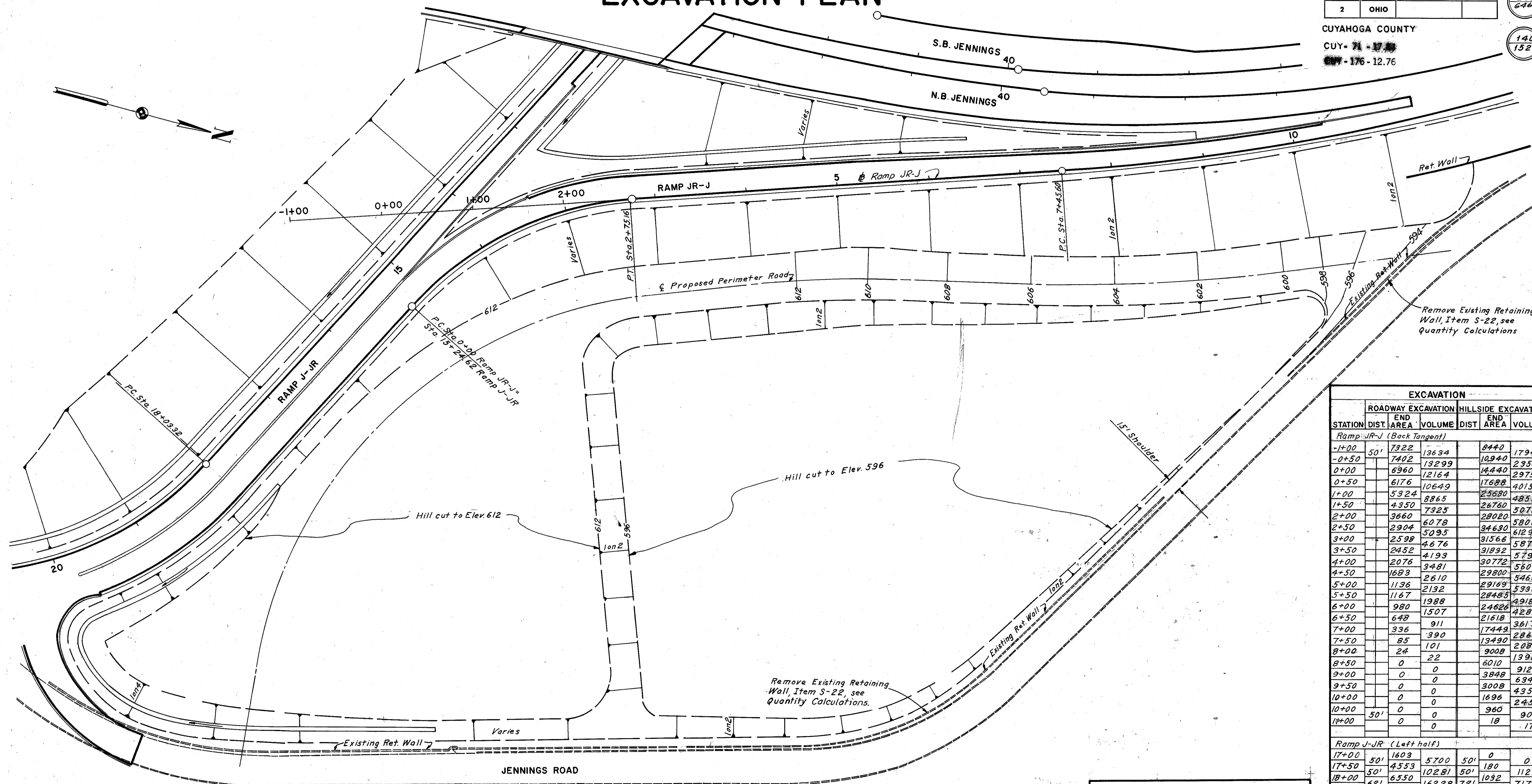
# EXCAVATION PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

238  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

140  
152



Remove Existing Retaining Wall, Item S-22, see Quantity Calculations

Remove Existing Retaining Wall, Item S-22, see Quantity Calculations.

EXCAVATION						
ROADWAY EXCAVATION			HILLSIDE EXCAVATION			
STATION	DIST	END AREA	VOLUME	DIST	END AREA	VOLUME
<b>Ramp JR-J (Back Tangent)</b>						
-1+00	50'	7322	13634		8440	17946
0+50		7402	13299		10940	23502
0+00		6960	12164		14440	29750
0+50		6176	10649		17688	40159
1+00		5324	8865		25680	48559
1+50		4350	7925		26760	50726
2+00		3660	6078		28020	58014
2+50		2904	5095		34690	61297
3+00		2598	4676		31566	58706
3+50		2452	4193		31892	57971
4+00		2076	3481		30772	56090
4+50		1683	2980		29800	54605
5+00		1136	2610		29169	53388
5+50		1167	1988		28485	49181
6+00		980	1507		24626	42822
6+50		648	911		21618	36176
7+00		336	390		17449	28649
7+50		85	101		13490	20833
8+00		24	22		9008	13907
8+50		0	0		6010	9128
9+00		0	0		3848	6349
9+50		0	0		3008	4356
10+00		0	0		1696	2459
10+50		0	0		960	906
11+00	50'	0	0		18	17
<b>Ramp J-JR (Left half)</b>						
17+00	50'	1603	5700	50'	0	0
17+50	50'	4553	10281	50'	180	1122
18+00	62'	6550	16228	72'	1032	7173
18+50	65'	7584	18521	77'	4348	15149
19+00	64'	7809	16681	70'	6276	10930
19+50		6272			2156	
<b>Relocated Jennings Rd.</b>						
5+00	37'	1778	1500	27'	54	539
5+50	38'	412	502	27'	1024	956
6+00	301	301	334	29'	889	804
6+50	38'	174			608	
<b>Grand Total</b>			<b>168867</b>			
<b>Grand Totals</b>			<b>861869</b>			

EMBANKMENT						
STATION	DIST	END AREA	VOLUME	DIST	END AREA	VOLUME
<b>Ramp JR-J (Back Tangent)</b>						
9+00				50'	75	69
9+50					695	643
10+00					1467	1358
10+50					2629	2527
11+00				50'	3826	3543
<b>Grand Total</b>			<b>8140</b>			

MADE \_\_\_\_\_ DATE \_\_\_\_\_ TRACED *D.V.S.* DATE 10/11/44  
CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE 1" = 50'

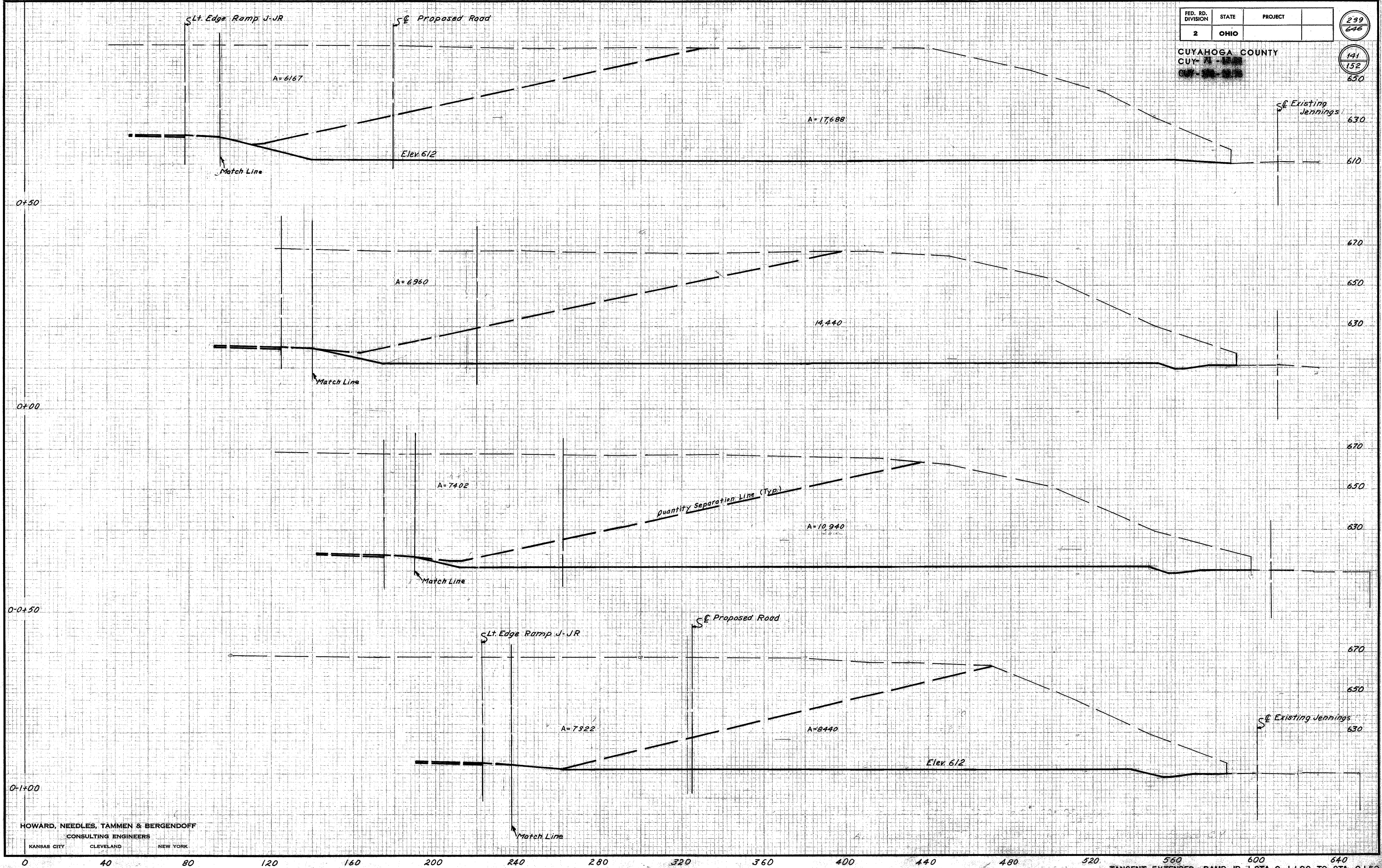
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

299  
646

CUYAHOGA COUNTY  
CUY-74-152  
CUY-74-152

141  
152  
650



CHECKED BY: [ ]  
 DESIGNED BY: [ ]  
 DRAWN BY: [ ]  
 DATE: [ ]

DWS 30-9-64 HLD 7-6-64  
 RBH 5-15-64 HLD 5-22-64  
 DWS 7-12-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

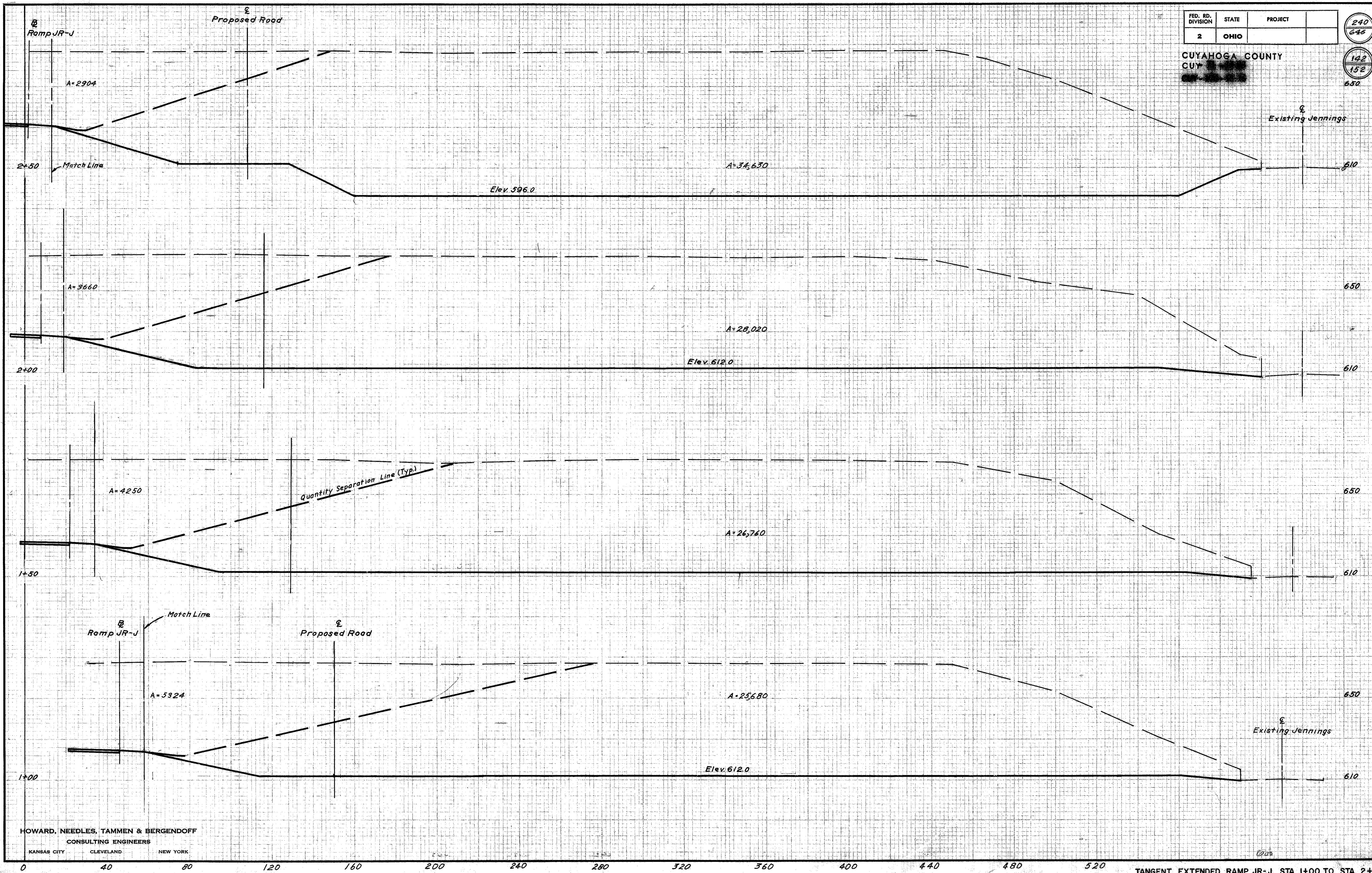
TANGENT EXTENDED RAMP JR-J STA. 0-1+00 TO STA. 0+50

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

240  
646

CUYAHOGA COUNTY  
CUY- [REDACTED]

142  
152  
650



SHEET NO. 1  
 DATE 7-1-64  
 DRAWN BY RBH 5-15  
 CHECKED BY HJS 7-13-64  
 PROJECT NO. 240-646  
 COUNTY CUYAHOGA  
 TANGENT EXTENDED RAMP JR-J STA. 1+00 TO STA. 2+50

SHEET NO. 1  
 DATE 7-1-64  
 DRAWN BY RBH 5-15  
 CHECKED BY HJS 7-13-64  
 PROJECT NO. 240-646  
 COUNTY CUYAHOGA  
 TANGENT EXTENDED RAMP JR-J STA. 1+00 TO STA. 2+50

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

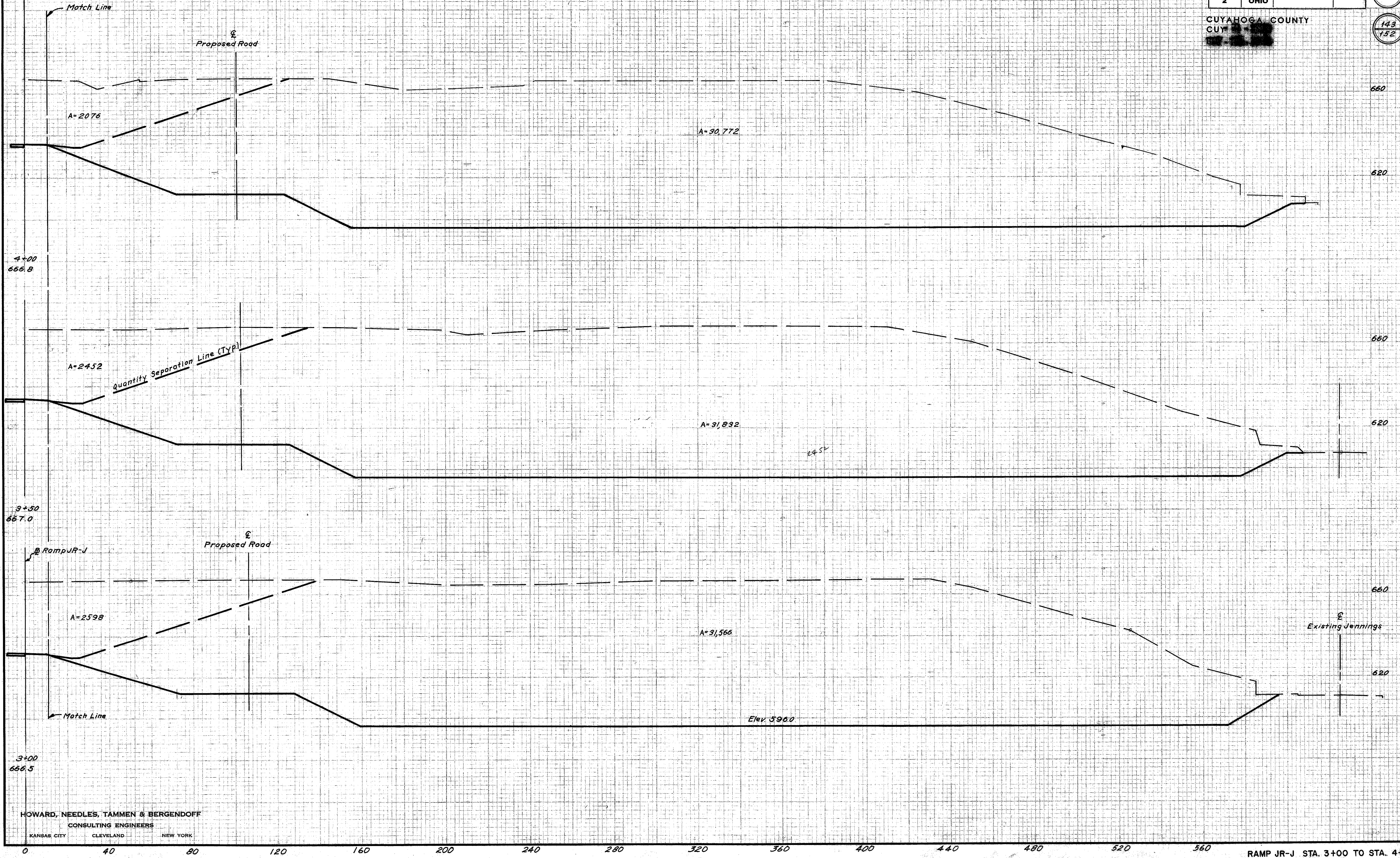


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

241  
646

143  
152

CUYAHOGA COUNTY  
CUY



DATE: 7-7-89  
 DRAWN BY: RBH  
 CHECKED BY: RBH  
 PROJECT: RAMP JR-J  
 SHEET: 2 OF 2

DATE: 7-7-89  
 MLD: 7-7-89  
 RBH: 7-7-89  
 RBH: 7-7-89  
 RBH: 7-7-89  
 RBH: 7-7-89

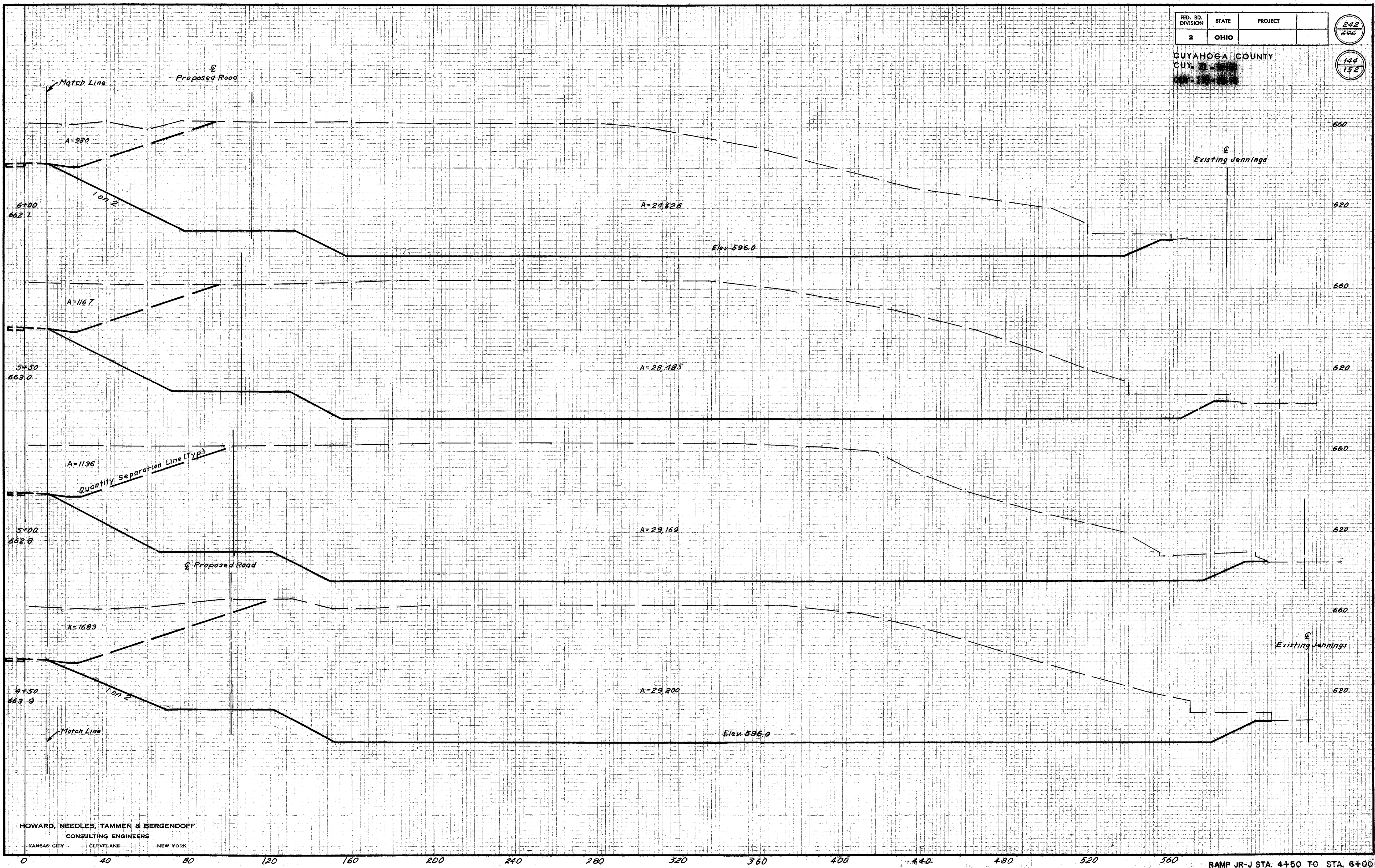
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

242  
696

CUYAHOGA COUNTY  
CUY. 144  
152

144  
152



DATE: 7-13-64  
BY: J. W. BROWN  
CHECKED: J. W. BROWN  
APPROVED: J. W. BROWN

DATE: 7-13-64  
BY: J. W. BROWN  
CHECKED: J. W. BROWN  
APPROVED: J. W. BROWN

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

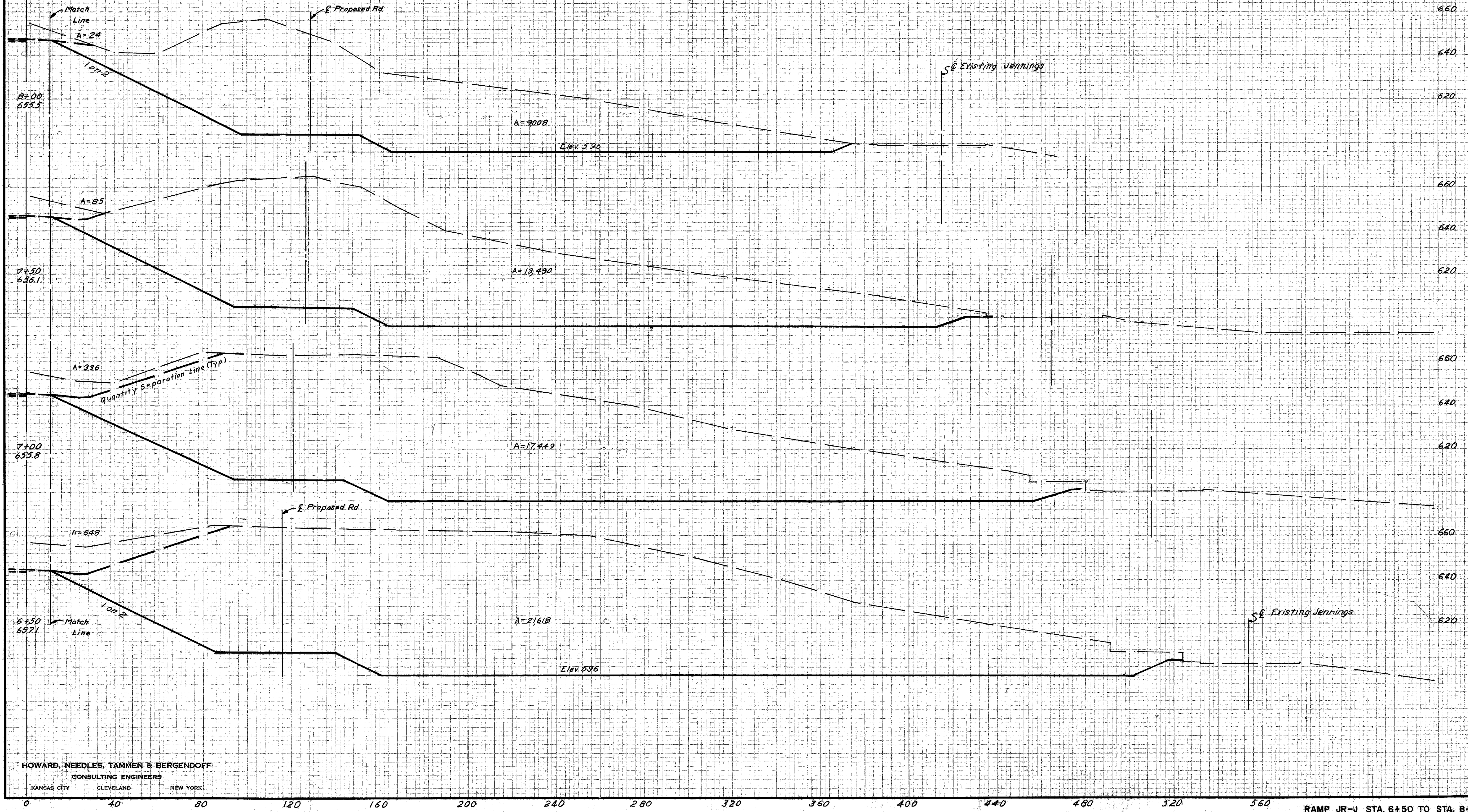
RAMP JR-J STA. 4+50 TO STA. 6+00

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

243  
646

CUYAHOGA COUNTY  
CUY-71-17  
CUY-171-22

145  
152



DATE: 7-13-48  
BY: [Signature]  
CHECKED: [Signature]  
APPROVED: [Signature]

NO. 100  
DATE: 7-13-48  
BY: [Signature]  
CHECKED: [Signature]  
APPROVED: [Signature]

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

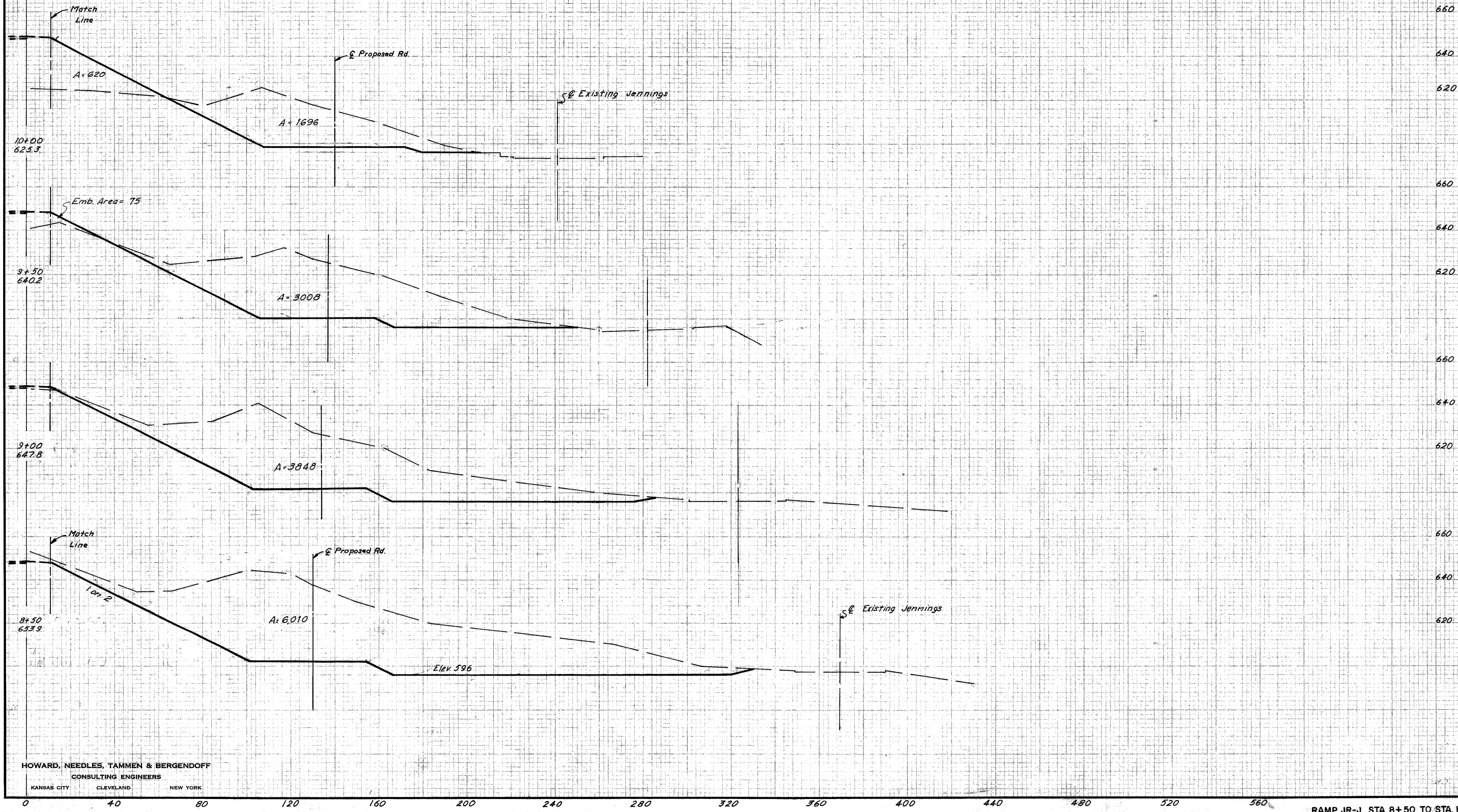
RAMP JR-J STA. 6+50 TO STA. 8+00

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

244  
646

CUYAHOGA COUNTY  
 CUY-71-17-23  
 CUY-17-12-75

146  
152



10+00  
 625.3  
 9+50  
 640.2  
 9+00  
 647.8  
 8+50  
 653.9

10+00  
 625.3  
 9+50  
 640.2  
 9+00  
 647.8  
 8+50  
 653.9

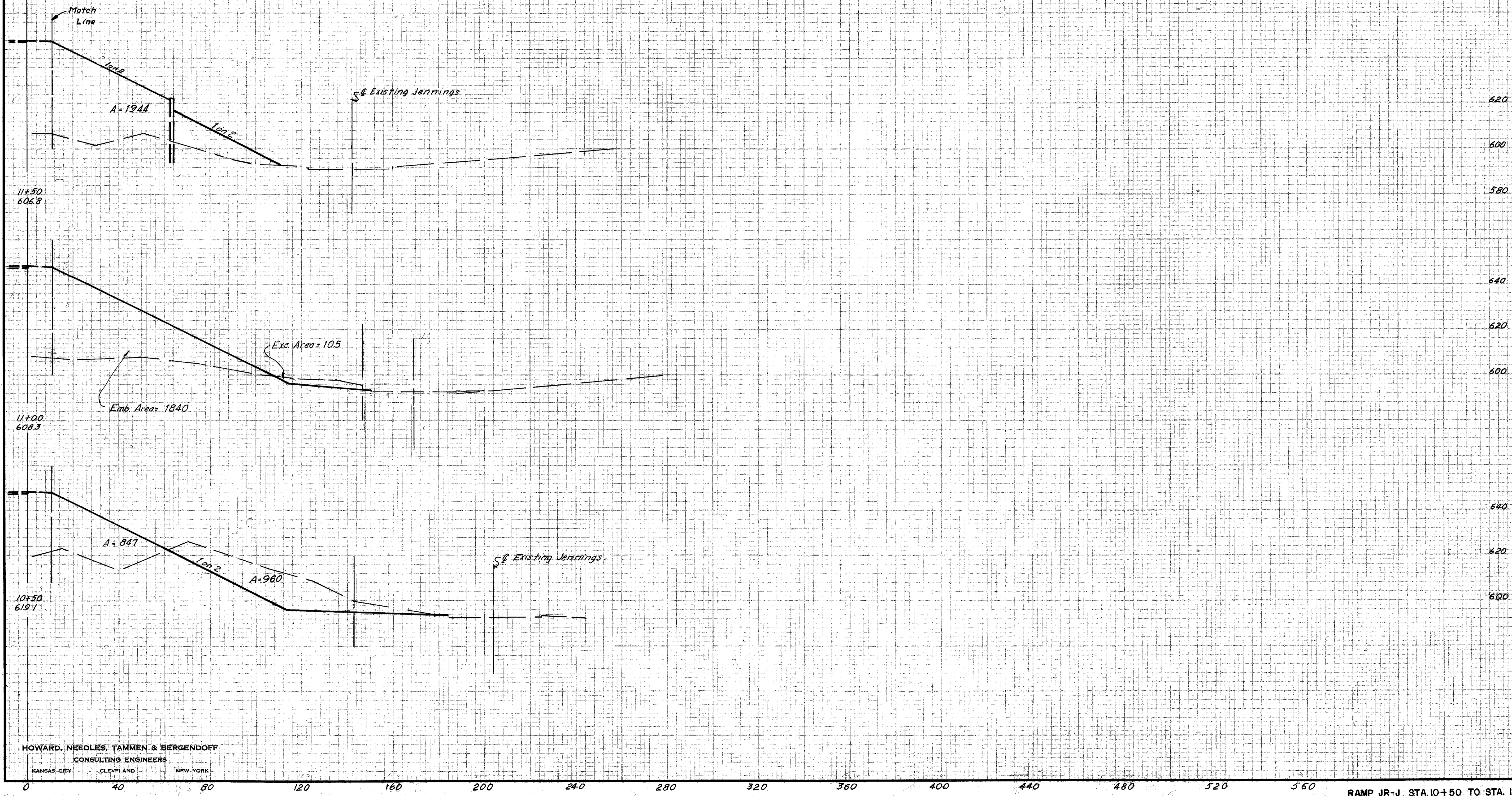
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

245  
646

147  
152

CUYAHOGA COUNTY  
GUY



DATE: 7-1-59  
BY: [Signature]  
CHECKED: [Signature]  
APPROVED: [Signature]

DESIGNER: DWS 7-1-59 VHD 7-1-59  
DRAWN: DRK 7-1-59 RBA 7-1-59  
CHECKED: MLD 7-1-59  
APPROVED: DWS 7-1-59

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

RAMP JR-J STA 10+50 TO STA 11+50

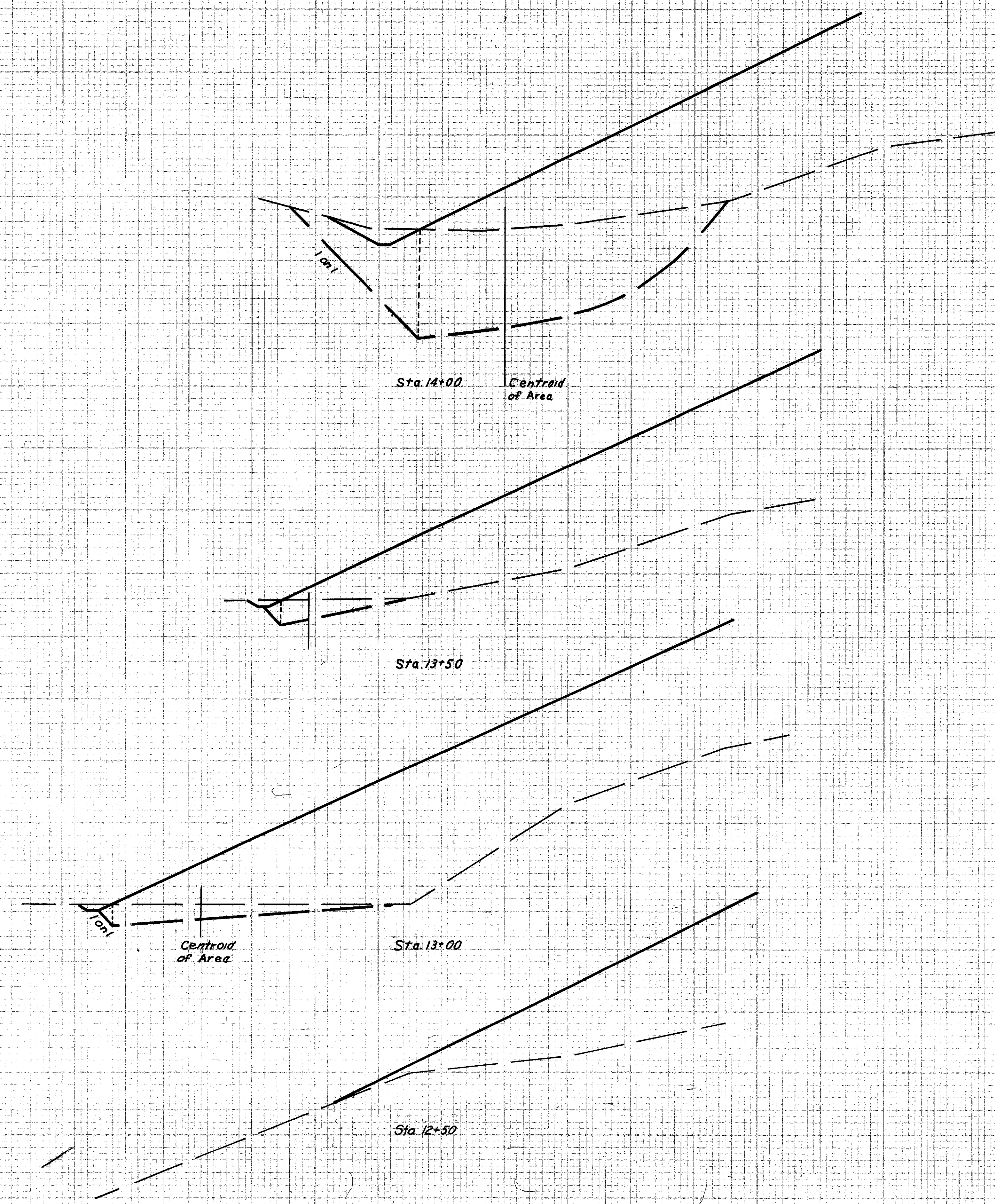
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

246  
646

CUYAHOGA COUNTY  
CUY

148  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		769	0
Exc. $\frac{(44+769)80}{2(27)}$		1204	0
		44	0
Exc. $\frac{(69+44)82}{2(27)}$		172	0
		69	0
Exc. $\frac{(0+69)82}{2(27)}$		105	97
		0	105



PROJECT NO. 2  
SURVEY NO. 2172  
DATE 9-20-49  
BY R.S.H.B. 0-3-9-21-49

DESIGNED BY R.S.H.B. 0-3-9-21-49  
CHECKED BY R.S.H.B. 0-3-9-21-49  
DATE 9-20-49

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

300 280 260 240 220 200 180 160 140 120

PEAT EXCAVATION AREA - STA. 12+50 TO STA. 14+00 REL. W. 14TH ST.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

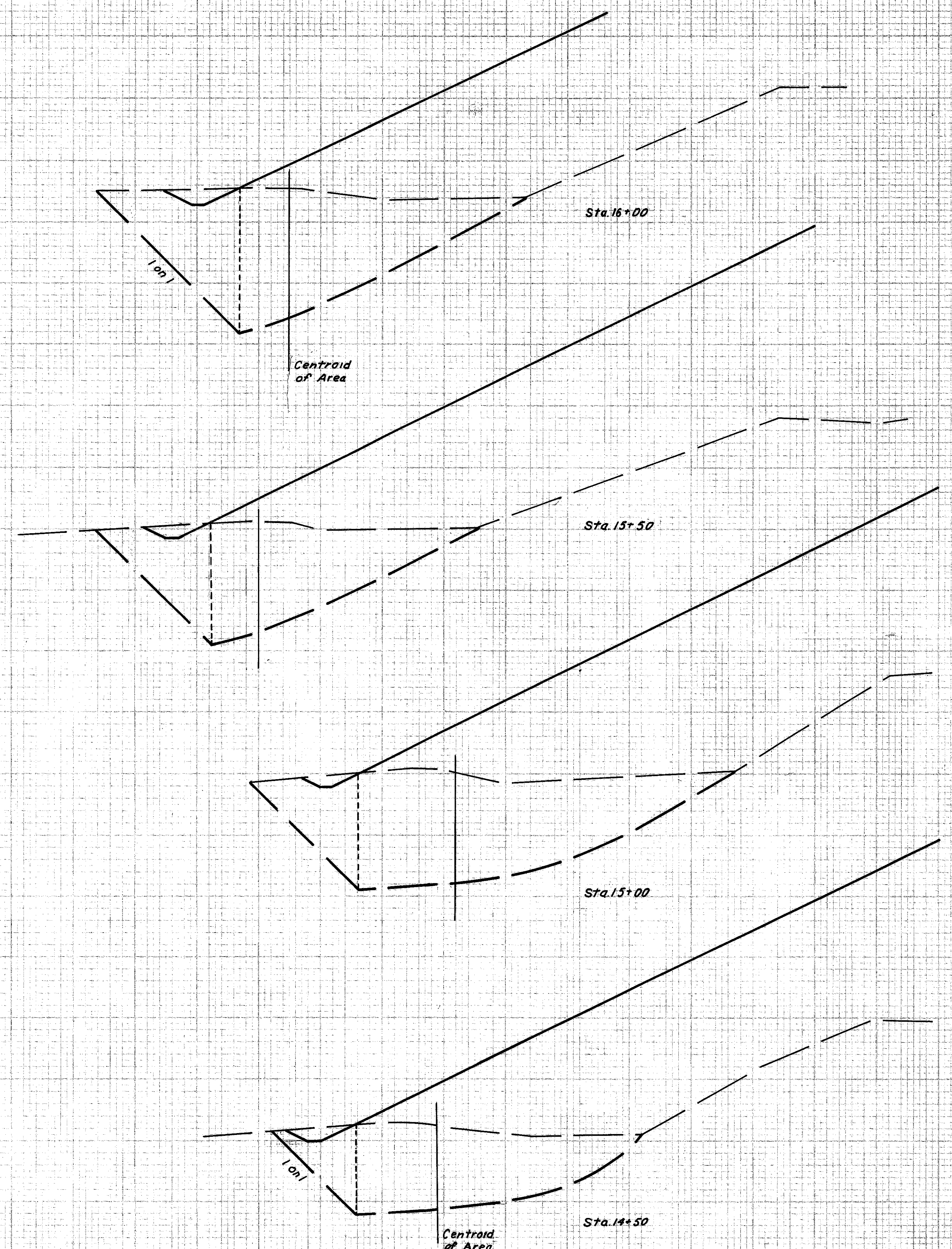
247  
646

CUYAHOGA COUNTY  
CUY-

149  
152

EARTHWORK

END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



Exc.  $\frac{(644+846)79}{2(27)}$

846 0

Exc.  $\frac{(644+644)79}{2(27)}$

644 0

Exc.  $\frac{(947+644)79}{2(27)}$

947 0

Exc.  $\frac{(593+941)74}{2(27)}$

593 0

Exc.  $\frac{(769+593)75}{2(27)}$

769 0

Sta. 14+00

1892 0

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

300 280 260 240 220 200 180 160 140 120 100

PEAT EXCAVATION AREA - STA. 14+50 TO STA. 16+00 REL. W. 14TH ST

R.S.K. 9-18-64 D.R.K. 9-20-67  
 R.S.K. 9-20-67 D.R.K. 9-20-67  
 R.S.K. 9-18-64 D.S. 9-20-67

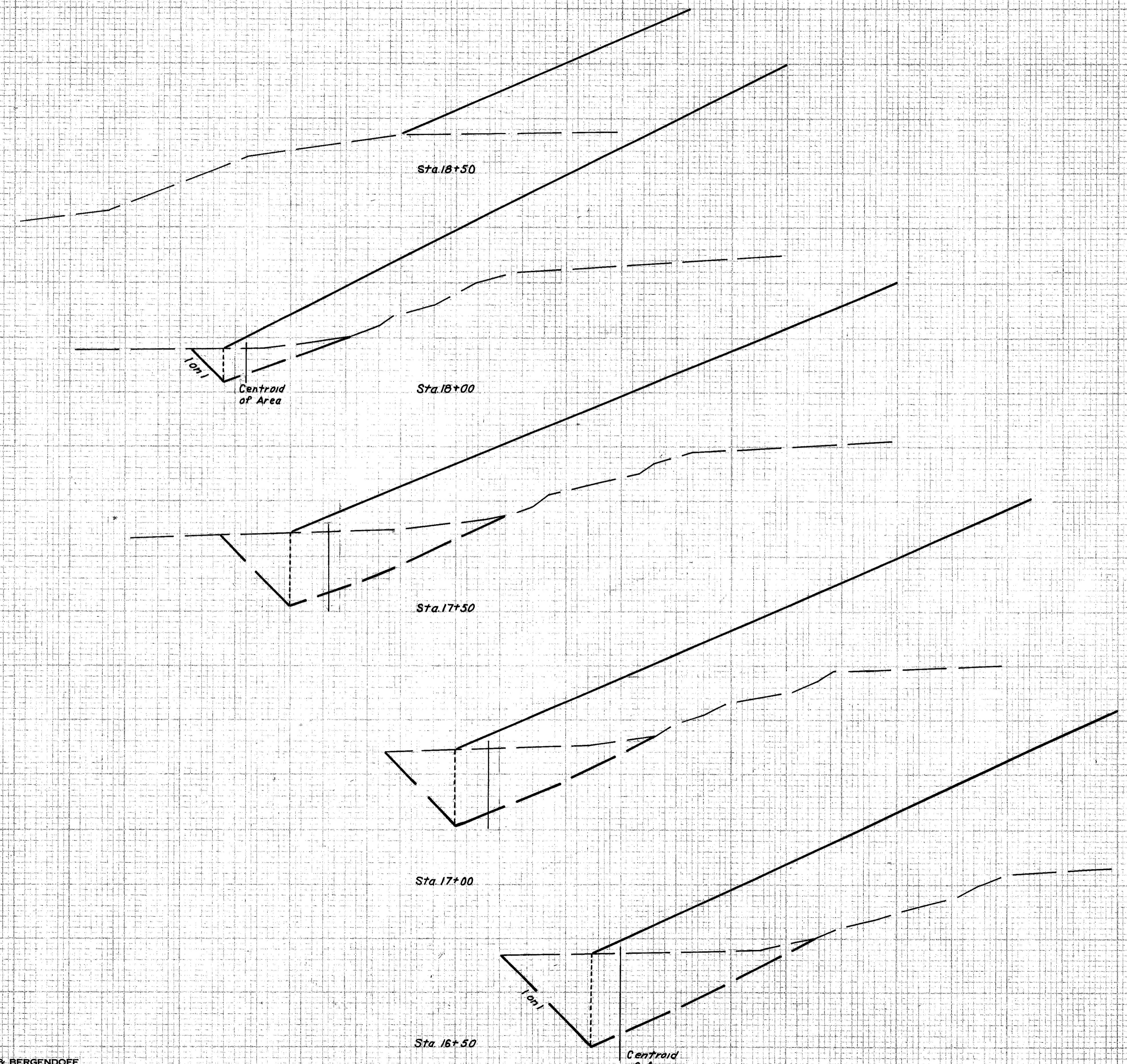
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

248  
646

CUYAHOGA COUNTY  
CUY. 71-1523  
CIV. 100-2236

150  
152

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
0	0		
		72	0
		80	0
		347	0
		341	0
		493	0
		846	0
			1240



Exc.  $\frac{(80+0)49}{2(27)}$

Exc.  $\frac{(347+80)53}{2(27)}$

Exc.  $\frac{(341+347)58}{2(27)}$

Exc.  $\frac{(493+341)56}{2(27)}$

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

340 320 300 280 260 240 220 200 180 160

140 PEAT EXCAVATION AREA-A-STA. 16+50 TO STA. 18+50 REL. W. 14TH S

R.S. 10/18/44 DEC. 9-20-49  
 R.S. 11/18/44 DEC. 9-20-49  
 R.S. 12/18/44 DEC. 9-20-49  
 D.J.S. 9-20-49



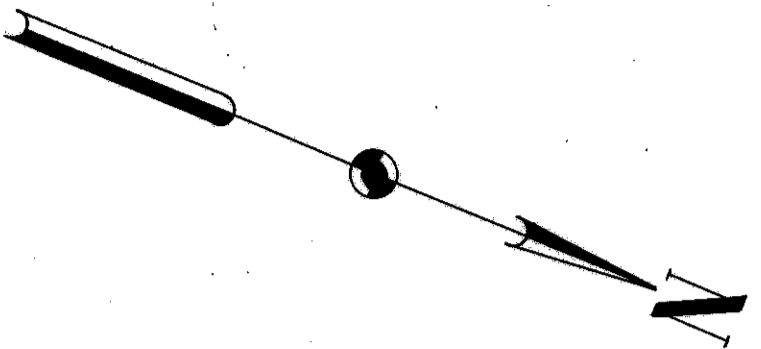
# CEMETERY FILL

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

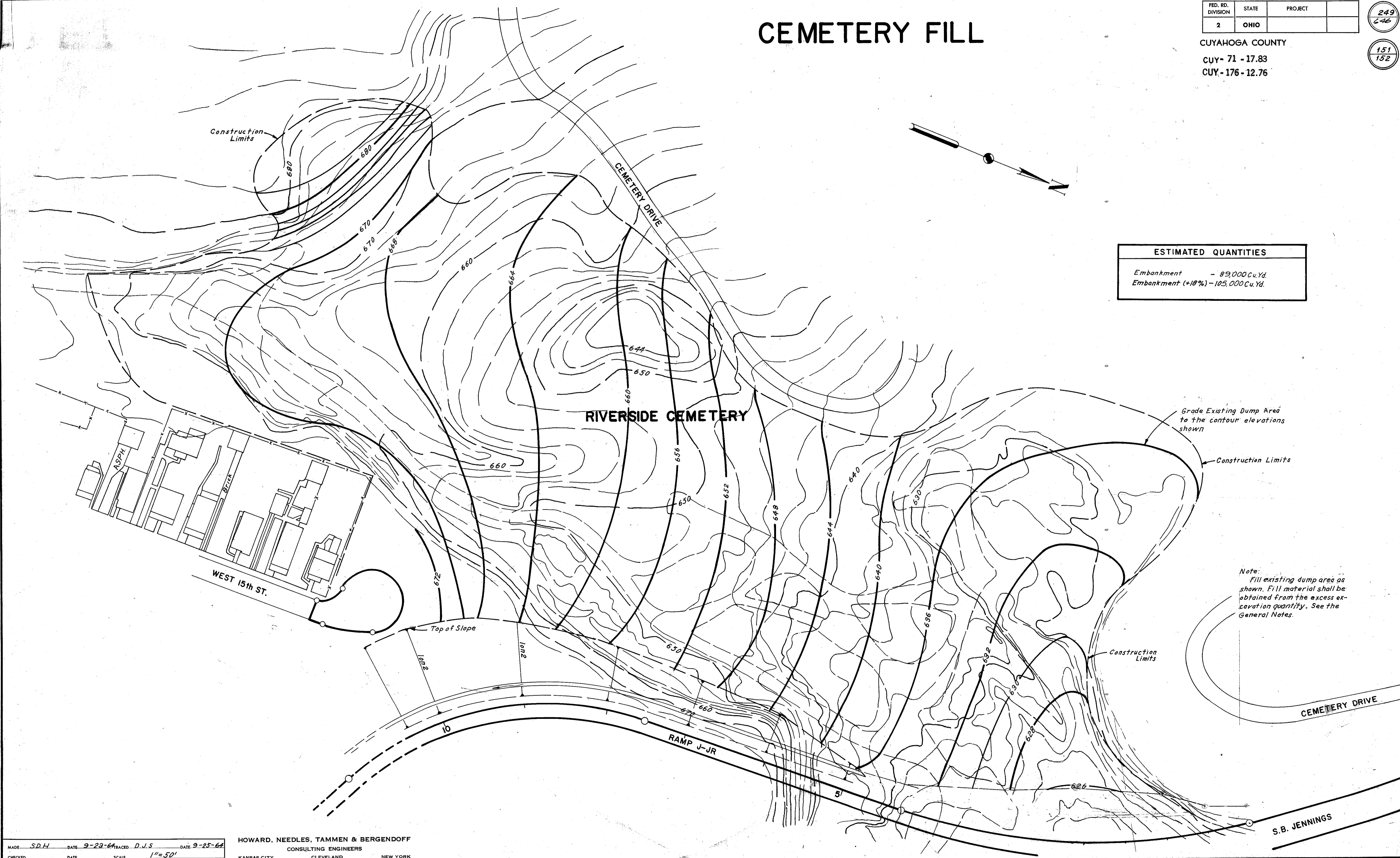
249  
646

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

151  
152



ESTIMATED QUANTITIES	
Embankment	- 89,000 Cu.Yd.
Embankment (+10%)	- 105,000 Cu.Yd.



MADE S.D.H. DATE 9-23-64 TRACED D.V.S. DATE 9-25-64  
CHECKED DATE SCALE 1"=50'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

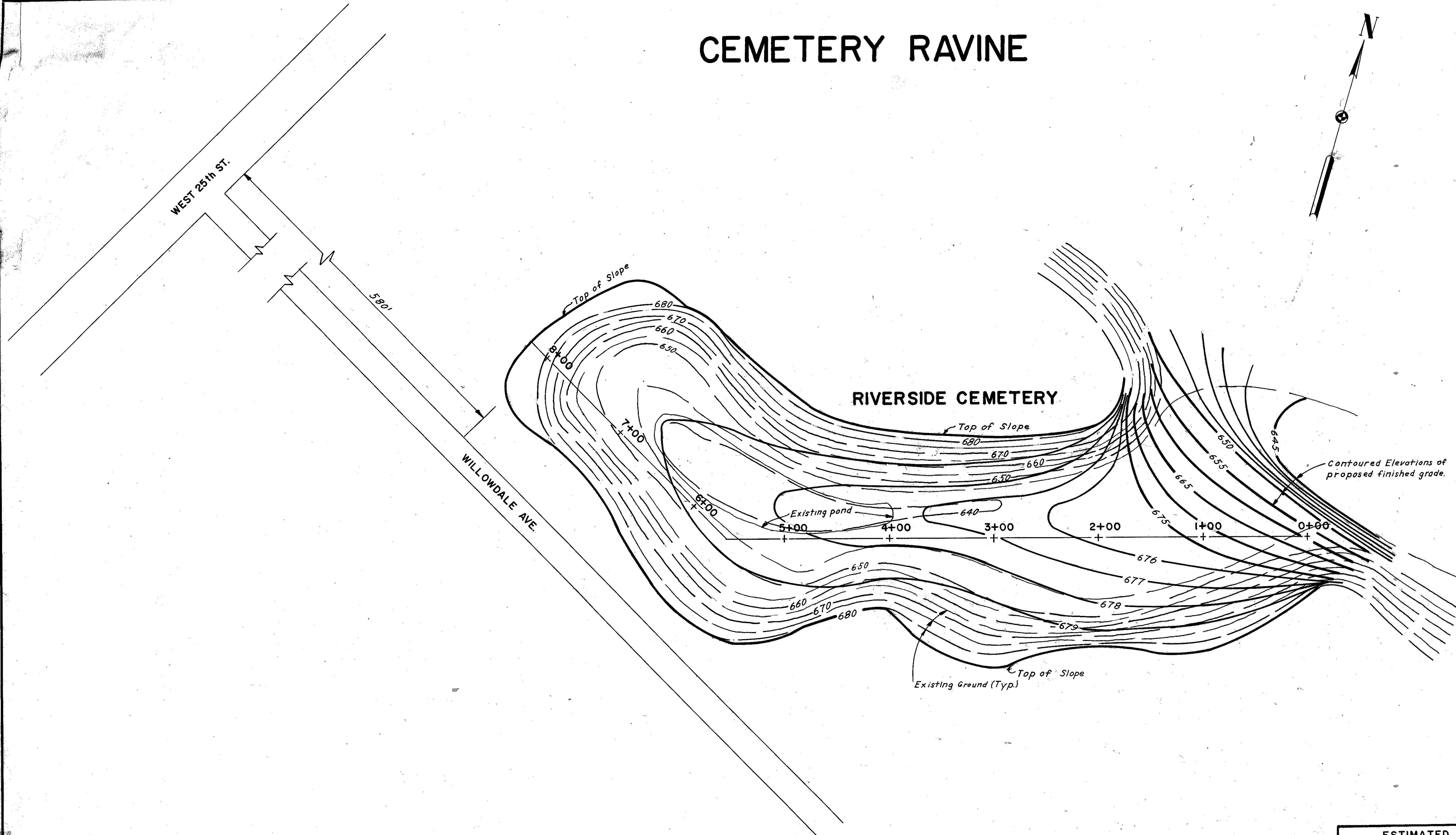
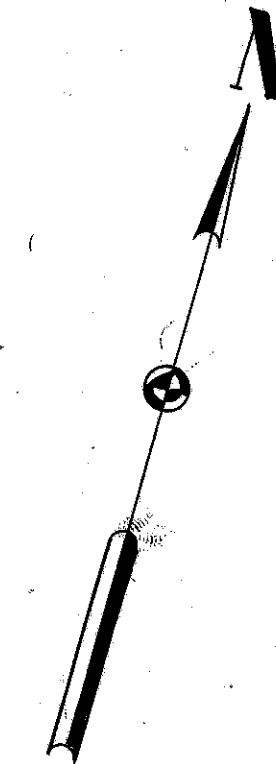
# CEMETERY RAVINE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

250  
646

152  
152

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



ESTIMATED QUANTITIES	
Embankment	-135,600 Cu. Yd.
Embankment (+18%)	-160,000 Cu. Yd.

MADE S.D.H. DATE 9/16/69 TRACED D.J.S. DATE 9-17-69  
 CHECKED DATE SCALE 1" = 50'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

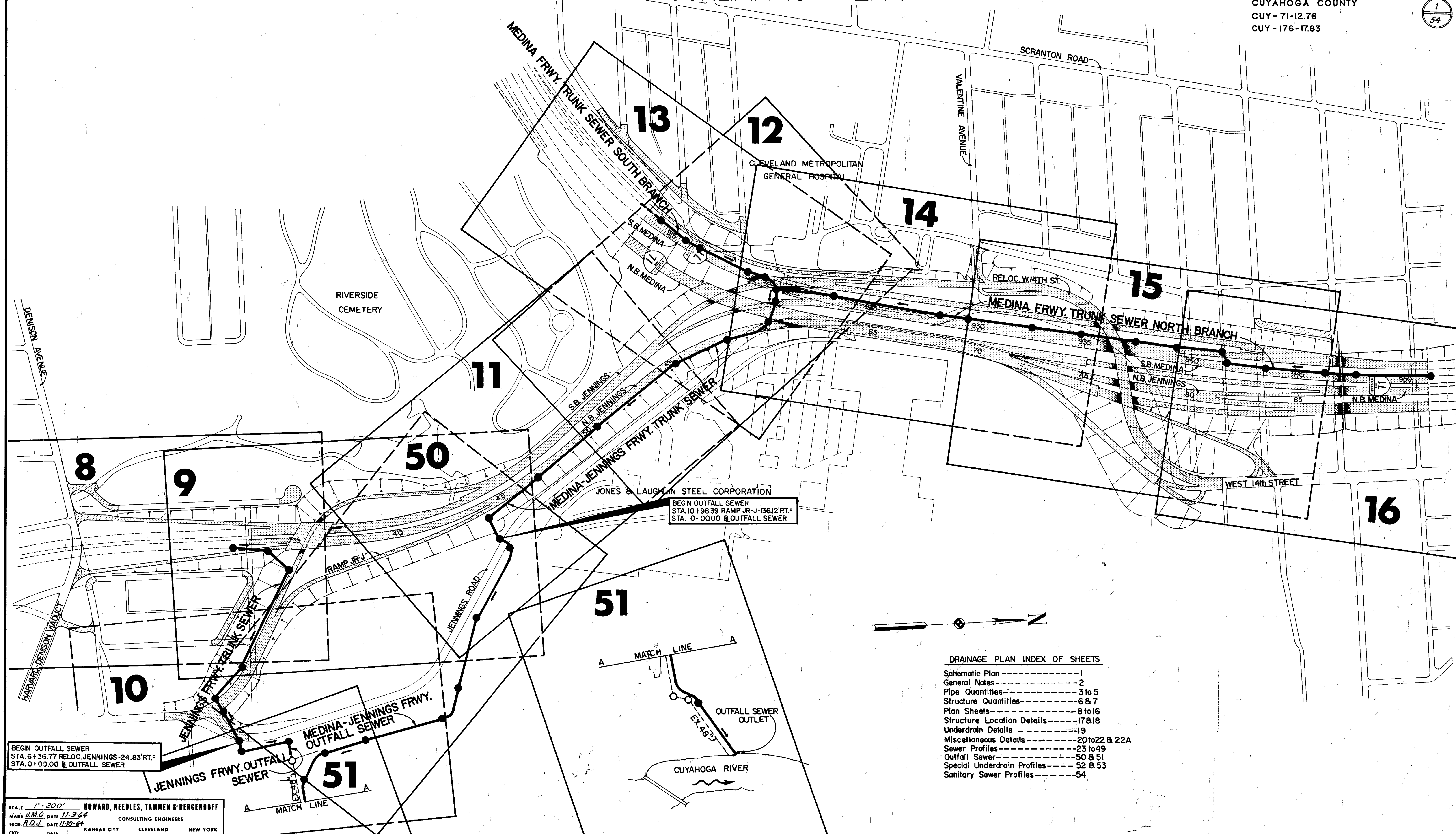
7-16

# DRAINAGE SCHEMATIC PLAN

FED. RD. DIVISION	STATE	PROJECT	251 646
2	OHIO		

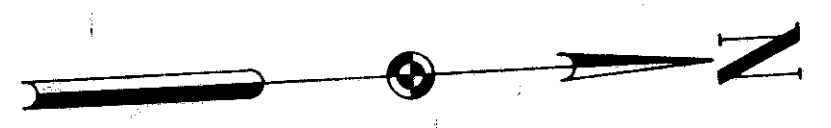
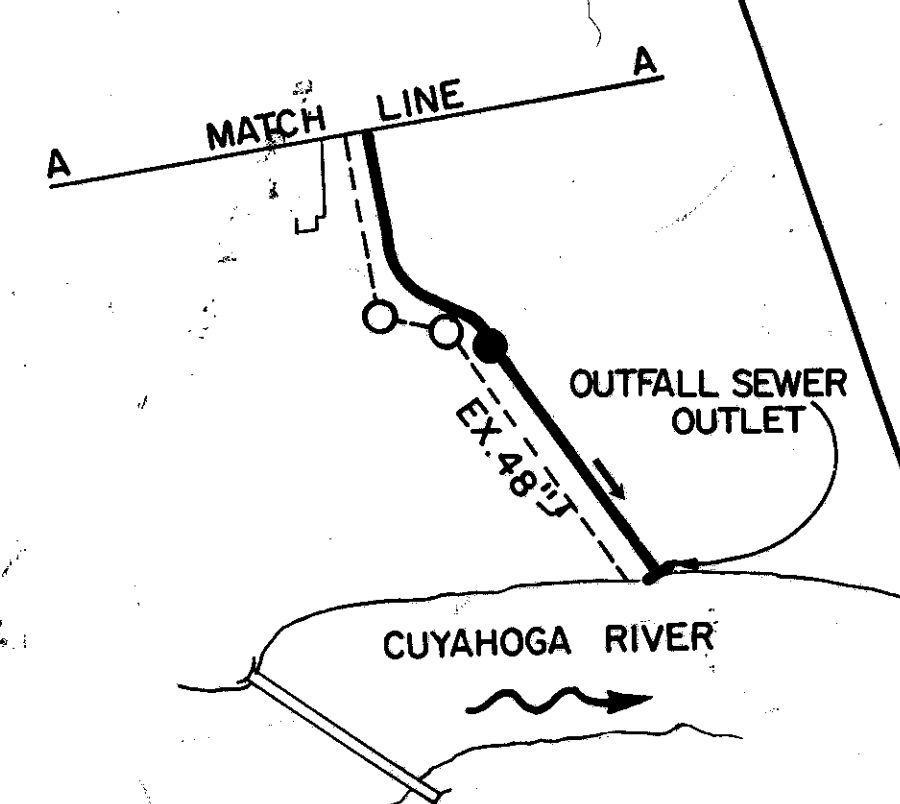
CUYAHOGA COUNTY  
 CUY - 71-12.76  
 CUY - 176-17.83

1
54



BEGIN OUTFALL SEWER  
 STA. 10+98.39 RAMP JR-J-136.12' RT.  
 STA. 0+00.00 @ OUTFALL SEWER

BEGIN OUTFALL SEWER  
 STA. 6+36.77 RELOC. JENNINGS-24.83' RT.  
 STA. 0+00.00 @ OUTFALL SEWER



### DRAINAGE PLAN INDEX OF SHEETS

Schematic Plan	-----	1
General Notes	-----	2
Pipe Quantities	-----	3 to 5
Structure Quantities	-----	6 & 7
Plan Sheets	-----	8 to 16
Structure Location Details	-----	17 & 18
Underdrain Details	-----	19
Miscellaneous Details	-----	20 to 22 & 22A
Sewer Profiles	-----	23 to 49
Outfall Sewer	-----	50 & 51
Special Underdrain Profiles	-----	52 & 53
Sanitary Sewer Profiles	-----	54

SCALE 1" = 200'  
 MADE U.M.O. DATE 11-9-64  
 TRCD. R.D.V. DATE 11-10-64  
 CKD. DATE \_\_\_\_\_

**HOWARD, NEEDLES, TANMEN & BERGENDOFF**  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

# GENERAL NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

252  
646

2  
54

CUYAHOGA COUNTY  
CUY. -71-17.83  
CUY-176-12.76

## DRAINAGE

### REVIEW OF PROJECT

Before any work is started on the project, representatives of the State, the City and the Contractor shall make a visual inspection of the existing storm, sanitary, and combined sewers which are to remain in service and which are within the limits of the work. A record of the inspection shall be kept in writing by the State. All new sewers, inlets and manholes constructed as a part of the project shall be free of all foreign matter and in a clean condition before the project will be accepted by the State. All existing sewers inspected initially by the above mentioned parties shall be maintained and left in the same condition as 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. The cost of making inspections and any repairing or correcting of sewers as a result of construction operations shall be included in the unit prices bid for the respective pipe items of the contract.

### EXISTING UNDERDRAINS

Where existing underdrains are encountered and no provision has been made for new underdrains, they shall be connected to new inlet with 6 inch Class I-3 Pipe. A quantity of 300 feet has been provided in the General Summary to be used as directed by the Engineer for that purpose. The materials shall not be ordered by the Contractor unless prior approval is received from the Project Engineer.

### UNINTERRUPTED FLOW

The Contractor shall so conduct his operations that the flow of all sewers which are to remain in service will be maintained at all times. Any additional labor or cost involved in maintaining this flow by pumping or by any other approved method found necessary for the completion of this project shall be included in the price bid for the pertinent drainage item.

When working in the area adjacent to existing sewers, the Contractor is to proceed with caution in order that no damage is done to the existing sewers. Any damage to existing sewers resulting from the Contractor's operations or negligence as determined by the Engineer shall immediately be repaired by the Contractor at no additional cost to the State.

### SANITARY SEWER CONNECTIONS

The following estimated quantities have been included in the General Summary (under Sanitary Sewers) for use in replacing disrupted sanitary service connections:

- Item I-1, 6" Pipe, Class J-1, Sec. M-6.8(a) 100 Lin. Ft.
- Item I-5, 6" Pipe Special, Class J-1, Sec. M-6.8(a) 5 Each
- Item I-5, 15" Pipe Special, Class J-1, Sec. M-6.8(a) 1 Each

The above estimated quantities shall not be ordered without prior approval of the Engineer.

### PLASTERING SANITARY MANHOLES

The sanitary sewer manholes shall be built according to the details shown on Standard Drawing "I-8 Manhole No. 1" or "I-8 Manhole No. 2", modified as follows: In addition to the requirements of Section I-8.05 the Contractor shall be required to cover the outside of the structure with a layer of mortar of a minimum thickness of 1/2 inch. The mortar shall be the approved masonry mortar. The cost of this work shall be included in the unit price bid for "Item I-8, Standard No. 1 Manhole," "Item I-8, Standard No. 2 Manhole, Modified", "Item I-8, Standard No. 2 Manhole," or "Item I-8, Manhole, Adjusted to Grade."

### ITEM I-1 CLASS I-3 PIPE UNDERDRAINS

In lieu of the requirements for Type 3 Backfill of Section I-1.07, backfill from a distance of 6 inches above the top of the pipe upward shall consist of Section M-2.1 sand or of Section M-3.13 granulated slag.

This material shall be used except where noted otherwise in the plans.

### CITY OF CLEVELAND MANHOLE FRAME AND COVER

City of Cleveland Standard Manhole Frame and Cover as detailed on Sheet 22A shall be used in lieu of Frame and Cover Detail shown on Standard Construction Drawing I-8 M.H. No. 1 and I-8 M.H. No. 2 on all new manholes to be constructed on this project.

## DRAINAGE

### SEALING OF PIPE JOINTS

Where connections are made between rigid and flexible pipe sections or between pipe sections of different kind or type of end fabrication, whether required by the plans, arising from permissible use of optional materials, or encountered in connection to existing facilities, the joint shall be sealed, if sealing is required by the Specifications, by means of a concrete collar in accordance with Standard Construction Drawing I-1.

### REINFORCED ENDS ON CORRUGATED METAL PIPE

Reinforced ends will be required for the exposed ends of all corrugated metal Class F-4 Pipe, Sec. M-6.4(c) used for all Underdrain Outlets if the exposed pipe ends are unprotected by Catch Basins or Manholes.

### PLUGGING PIPE

The upstream ends of all pipe or tile lines intercepted by earthwork operations shall be effectively blocked and covered. Broken pieces and portions of pipe or tile shall be removed until a whole length is encountered which shall be blocked with concrete, flat stone or brick laid in mortar, or a precast clay or concrete stopper. The Engineer will be provided with locations of sanitary service connections by the City of Cleveland prior to construction. Payment for the above work shall be included in the unit price bid for Item E-1, Roadway Excavation.

### PIPE CUT-OFFS

When bell and spigot pipe is used, any necessary pipe cut-offs will be made at the spigot end of the length of pipe adjacent to the end length. When tongue and groove pipe is used, the length of pipe next to the end length shall be cut and butt joint formed with a concrete collar in accordance with Standard Construction Drawing I-1.

### SPECIAL PIPE CONNECTION

The existing 24" x 30" sewer at approximate Station 45+00 Northbound Jennings shall be located in the field and removed to the limits of the proposed Granular Embankment.

If, after careful inspection the Engineer determines that the existing pipe should be connected to the proposed drainage system, this connection should be made to the special underdrain outlet pipe (U-48).

The following estimated quantities have been included in the General Summary for use in the construction of the connection.

- Item I-1, 24" Pipe, Class E-1 Sec. M-6.4(d) 10 gage-200 Lin. Ft.
- Item I-5, 24" Pipe Special, Class E-1 Sec. M-6.4(d) 10 gage-3 Each

The location, elevations and grade of the required connection shall be determined by the Engineer during construction and payment shall be made on final measurements.

The above estimated quantities shall not be ordered without prior approval of the Engineer.

If the Engineer and the City of Cleveland determine that the connection is unnecessary, the existing pipe shall be removed to the limits indicated and the upstream end plugged as per General Note "Plugging Pipe" and the proposed underdrain outlet pipe shall be constructed as proposed on the plan.

### PIPE UNDER WALLS

The backfill above the crown of the pipe shall be loosely compacted sawdust or other material approved by the Engineer. The cost of all materials, labor and other incidentals necessary to perform this operation shall be included in the unit price bid for the pertinent pipe item. Pipes P-78, P-85, P-100 and P-111 shall be installed as indicated on Pipe Profile Sheets

Limits of loose material backfill are indicated below:

Pipe	Location
P-78	Sta. 923+20 S.B. Medina 49' Left to 72' Left
P-85	Sta. 929+50 S.B. Medina 84' Left to 101' Left
P-100	Sta. 932+50 S.B. Medina 91' Left to 103' Left
P-111	Sta. 4+00 Ramp J-NBOR 43' Right to 58' Right

### ITEM I-5 PIPE SPECIALS

Pipe without perforations will be permitted for use on this project for all Item I-5 Pipe Specials.

## DRAINAGE

### TRACK BRACING

Construction of storm sewers under the B. and O., W. and L.E., and C.V. R.R. tracks shall be done in such a manner that the tracks are adequately braced as required by the Railroad and at such a time approved by the Railroad so as to cause a minimum of interference with Railroad operations. Sheeting and bracing plans must be submitted for approval by the Railroad.

### EROSION CONTROL

The Contractor shall place an 18 inch strip of sod along each side of each paved gutter and shall be compensated, therefore, in accordance with Item L-10, Sodding.

### SODDING FOR SPECIAL BERM AND SLOPE PROTECTION

The work for Special Berm and Slope Protection shall be performed as outlined under the "Approach Slab Erosion Control" detail shown in the Miscellaneous Details.

### SEEPAGE INTERCEPTION UNDERDRAINS

Underdrains U-37, U-38, U-39, U-40 and U-41 shall be placed as shown on Profile Sheet 52/53 when cut excavation is made. Temporary outlets shall be provided during the remainder of the cut excavation to insure continuous drainage through the construction period.

### CONNECTIONS TO EXISTING SEWERS

When the plans provide for proposed drainage pipe to be connected to existing pipes, the Contractor shall locate the existing pipe both as to line and grade before laying the proposed sewer. The cost of this operation shall be included in the unit price bid for the pertinent pipe item.

### ABANDONED SEWERS

Where previously abandoned sewers are encountered during construction, the pipes shall be cut at the limits of new construction and plugged in accordance with methods outlined in Section I-16.03. Payment for cutting and plugging shall be included in the unit price bid for Item E-1, Roadway Excavation.

### MANHOLE COVERS

The Contractor shall set the frames for manhole covers at such an elevation and inclination as to place the surface of the cover in the plane of the finished surface except on slopes steeper than 1 on 6.

### MANHOLES, CATCH BASINS AND INLETS

Removal and disposal of structures, not specifically removed or abandoned under Item I-16 shall be paid for under "Item E-1, Roadway Excavation".

### ITEM I-8 MANHOLE RECONSTRUCTED TO GRADE, AS PER PLAN

This item shall consist of the careful removal of the existing manhole to an elevation below the new grade, as required by the Engineer, and reconstruction of the manhole to the new grade, conforming as nearly as practicable to the existing dimensions and type of construction and using the salvaged manhole frame and cover. Where it is necessary to replace unsatisfactory manhole frame and cover castings, they shall be replaced with units from other removed manholes.

### MODIFIED MANHOLE

Manholes over 23' deep shall be built in accordance with Standard Construction Drawing "I-8 Manhole No. 2" except that No. 4 reinforcing bars shall be placed at about mid-depth of the base slab and at 8 inch centers in each direction and a 17" wall thickness shall be provided for that portion of the manhole below 20' in depth. The cost of this work shall be included in the unit price bid for "Item I-8, Standard No. 2 Manhole, Modified".

The following manholes shall be constructed as per this note:

STRUCTURE CODE	
S-43	SS-1
S-48	SS-2
S-54	
S-61	
S-71	
S-85	

SCALE: \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE BY: RJT DATE: 11-2-64 CONSULTING ENGINEERS  
TRCD: \_\_\_\_\_ DATE: \_\_\_\_\_  
CKD: DPS DATE: 11-4-64 KANSAS CITY CLEVELAND NEW YORK











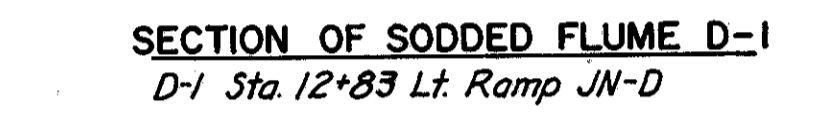
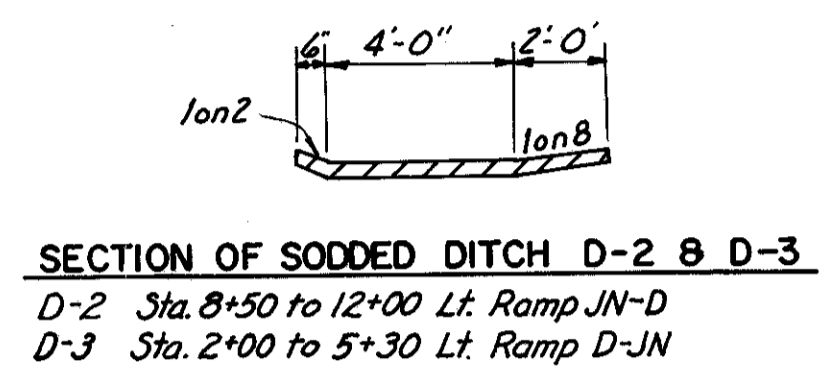
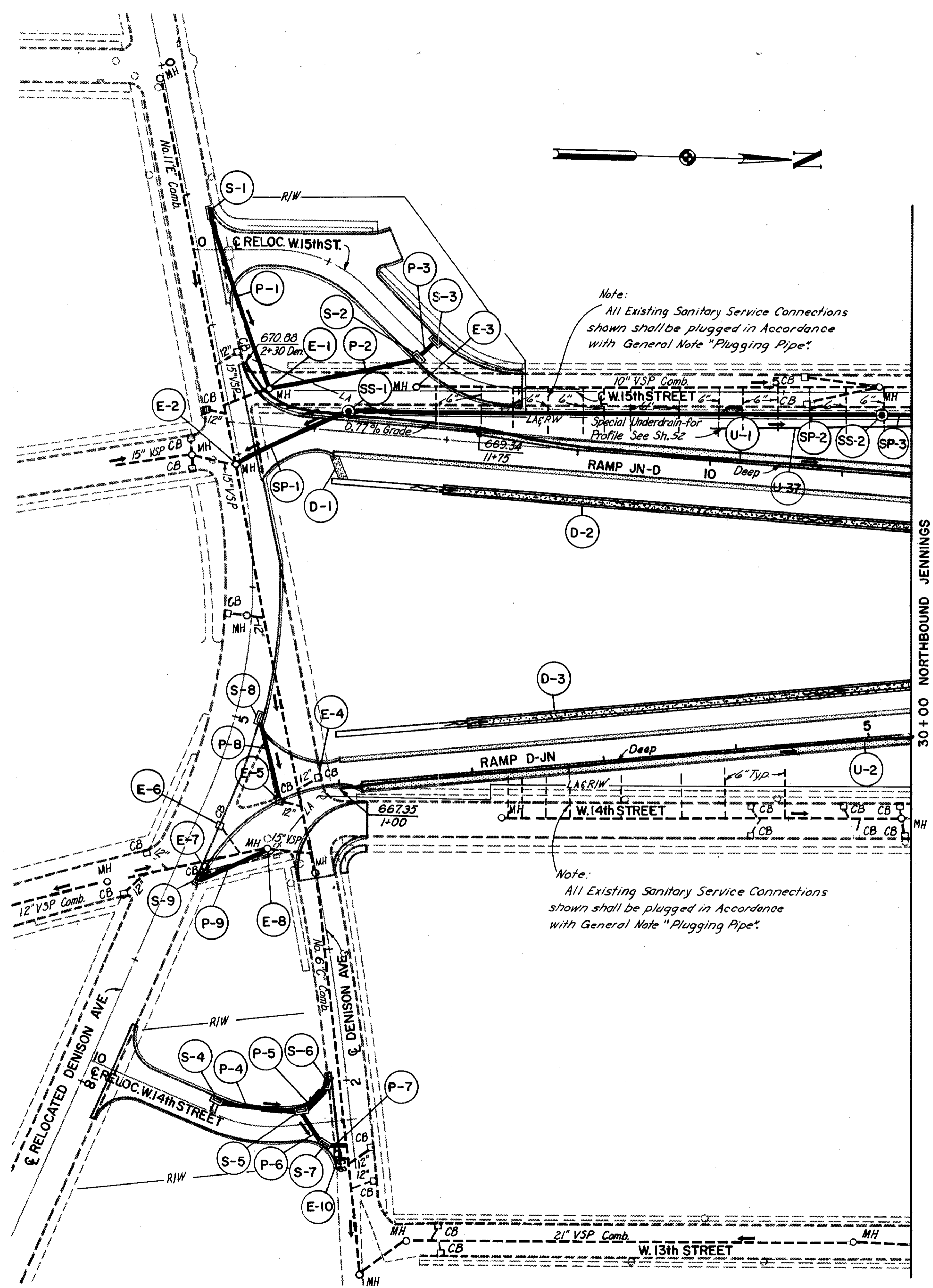


**DRAINAGE LEGEND**

- ⊙ PROPOSED STORM SEWER MANHOLE
- ⊙ PROPOSED SANITARY MANHOLE
- PROPOSED PAVED SHOULDER INLET
- ▢ PROPOSED DITCH CATCH BASIN
- ▣ PROPOSED PAVEMENT CATCH BASIN
- PROPOSED STORM OR SANITARY SEWER
- EXISTING MANHOLE
- EXISTING CATCH BASIN
- EXISTING STORM OR SANITARY SEWER
- ▨ JUTE MATTING
- ▩ SODDED DITCH

**CODE IDENTIFICATION**

- (P) STORM SEWER PIPE
- (S) STORM SEWER STRUCTURE
- (SP) SANITARY OR COMBINED SEWER PIPE
- (SS) SANITARY SEWER STRUCTURE
- (E) EXISTING STRUCTURE OF SEWER PIPE
- (U) UNDERDRAIN PIPE
- (D) DITCH PROTECTION

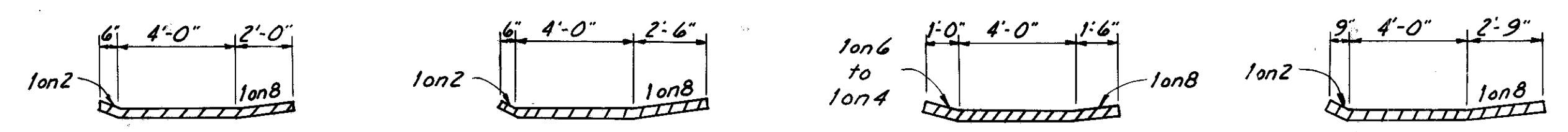


M.H. ADJUSTED TO GRADE		
Ref No.	Existing T/C Elev.	Adjusted T/C Elev.
E-1	677.17	677.6
E-3	675.63	676.0
E-8	673.64	674.7

DRAINAGE QUANTITIES		I-1				I-8		I-16	L-10
CODE	LOCATION	CI I-3	CI I-3	CI E-1	CI J-1	Std	MH	C.B.	Sodding
		Deep	M6.4(h)	M6.8(b)	M6.8(b) Encased	No.2 MH	Adjusted to Grade	Aband.	Sq. Yd.
<b>UNDERDRAINS</b>									
U-1	Ramp JN-D Rt. 8+50 to 2+30 Den.	520							
U-2	Ramp D-JN Rt. 1+00 to 5+30	430							
U-37	Ramp JN-D Rt. 8+50 to 10+00		150						
<b>EXISTING STRUCTURES</b>									
E-1	Reloc. Denison Ave.						1		
E-3	Reloc. West 15th St.						1		
E-4	Reloc. Denison Ave.							1	
E-5	Reloc. Denison Ave.							1	
E-6	Reloc. Denison Ave.							1	
E-7	Reloc. Denison Ave.							1	
E-8	Reloc. Denison Ave.						1		
E-10	Reloc. Denison Ave.							1	
<b>DITCH PROTECTION</b>									
D-1	Ramp JN-D Lt.								13
D-2	Ramp JN-D Lt.								253
D-3	Ramp D-JN Lt.								239
<b>SANITARY SEWERS</b>									
SP-1	Ramp JN-D				90				
SP-2	Ramp JN-D Rt.			402					
SP-3	Ramp JN-D Rt.			23					
SS-1	Ramp JN-D Rt.					1			
SS-2	Ramp JN-D Rt.					1			
<b>TOTAL</b>		950	150	425	90	2	3	5	505

E-4, E-6, E-7 & E-10 Seal Pipe at Catch Basin  
E-5 Connect Pipe through Catch Basin  
For Sanitary Sewer Profiles See Sh. 54.  
For Sewer Pipe & Drainage Structure Quantities See Sh. 3 to 7.





M.H. ADJUSTED TO GRADE		
Ref. No.	Existing T/C Elev.	Adjusted T/C Elev.
E-16*	672.96	672.45

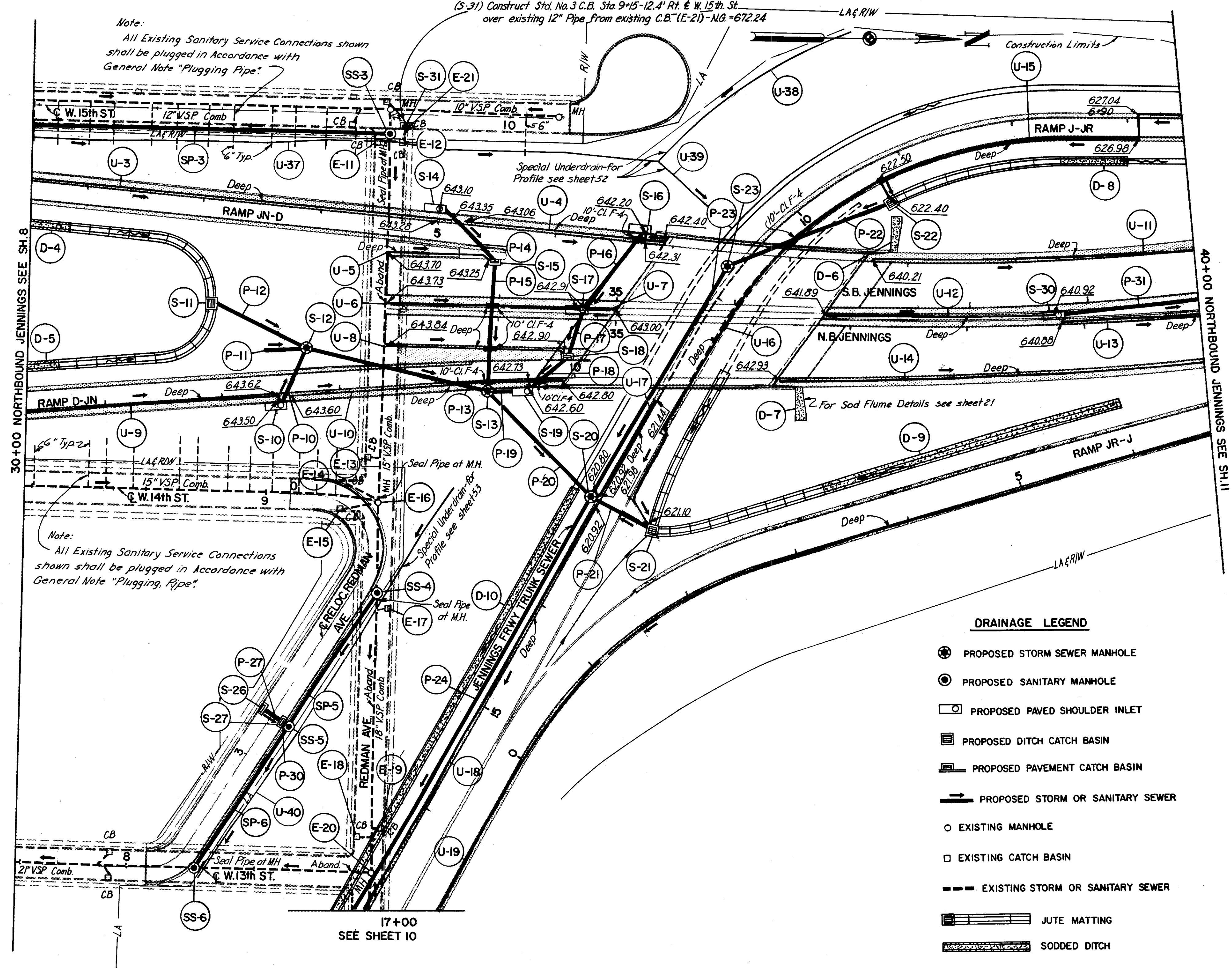
\*Reconstructed to grade

**SECTION OF SODDED DITCH D-4 & D-5**  
D-4 Sta. 8+10 to 8+50 Lt. Ramp JN-D  
D-5 Sta. 5+30 to 5+65 Lt. Ramp D-JN

**SECTION OF SODDED DITCH D-8**  
D-8 Sta. 7+00 to 7+60 Ramp J-JR Rt.

**SECTION OF SODDED DITCH D-9**  
Sta. 3+38 to 6+00 Lt. Ramp JR-J

**SECTION OF SODDED DITCH D-10**  
Sta. 13+00 to 17+00 Rt. Ramp J-JR

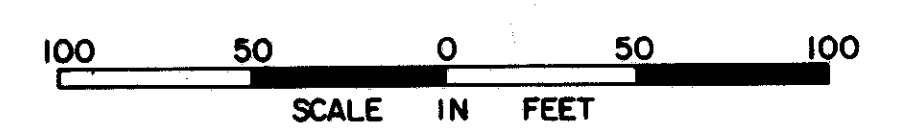


DRAINAGE QUANTITIES		I-1		I-8		I-16		L-10	
CODE	LOCATION	CI E-1	CI E-1	Std.	M.H.	C.B.	M.H.	Sodding	Sodding
		M6.8(b)	M6.8(b)	No.1 M.H.	Recons. to Grade	Aband.	Aband.	Spec. Slope & Berm Protection	Spec. Slope & Berm Protection
		18"	21"	Mod.				Sq. Yd.	Sq. Yd.
<b>EXISTING STRUCTURES</b>									
E-11	Redman Ave.								
E-12	Redman Ave.								
E-13	Redman Ave.								
E-14	West 14th St.								
E-15	West 14th St.								
E-16	Redman Ave.								
E-17	Redman Ave.								
E-18	Redman Ave.								
E-19	Redman Ave.								
E-20	Redman Ave.								
E-21	Redman Ave.								
<b>DITCH PROTECTION</b>									
D-4	Ramp JN-D Lt.							29	
D-5	Ramp D-JN Lt.							25	
D-6	S.B. Jennings Frwy. Lt.								25
D-7	N.B. Jennings Frwy. Rt.								25
D-8	Ramp J-JR Lt.								47
D-9	Ramp JR-J Lt.								189
D-10	Ramp J-JR Rt.								334
<b>SANITARY SEWERS</b>									
SP-3	Ramp JN-D Rt.		304						
SP-5	Reloc. Redman Ave.	135							
SP-6	Reloc. Redman Ave.	149							
SS-3	Ramp JN-D Rt.								
SS-4	Reloc. Redman Ave.								
SS-5	Reloc. Redman Ave.								
SS-6	Reloc. Redman Ave.								
<b>TOTAL</b>		284	304	4	1	9	1	624	50

E-12, L-14 & E-15 Seal Pipe at Catch Basin  
For Sanitary Sewer Profiles See Sh. 54

DRAINAGE QUANTITIES		I-1			I-5					
CODE	LOCATION	CI I-3	CI I-3	CI I-1	CI I-3	CI I-3	CI I-3	CI I-3	CI I-3	
		Deep	M6.4(h)	6"	6"	25° Bend	60° Bend	90° Bend	Tee	
		6"	6"	6"	6"	6"	6"	6"	6"x6"x6"	
		Lin. Ft.		Each						
<b>UNDERDRAINS</b>										
U-3	Ramp JN-D Rt. 4+87 to 8+50	7	365						1	
U-4	Ramp JN-D Rt. 3+10 to 4+83	17	163						1	
U-5	S.B. Jennings Frwy. Lt. 33+00 to 33+95	10	85						1	
U-6	S.B. Jennings Frwy. Rt. 33+00 to 34+70	20	150							
U-7	S.B. Jennings Frwy. Rt. 34+70 to 35+00	10	20							
U-8	N.B. Jennings Frwy. Rt. 33+00 to 34+60	20	140							
U-9	Ramp D-JN Rt. 5+30 to 7+50	7	220							
U-10	Ramp D-JN Rt. 7+57 to 9+87	27	210							
U-11	S.B. Jennings Frwy. Lt. 37+15 to 39+95		280							
U-12	S.B. Jennings Frwy. Rt. 36+80 to 38+75	10	185							
U-13	N.B. Jennings Frwy. Lt. 38+75 to 40+00		125							
U-14	N.B. Jennings Frwy. Rt. 36+40 to 40+00		360							
U-15	Ramp J-JR Lt. 6+55 to 9+25	10	280	21						
U-16	Ramp J-JR Lt. 9+27 to 13+00	20	370				3		3	
U-17	Ramp J-JR Rt. 12+00 to 12+98	7	98				1			
U-18	Ramp J-JR Rt. 13+02 to 17+00		398							
U-19	Ramp JR-J Rt. 16+70(JR-J) to 6+70		820							
U-37	Ramp JN-D Rt. 3+20 to 8+50		530						1	
U-38	Ramp J-JR Rt. 9+00 to 10+50		200							
U-39	Ramp J-JR Rt. 10+50	87			8	2				
U-40	Ramp J-JR Rt. 13+50 to 17+00		360							
<b>TOTAL</b>		252	4269	1090	21	8	2	6	4	3

SCALE 1"=50'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
MADE D.D.S. DATE 8-12-64  
TRCD R.D.J. DATE 8-14-64  
CRD R.U.T. DATE 10-14-64  
KANSAS CITY CLEVELAND NEW YORK

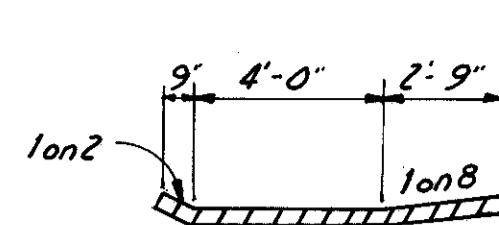


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

260  
646

CUYAHOGA COUNTY  
CUY - 71-17.83  
CUY-176-12.76

10  
54



SECTION OF SODDED DITCH D-11  
D-11 Sta 17+00 to 18+35 Rt. Ramp J-JR

M.H. ADJUSTED TO GRADE		
Ref. No.	Existing T/C Elev.	Adjusted T/C Elev.
E-22	605.65	604.13
E-25	607.83	608.99

**DRAINAGE LEGEND**

- ⊙ PROPOSED STORM SEWER MANHOLE
- ⊙ PROPOSED SANITARY MANHOLE
- ▭ PROPOSED PAVED SHOULDER INLET
- ▭ PROPOSED DITCH CATCH BASIN
- ▭ PROPOSED PAVEMENT CATCH BASIN
- PROPOSED STORM OR SANITARY SEWER
- EXISTING MANHOLE
- EXISTING CATCH BASIN
- EXISTING STORM OR SANITARY SEWER
- ▭ JUTE MATTING
- ▭ SODDED DITCH

**DRAINAGE QUANTITIES**

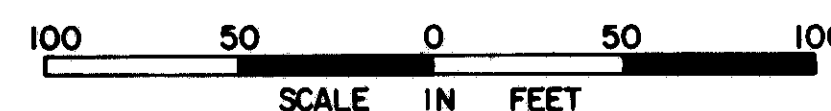
CODE	LOCATION	I-16		I-8	L-10
		M.H. Aband.	C.B. Aband.	M.H. Adjusted to Grade	Sodding
<b>EXISTING STRUCTURES</b>		Each			Sq. Yd.
E-22	Jennings Rd.			1	
E-23	Jennings Rd.		1		
E-24	Jennings Rd.		1		
E-25	Jennings Rd.			1	
E-26	Redman Ave.	1			
<b>DITCH PROTECTION</b>					
D-11	Ramp J-JR Rt.				113
<b>TOTAL</b>		1	2	2	113

E-24 Seal Pipe at C.B.  
E-23 Connect 18" Pipe through C.B.

**DRAINAGE QUANTITIES**

CODE	LOCATION	I-1				I-5				
		Cl. F-4	Cl. I-3 Deep	Cl. I-3 M6.4(h)	Cl. F-4 M6.4(c)	Cl. F-4 25° Bend	Cl. F-4 90° Bend	Cl. I-3 60° Bend	Cl. I-3 90° Bend	Cl. I-3 Tee
		6"	6"	6"	8"	6"	6"	6"	6"	6"x6"x6"
<b>UNDERDRAINS</b>		Lin. Ft.								
U-20	Ramp J-JR Rt. 17+00 to 20+00	10	290					1		
U-21	Ramp J-JR Rt. 20+04 to 22+55	10	265							1
U-22	Ramp J-JR Lt. 16+70 to 19+85	10	352							1
U-23	Ramp J-JR Lt. 22+00 to 22+70	8	44				1			
U-24	Rel Jennings Rd. Rt. 20+95 J-JR to 5+70	10	115						1	
U-25	Rel Jennings Rd. Rt. 5+70 to 6+75	14	110							1
U-26	Rel Jennings Rd. Lt. 20+00 J-JR to 5+70	10	65							
U-27	Rel Jennings Rd. Lt. 5+70 to 6+75	4	90							1
U-40	Ramp J-JR Rt. 17+00 to 18+50			131						
U-41	Ramp J-JR Rt. 18+50	116			10	1	1			
<b>TOTAL</b>		192	1351	131	10	1	1	2	1	4

SCALE 1"=50'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE D.D.S. DATE 8-14-64 CONSULTING ENGINEERS  
TRCD R.D.L. DATE 8-17-64 KANSAS CITY CLEVELAND NEW YORK  
CKD R.J.T. DATE 10-18-64



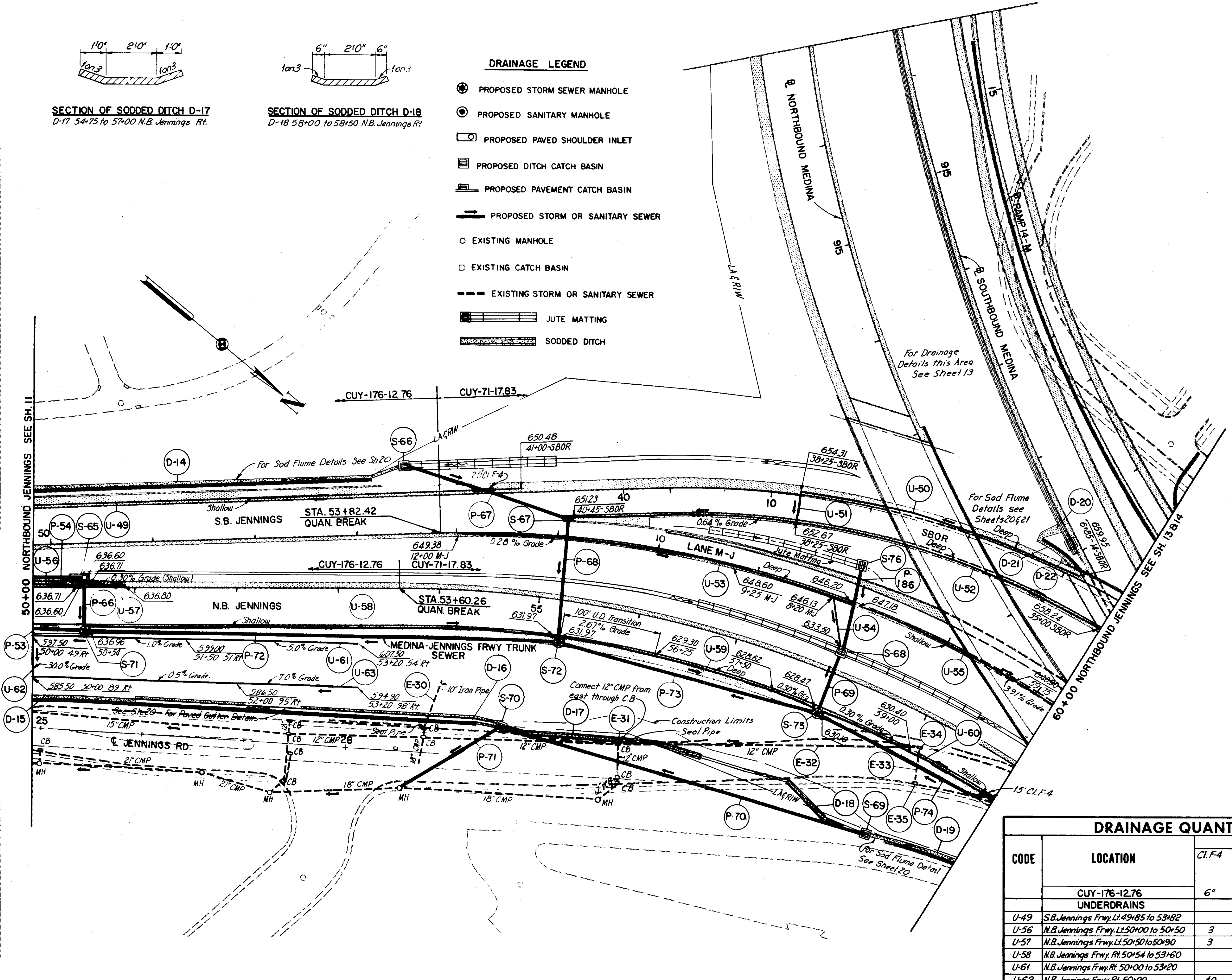




**SECTION OF SODDED DITCH D-17**  
D-17 54+75 to 57+00 N.B. Jennings Rt.

**SECTION OF SODDED DITCH D-18**  
D-18 58+00 to 58+50 N.B. Jennings Rt.

- DRAINAGE LEGEND**
- ⊕ PROPOSED STORM SEWER MANHOLE
  - ⊙ PROPOSED SANITARY MANHOLE
  - PROPOSED PAVED SHOULDER INLET
  - ▢ PROPOSED DITCH CATCH BASIN
  - ▣ PROPOSED PAVEMENT CATCH BASIN
  - PROPOSED STORM OR SANITARY SEWER
  - EXISTING MANHOLE
  - EXISTING CATCH BASIN
  - - - EXISTING STORM OR SANITARY SEWER
  - ▨ JUTE MATTING
  - ▧ SODDED DITCH



CODE	LOCATION	I-1						
		CI.F-4	CI.F-3 Shallow	CI.F-3 Deep	CI.J-1	CI.I-3 90° Bend	CI.I-3 Tee	CI.I-3 60° Wye
CUY-71-17.83		6"	6"	6"	6"	6"	6" x 6" x 6"	6" x 6" x 6"
UNDERDRAINS		LIN. FT.					EACH	
U-49	S.B. Jennings Fwy. Lt. 53+82 to 4+00 SBOR	20	60					
U-50	SBOR Rt. 6+85 to 14+50 SBOR to 38+25			287				
U-51	SBOR 38+25				30	1	1	
U-52	SBOR Lt. 35+00 to 40+45	10		535				
U-53	Lane M-J Lt. 8+05 to 12+00			398				
U-54	Lane M-J Lt. 8+20	10		45			1	
U-55	Lane M-J Lt. 5+80 to 7+95		215					
U-58	N.B. Jennings Rt. 53+60 to 55+25	10	150					
U-59	N.B. Jennings Rt. 55+28 to 58+00	10		255				
U-60	N.B. Jennings Rt. 58+03 to 60+00	25	165					
TOTAL		85	590	1520	30	1	1	1

CODE	LOCATION	E-12	I-16	L-10	
		Pipe Removed 15" and Under	C.B. Aband.	Sodding	Sodding Special Slope & Berm Protection
CUY-71-17.83		LIN. FT.	EACH	SQ. YDS.	
EXISTING STRUCTURES		LIN. FT.	EACH	SQ. YDS.	
E-31	N.B. Jennings Fwy. Rt. 56+00		1		
E-32	N.B. Jennings Fwy. Rt. 56+00 to 59+10	300			
E-33	N.B. Jennings Fwy. Rt. 59+10	35			
E-34	N.B. Jennings Fwy. Rt. 59+10		1		
E-35	N.B. Jennings Fwy. Rt. 59+35		1		
DITCH PROTECTION					
D-17	N.B. Jennings Fwy. Rt.			89	
D-18	N.B. Jennings Fwy. Rt.			17	
D-19	N.B. Jennings Fwy. Rt. 59+00 to 60+00			31	
D-20	Ramp 14-SBOR Rt. 7+35				17
D-21	Ramp 14-SBOR Rt. 6+95 to 7+35				17
D-22	Ramp 14-SBOR Rt. 7+05				8
TOTAL		335	3	154	25

CODE	LOCATION	I-1				
		CI.F-4	CI.F-3 Shallow	CI.F-3 M6.4(h)	CI.I-3 60° Bend	CI.I-3 Tee
CUY-176-12.76		6"	6"	6"	6"	6" x 6" x 6"
UNDERDRAINS		LIN. FT.				
U-49	S.B. Jennings Fwy. Lt. 49+85 to 53+82		397			
U-56	N.B. Jennings Fwy. Lt. 50+00 to 50+50	3	45		1	
U-57	N.B. Jennings Fwy. Lt. 50+50 to 50+90	3	35		1	
U-58	N.B. Jennings Fwy. Rt. 50+54 to 53+60		306			
U-61	N.B. Jennings Fwy. Rt. 50+00 to 53+20			320		
U-62	N.B. Jennings Fwy. Rt. 50+00	40				2
U-63	N.B. Jennings Fwy. Rt. 50+00 to 53+20			320		
TOTAL		46	783	640	2	2

CODE	LOCATION	E-12	I-14	L-10
		Pipe Removed 15" and Under	Special Paved Gutter	Sodding
CUY-176-12.76		LIN. FT.		SQ. YDS.
EXISTING STRUCTURES		LIN. FT.		SQ. YDS.
E-30	N.B. Jennings Fwy. Rt. 54+00	50		
DITCH PROTECTION				
D-14	S.B. Jennings Fwy. Lt. 49+85 to 53+50			122
D-15	N.B. Jennings Fwy. Rt. 50+00 to 51+00			34
D-16	N.B. Jennings Fwy. Rt. 51+00 to 54+75		360	63
TOTAL		50	360	219

SCALE 1"=50'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE D.D.S. DATE 10-26-64 CONSULTING ENGINEERS  
TRCD. JEN. DATE 10-26-64 KANSAS CITY CLEVELAND NEW YORK  
CRD. R.J.T. DATE 10-23-64



M.H. ADJUSTED TO GRADE		
Ref. No.	Existing T/C Elev.	Adjusted T/C Elev.
E-131*	686.78	686.12
E-138*	684.73	684.56

\*Reconstructed to grade

**DRAINAGE LEGEND**

- ⊕ PROPOSED STORM SEWER MANHOLE
- ⊙ PROPOSED SANITARY MANHOLE
- ◻ PROPOSED PAVED SHOULDER INLET
- ▭ PROPOSED DITCH CATCH BASIN
- ▭ PROPOSED PAVEMENT CATCH BASIN
- PROPOSED STORM OR SANITARY SEWER
- EXISTING MANHOLE
- EXISTING CATCH BASIN
- EXISTING STORM OR SANITARY SEWER
- ▨ JUTE MATTING
- ▨ SODDED DITCH

DRAINAGE QUANTITIES		I-1			I-5		
CODE	LOCATION	CI.F-4	CI.F-3 Shallow	CI.F-3 Deep	CI.F-3 60° Bend	CI.F-3 25° Bend	
		6"	6"	6"	6"	6"	
<b>UNDERDRAINS</b>		Lin. Ft.					Each
U-152	Ramp 14-M Rt. 9+58 to 15+77			619			
U-153	S.B. Medina Lt. 913+50 to 914+25	5	65		1		
U-154	S.B. Medina Lt. 914+30 to 915+75	5	35	100	1		
U-155	S.B. Medina Lt. 915+80 to 916+50	5		65	1		
U-156	S.B. Medina Lt. 916+55 to 919+00	5		235	1		
U-157	S.B. Medina Lt. 919+05 to 919+84	5		70	1		
U-158	S.B. Medina Lt. 919+84 to 920+00	5		10	1		
U-159	N.B. Medina Lt. 913+00 to 917+00		400				
U-160	N.B. Medina Lt. 913+00	10	78			1	
<b>Total</b>		40	578	1099	6	1	

DRAINAGE QUANTITIES		I-8		I-14		I-16		L-10	
CODE	LOCATION	M.H. Reconst. To Grade	Paved Gutter Type 1 Mod.	M.H. Aband.	C.B. Aband.	Sodding	Sodding Spec. Slope & Berm Protection		
		Each	Lin. Ft.	Each	Each	Sq. Yds.			
<b>EXISTING STRUCTURES</b>									
E-128	Reloc. W. 17th St. Lt. 1+30				1				
E-129	Reloc. W. 17th St. Lt. 1+30				1				
E-130	Reloc. W. 17th St. Rt. 1+50			1					
E-131	Reloc. W. 17th St. Lt. 1+55	1							
E-132	Reloc. W. 17th St. Rt. 1+60				1				
E-133	Reloc. W. 17th St. Lt. 1+85				1				
E-134	Reloc. W. 17th St. Rt. 3+40			1					
E-135	Reloc. W. 17th St. Rt. 5+60				1				
E-136	Reloc. W. 17th St. Rt. 5+60				1				
E-137	Reloc. W. 17th St. Rt. 5+65				1				
E-138	Reloc. W. 17th St. Rt. 5+90	1							
E-139	Reloc. W. 17th St. Rt. 6+00				1				
E-140	Reloc. W. 17th St. Rt. 5+85			1					
E-141	Ramp 14-M Rt. 14+05				1				
E-142	Ramp 14-M Lt. 13+55				1				
E-143	Ramp 14-M Rt. 13+45				1				
E-144	Ramp 14-M Lt. 13+40			1					
E-145	Ramp 14-M Lt. 12+50			1					
E-146	Ramp 14-M Rt. 11+35				1				
E-147	Ramp 14-M Rt. 11+10				1				
E-148	Ramp 14-M Rt. 11+05				1				
<b>DITCH PROTECTION</b>									
D-33	N.B. Medina Rt. 916+30								30
D-34	N.B. Medina Lt. 916+25								30
D-35	S.B. Medina Rt. 913+50 to 918+80		530					89	
<b>Total</b>		2	530	6	13	89	60		

E-128, E-129, E-133 & E-137 Seal Pipe at Catch Basin  
E-130 Seal Pipe at Manhole.

BEGIN WORK & PROJECT  
CUY.-71-17.83  
STA. 0+00 @ RELOC. W. 17th ST.

BEGIN WORK  
CUY.-71-17.83  
STA. 912+50

BEGIN PROJECT  
CUY.-71-17.83  
STA. 913+50

DRAINAGE QUANTITIES		I-1				I-5		
CODE	LOCATION	CI.F-4	CI.I-3	CI.I-3	CI.U-1	CI.I-3	CI.I-3	CI.I-3
		6"	6"	6"	6"	60" Band	90" Band	Te
<b>UNDERDRAINS</b>		Lin. Ft.				Each		
U-64	Ramp 14-M Rt. 4+90 to 9+58			468				
U-65	Ramp 14-M Rt. 0+65 to 4+70	7		405			1	
U-66	Ramp 14-SBOR Lt. 0+65(N.M.) to 2+76			595		3		
U-67	S.B. Medina Lt. 920+00 to 923+20			310				
U-69	S.B. Medina Lt. 923+20 to 928+20	4	370	126		1		
U-70	S.B. Medina Lt. 928+20 to 929+50	6	130			1		
U-71	S.B. Medina Lt. 929+50 to 930+00	6	44			1		
U-72	SBOR Rt. 24+60 to 30+11		90	461				
U-73	SBOR Rt. 30+11 to 31+27			116				
U-74	SBOR Lt. 31+27				28		2	
U-75	SBOR Rt. 31+27 to 32+25	10		88				
U-76	Lane M-J Lt. 4+00 to 5+80		180					
U-77	N.B. Jennings Lt. 60+00 to 63+65		355					
U-78	Valentine Ave. Rt. 0+10 to 1+25	10	85					
U-79	Valentine Ave. Rt. 0+65(N.M.) to 1+25	20	60					
U-80	Valentine Ave. Lt. 0+30 to 1+21		105					
U-81	Valentine Ave. Lt. 1+21 to 1+45		25					
U-113	Lane M-J Lt. 5+25				23		1	
	<b>Total</b>	63	1444	2569	51	6	2	2

DRAINAGE QUANTITIES		E-12		I-16		L-10	
CODE	LOCATION	Pipe Removed	Pipe Removed	M.H. Aband.	C.B. Aband.	Sodding	Sodding
		15" & Under	over 15"			Sp. Yds.	Sp. Slope of Berm Protection
<b>EXISTING STRUCTURES</b>		Lin. Ft.		Each		Sp. Yds.	
E-36	Ramp 14-M Rt. 7+50			1			
E-37	Ramp 14-M Rt. 6+80			1			
E-38	Ramp 14-M Rt. 5+25			1			
E-39	Ramp 14-M Rt. 5+40			1			
E-40	Ramp 14-M Rt. 5+28			1			
E-41	Ramp 14-M Rt. 4+55			1			
E-42	Ramp 14-M Rt. 3+45			1			
E-43	Ramp 14-M Rt. 2+50			1			
E-44	Ramp 14-M Rt. 1+70			1			
E-45	Ramp 14-M Lt. 1+70			1			
E-46	Ramp 14-M Lt. 1+73			1			
E-47	S.B. Medina Lt. 920+80			1			
E-48	S.B. Medina Lt. 922+30			1			
E-49	S.B. Medina Lt. 925+05			1			
E-50	S.B. Medina Rt. 925+25 to 28+35 SBOR	203					
E-51	S.B. Medina Rt. 925+25			1			
E-52	S.B. Medina Rt. 925+28			1			
E-53	S.B. Medina Lt. 27+35			1			
E-54	S.B. Medina Lt. 28+15			1			
E-55	S.B. Medina Lt. 28+25			1			
E-56	SBOR Rt. 25+00			1			
E-57	SBOR Rt. 25+05			1			
E-58	SBOR Rt. 24+40			1			
E-59	SBOR Lt. 25+00			1			
E-60	S.B. Medina 922+55	140					
E-61	N.B. Jennings Lt. 62+25			1			
E-62	N.B. Jennings Rt. 62+25			1			
E-63	N.B. Jennings Rt. 62+40			1			
E-64	N.B. Jennings Rt. 63+20			1			
E-65	N.B. Jennings Rt. 63+70 to 66+15	300					
E-66	N.B. Jennings Rt. 64+90			1			
E-67	N.B. Jennings Rt. 66+15			1			
E-68	N.B. Jennings Rt. 66+15 to 68+95	275					
E-69	N.B. Jennings Rt. 68+95			1			
E-70	Valentine Ave. Rt. 0+15			1			
E-71	Valentine Ave. Lt. 0+20			1			
E-72	SBOR 31+20			1			
E-73	SBOR 30+50			1			
E-74	SBOR Lt. 28+35			1			
E-75	SBOR Lt. Rt. 920+80(S.B. Medina) to 24+10	785					
E-76	SBOR Rt. 27+20			1			
E-77	SBOR Rt. 26+10			1			
E-78	Ramp 14-M 4+55 to 7+50	300					
<b>DITCH PROTECTION</b>							
D-23	N.B. Jennings Rt. 60+00 to 64+50					140	
D-24	N.B. Jennings Rt. 63+53						30
D-25	N.B. Jennings Lt. 63+50						16
	<b>Total</b>	1728	275	9	28	140	46

MEDINA FRWY. TRUNK SEWER SOUTH BRANCH

RAMP 14-M

RAMP 14-SBOR

LANE M-J

JENNINGS ROAD

MEDINA-JENNINGS FRWY. TRUNK SEWER

920+00 SOUTHBOUND MEDINA

930+00 SOUTHBOUND MEDINA

SEE SH. 12813

SEE SH. 12815

SEE SH. 12817

SEE SH. 12819

**STORM SEWER RADIUS PIPE CURVE DATA**

(P-76) & (P-187)  
PI. Sta. 920+53 S.B. Medina - 34' Lt.  
Δ = 82°00'00"  
R = 70.00'  
T = 60.85'  
L = 100.18'

(P-74)  
PI. Sta. 60+00 N.B. Jennings - 47' Rt.  
Δ = 62°00'00"  
R = 50.00'  
T = 30.04'  
L = 54.10'

**DRAINAGE LEGEND**

- PROPOSED STORM SEWER MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED PAVED SHOULDER INLET
- ▢ PROPOSED DITCH CATCH BASIN
- ▣ PROPOSED PAVEMENT CATCH BASIN
- PROPOSED STORM OR SANITARY SEWER
- EXISTING MANHOLE
- EXISTING CATCH BASIN
- EXISTING STORM OR SANITARY SEWER
- ▨ JUTE MATTING
- ▧ SODDED DITCH

SCALE 1" = 50'  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

SCALE IN FEET  
100 50 0 50 100

E-36 & E-71 Seal Pipe of Catch Basin



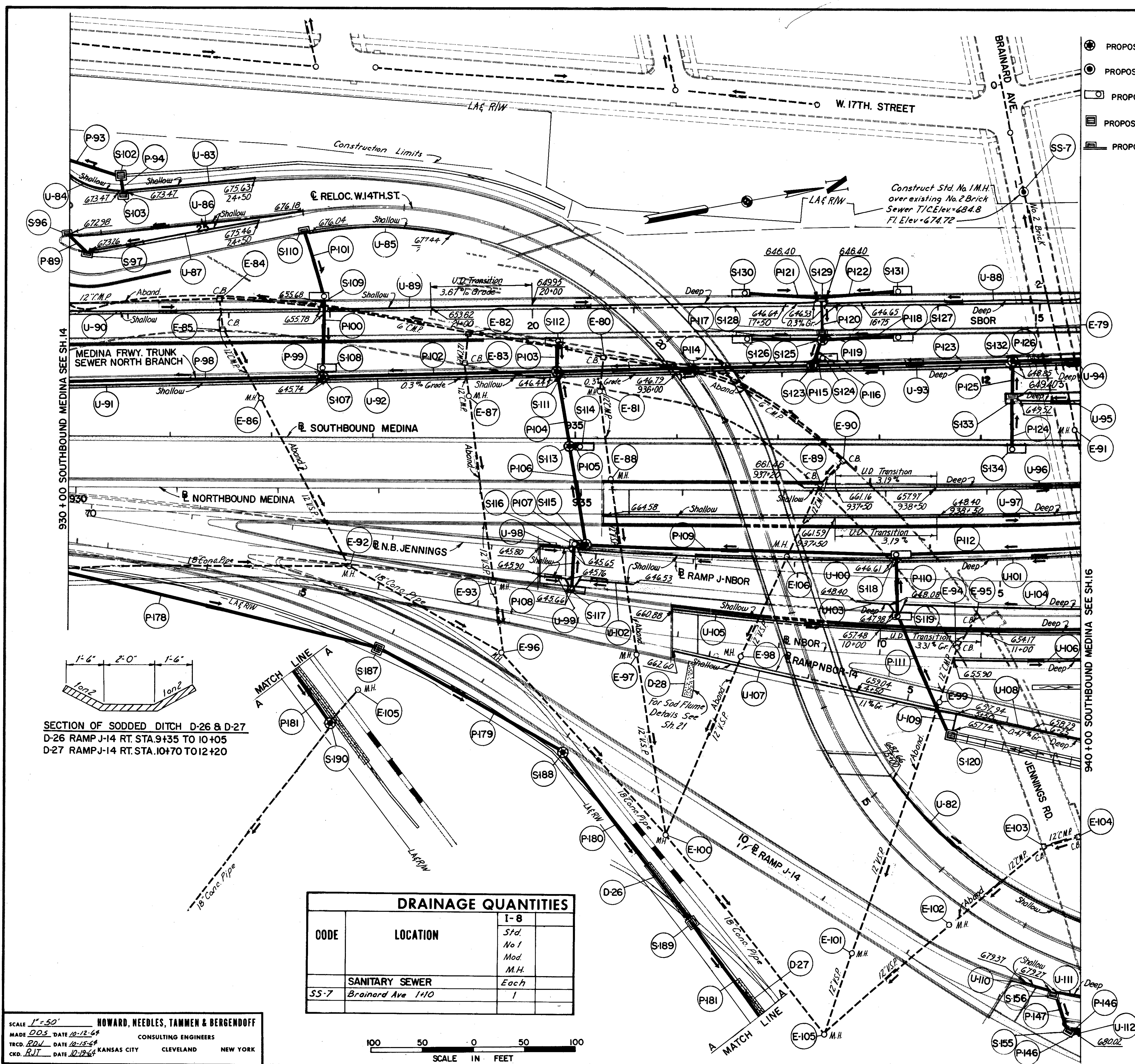
**DRAINAGE LEGEND**

- PROPOSED STORM SEWER MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED PAVED SHOULDER INLET
- ▣ PROPOSED DITCH CATCH BASIN
- ▩ PROPOSED PAVEMENT CATCH BASIN
- PROPOSED STORM OR SANITARY SEWER
- EXISTING MANHOLE
- EXISTING CATCH BASIN
- EXISTING STORM OR SANITARY SEWER
- ▩ JUTE MATTING
- ▨ SODDED DITCH

DRAINAGE QUANTITIES	LOCATION	EXISTINGS	STRUCTURES	Pipe Removed 15" & Over	Lin. Ft.	I-16		I-10	
						M.H. Aband.	C.B. Aband.		
E-79	S.B. Medina Lt. Rt. 939+95			240					
E-80	S.B. Medina Lt. 935+30								
E-81	S.B. Medina Lt. 935+27								
E-82	S.B. Rt. 20+45								
E-83	S.B. Rt. 20+70								
E-84	S.B. Rt. 23+07								
E-85	S.B. Rt. 23+07								
E-86	S.B. Medina Lt. 931+90								
E-87	S.B. Medina Lt. 933+95								
E-88	N.B. Medina Lt. 935+30								
E-89	N.B. Medina Lt. 937+35								
E-90	N.B. Medina Lt. 937+57								
E-91	N.B. Medina Lt. 939+92								
E-92	N.B. Jennings Rt. 72+60								
E-93	N.B. Jennings Rt. 74+05								
E-94	N.B. Rt. 10+75								
E-95	N.B. Rt. 10+95								
E-96	N.B. Rt. 6+30								
E-97	N.B. Rt. 7+65								
E-98	N.B. Rt. 8+45								
E-99	Ramp N.B. Rt. 5+30								
E-100	Ramp U-14 Rt. 9+35								
E-101	Ramp U-14 Rt. 11+50								
E-102	Ramp U-14 Rt. 12+20								
E-103	Reloc. W. 14th St. Rt. 13+25								
E-104	Reloc. W. 14th St. Rt. 12+95								
E-105	Ramp U-14 Rt. 11+75								
E-106	Ramp U-14 Rt. 2+95								
D-26	Ramp U-14							42	
D-27	Ramp U-14							87	
D-28	Ramp N.B. Rt. 2+85							30	
	Total				240	16	11	129	30

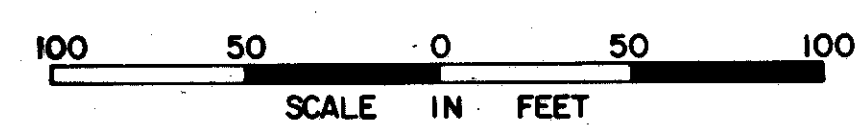
When Manhole or Catch Basin shown on this sheet are to be abandoned and are not removed entirely seal pipe or structure

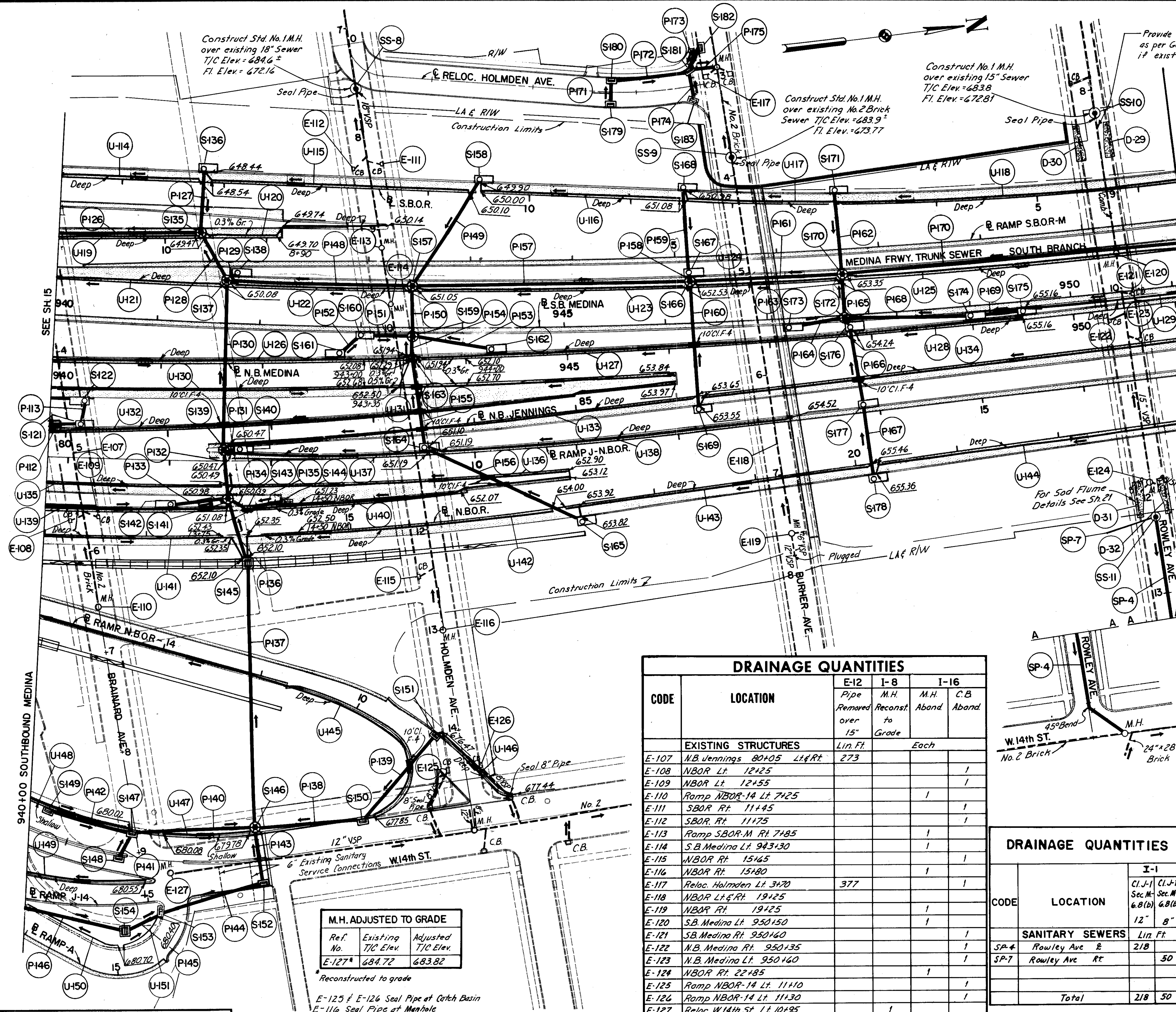
DRAINAGE QUANTITIES	LOCATION	UNDERDRAINS	Lin. Ft.	I-1		I-5	
				Cl. F-4	Cl. F-3	Cl. I-3	Cl. I-3
U-82	Rel. W. 14th St. Rt. 12+40 to 15+00		237				
U-83	Rel. W. 14th St. Rt. 24+50 to 25+75		130				
U-84	Rel. W. 14th St. Rt. 25+80 to 26+30		52				
U-85	Rel. W. 14th St. Rt. 27+50 to 28+00		150				
U-86	Rel. W. 14th St. Rt. 28+00 to 28+34		235				
U-87	N.B. Rel. W. 14th St. Rt. 28+50 to 28+16		166				
U-88	S.B. Rt. 14+60 to 17+14		9				
U-89	S.B. Rt. 17+14 to 22+10		9				
U-90	S.B. Rt. 22+105 to 24+58		10				
U-91	S.B. Medina Lt. 930+00 to 932+50		5				
U-92	S.B. Medina Lt. 932+50 to 934+81		5				
U-93	S.B. Medina Lt. 934+81 to 939+25		5				
U-94	S.B. Medina Lt. 939+30 to 940+00		9				
U-95	N.B. Medina Lt. 937+20 to 939+80		30				
U-96	N.B. Medina Lt. 935+25 to 939+80		225				
U-97	N.B. Medina Lt. 74+50 to 74+80		4				
U-98	N.B. Jennings Rt. 74+50 to 74+80		10				
U-99	N.B. Jennings Lt. 74+80 to 78+40		4				
U-100	N.B. Jennings Lt. 78+40 to 79+85		4				
U-101	N.B. Jennings Rt. 74+80 to 75+40		10				
U-102	N.B. Jennings Rt. 74+80 to 75+40		10				
U-103	Ramp U-14 Rt. 3+60 to 4+00		10				
U-104	Ramp U-14 Rt. 4+00 to 5+80		10				
U-105	N.B. Rt. 7+95 to 12+00		175				
U-106	N.B. Rt. 10+75 to 12+00		205				
U-107	Ramp N.B. Rt. 5+150 to 5+50		185				
U-108	Ramp N.B. Rt. 5+150 to 6+75		125				
U-109	Ramp N.B. Rt. 5+150		70				
U-110	Ramp U-14 Lt. 13+20 to 13+50		30				
U-111	Ramp U-14 Lt. 13+50 to 13+80		70				
U-112	Ramp A Lt. 13+75 to 13+85		119				
	Total		2884	2656	15	1	



DRAINAGE QUANTITIES		
CODE	LOCATION	I-8
		Std. No 1 Mod. M.H.
SS-7	Brainard Ave 1+10	Each

SECTION OF SODDED DITCH D-26 & D-27  
D-26 RAMP J-14 RT. STA. 9+35 TO 10+05  
D-27 RAMP J-14 RT. STA. 10+70 TO 12+20





- DRAINAGE LEGEND**
- ⊙ PROPOSED STORM SEWER MANHOLE
  - ⊙ PROPOSED SANITARY MANHOLE
  - PROPOSED PAVED SHOULDER INLET
  - ▣ PROPOSED DITCH CATCH BASIN
  - ▣ PROPOSED PAVEMENT CATCH BASIN
  - PROPOSED STORM OR SANITARY SEWER
  - EXISTING MANHOLE
  - EXISTING CATCH BASIN
  - EXISTING STORM OR SANITARY SEWER
  - ▨ JUTE MATTING
  - ▨ SODDED DITCH

DRAINAGE QUANTITIES				
CODE	LOCATION	I-5		
		CI.U-1 Sec. M-200 45° Bend 12" M.H.	I-8 Std. Mod. M.H.	L-10 Sodding Spec. Shop & Berm Protection Sq. Yds.
<b>DITCH PROTECTION</b>				
D-29	SBOR Rt. 4+25		1	30
D-30	SBOR Rt. 4+50		1	30
D-31	NBOR Rt. 22+70		1	30
D-32	NBOR Rt. 22+95		1	30
<b>SANITARY SEWERS</b>				
SS-8	Holmden Ave. 7+60		1	
SS-9	Burher Ave. 3+83		1	
SS-10	Rowley Ave. 8+23		1	
SS-11	Rowley Ave. 12+25		1	
	<b>Total</b>	1	4	120

DRAINAGE QUANTITIES							
CODE	LOCATION	I-1					
		CI.F-4 Shallow	CI.F-3 Deep	CI.U-1 6"	CI.I-3 60° Bend 30" Wye	CI.I-3 60° Wye	CI.I-3 Tee
<b>UNDERDRAINS</b>							
U-114	SBOR Rt. 13+25 to 14+60		135				
U-115	SBOR Rt. 10+60 to 13+20	10	255		1		
U-116	SBOR Rt. 8+55 to 10+50	10	195				
U-117	SBOR Rt. 3+60 to 8+50	10	475		1		
<b>SANITARY SEWERS</b>							
SP-4	Rowley Ave. E						50
SP-7	Rowley Ave. Rt						50
	<b>Total</b>	264	840	5533	32	25	100

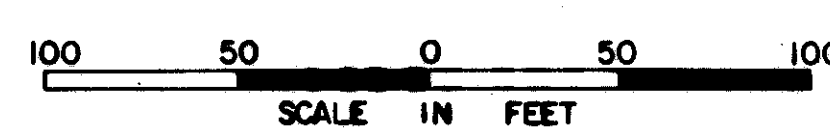
DRAINAGE QUANTITIES				
CODE	LOCATION	I-16		
		E-12 Pipe Removed over 15" Grade	I-8 M.H. Reconst. to Grade	I-16 M.H. Aband. C.B. Aband.
<b>EXISTING STRUCTURES</b>				
E-107	N.B. Jennings 80+05 Lt. Rt	273		
E-108	NBOR Lt. 12+25			1
E-109	NBOR Lt. 12+55			1
E-110	Ramp NBOR-14 Lt. 7+25			1
E-111	SBOR Rt. 11+45			1
E-112	SBOR Rt. 11+75			1
E-113	Ramp SBOR-M Rt. 7+85			1
E-114	S.B. Medina Lt. 943+30			1
E-115	NBOR Rt. 15+65			1
E-116	NBOR Rt. 15+80			1
E-117	Reloc. Holmden Lt. 3+70	377		1
E-118	NBOR Lt. E. Rt. 19+25			1
E-119	NBOR Rt. 19+25			1
E-120	S.B. Medina Lt. 950+50			1
E-121	S.B. Medina Rt. 950+60			1
E-122	N.B. Medina Rt. 950+35			1
E-123	N.B. Medina Lt. 950+60			1
E-124	NBOR Rt. 22+85			1
E-125	Ramp NBOR-14 Lt. 11+10			1
E-126	Ramp NBOR-14 Lt. 11+30			1
E-127	Reloc. W. 14th St. Lt. 10+95		1	
	<b>Total</b>	650	1	11

M.H. ADJUSTED TO GRADE		
Ref. No.	Existing T/C Elev.	Adjusted T/C Elev.
E-127*	684.72	683.82

\*Reconstructed to grade

E-125 f E-126 Seal Pipe at Catch Basin  
E-116 Seal Pipe at Manhole

SCALE 1" = 50'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE D.D.S. DATE 9-6-64 CONSULTING ENGINEERS  
 TRCD 100 U. DATE 9-10-64 KANSAS CITY CLEVELAND NEW YORK  
 CRD. R.J.T. DATE 10-17-64



# DRAINAGE LOCATION

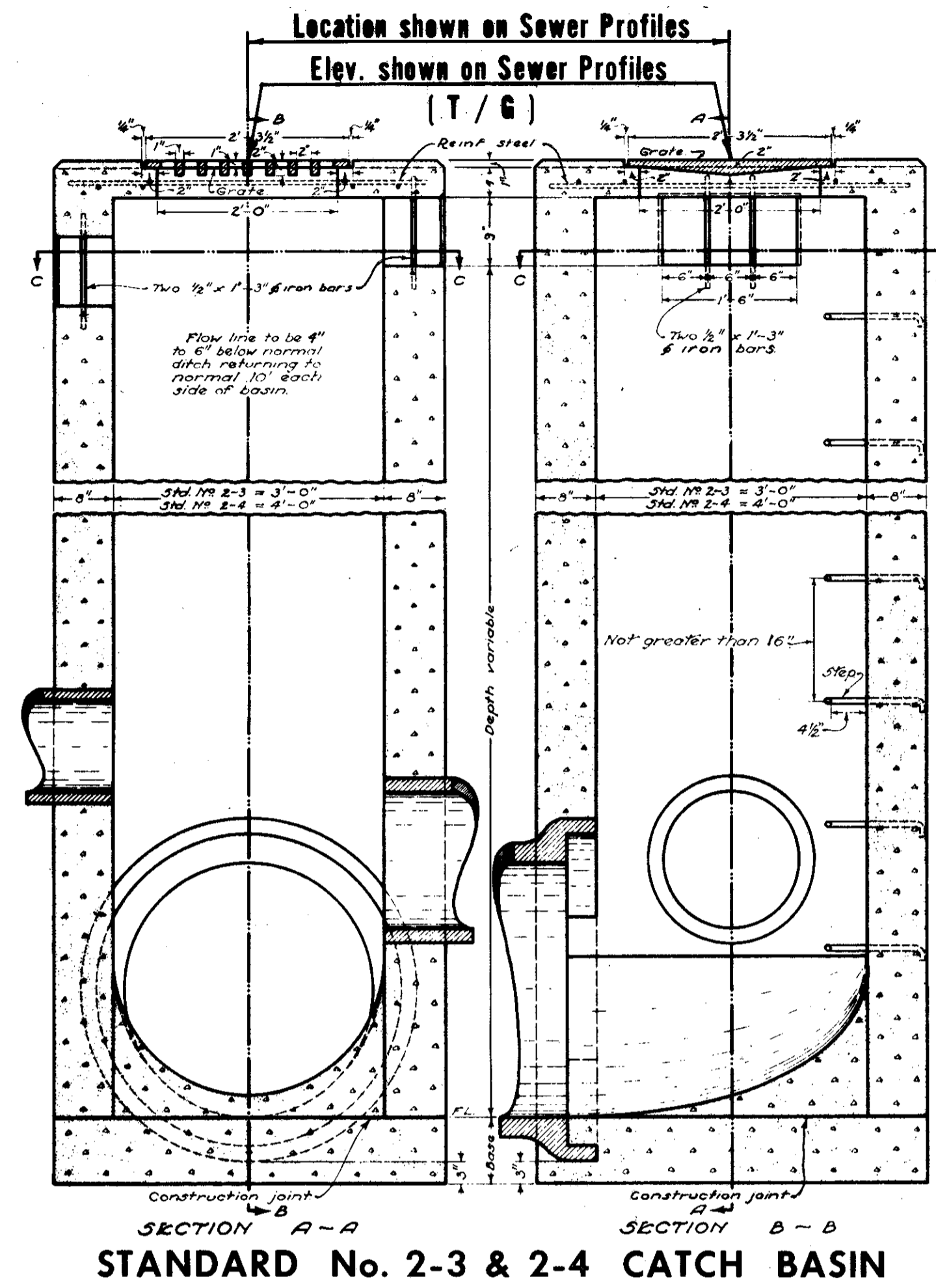
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FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

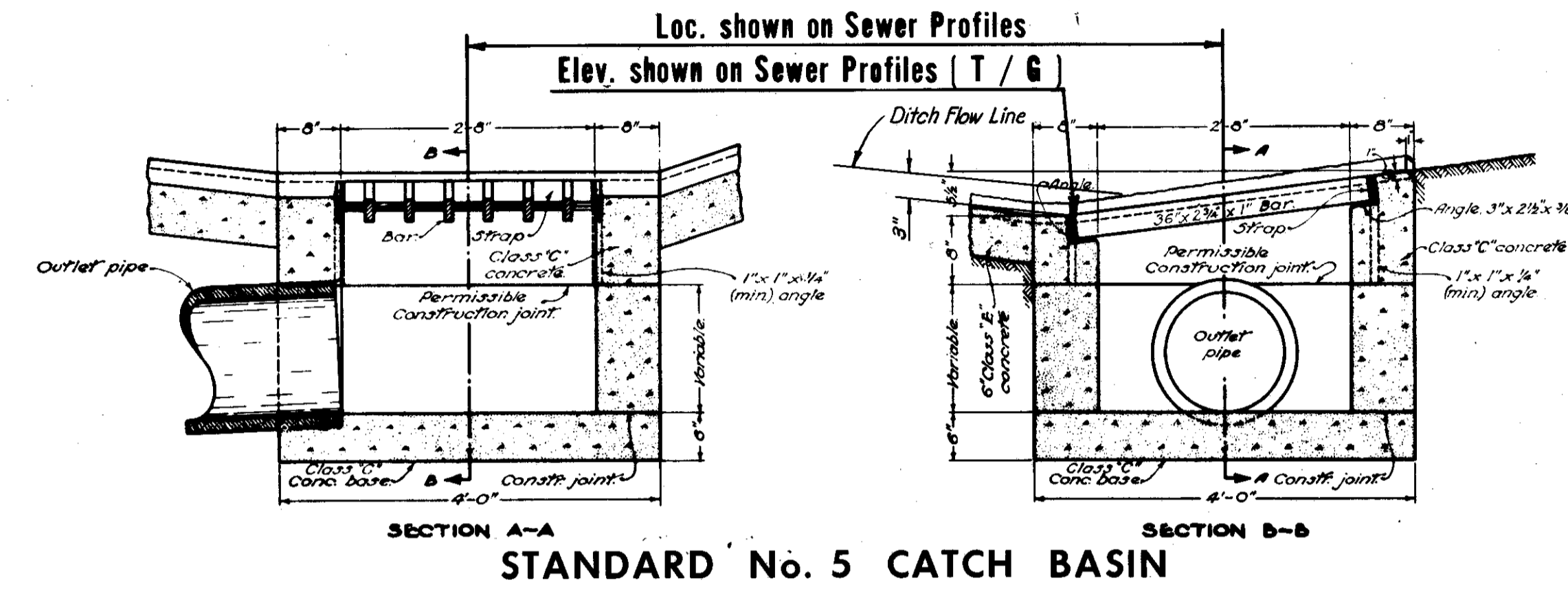
267  
646

17  
54

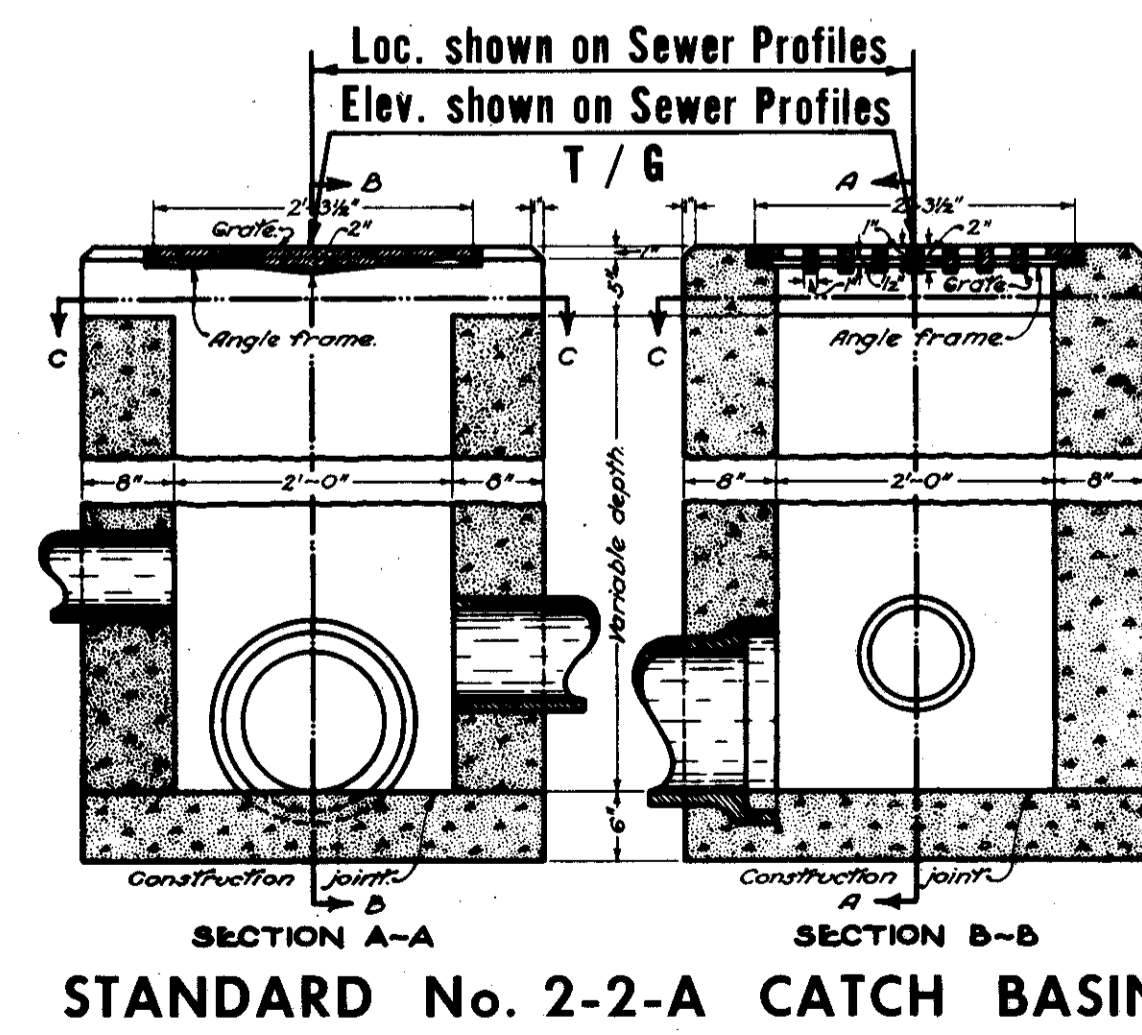
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



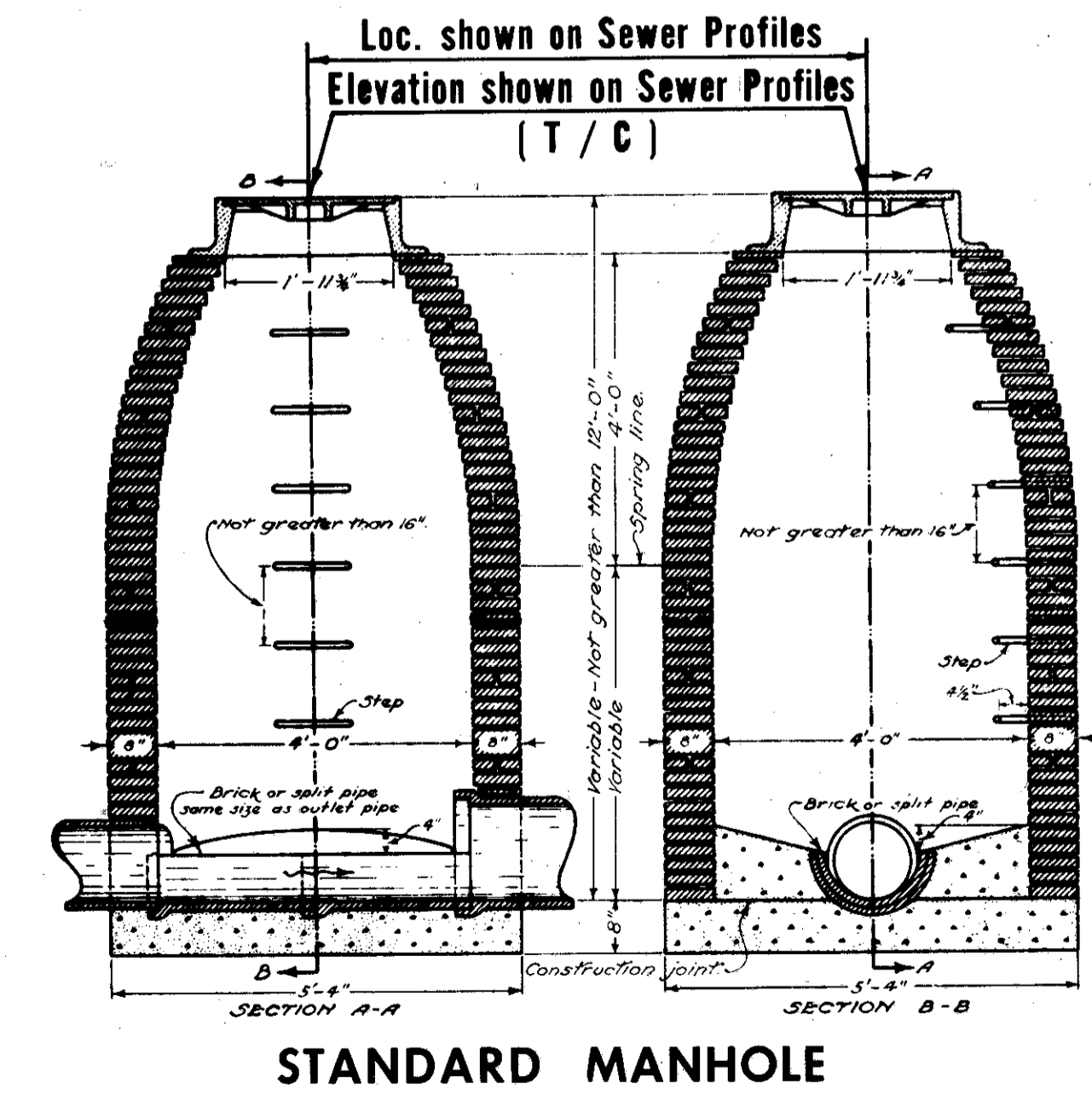
STANDARD No. 2-3 & 2-4 CATCH BASIN



STANDARD No. 5 CATCH BASIN



STANDARD No. 2-2-A CATCH BASIN



STANDARD MANHOLE

**LEGEND**  
 E.O.P.-Edge of Pavement or Paved Shoulder  
 N.G.-Normal Gutter Elevation at Face of Curb  
 T/G-Top of Catch Basin Grate Elevation  
 T/C-Top of Manhole Cover Elevation

NOTE:  
 LOCATION SHOWN ON PLANS FOR NO.2 MANHOLES ARE TO CENTER OF COVER AS SHOWN ABOVE FOR NO.1 MANHOLES.

MADE R.D.V. DATE 10-10-64 TRACED DATE  
 CHECKED D.D.S. DATE 10-8-64 SCALE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

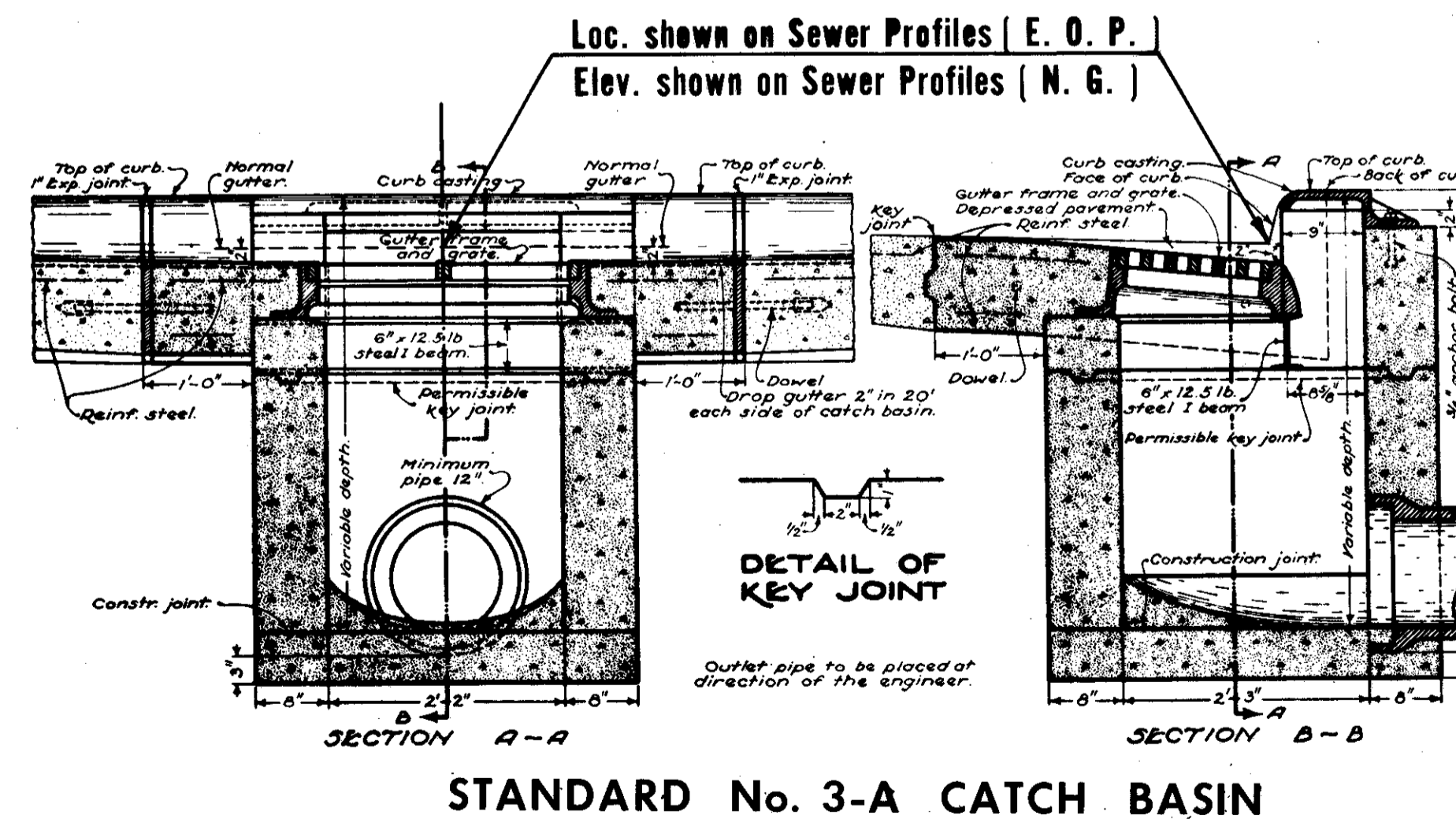
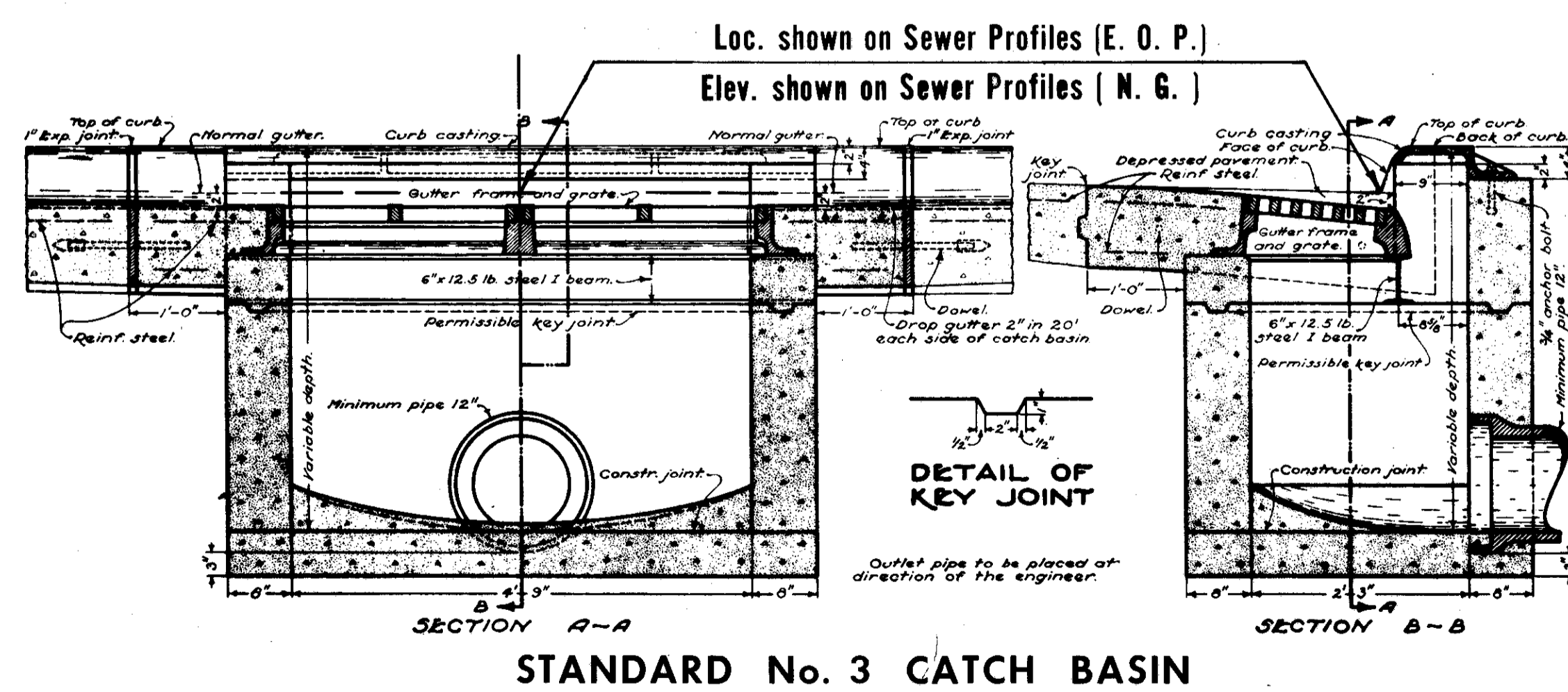
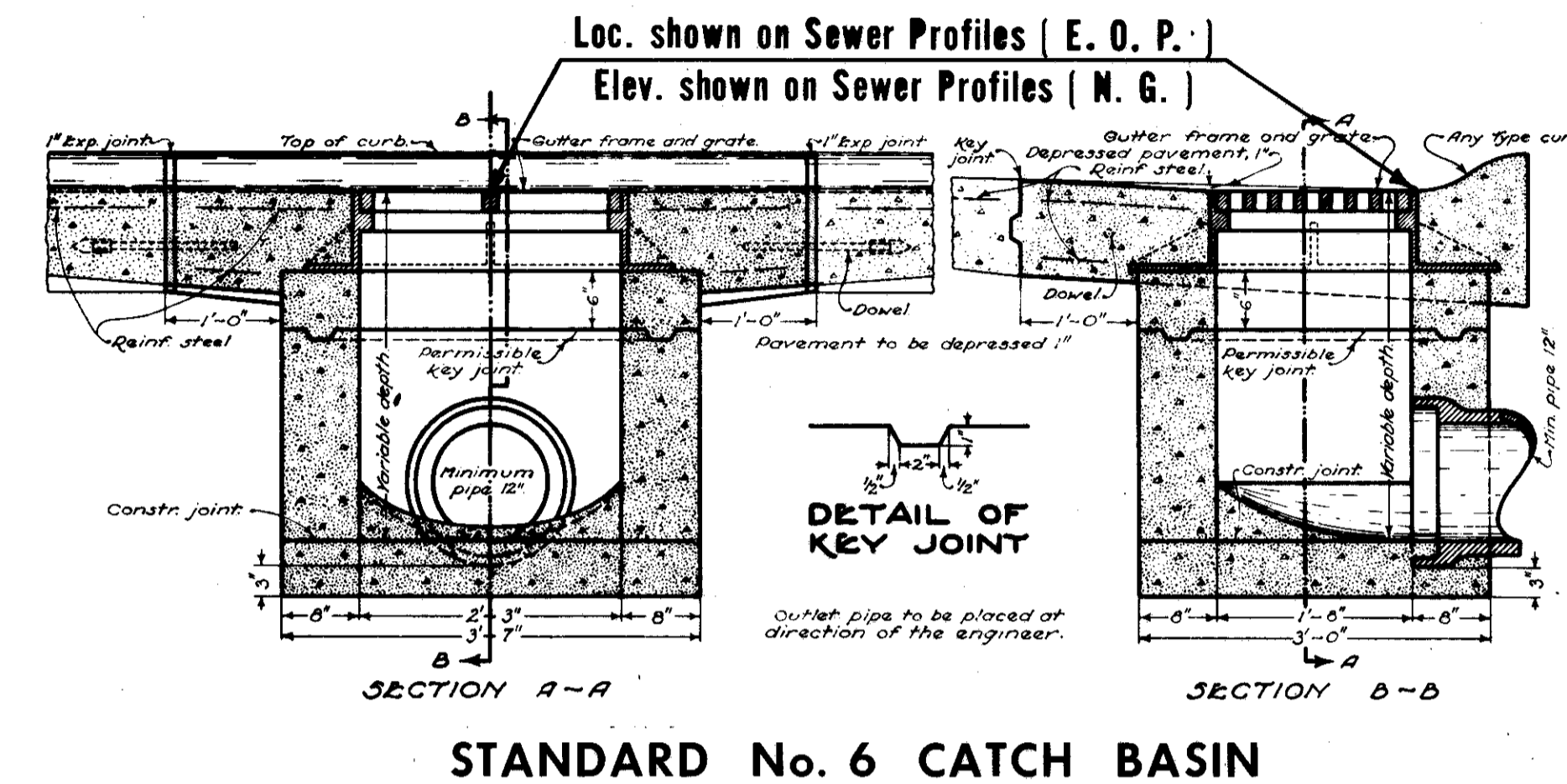
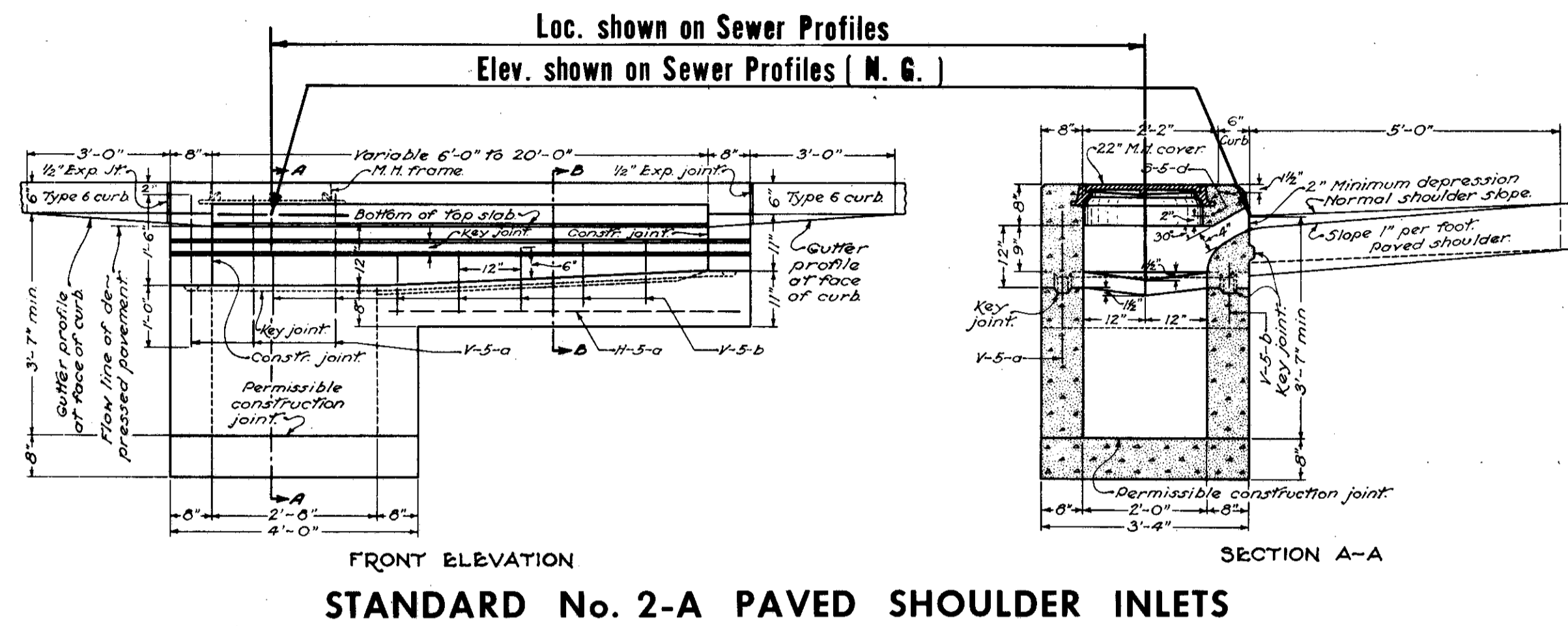
# DRAINAGE STRUCTURE LOCATION DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

268  
646

CUYAHOGA COUNTY  
 CUY - 71-17.83  
 CUY-176-12.76

18  
54



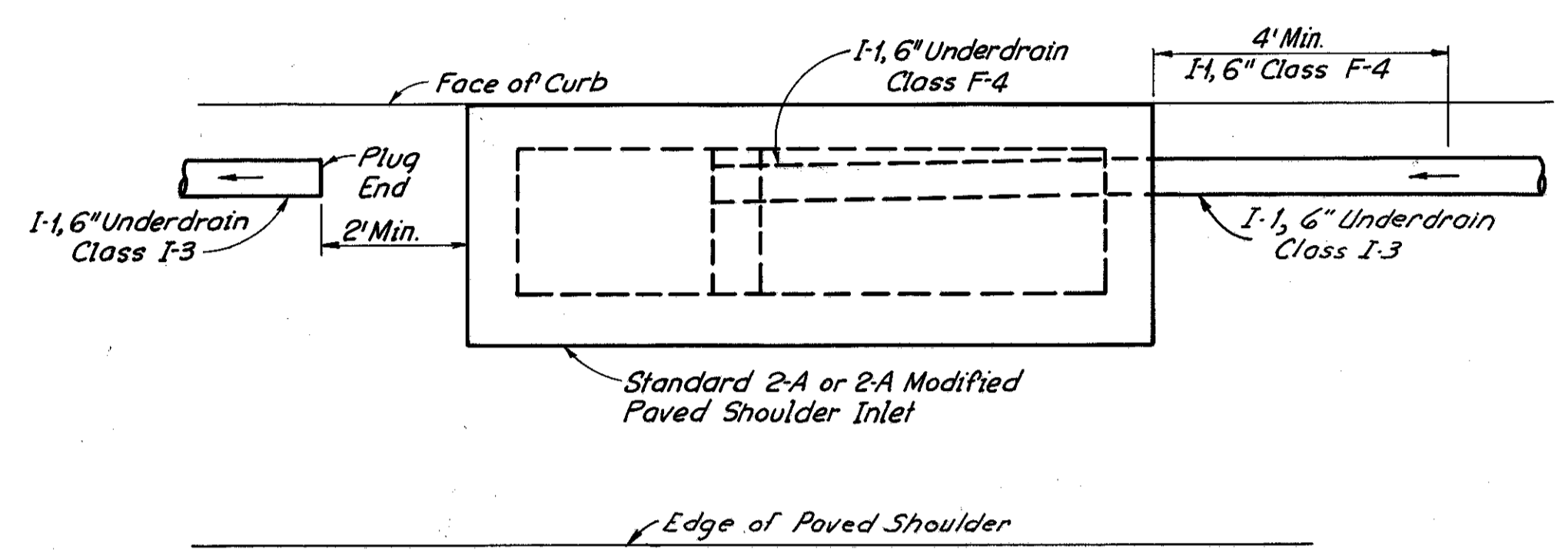
### LEGEND

- E.O.P.-Edge of Pavement or Paved Shoulder
- N.G.-Normal Gutter Elevation at Face of Curb
- T/G-Top of Catch Basin Grate Elevation
- T/C-Top of Manhole Cover Elevation

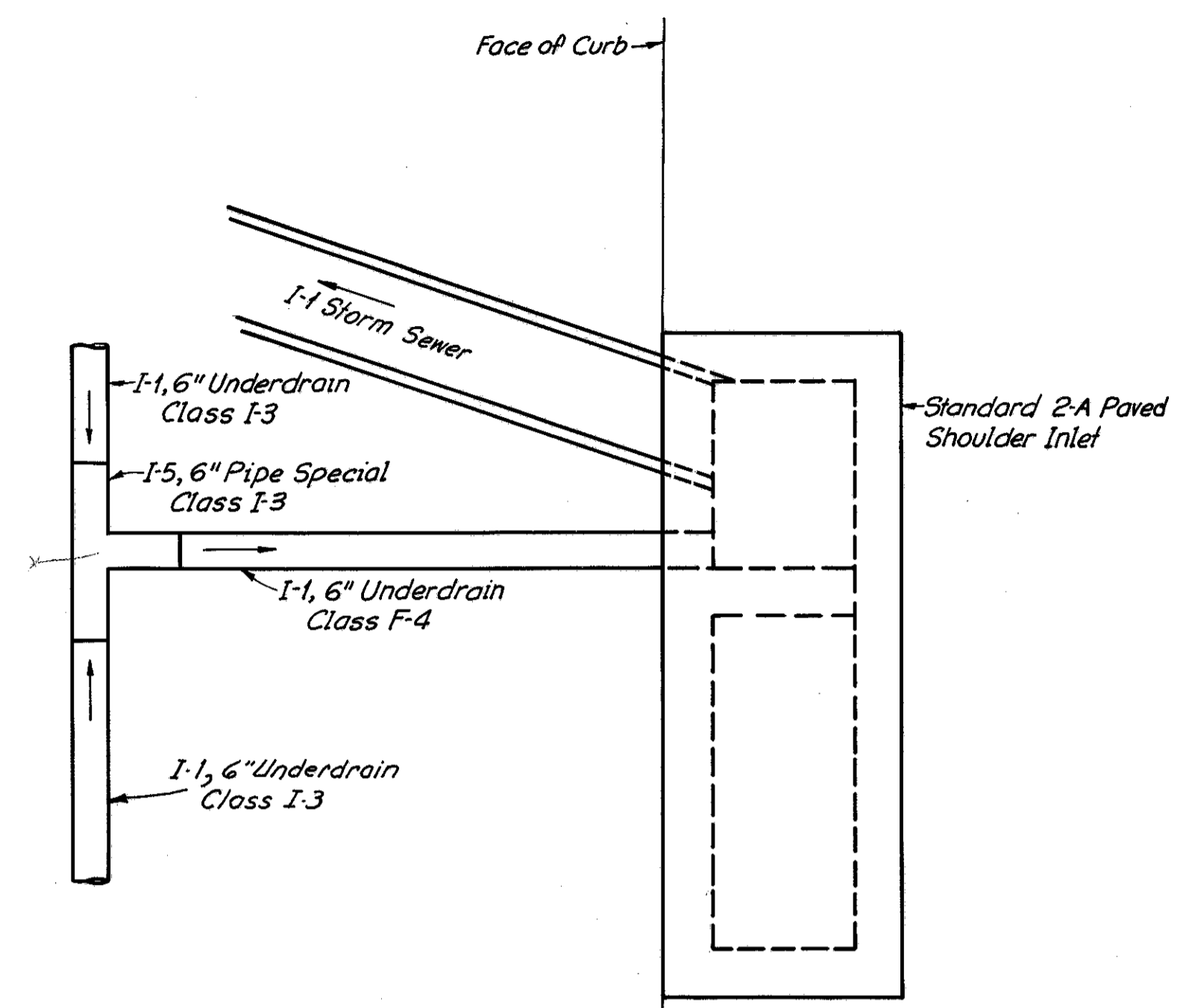
MADE R.D.V. DATE 10-18-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED D.D.S. DATE 10-10-64 SCALE \_\_\_\_\_

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

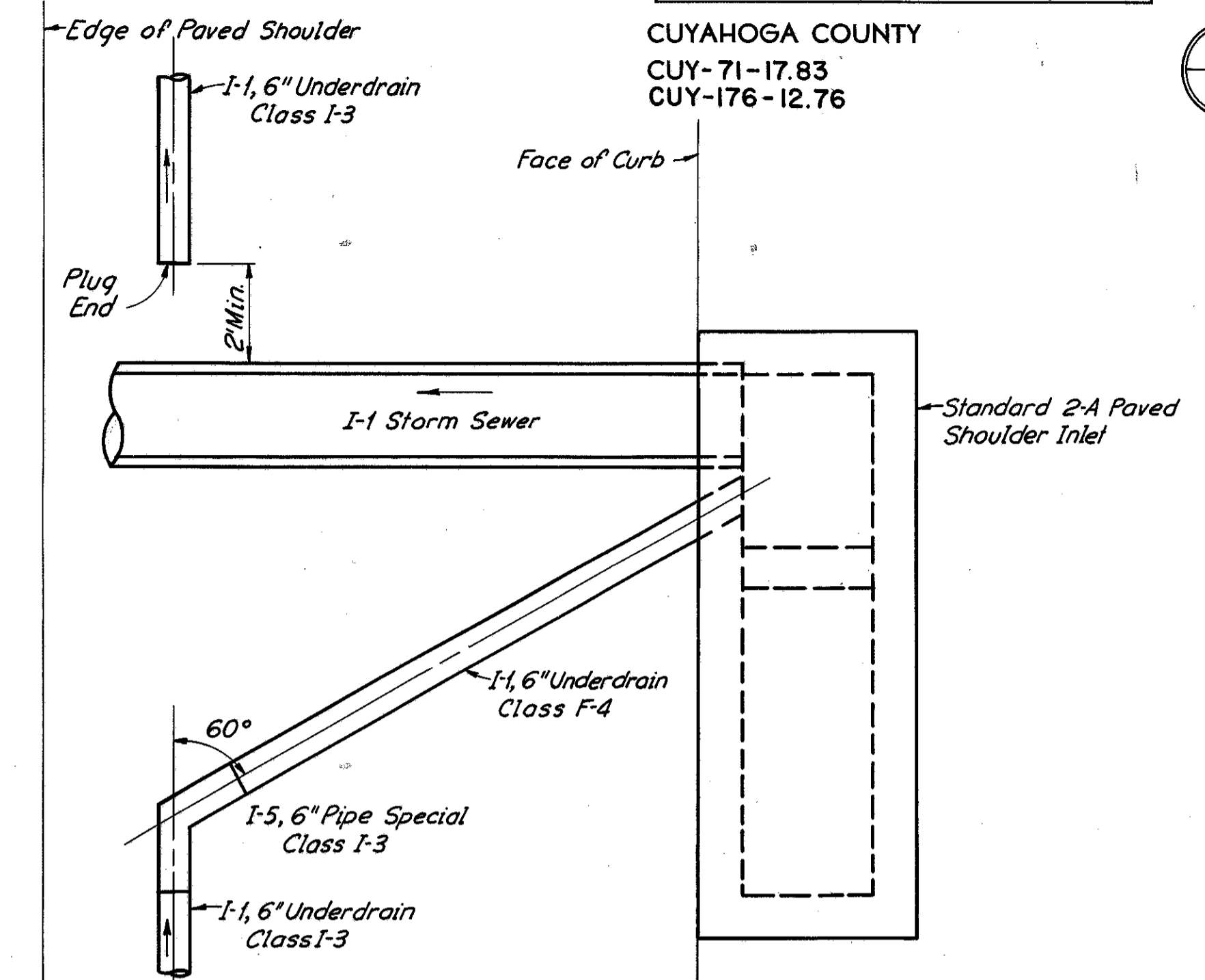
CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



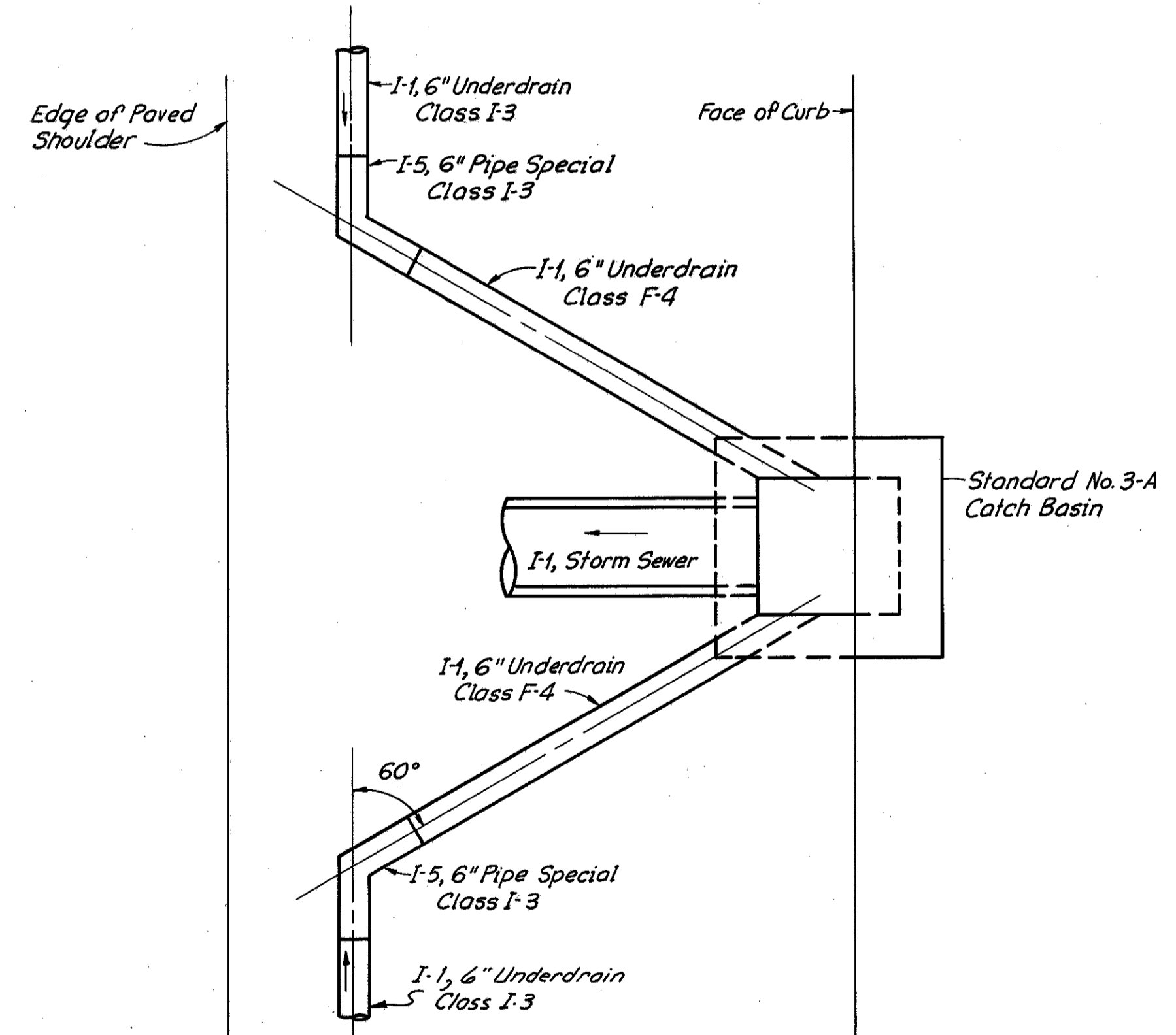
**MEDIAN ON GRADE**



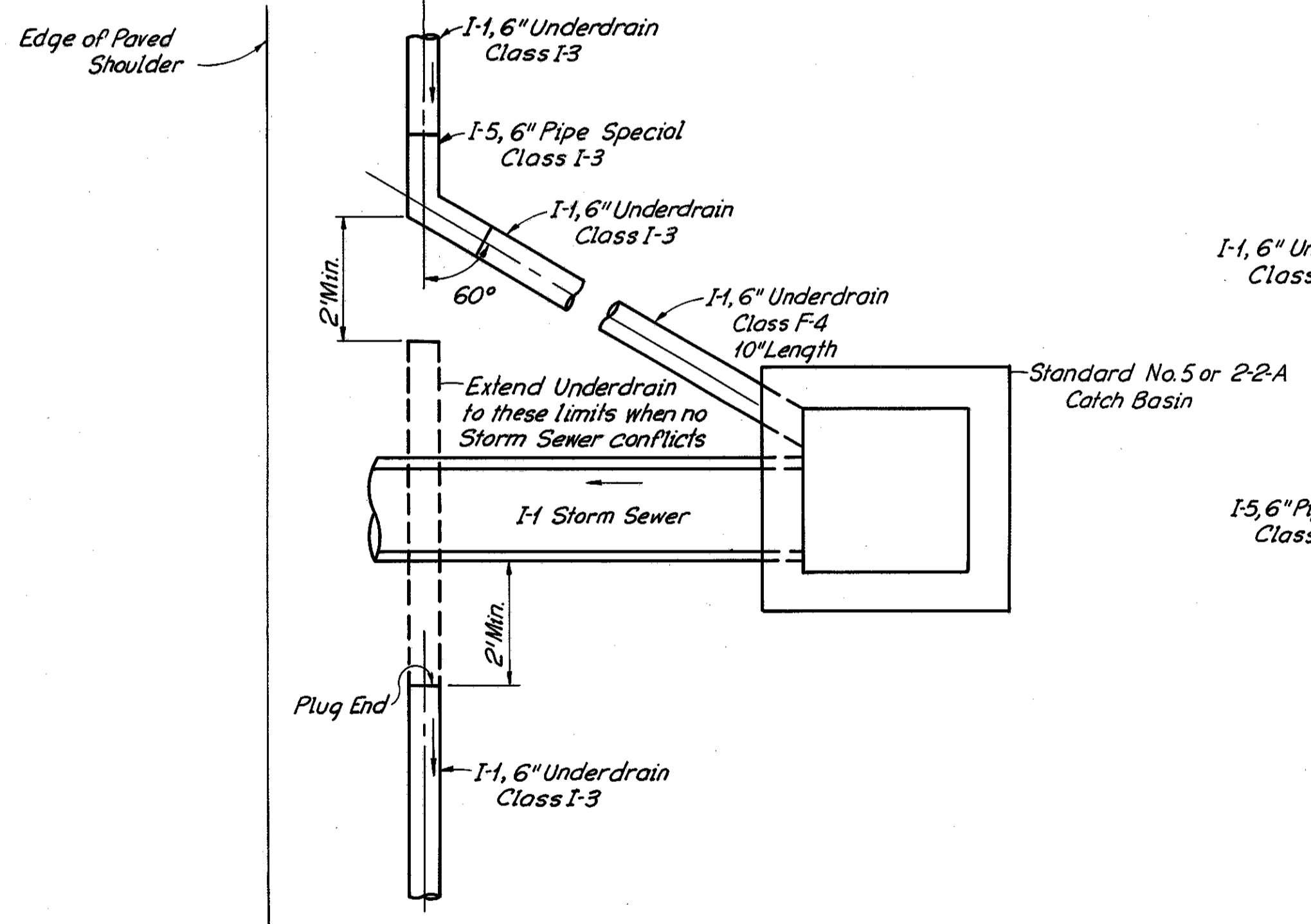
**PAVED SHOULDER ON GRADE**



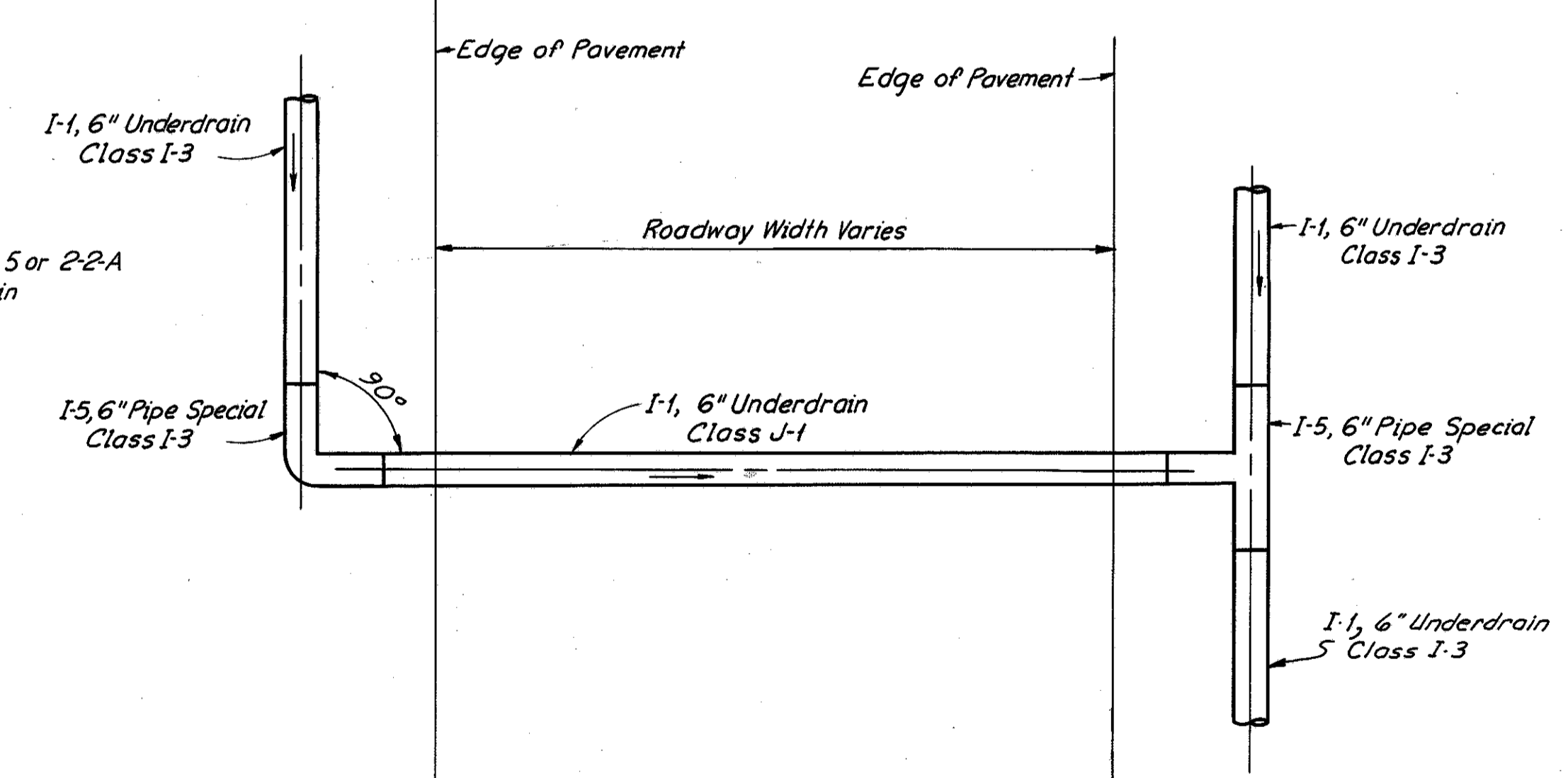
**PAVED SHOULDER ON GRADE**



**PAVED SHOULDER LOW POINT**



**ROADWAY DITCH**



**UNDERDRAIN CROSSING ROADWAY**

**TYPICAL UNDERDRAIN DETAILS**

MADE *JEN* DATE *10-5-64* TRACED DATE  
 CHECKED *R.U.T.* DATE *10-12-64* SCALE *None*

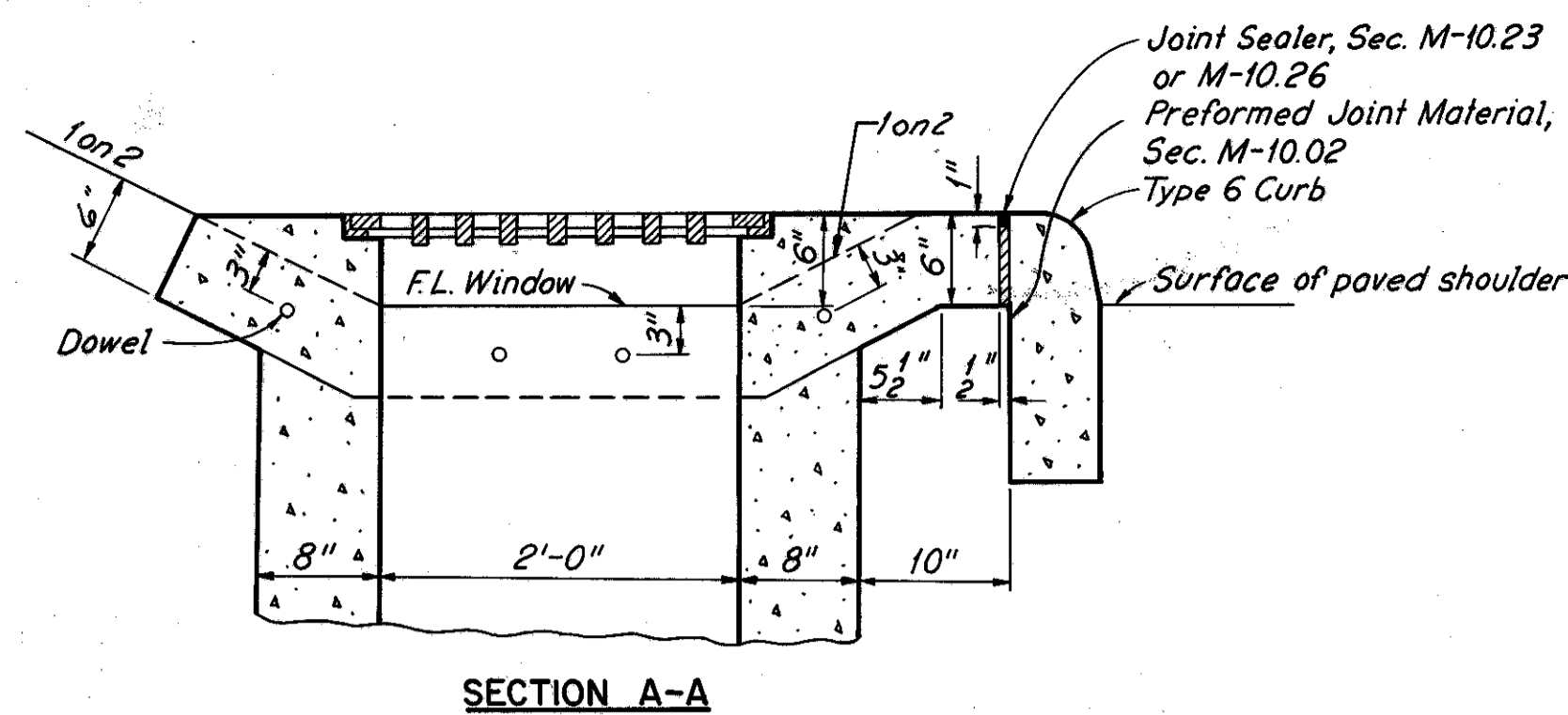
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FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

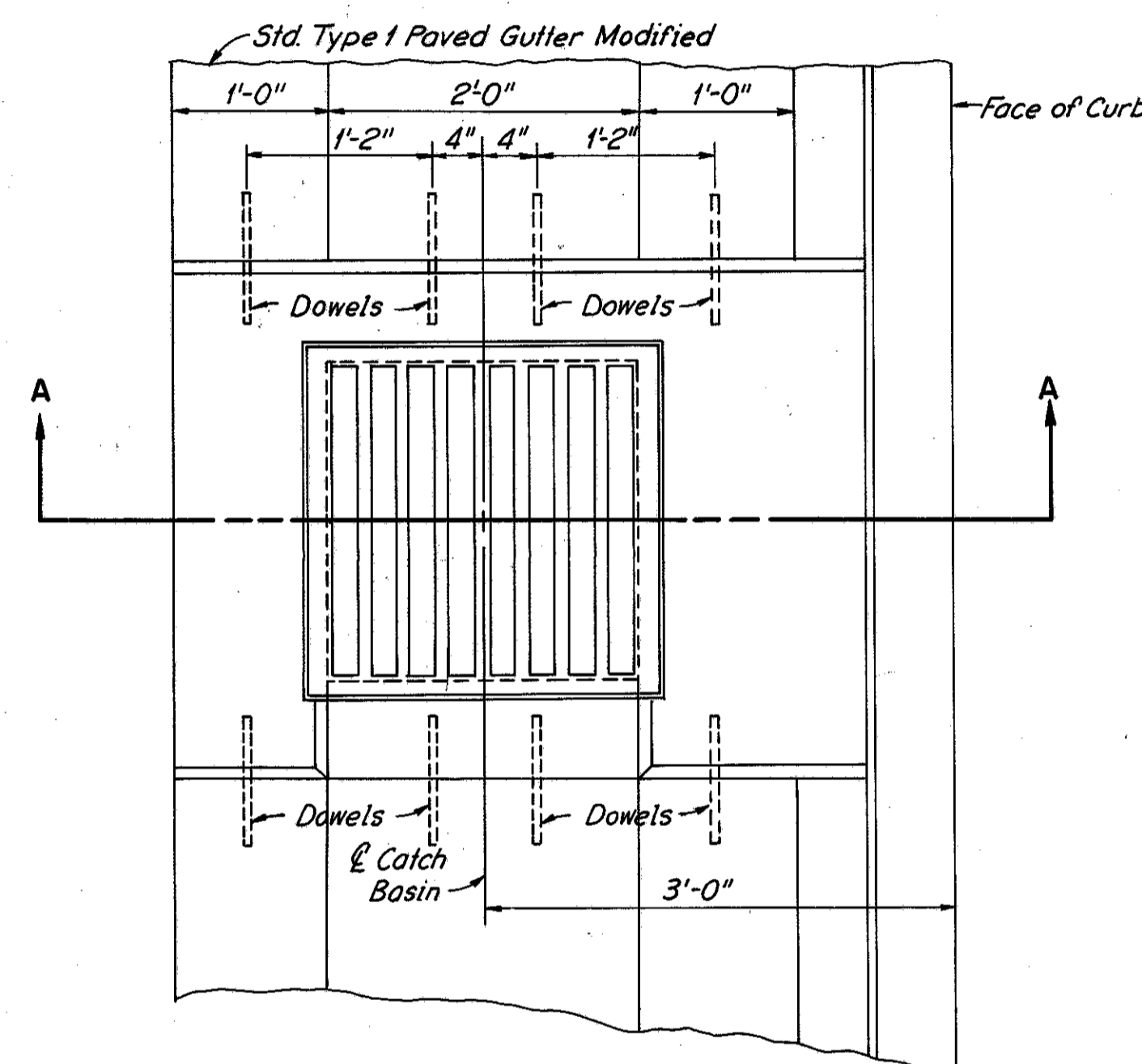
270  
646

20  
54



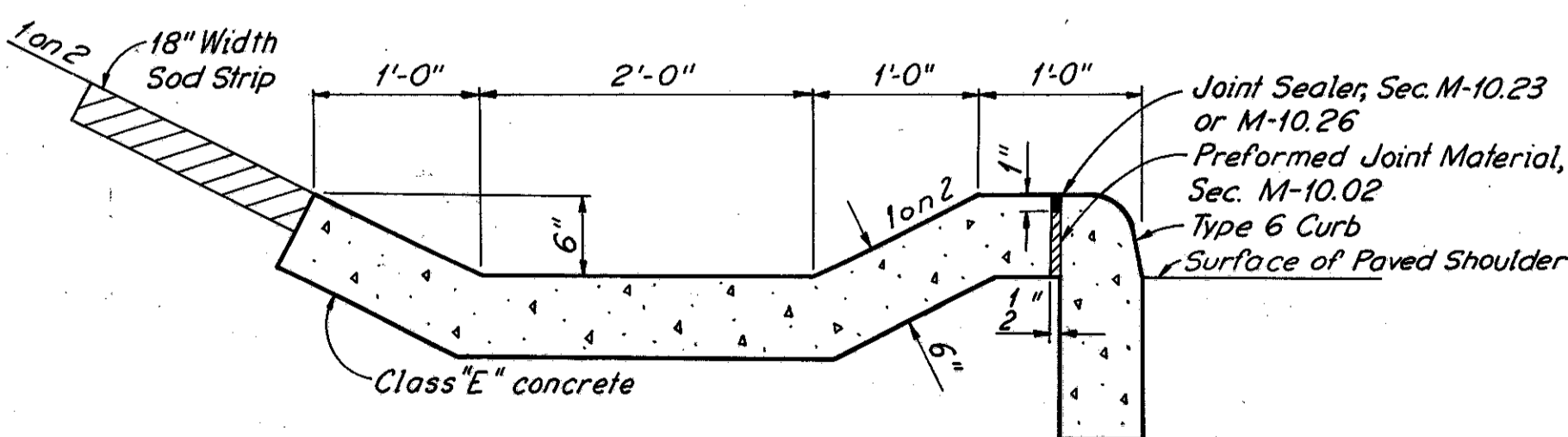
SECTION A-A

Note:  
 1. For details not shown see Standard Construction Drawing I-8 C.B., 2-2A.  
 2. Dowels to be 1/2" round, smooth bars 10" long, spaced as shown hereon and greased.



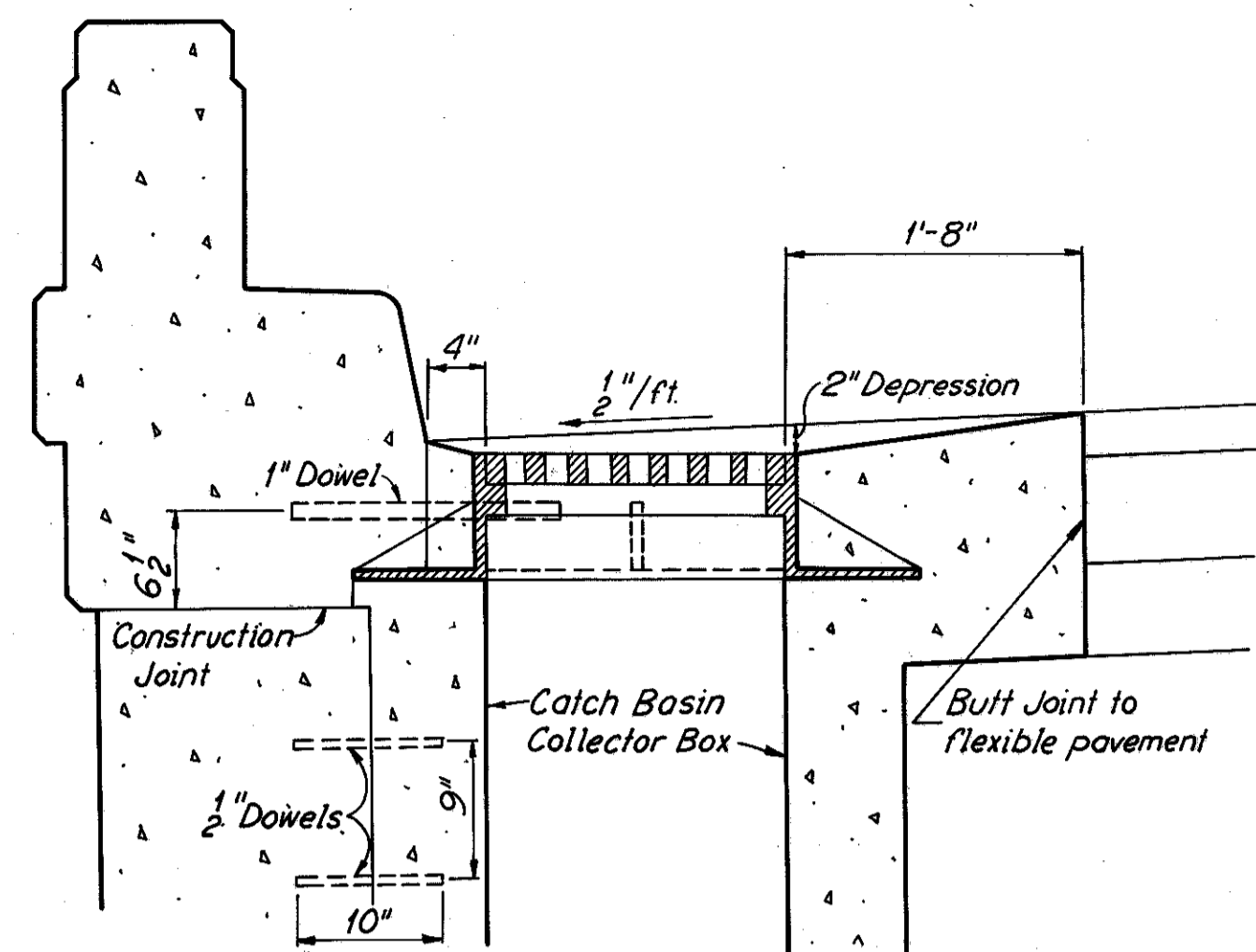
PLAN

STANDARD 2-2A CATCH BASIN MODIFIED



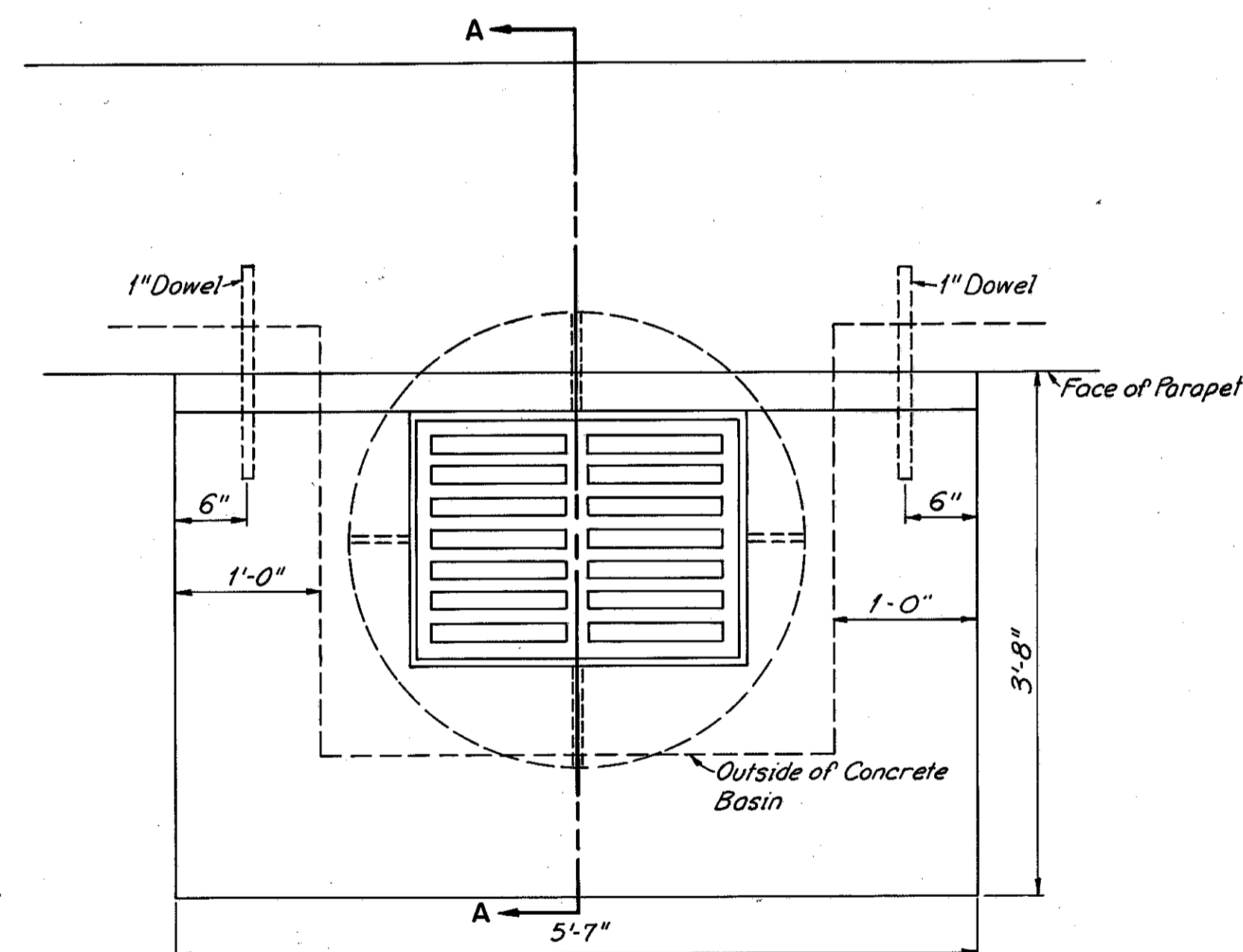
Note:  
 Provide cut-off wall as per Standard Construction Drawing I-14G Paved Gutter

STANDARD TYPE I PAVED GUTTER MODIFIED



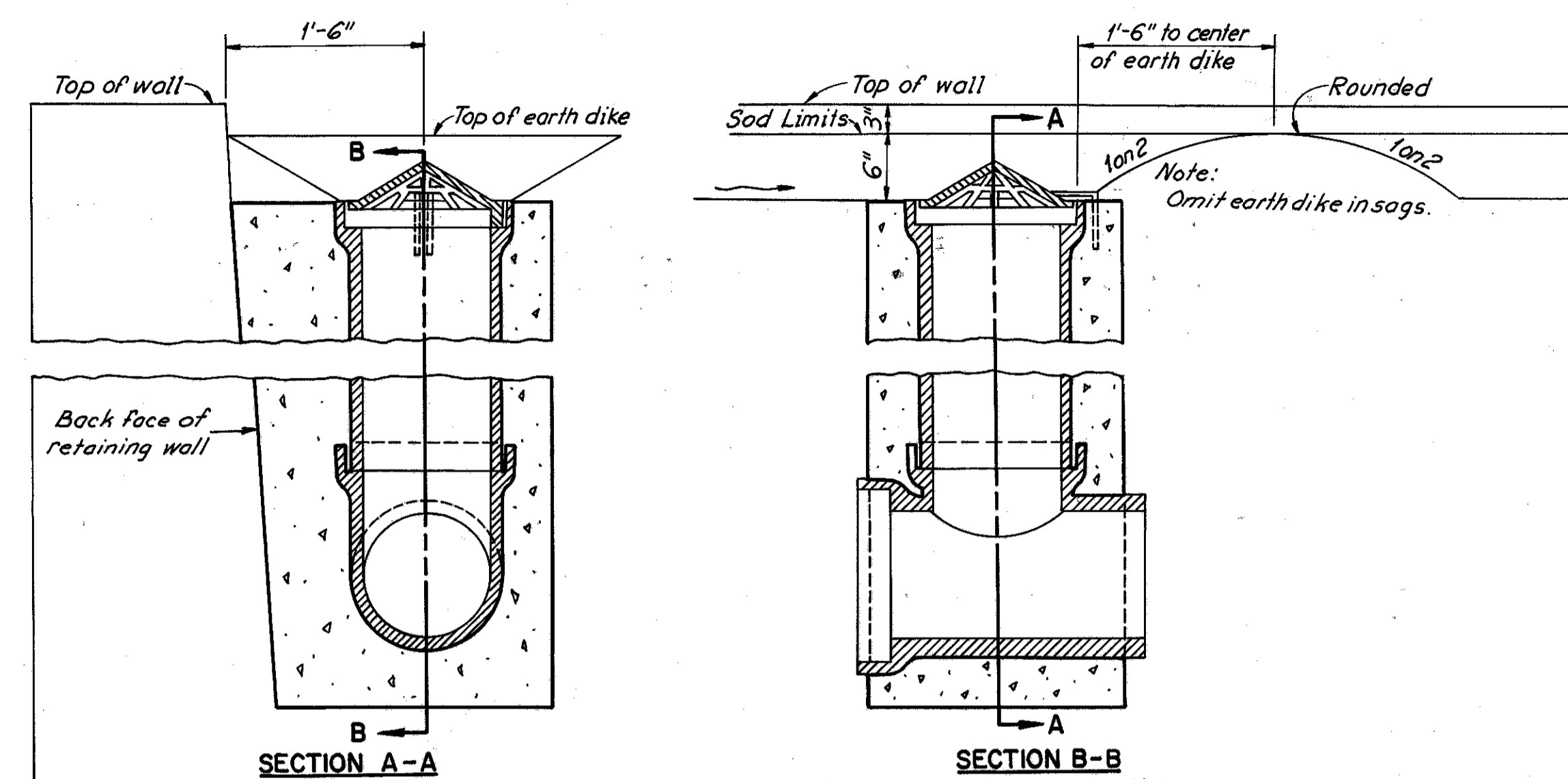
SECTION A-A

Note:  
 1. For details not shown see Standard Construction Drawing I-8 C.B. No. 6.  
 2. The construction of the No. 6 Catch Basin shall be coordinated with the wall construction and shall be placed prior to construction of parapet and safety walk.  
 3. The depressed apron shall be 9" thick, class "C" concrete.  
 4. Payment for all labor and materials required to construct the No. 6 Catch Basin as indicated including dowels, depressed apron, and placing the casting as indicated shall be included in the bid for Item I-8 No. 6 Catch Basin, Modified, as per plan.



PLAN

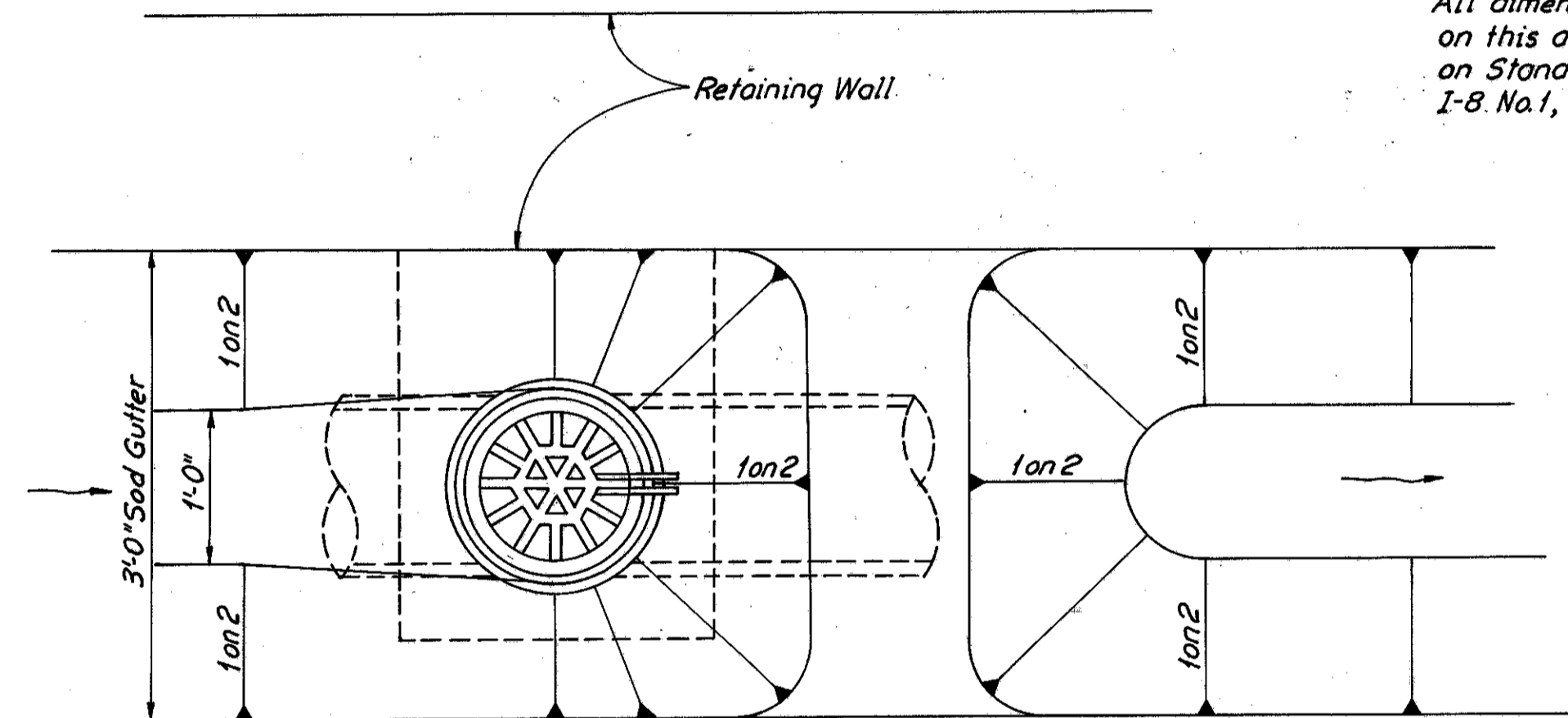
STANDARD NO. 6 CATCH BASIN MODIFIED



SECTION A-A

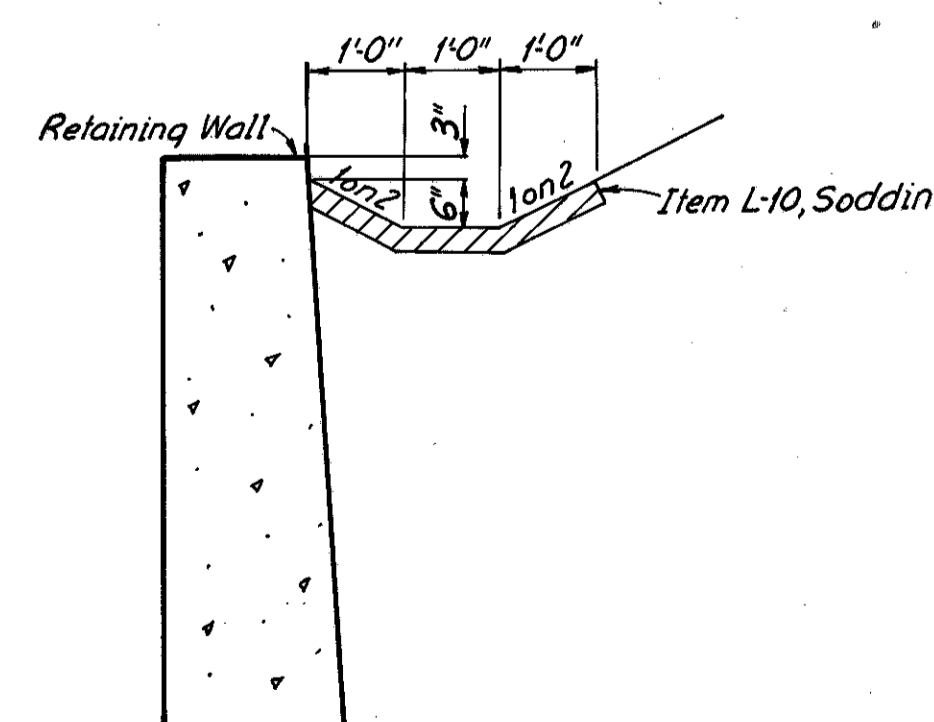
SECTION B-B

Note:  
 All dimensions and notes not shown on this detail shall be as shown on Standard Construction Drawings I-8 No. 1, Side Ditch Inlets.



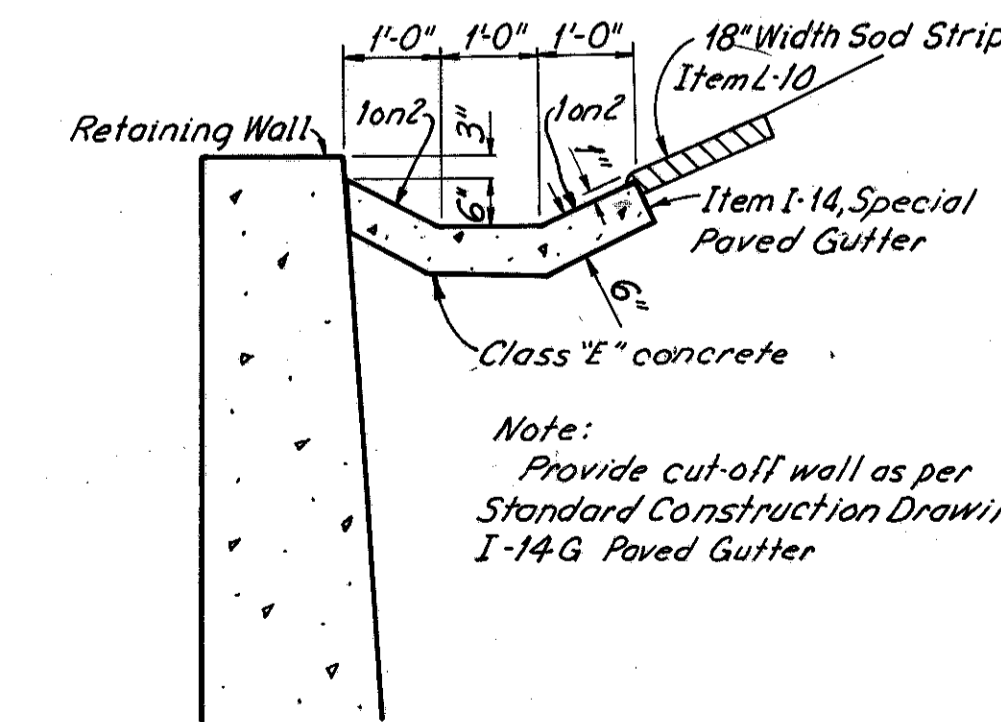
PLAN

STANDARD NO. 1 SIDE DITCH INLET MODIFIED



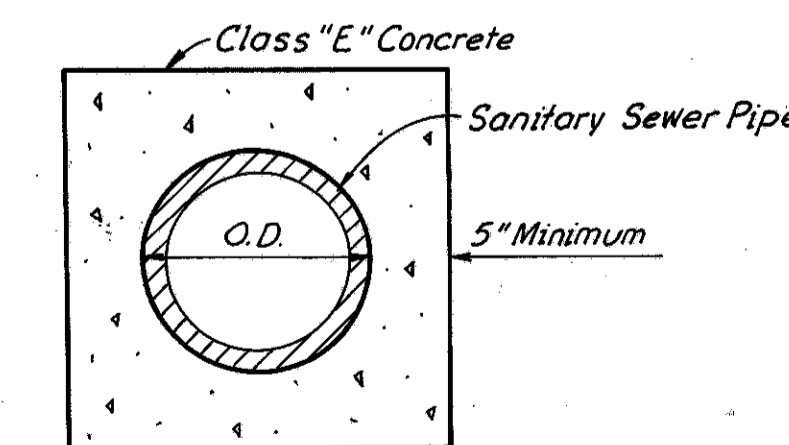
RETAINING WALL-SODDED FLUME DETAIL

Scale: 1/2" = 1'-0"



RETAINING WALL-PAVED GUTTER DETAIL

Scale: 1/2" = 1'-0"

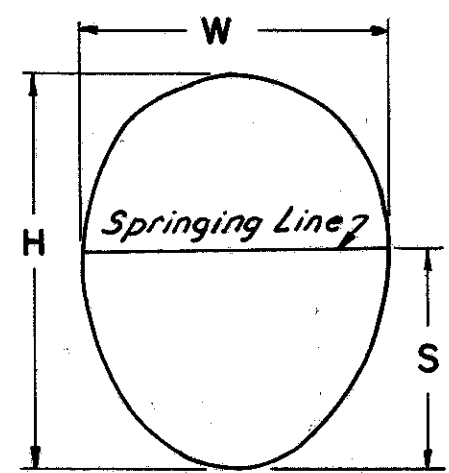


TYPICAL SEWER PIPE ENCASEMENT

No Scale

MADE JEN DATE 10-2-64 TRACED DATE  
 CHECKED RJT DATE 10-12-64 SCALE 1"=1'-0" or as Noted

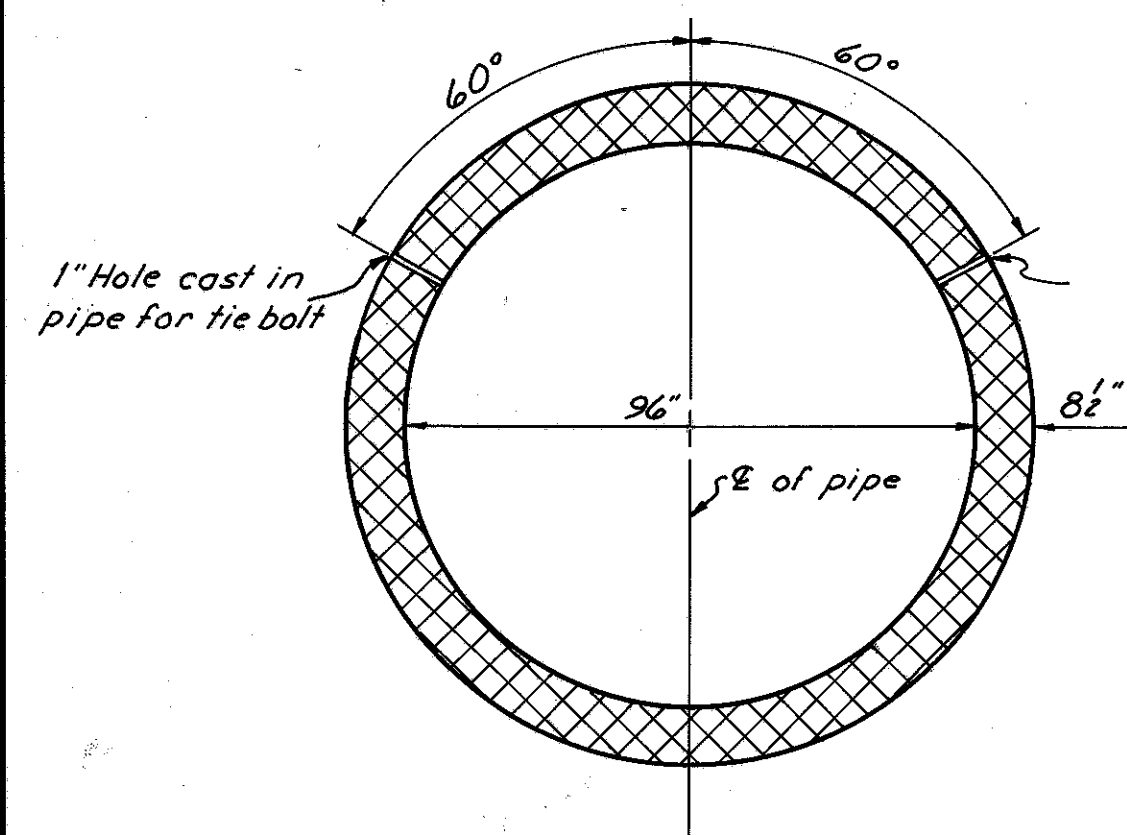
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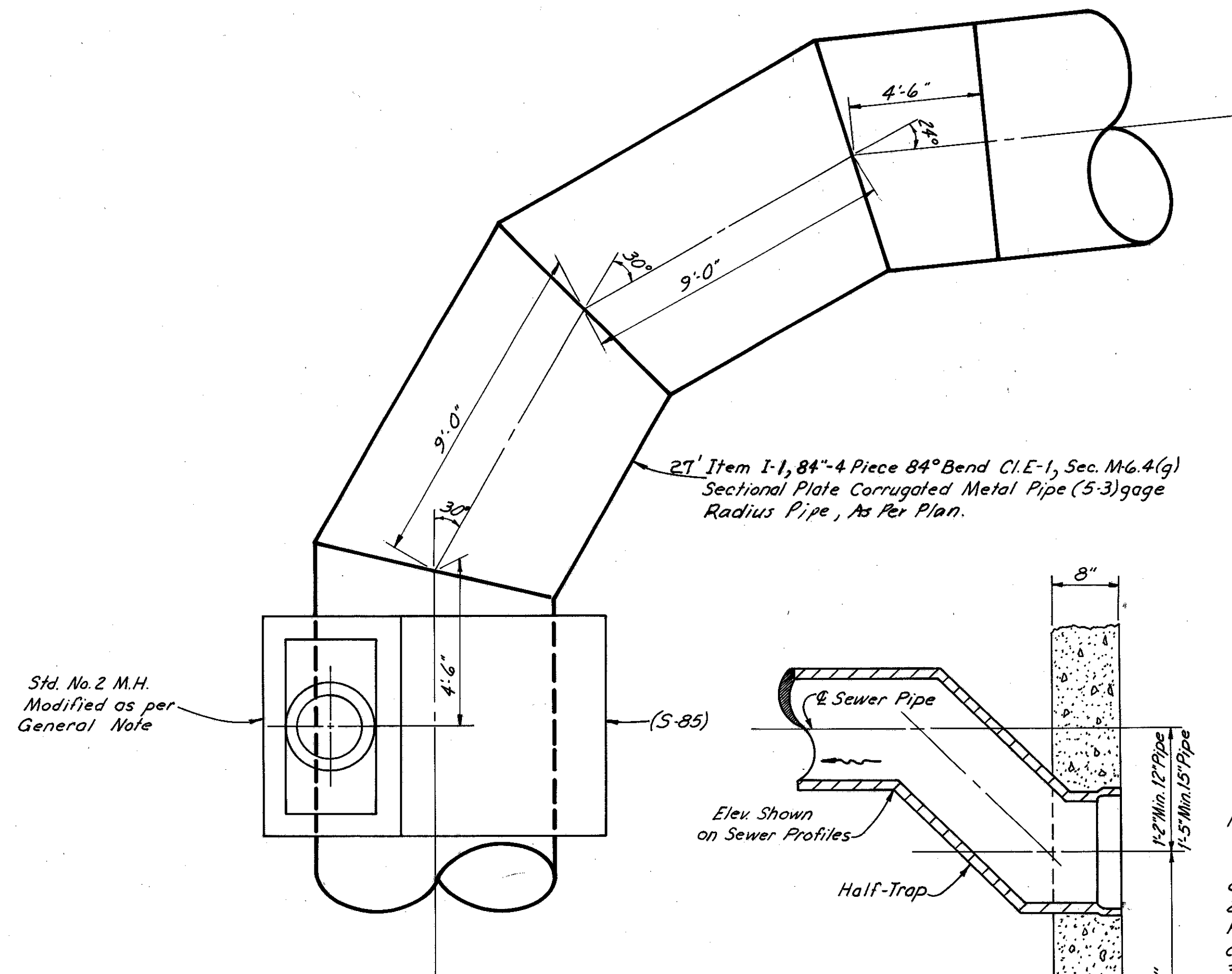
EGG SHAPE SEWERS				
NO.	H FEET	W FEET	S FEET	AREA SQ. FT.
2	2.25	1.94	1.28	3.41
6	4.23	3.34	2.23	10.90
11	6.33	4.99	3.35	24.46

TYPES OF EGG SHAPED SEWERS  
"C"-(2) RINGS OF BRICK ALL AROUND  
"E"-(3) RINGS OF BRICK ALL AROUND

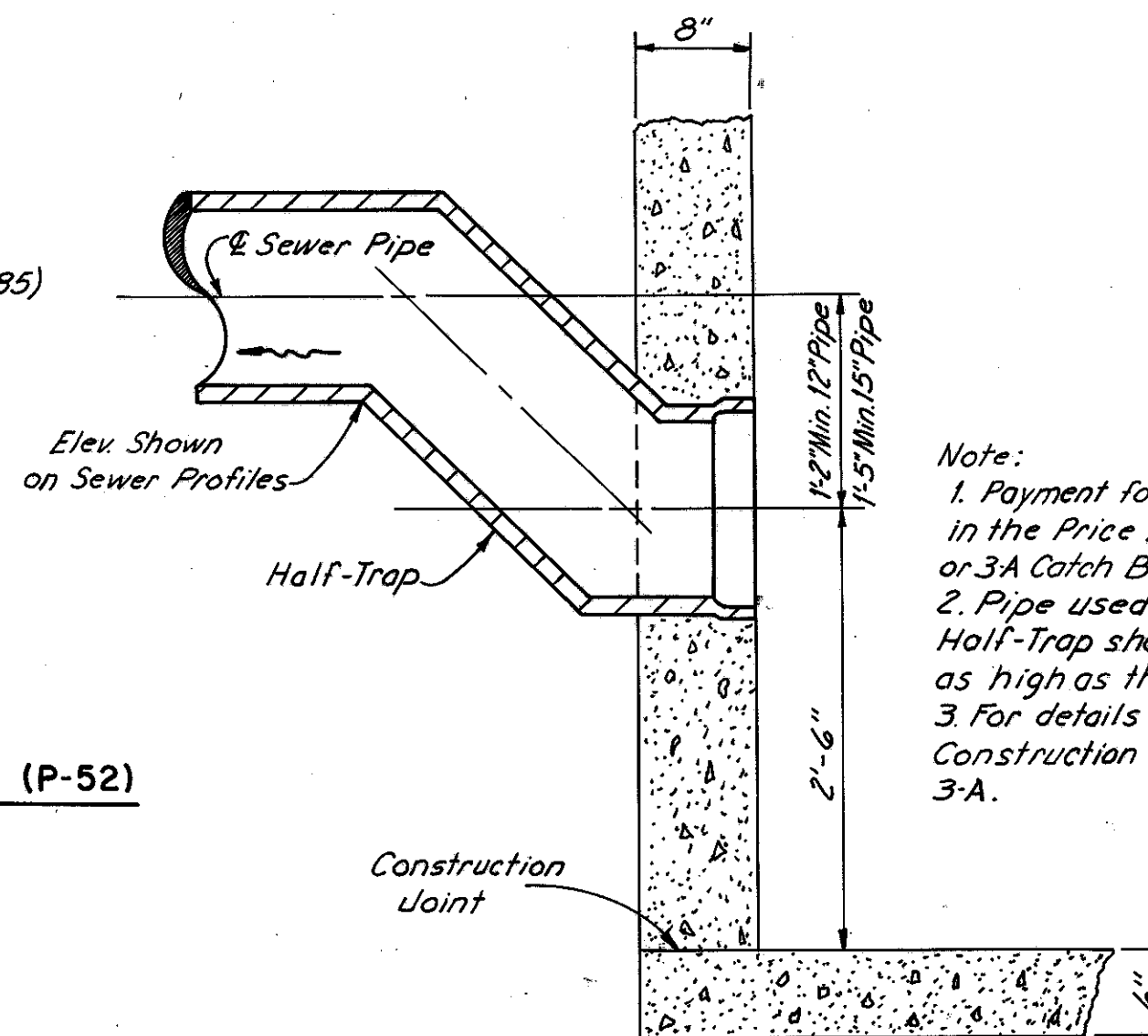
EXISTING CITY SEWER SIZES



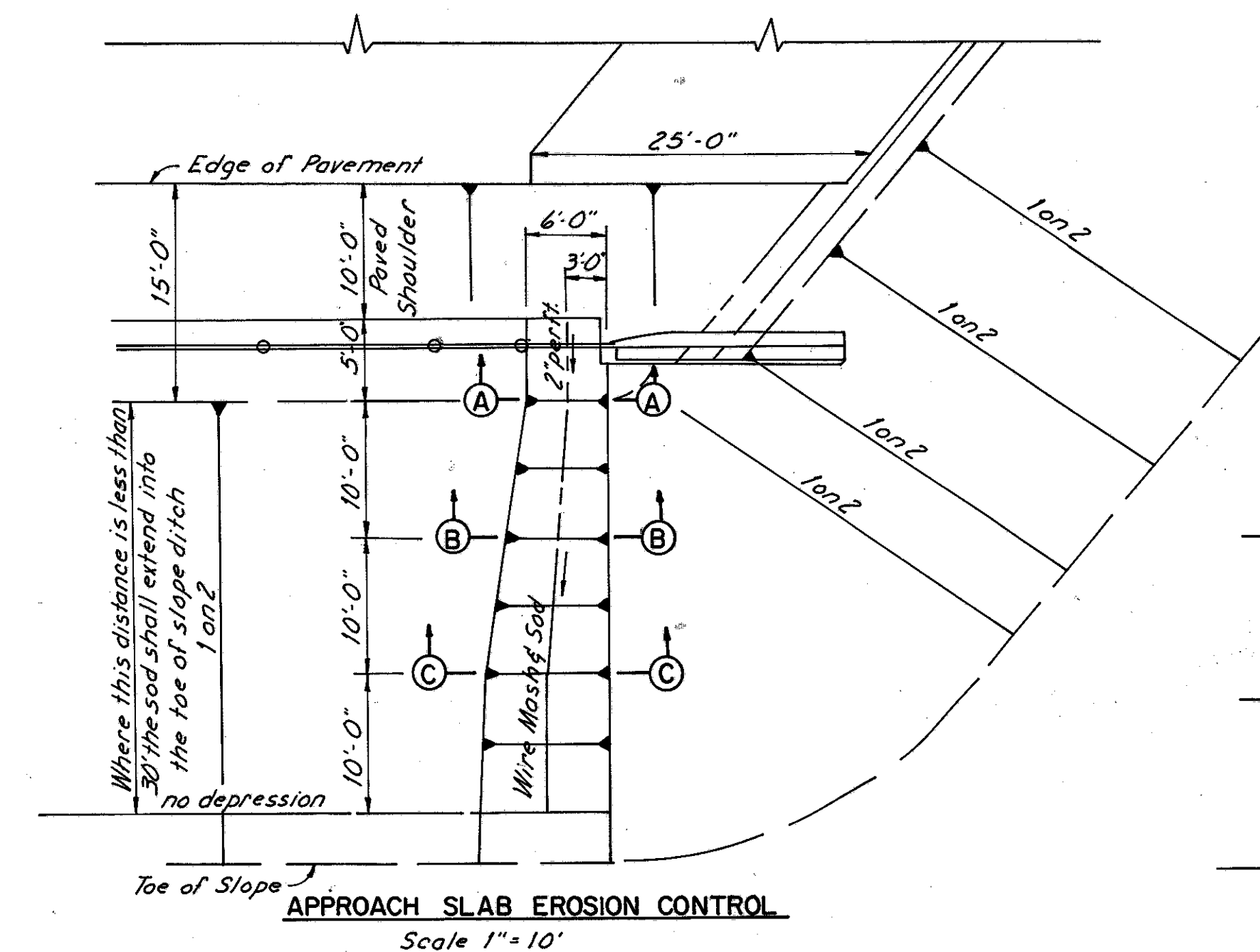
SECTION THRU PIPE AT TIE BOLT INSTALLATION  
Not to Scale



SECTIONAL PLATE CORRUGATED METAL RADIUS PIPE (P-52)

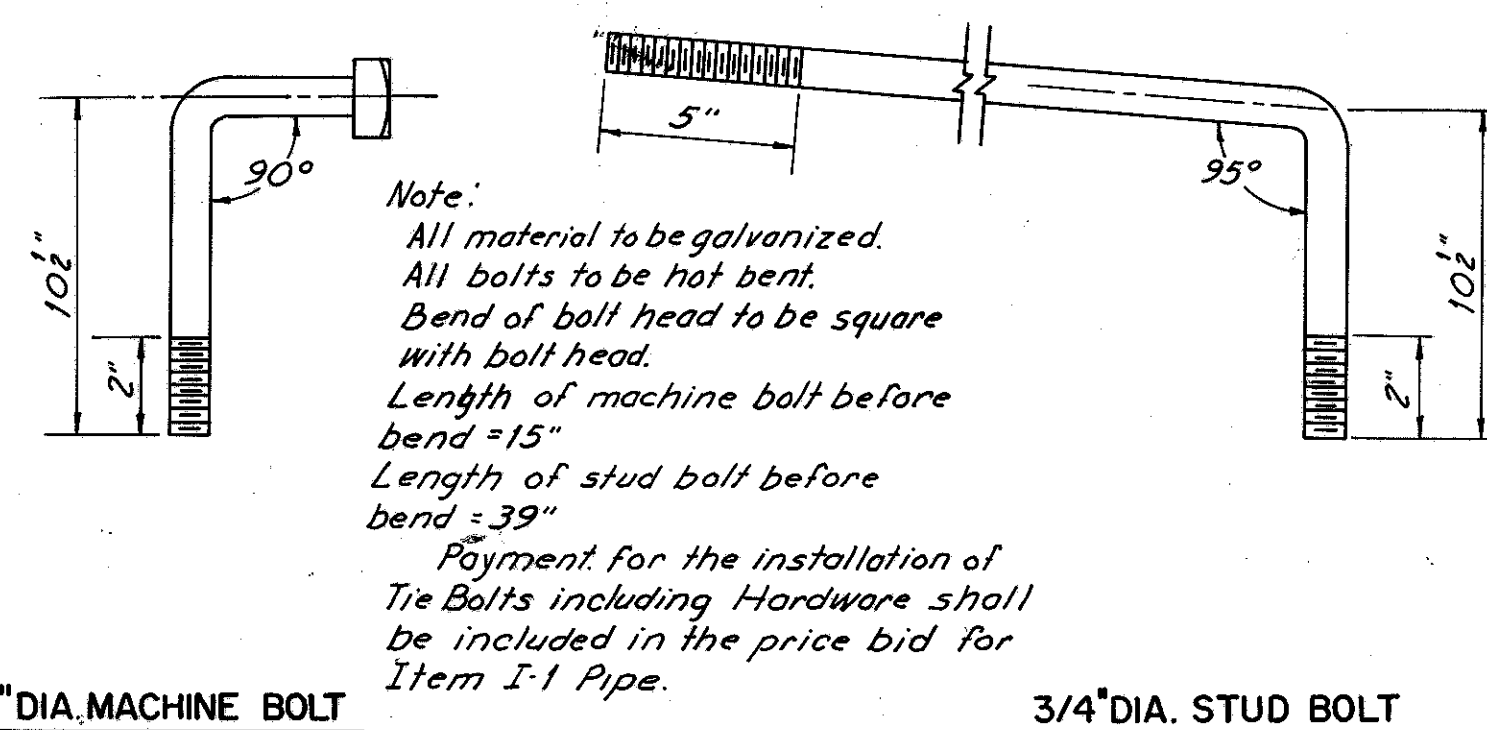


STANDARD NO. 3 & NO. 3-A CATCH BASIN MODIFIED

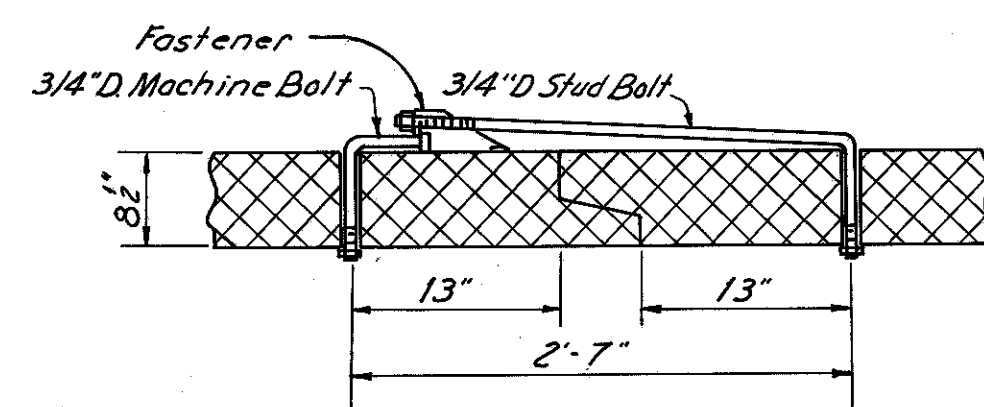


Note: Prior to placement of sod in the berm and slope, galvanized poultry fence shall be placed on the finished grade in strands which shall be at right angles to the direction of flow. Each strand shall be staked securely on top and bottom with stakes spaced at four foot intervals and alternated in rows four feet apart. Stakes shall be 1"x1/8" wood stakes and shall be perpendicular to the ground and flush with the finished grade. The fence shall be Straight Line Poultry Fence or equivalent with strand width of four feet, having a two inch mesh and all wires No. 20 gage. Each strand of fencing shall be fastened together at twelve inch intervals by means of hog rings. The fence shall be secured to the stakes by metal staples. Sod shall be laid in accordance with Construction and Materials Specifications Section L-10.07. For quantities see (Drainage Plan Sheets).

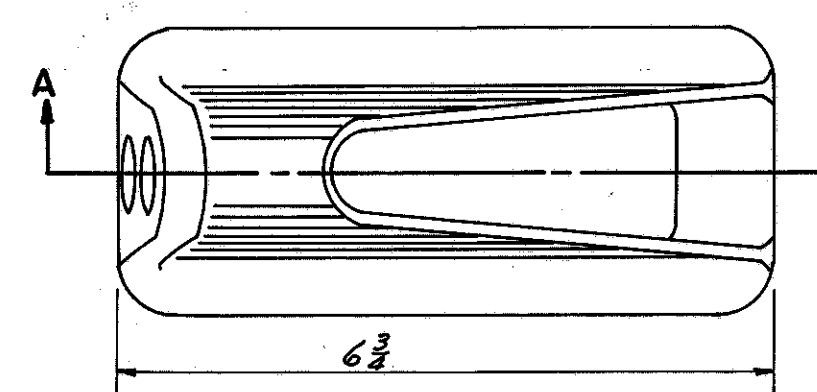
Note:  
1. Payment for Half-Trap to be included in the Price bid for Item I-8 Std. No. 3 or 3A Catch Basin, Modified, as per plan.  
2. Pipe used for construction of the Half-Trap shall be of a type at least as high as the adjoining outlet pipe.  
3. For details not shown see Standard Construction Drawings I-8CB, No. 3 or 3-A.



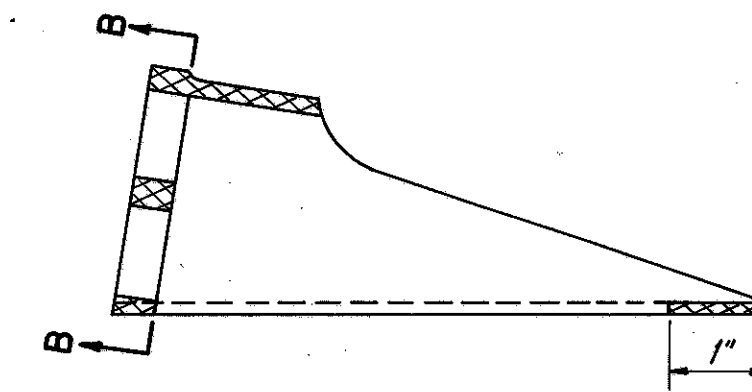
TIE BOLT DETAILS



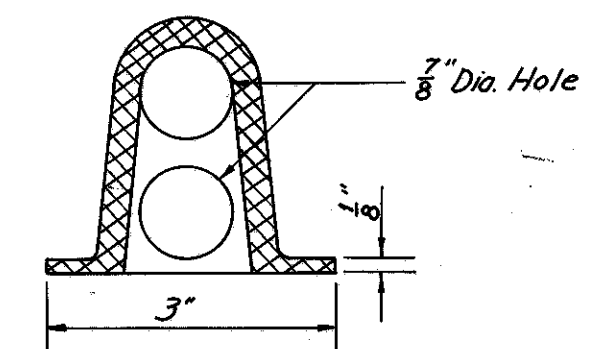
TIE BOLT INSTALLATION



PLAN



SECTION A-A



SECTION B-B

FASTENER DETAILS  
1/2 Scale







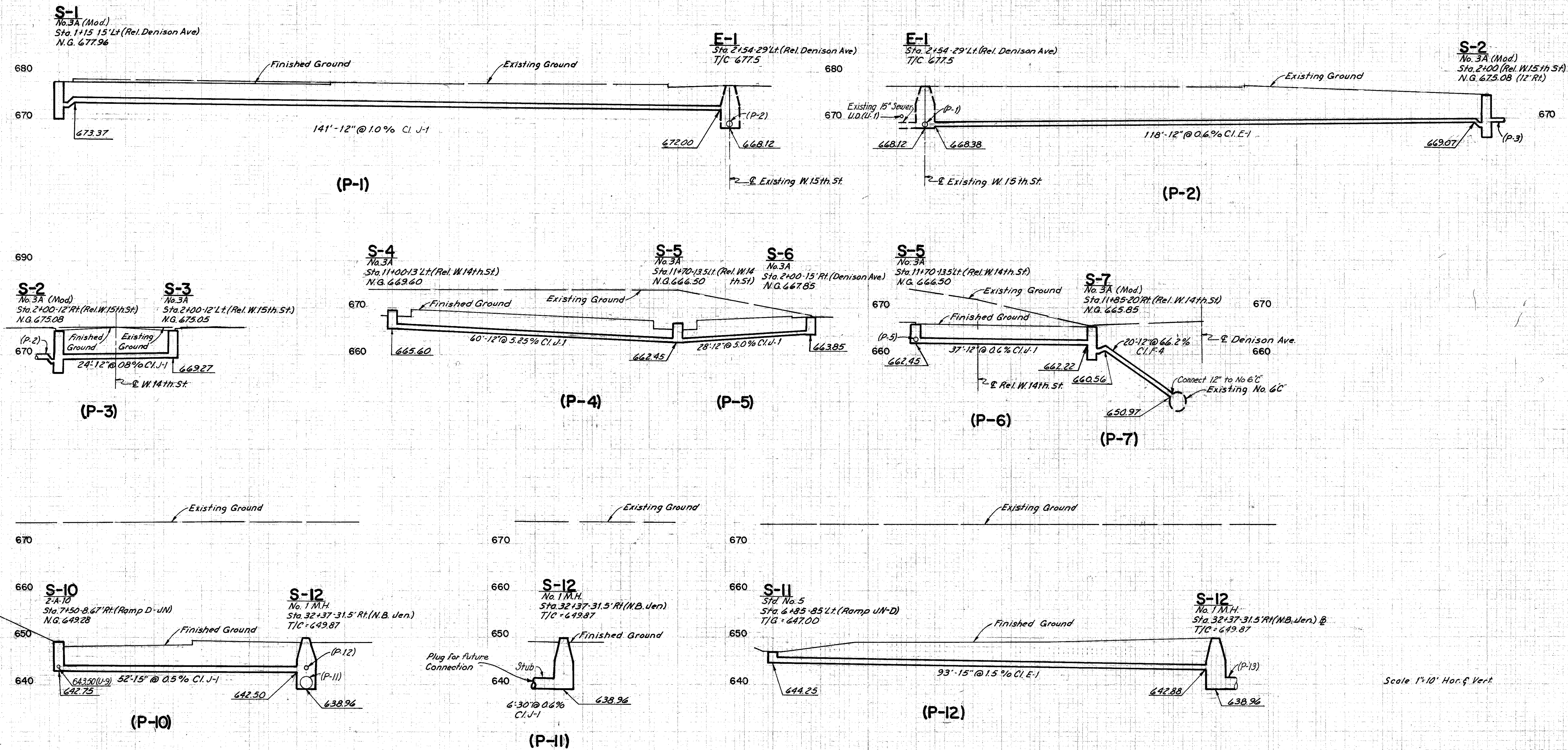
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

274  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

23  
54

R.D. 8-5-64  
C.M.C. 10-19-64



Scale 1"=10' Hor. & Vert.

P-8 & P-9 SEE SH. 24

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CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

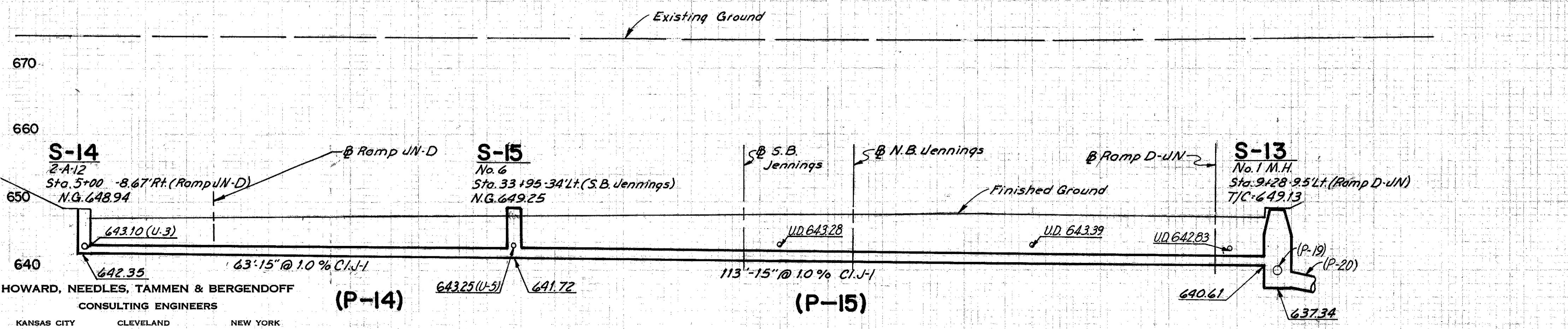
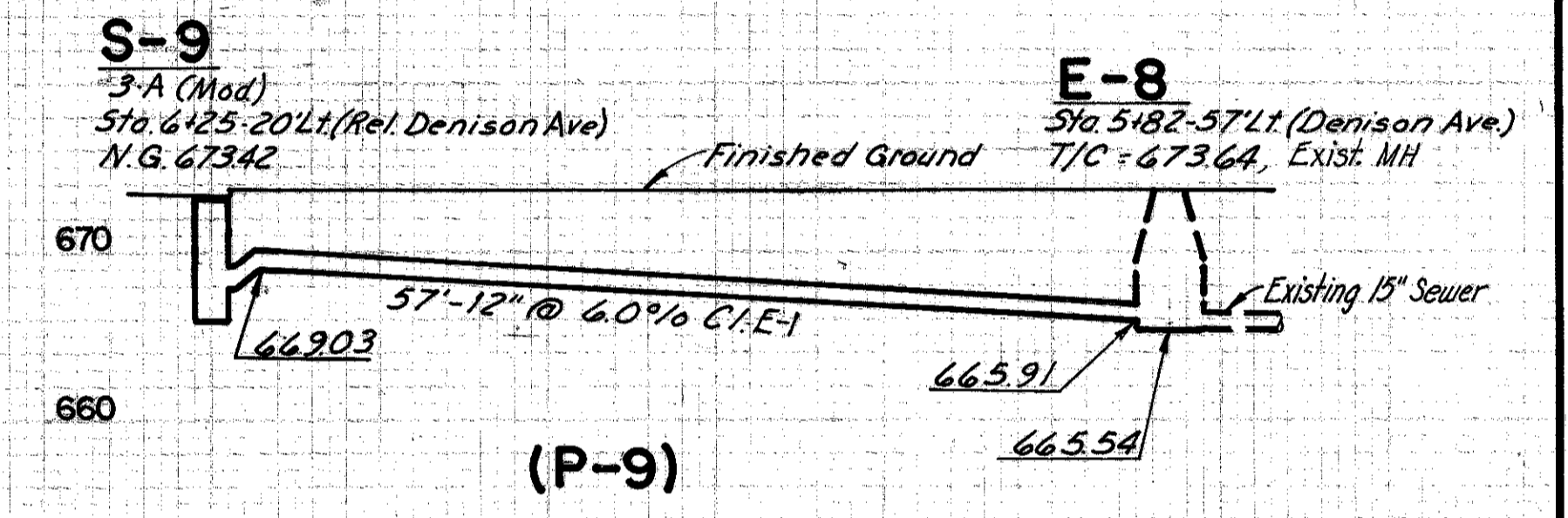
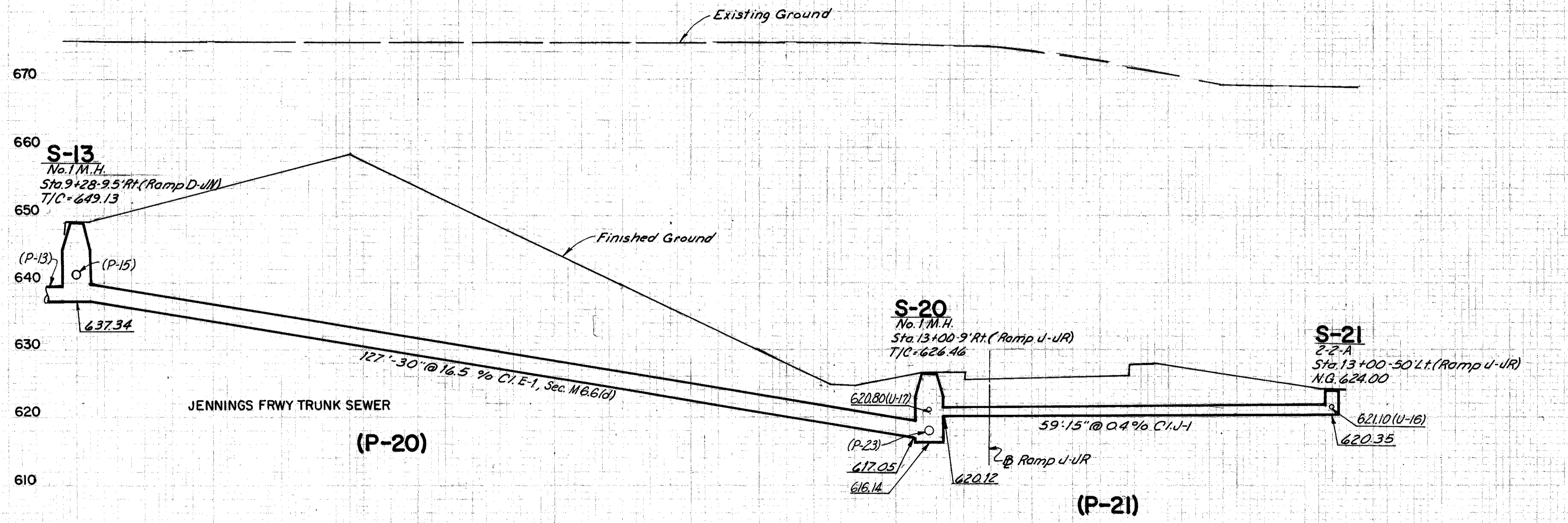
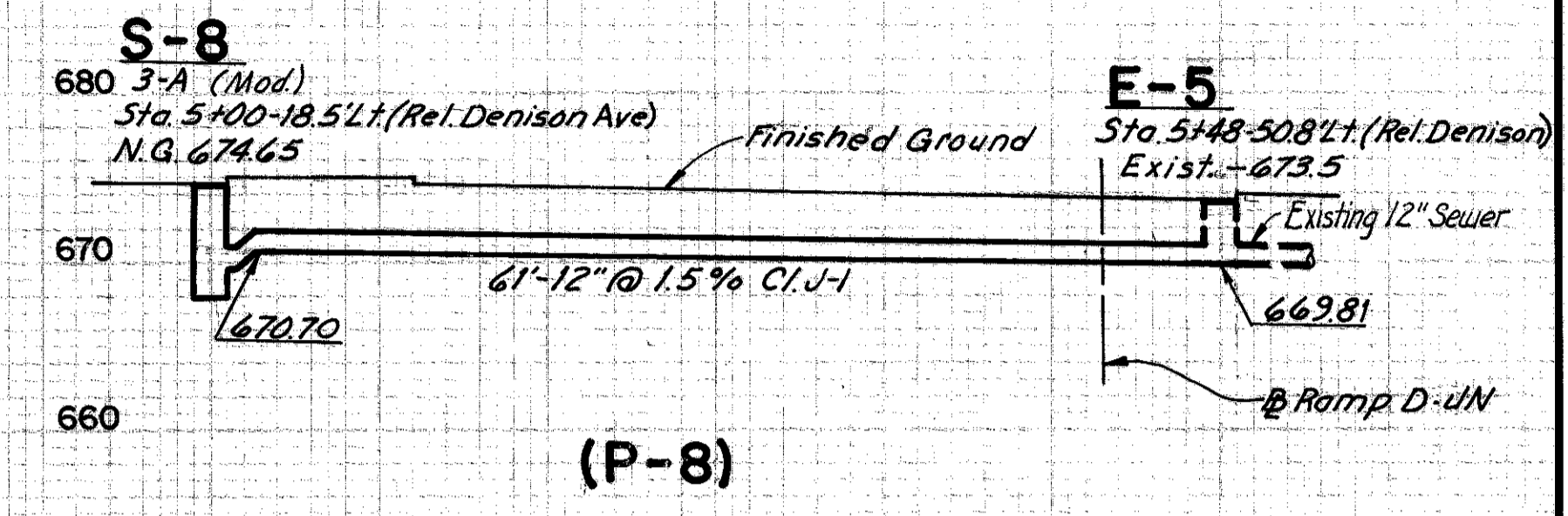
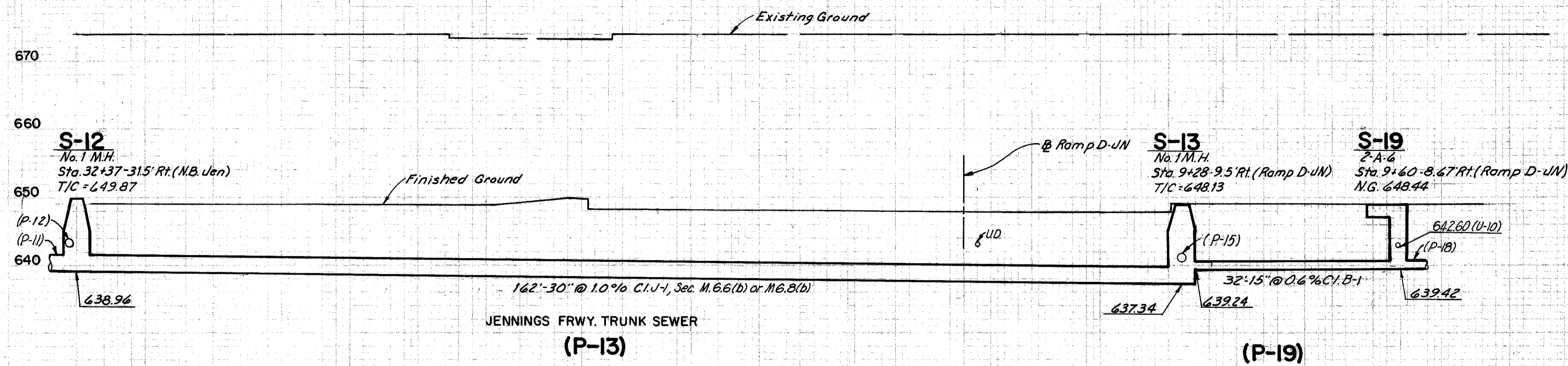
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

275  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

24  
54

R.D.L. 8-11-64  
U.M.C. 10-19-64



Scale 1" = 10' Hor. & Vert.

P-10 to P-12 SEE SH. 23  
P-16 to P-18 SEE SH. 25

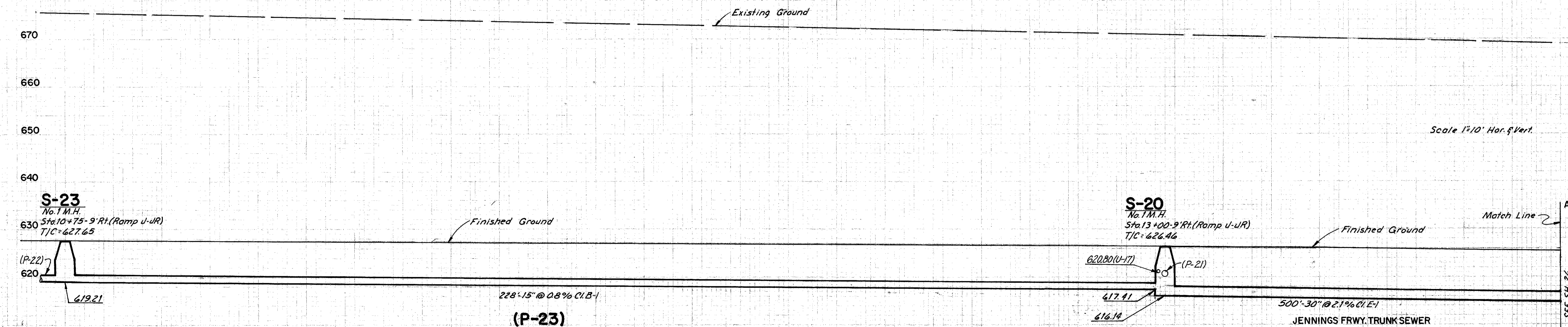
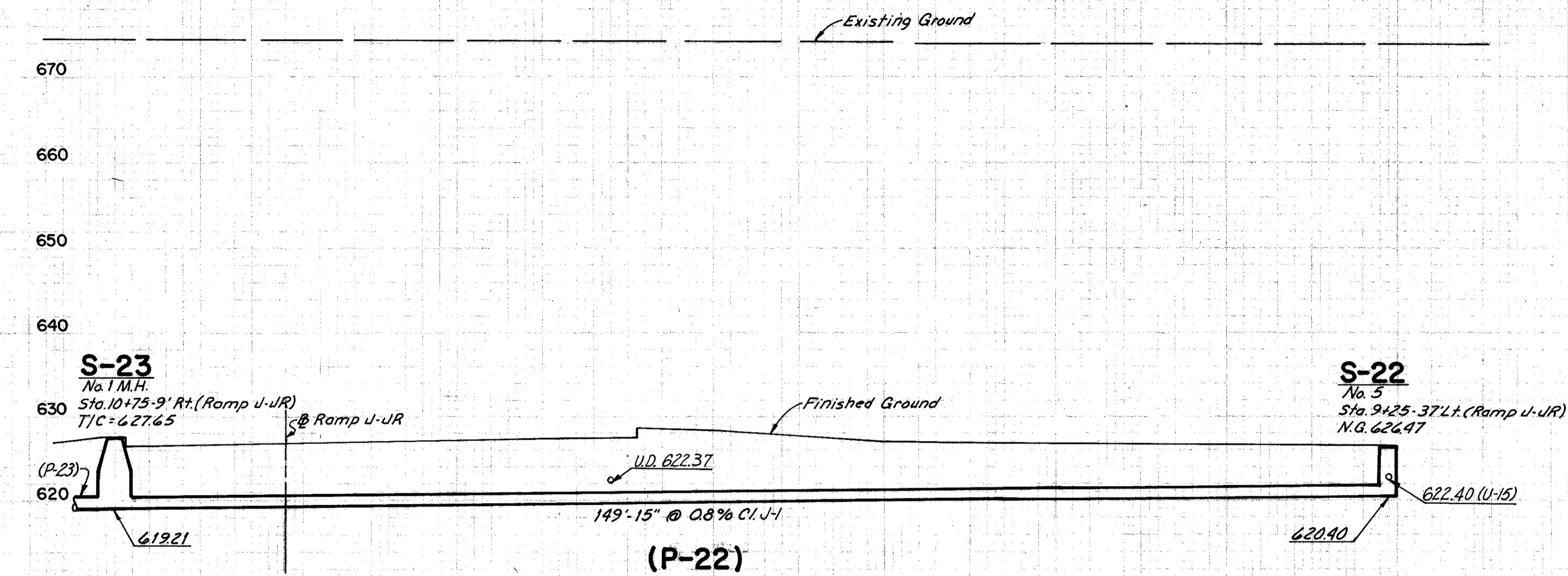
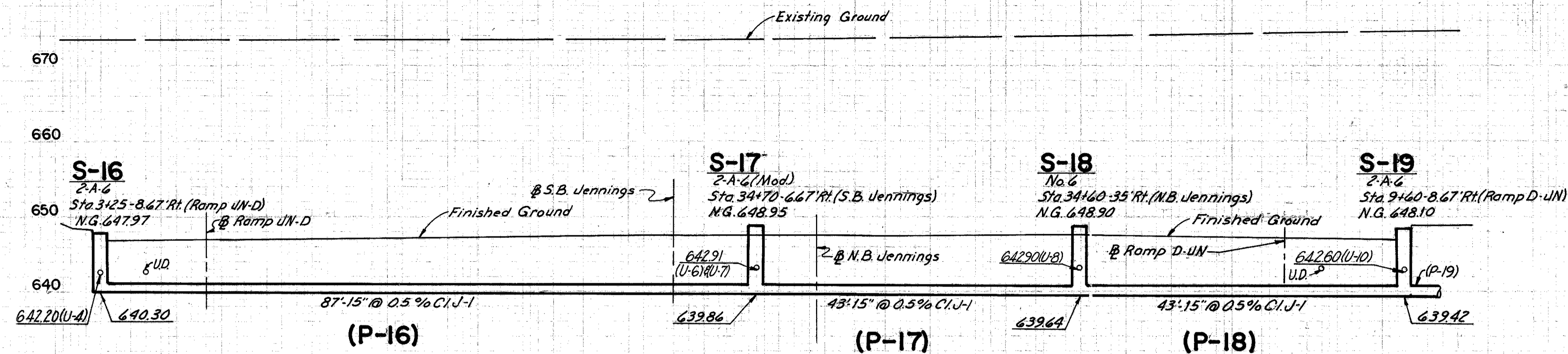
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

276  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

25  
54



Scale 1"=10' Hor. & Vert.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

JENNINGS FRWY. TRUNK SEWER  
(P-24)  
P-19 to P-21 SEE SH. 24

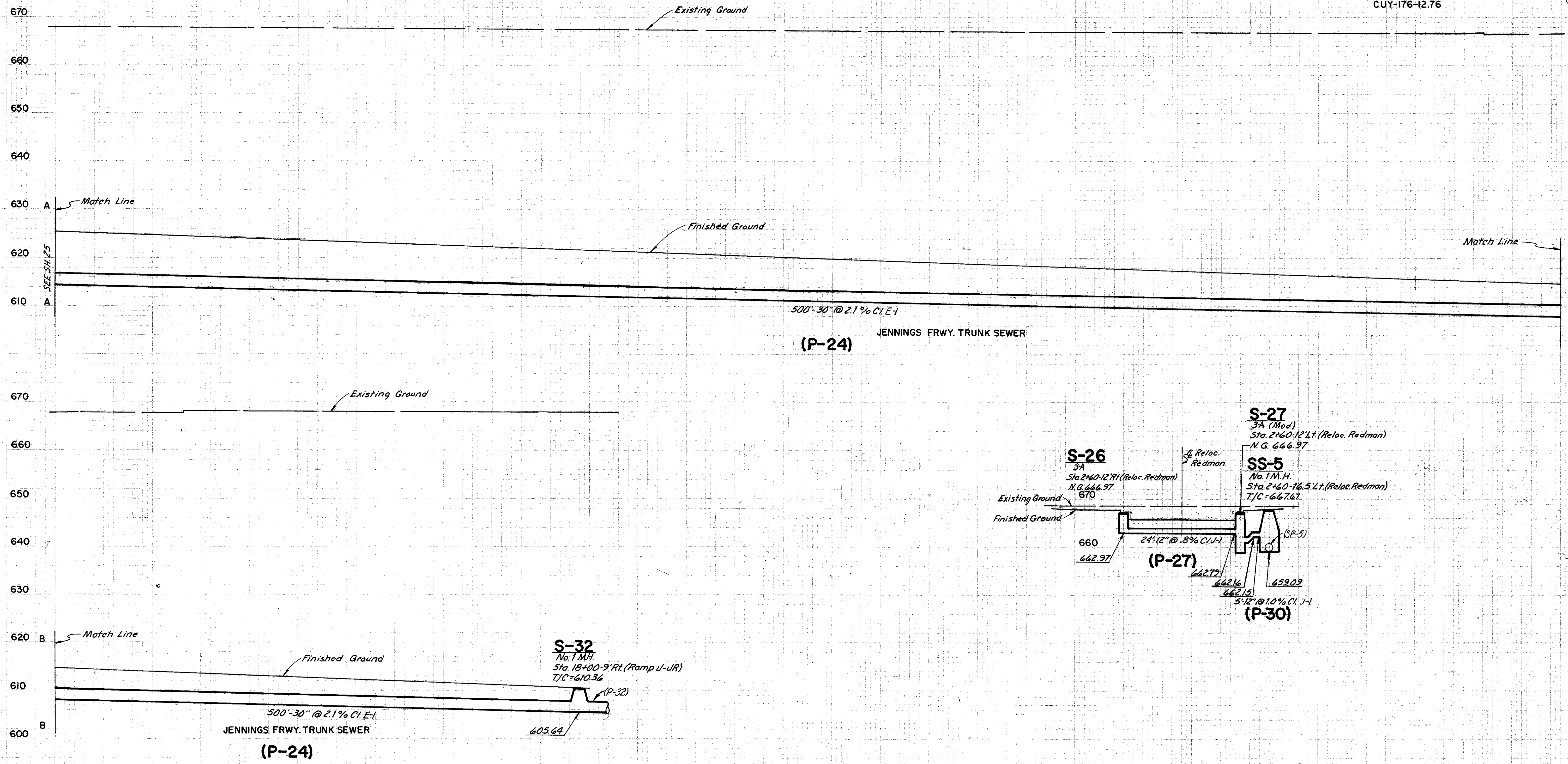
8-13-64  
R.D.J.  
U.M.O. 10-19-64

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

277  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

26  
54



RDJ B.1464 U.M.C. 10/19/84

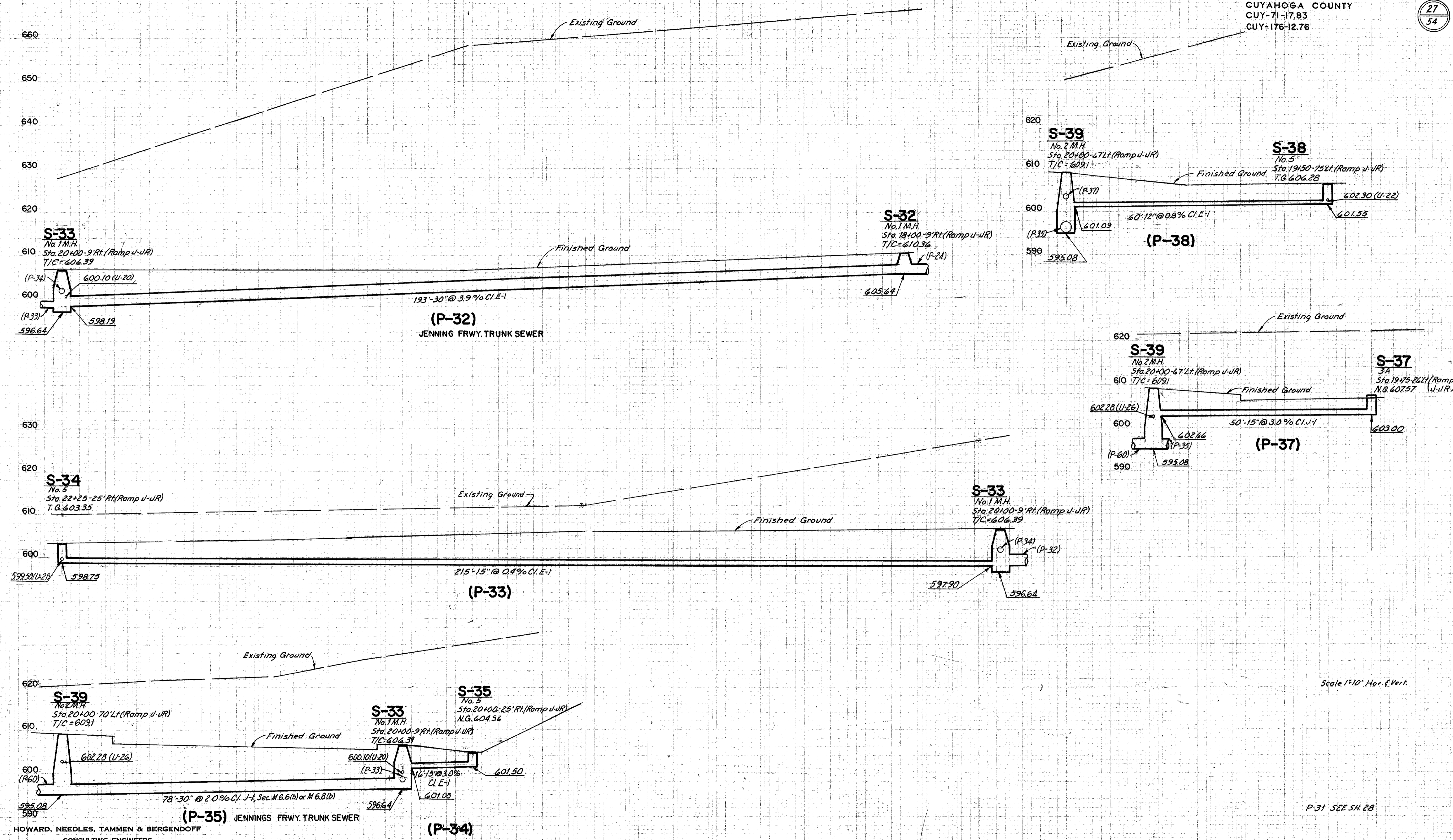
Scale 1" = 10' Hor. & Vert.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

278  
646  
27  
54

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

P.D.V. 8-17-64  
J.M.D. 10-20-64



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Scale 1"=10' Hor. & Vert.

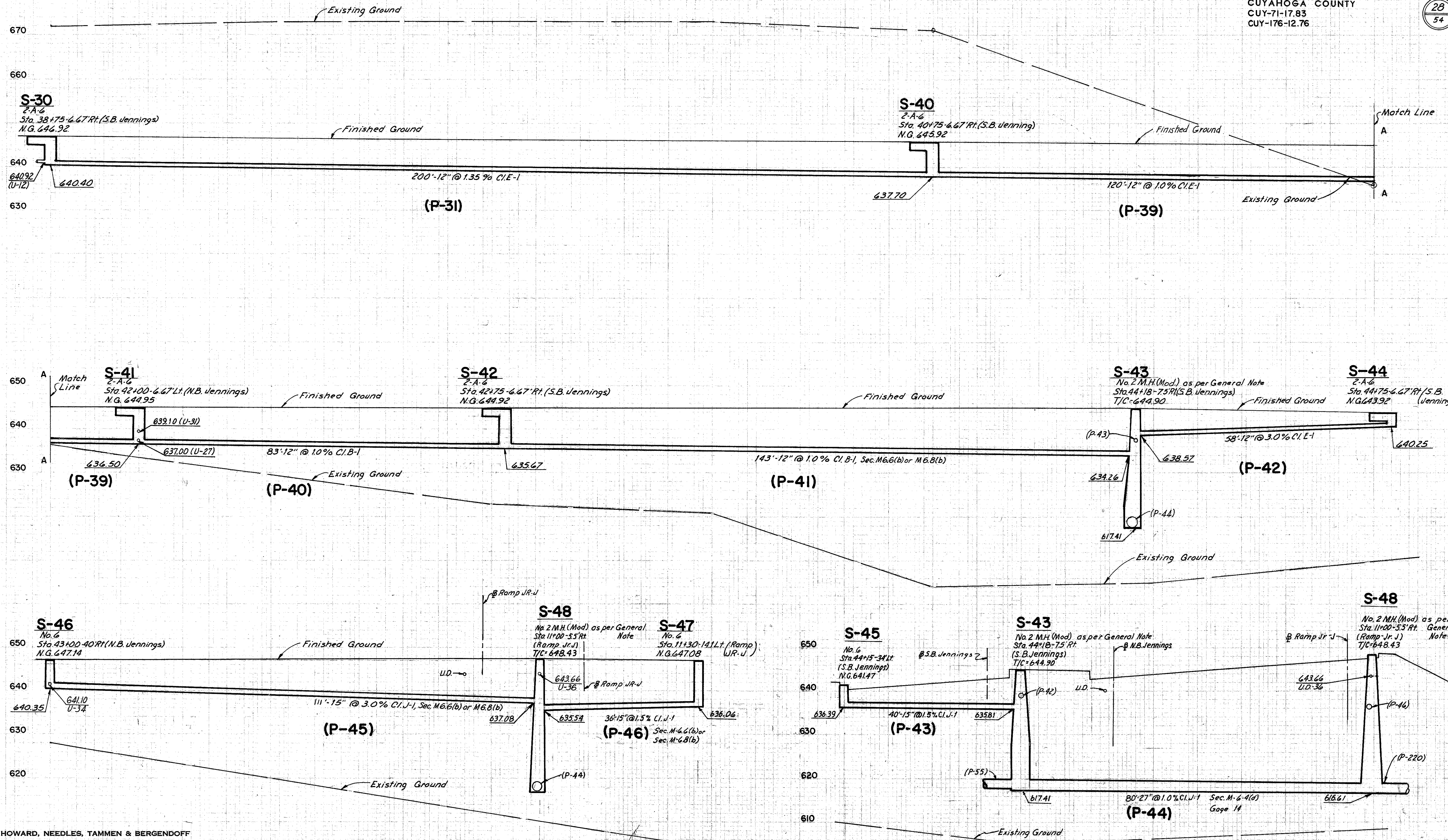
P-31 SEE SH. 28

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

279  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

28  
54



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CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Scale 1"=10' Hor. & Vert. P-32 to P-38 SEE SH. 27

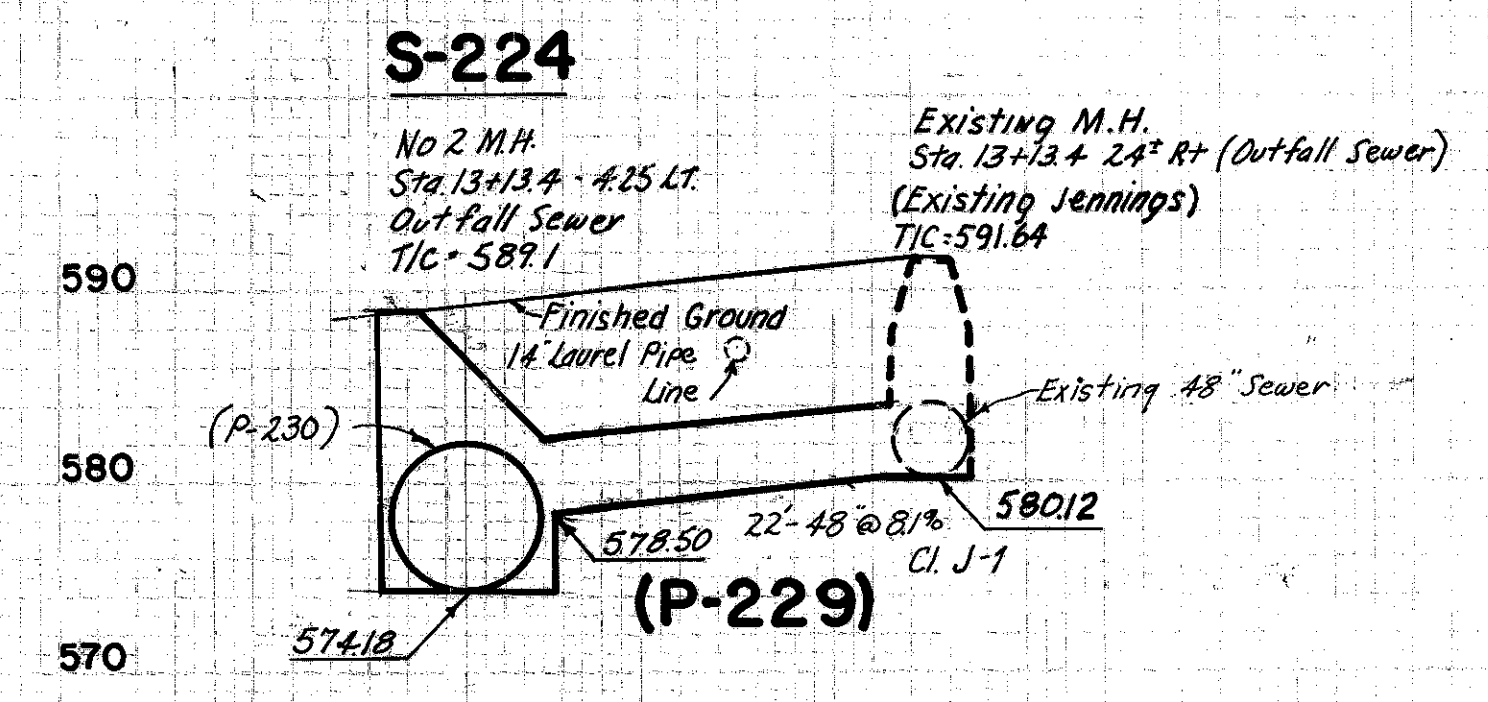
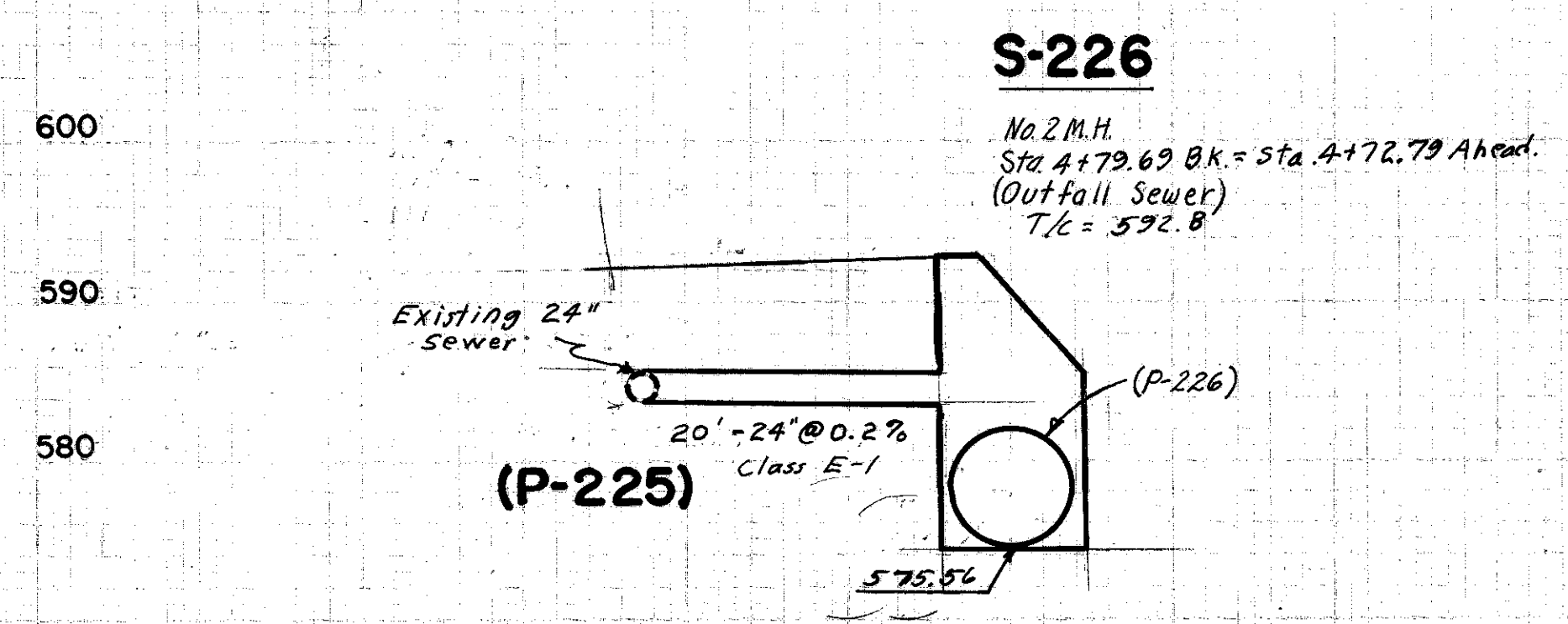
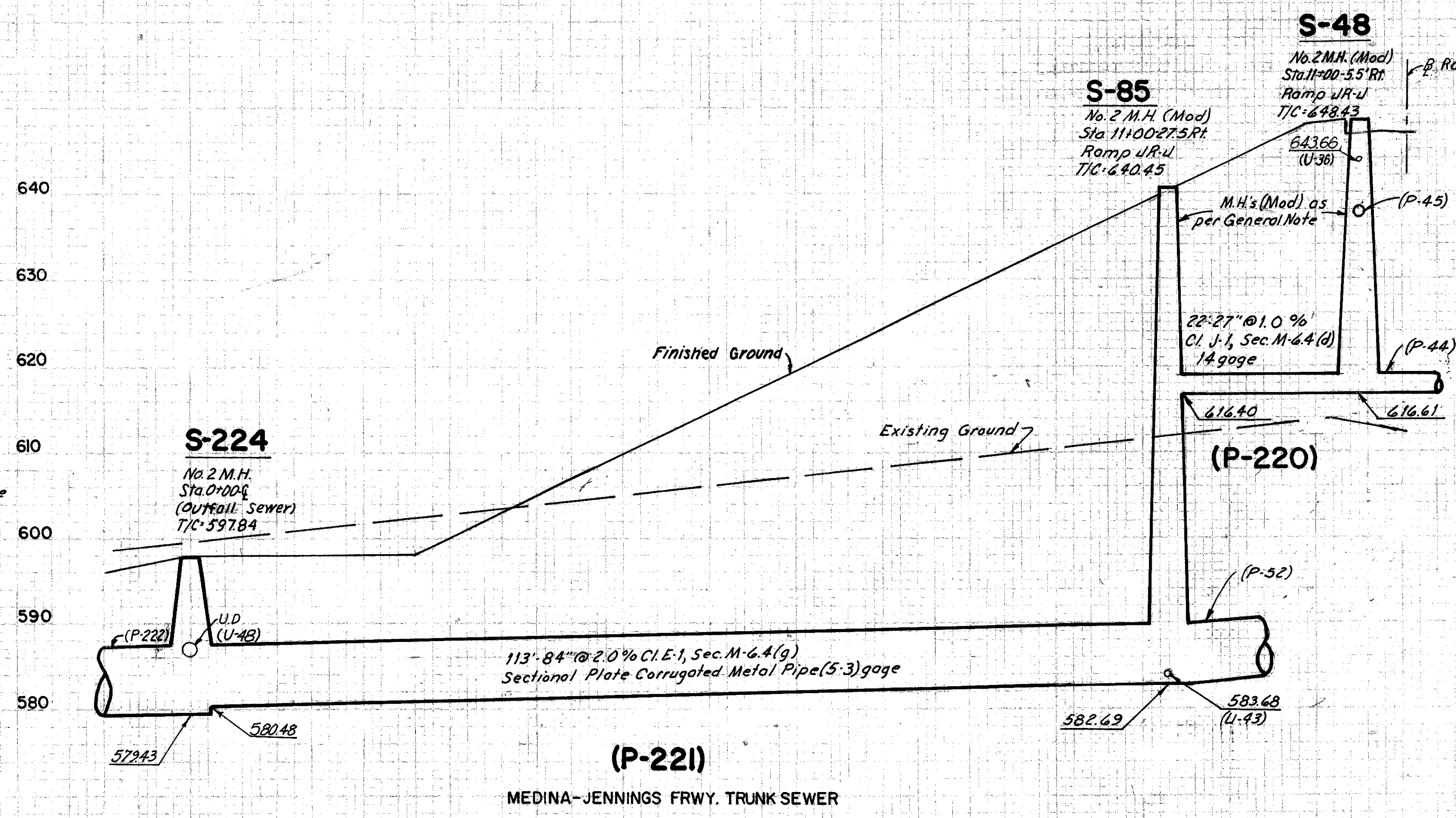
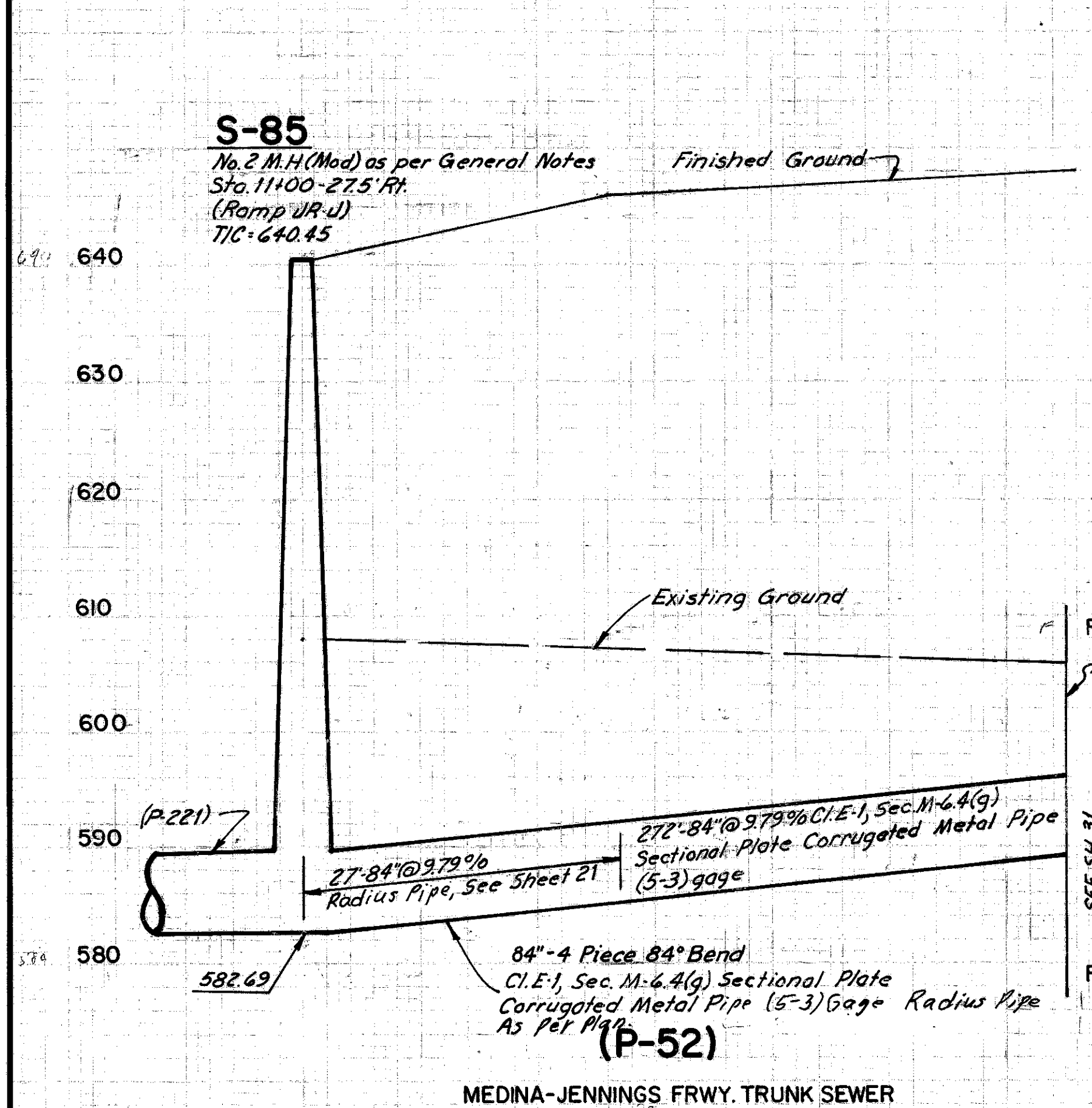




FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

281  
646  
30  
54

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



Scale 1" = 10' Hor. & Vert.

P-52 SEE ALSO SH. 31

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

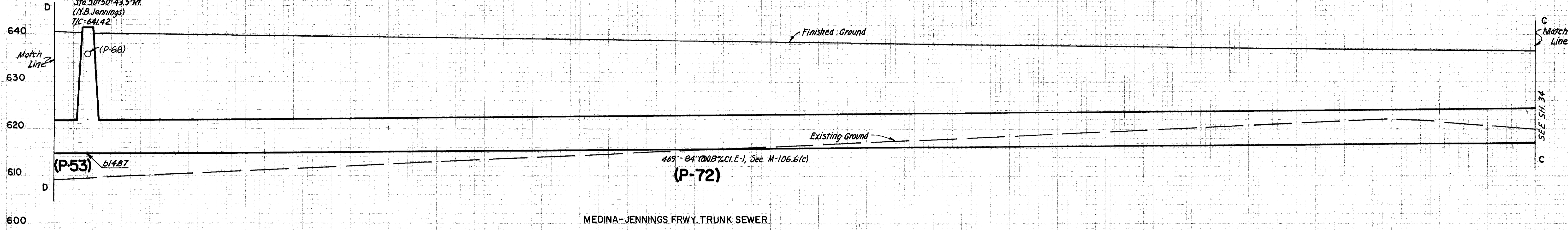
282  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

31  
54

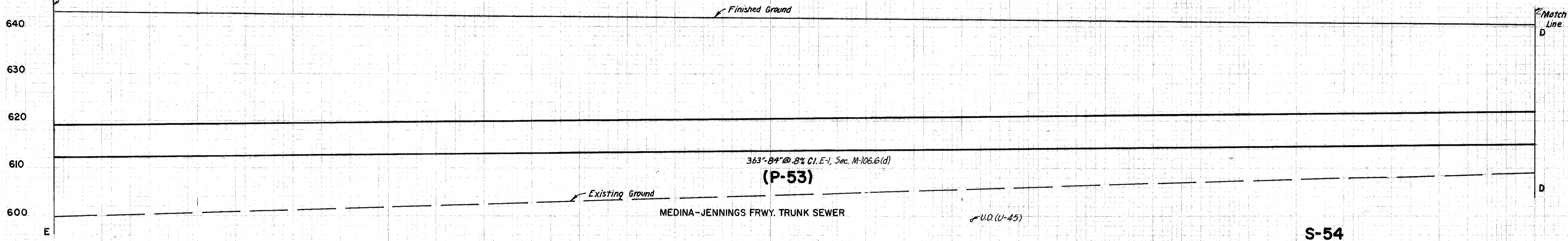
**S-71**

No. 2 M.H. (Mod) as per General Notes  
Sta. 50+50-43.5' RT.  
(N.B. Jennings)  
TIC=641.42

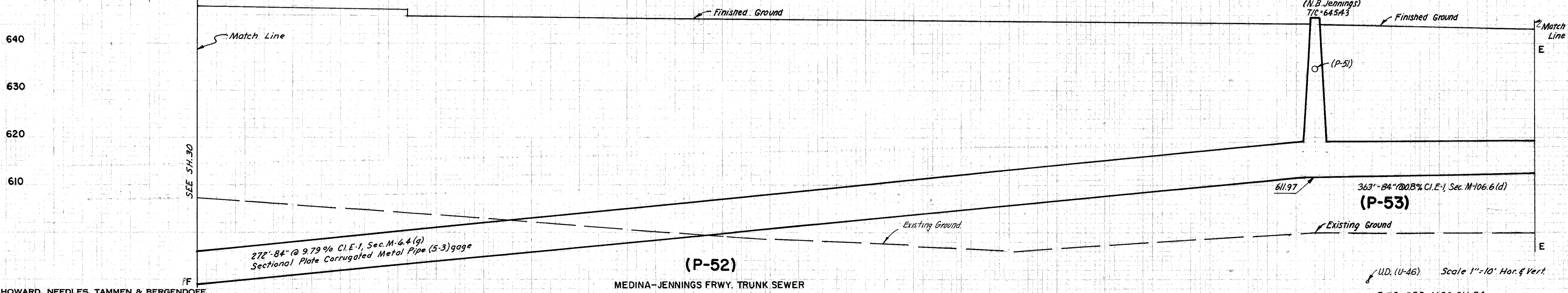


RDJ  
JMD  
10-9-64  
10-14-64

**E**



**F**



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

UD. (U-46) Scale 1"=10' Hor. & Vert.  
P-72 SEE ALSO SH. 34

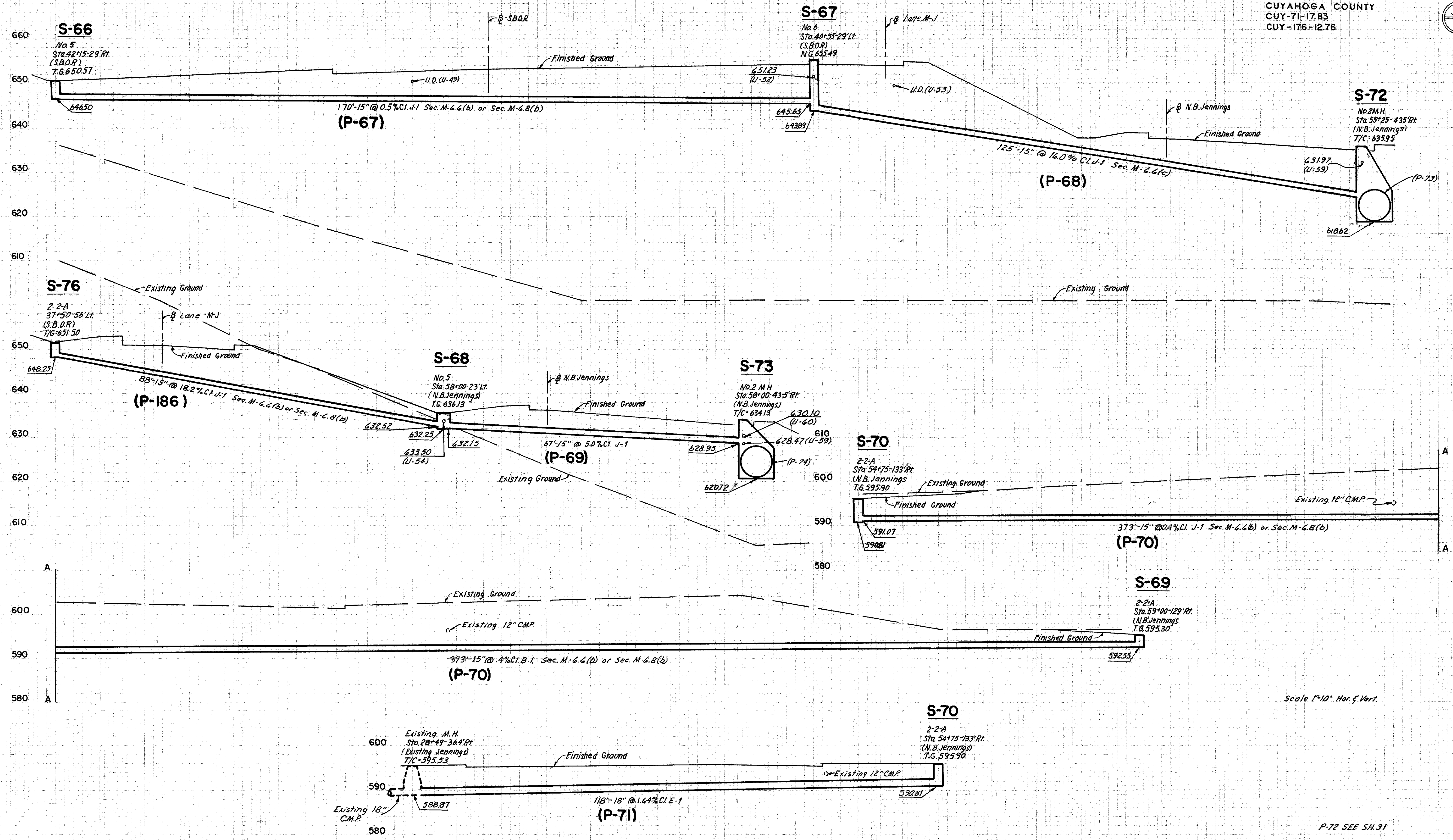


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

284  
646

33  
54

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



9-22-01  
 R.D.J.  
 J.M.D.

Scale 1"=10' Hor. & Vert.

P-72 SEE SH.31

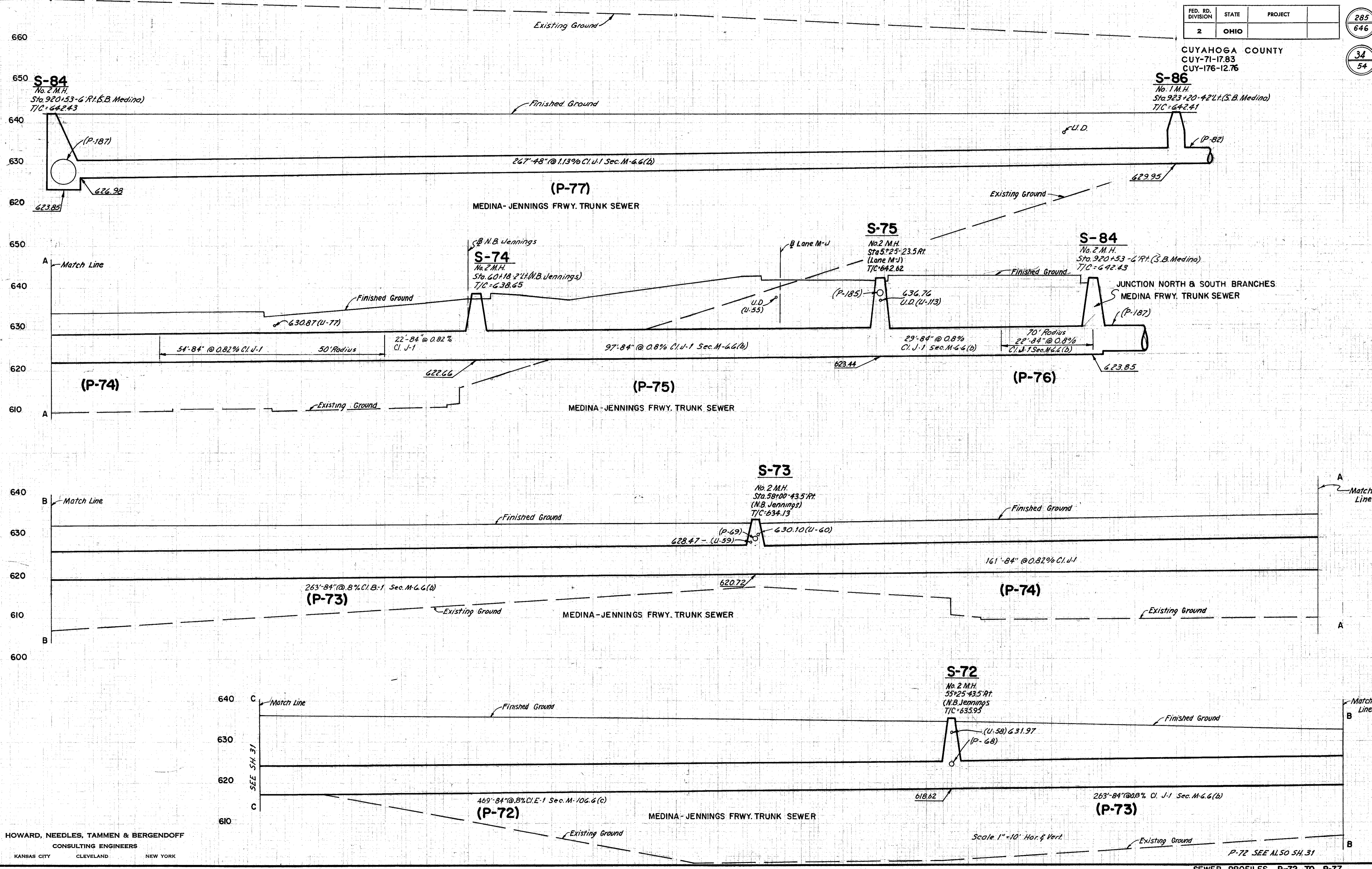
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

285  
646

34  
54

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



R.O.J. 10-9-68  
L.M.O. 10-14-68

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Scale 1" = 10' Hor. & Vert.

P-72 SEE ALSO SH. 31

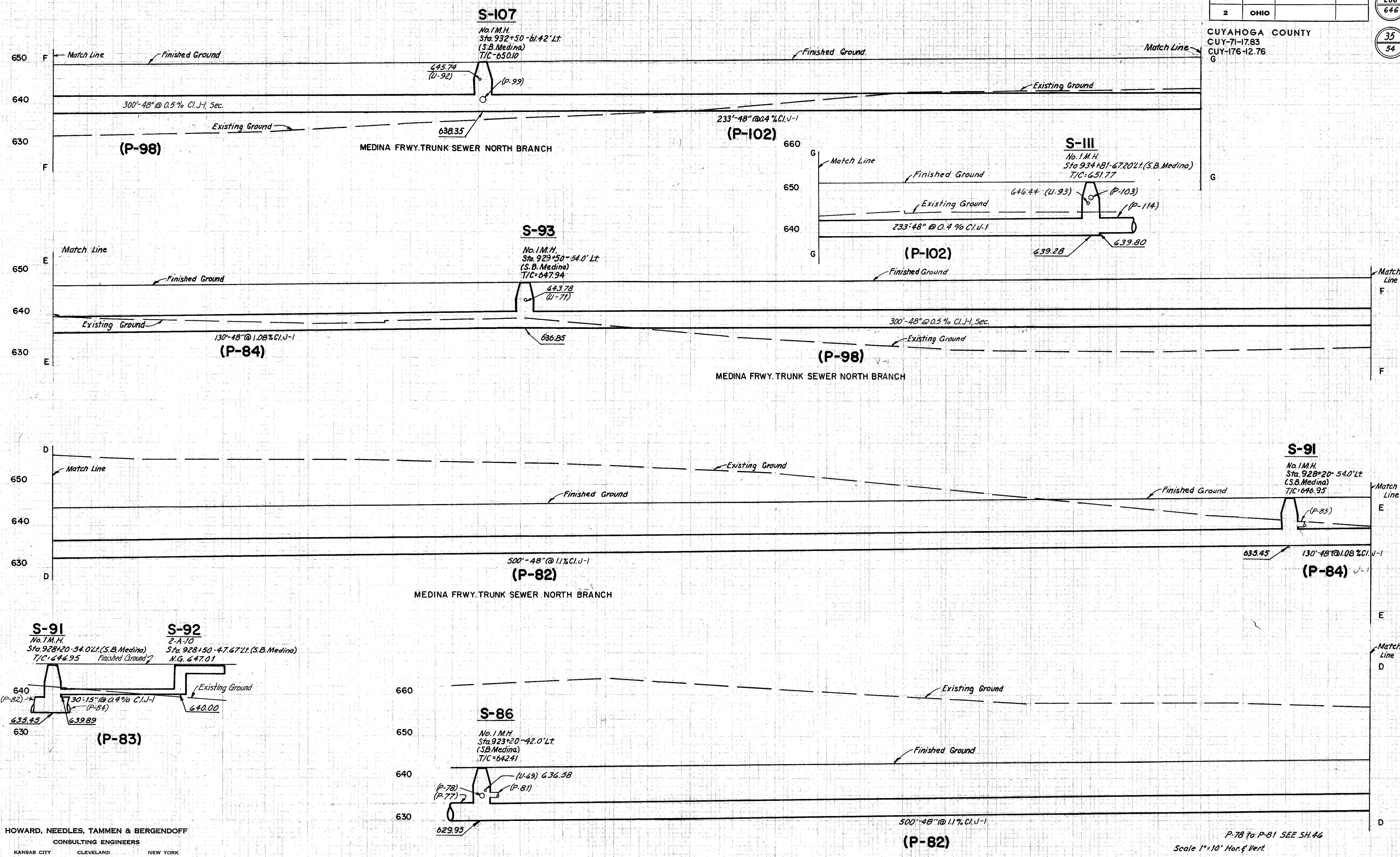
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

286  
646

35  
54

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76  
G

R.D. 1 9-23-64  
LMA 10-12-68



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

P-78 to P-81 SEE SH. 46  
Scale 1" = 10' Hor. & Vert.

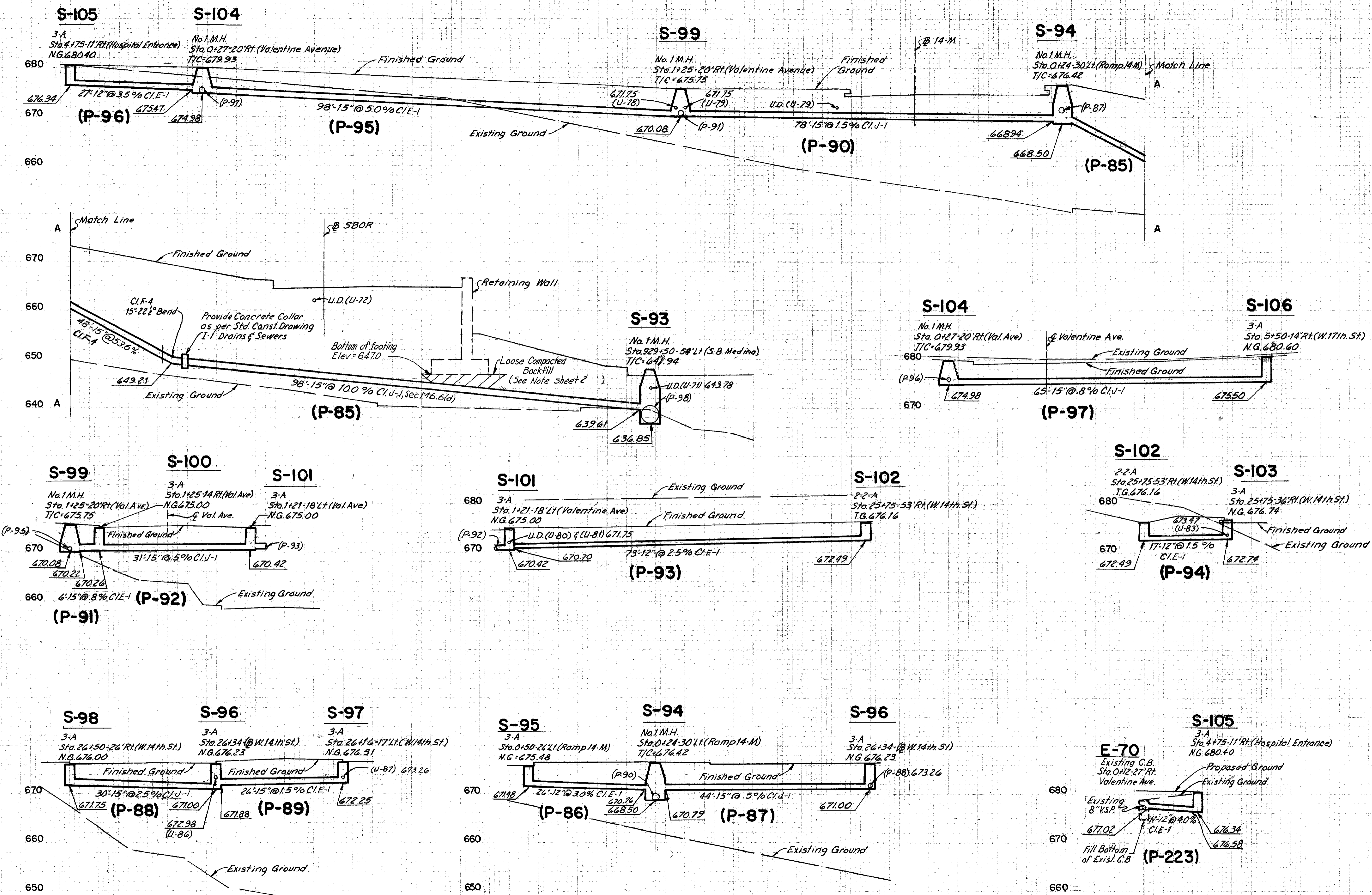
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

287  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

36  
54

R.D.J. 9-10-64  
J.M.O. 10-23-64



Scale 1"=10' Hor. & Vert.

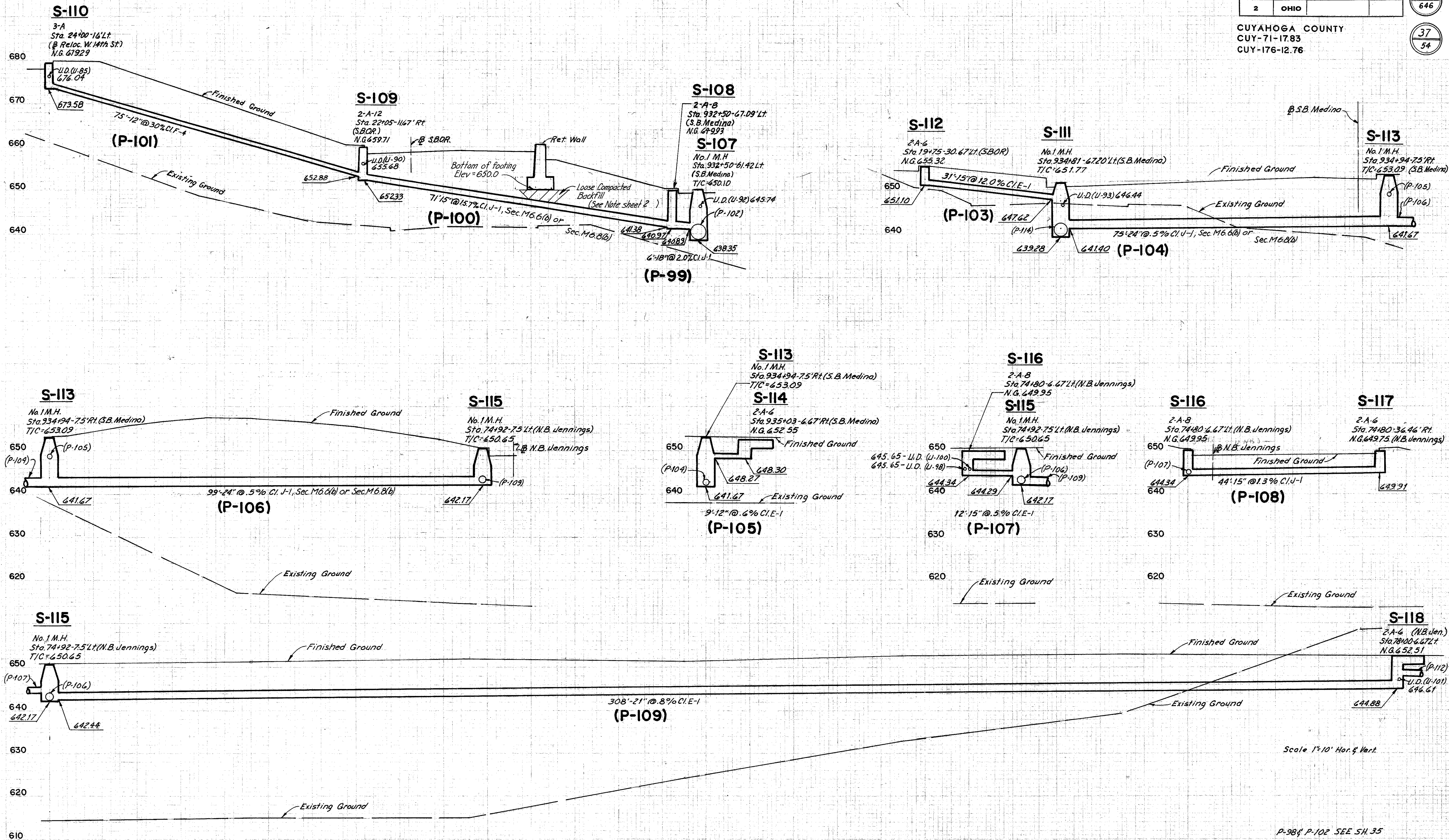
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

288  
646

CUYAHOGA COUNTY  
CUY-71-1783  
CUY-176-12.76

37  
54



Scale 1"=10' Hor. & Vert.

P-98 & P-102 SEE SH. 35

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

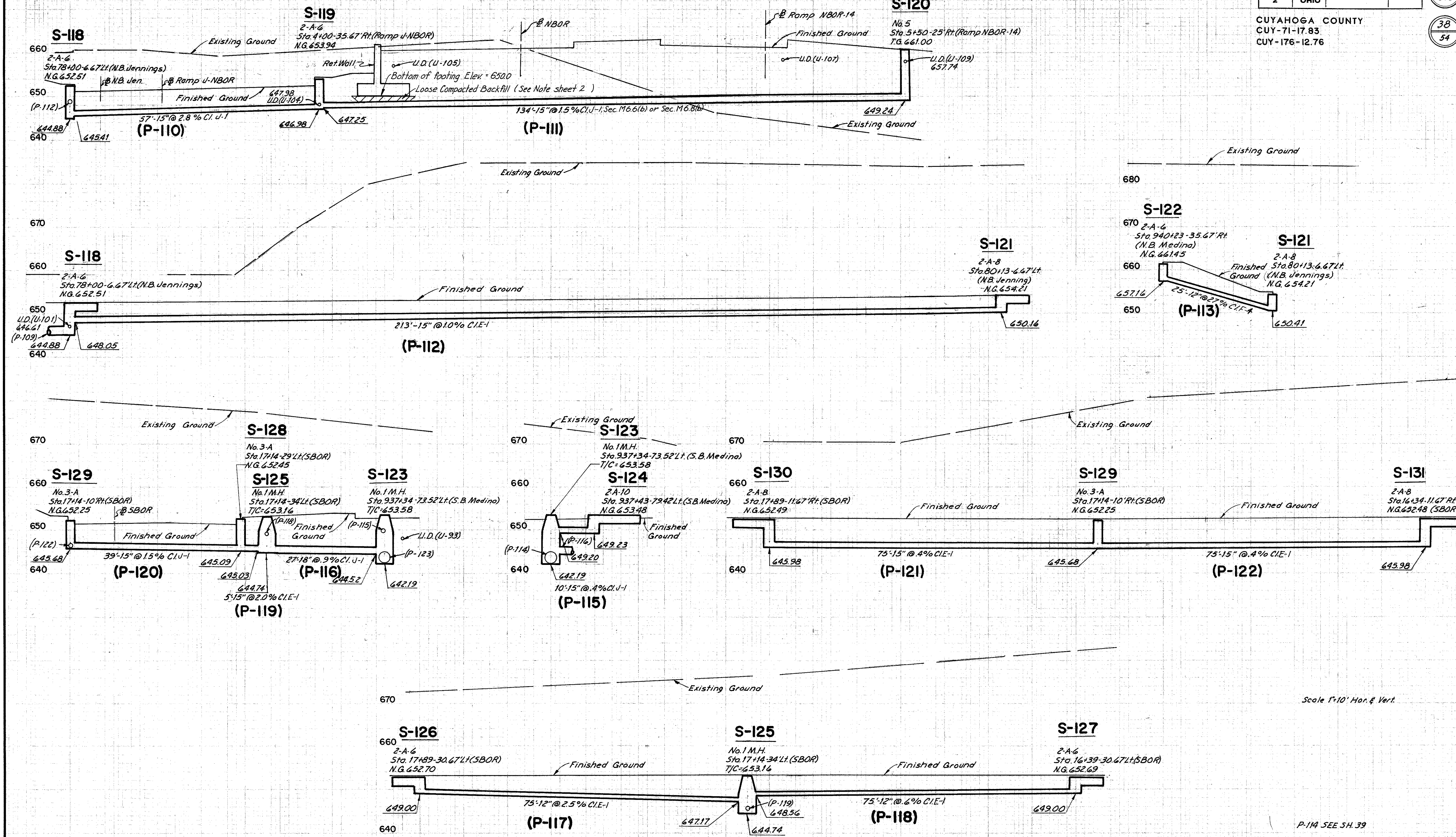
RDJ 9-14-64  
LMO 10-23-64



FED. RD. DIVISION	STATE	PROJECT
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289  
646  
38  
54

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



Scale 1"=10' Hor. & Vert.

P-114 SEE SH. 39

R.D.V. 9-16-64  
J.M.C. 10-27-64

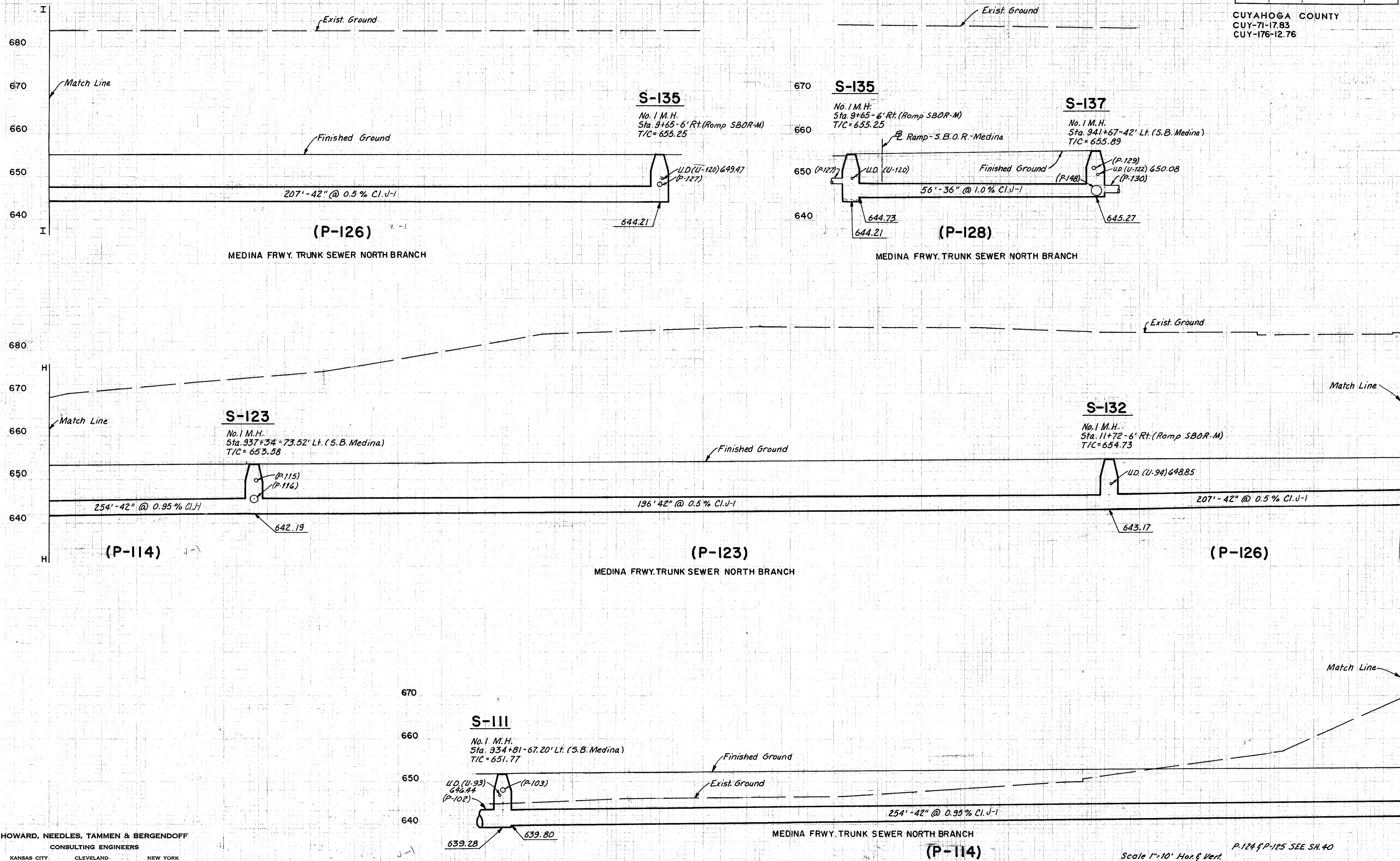
FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

39  
54

RDJ 9-22-64  
J.M.O. 10-13-64



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Scale 1"=10' Hor. & Vert. P-124 & P-125 SEE SH. 40

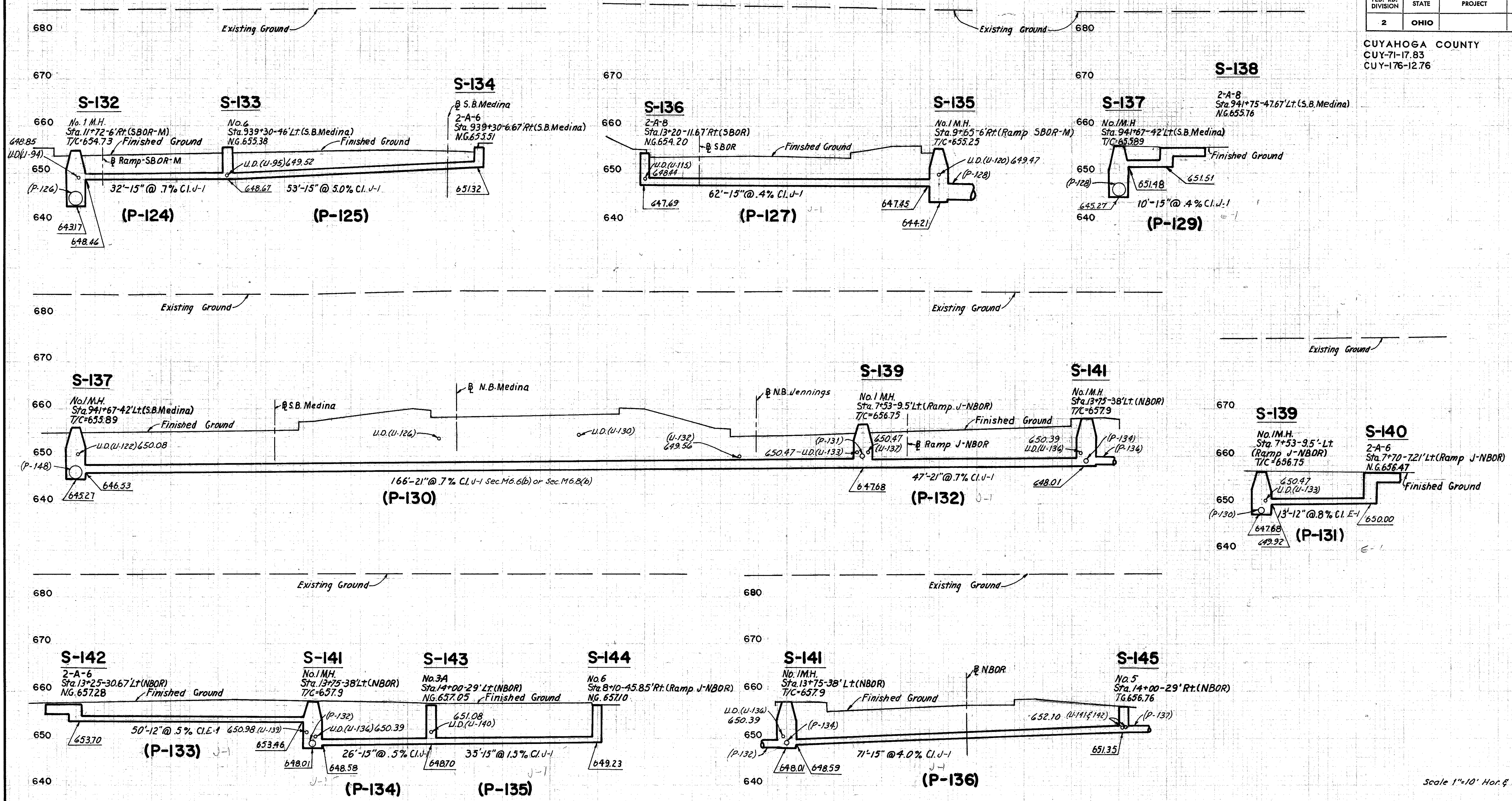
SEWER PROFILES P-114, P-123, P-126 & P-128

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

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R.D.J. 9-18-64  
J.M.C. 10-27-64

Scale 1"=10' Hor. & Vert.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

P-126 & P-128 SEE SH. 39

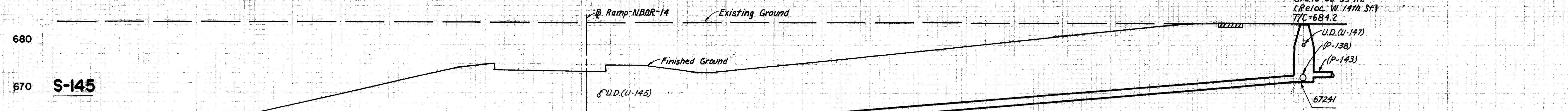
FED. RD. DIVISION	STATE	PROJECT
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54

**S-146** CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

No. 1 M.H.  
Sta. 10+05-33' Rt.  
(Reloc. W. 14th St.)  
T/C=684.2

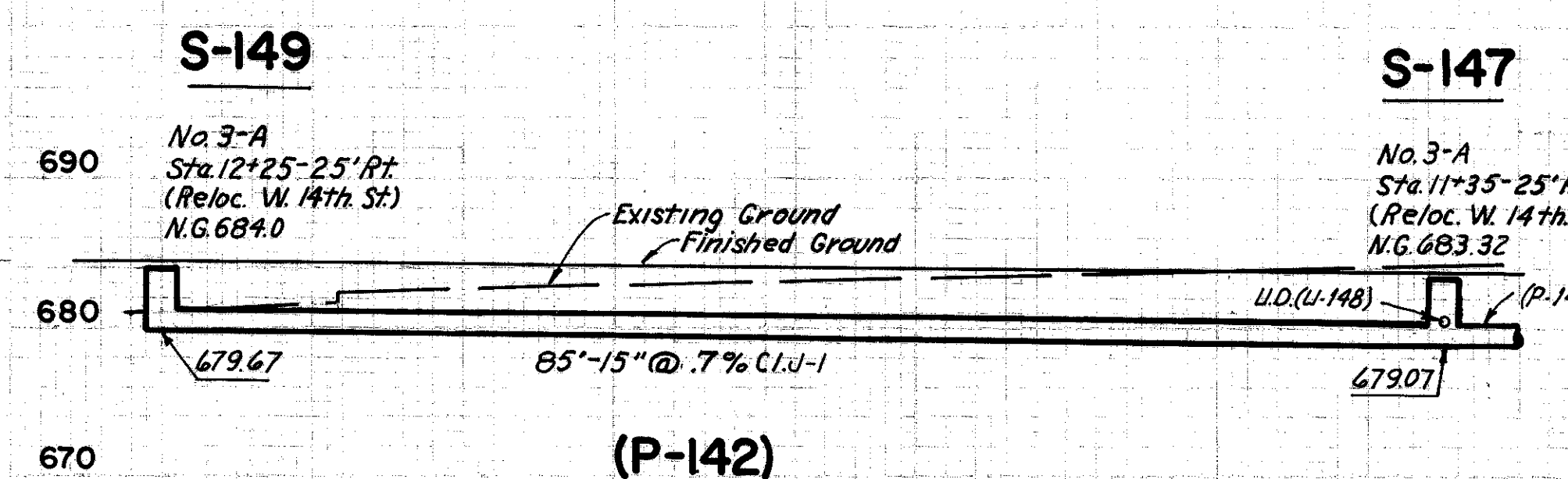


No. 5  
Sta. 14+00-29' Rt. (N.B.O.R.)  
T.G. 656.76

262'-15" @ 8.1% C.I. J-1 Sec. M.6.6(b)

(P-137)

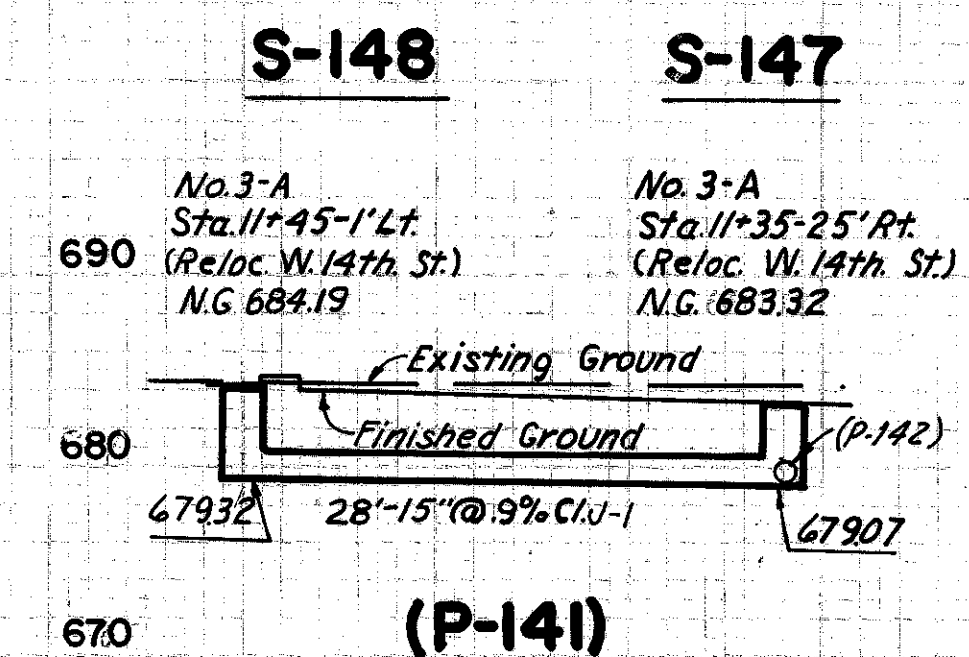
RDJ 9-17-64  
J.M.D. 10-27-64



No. 3-A  
Sta. 12+25-25' Rt.  
(Reloc. W. 14th St.)  
N.G. 684.0

No. 3-A  
Sta. 11+35-25' Rt.  
(Reloc. W. 14th St.)  
N.G. 683.32

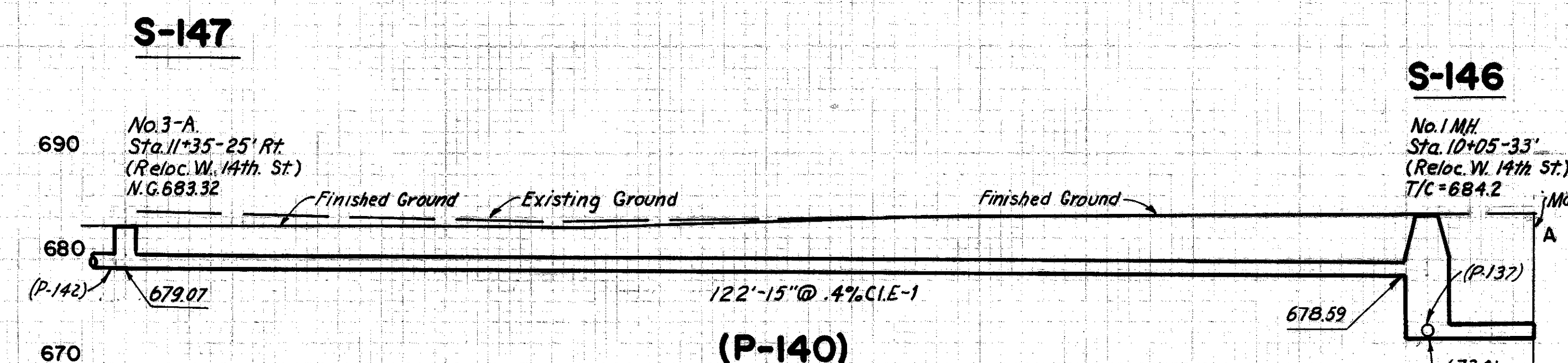
(P-142)



No. 3-A  
Sta. 11+45-1' Lt.  
(Reloc. W. 14th St.)  
N.G. 684.19

No. 3-A  
Sta. 11+35-25' Rt.  
(Reloc. W. 14th St.)  
N.G. 683.32

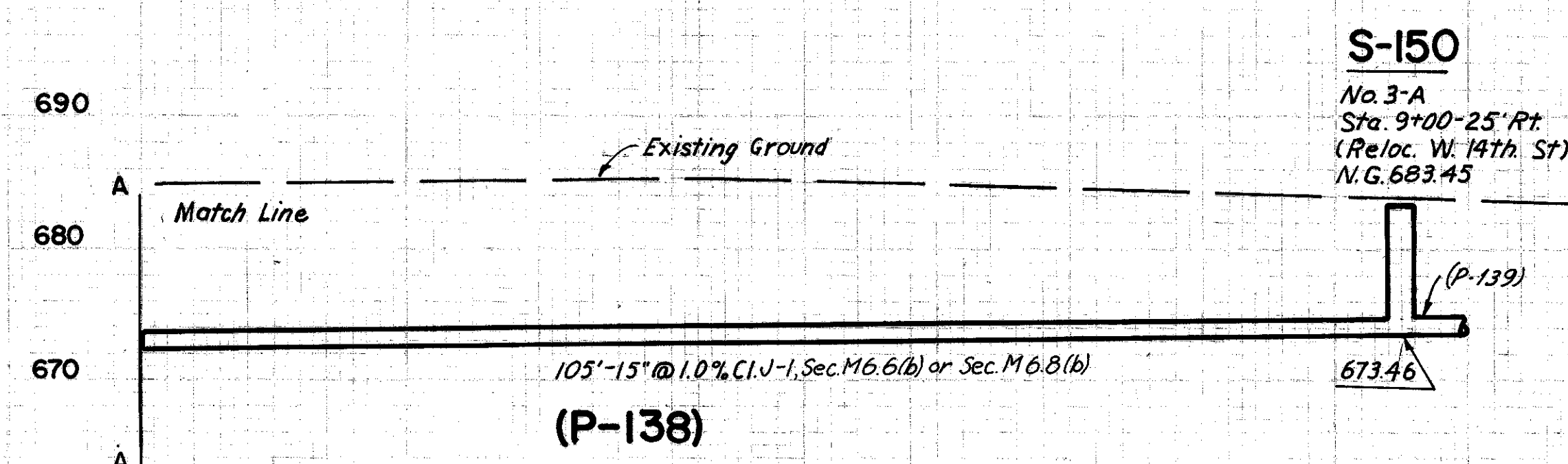
(P-141)



No. 3-A  
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(Reloc. W. 14th St.)  
N.G. 683.32

No. 1 M.H.  
Sta. 10+05-33' Rt.  
(Reloc. W. 14th St.)  
T/C=684.2

(P-140)



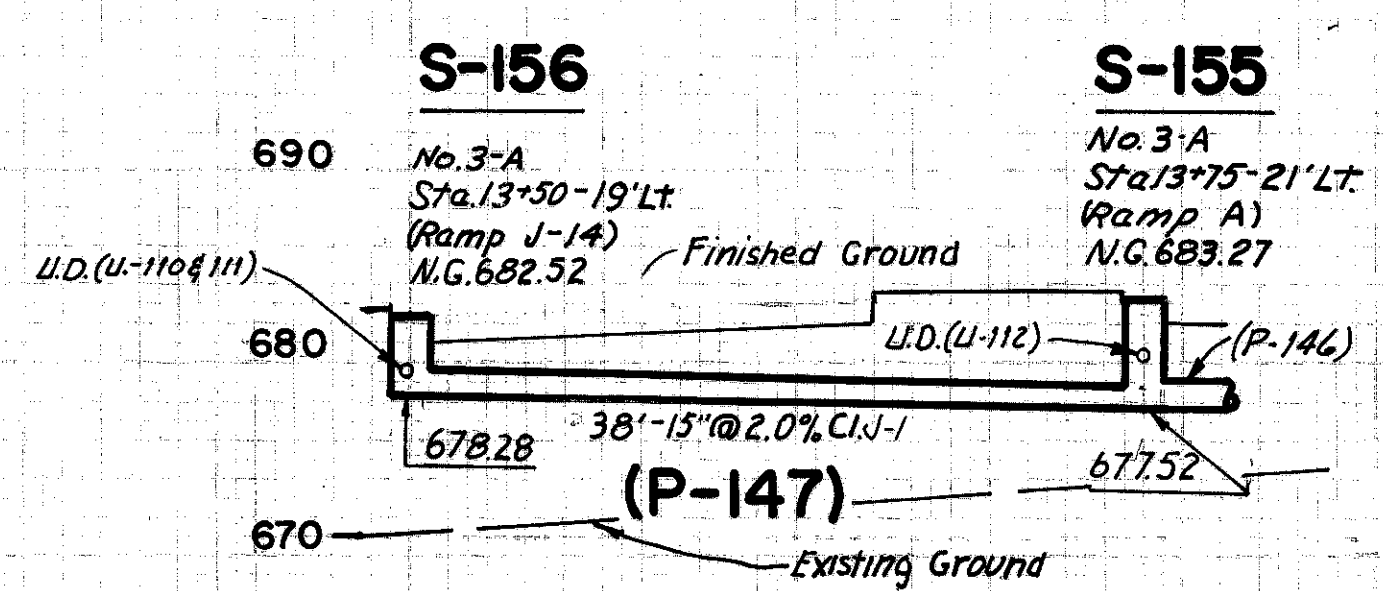
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Sta. 9+00-25' Rt.  
(Reloc. W. 14th St.)  
N.G. 683.45

No. 3-A  
Sta. 9+00-25' Rt.  
(Reloc. W. 14th St.)  
N.G. 683.45

No. 3-A  
Sta. 10+75-24' Lt.  
(Ramp N.B.O.R. 14)  
N.G. 682.38

(P-138)

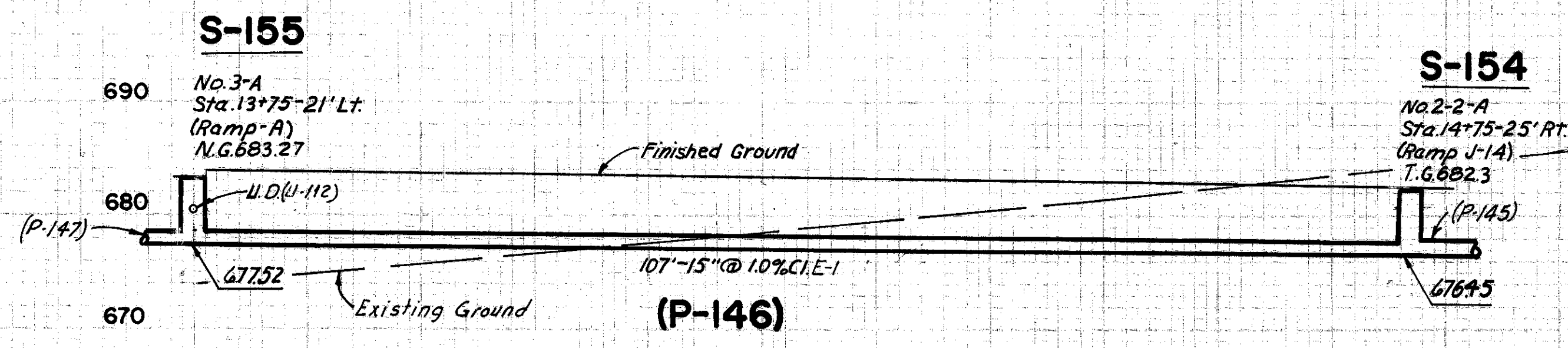
(P-139)



No. 3-A  
Sta. 13+50-19' Lt.  
(Ramp J-14)  
N.G. 682.32

No. 3-A  
Sta. 13+75-21' Lt.  
(Ramp A)  
N.G. 683.27

(P-147)



No. 3-A  
Sta. 13+75-21' Lt.  
(Ramp A)  
N.G. 683.27

No. 2-2-A  
Sta. 14+75-25' Rt.  
(Ramp J-14)  
T.G. 682.3

(P-146)

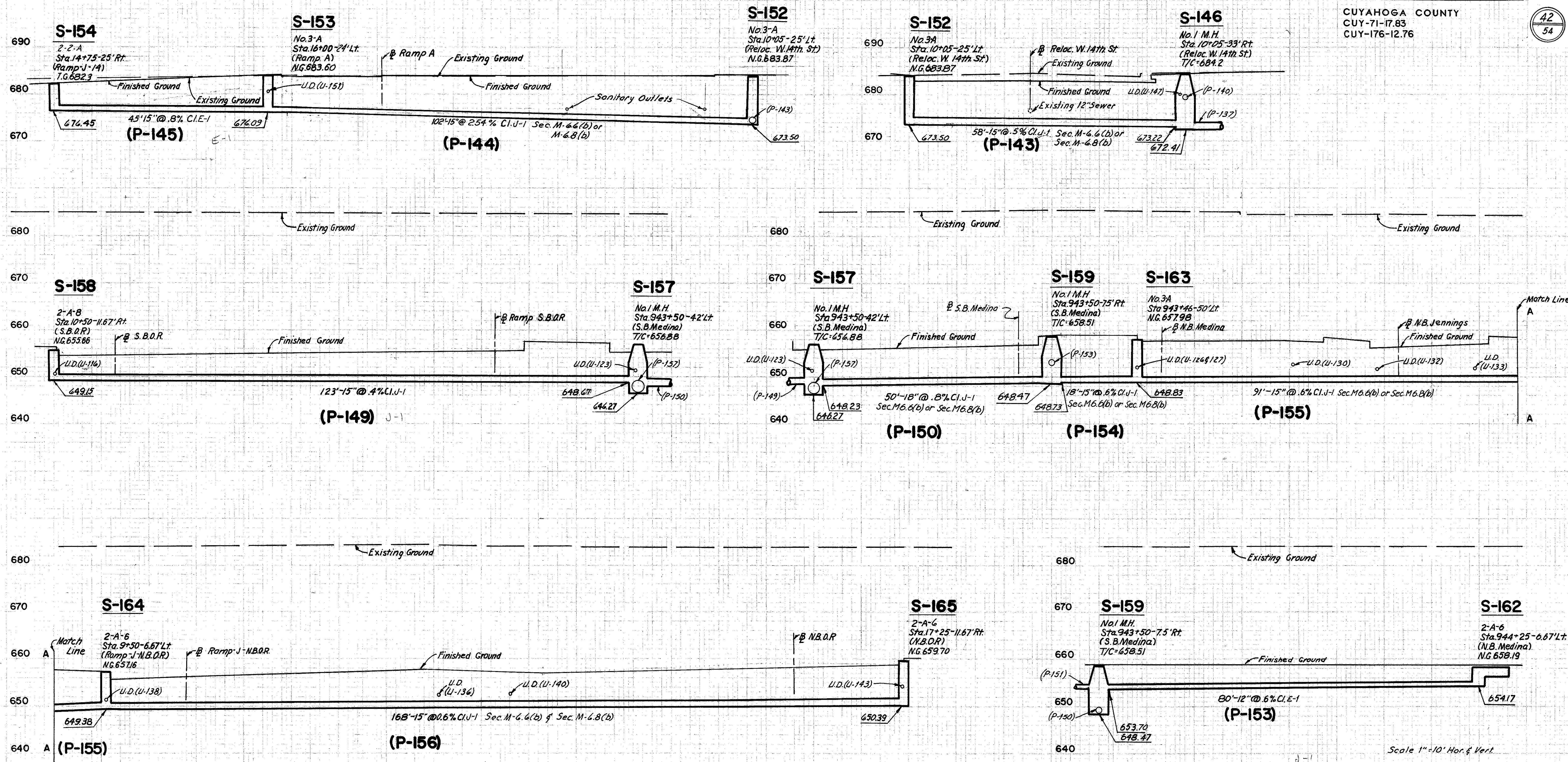
Scale 1" = 10' Hor. & Vert.

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CUYAHOGA COUNTY  
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CUY-176-12.76

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R.D.I. 9-18-64  
J.M.O. 10-28-64

Scale 1" = 10' Hor. & Vert.

P-148 SEE SH. 44  
P-151 & P-152 SEE SH. 43

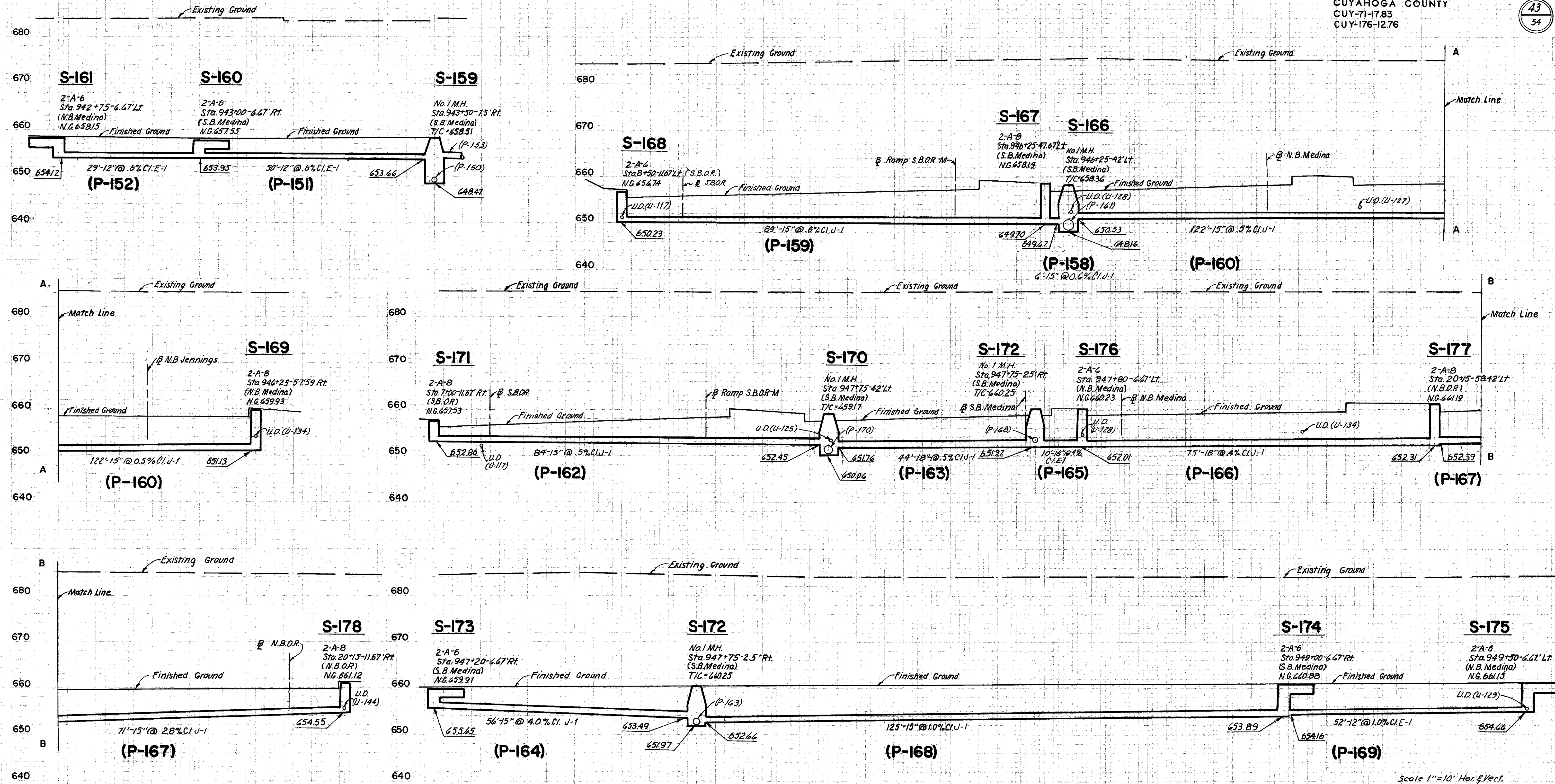
FED. RD. DIVISION	STATE	PROJECT
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54

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

R.A.J. 9-21-64  
J.M.D. 10-28-64



Scale 1"=10' Hor. & Vert.

P-157 & P-161 SEE SH. 44

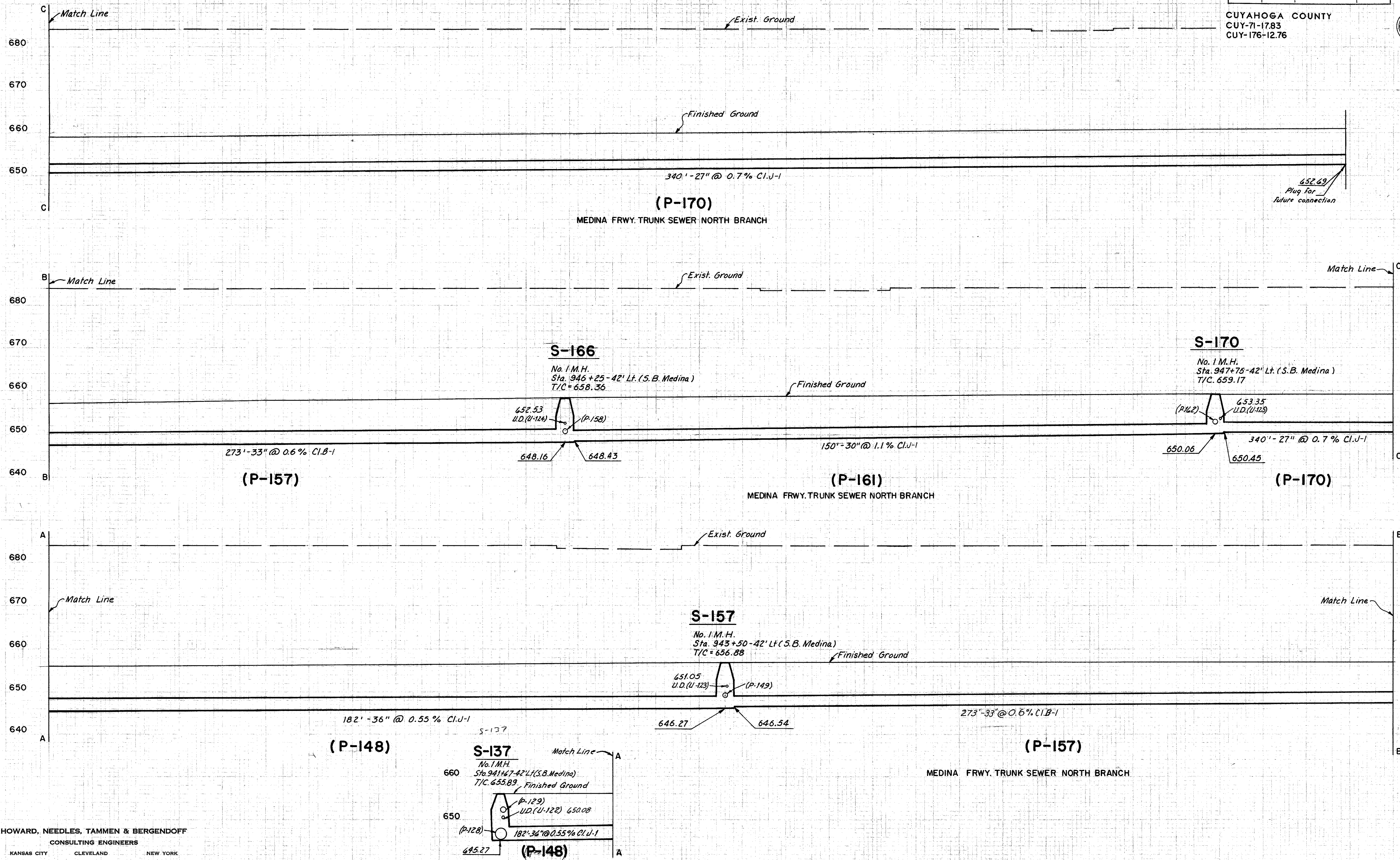
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
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CUY-176-12.76



R.D.J. 9-21-64  
J.M.O. 10-7-64

9-20-64

R.O.J.

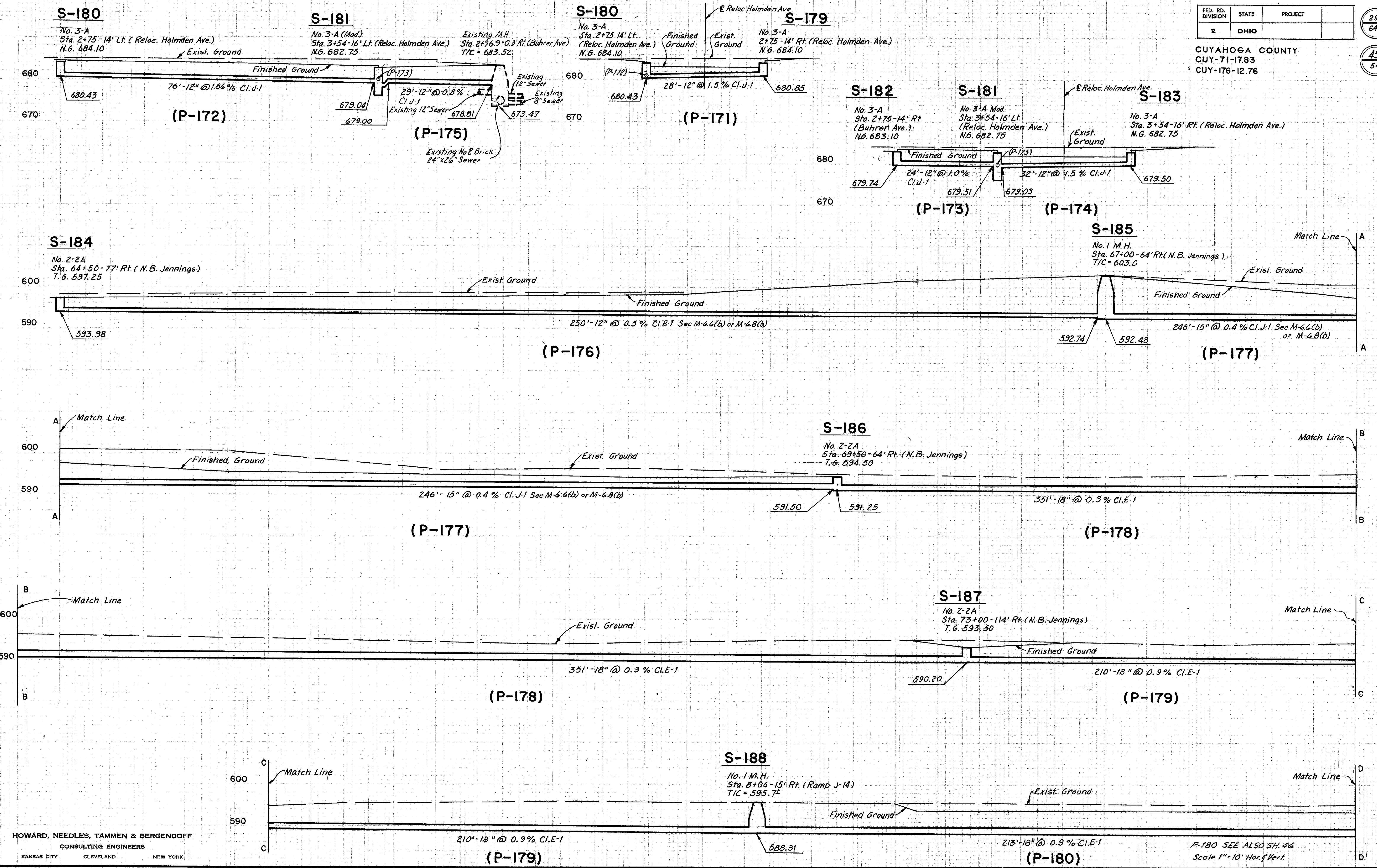
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
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RD.J. 9-23-64  
LMA 10-28-64

RD.J. 9-23-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

P-180 SEE ALSO SH. 46  
Scale 1" = 10' Hor. & Vert.

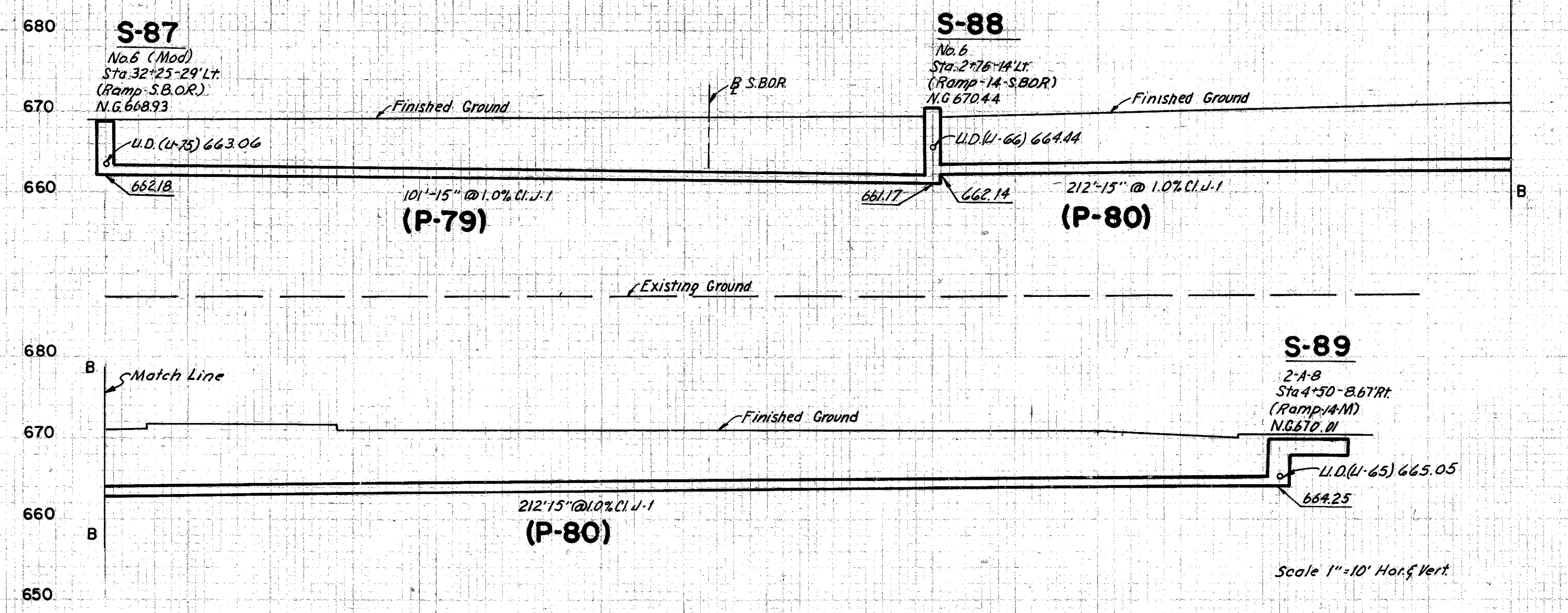
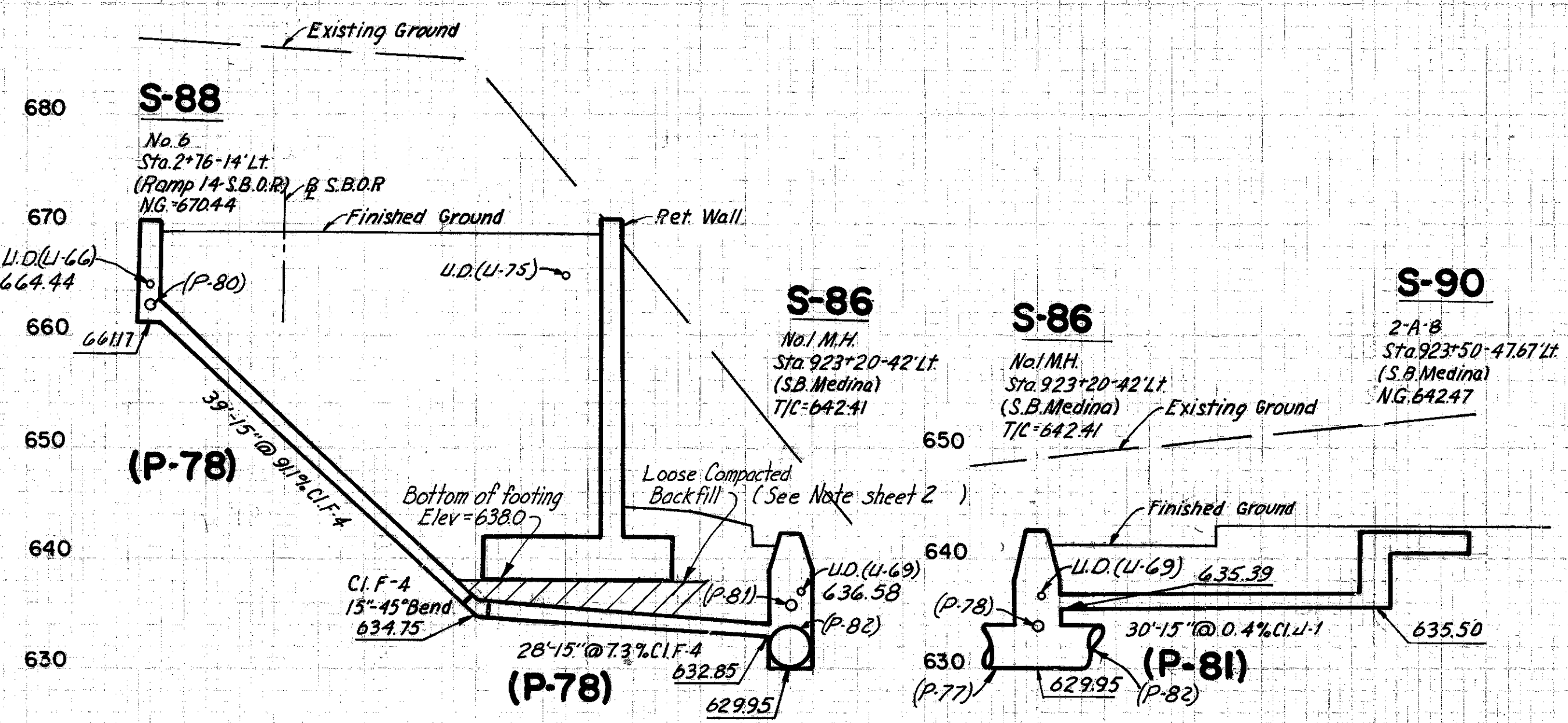
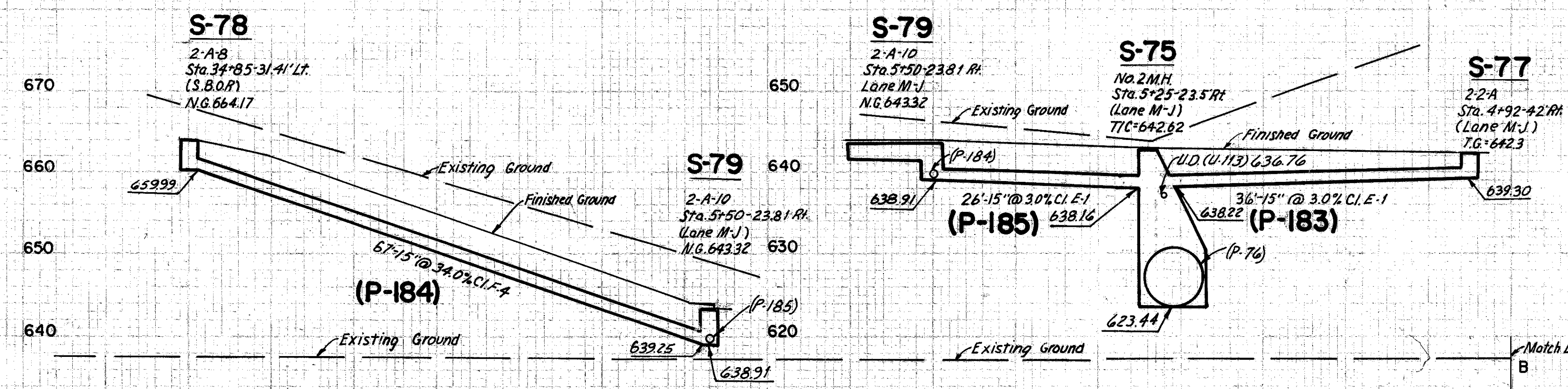
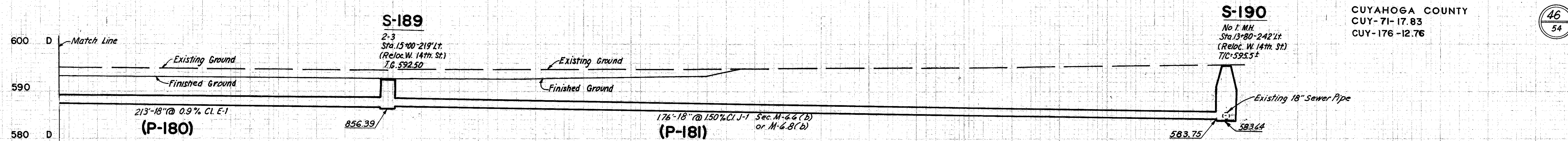


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CUY-71-17.83  
CUY-176-12.76

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HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Scale 1" = 10' Hor & Vert

R.D. 9-24-68  
U.M.D. 10-30-68

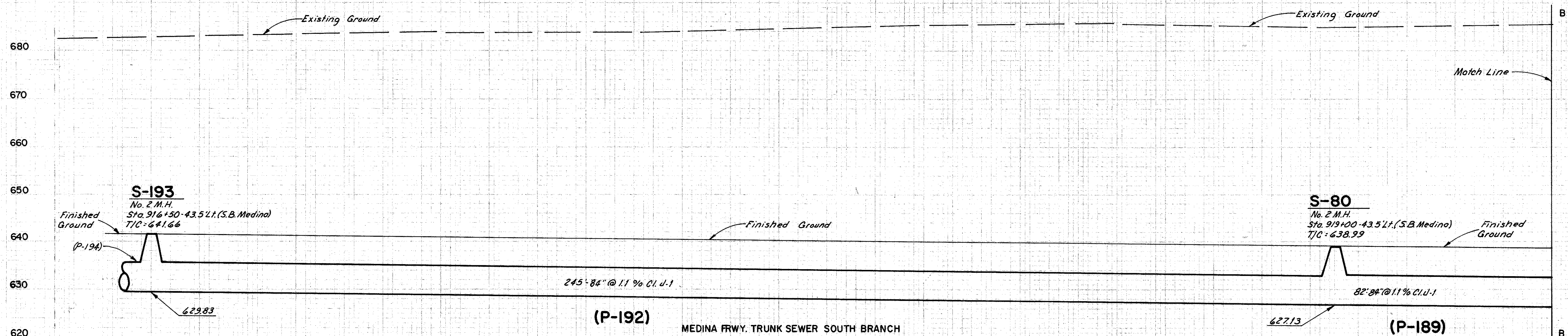
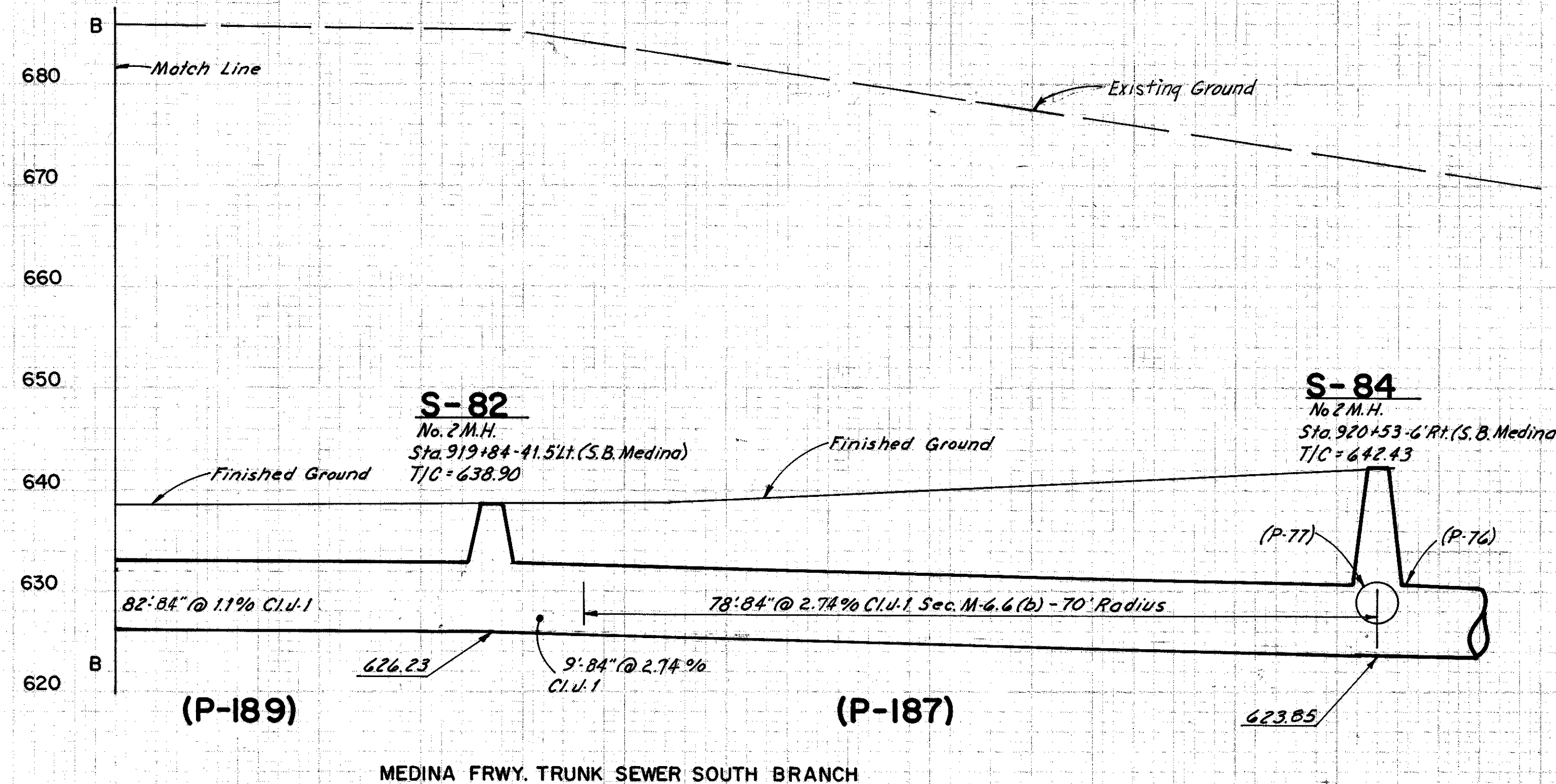
FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
CUY-71-1783  
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9-23-69  
R.D.V.  
J.M.C.



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Scale 1"=10' Hor. & Vert.

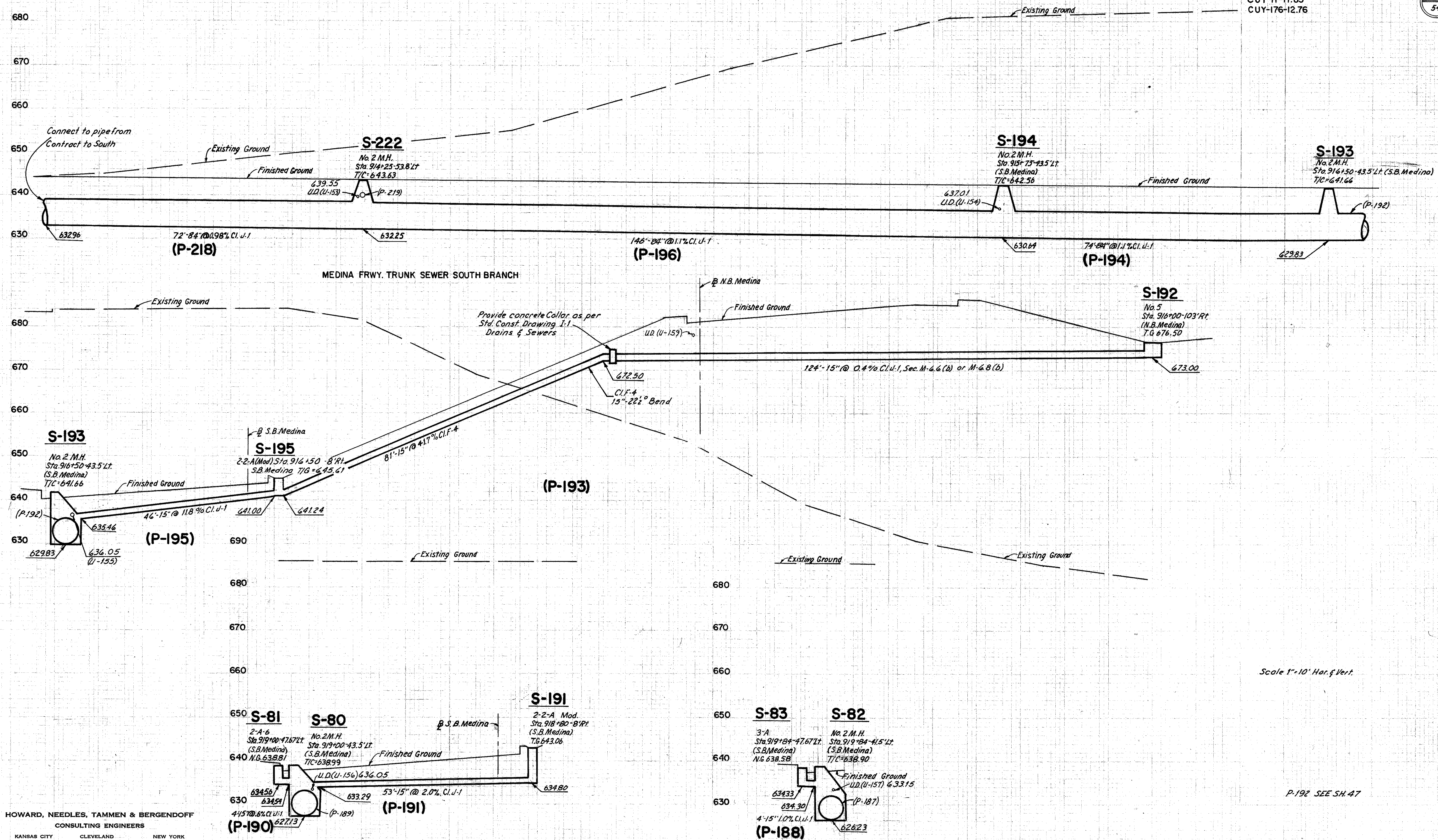
P-186 SEE SH. 33  
P-188, P-190 & P-191 SEE SH. 48

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54

CUYAHOGA COUNTY  
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CUY-176-12.76



Scale 1"=10' Hor. & Vert.

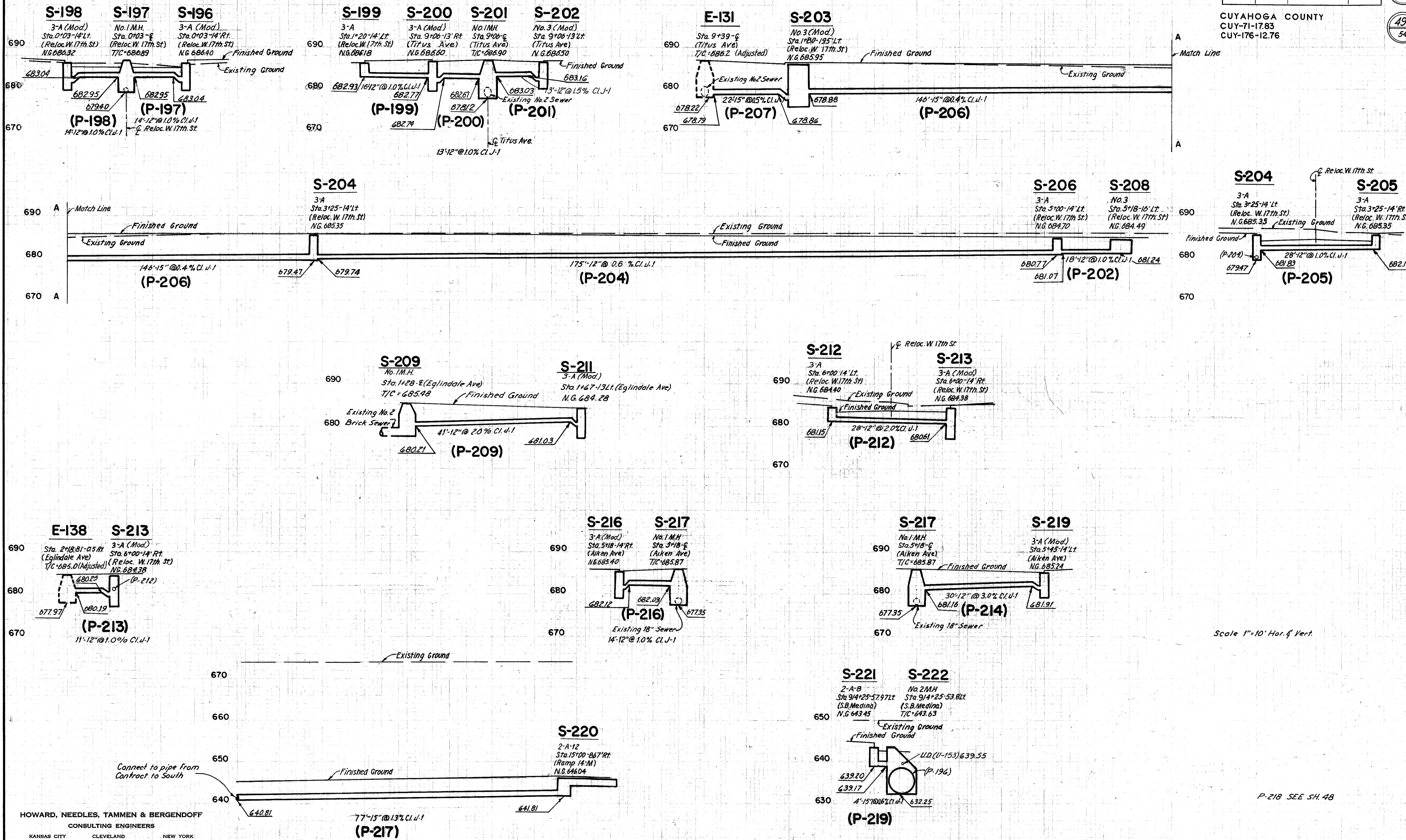
P-192 SEE SH. 47

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

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CUYAHOGA COUNTY  
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 CUY-176-12.76

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54

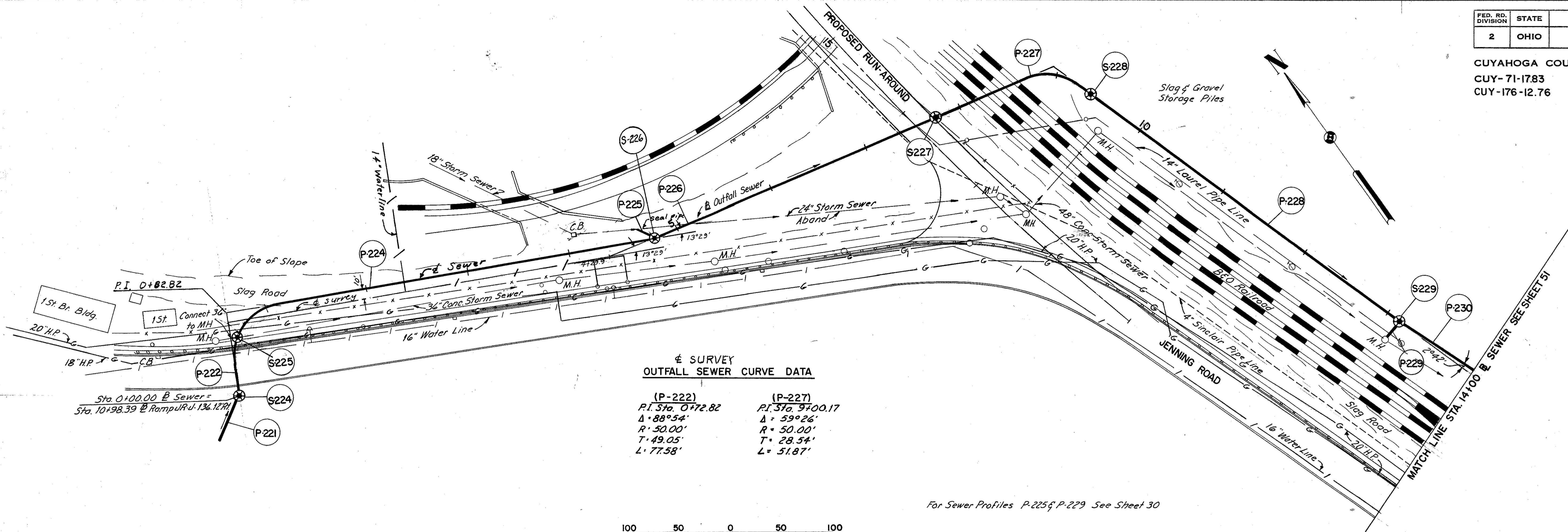


Scale 1"=10' Hor. & Vert.

P-218 SEE SH. 48

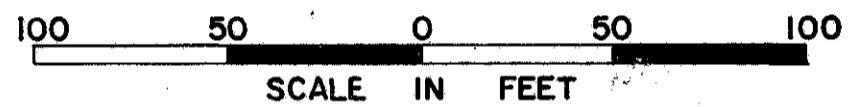
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

DATE: 10-22-66  
BY: R.O.L.  
SURVEYED, PLOTTED, ALIGNED, CHECKED, RT OF WAY CHECKED, NO.



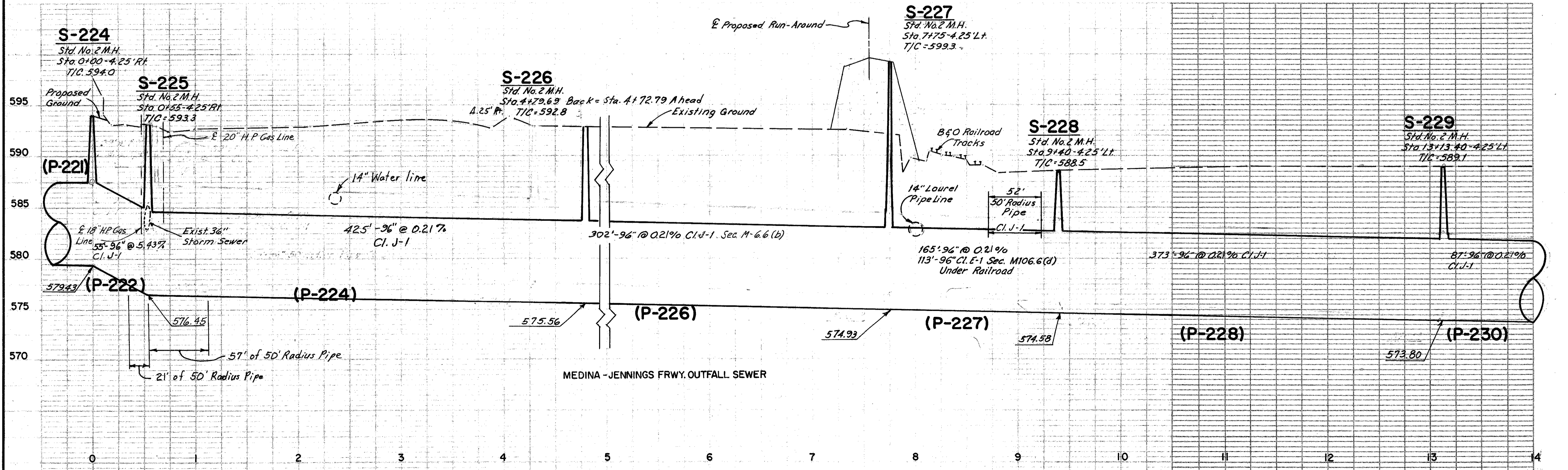
± SURVEY  
OUTFALL SEWER CURVE DATA

(P-222)	(P-227)
P.I. Sta. 0+72.82	P.I. Sta. 9+00.17
Δ = 88°54'	Δ = 59°26'
R = 50.00'	R = 50.00'
T = 49.05'	T = 28.54'
L = 77.58'	L = 51.87'



For Sewer Profiles P-225 & P-229 See Sheet 30

DATE: \_\_\_\_\_  
BY: \_\_\_\_\_  
SURVEYED, PLOTTED, GRADES CHECKED, B.M. NOTED, STRUCTURE NOTATION CHECKED, NO.



FED. RD. DIVISION	STATE	PROJECT
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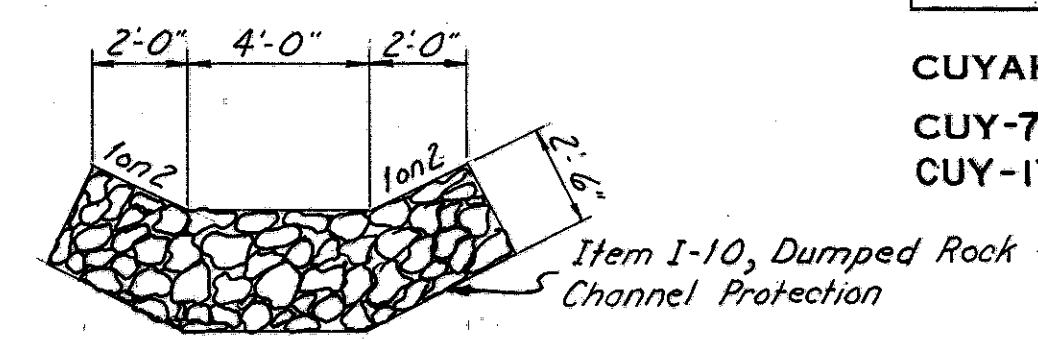
302  
646

CUYAHOGA COUNTY  
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54

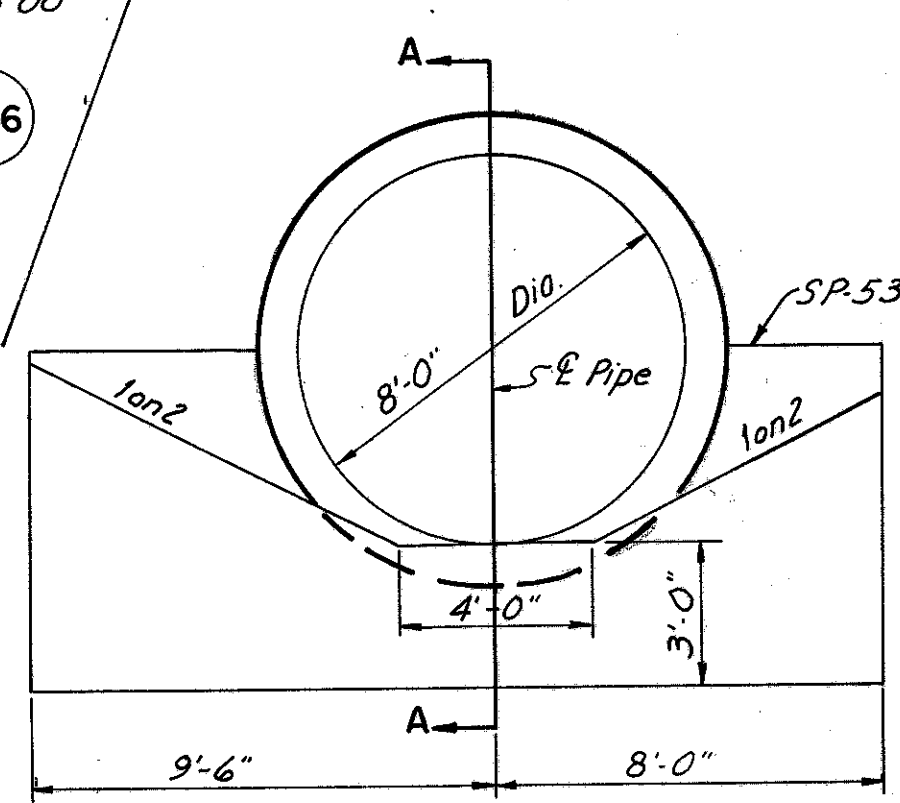
OUTFALL SEWER CURVE DATA

(P-231)	(P-232)	(P-232)	(P-232)
P.I. Sta. 15+57.20	P.I. Sta. 17+02.31	P.I. Sta. 19+27.79	P.I. Sta. 20+02.14
$\Delta = 47^{\circ}17'$	$\Delta = 34^{\circ}40'$	$\Delta = 56^{\circ}30'$	$\Delta = 31^{\circ}29'$
$R = 75.00'$	$R = 75.00'$	$R = 75.00'$	$R = 75.00'$
$T = 32.83'$	$T = 23.41'$	$T = 40.30'$	$T = 21.14'$
$L = 61.89'$	$L = 45.38'$	$L = 73.96'$	$L = 41.21'$

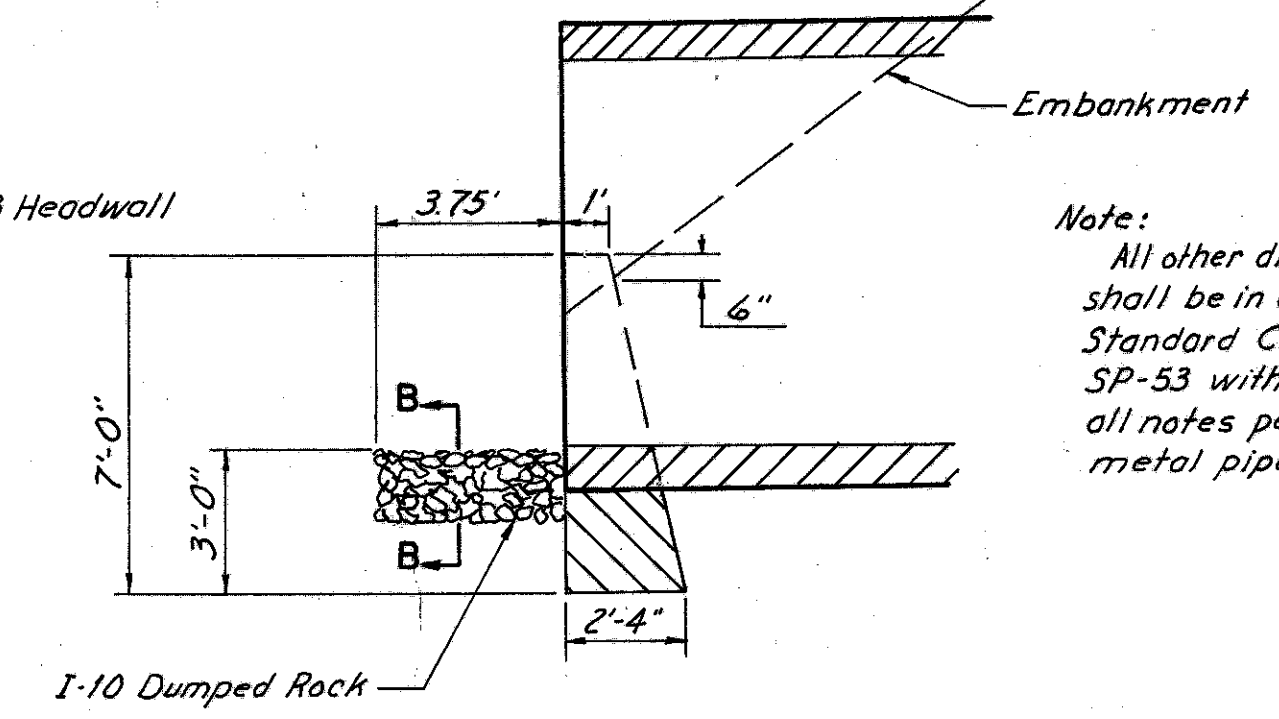


SECTION B-B

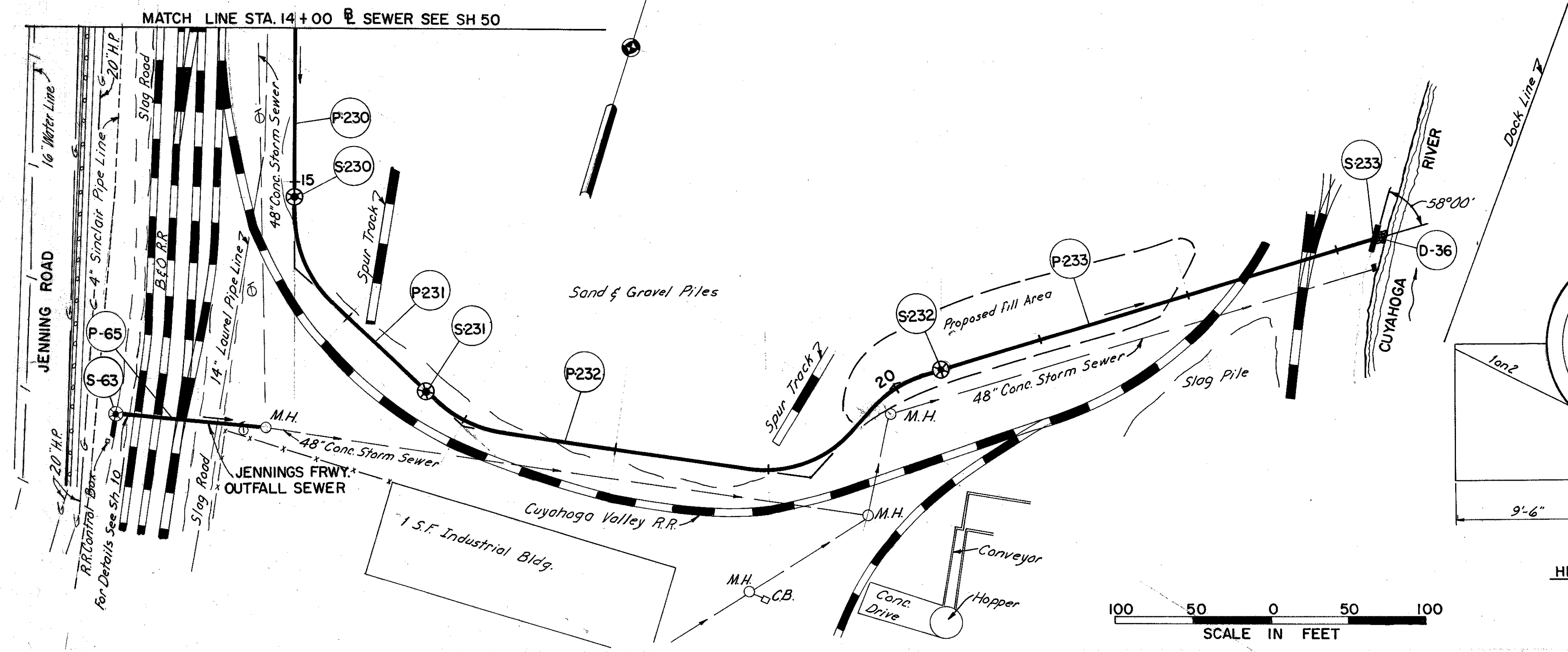
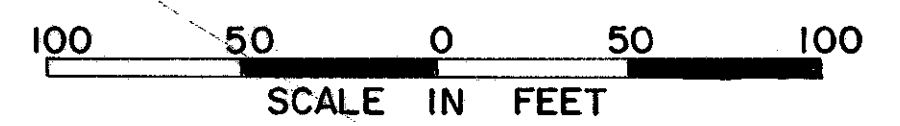
Note:  
All other dimensions and notes shall be in accordance with Standard Construction Drawings SP-53 with the exception that all notes pertaining to corrugated metal pipe shall be waived.



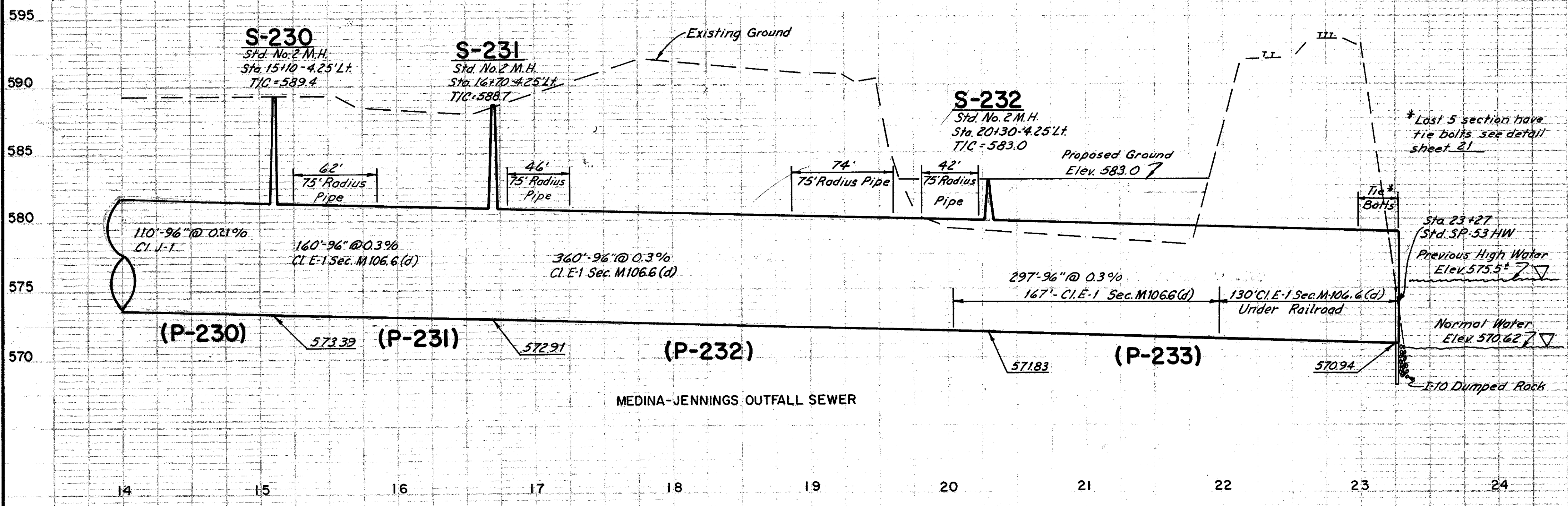
HEADWALL DETAIL  
Scale 1/4" = 1'-0"



SECTION A-A



DRAINAGE QUANTITIES			
CODE	LOCATION	I-2	I-10
		Masonry Cu. Yds.	Dumped Rock Channel Protection Cu. Yds.
S-233	23+27 Sewer	6.3	
D-36	23+27 Sewer		2.8



PLAN  
SURVEYED, PLOTTED, ALIGNED, CHECKED, RT. OF WAY CHECKED, NO. 1/2-2252

PROFILE  
SURVEYED, PLOTTED, GRADES CHECKED, STRUCTURE NOTATION CHECKED, NO.

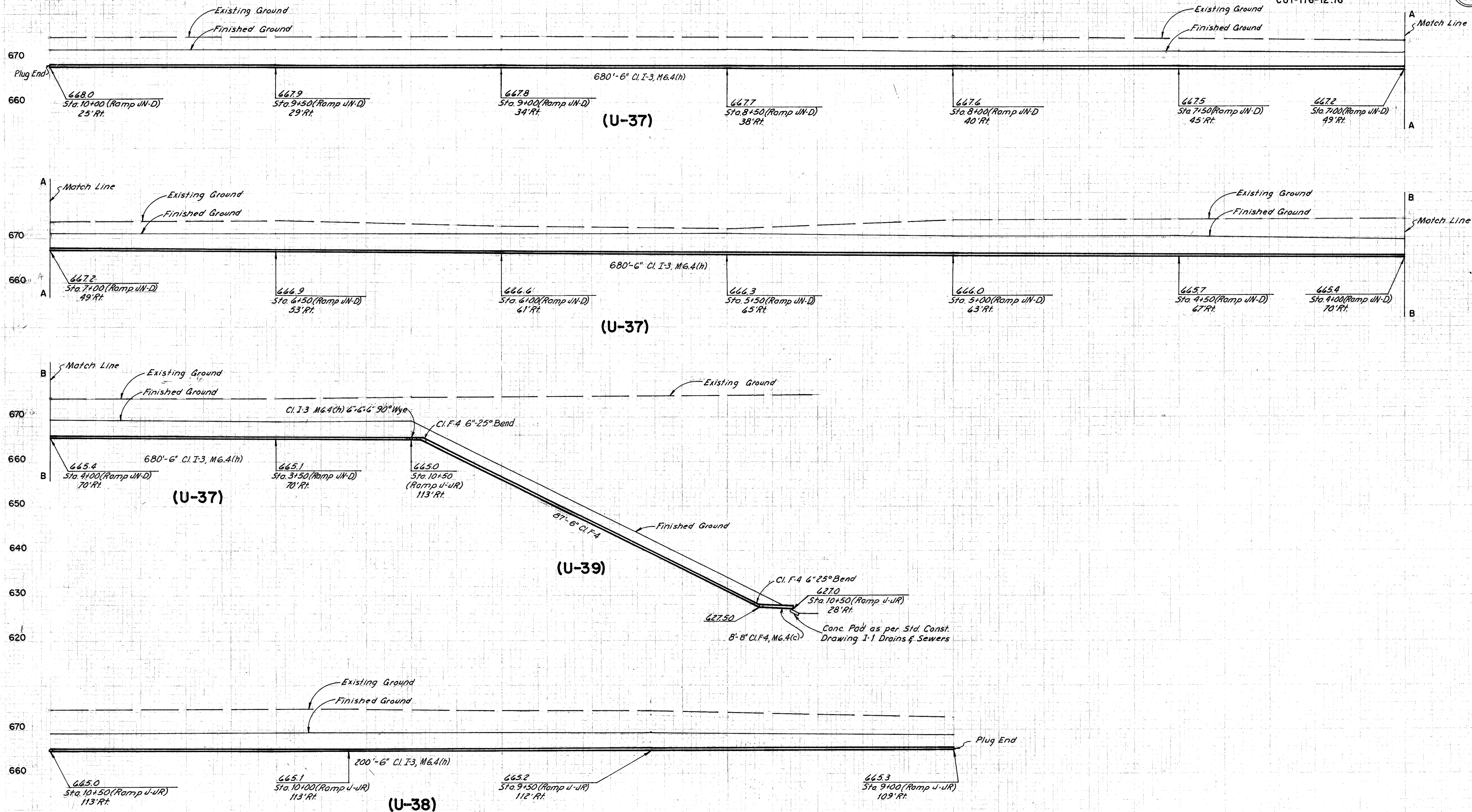
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

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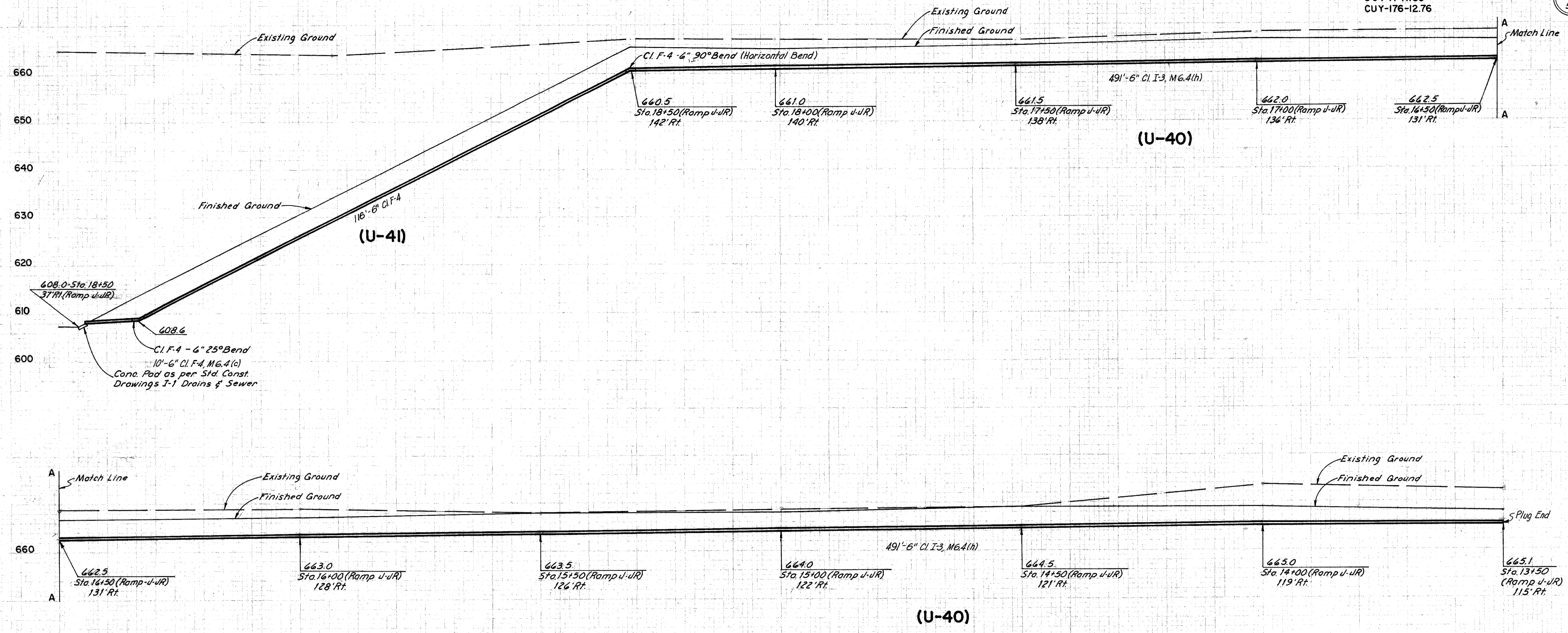
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54

CUYAHOGA COUNTY  
CUY-71-17.83  
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HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

RDW 9-29-64



R.D.J. 10-1-64  
 U.M.D. 10-19-64

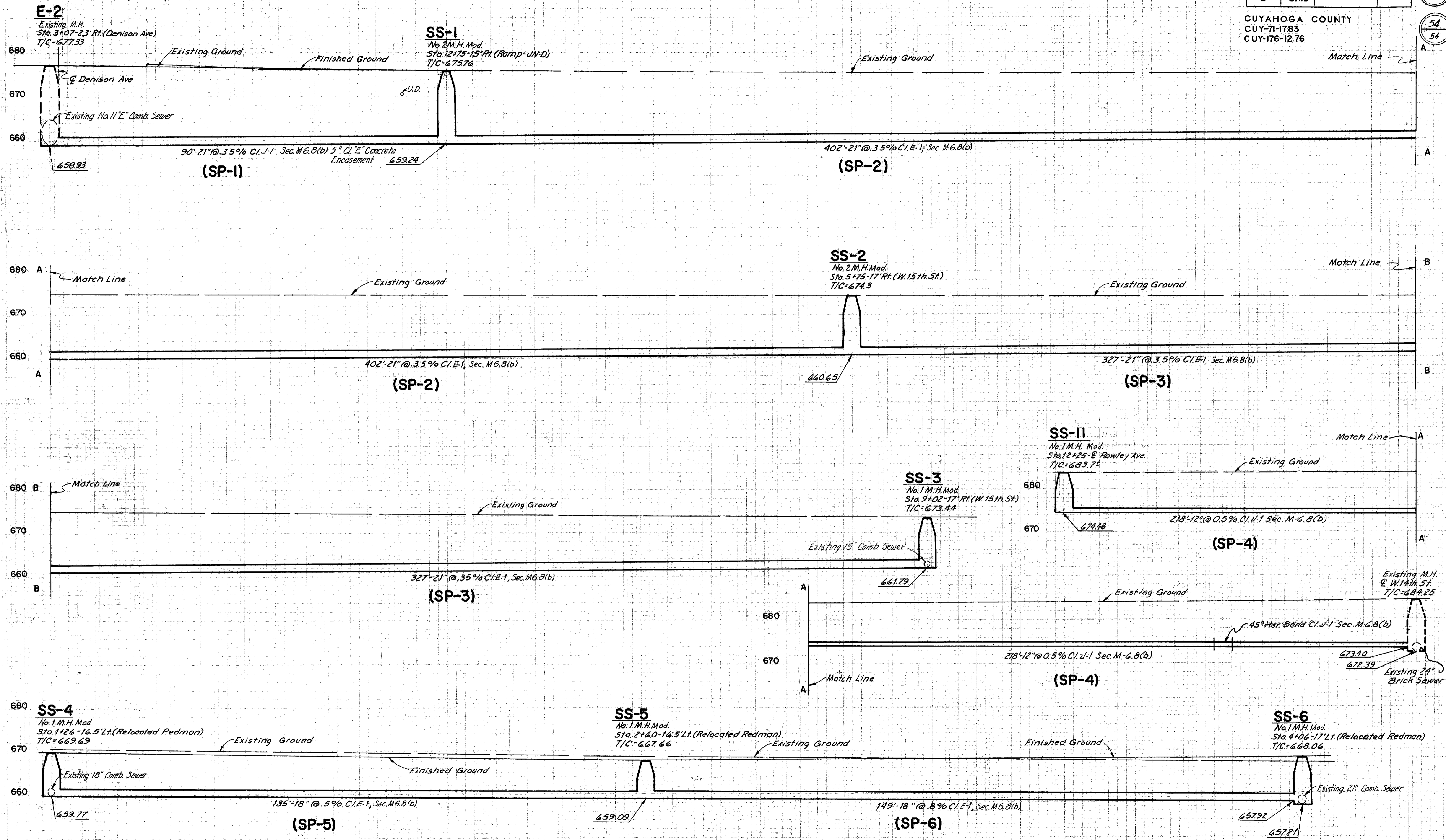


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P.O.L. 9-1-64  
 J.M.O. 10-19-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

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1. DESIGN SPECIFICATIONS

Design specifications for Highway Structures of the State of Ohio, Department of Highways, dated September 1, 1957, together with current revisions thereof. The design loadings are CF 2000(57) for Bridge Nos. 19, 20, 21A, 21B and 23 and 85 pounds per square foot for Bridge No. 18.

The classes of concrete and the grades of structural steel and reinforcing steel, together with the working stresses for each are as follows:

Concrete Class C - basic unit stress 1,333 p.s.i.  
Concrete Class E - basic unit stress 1,133 p.s.i.  
Structural Steel (except piling) - ASTM A36 - basic unit stress 20,000 p.s.i., except Rollers and Roller Bearing Plates ASTM A237-55, Class B, and Special Bearing Assemblies, as specified in the plans,

ASTM A237-55 Class B - ASTM A235-55, Class B, ASTM A441-60T, and ASTM A148-60, Grade 80-50, (ASTM A7 and A373 steel not permitted).

Reinforcing Steel - ASTM A15, A16, A160 deformed, intermediate or hard grade with basic unit stress of 20,000 p.s.i. except No. 18S bars ASTM A408 deformed, intermediate or hard grade with a basic unit stress of 20,000 p.s.i. and spiral reinforcement may be plain, structural grade with basic unit stress 18,000 p.s.i.

2. SUPPLEMENTAL SPECIFICATIONS

Reference shall be made to Supplemental Specifications No. S-307, Examination of Welds, revised October 1, 1964, No. S-407, Shear Connectors, dated December 21, 1962, and to No. S-101, Water-Reducing, Set-Retarding Admixtures, dated July 12, 1962.

3. REFERENCE DRAWINGS

Reference shall be made to Standard Drawing Numbers RB-1-55 revised 2-2-59, FSB-1-62 revised 1-15-63, AR-1-57 revised 4-2-62, SD-1-63 dated 11-12-63 (Sheets 1, 2, 3 and 4 of 4), AS-1-54 revised 7-5-62 and to I-15 (No. 2-A revised 8-17-60).

4. DIMENSIONS

Dimensions given are measured horizontally and at 60° F. unless otherwise noted.

5. UTILITIES

Any existing privately owned utility facilities encountered at the site of the work which will interfere with portions of the finished roadways or structures shall be removed or relocated by the owner and all expenses incurred in so doing shall be borne by the owner. The Contractor shall coordinate his operations with the work of the utility owners or others who may be making the relocations, and shall notify the owners of the utilities of his schedule sufficiently in advance to permit them to make the necessary alterations.

6. EXCAVATION AND BACKFILL

The embankment shall be placed and compacted to the finished spill-thru slope and to the level of the subgrade as shown on the plans, after which the excavation shall be made for the abutments, piers and retaining walls that are set in the embankment material.

The embankment at Bridge No. 19, and at the north end of Bridges Nos. 21A and 21B, shall be placed and compacted one year prior to making the excavation for Piers 19AW, 20AW, 21AW, 20AE, 21AE, 22AE and the north abutments of Bridge No. 21A; for Piers 20BW, 21BE through 28BE and the north abutments of Bridge No. 21B; for Piers 1, 2, 3 and the East Abutment of Bridge No. 19; and for retaining walls numbered 81, 81A and 81B within the limits of the embankment. Periodic reading of engineering control devices shall be made by the Engineer to ascertain the feasibility of decreasing the waiting period. In the event that all settlement of the embankment has ceased, the waiting period may be reduced at the discretion of the Director.

Piling for the above piers and abutments shall be prepared through the embankment material with 18" φ holes.

The excavation quantity includes the removal of embankment material required for the construction of the piers, abutments and retaining walls.

\* Ten months for Piers 19AW, 20AW & 21AW, Abutment AW and the portions of retaining walls numbered 81 and 81A that are set within the limits of the embankment.

7. FOUNDATION SOUNDINGS

Foundation design and foundation quantities are based on a study of soil-sampling soundings made at the site. This sounding information, the accuracy of which the State does not guarantee, is included with these plans but is not to be construed as a part of the plans governing construction of the project.

8. 12" φ CAST-IN PLACE REINFORCED CONCRETE PILES

All piles for the <sup>Abutments</sup> (East Abutment) of Bridge No. 18, the West Abutment of Bridge No. 19, South Abutment A of Bridge No. 21, and for retaining walls numbered 82, 83 and 84 shall be driven to a minimum bearing capacity of 35 tons per pile.

All piles for the piers, <sup>and</sup> for the abutments of Bridge No. 20, the West Abutment of Bridge No. 18 and for Retaining Wall No. 80 shall be driven to a minimum bearing capacity of 40 tons per pile.

9. STEEL BEARING PILES

All 10 BP 42 steel bearing piles shall be driven to a minimum bearing capacity of 35 tons per pile.

All 12 BP 53 steel bearing piles shall be driven to a minimum bearing capacity of 40 tons per pile except that the 12 BP 53 steel bearing piles for the piers of Bridge Nos. 21A and 21B shall be driven to a minimum bearing capacity of 50 tons per pile.

10. SPREAD TYPE FOOTINGS

The spread footings for retaining walls numbered 82, 89 and 90 are designed for a maximum bearing pressure of 1 1/2 tons per square foot, 3 tons per square foot and 1 ton per square foot respectively.

11. CONCRETE DECK

(a) The steel girders and beams shall be fabricated with camber, as specified on the plans, to compensate for the deflections due to weight of concrete and steel and for vertical curvature of the roadway. The theoretical deflections are tabulated on the plans.

(b) The final surface of the roadway shall conform as nearly as practicable to the elevations shown on the plans. To compensate for deflections due to dead load of the concrete, the screeds used to strike off the surface of the concrete to the final desired grade line shall be adjusted by amounts equal to deflections shown for this dead load. Screeds may require further adjustments due to irregularities in the fabricated steel.

(c) The depth of concrete over each beam or girder (top of concrete to top of flange or top of web) at the supports is given on the plans. The concrete slab shall be of uniform thickness between beams or girders, with adjustments obtained by varying the thickness of the haunches over the beams or girders.

(d) The aforementioned depth of concrete over each beam or girder is the nominal 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 may not have the exact camber or conformation required to place it parallel to the finished grade.

(e) In order to facilitate water curing, the placing of concrete shall progress upgrade. The slab may be placed in sections between transverse construction joints which are parallel to transverse reinforcing steel and are located near the center of any span.

(f) The decks of the bridges may, at the Contractor's option, be finished by the use of a finishing machine.

12. TEXTURED FINISH OF CONCRETE

The front faces of all retaining walls, <sup>and</sup> the abutments of Bridge No. 20 and the West Abutment of Bridge No. 18 shall have a textured finish as produced by striated plywood forms. The texture finish shall be uniform and extend to the limits shown on the plans.

Four-foot by four-foot form panels shall be used where possible. The panels shall be placed with the striations of the forms alternating horizontally and vertically between rustications which are located and detailed on the plans.

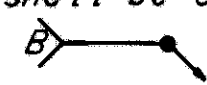
13. REINFORCING STEEL

(a) All bars are designated on the plans by bar numbers. The bar size is indicated by the first digit of three-digit numbers and by the first two digits of four-digit numbers.

All bar dimensions are given out to out. All bars of a series shall vary in length by a constant increment.

(b) The clear distance between reinforcing steel and face of concrete shall be 3" at the bottom of footings, 2 1/2" ± at bar mats under shoes and 2" elsewhere unless otherwise shown on the plans.

14. WELDING

Welds shown as field welds may, at the option of the Contractor, be made in the shop. All welds shall be Class "A" except as otherwise shown. Class "B" welds are shown thus: 

15. S-7.10 HIGH STRENGTH STEEL BOLTS

In the final assembly of the parts to be bolted, drift pins shall be placed in a sufficient number of holes, but not less than 25 per cent for field erection, to provide and maintain accurate alignment of holes and parts, and sufficient bolts shall be installed and brought to a snug tight condition to bring the parts into complete contact. Bolts shall then be installed in any remaining open holes and tightened to a snug tight fit, after which all bolts shall be tightened completely by calibrated wrenches or by the turn-of-nut method. Drift pins shall then be replaced with bolts tightened in the same manner. Bolt lengths determined by the use of Table No. 1 shall be adjusted to the next 1/4 inch length increment.

16. ERECTION BOLTS

All 3/4" φ erection bolts shall be left in place and tack welded after tightening.

17. LIGHTING NOTES

For general notes pertaining to lighting, see sheets 570, 571, 572 of the Roadway Plans.

18. ITEMS NOT INCLUDED IN BRIDGE PLANS

The following items are not included in the bridge plans. See Roadway Plans for details.

- (1) Curb transition at end of wingwalls.
- (2) Approach grading, pavement and slab.
- (3) Roadway guard rail and sod flumes.
- (4) Relocation or removal of existing utilities.
- (5) Removal of existing pavements, etc.
- (6) Lighting.

This sheet revised and supplemented by sheet 307A 12-9-65

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

GENERAL NOTES FOR STRUCTURES

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN C.P.	TRACED W.P.	REVIEWED R.E.R.
DATE 10-20-64	DATE 10-21-64	DATE 12-30-64
		SHEET 306

3-3-65

UNCLASSIFIED  
DEC 1 1965

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

		ESTIMATED QUANTITIES																							
ITEM	DESCRIPTION	UNIT	CUY-71-1847 H.N.T.B. BRIDGE NO. 18					CUY-71-1826 H.N.T.B. BRIDGE NO. 19																	
			ABUTMENTS	PIERS	SUPER-STRUCTURE	GENERAL	TOTAL	ABUTMENTS	PIERS	SUPER-STRUCTURE	GENERAL	TOTAL													
E-2	Unclassified Excavation	Cu. Yd.	404	141				545					311	633				944							
S-1	Class "C" Concrete, Superstructure	Cu. Yd.			80			80							1121				1121						
S-1	Class "C" Concrete, Pier Caps and Columns	Cu. Yd.		39				39					367						367						
S-1	Class "E" Concrete, Abutment (Above Footing)	Cu. Yd.	67					67				170							170						
S-1	Class "E" Concrete, Footings	Cu. Yd.	54	71				125				103	249						352						
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.										35							35						
S-4	Reinforcing Steel	Pounds	13,930	19,160	10,060			43,150				23,760	126,990	310,300					461,050						
S-7	Structural Steel	Pounds			105,200			105,200						1,097,400					1,097,400						
S-8	Field Painting of Structural Steel	Pounds			105,200			105,200						1,097,400					1,097,400						
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.										35							35						
S-14	Railing, Type C (Aluminum Rails and Supports and Concrete Parapet)	Lin. Ft.										97.57		1,204.45					1,302.02						
S-16	First Test Pile	Lump Sum																	Lump Sum						
S-17	First Pile Test Load	Lump Sum																	Lump Sum						
S-17	Subsequent Pile Test Load	Each																	1						
S-18	12" C.I.P. Reinforced Concrete Piles	Lin. Ft.	1,550	1,360				2,910				1,610	8,500						10,110						
S-18	Steel Bearing Piles (12BP53)	Lin. Ft.										3,080	9,740						12,820						
S-29	Porous Backfill	Cu. Yd.	30					30				60	22						82						
S-29	Scuppers, Including Supports	Each												8					8						
S-29	6" CMP (Including Specials), M-6.4(h) non-perforated	Lin. Ft.	7					7				68							68						
S-29	6" Perforated CMP (Including Specials), M-6.4(h)	Lin. Ft.	6					6				112							112						
S-29	8" Perforated Bituminous Coated CMP (Including Specials)	Lin. Ft.	6					6																	
S-25	For lighting quantities, See Sheet 582																								
S-101	Water Reducing Set Retarding Admixture	Each			80			80						1121					1121						
I-10	Crushed Aggregate, Slope Protection	Sq. Yd.					190	190											1,767						
I-26	8' Aluminum Chain Link Fence, as per plan	Lin. Ft.			733			733																	
Special	Preboring for Piling (Including Backfill)*	Lin. Ft.										1,275	2,265						3,570						

Revised see sh. 307A  
\* Includes (40) PILES to be paid for by the Cleveland Electric Illuminating Company.

Revised see sh. 307A

		ESTIMATED QUANTITIES																								
ITEM	DESCRIPTION	UNIT	CUY-71-1794 L H.N.T.B. BRIDGE NO. 20					CUY-176-1279 H.N.T.B. BRIDGE NO. 23																		
			ABUTMENTS	PIERS	SUPER-STRUCTURE	GENERAL	TOTAL	ABUTMENTS	PIERS	SUPER-STRUCTURE	GENERAL	TOTAL														
E-2	Unclassified Excavation	Cu. Yd.	3124					3124					650	455					1105							
S-1	Class "C" Concrete, Superstructure	Cu. Yd.			261			261							678				678							
S-1	Class "C" Concrete, Pier Caps and Columns	Cu. Yd.											205						205							
S-1	Class "E" Concrete, Abutment (Above Footing)	Cu. Yd.	1003					1003				284							284							
S-1	Class "E" Concrete, Footings	Cu. Yd.	680					680				214	180						394							
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	270					270				50							50							
S-4	Reinforcing Steel	Pounds	186,975		69,650			256,625				38,190	480,900	191,560					277,840							
S-407	Shear Connectors	Each			2,510			2,510																		
S-7	Structural Steel	Pounds			563,000			563,000						564,400					564,400							
S-8	Field Painting of Structural Steel	Pounds			563,000			563,000						564,400					564,400							
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	323					323				49							49							
S-14	Railing, Type A (Aluminum Rail and Supports and Concrete Parapet)	Lin. Ft.	42.09		346.39			388.48				63.61		345.33					408.94							
S-14	Barrier Guard Rail, Type I-15.11 rails with steel posts, brackets and bolts (Galvanized)	Lin. Ft.												178					178							
S-16	First Test Pile	Lump Sum																	Lump Sum							
S-17	First Pile Test Load	Lump Sum																	Lump Sum							
S-17	Subsequent Pile Test Load	Each																	1							
S-18	12" C.I.P. Reinforced Concrete Piles	Lin. Ft.	20,535					20,535																		
S-18	Steel Bearing Piles (12BP53)	Lin. Ft.											3,150						3,150							
S-18	Steel Bearing Piles (10BP42)	Lin. Ft.										3,830							3,830							
S-29	Porous Backfill	Cu. Yd.	636					636				127							127							
S-29	Scuppers, Including Supports	Each												12					12							
S-29	6" CMP (Including Specials), M-6.4(h) non-perforated	Lin. Ft.										142							142							
S-29	6" Perforated CMP (Including Specials), M-6.4(h)	Lin. Ft.										286							286							
S-29	8" Perforated Bituminous Coated CMP (Including Specials)	Lin. Ft.	150					150																		
S-101	Water Reducing Set Retarding Admixture	Each			261			261						678					678							
S-25	For lighting quantities, See Sheet 582																									
I-10	Crushed Aggregate Slope Protection	Sq. Yd.																	1550							

Note: First Pile Test Load and Subsequent Pile Test Load are to be applied only if directed by the Engineer and at a location chosen by the Engineer.  
\* Backfill (after piles are driven) shall be #4 or #6 gravel (excluding stone or slag)

This sheet Revised and supplemented by sh. 307A. 12-9-65

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

ESTIMATED QUANTITIES

\* ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	CUY-71-1847 H.N.T.B. BRIDGE NO. 18			
			ABUTMENTS	PIERS	SUPER-STRUCTURE	GENERAL TOTAL
E-2	Unclassified Excavation	Cu. Yd.	78	171		249
S-1	Class "C" Concrete, Superstructure	Cu. Yd.			86	86
S-1	Class "C" Concrete, Pier Caps and Columns	Cu. Yd.		50		50
S-1	Class "E" Concrete, Abutment (Above Footing)	Cu. Yd.	33			33
S-1	Class "E" Concrete, Footings	Cu. Yd.	21	83		104
S-4	Reinforcing Steel	Pounds	5428	22510	11,486	39,424
S-7	Structural Steel	Pounds			\$119,800	\$119,800
S-8	Field Painting of Structural Steel	Pounds			\$119,800	\$119,800
S-17	First Test Pile	Lump Sum			Lump Sum	Lump Sum
S-18	12" C.I.P. Reinforced Concrete Piles	Lin. Ft.	670	1690		2360
S-29	Porous Backfill	Cu. Yds.	5			5
S-29	6" CMP (Including Specials), M-G.4 (h) non-perforated	Lin. Ft.	14			14
S-29	6" Perforated CMP (Including Specials), M-G.4 (h)	Lin. Ft.	12			12
S-101	Water-Reducing Set-Retarding Admixture	Each			86	86
I-10	Crushed Aggregate, Slope Protection	Sq. Yds.	266			266
I-26	8' Aluminum Chain Link Fence, as per plan	Lin. Ft.			861	861

\* These quantities supercede those given for H.N.T.B. Bridge No. 18 on Sh. 307  
 † Includes 170 pounds to be paid for by the Cleveland Electric Illuminating Company.

REINFORCEMENT SCHEDULE

MARK	NO.	LENGTH	TYPE	WEIGHT (LBS.)	BENDING DIAGRAMS
WEST ABUTMENT (Relocated and Revised)					<p>* Number of turns at 4 1/2" pitch including 1/2 turns at each end.</p> <p>Note: For Bending Diagrams and Reinforcement Notes not shown, see Sh. 313</p>
Reinforcement identical to East Abutment Sh. 313					
TOTAL WEIGHT =				2714	
PIER E					
PE 401	1	21'10"	150	460	
PD 501	14	5'5"	105	79	
PD 502	2 Ser. 3	10'6" 11'0"	109	70	
PD 601	2	8'6"	Str.	26	
PD 602	4	8'8"	141	52	
PD 603	6	6'8"	105	60	
PD 801	10	13'10"	100	369	
PD 802	8	10'10"	100	231	
PD 803	5	11'8"	105	156	
PE 1101	12	23'5"	Str.	1493	
PD 1102	12	7'8"	101	489	
TOTAL WEIGHT =				3485	
SUPERSTRUCTURE (Revised)					
S 401	402	10'2"	100	2730	
S 402	160	36'6"	Str.	3901	
S 402A	32	25'3"	Str.	540	
S 403	30	27'0"	Str.	541	
S 501	402	9'0"	Str.	3774	
TOTAL WEIGHT =				11,486	

Vary by 3' increments

\* Number of turns at 4 1/2" pitch including 1/2 turns at each end.

Note: For Bending Diagrams and Reinforcement Notes not shown, see Sh. 313

Longitudinal bars for Span E

Size	No.	Length	Type
4	1	5'-3"	Str.
5	1	5'-9"	Str.
6	1	6'-0"	Str.
8	1	6'-6"	Str.
11	1	7'-6"	Str.

The PD bars for Pier E are identical to those for Pier 4 shown in the Reinforcement Schedule on Sh. 313

For reinforcement bars for East Abutment and Piers 1, 2, 3, 4 see Reinforcement Schedule on Sh. 313

See Sh. 306 for General Notes  
 The original West Abutment is to be non-performed.

This sheet supplements sheets 306, 307 and 313. 12-9-65

STATE OF OHIO DEPARTMENT OF HIGHWAYS DIVISION OF DESIGN AND CONSTRUCTION BUREAU OF BRIDGES					
BRIDGE EXTENSION PLANS BRIDGE NO. CUY-71-1847 1-71 UNDER PEDESTRIAN CROSSING AT BUHRER AVENUE CUYAHOGA COUNTY STA. 3+48.71 7+81.21					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
WTF	WTF		MPB	BFG	12-9-65

RECORDED  
DEC 14 1963

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

308  
646

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

ESTIMATED QUANTITIES							
ITEM	DESCRIPTION	UNIT	CUY-71-1789 R H.N.T.B. BRIDGE NO. 21A and 21B				
			ABUTMENTS	PIERS	SUPER-STRUCTURE	GENERAL	TOTAL
E-2	Cofferdams, Cribbs and Sheeting	Lump Sum					Lump Sum
E-2	Unclassified Excavation	Cu. Yd.	874	9,041			9,915
S-1	Class "C" Concrete, Superstructure	Cu. Yd.			7,054		7,054
S-1	Class "C" Concrete, Pier Caps and Columns	Cu. Yd.		5,694			5,694
S-1	Class "E" Concrete, Abutment (Above Footing)	Cu. Yd.	414				414
S-1	Class "E" Concrete, Footings	Cu. Yd.	266	3,520			3,786
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	41				41
S-4	Reinforcing Steel	Pounds	52,650	2,231,170	2,000,630		4,284,450
S-7	Structural Steel	Pounds			7,478,700		7,478,700
S-8	Field Painting of Structural Steel	Pounds			7,478,700		7,478,700
S-14	Railing, Type A (Aluminum Rail and Supports and Concrete Parapet)	Lin. Ft.	151.22		8,369.37		8,520.59
S-16	First Test Pile	Lump Sum				Lump Sum	Lump Sum
S-17	First Pile Test Load	Lump Sum				Lump Sum	Lump Sum
S-17	Subsequent Pile Test Load	Each				1	1
S-18	12" $\phi$ C.I.P. Reinforced Concrete Piles	Lin. Ft.	1,890	8,220			10,110
S-18	Steel Bearing Piles (12BP53)	Lin. Ft.	8,460	79,600			88,060
S-29	Porous Backfill	Cu. Yd.	146				146
S-29	Scuppers, Including Supports	Each			60		60
S-29	Collector Systems, Including Supports	Lin. Ft.				192	192
S-29	8" $\phi$ Downspouts Including Specials, Wrought Iron or Galvanized Steel	Lin. Ft.				851	851
S-29	6" $\phi$ CMP (Including Specials), M-6.4(h) non-perforated	Lin. Ft.	172				172
S-29	6" $\phi$ Perforated CMP (Including Specials), M-6.4(h)	Lin. Ft.	270				270
S-101	Water Reducing Set Retarding Admixture	Each			7,054		7,054
S-25	For lighting quantities, see Sheet 582						
I-10	Crushed Aggregate Slope Protection	Sq. Yd.				11,331	11,331
Special	Preboring for Piling (Including Backfill)*	Lin. Ft.	1,780	3,120			4,900

Note: First Pile Test Load and Subsequent Pile Test Load are to be applied only if directed by the Engineer and at a location chosen by the Engineer.  
\* Backfill (after piles are driven) shall be sand meeting the requirements of Sec. M-2.1.

REPLACEMENT REINFORCEMENT SCHEDULE			
Size	No.	Length	Type
4	6	5'-3"	Str.
5	48	5'-9"	Str.
6	117	6'-0"	Str.
7	16	6'-3"	Str.
8	20	6'-6"	Str.
9	99	7'-0"	Str.
10	19	7'-3"	Str.
11	43	7'-6"	Str.
18S	67	9'-9"	Str.

Note: Replacement bars are listed for all the Bridges and Retaining Walls.

See supplemental Replacement Reinforcement schedule on sh. 307A.

H. N. T. B. BR. NO.	STATE BR. NO.	DESCRIPTION
18	CUY-71-1847	I-71 Under Pedestrian Crossing at Buhler Avenue
19	CUY-71-1826	I-71 Under Relocated West 14th Street
20	CUY-71-1794 L	Southbound I-71 Under Southbound Outer Roadway
21A and 21B	CUY-71-1789 R	Northbound I-71 Over Northbound Jennings, and Northbound Jennings
23	CUY-176-1279	Northbound and Southbound Jennings Over Ramp J-JR

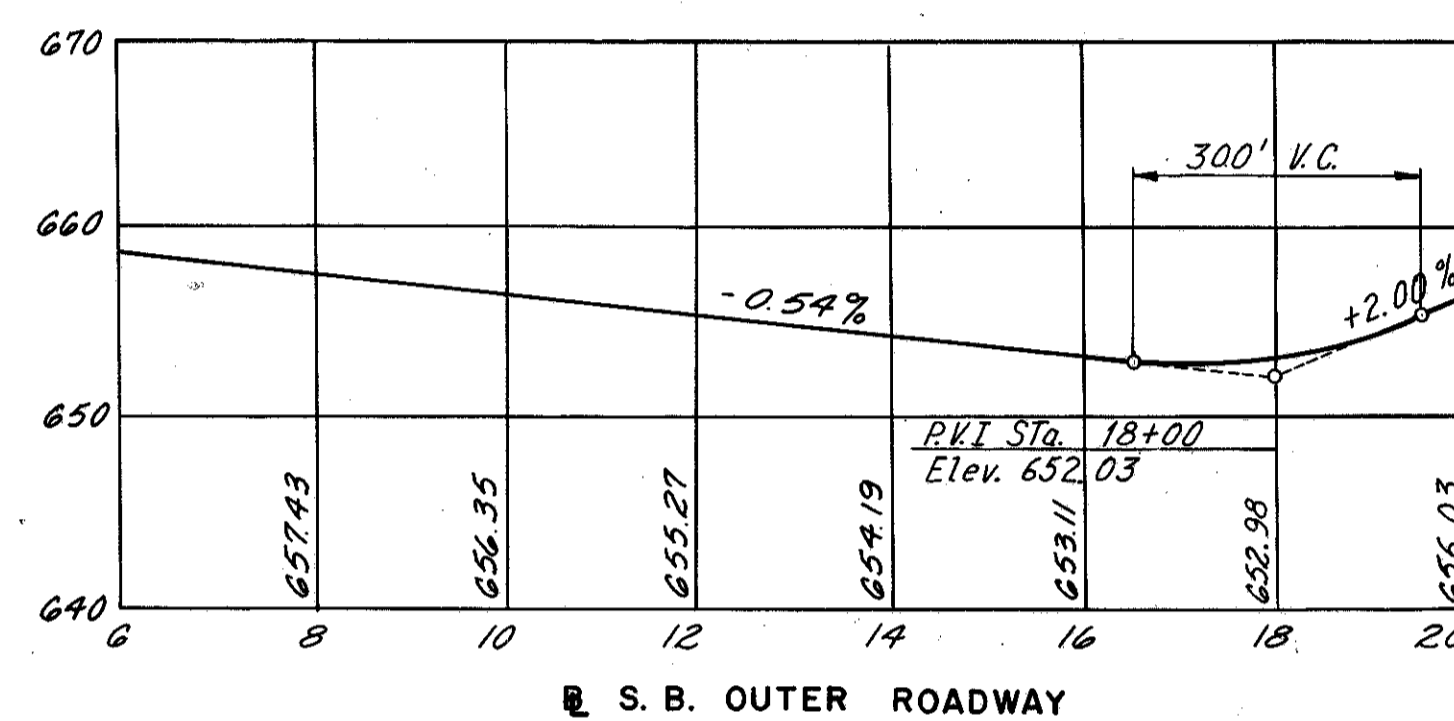
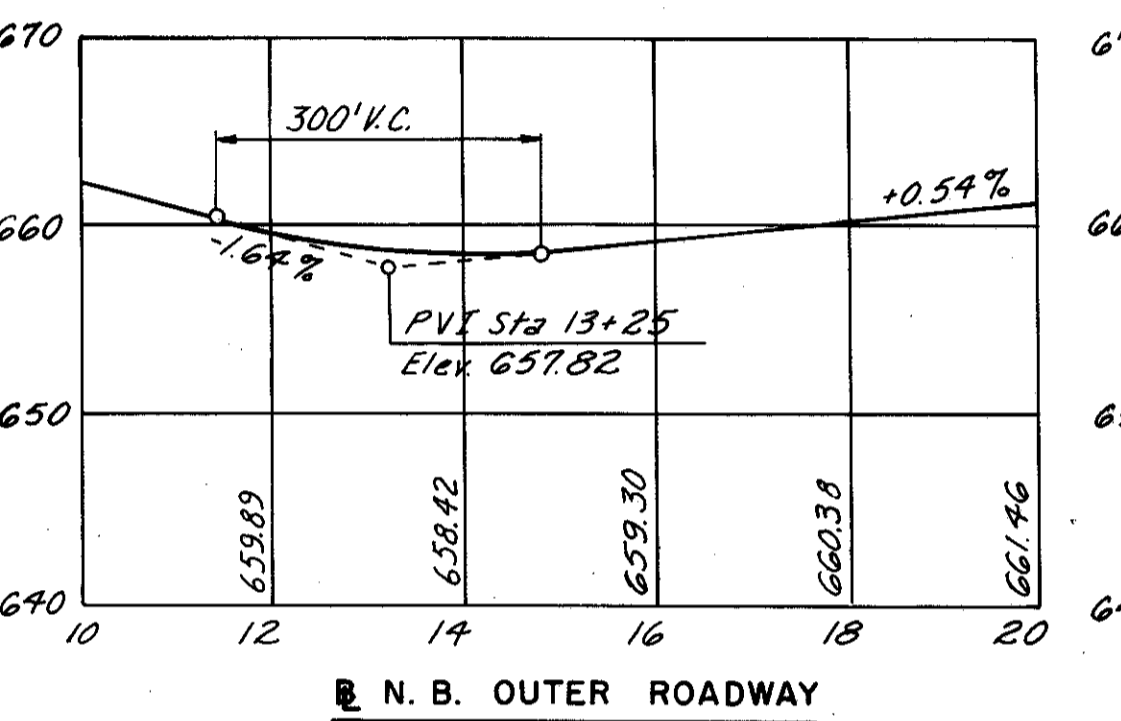
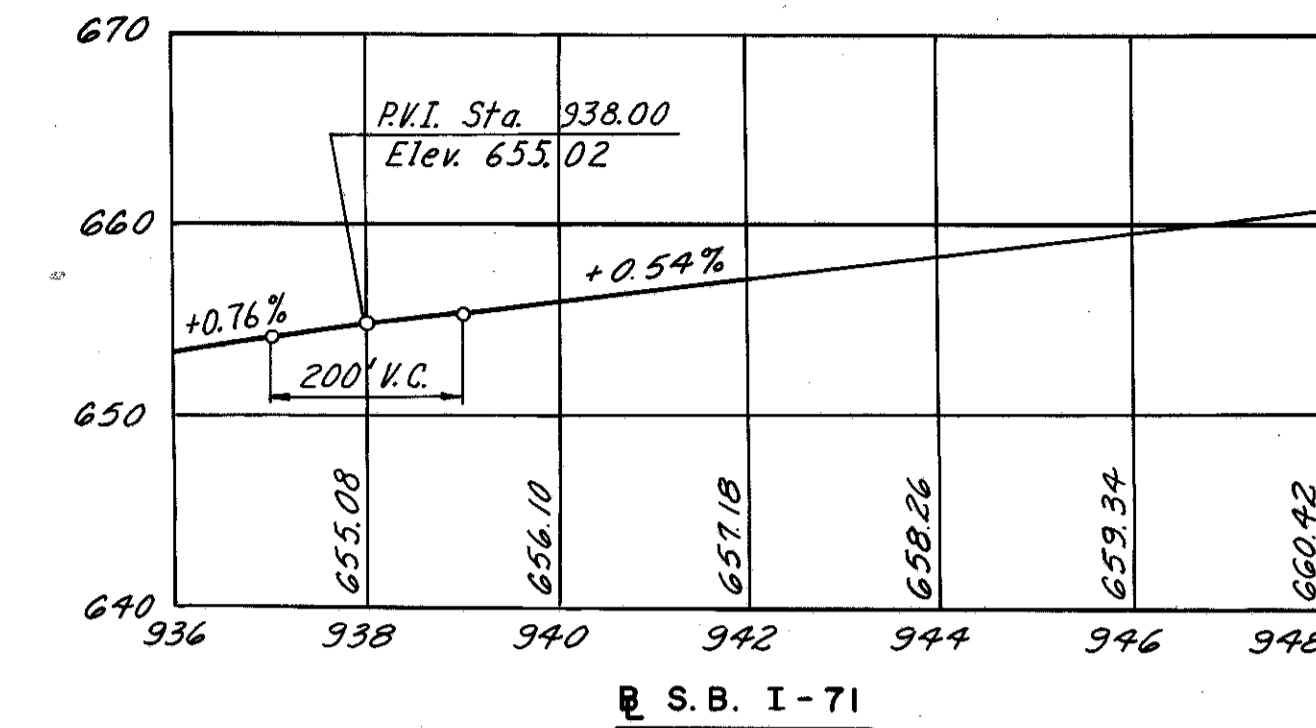
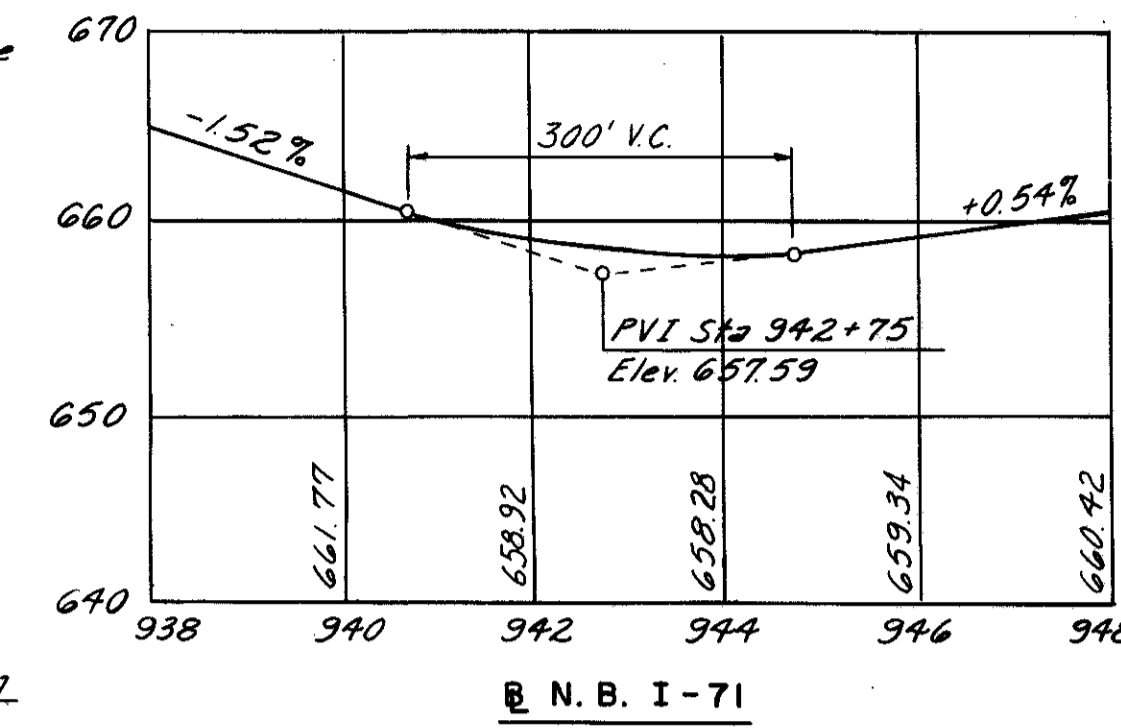
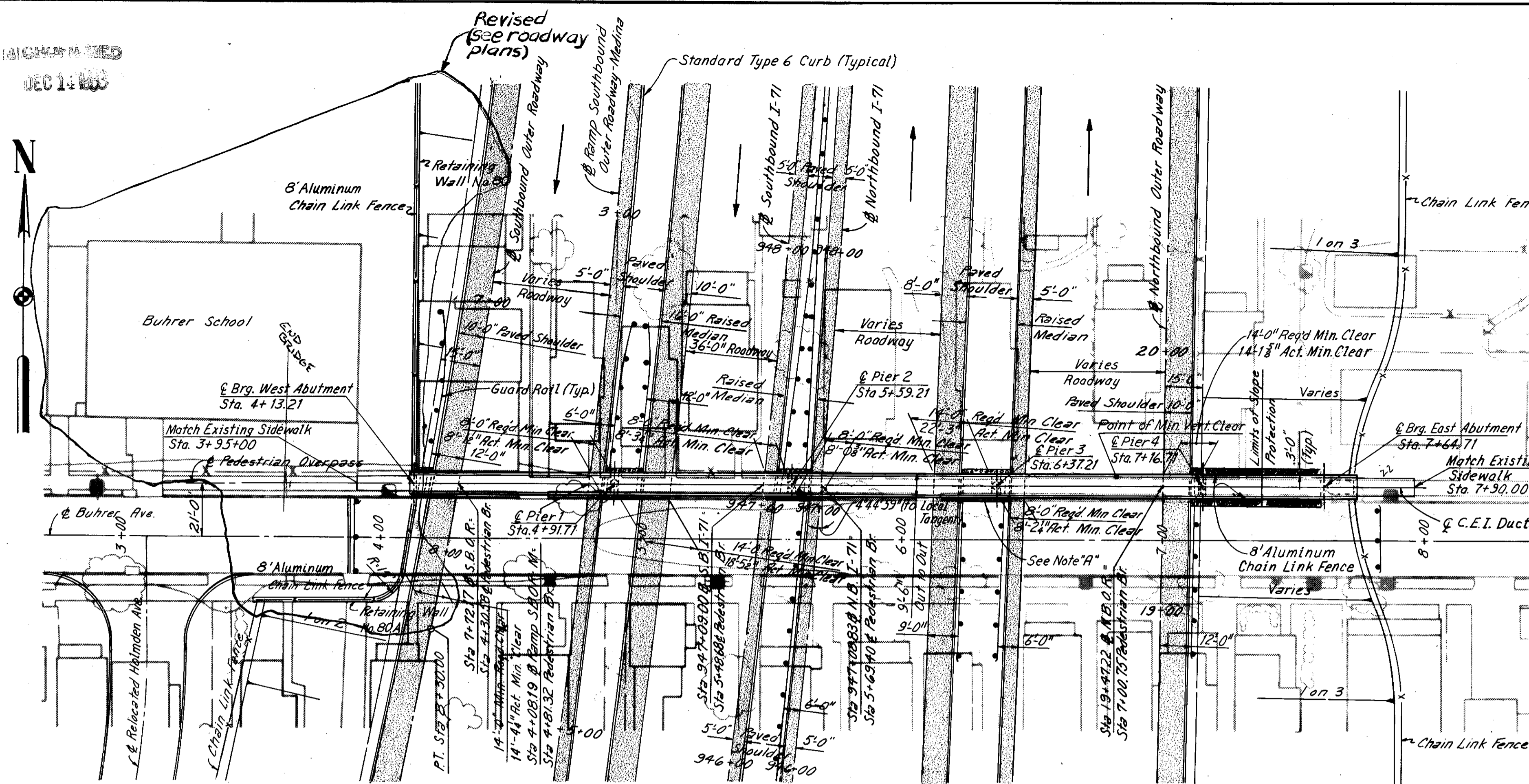
This sheet supplemented by sh. 307A  
12-9-63

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>ESTIMATED QUANTITIES</b>			
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN C.P.	TRACED	CHECKED P.A.B.	REVIEWED W.F.
DATE 12-28-64	DATE	DATE 12-29-64	DATE 12-30-64
			SHEET 308

DEC 1 1965

FED. RD. DIVISION	STATE	PROJECT	309 646
2	OHIO		

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



**CURVE DATA - S.B.O.R.-M**

PI Sta. 03+45.72  
 $\Delta = 06^{\circ} 59' 15''$   
 $D = 01^{\circ} 00' 43''$  Rt.  
 $R = 5662.58'$   
 $T = 345.72'$   
 $L = 630.58'$   
 $E = 10.54'$

**CURVE DATA - N.B. I-71**

PI Sta. 944+47.79  
 $\Delta = 10^{\circ} 52' 24''$   
 $D = 0^{\circ} 45' 00''$  Lt.  
 $R = 7639.42'$   
 $T = 727.07'$   
 $L = 1449.78'$   
 $E = 34.52'$

**CURVE DATA - S.B. I-71**

PI Sta. 947+84.78  
 $\Delta = 13^{\circ} 56' 45''$   
 $D = 01^{\circ} 00' 00''$  Lt.  
 $R = 5729.58'$   
 $T = 700.76'$   
 $L = 1394.59'$   
 $E = 42.69'$

**CURVE DATA - S.B.O.R.**

PI Sta. 5+29.81  
 $\Delta = 12^{\circ} 03' 08''$   
 $D = 02^{\circ} 00' 00''$  Rt.  
 $R = 2864.79'$   
 $T = 302.42'$   
 $L = 602.62'$   
 $E = 15.92'$

Note: Stationing along & pedestrian overpass is the same as shown for existing & Burrer Ave., but 21' left.

Note "A": Crushed Aggregate, to extend 31'-0" outside bridge limits and from curb to curb at Piers 1, 2 and 3, and from curb to front face of abutment of West Abutment; shall conform to and be included with "Item I-10.04, Crushed Aggregate Slope Protection" for payment.

**PROFILES**

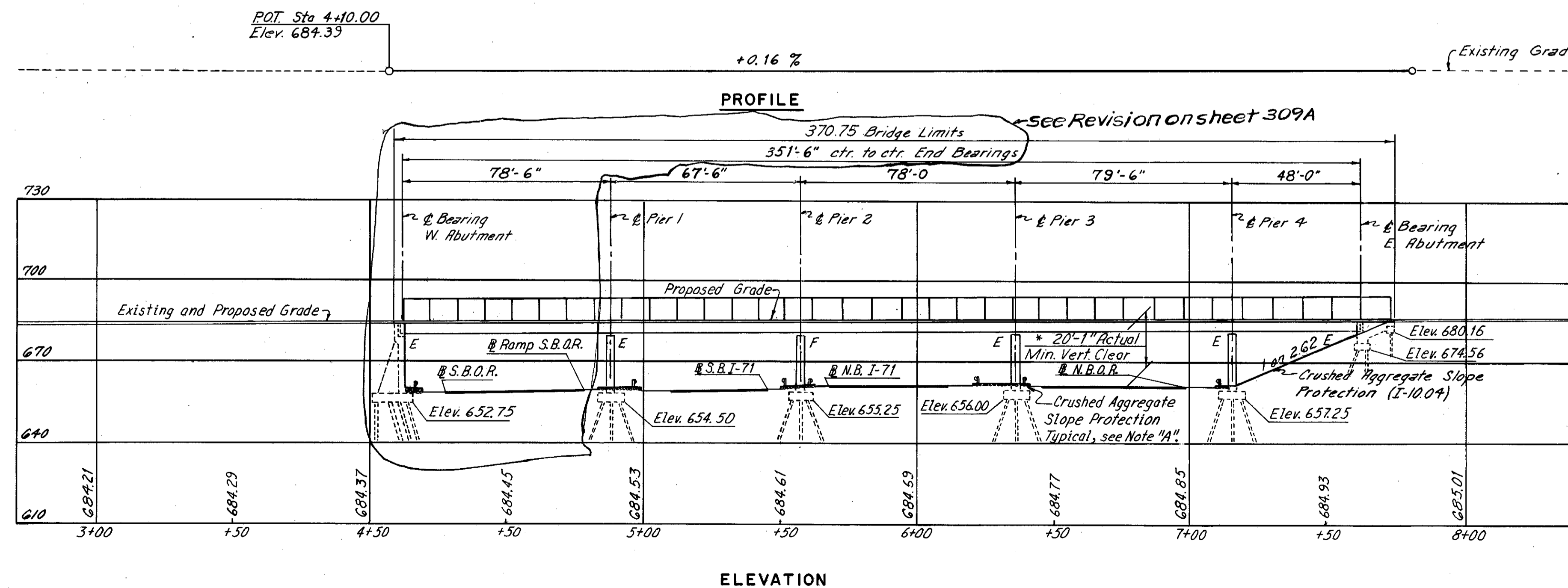
Scale: Horiz. 1" = 200'  
 Vert. 1" = 10'

PROPOSED STRUCTURE	
TYPE:	Continuous steel beam with reinforced concrete deck and substructure
SPANS:	78'-6", 67'-6", 78'-0", 79'-6", 48'-0"
WALKWAY:	8'-0"
LOADING:	85 lbs. per sq. ft.
SKREW:	None Except 0.53' 6" at West Abutment
WEARING SURFACE:	1/2" Monolithic Concrete
APPROACH SLABS:	None
ALIGNMENT:	Tangent

Note: All piles are 12" C.I.P. Reinforced Concrete piles with estimated average vertical lengths as tabulated:

West Abutment	55' revised, see sheet 309A
Pier 1	56'
Pier 2	56'
Pier 3	57'
Pier 4	58'
East Abutment	67'

\*Note: 15'-0" Required minimum vertical clearance. Point of actual minimum vertical clearance occurs at North beam and 24' west of N.B.O.R.



This sheet revised and supplemented Sh. 309A 12-9-65

H.N.T.B. BRIDGE NO. 18

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**SITE PLAN**

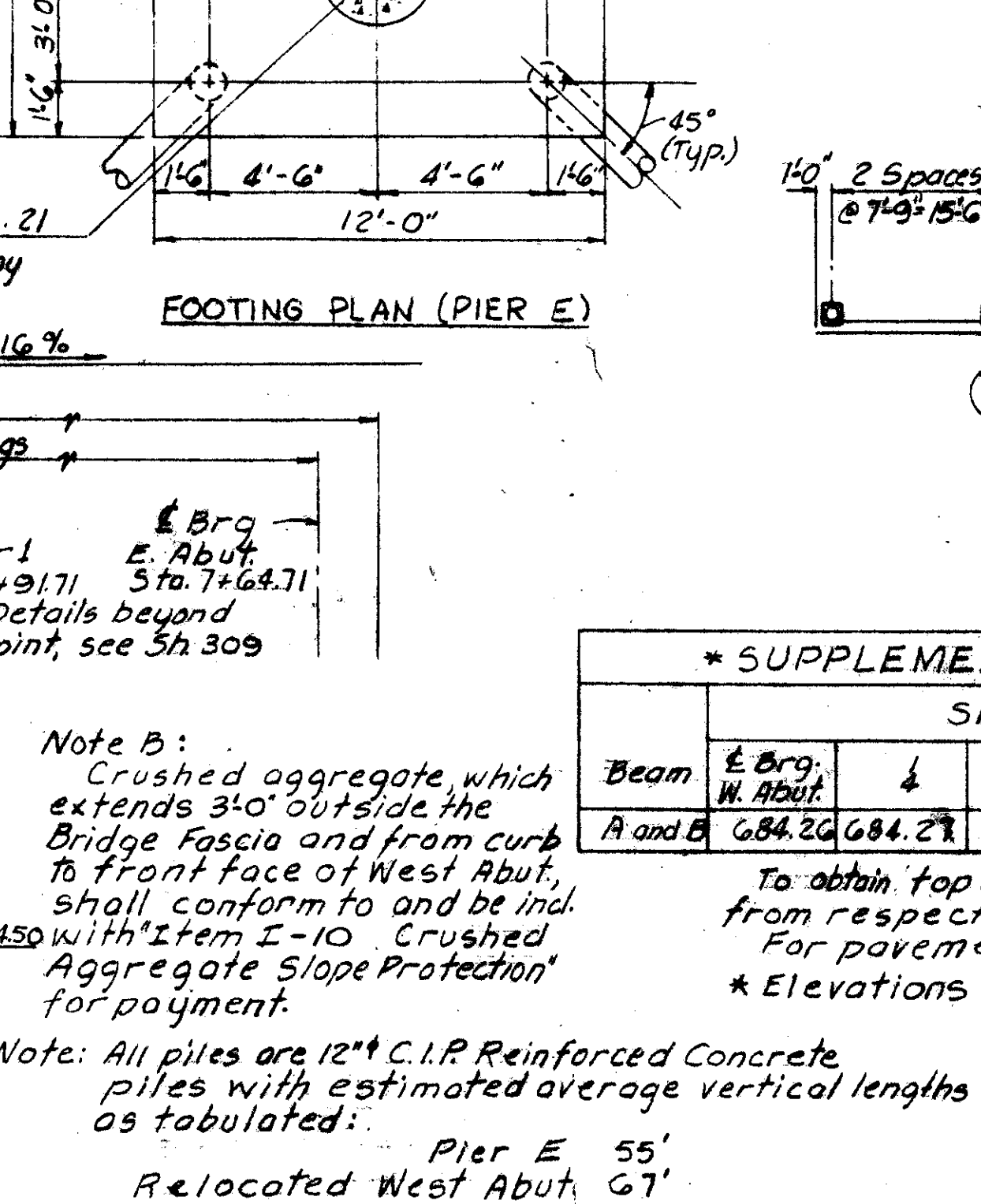
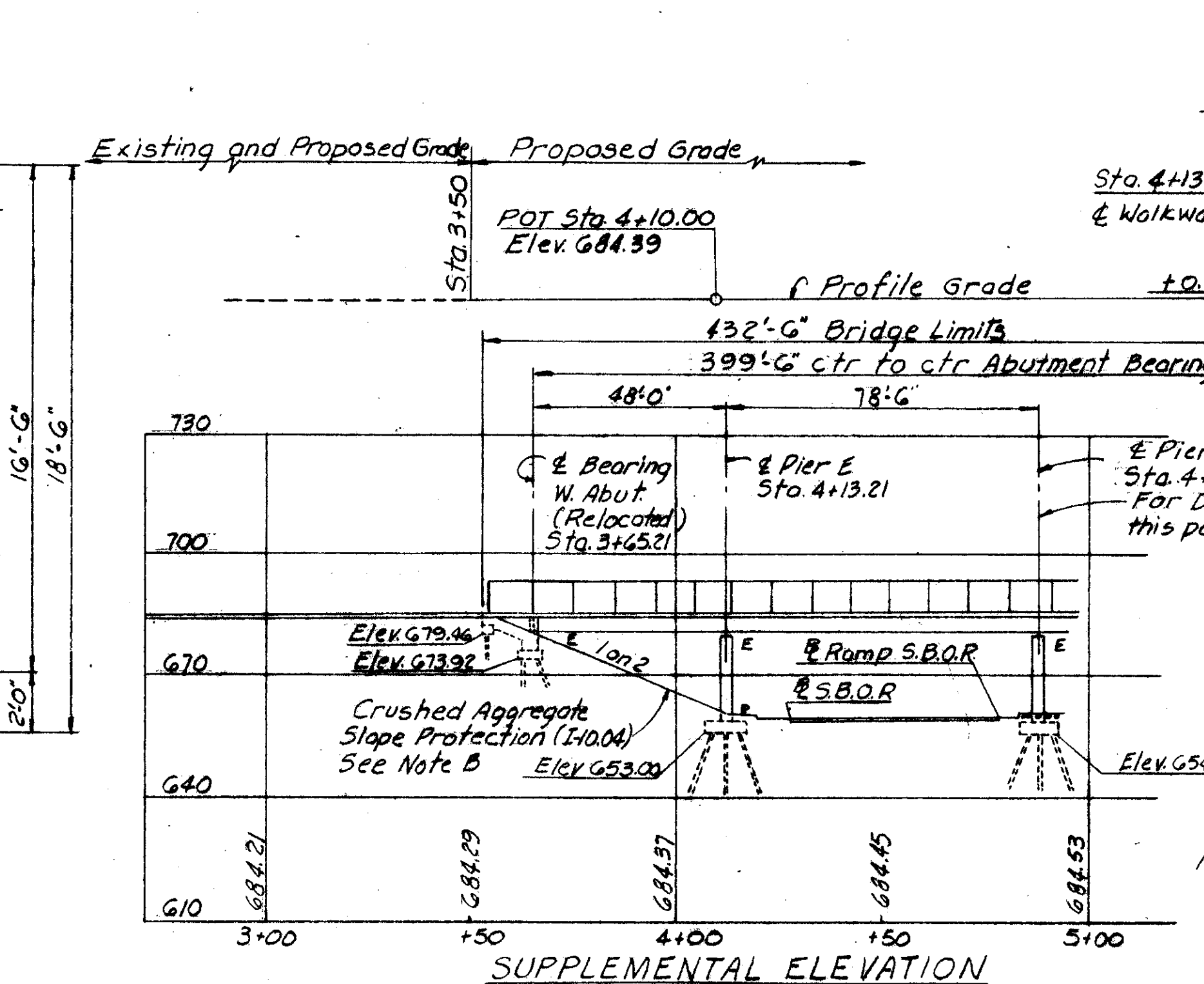
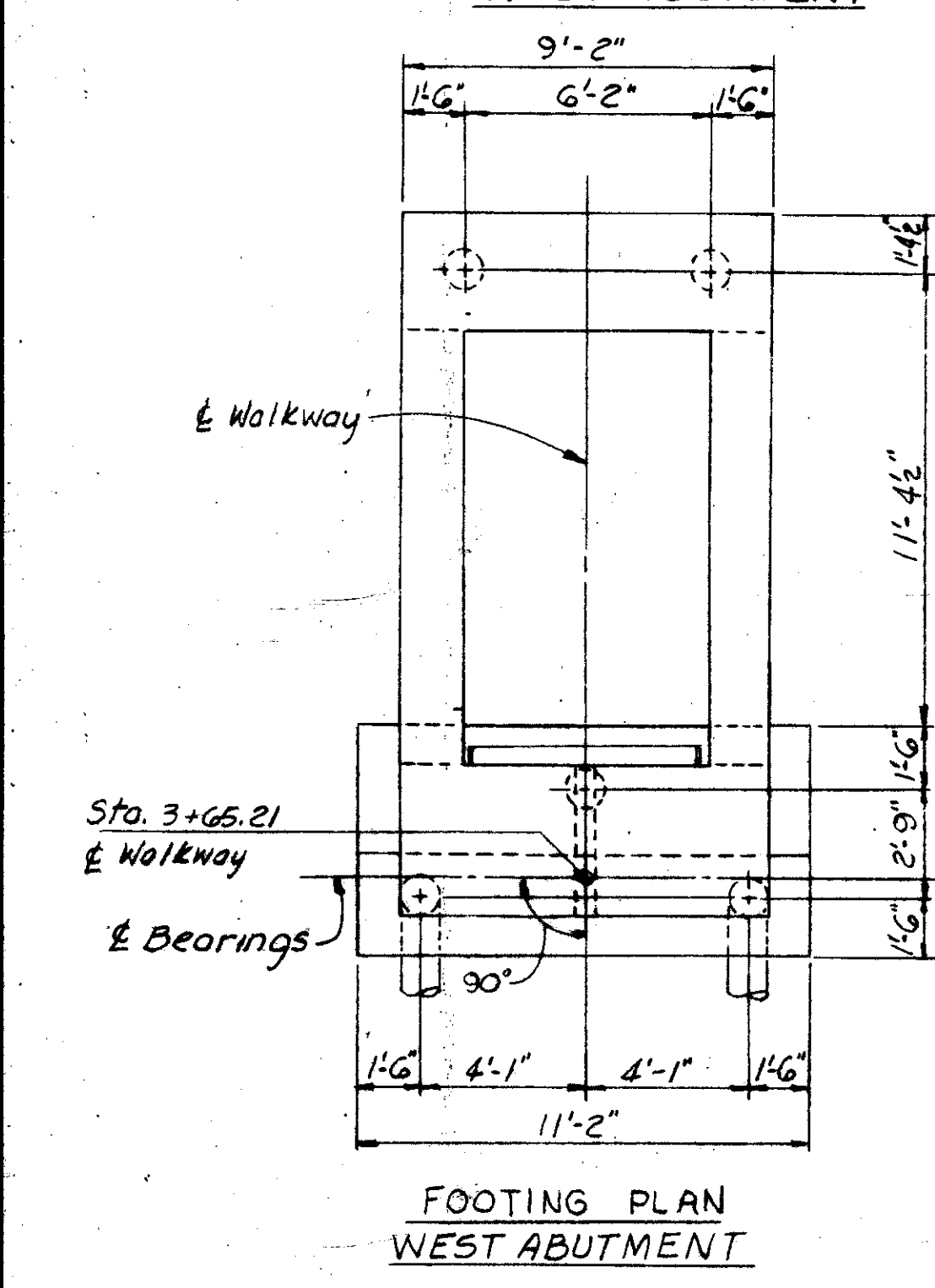
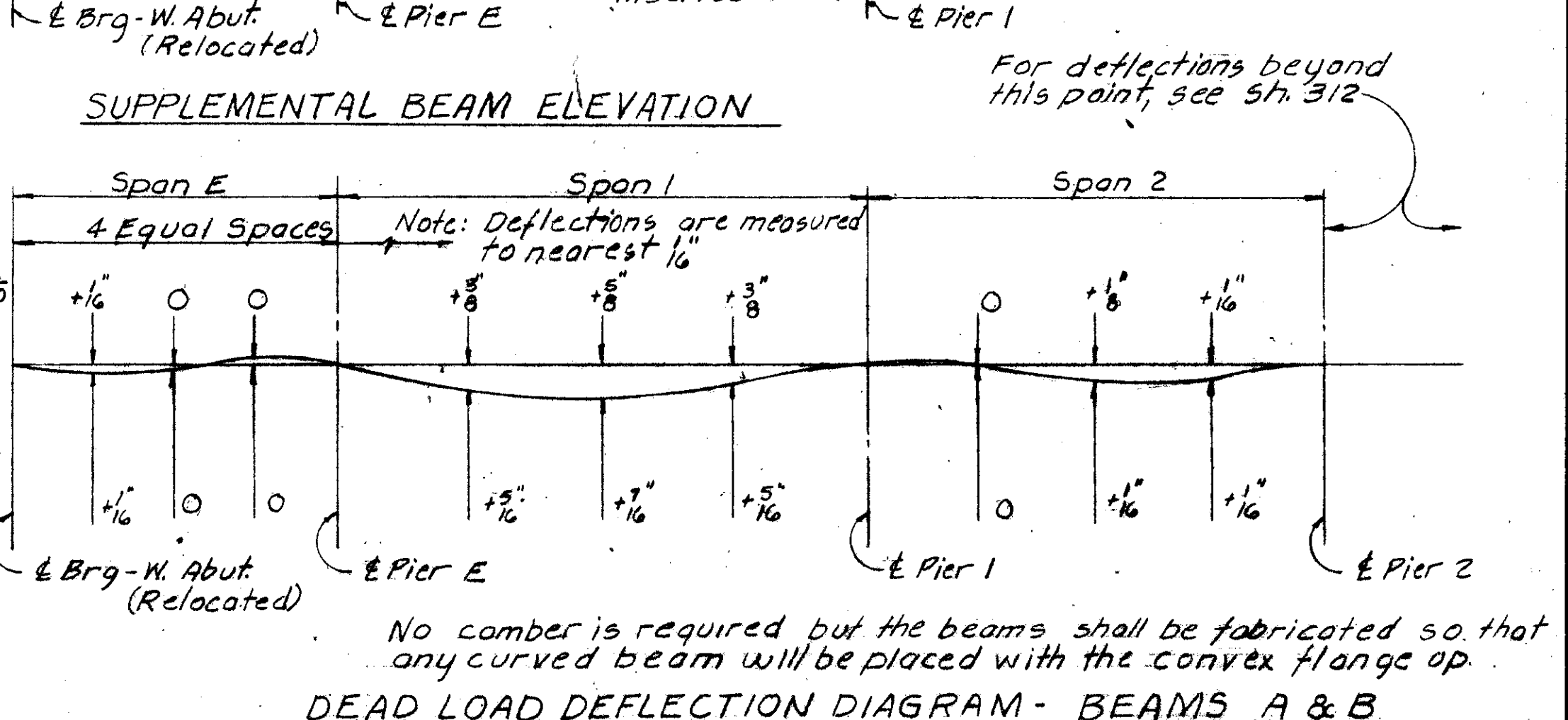
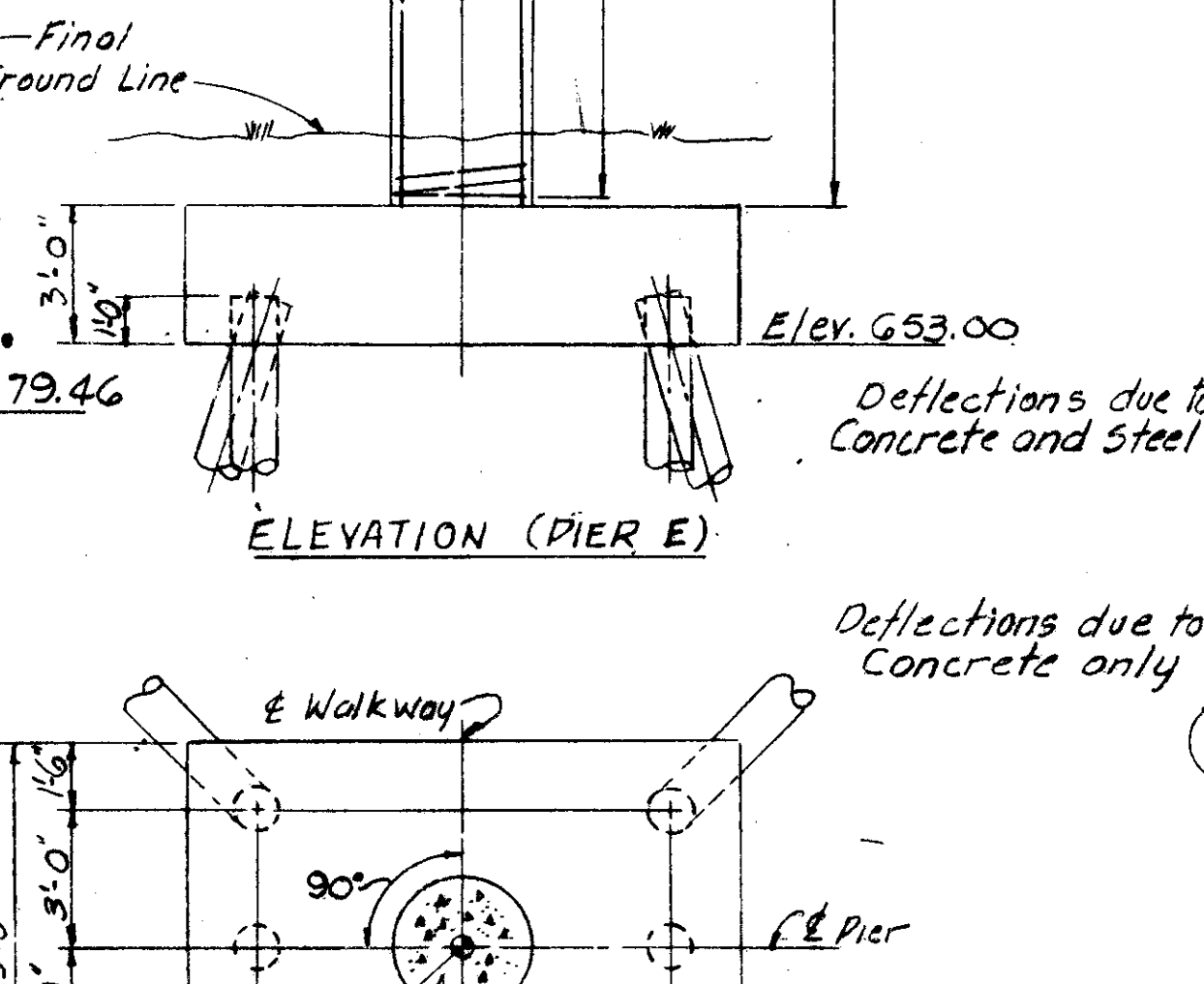
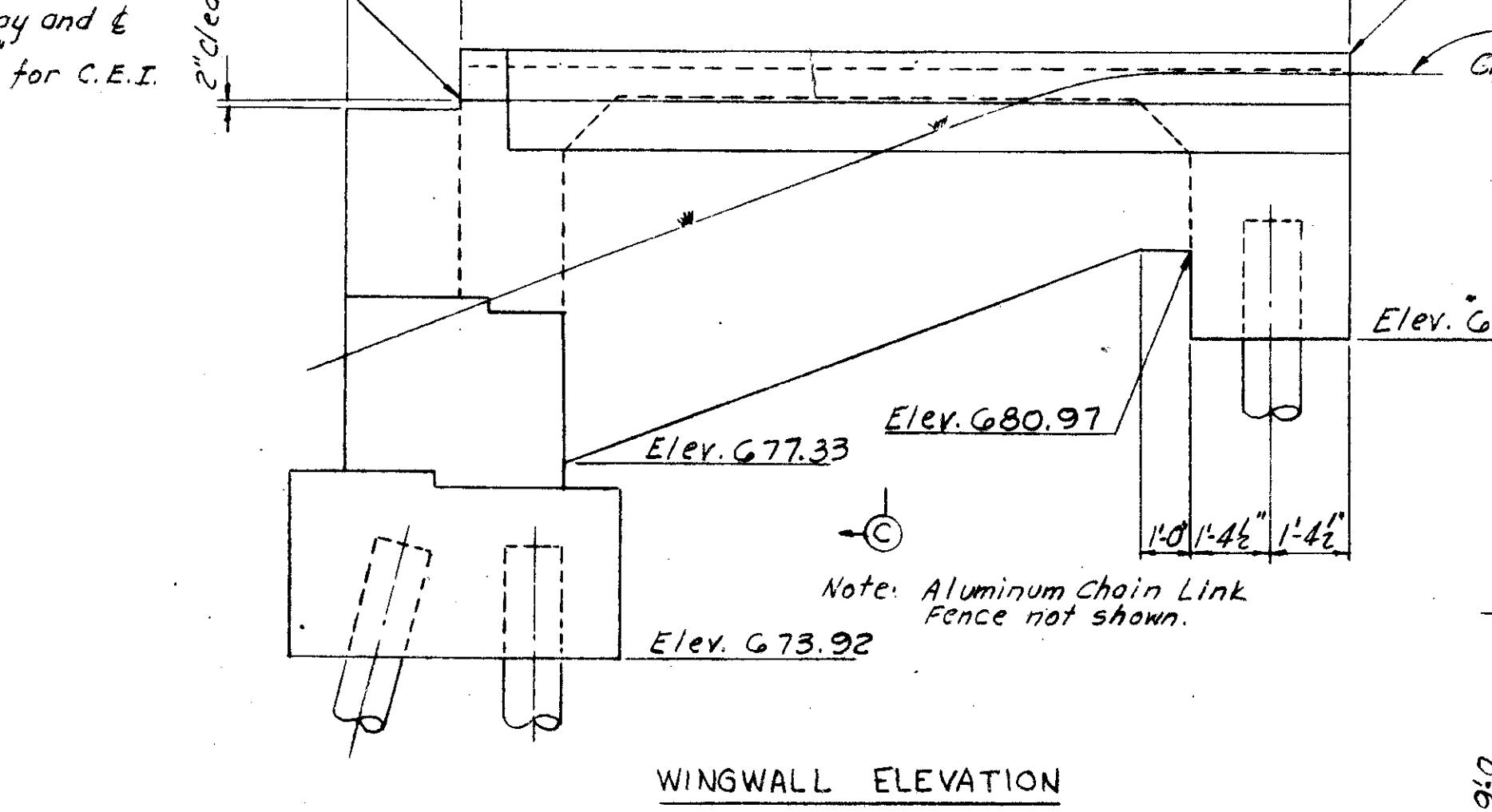
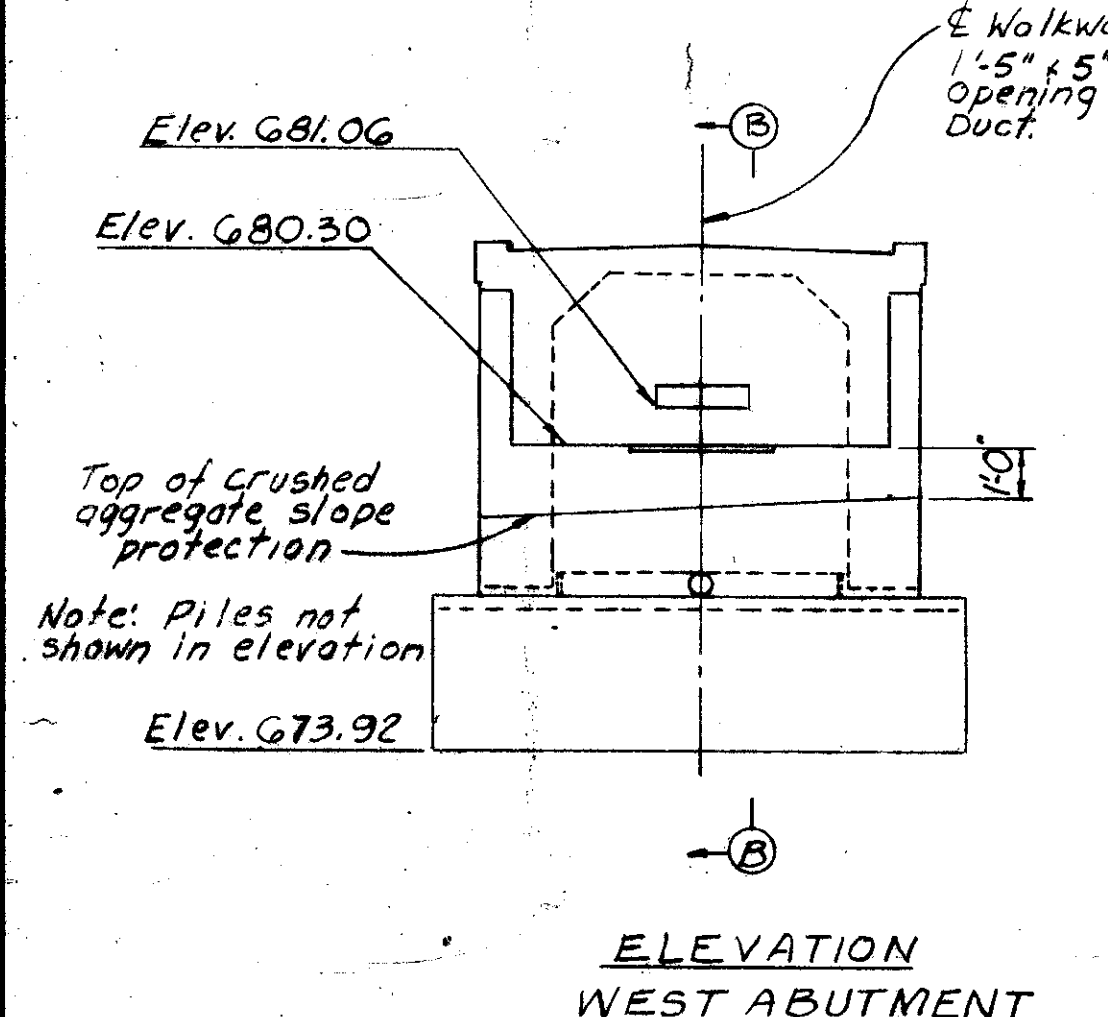
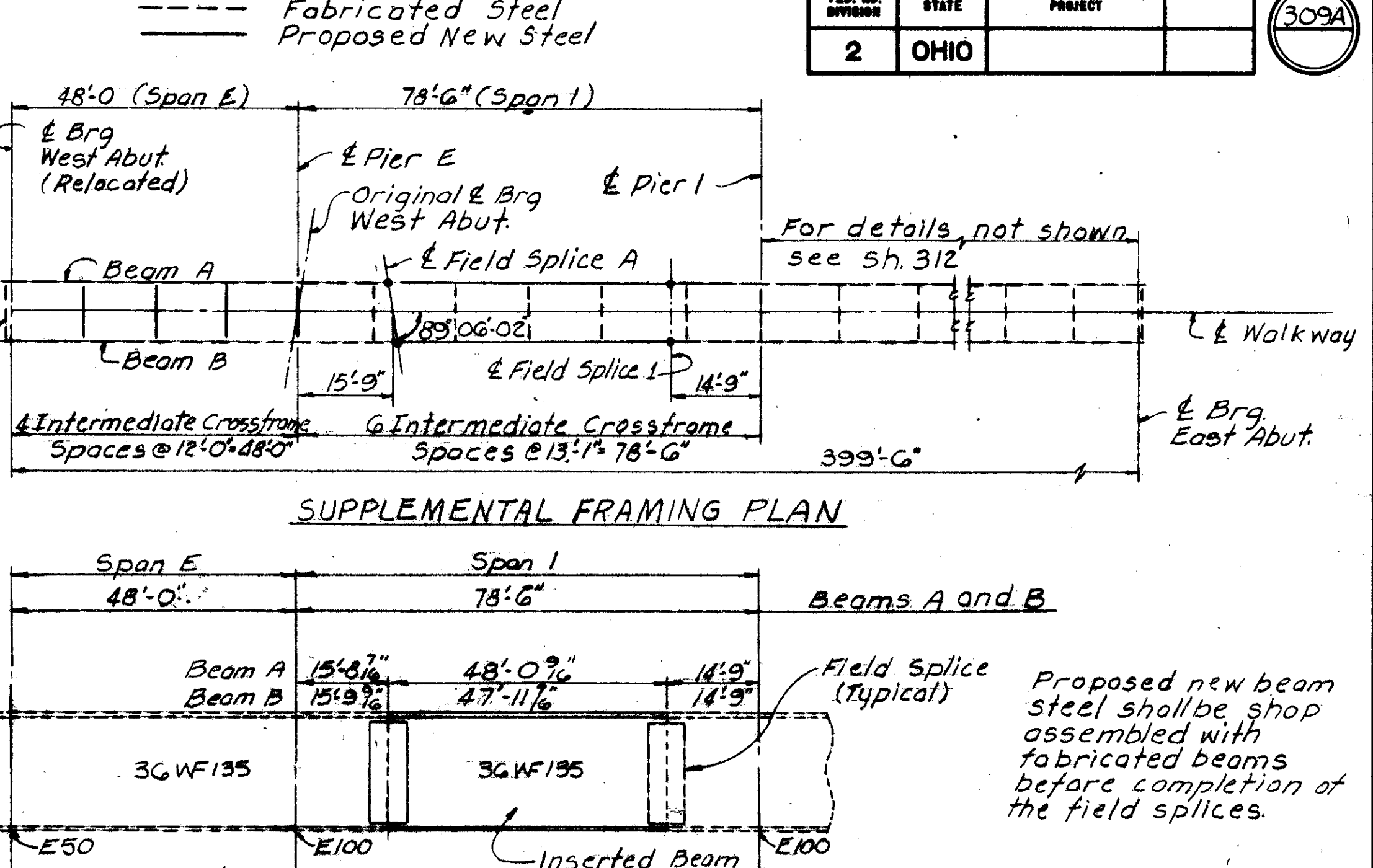
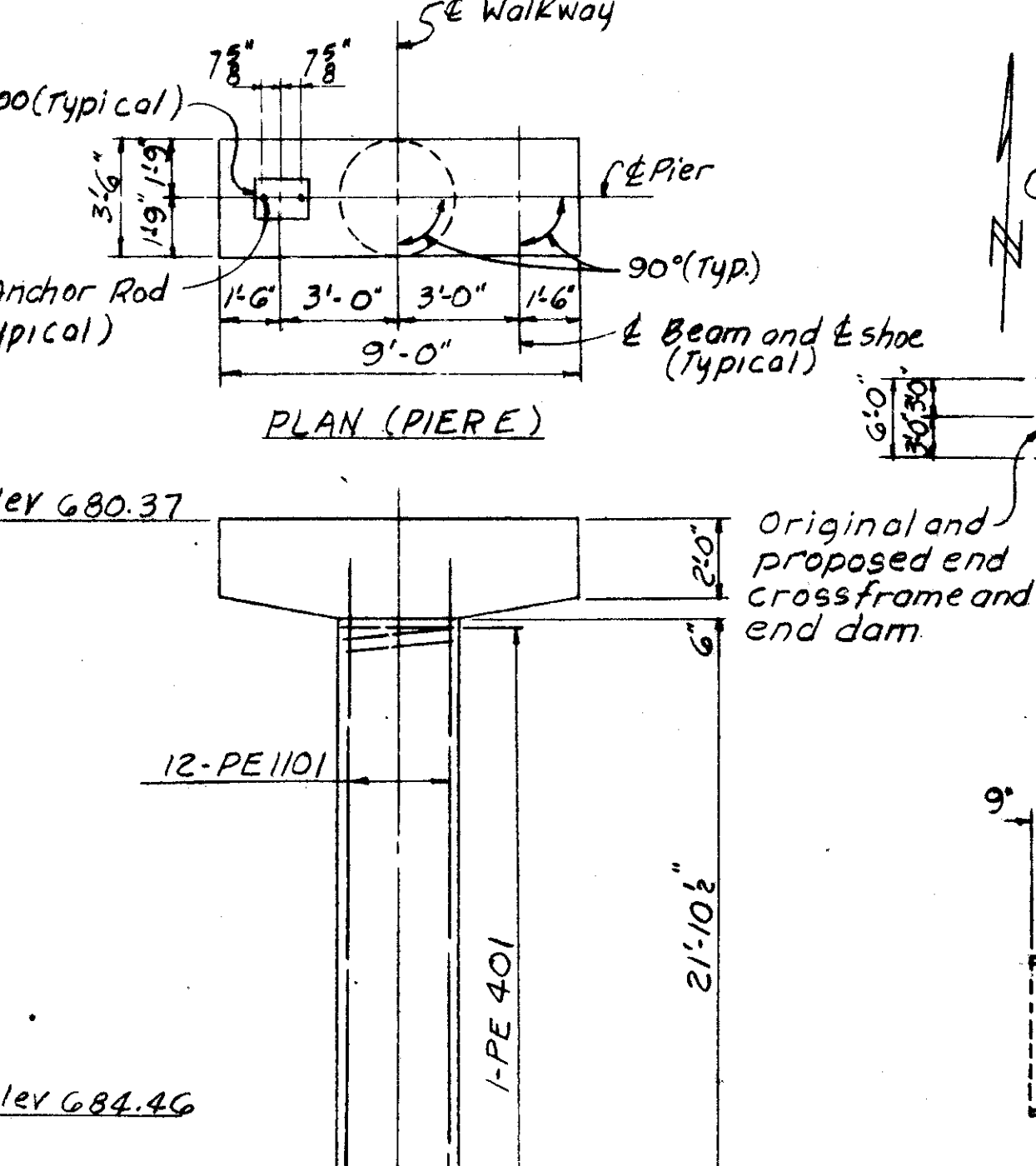
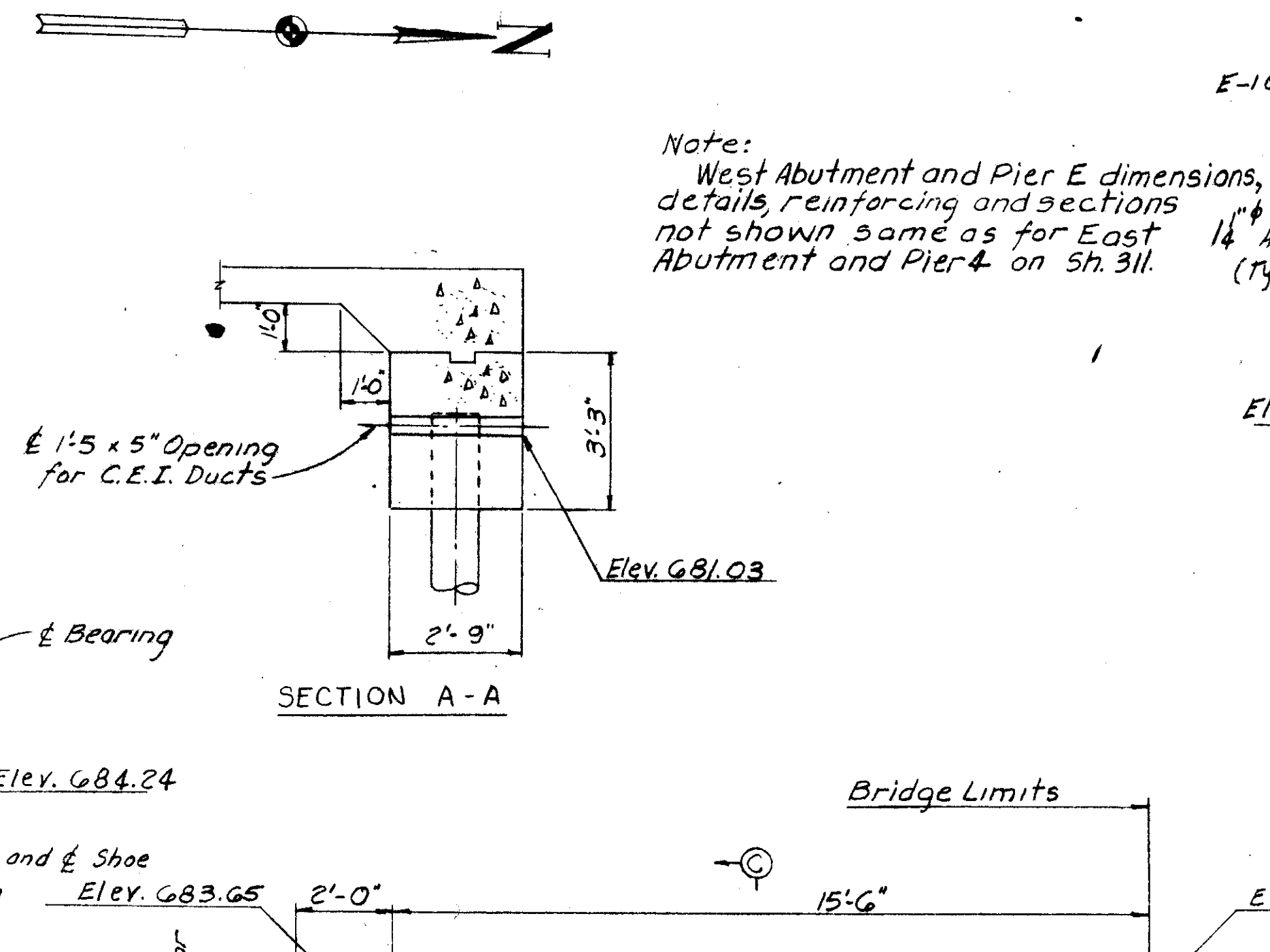
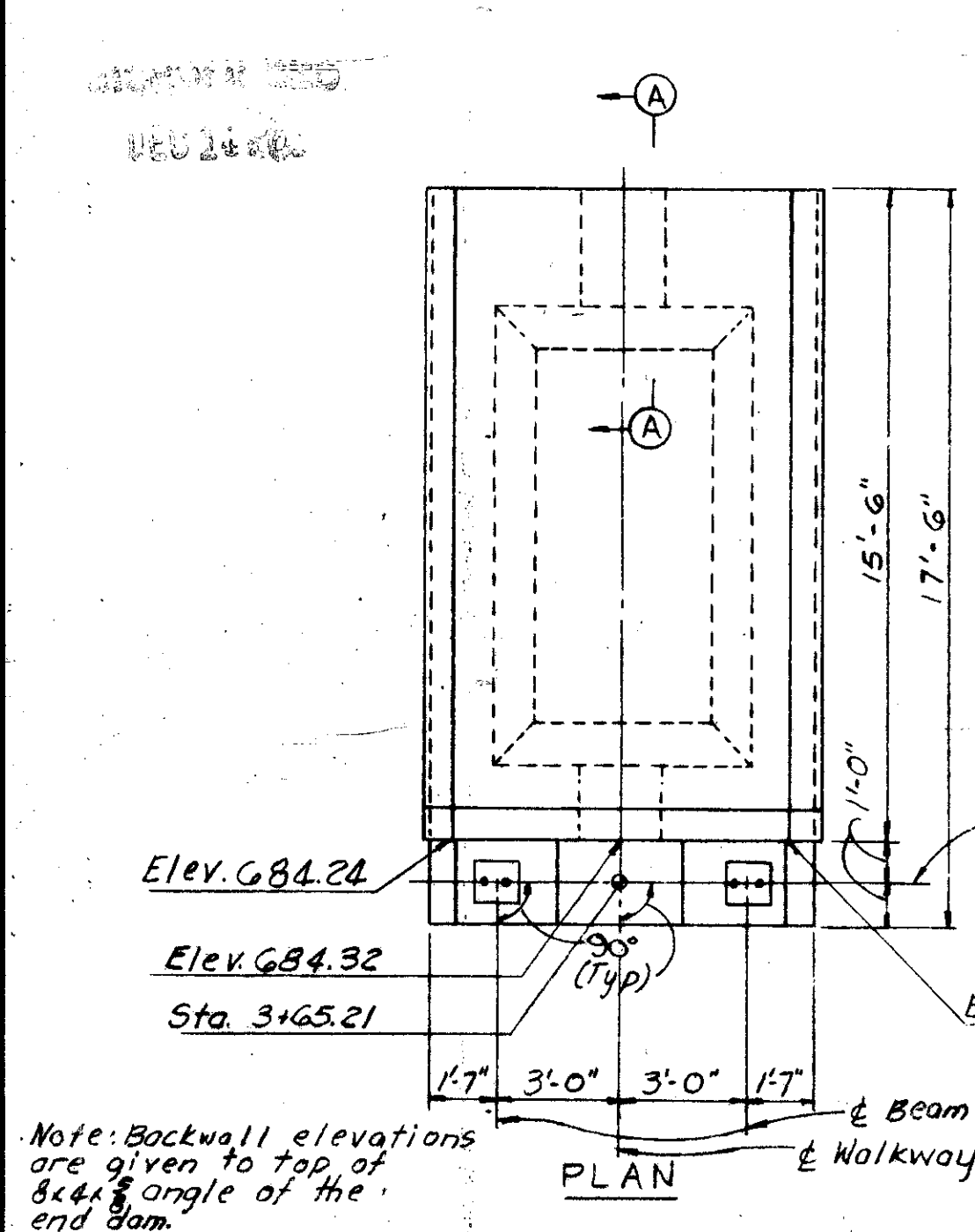
I-71 UNDER PEDESTRIAN CROSSING AT  
 BURRER AVENUE 3+48.71

BR. NO. CUY-71-1847 STA. 4+10.46  
 STA. 7+81.21

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
WJD	DATE	C.A.B.	DATE	DATE
DATE 9-25-64		DATE 12-14-64	DATE 12-15-64	

SHEET 309



**DEAD LOAD DEFLECTION DIAGRAM - BEAMS A & B**  
(Revised and supplemented)

No camber is required but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.

**REVISED FENCE POST AND DRAIN PIPE SPACING**  
(South Fascia shown, North similar)

40 Spaces @ about 9'-11 1/2" = 399'-6"

2 Spaces @ 7'-9 1/2"

For Drain Pipe Spacing between Pier I and E. Abut, see sh. 310.

**\* SUPPLEMENTAL TOP OF PAVEMENT ELEVATIONS**

To obtain top of beam elevations at supports, deduct .63 from respective top of pavement elevations.  
For pavement elevations in remaining spans, see sh. 312.  
\* Elevations are given at top of pavement above & Beams.

This sheet supplements sheets 309, 310, 311 and 312. 12-9-65

Note: Details not otherwise shown shall be in accordance with Item I-26 and Sec. M-10.40

STATE OF OHIO  
DEPARTMENT OF HIGHWAYS  
DIVISION OF DESIGN AND CONSTRUCTION  
BUREAU OF BRIDGES

**BRIDGE EXTENSION PLANS**  
BRIDGE NO. CUY-71-1847  
1-71 UNDER PEDESTRIAN CROSSING  
AT BUHRER AVENUE  
CUYAHOGA COUNTY STA. 3+48.71  
7+81.21

DESIGNED: WTF  
DRAWN: WTF  
CHECKED: MPB  
REVIEWED: BFG  
DATE: 12-9-65

Note: West Abutment and Pier E dimensions, details reinforcing and sections not shown same as for East Abutment and Pier 4 on Sh. 311.

Note: Backwall elevations are given to top of 8:41 angle of the end dam.

Note: Piles not shown in elevation

Note: Aluminum Chain Link Fence not shown.

Note B: Crushed aggregate which extends 3'-0" outside the Bridge Fascia and from curb to front face of West Abut, shall conform to and be incl. with "Item I-10 Crushed Aggregate Slope Protection" for payment.

Note: All piles are 12" C.I.R. Reinforced Concrete piles with estimated average vertical lengths as tabulated:

Pier E	55'
Relocated West Abut	67'





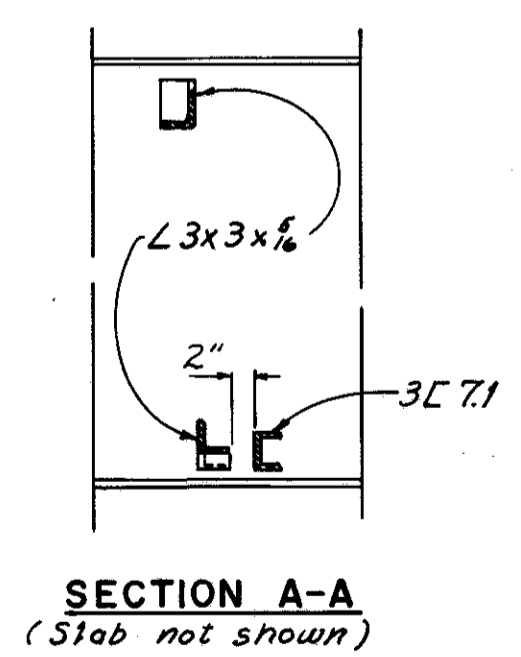
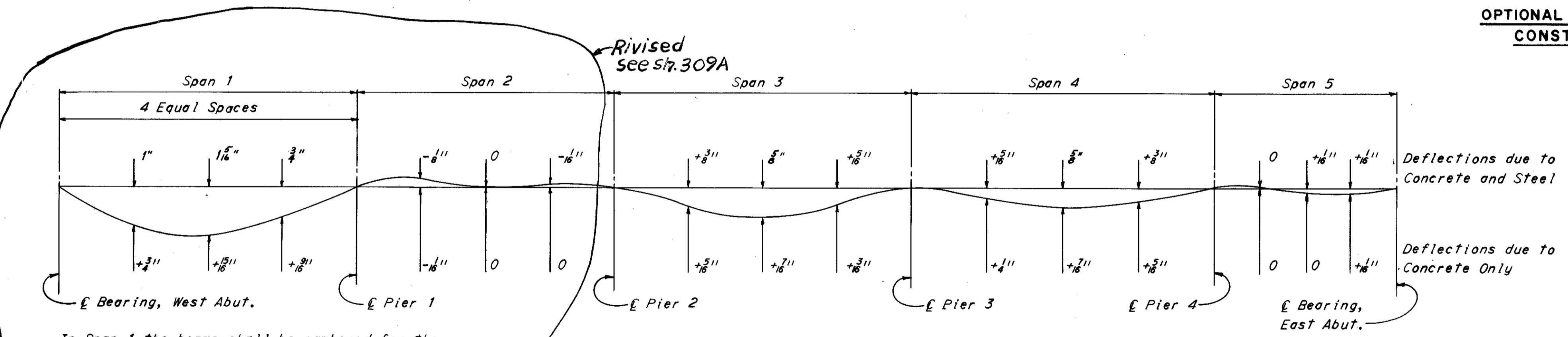
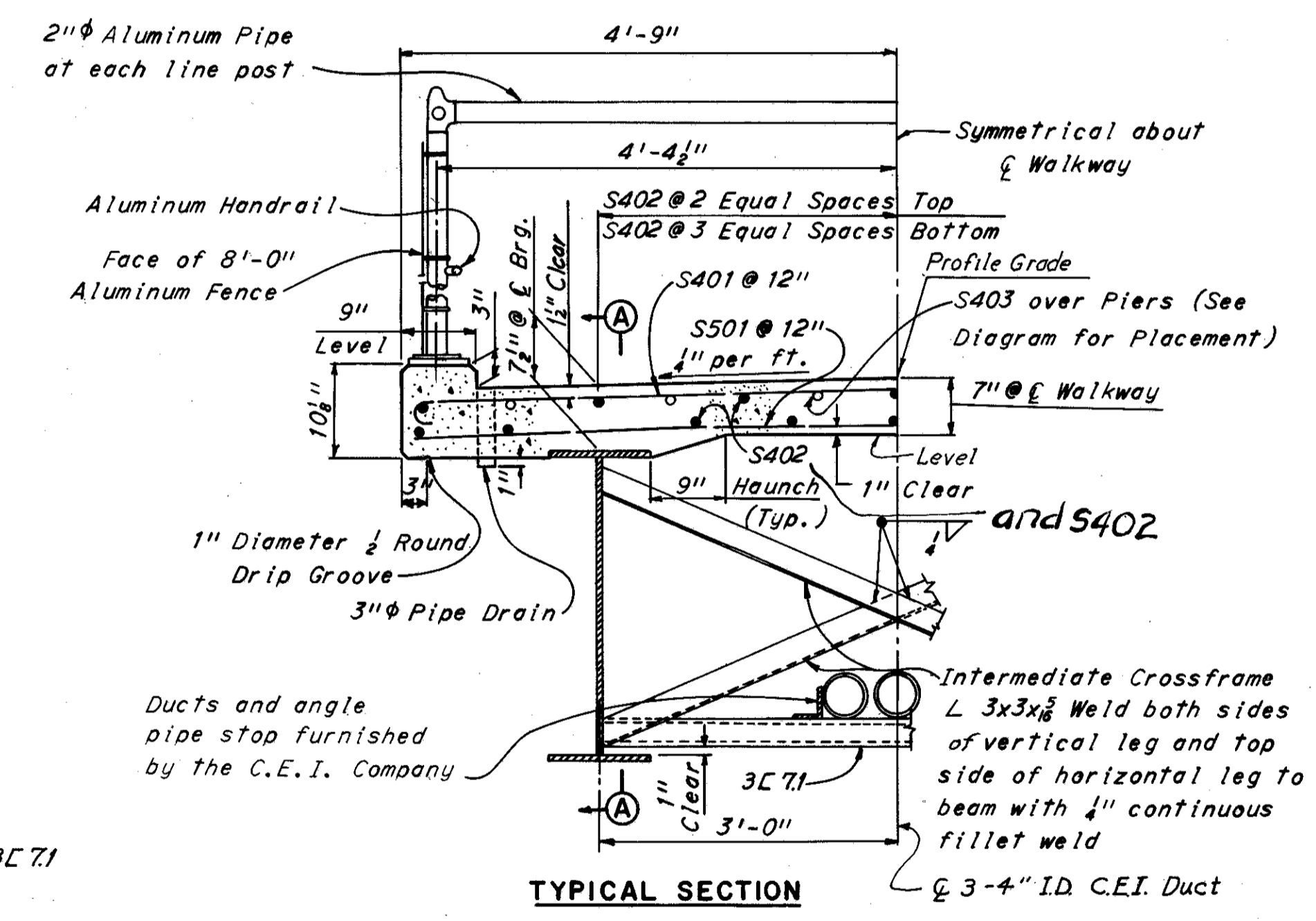
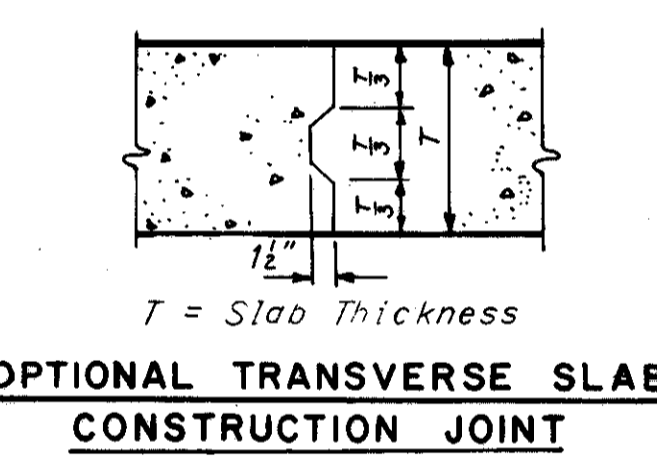
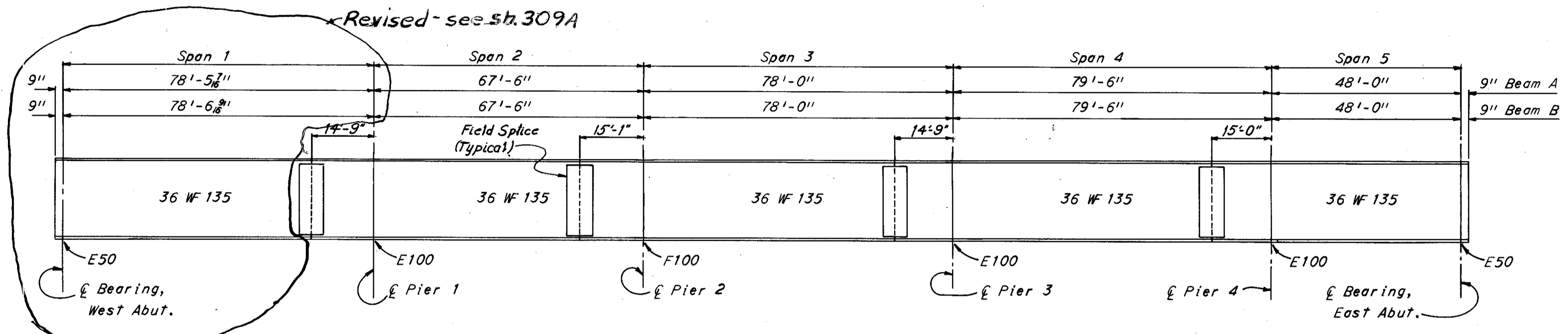
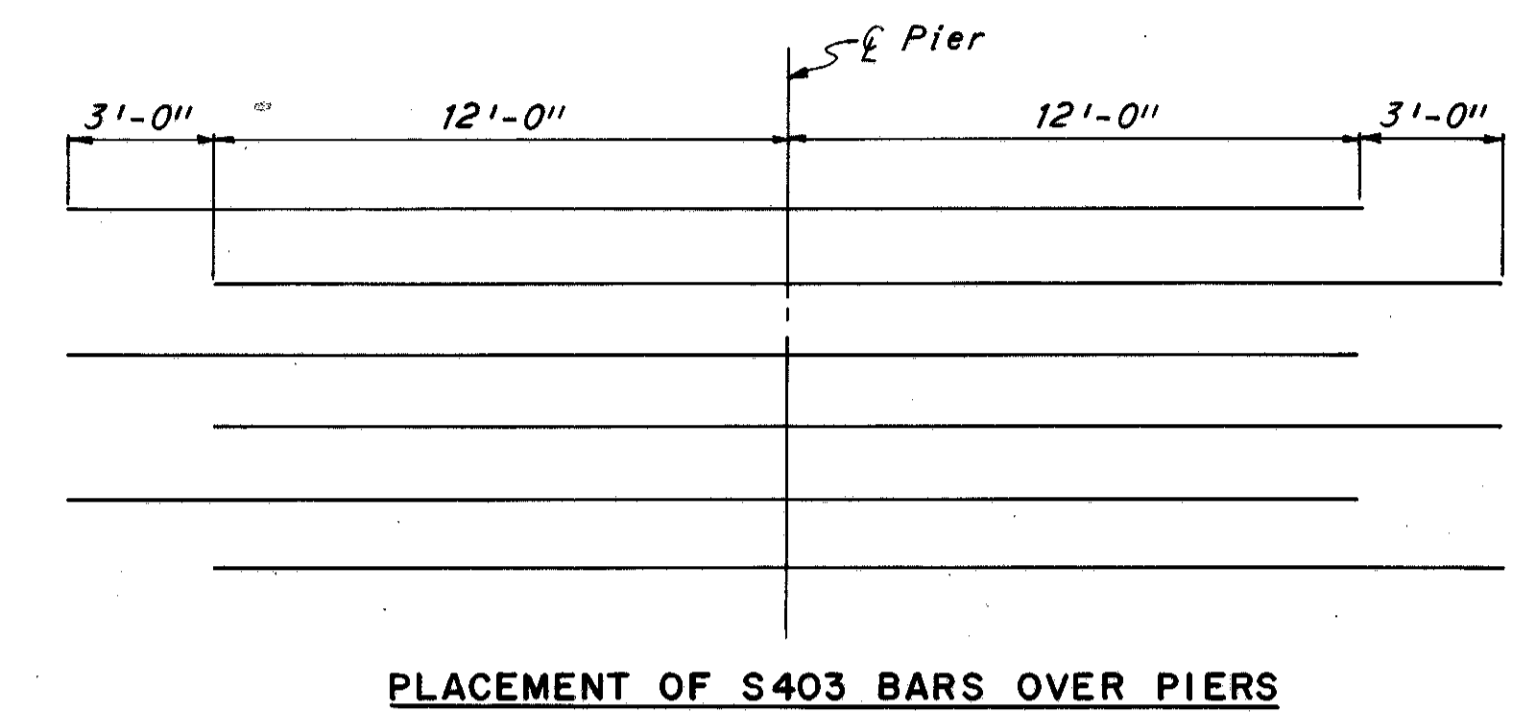
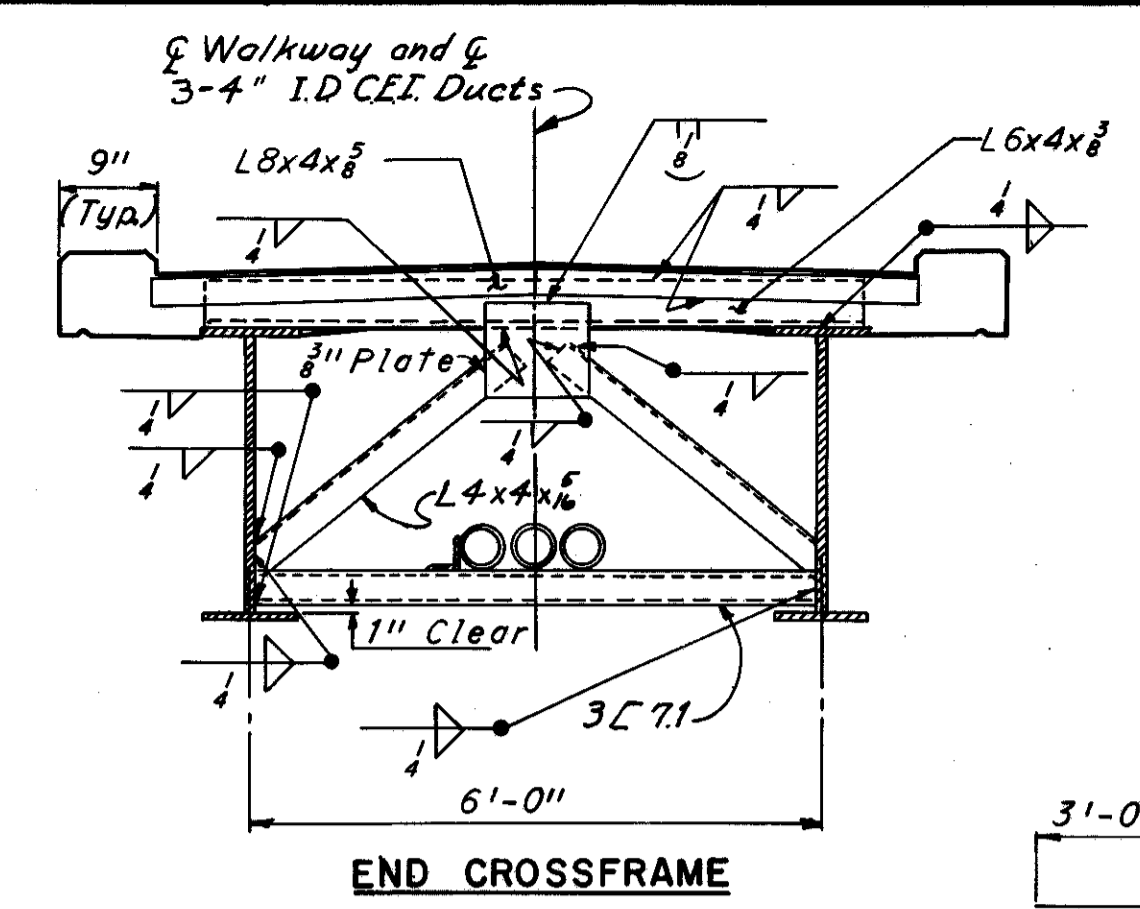
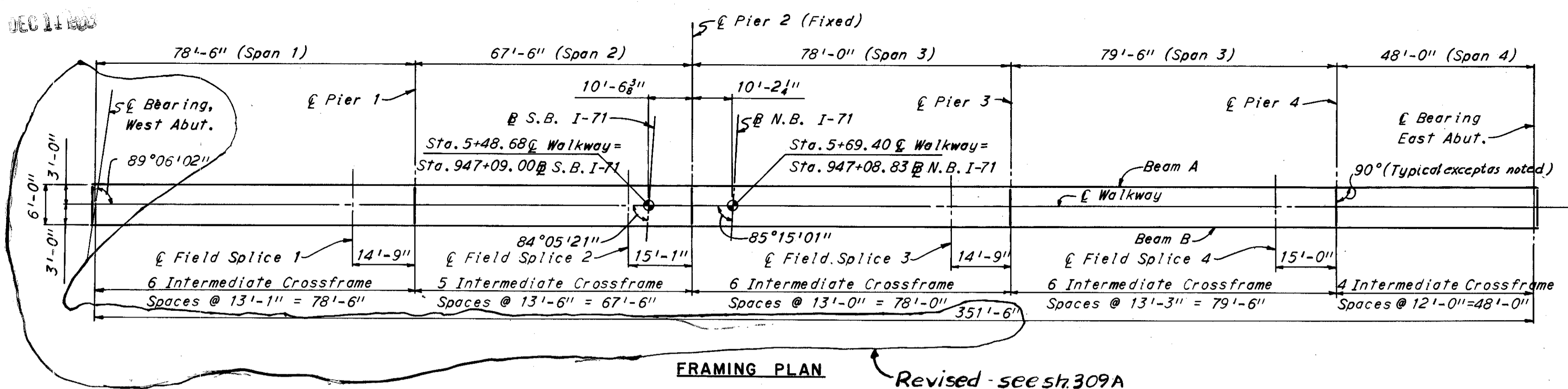


DEC 11 1965

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

312  
646

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



In Span 1 the beams shall be cambered for the effect of dead load deflection. In Spans 2, 3, 4, and 5 no camber is required but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.

Note: Deflections are measured to nearest 1/16".

Revised - See sh 309A

		TOP OF PAVEMENT ELEVATIONS																					
Beam	Brg. W Abut.	SPAN 1				SPAN 2				SPAN 3				SPAN 4				SPAN 5				Brg. E Abut.	Beam
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
A and B	684.33	684.36	684.40	684.43	684.46	684.49	684.51	684.54	684.57	684.60	684.63	684.66	684.69	684.72	684.75	684.79	684.82	684.84	684.86	684.88	684.90	A and B	

Note: To obtain top of beam elevations at supports, deduct .63 from respective top of pavement elevations.

Notes:  
For additional details of walkway end dam see Ohio Standard Drawing SD-1-63, Sheets 2 of 4 and 4 of 4.  
Curb plate details at end dams shall be similar to those shown on Ohio Standard Drawing SD-1-63, Sheet 2 of 4, except that the height of curb plate shall be 2 1/4" and straight and shall have only one 1/2"x4" bar on each side.  
For details of fixed and sliding bearings see Ohio Standard Drawing FSB-1-62. All machine surfaces of the bronze bearing plates and opposing steel plates shall be flat within 0.0005 inch per inch of length.  
For details of beam splices see Sheet 447.

This sheet revised and supplemented by sh. 309A 12-9-65

H.N.T.B. BRIDGE NO. 18

HOWARD, NEEDLES, TAMMEN & BERGENOFF  
CONSULTING ENGINEERS  
KANSAS CITY      CLEVELAND      NEW YORK

**SUPERSTRUCTURE**

I-71 UNDER PEDESTRIAN CROSSING AT  
BUHRER AVENUE 3+48.71

BR. NO. CUY-71-1847      STA. (4+10.46)  
STA. 7+81.21

CLEVELAND      CUYAHOGA COUNTY      OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 7-6-64	DATE	DATE 7-7-64	DATE 12-15-64	DATE

SHEET 312

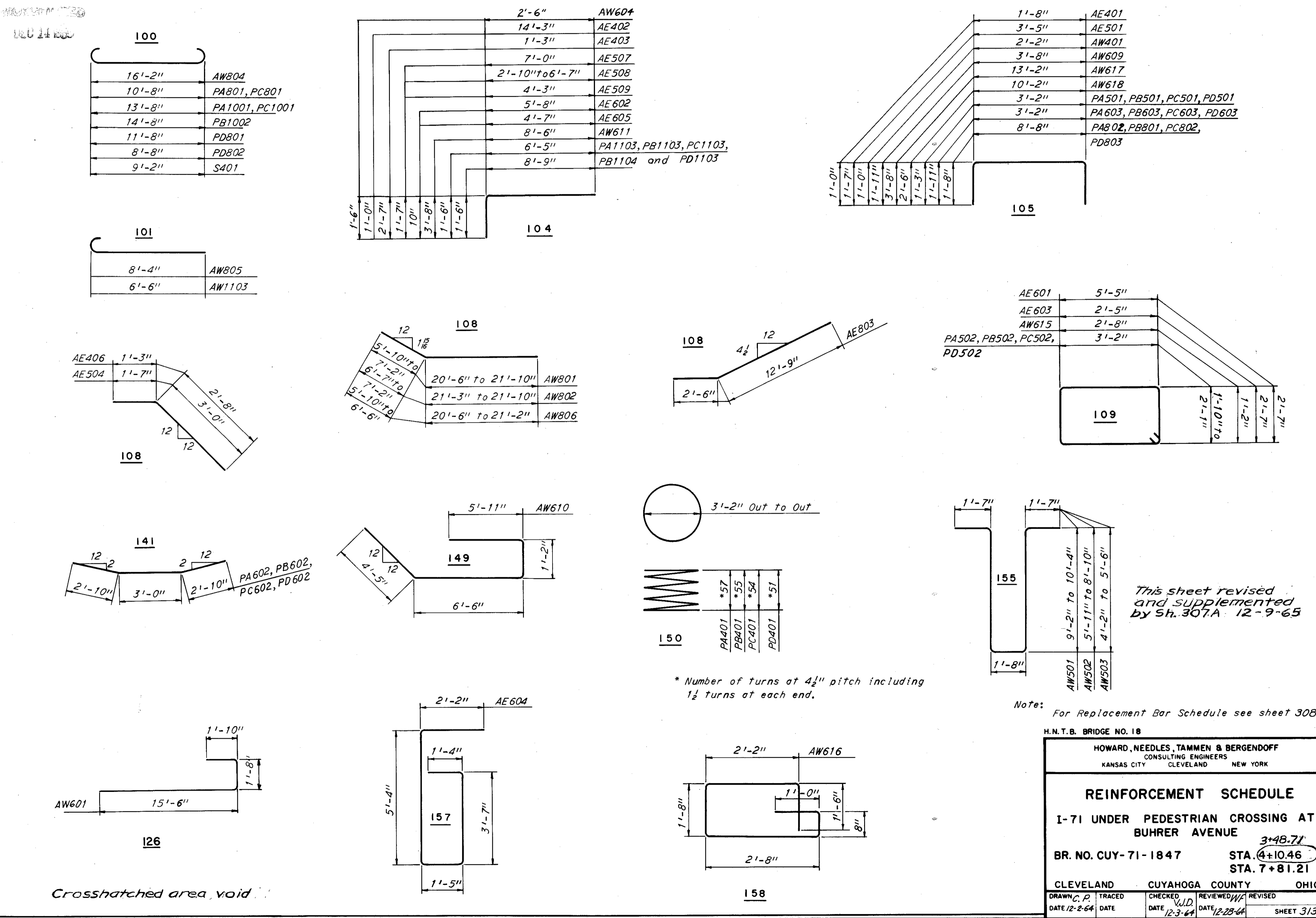
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
<b>EAST ABUTMENT</b>						<b>PIER 1</b>						<b>SUPERSTRUCTURE</b>					
AE401	14	3'-5"	105		32	PA401	1	20'-5"	150		429	SA01	35	10'-2"	100		2,404
AE402	11	15'-2"	104		112	PA501	14	5'-5"	105		79	SA02	160	36'-6"	STR.		3,901
AE403	11	3'-9"	104		28	PA502	2 Ser. 3	10'-6" to 11'-0"	109	3"	70	SA03	24	27'-0"	STR.		433
AE404	2	14'-3"	STR.		19												
AE405	8	9'-0"	STR.		48	PA601	2	8'-6"	STR.		26	SS01	354	9'-0"	STR.		3,324
AE406	16	3'-10"	108		41	PA602	4	8'-8"	141		52	TOTAL WEIGHT = 10,061					
AE407	2	17'-0"	STR.		23	PA603	6	6'-8"	105		60						
AE501	6	6'-4"	105		40	PA801	10	12'-10"	100		343						
AE502	35	8'-9"	STR.		320	PA802	5	11'-8"	105		156						
AE503	10	4'-3"	STR.		44												
AE504	20	4'-6"	108		94	PA1001	10	16'-6"	100		710						
AE505	4	6'-0"	STR.		25												
AE506	2	7'-0"	STR.		15	PA1101	12	22'-9"	STR.		1,450						
AE507	4	8'-6"	104		35	PA1102	12	8'-9"	STR.		558						
AE508	2 Ser. 10	8'-1" to 4'-4"	104	5"	130	PA1103	24	7'-8"	104		978						
AE509	8	5'-9"	104		48							TOTAL WEIGHT = 4,911					
AE601	8	16'-9"	109		201												
AE602	12	6'-4"	104		114												
AE603	6	10'-9"	109		97	<b>PIER 2</b>											
AE604	6	13'-2"	157		119	PB401	1	19'-8"	150		414						
AE605	10	5'-3"	104		79												
AE606	4	6'-0"	STR.		36	PB501	14	5'-5"	105		79						
AE607	2 Ser. 11	6'-3" to 2'-11"	STR.	4"	151	PB502	2 Ser. 3	10'-6" to 11'-0"	109	3"	70						
AE608	8	3'-6"	STR.		42												
AE609	4	17'-0"	STR.		102	PB601	2	8'-6"	STR.		26						
AE610	4	15'-0"	STR.		90	PB602	4	8'-8"	141		52						
AE611	2	10'-0"	STR.		30	PB603	6	6'-8"	105		60						
AE612	2	8'-0"	STR.		24	PB801	5	11'-8"	105		156						
AE613	2	6'-6"	STR.		20												
AE614	2	4'-6"	STR.		14	PB1001	20	17'-6"	100		1,506						
AE615	2	3'-3"	STR.		10												
AE801	8	10'-9"	STR.		230	PB1101	12	21'-9"	STR.		1,387						
AE802	6	8'-9"	STR.		140	PB1102	12	11'-9"	STR.		749						
AE803	4	15'-1"	108		161	PB1103	24	7'-8"	104		978						
						PB1104	12	10'-0"	104		638						
												TOTAL WEIGHT = 2,714					
												TOTAL WEIGHT = 6,115					
<b>WEST ABUTMENT</b>						<b>PIER 3</b>											
AW401	14	3'-11"	105		37	PC401	1	19'-2"	150		406						
AW501	2 Ser. 6	25'-0" to 22'-8"	155	5"	298	PC501	14	5'-5"	105		79						
AW502	2 Ser. 10	22'-0" to 16'-2"	152	7"	398	PC502	2 Ser. 3	10'-5" to 11'-0"	109	3"	70						
AW503	2 Ser. 4	15'-8" to 12'-8"	155	10"	151	PC601	2	8'-6"	STR.		26						
AW601	25	18'-8"	126		635	PC602	4	8'-8"	141		52						
AW602	20	14'-6"	STR.		36	PC603	6	6'-8"	105		60						
AW603	2	13'-0"	STR.		38	PC801	10	12'-10"	100		343						
AW604	48	3'-10"	104		278	PC802	5	11'-8"	105		156						
AW605	10	28'-8"	STR.		428												
AW606	6	24'-0"	STR.		316	PC1001	10	16'-6"	100		710						
AW607	6	21'-3"	STR.		192												
AW608	2	27'-9"	STR.		83	PC1101	12	21'-3"	STR.		1,355						
AW609	6	7'-8"	185		65	PC1102	12	8'-9"	STR.		558						
AW610	10	17'-7"	149		264	PC1103	24	7'-8"	104		978						
AW611	4	12'-0"	104		72												
AW612	44	5'-0"	STR.		338												
AW613	4	27'-9"	STR.		157												
AW614	4 Ser. 4	18'-6" to 14'-5"	STR.	4"	276	<b>PIER 4</b>											
AW615	2	8'-5"	109		25	PD401	1	18'-1"	150		383						
AW616	8	8'-10"	158		89												
AW617	4	20'-2"	105		94	PD501	14	5'-5"	105		79						
AW618	3	14'-10"	105		89	PD502	2 Ser. 3	10'-6" to 11'-0"	109	3"	70						
AW801	1 Ser. 16	29'-8" to 28'-4"	108	2 1/2"	1,188	PD601	2	8'-6"	STR.		26						
AW802	1 Ser. 6	29'-0" to 27'-10"	108	2 1/2"	455	PD602	4	8'-8"	141		52						
AW803	17	16'-0"	STR.		76	PD603	6	6'-8"	105		60						
AW804	22	18'-4"	100		1,877	PD801	10	13'-10"	100		369						
AW805	12	9'-5"	101		302	PD802	8	10'-10"	100		231						
AW806	1 Ser. 8	27'-8" to 26'-4"	108	2 1/2"	577	PD803	5	11'-8"	105		156						
AW1101	8	25'-6"	STR.		1,284	PD1101	12	20'-3"	STR.		1,291						
AW1102	8	9'-6"	STR.		484	PD1102	12	7'-8"	101		489						
AW1103	16	8'-1"	101		687												
												TOTAL WEIGHT = 11,197					
												TOTAL WEIGHT = 3,206					

**SPIRAL REINFORCEMENT NOTE:**

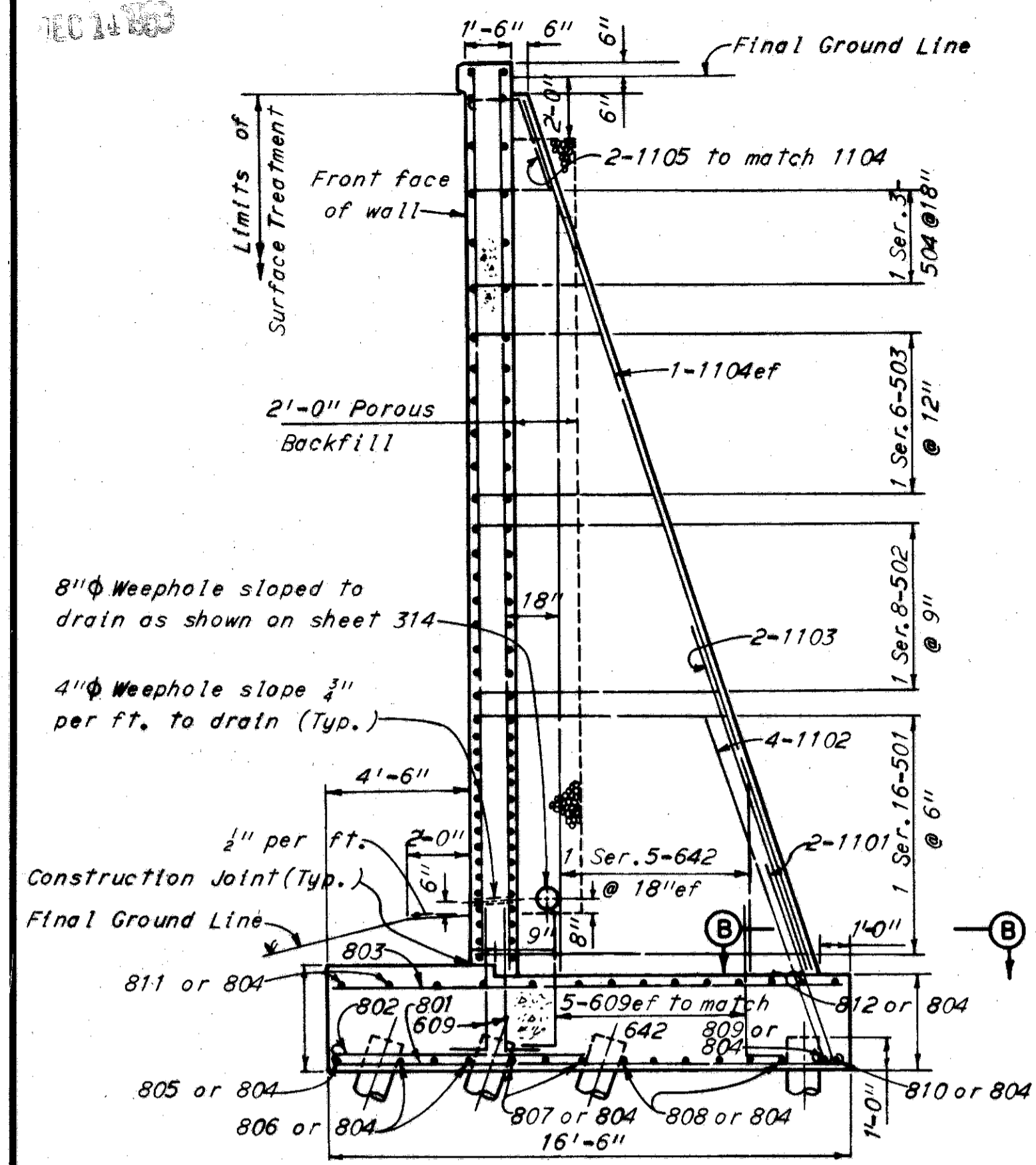
The "Length" shown in the reinforcement schedule for the spiral bars is the distance from the top of the footing to the bottom of the pier cap.  
Four steel channel, tee or angle spacers, weighing approximately 0.68 lbs. per linear foot of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil. The number of pounds of these spacers, based on 0.68 lbs. per linear foot will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.  
Spiral reinforcing bars shall not have deformations but shall in other respects conform to Item S-4.

**BENDING DIAGRAMS**

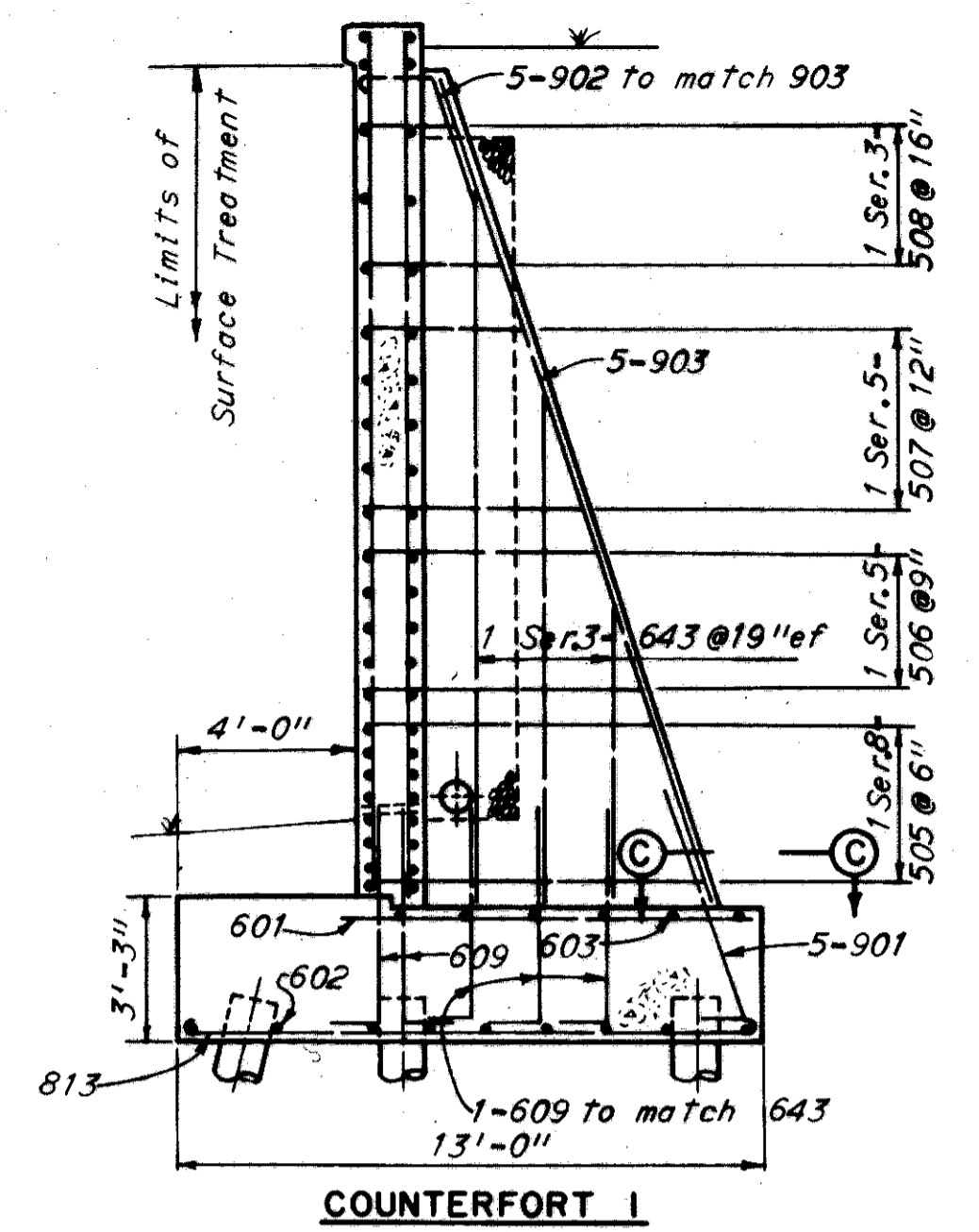




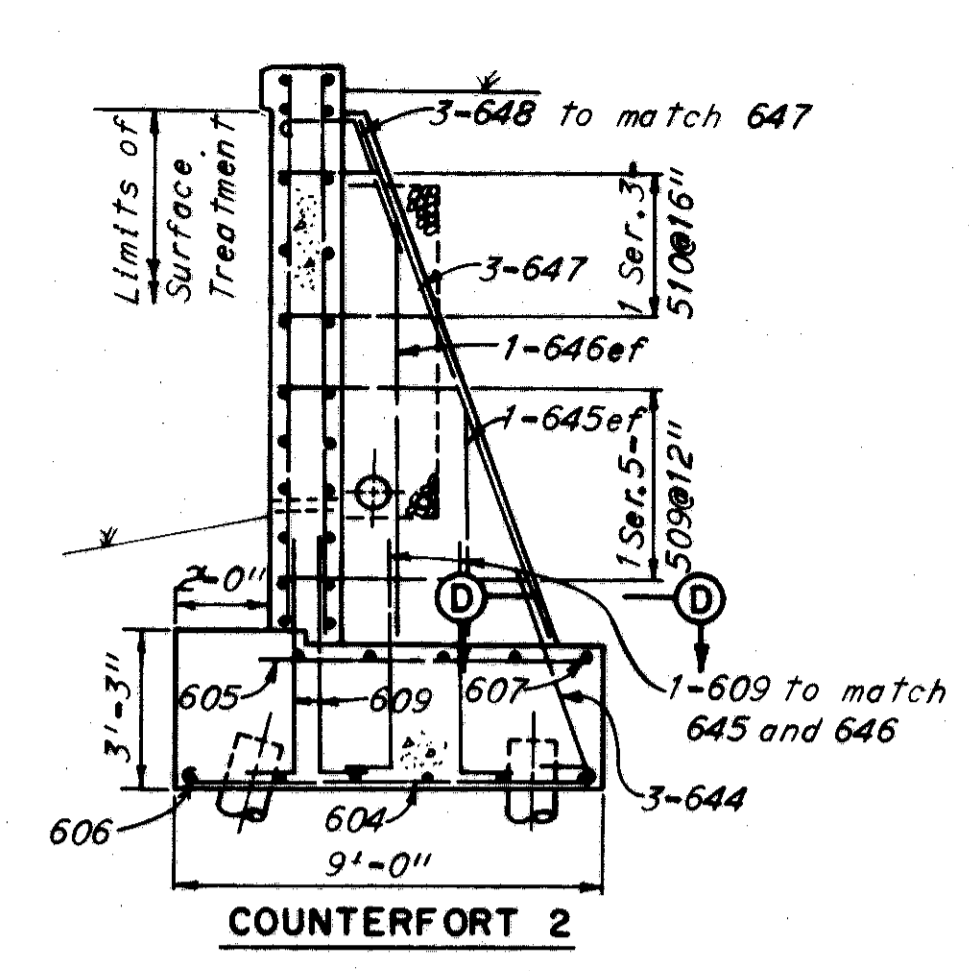
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



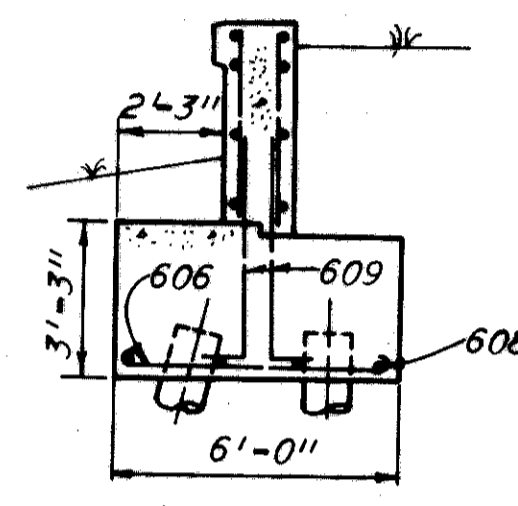
**TYPICAL COUNTERFORT TYPE A**  
 (Dimension and notes are typical for Counterforts 1, 2 and Section A-A except as shown)



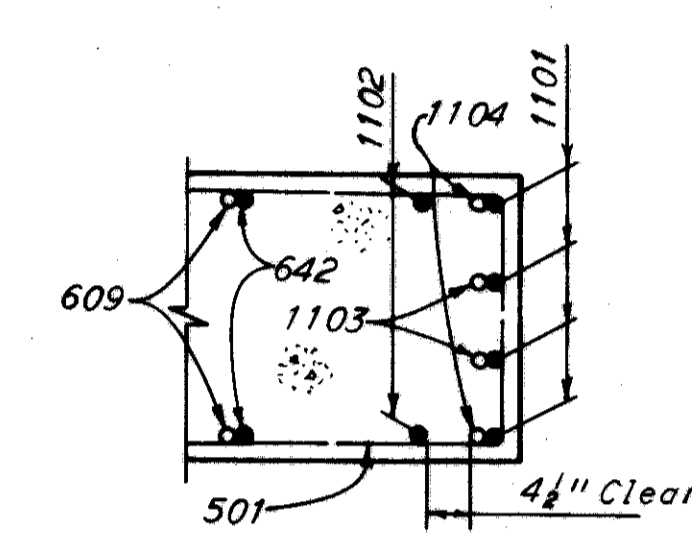
**COUNTERFORT 1**



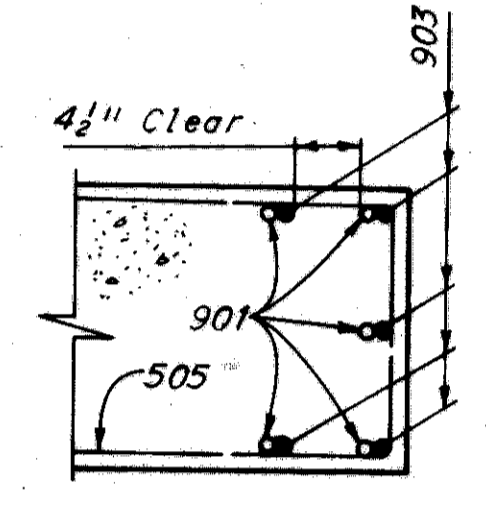
**COUNTERFORT 2**



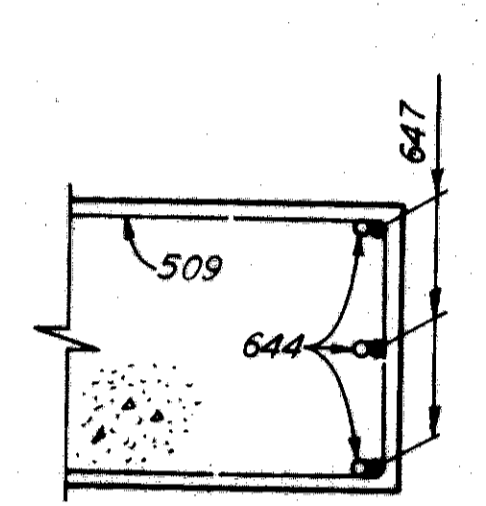
**SECTION A-A**



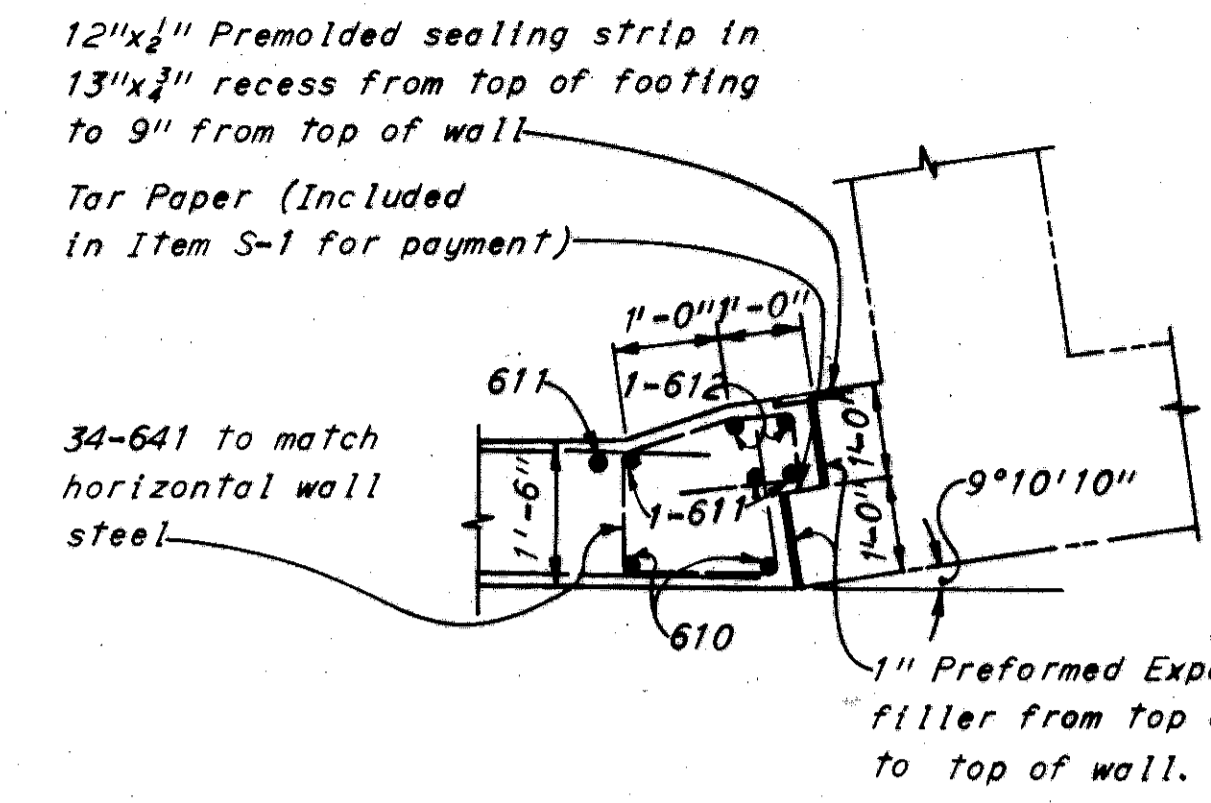
**SECTION B-B**



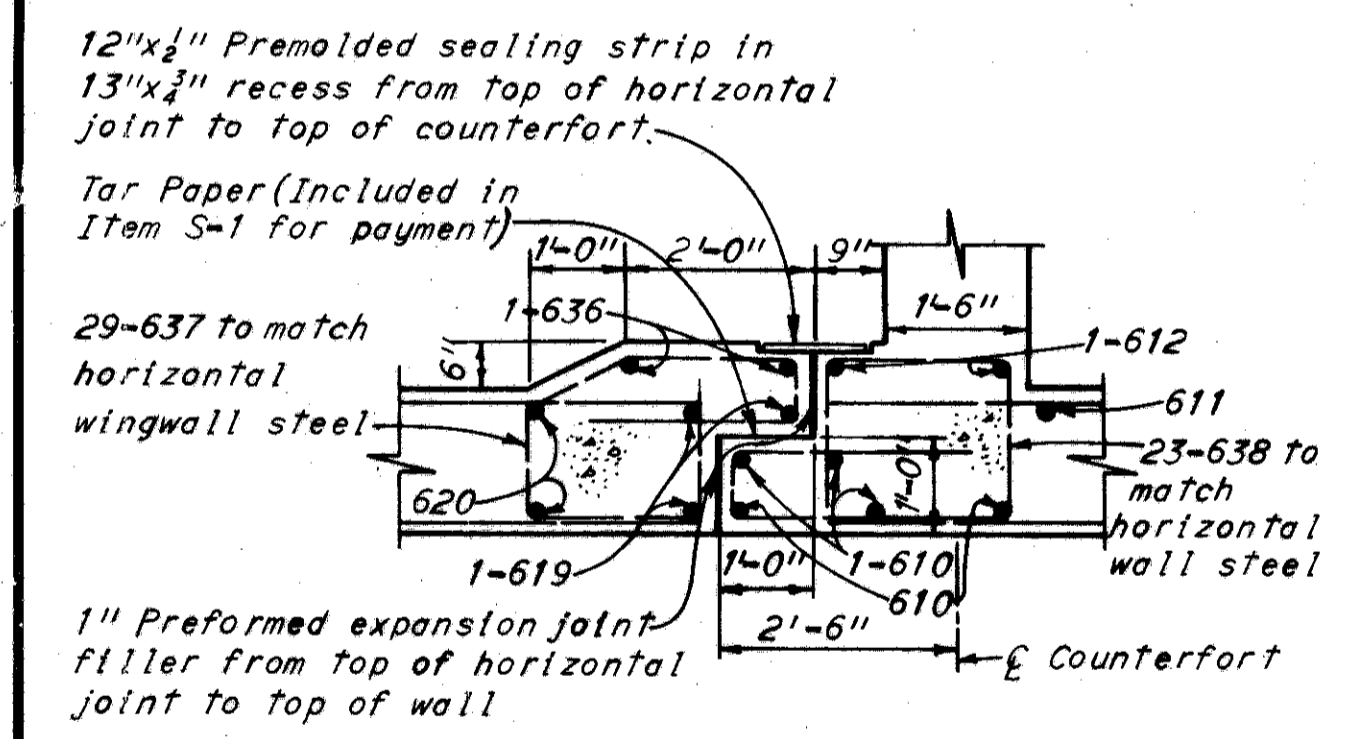
**SECTION C-C**



**SECTION D-D**

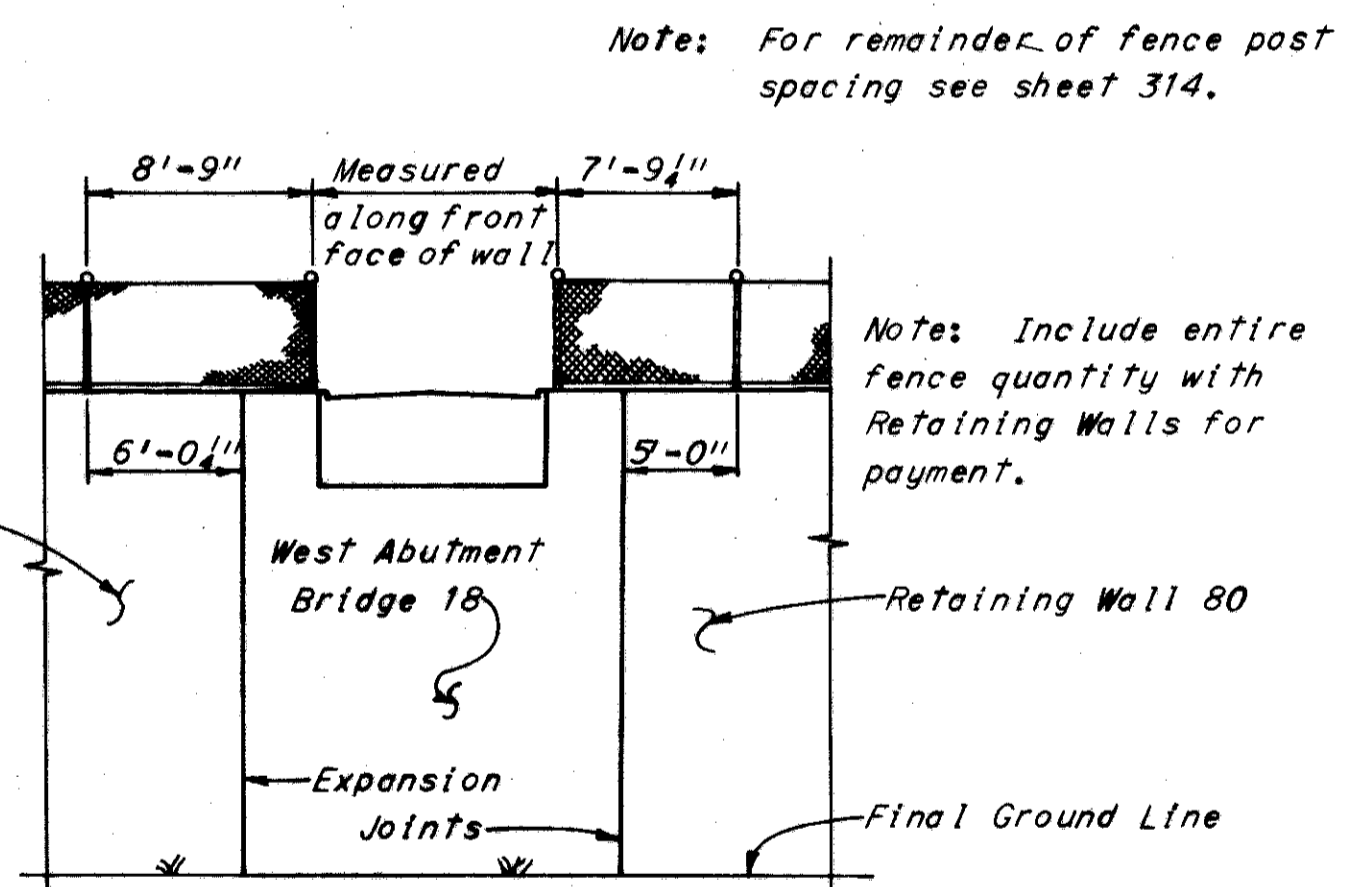


**DETAIL H**

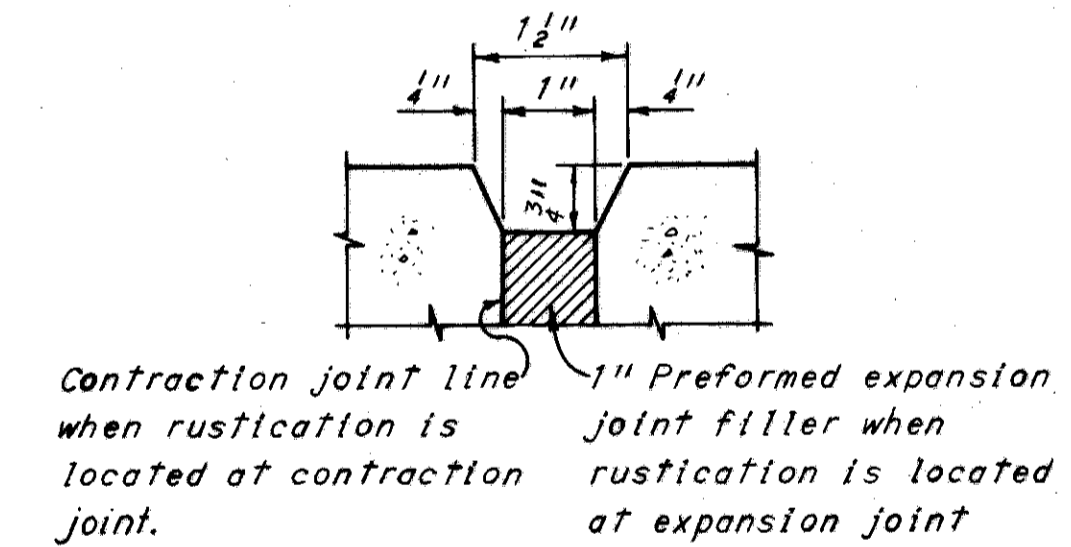


**DETAIL G**

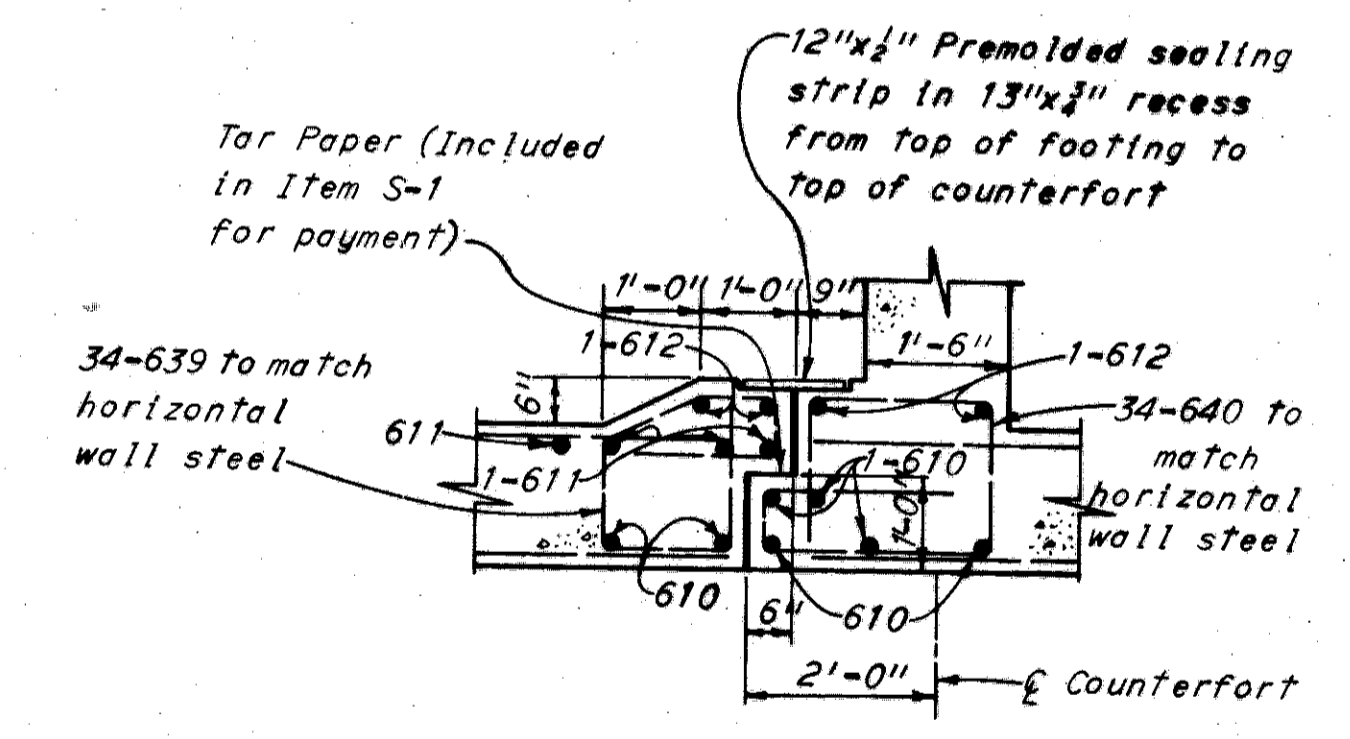
Notes:  
 All reinforcing bar marks shall be prefixed WB.



**FENCE SPACING AT ABUTMENT**  
 (For section showing fence anchorage see sheet 317.)



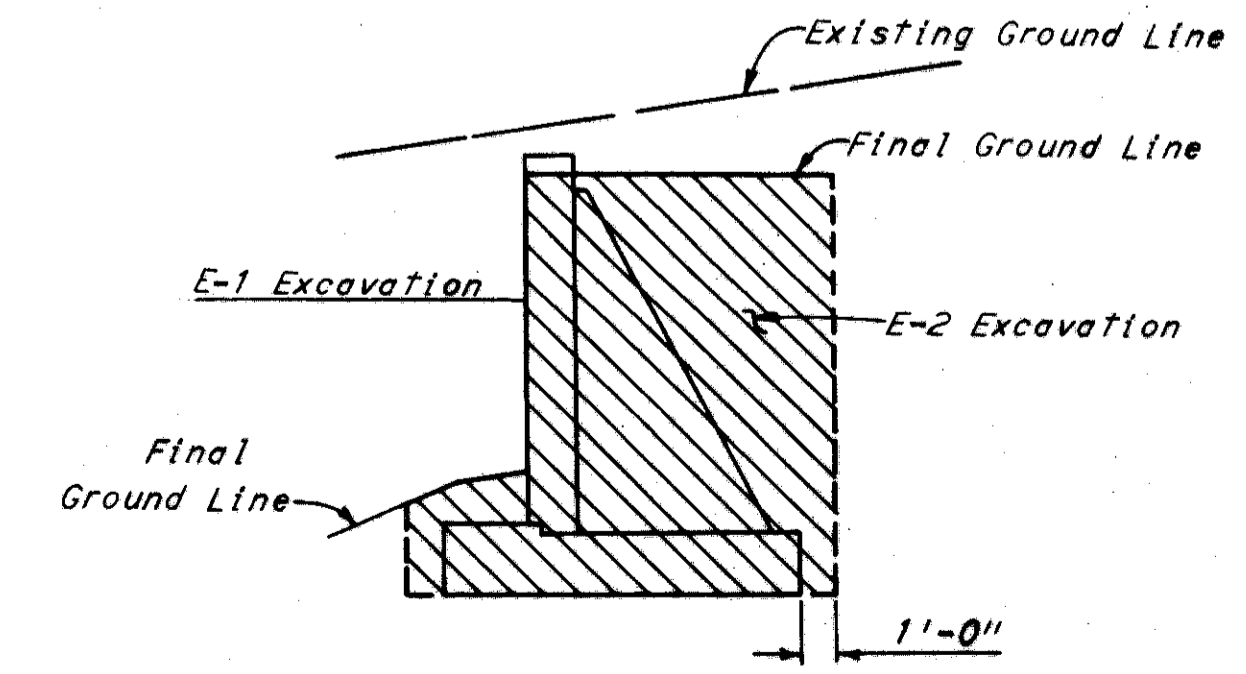
**RUSTICATION DETAIL**



**DETAIL F**

ESTIMATED QUANTITIES-RETAINING WALLS			80	80A
ITEM	DESCRIPTION	UNIT	QUANTITY	QUANTITY
E-2	Cofferdams, Cribbs and Sheeting	Lump Sum	Lump Sum	Lump Sum
E-2	Unclassified Excavation	Cu. Yd.	4,312	812
S-1	Class "C" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	581	149
S-1	Class "E" Concrete, Retaining Wall (Footing)	Cu. Yd.	505	95
S-3	Waterproofing, Preformed Sealing Strip	Lin. Ft.	282	78
S-4	Reinforcing Steel	Pounds	143,154	30,494
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	553	162
S-16	First Test Pile	Lump Sum	Lump Sum	Lump Sum
S-18	12" φ C.I.P. Reinforced Concrete Piles	Lin. Ft.	11,330	2,585
S-29	Porous Backfill	Cu. Yd.	423	91

Fence Quantities carried on Sheet 613  
 Note: Wall Quantities carried to General Summary, sheet 42



**TYPICAL SECTION USED TO DETERMINE UNCLASSIFIED EXCAVATION QUANTITIES**

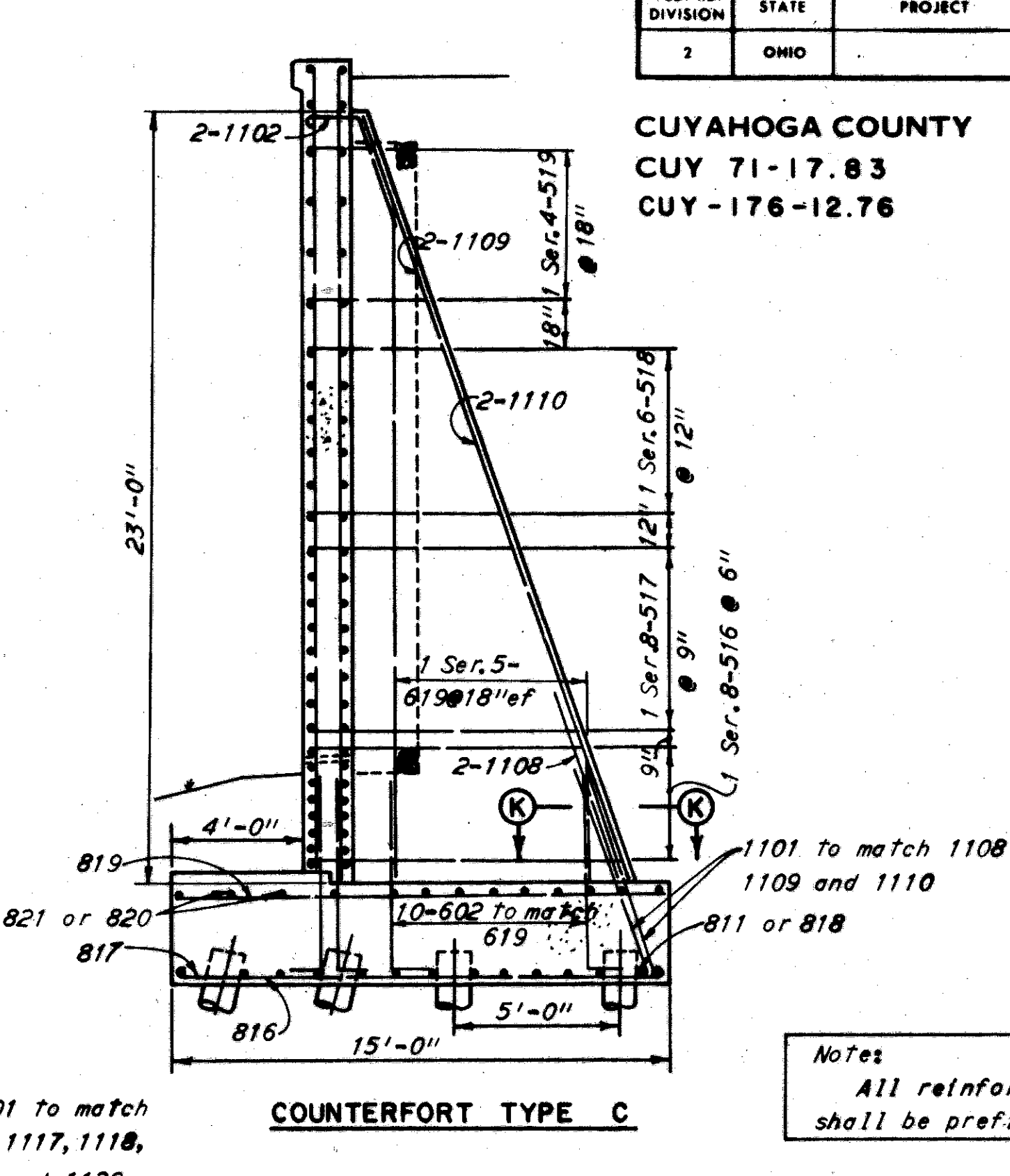
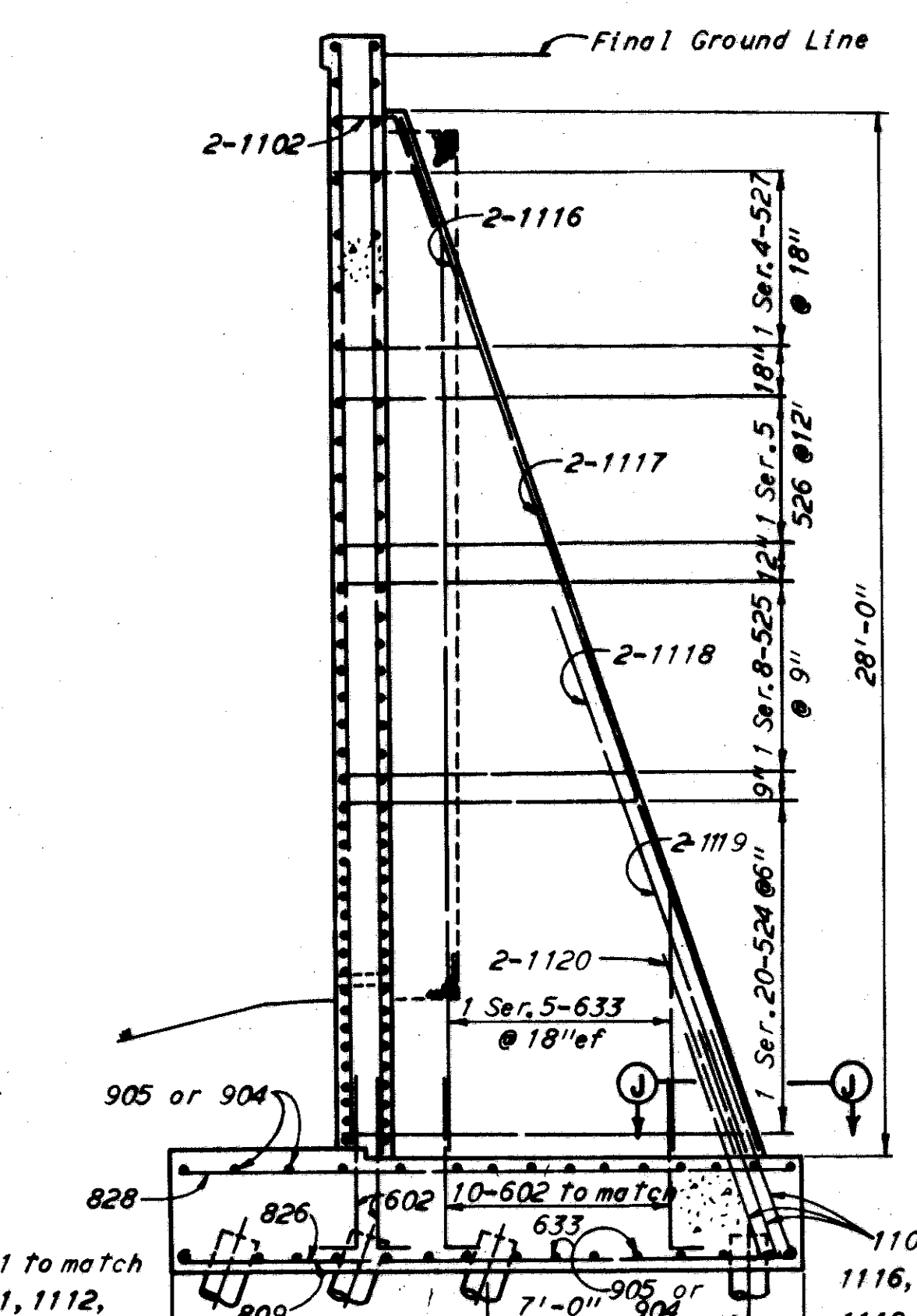
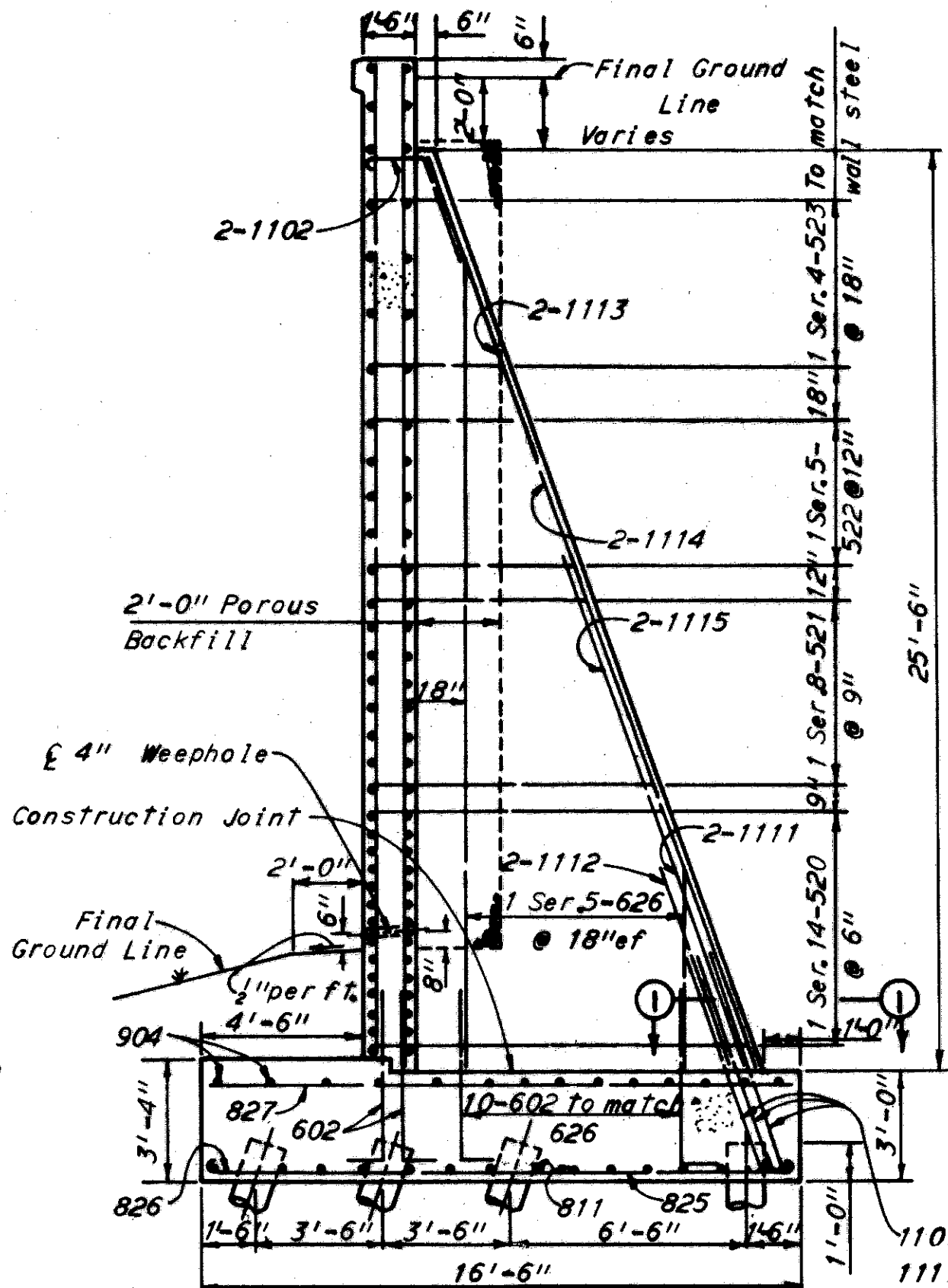
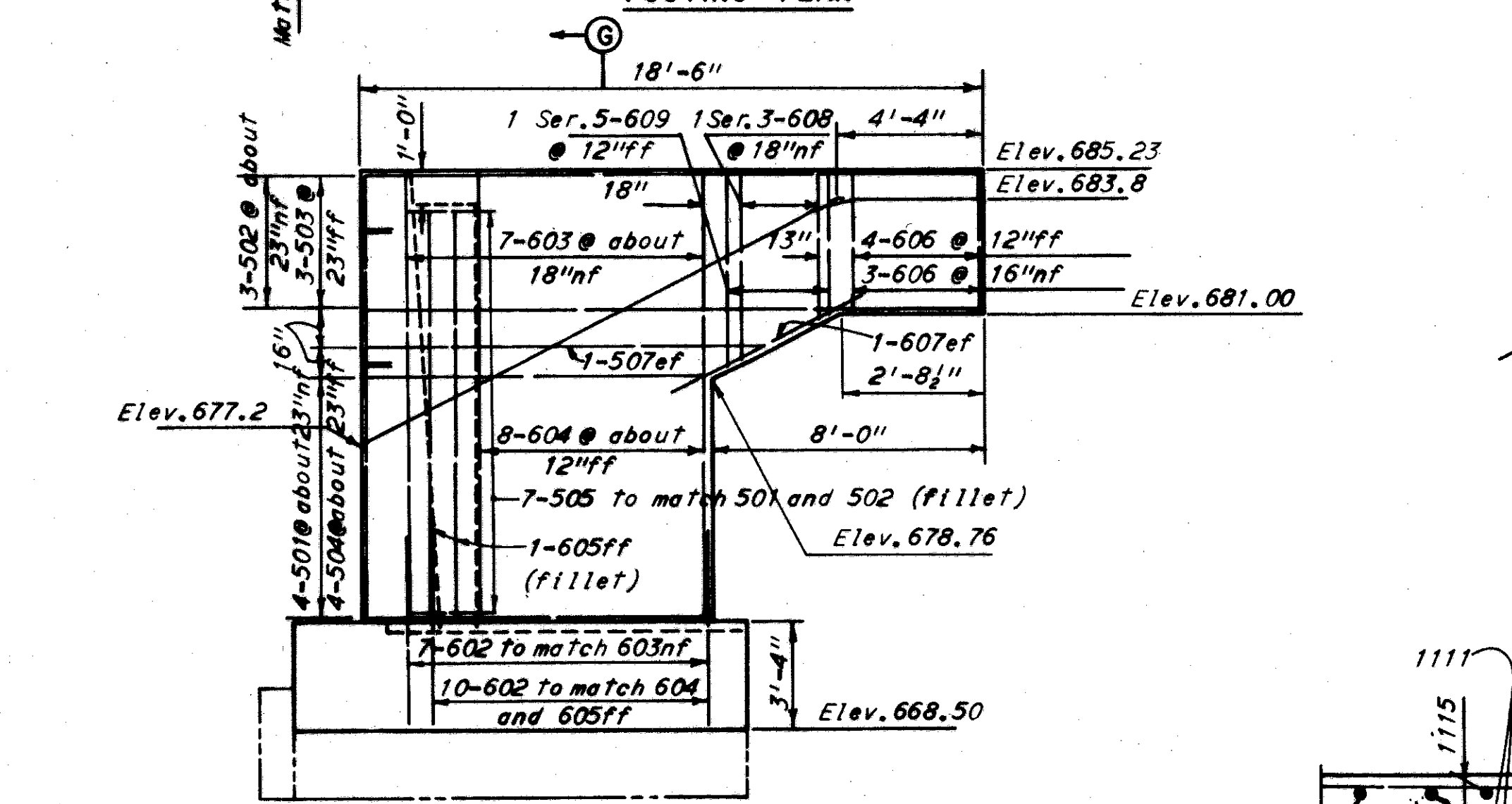
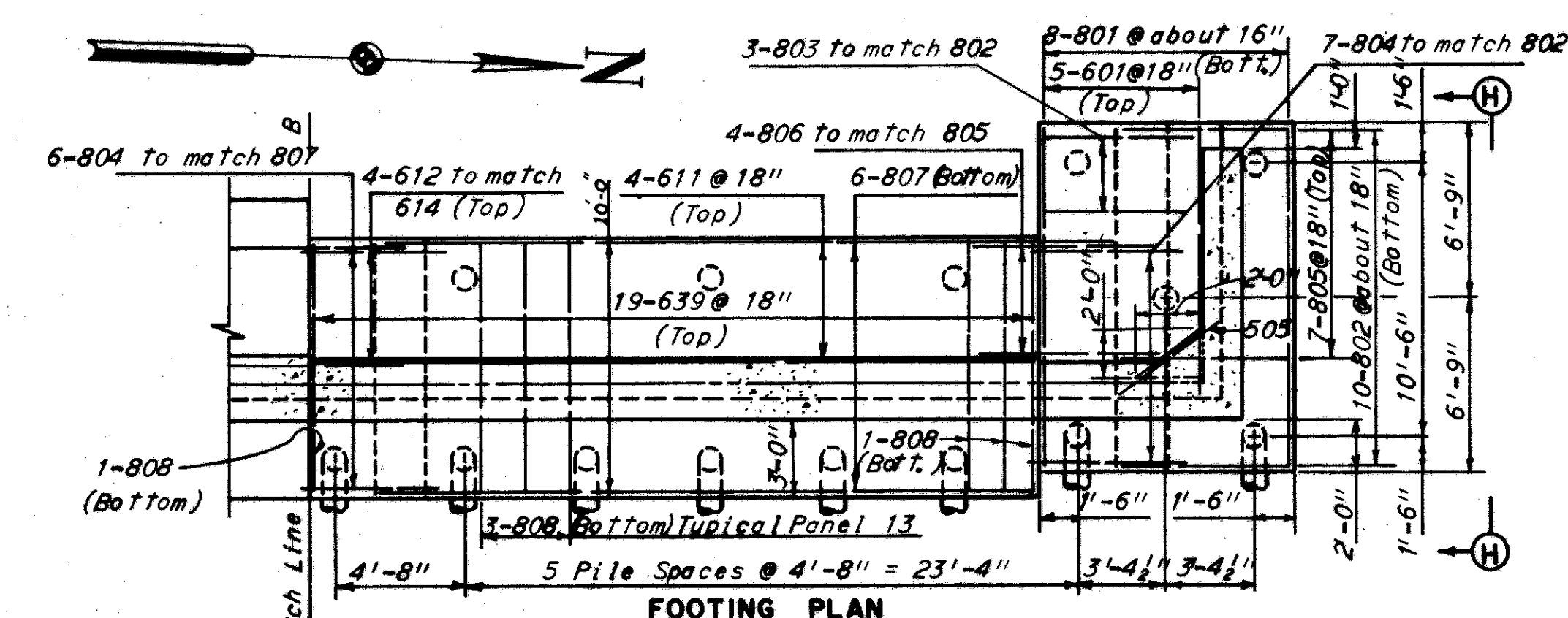
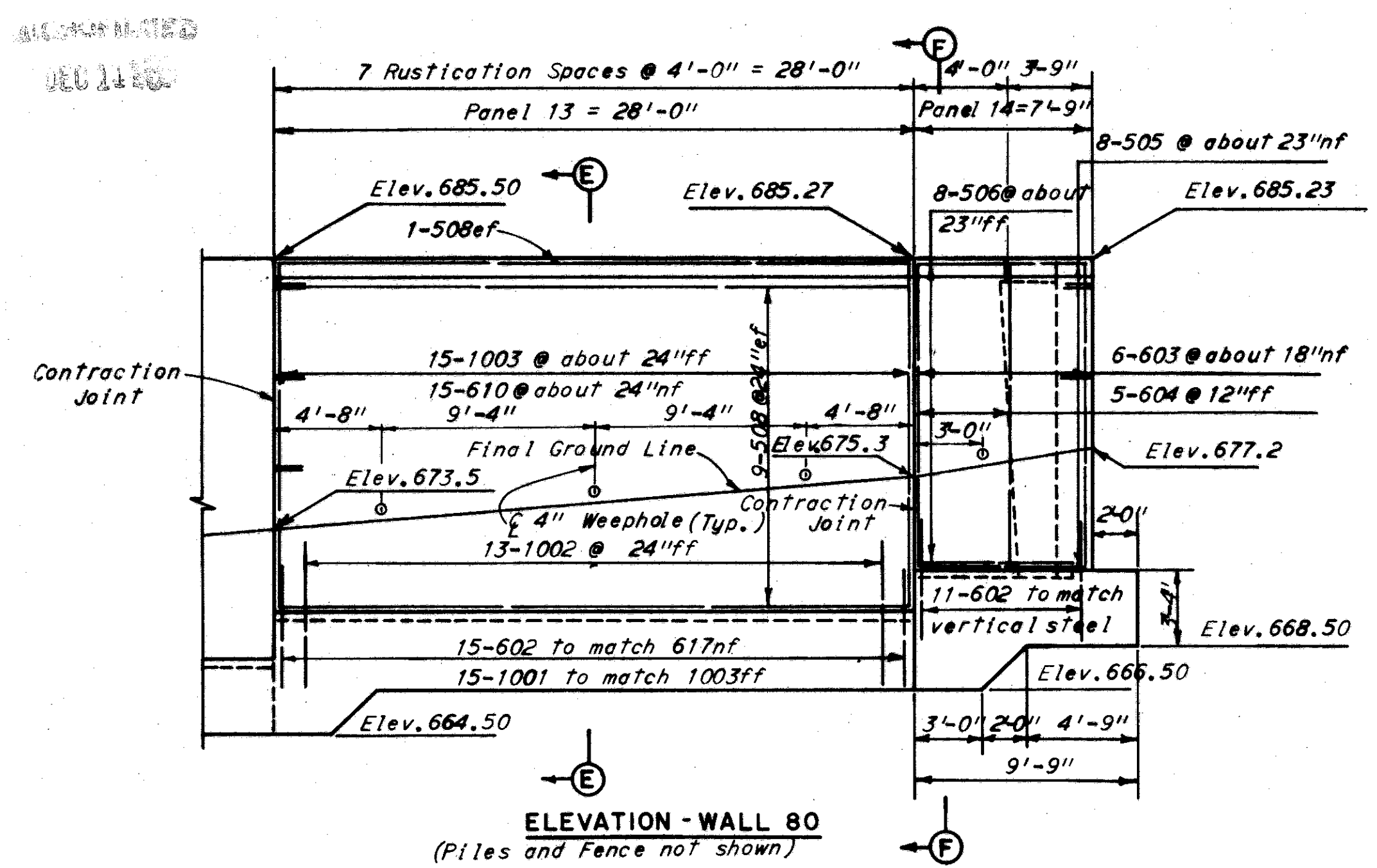
For notes see sheet 315.

This sheet void 12-9-65  
 H.N.T.B. WALL NO. 80 AND 80A  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK  
**WALL AT BUHRER SCHOOL RIGHT OF SOUTHBOUND OUTER ROADWAY**  
 STA. 4 + 50±  
 STA. 8 + 32±  
 CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN: JVG TRACED: WLD CHECKED: WLD REVIEWED: WLD  
 DATE: 7-25-65 DATE: 1-18-65 DATE: 1-29-65  
 SHEET 315

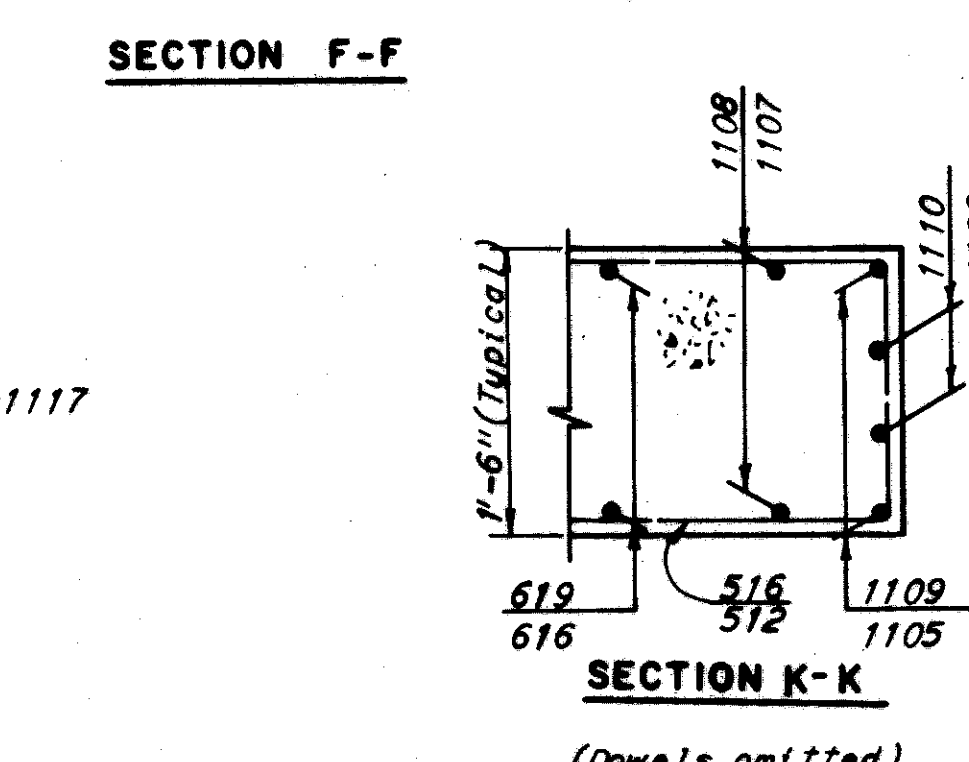
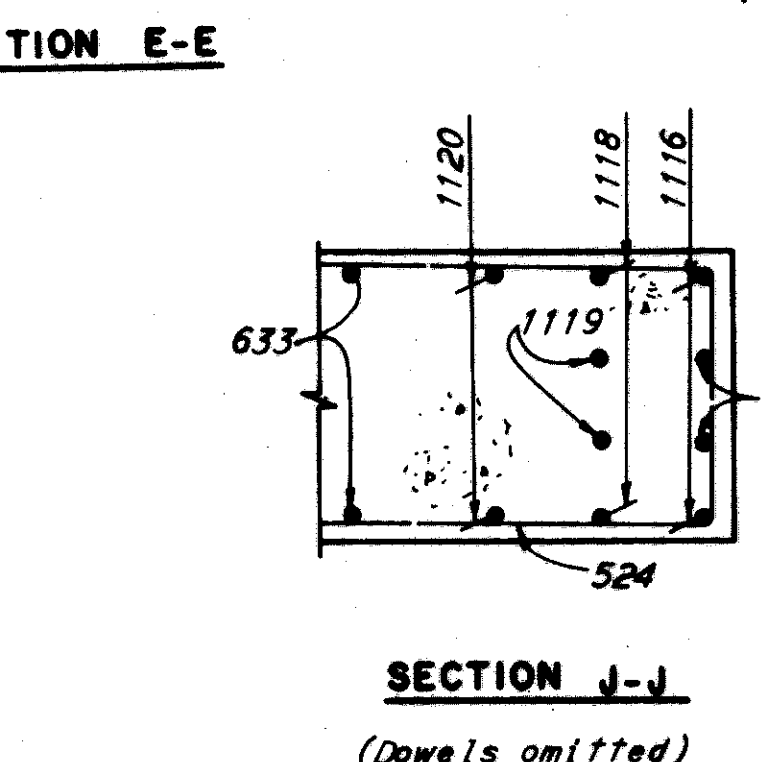
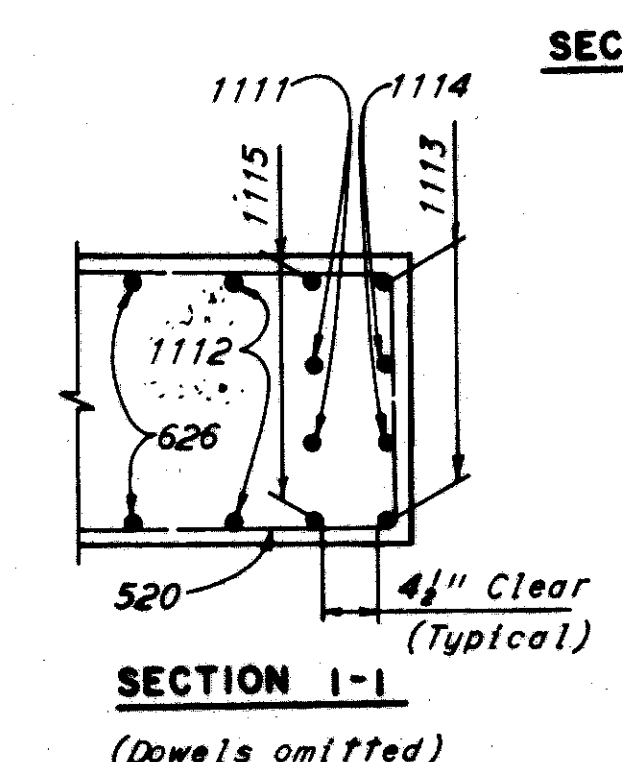
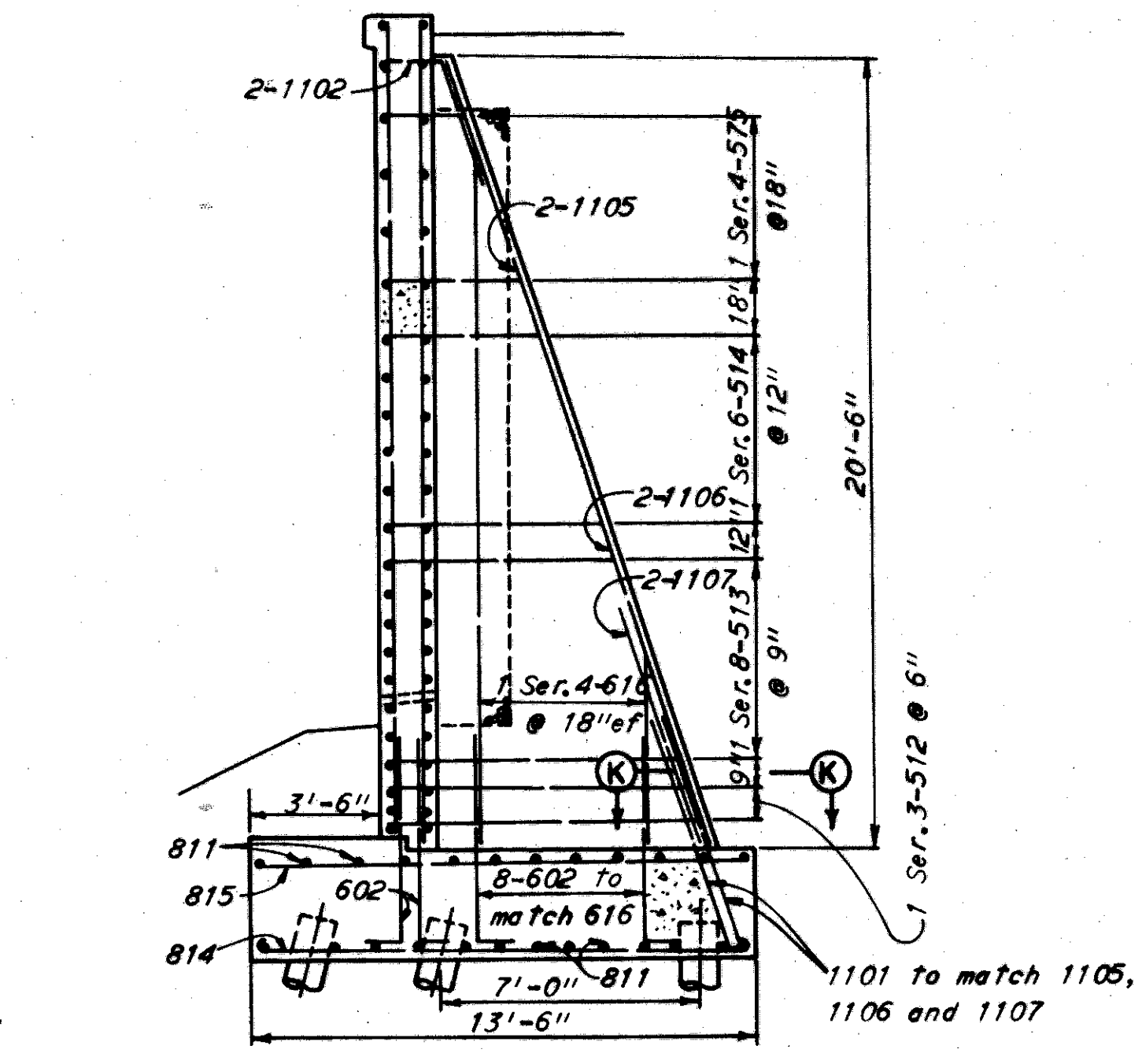
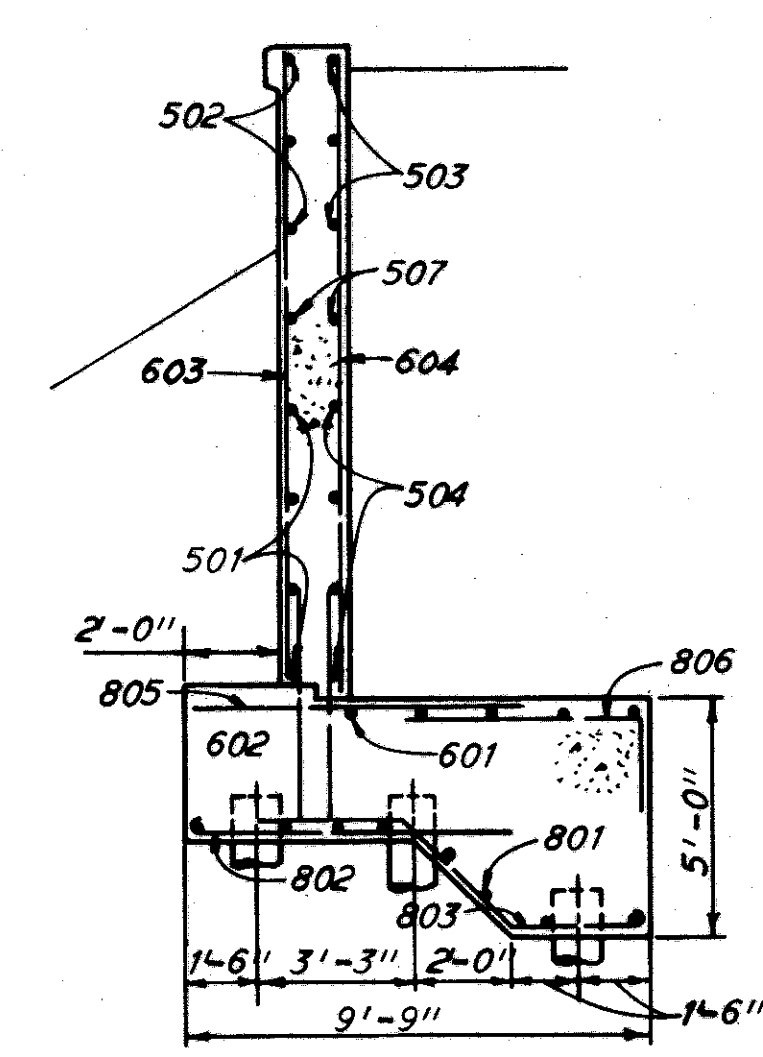
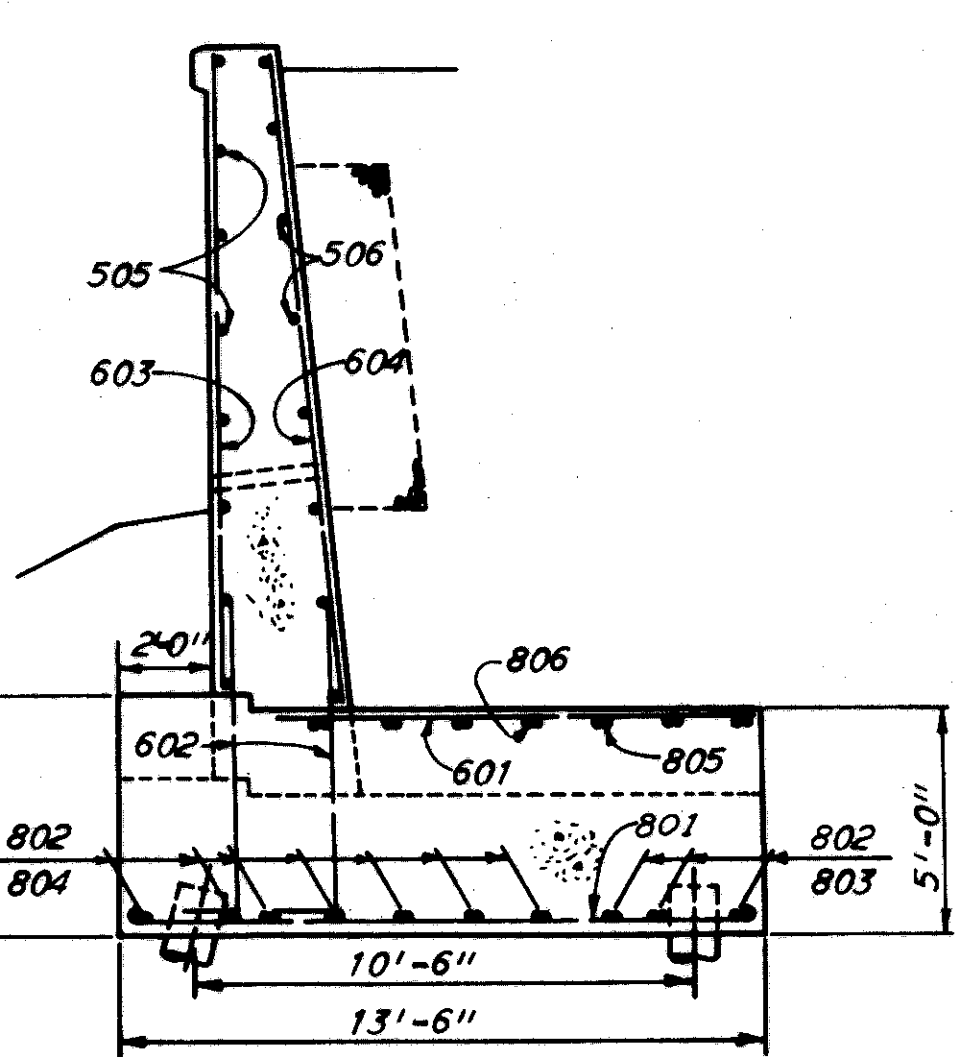
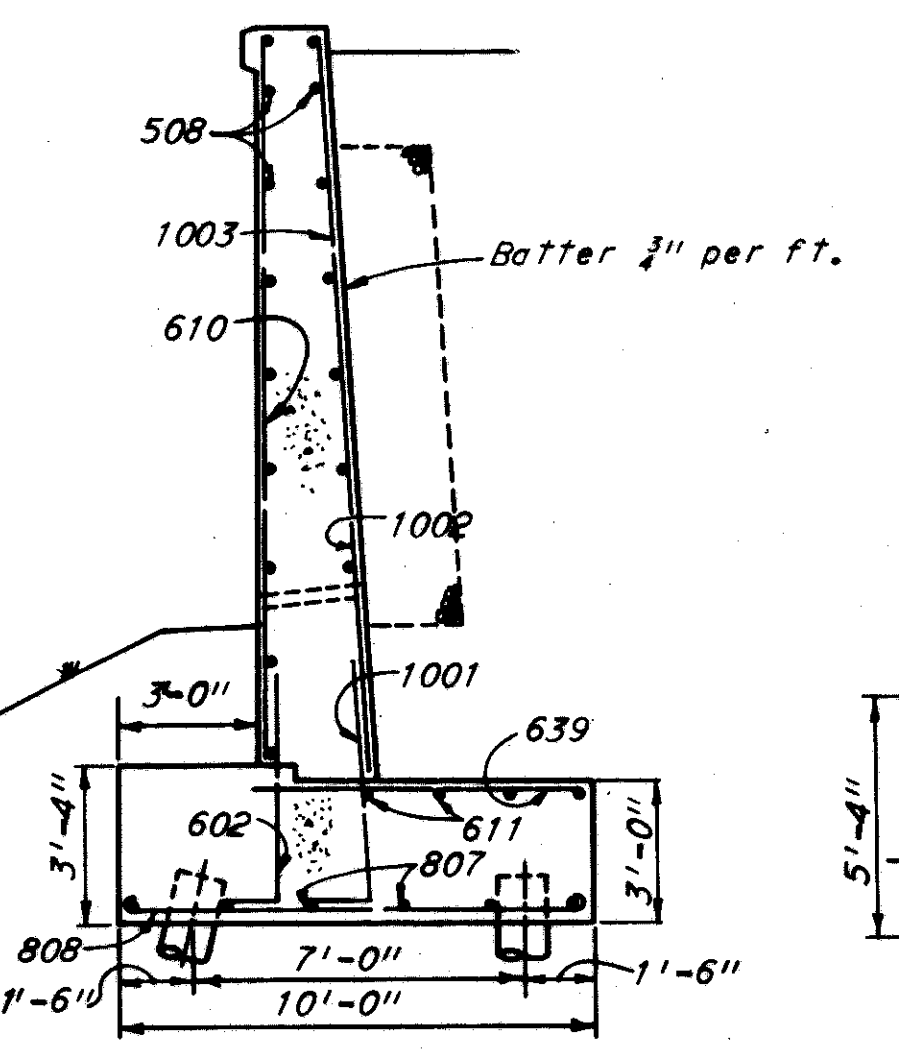




CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Notes  
 All reinforcing bar marks shall be prefixed WA.



This sheet void 12-9-65  
 H.N.T.B. WALL NO. 80 AND 80A

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WALL AT BUHRER SCHOOL RIGHT OF SOUTHBOUND OUTER ROADWAY**

STA. 4+50±  
 STA. 8+32±

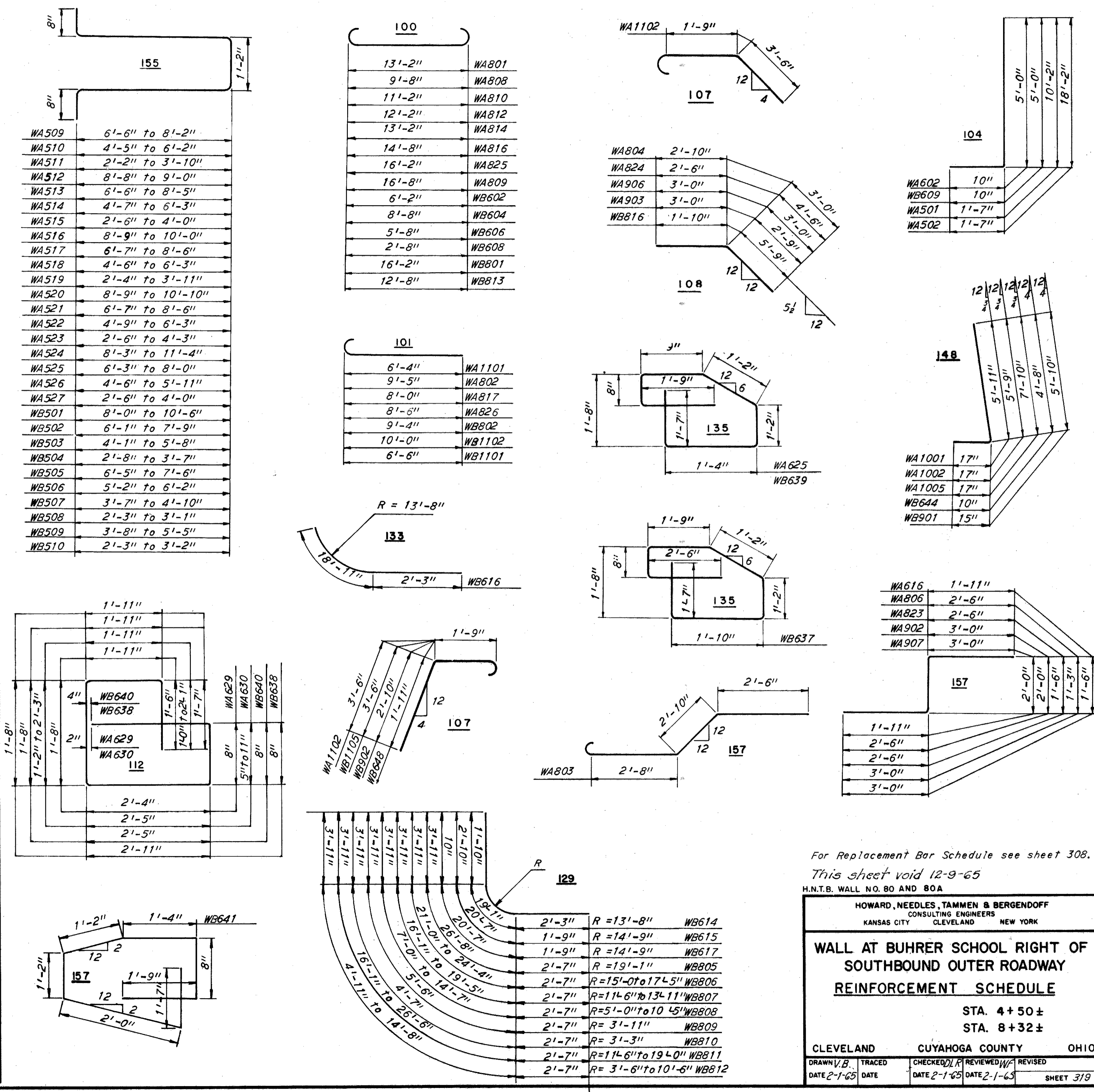
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN	TRACED	CHECKED (RSD)
DATE	DATE	DATE



CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	
<b>WALL NO. 80</b>																		
WA501	4	17'-7"	104		48	WA817	99	27'-9"	STR.		1,333	WB615	11	25'-2"	129		476	
WA502	3	19'-7"	104		61	WA812	19	14'-4"	100		727	WB616	25	21'-2"	133		795	
WA503	3	16'-6"	STR.		52	WA814	19	15'-4"	100		609	WB617	25	23'-2"	129		870	
WA504	4	8'-6"	STR.		35	WA815	19	13'-0"	STR.		778	WB618	72	23'-6"	STR.		2,541	
WA505	7	6'-6"	STR.		47	WA816	40	16'-10"	100		659	WB619	3	22'-9"	STR.		103	
WA506	8	7'-3"	STR.		60	WA817	25	9'-7"	101		1,798	WB620	2 Ser. 3	21'-0"	STR.	10 1/2"	197	
WA507	2	10'-0"	STR.		21	WA818	14	32'-0"	STR.		606	WB621	10	19'-0"	STR.		285	
WA508	40	27'-6"	STR.		1,147	WA819	37	14'-6"	STR.		1,196	WB622	2 Ser. 4	14'-0"	STR.	10"	183	
WA509	2 Ser. 8	15'-0"	55	5 1/2"	278	WA820	13	31'-3"	STR.		1,432	WB623	8	11'-8"	STR.		138	
WA510	2 Ser. 6	10'-10"	55	8 1/2"	157	WA821	13	27'-6"	STR.		1,085	WB624	2 Ser. 5	6'-6"	STR.	10 1/2"	124	
WA511	2 Ser. 3	8'-4"	55	11-5"	50	WA822	2	4'-6"	STR.		955	WB625	12	4'-0"	STR.		72	
WA512	2 Ser. 3	19'-4"	55	4"	123	WA823	13	6'-2"	STR.		24	WB626	2 Ser. 3	2'-9"	STR.	11-3"	36	
WA513	2 Ser. 8	15'-2"	55	6 1/2"	284	WA824	29	7'-0"	STR.		214	WB627	8	5'-9"	STR.		81	
WA514	2 Ser. 6	11'-2"	55	8"	167	WA825	43	18'-4"	100		542	WB628	8	13'-3"	STR.		159	
WA515	2 Ser. 4	7'-0"	55	12"	71	WA826	70	9'-7"	101		2,105	WB629	2 Ser. 4	14'-5"	STR.	11-1 1/2"	193	
WA516	4 Ser. 8	10'-6"	55	4 1/2"	693	WA827	38	16'-0"	STR.		1,791	WB630	2	19'-3"	STR.		58	
WA517	4 Ser. 8	15'-2"	55	6 1/2"	570	WA828	55	16'-6"	STR.		1,623	WB631	6	21'-6"	STR.		194	
WA518	4 Ser. 6	11'-0"	55	8 1/2"	319	WA901	19	8'-8"	STR.		2,423	WB632	2	27'-6"	STR.		83	
WA519	4 Ser. 4	6'-8"	55	12 1/2"	138	WA902	15	6'-9"	STR.		904	WB633	2 Ser. 4	28'-0"	STR.	2'-2"	376	
WA520	4 Ser. 14	10'-6"	55	3 1/2"	1,261	WA903	15	5'-8"	STR.		382	WB634	12	37'-6"	STR.		676	
WA521	4 Ser. 8	15'-2"	55	6 1/2"	570	WA904	58	30'-0"	STR.		344	WB635	8	9'-9"	STR.		174	
WA522	4 Ser. 5	11'-6"	55	9"	271	WA905	60	29'-0"	STR.		289	WB636	2	21'-9"	STR.		65	
WA523	4 Ser. 4	7'-0"	55	15"	148	WA906	15	5'-11"	STR.		5,916	WB637	29	9'-10"	STR.		428	
WA524	6 Ser. 20	18'-6"	55	3 1/2"	2,701	WA907	28	7'-0"	STR.		5,916	WB638	23	10'-6"	STR.		363	
WA525	6 Ser. 8	14'-6"	55	6"	814	WA1001	30	7'-0"	STR.		302	WB639	34	7'-7"	STR.		387	
WA526	6 Ser. 5	11'-0"	55	8 1/2"	389	WA1002	13	6'-10"	STR.		666	WB640	34	9'-4"	STR.		477	
WA527	6 Ser. 4	7'-0"	55	12"	213	WA1003	15	15'-6"	STR.		904	WB641	34	8'-10"	STR.		451	
WA601	5	10'-0"	STR.		75	WA1004	18	17'-9"	STR.		382	WB642	8 Ser. 5	6'-0"	STR.		911	
WA602	552	5'-8"	104		4,698	WA1005	13	8'-11"	STR.		1,000	WB643	2 Ser. 3	5'-6"	STR.		94	
WA603	13	13'-3"	STR.		259	WA1101	146	7'-11"	101		1,375	WB644	3	5'-4"	STR.		24	
WA604	13	13'-6"	STR.		264	WA1102	40	6'-10"	107		499	WB645	2	4'-0"	STR.		12	
WA605	2	12'-6"	STR.		38	WA1103	4	20'-0"	STR.		6,141	WB646	2	8'-3"	STR.		25	
WA606	7	3'-9"	STR.		39	WA1104	4	10'-0"	STR.		1,452	WB647	3	11'-6"	STR.		52	
WA607	2	10'-3"	STR.		31	WA1105	4	5'-3"	STR.		425	WB648	3	4'-4"	STR.		20	
WA608	1 Ser. 3	4'-3"	STR.	6"	21	WA1106	4	11'-9"	STR.		213	WB801	38	18'-4"	100		1,860	
WA609	1 Ser. 5	4'-0"	STR.	4 1/2"	36	WA1107	4	11'-9"	STR.		250	WB802	22	10'-5"	101		612	
WA610	15	15'-3"	STR.		344	WA1108	8	7'-9"	STR.		112	WB803	36	16'-0"	STR.		1,538	
WA611	13	28'-6"	STR.		556	WA1109	8	24'-6"	STR.		329	WB804	29	21'-3"	STR.		1,645	
WA612	4	5'-6"	STR.		33	WA1110	8	14'-6"	STR.		329	WB805	1	33'-2"	STR.		89	
WA613	4 Ser. 4	3'-3"	STR.		240	WA1111	8	7'-9"	STR.		1,041	WB806	1 Ser. 3	27'-6"	STR.		234	
WA614	18	19'-6"	STR.		527	WA1112	8	3'-9"	STR.		616	WB807	1 Ser. 3	22'-7"	STR.		196	
WA615	18	19'-9"	STR.		534	WA1113	8	27'-0"	STR.		329	WB808	1 Ser. 6	13'-6"	STR.		277	
WA616	4 Ser. 4	4'-9"	STR.		273	WA1114	8	20'-3"	STR.		159	WB809	1	12'-0"	STR.		32	
WA617	18	21'-9"	STR.		588	WA1115	8	14'-9"	STR.		1,148	WB810	1	11'-1"	STR.		30	
WA618	18	22'-0"	STR.		595	WA1116	12	29'-6"	STR.		861	WB811	1 Ser. 6	22'-7"	STR.		445	
WA619	8 Ser. 5	3'-0"	STR.		706	WA1117	12	20'-6"	STR.		627	WB812	1 Ser. 8	11'-5"	STR.		348	
WA620	36	24'-0"	STR.		1,298	WA1118	12	14'-3"	STR.		1,881	WB813	7	14'-10"	STR.		277	
WA621	36	24'-3"	STR.		1,311	WA1119	12	8'-9"	STR.		1,307	WB814	4	11'-6"	STR.		123	
WA622	15	17'-6"	STR.		394	WA1120	12	5'-3"	STR.		909	WB815	4	13'-0"	STR.		192	
WA623	18	25'-9"	STR.		696	WA1121	4	21'-9"	STR.		558	WB816	4	7'-7"	STR.		81	
WA624	18	26'-0"	STR.		703	WA1122	4	21'-9"	STR.		335	WB901	5	6'-10"	STR.		176	
WA625	271	7'-7"	STR.		3,087	WA1123	4	21'-9"	STR.		462	WB902	5	5'-10"	STR.		99	
WA626	8 Ser. 5	6'-0"	STR.		864	WA1124	4	21'-9"	STR.		335	WB903	5	19'-3"	STR.		327	
WA627	18	27'-3"	STR.		737	<b>WALL NO. 80A</b>												
WA628	18	27'-6"	STR.		743	WB501	4 Ser. 16	10'-0"	STR.		1,368	WB1101	16	8'-1"	101		687	
WA629	270	9'-5"	STR.		3,819	WB502	4 Ser. 8	14'-2"	STR.		526	WB1102	8	11'-7"	101		492	
WA630	1 Ser. 19	10'-11"	STR.	1 1/2"	273	WB503	4 Ser. 6	10'-2"	STR.		294	WB1103	8	14'-9"	STR.		627	
WA631	18	28'-9"	STR.		777	WB504	4 Ser. 3	7'-4"	STR.		103	WB1104	8	28'-9"	STR.		1,222	
WA632	18	29'-0"	STR.		784	WB505	1 Ser. 8	14'-0"	STR.		129	WB1105	8	6'-8"	STR.		283	
WA633	12 Ser. 5	6'-10"	STR.		1,423	WB506	1 Ser. 5	12'-4"	STR.		70	<b>TOTAL WEIGHT</b>						30,494
WA634	22	29'-9"	STR.		983	WB507	1 Ser. 5	8'-2"	STR.		54							
WA635	21	30'-0"	STR.		946	WB508	1 Ser. 3	6'-6"	STR.		23							
WA636	1 Ser. 11	28'-3"	STR.	1 1/2"	476	WB509	1 Ser. 5	9'-4"	STR.		58							
WA637	1 Ser. 11	28'-6"	STR.	1 1/2"	483	WB510	1 Ser. 3	6'-6"	STR.		23							
WA638	1	28'-3"	STR.		42	WB601	5	9'-3"	STR.		69							
WA639	19	9'-6"	STR.		271	WB602	9	7'-6"	STR.		101							
WA701	570	27'-6"	STR.		32,040	WB603	6	6'-0"	STR.		54							
WA801	8	15'-4"	100		328	WB604	7	10'-0"	STR.		105							
WA802	10	10'-6"	101		280	WB605	5	7'-0"	STR.		53							
WA803	3	8'-11"	157		71	WB606	10	7'-0"	STR.		105							
WA804	43	5'-9"	108		660	WB607	5	5'-6"	STR.		41							
WA805	7	9'-3"	STR.		173	WB608	4	4'-0"	STR.		24							
WA806	36	6'-8"	118		641	WB609	143	5'-8"	STR.		1,217							
WA807	6	29'-0"	STR.		465	WB610	31	28'-3"	STR.		1,315							
WA808	19	11'-10"	100		600	WB611	28	28'-6"	STR.		1,199							
WA809	67	18'-10"	100		3,369	WB612	8	27'-6"	STR.		330							
WA810	19	13'-4"	100		676	WB613	2	5'-0"	STR.		15							
						WB614	11	23'-2"	STR.		383							

**BENDING DIAGRAMS**



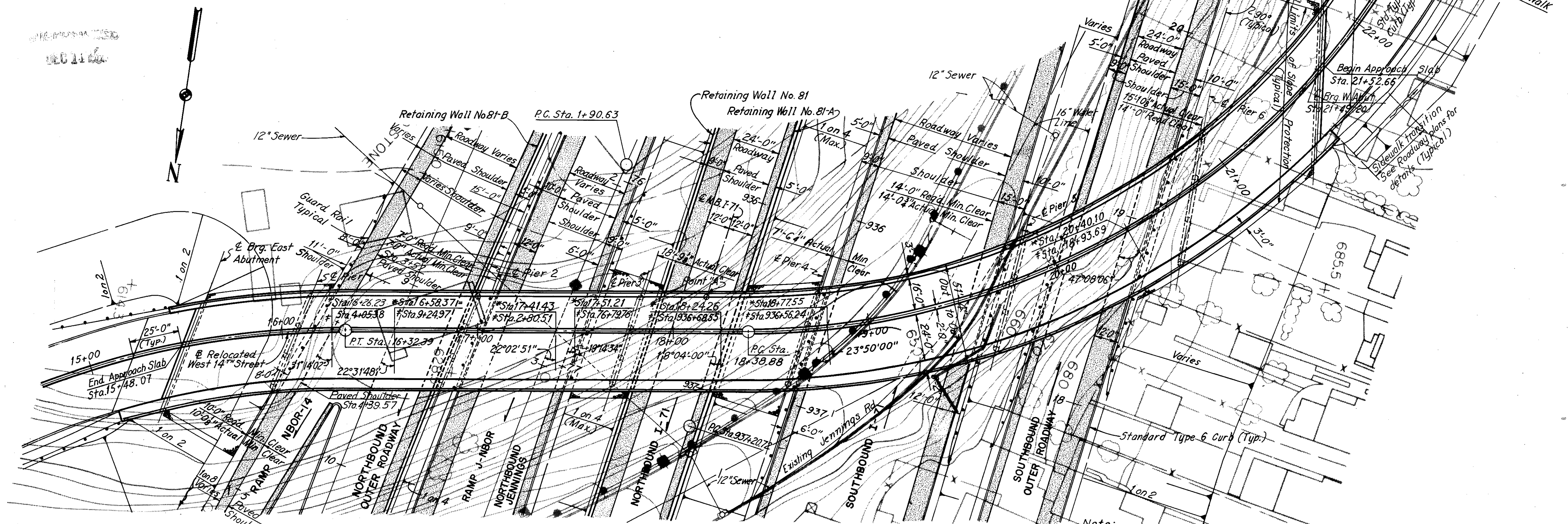
CURVE DATA

NORTHBOUND OUTER ROADWAY	RAMP J-NBOR	NORTHBOUND JENNINGS	NORTHBOUND I-71	RELOCATED WEST 14TH STREET	WEST 14TH STREET
P.I. = Sta. 12+04.74 Δ = 20°45'45" D = 2°00'00" Lt. R = 2864.79 T = 524.82 L = 1038.12 E = 47.68	P.I. Sta. 7+03.56 Δ = 15°17'47" D = 1°30'00" Lt. R = 3819.72 T = 512.93 L = 1019.77 E = 34.29	P.I. Sta. 79+15.83 Δ = 15°17'47" D = 1°30'00" Lt. R = 3819.72 T = 512.93 L = 1019.77 E = 34.29	P.I. Sta. 944+47.79 Δ = 10°52'24" D = 0°45'00" Lt. R = 7639.42 T = 727.07 L = 1449.78 E = 34.52	P.I. Sta. 13+87.17 Δ = 83°26'17" D = 13°11'38" R R = 434.26 T = 387.17 L = 632.39 E = 147.53	P.I. Sta. 21+51.44 Δ = 78°15'07" D = 14°54'39" L R = 384.26 T = 312.57 L = 524.80 E = 111.07

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

320  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



**PROPOSED STRUCTURE**

TYPE: Continuous welded girder with reinforced concrete deck and substructure.  
 SPANS: 56'-6", 86'-6", 84'-0", 89'-6", 105'-0", 100'-0" and 77'-0" measured along @ Relocated W. 14<sup>th</sup> Street.  
 ROADWAY: 42'-0" curb/curb with one 5'-0" sidewalk, one 2'-0" safety curb, and a 2'-0" raised median.  
 LOAD FREQUENCY: CF 2000 (57)

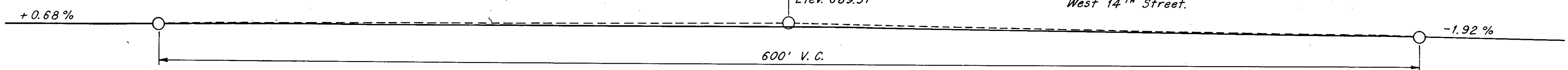
SKIEW: Varies  
 WEARING SURFACE: 1" Monolithic Concrete.  
 APPROACH SLABS: AS-1-54 (25'-0" long)  
 ALIGNMENT: 13°11'38" Right, Tangent, 14°54'39" Left

TRAFFIC DATA: 1975 A.D.T. = 12,200 S.B. ; 1,500 N.B.

PLAN

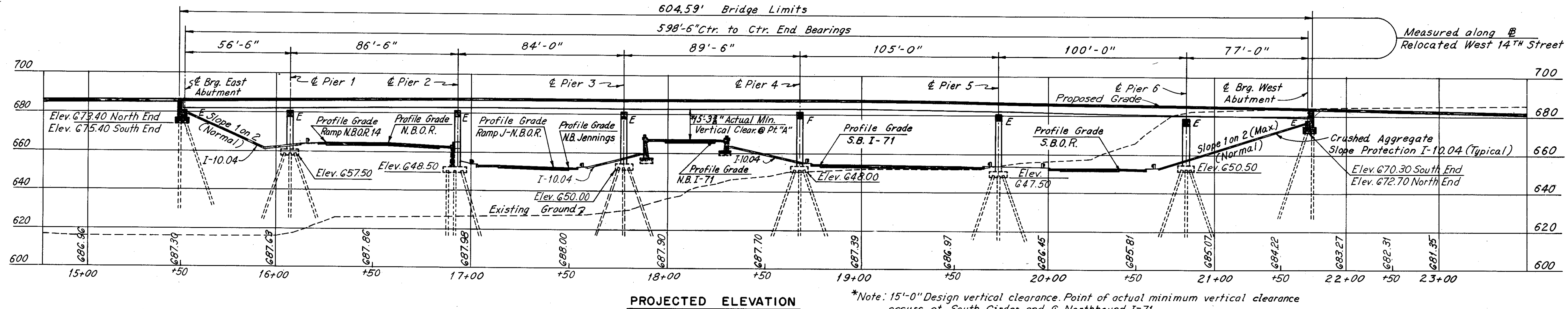
Scale: 1" = 30'-0"

P.V.I. Sta. 18+75  
Elev. 689.51



PROFILE

Scale 1" = 30'-0"



PROJECTED ELEVATION

\*Note: 15'-0" Design vertical clearance. Point of actual minimum vertical clearance occurs at South Girder and @ Northbound I-71.

Note:  
 Piers at the East Abutment and Piers 1, 2 and 3 are 12BP53.  
 Piers at Piers 4, 5, 6 and the West Abutment are 12" # C.I.P. Reinforced Concrete. Estimated average vertical lengths are as follows:  
 East Abutment 140'  
 Pier 1 126'  
 Pier 2 117'  
 Pier 3 119'  
 Pier 4 85'  
 Pier 5 75'  
 Pier 6 65'  
 West Abutment 70'

Note: For light standard support locations see sheet 476.A.

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KANSAS CITY CLEVELAND NEW YORK

**SITE PLAN**

I-71 UNDER RELOCATED WEST 14<sup>TH</sup> STREET

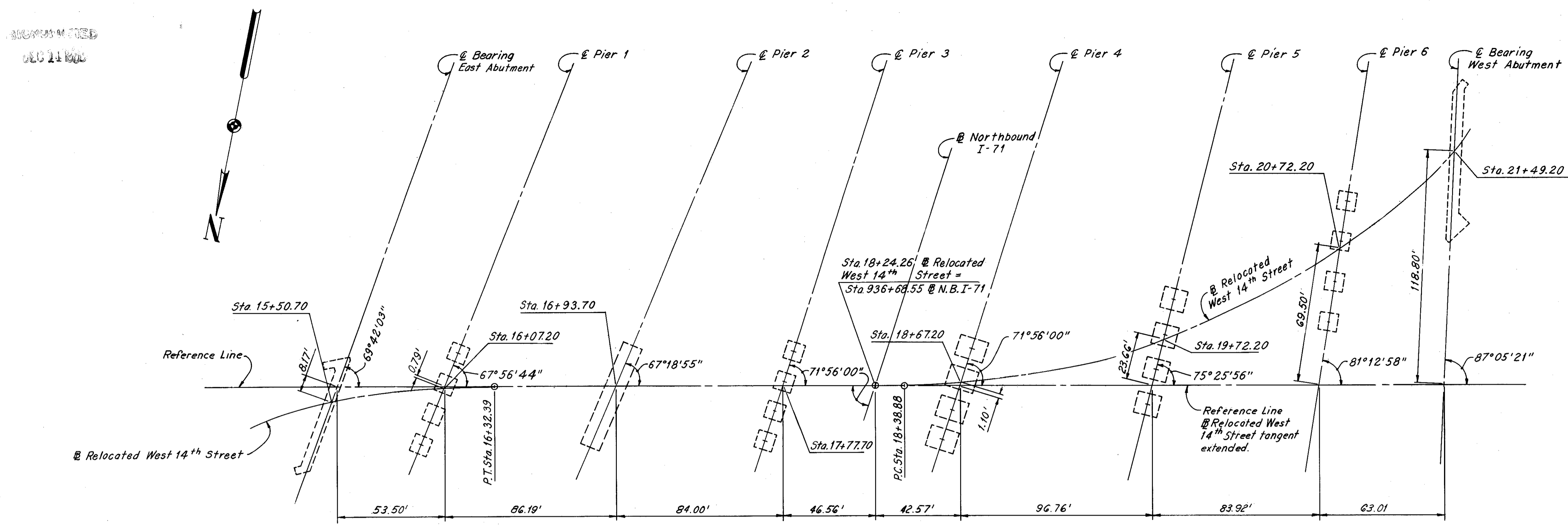
BR. NO. CUY-71-1826 STA. 15+ 48.07  
STA. 21+ 52.66

CLEVELAND CUYAHOGA COUNTY OHIO

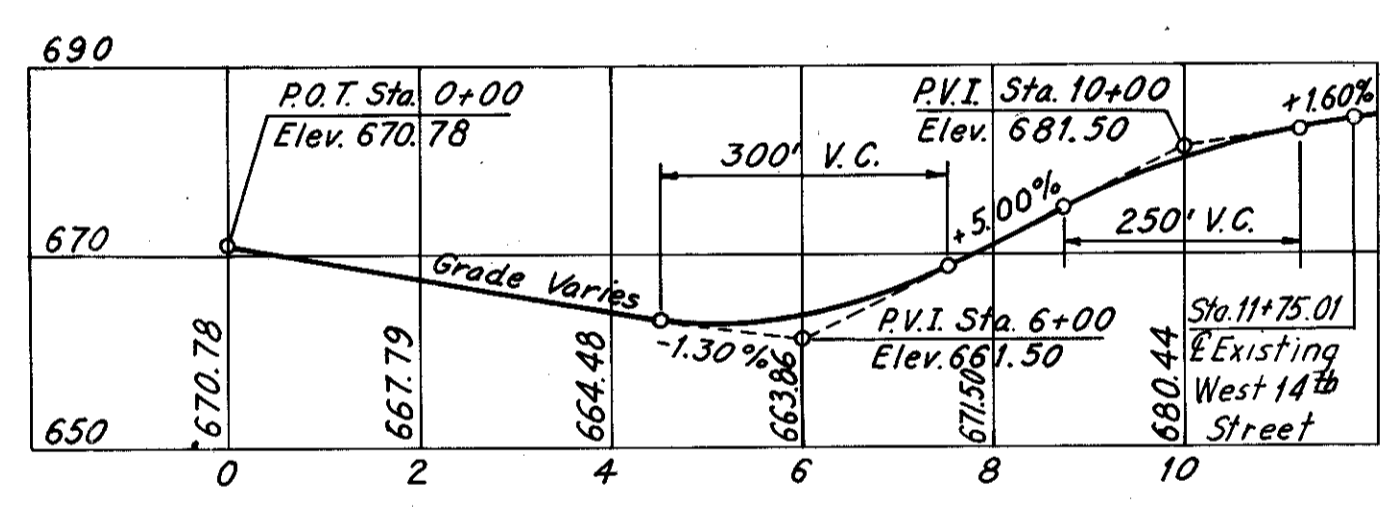
DRAWN: GAB TRACED: C.P. CHECKED: GAB REVIEWED: JWF  
DATE: 2-64 DATE: 2-18-64 DATE: 10-30-64 DATE: 12-28-64

H. N. T. B. BRIDGE NO. 19 SHEET 320

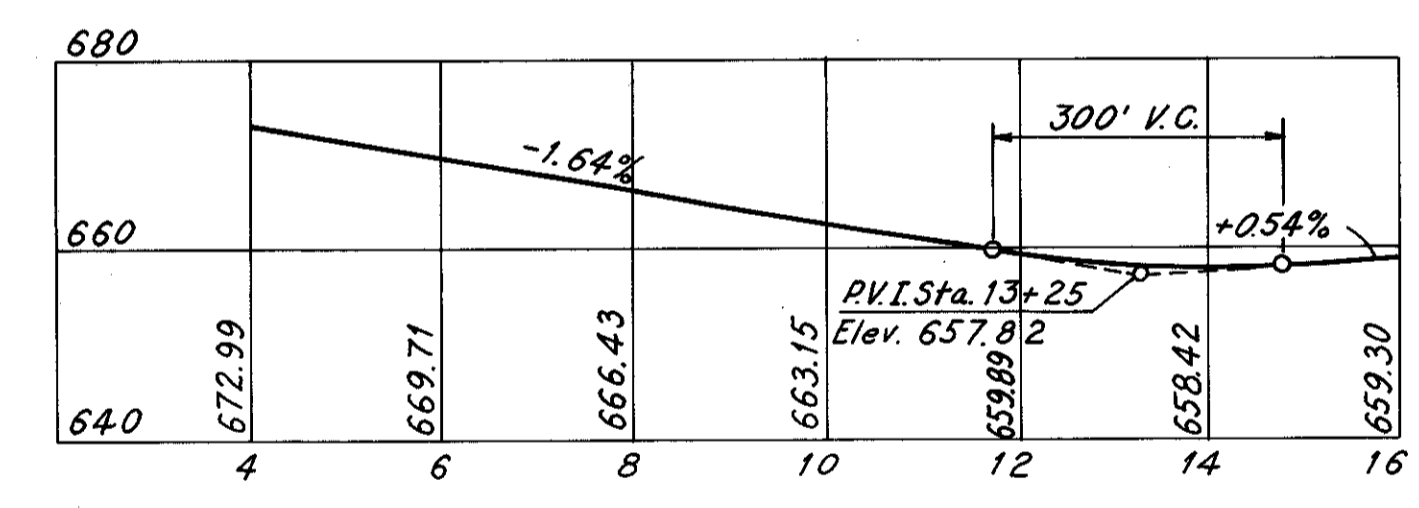
CUYAHOGA COUNTY  
 CUY - 71-17.83  
 CUY-176-12.76



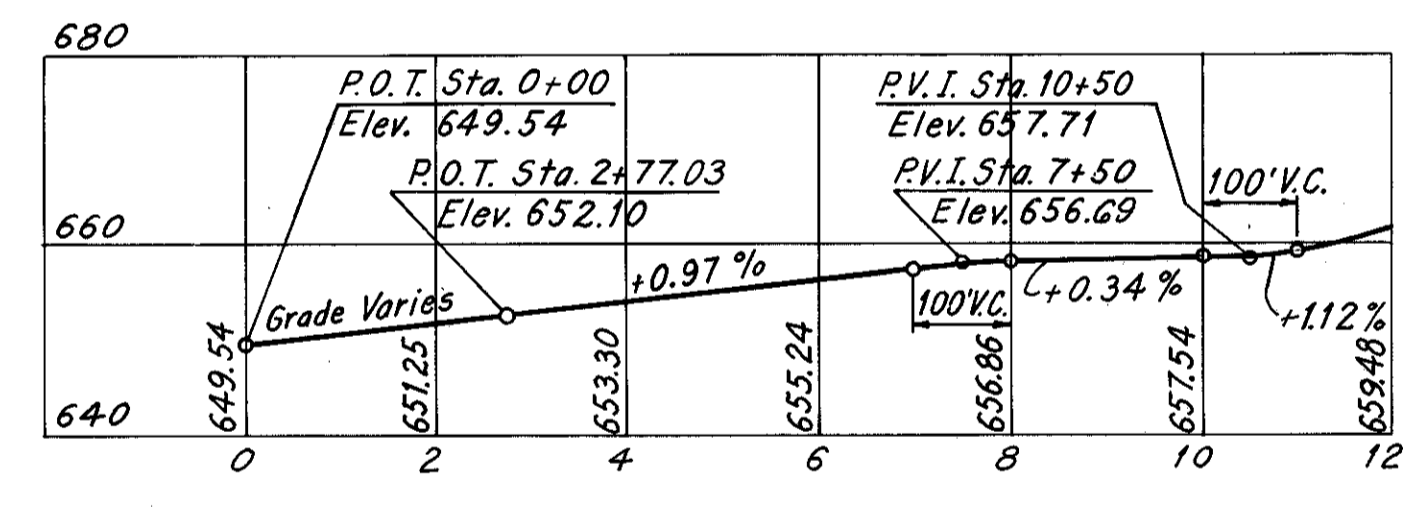
**SUBSTRUCTURE LAYOUT DIAGRAM**



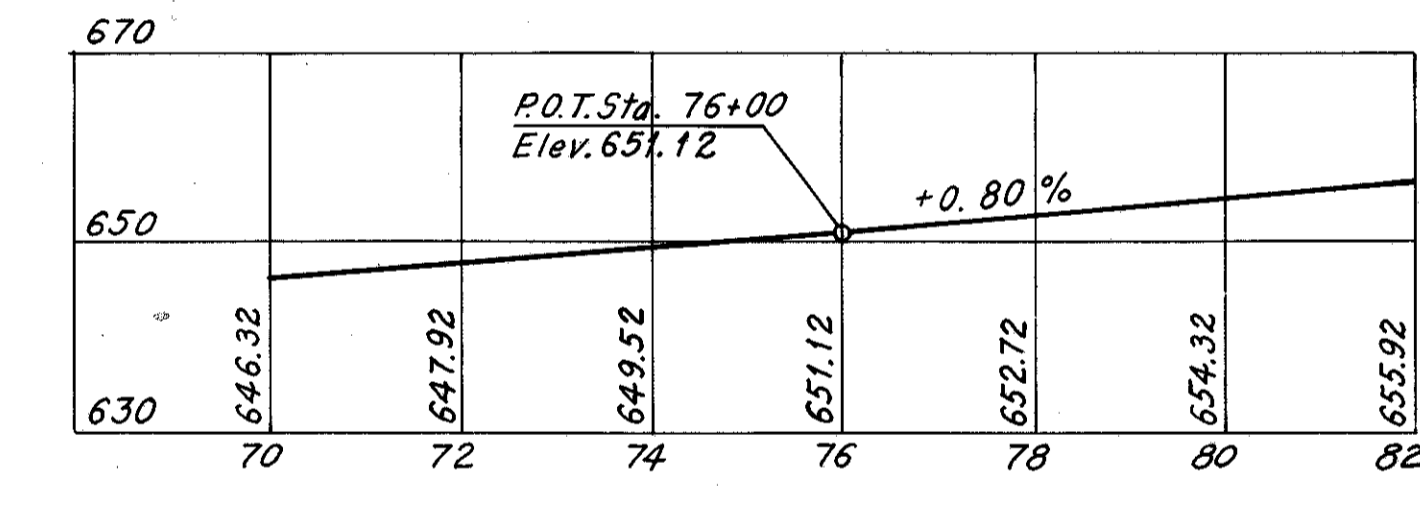
**RAMP NBOR 14**



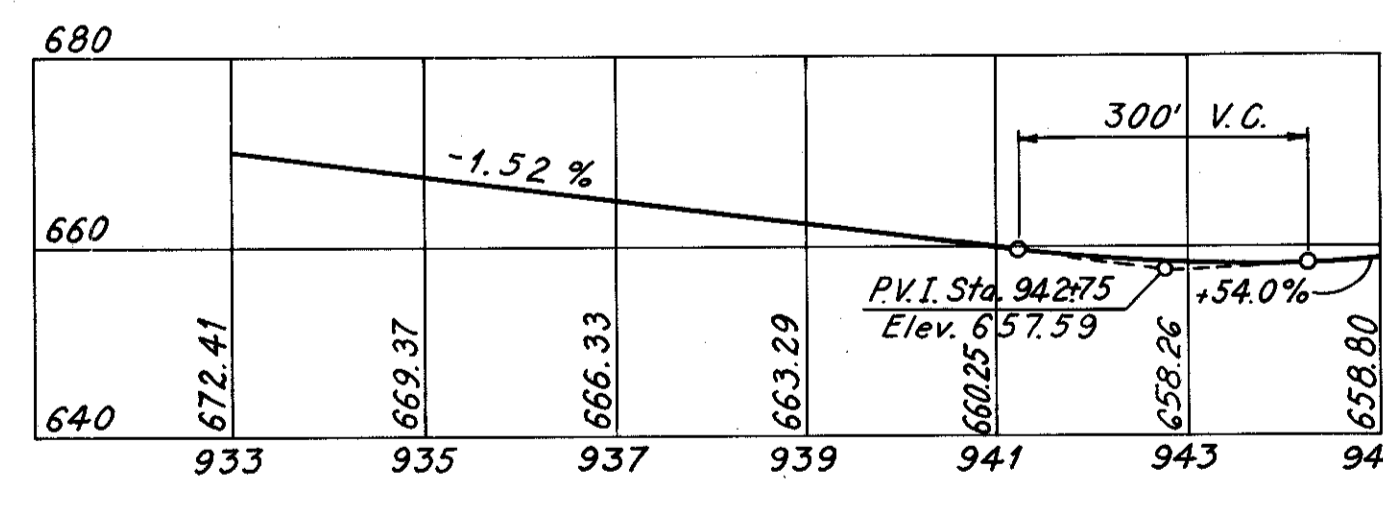
**NORTHBOUND OUTER ROADWAY**



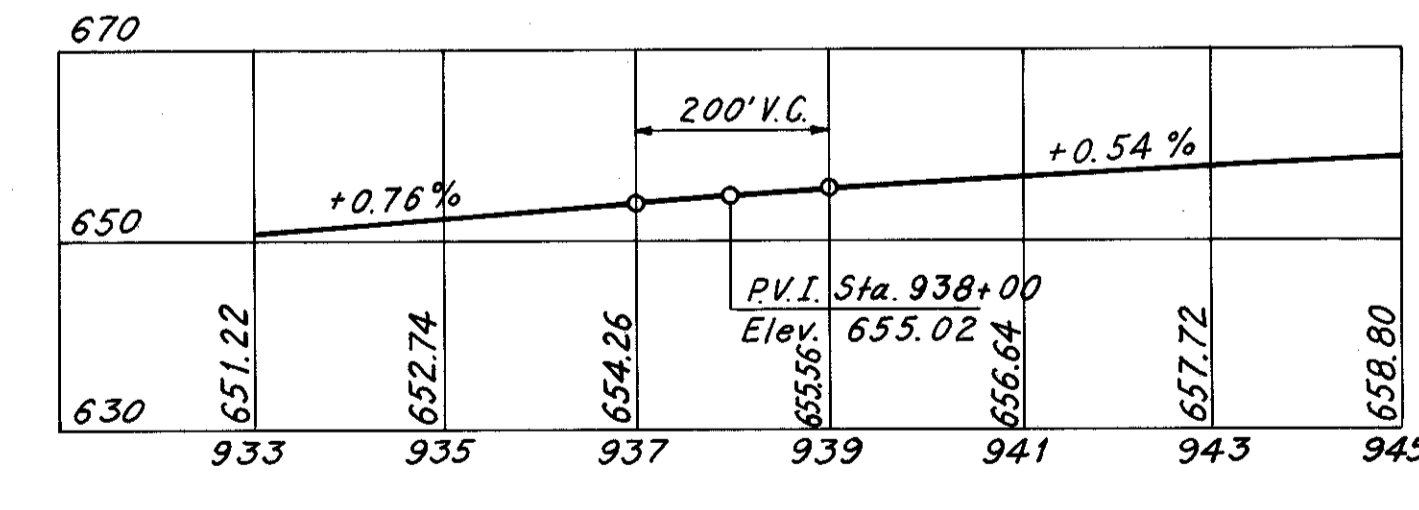
**RAMP J-NBOR**



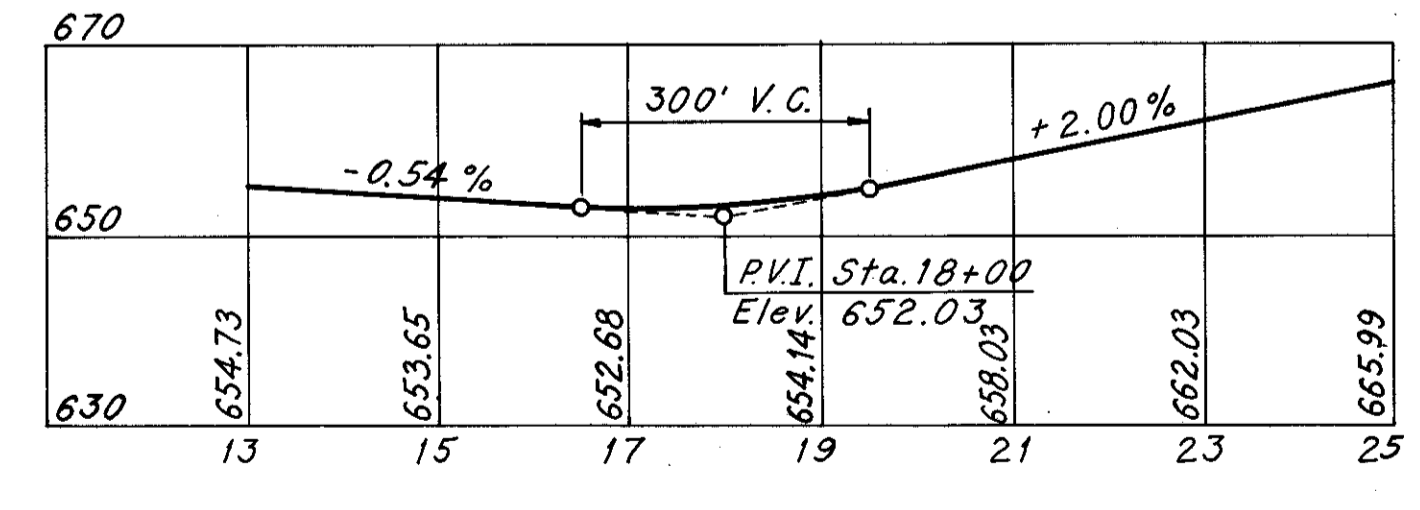
**NORTHBOUND JENNINGS**



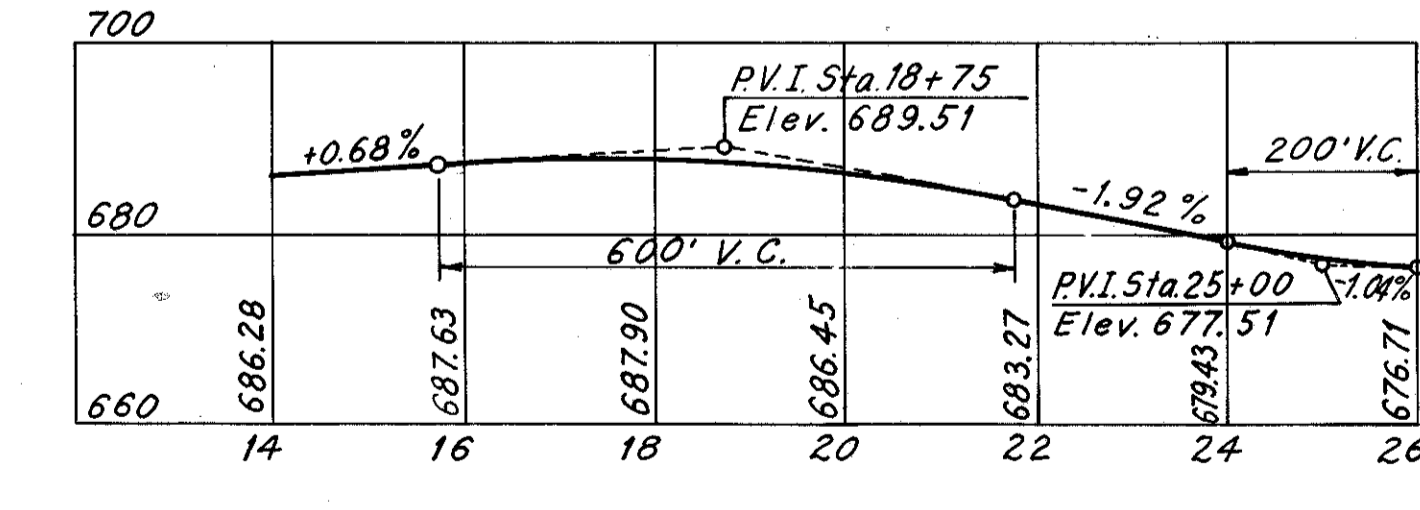
**NORTHBOUND MEDINA**



**SOUTHBOUND MEDINA**



**SOUTHBOUND OUTER ROADWAY**



**RELOCATED WEST 14 STREET**

**PROFILES**  
 Scale 1" = 200' Horiz.  
 1" = 20' Vert.

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 KANSAS CITY CLEVELAND NEW YORK

**BRIDGE LAYOUT DIAGRAM  
 AND PROFILES**  
 I-71 UNDER RELOCATED WEST 14<sup>TH</sup> STREET

BR. NO. CUY - 71-1826 STA. 15 + 48.07  
 STA. 21 + 52.66

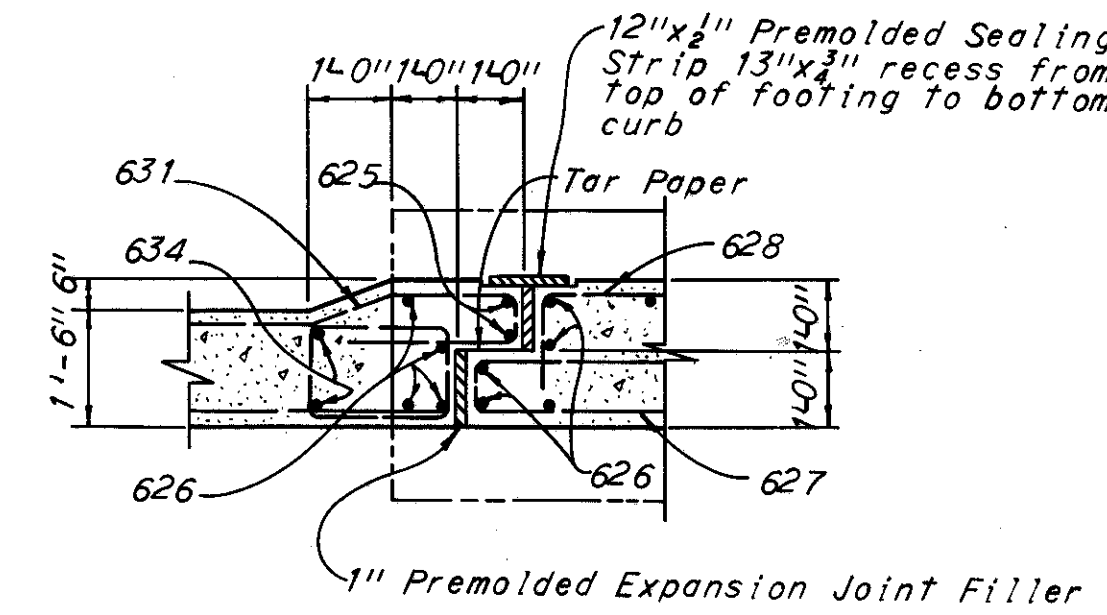
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 8-7-64	DATE 2-18-64	DATE 12-14-64	DATE 12-20-64	

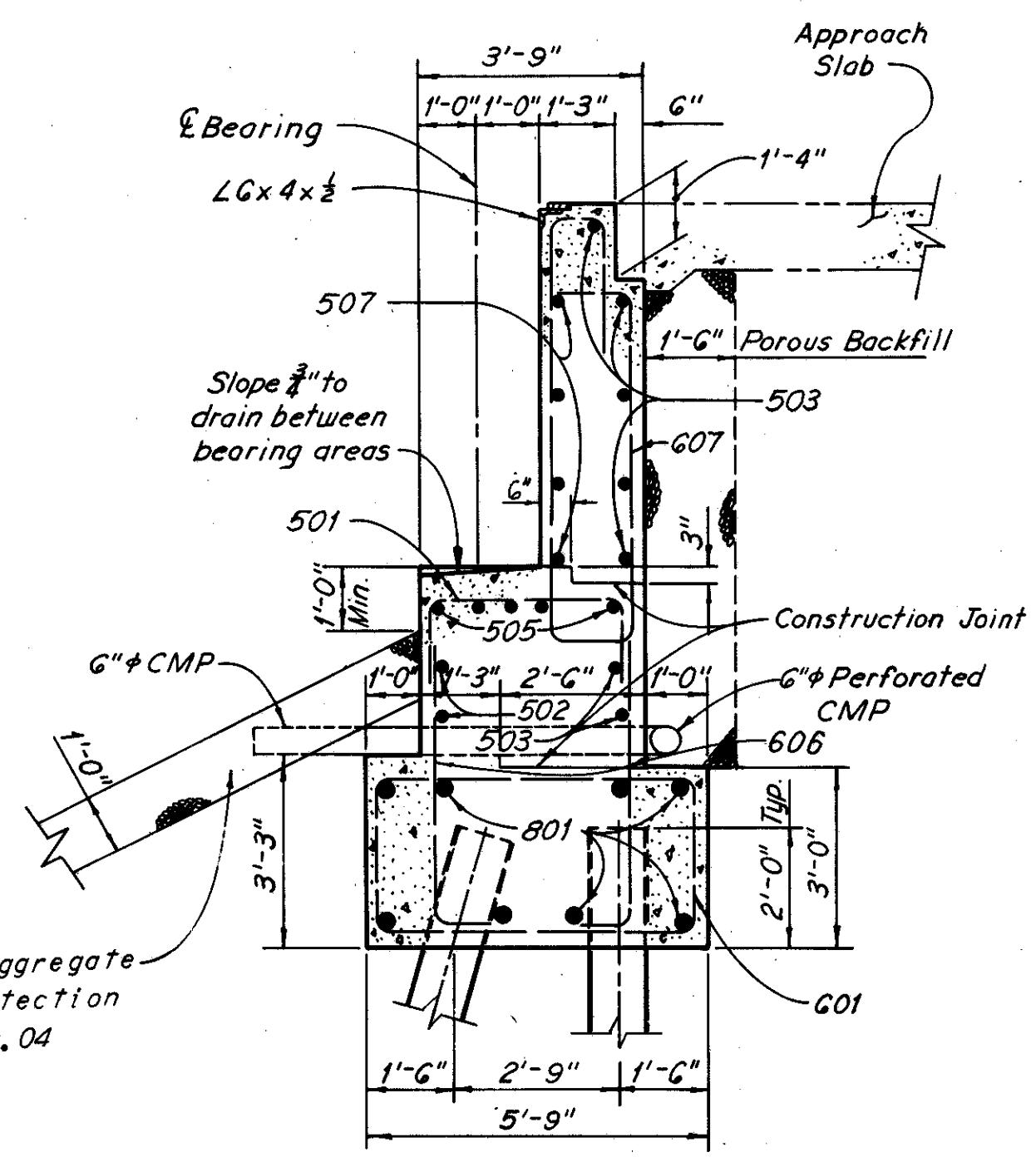
SHEET 321

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

Note:  
 Tar paper to be included with Class "E" concrete for payment.



DETAIL "A"



SECTION A-A

Notes:  
 All piles are 12BP53.  
 All Battered piles shall be inclined 3 in 12 in the direction shown.  
 For Reinforcement Schedule and Bending Diagrams see sheet 335.  
 For wingwall details see sheet 324.  
 For roadway end dam and curb plate details see sheet 329  
 and Ohio Standard Drawing SD-1-63, sheet 2 of 4 and 4 of 4.  
 The following abbreviations are used:  
 nf = near face    ef = each face  
 ff = far face

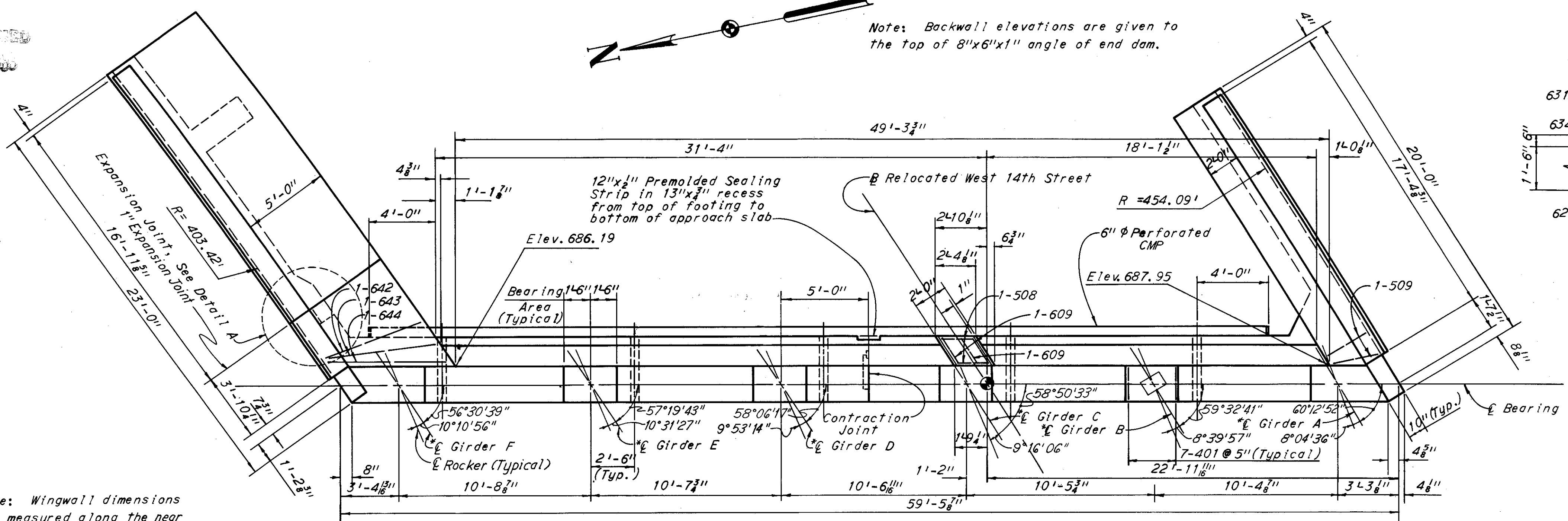
Note: Backwall elevations are given to the top of 8"x6"x1" angle of end dam.

Note: Wingwall dimensions are measured along the near face of the wingwall.

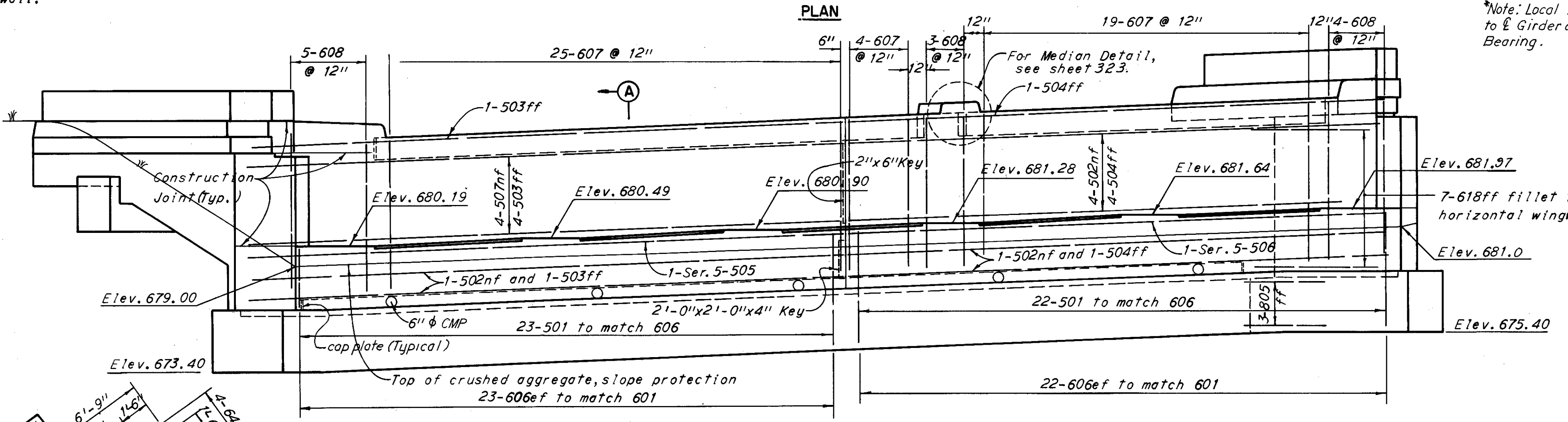
Note: Local tangent to E Girder at E Bearing.

Note: All reinforcing bar marks shall be prefixed AE.

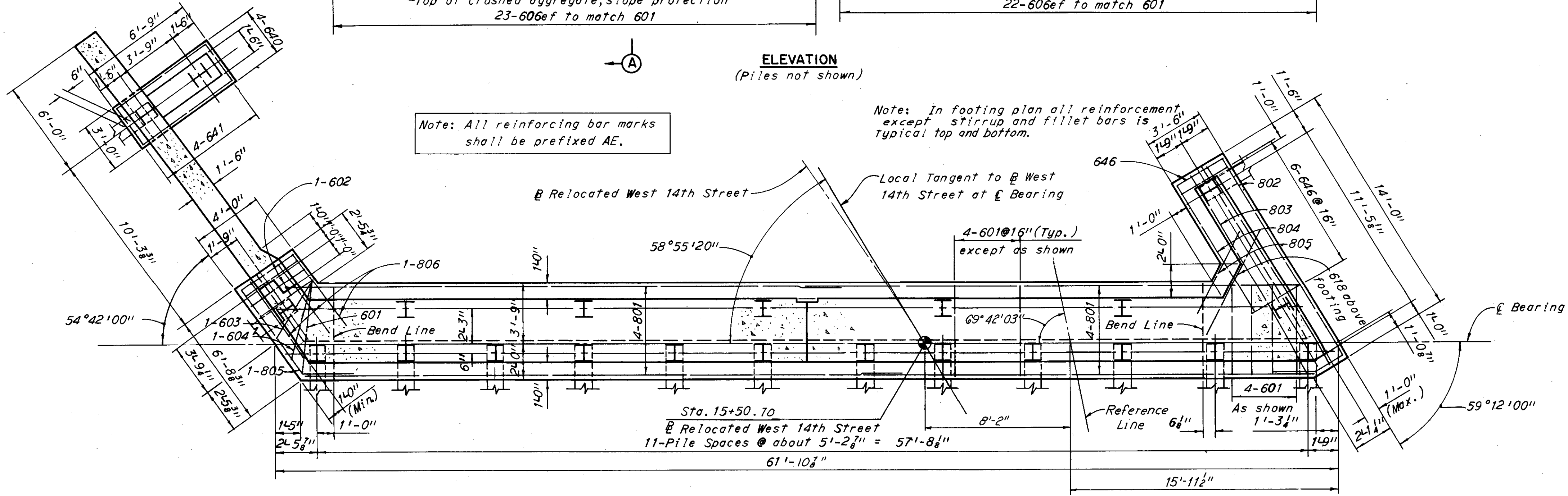
Note: In footing plan all reinforcement except stirrup and fillet bars is 3/8" typical top and bottom.



PLAN



ELEVATION  
 (Piles not shown)



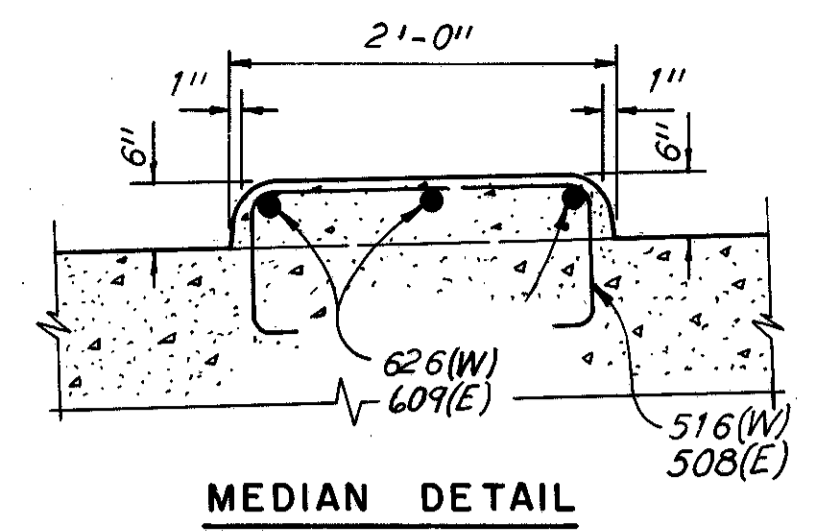
FOOTING PLAN

H.N.T.B. BR. NO. 19			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY    CLEVELAND    NEW YORK			
<b>EAST ABUTMENT</b>			
<b>I-71 UNDER RELOCATED WEST 14TH STREET</b>			
BR. NO. CUY-71-1826		STA. 15 + 48.07 STA. 21 + 52.66	
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN/S. TRACED	CHECKED/R.S.M.	REVIEWED/W.M.	REVISED
DATE 11-6-64	DATE 12-15-64	DATE 12-20-64	
			SHEET 322

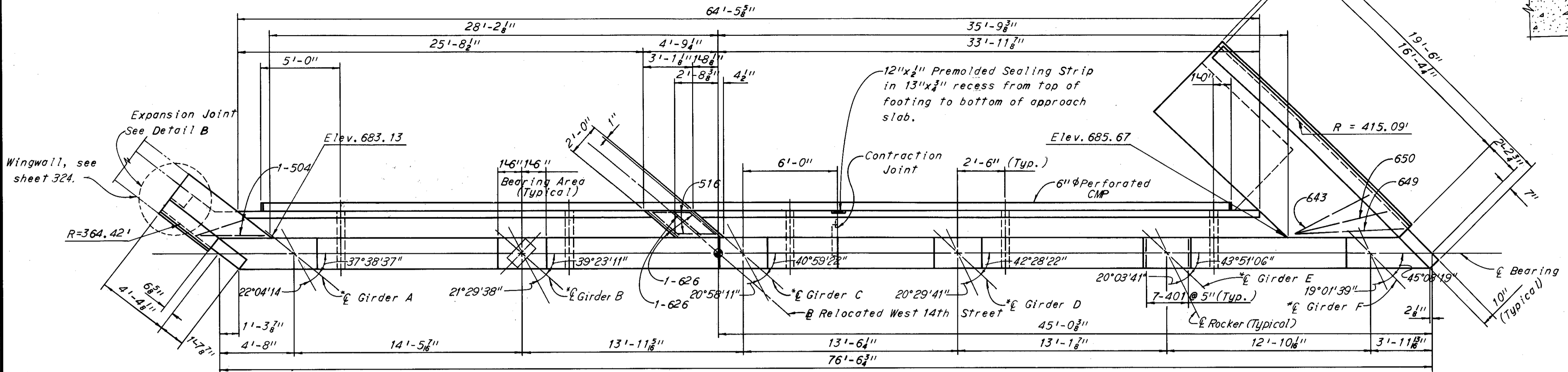
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

Note: Backwall elevations are given to the top of 8"x6"x1" angle of the end dam.

Note: Local tangent to E Girder at E Bearing.

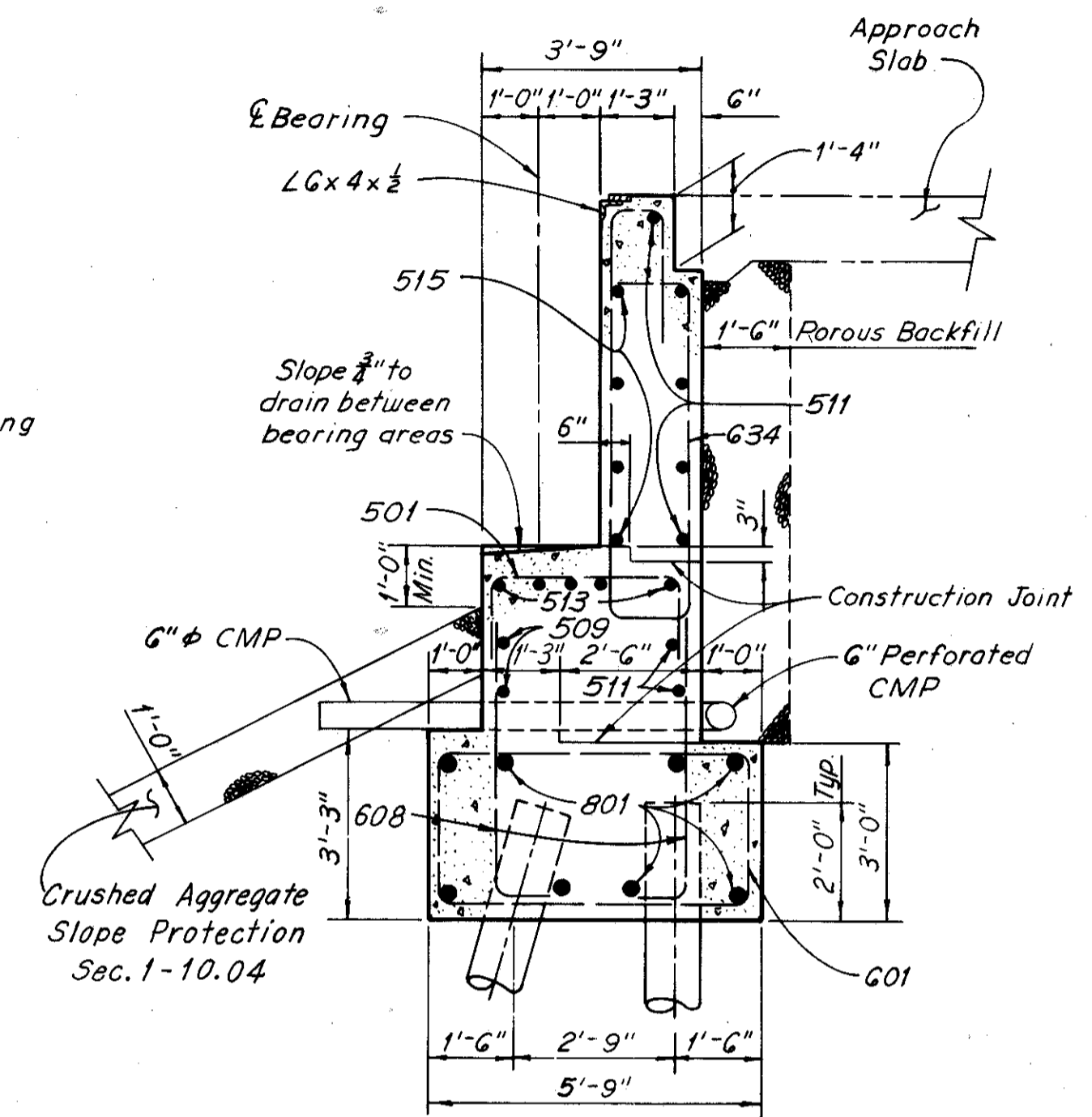


MEDIAN DETAIL



PLAN

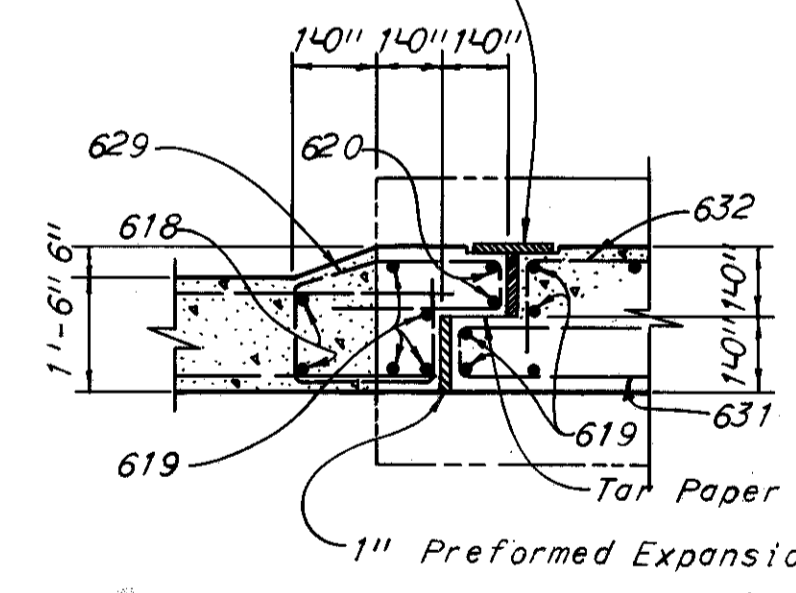
Note: Wingwall dimensions are measured along the outer face of the wingwalls.



SECTION D-D

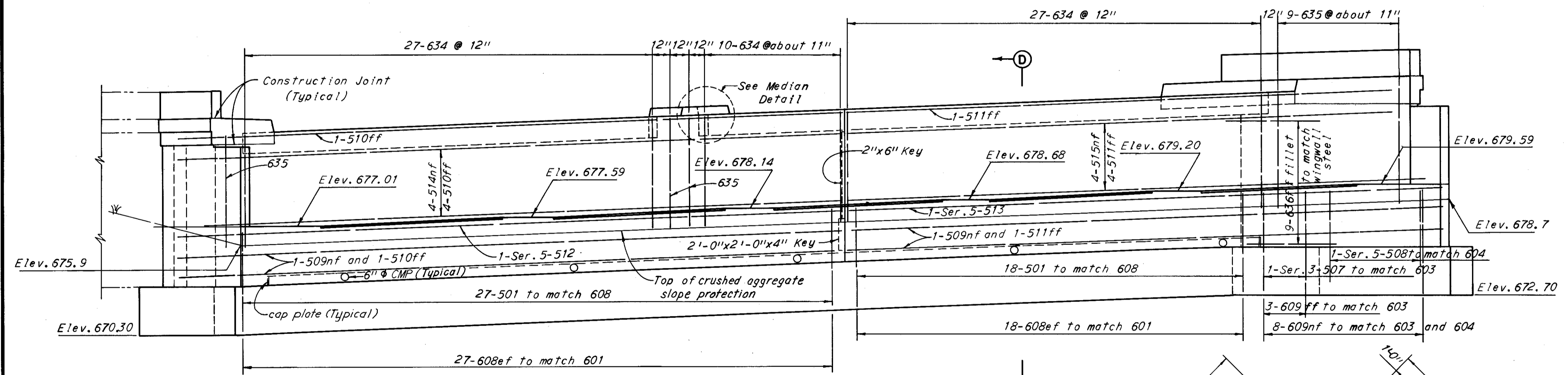
12"x1/2" Premolded Sealing Strip in 13"x3" recess from top of footing to bottom of curb

Note: Tar paper to be included with Class "E" concrete for payment.



DETAIL "B"

Notes:  
 All piles are 12" C.I.P. Reinforced Concrete. Battered piles are inclined 3 in 12 in the direction shown.  
 The following abbreviations are used: (W)=West Abutment, (E)=East Abutment, nf = near face, ff = far face.  
 For additional notes see sheet 322.

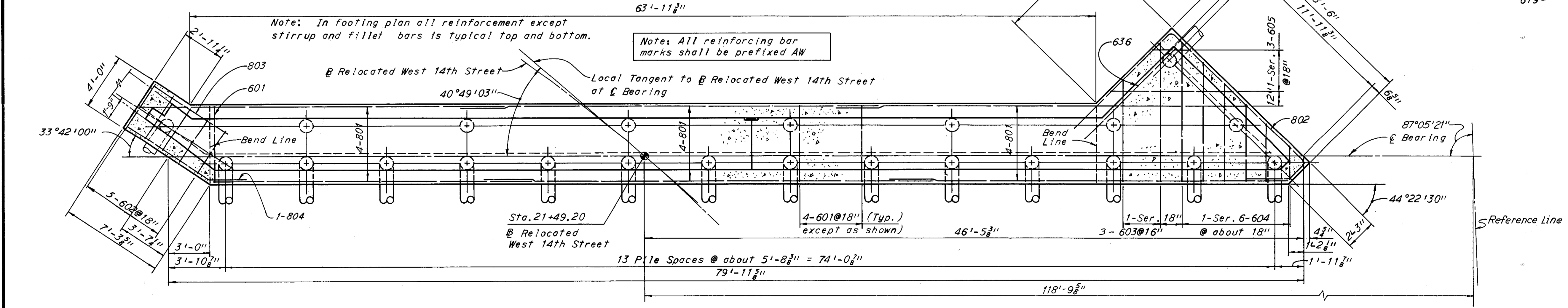


ELEVATION

(Piles not shown)

Note: In footing plan all reinforcement except stirrup and fillet bars is typical top and bottom.

Note: All reinforcing bar marks shall be prefixed AW



FOOTING PLAN

H.N.T.B. BR. NO. 19  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WEST ABUTMENT**  
 I-71 UNDER RELOCATED WEST 14TH STREET

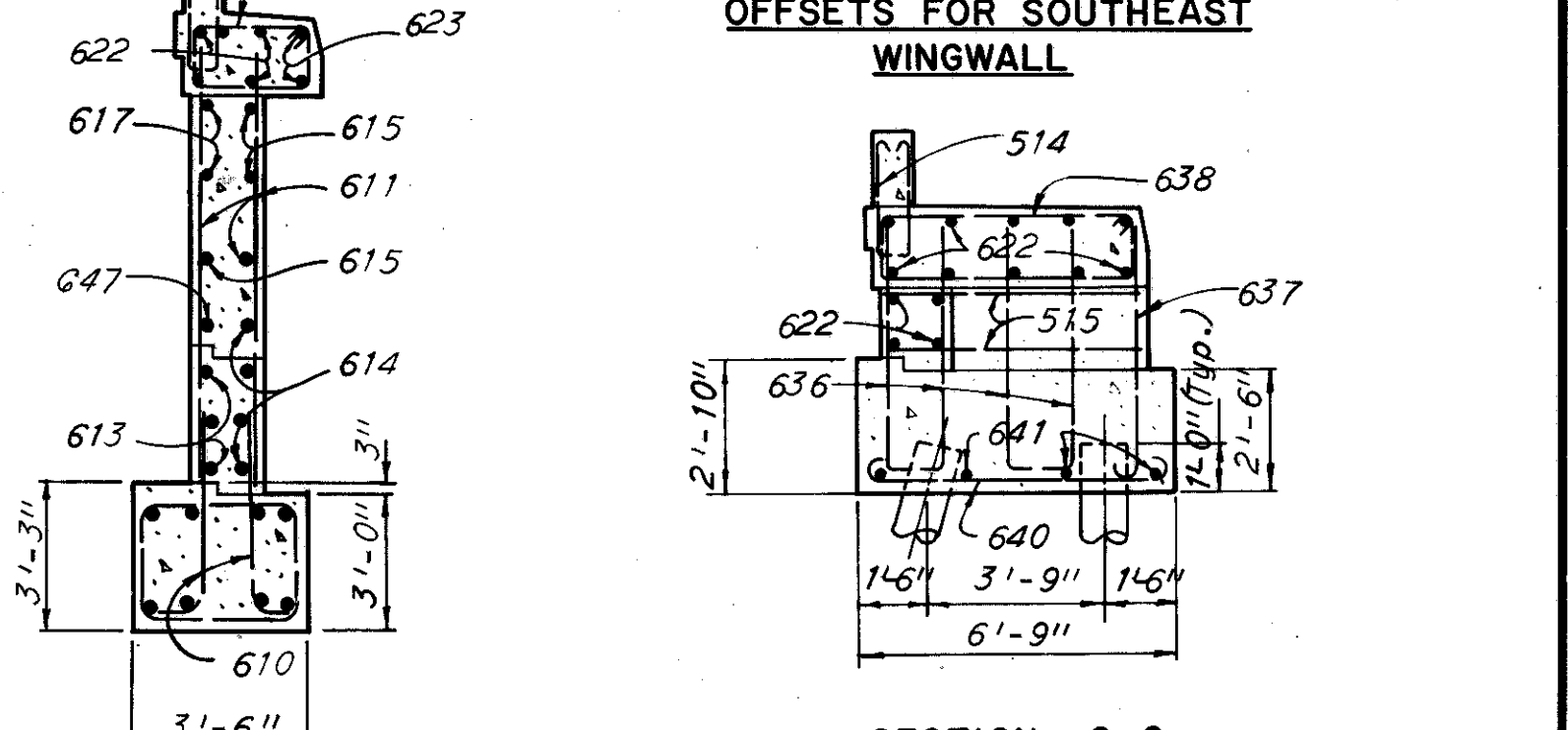
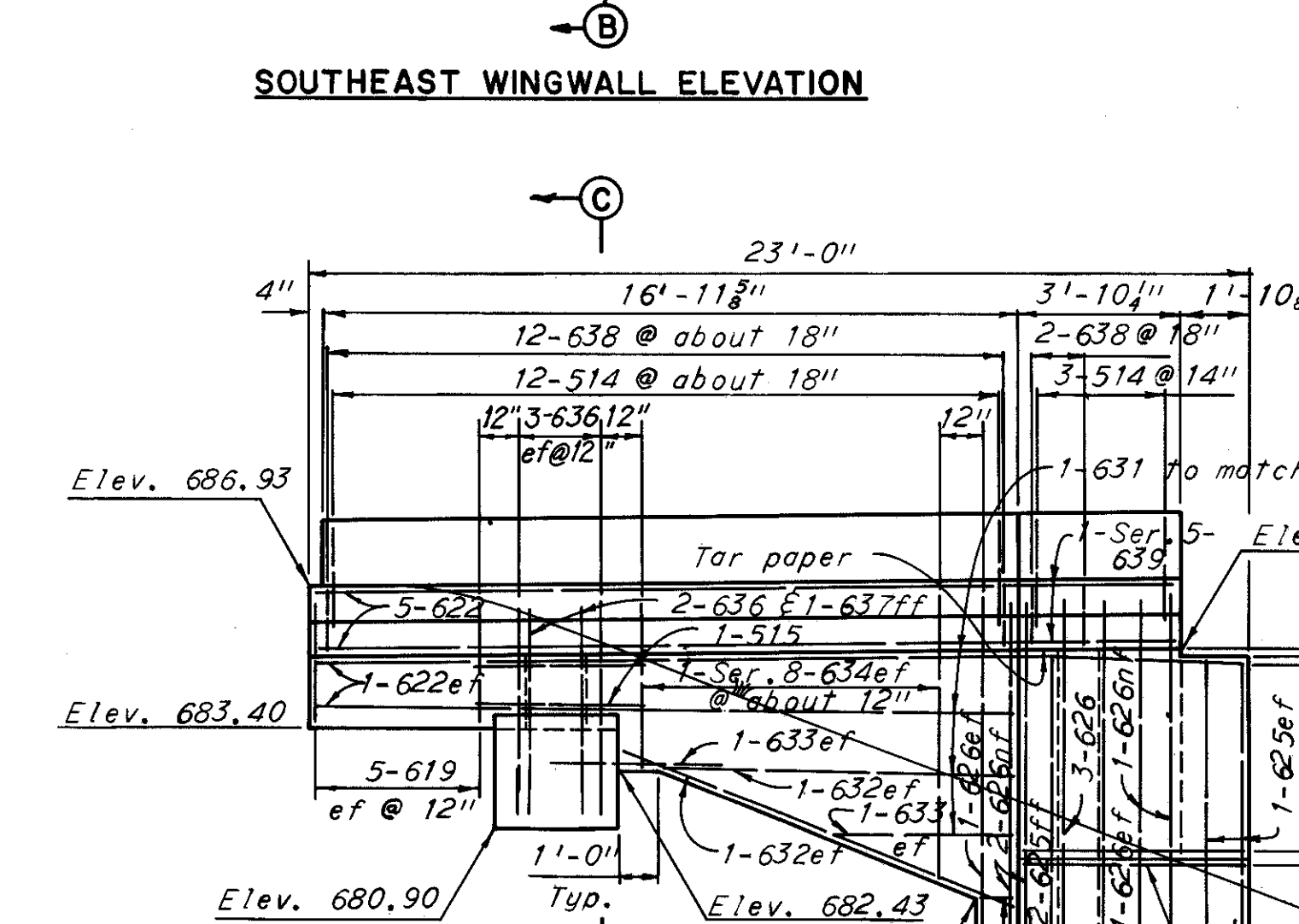
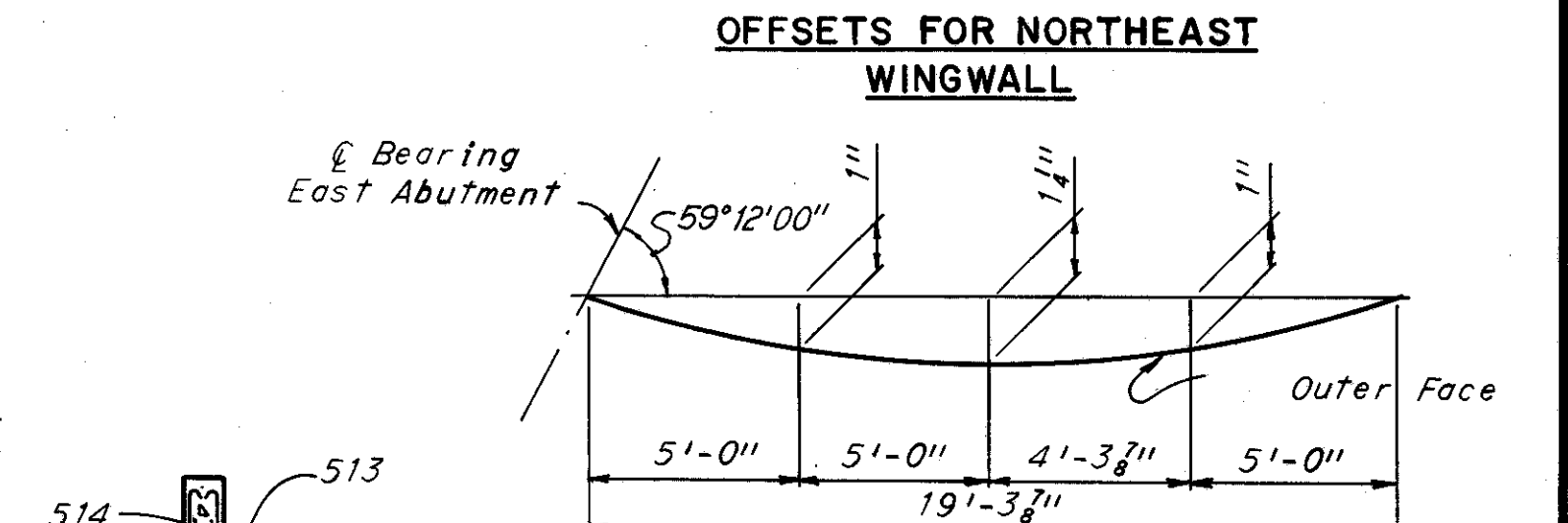
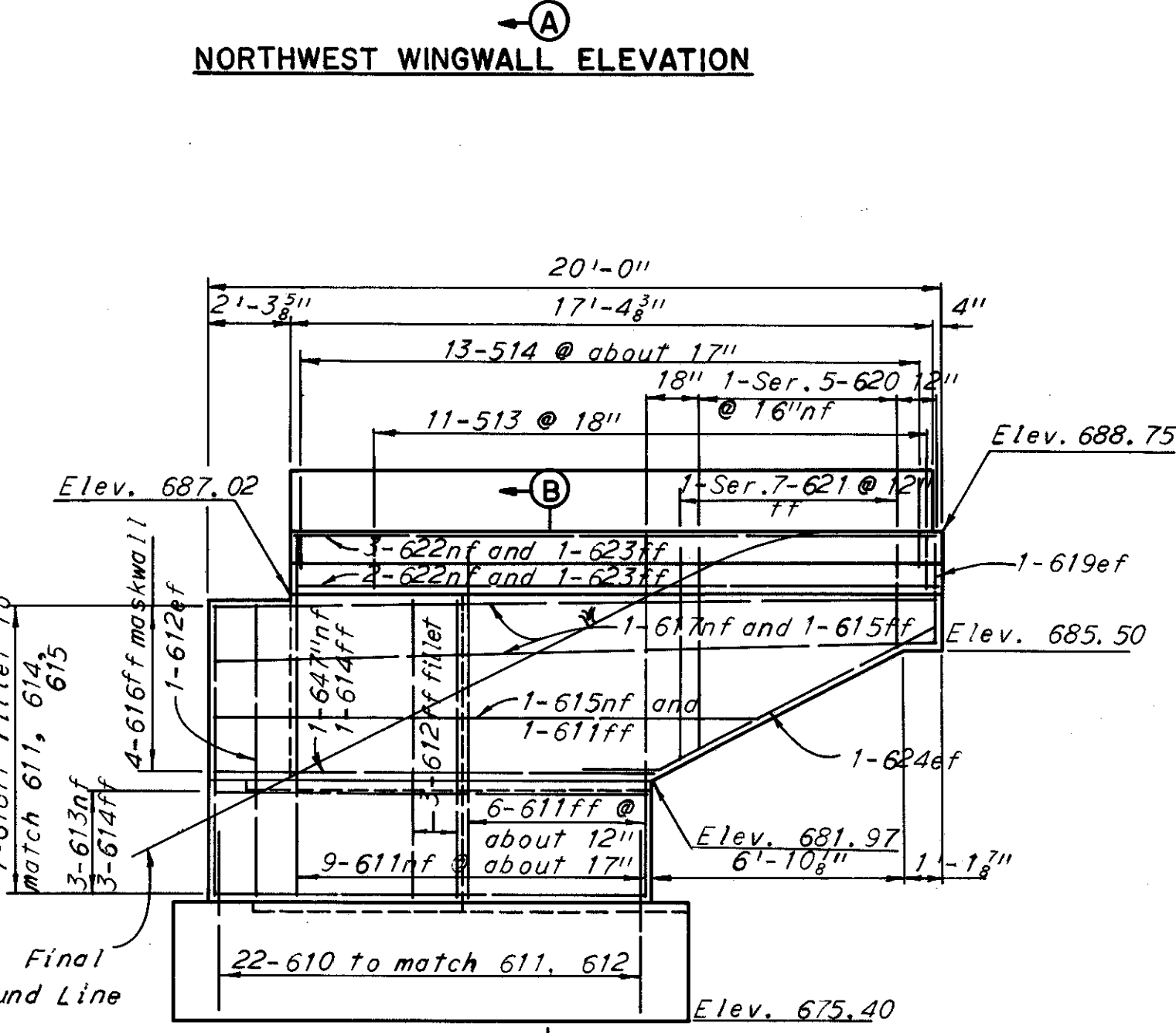
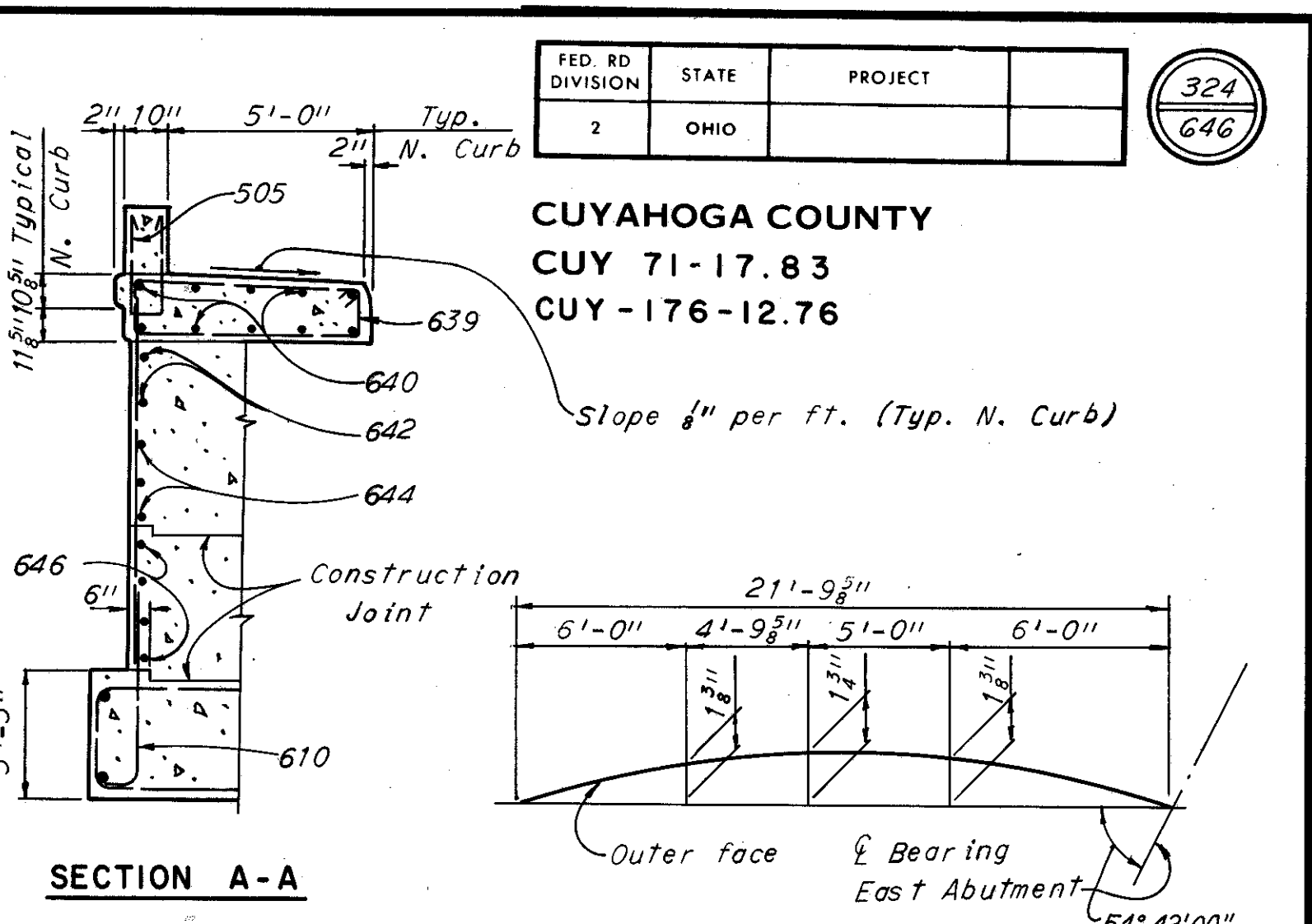
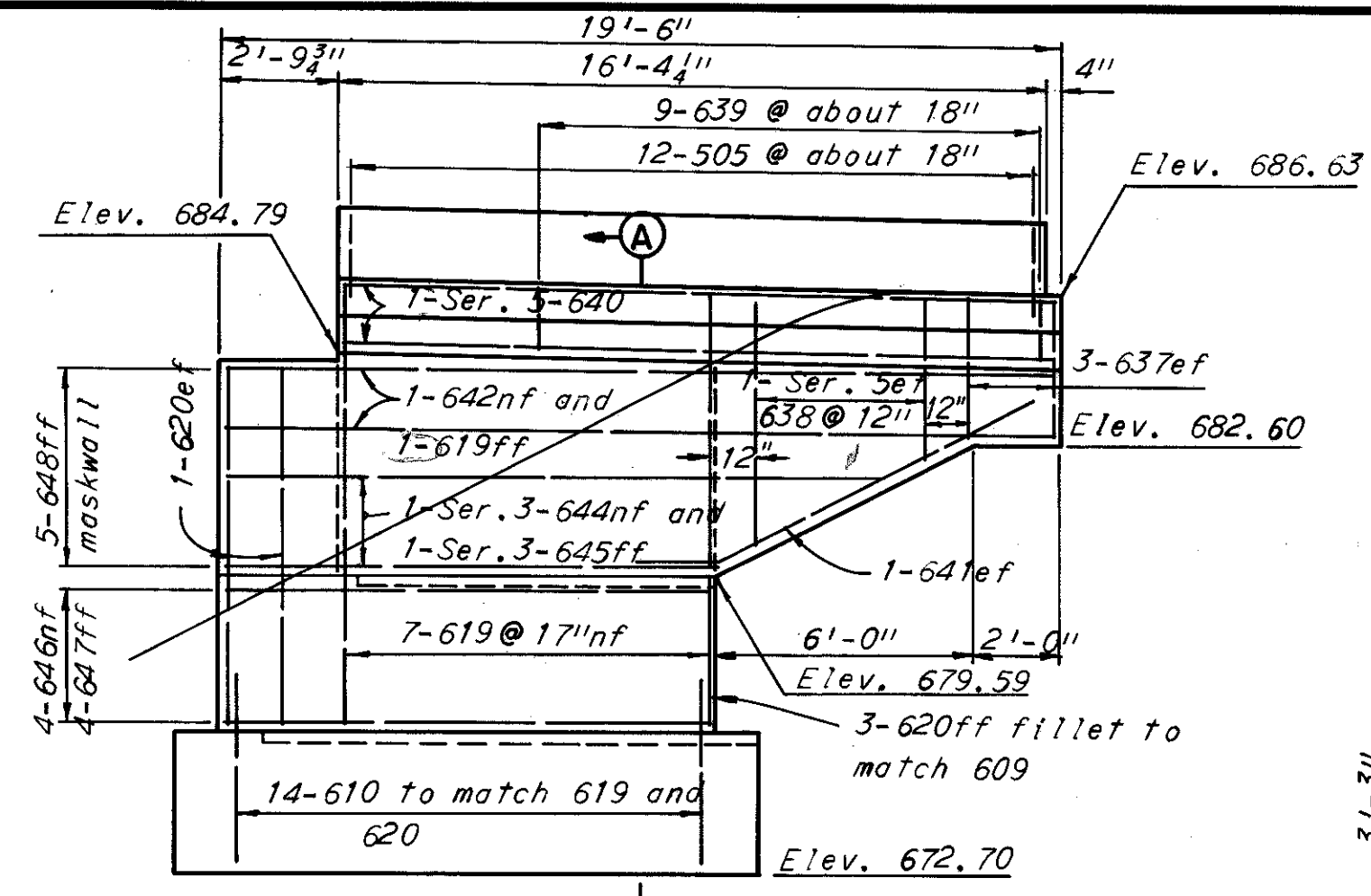
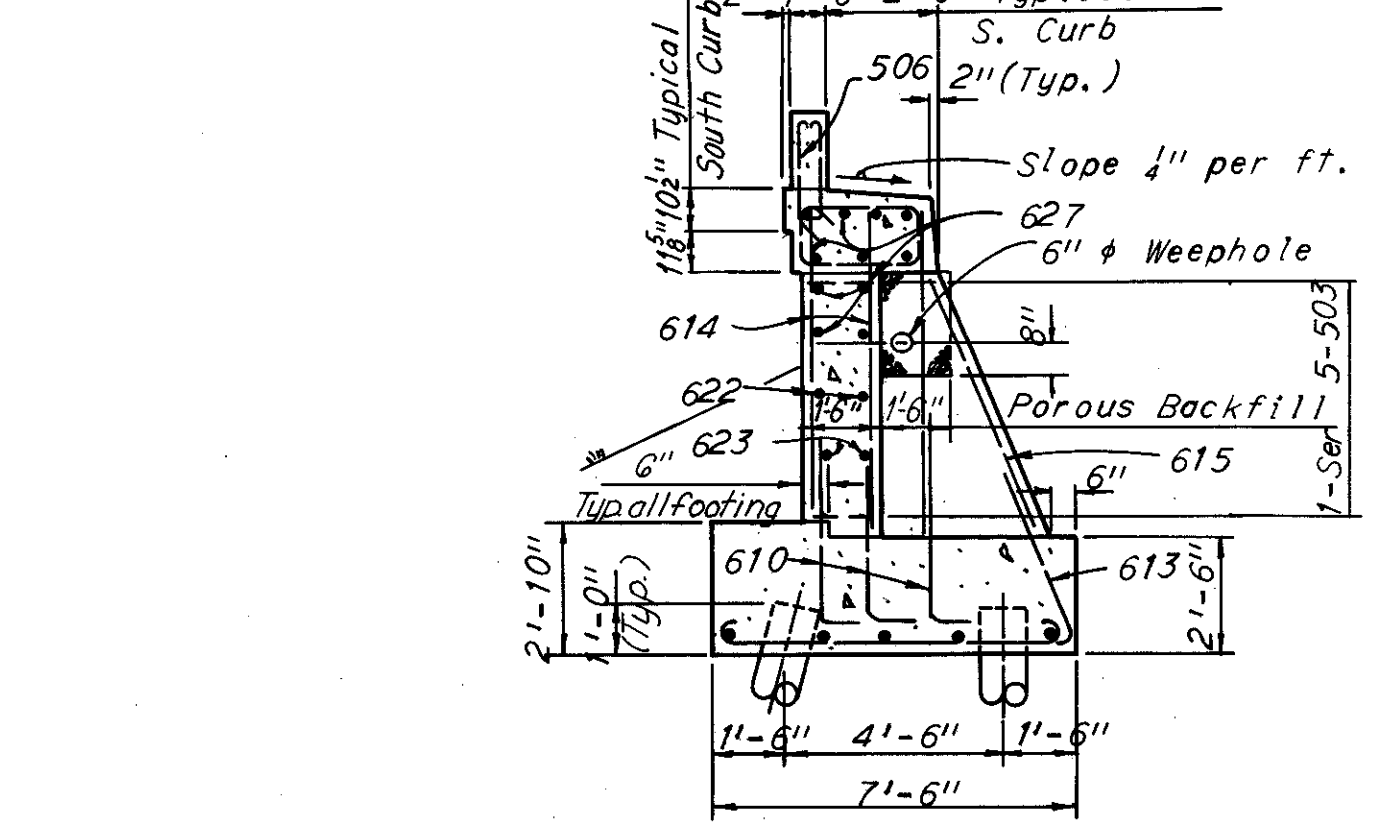
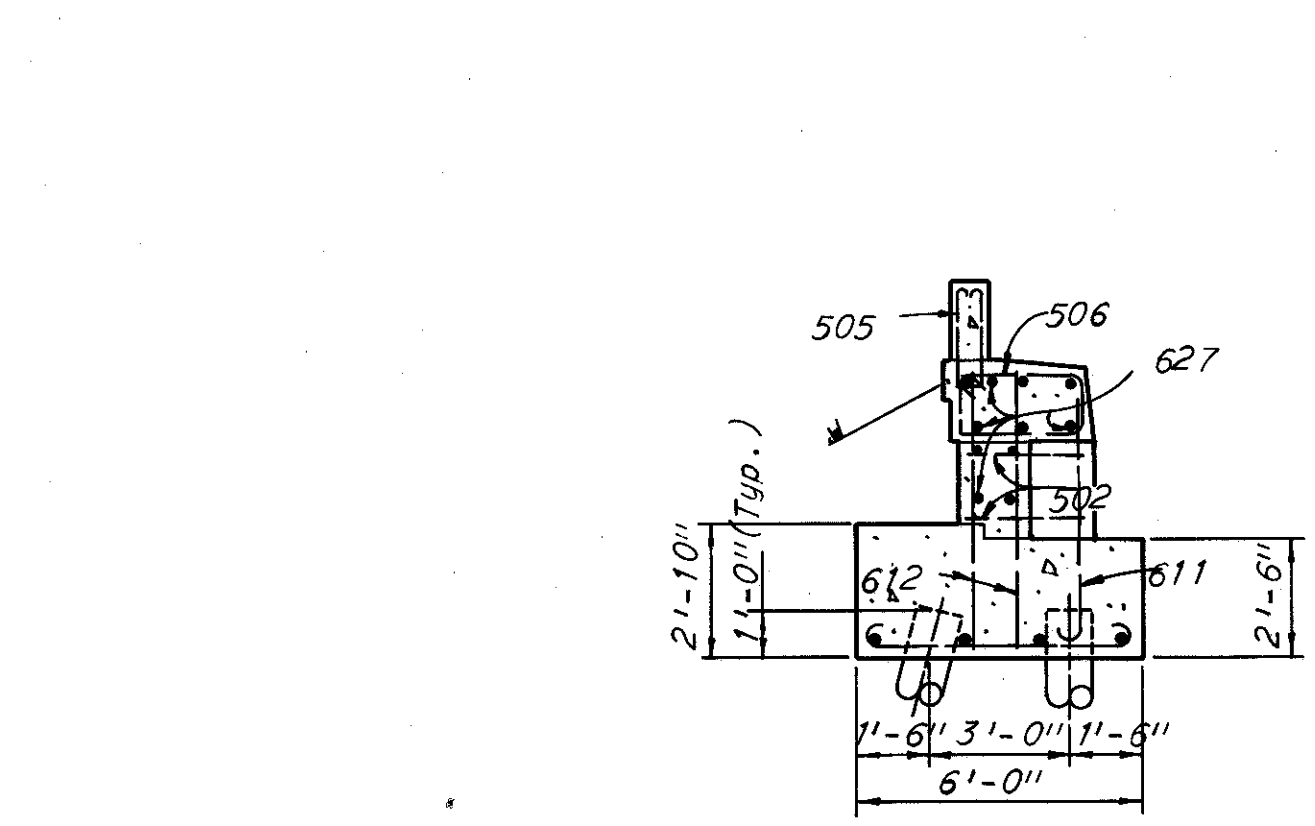
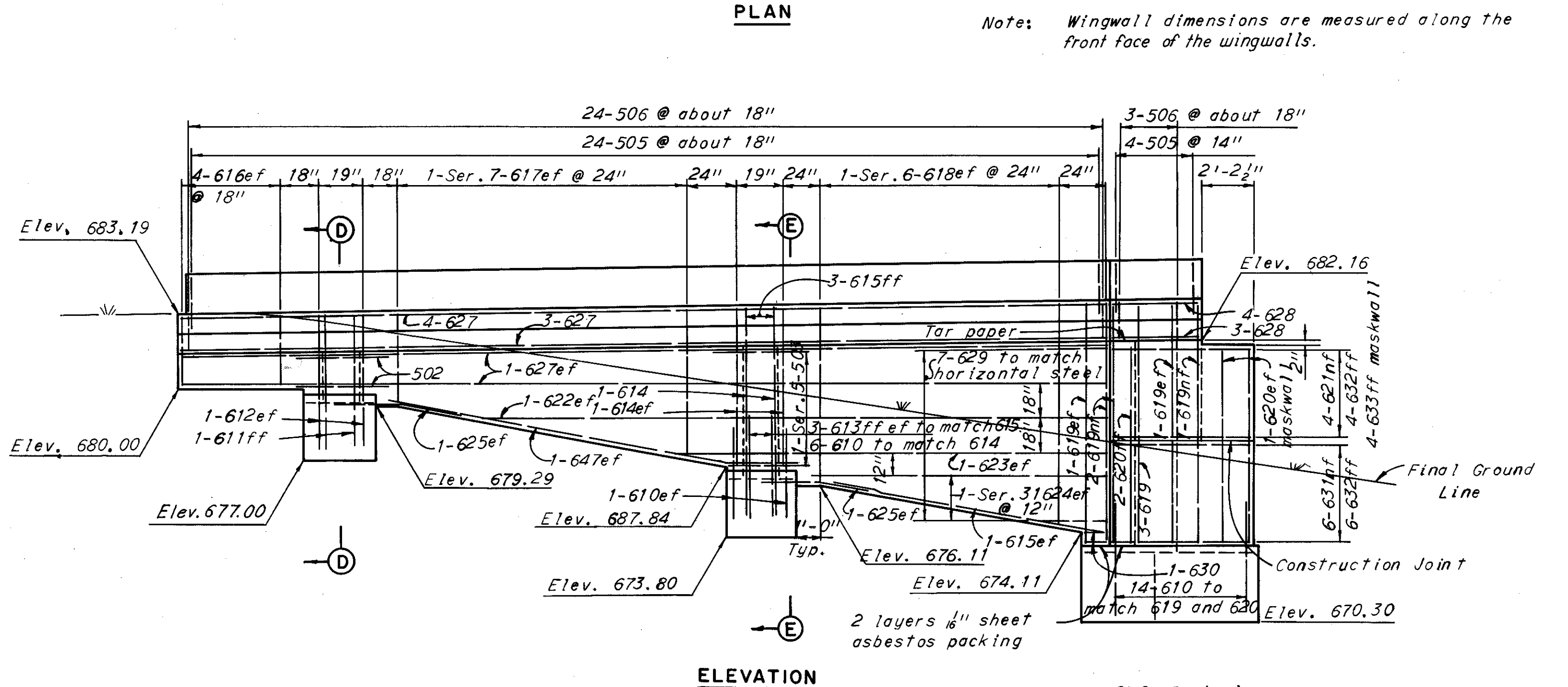
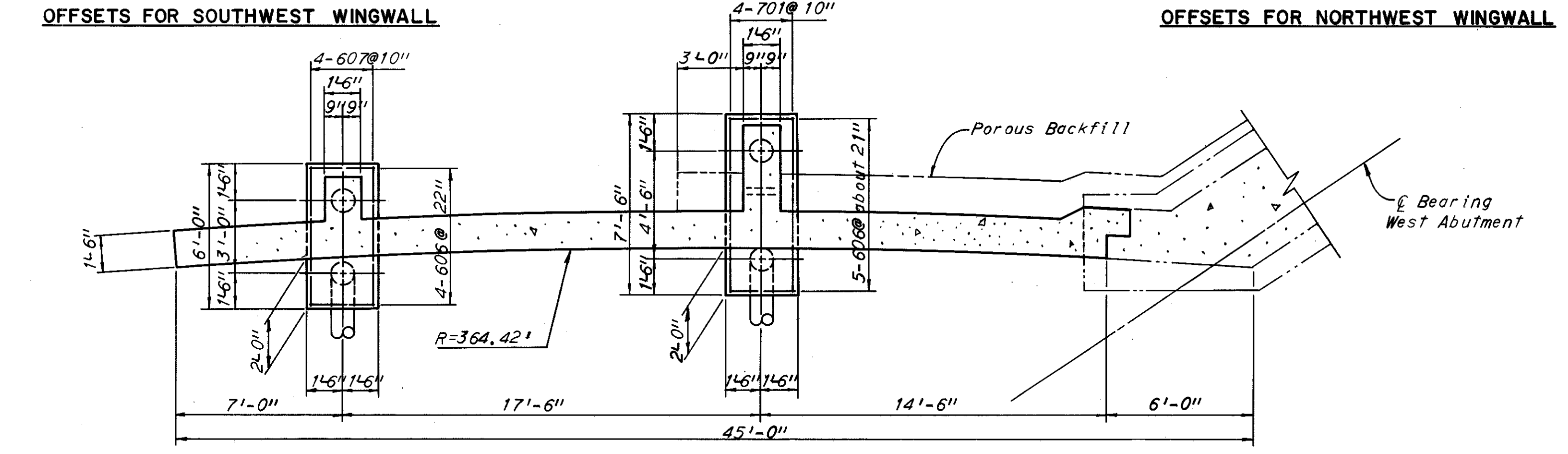
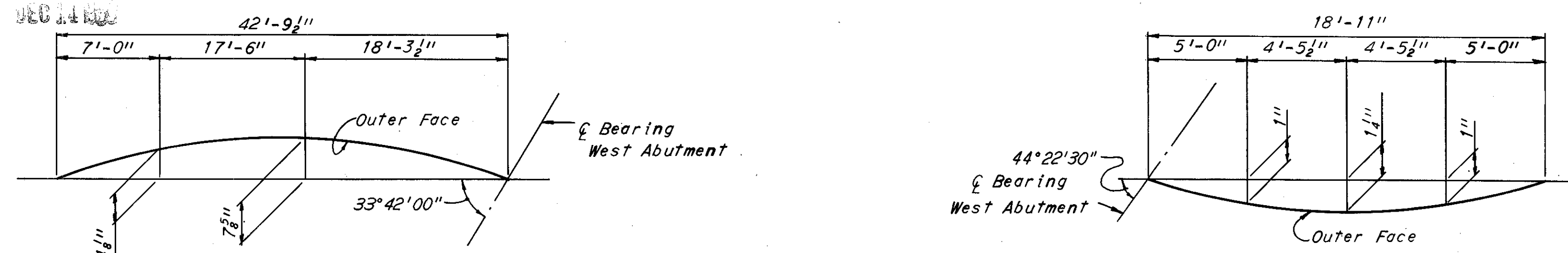
BR. NO. CUY-71-1826 STA. 15 + 48.07  
 STA. 21 + 52.66

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN / S. TRACED CHECKED / R.S.D. REVIEWED / W.C. REVISIONS  
 DATE 11-2-64 DATE DATE 12-22-64 SHEET 323

**CUYAHOGA COUNTY**  
**CUY 71-17.83**  
**CUY-176-12.76**

Slope 1/4" per ft. (Typ. N. Curb)



Note: All reinforcing bar marks in the Southeast and Northeast Wingwalls shall be prefixed AE. All reinforcing bar marks in the Southwest and Northwest Wingwalls shall be prefixed AW.

Notes:  
 Piles are not shown in Wingwall Elevations. Backfill shall be completed prior to construction of safety curb or sidewalk.  
 For railing details and longitudinal reinforcement in the parapets, see sheet 334.  
 For Reinforcement Schedule and Bar Bending Diagrams see sheet 337.  
 Longitudinal reinforcement to be field bent as required. Field bending included with Item S-4, for payment.  
 The following abbreviations are used:  
 nf = near face  
 ff = far face  
 ef = each face  
 Tar paper and sheet asbestos packing to be included with Item S-1 for payment.

H.N.T.B. BR. NO. 19

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WINGWALLS**

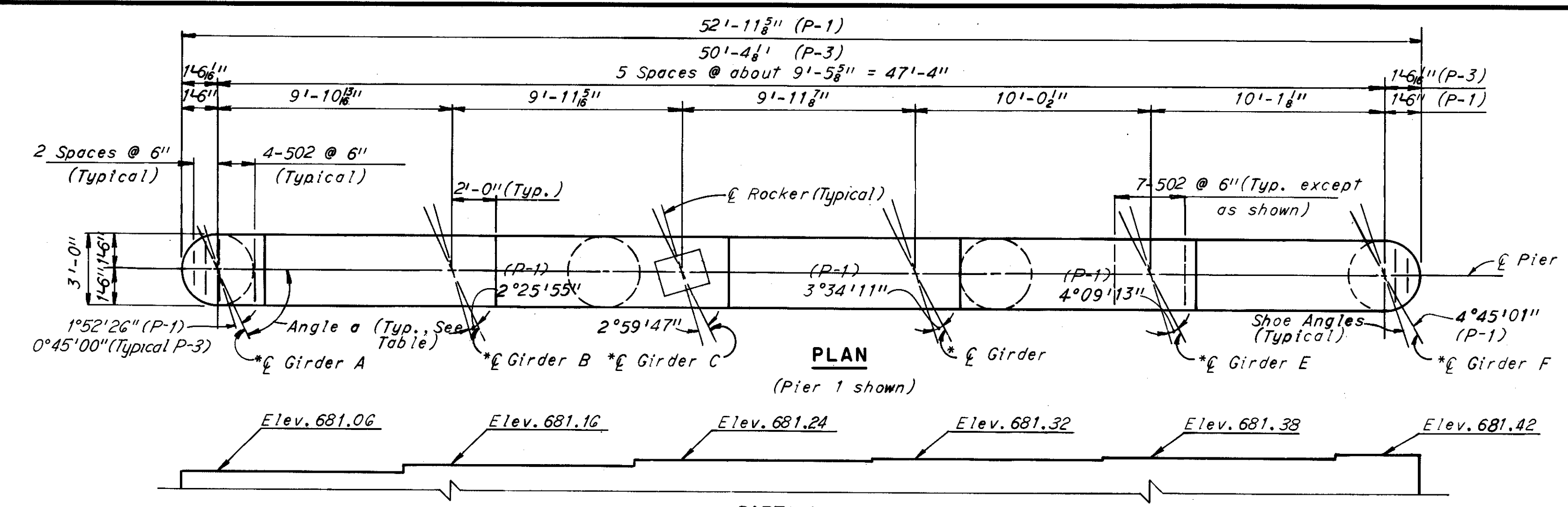
**I-71 UNDER RELOCATED WEST 14TH STREET**

BR. NO. CUY-71-1826 STA. 15 + 48.07  
 STA. 21 + 52.66

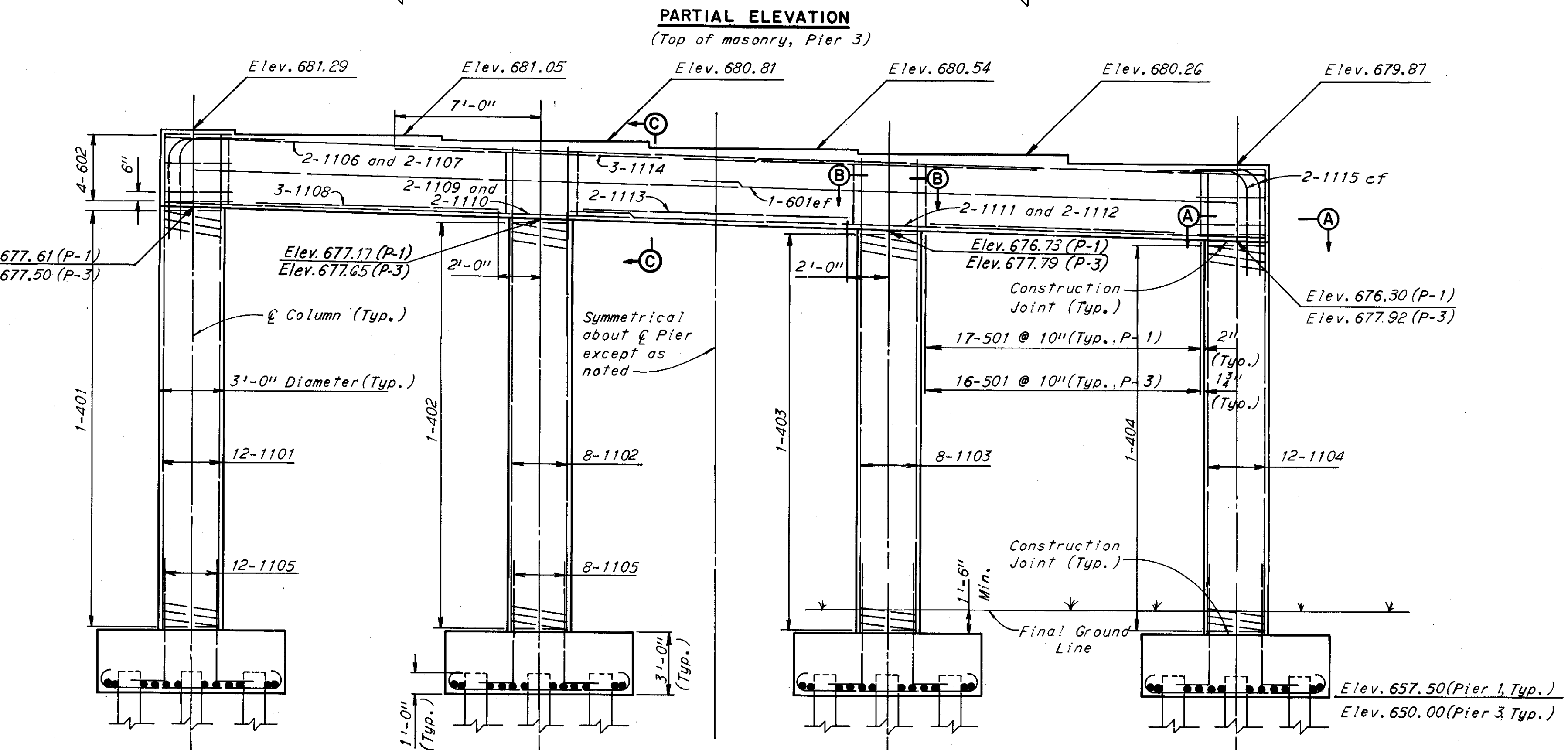
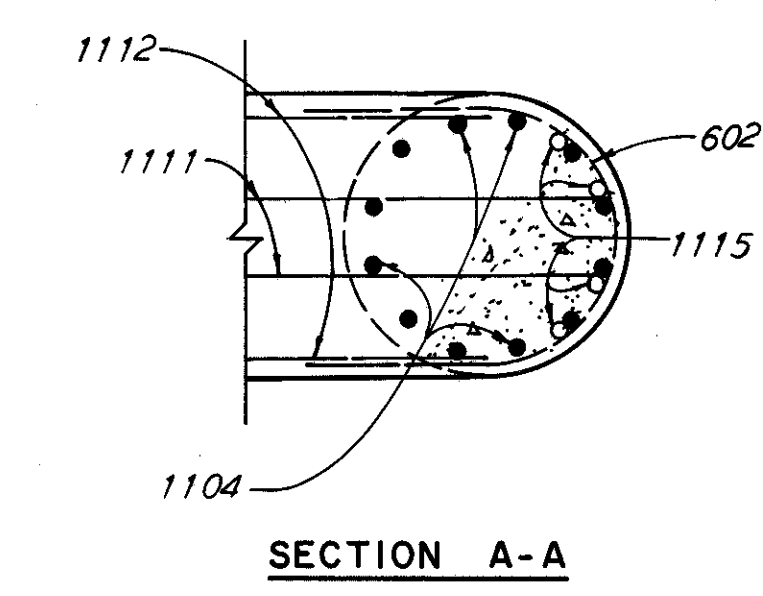
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN J.S. TRACED	CHECKED R.S.D. REVIEWED W.J.F.	REVISED
DATE 11-12-64	DATE 12-15-64	DATE 12-22-64

SHEET 324

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

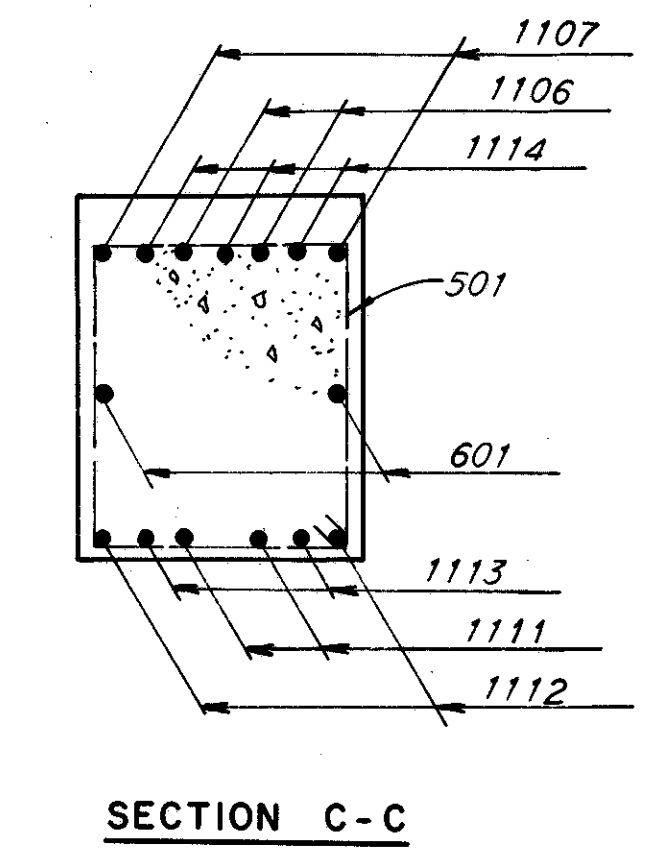


Note:  
 For Pier 1 this line is the local tangent to the Girder & at the & Bearing of the Pier.

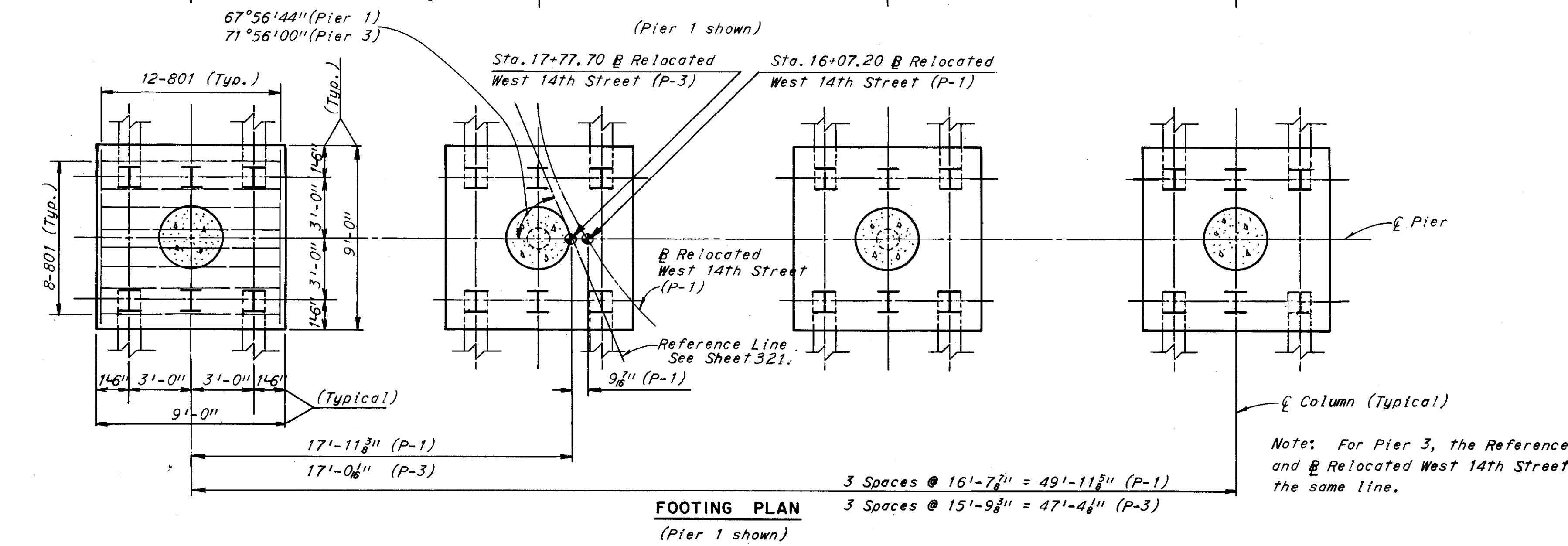


Girder	Pier 1	Pier 3
A	65°38'28"	71°56'00"
B	65°06'43"	71°56'00"
C	64°33'31"	71°56'00"
D	63°58'44"	71°56'00"
E	63°22'16"	71°56'00"
F	62°43'58"	71°56'00"

Note: All reinforcing bar marks shall be prefixed PA for Pier 1 and PC for Pier 3.



Notes:  
 All piles are 12BP53  
 All battered piles shall be inclined 3 in 12 in the direction shown.  
 Pile spacings are measured along bottom of footing.  
 For Reinforcement Schedule and Bending Diagrams see sheet 336.  
 The following abbreviations are used:  
 ef = each face P-1 = Pier 1  
 P-3 = Pier 3



H.N.T.B. BR. NO. 19  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIERS 1 AND 3**  
 I-71 UNDER RELOCATED WEST 14TH STREET

BR. NO. CUY-71-1826 STA. 15 + 48.07  
 STA. 21 + 52.66

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN BY	TRACED	CHECKED
DATE 9-14-64	DATE	DATE 10-23-64
		REVIEWED
		DATE 12-22-64
		REVISOR
		DATE
		SHEET 325

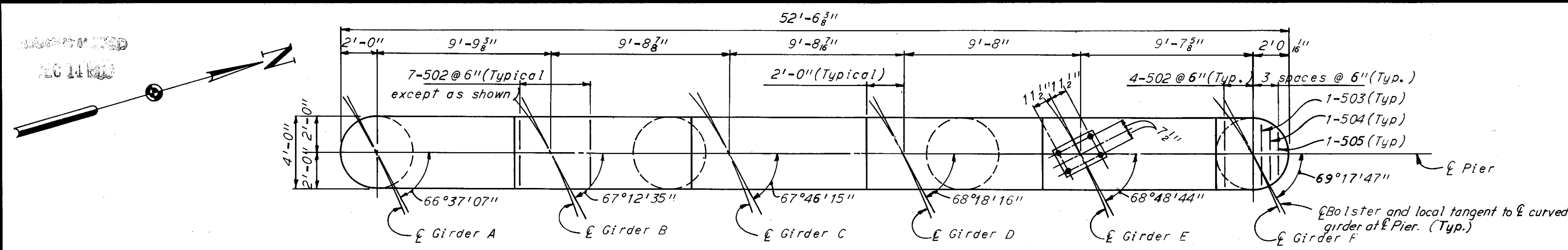




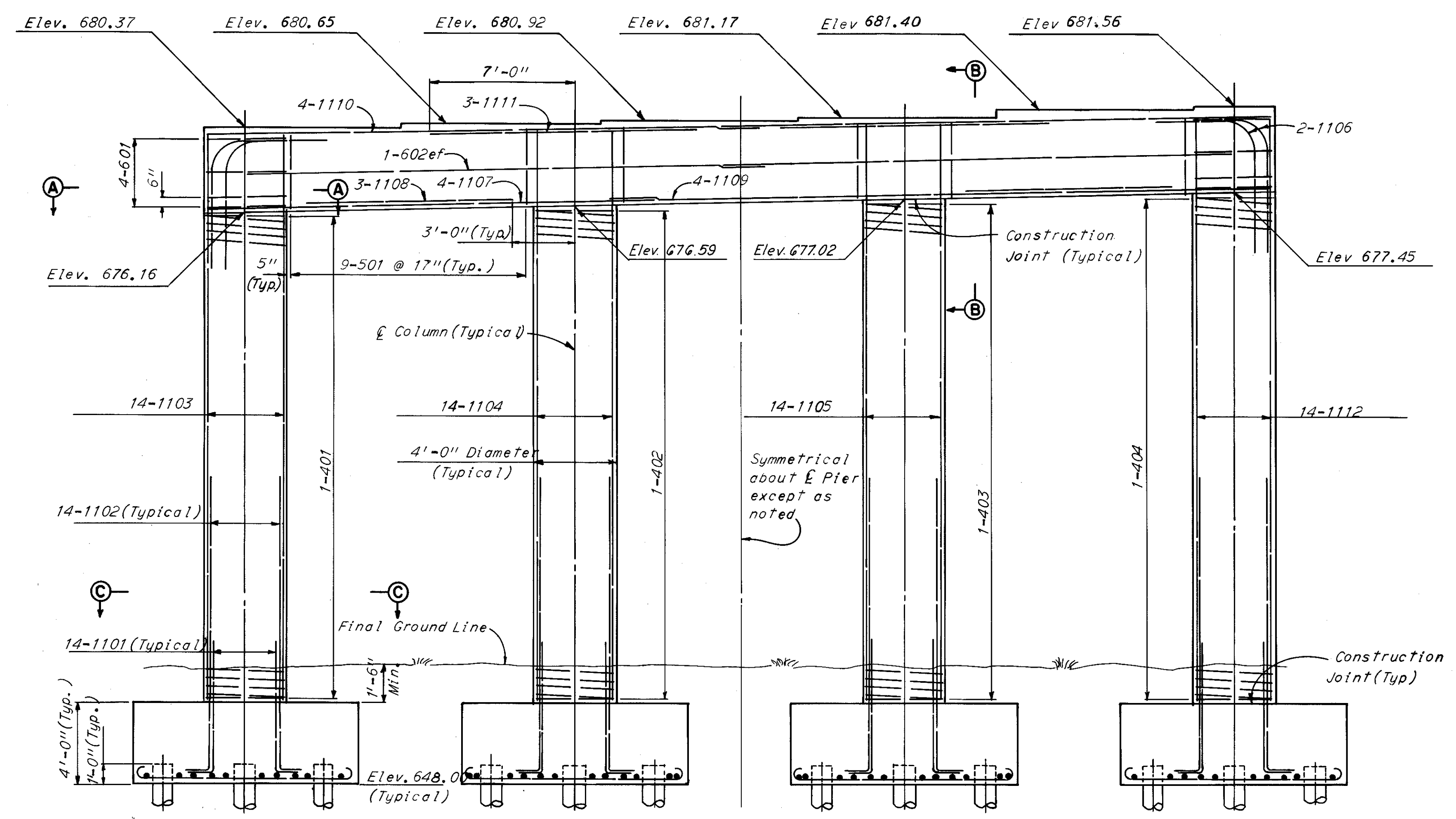
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

327  
646

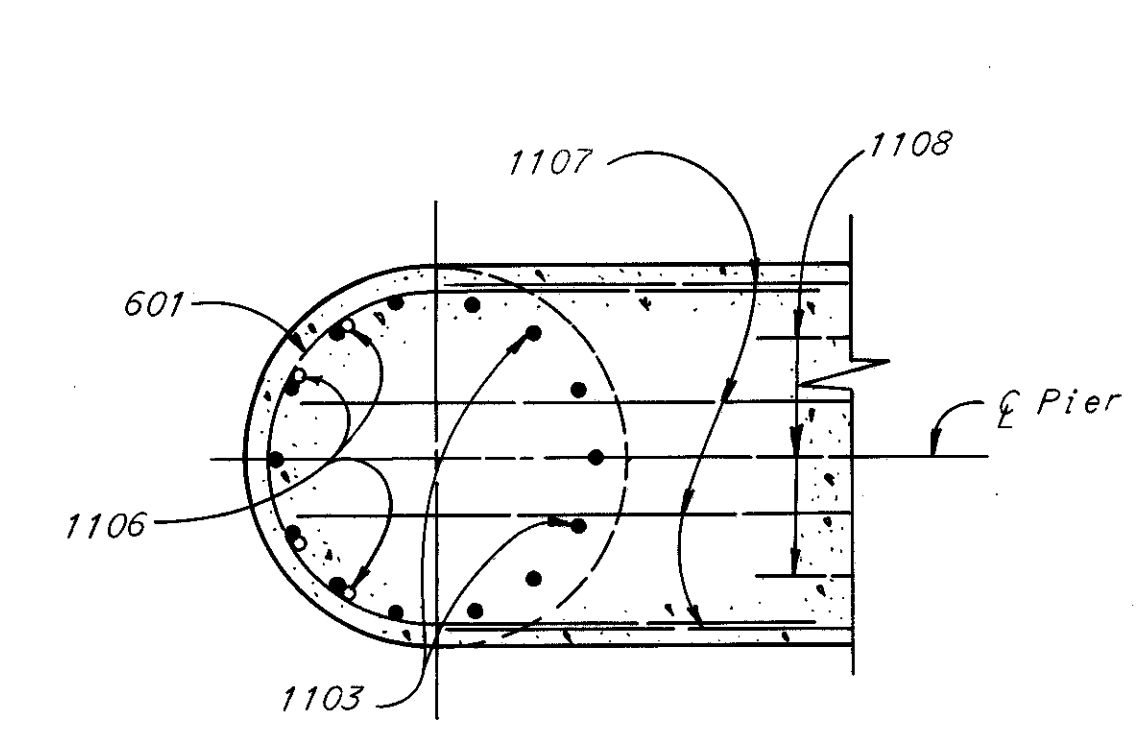
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



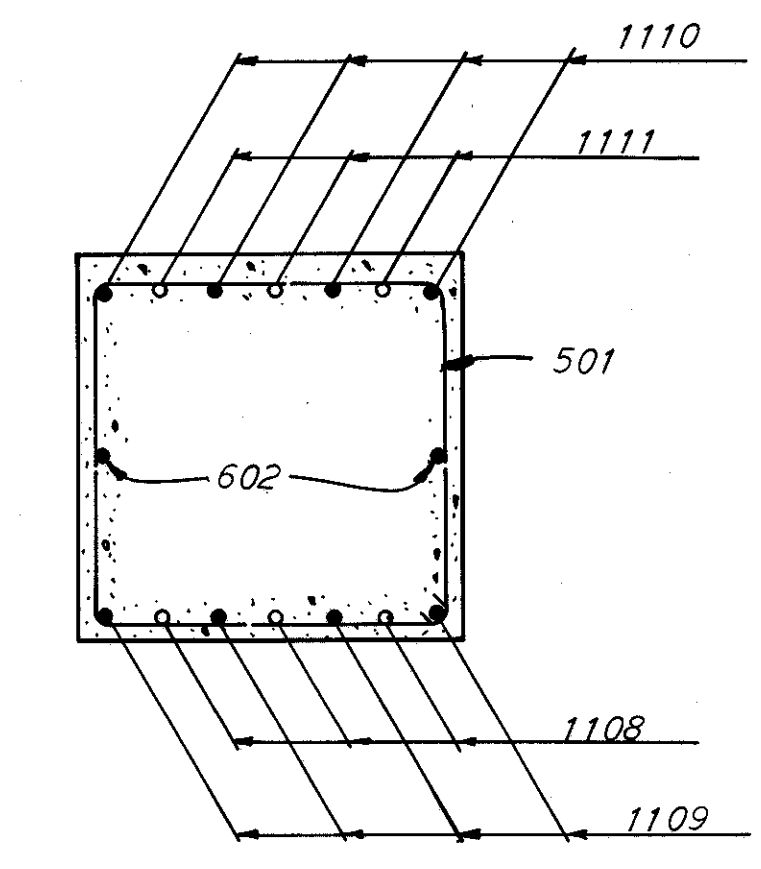
PLAN



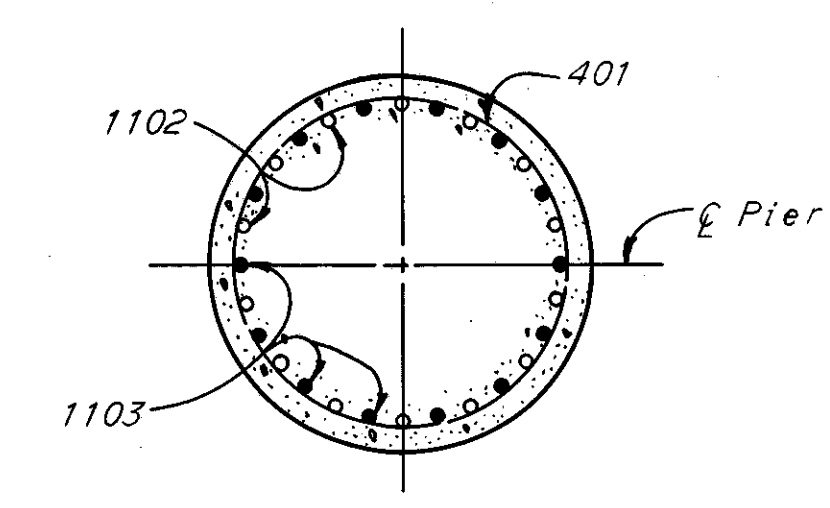
ELEVATION



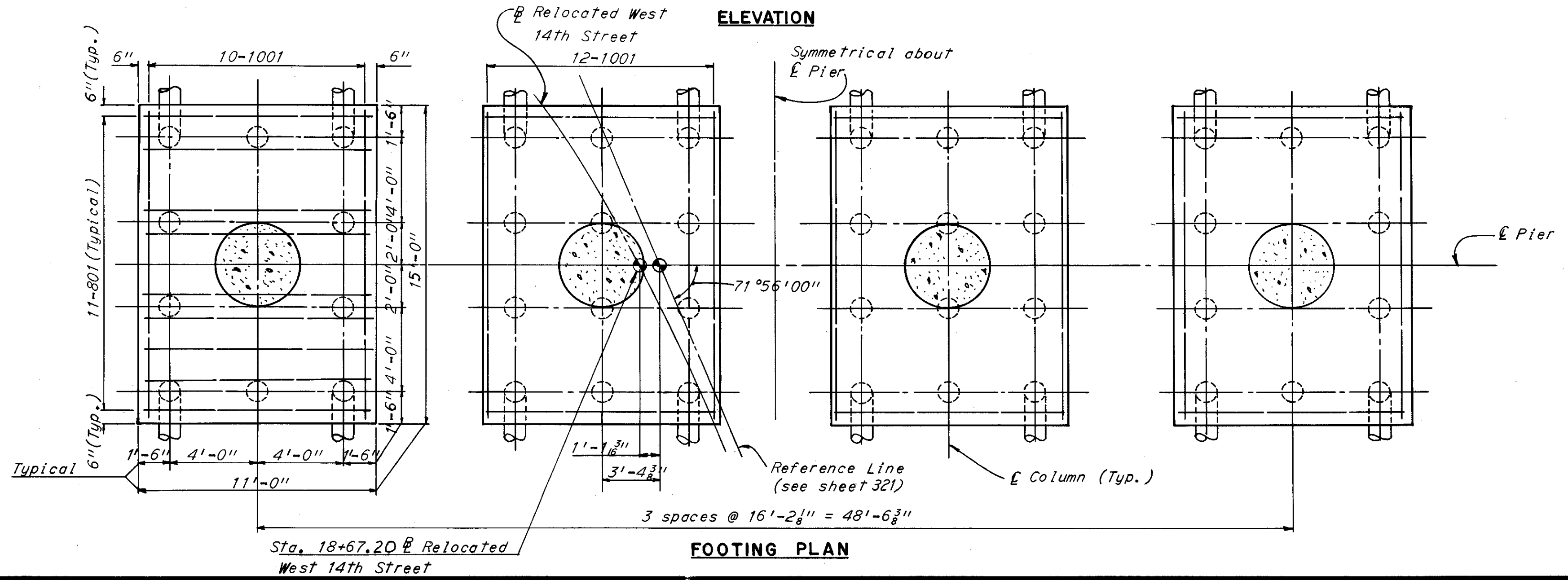
SECTION A-A



SECTION B-B



SECTION C-C



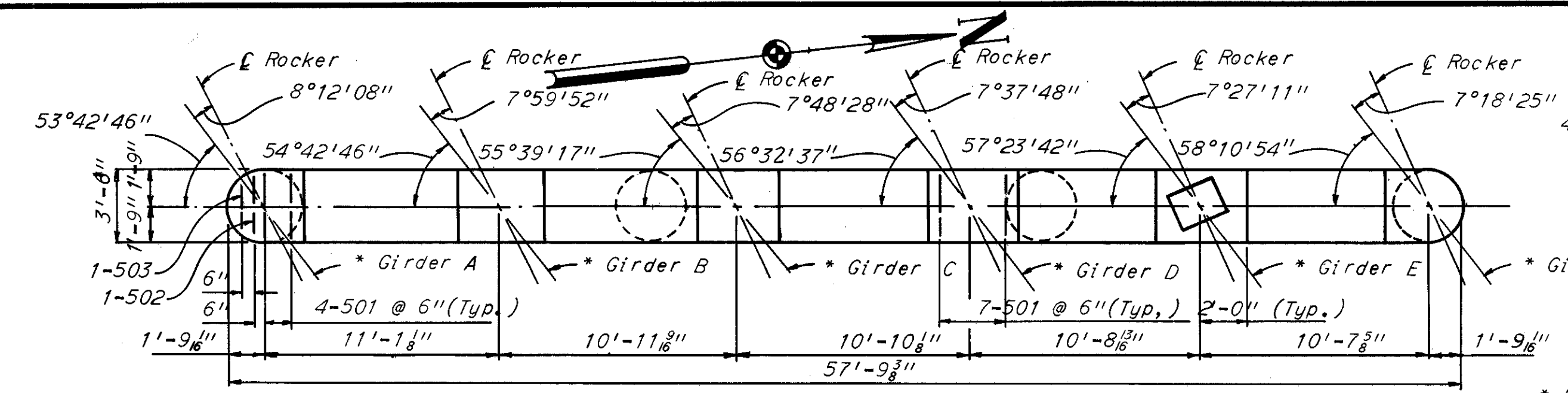
FOOTING PLAN

Note: All reinforcing bar marks in Pier 4 shall be prefixed PD.

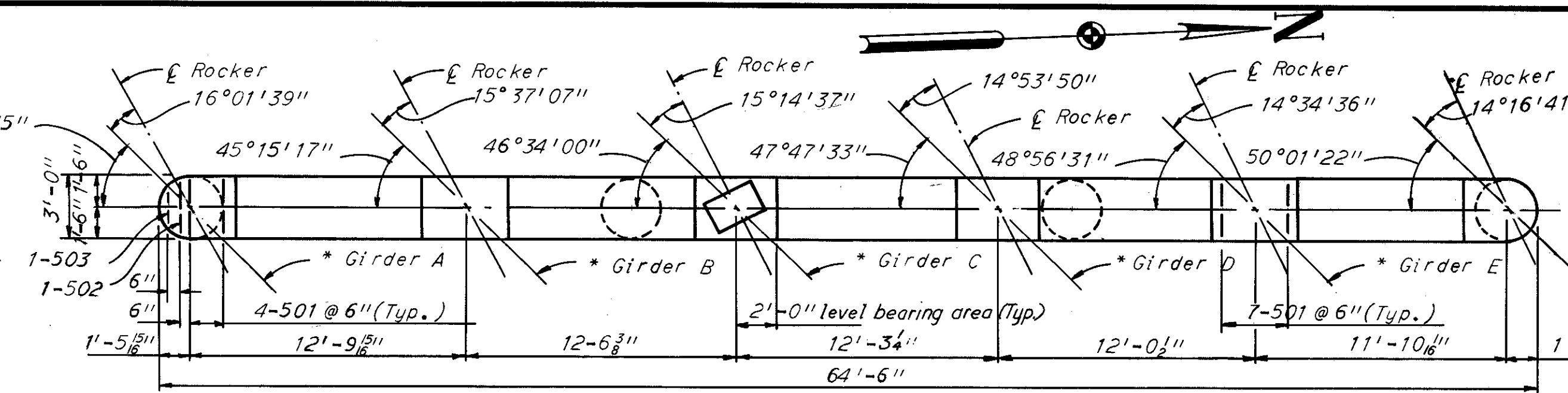
Notes:  
All piles are 12" Ø C.I.P. Reinforced Concrete.  
All battered piles shall be inclined 3 in 12 in the direction shown.  
Pile layout dimensions are measured along bottom of footing.  
The following abbreviation is used:  
e.f. = each face  
For Reinforcing Schedule and Bar Bending Diagram see sheet 336.

H.N.T.B. BR. NO. 19				
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK				
<b>PIER 4</b>				
I-71 UNDER RELOCATED WEST 14TH STREET				
BR. NO. CUY-71-1826			STA. 15 + 48.07 STA. 21 + 52.66	
CLEVELAND		CUYAHOGA COUNTY		OHIO
DRAWN DATE	TRACED DATE	CHECKED DATE	REVIEWED DATE	REVISED
10-15-64		11-5-64	12-22-64	
				SHEET 327

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

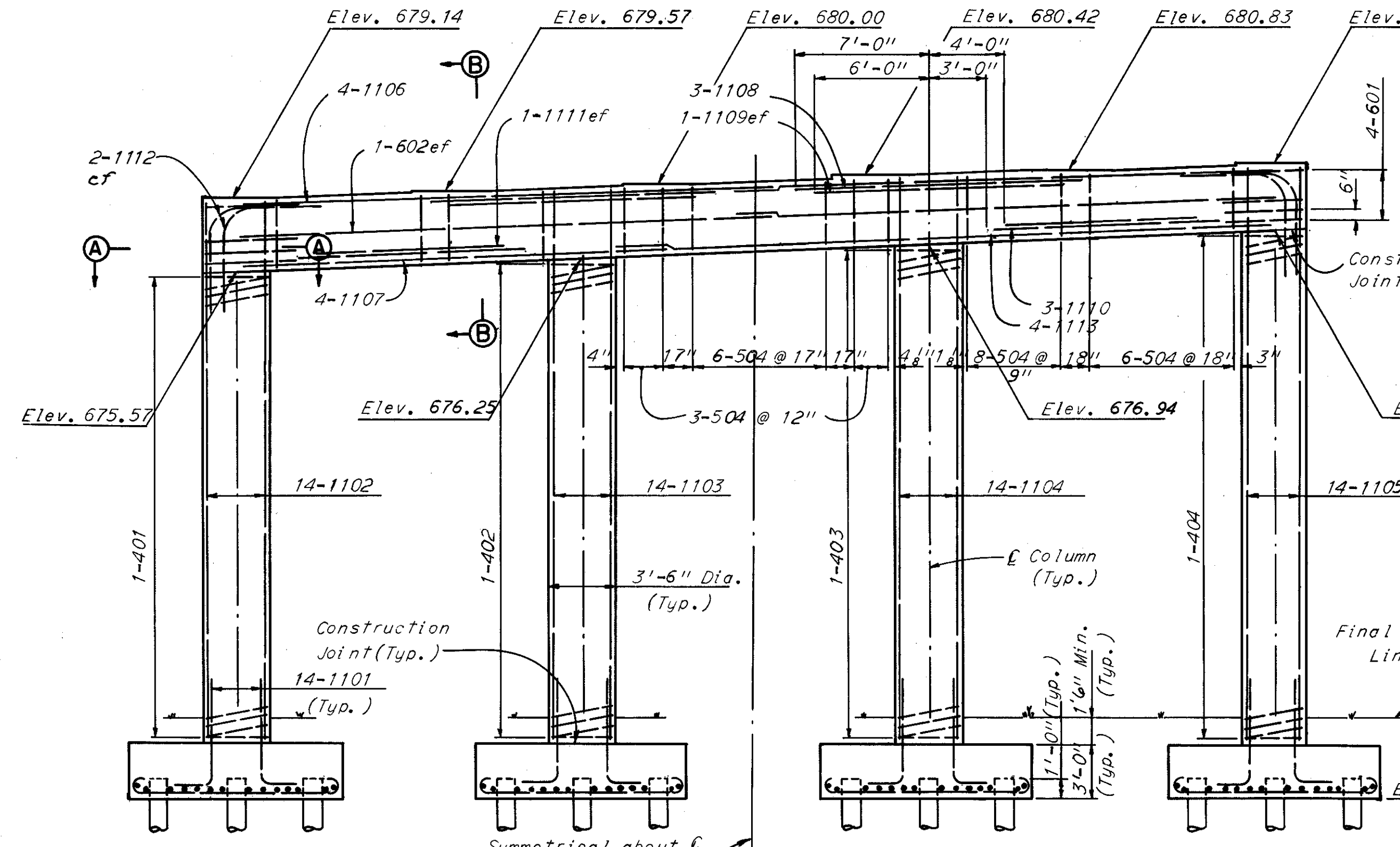


PLAN

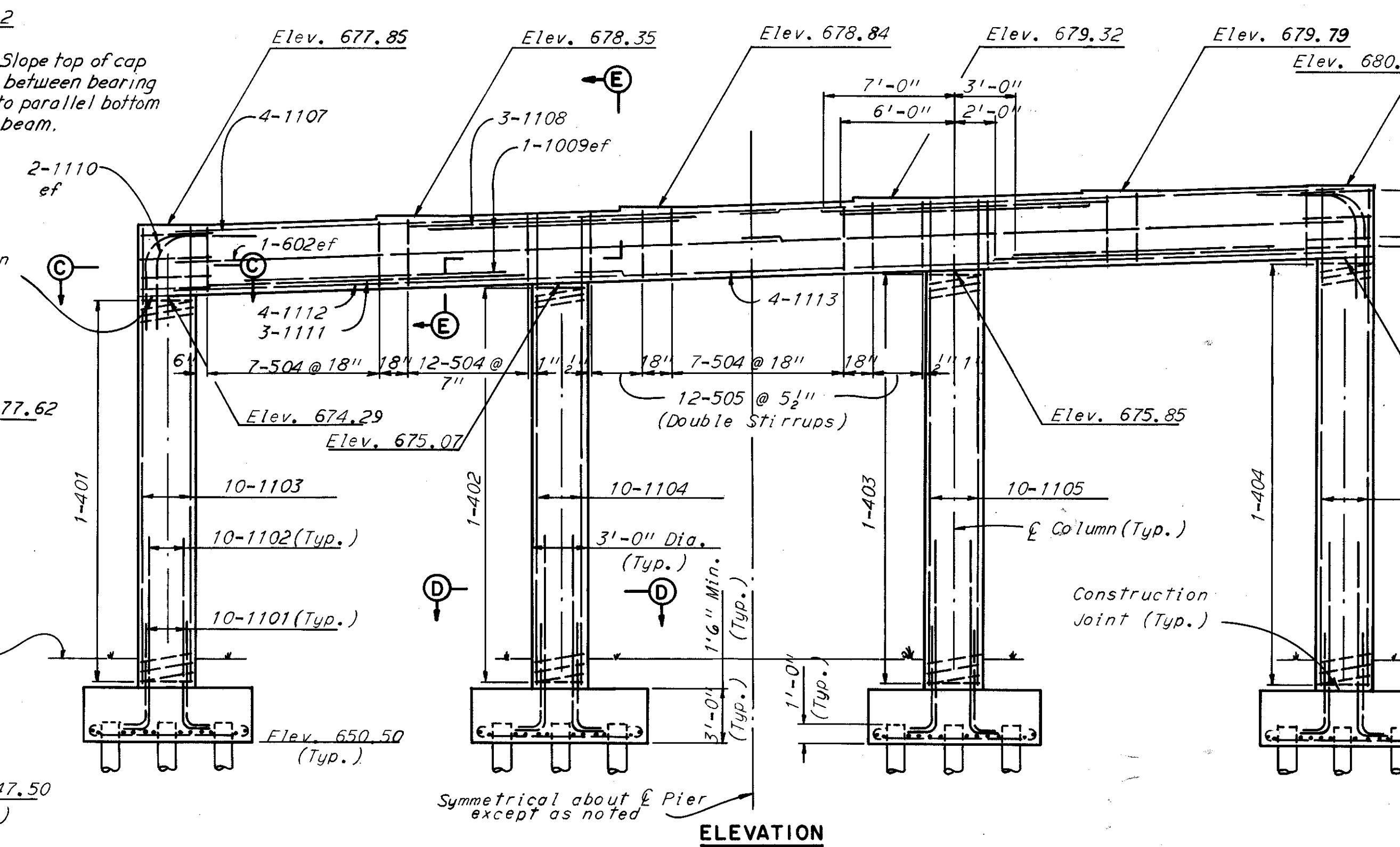


PLAN

\* Note:  
 Local Tangent  
 to  $\epsilon$  Girder at  $\epsilon$  Pier

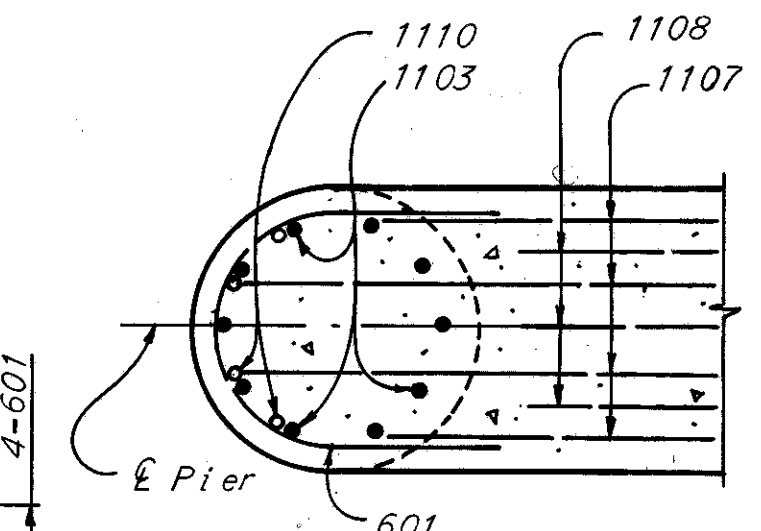


ELEVATION

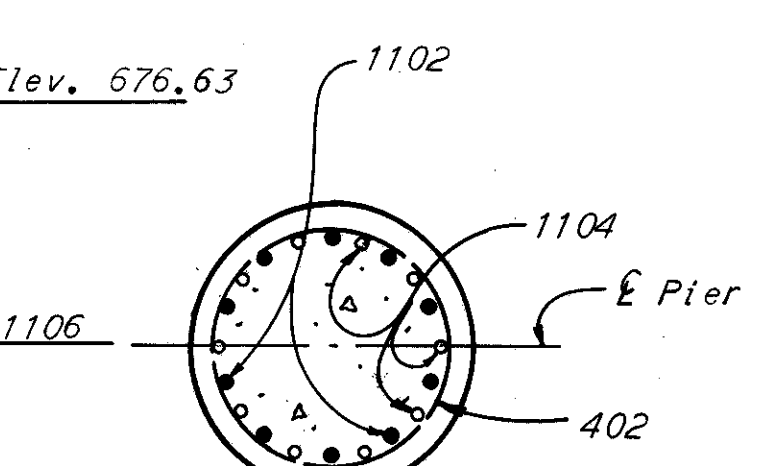


ELEVATION

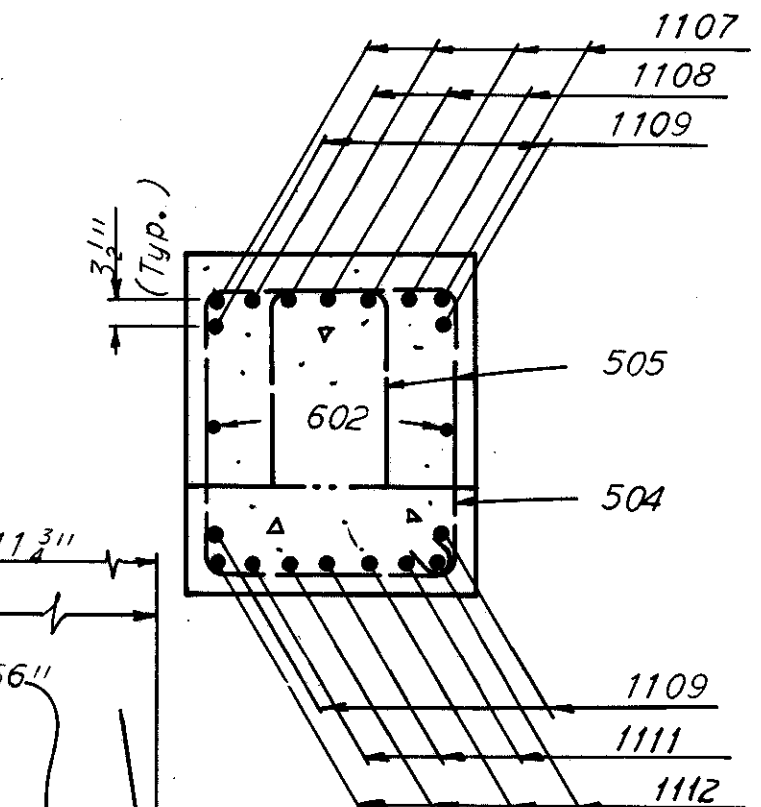
All reinforcing bar marks shall  
 be prefixed PE in Pier 5 and  
 PF in Pier 6.



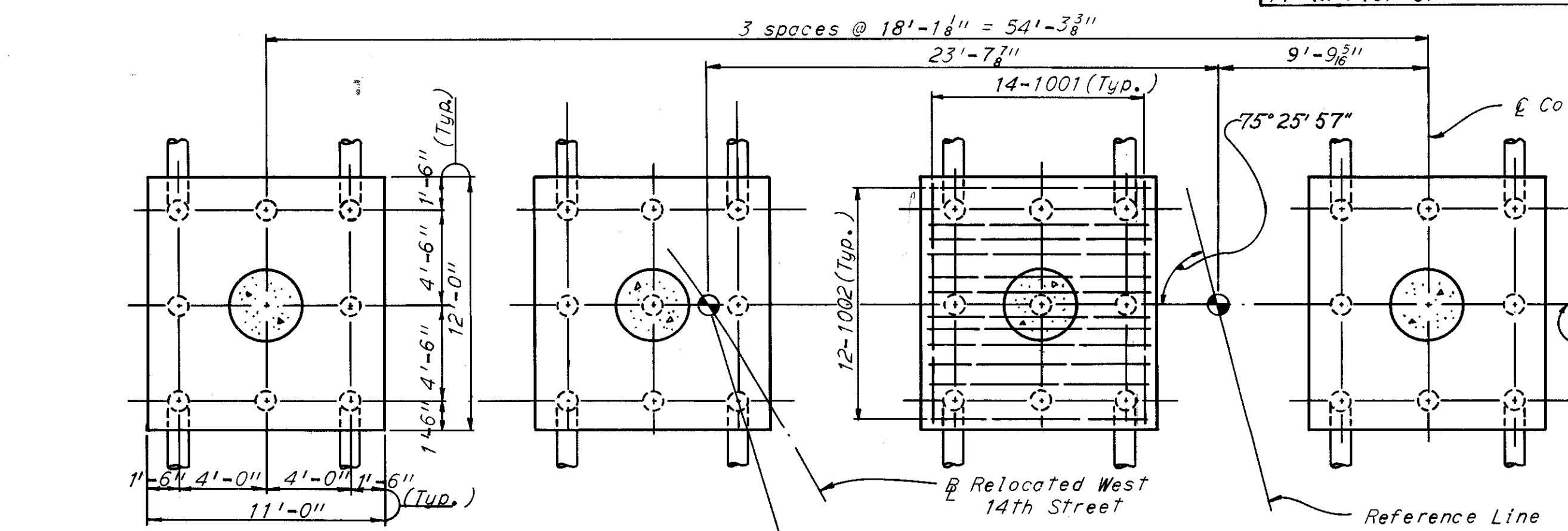
SECTION C-C



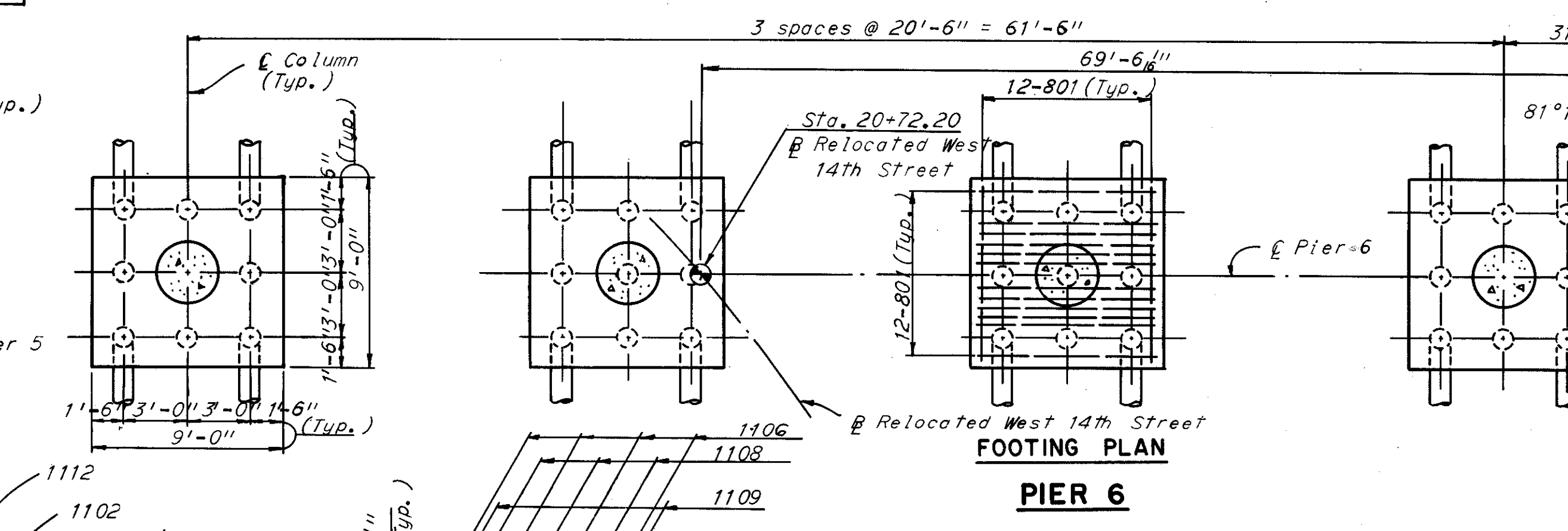
SECTION D-D



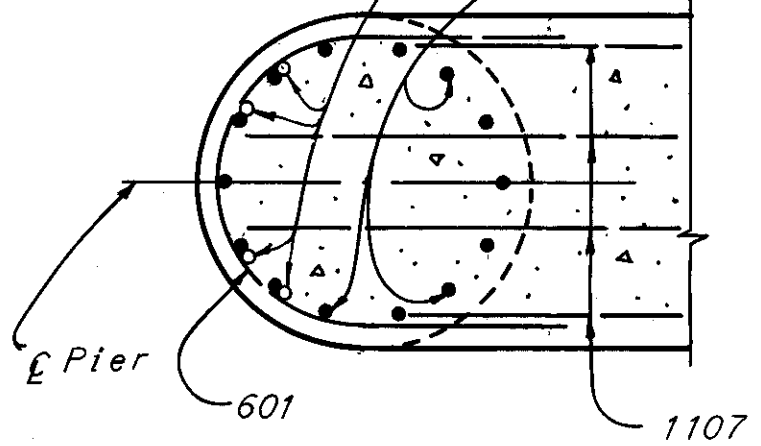
SECTION E-E



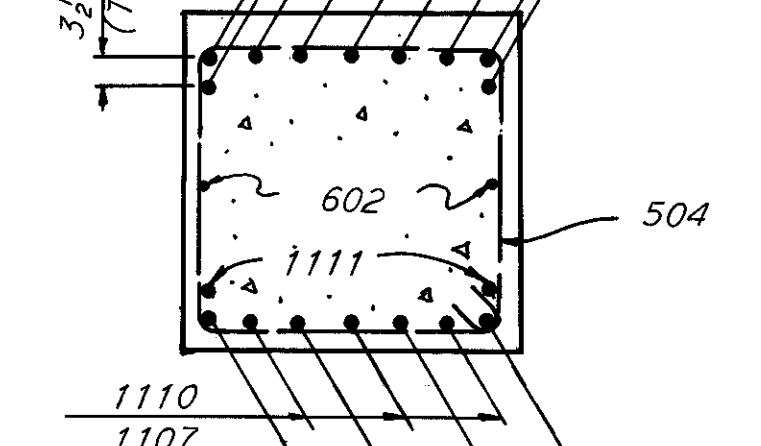
FOOTING PLAN  
 PIER 5



FOOTING PLAN  
 PIER 6



SECTION A-A



SECTION B-B

Notes:  
 All piles are 12"  $\phi$  C.I.P. Reinforced Concrete Piles.  
 Pile layout dimensions are measured along bottom of footing.  
 All battered piles shall be inclined 3 in 12 in the direction shown.  
 For Reinforcement Schedule and Bending Diagrams see sheet.  
 The following abbreviation is used:  
 ef = each face

H.N.T.B. BR. NO. 19  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

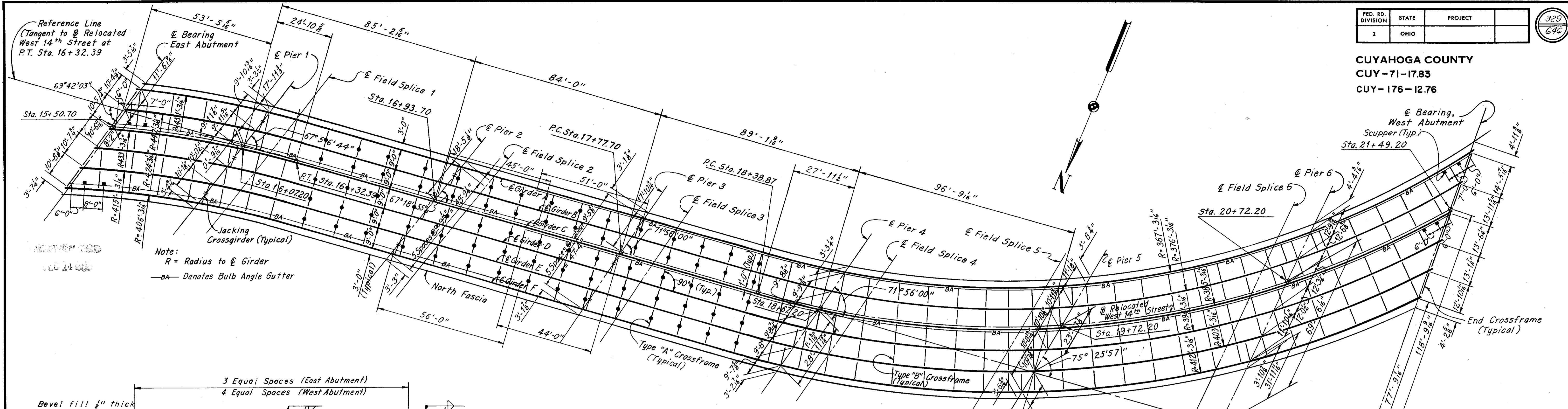
**PIERS 5 AND 6**  
 I-71 UNDER RELOCATED WEST 14TH STREET

BR. NO. CUY-71-1826 STA. 15 + 48.07  
 STA. 21 + 52.66

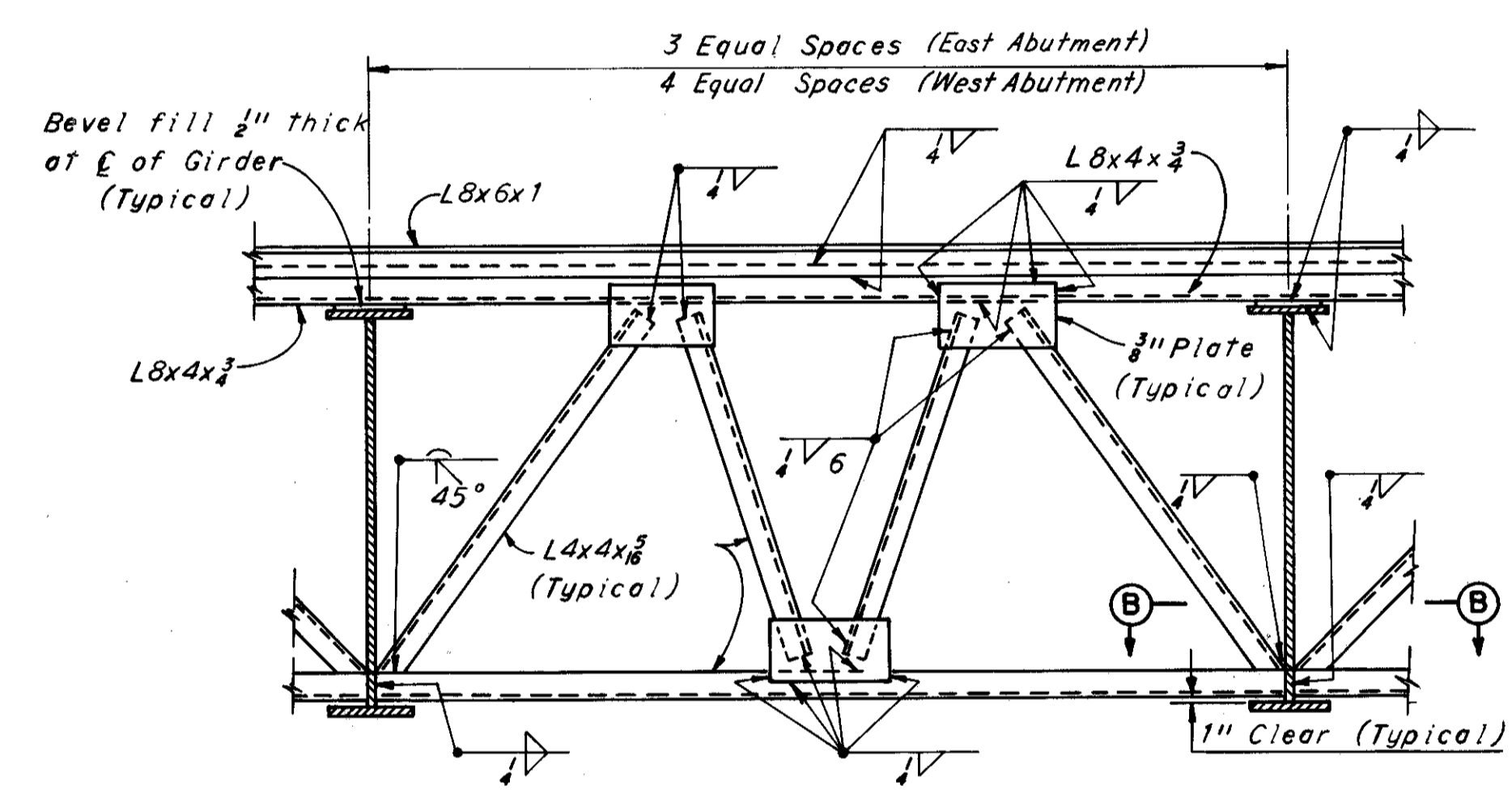
OHIO	CUYAHOGA COUNTY	CHECKED	TRACED	DATE
DATE	DATE	DATE	DATE	DATE
7-17-64	11-2-64	11-2-64	11-2-64	11-2-64

SHEET 328

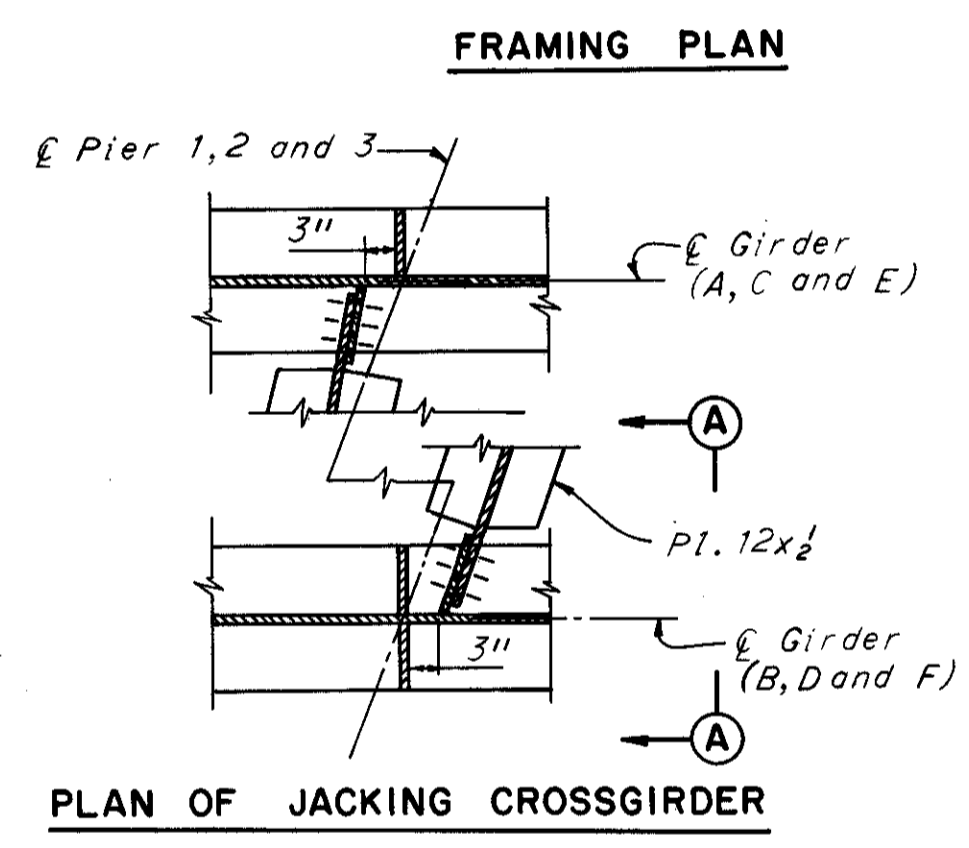
CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



Note:  
 R = Radius to  $\epsilon$  Girder  
 BA = Denotes Bulb Angle Gutter

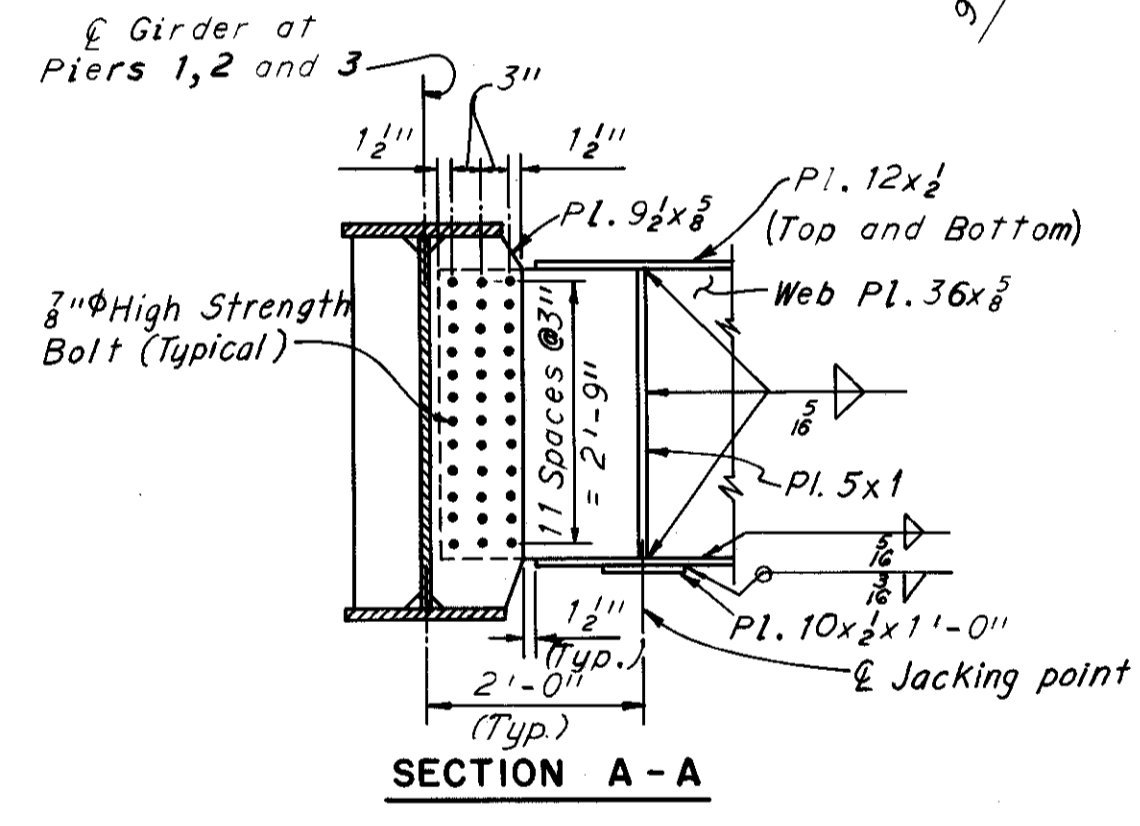


**END CROSSFRAME**  
 (East end crossframe shown, West end crossframe similar except as noted.)

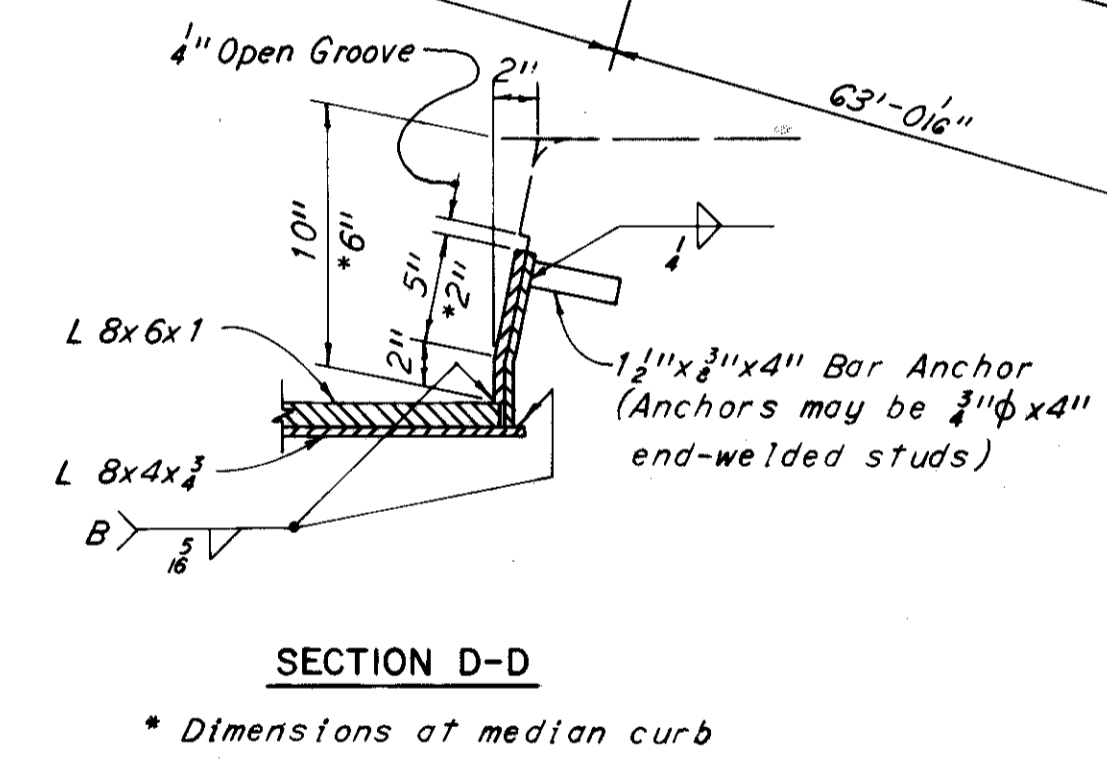


**FRAMING PLAN**

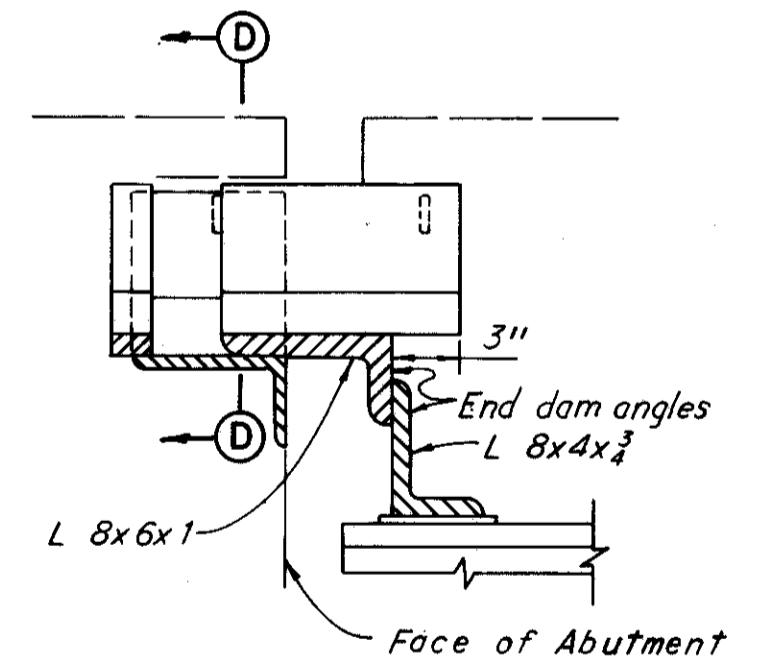
**PLAN OF JACKING CROSSGIRDER**



**SECTION A-A**

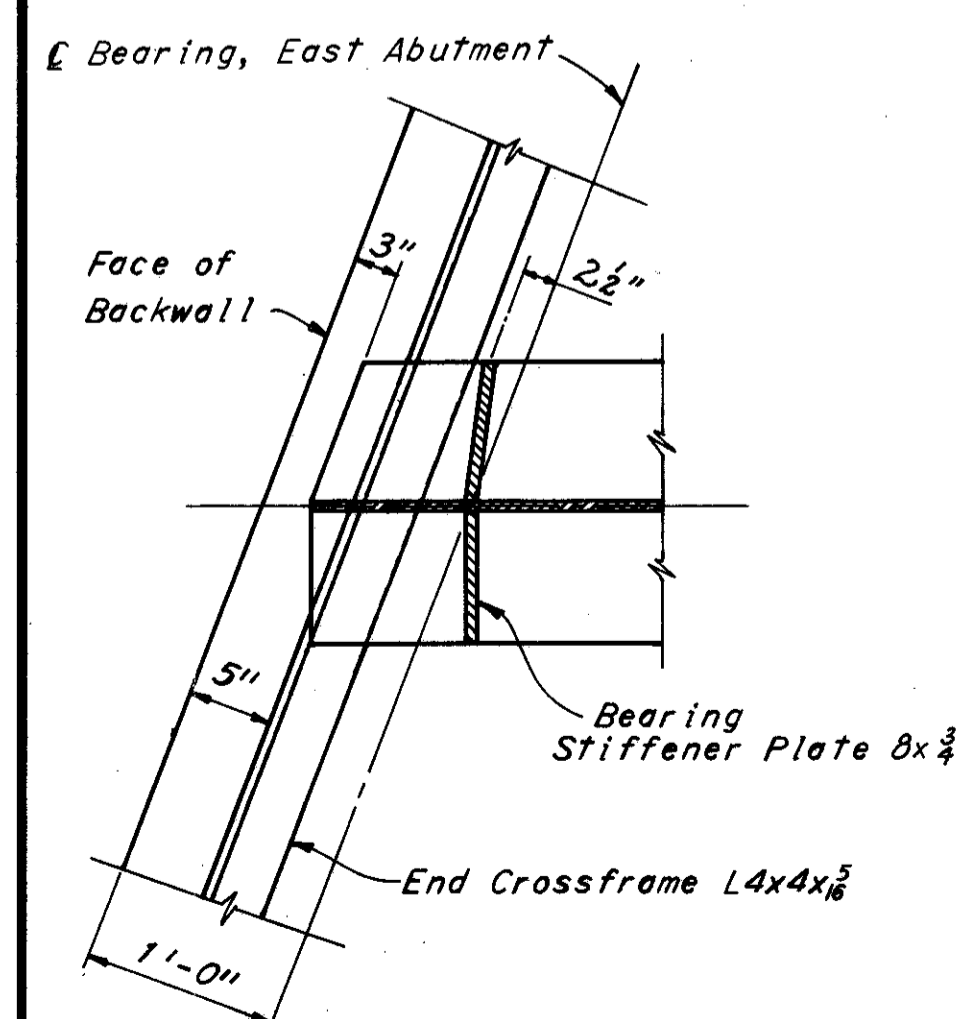


**SECTION D-D**  
 \* Dimensions at median curb

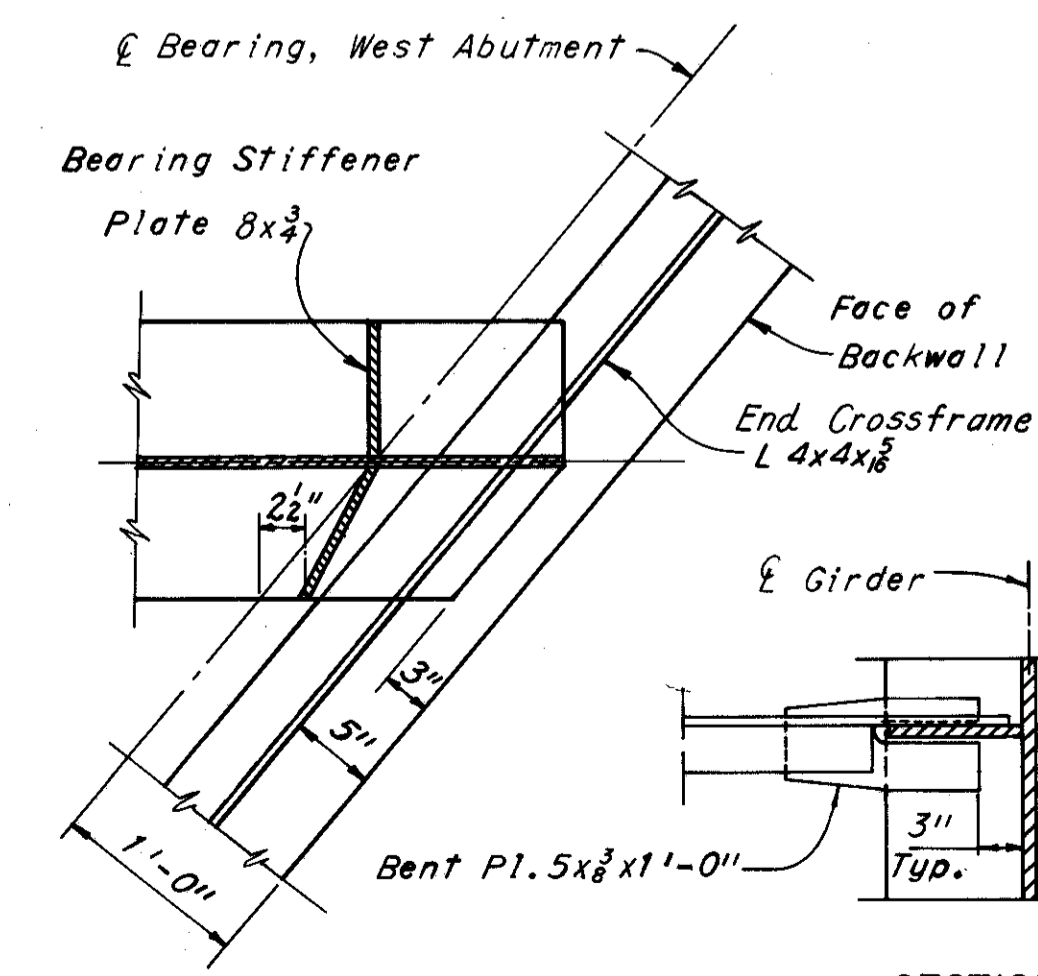


**CURB PLATE DETAIL**

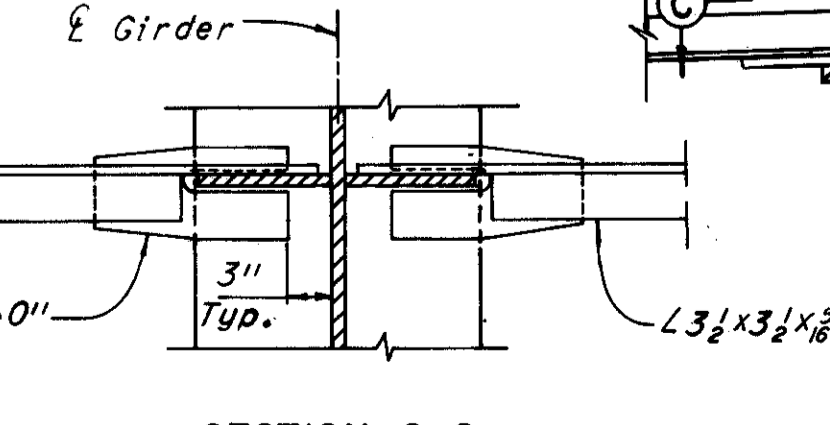
Shown without bulb angle. For similar detail with bulb angle see Ohio Standard Drawing SD-1-63, sheet 4 of 4.



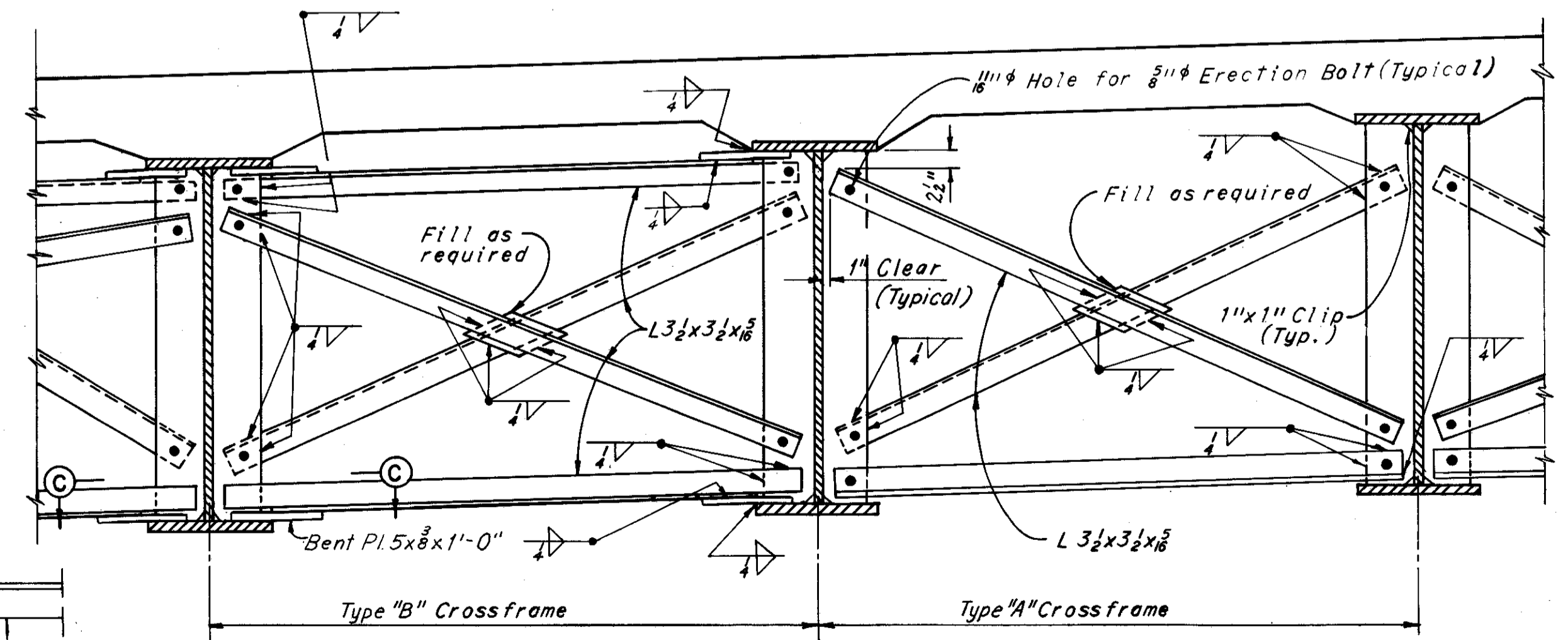
**SECTION B-B EAST ABUTMENT**



**SECTION B-B WEST ABUTMENT**



**SECTION C-C**



**TYPICAL INTERMEDIATE CROSSFRAME**

Notes:  
 For girder details, crossframe spacing and field splice locations see sheets 330 and 331  
 For details of roadway end dam see Ohio Standard Drawing SD-1-63, sheet 2 of 4.  
 For details of scuppers and bulb angle gutter support see sheet 333.

H.N.T.B. BR. NO. 19  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**FRAMING PLAN AND CROSSFRAME DETAILS**  
 I-71 UNDER RELOCATED WEST 14TH STREET

BR. NO. CUY-71-1826 STA. 15+48.07  
 STA. 21+52.66

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN RSD	TRACED	CHECKED JMC
DATE 12.16.64	DATE	DATE 12.22.64

REVIEWED [Signature] REVISION [Signature]  
 DATE 12.22.64

SHEET 329

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	



CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

WEB TO FLANGE-WELD SIZE	
Flange Plate Thickness	Fillet Weld Size
3/4", 1" and 1 1/2"	3/8"
1 1/2", 2" and 2 1/2"	1/2"

Note:  
 Girders B thru D:  
 \* Crossframes North side only.  
 \* Crossframes South side only.

Notes:  
 Connection plates for jacking crossgirders are not shown in girder elevations. For location and details see sheet 329.  
 For details of rockers and bolsters see Ohio Standard Drawing RB-1-55.  
 The rockers at Piers 1, 2 and 3 shall be provided with shims under the base plates. Shims are to be 1/2" thick with other dimensions to match base plate. Provide 7 shims under each rocker at Pier 1, 5 shims under each rocker at Pier 2 and 3 shims under each rocker at Pier 3.  
 For additional notes see sheet 331.

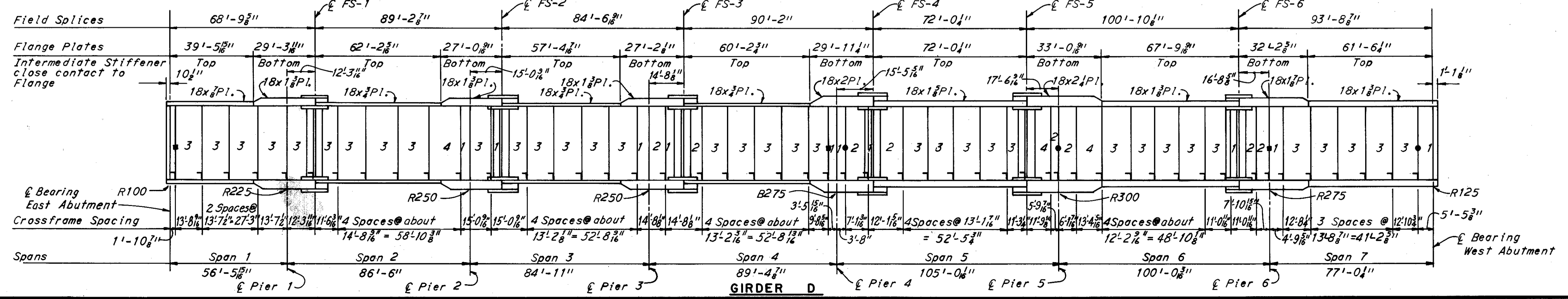
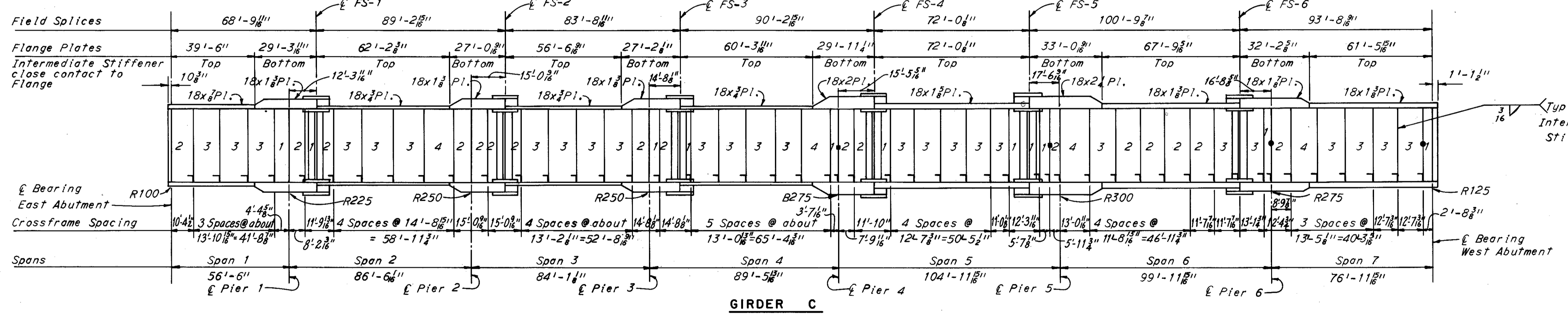
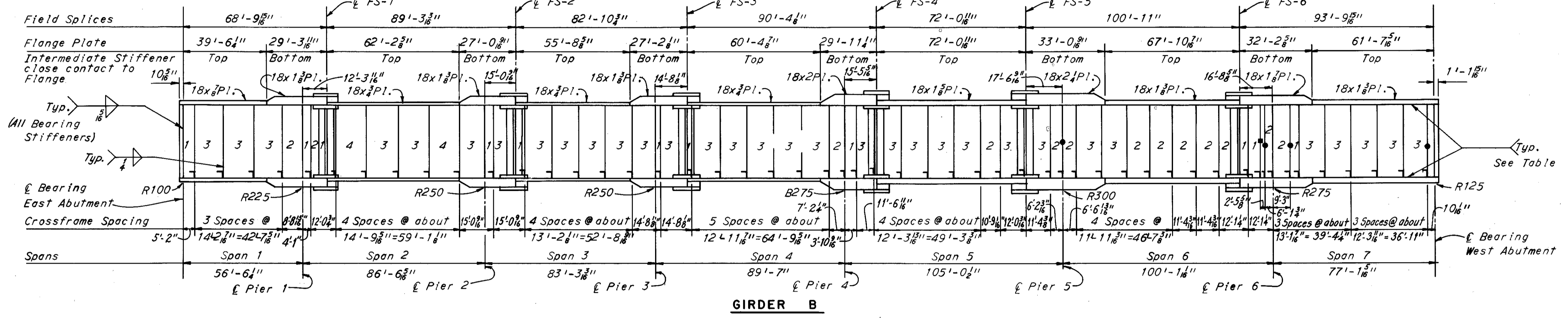
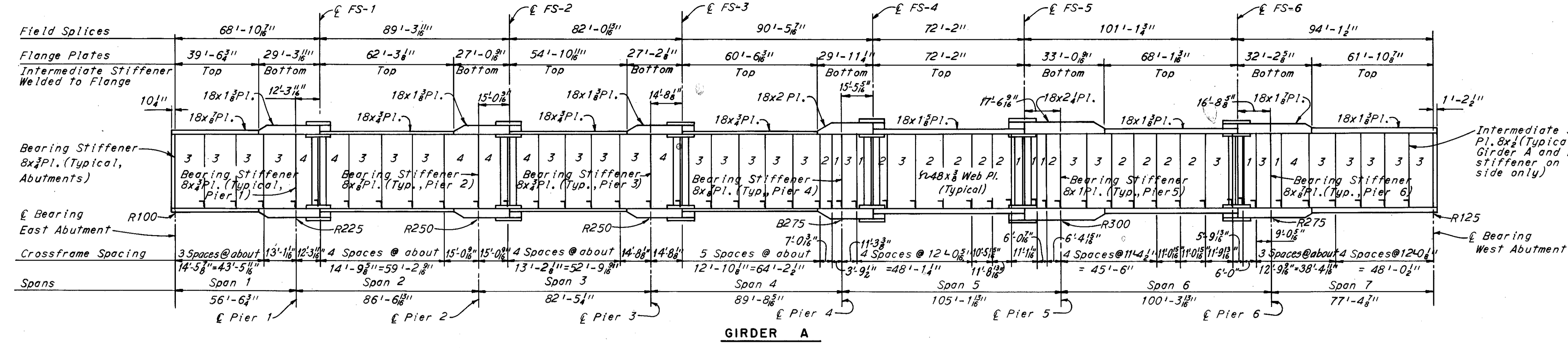
H.N.T.B. BR. NO. 19  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**GIRDER ELEVATIONS**  
 I-71 UNDER RELOCATED WEST 14TH STREET

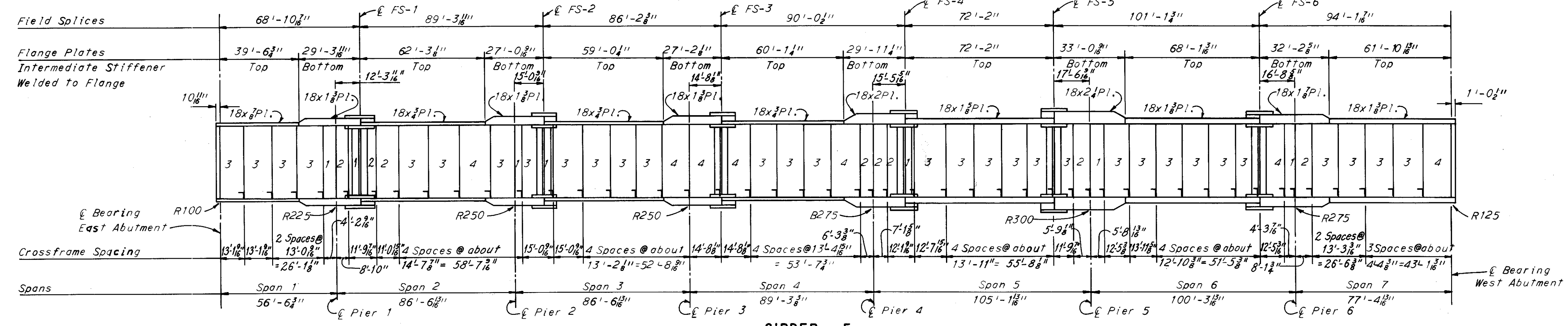
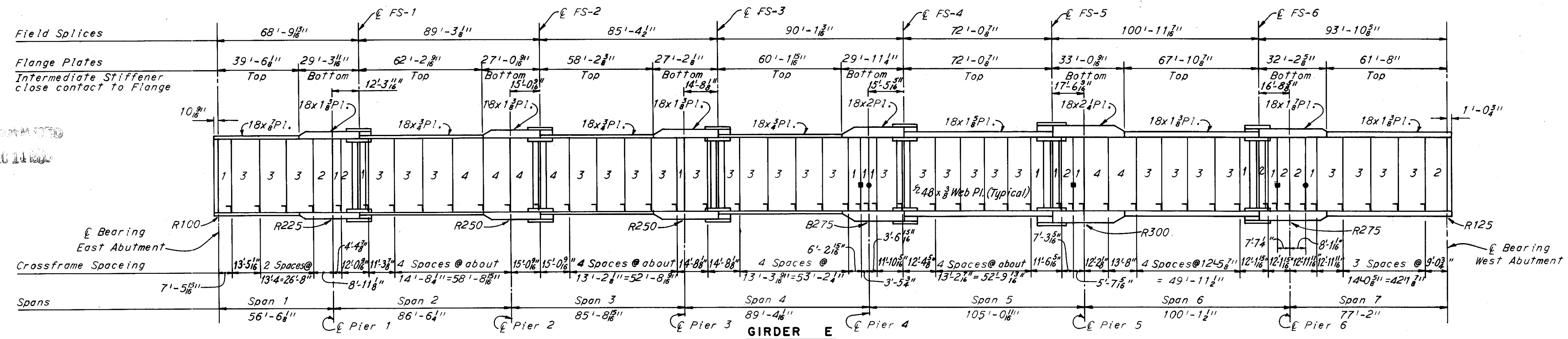
BR. NO. CUY-71-1826 STA. 15 + 48.07  
 STA. 21 + 52.66

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN R.S.D. TRACED	CHECKED J.M.C.	REVIEWED W.A.
DATE 12-16-64	DATE 12-17-64	DATE 12-28-64

SHEET 330

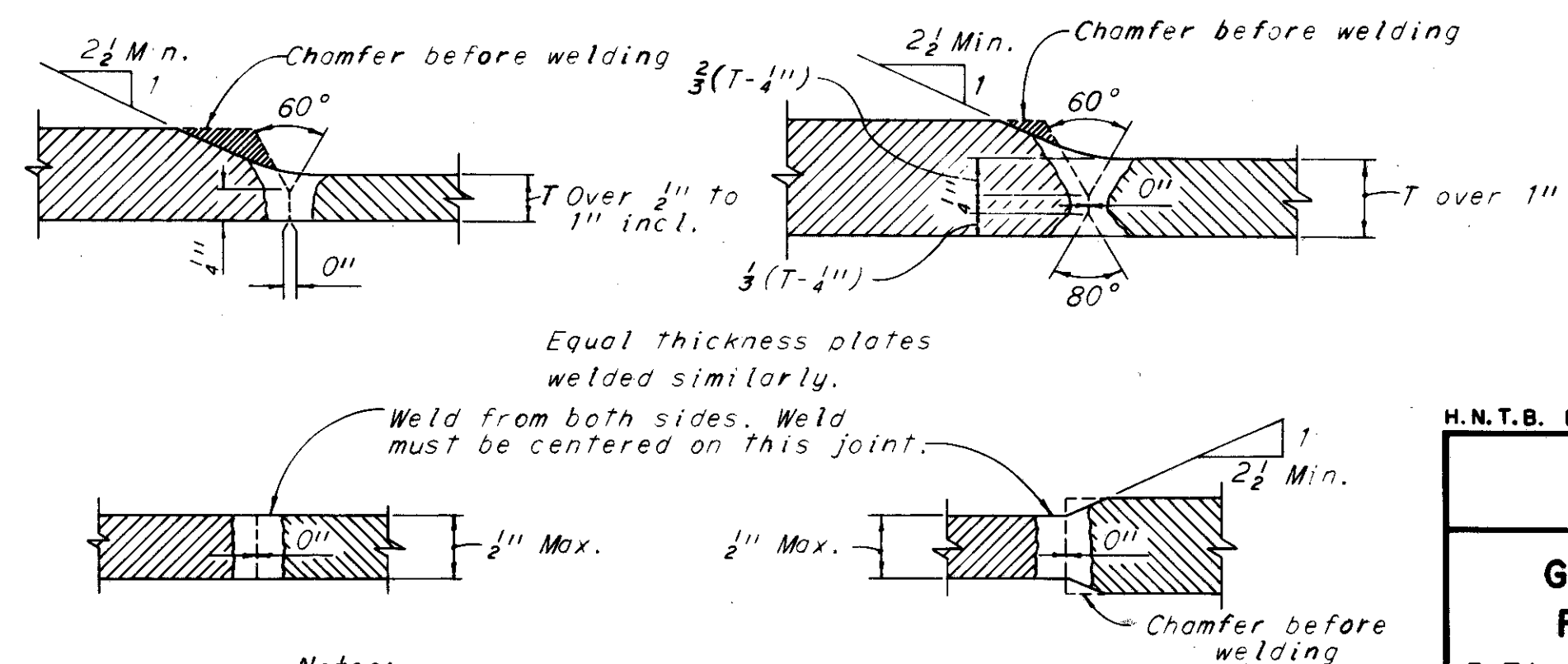
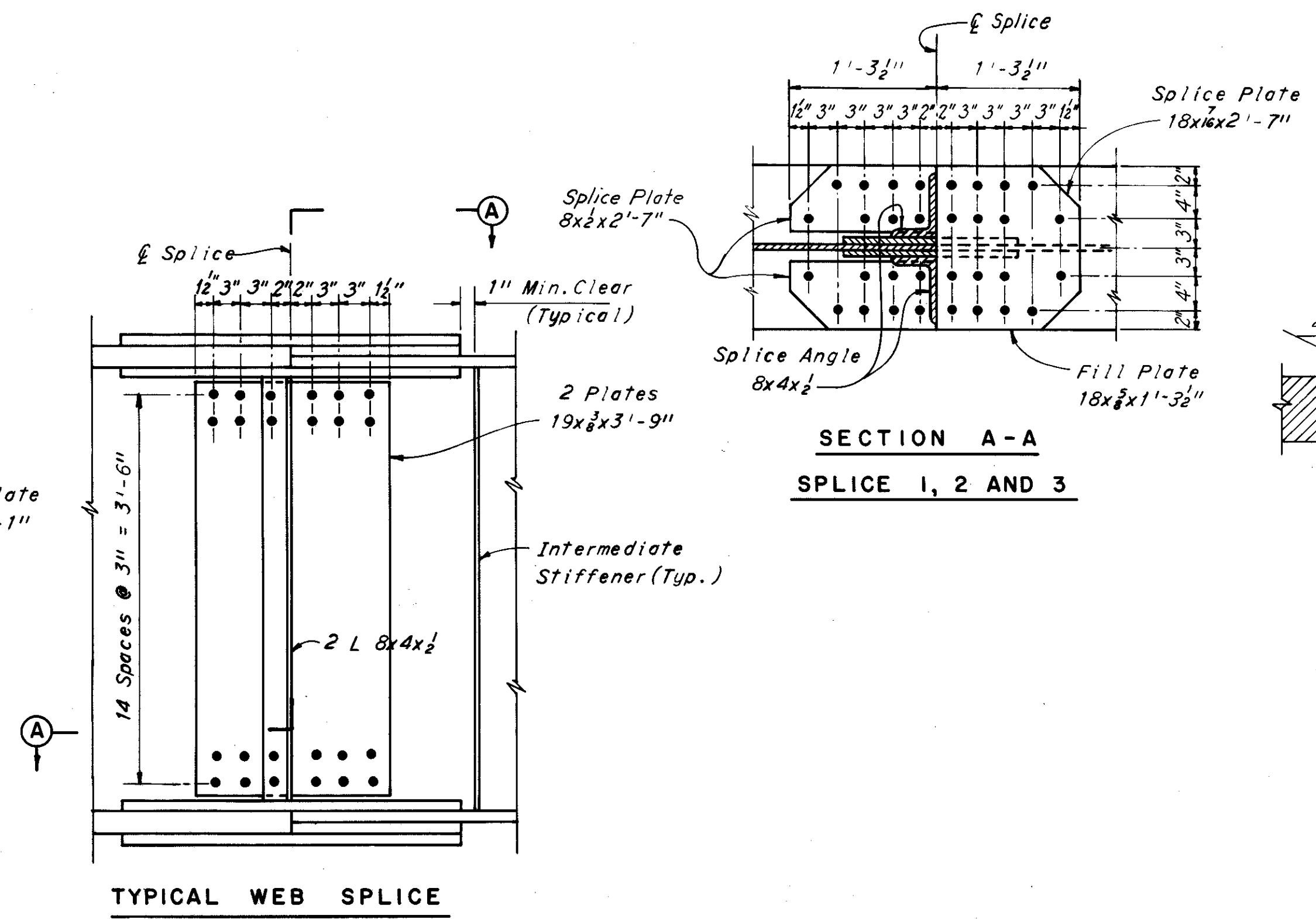
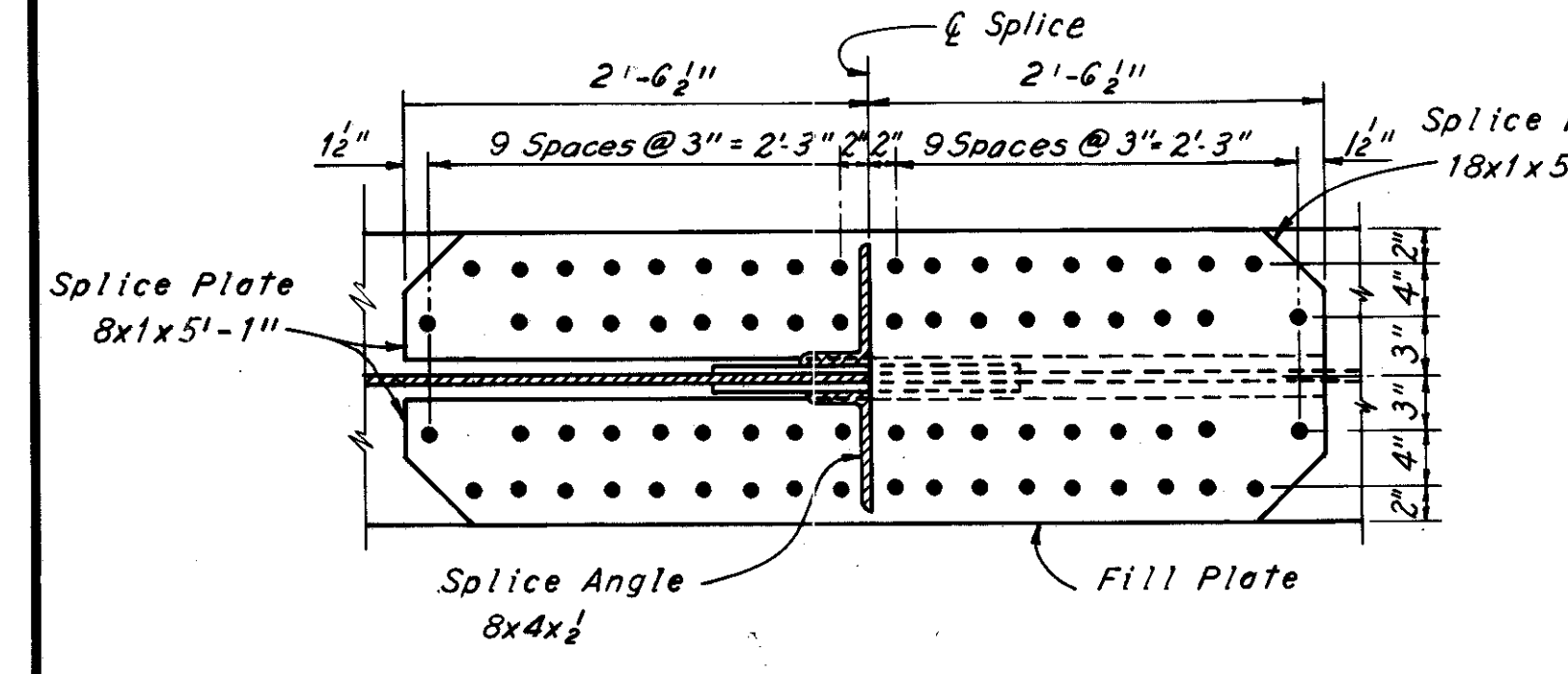
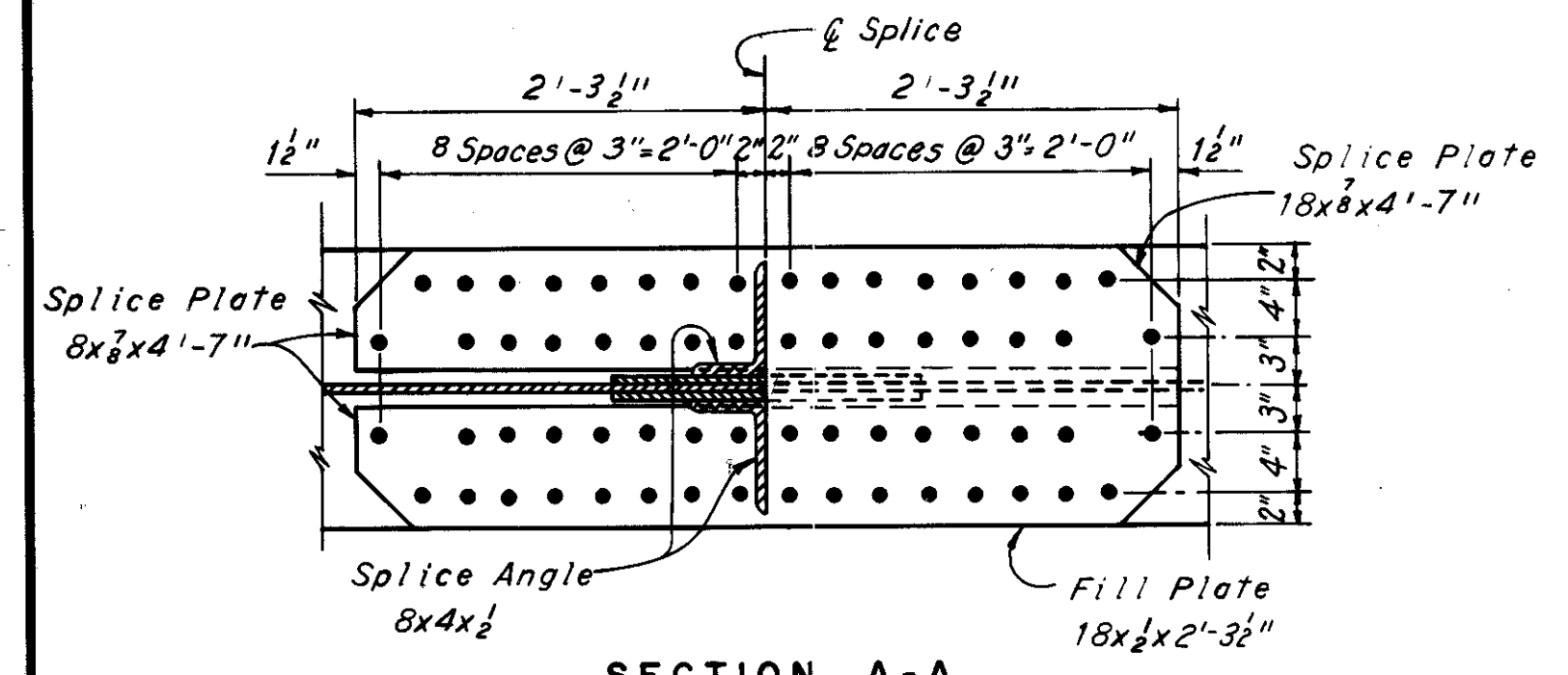


**CUYAHOGA COUNTY**  
**CUY-71-17.83**  
**CUY-176-12.76**



**GIRDER E:**  
 ♣ Crossframes North side only.  
 ♠ Crossframes South side only.

**Girder Notes:**  
 All measurements are given along center line of girders.  
 The girders shall be fabricated to compensate for effects of vertical curvature, super-elevation and dead load deflections, and under full dead load shall parallel the profiles formed by the top of pavement elevations directly over the girders.  
 Top and bottom flange plates are to be the same and shall be spliced at points shown on the girder elevations.  
 The web plate may be shop spliced as required by available plate lengths.  
 The location of shop web splices and the locations and details of any additional shop flange splices shall be submitted to the Director for approval prior to ordering of material.  
 Numbers shown on the web indicate the number of intermediate stiffeners to be equally spaced in that interval.  
 Intermediate stiffeners shall be placed in pairs on interior girders and on the inside only of exterior girders. Stiffeners placed in pairs shall have contact bearing with the flange indicated in the girder elevations and stiffeners placed singly shall be welded to the flange indicated in the girder elevations. A clearance of not more than 1/4 inch shall be maintained from the opposite flanges. In shop painting care shall be taken to make certain that point is forced through the 1/4 inch opening. Welding of the stiffeners to the flanges where indicated shall be made with a 3/8 inch fillet weld on both sides of the stiffener with the welds stopping 2 inches from the outside edge of the stiffener.  
 Bearing stiffeners at piers and abutments shall be placed in pairs on all girders and shall be bevelled and fully butt welded to the lower flange and fitted to close contact with the upper flange without welding.  
 All stiffeners shall be set normal to girder flanges.  
 All girder field splices shall be made with 7/8" diameter high strength steel bolts. The bolts shall be placed with their heads on outside face of exterior girders and on the bottom of all flange plates.  
 The contractor shall submit to the Director, for approval, three prints showing his proposed erection procedure.  
 For additional notes see sheet 330.



**Notes:**  
 All the above full penetration welds shall be back-gauged and welded after welding for side.  
 Butt welds on girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.

**GIRDER SHOP WELDING DETAILS**

H.N.T.B. BR. NO. 19  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

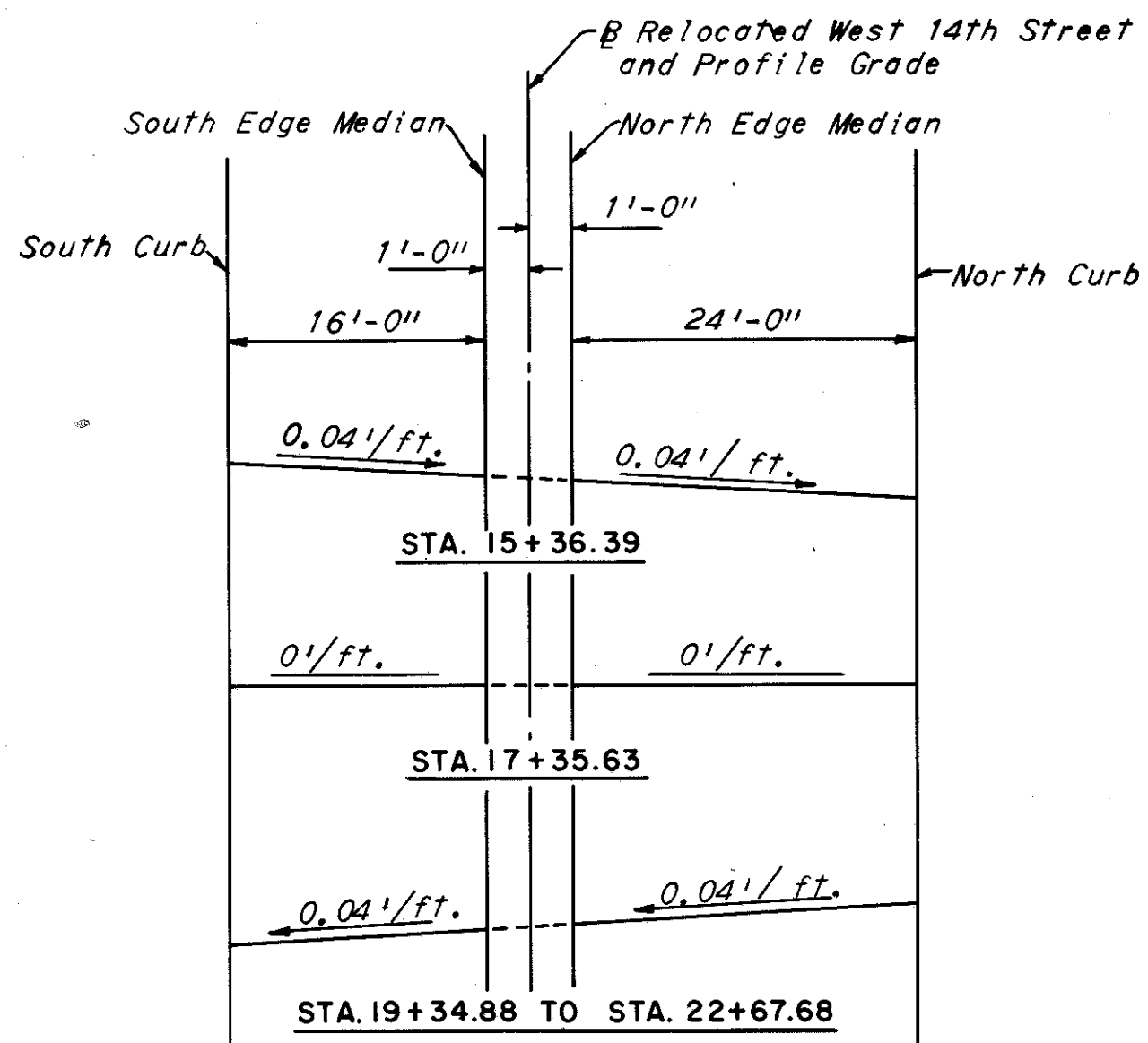
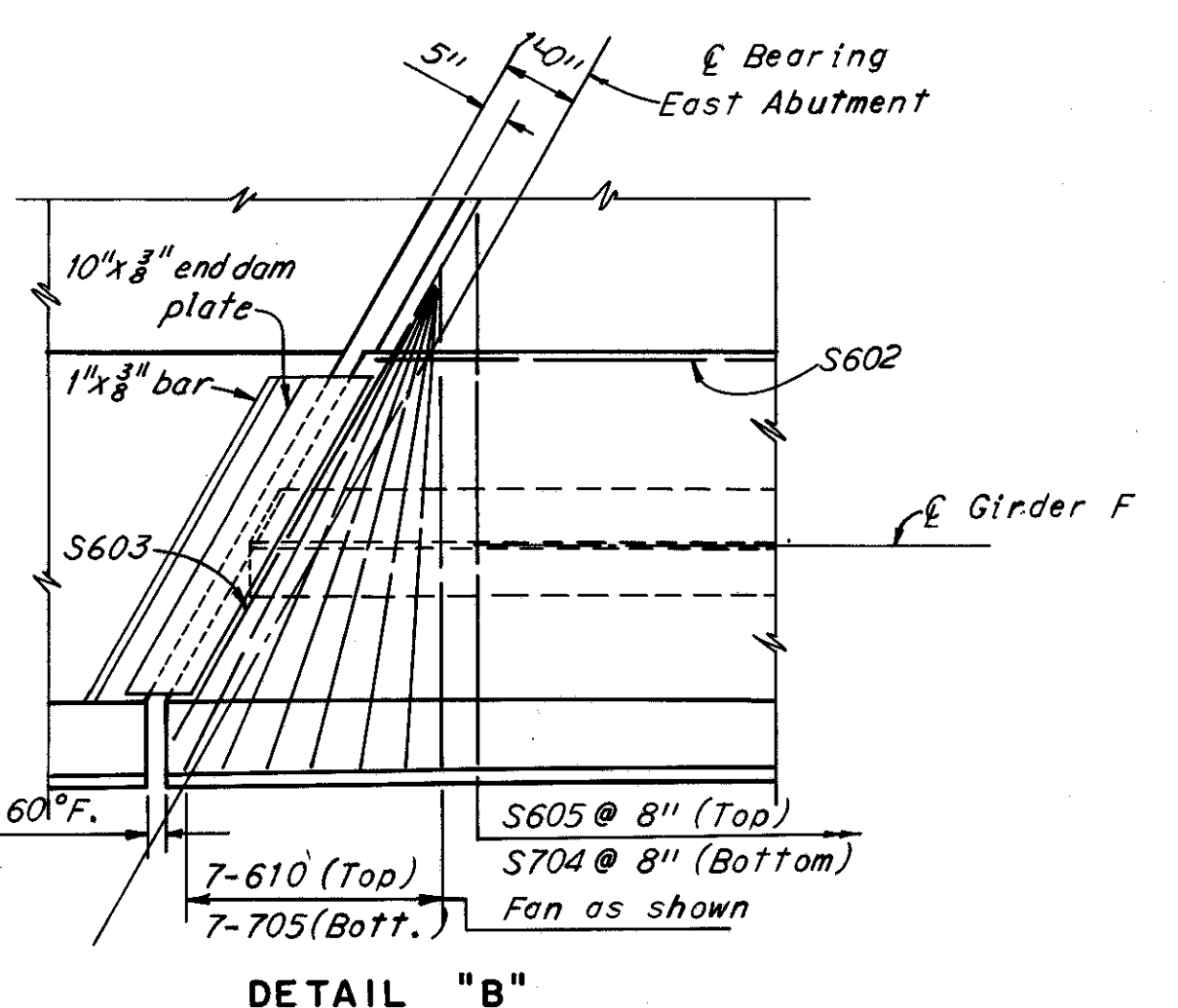
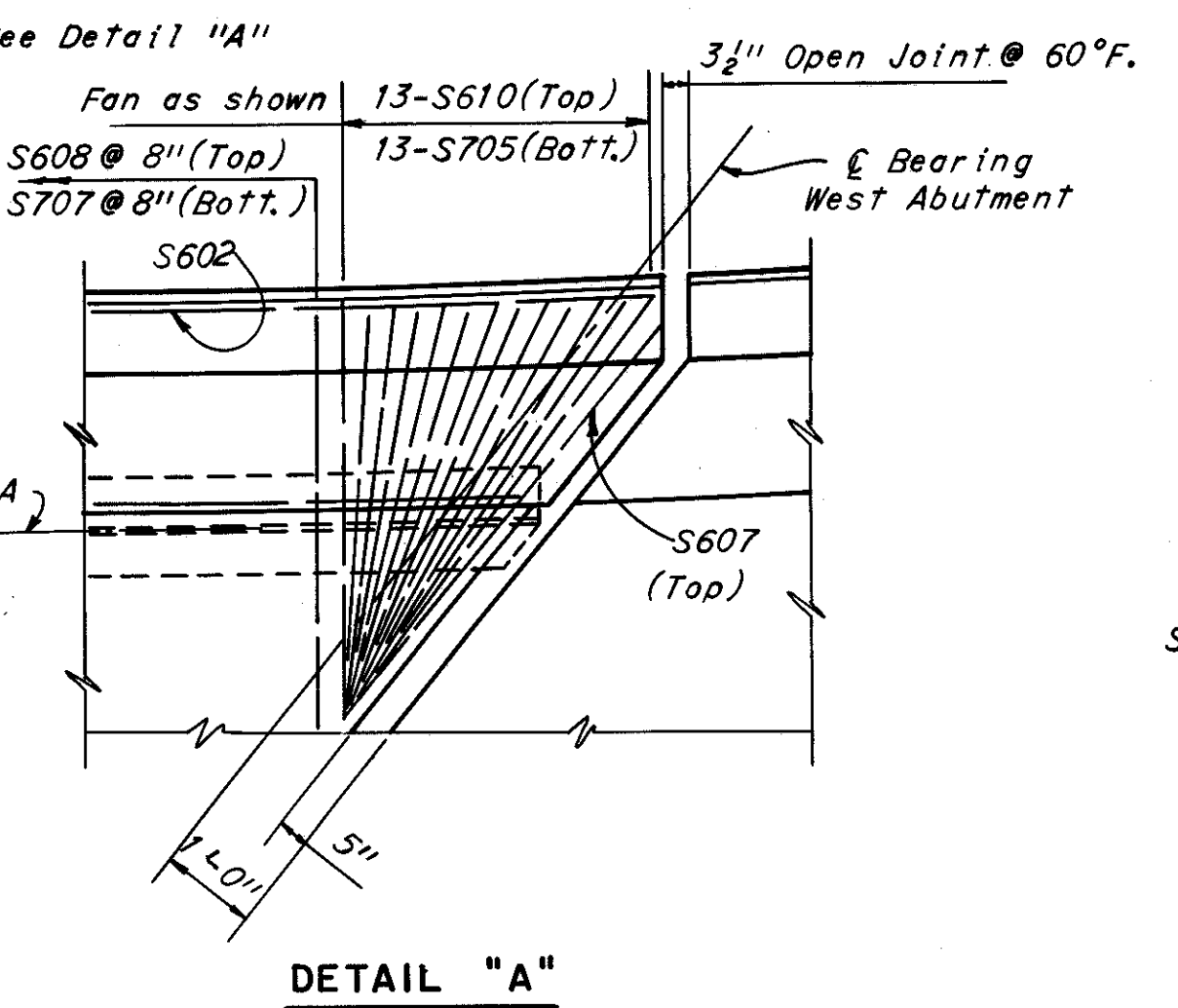
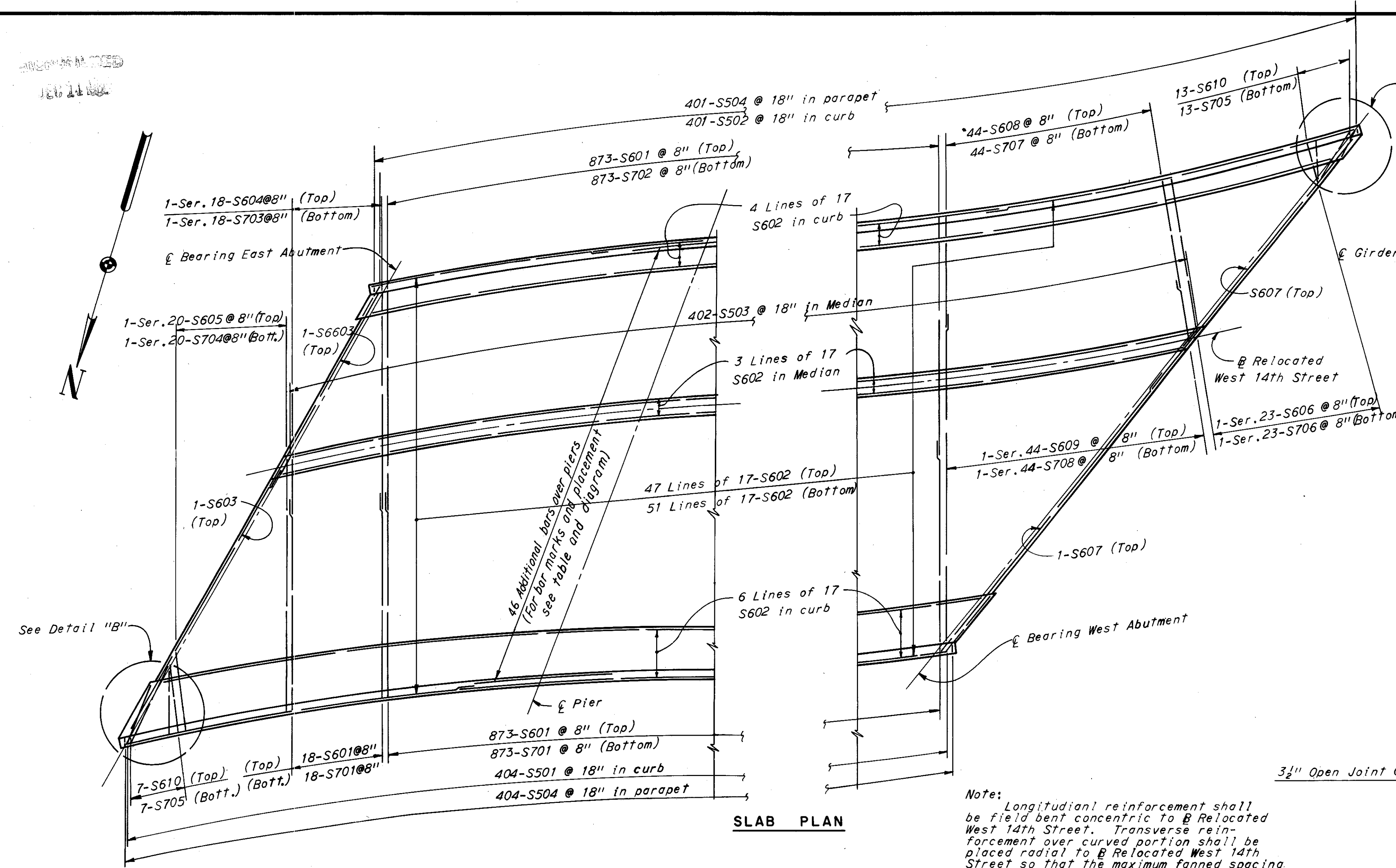
**GIRDER ELEVATIONS AND  
 FIELD SPLICE DETAILS**  
 I-71 UNDER RELOCATED WEST 14TH STREET

BR. NO. CUY-71-1826 STA. 15 + 48.07  
 STA. 21 + 52.66

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/250 TRACED CHECKED/ JMC REVIEWED/ WJG REVISION  
 DATE 12-16-64 DATE 12-17-64 DATE 12-22-64 SHEET 331

**CUYAHOGA COUNTY**  
**CUY-71-17.83**  
**CUY-176-12.76**

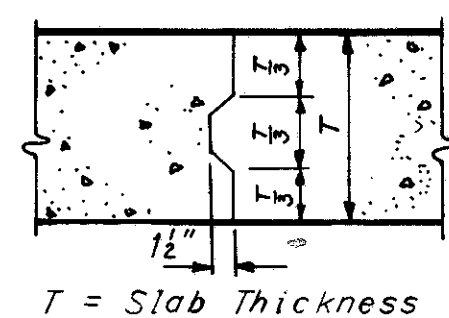


**Note:** Rate of transition between stations shown above is uniform.

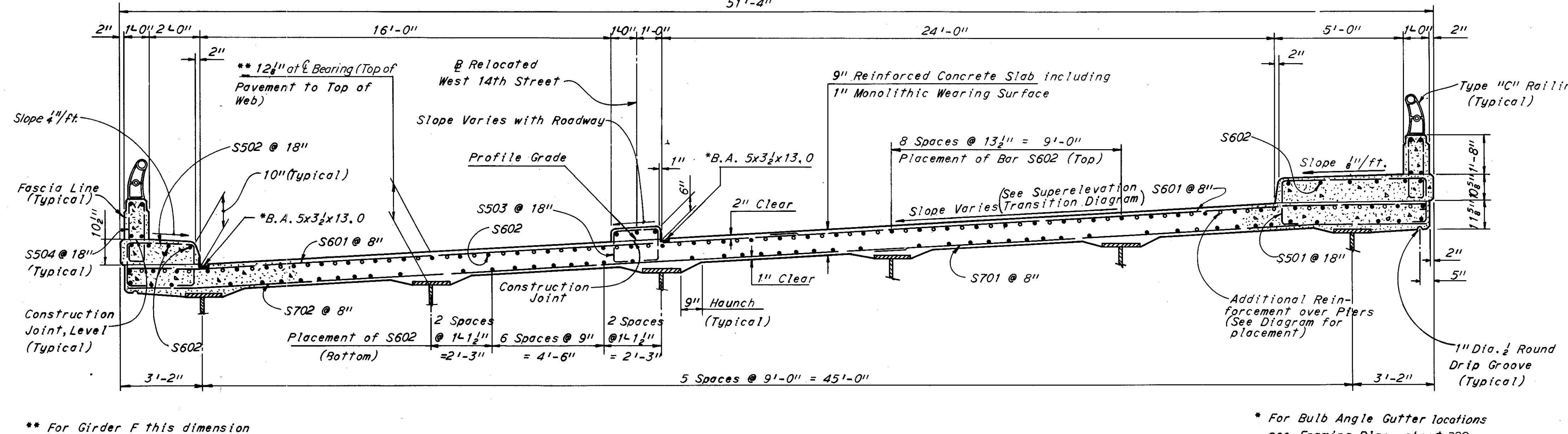
**Notes:**  
 For Reinforcement Schedule and Bending Diagrams see sheet 336.  
 For railing post spacing, parapet joint spacing and longitudinal reinforcement in the parapet see sheet 333.

**Note:**  
 Longitudinal reinforcement shall be field bent concentric to Relocated West 14th Street. Transverse reinforcement over curved portion shall be placed radial to Relocated West 14th Street so that the maximum fanned spacing at outer end is equal to the spacing shown. Field bending of the reinforcing bars shall be included in "Item S-4, Reinforcing Steel" for payment.

For additional sidewalk end dam details see Ohio Standard Drawing SD-1-63, sheet 2 of 4 and 4 of 4.



ADDITIONAL REINFORCEMENT OVER PIERS			
Pier	Bar Mark	Dim. a	Dim. b
1	S611	13'-0"	13'-0"
2	S611	13'-0"	13'-0"
3	S612	13'-0"	13'-6"
4	S613	13'-6"	15'-9"
5	S614	15'-9"	15'-0"
6	S615	15'-0"	15'-0"



\*\* For Girder F this dimension is measured from the curb construction joint.

\* For Bulb Angle Gutter locations see Framing Plan, sheet 329.

**PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIERS**

**Note:** Additional reinforcement over piers shall be placed concentric with normal longitudinal reinforcement.

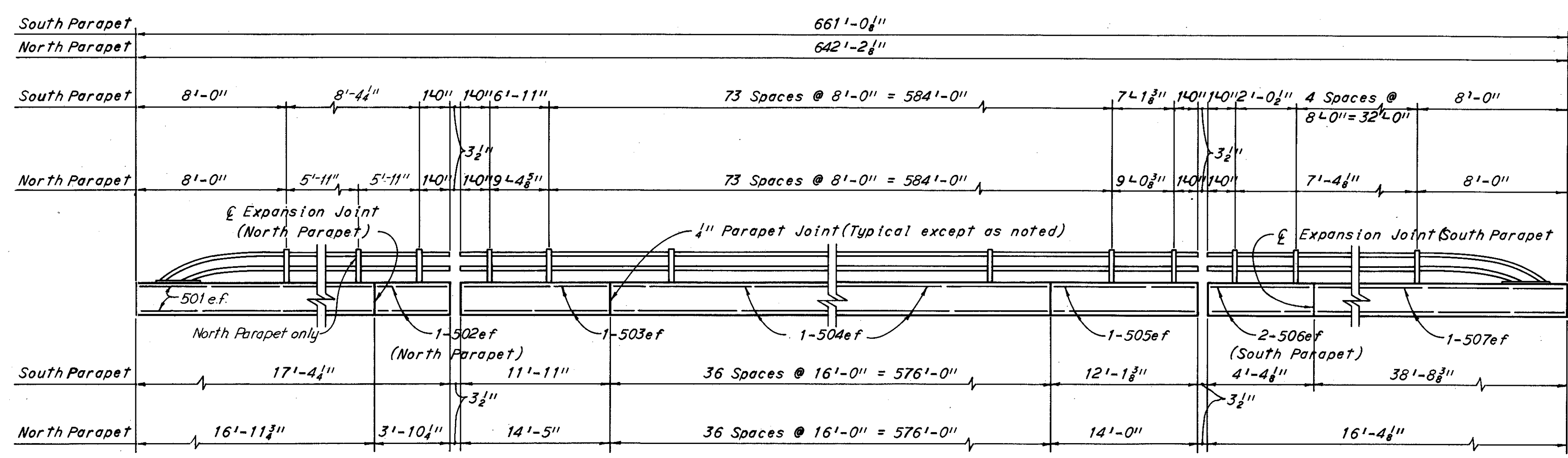
H.N.T.B. BR. NO. 19  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**DECK REINFORCEMENT**  
**I-71 UNDER RELOCATED WEST 14TH STREET**  
 BR. NO. CUY-71-1826 STA. 15+48.07  
 STA. 21+52.66

CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN RSD TRACED CHECKED JMC REVIEWED WJZ REVISION  
 DATE 12/16/64 DATE 12/17/64 DATE 12/22/64 SHEET 332



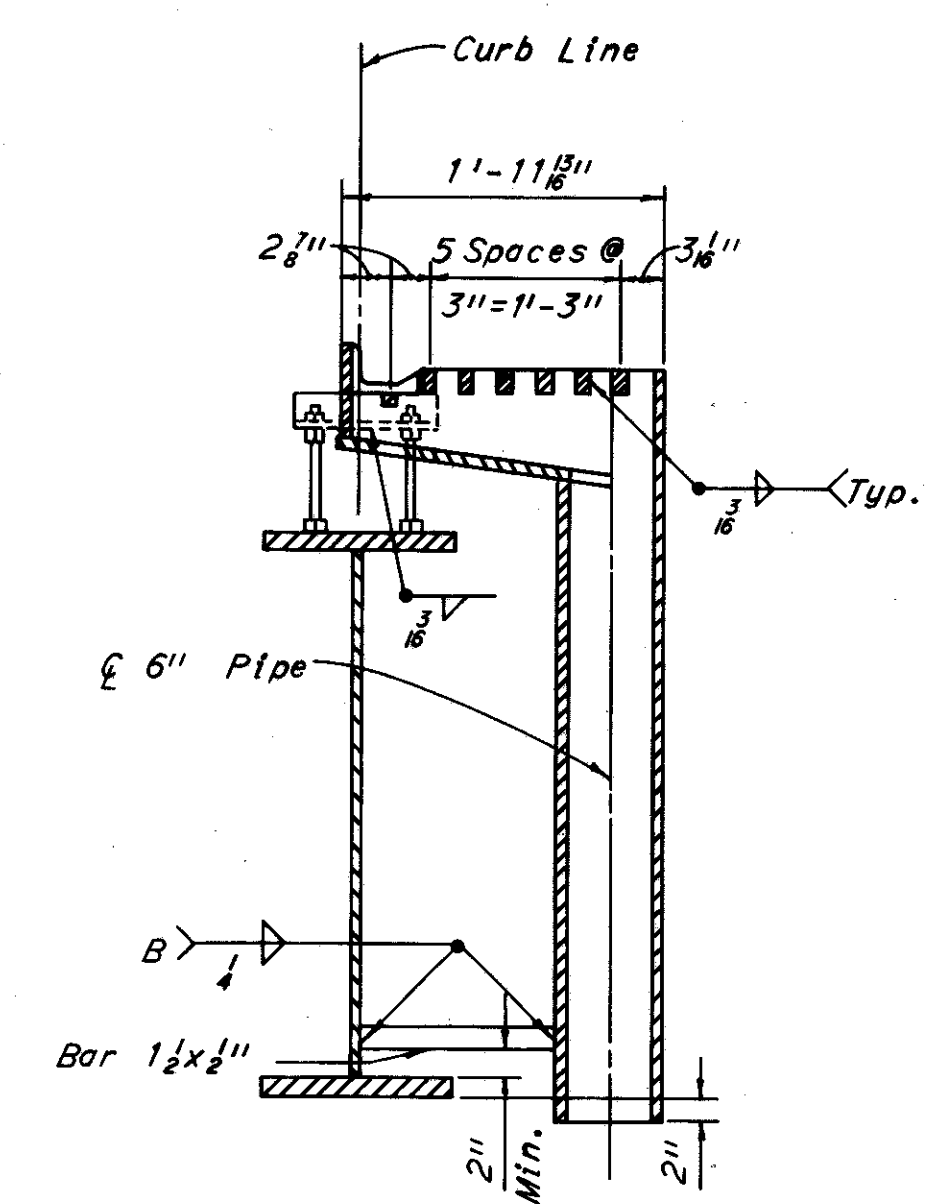
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



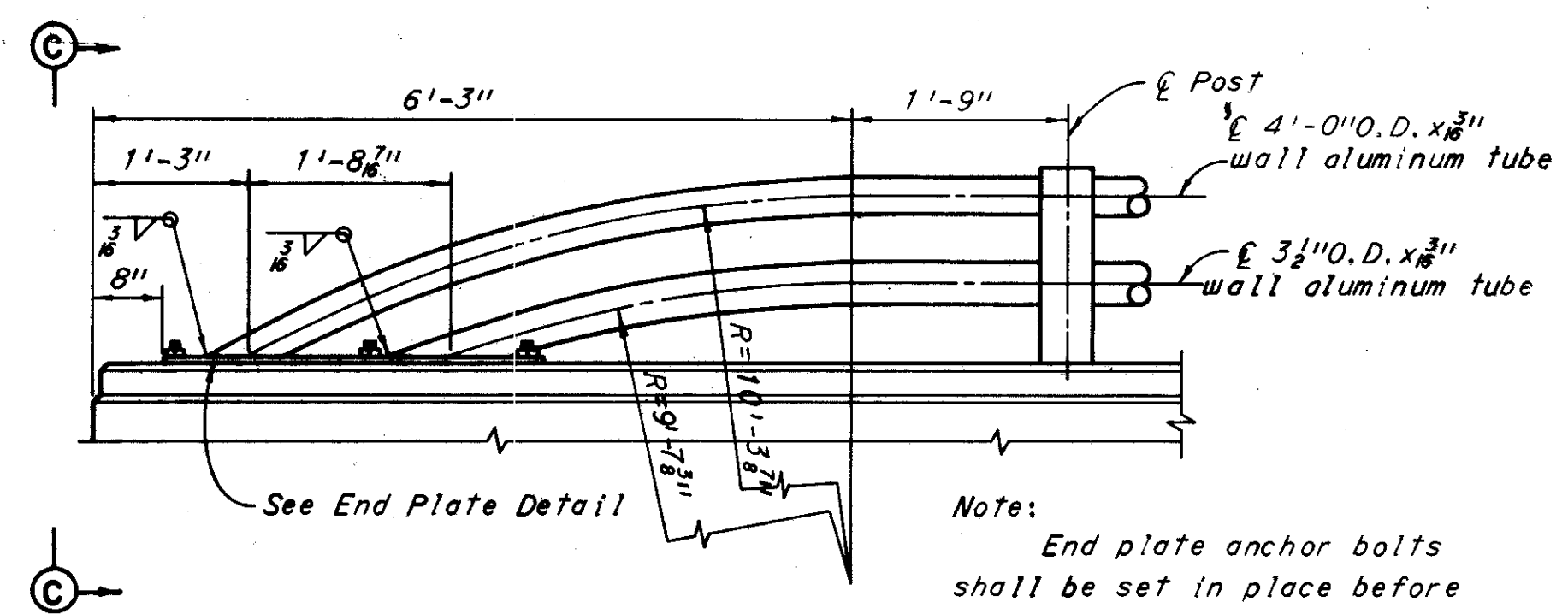
EAST ABUTMENT

TYPE "C" RAILING

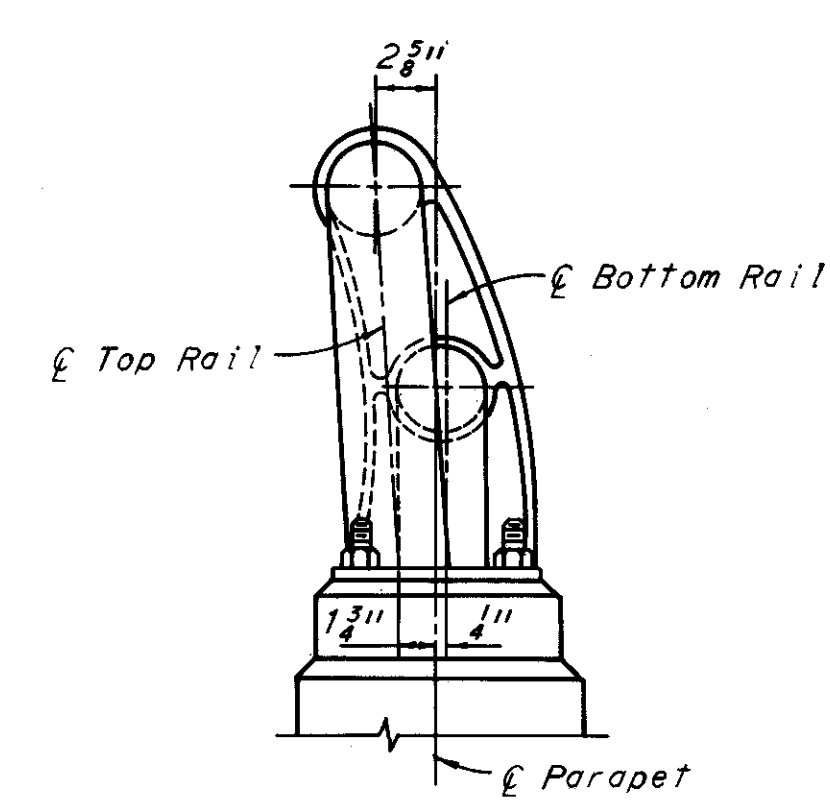
WEST ABUTMENT



SCUPPER CROSS SECTION



TYPE "C" RAILING END TREATMENT

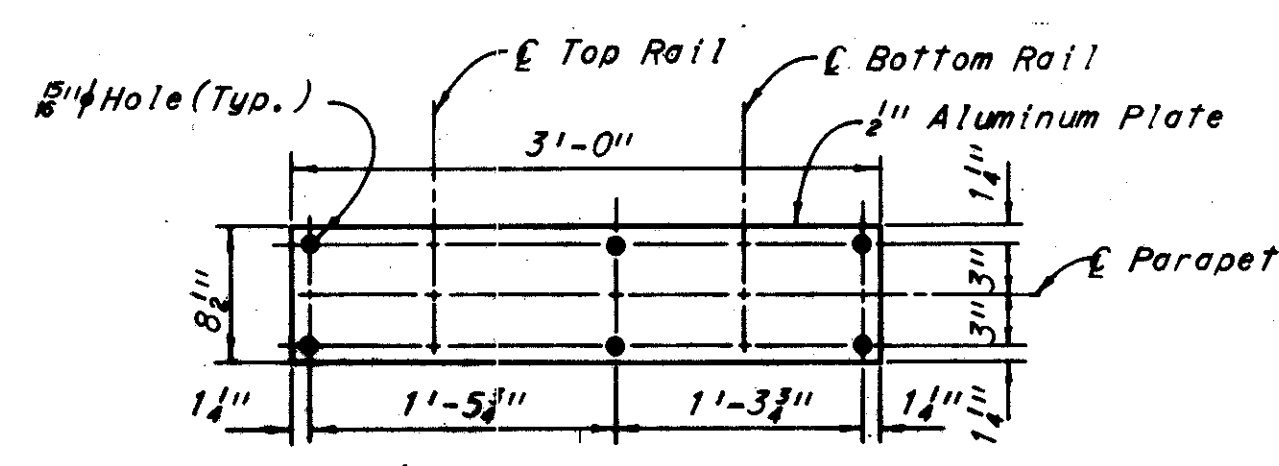


VIEW C-C

Mark	South Parapet		North Parapet	
	No.	Length	No.	Length
501	4	17'-0"	4	16'-6"
502			4	3'-6"
503	4	11'-6"	4	14'-0"
504	144	15'-6"	144	15'-6"
505	4	11'-9"	4	13'-6"
506	4	4'-0"		
507	4	38'-3"	4	16'-0"

Note: Longitudinal steel in the parapets shall be prefixed as follows:  
North Parapet - RN  
South Parapet - RS

Notes:  
Scupper dimensions shown are typical for all scuppers. The type of support shown is for scuppers at safety curb and north side of median. For additional details and scupper support at sidewalk and south side of median see Ohio Standard Drawing SD-1-63, sheet 3 of 4.  
Scuppers, including two supporting angles 2 1/2 x 2 1/2 x 1/4 and 1 1/2 x 1/2 bar supports, are included with "Item S-29, Scuppers" for payment.  
The bulb angle gutter, including supports, is included with "Item S-7, Structural Steel," for payment.



END PLATE DETAIL

**RAILING NOTES:**

Railing shall be fabricated in lengths not less than three panels each, unless otherwise shown, and finished railing shall be free of burrs, sharp corners and rough surfaces.  
Railing posts shall be normal to grade.  
Payment for railing shall be made at the contract unit price bid for "Item S-14." Pay length shall be the overall length of the parapets and shall include cost of anchor bolts, set screws, nuts, shims, etc., necessary to complete the installation of railing. Concrete, expansion joint material, and longitudinal reinforcing steel in the parapets shall be included in "Item S-14" for payment. All other reinforcing steel in the parapet shall be included in "Item S-4" for payment.  
For additional details and notes regarding railing see Ohio Standard Drawing AR-1-57.

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**RAILING AND DRAINAGE DETAILS**  
I-71 UNDER RELOCATED WEST 14TH STREET

BR. NO. CUY-71-1826 STA. 15+48.07  
STA. 21+52.66

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN RSD	TRACED	CHECKED
DATE 12.14.66	DATE	DATE 12.28.66
		REVIEWED
		DATE 12.28.66

SHEET 334





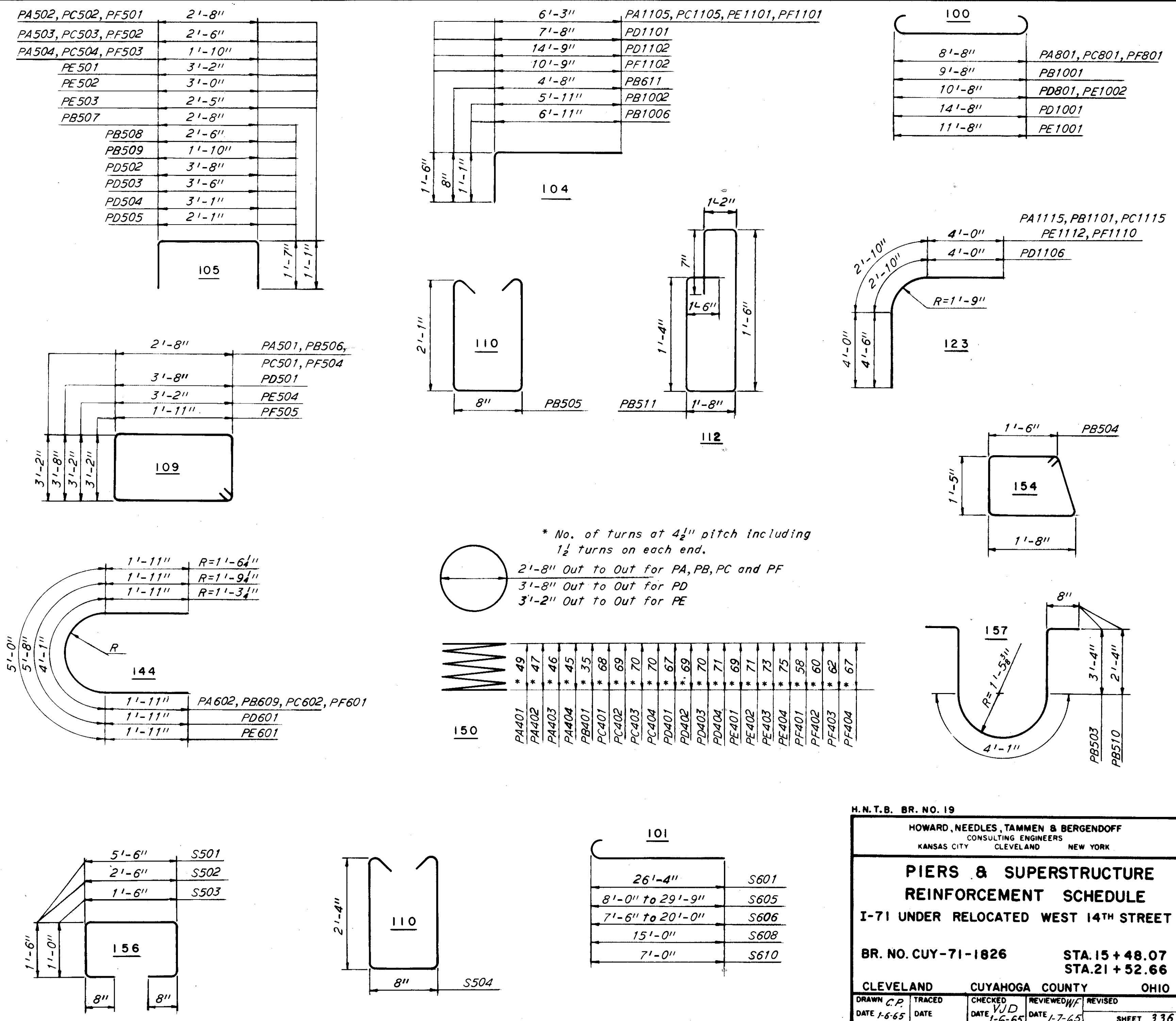
**CUYAHOGA COUNTY**  
**CUY 71-17.83**  
**CUY-176-12.76**

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
<b>PIER 1</b>						<b>PIER 3</b>						PE502	2	4'-11"	105	70	S615	46	33'-0"	Str.		2,280	
PA401	1	17'-1"	150		317	PC401	1	24'-6"	150		442	PE503	2	4'-4"	105	9	S701	891	22'-0"	Str.		40,066	
PA402	1	16'-7"	150		304	PC402	1	24'-8"	150		448	PE504	40	13'-2"	109	549	S702	873	31'-0"	Str.		55,317	
PA403	1	16'-1"	150		297	PC403	1	24'-10"	150		454	PE601	8	8'-10"	144	106	S703	1 Ser. 18	11'-0" 31'-0"	Str.	142 1/2"	773	
PA404	1	15'-7"	150		291	PC404	1	25'-0"	150		454	PE602	4	28'-3"	Str.	170	S704	1 Ser. 20	8'-0" 29'-9"	Str.	14 1/2"	772	
PA501	51	12'-2"	109		647	PC501	48	12'-2"	109		609	PE1001	56	14'-6"	100	3,494	S705	20	7'-0"	Str.		286	
PA502	36	4'-7"	105		172	PC502	36	4'-7"	105		172	PE1002	48	13'-6"	100	2,788	S706	1 Ser. 23	7'-6" 20'-0"	Str.	6 1/2"	646	
PA503	2	4'-5"	105		9	PC503	2	4'-5"	105		9	PE1101	56	7'-6"	104	2,231	S707	44	15'-0"	Str.		1,349	
PA504	2	3'-9"	105		8	PC504	2	3'-9"	105		8	PE1102	14	28'-0"	Str.	2,083	S708	1 Ser. 44	7'-6" 38'-0"	Str.	8 1/2"	2,046	
PA601	4	26'-0"	Str.		156	PC601	4	24'-9"	Str.		149	PE1103	14	28'-6"	Str.	2,120	(3) Light Standard Supports			366			
PA602	8	7'-11"	144		95	PC602	8	7'-11"	144		95	PE1104	14	29'-3"	Str.	2,176	TOTAL WEIGHT =			310,180			
PA801	80	10'-10"	100		2,314	PC801	80	10'-10"	100		2,314	PE1105	14	30'-0"	Str.	2,231							
PA1101	12	20'-6"	Str.		1,307	PC1101	12	27'-6"	Str.		1,753	PE1106	8	30'-6"	Str.	1,296							
PA1102	8	20'-0"	Str.		850	PC1102	8	27'-9"	Str.		1,179	PE1107	4	24'-6"	Str.	521							
PA1103	8	19'-6"	Str.		829	PC1103	8	28'-0"	Str.		1,190	PE1108	6	15'-0"	Str.	478							
PA1104	12	19'-0"	Str.		1,211	PC1104	12	28'-3"	Str.		1,801	PE1109	4	13'-0"	Str.	276							
PA1105	40	7'-5"	104		1,576	PC1105	40	7'-5"	104		1,576	PE1110	6	12'-3"	Str.	391							
PA1106	4	28'-3"	Str.		600	PC1106	4	26'-9"	Str.		568	PE1111	4	10'-3"	Str.	219							
PA1107	4	26'-9"	Str.		568	PC1107	4	25'-6"	Str.		542	PE1112	8	10'-10"	123	460							
PA1108	6	11'-9"	Str.		375	PC1108	6	10'-9"	Str.		343	PE1113	4	36'-6"	Str.	776							
PA1109	2	22'-3"	Str.		236	PC1109	2	20'-9"	Str.		220	TOTAL WEIGHT =			24,737								
PA1110	2	20'-6"	Str.		218	PC1110	2	19'-6"	Str.		207	<b>PIER 6</b>											
PA1111	2	34'-3"	Str.		364	PC1111	2	32'-9"	Str.		348	PF401	1	20'-7"	150	376							
PA1112	2	32'-6"	Str.		345	PC1112	2	31'-6"	Str.		335	PF402	1	21'-4"	150	389							
PA1113	2	12'-9"	Str.		135	PC1113	2	11'-9"	Str.		125	PF403	1	22'-2"	150	402							
PA1114	3	13'-0"	Str.		207	PC1114	3	13'-0"	Str.		207	PF404	1	22'-11"	150	435							
PA1115	8	10'-10"	123		460	PC1115	8	10'-10"	123		460	PF501	36	4'-7"	105	172							
TOTAL WEIGHT = 13,891						TOTAL WEIGHT = 16,008						PF502	2	4'-5"	105	9							
												PF503	2	3'-9"	105	8							
<b>PIER 2</b>						<b>PIER 4</b>						PF504	45	12'-2"	109	571							
PB401	4	12'-0"	150		904	PD401	1	24'-2"	150		575	PF505	24	10'-8"	109	267							
PB501	32	27'-9"	Str.		926	PD402	1	24'-7"	150		592	PF601	8	7'-11"	144	95							
PB502	14	28'-3"	Str.		413	PD403	1	25'-0"	150		601	PF602	4	31'-9"	Str.	191							
PB503	32	11'-10"	157		741	PD404	1	25'-5"	150		609	PF801	96	10'-10"	100	2,778							
PB504	37	6'-6"	154		251	PD501	27	15'-2"	109		427	PF1101	40	7'-6"	104	1,594							
PB505	37	5'-5"	110		209	PD502	36	6'-7"	105		247	PF1102	40	12'-0"	104	2,550							
PB506	32	12'-1"	109		403	PD503	2	6'-5"	105		13	PF1103	10	24'-0"	Str.	1,275							
PB507	36	5'-7"	105		210	PD504	2	6'-0"	105		13	PF1104	10	24'-6"	Str.	1,302							
PB508	2	5'-5"	105		11	PD505	2	5'-0"	105		10	PF1105	10	25'-6"	Str.	1,355							
PB509	2	4'-9"	105		10							PF1106	10	26'-3"	Str.	1,395							
PB510	12	9'-10"	157		123	PD601	8	9'-6"	144		114	PF1107	8	33'-9"	Str.	1,434							
PB511	14	7'-2"	112		105	PD602	4	25'-5"	Str.		152	PF1108	6	15'-0"	Str.	478							
PB601	20	28'-9"	Str.		864	PD801	44	12'-10"	100		1,508	PF1109	8	13'-6"	Str.	574							
PB602	2	11'-0"	Str.		33	PD1001	44	17'-6"	100		3,313	PF1110	8	10'-10"	123	461							
PB603	2	12'-6"	Str.		38							PF1111	6	16'-6"	Str.	526							
PB604	1 Ser. 8	12'-7" 12'-4"	Str.	7"	150	PD1101	56	8'-6"	104		2,529	PF1112	4	27'-6"	Str.	584							
PB605	1 Ser. 8	12'-4" 12'-1"	Str.	6"	147	PD1102	56	16'-0"	104		4,760	PF1113	4	40'-0"	Str.	850							
PB606	1 Ser. 8	12'-1" 11'-10"	Str.	6"	144	PD1103	14	27'-9"	Str.		2,064	TOTAL WEIGHT =			20,071								
PB607	2	11'-10"	Str.		36	PD1104	14	28'-0"	Str.		2,083	<b>SUPERSTRUCTURE</b>											
PB608	2	10'-0"	Str.		30	PD1105	14	28'-9"	Str.		2,138	S501	404	9'-4"	156	3,933							
PB609	8	7'-11"	144		95	PD1106	8	11'-4"	123		482	S502	401	6'-4"	156	2,649							
PB610	4	26'-9"	Str.		161	PD1107	4	21'-9"	Str.		462	S503	402	4'-4"	156	1,817							
PB611	30	5'-2"	104		233	PD1108	6	10'-3"	Str.		327	S504	805	5'-11"	110	4,968							
PB1001	78	12'-6"	100		4,195	PD1109	4	34'-3"	Str.		728	S601	1,764	27'-0"	101	71,537							
PB1002	83	6'-9"	104		2,411	PD1110	8	28'-0"	Str.		1,190	S602	1,807	37'-6"	Str.	106,285							
PB1003	40	15'-0"	Str.		2,582	PD1111	6	13'-0"	Str.		414	S603	2	30'-9"	Str.	92							
PB1004	1 Ser. 55	12'-8" 11'-10"	Str.	3"	2,899	PD1112	14	29'-0"	Str.		2,157	S604	1 Ser. 18	6'-6" 26'-6"	Str.	142 1/2"	446						
PB1005	28	17'-6"	Str.		2,108	TOTAL WEIGHT =			27,508	S605	1 Ser. 20	8'-8" 30'-5"	Str.	14 1/2"	587								
PB1006	20	7'-9"	104		667							S606	1 Ser. 23	7'-8" 20'-8"	Str.	7 1/2"	489						
PB1101	8	10'-10"	123		460	<b>PIER 5</b>						S607	2	39'-6"	Str.	119							
PB1102	4	21'-3"	Str.		452	PE401	1	24'-10"	150		520	S608	44	15'-8"	101	1,035							
PB1103	6	11'-3"	Str.		359	PE402	1	25'-6"	150		534	S609	1 Ser. 44	7'-3" 37'-9"	Str.	8 1/2"	1,487						
PB1104	4	33'-3"	Str.		707	PE403	1	26'-3"	150		549	S610	20	7'-8"	101	230							
PB1105	8	27'-3"	Str.		1,158	PE404	1	26'-11"	150		559	S611	92	29'-0"	Str.	4,007							
PB1106	6	13'-0"	Str.		414	PE501	36	5'-1"	105		191	S612	46	29'-6"	Str.	2,038							
PB1107	12	12'-3"	Str.		130							S613	46	32'-3"	Str.	2,228							
TOTAL WEIGHT = 24,779												S614	46	33'-9"	Str.	2,332							

**SPIRAL REINFORCEMENT NOTE**

The "Length" shown in the reinforcement schedule for the spiral bars is the distance from the top of the footing to the bottom of the pier cap.  
Four steel channel, tee or angle spacers, weighing approximately 0.68 lbs. per linear foot of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil. The number of pounds of these spacers, based on 0.68 lbs. per linear foot will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.  
Spiral reinforcing bars shall not have deformations but shall in other respects conform to Item S-4.

**BENDING DIAGRAMS**



H.N.T.B. BR. NO. 19  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

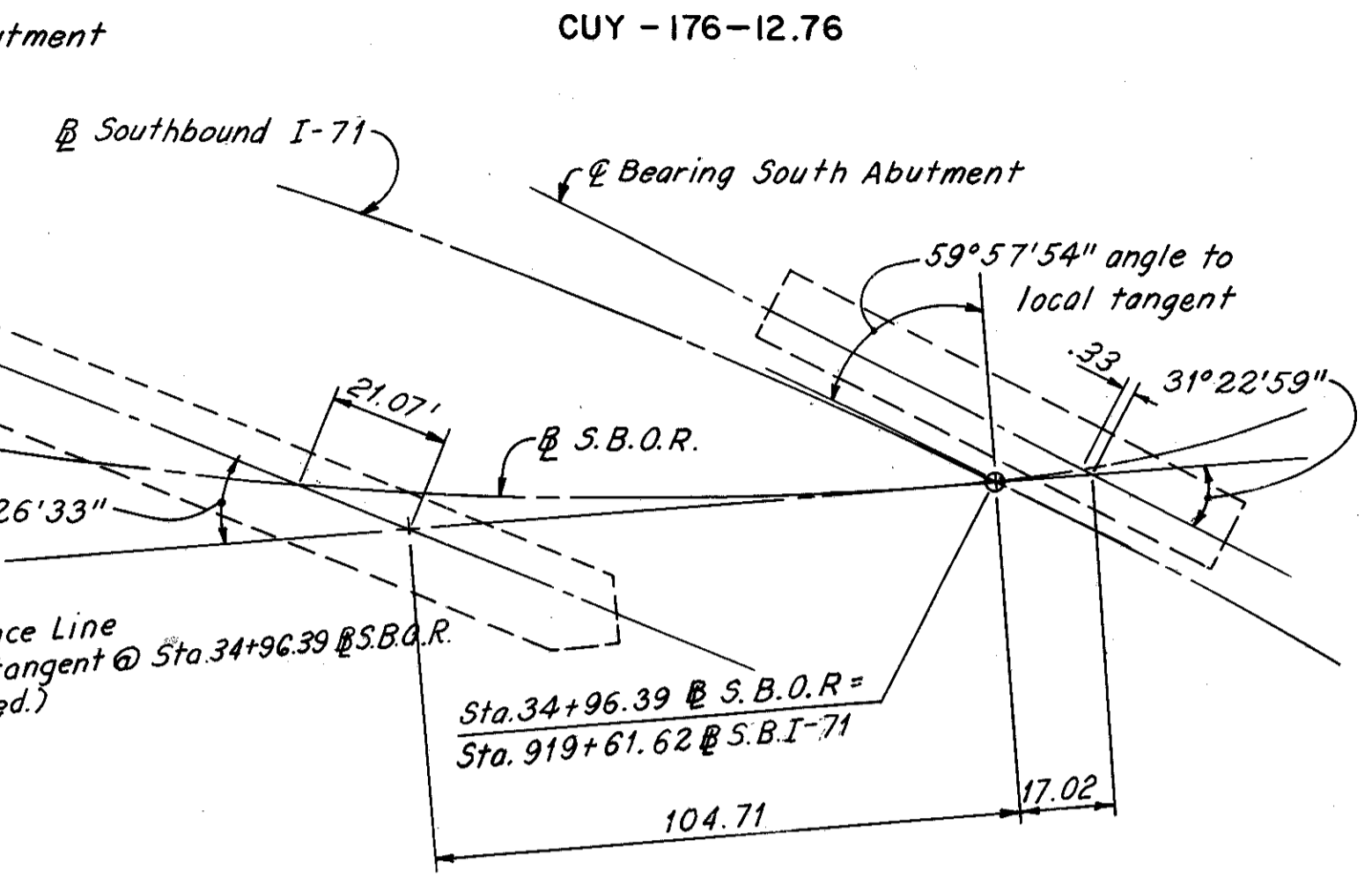
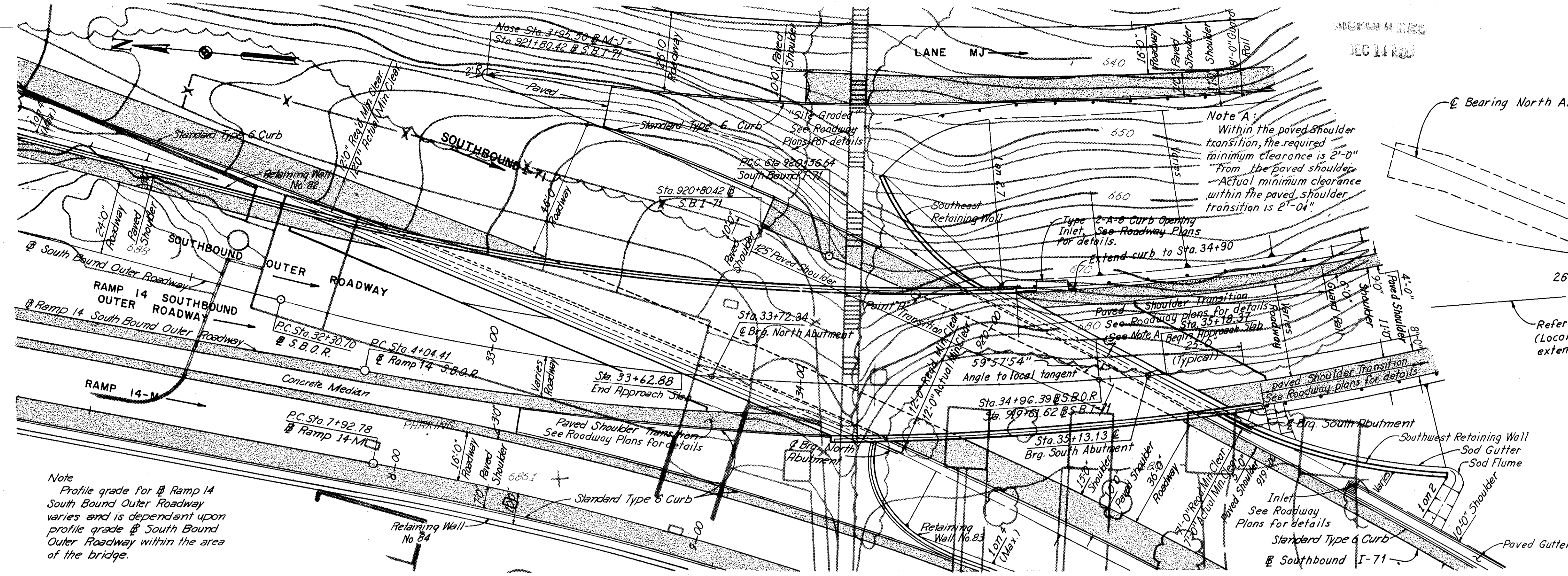
**PIERS & SUPERSTRUCTURE REINFORCEMENT SCHEDULE**  
 I-71 UNDER RELOCATED WEST 14TH STREET

BR. NO. CUY-71-1826 STA. 15 + 48.07  
 STA. 21 + 52.66

CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN C.P. DATE 1-6-65  
 CHECKED W.D. DATE 1-6-65  
 REVIEWED H.F. DATE 1-7-65  
 REVISIONS  
 SHEET 336

91-W

CUYAHOGA COUNTY  
 CUY - 71-17.83  
 CUY - 176-12.76



SUBSTRUCTURE LAYOUT DIAGRAM

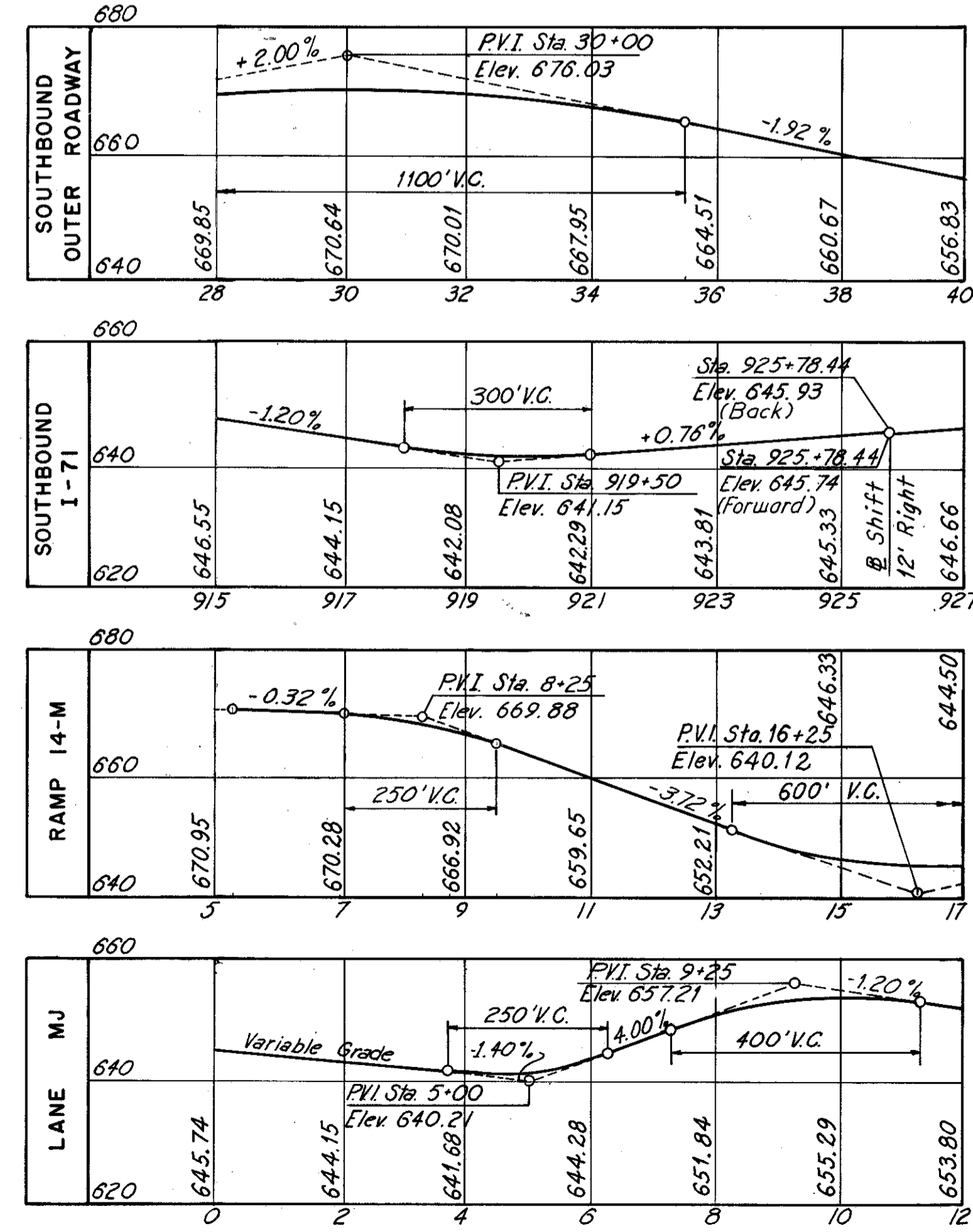
**PROPOSED STRUCTURE**  
 Type: Simple span welded girder with reinforced concrete deck and substructure.  
 SPAN: 140'-9" Measured along @ South Bound Outer Roadway.  
 ROADWAY: Varies  
 LOAD FREQUENCY: CF 2000 (57) Adequate for A.A.S.H.O. alternate loading.  
 SKEW: Varies  
 WEARING SURFACE: 1" Monolithic concrete  
 APPROACH SLABS: AS-1-54 (25'-0" long)  
 ALIGNMENT: 7'00"00" Left S.B.O.R.  
 6'37"00" Left Ramp 14 S.B.O.R.  
 TRAFFIC DATA: 1975 A.D.T. = 18,860 (One Way)

Note  
 Profile grade for @ Ramp 14 South Bound Outer Roadway varies and is dependant upon profile grade @ South Bound Outer Roadway within the area of the bridge.

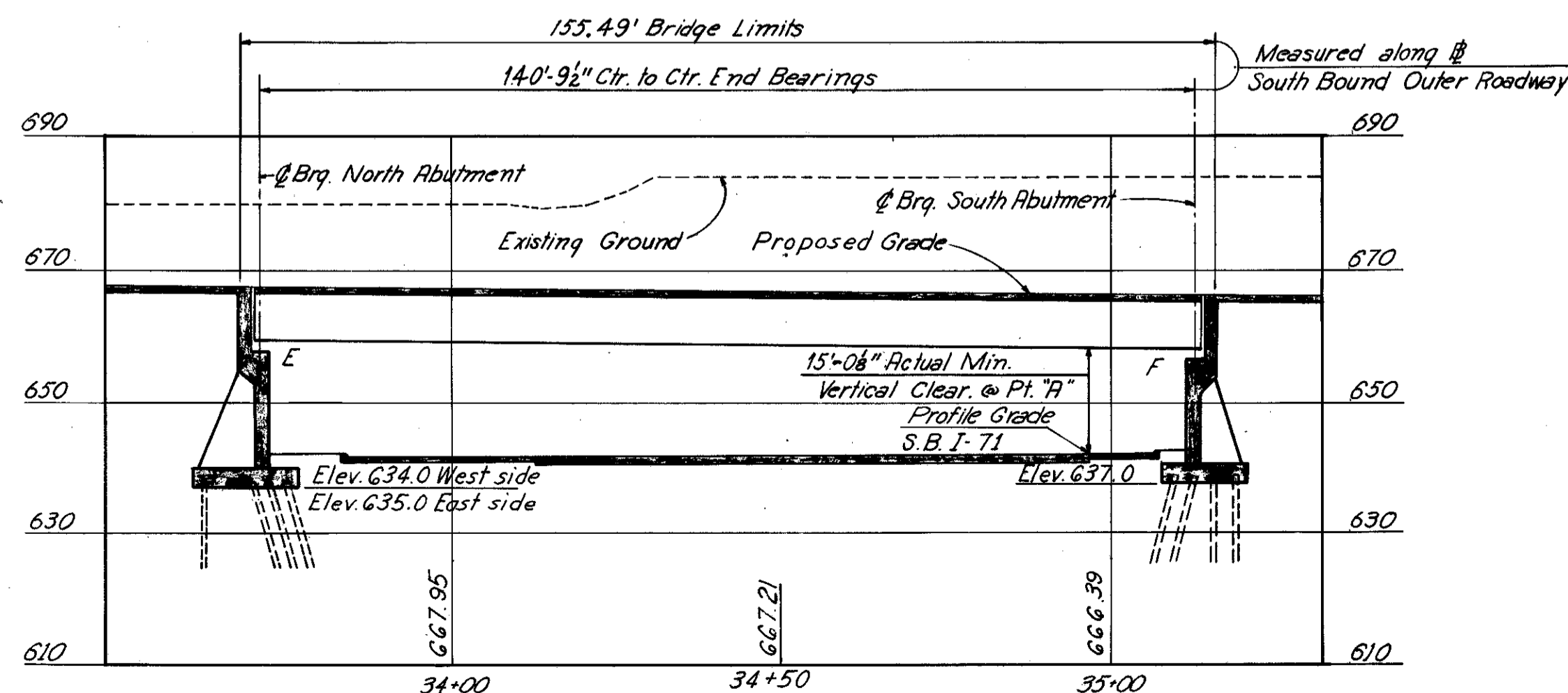
PLAN  
 Scale: 1" = 20'-0"

CURVE DATA

SOUTHBOUND OUTER ROADWAY	RAMP 14 SOUTHBOUND OUTER ROADWAY	LANE MJ	RAMP 14-M	SOUTHBOUND I-71	
PI. Sta. 36+22.27 Δ = 51°07'42" D = 7°00'00" Lt. R = 818.51' T = 391.53' L = 730.40' E = 88.83'	PI. Sta. 7+77.18 D = 6°37'00" Lt. R = 865.93' L = 704.01' E = 76.83'	PI. Sta. 7+79.42 Δ = 52°03'49" D = 5°30'00" Lt. R = 1041.74' T = 508.81' L = 948.61' E = 117.62'	PI. Sta. 12+01.09 Δ = 39°13'24" D = 5°00'00" Rt. R = 1145.92' T = 784.47' E = 70.57'	PI. Sta. 915+72.64 Δ = 29°43'32" D = 3°00'00" Lt. R = 1909.86' T = 506.84' L = 990.85' E = 66.11'	PI. Sta. 923+17.93 Δ = 7°39'11" D = 1°28'00" Lt. R = 3906.52' T = 261.28' L = 521.80' E = 8.73'



PROFILES  
 Scale: 1" = 200' Horiz.  
 1" = 20' Vert.



ELEVATION  
 Scale: 1" = 20'-0"

Note: 15'-0" Design vertical clearance. Point of actual minimum vertical clearance occurs at inside edge of Girder D and @ Southbound I-71.

Note: All piles are 12" # C.I.P. Reinforced Concrete Piles with an estimated average vertical length of 65'

H.N.T.B. BRIDGE NO. 20

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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**SITE PLAN**

SOUTHBOUND I-71 UNDER SOUTHBOUND OUTER ROADWAY

BR. NO. CUY-71-1794-L STA. 33+62.88  
 STA. 35+18.37

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN BY	TRACED	CHECKED BY	REVIEWED BY	REVISED
DATE 2-18-64	DATE	DATE 10-20-64	DATE 12-2-64	

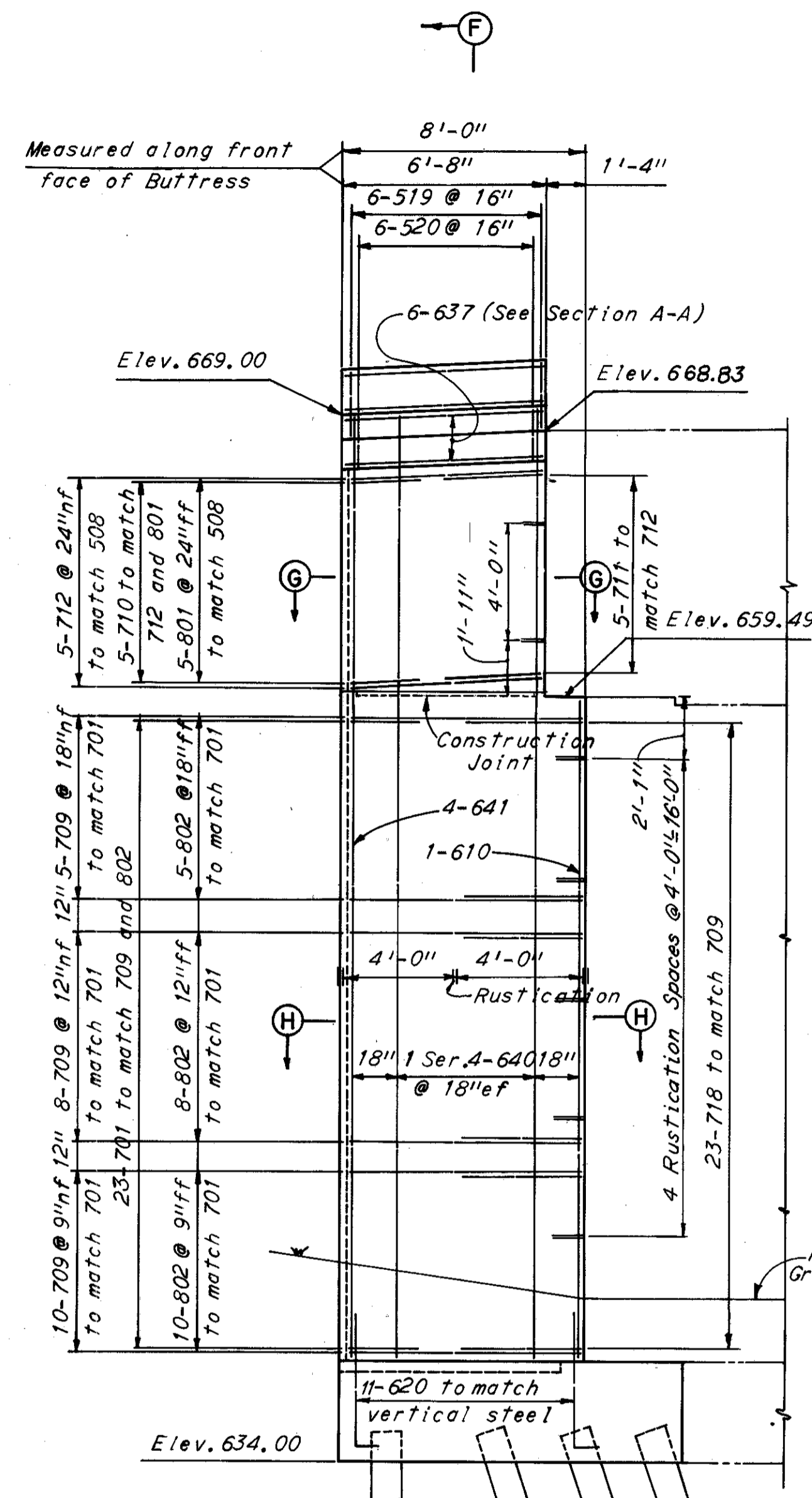
SHEET 337



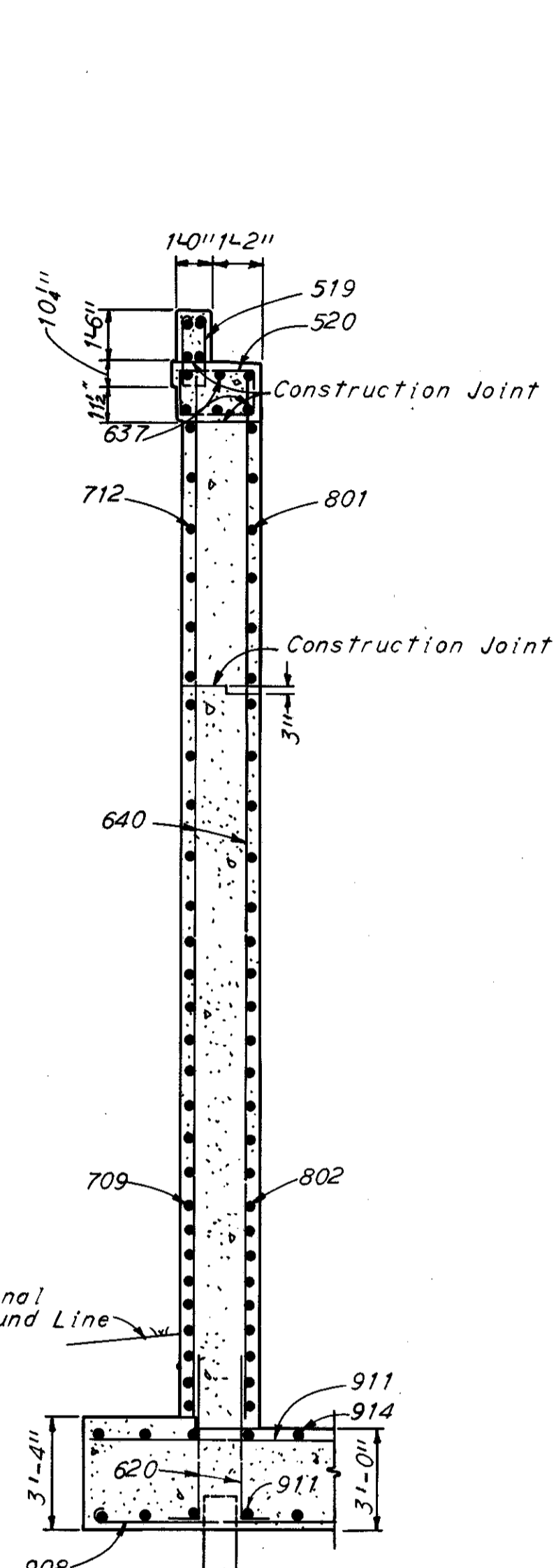




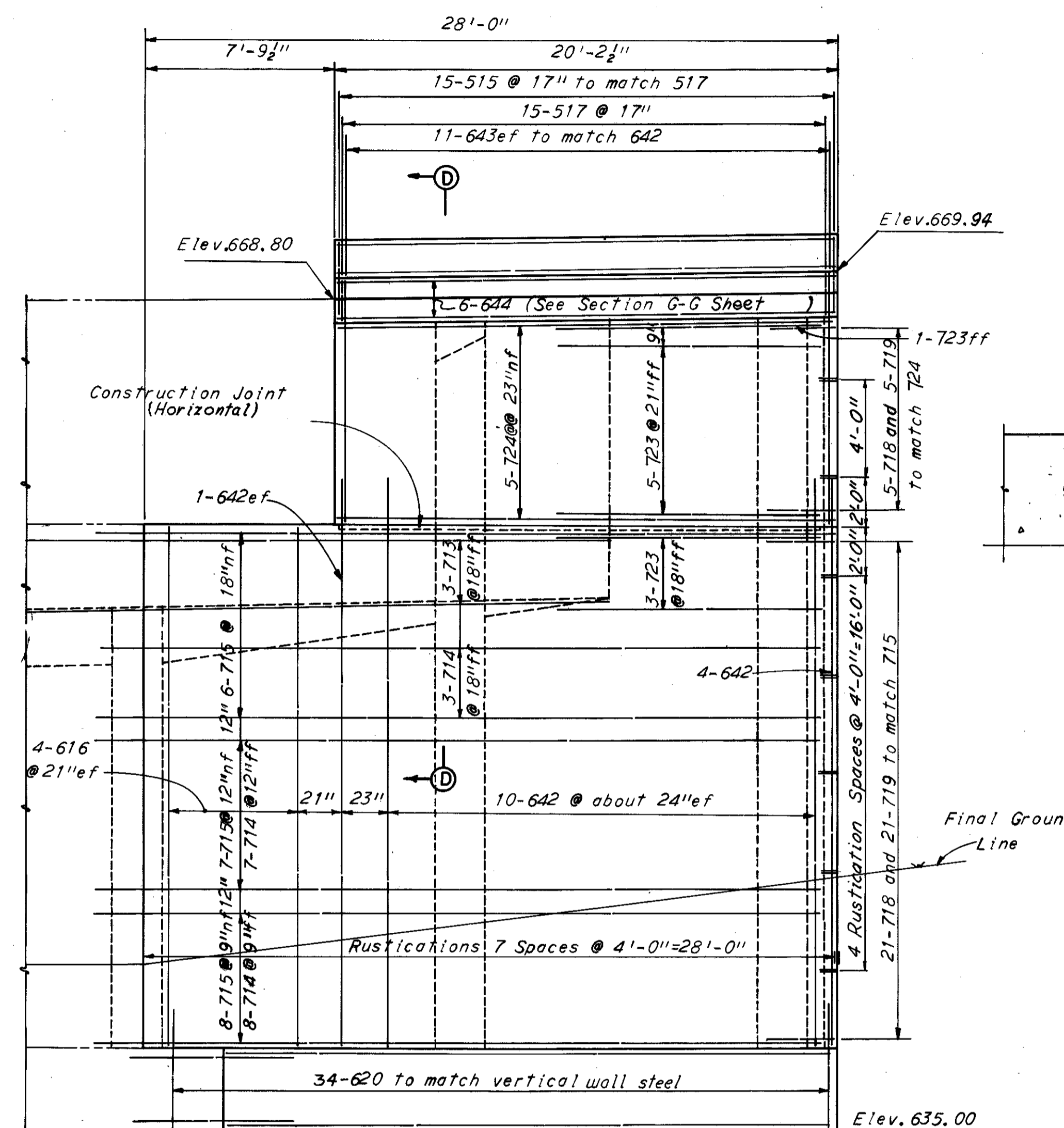
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



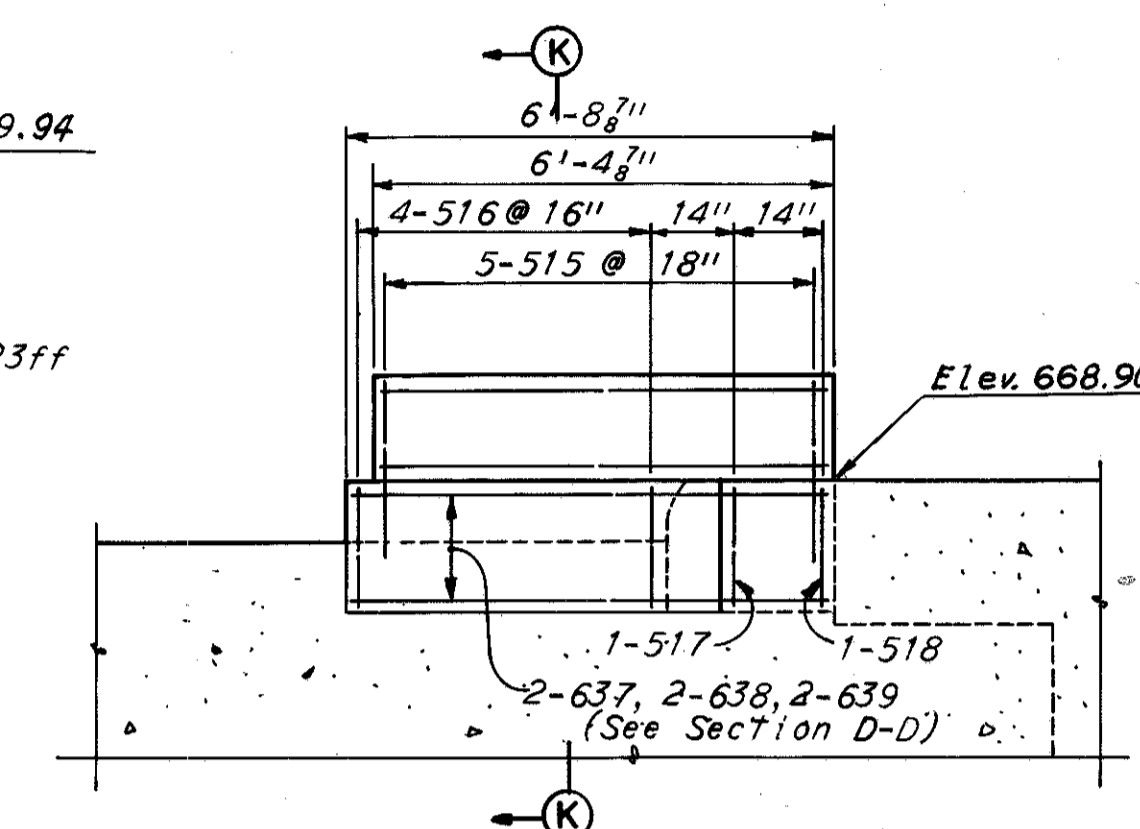
VIEW B-B



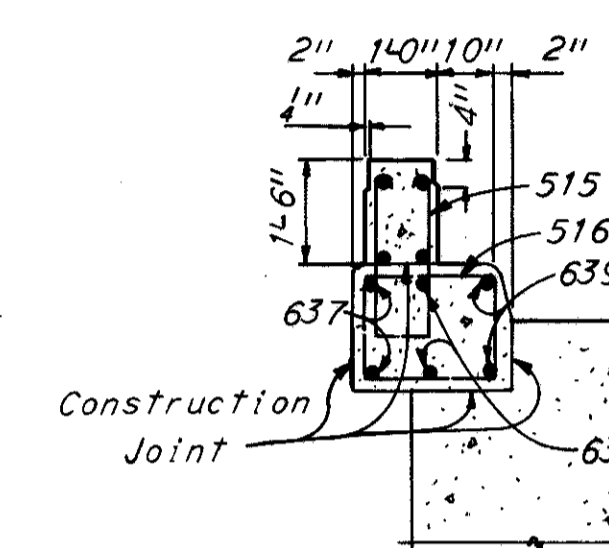
SECTION F-F



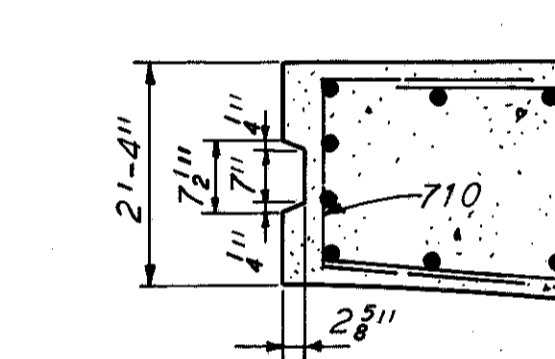
VIEW C-C  
(Piles not shown)



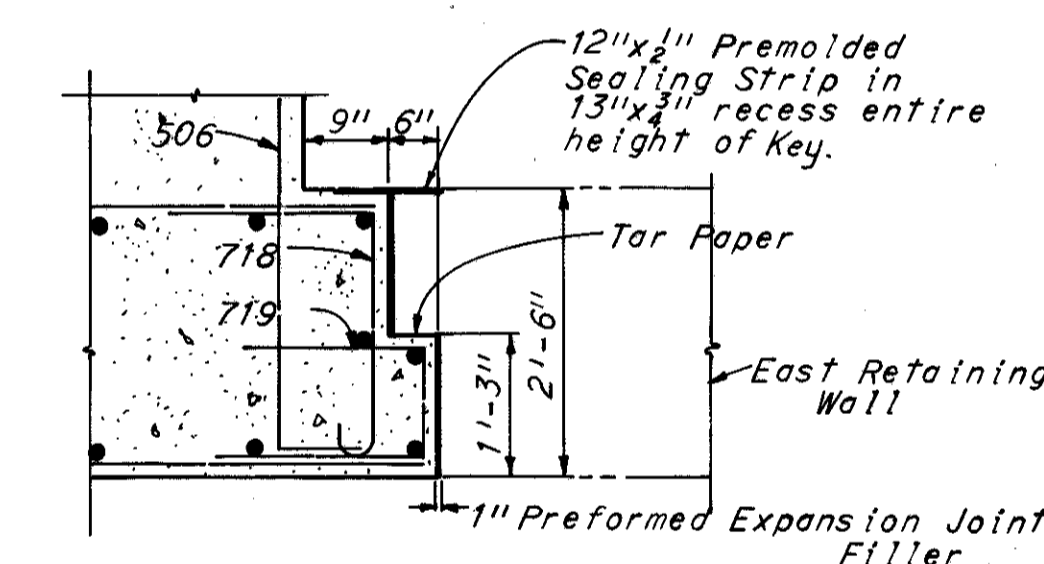
WEST WINGWALL ELEVATION



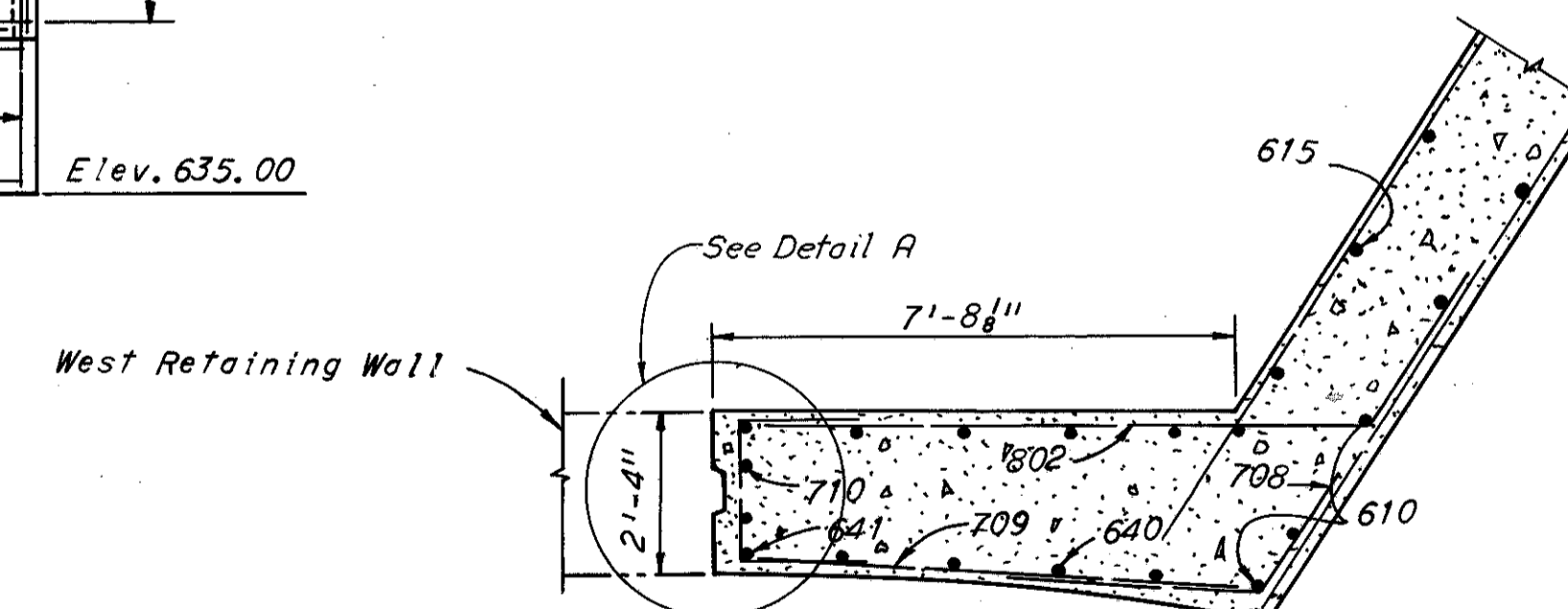
SECTION K-K  
(Abutment Backwall  
Reinforcement not shown)



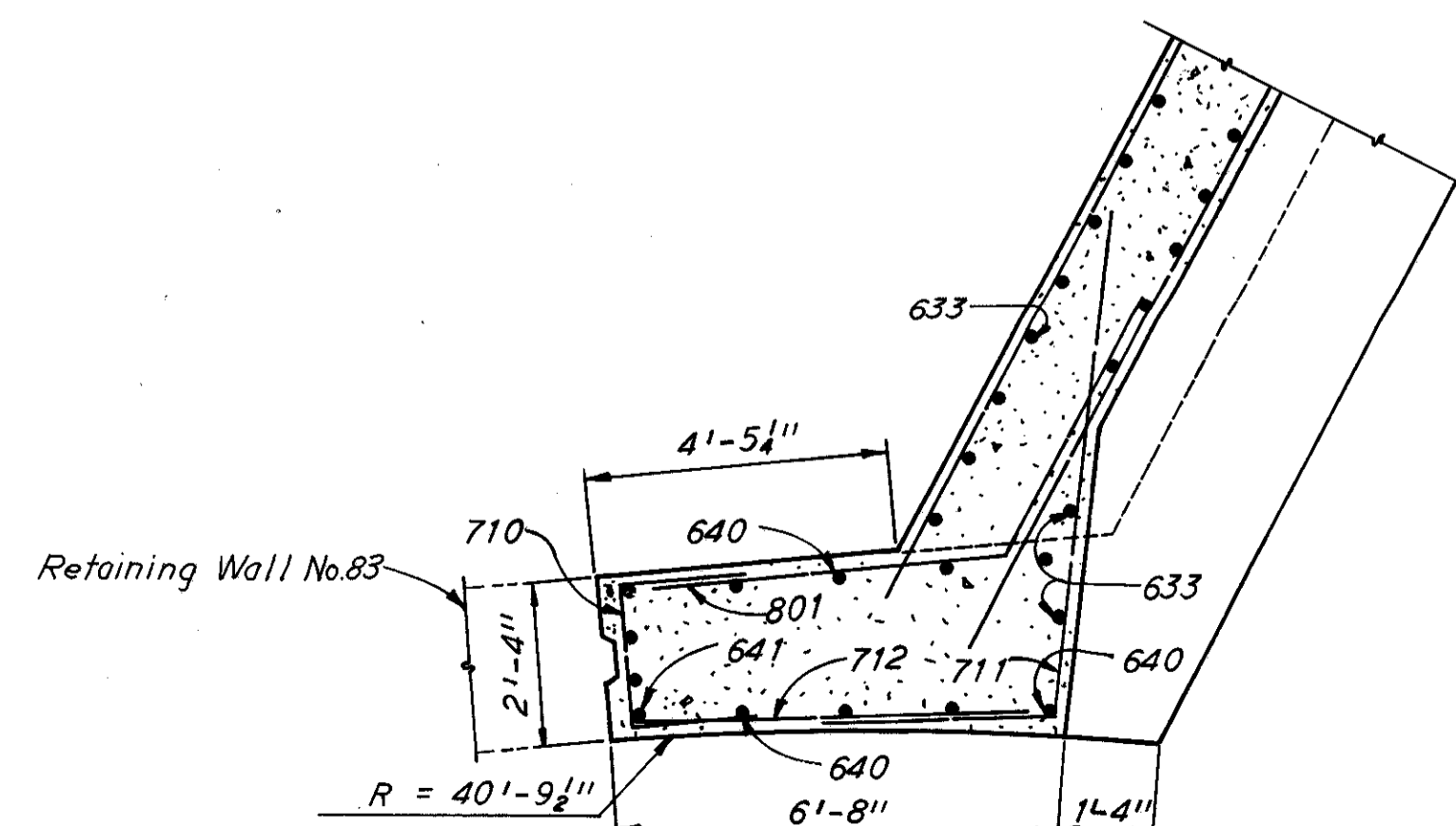
DETAIL A



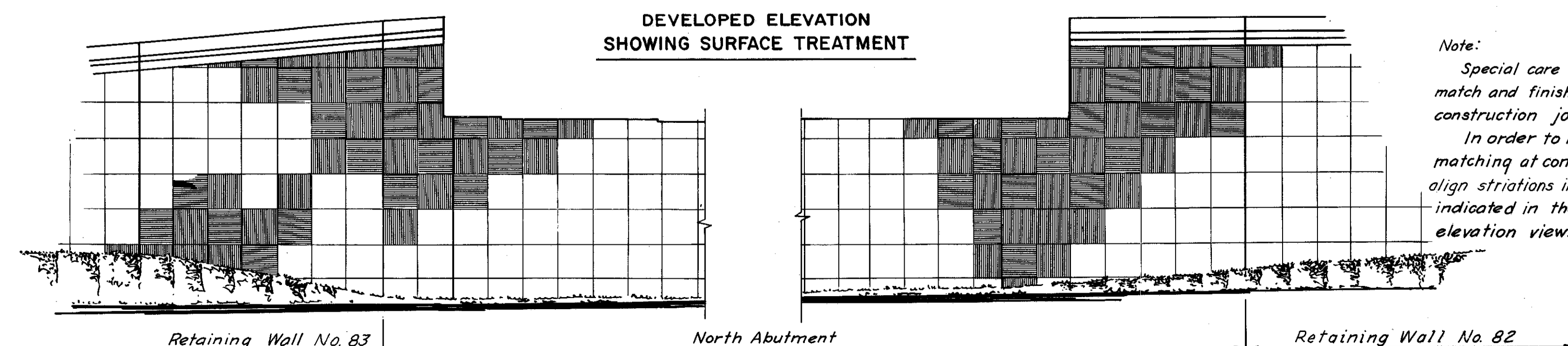
EXPANSION JOINT AT  
RETAINING WALL NO. 82



SECTION H-H



SECTION G-G



DEVELOPED ELEVATION  
SHOWING SURFACE TREATMENT

Note:  
 Special care shall be taken to match and finish striations at construction joints.  
 In order to minimize mismatching at construction joints align striations in the direction indicated in the developed elevation view.

H.N.T.B. BRIDGE NO. 20  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
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 KANSAS CITY CLEVELAND NEW YORK

NORTH ABUTMENT-DETAILS

I-71 UNDER SOUTHBOUND OUTER ROADWAY

BR. NO. CUY-71-1794L STA. 33 + 62.88  
 STA. 35 + 18.37

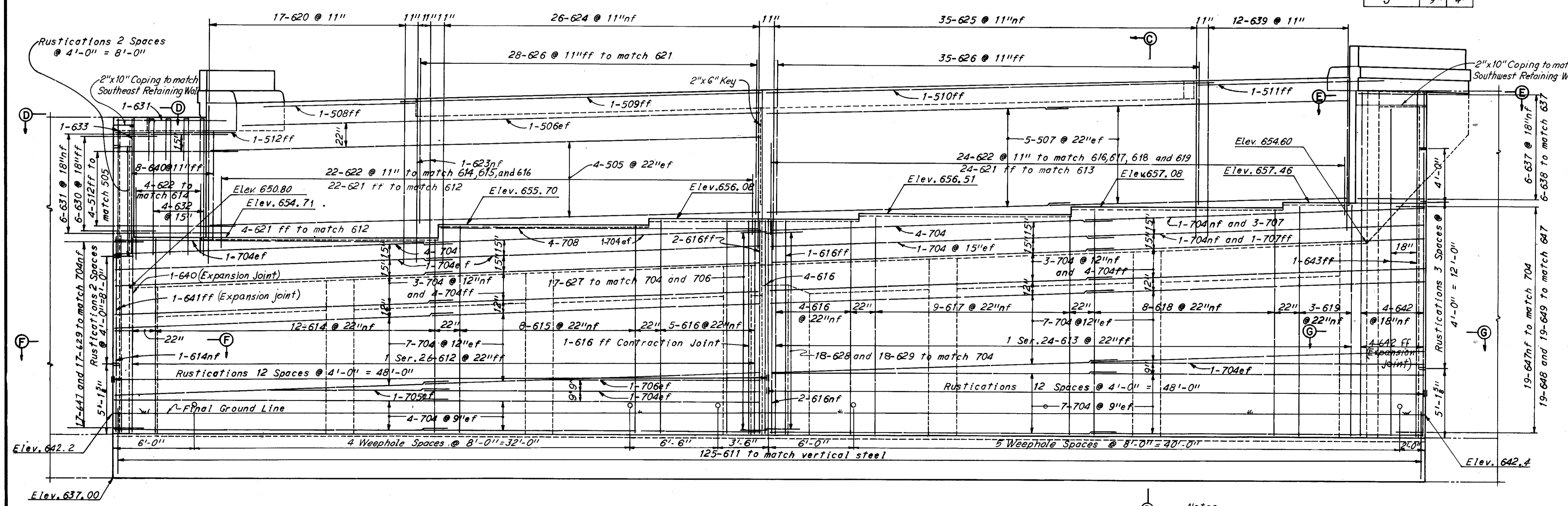
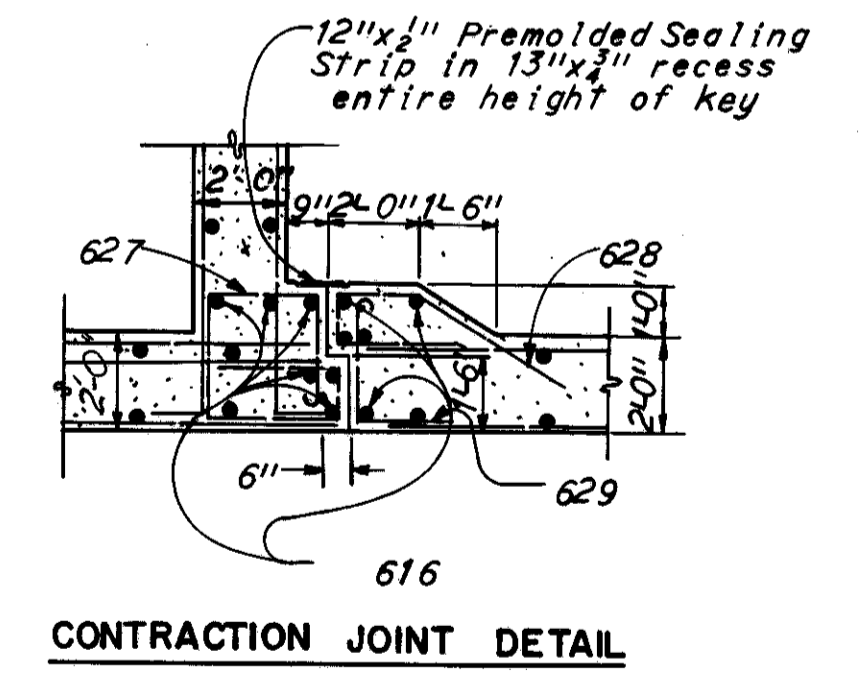
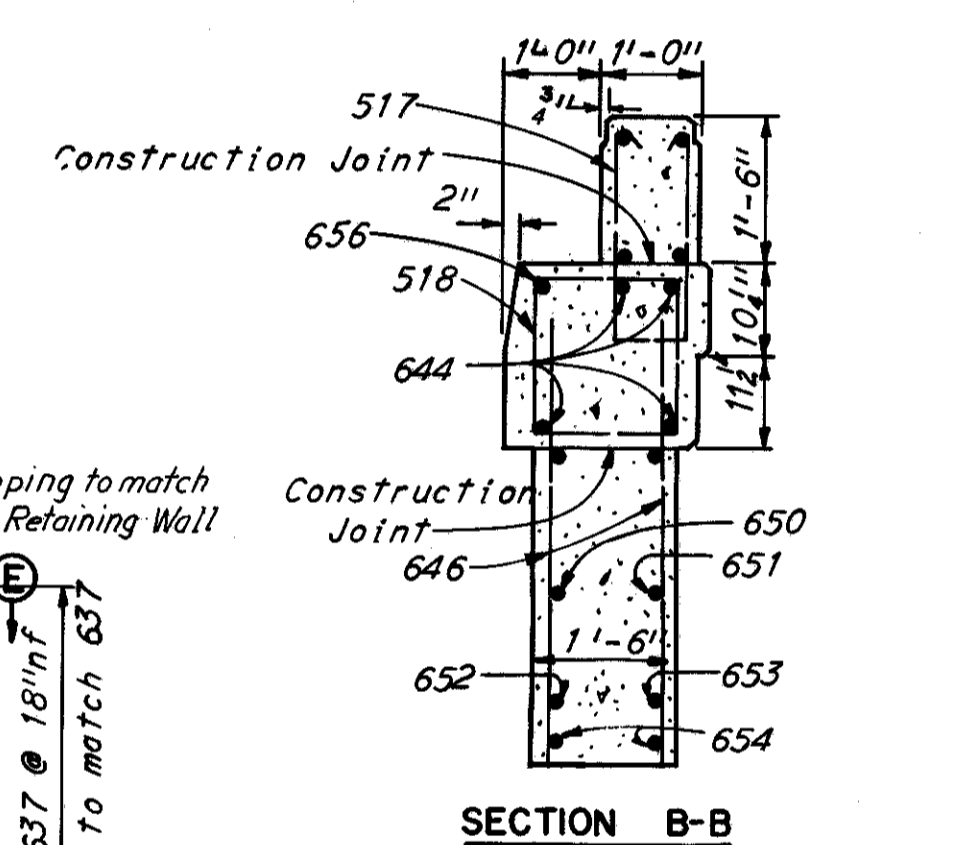
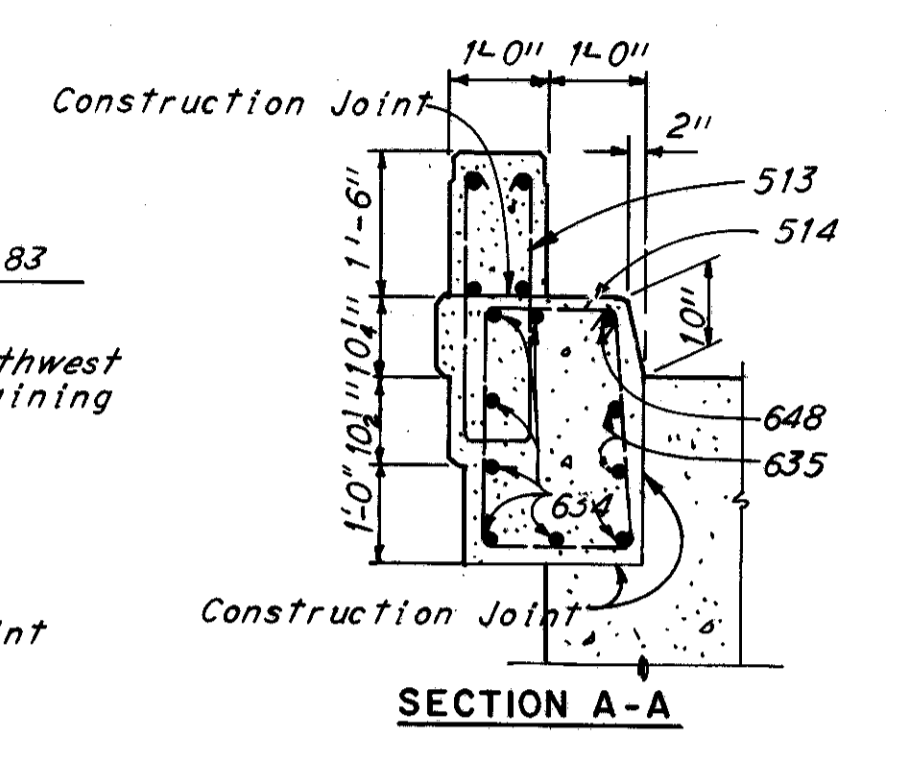
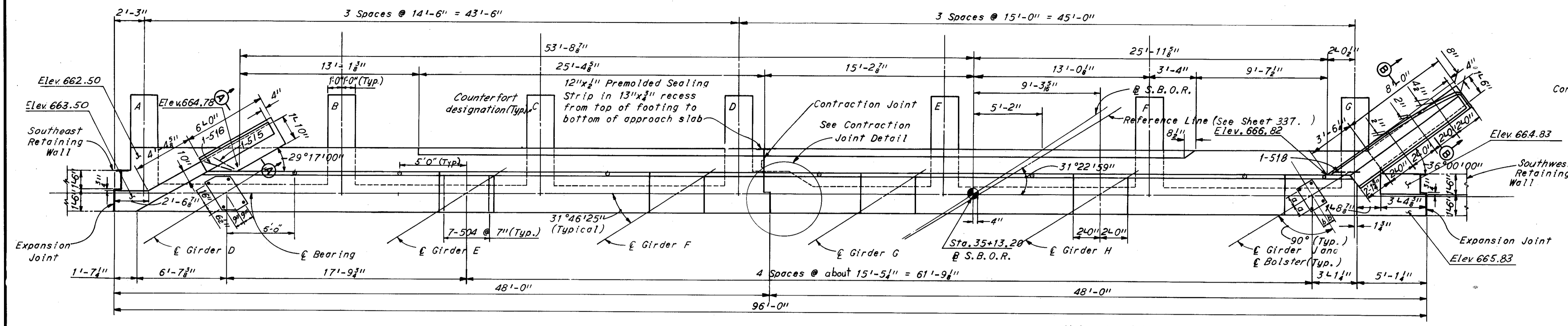
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN LJD	TRACED	CHECKED RSD
DATE 12-14-66	DATE	DATE 12-17-67
		REVIEWED W/P
		DATE 12-28-66





CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

Note  
 Backwall elevations are given to the top of 8x6x1 angle of the end dam.



Notes.  
 For roadway end dam and curb plate details see sheet 351 and Ohio Standard Drawing SD-1-63, sheets 2 and 4, of 4  
 For Sections C-C, D-D, E-E, F-F and G-G, see sheet 344.  
 The following abbreviations are used:  
 nf = near face  
 ff = far face  
 ef = each face  
 For Bridge Seat drain, see sheet 342.

H.N.T.B. BRIDGE NO. 20

HOWARD, NEEDLES, TAMMEN & BERGENOFF  
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 KANSAS CITY      CLEVELAND      NEW YORK

**SOUTH ABUTMENT**

I-71 UNDER SOUTH OUTER ROADWAY

BR. NO. CUY-71-1794L      STA. 33 + 62.88  
 STA. 35 + 18.37

CLEVELAND      CUYAHOGA COUNTY      OHIO

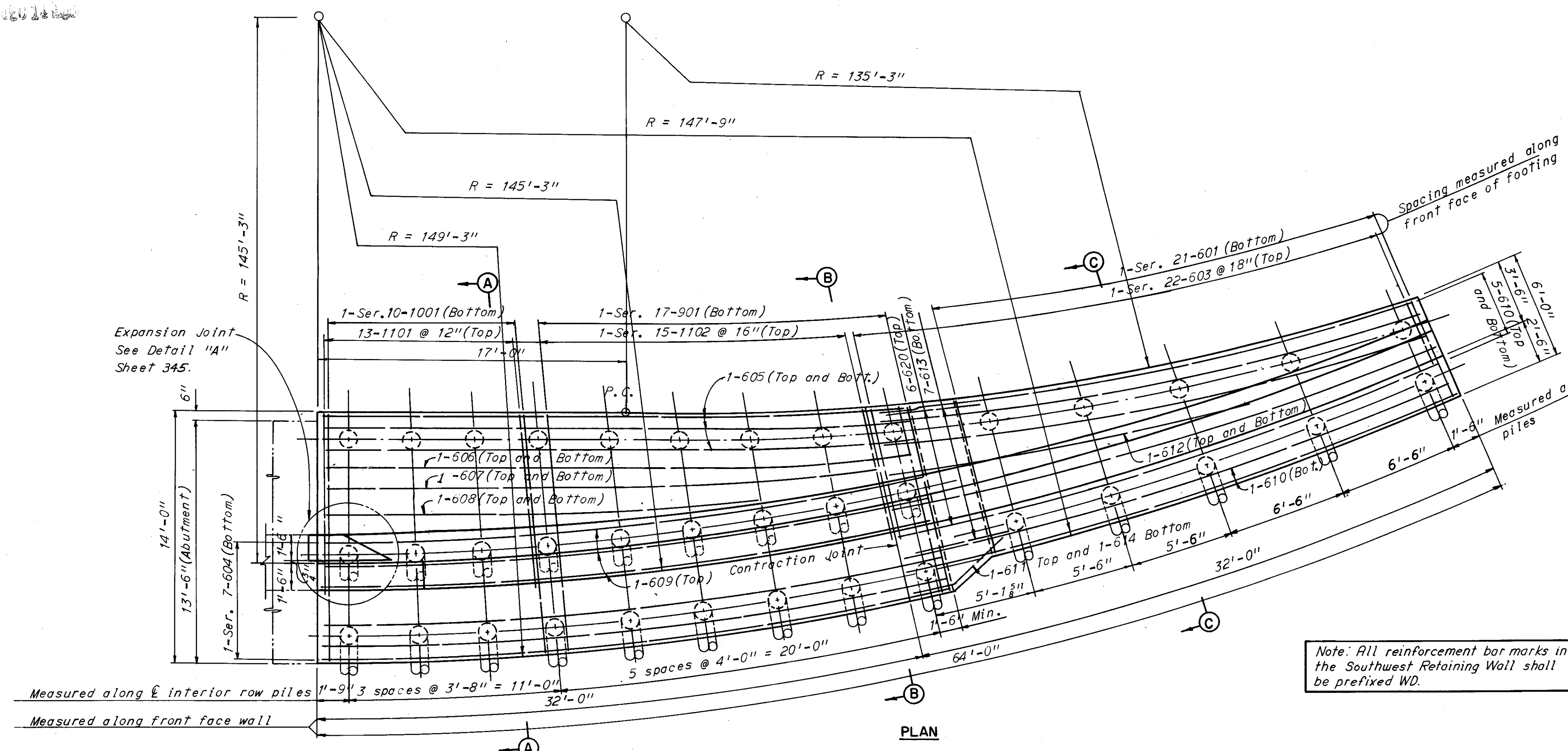
DRAWN L.J.D.	TRACED	CHECKED R.S.J.	REVIEWED W.F.	REVISED
DATE 12-14-64	DATE	DATE 12-24-64	DATE 12-28-64	

SHEET 343

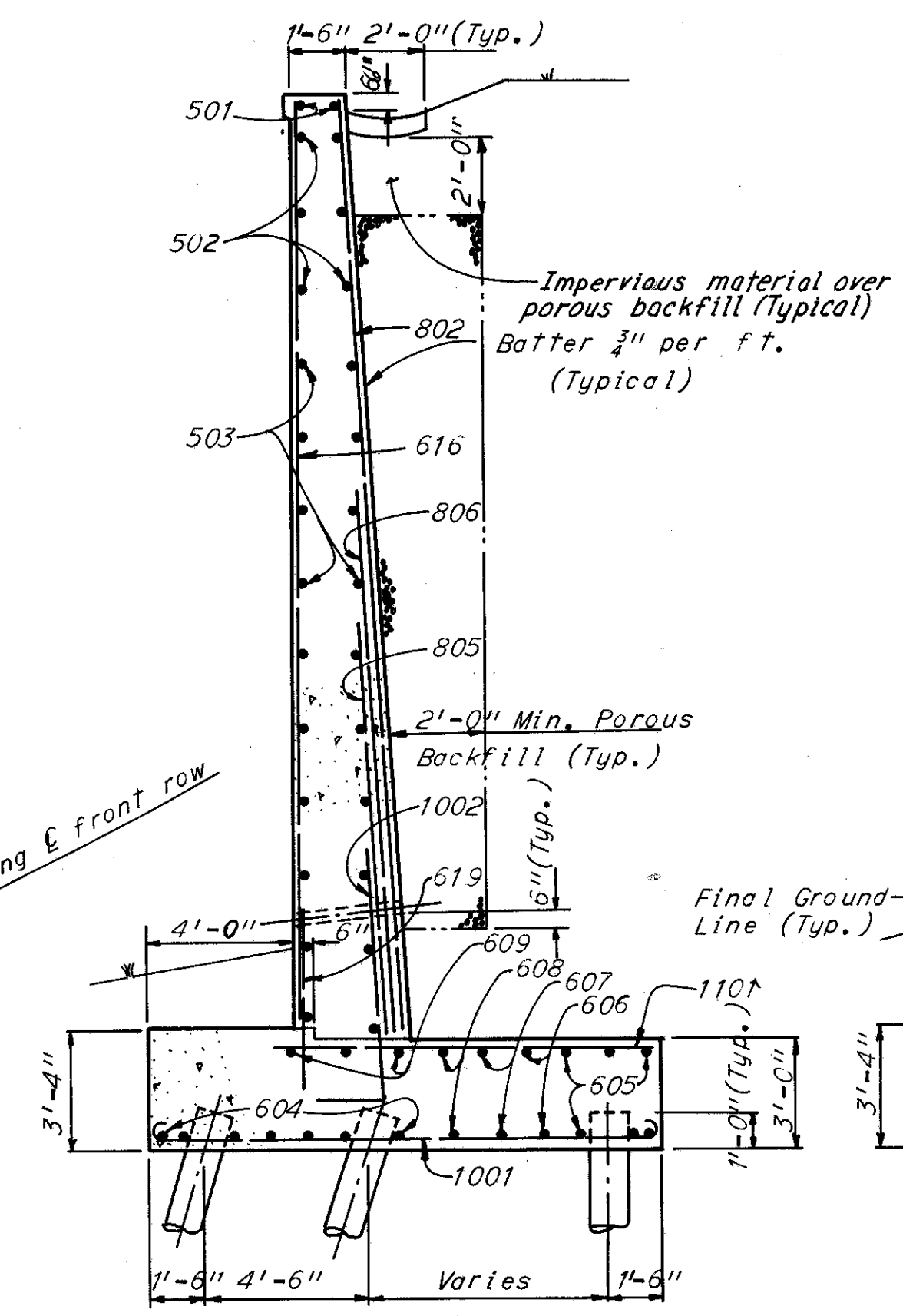




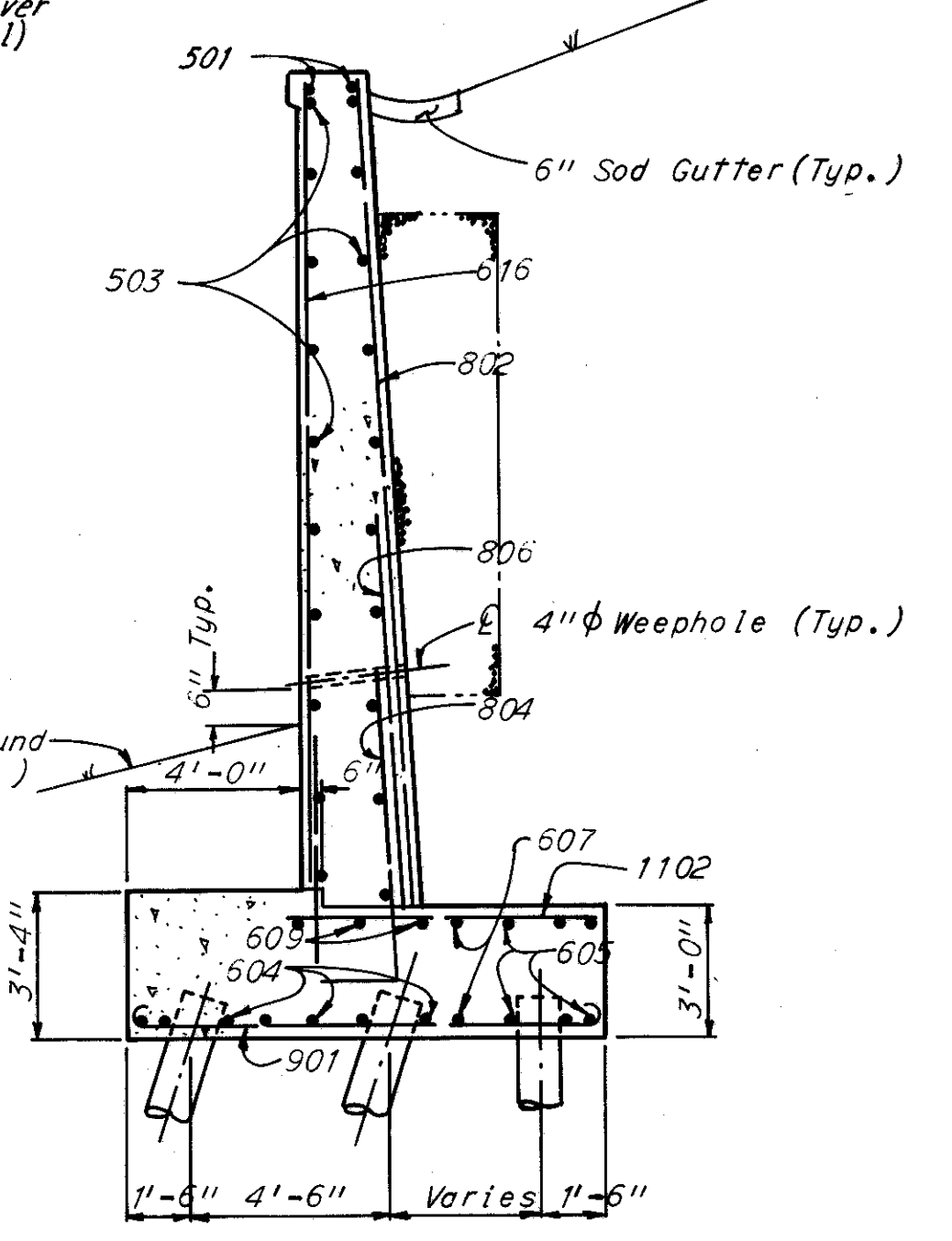
**CUYAHOGA COUNTY**  
**CUY 71-17.83**  
**CUY-176-12.76**



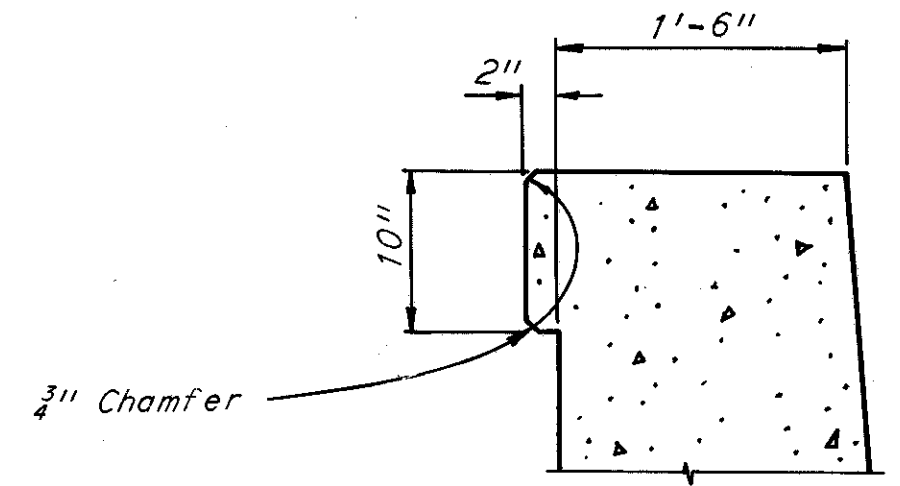
Note: All reinforcement bar marks in the Southwest Retaining Wall shall be prefixed WD.



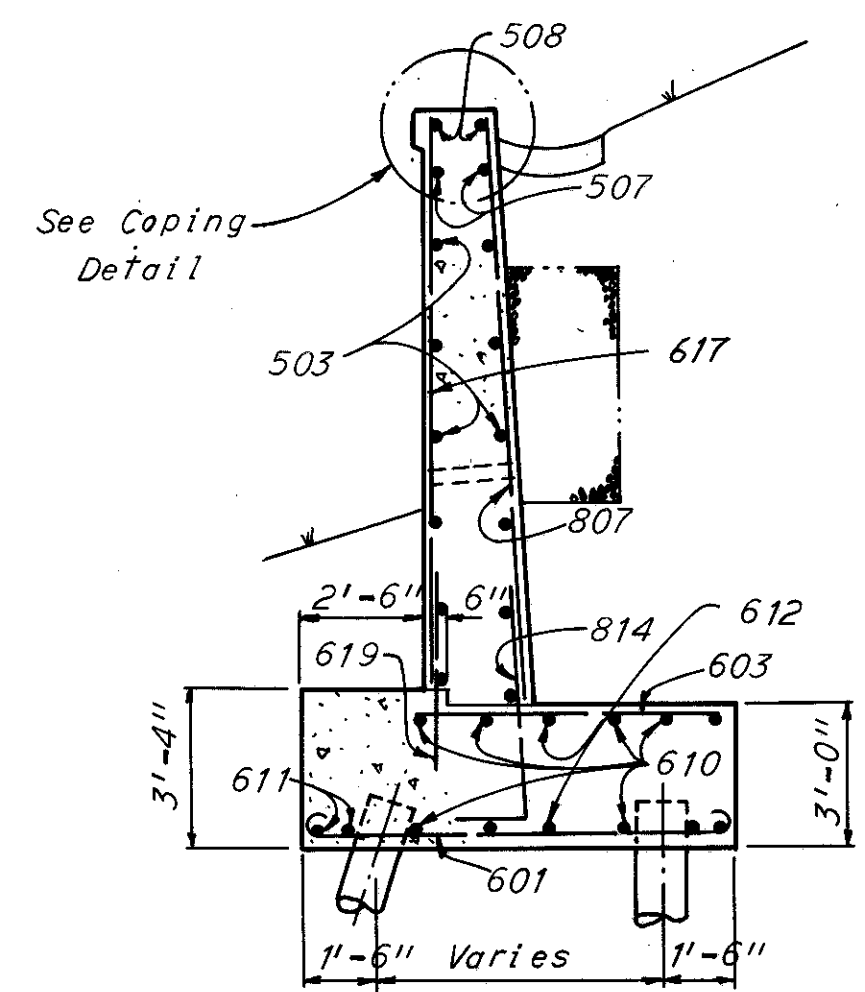
**SECTION A-A**



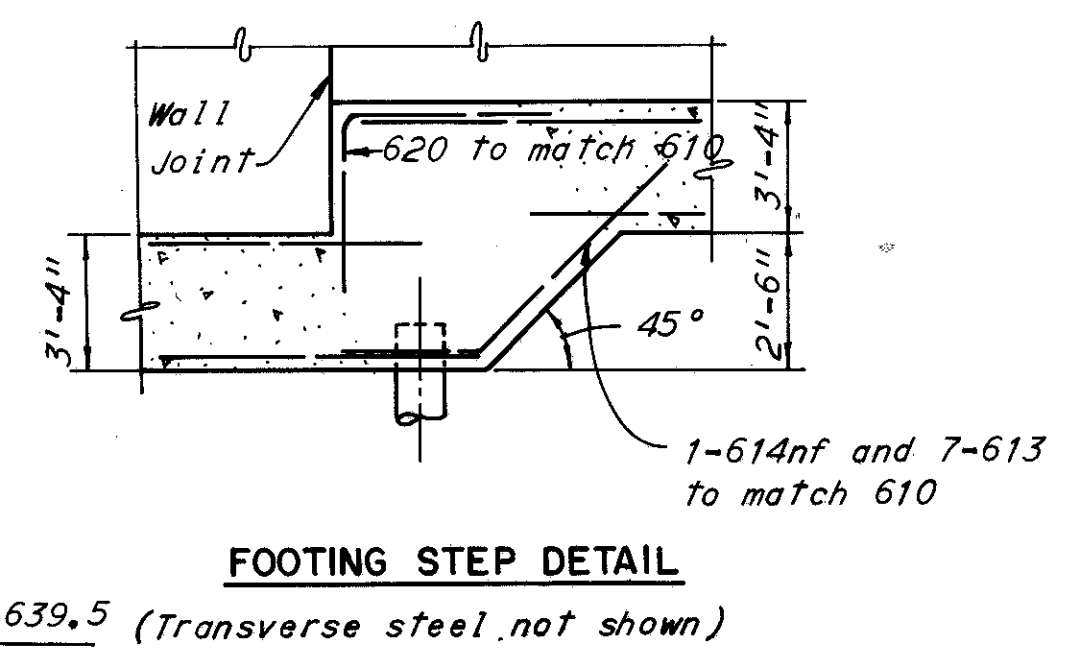
**SECTION B-B**



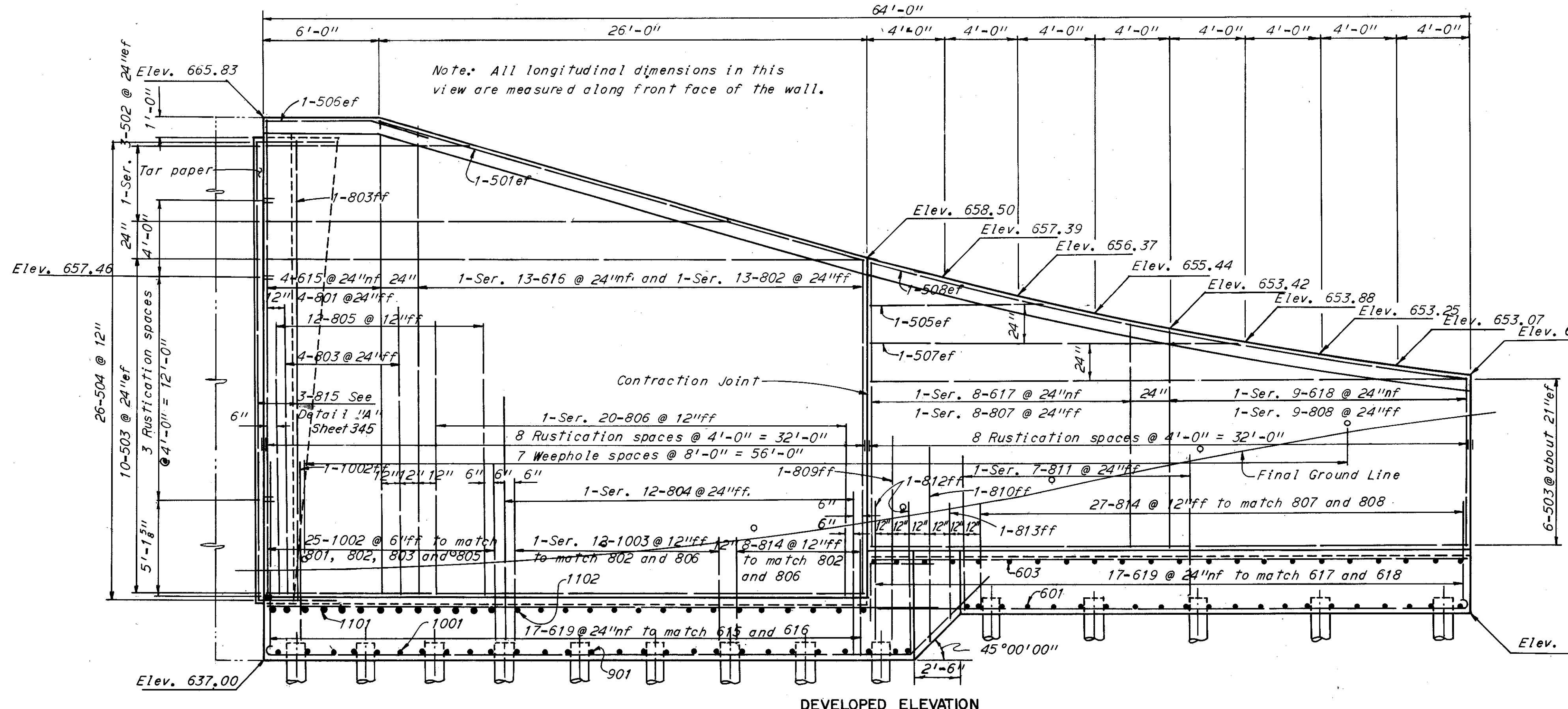
**COPING DETAILS**  
 Reinforcement not shown



**SECTION A-A**



**FOOTING STEP DETAIL**



**DEVELOPED ELEVATION**

Notes:  
 For Reinforcement Schedule and Bending Diagrams see sheet 357-357A  
 Longitudinal reinforcement to be field bent as required. Field bending included with Item S-4, for payment.  
 For Contraction Joint and Rustication details see sheet 345.  
 For Expansion Joint detail see sheet 345.  
 The following abbreviations are used:  
 nf = near face ff = far face ef = each face

H.N.T.B. BRIDGE NO. 20  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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**SOUTHWEST RETAINING WALL**

I-71 UNDER SOUTHBOUND OUTER ROADWAY

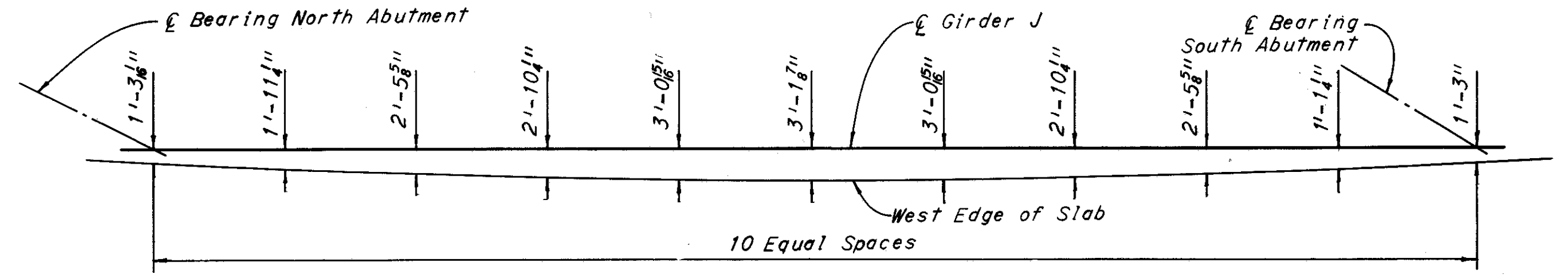
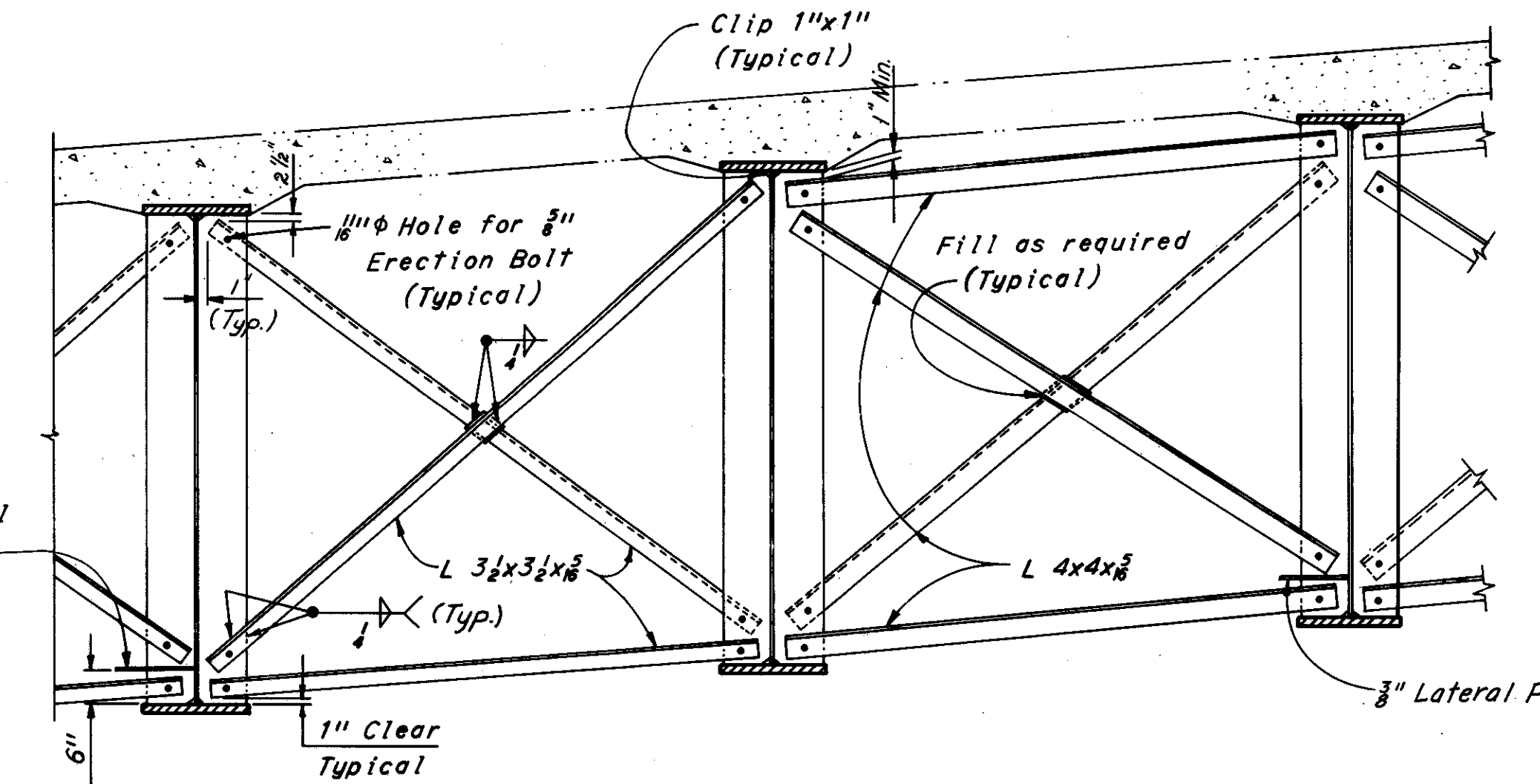
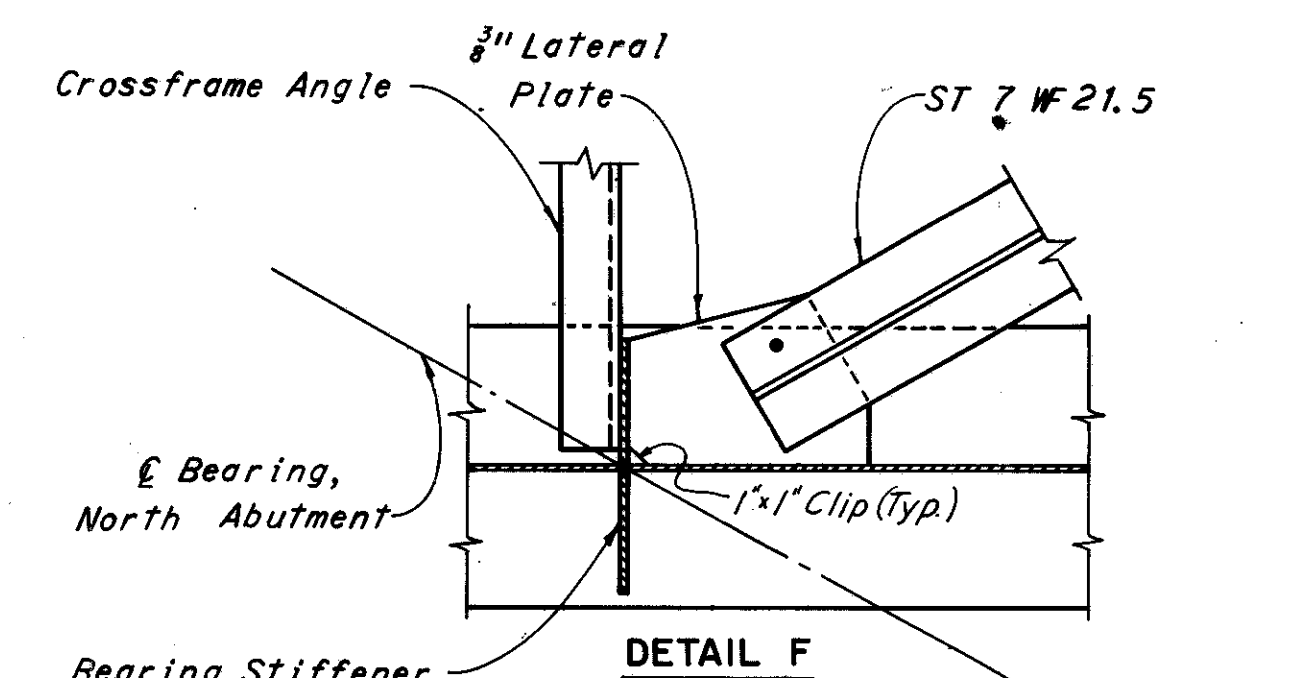
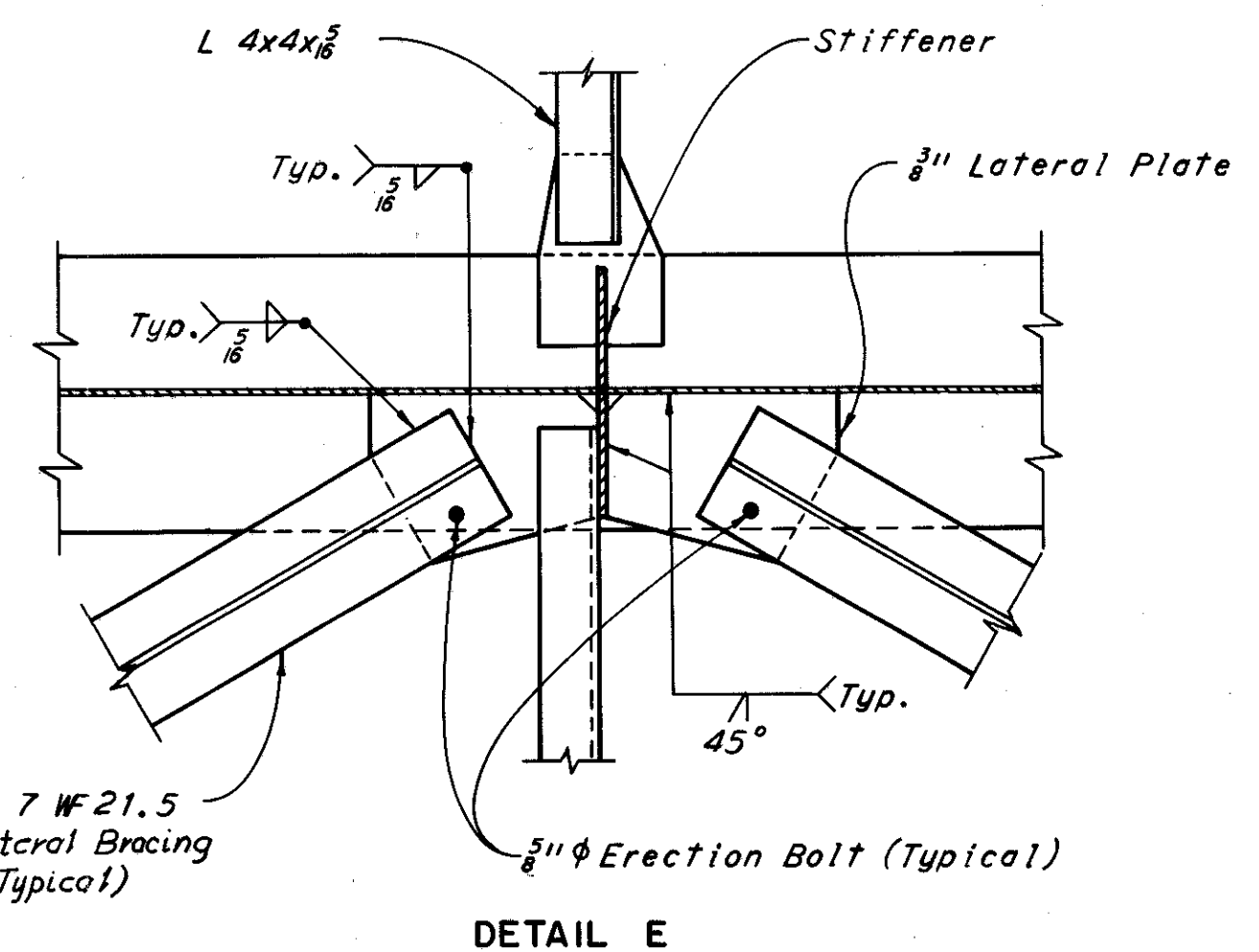
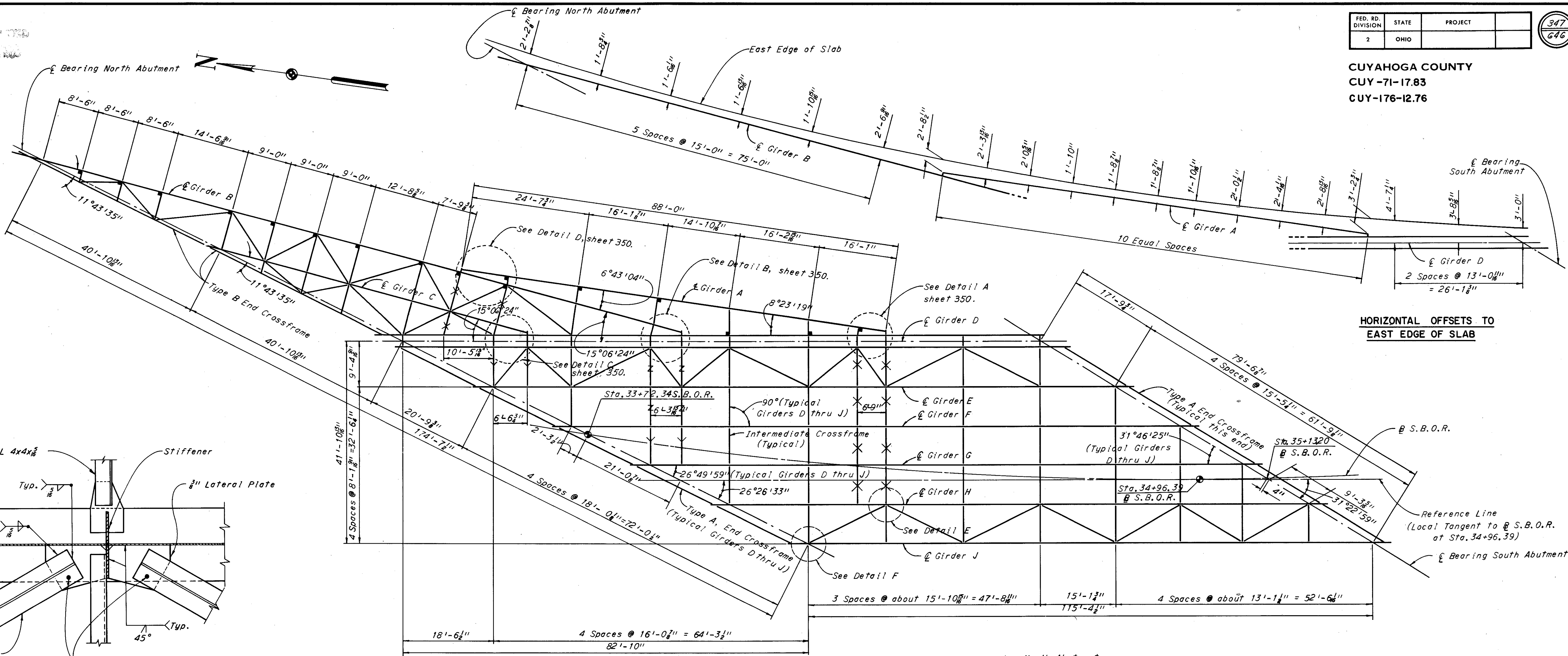
BR. NO. CUY-71-1794L STA. 33 + 62.88  
 STA. 35 + 18.37

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN J.S.	TRACED	CHECKED (25.0)
DATE 7-24-44	DATE	DATE 12-17-44
		REVIEWED (WF)
		DATE 12-28-44

REVISED 3-10-56

SHEET 346

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



**Notes.**  
 Girders D thru A shall be erected and in final position with crossframe and lateral bracing connections completed prior to erection of Girders A, B, and C.  
 For details of end crossframes see sheet 351

□ Indicates 90° angle.  
 Y Indicates Type Y Intermediate Crossframe.  
 Z Indicates Type Z Intermediate Crossframe.  
 X Indicates Type X Intermediate Crossframe.

For details of Type Y and Z Crossframes see sheet 350.  
 S.B.O.R. = Southbound Outer Roadway.  
 For further notes see sheet 348.

**TYPICAL LATERAL BRACING CONNECTIONS**

**TYPICAL INTERMEDIATE CROSSFRAME TYPE X CROSSFRAME**

**HORIZONTAL OFFSETS TO WEST EDGE OF SLAB**

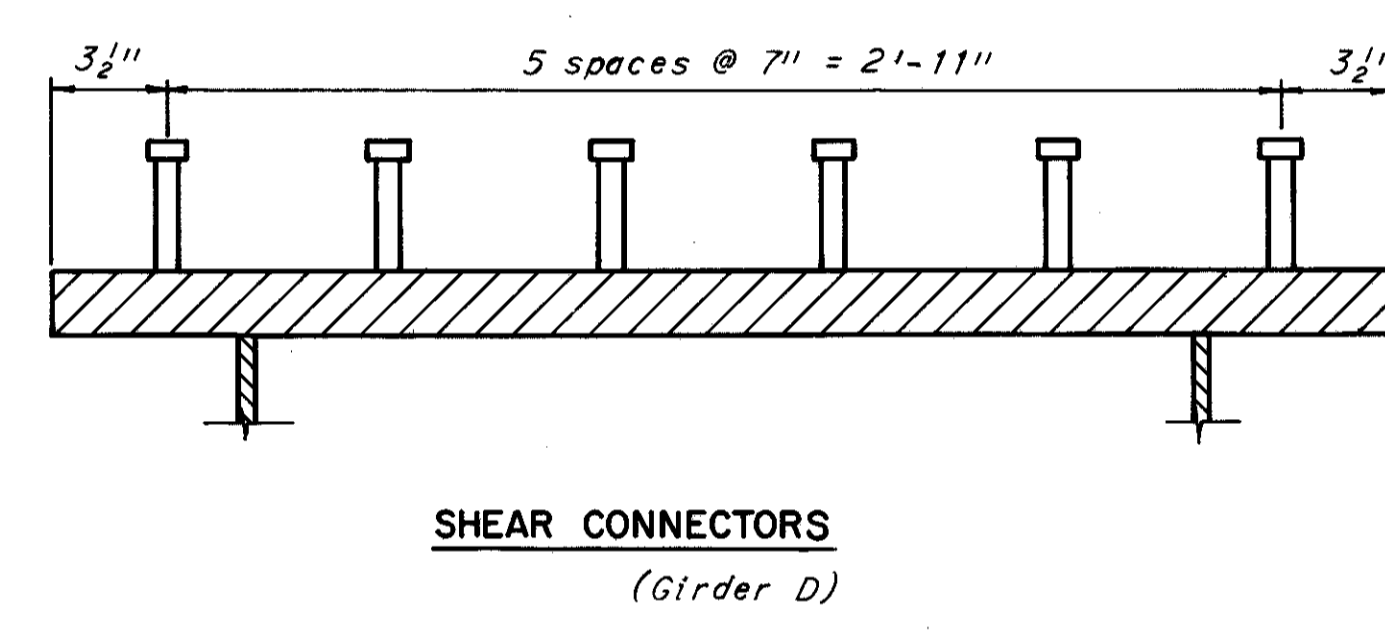
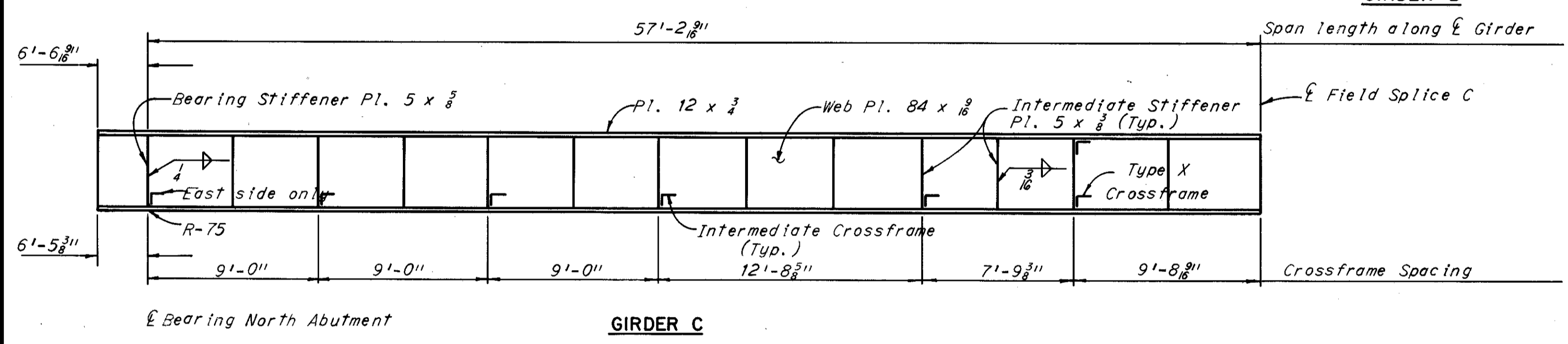
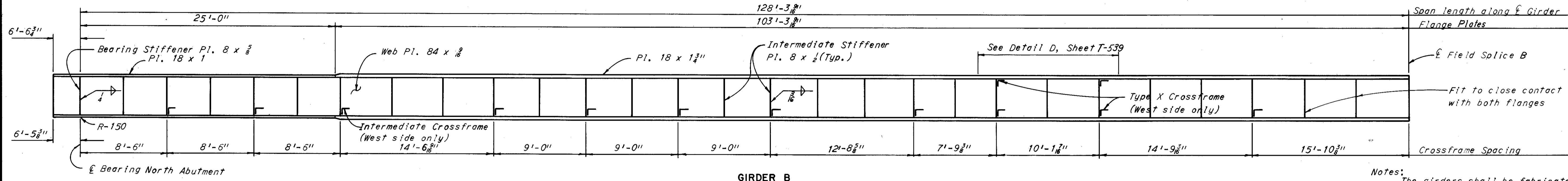
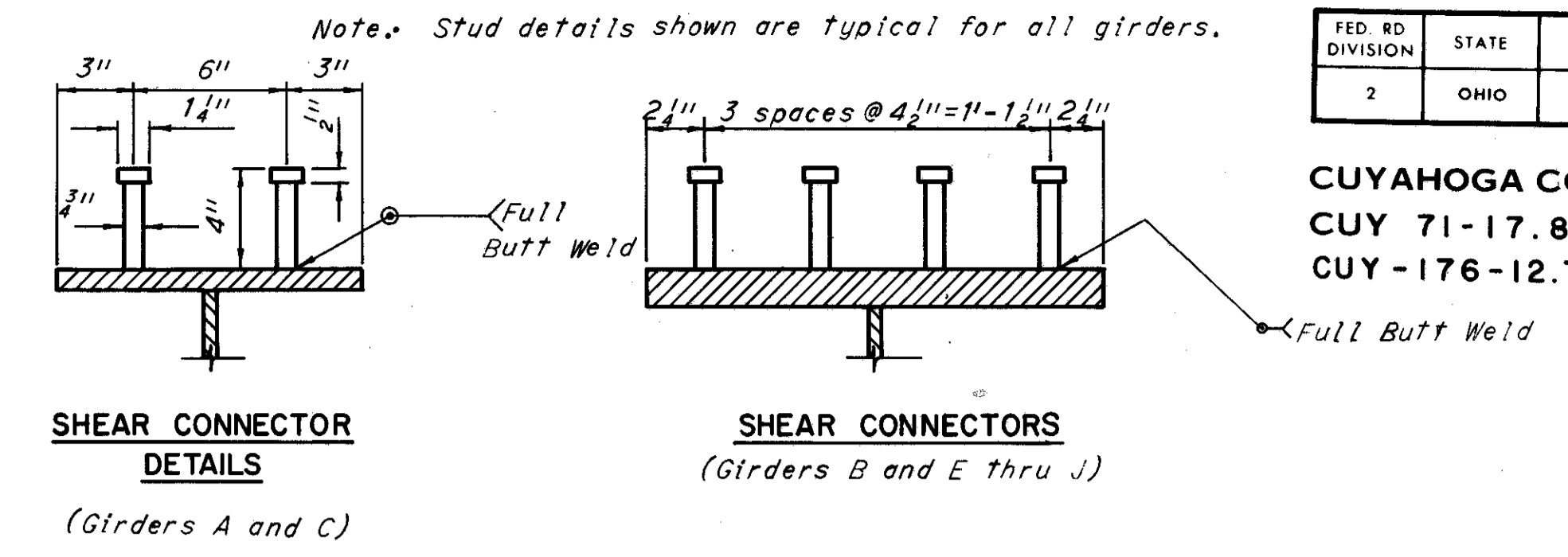
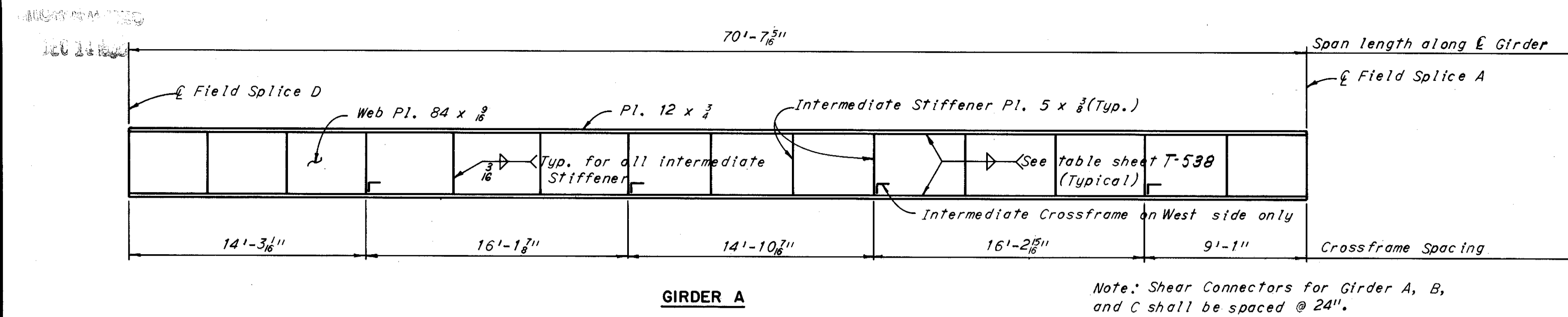
H.N.T.B. BRIDGE NO. 20  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**FRAMING PLAN**  
 I-71 UNDER SOUTHBOUND OUTER ROADWAY  
 BR. NO. CUY-71-1794L STA. 33 + 62.88  
 STA. 35 + 18.37

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN	TRACED	CHECKED
DATE 10-15-66	DATE 12-17-66	DATE 12-28-66

SHEET 347

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



**Notes:**

The girders shall be fabricated to compensate for the effects of dead load deflections and, under full dead load shall parallel the profiles formed by the top of pavement elevations directly over the  $\bar{C}$  of the girders, except as noted for Girder A on sheet 354.

Top and bottom flange plates are to be the same and shall be spliced at points shown on the girder elevations. The web plates may be shop spliced as required by available plate lengths. The location of such shop web splices and the location and details of any additional shop flange splices shall be submitted to the Director for approval prior to ordering of material.

Intermediate stiffeners shall be placed in pairs equally spaced between crossframes or crossframes and field splices or crossframes and bearing stiffeners and shall have contact bearing with the top flange except as noted for Girder B. A clearance of not more than  $\frac{1}{8}$ " from the bottom flange shall be maintained. In shop painting care shall be taken to force paint through the  $\frac{1}{8}$ " opening.

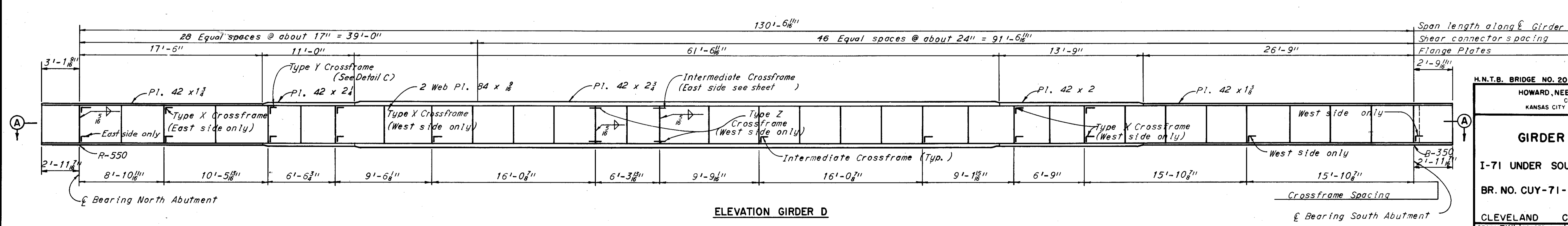
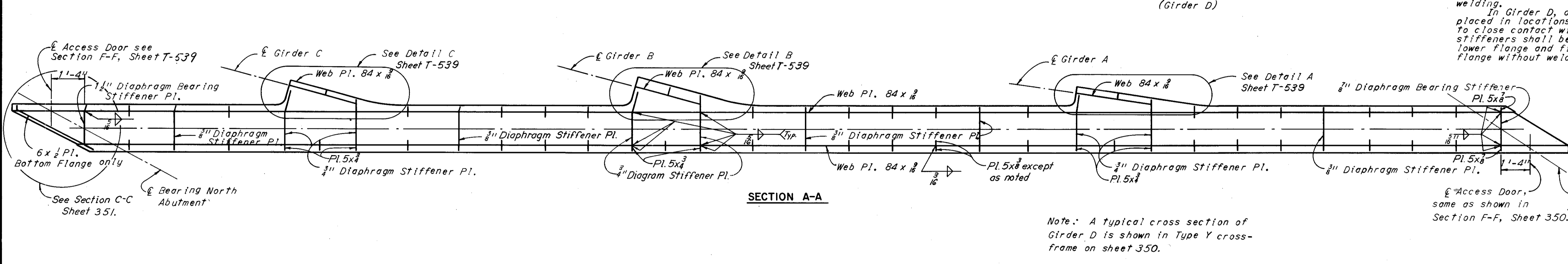
Bearing stiffeners at abutments shall be placed in pairs and shall be beveled and fully butt welded to the lower flange and fitted to close contact to the upper flange without welding.

In Girder D, diaphragm stiffeners shall be placed in locations shown in Section A-A and shall be fitted to close contact with both flanges. The diaphragm bearing stiffeners shall be beveled and fully butt welded to the lower flange and fitted to close contact with the upper flange without welding.

All stiffeners shall be set normal to girder flanges.

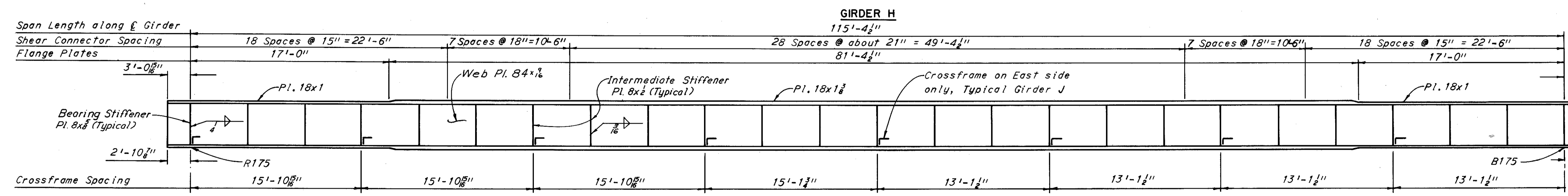
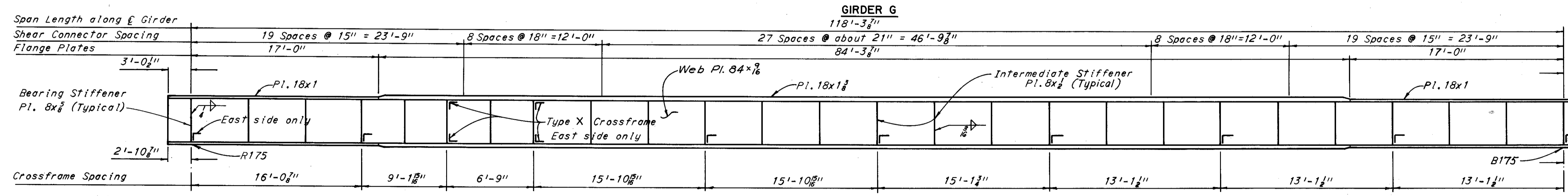
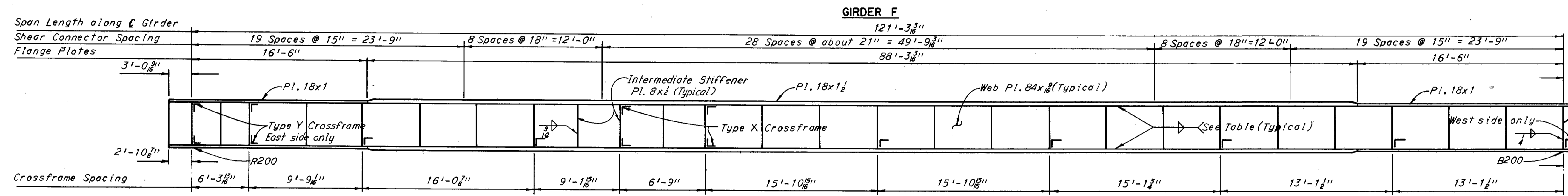
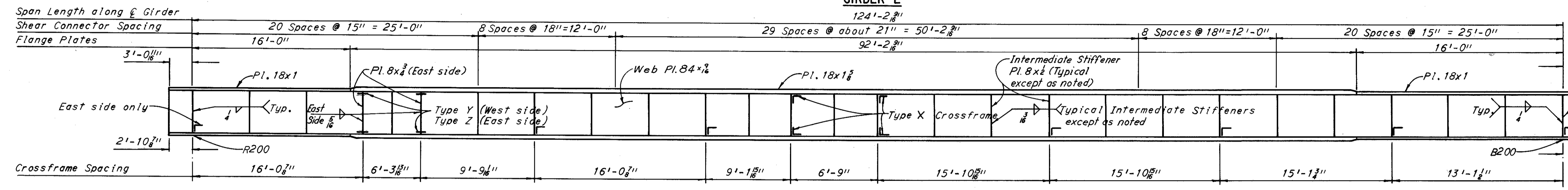
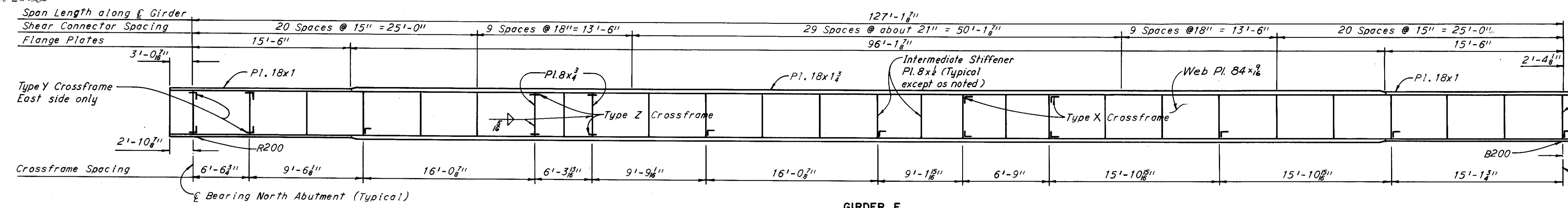
All girder field splices shall be made with  $\frac{7}{8}$ " high strength steel bolts. The bolts shall be placed with the heads on the outside face of the exterior girders and on the bottom of all flange plates.

For details of Rockers and Bolsters for girders A thru C and E thru J, see Ohio Standard Drawing RB-1-55 and for details of Rocker and Bolster for girder D see sheet 352.



H.N.T.B. BRIDGE NO. 20			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>GIRDER ELEVATIONS</b>			
I-71 UNDER SOUTHBOUND OUTER ROADWAY			
BR. NO. CUY-71-1794L		STA. 33 + 62.88	
		STA. 35 + 18.37	
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN JKH	TRACED	CHECKED RSD	REVIEWED WJL
DATE 12/17/64	DATE	DATE 12-17-64	DATE 12-28-64
			SHEET 348

**CUYAHOGA COUNTY**  
**CUY-71-17.83**  
**CUY-176-12.76**



**GIRDER J**

Flange to Web Weld Size	
Flange Pl. Thickness	Fillet Weld Size
1/2" through 1 1/2"	3/8"
1 3/4", 1 5/8" & 2"	3/4"
2 1/2"	1"

Bearing Stiffeners Pl. 8x2 (Typical) West side only  
 Bearing South Abutment (Typical)

Bearing Stiffeners Pl. 8x2 (Typical) West side only

Bearing Stiffeners Pl. 8x2 (Typical) West side only

West side only

Note: For notes see sheet 348

H.N.T.B. BRIDGE NO. 20

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**GIRDER ELEVATIONS**

I-71 UNDER SOUTHBOUND OUTER ROADWAY

BR. NO. CUY-71-1794L STA. 33 + 62.88  
 STA. 35 + 18.37

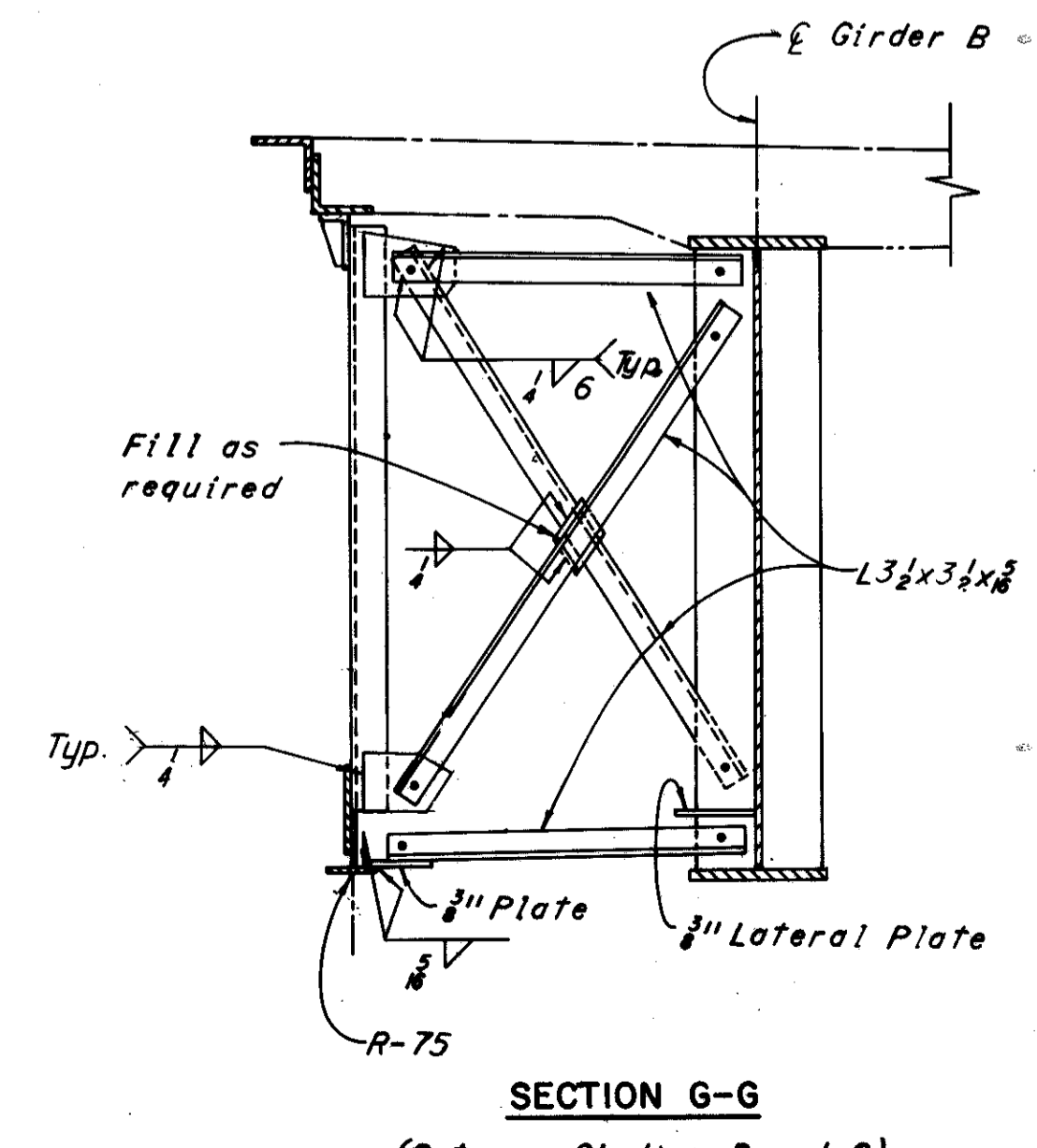
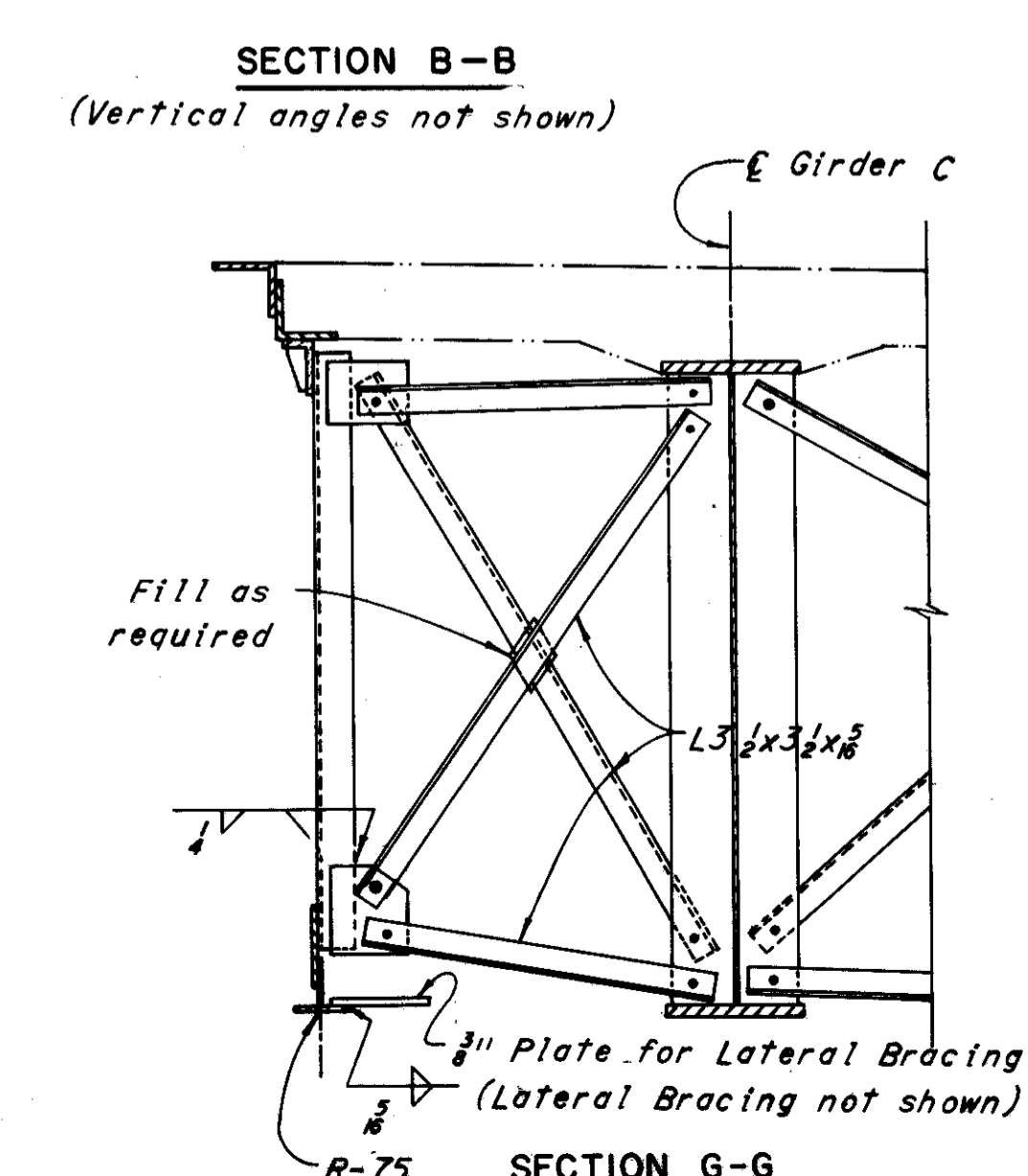
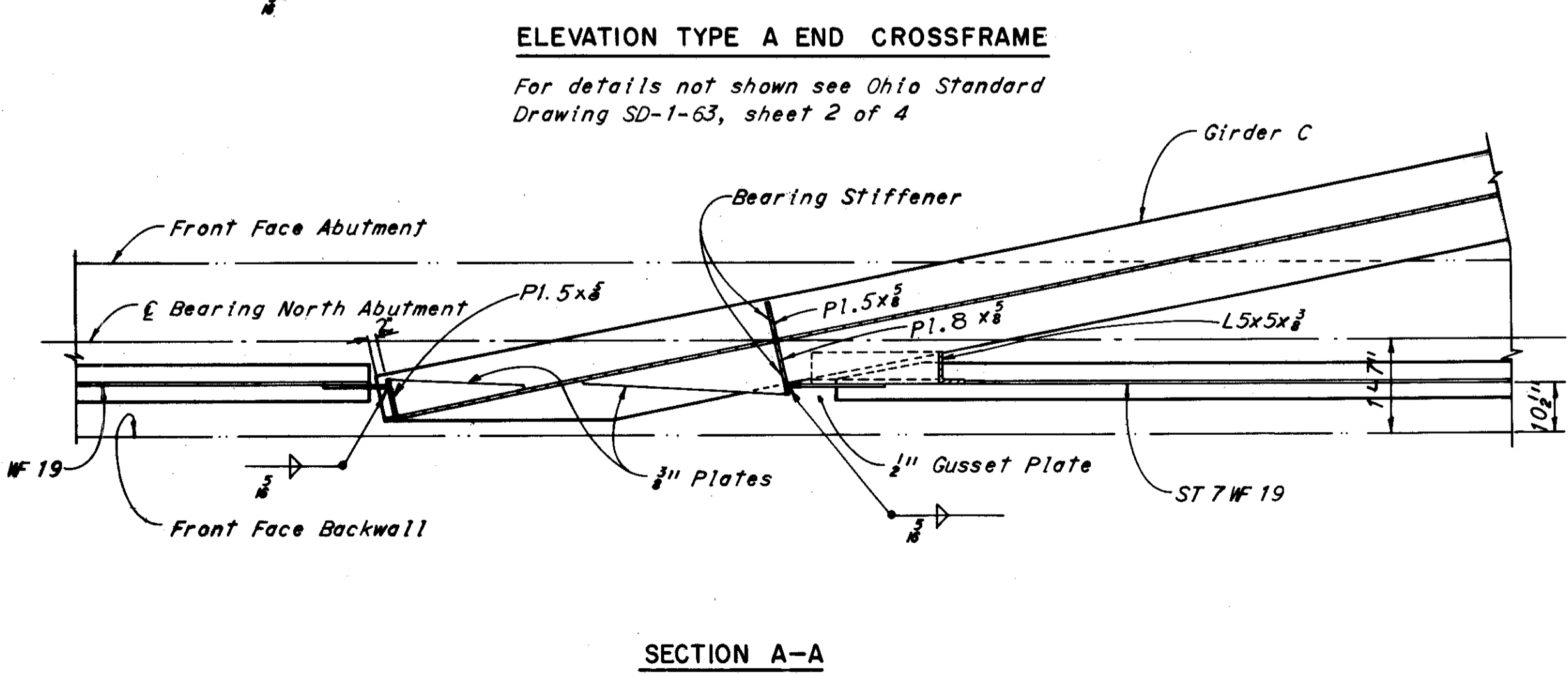
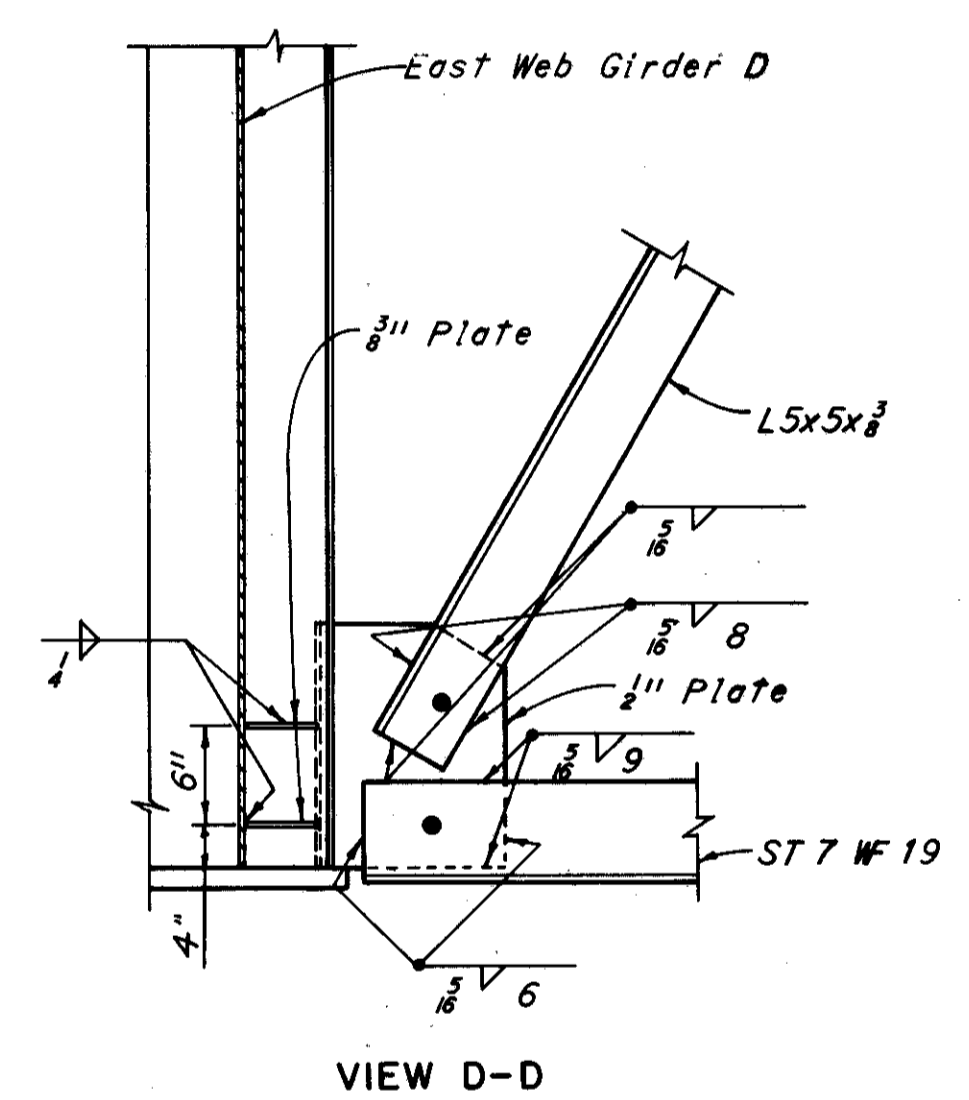
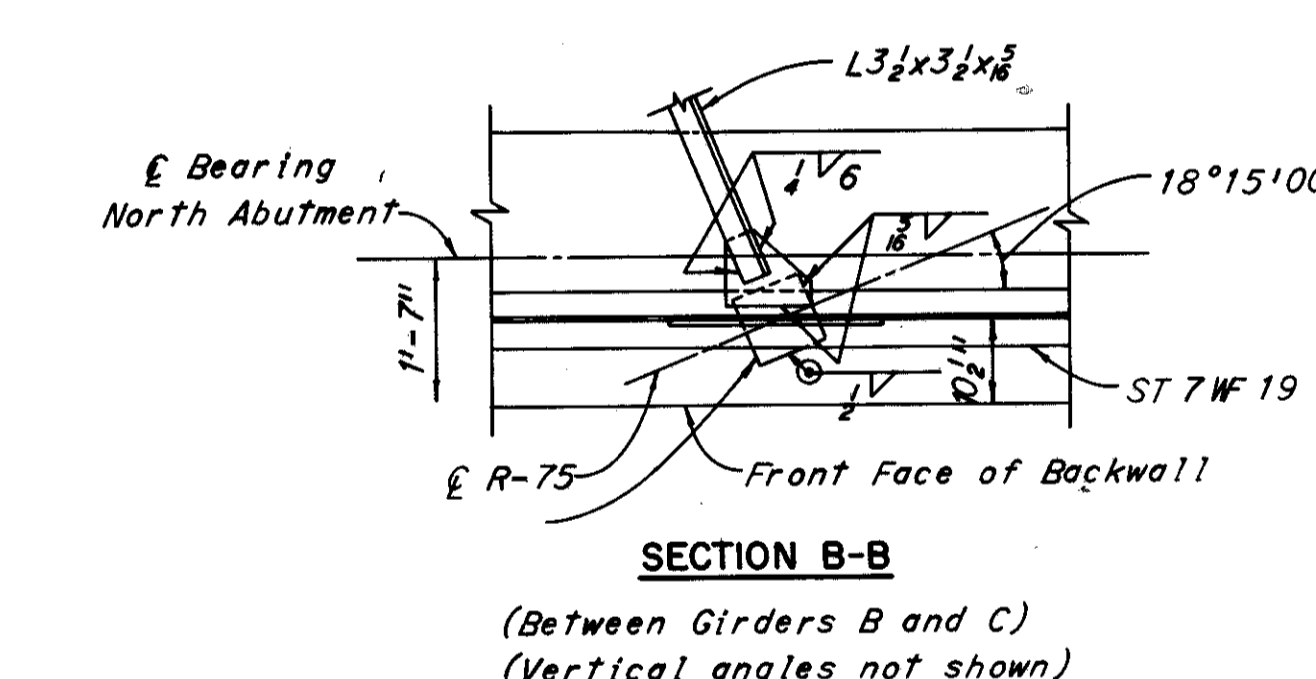
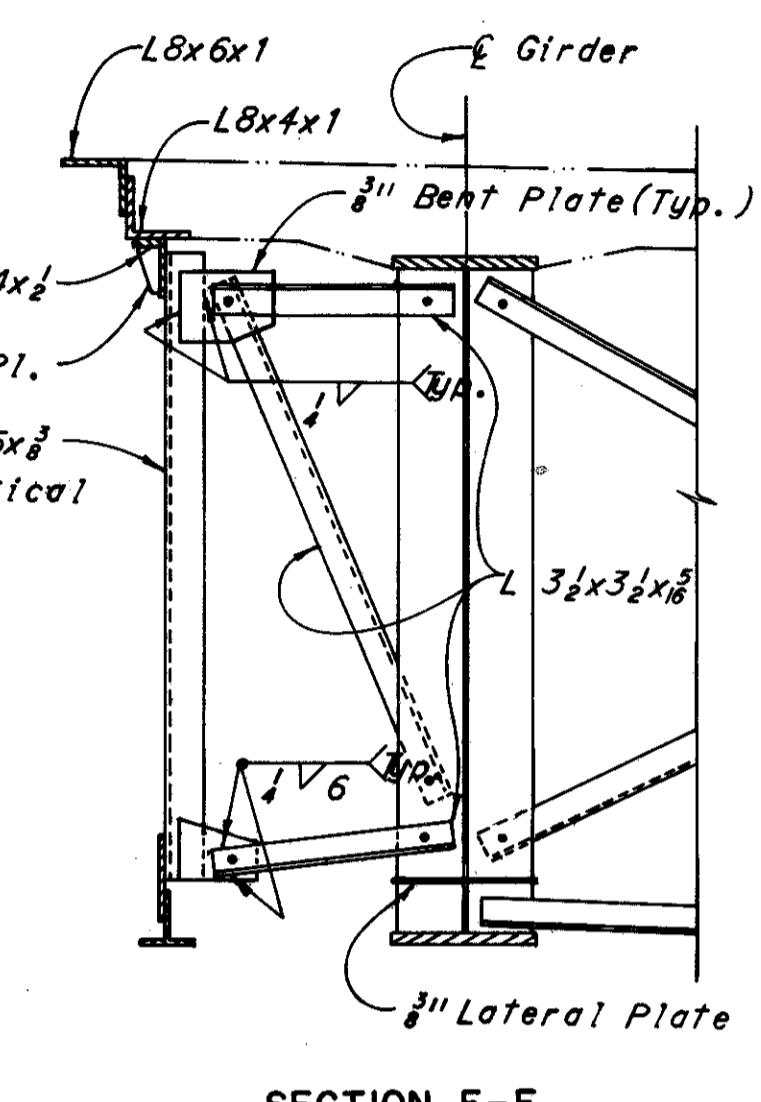
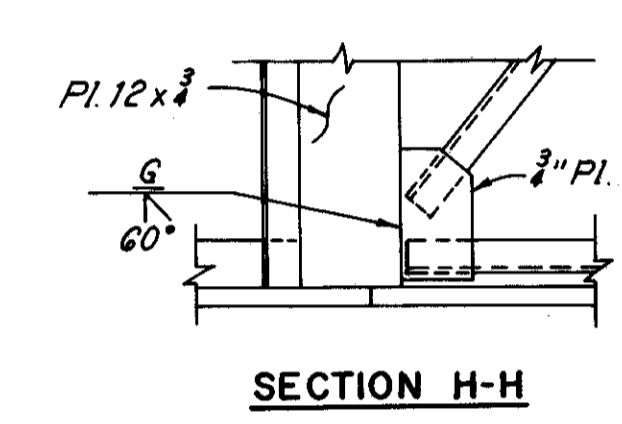
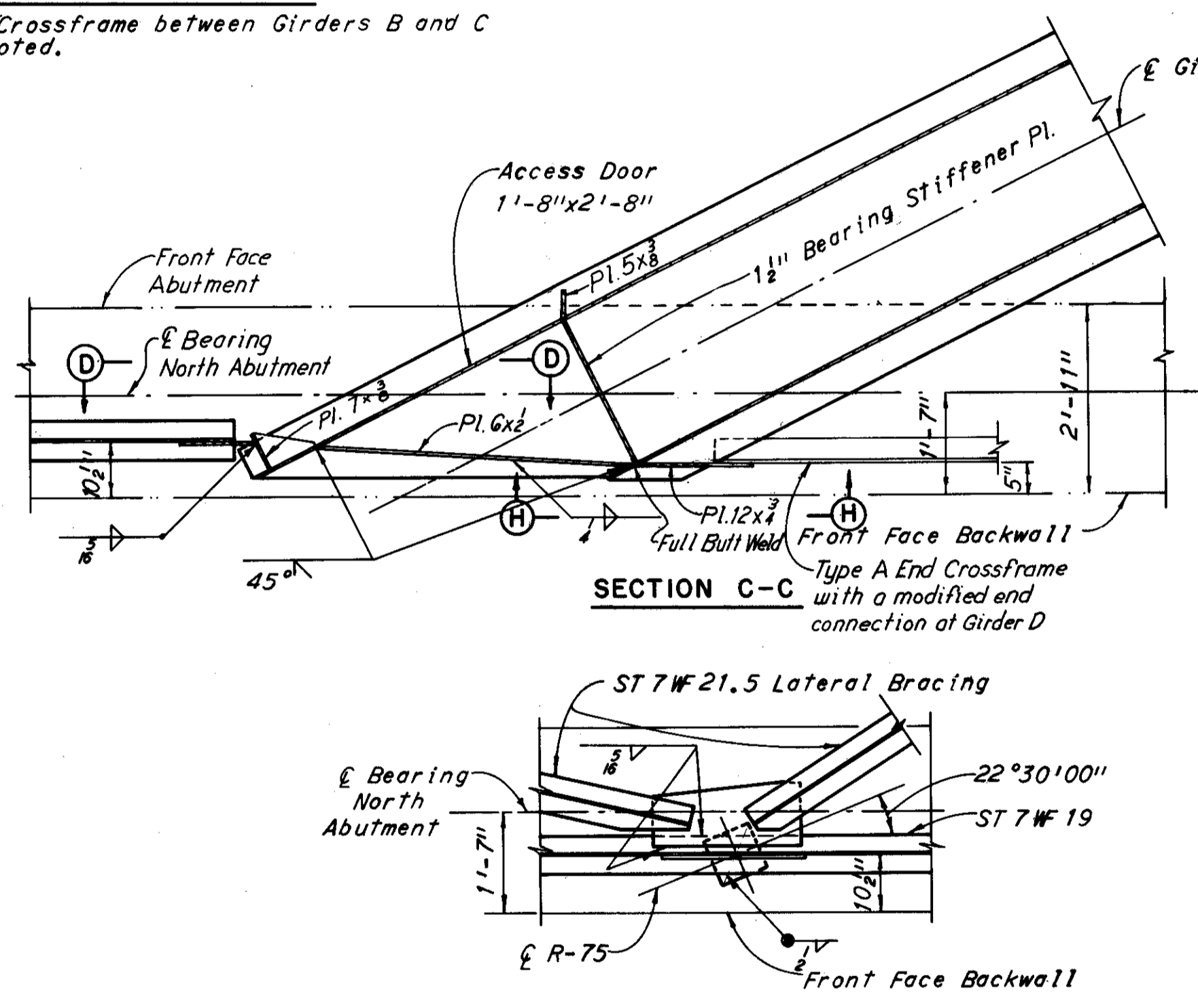
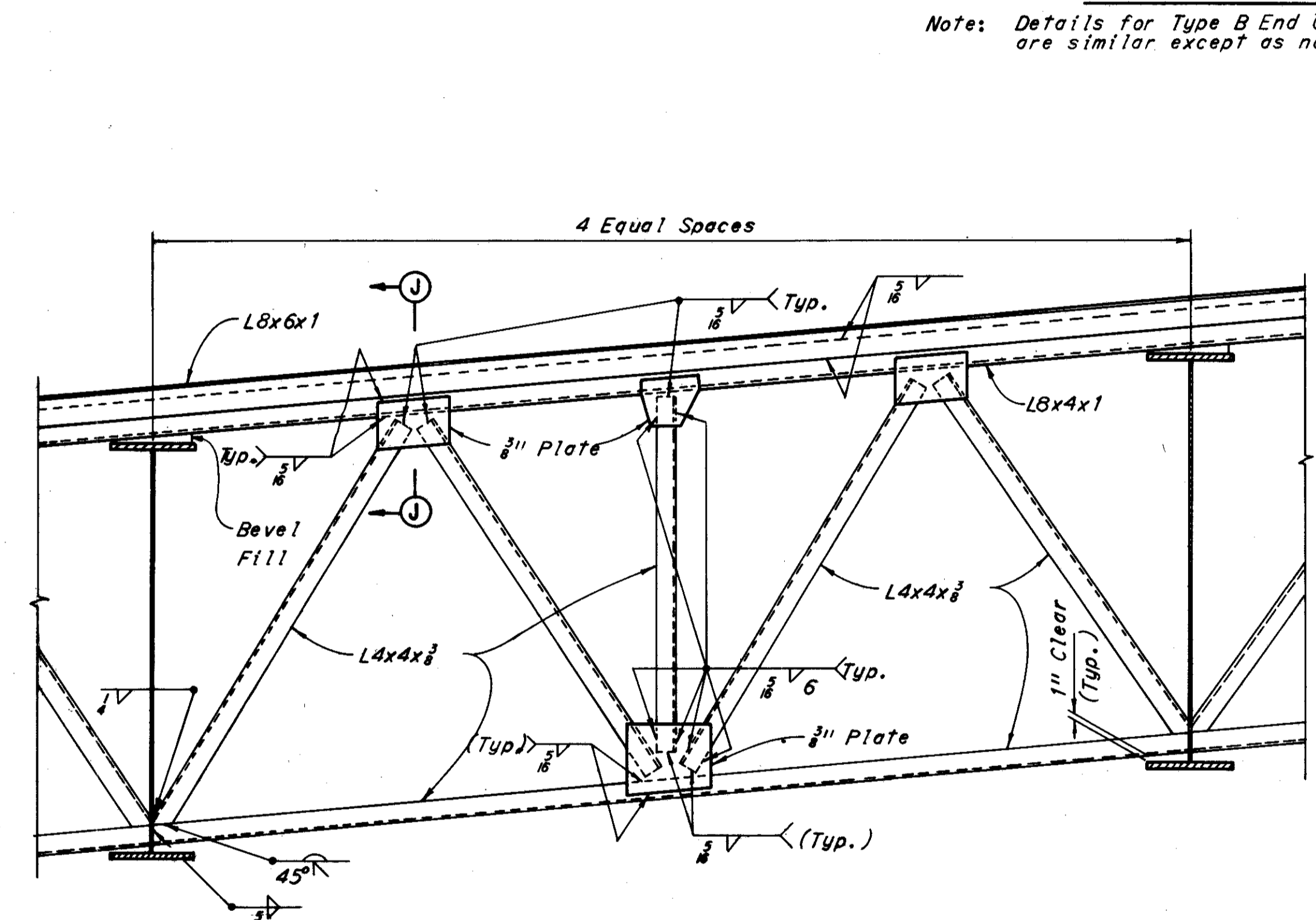
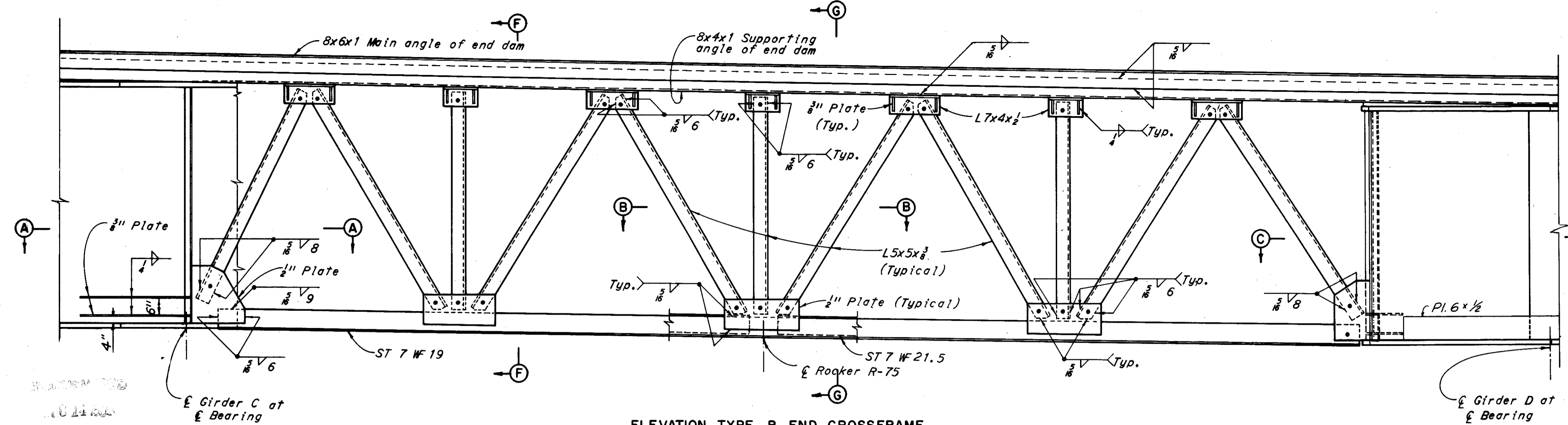
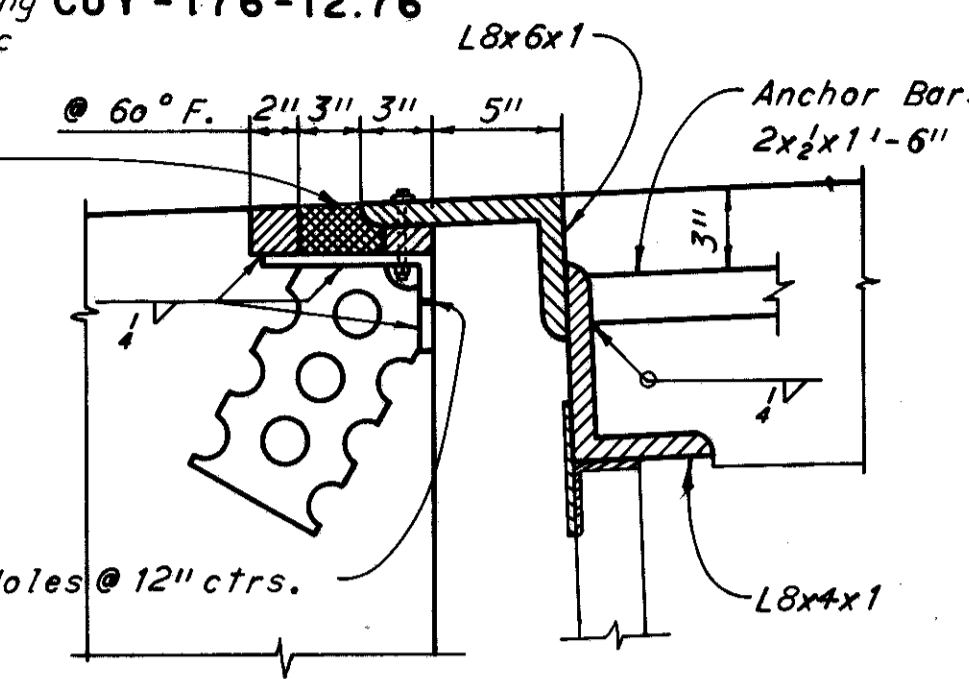
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN BY: J/K	TRACED	CHECKED BY: J/S
DATE: 12/17/64	DATE:	DATE: 12/28/64

SHEET 349





Permagile rubber sealing compound or Permalastic J-Seal or approved equal. Included with Item 5-7 for payment



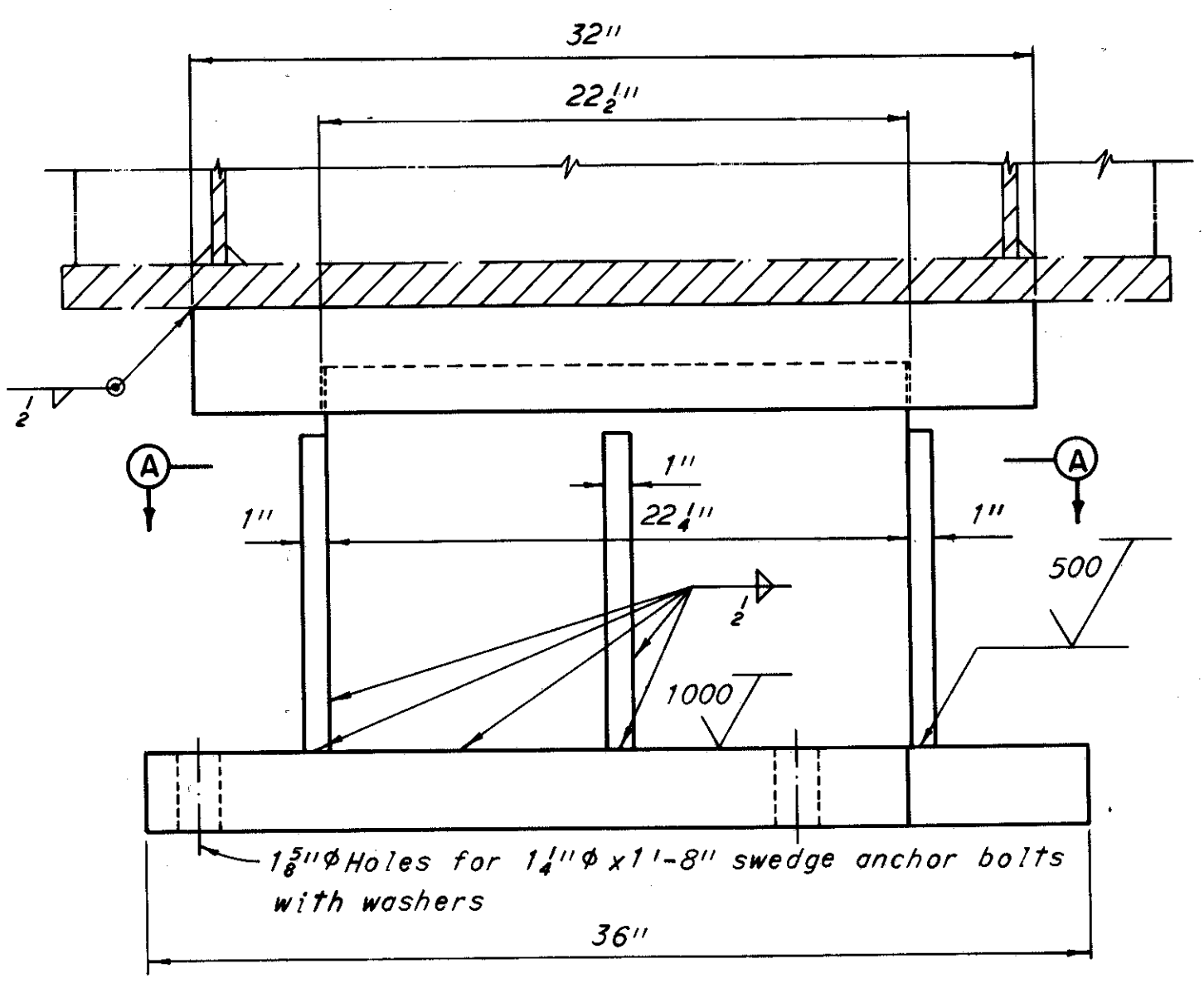
H.N.T.B. BRIDGE NO. 20			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>SUPERSTRUCTURE DETAILS</b>			
I-71 UNDER SOUTHBOUND OUTER ROADWAY			
BR. NO. CUY-71-1794L		STA. 33 + 62.88 STA. 35 + 18.37	
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN BY JCH	TRACED	CHECKED RSD	REVIEWED WJF
DATE 7-7-64	DATE	DATE 12-17-64	DATE 12-28-64
			SHEET 35/4

APPROVED  
DEC 21 1964

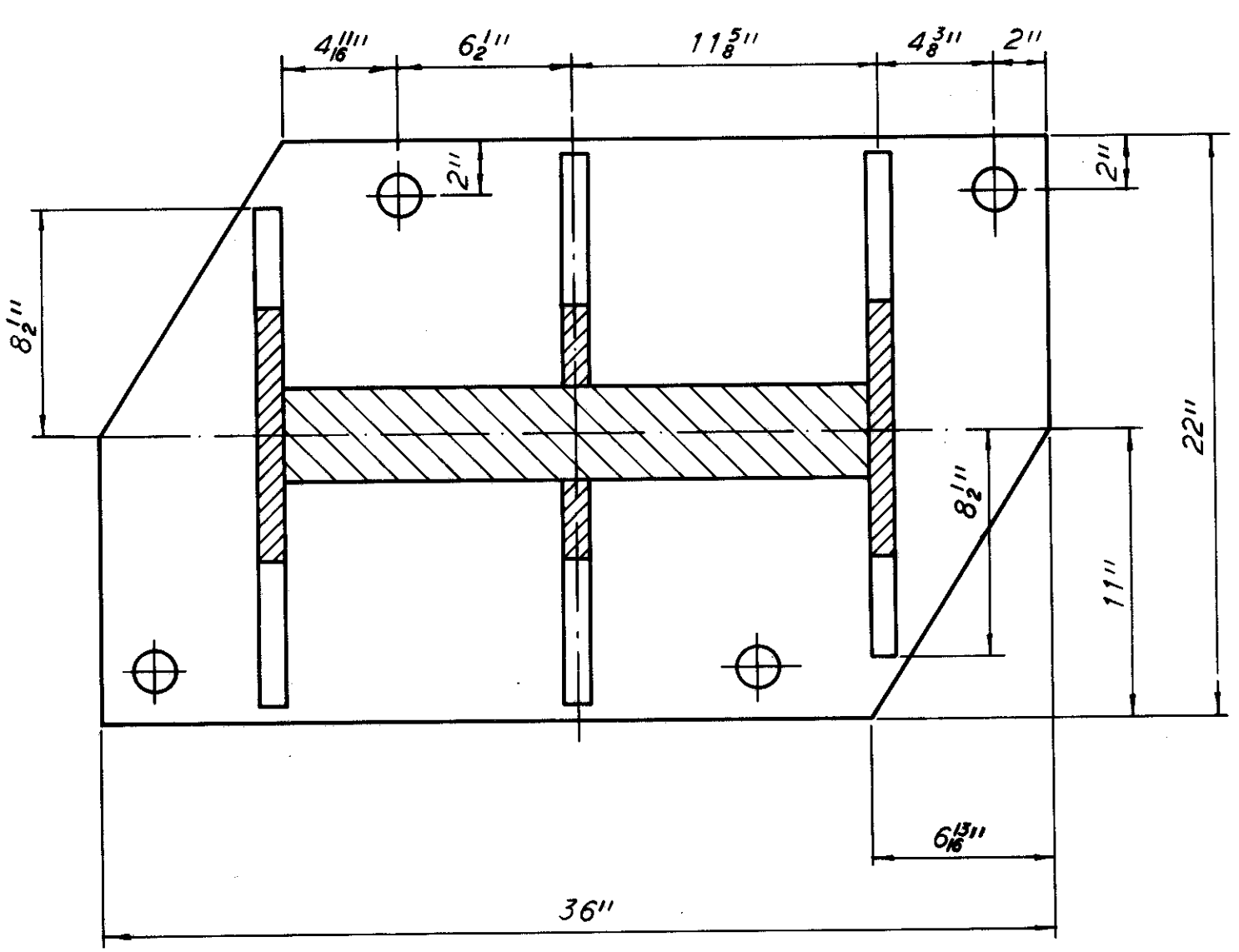
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

352  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

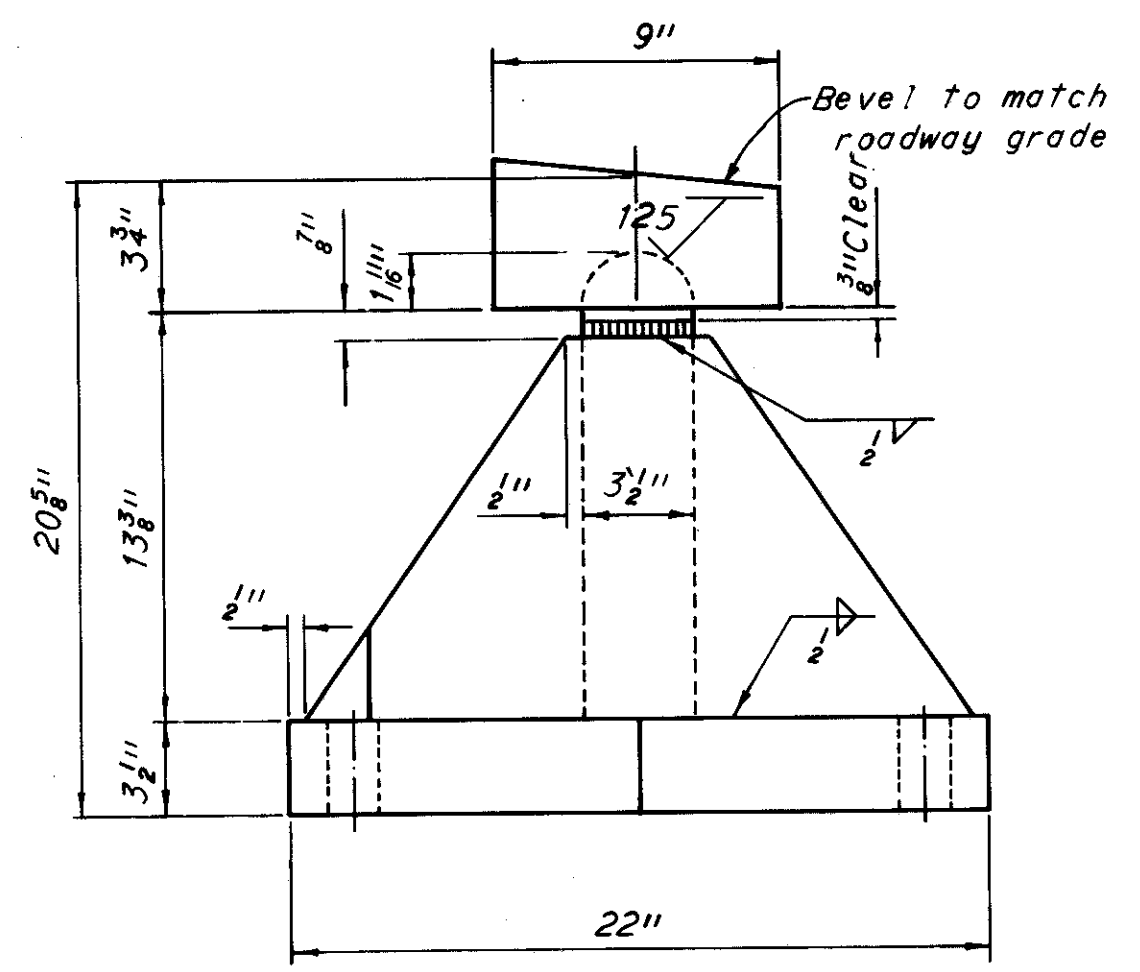


ELEVATION

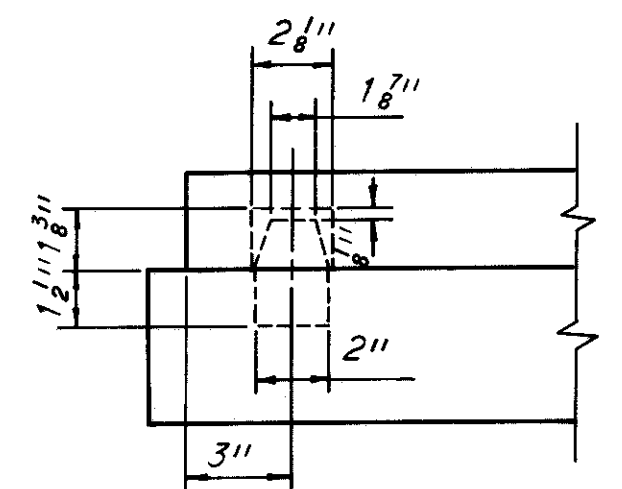


SECTION A-A

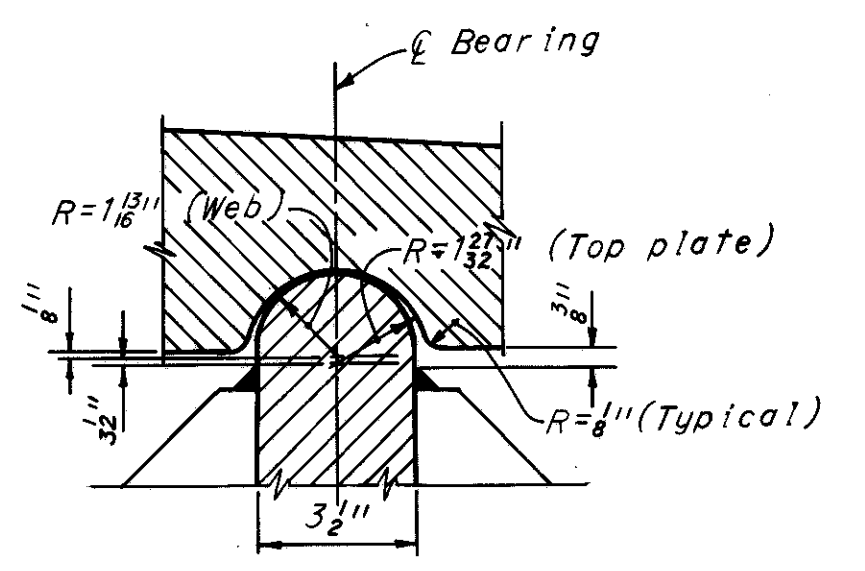
BOLSTER AT SOUTH ABUTMENT - B-350



END ELEVATION

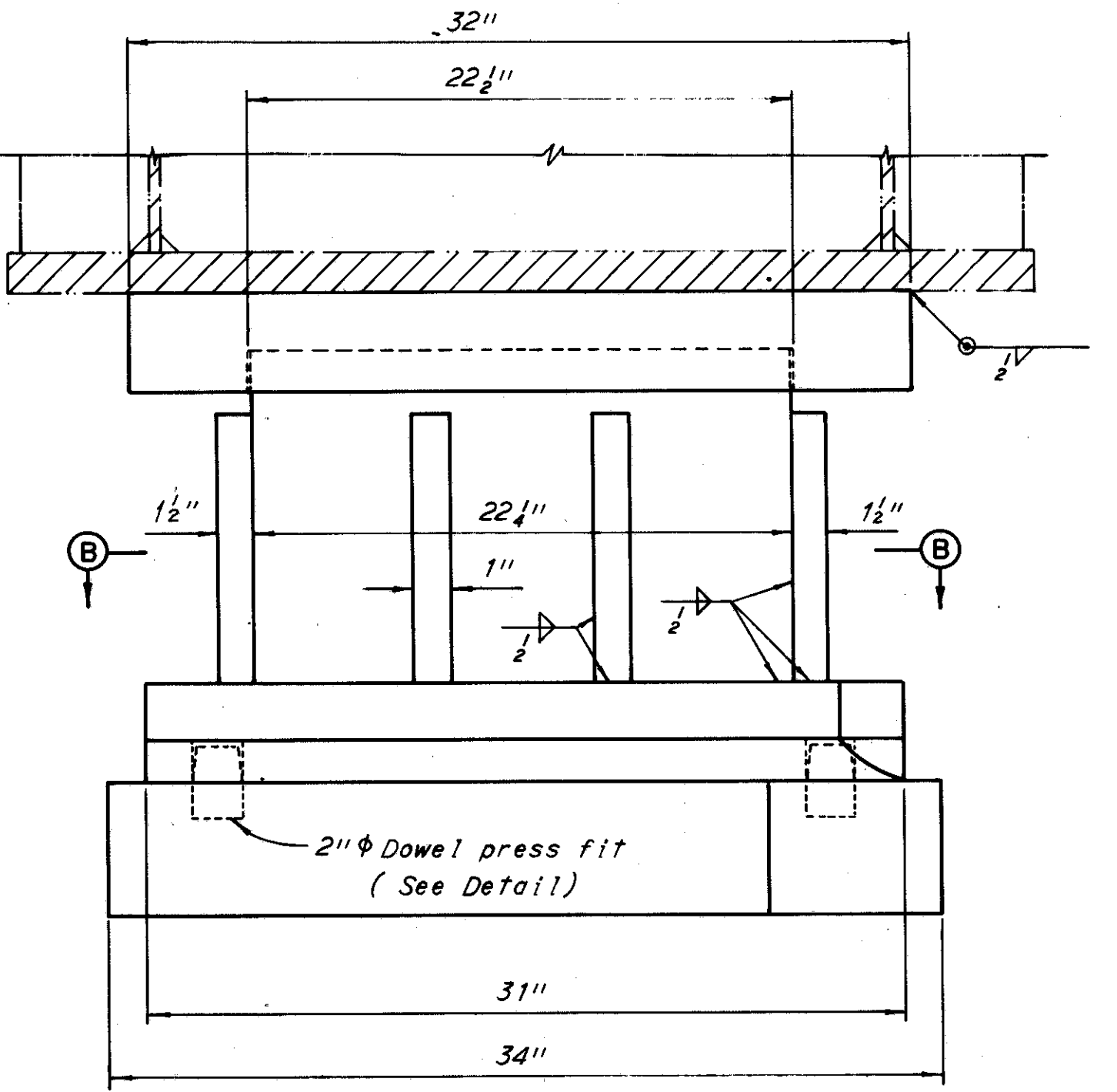


DOWEL DETAIL

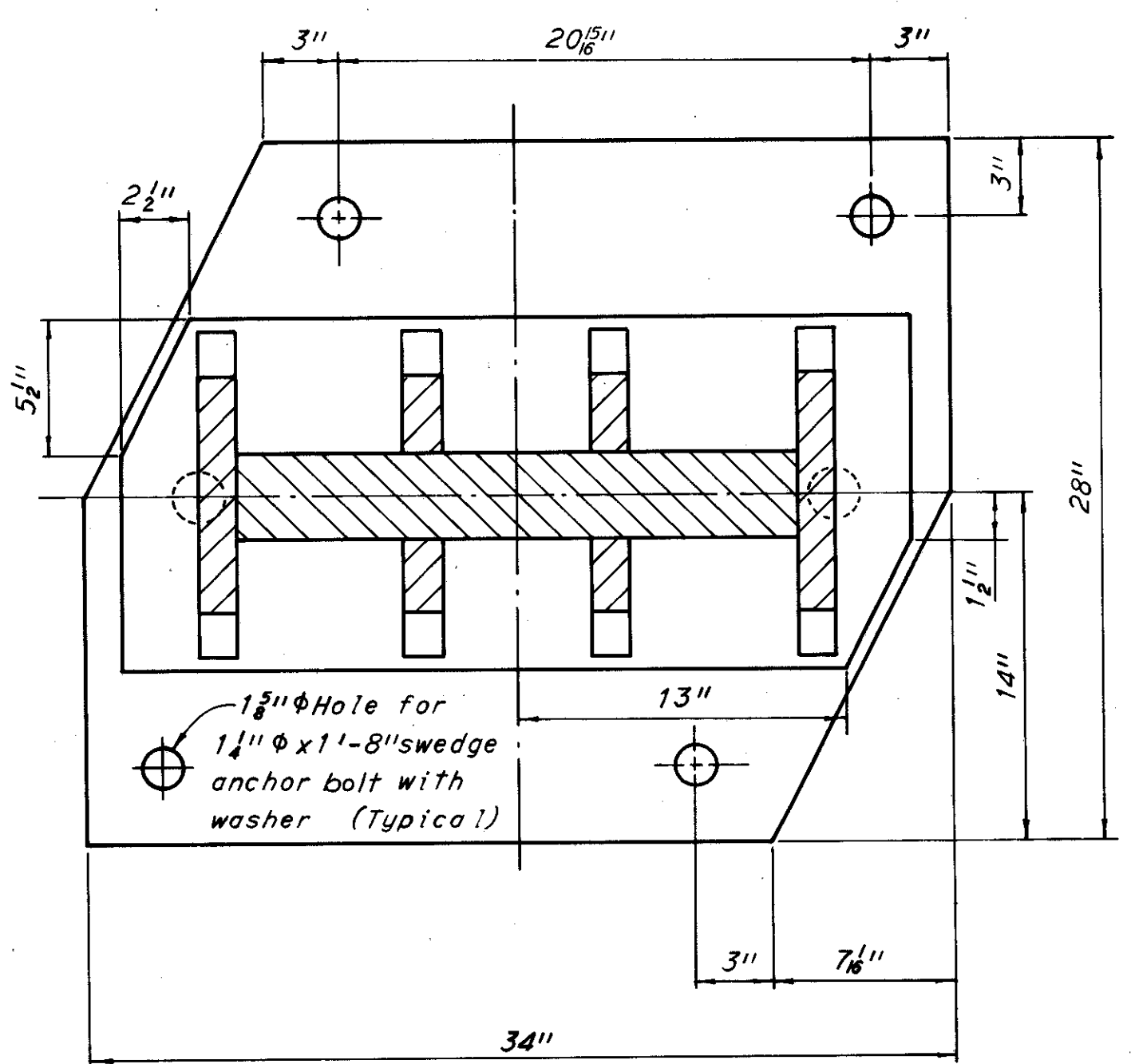


TOP BEARING PLATE

Notes:  
All materials shall conform to ASTM A441-60T, except masonry plate for Rocker R-550 shall conform to ASTM A148-60, Grade 80-50.  
Anchor bolts shall be in place prior to erection of superstructure steel.  
The annular spaces between anchor bolts and masonry plates shall be filled with lead or babbitt before setting nuts.  
All masonry plates, rockers and sole plates shall be scribed with center lines in both directions.  
All material is included with "Item S-7 Structural Steel," for payment.

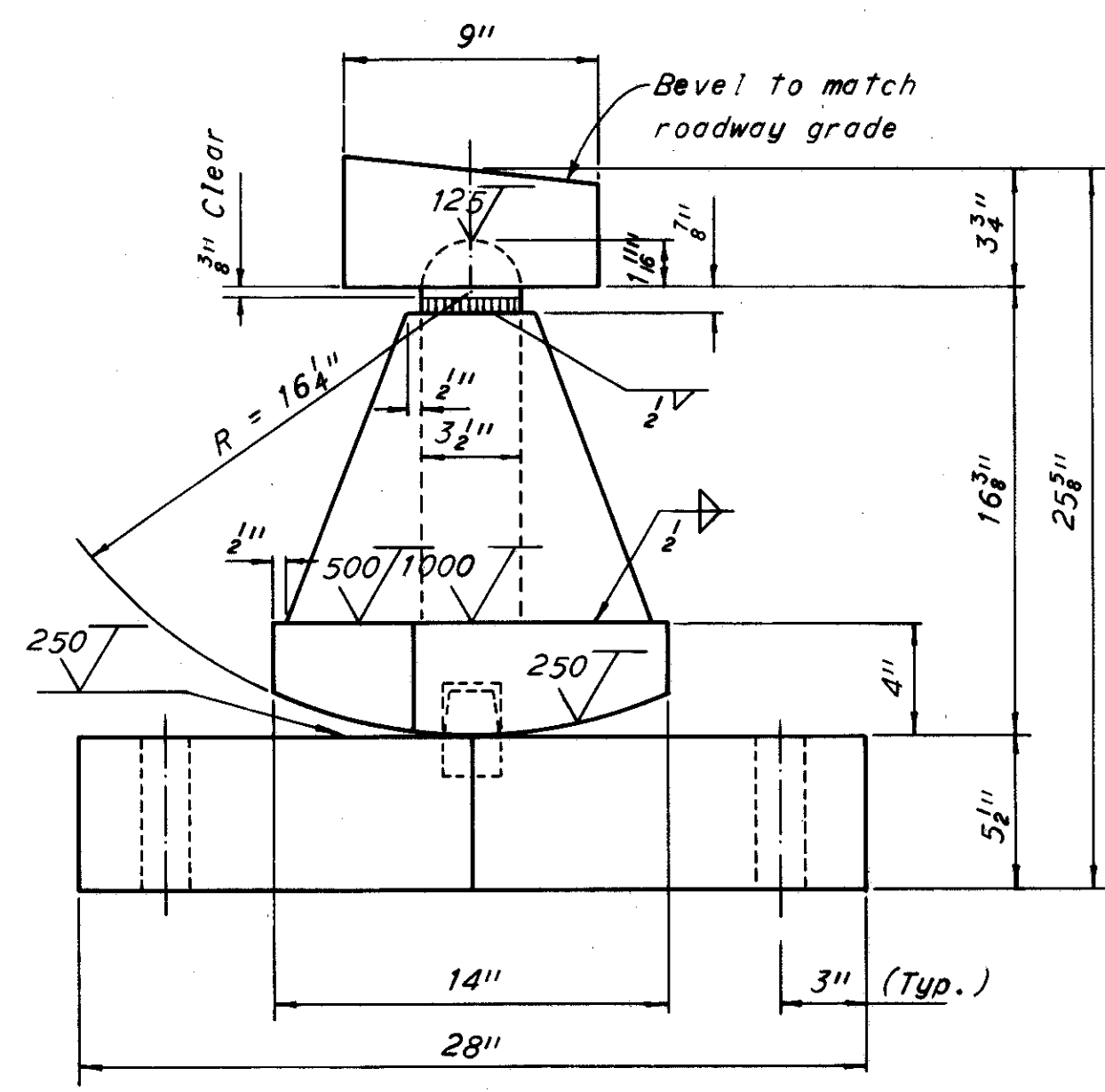


ELEVATION



SECTION B-B

ROCKER AT NORTH ABUTMENT - R-550



END ELEVATION

H.N.T.B. BRIDGE NO. 20

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**ROCKER AND BOLSTER DETAILS  
FOR GIRDER D**

I-71 UNDER SOUTHBOUND OUTER ROADWAY

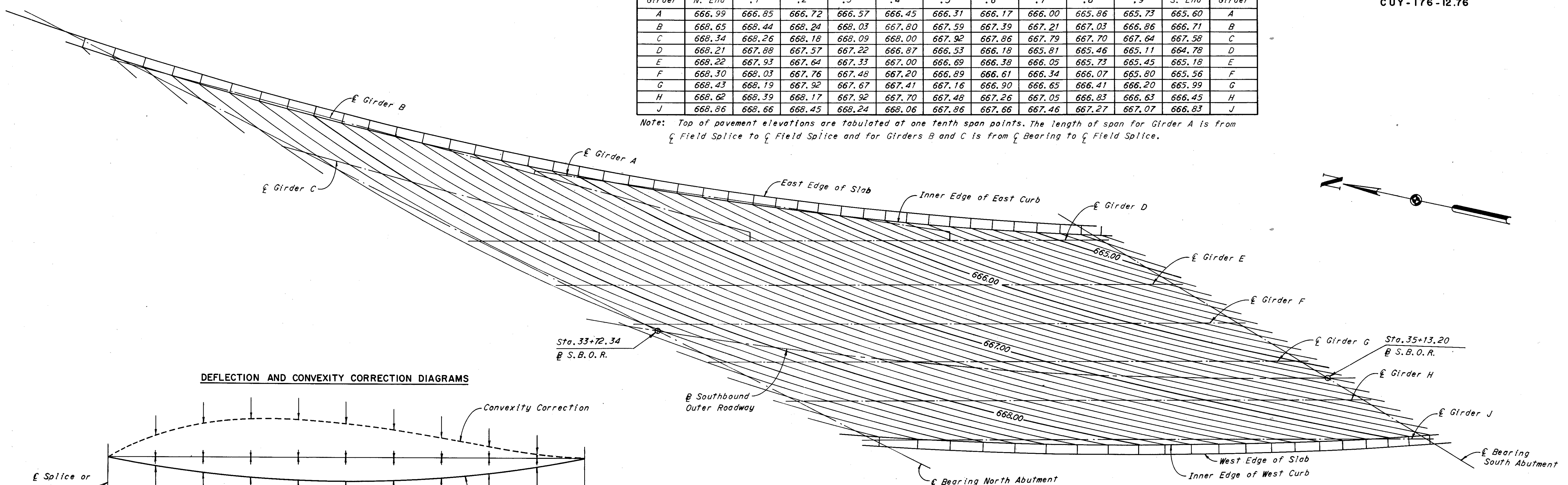
BR. NO. CUY-71-1794L STA. 33 + 62.88  
STA. 35 + 18.37

CLEVELAND	TRACED	CUYAHOGA COUNTY	REVIEWED	OHIO
DATE 12/17/64	DATE 12-17-64	DATE 12-28-64	DATE 12-28-64	SHEET 352

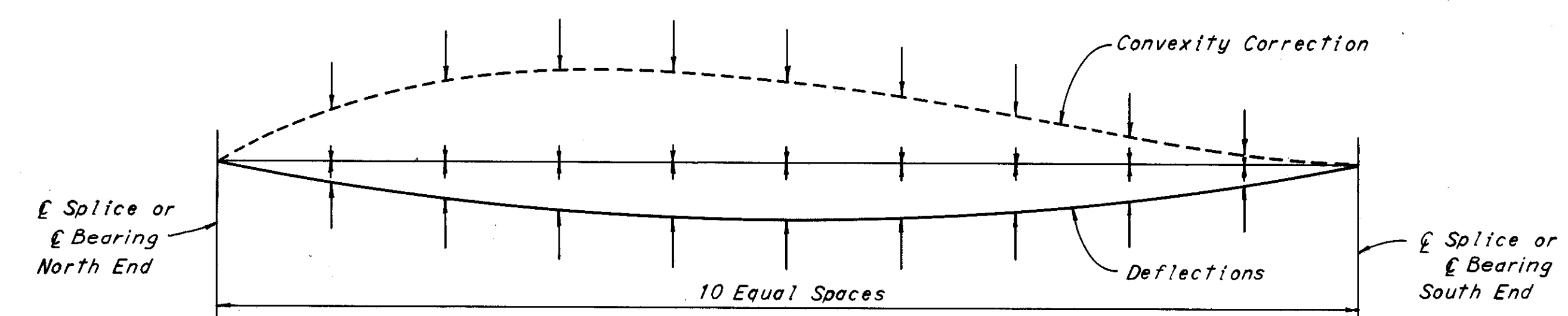
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

Girder	N. End	.1	.2	.3	.4	.5	.6	.7	.8	.9	S. End	Girder
A	666.99	666.85	666.72	666.57	666.45	666.31	666.17	666.00	665.86	665.73	665.60	A
B	668.65	668.44	668.24	668.03	667.80	667.59	667.39	667.21	667.03	666.86	666.71	B
C	668.34	668.26	668.18	668.09	668.00	667.92	667.86	667.79	667.70	667.64	667.58	C
D	668.21	667.88	667.57	667.22	666.87	666.53	666.18	665.81	665.46	665.11	664.78	D
E	668.22	667.93	667.64	667.33	667.00	666.69	666.38	666.05	665.73	665.45	665.18	E
F	668.30	668.03	667.76	667.48	667.20	666.89	666.61	666.34	666.07	665.80	665.56	F
G	668.43	668.19	667.92	667.67	667.41	667.16	666.90	666.65	666.41	666.20	665.99	G
H	668.62	668.39	668.17	667.92	667.70	667.48	667.26	667.05	666.83	666.63	666.45	H
J	668.86	668.66	668.45	668.24	668.06	667.86	667.66	667.46	667.27	667.07	666.83	J

Note: Top of pavement elevations are tabulated at one tenth span points. The length of span for Girder A is from  $\zeta$  Field Splice to  $\zeta$  Field Splice and for Girders B and C is from  $\zeta$  Bearing to  $\zeta$  Field Splice.



DEFLECTION AND CONVEXITY CORRECTION DIAGRAMS



CONTOUR PLAN  
(Parapets not shown)

Scale 0 5 10 15 20 25

Girder	N. End	.1	.2	.3	.4	.5	.6	.7	.8	.9	S. End	Girder
A	0	0	+1/8	0	+1/8	+1/8	+1/8	-1/8	-1/8	-1/8	0	A
B	0	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	0	B
C	0	0	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	0	C
D	0	+1/8	+1/8	+1/8	+1/8	+1/8	0	-1/8	-1/8	-1/8	0	D
E	0	+1/8	+1/8	+1/8	0	-1/8	-1/8	-1/8	-1/8	-1/8	0	E
F	0	0	+1/8	0	0	-1/8	-1/8	-1/8	-1/8	-1/8	0	F
G	0	0	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	0	G
H	0	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	-1/8	0	H
J	0	0	0	-1/8	+1/8	+1/8	+1/8	+1/8	+1/8	+1/8	0	J

Girder	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Tot.	Con.	Girder	
A	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	A
B	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	B
C	0	0	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	C
D	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	D
E	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	E
F	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	F
G	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	G
H	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	H
J	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	0	J

Note: Tot. indicates deflection due to dead load of Steel and Concrete. Con. indicates deflections due to dead load of Concrete only. Deflections are measured to nearest 1/16 inch.

Note: For slab reinforcement see sheet 352.

H.N.T.B. BRIDGE NO. 20

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

DECK CONTOUR PLAN

I-71 UNDER SOUTHBOUND OUTER ROADWAY

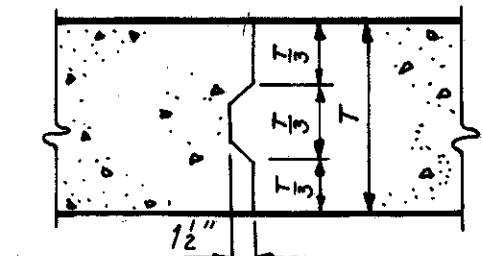
BR. NO. CUY-71-1794L STA. 33 + 62.88  
STA. 35 + 18.37

CLEVELAND CUYAHOGA COUNTY OHIO

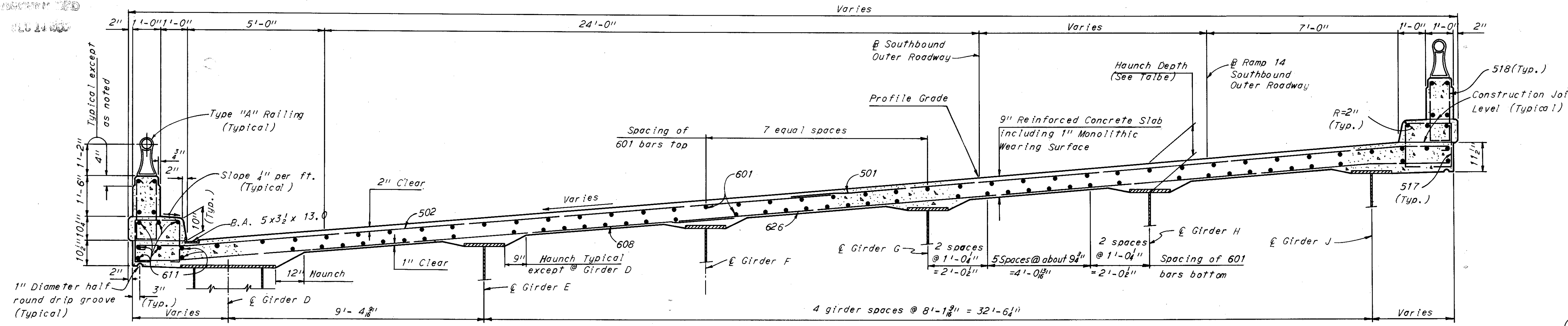
DRAWN J.R.H. TRACED 12/17/64 DATE 64  
CHECKED R.S.D. REVIEWED W.F. DATE 12/28/64

SHEET 353

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



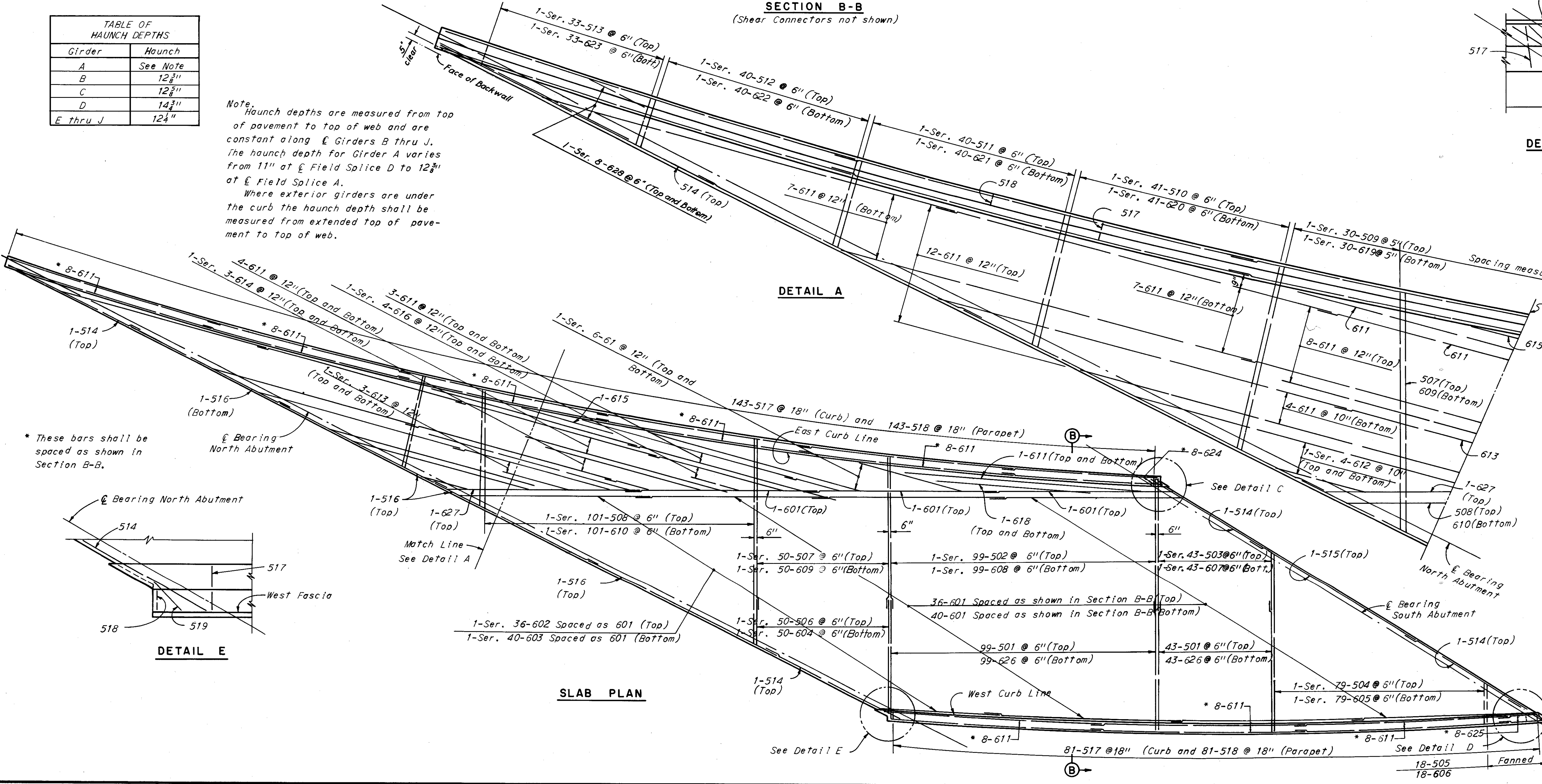
OPTIONAL TRANSVERSE SLAB CONSTRUCTION JOINT



SECTION B-B  
 (Shear Connectors not shown)

Girder	Haunch
A	See Note
B	12 3/8"
C	12 3/8"
D	14 3/8"
E thru J	12 1/4"

Note: Haunch depths are measured from top of pavement to top of web and are constant along Girders B thru J. The haunch depth for Girder A varies from 11" at E Field Splice D to 12 3/8" at E Field Splice A. Where exterior girders are under the curb the haunch depth shall be measured from extended top of pavement to top of web.



DETAIL A

DETAIL C

DETAIL D

DETAIL E

SLAB PLAN

Notes:  
 For Reinforcement Schedule and Bending Diagrams see Sheet 357.  
 For railing post spacing, parapet joint spacing and longitudinal reinforcement in the parapet see Sheet 355.  
 Longitudinal reinforcing bars shall be field bent as required. The field bending shall be included with "Item S-4, Reinforcing Steel" for payment.  
 For details of gutter support see Ohio Standard Drawing SD-1-63, Sheet 3 of 4.  
 Include B.A. gutter and supports with "Item S-7" for payment.

H.N.T.B. BRIDGE NO. 20  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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 KANSAS CITY CLEVELAND NEW YORK

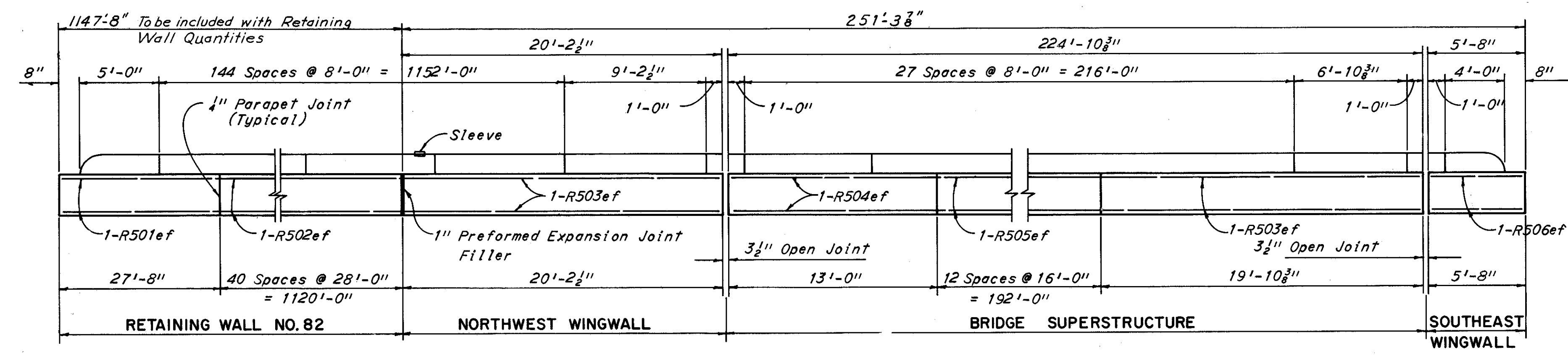
**DECK REINFORCEMENT**

I-71 UNDER SOUTHBOUND OUTER ROADWAY  
 BR. NO. CUY-71-1794L STA. 33 + 62.88  
 STA. 35 + 18.37

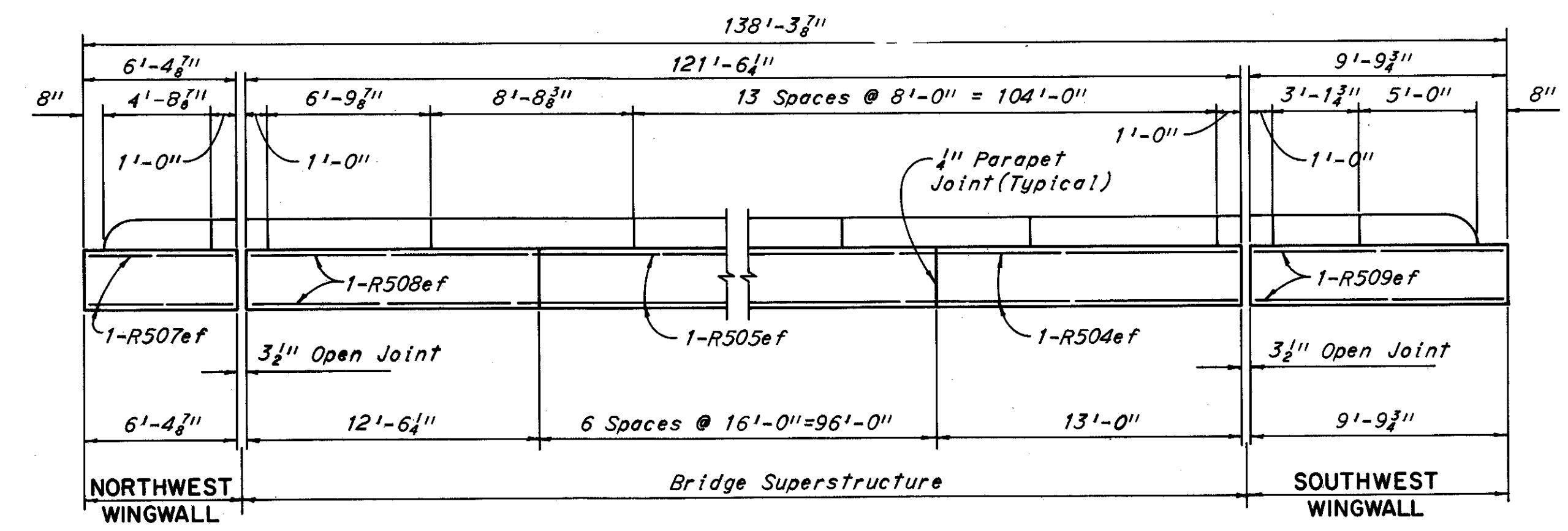
CLEVELAND	CUYAHOGA COUNTY	OHIO
DATE 12/17/64	DATE 12/22/64	DATE
18-505	18-606	18-606

DATE 6/4

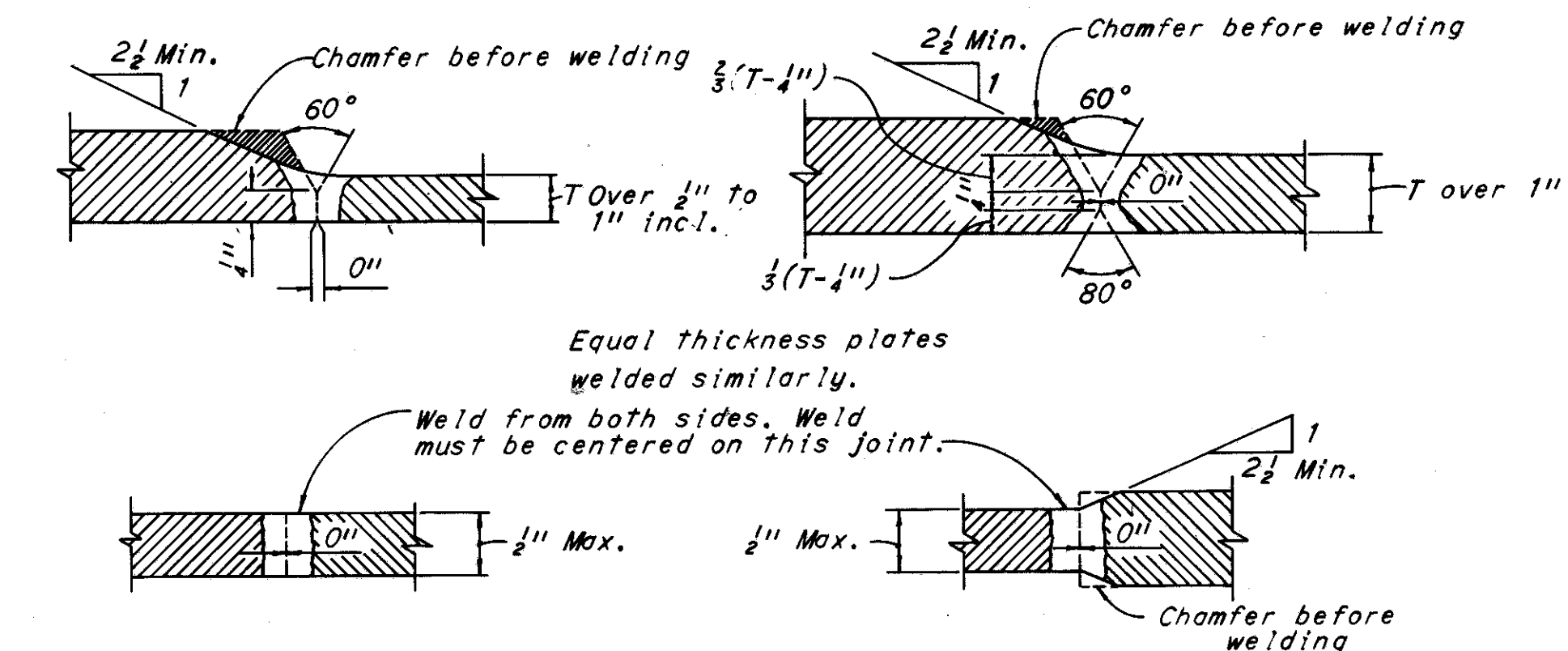
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



EAST RAILING



WEST RAILING



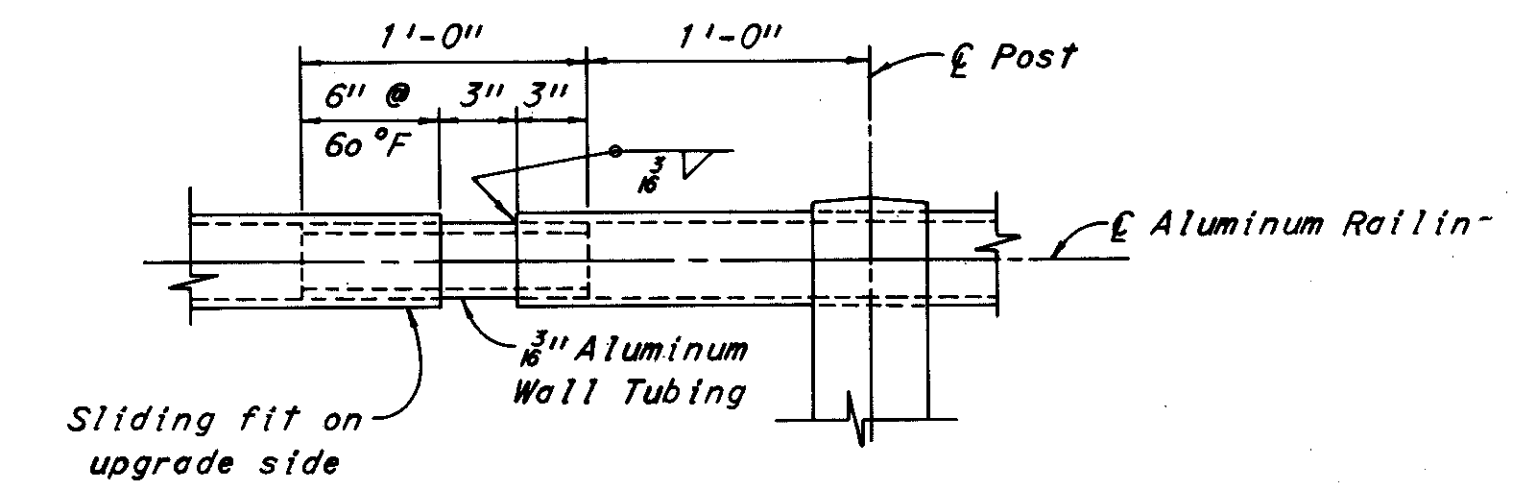
All the above full penetration welds shall be back-gouged and welded after welding far side.  
Butt welds on girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.

GIRDER SHOP WELDING DETAILS

Railing shall be fabricated in lengths not less than three panels each unless otherwise shown, and finished railing shall be free of burrs, sharp corners and rough surfaces.  
Railing posts shall be normal to grade.  
Payment for railing shall be made at the contract unit price bid for "Item S-14." Pay length shall be the overall length of the parapets and shall include cost of anchor bolts, set screws, nuts, shims, etc., necessary to complete the installation of railing. Concrete, expansion joint material, and longitudinal reinforcing steel in the parapets shall be included in "Item S-14" for payment. All other reinforcing steel in the parapet shall be included in "Item S-4" for payment.  
For additional details and notes regarding railing see Ohio Standard Drawing AR-1-57.

Mark	No.	Length	Type
*R501	4	27'-3"	Str.
*R502	160	27'-6"	Str.
R503	8	19'-6"	Str.
R504	8	12'-6"	Str.
R505	72	15'-6"	Str.
R506	4	5'-3"	Str.
R507	4	6'-0"	Str.
R508	4	12'-0"	Str.
R509	4	9'-3"	Str.

\* R501 and R502 Bars to be included with Retaining Wall No. 82 Quantities.



SLEEVE DETAIL

H.N.T.B. BRIDGE NO. 20

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY, CLEVELAND, NEW YORK

MISCELLANEOUS DETAILS

I-71 UNDER SOUTHBOUND OUTER ROADWAY

BR. NO. CUY-71-1794L STA. 33 + 62.88  
STA. 35 + 18.37

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JKH	TRACED	CHECKED RSC	REVIEWED WJ	REVISED
DATE 12/17/64	DATE	DATE 12-17-64	DATE 12-28-64	SHEET 355

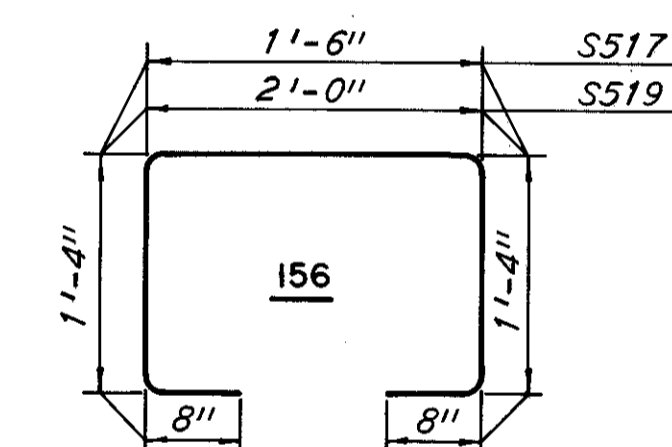
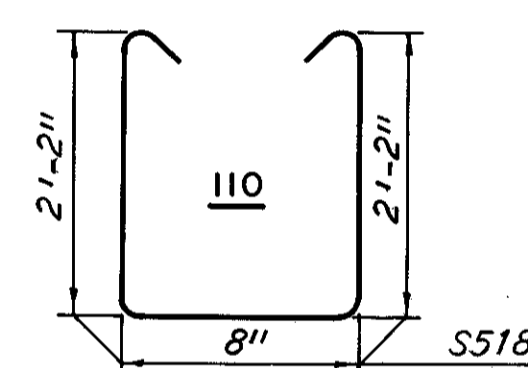
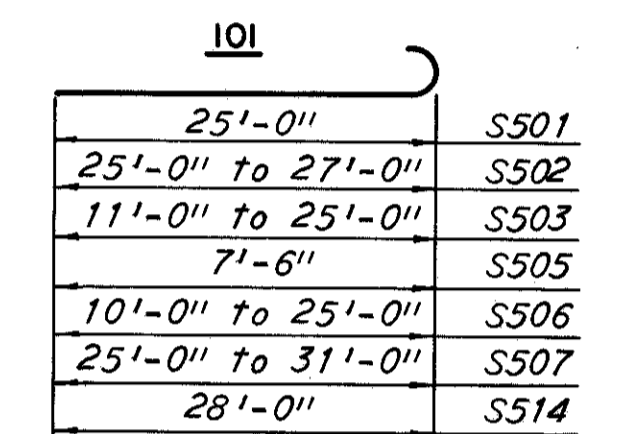
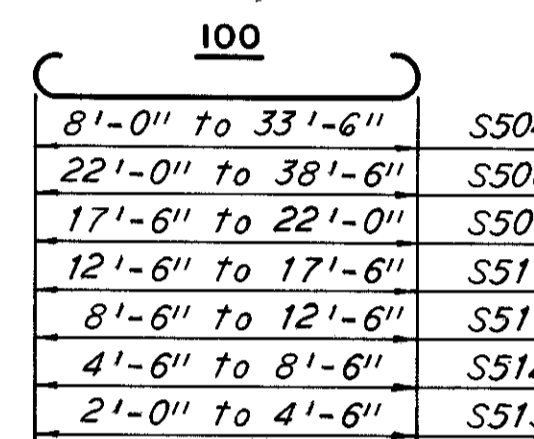
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)								
<b>NORTH ABUTMENT</b>												<b>SOUTH ABUTMENT</b>																			
AN501	2 ser 10	18'-10"	Str.	155	5 3/4"	459	AN641	4	29'-6"	Str.		177	AN1109	26	14'-3"	Str.		1,968	AS638	6	7'-9"	159		70							
AN502	3 ser 11	21'-2"	Str.	155	3 3/8"	780	AN642	26	23'-3"	Str.		908	AN1110	26	17'-6"	Str.		2,417	AS639	12	20'-11"	126		377							
AN503	2 ser 11	20'-10"	Str.	155	4"	516	AN643	22	9'-9"	Str.		322	AN1111	150	8'-1"	101		6,442	AS640	8	7'-9"	Str.		93							
AN504	3 ser 10	21'-0"	Str.	155	4 1/4"	707	AN644	11	19'-9"	Str.		326	AN1112	6	9'-0"	Str.		287	AS641	3	22'-0"	Str.		99							
AN505	1 ser 8	20'-8"	Str.	155	6"	187						AN1113	4	12'-0"	Str.		255	AS642	8	25'-0"	Str.		300								
AN506	1 ser 8	21'-6"	Str.	155	5 1/8"	192						AN1114	4	19'-6"	Str.		414	AS643	2	24'-0"	Str.		72								
AN507	1	20'-0"	Str.			21	AN701	51	31'-9"	Str.		3,310	AN1115	3	30'-3"	Str.		482	AS644	4	9'-9"	Str.		59							
AN508	16	31'-0"	Str.			517	AN702	61	34'-9"	Str.		4,333						Total = 132,901	AS646	2 ser 6	4'-6"	18"		149							
AN509	22	34'-6"	Str.			792	AN703	4	9'-4"	Str.		80						AS647	26	4'-5"	126		239								
AN510	11	40'-6"	Str.			465	AN704	60	39'-6"	Str.		4,844						AS648	30	4'-5"	108		135								
AN511	2	8'-0"	Str.			17	AN705	6	26'-3"	Str.		322						AS649	19	7'-2"	103		205								
AN512	11	27'-6"	Str.			316	AN706	55	34'-9"	Str.		3,907						AS650	3	13'-0"	Str.		59								
AN513	1	2'-3"	Str.			2	AN707	45	27'-3"	Str.		2,506						AS651	3	12'-0"	Str.		54								
AN514	6	20'-3"	Str.			127	AN708	22	6'-0"	108		270						AS652	2 ser 5	3'-6"	108		92								
AN515	20	6'-1"	110			127	AN709	23	7'-6"	Str.		353	ASS01	2 ser 4	17'-8"	155	6 1/8"	154	AS653	10	3'-0"	108		45							
AN516	4	7'-1"	109			30	AN710	27	6'-8"	105		368	ASS02	2 ser 5	17'-2"	155	6 1/2"	190	AS654	2	15'-0"	108		45							
AN517	16	7'-3"	109			121	AN711	5	9'-1"	104		93	ASS03	3 ser 7	17'-0"	155	4 1/8"	398	AS655	2	11'-9"	Str.		35							
AN518	7	7'-5"	109			54	AN712	5	6'-0"	Str.		61	ASS04	42	5'-6"	105		241	AS656	1	11'-3"	108		17							
AN519	6	12'-7"	110			79	AN713	3	30'-0"	Str.		184	ASS05	8	40'-0"	Str.		334						AS657	20	23'-0"	Str.		480		
AN520	2	13'-6"	155			28	AN714	18	29'-5"	108		1,082	ASS06	2	38'-0"	Str.		79						AS658	1	11'-9"	108		17		
AN521	1	9'-9"	Str.			10	AN715	21	29'-10"	108		1,281	ASS07	20	23'-0"	Str.		480						AS659	1	11'-0"	Str.		11		
AN522	1	7'-6"	108			8	AN716	25	10'-9"	Str.		549	ASS08	1	11'-0"	Str.		11						AS660	1	26'-9"	Str.		28		
AN523	2 ser 7	17'-6"	20'-0"	155	5"	274	AN717	22	11'-3"	Str.		506	ASS09	1	26'-9"	Str.		28						AS661	1	32'-6"	Str.		34		
AN524	2 ser 11	7'-2"	16'-10"	155	11 1/2"	275	AN718	26	7'-0"	103		372	ASS10	1	13'-6"	Str.		14						AS662	2	17'-2"	105		70		
AN525	70	4'-3"	105			310	AN719	26	5'-7"	126		297	ASS11	5	8'-9"	Str.		46						AS663	156	25'-0"	Str.		7,972		
AN526	1 ser 8	14'-10"	18'-2"	155	7 1/2"	142	AN720	136	13'-3"	158		3,683	ASS12	5	6'-11"	110		36						AS664	2	13'-9"	Str.		56		
AN527	3 ser 3	12'-10"	14'-10"	155	12"	130	AN721	122	10'-3"	149		2,556	ASS13	4	8'-3"	109		34						AS665	2	15'-0"	Str.		61		
AN528	3 ser 9	16'-4"	20'-4"	155	6"	516	AN722	122	7'-5"	103		1,849	ASS14	1	8'-5"	109		9						AS666	4	20'-3"	Str.		166		
AN529	3 ser 5	13'-2"	16'-0"	155	8 1/2"	228	AN723	9	10'-8"	108		196	ASS15	1	8'-9"	109		9						AS667	4	23'-3"	Str.		190		
AN530	2 ser 9	16'-8"	20'-4"	155	5 1/2"	347	AN724	5	19'-9"	Str.		202	ASS16	7	5'-3"	110		38						AS668	8	6'-5"	109		54		
AN531	2 ser 5	11'-2"	15'-8"	155	13 1/2"	140						ASS17	8	6'-5"	109		54						AS669	1 ser 8	13'-2"	17'-2"	155	6 7/8"	127		
AN532	3 ser 9	16'-2"	20'-6"	155	6 1/2"	516						ASS18	1 ser 8	13'-2"	17'-2"	155	6 7/8"	129						AS670	1 ser 8	13'-6"	17'-4"	155	6 7/8"	129	
AN533	3 ser 5	13'-4"	16'-0"	155	8"	229	AN801	5	8'-5"	108		112	ASS19	1 ser 8	13'-6"	17'-4"	155	6 7/8"	129						AS671	75	33'-5"	Str.		6,708	
AN534	3 ser 7	15'-8"	18'-10"	155	8 1/8"	389	AN802	23	11'-11"	108		732	ASS20	1 ser 8	13'-6"	17'-4"	155	6 7/8"	129						AS672	2 ser 8	13'-2"	16'-8"	155	6"	249
												ASS21	1 ser 8	13'-6"	17'-4"	155	6 7/8"	129						AS673	1 ser 9	13'-8"	16'-8"	155	4 1/2"	142	
												ASS22	1 ser 8	13'-8"	17'-8"	155	6 7/8"	131						AS674	5	13'-9"	Str.		296		
												ASS23	2 ser 8	13'-2"	16'-8"	155	6"	249						AS675	5	15'-3"	Str.		328		
												ASS24	1 ser 9	13'-8"	16'-8"	155	4 1/2"	142						AS676	5	14'-3"	Str.		307		
AN601	150	5'-9"	Str.			1295	AN901	102	9'-7"	101		3,323	AS677	5	14'-9"	Str.		317						AS678	5	15'-3"	Str.		329		
AN602	4 ser 5	4'-8"	22'-0"	Str.		402	AN902	151	18'-8"	100		9,583	AS679	5	15'-9"	Str.		339						AS680	9'-10"				350		
AN603	1 ser 5	4'-8"	21'-8"	Str.		100	AN903	16	10'-1"	101		549	AS681	5	16'-3"	Str.		360						AS682	8'-10"				360		
AN604	2 ser 5	4'-8"	21'-6"	Str.		197	AN904	26	19'-2"	100		1,694	AS683	5	16'-9"	Str.		372						AS684	5	16'-9"	Str.		360		
AN605	3 ser 5	4'-8"	20'-4"	Str.		282	AN905	123	15'-0"	Str.		6,691	AS685	5	15'-9"	Str.		329						AS686	5	15'-9"	Str.		339		
AN606	2 ser 5	4'-8"	21'-0"	Str.		186	AN906	18	16'-6"	Str.		1,010	AS687	5	16'-3"	Str.		350						AS688	5	16'-9"	Str.		360		
AN607	1 ser 5	4'-8"	21'-3"	Str.		94	AN907	1 ser 3	16'-8"	100	10 1/2"	180	AS689	5	16'-9"	Str.		360						AS690	5	16'-9"	Str.		360		
AN608	1 ser 5	4'-8"	20'-6"	Str.		112	AN908	1 ser 3	10'-0"	101	16 1/2"	115	AS691	5	16'-9"	Str.		360						AS692	5	16'-9"	Str.		360		
AN609	1 ser 5	4'-8"	20'-9"	Str.		113	AN909	1 ser 3	8'-9"	101	7 1/2"	91	AS693	5	16'-9"	Str.		360						AS694	5	16'-9"	Str.		360		
AN610	3	22'-0"	Str.			99	AN910	1 ser 3	6'-9"	101	6"	74	AS695	5	16'-9"	Str.		360						AS696	5	16'-9"	Str.		360		
AN611	28	21'-6"	Str.			904	AN911	10	11'-0"	Str.		374	AS697	5	16'-9"	Str.		360						AS698	5	16'-9"	Str.		360		
AN612	28	21'-3"	Str.			894	AN912	1	12'-6"	101		43	AS699	5	16'-9"	Str.		360						AS699	2 ser 3	5'-9"	16'-8"	105	5'-8"	99	
AN613	30	20'-0"	Str.			901	AN913	1	6'-3"	101		21	AS700	2	16'-8"	Str.		50						AS701	2	16'-8"	Str.		50		
AN614	23	21'-9"	Str.			751	AN914	1 ser 8	5'-0"	11'-9"	Str.	221	AS702	2	16'-8"	Str.		50						AS702	2	16'-8"	Str.		50		
AN615	41	20'-9"	Str.			1,278	AN915	86	39'-6"	Str.		11,550	AS703	2	16'-8"	Str.		50						AS703	2	16'-8"	Str.		50		
AN616	12	21'-0"	Str.			379	AN916	1 ser 15	27'-0"	20'-6"	Str.	2 1/2"	1,441	AS704	2	16'-8"	Str.		50						AS704	2	16'-8"	Str.		50	
AN617	18	20'-3"	Str.			547	AN917	1 ser 13	27'-0"	20'-6"	Str.	2 1/2"	1,249	AS705	2	16'-8"	Str.		50						AS705	2	16'-8"	Str.		50	
AN618	29	19'-0"	Str.			828	AN918	1 ser 14	27'-0"	20'-6"	Str.	3 1/2"	1,856	AS706	2	16'-8"	Str.		50						AS706	2	16'-8"	Str.		50	
AN619	24	19'-3"	Str.			694	AN919	1 ser 12	27'-0"	20'-6"	Str.	3 1/2"	1,591	AS707	2	16'-8"	Str.		50						AS707	2	16'-8"	Str.		50	
AN620	228	5'-8"	104			1,941	AN920	2	6'-6"	108		44	AS708	2	16'-8"	Str.		50						AS708	2	16'-8"	Str.		50		
AN621	91	10'-2"	108			1,390	AN921	2	24'-6"	Str.		167	AS709	2	16'-8"	Str.		50						AS709	2	16'-8"	Str.		50		
AN622	98	6'-1"	104			895	AN9																								

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
<b>SUPERSTRUCTURE</b>											
S501	142	25'-7"	101		3,789						
S502	1 Ser. 99	<del>25'-7"</del> 27'-7"	101	1"	2,745						
S503	1 Ser. 43	<del>11'-7"</del> 25'-7"	101	4"	833						
S504	1 Ser. 79	<del>9'-2"</del> 34'-5"	100	3 1/2"	1,796						
S505	18	8'-1"	101		152						
S506	1 Ser. 50	<del>10'-7"</del> 25'-7"	101	3 1/8"	943						
S507	1 Ser. 50	<del>25'-7"</del> 31'-7"	101	1 1/2"	1,491						
S508	1 Ser. 101	<del>23'-2"</del> 39'-8"	100	2"	3,327						
S509	1 Ser. 30	<del>18'-8"</del> 23'-2"	100	1 1/8"	654						
S510	1 Ser. 41	<del>13'-8"</del> 18'-8"	100	1 1/2"	691						
S511	1 Ser. 40	<del>9'-8"</del> 13'-8"	100	1 1/4"	487						
S512	1 Ser. 40	<del>5'-8"</del> 9'-8"	100	1 1/4"	320						
S513	1 Ser. 33	<del>3'-2"</del> 5'-8"	100	1 1/8"	152						
S514	4	28'-7"	101		119						
S515	1	36'-0"	Str.		38						
S516	4	34'-0"	Str.		142						
S517	233	5'-0"	156		1,215						
S518	233	5'-7"	110		1,357						
S519	3	5'-6"	156		17						
S601	231	36'-0"	Str.		12,491						
S602	1 Ser. 36	<del>23'-0"</del> 36'-0"	Str.	4 1/2"	1,595						
S603	1 Ser. 40	<del>23'-0"</del> 36'-0"	Str.	4"	1,772						
S604	1 Ser. 50	<del>14'-0"</del> 27'-0"	Str.	3 3/8"	1,540						
S605	1 Ser. 79	<del>8'-0"</del> 32'-3"	Str.	3 3/8"	2,447						
S606	18	7'-6"	Str.		203						
S607	1 Ser. 43	<del>7'-0"</del> 21'-0"	Str.	4"	904						
S608	1 Ser. 99	<del>21'-0"</del> 27'-0"	Str.	1"	3,271						
S609	1 Ser. 50	<del>24'-0"</del> 27'-0"	Str.	3"	1,915						
S610	1 Ser. 101	<del>22'-0"</del> 38'-6"	Str.	2"	4,589						
S611	119	40'-0"	Str.		7,150						
S612	2 Ser. 4	<del>8'-6"</del> 34'-0"	Str.	9'-2"	255						
S613	2 Ser. 3	<del>13'-0"</del> 30'-0"	Str.	8'-6"	194						
S614	2 Ser. 3	<del>8'-0"</del> 30'-0"	Str.	11'-0"	171						
S615	1	18'-0"	Str.		27						
S616	2 Ser. 4	<del>8'-0"</del> 26'-0"	Str.	6'-0"	204						
S617	2 Ser. 6	<del>20'-0"</del> 40'-0"	Str.	4'-0"	541						
S618	2	29'-0"	Str.		87						
S619	1 Ser. 30	<del>17'-6"</del> 22'-0"	Str.	1 1/2"	890						
S620	1 Ser. 41	<del>12'-6"</del> 17'-6"	Str.	1 1/2"	924						
S621	1 Ser. 40	<del>8'-6"</del> 12'-6"	Str.	1 1/4"	631						
S622	1 Ser. 40	<del>4'-6"</del> 8'-6"	Str.	1 1/4"	391						
S623	1 Ser. 33	<del>2'-0"</del> 4'-6"	Str.	1 1/8"	161						
S624	8	25'-0"	Str.		300						
S625	8	6'-0"	Str.		72						
S626	142	29'-6"	Str.		6,292						
S627	1	36'-0"	Str.		54						
S628	2 Ser. 8	<del>6'-0"</del> 20'-0"	Str.	2'-0"	312						
TOTAL WEIGHT					=	69,651					



H.N.T.B. BRIDGE NO. 20

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**REINFORCEMENT SCHEDULE  
 SUPERSTRUCTURE**

I-71 UNDER SOUTHBOUND OUTER ROADWAY

BR. NO. CUY-71-1794L STA. 33 + 62.88  
 STA. 35 + 18.37

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/DLR	TRACED	CHECKED	REVIEWED	REVISED
DATE 11-21-64	DATE	DATE 5-5-65	DATE 12-28-64	DATE

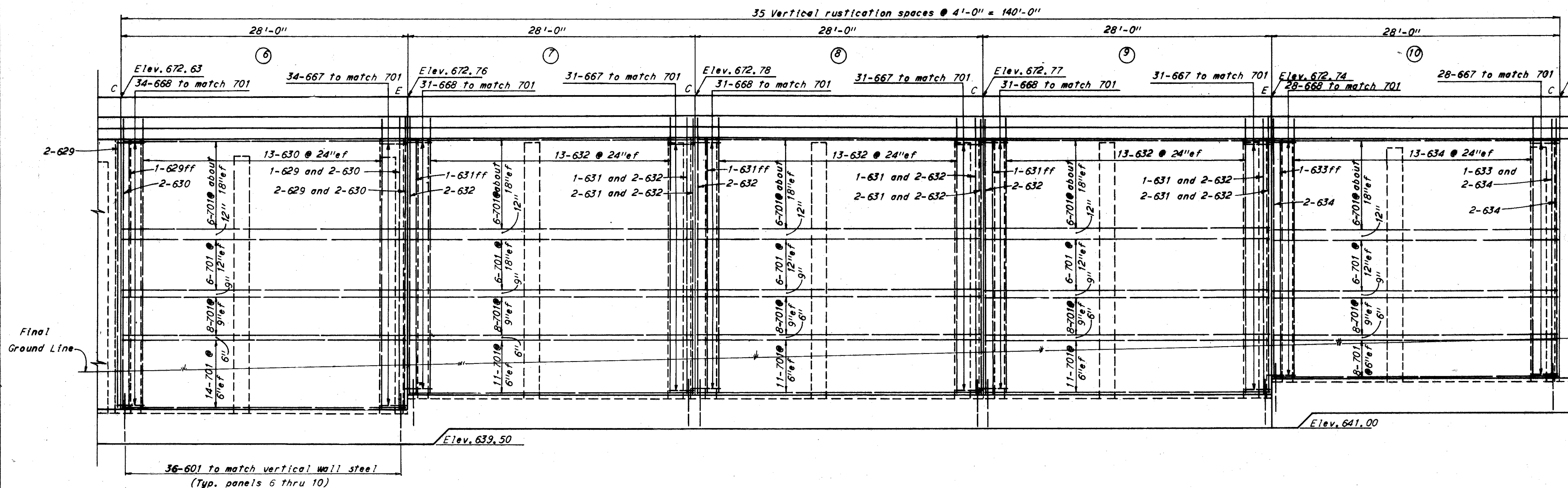
SHEET 357



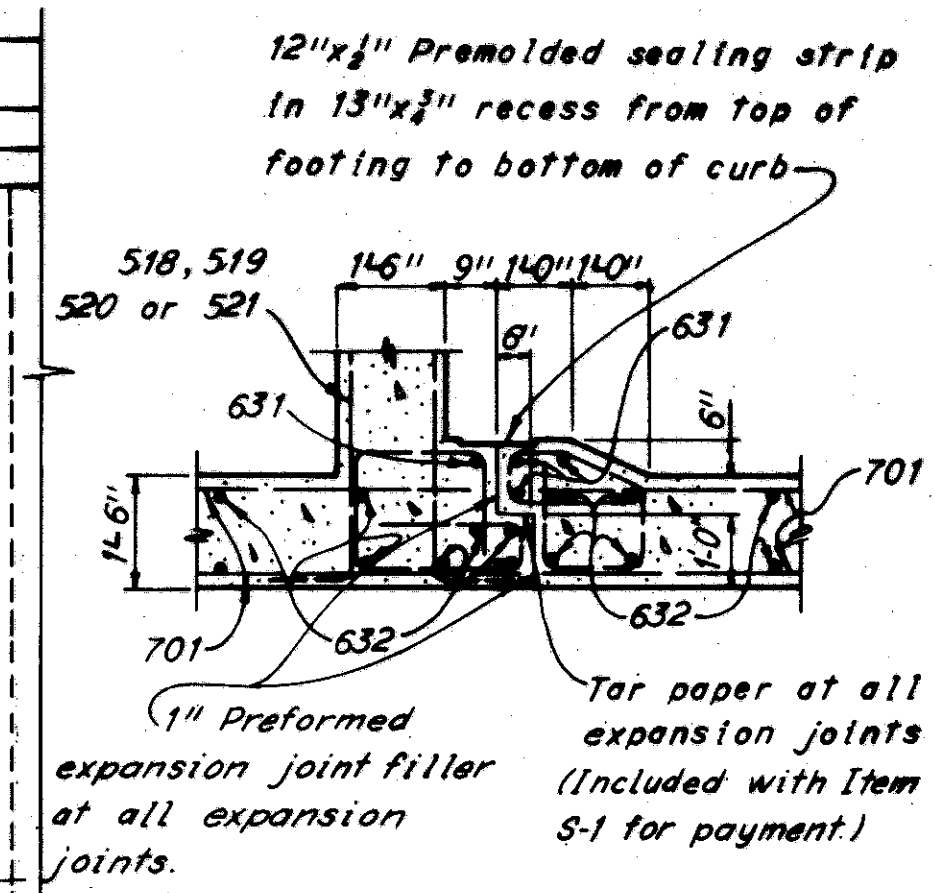




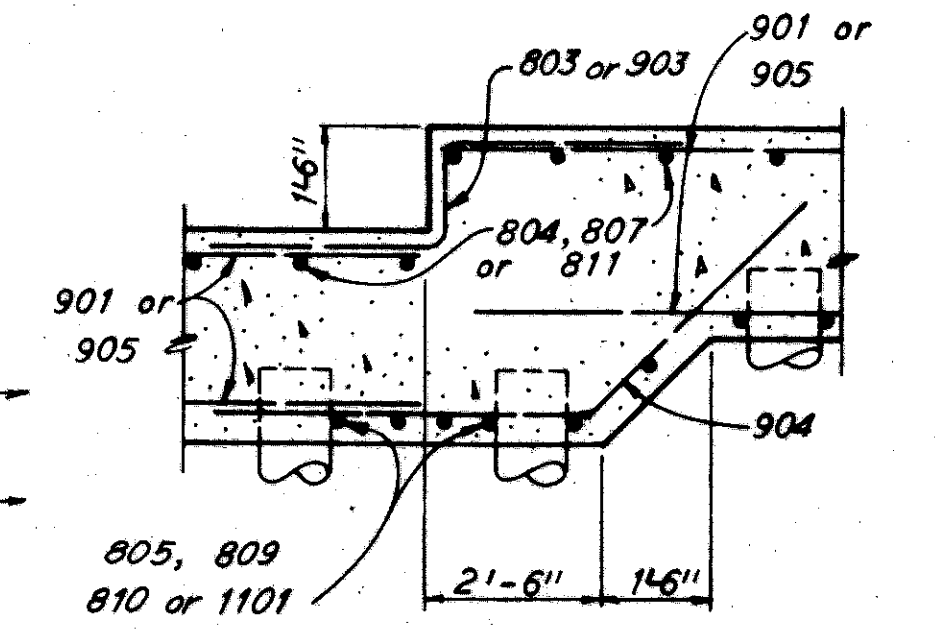
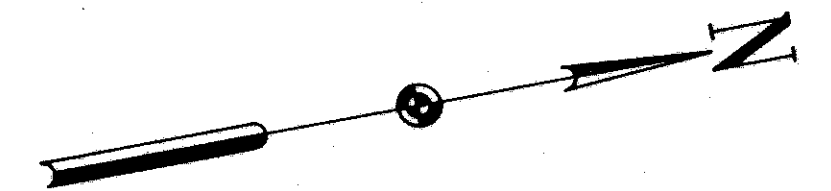
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



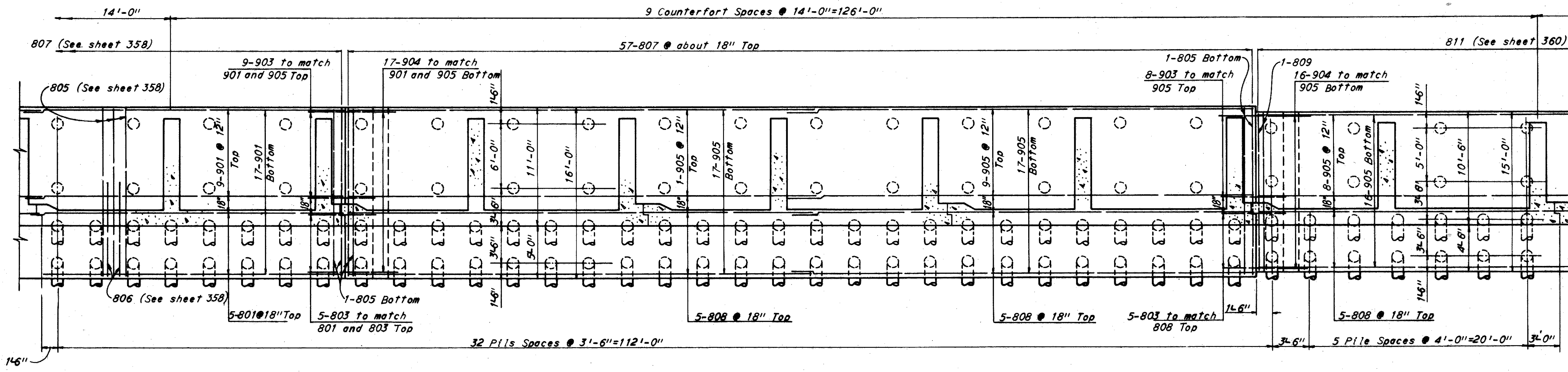
**ELEVATION**  
 (Piles and Type "A" Railing not shown)



**TYPICAL COUNTERFORTED JOINT DETAIL PANELS 1 THRU 15**  
 (Section shown is at panel 8 Elev. 642.50 and panel 9)



**TYPICAL FOOTING STEP DETAIL PANELS 2 TO 14**



**FOOTING PLAN**

Note:  
 For transverse steel in footing panel 10 see sheet 360

N.H.T.B. WALL NO. 82

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF SOUTHBOUND OUTER ROADWAY**

STA. 20+69.34  
 STA. 32+17.34

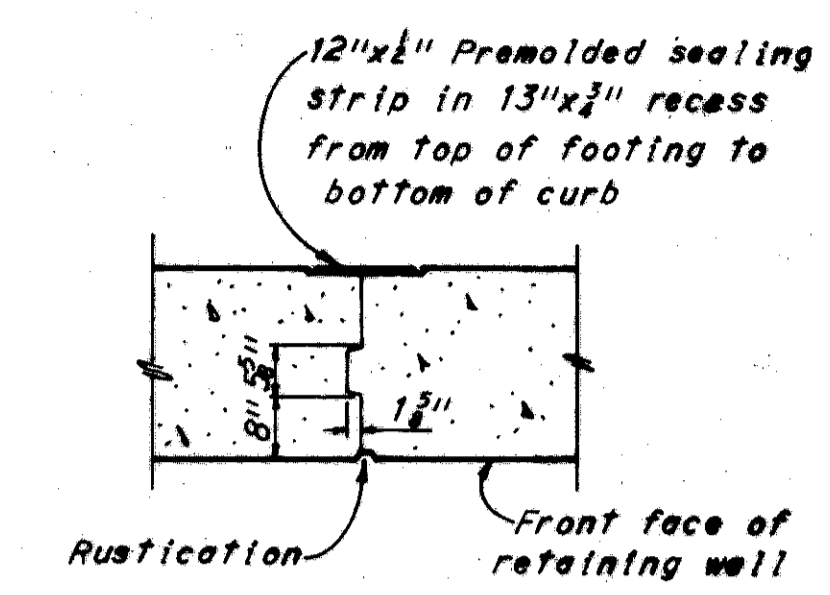
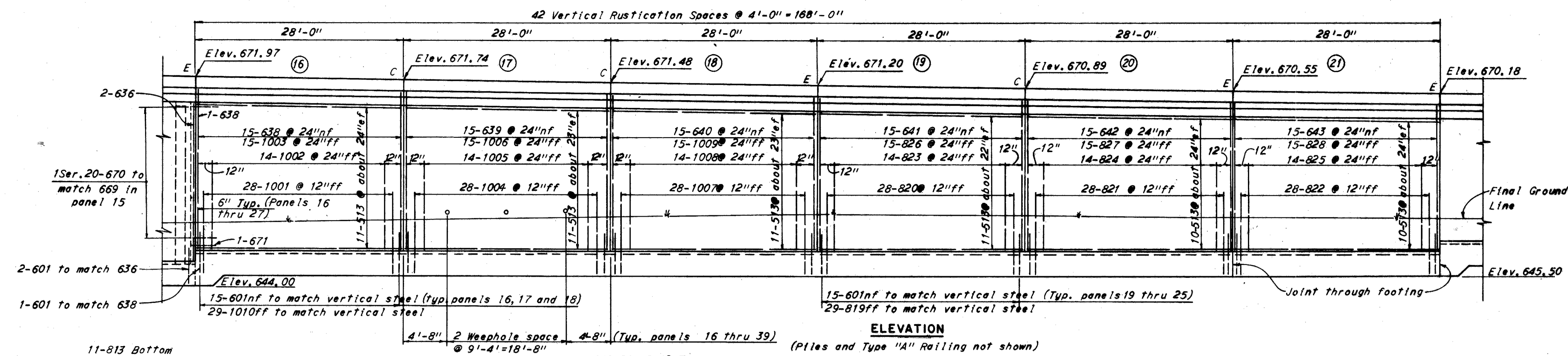
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN CHB	TRACED	CHECKED TJS	REVIEWED WJ	REVISED
DATE 1-18-65	DATE	DATE 1-27-65	DATE 1-28-65	

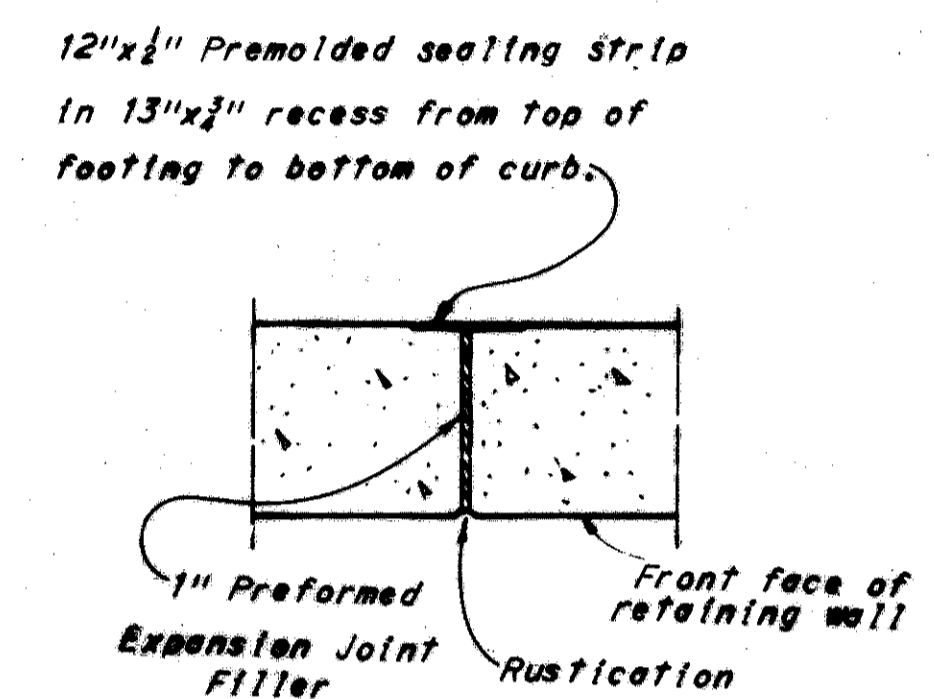
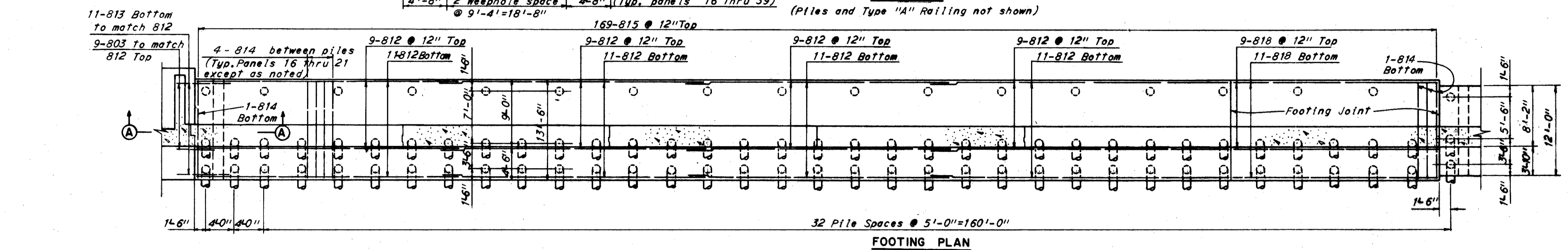
SHEET 359



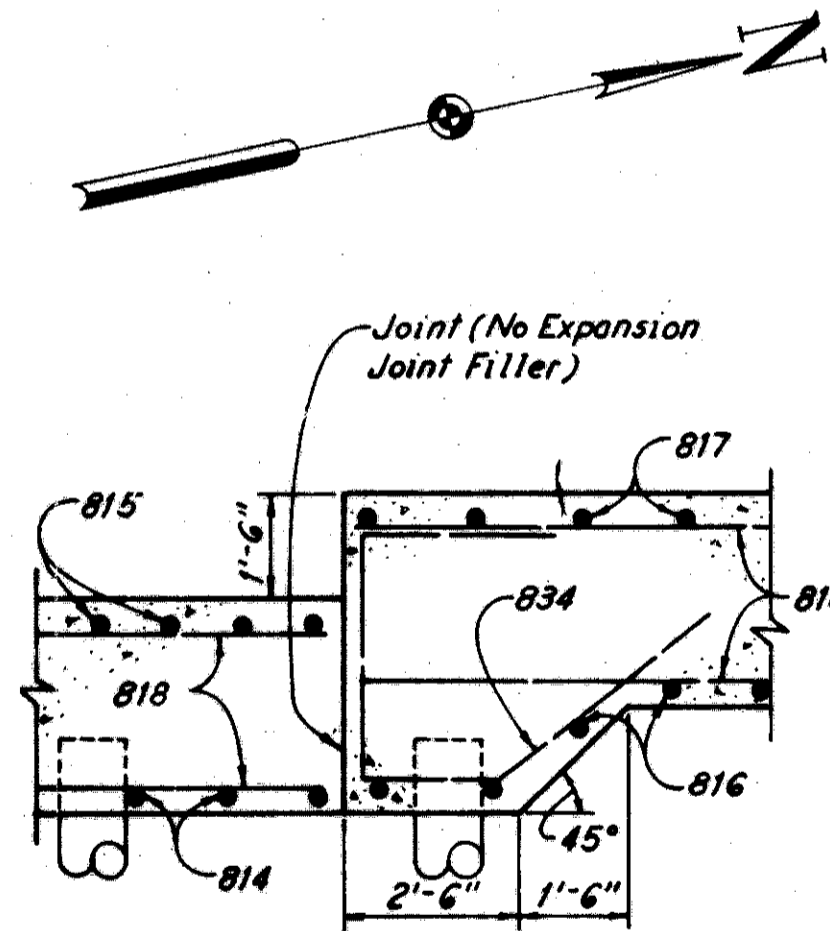
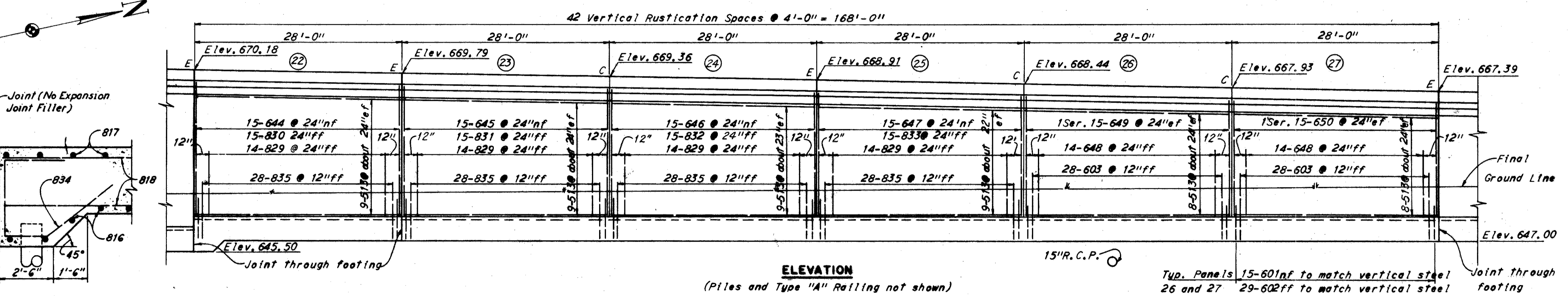
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12:76



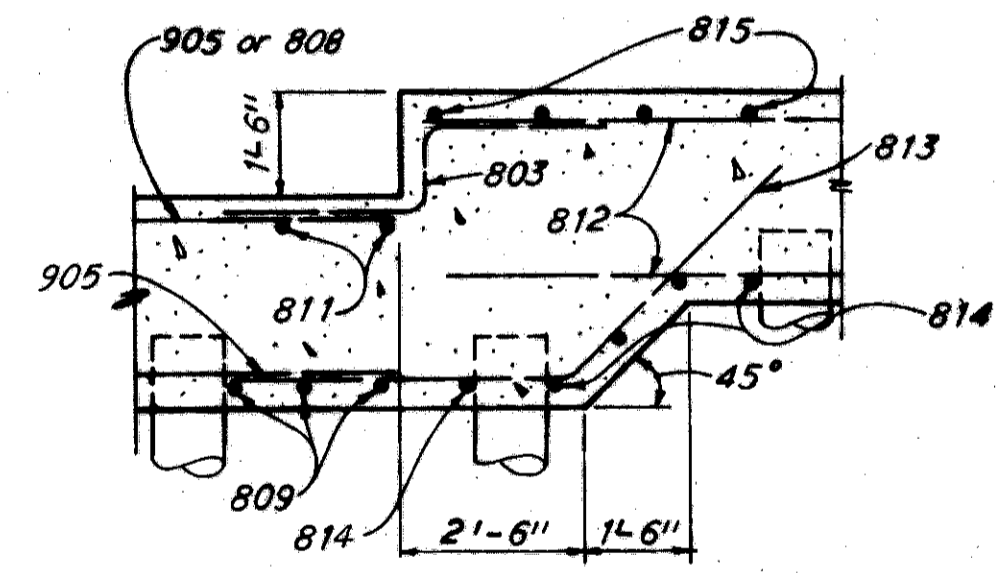
CONTRACTION JOINT DETAIL  
 FOR PANELS 16 THRU 41



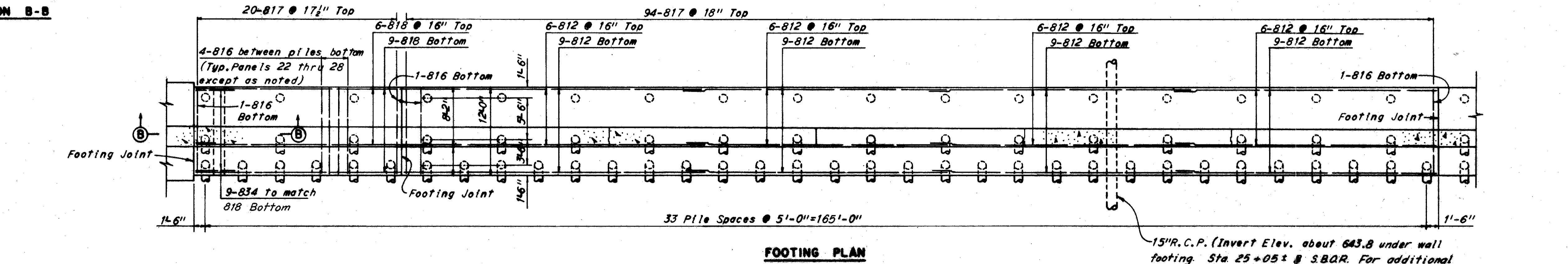
EXPANSION JOINT DETAIL  
 FOR PANELS 18 THRU 41



SECTION B-B



SECTION A-A



15"R.C.P. (Invert Elev. about 643.8 under wall footing. Sta. 25+05 ± @ S.B.R. For additional sewer details see Drainage Plans.) Care shall be taken when placing pipe so as to clear piles.

For notes see sheet 358.

H.M.T.B. WALL NO. 82

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF SOUTHBOUND OUTER ROADWAY**

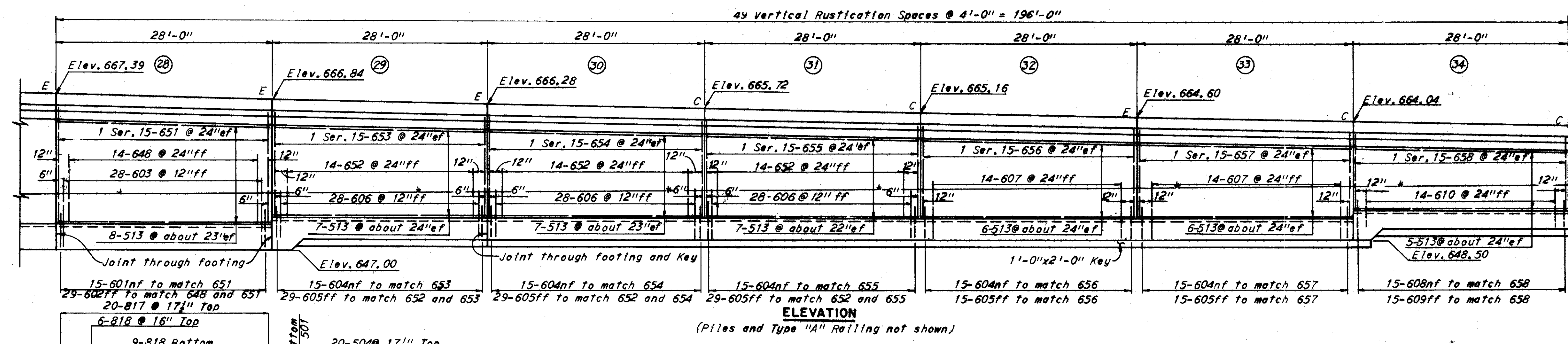
STA. 20+69.34  
 STA. 32+17.34

DRAWN	TRACED	CHECKED	REVIEWED
DATE 1-18-65	DATE	DATE 1-26-65	DATE 1-28-65

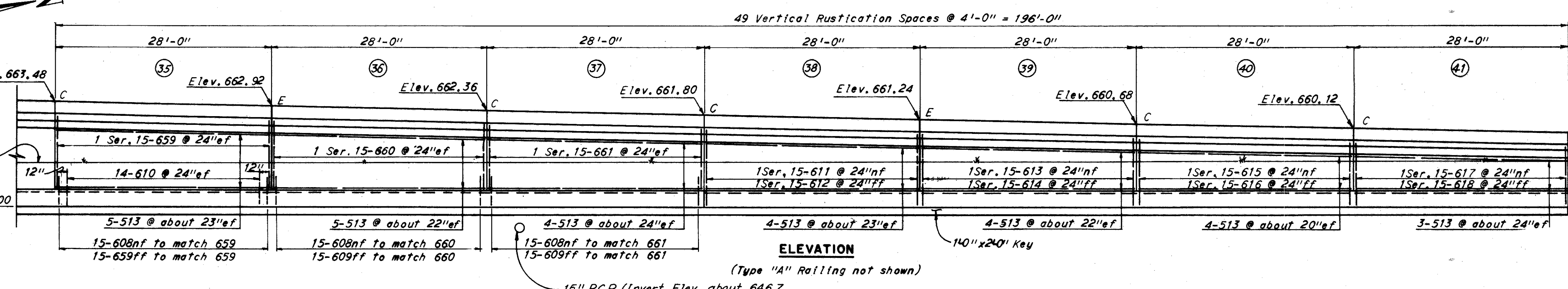
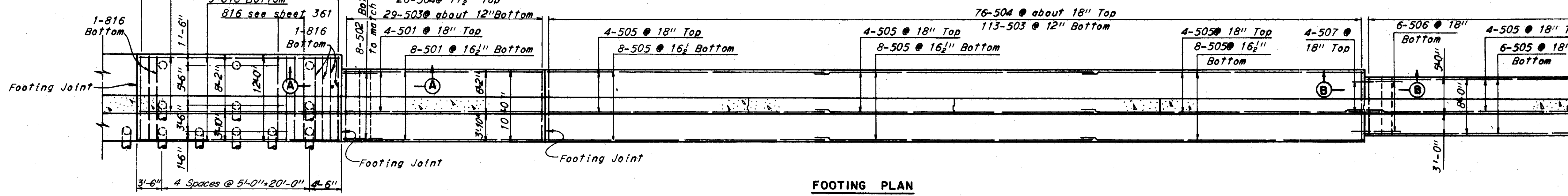
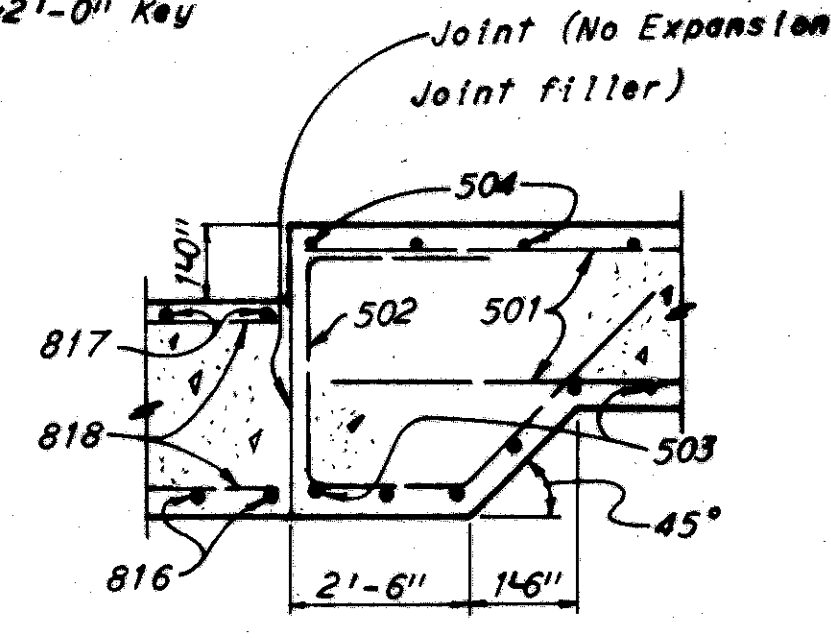
CLEVELAND CUYAHOGA COUNTY OHIO

SHEET 361

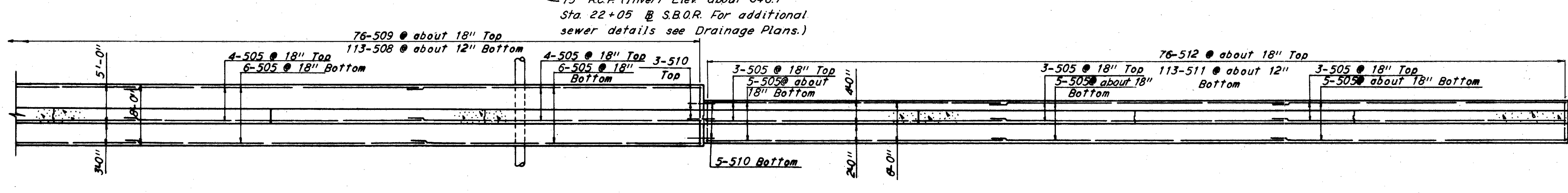
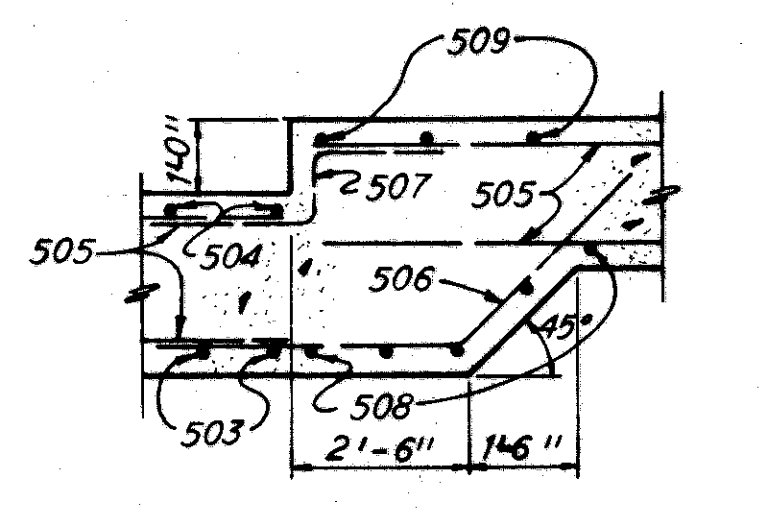
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



**ELEVATION**  
 (Piles and Type "A" Railing not shown)



**ELEVATION**  
 (Type "A" Railing not shown)



Note:  
 The 1'-0" x 2'-0" key for footings (Panels 29 thru 41) shall be placed in a carefully made trench against undisturbed earth.  
 For additional notes see sheet 358

H.N.T.B. WALL NO. 82  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF SOUTHBOUND OUTER ROADWAY**

STA. 20+69.34  
 STA. 32+17.34

CLEVELAND CUYAHOGA COUNTY OHIO

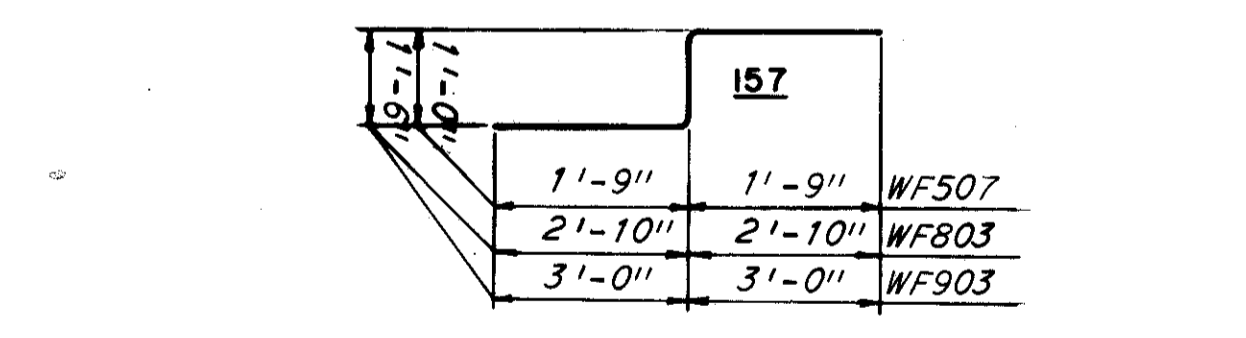
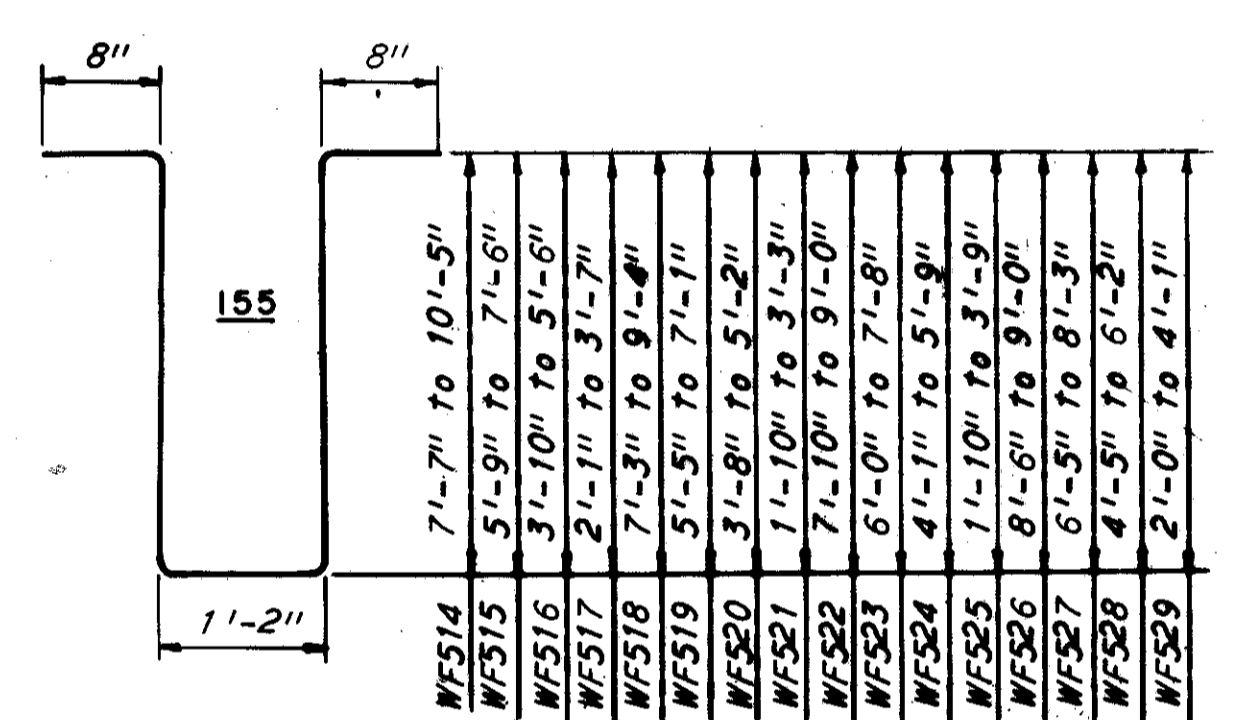
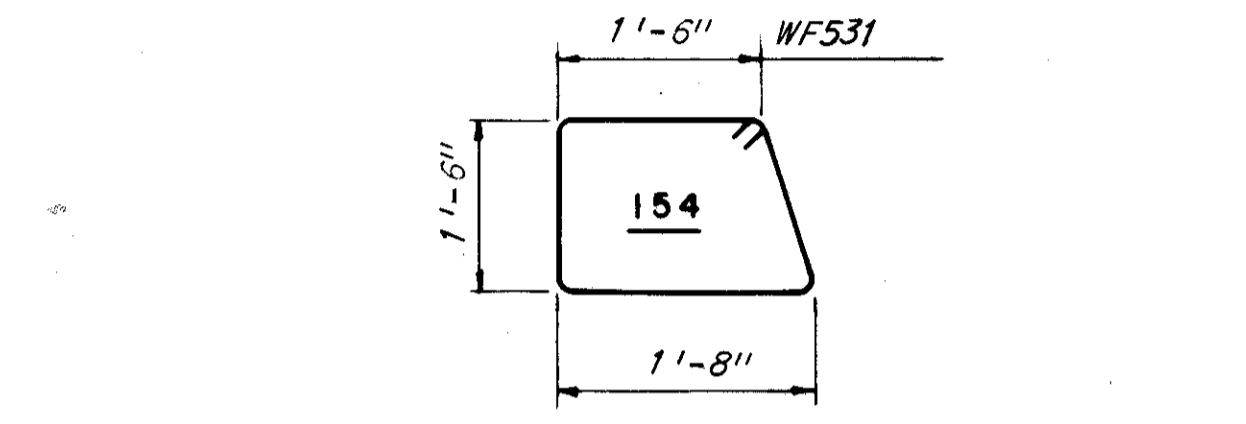
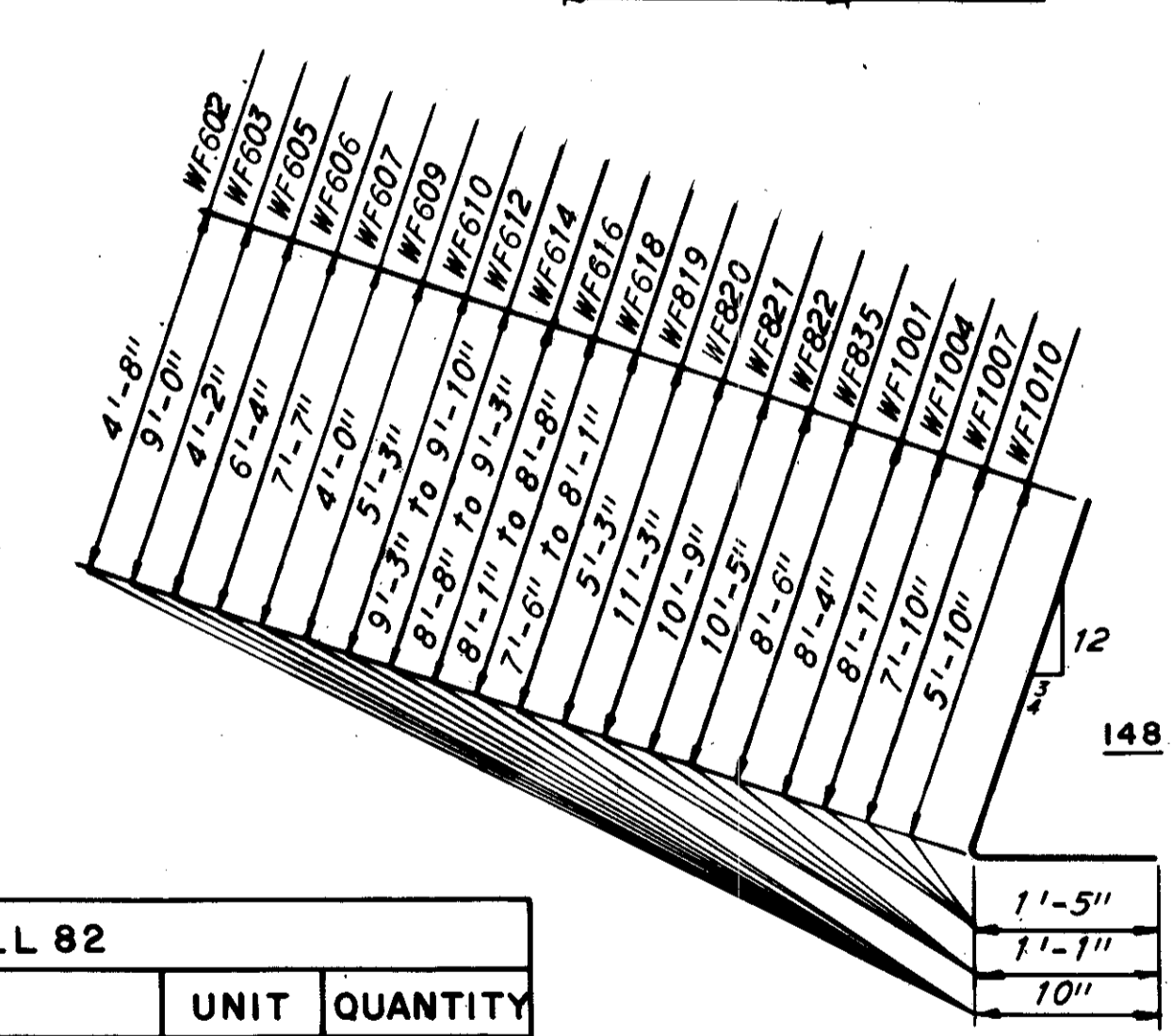
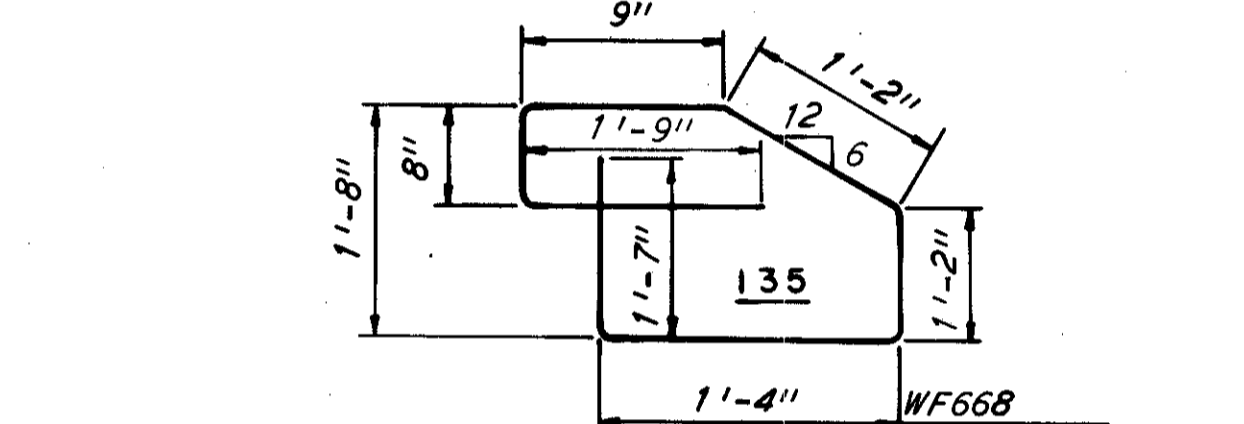
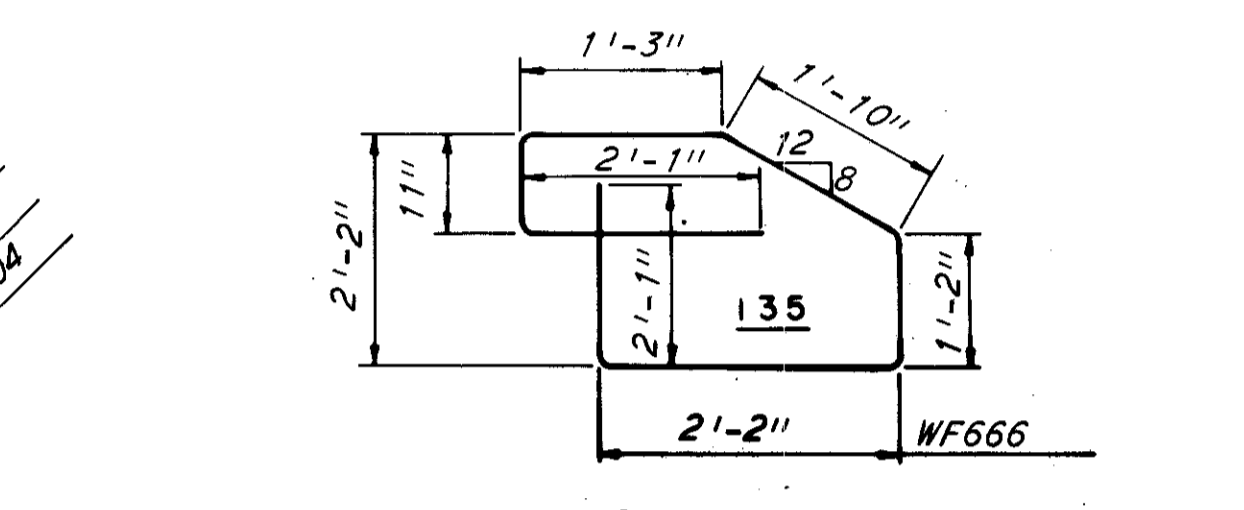
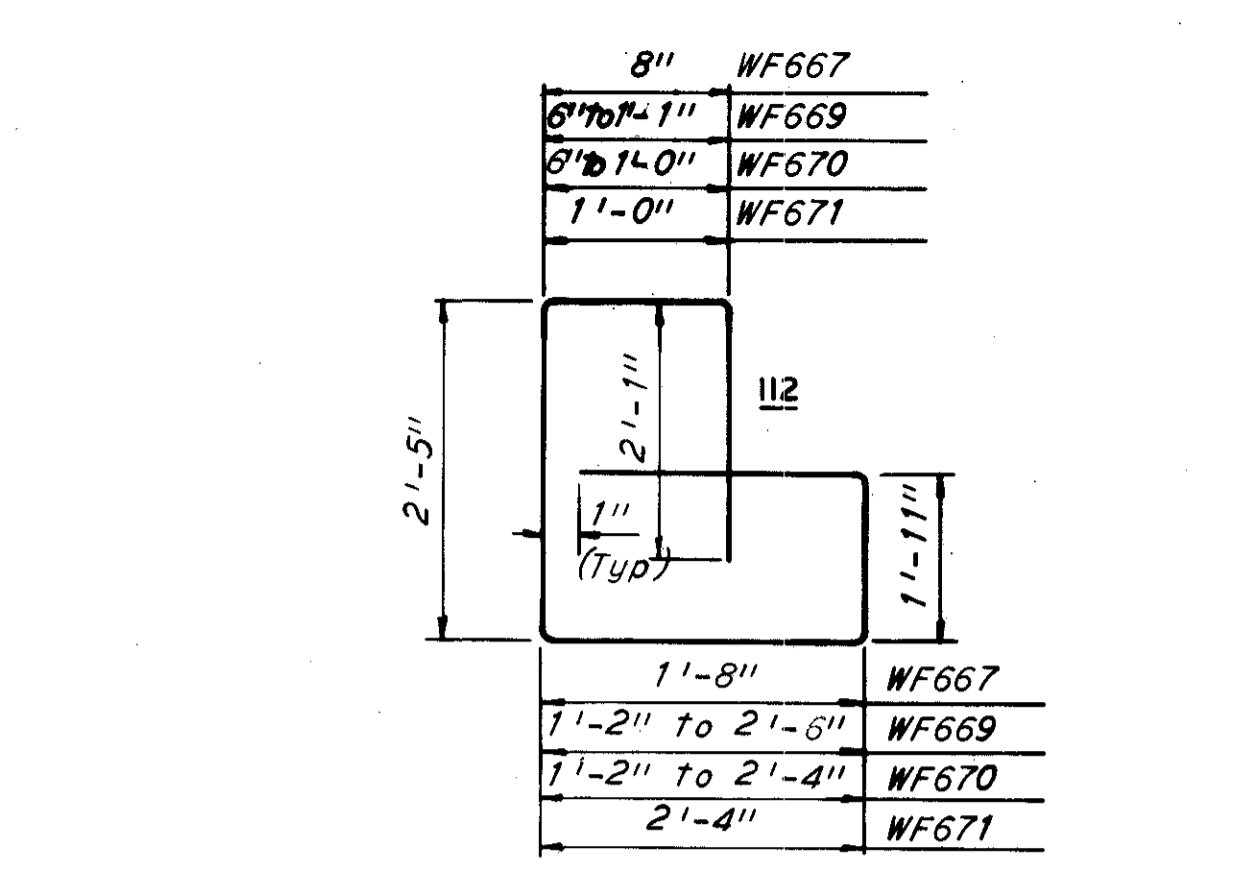
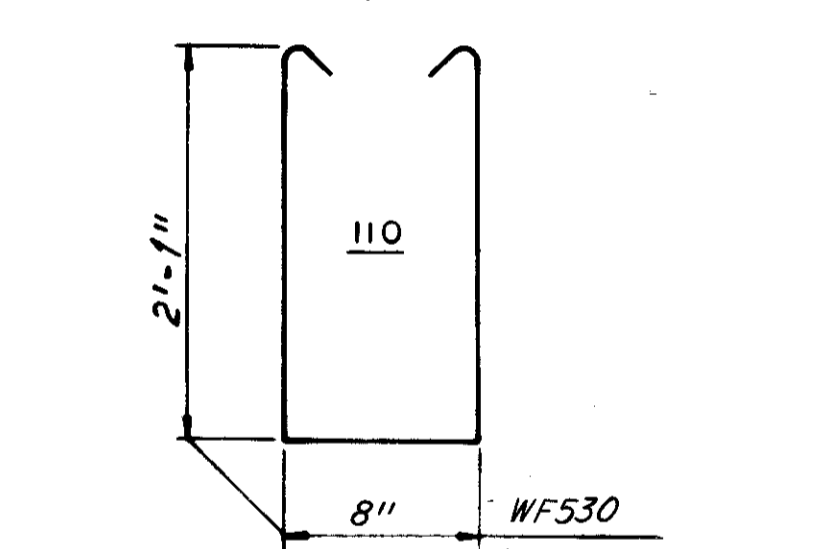
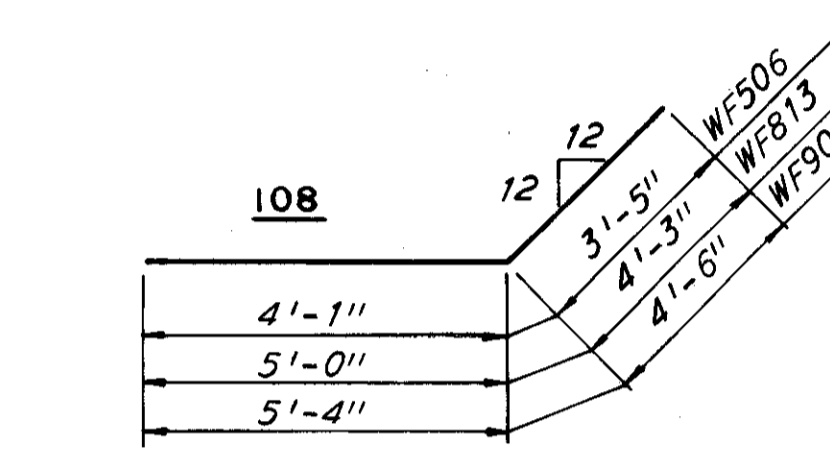
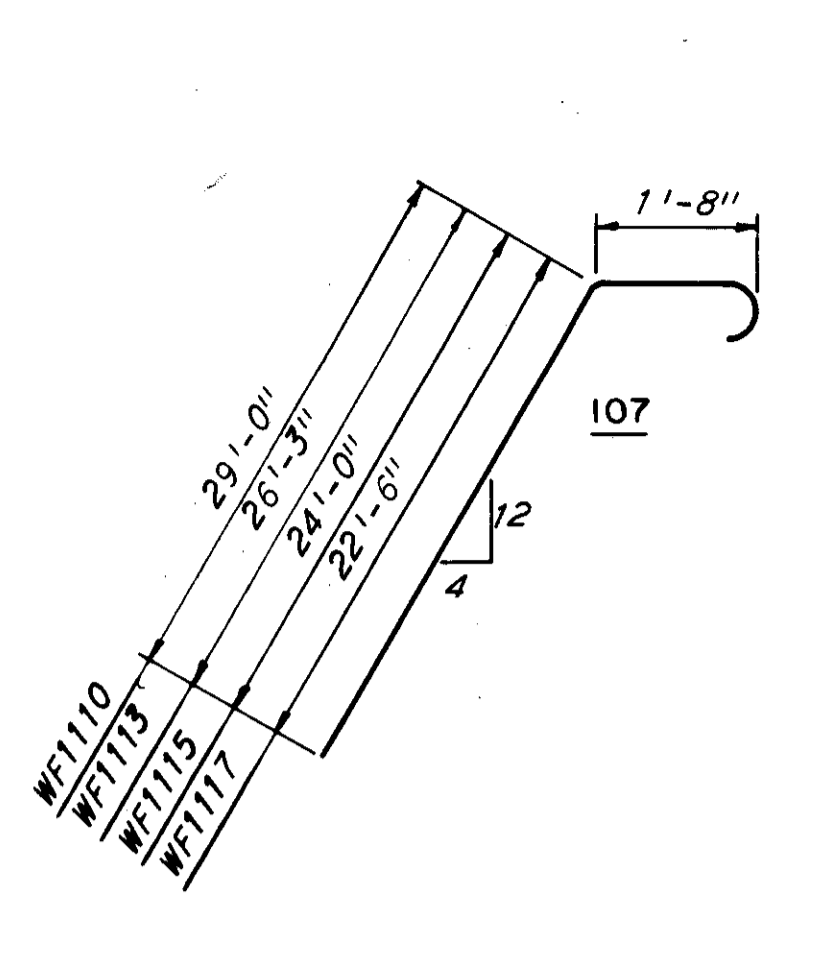
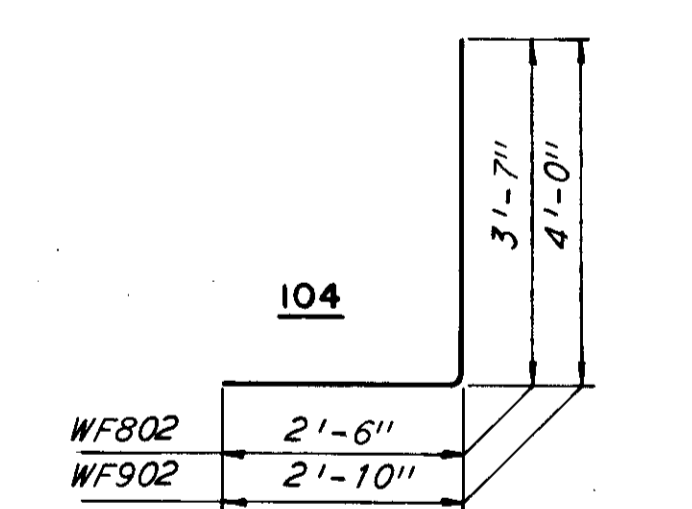
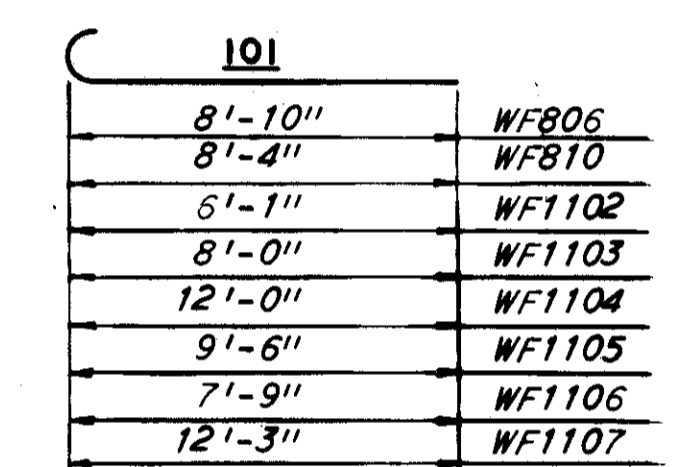
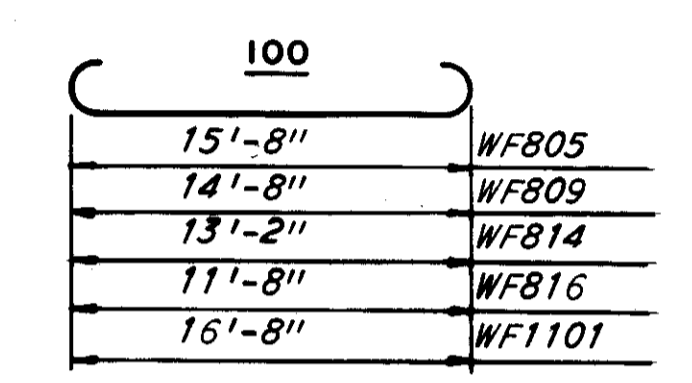
DRAWN CHB	TRACED	CHECKED L.S.	REVIEWED W.F.	REVISED
DATE 1-18-65	DATE	DATE 1-26-65	DATE 1-28-65	DATE

SHEET 362



CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	
WF501	12	27'-6"	Str.		344	WF651	2 Ser. 15	15'-4"	Str.	2"	704	WF1101	110	19'-10"	100		11,591	
WF502	8	10'-6"	149		88	WF652	2 Ser. 15	14'-10"	Str.	16"	680	WF1102	176	7'-8"	101		7,169	
WF503	142	9'-6"	Str.		1407	WF653	2 Ser. 15	13'-3"	Str.	2"	442	WF1103	16	9'-7"	101		815	
WF504	96	6'-0"	Str.		601	WF654	2 Ser. 15	12'-8"	Str.	2"	610	WF1104	16	13'-7"	101		1,155	
WF505	90	38'-6"	Str.		3614	WF655	2 Ser. 15	12'-8"	Str.	2"	584	WF1105	32	11'-1"	101		1,884	
WF506	6	7'-6"	108		47	WF656	2 Ser. 15	12'-7"	Str.	2"	558	WF1106	12	9'-4"	101		595	
WF507	4	4'-3"	157		18	WF657	2 Ser. 15	11'-7"	Str.	2"	533	WF1107	12	13'-10"	101		882	
WF508	113	7'-6"	Str.		884	WF658	2 Ser. 15	11'-0"	Str.	2"	509	WF1108	16	14'-6"	Str.		1,233	
WF509	76	4'-6"	Str.		357	WF659	2 Ser. 15	10'-5"	Str.	2"	437	WF1109	16	20'-9"	Str.		1,764	
WF510	8	3'-6"	Str.		29	WF660	2 Ser. 15	8'-10"	Str.	2"	411	WF1110	16	32'-0"	107		2,720	
WF511	113	5'-6"	Str.		648	WF661	2 Ser. 15	8'-4"	Str.	2"	387	WF1111	20	12'-0"	Str.		1,275	
WF512	76	4'-0"	Str.		317	WF662	2 Ser. 15	7'-9"	Str.	2"	362	WF1112	20	18'-3"	Str.		1,939	
WF513	382	27'-6"	Str.		10,957	WF663	16 Ser. 4	6'-0"	Str.	4'-8"	1,847	WF1113	20	29'-5"	107		3,126	
WF514	8 Ser. 18	17'-2"	22'-10"	155	4"	3004	WF664	20 Ser. 4	7'-0"	Str.	5'-0"	1,742	WF1114	12	16'-0"	Str.		1,020
WF515	8 Ser. 8	13'-6"	17'-0"	155	6"	1,018	WF665	12 Ser. 4	6'-2"	Str.	4'-12"	943	WF1115	12	27'-0"	107		1,721
WF516	8 Ser. 6	9'-8"	13'-0"	155	8"	567	WF666	12 Ser. 4	5'-6"	Str.	4'-7"	874	WF1116	12	13'-6"	Str.		861
WF517	8 Ser. 4	6'-2"	9'-2"	155	12"	256	WF667	38	10'-8"	135	609	WF1117	12	25'-6"	107		1,626	
WF518	10 Ser. 14	16'-6"	20'-4"	155	3 3/8"	2,689	WF668	438	9'-6"	112	6250							
WF519	10 Ser. 8	12'-0"	16'-2"	155	5 3/8"	1,210	WF669	423	7'-8"	135	4,871							
WF520	10 Ser. 6	9'-4"	12'-4"	155	7 3/8"	678	WF670	1 Ser. 22	8'-4"	112	1 3/8"	329						
WF521	10 Ser. 4	5'-8"	8'-6"	155	1 1/8"	296	WF671	1 Ser. 20	8'-4"	112	1 1/8"	292						
WF522	6 Ser. 8	17'-8"	20'-0"	155	4"	943	WF701	1	11'-2"	112	17							
WF523	6 Ser. 8	14'-0"	17'-4"	155	5 3/8"	784	WF702	38	26'-6"	Str.	2,058							
WF524	6 Ser. 6	10'-2"	13'-6"	155	8"	444	WF801	30	29'-3"	Str.	2,343							
WF525	6 Ser. 5	5'-8"	9'-6"	155	11 1/2"	237	WF802	5	5'-11"	104	79							
WF526	6 Ser. 4	19'-0"	20'-0"	155	4"	488	WF803	25	6'-10"	157	456							
WF527	6 Ser. 8	14'-0"	18'-6"	155	6 3/8"	835	WF804	76	16'-6"	Str.	3,348							
WF528	6 Ser. 6	10'-10"	14'-4"	155	8 3/8"	472	WF805	122	17'-10"	100	5,809							
WF529	6 Ser. 5	6'-0"	10'-2"	155	10"	253	WF806	76	9'-11"	101	2,012							
WF530	820	5'-5"	110		4,632	WF807	95	15'-6"	Str.	3,932								
WF531	820	6'-7"	154		5,630	WF808	30	43'-3"	Str.	3,464								
WF601	994	5'-0"	Str.		7,465	WF809	130	16'-10"	100	5,842								
WF602	87	5'-4"	148		697	WF810	80	9'-5"	101	2,011								
WF603	84	9'-8"	148		1,220	WF811	114	14'-6"	Str.	4,414								
WF604	75	4'-6"	Str.		507	WF812	140	37'-0"	Str.	13,831								
WF605	117	4'-10"	148		849	WF813	11	9'-2"	108	269								
WF606	84	7'-0"	148		883	WF814	136	15'-4"	100	5,568								
WF607	28	8'-3"	148		347	WF815	169	8'-9"	Str.	3,948								
WF608	60	4'-0"	Str.		360	WF816	157	13'-10"	100	5,799								
WF609	60	4'-8"	148		421	WF817	134	8'-0"	Str.	2,862								
WF610	28	5'-11"	148		249	WF818	50	27'-6"	Str.	3,671								
WF611	1 Ser. 15	9'-3"	9'-10"	Str.	2"	215	WF819	203	6'-2"	148	3,343							
WF612	1 Ser. 15	9'-11"	10'-6"	Str.	2"	231	WF820	28	12'-2"	148	910							
WF613	1 Ser. 15	8'-8"	9'-3"	Str.	2"	202	WF821	28	11'-8"	148	872							
WF614	1 Ser. 15	9'-4"	9'-11"	Str.	2"	217	WF822	28	11'-4"	148	847							
WF615	1 Ser. 15	8'-1"	8'-8"	Str.	2"	189	WF823	14	12'-6"	Str.	467							
WF616	1 Ser. 15	8'-9"	9'-4"	Str.	2"	204	WF824	14	12'-3"	Str.	458							
WF617	1 Ser. 15	7'-8"	8'-14"	Str.	2"	176	WF825	14	12'-0"	Str.	449							
WF618	1 Ser. 15	8'-2"	8'-9"	Str.	2"	191	WF826	15	20'-6"	Str.	821							
WF619	3	28'-3"	Str.		127	WF827	15	20'-3"	Str.	811								
WF620	33	29'-9"	Str.		1,475	WF828	15	20'-0"	Str.	801								
WF621	6	28'-6"	Str.		257	WF829	56	10'-0"	Str.	1,495								
WF622	32	30'-0"	Str.		1,442	WF830	15	17'-9"	Str.	711								
WF623	2	27'-3"	Str.		82	WF831	15	17'-6"	Str.	701								
WF624	32	28'-9"	Str.		1,382	WF832	15	17'-0"	Str.	681								
WF625	211	27'-6"	Str.		8715	WF833	15	16'-9"	Str.	671								
WF626	32	29'-3"	Str.		1,406	WF834	9	12'-7"	149	302								
WF627	2	26'-3"	Str.		79	WF835	112	9'-5"	148	2,816								
WF628	32	27'-9"	Str.		1,334													
WF629	6	26'-6"	Str.		239													
WF630	32	28'-0"	Str.		1,346													
WF631	12	25'-0"	Str.		450	WF901	164	29'-6"	Str.	16,449								
WF632	96	26'-9"	Str.		3,857	WF902	10	6'-7"	104	224								
WF633	12	23'-6"	Str.		424	WF903	44	7'-0"	157	1,047								
WF634	96	24'-9"	Str.		3,569	WF904	84	9'-9"	108	2,785								
WF635	6	21'-6"	Str.		194	WF905	148	43'-3"	Str.	21,763								
WF636	99	23'-0"	Str.		3,420													
WF637	3	21'-3"	Str.		96	WF1001	28	9'-5"	148	1,135								
WF638	16	21'-0"	Str.		505	WF1002	14	10'-9"	Str.	648								
WF639	15	20'-9"	Str.		467	WF1003	15	21'-6"	Str.	1,388								
WF640	15	20'-6"	Str.		462	WF1004	28	9'-2"	148	1,104								
WF641	15	20'-3"	Str.		456	WF1005	14	10'-6"	Str.	633								
WF642	15	20'-0"	Str.		451	WF1006	15	21'-0"	Str.	1,355								
WF643	15	19'-6"	Str.		439	WF1007	28	8'-11"	148	1,074								
WF644	15	17'-9"	Str.		400	WF1008	14	10'-3"	Str.	617								
WF645	15	17'-3"	Str.		389	WF1009	15	20'-9"	Str.	1,339								
WF646	15	16'-9"	Str.		377	WF1010	87	6'-11"	148	2,589								
WF647	15	16'-3"	Str.		366													
WF648	42	9'-6"	Str.		599													
WF649	2 Ser. 15	15'-11"	16'-9"	Str.	7"	728												



ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Cofferdams, Cribbs and Sheeting	Lump Sum	Lump Sum
E-2	Unclassified Excavation	Cu. Yd.	9,297
S-1	Class "C" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	852
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	765
S-1	Class "E" Concrete, Retaining Wall (Footing)	Cu. Yd.	1,603
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	717
S-4	Reinforcing Steel	Pounds	351,982
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	682
S-14	Rolling, Type A (Aluminum Rails and Supports and Concrete Parapet)	Lin. Ft.	1147.67
S-16	First Test Pile	Lump Sum	Lump Sum
S-18	12" C.I.P. Reinforced Concrete Piles	Lin. Ft.	33,670
S-29	Perous Backfill	Cu. Yd.	1,145

Note: Wall Quantities carried to General Summary, sheet 42.

For Replacement Bar Schedule see sheet 308.

H.N.T.B. WALL NO. 82

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

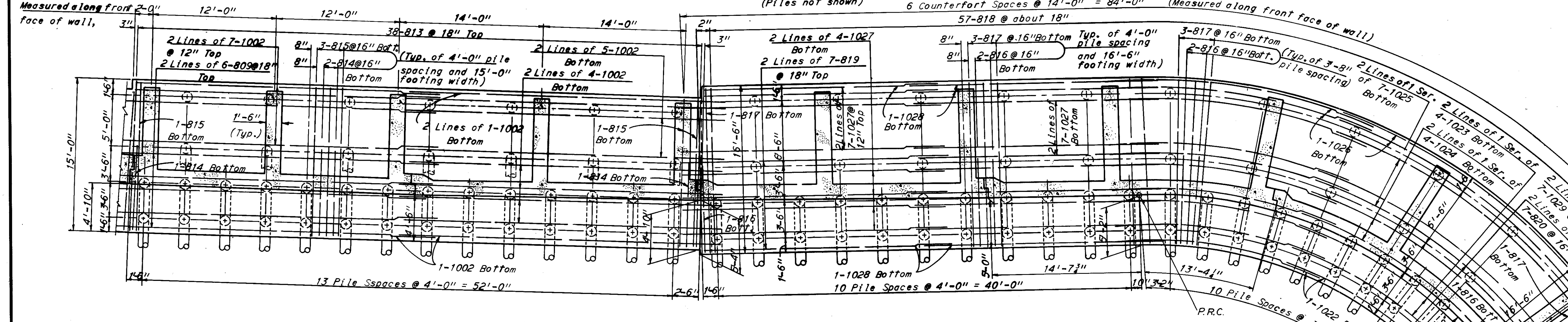
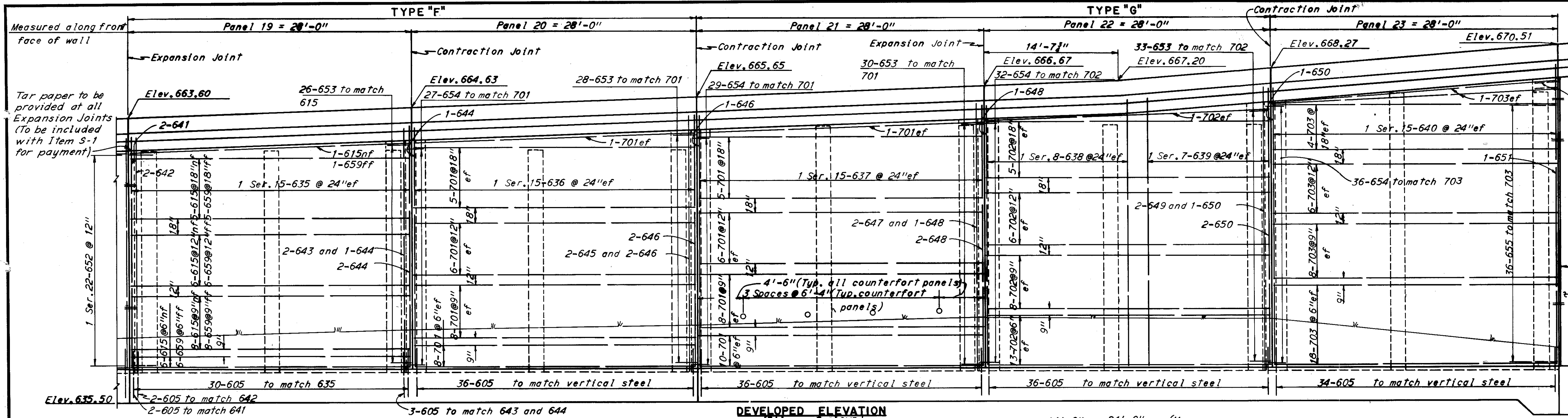
**WALL LEFT OF SOUTHBOUND OUTER ROADWAY REINFORCEMENT SCHEDULE**

STA. 20+69.34  
 STA. 32+17.34

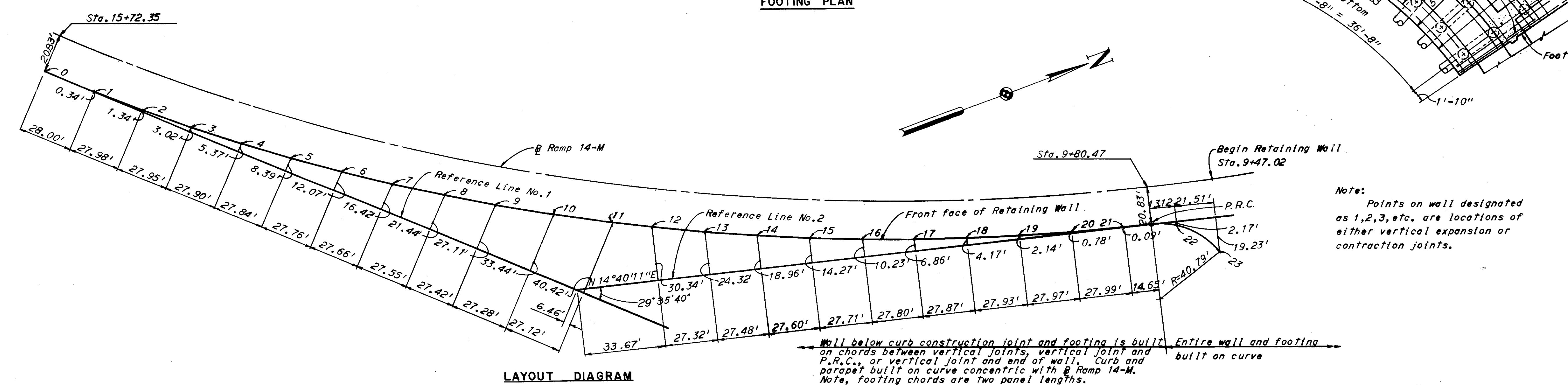
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN: CHD TRACED: CHECKED: TJS REVIEWED: WJR REVISION: 126-65 DATE: DATE: 4-26-65 DATE: 1-29-65 SHEET 364

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Note:  
 All reinforcing bars shall be prefixed WC.



Notes:  
 For location of steel in counterforts see sheet 368.  
 Field bend bars in panels 22 and 23 (wall and footing) as required. Field bending to be included with Item S-4 for payment.  
 For additional notes see sheet 367.

H.N.T.B. WALL NO. 83

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF RAMP 14-M**

STA. 9+47.02  
 STA. 15+72.35

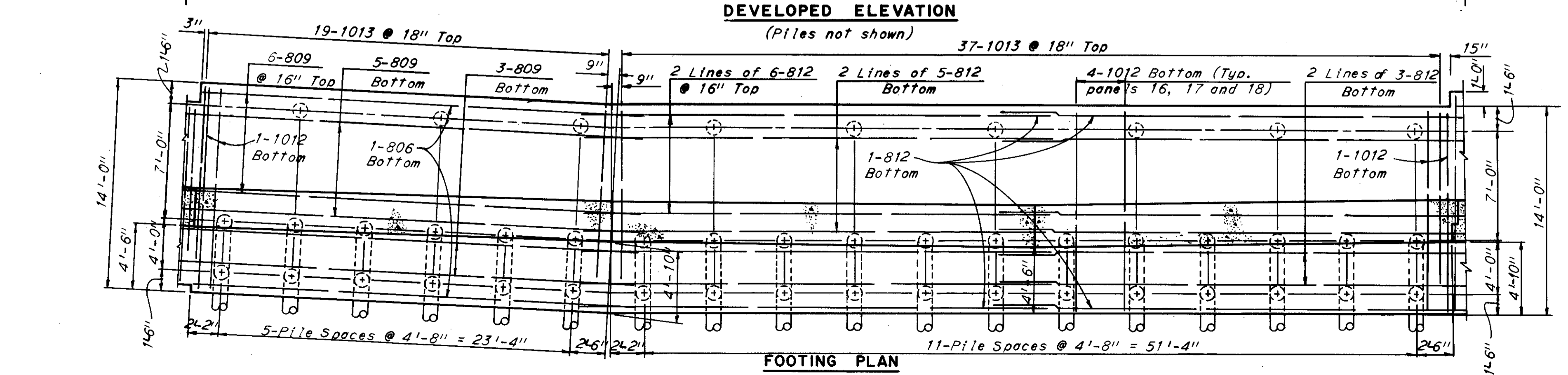
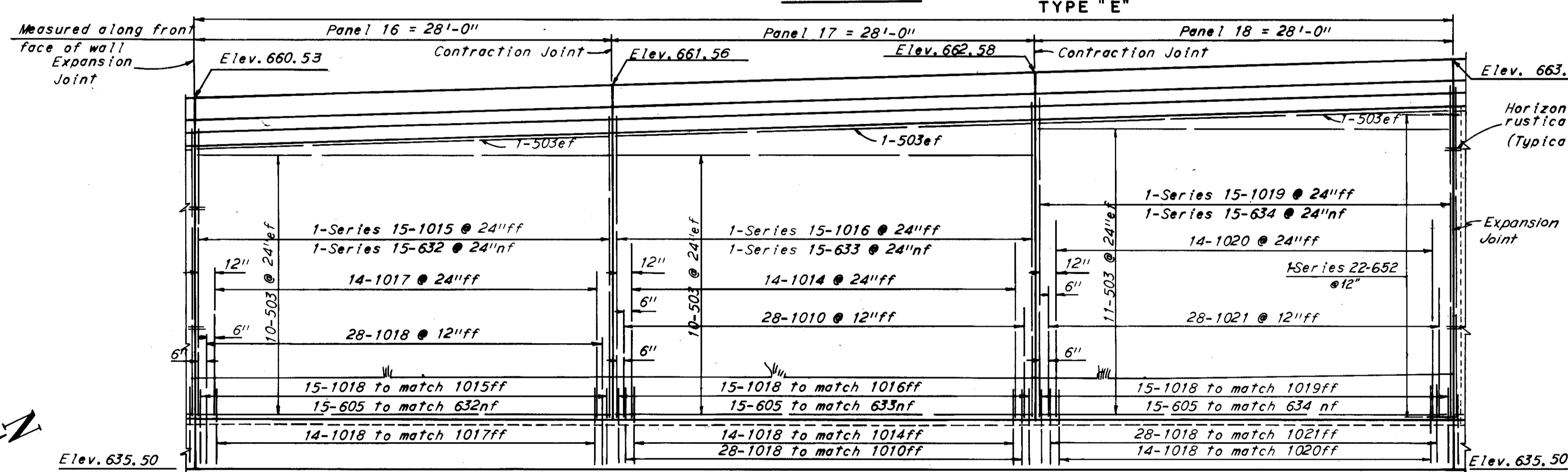
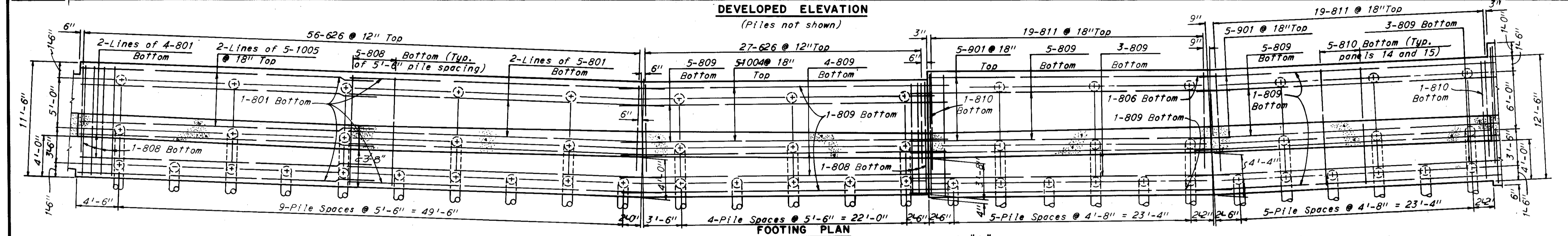
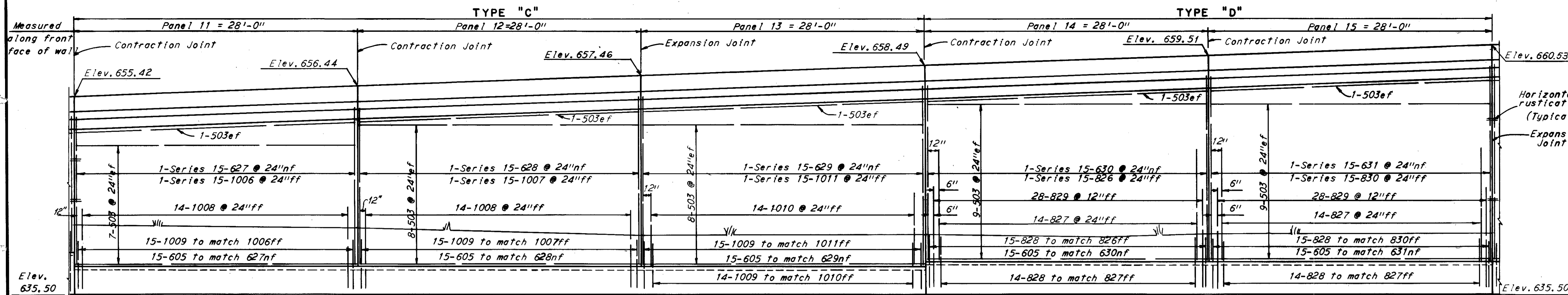
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN T.L.S.	TRACED	CHECKED J.H.B.	REVIEWED J.F.
DATE 10-2-64	DATE	DATE 1-27-65	DATE 7-28-65

SHEET 365



CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Note:  
 All reinforcing bars shall be prefixed WG.

ESTIMATED QUANTITIES-RETAINING WALL 83			
ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Unclassified Excavation	Cu. Yd.	4,887
S-1	Class "C" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	280
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	520
S-1	Class "E" Concrete, Retaining Wall (Footing)	Cu. Yd.	772
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	357
S-4	Reinforcing Steel	Pounds	177,388
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	281
S-14	Railing, Type A (Aluminum Rails and Supports and Concrete Parapet)	Lin. Ft.	650.67
S-16	First Test Pile	Lump Sum	Lump Sum
S-18	12" C.I.P. Reinforced Concrete Piles	Lin. Ft.	14,410
S-29	Porous Backfill	Cu. Yd.	554

Note: Wall Quantities carried to General Summary, sheet 42

H.N.T.B. WALL NO. 83  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

WALL LEFT OF RAMP 14-M

STA. 9 + 47.02  
 STA. 15 + 72.35

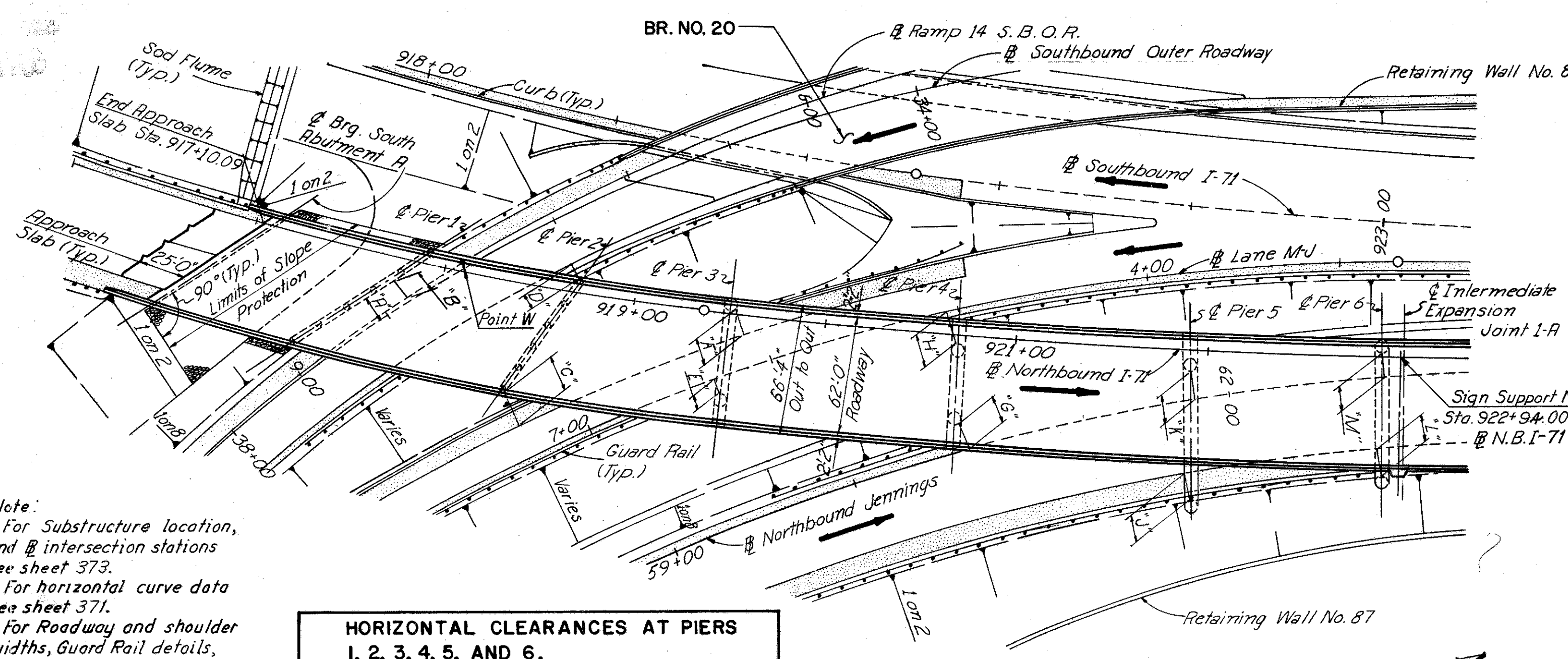
For notes see sheet 367.





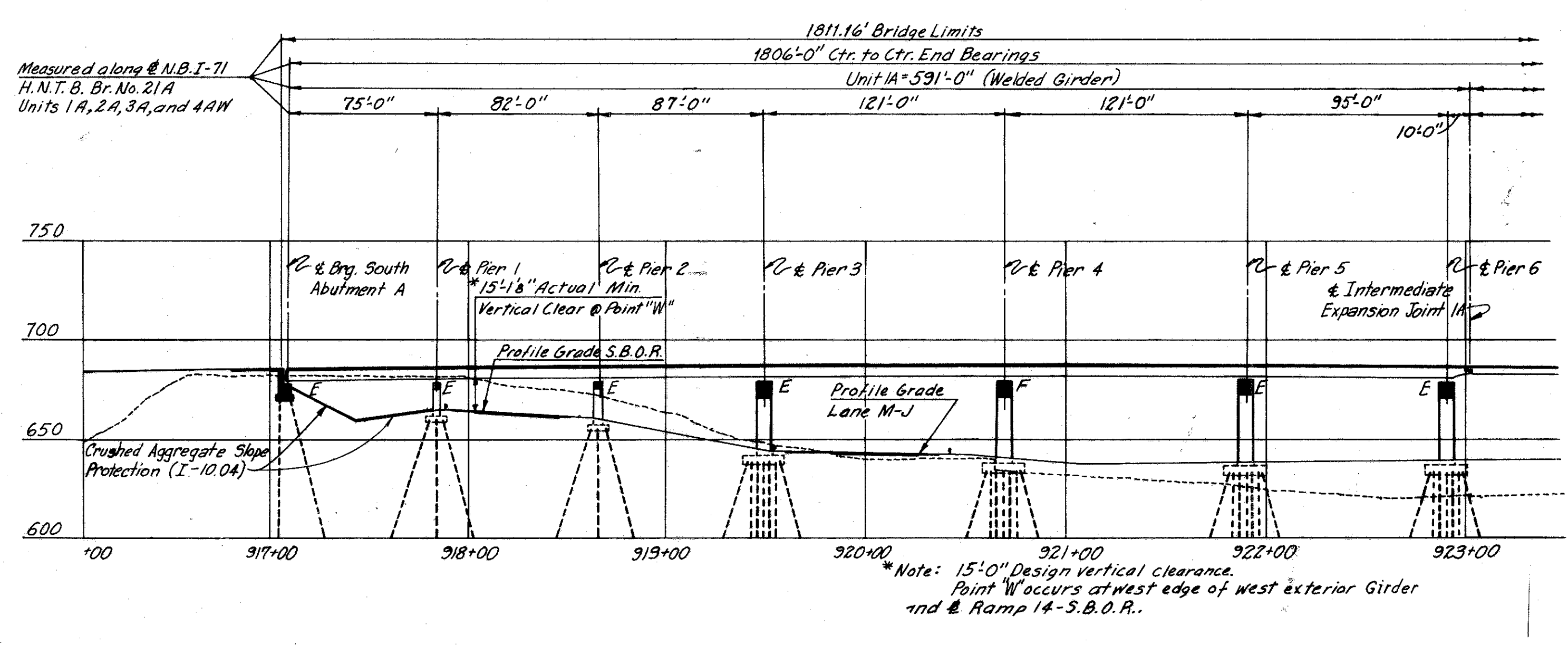
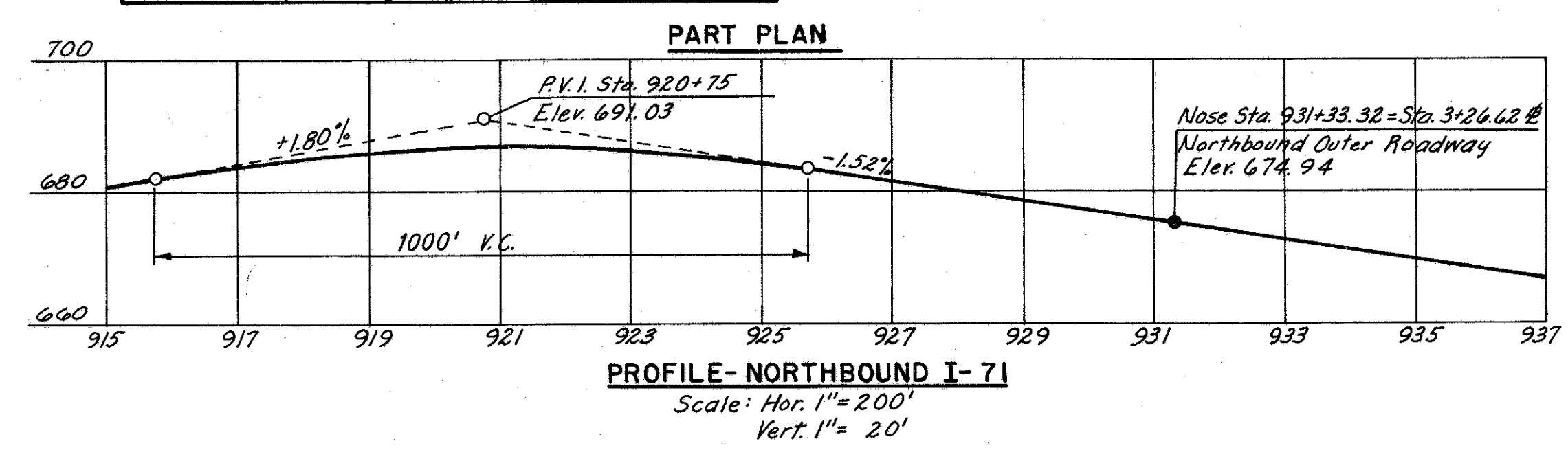


CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76



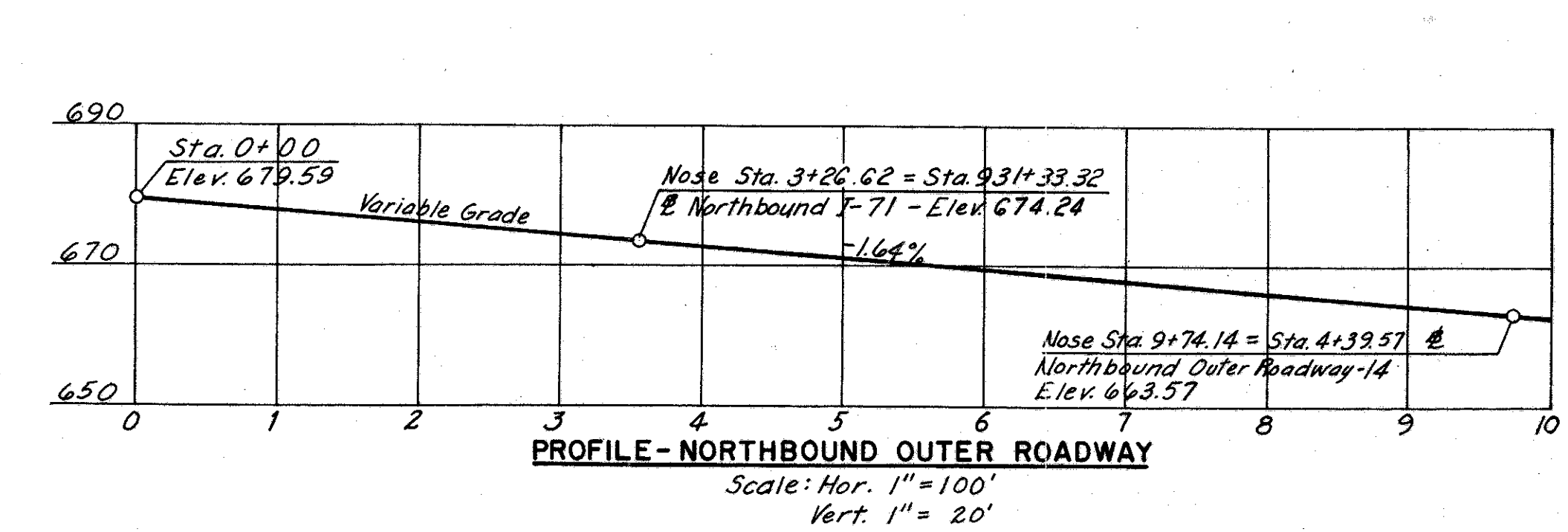
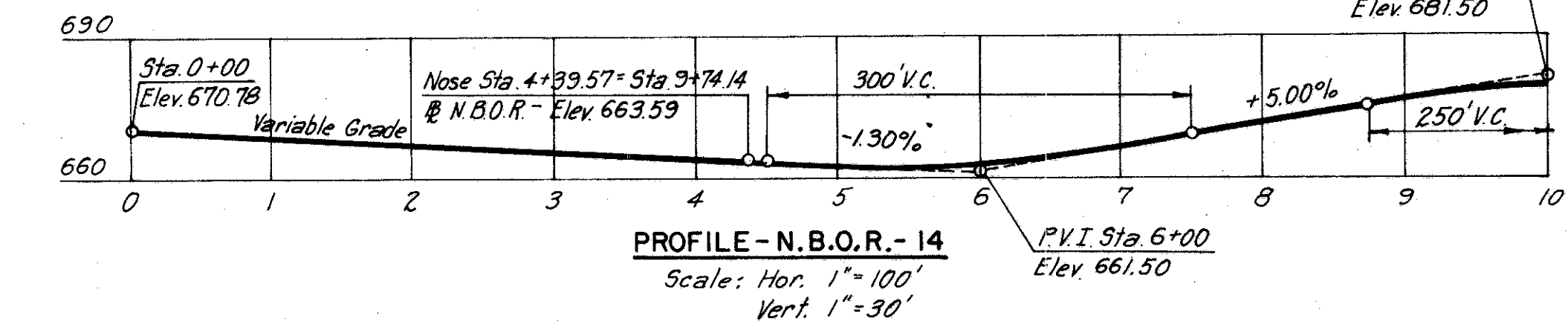
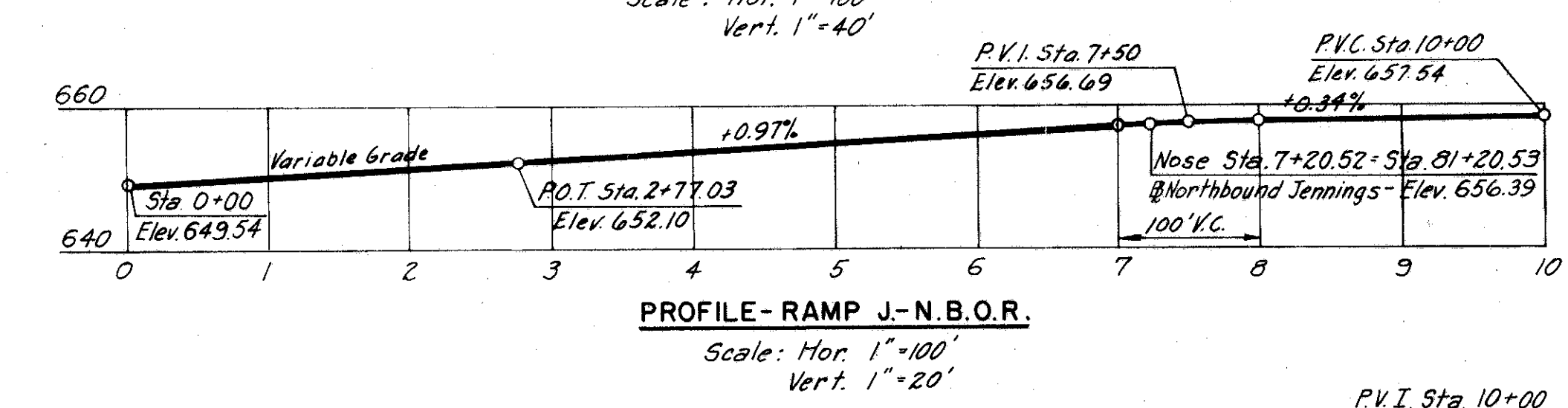
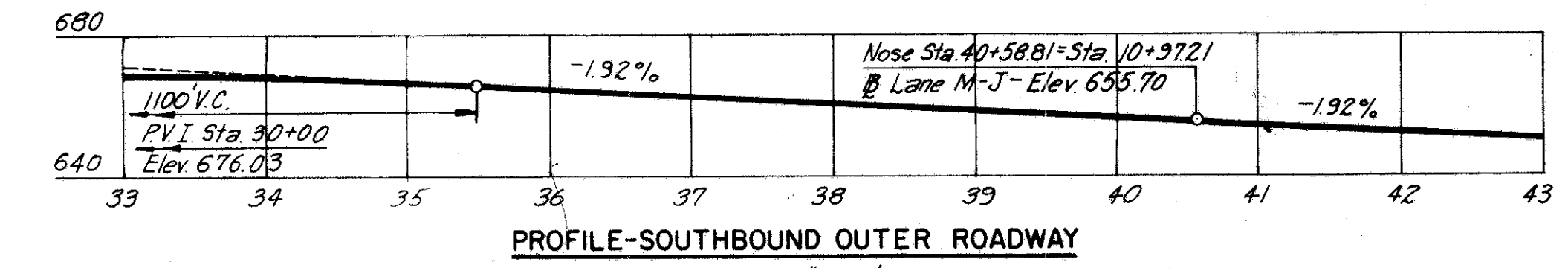
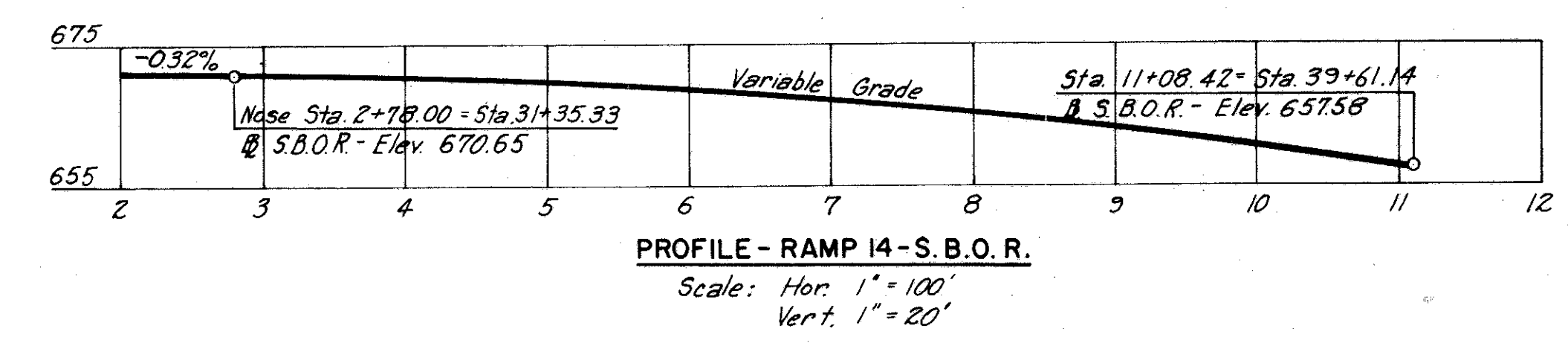
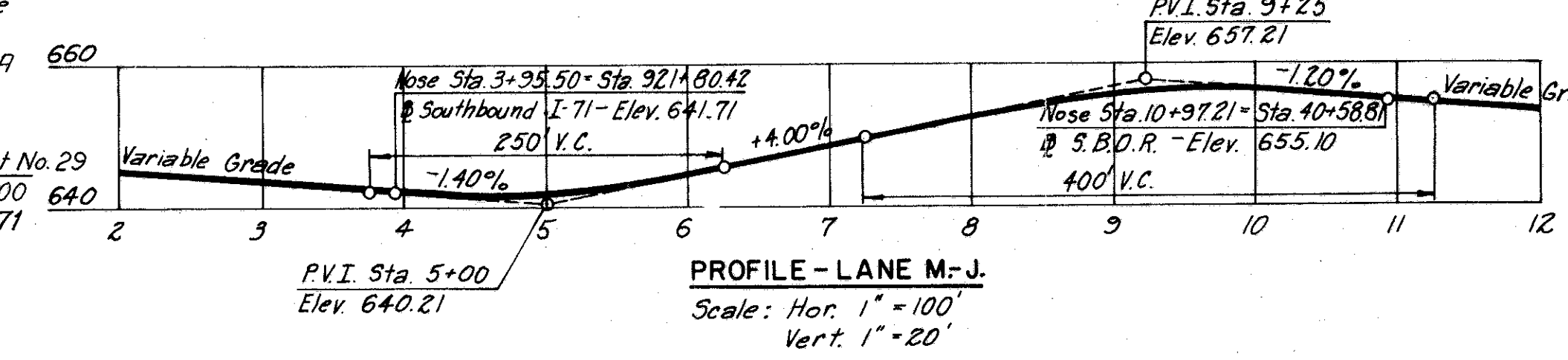
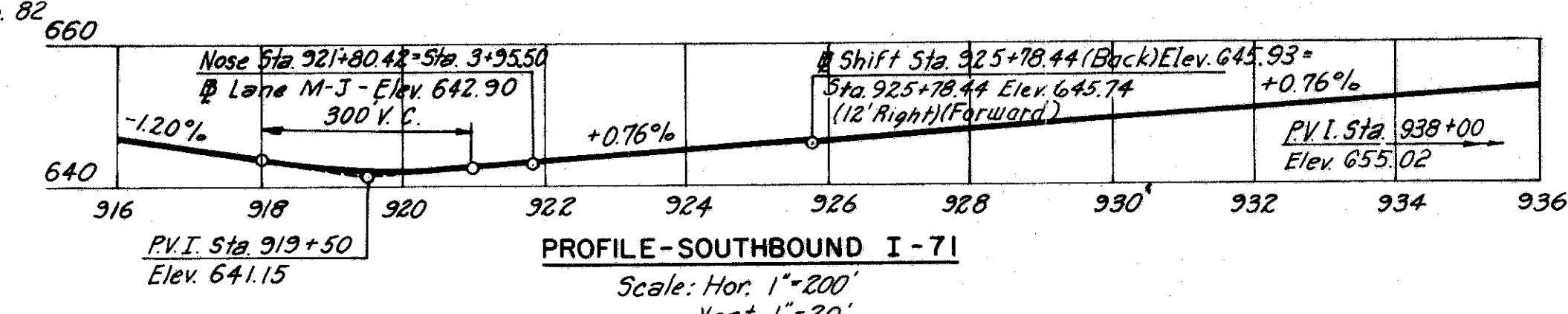
Note:  
 For Substructure location, and intersection stations see sheet 373.  
 For horizontal curve data see sheet 371.  
 For Roadway and shoulder widths, Guard Rail details, existing ground and utilities See Highway Plans.

Required Min. Clear	Actual Min. Clear	Required Min. Clear	Actual Min. Clear
"A" = 14'-0"	14'-0 3/4"	"G" = 8'-0"	10'-5 3/4"
"B" = 10'-0"	11'-11 3/8"	"H" = 6'-0"	19'-3"
"C" = 10'-0"	19'-4 1/2"	"J" = 14'-0"	14'-0"
"D" = 8'-0"	8'-4"	"K" = 8'-0"	8'-2 3/4"
"E" = 6'-0"	8'-0 1/4"	"L" = 14'-0"	14'-0"
"F" = 10'-0"	13'-9 1/2"	"M" = 8'-0"	9'-6 1/2"



ELEVATION

Note: 15'-0" Design vertical clearance. Point W occurs at west edge of west exterior Girder and @ Ramp 14 - S.B.O.R.



**PROPOSED STRUCTURE - BRIDGE NO. 21A**  
 TYPE: Continuous welded girder (Unit 1A) and continuous steel beam (Units 2A, 3A, 4AW, and 4AE) with reinforced concrete deck and sub-structure.  
 SPANS: Unit 1A - 75'-0", 82'-0", 87'-0", 2 @ 121'-0", 95'-0" and 101'-0" cantilever; Unit 2A - 68'-6", 4 @ 78'-6" and 61'-0" cantilever; Unit 3A - 72'-6", 4 @ 78'-6" and 61'-0" cantilever; Unit 4AW - 72'-6", 2 @ 78'-6", 70'-0" and 56'-0"; Unit 4AE - 73'-5", 2 @ 79'-6", 70'-11 1/2", 70'-10 1/2" and 56'-6".  
 ROADWAY: Unit 1A - 64'-0" face to face of parapets; Unit 2A - 64'-0" face to face of parapets; Unit 3A - varies face to face of parapets; Unit 4AW - 40'-0" face to face of parapets; Unit 4AE - Varies face to face of parapets; with 1'-0" safety curbs.  
 LOAD FREQUENCY: CF 2000 (57) Adequate for A.A.S.H.O. alternate loading.  
 SKEW: Unit 1A - Varies, Unit 2A, 3A, 4AW and 4AE - None, with respect to @ Northbound I-71.  
 WEARING SURFACE: 1" Monolithic Concrete  
 APPROACH SLABS: AS-1-54 (25' long)  
 ALIGNMENT: Units 1A, 2A, 3A and 4AW - 4°00'00" Curve Left, 1°28'00" Curve Left and Tangent; Unit 4AE - 2°30'00" Curve Right, Tangent and 2°00'00" Curve Left.

**PROPOSED STRUCTURE - BRIDGE NO. 21B**  
 TYPE: Continuous steel beam with reinforced concrete deck and sub-structure.  
 SPANS: Unit 1B - 62'-0", 4 @ 78'-6" and 72'-6"; Unit 2B - 61'-0" cantilever, 78'-6", 78'-6", 78'-10", 78'-4", and 73'-4"; Unit 3BW - 6'-0" cantilever, 2 @ 78'-10", and 62'-3"; Unit 3BE - 6'-0" cantilever, 5 @ 75'-0" and 69'-0"; Unit 4BE - 6'-0" cantilever, 4 @ 75'-0" and 60'-0".  
 ROADWAY: Varies face to face of parapets with 1'-0" safety curbs.  
 LOAD FREQUENCY: CF 2000 (57) Adequate for A.A.S.H.O. alternate loading.  
 SKEW: Units 1B, 2B and 3BW - None with respect to @ Northbound I-71; Units 3BE and 4BE - Varies.  
 WEARING SURFACE: 1" Monolithic Concrete  
 APPROACH SLABS: AS-1-54 (25' long)  
 ALIGNMENT: Units 1B, 2B and 3BW - 5°00'00" Curve Right, Tangent, 2°30'00" Curve Right, Tangent, and 1°30'00" Curve Left; Units 3BE and 4BE - 6°00'00" Curve Right, Tangent and 14°00'00" Curve Left.

TRAFFIC DATA:  
 Northbound I-71: 1975 - 37,296 ADT. (Total one way)  
 Northbound Jennings: 1975 - 21,366 (Total one way)  
 For light Standard support location see sheet 476A.

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**SITE PLAN**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS  
 BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN: J.A.B. TRACED: C.H.B. CHECKED: J.H.B. REVIEWED: J.H.B. REVISION: J.H.B.  
 DATE: 7-18-64 DATE: 7-11-64 DATE: 12-22-64 SHEET 370

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

**CURVE DATA**

RAMP 14-S.B.O.R.	SOUTHBOUND OUTER ROADWAY
P.C. Sta. 4+04.41	P.C. Sta. 32+30.74
P.I. Sta. 7+77.18	P.I. Sta. 36+22.27
P.T. Sta. 11+08.42	P.T. Sta. 39+61.14
$\Delta = 46^{\circ}34'54''$	$\Delta = 51^{\circ}07'41''$
$D = 6^{\circ}37'00''/Lt$	$D = 7^{\circ}00'00''/Lt$
$R = 865.93'$	$R = 818.51'$
$T = 372.76'$	$T = 391.53'$
$L = 704.00'$	$L = 730.40'$
$E = 76.83'$	$E = 88.82'$

LANE M-J	RAMP N.B.O.R.-14
P.C. Sta. 2+70.62	P.C. Sta. 0+00.00
P.I. Sta. 7+79.42	P.I. Sta. 0+59.81
P.T. Sta. 12+17.23	P.T. Sta. 1+19.60
$\Delta = 52^{\circ}03'49''$	$\Delta = 2^{\circ}59'24''$
$D = 5^{\circ}30'00''/Lt$	$D = 2^{\circ}30'00''/Rt$
$R = 1041.74'$	$R = 2,291.83'$
$T = 508.81'$	$T = 59.81'$
$L = 946.61'$	$L = 119.60'$
$E = 117.62'$	$E = 0.78'$

NORTHBOUND I-71	NORTHBOUND OUTER ROADWAY
P.C.C. Sta. 910+45.18	P.C.C. Sta. 919+38.10
P.I. Sta. 915+06.69	P.I. Sta. 921+59.77
P.C.C. Sta. 919+38.10	P.T. Sta. 923+80.96
$\Delta = 35^{\circ}43'01''$	$\Delta = 6^{\circ}29'43''$
$D = 4^{\circ}00'00''/Lt$	$D = 1^{\circ}28'00''/Lt$
$R = 1,432.39'$	$R = 3,906.53'$
$T = 461.50'$	$T = 221.66'$
$L = 892.92'$	$L = 442.86'$
$E = 72.52'$	$E = 6.28'$

SOUTHBOUND I-71	NORTHBOUND JENNINGS
P.C.C. Sta. 910+65.79	P.C.C. Sta. 920+56.64
P.I. Sta. 915+72.64	P.I. Sta. 923+17.93
P.C.C. Sta. 920+56.64	P.T. Sta. 925+78.44
$\Delta = 29^{\circ}43'32''$	$\Delta = 7^{\circ}39'11''$
$D = 3^{\circ}00'00''/Lt$	$D = 1^{\circ}28'00''/Lt$
$R = 1,909.86'$	$R = 3,906.52'$
$T = 506.84'$	$T = 261.28'$
$L = 990.85'$	$L = 521.80'$
$E = 66.11'$	$E = 8.73'$

NORTHBOUND JENNINGS	NORTHBOUND JENNINGS
P.C. Sta. 53+60.26	P.C. Sta. 67+82.31
P.I. Sta. 58+25.63	P.I. Sta. 68+88.97
P.T. Sta. 63+61.93	P.T. Sta. 69+95.47
$\Delta = 50^{\circ}05'01''$	$\Delta = 5^{\circ}19'44''$
$D = 5^{\circ}00'00''/Rt$	$D = 2^{\circ}30'00''/Rt$
$R = 1,145.92'$	$R = 2,291.83'$
$T = 535.37'$	$T = 106.66'$
$L = 1,001.67'$	$L = 213.16'$
$E = 118.89'$	$E = 2.48'$

NORTHBOUND JENNINGS	NORTHBOUND JENNINGS
P.C. Sta. 74+02.90	P.C. Sta. 74+02.90
P.I. Sta. 79+15.83	P.I. Sta. 79+15.83
P.T. Sta. 84+22.67	P.T. Sta. 84+22.67
$\Delta = 15^{\circ}17'47''$	$\Delta = 15^{\circ}17'47''$
$D = 1^{\circ}30'00''/Lt$	$D = 1^{\circ}30'00''/Lt$
$R = 3,819.72'$	$R = 3,819.72'$
$T = 512.93'$	$T = 512.93'$
$L = 1,019.77'$	$L = 1,019.77'$
$E = 34.29'$	$E = 34.29'$

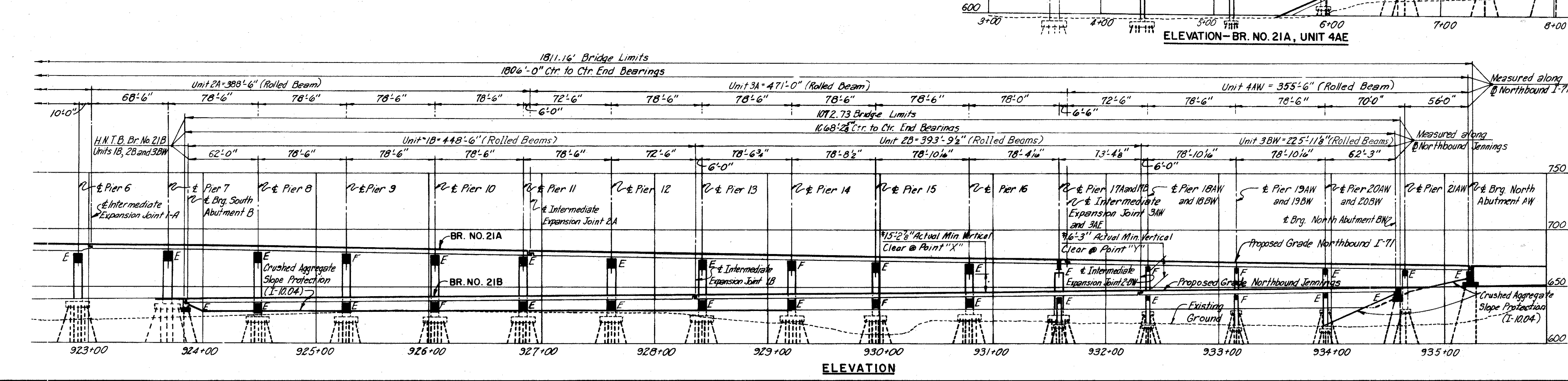
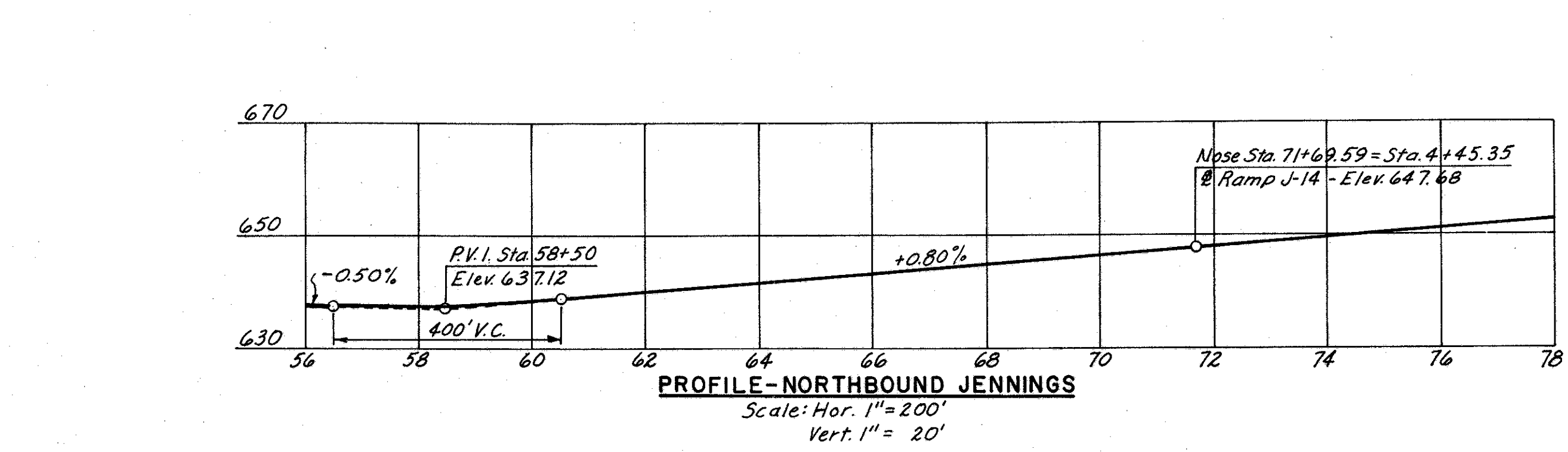
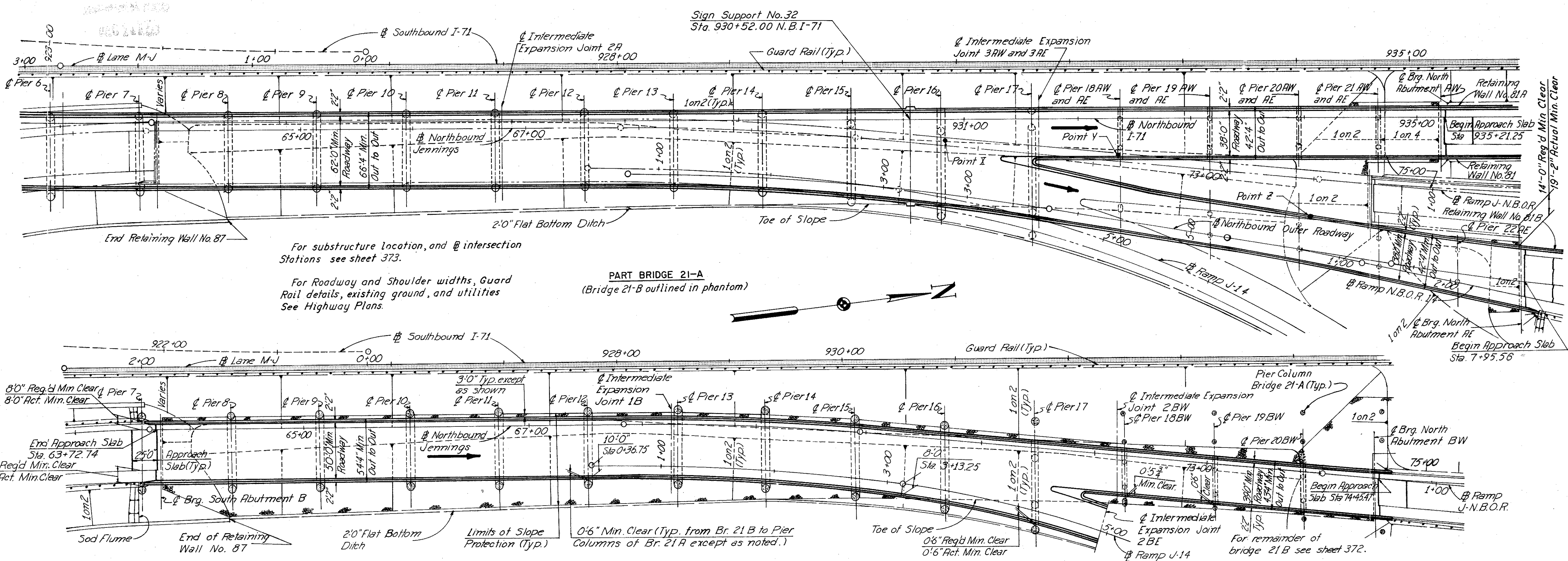
\*Note: 15'-0" Design Vertical Clearance  
 Point "X" occurs at north bottom edge of Pier 16 cap beam and west curb line of Br. No. 21 B.  
 Point "Y" occurs at south bottom edge of Pier 18 AW cap beam and west curb line of Br. No. 21 B.  
 Point "Z" occurs at west edge of west exterior beam and east curb line of Northbound Jennings Br. No. 21 B.

H.N.T.B. BRIDGE NOS. 21A & 21B  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**SITE PLAN**

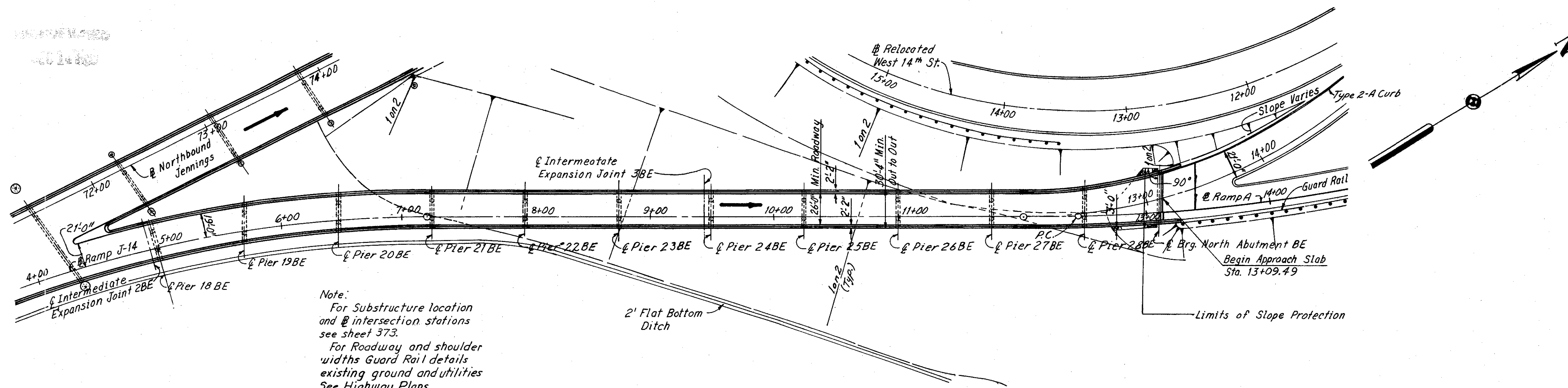
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS  
 BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

DRAWN BY	CHECKED BY	REVIEWED BY
DATE	DATE	DATE
11-8-64	11-12-64	12-22-64

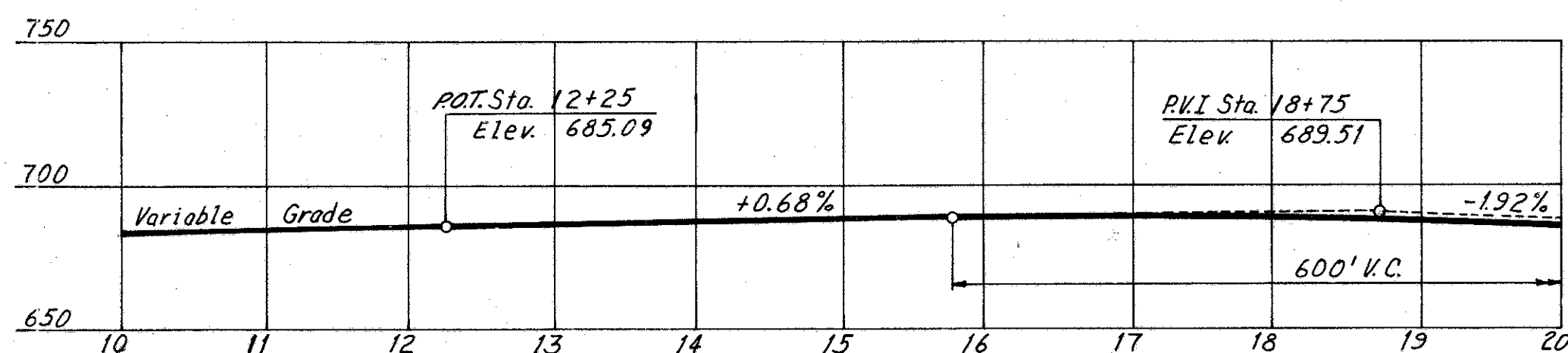


CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

Note: For pile data see tabulated results below.

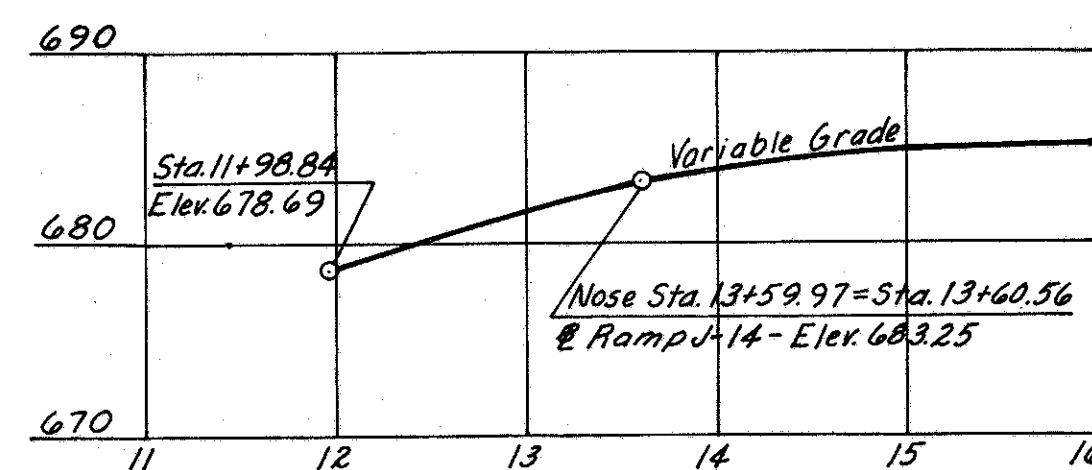


**PART PLAN**  
 (Bridge 21A not shown)

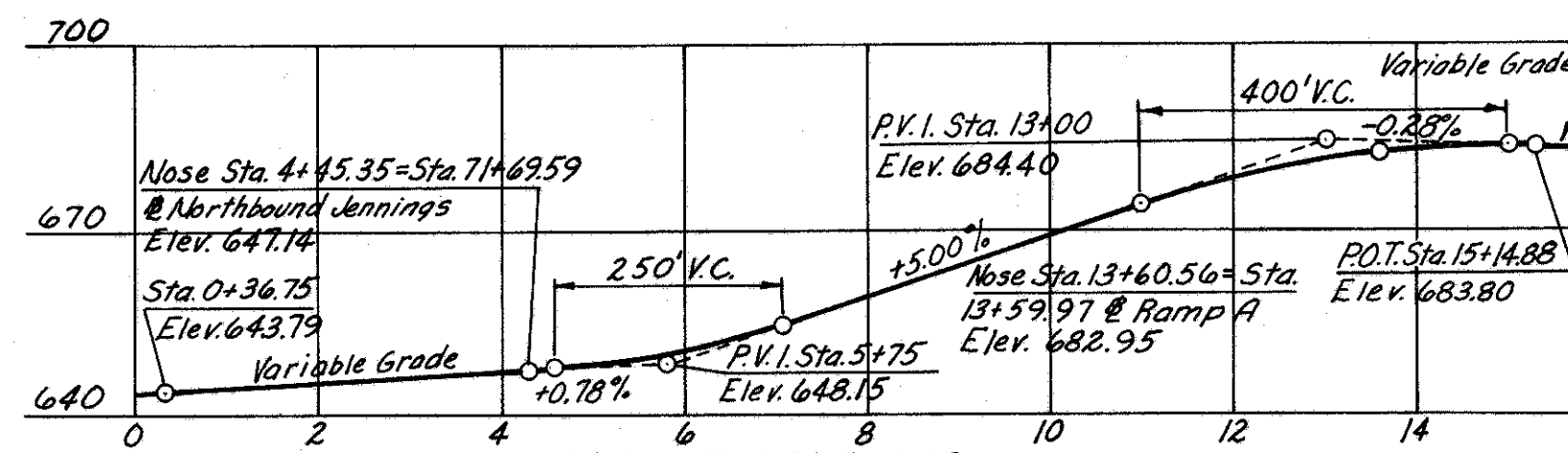


**PROFILE-RELOCATED WEST 14th STREET**

CURVE DATA			
RAMP J-14		RAMP A	
P.C. Sta. 0+36.75	P.C.C. Sta. 3+13.25	P.C. Sta. 11+98.84	P.C. Sta. 12+41.14
P.I. Sta. 1+75.24	P.I. Sta. 5+20.11	P.I. Sta. 13+65.21	P.I. Sta. 13+52.97
P.C.C. Sta. 3+13.25	P.T. Sta. 7+20.67	P.T. Sta. 15+14.88	P.C.C. Sta. 14+64.34
$\Delta = 8^{\circ}17'42''$	$\Delta = 24^{\circ}26'43''$	$\Delta = 44^{\circ}14'42''$	$\Delta = 8^{\circ}55'41''$
$D = 3^{\circ}00'00''$ Rt.	$D = 6^{\circ}00'00''$ Rt.	$D = 14^{\circ}00'00''$ Lt.	$D = 4^{\circ}00'00''$ Lt.
$R = 1909.86'$	$R = 954.93'$	$R = 409.26'$	$R = 1432.39'$
$T = 138.49'$	$T = 206.86'$	$T = 166.37'$	$T = 111.83'$
$L = 276.50'$	$L = 407.42'$	$L = 316.04'$	$L = 223.20'$
$E = 5.02'$	$E = 22.15'$	$E = 32.52'$	$E = 4.36'$



**PROFILE-RAMP A**



**PROFILE-RAMP J-14**

SUBSTRUCTURE UNIT	PILE TYPE	EST. AVE. VERTICAL PILE LENGTH (FT.)
So. Abut. A	12" C.I.P.C.	65'
Pier 1	12" C.I.P.C.	65'
Pier 2	12" C.I.P.C.	65'
Pier 3	12" C.I.P.C.	55'
Pier 4	12" B.P. 53	68'
Pier 5	12" B.P. 53	73' (W), 64' (E)
Pier 6	12" B.P. 53	76' (W), 68' (E)
Pier 7	12" B.P. 53	77' (W), 71' (E)
Pier 8	12 B.P. 53	67' (W), 48' (E)
Pier 9	12 B.P. 53	68' (W), 48' (E)
Pier 10	12 B.P. 53	69' (W), 47' (E)
Pier 11	12 B.P. 53	69' (W), 47' (E)
Pier 12	12 B.P. 53	74' (W), 52' (E)
Pier 13	12 B.P. 53	72' (W), 46' (E)
Pier 14	12 B.P. 53	70' (W), 44' (E)
Pier 15	12 B.P. 53	63' (W), 44' (E)
Pier 16	12 B.P. 53	66' (W), 42' (E)
Pier 17A	12 B.P. 53	77' (W), 50' (E)
Pier 18AW	12 B.P. 53	80' (W), 70' (E)
Pier 19AW	12 B.P. 53	80' (W), 70' (E)
Pier 20AW	12 B.P. 53	81' (W), 71' (E)
Pier 21AW	12 B.P. 53	102'
No. Abut. AW	12 B.P. 53	115'
Pier 18AE	12 B.P. 53	52'
Pier 19AE	12 B.P. 53	51'
Pier 20AE	12 B.P. 53	63'
Pier 21AE	12 B.P. 53	97' (W), 87' (E)
Pier 22AE	12 B.P. 53	104' (W), 103' (E)
No. Abut. AE	12 B.P. 53	112'
So. Abut. B	12 B.P. 53	81'
Pier 17B	12 B.P. 53	66' (W), 52' (E)
Pier 18BW	12 B.P. 53	70' (W), 52' (E)
Pier 19BW	12 B.P. 53	70' (W), 57' (E)
Pier 20BW	12 B.P. 53	70' (W), 69' (E)
No. Abut. BW	12 B.P. 53	100'
Pier 18BE	12 B.P. 53	52'
Pier 19BE	12 B.P. 53	52'
Pier 20BE	12 B.P. 53	52'
Pier 21BE	12 B.P. 53	56'
Pier 22BE	12 B.P. 53	56'
Pier 23BE	12 B.P. 53	66'
Pier 24BE	12 B.P. 53	79'
Pier 25BE	12 B.P. 53	92'
Pier 26BE	12 B.P. 53	104'
Pier 27BE	12 B.P. 53	116'
Pier 28BE	12 B.P. 53	117'
No. Abut. BE	12 B.P. 53	134'

Note:  
 (W) denotes West footing of Pier.  
 (E) denotes East footing of Pier.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**SITE PLAN**

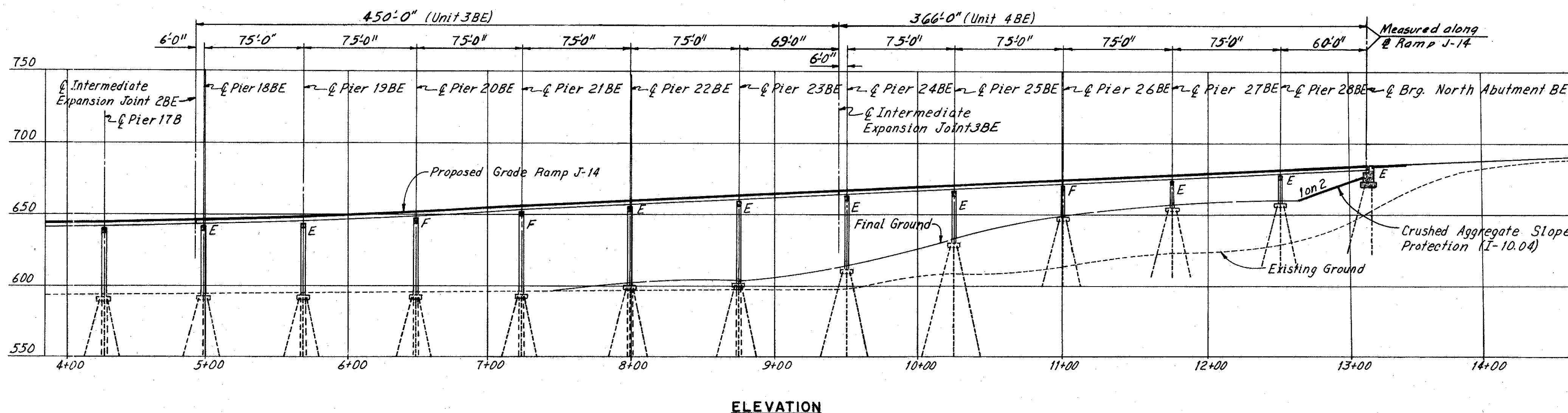
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN R.A.B. TRACED C.H.B. CHECKED R.A.B. REVIEWED W.A. REISED  
 DATE 11-8-64 DATE 11-12-64 DATE 12-22-64

SHEET 372





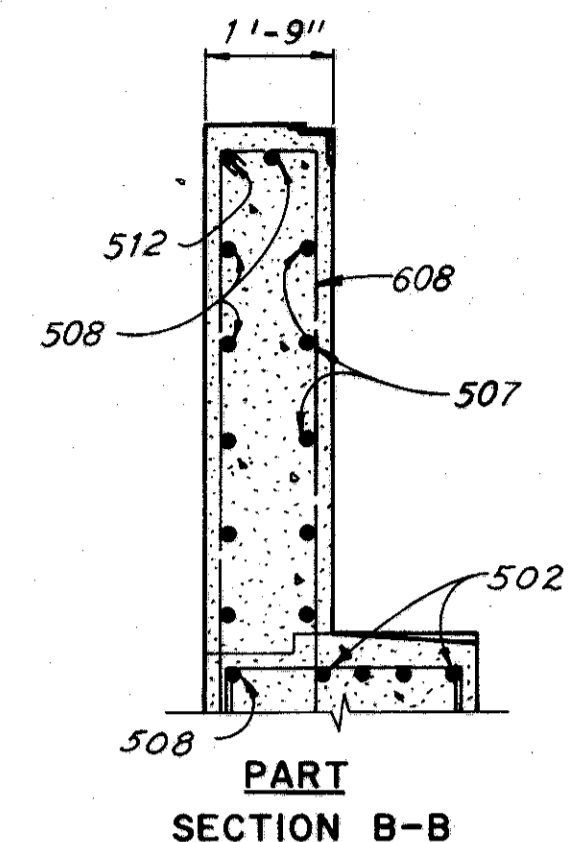
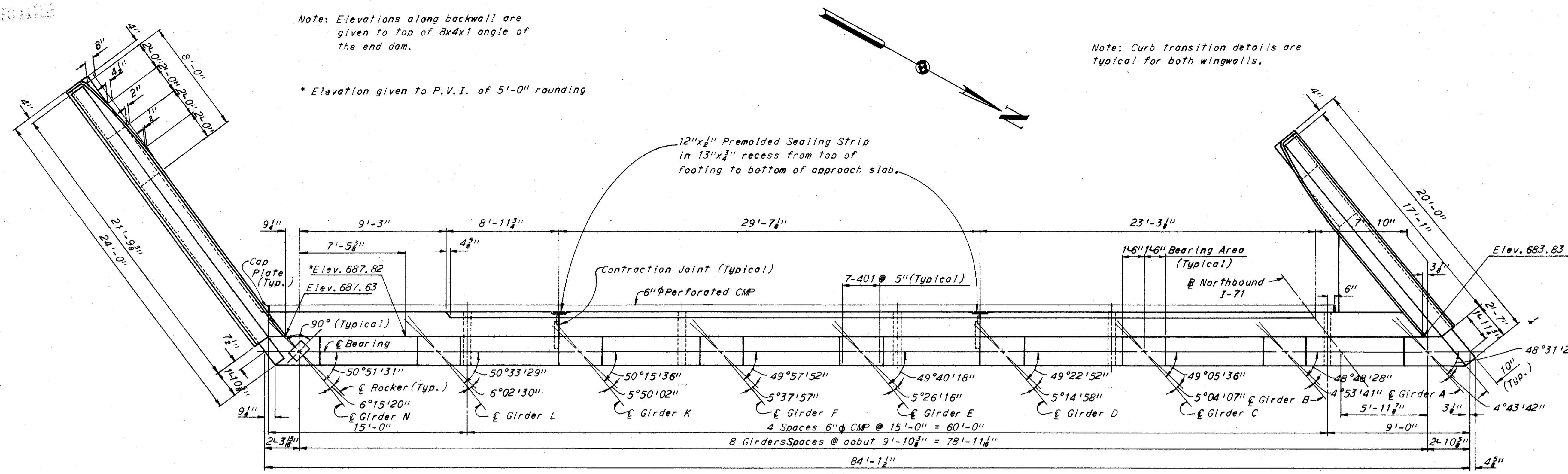


CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

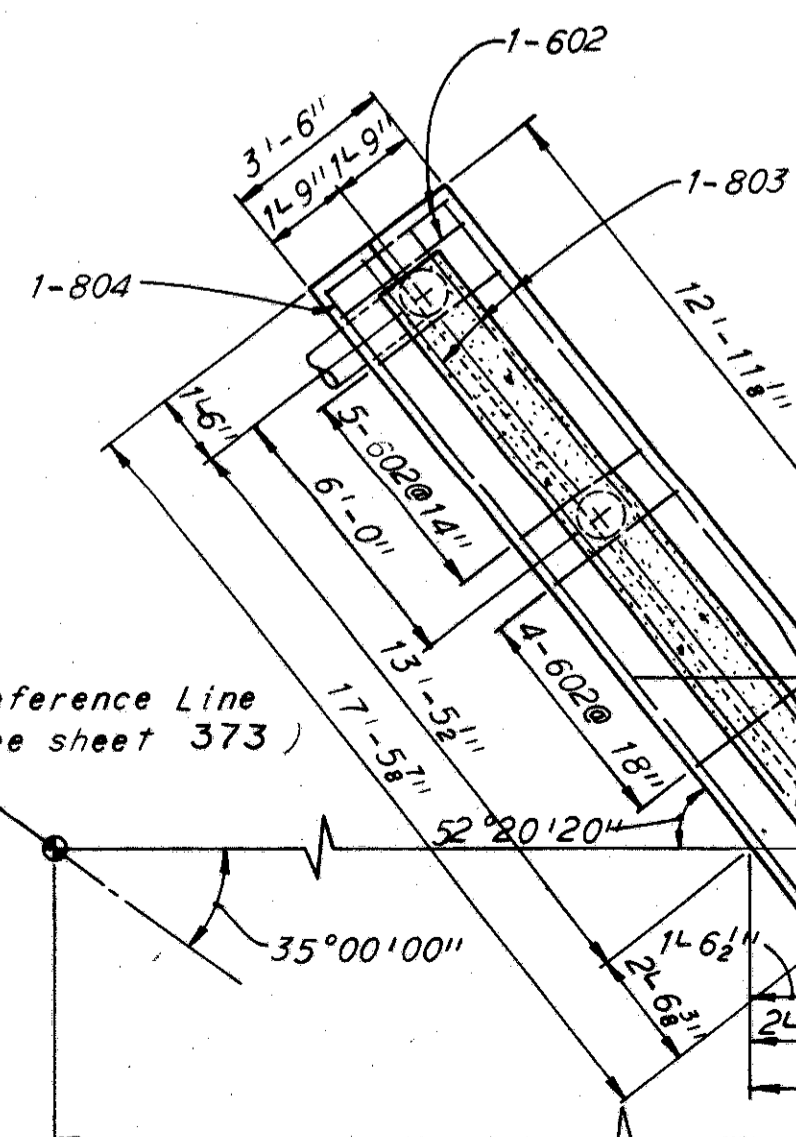
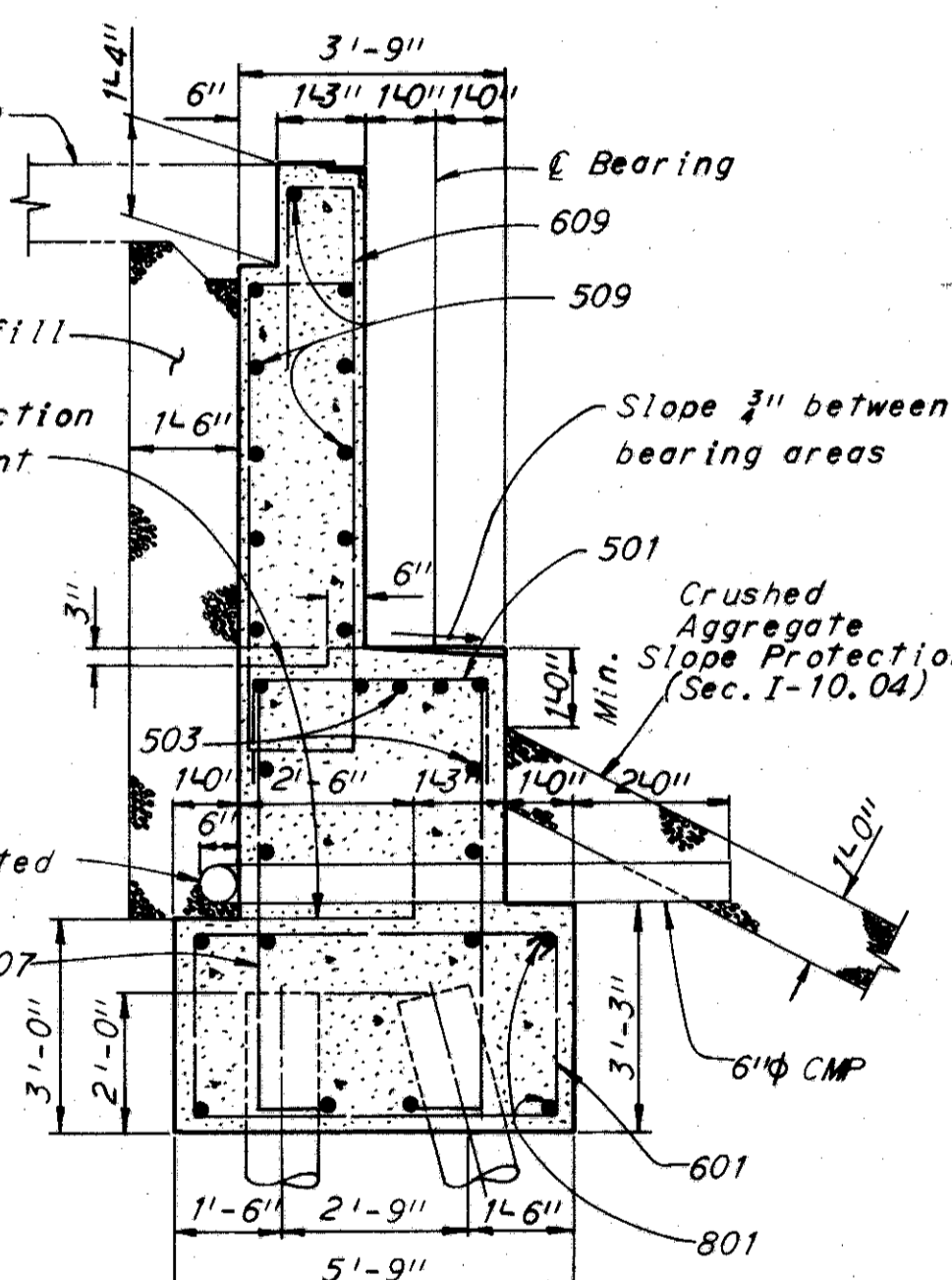
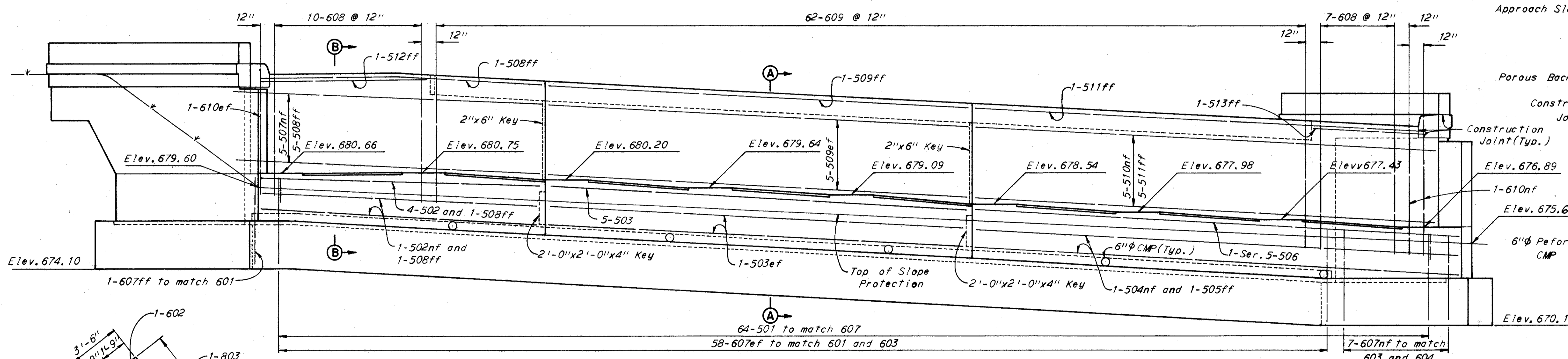
Note: Elevations along backwall are given to top of 8x4x1 angle of the end dam.

\* Elevation given to P.V.I. of 5'-0" rounding

Note: Curb transition details are typical for both wingwalls.

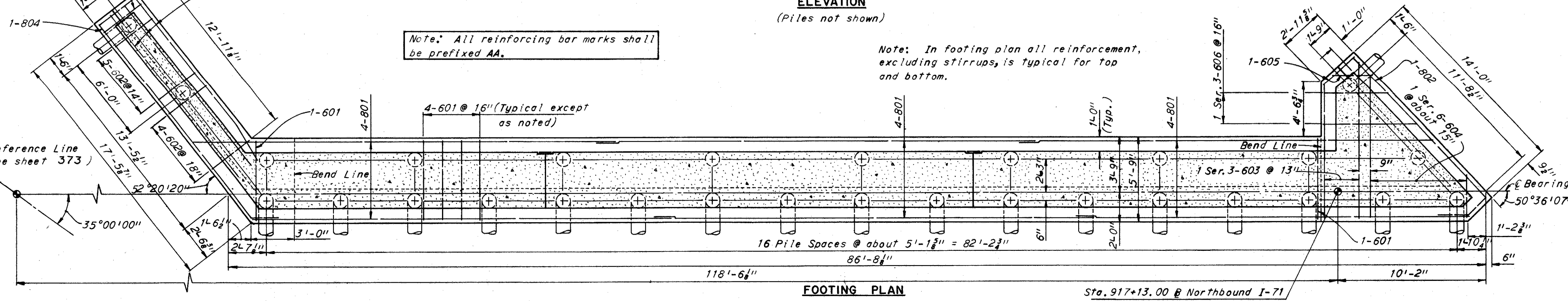


Notes: All piles shall be 12" φ C.I.P. Reinforced Concrete.  
 The following abbreviations are used:  
 nf = near face    ef = each face  
 ff = far face  
 For wingwall details and additional notes see sheet 375.



Note: All reinforcing bar marks shall be prefixed AA.

Note: In footing plan all reinforcement, excluding stirrups, is typical for top and bottom.



H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**SOUTH ABUTMENT - A**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R    STA. 917+10.09  
 STA. 935+21.25

CLEVELAND    CUYAHOGA COUNTY    OHIO

DRAWN: J.M.C.    TRACED:    CHECKED:    REVIEWED:    REVISIONS:  
 DATE: 12-20-84    DATE: 12-22-84    DATE: 12-22-84

SHEET 374



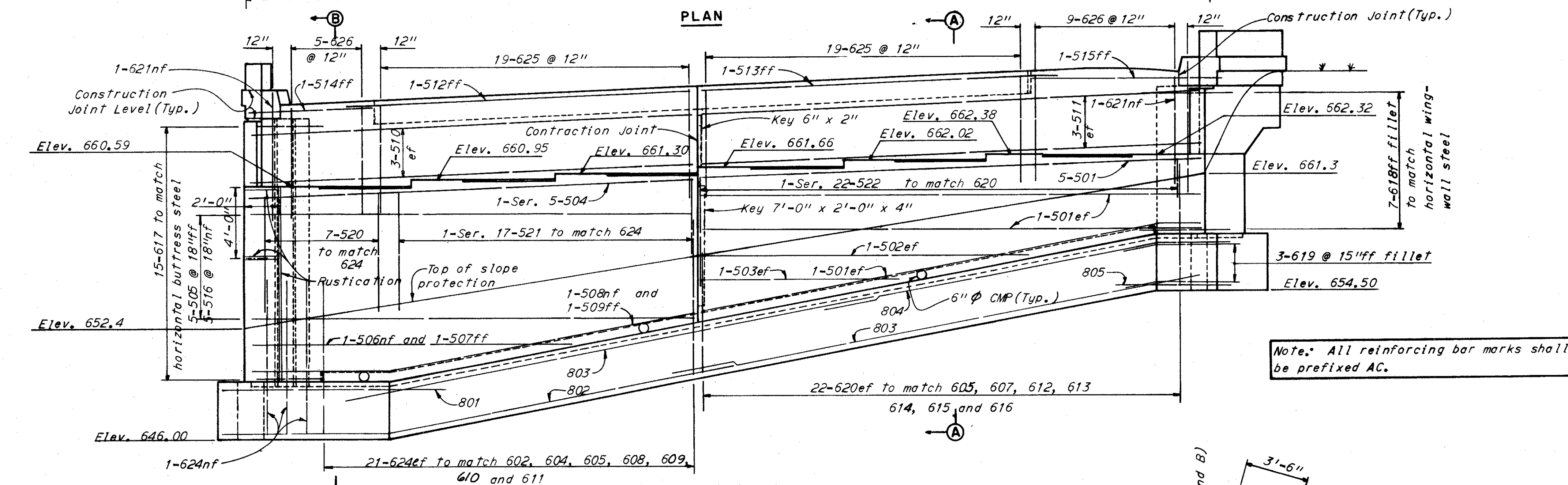
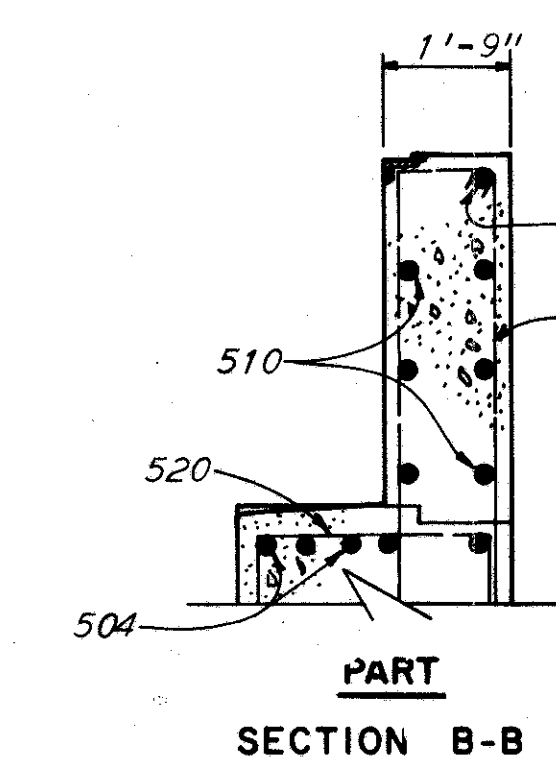
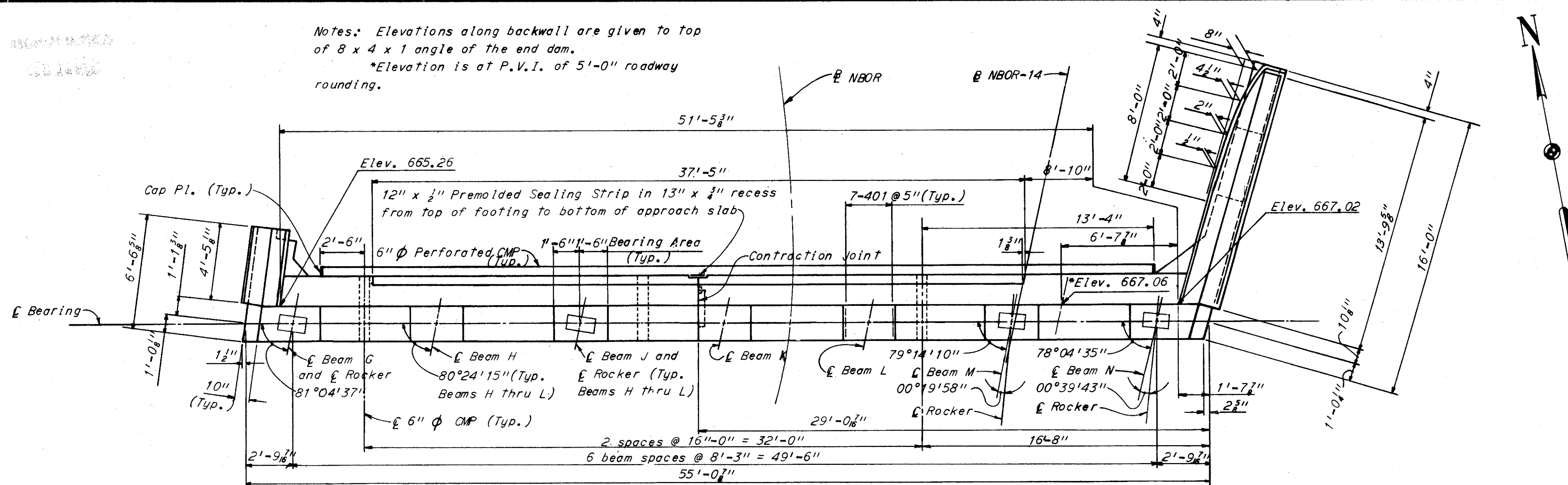


FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

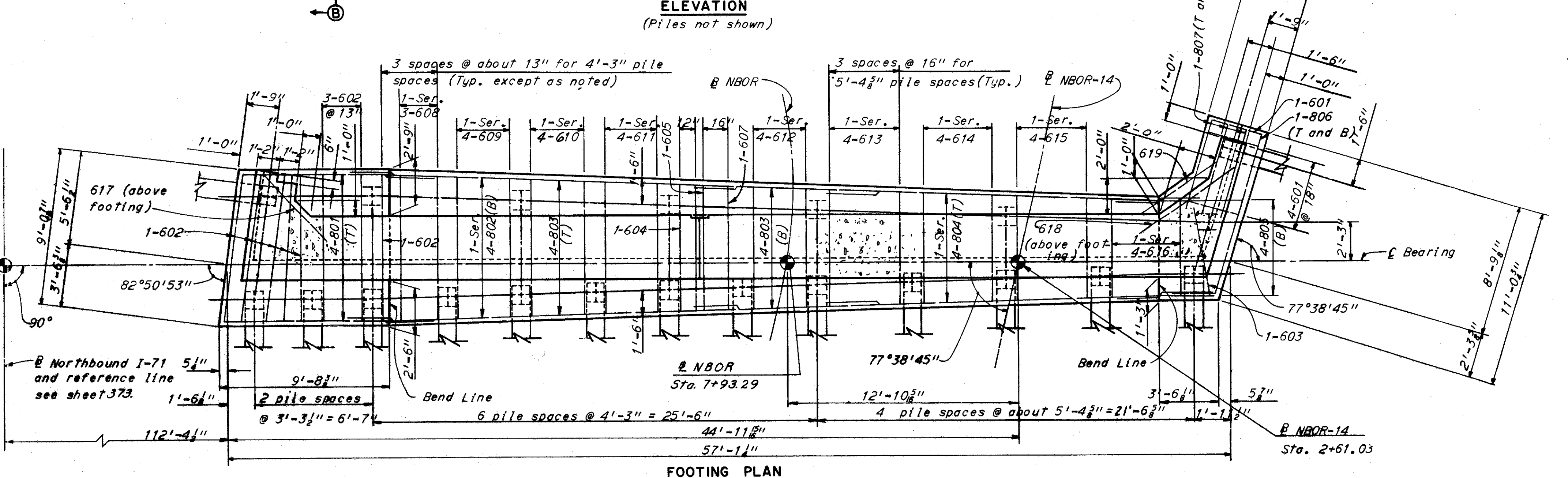
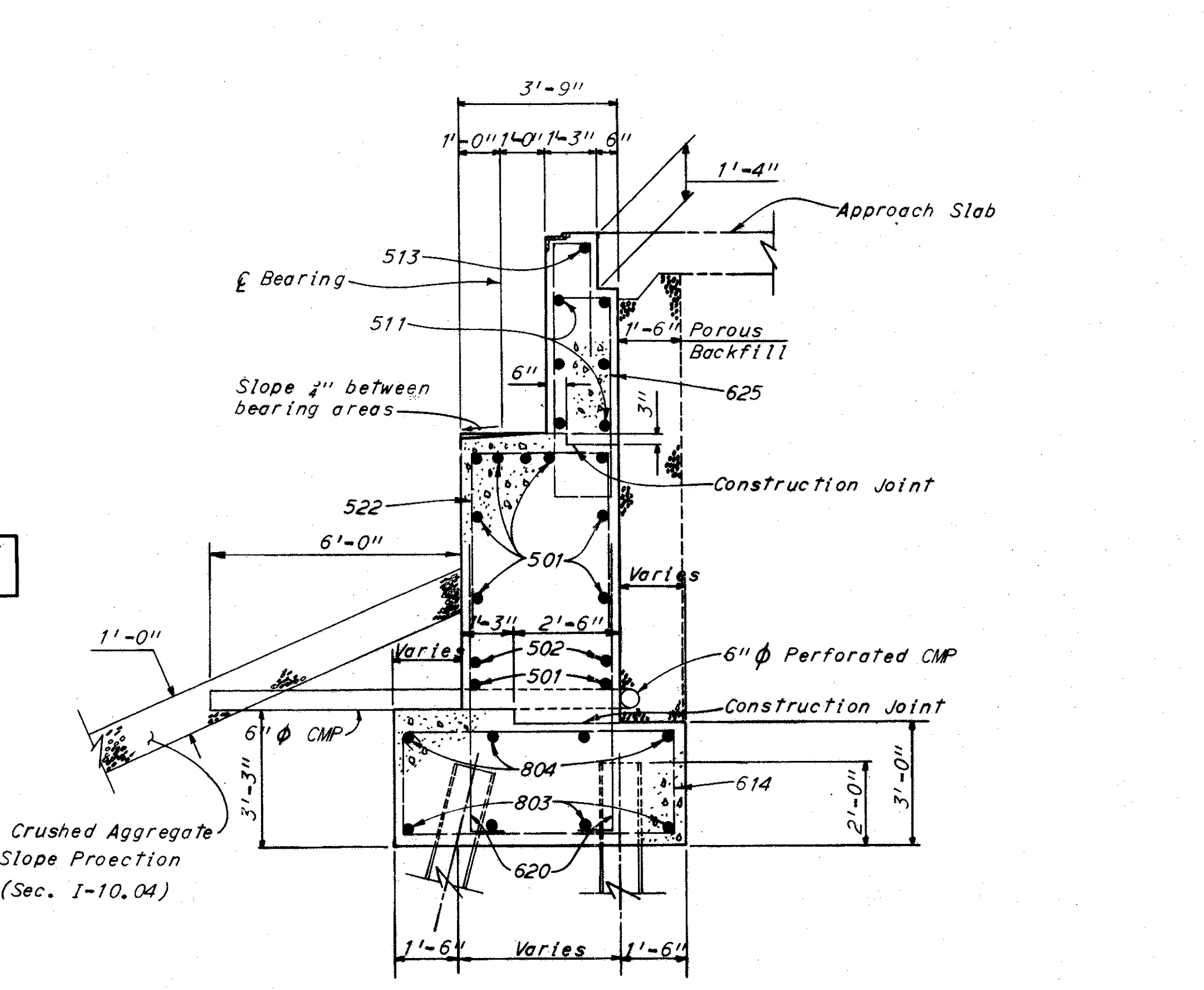
377  
646

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

Notes: Elevations along backwall are given to top of 8 x 4 x 1 angle of the end dam.  
\*Elevation is at P.V.I. of 5'-0" roadway rounding.



Note: All reinforcing bar marks shall be prefixed AC.



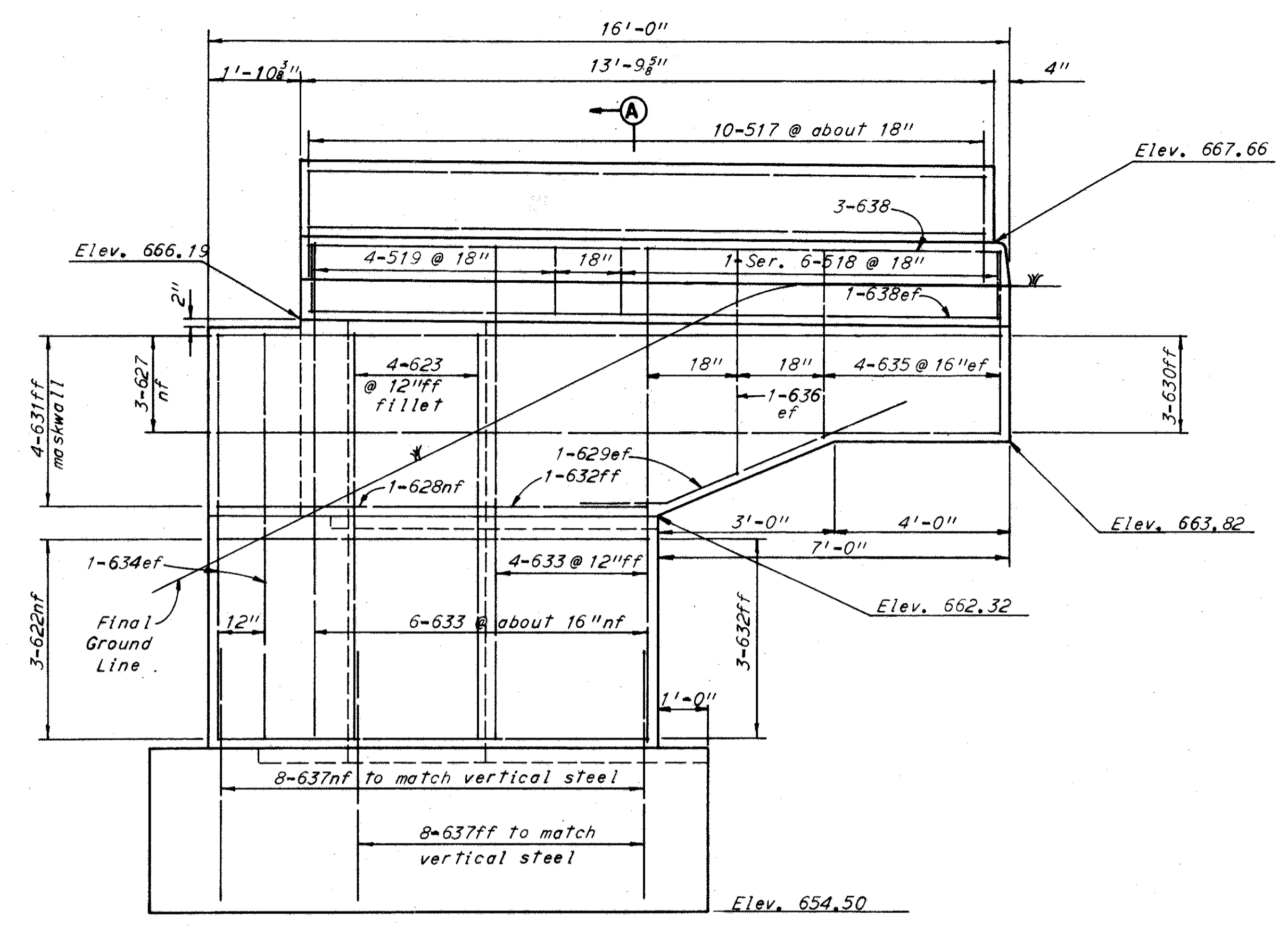
Notes:  
All piles shall be 12 BP 53 steel bearing piles.  
Textured finish, as described in the General Notes, shall be used on buttress and shall extend 2'-0" to vertical rustication on front face of abutment.  
For wingwall and buttress details see Sheet 378.  
The following abbreviations are used:  
nf = near face  
ff = far face  
ef = each face  
T = top face  
B = bottom face  
For additional notes see Sheet 375.

H.N.T.B BRIDGE NOS. 21A & 21B			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>NORTH ABUTMENT - AE</b>			
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS			
BR. NO. CUY-71-1789R		STA. 917+10.09	
		STA. 935+21.25	
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN BY J.E. TRACED	CHECKED BY J.E. TRACED	REVIEWED BY J.E. TRACED	REVISION
DATE 8-15-61	DATE 11-6-61	DATE 12-8-61	

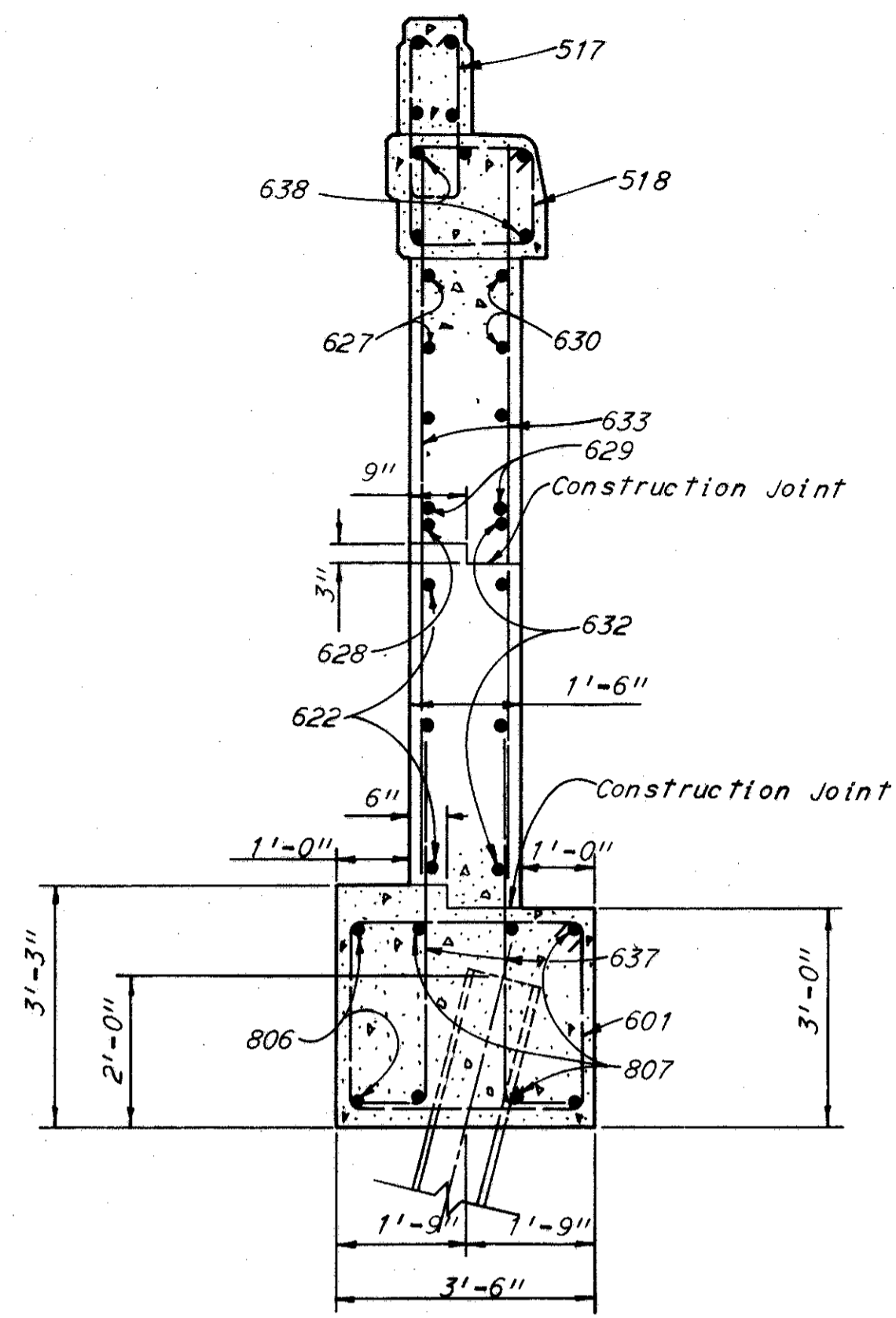
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

378  
646

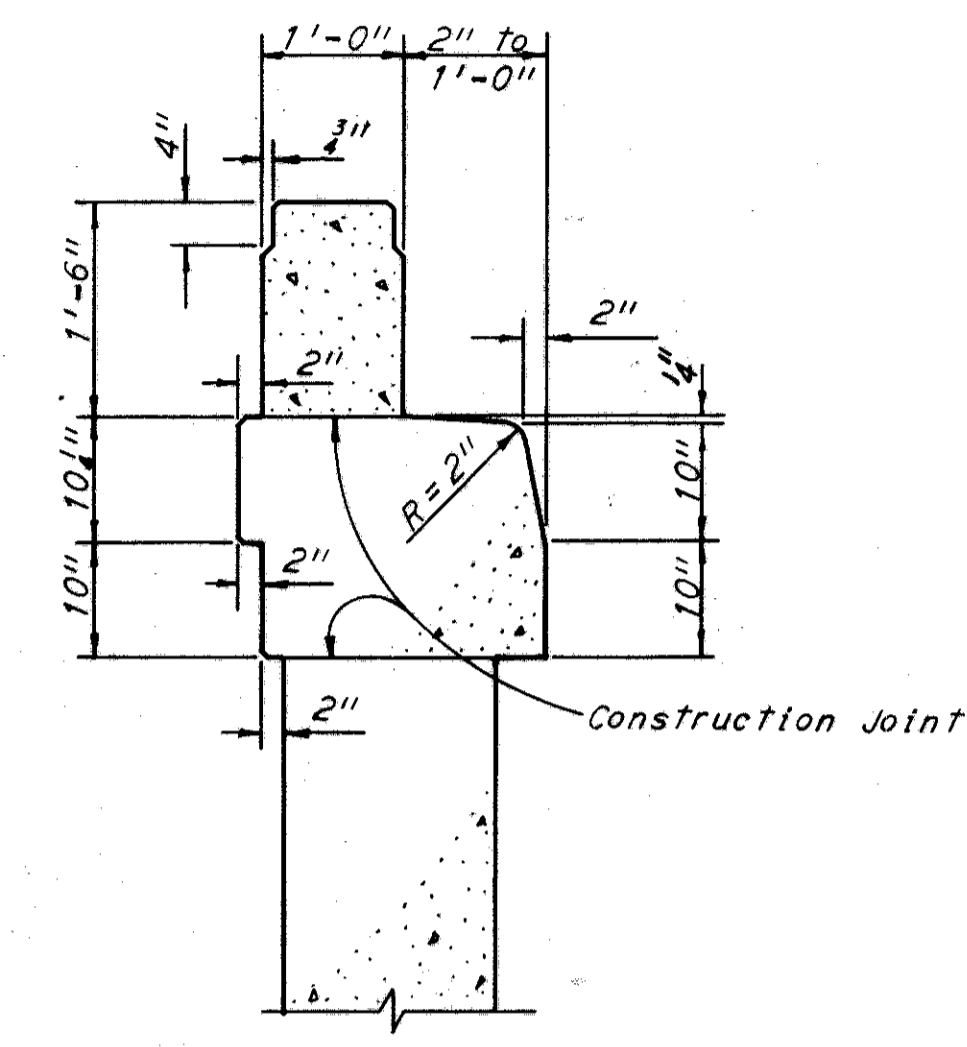
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



**WINGWALL ELEVATION**  
(Piles not shown)

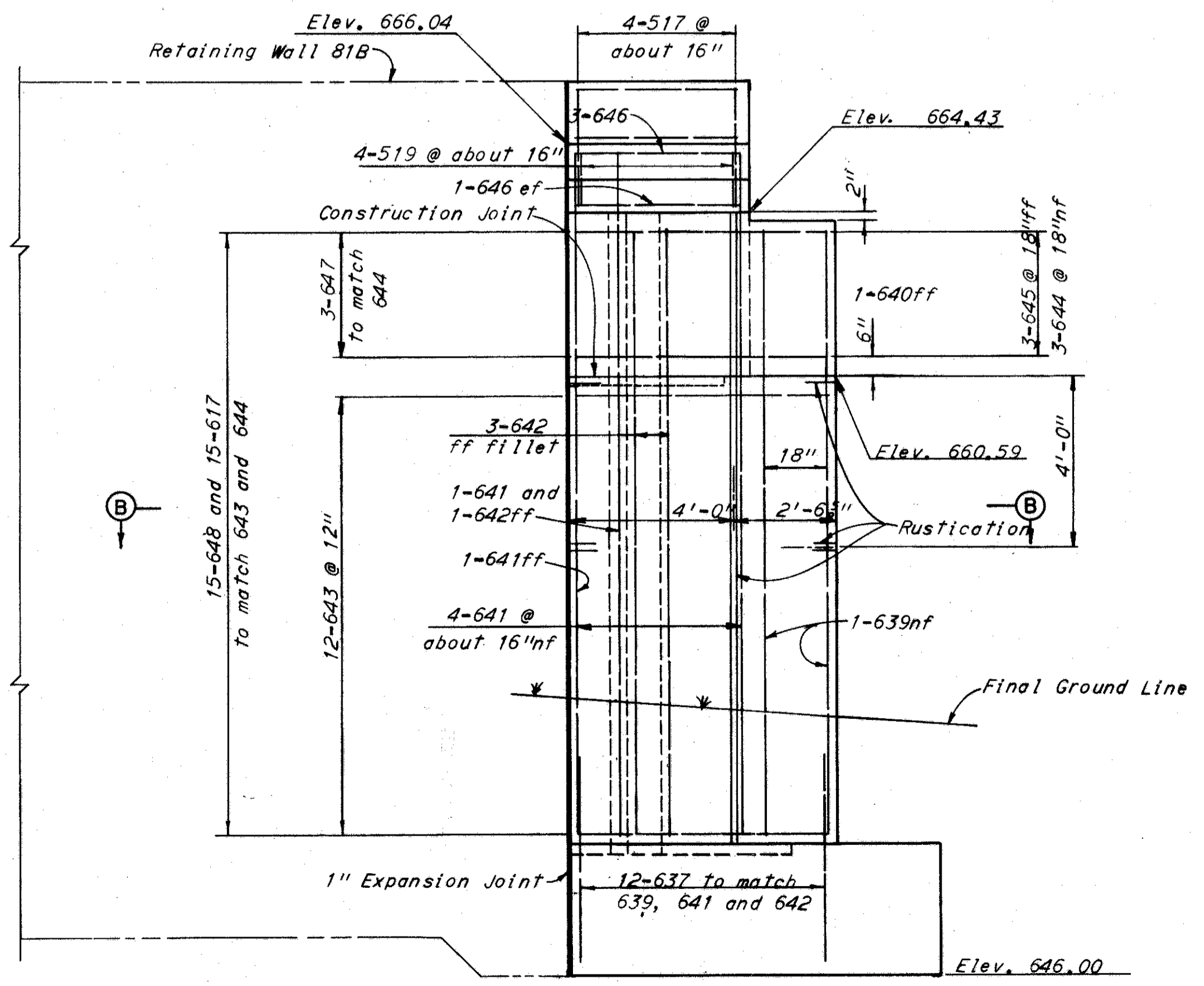


**SECTION A-A**



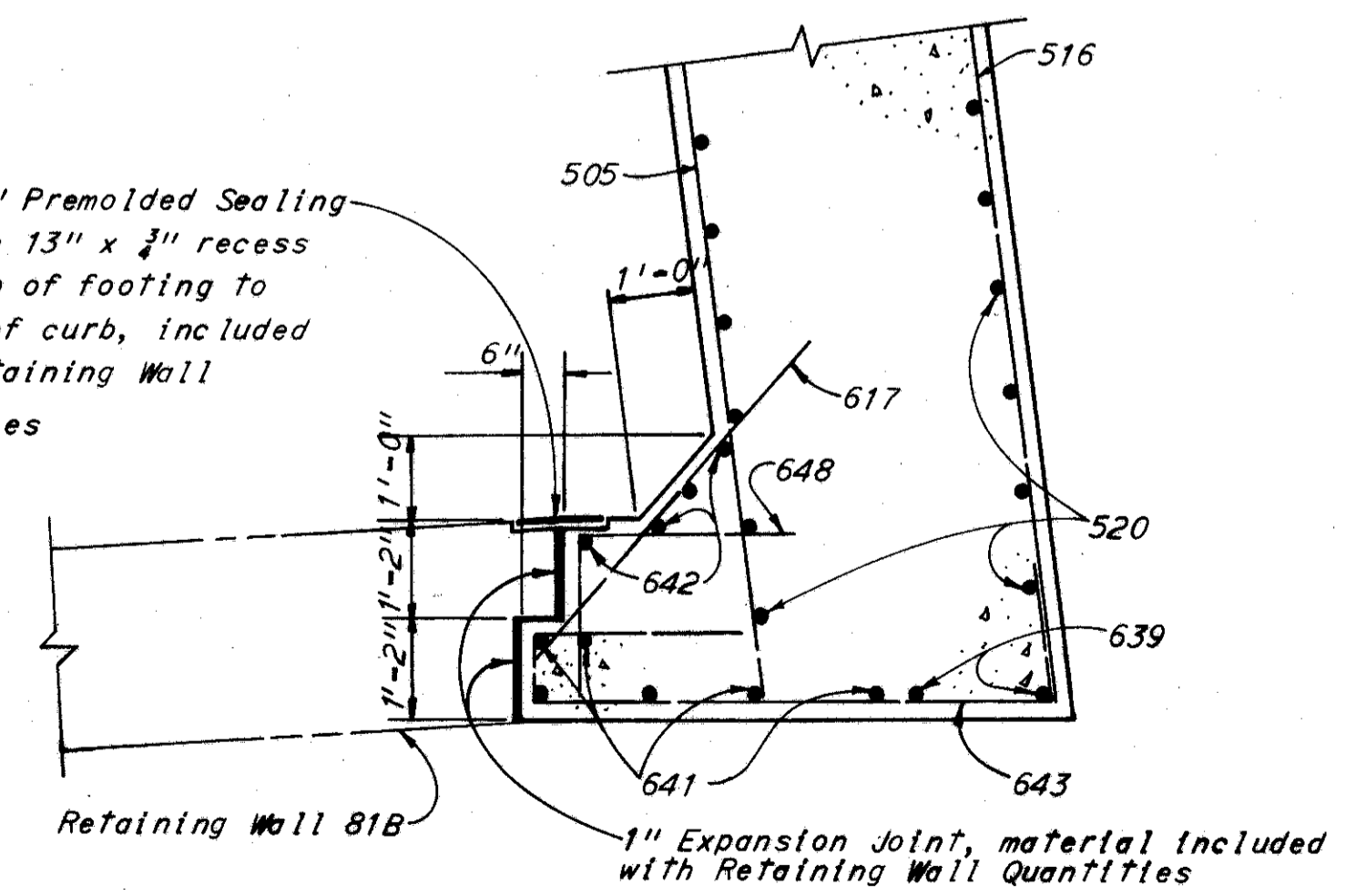
**TYPICAL CURB DETAIL**  
(Reinforcement and Type "A" Railing not shown)

Note: All reinforcing bar marks shall be prefixed AC.

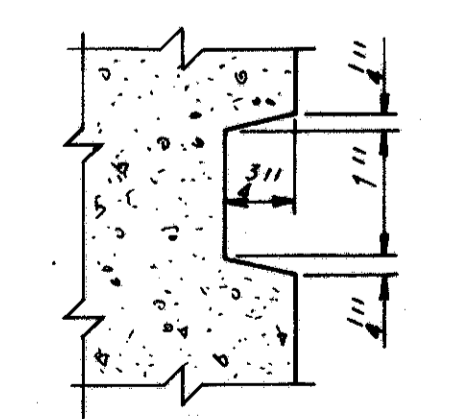


**BUTTRESS ELEVATION**  
(Piles not shown)

12" x 1/2" Premolded Sealing Strip in 13" x 3/4" recess from top of footing to bottom of curb, included with Retaining Wall quantities



**SECTION B-B**



**RUSTICATION DETAIL**

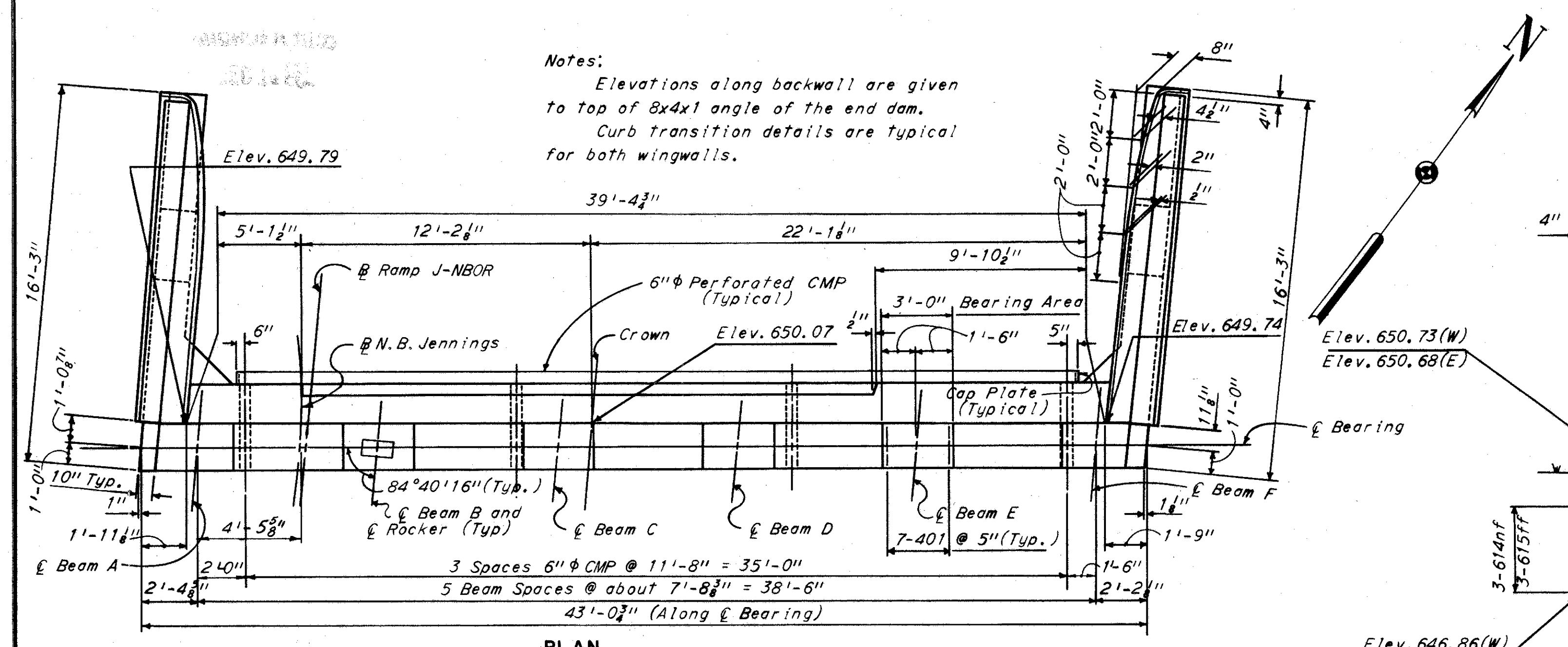
Notes:  
The following abbreviations are used:  
nf = near face  
ff = far face  
ef = each face  
For additional notes see sheet 375.

H.N.T.B BRIDGE NOS. 21A & 21B			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>NORTH ABUTMENT-AE-WINGWALLS</b>			
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS			
BR. NO. CUY-71-1789 R		STA. 917+10.09 STA. 935+21.25	
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN BY DATE 8-16-64	TRACED DATE	CHECKED BY DATE 11-15-64	REVIEWED BY DATE 12-22-64
			REVISED DATE
SHEET 378			

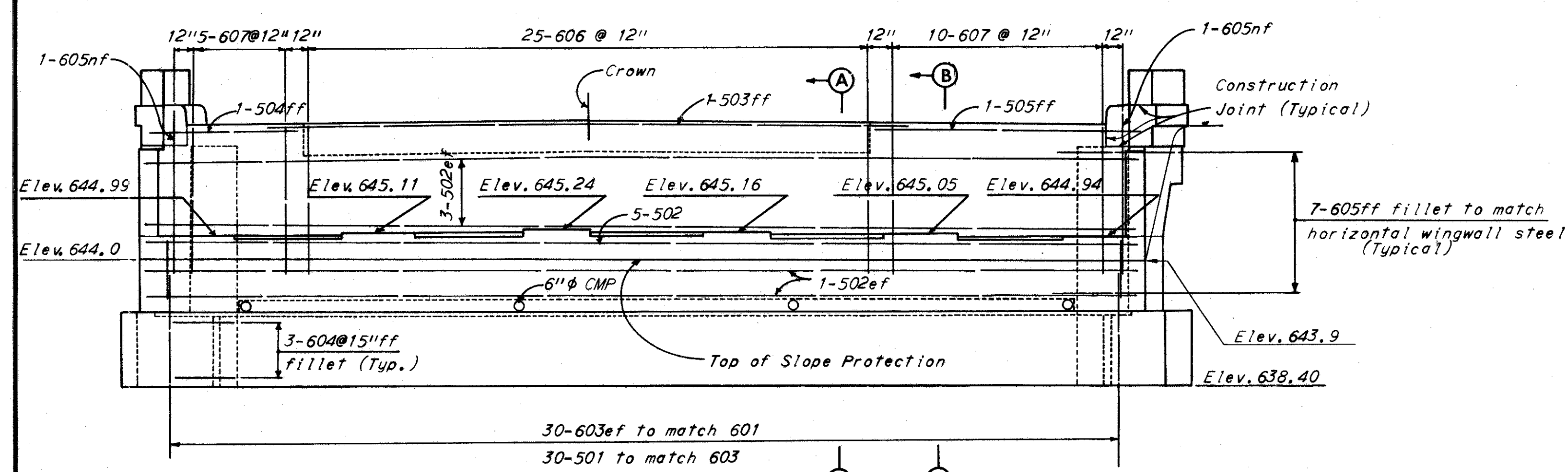


**CUYAHOGA COUNTY**  
**CUY 71-17.83**  
**CUY-176-12.76**

**Notes:**  
 Elevations along backwall are given to top of 8x4x1 angle of the end dam.  
 Curb transition details are typical for both wingwalls.

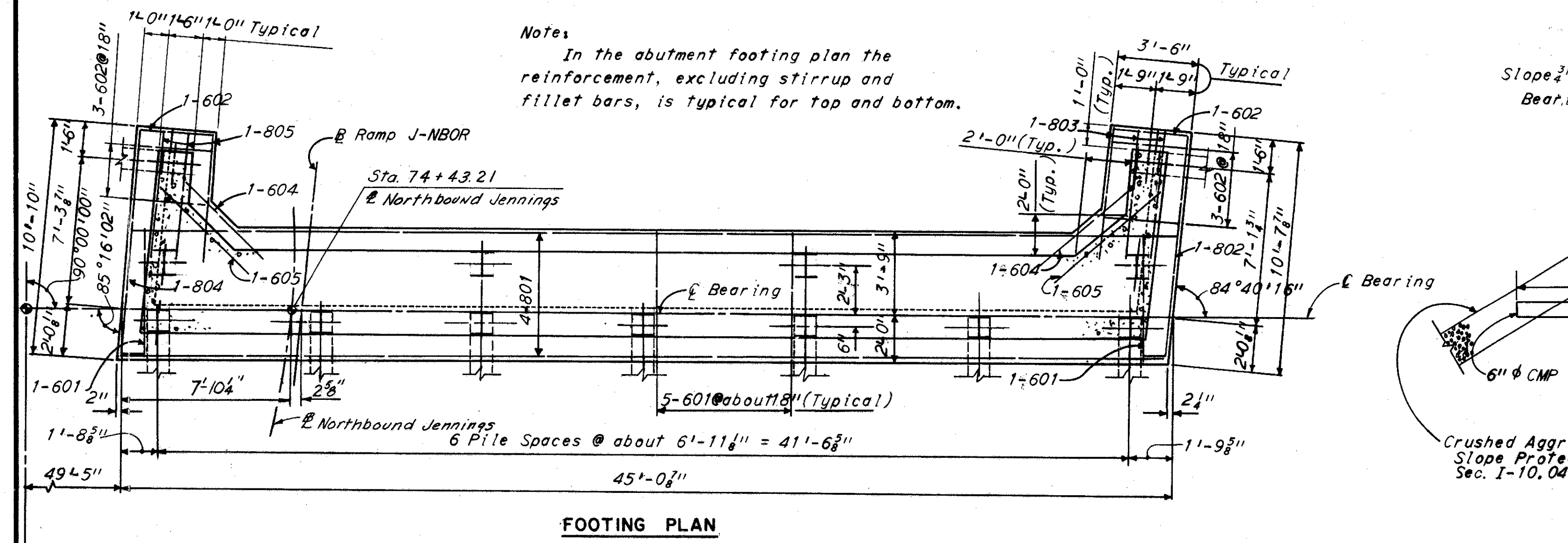


**PLAN**

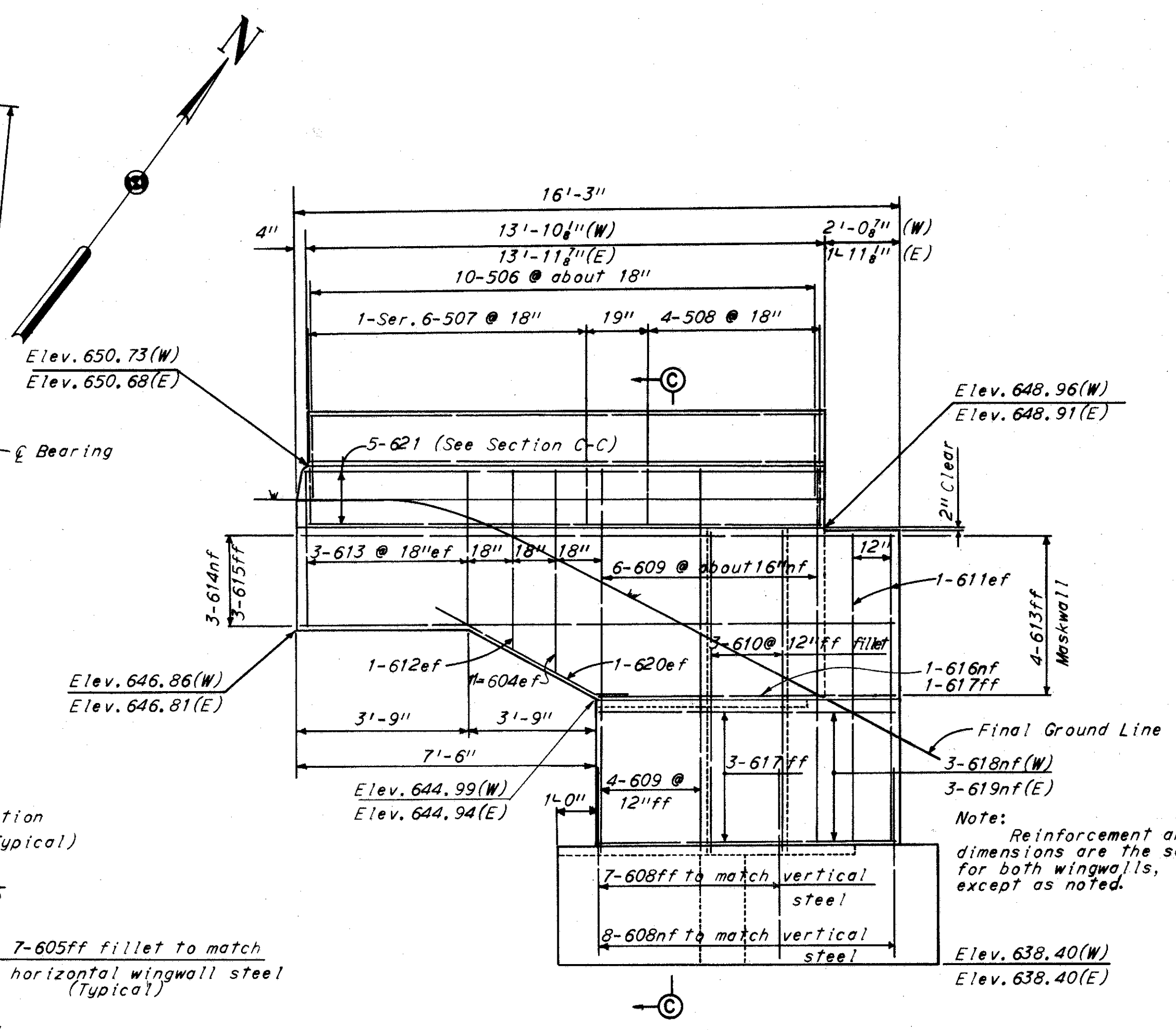


**ELEVATION**  
 (Piles not shown)

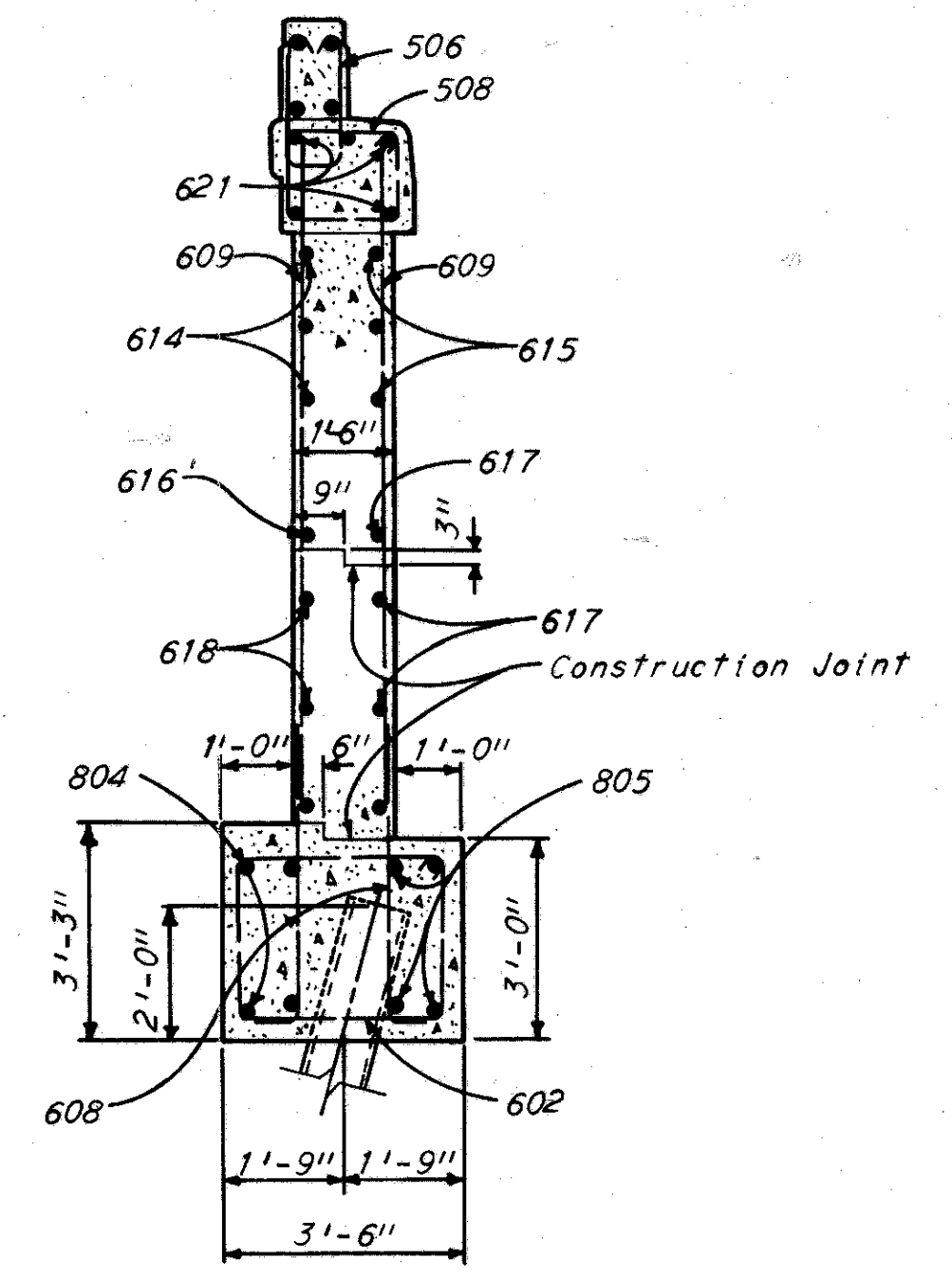
**Note:** All Reinforcing Bar Marks shall be prefixed AE.



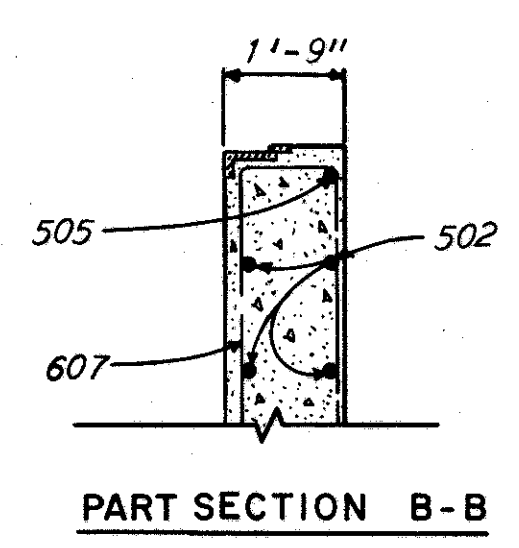
**FOOTING PLAN**



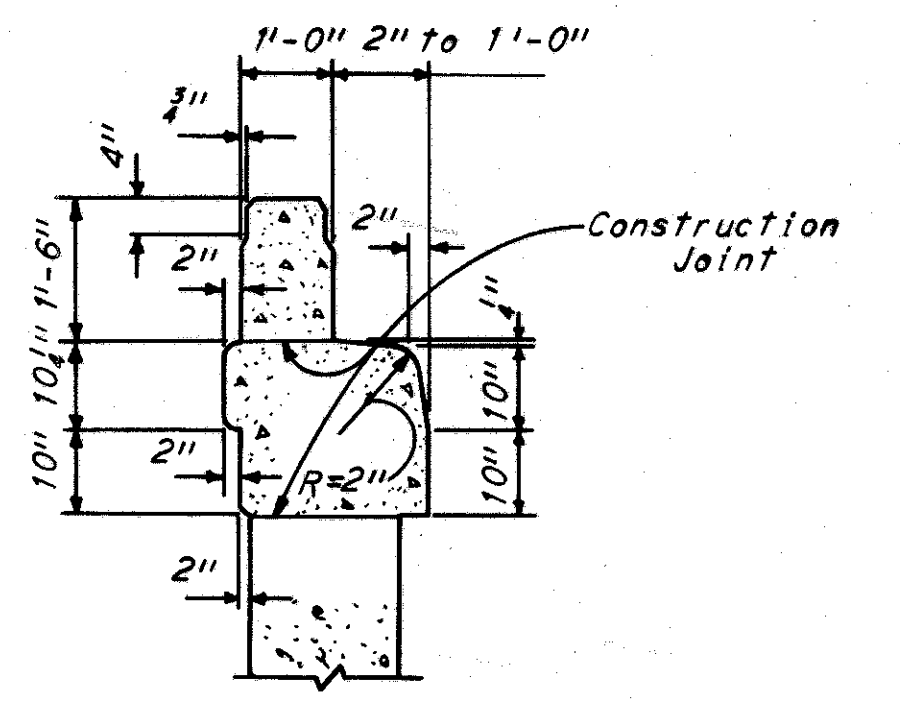
**WINGWALL ELEVATION**  
 (Piles not shown)



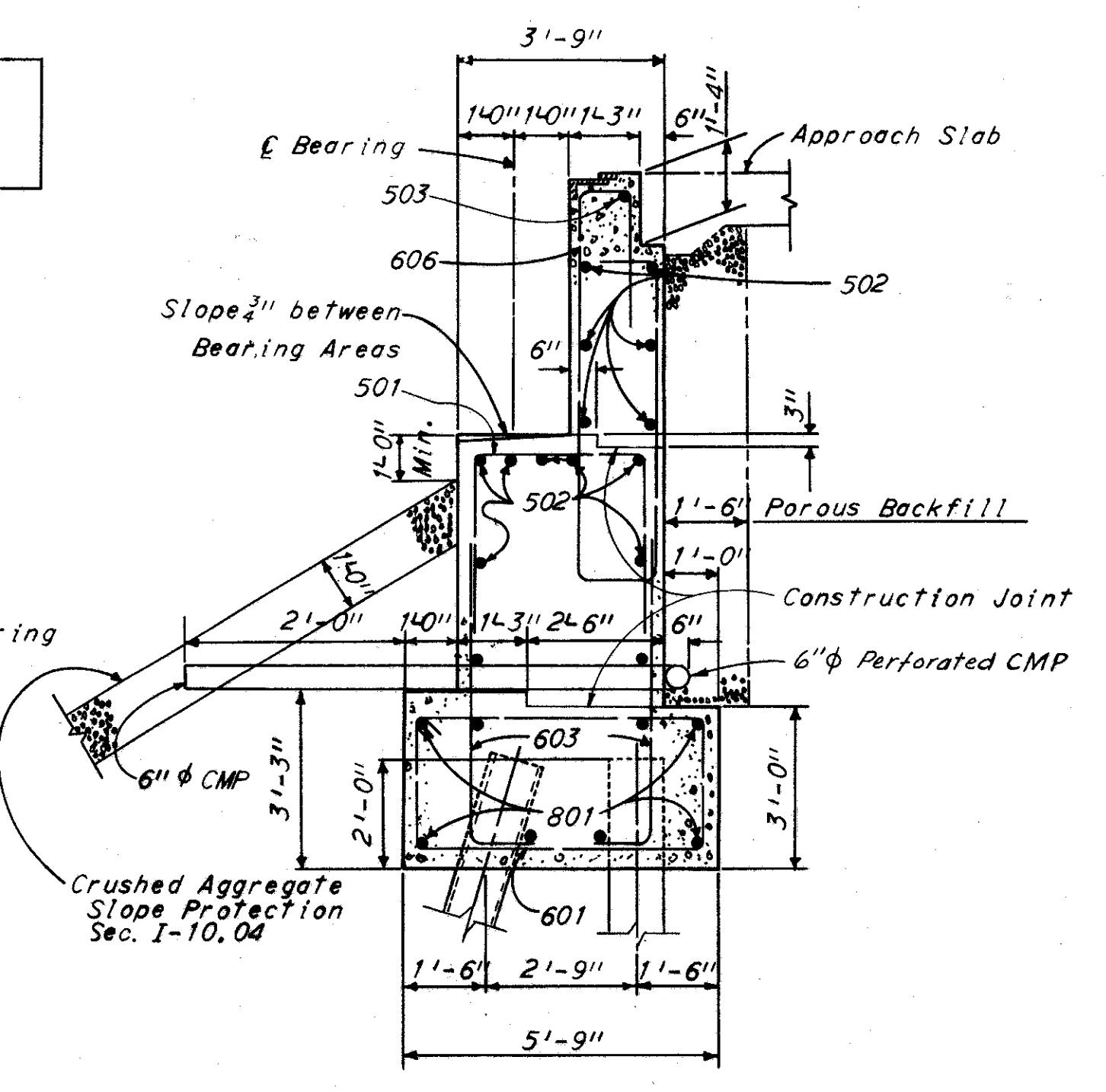
**SECTION C-C**  
 (West Wingwall shown)



**PART SECTION B-B**



**TYPICAL CURB DETAIL**  
 (Reinforcement and Type "A" Railing not shown)



**SECTION A-A**

**Notes:**  
 All piles shall be 12 PB 53 steel bearing piles.  
 The following abbreviations are used:  
 nf = near face  
 ff = far face  
 ef = each face  
 (W) = West  
 (E) = East  
 For additional notes see Sheet 379

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**NORTH ABUTMENT -BW**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

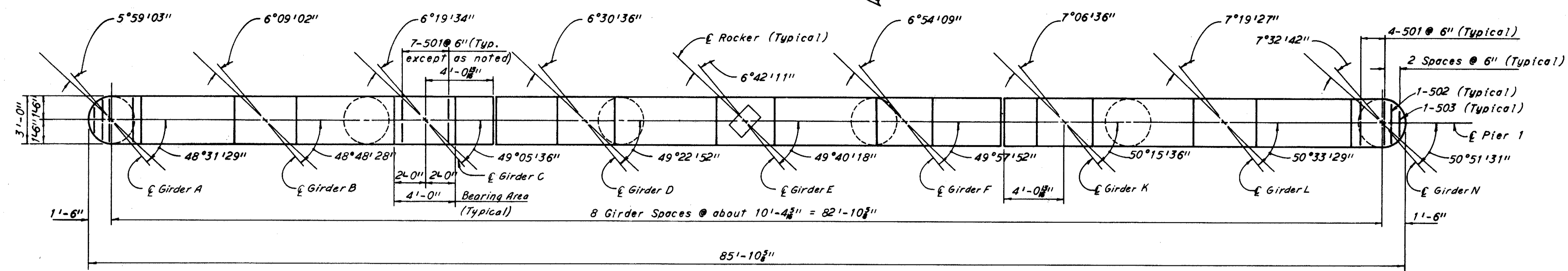
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN J.G.	TRACED	CHECKED W.F.
DATE 9-11-64	DATE	DATE 12-22-64

SHEET 380

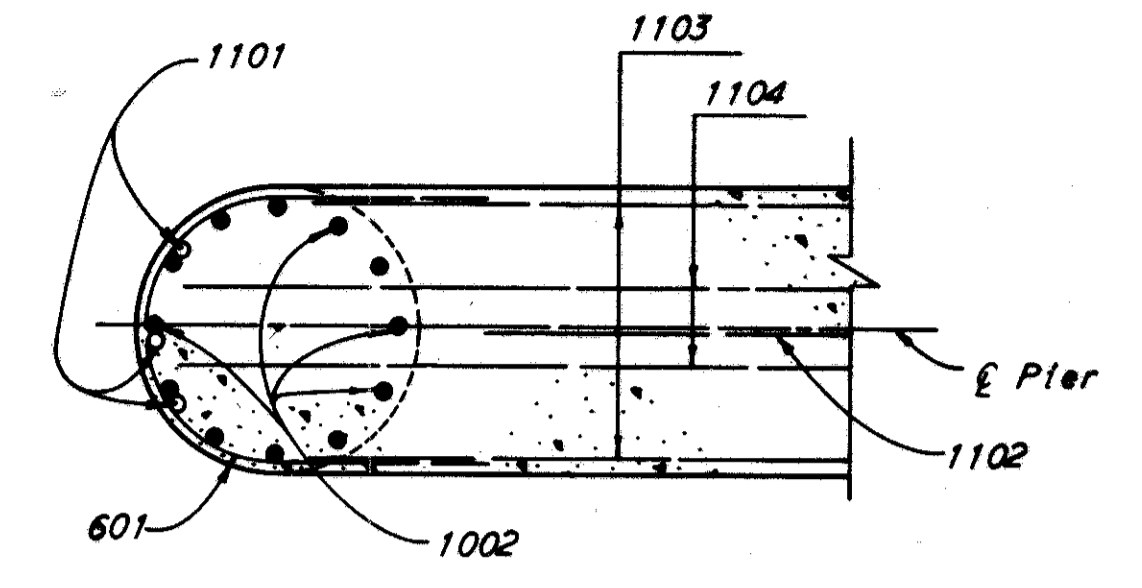




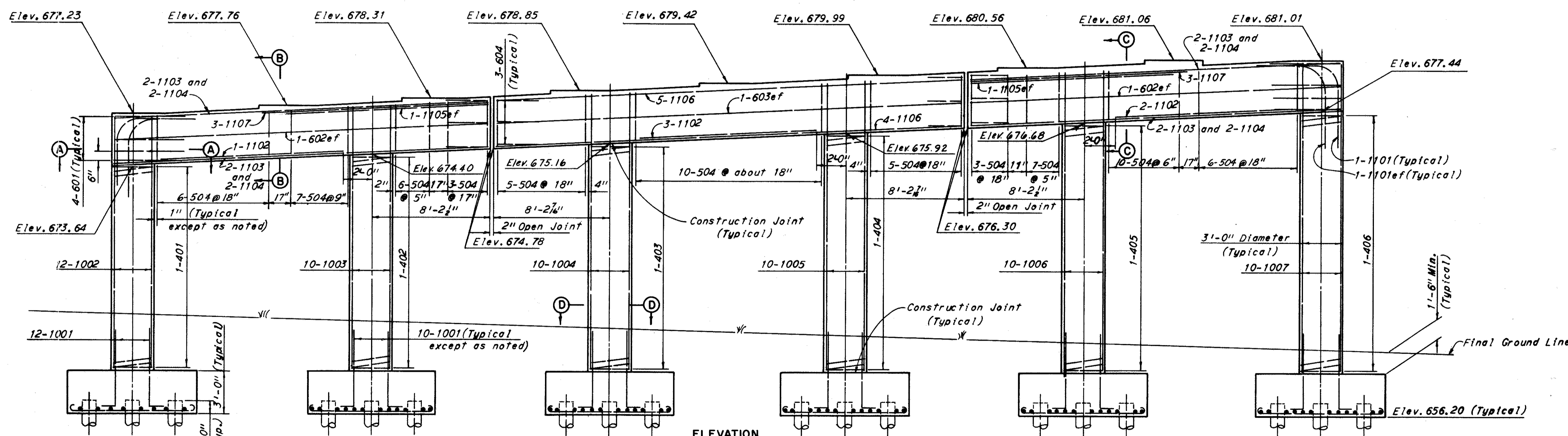
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



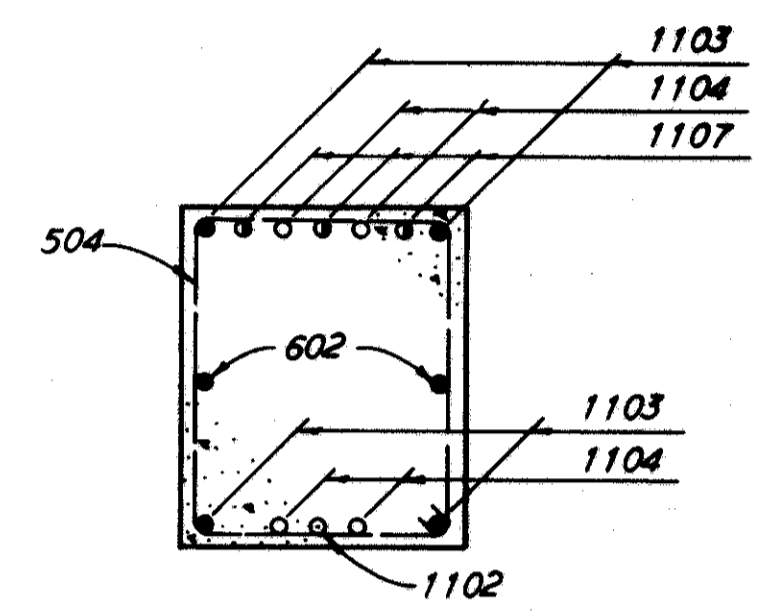
PLAN



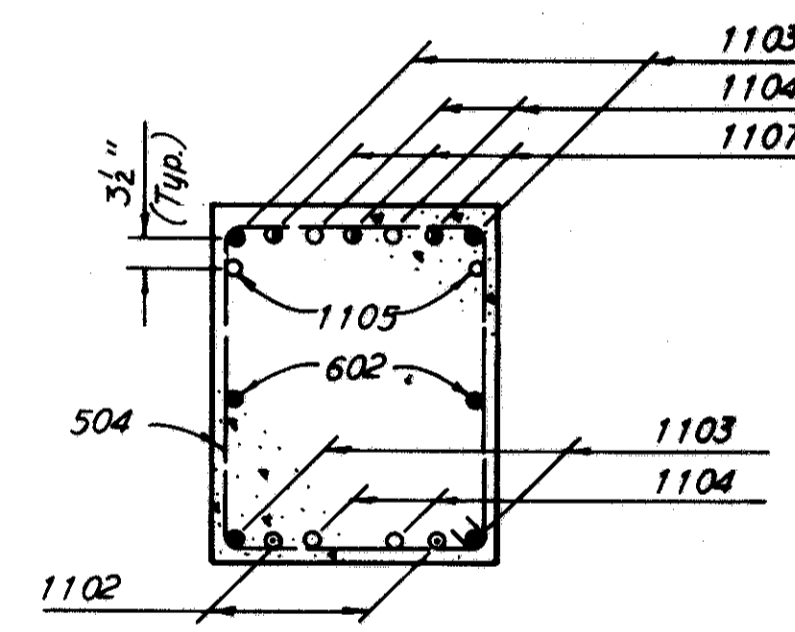
SECTION A-A



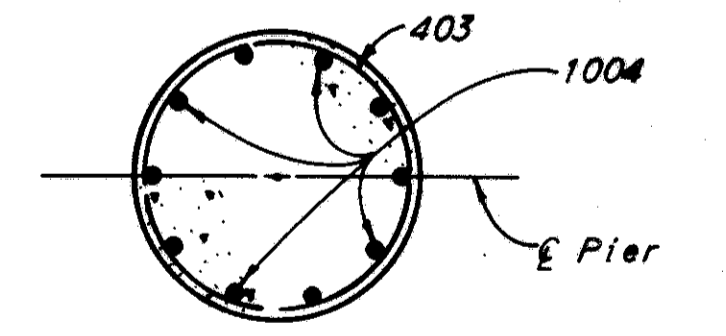
ELEVATION



SECTION B-B



SECTION C-C

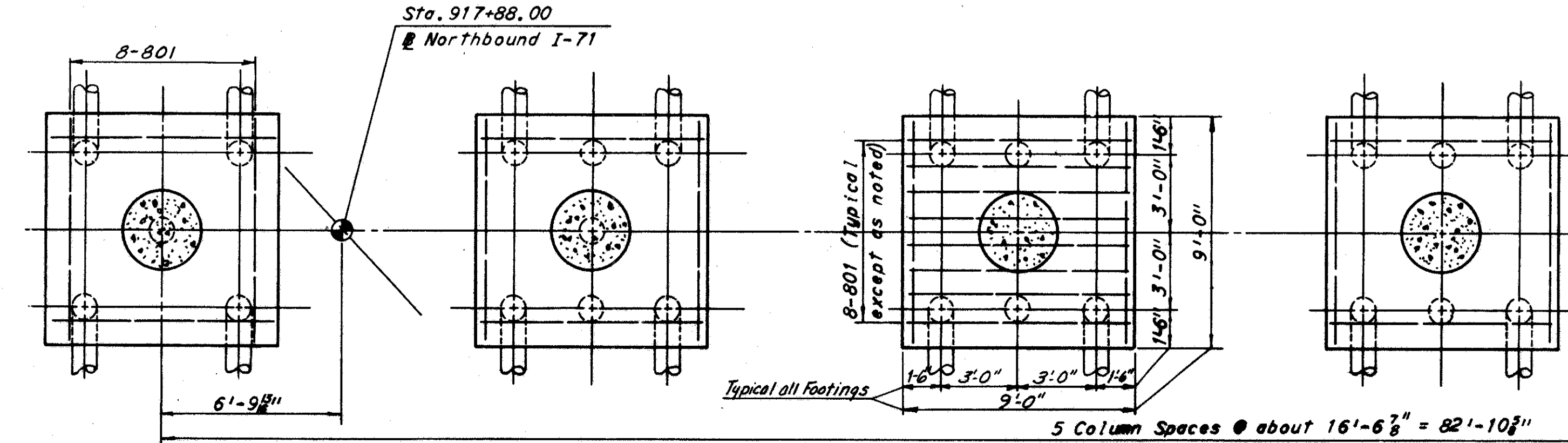


SECTION D-D

Note: Top of Pier Cap shall parallel bottom of Pier Cap between bearing areas.

Note: All reinforcing bar marks shall be prefixed PA.

Notes:  
All piles are 12" C.I.P. Reinforced Concrete Piles.  
The following abbreviation is used:  
ef = each face  
For additional notes see sheet 383.



FOOTING PLAN

M.L.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
CLEVELAND NEW YORK

**PIER 1**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

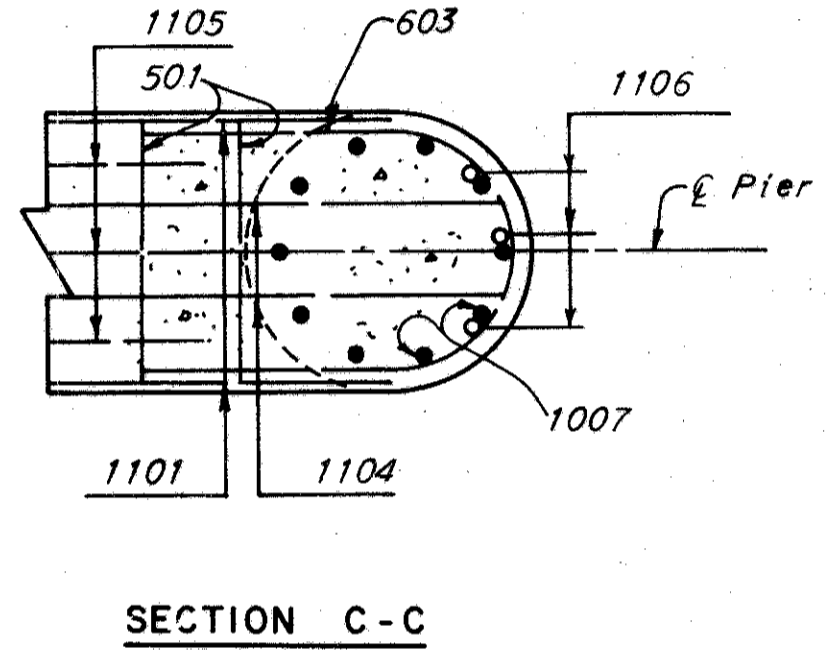
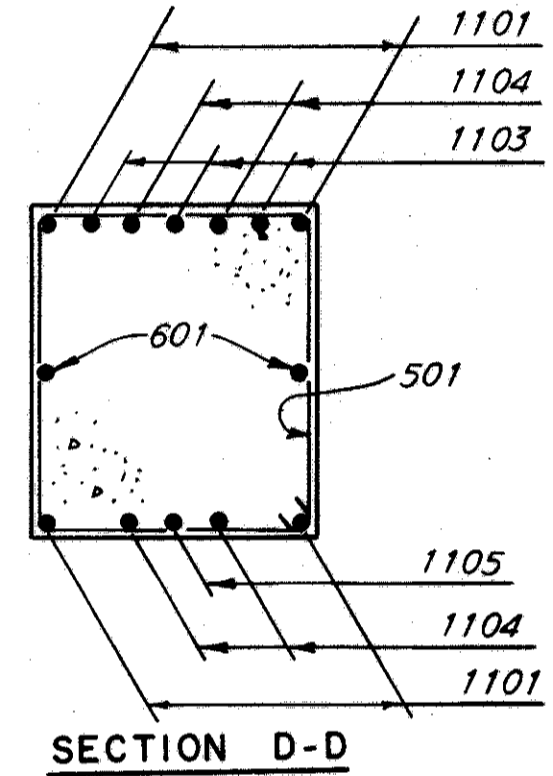
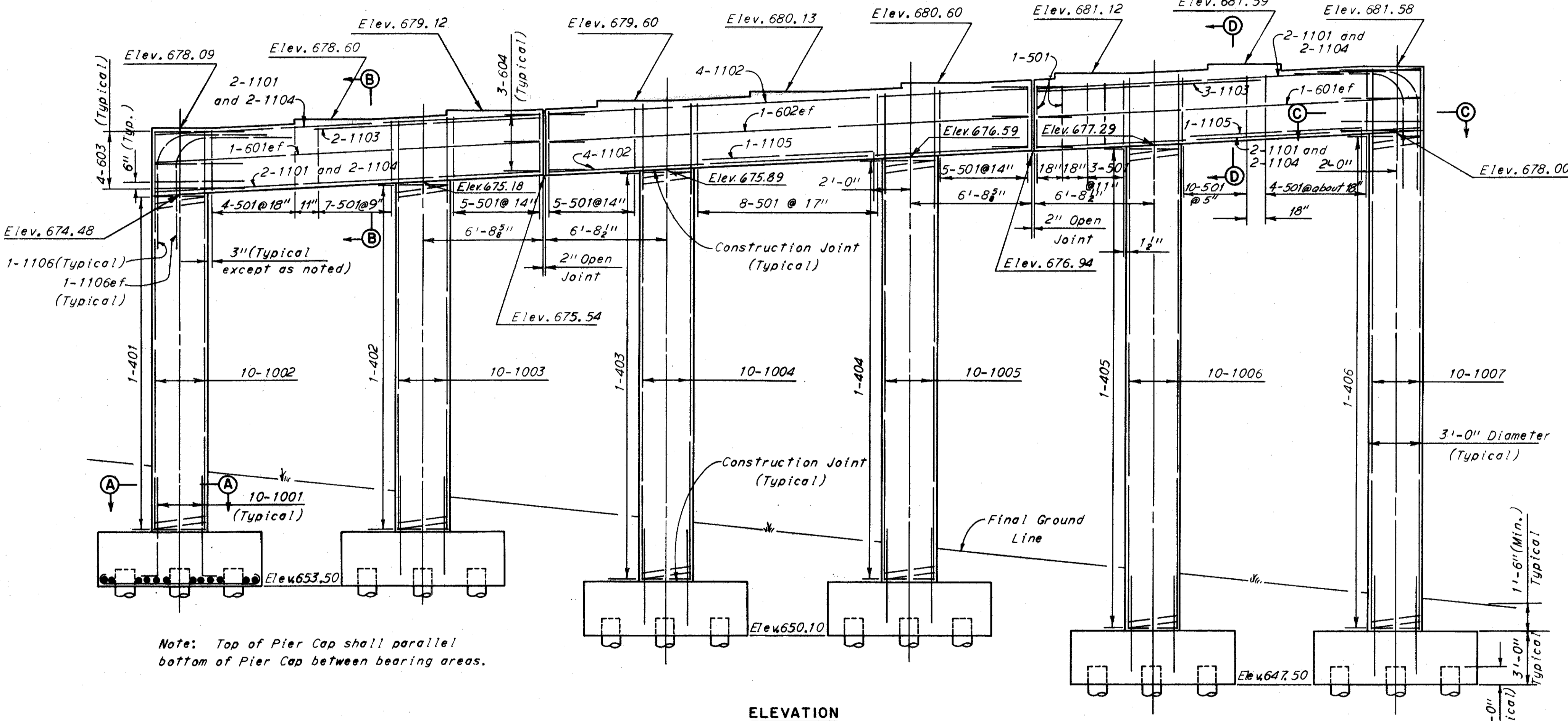
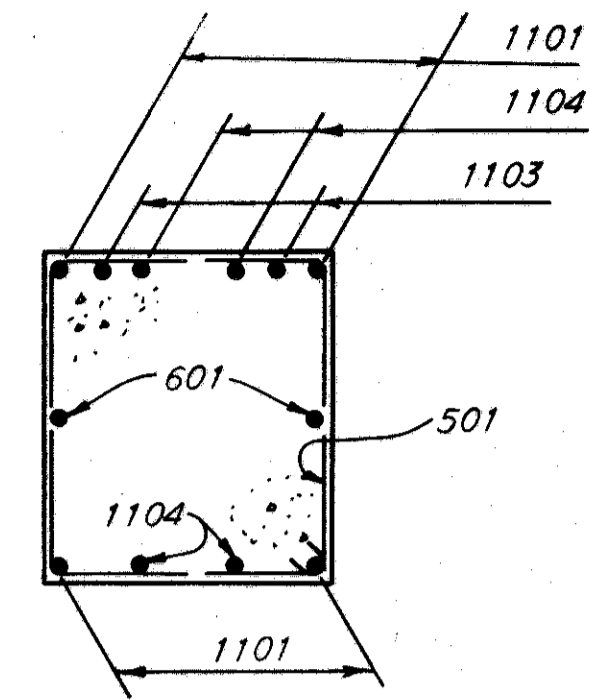
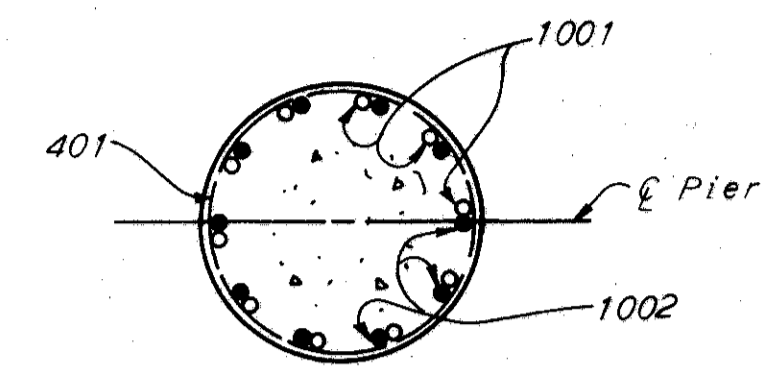
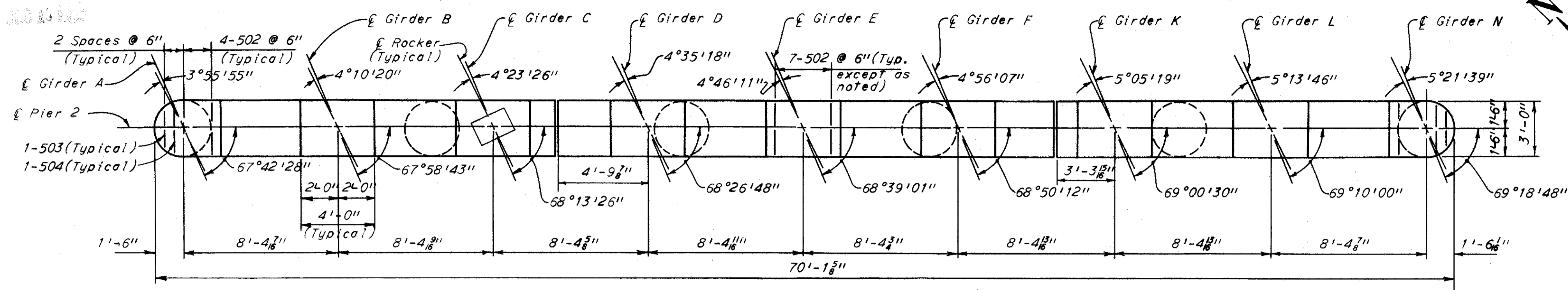
DATE 1/16/64	TRACED	CHECKED	DATE 2/22/64	REVIEWED	DATE 12/28/64
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SHEET 382

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

383  
646

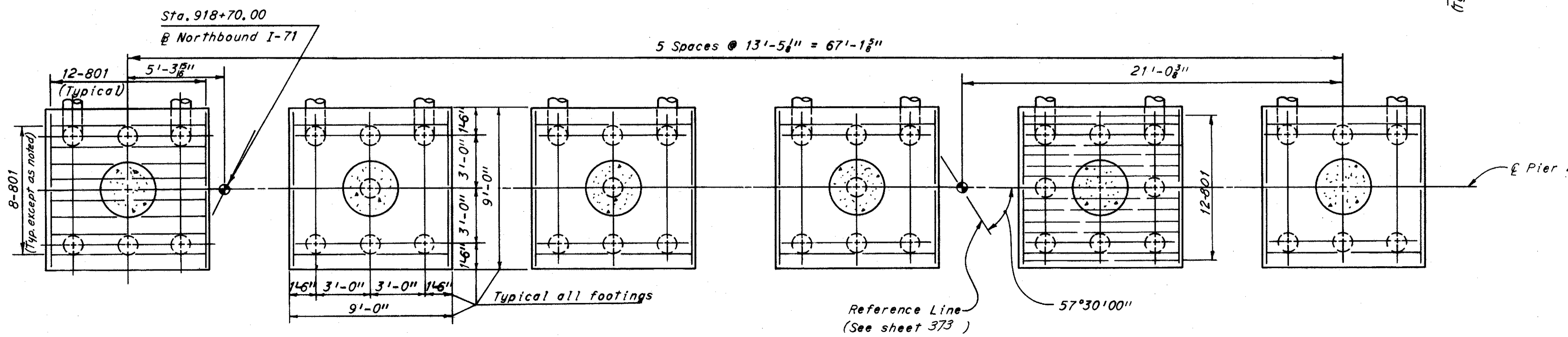
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



Notes:  
All piles are 12"  $\phi$  C.I.P. Reinforced Concrete.  
All battered piles shall be inclined 3 in 12 in the direction shown.  
Pile layout dimensions are measured along bottom of footing.  
For Reinforcement Schedule and Bar Bending Diagrams see Sheet 452.  
The following abbreviation is used:  
ef = each face

Note: All reinforcing bar marks shall be prefixed PB.

Note: Top of Pier Cap shall parallel bottom of Pier Cap between bearing areas.



H.N.T.B BRIDGE NOS. 21A & 21B

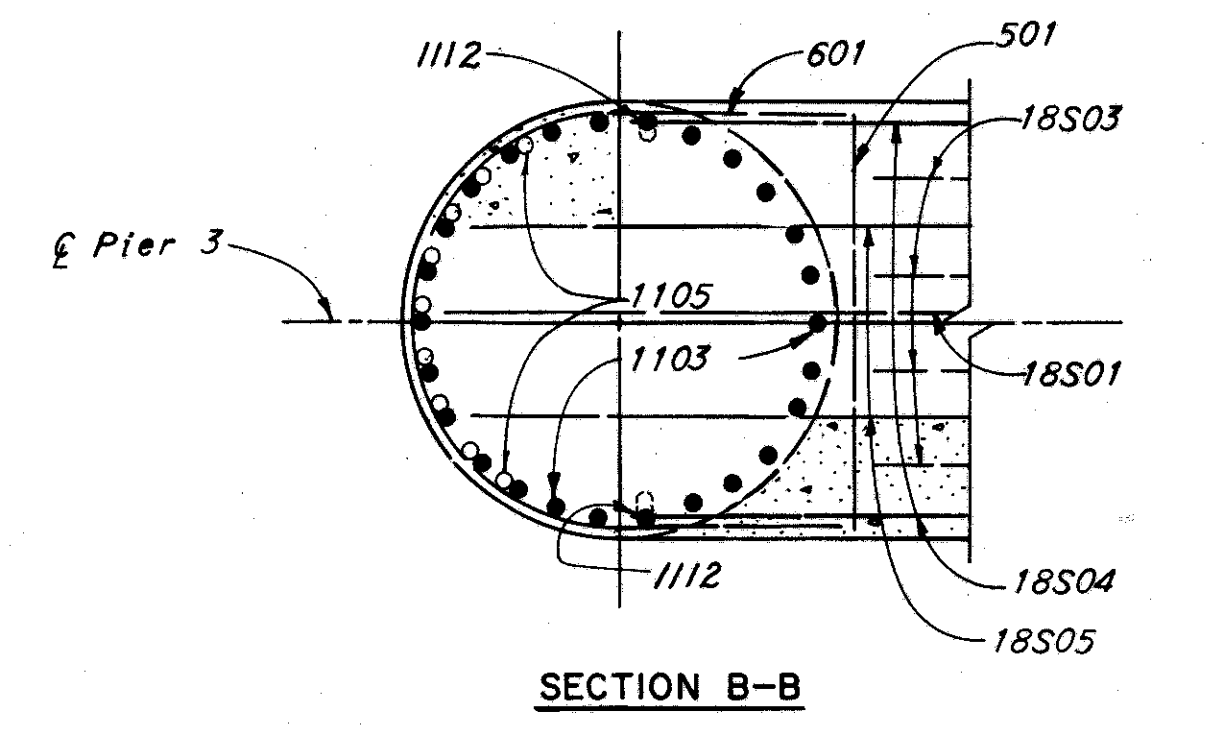
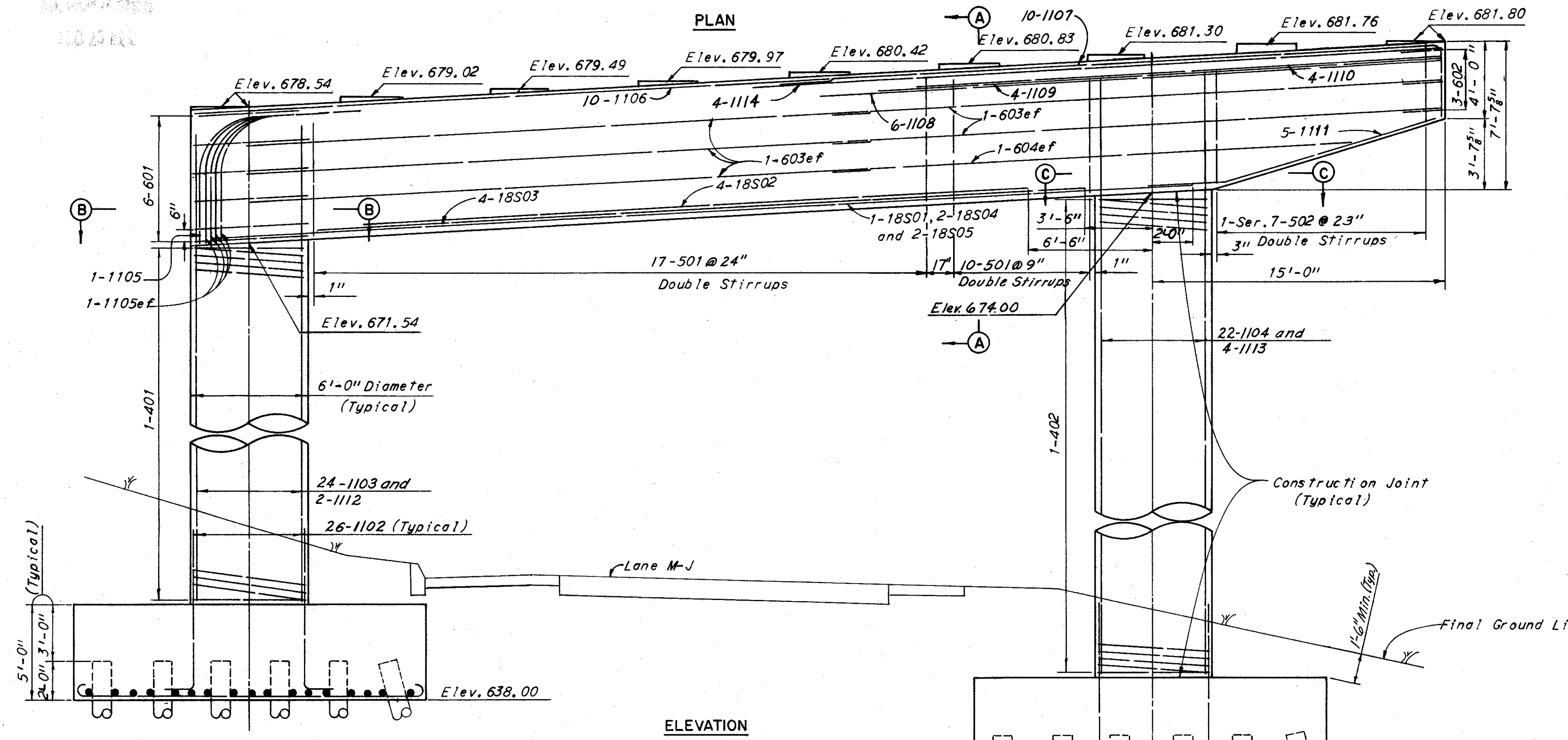
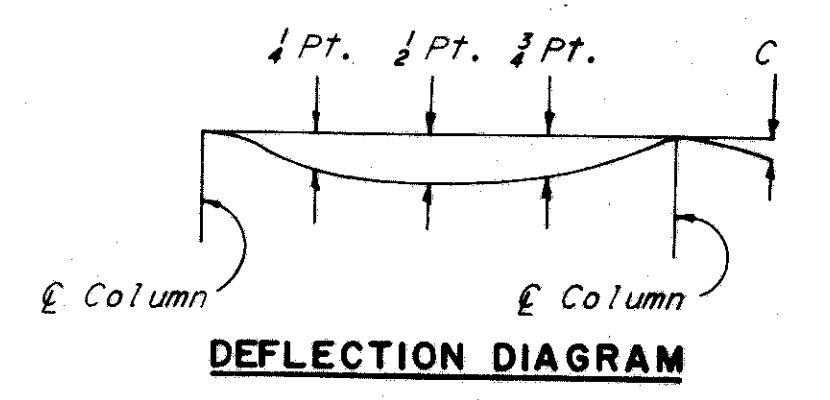
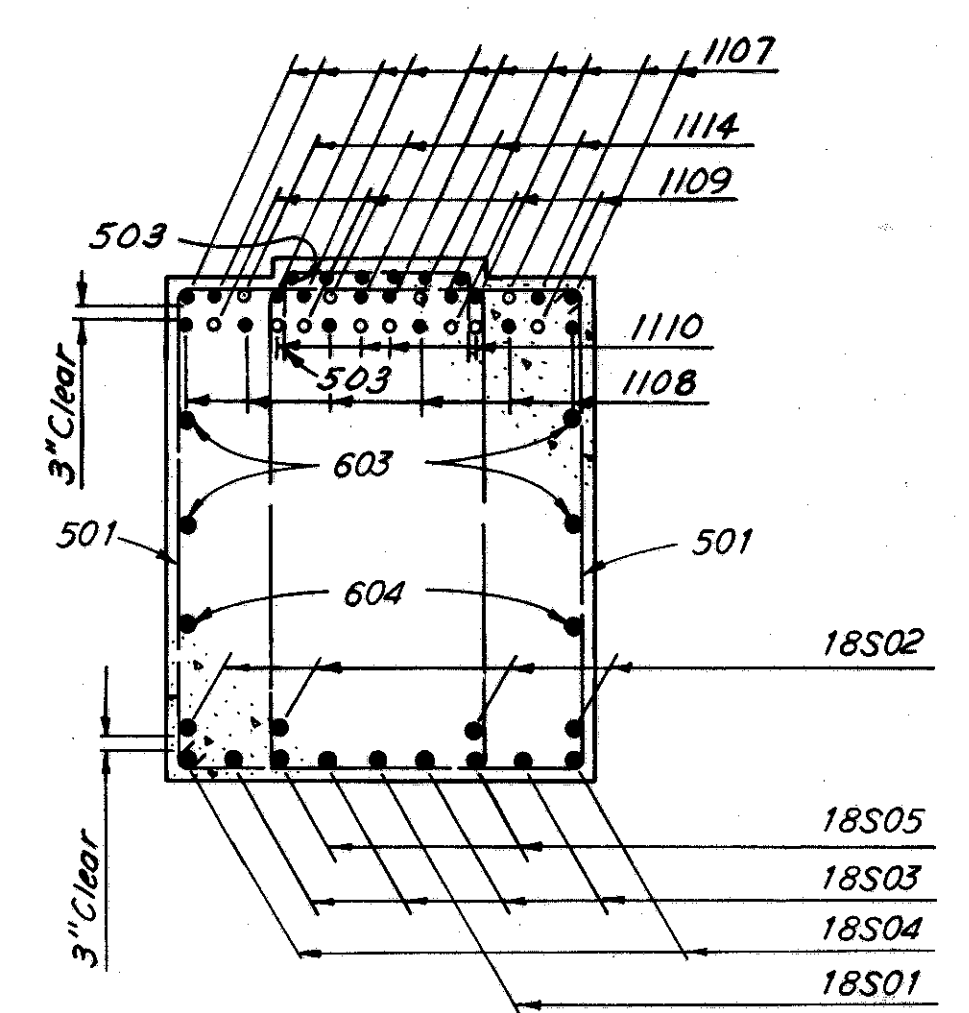
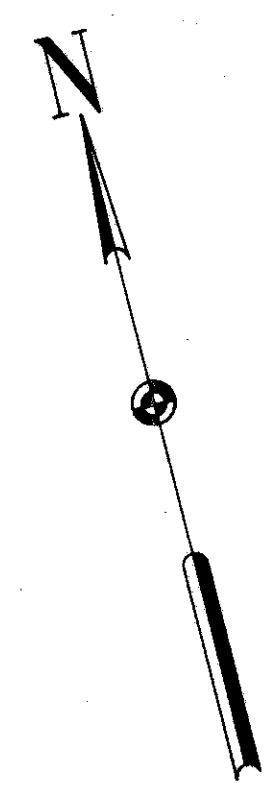
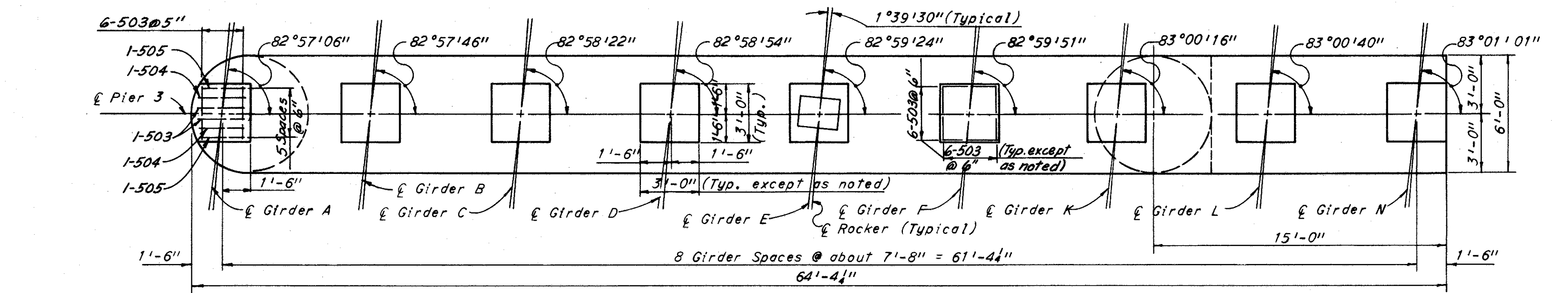
HOWARD, NEEDLES TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
CLEVELAND NEW YORK

**PIER 2**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS  
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 8-12-64	DATE	DATE 10-10-64	DATE 12-22-64	

SHEET 383

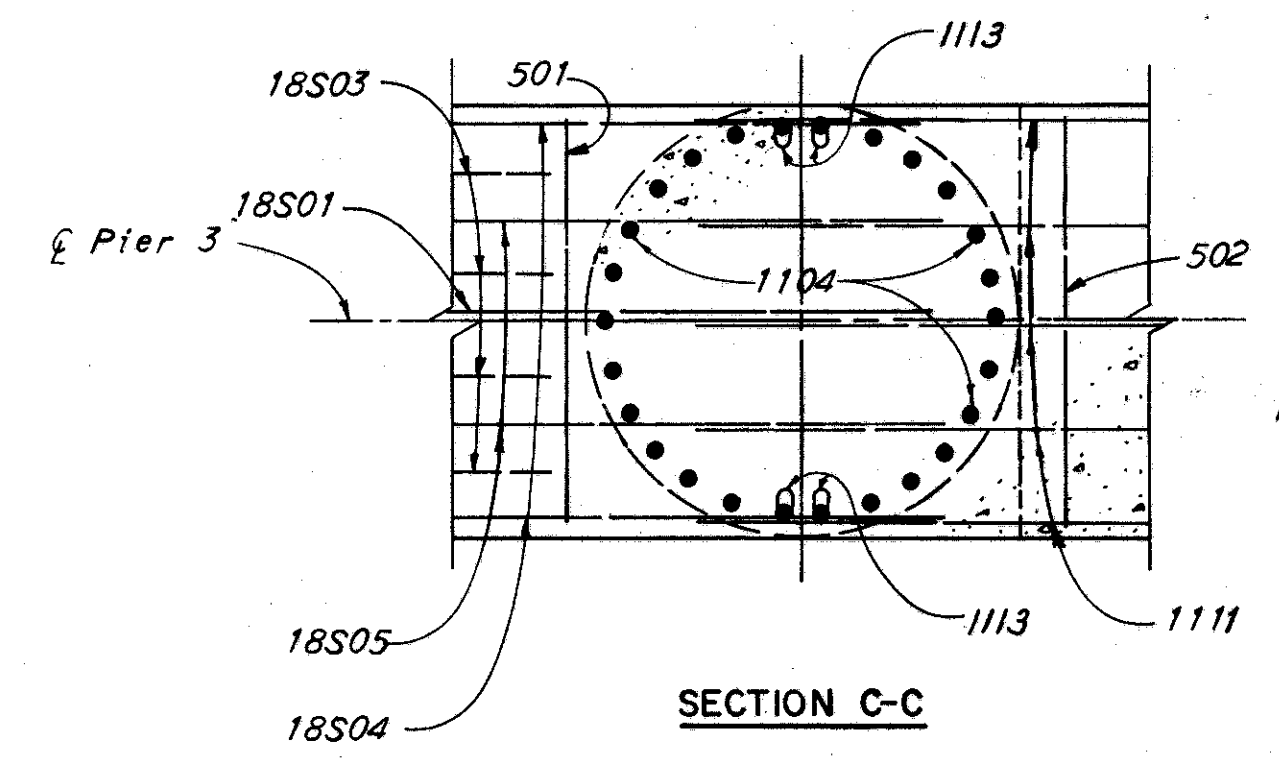
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



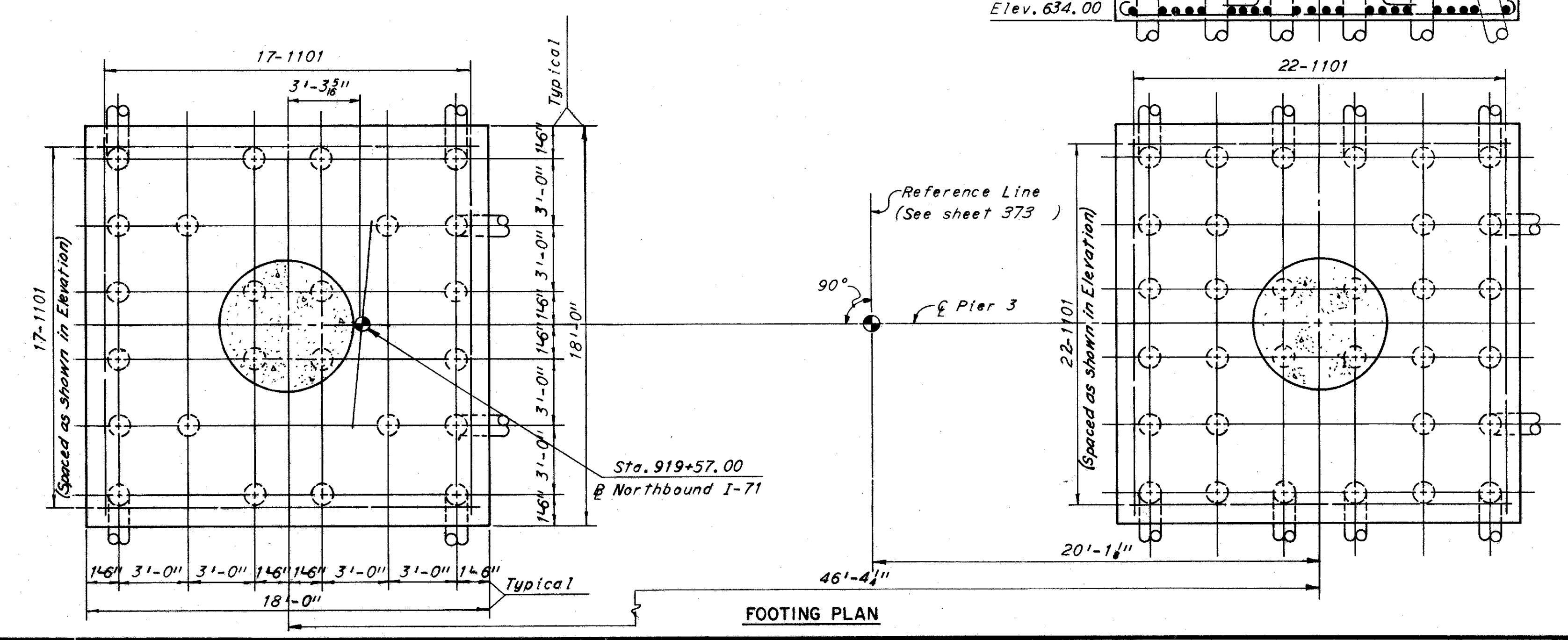
Point of Deflection	1/4	1/2	3/4	C
Initial - Cap Beam Only	0	0	0	0
Initial - Total Structure	1/8"	1/8"	1/8"	1/8"
Ultimate - Total Structure	3/8"	1/2"	3/8"	1/8"

Notes: Cap beam shall be cambered for ultimate dead load deflections.  
 Bearing Pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

Note: All reinforcing bar marks shall be prefixed PC.



Note: All piles are 12" C.I.P. Reinforced Concrete Piles. The following abbreviation is used: ef = each face. For additional notes see sheet 383.



H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIER 3**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R STA. 917+10.09  
 STA. 935+21.25

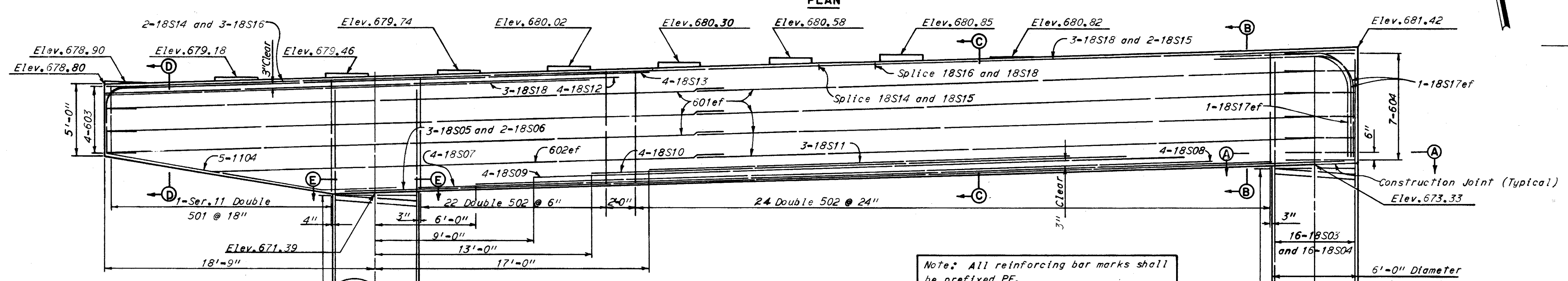
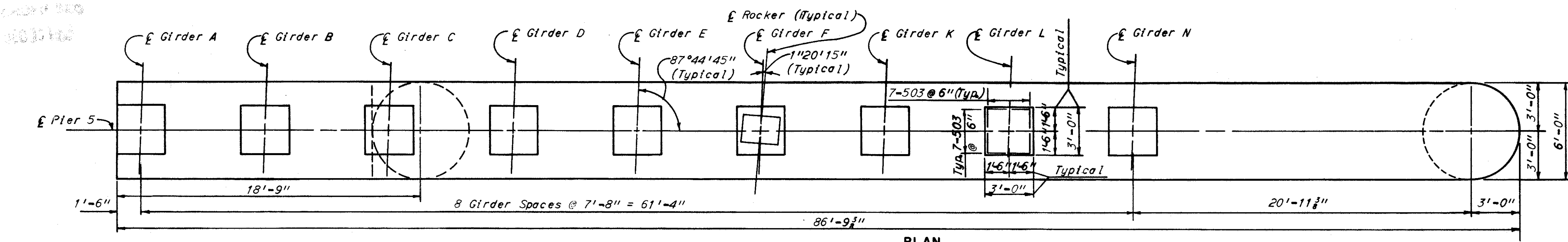
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN/DLR	TRACED	CHECKED/2002
DATE/1-11-64	DATE	DATE/12-22-64

REVIEWED/11/2  
 DATE/12-22-64

SHEET 384

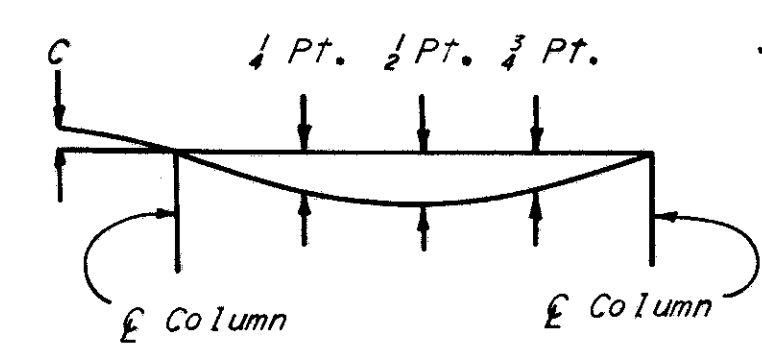


CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

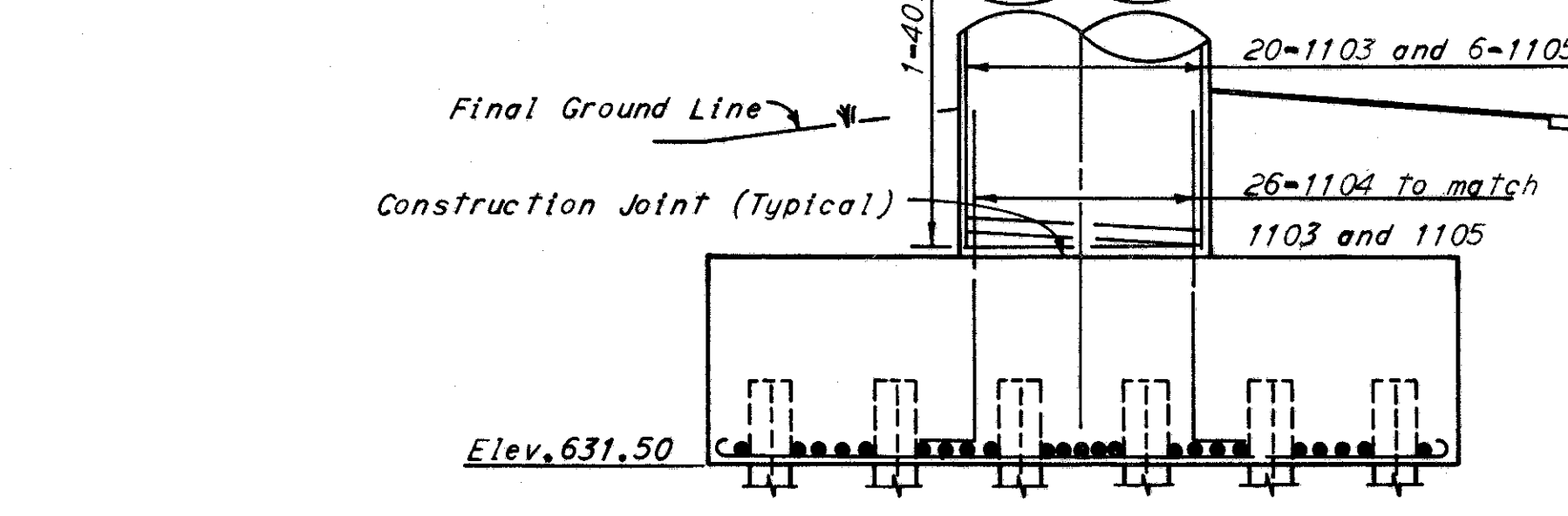
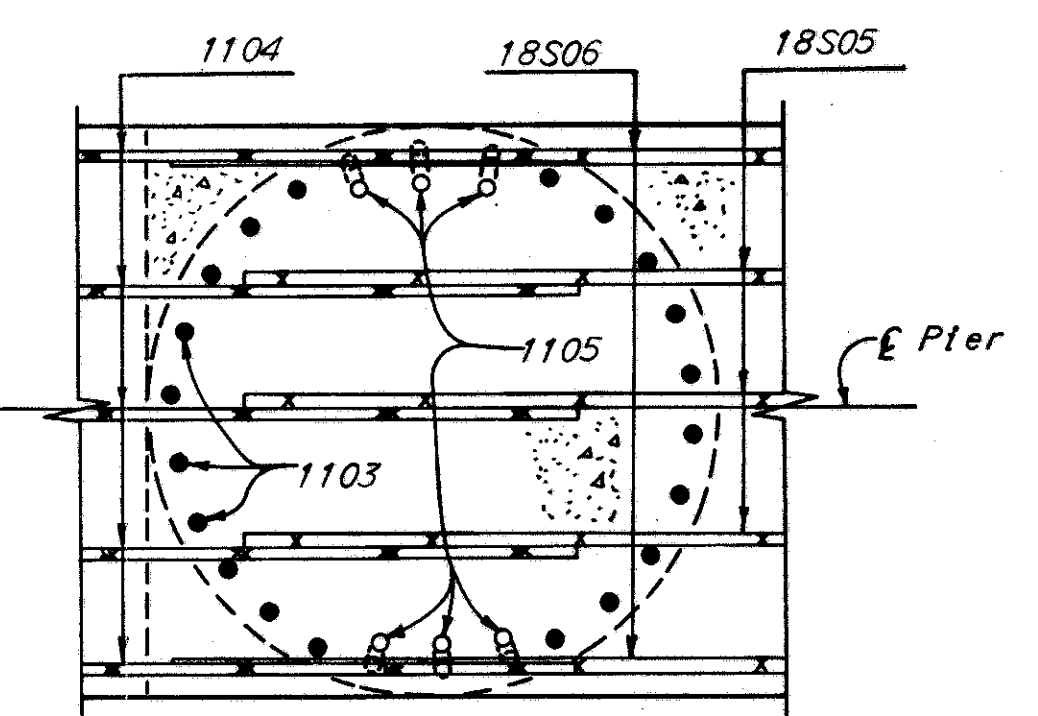
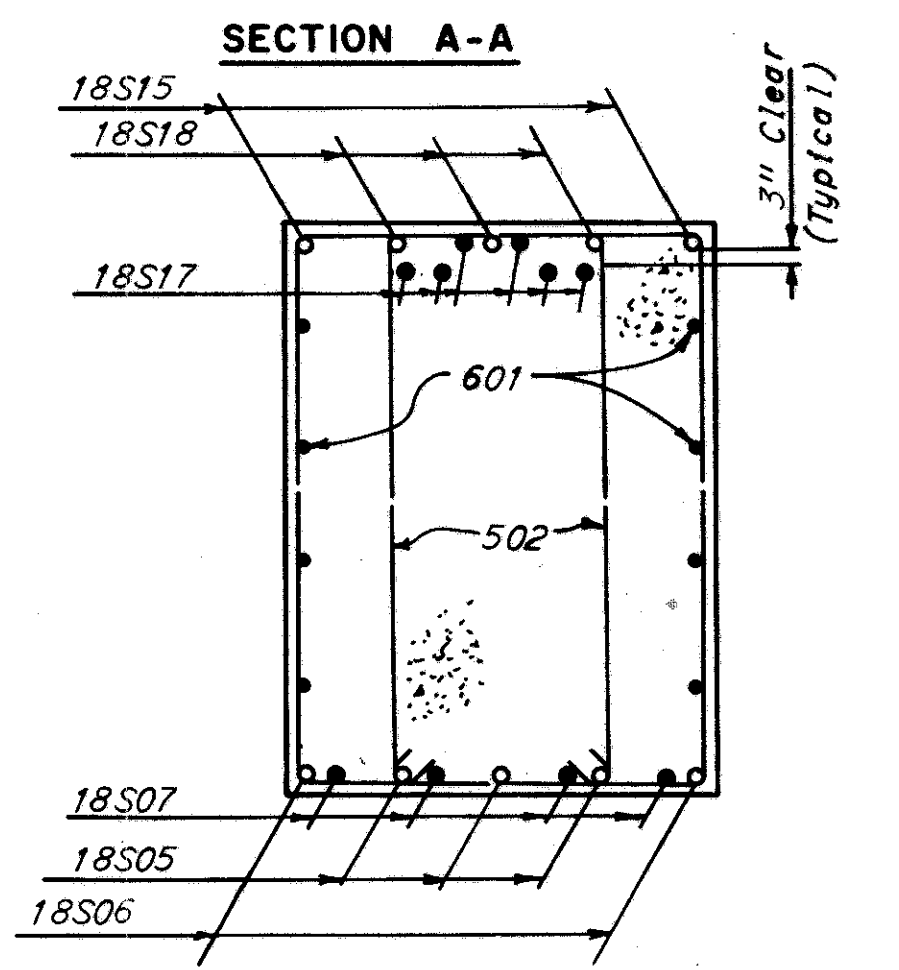
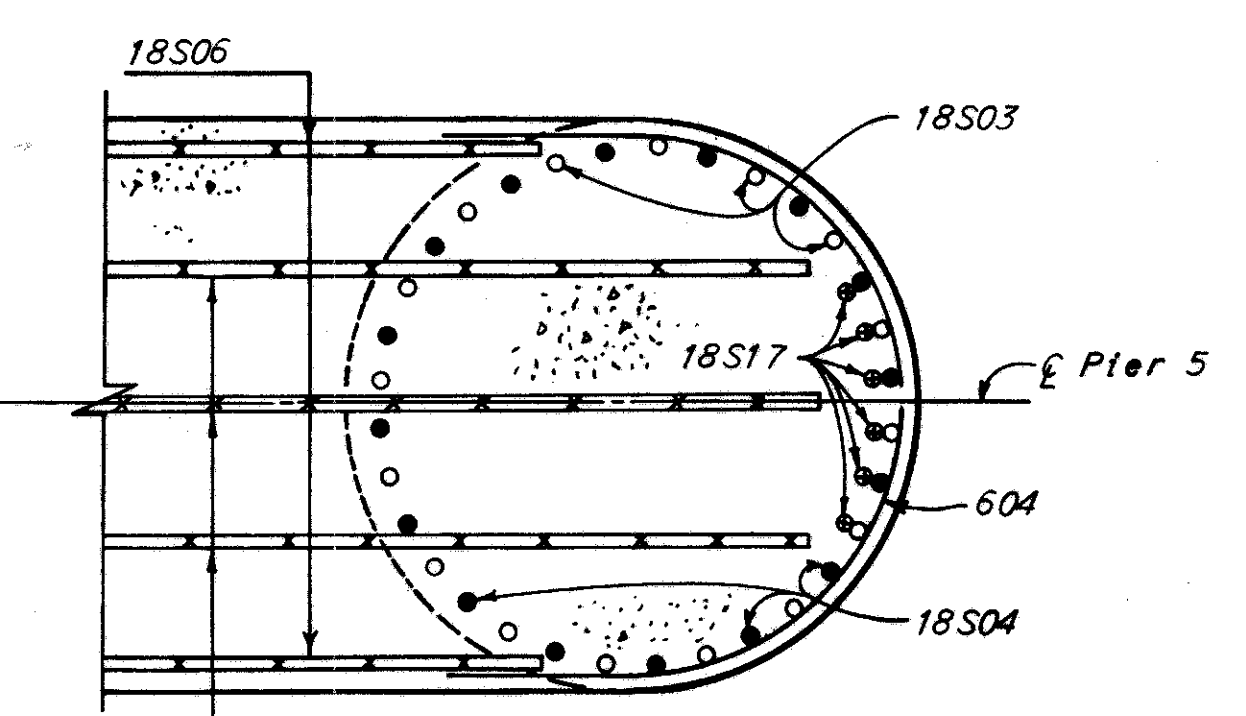


**DEAD LOAD DEFLECTION TABLE**

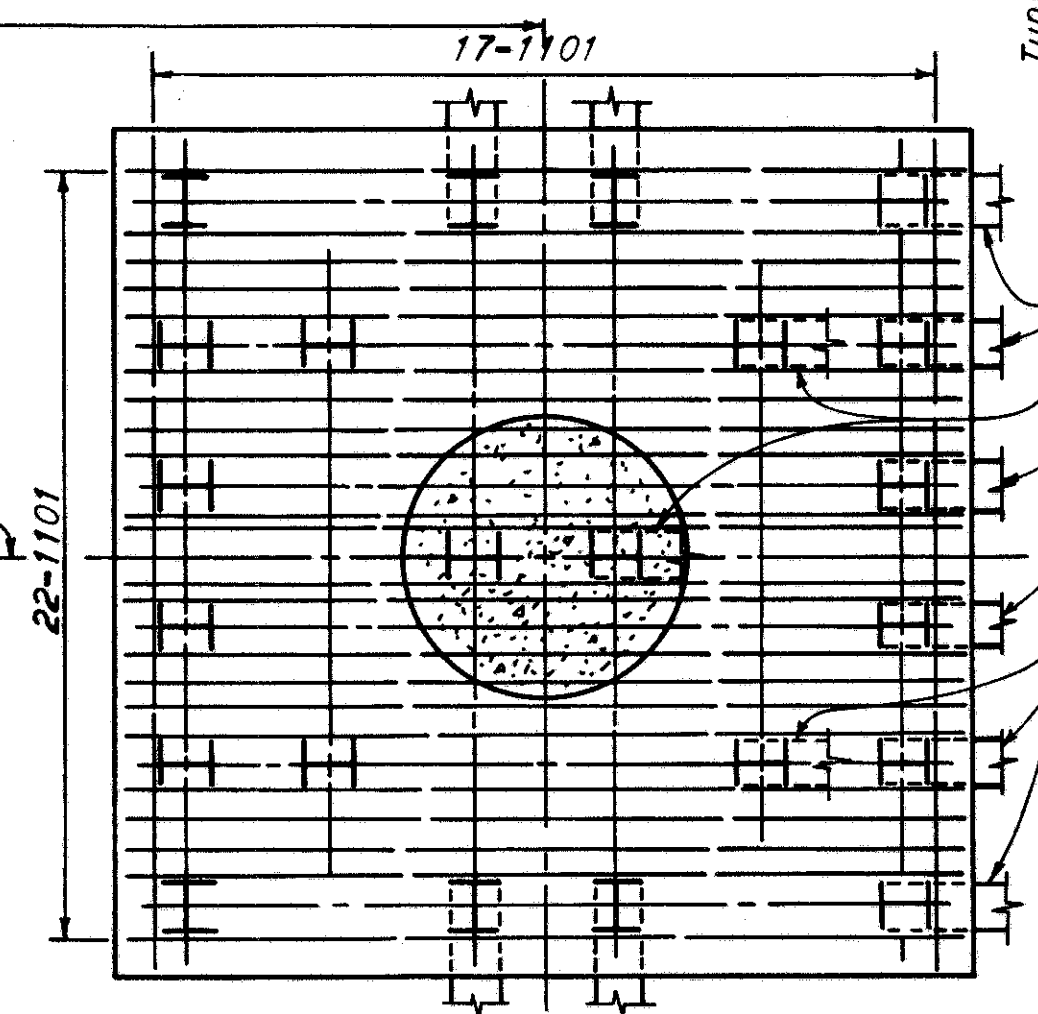
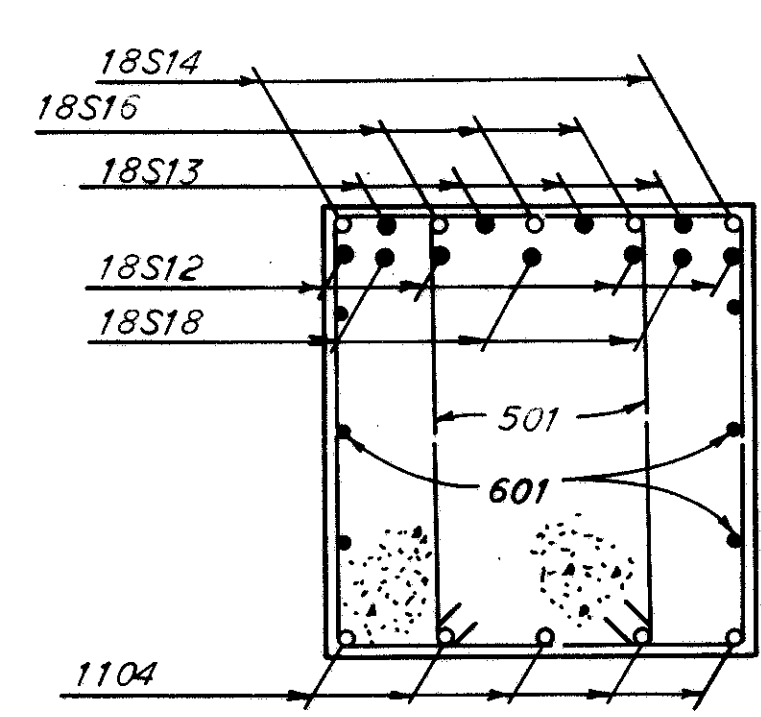
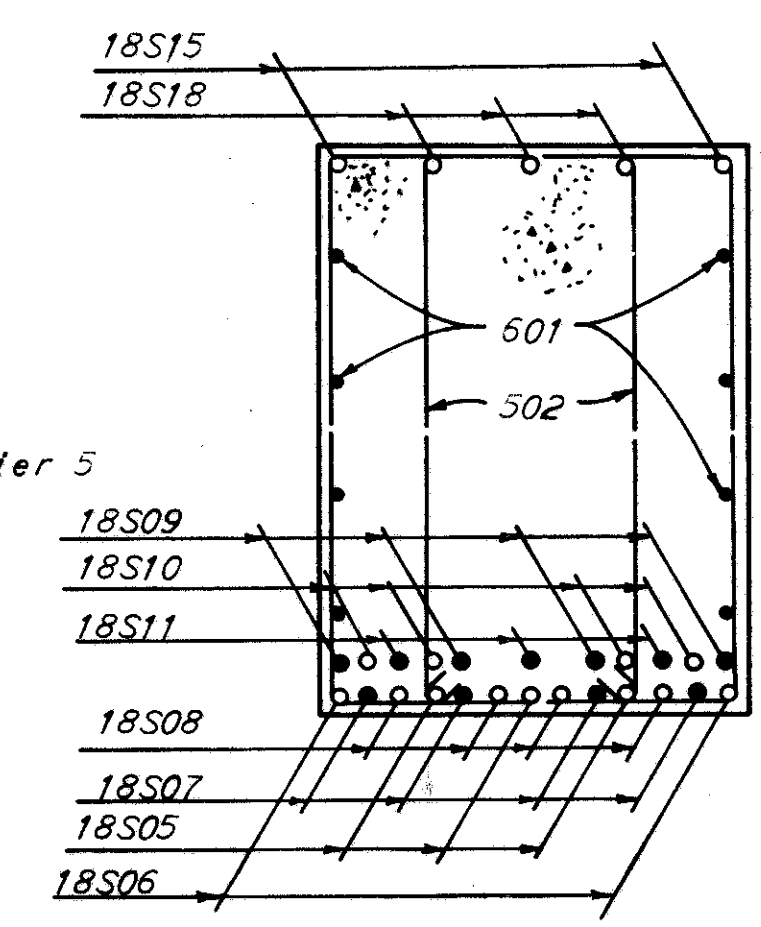
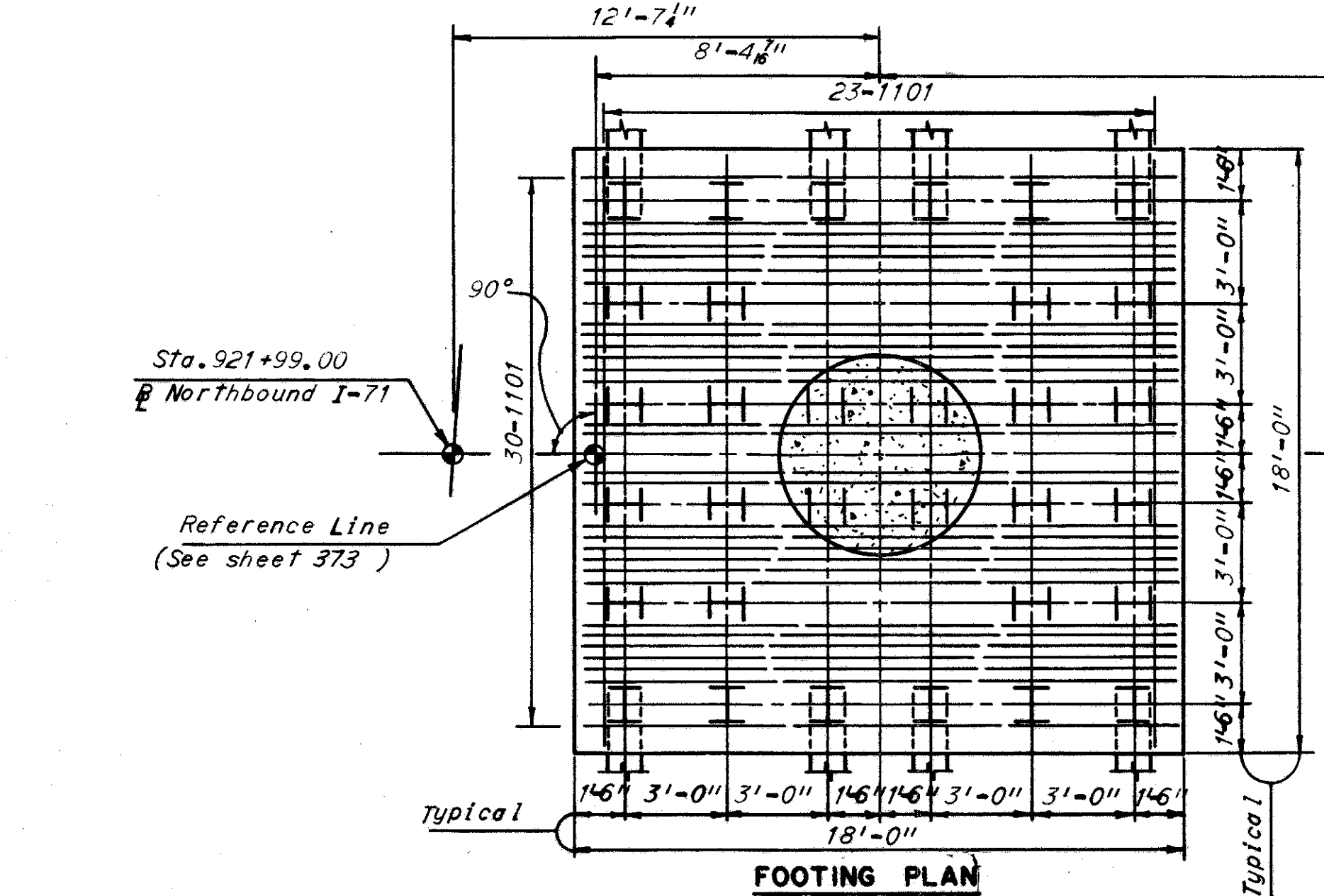
Point of Deflection	1/4 Pt.	1/2 Pt.	3/4 Pt.	C
Initial - Cap Beam Only	1/16"	1/16"	1/16"	-1/16"
Initial - Total Structure	3/16"	1/4"	3/16"	0
Ultimate - Total Structure	1/2"	3/4"	1/2"	1/16"



**Notes:**  
Cap beams shall be cambered for ultimate dead load deflections.  
Bearing pads shall be set so that after initial total structure deflections the designated bearing pad elevations are reached.



**ELEVATION**



**Notes:**  
For details for field welding No. 18S reinforcement bars see sheet 389.  
The following abbreviation is used:  
ef = each face  
For additional notes see sheet 385.  
All piles are 12BP53.

H.N.T.B. BRIDGE NOS. 21A & 21B  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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KANSAS CITY CLEVELAND NEW YORK

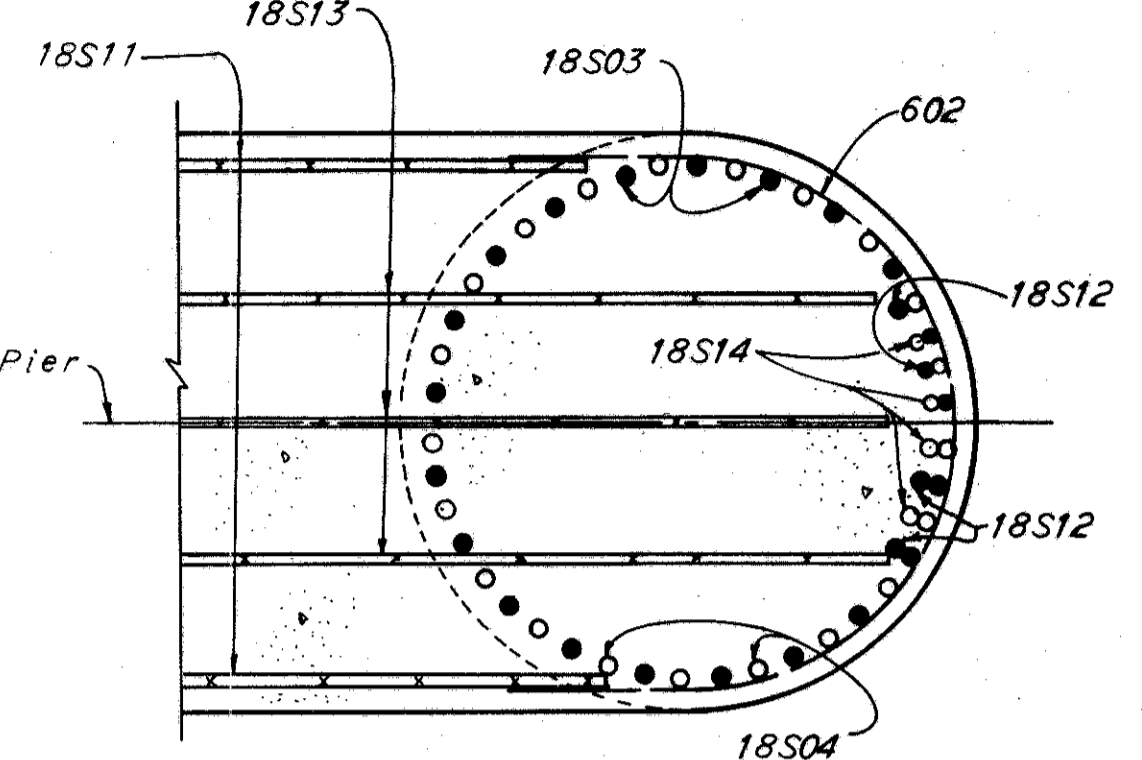
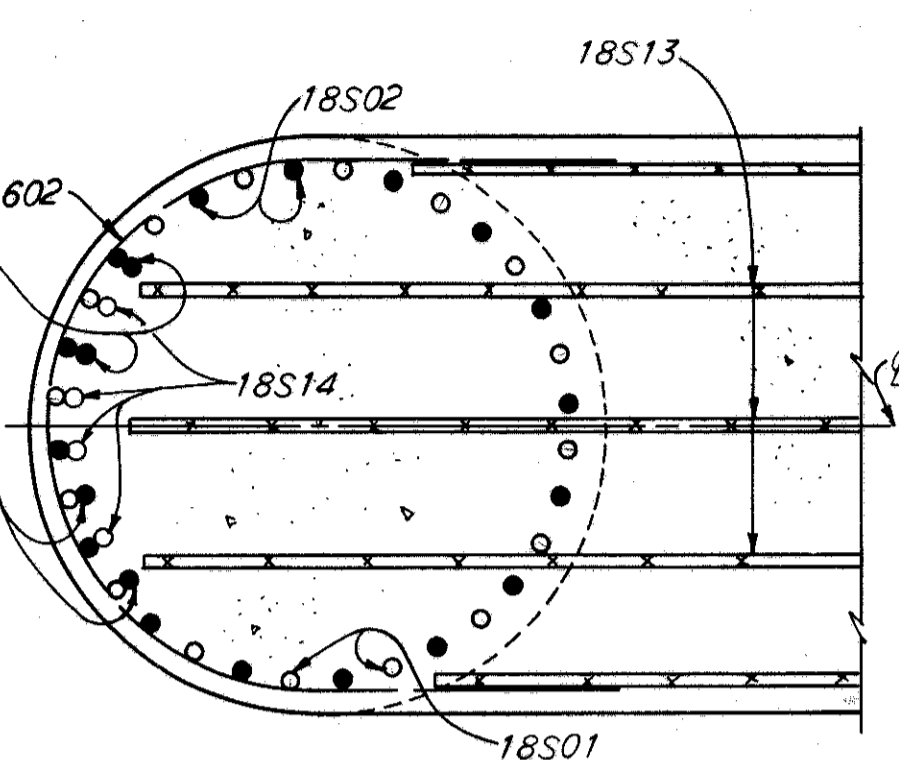
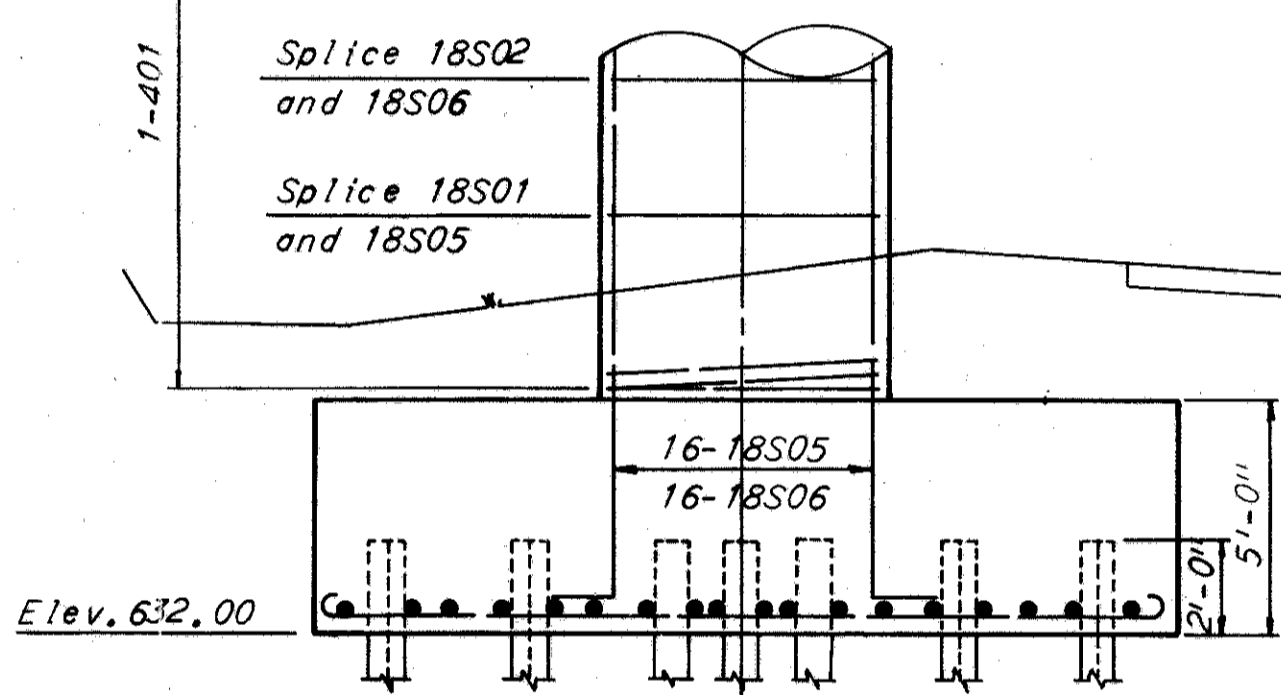
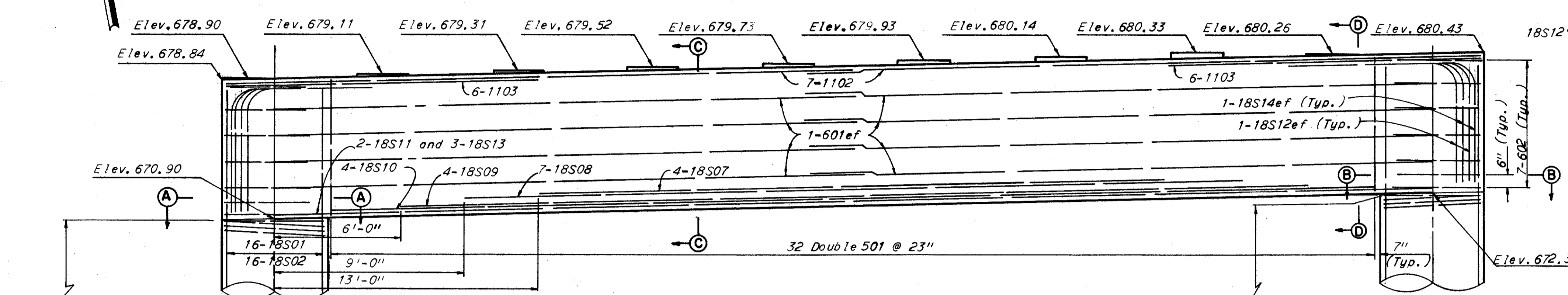
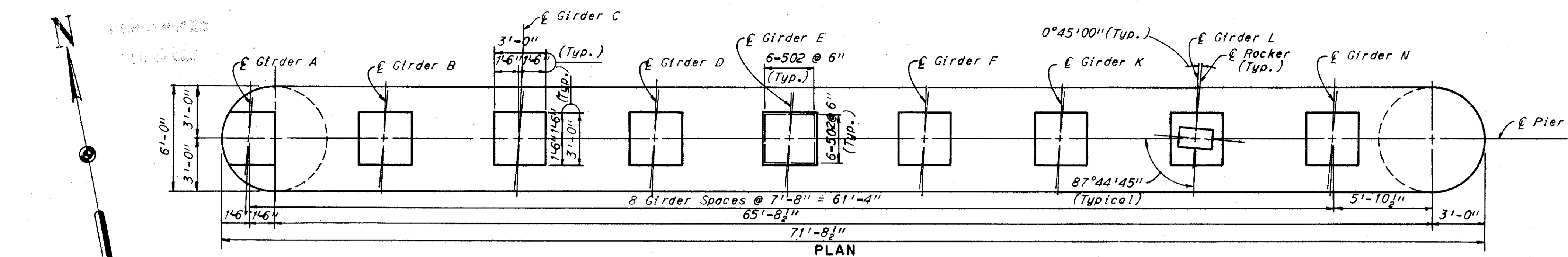
**PIER 5**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS  
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN LJS	TRACED	CHECKED PLS	REVIEWED WFE	REVISED
DATE 10-12-64	DATE	DATE 10-28-64	DATE 12-22-64	

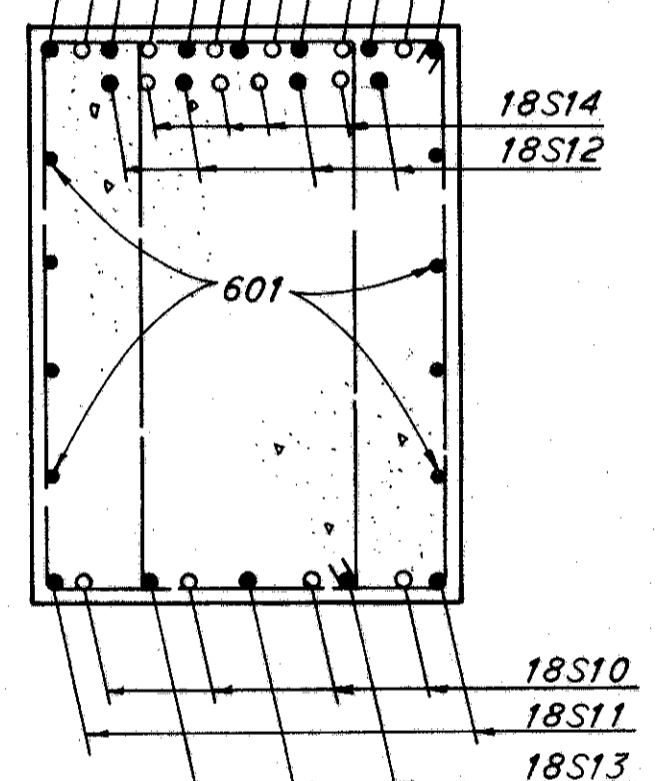
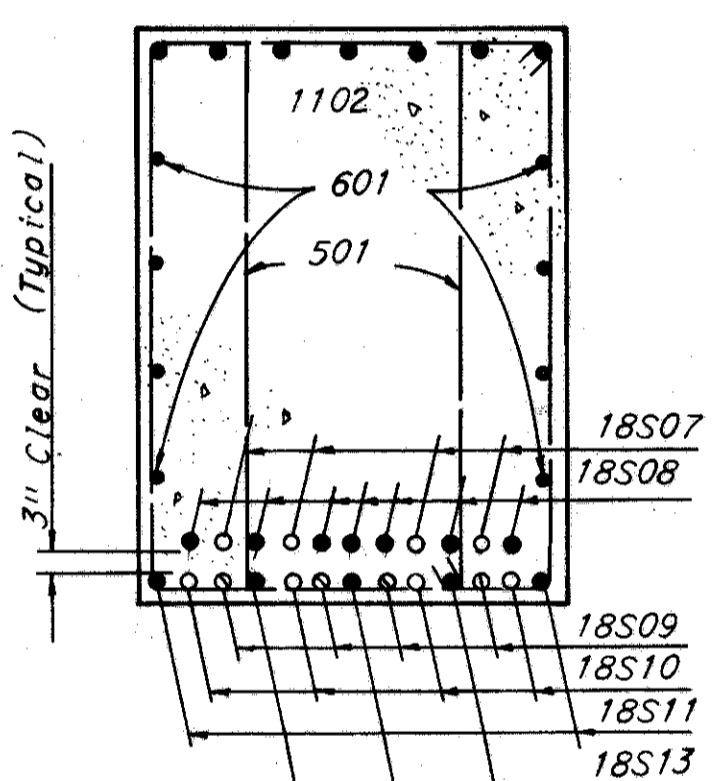
SHEET 386

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



SECTION A-A

SECTION B-B



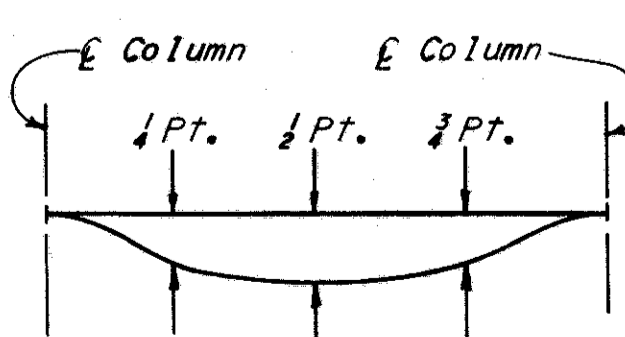
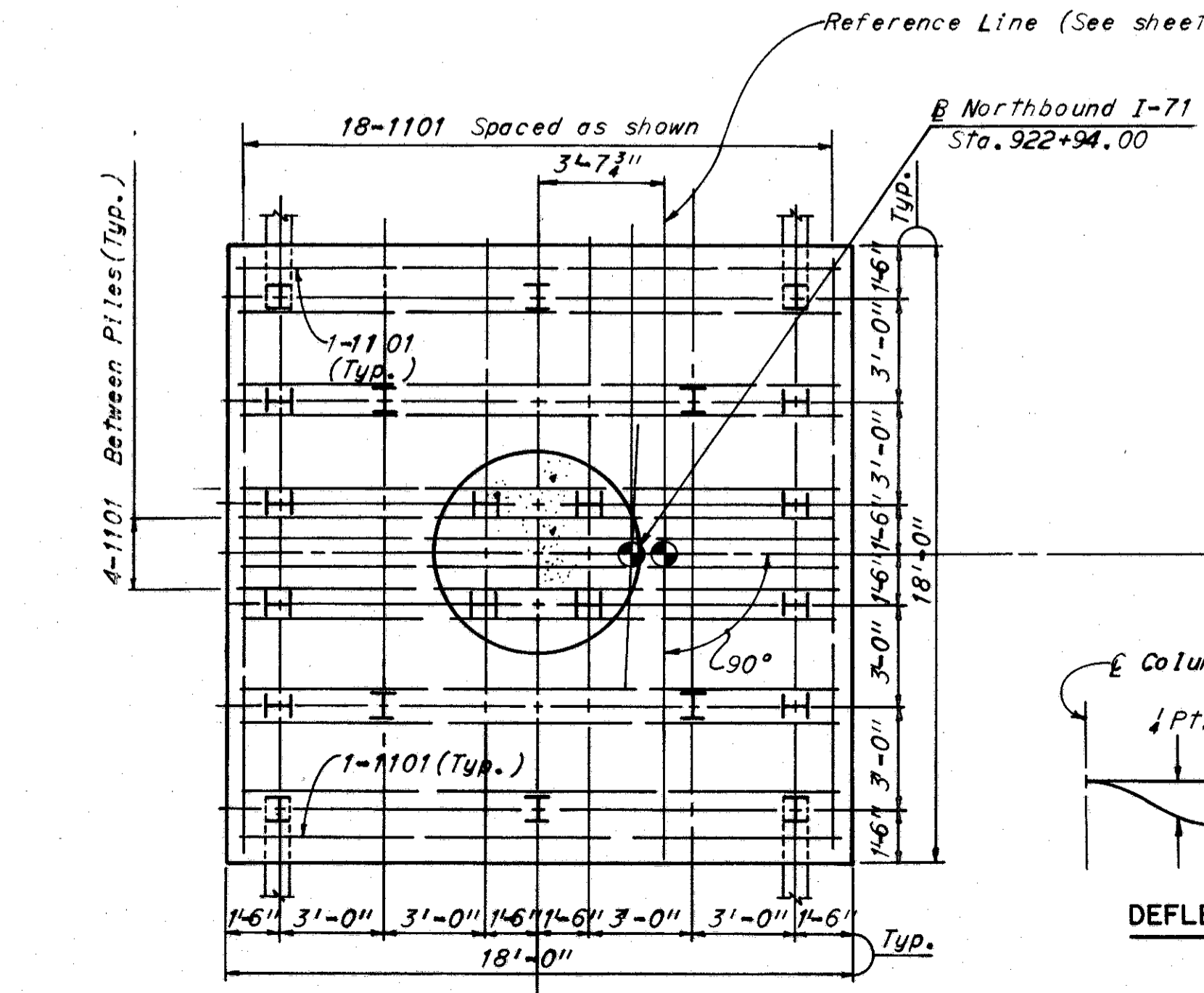
SECTION C-C

SECTION D-D

Note: All reinforcing bar marks shall be prefixed PF.

ELEVATION

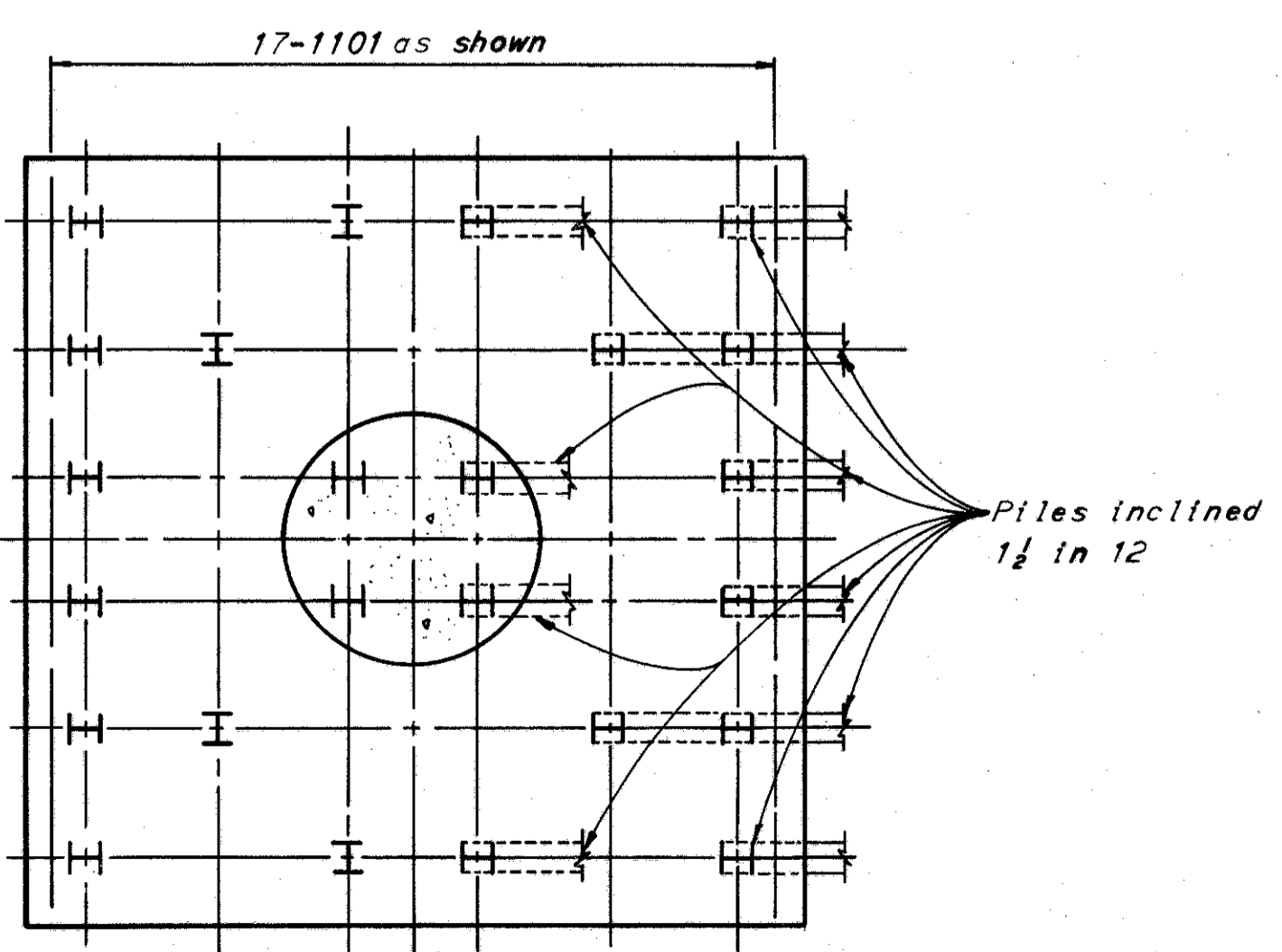
DEAD LOAD DEFLECTION TABLE			
Point of Deflection	1/4	1/2	3/4
Initial-Cap Beam Only	1/16"	1/8"	1/4"
Initial-Total Structure	3/16"	1/4"	3/8"
Ultimate-Total Structure	5/16"	3/8"	1/2"



DEFLECTION DIAGRAM

Notes:  
Cap beams shall be combined for ultimate dead load deflections.  
Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

FOOTING PLAN



Notes:  
All piles are 12BP53.  
For details for field welding No. 18S reinforcement bars see Sheet 389.  
The following abbreviation is used:  
ef = each face  
For additional notes see Sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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**PIER 6**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

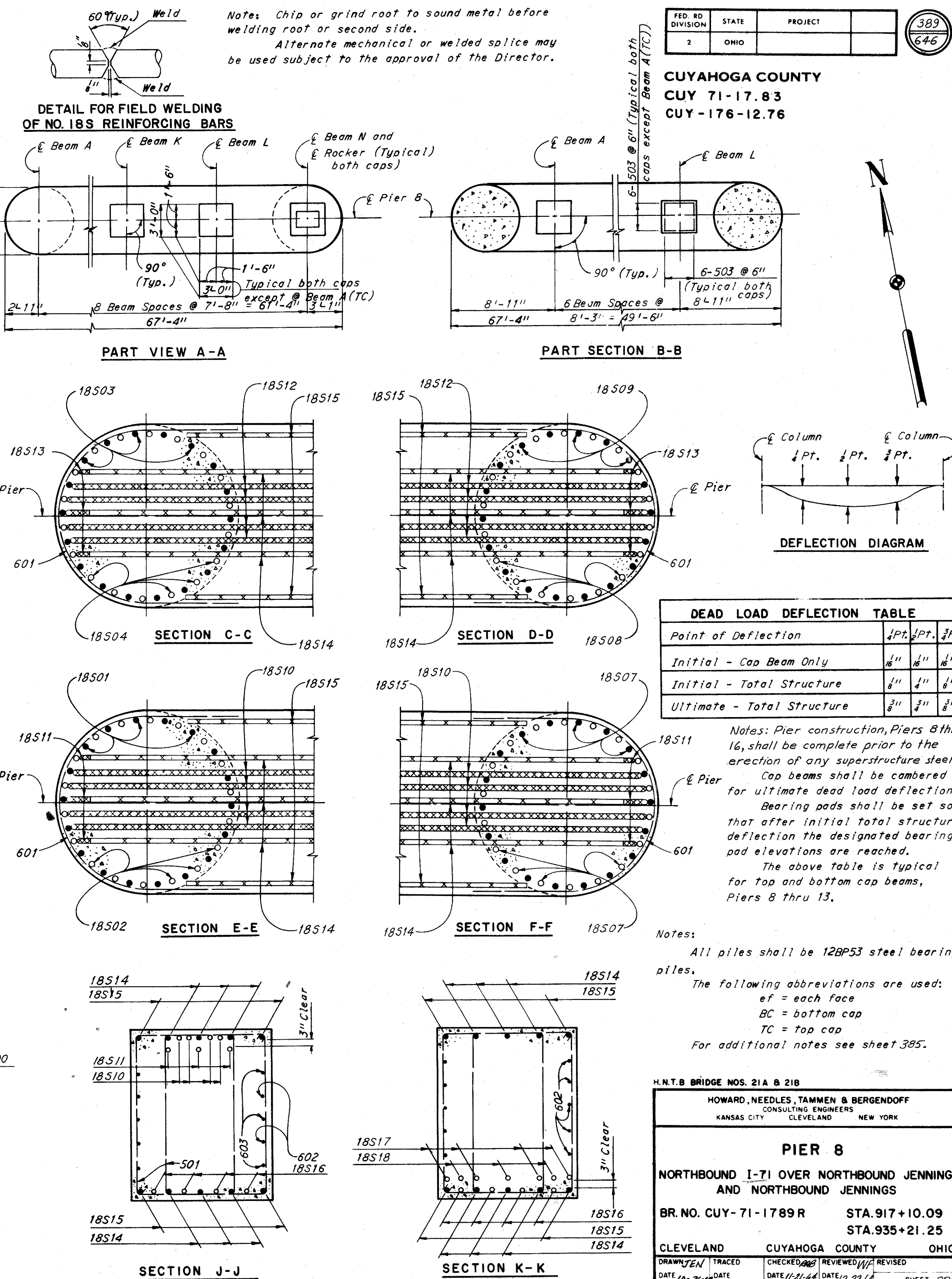
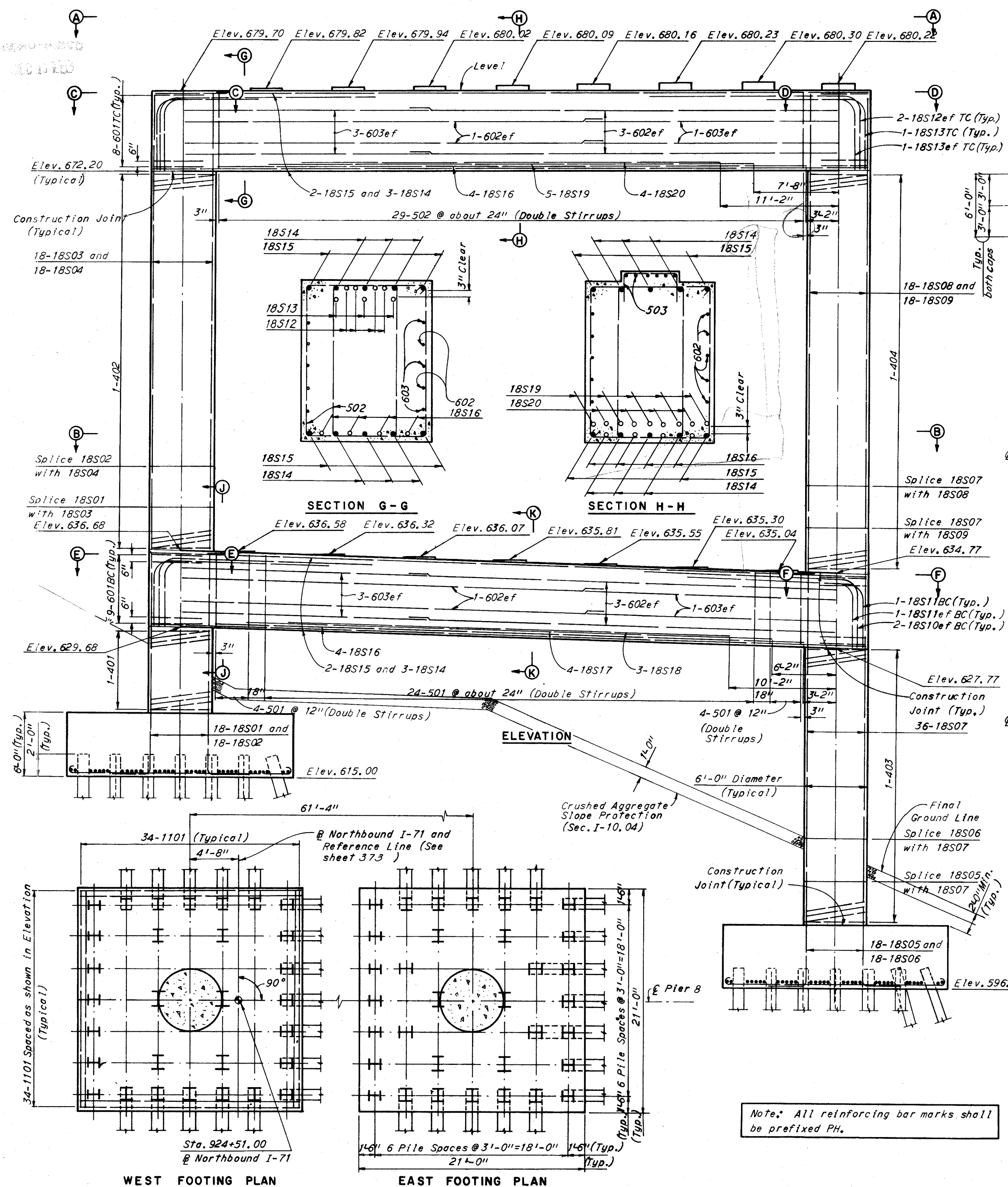
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN 7ZS TRACED CHECKED C.R.B. REVISIONS  
DATE 10-14-64 DATE 12-22-64 DATE 12-22-64

SHEET 387



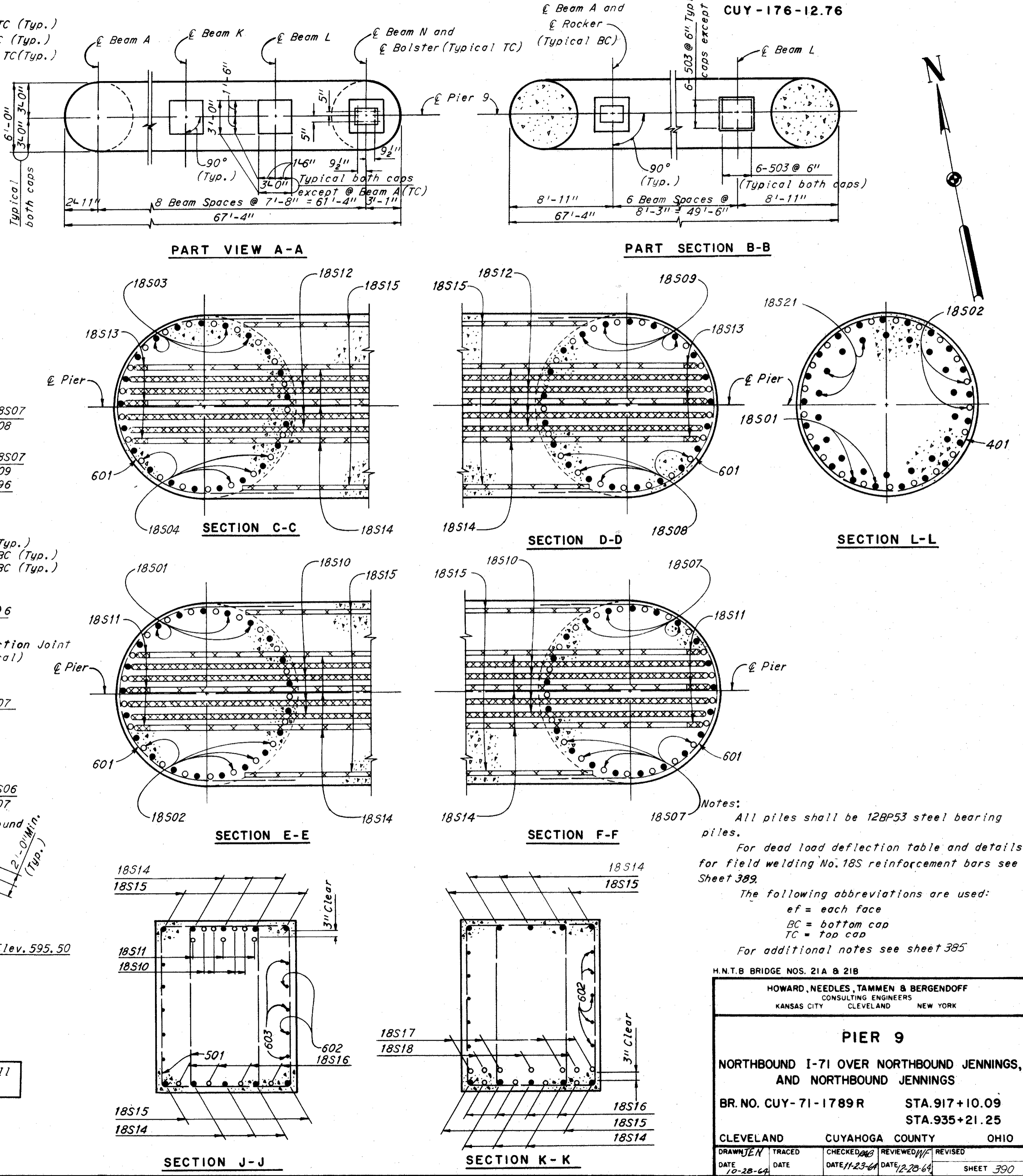
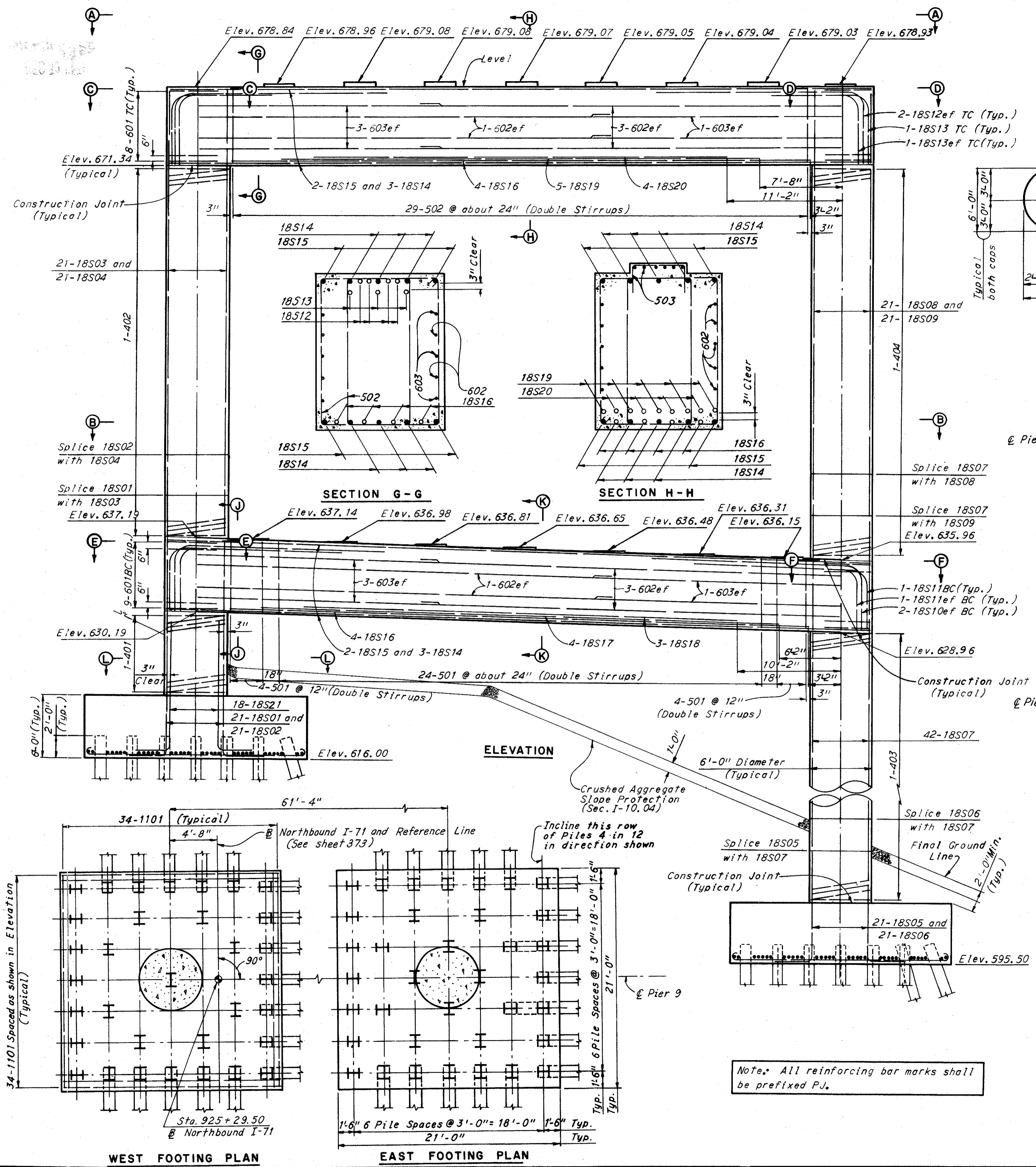
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76





CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

Note:  
 Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



Notes:  
 All piles shall be 12BP53 steel bearing piles.  
 For dead load deflection table and details for field welding No. 18S reinforcement bars see Sheet 389.  
 The following abbreviations are used:  
 ef = each face  
 BC = bottom cap  
 TC = top cap  
 For additional notes see sheet 385

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIER 9**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

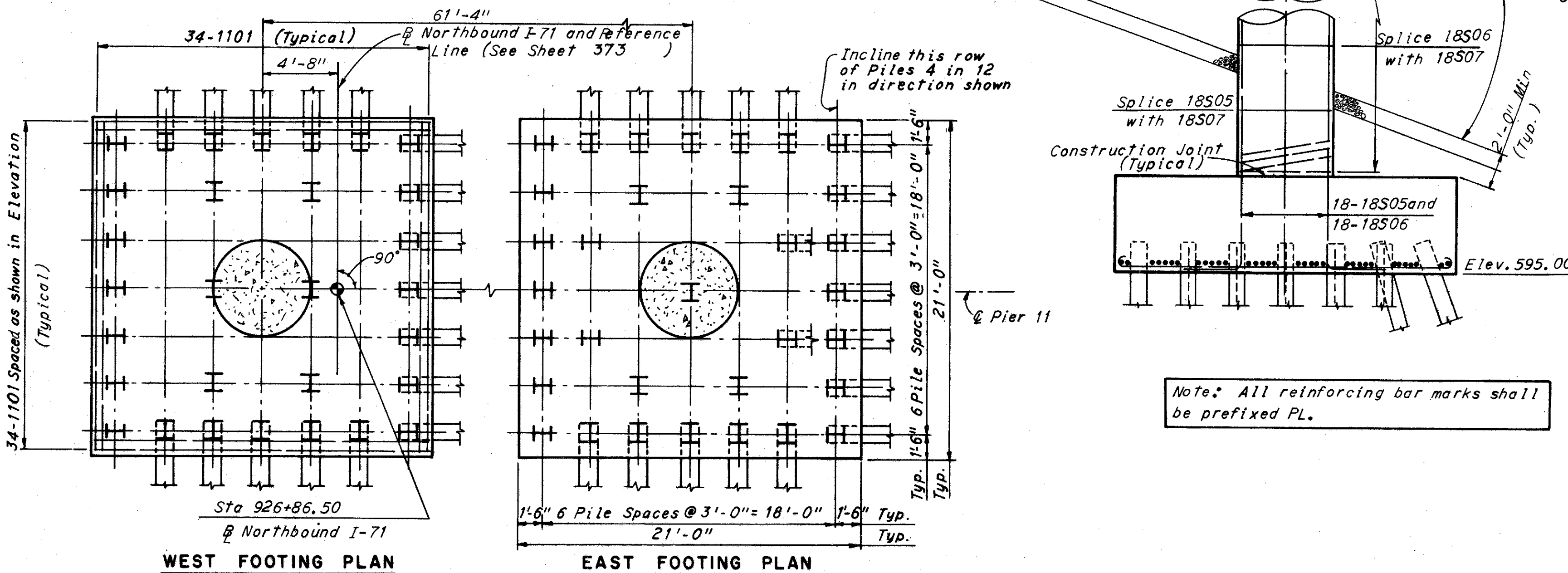
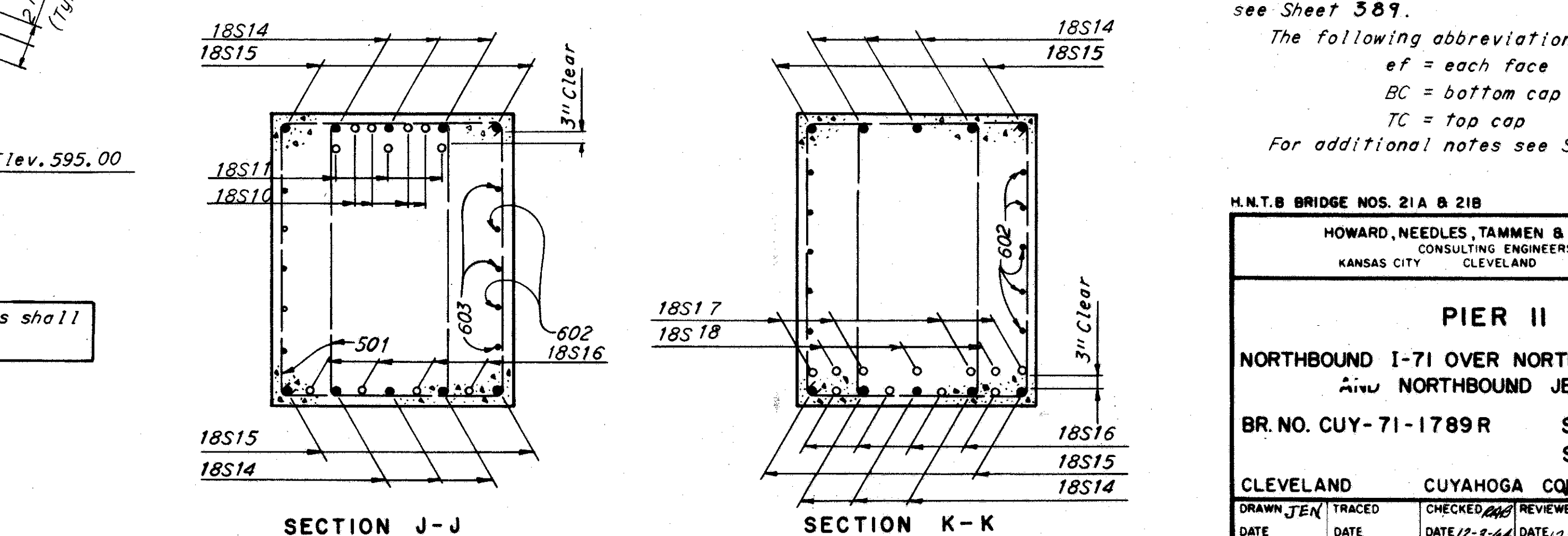
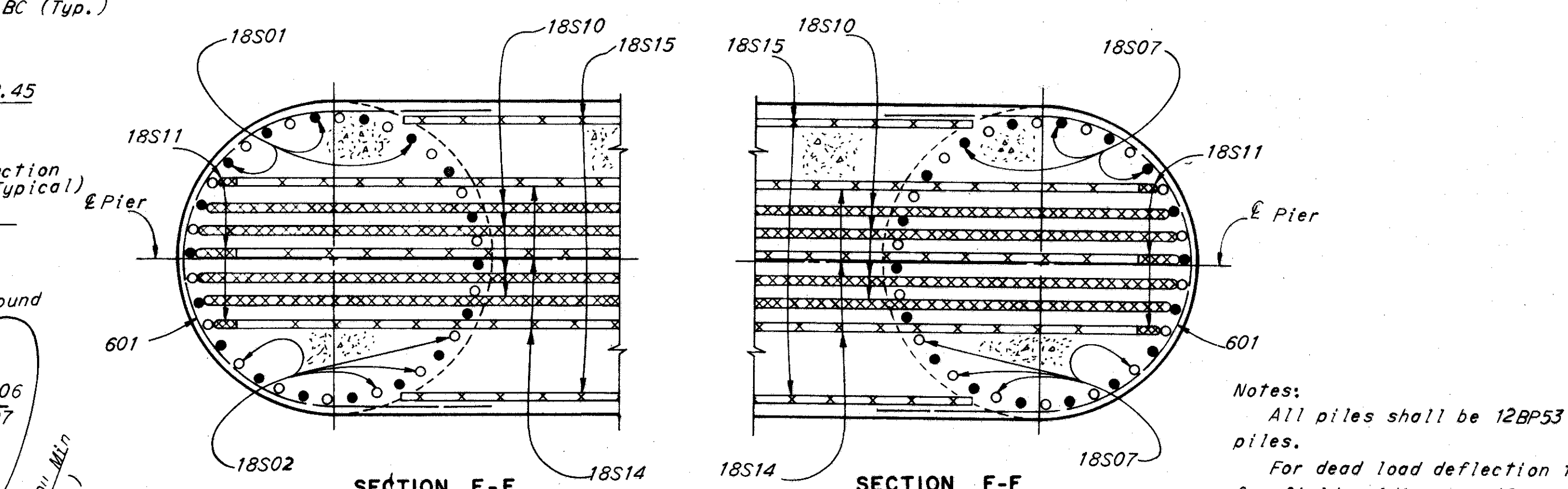
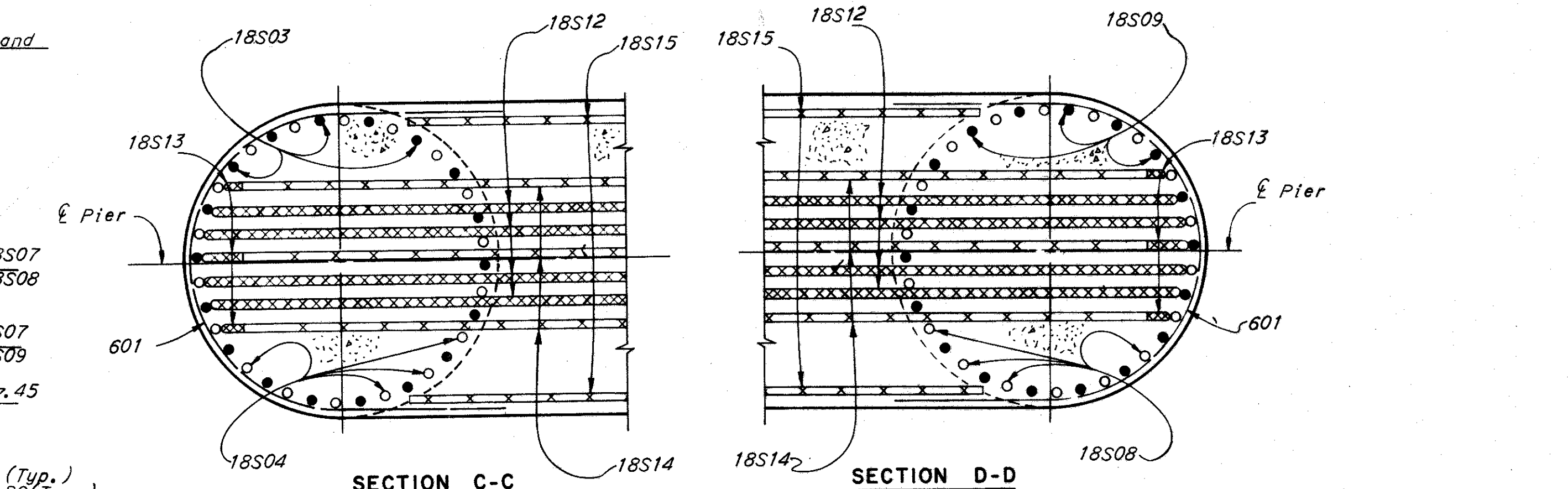
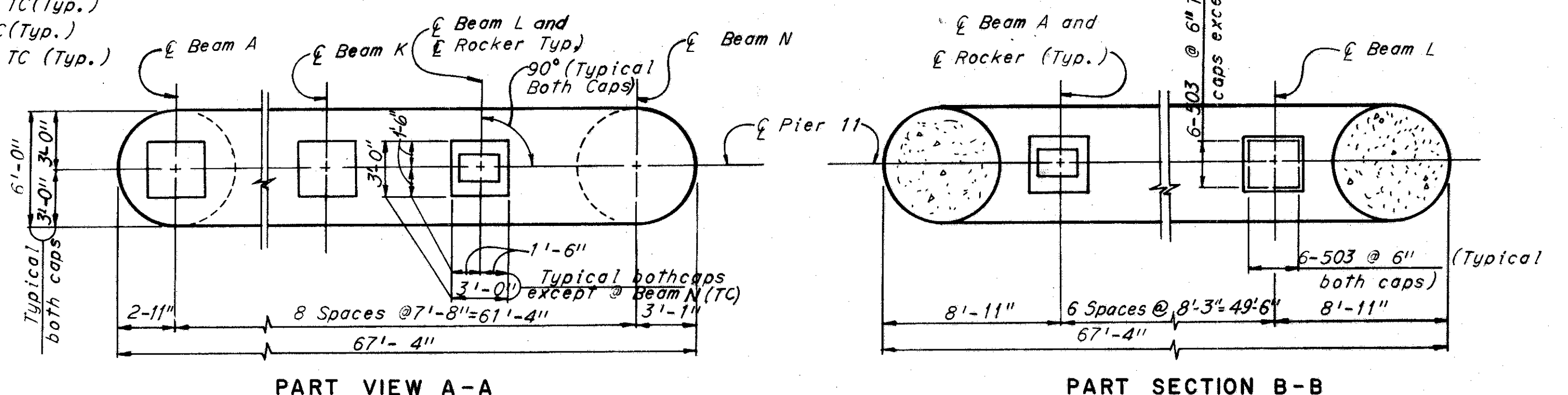
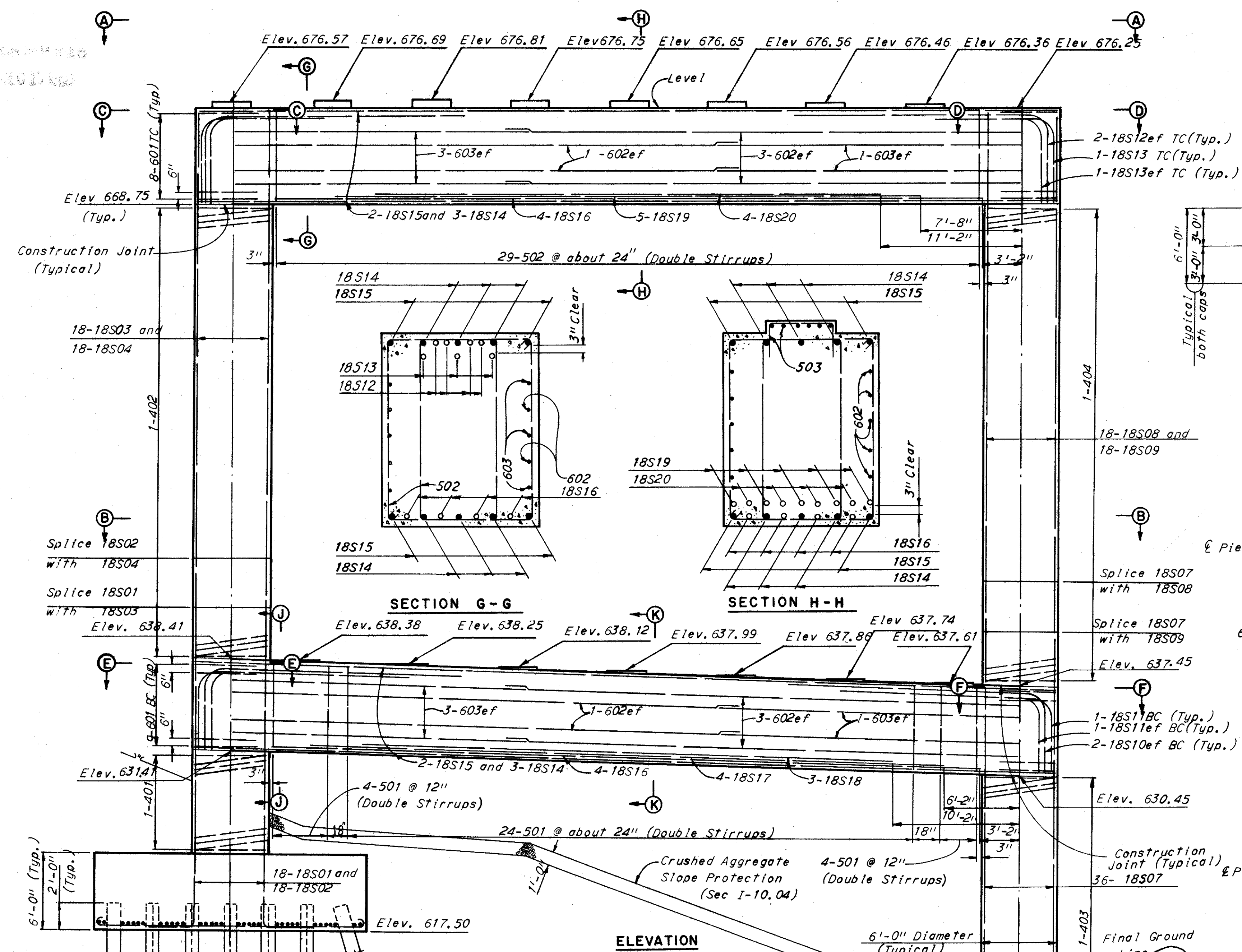
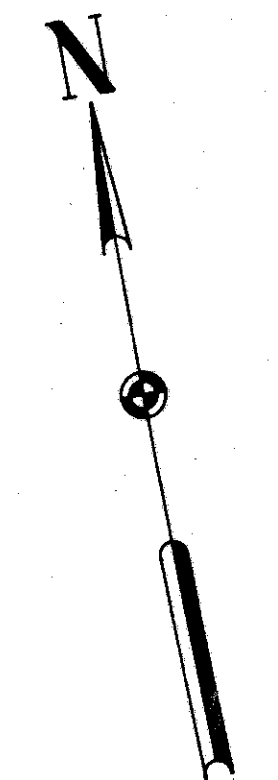
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN BY TRACED CHECKED BY REVIEWED BY REVISION  
 DATE 10-28-64 DATE 11-23-64 DATE 12-28-64 SHEET 390



CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Notes:  
 All piles shall be 12BP53 steel bearing piles.  
 For dead load deflection table and details for field welding No. 18S reinforcement bars see Sheet 389.  
 The following abbreviations are used:  
 ef = each face  
 BC = bottom cap  
 TC = top cap  
 For additional notes see Sheet 385.

Note: All reinforcing bar marks shall be prefixed PL.

H.N.T.B. BRIDGE NOS. 21A & 21B

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**PIER II**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

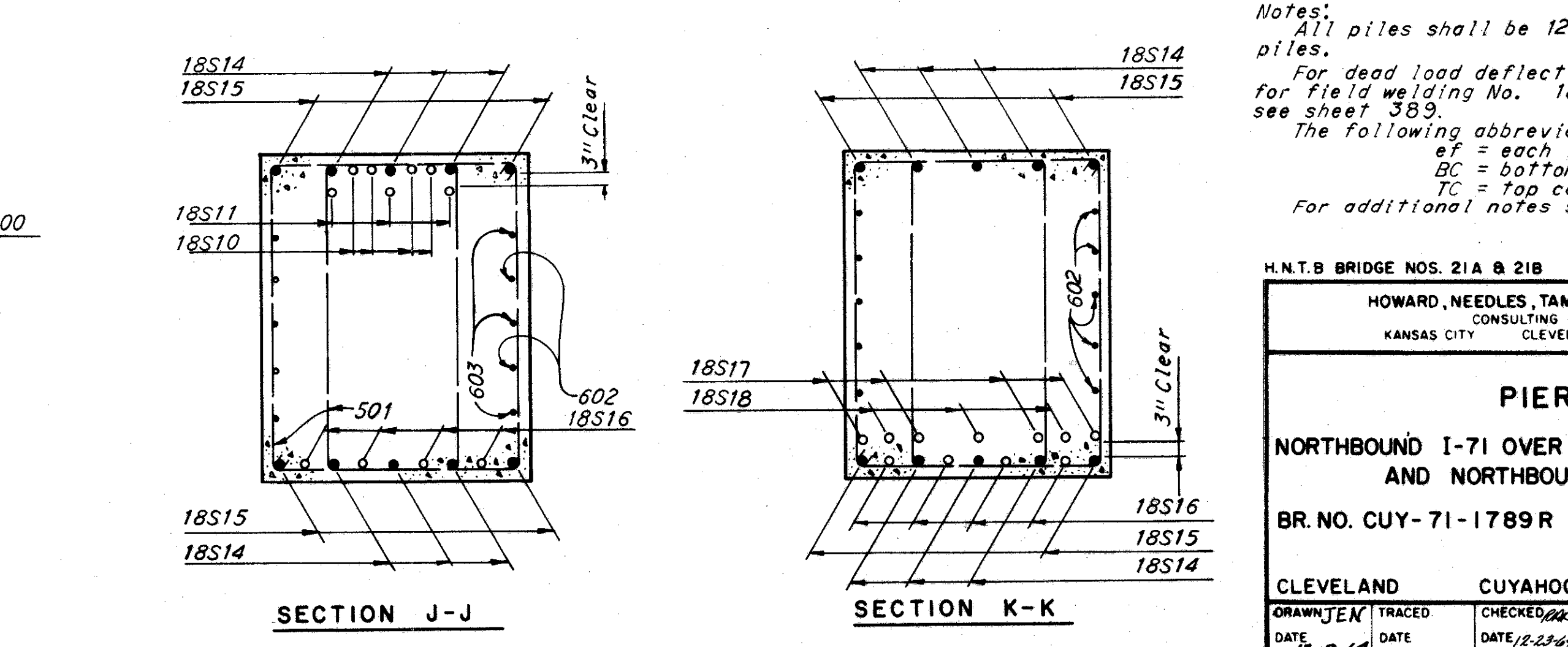
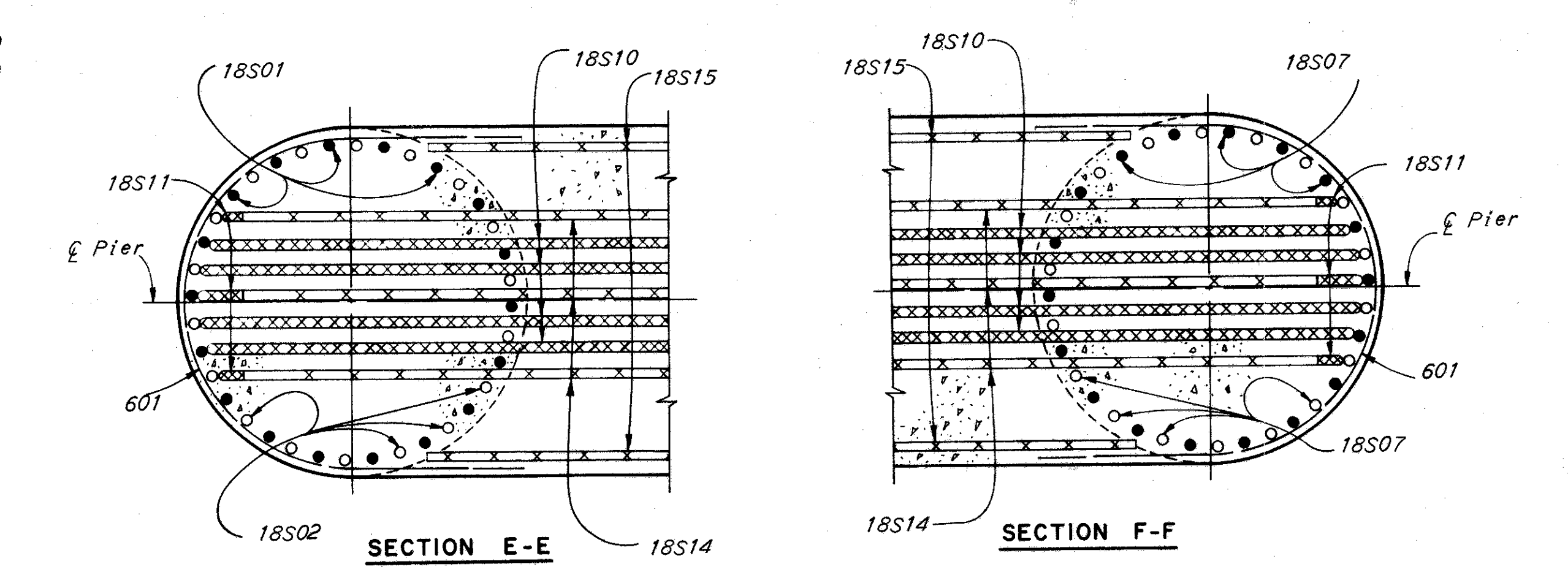
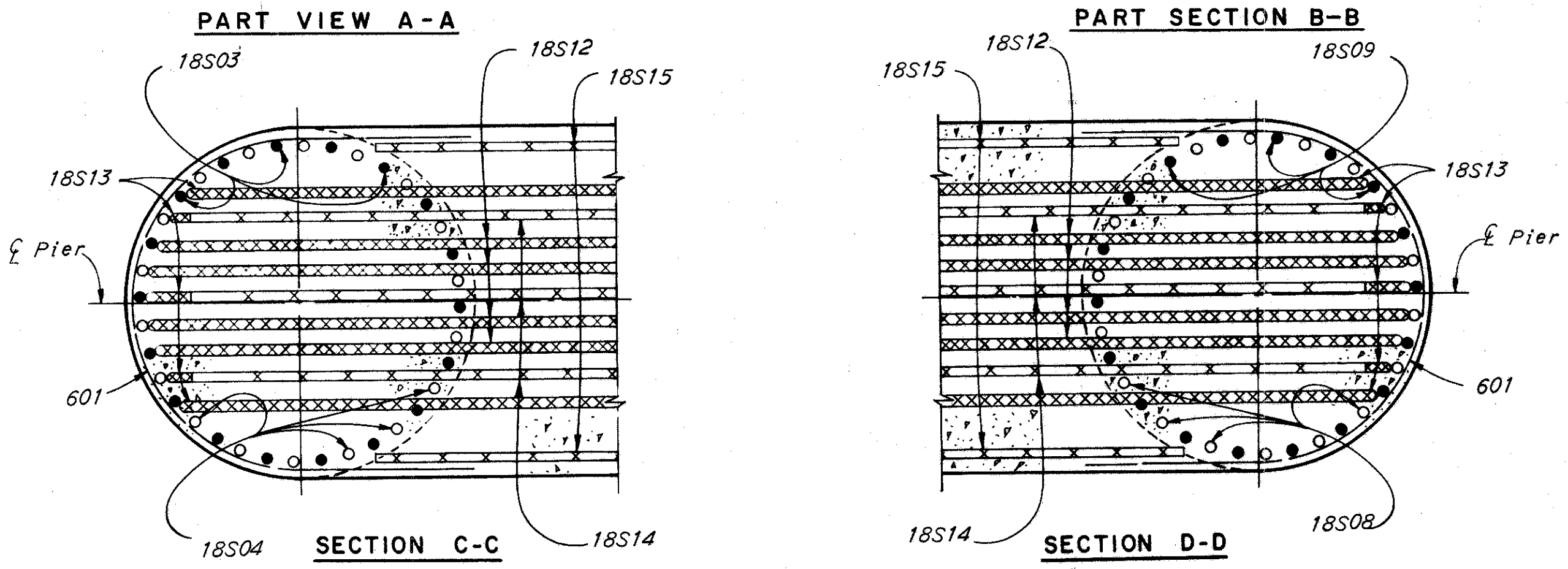
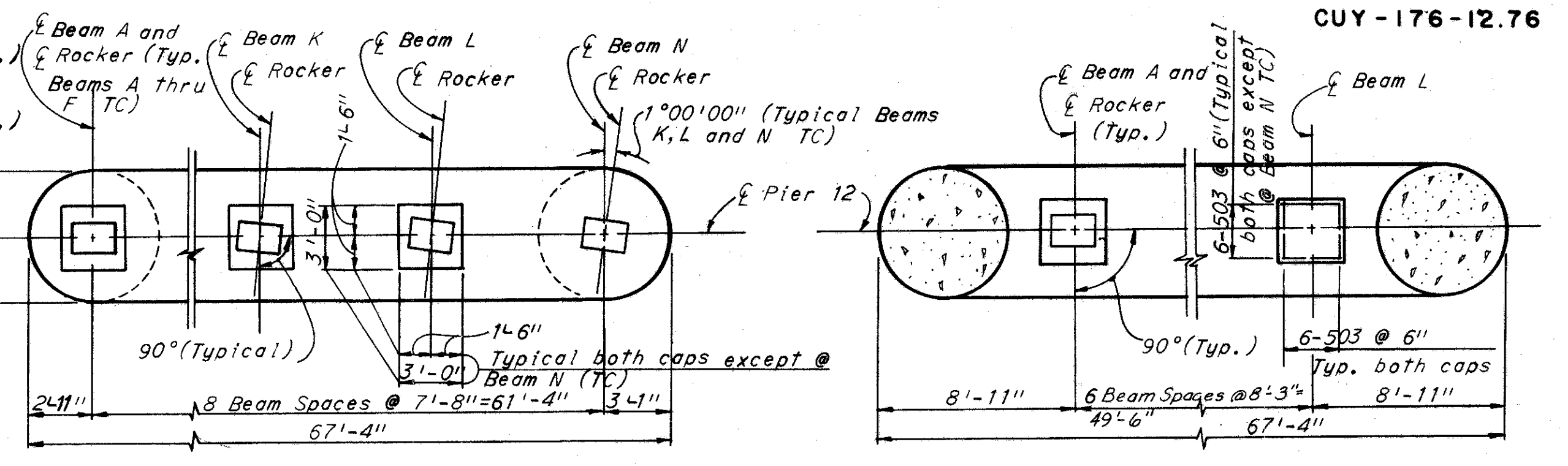
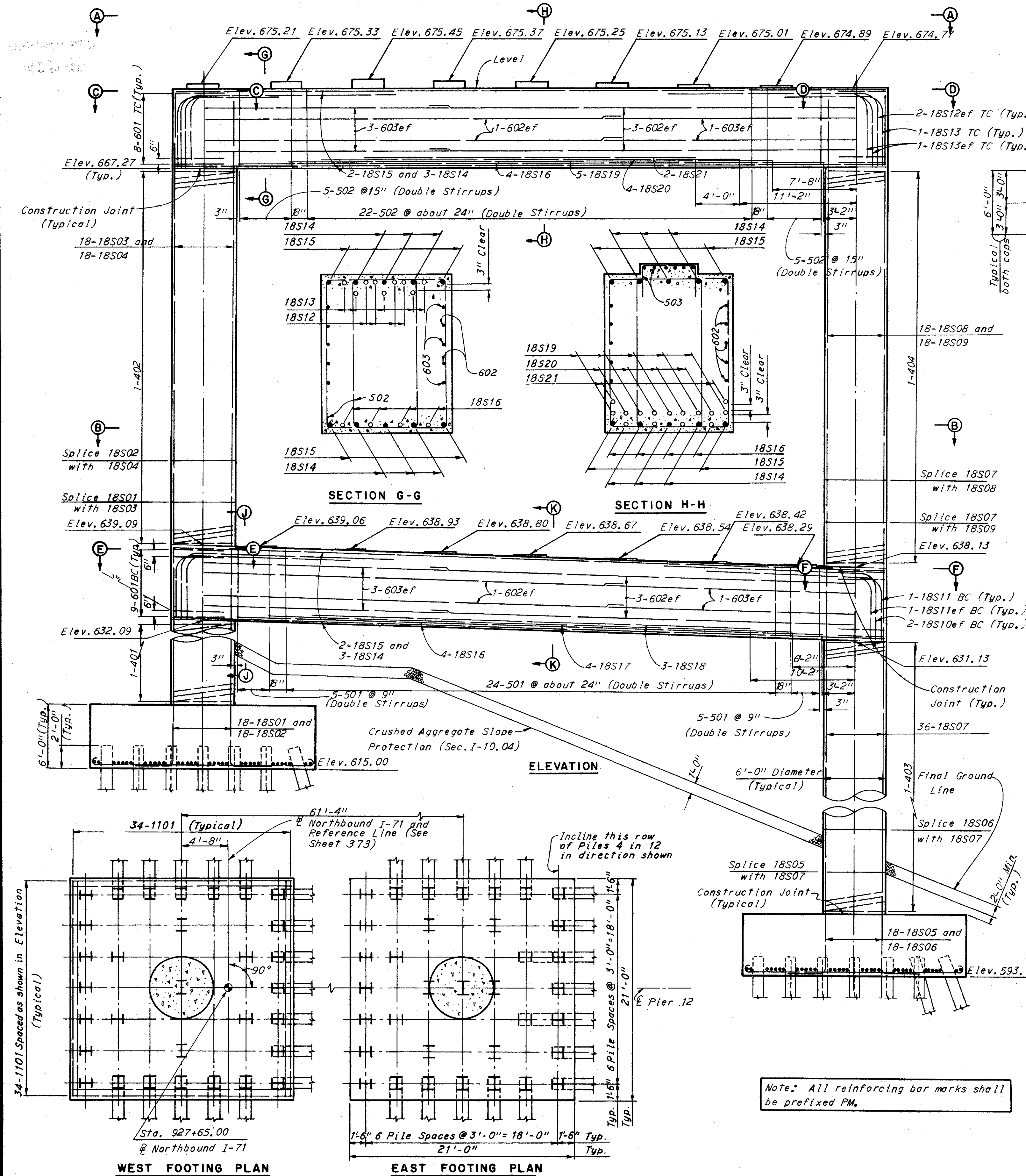
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DATE 11-10-64 TRACED CHECKED 11/17/64 REVIEWED 11/17/64 REVISIONS  
 DATE 12-3-64 DATE 12-28-64

SHEET 392

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Notes:  
 All piles shall be 12BP53 steel bearing piles.  
 For dead load deflection table and details for field welding No. 18S reinforcement bars see sheet 389.  
 The following abbreviations are used:  
 ef = each face  
 BC = bottom cap  
 TC = top cap  
 For additional notes see sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIER 12**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

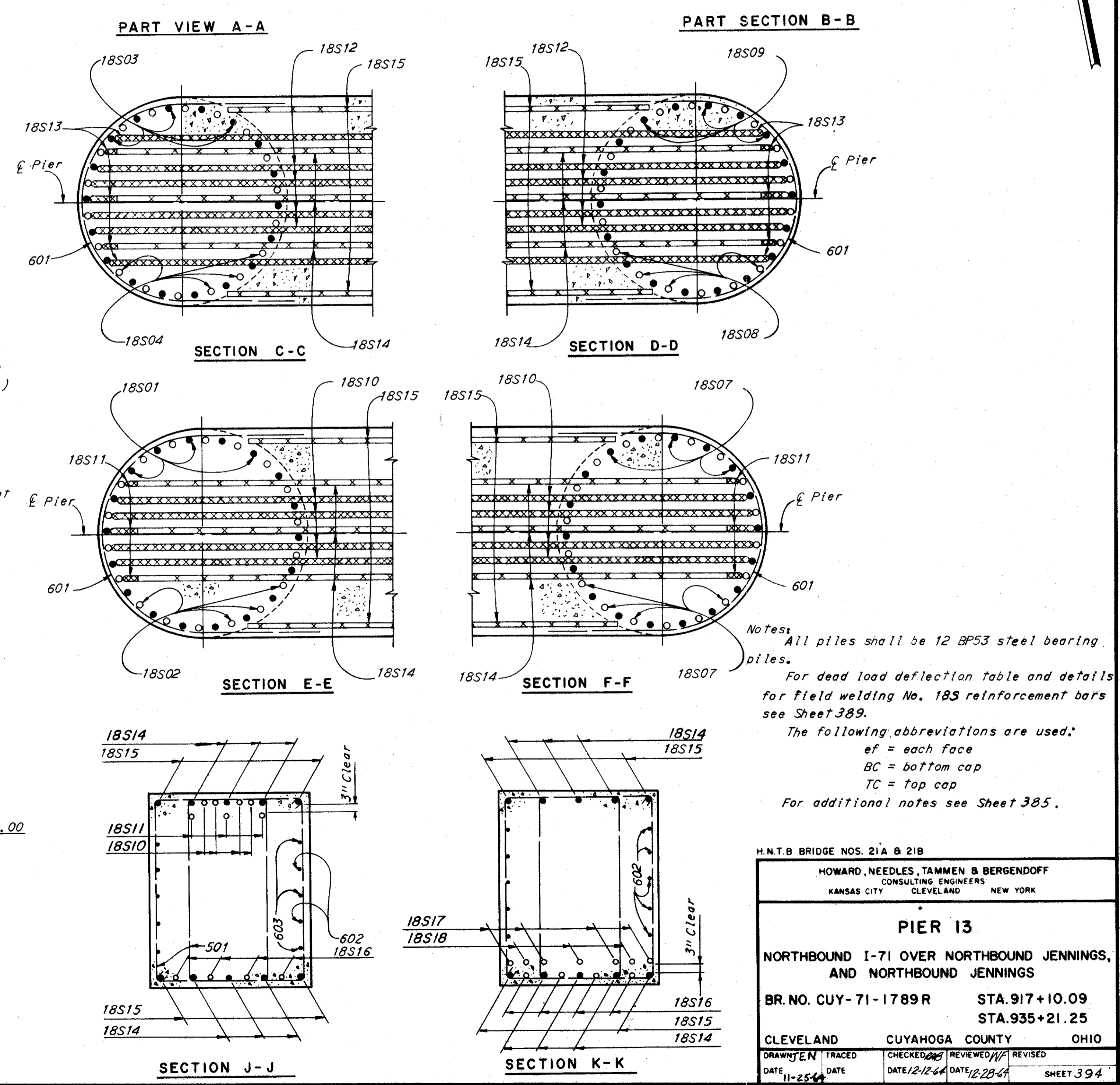
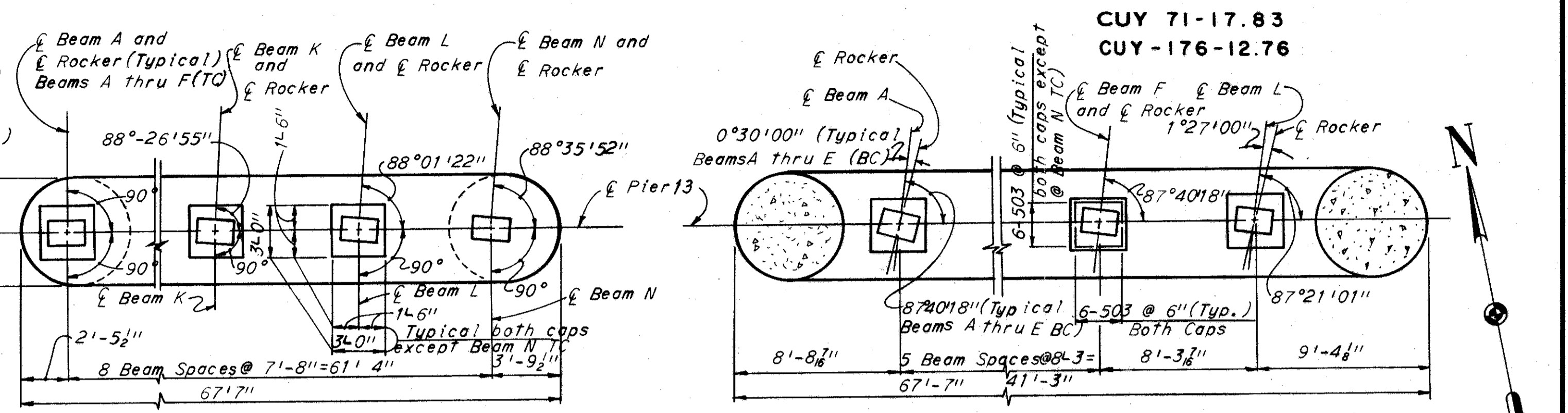
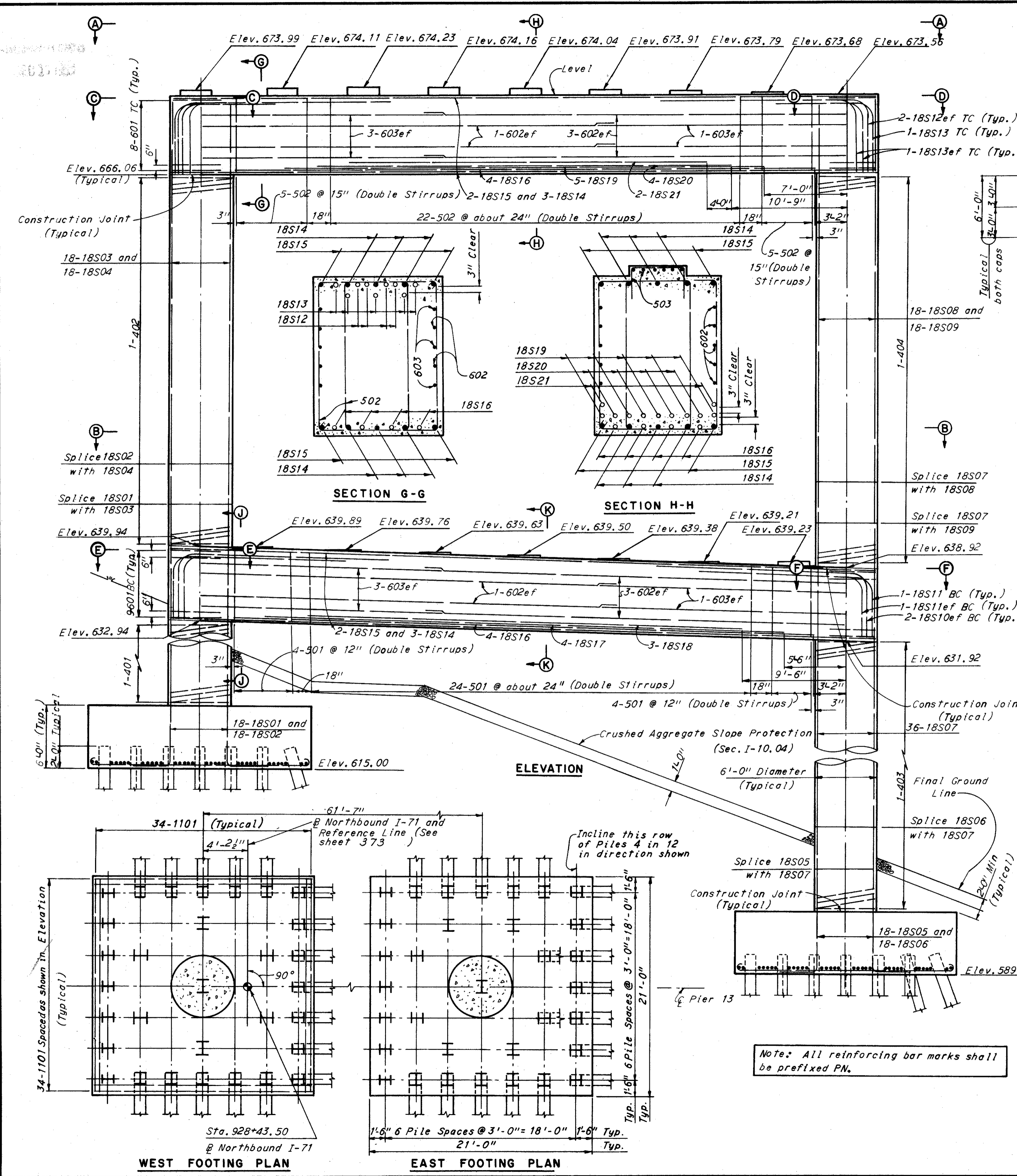
BR. NO. CUY-71-1789 R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/JEN TRACED/CHEK/2005 REVIEWED/W/2005 REVISION  
 DATE 12-7-64 DATE 12-23-64 DATE 12-28-64

SHEET 393

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



No Test  
 All piles shall be 12 BP53 steel bearing piles.  
 For dead load deflection table and details for field welding No. 18S reinforcement bars see Sheet 389.  
 The following abbreviations are used:  
 ef = each face  
 BC = bottom cap  
 TC = top cap  
 For additional notes see Sheet 385.

Note: All reinforcing bar marks shall be prefixed PN.

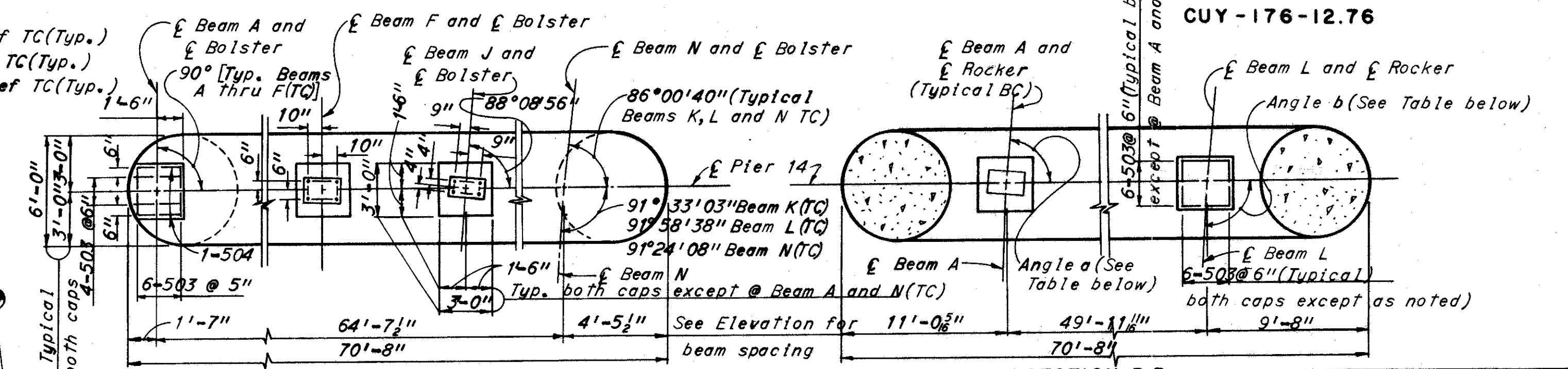
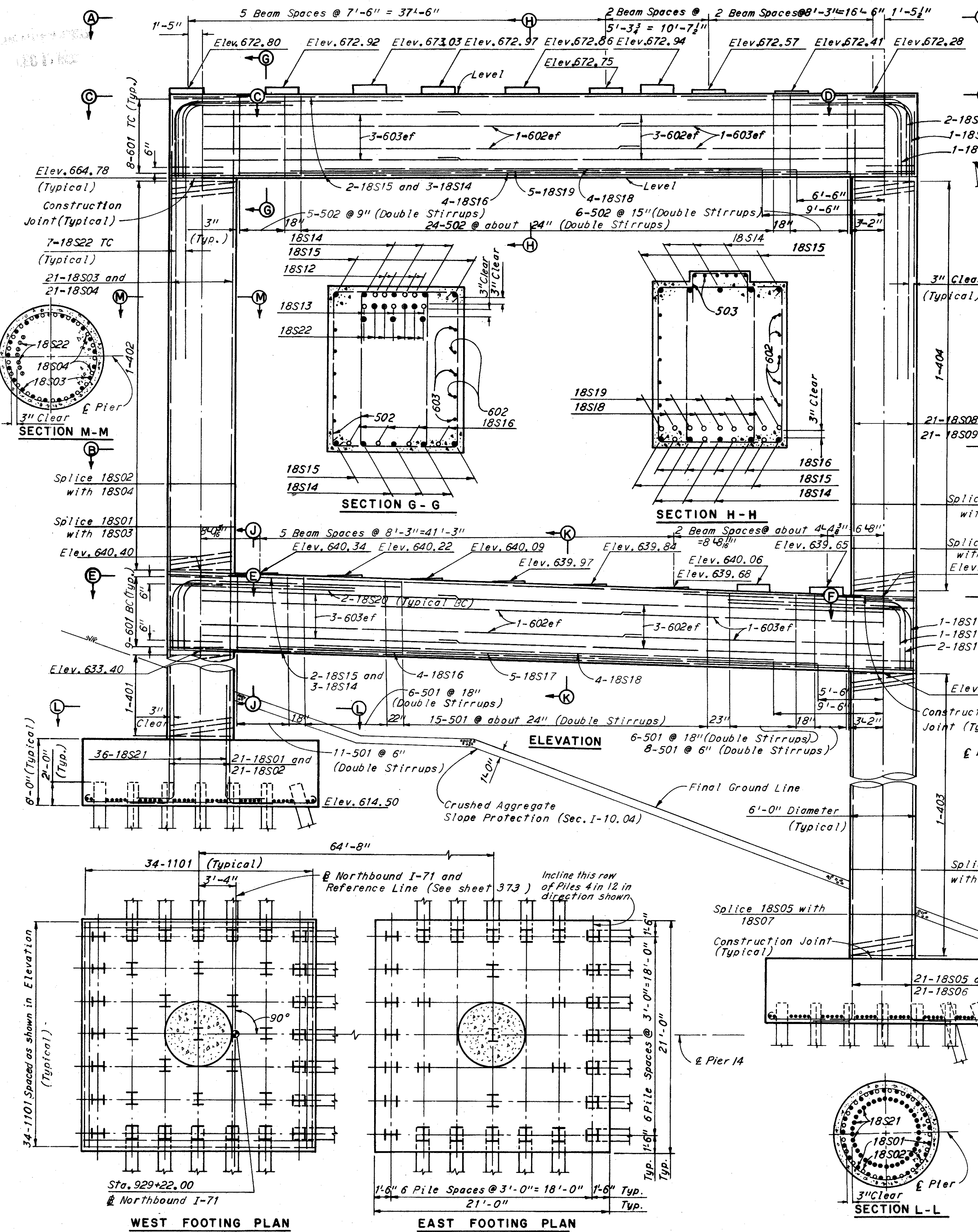
H.N.T.B BRIDGE NOS. 21A & 21B  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIER 13**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS  
 BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN BY: JEN TRACED CHECKED: [initials] REVIEWED: [initials] REVISION  
 DATE: 11-25-44 DATE: 12-12-44 DATE: 12-28-44 SHEET 394

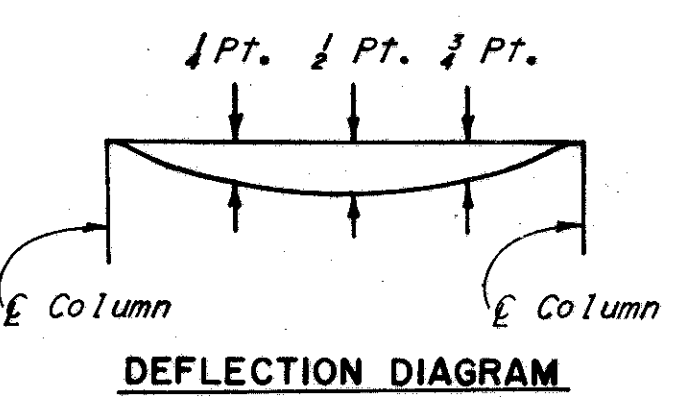
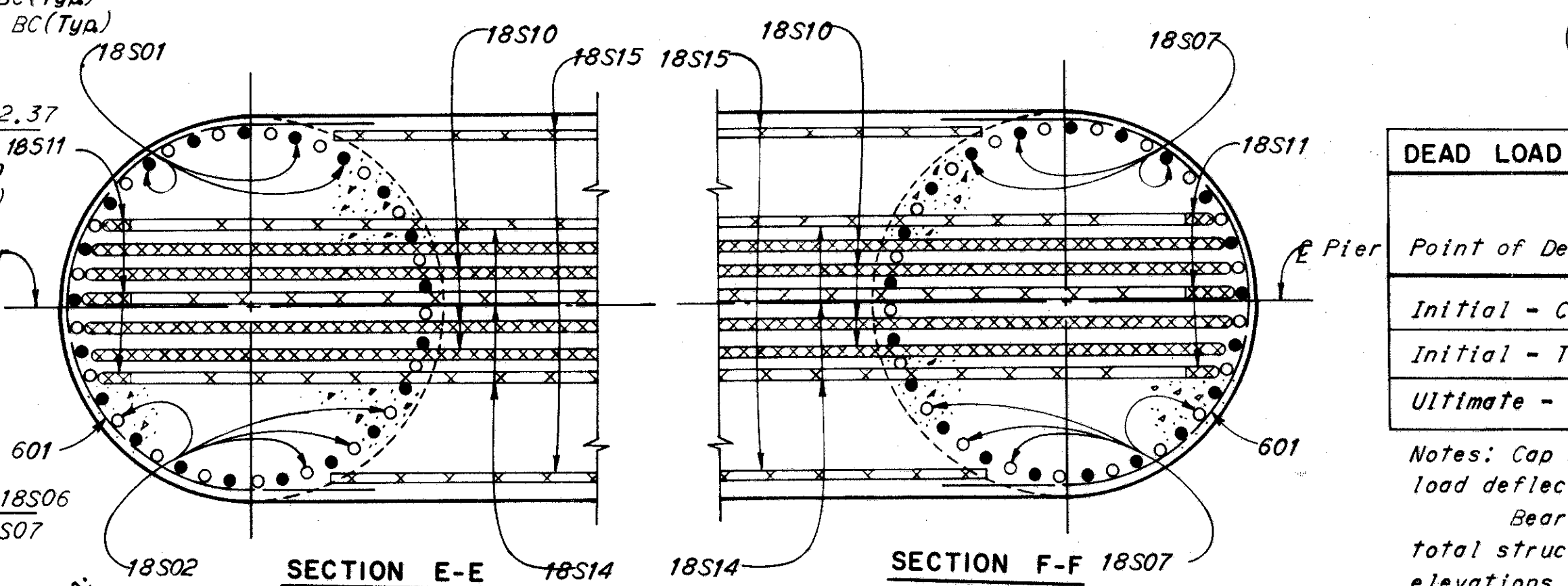
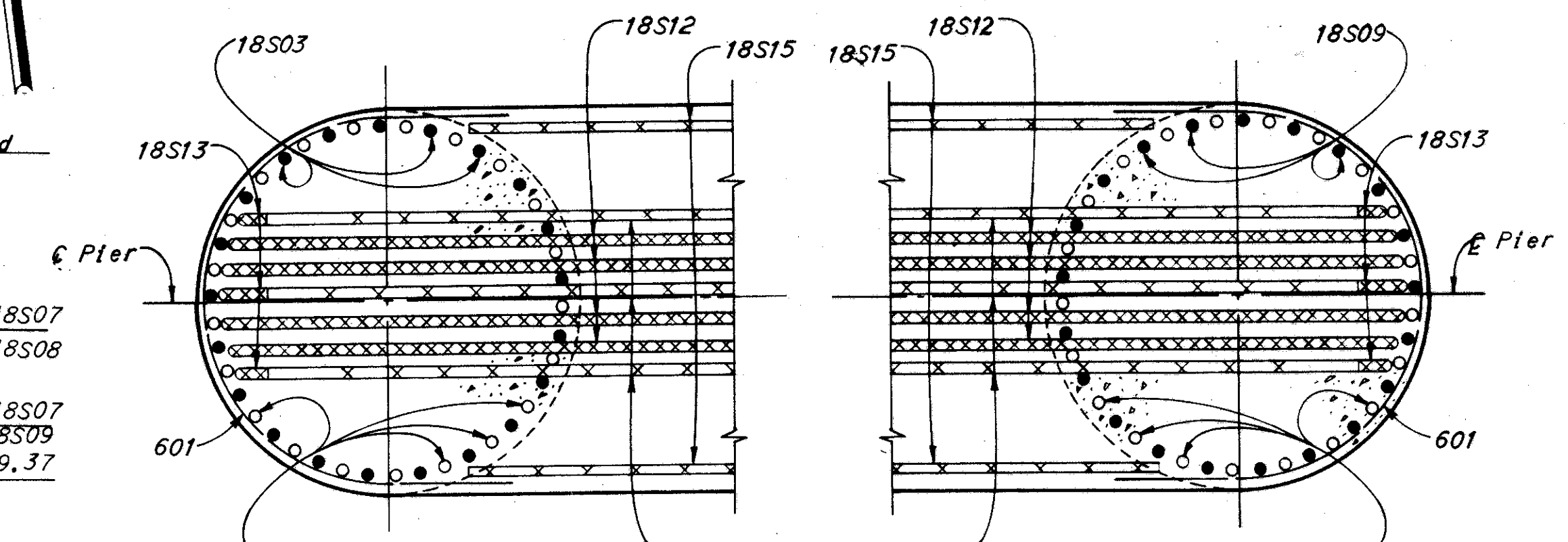
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

Note:  
 Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



Beam	Angle a	Angle b
A	85°49'52"	92°19'42"
B	86°13'51"	92°19'42"
C	86°37'50"	92°19'42"
D	87°01'51"	92°19'42"
E	87°25'53"	92°19'42"
F	87°49'56"	92°19'42"
J	87°26'45"	92°33'15"
L	84°26'45"	92°38'59"

Note: All reinforcing bar marks shall be prefixed PP.



Point of Deflection	Both Caps		
	1/4"	1/2"	3/4"
Initial - Cap Beam Only	1/16"	1/8"	1/16"
Initial - Total Structure	3/8"	1/2"	5/8"
Ultimate - Total Structure	9/16"	3/4"	1 1/8"

Notes: Cap beams shall be cambered for ultimate dead load deflections.  
 Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached. Pier construction shall be complete prior to the erection of any superstructure steel.

Notes:  
 All piles shall be 128P53 steel bearing piles.  
 For details for field welding No. 18S reinforcement bars see sheet 389.  
 The following abbreviations are used:  
 ef = each face  
 BC = bottom cap  
 TC = top cap  
 For additional notes see sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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 KANSAS CITY CLEVELAND NEW YORK

**PIER 14**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

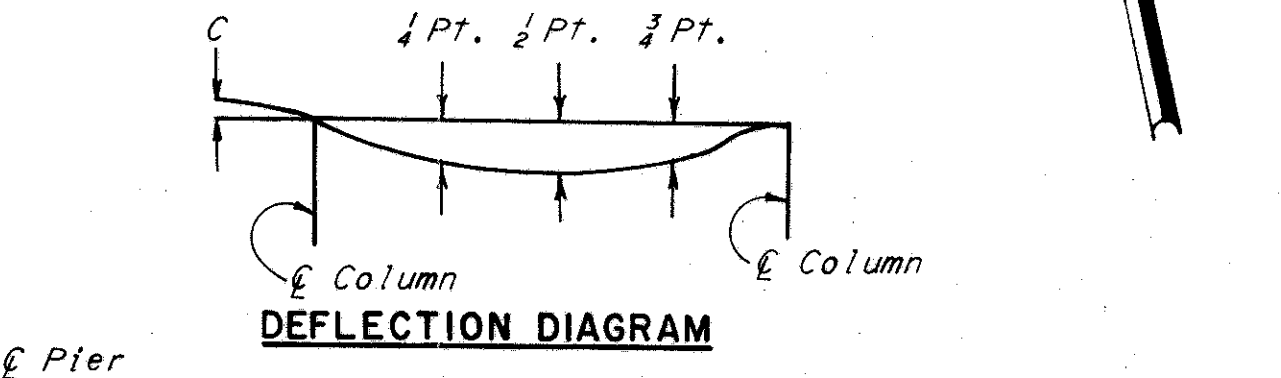
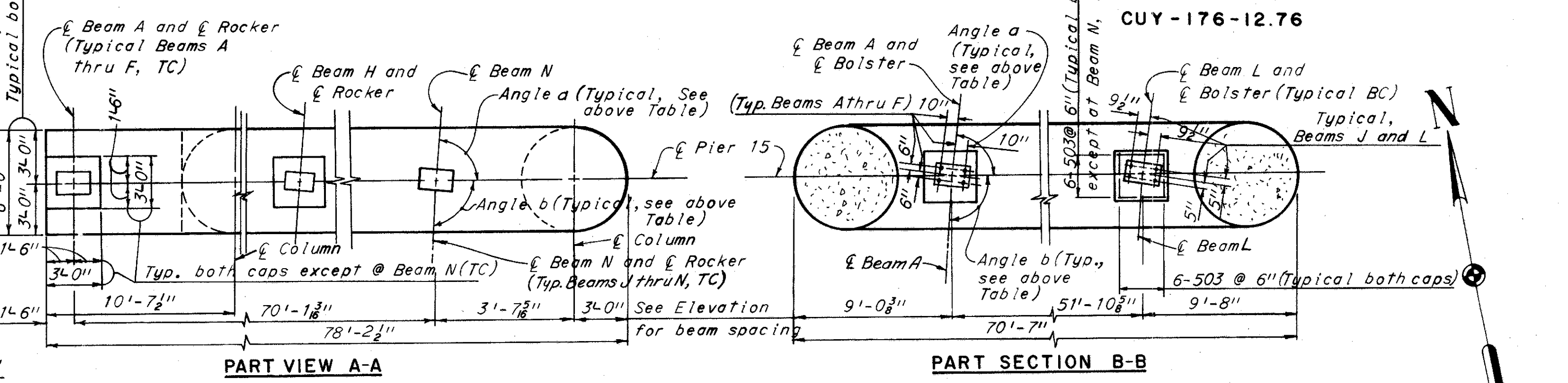
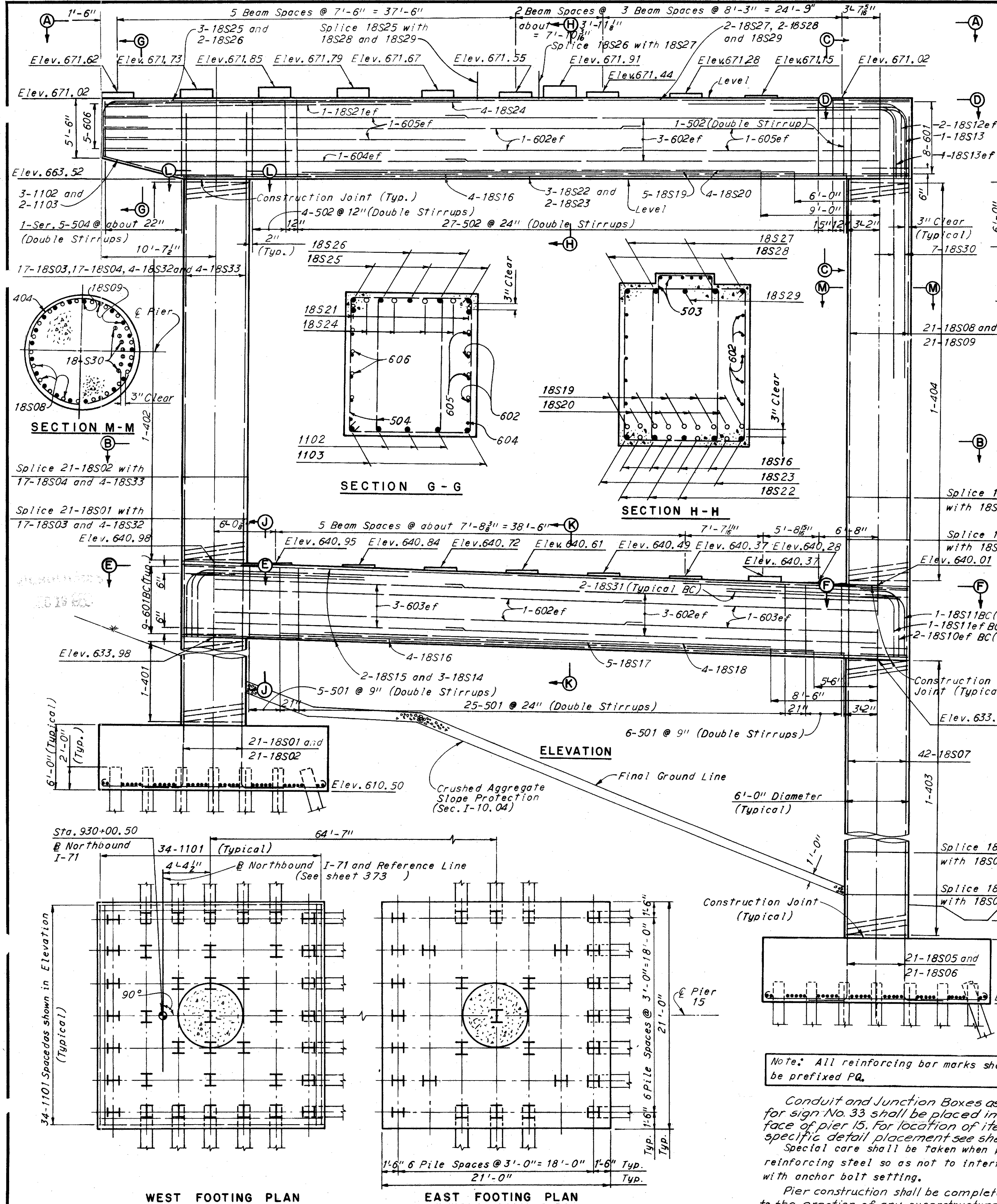
CLEVELAND CUYAHOGA COUNTY OHIO

DATE 11-4-64 TRACED CHECKED 12-7-64 REVISION 11/28/64 SHEET 395

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

BEAM AND ROCKER OR BOLSTER LOCATION - BOTH CAPS

Cap	Angle	Beam A	Beam B	Beam C	Beam D	Beam E	Beam F	Beam H	Beam J	Beam K	Beam L	Beam N
Top	a	90°00'00"	90°00'00"	90°00'00"	90°00'00"	90°00'00"	90°00'00"	87°9'08"	84°0'153"	84°0'153"	84°0'153"	84°0'153"
Bottom	b	90°00'00"	90°00'00"	90°00'00"	90°00'00"	90°00'00"	90°00'00"	92°29'52"	91°51'04"	93°59'20"	93°59'20"	93°59'20"
		84°0'14"	84°0'14"	84°0'14"	84°0'14"	84°0'14"	84°0'14"	83°47'40"	83°47'40"	81°33'42"	81°33'42"	81°33'42"
		94°10'08"	93°46'09"	93°22'10"	92°58'09"	92°34'07"	92°10'04"	—	92°33'15"	—	95°33'15"	—



DEAD LOAD DEFLECTION TABLE

Point of Deflection	Top Cap			Bottom Cap		
	C	1	2	1	2	3
Initial - Cap Beam Only	0	1/16"	1/16"	1/16"	1/16"	1/16"
Initial - Total Structure	-1/16"	3/16"	4/16"	3/16"	1/16"	8/16"
Ultimate - Total Structure	-3/16"	1/8"	3/16"	1/8"	3/16"	8/16"

Notes: Cap beams shall be cambered for ultimate dead load deflections.  
 Bearing Pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

Note: All reinforcing bar marks shall be prefixed PQ.  
 Conduit and Junction Boxes as specified for sign No. 33 shall be placed in the South face of pier 15. For location of items and specific detail placement see sheet No. 584. Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.  
 Pier construction shall be complete prior to the erection of any superstructure steel.

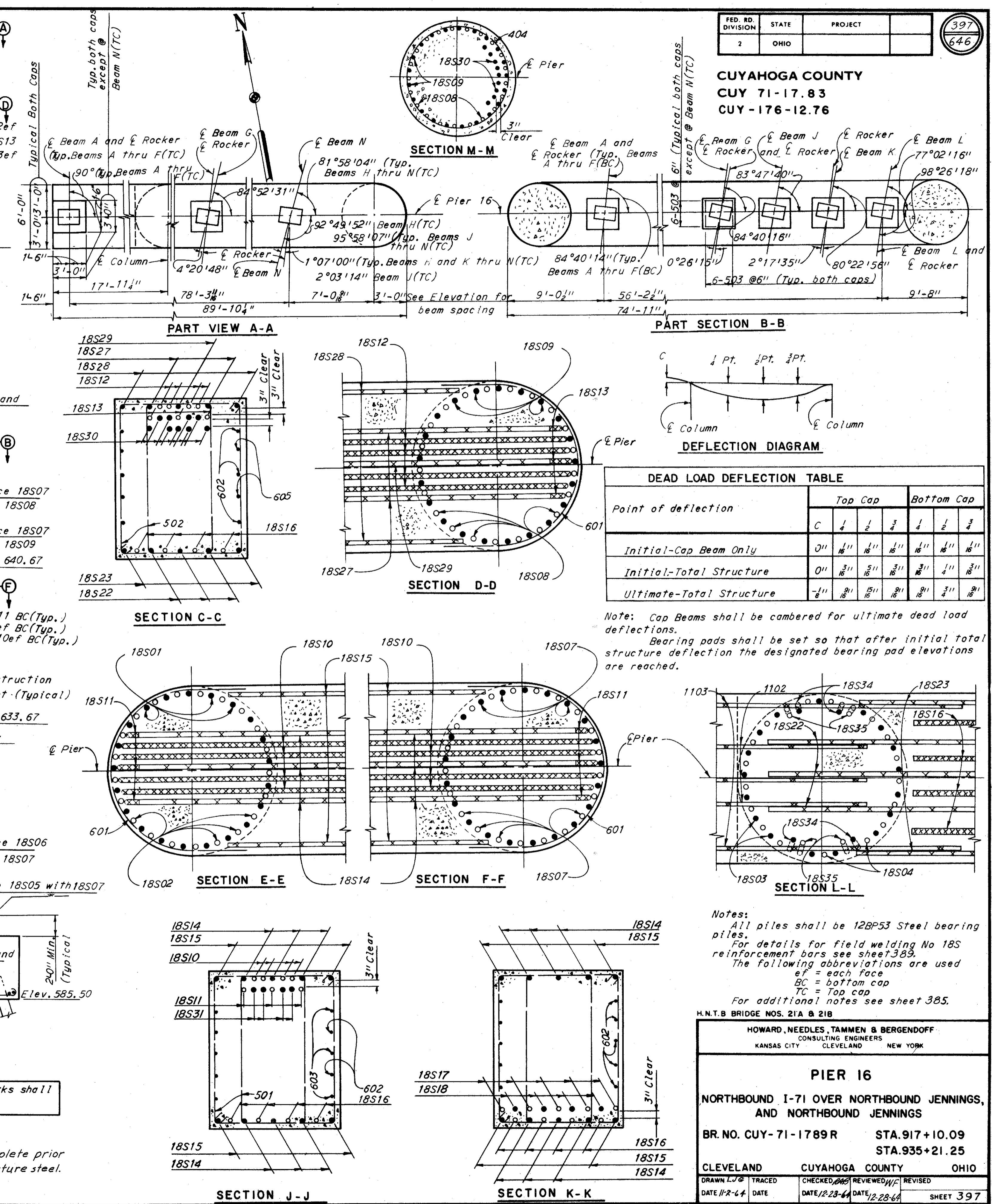
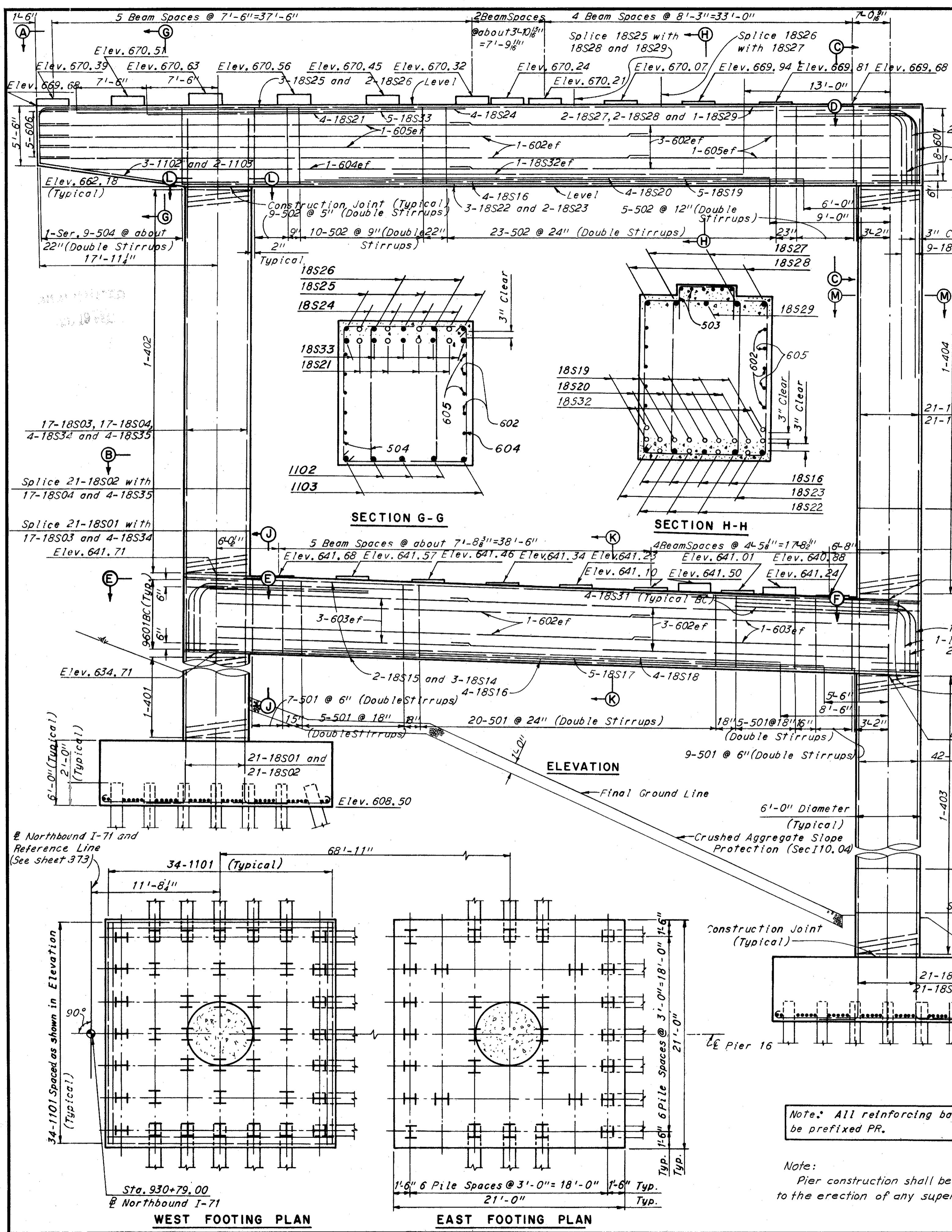
Notes: All piles shall be 12BP53 steel bearing piles. For details for field welding No. 18S reinforcement bars see Sheet 389. The following abbreviations are used: ef = each face, BC = bottom cap, TC = top cap. For additional notes see Sheet 385.

H.N.T.B. BRIDGE NOS. 21A & 21B  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIER 15**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS  
 BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN J.J.G. TRACED CHECKED [initials] REVIEWED [initials] REVISIONS  
 DATE 10-23-64 DATE 12-10-64 DATE 12-28-64 SHEET 39C

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



**DEAD LOAD DEFLECTION TABLE**

Point of deflection	Top Cap			Bottom Cap		
	C	D	E	F	G	H
Initial-Cap Beam Only	0"	1/16"	1/16"	1/16"	1/16"	1/16"
Initial-Total Structure	0"	3/16"	5/16"	3/16"	1/4"	3/8"
Ultimate-Total Structure	1/4"	3/8"	5/8"	3/8"	1/2"	3/4"

Note: Cap Beams shall be cambered for ultimate dead load deflections.  
 Bearing pads shall be set so that after initial total structure deflection the designated bearing pad elevations are reached.

**Notes:**  
 All piles shall be 12BP53 Steel bearing piles.  
 For details for field welding No 18S reinforcement bars see sheet 389.  
 The following abbreviations are used:  
 ef = each face  
 BC = bottom cap  
 TC = top cap  
 For additional notes see sheet 385.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIER 16**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS  
 BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

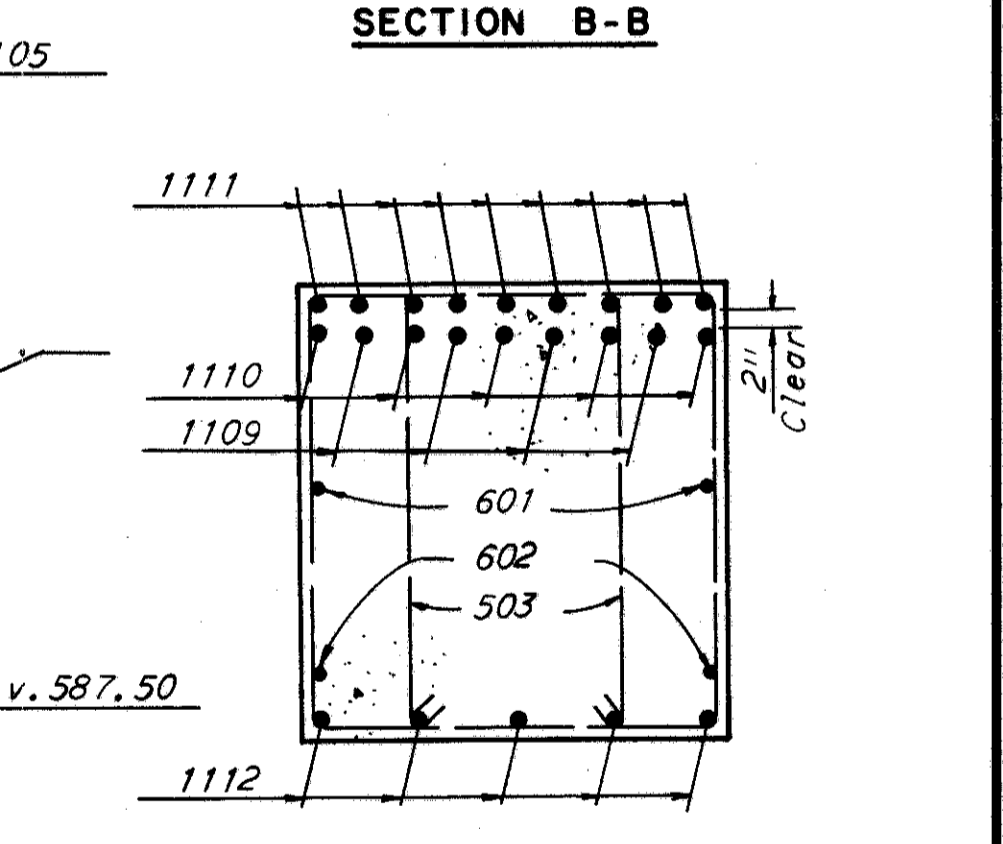
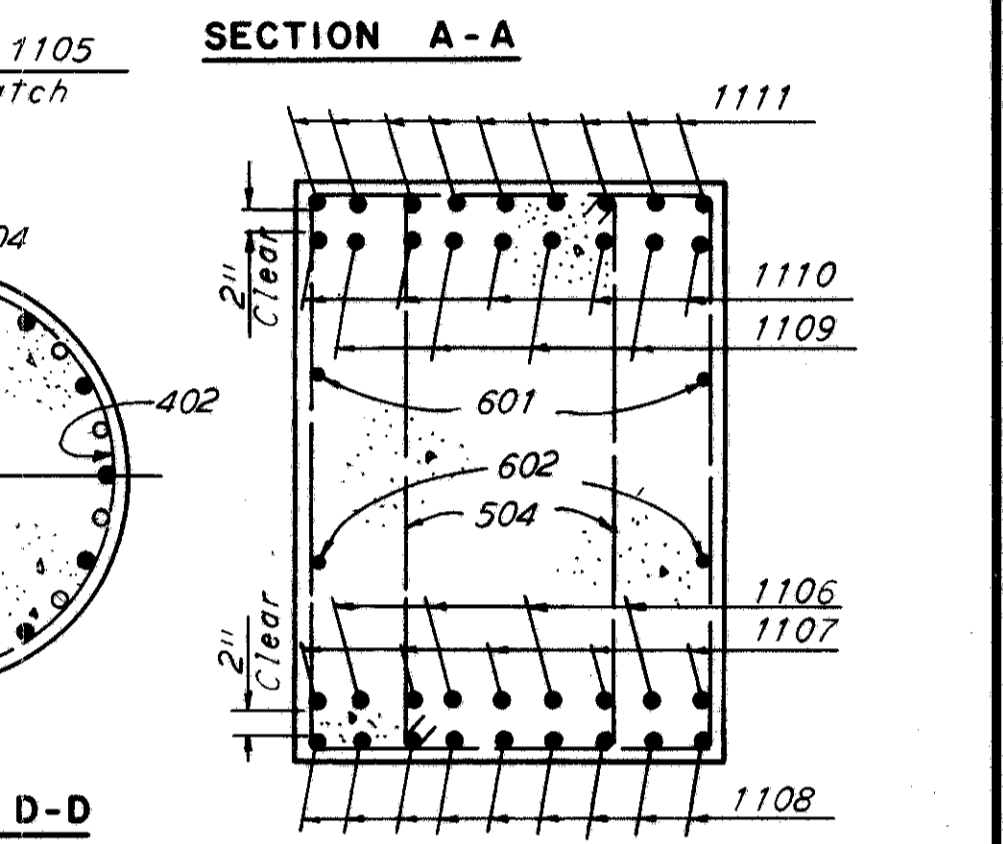
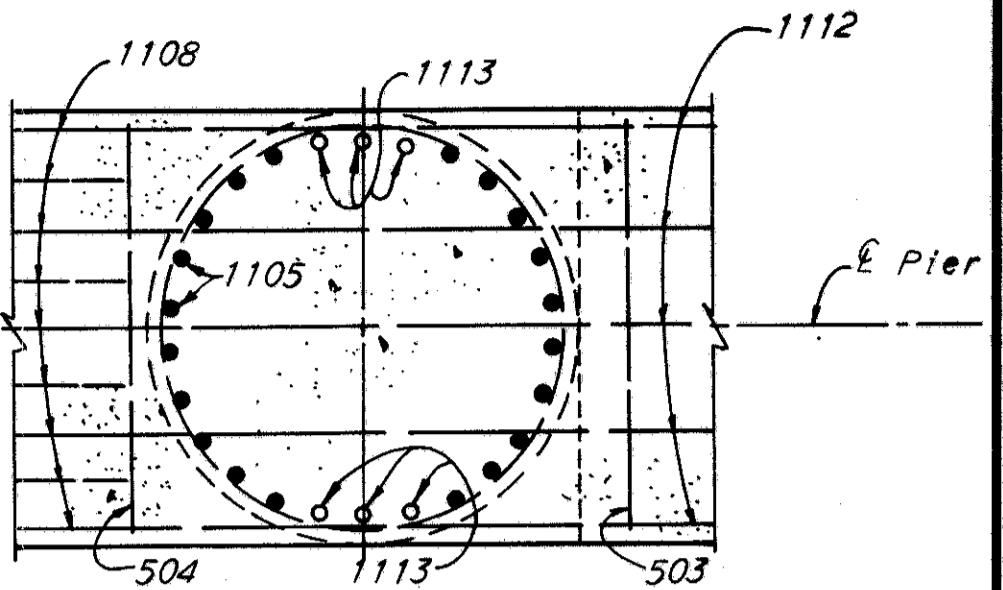
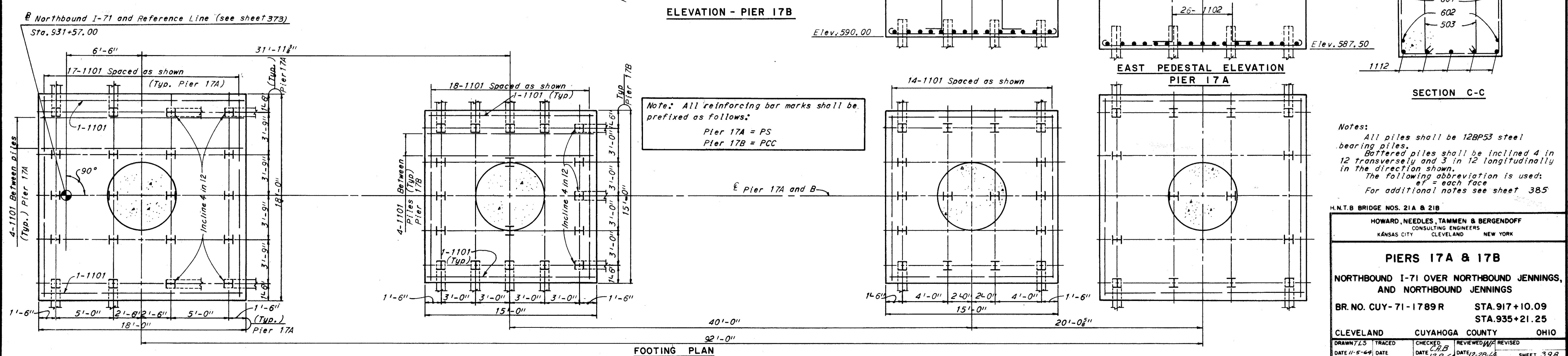
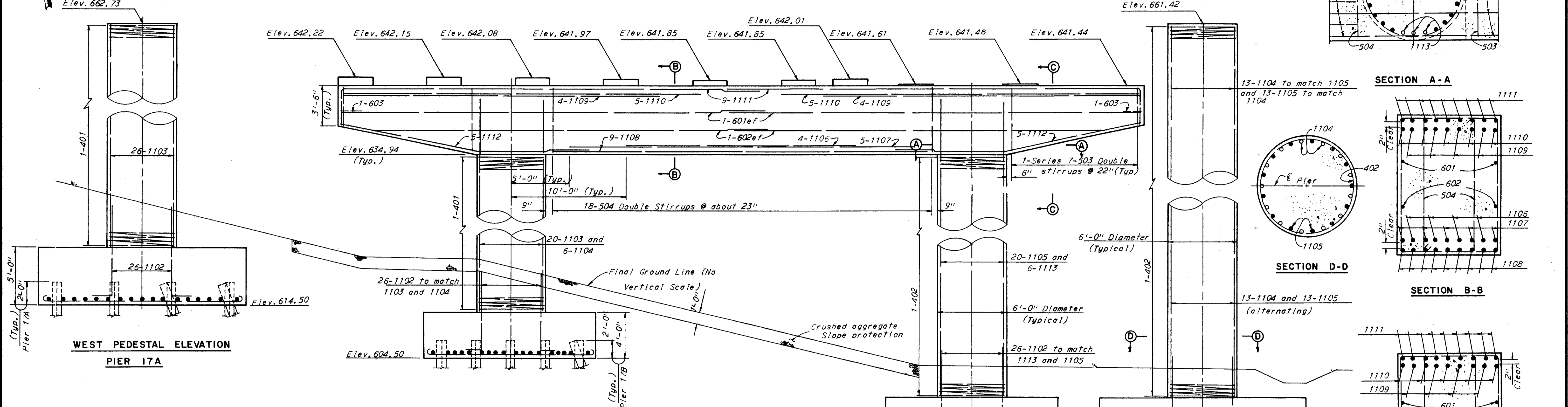
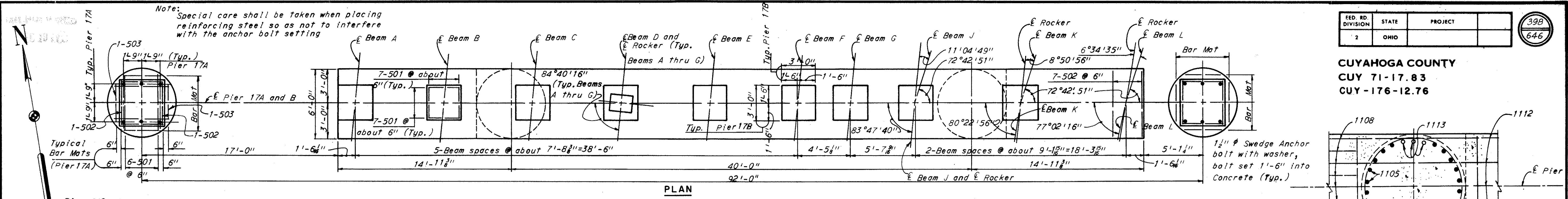
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SHEET 397



CUYAHOGA COUNTY  
CUI 71-17.83  
CUI-176-12.76

Note: Special care shall be taken when placing reinforcing steel so as not to interfere with the anchor bolt setting



WEST PEDESTAL ELEVATION  
PIER 17A

EAST PEDESTAL ELEVATION  
PIER 17A

Note: All reinforcing bar marks shall be prefixed as follows:  
Pier 17A = PS  
Pier 17B = PCC

Notes:  
All piles shall be 12BP53 steel bearing piles.  
Battered piles shall be inclined 4 in 12 transversely and 3 in 12 longitudinally in the direction shown.  
The following abbreviation is used:  
8" = each face  
For additional notes see sheet 385

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**PIERS 17A & 17B**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

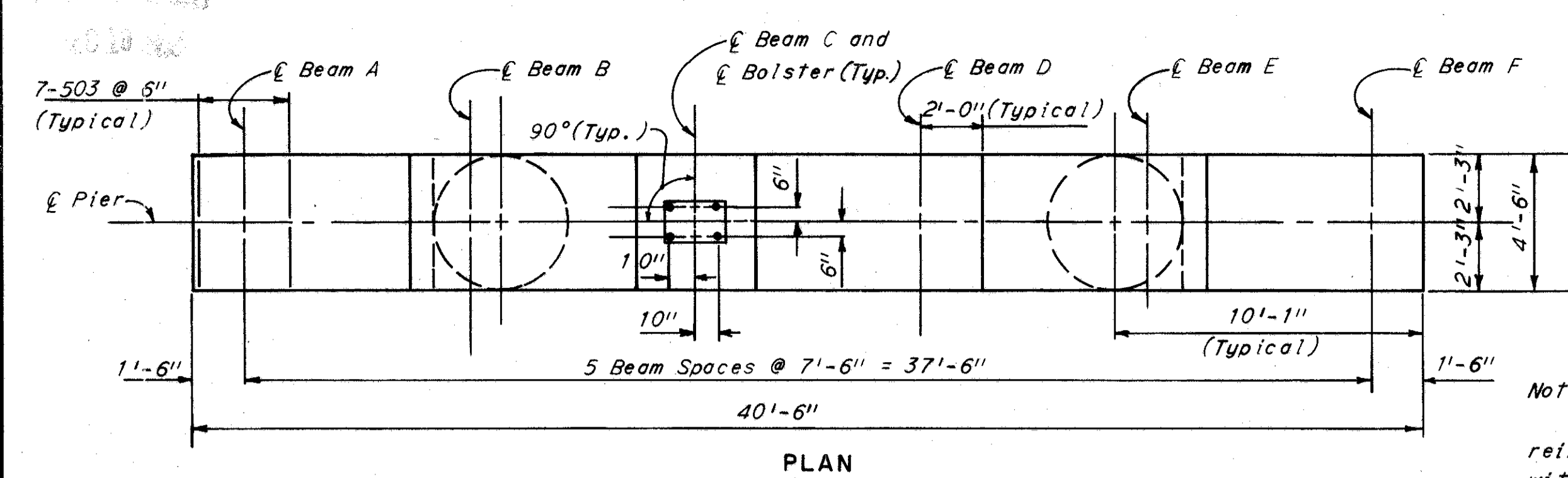
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

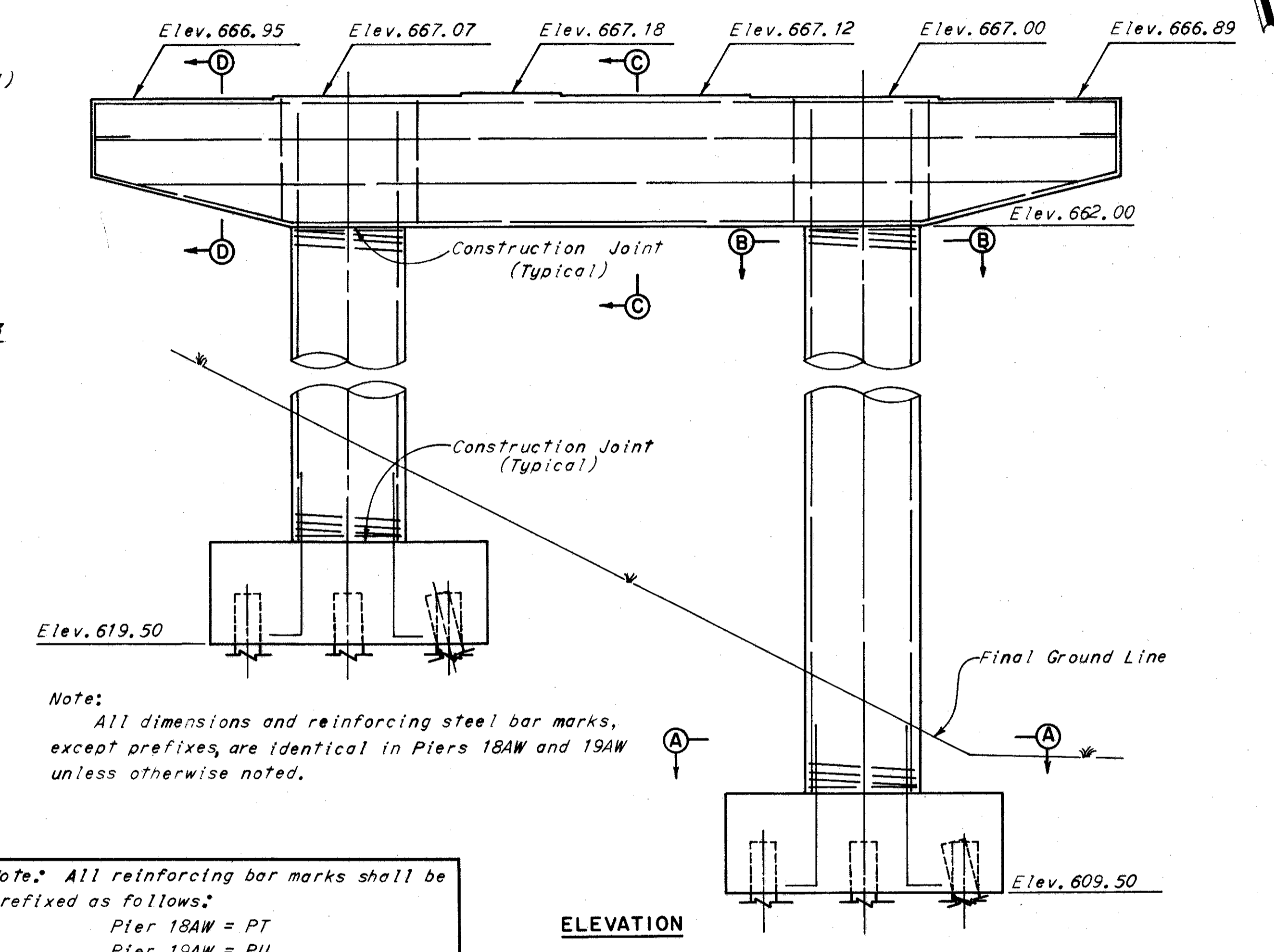
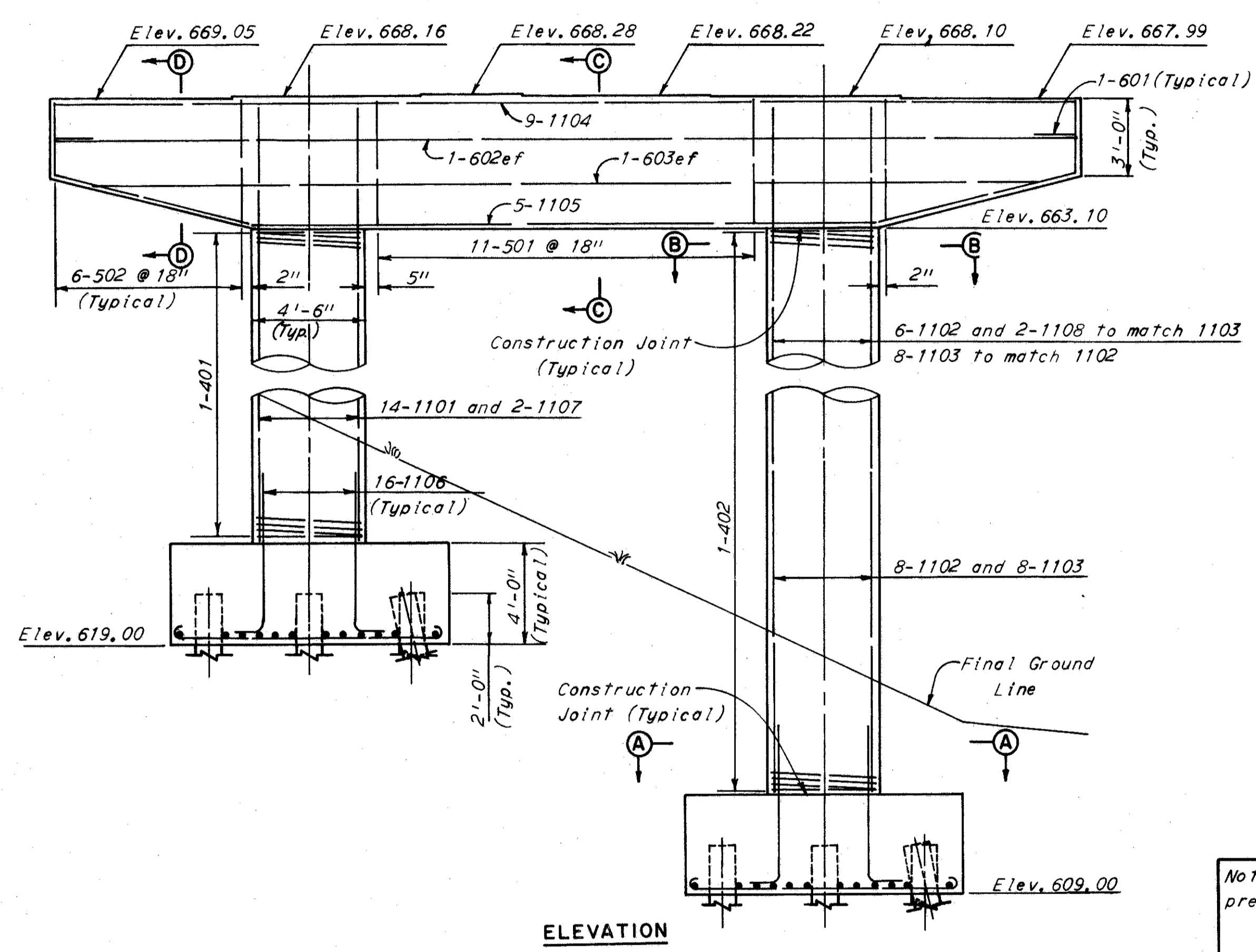
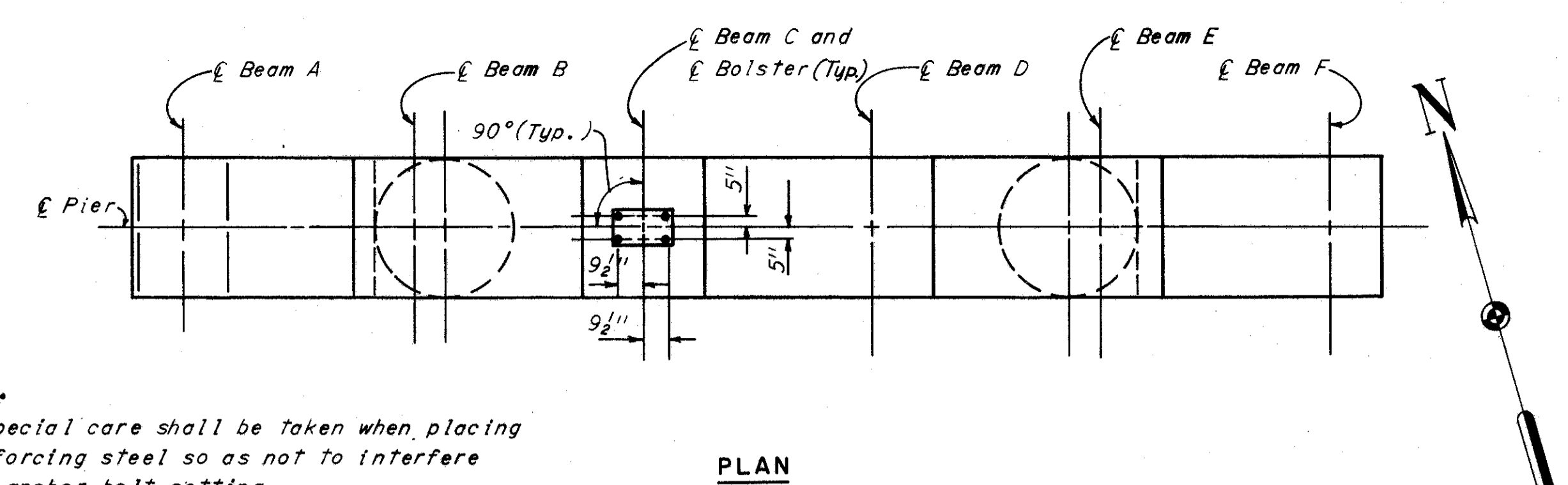
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DATE 11-5-64 DATE 12-8-64 DATE 12-28-64

SHEET 398

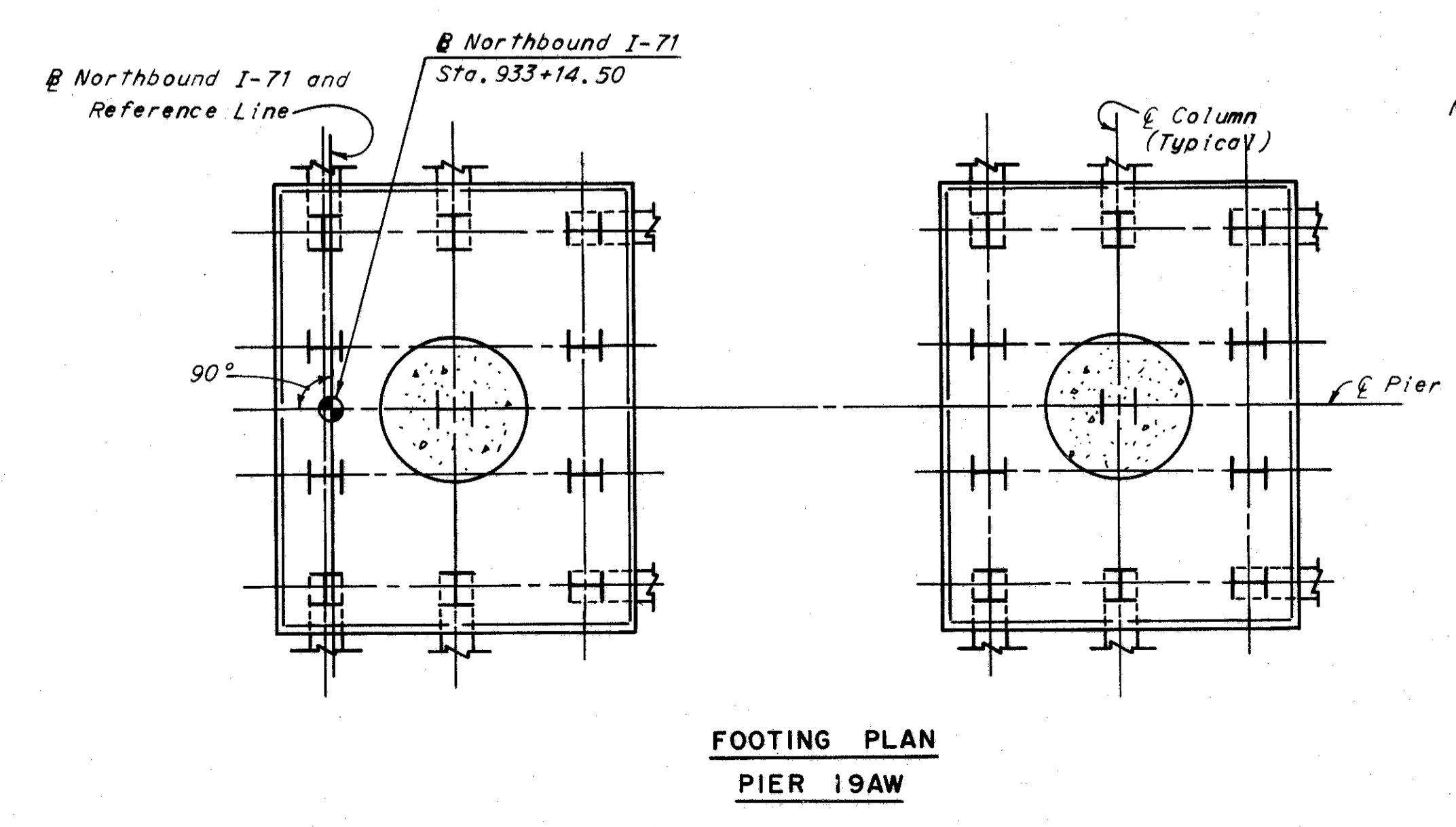
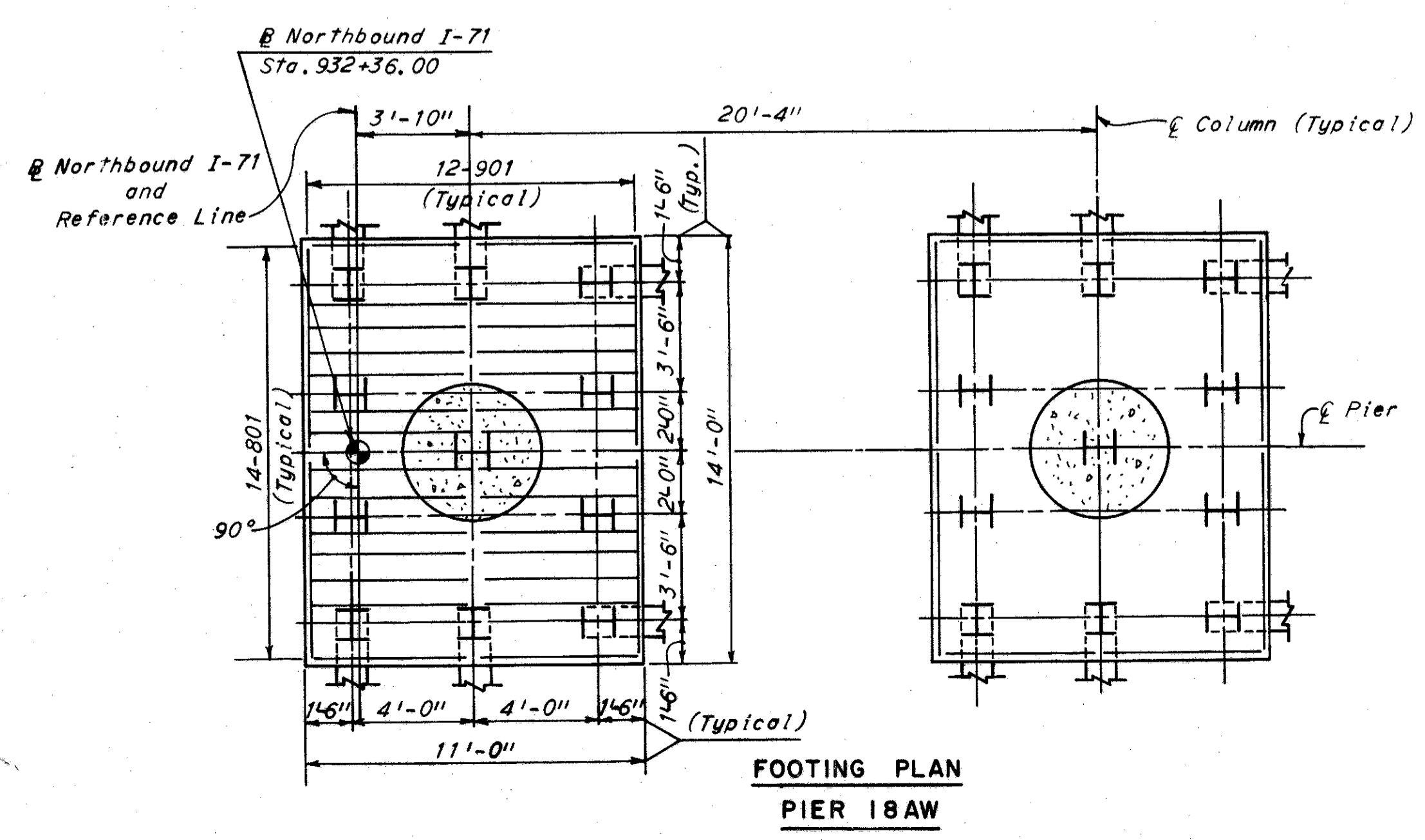
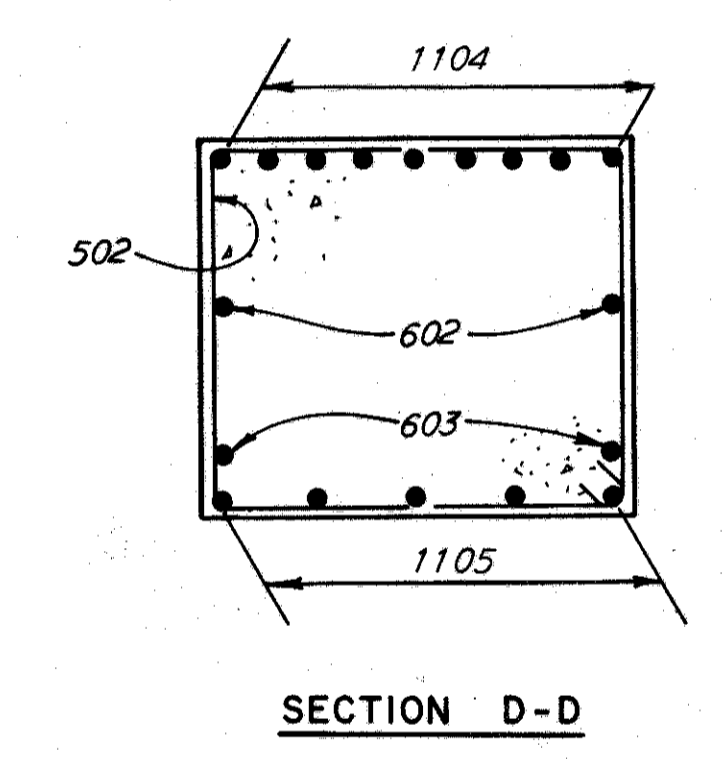
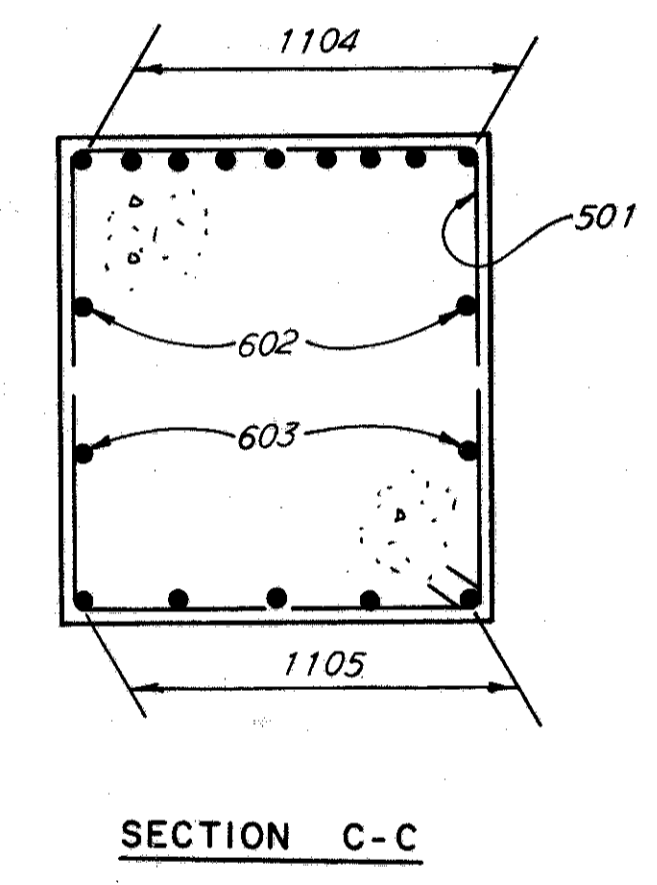
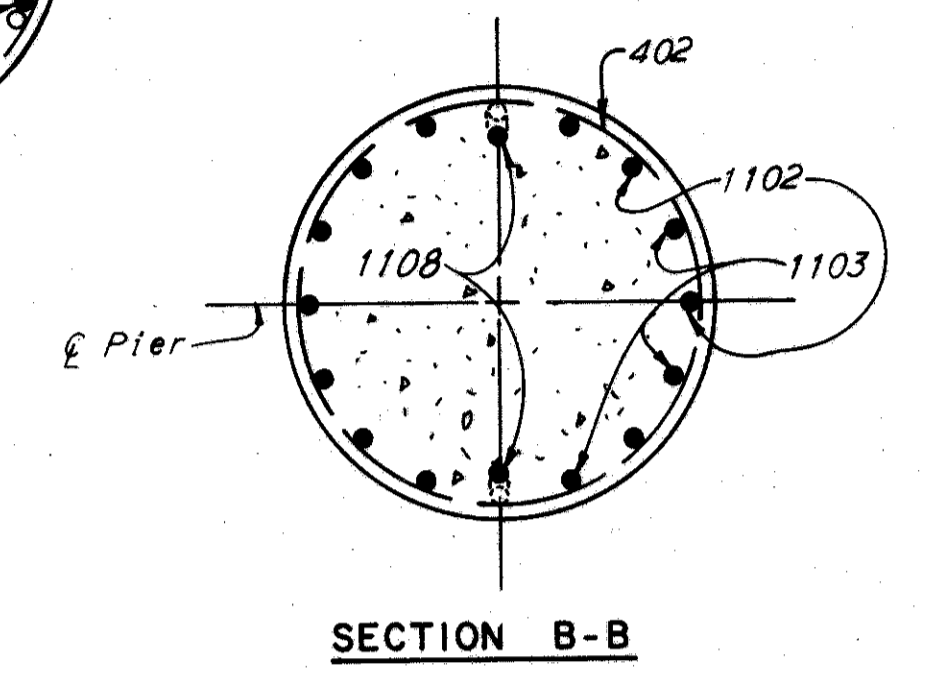
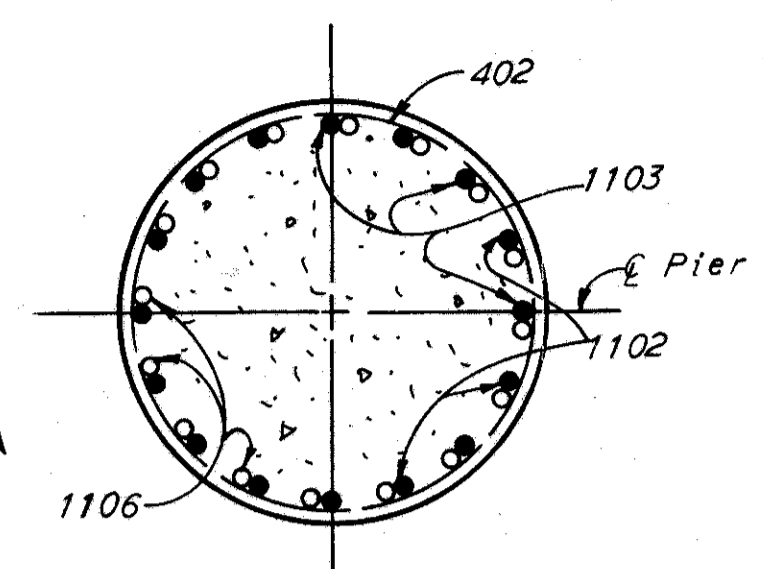
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Note:  
 Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



Note: All dimensions and reinforcing steel bar marks, except prefixes, are identical in Piers 18AW and 19AW unless otherwise noted.  
 Note: All reinforcing bar marks shall be prefixed as follows:  
 Pier 18AW = PT  
 Pier 19AW = PU



Notes:  
 All piles are 12BP53.  
 The following abbreviation is used: ef = each face  
 For additional notes see sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

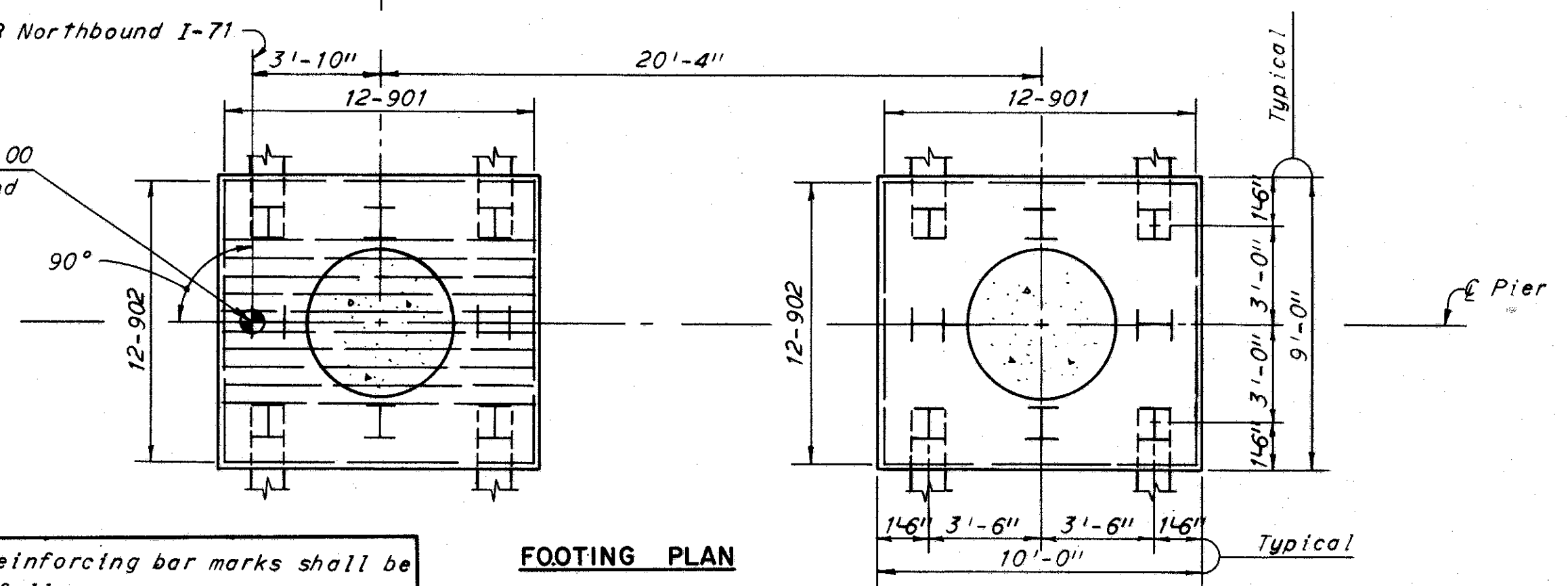
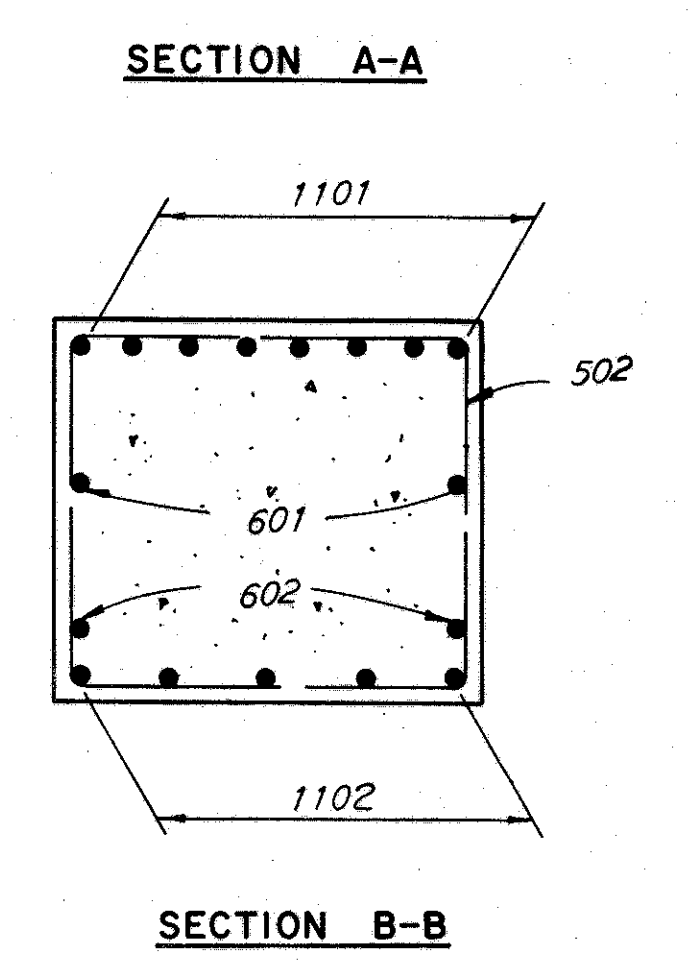
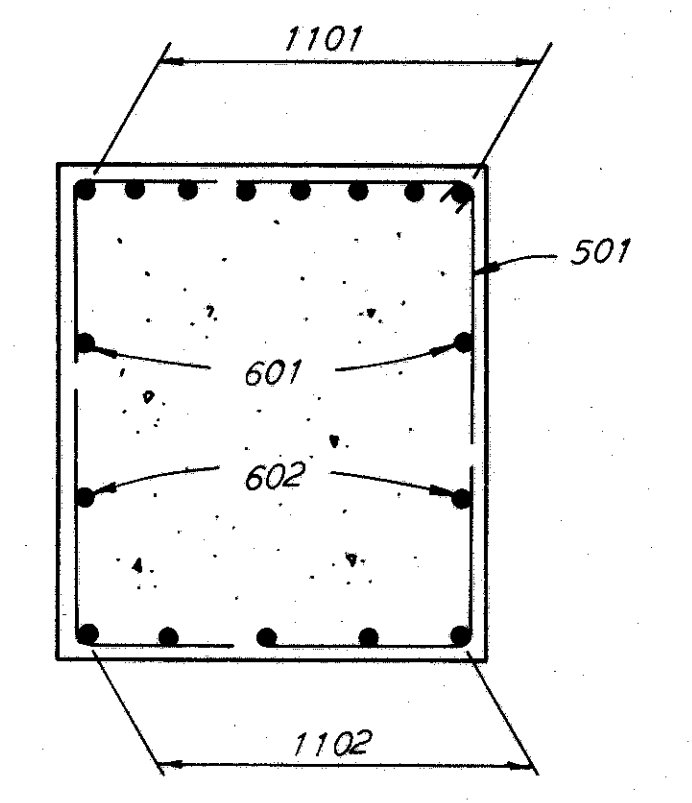
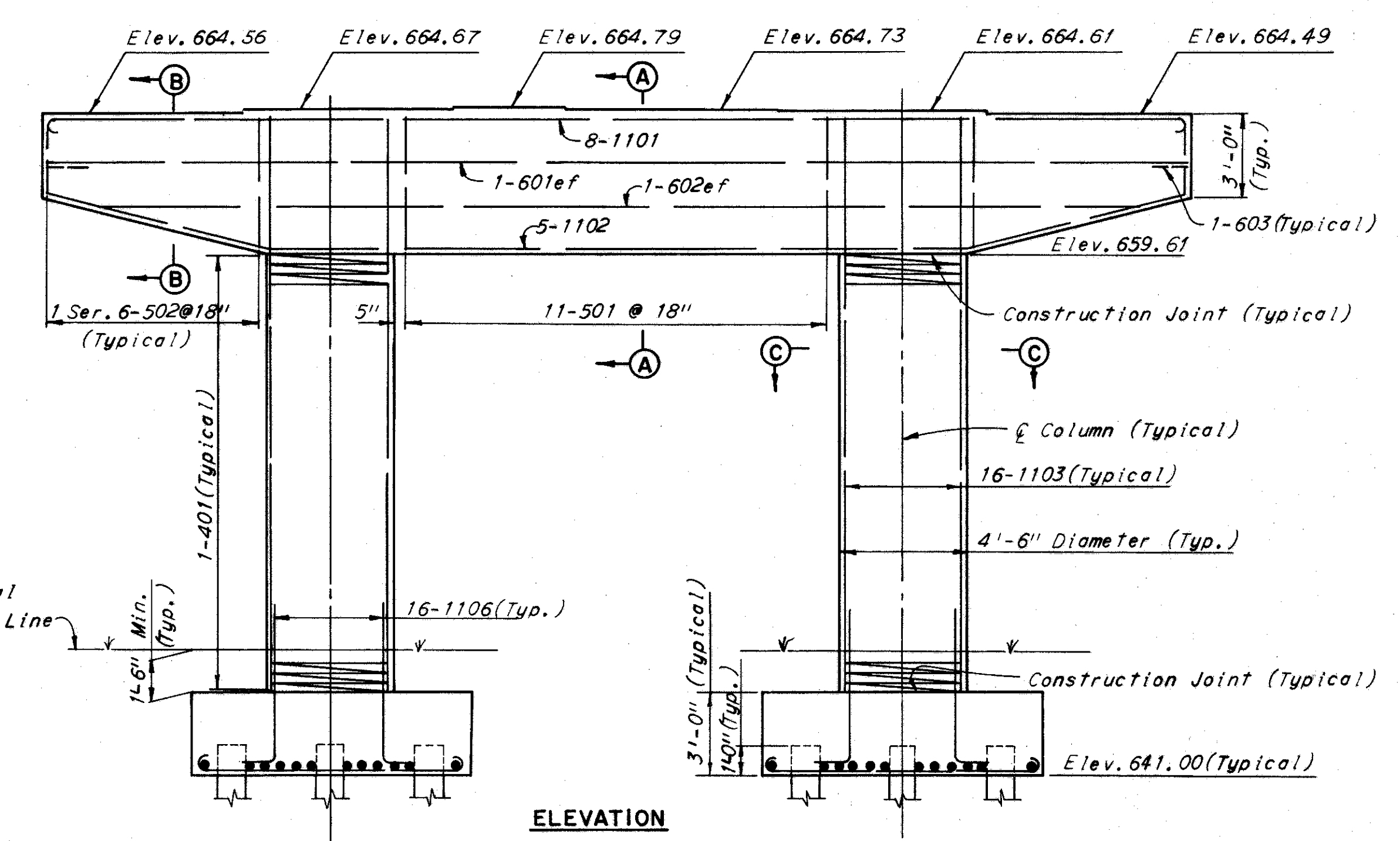
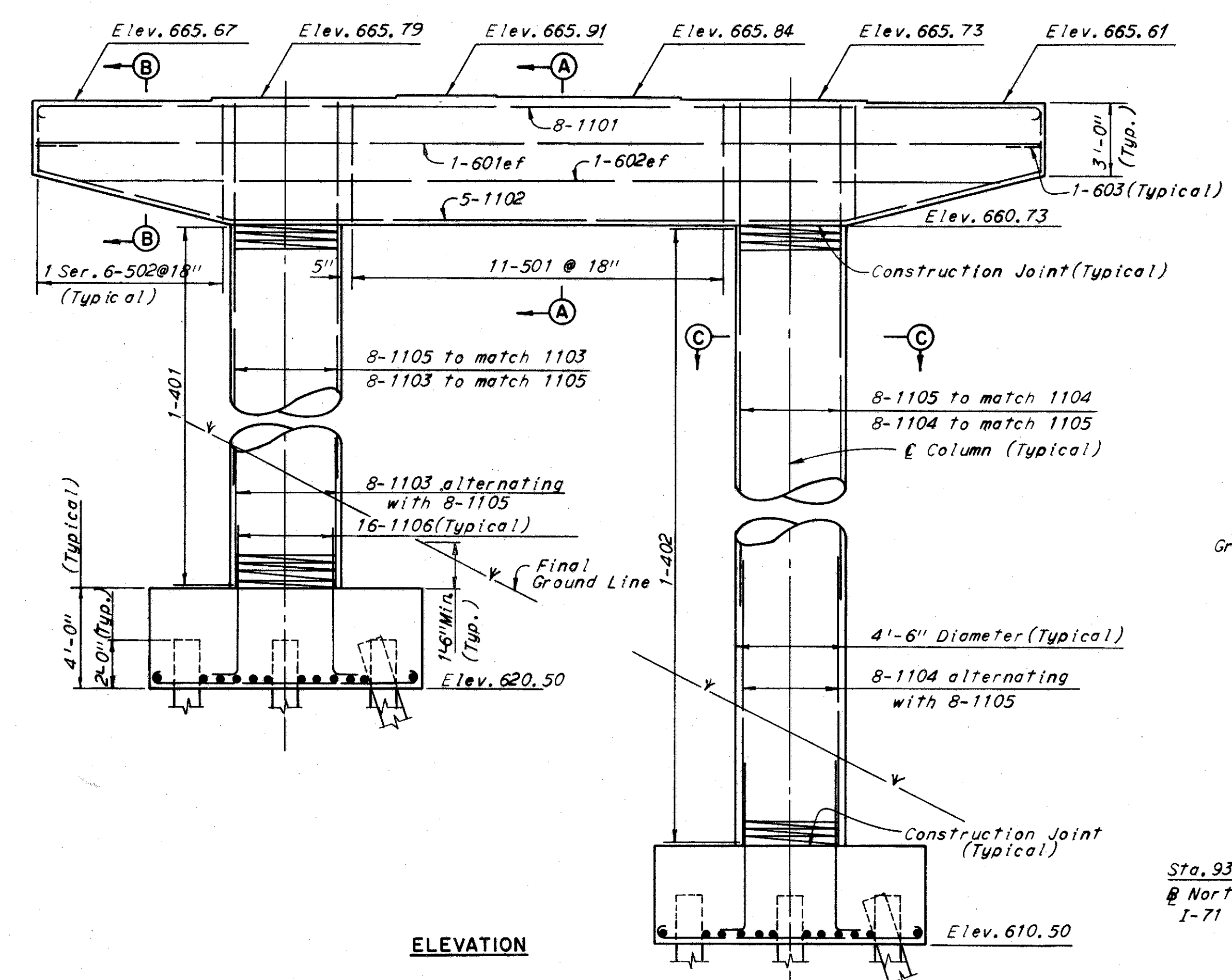
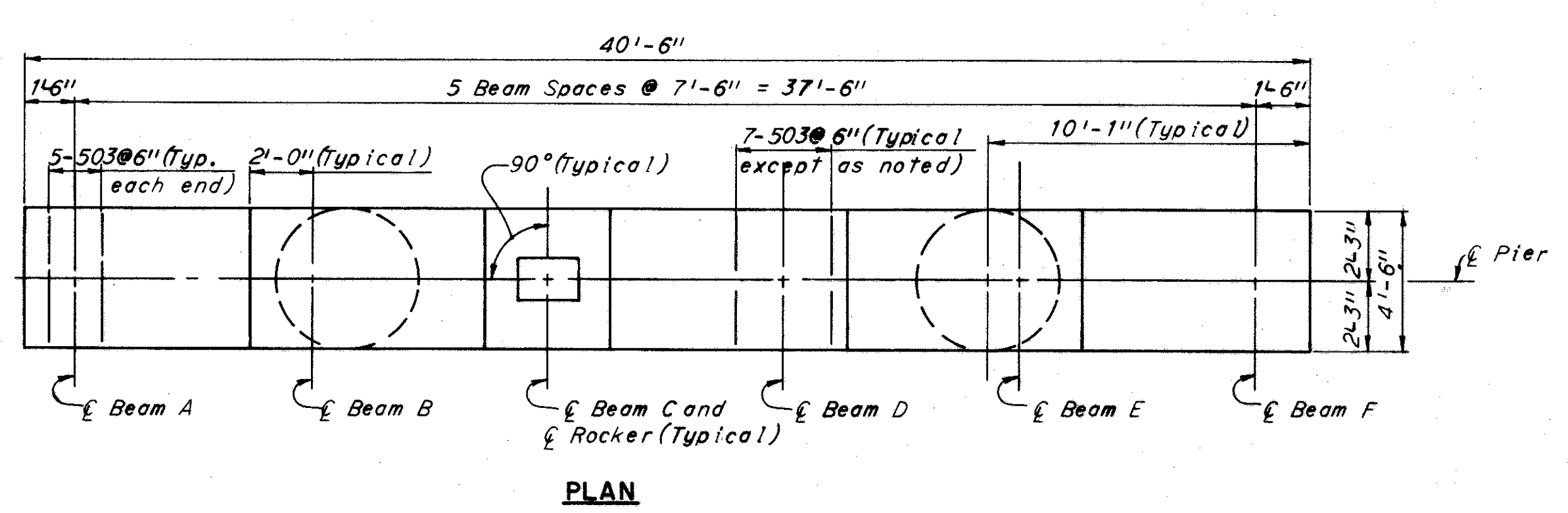
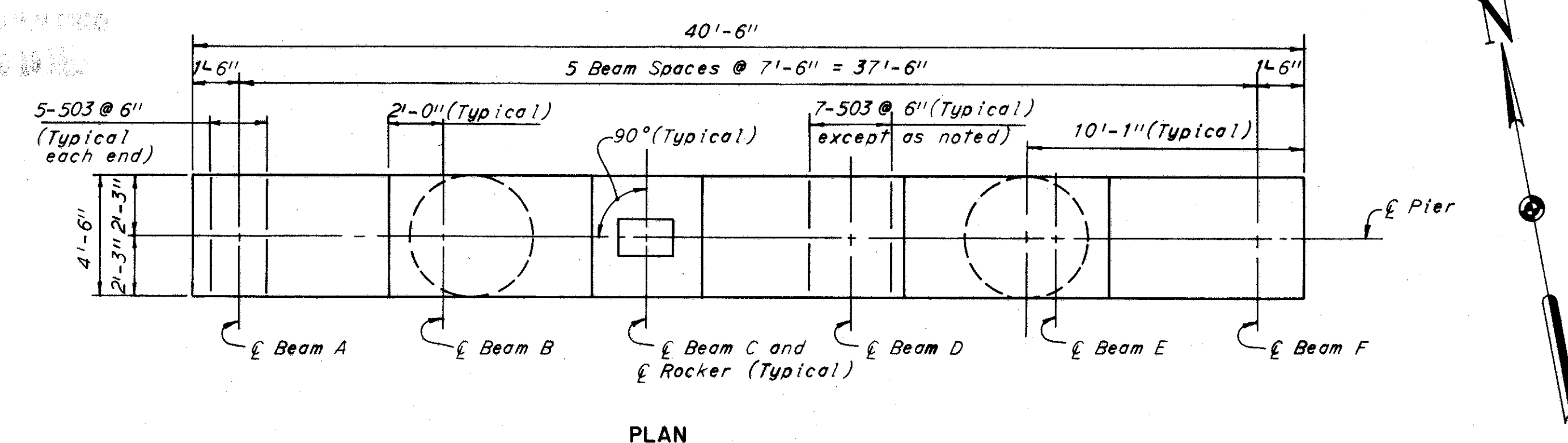
**PIERS 18AW & 19AW**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R STA. 917+10.09  
 STA. 935+21.25

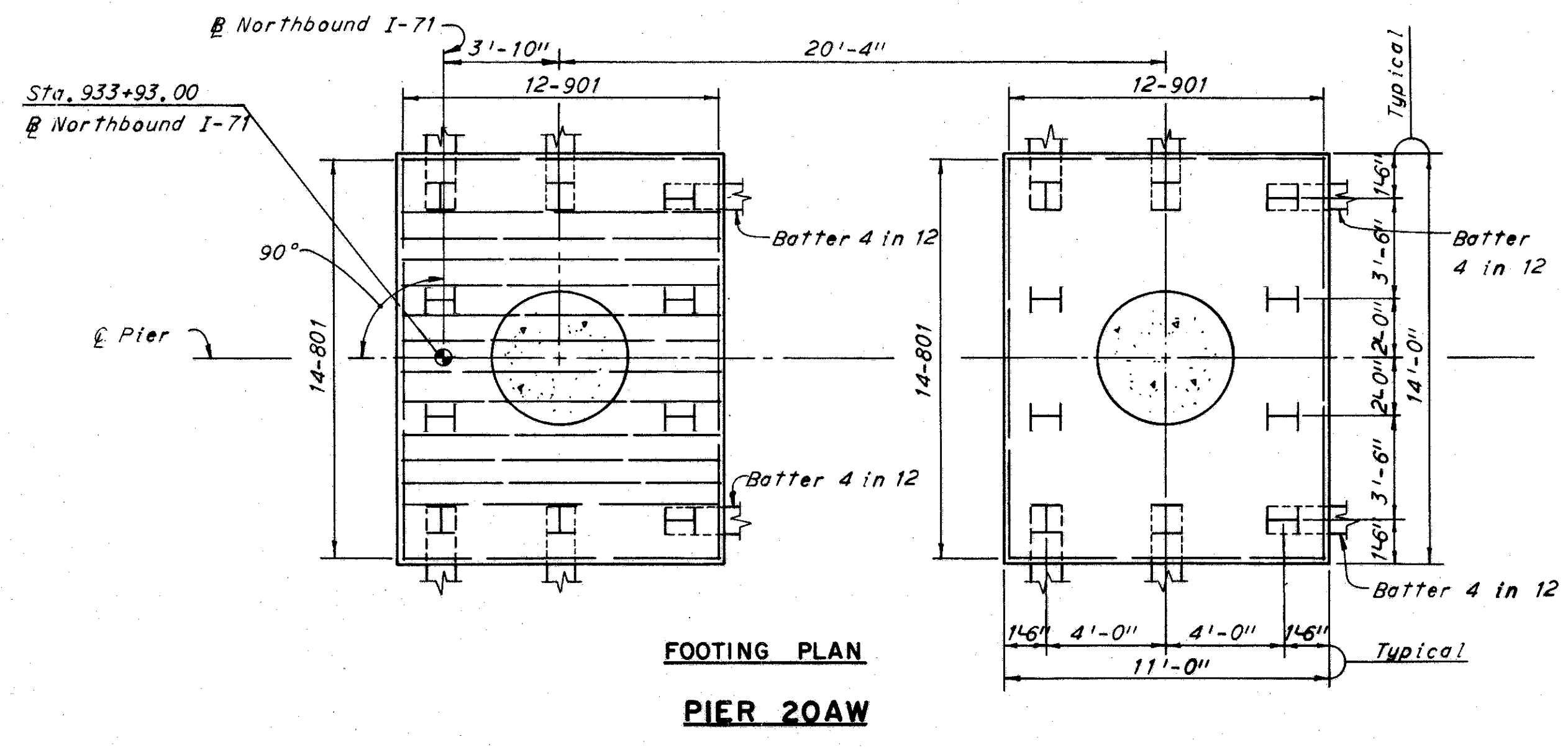
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		REVIEWED/11/2
		REVISOR

SHEET 399

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Note: All reinforcing bar marks shall be prefixed as follows:  
 Pier 20AW = PV  
 Pier 21AW = PW



Notes:  
 All piles are 12BF53.  
 All battered piles shall be inclined 3 in 12 in the direction shown except as noted.  
 The following abbreviation is used:  
 ef = each face  
 For additional notes see Sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIERS 20AW & 21AW**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

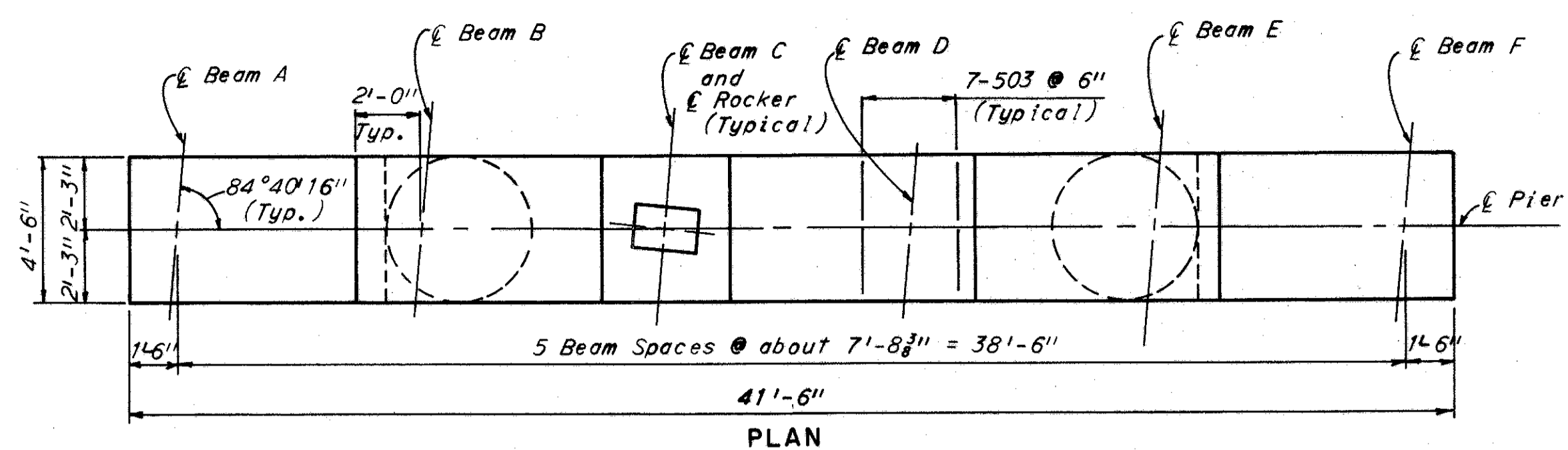
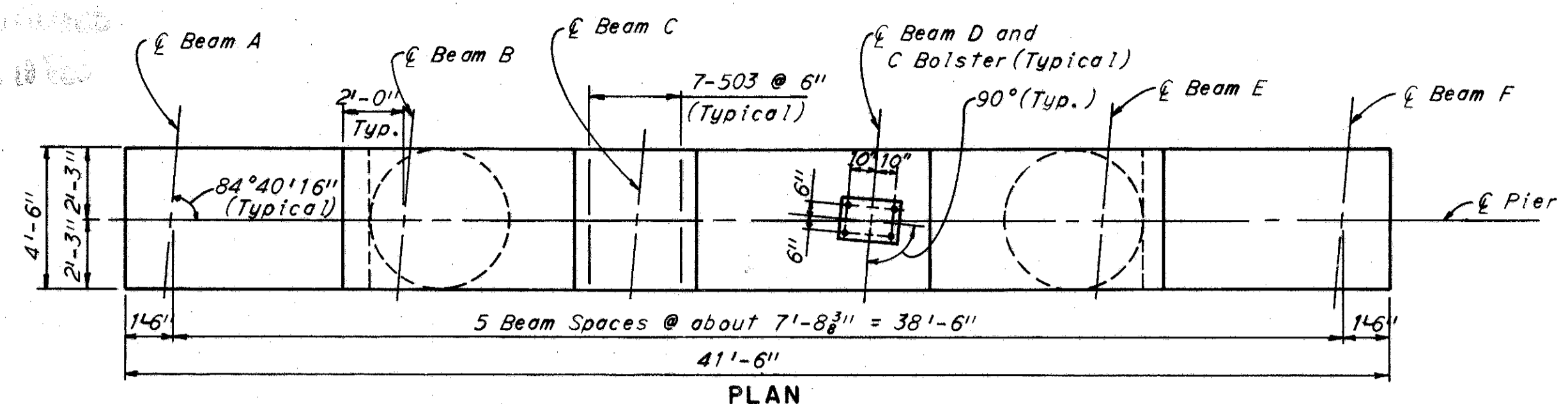
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DATE 8-7-64	DATE	DATE 9-14-64	DATE 12-28-64	

SHEET 400

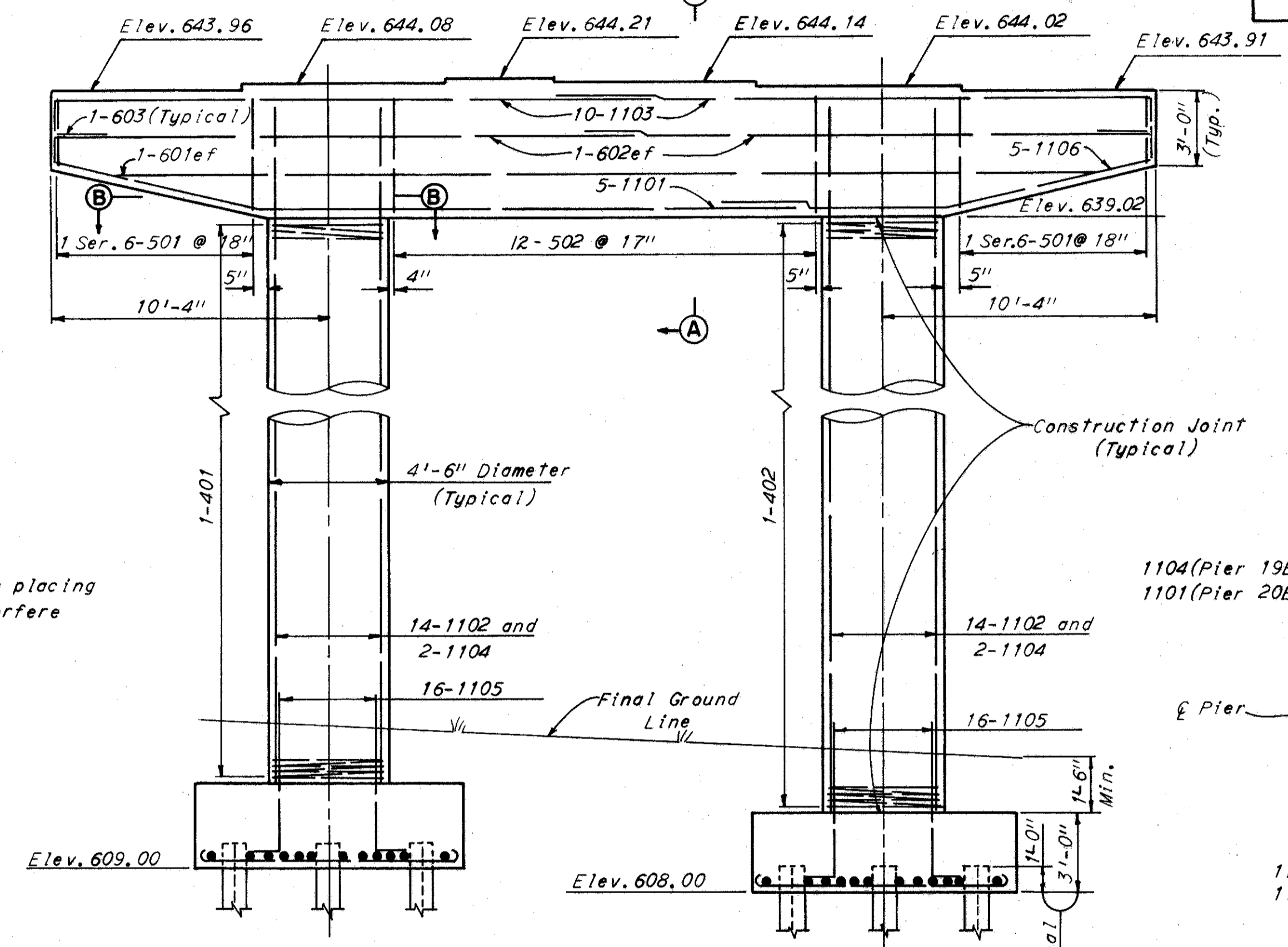
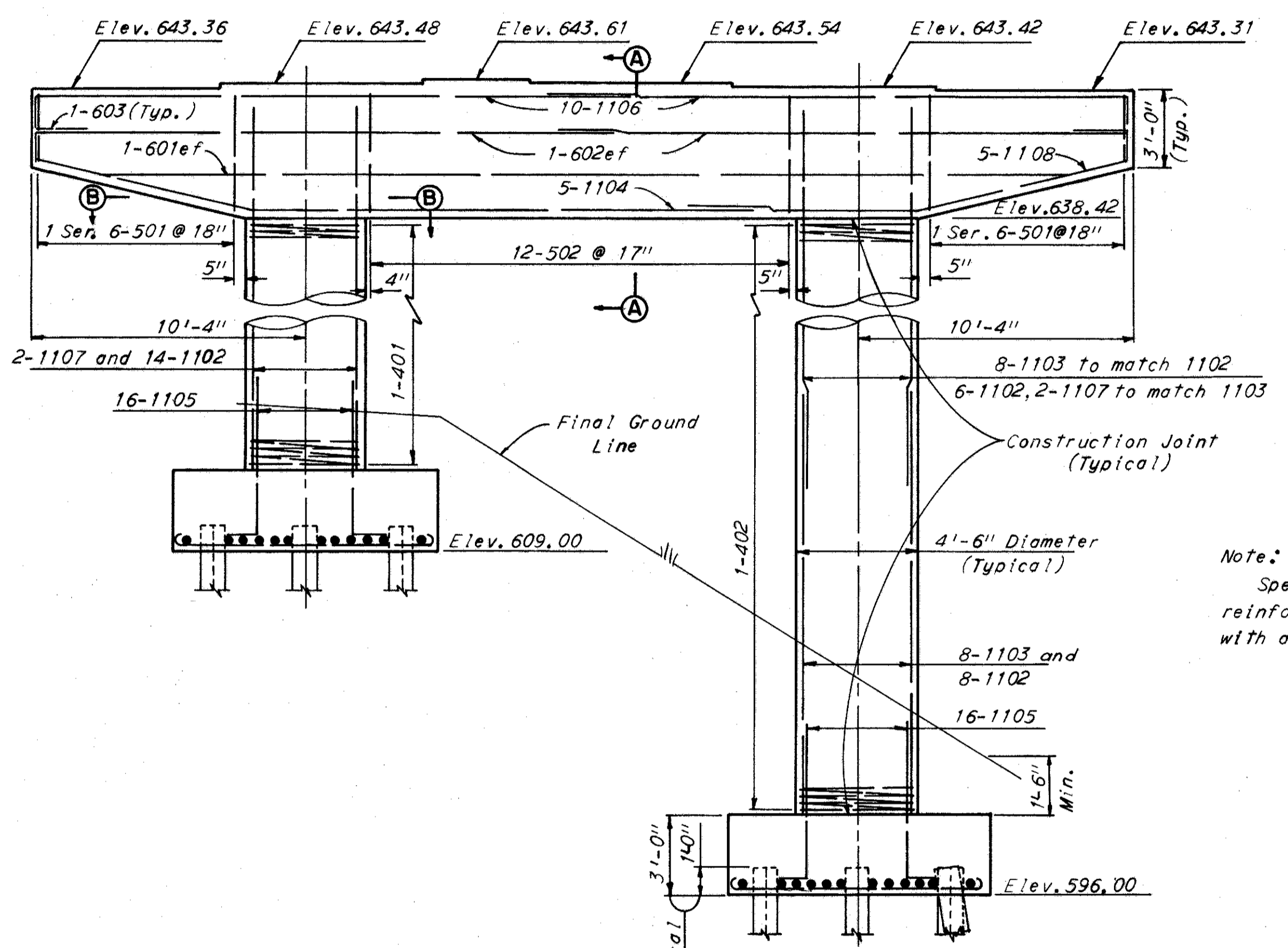




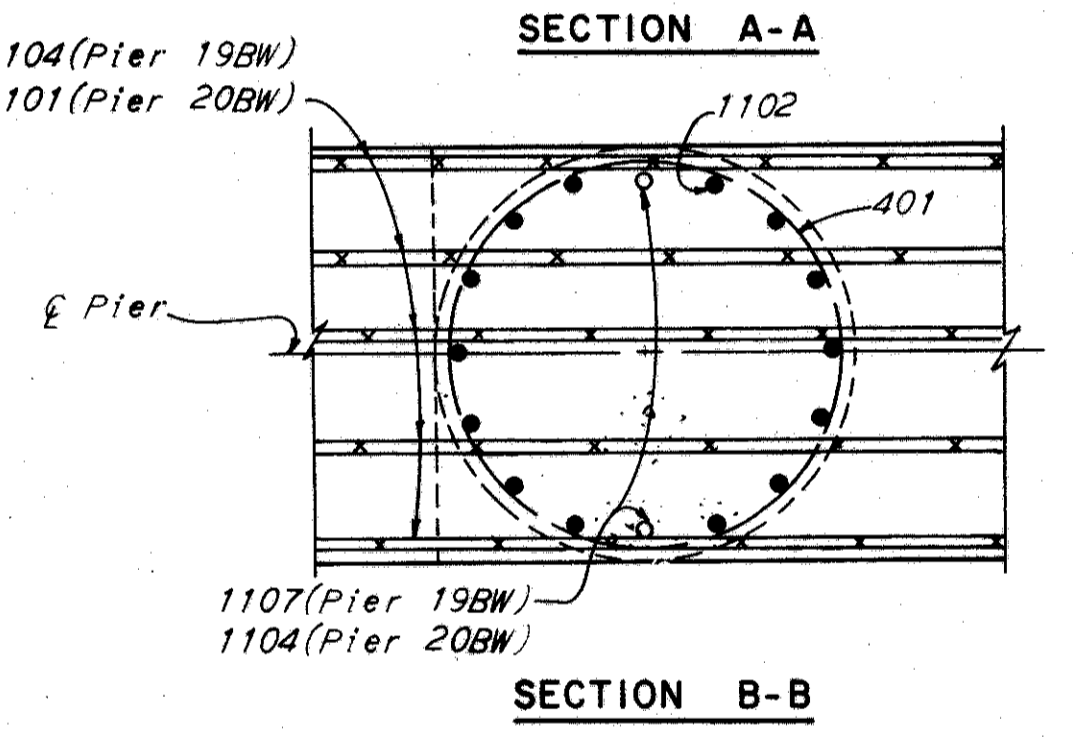
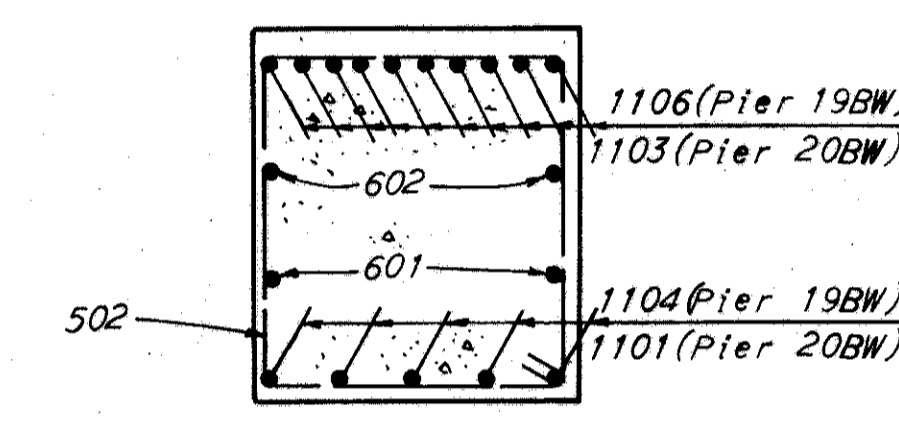
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



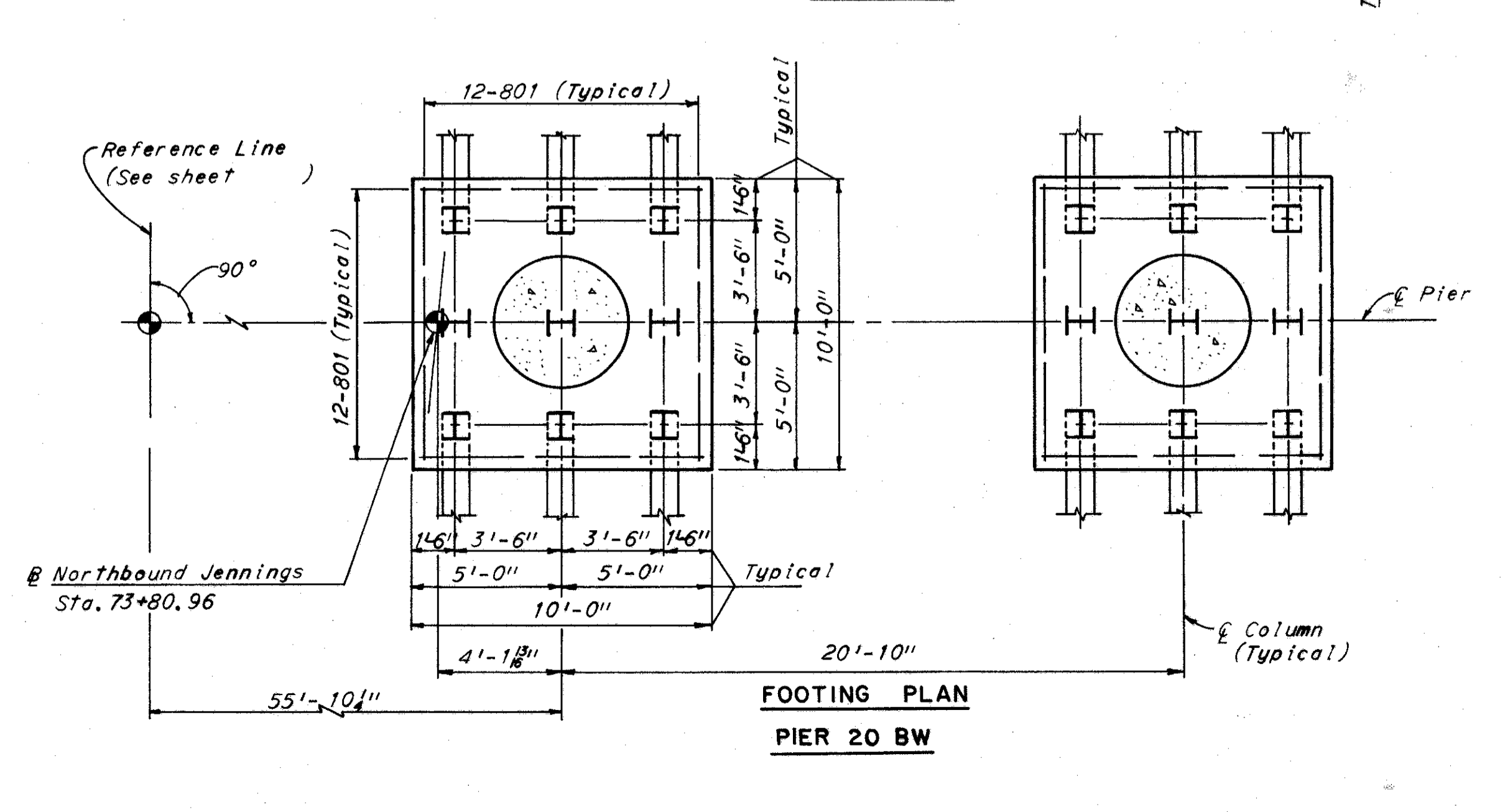
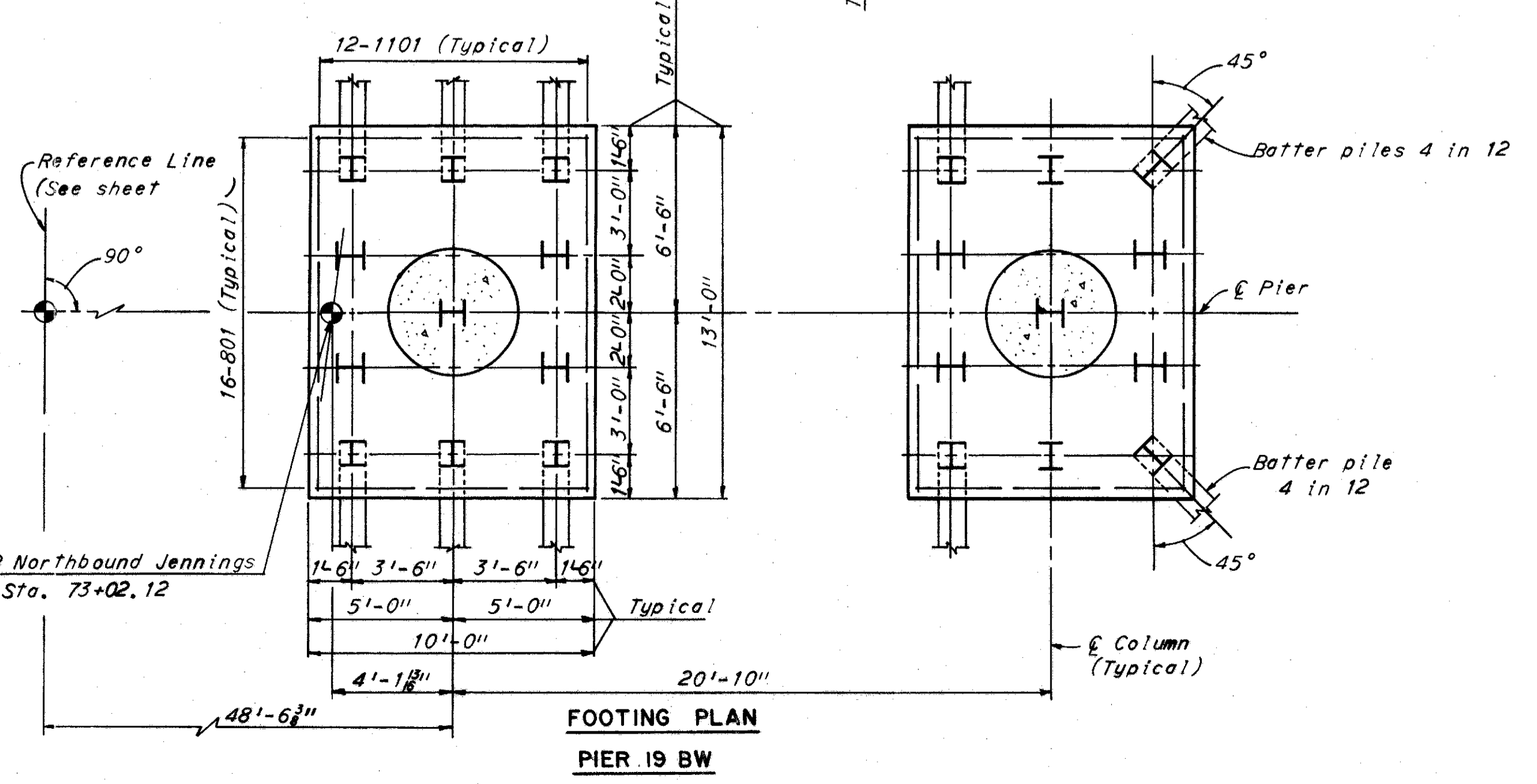
Note: All reinforcing bar marks shall be prefixed as follows:  
 Pier 19BW = PEE  
 Pier 20BW = PFF



Note:  
 Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



Notes:  
 All piles are 12BP53.  
 The following abbreviation is used:  
 ef = each face  
 For additional notes see Sheet 385.



H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIERS 19BW & 20BW**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

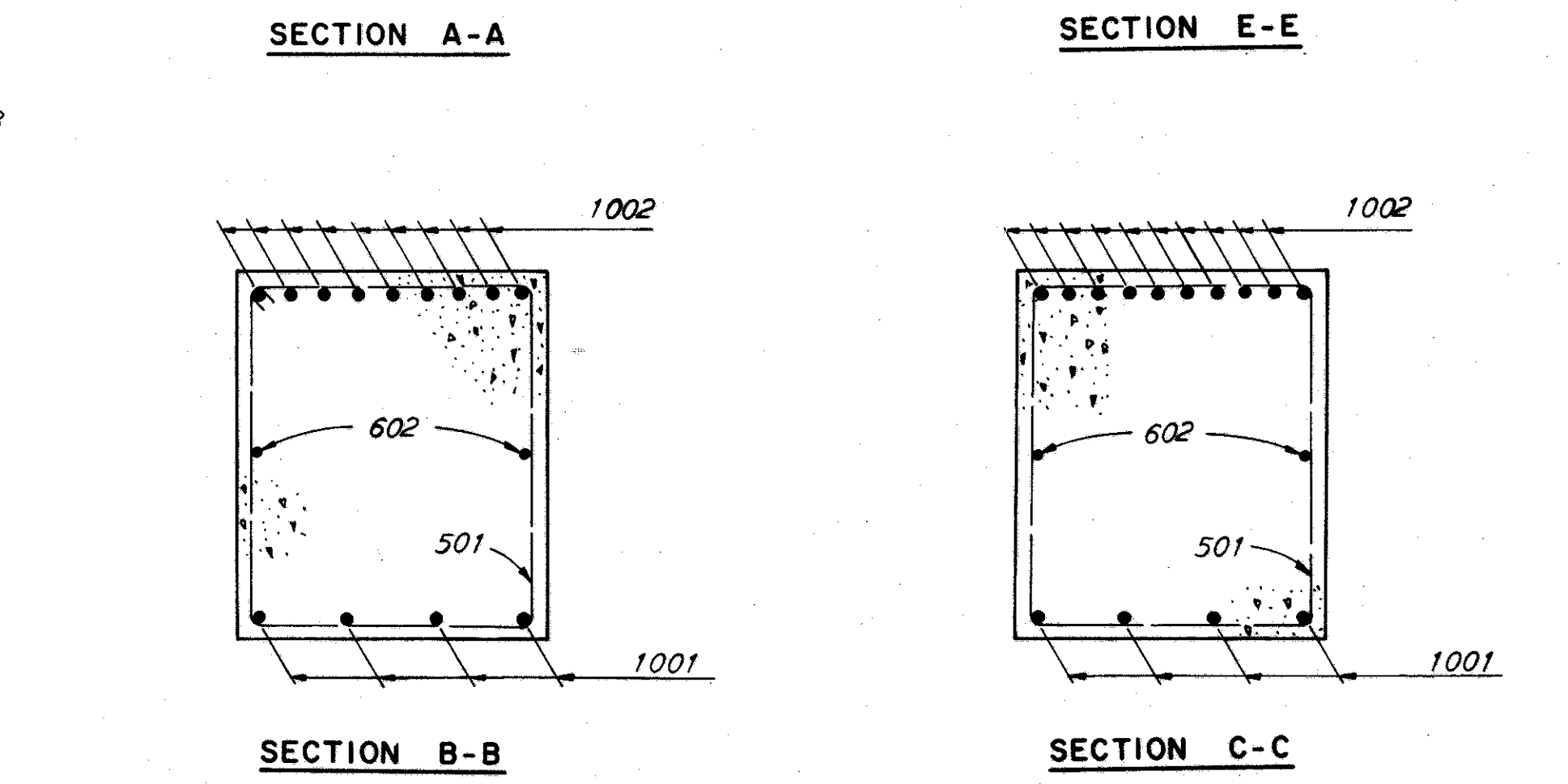
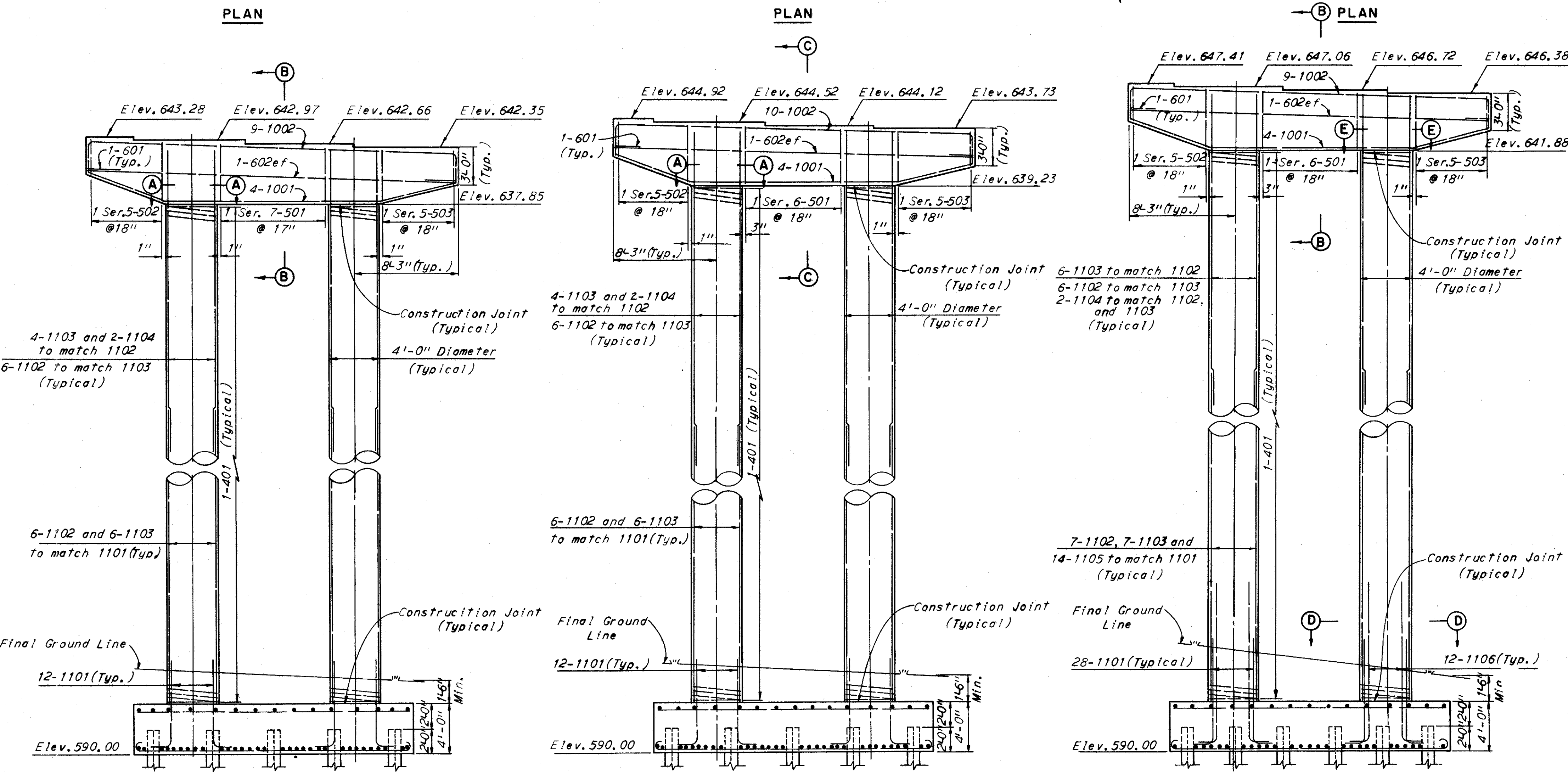
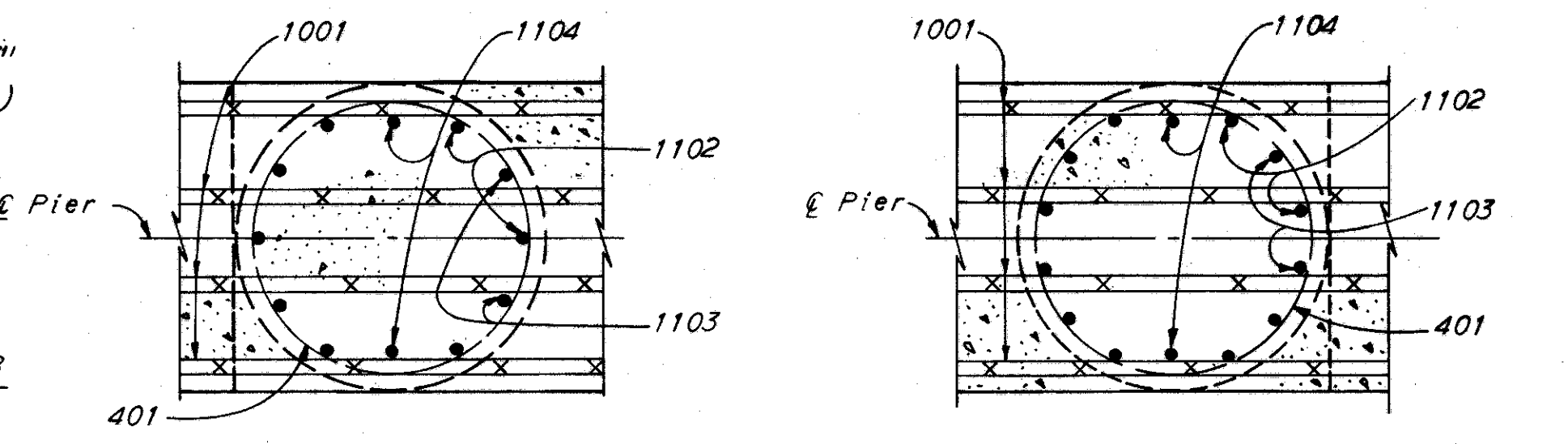
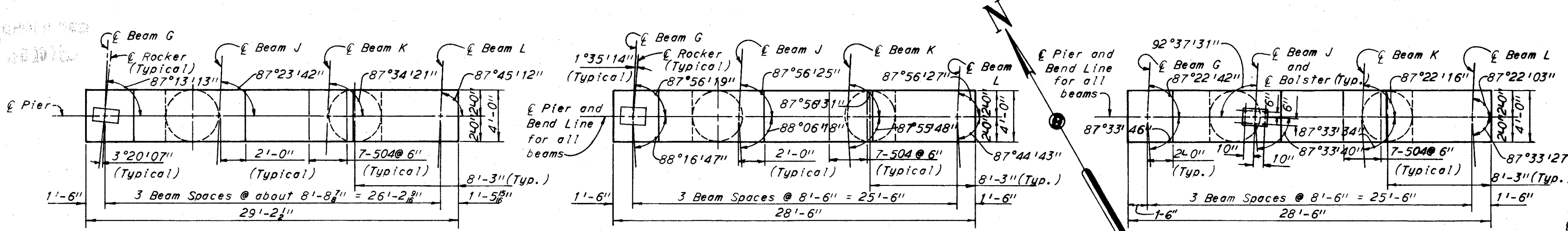
CLEVELAND	CUYAHOGA COUNTY	OHIO
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DATE 8-16-64	DATE	DATE 12-22-64

REVISOR  
 DATE

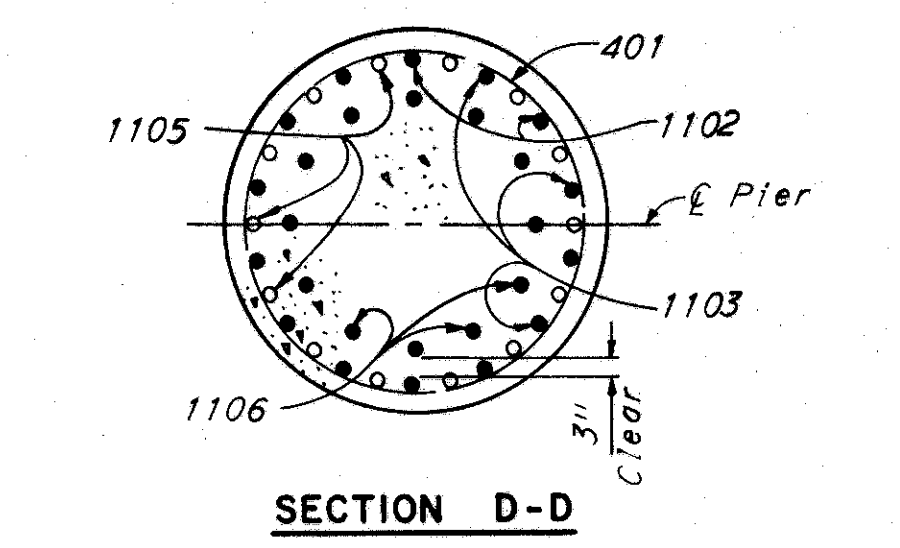
SHEET 403

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

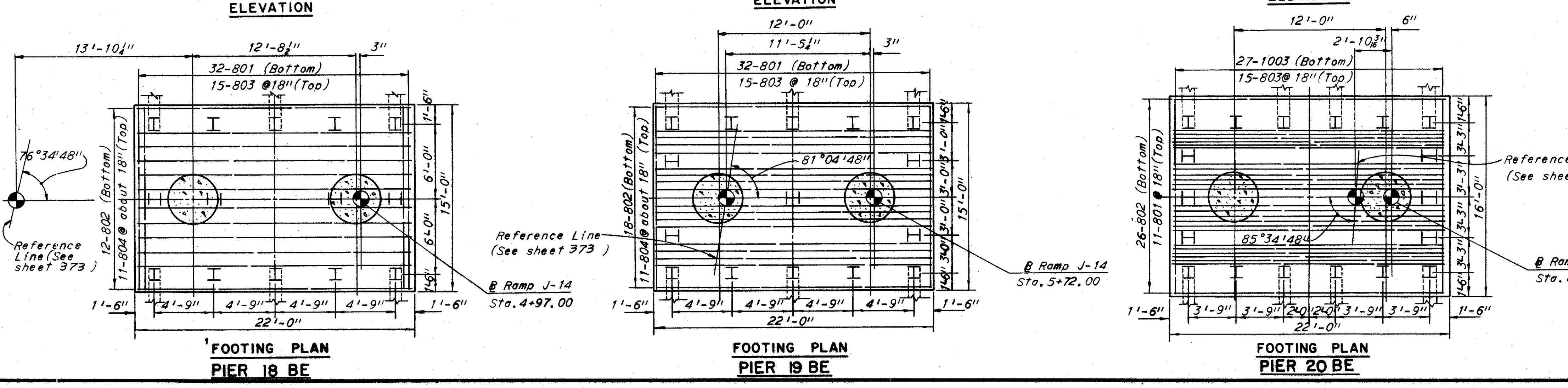
Note:  
 Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



Note: All reinforcing bar marks shall be prefixed as follows:  
 Pier 18BE = PGG  
 Pier 19BE = PHH  
 Pier 20BE = PJJ

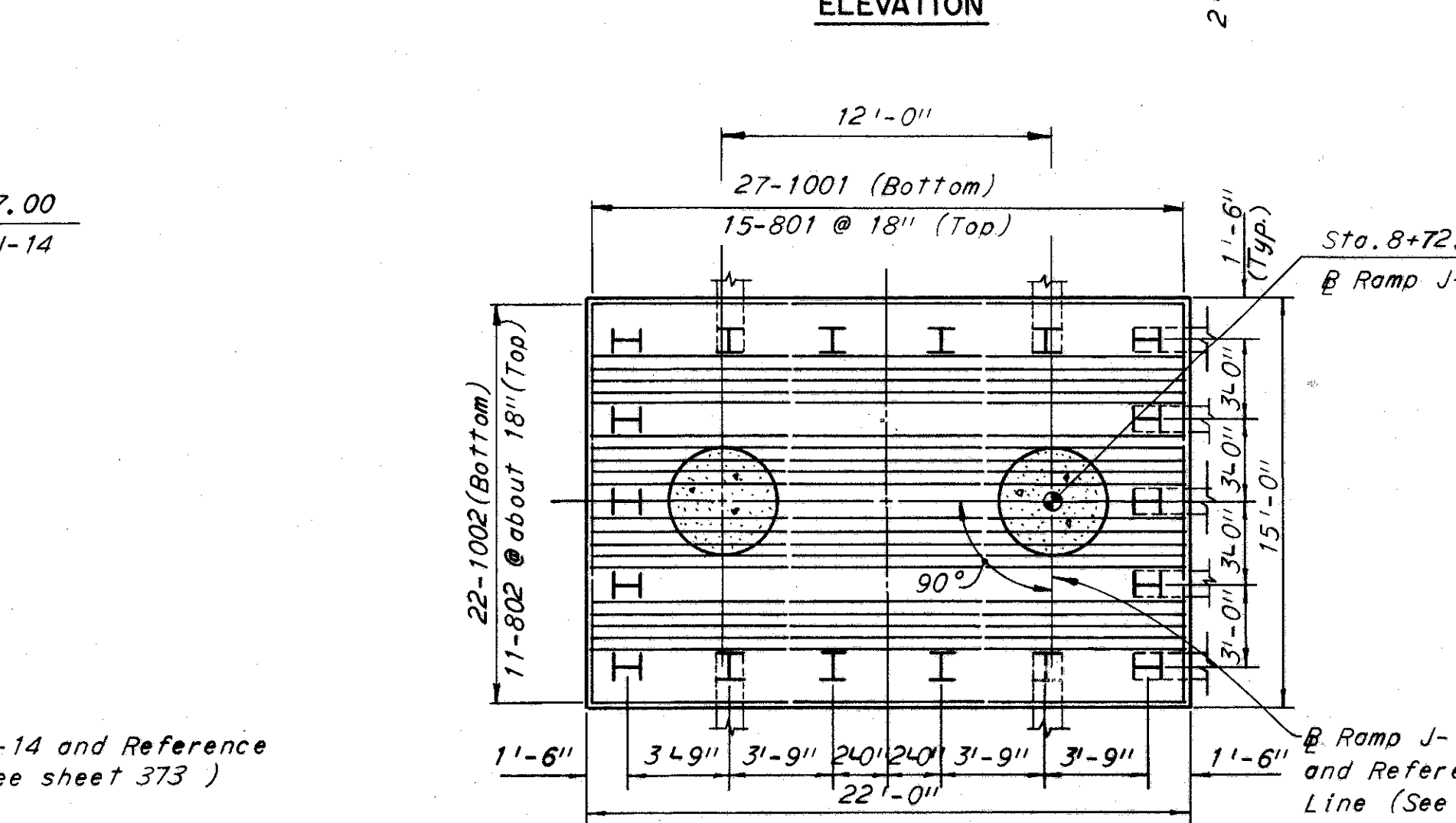
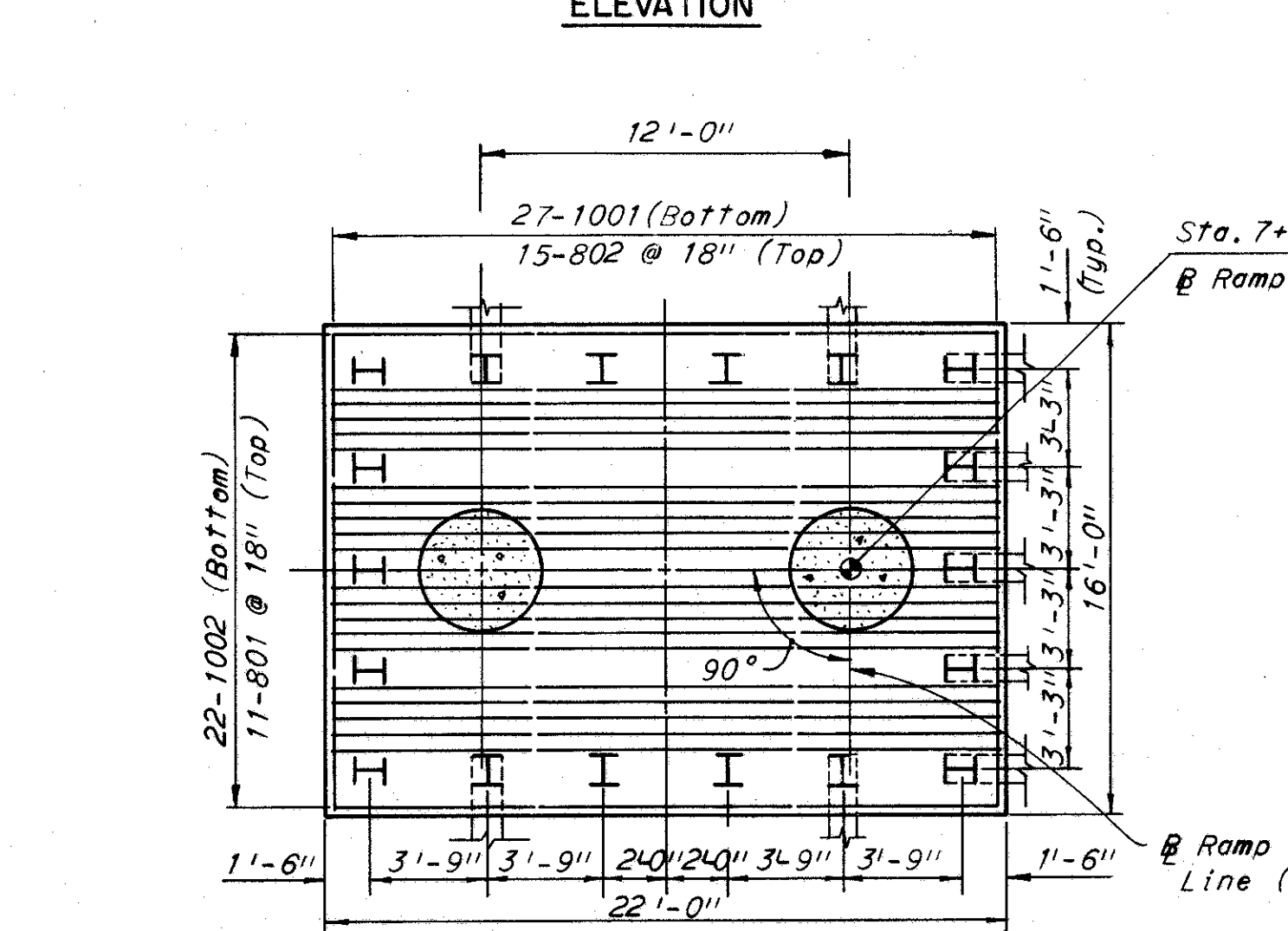
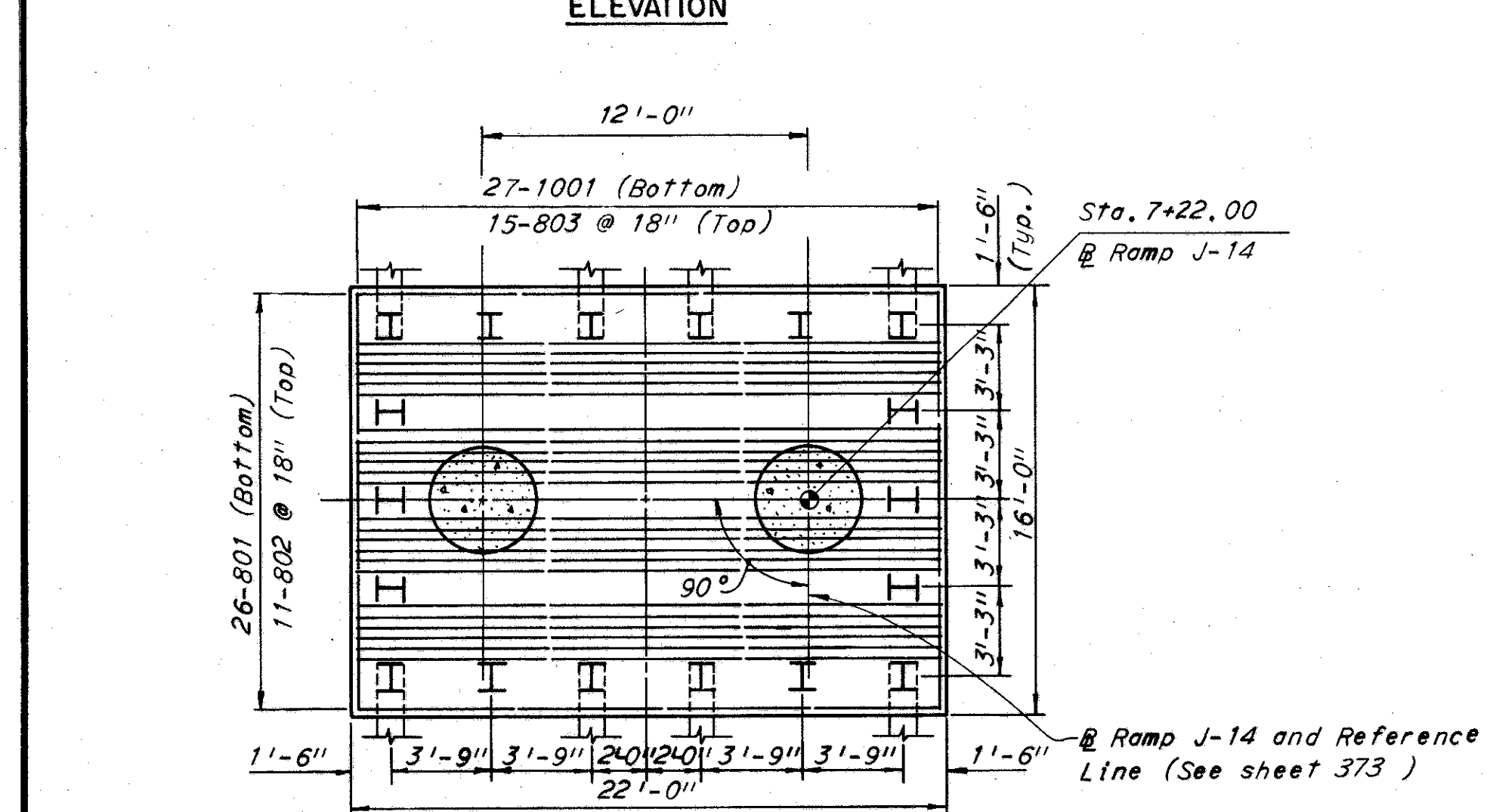
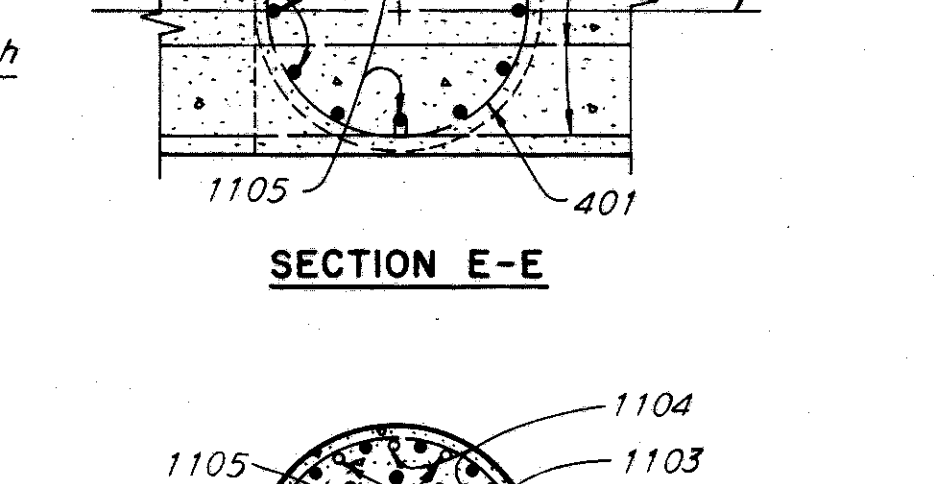
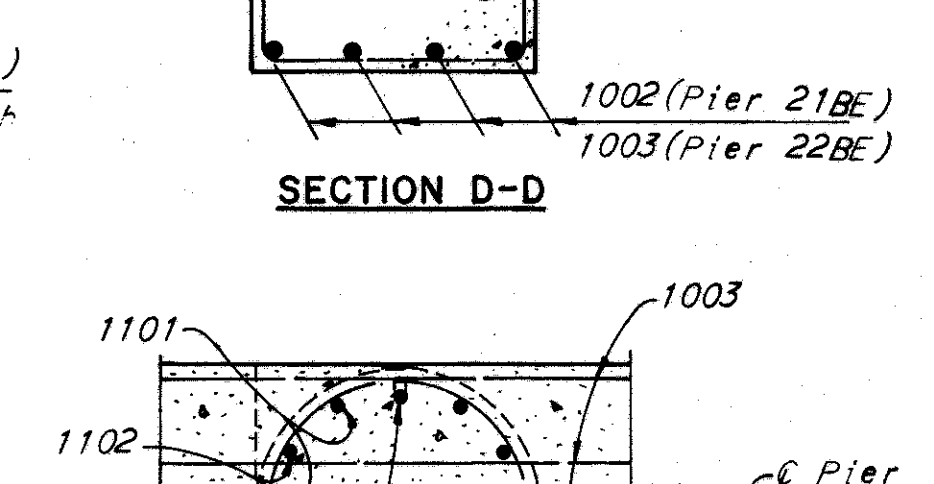
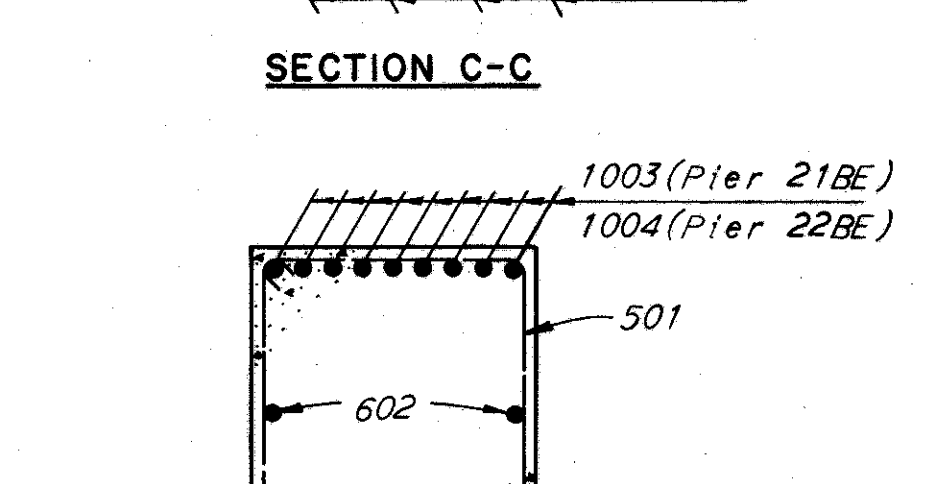
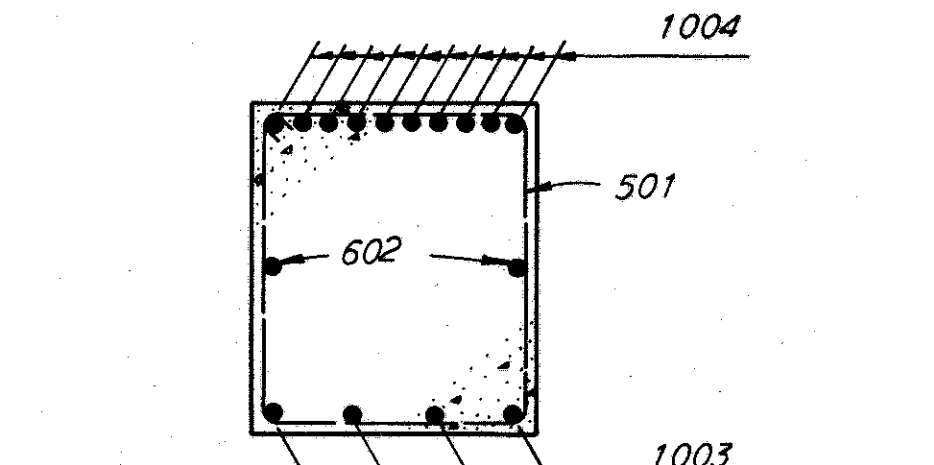
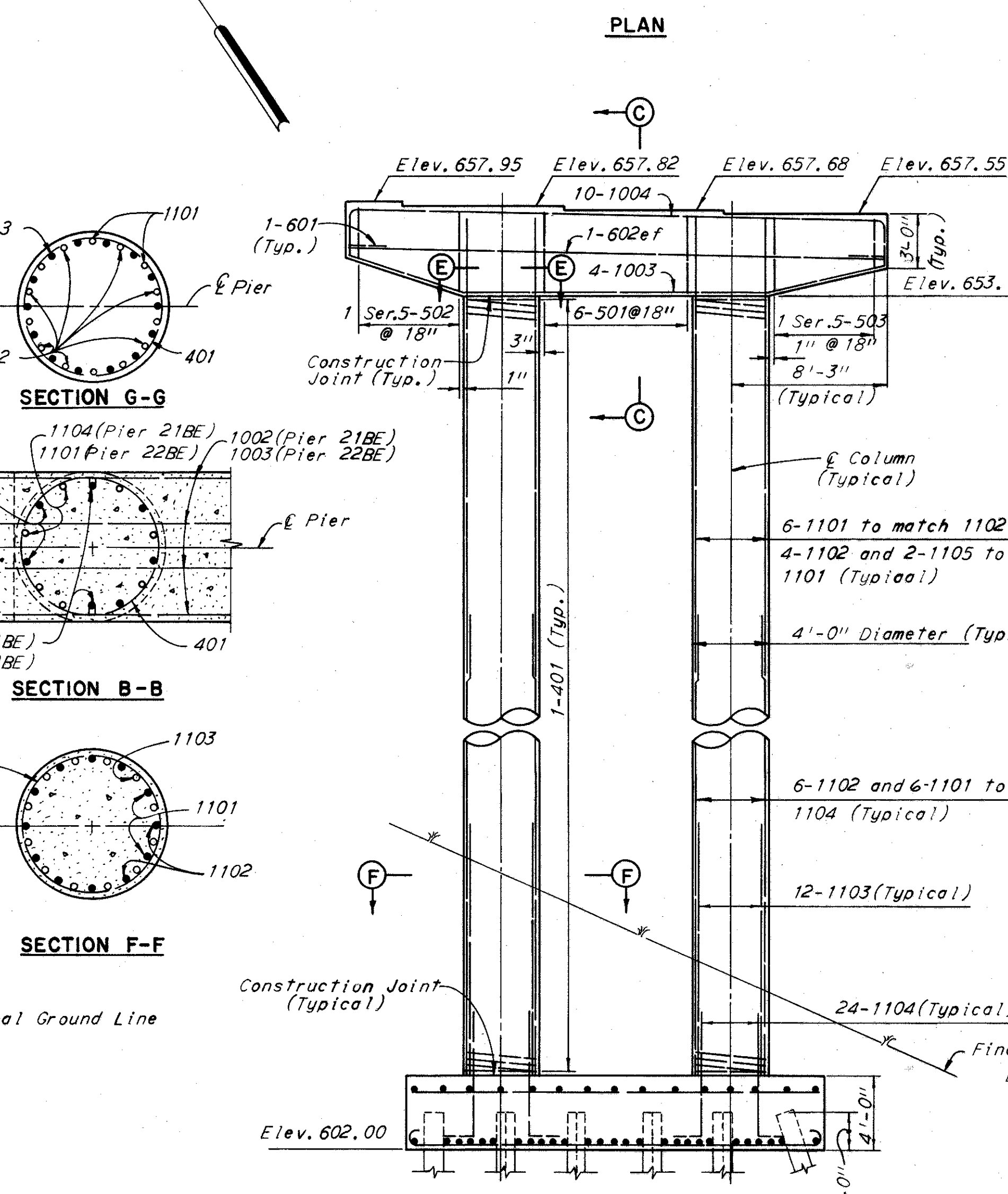
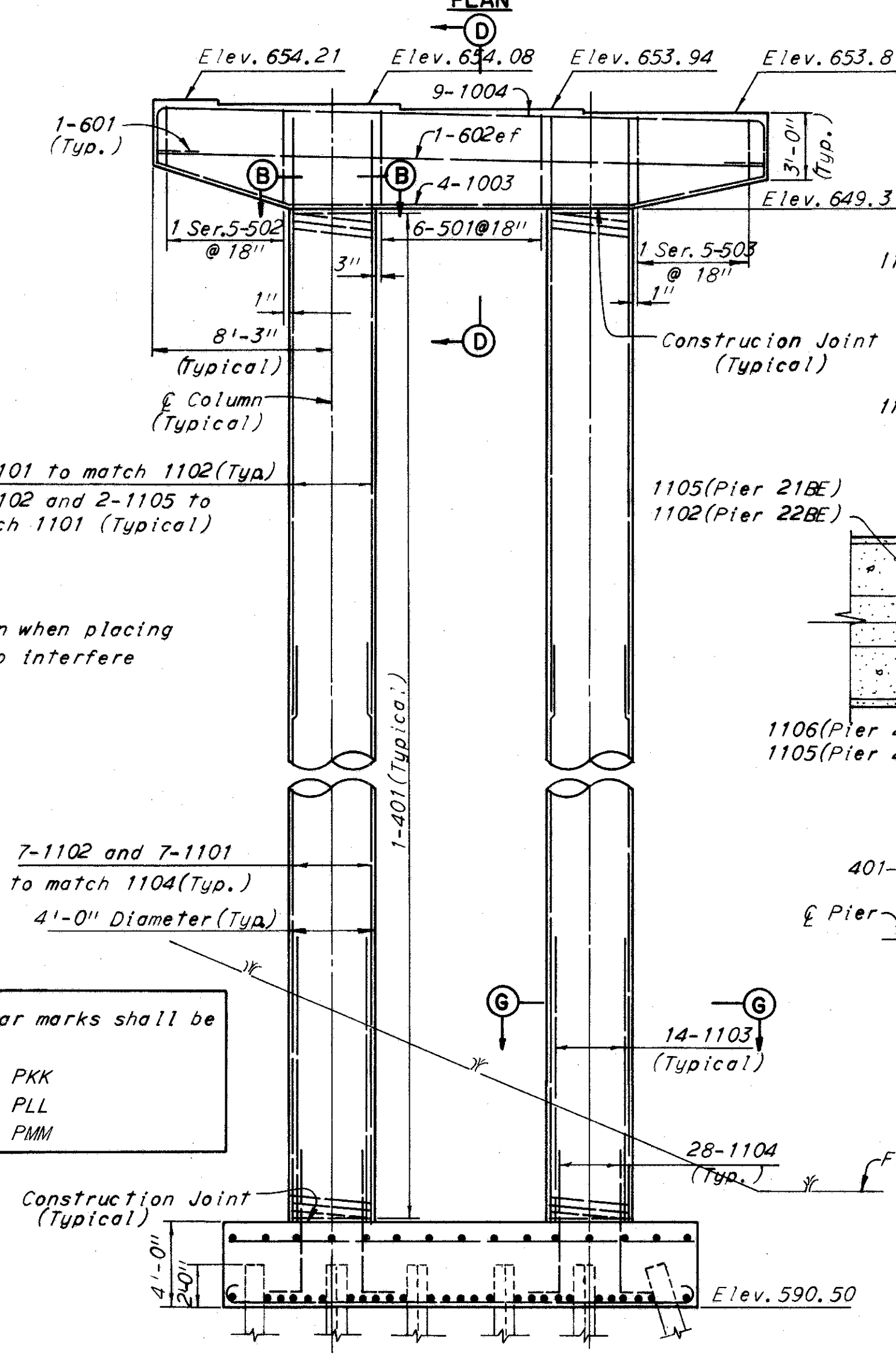
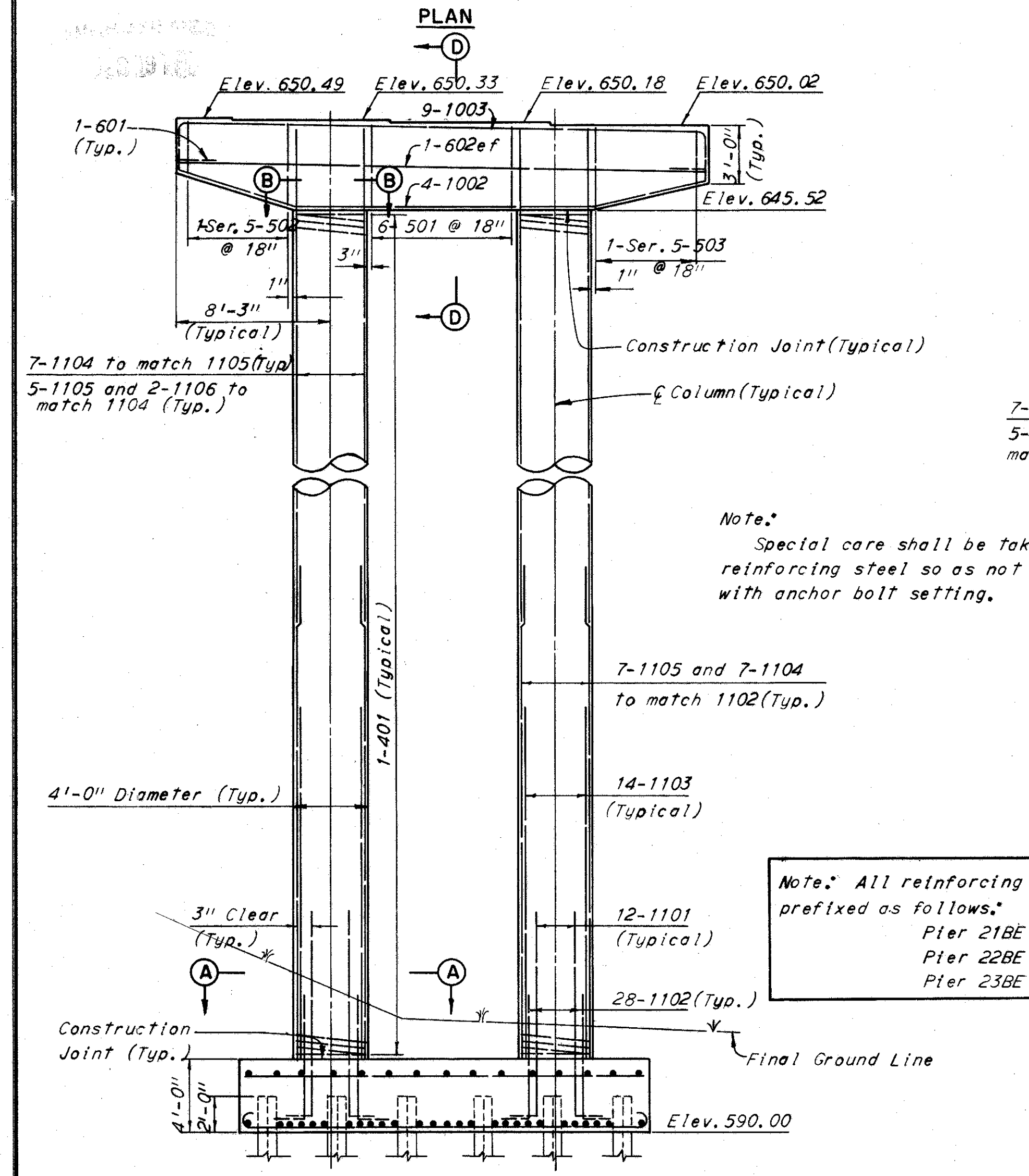
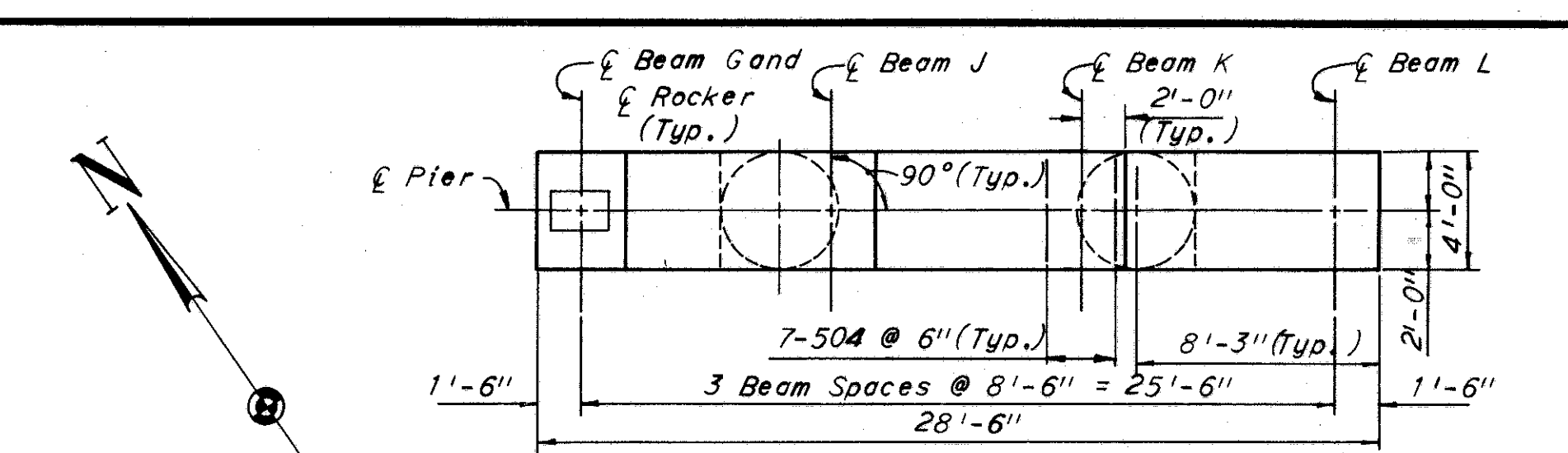
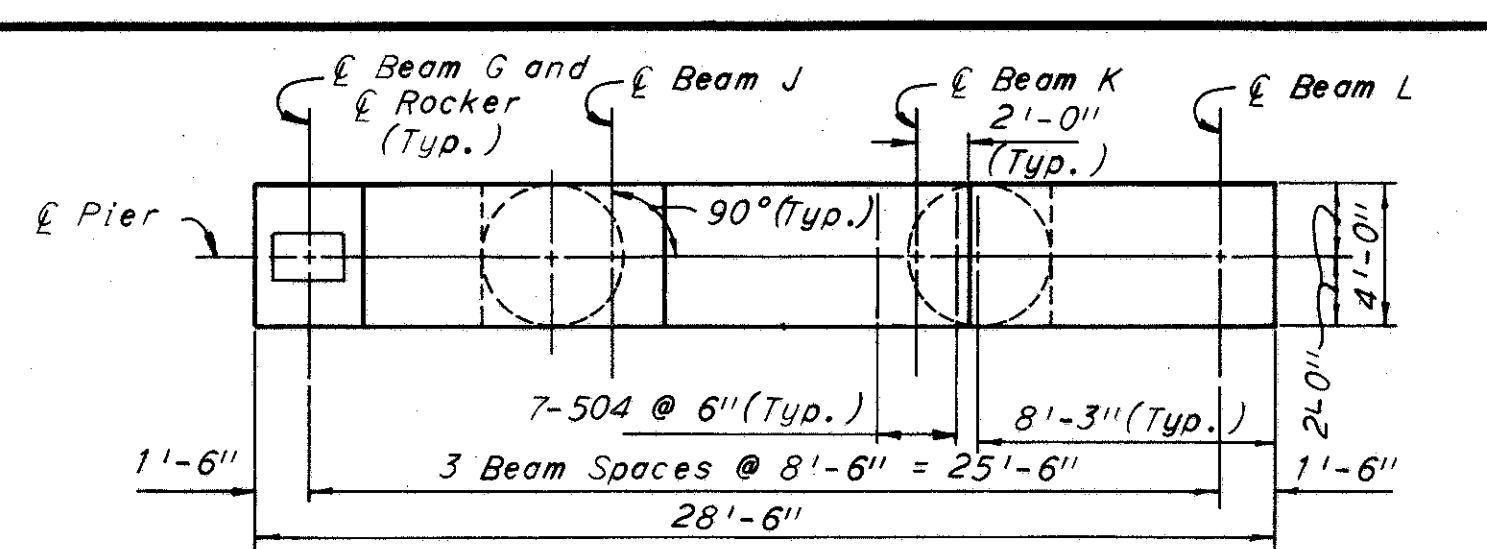
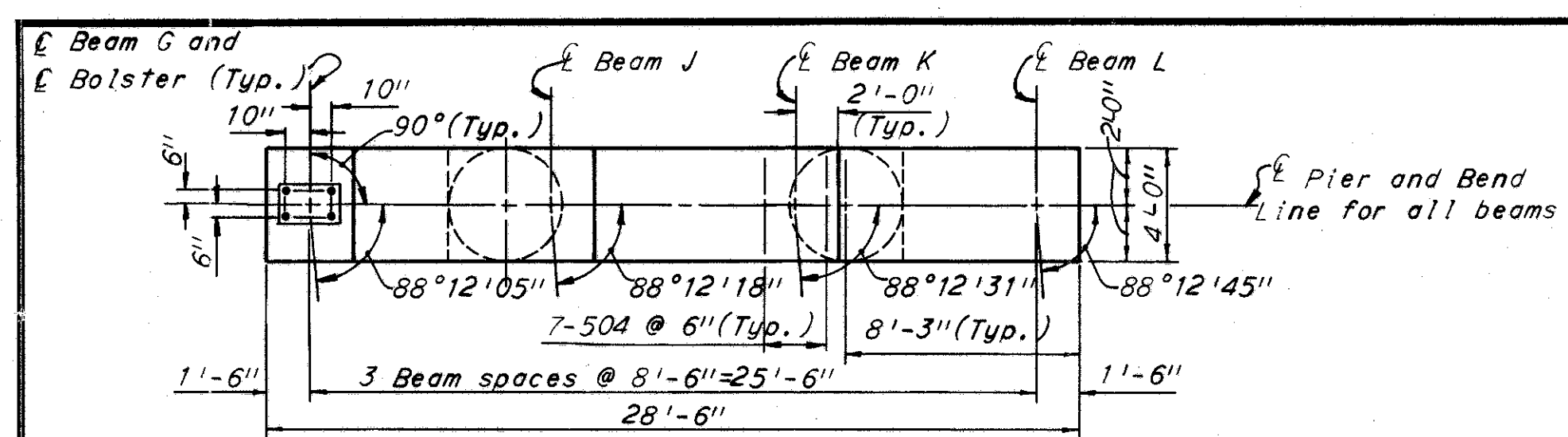


Notes:  
 The following abbreviation is used:  
 ef = each face  
 For additional notes see Sheet 365  
 All piles are 12BP53.



H.N.T.B BRIDGE NOS. 21A & 21B			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY NEW YORK			
<b>PIERS 18BE, 19BE, 20BE</b>			
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS			
BR. NO. CUY-71-1789 R		STA. 917+10.09 STA. 935+21.25	
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DATE 11-5-64	DATE 11-12-64	DATE 12-22-64	REVISION
DRAWN/DLR		CHECKED/TZS	
TRACED		REVIEWED/WJ	
SHEET 404			

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Notes:  
 The following abbreviation is used:  
 ef = each face  
 For additional notes see Sheet 385.  
 All piles are I2BP53.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**PIERS 21 BE, 22 BE, 23 BE**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

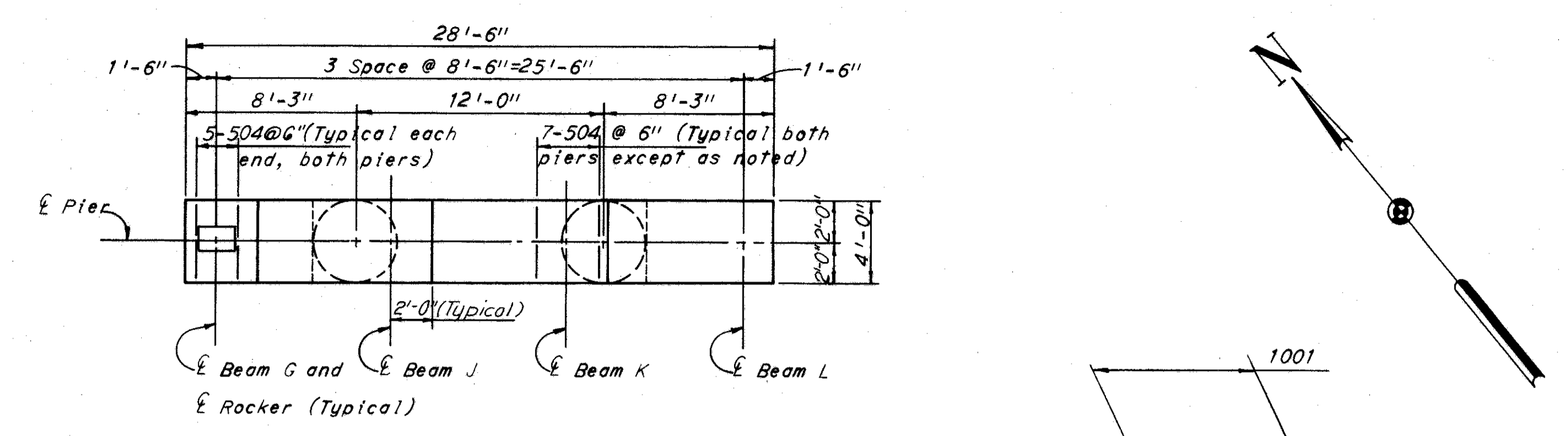
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

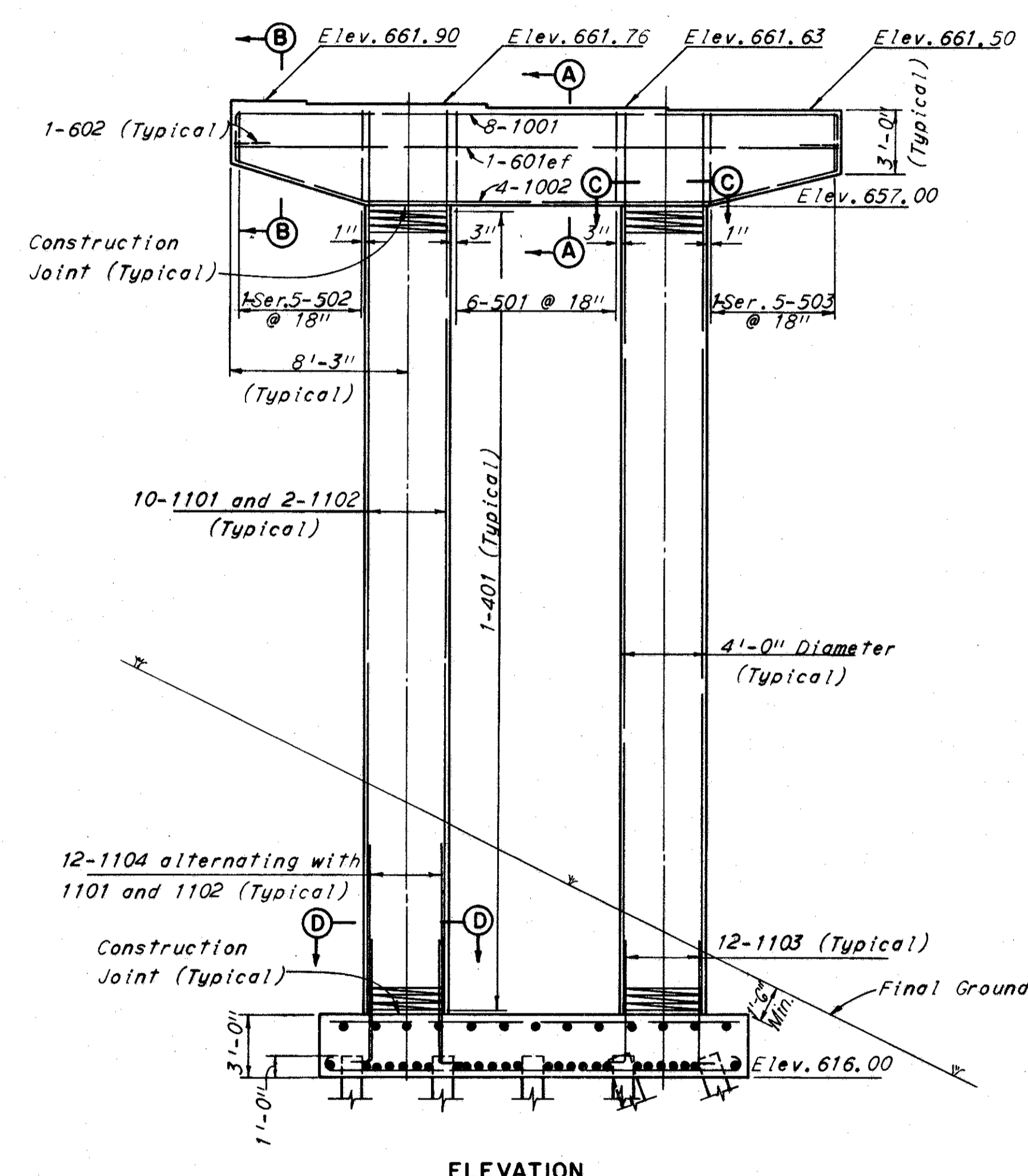
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 DATE 11-9-64 DATE 12-1-64 DATE 12-22-64 SHEET 405



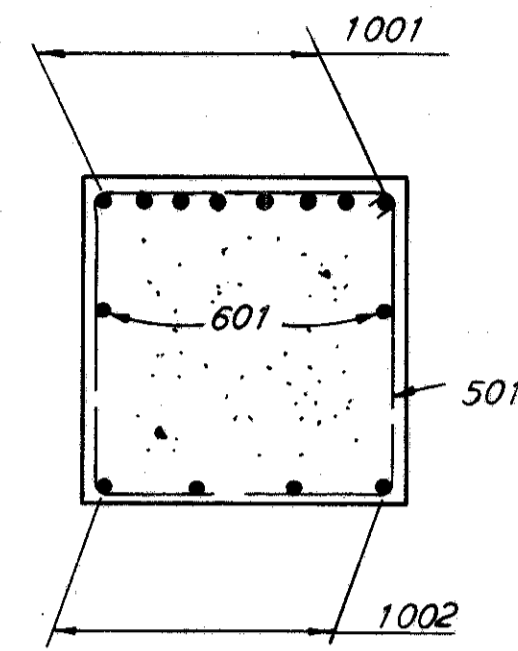
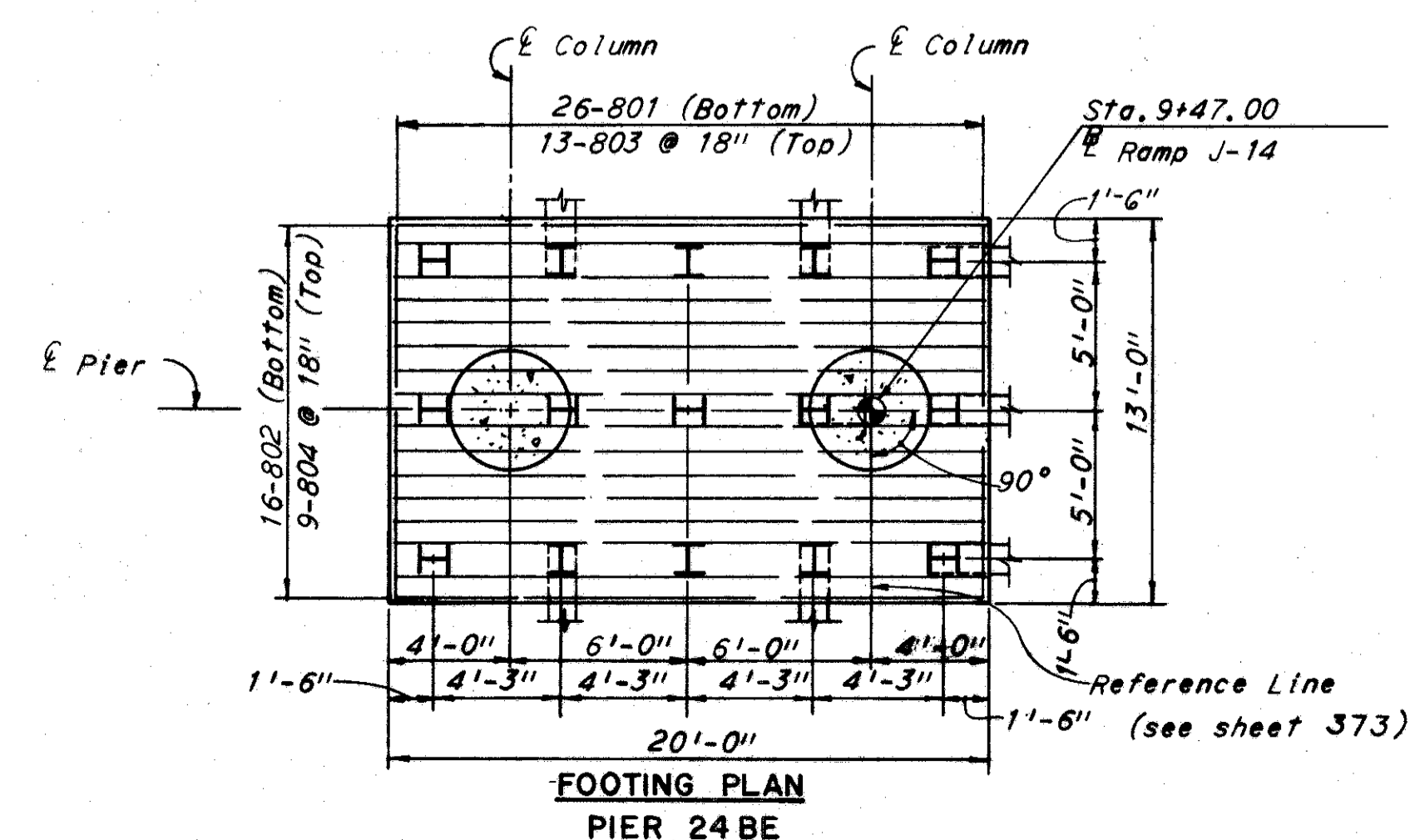
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



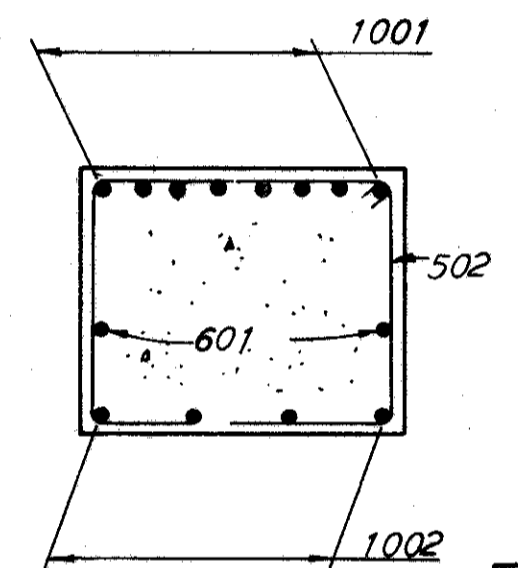
PLAN



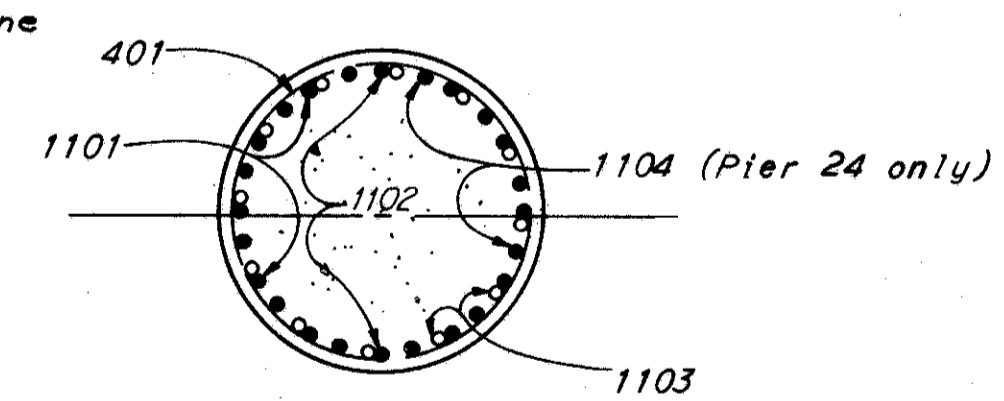
ELEVATION



SECTION A-A



SECTION B-B

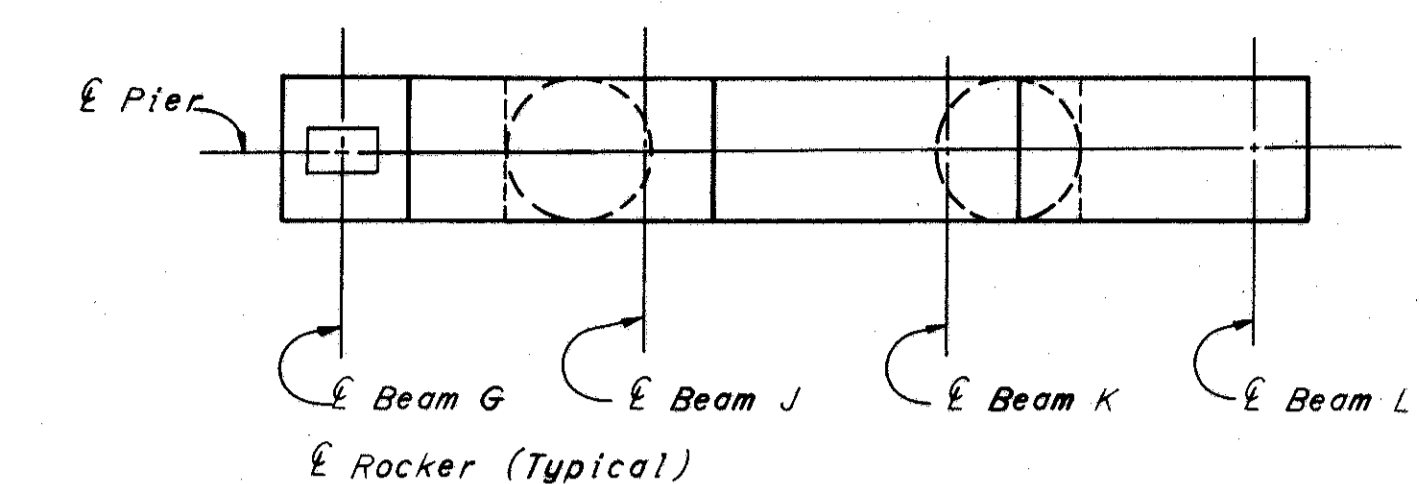


SECTION C-C

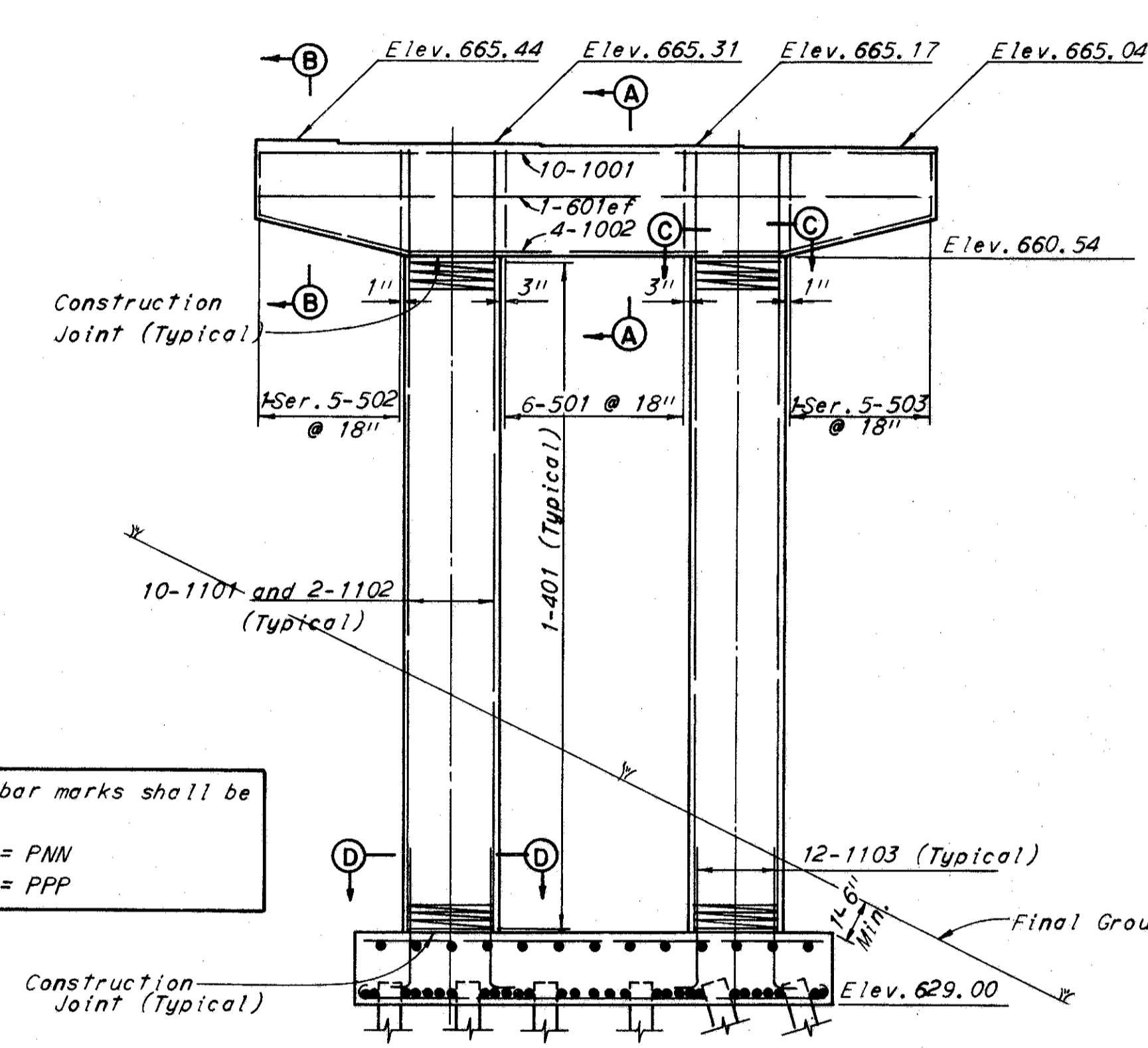
(Both Piers)

Note: All reinforcing bar marks shall be prefixed as follows:  
Pier 24BE = PNN  
Pier 25BE = PPP

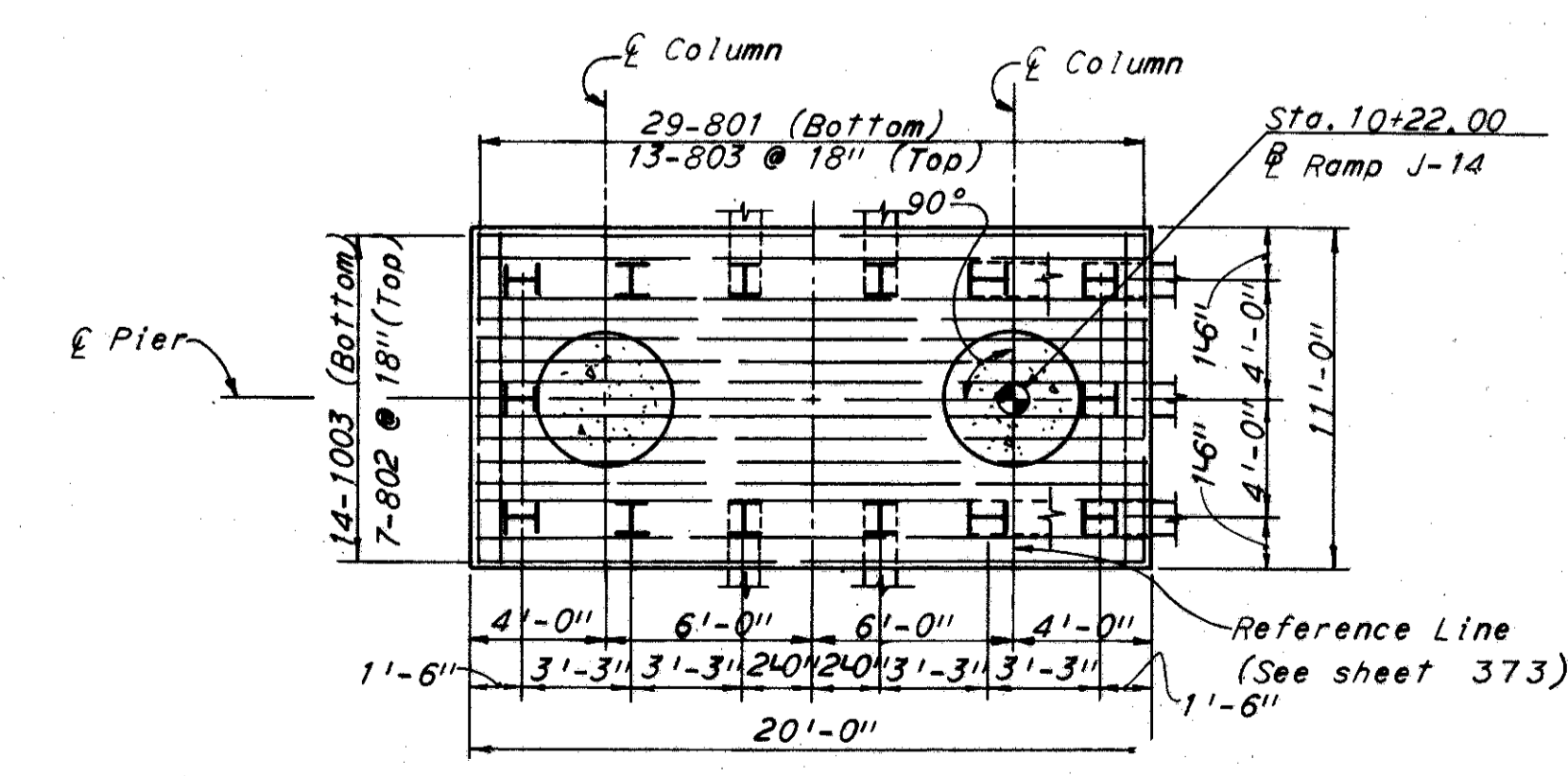
Note:  
All dimensions in Pier 24 are typical for Pier 25 except as noted.



PLAN

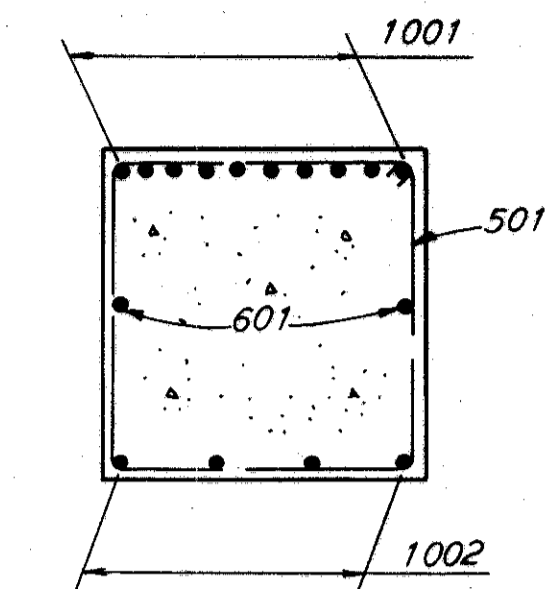


ELEVATION

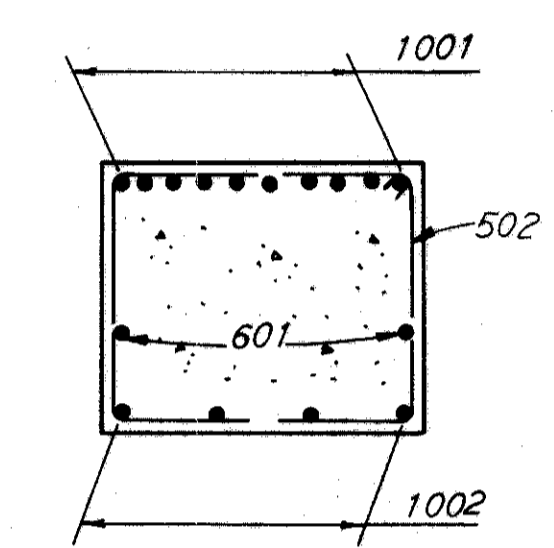


FOOTING PLAN

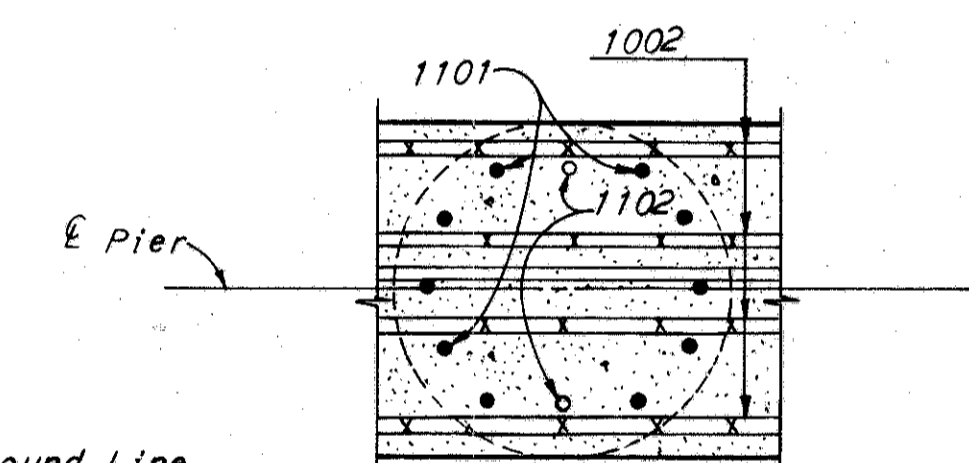
PIER 25 BE



SECTION A-A



SECTION B-B



SECTION D-D

(Both Piers)

Notes:  
All piles are 12BP53.  
The following abbreviation is used:  
ef = each face  
For additional notes see Sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

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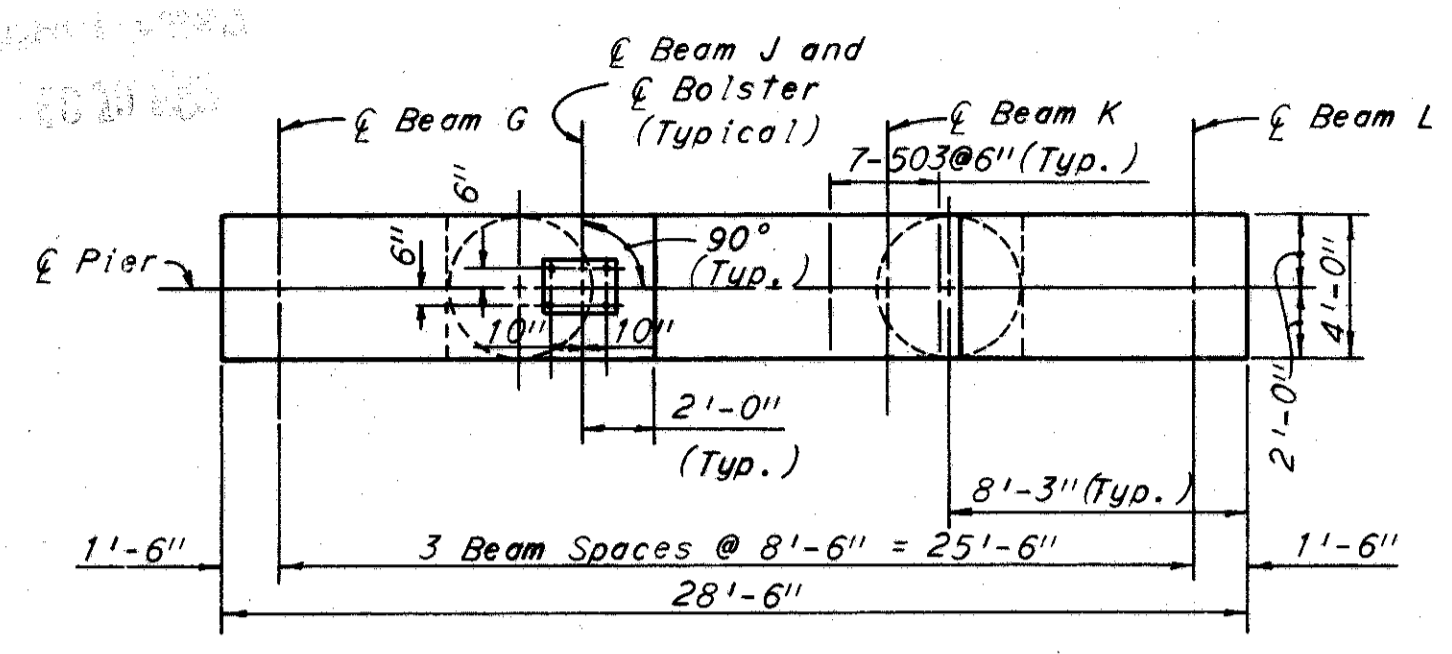
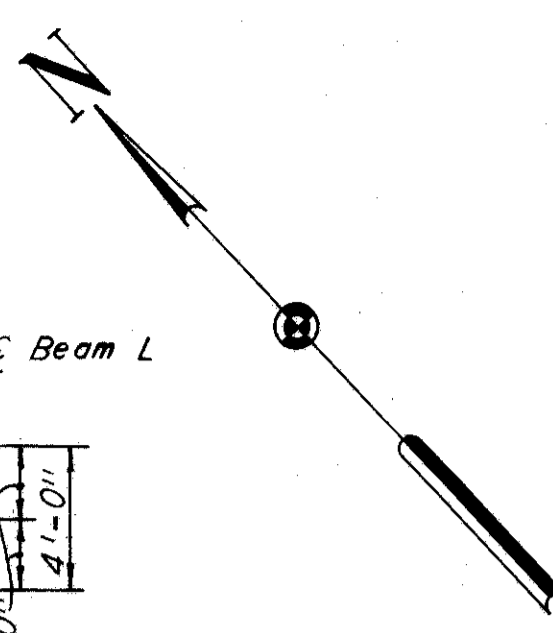
**PIERS 24 BE & 25 BE**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS  
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25  
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN BY	TRACED	CHECKED BY	REVIEWED BY	REVISED
DATE 8-31-64	DATE	DATE 11-10-64	DATE 12-22-64	

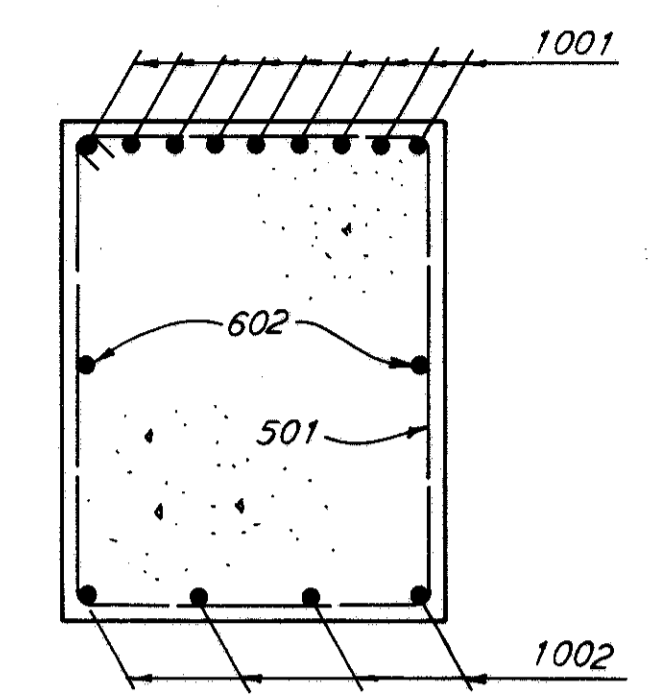
SHEET 406

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

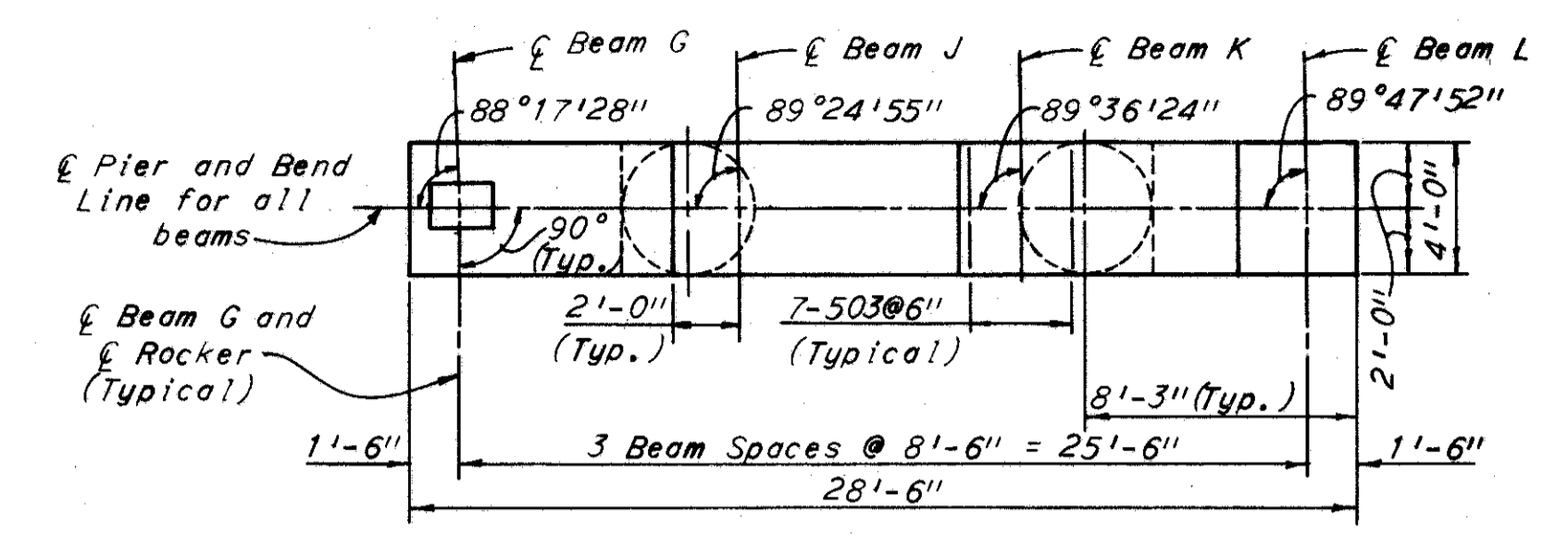
Note:  
Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



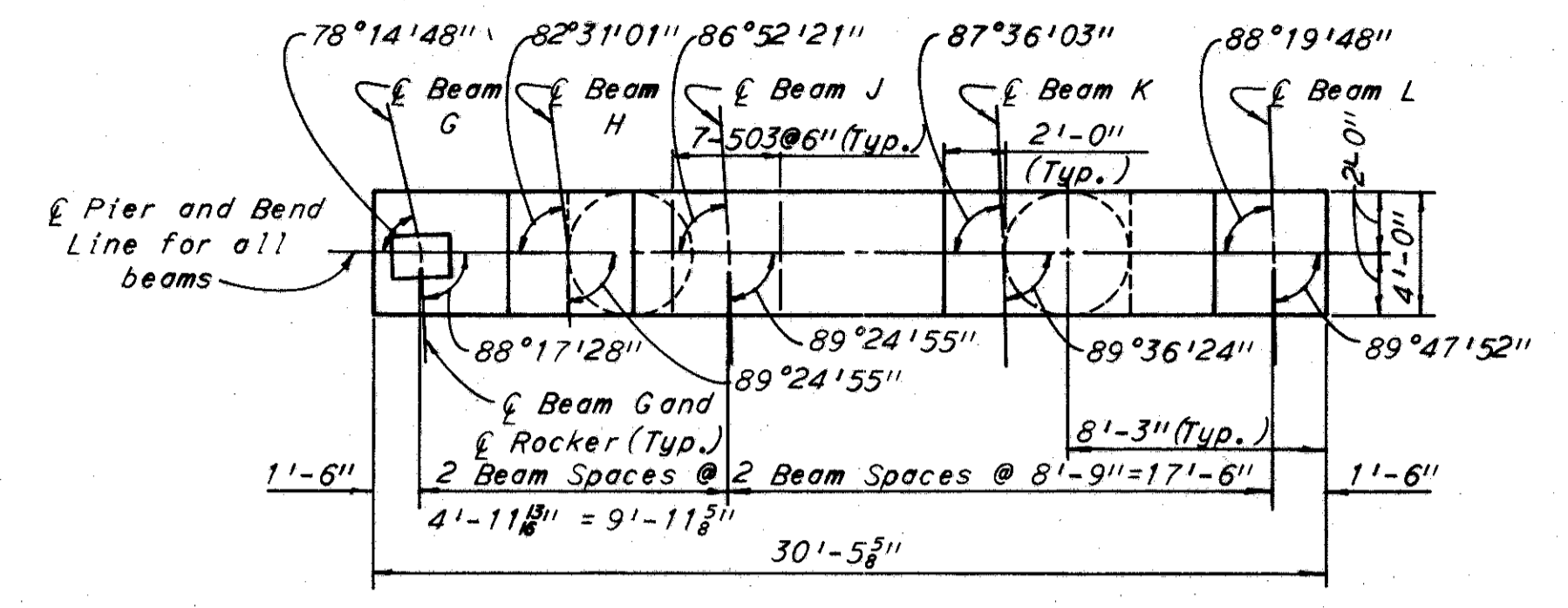
PLAN



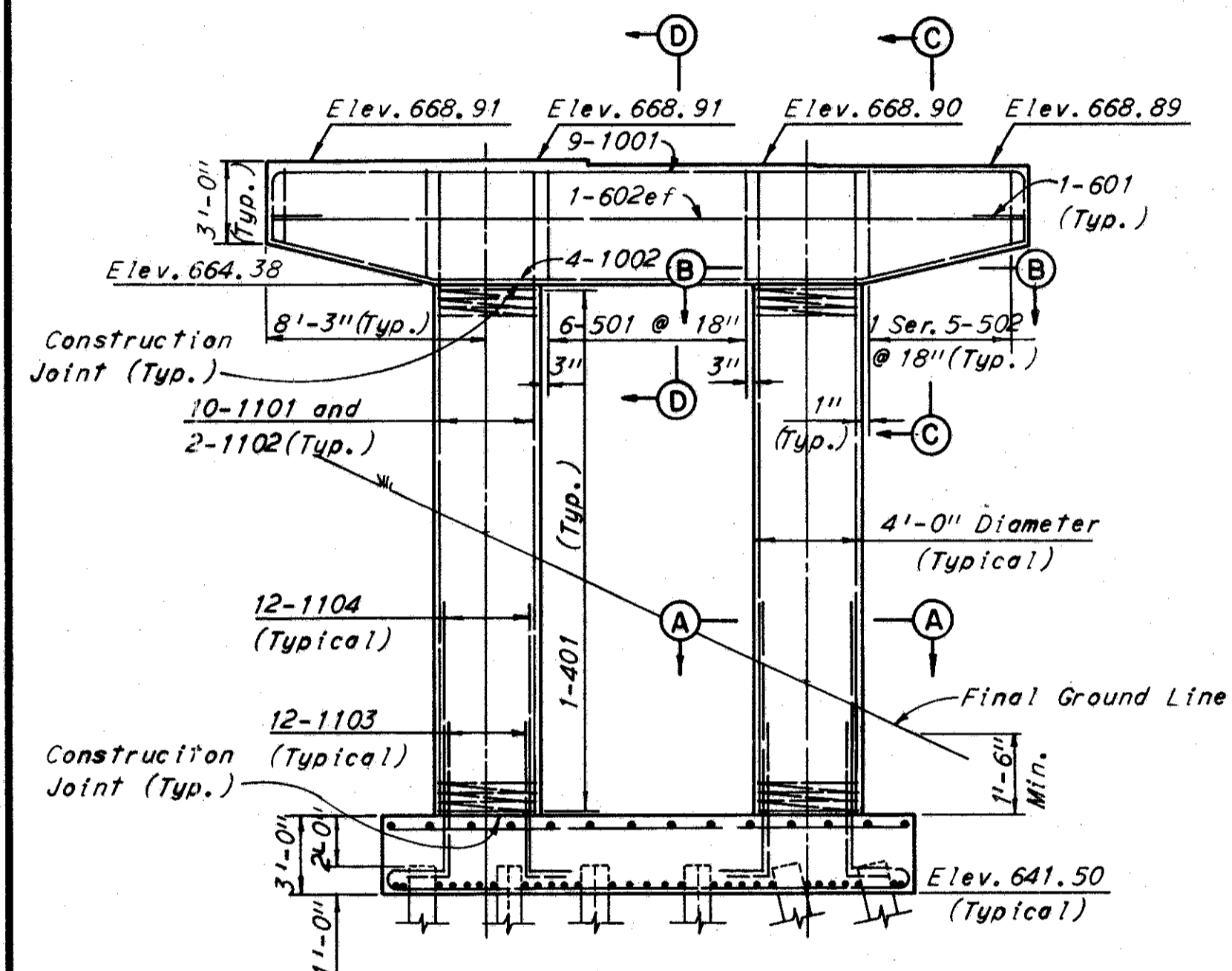
SECTION D-D



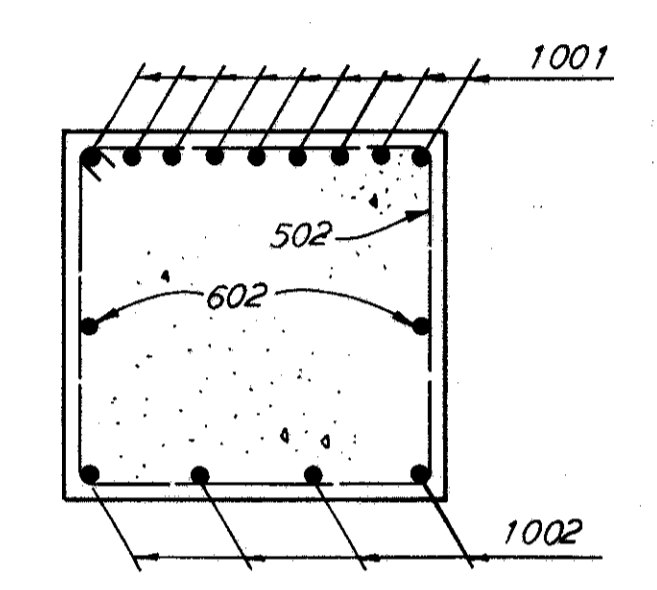
PLAN



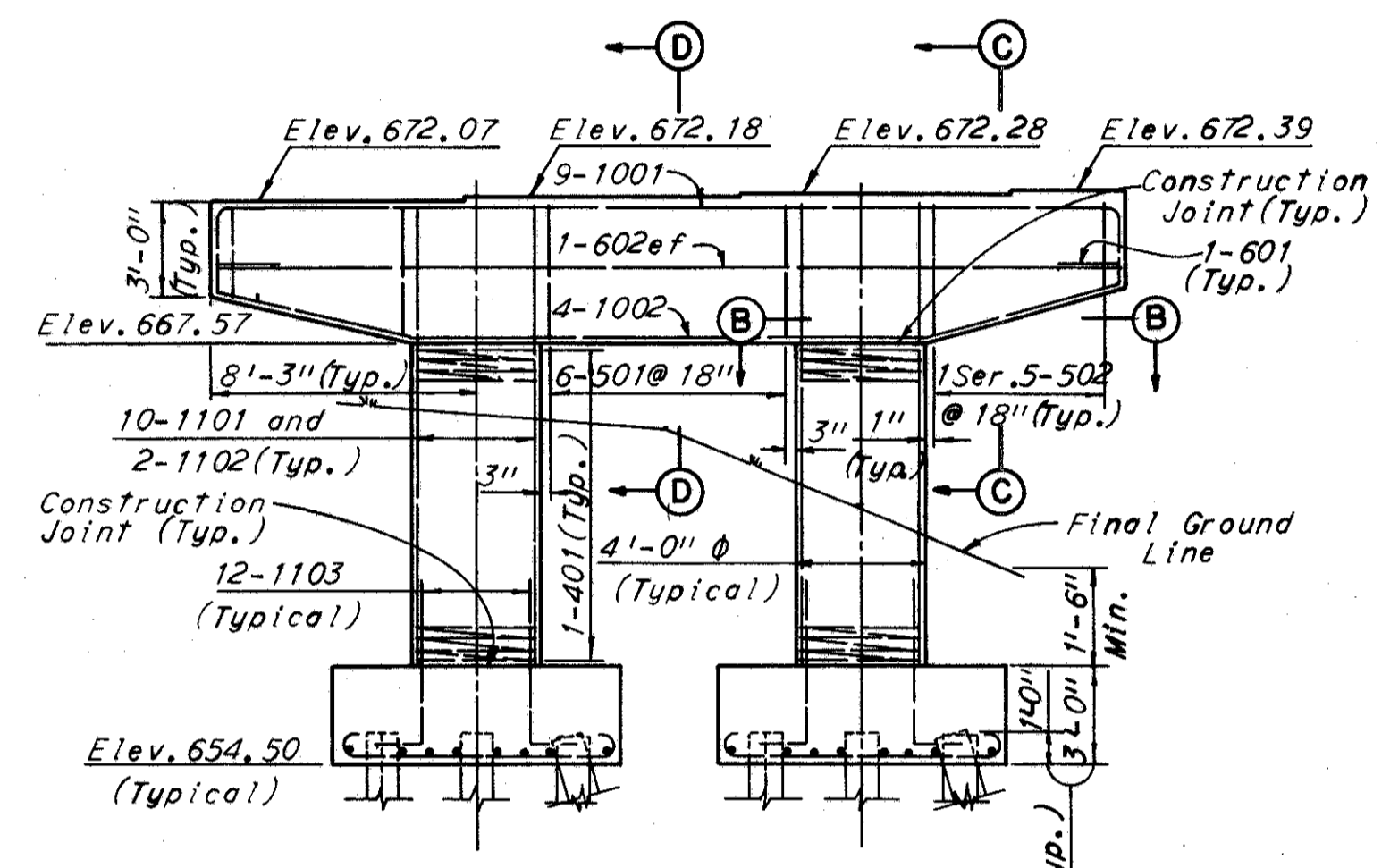
PLAN



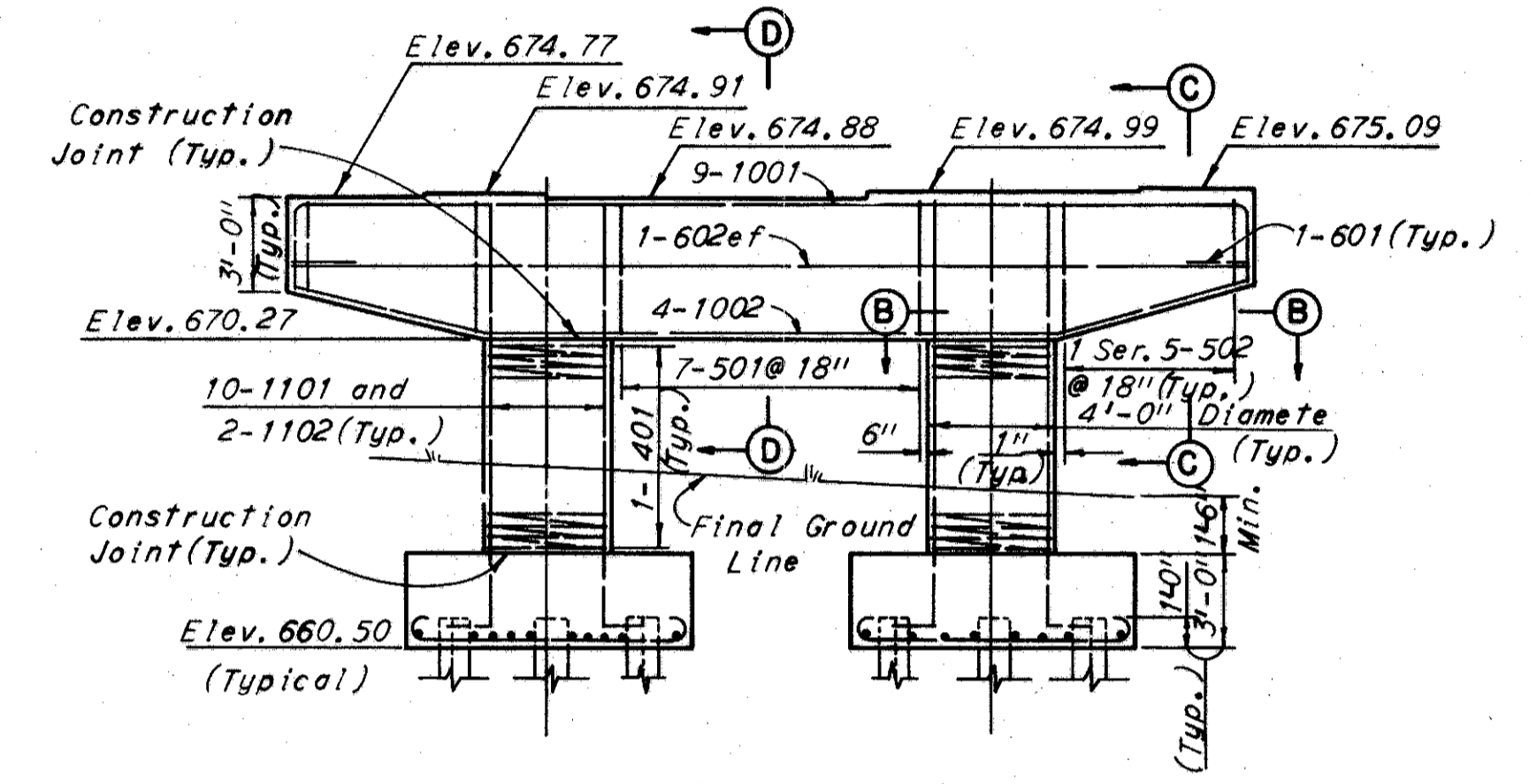
ELEVATION



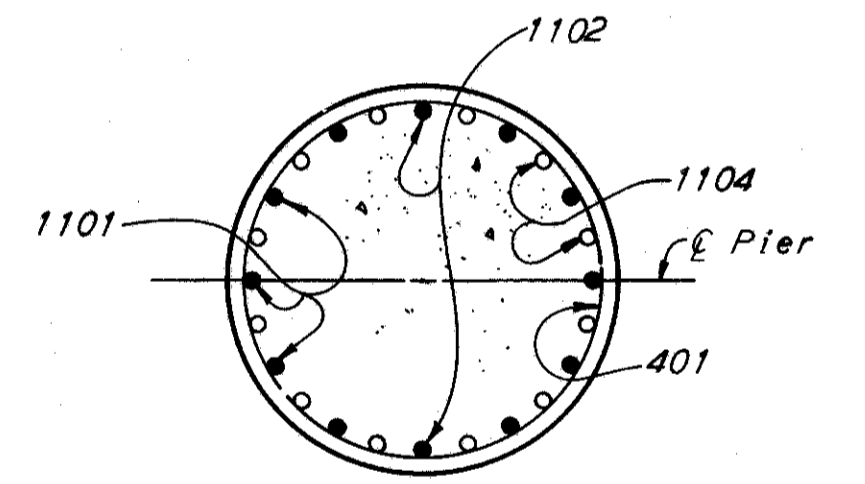
SECTION C-C



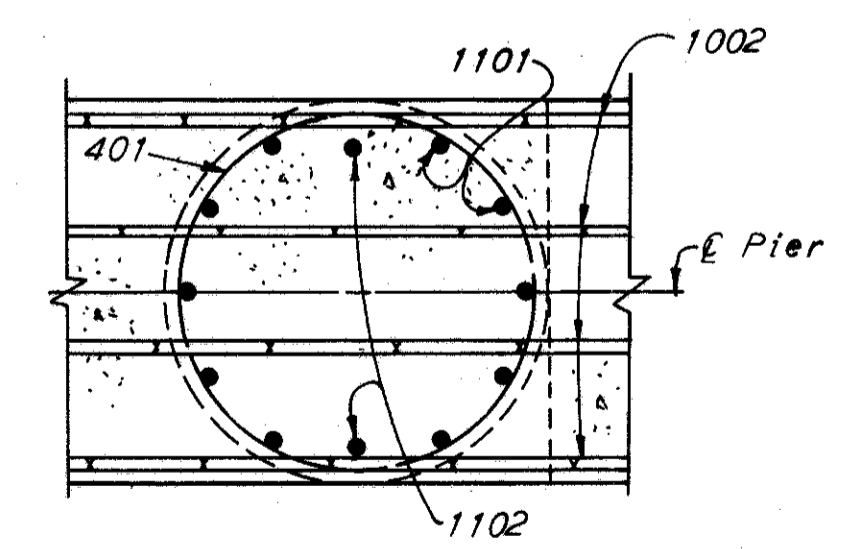
ELEVATION



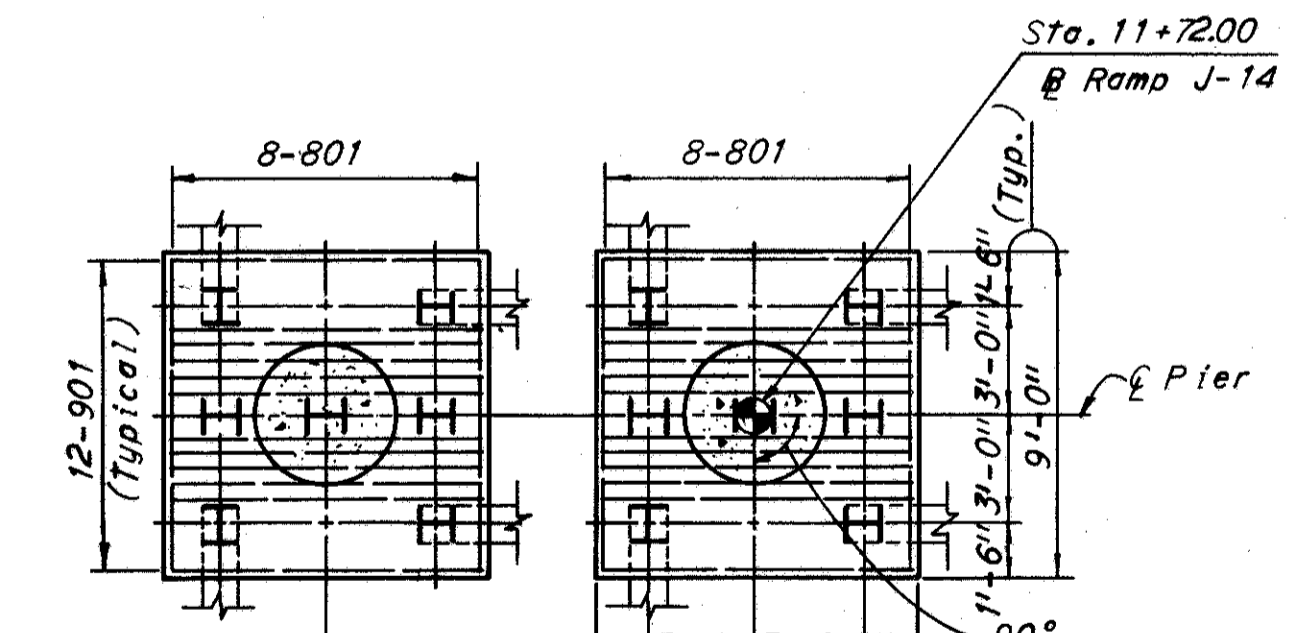
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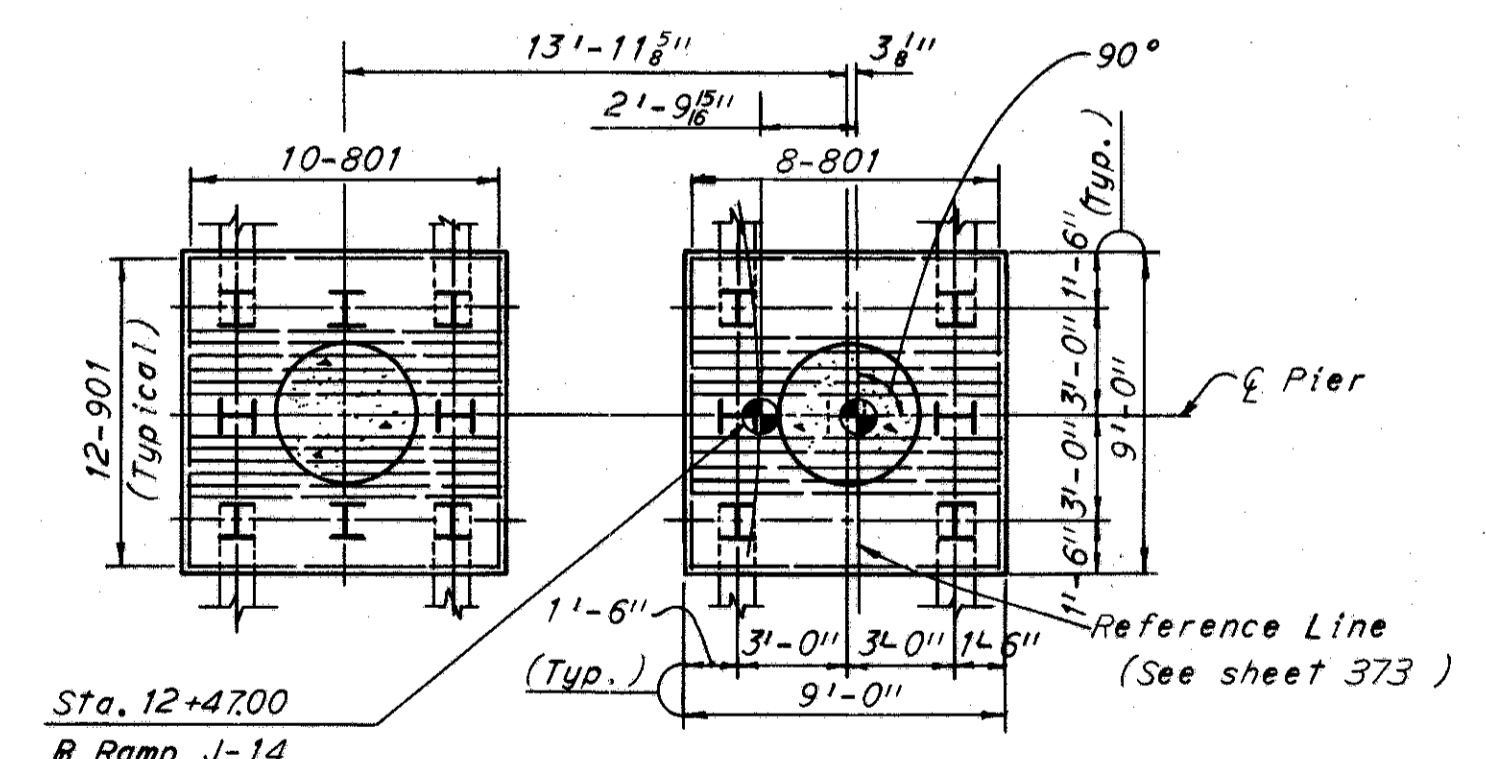
SECTION A-A



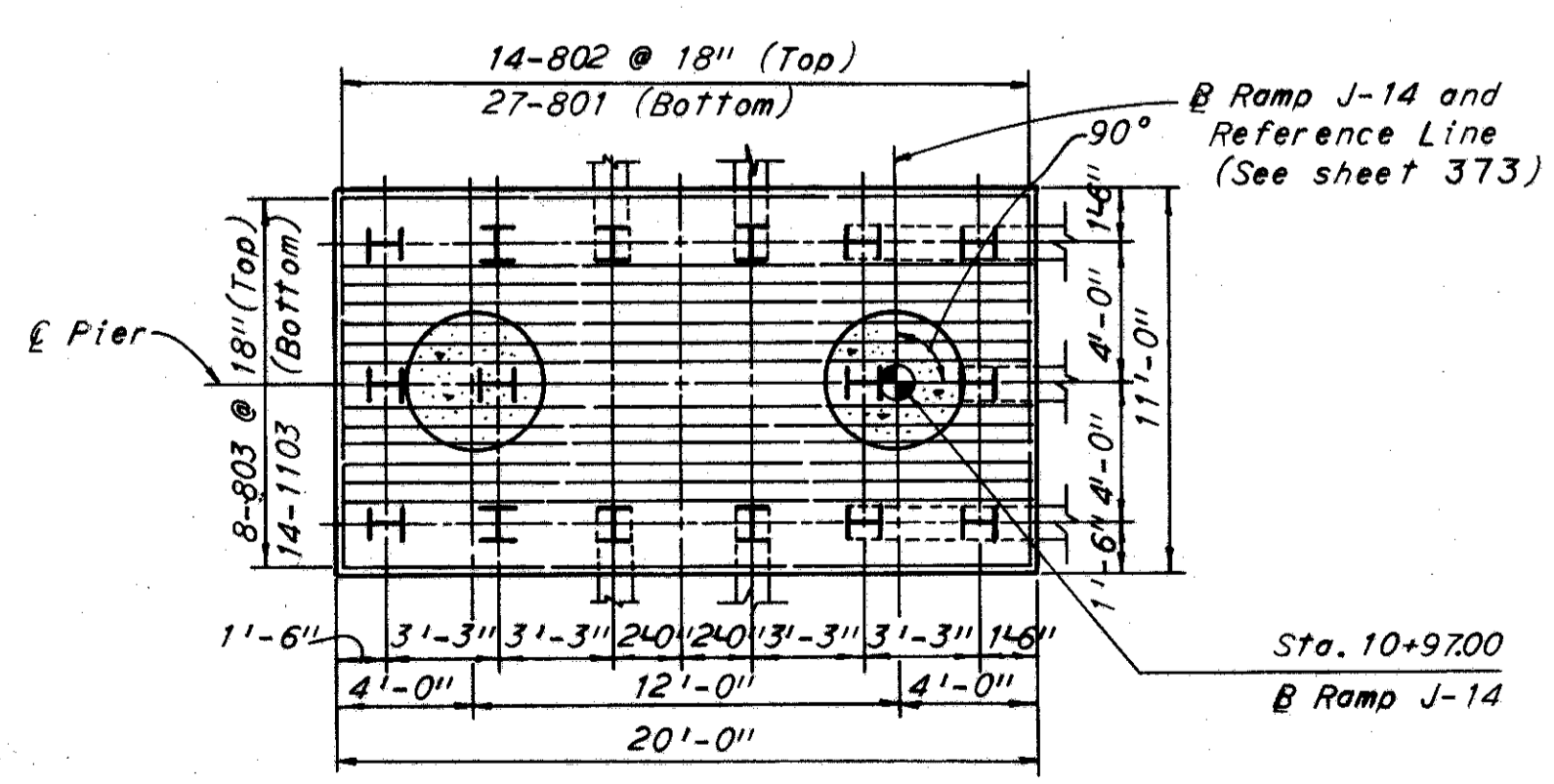
SECTION B-B



FOOTING PLAN  
PIER 27 BE



FOOTING PLAN  
PIER 28 BE



FOOTING PLAN  
PIER 26 BE

Note: All reinforcing bar marks shall be prefixed as follows:  
Pier 26BE = PQQ  
Pier 27BE = PRR  
Pier 28BE = PSS

Notes:  
All piles are 12BP53.  
The following abbreviation is used:  
ef = each face  
For additional notes see Sheet 385.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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**PIERS 26BE, 27BE, 28BE**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

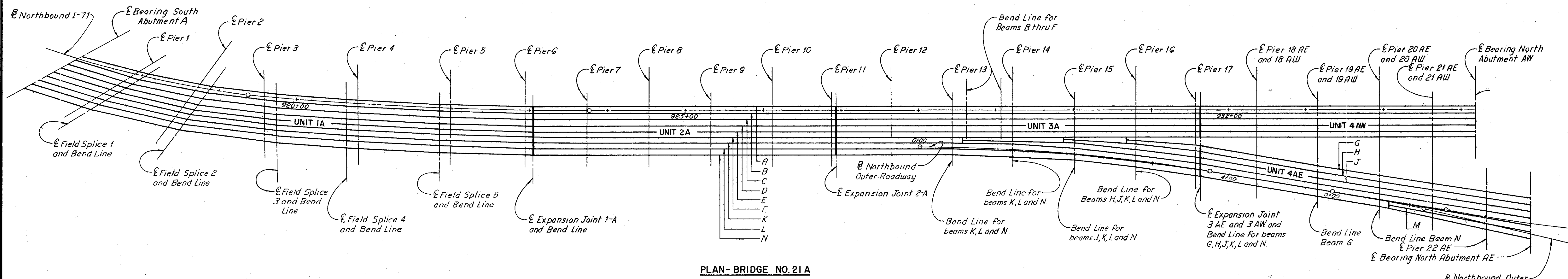
DRAWN DLR	TRACED	CHECKED JEN	REVIEWED WZ	REVISED
DATE 7-12-64	DATE	DATE 12-11-64	DATE 2-22-64	

SHEET 407

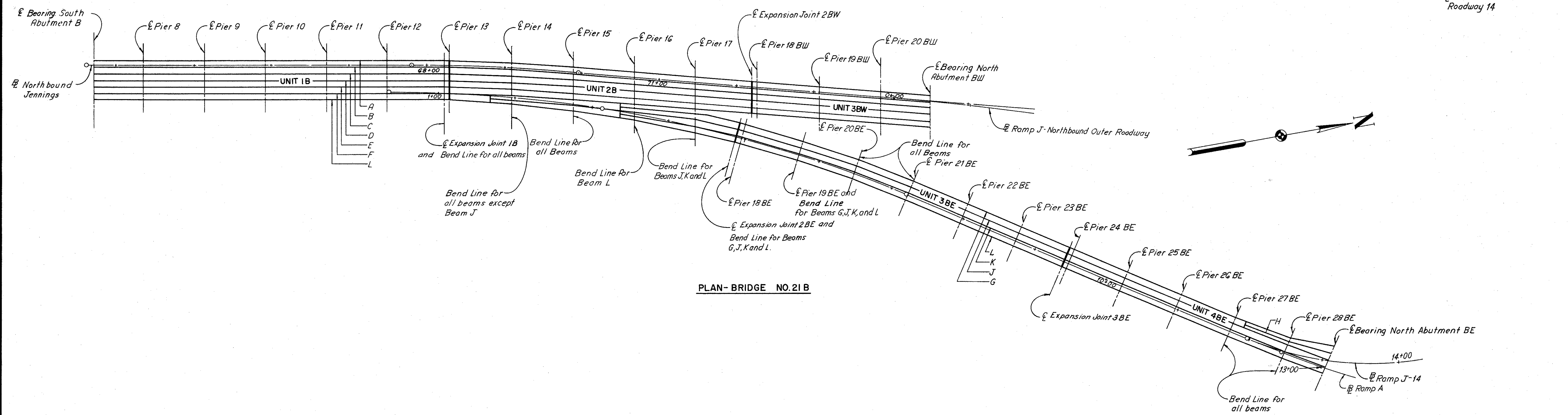
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

408  
646

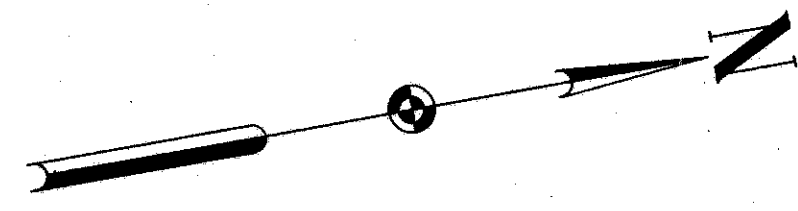
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



PLAN-BRIDGE NO. 21A



PLAN-BRIDGE NO. 21B



H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**SCHEMATIC FRAMING PLAN**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

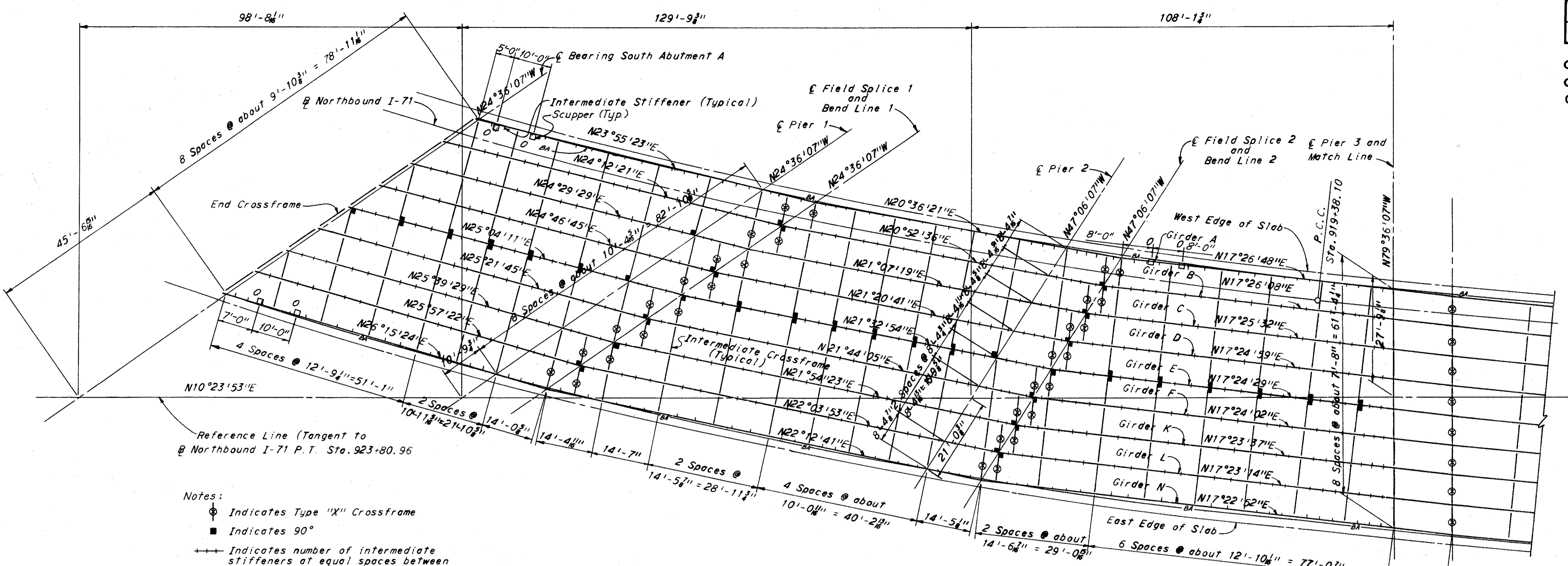
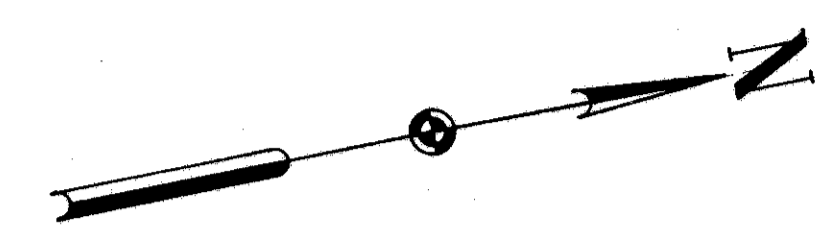
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.M.C.	TRACED	CHECKED 2/24/64	REVIEWED W.F.	REVISED
DATE 12-11-64	DATE	DATE 12-13-64	DATE 12-22-64	

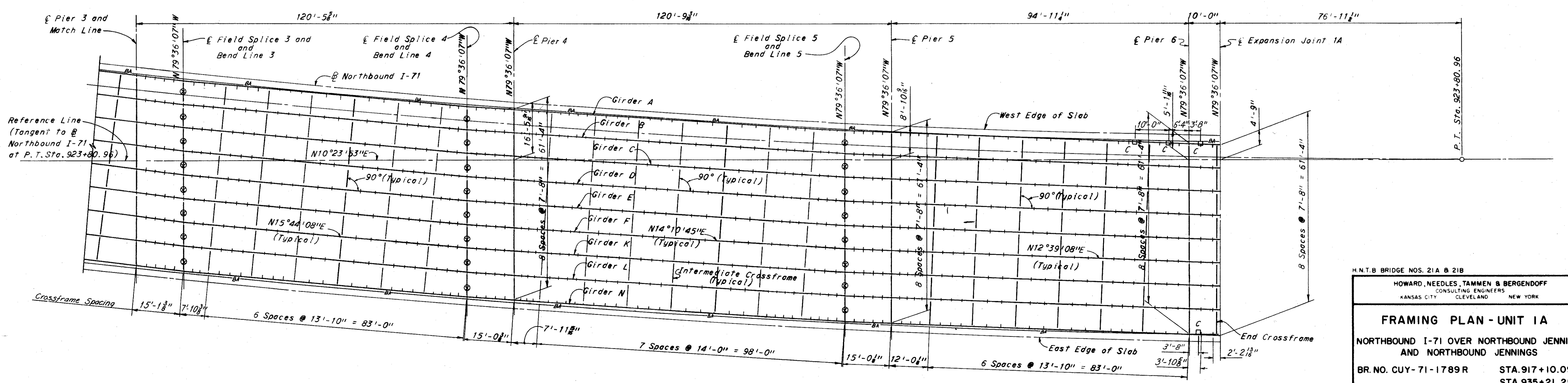
SHEET 408

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



- Notes:
- ⊙ Indicates Type "X" Crossframe
  - Indicates 90°
  - Indicates number of intermediate stiffeners at equal spaces between crossframes or between crossframes and bearing stiffeners.
  - BA- Denotes Bulb Angle Gutter
- SCUPPER LEGEND
- C - Outlets at ground level
  - O - Outlets just below superstructure

FRAMING PLAN



FRAMING PLAN

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**FRAMING PLAN - UNIT 1A**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

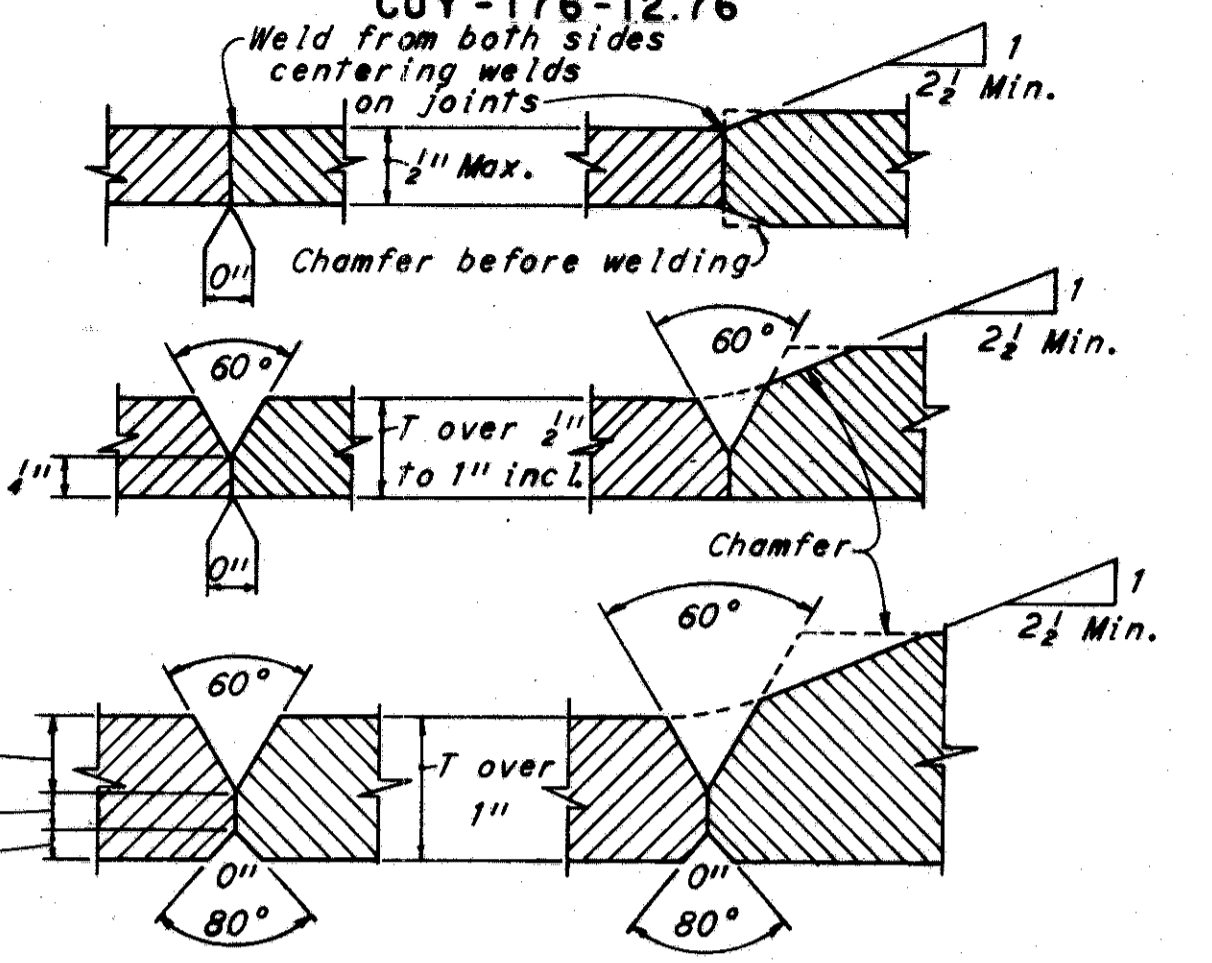
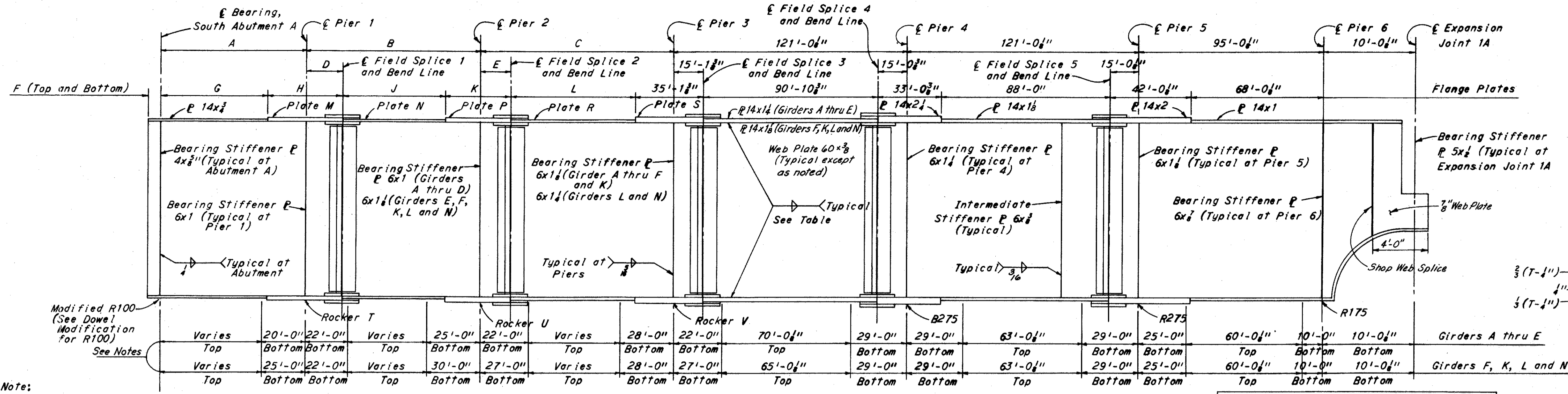
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN GED	TRACED	CHECKED J.M.
DATE 7-16-64	DATE 12-21-64	DATE 12-22-64

REVISOR W.F. REVISIONS

SHEET 409

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Note: All of the above full penetration welds shall be back-gauged and welded after welding for side. Butt welds on girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.

Note: Intermediate stiffeners on Girders B thru F, K, and L are to have contact bearing with the top or bottom flanges as indicated. Intermediate stiffeners on Girders A and N are to be welded to the top or bottom flange as indicated.

**TABLE OF DIMENSIONS**

Girder	A	B	C	D	E	F	G	H	J	K	L	Plate M	Plate N	Plate P	Plate R	Plate S	Rocker T	Rocker U	Rocker V
A	75'-6 3/4"	79'-2 1/4"	84'-1 1/8"	14'-6 3/8"	14'-7"	11 1/8"	63'-6 3/8"	26'-6 3/8"	52'-8 1/4"	26'-7"	49'-6 3/8"	14x1 1/2	14x2	14x1	14x2	14x1 1/2	225	200	250
B	75'-2 1/4"	83'-4 1/4"	88'-8 1/8"	14'-5 5/8"	14'-6 1/8"	11 1/8"	63'-2 1/2"	26'-5 5/8"	56'-10 1/8"	26'-6 1/8"	54'-1 1/8"	14x1 1/2	14x2	14x1	14x2	14x1 1/2	225	200	250
C	74'-10 3/8"	87'-5 5/8"	93'-2 1/8"	14'-5 1/4"	14'-6 1/4"	11 1/8"	62'-10 3/8"	26'-5 1/4"	61'-0 3/8"	26'-6 1/4"	58'-8 3/8"	14x1 1/2	14x2	14x1 1/2	14x2	14x1 1/2	225	200	250
D	74'-6 3/8"	91'-7 3/8"	97'-9 1/4"	14'-4 3/8"	14'-6 1/4"	11 1/8"	59'-6 3/8"	29'-4 3/8"	62'-3"	29'-6 1/4"	63'-3"	14x1 1/2	14x2	14x1 1/2	14x2	14x1 1/2	225	225	250
E	74'-2 1/8"	95'-8 3/8"	102'-3 3/8"	14'-3 3/8"	14'-5 3/8"	11 3/8"	56'-2 3/8"	32'-3 3/8"	63'-5 1/4"	32'-5 1/4"	67'-10"	14x1 1/2	14x2	14x1 1/2	14x2	14x2	225	225	250
F	73'-1 1/4"	99'-10 1/8"	106'-4 0 1/2"	14'-2 3/8"	14'-5 3/8"	11 3/8"	55'-1 1/4"	32'-2 3/8"	67'-7 3/8"	32'-5 1/4"	72'-4 1/8"	14x1 1/2	14x2	14x1 1/2	14x2	14x2	225	250	275
K	73'-7 3/8"	103'-1 1/8"	111'-5 1/8"	14'-2 1/4"	14'-5 1/4"	11 3/8"	53'-7 3/8"	34'-2 1/4"	71'-9 3/8"	32'-5 1/4"	76'-1 1/8"	14x1 1/2	14x2	14x1 1/2	14x1	14x2	225	250	275
L	73'-3 3/8"	108'-1 1/8"	115'-4 1/8"	14'-1 1/8"	14'-5 1/4"	11 3/8"	51'-3 3/8"	36'-1 1/8"	75'-0 3/8"	33'-5 1/4"	81'-6 3/8"	14x1 1/2	14x2	14x2	14x1	14x2	250	275	275
N	72'-1 1/8"	112'-2 1/8"	120'-6 1/8"	14'-0 3/8"	14'-5 1/4"	11 3/8"	50'-4 1/8"	36'-0 3/8"	79'-2 1/4"	33'-5 1/4"	86'-1 3/8"	14x1 1/2	14x2	14x2	14x1	14x2	250	275	275

Note: For details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55.

**WELD SIZE WEB TO FLANGE**

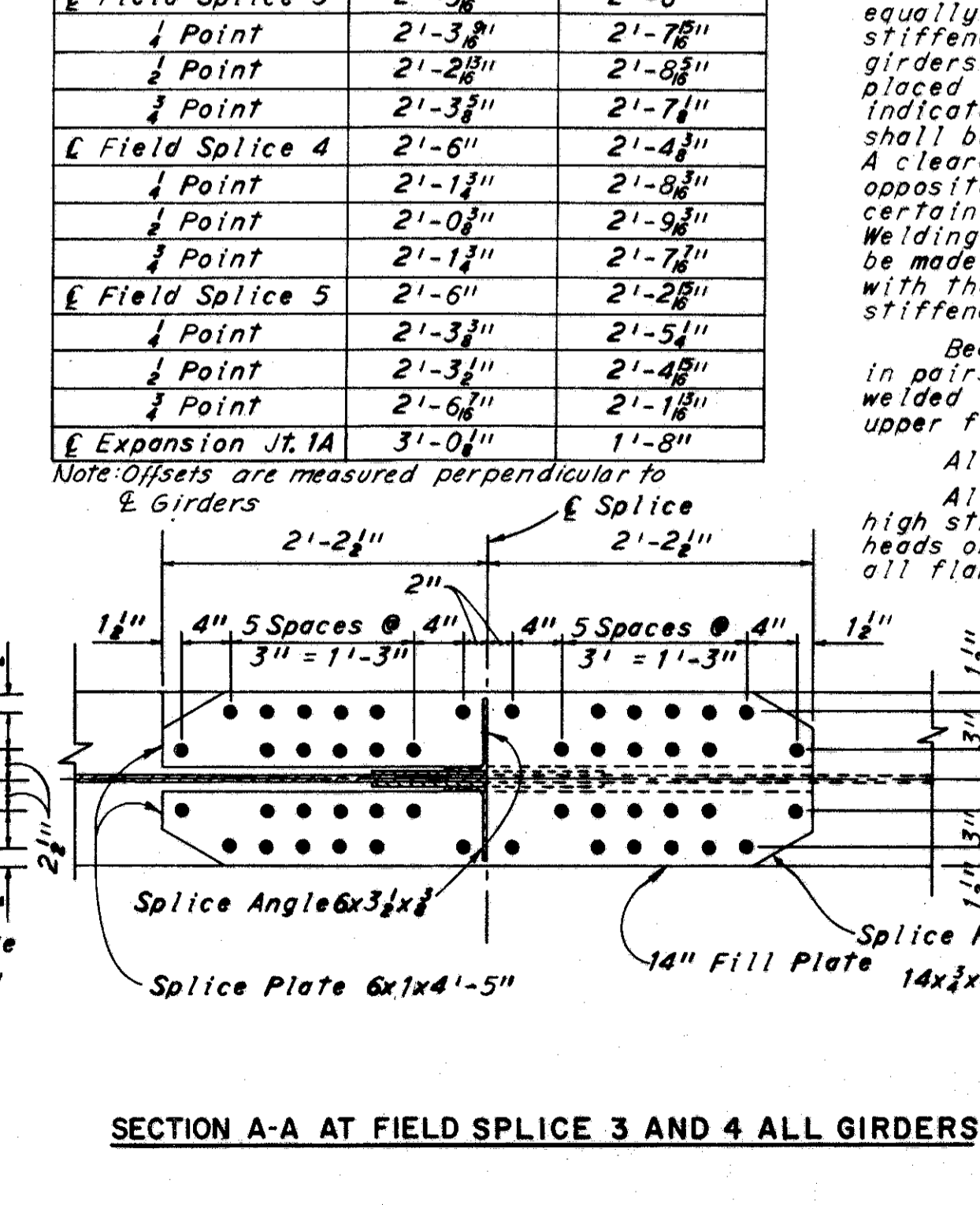
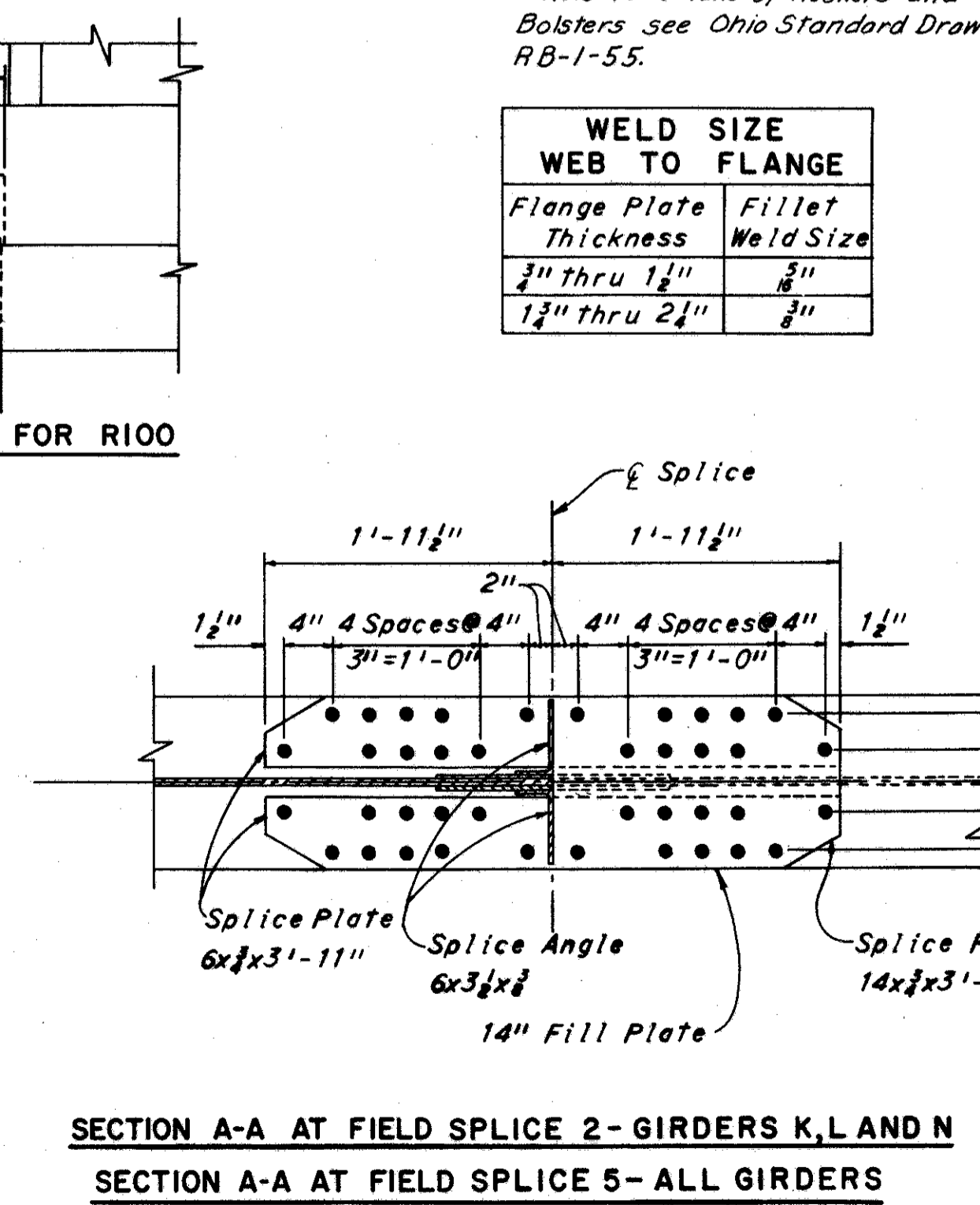
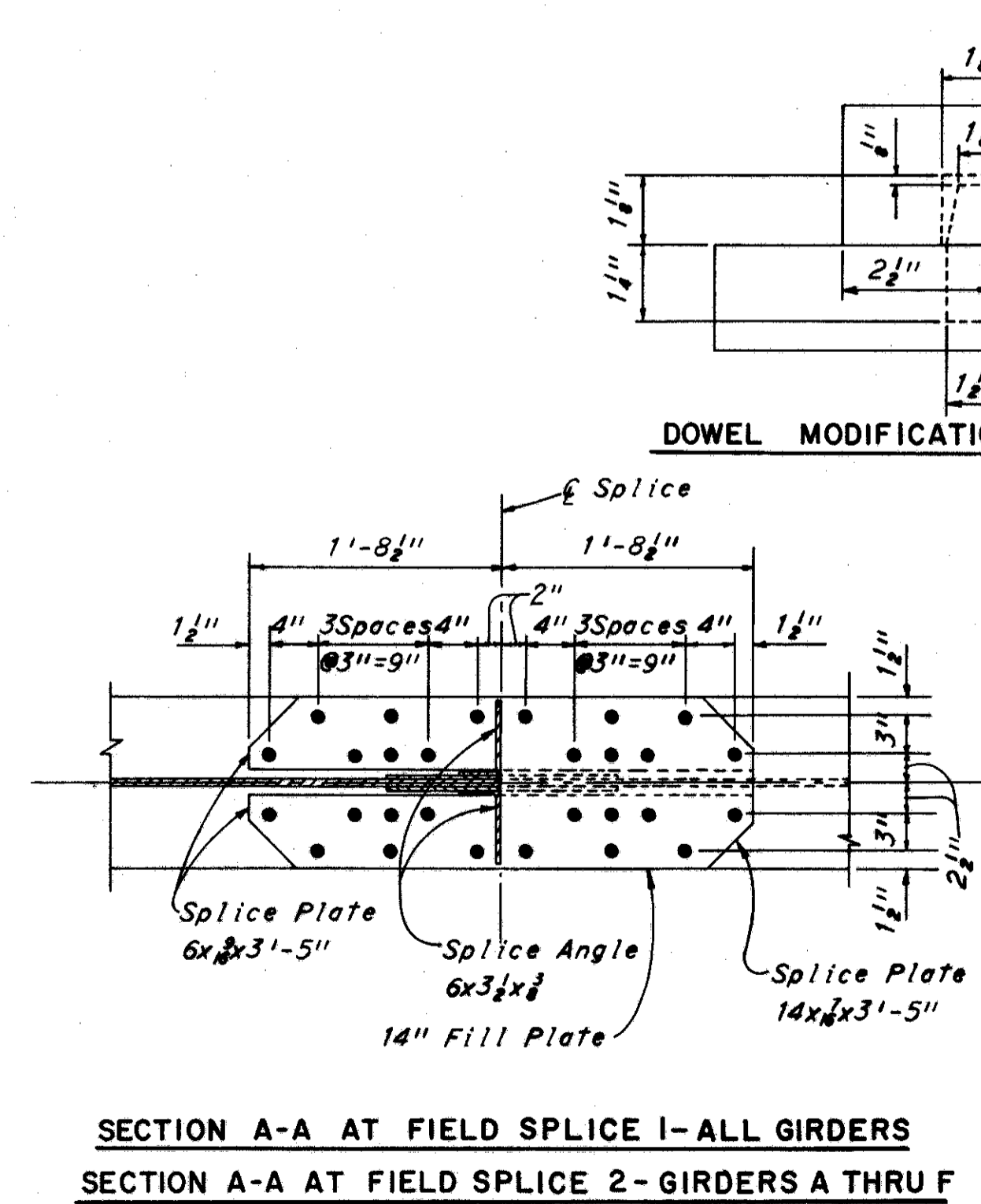
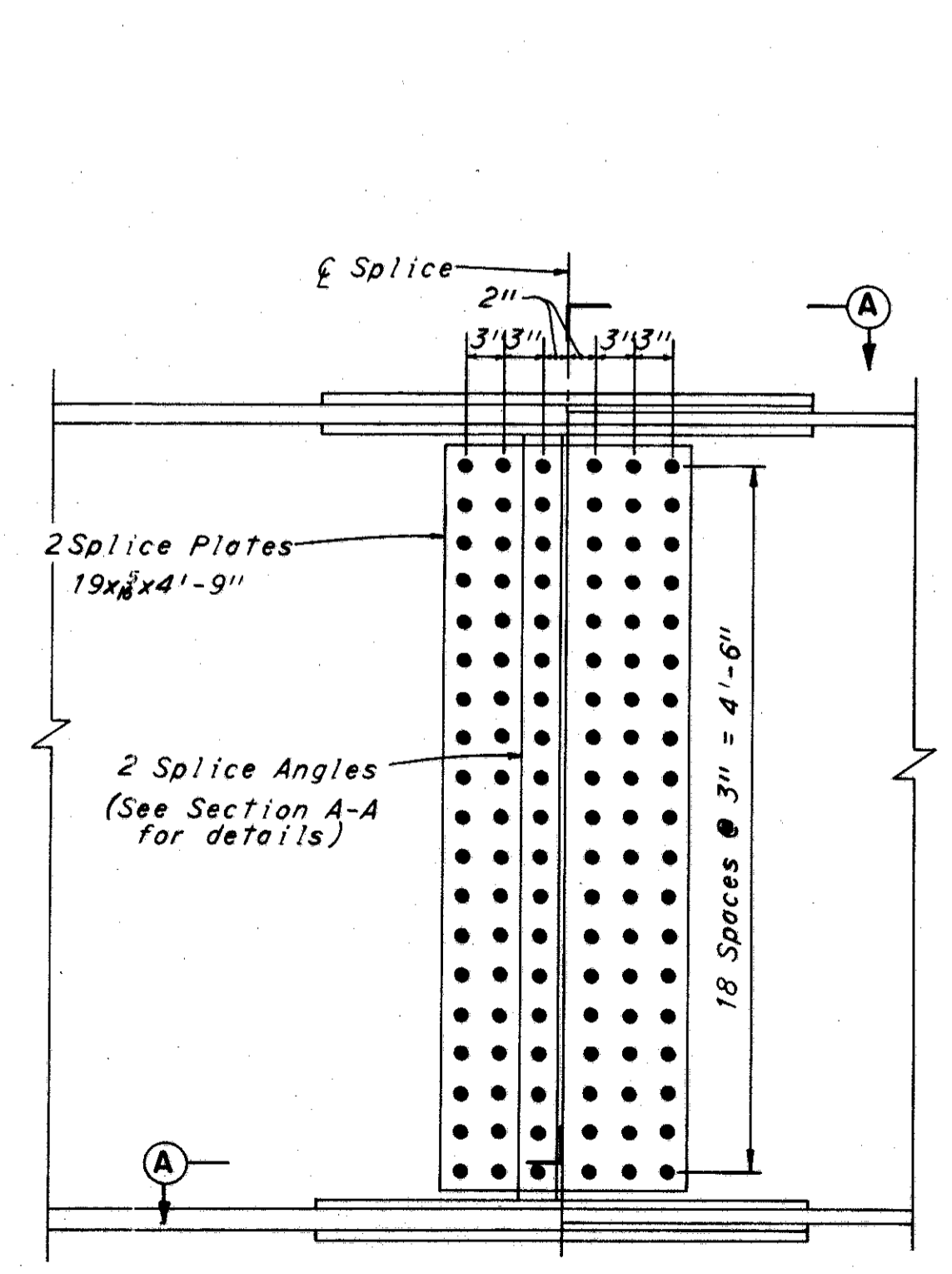
Flange Plate Thickness	Fillet Weld Size
3" thru 1 1/2"	3/8"
1 1/2" thru 2 1/4"	3/4"

**HORIZONTAL OFFSETS TO EDGE OF SLAB**

Location	Girder A to West Edge	Girder N to East Edge
€ Brg. S. Abutment	2'-4 3/8"	2'-0"
1/4 Point	1'-10 3/8"	2'-4 3/8"
1/2 Point	1'-7 7/8"	2'-5 3/8"
3/4 Point	1'-10 1/8"	2'-2 3/8"
€ Field Splice 1	2'-4 3/8"	1'-7 1/2"
1/4 Point	1'-11 1/8"	2'-4 3/8"
1/2 Point	1'-10 3/8"	2'-7 1/2"
3/4 Point	2'-0 1/8"	2'-4 3/8"
€ Field Splice 2	2'-5 1/2"	1'-6 1/2"
1/4 Point	2'-0 1/8"	2'-7 1/2"
1/2 Point	1'-11 1/8"	3'-1"
3/4 Point	2'-2"	2'-11 3/8"
€ Field Splice 3	2'-5 5/8"	2'-6"
1/4 Point	2'-3 3/8"	2'-7 5/8"
1/2 Point	2'-2 3/8"	2'-6 3/8"
3/4 Point	2'-3 3/8"	2'-7 1/4"
€ Field Splice 4	2'-6"	2'-4 3/8"
1/4 Point	2'-1 3/8"	2'-8 3/8"
1/2 Point	2'-0 3/8"	2'-9 3/8"
3/4 Point	2'-1 3/8"	2'-7 1/4"
€ Field Splice 5	2'-6"	2'-2 3/8"
1/4 Point	2'-3 3/8"	2'-5 1/4"
1/2 Point	2'-3 3/8"	2'-4 5/8"
3/4 Point	2'-6 3/8"	2'-1 3/8"
€ Expansion Jt. 1A	3'-0 1/4"	1'-8"

**GIRDER SHOP WELDING DETAILS**

**Girder Notes:**  
 All measurements are given along center line of girders. The girders shall be fabricated to compensate for effects of vertical curvature, super-elevation and dead load deflections, and under full dead load shall parallel the profiles formed by the top of pavement elevations directly over the girders. Top and bottom flange plates are to be the same and shall be spliced at points shown on the girder elevations. The web plate may be shop spliced as required by available plate lengths. The location of shop web splices and the locations and details of any additional shop flange splices shall be submitted to the Director for approval prior to ordering of materials. Intermediate stiffeners shall be placed as shown on framing plan equally spaced between crossframes, or crossframes and bearing stiffeners. Stiffeners shall be placed in pairs on the interior girders and on the inside only of exterior girders. Stiffeners placed in pairs shall have contact bearing with the flange indicated in the girder elevations and stiffeners placed singly shall be welded to the flange indicated in the girder elevations. A clearance of not more than 1/8 inch shall be maintained from the opposite flanges. In shop painting care shall be taken to make certain that paint is forced through the 1/4 inch opening. Welding of the stiffeners to the flanges where indicated shall be made with a 3/8 inch fillet weld on both sides of the stiffener with the welds stopping 2 inches from the outside edge of the stiffener. Bearing stiffeners at piers and abutments shall be placed in pairs on all girders and shall be beveled and fully butt welded to the lower flange and fitted to close contact with the upper flange without welding. All stiffeners shall be set normal to girder flanges. All girder field splices shall be made with 7/8" diameter high strength steel bolts. The bolts shall be placed with their heads on outside face of exterior girders and on the bottom of all flange plates. The contractor shall submit to the Director, for approval, three prints showing his proposed erection procedure.



TYPICAL FIELD WEB SPLICE

SECTION A-A AT FIELD SPLICE 1 - ALL GIRDERS  
 SECTION A-A AT FIELD SPLICE 2 - GIRDERS A THRU F

SECTION A-A AT FIELD SPLICE 2 - GIRDERS K, L AND N  
 SECTION A-A AT FIELD SPLICE 5 - ALL GIRDERS

SECTION A-A AT FIELD SPLICE 3 AND 4 ALL GIRDERS

H.N.T.B BRIDGE NOS. 21A & 21B  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

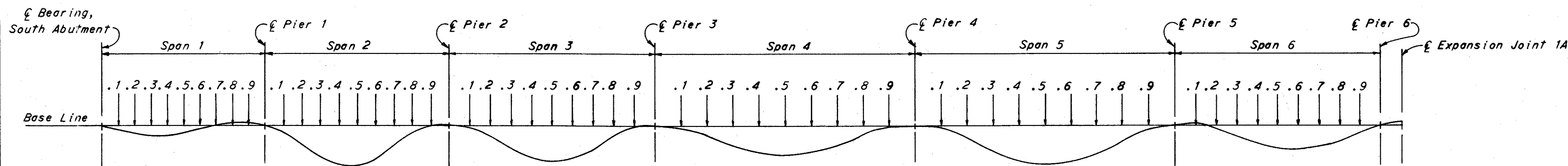
**SUPERSTRUCTURE DETAILS**  
 UNIT I-A  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN: G.R.D.	CHECKED: J.M.C.	REVIEWED: J.V.
DATE: 7-16-64	DATE: 12-21-64	DATE: 12-22-64

SHEET 410

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



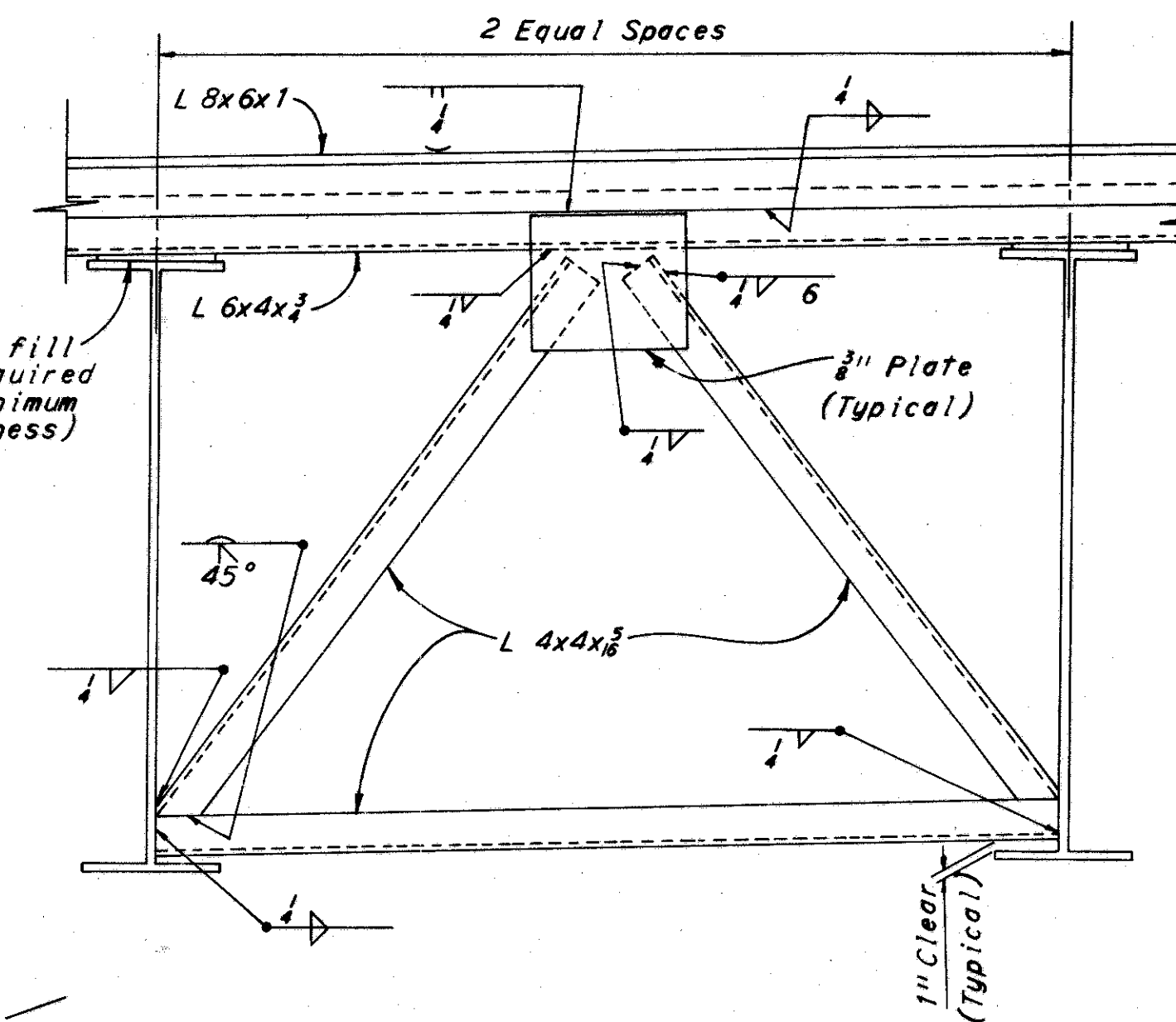
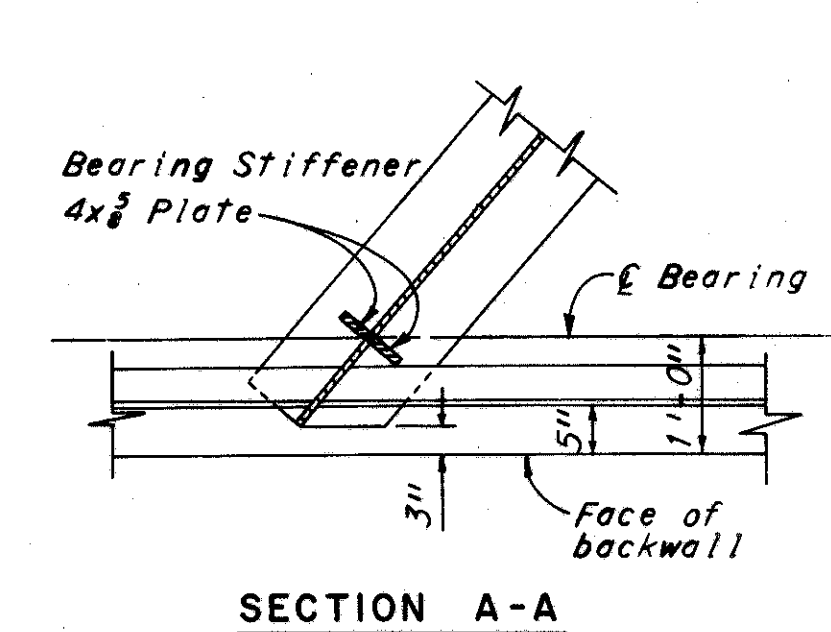
DEAD LOAD DEFLECTION DIAGRAM

DEAD LOAD DEFLECTION TABLE

Girder	Span 1									Span 2									Span 3									Span 4								
	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9
A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
B	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
C	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
D	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
E	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
K	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
L	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
N	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

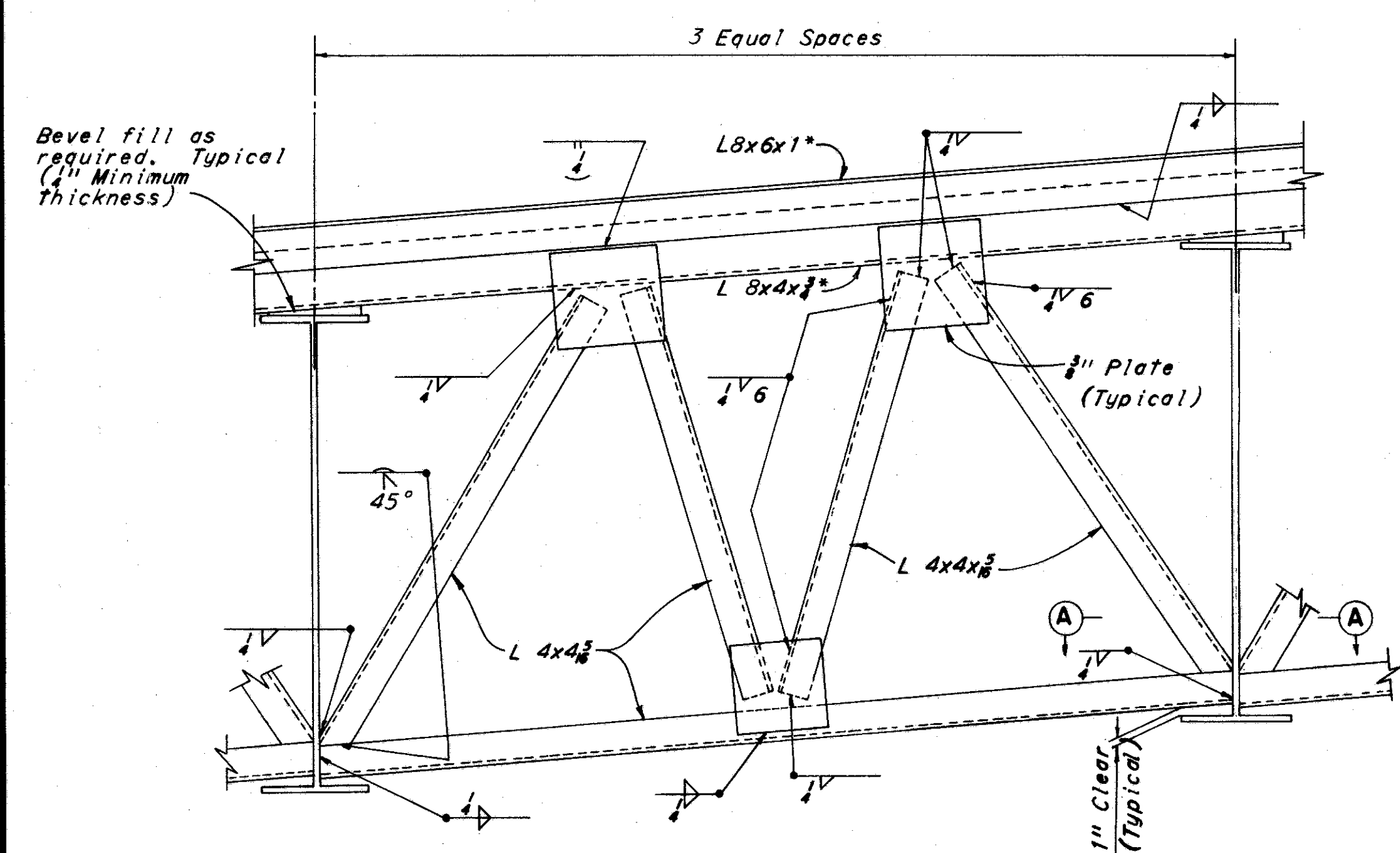
Girder	Span 5									Span 6									Exp. Jt. 1A
	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	
A	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
B	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
C	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
D	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
E	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
K	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
L	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
N	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Notes:  
 Deflections are measured to nearest 1/16 inch.  
 Negative deflections indicate deflection above base line.  
 T indicates deflection due to both concrete and steel.  
 C indicates deflection due to concrete only.



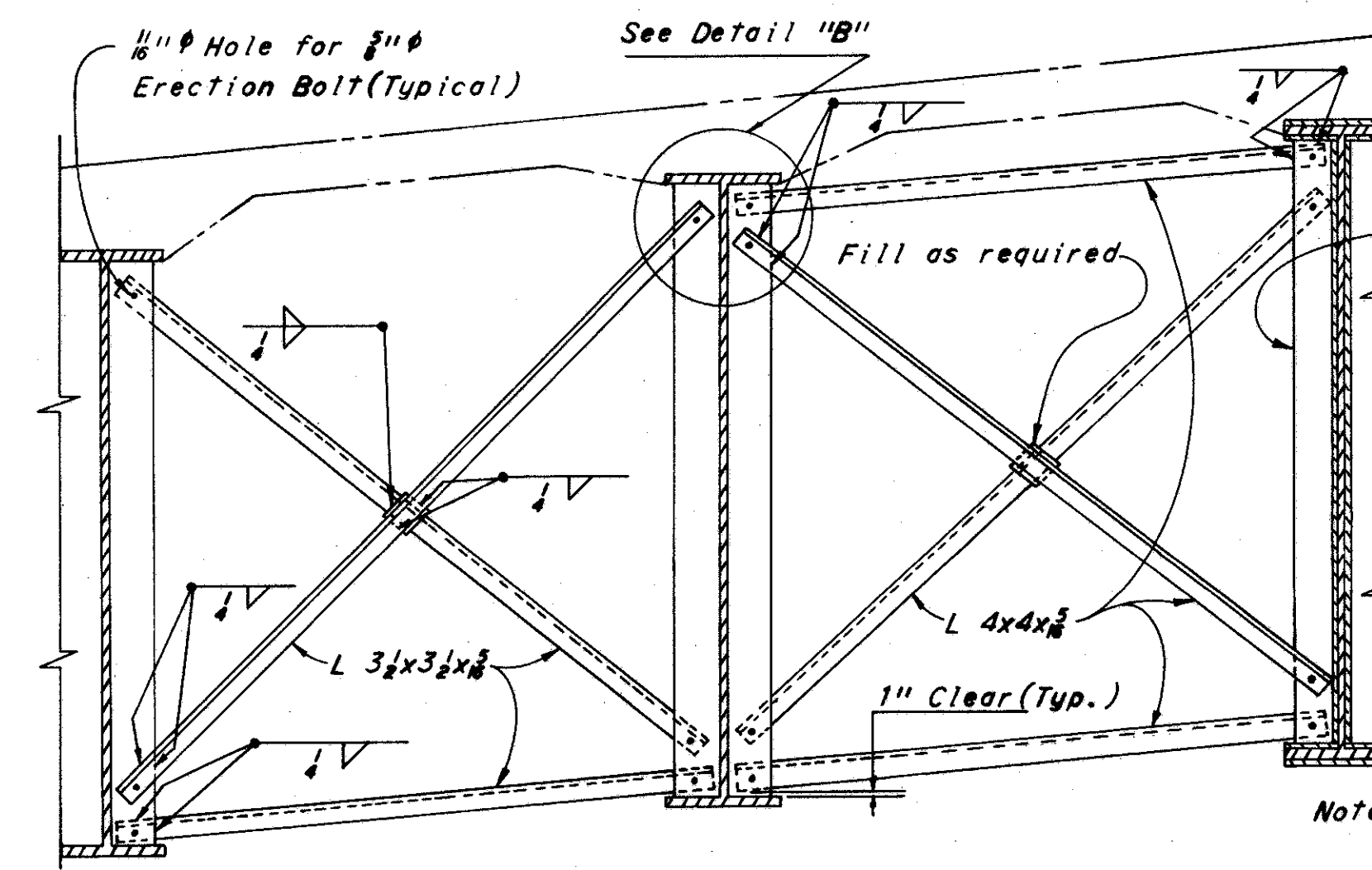
END CROSSFRAME  
 (Typical at Expansion Joint 1A)

For additional roadway end dam and curb plate details see Ohio Standard Drawing SD-1-63, sheets 2 of 4 and 4 of 4.

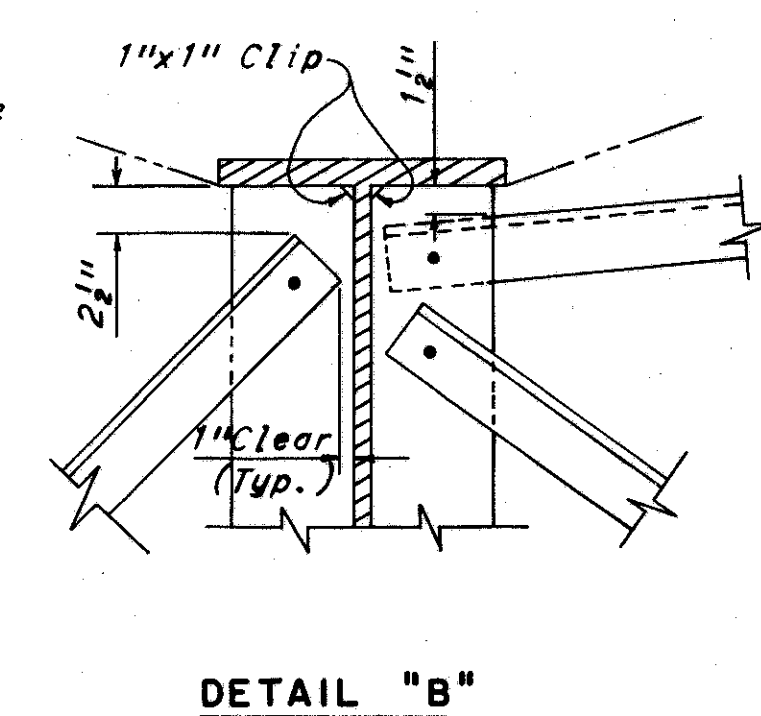


END CROSSFRAME  
 (Typical at South Abutment A)

\* Note: The supporting angle and main angle shown in Roadway End Dam Table in Ohio Standard Drawing SD-1-63, sheet 2 of 4, shall be increased from 6x4x3/8 to 8x4x3/8 and from 8x4x1 to 8x6x1, respectively.



INTERMEDIATE TYPE "X"  
 TYPICAL CROSSFRAMES



Note: Tack weld all 3/8 inch Erection Bolts after tightening.

H.N.T.B. BRIDGE NOS. 21A & 21B  
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**CROSSFRAMES AND DEFLECTIONS UNIT I-A**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

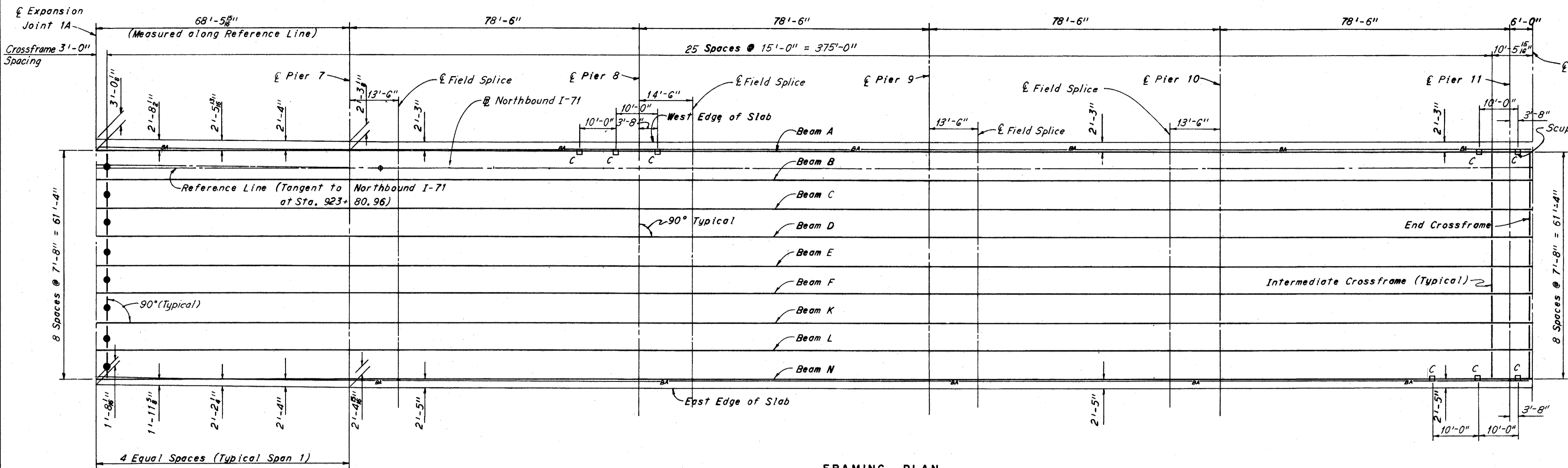
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED
G.R.D.	J.M.C.	W.P.	
DATE	DATE	DATE	DATE
8-14-64	12-23-64	12-22-64	

SHEET 411

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



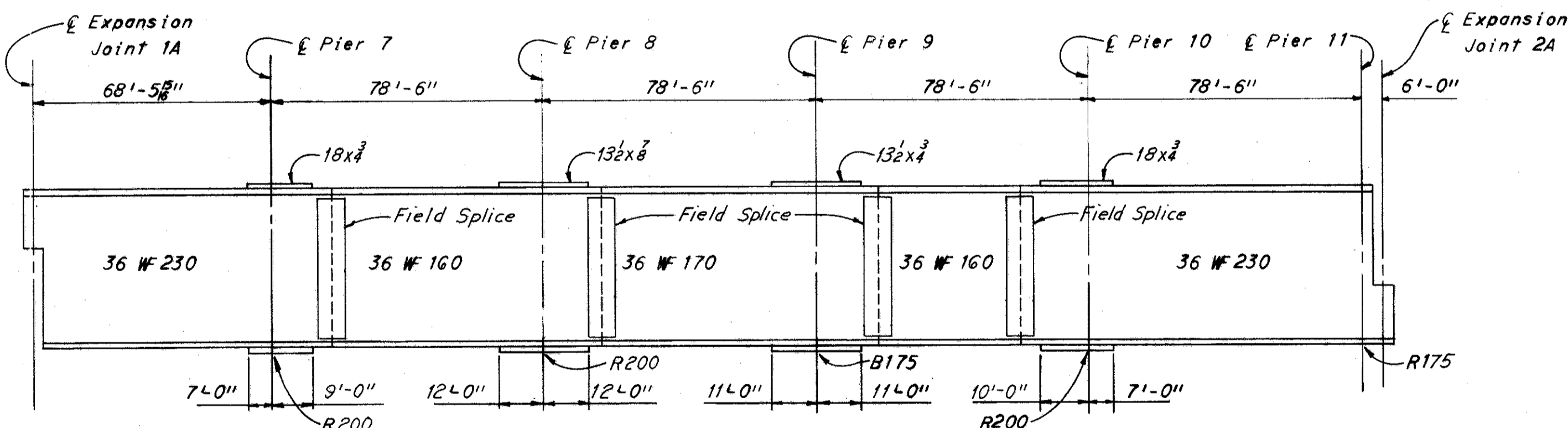
FRAMING PLAN

**SCUPPER LEGEND**  
 C - Outlets at ground level  
 O - Outlets just below superstructure

**Note:**  
 • Denotes Type "Y" Crossframe  
 -BA- Denotes Bulb Angle Gutter

**BEAM CAMBER NOTE**

Where the combined effects of total dead load deflection and convexity is  $\frac{3}{8}$ " or more, the required camber shall be the same as this sum. Where the combined effects are less than  $\frac{3}{8}$ ", no camber is required but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.



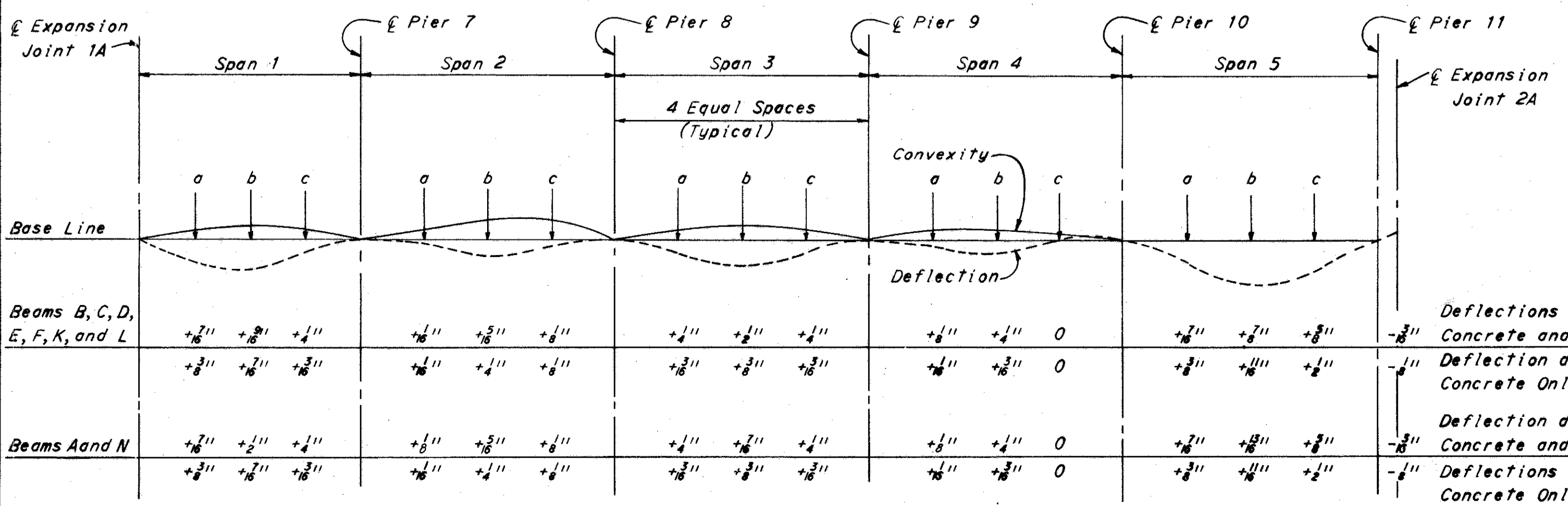
TYPICAL BEAM ELEVATION

Note: Cover plate lengths and sizes shown are typical top and bottom.

Beam	CONVEXITY CORRECTIONS														
	Span 1			Span 2			Span 3			Span 4			Span 5		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
A	1/16"	3/16"	1/8"	5/16"	3/8"	1/4"	1/16"	3/16"	1/8"	3/16"	1/8"	1/16"	0	0	0
B				3/16"	1/4"	3/16"	1/16"	3/16"	1/8"	3/16"	1/8"	1/16"			
C				1/16"	1/8"	1/16"	1/16"	3/16"	1/8"	3/16"	1/8"	1/16"			
D				1/16"	1/8"	3/16"	3/16"	1/8"	3/16"	1/8"	3/16"	1/8"			
E				3/16"	1/4"	1/16"	1/16"	3/16"	1/8"	1/16"	3/16"	1/8"			
F				3/16"	1/4"	3/16"	1/16"	3/16"	1/8"	1/16"	3/16"	1/8"			
K				1/16"	1/8"	3/16"	1/16"	3/16"	1/8"	1/16"	3/16"	1/8"	0	0	0
L	1/16"	3/16"	1/8"	3/16"	1/4"	1/16"	0	0	0	0	0	0			
N	3/16"	1/4"	3/16"	3/16"	1/8"	1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	0	0	0

**Notes:**  
 Negative values for convexity indicate convexity below the base line.  
 Negative values for deflection indicate deflection above the base line.  
 Deflections are measured to nearest 1/16 inch.

**Notes:**  
 For details of beam field splices see sheet 447.  
 For crossframes and cover plate details see sheet 414.  
 For details of Rockers and bolsters see Ohio Standard Drawing RB-1-55.



DEAD LOAD DEFLECTION AND CONVEXITY DIAGRAM

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**FRAMING PLAN - UNIT 2A**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN: S.P.D. TRACED: J.M.C. CHECKED: J.M.C. REVIEWED: J.P. REVISIONS:  
 DATE: 7-16-64 DATE: 12-22-64 DATE: 12-22-64

SHEET 412

SCUPPER LEGEND  
C - Outlets at ground level  
O - Outlets just below superstructure

Notes:  
• Denotes Type "Y" Crossframe  
■ Denotes 90°  
-BA- Denotes Bulb Angle Gutter

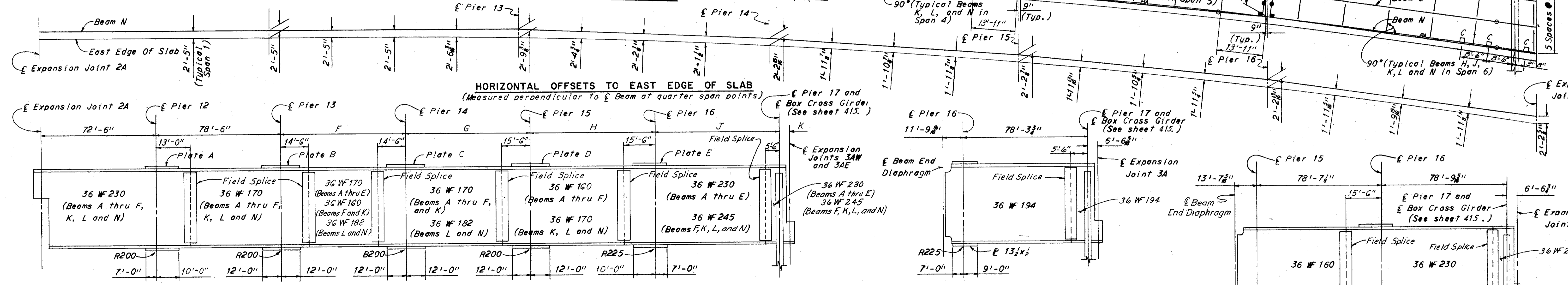
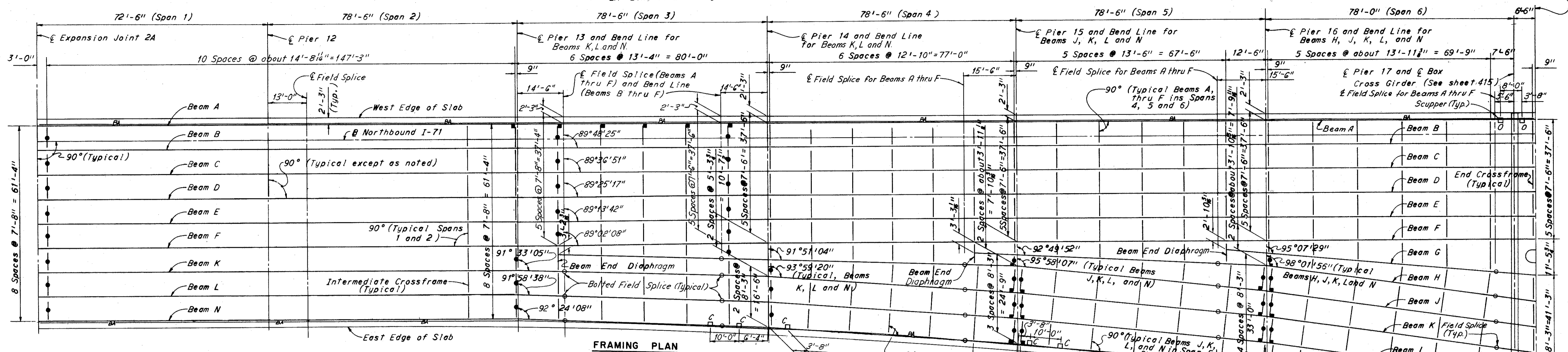
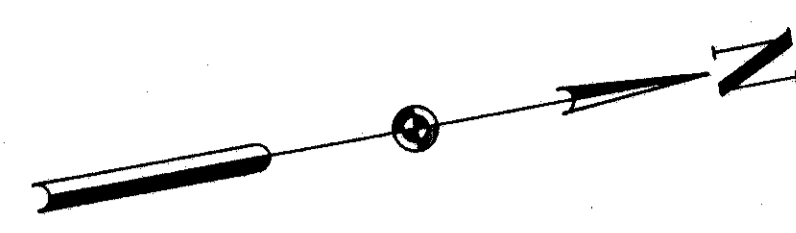


TABLE OF DIMENSIONS

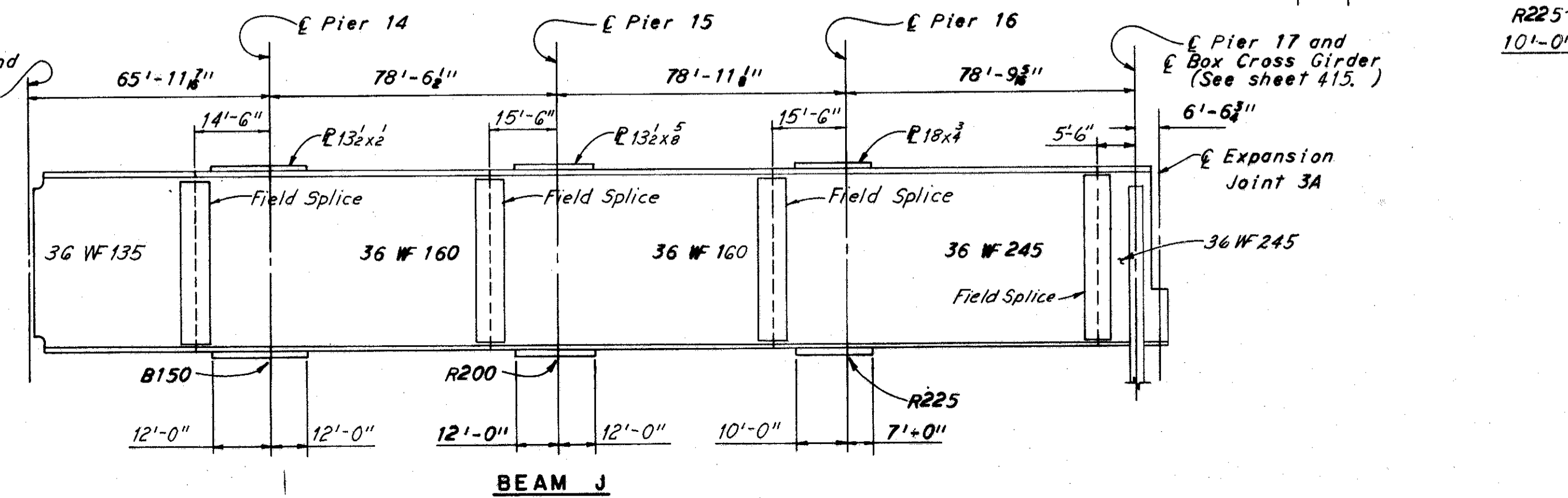
Beams	Plate A	Plate B	Plate C	Plate D	Plate E
A thru E	18x3	13x3	13x3	13x3	18x3
F	18x3	13x3	13x3	13x3	18x3
K	18x3	13x3	13x3	13x3	18x3
L and N	18x3	13x3	13x3	13x3	18x3

TABLE OF DIMENSIONS

Beams	F	G	H	J	K
A thru D	78'-6"	78'-6"	78'-6"	78'-0"	6'-6"
E and F	78'-6"	78'-6"	78'-6"	78'-0"	6'-6"
K	78'-6"	78'-8"	78'-11"	78'-9"	6'-6"
L	78'-6"	78'-8"	78'-11"	78'-9"	6'-6"
N	78'-6"	78'-8"	78'-11"	78'-9"	6'-6"

Note:  
Beams with bend points at piers shall be shop spliced in accordance with the procedure outlined on Ohio Standard Drawing SD-1-63, sheet 1 of 4.

Notes:  
For beam end diaphragm details and dead load deflection and convexity diagrams see sheet 414.  
For additional notes see sheet 412.



H.N.T.B BRIDGE NOS. 21A & 21B  
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KANSAS CITY

**FRAMING PLAN - UNIT 3A**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

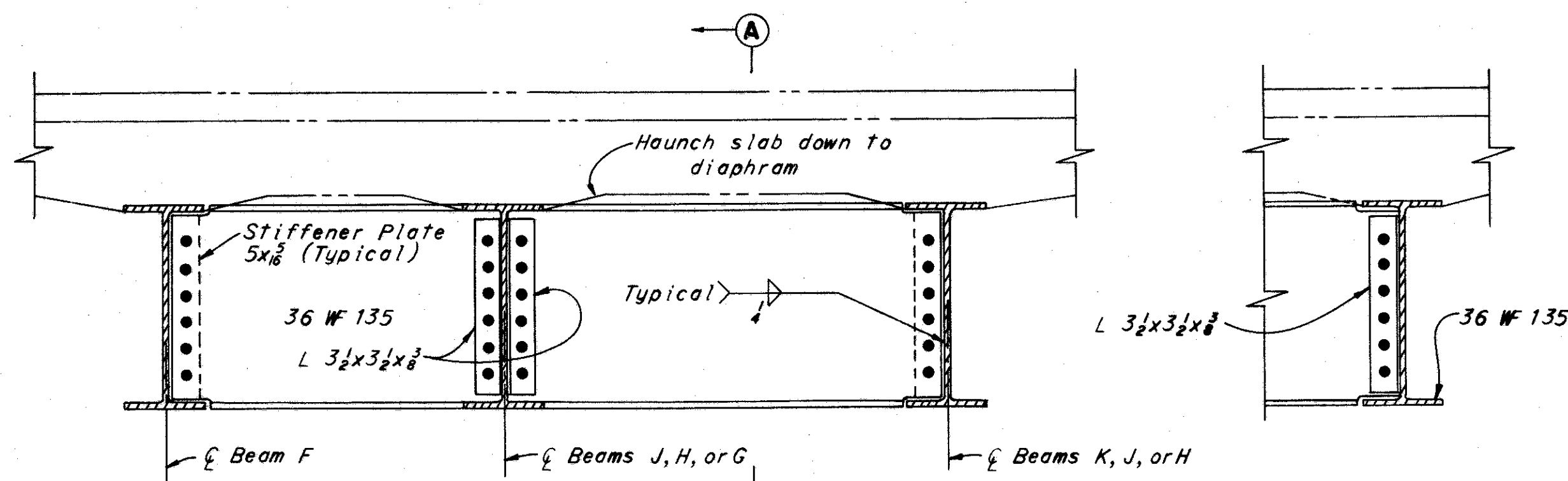
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN G.R.D.	TRACED DATE	CHECKED J.M.C.	REVIEWED DATE
7-18-64		12-21-64	12-22-64

SHEET 413

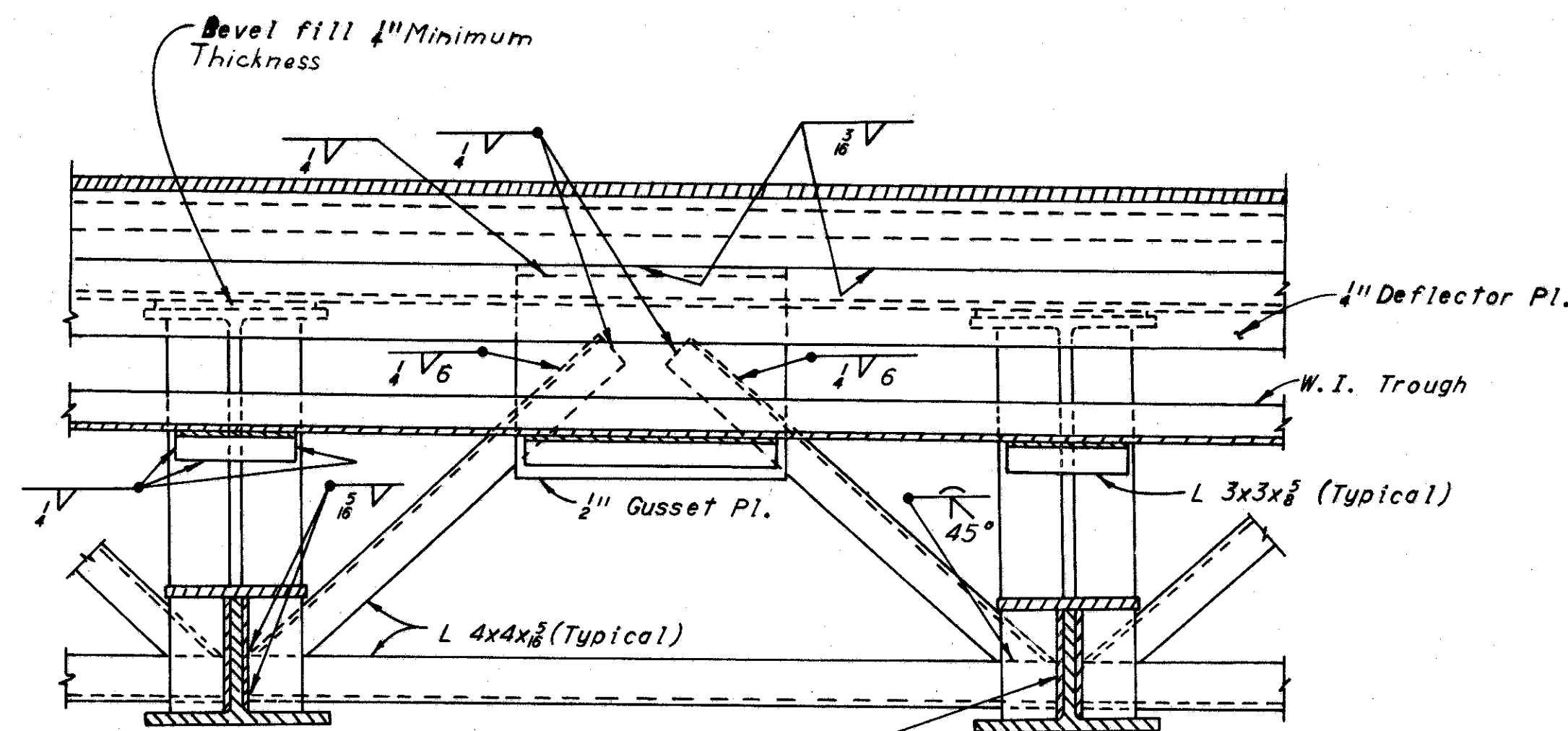


CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

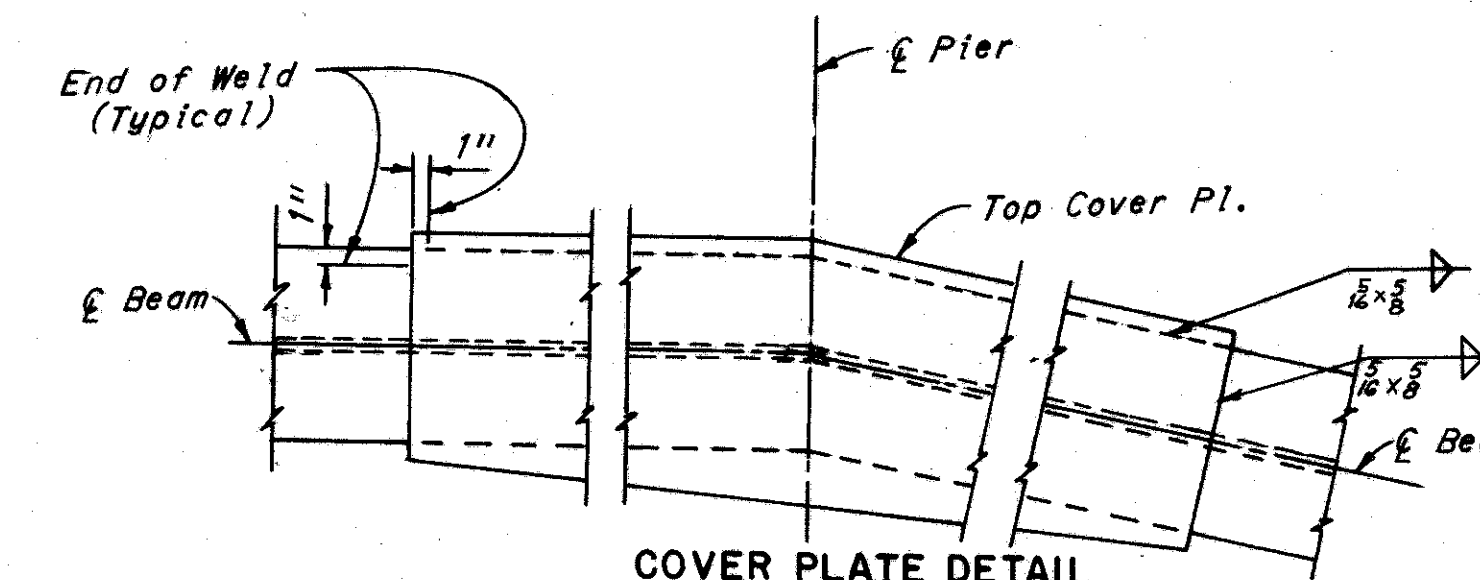


BEAM END DIAPHRAGM

Note: Beam end diaphragm field connections shall be made with 7/8" high strength bolts.

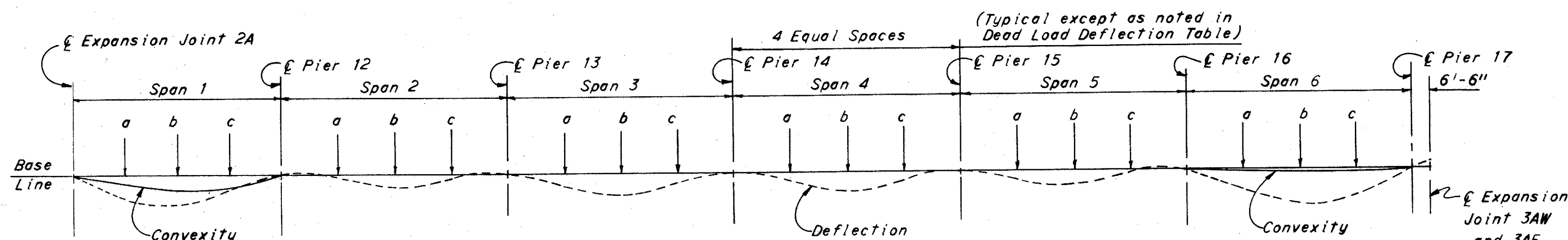


END CROSSFRAME AT EXPANSION JOINTS - BR. NO. 21A

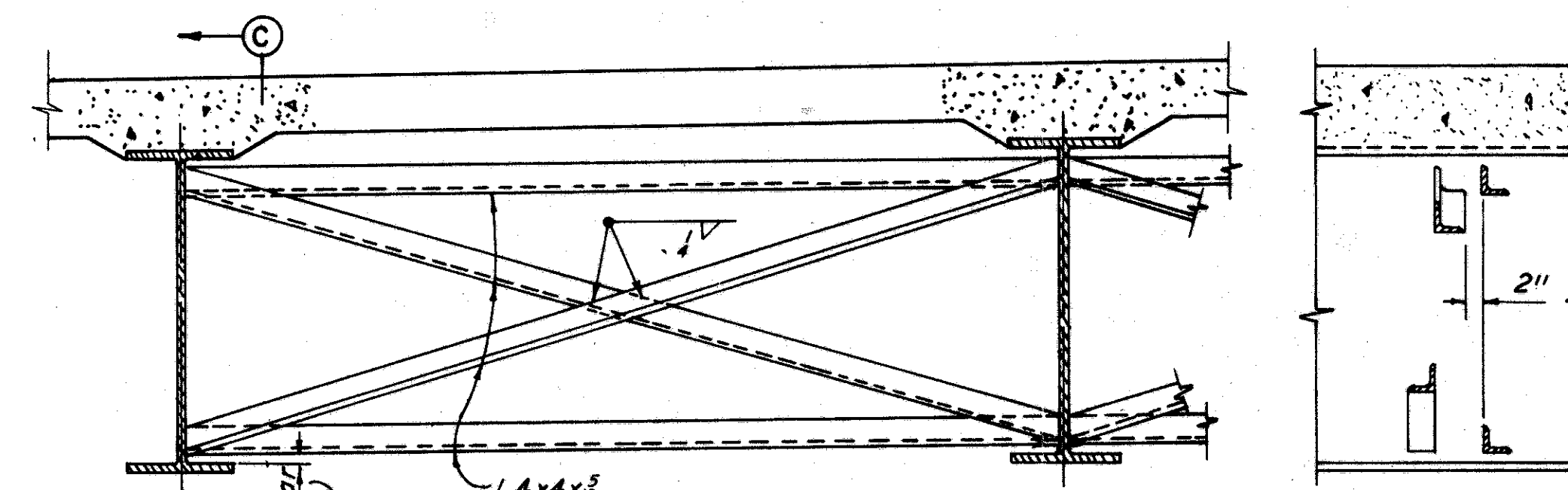


COVER PLATE DETAIL

(For additional details, see Ohio Standard Drawing SD-1-63, sheet 1 of 4.)



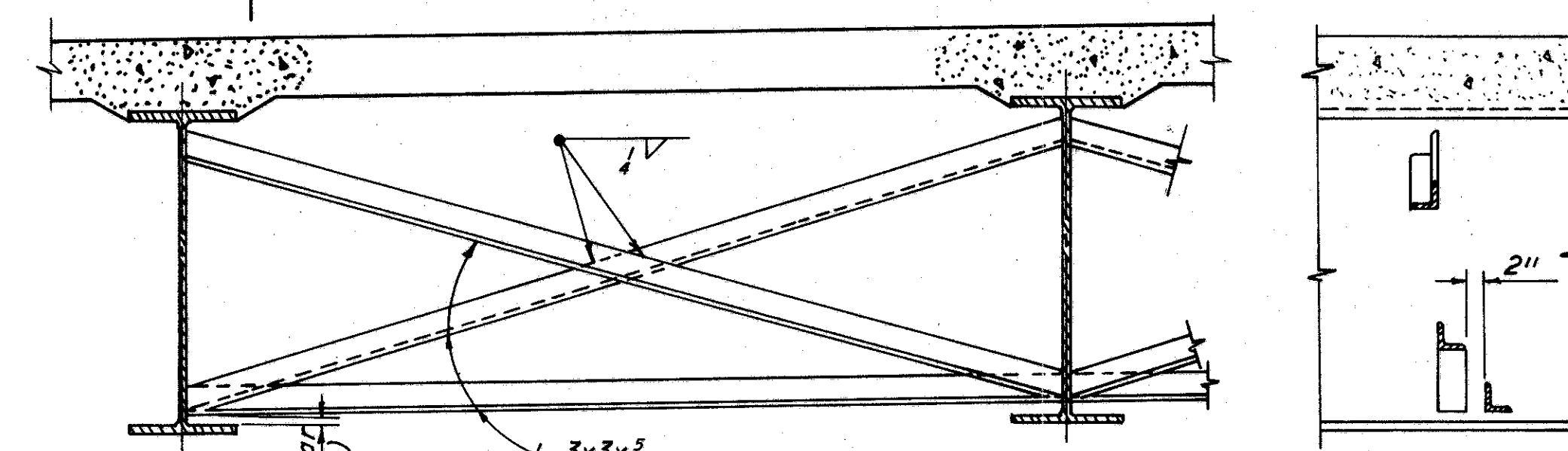
DEAD LOAD DEFLECTION AND CONVEXITY DIAGRAM



SECTION C-C

Note: Weld both sides of vertical leg and top side of horizontal leg to beam with 1/4" continuous fillet weld.

TYPE "Y" CROSS FRAME



SECTION B-B

Note: Weld both sides of vertical leg and top side of horizontal leg to beam with 1/4" continuous fillet weld.

Beam	DEAD LOAD DEFLECTION TABLE																								Exp. Jt. 3A				
	Span 1				Span 2				Span 3				Span 4				Span 5				Span 6								
	a	b	c	Exp. Jt.	a	b	c	Exp. Jt.	a	b	c	Exp. Jt.	a	b	c	Exp. Jt.	a	b	c	Exp. Jt.									
A	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0
B thru E	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0
F	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0
G	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0
H	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0
J	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0
K	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0
L	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0
N	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	1/16	1/16	1/16	0	0

Deflections for Beam J in Span 3 are given at the 1/4 points between the beam end diaphragm and Pier 14.  
Deflection for Beam J at beam end diaphragm due to concrete and steel equals 1/16 inch.  
Deflection for Beam J at beam end diaphragm due only to concrete equals 3/16 inch.

\* Deflection at beam end diaphragm

Beam	Span 1			Span 2 thru Span 5			Span 6		
	a	b	c	a	b	c	a	b	c
A and B	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
D	-1/16	-1/16	-1/16	0	0	0	0	0	0
E	-1/16	-1/16	-1/16	0	0	0	0	0	0
F	-1/16	-1/16	-1/16	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0
H	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0
K	-1/16	-1/16	-1/16	0	0	0	0	0	0
L	-1/16	-1/16	-1/16	0	0	0	0	0	0
N	-1/16	-1/16	-1/16	0	0	0	0	0	0

Notes:  
Deflections and convexities are given to the nearest 1/16 inch.  
Negative values for deflection indicate deflection above the base line.  
Negative values for convexity indicate convexity below the base line.  
Tot. indicates deflection due to dead load of concrete and steel.  
Con. indicates deflection due to dead load of concrete only.

BEAM CAMBER NOTE

Where the combined effects of total dead load deflection and convexity is 3/16" or more, the required camber shall be the same as this sum. Where the combined effects are less than 3/16", no camber is required but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.

INTERMEDIATE CROSS FRAME

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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KANSAS CITY CLEVELAND NEW YORK

**SUPERSTRUCTURE DETAILS**  
UNIT 3-A  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

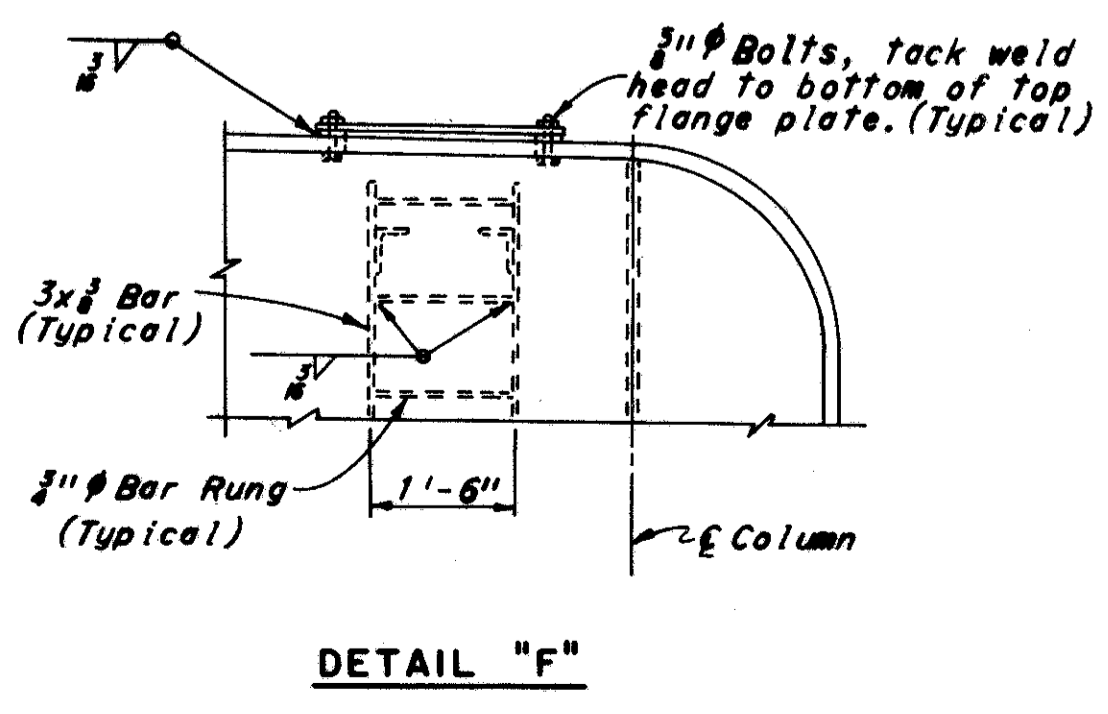
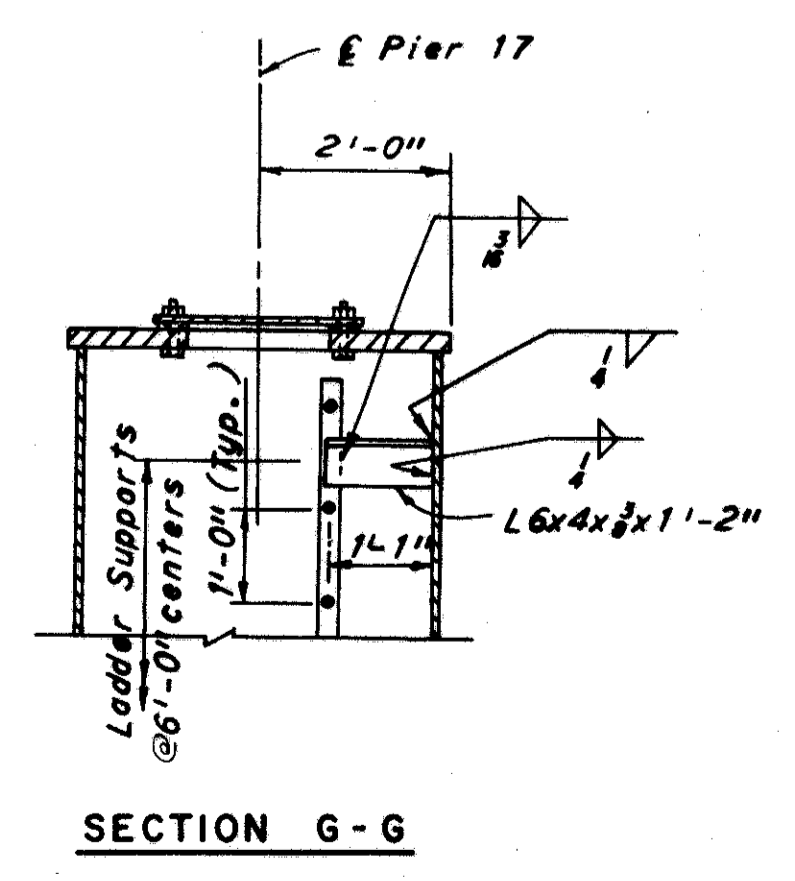
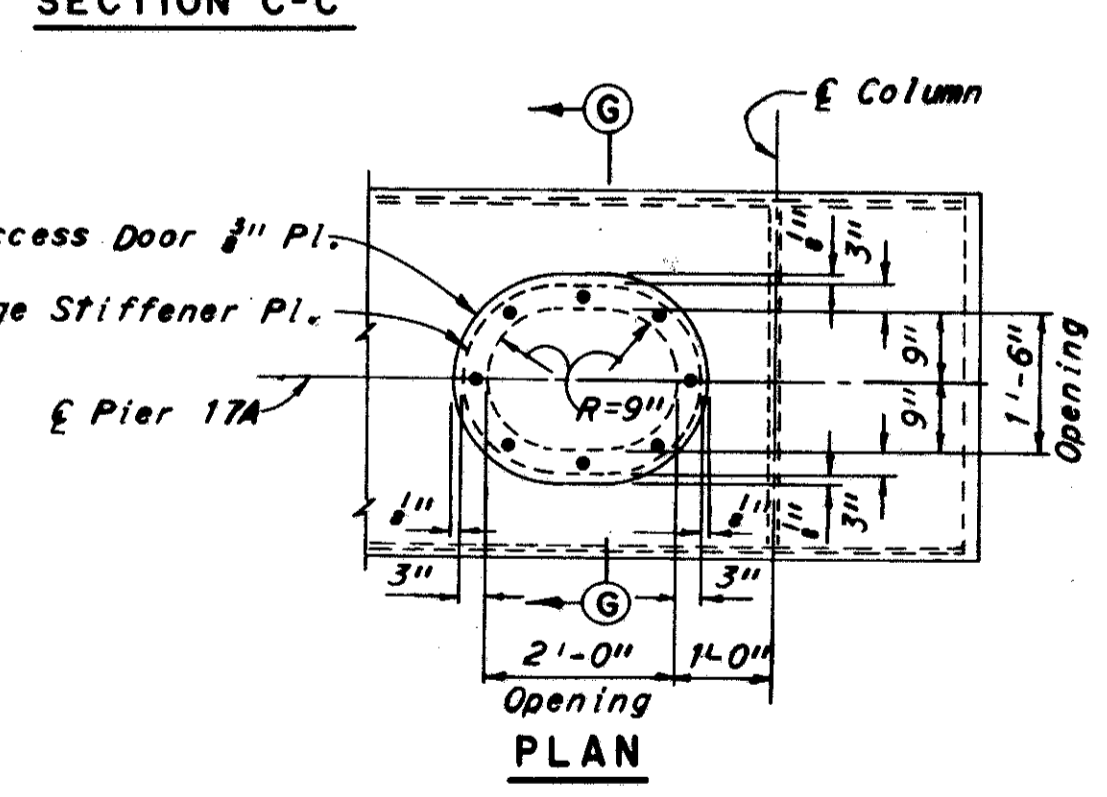
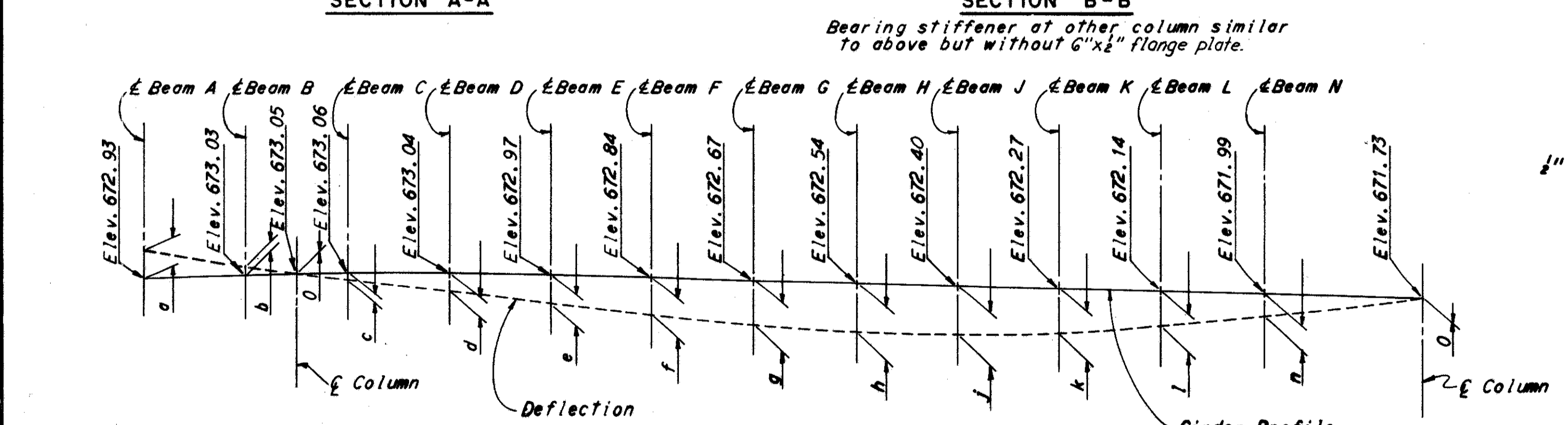
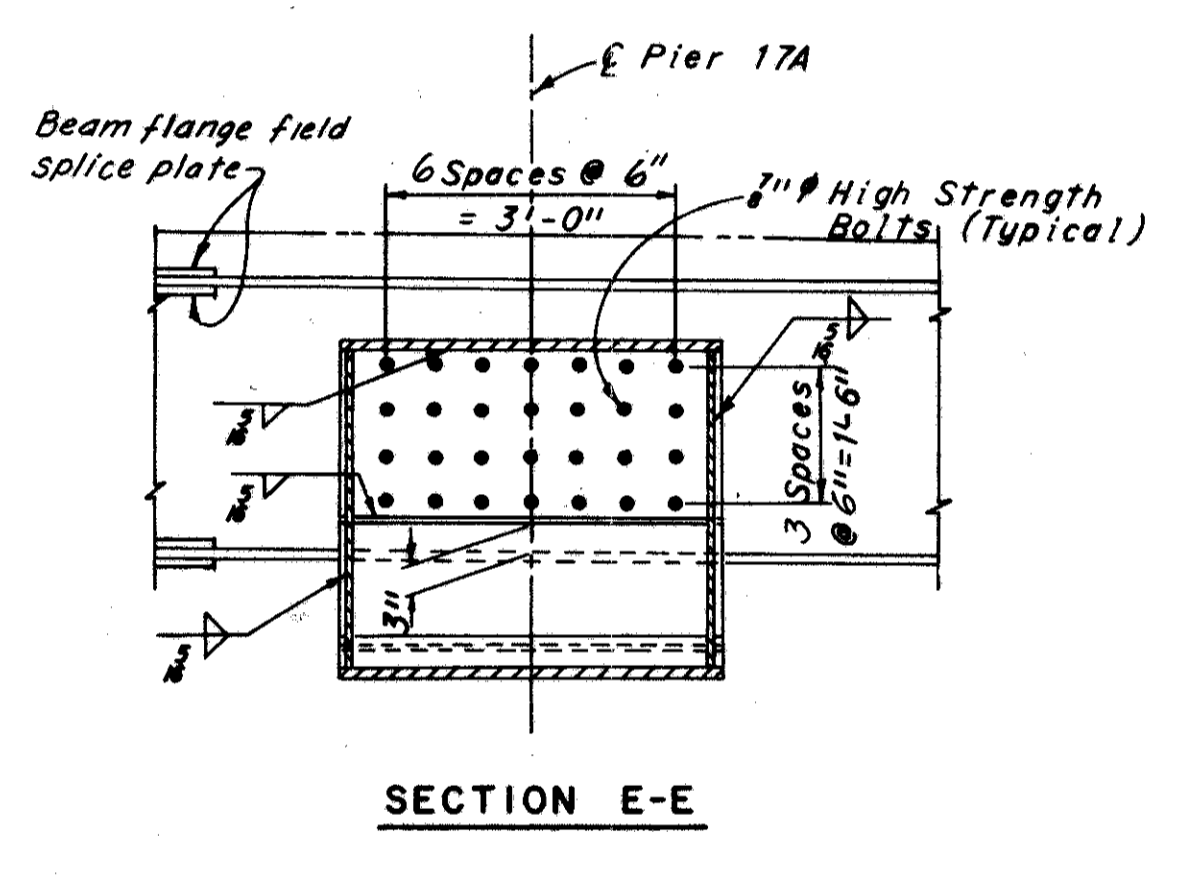
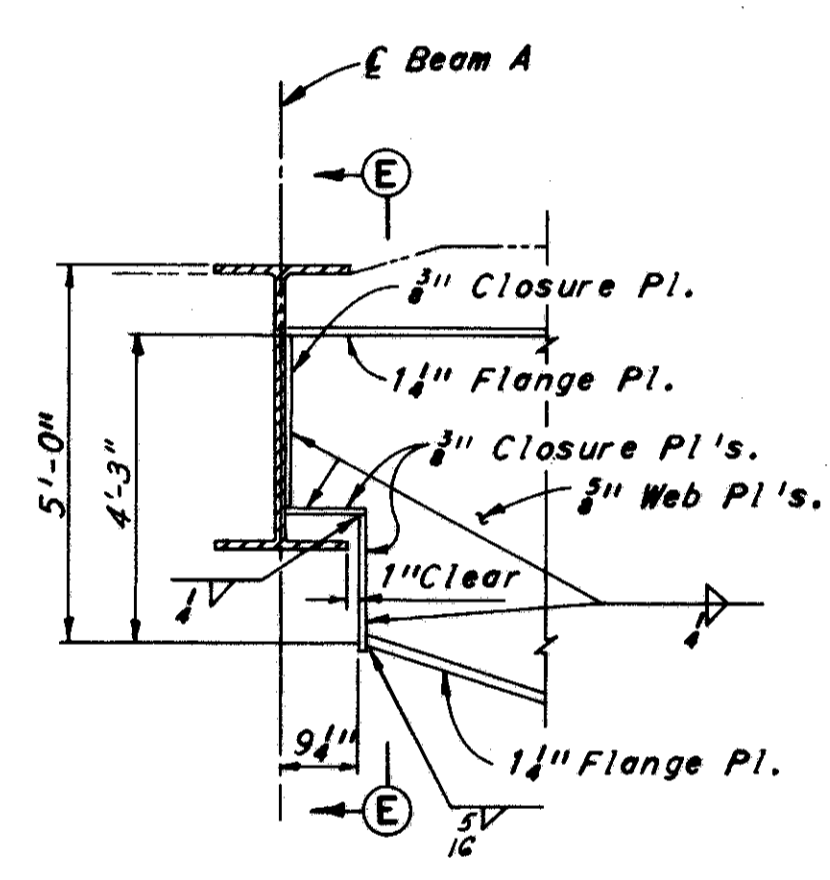
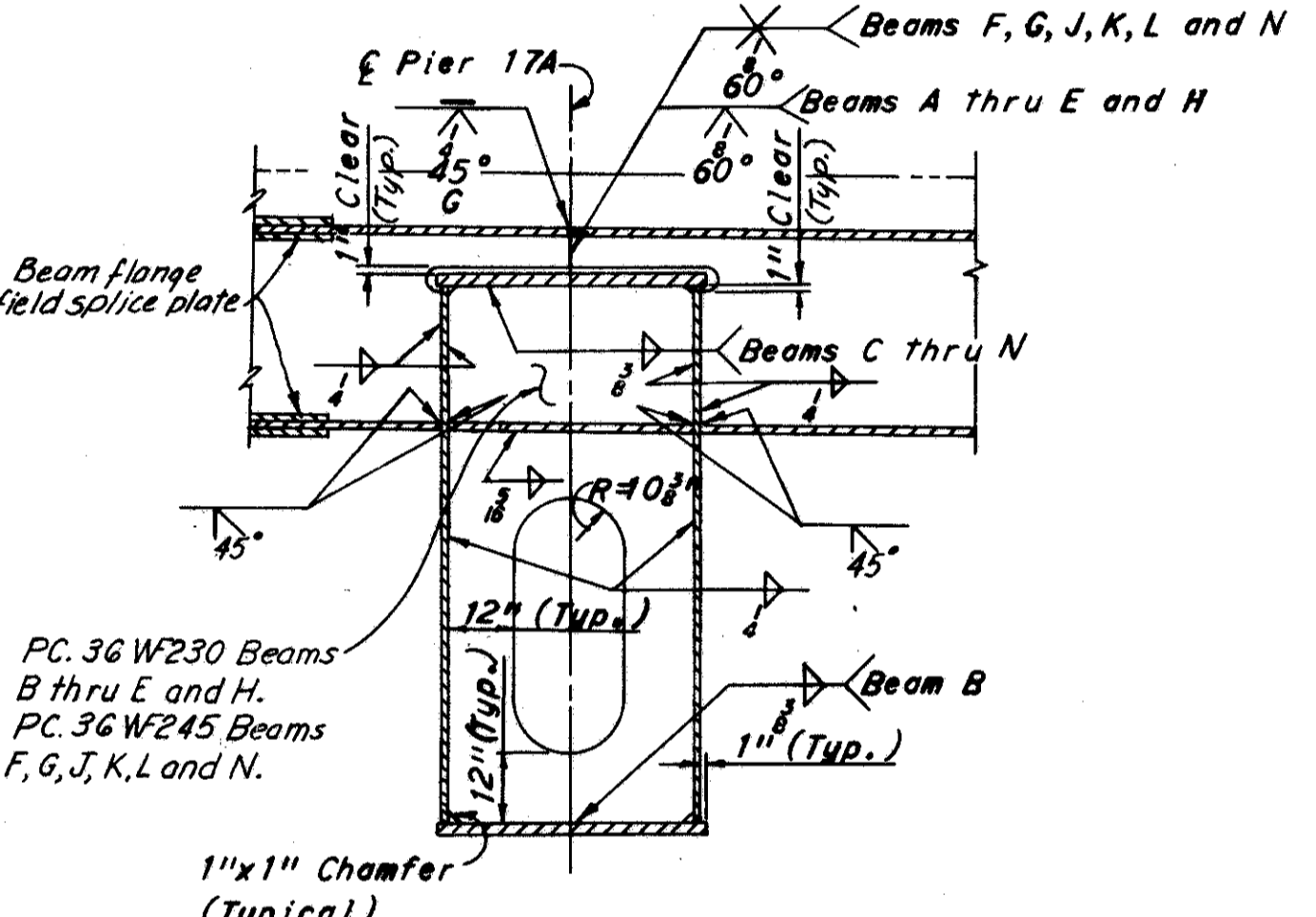
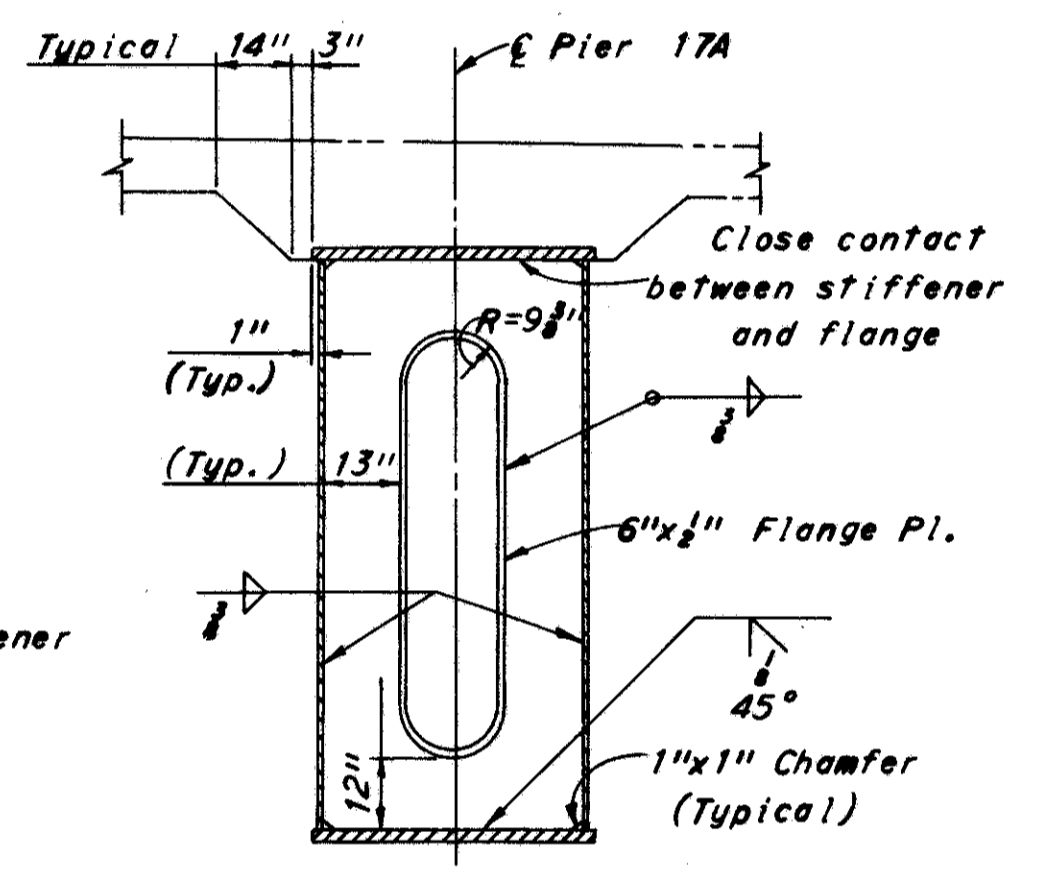
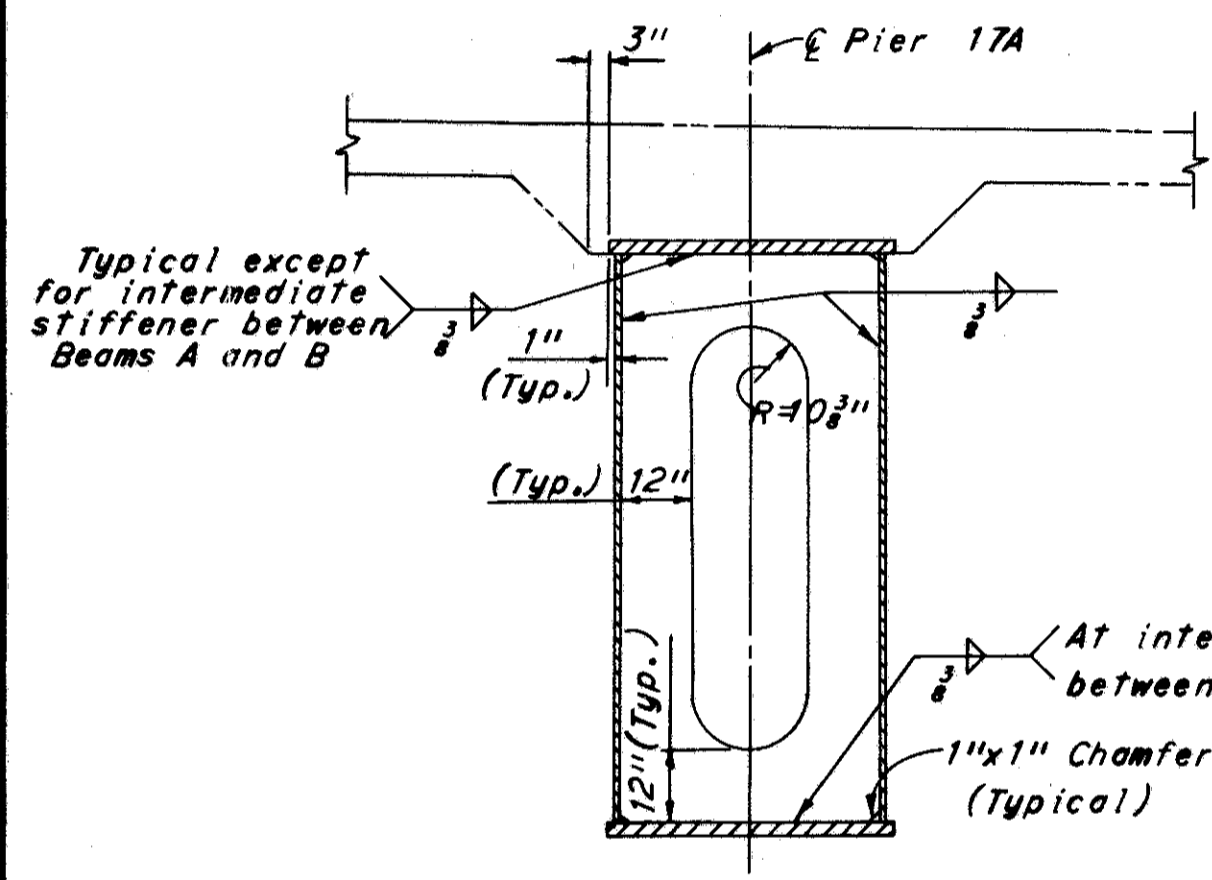
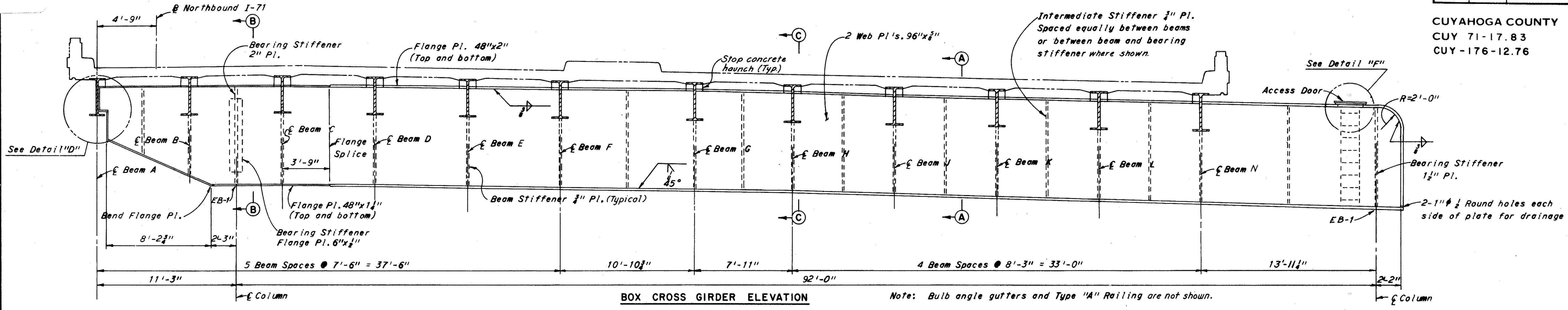
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN G.R.D.	CHECKED J.M.C.	REVIEWED W.P.
DATE 7/15-64	DATE 12/23-64	DATE 2/22-64

SHEET 414

91-W

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



The girder shall be fabricated to compensate for the effects of dead load deflections and, under full dead load shall match the girder elevations shown.

The web plates may be shop spliced as required by available plate lengths.

The locations of shop web splices and the location and details of any additional shop flange splices shall be submitted to the Director for approval prior to ordering of material.

Intermediate stiffeners shall be welded to the flange indicated, and shall be fitted to close contact with the other flange.

All stiffeners shall be set normal to the girder flanges.

For shop splice details see sheet 410.

For top of pavement elevations at the beams see sheet 432.

Deflection	a	b	c	d	e	f	g	h	i	j	k	l	n
Girder	0	0	0	0	0	0	0	0	0	0	0	0	0
Beam framing from South	0	0	0	0	0	0	0	0	0	0	0	0	0
Beam framing from North	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Steel	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Concrete	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Steel and Concrete	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Deflections are measured to the nearest 1/16 inch.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**BOX GIRDER DETAILS  
UNIT 3-A**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

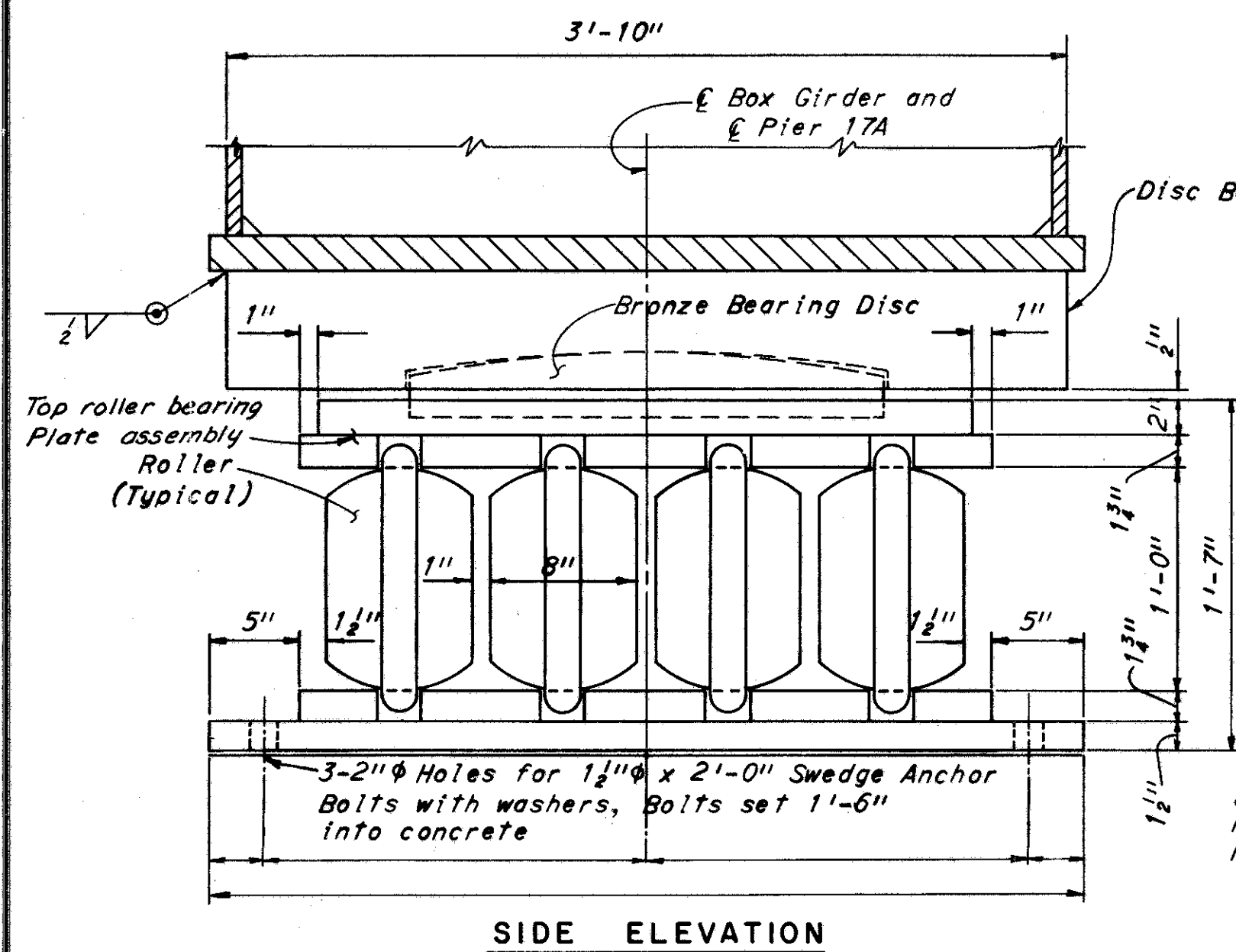
DRAWN BY	TRACED	CHECKED	REVIEWED
DATE 10-5-64	DATE	DATE 12-24-64	DATE 12-28-64

SHEET 415

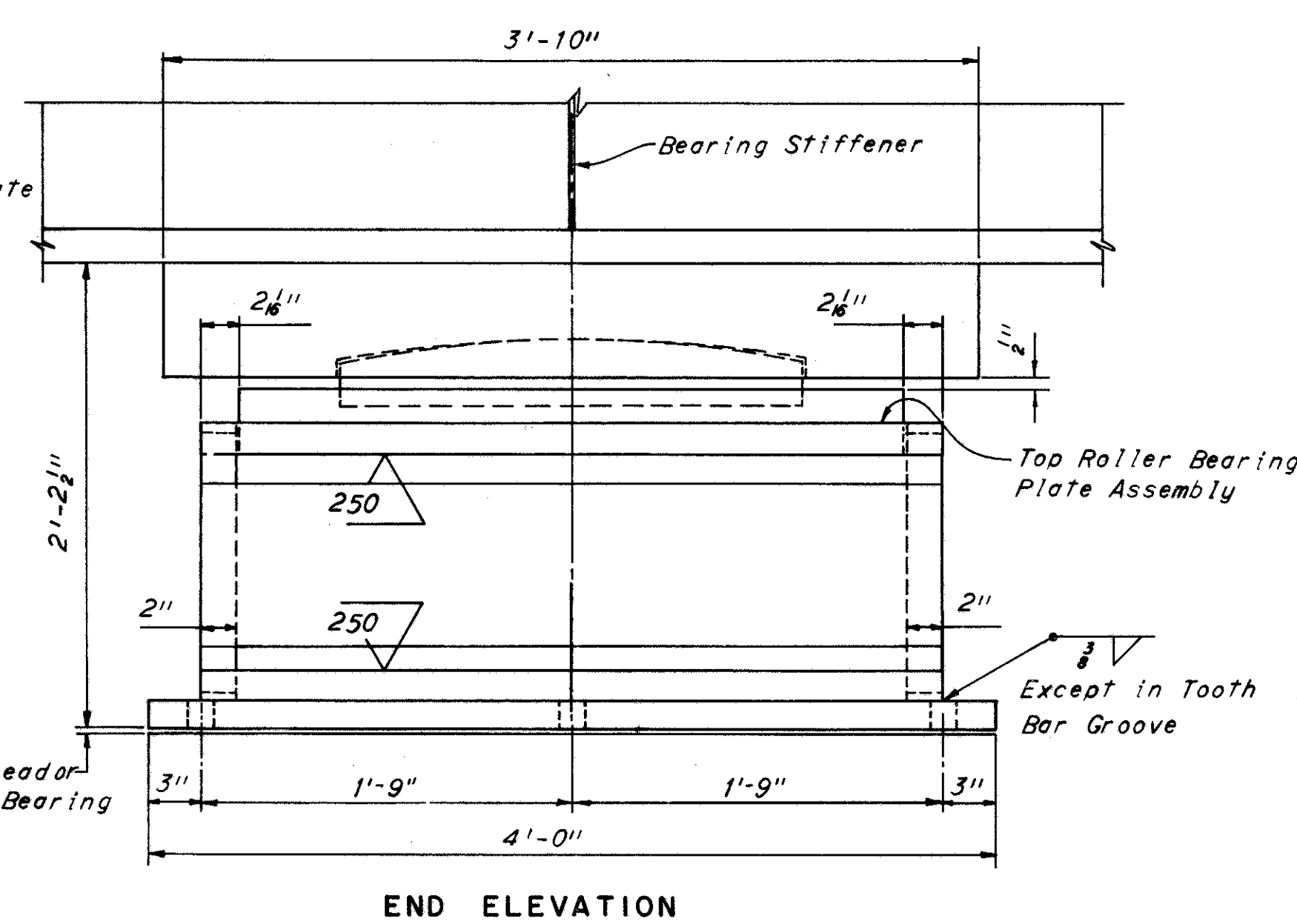
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

416  
646

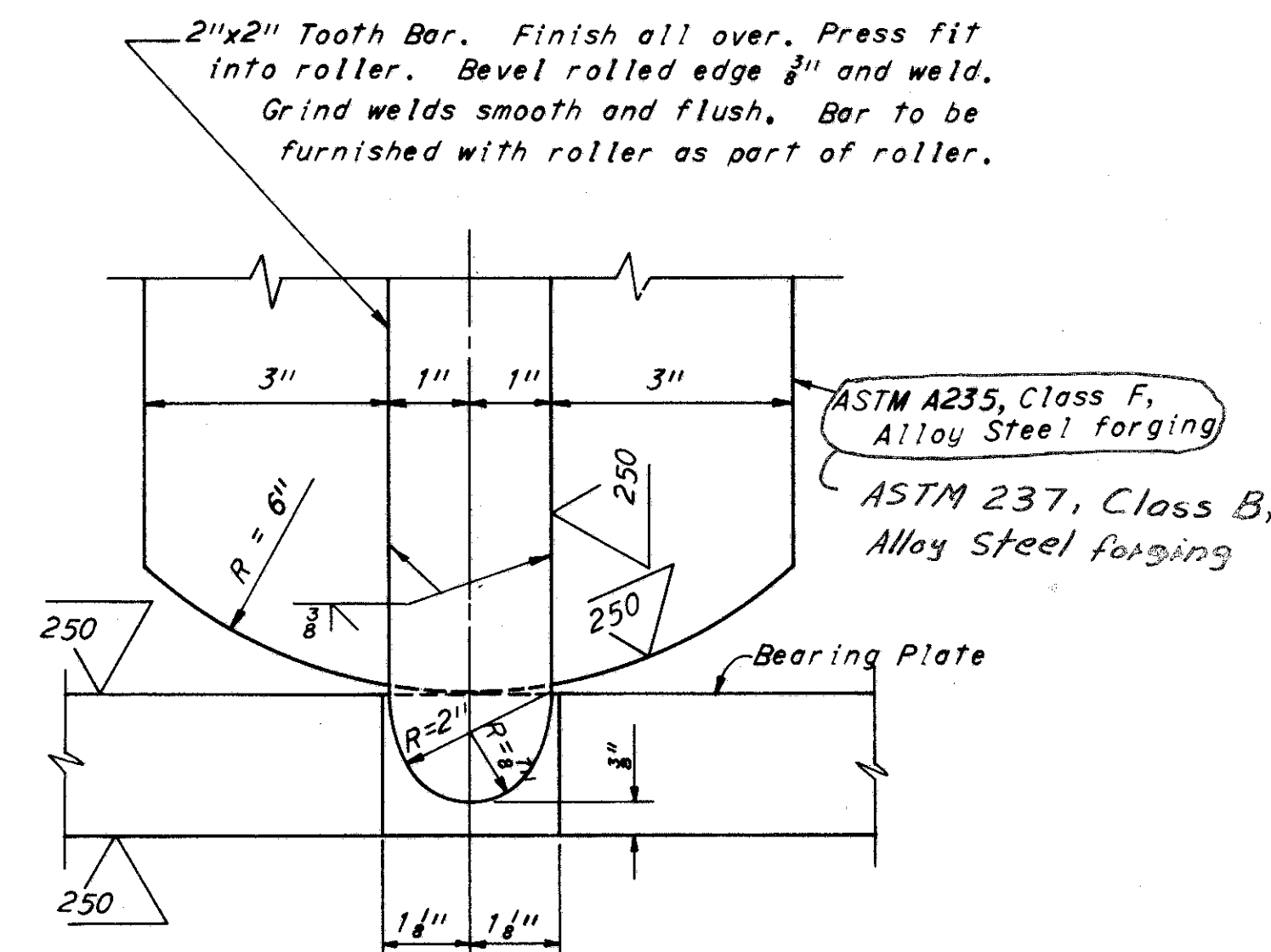
CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY-176-12.76



SIDE ELEVATION

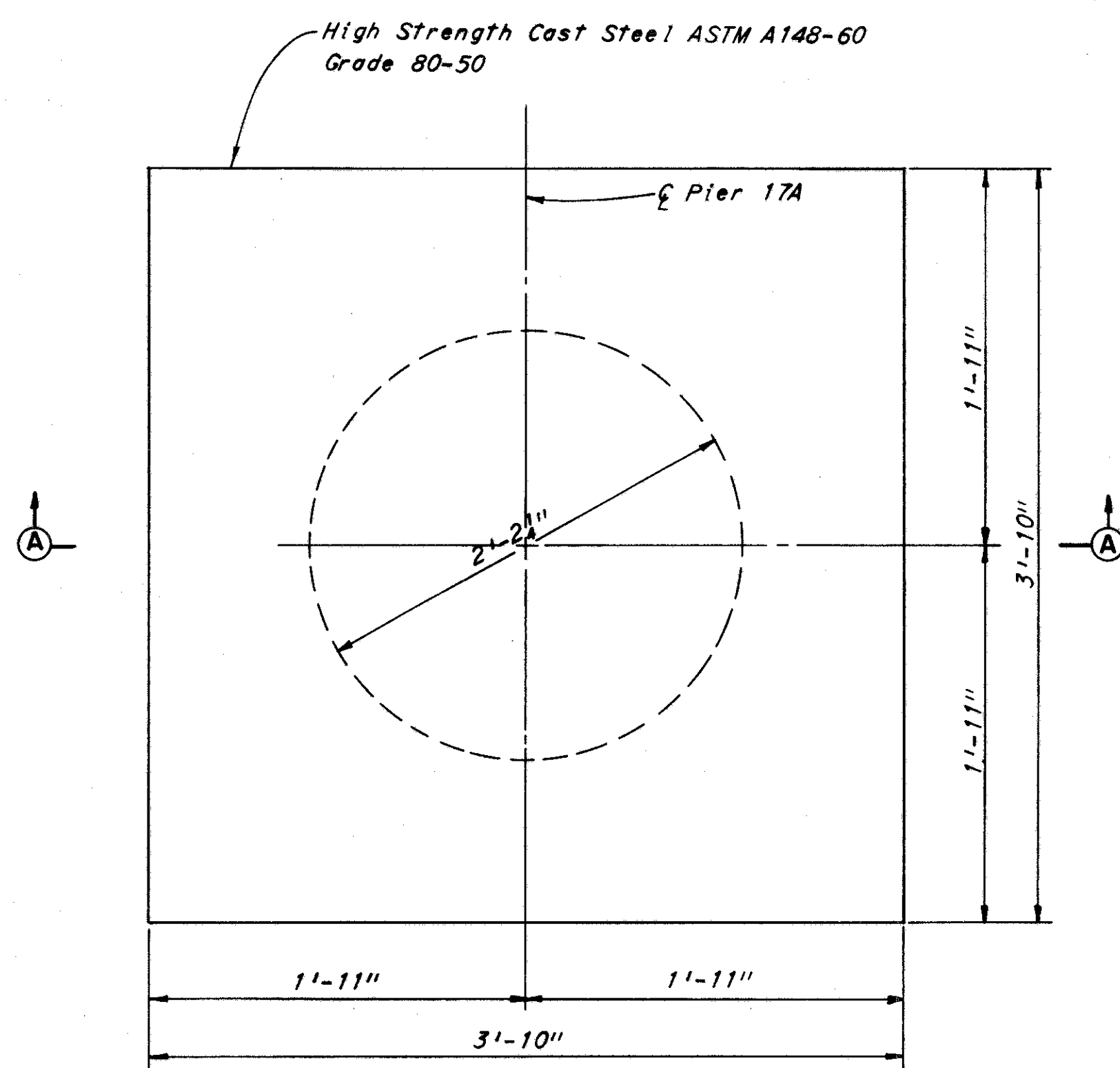


END ELEVATION

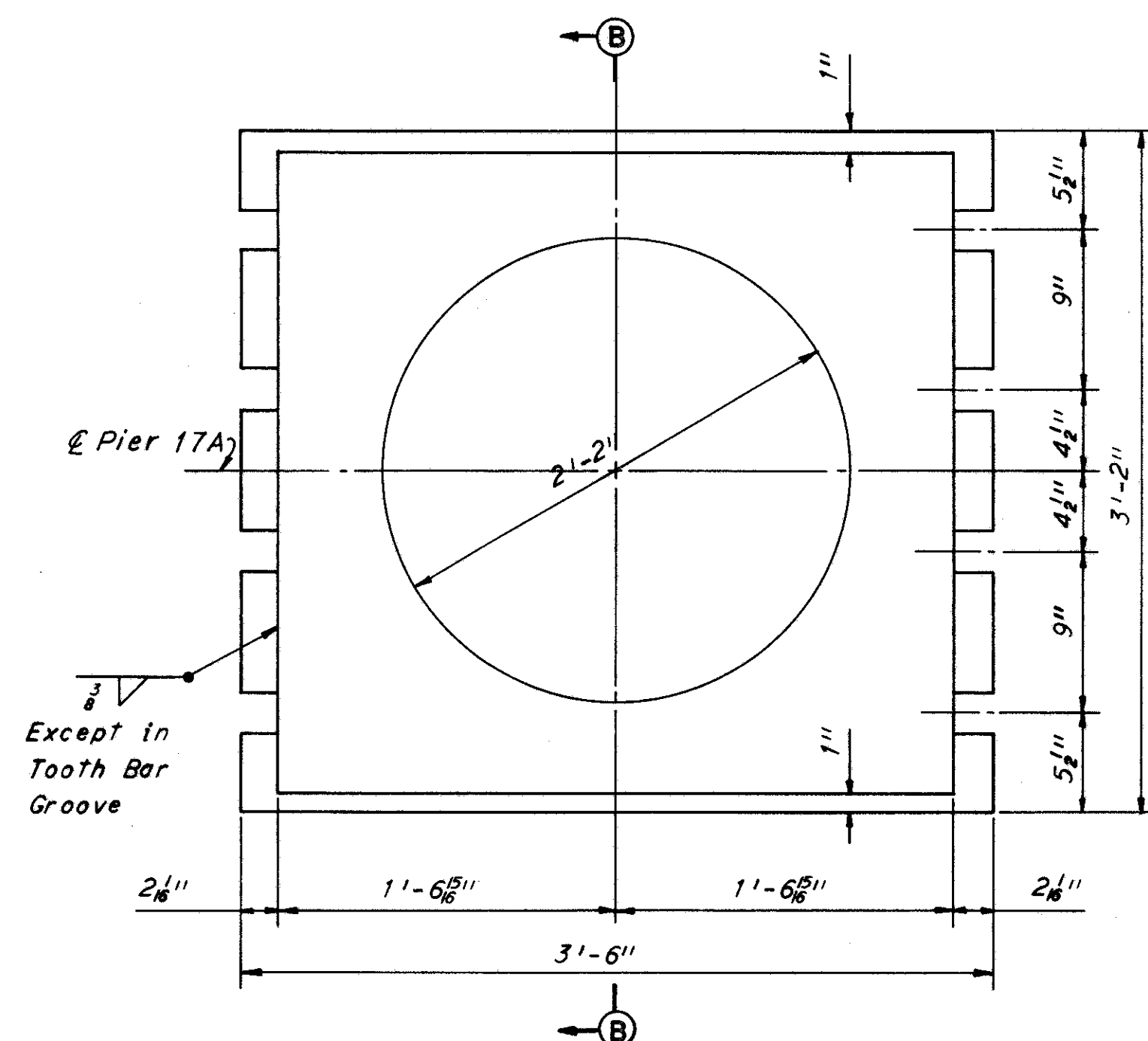


ROLLER AND TOOTH BAR DETAIL

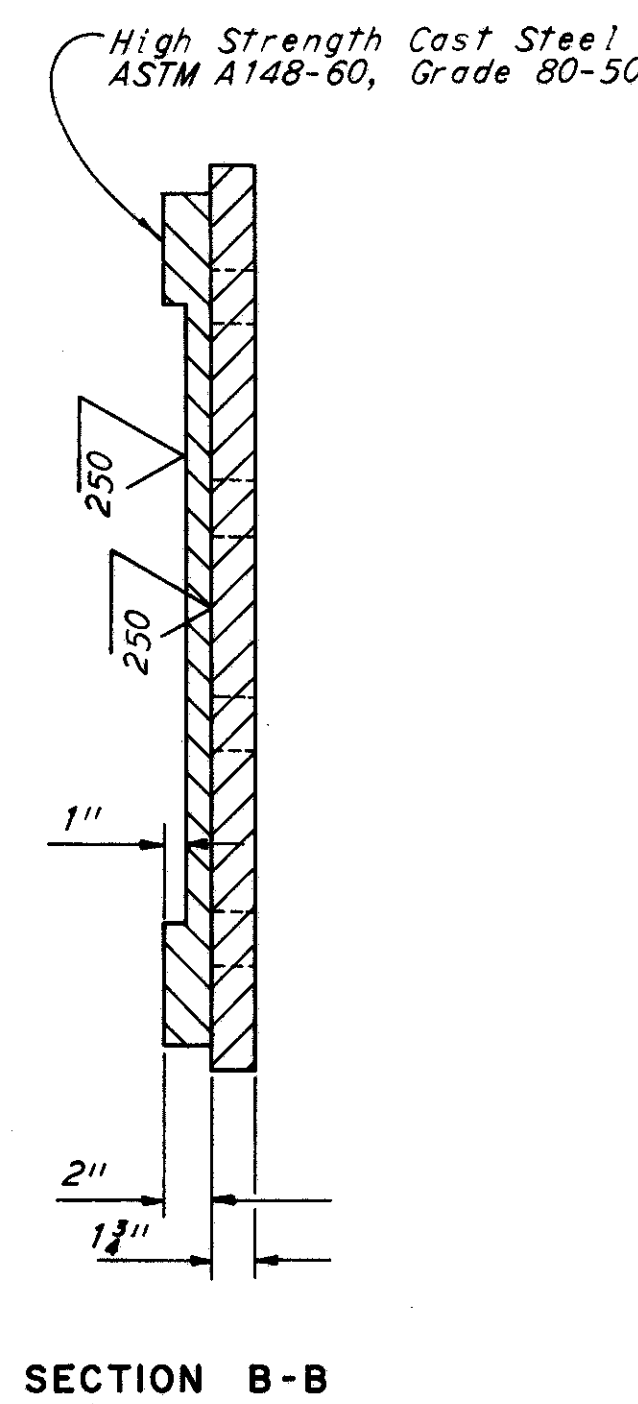
Note:  
Swedge Anchor Bolts and steel washer not shown.



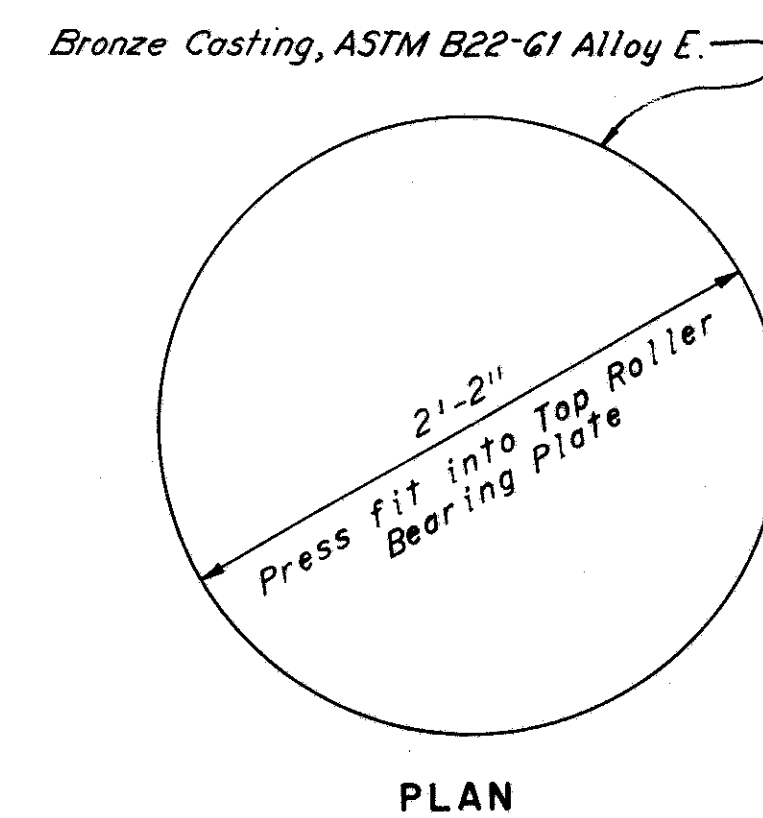
PLAN



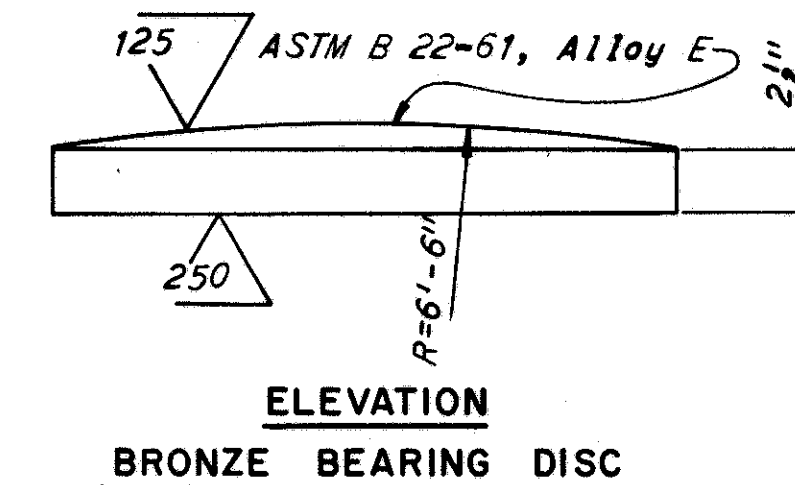
TOP ROLLER BEARING PLATE ASSEMBLY



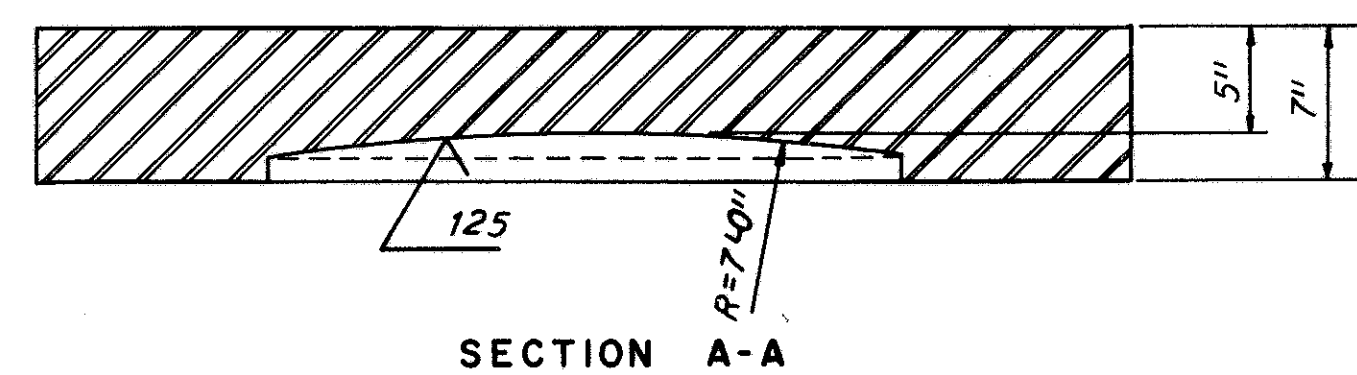
SECTION B-B



PLAN



ELEVATION  
BRONZE BEARING DISC



SECTION A-A  
DISC BEARING PLATE

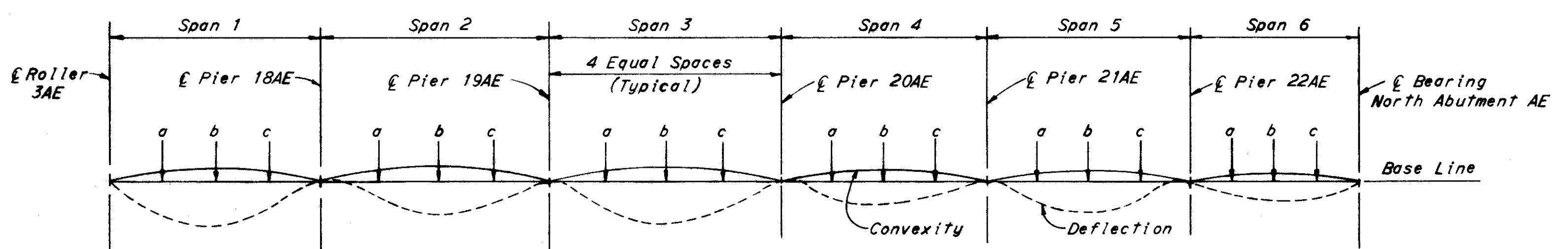
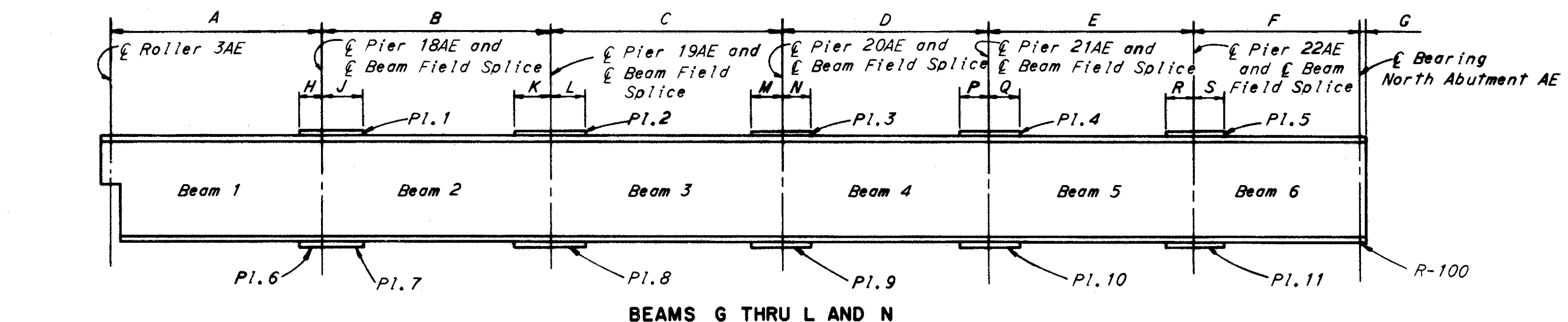
Notes:  
All materials shall conform to ASTM A441-60T, except as otherwise shown.  
Anchor bolts shall be in place or prior to erection of superstructure steel.  
The annular spaces between anchor bolts and masonry plates shall be filled with lead or babbitt before setting nuts.  
All masonry plates, rockers and sole plates shall be scribed with center lines in both directions.  
All material is included with "Item S-7, Structural Steel," for payment.

H.N.T.B BRIDGE NOS. 21A & 21B			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
EXPANSION BEARING EB-1 UNIT 3-A NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS			
BR. NO. CUY- 71 - 1789 R		STA. 917+10.09 STA. 935+21.25	
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN DATE 12-21-64	TRACED DATE 12-21-64	CHECKED DATE 12-22-64	REVIEWED DATE 12-22-64
			REVISED 6-2-65
			SHEET 416





CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



Beams	Span 1			Span 2			Span 3			Span 4			Span 5			Span 6		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
G	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
H	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
J	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
K	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
L	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
M	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
N	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11

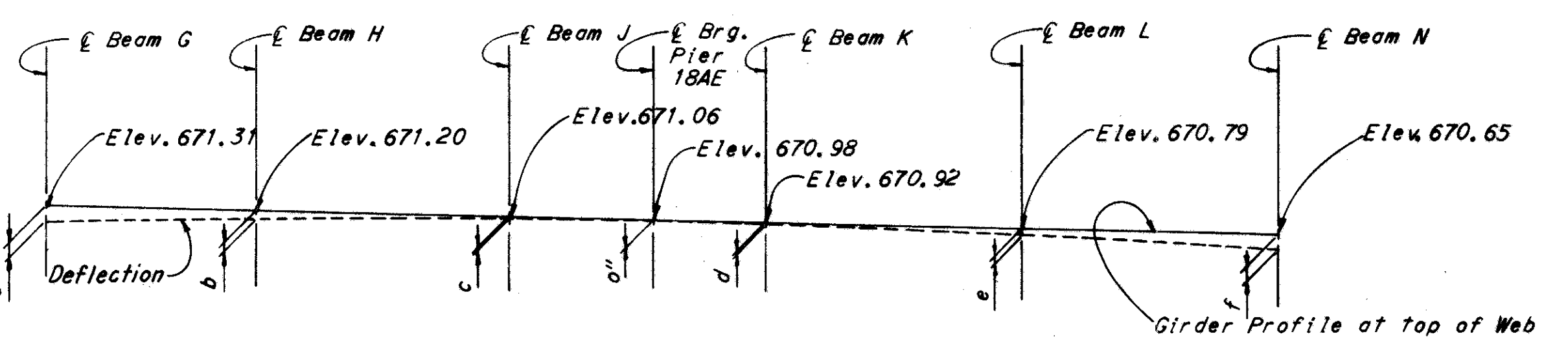
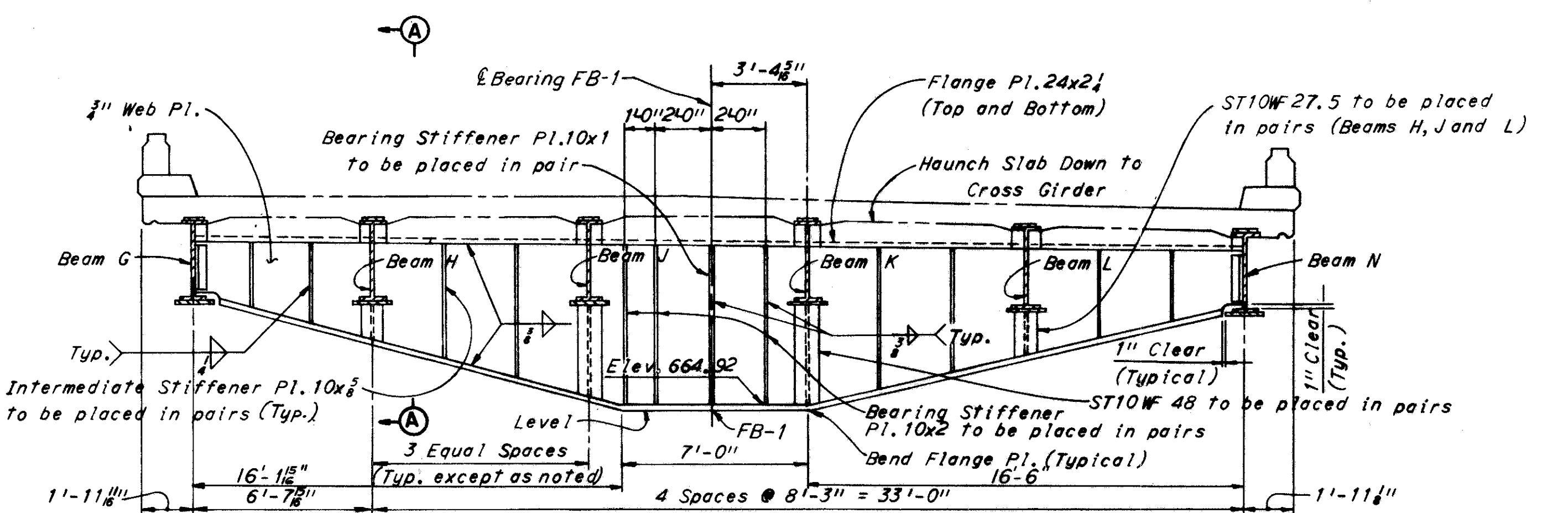
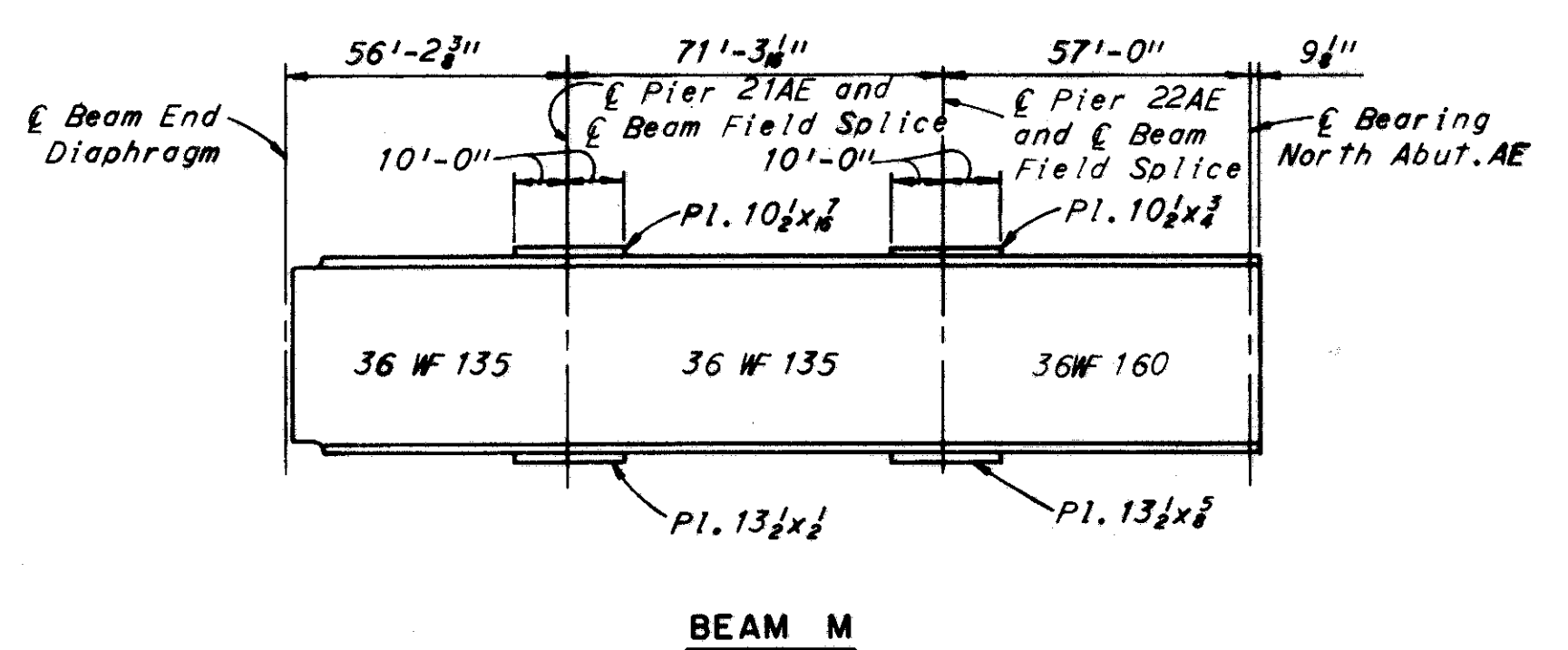
\* Indicates End Diaphragm Deflections for Beam M.

Beams	Span 1			Span 2			Span 3			Span 4			Span 5			Span 6		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
G	+0.11	+0.11	+0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
H	+0.11	+0.11	+0.11	0.00	0.00	0.00	+0.11	+0.11	+0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
J	+0.11	+0.11	+0.11	0.00	0.00	0.00	+0.11	+0.11	+0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
K	0.00	0.00	0.00	0.00	0.00	0.00	+0.11	+0.11	+0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
L	0.00	0.00	0.00	0.00	0.00	0.00	+0.11	+0.11	+0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
M	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11
N	0.00	0.00	0.00	0.00	0.00	0.00	+0.11	+0.11	+0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11

\* Indicates Point Convexity Corrections for Beam M between End Diaphragm and Pier 21AE.

Beams	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
G	73'-9 3/4"	79'-1 1/4"	79'-5 1/4"	70'-4 1/8"	70'-10 3/8"	56'-8 1/4"	9 1/8"	7'-0"	14'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
H	73'-6 3/4"	79'-7 3/8"	79'-7 3/8"	70'-11 1/8"	70'-11 1/8"	56'-9 1/4"	9 1/8"	7'-0"	14'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
J	73'-6 3/4"	79'-7 3/8"	79'-7 3/8"	70'-11 1/8"	70'-11 1/8"	56'-9 1/4"	9 1/8"	8'-0"	13'-0"	12'-0"	12'-0"	10'-0"	12'-0"	10'-0"	10'-0"	11'-0"	11'-0"
K	73'-6 3/4"	79'-7 3/8"	79'-7 3/8"	70'-11 1/8"	70'-11 1/8"	56'-9 1/4"	9 1/8"	8'-0"	13'-0"	12'-0"	12'-0"	10'-0"	12'-0"	10'-0"	10'-0"	11'-0"	11'-0"
L	73'-6 3/4"	79'-7 3/8"	79'-7 3/8"	70'-11 1/8"	70'-11 1/8"	56'-9 1/4"	9 1/8"	8'-0"	13'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"
N	73'-6 3/4"	79'-7 3/8"	79'-7 3/8"	71'-6 1/4"	71'-6 1/4"	57'-2 1/8"	9 1/8"	8'-0"	13'-0"	11'-0"	11'-0"	10'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"

Beams	Plates											Beams					
	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6
G	10 1/2 x 1 1/2	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	18 x 1 1/2	13 1/2 x 1 1/2	13 1/2 x 3/4	13 1/2 x 3/4	13 1/2 x 3/4	13 1/2 x 3/4	36W230	36W160	36W170	36W150	36W150	36W160
H	10 1/2 x 1 1/2	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	18 x 1 1/2	13 1/2 x 1 1/2	13 1/2 x 3/4	13 1/2 x 3/4	13 1/2 x 3/4	13 1/2 x 3/4	36W230	36W160	36W170	36W150	36W150	36W160
J	10 1/2 x 1 1/2	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	18 x 1 1/2	13 1/2 x 1 1/2	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	36W230	36W182	36W194	36W160	36W160	36W160
K	10 1/2 x 1 1/2	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	18 x 1 1/2	13 1/2 x 1 1/2	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	36W230	36W182	36W194	36W160	36W160	36W160
L	10 1/2 x 1 1/2	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	10 1/2 x 3/4	18 x 1	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	36W230	36W194	36W194	36W160	36W150	36W160
N	10 1/2 x 1 1/2	10 1/2 x 1	10 1/2 x 1 1/2	10 1/2 x 3/4	10 1/2 x 3/4	18 x 1	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	13 1/2 x 1	36W230	36W194	36W194	36W160	36W150	36W160



Deflection	a	b	c	d	e	f
Total Concrete	1 1/8"	1 1/8"	0"	0"	0"	1 1/8"
Total Steel and Conc.	1 1/8"	1 1/8"	0"	0"	1 1/8"	1 1/8"

Notes:  
 For cover plate details see Ohio Standard Drawing SD-1-63, sheet 1 of 4.  
 For Section A-A see sheet 421.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**SUPERSTRUCTURE DETAILS**  
 UNIT 4-AE  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

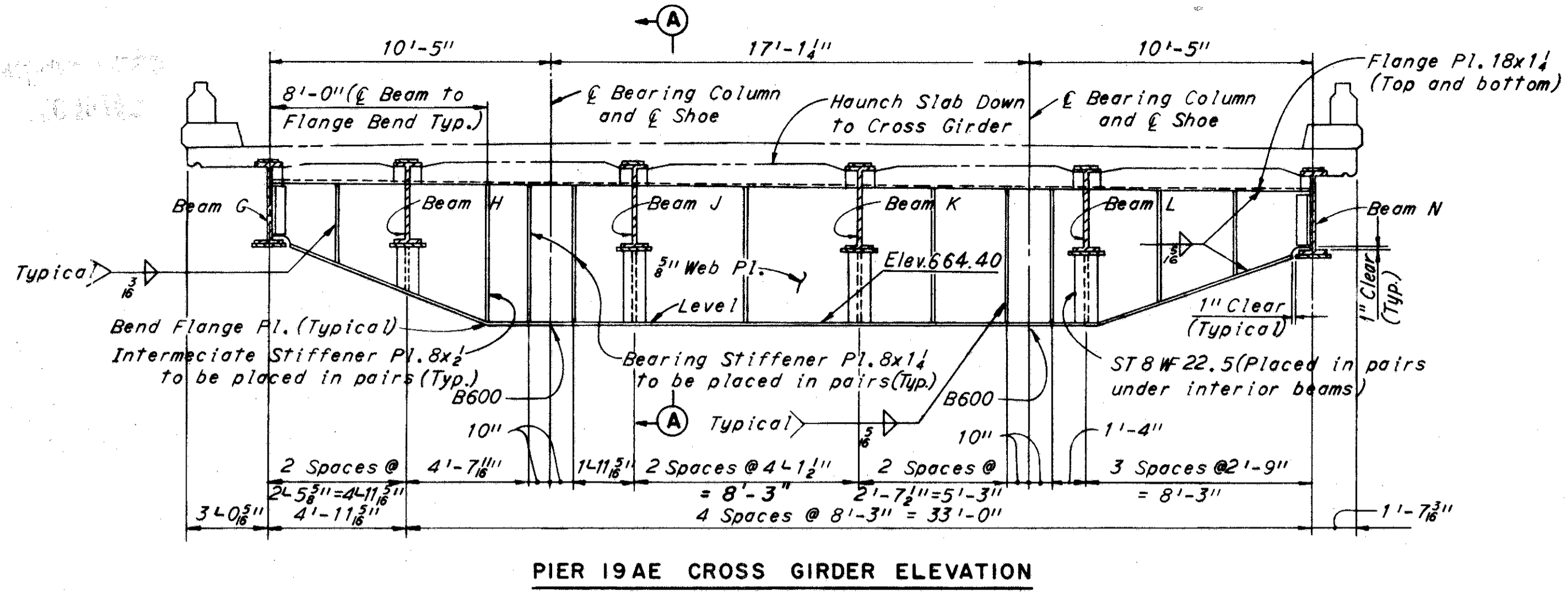
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

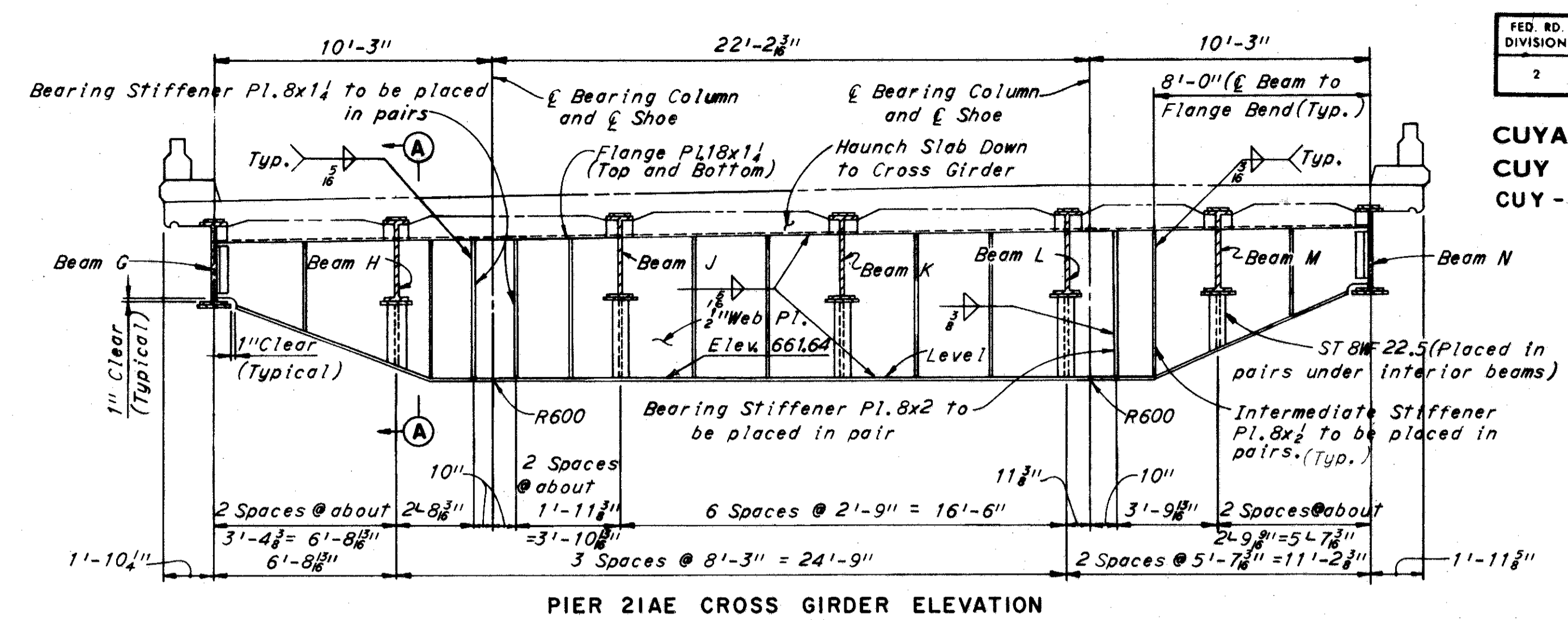
DRAWN	JEN	TRACED	DATE	11-3-64	CHECKED	DATE	12-22-64	REVIEWED	DATE	12-22-64	REVISION	
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SHEET 419

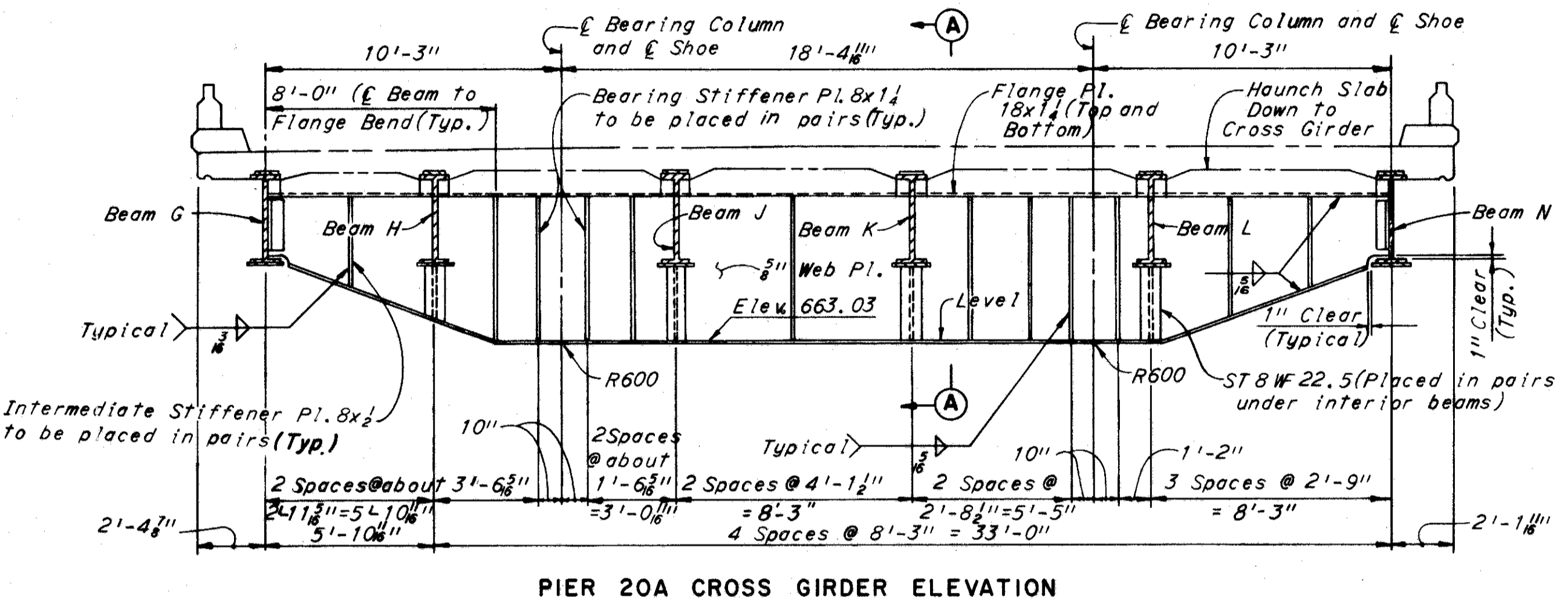
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



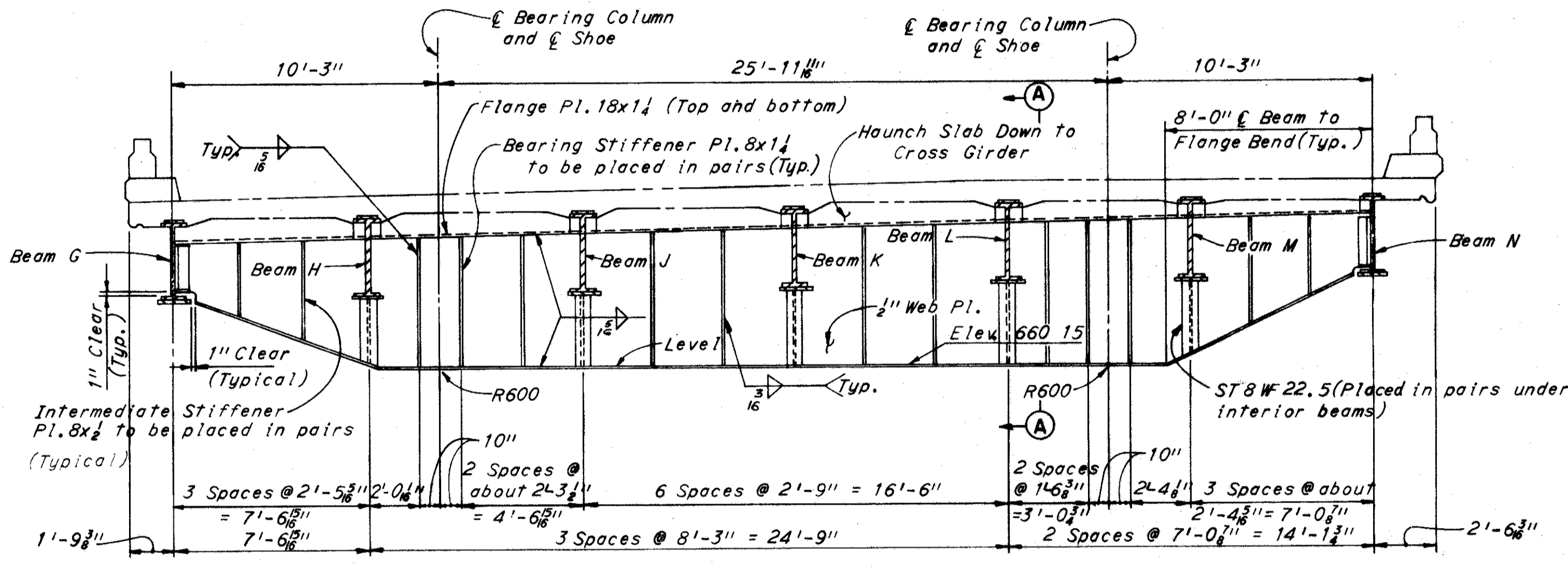
PIER 19AE CROSS GIRDER ELEVATION



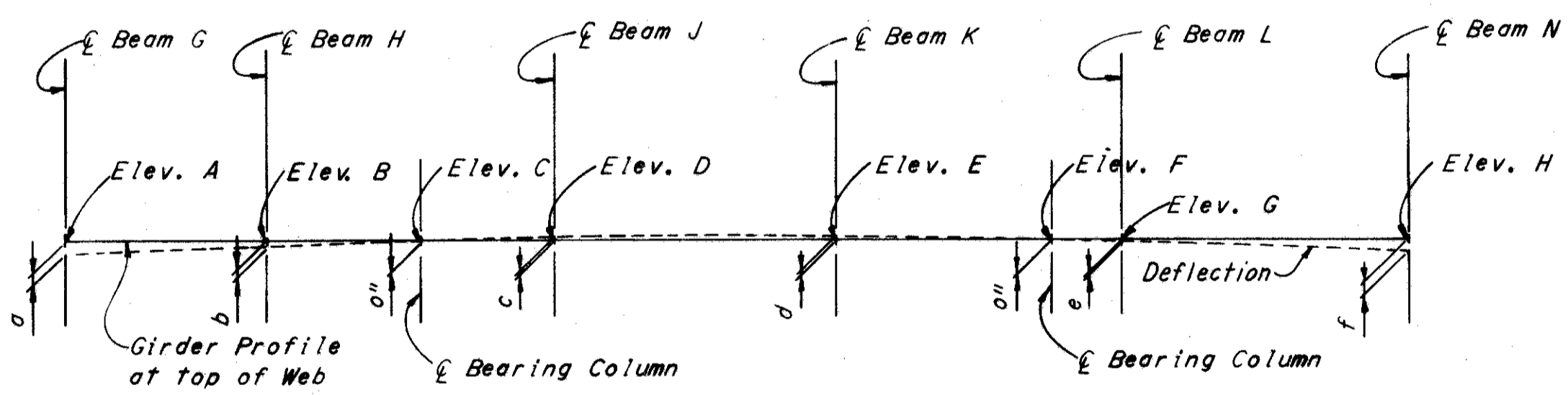
PIER 21AE CROSS GIRDER ELEVATION



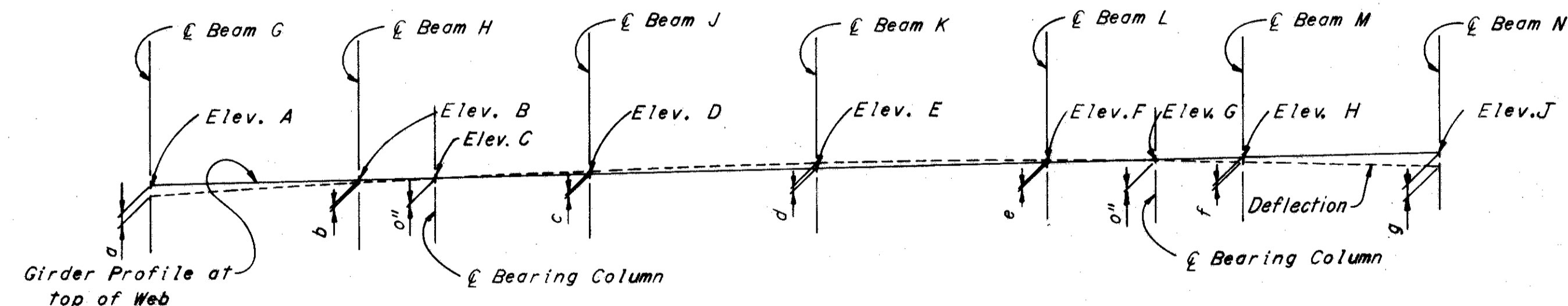
PIER 20A CROSS GIRDER ELEVATION



PIER 22AE CROSS GIRDER ELEVATION



GIRDER ELEVATION AND DEAD LOAD DEFLECTION DIAGRAMS



GIRDER ELEVATION AND DEAD LOAD DEFLECTION DIAGRAMS

Note:  
The rockers at Pier 22AE shall be provided with 4-1/2" shims under the base plates and the rockers at Pier 21AE shall be provided with 2-1/2" shims under the rockers. Other dimensions of shims to match base plate.  
Beams shall be fabricated so that the end of web faces are vertical after the beams are in final position and before beam splice welding is done. For Section A-A see sheet 421.

Pier	Deflections	a	b	c	d	e	f
19AE	Total Concrete	8/16"	16/16"	0"	0"	0"	8/16"
	Total Steel and Conc.	8/16"	16/16"	0"	0"	0"	8/16"
20AE	Total Concrete	8/16"	16/16"	0"	0"	0"	8/16"
	Total Steel and Conc.	8/16"	16/16"	0"	0"	0"	8/16"

Pier	Deflections	a	b	c	d	e	f	g
21AE	Total Concrete	8/16"	16/16"	0"	0"	0"	0"	8/16"
	Total Steel and Conc.	8/16"	16/16"	0"	0"	0"	0"	8/16"
22AE	Total Concrete	8/16"	0"	0"	0"	0"	0"	8/16"
	Total Steel and Conc.	8/16"	0"	0"	0"	0"	0"	8/16"

Elevations	A	B	C	D	E	F	G	H
Pier 19AE	669.61	669.57	669.54	669.52	669.46	669.42	669.40	669.34
Pier 20AE	668.01	668.02	668.03	668.04	668.06	668.08	668.08	668.10

Elevations	A	B	C	D	E	F	G	H	J
Pier 21AE	666.55	666.63	666.67	666.73	666.82	666.92	666.93	666.98	667.05
Pier 22AE	664.94	665.14	665.20	665.35	665.57	665.78	665.88	665.96	666.14

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

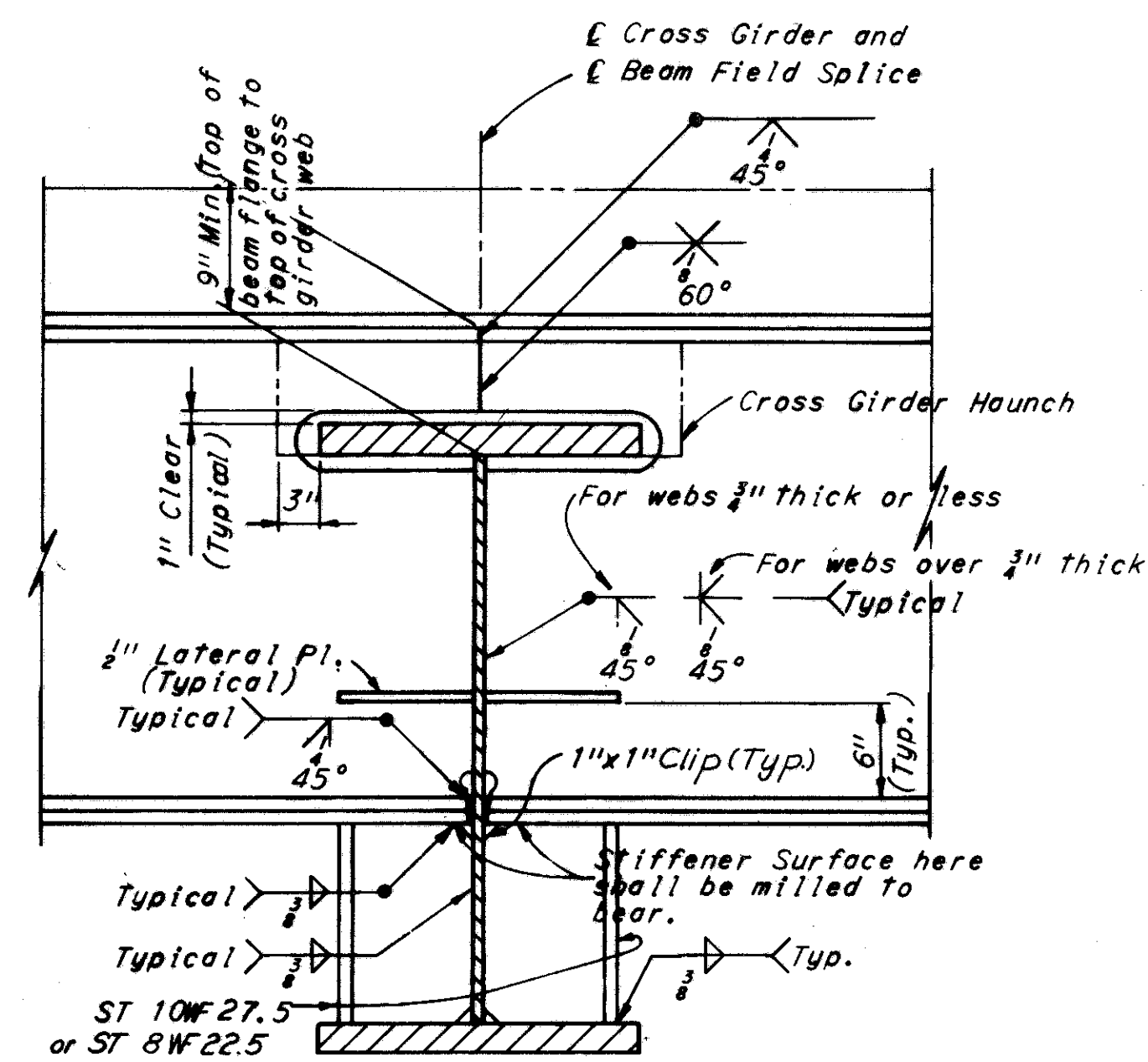
**SUPERSTRUCTURE DETAILS**  
UNIT 4-AE  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

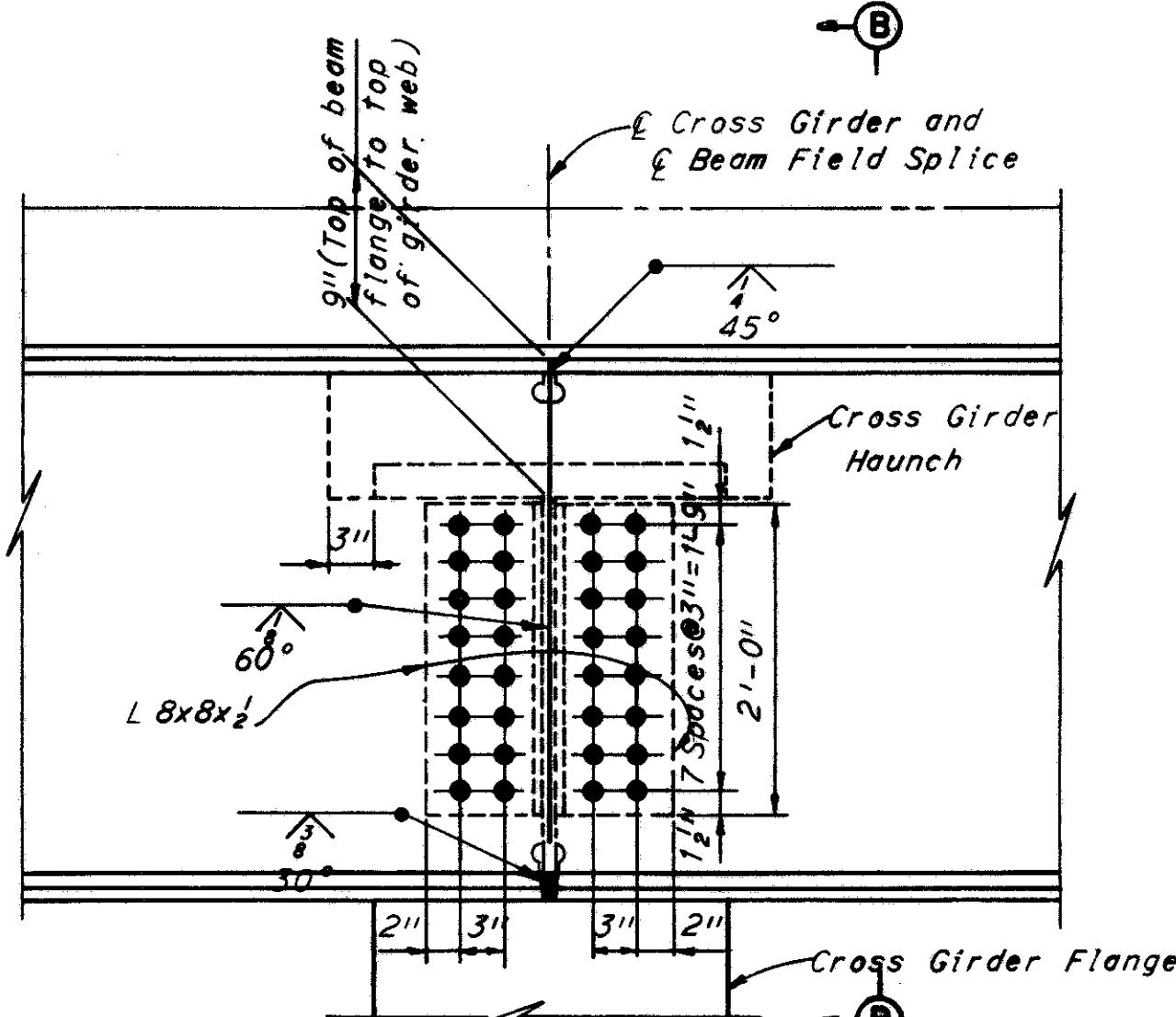
DRAWN BY JEN TRACED CHECKED BY JKH REVIEWED BY WVF REVISIONS  
DATE 11-10-64 DATE 12-21-64 DATE 12-22-64 SHEET 420

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



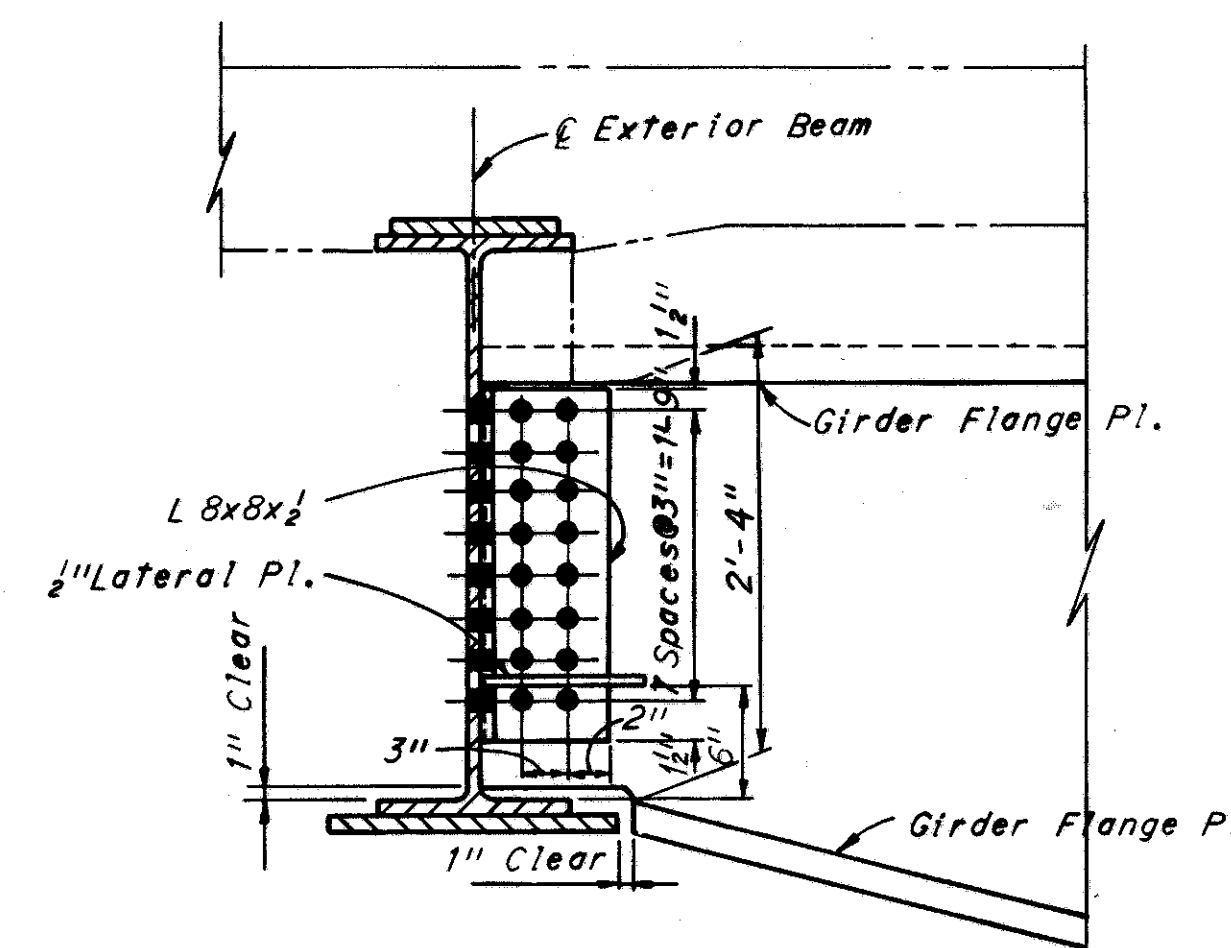
SECTION A-A

Showing Typical interior beam splice details

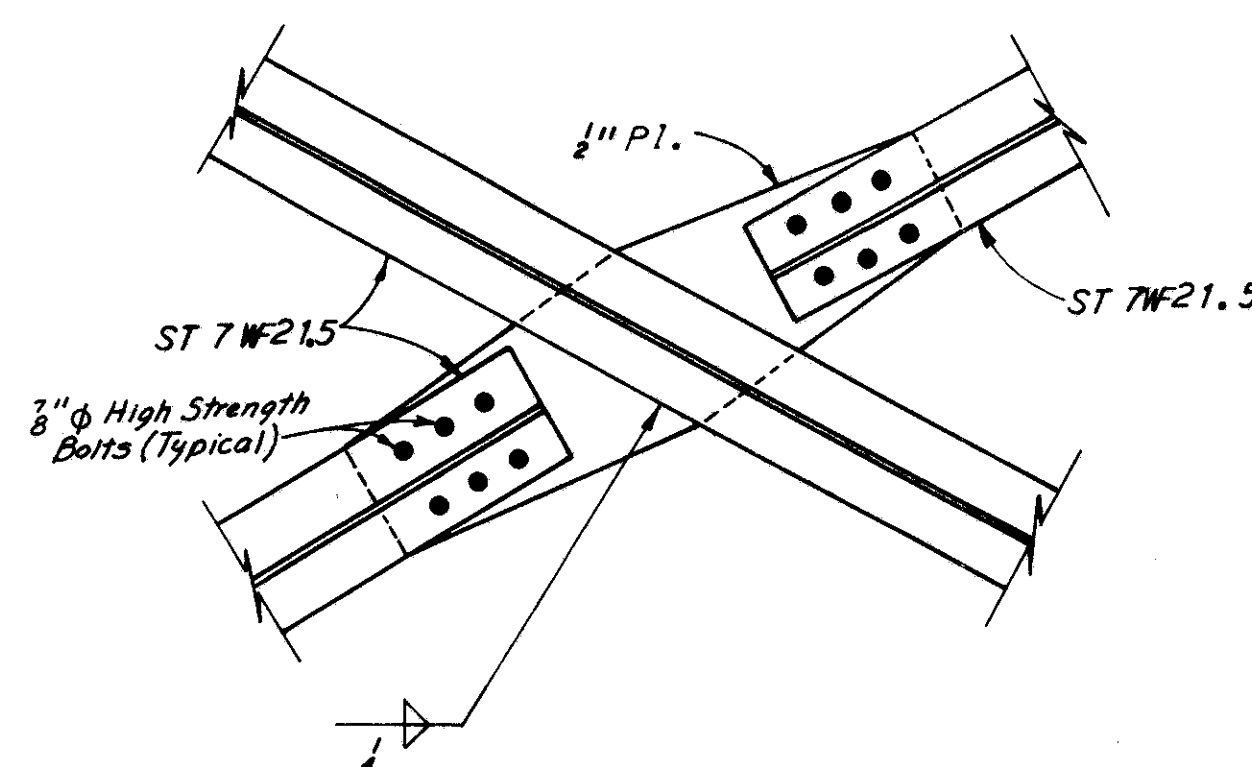


TYPICAL EXTERIOR BEAM SPLICE DETAILS

Notes:  
Use 3/4" High Strength Bolts for the bolted connections.  
Bolts shall be tightened after welds are completed.



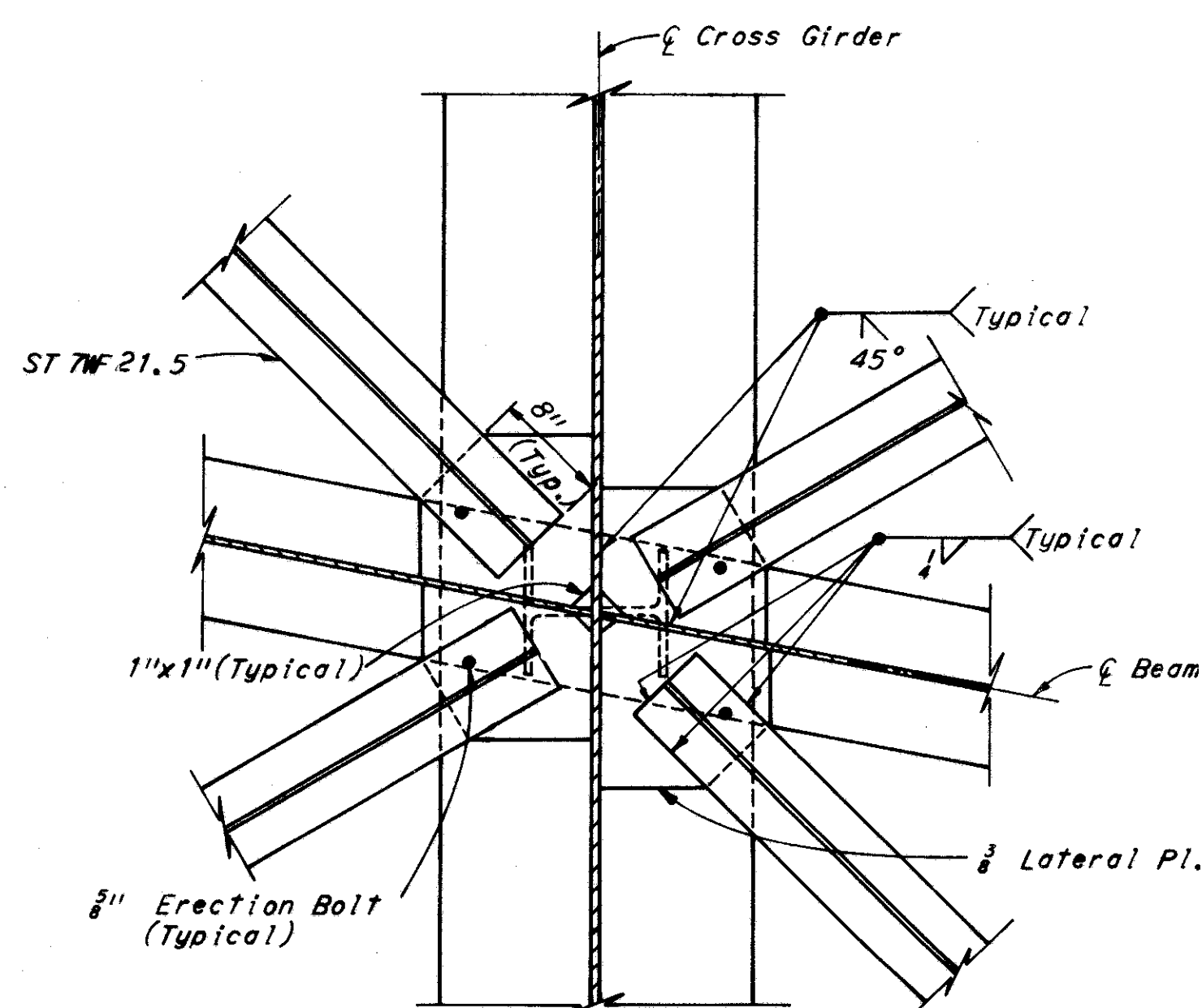
SECTION B-B



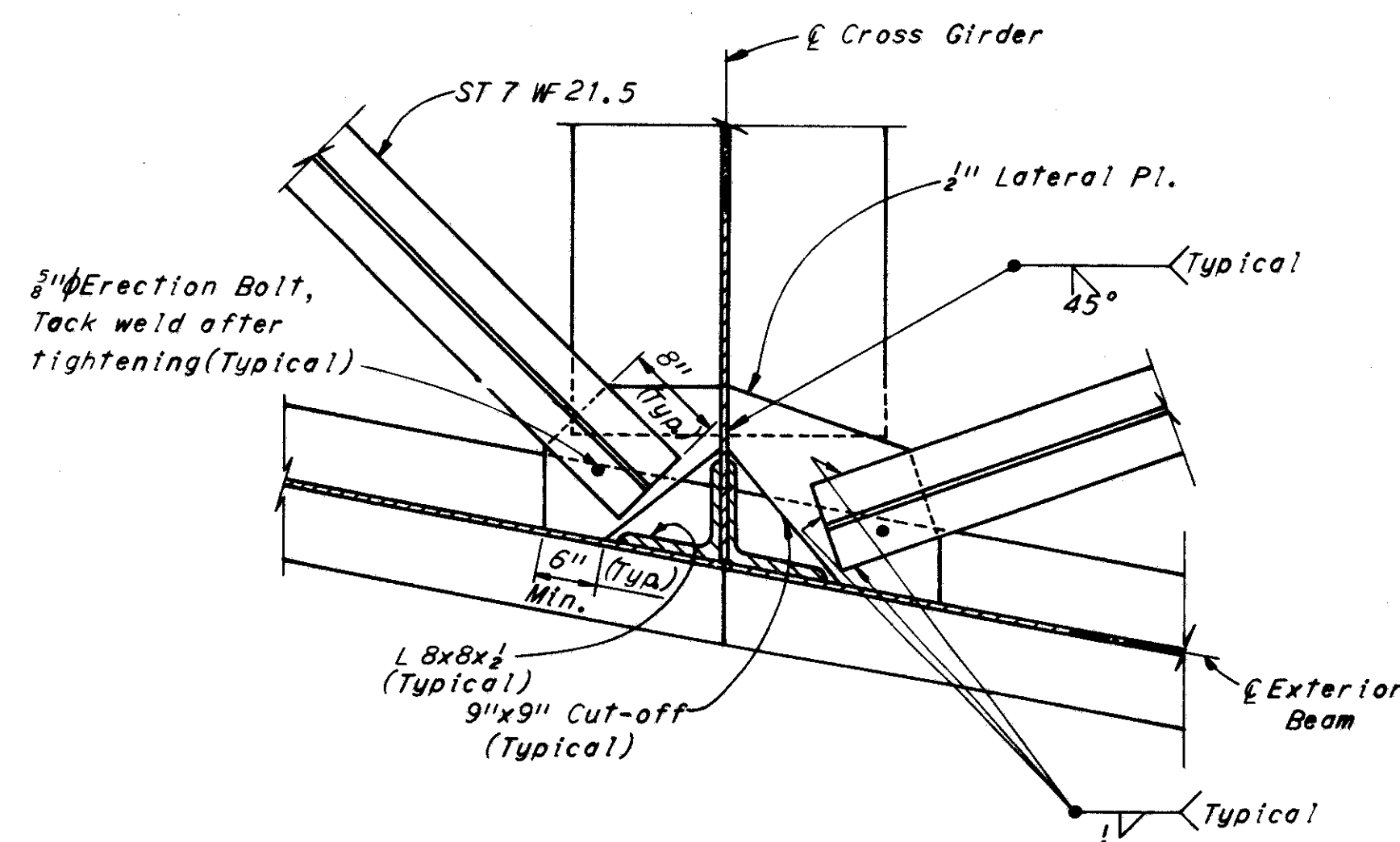
LATERAL BRACING CONNECTION AT MID PANEL

Bolster No.	Rocker No.	Dimension (Inches)														Weight each (Lb.)	
		A	B	C	D	E	F	G	H	K	L	M	R	T	Y	Bolster	Rocker
B-600	R-600	4	26	4	4	-	1 1/2	18	26	24	36	28	17 1/2	4 1/2	1 5/8	2357	2529

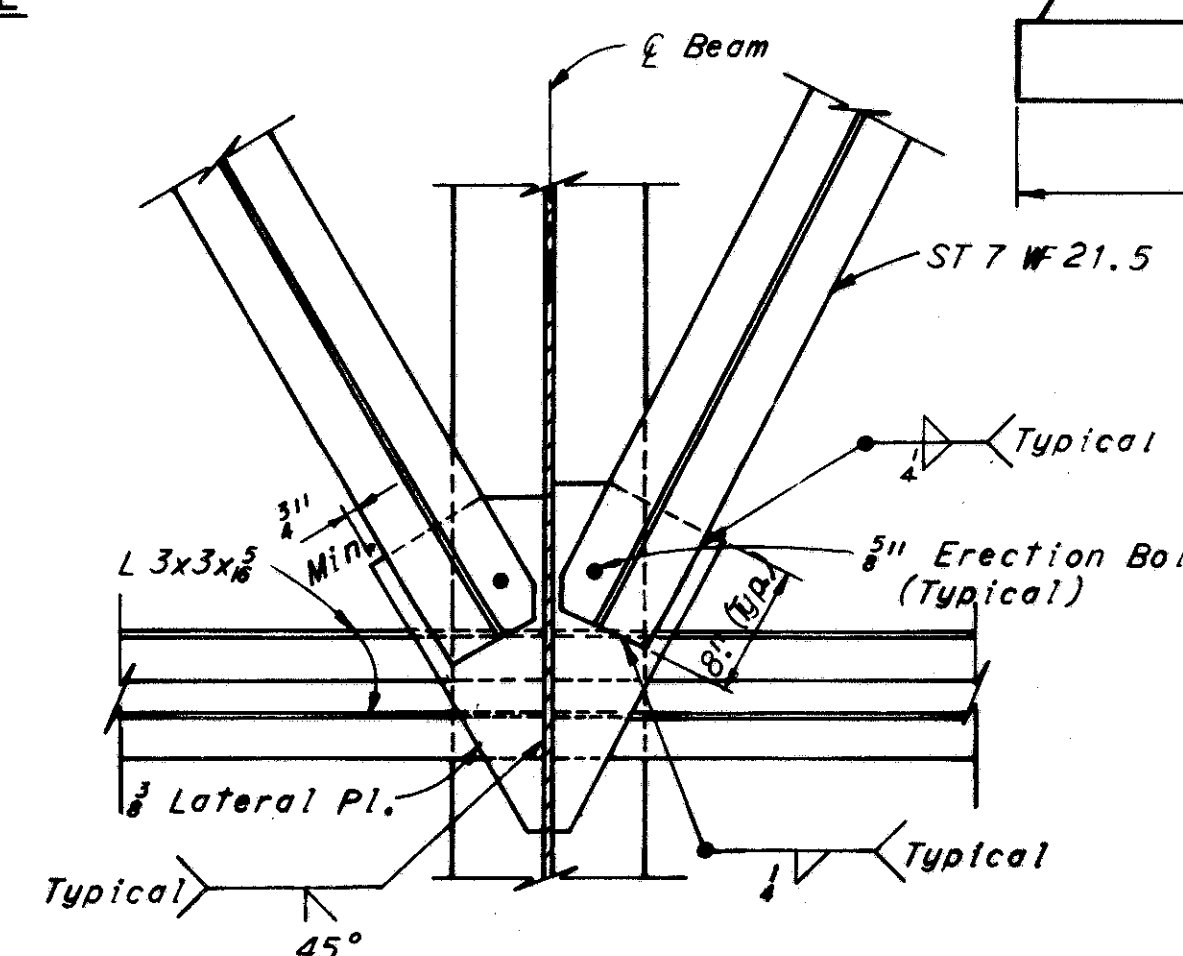
Note: For additional details and Reference Drawings see Ohio Standard Drawing RB-1-55. Weights given are for on Rocker or Bolster complete (including sheet lead, anchor bolts and washers).



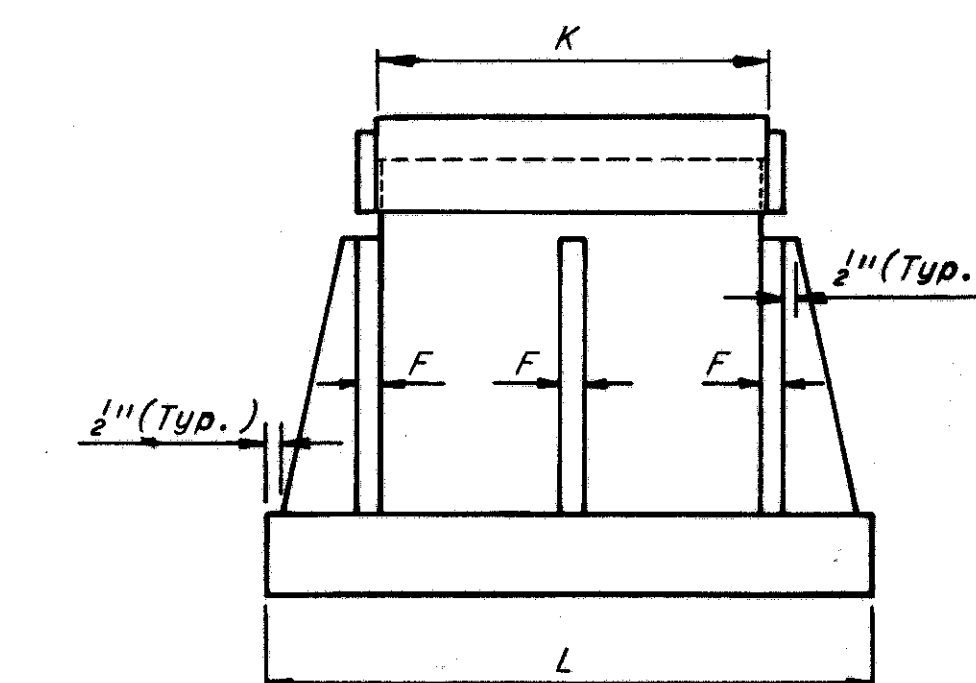
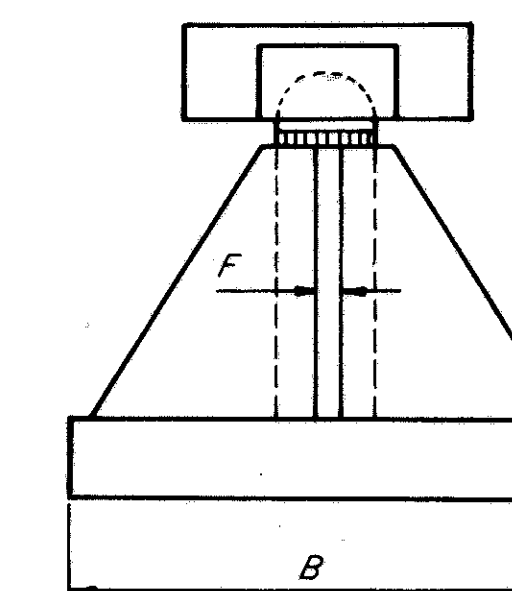
LATERAL BRACING AT CROSS GIRDER INTERIOR BEAM



LATERAL BRACING AT CROSS GIRDER EXTERIOR BEAM



LATERAL BRACING CONNECTION AT INTERMEDIATE CROSSFRAME



B-600

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
CLEVELAND NEW YORK

**SUPERSTRUCTURE DETAILS  
UNIT 4-AE**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

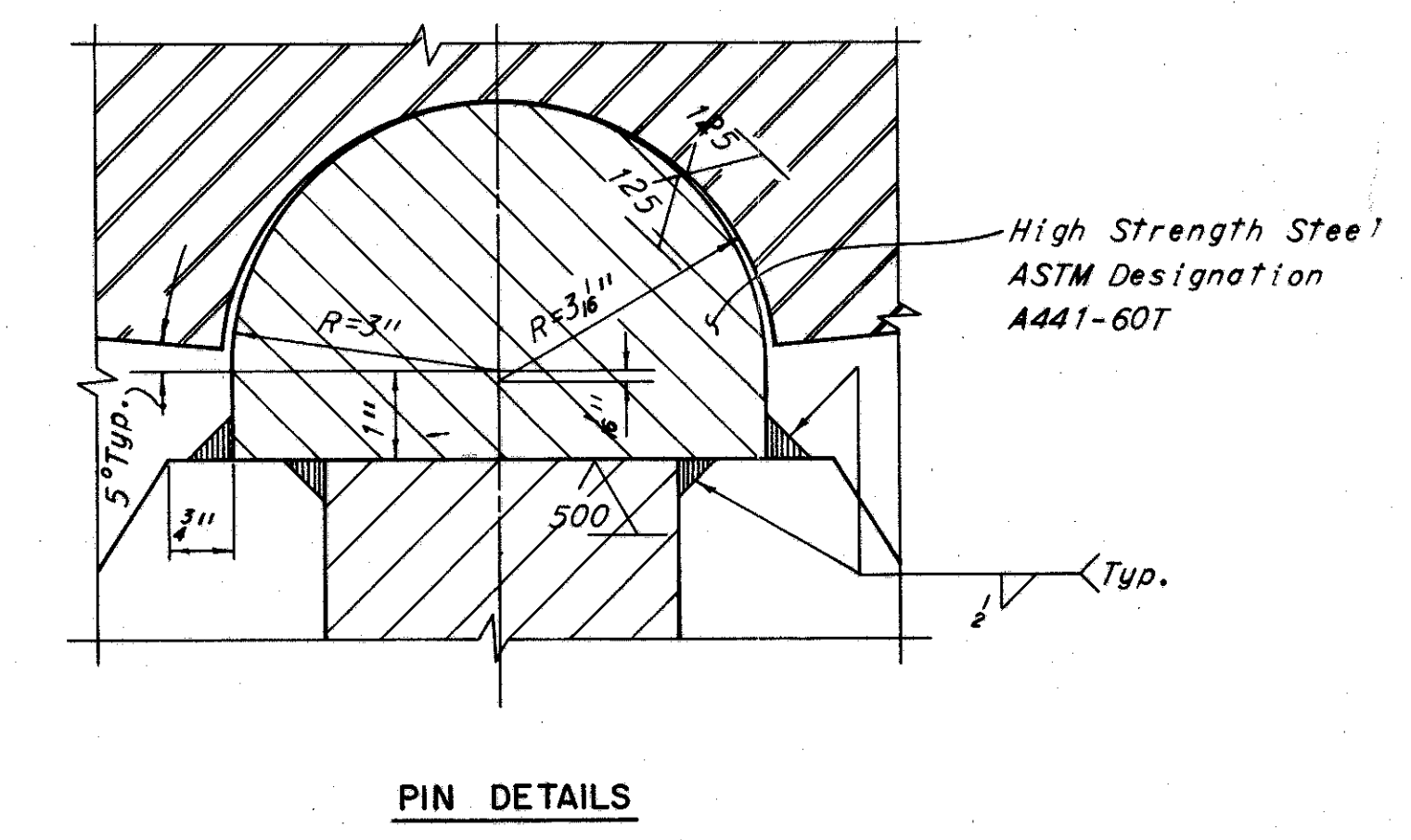
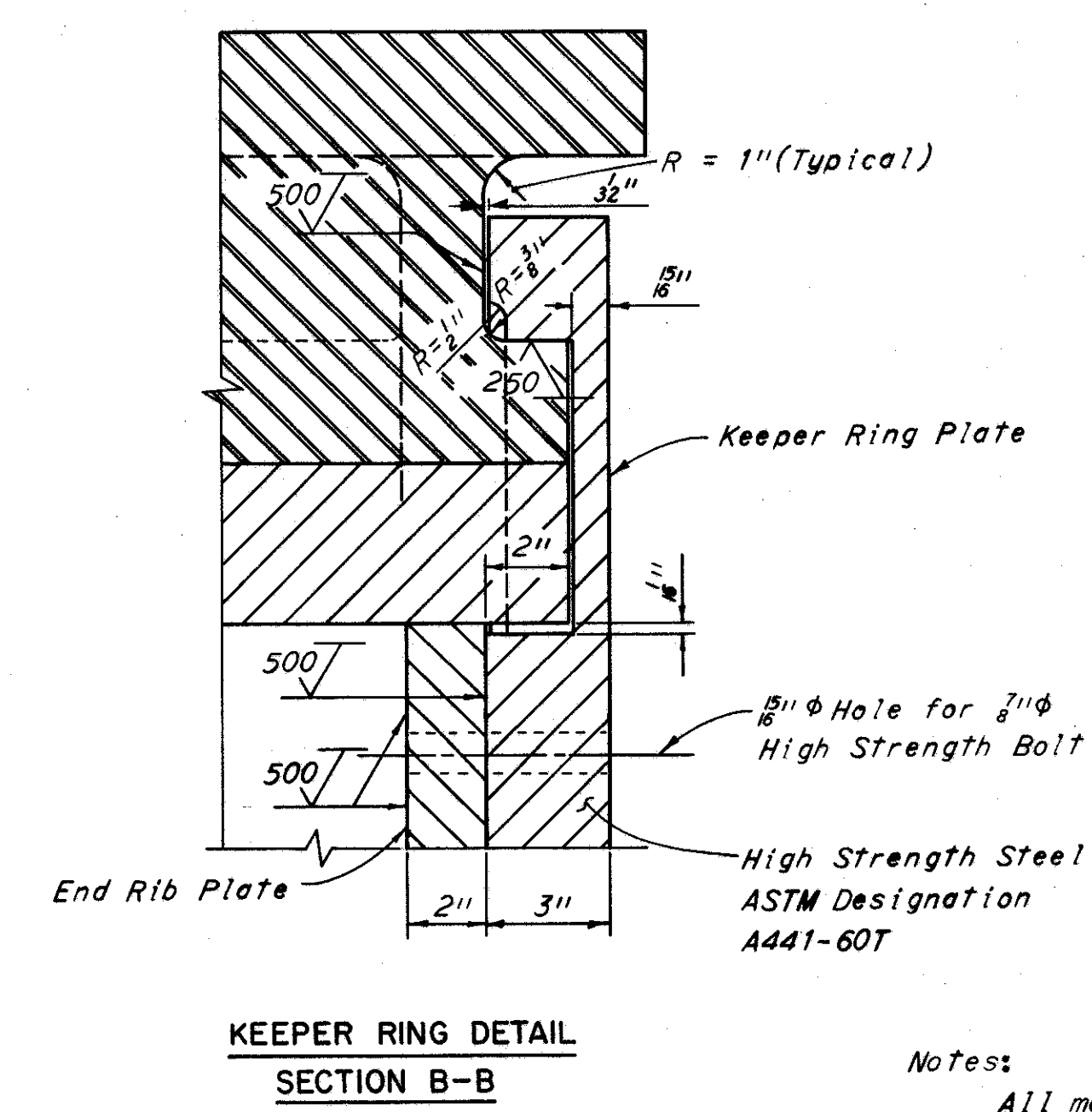
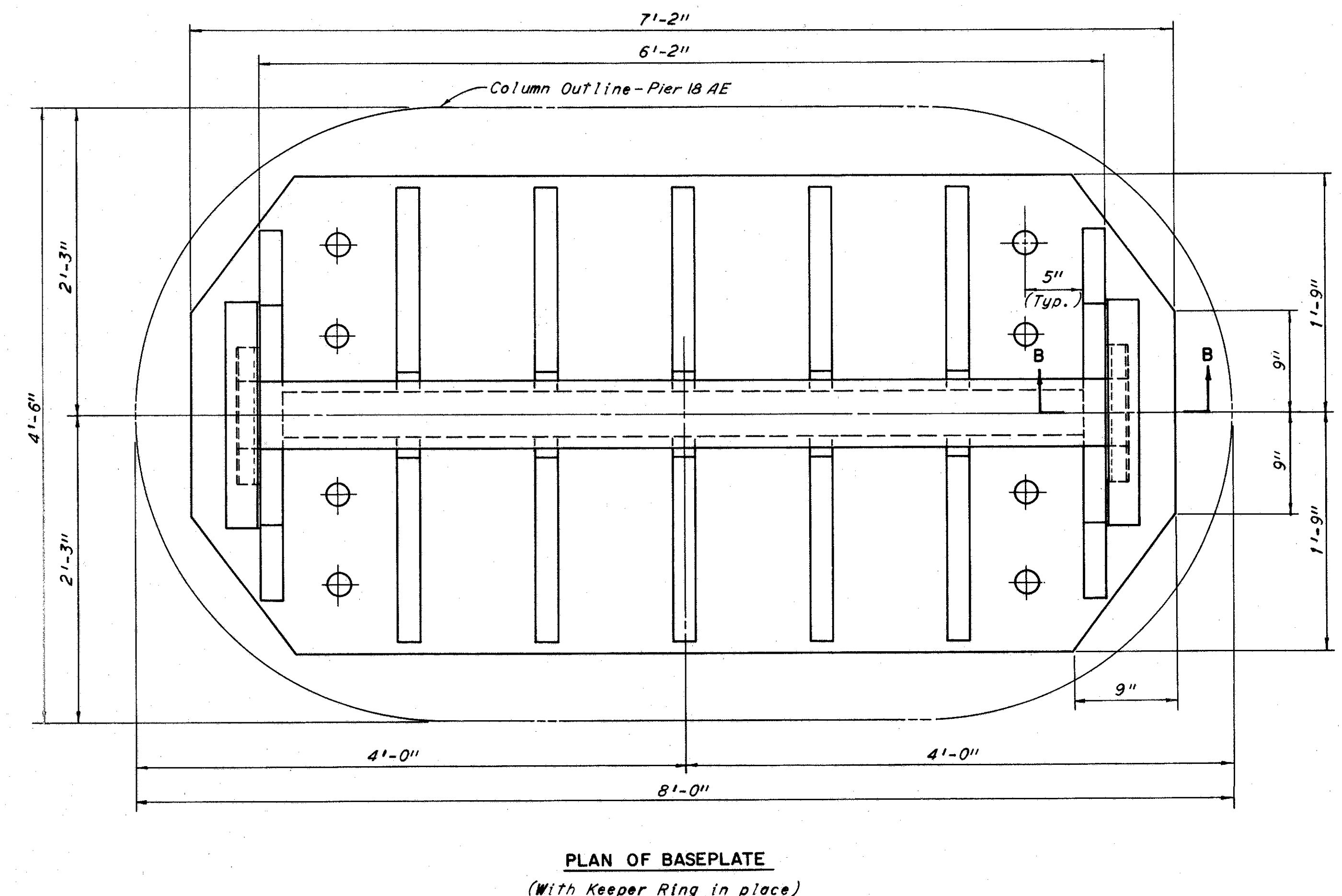
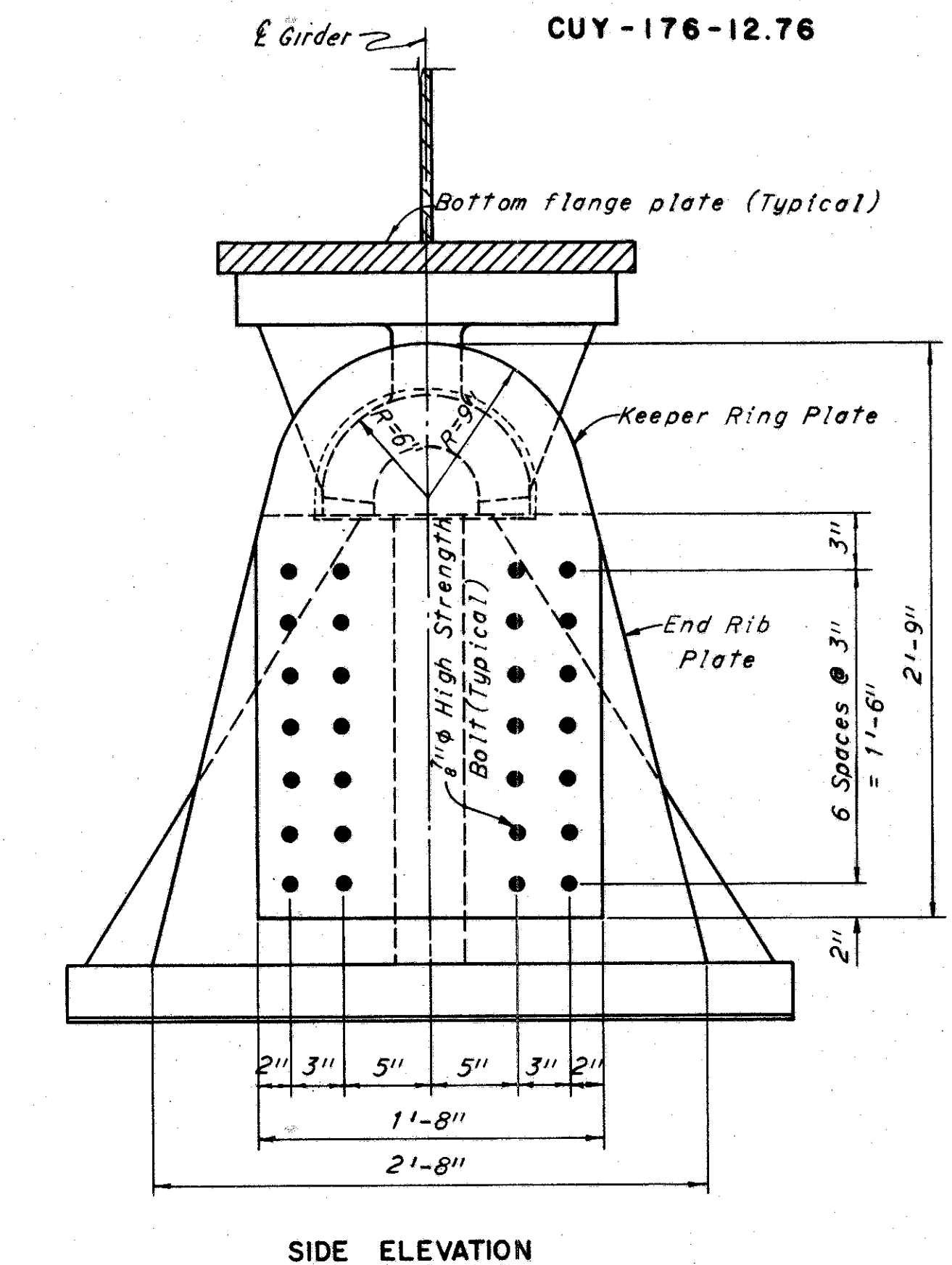
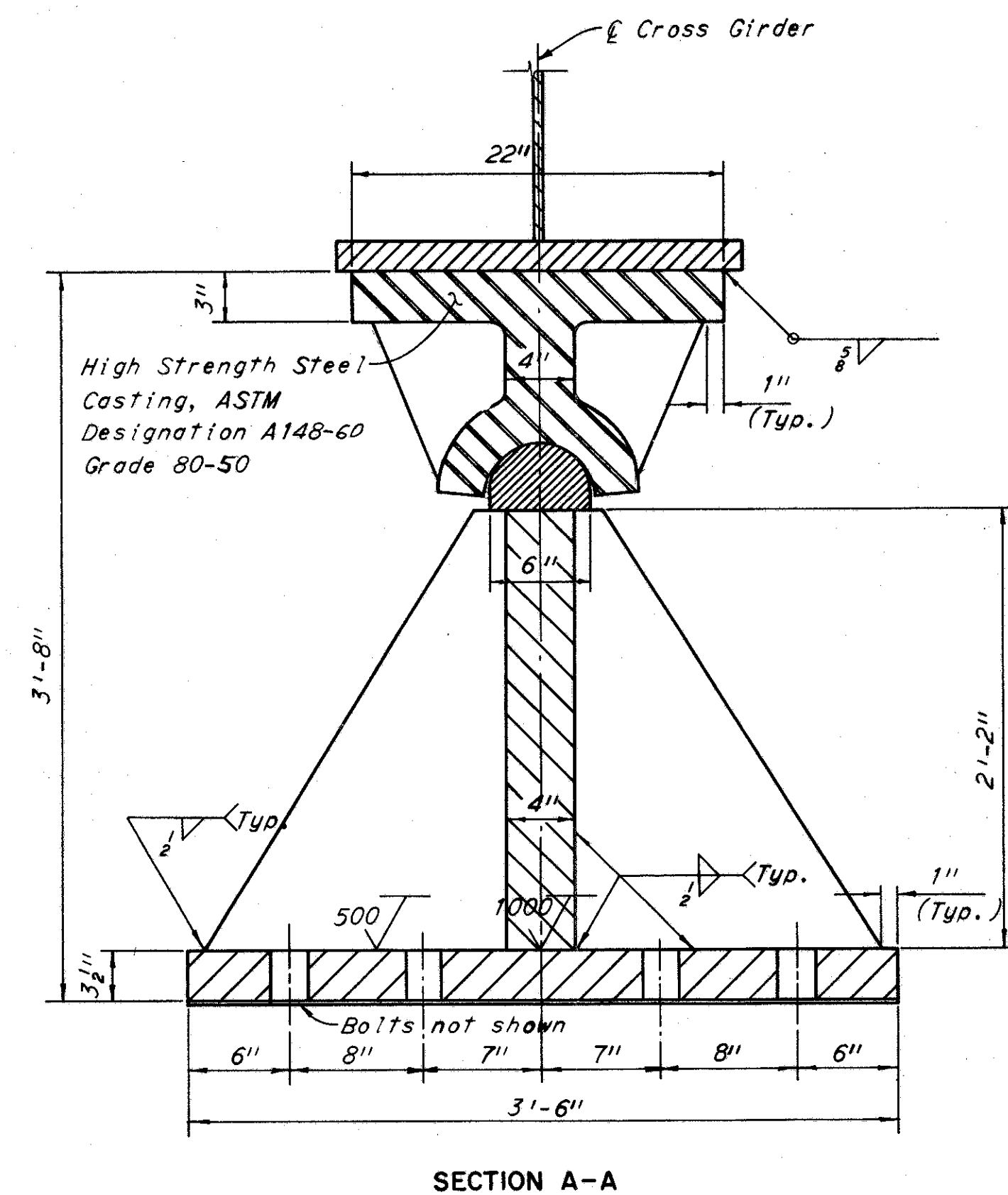
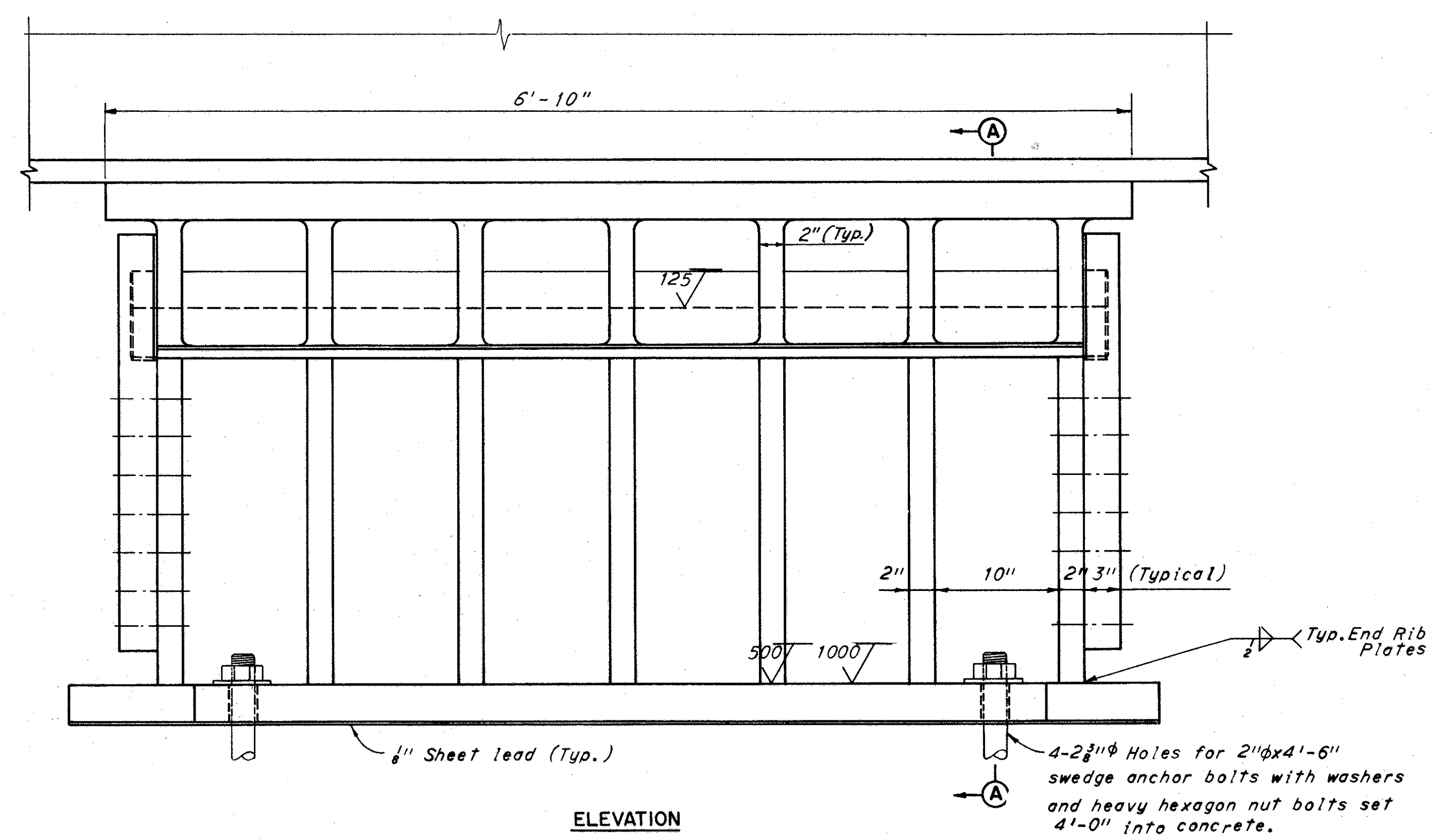
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED
DATE 11-10-64	DATE	DATE 12-21-64	DATE 12-22-64

SHEET 421



CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



Notes

All materials shall conform to ASTM A-36, except as otherwise shown.

Anchor bolts shall be in place prior to erection of superstructure steel.

The annular spaces between anchor bolts and masonry plates shall be filled with lead or babbitt before setting nuts.

All masonry plates, rockers and sole plates shall be scribed with center lines in both directions.

All material is included with "Item S-7, Structural Steel," for payment.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**FIXED BEARING FB-1 UNIT 4-AE**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

DRAWN	TRACED	CUYAHOGA COUNTY	OHIO
DATE 12-21-64	DATE	DATE 12-21-64	DATE 12-22-64

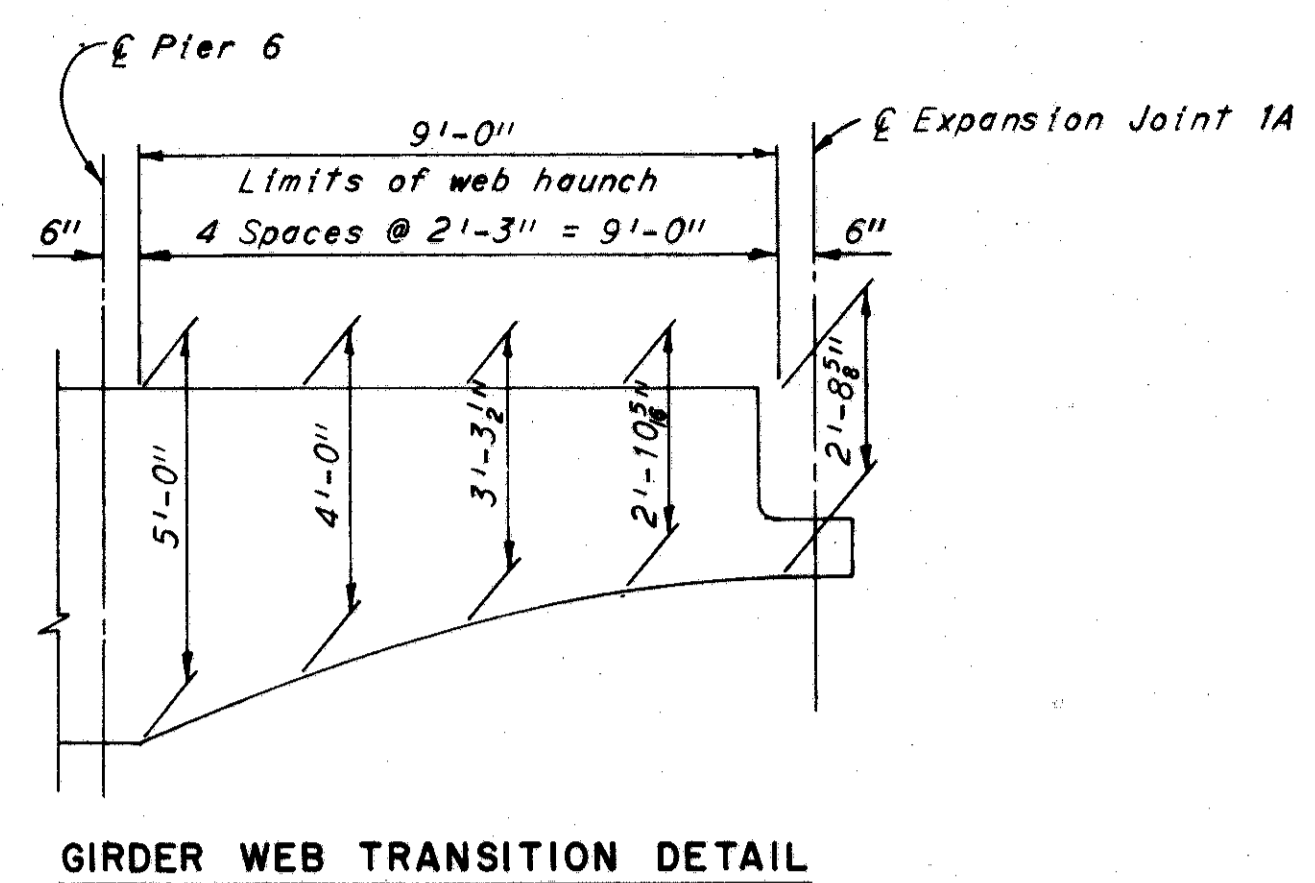
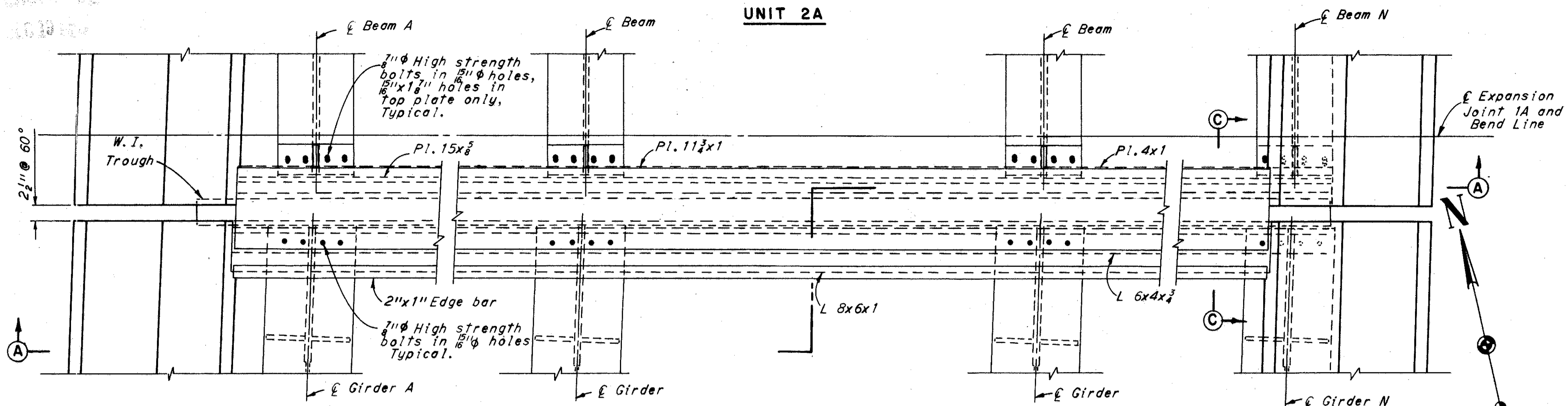
SHEET 422

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

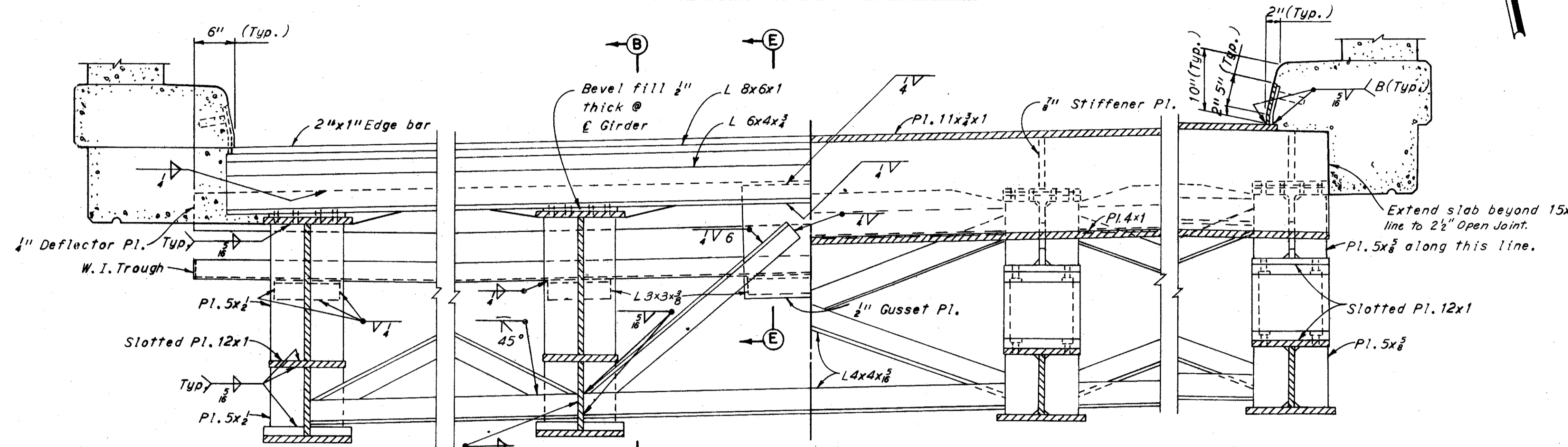
UNIT 2A

UNIT 1A

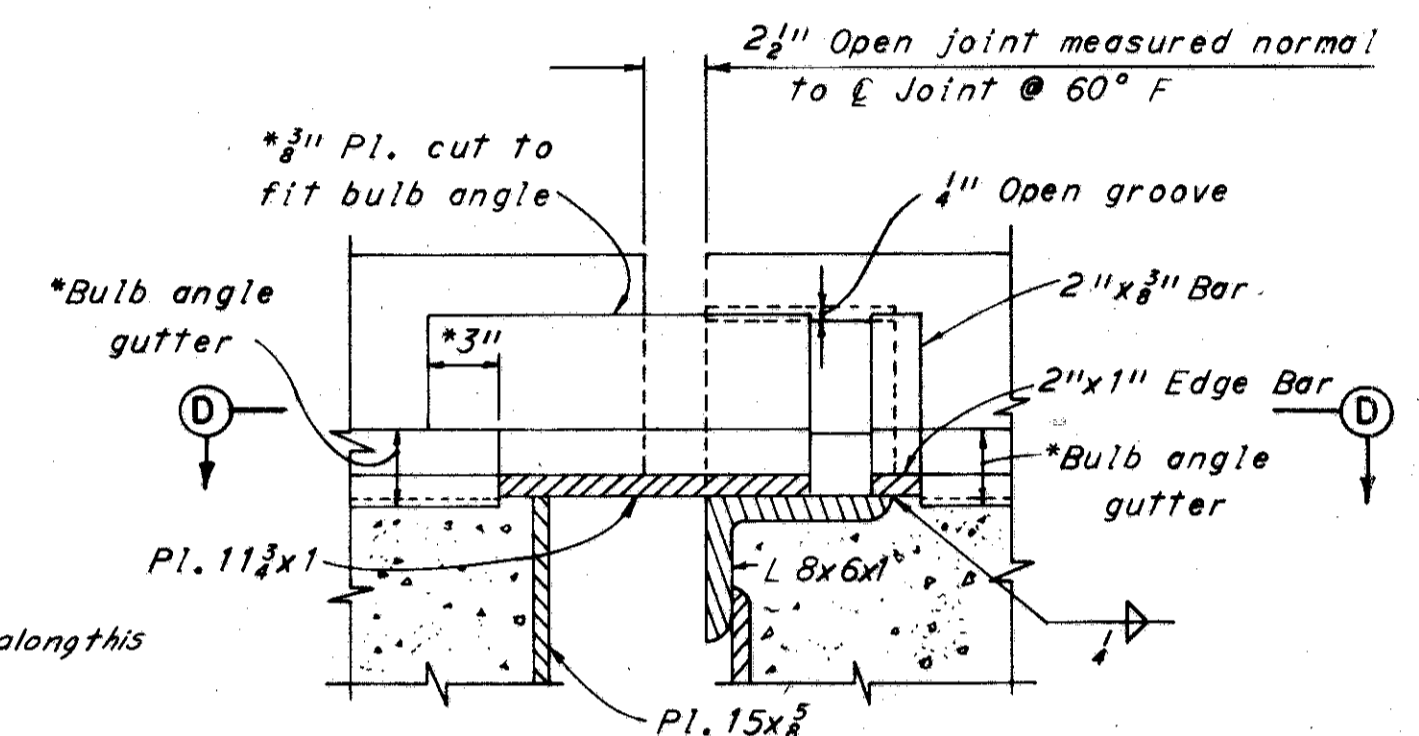
PART PLAN OF EXPANSION JOINT 1A



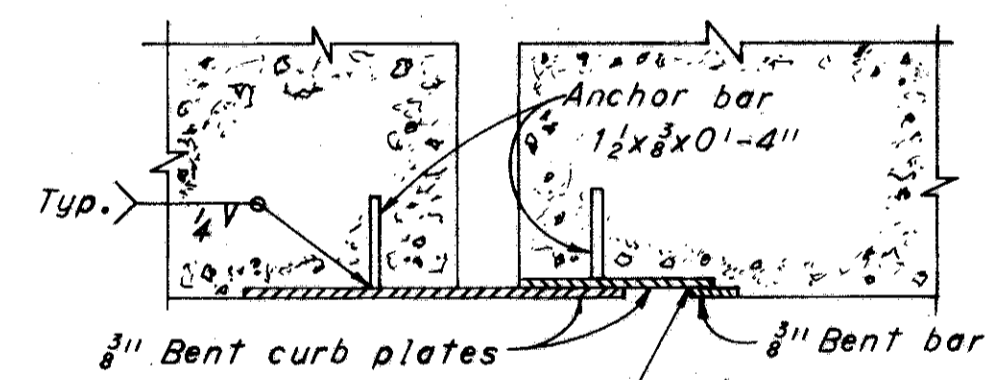
GIRDER WEB TRANSITION DETAIL



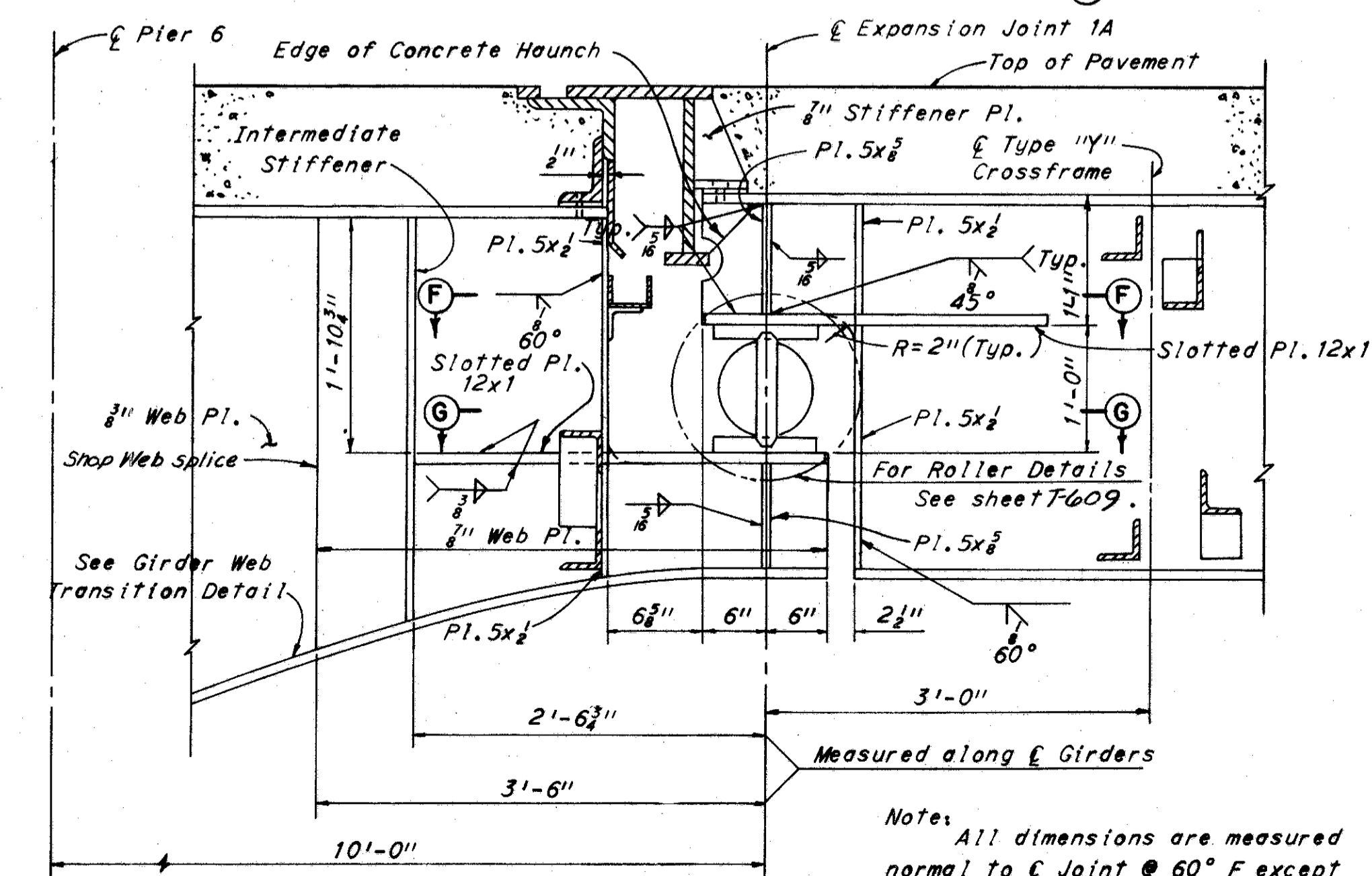
SECTION A-A



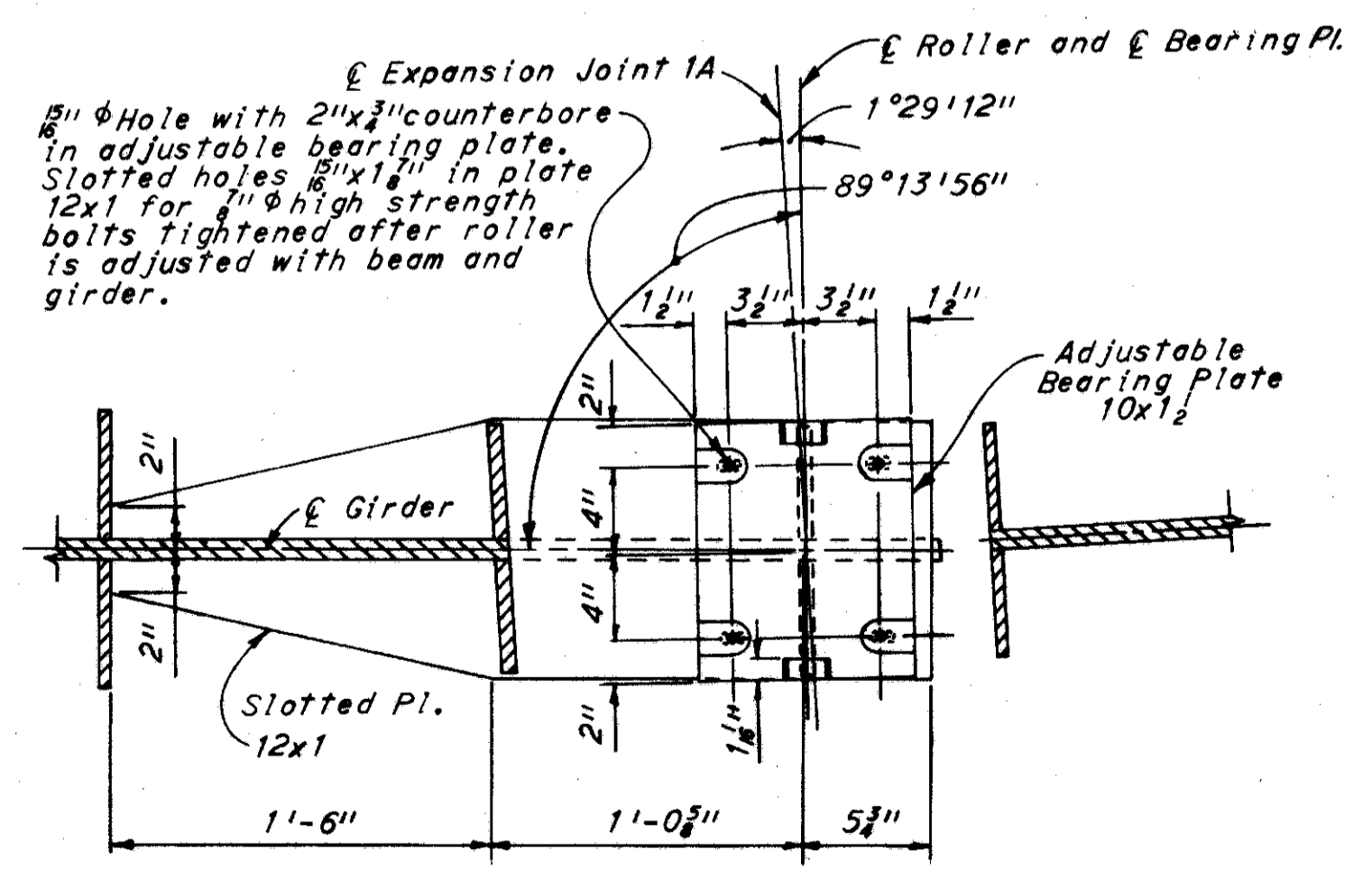
SECTION C-C  
(Expansion Joints 1A, 2A and 3A)



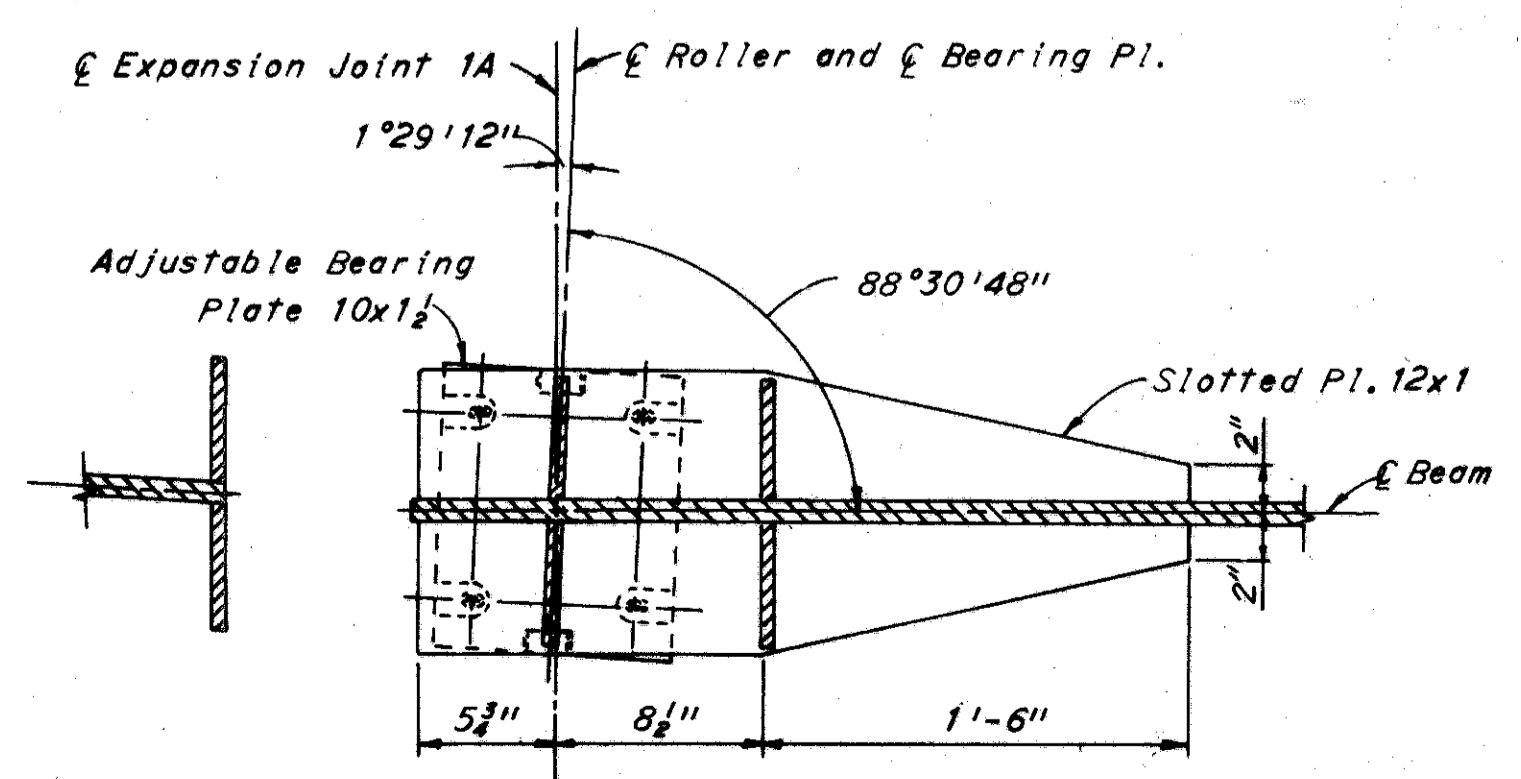
SECTION D-D  
(Expansion Joints 1A, 2A and 3A)



SECTION B-B



SECTION G-G



SECTION F-F

Note: For details not shown see Section G-G

Notes:  
The rollers and adjustable bearing plates shall be alloy steel forgings conforming to ASTM A-237-55 Class B and shall be included with "Item S-7, Structural Steel" for payment.  
All sliding contact surfaces shall not be painted but shall be lubricated with flake graphite.  
For Section E-E and for Roller Details see sheet 424.

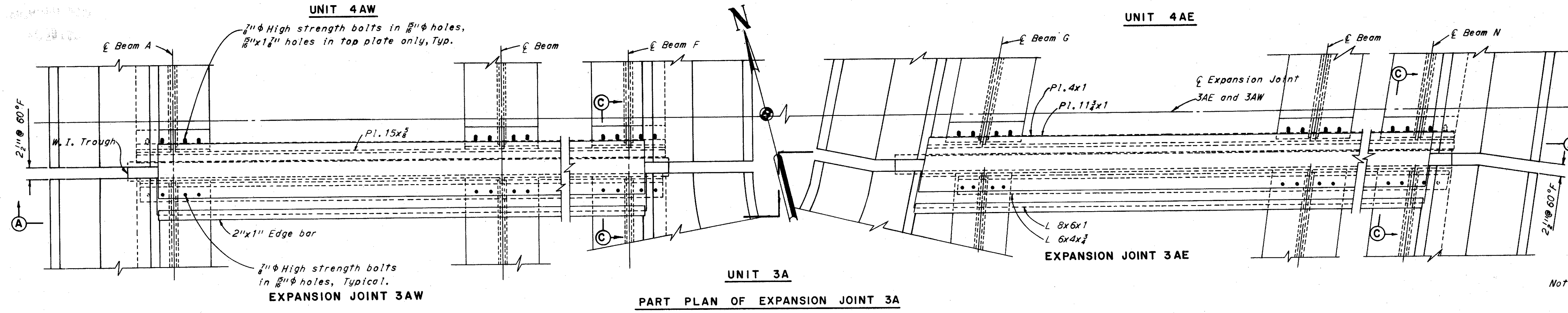
H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK		
EXPANSION JOINT 1-A		
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS		
BR. NO. CUY-71-1789R	STA. 917+10.09	
	STA. 935+21.25	
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN RAB	TRACED	CHECKED AS
DATE 7-10-64	DATE	DATE 7-20-64
		REVIEWED WFC
		DATE 12-22-64
		REVISED

SHEET 423

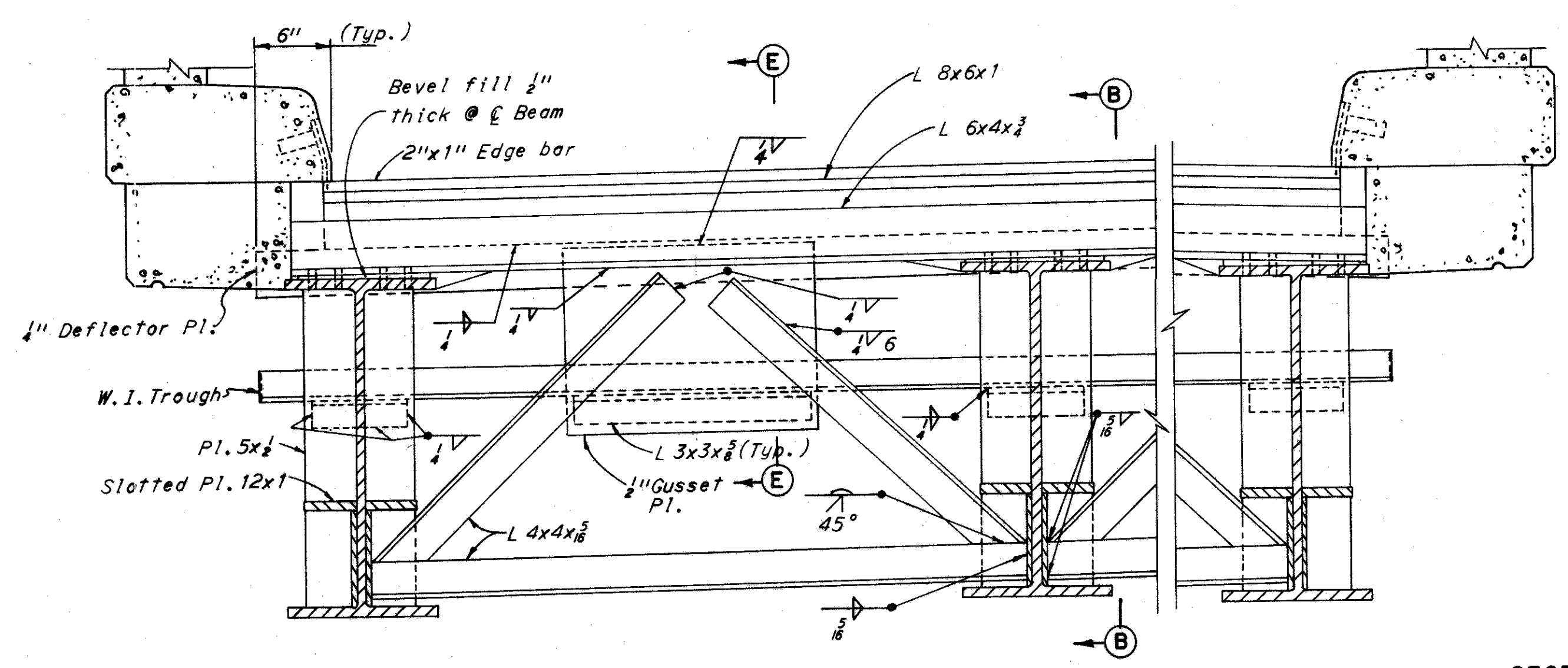


CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

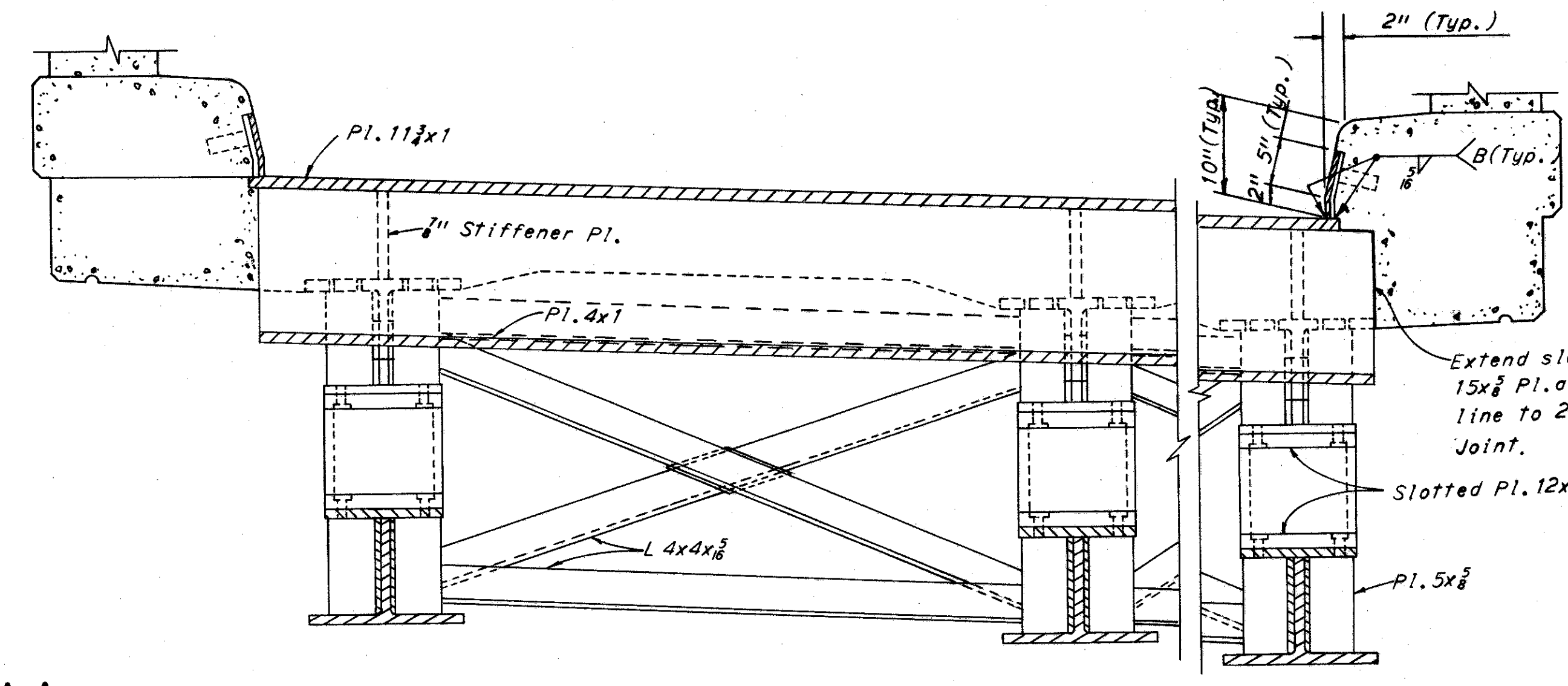


PART PLAN OF EXPANSION JOINT 3A

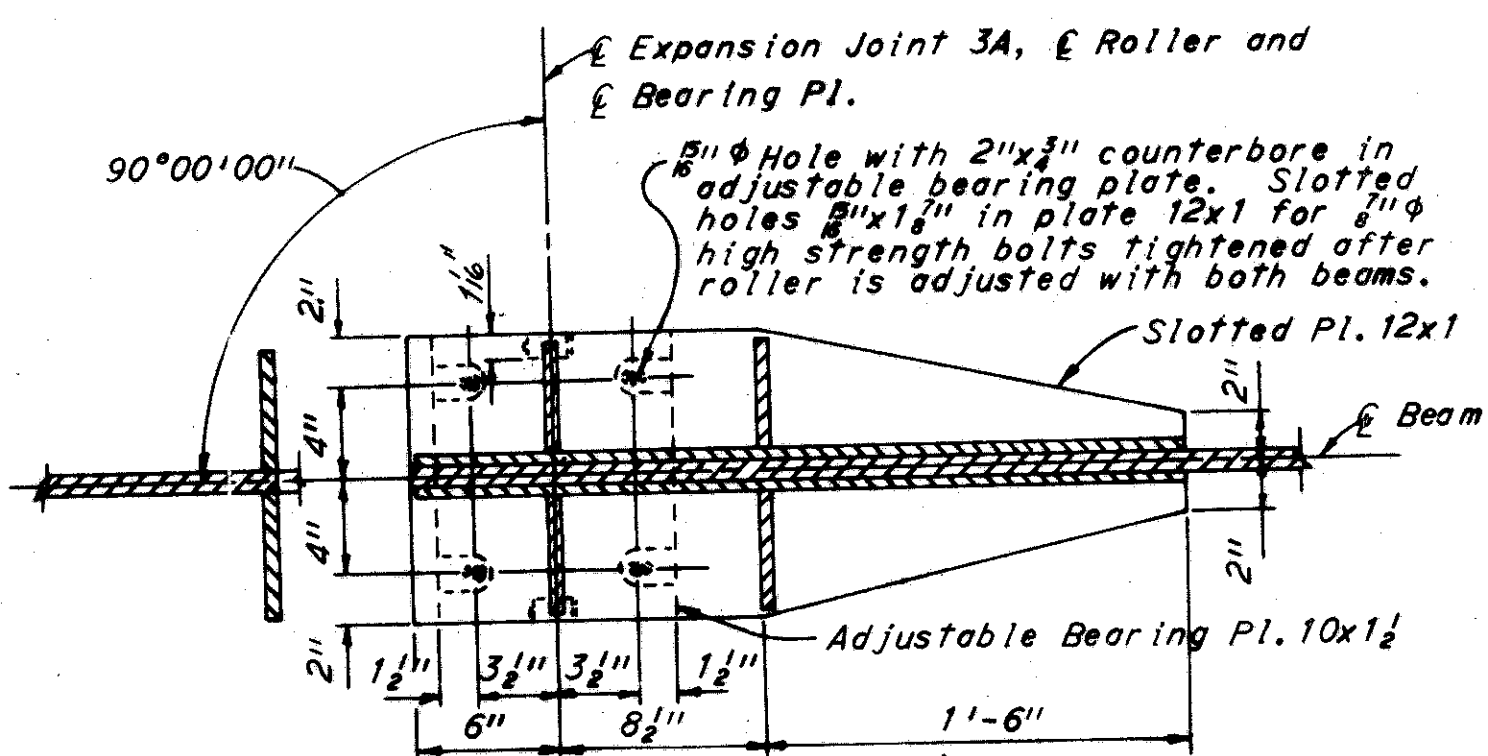
Notes:  
 For Section C-C see sheet 423.  
 For Section B-B, Section E-E, Roller Details and for location of Section F-F and Section G-G see sheet 424.  
 For additional notes see sheet 423.



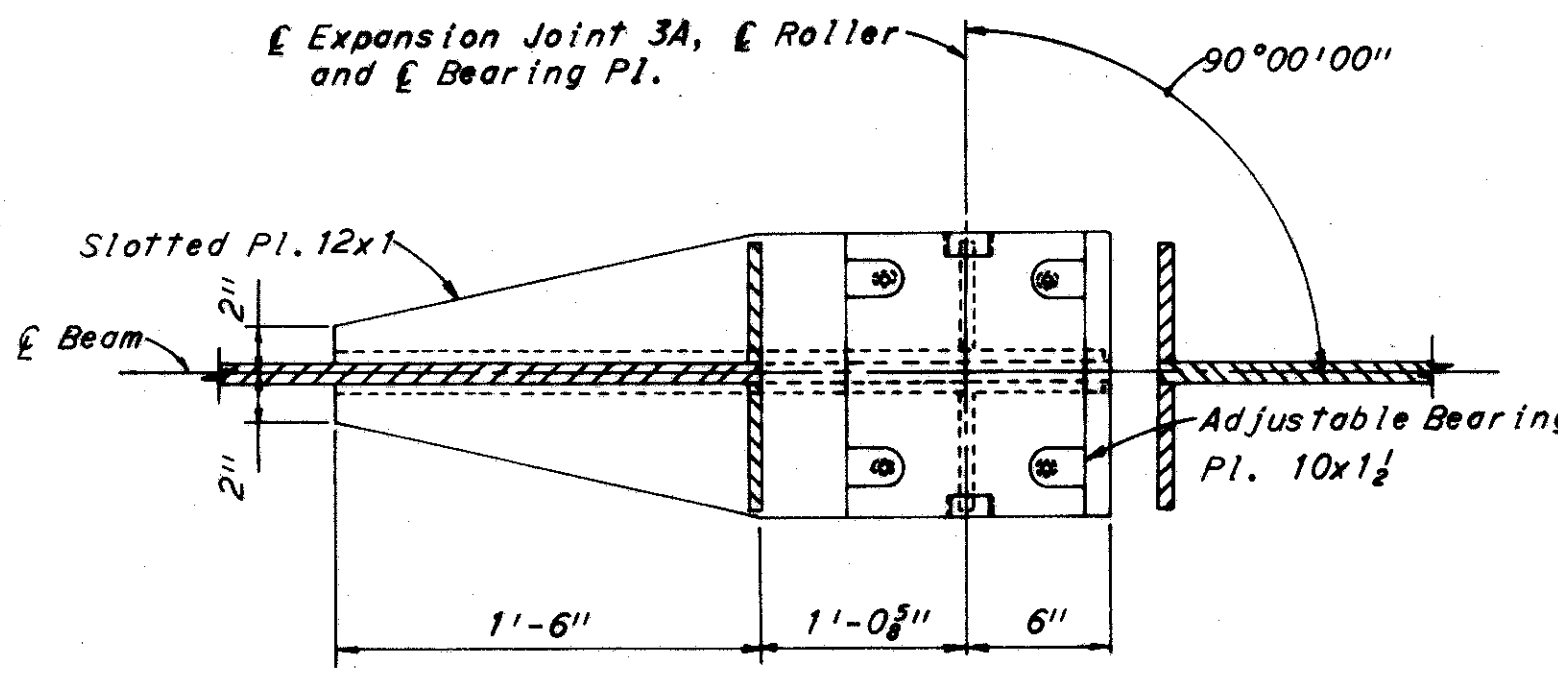
SECTION A-A



Extend slab beyond 15x3/8 Pl. along this line to 2 1/2" Open Joint.

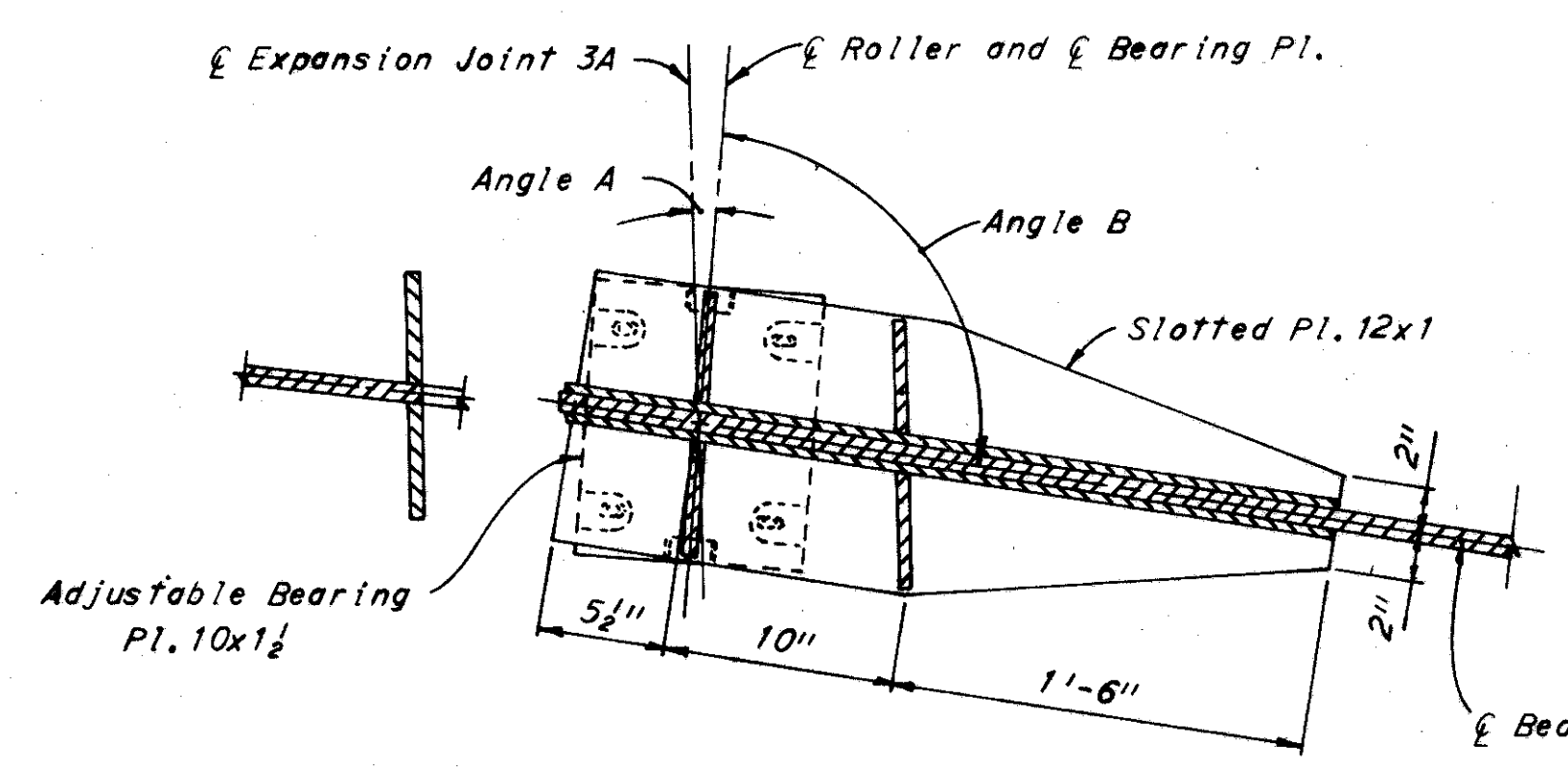


SECTION F-F BEAMS A THRU F



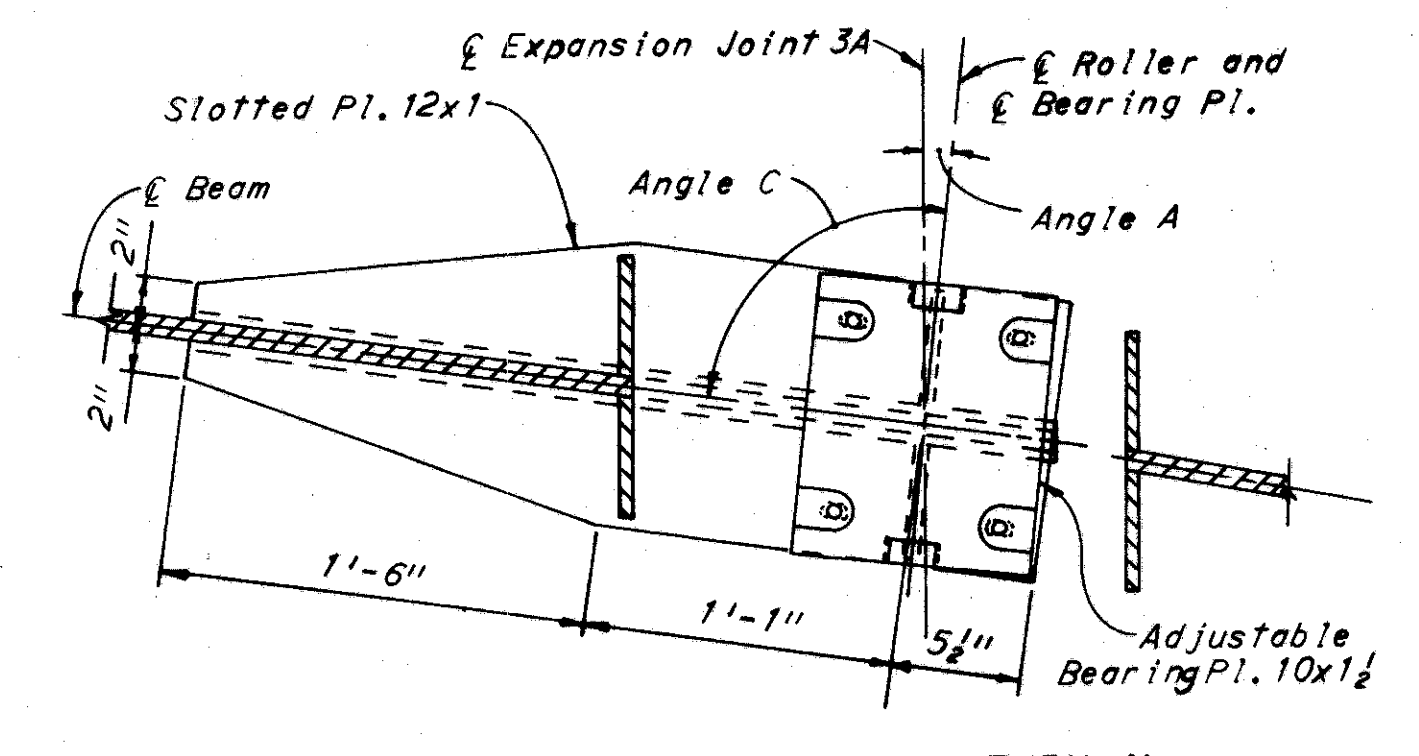
SECTION G-G BEAMS A THRU F

Note: For details not shown see Section F-F, Beams A thru F.



SECTION F-F BEAMS G THRU N

Note: For details not shown see Section F-F, Beams A thru F.



SECTION G-G BEAMS G THRU N

Note: For details not shown see Section F-F, Beams A thru F.

EXPANSION JOINT ANGLES			
Beam	Angle A	Angle B	Angle C
G	4°17'25"	96°31'18"	89°09'56"
H	5°10'36"	94°25'11"	87°08'40"
J	6°20'49"	93°14'58"	88°18'53"
K thru N	6°52'32"	92°43'14"	88°50'37"

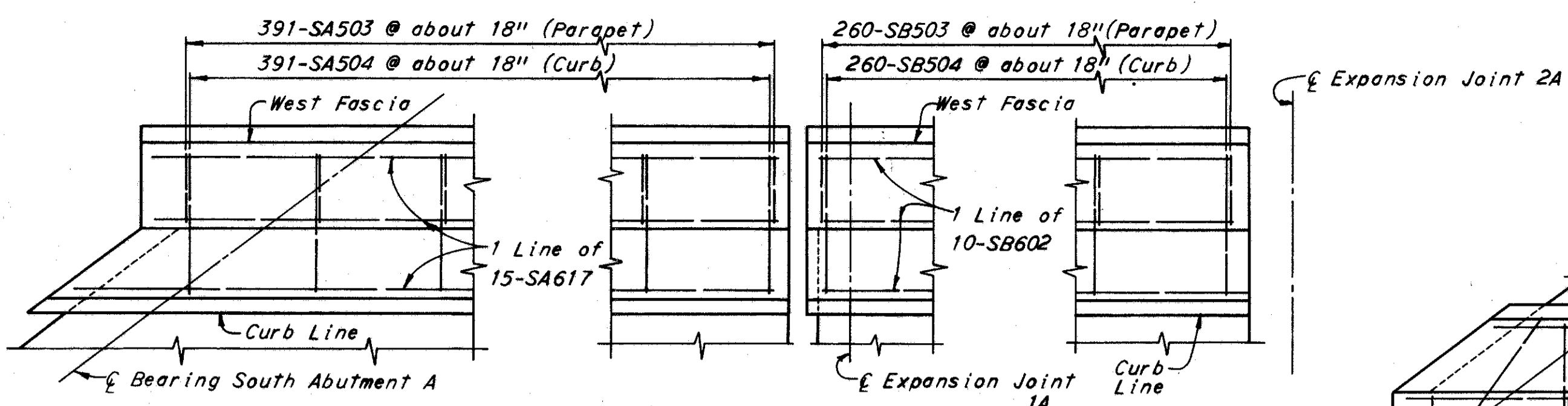
H.N.T.B BRIDGE NOS. 21A & 21B  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**EXPANSION JOINT 3-AW AND 3-AE**  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS  
 BR. NO. CUY-71-1789 R STA. 917+10.09  
 STA. 935+21.25

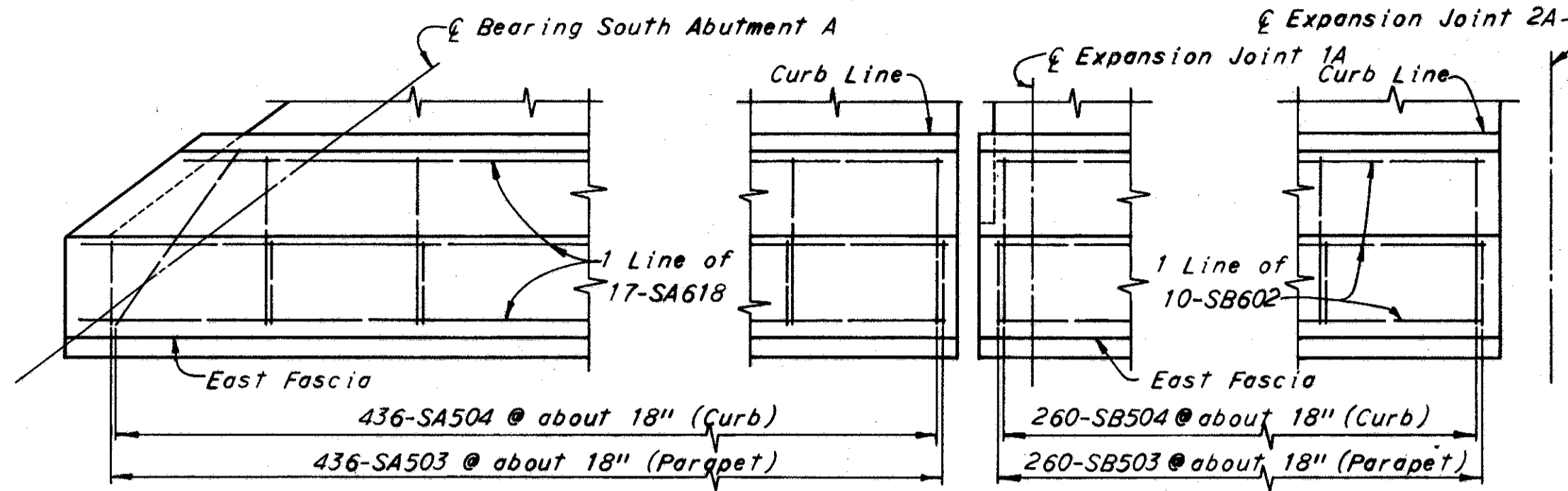
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN RAB	CHECKED AJ	REVIEWED WJ
DATE 9-10-64	DATE 9-20-64	DATE 12-22-64

SHEET 425

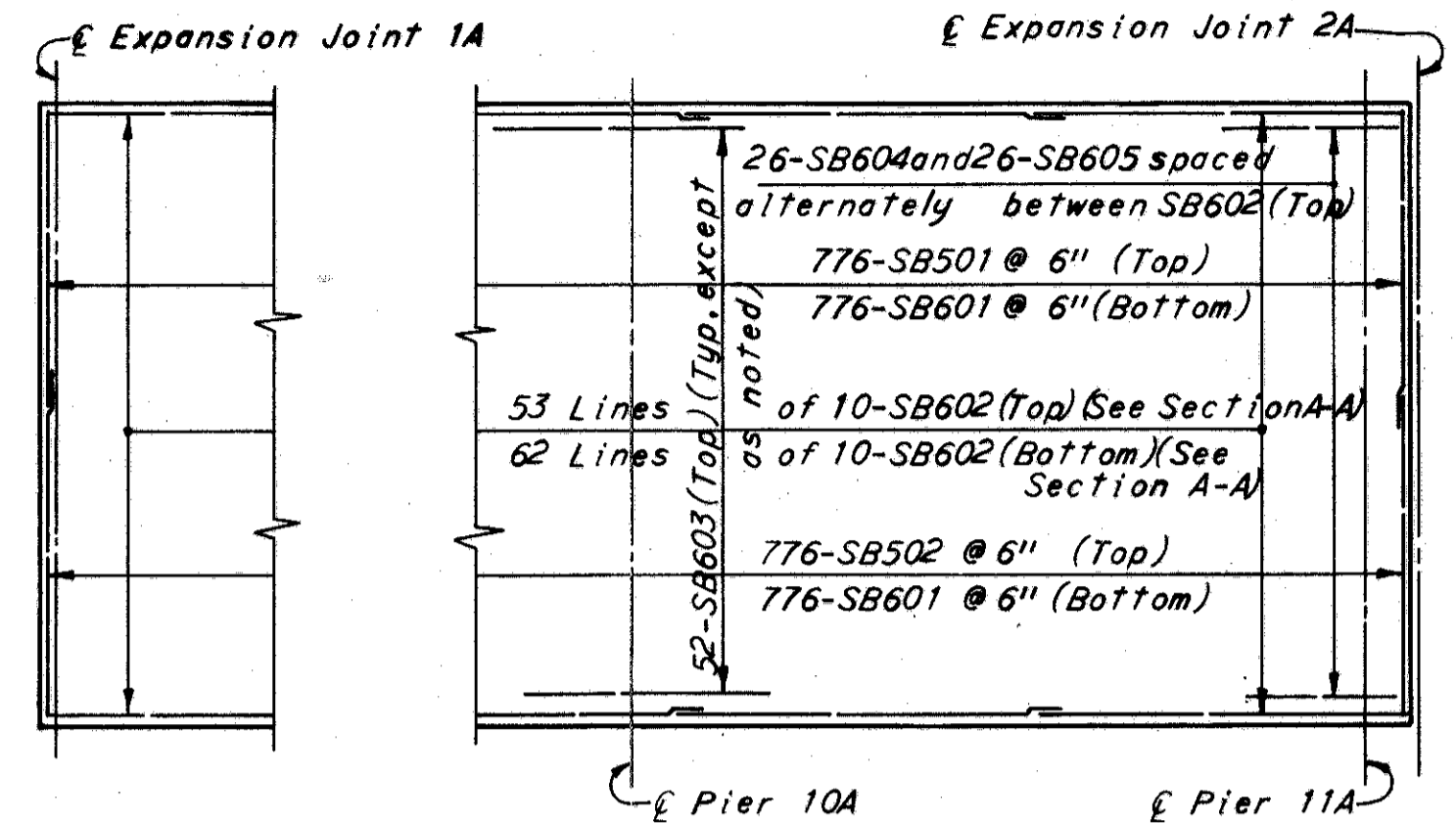
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



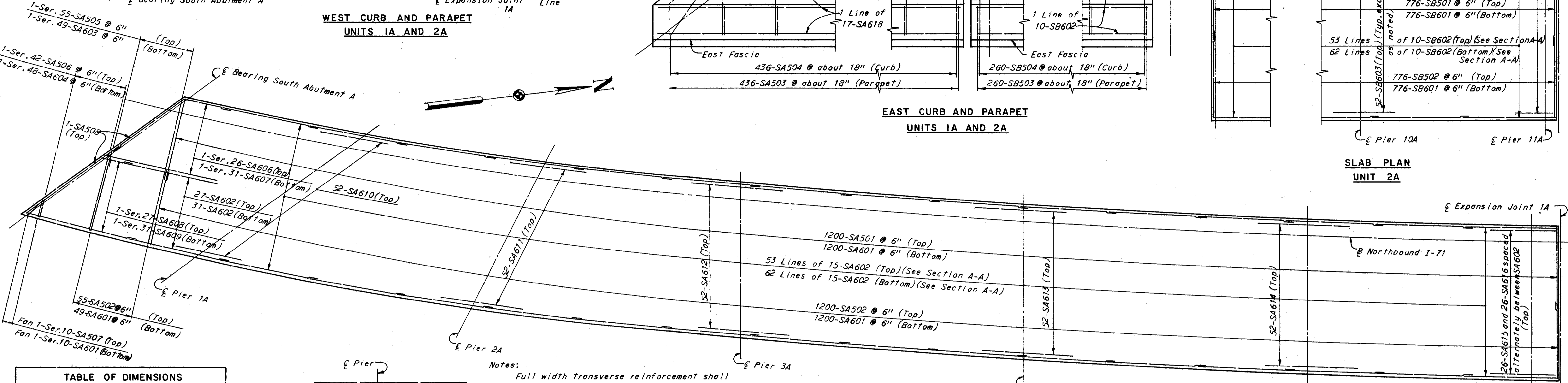
WEST CURB AND PARAPET UNITS 1A AND 2A



EAST CURB AND PARAPET UNITS 1A AND 2A



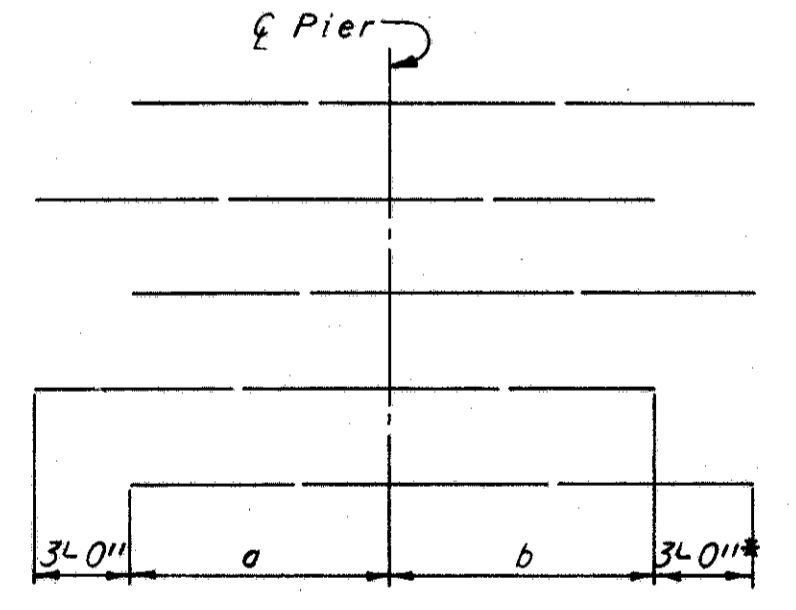
SLAB PLAN UNIT 2A



SLAB PLAN UNIT 1A

Pier	Bar Mark	Dim. a	Dim. b
1A	SA610	12'-6"	12'-6"
2A	SA611	12'-6"	13'-3"
3A	SA612	13'-3"	18'-3"
4A	SA613	18'-3"	18'-3"
5A	SA614	18'-3"	14'-3"
6A	SA615 and SA616	14'-3"	8'-9"
7 thru 10A	SB603	12'-0"	12'-0"
11A	SB604 and SB605	12'-0"	4'-9"

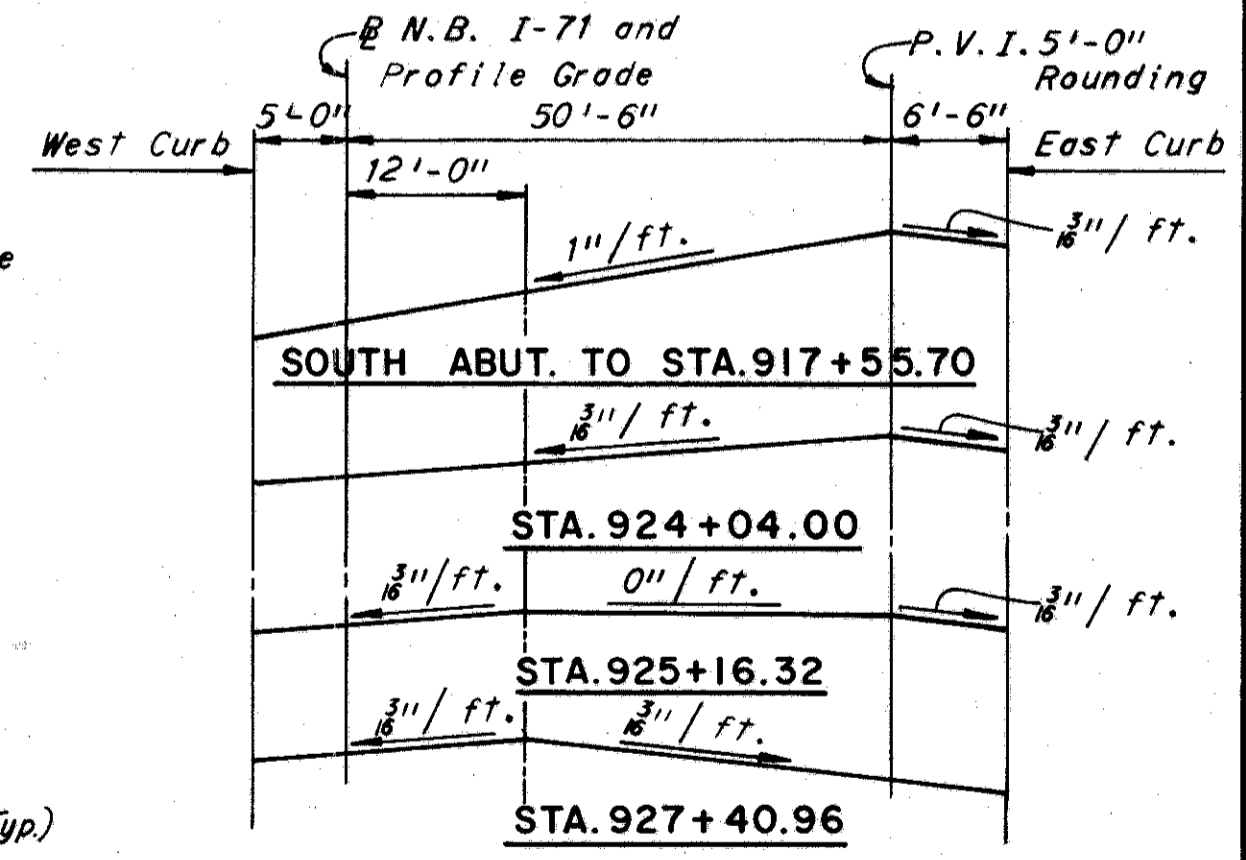
\*Note: The 3'-0" additional length on alternate bars is omitted on North side of Pier 6 and Pier 11.



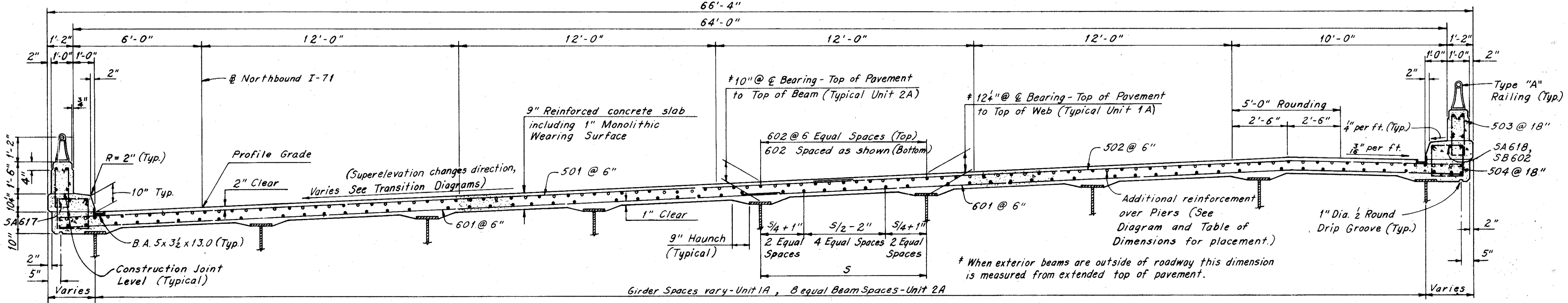
PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIERS

Notes:  
 Full width transverse reinforcement shall be spaced along and radial to East edge of slab. Transverse series reinforcement shall be spaced parallel to the nearest full width transverse reinforcement.  
 Longitudinal reinforcement shall be field bent concentric, as required.  
 Transverse slab bars shall be field bent below safety curb and roadway crowns as required.  
 Field bending shall be included in "Item S-4, Reinforcing Steel" for payment.  
 Additional reinforcement over piers shall be placed parallel to normal longitudinal reinforcement.

Notes:  
 For Reinforcement Schedule and Bending Diagrams see sheet 455.  
 For railing post and parapet joint spacing and longitudinal reinforcement in the parapet see sheet 431.  
 For additional details of railing see Ohio Standard Drawing AR-1-57.  
 For optional transverse slab construction joint see sheet 429.  
 For details of intermediate expansion joints, see sheets 423, 424 and 425.



SUPERELEVATION TRANSITION DIAGRAM  
 Note: Rate of transition between stations shown above is uniform.  
 H.N.T.B. BRIDGE NOS. 21A & 21B



TYPICAL SECTION

Note: All reinforcing bar marks in Unit 1A shall be prefixed SA and all reinforcing bar marks in Unit 2A shall be prefixed SB. In Typical Section bars having no prefix are typical for both units.

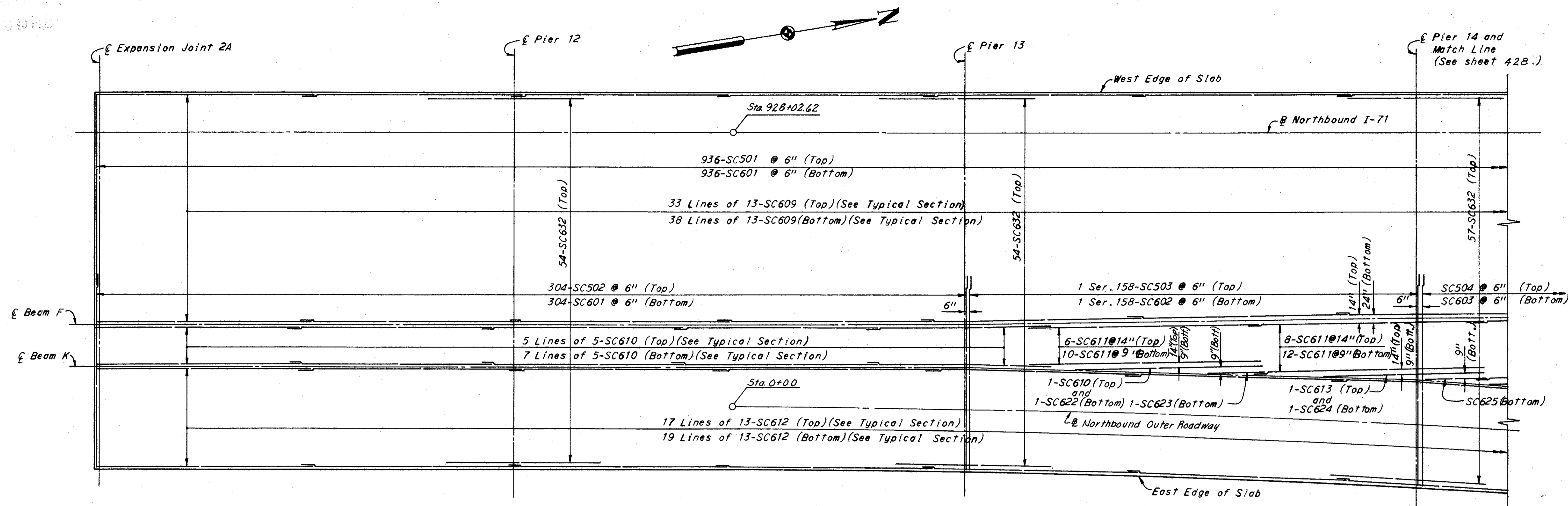
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

DECK REINFORCEMENT  
 UNIT 1-A AND 2-A  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

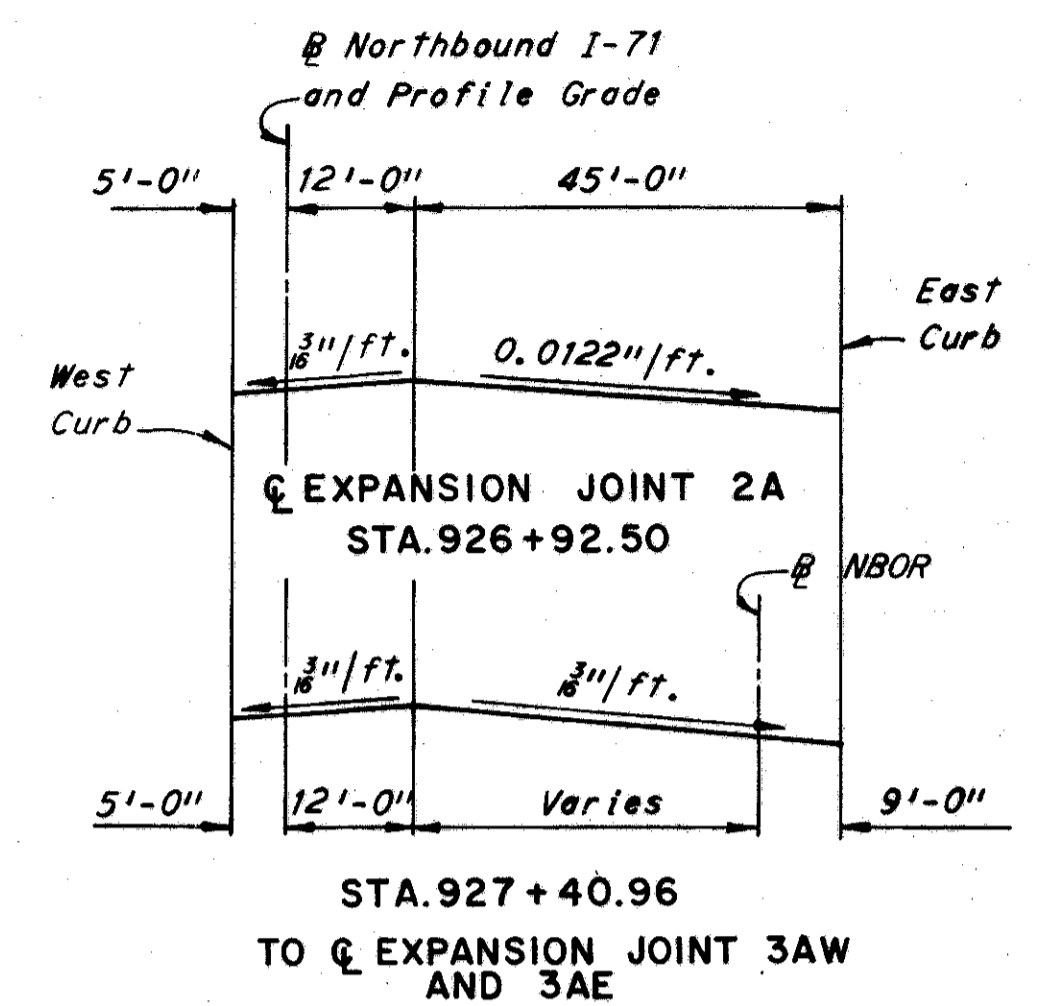
BR. NO. CUY-71-1789 R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN/MC TRACED CHECKED/DATE REVIEWED/DATE REVISIONS  
 DATE 10-10-64 DATE 11-17-64 DATE 12-22-64 SHEET 426

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



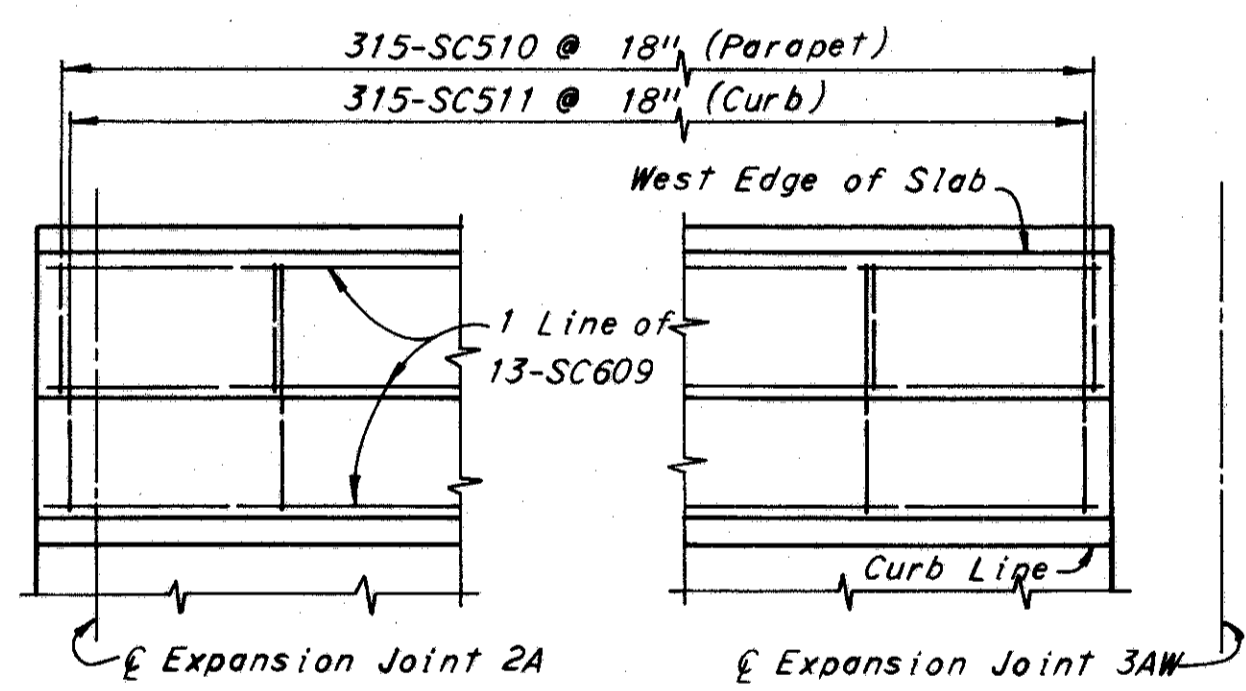
PART SLAB PLAN



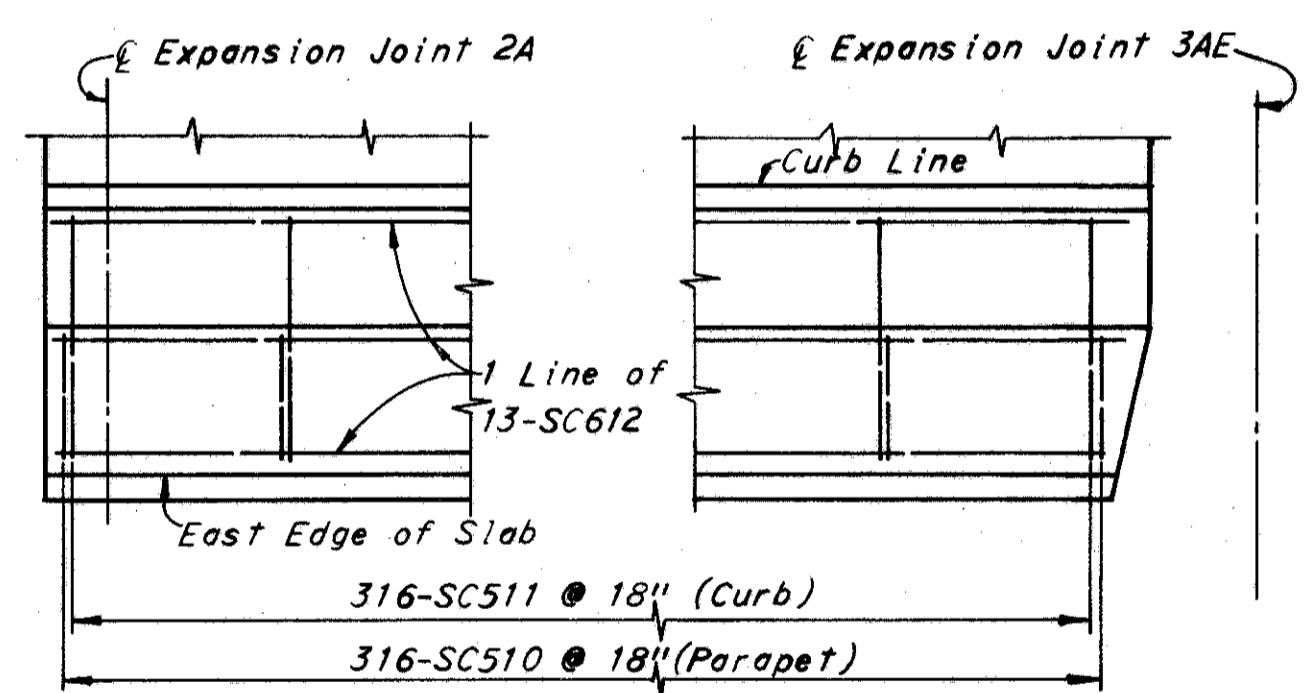
SUPERELEVATION TRANSITION DIAGRAMS

Note: Rate of transition between stations shown above is uniform.

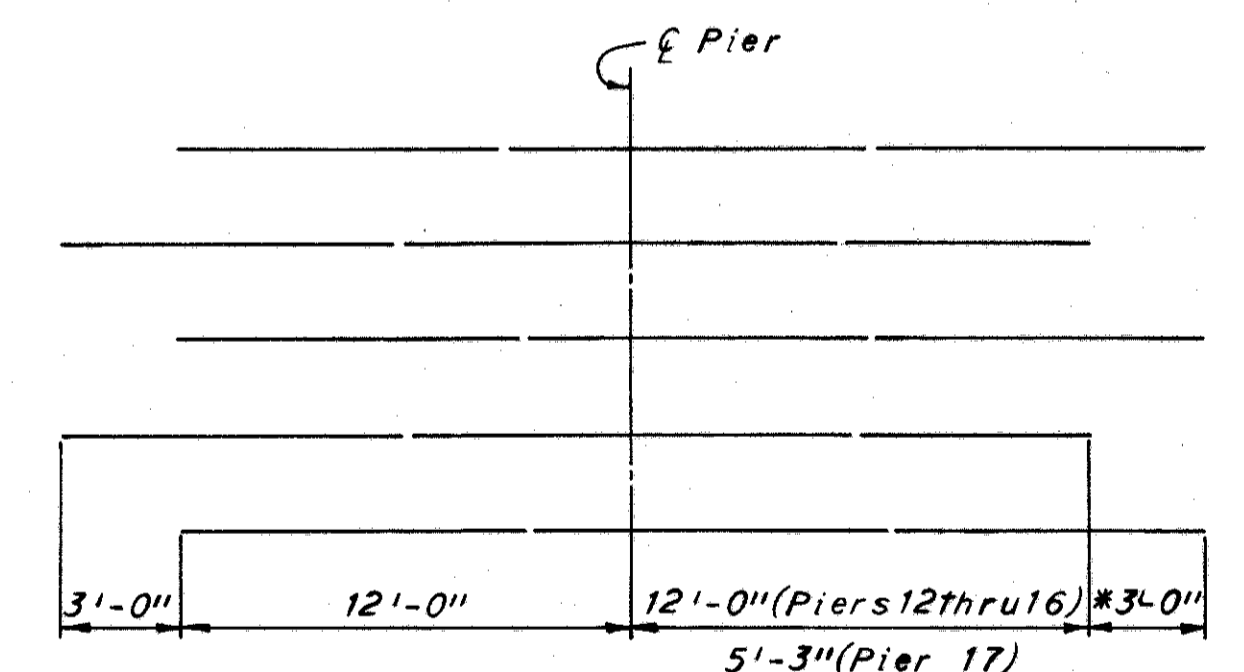
Notes:  
 All transverse reinforcement shall be spaced along  $\epsilon$  Beam A.  
 Longitudinal reinforcement between the West Edge of Slab and  $\epsilon$  Beam K shall be parallel to  $\epsilon$  Beam A. Longitudinal reinforcement between  $\epsilon$  Beam K and the East Edge of Slab shall be parallel to  $\epsilon$  Northbound I-71 to Sta. 928+02.62  $\epsilon$  Northbound I-71, and then shall be concentric with  $\epsilon$  Northbound Outer Roadway from Sta. 0+00.00  $\epsilon$  Northbound Outer Roadway.



WEST CURB & PARAPET

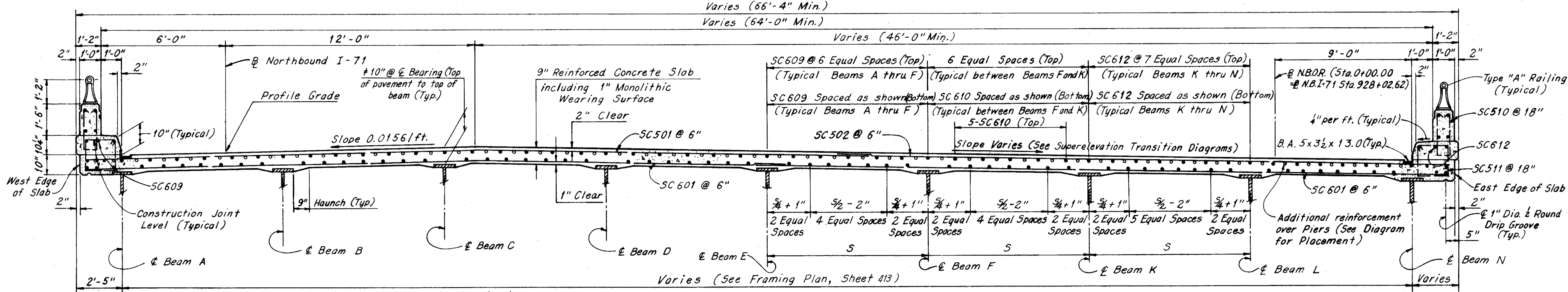


EAST CURB & PARAPET



PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIERS

\* The 3'-0" additional length on alternate bars is omitted on North side of Pier 17.



TYPICAL SECTION  
 (Beam F adjacent to Beam K)

\* Note: When exterior beams are outside of roadway this dimension is measured from extended top of pavement.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

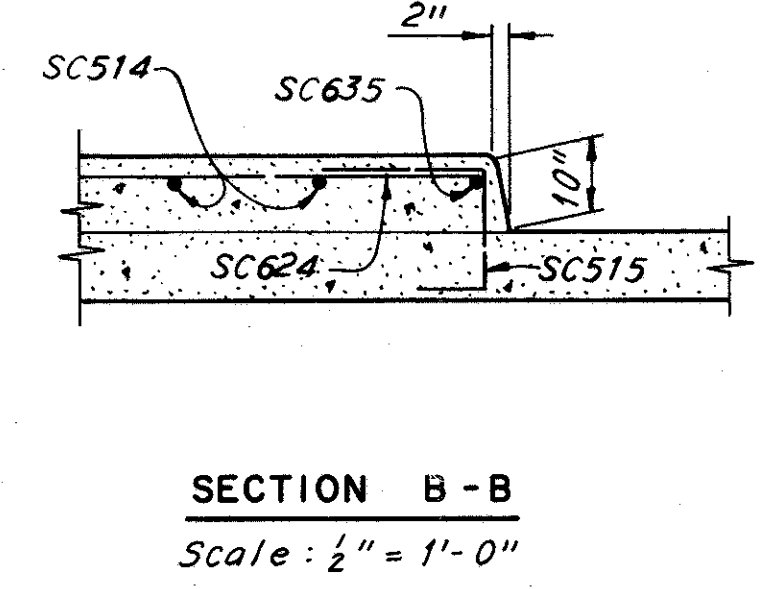
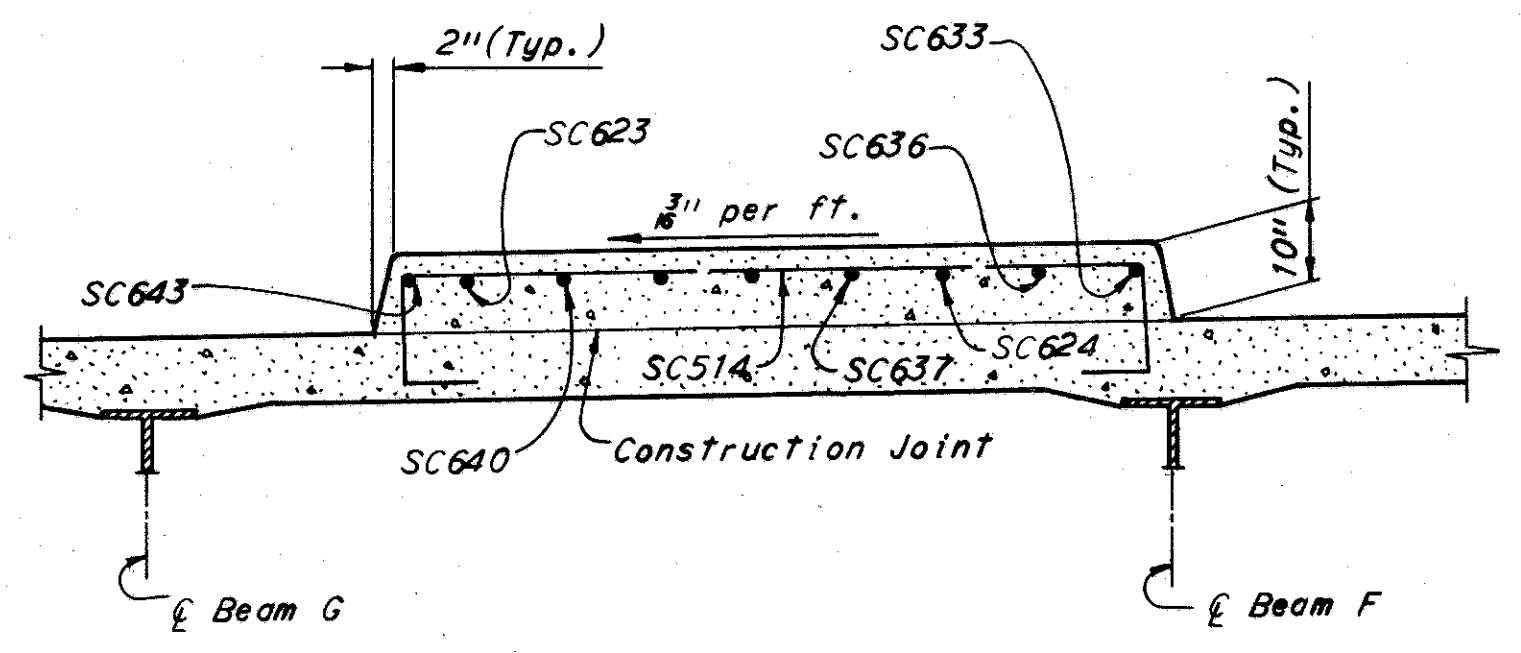
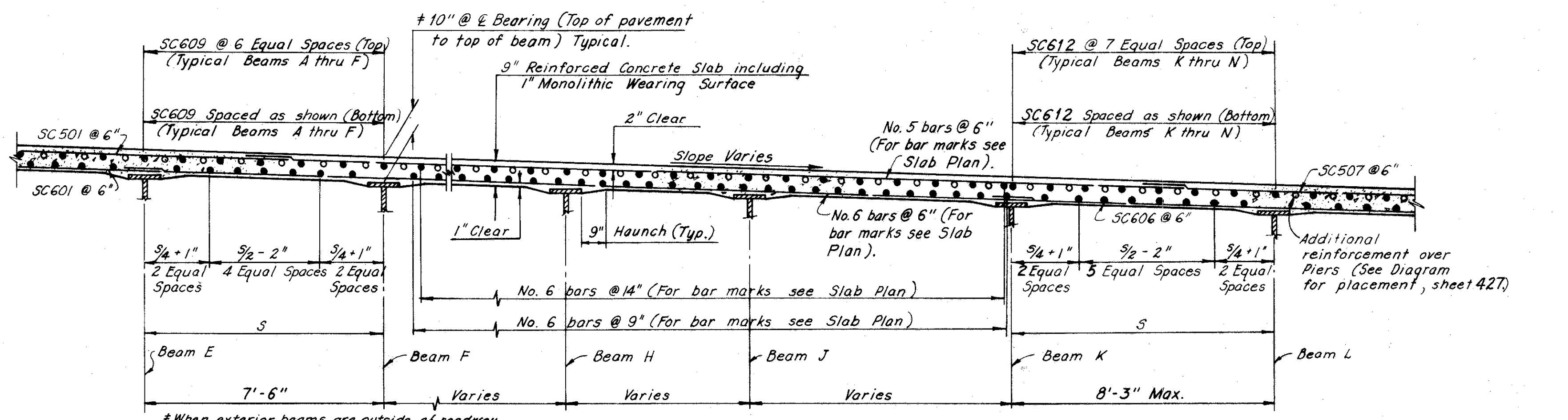
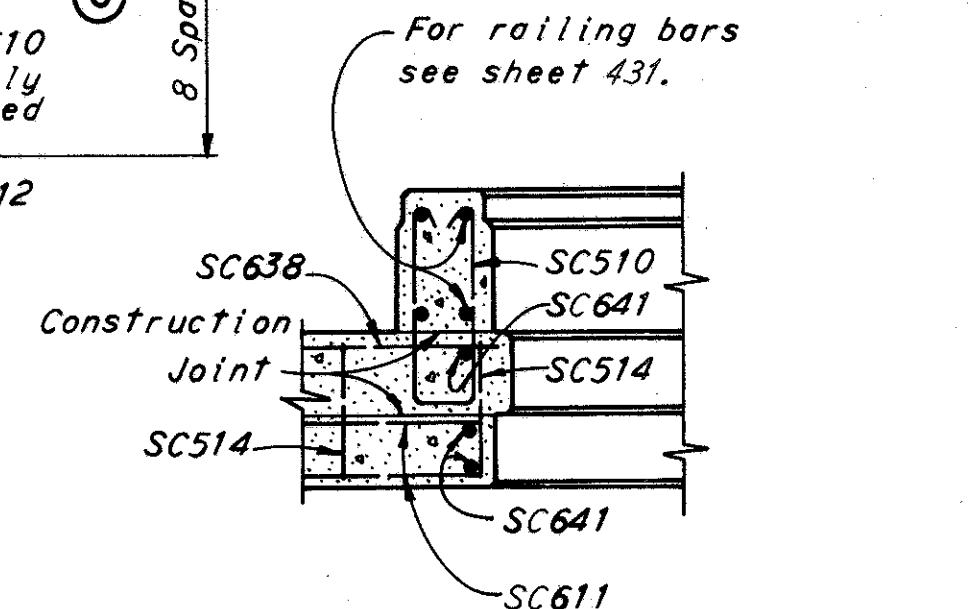
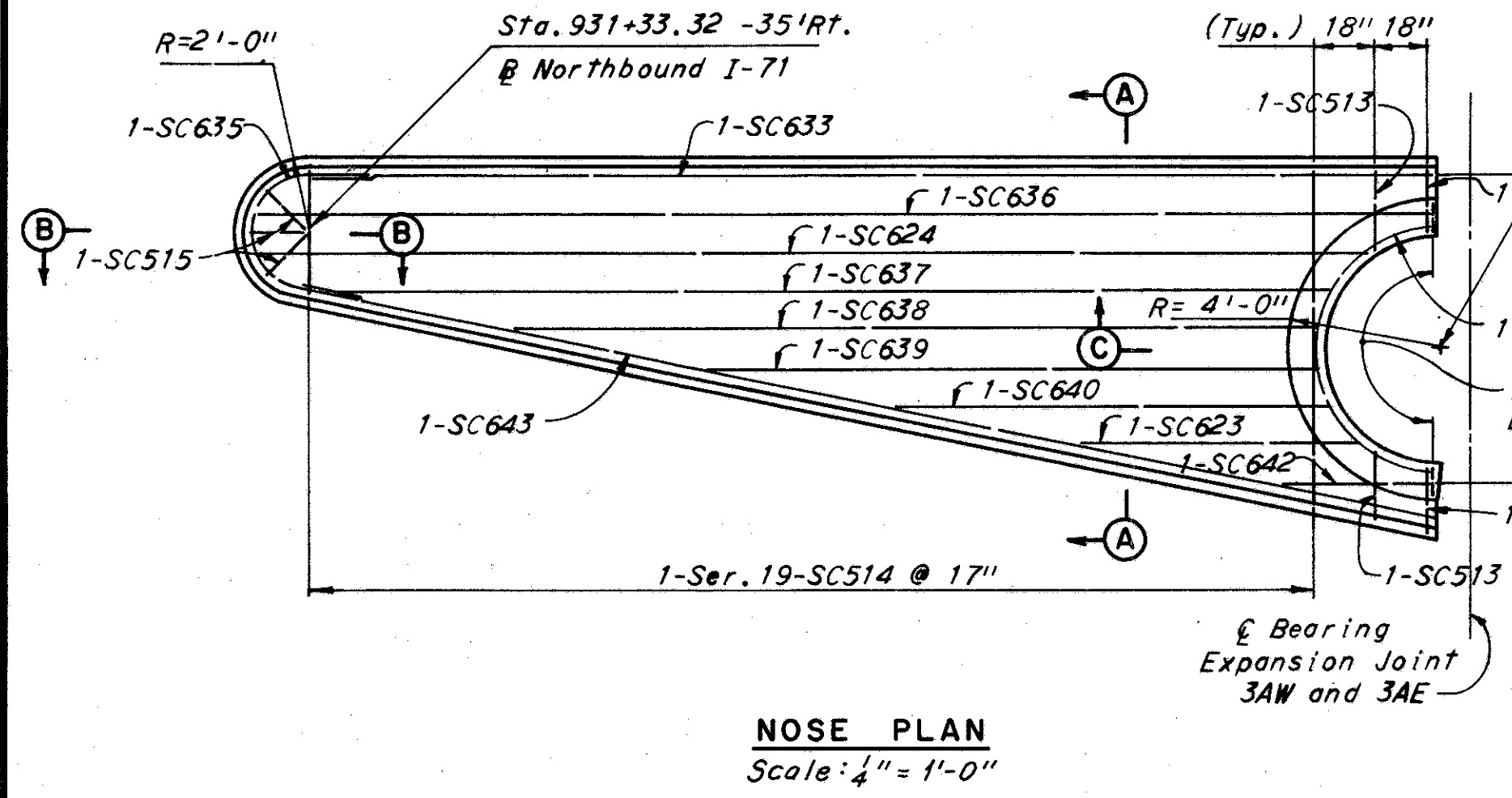
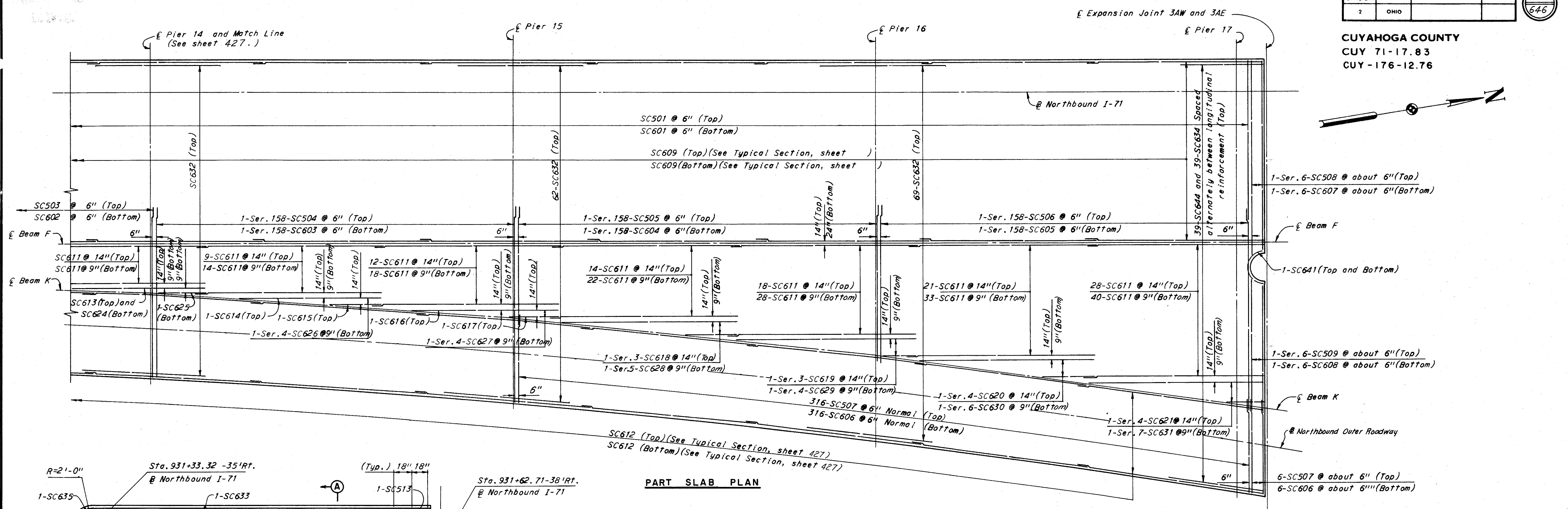
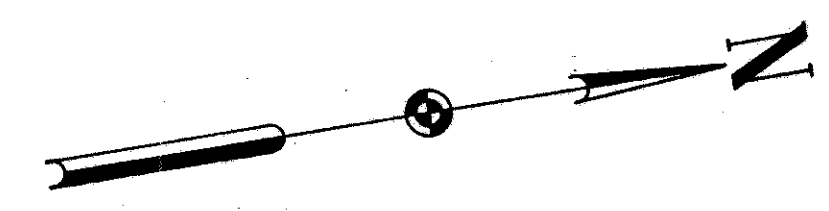
DECK REINFORCEMENT  
 UNIT 3-A  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/MC TRACED CHECKED/AS REVIEWED/WZ  
 DATE 10-10-64 DATE 10-20-64 DATE 12-22-64 SHEET 427

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**DECK REINFORCEMENT  
UNIT 3-A**

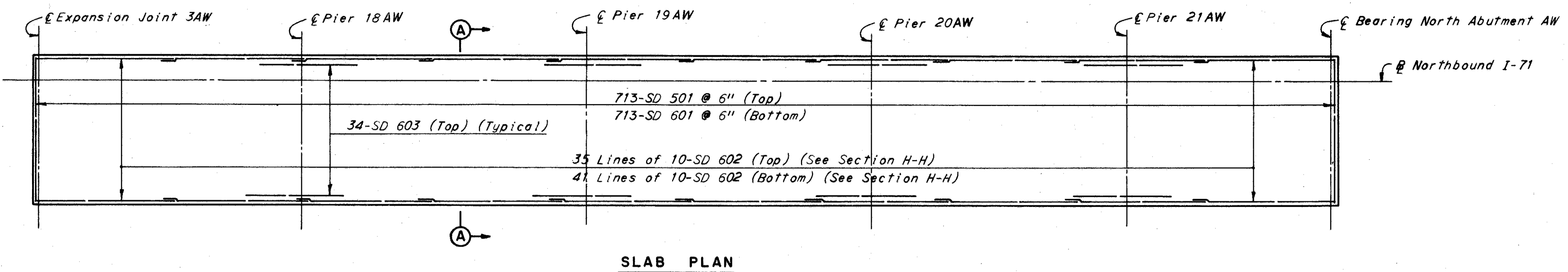
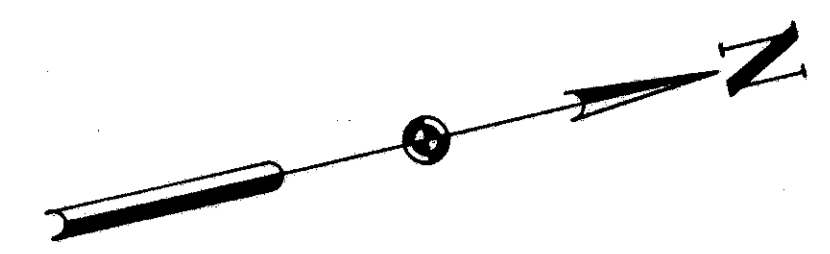
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

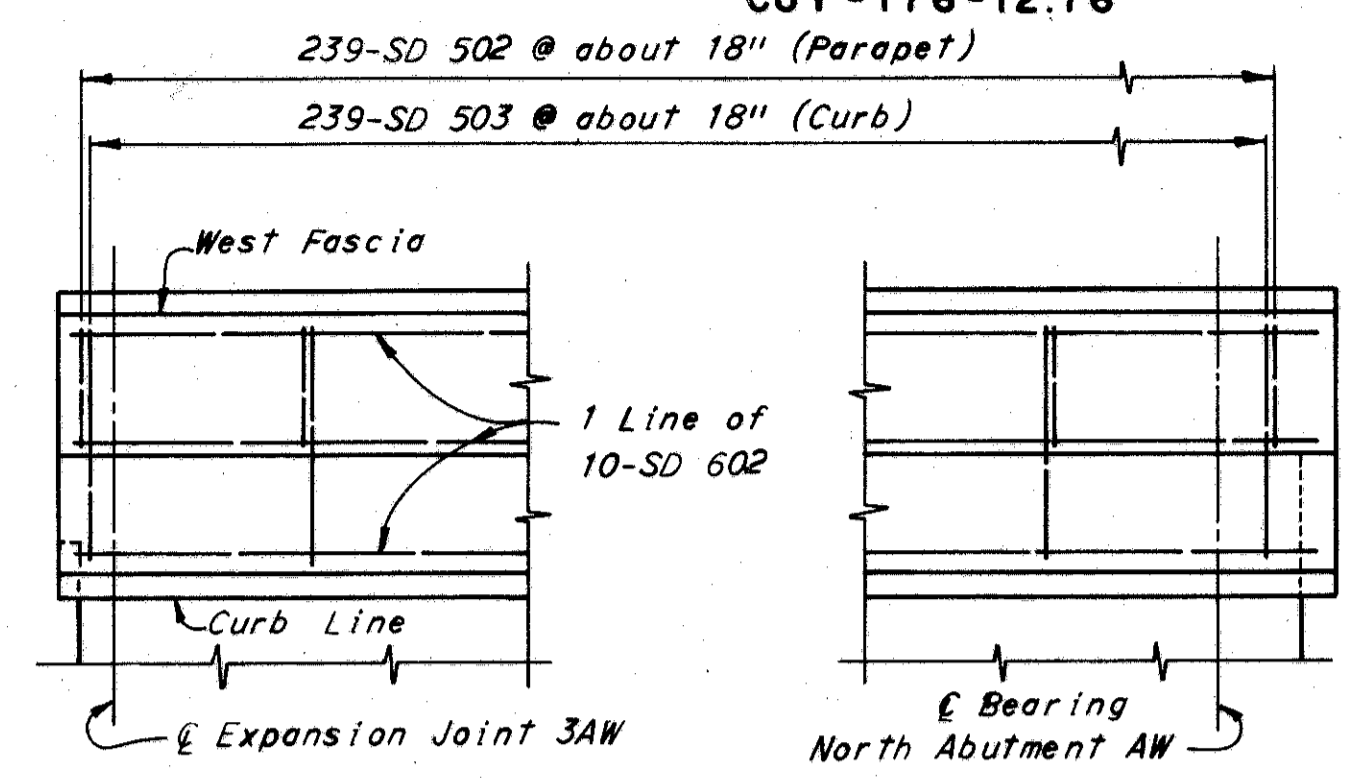
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/MC	TRACED	CHECKED/AF	REVIEWED/WZ	REVISED
DATE 10-10-64	DATE	DATE 10-20-64	DATE 12-22-64	SHEET 428

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

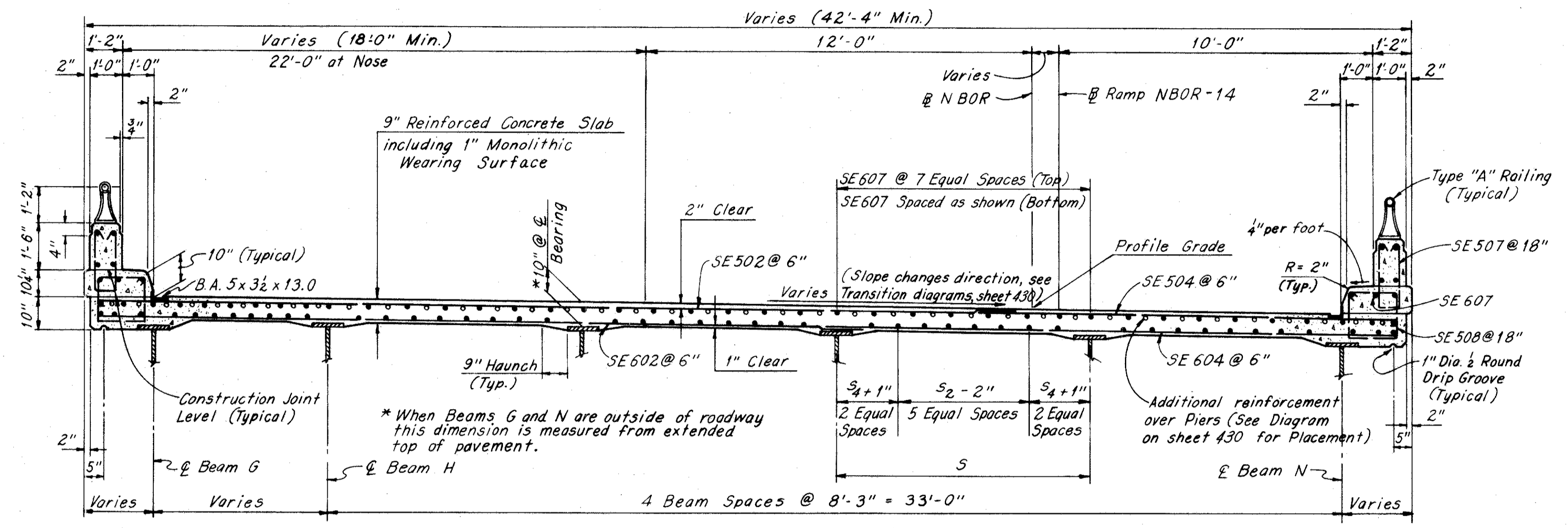


SLAB PLAN

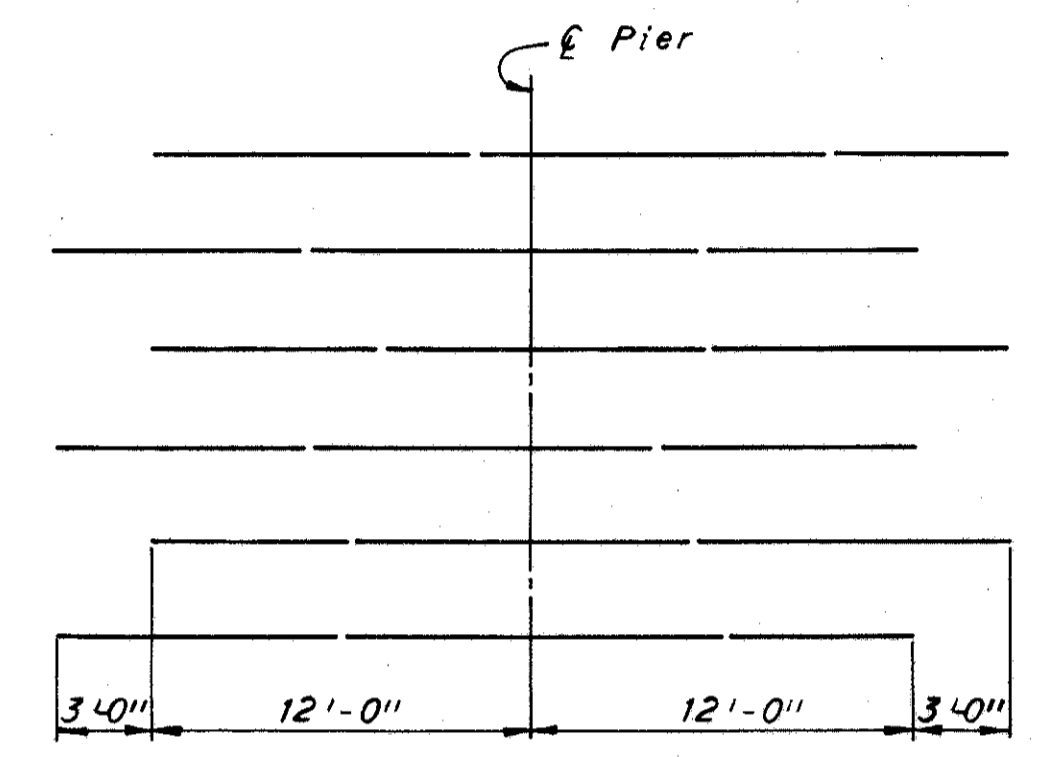


WEST CURB AND PARAPET

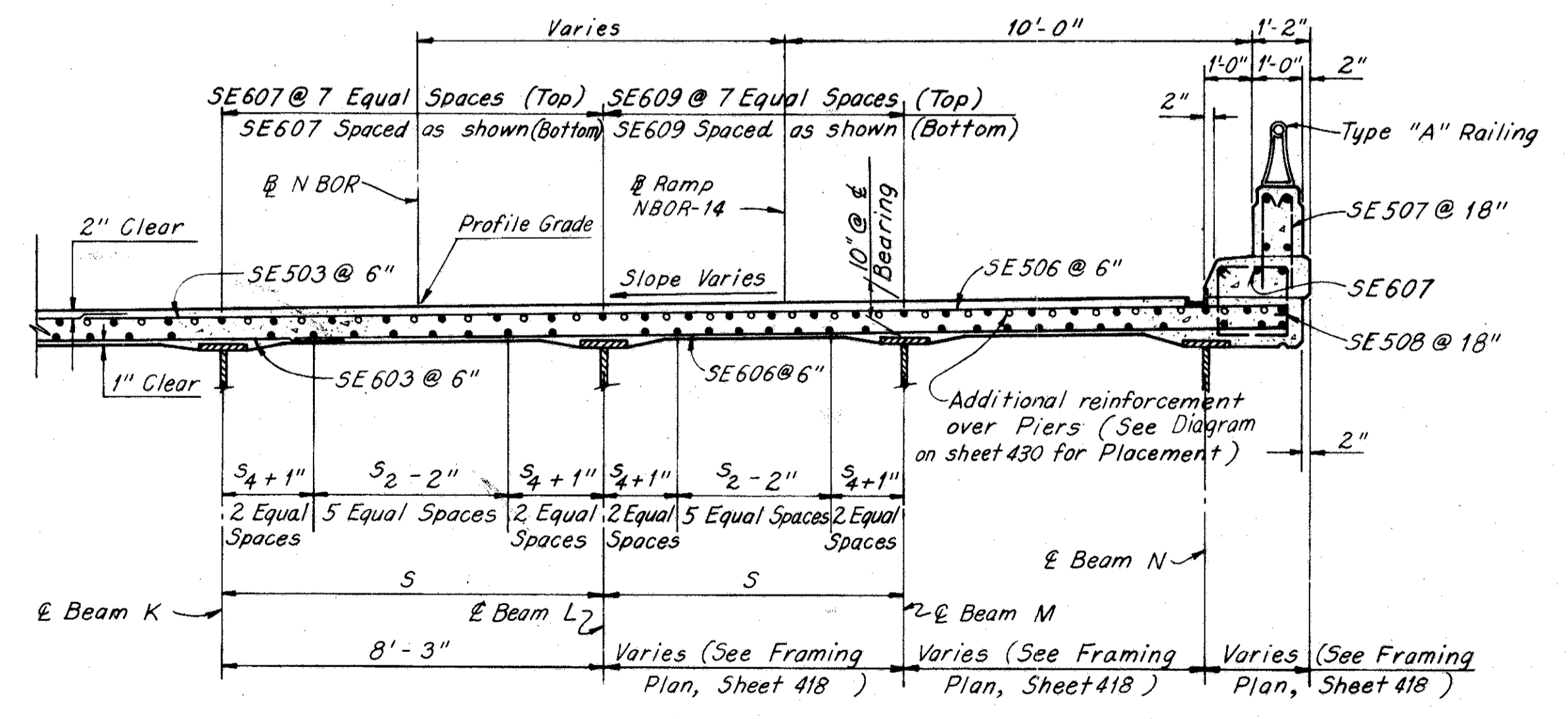
EAST CURB AND PARAPET



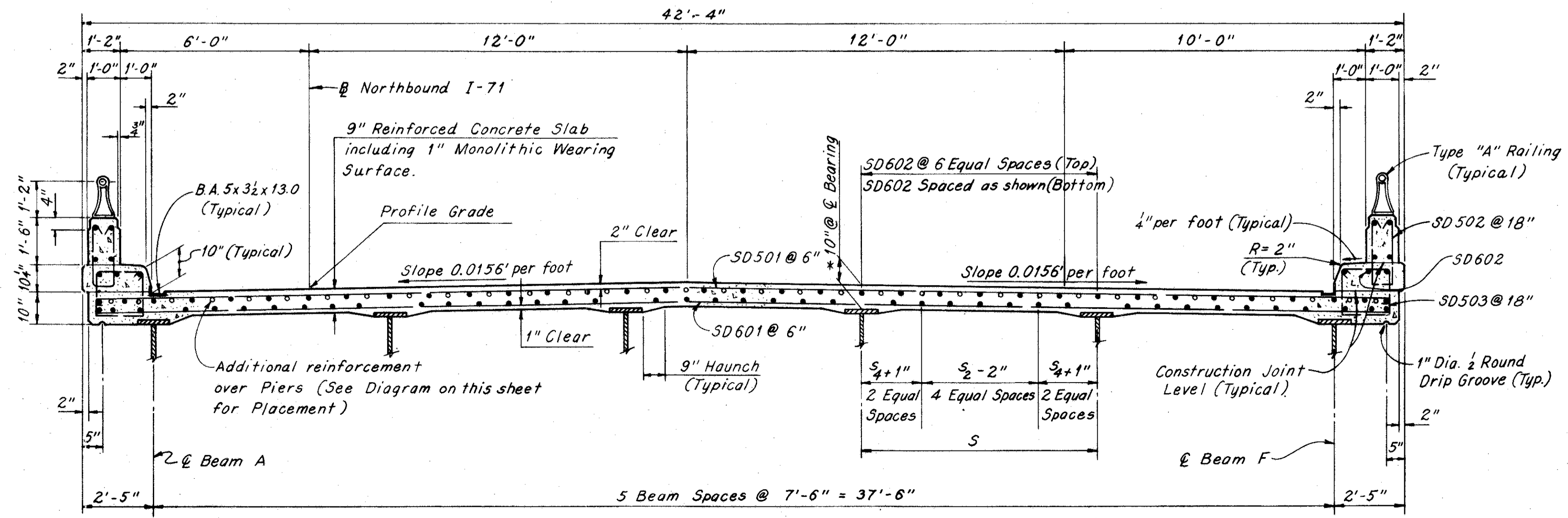
SECTION B-B



PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIERS

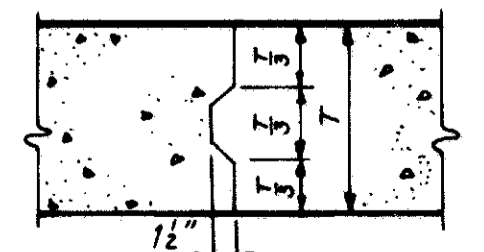


SECTION C-C



SECTION A-A

\* For Beams A and F this dimension is measured from extended top of pavement.



OPTIONAL TRANSVERSE SLAB CONSTRUCTION JOINT

Notes:  
 All reinforcing bar marks in Unit 4AW shall be prefixed SD and all reinforcing bar marks in Unit 4AE shall be prefixed SE.  
 For location of Sections B-B and C-C see sheet 430.  
 For additional notes see sheet 426.

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**DECK REINFORCEMENT UNIT 4-AW**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

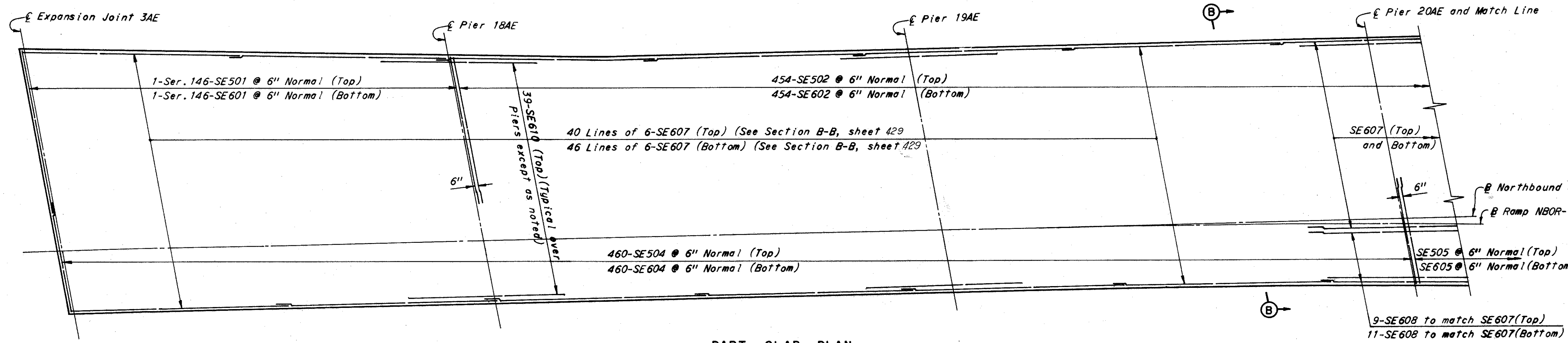
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/MC TRACED CHECKED/MS REVIEWED/JF REVISIONS  
 DATE 10-10-64 DATE 11-19-64 DATE 12-22-64 SHEET 429

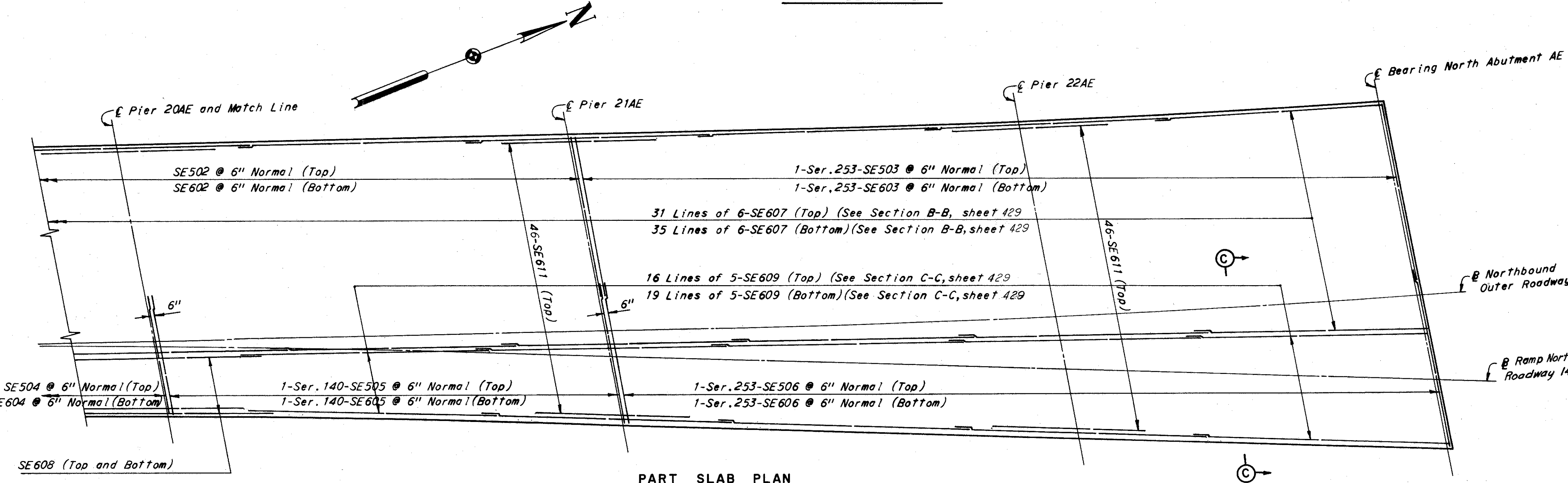


CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

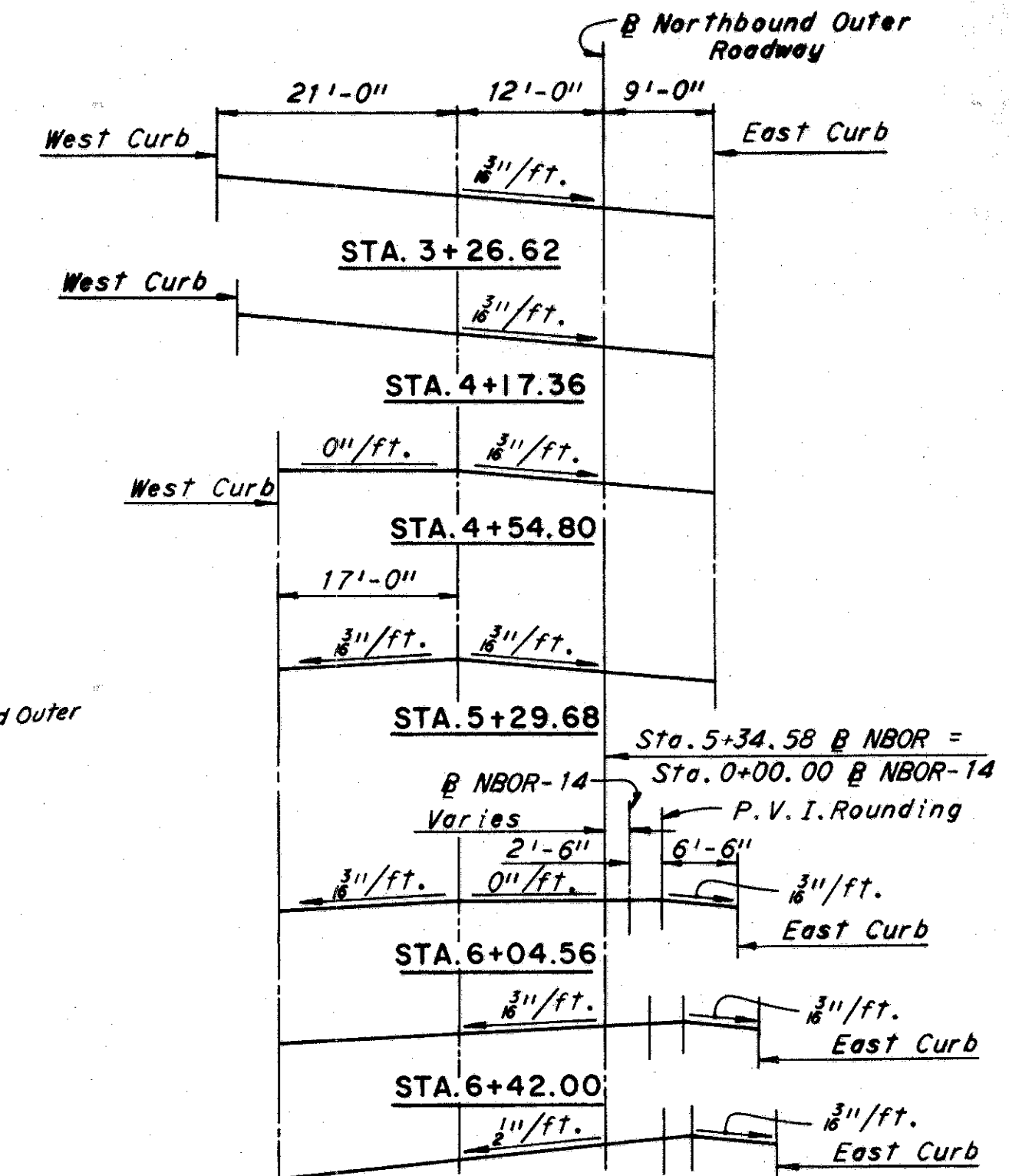


PART SLAB PLAN

Note:  
 For Sections B-B and C-C  
 and for notes see sheet 429.

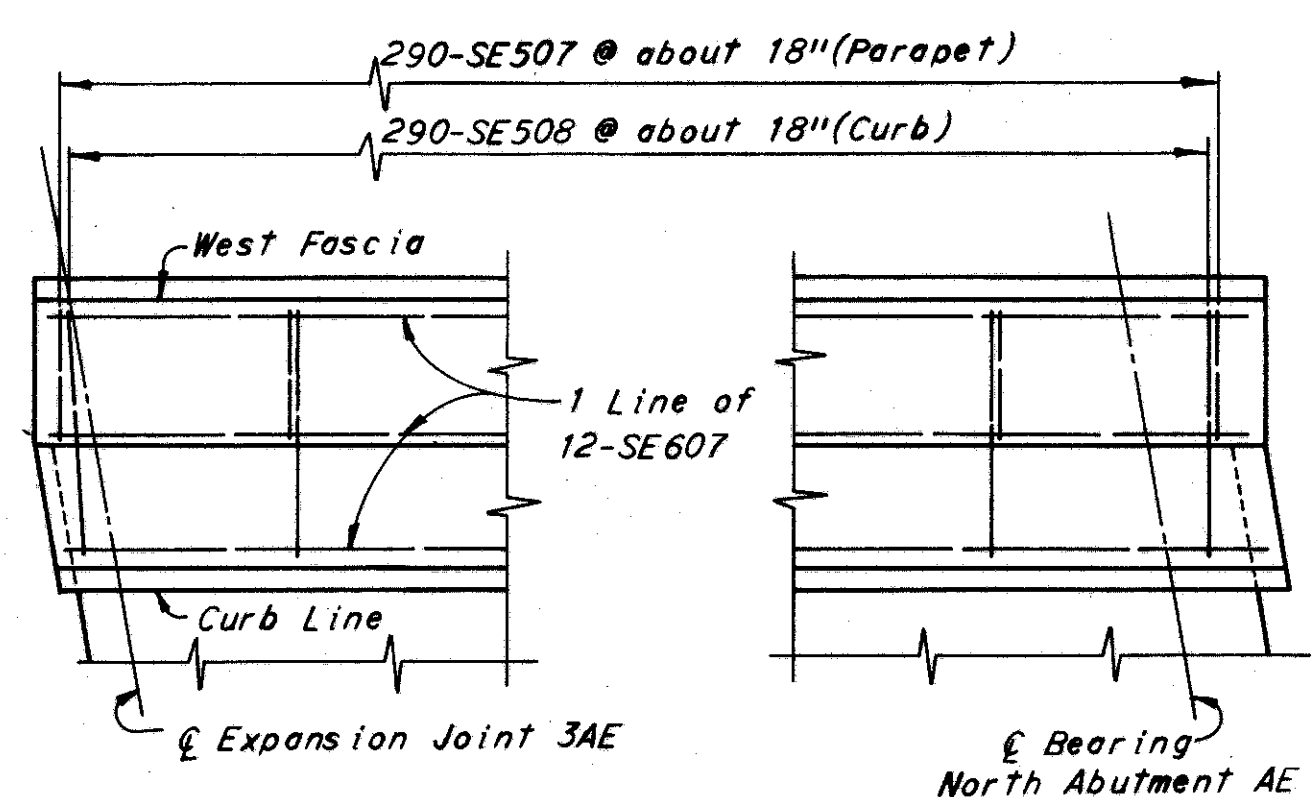


PART SLAB PLAN

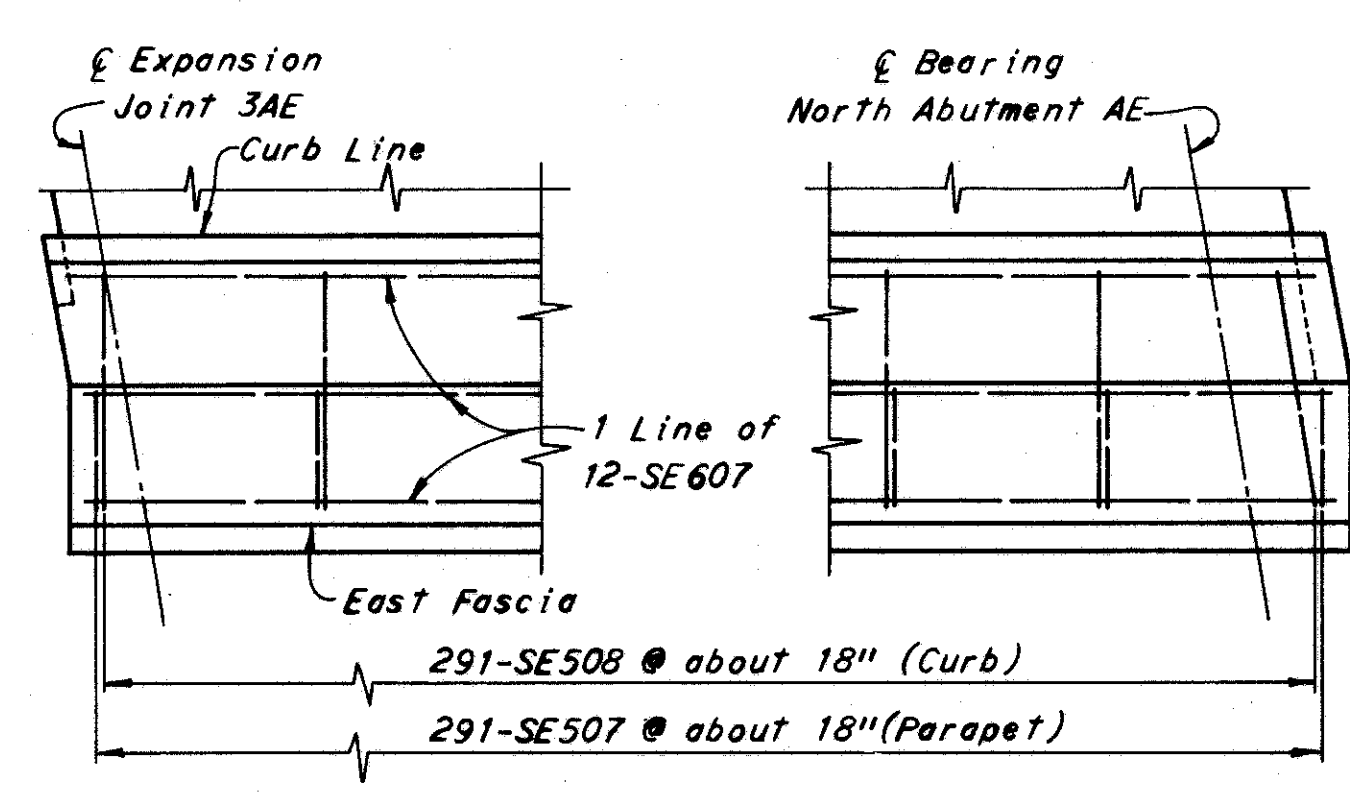


STA. 7+92.72 TO NORTH ABUTMENT  
 SUPERELEVATION TRANSITION DIAGRAMS

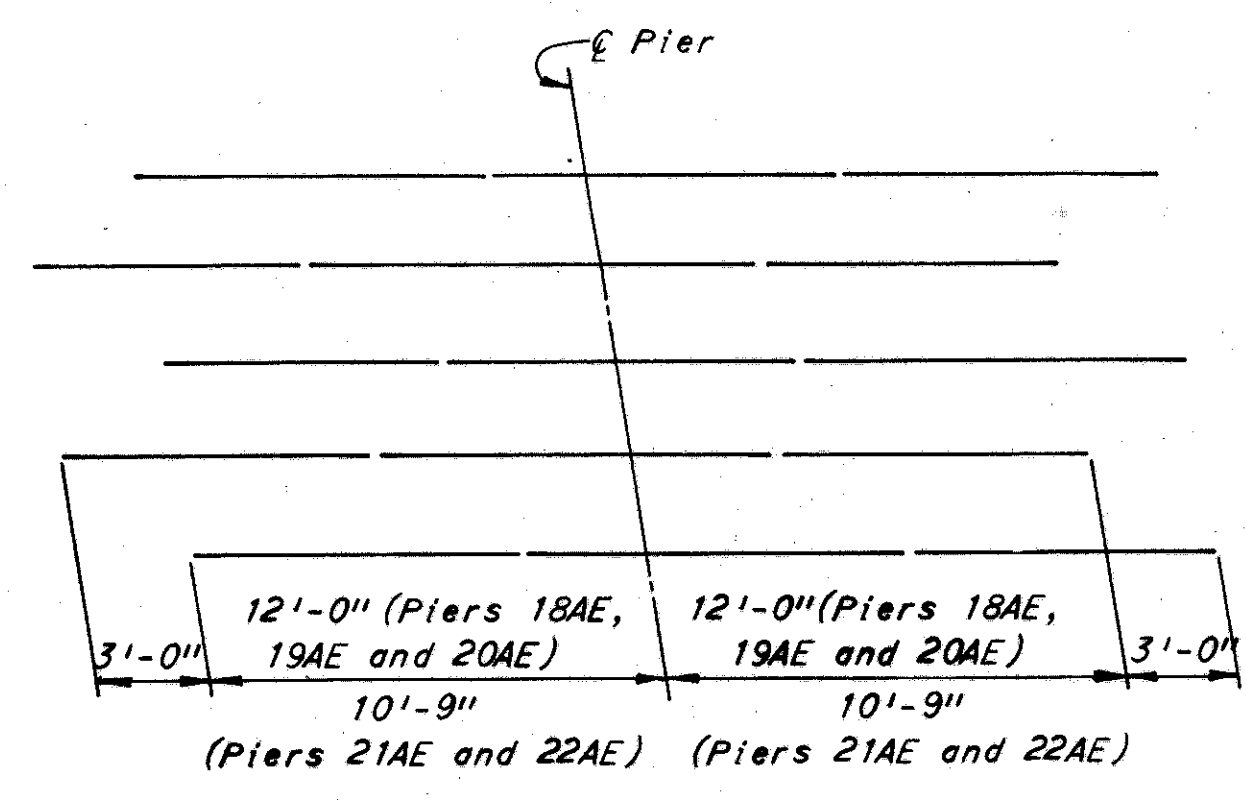
Note: Rate of transition between stations shown above is uniform.



WEST CURB & PARAPET



EAST CURB & PARAPET



PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIERS

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**DECK REINFORCEMENT  
 UNIT 4-AE**

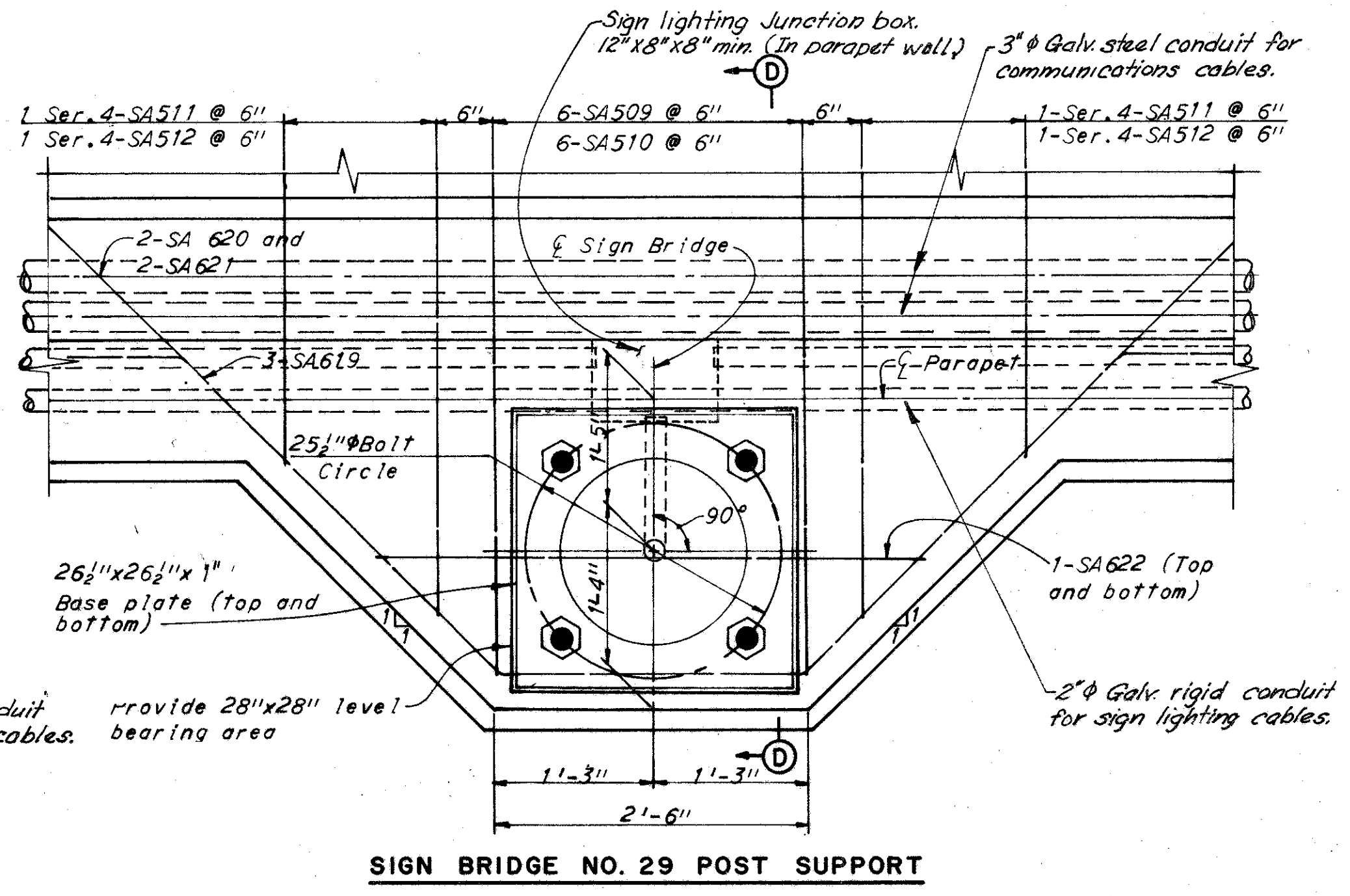
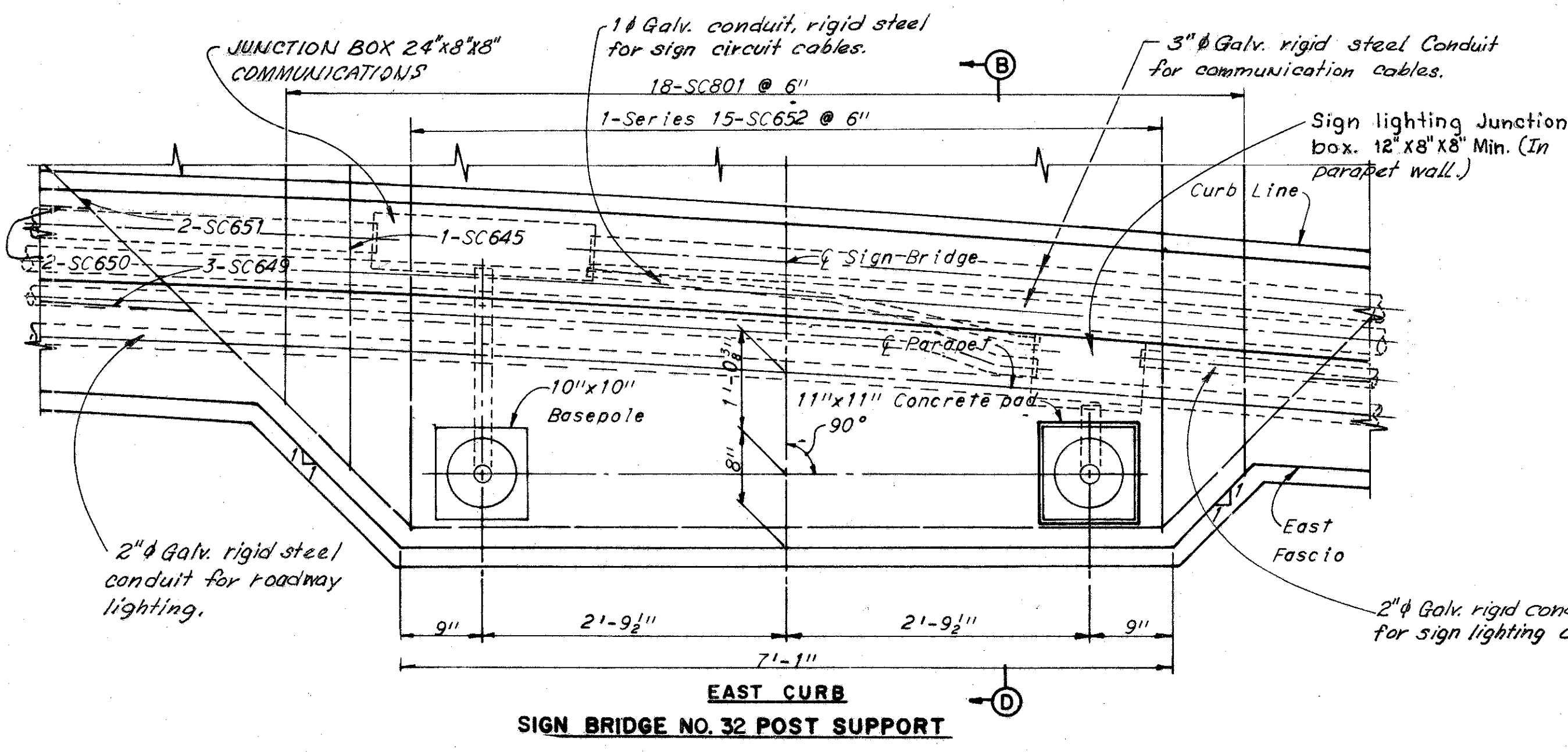
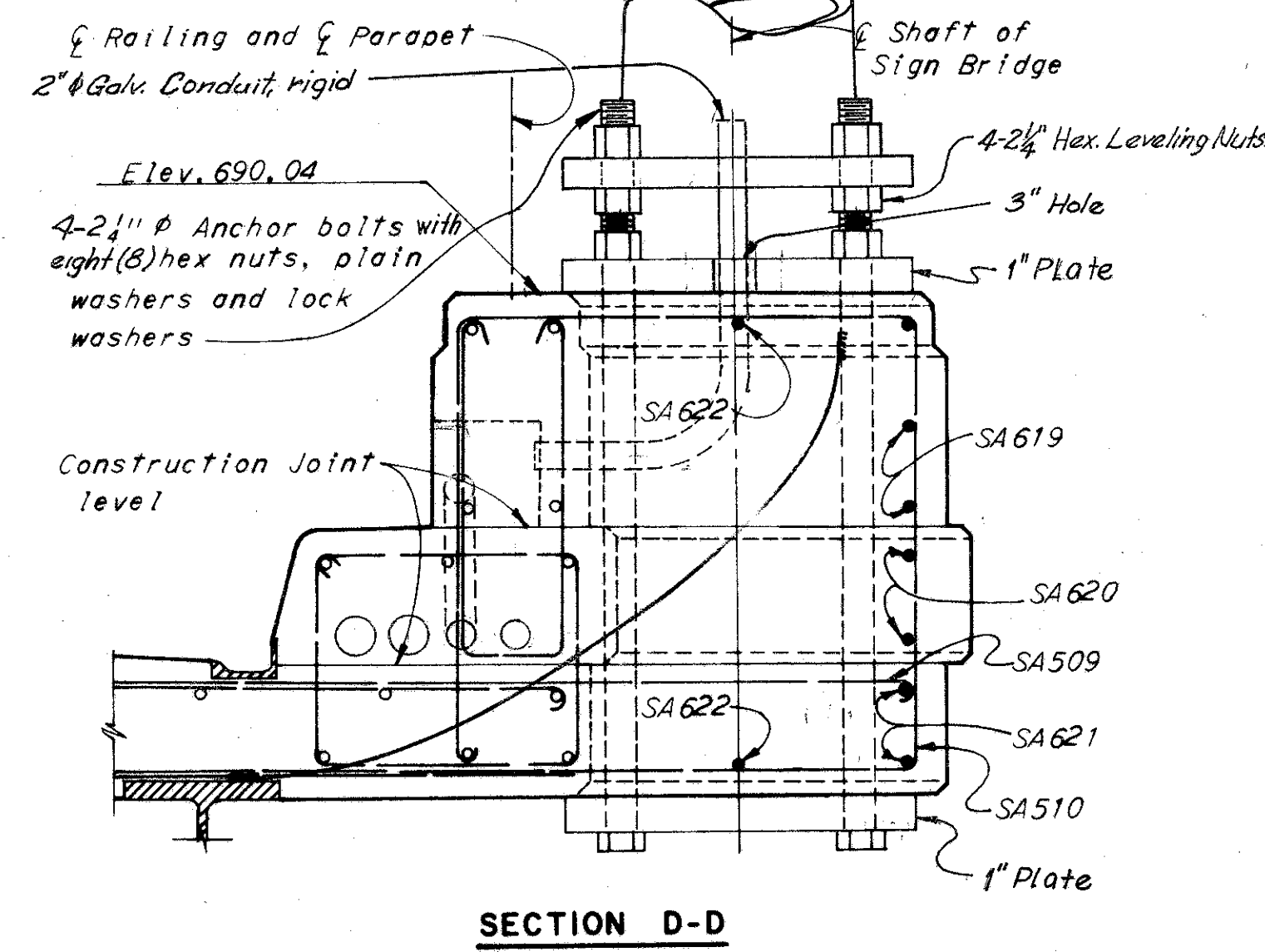
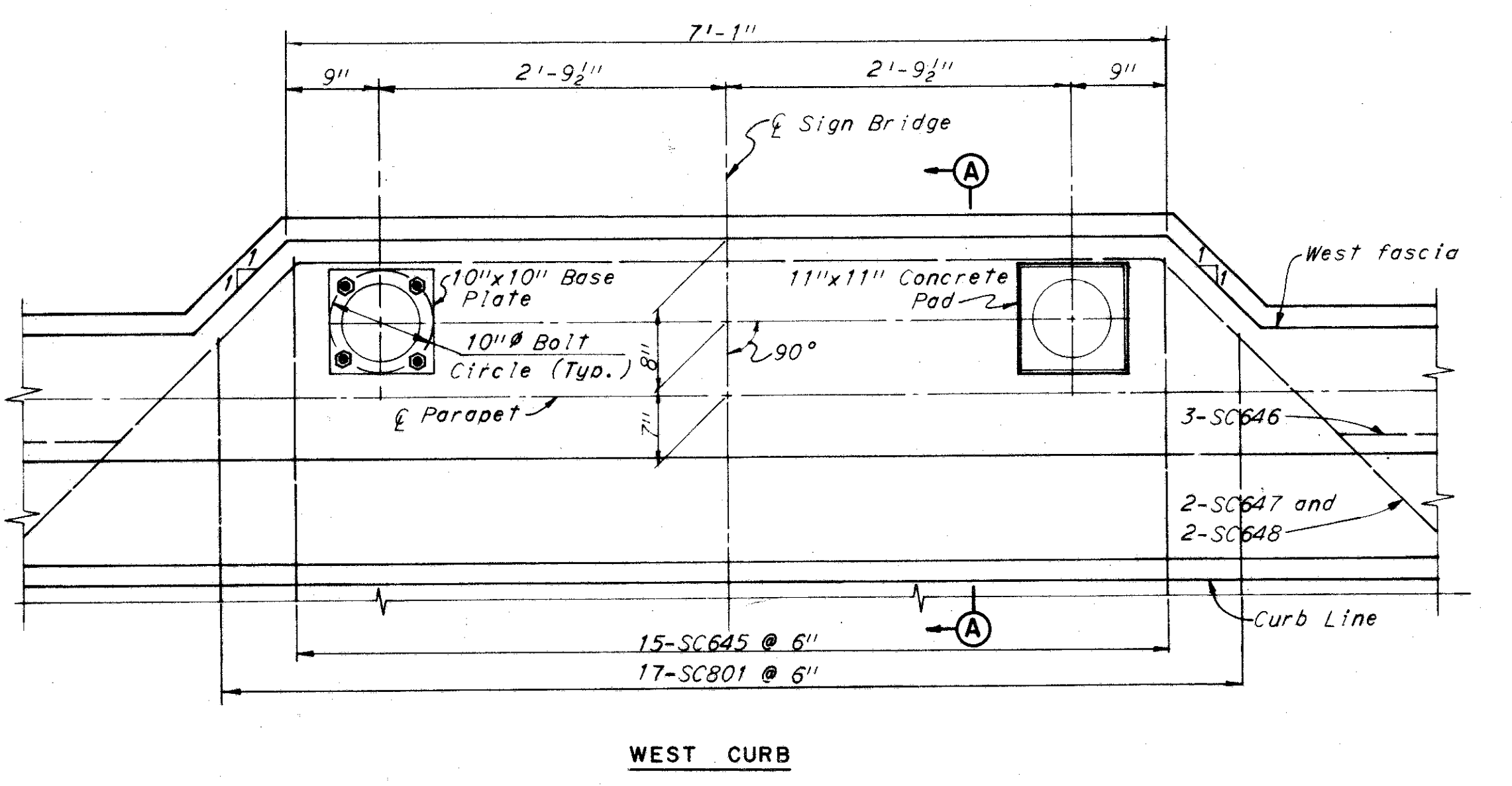
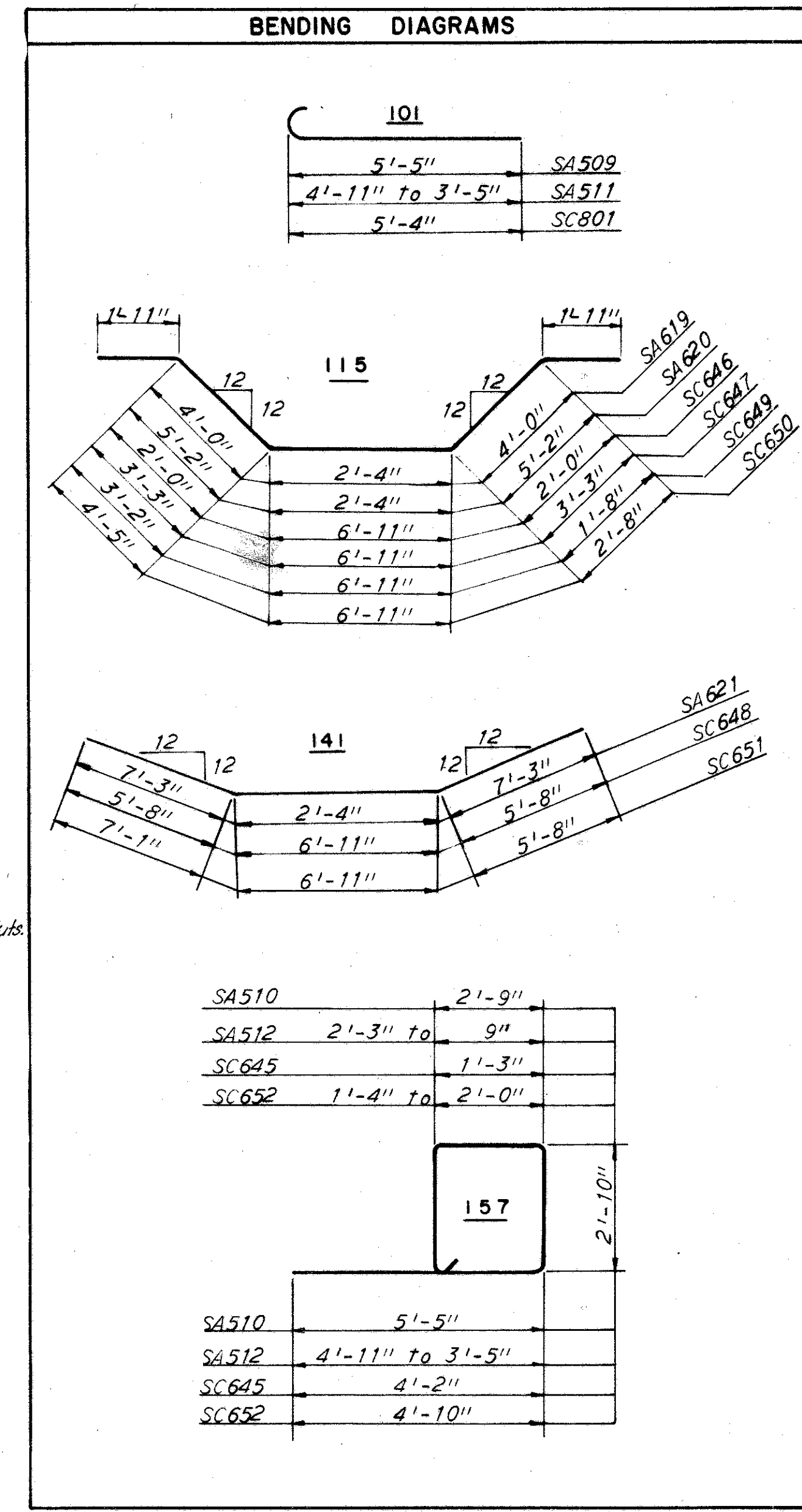
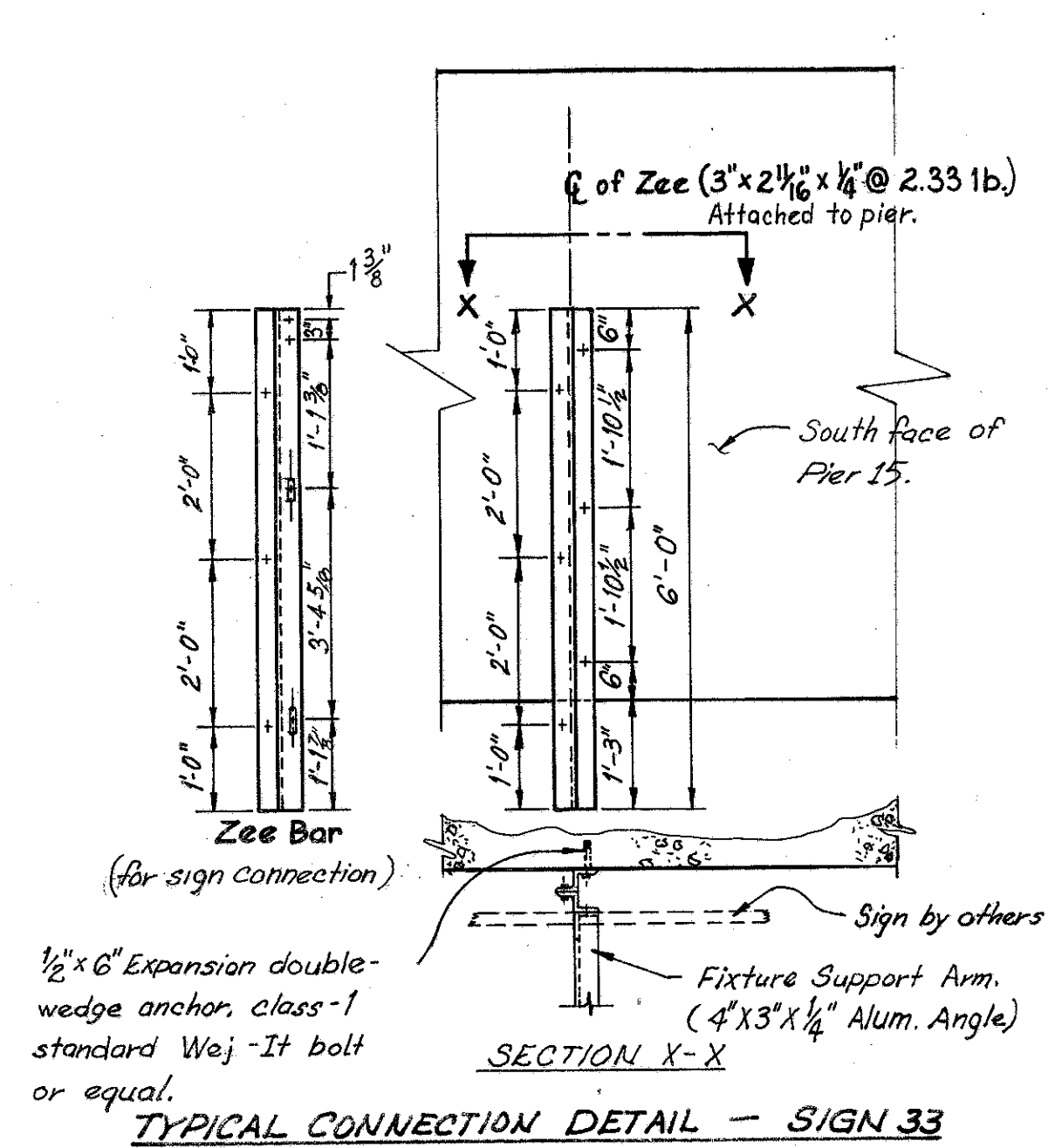
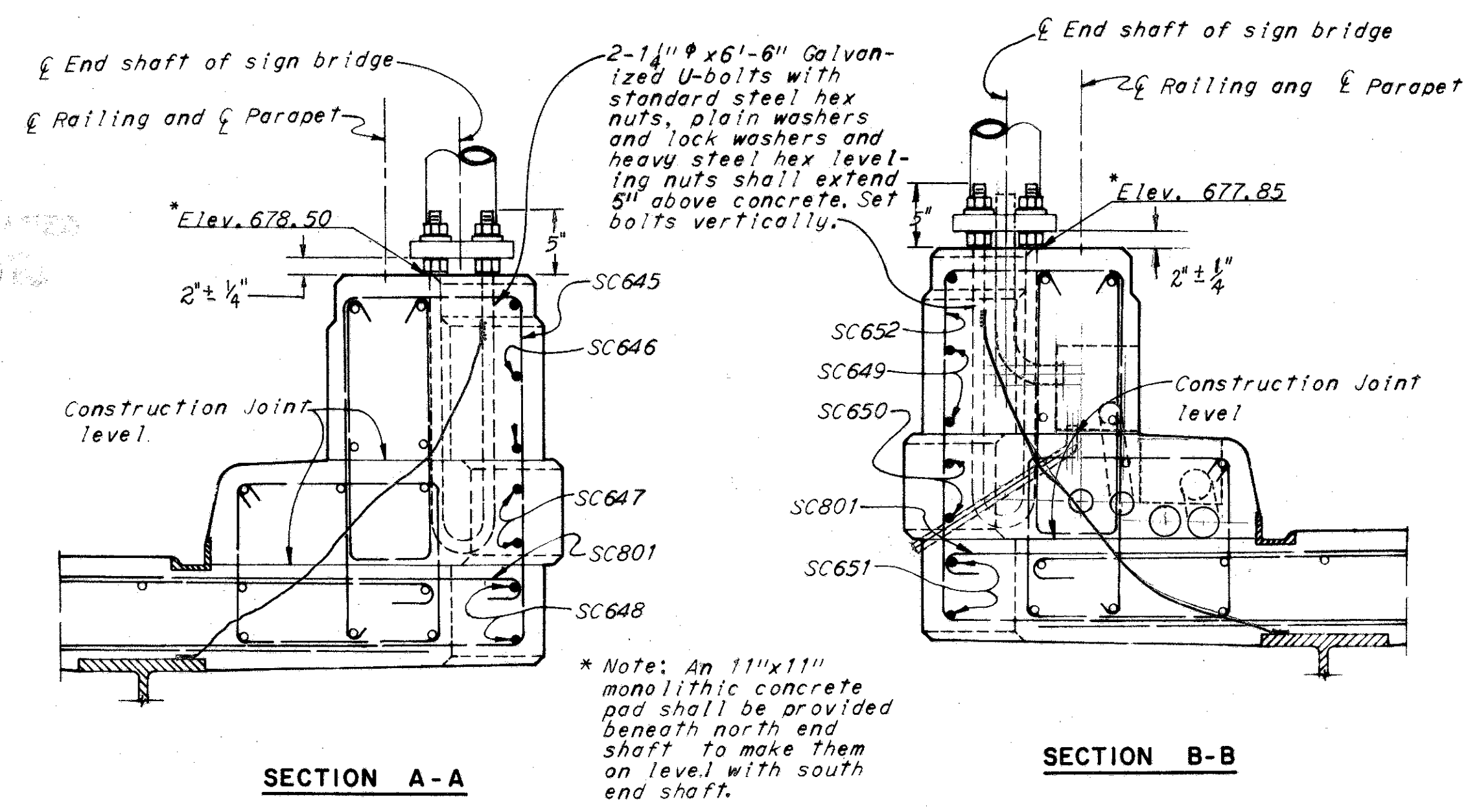
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN/MC	TRACED	CHECKED/WF
DATE 10-10-64	DATE	DATE 12-22-64

SHEET 430

**CUYAHOGA COUNTY**  
**CUY 71-17.83**  
**CUY-176-12.76**



Reinforcement for Sign Bridge No. 29 to be included with Superstructure Unit 1A and for Sign Bridge No. 32 with Superstructure Unit 3A.

Note: Concrete and reinforcement to be included with superstructure quantities. Anchor bolts to be included with respective sign quantities.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**SIGN SUPPORT DETAILS**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

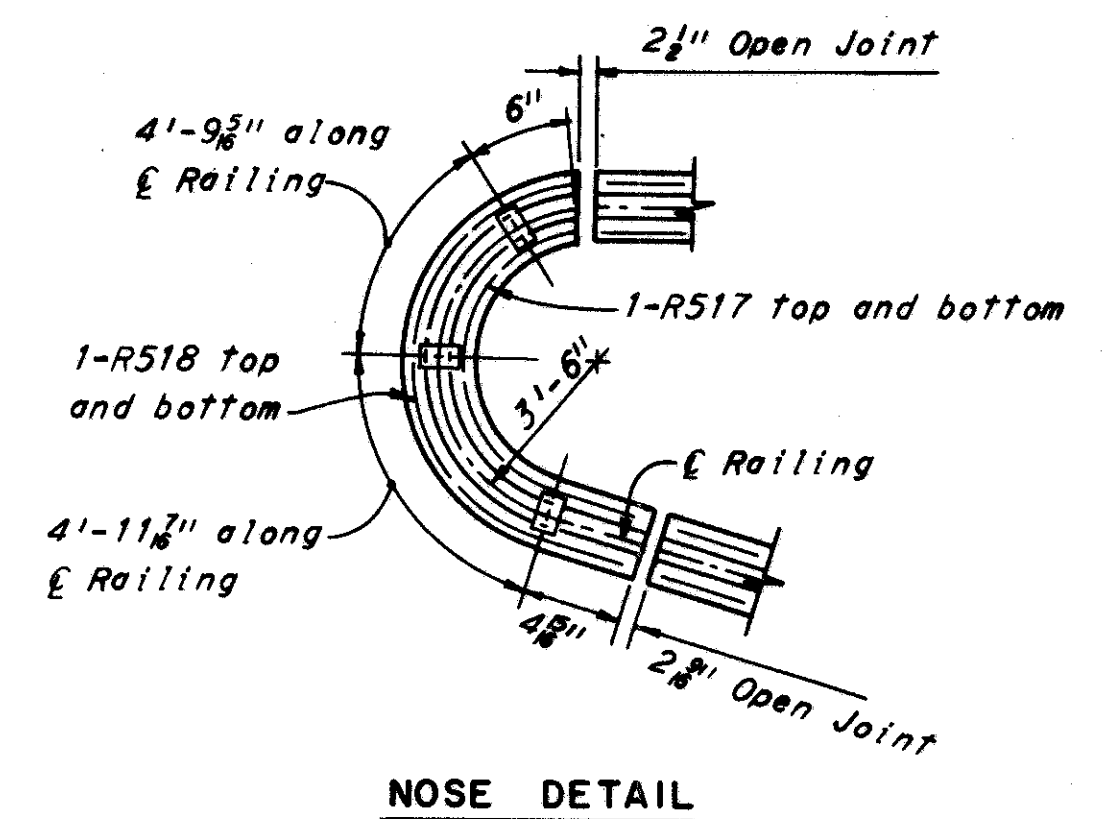
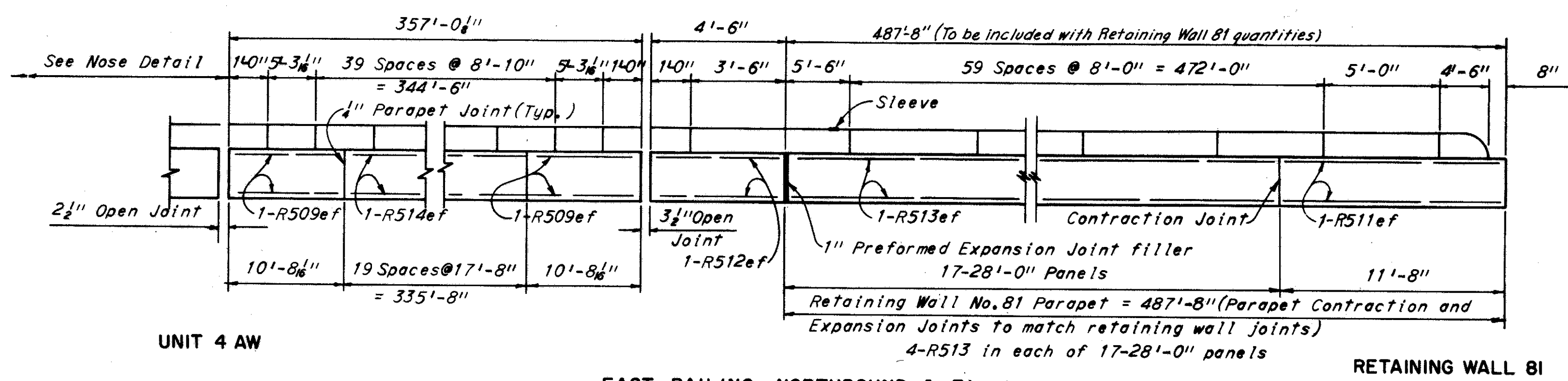
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN V.J.D. TRACED DATE 1-4-65  
CHECKED W.F. DATE 1-7-65  
REVIEWED W.F. DATE 1-14-65  
REVISED DATE 1-14-65

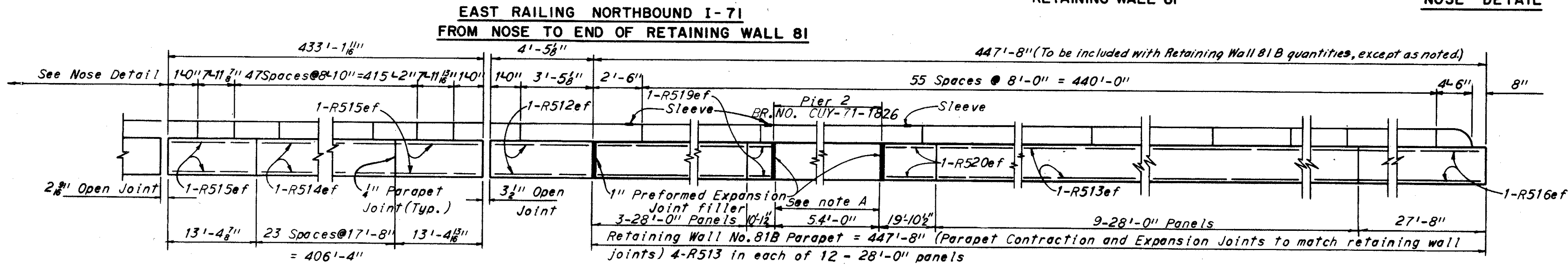
SHEET 430A

'AHOGA COUNTY  
71-17.83  
CUY-176-12.76

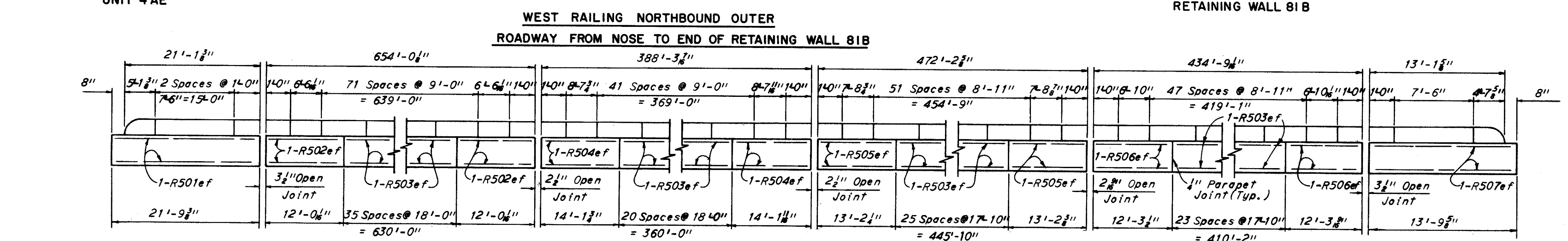
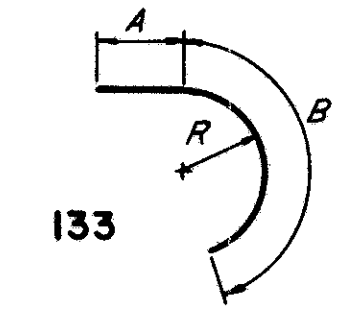


Mark	No.	Length	Type
R501	4	21'-3"	Str.
R502	8	11'-6"	Str.
R503	716	17'-6"	Str.
R504	16	13'-9"	Str.
R505	16	12'-9"	Str.
R506	8	11'-9"	Str.
R507	4	13'-6"	Str.
R508	4	16'-9"	Str.
R509	16	10'-3"	Str.
R510	8	12'-0"	Str.
R511	8	11'-3"	Str.
R512	12	4'-0"	Str.
R513	144	27'-6"	Str.
R514	244	17'-3"	Str.
R515	8	13'-0"	Str.
R516	4	27'-3"	Str.
R517	2	9'-4"	133
R518	2	11'-3"	133
R519	4	9'-9"	Str.
R520	4	19'-6"	Str.

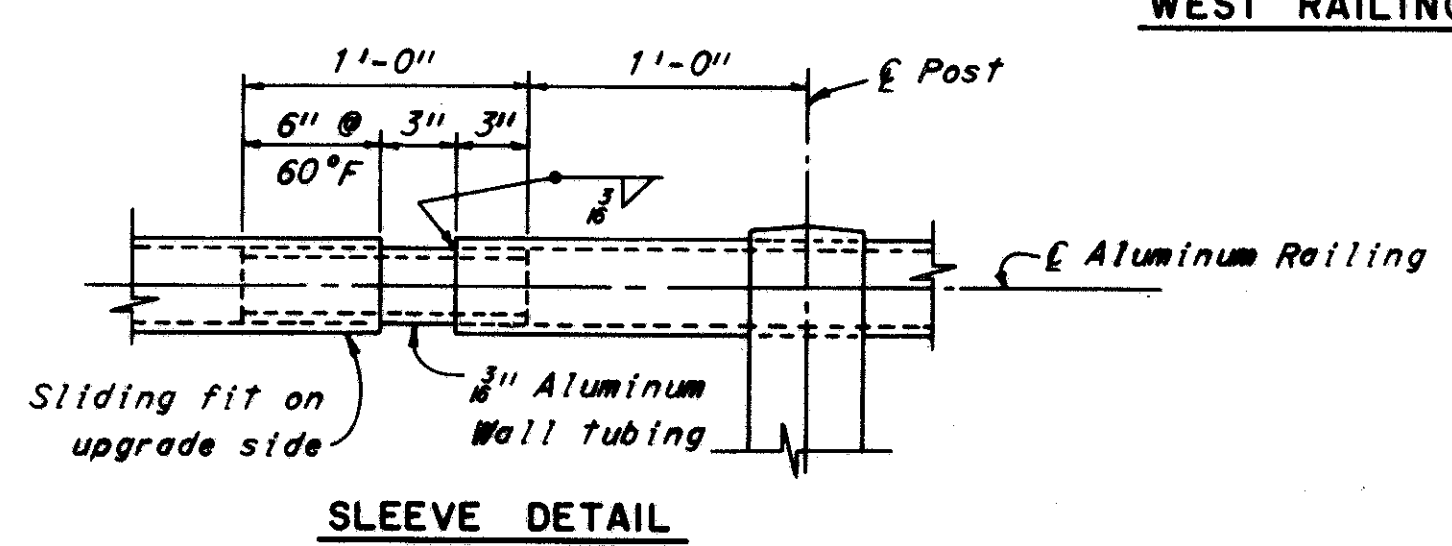
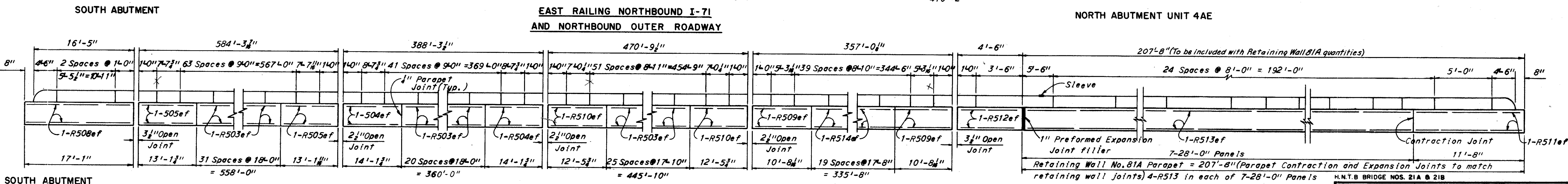
Note A:  
The concrete and reinforcing steel in the parapet are included with Pier 2 quantities.



Mark	A	B	R
R517	3"	9'-1"	34.23"
R518	3"	11'-0"	34.93"



Notes:  
Railing shall be Type 'A'.  
The following abbreviation is used:  
ef = each face  
For Railing Notes see sheet 445.



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**RAILINGS**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS  
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25  
CLEVELAND CUYAHOGA COUNTY OHIO  
DRAWN G.R.D. TRACED CHECKED DATE 7-15-64  
REVIEWED DATE 12-22-64  
REVISED SHEET 431

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

UNIT 1A

Girder	Brig. South Abut. A	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Bend Line and Field Splice 1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Bend Line and Field Splice 2	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Bend Line and Field Splice 3	£ Pier 1	£ Pier 2	£ Pier 3	Girder
A	683.87	683.96	684.06	684.16	684.27	684.38	684.49	684.60	684.72	684.84	684.95	685.02	685.10	685.17	685.24	685.32	685.40	685.47	685.55	685.63	685.71	685.77	685.82	685.88	685.94	686.00	686.06	686.12	686.17	686.23	686.29	684.76	685.57	686.19	A
B	684.41	684.51	684.61	684.72	684.82	684.93	685.03	685.14	685.25	685.36	685.48	685.54	685.61	685.69	685.76	685.83	685.91	685.99	686.06	686.14	686.22	686.27	686.32	686.38	686.43	686.48	686.54	686.59	686.65	686.70	686.75	685.29	686.08	686.66	B
C	684.96	685.06	685.16	685.27	685.38	685.48	685.59	685.69	685.80	685.90	686.01	686.07	686.14	686.21	686.28	686.36	686.43	686.51	686.58	686.66	686.74	686.78	686.83	686.87	686.92	686.97	687.02	687.07	687.12	687.17	687.21	685.84	686.61	687.14	C
D	685.52	685.62	685.72	685.82	685.93	686.04	686.15	686.25	686.35	686.46	686.56	686.62	686.68	686.75	686.82	686.89	686.96	687.04	687.11	687.19	687.26	687.30	687.34	687.38	687.42	687.46	687.51	687.55	687.60	687.64	686.39	687.14	687.61	D	
E	686.07	686.17	686.28	686.38	686.49	686.60	686.71	686.82	686.92	687.02	687.12	687.18	687.24	687.30	687.36	687.43	687.50	687.57	687.64	687.72	687.79	687.82	687.85	687.88	687.92	687.96	687.99	688.03	688.07	688.10	688.14	686.96	687.68	688.09	E
F	686.62	686.73	686.83	686.94	687.05	687.16	687.28	687.39	687.49	687.59	687.69	687.74	687.80	687.86	687.92	687.98	688.05	688.12	688.18	688.25	688.32	688.35	688.37	688.39	688.42	688.45	688.48	688.51	688.54	688.57	688.60	687.53	688.22	688.56	F
K	687.18	687.29	687.39	687.50	687.61	687.73	687.84	687.96	688.07	688.17	688.27	688.32	688.37	688.43	688.48	688.54	688.60	688.67	688.73	688.80	688.86	688.88	688.89	688.91	688.93	688.95	688.97	689.00	689.02	689.04	689.06	688.11	688.77	689.03	K
L	687.73	687.84	687.94	688.05	688.17	688.28	688.40	688.52	688.64	688.75	688.85	688.90	688.95	689.00	689.05	689.10	689.16	689.22	689.28	689.34	689.40	689.40	689.41	689.41	689.42	689.44	689.45	689.47	689.48	689.50	689.50	688.68	689.32	689.49	L
N	687.64	687.76	687.89	688.01	688.13	688.25	688.37	688.48	688.59	688.69	688.77	688.87	688.96	689.02	689.09	689.14	689.19	689.24	689.28	689.32	689.35	689.39	689.43	689.46	689.49	689.51	689.52	689.53	689.53	689.53	689.53	689.53	689.53	689.53	N

Girder	Bend Line and Field Splice 3	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Bend Line and Field Splice 4	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Bend Line and Field Splice 5	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	£ Expansion Rollers 1A	£ Pier 4	£ Pier 5	£ Pier 6	Girder
A	686.29	686.33	686.37	686.40	686.44	686.48	686.51	686.54	686.57	686.60	686.63	686.65	686.66	686.67	686.68	686.69	686.69	686.68	686.67	686.66	686.64	686.60	686.57	686.53	686.49	686.45	686.40	686.35	686.29	686.23	686.65	686.63	686.28	A	
B	686.75	686.78	686.82	686.85	686.88	686.91	686.93	686.96	686.98	687.00	687.02	687.03	687.03	687.03	687.03	687.02	687.01	687.00	686.98	686.96	686.92	686.88	686.83	686.79	686.74	686.68	686.62	686.56	686.50	686.42	687.03	686.91	686.48	B	
C	687.21	687.24	687.27	687.29	687.31	687.33	687.35	687.37	687.38	687.40	687.41	687.41	687.40	687.39	687.38	687.37	687.35	687.33	687.31	687.28	687.25	687.20	687.15	687.10	687.04	686.98	686.92	686.85	686.78	686.70	686.62	687.41	687.19	686.69	C
D	687.68	687.70	687.71	687.73	687.74	687.76	687.77	687.78	687.79	687.80	687.80	687.79	687.77	687.75	687.73	687.71	687.68	687.65	687.62	687.58	687.54	687.48	687.43	687.36	687.30	687.23	687.15	687.08	687.00	686.91	686.82	687.78	687.47	686.90	D
E	688.14	688.15	688.16	688.17	688.18	688.18	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	688.19	E
F	688.60	688.60	688.61	688.61	688.61	688.61	688.60	688.59	688.58	688.58	688.58	688.54	688.51	688.47	688.43	688.39	688.34	688.29	688.24	688.18	688.12	688.05	687.97	687.89	687.80	687.72	687.62	687.53	687.43	687.32	687.22	688.54	688.03	687.31	FF
K	689.06	689.05	689.05	689.04	689.04	689.03	689.02	689.01	688.99	688.98	688.96	688.92	688.88	688.83	688.78	688.73	688.67	688.61	688.55	688.48	688.41	688.33	688.24	688.15	688.06	687.96	687.86	687.75	687.64	687.53	687.41	688.91	688.31	687.51	K
L	689.50	689.49	689.48	689.47	689.46	689.44	689.42	689.40	689.38	689.36	689.34	689.29	689.23	689.18	689.12	689.05	688.99	688.92	688.85	688.77	688.69	688.60	688.50	688.40	688.30	688.19	688.08	687.97	687.85	687.73	687.60	689.27	688.58	687.71	L
N	689.52	689.51	689.50	689.49	689.48	689.46	689.44	689.41	689.39	689.36	689.33	689.28	689.23	689.18	689.12	689.06	688.99	688.91	688.83	688.75	688.66	688.57	688.47	688.37	688.27	688.16	688.04	687.92	687.79	687.66	687.52	689.27	688.54	687.64	N

UNIT 2A

UNIT 3A

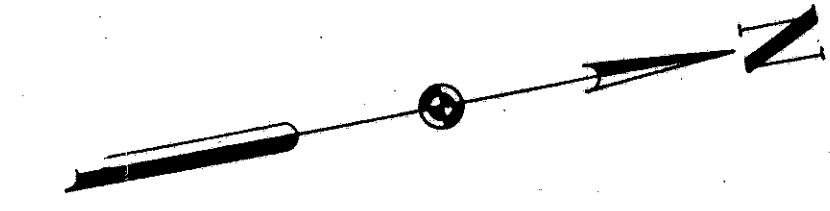
Beam	£ Expansion Rollers 1A	1	2	3	£ Pier 7	1	2	3	£ Pier 8	1	2	3	£ Pier 9	1	2	3	£ Pier 10	1	2	3	£ Pier 11	Beam	£ Expansion Rollers 2A	1	2	3	£ Pier 12	1	2	3	£ Pier 13	1	2	3	£ Pier 14	Beam
A	686.23	686.12	686.00	685.87	685.74	685.57	685.39	685.20	684.98	684.76	684.52	684.28	684.01	683.74	683.45	683.15	682.85	682.56	682.26	681.96	681.66	A	681.57	681.29	681.02	680.74	680.47	680.17	679.87	679.57	679.27	678.98	678.68	678.38	678.08	A
B	686.42	686.30	686.17	686.03	685.88	685.70	685.51	685.32	685.10	684.88	684.64	684.39	684.13	683.86	683.57	683.27	682.97	682.68	682.38	682.08	681.78	B	681.69	681.41	681.14	680.86	680.59	680.29	679.99	679.69	679.39	679.10	678.80	678.50	678.20	B
C	686.62	686.48	686.34	686.19	686.03	685.83	685.63	685.44	685.22	685.00	684.76	684.51	684.25	683.98	683.69	683.39	683.09	682.80	682.50	682.20	681.90	C	681.81	681.53	681.26	680.98	680.71	680.41	680.11	679.81	679.51	679.21	678.91	678.62	678.32	C
D	686.82	686.67	686.51	686.35	686.17	685.96	685.75	685.53	685.30	685.06	684.80	684.54	684.26	683.98	683.68	683.37	683.07	682.76	682.46	682.15	681.84	D	681.75	681.47	681.19	680.90	680.63	680.33	680.04	679.74	679.44	679.14	678.85	678.55	678.25	D
E	687.02	686.85	686.68	686.50	686.32	686.09	685.87	685.63	685.37	685.10	684.83	684.54	684.25	683.95	683.64	683.32	683.01	682.69	682.38	682.06	681.75	E	681.65	681.36	681.07	680.78	680.51	680.21	679.92	679.62	679.32	679.02	678.73	678.43	678.14	E
F	687.22	687.04	686.85	686.66	686.46	686.22	685.98	685.72	685.44	685.15	684.85	684.54	684.23	683.92	683.60	683.27	682.95	682.62	682.30	681.97	681.65	F	681.55	681.25	680.95	680.66	680.39	680.09	679.80	679.50	679.20	678.90	678.61	678.31	678.02	F
K	687.41	687.22	687.02	686.82	686.61	686.35	686.10	685.82	685.51	685.19	684.87	684.54	684.22	683.89	683.56	683.22	682.89	682.55	682.22	681.89	681.55	J														
L	687.60	687.41	687.19	686.98	686.75	686.48	686.21	685.91	685.58	685.23	684.89	684.55	684.20	683.86	683.52	683.17	682.83	682.49	682.14	681.80	681.46	K	681.45	681.14	680.84	680.54	680.27	679.97	679.68	679.38	679.08	678.77	678.47	678.16	677.85	K
N	687.52	687.33	687.13	686.91	686.69	686.42	686.14	685.83	685.50	685.15	684.80	684.45	684.10	683.76	683.41	683.07	682.72	682.38	682.03	681.69	681.34	L	681.35	681.04	680.72	680.42	680.15	679.85	679.56	679.26	678.96	678.65	678.34	678.03	677.72	L
N	687.52	687.33	687.13	686.91	686.69	686.42	686.14	685.83	685.50	685.15	684.80	684.45	684.10	683.76	683.41	683.07	682.72	682.38	682.03	681.69	681.34	N	681.24	680.92	680.60	680.30	680.03	679.73	679.44	679.14	678.84	678.53	678.22	677.91	677.60	N

UNIT 3A

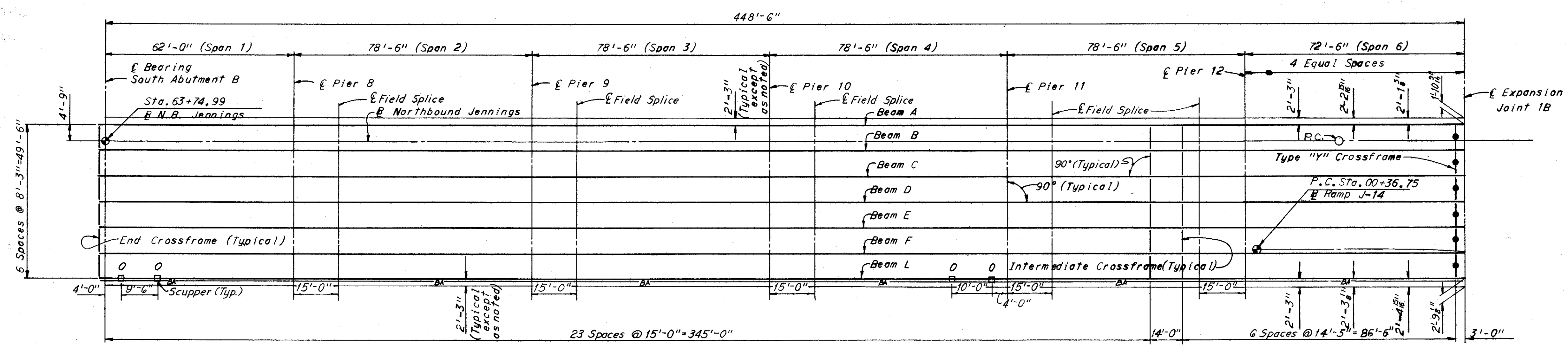
UNIT 4AW

Beam	£ Pier 14	1	2	3
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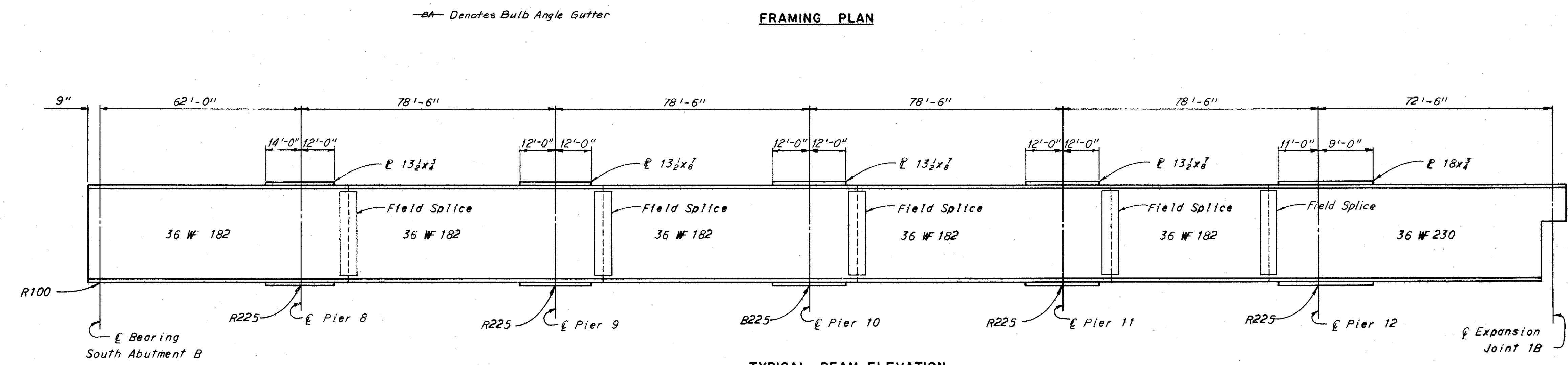
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



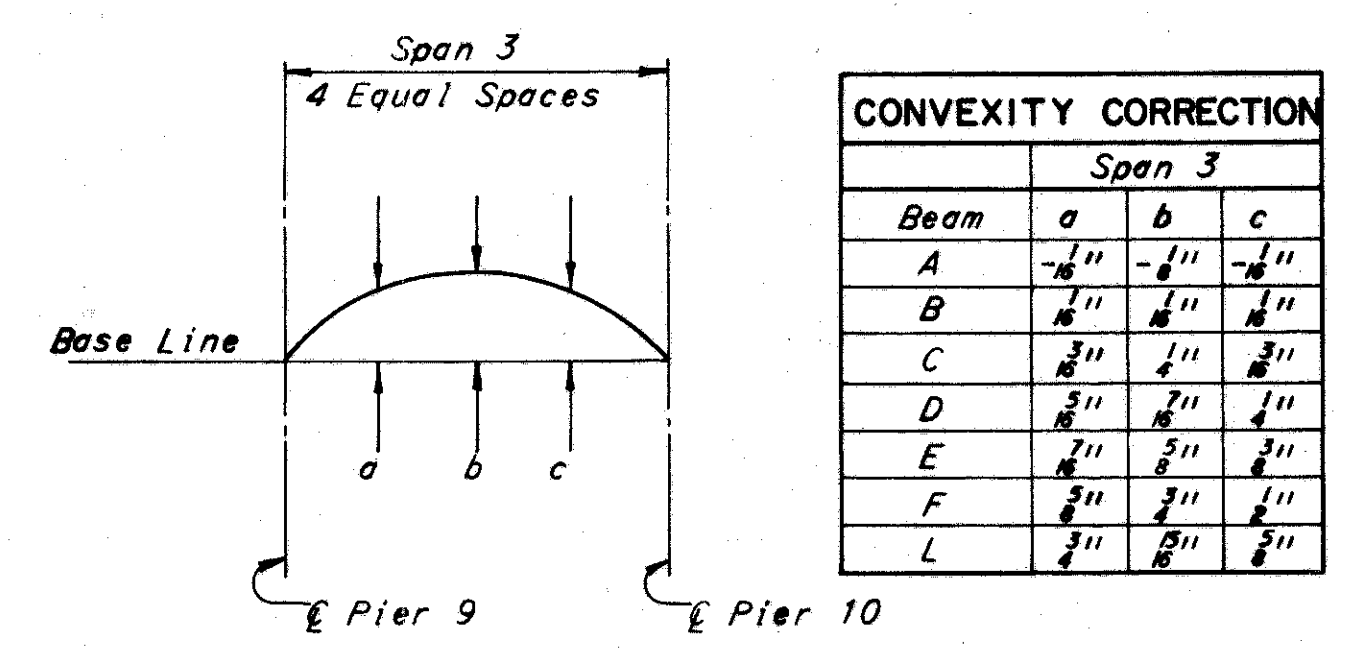
SCUPPER LEGEND  
 C - Outlets at ground level  
 O - Outlets just below superstructure



FRAMING PLAN

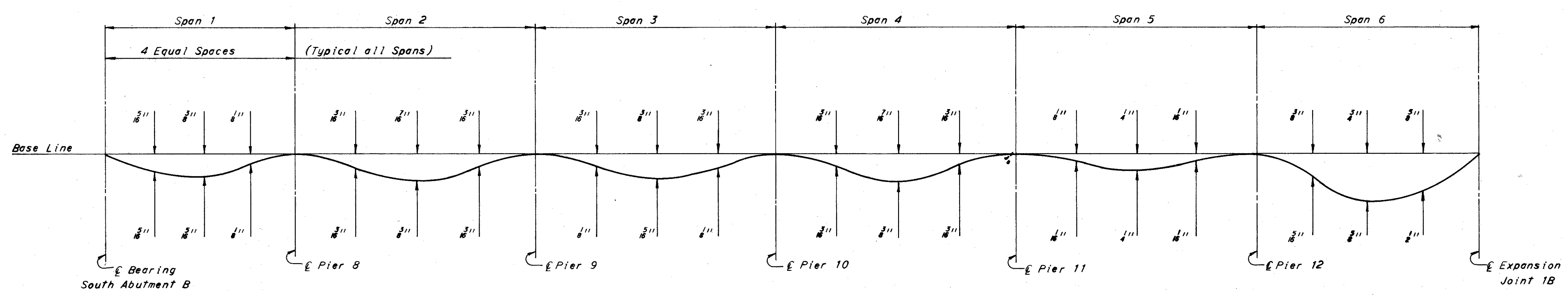


TYPICAL BEAM ELEVATION



CONVEXITY DIAGRAM

Notes:  
 Convexity corrections in Spans 1, 2, 4, 5 and 6 are equal to zero.  
 Negative values for convexity indicate convexity below base line.



DEAD LOAD DEFLECTION DIAGRAM

Note: Values shown above base line are total deflections due to steel and concrete.  
 Values shown below base line are for deflections due to concrete only.  
 Deflections are measured to nearest 1/16 inch.

BEAM CAMBER NOTE

Where the combined effects of dead load deflection and convexity is 3/8" or more, the required camber shall be the same as this sum.  
 Where the combined effects are less than 3/8", no camber is required but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.

Notes:  
 For details of beam field splices see sheet 447.  
 For end crossframe, end dam and curb plate details at the abutment see Ohio Standard Drawing SD-1-63, sheets 2 of 4 and 4 of 4.  
 The supporting angle shown in the "Roadway End Dam Table" shall be increased from 6x4x1/2 to 8x4x1/2.  
 For crossframe and cover plate details see sheet 414.  
 For rocker and bolster details see Ohio Standard Drawing RB-1-55.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

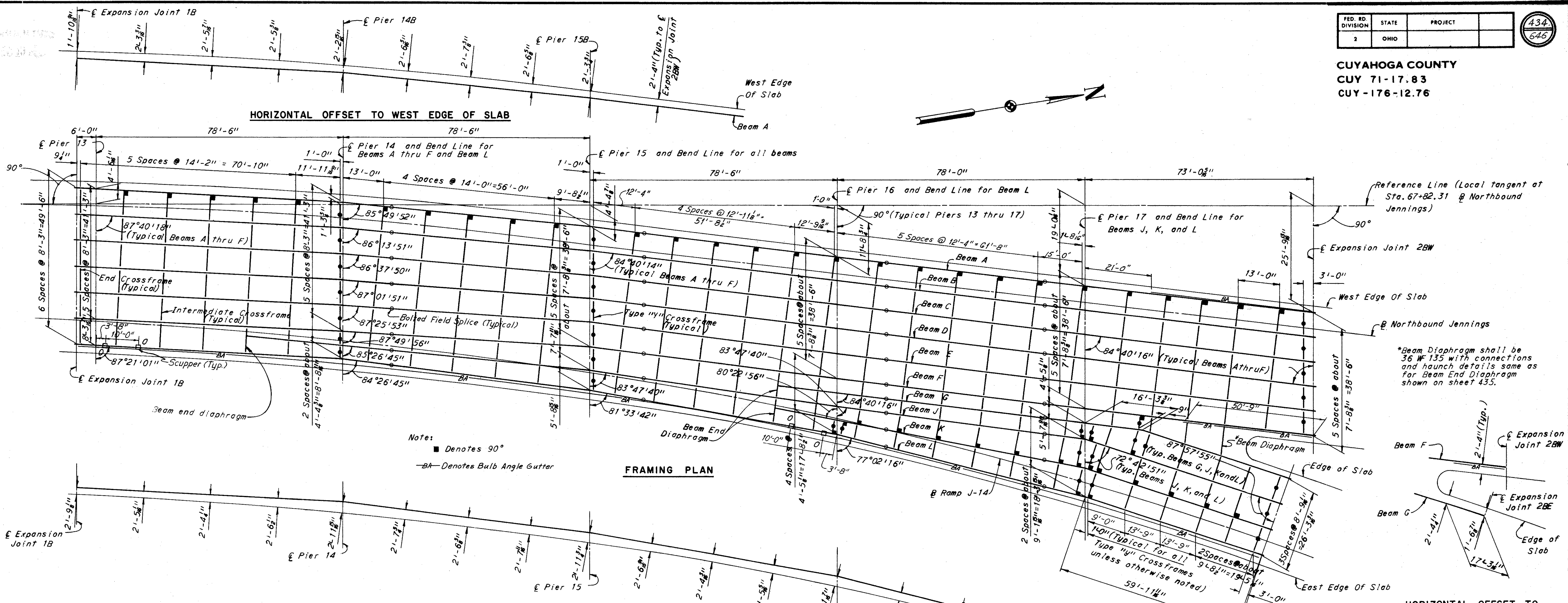
FRAMING PLAN UNIT I-B  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS  
 BR. NO. CUY-71-1789 R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN J.M.C.	TRACED J.L.H.	CHECKED J.L.H.
DATE 7-31-64	DATE 12-23-64	DATE 12-23-64

REVIEWED W.F. REVISOR  
 DATE 12-23-64

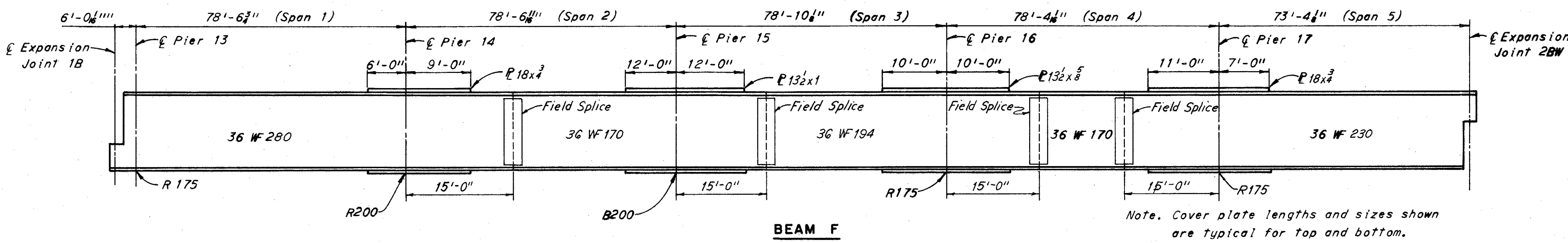
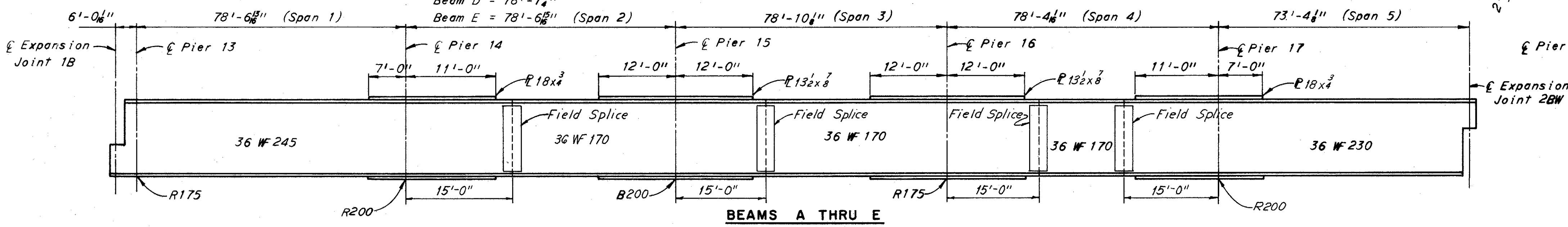
SHEET 433

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



**HORIZONTAL OFFSET TO EAST EDGE OF SLAB**  
 (Offset measured perpendicular to beam at quarter span points)

Beam A	= 78'-8 1/2"
Beam B	= 78'-9 1/8"
Beam C	= 78'-7 3/8"
Beam D	= 78'-7 1/4"
Beam E	= 78'-6 5/8"



Note. Cover plate lengths and sizes shown are typical for top and bottom.

Notes:  
 For Beam End Diaphragm details see sheet 435  
 For Dead Load Deflection and Convexity Diagrams see sheet 435  
 For details of beam field splices see sheet 447.  
 Beams with bend points at pier shall be shop spliced in accordance with the procedure as outlined on Ohio Standard Drawing SD-1-63, sheet 1 of 4.  
 For additional notes see sheet 433

**HORIZONTAL OFFSET TO EDGE OF SLAB (NOSE AREA)**

**SCUPPER LEGEND**  
 C - Outlets at ground level  
 O - Outlets just below superstructure

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**FRAMING PLAN UNIT 2-B**

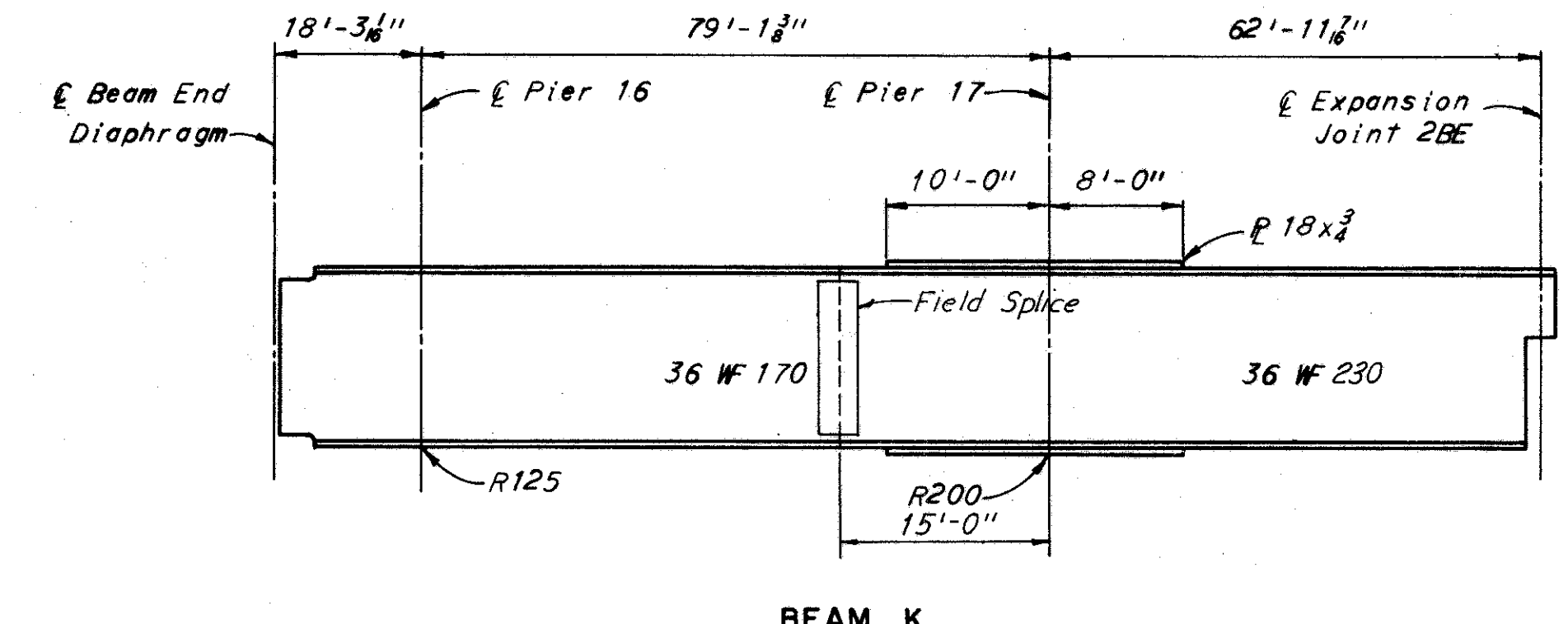
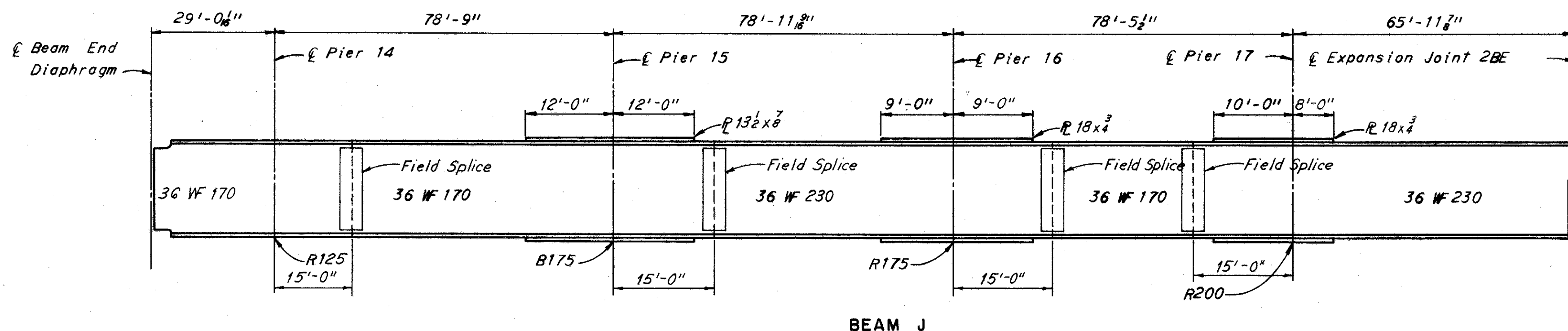
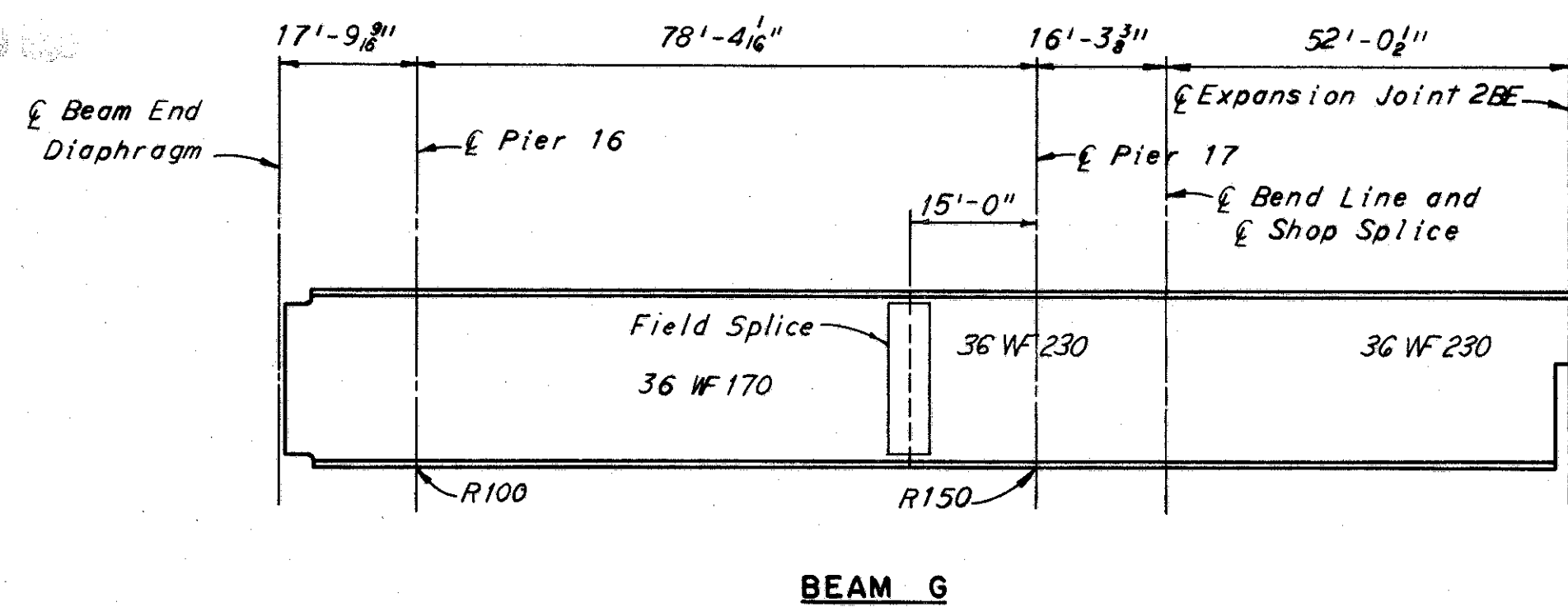
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN J.M.C.	TRACED	CHECKED J.K.M.
DATE 7-2-64	DATE	DATE 12-28-64
		REVIEWED

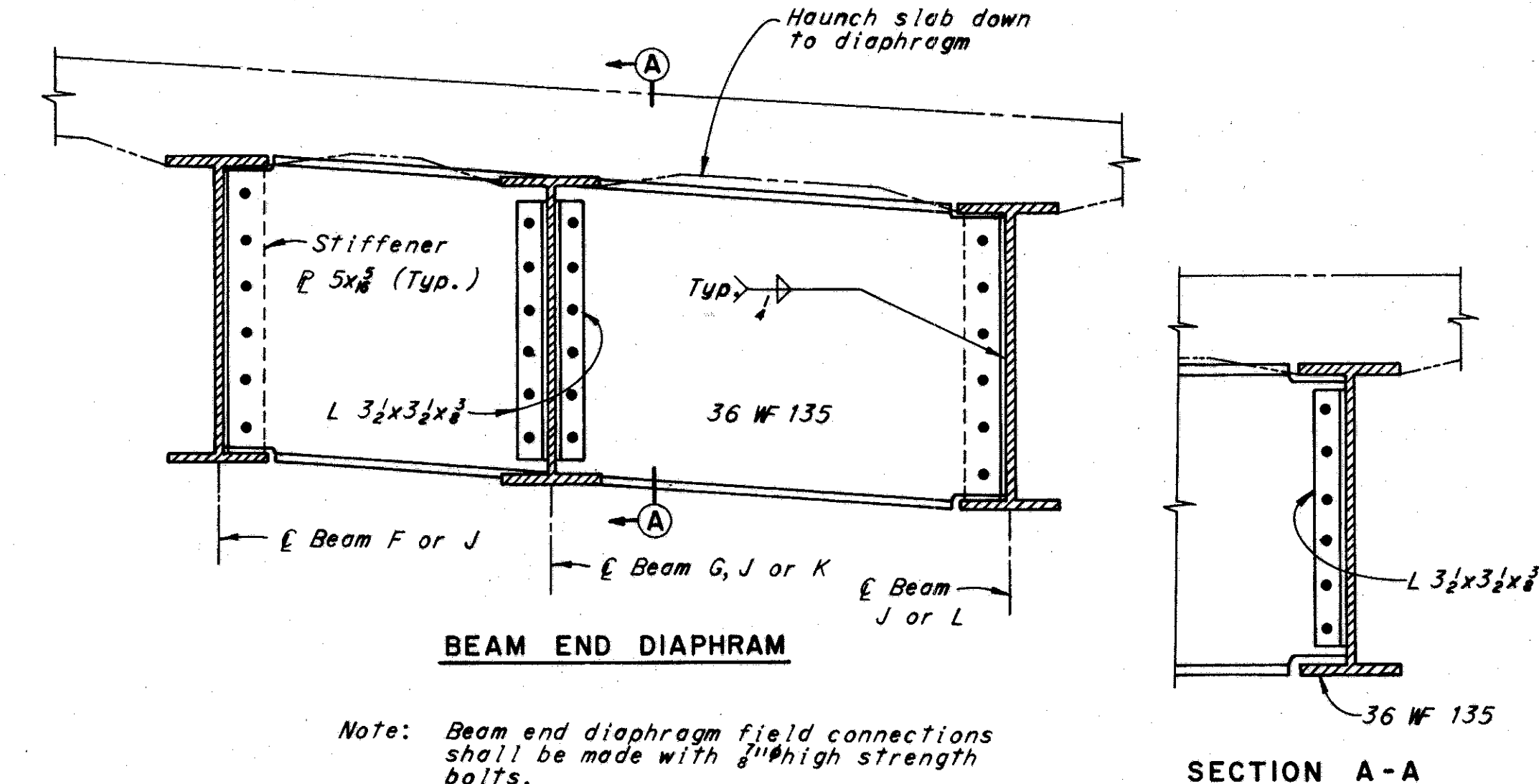
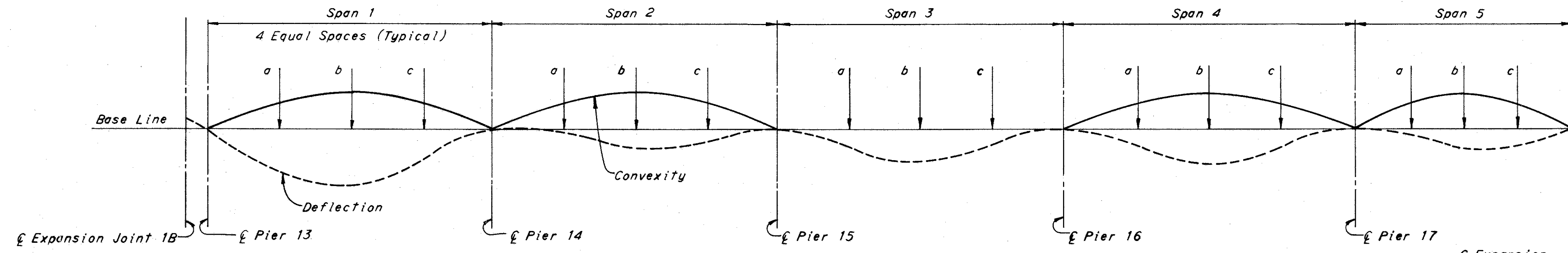
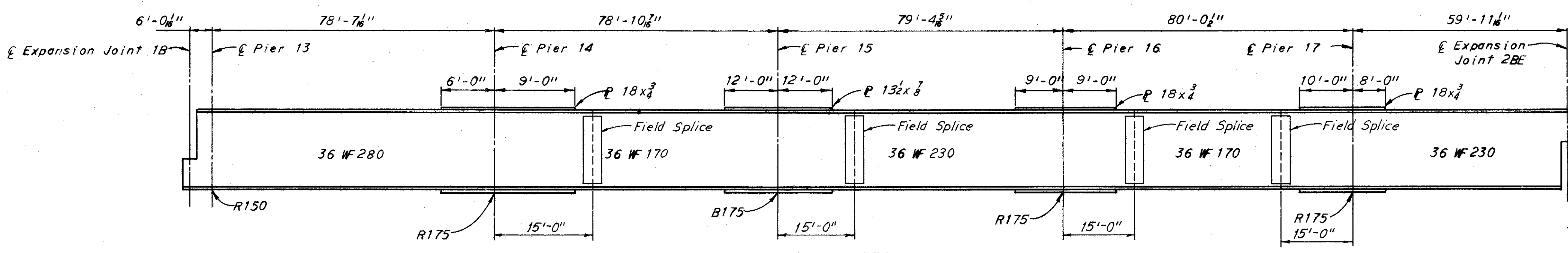
SHEET 434

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



**BEAM CAMBER NOTE**

Where the combined effects of dead load deflection and convexity is 3/4" or more, the required camber shall be the same as this sum. Where the combined effects are less than 3/4", no camber is required but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.



Note: Beam end diaphragm field connections shall be made with 3/4" high strength bolts.

**DEAD LOAD DEFLECTION TABLE**

Beam	Span 1		Span 2		Span 3		Span 4		Span 5	
	a	b	a	b	a	b	a	b	a	b
	Tot. Con.	Tot. Con.	Tot. Con.	Tot. Con.	Tot. Con.	Tot. Con.	Tot. Con.	Tot. Con.	Tot. Con.	Tot. Con.
Athru E	5/16"	2/16"	13/16"	1/16"	7/16"	3/16"	0	0	1/16"	3/16"
F	9/16"	7/16"	3/16"	9/16"	8/16"	5/16"	0	0	1/16"	8/16"
G										
J										
K										
L	9/16"	2/16"	11/16"	1/16"	3/16"	5/16"	0	0	3/16"	1/16"

**Notes:**  
Dead Load Deflections and Convexity Corrections are measured to nearest 1/16 inch.  
Tot. denotes total deflection of concrete and steel.  
Con. denotes deflections due to dead load of concrete only.  
Negative values indicate convexity below the base line or deflection above the base line.  
For additional notes see sheets 413.

**CONVEXITY CORRECTIONS**

Beam	Span 1			Span 2			Span 4			Span 5		
	a	b	c	a	b	c	a	b	c	a	b	c
A	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"
B	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"
C	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"
D	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"
E	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"
F	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"
G												
J												
K												
L	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"	-1/16"

\*End of beam.

H.N.T.B BRIDGE NOS. 21A & 21B

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**SUPERSTRUCTURE DETAILS**  
UNIT 2-B

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

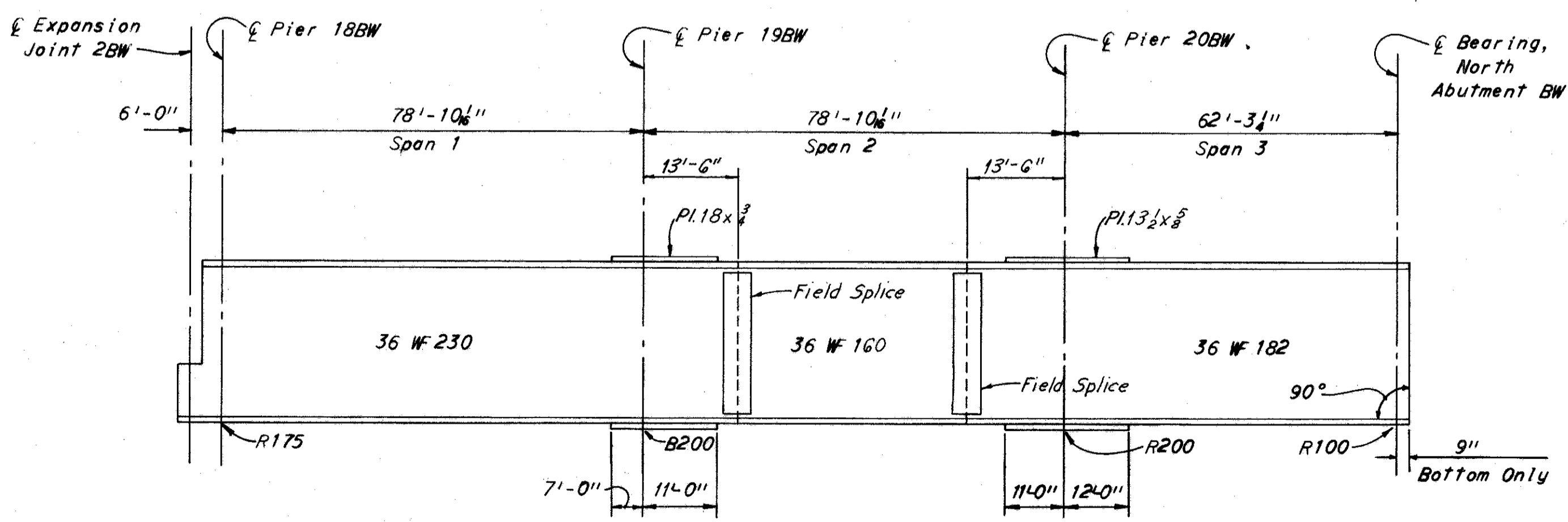
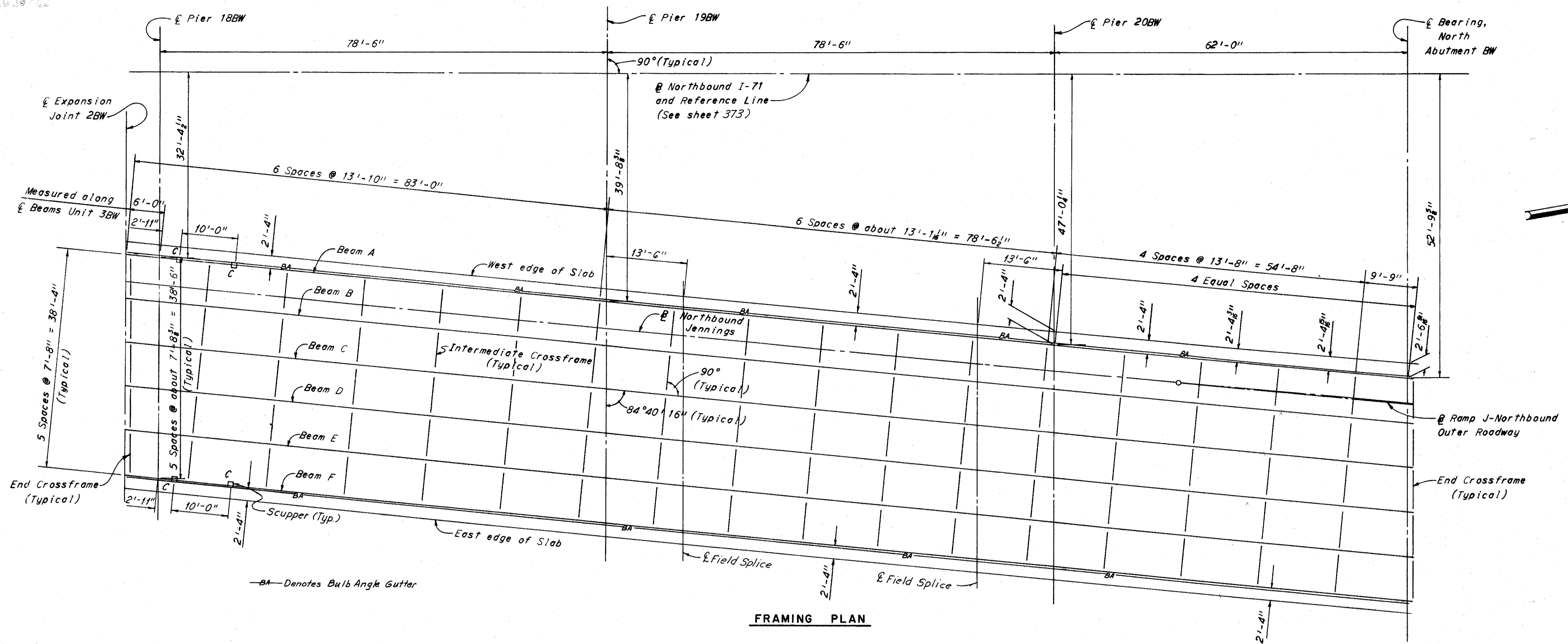
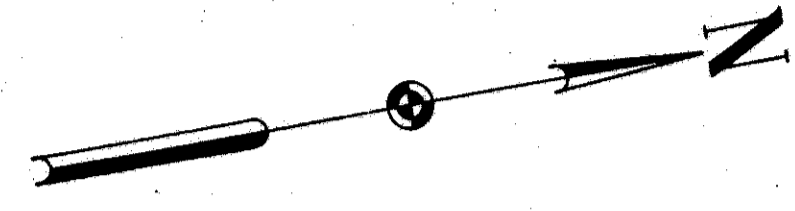
BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	J.M.C.	TRACED	DATE	CHECKED	DATE	REVIEWED	DATE	REVISOR	DATE
			8-28-64		12-28-64		12-28-64		

SHEET 435

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



Note: Cover plate lengths and sizes shown are typical top and bottom.

	Pier 18BW			Pier 19BW			Pier 20BW				
	a	b	c	a	b	c	a	b	c		
Typical-Beams	-3/8"	+5/8"	+7/8"	+7/8"	0	+1/8"	+1/8"	+3/8"	+7/8"	+3/8"	Deflections due to Concrete and Steel
A thru F	-1/8"	+1/2"	+1/2"	+3/8"	0	+1/8"	+1/8"	+3/8"	+5/8"	+3/8"	
Beam A	-1/8"	-1/8"	-1/8"	0	0	0	0	0	0	0	Convexity
Beam B	+1/8"	+1/8"	+1/8"	0	0	0	0	0	0	0	Convexity
Beams C thru F	+3/8"	+1/4"	+1/8"	0	0	0	0	0	0	0	Convexity

Note: Dead load deflections and convexity are measured to the nearest 1/8 inch. Negative values for deflection indicate deflection above the base line. Negative values for convexity indicate convexity below the base line.

**BEAM CAMBER NOTE:**

Where the combined effects of dead load deflection and convexity are 1/4 inch or more, the required camber shall be the same as this amount. If the combined effects are less than 1/4 inch, no camber is required, but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.

**SCUPPER LEGEND**  
C - Outlets at ground level  
O - Outlets just below superstructure

Note: For notes see sheet 433.

H.N.T.B BRIDGE NOS. 21A & 21B

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**FRAMING PLAN UNIT 3-BW**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

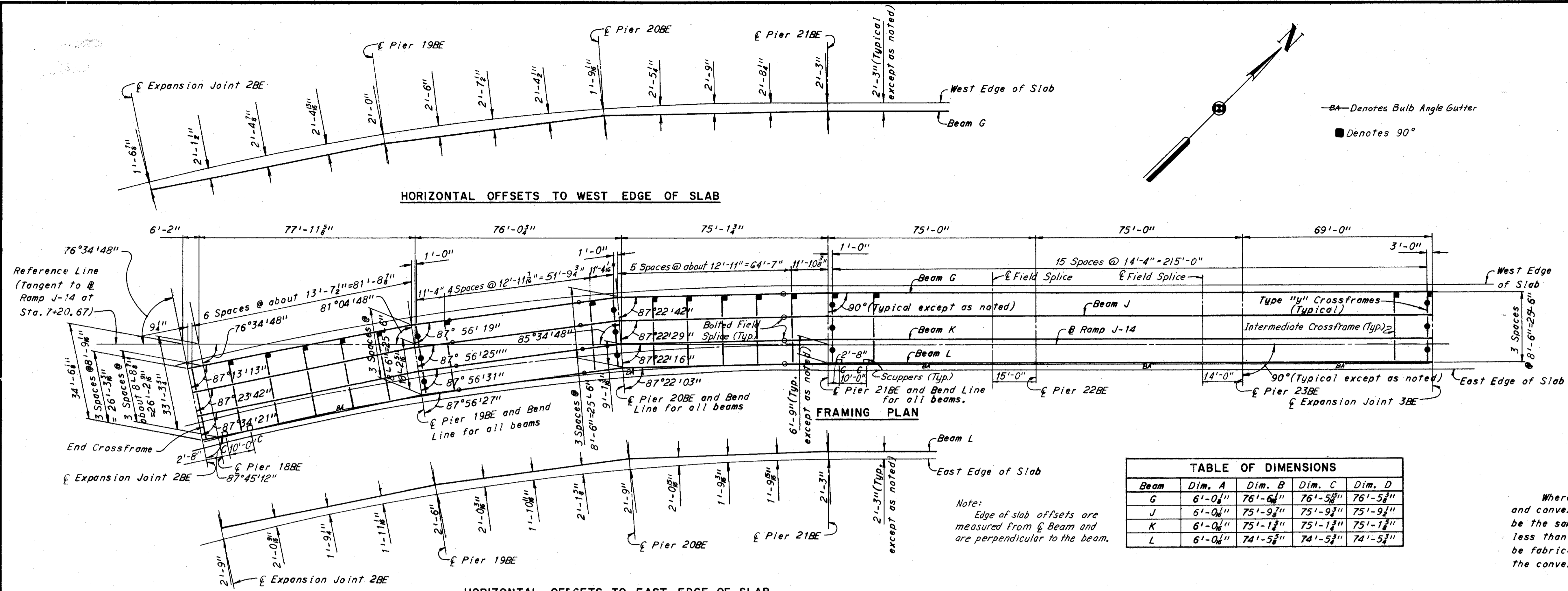
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
G.R.D.				
DATE	DATE	DATE	DATE	DATE
7-15-64	8-21-64	12-22-64		

SHEET 436



CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



**SCUPPER LEGEND**

C - Outlets at ground level  
 O - Outlets just below superstructure

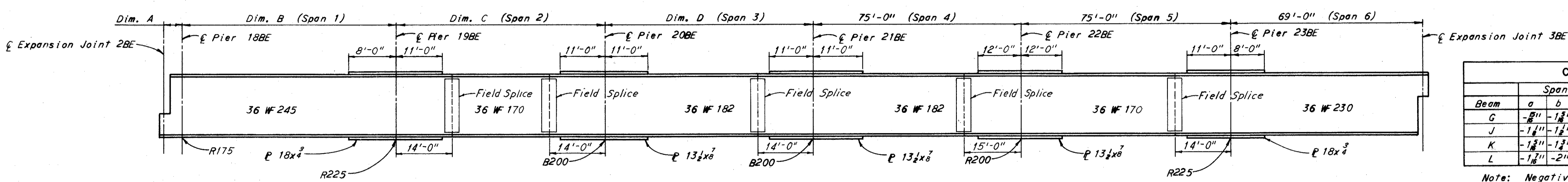
**TABLE OF DIMENSIONS**

Beam	Dim. A	Dim. B	Dim. C	Dim. D
G	6'-0 1/2"	76'-6 1/2"	76'-5 1/2"	76'-5 1/2"
J	6'-0 1/2"	75'-9 1/2"	75'-9 1/2"	75'-9 1/2"
K	6'-0 1/2"	75'-1 1/2"	75'-1 1/2"	75'-1 1/2"
L	6'-0 1/2"	74'-5 1/2"	74'-5 1/2"	74'-5 1/2"

Note: Edge of slab offsets are measured from @ Beam and are perpendicular to the beam.

**BEAM CAMBER NOTE**

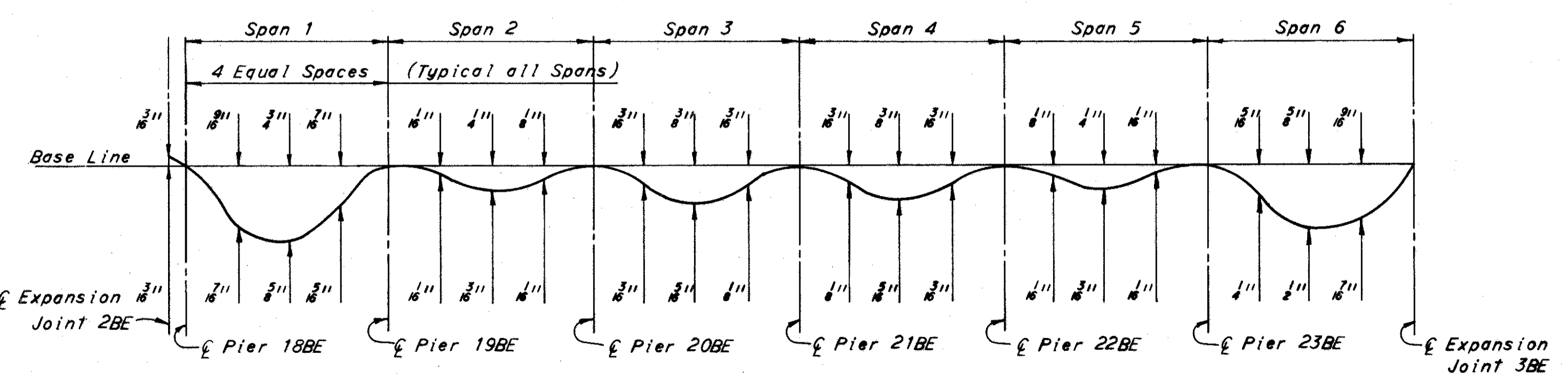
Where the combined effects of dead load deflection and convexity is 3/4" or more, the required camber shall be the same as this sum. Where the combined effects are less than 3/4", no camber is required but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.



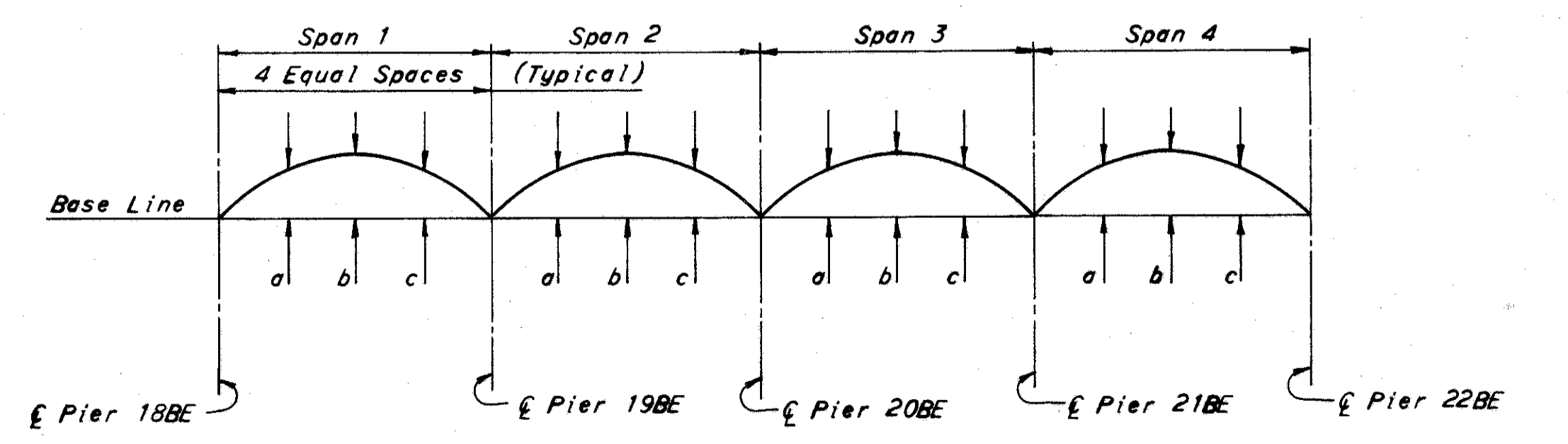
**CONVEXITY CORRECTIONS**

Beam	Span 1			Span 2			Span 3			Span 4		
	a	b	c	a	b	c	a	b	c	a	b	c
G	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"
J	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"
K	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"
L	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"	-1 1/2"

Note: Negative values indicate convexity below the base line.



Note: Values shown above base line are total deflections due to steel and concrete. Values shown below base line for deflections due to concrete only. Deflections are measured to nearest 1/16 inch.



Note: Convexity corrections in Span 5 and Span 6 are equal to zero.

Note: For notes see sheet 433.

H.N.T.B BRIDGE NOS. 21A & 21B

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**FRAMING PLAN UNIT 3-BE**

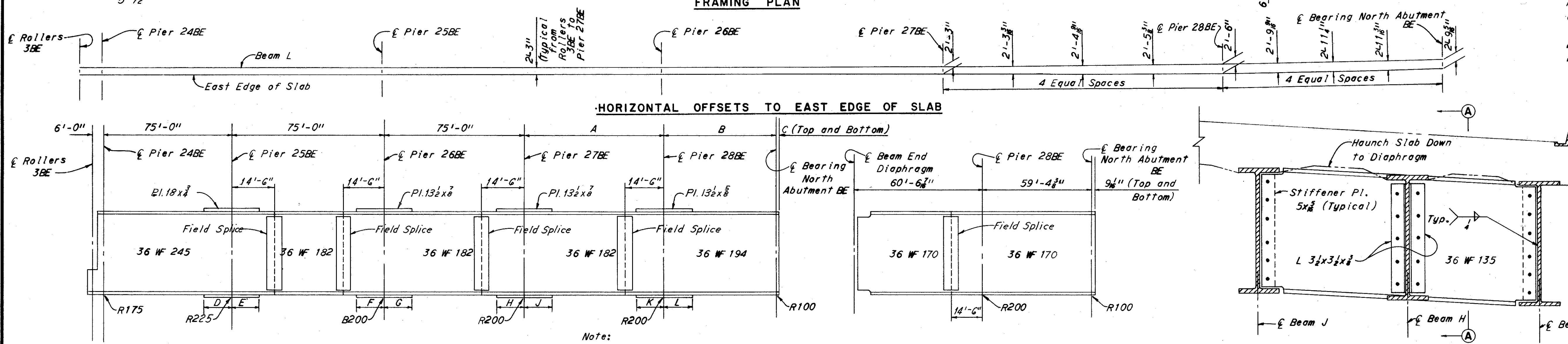
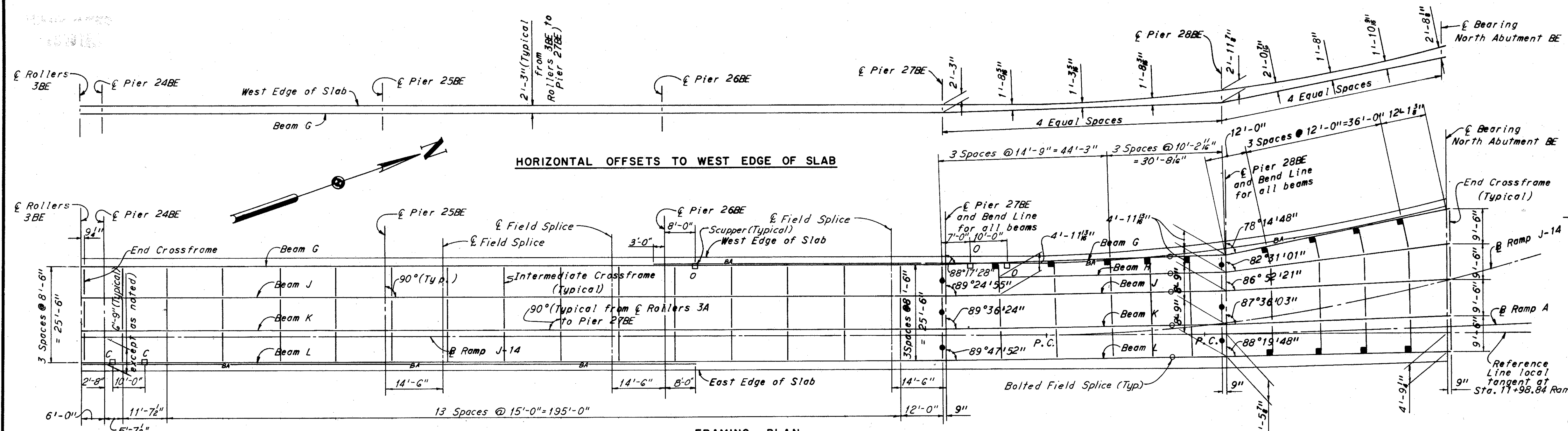
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN J.M.C.	TRACED	REVIEWED
DATE 7-8-64	DATE 7-23-64	DATE 2-28-64

SHEET 437

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



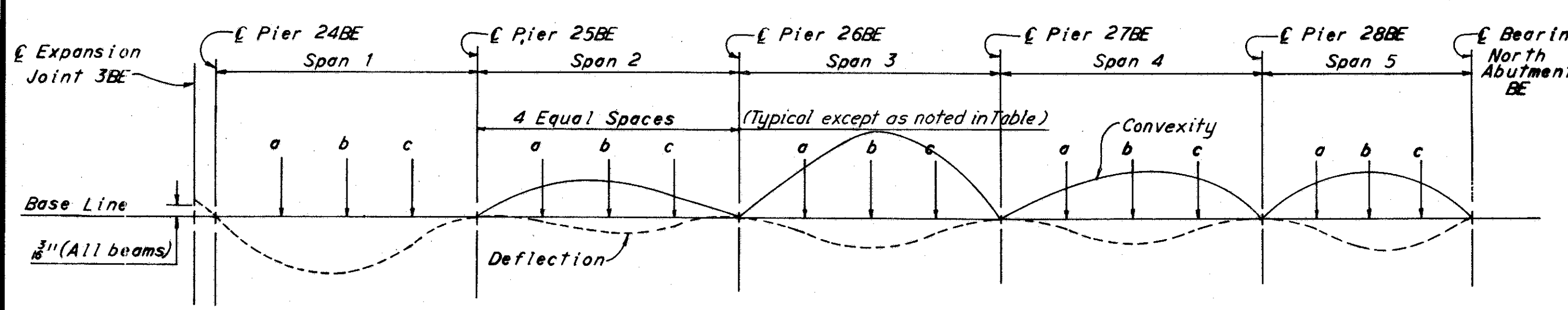
Denotes Type "y" Crossframe  
 Denotes 90°  
 Denotes Bulb Angle Gutter

SCUPPER LEGEND  
 C - Outlets at ground level  
 O - Outlets just below superstructure

BEAM CAMBER NOTE  
 Where the combined effects of the total dead load deflection and convexity is  $\frac{3}{4}$ " or more, the required camber shall be the same as this sum. Where the combined effects are less than  $\frac{3}{4}$ " no camber is required but the beams shall be fabricated so that any curved beam will be placed with the convex flange up.

TABLE OF DIMENSIONS

Beams	A	B	C	D	E	F	G	H	J	K	L
G	74'-11 $\frac{1}{2}$ "	60'-1 $\frac{3}{4}$ "	9 $\frac{3}{4}$ "	7'-0"	10'-0"	12'-0"	12'-0"	12'-0"	10'-0"	10'-0"	11'-0"
J	74'-10 $\frac{3}{4}$ "	58'-11 $\frac{3}{4}$ "	9"	7'-0"	10'-0"	12'-0"	12'-0"	12'-0"	10'-0"	10'-0"	11'-0"
K	74'-10 $\frac{3}{4}$ "	58'-10 $\frac{3}{4}$ "	9"	7'-0"	10'-0"	12'-0"	12'-0"	12'-0"	10'-0"	10'-0"	11'-0"
L	74'-10 $\frac{3}{4}$ "	58'-10 $\frac{3}{4}$ "	9"	7'-0"	10'-0"	12'-0"	12'-0"	12'-0"	10'-0"	10'-0"	11'-0"



DEAD LOAD DEFLECTION TABLE

Beam	Span 1			Span 2			Span 3			Span 4			Span 5		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
G	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
H	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
J	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
K	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
L	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16

CONVEXITY

Beam	Span 1			Span 2			Span 3			Span 4			Span 5		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
G	0	0	0	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
H	0	0	0	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
J	0	0	0	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
K	0	0	0	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
L	0	0	0	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16

\* At beam end diaphragm in Span 4

Deflections and convexity given for Beam H in Span 4 are at 4 points from beam end diaphragm to Pier 28BE.

Notes:  
 Deflections and Convexities are given to nearest  $\frac{1}{16}$  inch. Negative values for convexity indicate displacement below the base line.  
 T indicates deflection due to both concrete and steel.  
 C indicates deflection due to concrete only.

Notes:  
 For end crossframe, end dam, and curb plate details at the abutment see Ohio Standard Drawing SD-1-63, sheets 2 of 4 and 4 of 4. The main angle shown in the End Dam Data table shall be 8x6x1.  
 For additional notes see sheet 433.

H.N.T.B BRIDGE NOS. 21A & 21B

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FRAMING PLAN UNIT 4-BE

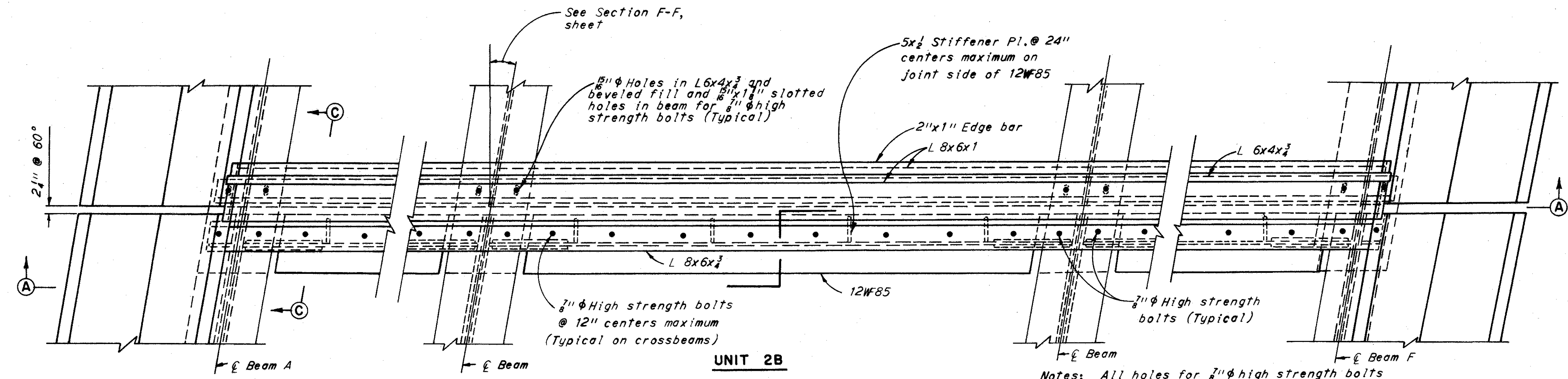
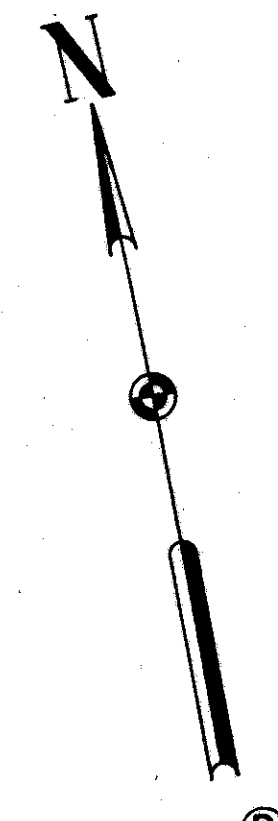
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789 R      STA. 917+10.09  
 STA. 935+21.25

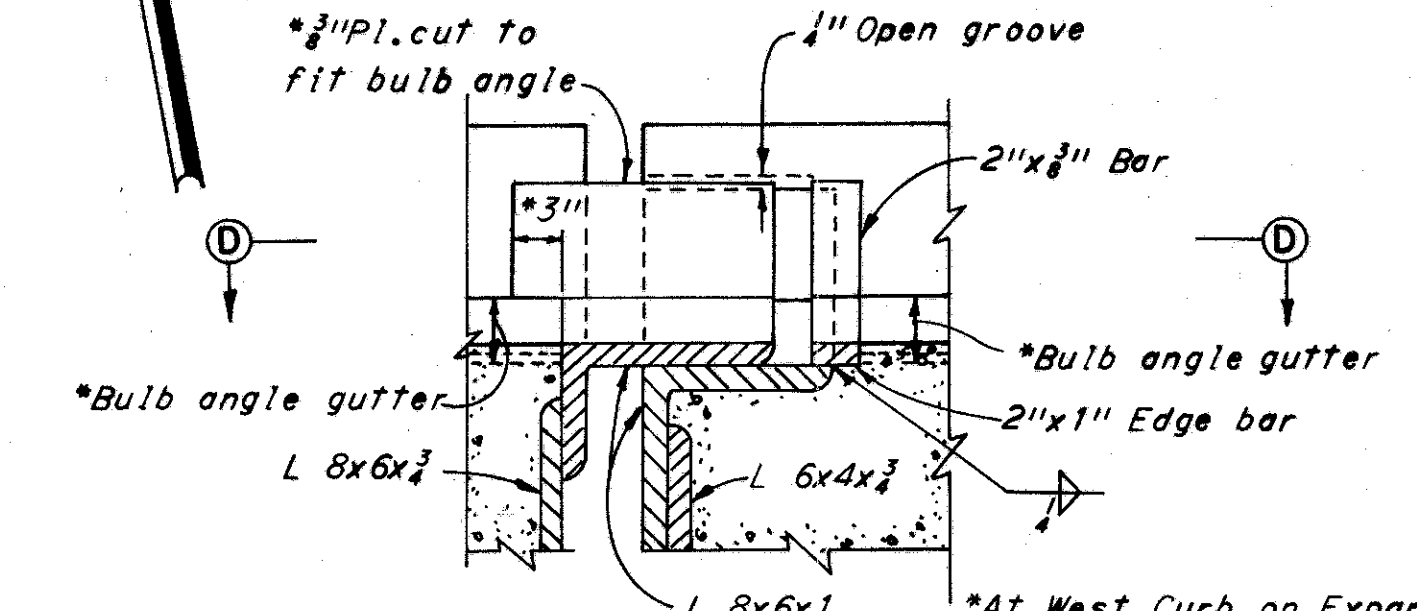
CLEVELAND      CUYAHOGA COUNTY      OHIO

DRAWN: G.R.D.      TRACED:      CHECKED:      REVIEWED:      REVISION  
 DATE: 7-15-64      DATE:      DATE: 12-23-64      DATE:      SHEET 438

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

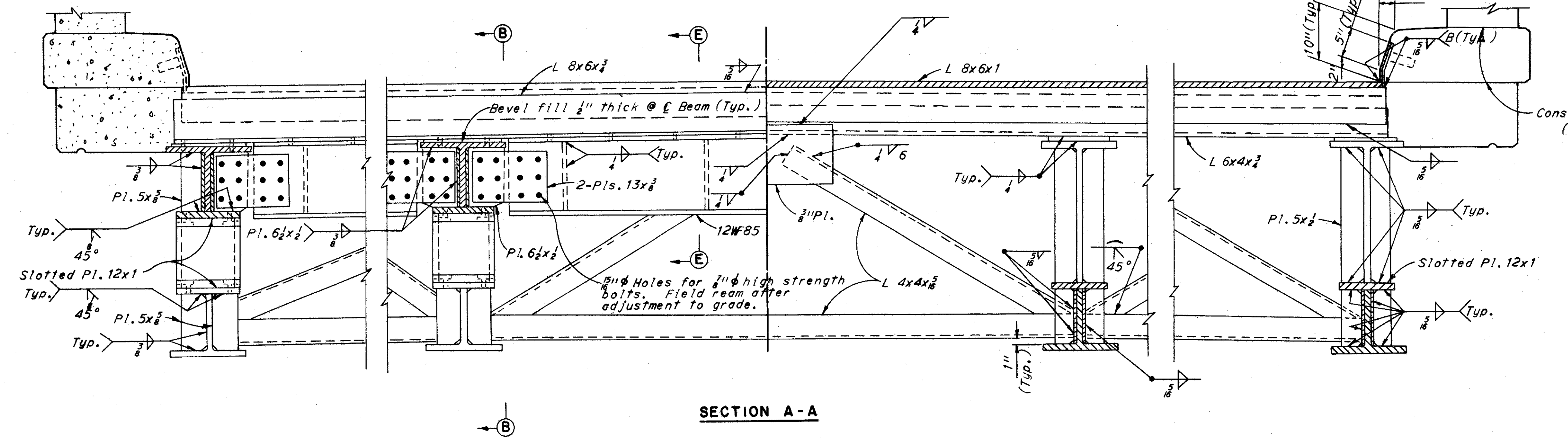


**PART PLAN OF EXPANSION JOINT**  
 (Expansion Joint 2BW shown,  
 Joints 1B, 2BE and 3BE similar)

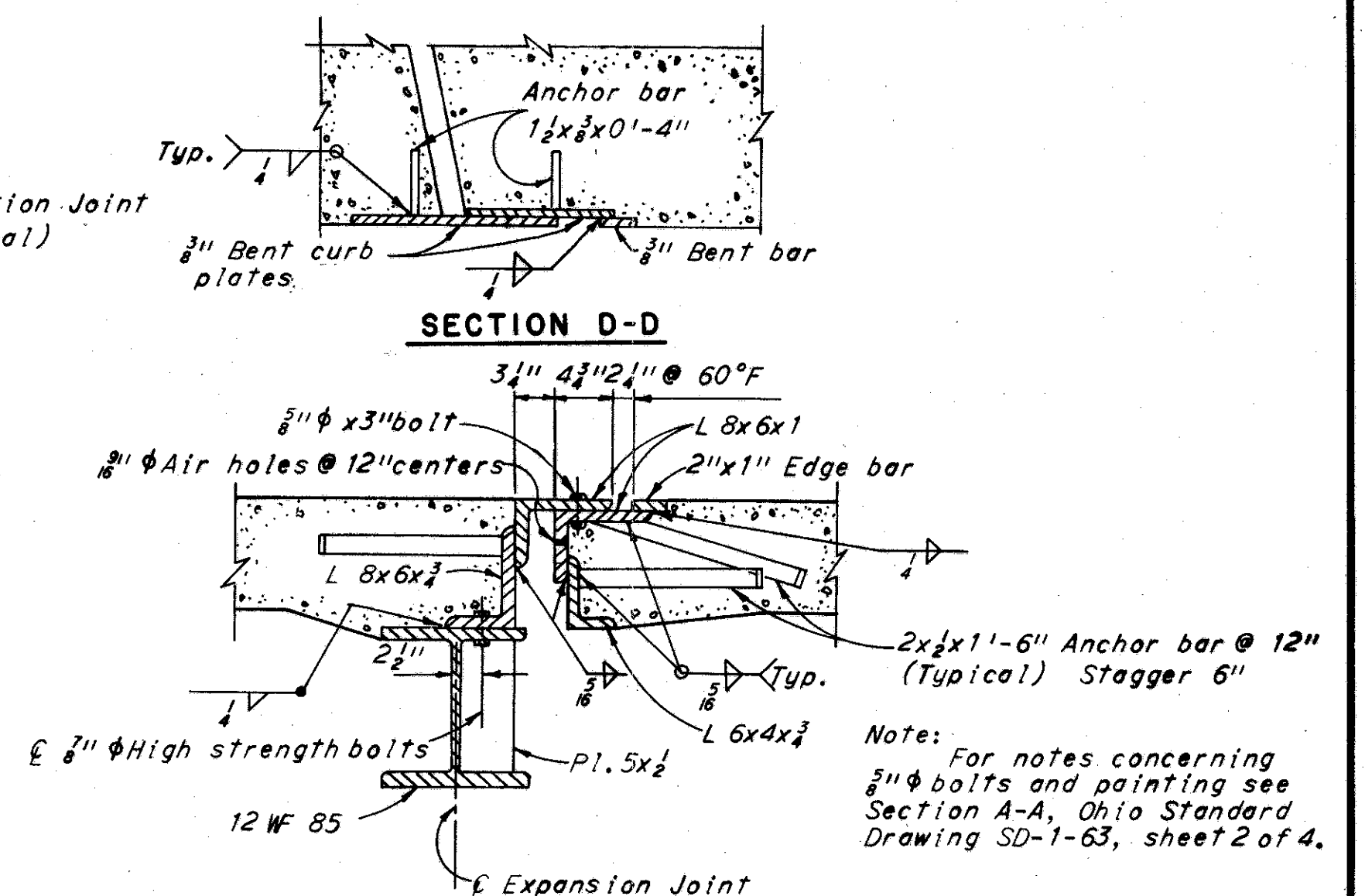


**SECTION C-C**

\*At West Curb on Expansion Joint 1B the 3" cutout shown of the 3/8" Pl. and the bulb angle gutters are deleted.

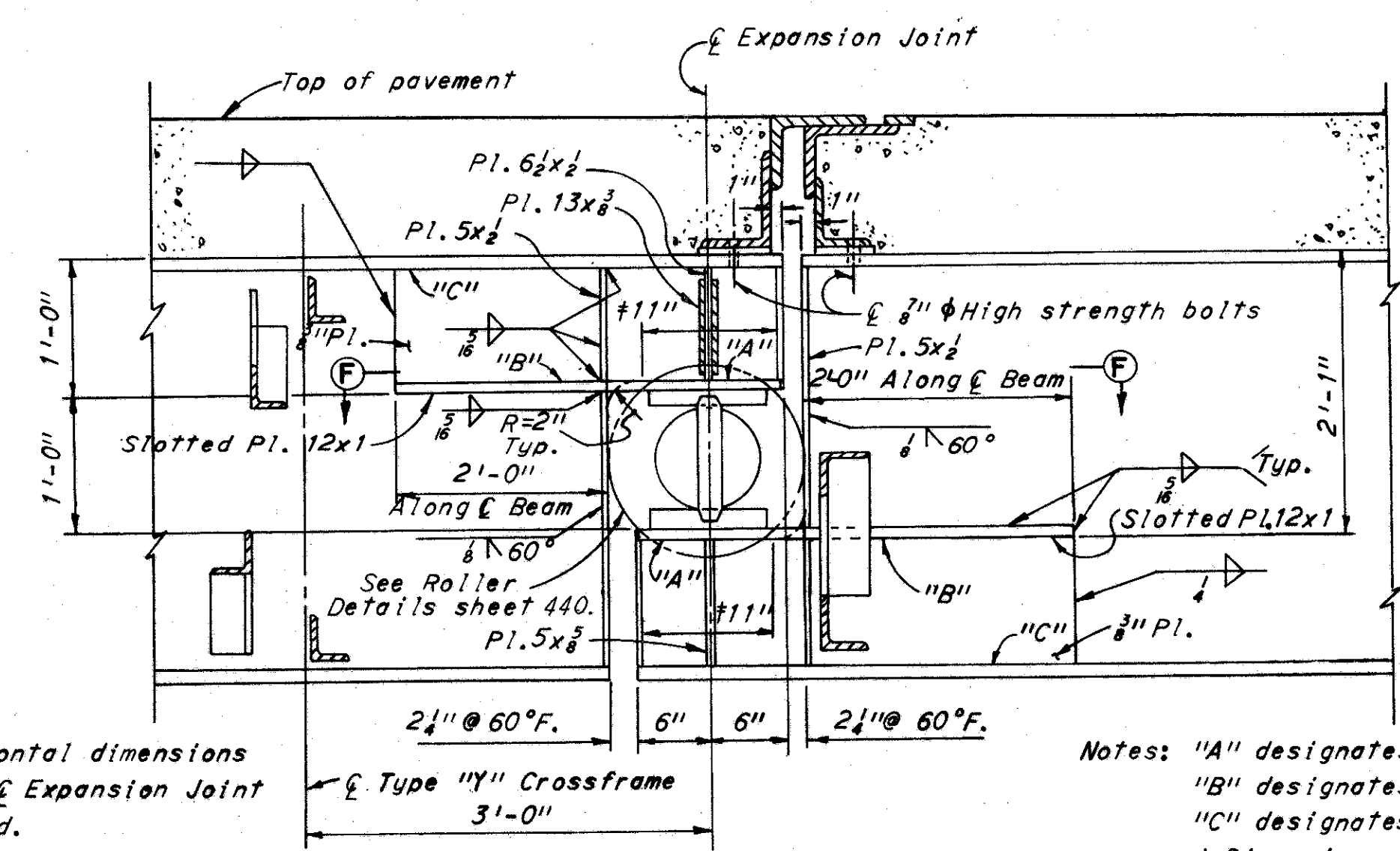


**SECTION A-A**



**SECTION D-D**

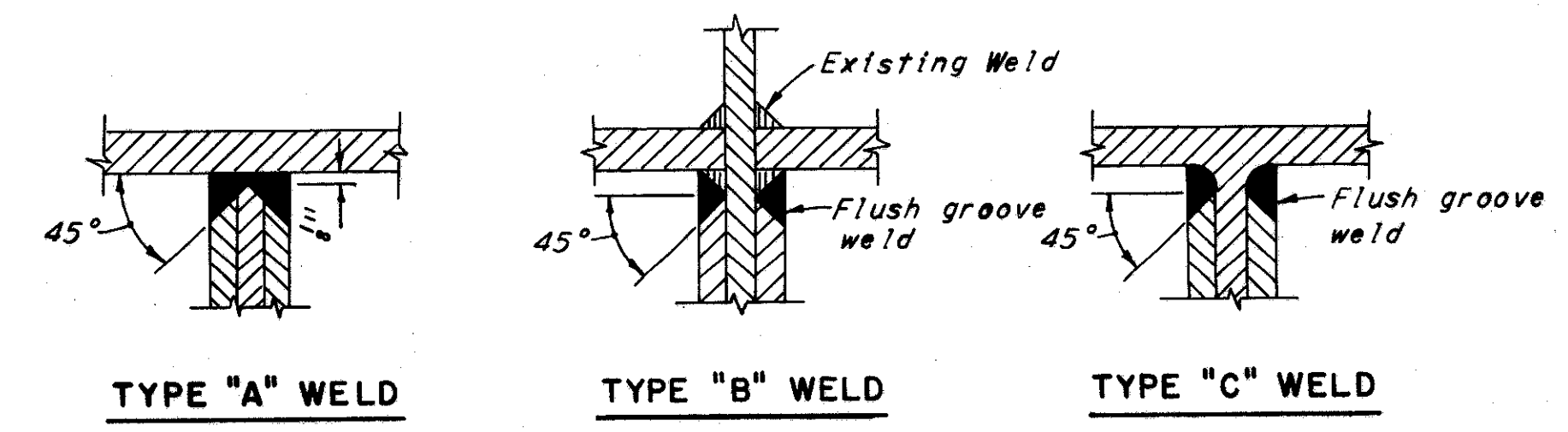
Note: For notes concerning 5/16" bolts and painting see Section A-A, Ohio Standard Drawing SD-1-63, sheet 2 of 4.



**SECTION B-B**

Notes: All horizontal dimensions are normal to Expansion Joint except as noted.

Notes: "A" designates Type "A" weld.  
 "B" designates Type "B" weld.  
 "C" designates Type "C" weld.  
 # Dimension shown is for length of Type "A" weld.  
 For Section F-F see sheet 440.



Notes:  
 The rollers and adjustable bearing plates shall be alloy steel forgings conforming to ASTM A-237-55 Class B and shall be included with "Item S-7, Structural Steel" for payment.  
 All sliding contact surfaces shall not be painted but shall be lubricated with flake graphite.  
 For Roller, Slotted Plate and Roller Positioning Details see sheet 440.

H.N.T.B. BRIDGE NOS. 21A & 21B.

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**EXPANSION JOINT DETAILS**

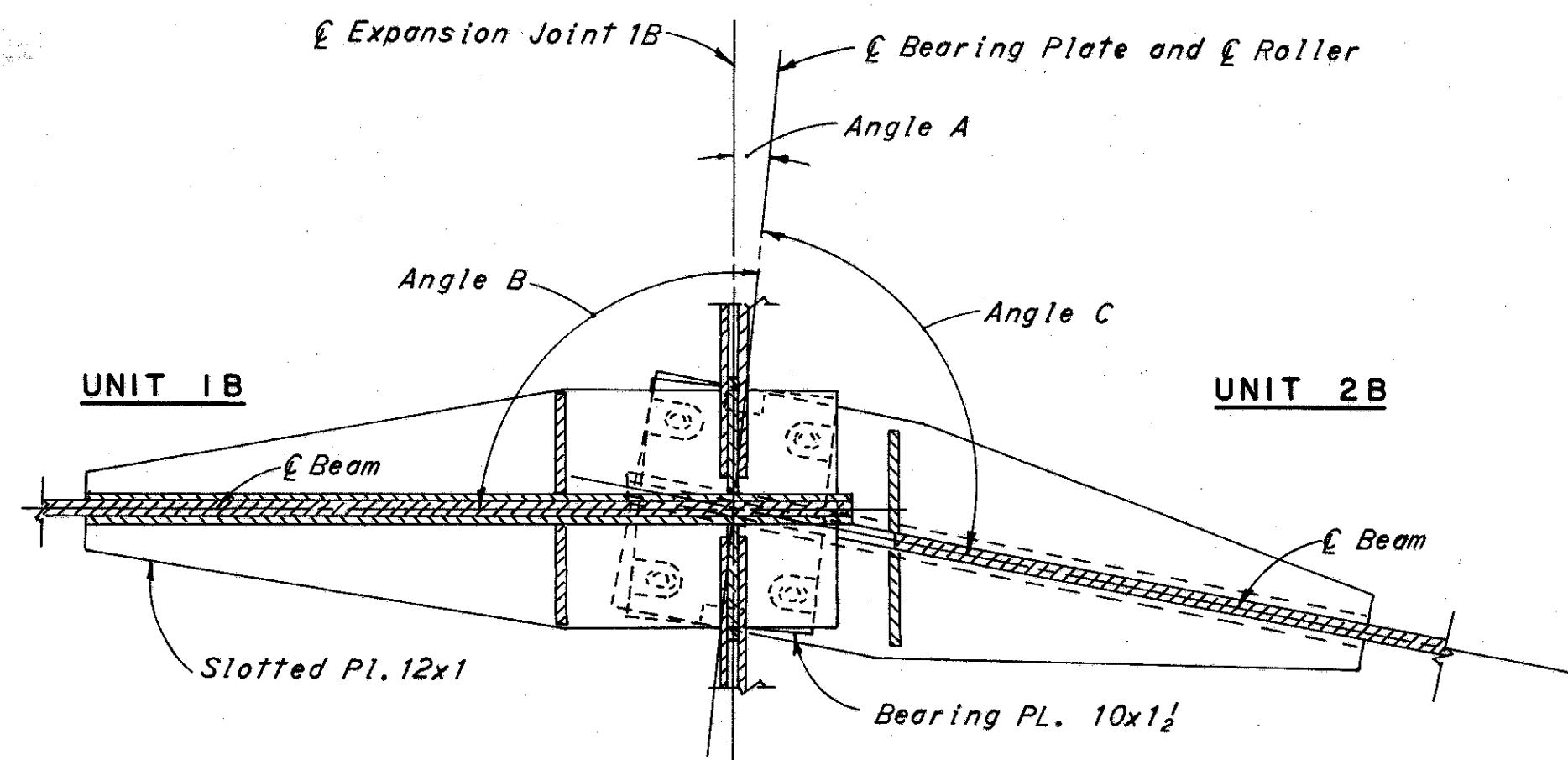
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

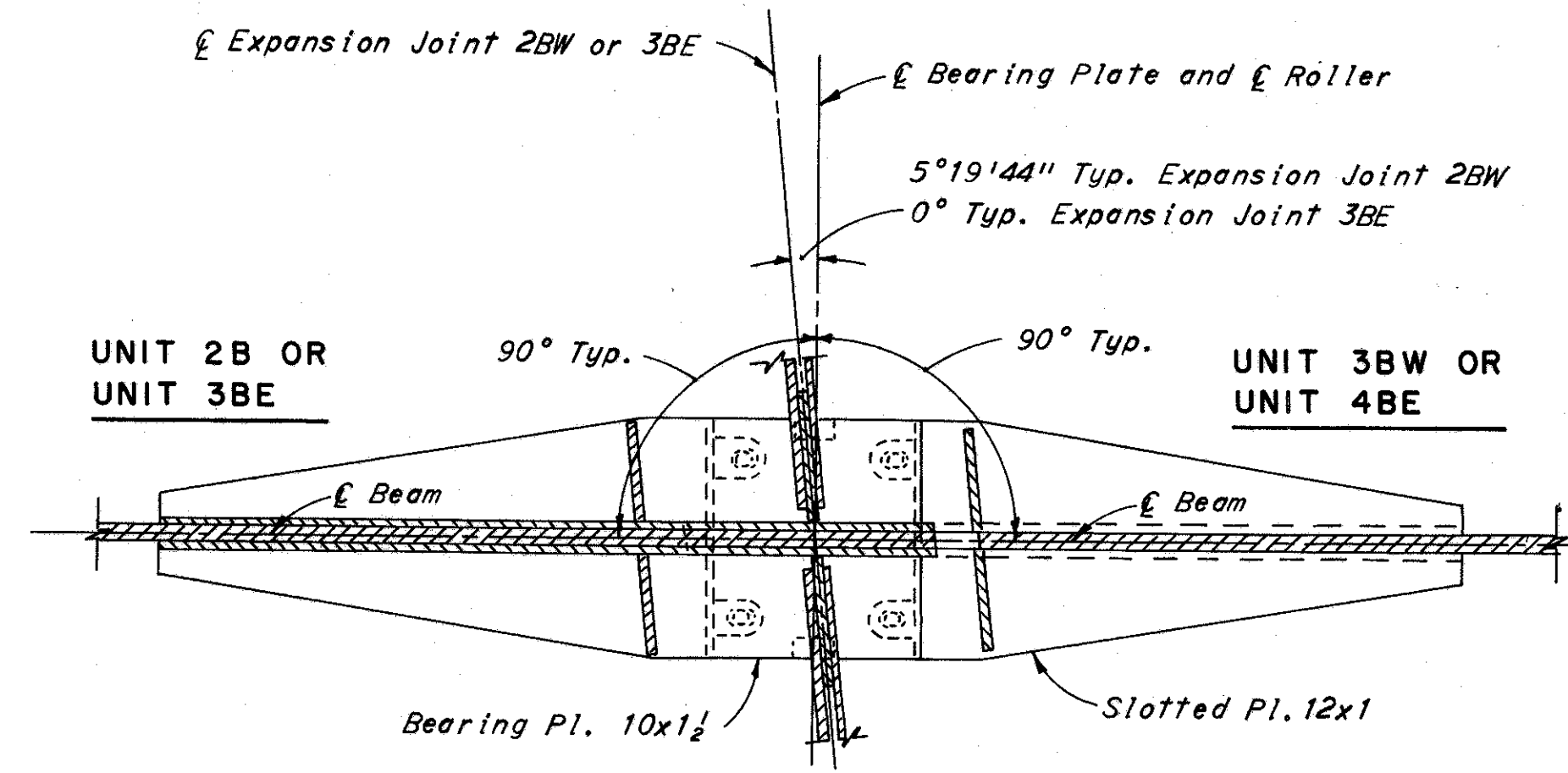
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN RAB	TRACED	CHECKED JAS
DATE 9-12-64	DATE	DATE 9-28-64
		REVIEWED WAF
		DATE 12-22-64
		REVISOR

SHEET 439

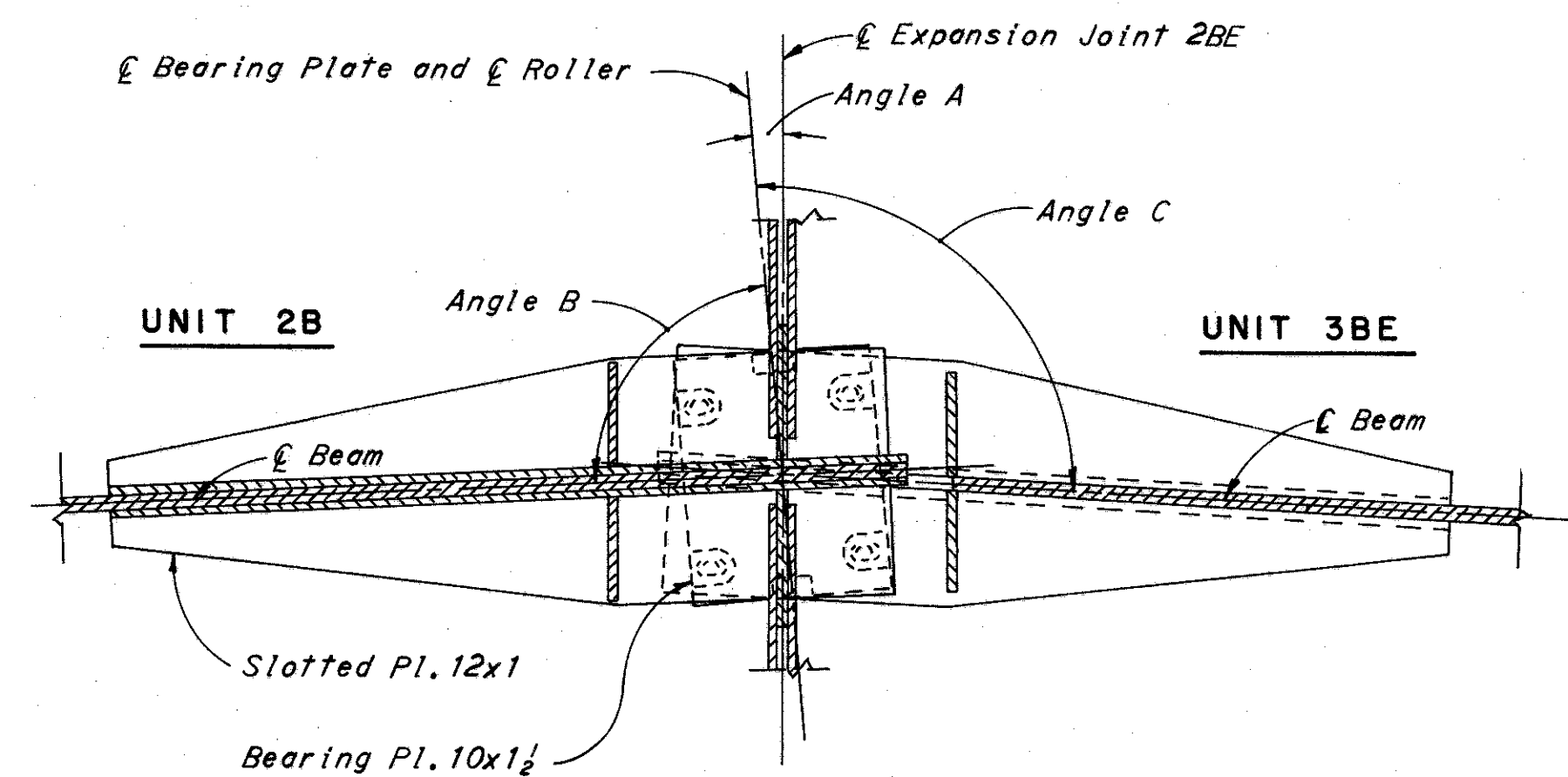
**CUYAHOGA COUNTY**  
 CUY 71-17.83  
 CUY-176-12.76



**SECTION F-F EXPANSION JOINT 1B**

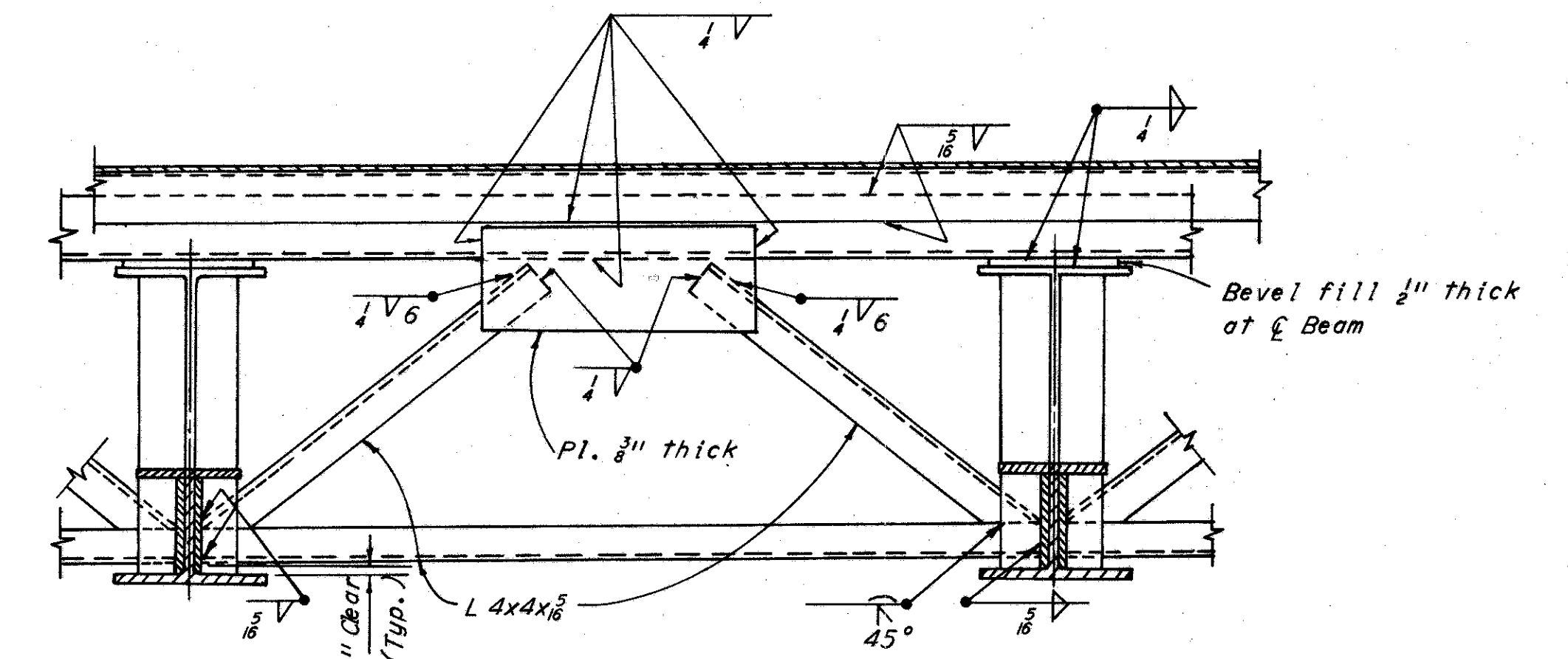


**SECTION F-F EXPANSION JOINT 2BW AND 3BE**

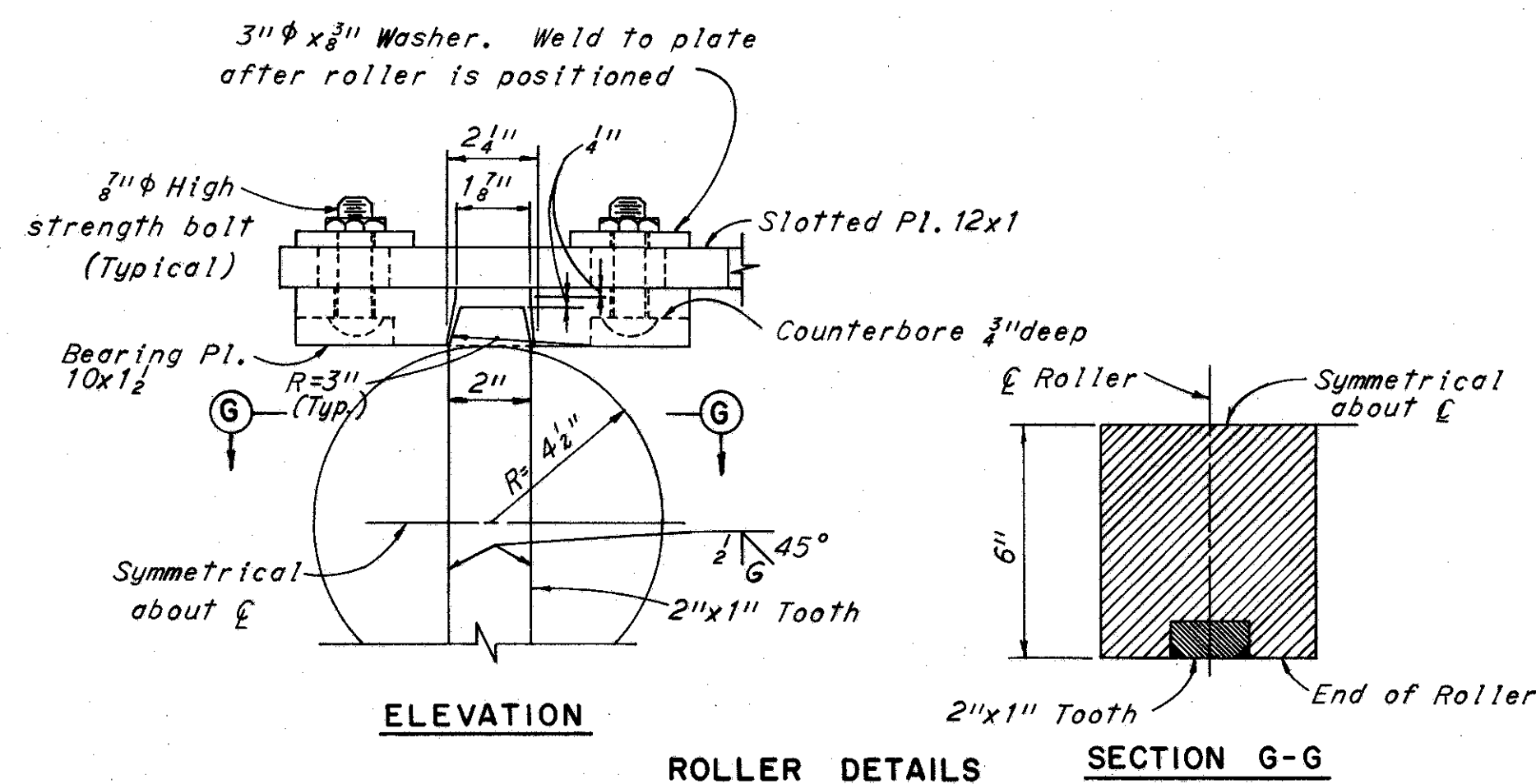


**SECTION F-F EXPANSION JOINT 2BE**

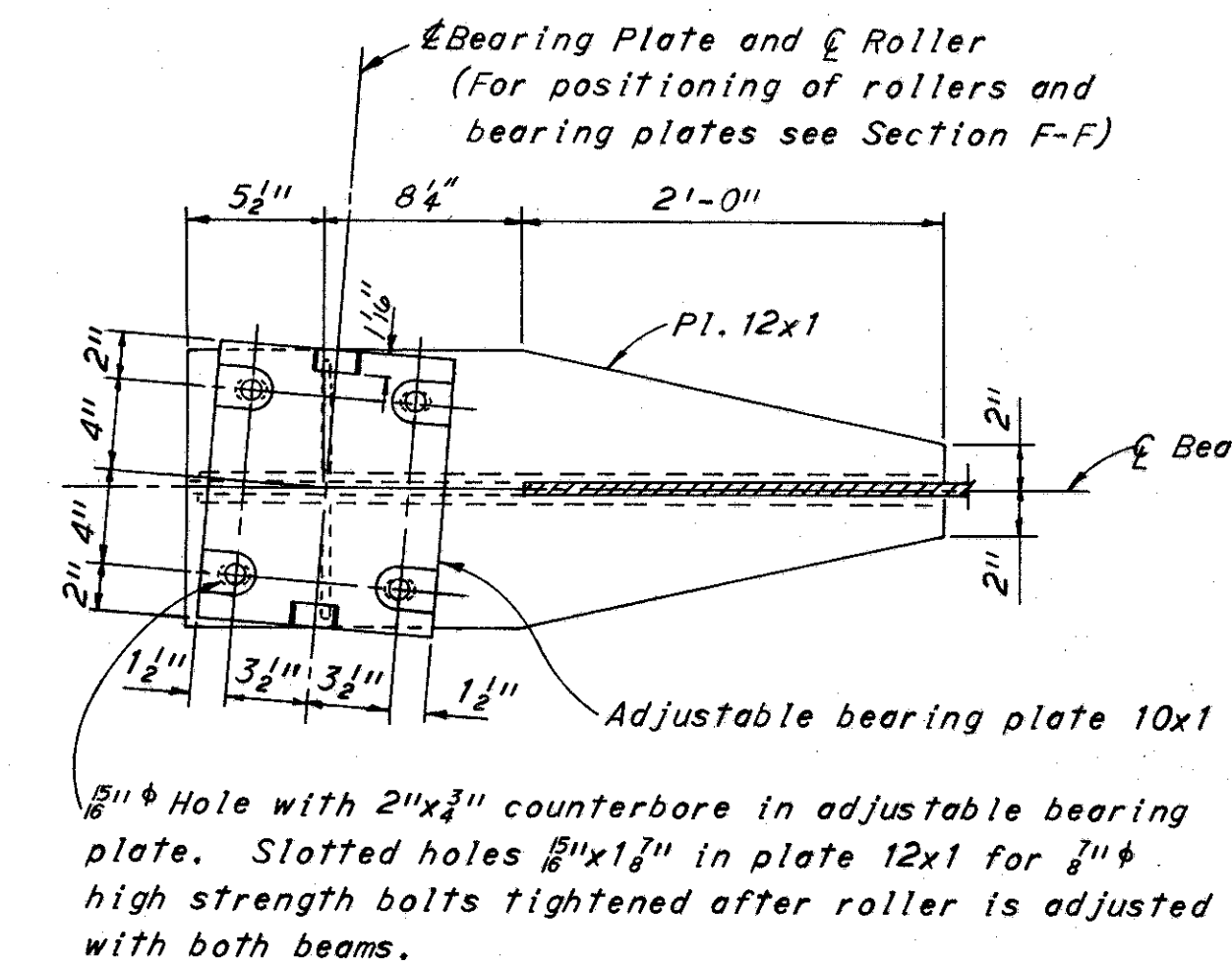
EXPANSION JOINT ANGLES							
EXPANSION JOINT 1B				EXPANSION JOINT 2BE			
Beam	Angle A	Angle B	Angle C	Beam	Angle A	Angle B	Angle C
A	1°20'12"	91°20'12"	90°59'30"	G	4°41'11"	87°20'54"	97°27'58"
B	1°15'23"	91°15'23"	91°04'19"	J	3°54'15"	88°07'50"	96°30'33"
C	1°10'34"	91°10'34"	91°09'08"	K	3°08'37"	88°58'28"	95°29'16"
D	1°05'45"	91°05'45"	91°13'57"	L	2°12'18"	89°49'47"	94°27'06"
E	1°00'56"	91°00'56"	91°18'46"				
F	0°56'07"	90°56'07"	91°23'35"				
L	1°41'05"	91°41'05"	90°57'54"				



**END CROSSFRAME AT EXPANSION JOINTS-BR. NO. 21B**



Note: Set bearing plates so that the  $I$  of the Roller is vertical at 60°F.



**SLOTTED PLATE DETAIL**

Note: For additional Expansion Joint details see sheet 439.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**EXPANSION JOINT DETAILS**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

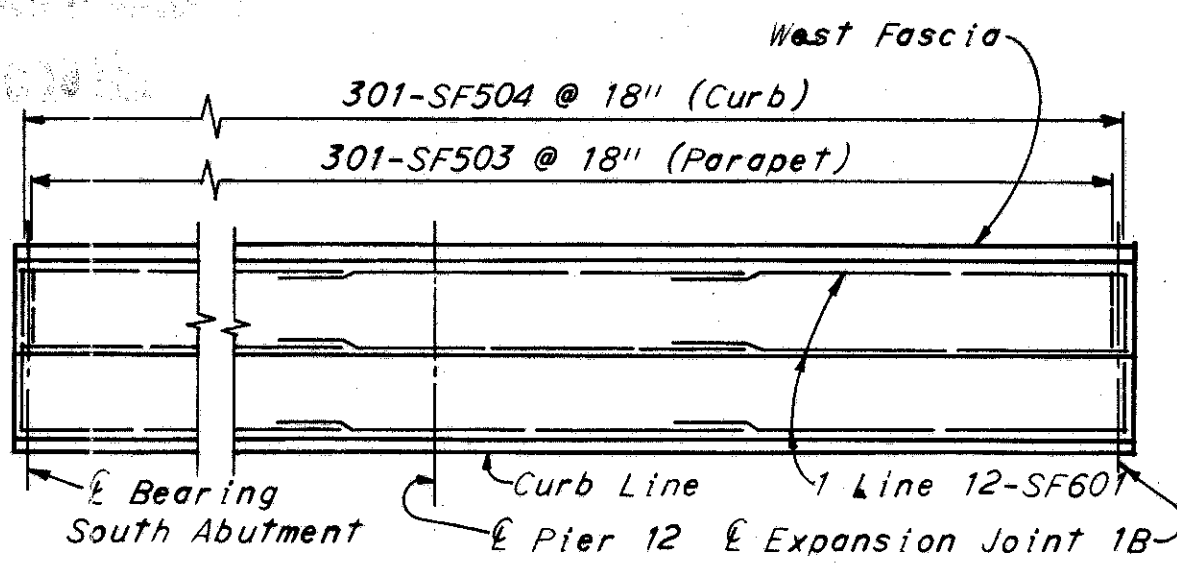
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

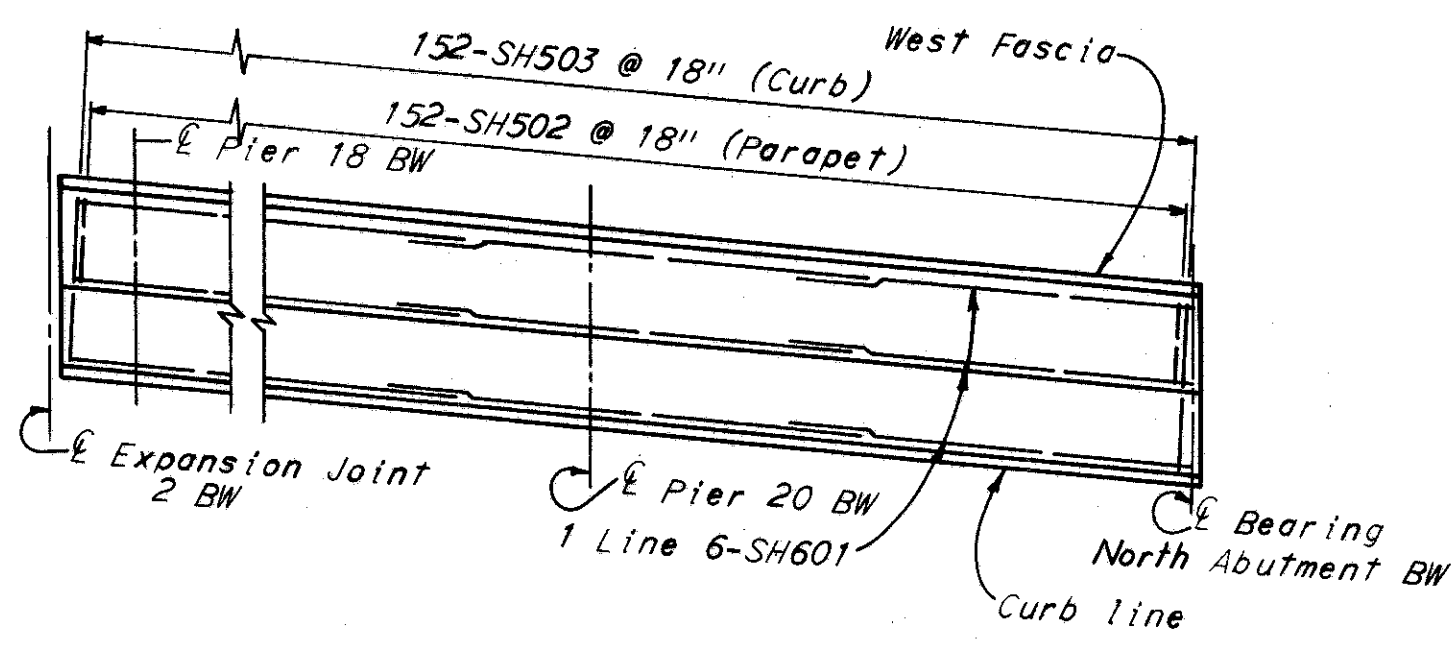
DRAWN RAB TRACED CHECKED AS REVIEWED WJF REVISIONS  
 DATE 9-12-64 DATE 9-28-64 DATE 12-22-64

SHEET 440

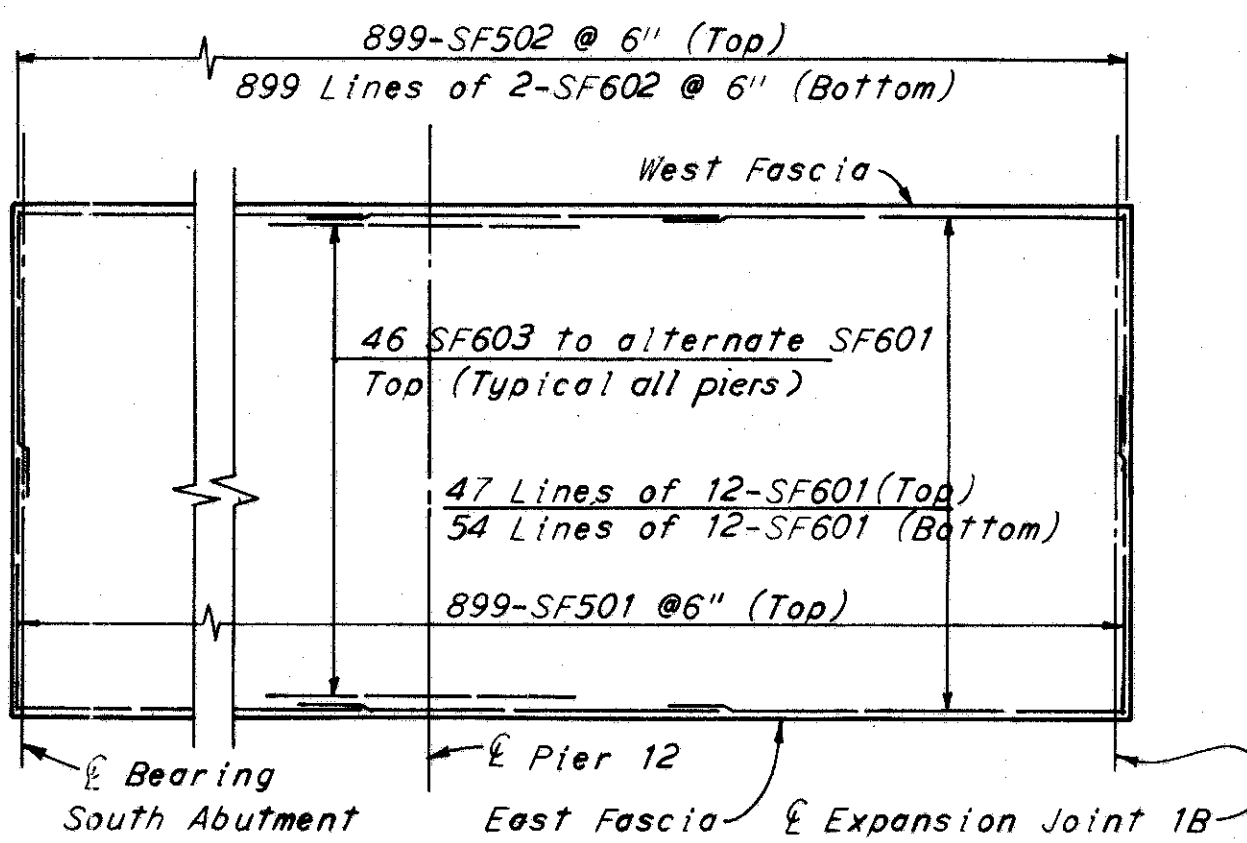
**CUYAHOGA COUNTY**  
**CUY 71-17.83**  
**CUY-176-12.76**



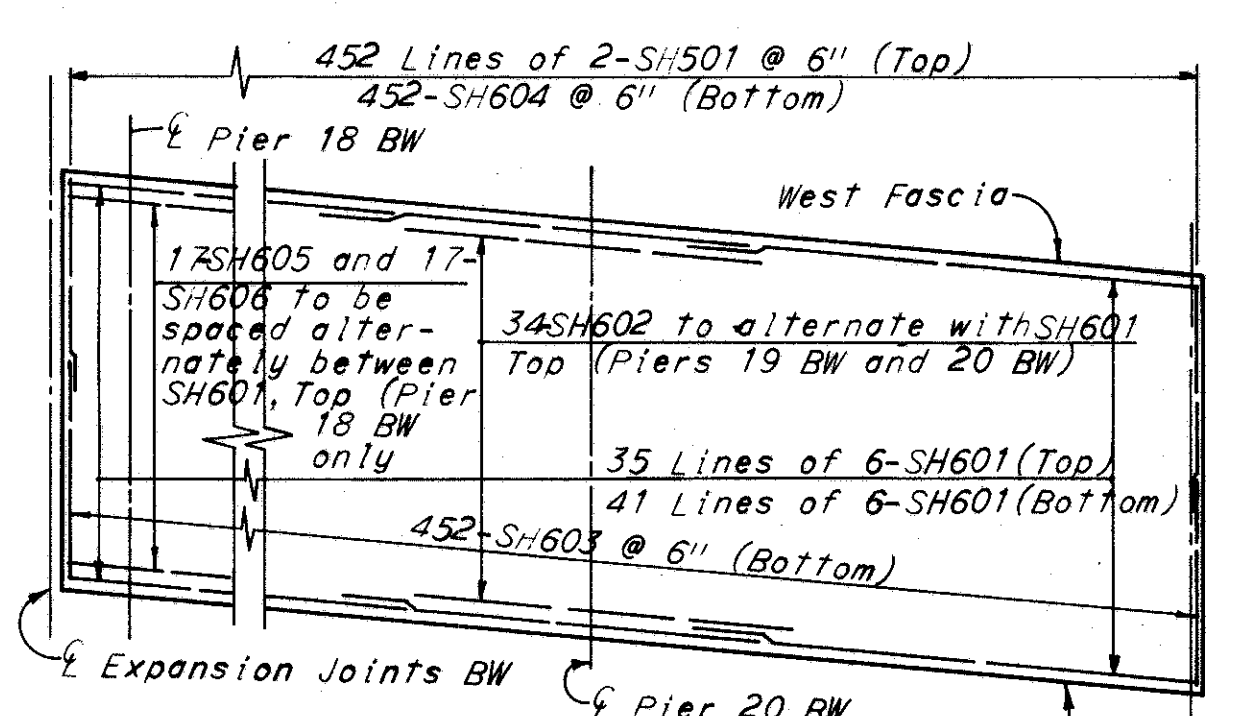
**WEST CURB AND PARAPET**



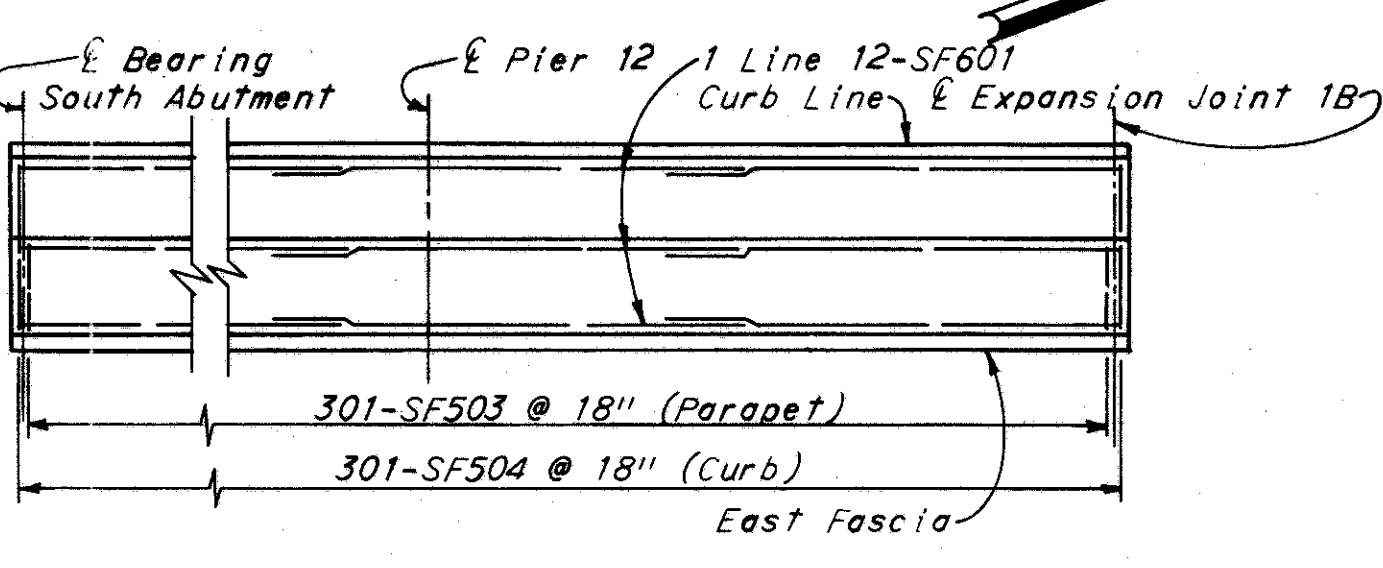
**WEST CURB AND PARAPET**



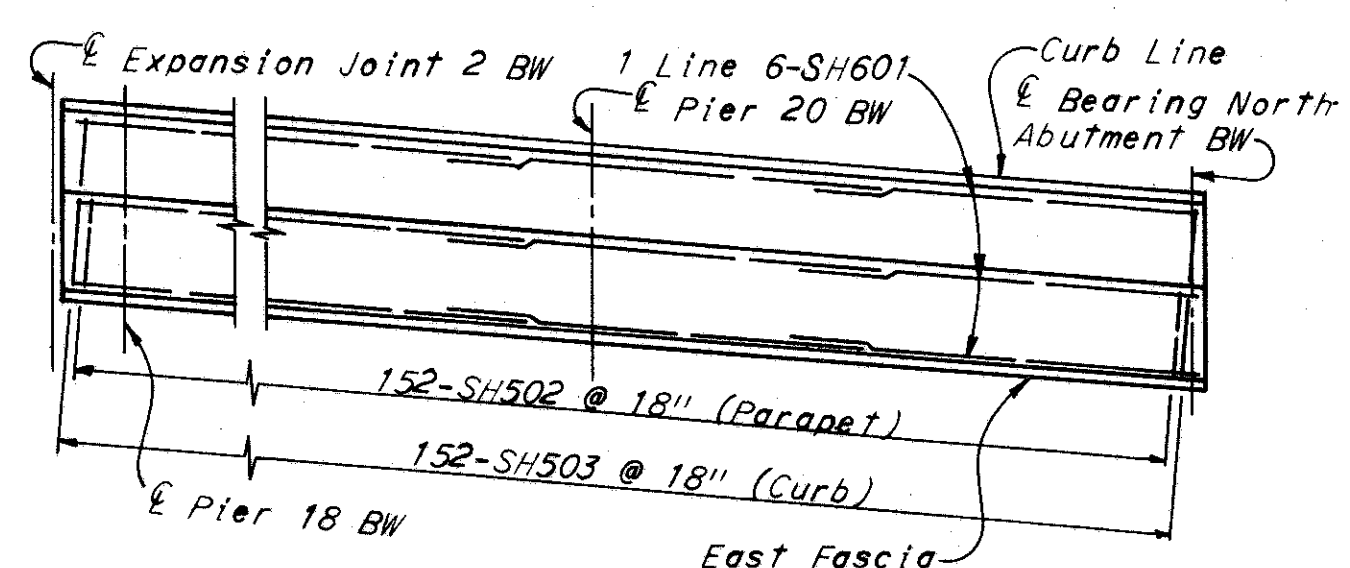
**SLAB PLAN**



**SLAB PLAN**



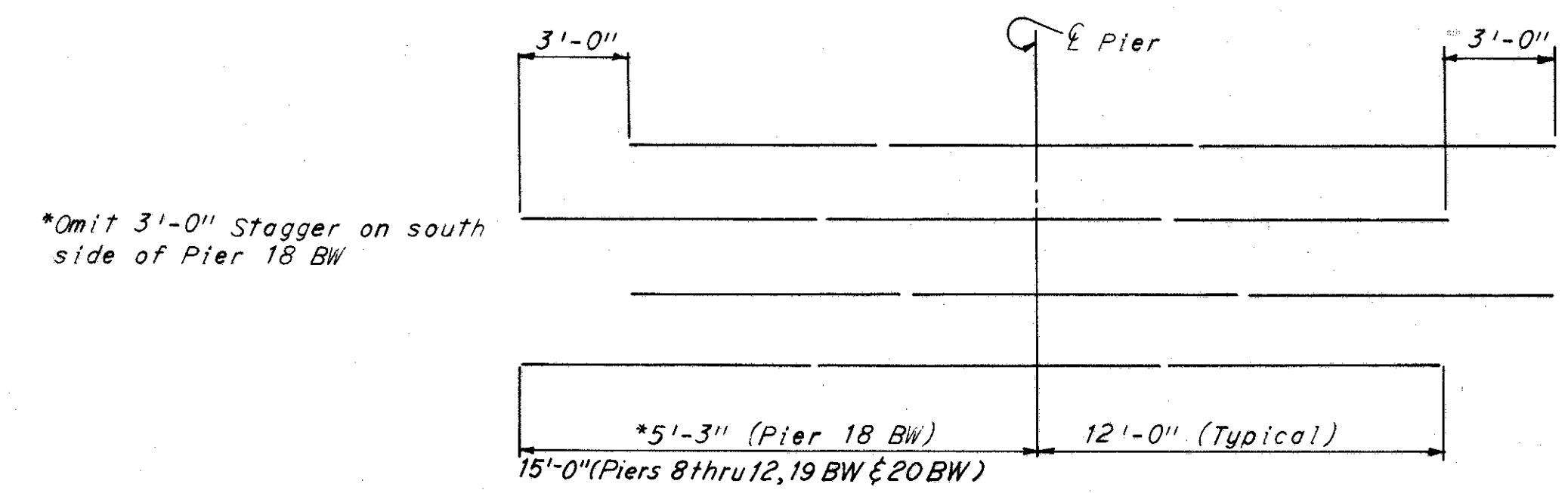
**EAST CURB AND PARAPET**



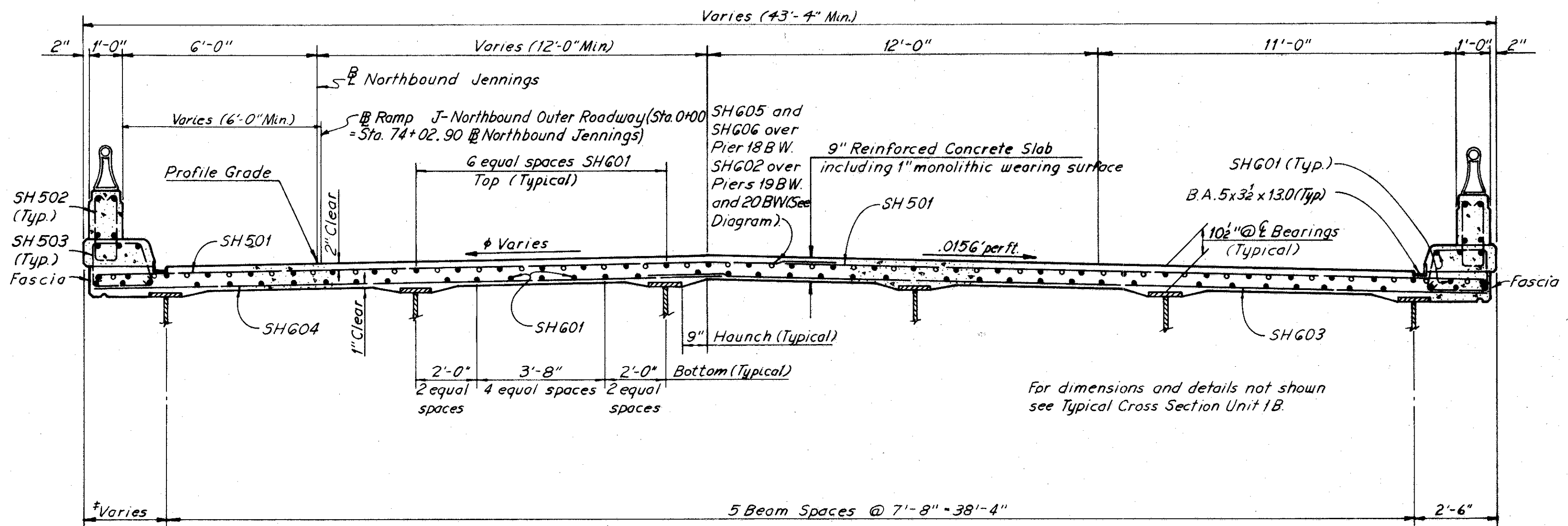
**EAST CURB AND PARAPET**

**UNIT 1B**

**UNIT 3BW**

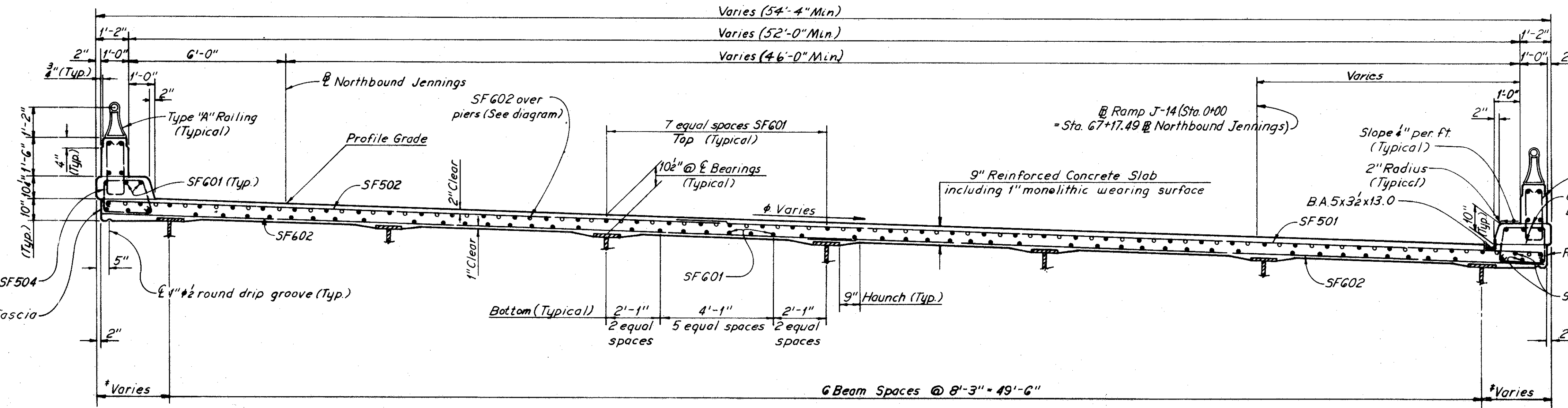


**DIAGRAM SHOWING PLACEMENT OF ADDITIONAL LONGITUDINAL BARS OVER PIERS**



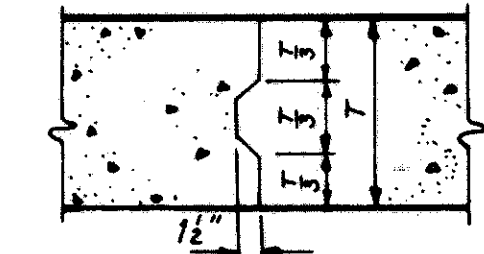
**TYPICAL CROSS SECTION (UNIT 3BW)**

\*See Framing Plan, Sheet 433.  
 \*See Superelevation Transition Diagrams Sheet 442.



**TYPICAL CROSS SECTION (UNIT 1-B)**

Notes:  
 For longitudinal reinforcement in the parapet see sheet 445.  
 For railing post spacing and parapet joint spacing see sheet 445.  
 For additional railing details see Ohio Standard Drawing AP-1-57.  
 For Reinforcement Schedule and Bending Diagrams see sheet 455.



**OPTIONAL TRANSVERSE SLAB CONSTRUCTION JOINT**

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**DECK REINFORCEMENT**  
**UNIT 1-B AND 3-BW**  
**NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,**  
**AND NORTHBOUND JENNINGS**

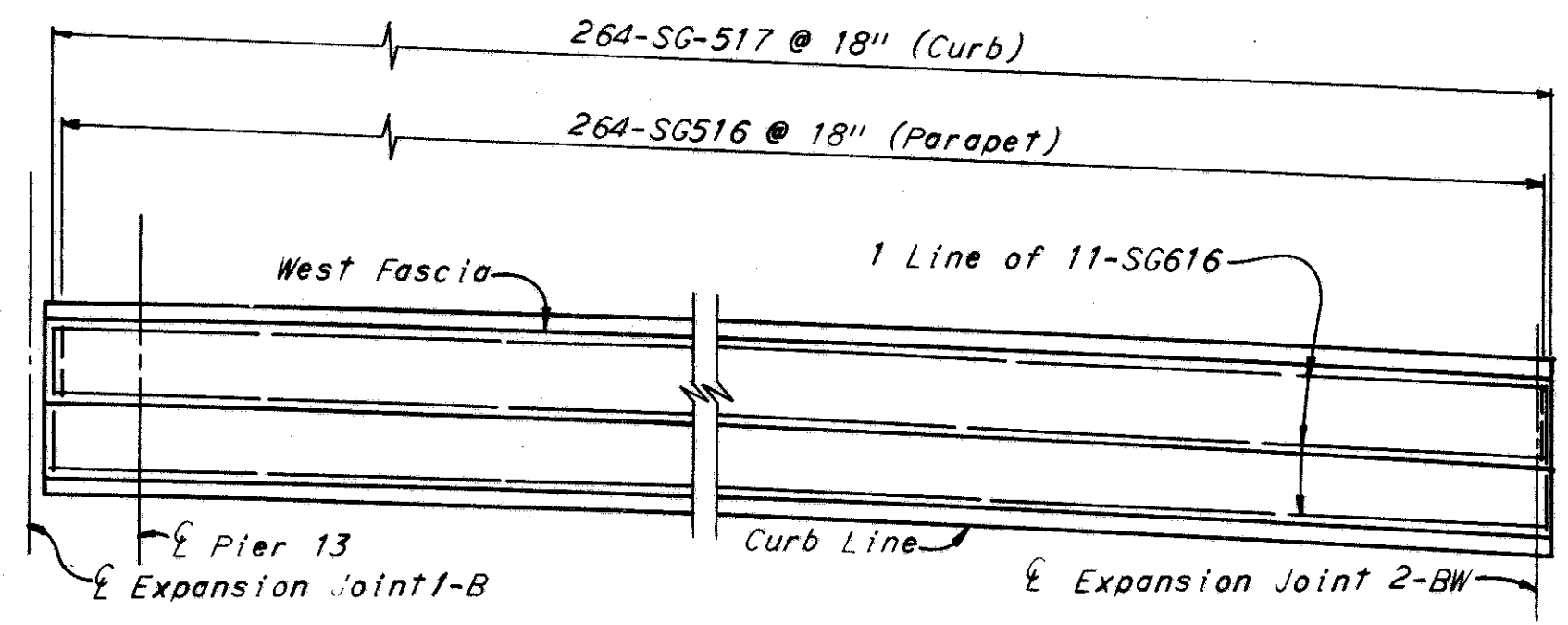
BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

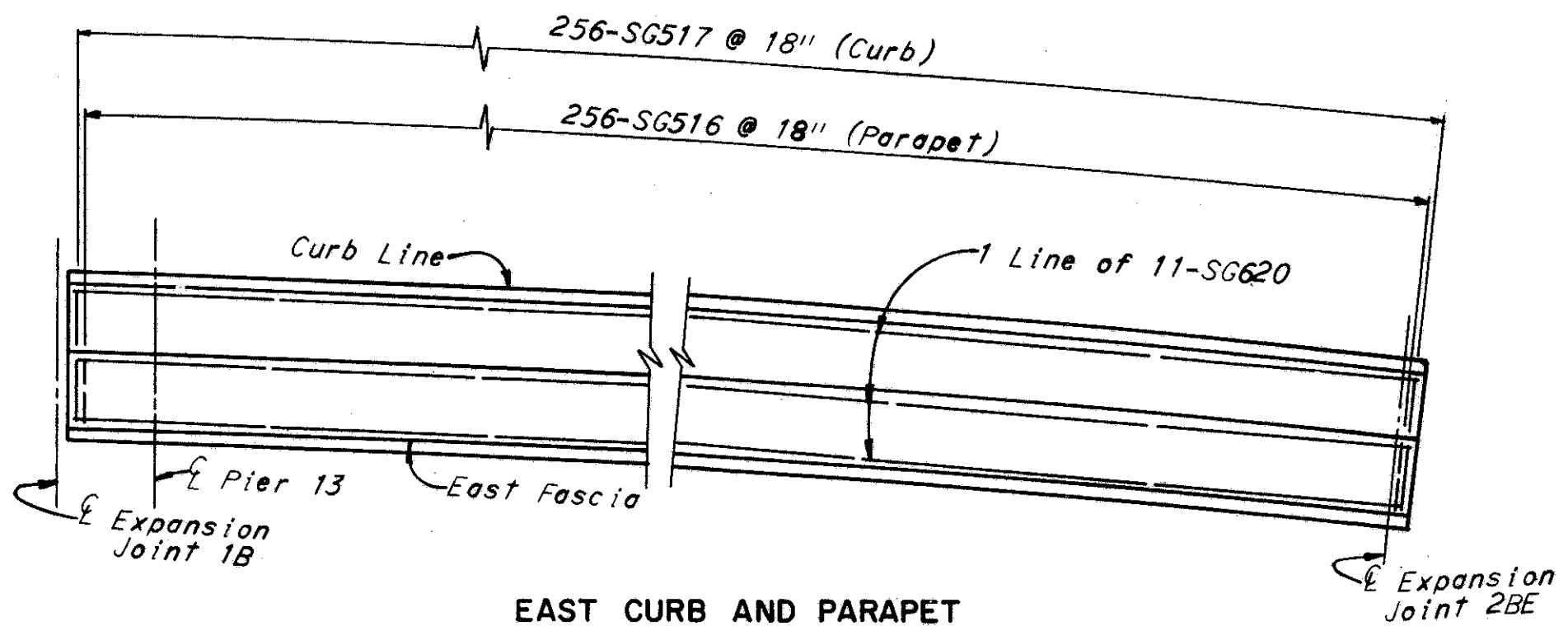
DRAWN W/D	TRACED	CHECKED J.M.C.	REVIEWED W.F.
DATE 7-8-64	DATE	DATE 12-21-64	DATE 12-22-64

SHEET 441

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



WEST CURB AND PARAPET



EAST CURB AND PARAPET

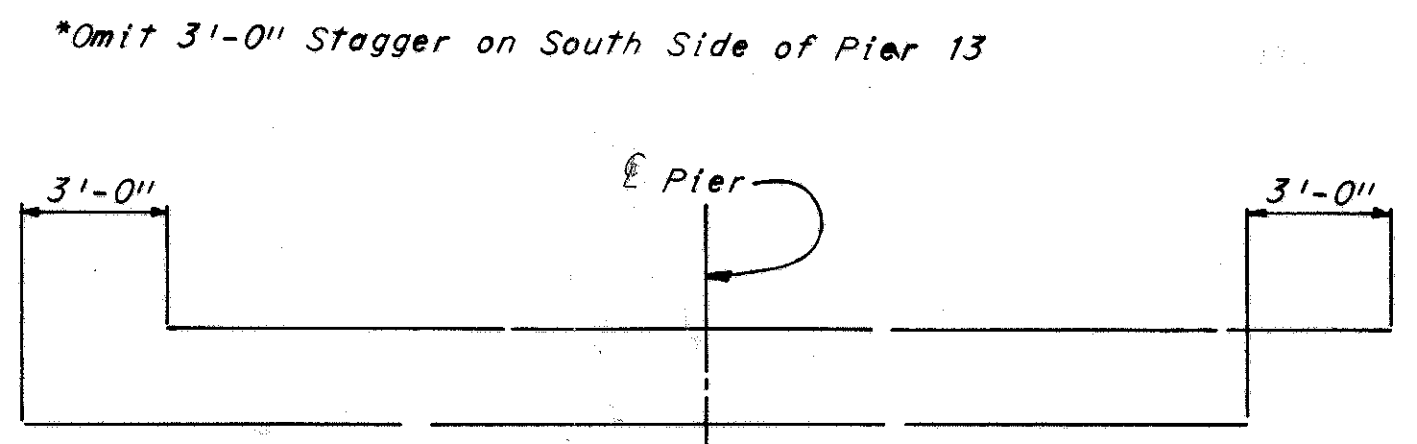
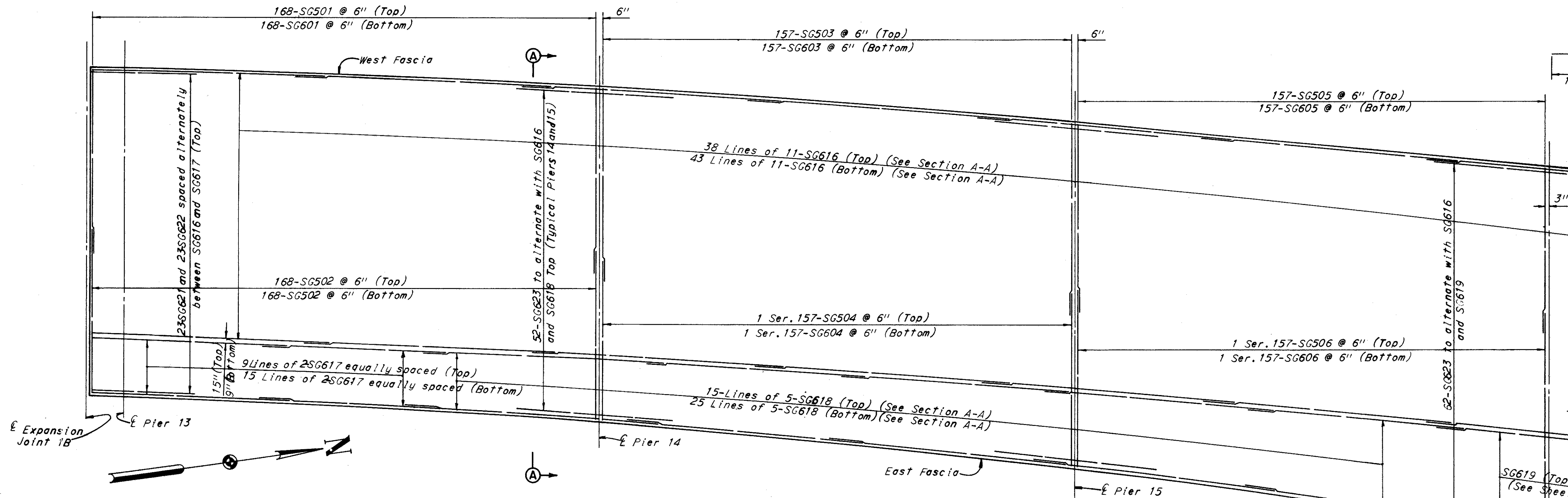
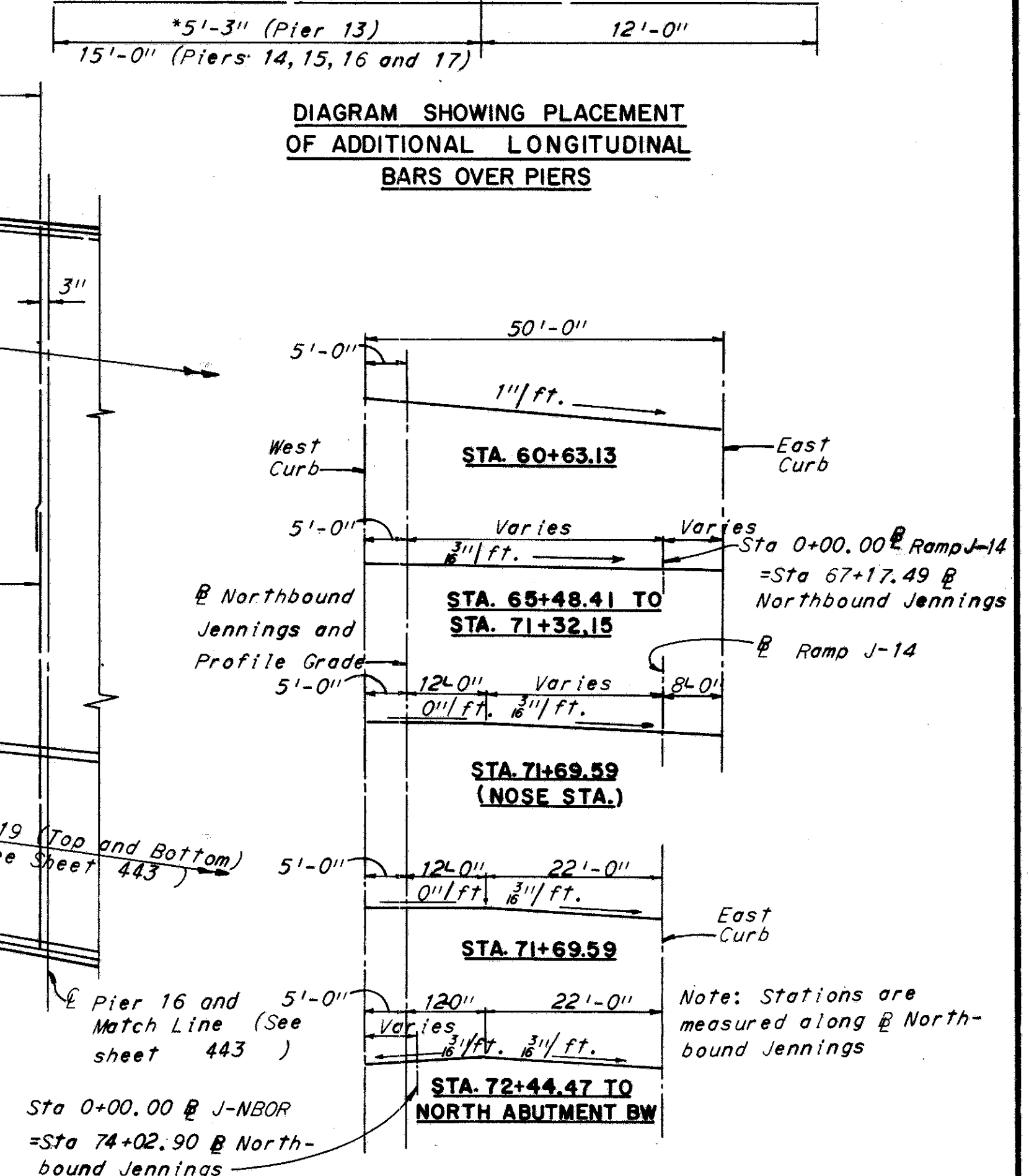


DIAGRAM SHOWING PLACEMENT OF ADDITIONAL LONGITUDINAL BARS OVER PIERS

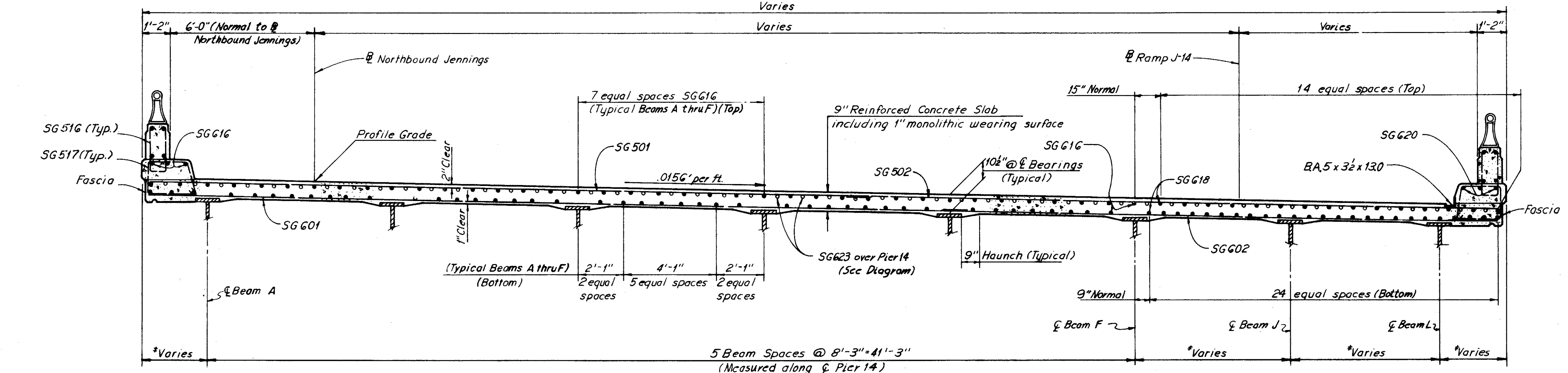


PART SLAB PLAN (UNIT 2B)



SUPERELEVATION TRANSITION DIAGRAMS (UNITS 1B, 2B TO NOSE, AND 3BW)

Note: Rate of transition between stations shown above is uniform.



SECTION A-A

\*See Framing Plan, Sheet 434.

Notes:  
 For additional Slab Plan details of Unit 2B see sheet 443.  
 For cross section details and dimensions not shown see Typical Cross Section Unit 1B  
 For additional notes see sheet 441.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

DECK REINFORCEMENT  
 UNIT 2-B  
 NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

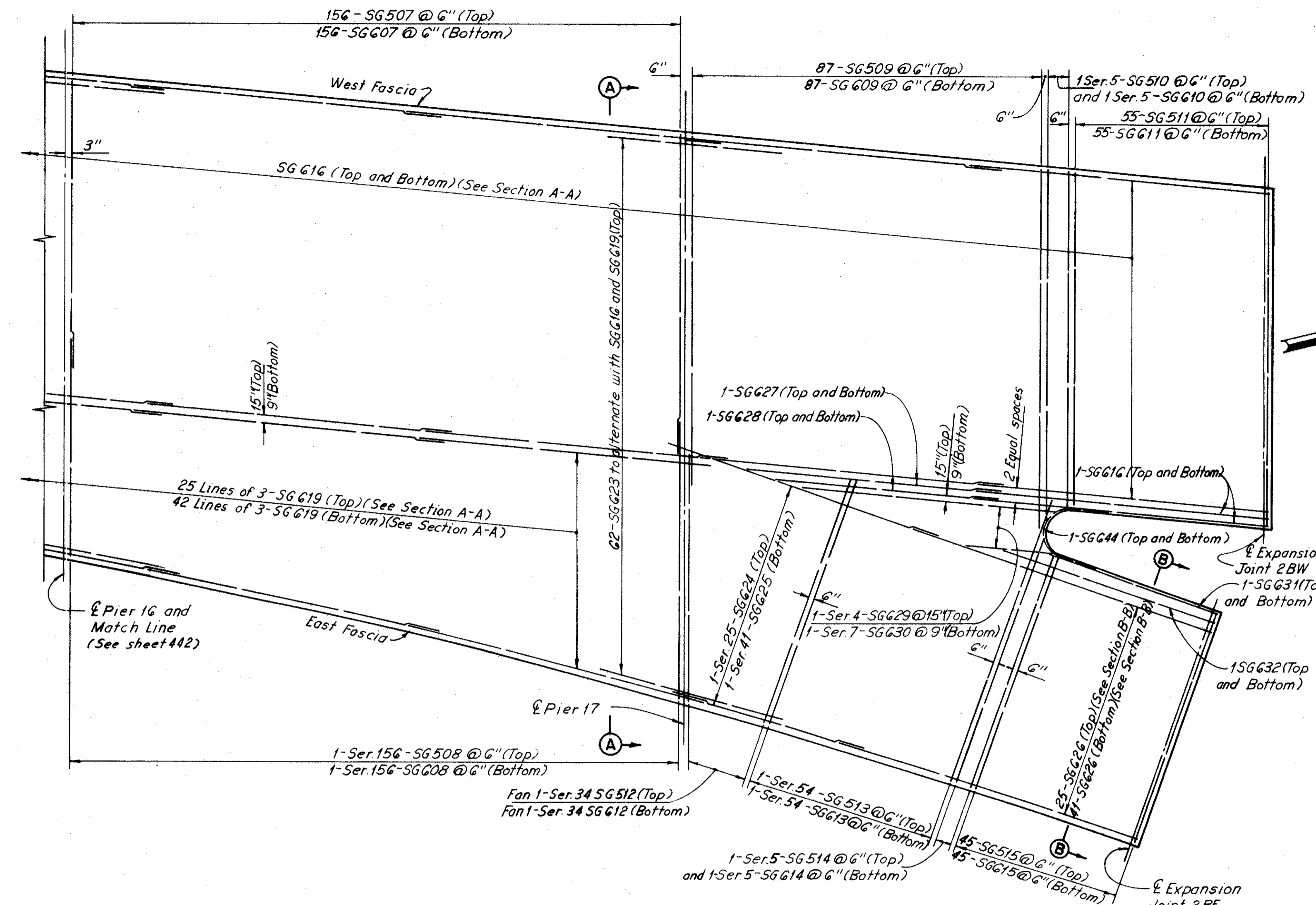
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 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

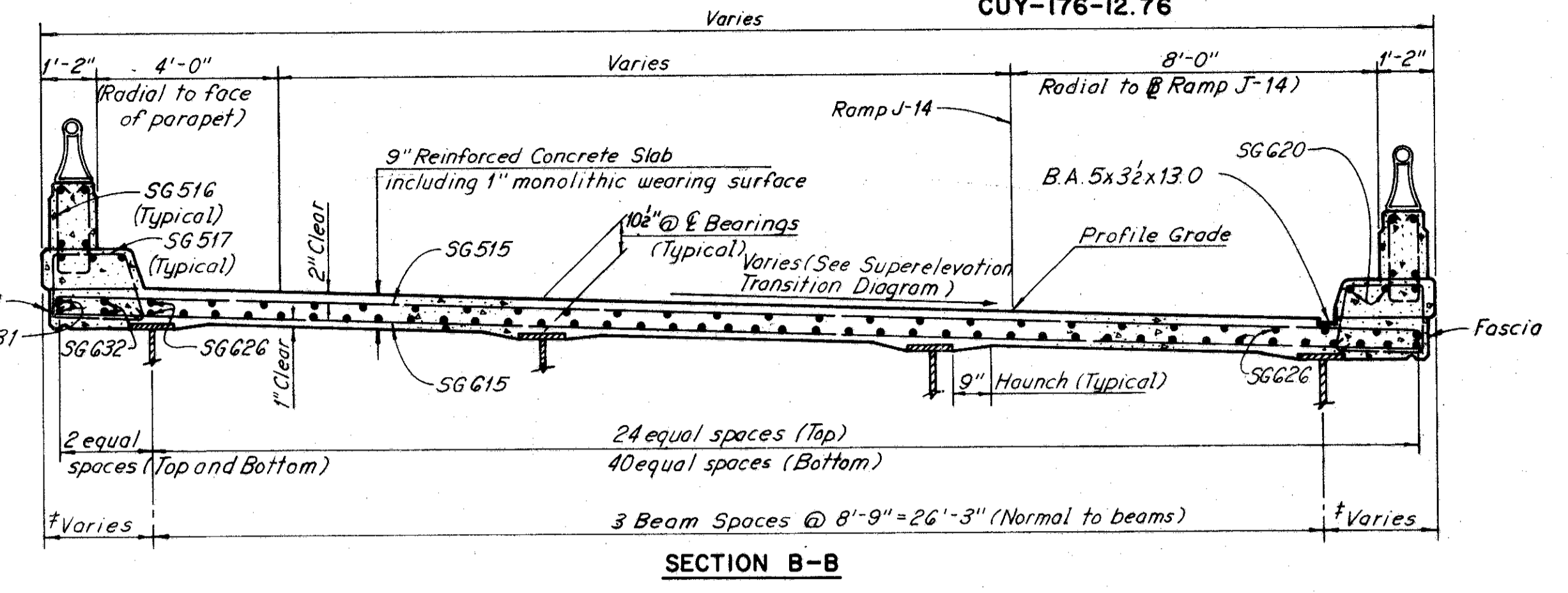
DRAWN	TRACED	CHECKED	REVIEWED
WD	JMC	JMC	JMC
DATE	DATE	DATE	DATE
7-10-64	12-23-64	12-23-64	12-23-64

SHEET 442

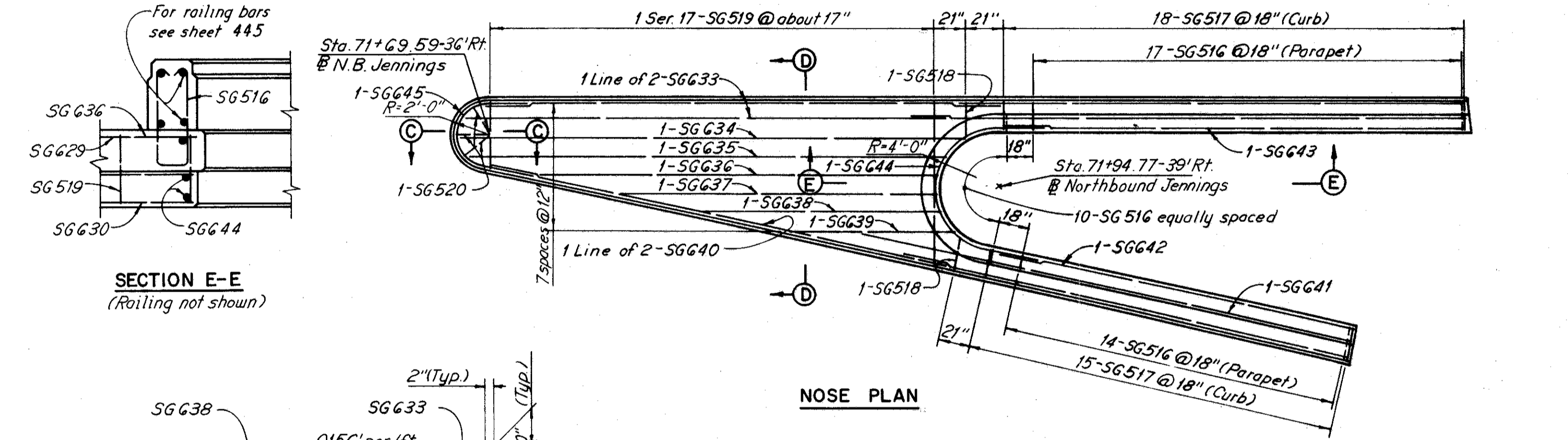
CUYAHOGA COUNTY  
 CUY 71-1783  
 CUY-176-12.76



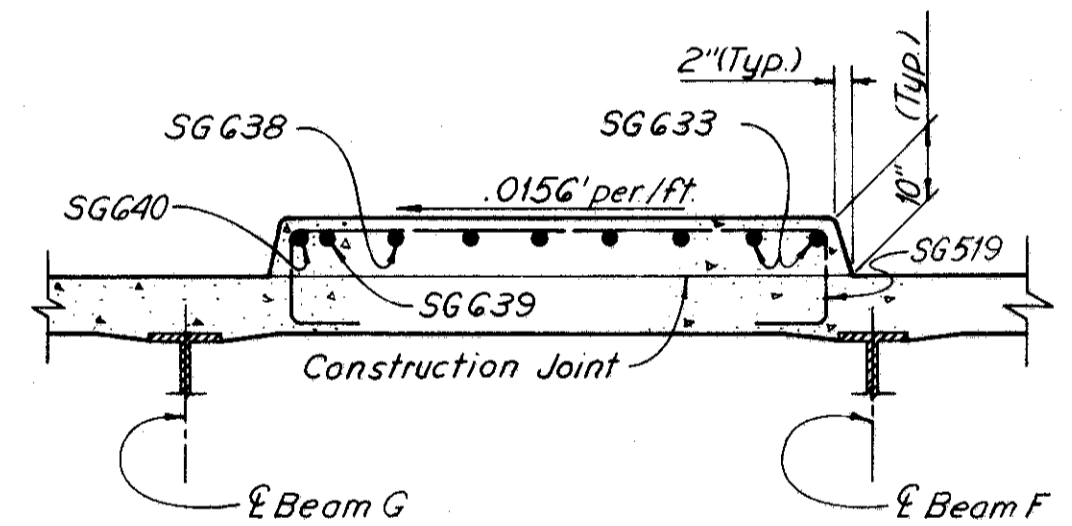
PART SLAB PLAN (UNIT 2B)



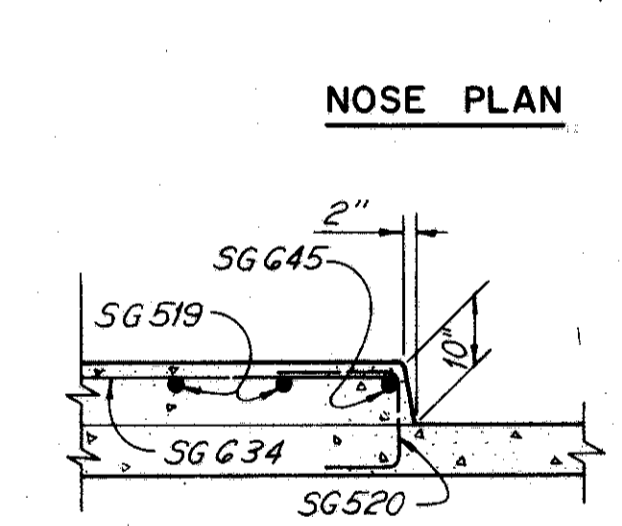
SECTION B-B



SECTION E-E (Railing not shown)

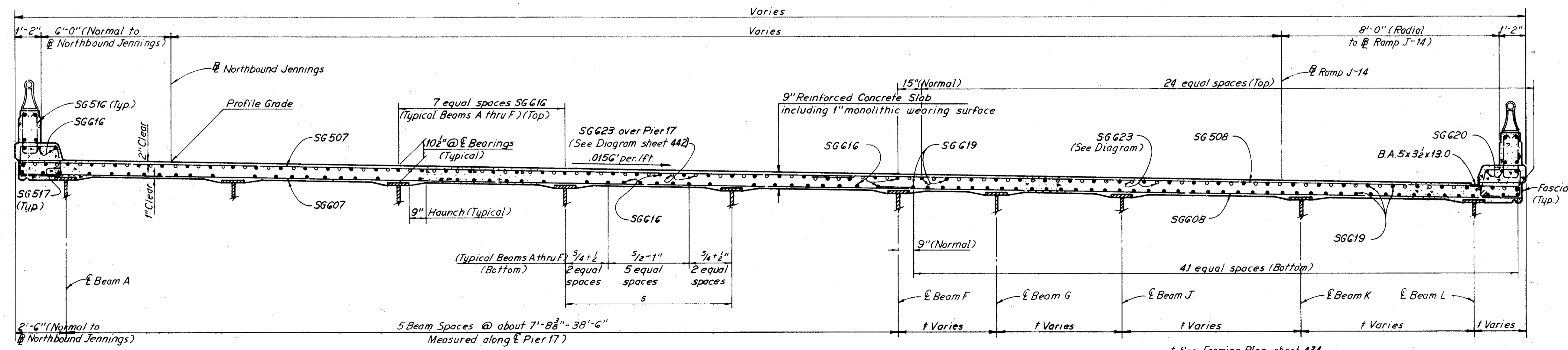


SECTION D-D



SECTION C-C

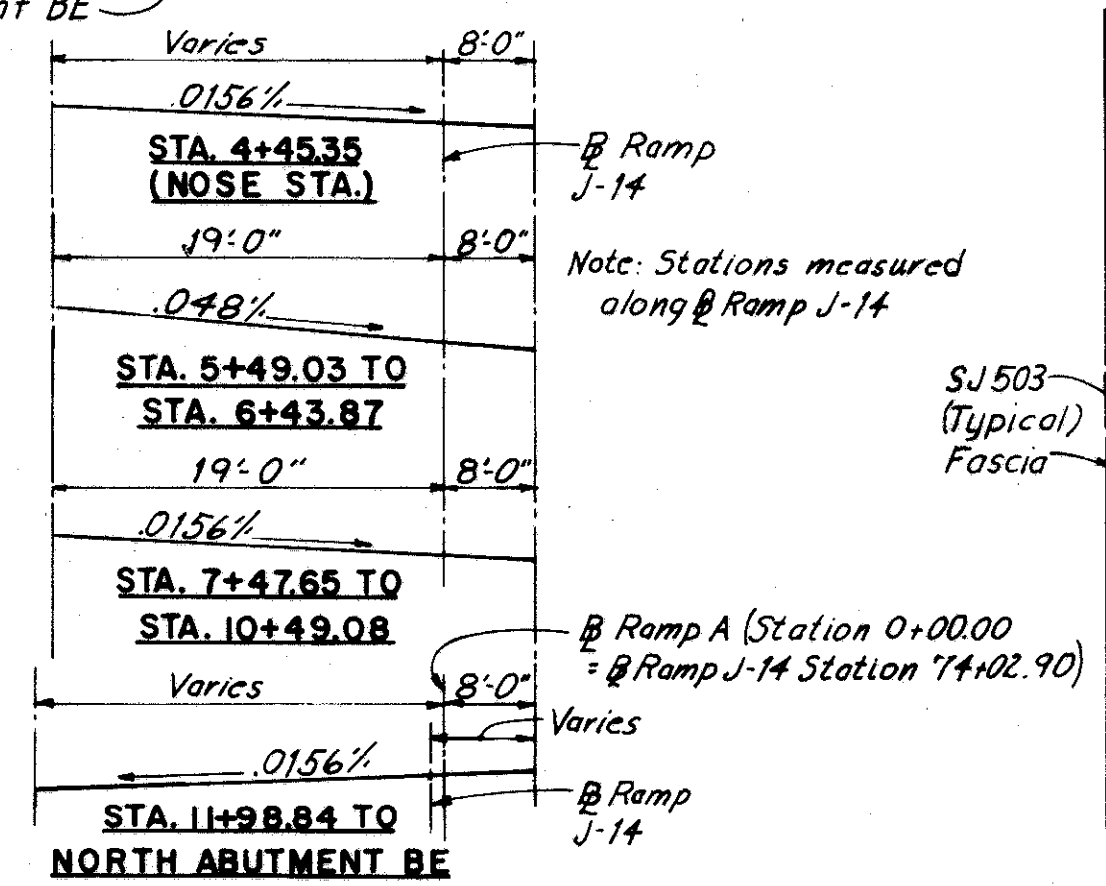
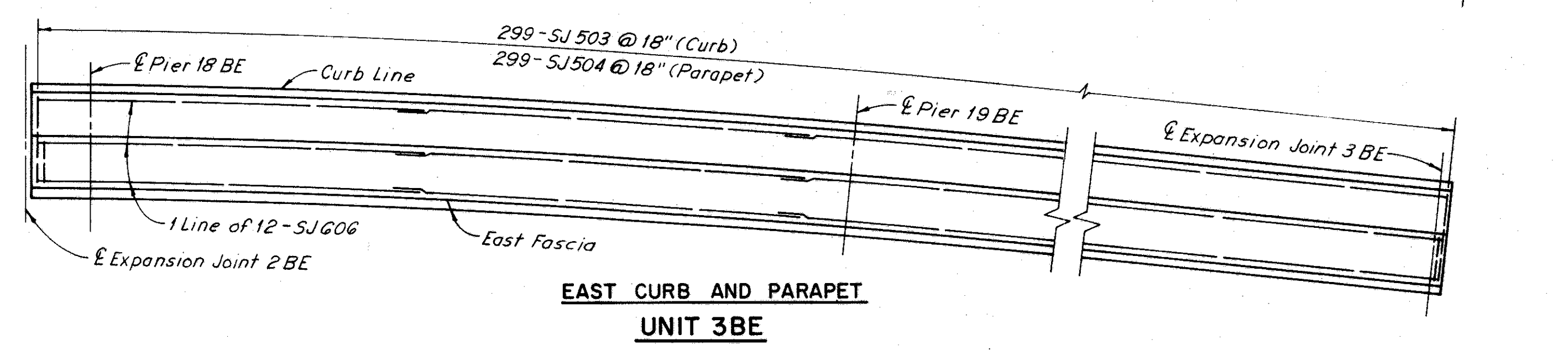
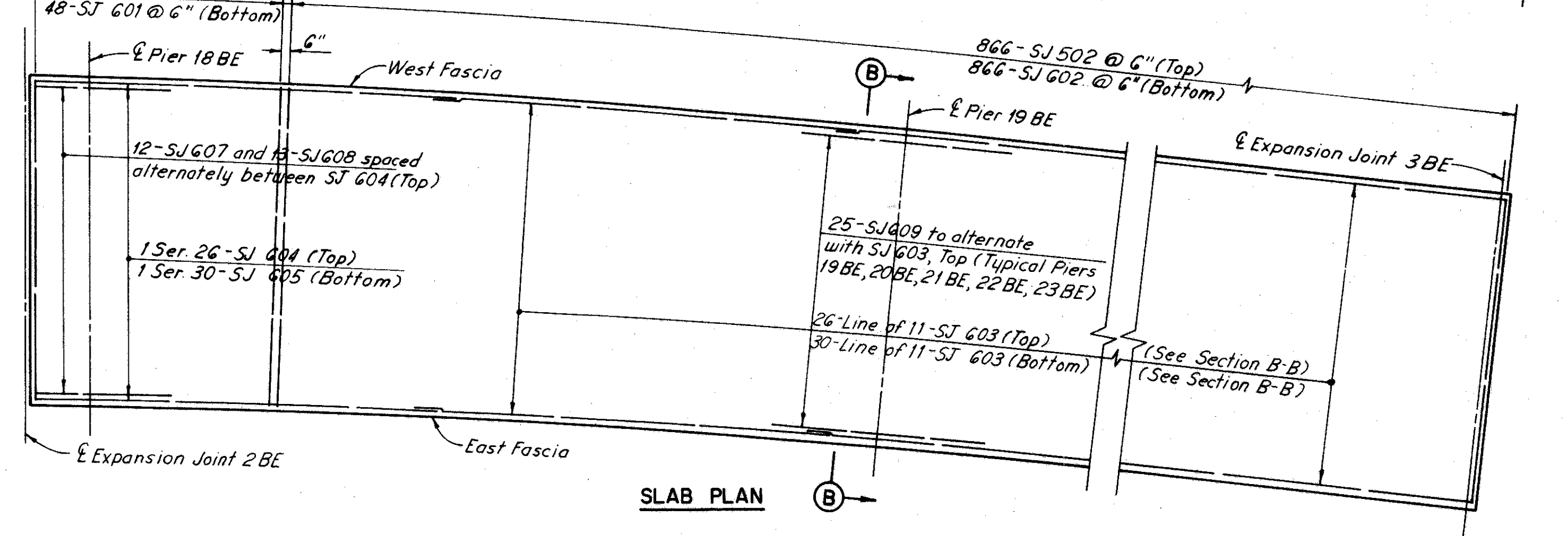
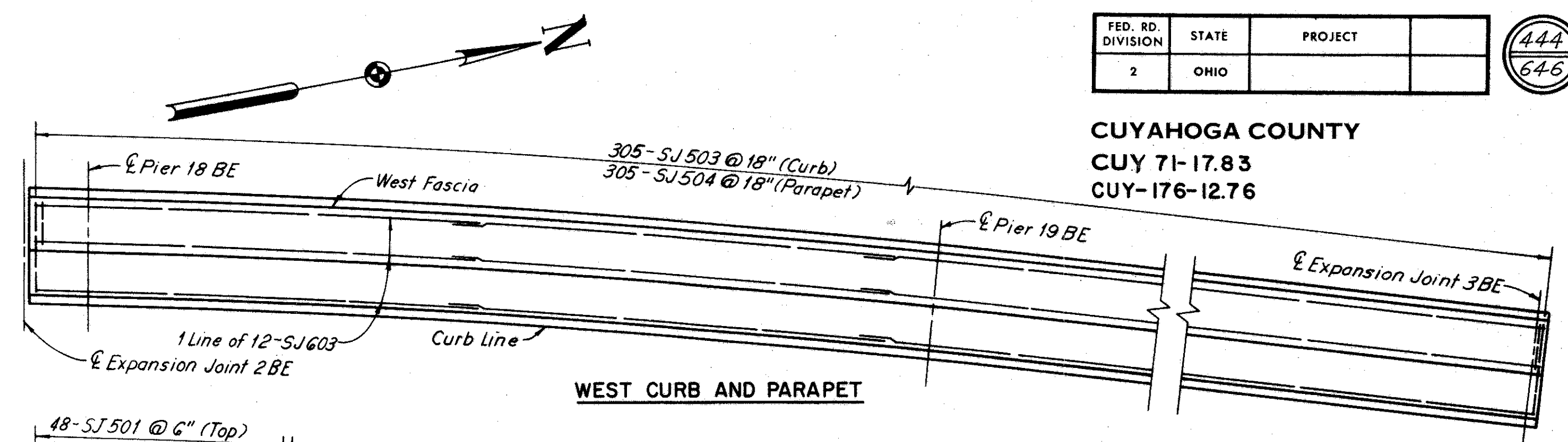
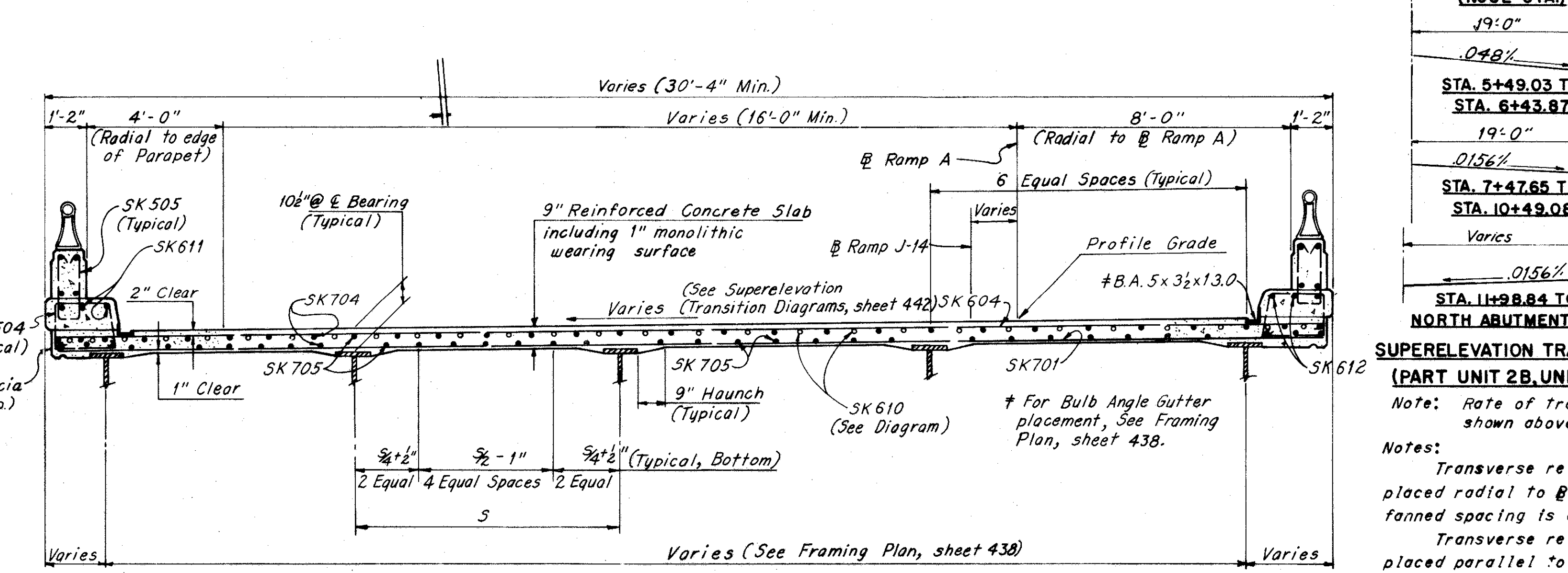
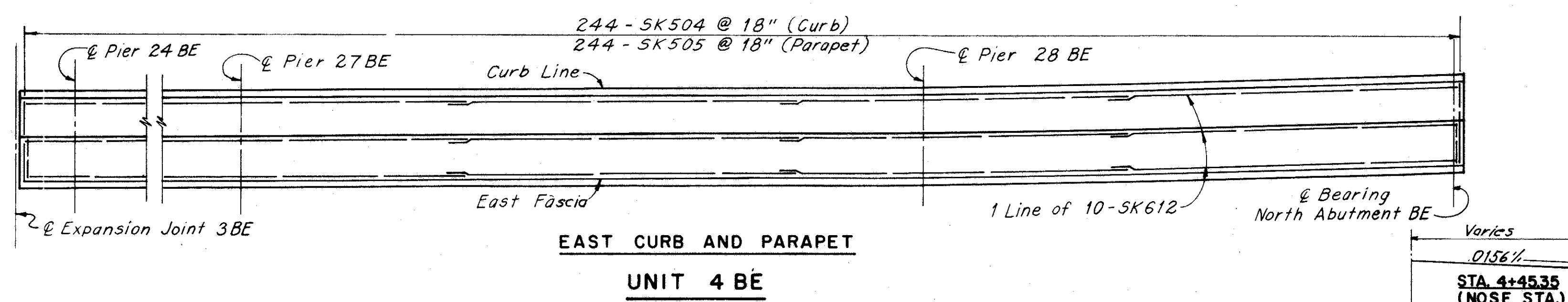
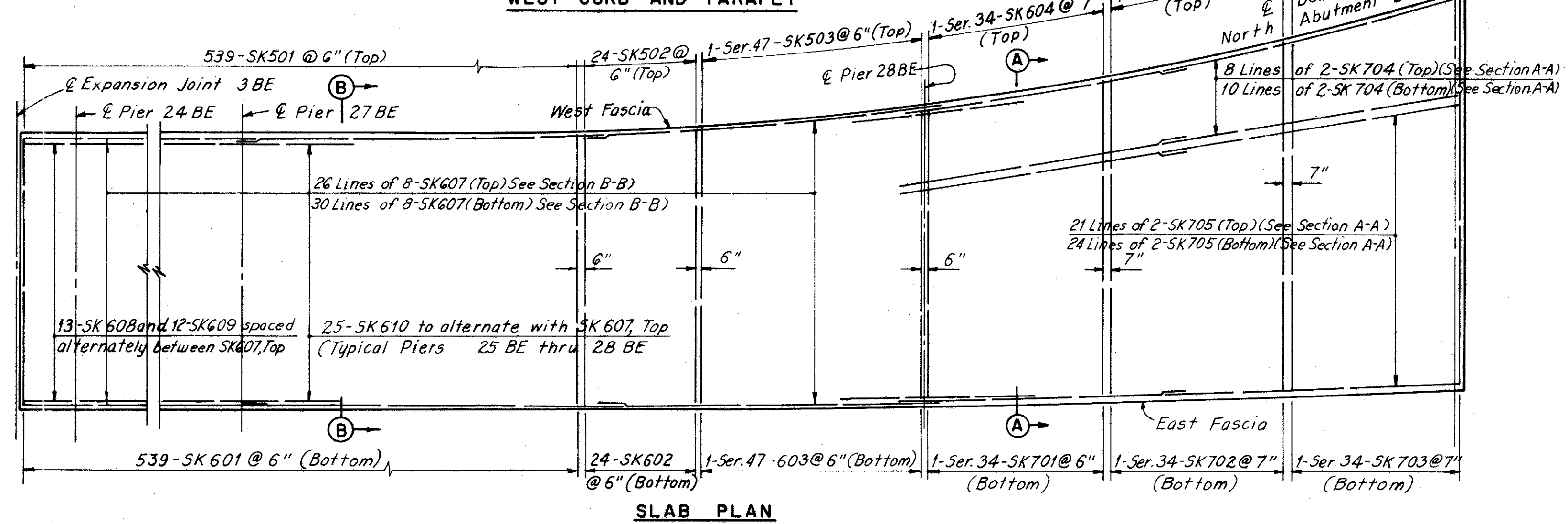
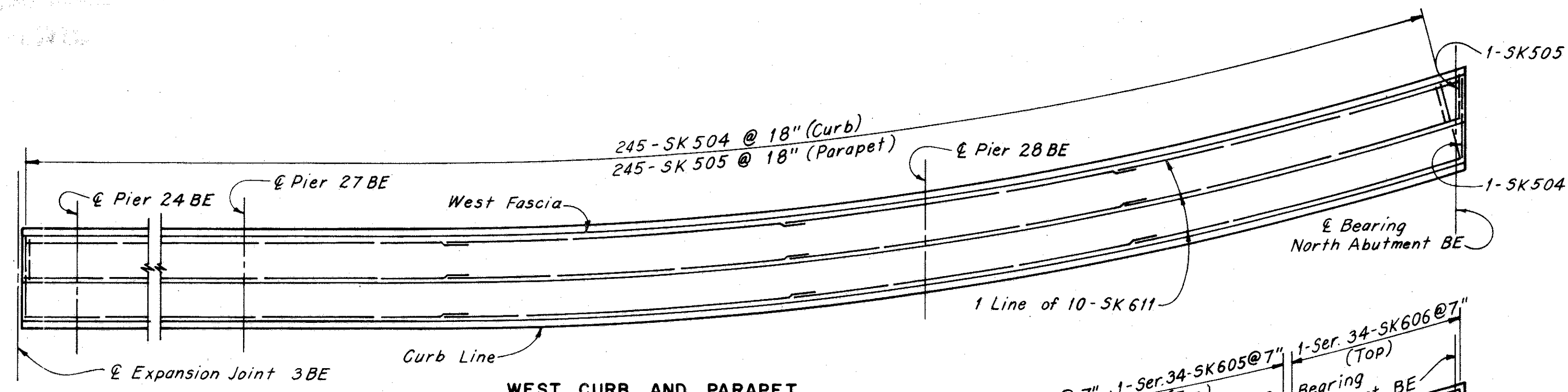
Notes:  
 For additional Slab Plan details of Unit 2B, see sheet 442.  
 For placement of additional reinforcement over Pier 17 see sheet 442.  
 For additional notes see sheet 441.



SECTION A-A

H.N.T.B BRIDGE NOS. 21A & 21B			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>DECK REINFORCEMENT UNIT-2B</b>			
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS, AND NORTHBOUND JENNINGS			
BR. NO. CUY-71-1789R		STA. 917+10.09 STA. 935+21.25	
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN DATE 7-14-64	TRACED DATE	CHECKED DATE 12-23-64	REVIEWED DATE 12-28-64
			SHEET 443

**CUYAHOGA COUNTY**  
**CUY 71-17.83**  
**CUY-176-12.76**



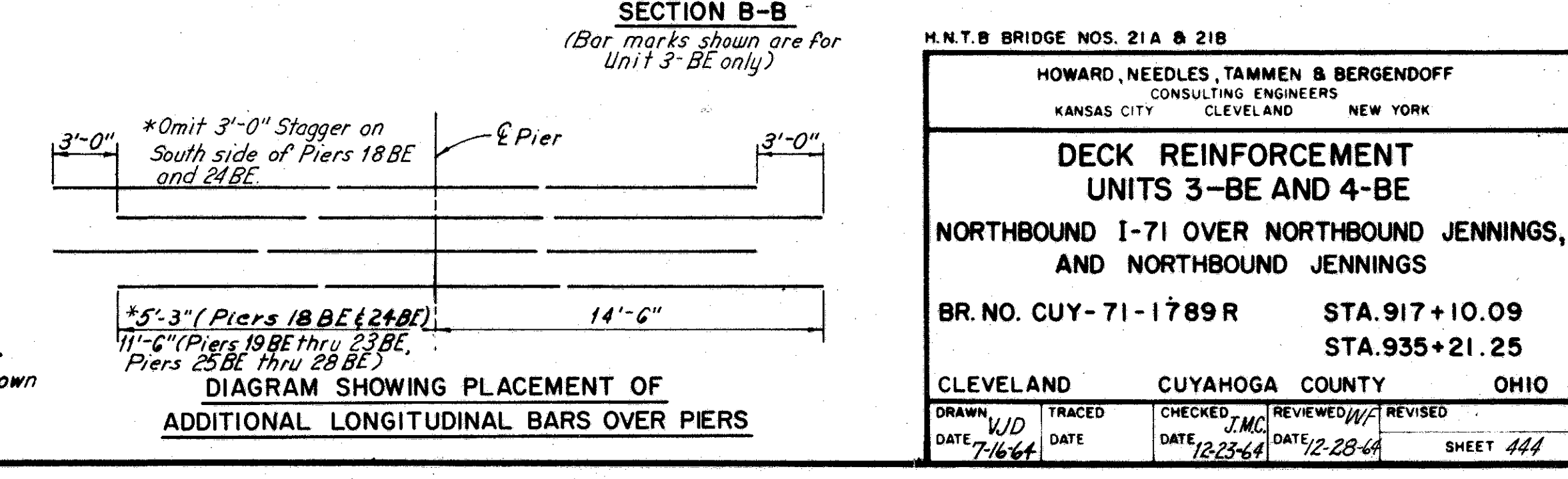
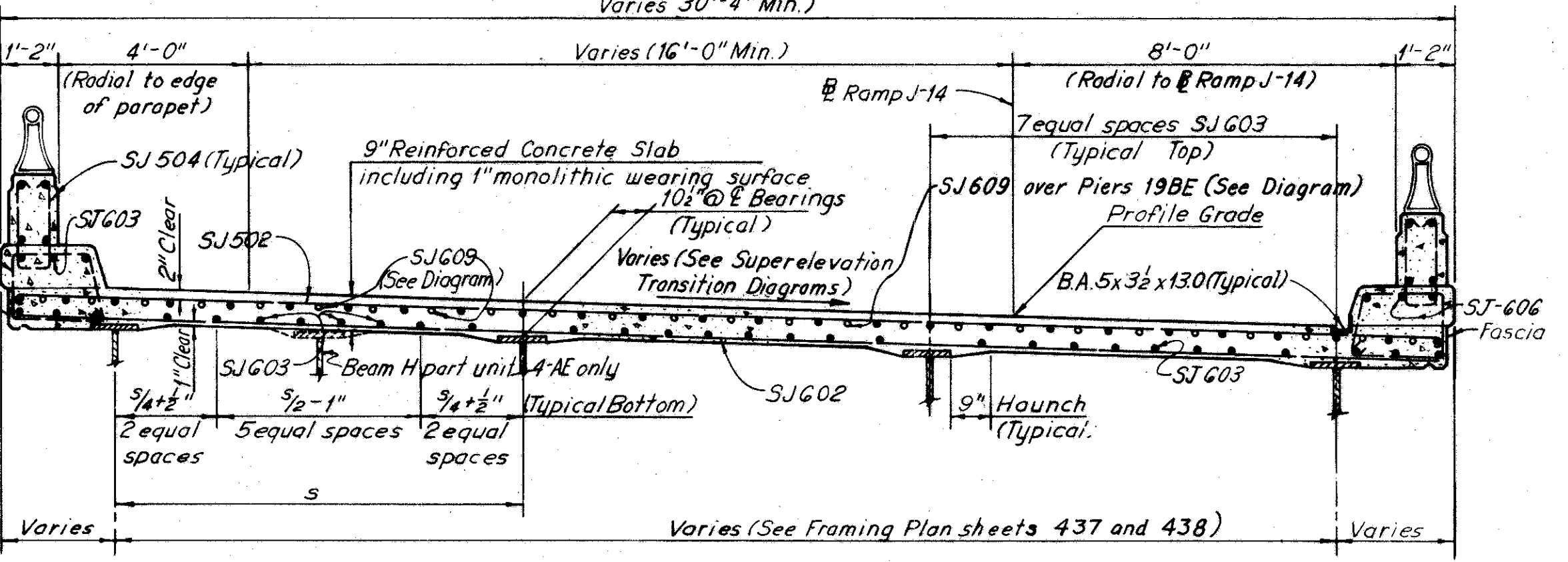
**Notes:**

Transverse reinforcement in Unit 3BE shall be placed radial to Ramp J-14 so that the maximum fanned spacing is equal to the spacing shown.

Transverse reinforcement in Unit 4BE shall be placed parallel to Piers. Spacing shown is normal.

For cross section details and dimensions not shown see Typical Cross Section Unit 1B, sheet 441.

For additional notes see sheet 443.







CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

TOP OF PAVEMENT ELEVATIONS UNIT 1B

Beam	Exp. South Abut. B	1	2	3	Exp. Pier 8	1	2	3	Exp. Pier 9	1	2	3	Exp. Pier 10	1	2	3	Exp. Pier 11	1	2	3	Exp. Pier 12	1	2	3	Exp. Rollers 1B	Beam
A	641.51	641.62	641.74	641.85	641.96	642.11	642.25	642.40	642.54	642.68	642.83	642.99	643.15	643.30	643.46	643.62	643.77	643.93	644.09	644.24	644.40	644.55	644.69	644.84	644.99	A
B	641.18	641.31	641.44	641.58	641.71	641.87	642.04	642.21	642.37	642.54	642.70	642.86	643.02	643.17	643.33	643.49	643.65	643.80	643.96	644.12	644.27	644.42	644.56	644.71	644.86	B
C	640.85	641.00	641.15	641.30	641.45	641.64	641.83	642.02	642.21	642.39	642.57	642.73	642.89	643.05	643.20	643.36	643.52	643.67	643.83	643.99	644.15	644.29	644.43	644.58	644.73	C
D	640.53	640.69	640.86	641.03	641.20	641.41	641.62	641.83	642.04	642.25	642.44	642.60	642.76	642.92	643.08	643.23	643.39	643.55	643.70	643.86	644.02	644.16	644.31	644.45	644.60	D
E	640.20	640.39	640.57	640.76	640.94	641.17	641.41	641.64	641.88	642.10	642.31	642.48	642.63	642.79	642.95	643.10	643.26	643.42	643.57	643.73	643.89	644.03	644.18	644.33	644.48	E
F	639.87	640.08	640.28	640.48	640.68	640.94	641.20	641.45	641.71	641.96	642.17	642.35	642.51	642.66	642.82	642.98	643.13	643.29	643.45	643.60	643.76	643.90	644.05	644.20	644.35	F
L	639.55	639.77	639.99	640.21	640.43	640.71	640.99	641.27	641.54	641.81	642.04	642.22	642.38	642.53	642.69	642.85	643.00	643.16	643.32	643.48	643.63	643.77	643.92	644.07	644.22	L

TOP OF PAVEMENT ELEVATIONS UNIT 2B

Beam	Exp. Pier 13	1	2	3	Exp. Pier 14	1	2	3	Exp. Pier 15	1	2	3	Exp. Pier 16	1	2	3	Exp. Pier 17B	1	2	3	Exp. Rollers 2B or 2BE	Beam				
A	645.03	645.18	645.34	645.50	645.66	645.81	645.96	646.12	646.28	646.44	646.60	646.76	646.91	647.07	647.23	647.38	647.52	647.63	647.75	647.88	648.01	A				
B	644.91	645.06	645.21	645.37	645.53	645.69	645.85	646.01	646.17	646.33	646.48	646.64	646.80	646.96	647.11	647.27	647.45	647.62	647.78	647.94	648.10	B				
C	644.78	644.93	645.09	645.25	645.41	645.56	645.73	645.89	646.05	646.21	646.37	646.53	646.69	646.84	647.00	647.16	647.38	647.60	647.81	648.00	648.18	C				
D	644.65	644.80	644.96	645.12	645.28	645.44	645.61	645.77	645.94	646.10	646.26	646.41	646.57	646.73	646.89	647.04	647.27	647.51	647.71	647.91	648.10	D				
E	644.52	644.68	644.83	644.99	645.16	645.32	645.49	645.66	645.83	645.98	646.14	646.30	646.46	646.61	646.77	646.93	647.15	647.40	647.59	647.79	647.98	E				
F	644.40	644.55	644.71	644.87	645.03	645.20	645.37	645.54	645.71	645.87	646.03	646.19	646.34	646.50	646.66	646.81	647.05	647.32	647.49	647.68	647.87	F				
G																										G
J					*644.74	644.97	645.12	645.28	645.44	645.60	645.75	645.91	646.06	646.21	646.36	646.52	646.67	646.91	647.22	647.46	647.69	648.02	J			
K																										K
L	644.27	644.42	644.58	644.74	644.90	645.05	645.20	645.36	645.51	645.66	645.80	645.94	646.08	646.20	646.32	646.43	646.64	646.95	647.14	647.28	647.42	L				

TOP OF PAVEMENT ELEVATIONS UNIT 3BW

Beam	Exp. Pier 18BW	1	2	3	Exp. Pier 19BW	1	2	3	Exp. Pier 20BW	1	2	3	Exp. Brg. North Abut. BW	Beam
A	648.05	648.20	648.35	648.50	648.66	648.82	648.98	649.13	649.29	649.42	649.54	649.66	649.79	A
B	648.14	648.31	648.47	648.63	648.79	648.94	649.10	649.25	649.42	649.54	649.67	649.79	649.91	B
C	648.24	648.42	648.59	648.75	648.91	649.07	649.23	649.38	649.54	649.67	649.79	649.92	650.04	C
D	648.16	648.35	648.52	648.68	648.84	649.00	649.15	649.31	649.47	649.59	649.72	649.84	649.97	D
E	648.05	648.23	648.41	648.57	648.72	648.88	649.04	649.20	649.36	649.48	649.60	649.73	649.85	E
F	647.93	648.12	648.29	648.45	648.61	648.77	648.93	649.08	649.24	649.37	649.49	649.62	649.74	F

TOP OF PAVEMENT ELEVATIONS UNIT 3BE

Beam	Exp. Pier 18BE	1	2	3	Exp. Pier 19BE	1	2	3	Exp. Pier 20BE	1	2	3	Exp. Pier 21BE	1	2	3	Exp. Pier 22BE	1	2	3	Exp. Pier 23BE	1	2	3	Exp. Rollers 3BE	Beam
G	648.43	648.81	649.24	649.73	650.27	650.81	651.40	652.06	652.76	653.45	654.20	655.00	655.85	656.74	657.67	658.61	659.54	660.48	661.42	662.36	663.29	664.16	665.02	665.88	666.74	G
J	648.12	648.46	648.87	649.34	649.87	650.41	651.02	651.69	652.42	653.15	653.94	654.79	655.69	656.60	657.54	658.47	659.41	660.35	661.29	662.22	663.16	664.02	664.89	665.75	666.61	J
K	647.81	648.12	648.50	648.95	649.48	650.02	650.63	651.32	652.08	652.84	653.68	654.59	655.53	656.47	657.40	658.34	659.28	660.21	661.15	662.09	663.03	663.89	664.75	665.61	666.48	K
L	647.50	647.77	648.12	648.56	649.08	649.62	650.24	650.95	651.74	652.54	653.43	654.39	655.38	656.33	657.27	658.21	659.14	660.08	661.02	661.96	662.89	663.76	664.62	665.48	666.34	L

TOP OF PAVEMENT ELEVATIONS UNIT 4BE

Beam	Exp. Pier 24BE	1	2	3	Exp. Pier 25BE	1	2	3	Exp. Pier 26BE	1	2	3	Exp. Pier 27BE	1	2	3	Exp. Pier 28BE	1	2	3	Exp. Brg. North Abut. BE	Beam
G	667.04	667.98	668.92	669.86	670.79	671.72	672.60	673.44	674.27	675.10	675.93	676.71	677.42	678.10	678.79	679.47	680.11	680.56	680.98	681.38	681.75	G
H													*678.02	*678.58	*679.13	*679.66	680.17	680.62	681.05	681.46	681.84	H
J	665.91	667.85	668.79	669.72	670.66	671.59	672.50	673.38	674.26	675.13	675.98	676.78	677.53	678.23	678.93	679.60	680.23	680.69	681.12	681.53	681.92	J
K	665.78	667.71	668.65	669.59	670.53	671.46	672.40	673.32	674.25	675.16	676.04	676.86	677.64	678.36	679.05	679.71	680.33	680.79	681.22	681.62	682.01	K
L	666.64	667.58	668.52	669.46	670.39	671.34	672.29	673.27	674.24	675.20	676.09	676.94	677.74	678.49	679.18	679.83	680.44	680.89	681.31	681.72	682.10	L

Notes: \* Elevation at beam end diaphragm in span noted.  
\* Elevations at 1/4 points between beam end diaphragm and Pier 28BE.

Note:  
Top of pavement elevations are given at 1/4 span points between piers or at 1/4 points between pier and expansion roller along Exp. beam, except as noted.  
When the exterior beams fall outside the roadway the elevation given is to extended top of pavement.

H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**TOP OF PAVEMENT ELEVATIONS**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

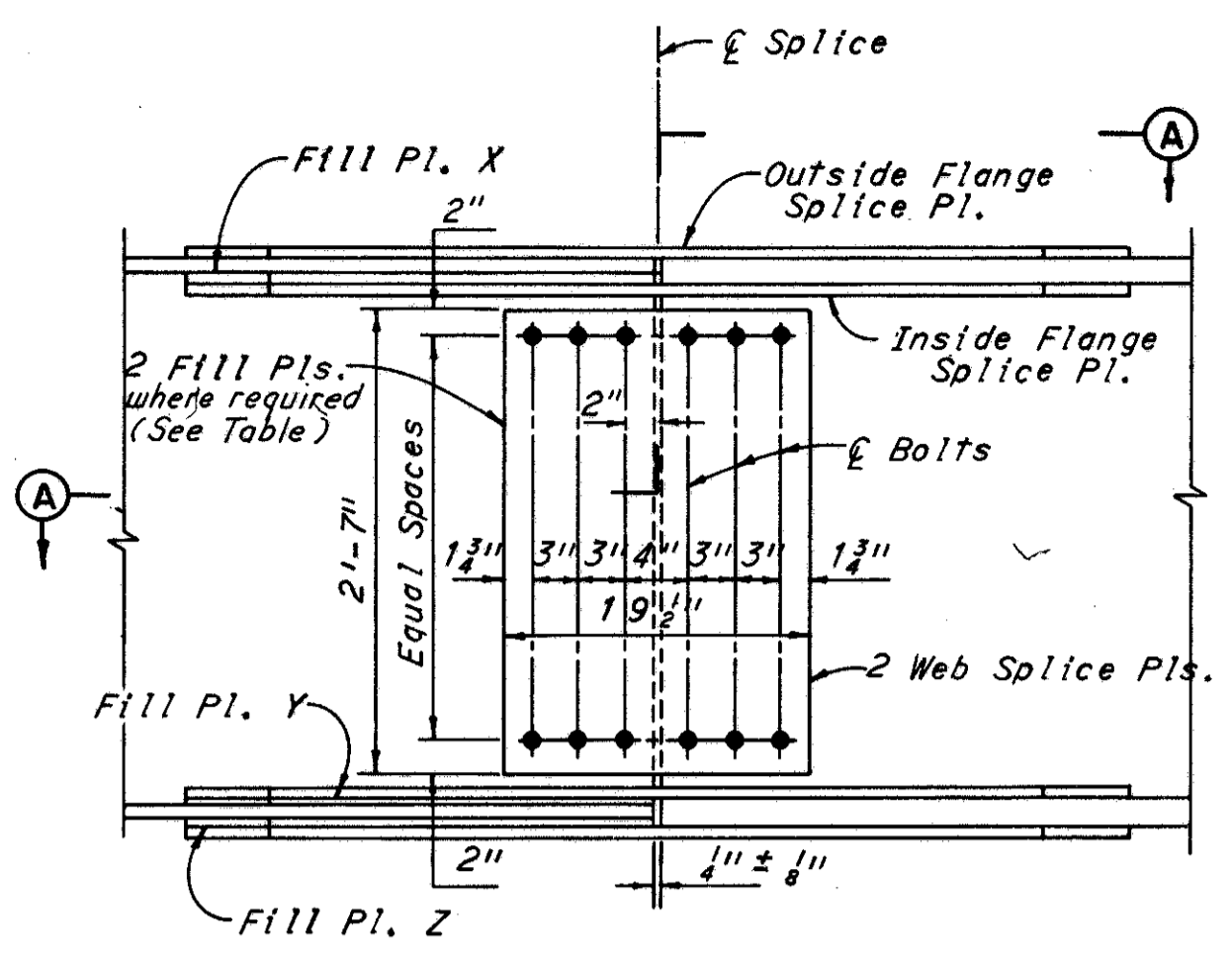
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DATE 12-16-64	DATE	DATE 12-16-64	DATE 12-22-64

SHEET 446

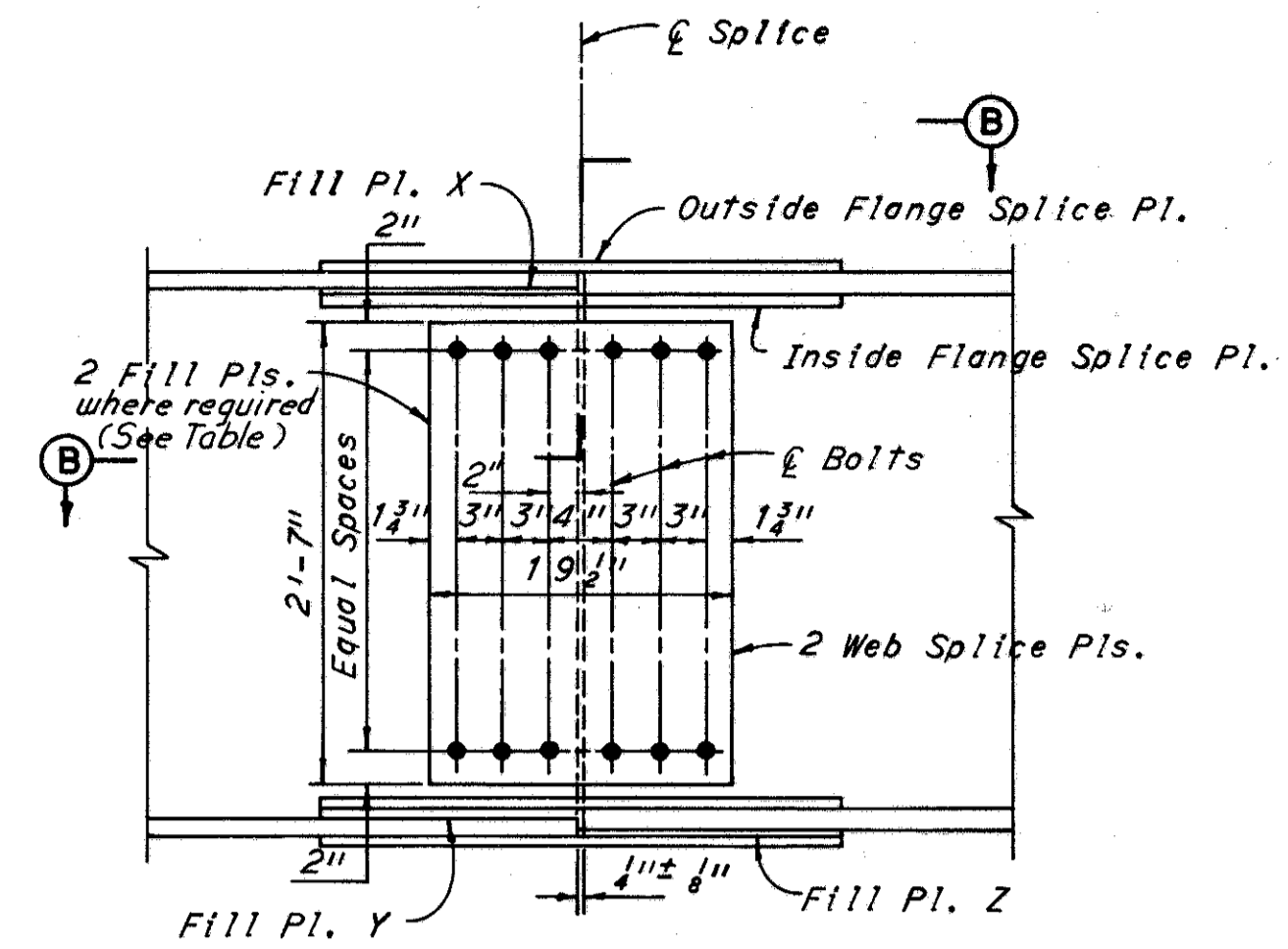
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY - 176-12.76

DETAILS OF 36 WF BEAM SPLICES																	
BEAM 36WF TO BEAM 36WF	WEB SPLICE				FLANGE SPLICE												
	Type	*WEB PLATES	WEB BOLTS	FILL PLS.	*FLANGE PLATES		*FILL PLATES			FLANGE BOLTS							
		2 Required	No.	2	Type	Outside	Inside	Type	Thickness(in.)	No.	Spa.	Dimensions (inches)					
					2 Required	2 Required	X	Y	Z	N	Pitch	A	B	C			
135 to 135	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
135 to 150	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
135 to 160	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
135 to 170	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
135 to 182	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
135 to 194	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
135 to 230	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	1/8	1/8	1/8	32	3	3 1/2	2 1/2	6 1/2	
135 to 245	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	1/8	1/8	1/8	32	3	3 1/2	2 1/2	6 1/2	
135 to 260	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	C	3/8	3/8	3/8	32	3	3 1/2	2 1/2	6 1/2	
135 to 280	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	C	3/8	3/8	3/8	32	3	3 1/2	2 1/2	6 1/2	
150 to 150	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
150 to 160	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
150 to 170	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
150 to 182	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
150 to 194	B	13/8 x 2 1/2 - 7"	40	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
150 to 230	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	5/16	5/16	5/16	32	3	3 1/2	2 1/2	6 1/2	
150 to 245	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	5/16	5/16	5/16	32	3	3 1/2	2 1/2	6 1/2	
150 to 260	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	5/16	5/16	5/16	32	3	3 1/2	2 1/2	6 1/2	
150 to 280	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	C	5/8	5/8	5/8	32	3	3 1/2	2 1/2	6 1/2	
150 to 300	B	13/8 x 2 1/2 - 7"	40	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	C	5/8	5/8	5/8	32	3	3 1/2	2 1/2	6 1/2	
160 to 160	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
160 to 170	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
160 to 182	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
160 to 194	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	-	-	-	32	3	3 1/2	2 1/2	6 1/2		
160 to 230	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	5/16	5/16	5/16	32	3	3 1/2	2 1/2	6 1/2	
160 to 245	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	5/16	5/16	5/16	32	3	3 1/2	2 1/2	6 1/2	
160 to 260	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	5/16	5/16	5/16	32	3	3 1/2	2 1/2	6 1/2	
160 to 280	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	A	5/16	5/16	5/16	32	3	3 1/2	2 1/2	6 1/2	
160 to 300	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 4 1/2"	4 1/2 x 2 1/2 - 4 1/2"	C	5/8	5/8	5/8	32	3	3 1/2	2 1/2	6 1/2	
170 to 170	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	-	-	-	40	4	3 1/2	2 1/2	6 1/2		
170 to 182	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	-	-	-	40	4	3 1/2	2 1/2	6 1/2		
170 to 194	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	-	-	-	40	4	3 1/2	2 1/2	6 1/2		
170 to 230	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	B	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
170 to 245	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	B	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
170 to 260	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	A	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
170 to 280	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	A	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
170 to 300	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	A	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
182 to 182	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	-	-	-	40	4	3 1/2	2 1/2	6 1/2		
182 to 194	A	19/8 x 2 1/2 - 7"	48	-	C	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	-	-	-	40	4	3 1/2	2 1/2	6 1/2		
182 to 230	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	B	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
182 to 245	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	B	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
182 to 260	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	B	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
182 to 280	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	A	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
182 to 300	A	19/8 x 2 1/2 - 7"	48	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	A	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
194 to 194	A	19/8 x 2 1/2 - 7"	54	-	C	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	-	-	-	40	4	3 1/2	2 1/2	6 1/2		
194 to 230	A	19/8 x 2 1/2 - 7"	54	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	B	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
194 to 245	A	19/8 x 2 1/2 - 7"	54	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	B	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
194 to 260	A	19/8 x 2 1/2 - 7"	54	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	B	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
194 to 280	A	19/8 x 2 1/2 - 7"	54	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	A	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
194 to 300	A	19/8 x 2 1/2 - 7"	54	-	B	11 x 8 x 2 1/2 - 11 1/2"	4 1/2 x 2 1/2 - 11 1/2"	A	1/8	1/8	1/8	40	4	3 1/2	2 1/2	6 1/2	
230 to 230	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	-	-	-	64	7	3 3/4	1 3/4	3	6 1/2	
230 to 245	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
230 to 260	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
230 to 280	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
230 to 300	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
245 to 245	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	-	-	-	64	7	3 3/4	1 3/4	3	6 1/2	
245 to 260	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
245 to 280	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
245 to 300	A	19/8 x 2 1/2 - 7"	54	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
260 to 260	A	19/8 x 2 1/2 - 7"	60	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	-	-	-	64	7	3 3/4	1 3/4	3	6 1/2	
260 to 280	A	19/8 x 2 1/2 - 7"	60	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
260 to 300	A	19/8 x 2 1/2 - 7"	60	-	A	16 x 8 x 5 1/2 - 0"	6 1/2 x 3 1/2 - 0"	C	1/8	1/8	1/8	64	7	3 3/4	1 3/4	3	6 1/2
280 to 280	A	19/8 x 2 1/2 - 7"	60	-	A	16 x 8 x 6 1/2 - 3"	6 1/2 x 3 1/2 - 3"	-	-	-	80	9	3 3/4	1 3/4	3	6 1/2	
280 to 300	A	19/8 x 2 1/2 - 7"	60	-	A	16 x 8 x 6 1/2 - 3"	6 1/2 x 3 1/2 - 3"	C	1/8	1/8	1/8	80	9	3 3/4	1 3/4	3	6 1/2
300 to 300	A	19/8 x 2 1/2 - 7"	60	-	A	16 x 8 x 6 1/2 - 3"	6 1/2 x 3 1/2 - 3"	-	-	-	80	9	3 3/4	1 3/4	3	6 1/2	

FILLS are based on the nominal member sizes being spliced, however, in the final shop assembly, fills shall be furnished to the nearest 1/8 inch in thickness based on the actual measured sizes of the members being spliced. Drawing together of splice plates over material that varies by 1/8 inches or more in thickness, at the centerline of the splice, will not be permitted.

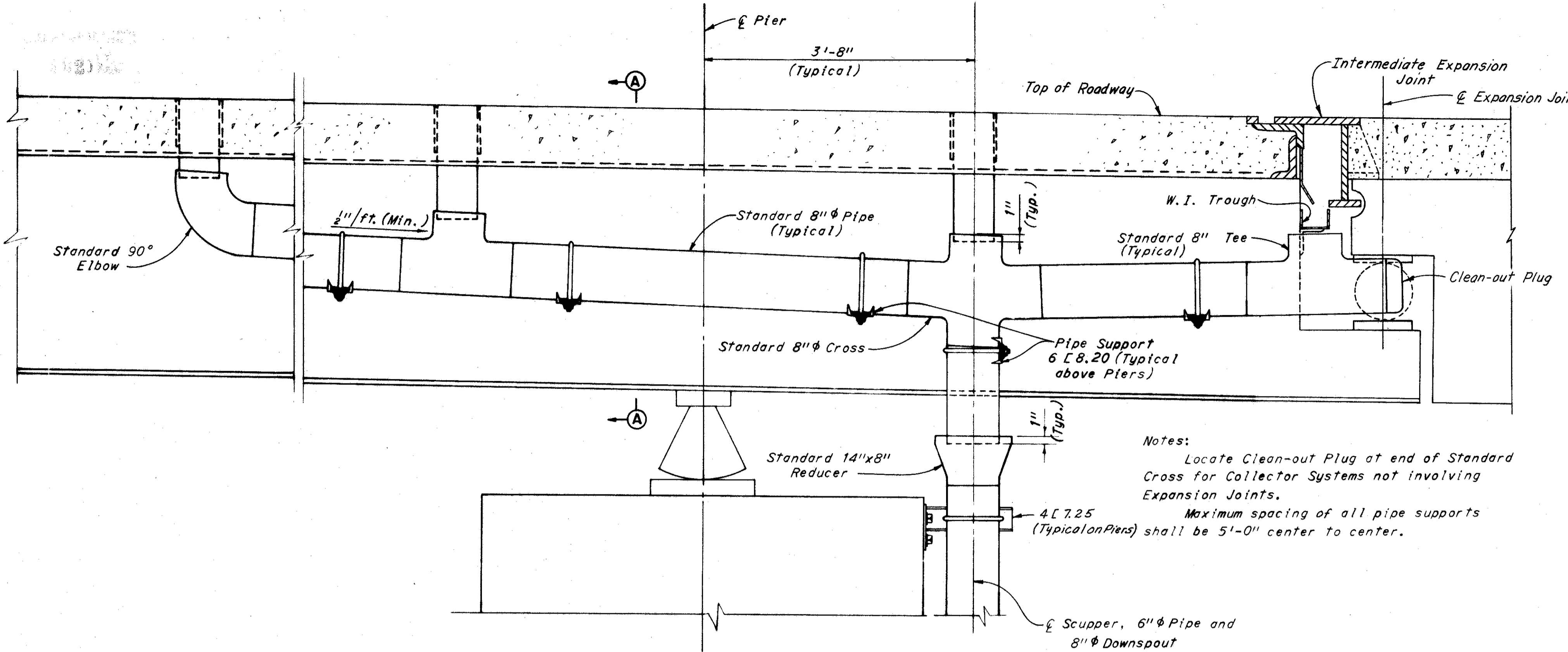


BEAM SPLICE DETAIL 1  
 FLANGE SPLICE TYPE A  
 FLANGE FILL PLATES TYPE A  
 WEB SPLICE TYPE A



BEAM SPLICE DETAIL 2  
 FLANGE SPLICE TYPE B

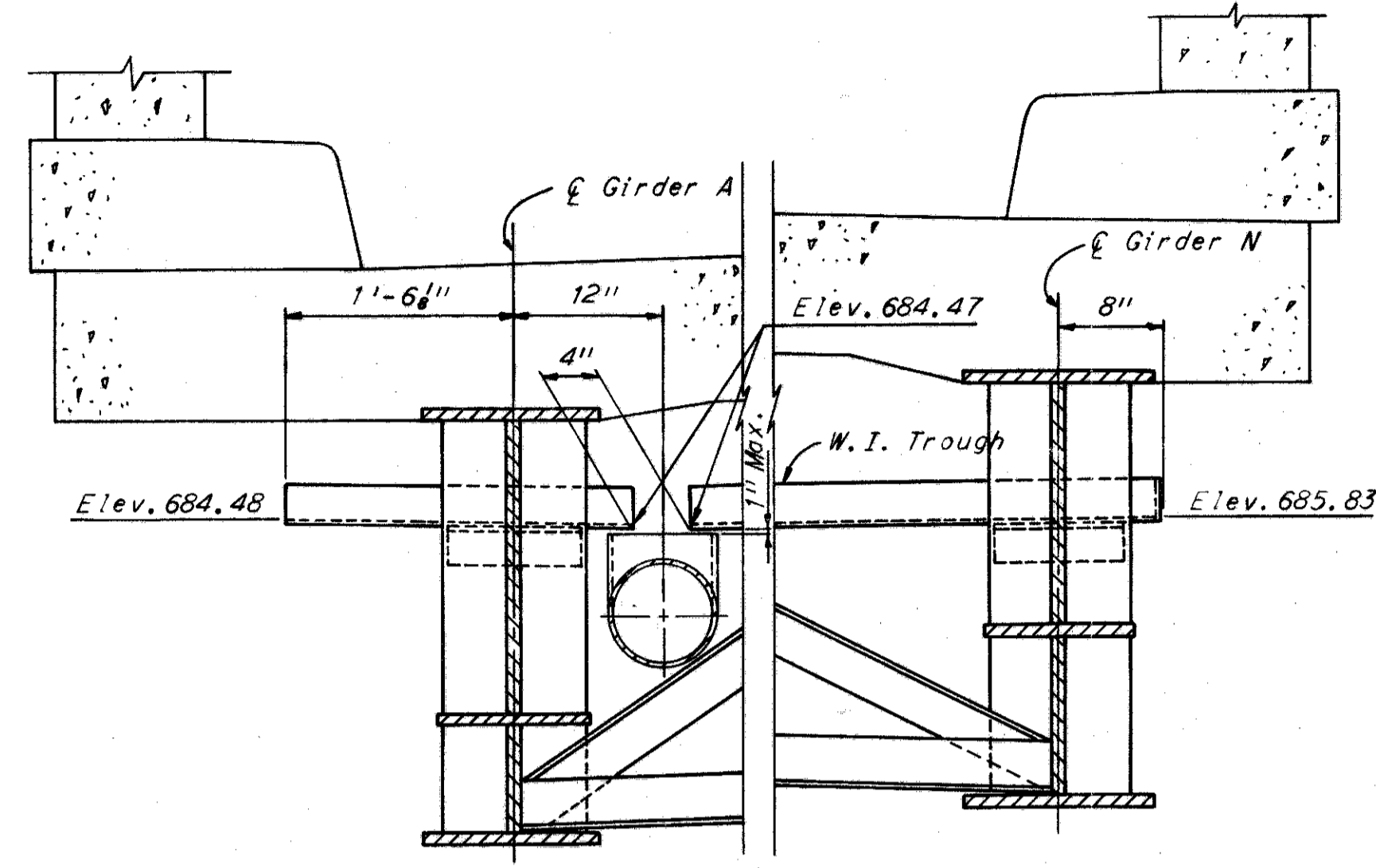
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



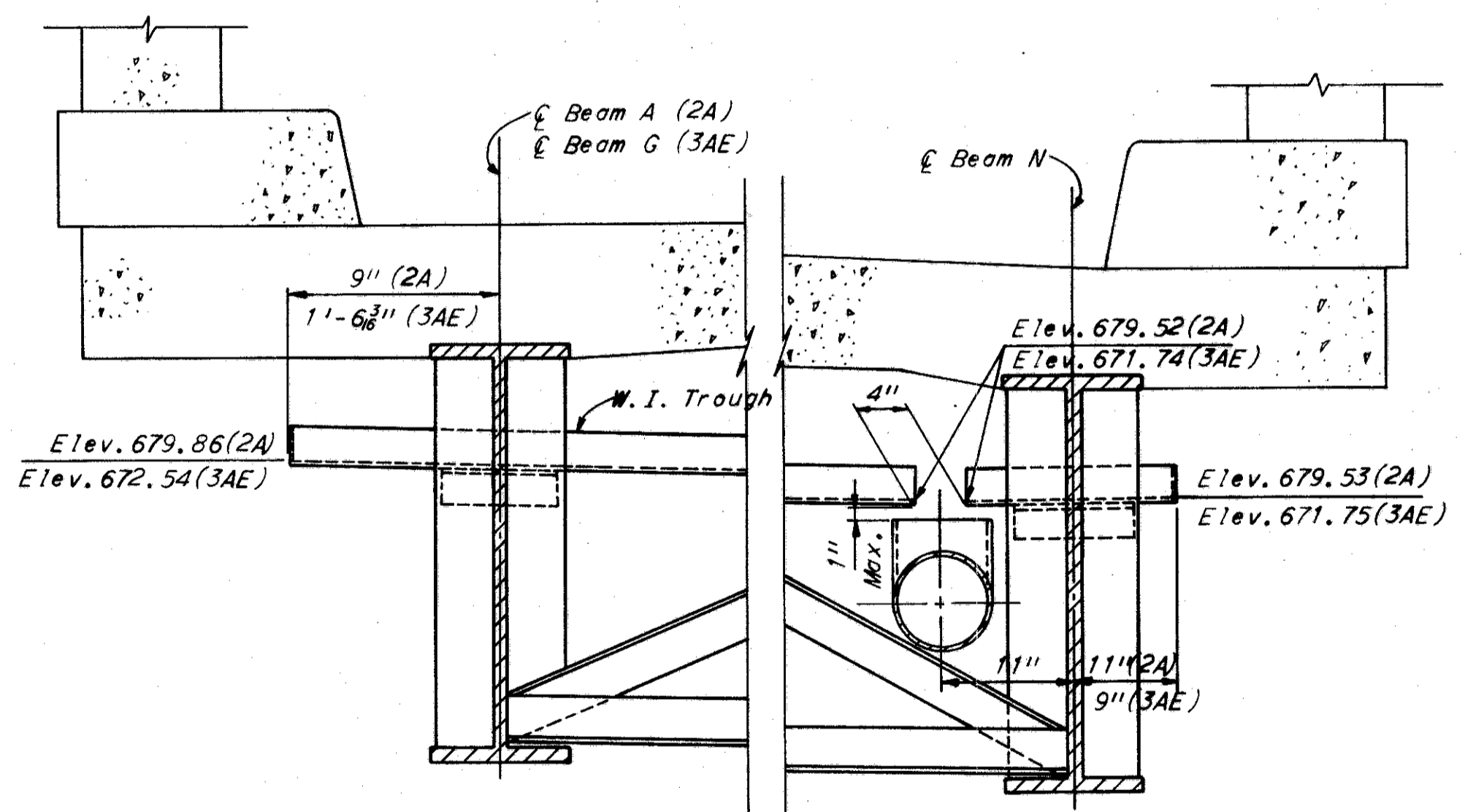
**ELEVATION**  
**COLLECTOR SYSTEM AT INTERMEDIATE EXPANSION JOINT**  
(Upper Deck Joints 1A, 2A, and 3AE)

Note:  
Other Collector Systems similar except as noted.

Notes:  
Locate Clean-out Plug at end of Standard Cross for Collector Systems not involving Expansion Joints.  
Maximum spacing of all pipe supports (Typical on Piers) shall be 5'-0" center to center.



**COLLECTOR SYSTEM AT INTERMEDIATE EXPANSION JOINT 1A**



**COLLECTOR SYSTEM AT INTERMEDIATE EXPANSION JOINT**  
(Upper Deck Joints 2A and 3AE)

Notes:  
For additional W. I. Trough details, see Section E-E sheet 424.  
For Scupper Locations see Framing Plans.  
Bulb Angle Gutters and Supports not shown.

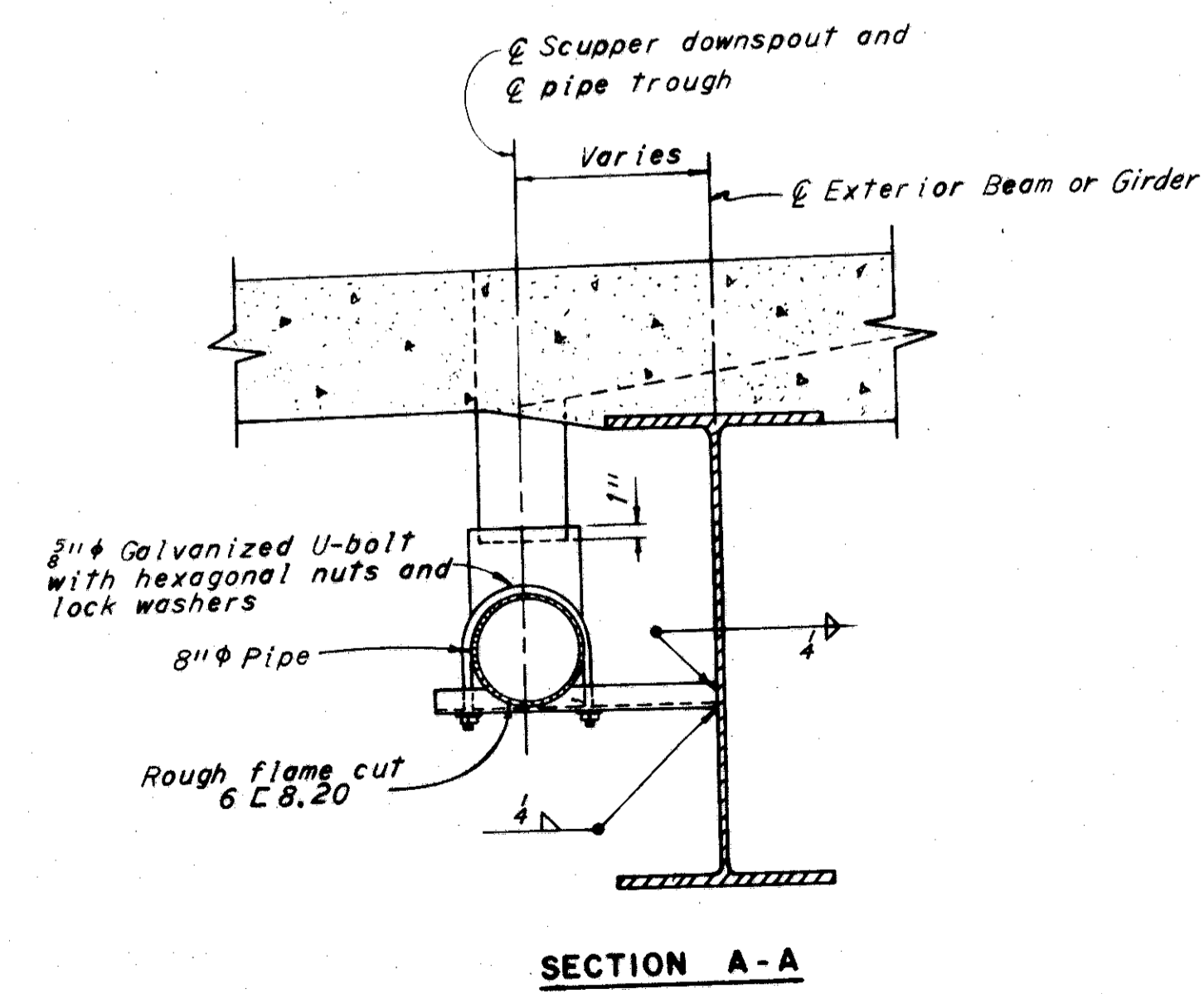
H.N.T.B BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

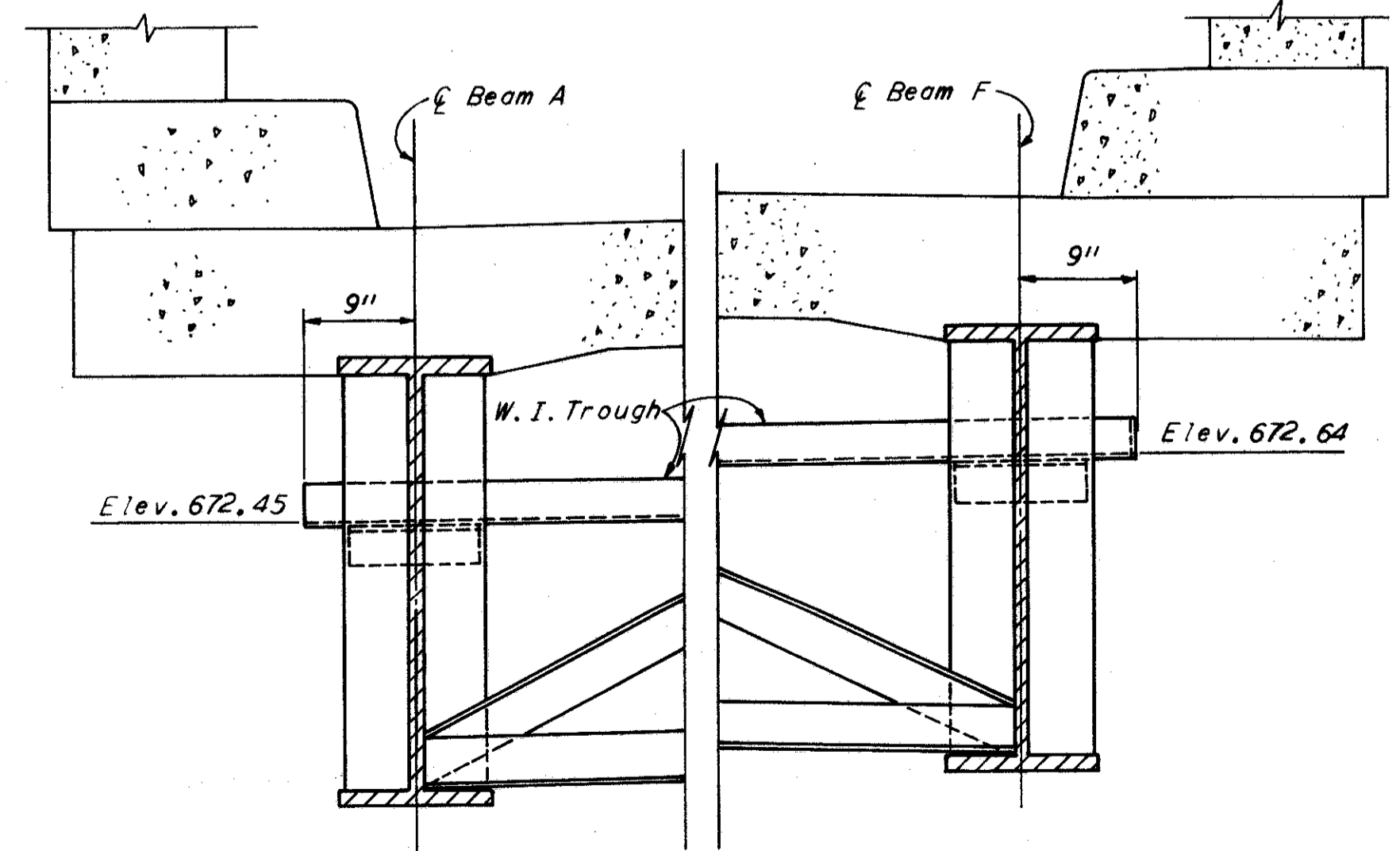
**DRAINAGE DETAILS AT EXPANSION JOINTS**  
NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO  
DRAWN JEN TRACED CHECKED JEN REVIEWED W.F.  
DATE 9-23-64 DATE 12-22-64 SHEET 448

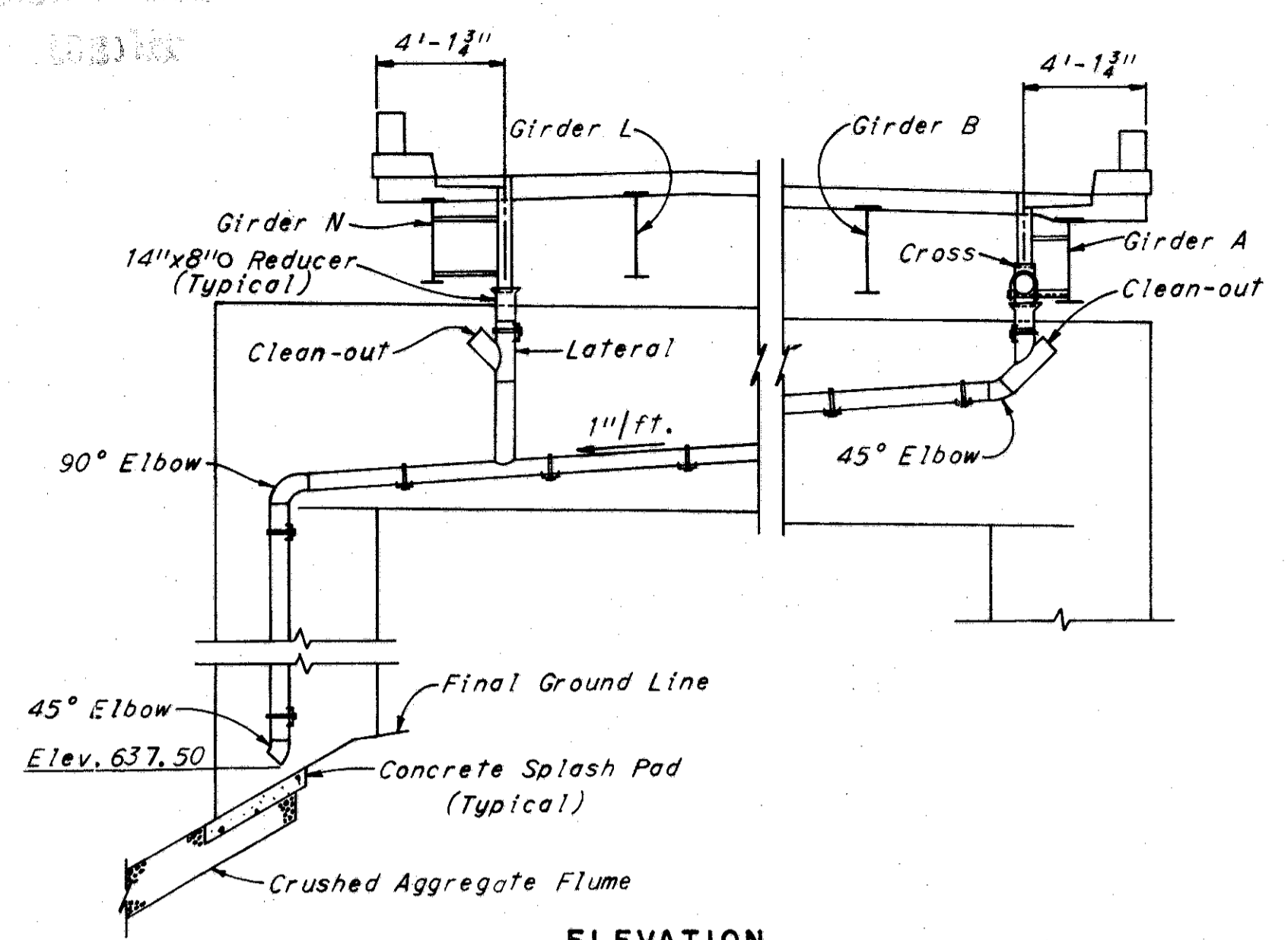


**SECTION A-A**

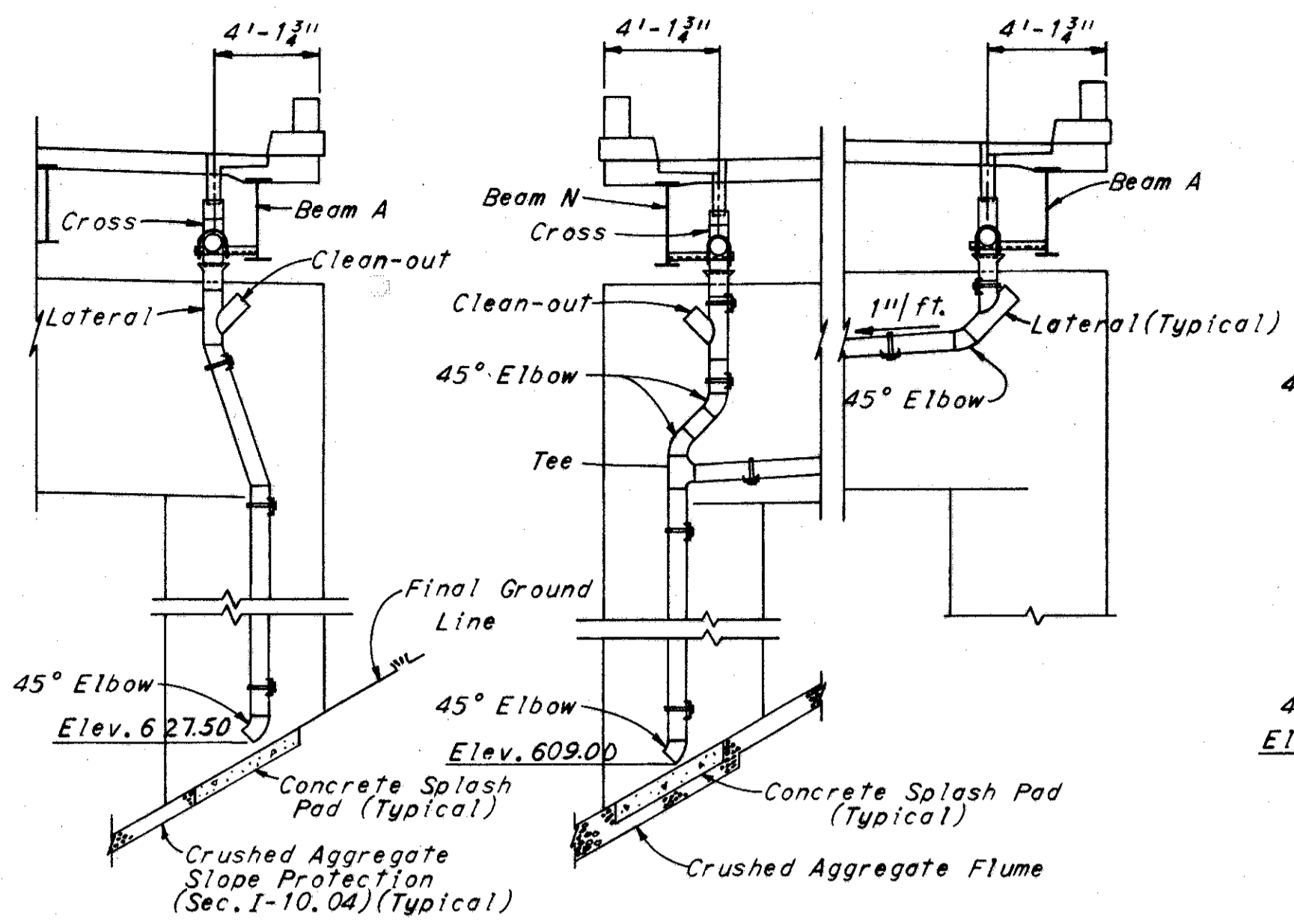


**COLLECTOR SYSTEM AT INTERMEDIATE EXPANSION JOINT 3AW**

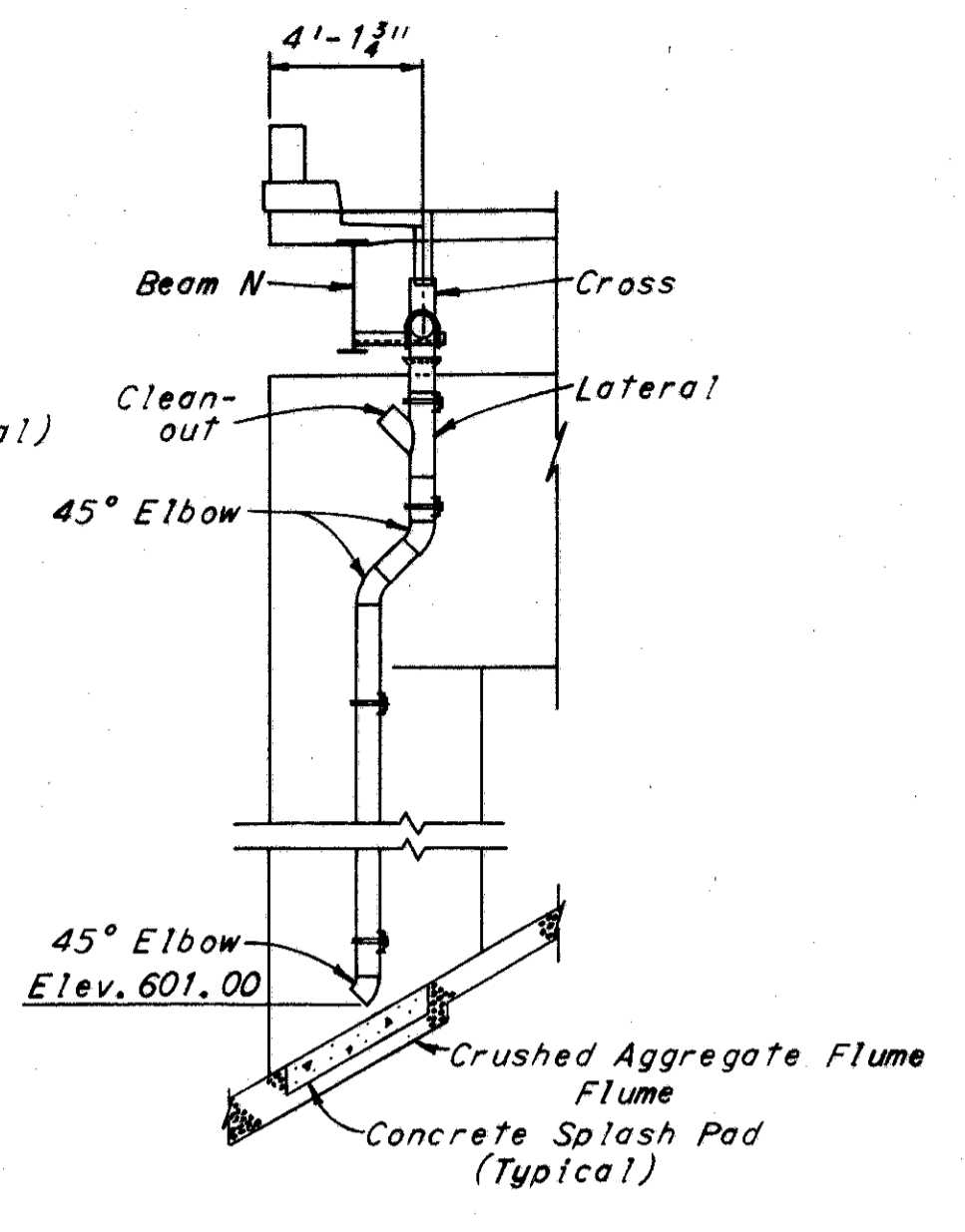
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



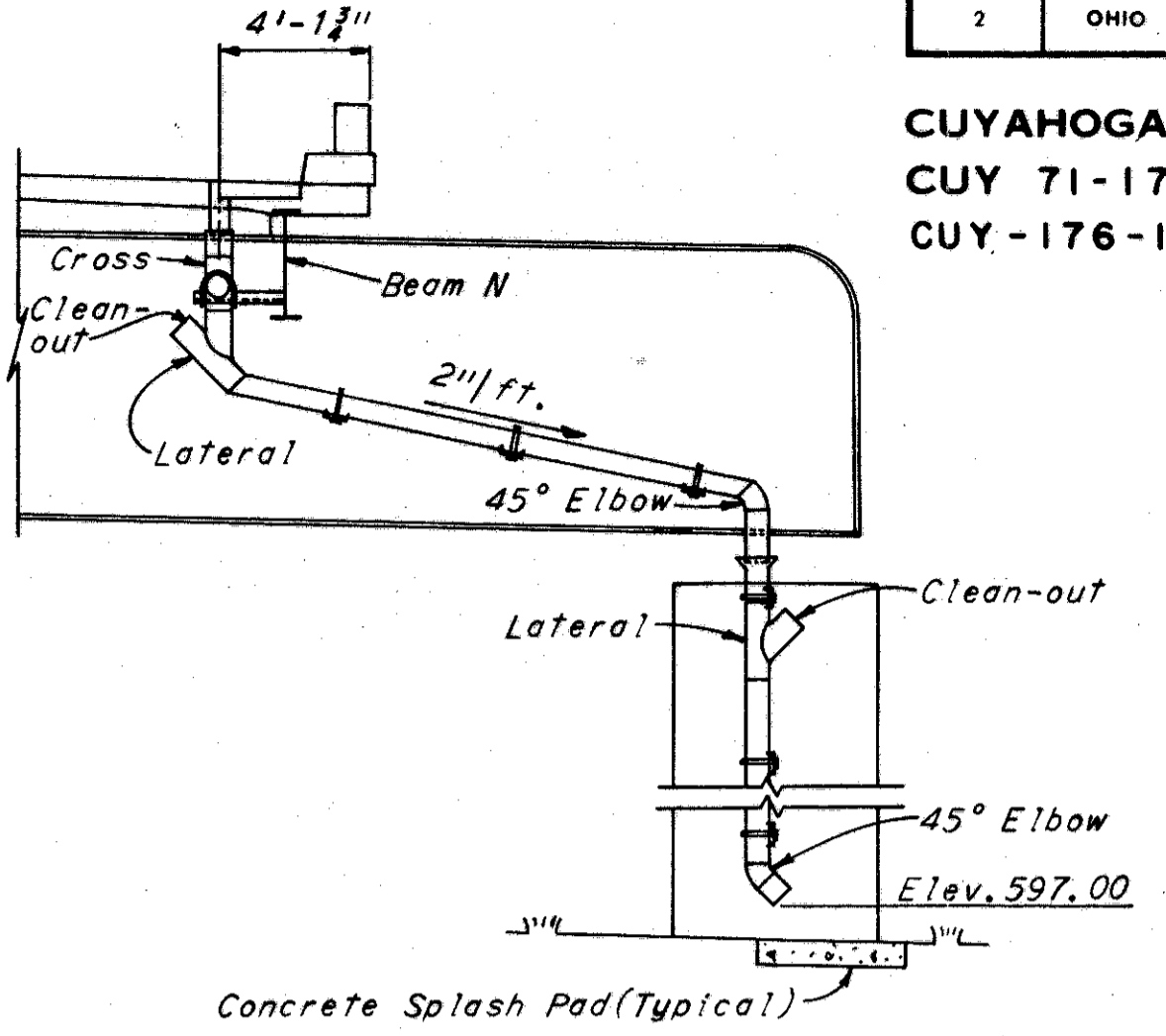
**ELEVATION**  
**PIER 6**  
 (Looking South)



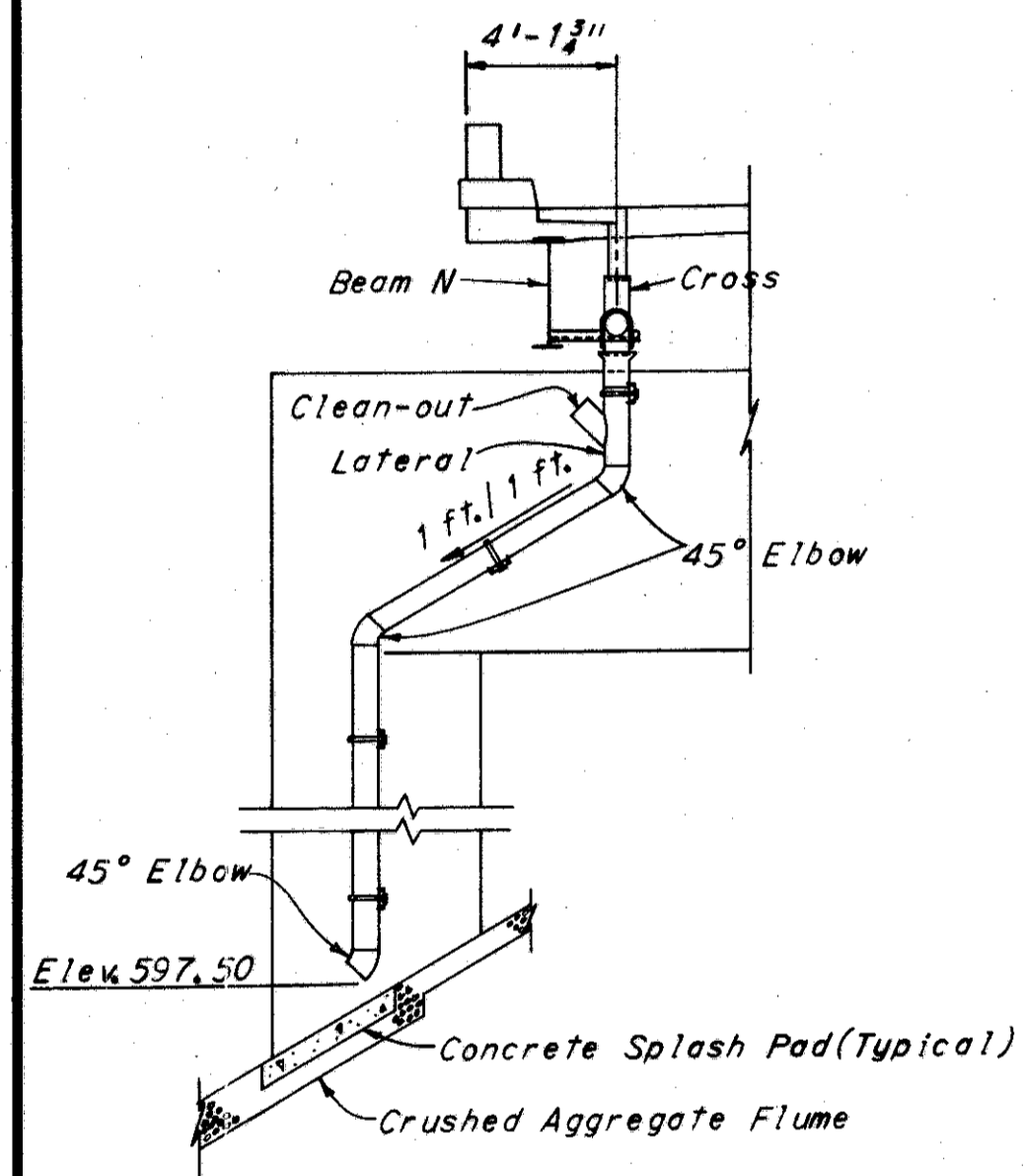
**ELEVATION**  
**PIER 8**  
 (Looking South)



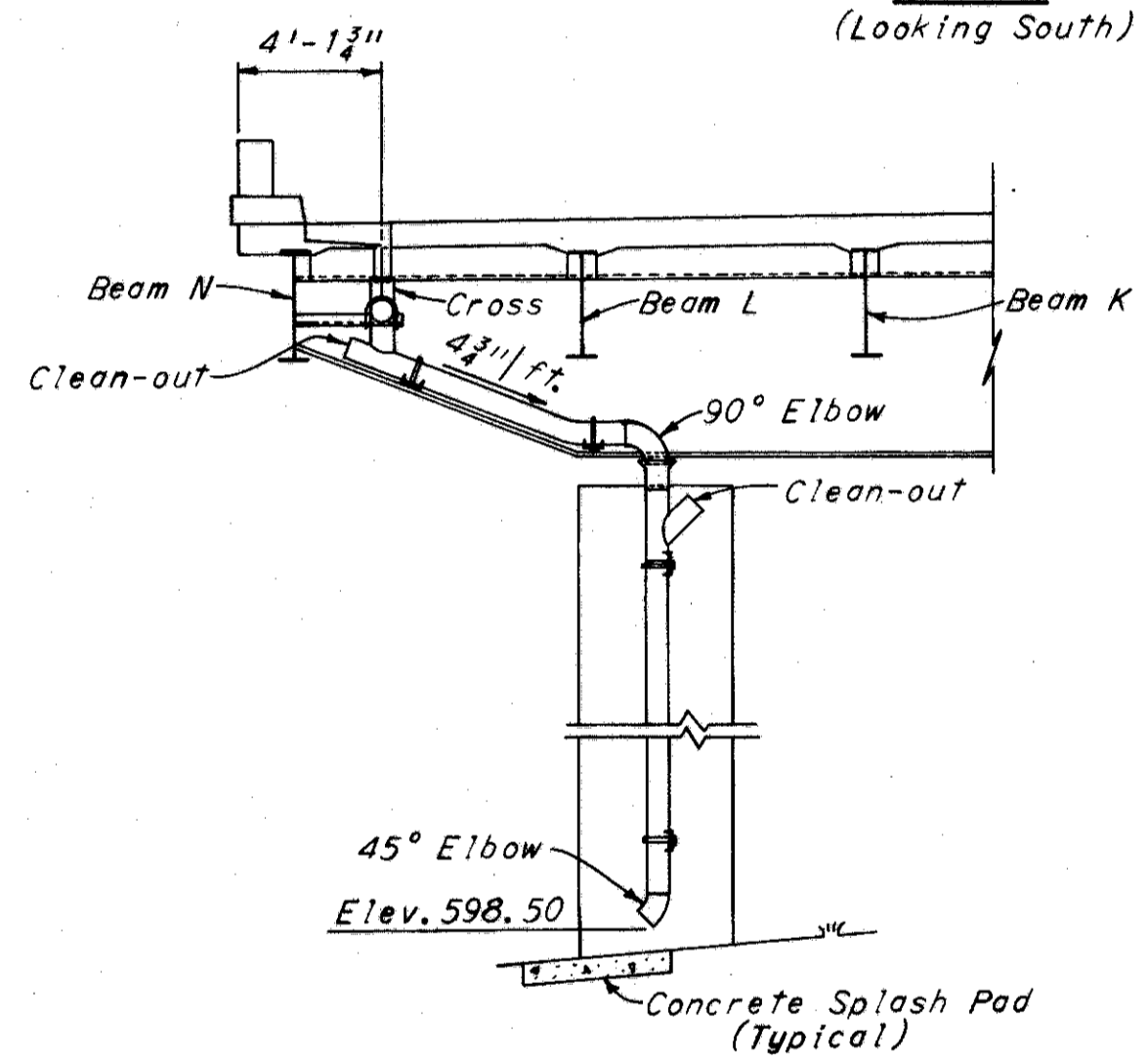
**ELEVATION**  
**PIER 14**  
 (Looking South)



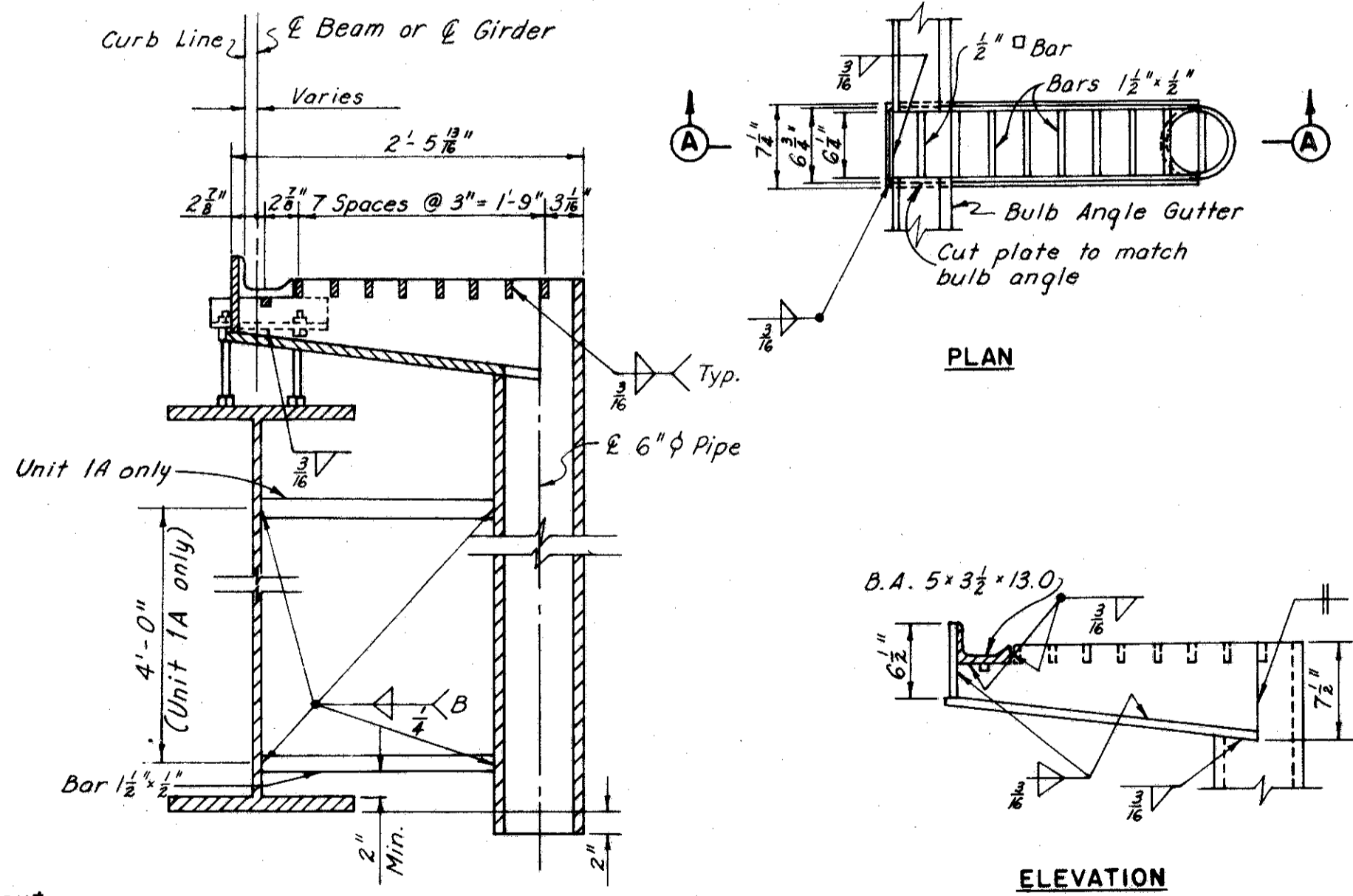
**ELEVATION**  
**PIER 17A**  
 (Looking North)



**ELEVATION**  
**PIER 15**  
 (Looking South)

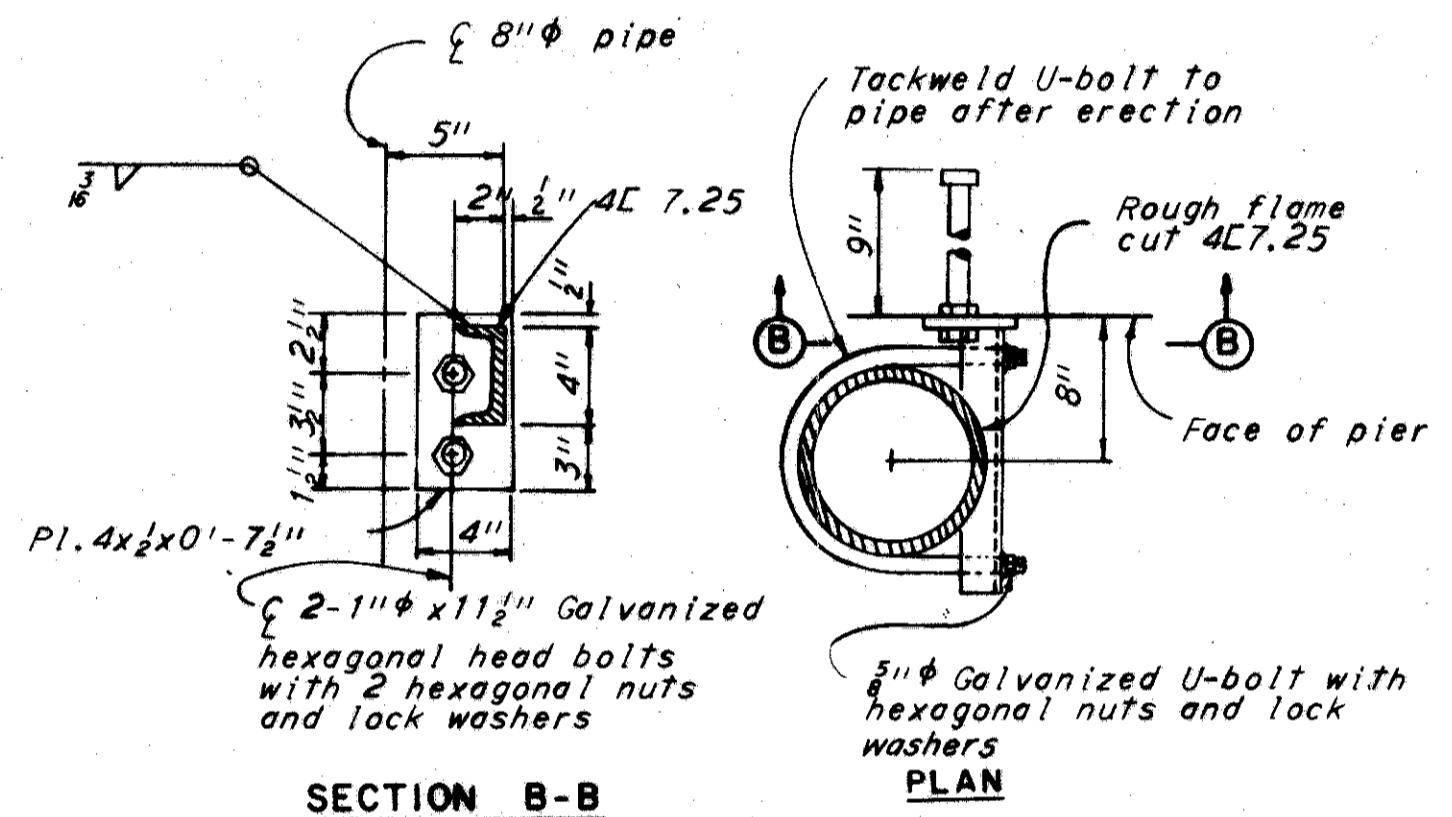


**ELEVATION**  
**PIER 19AE**  
 (Looking South)



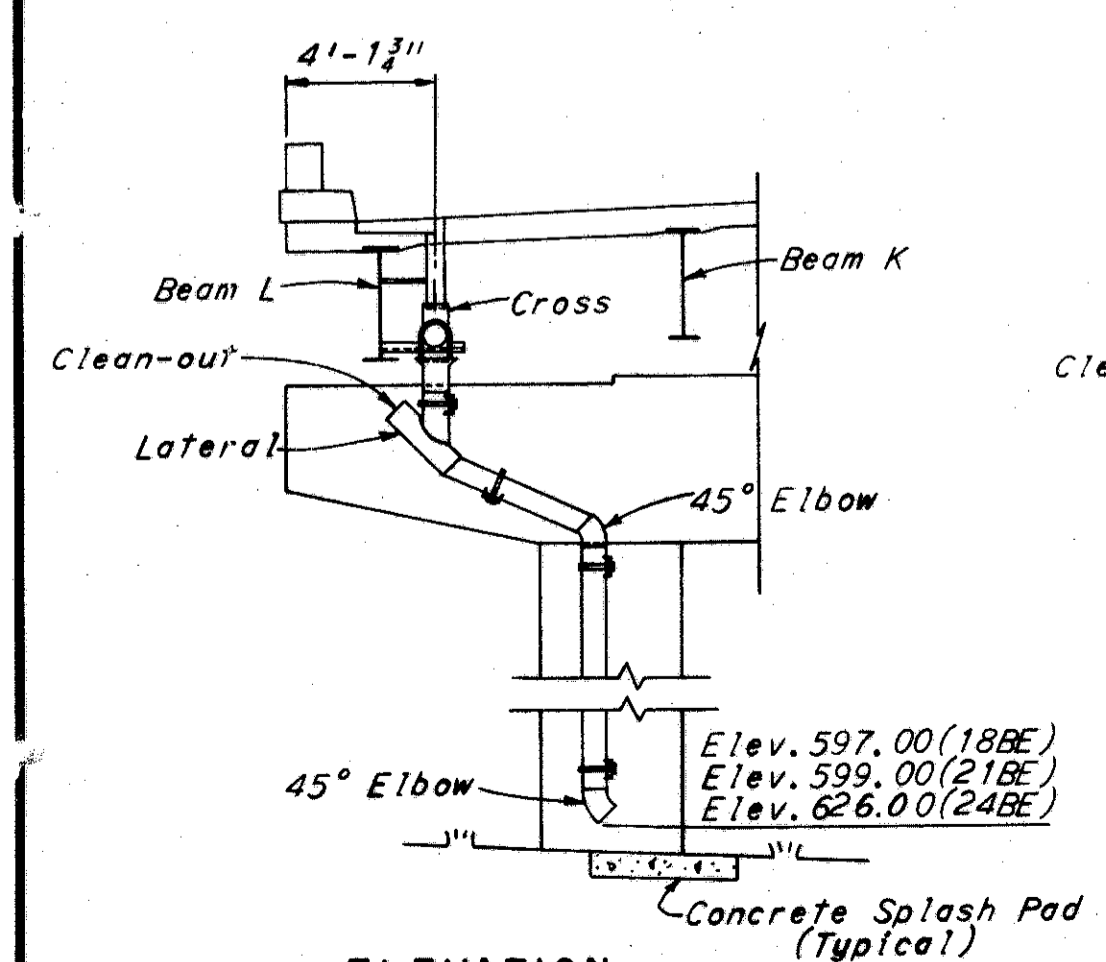
**SECTION A-A**  
**SUPPORT AT CURBS**  
 (Typical at Abutments and "O" Type Outlets indicated on Framing Plans)

**SCUPPER DETAILS**

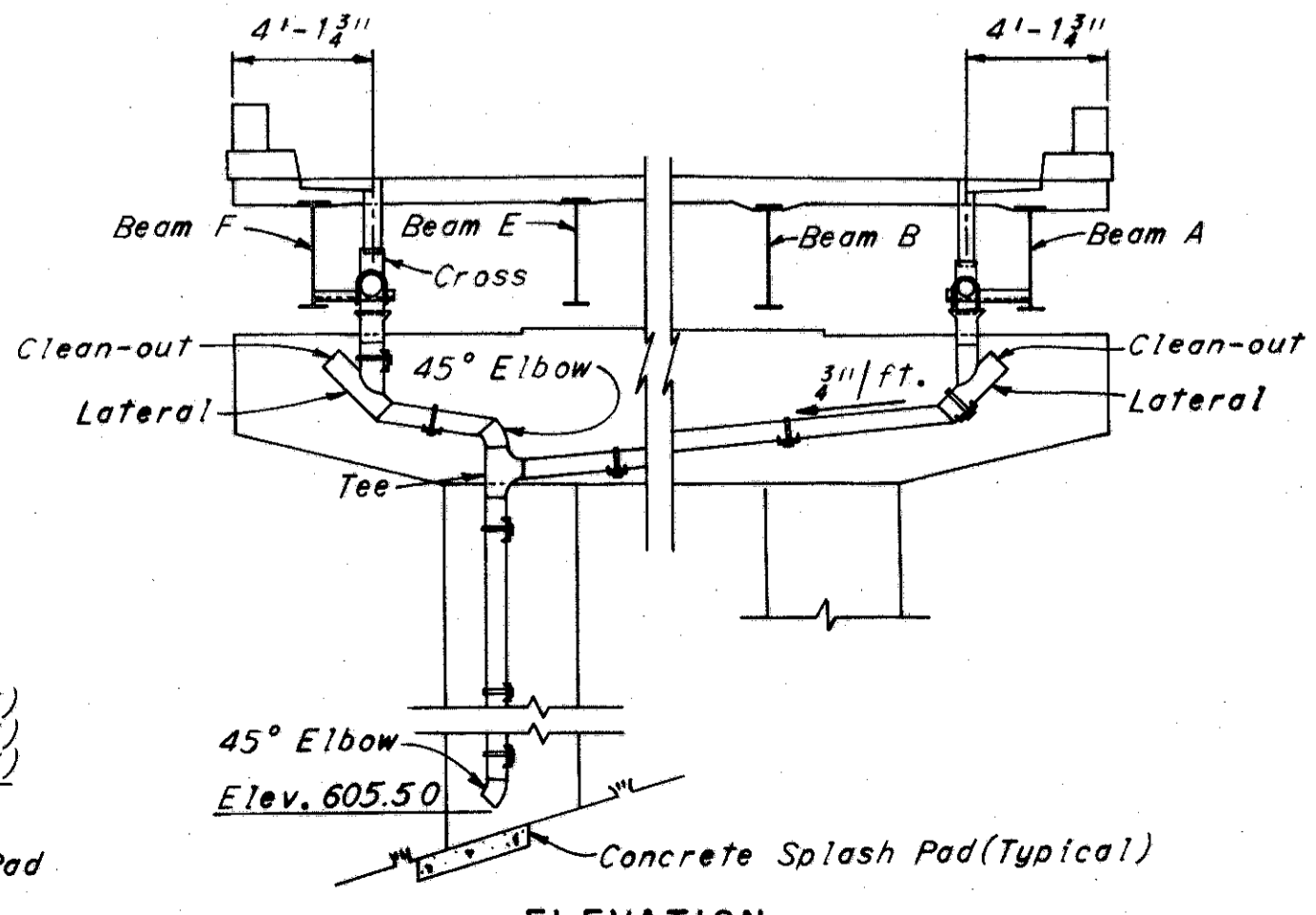


**SECTION B-B**  
**PIPE SUPPORT DETAIL**  
**ON PIERS**

**Notes:**  
 The 6" and 8" standard weight pipes, including specials, shall be standard weight wrought iron or hot-dipped galvanized steel pipe. Support channels shall be structural carbon steel and shall be painted in accordance with "Item S-8" unless shown otherwise. Pipe joints shall be made by welding or by use of a clamp type coupling with a ring gasket. All welding shall be done before galvanizing. Galvanizing as specified in Section M-10.30 will be considered sufficient for bolts.  
 The 8" pipe attached to substructure including fittings, supports and accessories is included with "Item S-29", 8" Pipe, Collector Systems, Including Supports" for payment.  
 The 8" pipe attached to substructure, including fittings, supports and accessories is included with "Item S-29, 8" Pipe Downspouts, Including Specials" for payment.  
 Standard 14"x8" reducers and 8" elbows, tees, crosses, and laterals shall be used in all cases.  
 Bulb angles and supports are included for payment with "Item S-7, Structural Steel."  
 Scuppers, including two supporting Ls 2 1/2"x2 1/2"x4, attached 6" pipe and 1 1/2" bar supports are included with "Item S-29, Scuppers" for payment.  
 For Scupper Details not shown and Gutter Support Details not shown see Ohio Standard Drawing SD-1-63, sheet 3 of 4.  
 For details of Crushed Aggregate Flume see Roadway Plans.  
 For additional details and notes see sheet 448.



**ELEVATION**  
**PIERS 18BE, 21BE & 24BE**  
 (Looking South)



**ELEVATION**  
**PIER 18BW**  
 (Looking South)

H.N.T.B. BRIDGE NOS. 21A & 21B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**DRAINAGE DETAILS**

NORTHBOUND I-71 OVER NORTHBOUND JENNINGS,  
 AND NORTHBOUND JENNINGS

BR. NO. CUY-71-1789R STA. 917+10.09  
 STA. 935+21.25

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
JEN				
DATE 9-5-64	DATE 10-3-64	DATE 2-22-66		

SHEET 449

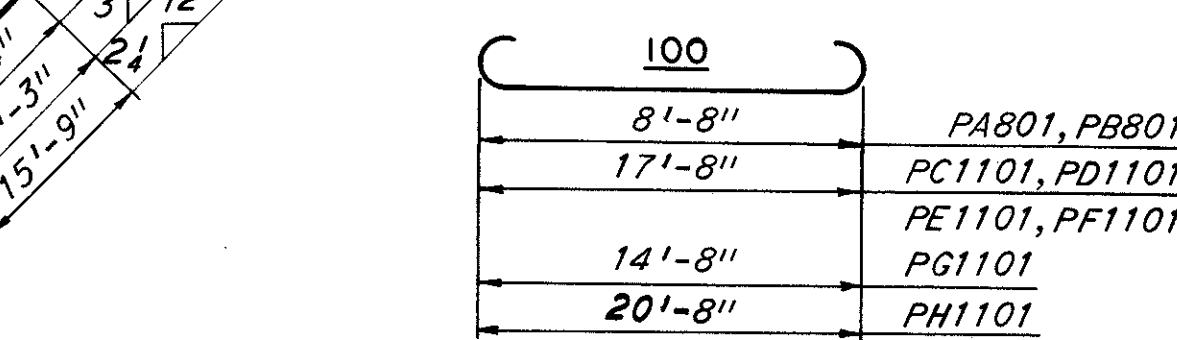
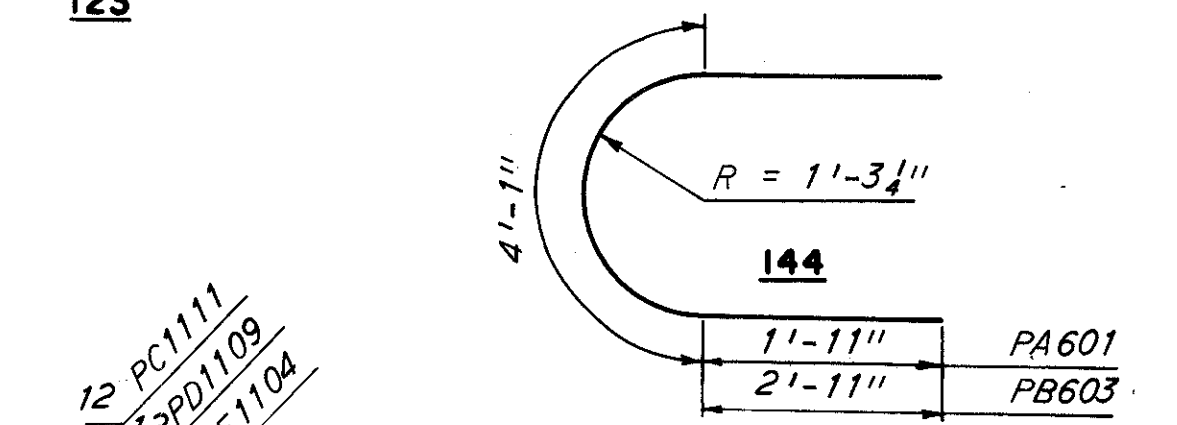
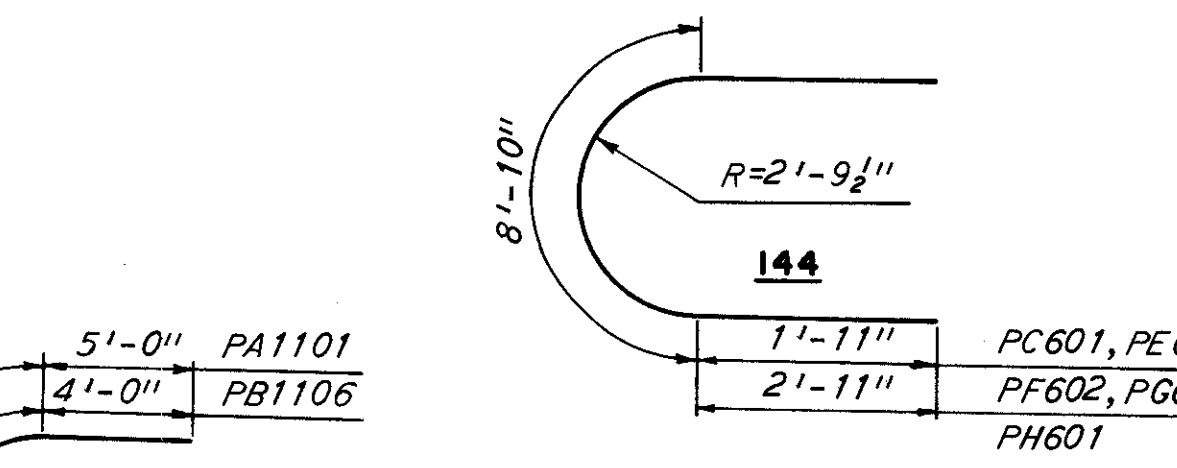
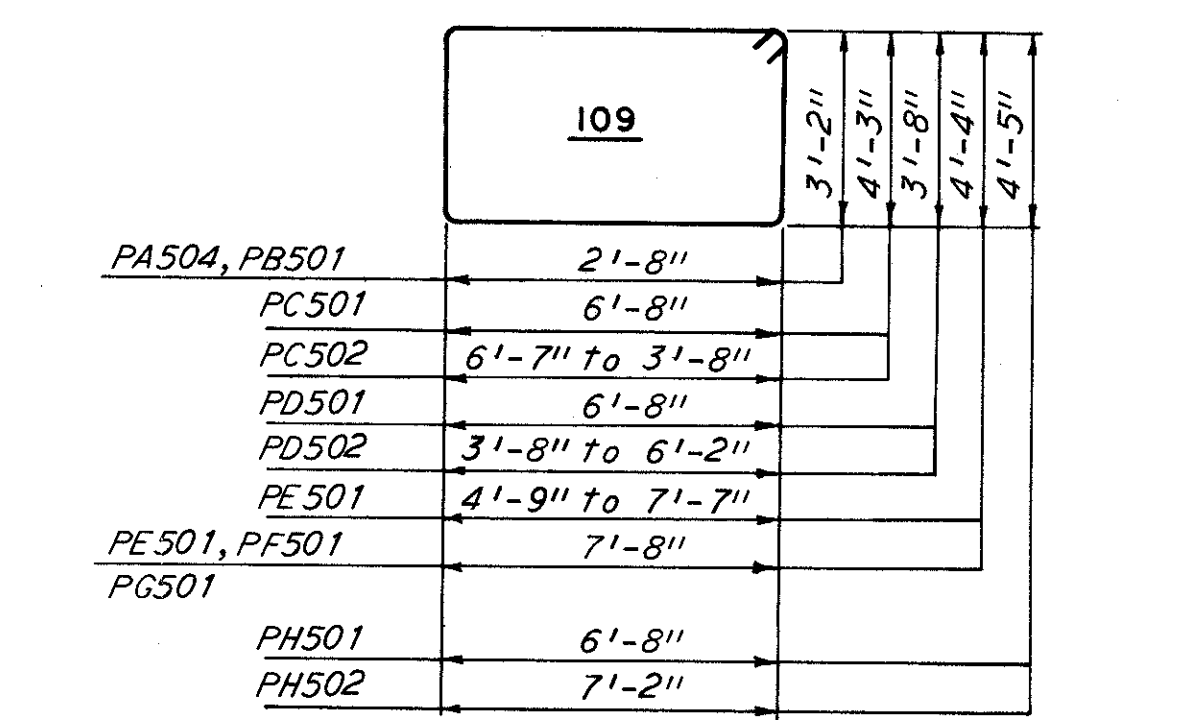
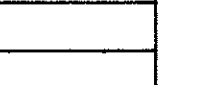
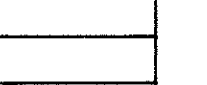
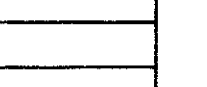
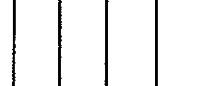
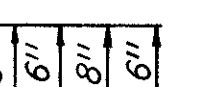
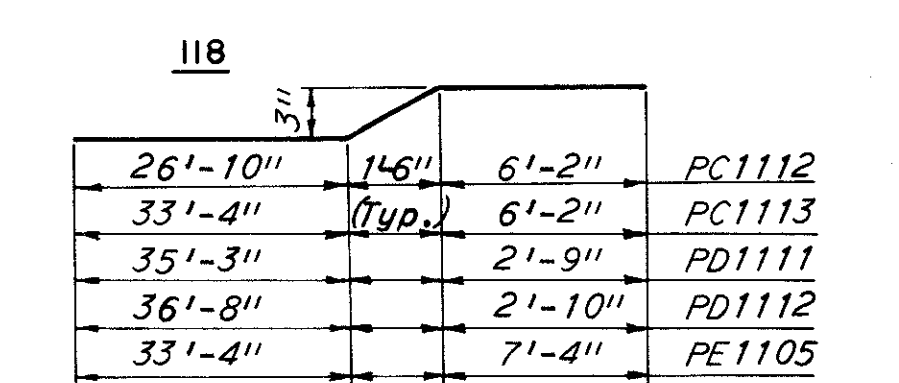
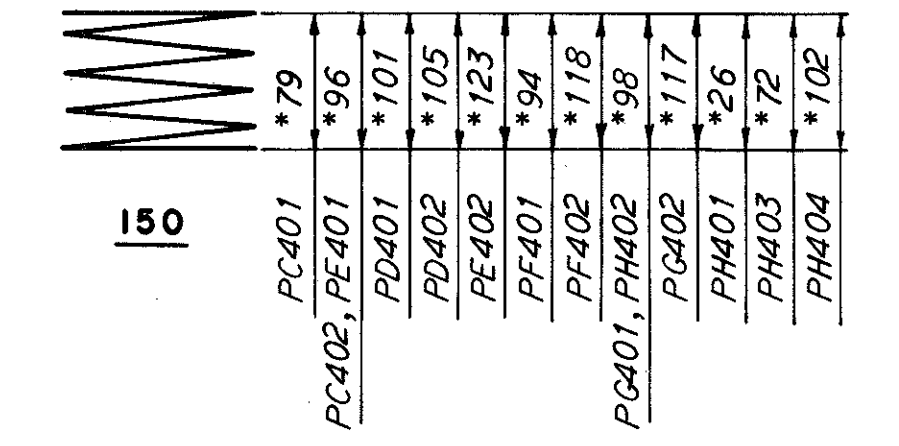
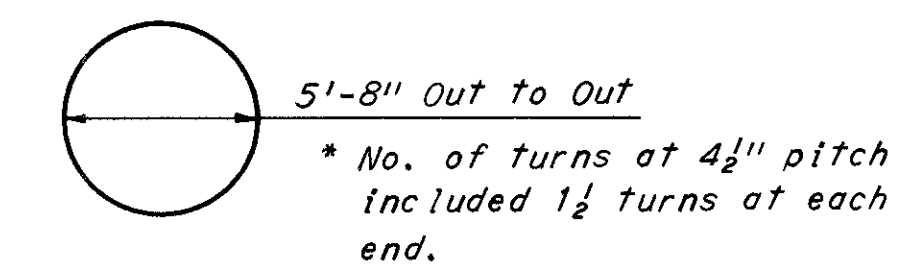
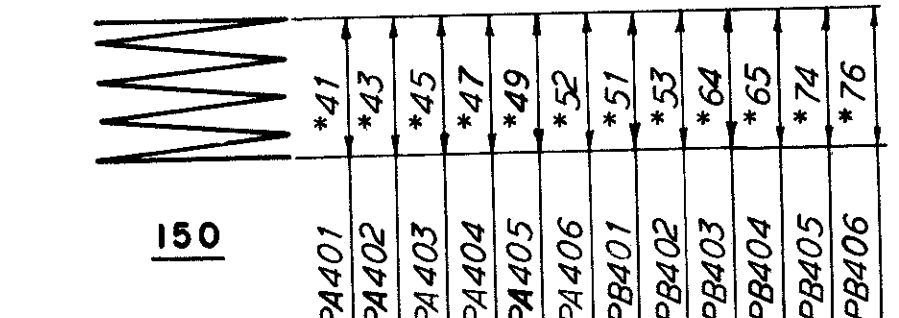
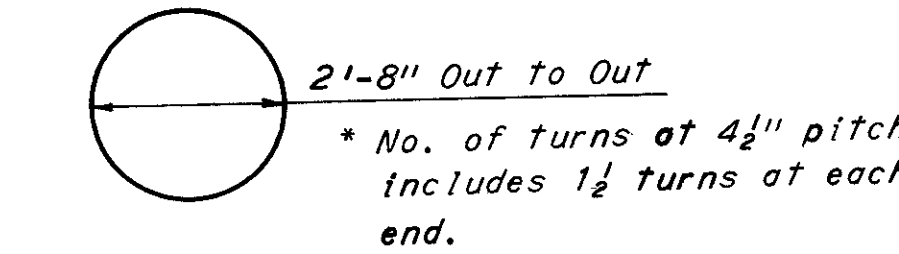
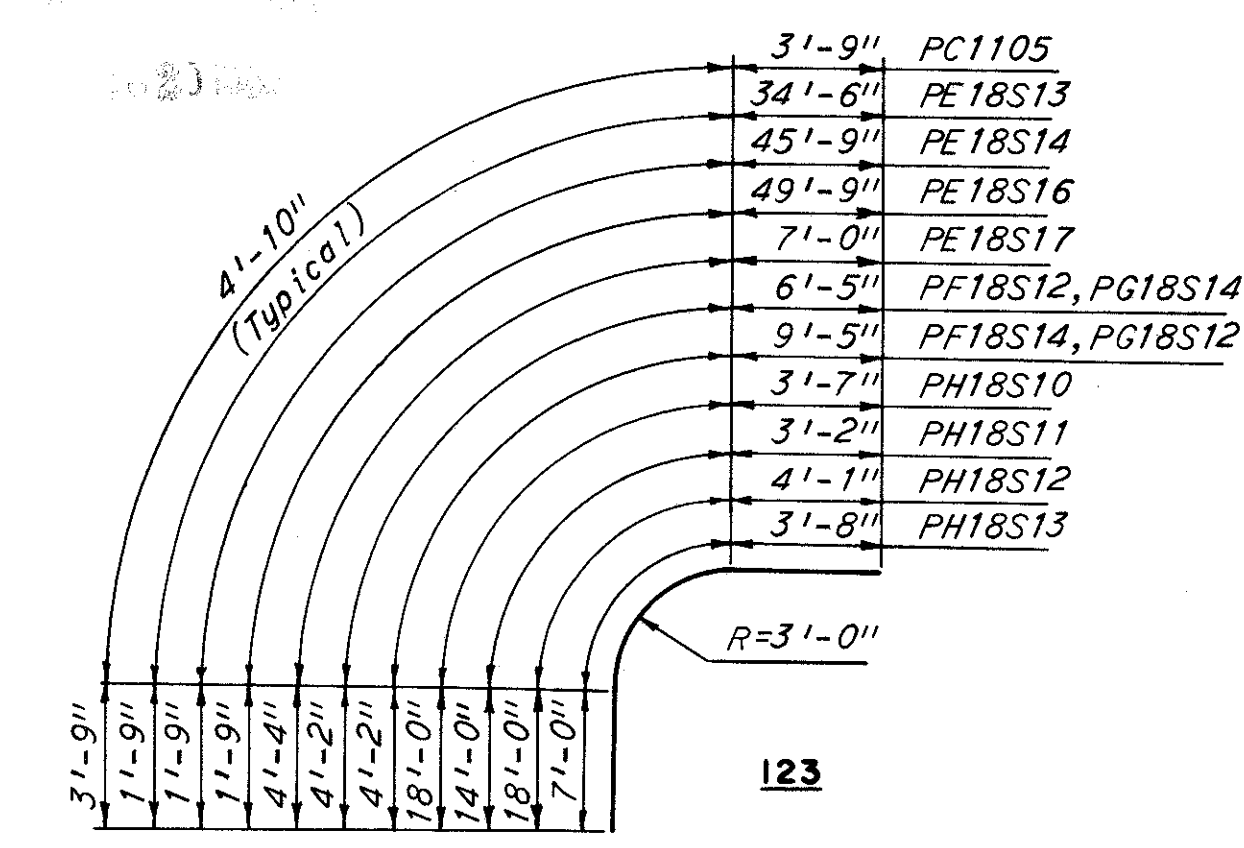




CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
<b>PIER 1</b>						<b>PIER 3</b>						<b>PIER 8</b>											
PA401	1	14'-5"	150		265	PC401	1	28'-6"	150		1,010	PE602	2	36'-6"	Str.		110	PG18S01	16	39'-0"	Str.		8,486
PA402	1	15'-2"	150		278	PC402	1	35'-0"	150		1,229	PE603	4	9'-2"	105		55	PG18S02	16	35'-0"	Str.		7,616
PA403	1	15'-11"	150		291	PC501	54	22'-4"	109		1,252	PE1101	92	20'-10"	100		10,183	PG18S03	16	46'-0"	Str.		10,010
PA404	1	16'-8"	150		304	PC502	2 Ser. 7	16'-4" 22'-2"	109	8 3/4"	281	PE1102	26	9'-0"	104		1,243	PG18S04	16	42'-0"	Str.		9,139
PA405	1	17'-5"	150		318	PC503	104	4'-11"	105		533	PE1103	20	42'-0"	Str.		4,463	PG18S05	32	10'-6"	104		4,570
PA406	1	18'-3"	150		336	PC504	2	4'-9"	105		10	PE1104	5	20'-3"	108		538	PG18S06	32	14'-6"	104		6,310
PA501	57	4'-7"	105		272	PC505	2	4'-7"	105		10	PE1105	6	42'-0"	118		1,339	PG18S07	4	38'-0"	Str.		2,067
PA502	2	4'-5"	105		9	PC601	6	12'-8"	144		114	PE18S01	16	10'-6"	104		2,285	PG18S08	7	46'-0"	Str.		4,379
PA503	2	3'-9"	105		8	PC602	3	9'-2"	105		41	PE18S02	16	14'-6"	104		3,155	PG18S09	4	52'-0"	Str.		2,829
PA504	68	12'-2"	109		863	PC603	10	31'-6"	Str.		473	PE18S03	16	44'-6"	Str.		9,683	PG18S10	4	58'-0"	Str.		3,155
PA601	8	7'-11"	144		95	PC604	2	28'-0"	Str.		84	PE18S04	16	48'-6"	Str.		10,554	PG18S11	2	62'-0"	Str.		1,686
PA602	4	24'-3"	Str.		146	PC1101	78	20'-10"	100		8,634	PE18S05	3	69'-0"	Str.		2,815	PG18S12	8	18'-5"	123		2,004
PA603	2	32'-6"	Str.		98	PC1102	52	9'-6"	104		2,625	PE18S06	2	67'-0"	Str.		1,822	PG18S13	3	68'-0"	Str.		2,714
PA604	12	6'-2"	105		111	PC1103	24	34'-6"	Str.		4,399	PE18S07	4	59'-0"	Str.		3,210	PG18S14	8	15'-5"	123		1,677
PA801	120	10'-10"	100		3,471	PC1104	22	41'-0"	Str.		4,792	PE18S08	4	53'-0"	Str.		2,883	<b>PIER 6</b>					
PA1001	62	7'-1"	104		1,890	PC1105	9	12'-4"	123		590	PE18S09	4	47'-0"	Str.		2,557	PH601	34	14'-8"	144		750
PA1002	12	17'-6"	Str.		904	PC1106	10	33'-9"	Str.		1,793	PE18S10	4	39'-0"	Str.		2,122	PH602	20	40'-0"	Str.		1,202
PA1003	10	18'-3"	Str.		785	PC1107	10	37'-2"	104		1,975	PE18S11	3	31'-0"	Str.		1,265	PH603	20	23'-3"	Str.		698
PA1004	10	19'-0"	Str.		818	PC1108	6	31'-9"	Str.		1,012	PE18S12	4	35'-6"	Str.		1,931	PH401	1	8'-7"	150		340
PA1005	10	19'-9"	Str.		850	PC1109	4	28'-9"	Str.		611	PE18S13	4	41'-1"	123		2,235	PH402	1	35'-6"	150		1,296
PA1006	10	20'-6"	Str.		882	PC1110	4	26'-9"	Str.		568	PE18S14	2	52'-4"	123		1,423	PH403	1	25'-9"	150		951
PA1007	10	21'-3"	Str.		914	PC1111	5	16'-9"	108		445	PE18S15	2	37'-6"	Str.		1,020	PH404	1	37'-4"	150		1,362
PA1101	6	12'-10"	123		409	PC1112	2	34'-6"	118		367	PE18S16	3	56'-4"	123		2,298	PH501	64	22'-8"	109		1,513
PA1102	6	12'-9"	Str.		406	PC1113	4	41'-0"	118		871	PE18S17	6	16'-2"	123		1,319	PH502	58	23'-8"	109		1,432
PA1103	8	24'-3"	Str.		1,031	PC1114	4	37'-8"	104		800	PE18S18	6	33'-6"	Str.		2,734	PH503	186	5'-7"	105		1,083
PA1104	8	25'-9"	Str.		1,094	PC18S01	1	51'-0"	Str.		694	<b>PIER 7</b>											
PA1105	4	14'-0"	Str.		298	PC18S02	4	33'-6"	Str.		1,822	PF401	1	38'-10"	150		1,245	PH1101	136	23'-10"	100		17,221
PA1106	9	32'-6"	Str.		1,554	PC18S03	4	39'-6"	Str.		2,149	PF402	1	42'-11"	150		1,565	PH18S01	18	27'-3"	104		6,671
PA1107	6	15'-0"	Str.		478	PC18S04	2	48'-3"	Str.		1,312	PF501	64	24'-5"	109		1,630	PH18S02	18	31'-3"	104		7,650
<b>TOTAL WEIGHT = 19,178</b>						<b>TOTAL WEIGHT = 41,882</b>						<b>TOTAL WEIGHT = 80,386</b>											
<b>PIER 2</b>						<b>PIER 4</b>						<b>PIER 5</b>											
PB401	1	17'-11"	150		330	PD401	1	36'-10"	150		1,293	PE401	1	34'-10"	150		1,263						
PB402	1	18'-8"	150		343	PD402	1	38'-4"	150		1,344	PE402	1	45'-3"	150		1,649						
PB403	1	22'-9"	150		415	PD501	30	21'-2"	109		662	PE501	2 Ser. 11	18'-8" 24'-4"	109	6 3/4"	247						
PB404	1	23'-5"	150		422	PD502	4 Ser. 7	15'-2" 21'-0"	109	8 3/4"	528	PE502	92	24'-6"	109		2,351						
PB405	1	26'-9"	150		481	PD503	108	4'-11"	105		554	PE503	126	4'-7"	105		602						
PB406	1	27'-6"	150		494	PD601	6	9'-2"	105		83	PE601	14	42'-9"	Str.		899						
PB501	53	12'-2"	109		673	PD602	4	28'-9"	Str.		173	PG501	62	24'-5"	109		1,579						
PB502	57	4'-7"	105		272	PD603	8	33'-0"	Str.		397	PG502	108	4'-7"	105		516						
PB503	2	3'-9"	105		8	PD1101	88	20'-10"	100		9,740	PG601	16	33'-0"	Str.		793						
PB504	2	4'-5"	105		9	PD1102	52	22'-0"	104		6,078	PG602	14	14'-9"	144		310						
PB601	4	19'-9"	Str.		119	PD1103	22	39'-6"	Str.		4,617	PH18S01	16	37'-0"	Str.		8,051						
PB602	2	26'-6"	Str.		80	PD1104	22	41'-0"	Str.		4,792	PH18S02	16	33'-0"	Str.		7,181						
PB603	8	7'-11"	144		95	PD1105	8	38'-6"	Str.		1,636	PH18S03	21	46'-0"	Str.		13,138						
PB604	12	6'-2"	105		111	PD1106	4	27'-6"	Str.		584	PH18S04	21	42'-0"	Str.		11,995						
PB801	124	10'-10"	100		3,587	PD1107	4	27'-6"	Str.		584	PH18S05	37	10'-6"	104		5,284						
PB1001	60	10'-11"	104		2,818	PD1108	24	33'-9"	Str.		4,304	PH18S06	37	14'-6"	104		7,296						
PB1002	10	21'-3"	Str.		914	PD1109	12	16'-8"	108		1,063	PH18S07	4	39'-9"	Str.		2,162						
PB1003	10	22'-0"	Str.		947	PD1110	52	9'-6"	104		2,525	PH18S08	7	47'-9"	Str.		4,546						
PB1004	10	26'-3"	Str.		1,130	PD1111	4	39'-6"	118		829	PH18S09	18	40'-6"	Str.		9,914						
PB1005	10	27'-0"	Str.		1,162	PD1112	4	41'-0"	118		871	PH18S10	8	16'-5"	123		2,874						
PB1006	10	30'-3"	Str.		1,302	PD1113	52	16'-0"	104		4,420	PH18S11	6	22'-0"	123		1,795						
PB1007	10	30'-9"	Str.		1,323	<b>TOTAL WEIGHT = 51,353</b>						PH18S12	8	26'-11"	123		2,929						
PB1101	8	19'-9"	Str.		839	<b>PIER 5</b>						PH18S13	6	15'-6"	123		1,265						
PB1102	8	26'-6"	Str.		1,126	PE401	1	34'-10"	150		1,263	PH18S14	12	65'-0"	Str.		10,608						
PB1103	5	12'-6"	Str.		332	PE402	1	45'-3"	150		1,649	PH18S15	8	59'-3"	Str.		6,446						
PB1104	8	21'-0"	Str.		893	PE501	2 Ser. 11	18'-8" 24'-4"	109	6 3/4"	247	PH18S16	8	55'-0"	Str.		5,984						
PB1105	2	9'-6"	Str.		101	PE502	92	24'-6"	109		2,351	PH18S17	4	49'-0"	Str.		2,666						
PB1106	6	10'-10"	123		345	PE503	126	4'-7"	105		602	PH18S18	3	41'-0"	Str.		1,673						
<b>TOTAL WEIGHT = 20,671</b>						PE601	14	42'-9"	Str.		899	PH18S19	5	46'-0"	Str.		3,128						

**BENDING DIAGRAMS**



Notes:  
For Spiral Reinforcement note see sheet 453.  
For Replacement Bar Schedule see sheet

H.N.T.B BRIDGE NOS. 21A & 21B



CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

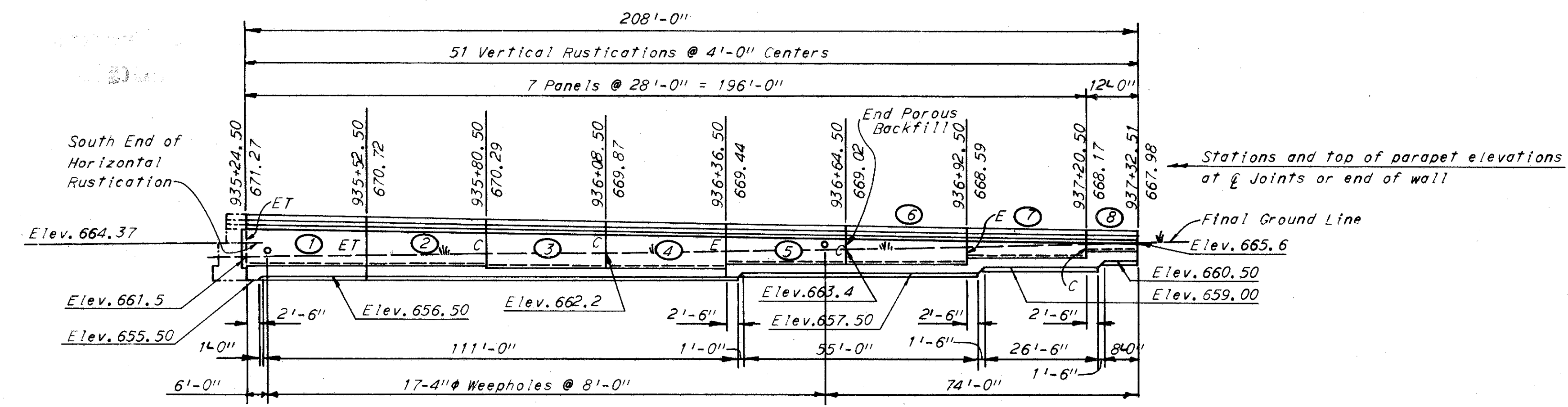
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<b>PIER 9</b>						PK18S21	2	31'-0"	Str.		843	PM18S19	5	46'-0"	Str.		3,128	PP18S14	12	68'-6"	Str.		11,179	
PJ401	1	8'-2"	150		327	<b>TOTAL WEIGHT = 146,407</b>						PM18S20	4	9'-0"	Str.		2,122	PP18S15	8	62'-6"	Str.		6,800	
PJ402	1	34'-2"	150		1,243	<b>PIER 11</b>						PM18S21	2	31'-0"	Str.		843	PP18S16	8	58'-3"	Str.		6,338	
PJ403	1	27'-5"	150		1,004	PL401	1	7'-11"	150		314	<b>TOTAL WEIGHT = 141,531</b>						PP18S17	5	54'-0"	Str.		3,672	
PJ404	1	35'-4"	150		1,283	PL402	1	30'-4"	150		1,110	<b>PIER 13</b>						PP18S18	8	46'-0"	Str.		5,005	
PJ501	64	22'-4"	109		1,491	PL403	1	29'-6"	150		1,083	PN401	1	11'-11"	150		463	PP18S19	5	52'-0"	Str.		3,536	
PJ502	58	23'-4"	109		1,412	PL404	1	31'-4"	150		1,149	PN402	1	26'-2"	150		970	PP18S20	4	18'-0"	Str.		979	
PJ503	186	5'-7"	105		1,083	PL501	64	22'-8"	109		1,513	PN403	1	36'-11"	150		1,346	PP18S21	36	18'-9"	104		9,180	
PJ601	34	14'-8"	144		750	PL502	58	23'-8"	109		1,432	PN404	1	27'-2"	150		998	PP18S22	14	31'-0"	123		5,902	
PJ602	20	40'-0"	Str.		1,202	PL503	186	5'-7"	105		1,083	<b>TOTAL WEIGHT = 173,125</b>												
PJ603	20	23'-3"	Str.		698	PL601	34	14'-8"	144		750	PN501	64	22'-8"	109		1,513							
PJ1101	136	23'-10"	100		17,221	PL602	20	40'-0"	Str.		1,202	PN502	64	23'-8"	109		1,580							
PJ18S01	21	26'-9"	104		7,640	PL603	20	23'-3"	Str.		698	PN503	186	5'-7"	105		1,083							
PJ18S02	21	30'-9"	104		8,782	PL1101	136	23'-10"	100		17,221	PN601	34	14'-8"	144		750							
PJ18S03	21	37'-3"	Str.		10,639	PL18S01	18	26'-9"	104		6,548	PN602	20	40'-0"	Str.		1,202							
PJ18S04	21	33'-3"	Str.		9,496	PL18S02	18	30'-9"	104		7,528	PN603	20	23'-6"	Str.		706							
PJ18S05	21	11'-9"	104		3,356	PL18S03	18	33'-6"	Str.		8,201	PN1101	136	23'-10"	100		17,221							
PJ18S06	21	15'-9"	104		4,498	PL18S04	18	29'-6"	Str.		7,222	PN18S01	18	30'-6"	104		7,466							
PJ18S07	42	35'-0"	Str.		19,992	PL18S05	18	11'-9"	104		2,876	PN18S02	18	34'-6"	104		8,446							
PJ18S08	21	34'-0"	Str.		9,710	PL18S06	18	15'-9"	104		3,856	PN18S03	18	29'-3"	Str.		7,160							
PJ18S09	21	38'-0"	Str.		10,853	PL18S07	36	37'-0"	Str.		18,115	PN18S04	18	25'-3"	Str.		6,181							
PJ18S10	8	26'-5"	123		2,874	PL18S08	18	30'-0"	Str.		7,344	PN18S05	18	11'-9"	104		2,876							
PJ18S11	6	22'-0"	123		1,795	PL18S09	18	34'-0"	Str.		8,323	PN18S06	18	15'-9"	104		3,856							
PJ18S12	8	26'-11"	123		2,929	PL18S10	8	26'-5"	123		2,874	PN18S07	36	44'-0"	Str.		21,542							
PJ18S13	6	15'-9"	123		1,265	PL18S11	6	22'-0"	123		1,795	PN18S08	18	26'-0"	Str.		6,365							
PJ18S14	12	65'-0"	Str.		10,608	PL18S12	8	26'-11"	123		2,929	PN18S09	18	30'-0"	Str.		7,344							
PJ18S15	8	59'-3"	Str.		6,446	PL18S13	6	15'-6"	123		1,265	PN18S10	8	26'-11"	123		2,929							
PJ18S16	8	55'-0"	Str.		5,984	PL18S14	12	65'-0"	Str.		10,608	PN18S11	6	22'-6"	123		1,836							
PJ18S17	4	49'-0"	Str.		2,666	PL18S15	8	59'-3"	Str.		6,446	PN18S12	8	27'-5"	123		2,983							
PJ18S18	3	41'-0"	Str.		1,673	PL18S16	8	55'-0"	Str.		5,984	PN18S13	10	15'-6"	123		2,108							
PJ18S19	5	46'-0"	Str.		3,128	PL18S17	4	49'-0"	Str.		2,666	PN18S14	12	65'-3"	Str.		10,649							
PJ18S20	4	39'-0"	Str.		2,122	PL18S18	3	41'-0"	Str.		1,673	PN18S15	8	59'-6"	Str.		6,474							
PJ18S21	18	14'-9"	104		3,611	PL18S19	5	46'-0"	Str.		3,128	PN18S16	8	55'-3"	Str.		6,011							
<b>TOTAL WEIGHT = 157,781</b>						PL18S20	4	39'-0"	Str.		2,122	PN18S17	4	50'-6"	Str.		2,747							
<b>PIER 10</b>						PN18S18	3	42'-6"	Str.		1,734	PN18S18	3	42'-6"	Str.		1,734							
PK401	1	7'-9"	150		313	PN18S19	5	47'-6"	Str.		3,230	PN18S19	5	47'-6"	Str.		3,230							
PK402	1	32'-2"	150		1,177	PN18S20	4	40'-0"	Str.		2,176	PN18S20	4	40'-0"	Str.		2,176							
PK403	1	28'-10"	150		1,057	PN18S21	2	32'-0"	Str.		870	PN18S21	2	32'-0"	Str.		870							
PK404	1	33'-1"	150		1,204	<b>TOTAL WEIGHT = 139,058</b>						PN18S22	14	31'-0"	123		5,902							
<b>PIER 12</b>						PM401	1	11'-0"	150		421	<b>PIER 14</b>												
PK501	64	22'-8"	109		1,513	PM402	1	28'-2"	150		1,043	PP401	1	12'-10"	150		490							
PK502	64	23'-8"	109		1,580	PM403	1	32'-2"	150		1,176	PP402	1	24'-5"	150		904							
PK503	186	5'-7"	105		1,083	PM404	1	29'-2"	150		1,070	PP403	1	39'-5"	150		1,438							
PK601	34	14'-8"	144		750	PM501	68	22'-8"	109		1,608	PP404	1	25'-4"	150		943							
PK602	20	40'-0"	Str.		1,202	PM502	64	23'-8"	109		1,580	PP501	92	22'-4"	109		2,143							
PK603	20	23'-3"	Str.		698	PM503	186	5'-7"	105		1,083	PP502	70	23'-4"	109		1,704							
PK1101	136	23'-10"	100		17,221	PM601	34	14'-8"	144		750	PP503	208	5'-7"	105		1,211							
PK18S01	21	26'-6"	104		7,568	PM602	20	40'-0"	Str.		1,202	PP504	2	5'-4"	105		11							
PK18S02	21	30'-6"	104		8,711	PM603	20	23'-3"	Str.		698	PP601	34	14'-8"	144		749							
PK18S03	21	35'-3"	Str.		10,067	PM1101	136	23'-10"	100		17,221	PP602	20	40'-0"	Str.		1,202							
PK18S04	21	31'-3"	Str.		8,925	PM18S01	18	29'-9"	104		7,283	PP603	20	26'-9"	Str.		804							
PK18S05	18	11'-9"	104		3,356	PM18S02	18	33'-9"	104		8,262	PP1101	136	23'-10"	100		17,221							
PK18S06	18	15'-9"	104		4,498	PM18S03	18	31'-3"	Str.		7,650	PP18S01	21	31'-6"	104		8,996							
PK18S07	36	36'-0"	Str.		17,626	PM18S04	18	27'-3"	Str.		6,671	PP18S02	21	35'-6"	104		10,139							
PK18S08	18	32'-0"	Str.		7,834	PM18S05	18	11'-9"	104		2,876	PP18S03	21	26'-9"	Str.		7,640							
PK18S09	18	36'-0"	Str.		8,813	PM18S06	18	15'-9"	104		3,856	PP18S04	21	22'-9"	Str.		6,497							
PK18S10	8	26'-5"	123		2,874	PM18S07	36	39'-3"	Str.		19,217	PP18S05	21	11'-9"	104		3,356							
PK18S11	6	22'-0"	123		1,795	PM18S08	18	28'-0"	Str.		6,856	PP18S06	21	15'-9"	104		4,498							
PK18S12	8	26'-11"	123		2,929	PM18S09	18	32'-0"	Str.		7,834	PP18S07	42	46'-6"	Str.		26,561							
PK18S13	6	15'-9"	123		1,265	PM18S10	8	26'-11"	123		2,929	PP18S08	21	23'-6"	Str.		6,712							
PK18S14	12	65'-0"	Str.		10,608	PM18S11	6	22'-0"	123		1,795	PP18S09	21	27'-6"	Str.		7,854							
PK18S15	8	59'-3"	Str.		6,446	PM18S12	8	26'-11"	123		2,929	PP18S10	8	28'-5"	123		3,092							
PK18S16	8	55'-0"	Str.		5,984	PM18S13	10	15'-6"	123		2,108	PP18S11	6	24'-0"	123		1,958							
PK18S17	4	49'-0"	Str.		2,666	PM18S14	12	65'-0"	Str.		10,608	PP18S12	8	28'-11"	123		3,146							
PK18S18	3	41'-0"	Str.		1,673	PM18S15	8	59'-3"	Str.		6,446	PP18S13	6	15'-6"	123		1,265							
PK18S19	5	46'-0"	Str.		3,128	PM18S16	8	55'-0"	Str.		5,984													
PK18S20	4	39'-0"	Str.		2,122	PM18S17	4	49'-0"	Str.		2,666													
						PM18S18	3	41'-0"	Str.		1,673													



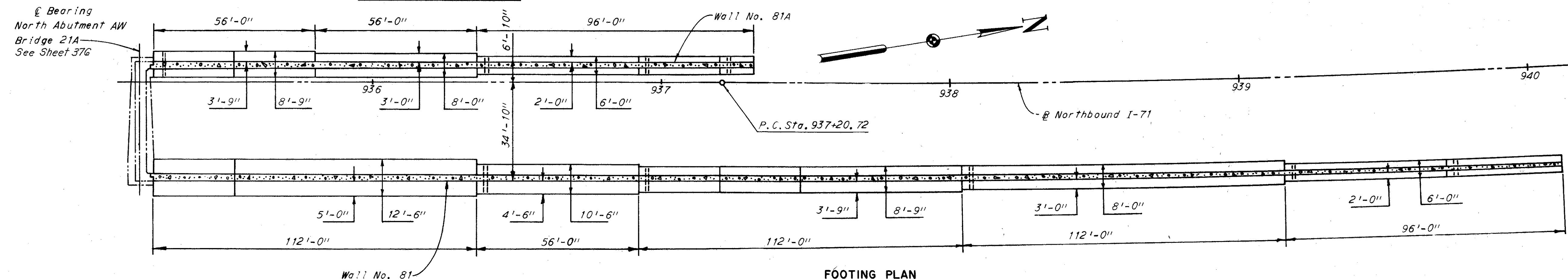




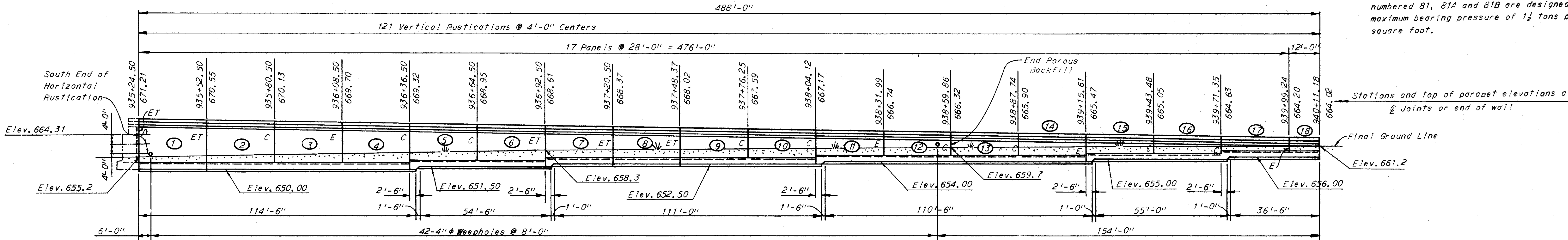
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)												
<b>UNIT 1-A</b>						SC613	1	11'-9"	Str		18	SF601	1284	39'-3"	Str		75,696	<b>UNIT 3-BW</b>																	
SA501	1200	38'-1"	101		47,665	SC614	1	33'-0"	Str		50	SF602	1798	28'-0"	Str		75,617	SH501	904	22'-11"	101		21,608	SH502	304	5'-7"	110		1,770	SH503	304	6'-2"	109		1,955
SA502	1255	30'-5"	101		39,814	SC615	1	17'-6"	Str		26	<b>UNIT 2-B</b>																							
SA503	827	5'-7"	110		4,816	SC616	1	21'-0"	Str		32	SG501	168	32'-7"	101		5,709	SH601	492	39'-3"	Str.		29,005	SH602	68	27'-0"	Str.		2,758						
SA504	827	6'-4"	109		5,463	SC617	1	7'-3"	Str		11	SG502	168	25'-1"	101		4,395	SH603	452	26'-3"	Str.		17,821	SH604	452	18'-6"	Str.		12,560						
SA505	1-Ser 55	4'-0" 37'-0"	Str	7/16"	1,176	SC618	1-Ser 3	4'-6" 34'-0"	Str	11/4"	106	SG503	157	32'-9"	101		5,363	SH605	17	17'-3"	Str.		440	SH606	17	20'-3"	Str.		517						
SA506	1-Ser 42	7'-1" 31'-10"	101	7/16"	852	SC619	1-Ser 3	6'-0" 27'-6"	Str	10/9"	75	SG504	1-Ser 157	24'-11" 26'-11"	101	8/16"	4,244	<b>UNIT 3-BE</b>																	
SA507	1-Ser 10	4'-1" 6'-10"	101	3/16"	57	SC620	1-Ser 4	11'-0" 35'-0"	Str	8/0"	138	SG505	157	30'-7"	101		5,008	SJ501	48	31'-2"	100		1,560	SJ502	866	30'-10"	100		27,849						
SA508	2	43'-11"	101		92	SC621	1-Ser 4	7'-8" 32'-0"	Str	8/1"	119	SG506	1-Ser 157	29'-1" 33'-4"	101	5/16"	5,110	SJ503	604	6'-2"	109		3,885	SJ504	604	5'-7"	110		3,517						
SA601	2449	34'-0"	Str		125,066	SC622	1	25'-6"	Str		38	SG507	156	38'-3"	101		6,224	<b>UNIT 4-BE</b>																	
SA602	1783	40'-0"	Str		107,123	SC623	2	9'-0"	Str		27	SG508	1-Ser 156	25'-8" 36'-5"	101	8/16"	5,051	SK501	539	30'-10"	100		17,334	SK502	24	31'-0"	100		776						
SA603	1-Ser 49	4'-0" 34'-0"	Str	7/16"	1,398	SC624	2	29'-0"	Str		87	SG509	157	44'-8"	101		4,053	SK503	1 Ser. 47	31'-2" 33'-5"	100	8/16"	1,583	SK504	489	6'-2"	109		3,145						
SA604	1-Ser 48	4'-6" 35'-3"	Str	7/16"	1,505	SC625	1	10'-0"	Str		15	SG510	87	44'-8"	101		4,053	SK505	489	5'-7"	110		2,848												
SA605	1-Ser 10	3'-6" 6'-3"	Str	3/16"	73	SC626	1-Ser 4	5'-9" 37'-6"	Str	10/7"	130	SG511	1-Ser 5	43'-9" 45'-2"	100	4/16"	232	SK601	539	29'-6"	Str.		23,883	SK602	24	29'-9"	Str.		1,072						
SA606	1-Ser 26	11'-6" 46'-0"	Str	1/4"	1,123	SC627	1-Ser 4	4'-6" 32'-0"	Str	9/2"	110	SG512	1-Ser 5	44'-1"	100		2,524	SK603	1 Ser. 47	30'-0" 32'-3"	Str.	8/16"	2,197	SK604	1 Ser. 34	33'-8" 36'-5"	100	1"	1,792						
SA607	1-Ser 31	11'-6" 46'-0"	Str	1/4"	1,339	SC628	1-Ser 5	7'-6" 35'-0"	Str	7/6"	150	SG513	1-Ser 34	31'-1" 33'-1"	101	3/16"	1,138	SK605	1 Ser. 34	36'-7" 36'-5"	100	1/8"	1,960	SK606	1 Ser. 34	40'-3" 44'-6"	100	1/8"	2,164						
SA608	1-Ser 27	8'-3" 44'-3"	Str	1/4"	1,065	SC629	1-Ser 4	7'-6" 29'-9"	Str	7/5"	112	SG514	1-Ser 5	31'-4" 32'-7"	100	3/16"	167	SK607	1 Ser. 34	40'-3" 44'-6"	100	1/8"	2,164	SK608	12	16'-9"	Str.		302						
SA609	1-Ser 31	8'-3" 44'-3"	Str	1/4"	1,222	SC630	1-Ser 6	6'-6" 35'-0"	Str	5/8"	187	SG515	45	31'-4"	100		1,471	SK609	13	19'-9"	Str.		386												
SA610	52	28'-0"	Str		2,187	SC631	1-Ser 7	8'-0" 35'-0"	Str	5/4"	200	SG516	561	5'-7"	110		3,267	SK610	100	26'-0"	Str.		3,905												
SA611	52	28'-9"	Str		2,245	SC632	2-96	27'-0"	Str		12,004	SG517	553	6'-2"	109		3,557	SK611	30	38'-6"	Str.		1,735												
SA612	52	34'-6"	Str		2,695	SC633	1	28'-9"	Str		43	SG518	2	6'-8"	109		14	SK612	30	38'-3"	Str.		1,724												
SA613	52	39'-6"	Str		3,085	SC634	39	20'-3"	Str		1,186	SG519	1-Ser 17	6'-11" 12'-11"	156	3/8"	168	SK701	1 Ser. 34	32'-3" 35'-0"	Str.	1"	2,337												
SA614	52	35'-6"	Str		2,773	SC635	1	9'-1"	144		14	SG520	3	3'-4"	126		10	SK702	1 Ser. 34	38'-9" 43'-0"	Str.	1/8"	2,841												
SA615	26	26'-0"	Str		1,015	SC636	1	30'-6"	Str		46	SG601	168	36'-3"	Str		9,147	SK703	1 Ser. 34	38'-9" 43'-0"	Str.	1/8"	2,841												
SA616	26	23'-0"	Str		898	SC637	1	27'-6"	Str		41	SG602	168	20'-6"	Str		5,173	SK704	36	32'-3"	Str.		2,373												
SA617	45	40'-9"	Str		2,754	SC638	1	22'-9"	Str		34	SG603	157	36'-3"	Str		8,548	SK705	90	31'-9"	Str.		5,841												
SA618	51	40'-3"	Str		3,083	SC639	1	17'-9"	Str		27	SG604	1-Ser 157	20'-8" 22'-9"	Str	8/16"	5,129	<b>UNIT 4-AE</b>																	
Additional reinforcement for Sign Support is tabulated on sheet 430A						SC640	1	12'-9"	Str		19	SG605	1-Ser 156	21'-3" 22'-0"	Str	8/16"	6,239	SE501	1-Ser 143	22'-5" 25'-2"	101	4/16"	3,623												
Additional reinforcement for Sign Supports is tabulated on Sheet 430A						SC641	3	10'-3"	121		46	SG606	1-Ser 157	24'-9" 26'-0"	Str	8/16"	6,338	SE502	454	22'-5"	101		10,615												
<b>UNIT 2-A</b>						SC642	1	5'-9"	Str		9	SG607	156	42'-0"	Str		9,841	SE503	1-Ser 253	22'-5" 24'-11"	101	8/16"	6,245												
SB501	776	38'-1"	101		30,823	SC643	1	29'-9"	Str		45	SG608	1-Ser 156	21'-3" 22'-0"	Str	8/16"	6,239	SE504	460	24'-3"	101		11,635												
SB502	776	30'-5"	101		24,618	<b>UNIT 4-AW</b>						SG609	87	44'-3"	Str		5,782	SE505	1-Ser 140	24'-3" 27'-0"	101	1/16"	3,742												
SB503	520	5'-7"	110		3,028	SD501	713	42'-10"	100		31,853	SG610	1-Ser 5	42'-6" 44'-0"	Str	4/16"	325	SE506	1-Ser 253	22'-5" 24'-11"	101	8/16"	7,982												
SB504	520	6'-4"	109		3,435	SD502	478	5'-7"	110		2,784	SG611	55	42'-9"	Str		3,532	SE507	581	5'-7"	110		3,383												
SB601	1552	34'-0"	Str		79,258	SD503	478	6'-4"	109		3,157	SG612	1-Ser 34	30'-6" 32'-9"	Str	1/8"	1,615	SE508	581	6'-4"	109		3,838												
SB602	1210	40'-6"	Str		73,606	SD601	713	41'-6"	Str		44,443	SG613	1-Ser 54	32'-6" 37'-6"	Str	1/8"	2,839	SE601	1-Ser 146	26'-0" 28'-9"	Str	4/16"	6,003												
SB603	208	27'-0"	Str		8,435	SD602	820	37'-6"	Str		45,187	SG614	1-Ser 54	32'-6" 37'-6"	Str	1/8"	2,839	SE602	454	26'-0"	Str		17,730												
SB604	26	19'-9"	Str		771	SD603	133	27'-0"	Str		5,515	SG615	45	30'-0"	Str		2,028	SE603	1-Ser 253	22'-5" 24'-11"	Str	8/16"	10,355												
SB605	26	16'-9"	Str		654	<b>UNIT 4AE</b>						SG616	928	37'-6"	Str		52,270	SE604	460	19'-6"	Str		13,473												
SC501	936	38'-1"	101		37,179	SE501	1-Ser 143	22'-5" 25'-2"	101	4/16"	3,623	SG617	48	29'-6"	Str		2,127	SE605	1-Ser 140	10'-6" 12'-9"	Str	4/16"	4,390												
SC502	304	30'-9"	101		9,750	SE502	454	22'-5"	101		10,615	SG618	200	35'-9"	Str		10,739	SE606	1-Ser 253	22'-5" 24'-11"	Str	8/16"	9,690												
SC503	1-Ser 158	30'-9" 33'-6"	101	1/8"	5,294	SE503	1-Ser 253	22'-5" 24'-11"	101	8/16"	6,245	SG619	201	35'-3"	Str		10,642	SE607	984	38'-0"	Str		56,163												
SC504	1-Ser 158	33'-6" 33'-6"	101	1/8"	5,967	SE504	460	24'-3"	101		11,635	SG620	33	36'-6"	Str		1,809	SE608	20	33'-6"	Str		1,006												
SC505	1-Ser 158	33'-6" 34'-0"	Str	3/16"	4,923	SE505	1-Ser 140	24'-3" 27'-0"	101	1/16"	3,742	SG621	23	17'-3"	Str		596	SE609	175	39'-0"	Str		10,251												
SC506	1-Ser 158	33'-6" 45'-0"	Str	7/16"	6,571	SE506	1-Ser 253	22'-5" 24'-11"	101	8/16"	7,982	SG622	23	20'-3"	Str		700	SE610	117	27'-0"	Str		4,745												
SC507	322	14'-9"	101		4,954	SE507	581	5'-7"	110		3,383	SG623	228	27'-0"	Str		9,246	SE611	92	24'-6"	Str		3,386												
SC508	1-Ser 6	42'-7" 43'-10"	100	3"	270	SE508	581	6'-4"	109		3,838	SG624	1-Ser 25	23'-0" 32'-6"	Str	4/16"	1,042	SE612	1-Ser 8	11'-9" 27'-3"	Str	3/7/16"	294												
SC509	1-Ser 6	33'-10" 35'-11"	101	3"	216	SE601	1-Ser 146	26'-0" 28'-9"	Str	4/16"	6,003	SG625	1-Ser 41	23'-0" 32'-6"	Str	2/8"	1,709	SE613	2	21'-9"	Str		65												
SC510	640	5'-7"	110		3,727	SE602	454	26'-0"	Str		17,730	SG626	66	40'-0"	Str		3,965	SE614	2	29'-0"	Str		87												
SC511	631	6'-4"	109		4,168	SE603	1-Ser 253	22'-5" 24'-11"	Str	8/16"	10,355	SG627	2	35'-9"	Str		110	SE615	4	27'-6"	Str		165												
SC512	2	5'-11"	156		11	SE604	460	19'-6"	Str		13,473	SG628	2	33'-0"	Str		99	SE616	1	25'-0"	Str		38												
SC513	2	5'-8"	156		12	SE605	1-Ser 140	10'-6" 12'-9"	Str	4/16"	4,390	SG629	1-Ser 5	11'-0" 34'-3"	Str	5/9/16"	170	SE617	1	23'-3"	Str		35												
SC514	1-Ser 19	6'-11" 12'-3"	156	3/8"	190	SE606	1-Ser 253	22'-5" 24'-11"	Str	8/16"	9,690	SG630	1-Ser 8	11'-9" 27'-3"	Str	3/7/16"	294	SE618	1	19'-3"	Str		29												
SC515	3	3'-4"	126		10	SE607	984	38'-0"	Str		56,163	SG631	2	21'-9"	Str		65	SE619	1	15'-3"	Str		23												
SC601	1240	34'-0"	Str		63,324	SE608	20	33'-6"	Str		1,006	SG632	2	29'-0"	Str		87	SE620	1	11'-0"	Str		17												
SC602	1-Ser 158	34'-0" 36'-9"	Str	3/16"	8,395	SE609	175	39'-0"	Str		10,251	SG633	4	27'-6"	Str		165	SE621	1	7'-9"	Str		12												
SC603	1-Ser 158	36'-9" 42'-3"	Str	1/8"	9,374	SE610	117	27'-0																											



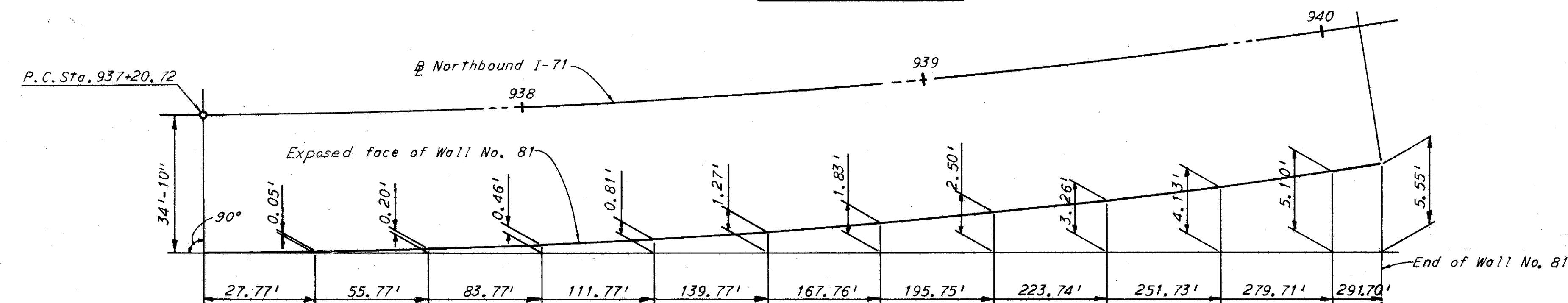
ELEVATION WALL NO. 81A



FOOTING PLAN



ELEVATION WALL NO. 81



LAYOUT DIAGRAM - WALL NO. 81

ESTIMATED QUANTITIES-RETAINING WALL 81			
ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Unclassified Excavation	Cu. Yd.	1,614
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	371
S-1	Class "E" Concrete, Retaining Wall Footing	Cu. Yd.	451
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	168
S-4	Reinforcing Steel	Pounds	49,888
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	254
S-14	Railing, Type A (Aluminum Rail and Supports and Concrete Parapet)	Lin. Ft.	487.67
S-29	Porous Backfill	Cu. Yd.	194

Note: Wall Quantities carried to General Summary, sheet 42.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



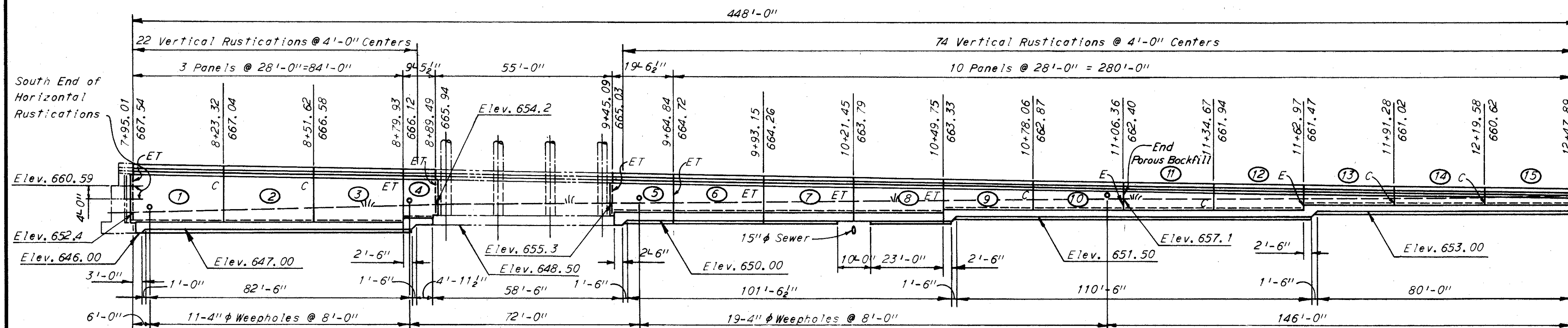
Notes:  
 All longitudinal dimensions shown in Footing Plan and Elevations are measured along exposed face of walls.  
 ① Indicates wall panel numbered 1.  
 C Indicates contraction joint, E indicates expansion joint, and ET indicates expansion joint through footing.  
 For railing post spacing and longitudinal reinforcing in the parapet see sheet 431.  
 For details of light standard supports on Retaining Wall No. 81 see sheet 476A.  
 Backfill shall be placed in front of the wall prior to or simultaneous with the placing of fill behind the wall.  
 Location of construction joints in the footing are optional but shall be located a minimum of 5'-0" from wall joints.  
 The spread footings for retaining walls numbered 81, 81A and 81B are designed for a maximum bearing pressure of 1 1/2 tons per square foot.

H.N.T.B. WALL NO. 81, 81A AND 81B  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

WALL RIGHT AND LEFT OF NORTHBOUND I-71  
 STA. 935+24.50 TO STA. 937+32.51 (81A)  
 STA. 935+24.50 TO STA. 940+11.18 (81)  
 WALL LEFT OF NORTHBOUND OUTER ROADWAY  
 STA. 7+95.01 TO STA. 12+47.89 (81B)

CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN Lee TRACED CHECKED EN REVIEWED WJ REVISIONS  
 DATE 11-20-64 DATE 1-19-65 DATE 1-20-65 SHEET 456

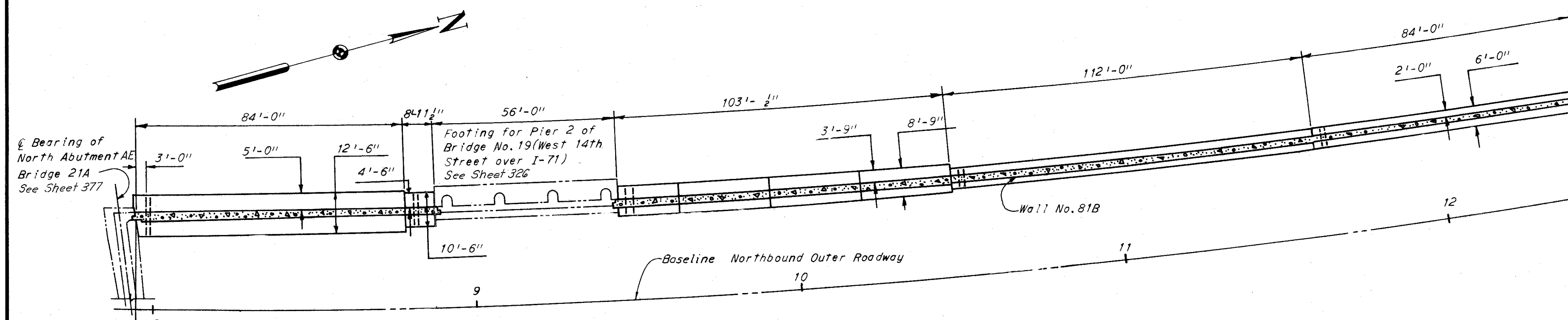
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



ELEVATION WALL NO. 81B

ESTIMATED QUANTITIES-RETAINING WALL 81A

ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Unclassified Excavation	Cu. Yd.	506
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	118
S-1	Class "E" Concrete, Retaining Wall Footing	Cu. Yd.	149
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	55
S-4	Reinforcing Steel	Pounds	15,864
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	105
S-14	Railing, Type A (Aluminum Rails and Supports and Concrete Parapet)	Lin. Ft.	207.67
S-29	Porous Backfill	Cu. Yd.	49

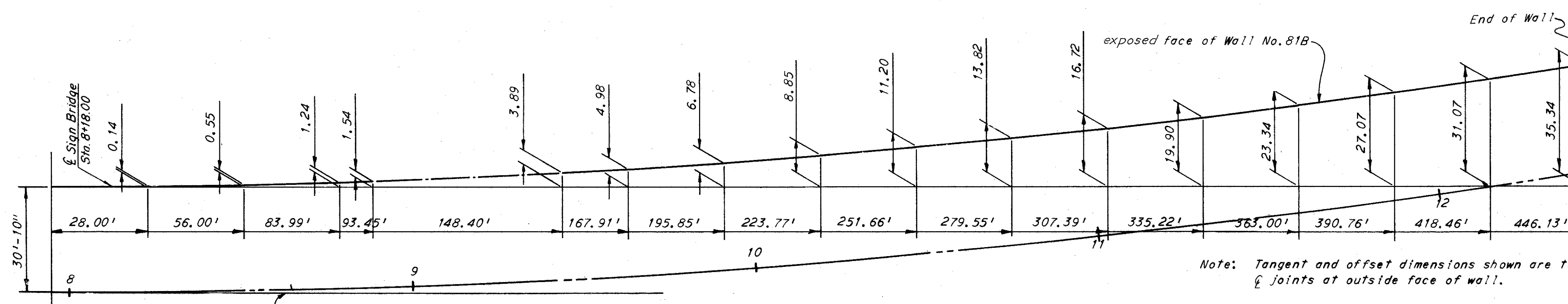


FOOTING PLAN

ESTIMATED QUANTITIES-RETAINING WALL 81B

ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Unclassified Excavation	Cu. Yd.	1,028
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	249
S-1	Class "E" Concrete, Retaining Wall Footing	Cu. Yd.	330
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	134
S-4	Reinforcing Steel	Pounds	38,432
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	252
S-14	Railing, Type A (Aluminum Rails and Supports and Concrete Parapet)	Lin. Ft.	447.67
S-29	Porous Backfill	Cu. Yd.	126

Note: Wall Quantities carried to General Summary, sheet 42



LAYOUT DIAGRAM - WALL NO. 81B

Note: Tangent and offset dimensions shown are to & joints at outside face of wall.

H.N.T.B. WALL NO. 81, 81A AND 81B

HOWARD, NEEDLES, TAMMEN & BERGENDOFF,  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

WALL RIGHT AND LEFT OF NORTHBOUND I-71  
STA. 935+24.50 TO STA. 937+32.51 (81A)  
STA. 935+24.50 TO STA. 940+11.18 (81)

WALL LEFT OF NORTHBOUND OUTER ROADWAY  
STA. 7+95.01 TO STA. 12+47.89 (81B)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN Lee TRACED CHECKED JEN REVIEWED W/F REVISIONS  
DATE 11-20-64 DATE 1-19-65 DATE 7-20-65 SHEET 457









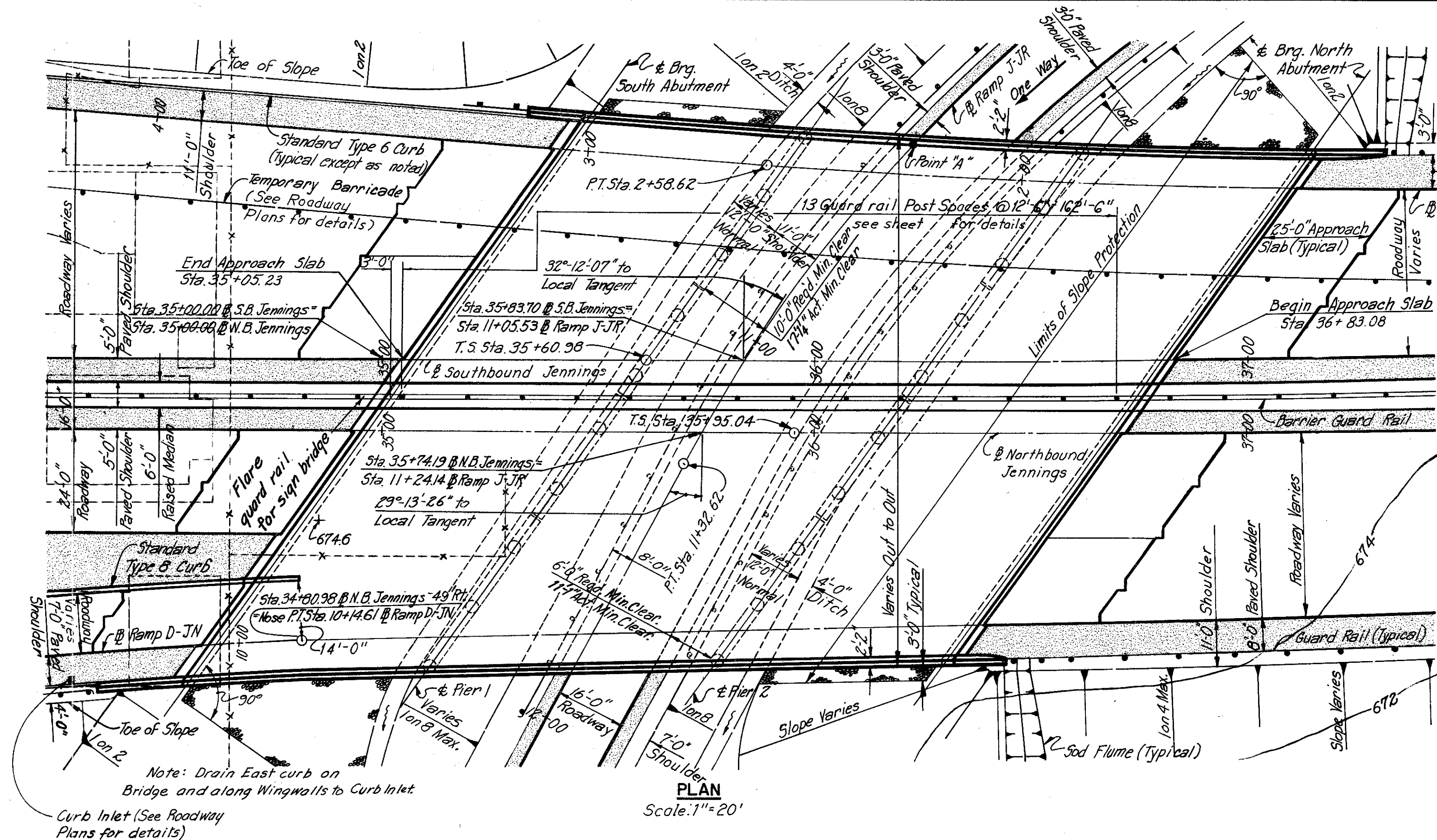
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	
RETAINING WALL NO. 81						RETAINING WALL NO. 81A						RETAINING WALL NO. 81B						
WC501	349	6'-3"	154		2,275	WD501	149	6'-3"	154		971	WE616	1 Ser. 15	6'-10"	7'-9"	Str.	3/8"	159
WC502	349	5'-5"	110		1,972	WD502	149	5'-5"	110		842	WE617	1 Ser. 15	7'-2"	7'-7"	Str.	3/8"	166
WC503	6	11'-6"	Str.		72	WD503	4	11'-6"	Str.		48	WE618	1 Ser. 15	7'-3"	7'-9"	Str.	3/8"	169
WC504	202	27'-6"	Str.		5,794	WD504	64	27'-6"	Str.		1,836	WE619	1 Ser. 15	7'-7"	8'-1"	Str.	3/8"	176
WC505	97	5'-6"	Str.		556	WD505	97	5'-6"	Str.		556	WE620	1 Ser. 15	8'-10"	9'-3"	Str.	3/8"	204
WC506	97	4'-0"	Str.		405	WD506	97	4'-0"	Str.		405	WE621	1 Ser. 29	9'-2"	9'-7"	Str.	3/8"	409
WC507	113	7'-6"	Str.		884	WD507	57	7'-6"	Str.		446	WE622	1 Ser. 15	9'-2"	9'-8"	Str.	3/8"	212
WC508	228	5'-0"	Str.		1,189	WD508	115	5'-0"	Str.		600	WE623	1 Ser. 29	9'-6"	10'-0"	Str.	3/8"	425
WC509	115	8'-3"	Str.		990	WD509	58	8'-3"	Str.		499	WE624	1 Ser. 15	9'-8"	10'-2"	Str.	3/8"	223
WC510	57	6'-0"	Str.		357							WE625	1 Ser. 29	10'-0"	10'-6"	Str.	3/8"	446
												WE626	1 Ser. 11	10'-2"	10'-6"	Str.	3/8"	171
												WE627	1 Ser. 20	10'-6"	10'-10"	Str.	3/8"	320
												WE628	6	12'-10"	Str.		116	
WC601	5	11'-6"	Str.		86	WD601	5	11'-6"	Str.		86	WE629	1 Ser. 15	14'-8"	15'-0"	Str.	3/8"	332
WC602	85	27'-6"	Str.		3,511	WD602	35	27'-6"	Str.		1,446	WE630	1 Ser. 15	15'-0"	15'-5"	Str.	3/8"	343
WC603	1 Ser. 7	6'-4"	6'-6"	Str.	67	WD603	1 Ser. 7	5'-10"	6'-0"	Str.	67	WE631	1 Ser. 16	15'-5"	15-11"	Str.	3/8"	377
WC604	1 Ser. 7	6'-3"	6'-5"	Str.	72	WD604	1 Ser. 7	6'-3"	6'-5"	Str.	67	WE632	84	6'-5"	148		810	
WC605	1 Ser. 15	6'-8"	6'-11"	Str.	151	WD605	1 Ser. 15	7'-6"	7'-11"	Str.	174	WE633	9	11'-3"	135		152	
WC606	1 Ser. 15	6'-7"	7'-4"	Str.	148	WD606	1 Ser. 15	7'-11"	8'-4"	Str.	183	WE634	5	9'-0"	Str.		68	
WC607	1 Ser. 15	7'-11"	8'-4"	Str.	183	WD607	1 Ser. 15	7'-11"	7'-6"	Str.	164	WE635	3	15'-0"	Str.		68	
WC608	1 Ser. 15	8'-4"	8'-9"	Str.	152	WD608	90	4'-6"	Str.		608	WE636	3	11'-0"	Str.		50	
WC609	1 Ser. 15	6'-1"	6'-6"	Str.	142	WD609	60	4'-4"	148		391	WE637	13	10'-3"	135		200	
WC610	1 Ser. 15	6'-5"	6'-10"	Str.	149	WD610	30	4'-10"	148		218	WE638	3	10'-0"	Str.		45	
WC611	45	4'-4"	148		293	WD611	1 Ser. 15	7'-5"	7'-10"	Str.	172	WE639	5	6'-9"	108		51	
WC612	1 Ser. 15	7'-6"	7'-11"	Str.	174	WD612	1 Ser. 15	7'-6"	7'-11"	Str.	174	WE640	20	8'-3"	Str.		248	
WC613	225	4'-6"	Str.		1,521	WD613	1 Ser. 15	7'-10"	8'-3"	Str.	181	WE641	3	10'-8"	149		48	
WC614	1 Ser. 15	7'-10"	8'-3"	Str.	181	WD614	1 Ser. 15	8'-11"	9'-4"	Str.	206	WE642	1 Ser. 6	9'-4"	10'-2"	149		88
WC615	1 Ser. 15	8'-0"	8'-5"	Str.	185	WD615	1 Ser. 15	9'-3"	9'-8"	Str.	213	WE643	15	11'-3"	149		253	
WC616	1 Ser. 15	8'-3"	8'-8"	Str.	191	WD616	28	5'-11"	148		249	WE644	3	5'-8"	118		26	
WC617	1 Ser. 15	8'-5"	8'-10"	Str.	194	WD617	28	6'-5"	148		270	WE645	5	10'-9"	149		81	
WC618	1 Ser. 15	8'-9"	9'-2"	Str.	202	WD618	1 Ser. 15	9'-4"	9'-9"	Str.	215	WE646	24	39'-6"	Str.		1,424	
WC619	1 Ser. 15	10'-2"	10'-7"	Str.	234	WD619	1 Ser. 15	9'-8"	10'-1"	Str.	222	WE647	11	18'-9"	Str.		310	
WC620	1 Ser. 15	10'-6"	10'-11"	Str.	241	WD620	1 Ser. 15	9'-2"	9'-9"	Str.	215	WE648	33	27'-6"	Str.		1,363	
WC621	140	6'-11"	148		1,454	WD621	1 Ser. 15	9'-9"	10'-2"	Str.	224	WE649	66	29'-3"	Str.		2,900	
WC622	1 Ser. 15	10'-7"	11'-0"	Str.	243	WD622	1 Ser. 15	9'-8"	10'-3"	Str.	224	WE650	10	10'-0"	Str.		150	
WC623	1 Ser. 15	10'-11"	11'-4"	Str.	251	WD623	1 Ser. 15	10'-10"	10'-2"	Str.	232	WE651	85	7'-6"	Str.		958	
WC624	1 Ser. 15	11'-0"	11'-4"	Str.	252	WD624	15	29'-6"	Str.		665	WE652	12	8'-3"	Str.		149	
WC625	1 Ser. 15	11'-4"	11'-8"	Str.	259	WD625	3	9'-3"	Str.		42	WE653	15	9'-1"	107		205	
WC626	28	7'-11"	148		333	WD626	6	10'-9"	135		97	WE654	15	8'-11"	109		201	
WC627	1 Ser. 15	11'-4"	11'-7"	Str.	258	WD627	3	5'-2"	118		23	WE655	2	7'-11"	109		24	
WC628	1 Ser. 15	11'-8"	11'-11"	Str.	266	WD628	4	6'-0"	108		36	WE656	2	8'-8"	107		26	
WC629	1 Ser. 15	12'-7"	12'-10"	Str.	286	WD629	6	5'-8"	118		51	WE657	3	14'-5"	115		65	
WC630	1 Ser. 15	12'-10"	13'-4"	Str.	295	WD630	10	6'-9"	108		101	WE658	3	16'-11"	115		76	
WC631	3	14'-9"	Str.		66	WD631	8	11'-6"	Str.		138							
WC632	60	4'-10"	148		436	WD632	14	29'-0"	Str.		610	WE801	5	8'-8"	148		116	
WC633	9	10'-9"	135		145	WD633	12	31'-0"	Str.		559	WE802	94	5'-8"	148		1,422	
WC634	1 Ser. 15	14'-10"	15'-2"	Str.	338	WD634	25	27'-6"	Str.		1,033	WE803	6	13'-2"	Str.		211	
WC635	1 Ser. 15	15'-2"	15'-7"	Str.	346	WD635	7	10'-0"	149		105	WE804	1 Ser. 15	14'-10"	15'-4"	Str.	3/8"	604
WC637	1 Ser. 15	15'-0"	16'-8"	Str.	368							WE805	42	6'-6"	Str.		729	
WC638	6	5'-2"	118		47							WE806	1 Ser. 15	15'-4"	15'-9"	Str.	3/8"	622
WC639	9	6'-0"	108		81	RETAINING WALL NO. 81B						WE807	1 Ser. 16	15'-9"	16'-3"	Str.	3/8"	684
WC640	8	5'-8"	118		68							WE808	56	12'-0"	Str.		1,794	
WC641	13	6'-9"	108		132	WE501	281	6'-3"	154		1,832	(2) Light Standard Supports 204						
WC642	8	39'-6"	Str.		475	WE502	281	5'-5"	110		1,588	TOTAL WEIGHT = 38,512						
WC643	40	28'-9"	Str.		1,727	WE503	12	19'-3"	Str.		241							
WC644	12	38'-6"	Str.		694	WE504	140	27'-6"	Str.		4,016							
WC645	36	27'-6"	Str.		1,487	WE505	14	9'-0"	Str.		131							
WC646	15	29'-3"	Str.		659	WE506	198	5'-6"	Str.		1,136							
WC647	57	10'-0"	Str.		856	WE507	198	4'-0"	Str.		826							
WC648	114	7'-6"	Str.		1,284	WE508	10	6'-0"	Str.		63							
WC649	51	30'-0"	Str.		2,298	WE509	107	5'-0"	Str.		558							
WC650	7	10'-0"	Str.		105	WE510	87	8'-3"	Str.		749							
WC651	18	39'-0"	Str.		1,054	WE511	17	7'-1"	101		126							
WC801	30	5'-2"	148		414	WE601	5	19'-3"	Str.		145							
WC802	146	5'-8"	148		2,209	WE602	65	27'-6"	Str.		2,685							
WC803	1 Ser. 15	8'-8"	9'-1"	Str.	355	WE603	1 Ser. 15	5'-6"	5'-10"	Str.	128							
WC804	1 Ser. 15	9'-1"	9'-6"	Str.	372	WE604	1 Ser. 15	5'-11"	6'-3"	Str.	137							
WC805	1 Ser. 15	12'-11"	13'-2"	Str.	522	WE605	1 Ser. 15	5'-10"	6'-3"	Str.	136							
WC806	28	7'-2"	148		536	WE606	1 Ser. 15	6'-3"	6'-8"	Str.	146							
WC807	1 Ser. 15	13'-2"	13'-8"	Str.	537	WE607	1 Ser. 15	6'-3"	6'-9"	Str.	146							
WC808	1 Ser. 15	15'-2"	15'-6"	Str.	614	WE608	1 Ser. 15	6'-9"	7'-3"	Str.	158							
WC809	56	7'-0"	Str.		1,047	WE609	60	4'-4"	148		391							
WC810	1 Ser. 15	15'-6"	15'-11"	Str.	629	WE610	107	4'-10"	148		777							
WC811	1 Ser. 15	15'-7"	16'-4"	Str.	646	WE611	168	4'-6"	Str.		1,136							
WC812	1 Ser. 15	16'-4"	17'-0"	Str.	668	WE612	1 Ser. 15	5'-11"	6'-4"	Str.	138							
WC813	77	12'-0"	Str.		1,388	WE613	1 Ser. 15	6'-3"	6'-8"	Str.	146							
						WE614	1 Ser. 15	6'-4"	6'-10"	Str.								

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

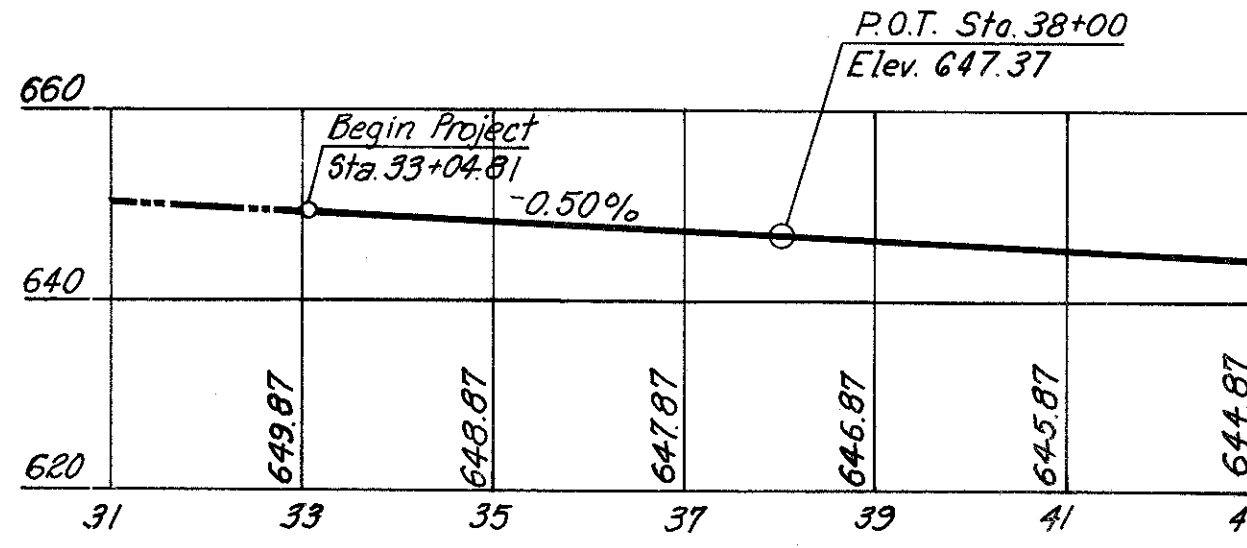
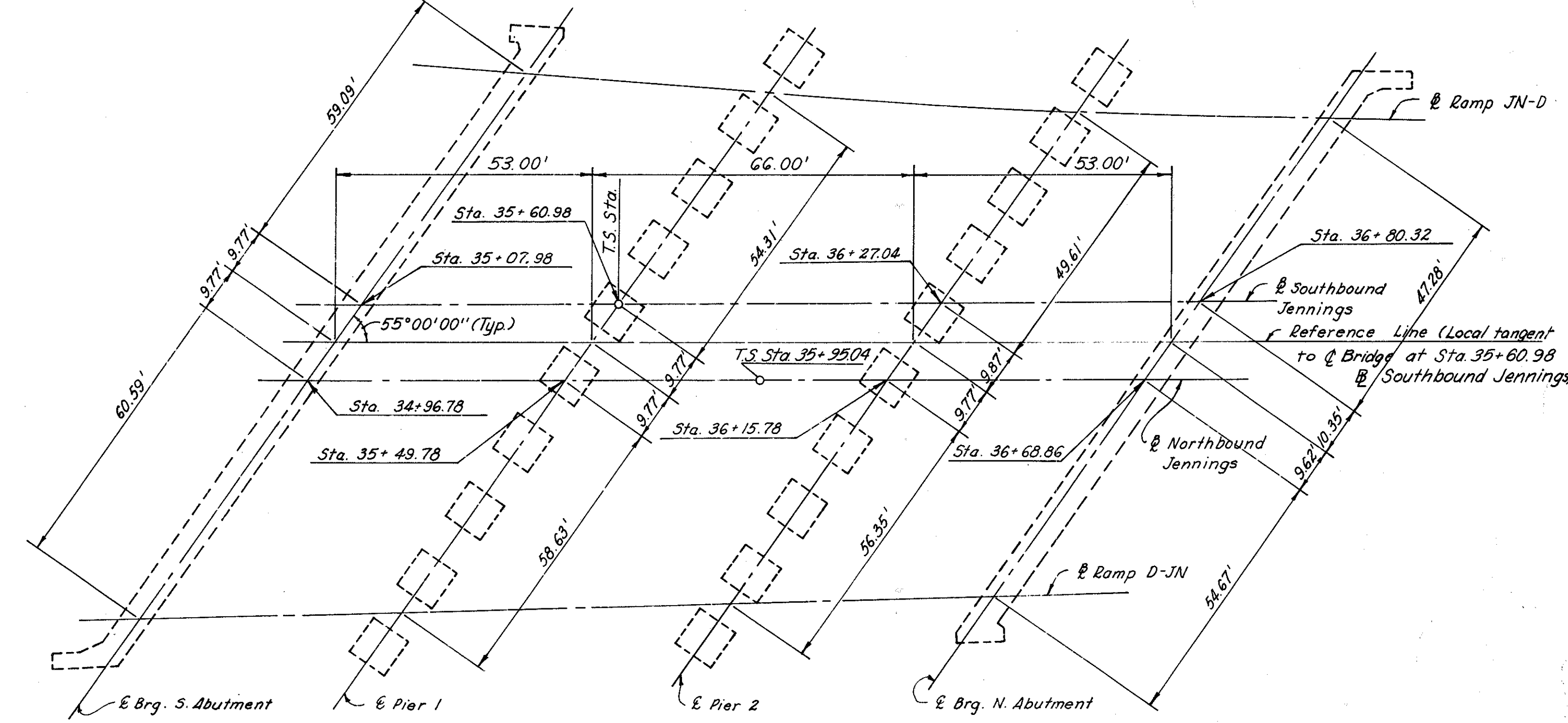
461  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

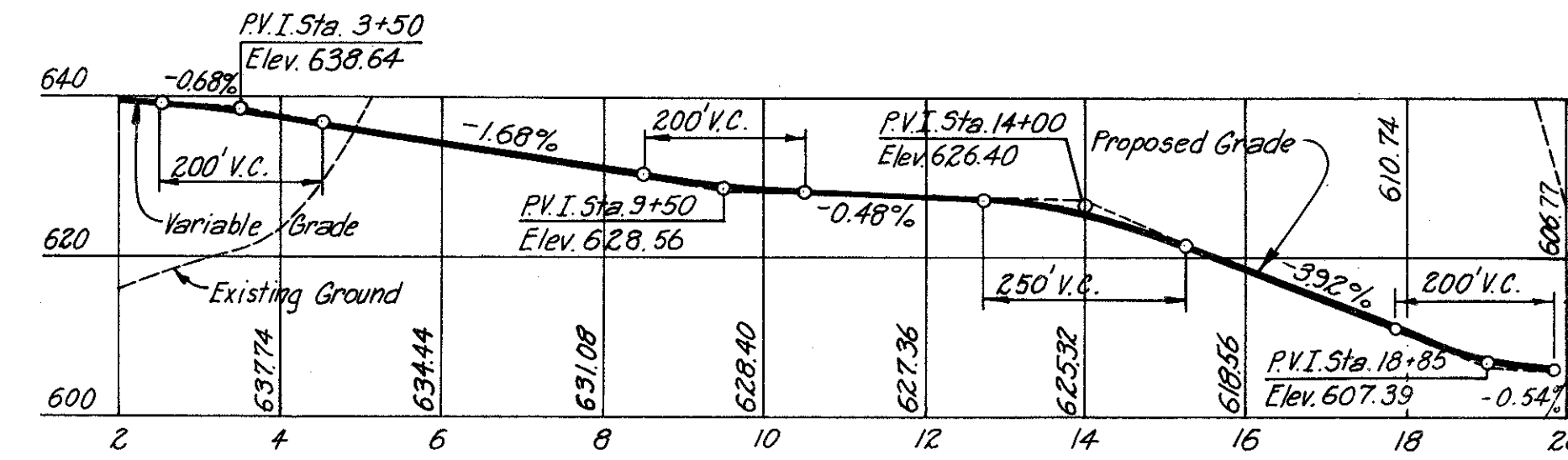


**CURVE DATA**

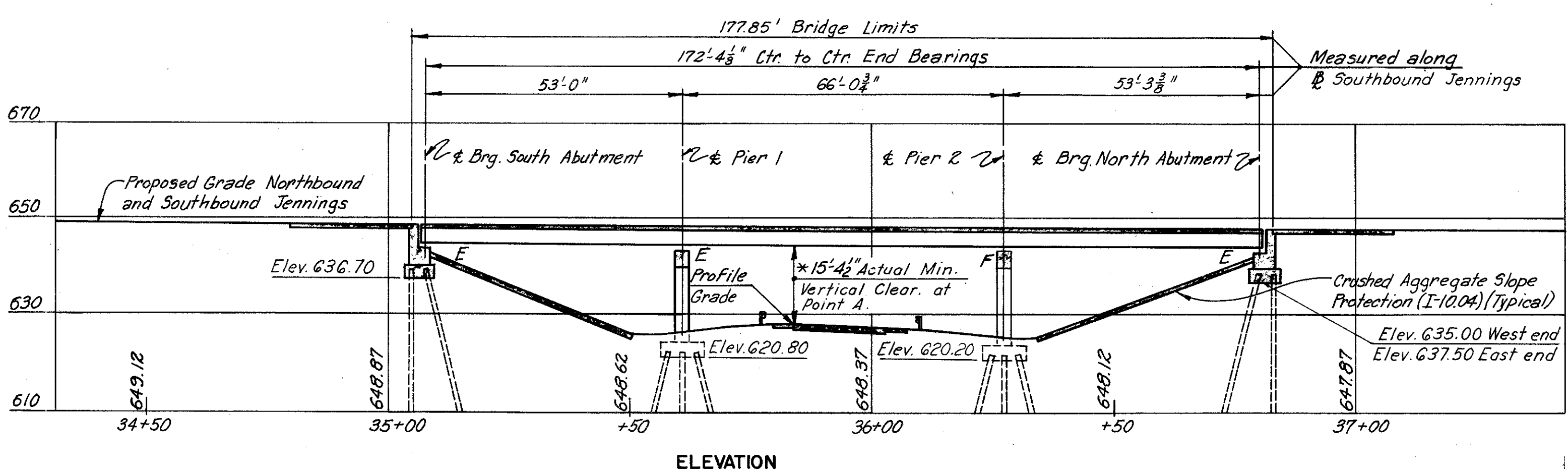
RAMP JN-D	SOUTHBOUND JENNINGS	NORTHBOUND JENNINGS	RAMP D-JN	RAMP J-JR
P.C. Sta. 0+00.00	T.S. Sta. 35+60.98	T.S. Sta. 35+95.04	P.C. Sta. 8+94.04	P.C. Sta. 7+52.15
P.I. Sta. 1+29.51	S.C. Sta. 40+10.90	S.C. Sta. 40+45.04	P.I. Sta. 9+54.35	P.I. Sta. 9+62.56
P.T. Sta. 2+58.62	C.S. Sta. 45+64.45	C.S. Sta. 45+53.01	P.T. Sta. 10+14.61	P.T. Sta. 11+32.62
$\Delta = 7^\circ 45' 31''$	S.T. Sta. 50+18.45	S.T. Sta. 50+03.01	$\Delta = 3^\circ 37' 02''$	$\Delta = 6^\circ 52' 31''$
$D = 3^\circ 00' 00''$ Rt.	$\Delta_c = 22^\circ 17' 56''$	$\Delta_c = 20^\circ 19' 08''$	$D = 3^\circ 00' 00''$ Rt.	$D = 16^\circ 00' 00''$ Lt.
$R = 1909.86'$	$D_c = 4^\circ 00' 00''$ Lt.	$D_c = 4^\circ 00' 00''$ Lt.	$R = 1909.86'$	$R = 358.10'$
$T = 129.51'$	$R_c = 1432.39'$	$R_c = 1432.39'$	$T = 60.31'$	$T = 210.41'$
$L = 258.62'$	$L_c = 557.47'$	$L_c = 507.97'$	$L = 120.58'$	$L = 380.47'$
$E = 4.39'$	$L_s = 450.00'$	$L_s = 450.00'$	$E = 0.95'$	$E = 57.24'$
	$\theta_s = 9^\circ 00' 00''$	$\theta_s = 9^\circ 00' 00''$		



**PROFILE—NORTHBOUND AND SOUTHBOUND JENNINGS**  
Scale: 1"=200' Hor.  
1"=20' Vert.



**PROFILE - RAMP J-JR**  
Scale: 1"=200' Hor.  
1"=20' Vert.



**ELEVATION**

**BRIDGE LAYOUT DIAGRAM**  
No Scale

**PROPOSED STRUCTURE**

TYPE: Continuous steel beam with reinforced concrete deck and substructure.

SPANS: 53'-0", 66'-0 3/4", 53'-3 3/8".

ROADWAY: Southbound Jennings - Width Varies  
Northbound Jennings - Width Varies

LOAD FREQUENCY: CF 2000 (57) Adequate for AASHO alternate loading

SKREW: Varies

WEARING SURFACE: 1" Monolithic concrete.

APPROACH SLABS: A5-1-54 (25'-0" long)

ALIGNMENT: Tangent and spiral curve left.

TRAFFIC DATA: 1975 - 23,092 A.D.T. (Each way)

Notes:

- All pier piles are 12BP53 and all abutment piles are 10BP42.
- The estimated average vertical lengths are as follows:  
South Abutment - 49'-0"  
Pier 1 - 32'-0"  
Pier 2 - 31'-0"  
North Abutment - 48'-0"
- For scupper locations see sheet 471.
- For light standard support locations see sheet 476A.

Notes:

- \*15'-0" Required minimum clear.
- Point "A" occurs at west edge of west exterior beam and @ Ramp J-JR.

H.N.T.B. BR. NO. 23

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**SITE PLAN**  
NORTHBOUND AND SOUTHBOUND JENNINGS  
OVER RAMP J-JR

CUY-176-1279

STA. 35+05.23  
STA. 36+83.08

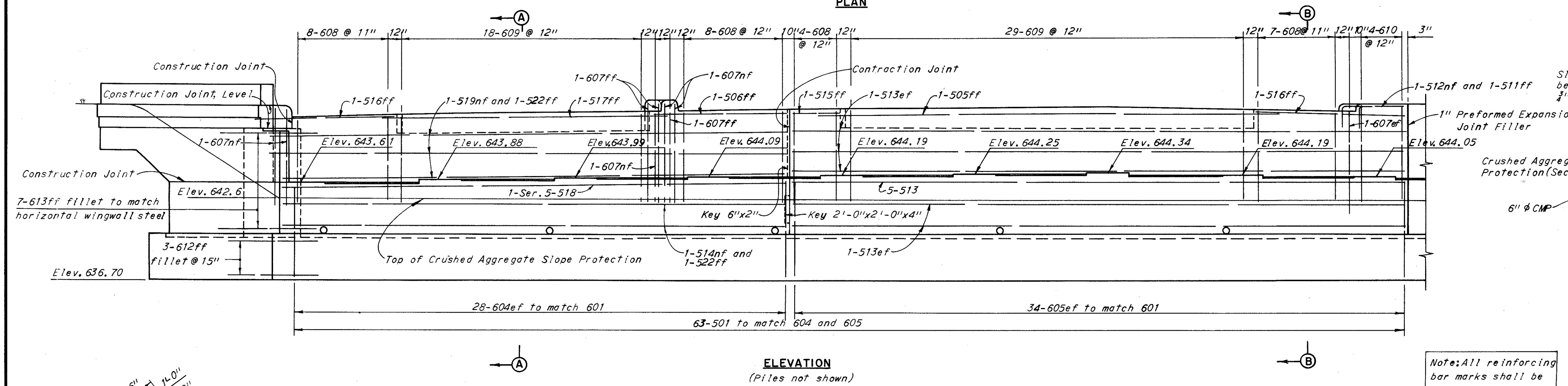
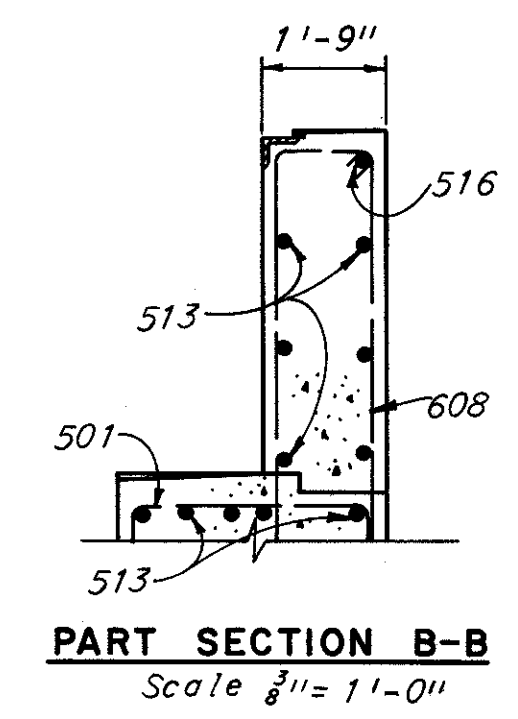
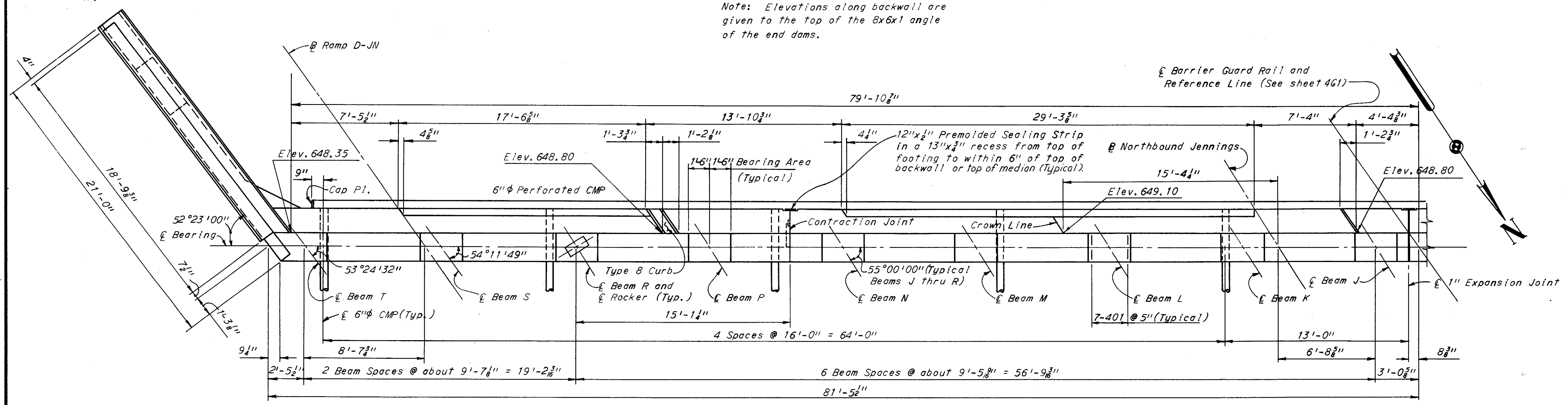
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 1/1/64	DATE	DATE 10-2-64	DATE 12-28-64	

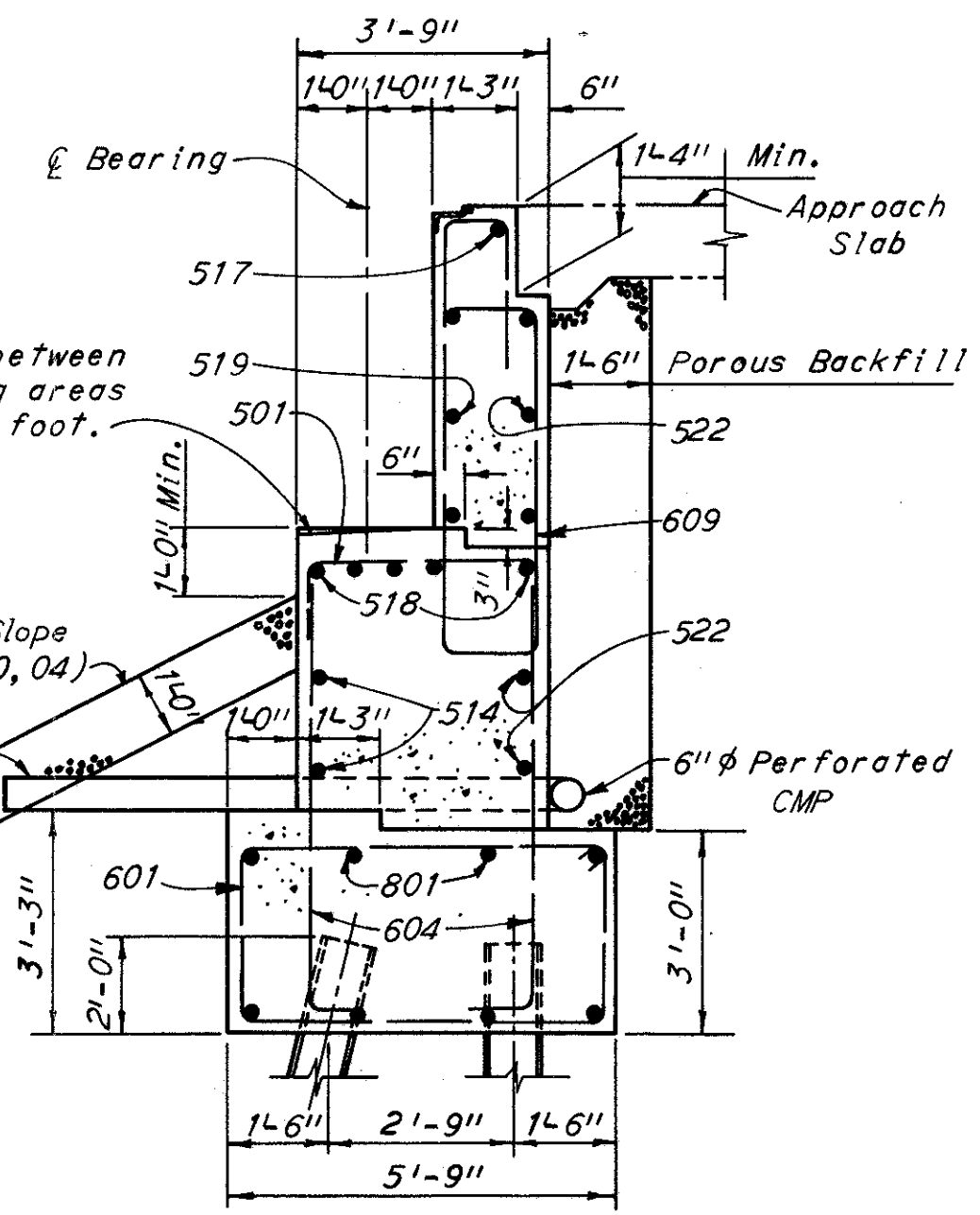
SHEET 461

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

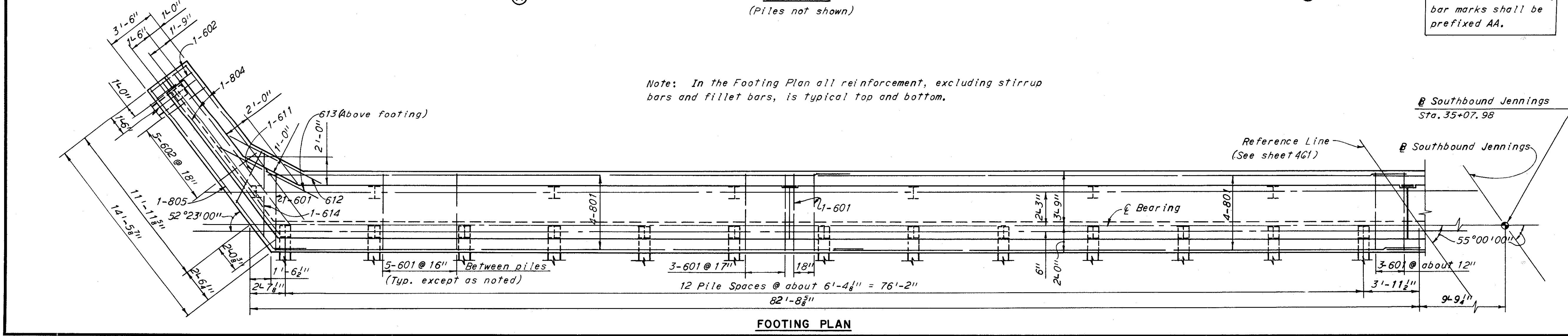
Note: Elevations along backwall are given to the top of the 8x6x1 angle of the end dams.



Note: All reinforcing bar marks shall be prefixed AA.



Note: For west portion of the South Abutment and notes see sheet 463.



H.N.T.B. BR. NO. 23

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**SOUTH ABUTMENT**

NORTHBOUND AND SOUTHBOUND JENNINGS  
OVER RAMP J-JR

CUY-176-1279 STA. 35+05.23  
STA. 36+83.08

CLEVELAND	CUYAHOGA COUNTY	OHIO
DATE 2-24-64	CHECKED C.H.B. DATE 12-5-64	REVIEWED W.F. DATE 12-22-64
DATE	DATE	DATE

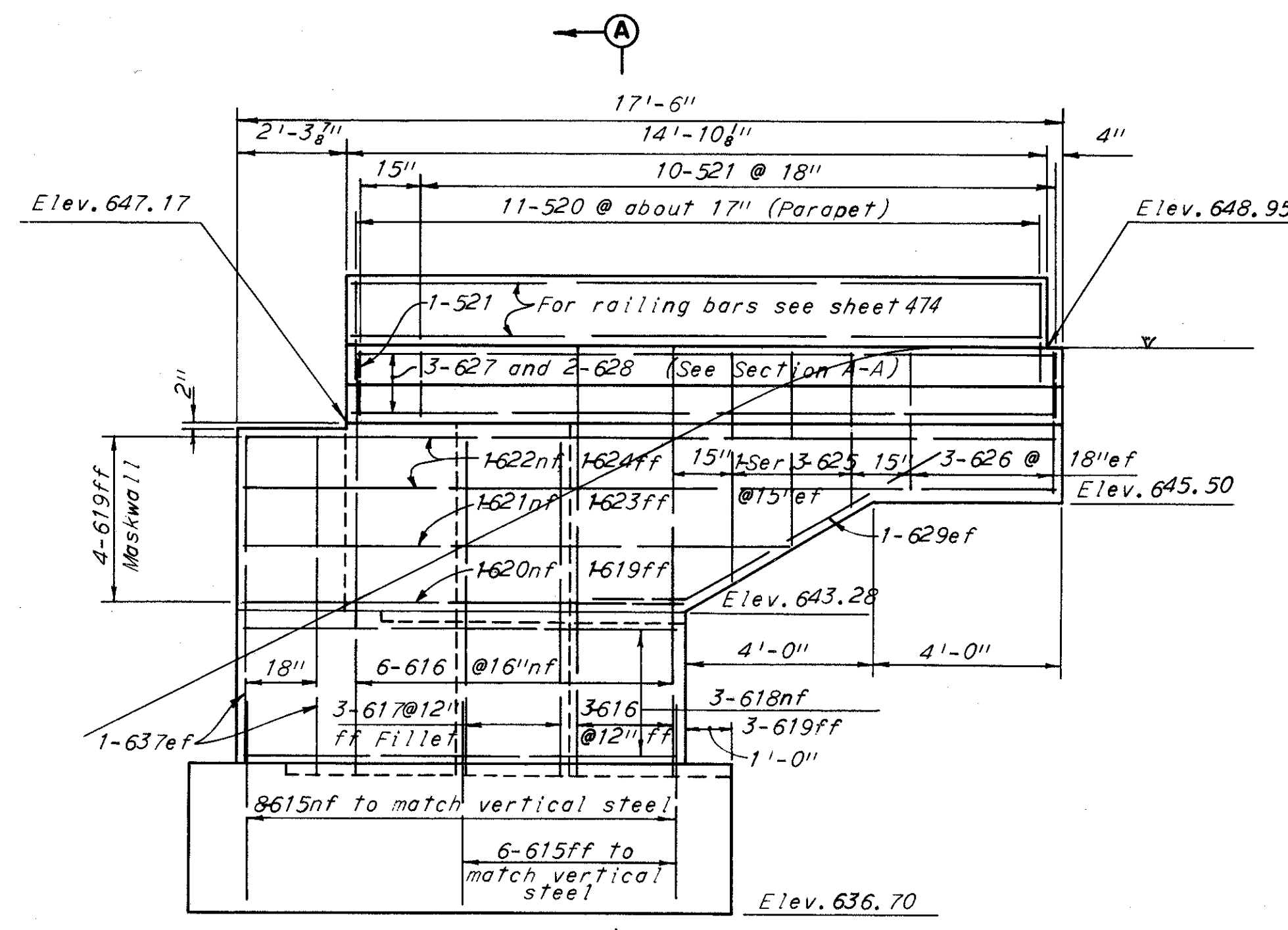
SHEET 462



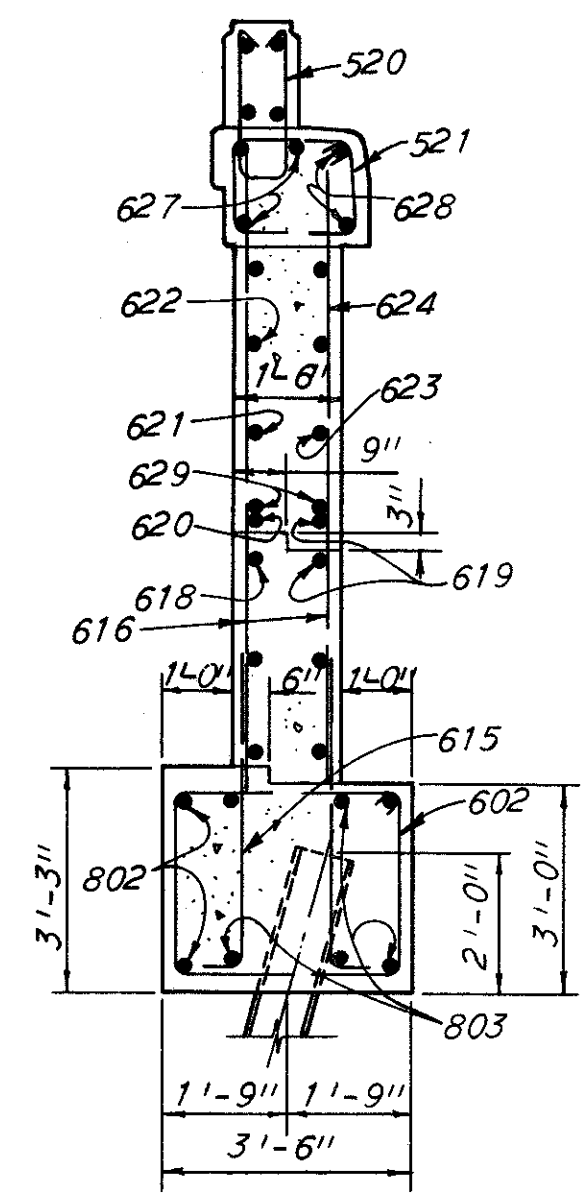




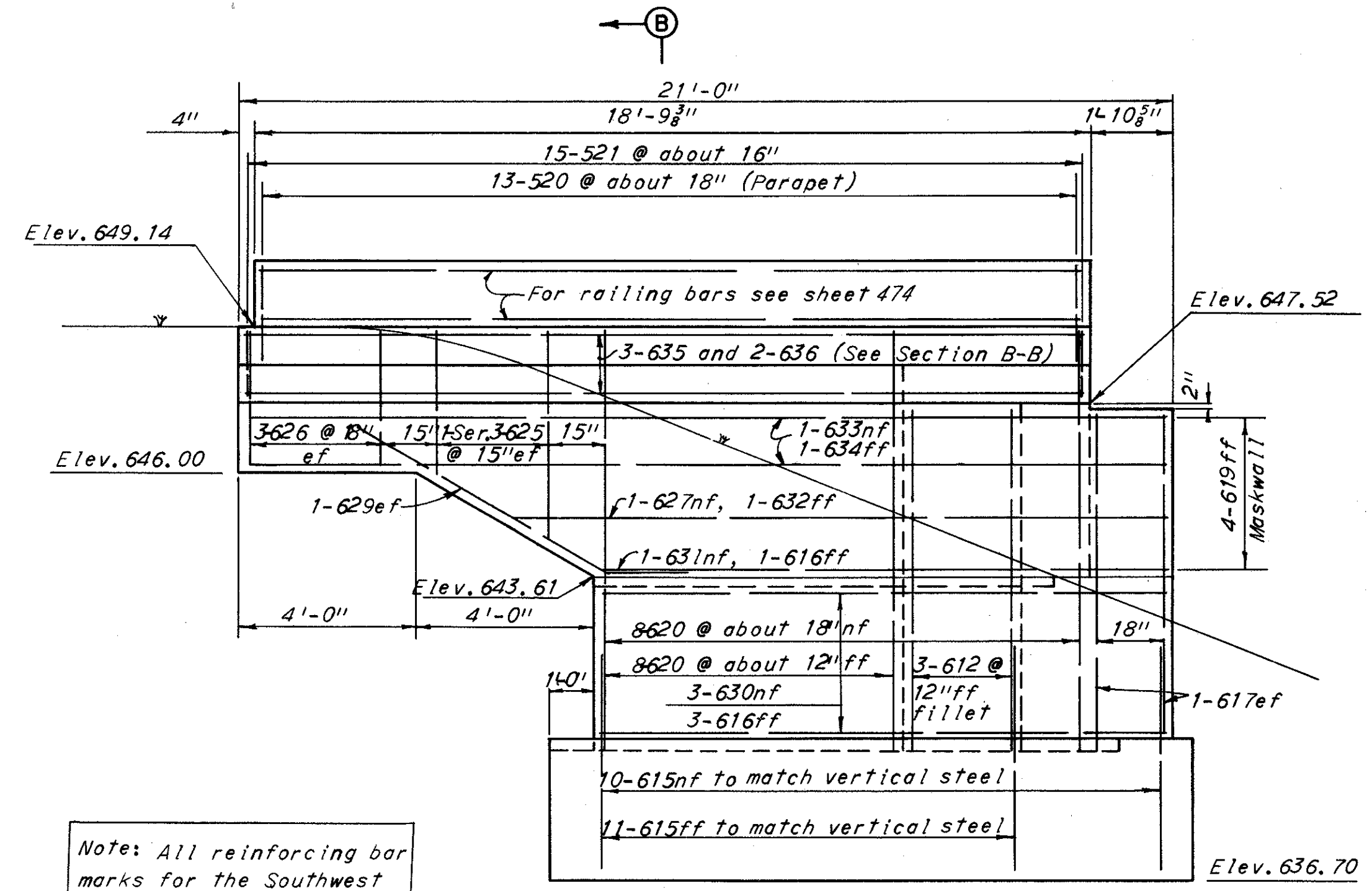




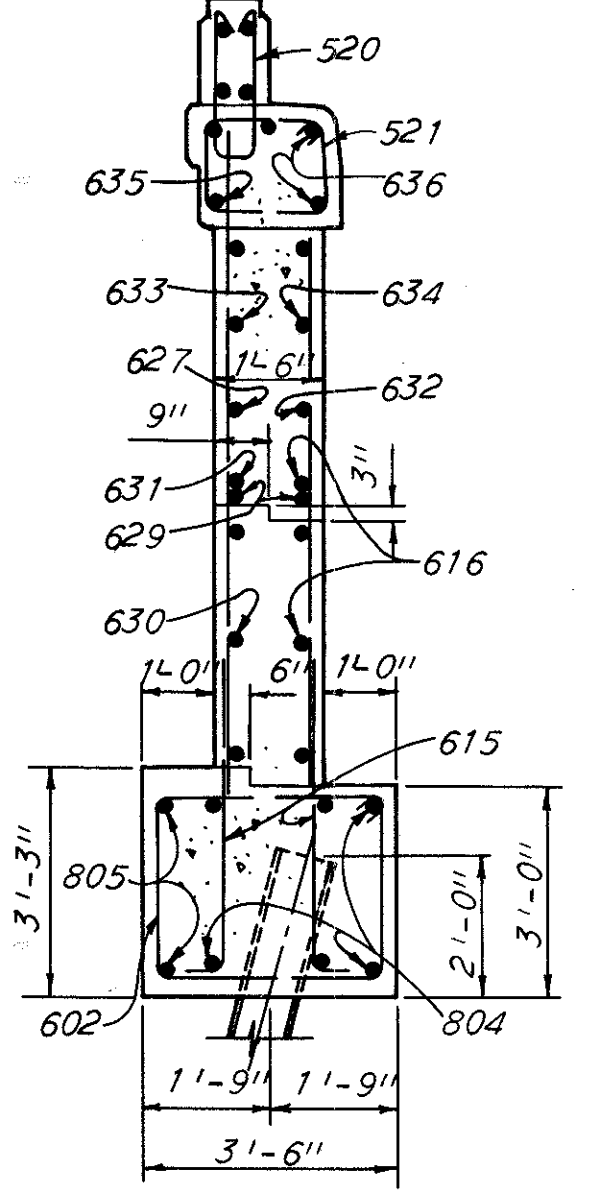
**SOUTHWEST WINGWALL**  
(Piles not shown)



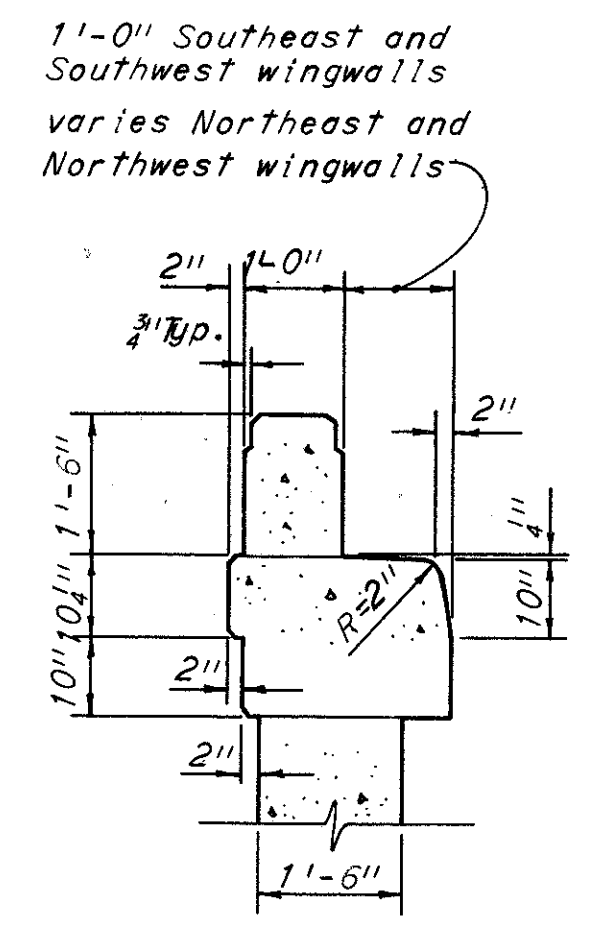
SECTION A-A



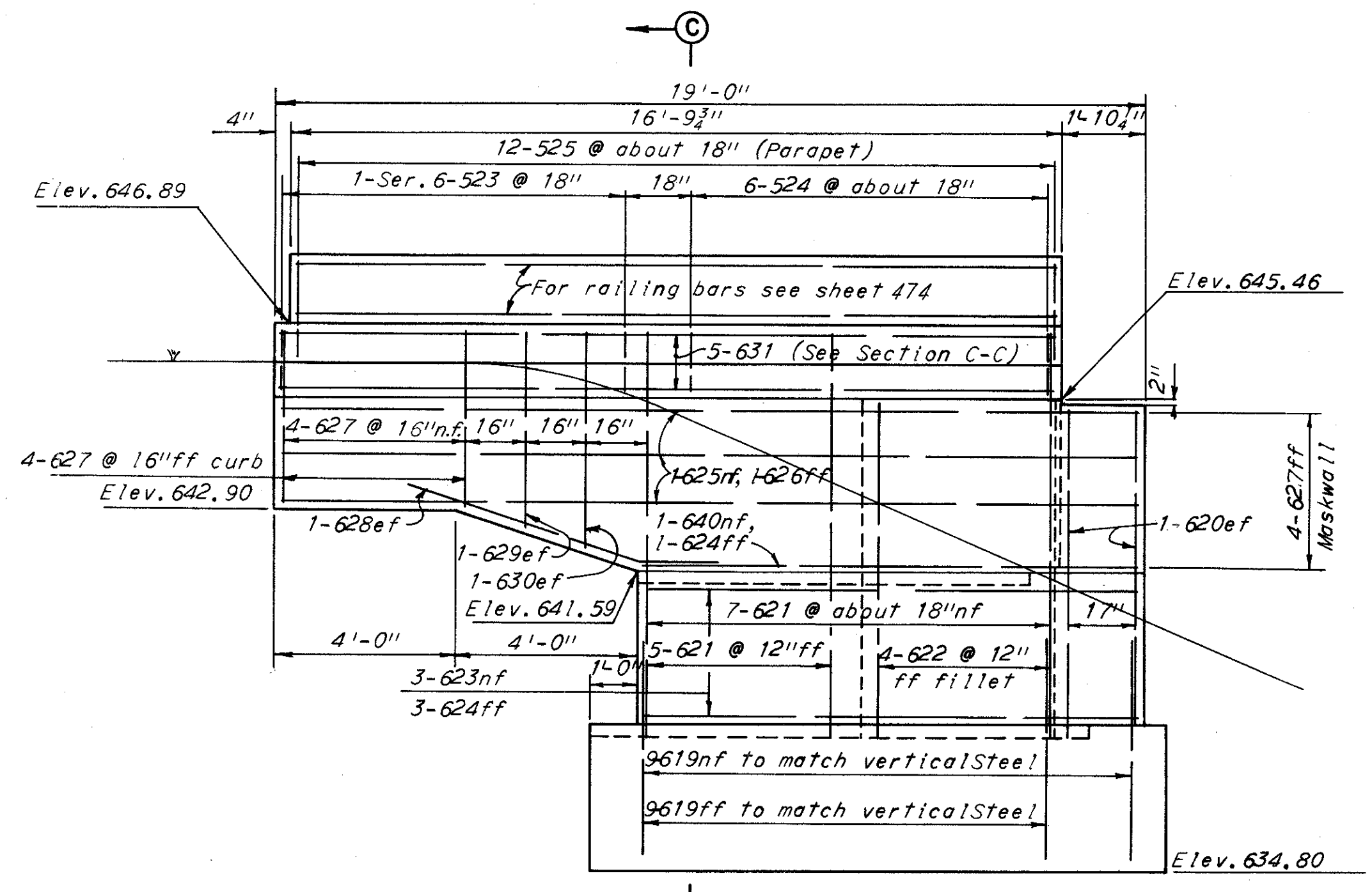
**SOUTHEAST WINGWALL**  
(Piles not shown)



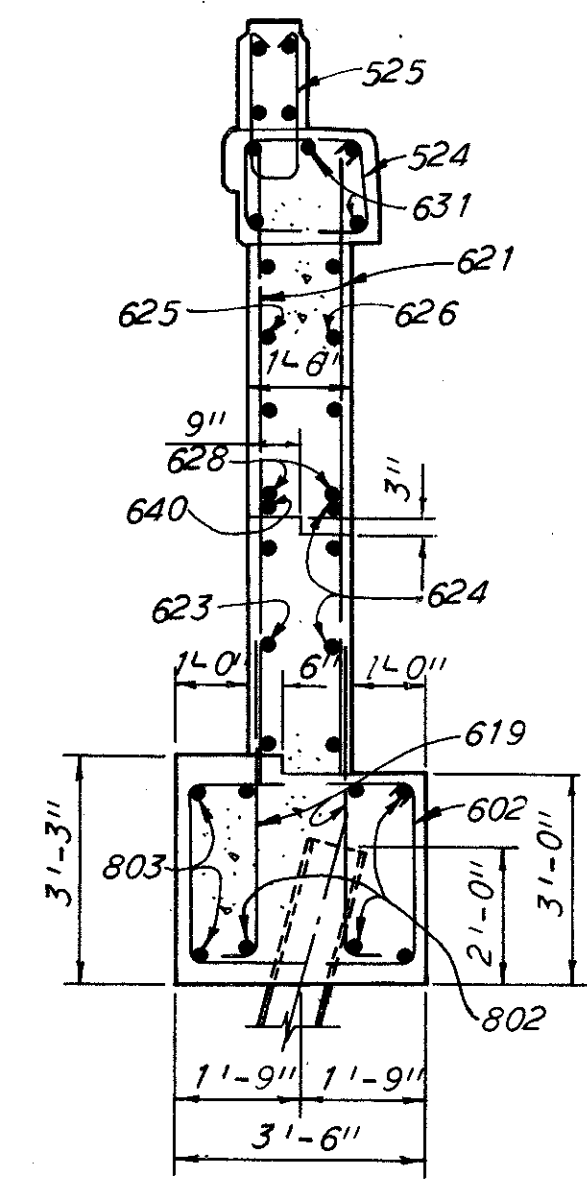
SECTION B-B



Note: All reinforcing bar marks for the Southwest and Southeast Wingwalls shall be prefixed AA

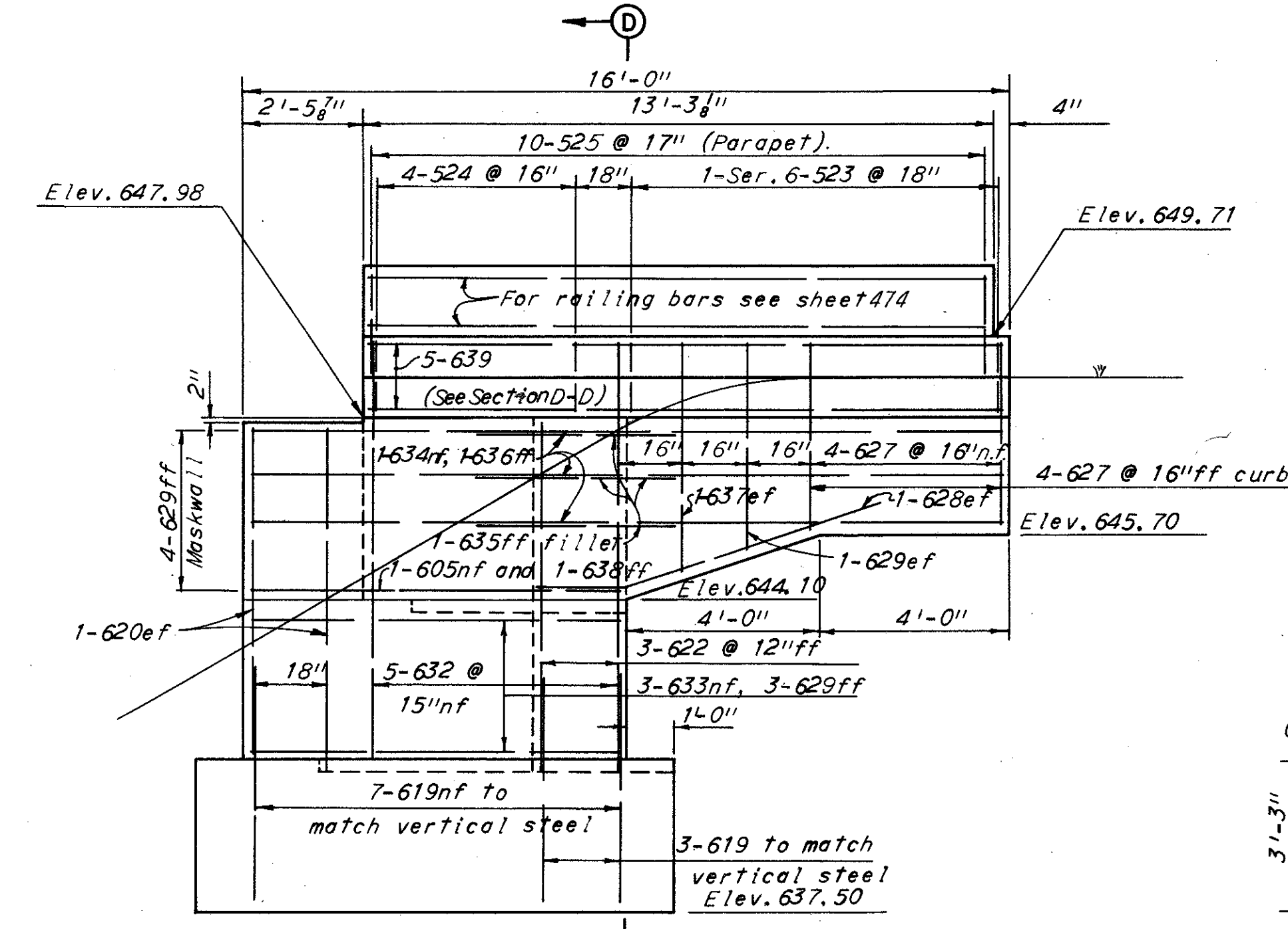


**NORTHWEST WINGWALL**  
(Piles not shown)

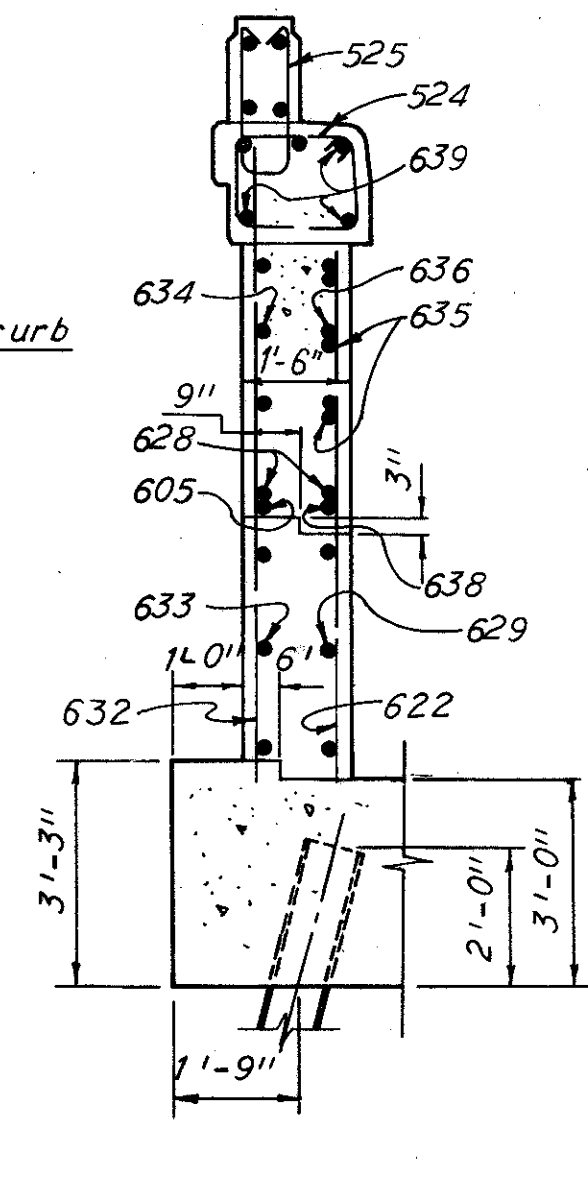


SECTION C-C

Note: All reinforcing bar marks for the Northwest and Northeast Wingwalls shall be prefixed A-B



**NORTHEAST WINGWALL**  
(Piles not shown)



SECTION D-D  
(Reinforcement not shown)

Notes: For railing details see Ohio Standard Drawing AR-1-57  
For longitudinal reinforcement in the parapets and railing post spacing see sheet 464  
The following abbreviations are used: nf=near face, ff=for face, ef=each face.  
For additional notes see sheet 463.

H.N.T.B. BR. NO. 23

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

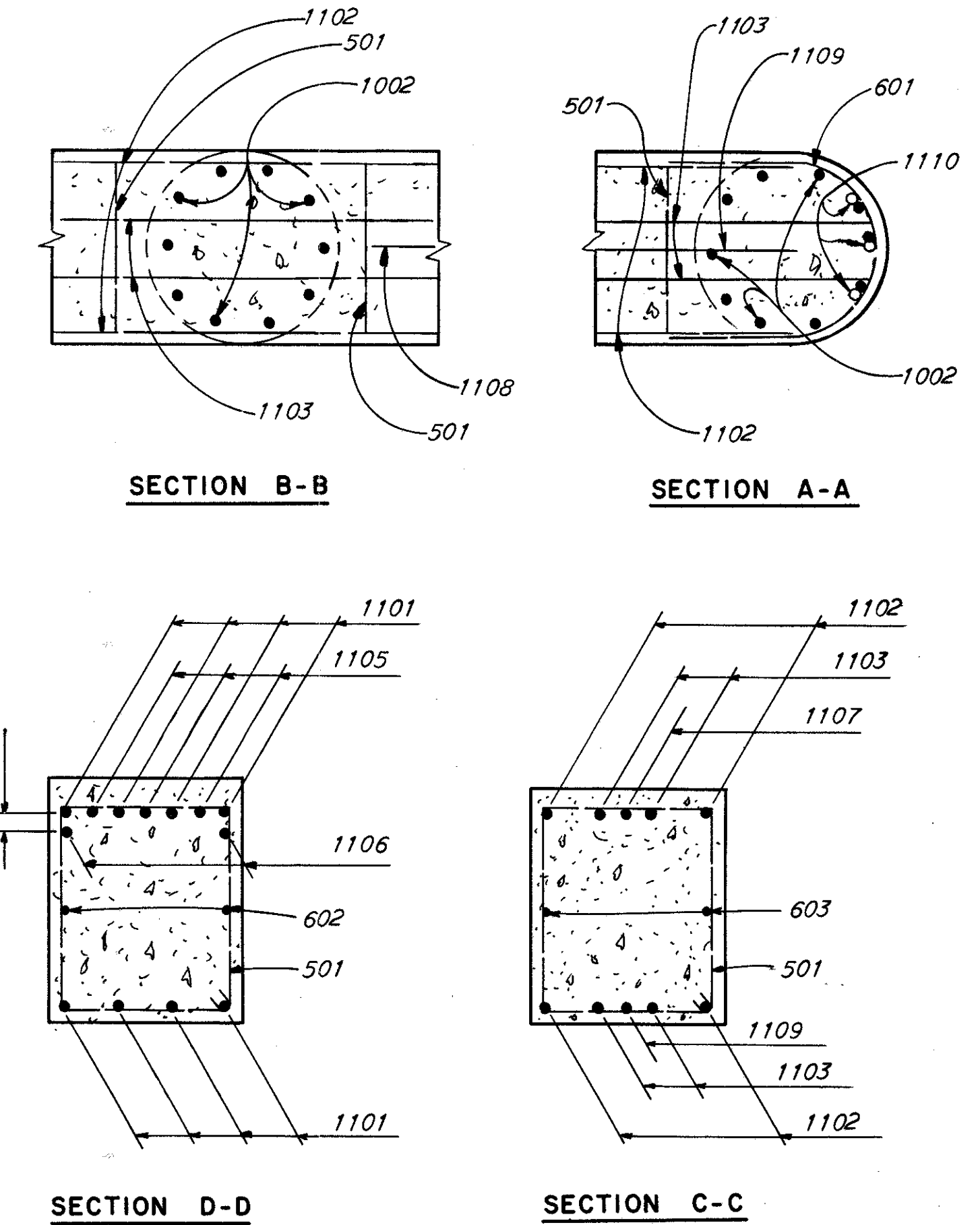
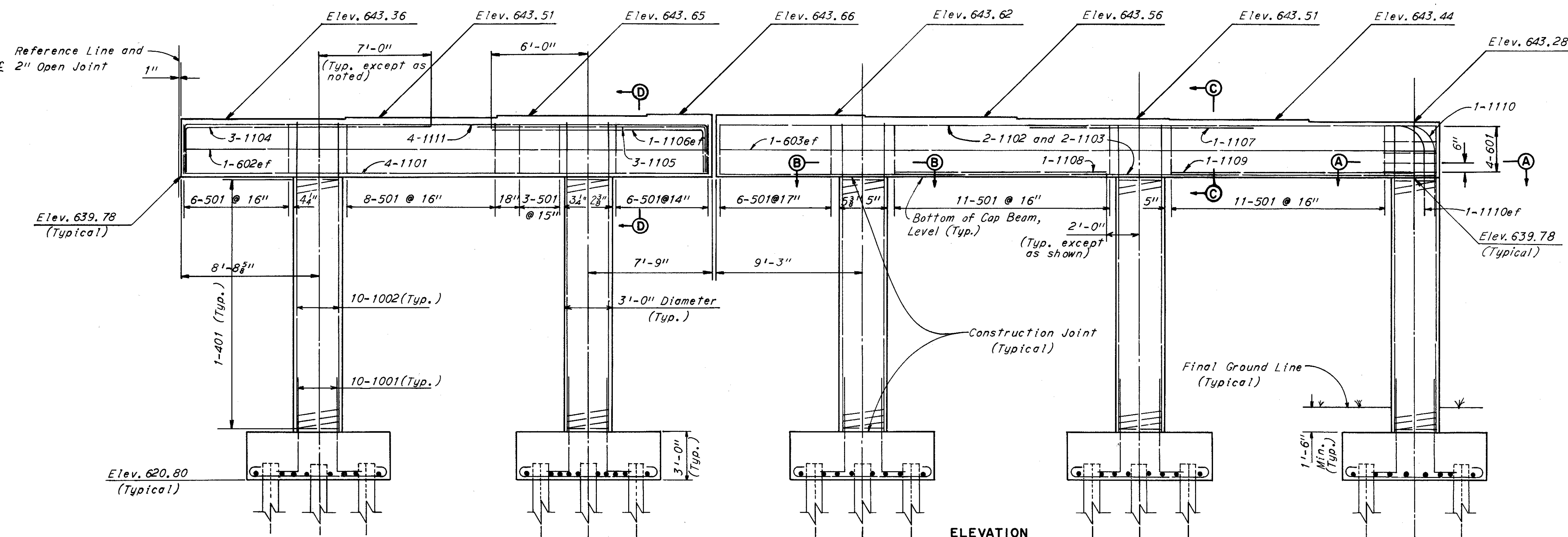
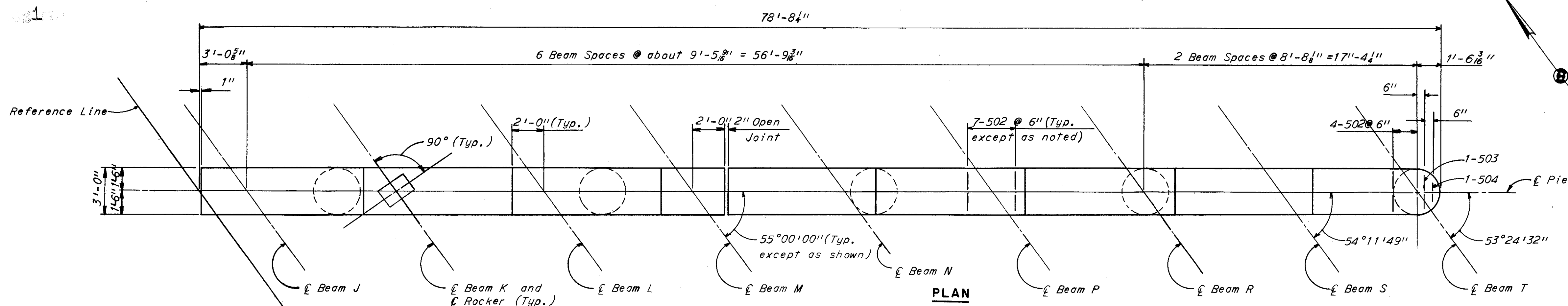
**WINGWALLS**  
NORTHBOUND AND SOUTHBOUND JENNINGS  
OVER RAMP J-JR  
CUY-176-1279 STA. 35+05.23  
STA. 36+83.08

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN XLS	CHECKED C.R.B.	REVIEWED W.F.
DATE 6-24-64	DATE 12-5-64	DATE 12-22-64

SHEET 466

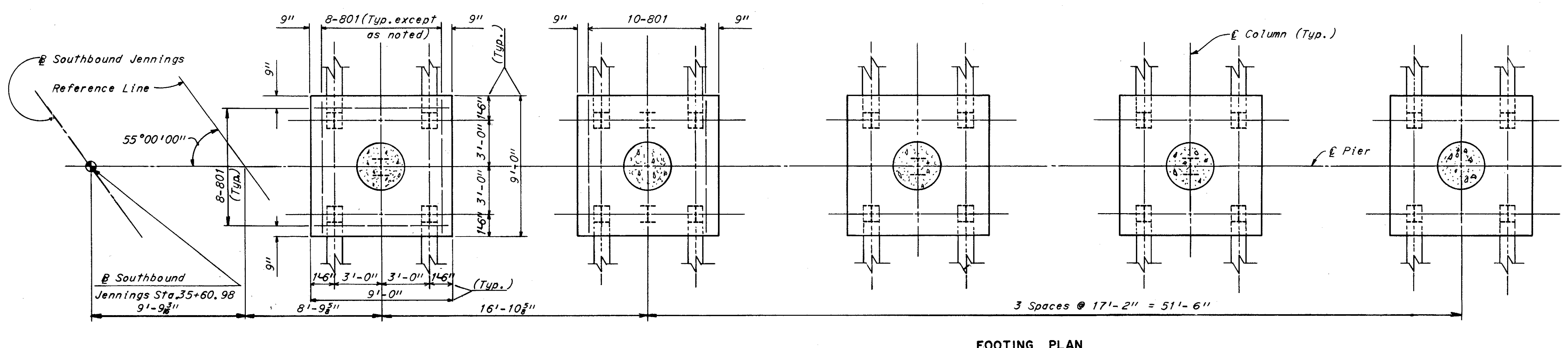


CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



Note: All reinforcing bar marks shall be prefixed PB.

Note: For notes see sheet 467.



H.N.T.B. BR. NO. 23

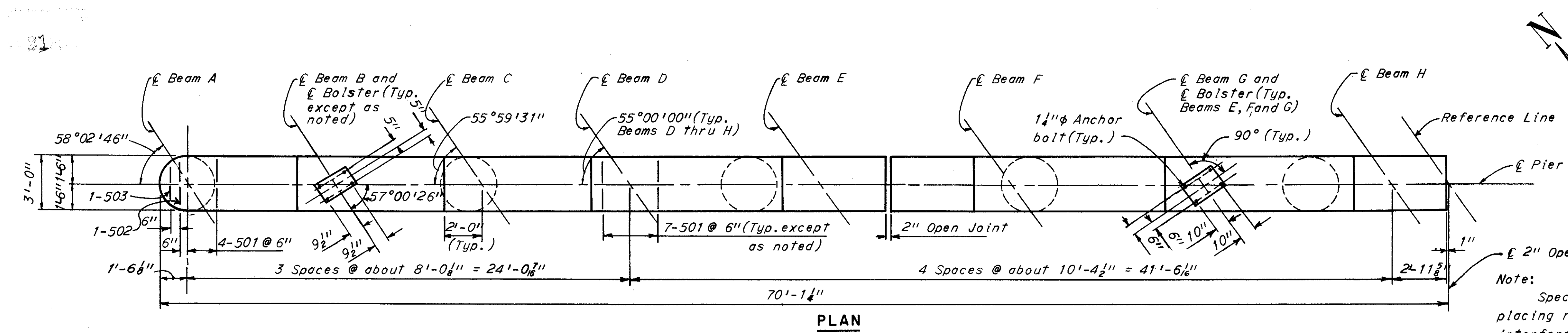
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

PIER 1E  
NORTHBOUND AND SOUTHBOUND JENNINGS  
OVER RAMP J-JR  
CUY-176-1279 STA. 35+05.23  
STA. 36+83.08

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN SJE	TRACED	CHECKED/S
DATE 7-10-64	DATE 7-4-64	DATE 7-26-64
		REVIEWED/WZ
		REVIS

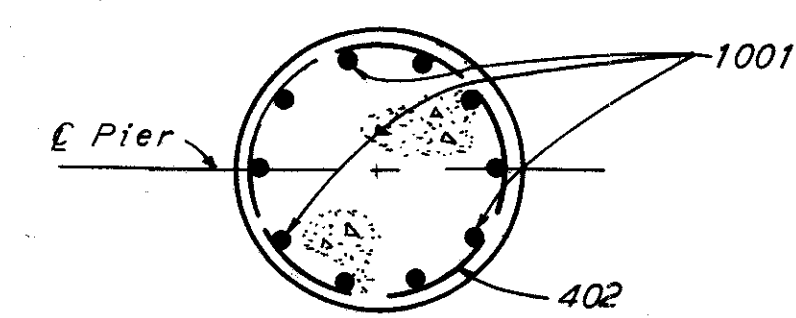
SHEET 468

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

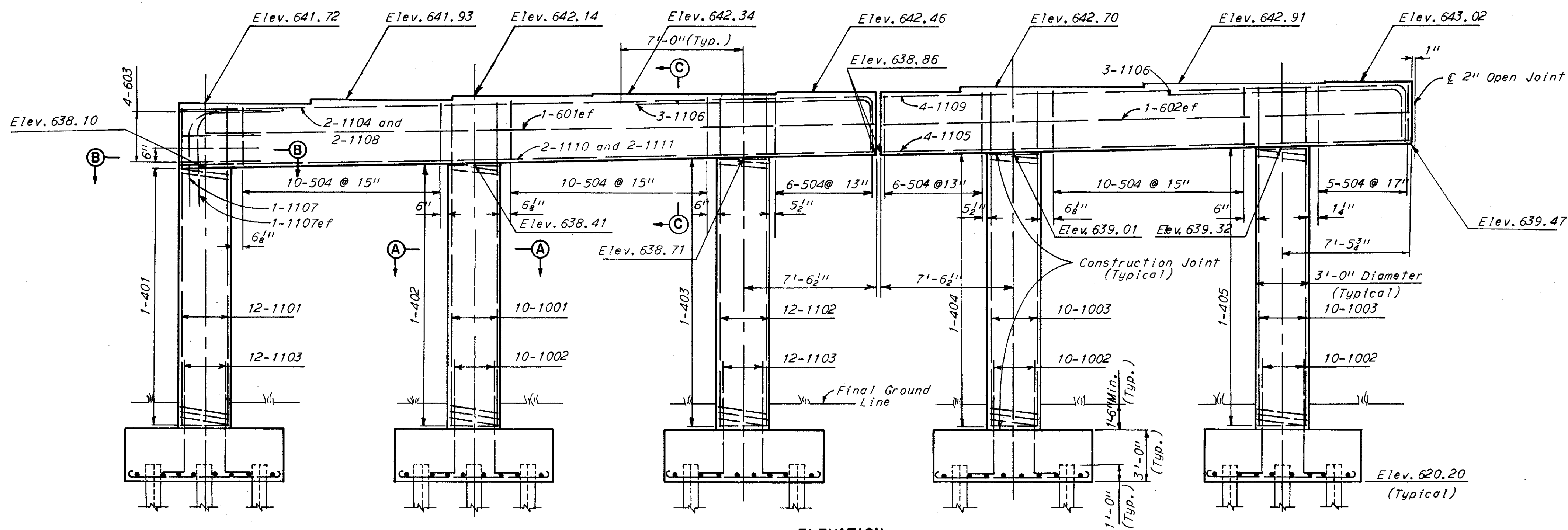


PLAN

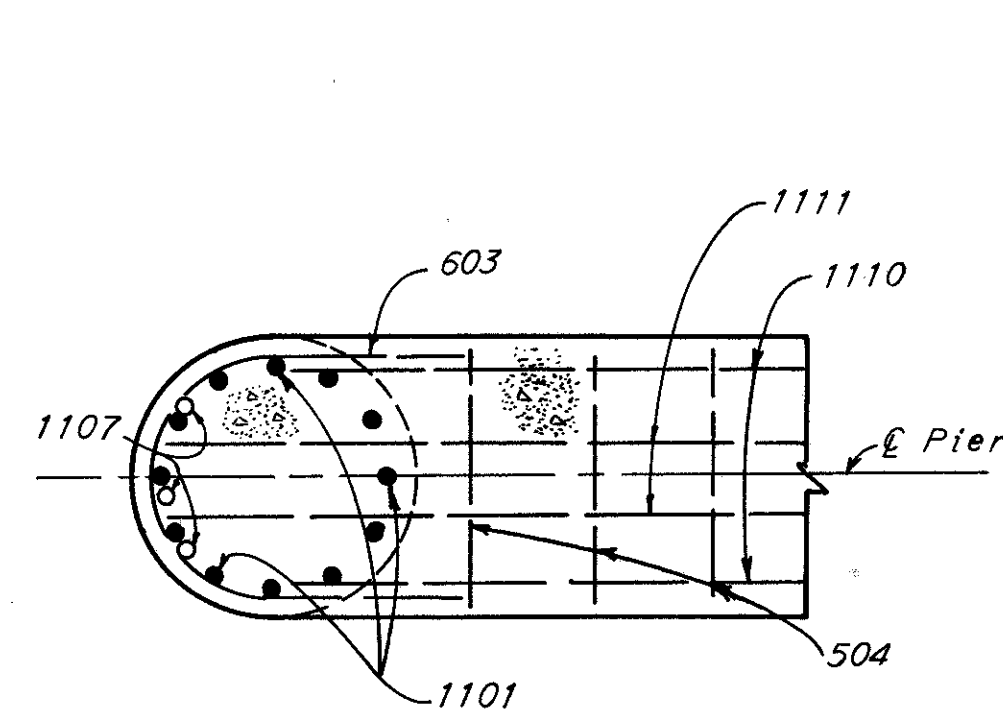
Note:  
Special care shall be taken when placing reinforcement so as not to interfere with anchor bolt setting.



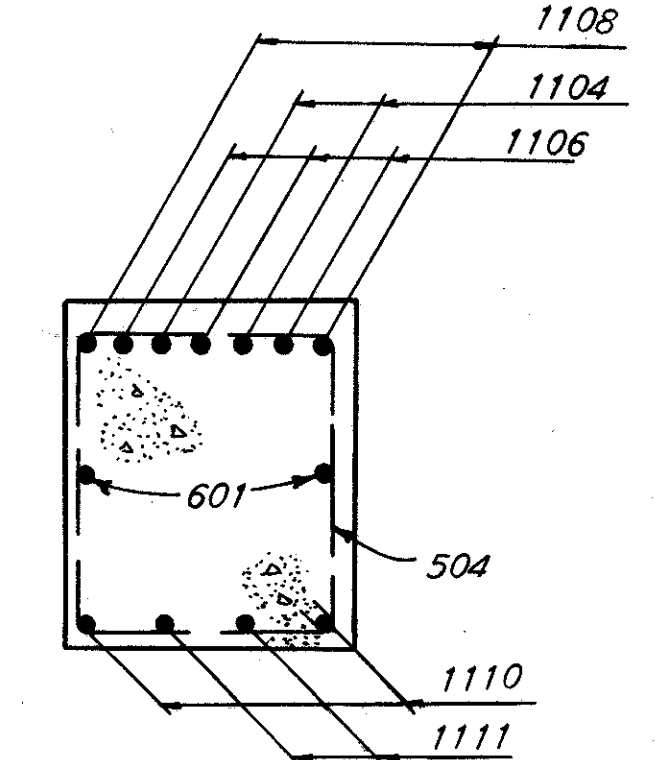
SECTION A-A



ELEVATION

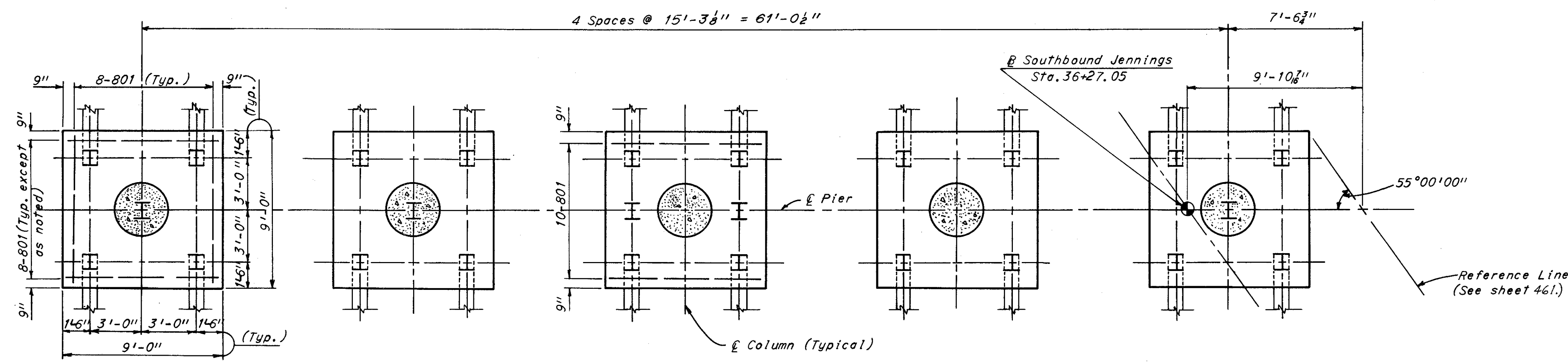


SECTION B-B



SECTION C-C

Note:  
All reinforcing bar marks shall be prefixed PC.



FOOTING PLAN

Notes:  
All piles are 12BP53. All battered piles are inclined 3 in 12 in the direction shown.  
Pile layout dimensions are measured along bottom of footing.  
For Reinforcement Schedule and Bending Diagrams see sheet 476.  
The following abbreviation is used:  
ef = each face

H.N.T.B. BR. NO. 23  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

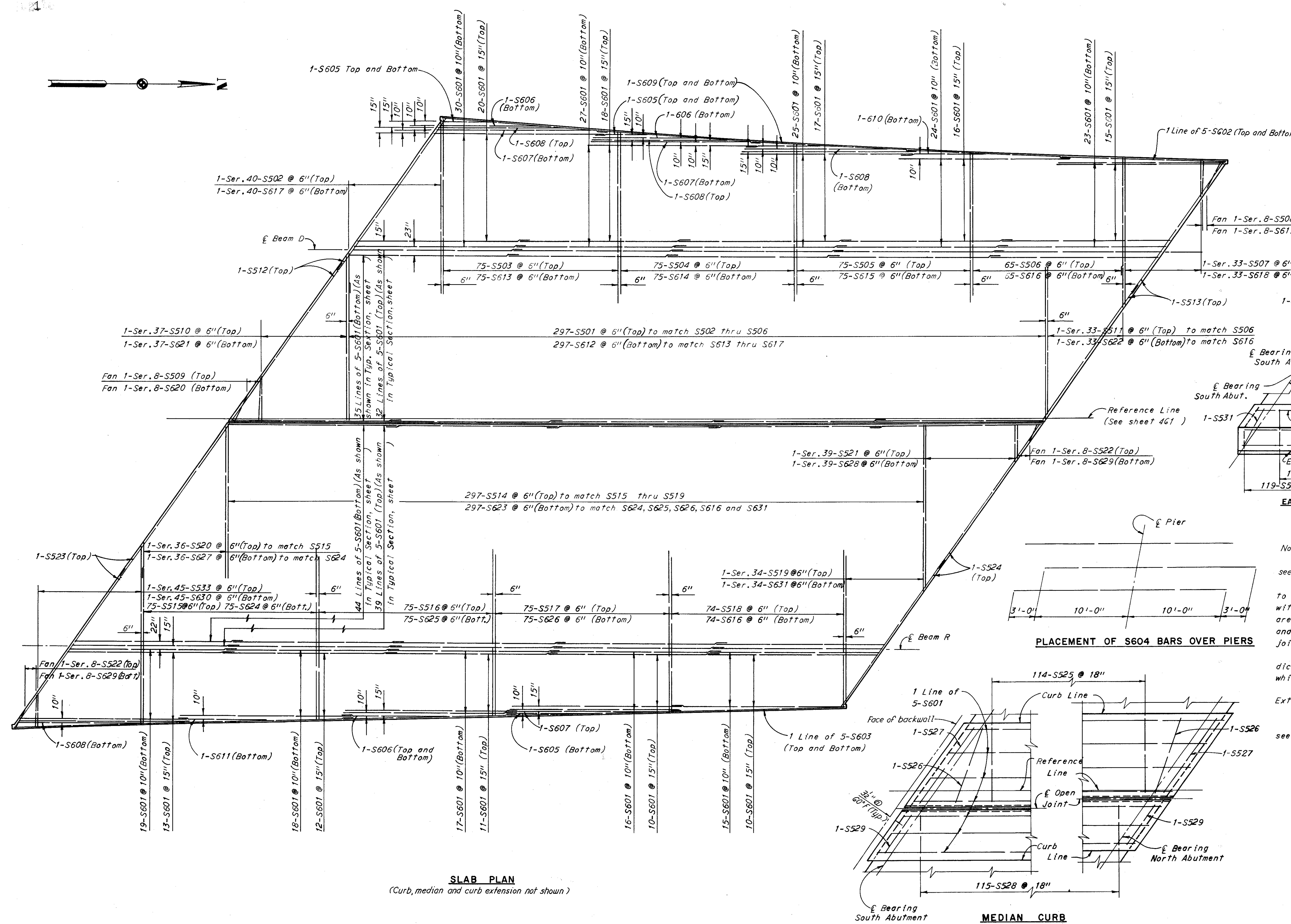
**PIER 2W**  
NORTHBOUND AND SOUTHBOUND JENNINGS  
OVER RAMP J-JR  
CUY-176-1279 STA. 35+05.23  
STA. 36+83.08

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN 7/25	TRACED	CHECKED 5
DATE 7-15-64	DATE 9-6-64	DATE 12-8-64

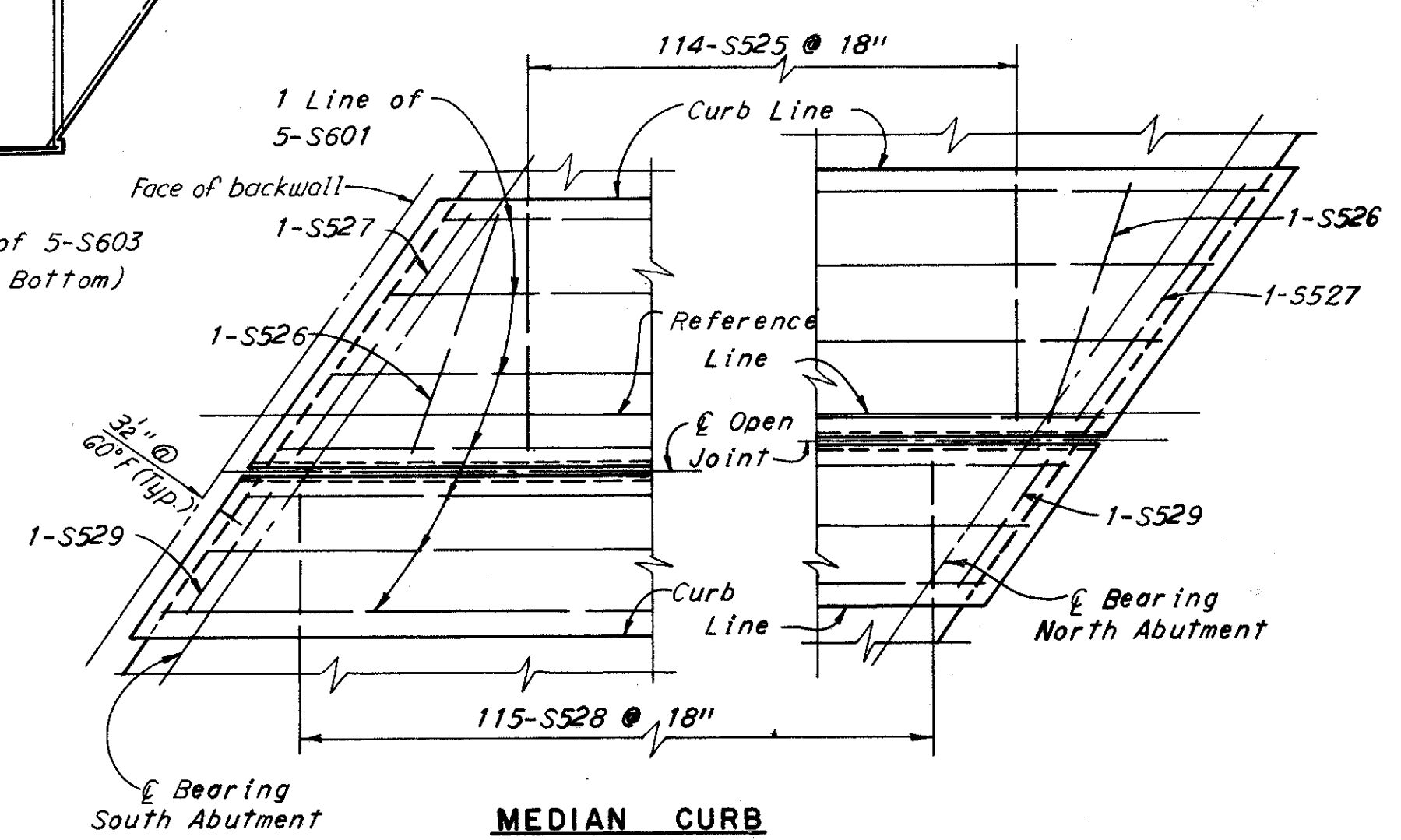
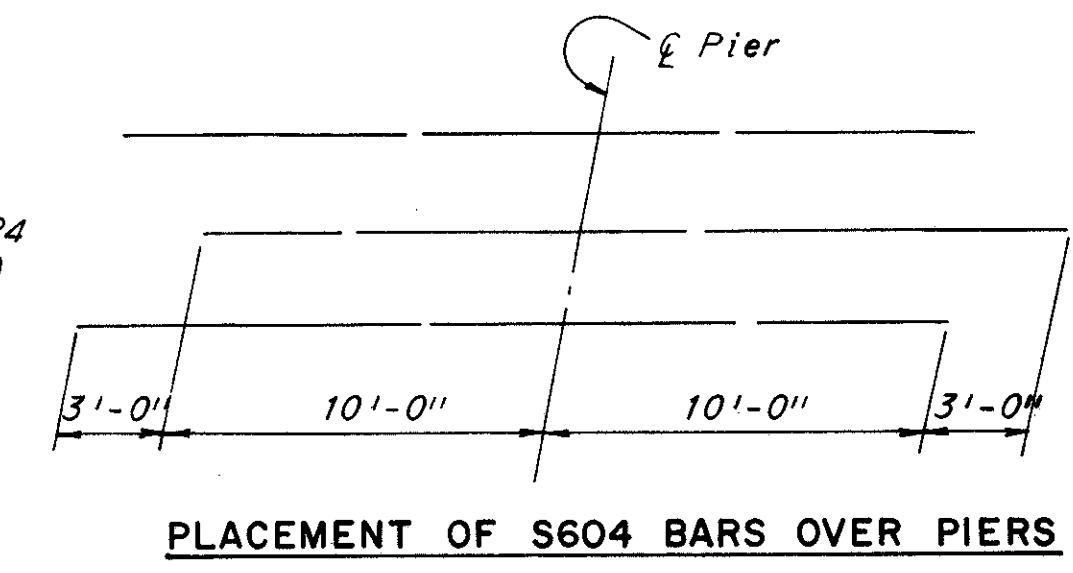
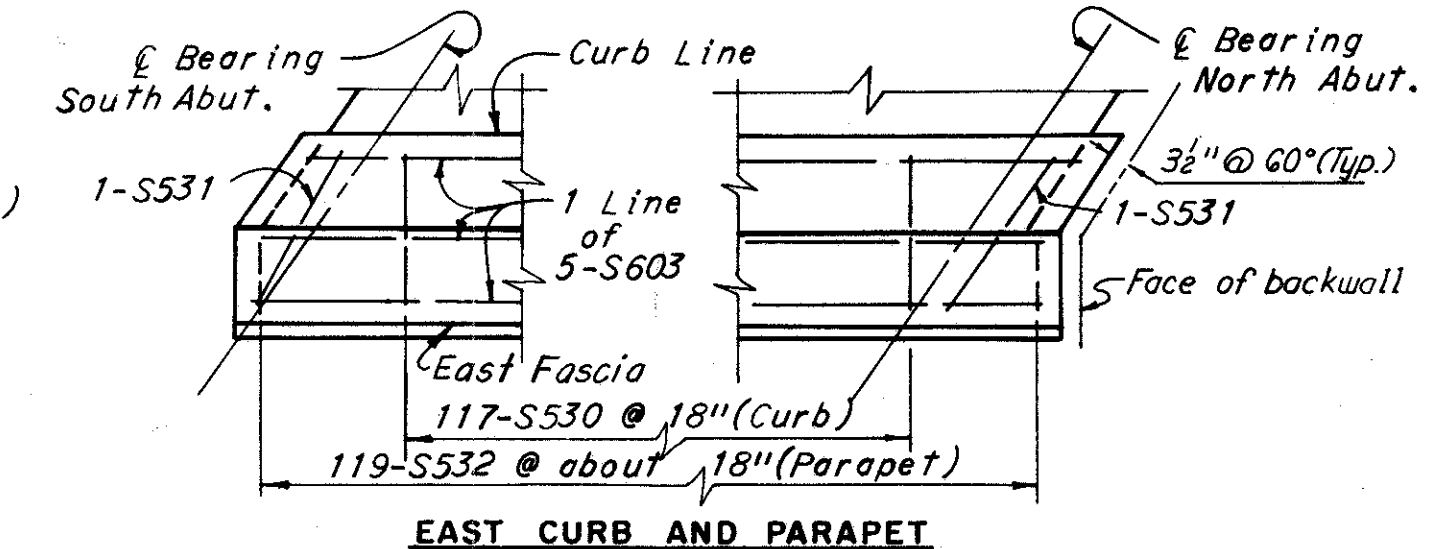
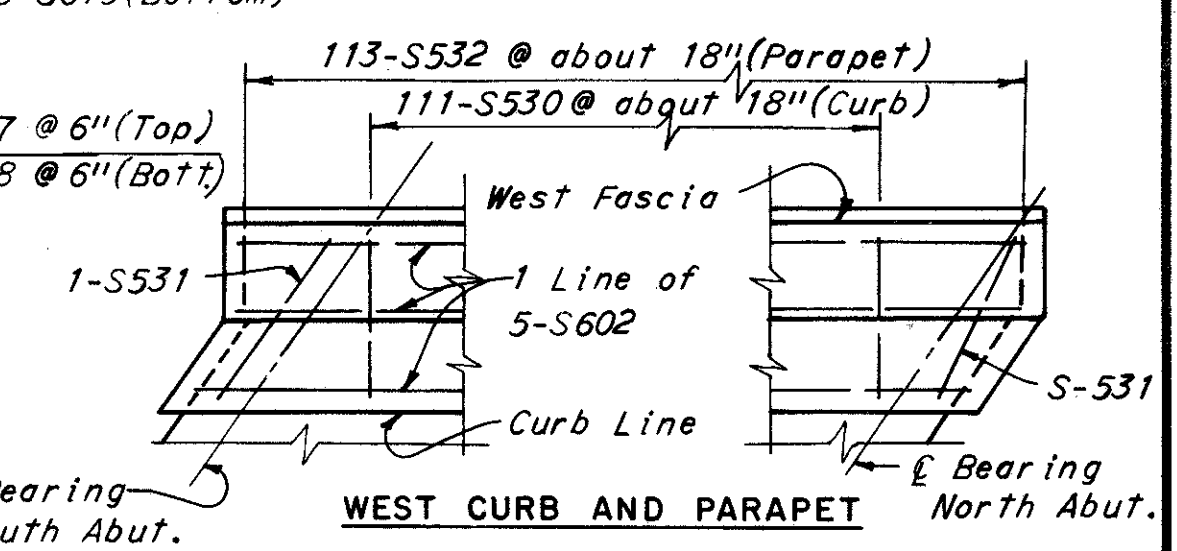
SHEET 469







**SLAB PLAN**  
 (Curb, median and curb extension not shown)



Notes:  
 For Reinforcement Schedule and bending diagram see sheet 476.  
 All longitudinal bars in the slab are parallel to Beams D thru R except S602 bars are concentric with and parallel to the West Fascia, S603 bars are concentric with and parallel to the East Fascia, and S601 bars in the median curb and along the open joint are parallel to the open joint.  
 All transverse bars in the slab are perpendicular to Beams D thru R except the fanned bars which are at 6" maximum along E of the beam.  
 For location and reinforcement of Type 8 Curb Extension see sheet 474.  
 For additional notes see sheet 473.  
 For longitudinal reinforcement in the parapets see sheet 474.

H.N.T.B. BR. NO. 23

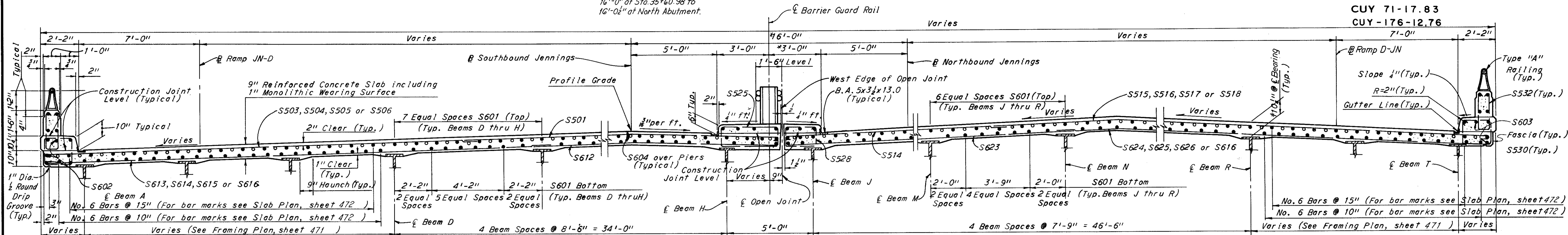
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**DECK REINFORCEMENT**  
 NORTHBOUND AND SOUTHBOUND JENNINGS  
 OVER RAMP J-JR  
 CUY-176-1279 STA. 35+05.23  
 STA. 36+83.08

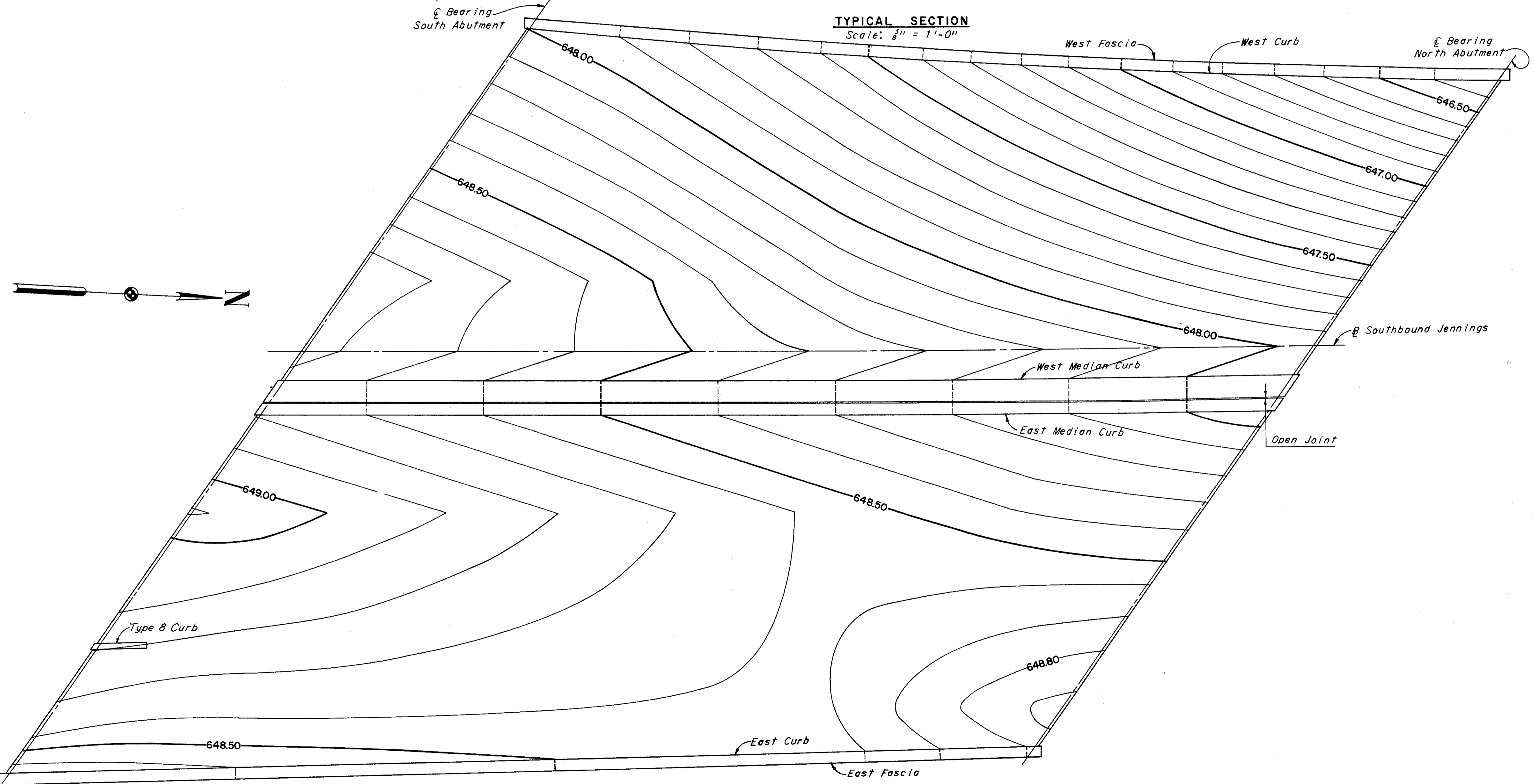
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN BY	TRACED	CHECKED BY
DATE 6-17-64	DATE 9-8-64	DATE 12-8-64
REVIEWED BY	REVISION	SHEET 472

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

\*Varies 3'-0" at Sta. 35+60.98  
To 3'-0 1/2" at North Abutment  
16'-0" at Sta. 35+60.98 to  
16'-0 1/2" at North Abutment.



† When curb beams and median beams fall beneath the curbs and median, the 10 1/4" dimension is measured from the gutter line elevation.



Notes:  
For railing post spacing, parapet joint spacing and longitudinal reinforcement in the parapet see sheet 474.  
For Type 8 Curb nose reinforcement see sheet 474.  
For Reinforcement Schedule and Bending Diagrams see sheet 476.

H.N.T.B. BR. NO. 23  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**CONTOUR PLAN AND TYPICAL SECTION**  
NORTHBOUND AND SOUTHBOUND JENNINGS OVER RAMP J-JR  
CUY-176-1279 STA. 35+05.23  
STA. 36+83.08

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 6-20-64	DATE 7-8-64	DATE 12-8-64		

SHEET 473





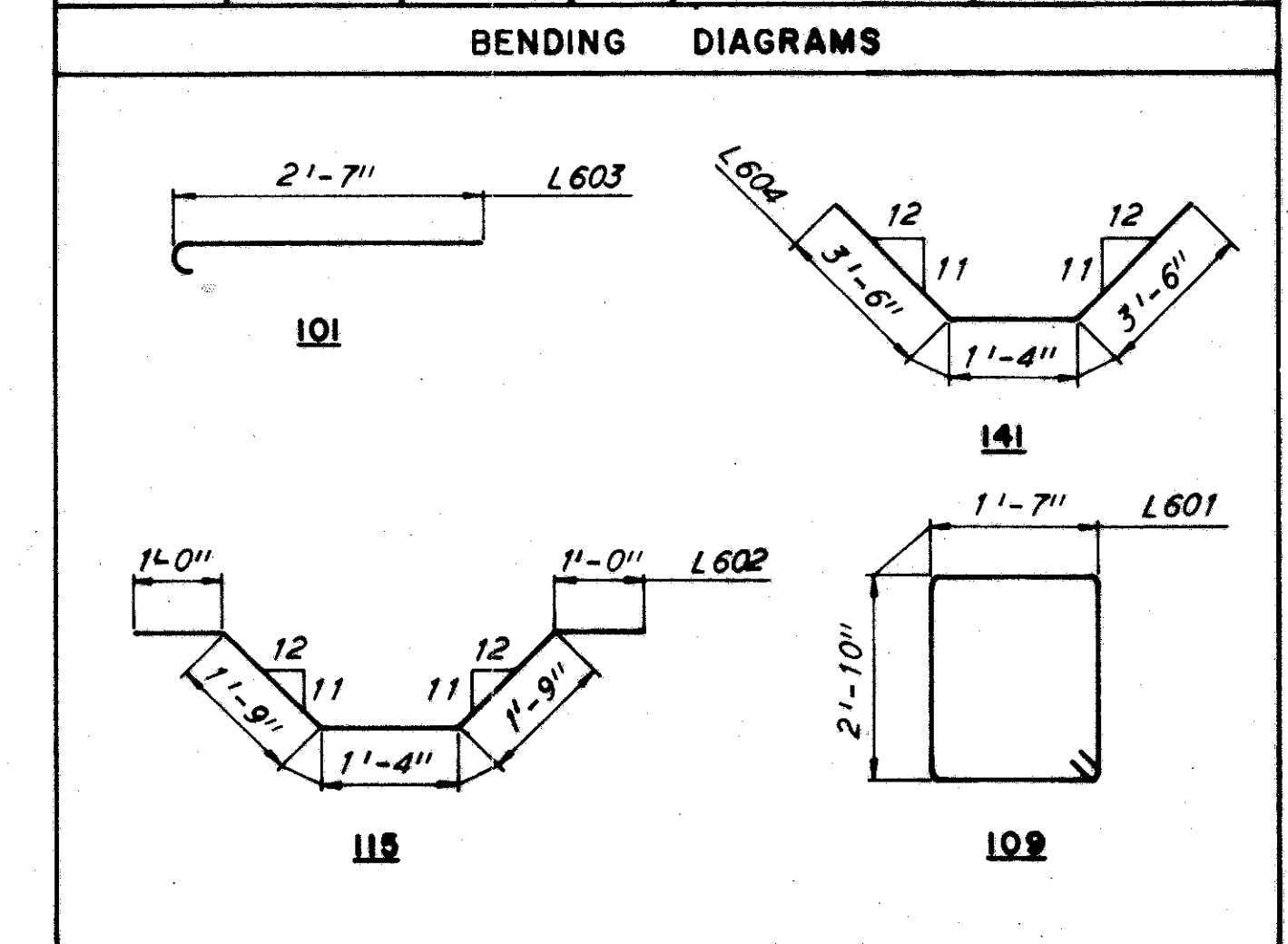




CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

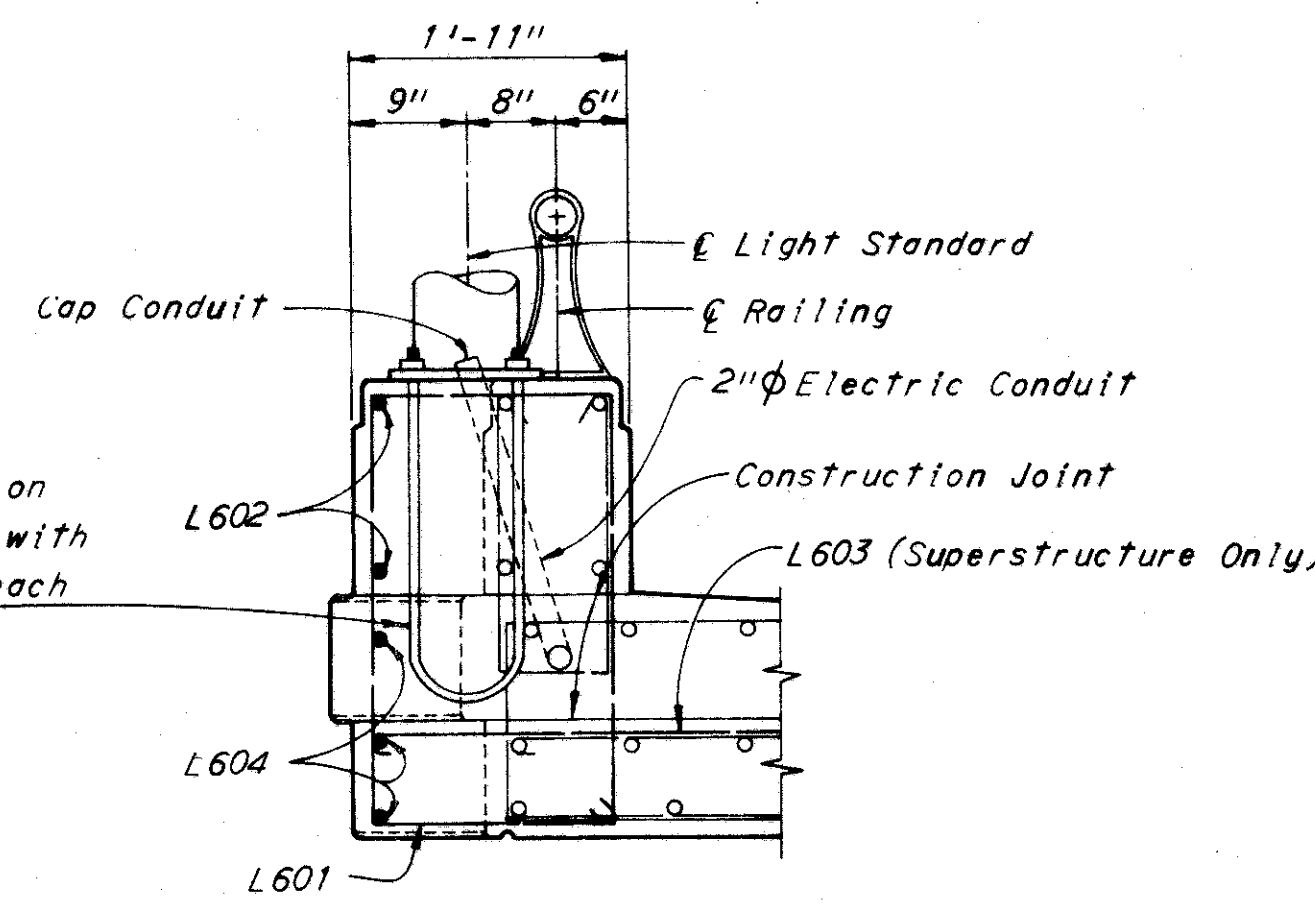
LIGHT STANDARD SUPPORT STATIONS			
BRIDGE NO. CUY-71-1789R (UPPER)			
Stations along @ Northbound I-71		Stations along @ NBOR-East Side	
East Side	West Side	East Side	West Side
917+56	919+02	1+79	1+54
920+53	922+09	3+23	
923+63	925+24	5+09	
926+69	928+20		
932+70	930+91		
934+29			
BRIDGE NO. CUY-71-1789R (LOWER)			
Stations along @ N.B. Jennings		Stations along @ Ramp J-14	
East Side	West Side	East Side	West Side
64+66 *	64+13 *	1+46 *	4+97 *
65+55 *	65+02 *	2+36 *	
66+61 *	66+08 *	3+26 *	
67+67 *	67+14 *	4+52 *	
71+99 *	68+03 *	5+66	
	69+14 *	7+62	
	70+03 *	9+46	
	71+08 *	11+42	
	71+61 *		
	73+12		
BRIDGE NO. CUY-71-1826			
Stations along @ Relocated W. 14 St.			
North Side	South Side		
18+47 *	16+73 *		
20+39 *			
BRIDGE NO. CUY-176-1279			
Stations along @ Ramp D-JN	Stations along @ Ramp JN-D		
East Side	West Side		
11+28	2+50		
RETAINING WALL NO. 81			
Stations along @ Northbound I-71			
	935+98		
	937+82		
	939+65		
RETAINING WALL 81B			
Stations along @ N.B.O.R.			
	8+42 (76+30± @ N.B. Jennings)		
	11+82 (79+60± @ N.B. Jennings)		

REINFORCEMENT SCHEDULE					
Mark	Number	Length	Type	Weight (Pounds)	
				Superstructure	Retaining Wall
L601	3	9'-7"	109	43	43
L602	2	6'-10"	115	21	21
L603	4	3'-3"	101	20	
L604	3	8'-4"	141	38	38
			Total	122	102



Notes:  
 \* Indicates 9" bolt circle.  
 \* Indicates 11" bolt circle.  
 All other bolt circles are 12 1/2".  
 Bolt circle is dimension B in Plan View.

Notes:  
 Reinforcement is included for payment with slab or retaining wall reinforcement.  
 Concrete below the parapet joint is included for payment with slab or retaining wall concrete. Concrete above the parapet joint is included for payment with Item S-14, "Aluminum Railing".  
 For location of conduit in structures, additional lighting and police call box details and summary of Item S-25, Lighting Quantities see Lighting Plans.

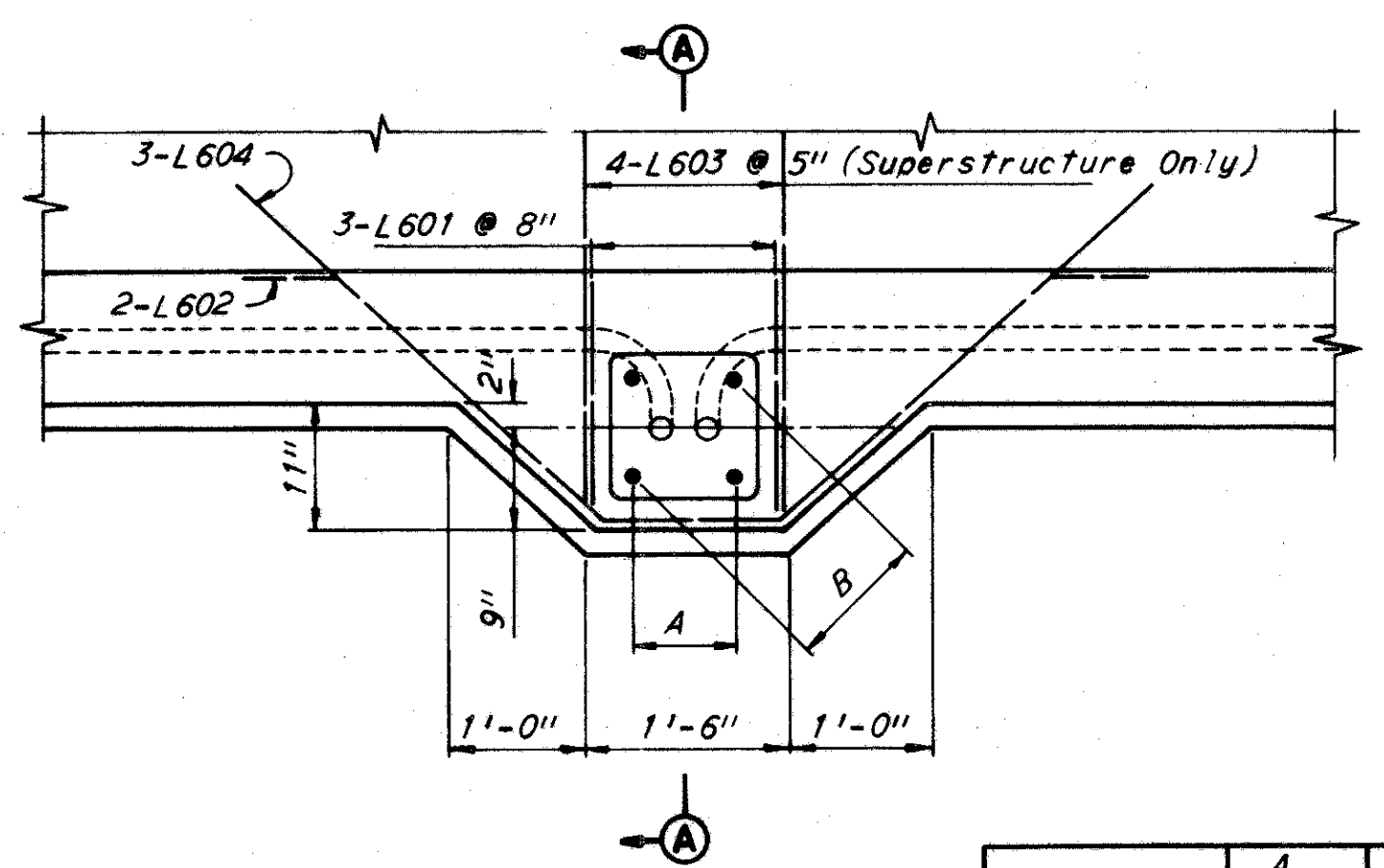


2-1" Anchor U-bolts, 5'-8" long on Br. 19 and 5'-4" long otherwise, with 2 lock nuts and anchor nuts for each bolt.

Note:  
 o denotes normal longitudinal reinforcement.

SECTION A-A

Bridge cross-section shown. Retaining wall cross-section similar except as noted.



PLAN

	A	B
6" Pole	6 3/4"	9"
8" Pole	8 7/8"	12 1/2"
8" Pole	7 3/4"	11"

Note:  
 Details for Light Standard Support are shown; details for Police Call Box Support are identical except for anchor bolts. For anchor bolt details at Police Call Box see sheet 590A.

POLICE CALL BOX STATIONS	
Sta. 925+07 @ N.B. I-71	East side
Sta. 5+45 @ N.B.O.R.	East side
Sta. 73+30 @ N.B. Jennings	West side
Sta. 18+31 @ Reloc. W. 14 St.	North side
Sta. 935+66 @ N.B. I-71	Ret. Wall 81

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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LIGHT STANDARD AND POLICE CALL BOX SUPPORT DETAILS

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.M.C.	TRACED	CHECKED W.F.	REVIEWED W.F.	REVISED
DATE 1-14-65	DATE	DATE 1-21-65	DATE 1-28-65	

SHEET 476A

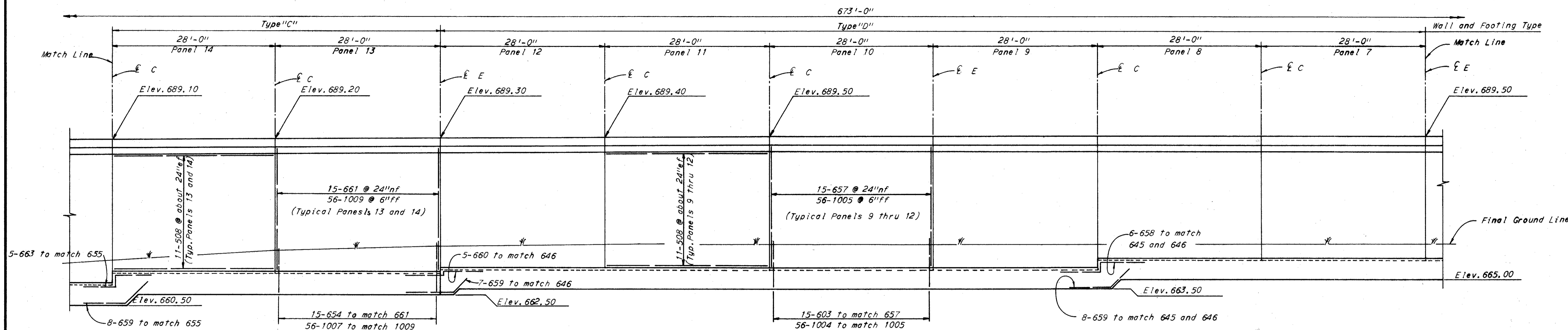


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

478  
646

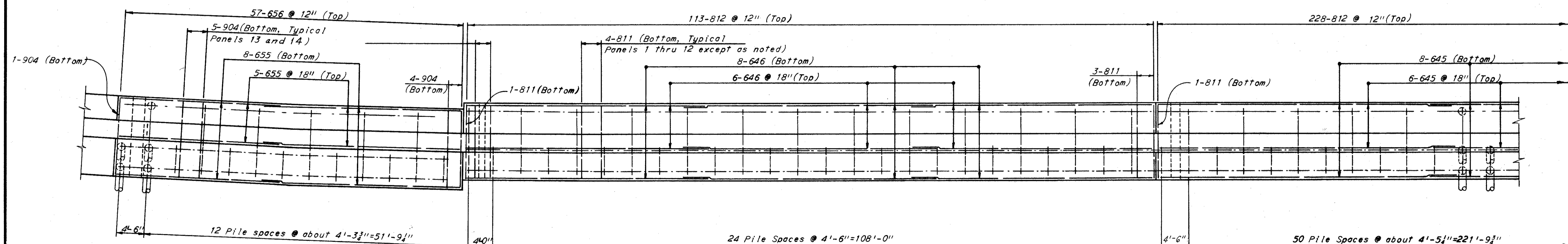
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

Note: For reinforcement of  
curb and parapet see sheet 477.



**DEVELOPED ELEVATION**  
(Panels 7 through 14 shown)

Note:  
Piles and Chain Link  
Fence not shown.



**FOOTING PLAN**

H.N.T.B. WALL NO. 84

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**WALL RIGHT OF RAMP 14 - M**

STA. 4 + 58±  
STA. 10 + 84±

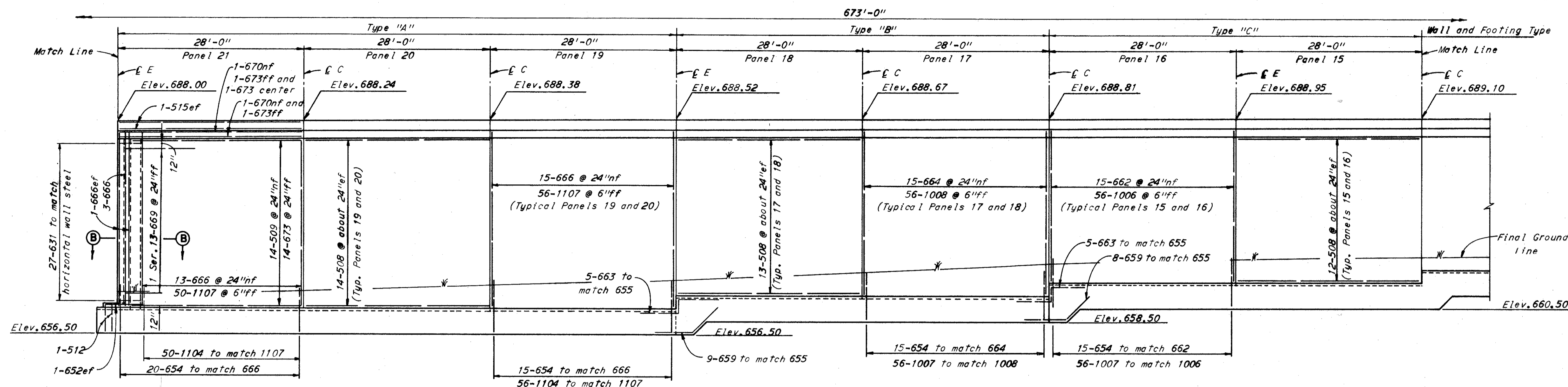
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
JKH		JEM	WJF	
DATE	DATE	DATE	DATE	DATE
10-21-64		1-29-65	1-29-65	

SHEET 4

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

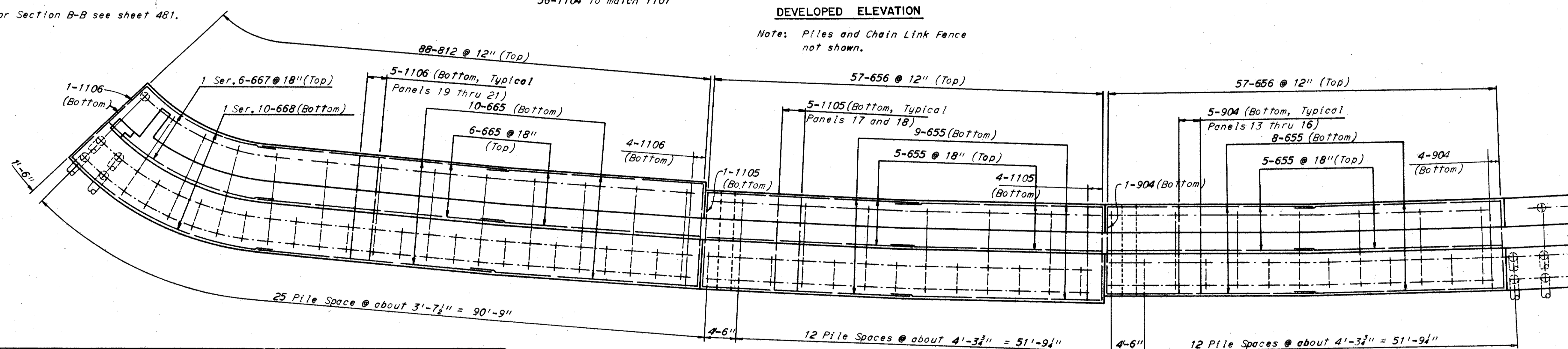
Note: For reinforcement of curb and parapet see sheet 477.



DEVELOPED ELEVATION

Note: Piles and Chain Link Fence not shown.

Note: For Section B-B see sheet 481.



FOOTING PLAN

ESTIMATED QUANTITIES-RETAINING WALL 84			
ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Cofferdams, Crib and Sheeting	Lump Sum	Lump Sum
E-2	Unclassified Excavation	Cu. Yd.	5,881
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	1,125
S-1	Class "E" Concrete, Retaining Wall Footing	Cu. Yd.	1,048
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	460
S-4	Reinforcing Steel	Pounds	251,525
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	364
S-16	First Test Pile	Lump Sum	Lump Sum
S-18	12" C.I.P. Reinforced Concrete Piles	Lin. Ft.	22,860
S-29	Porous Backfill	Cu. Yd.	781

Fence Quantities carried on sheet 613  
 Note: Wall Quantities carried to General Summary, sheet 42.  
 Estimated average vertical length of piles is 60'.

H.N.T.B. WALL NO. 84

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

WALL RIGHT OF RAMP 14 - M

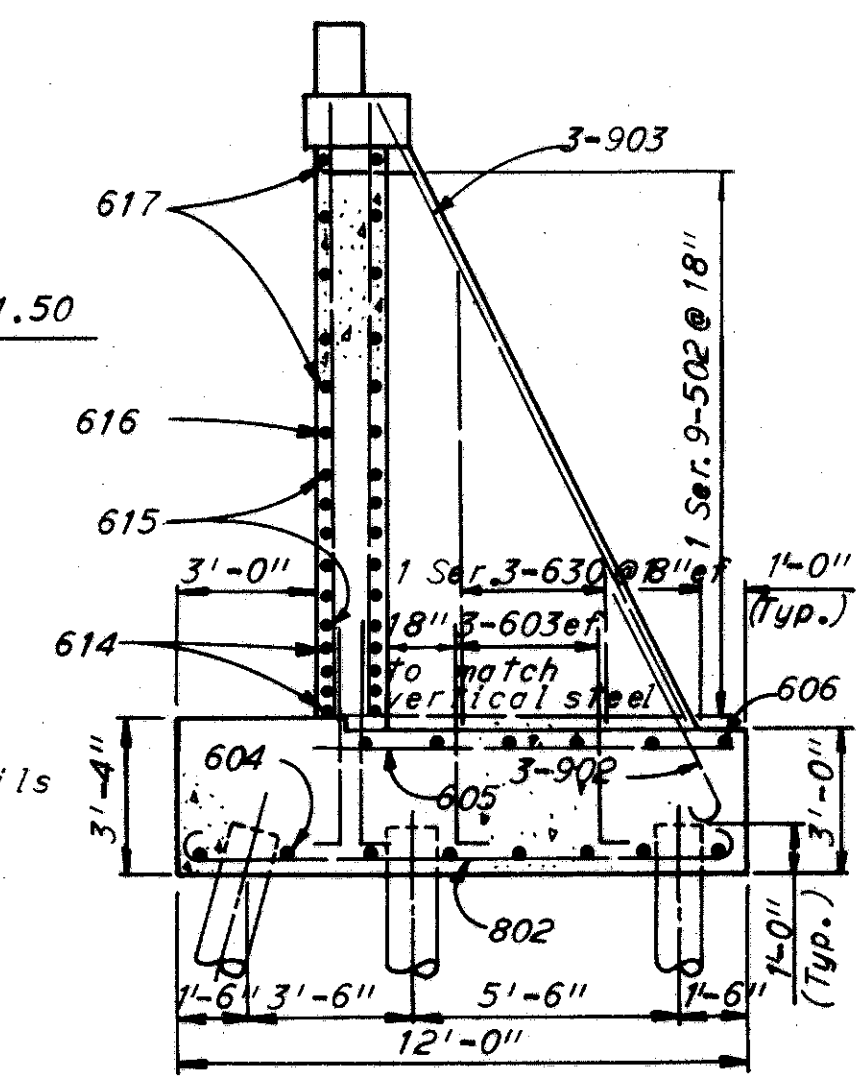
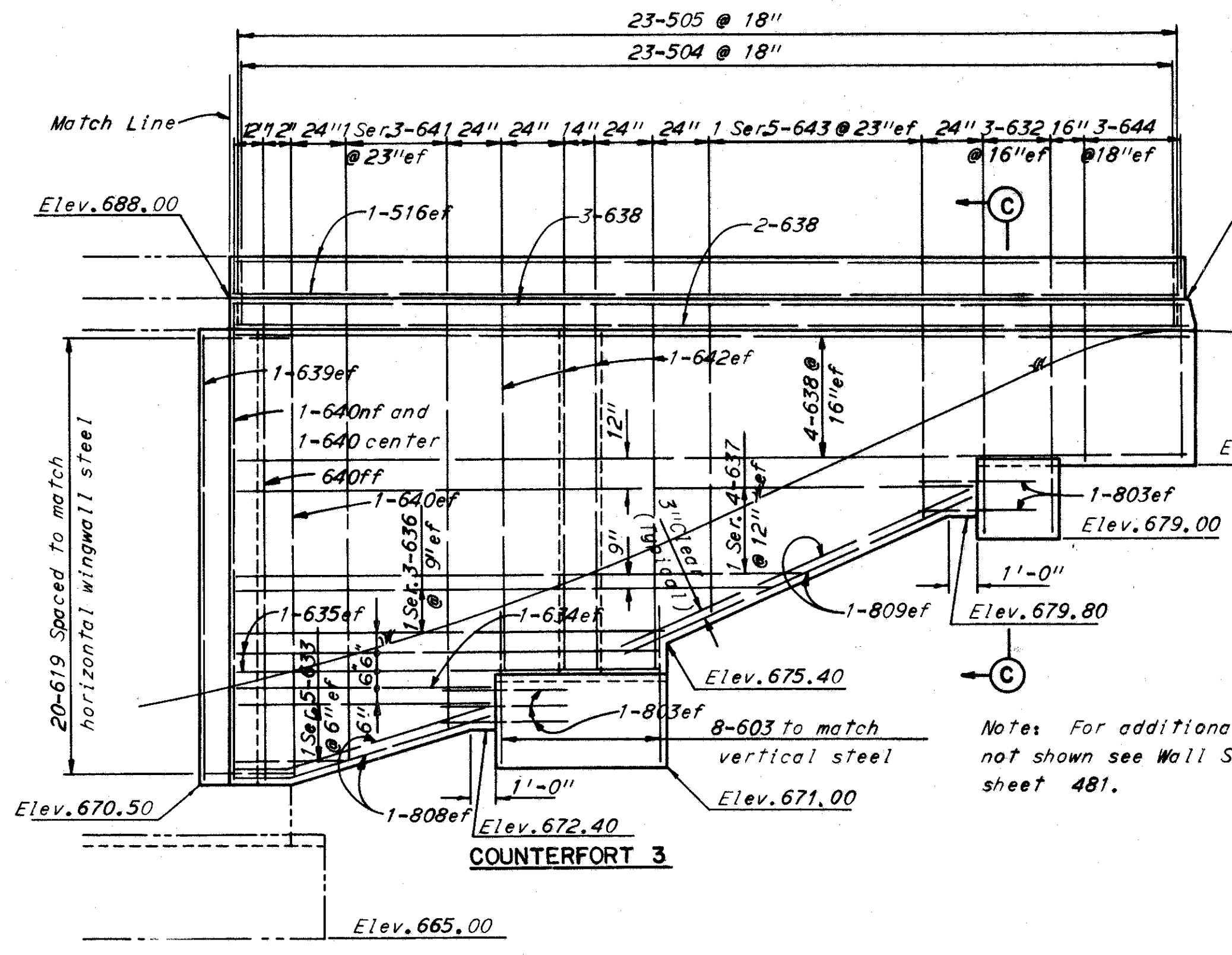
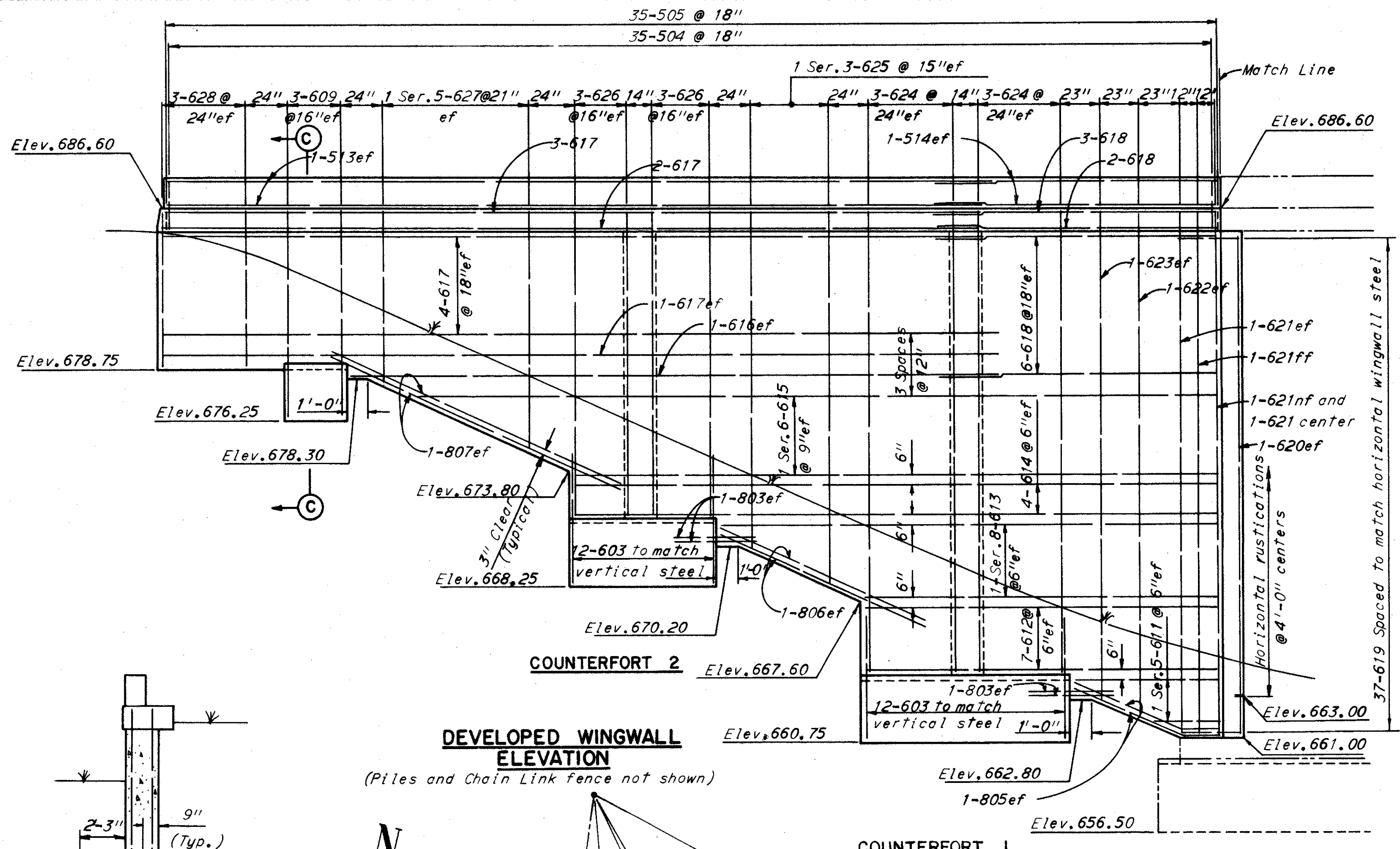
STA. 4 + 58 ±  
 STA. 10 + 84 ±

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN DATE 10-21-64	TRACED DATE	CHECKED DATE 1-29-65	REVIEWED DATE 1-29-65	REVISED
---------------------------	----------------	-------------------------	--------------------------	---------

SHEET 4

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76  
 Elev. 687.30

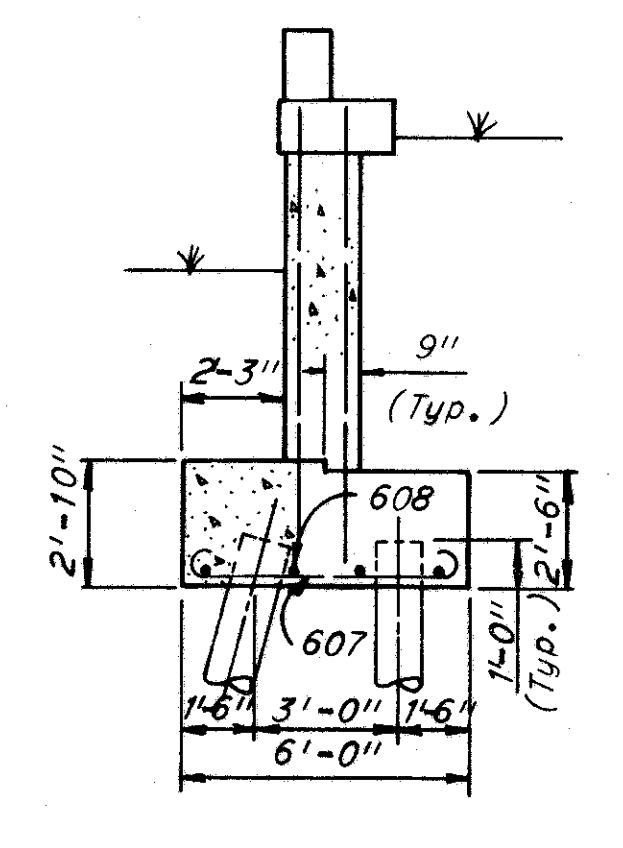


Notes: For additional details not shown see Wall Section sheet 481.

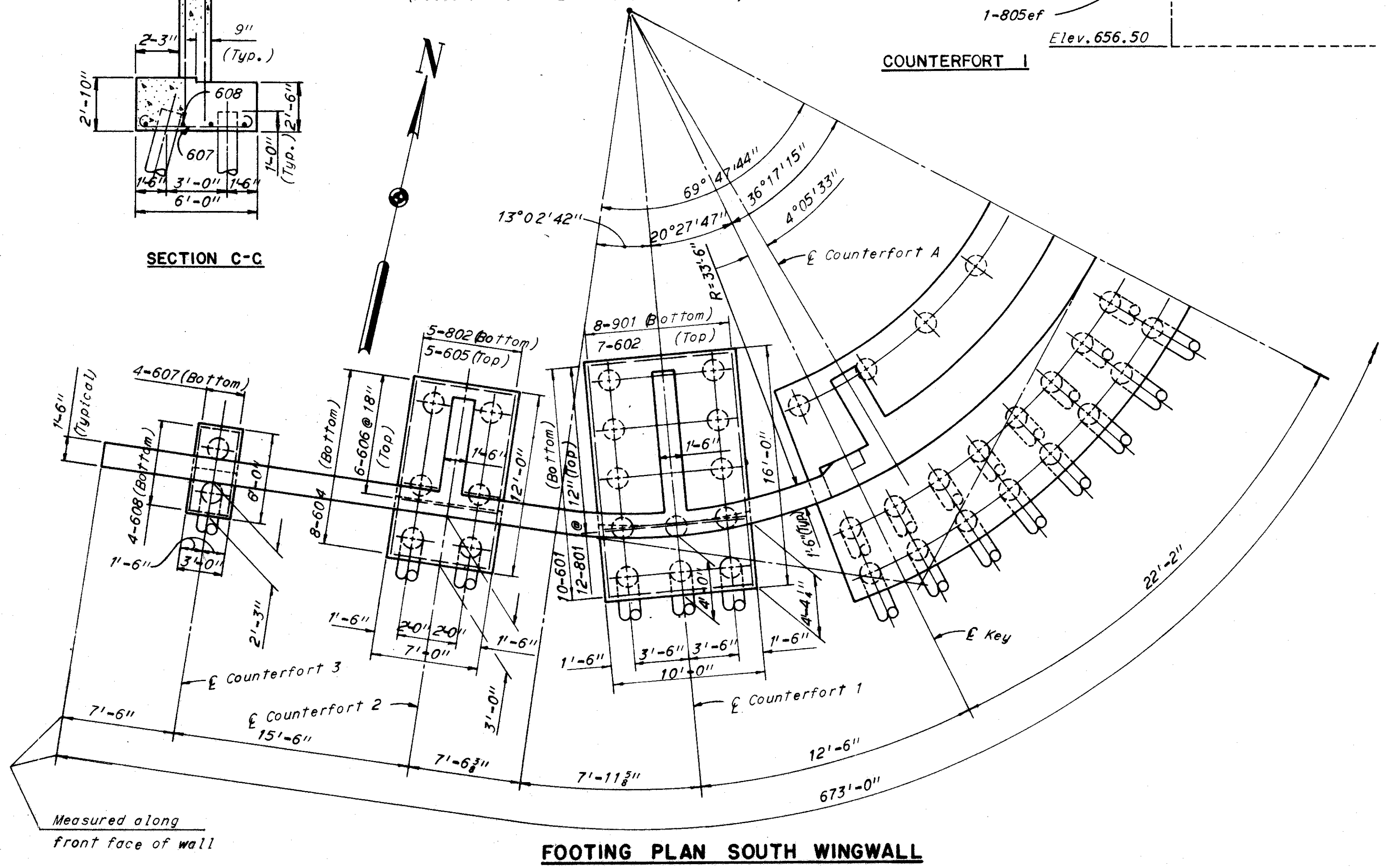
**COUNTERFORT 2**  
 Notes: Reinforcement is similar for all Counterfort Sections except as shown.

**DEVELOPED WINGWALL ELEVATION**  
 (Piles and Chain Link fence not shown)

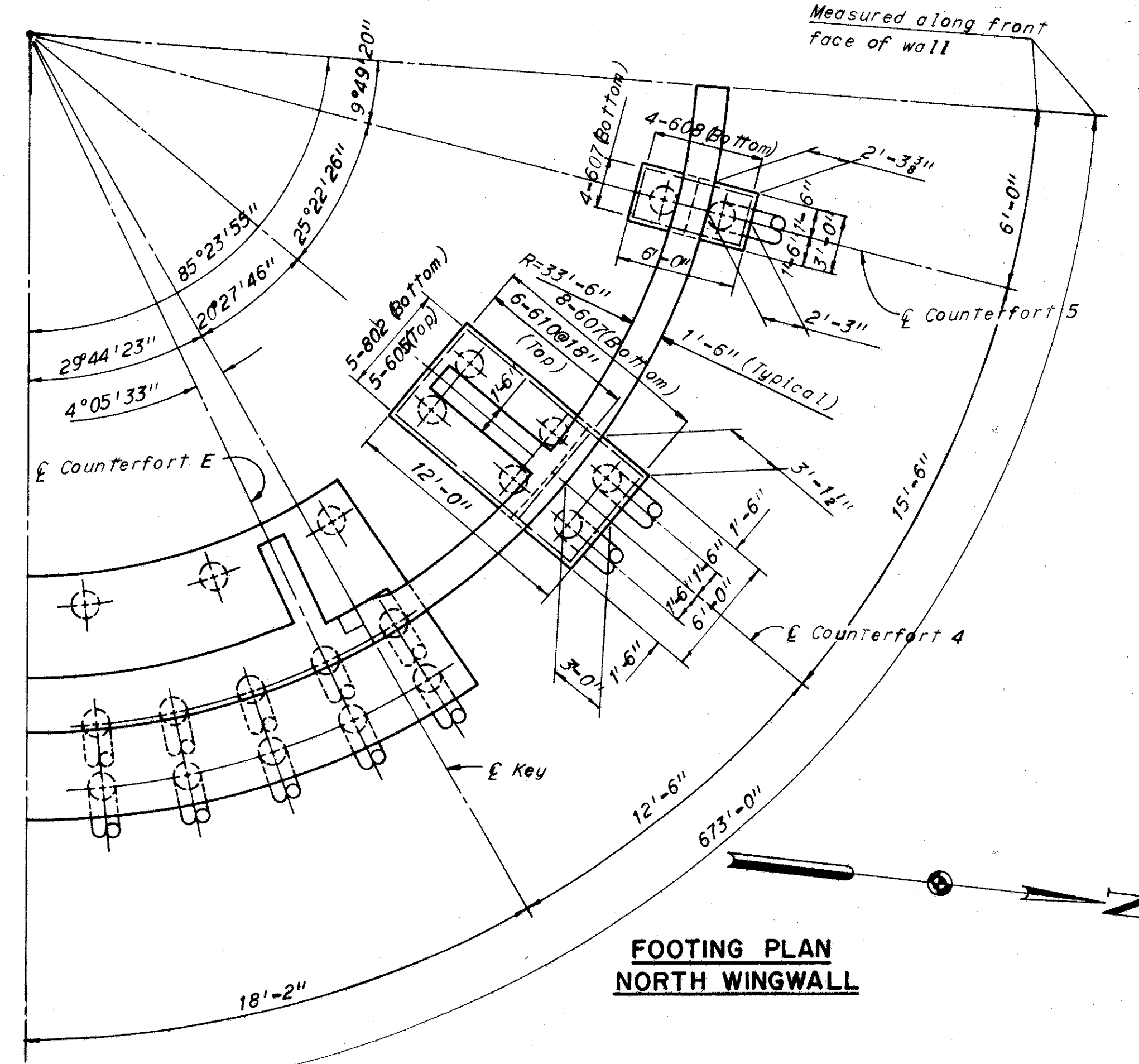
**DEVELOPED WINGWALL ELEVATION**  
 (Piles and Chain Link fence not shown)



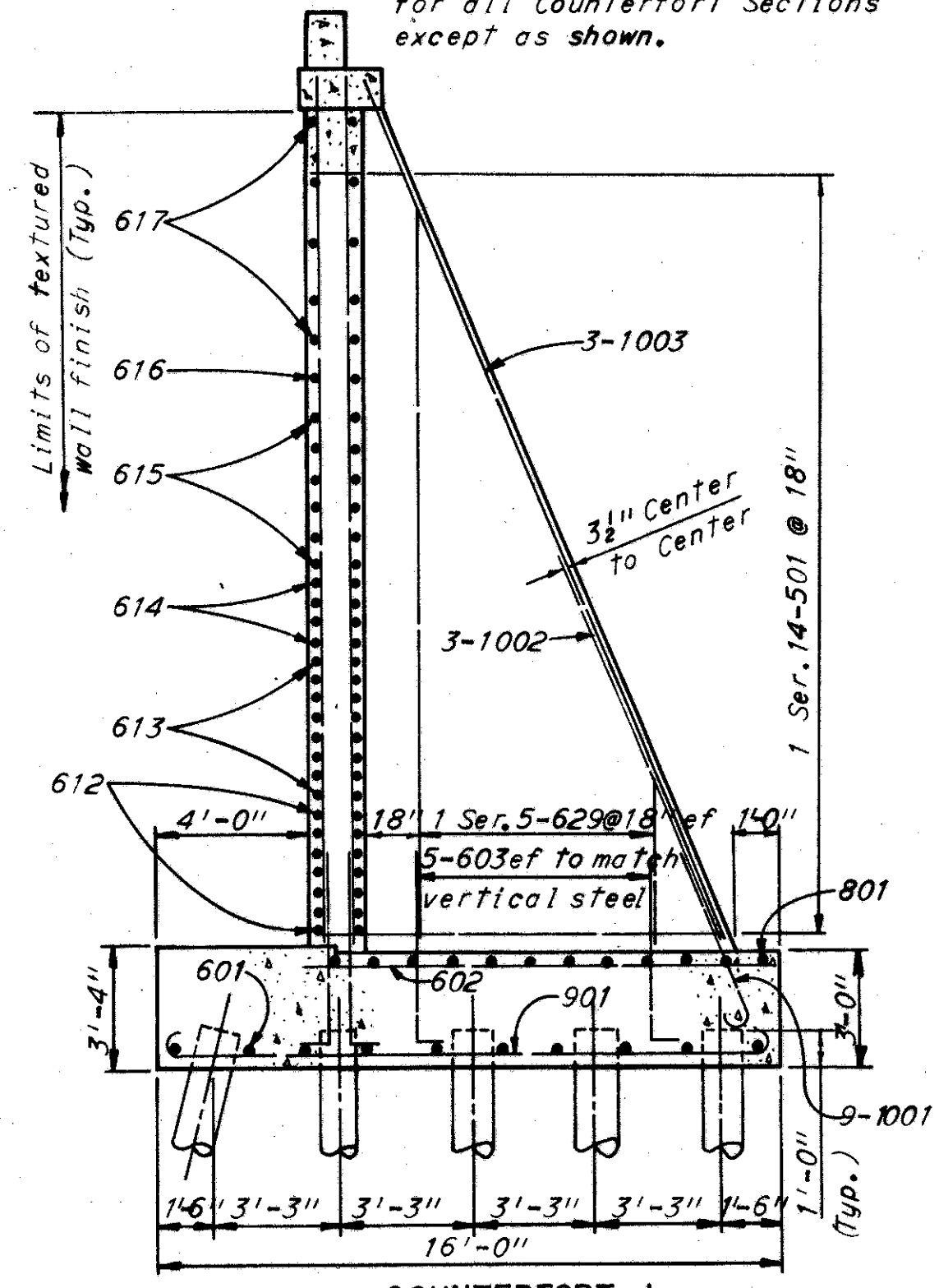
**SECTION C-C**



**FOOTING PLAN SOUTH WINGWALL**



**FOOTING PLAN NORTH WINGWALL**



**COUNTERFORT 1**

H.N.T.B. WALL NO. 84  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WALL RIGHT OF RAMP 14 - M**

STA. 4 + 58<sup>±</sup>  
 STA. 10 + 84<sup>±</sup>

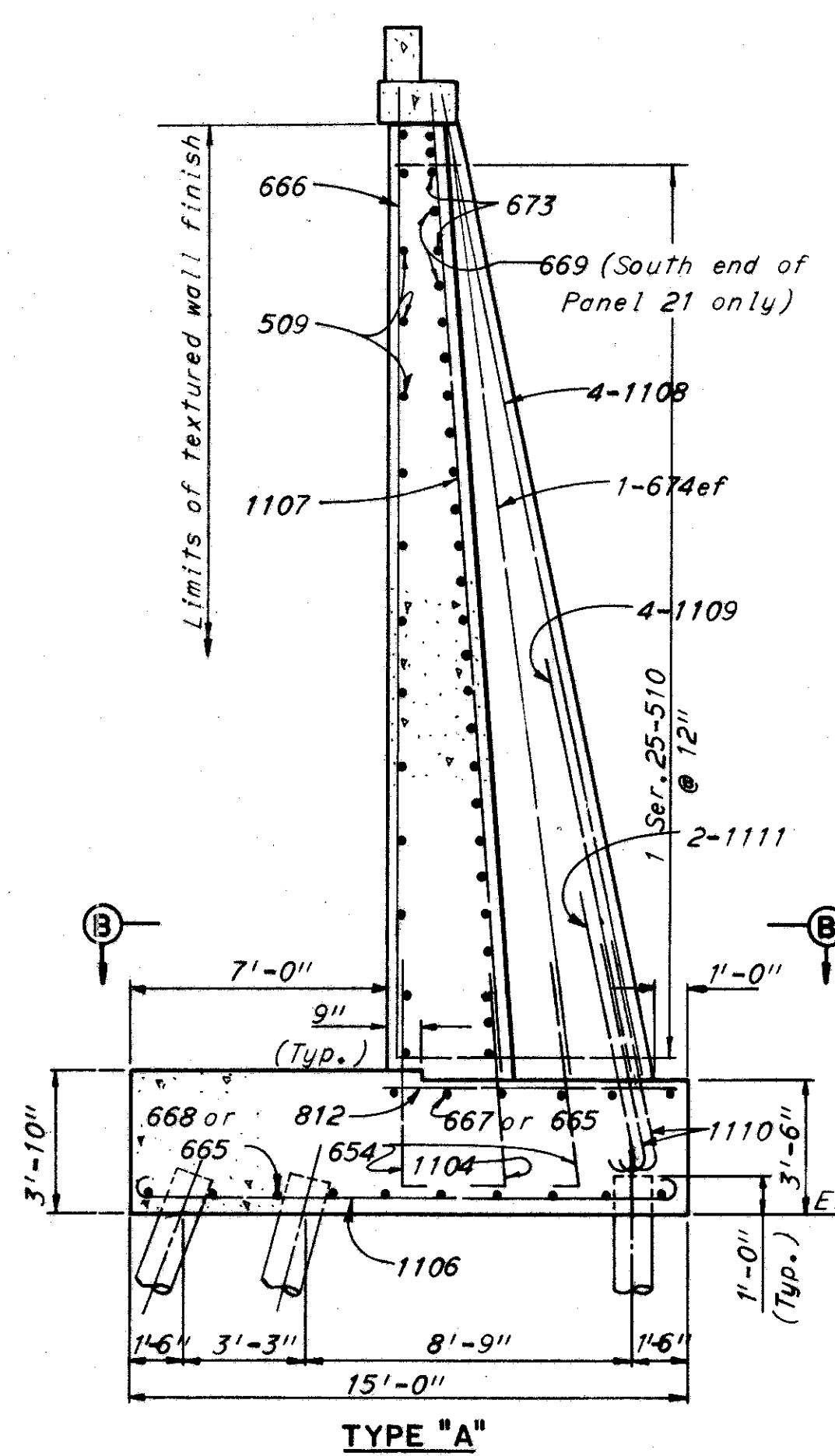
CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN: J.K.H. TRACED: J.K.H. CHECKED: J.E.N. REVIEWED: W.F. REISED: W.F.  
 DATE: 10-21-64 DATE: DATE: 1-29-65 DATE: 2-24-65 SHEET 4



CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

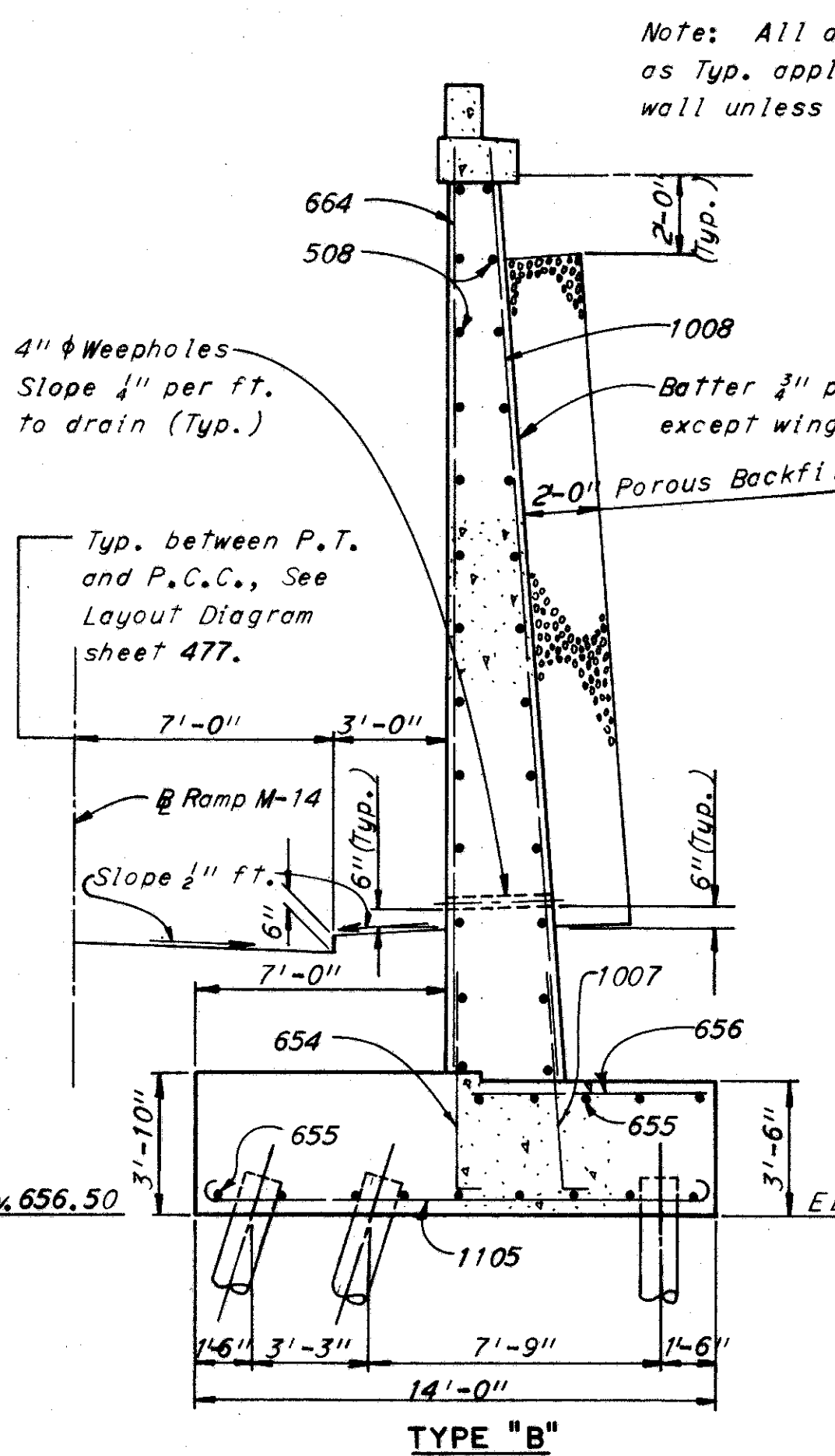
#Note:  
 The 2" dimension is typical  
 except between vertical wall joint  
 in panels 12 thru 20.

Note: All details denoted  
 as Typ. apply to entire  
 wall unless otherwise noted.

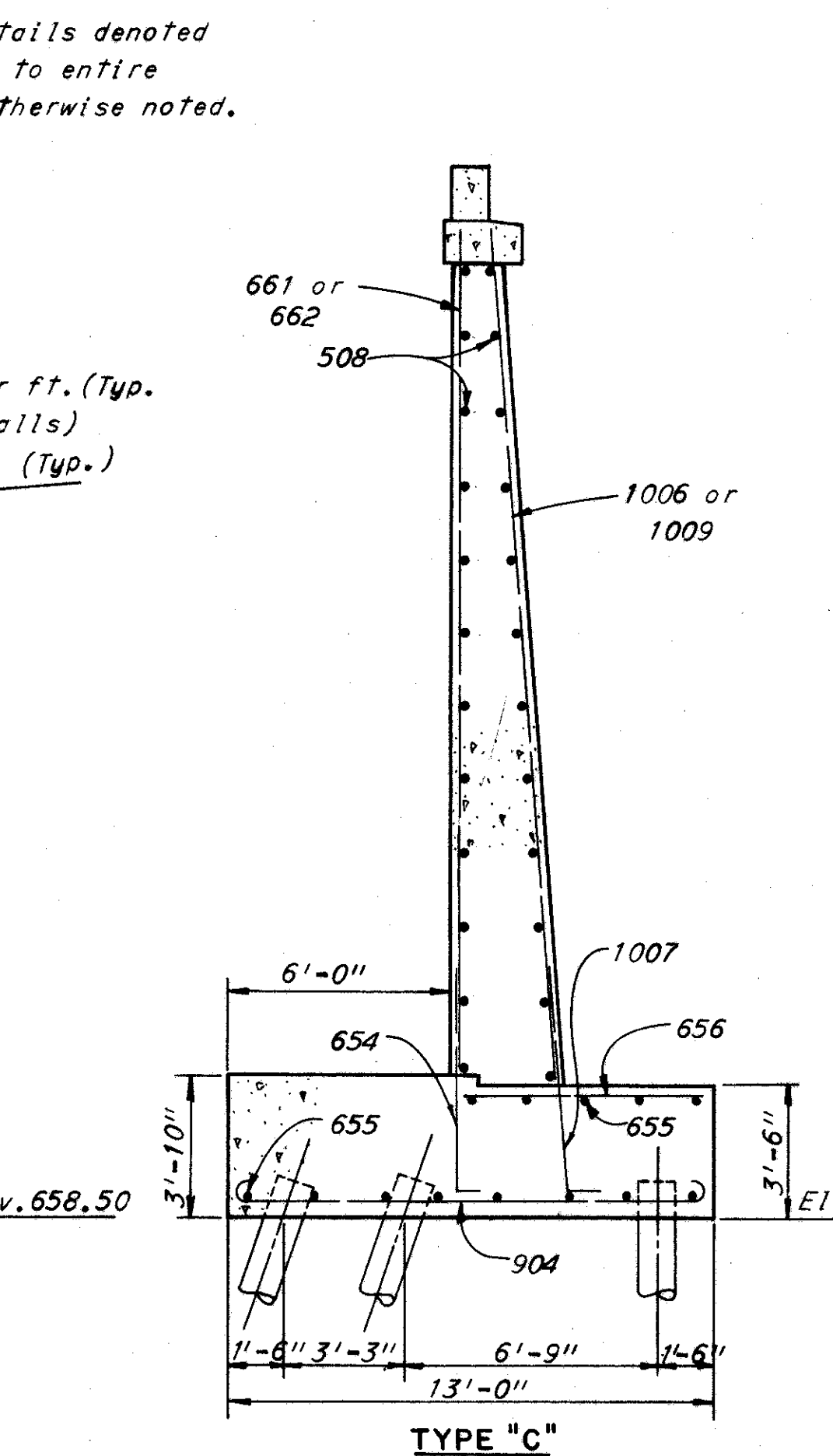


TYPE "A"

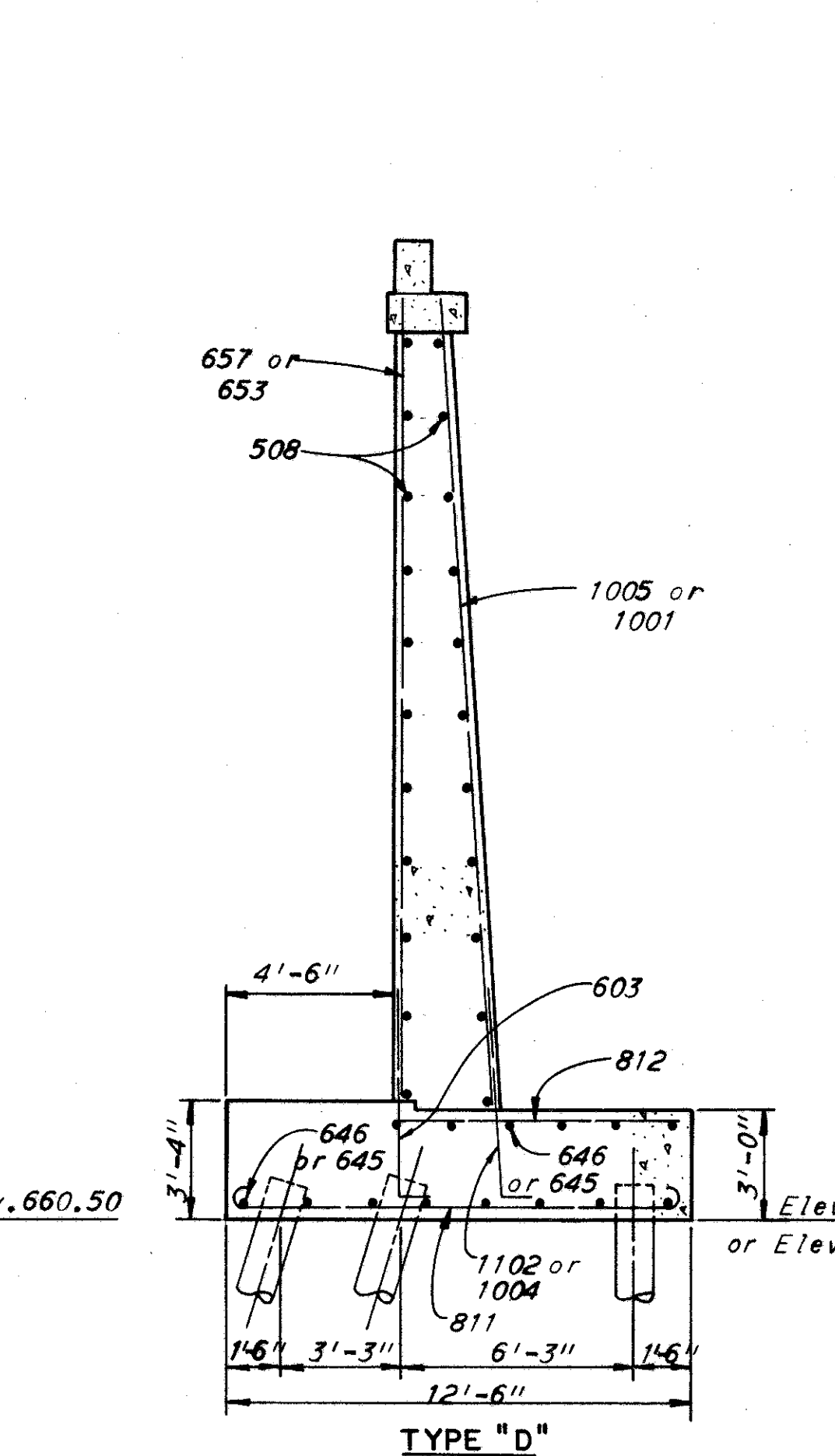
(Counterfort A, Panel 21 also shown)



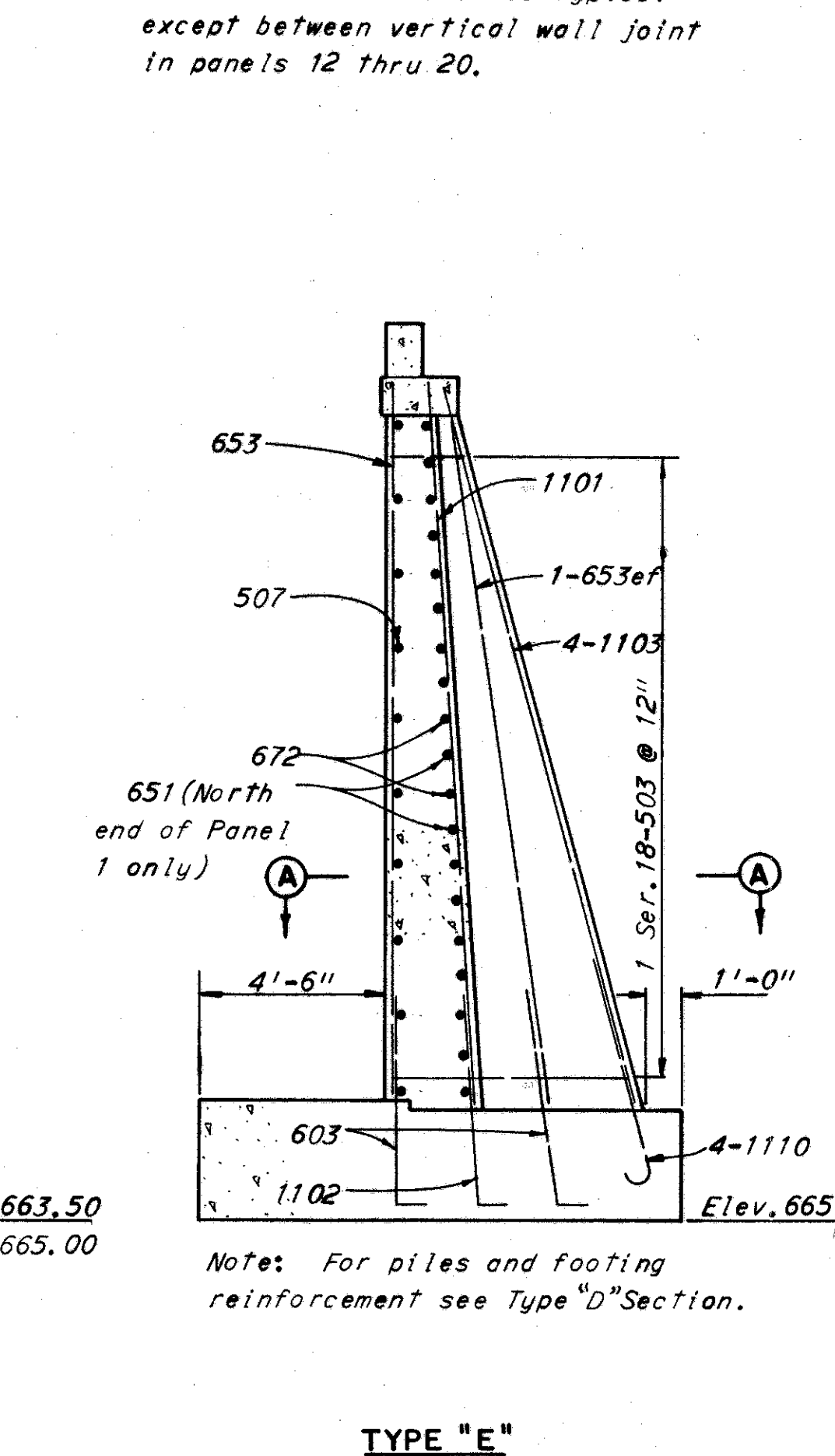
TYPE "B"



TYPE "C"

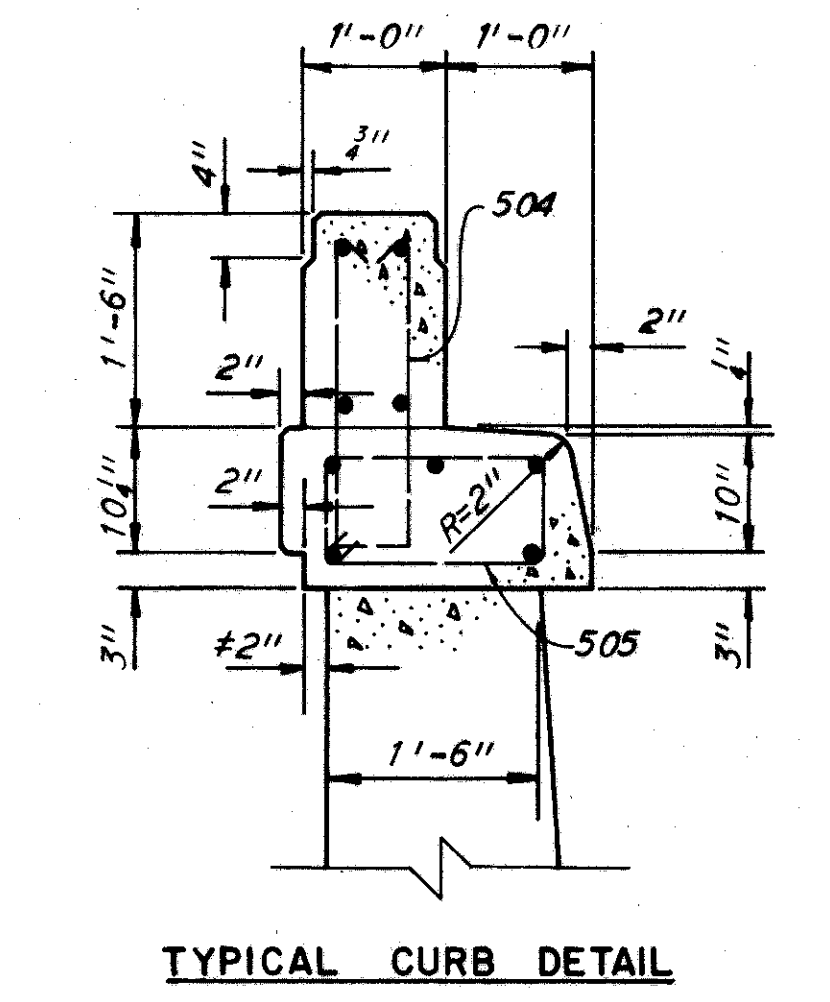


TYPE "D"



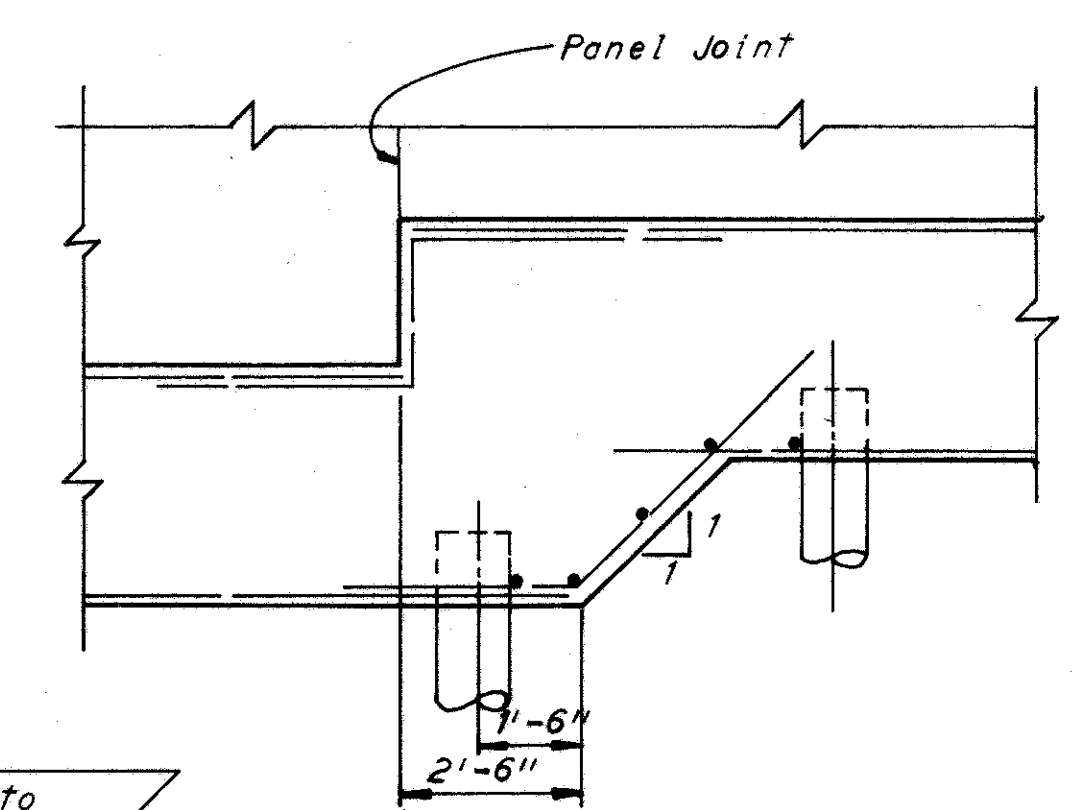
TYPE "E"

(Counterfort E, Panel 1 also shown)

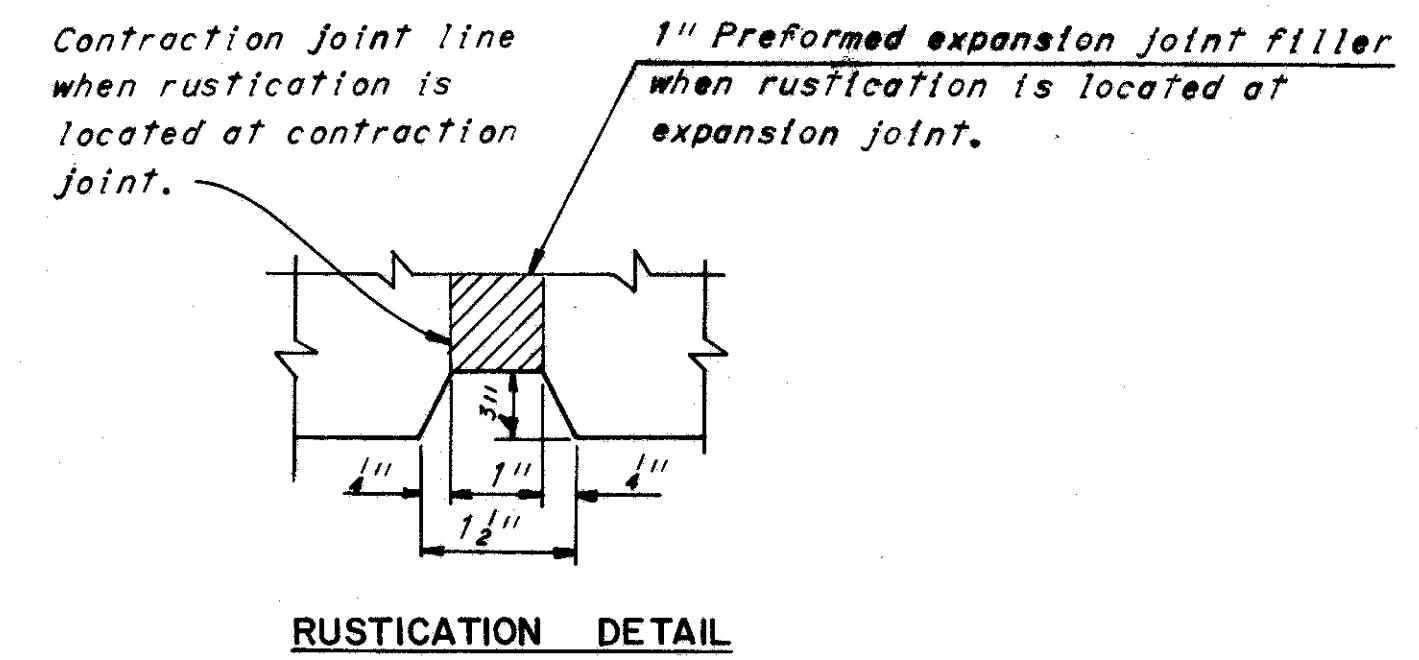


TYPICAL CURB DETAIL

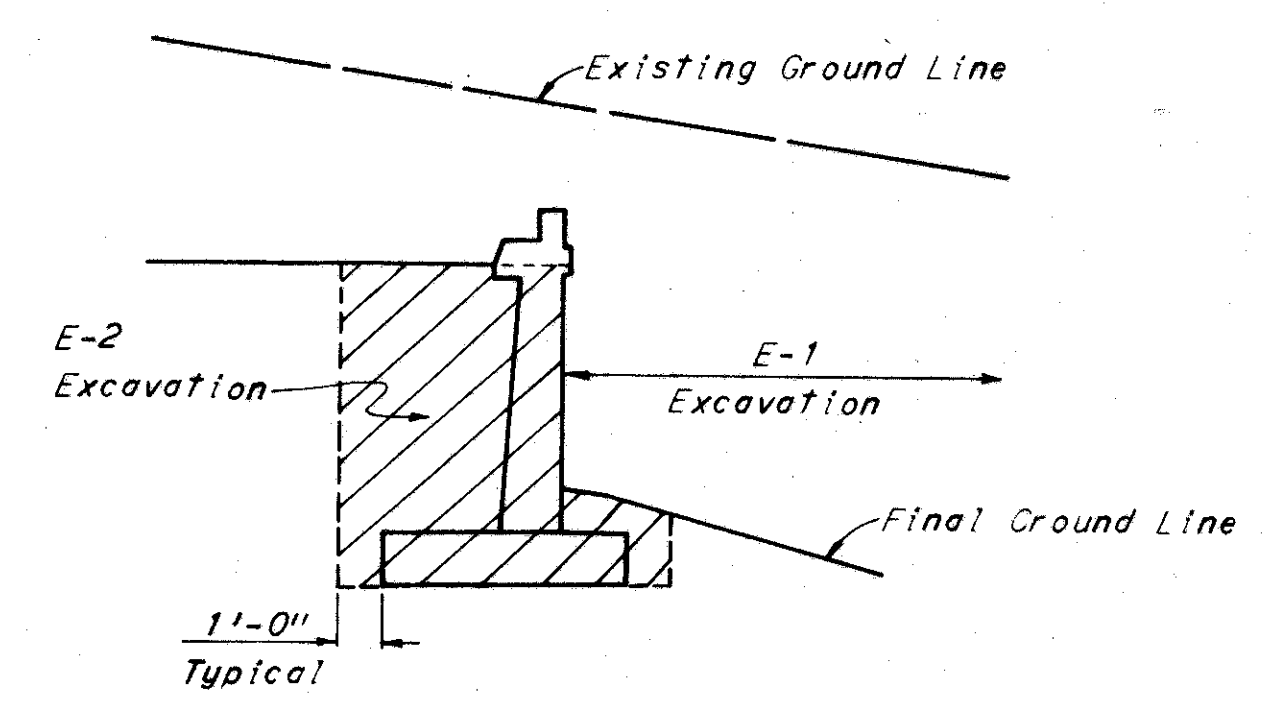
Note: For piles and footing  
 reinforcement see Type "D" Section.



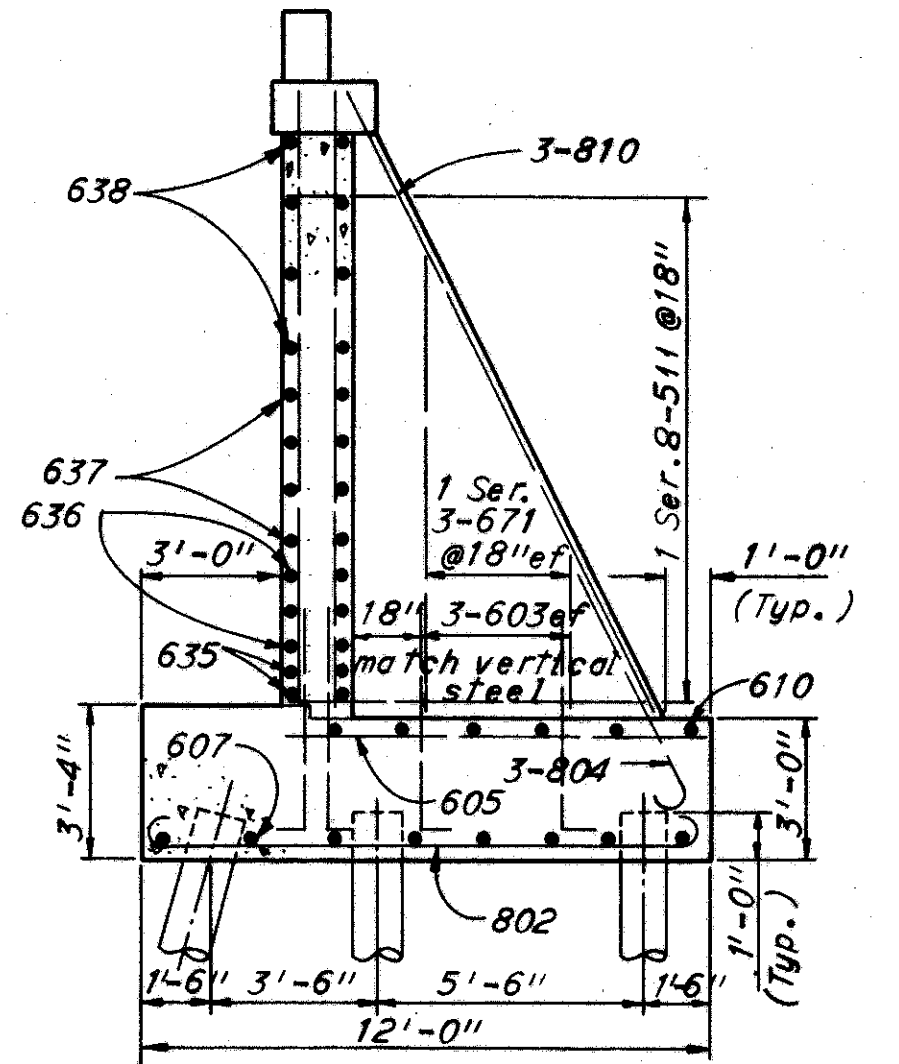
FOOTING STEP DETAIL



RUSTICATION DETAIL

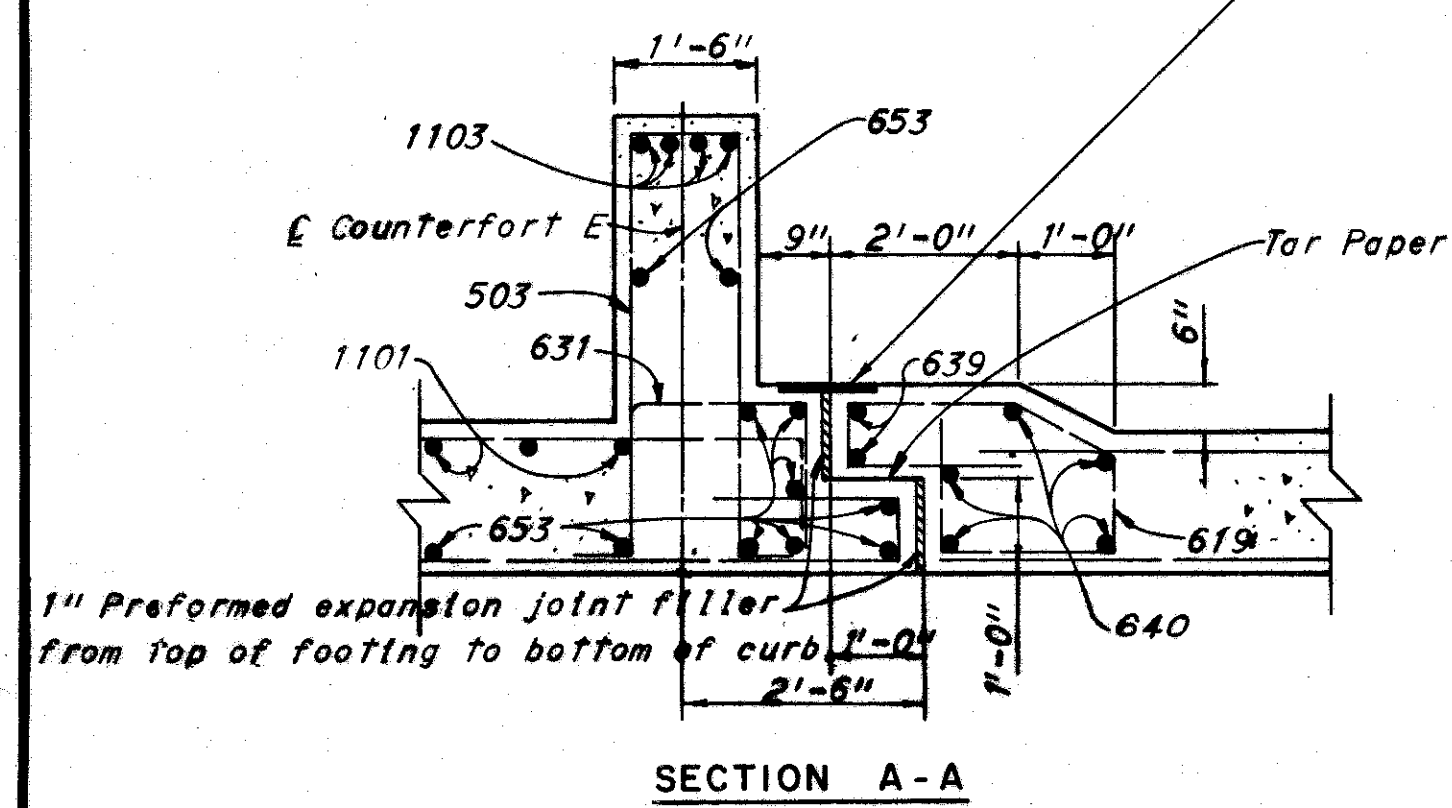


TYPICAL SECTION USED TO DETERMINE  
 UNCLASSIFIED EXCAVATION QUANTITIES

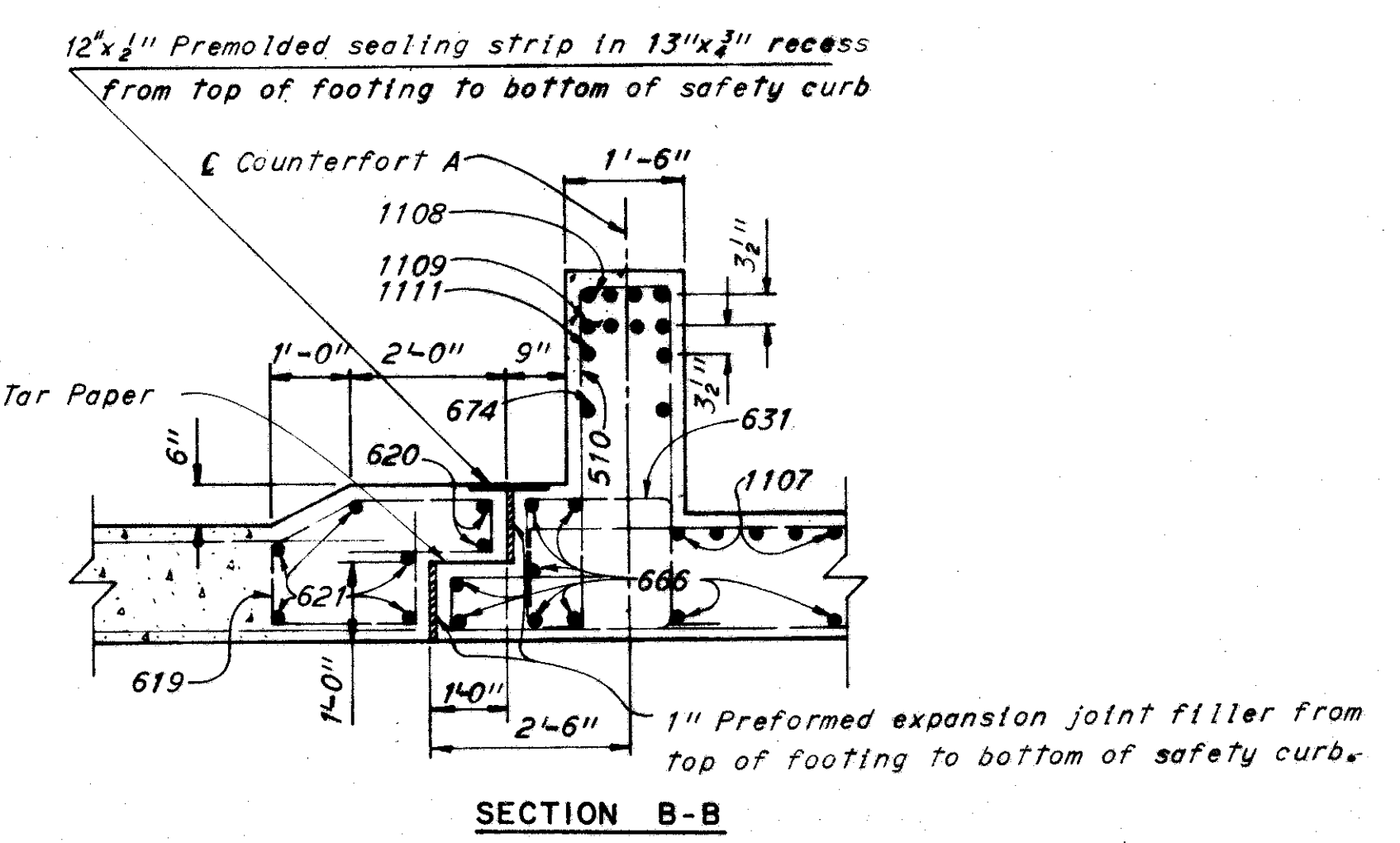


COUNTERFORT 3

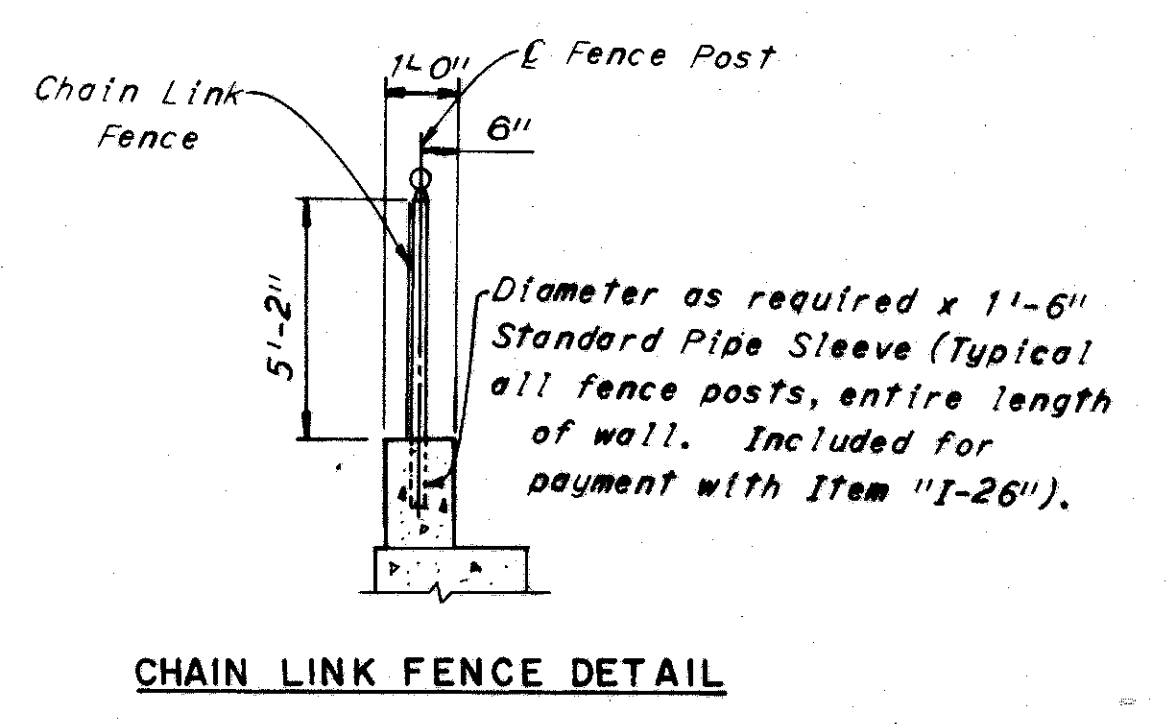
12"x 1/2" Preformed sealing strip in  
 13"x 3/4" recess from top of footing to  
 bottom of safety curb



SECTION A-A



SECTION B-B



CHAIN LINK FENCE DETAIL

H.N.T.B. WALL NO. 84  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WALL RIGHT OF RAMP 14 - M**

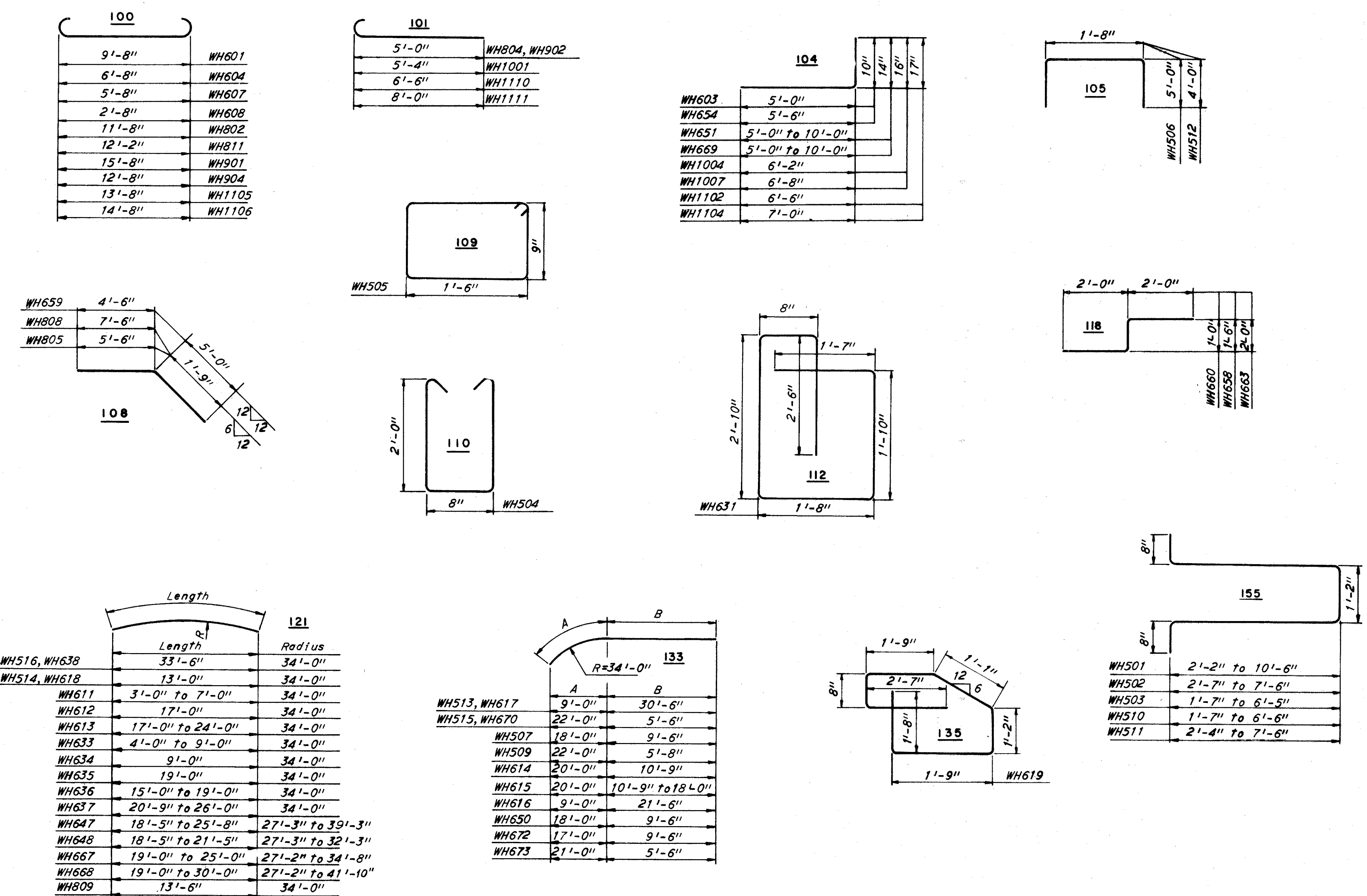
STA. 4 + 58 ±  
 STA. 10 + 84 ±

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN BY JKH TRACED BY JKH CHECKED BY JKH REVIEWED BY JKH REVISIONS  
 DATE 10-21-62 DATE 1-29-65 DATE 1-29-65 SHEET 481

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
WH501	1 Ser. 14	6'-4" 23'-0"	155	15 1/2"	214	WH664	30	24'-6"	Str.		1, 1"
WH502	1 Ser. 9	6'-4" 17'-0"	155	16"	110	WH665	32	33'-0"	Str.		1, 586
WH503	1 Ser. 18	5'-2" 14'-10"	155	6 1/2"	187	WH666	50	26'-0"	Str.		1, 953
WH504	478	5'-3"	110		2, 617	WH667	1 Ser. 6	19'-0" 25'-0"	121	14 1/2"	198
WH505	478	5'-0"	109		2, 493	WH668	1 Ser. 10	19'-0" 30'-0"	121	14 1/2"	368
WH506	2	11'-5"	105		24	WH669	1 Ser. 13	5'-0" 11'-0"	104	5"	166
WH507	14	27'-6"	133		402	WH670	2	27'-6"	133		83
WH508	504	27'-6"	Str.		14, 456	WH671	2 Ser. 3	3'-9" 8'-9"	Str.	340"	61
WH509	14	27'-8"	133		404	WH672	13	26'-6"	133		517
WH510	1 Ser. 25	5'-2" 15'-0"	155	4 1/2"	263	WH673	17	26'-6"	133		677
WH511	1 Ser. 8	6'-8" 17'-0"	155	14 1/2"	99	WH674	2	25'-6"	Str.		77
WH512	2	9'-5"	105		20						
WH513	4	39'-6"	133		165	WH801	12	9'-6"	Str.		304
WH514	4	13'-0"	121		54	WH802	10	13'-10"	100		369
WH515	4	27'-6"	133		115	WH803	18	6'-0"	Str.		288
WH516	4	33'-6"	121		140	WH804	3	6'-1"	101		49
						WH805	4	7'-2"	108		77
WH501	10	11'-0"	100		165	WH806	4	11'-0"	Str.		117
WH502	7	12'-0"	Str.		126	WH807	4	15'-0"	Str.		160
WH503	241	5'-8"	104		2, 051	WH808	4	9'-2"	108		98
WH504	8	8'-0"	100		96	WH809	4	13'-6"	121		144
WH505	10	9'-0"	Str.		135	WH810	3	14'-9"	Str.		118
WH506	6	6'-6"	Str.		59	WH811	306	14'-4"	100		11, 710
WH507	16	7'-0"	100		168	WH812	429	8'-0"	Str.		9, 163
WH508	8	4'-0"	100		48						
WH509	6	9'-9"	Str.		88	WH901	8	18'-2"	100		494
WH510	6	5'-6"	Str.		50	WH902	3	6'-3"	101		64
WH511	2 Ser. 5	5'-0" 7'-0"	121	12"	75	WH903	3	16'-3"	Str.		166
WH512	14	17'-0"	121		357	WH904	130	15'-2"	100		6, 704
WH513	2 Ser. 8	17'-0" 24'-0"	121	12"	493						
WH514	8	30'-9"	133		369	WH1001	9	6'-9"	101		261
WH515	2 Ser. 6	30'-9" 38'-0"	133	17 1/2"	620	WH1002	3	12'-0"	Str.		155
WH516	2	30'-6"	133		92	WH1003	3	24'-6"	Str.		316
WH517	15	39'-6"	133		890	WH1004	224	7'-3"	104		6, 988
WH518	17	13'-0"	121		332	WH1005	224	21'-0"	Str.		20, 241
WH519	57	9'-10"	135		842	WH1006	112	23'-0"	Str.		11, 084
WH520	2	24'-0"	Str.		72	WH1007	336	7'-9"	104		11, 205
WH521	5	25'-0"	Str.		188	WH1008	112	24'-9"	Str.		11, 928
WH522	2	24'-0"	Str.		72	WH1009	112	21'-3"	Str.		10, 241
WH523	2	23'-3"	Str.		70						
WH524	12	22'-0"	Str.		397	WH1101	228	19'-9"	Str.		23, 924
WH525	2 Ser. 3	16'-7" 17'-9"	Str.	7"	155	WH1102	228	7'-8"	104		9, 288
WH526	12	14'-6"	Str.		263	WH1103	4	20'-0"	Str.		425
WH527	2 Ser. 5	8'-0" 11'-4"	Str.	10"	145	WH1104	162	8'-2"	104		7, 029
WH528	6	7'-3"	Str.		65	WH1105	65	16'-10"	100		5, 813
WH529	2 Ser. 5	4'-3" 18'-6"	Str.	3 1/2"	171	WH1106	125	17'-10"	100		11, 844
WH530	2 Ser. 3	4'-3" 11'-3"	Str.	3 1/2"	70	WH1107	162	26'-0"	Str.		22, 378
WH531	46	10'-3"	112		708	WH1108	4	27'-0"	Str.		574
WH532	6	8'-0"	Str.		72	WH1109	4	11'-0"	Str.		234
WH533	2 Ser. 5	4'-0" 9'-0"	121	14 1/2"	98	WH1110	12	8'-1"	101		515
WH534	2	9'-0"	121		27	WH1111	2	9'-7"	101		102
WH535	4	15'-0"	121		90						
WH536	2 Ser. 3	15'-0" 19'-0"	121	24 1/2"	153						
WH537	2 Ser. 4	20'-9" 28'-0"	121	14 9/16"	281						
WH538	13	33'-6"	121		654						
WH539	2	15'-9"	Str.		473						
WH540	5	17'-0"	Str.		128						
WH541	2 Ser. 3	15'-0" 16'-3"	Str.	7 1/2"	141						
WH542	8	13'-0"	Str.		156						
WH543	2 Ser. 5	7'-6" 11'-0"	Str.	10 1/2"	139						
WH544	6	5'-3"	Str.		47						
WH545	84	36'-0"	Str.		4, 542						
WH546	42	38'-9"	Str.		2, 445						
WH547	1 Ser. 8	18'-5" 25'-8"	121	12 1/2"	265						
WH548	1 Ser. 6	18'-5" 21'-5"	121	7 1/2"	179						
WH549	95	27'-6"	Str.		3, 924						
WH550	2	27'-6"	133		83						
WH551	1 Ser. 9	6'-0" 11'-0"	104	7 1/2"	115						
WH552	6	4'-0"	Str.		36						
WH553	127	19'-3"	Str.		3, 672						
WH554	140	6'-2"	104		1, 297						
WH555	80	29'-6"	Str.		3, 545						
WH556	171	7'-0"	Str.		1, 798						
WH557	60	20'-9"	Str.		1, 870						
WH558	6	5'-3"	118		47						
WH559	40	9'-5"	108		567						
WH560	5	4'-9"	118		36						
WH561	30	21'-0"	Str.		946						
WH562	30	22'-6"	Str.		1, 014						
WH563	15	5'-9"	118		130						

BENDING DIAGRAMS



TOTAL WEIGHT = 251,525

Note:  
For Replacement Bar Schedule  
see sheet 308.

H.N.T.B. WALL NO. 84

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

WALL RIGHT OF RAMP 14 - M  
 REINFORCEMENT SCHEDULE

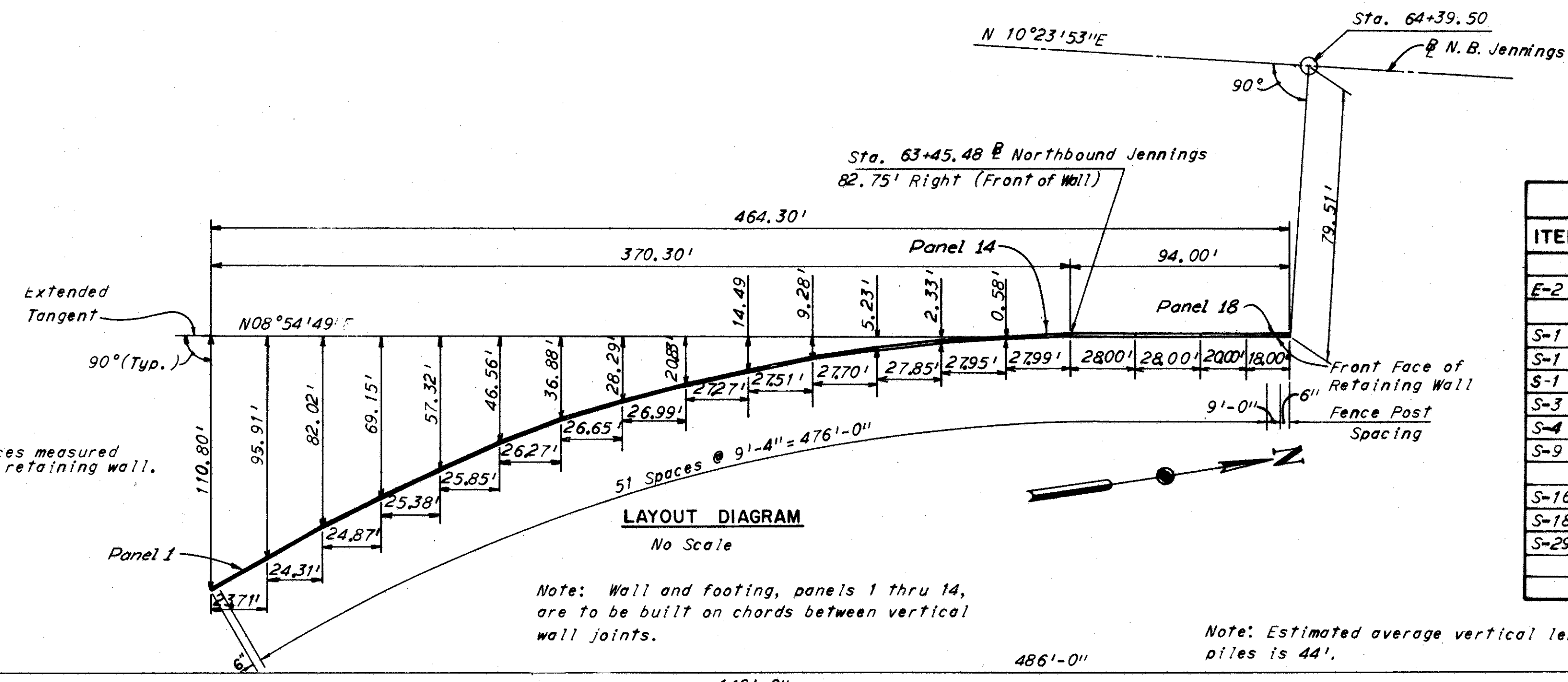
STA. 4 + 58 ±  
 STA. 10 + 84 ±

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/JEN	TRACED	CHECKED/JS	REVIEWED/WT	REVISED
DATE 1-29-65	DATE	DATE 1-29-65	DATE 1-29-65	DATE

SHEET 482

ESTIMATED QUANTITIES-RETAINING WALL 87			
ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Unclassified Excavation	Cu. Yd.	1,684
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	99
S-1	Class "E" Concrete, Retaining Wall (Footing)	Cu. Yd.	760
S-1	Class "G" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	615
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	326
S-4	Reinforcing Steel	Pounds	190,174
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	607
S-16	First Test Pile	Lump Sum	Lump Sum
S-18	Steel Bearing Piles (12 BP 53)	Lin. Ft.	14,564
S-29	Porous Backfill	Cu. Yd.	523



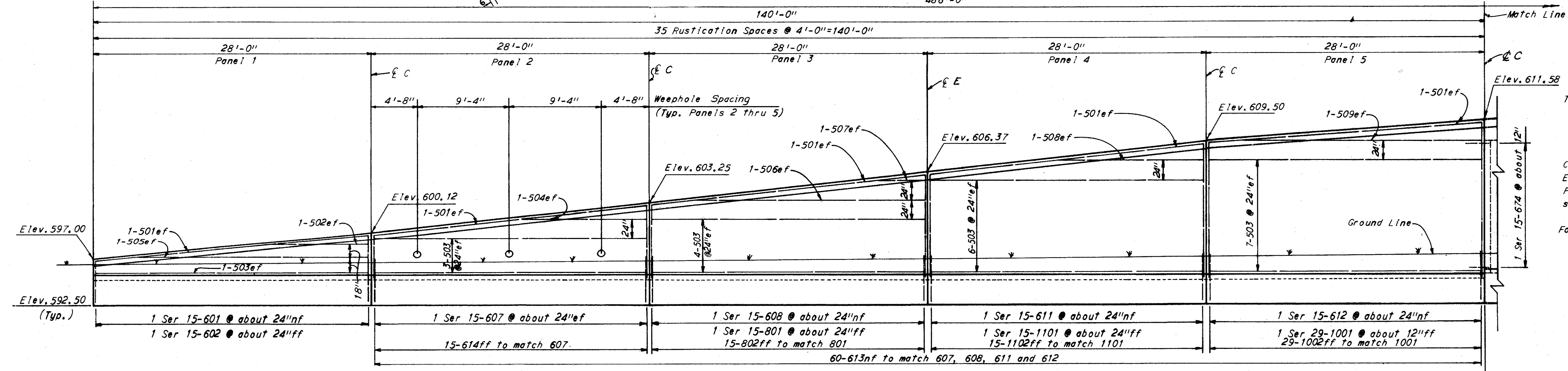
Note:  
 Offset distances measured to front face of retaining wall.

LAYOUT DIAGRAM  
 No Scale

Note: Wall and footing, panels 1 thru 14, are to be built on chords between vertical wall joints.

Note: Estimated average vertical length of piles is 44'.

Note: Wall Quantities carried to General Summary, sheet 42.  
 Fence Quantities carried on Sheet 613

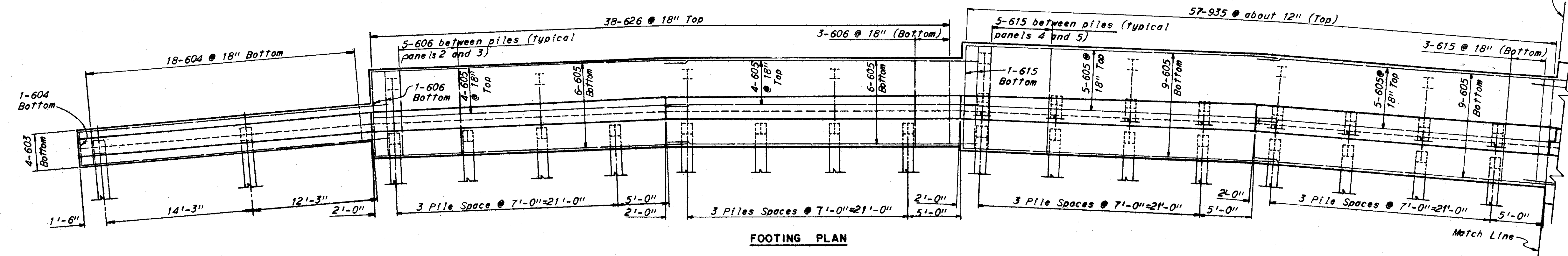


DEVELOPED ELEVATION  
 (Piles and chain link fence not shown)

Note: All longitudinal dimensions shown in footing plan and elevation shall be measured along the front face of wall.

Notes:  
 The following abbreviations are used:  
 ff = far face  
 nf = near face  
 ef = each face  
 C indicates contraction joint.  
 E indicates expansion joint.  
 For chain link fence details see sheet 489.  
 For additional notes see sheet 486

Note:  
 All reinforcing bar marks shall be prefixed WJ.



FOOTING PLAN

H.N.T.B. WALL NO. 87

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

WALL RIGHT OF NORTHBOUND  
 JENNINGS FREEWAY

STA. 59+22±  
 STA. 64+39.50

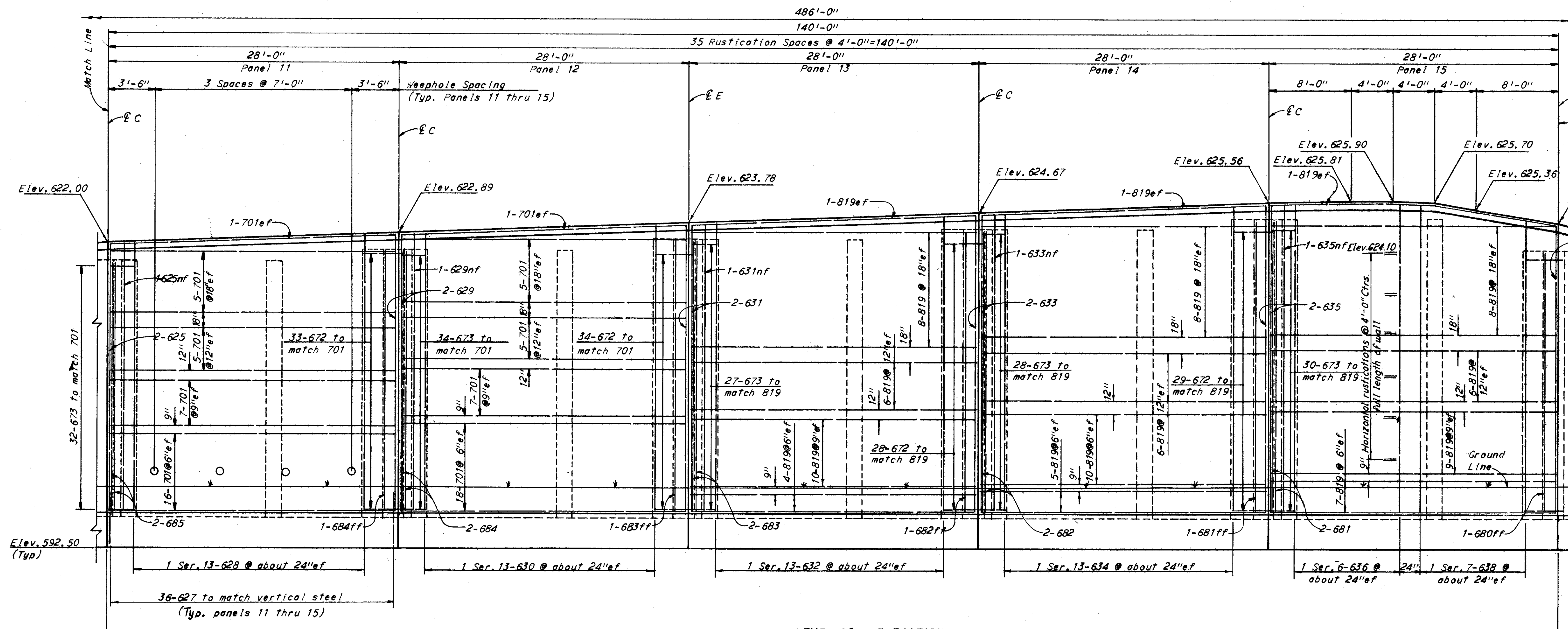
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN S.J.E.	TRACED	CHECKED J.K.H.	REVIEWED W.P.
DATE 8/21/64	DATE	DATE 7-5-65	DATE 1-29-65

SHEET 483



CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

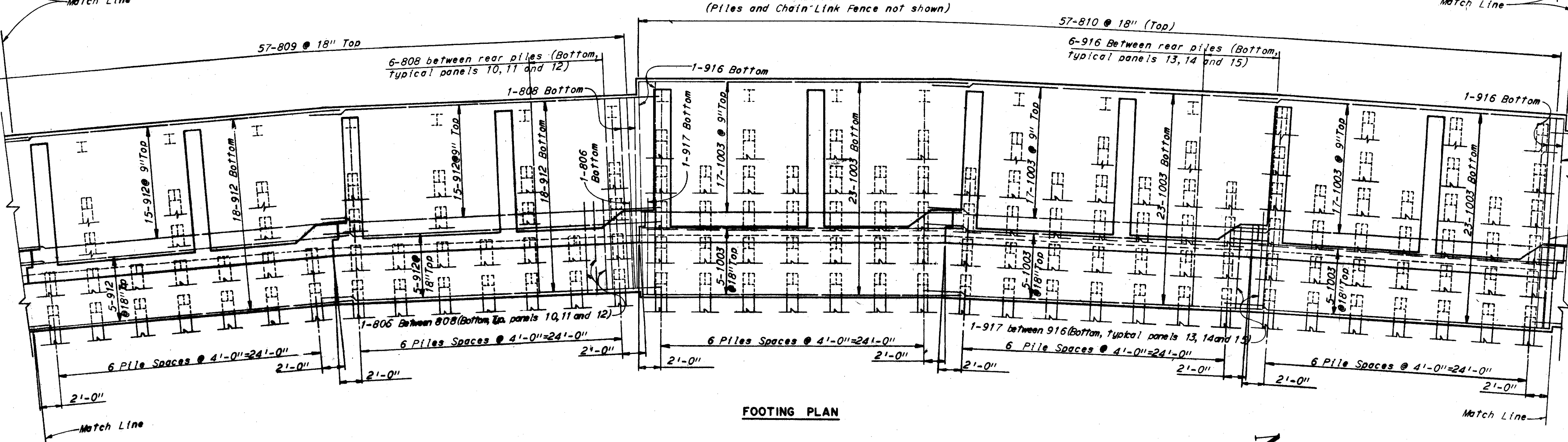


Notes:  
The following abbreviations are used:  
ff = far face  
nf = near face  
ef = each face  
C = Contraction Joint  
E = Expansion Joint  
For additional notes see sheet 486.

Notes:  
All reinforcing bar marks shall be prefixed WJ.

Note: Rear piles in panel 15 shall be inclined 2 in 12 in direction shown.

DEVELOPED ELEVATION  
(Piles and Chain Link Fence not shown)



FOOTING PLAN

H.N.T.B. WALL NO. 87  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

WALL RIGHT OF NORTHBOUND  
JENNINGS FREEWAY

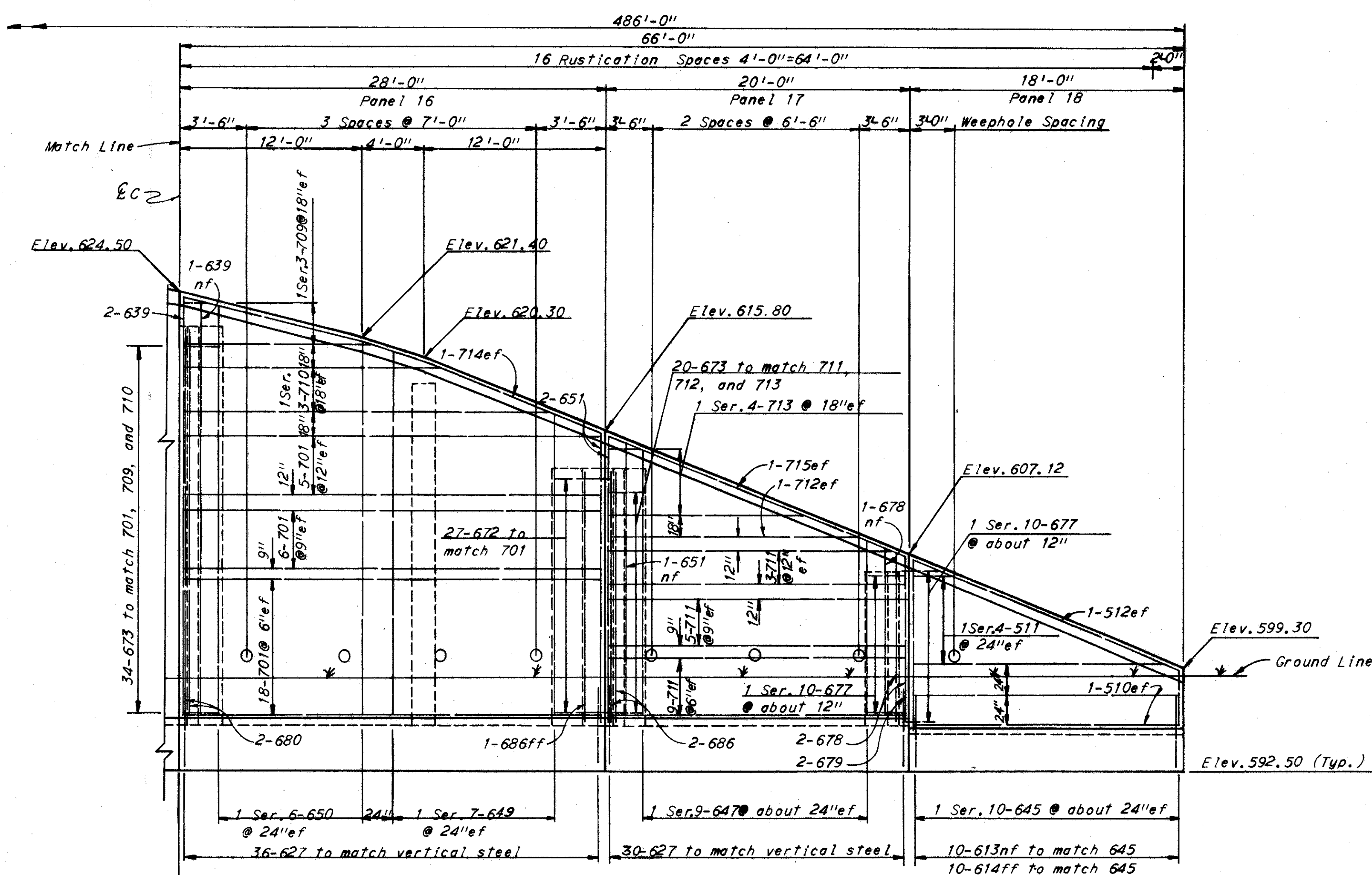
STA. 59+22±  
STA. 64+39.50

CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN SJE	TRACED	CHECKED
DATE 9/25/64	DATE	DATE 1-5-65
		REVIEWED
		DATE 1-29-65
		REVISOR
		DATE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

486  
646

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

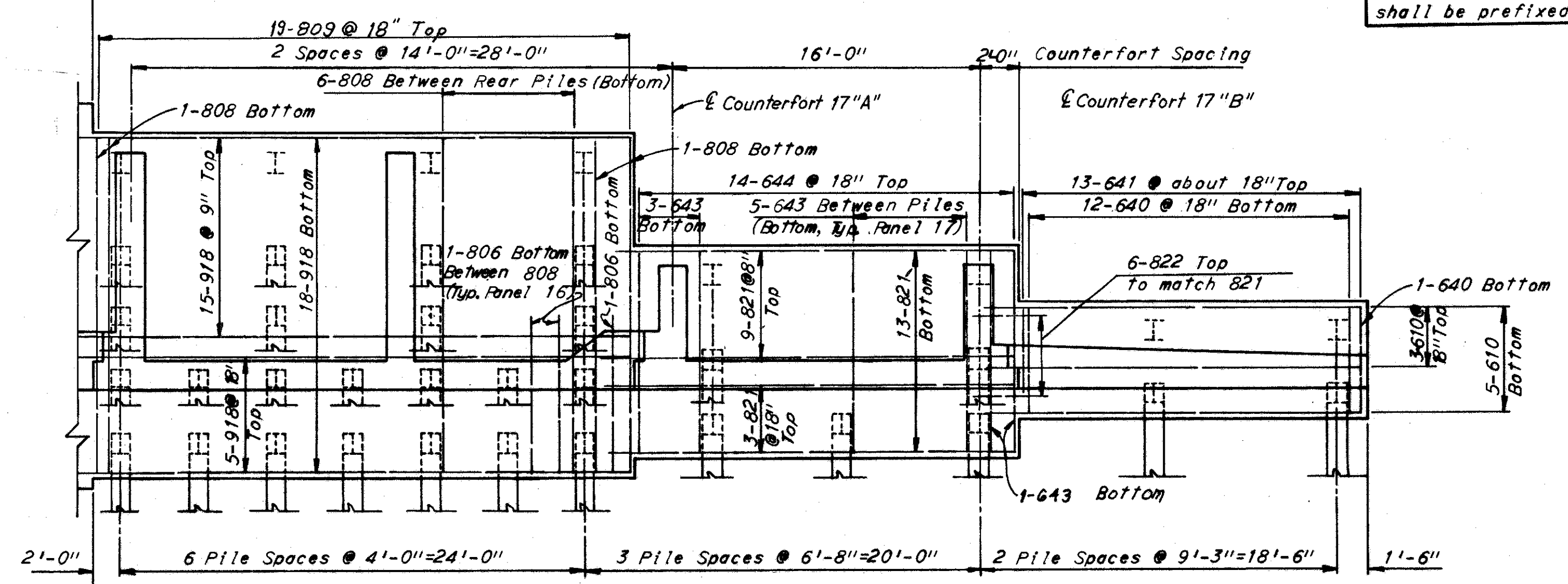


**DEVELOPED ELEVATION**

(Piles and Chain Link Fence not shown)

**Notes.**  
 All piles are 12BP53.  
 All battered piles shall be inclined 4 in 12 in the direction shown except as noted.  
 Pile layout dimensions are measured along bottom of footing.  
 Optional transverse construction joints in footings shall not be less than 5'-0" from wall panel joints and shall be centered between piles. All longitudinal footing bars shall be doweled through construction joints.  
 For wall joint details see sheet 489.  
 Backfill shall be placed in front of wall prior to or simultaneous with the placing of fill behind the wall.  
 Panels 1 thru 5 and Panel 18 shall be Class E concrete. Panels 6 thru 17 shall be Class C concrete.  
 Vertical rustications shall coincide with panel joints and shall extend from top of footing to bottom of coping.  
 For rustication details see sheet 489.  
 For Reinforcing Schedule and Bar Bending Diagrams see sheet 490.  
 A 5' Chain Link Fence shall be provided along top of wall for details see sheet 489.  
 The following abbreviations are used:  
 ff = far face  
 nf = near face  
 ef = each face

**Note:**  
 All reinforcing bar marks shall be prefixed WJ.



**FOOTING PLAN**

H.N.T.B. WALL NO. 87

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
<b>WALL RIGHT OF NORTHBOUND JENNINGS FREEWAY</b>			
STA. 59+22± STA. 64+39.50			
CLEVELAND	CUYAHOGA COUNTY	OHIO	
DRAWN BY DATE 9/26/64	TRACED DATE	CHECKED DATE 7-9-65	REVIEWED DATE 1-29-65

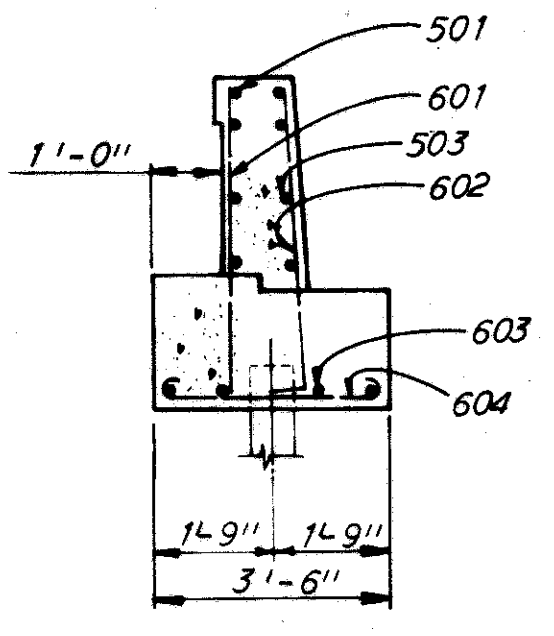
SHEET 486

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

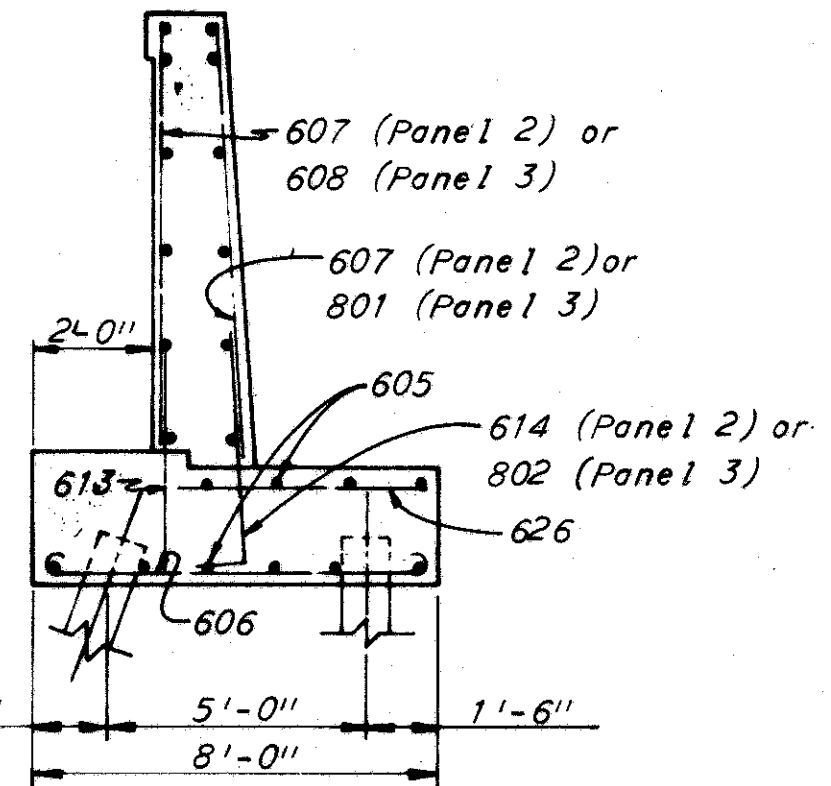
487  
646

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

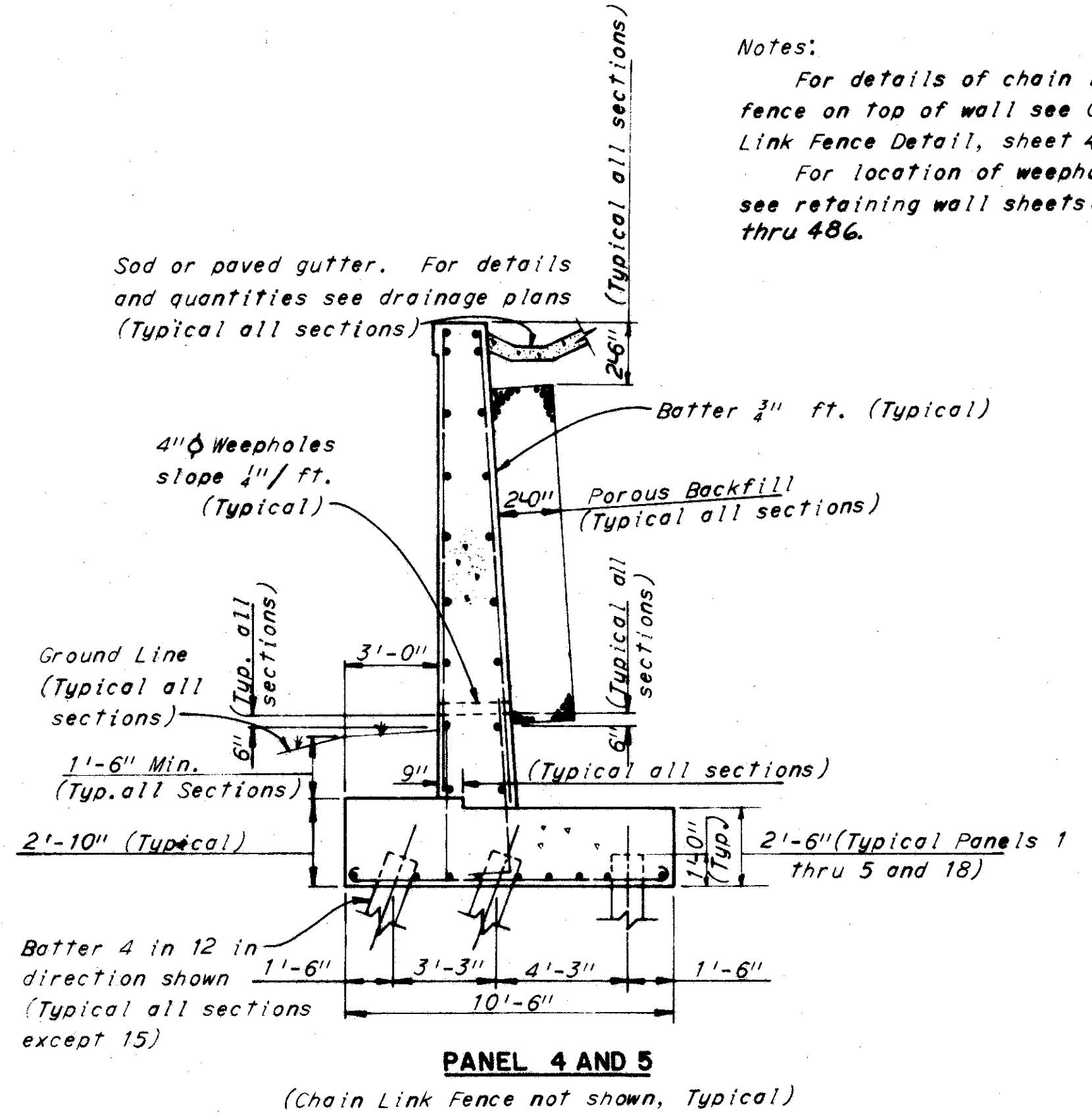
Notes:  
For details of chain link fence on top of wall see Chain Link Fence Detail, sheet 489.  
For location of weepholes see retaining wall sheets 483. thru 486.



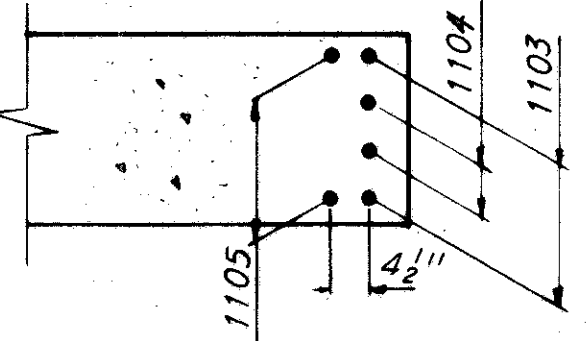
**PANEL 1**  
(For additional details see panels 4, 5 and 6)



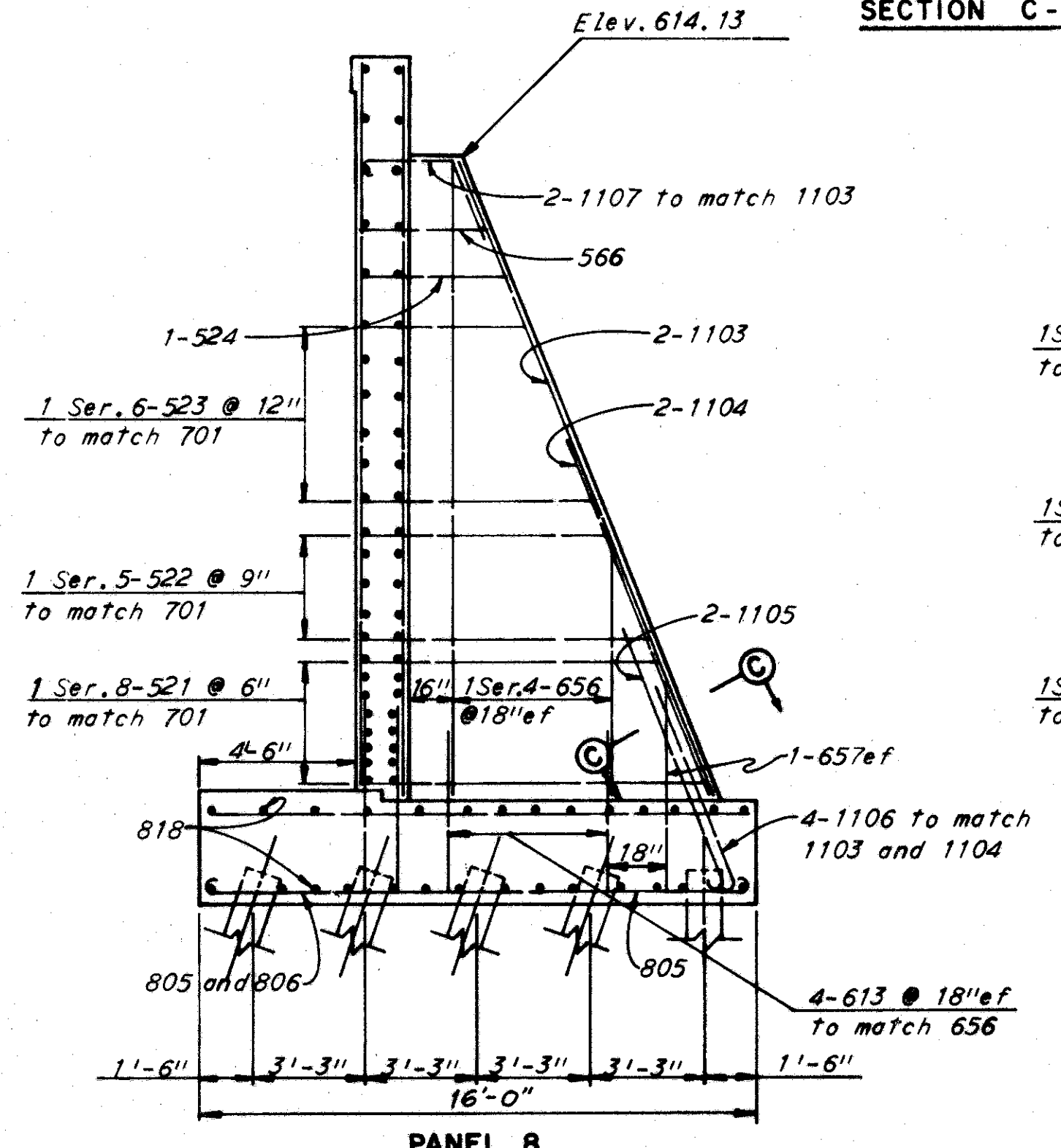
**PANEL 2 AND 3**  
(For additional details see panels 4, 5 and 6)



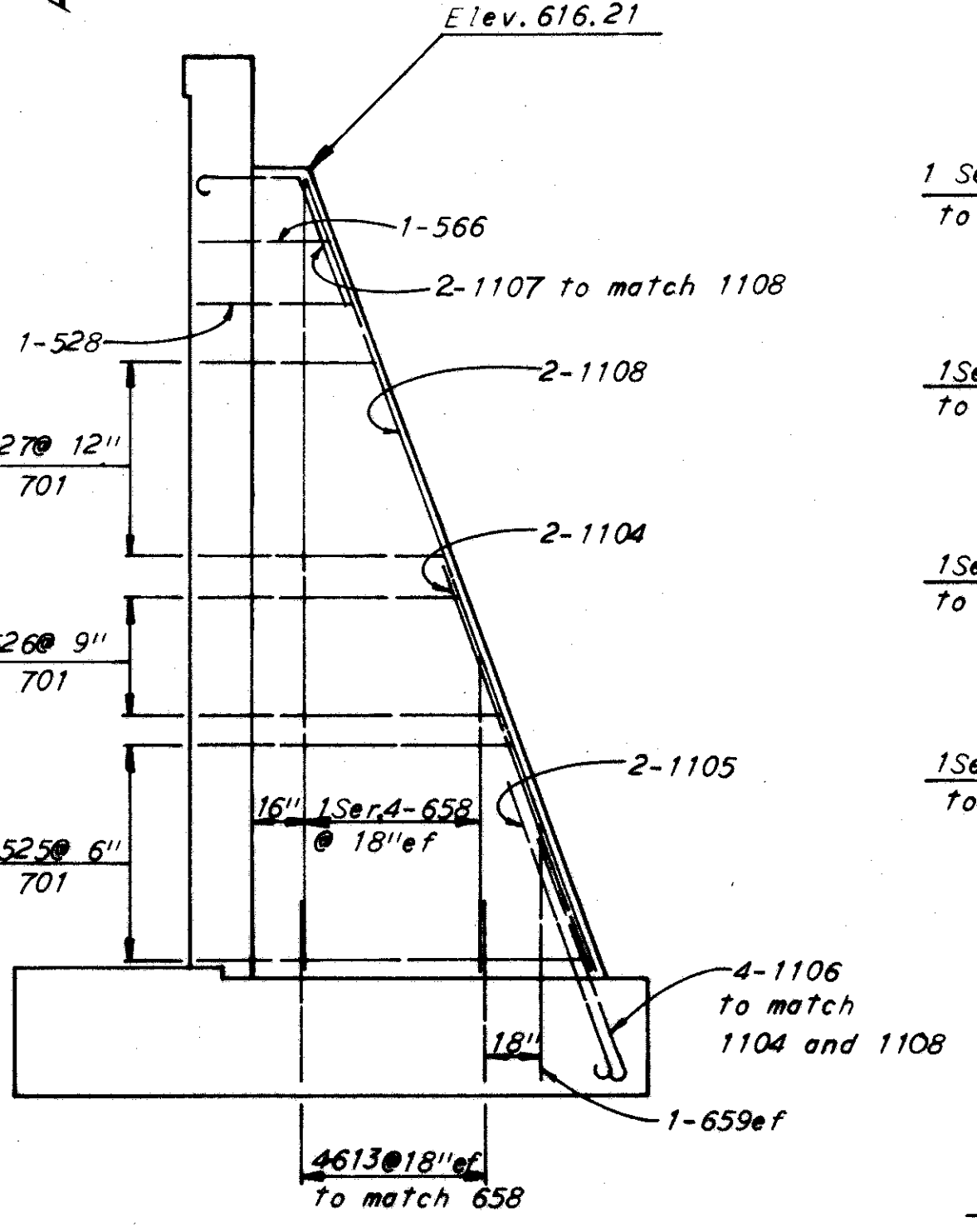
**PANEL 4 AND 5**  
(Chain Link Fence not shown, Typical)



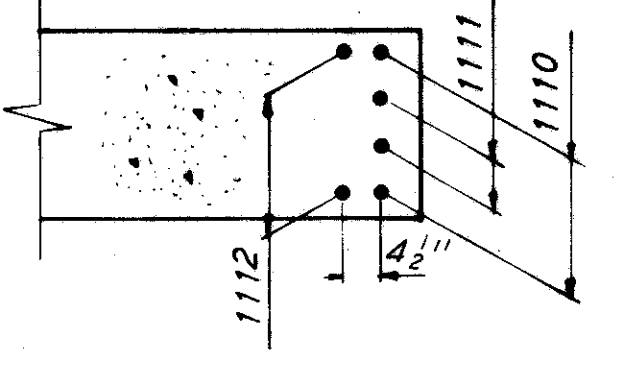
**SECTION C-C**



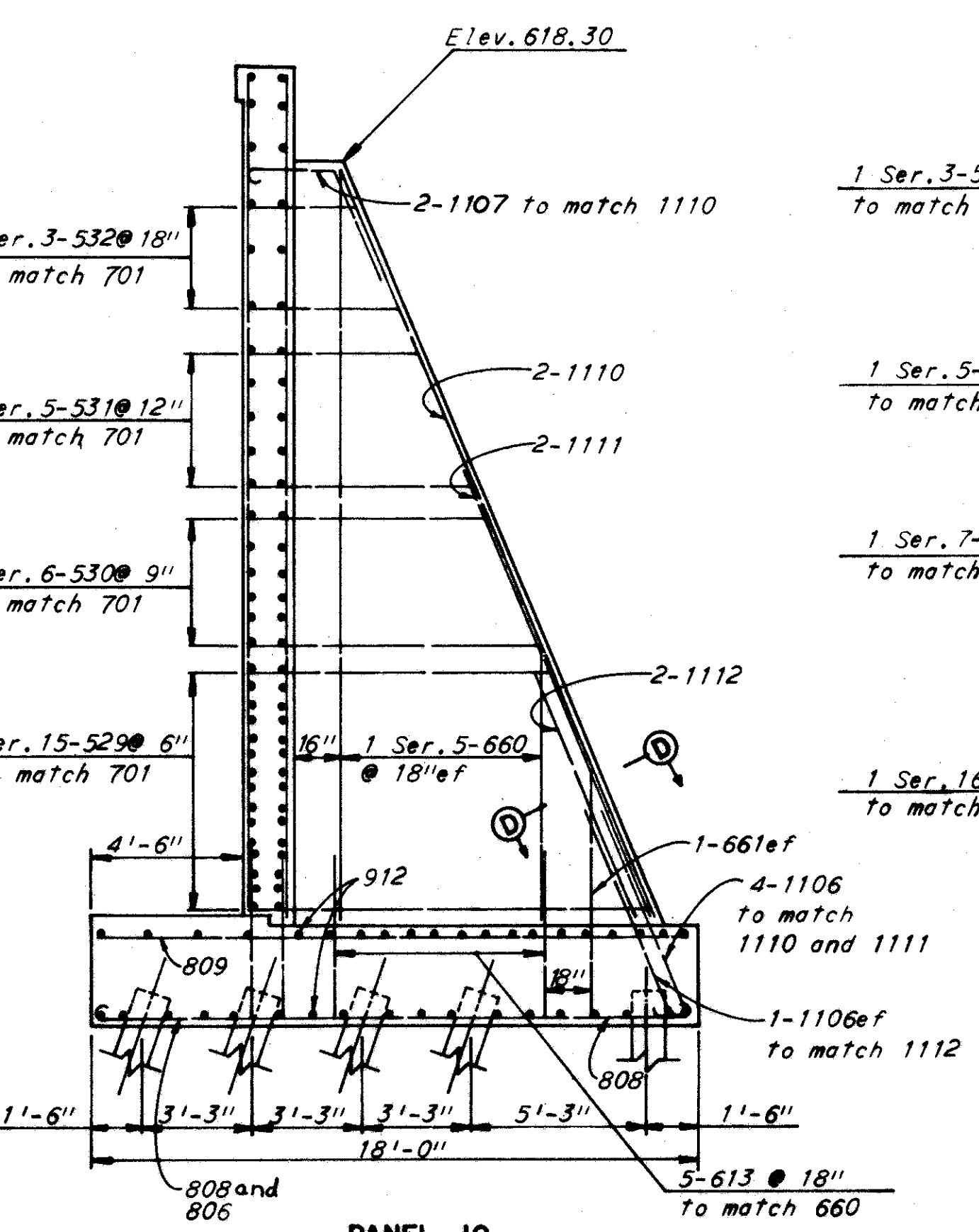
**PANEL 8**



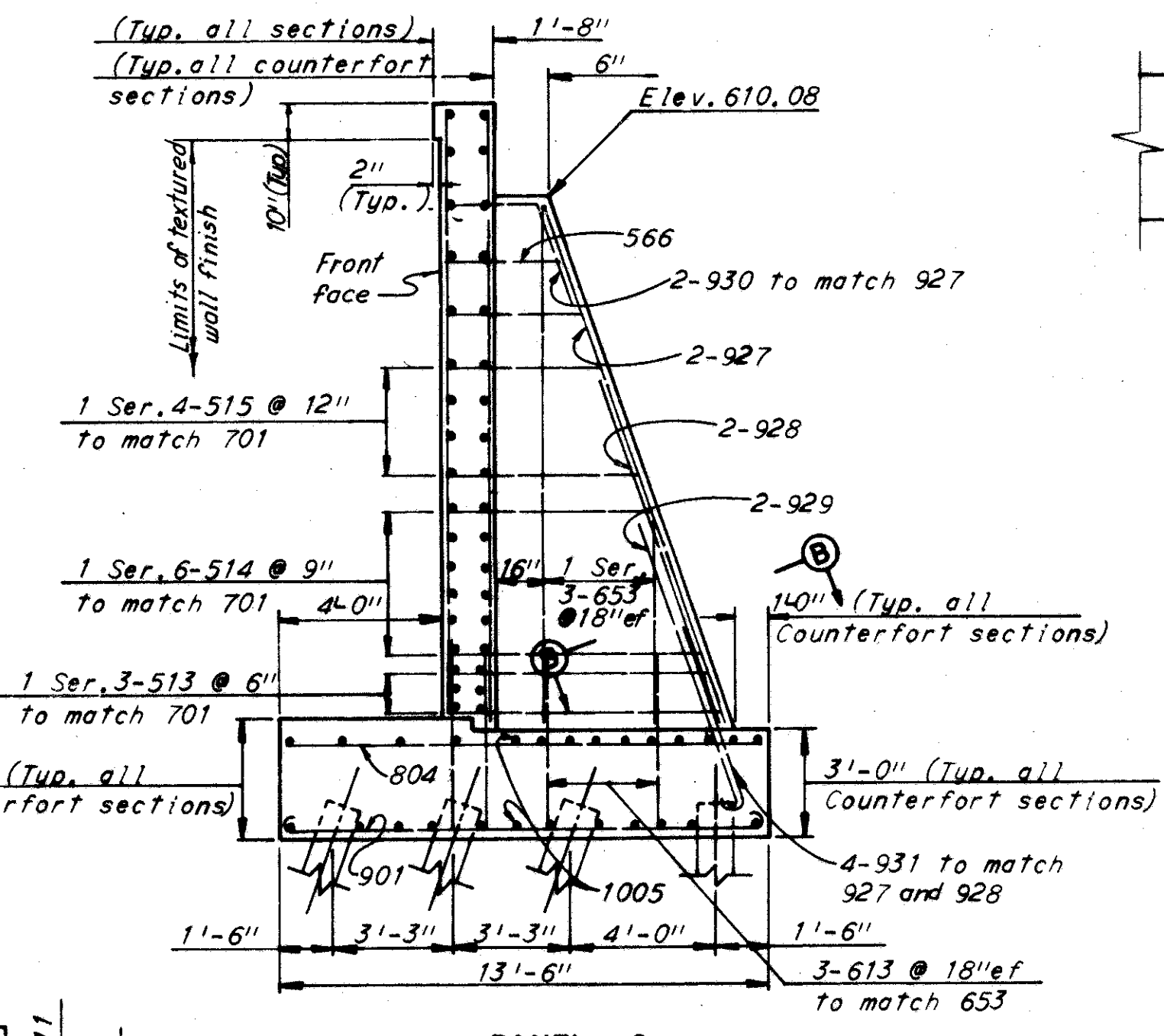
**PANEL 9**  
(For additional details see Panel 8)



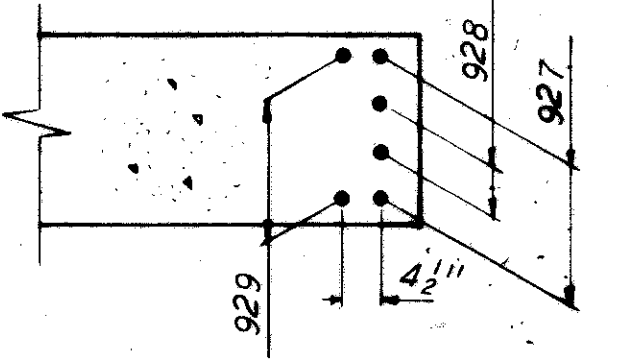
**SECTION D-D**



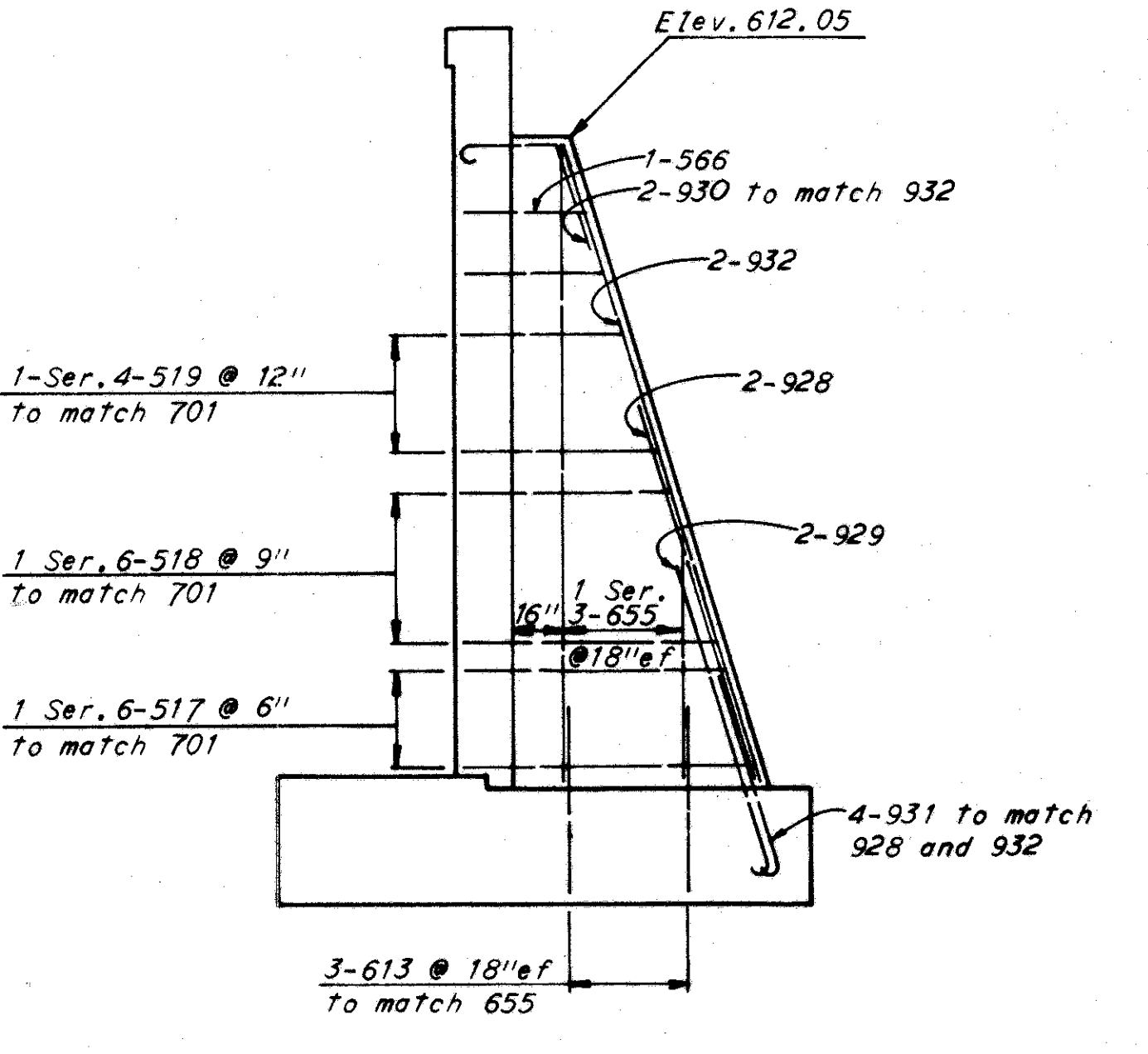
**PANEL 10**



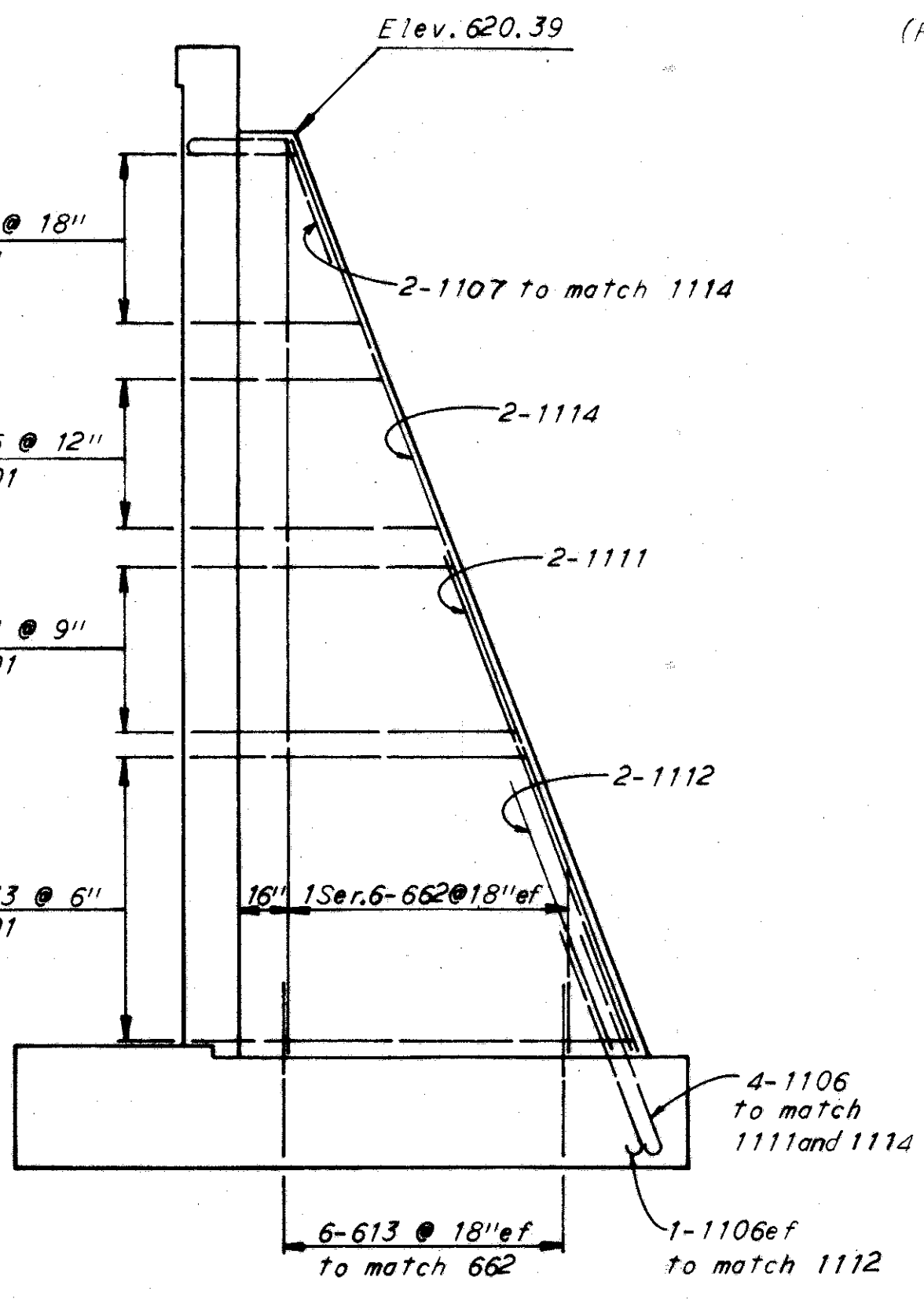
**PANEL 6**



**SECTION B-B**



**PANEL 7**  
(For additional details see Panel 6)



**PANEL 11**  
(For additional details see Panel 10)

For notes see sheet 486.

H.N.T.B. WALL NO. 87  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

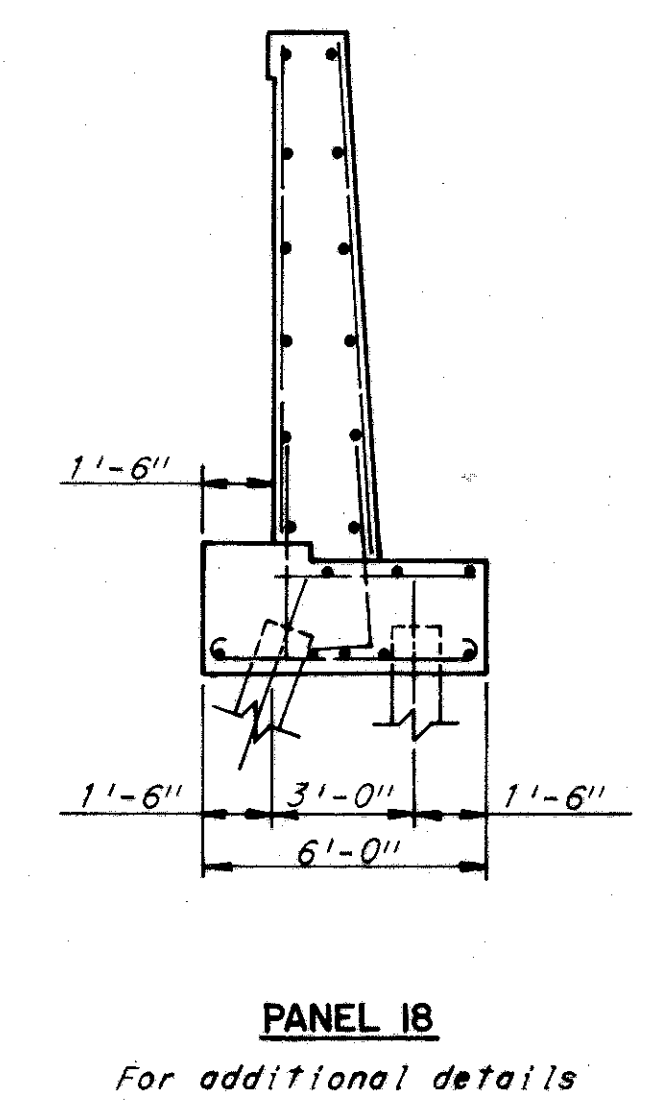
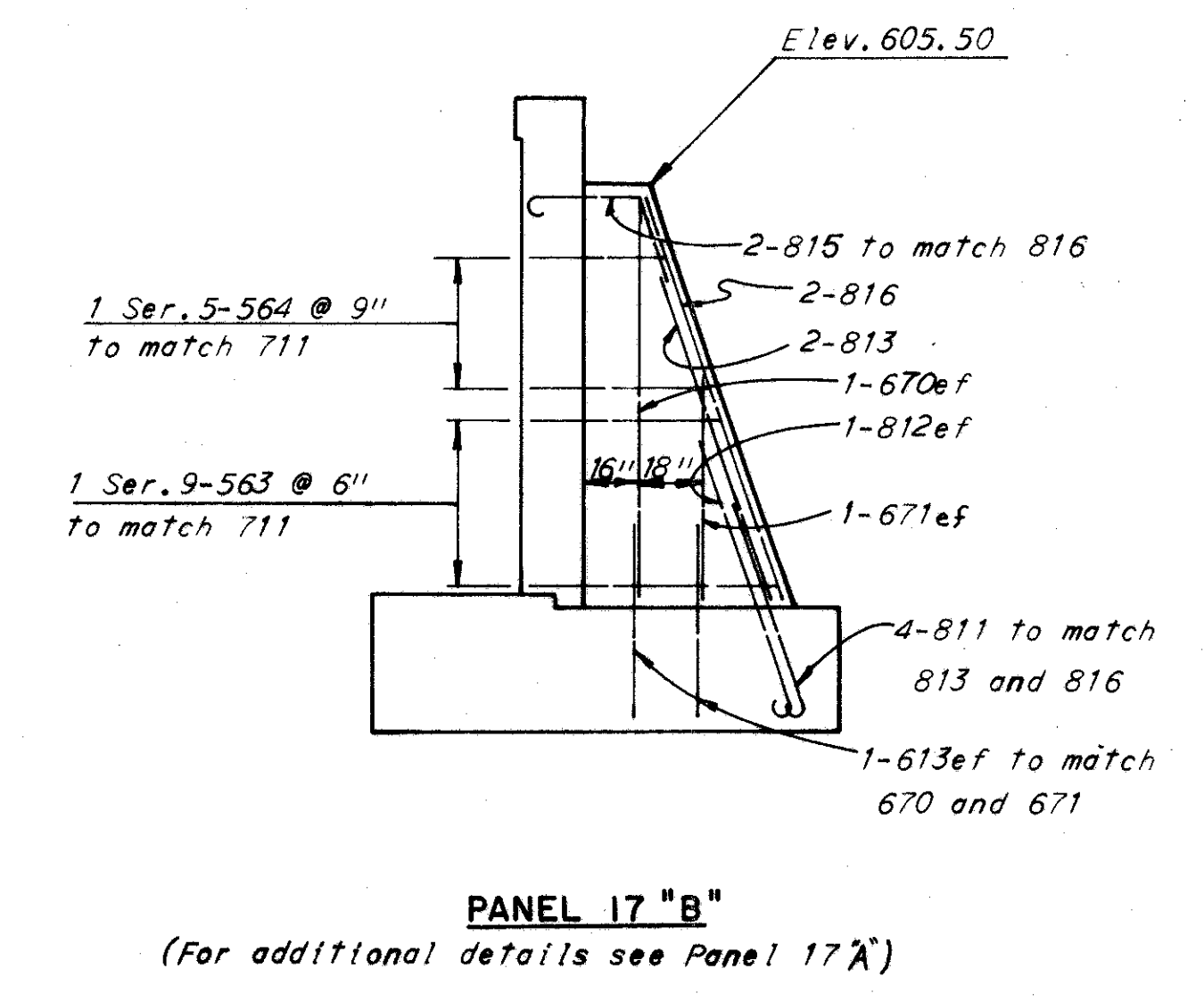
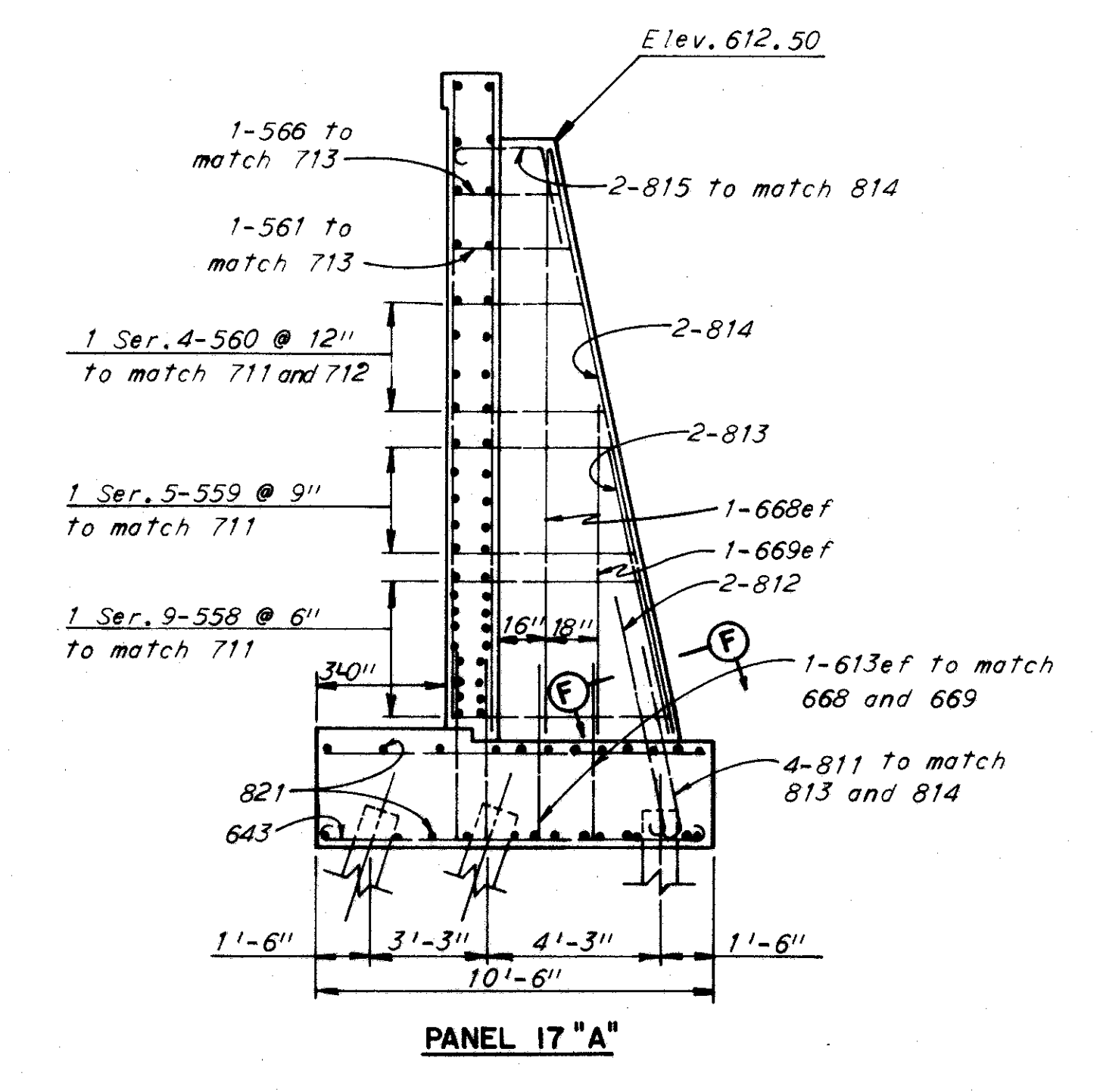
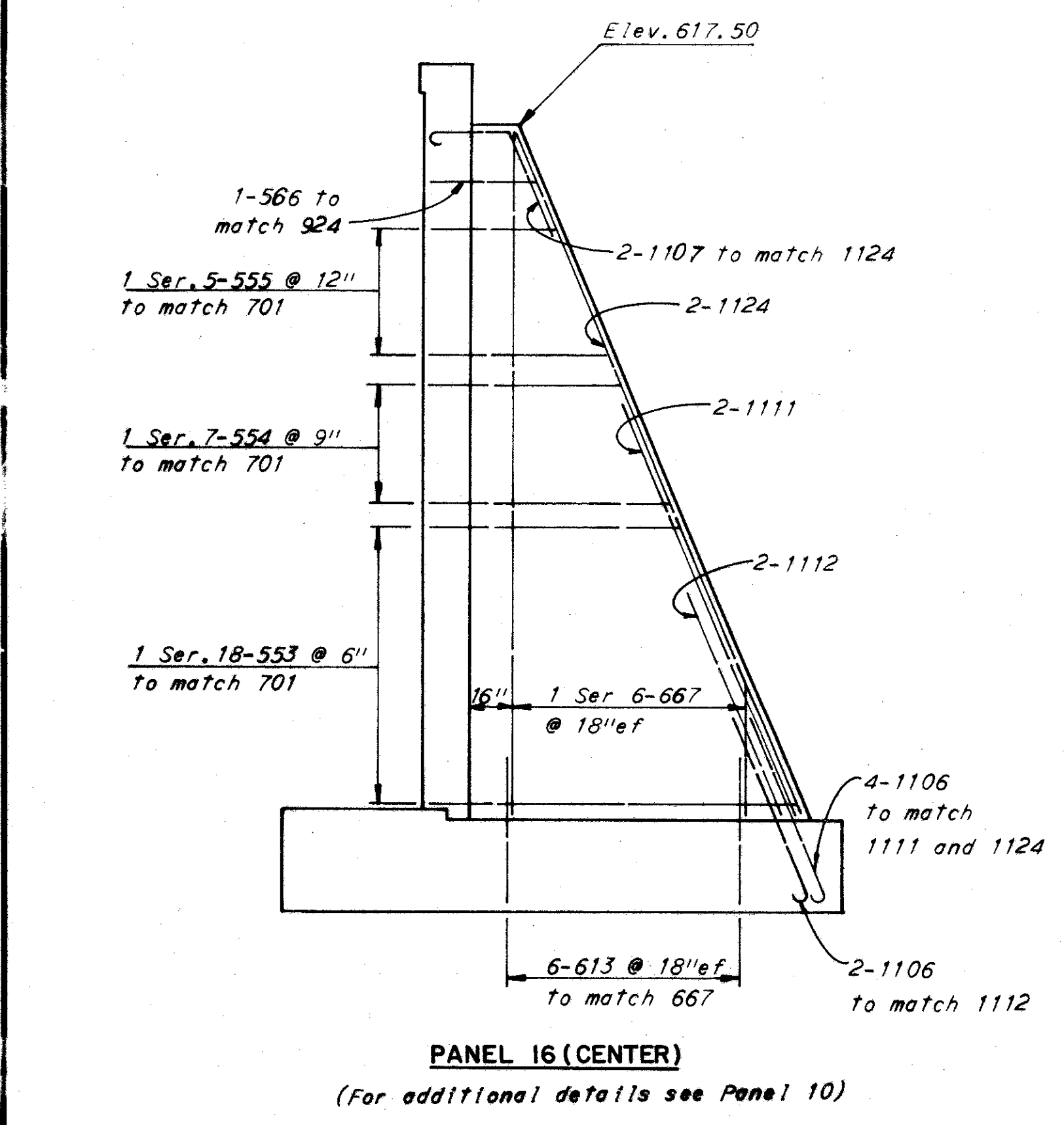
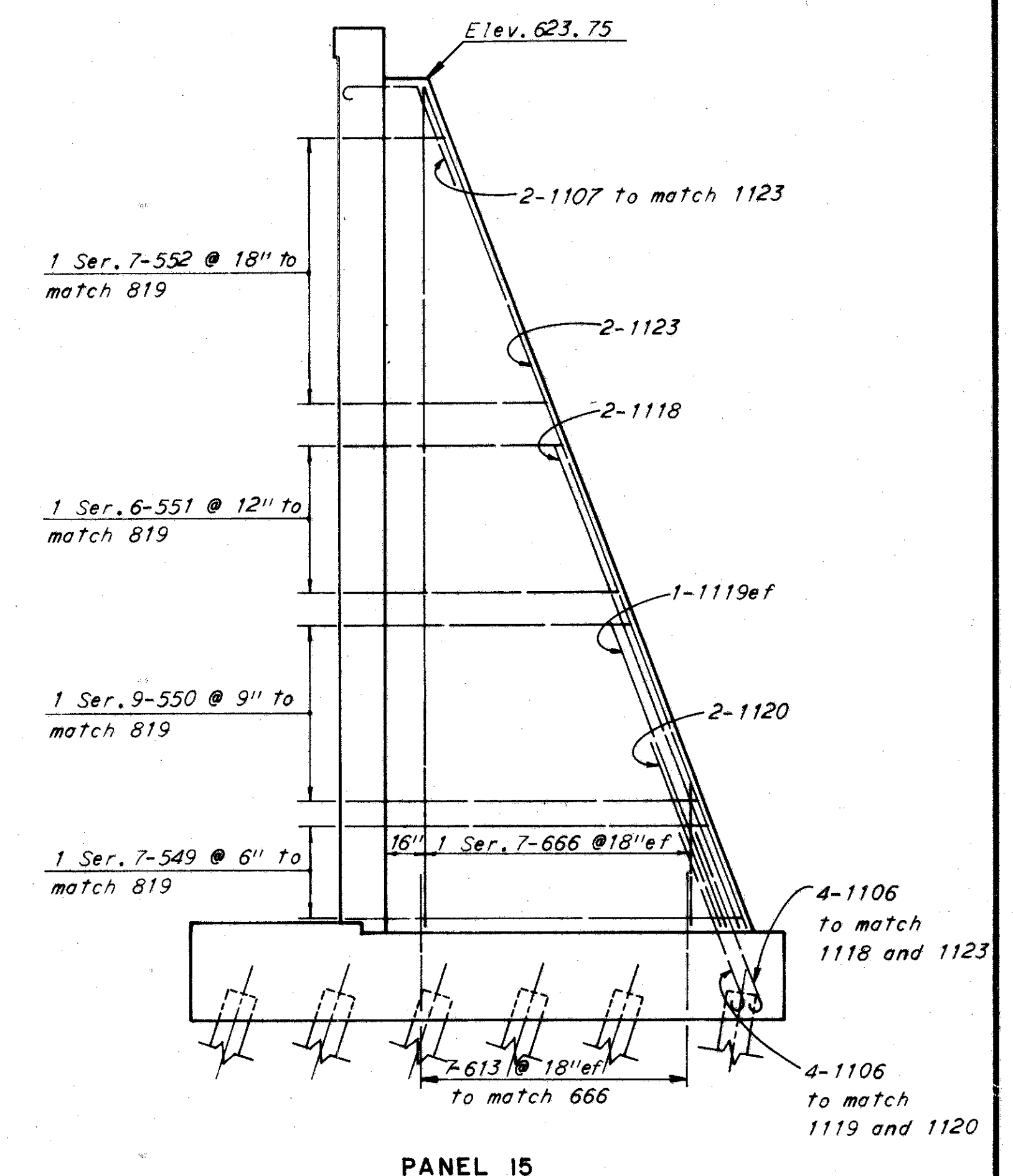
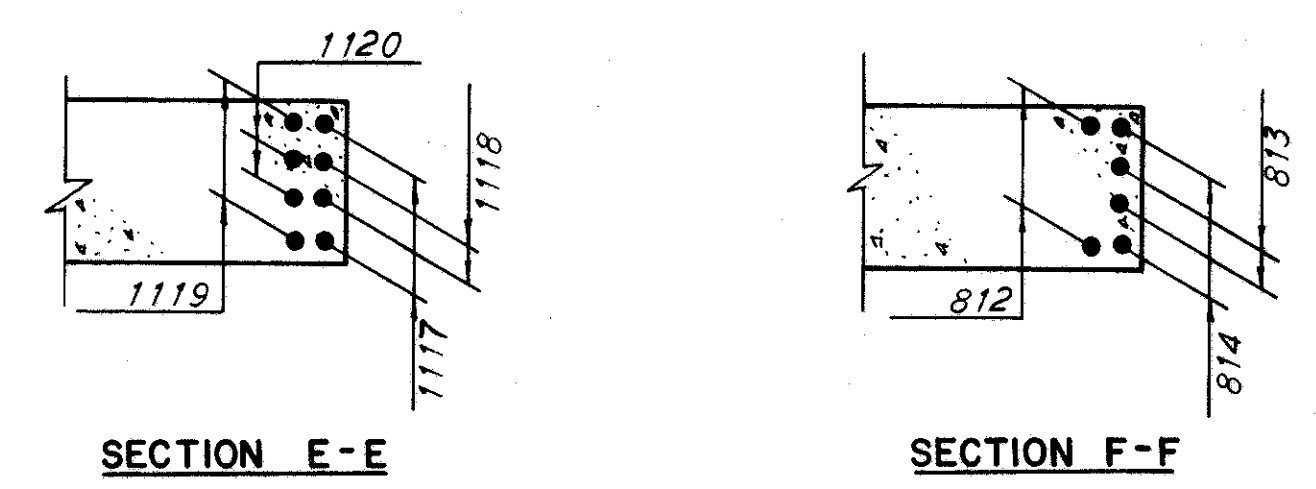
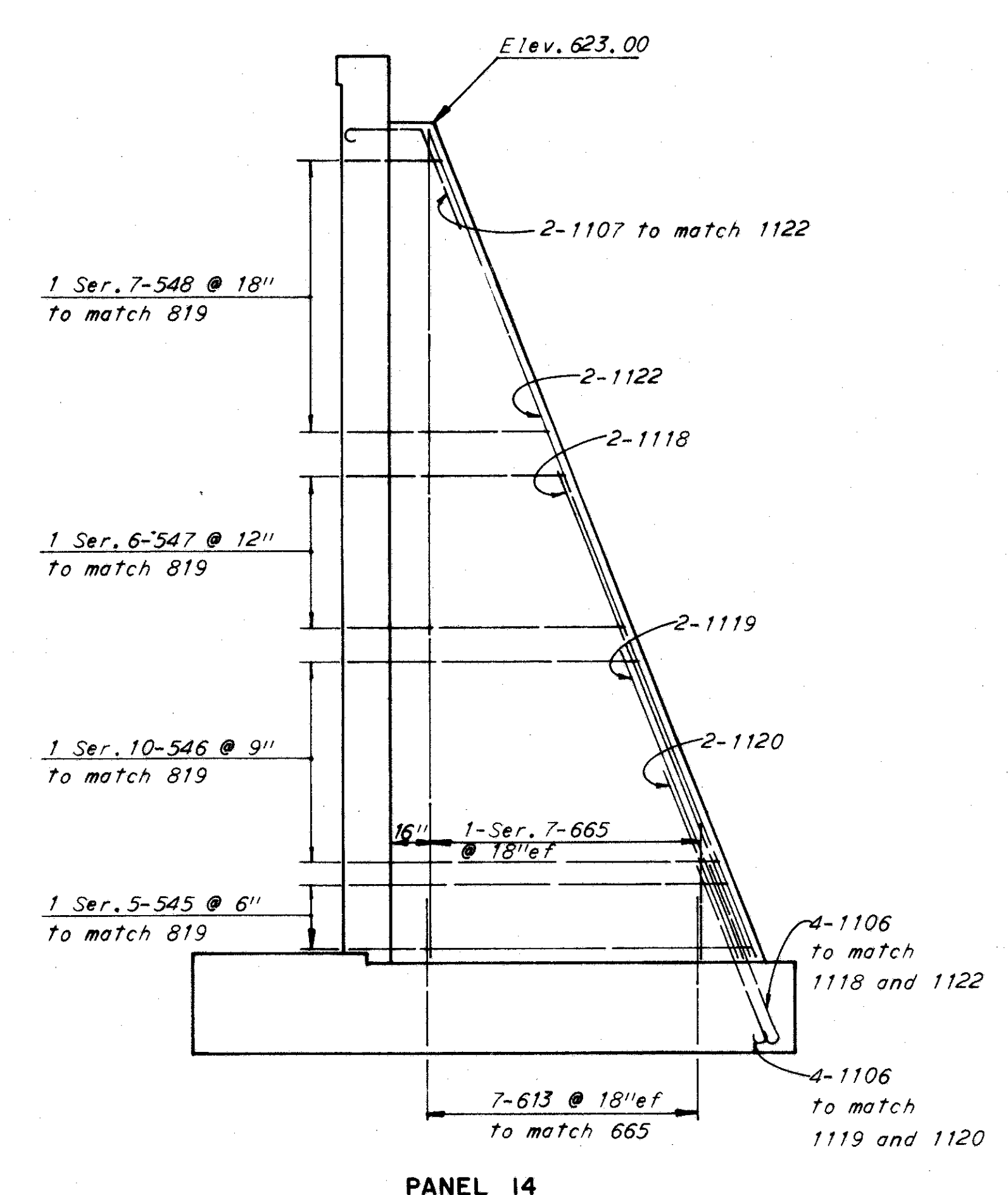
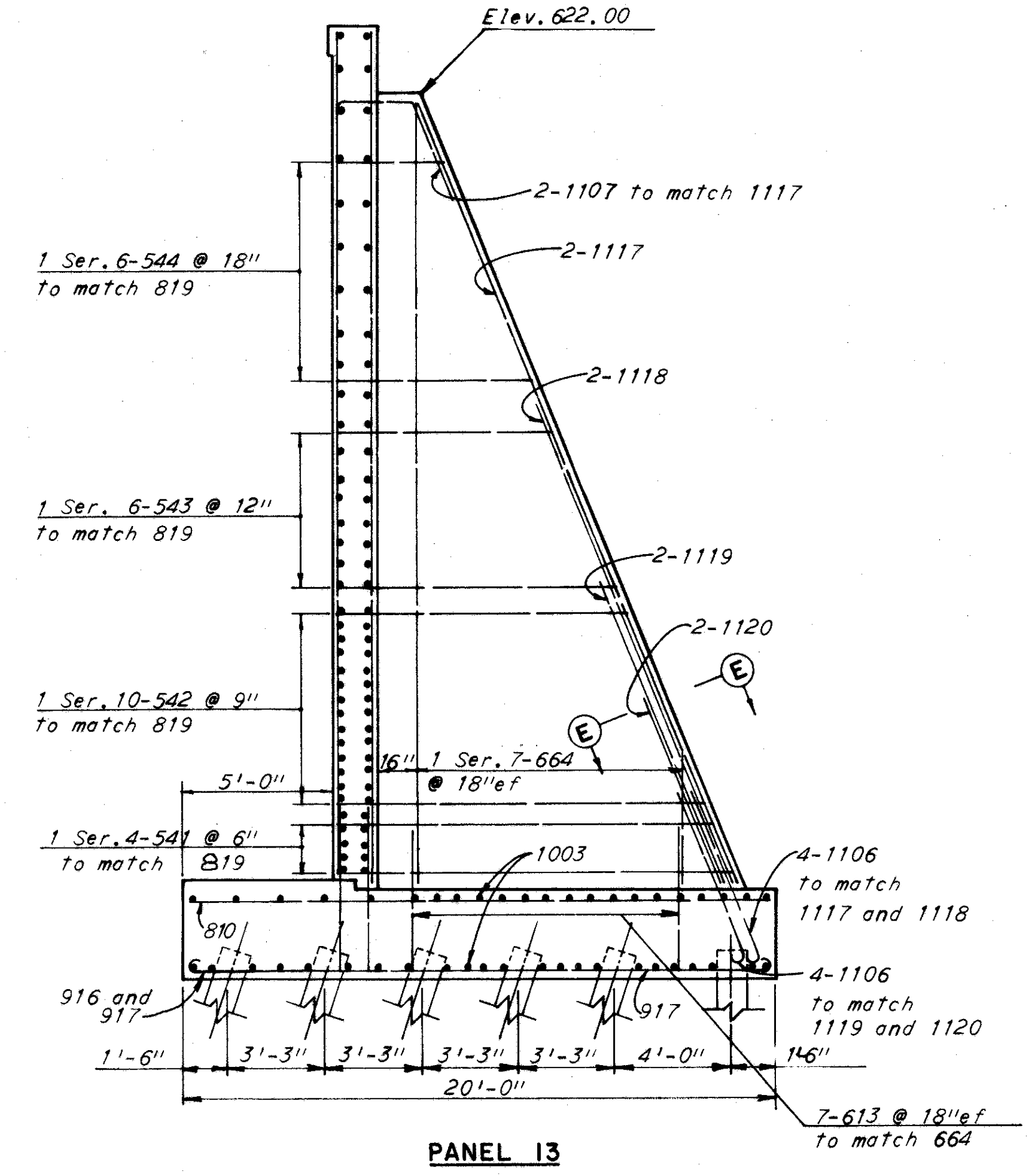
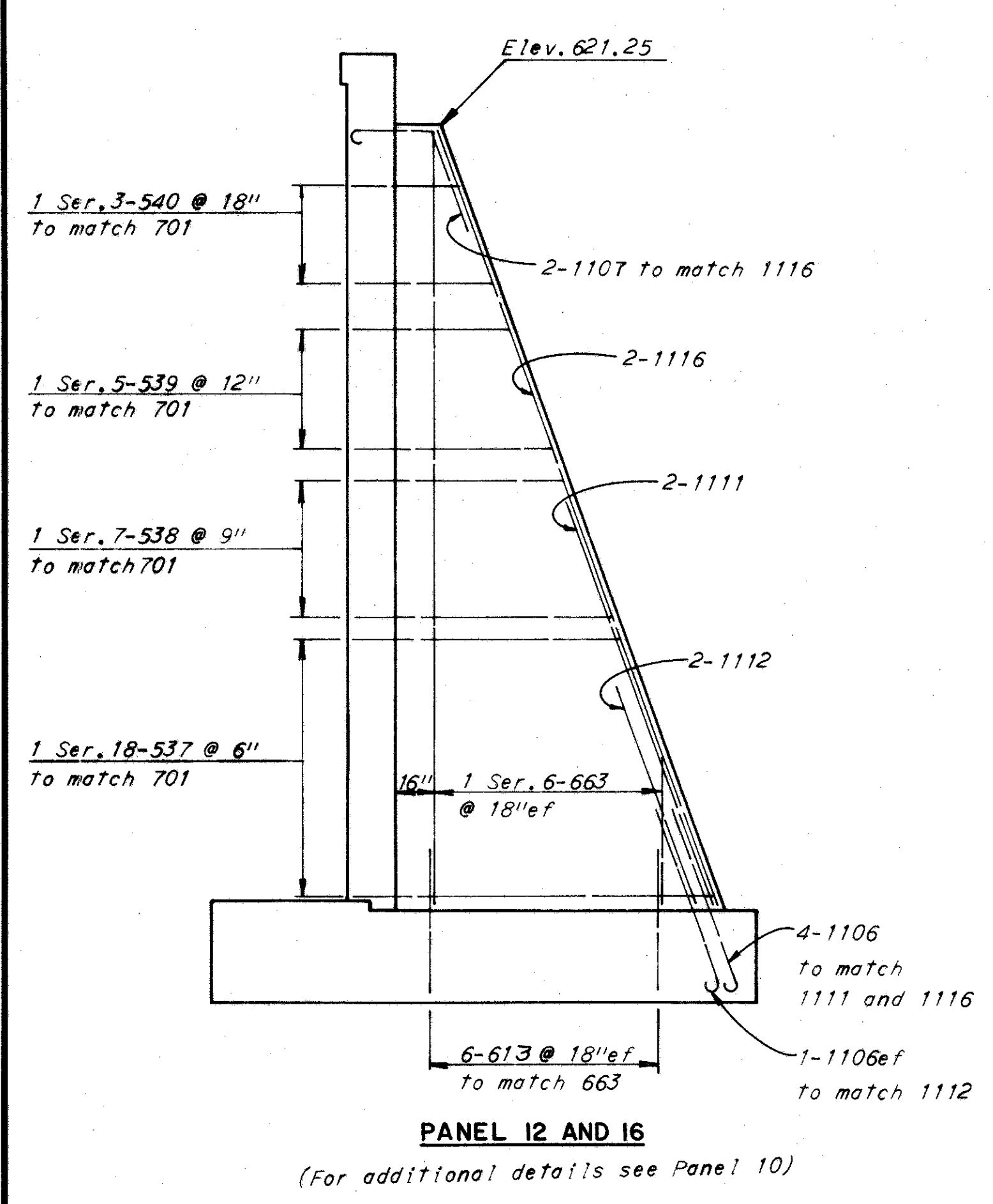
**WALL RIGHT OF NORTHBOUND JENNINGS FREEWAY**

STA. 59+22 ±  
STA. 64+39.50

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN BY J.E. TRACED CHECKED J.R.H. REVIEWED J.F. REVISOR  
DATE 10-21-64 DATE 7-8-65 DATE 7-29-65 SHEET 487

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY -176-12.76



H.N.T.B. WALL NO. 87

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY      CLEVELAND      NEW YORK

**WALL RIGHT OF NORTHBOUND JENNINGS FREEWAY**

STA. 59+22±  
 STA. 64+39.50

CLEVELAND      CUYAHOGA COUNTY      OHIO

DRAWN BY *JE* TRACED      CHECKED *JKH*      REVIEWED *WJF*      REVISED

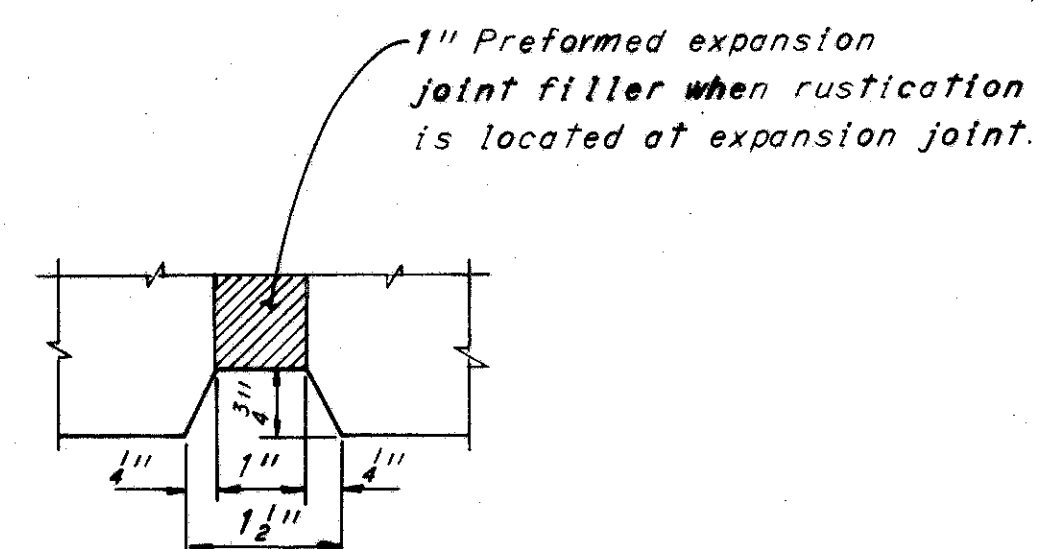
DATE 10/21/64      DATE 1-5-65      DATE 1-29-65      SHEET 488



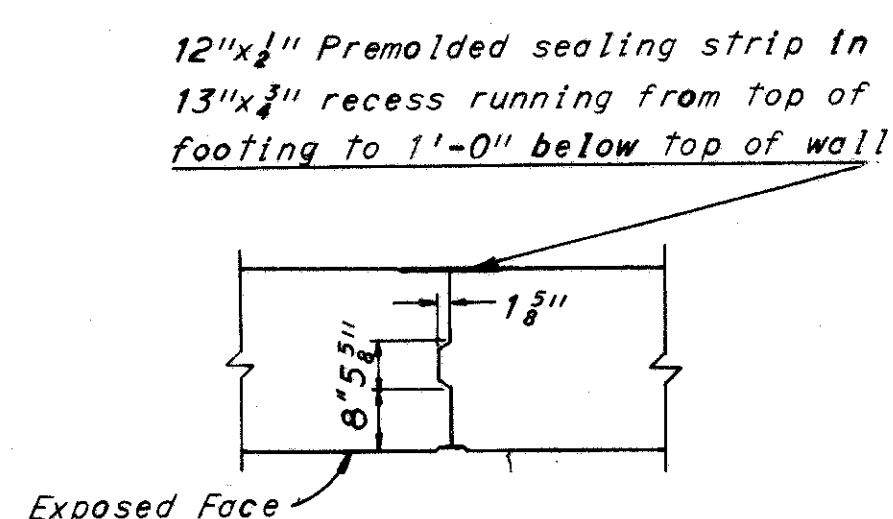
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

489  
646

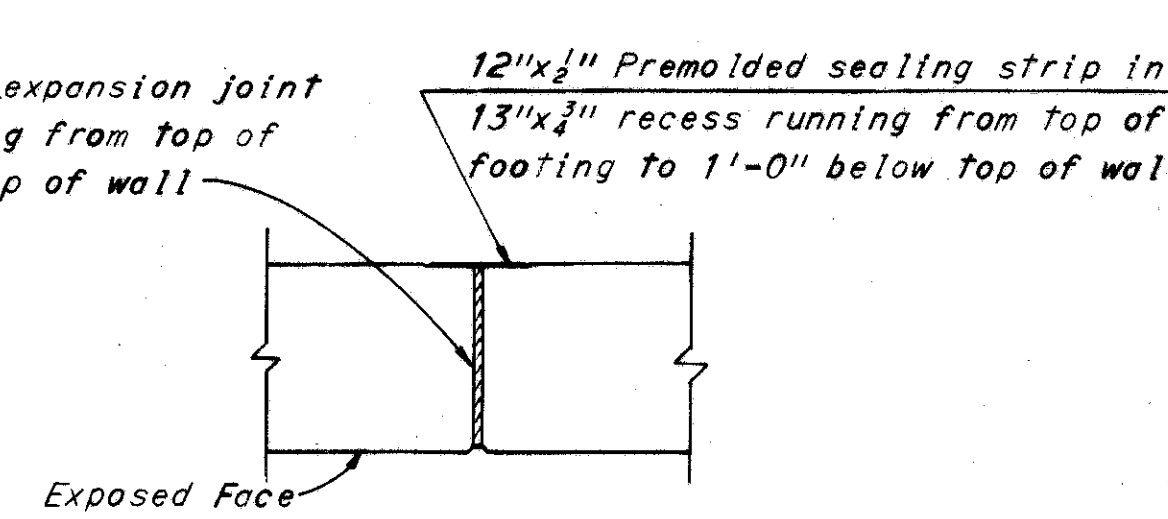
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



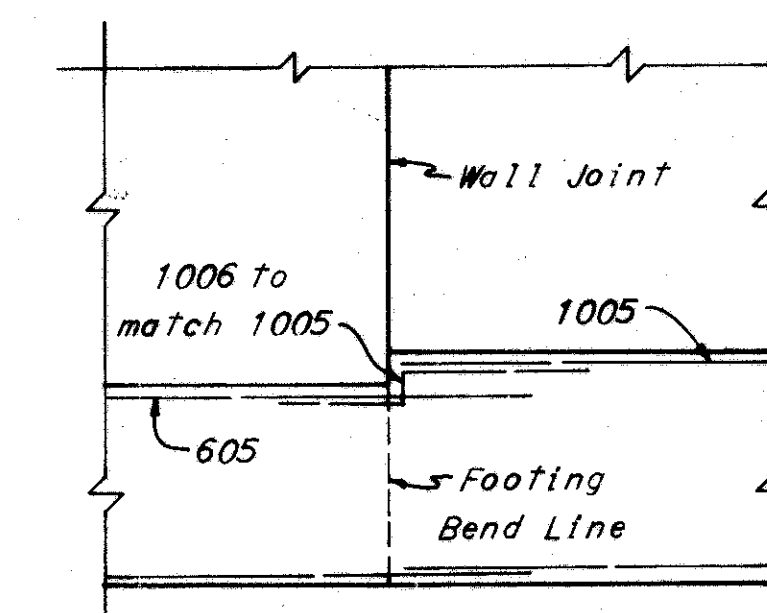
**RUSTICATION DETAIL**



**CONTRACTION JOINT DETAIL**

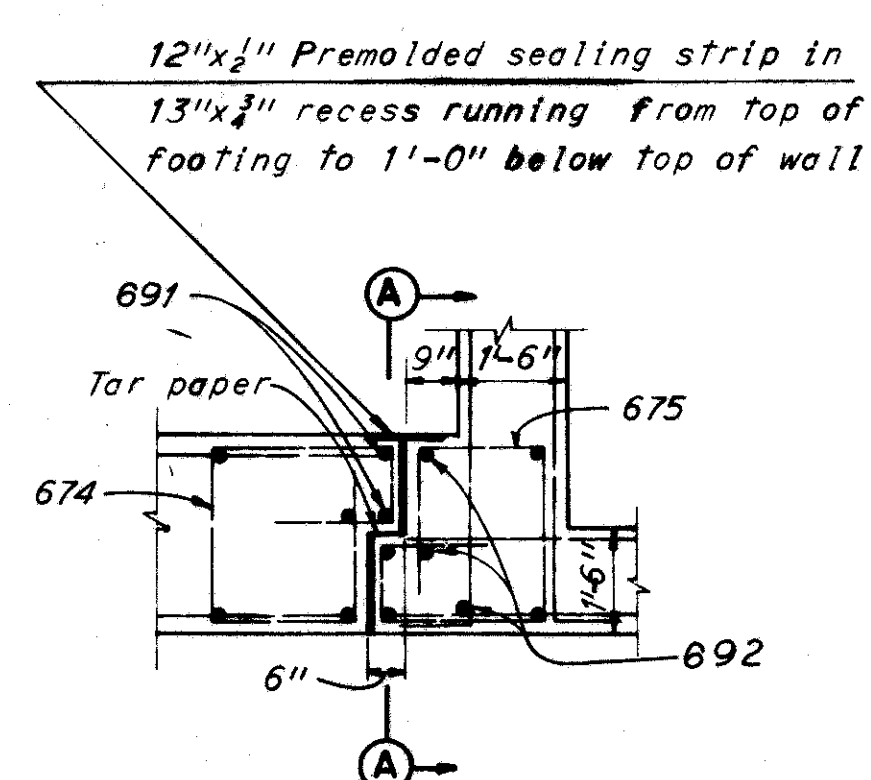


**EXPANSION JOINT DETAIL**

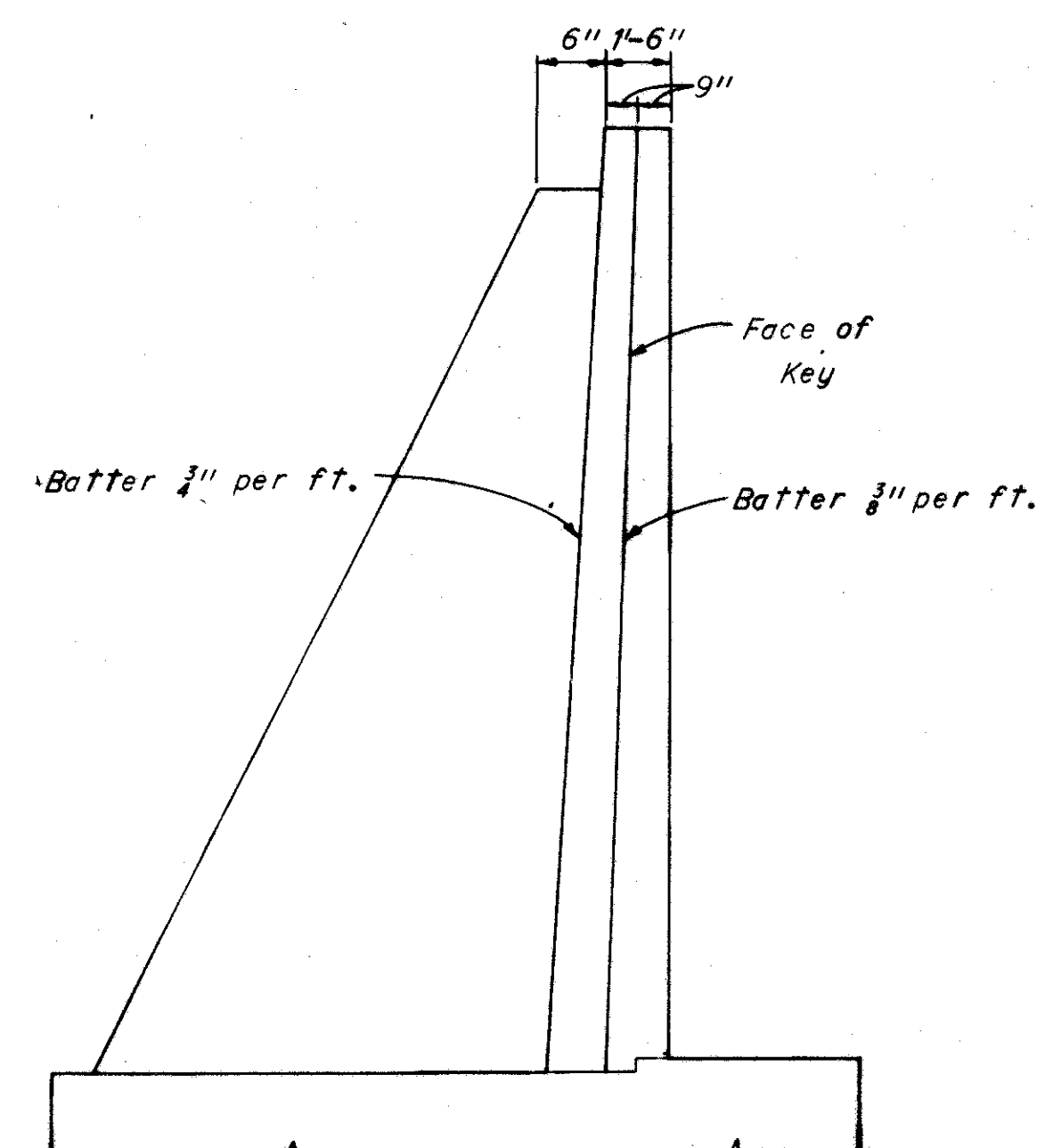


**FOOTING STEP DETAIL**  
(Step at Panel 6 shown)

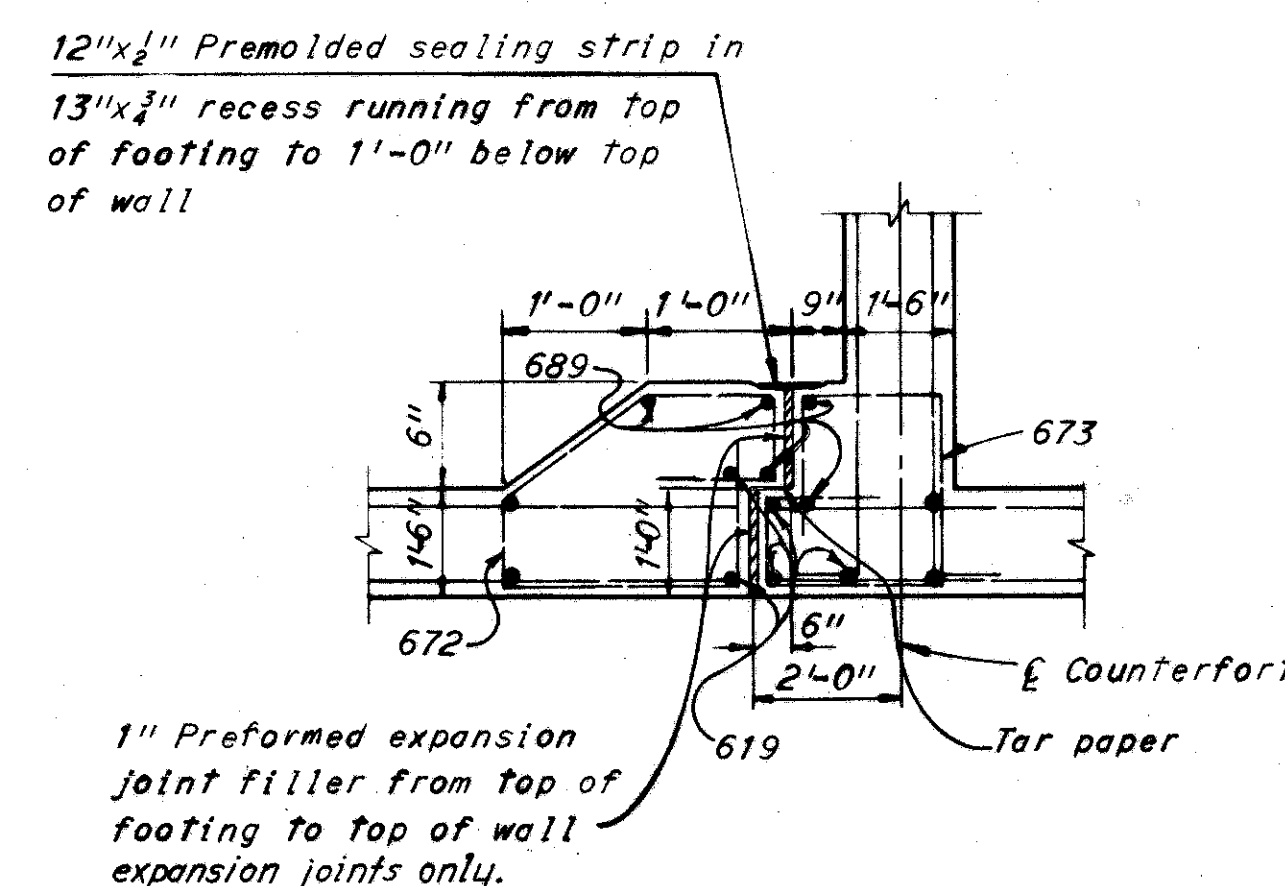
**CANTILEVERED WALL JOINT DETAILS**



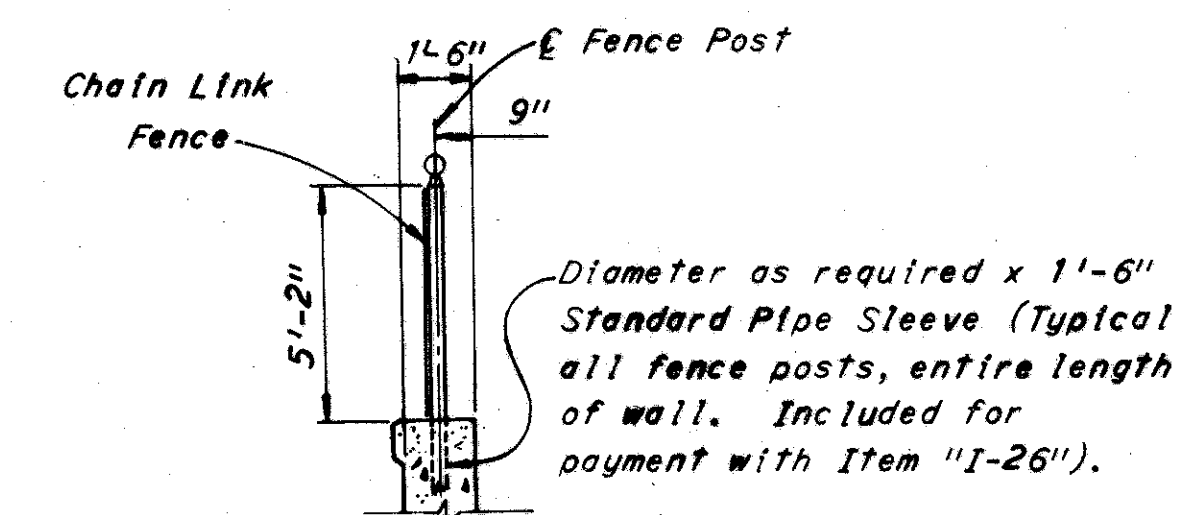
**COUNTERFORT TO CANTILEVER PANEL JOINT**  
(Joint between Panels 5 and 6 shown)



**SECTION A-A**



**COUNTERFORT PANEL TO PANEL JOINT**  
(Joint at Panels 7 and 8 shown)



**CHAIN LINK FENCE DETAIL**

H.N.T.B. WALL NO. 87

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**WALL RIGHT OF NORTHBOUND JENNINGS FREEWAY**

STA. 59+22±  
STA. 64+39.50

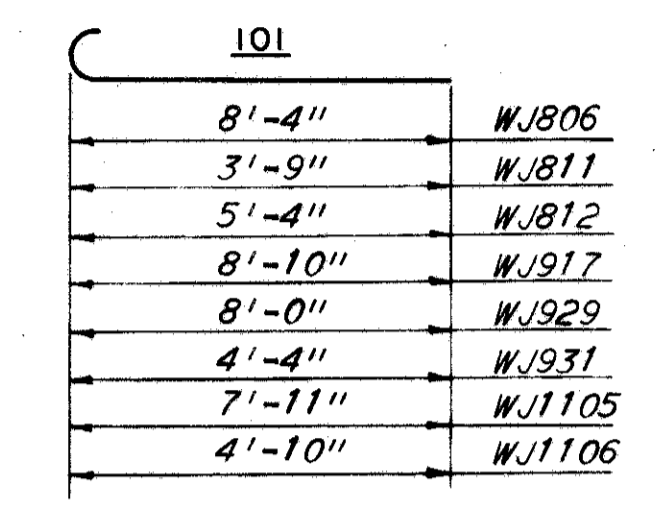
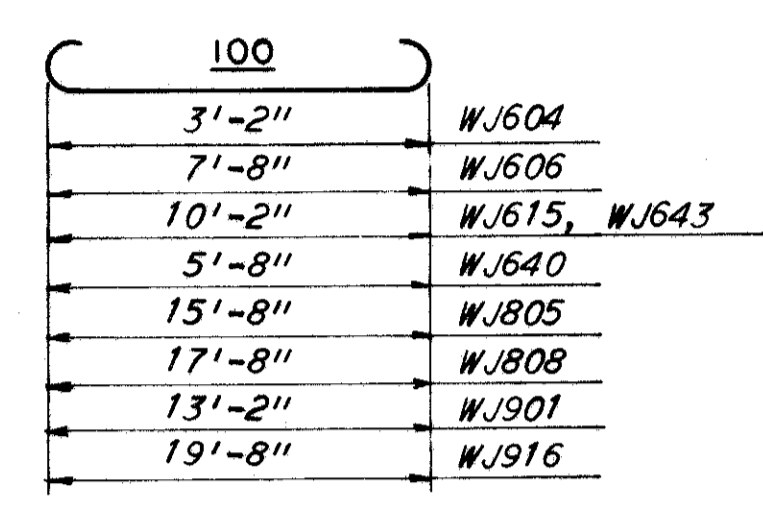
CLEVELAND CUYAHOGA COUNTY OHIO

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10/21/64		7-5-65	1-29-65

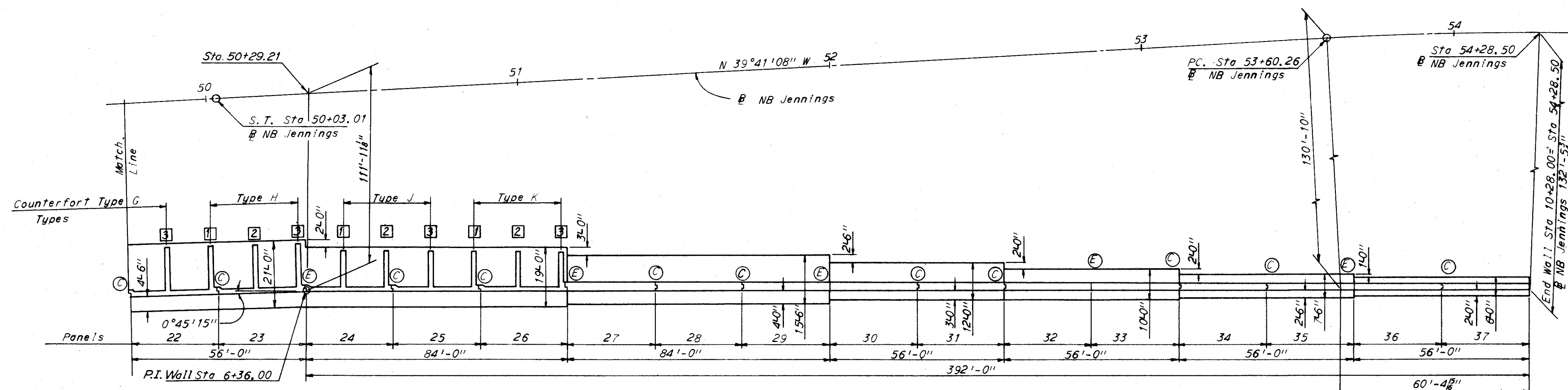
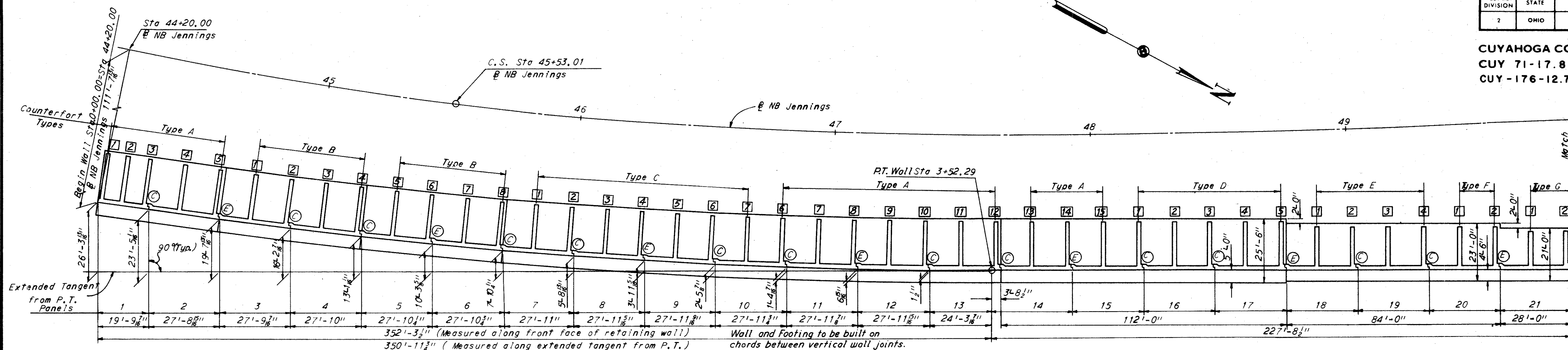
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	
WJ501	10	27'-9"	Str.		287	WJ620	2 Ser. 13	10'-9"	Str.	1 1/2"	805	WJ801	1 Ser. 15	8'-0"	Str.	2 3/8"	380	
WJ502	2	13'-0"	Str.		27	WJ621	5	21'-9"	Str.		163	WJ802	15	5'-10"	104		234	
WJ503	42	27'-6"	Str.		1,205	WJ622	2 Ser. 13	21'-9"	Str.	2"	888	WJ804	38	13'-0"	101		1,319	
WJ504	2	14'-0"	Str.		29	WJ623	5	23'-9"	Str.		178	WJ805	43	17'-10"	100		2,047	
WJ505	2	26'-6"	Str.		55	WJ624	2 Ser. 13	23'-9"	Str.	2"	967	WJ806	83	9'-5"	101		2,087	
WJ506	2	24'-0"	Str.		50	WJ625	5	25'-9"	Str.		193	WJ807	38	15'-6"	101		1,573	
WJ507	2	6'-0"	Str.		13	WJ626	38	5'-3"	Str.		300	WJ808	86	19'-10"	100		4,554	
WJ508	2	16'-3"	Str.		34	WJ627	428	5'-0"	Str.		3,214	WJ809	76	17'-6"	101		3,551	
WJ509	2	25'-6"	Str.		53	WJ628	2 Ser. 13	25'-9"	Str.	1"	1,025	WJ810	58	19'-6"	101		3,020	
WJ510	4	17'-6"	Str.		73	WJ629	5	26'-9"	Str.		201	WJ811	8	6'-1"	101		130	
WJ511	2 Ser. 4	2'-9"	Str.	4'-7"	80	WJ630	2 Ser. 13	26'-9"	Str.	3"	1,059	WJ812	4	8'-1"	101		86	
WJ512	2	19'-0"	Str.		40	WJ631	5	27'-6"	Str.		207	WJ813	4	8'-3"	101		88	
WJ513	2 Ser. 3	16'-8"	Str.	155	6"	107	WJ632	2 Ser. 13	27'-6"	Str.	1"	1,093	WJ814	2	17'-0"	101		91
WJ514	2 Ser. 6	12'-8"	Str.	155	8"	179	WJ633	5	28'-6"	Str.		214	WJ815	4	6'-1"	107		65
WJ515	2 Ser. 4	9'-2"	Str.	155	10 1/2"	88	WJ634	2 Ser. 13	28'-6"	Str.	1"	1,133	WJ816	2	10'-6"	101		56
WJ516	2	7'-10"	Str.		16	WJ635	5	29'-6"	Str.		222	WJ818	70	30'-3"	101		5,654	
WJ517	2 Ser. 6	15'-8"	Str.	155	4 3/4"	209	WJ636	2 Ser. 6	29'-6"	Str.	3/4"	534	WJ819	180	27'-6"	101		13,217
WJ518	2 Ser. 6	12'-2"	Str.	155	7 1/2"	171	WJ638	2 Ser. 7	28'-6"	Str.	2"	610	WJ821	25	22'-0"	101		1,469
WJ519	2 Ser. 4	9'-2"	Str.	155	9 3/4"	85	WJ639	5	28'-3"	Str.		212	WJ822	6	5'-2"	157		83
WJ520	2	8'-0"	Str.		17	WJ640	13	7'-0"	100		137							
WJ521	2 Ser. 8	18'-6"	Str.	155	5 1/8"	335	WJ641	13	4'-6"	Str.		88	WJ901	31	15'-8"	100		1,651
WJ522	2 Ser. 5	15'-0"	Str.	155	8 1/2"	171	WJ643	15	11'-6"	100		259	WJ912	114	30'-9"	Str.		11,919
WJ523	2 Ser. 6	9'-6"	Str.	155	11 1/8"	148	WJ644	14	10'-0"	Str.		210	WJ916	64	22'-2"	100		4,823
WJ524	2	8'-4"	Str.		17	WJ645	2 Ser. 10	3'-9"	Str.	10 5/8"	229	WJ917	42	10'-1"	101		1,440	
WJ525	2 Ser. 2	17'-2"	Str.	155	4 3/8"	486	WJ647	2 Ser. 9	12'-3"	Str.	9 3/8"	416	WJ918	38	30'-3"	Str.		3,908
WJ526	2 Ser. 5	14'-2"	Str.	155	7 1/4"	161	WJ649	2 Ser. 7	20'-3"	Str.	8 3/4"	471	WJ927	4	15'-6"	Str.		211
WJ527	2 Ser. 6	9'-2"	Str.	155	10"	141	WJ650	2 Ser. 6	25'-0"	Str.	6 3/8"	473	WJ928	8	11'-9"	Str.		320
WJ528	2	8'-0"	Str.		17	WJ651	5	19'-3"	Str.		145	WJ929	8	10'-3"	101		279	
WJ529	2 Ser. 15	19'-4"	Str.	155	5 1/2"	704	WJ653	4 Ser. 3	5'-3"	Str.	3'-4 1/2"	155	WJ930	4	5'-6"	107		75
WJ530	2 Ser. 6	15'-2"	Str.	155	8 3/8"	212	WJ655	4 Ser. 3	6'-0"	Str.	3'-9 1/4"	176	WJ931	16	6'-7"	101		358
WJ531	2 Ser. 5	10'-6"	Str.	155	10 1/2"	128	WJ656	4 Ser. 4	6'-3"	Str.	3'-4 1/4"	270	WJ932	4	17'-3"	Str.		235
WJ532	2 Ser. 3	6'-4"	Str.	155	14 5/8"	48	WJ657	4	4'-3"	Str.		26	WJ935	57	6'-9"	Str.		1,308
WJ533	2 Ser. 16	19'-6"	Str.	155	4 3/8"	754	WJ658	4 Ser. 4	7'-0"	Str.	3'-8"	300						
WJ534	2 Ser. 7	15'-0"	Str.	155	7 1/4"	247	WJ659	4	4'-6"	Str.		27	WJ1001	1 Ser. 29	14'-3"	Str.	2"	1,903
WJ535	2 Ser. 5	10'-8"	Str.	155	10 1/2"	130	WJ660	4 Ser. 5	7'-6"	Str.	3'-2 1/4"	417	WJ1002	29	6'-6"	104		811
WJ536	2 Ser. 3	7'-0"	Str.	155	14-3/4"	52	WJ661	4	5'-3"	Str.		32	WJ1003	135	30'-3"	Str.		17,572
WJ537	3 Ser. 18	18'-10"	Str.	155	4 1/8"	1,253	WJ662	4 Ser. 6	4'-6"	Str.	3'-6 3/4"	482	WJ1005	52	31'-0"	Str.		6,936
WJ538	3 Ser. 7	14'-8"	Str.	155	7 3/8"	361	WJ663	6 Ser. 6	4'-8"	Str.	3'-8 1/4"	743	WJ1006	11	5'-11"	157		280
WJ539	3 Ser. 5	10'-6"	Str.	155	10"	190	WJ664	4 Ser. 7	4'-9"	Str.	3'-3 3/4"	594						
WJ540	3 Ser. 3	6'-10"	Str.	155	14-3/4"	76	WJ665	4 Ser. 7	4'-3"	Str.	3'-5 1/4"	610	WJ1101	1 Ser. 15	11'-0"	Str.	2 1/8"	1,006
WJ541	2 Ser. 4	27'-4"	Str.	155	4 1/8"	233	WJ666	4 Ser. 7	4'-6"	Str.	3'-6 1/4"	636	WJ1102	15	6'-11"	104		551
WJ542	2 Ser. 10	20'-6"	Str.	155	8 1/4"	492	WJ667	2 Ser. 6	4'-0"	Str.	3'-1 1/4"	212	WJ1103	4	20'-0"	Str.		425
WJ543	2 Ser. 6	15'-0"	Str.	155	10 1/8"	216	WJ668	2	13'-0"	Str.		39	WJ1104	8	12'-0"	Str.		510
WJ544	2 Ser. 6	6'-10"	Str.	155	14-3/8"	128	WJ669	2	7'-3"	Str.		22	WJ1105	8	9'-6"	101		404
WJ545	2 Ser. 5	27'-0"	Str.	155	4 1/4"	289	WJ670	2	7'-5"	Str.		23	WJ1106	100	6'-5"	101		3,409
WJ546	2 Ser. 10	20'-4"	Str.	155	7 3/4"	485	WJ671	2	4'-3"	Str.		13	WJ1107	36	6'-6"	107		1,243
WJ547	2 Ser. 6	15'-0"	Str.	155	10 3/8"	217	WJ672	297	7'-3"	135	3,234	WJ1108	4	22'-0"	Str.		468	
WJ548	2 Ser. 7	6'-0"	Str.	155	14 3/8"	144	WJ673	301	9'-0"	112	4,069	WJ110	4	24'-9"	Str.		526	
WJ549	2 Ser. 7	20'-2"	Str.	155	4 1/4"	399	WJ674	2 Ser. 15	7'-9"	112	2 1/4"	406	WJ111	16	14'-9"	Str.		1,258
WJ550	2 Ser. 9	20'-4"	Str.	155	7 3/8"	430	WJ677	2 Ser. 10	7'-9"	112	2 3/8"	260	WJ112	16	8'-3"	Str.		701
WJ551	2 Ser. 6	15'-8"	Str.	155	10"	218	WJ678	5	11'-0"	Str.		83	WJ114	4	26'-6"	Str.		563
WJ552	2 Ser. 7	6'-4"	Str.	155	14 3/8"	147	WJ679	2	9'-9"	Str.		29	WJ116	6	27'-6"	Str.		877
WJ553	1 Ser. 18	17'-6"	Str.	155	5 3/8"	405	WJ680	5	25'-3"	Str.		190	WJ117	4	28'-9"	Str.		611
WJ554	1 Ser. 7	12'-6"	Str.	155	8 1/8"	107	WJ681	5	27'-9"	Str.		208	WJ118	12	18'-0"	Str.		1,148
WJ555	1 Ser. 5	7'-8"	Str.	155	11 1/4"	50	WJ682	5	27'-0"	Str.		203	WJ119	12	12'-0"	Str.		765
WJ556	1 Ser. 9	11'-10"	Str.	155	3 1/4"	121	WJ683	5	26'-0"	Str.		195	WJ120	12	7'-0"	Str.		446
WJ557	1 Ser. 5	9'-10"	Str.	155	5"	56	WJ684	5	25'-3"	Str.		190	WJ122	4	29'-6"	Str.		627
WJ558	1 Ser. 4	7'-10"	Str.	155	6"	36	WJ685	5	24'-3"	Str.		182	WJ123	4	30'-3"	Str.		643
WJ559	1	7'-0"	Str.		7	WJ686	5	16'-6"	Str.		124	WJ1124	2	24'-0"	Str.		255	
WJ560	1 Ser. 9	10'-2"	Str.	155	5 1/4"	112	WJ687	5	22'-3"	Str.		167						
WJ561	1 Ser. 5	7'-0"	Str.	155	7"	43	WJ688	5	20'-0"	Str.		150						
WJ562	6	6'-6"	Str.		68	WJ689	5	18'-0"	Str.		135							
WJ601	1 Ser. 15	4'-0"	Str.	2 3/8"	124	WJ690	5	16'-0"	Str.		120							
WJ602	1 Ser. 15	4'-9"	Str.	2 3/8"	142	WJ691	2	14'-0"	Str.		42							
WJ603	4	29'-6"	Str.		177	WJ692	5	15'-6"	Str.		116							
WJ604	19	4'-6"	100		128	WJ701	440	27'-6"	Str.		24,732							
WJ605	48	29'-9"	Str.		2,145	WJ702	2	26'-9"	Str.		109							
WJ606	40	9'-0"	100		541	WJ703	2	6'-6"	Str.		27							
WJ607	2 Ser. 15	4'-3"	Str.	2 3/8"	265	WJ704	2	7'-9"	Str.		32							
WJ608	1 Ser. 15	7'-6"	Str.	2 3/8"	203	WJ705	2	12'-3"	Str.		50							
WJ610	8	19'-6"	Str.		234	WJ706	2	13'-3"	Str.		54							
WJ611	1 Ser. 15	10'-6"	Str.	2 3/8"	273	WJ707	2	24'-6"	Str.		100							
WJ612	1 Ser. 15	13'-8"	Str.	1 1/2"	332	WJ708	2	4'-3"	Str.		17							
WJ613	310	4'-9"	Str.		2,212	WJ709	2 Ser. 3	4'-6"	Str.	5-7 1/4"	124							
WJ614	25	5'-2"	104		194	WJ710	2 Ser. 3	10'-0"	Str.	3-10 1/4"	290							
WJ615	40	11'-6"	100		691	WJ711	34	19'-6"	Str.		1,355							
WJ616	2 Ser. 13	15'-6"	Str.	2"	644	WJ712	2	17'-9"	Str.		73							
WJ617	5	17'-6"	Str.		131	WJ713	2 Ser. 4	4'-0"	Str.	3-5 1/4"	149							
WJ618	2 Ser. 13	17'-9"	Str.	1 1/2"	727	WJ714	2	28'-6"	Str.		117							
WJ619	5	19'-9"	Str.		148	WJ715	2	21'-3"	Str.		87							

TOTAL WEIGHT = 190,174



CUYAHOGA COUNTY  
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LAYOUT DIAGRAM

Notes:  
 (E) Indicates Expansion Joint.  
 (C) Indicates Contraction Joint.  
 (T) Indicates Counterfort number under counterfort types.  
 All longitudinal dimensions are measured along front face of retaining wall, except as shown.  
 For additional notes see sheet 492.

ESTIMATED QUANTITIES-RETAINING WALL 88			
ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Unclassified Excavation	Cu. Yd.	6,449
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	284
S-1	Class "E" Concrete, Retaining Wall (Footing)	Cu. Yd.	2,357
S-1	Class "C" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	2,067
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	896
S-4	Reinforcing Steel	Pounds	643,683
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	631
S-16	First Test Pile	Lump Sum	Lump Sum
S-18	Steel Bearing Piles (10 BP 42)	Lin. Ft.	22,741
S-29	Porous Backfill	Cu. Yd.	1,327

Note:  
 Estimated average vertical length of piles varies from 13' to 24'.

Note: Wall Quantities carried to General Summary, sheet 42  
 Fence Quantities carried on sheet 613

H.N.T.B. WALL NO. 88

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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 KANSAS CITY CLEVELAND NEW YORK

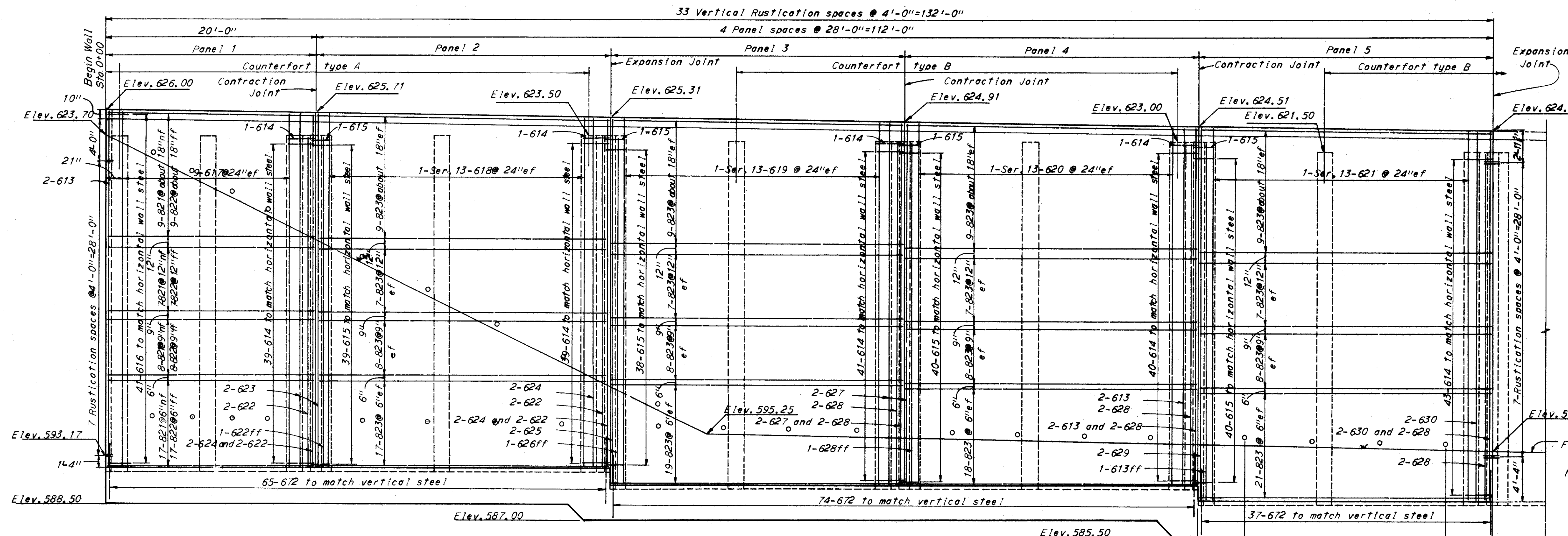
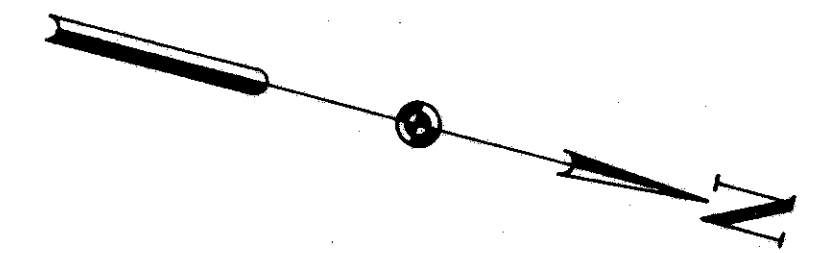
WALL RIGHT OF NORTHBOUND  
 JENNINGS FREEWAY

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 STA. 54+28.50

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DRAWN L.J.D.	TRACED	CHECKED J.W.	REVIEWED J.W.	REVISED
DATE 12-20-64	DATE	DATE 1-26-65	DATE 1-29-65	SHEET 491

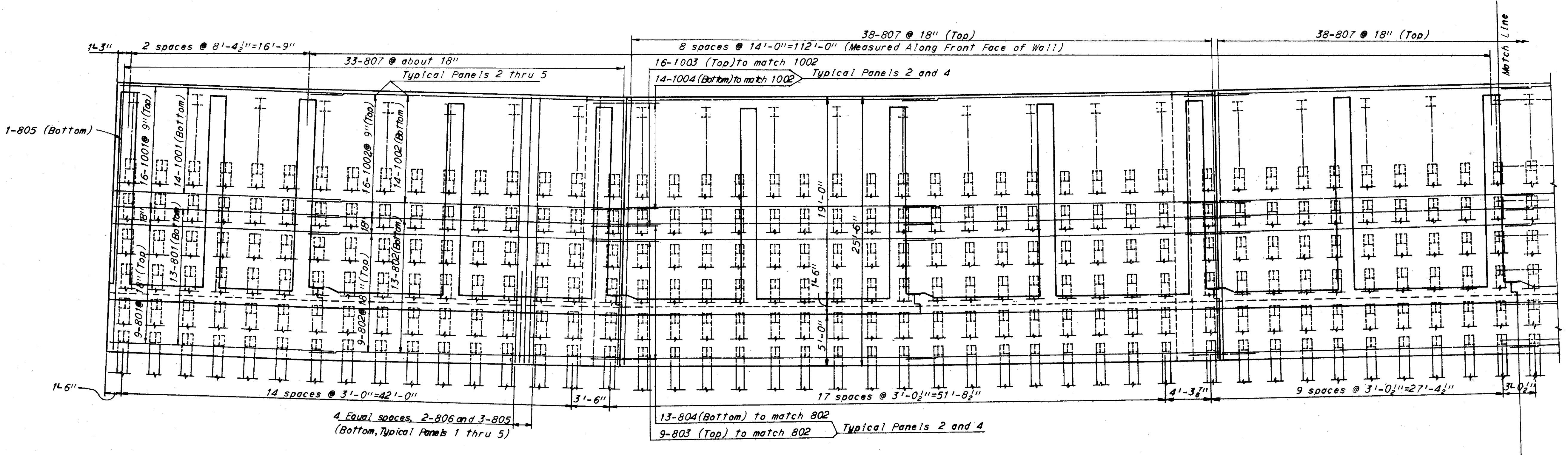
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 CUY-176-12.76



**ELEVATION**  
 (Piles and Chain Link Fence not shown)

**Notes:**

- All piles are 10BH42
- All battered piles shall be inclined 4 in 12 in direction shown.
- Pile dimensions are given along bottom of footing.
- Wall shall be constructed of Class "C" Concrete in panels 1 thru 26 and Class "E" Concrete in panels 27 thru 37.
- Location of Construction joints in the footing are optional but shall be located a minimum of 5'-0" from panel joints, and shall be centered between piles. Footing bars shall be doweled through construction joints.
- Backfill shall be placed in front of the wall prior to or simultaneous with the placing of fill behind the wall.
- 4" Weepholes shall be provided in Panels 1 thru 35, spaced as shown in panels 5 and 35. Special 4" Weepholes shall be provided for future construction in Panels 1, 2 and 3 as shown.
- Porous Backfill shall be provided for Panels 1 thru 35 to accommodate all weepholes.
- For details of chain link fence on top of wall see sheet 499.
- For sections and additional details see sheets 498, 499 and 500.
- For reinforcement Schedule and Bar Bending Diagrams see sheet 501.
- The following abbreviations are used.
- nf = near face
- ff = far face
- ef = each face



**FOOTING PLAN**

All reinforcing bar marks shall be prefixed WK.

H.N.T.B. WALL NO. 88

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**WALL RIGHT OF NORTHBOUND JENNINGS FREEWAY**

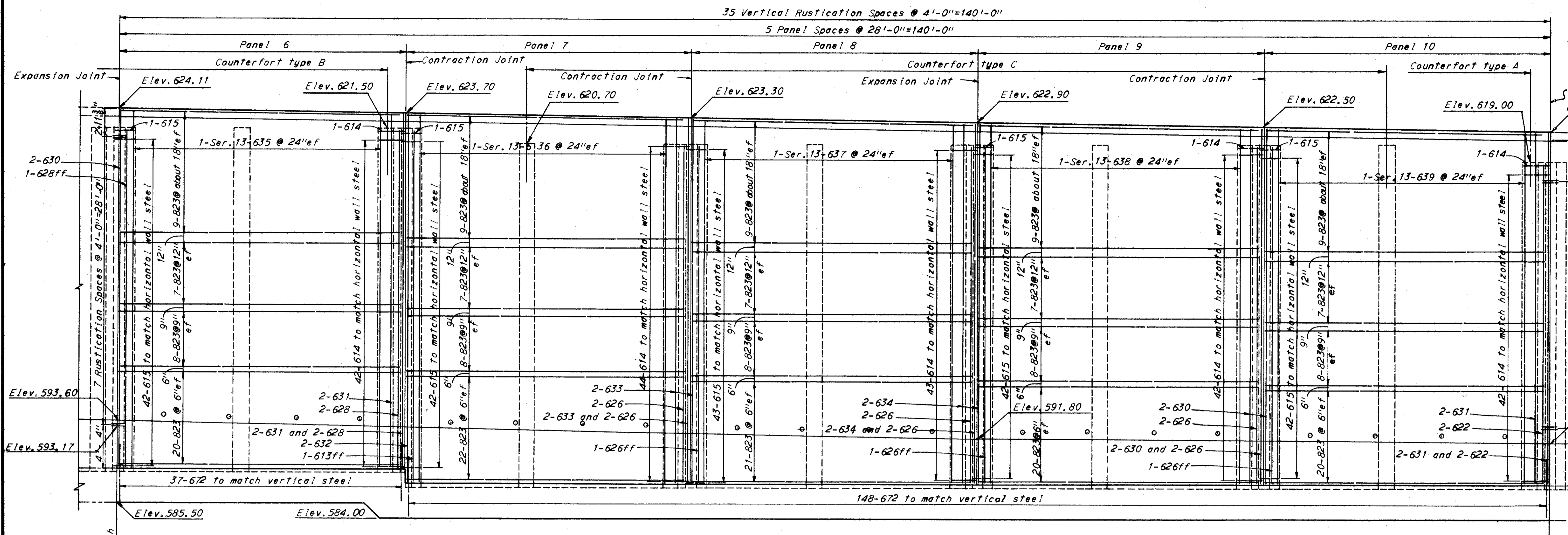
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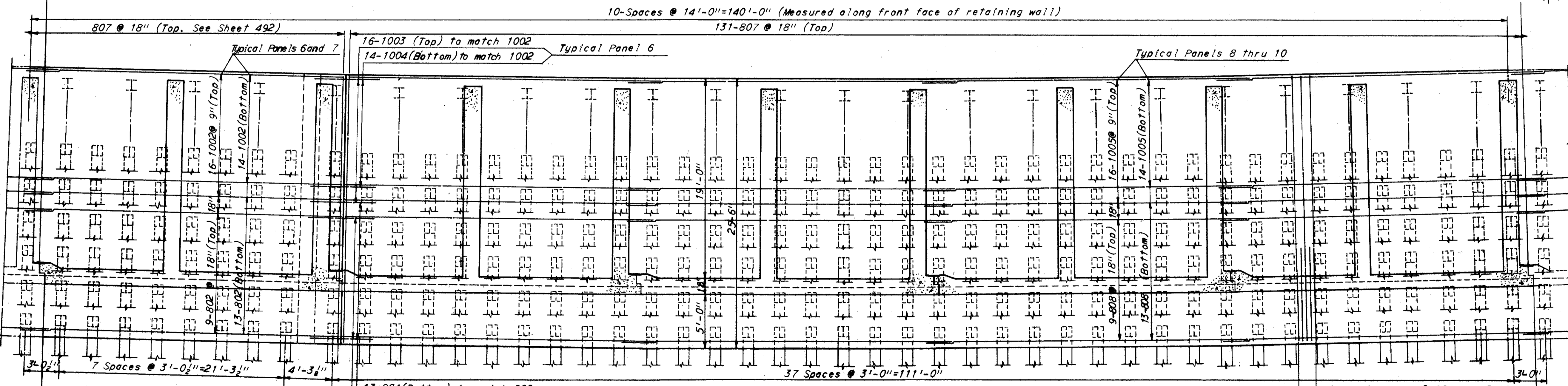
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DATE 12-28-64	DATE	DATE 1-26-65	DATE 1-29-65	

SHEET 492

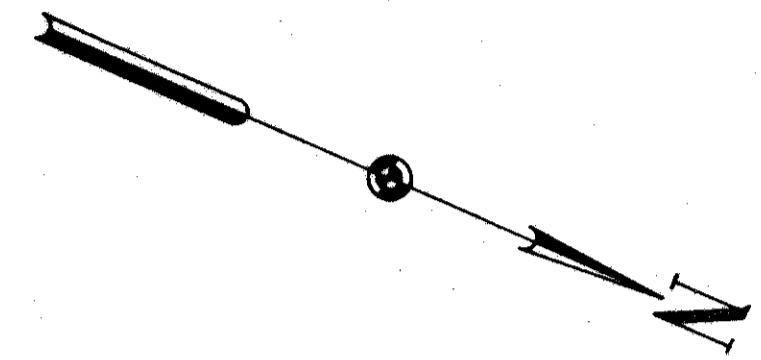
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 CUY-176-12.76



**DEVELOPED ELEVATION**  
 (Piles and Chain Link Fence not shown)



**FOOTING PLAN**



For Notes see sheet 492

H.N.T.B. WALL NO. 88  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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 KANSAS CITY CLEVELAND NEW YORK

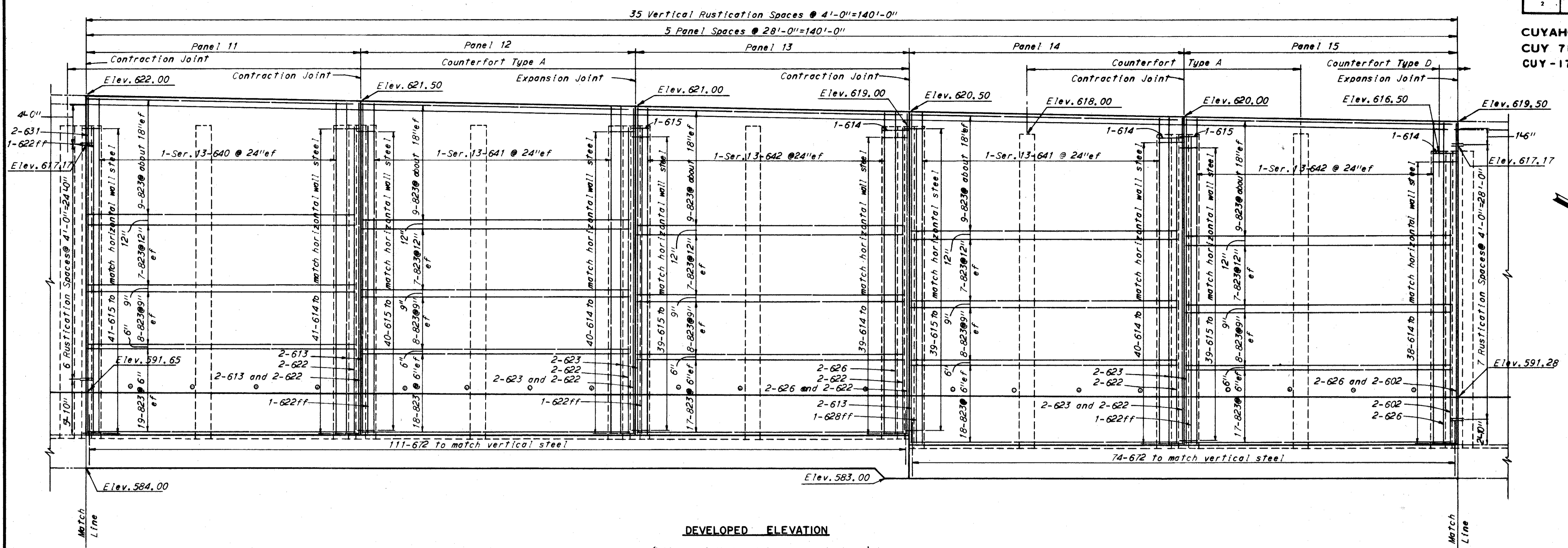
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 JENNINGS FREEWAY**

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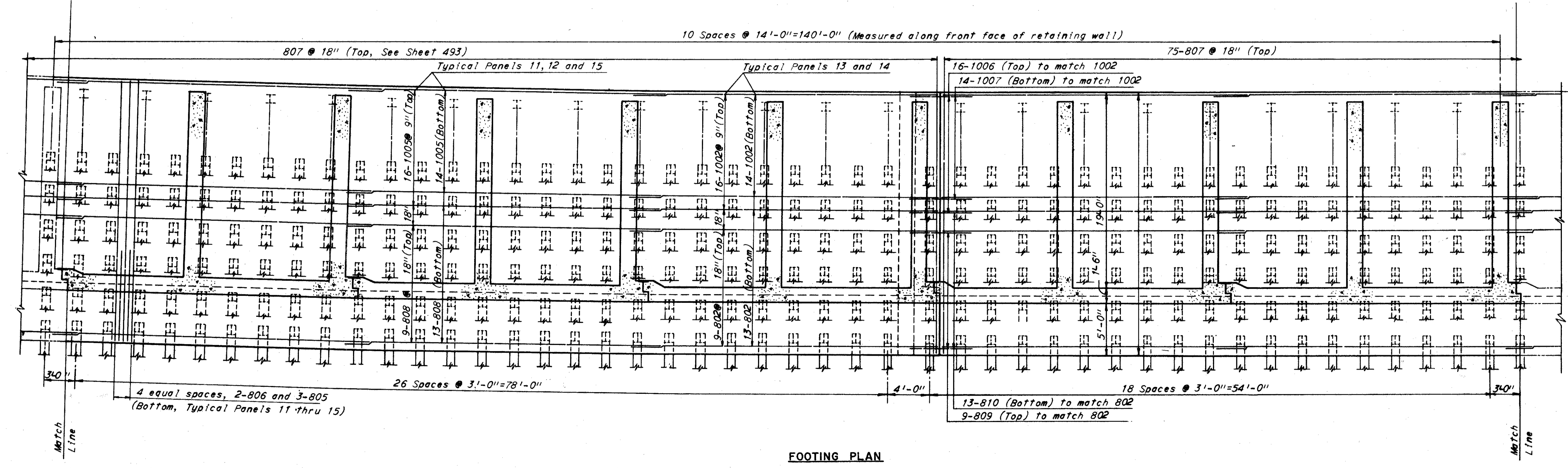
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DATE 12-28-64	DATE 1-26-65	DATE 1-29-65

SHEET 493

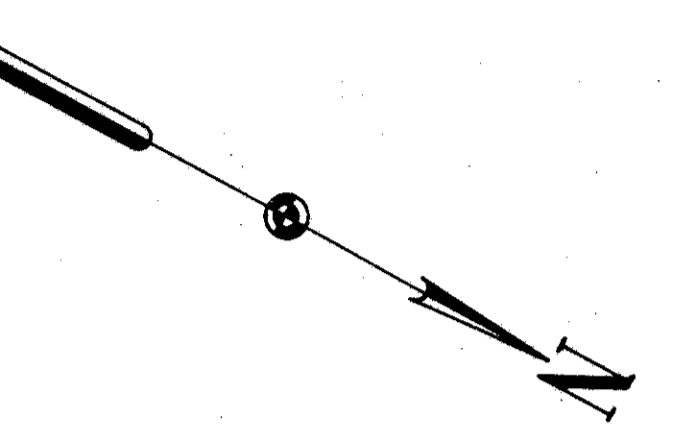
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 CUY-176-12.76



**DEVELOPED ELEVATION**  
 (Piles and Chain Link Fence not shown)



**FOOTING PLAN**



For notes see sheet 492.

H.N.T.B. WALL NO. 88

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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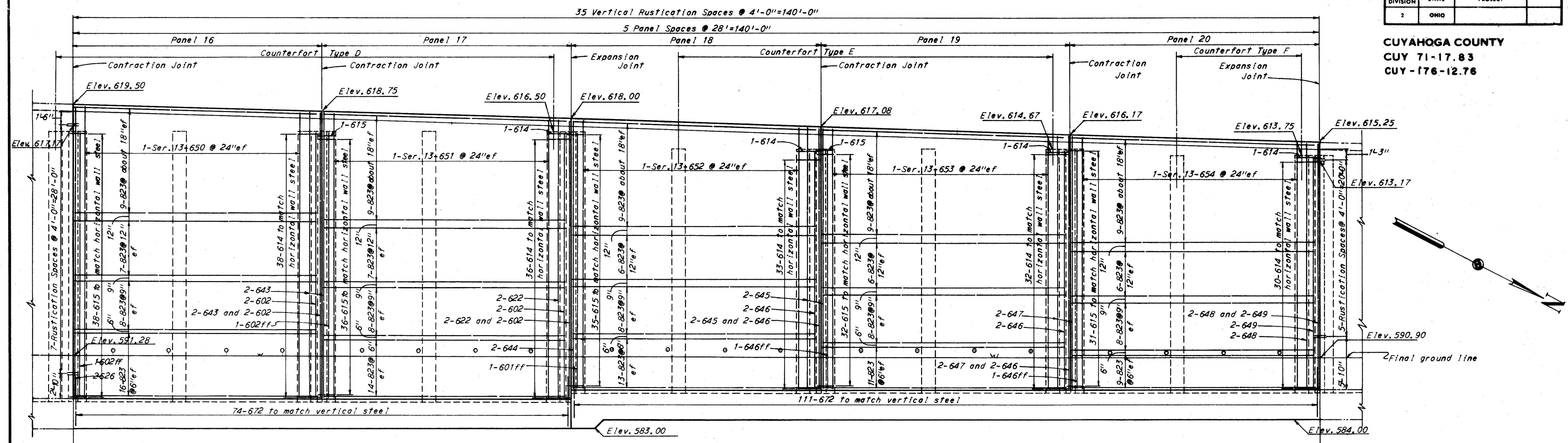
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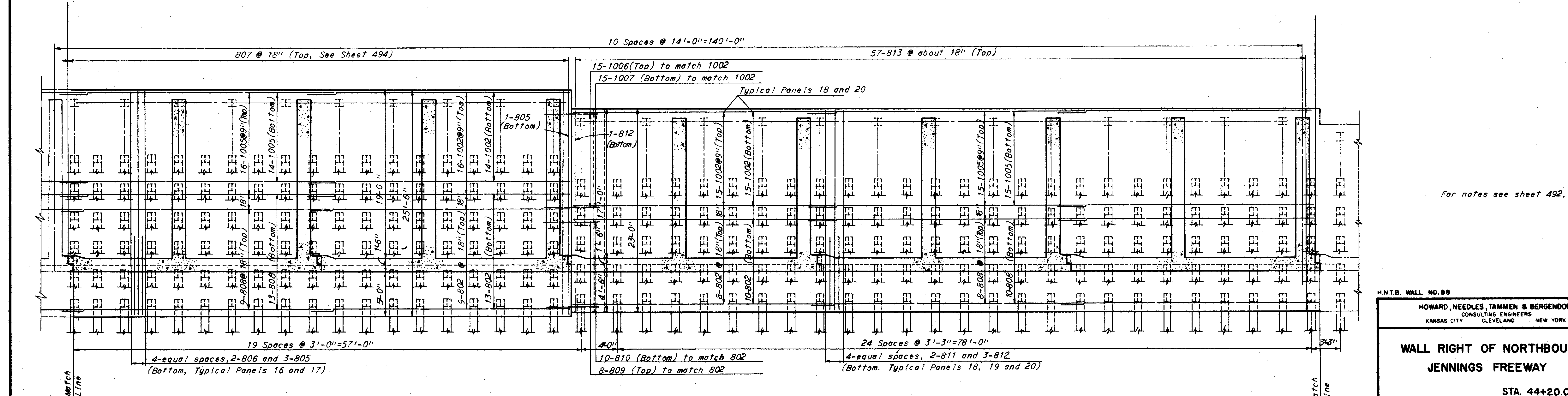
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DRAWN L.J.D.	TRACED	CHECKED	REVIEWED	REVISED
DATE 12-26-64	DATE	DATE 1-26-65	DATE	SHEET 494

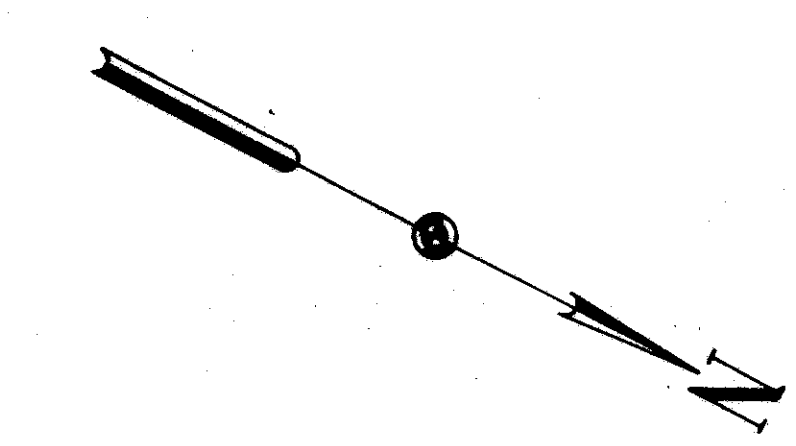
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 CUY 71-17.83  
 CUY-176-12.76



**ELEVATION**  
 (Piles and Chain Link Fence not shown.)



**FOOTING PLAN**



For notes see sheet 492.

H.N.T.B. WALL NO. 88

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**WALL RIGHT OF NORTHBOUND  
 JENNINGS FREEWAY**

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 STA. 54+28.50

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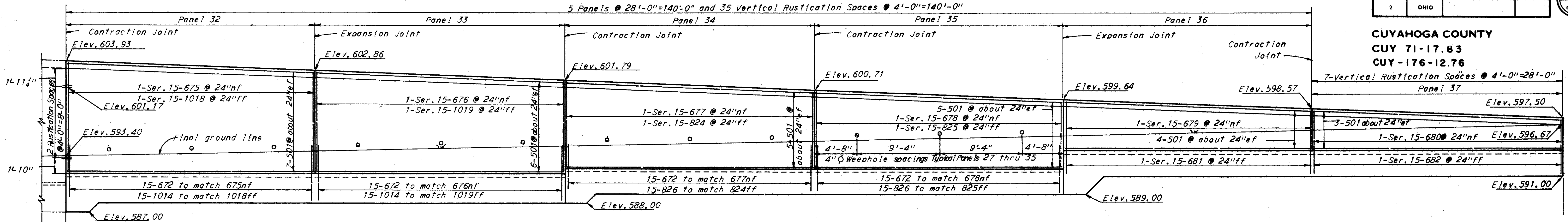
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 DATE 12-28-64 DATE 1/26-65 DATE 1-27-65

SHEET 495

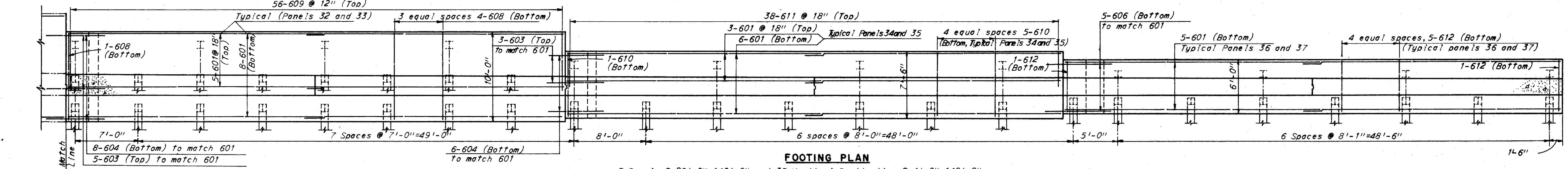




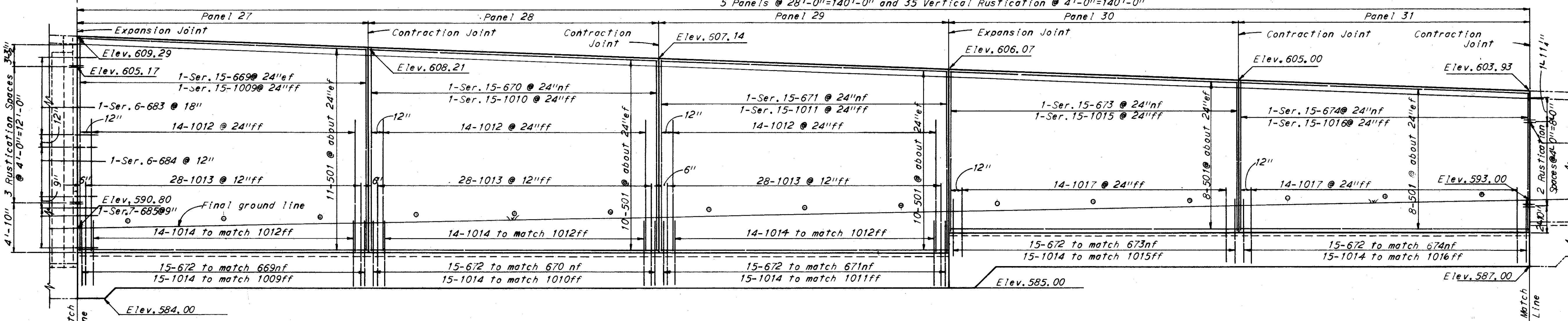
**CUYAHOGA COUNTY**  
**CUY 71-17.83**  
**CUY-176-12.76**



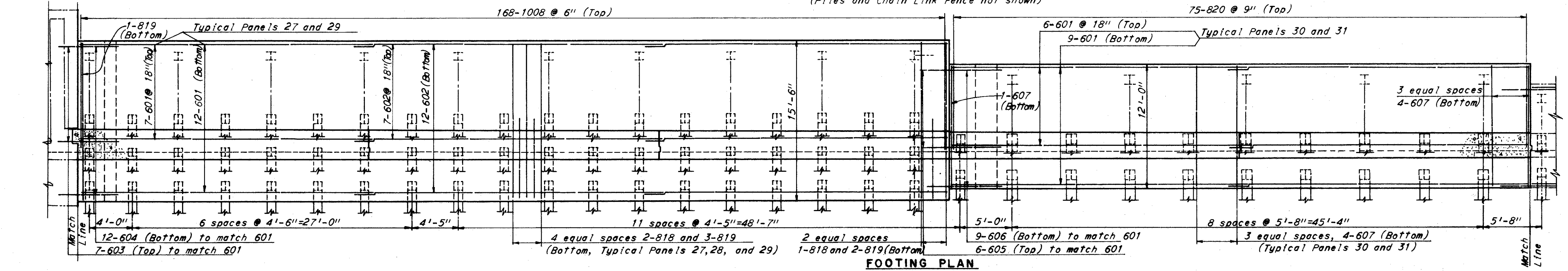
**ELEVATION**  
 (Piles and Chain Link Fence not shown)



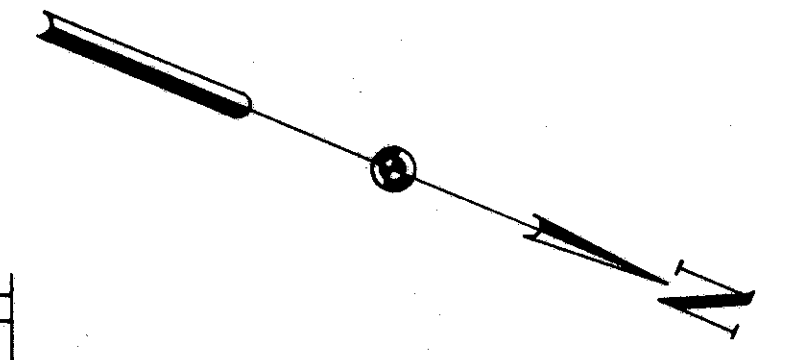
**FOOTING PLAN**



**ELEVATION**  
 (Piles and Chain Link Fence not shown)



**FOOTING PLAN**



For Notes see sheet 492.

H.N.T.B. WALL NO. 88

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

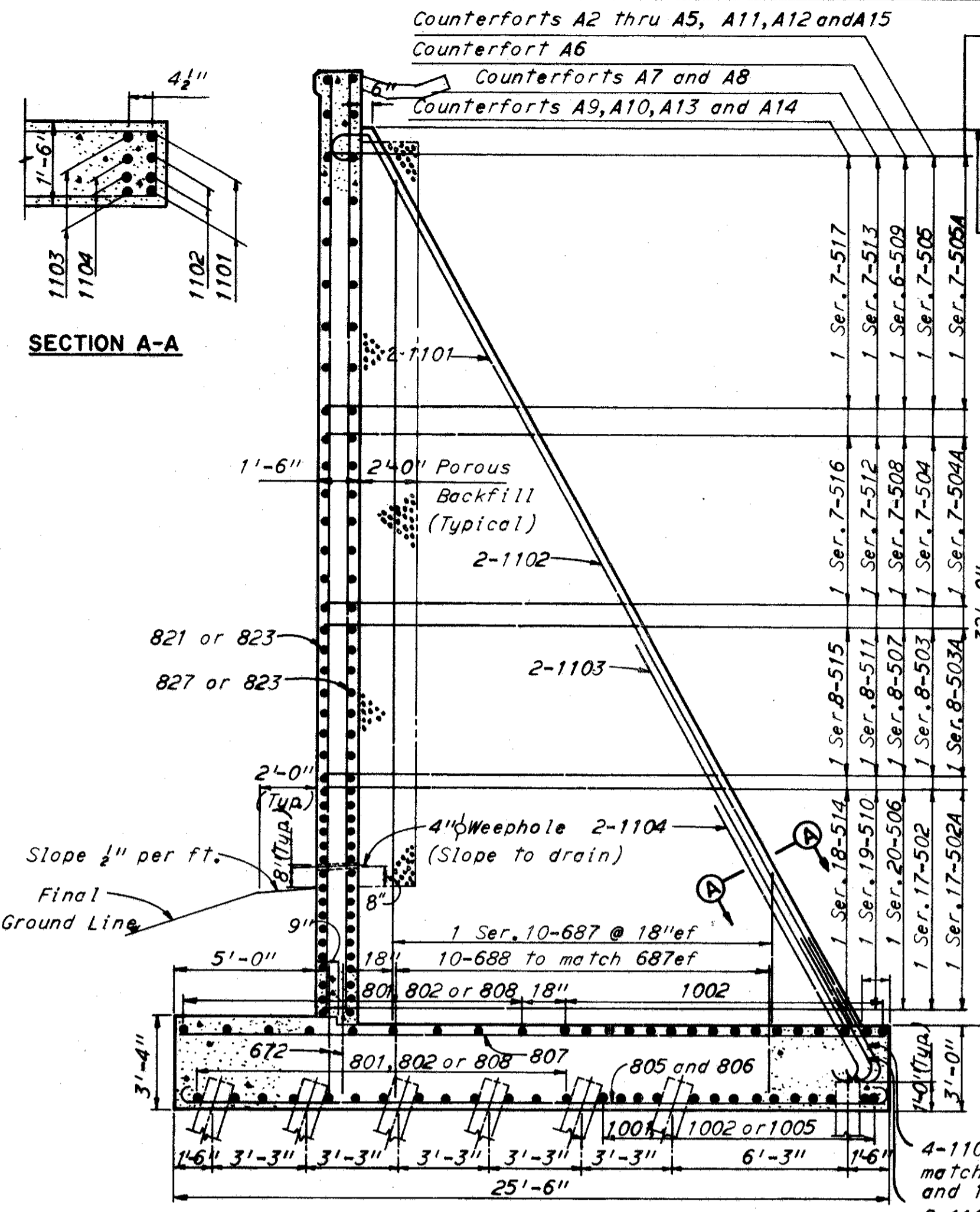
**WALL RIGHT OF NORTHBOUND  
 JENNINGS FREEWAY**

STA. 44+20.00  
 STA. 54+28.50

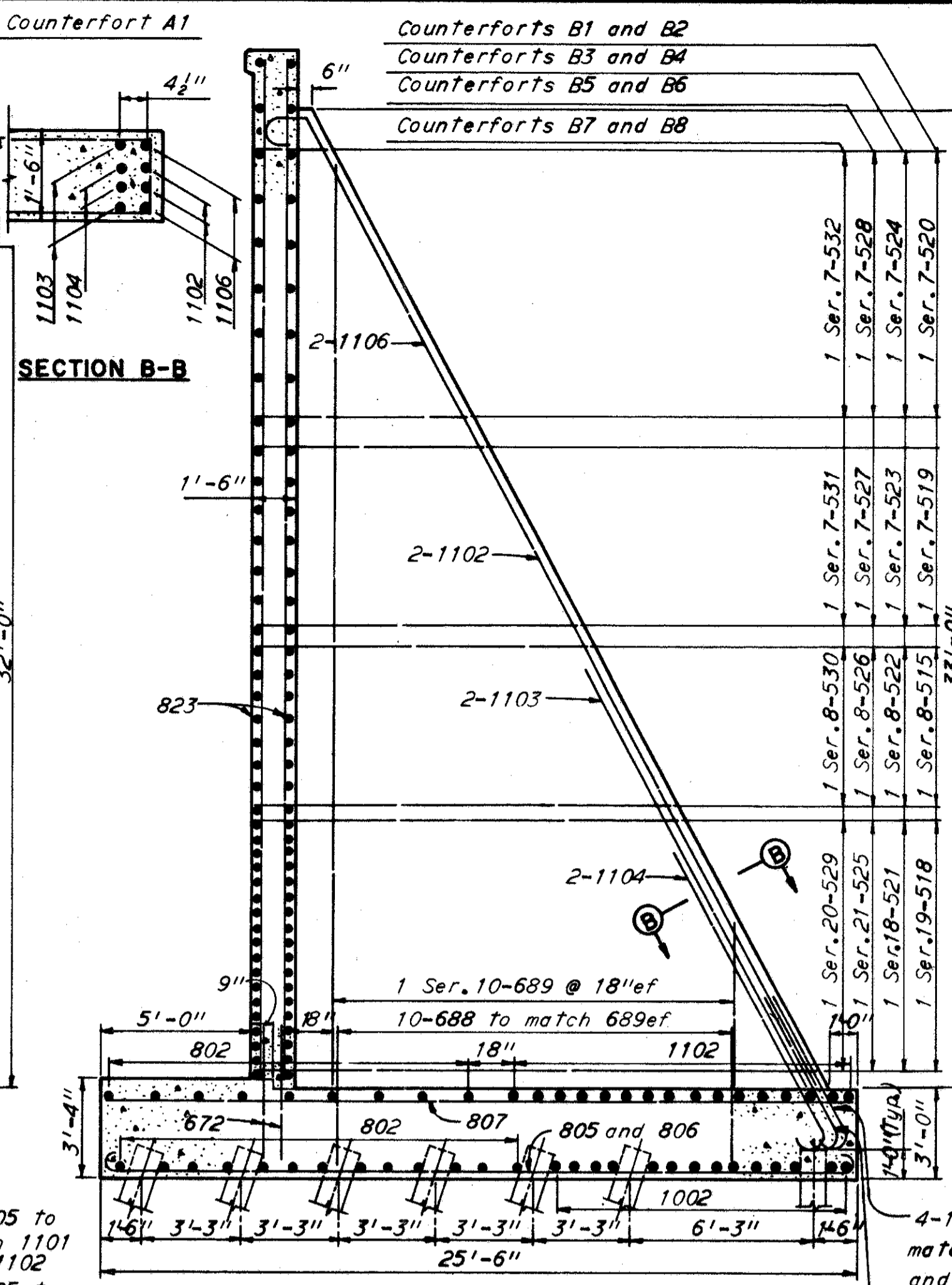
CLEVELAND CUYAHOGA COUNTY OHIO  
 DRAWN: J.D. TRAGED (CHECKED: [initials]) (REVIEWED: [initials]) (REVISED: [initials])  
 DATE: 12-28-64 DATE: 1-26-65 DATE: 1-29-65

SHEET 497

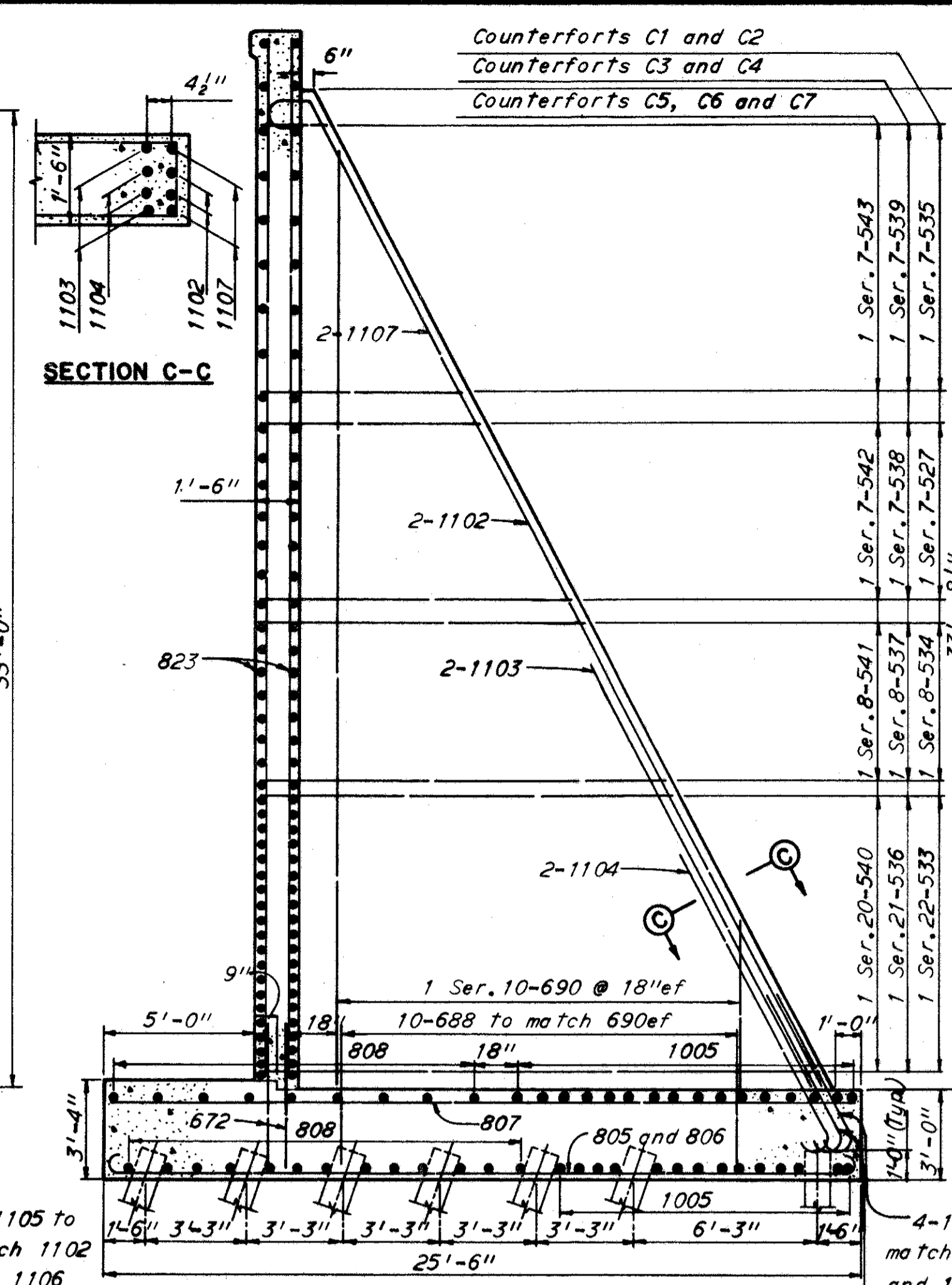
CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76



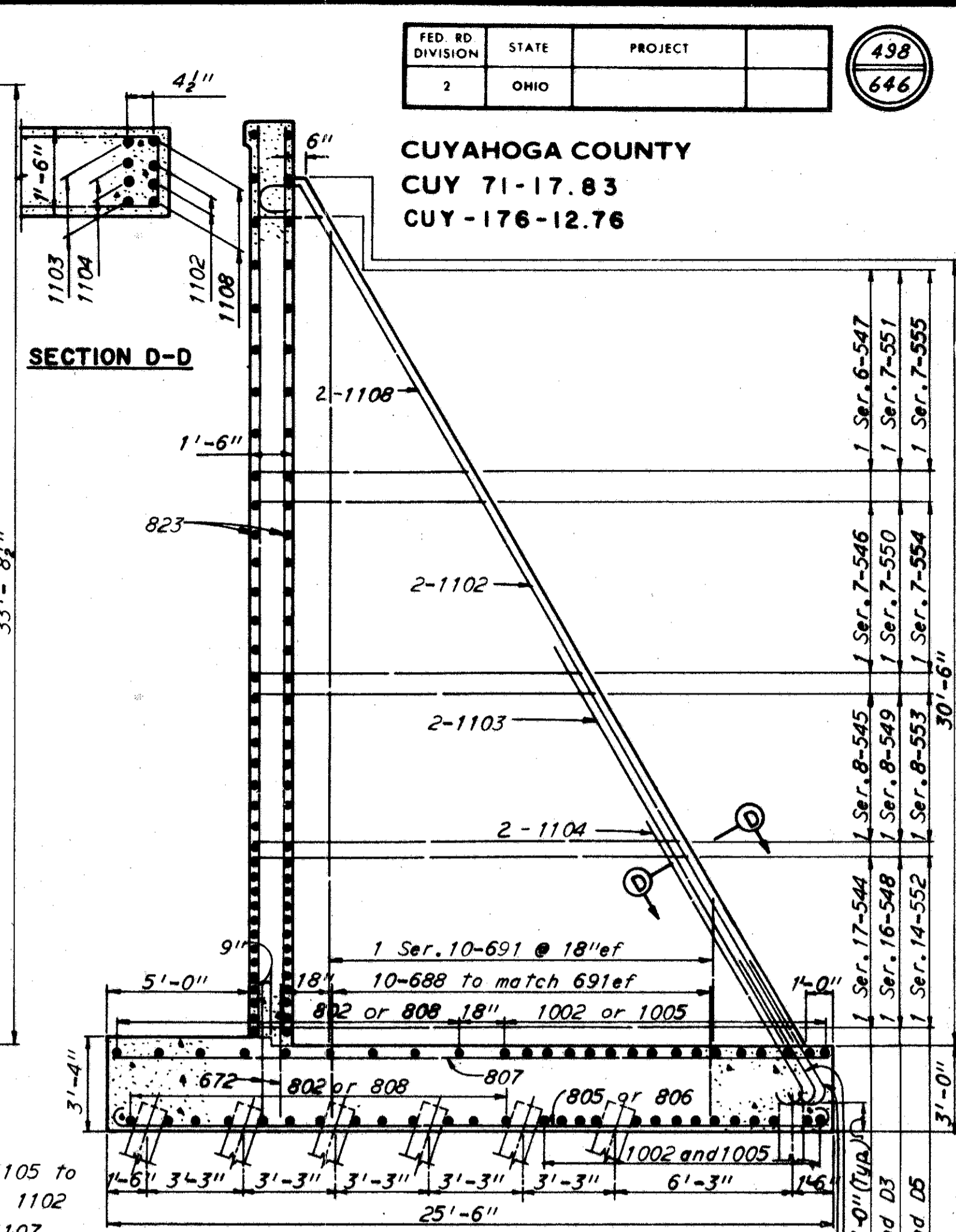
**TYPE A**  
 (Counterforts A1 thru A15)



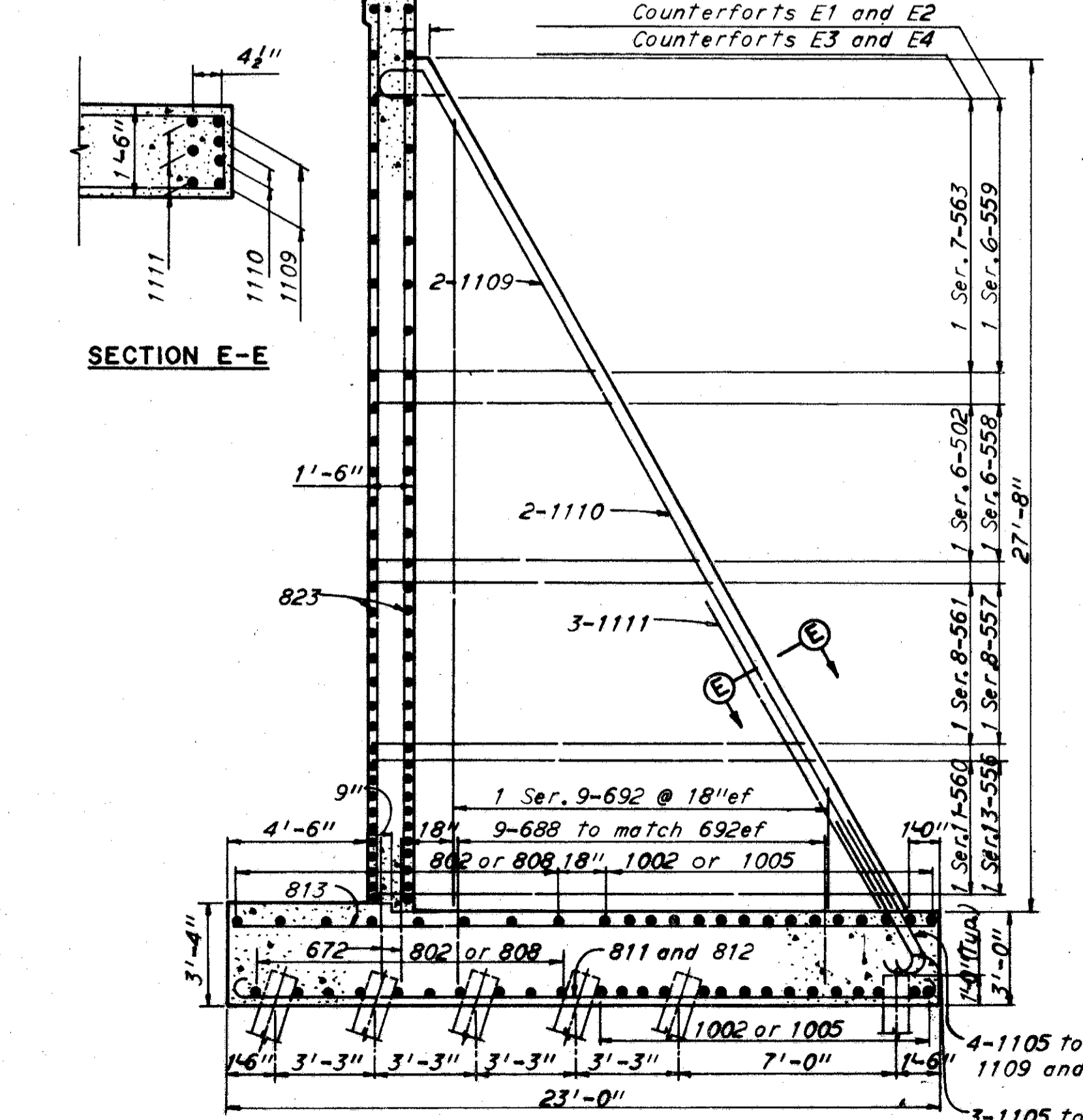
**TYPE B**  
 (Counterforts B1 thru B8)



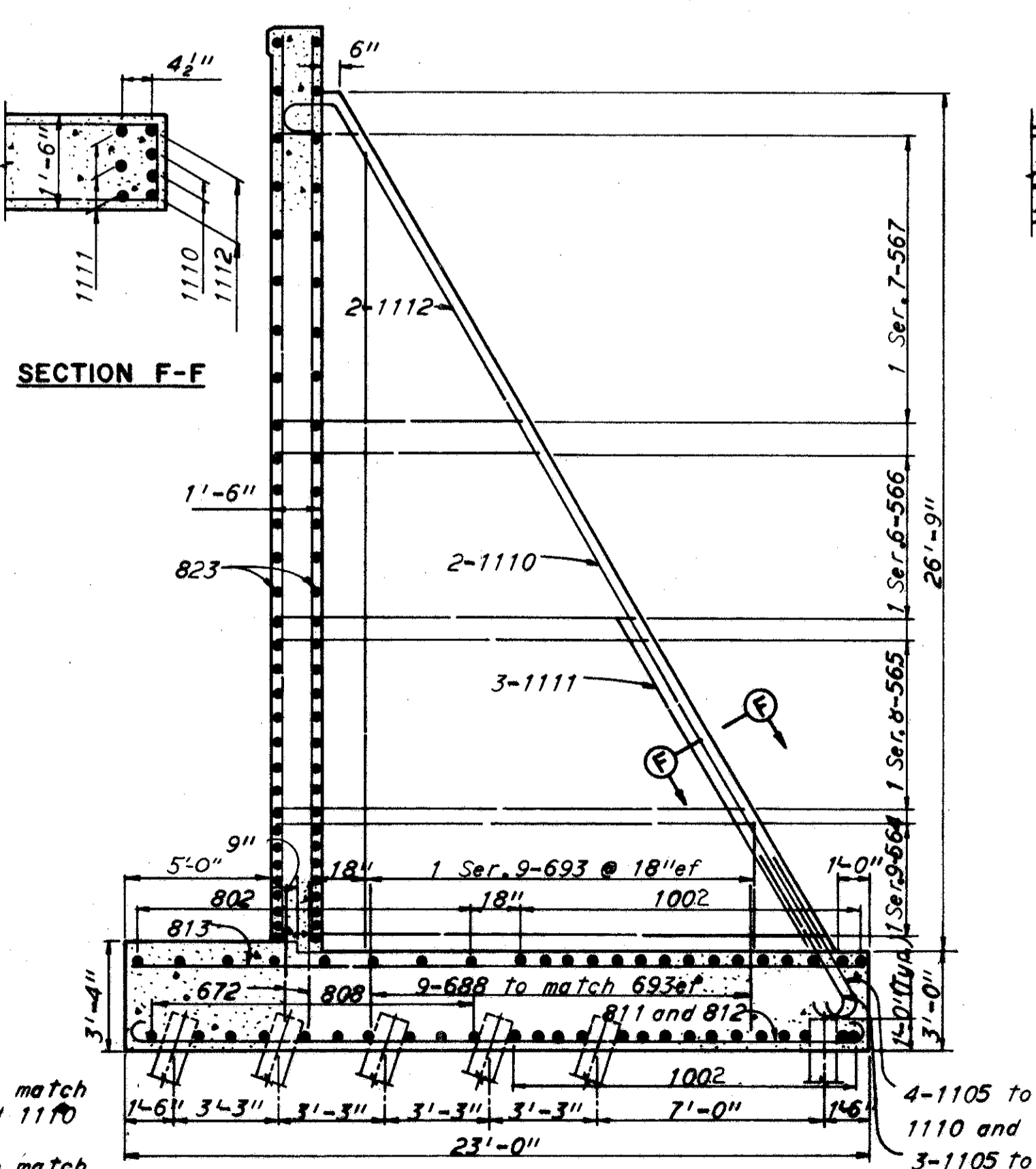
**TYPE C**  
 (Counterforts C1 thru C7)



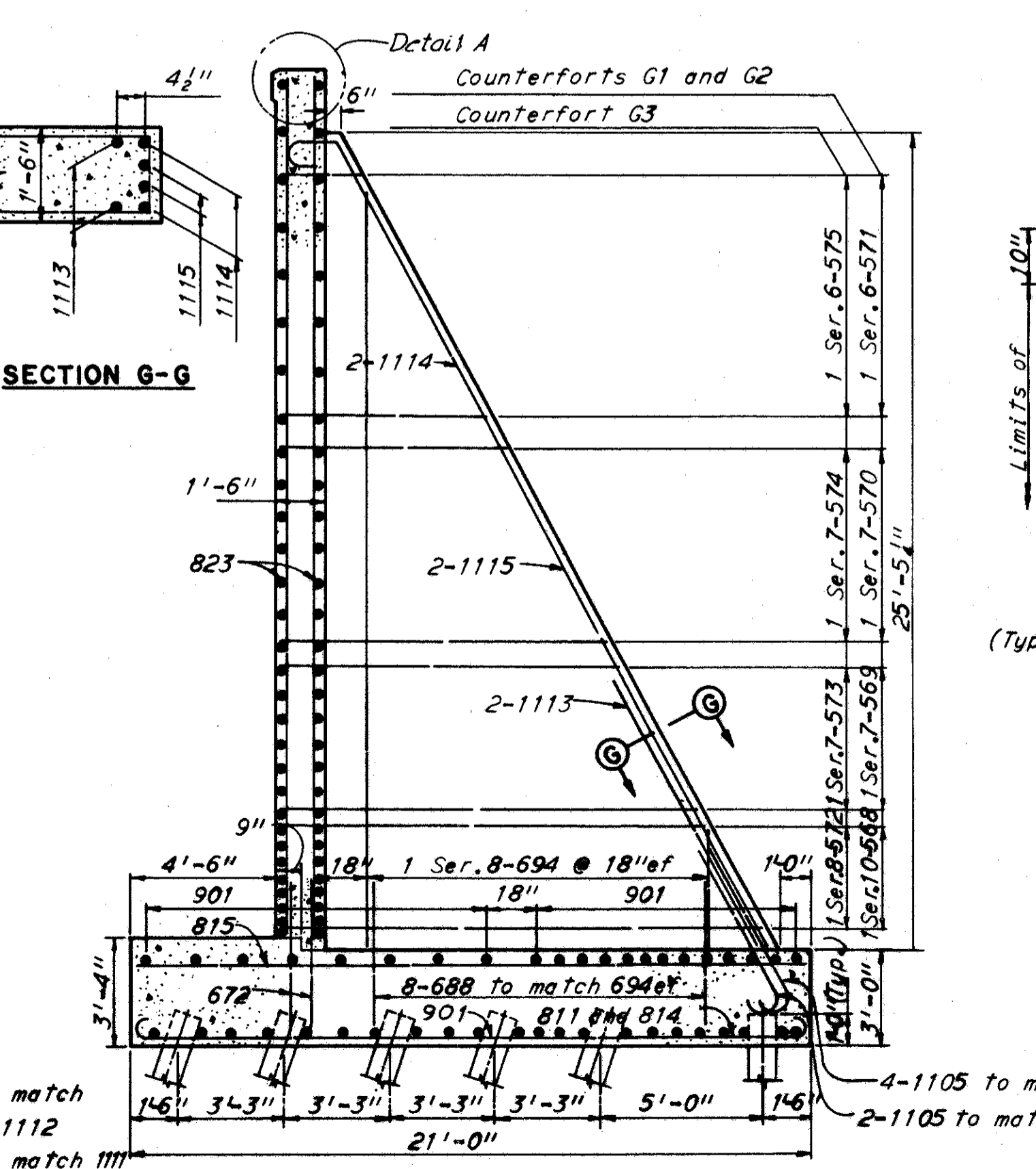
**TYPE D**  
 (Counterforts D1 thru D5)



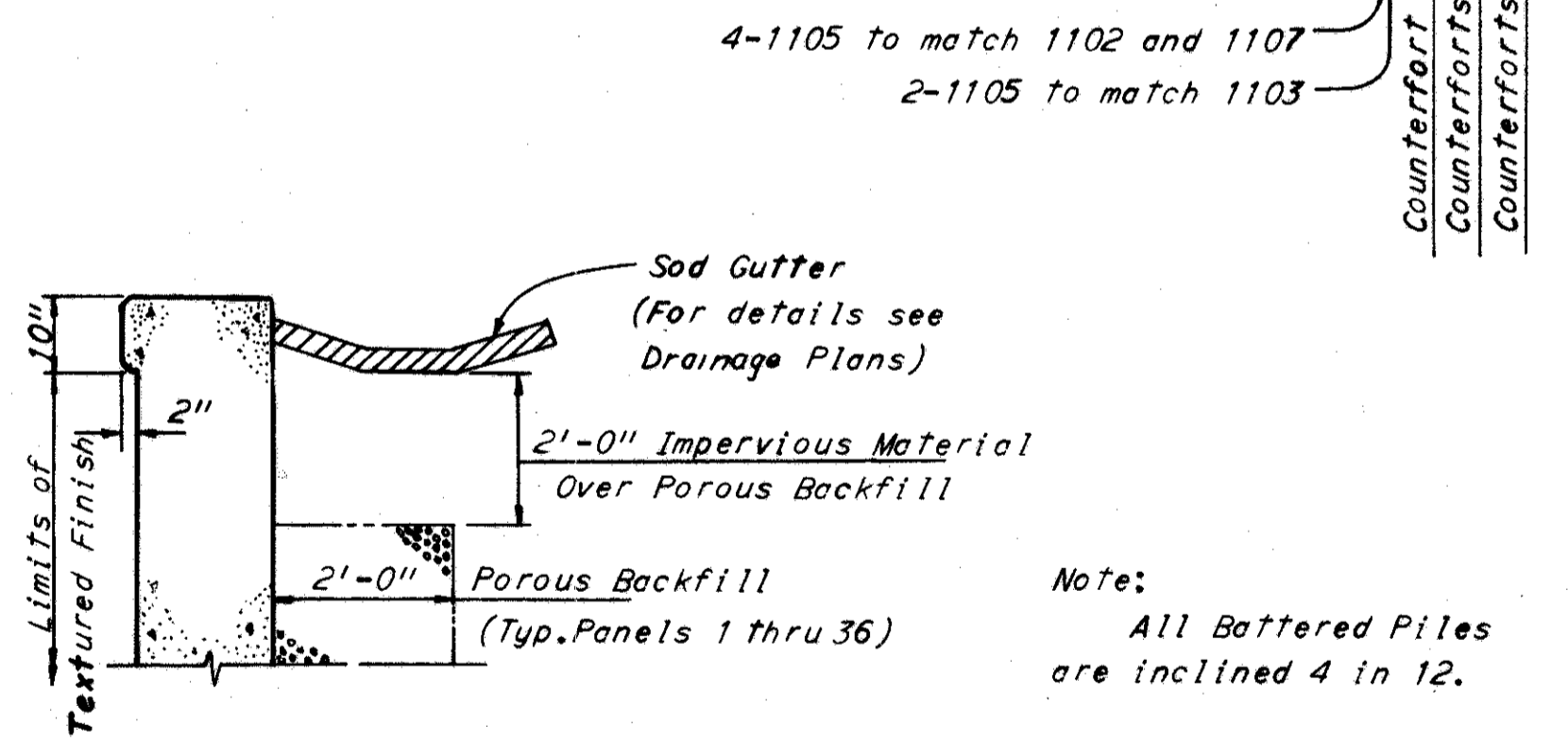
**TYPE E**  
 (Counterforts E1 thru E4)



**TYPE F**  
 (Counterforts F1 and F2)



**TYPE G**  
 (Counterforts G1, G2 and G3)



**DETAIL A**

(Typical entire length of Wall except as noted)

Note:  
 All Battered Piles  
 are inclined 4 in 12.

M.N.T.B. WALL NO. 88

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

**WALL RIGHT OF NORTHBOUND  
 JENNINGS FREEWAY**

STA. 44+20.00  
 STA. 54+28.50

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN Z.J.D. TRACED CHECKED [initials] REVIEWED [initials] REVISIONS [initials]  
 DATE 1-22-65 DATE 1-26-65 DATE 1-29-65

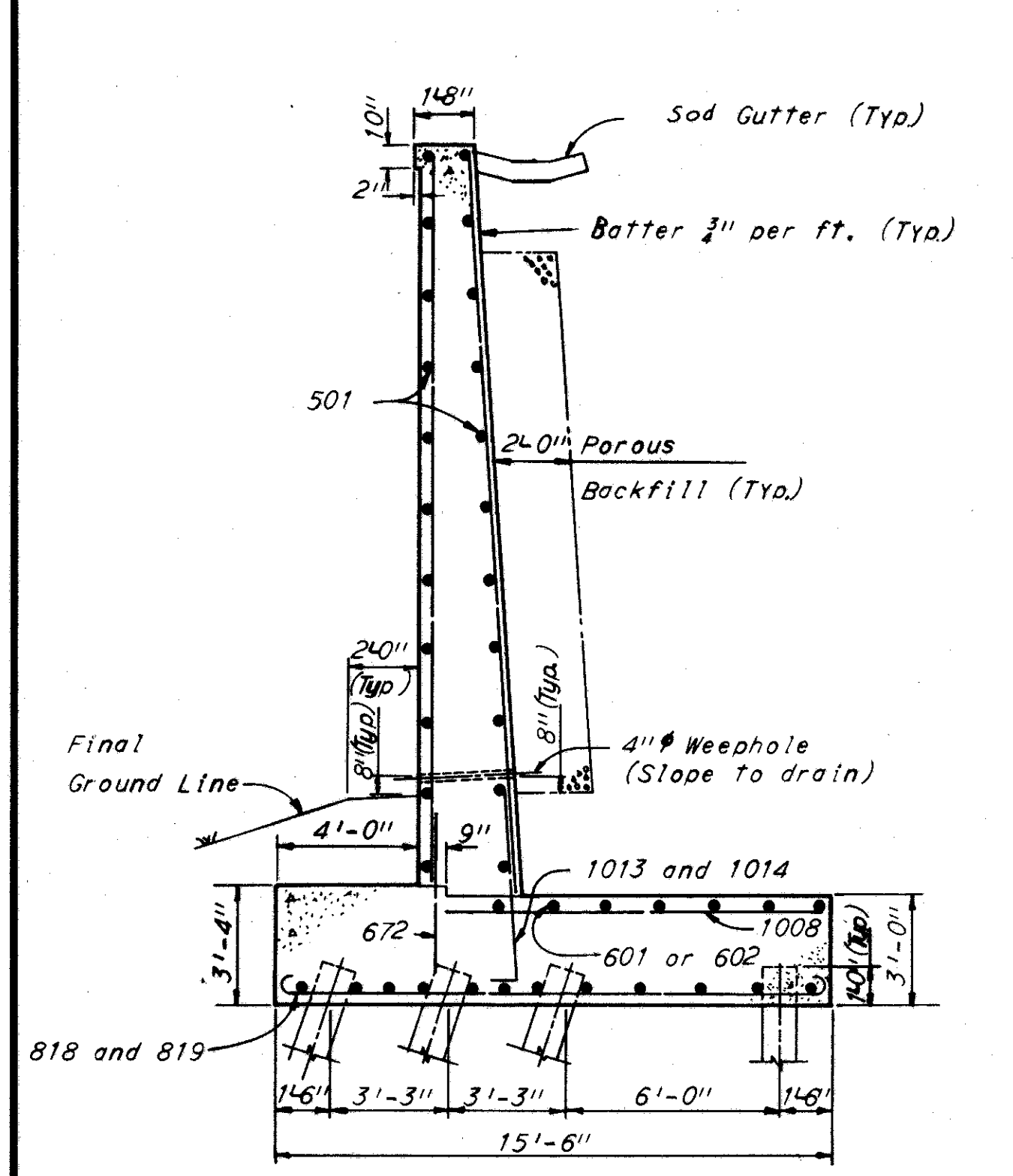
SHEET 498



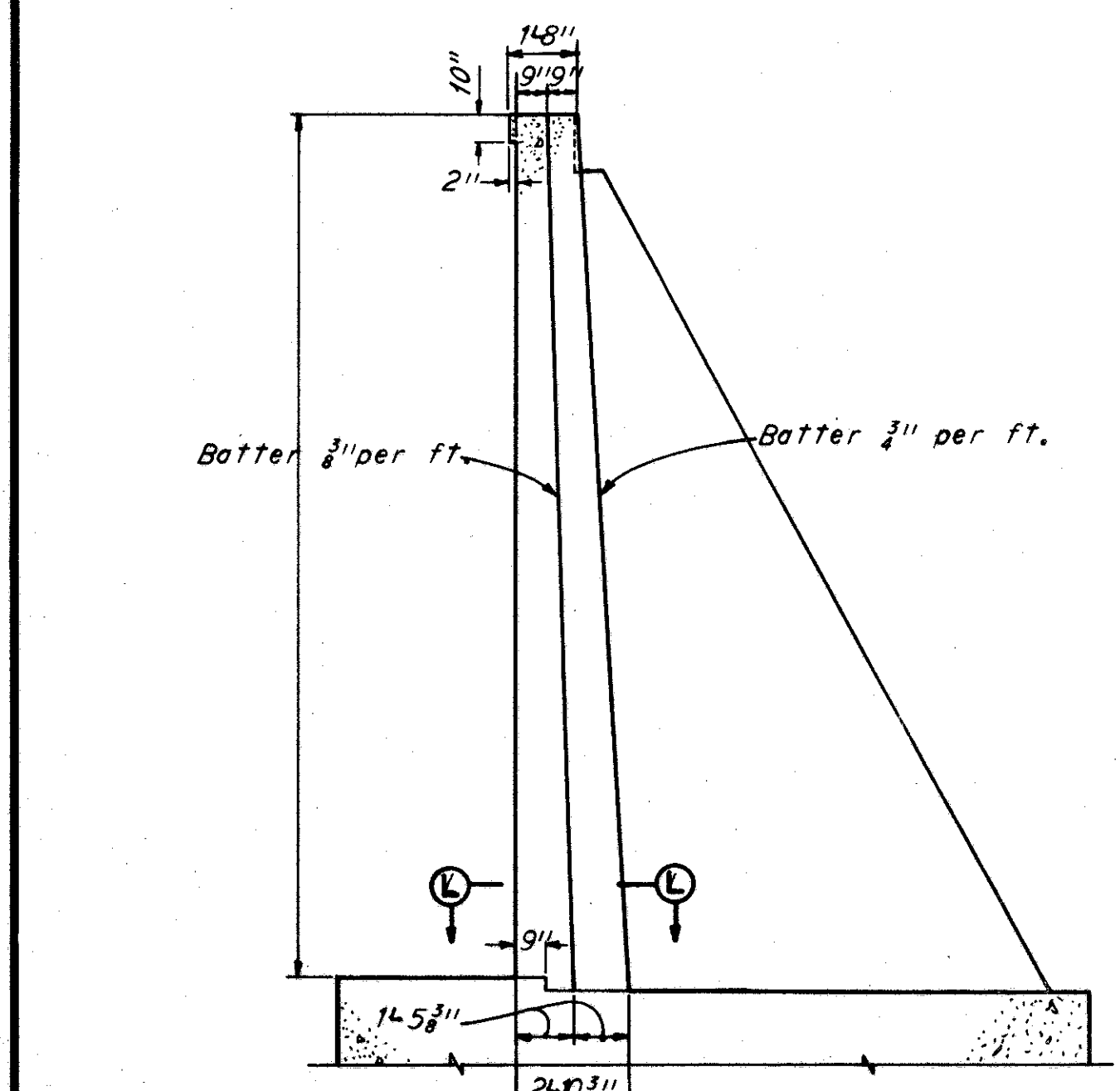
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

500  
646

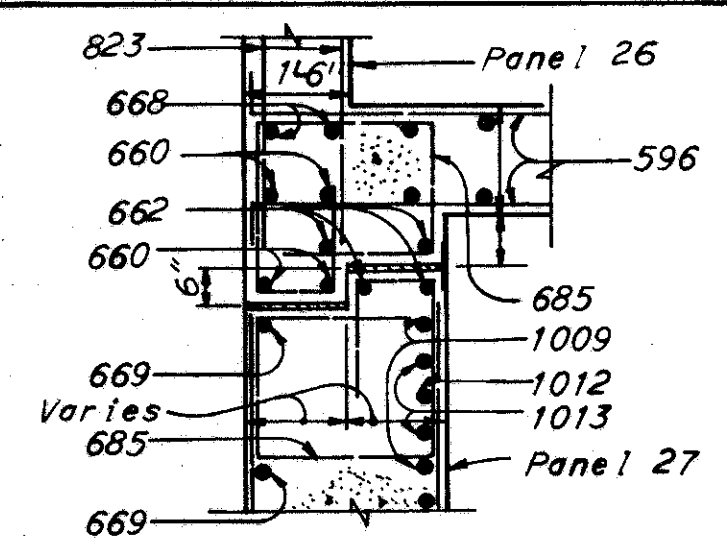
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



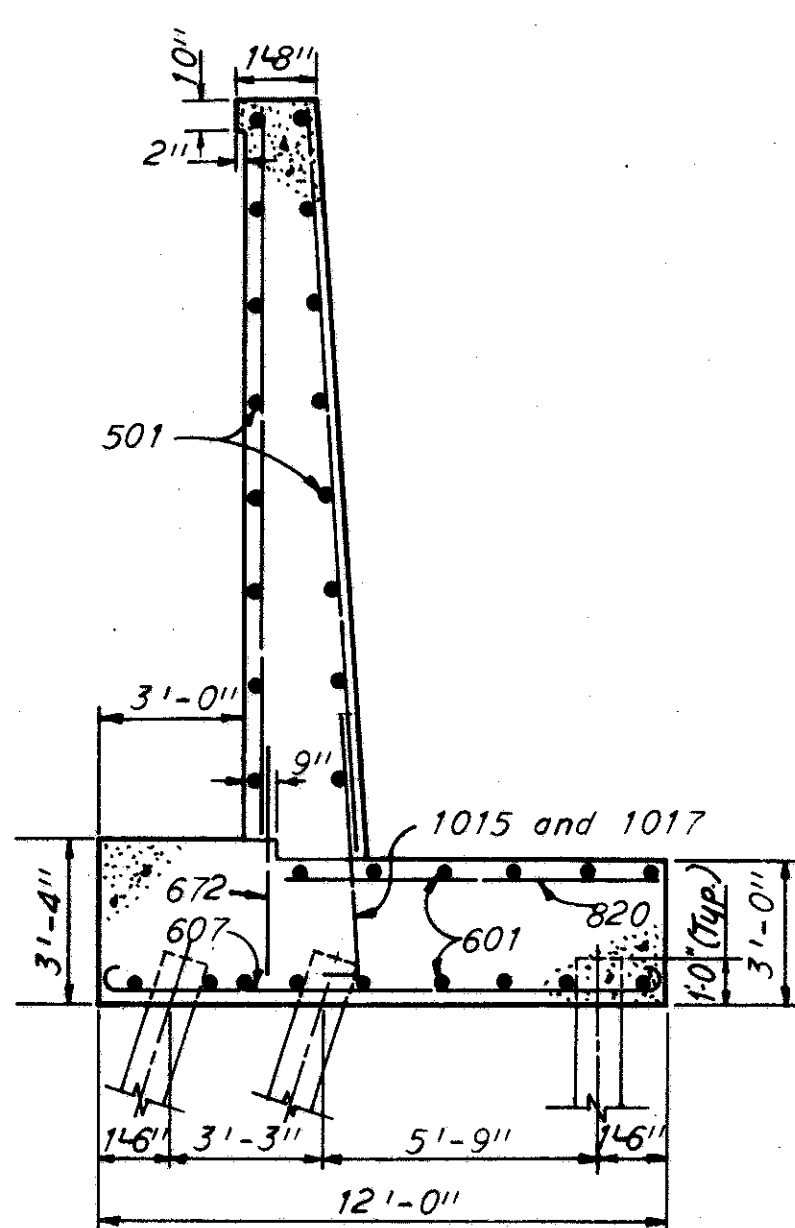
TYPICAL SECTION  
PANELS 27, 28 AND 29



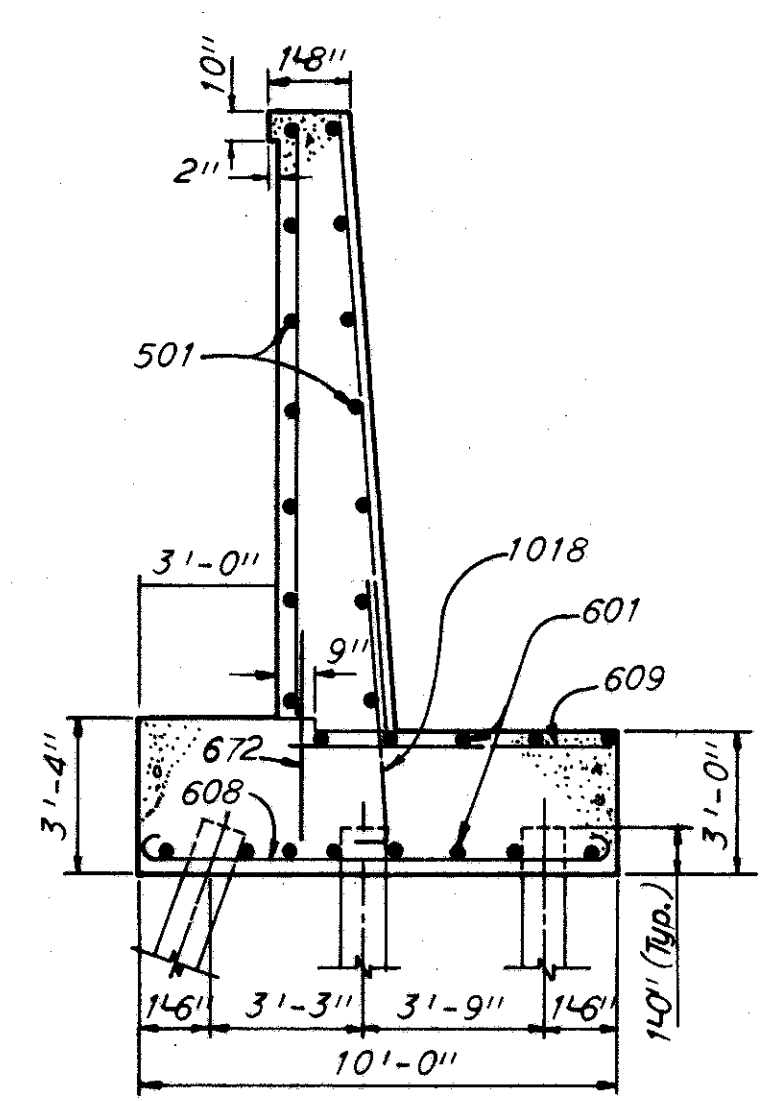
TYPICAL SECTION BETWEEN PANELS 26 AND 27



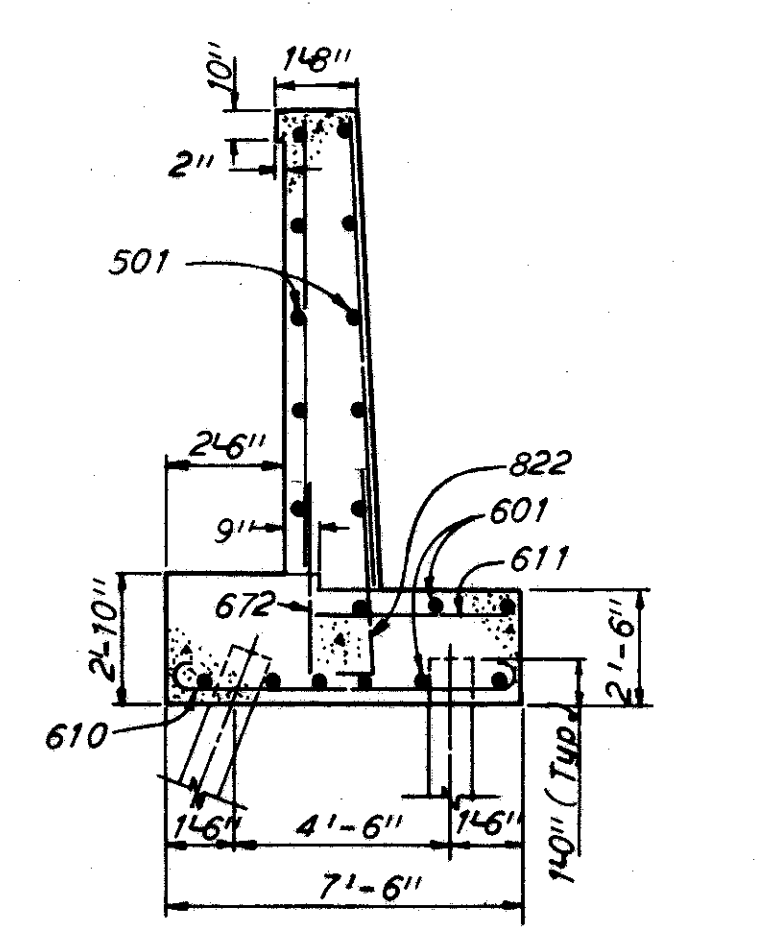
SECTION L-L



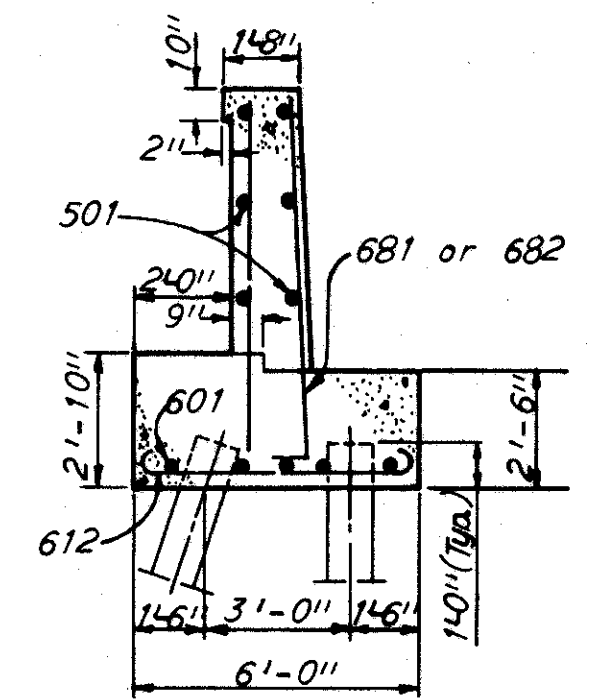
TYPICAL SECTION  
PANELS 30 AND 31



TYPICAL SECTION  
PANELS 32 AND 33

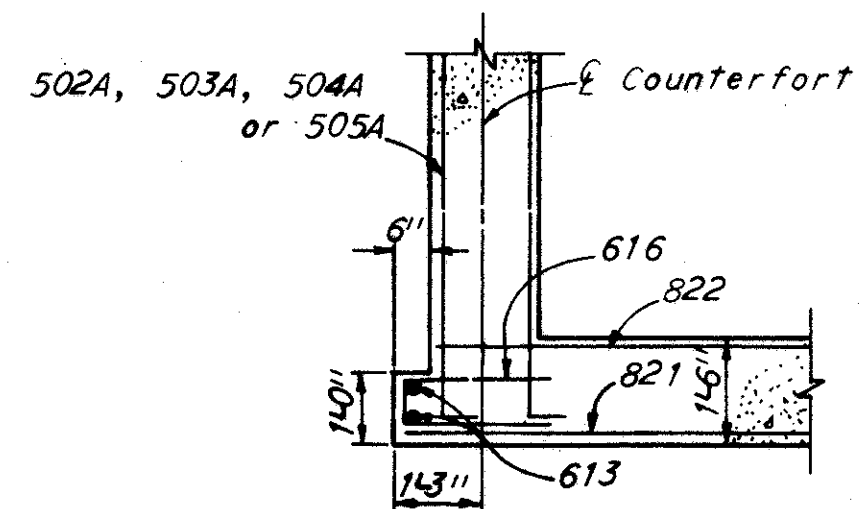


TYPICAL SECTION  
PANELS 34 AND 35



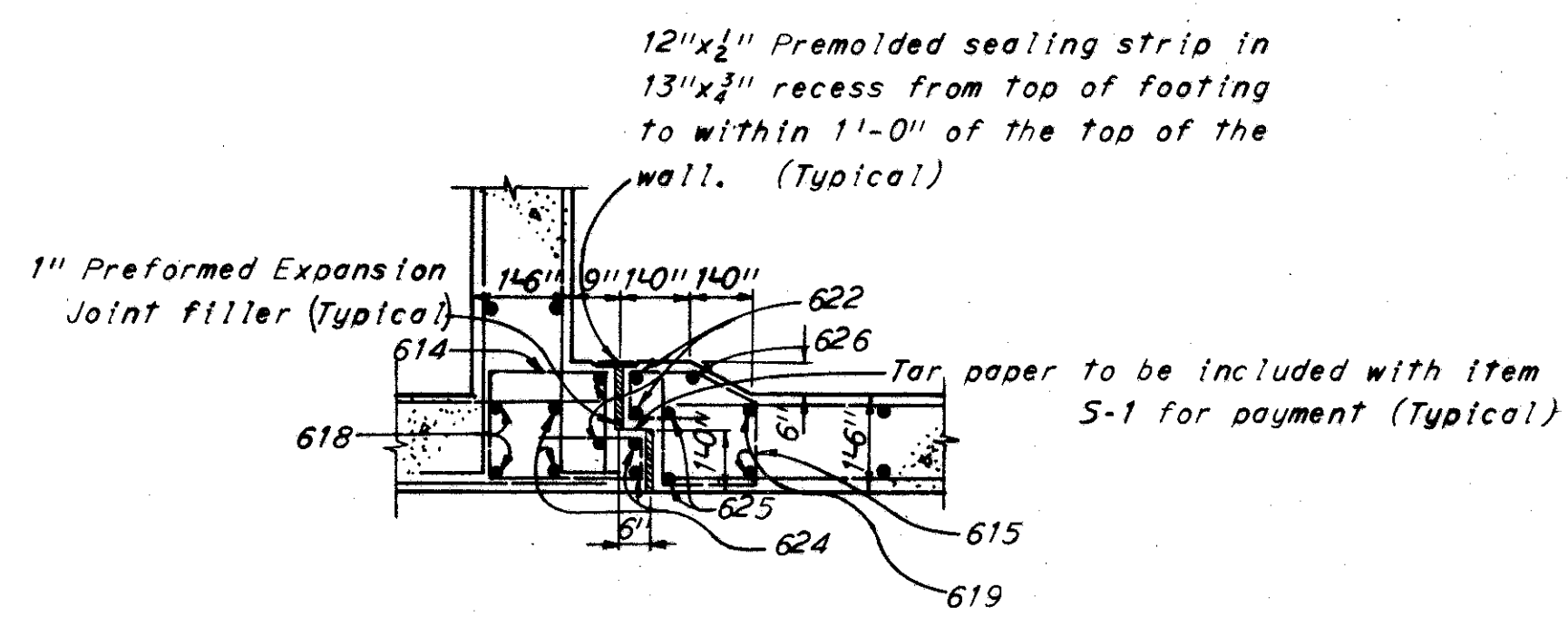
TYPICAL SECTION  
PANELS 36 AND 37

1" Preformed Expansion Joint filler when rustication is located at Expansion Joint

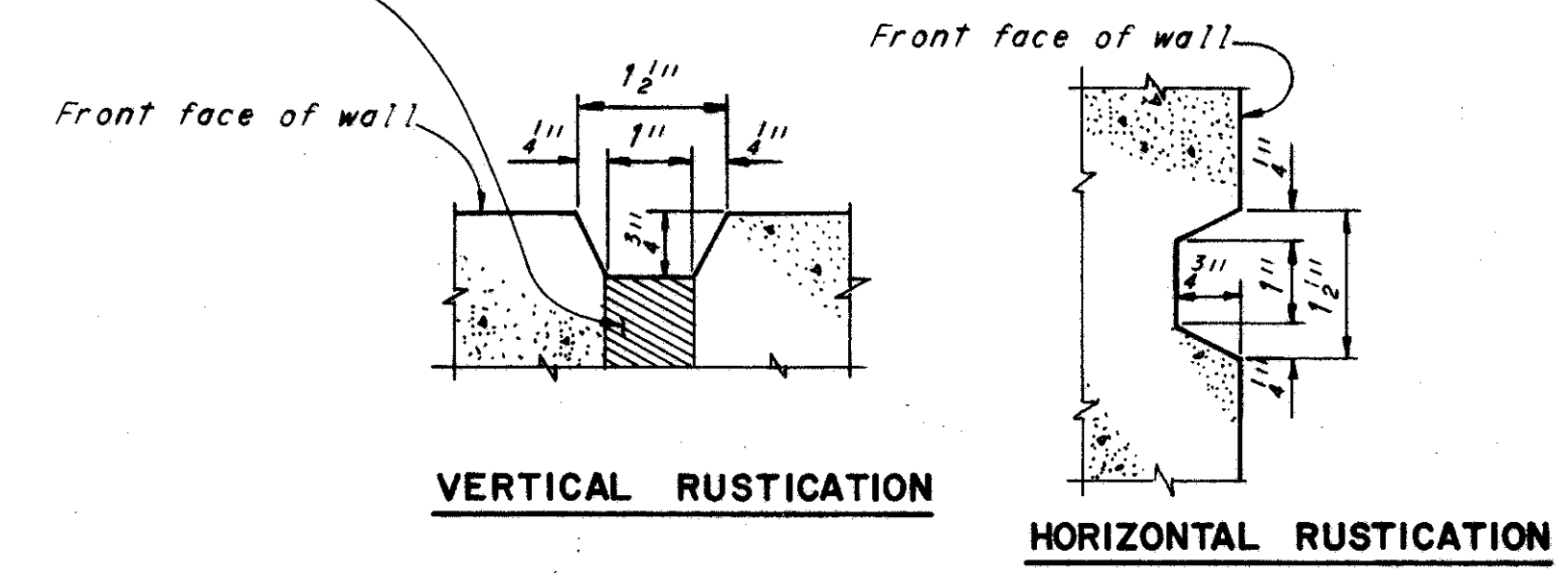


SOUTH END OF WALL  
(Panel 1)

Note: Expansion Joint shown. Contraction Joint similar excluding Joint Filler.

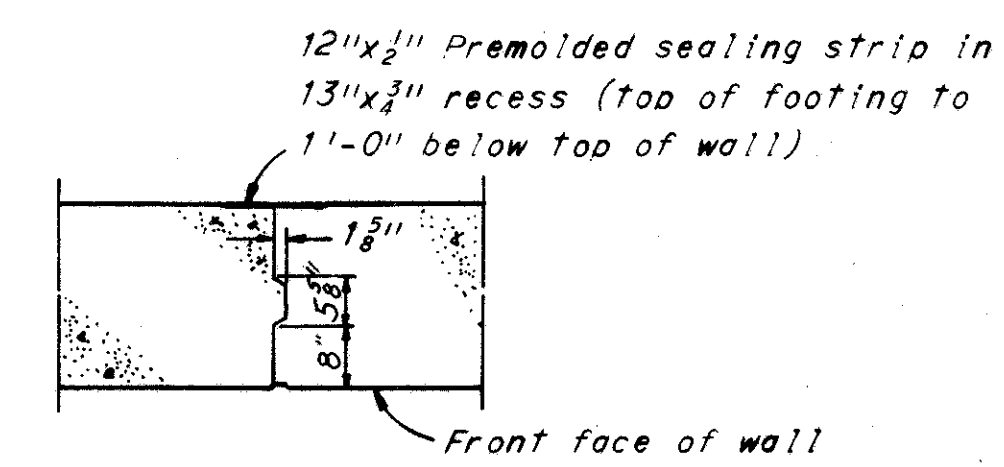


TYPICAL JOINT DETAIL  
(Joint between Panels 2 and 3 shown)

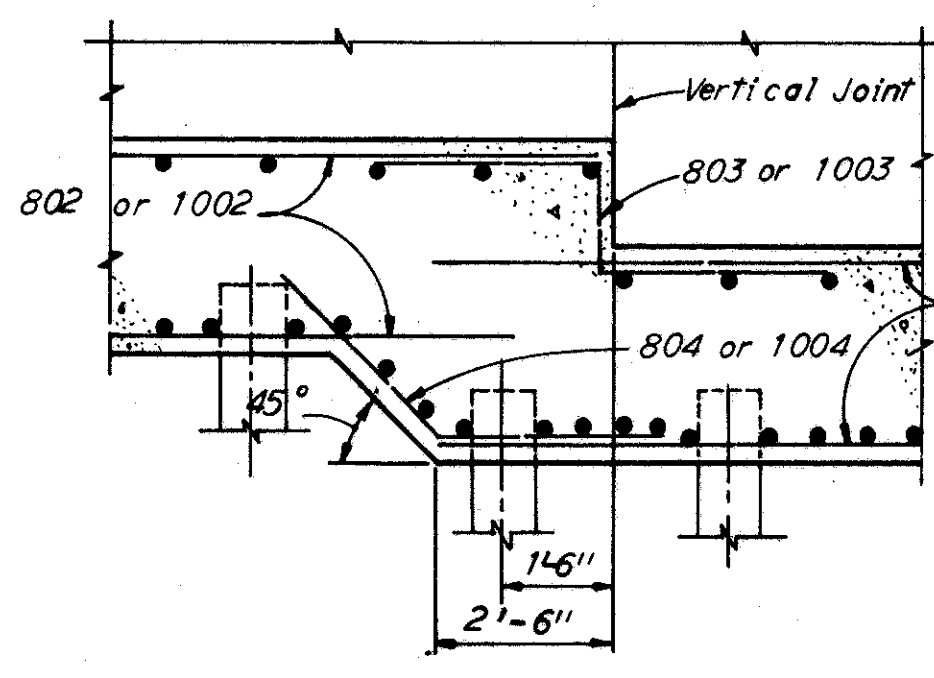


VERTICAL RUSTICATION  
HORIZONTAL RUSTICATION

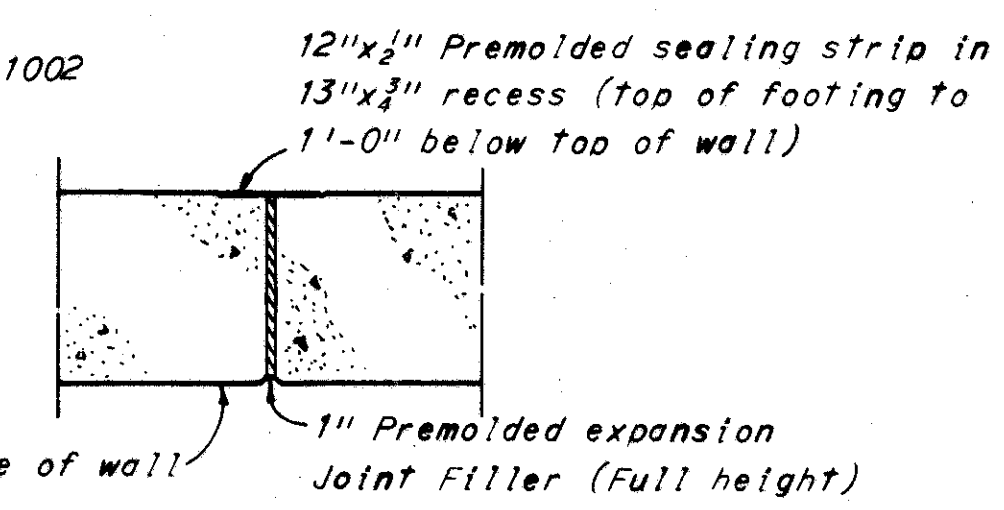
Note: Rustication at Expansion Joint shown. Contraction Joint similar excluding Joint Filler.



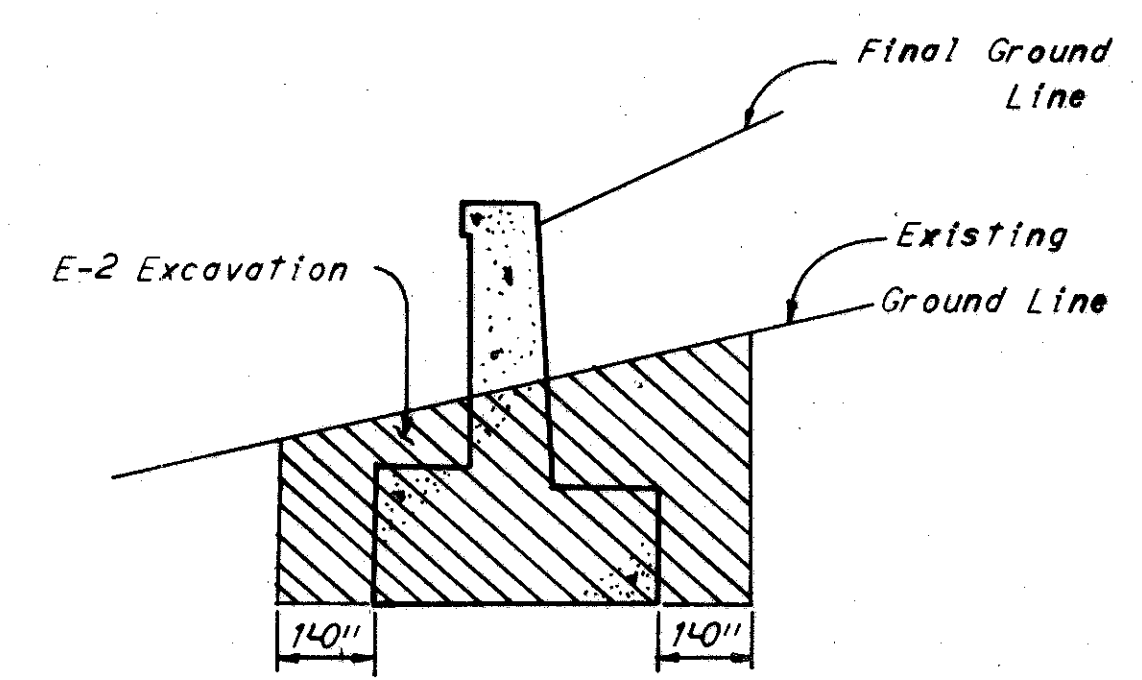
CONTRACTION JOINT DETAIL  
(Typical for cantilevered wall section)



TYPICAL FOOTING STEP DETAIL  
(Step between Panels 2 and 3 shown)



EXPANSION JOINT DETAIL  
(Typical for cantilevered wall section)



TYPICAL SECTION USED TO  
DETERMINE UNCLASSIFIED  
EXCAVATION QUANTITIES

H.N.T.B. WALL NO. 88

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**WALL RIGHT OF NORTHBOUND  
JENNINGS FREEWAY**

STA. 44+20.00  
STA. 54+28.50

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN: JVD TRACED: [ ] CHECKED: [ ] REVIEWED: [ ] REVISION: [ ]  
DATE: 2-30-64 DATE: 1-26-65 DATE: 1-29-65

SHEET 500

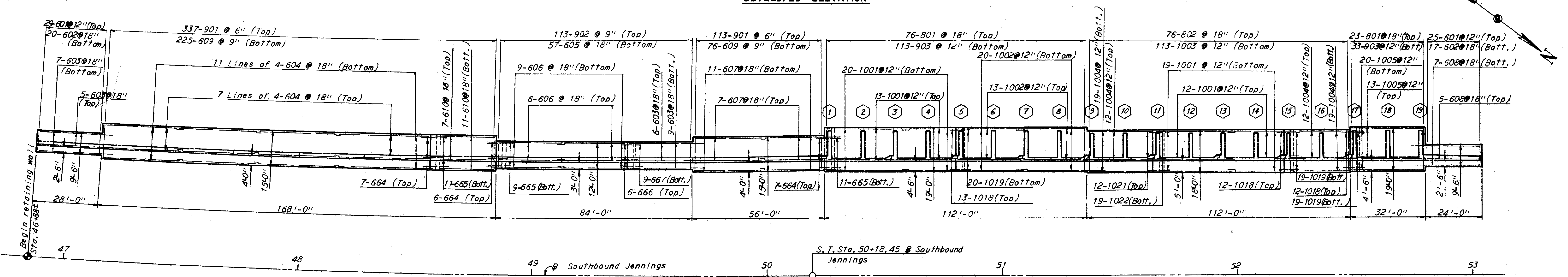
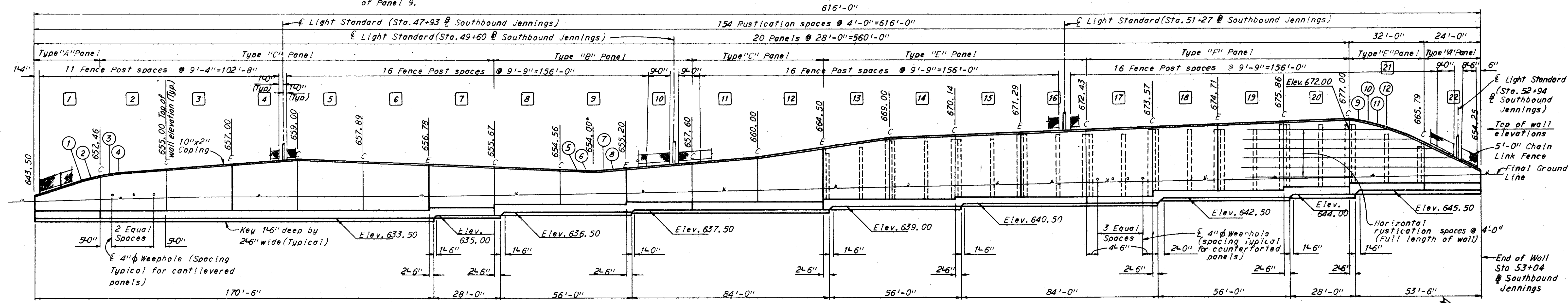
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)		
WK501	154	27'-9"	Str.		4,457	WK582	2 Ser. 7	13'-8"	Str.		279	WK658	10	23'-6"	Str.		353	WK1012	42	11'-0"	Str.	1,988			
WK502	6 Ser. 17	31'-0"	Str.	155	6 3/4"	3,750	WK583	2 Ser. 6	6'-2"	Str.	129	WK659	6	25'-0"	Str.		225	WK1013	84	10'-11"	Str.	148	3,946		
WK503	6 Ser. 8	24'-8"	Str.	155	10"	1,380	WK584	2 Ser. 6	25'-2"	Str.	155	6 3/8"	332	WK660	9	21'-9"	Str.	294	WK1014	147	7'-4"	Str.	148	4,639	
WK504	6 Ser. 7	17'-2"	Str.	155	13"	894	WK585	2 Ser. 7	20'-0"	Str.	155	9 3/8"	326	WK661	6	22'-9"	Str.	205	WK1015	1 Ser. 15	14'-9"	Str.	7"	984	
WK505	6 Ser. 7	6'-2"	Str.	155	19 1/4"	486	WK586	2 Ser. 6	14'-2"	Str.	155	12 3/4"	210	WK662	9	20'-3"	Str.	274	WK1016	1 Ser. 15	13'-9"	Str.	7"	920	
WK506	1 Ser. 20	29'-2"	Str.	155	6 1/4"	716	WK587	2 Ser. 6	5'-8"	Str.	155	18"	118	WK663	2 Ser. 13	24'-11"	Str.	1,066	WK1017	28	9'-6"	Str.	148	1,145	
WK507	1 Ser. 8	23'-0"	Str.	155	9 1/4"	216	WK588	1 Ser. 4	26'-2"	Str.	155	6 1/2"	113	WK664	2 Ser. 13	24'-0"	Str.	1,030	WK1018	1 Ser. 15	11'-8"	Str.	7"	785	
WK508	1 Ser. 7	15'-2"	Str.	155	13 1/4"	136	WK589	1 Ser. 7	21'-2"	Str.	155	8 1/4"	170	WK665	2 Ser. 13	25'-10"	Str.	994	WK1019	1 Ser. 15	10'-7"	Str.	7"	715	
WK509	1 Ser. 6	6'-0"	Str.	155	9 3/4"	63	WK590	1 Ser. 6	15'-4"	Str.	155	12"	112	WK666	2 Ser. 13	24'-0"	Str.	955	WK1101	30	39'-3"	Str.	107	6,256	
WK510	2 Ser. 19	29'-8"	Str.	155	6 3/4"	1,371	WK591	1 Ser. 6	6'-0"	Str.	155	18 1/2"	65	WK667	2 Ser. 13	24'-0"	Str.	913	WK1102	70	24'-3"	Str.	107	9,019	
WK511	2 Ser. 8	23'-8"	Str.	155	9 1/4"	439	WK592	1 Ser. 4	26'-0"	Str.	155	6 1/4"	112	WK668	2 Ser. 13	21'-0"	Str.	871	WK1103	70	15'-0"	Str.	107	5,579	
WK512	2 Ser. 7	16'-0"	Str.	155	13 3/8"	282	WK593	1 Ser. 7	20'-6"	Str.	155	9 3/8"	167	WK669	1 Ser. 15	19'-9"	Str.	455	WK1104	70	12'-10"	Str.	107	4,773	
WK513	2 Ser. 7	5'-2"	Str.	155	19 1/4"	147	WK594	1 Ser. 6	13'-0"	Str.	155	13 3/4"	104	WK670	1 Ser. 15	18'-9"	Str.	432	WK1105	324	7'-1"	Str.	107	12,193	
WK514	2 Ser. 18	30'-4"	Str.	155	6 1/4"	1,311	WK595	1 Ser. 5	6'-0"	Str.	155	20 3/4"	40	WK671	1 Ser. 15	17'-8"	Str.	408	WK1106	16	40'-1"	Str.	107	3,407	
WK515	4 Ser. 8	24'-0"	Str.	155	10"	898	WK596	2	27'-0"	Str.	155	56	WK672	1,088	5'-0"	Str.	8,171	WK1107	14	40'-8"	Str.	107	3,025		
WK516	2 Ser. 7	16'-8"	Str.	155	13"	291	WK597	2 Ser. 7	21'-8"	Str.	155	9 1/4"	352	WK673	1 Ser. 15	14'-7"	Str.	339	WK1108	10	37'-10"	Str.	107	2,010	
WK517	2 Ser. 7	5'-8"	Str.	155	19 1/4"	155	WK598	2 Ser. 6	15'-2"	Str.	155	13 3/8"	224	WK674	1 Ser. 15	13'-6"	Str.	314	WK1109	8	34'-6"	Str.	107	1,466	
WK518	2 Ser. 19	30'-4"	Str.	155	6 1/4"	1,384	WK599	2 Ser. 6	5'-0"	Str.	155	20"	125	WK675	1 Ser. 15	11'-5"	Str.	268	WK1110	12	20'-3"	Str.	107	1,291	
WK519	2 Ser. 7	17'-0"	Str.	155	12 1/4"	294	WK596A	2	27'-8"	Str.	155	58	WK676	1 Ser. 15	10'-8"	Str.	243	WK1111	18	12'-3"	Str.	107	1,172		
WK520	2 Ser. 7	6'-4"	Str.	155	19 3/4"	163	WK502A	1 Ser. 17	31'-0"	Str.	155	6 3/4"	625	WK677	1 Ser. 15	8'-6"	Str.	205	WK1112	4	33'-8"	Str.	107	715	
WK521	2 Ser. 18	30'-8"	Str.	155	6 1/4"	1,317	WK503A	1 Ser. 8	24'-8"	Str.	155	10"	230	WK678	1 Ser. 15	7'-6"	Str.	180	WK1113	12	9'-9"	Str.	107	622	
WK522	2 Ser. 8	24'-8"	Str.	155	9 3/4"	458	WK504A	1 Ser. 7	17'-2"	Str.	155	13"	149	WK679	1 Ser. 15	7'-3"	Str.	174	WK1114	6	31'-6"	Str.	107	1,004	
WK523	2 Ser. 7	11'-8"	Str.	155	12 1/4"	302	WK505A	1 Ser. 7	6'-2"	Str.	155	19 1/4"	81	WK680	1 Ser. 15	6'-2"	Str.	149	WK1115	12	17'-3"	Str.	107	1,100	
WK524	2 Ser. 7	6'-10"	Str.	155	19 3/8"	170	WK601	124	29'-0"	Str.	5,401	WK602	47	30'-0"	Str.	12,118	WK681	1 Ser. 15	7'-11"	Str.	189	189			
WK525	2 Ser. 21	29'-0"	Str.	155	6 3/4"	1,500	WK603	15	4'-10"	Str.	109	WK604	26	7'-0"	Str.	273	WK682	1 Ser. 15	6'-10"	Str.	164	164			
WK526	2 Ser. 8	23'-0"	Str.	155	9 3/4"	430	WK605	6	5'-10"	Str.	157	53	WK686	2	11'-11"	Str.	112	WK683	2 Ser. 6	9'-5"	Str.	112	3"	154	
WK527	4 Ser. 7	15'-10"	Str.	155	12 1/4"	555	WK606	14	8'-5"	Str.	108	177	WK687	30 Ser. 10	3'-6"	Str.	2,816	7,998	WK684	2 Ser. 6	9'-5"	Str.	112	176	
WK528	2 Ser. 7	5'-4"	Str.	155	18 1/4"	146	WK607	41	13'-0"	Str.	100	801	WK688	1,288	4'-9"	Str.	9,189	9,189	WK685	2 Ser. 7	10'-3"	Str.	112	1 3/8"	222
WK529	2 Ser. 20	29'-6"	Str.	155	6 3/4"	1,439	WK608	33	11'-0"	Str.	100	545	WK689	16 Ser. 10	5'-6"	Str.	2,100	4,386	WK686	2	11'-11"	Str.	112	33	
WK530	2 Ser. 8	23'-6"	Str.	155	9 3/4"	438	WK609	56	6'-0"	Str.	156	505	WK690	14 Ser. 10	5'-7"	Str.	2,103	3,925	WK687	30 Ser. 10	3'-6"	Str.	2,816	7,998	
WK531	2 Ser. 7	16'-8"	Str.	155	12 1/4"	287	WK610	36	8'-6"	Str.	100	460	WK691	10 Ser. 10	5'-3"	Str.	2,541	2,541	WK688	1,288	4'-9"	Str.	9,189	9,189	
WK532	2 Ser. 7	8'-0"	Str.	155	18 1/4"	156	WK611	38	4'-0"	Str.	100	228	WK692	8 Ser. 9	4'-3"	Str.	2,888	1,636	WK689	16 Ser. 10	5'-6"	Str.	2,100	4,386	
WK533	2 Ser. 22	28'-10"	Str.	155	6 1/4"	1,568	WK612	37	7'-0"	Str.	100	389	WK693	4 Ser. 9	4'-0"	Str.	2,174	780	WK690	14 Ser. 10	5'-7"	Str.	2,103	3,925	
WK534	2 Ser. 8	22'-10"	Str.	155	9 3/4"	427	WK613	16	34'-0"	Str.	817	WK694	6 Ser. 8	3'-9"	Str.	2,998	982	WK691	10 Ser. 10	5'-3"	Str.	2,541	2,541		
WK535	2 Ser. 7	5'-8"	Str.	155	18 1/4"	148	WK614	928	9'-6"	Str.	112	13,242	WK695	6 Ser. 8	3'-7"	Str.	2,8"	931	WK692	8 Ser. 9	4'-3"	Str.	2,888	1,636	
WK536	2 Ser. 21	29'-0"	Str.	155	6 3/4"	1,504	WK615	907	7'-8"	Str.	135	10,444	WK696	6 Ser. 7	3'-0"	Str.	2,118	744	WK693	4 Ser. 9	4'-0"	Str.	2,174	780	
WK537	2 Ser. 8	23'-8"	Str.	155	9 1/4"	434	WK616	41	4'-2"	Str.	105	257	WK697	6 Ser. 7	2'-9"	Str.	2,82"	686	WK694	6 Ser. 8	3'-9"	Str.	2,998	982	
WK538	2 Ser. 7	16'-2"	Str.	155	12 3/4"	282	WK617	18	33'-9"	Str.	912	WK618	2 Ser. 13	33'-2"	Str.	1,308	1,308	WK695	6 Ser. 8	3'-7"	Str.	2,8"	931		
WK539	2 Ser. 7	6'-0"	Str.	155	18 3/4"	155	WK618	18	33'-9"	Str.	912	WK619	2 Ser. 13	34'-5"	Str.	1,351	1,351	WK696	6 Ser. 7	3'-0"	Str.	2,118	744		
WK540	3 Ser. 20	29'-10"	Str.	155	6 1/4"	2,169	WK619	2 Ser. 13	34'-5"	Str.	1,351	WK620	2 Ser. 13	34'-0"	Str.	1,334	1,334	WK697	6 Ser. 7	2'-9"	Str.	2,82"	686		
WK541	3 Ser. 8	23'-8"	Str.	155	9 3/4"	661	WK620	2 Ser. 13	34'-0"	Str.	1,334	WK621	2 Ser. 13	35'-2"	Str.	1,380	1,380	WK801	22	21'-3"	Str.	107	1,248		
WK542	3 Ser. 7	16'-10"	Str.	155	12 3/4"	436	WK621	2 Ser. 13	35'-2"	Str.	1,380	WK622	37	31'-6"	Str.	1,751	1,751	WK802	234	29'-3"	Str.	107	18,275		
WK543	3 Ser. 7	6'-4"	Str.	155	19"	243	WK622	37	31'-6"	Str.	1,751	WK623	18	33'-6"	Str.	906	906	WK803	27	6'-6"	Str.	107	469		
WK544	1 Ser. 17	30'-6"	Str.	155	6"	621	WK623	18	33'-6"	Str.	906	WK624	4	33'-3"	Str.	200	200	WK804	39	9'-0"	Str.	108	937		
WK545	1 Ser. 8	24'-0"	Str.	155	10 1/4"	225	WK624	4	33'-3"	Str.	200	WK625	2	34'-9"	Str.	104	104	WK805	462	27'-4"	Str.	100	33,717		
WK546	1 Ser. 7	16'-2"	Str.	155	14"	144	WK625	2	34'-9"	Str.	104	WK626	26	33'-0"	Str.	1,289	1,289	WK806	306	9'-11"	Str.	107	8,102		
WK547	1 Ser. 6	6'-4"	Str.	155	20 3/8"	67	WK626	26	33'-0"	Str.	1,289	WK627	6	34'-3"	Str.	309	309	WK807	315	25'-0"	Str.	107	21,026		
WK548	2 Ser. 16	31'-2"	Str.	155	6 1/4"	1,179	WK627	6	34'-3"	Str.	309	WK628	19	32'-6"	Str.	927	927	WK808	172	30'-6"	Str.	107	14,007		
WK549	2 Ser. 8	24'-6"	Str.	155	10 3/8"	459	WK628	19	32'-6"	Str.	927	WK629	2	35'-6"	Str.	107	107	WK809	17	6'-0"	Str.	157	272		
WK550	2 Ser. 7	16'-8"	Str.	155	14"	294	WK629	2	35'-6"	Str.	107	WK630	12	35'-0"	Str.	631	631	WK810	23	8'-3"	Str.	108	507		
WK551	2 Ser. 7	5'-4"	Str.	155	20 1/4"	153	WK630	12	35'-0"	Str.	631	WK631	10	34'-6"	Str.	518	518	WK811	144	9'-5"	Str.	107	3,621		
WK552	2 Ser. 14	32'-6"	Str.	155	6 1/4"	1,051	WK631	10	34'-6"	Str.	518	WK632	2	36'-0"	Str.	108	108	WK812	76	24'-10"	Str.	100	5,039		
WK553	2 Ser. 8	25'-10"	Str.	155	10 3/8"	481	WK632	2	36'-0"	Str.	108	WK633	6	35'-9"	Str.	322	322	WK813	57	22'-6"	Str.	107	3,424		
WK554	2 Ser. 7	18'-0"	Str.	155	14"	314	WK633	6	35'-9"	Str.	322	WK634	6	35'-3"	Str.	318	318	WK814	75	22'-10"	Str.	100	4,572		
WK555	2 Ser. 7	6'-6"	Str.	155	20 1/4"	170	WK634	6	35'-3"	Str.	318	WK635	2 Ser. 13	34'-9"	Str.	1,364	1,364	WK815	57	20'-6"	Str.	107	3,120		
WK556	2 Ser. 13	28'-10"	Str.	155	6 1/4"	872	WK635	2 Ser. 13	34'-9"	Str.	1,364	WK636	2 Ser. 13	35'-10"	Str.	1,406	1,406	WK816	66	20'-10"	Str.	100	3,671		
WK557	2 Ser. 8	22'-8"	Str.	155	10"	421	WK636	2 Ser. 13	35'-10"	Str.	1,406	WK637	2 Ser. 13	35'-5"	Str.	1,373	1,373	WK817	57	18'-6"	Str.	107	2,816		
WK558	2 Ser. 6	16'-0"	Str.	155	13 3/4"	235	WK637	2 Ser. 13	35'-5"	Str.	1,373	WK638	2 Ser. 13	34'-6"	Str.	1,355	1,								

CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

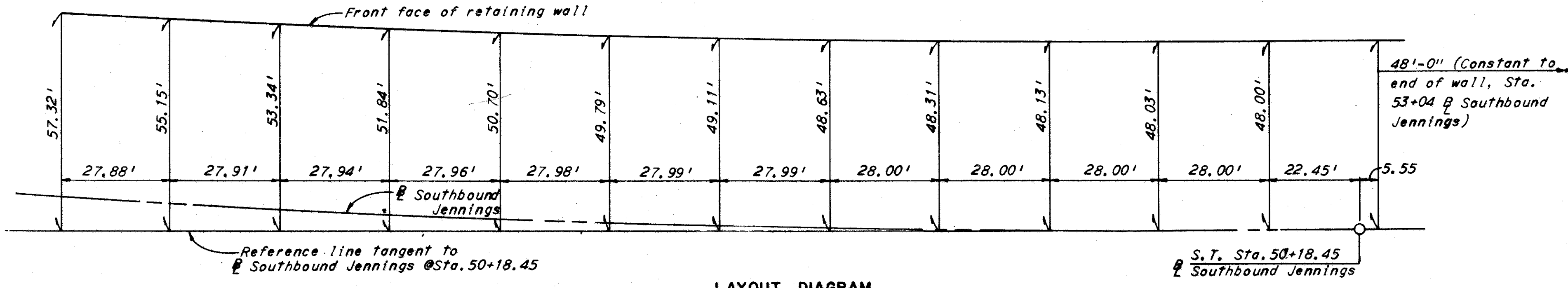
Note:  
 Top of wall elevations are given at 4'-0" intervals from joints in panels 1, 2 and 21. In panel 9 top of wall elevations are given at 4'-0" intervals from center point

TOP OF WALL ELEVATION												
POINT	1	2	3	4	5	6	7	8	9	10	11	12
ELEVATION	650.29	651.51	653.00	653.57	654.14	654.01	654.16	654.47	676.90	676.28	675.14	673.48

\* Elevation at center point of Panel 9.



Note:  
 All Reinforcing bar marks shall be prefixed WL



Notes:  
 All longitudinal dimensions are measured along front face of retaining wall.  
 Wall and footing for panels 1 thru 12 shall be built on chords between vertical wall joints.  
 [Symbol] Indicates wall panel numbered 1.  
 [Symbol] Indicates counterfort numbered 1.  
 C Indicates contraction joint.  
 E Indicates expansion joint.  
 Backfill shall be placed in front of the wall prior to or simultaneous with the placing of fill behind the wall.  
 Location of construction joints in the footing are optional but shall be located a minimum of 5'-0" from wall joints.  
 All longitudinal footing bars shall be dowelled through construction joints.  
 Panels 1 thru 12 and 22 shall be Class "E" Concrete.  
 Panels 13 thru 21 shall be Class "C" Concrete.  
 The following abbreviations are used:  
 ff = far face      ef = each face  
 nf = near face

H.N.T.B. WALL NO 89

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY      CLEVELAND      NEW YORK

**WALL LEFT OF SOUTHBOUND JENNINGS FREEWAY**

STA. 46+88 ±  
 STA. 53+04

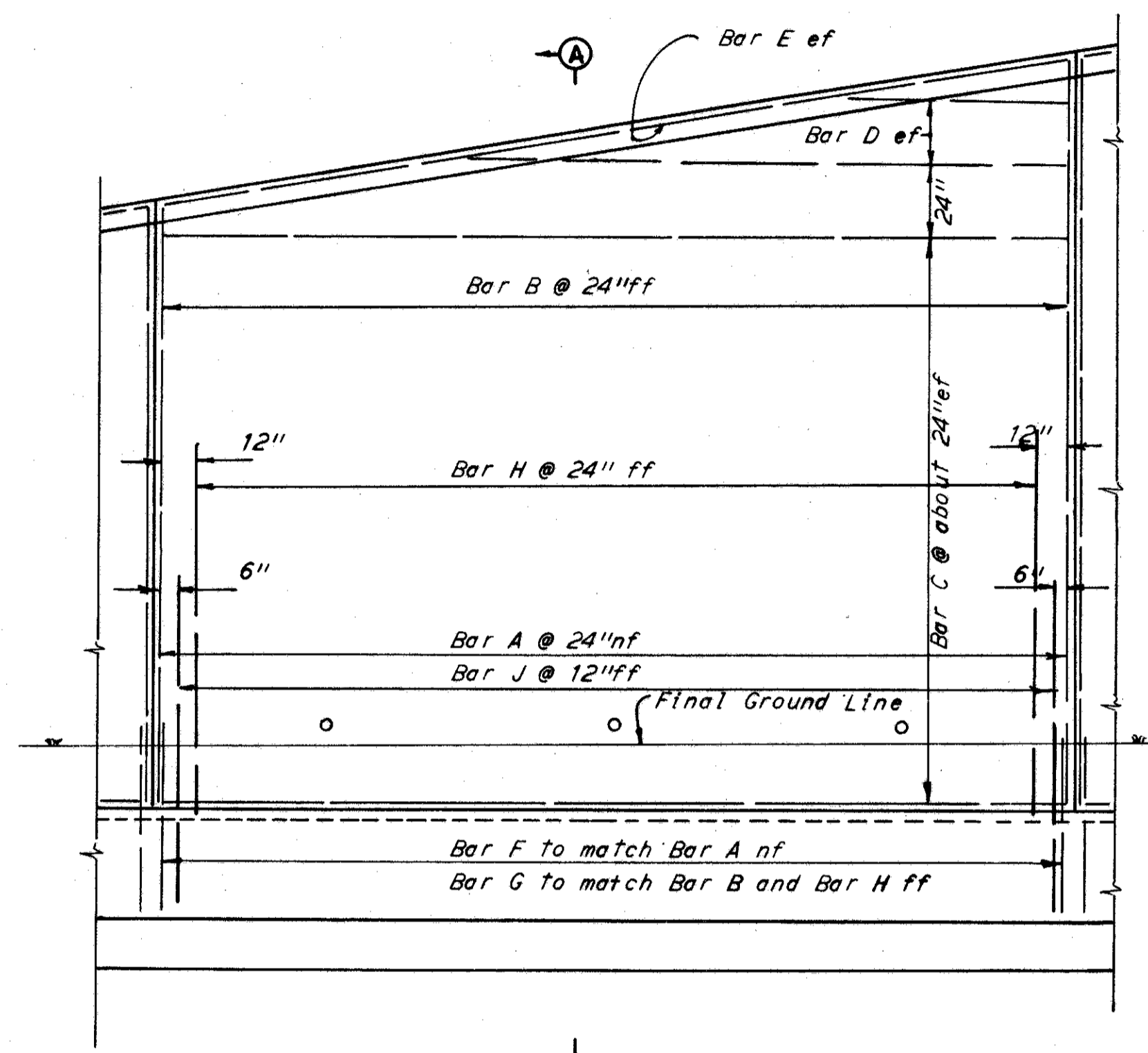
CLEVELAND	CUYAHOGA COUNTY	OHIO
DRAWN RSD	CHECKED JMC	REVIEWED WJ
DATE 1-29-65	DATE 1-29-65	DATE 1-29-65

SHEET 502

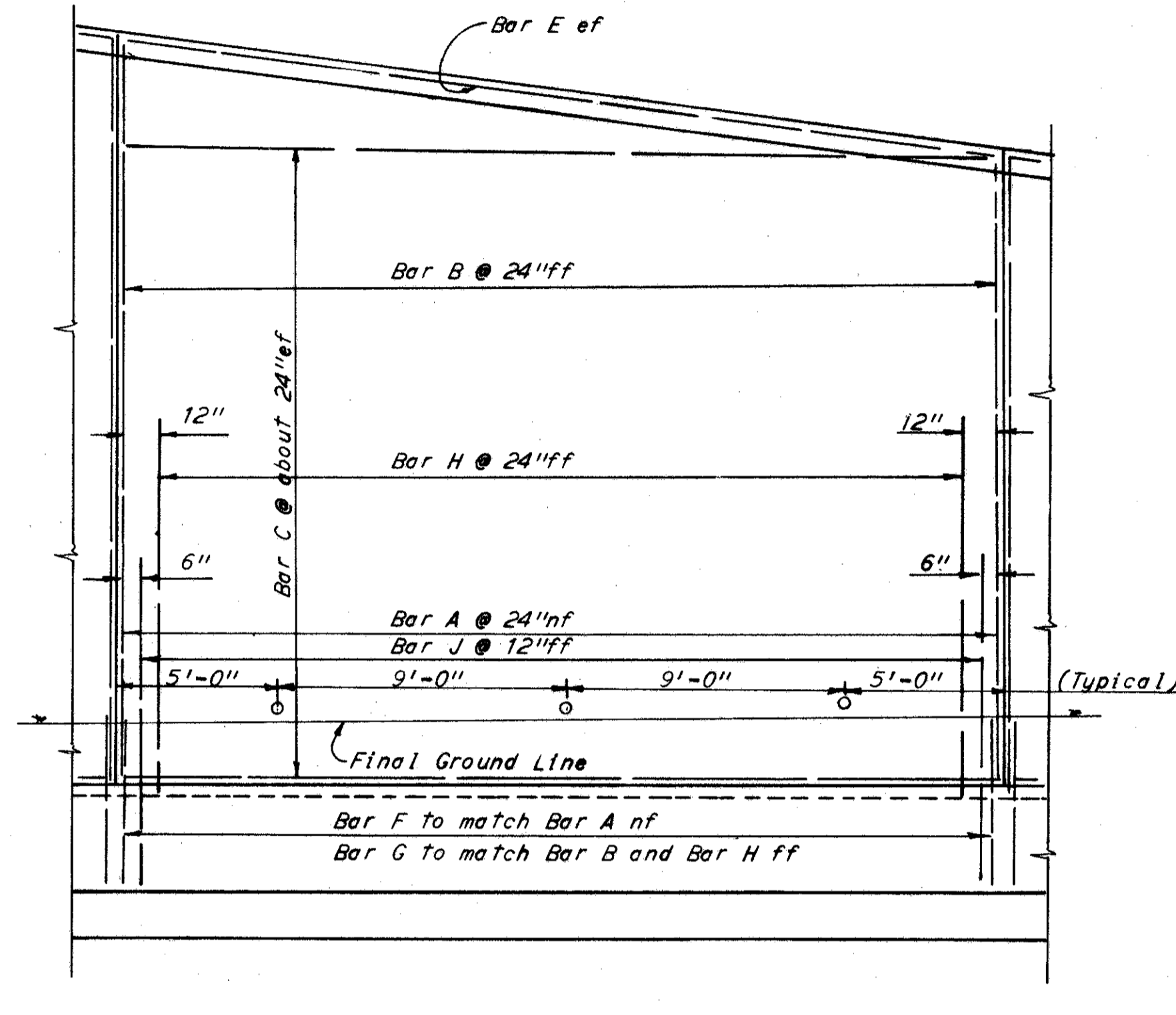
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76

Note: All Reinforcing bar marks shall be prefixed WL.

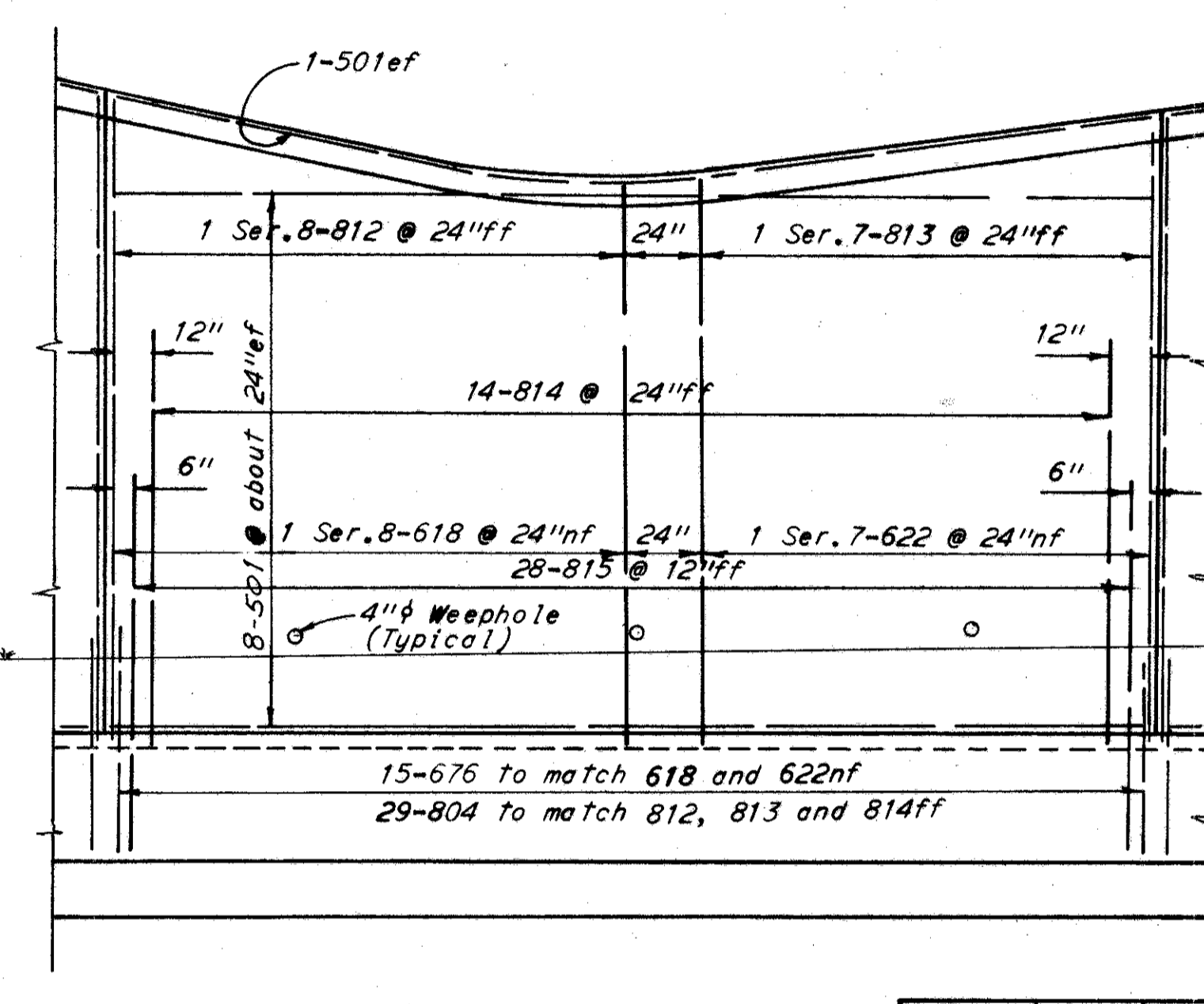
Note: 501 Bars in Panel 9 to be field bent as required and the payment for field bending shall be included with "Item S-4 Reinforcing Steel!"



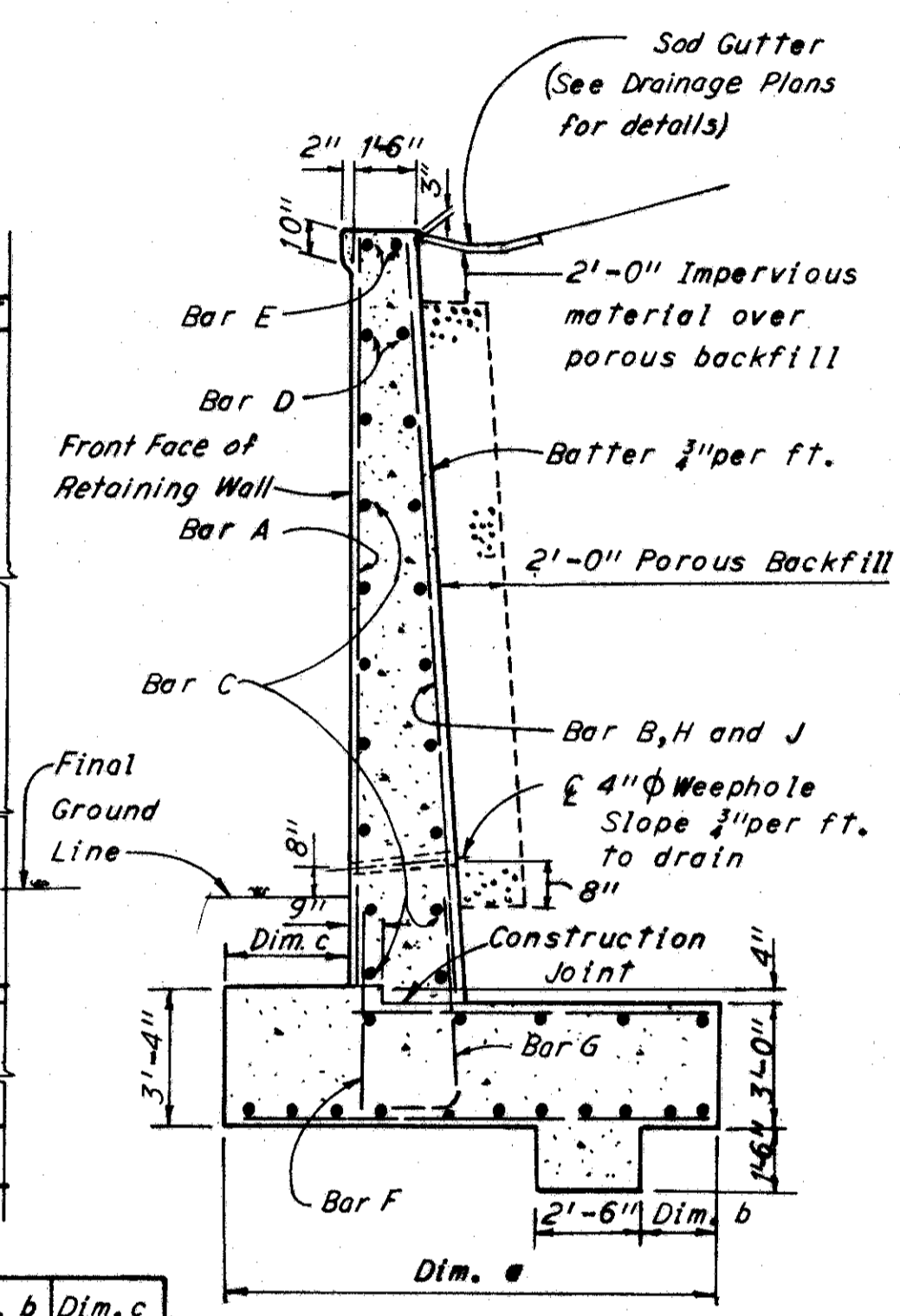
**ELEVATION-PANELS 1,2,3,4,10,11 AND 12**  
For special details of key at north end of Panel 12 and reinforcement in key see Joint Detail at Panels 12 and 13 on Sheet 507 and Panel 13 on Sheet 504.



**ELEVATION - PANELS 5,6,7 AND 8**



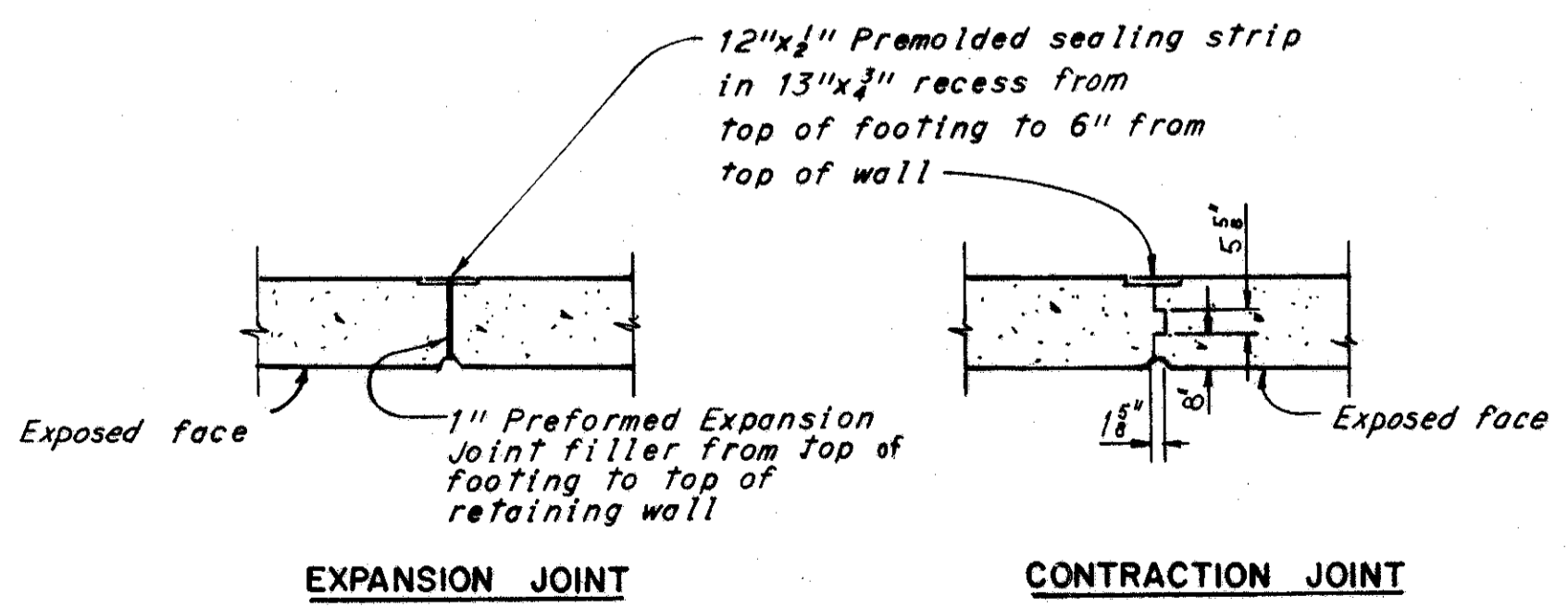
**ELEVATION - PANEL 9**



**SECTION A A**

Panel	Dim. a	Dim. b	Dim. c
1	9'-6"	1'-8"	2'-6"
2 thru 7, 11, 12	15'-0"	3'-6"	4'-0"
8, 9 and 10	12'-0"	2'-6"	3'-0"

BAR DESIGNATION	WALL REINFORCEMENT											
	PANEL DESIGNATION											
	1	2	3	4	5	6	7	8	10	11	12	
A	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	Number
	623	611	612	613	614	615	616	617	619	620	621	Mark
B	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	1 Ser. 15	Number
	803	1023	1007	1008	1009	1010	1011	807	809	1012	1144	Mark
C	4	9	10	11	11	11	10	8	8	9	11	Number
	501	501	501	501	501	501	501	501	501	501	501	Mark
D	1 Ser. 4	1	-	-	-	-	-	-	-	-	-	Number
	502	504	-	-	-	-	-	-	-	-	-	Mark
E	1	1	1	1	1	1	1	1	1	1	1	Number
	503	501	501	501	501	501	501	501	501	501	501	Mark
F	15	15	15	15	15	15	15	15	15	15	15	Number
	676	676	676	676	676	676	676	676	676	676	676	Mark
G	29	29	29	29	29	29	29	29	29	29	29	Number
	804	1006	1006	1006	1006	1006	1006	804	804	1006	1147	Mark
H	1 Ser. 14	14	14	14	14	14	14	14	14	14	14	Number
	805	1024	1026	1028	1028	1030	1015	816	810	1017	1145	Mark
J	28	28	28	28	28	28	28	28	28	28	28	Number
	806	1025	1027	1029	1029	1031	1016	808	811	1020	1146	Mark



For notes see sheet 502.

H.N.T.B. WALL NO. 89

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF SOUTHBOUND JENNINGS FREEWAY**

STA. 46+88 ±  
STA. 53+04

CLEVELAND CUYAHOGA COUNTY OHIO

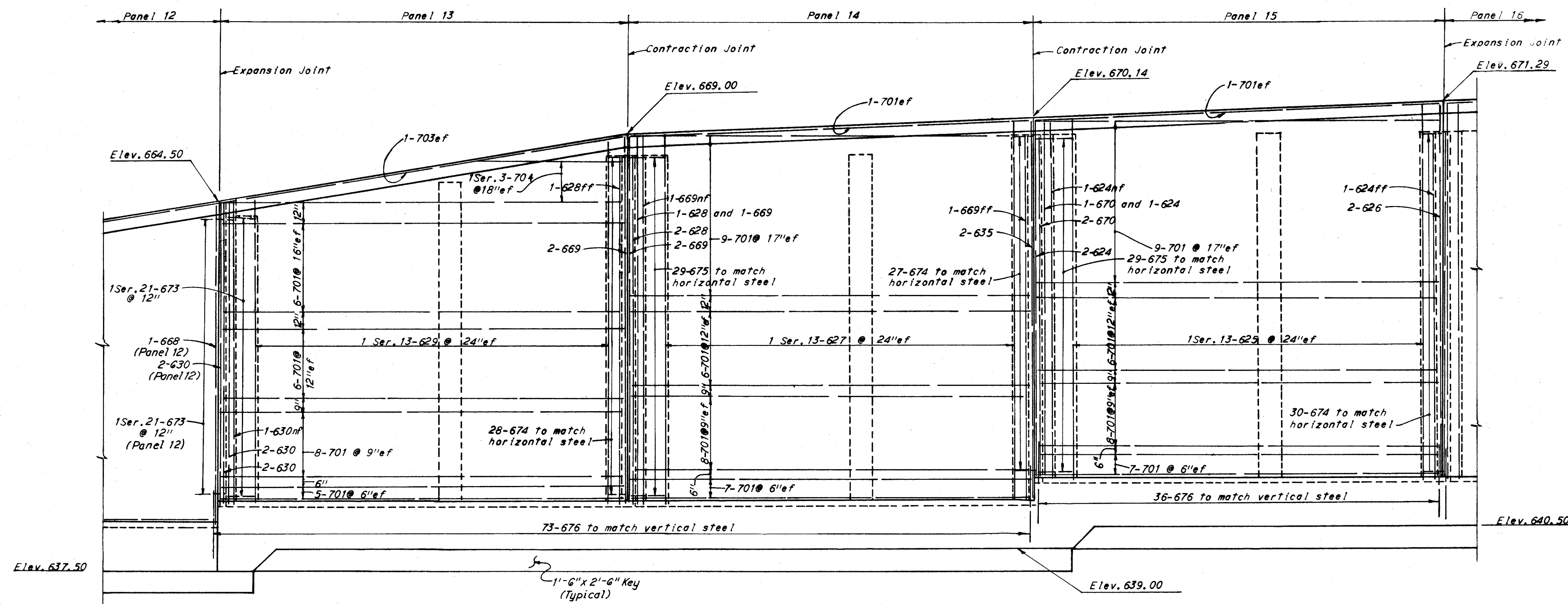
DRAWN R.S.D.	TRACED	CHECKED J.M.C.	REVIEWED	REVISED
DATE 1-29-65	DATE	DATE 1-29-65	DATE 1-29-65	DATE

SHEET 503

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

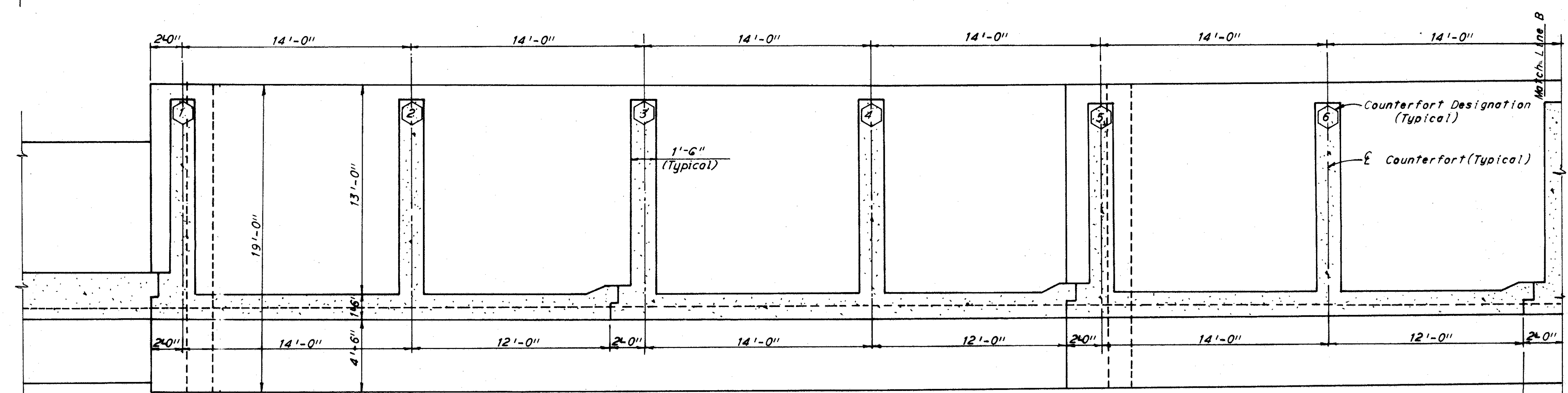
504  
646

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



Note:  
All reinforcing bar marks shall be prefixed WL.

For notes see sheet 502.



FOOTING PLAN

H.N.T.B. WALL NO. 99

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF SOUTHBOUND  
JENNINGS FREEWAY**

STA. 46+88 ±  
STA. 53+04

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN RSD TRACED CHECKED JMC REVIEWED WJF REVISIONS  
DATE 1-29-65 DATE 1-29-65 DATE 1-29-65

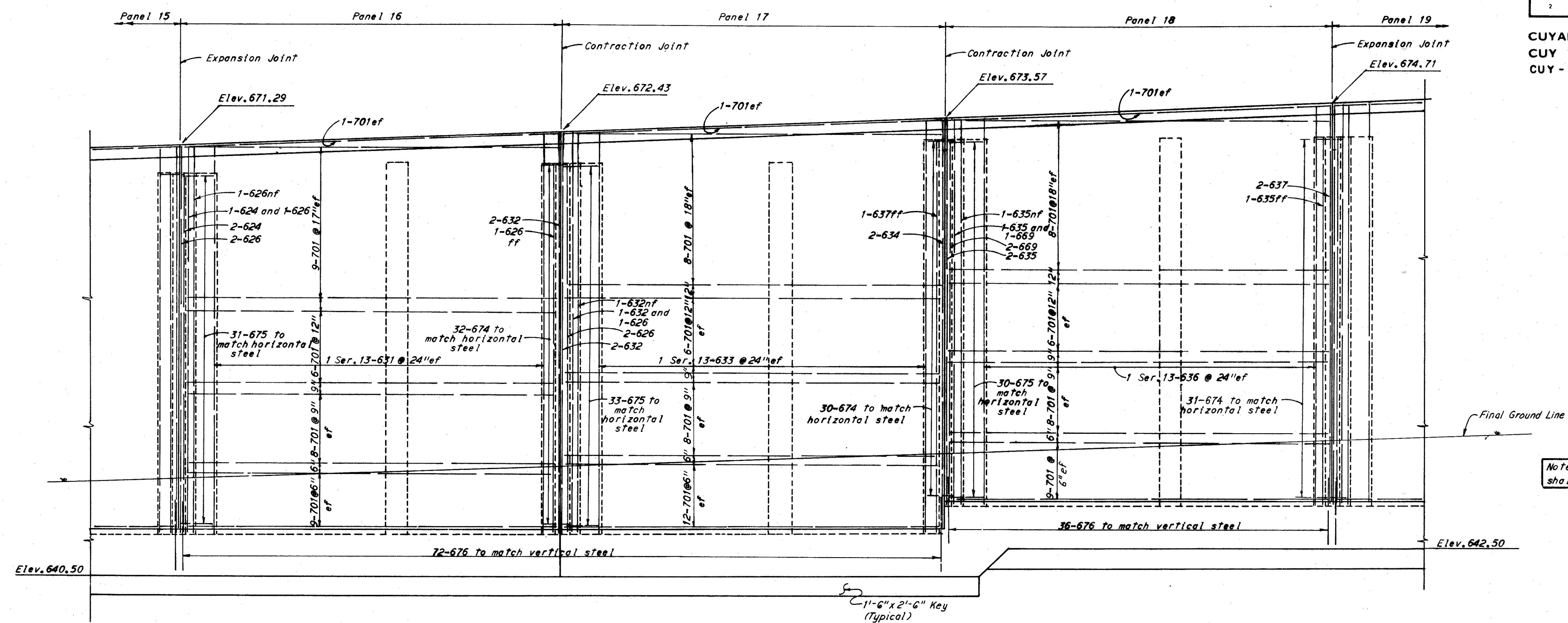
SHEET 504



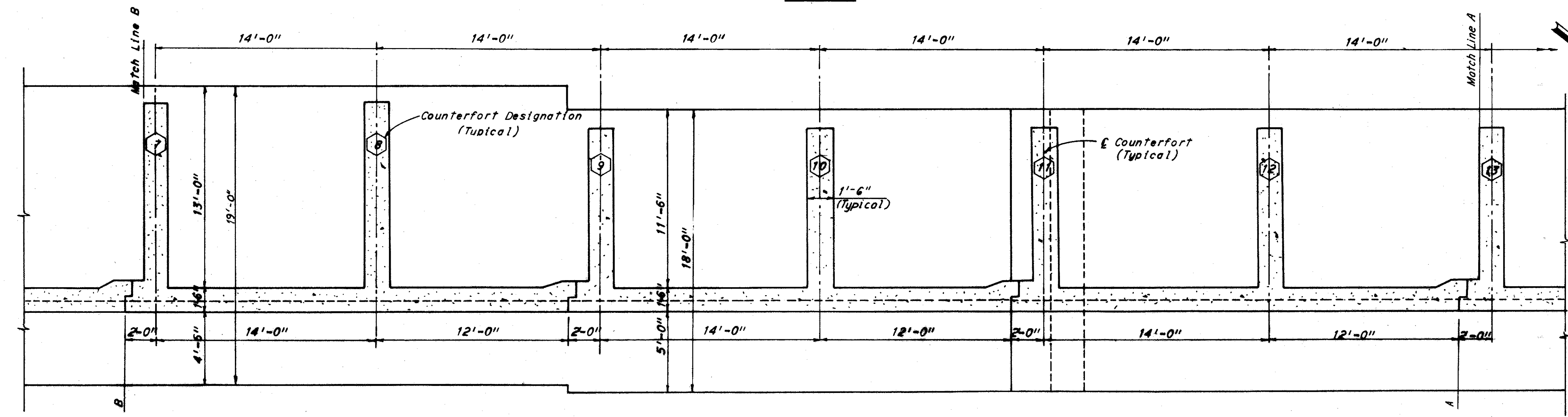
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

505  
646

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



ELEVATION



FOOTING PLAN

H.N.T.B. WALL NO. 89

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF SOUTHBOUND  
JENNINGS FREEWAY**

STA. 46+88 ±  
STA. 53+04

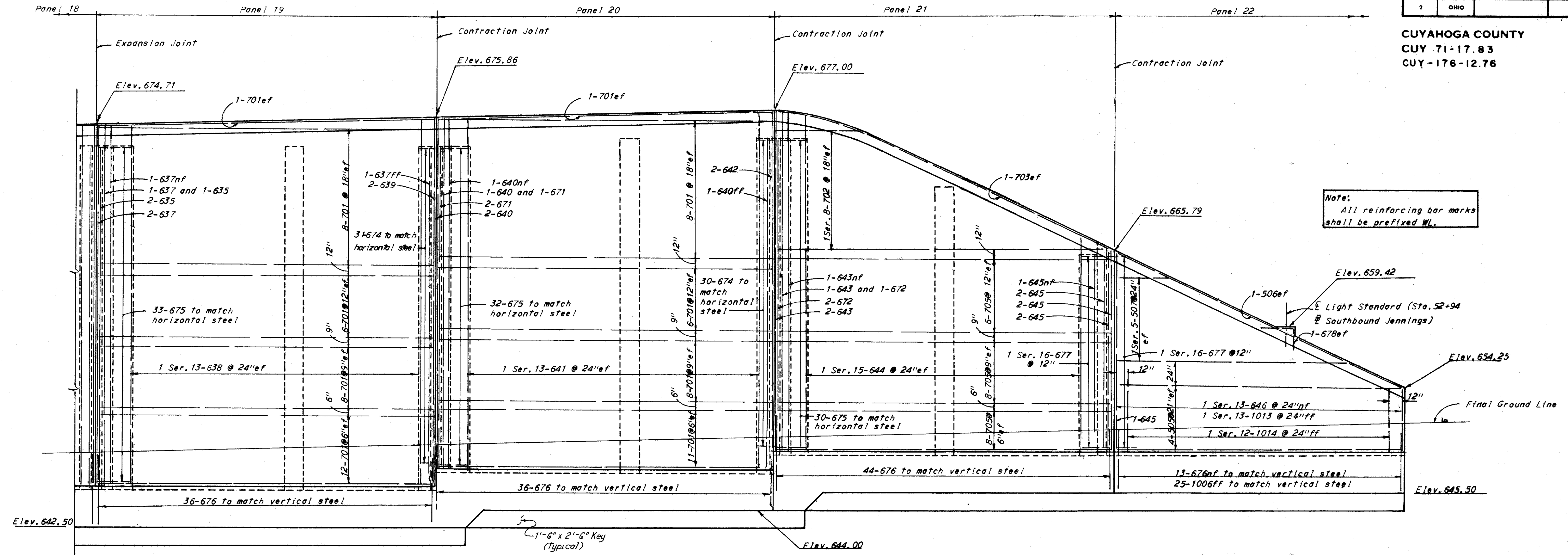
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN RSD	TRACED	CHECKED JMC	REVIEWED WJF	REVISED
DATE 1-29-65	DATE	DATE 1-29-65	DATE 1-29-65	SHEET 505

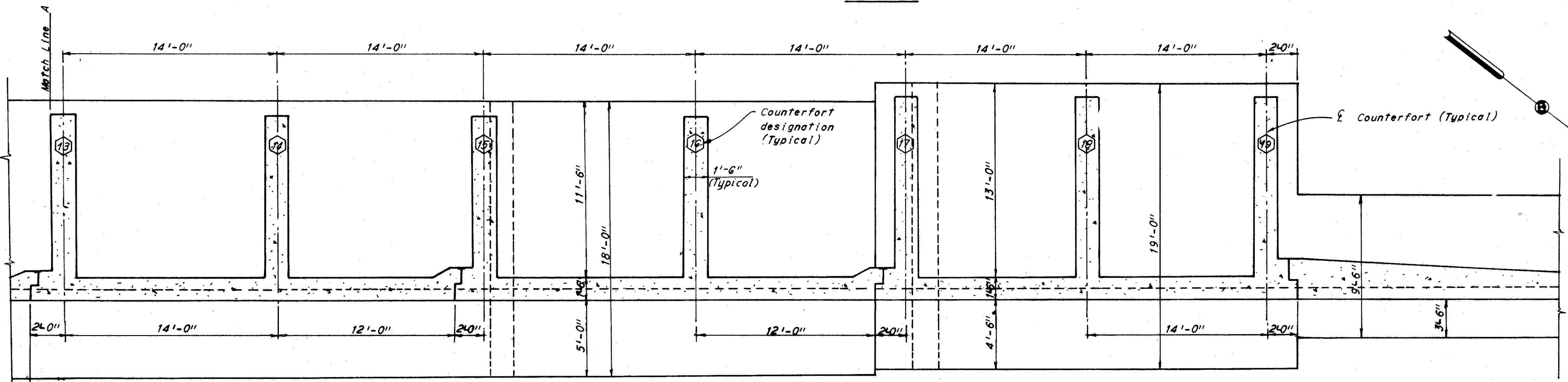
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

506  
646

CUYAHOGA COUNTY  
CUY 71-17.83  
CUY-176-12.76



ELEVATION



FOOTING PLAN

For notes see sheet 502.

H.N.T.B. WALL NO. 89

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF SOUTHBOUND JENNINGS FREEWAY**

STA. 46+88 ±  
STA. 53+04

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN/RSD	TRACED	CHECKED	REVIEWED	REVISED
DATE 1-29-65	DATE	DATE 1-29-65	DATE 1-29-65	DATE

SHEET 506



CUYAHOGA COUNTY  
 CUY 71-17.83  
 CUY-176-12.76

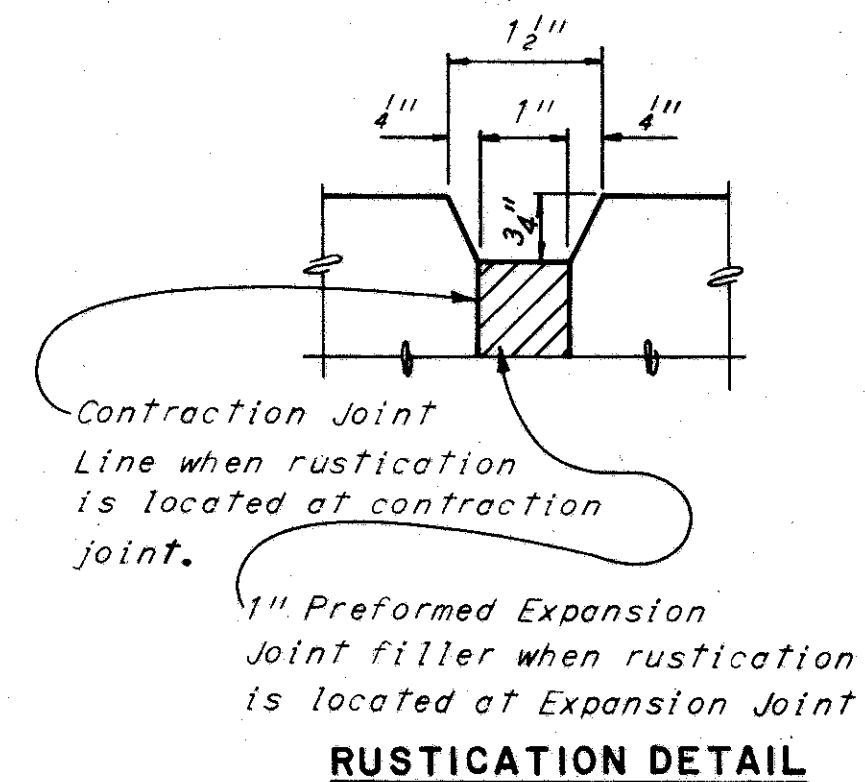
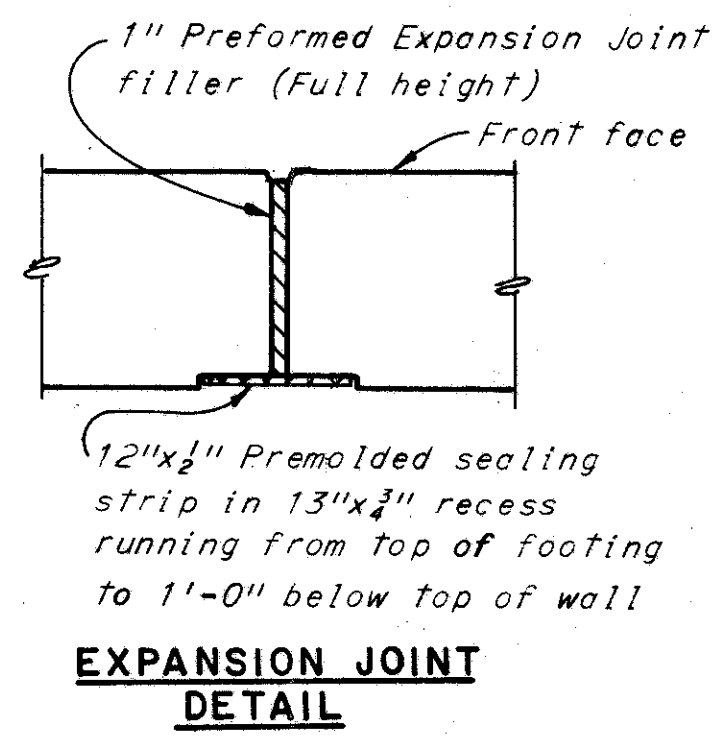
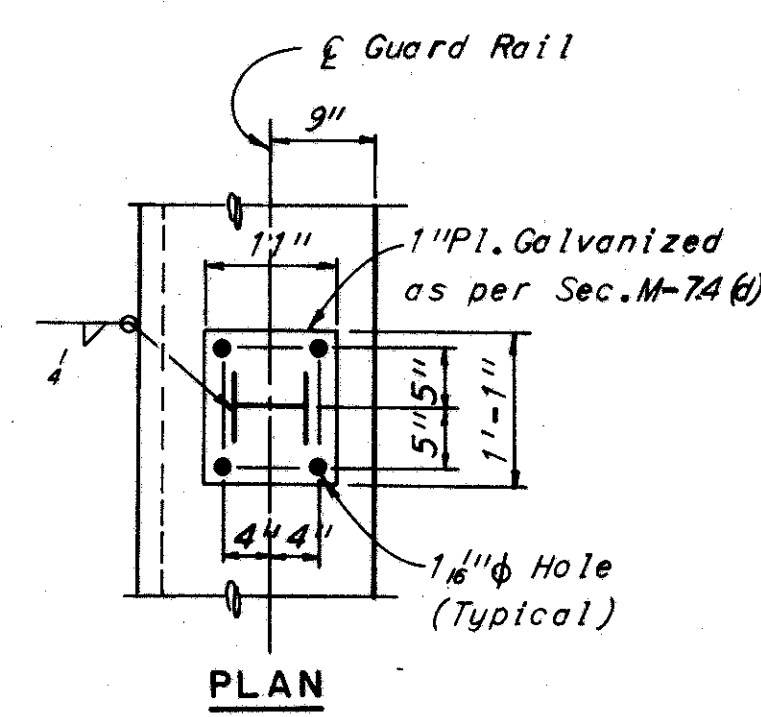
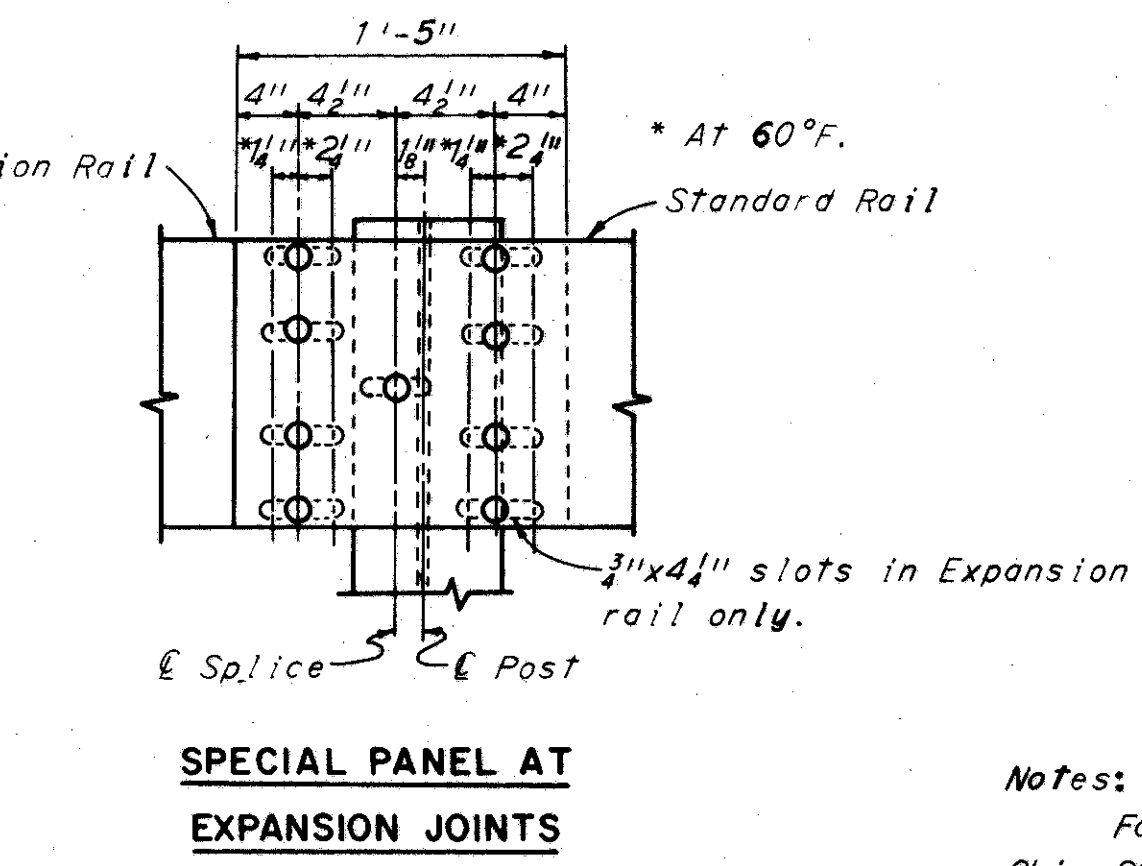
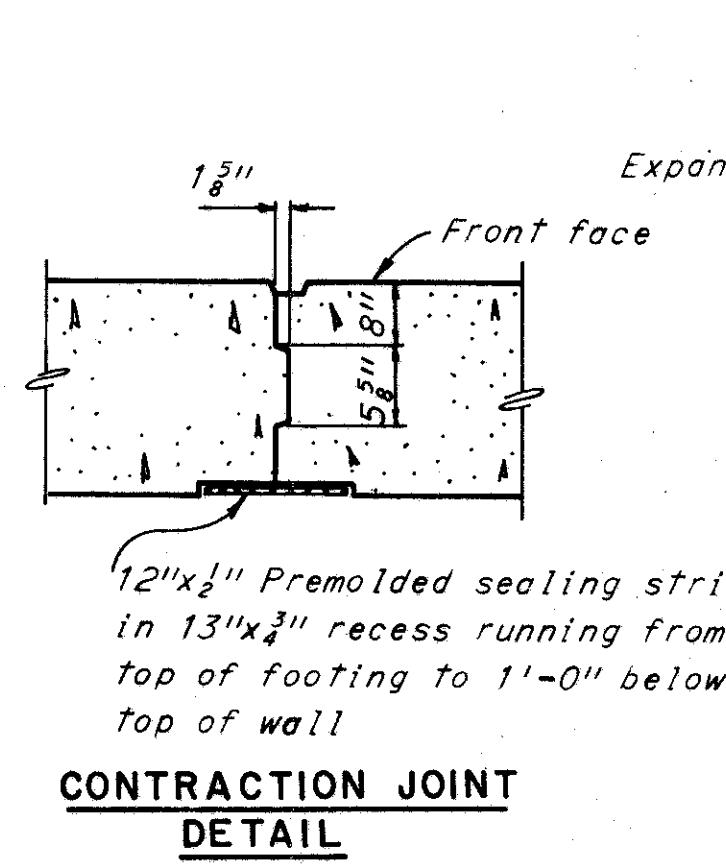
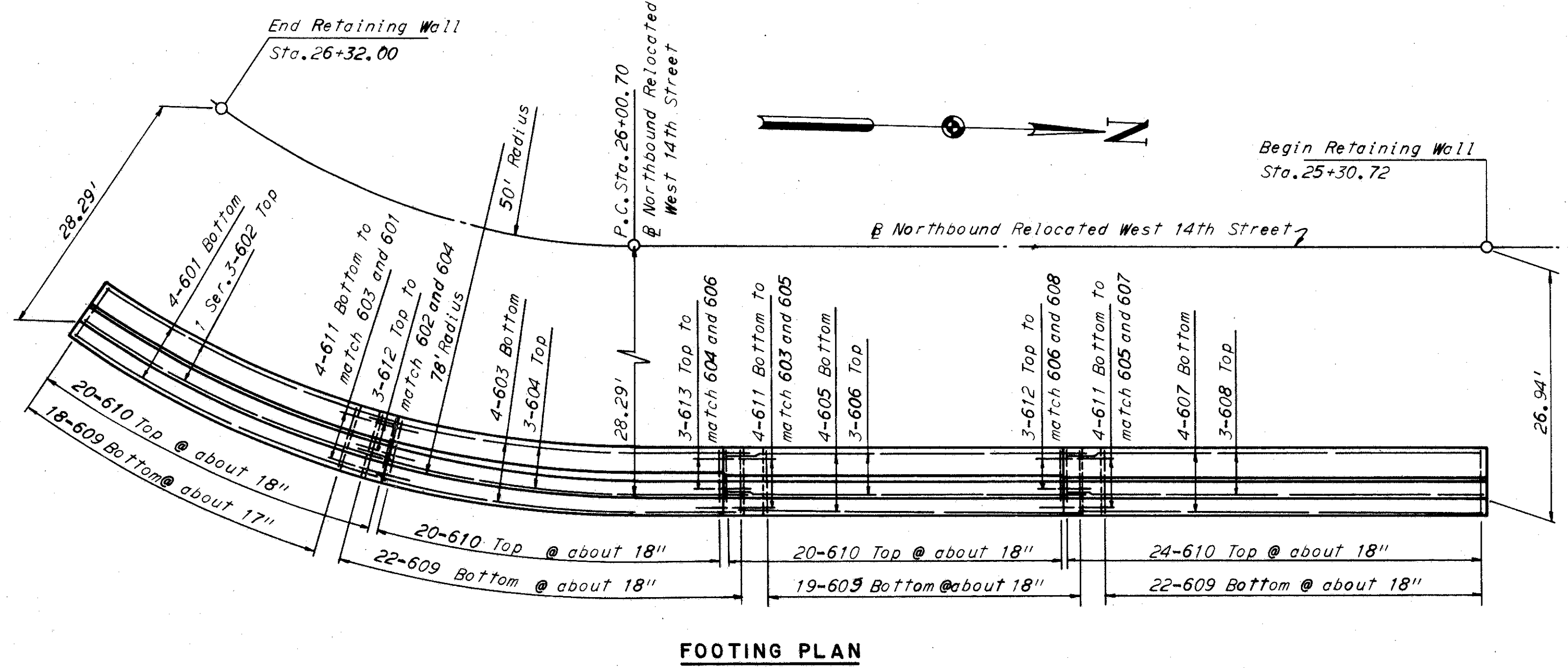
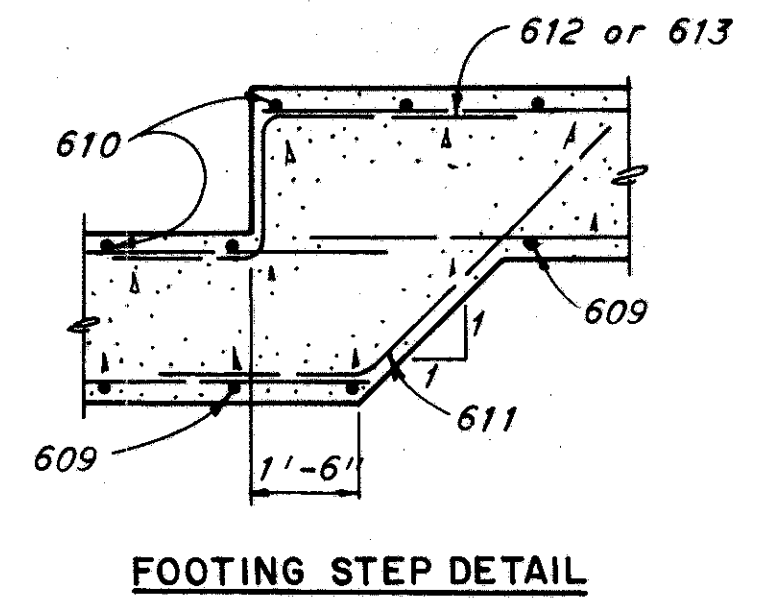
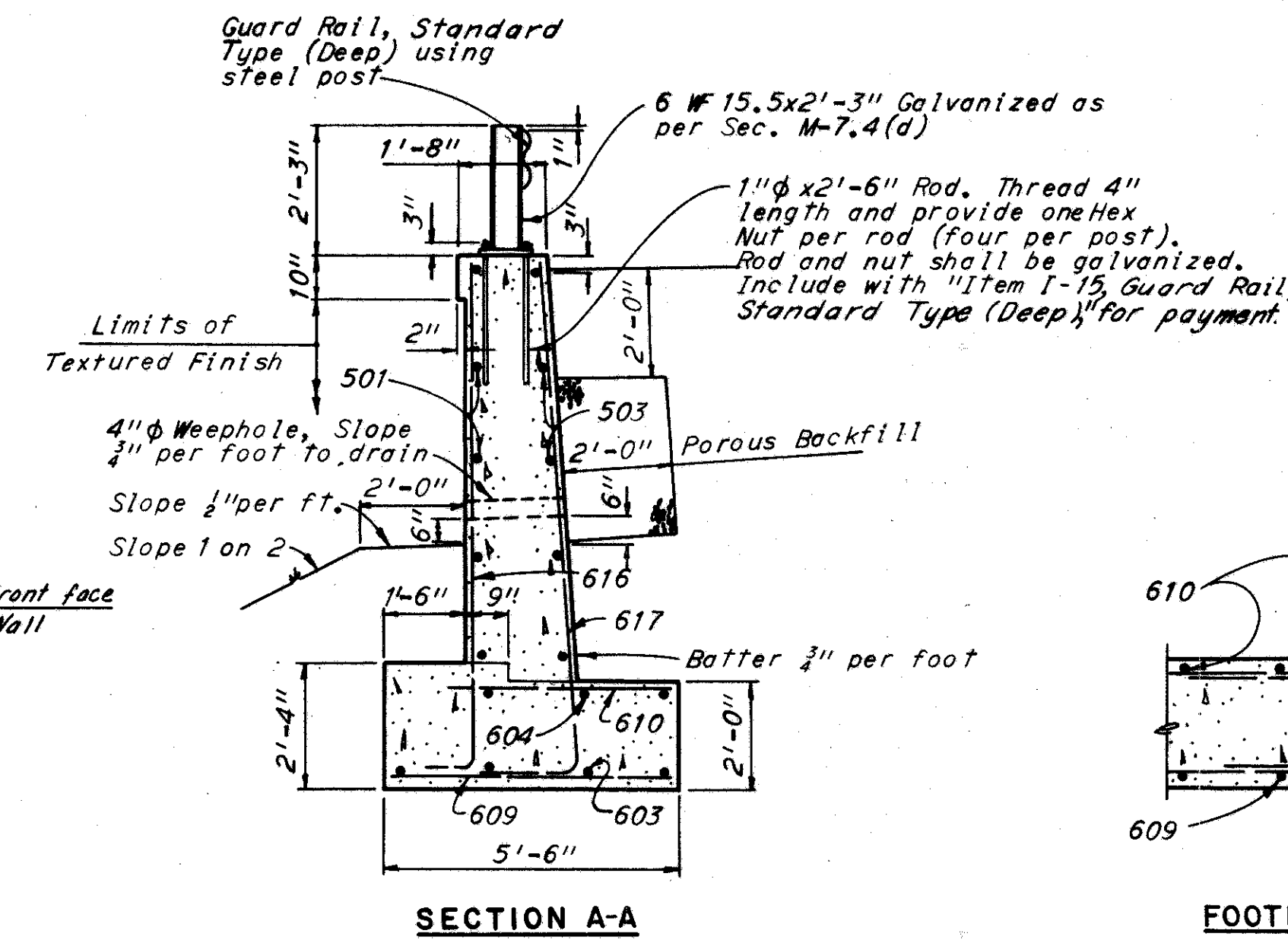
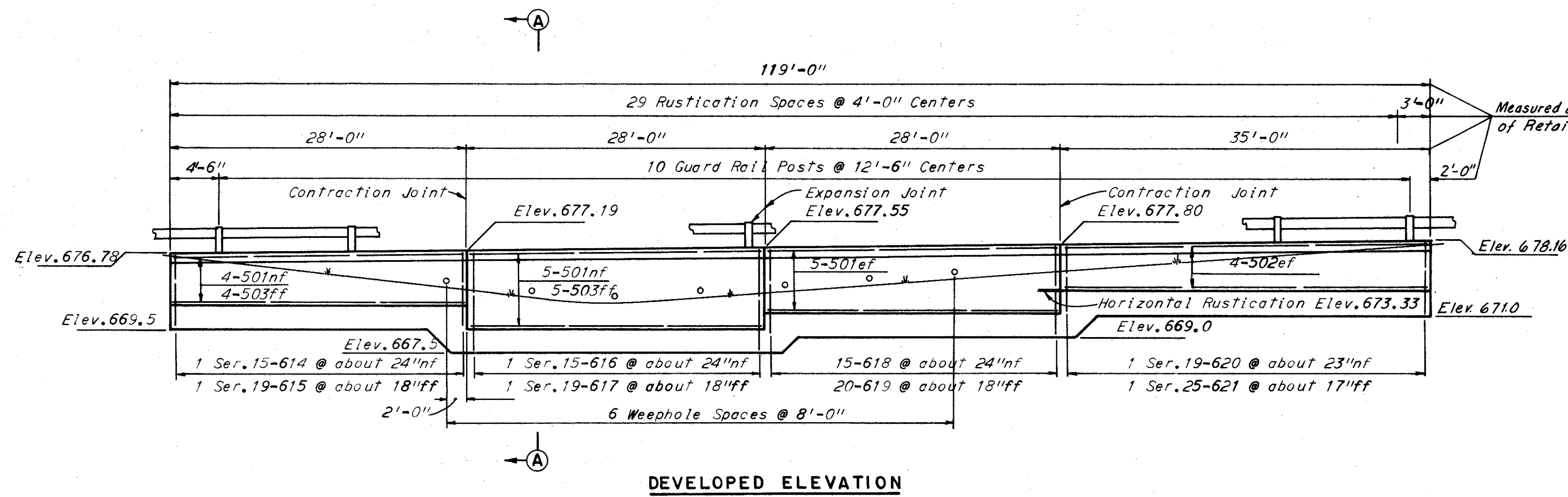
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	
WL501	242	27'-6"	Str.		6,941	WL607	18	29'-9"	Str.		804	WL903	1 Ser. 15	6'-9"	Str.	7/8"	451	WL1131	2	14'-3"	Str.		151	
WL502	2 Ser. 4	4'-0"	Str.	6'-1"	110	WL608	12	26'-0"	Str.		469	WL904	116	6'-2"	104		1,910	WL1132	4	11'-3"	101		239	
WL503	2	29'-0"	Str.		60	WL609	301	14'-6"	Str.		6,555	WL905	1 Ser. 14	6'-9"	Str.	1/2"	262	WL1133	2	14'-6"	Str.		154	
WL504	2	6'-6"	Str.		14	WL610	18	27'-6"	Str.		743	WL906	28	7'-3"	104		542	WL1134	6	11'-8"	101		372	
WL505	4	23'-6"	Str.		98	WL611	1 Ser. 15	15'-3"	Str.	2 3/4"	375	WL907	1 Ser. 15	14'-9"	Str.	1 1/2"	616	WL1135	4	15'-0"	Str.		319	
WL506	2	26'-3"	Str.		55	WL612	1 Ser. 15	18'-0"	Str.	1 1/2"	428	WL908	28	6'-4"	104		473	WL1136	6	12'-4"	101		393	
WL507	2 Ser. 5	3'-0"	Str.	4'-2 1/2"	119	WL613	1 Ser. 15	20'-0"	Str.	1 1/2"	473	WL909	1 Ser. 15	14'-6"	Str.	1 1/2"	626	WL1137	2	10'-8"	101		113	
WL508	1 Ser. 5	5'-10"	155	1'-6"	46	WL614	1 Ser. 15	20'-9"	Str.	1 1/2"	482	WL910	14	8'-0"	104		299	WL1138	6	14'-3"	Str.		454	
WL509	1 Ser. 6	6'-4"	155	1'-4 1/2"	62	WL615	1 Ser. 15	19'-9"	Str.	1 1/2"	456	WL911	28	8'-5"	104		628	WL1139	2	14'-9"	Str.		157	
WL510	1 Ser. 7	6'-8"	155	1'-3 3/8"	74	WL616	1 Ser. 15	17'-0"	Str.	1 1/2"	397	WL912	1 Ser. 8	14'-3"	Str.	7/8"	310	WL1140	2	15'-6"	Str.		165	
WL511	1 Ser. 7	6'-4"	155	1'-4"	75	WL617	1 Ser. 15	14'-6"	Str.	7/8"	338	WL913	1 Ser. 7	14'-6"	Str.	2"	280	WL1141	2	12'-8"	101		135	
WL512	1 Ser. 7	5'-10"	155	1'-4"	72	WL618	1 Ser. 8	14'-0"	Str.	7/8"	171	WL914	14	7'-0"	104		262	WL1142	2	9'-6"	101		101	
WL513	1 Ser. 7	6'-2"	155	1'-3 3/8"	66	WL619	1 Ser. 15	14'-0"	Str.	2 1/2"	344	WL915	28	7'-0"	104		523	WL1143	2	10'-3"	Str.		109	
WL514	1 Ser. 7	5'-10"	155	1'-4"	72	WL620	1 Ser. 15	16'-0"	Str.	2 1/2"	400	WL916	14	7'-3"	Str.		271	WL1144	1 Ser. 15	19'-3"	Str.	3/4"	1,713	
WL515	1 Ser. 7	6'-8"	155	1'-3"	75	WL621	1 Ser. 15	18'-0"	Str.	3 1/2"	479	WL917	14	12'-6"	Str.		930	WL1145	14	12'-6"	Str.		930	
WL516	1 Ser. 6	6'-4"	155	1'-2"	58	WL622	1 Ser. 7	14'-0"	Str.	2"	152	WL918	450	11'-0"	Str.		16,830	WL1146	28	12'-0"	104		1,785	
WL517	2 Ser. 7	5'-10"	155	1'-1"	133	WL623	1 Ser. 15	6'-6"	Str.	7/8"	245	WL919	113	9'-0"	Str.		3,458	WL1147	29	7'-6"	104		1,156	
WL518	1 Ser. 7	6'-2"	155	1'-1 1/2"	69	WL624	8	26'-0"	Str.		312	WL920	146	18'-6"	Str.		9,183							
WL519	1 Ser. 7	6'-8"	155	1'-1"	72	WL625	2 Ser. 13	25'-0"	Str.	1 1/2"	1,040	WL1001	128	29'-9"	Str.		16,386							
WL520	1 Ser. 7	6'-2"	155	1'-0 1/2"	68	WL626	10	27'-3"	Str.		409	WL1002	66	31'-3"	Str.		8,875							
WL521	2 Ser. 7	6'-4"	155	1'-0 1/2"	139	WL627	2 Ser. 4	25'-6"	Str.	1"	1,054	WL1003	113	17'-6"	Str.		8,509							
WL522	1 Ser. 7	6'-10"	155	1'-3 3/8"	78	WL628	4	25'-0"	Str.		150	WL1004	62	28'-0"	Str.		7,470							
WL523	1 Ser. 5	6'-0"	155	1'-6"	47	WL629	2 Ser. 13	22'-3"	Str.	3"	947	WL1005	33	31'-6"	Str.		4,473							
WL524	1 Ser. 6	12'-10"	155	1'-1 1/2"	98	WL630	7	22'-0"	Str.		231	WL1006	228	7'-1"	104		6,949							
WL525	1 Ser. 6	14'-3"	155	1'-0"	105	WL631	2 Ser. 13	22'-3"	Str.	1"	1,084	WL1007	1 Ser. 15	18'-3"	Str.	1 1/2"	1,242							
WL526	2 Ser. 6	15'-0"	155	10 1/2"	216	WL632	6	28'-3"	Str.		255	WL1008	1 Ser. 15	20'-3"	Str.	1 1/2"	1,372							
WL527	1 Ser. 6	15'-4"	155	10 1/2"	109	WL633	2 Ser. 13	28'-3"	Str.	1 1/2"	1,128	WL1009	1 Ser. 15	21'-0"	Str.	1 1/2"	1,396							
WL528	1 Ser. 6	14'-10"	155	10 1/2"	110	WL634	2	29'-6"	Str.		89	WL1010	1 Ser. 15	20'-0"	Str.	7/8"	1,323							
WL529	1 Ser. 6	14'-8"	155	9 3/4"	104	WL635	10	27'-6"	Str.		413	WL1011	1 Ser. 15	17'-3"	Str.	1 1/2"	1,154							
WL530	1 Ser. 6	15'-0"	155	10 1/2"	111	WL636	2 Ser. 13	27'-6"	Str.	1"	1,093	WL1012	1 Ser. 15	16'-9"	Str.	2 1/2"	1,162							
WL531	1 Ser. 6	12'-10"	155	8 1/2"	92	WL637	8	28'-6"	Str.		342	WL1013	1 Ser. 13	5'-6"	Str.	1 1/2"	629							
WL532	2 Ser. 6	13'-0"	155	8 1/2"	186	WL638	2 Ser. 13	28'-9"	Str.	1 1/2"	1,137	WL1014	1 Ser. 12	5'-6"	Str.	1 1/2"	321							
WL533	1 Ser. 6	13'-6"	155	9 3/4"	97	WL639	2	29'-9"	Str.		89	WL1015	14	8'-6"	Str.		512							
WL534	1 Ser. 6	14'-0"	155	8 1/2"	99	WL640	4	28'-3"	Str.		170	WL1016	28	7'-10"	104		944							
WL535	1 Ser. 6	13'-2"	155	8 1/2"	93	WL641	2 Ser. 13	28'-3"	Str.	1 1/2"	1,128	WL1017	14	9'-3"	Str.		557							
WL536	1 Ser. 6	13'-2"	155	8 1/2"	94	WL642	2	29'-6"	Str.		89	WL1018	37	7'-8"	Str.		1,221							
WL537	1 Ser. 6	13'-4"	155	8 1/2"	95	WL643	4	28'-0"	Str.		168	WL1019	58	10'-9"	118		2,683							
WL538	1 Ser. 6	15'-6"	155	9 3/4"	110	WL644	2 Ser. 15	17'-6"	Str.	1 1/2"	1,025	WL1020	28	9'-0"	104		1,084							
WL539	1 Ser. 6	13'-2"	155	11 3/8"	98	WL645	8	16'-9"	Str.		201	WL1021	12	8'-2"	Str.		422							
WL540	1 Ser. 6	6'-2"	155	1'-5 1/2"	62	WL646	1 Ser. 13	5'-3"	Str.	11 1/2"	430	WL1022	19	11'-9"	118		961							
WL541	1 Ser. 8	19'-6"	155	10 1/2"	187	WL647	2 Ser. 7	3'-3"	Str.	2'-9"	231	WL1023	1 Ser. 15	15'-9"	Str.	2 1/2"	1,097							
WL542	1 Ser. 8	20'-4"	155	8 7/8"	191	WL648	2 Ser. 7	3'-3"	Str.	3'-0"	258	WL1024	14	8'-3"	Str.		497							
WL543	1 Ser. 8	20'-2"	155	7 1/2"	187	WL649	2 Ser. 7	3'-0"	Str.	3'-3 1/2"	271	WL1025	28	7'-6"	104		904							
WL544	1 Ser. 8	20'-4"	155	8"	189	WL650	2 Ser. 7	3'-9"	Str.	3'-4"	289	WL1026	14	10'-3"	Str.		617							
WL545	1 Ser. 8	20'-0"	155	8"	186	WL651	2 Ser. 7	3'-0"	Str.	3'-3 1/2"	271	WL1027	28	9'-6"	104		1,145							
WL546	1 Ser. 8	20'-0"	155	8 3/4"	187	WL652	2 Ser. 7	3'-3"	Str.	3'-4"	279	WL1028	28	12'-3"	Str.		1,476							
WL547	1 Ser. 8	19'-6"	155	8"	182	WL653	2 Ser. 7	3'-3"	Str.	3'-5"	284	WL1029	56	11'-6"	104		2,771							
WL548	1 Ser. 8	19'-10"	155	7 1/2"	184	WL654	4 Ser. 7	3'-3"	Str.	3'-6 1/2"	584	WL1030	14	11'-0"	Str.		663							
WL549	1 Ser. 8	17'-2"	155	6"	158	WL655	2 Ser. 6	4'-0"	Str.	4'-1 1/2"	257	WL1031	28	10'-5"	104		1,255							
WL550	2 Ser. 8	17'-4"	155	6"	318	WL656	2 Ser. 6	4'-6"	Str.	4'-1 1/2"	268	WL1101	2	26'-10"	107		285							
WL551	1 Ser. 8	18'-0"	155	6 1/2"	165	WL657	2 Ser. 6	4'-0"	Str.	4'-0"	252	WL1102	2	29'-0"	107		308							
WL552	1 Ser. 8	18'-2"	155	6 1/2"	167	WL658	2 Ser. 6	4'-3"	Str.	4'-0 1/2"	259	WL1103	2	30'-8"	107		326							
WL553	1 Ser. 8	17'-4"	155	6 1/2"	160	WL659	4 Ser. 6	4'-3"	Str.	4'-1 1/2"	523	WL1104	2	31'-4"	107		333							
WL554	1 Ser. 8	17'-6"	155	6"	161	WL660	2 Ser. 6	4'-0"	Str.	4'-4"	264	WL1105	2	30'-4"	107		322							
WL555	1 Ser. 8	17'-8"	155	6"	162	WL661	2 Ser. 6	3'-9"	Str.	4'-1 1/2"	255	WL1106	2	31'-1"	107		330							
WL556	1 Ser. 8	20'-4"	155	7 1/2"	187	WL662	2 Ser. 7	2'-9"	Str.	3'-0"	247	WL1107	2	31'-4"	107		333							
WL557	1 Ser. 8	18'-0"	155	8"	178	WL663	2 Ser. 7	2'-0"	Str.	2'-1"	171	WL1108	2	32'-1"	107		341							
WL558	1 Ser. 8	12'-6"	155	1'-0 1/2"	135	WL664	20	5'-5"	Str.		163	WL1109	2	31'-11"	107		339							
WL559	1 Ser. 5	25'-10"	155	6 1/2"	140	WL665	31	8'-5"	Str.		392	WL1110	2	32'-8"	107		347							
WL560	1 Ser. 5	26'-0"	155	5 1/2"	140	WL666	6	4'-11"	Str.		44	WL1111	2	31'-1"	107		330							
WL561	1 Ser. 7	25'-2"	155	5 1/2"	194	WL667	9	7'-9"	Str.		105	WL1112	2	31'-10"	107		338							
WL562	1 Ser. 7	25'-6"	155	5"	195	WL668	1	23'-6"	Str.		35	WL1113	2	32'-3"	107		343							
WL563	1 Ser. 7	25'-0"	155	5"	192	WL669	10	26'-3"	Str.		394	WL1114	2	32'-10"	107		349							
WL564	1 Ser. 7	25'-4"	155	5 3/4"	195	WL670	3	24'-9"	Str.		112	WL1115	2	32'-1"	107		341							
WL565	2 Ser. 9	24'-8"	155	5"	494	WL671	3	27'-0"	Str.		122	WL1116	2	32'-6"	107		345							

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Note: All reinforcing bar marks shall be prefixed WM.



**Notes:**

For additional guard rail details, see Ohio Standard Drawing I-15 (No. 2-A).

Backfill shall be placed in front of the retaining wall prior to or simultaneous with the placing of fill behind the wall.

Locations of construction joints in the footings are optional but shall be located a minimum of 5'-0" from wall joints and shall be centered between piles. All longitudinal footing bars shall be doweled through construction joint.

Field bend longitudinal bars as required. Field bending shall be included with "Item S-4, Reinforcing Steel" for payment.

The following abbreviations are used:

ef = each face  
nf = near face  
ff = far face

For Reinforcement Schedule and Bar Bending Diagrams, see sheet 510.

H.N.T.B. WALL NO. 90

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**WALL LEFT OF NORTHBOUND RELOCATED WEST 14th STREET**

STA. 25+30.72  
STA. 26+32.00

CLEVELAND CUYAHOGA COUNTY OHIO

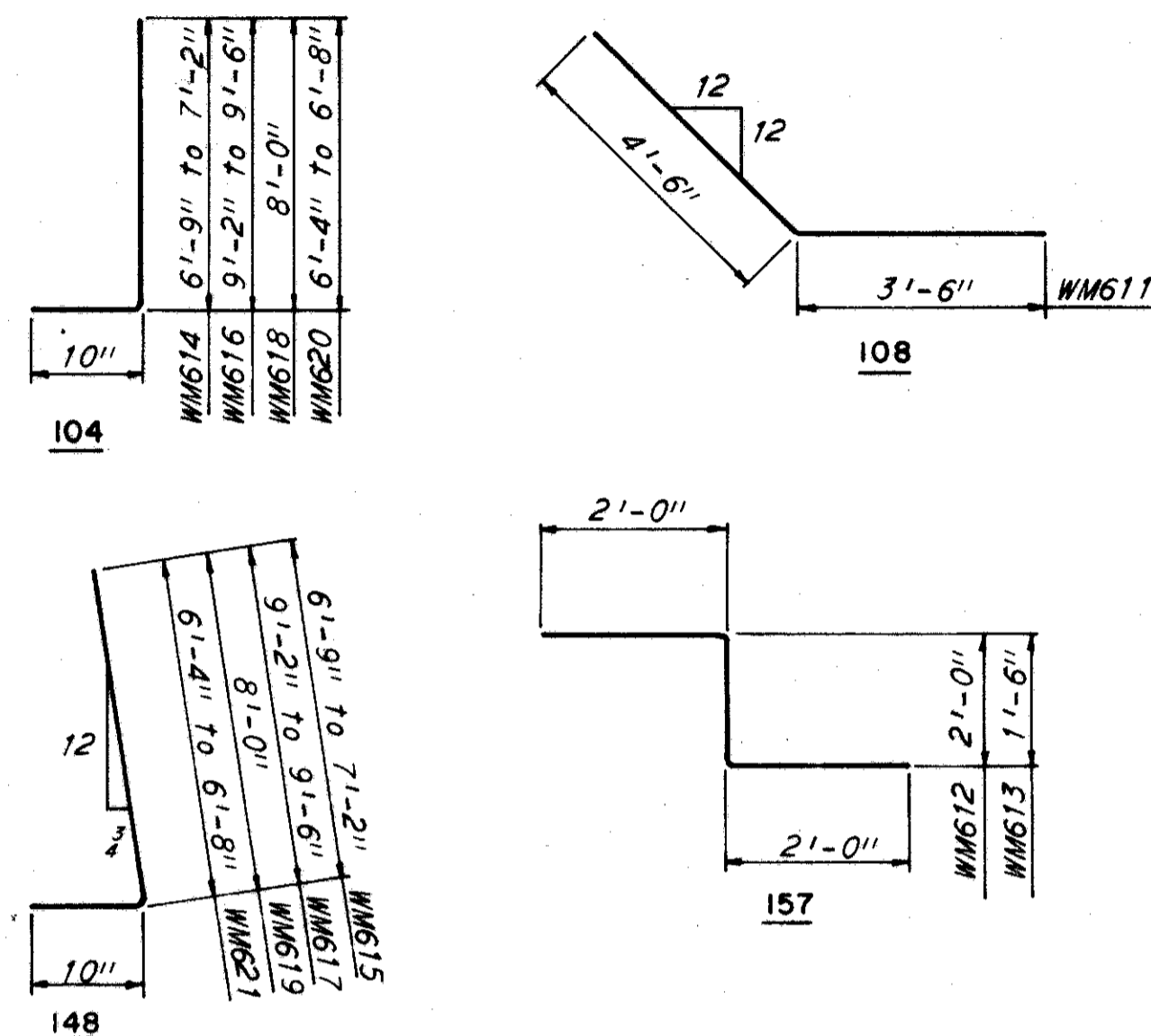
DRAWN: CHB	TRACED	CHECKED: [Signature]	REVIEWED: WA	REVISED
DATE: 1-25-65	DATE	DATE: 1-24-65	DATE: 1-24-65	SHEET 509

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CUYAHOGA COUNTY  
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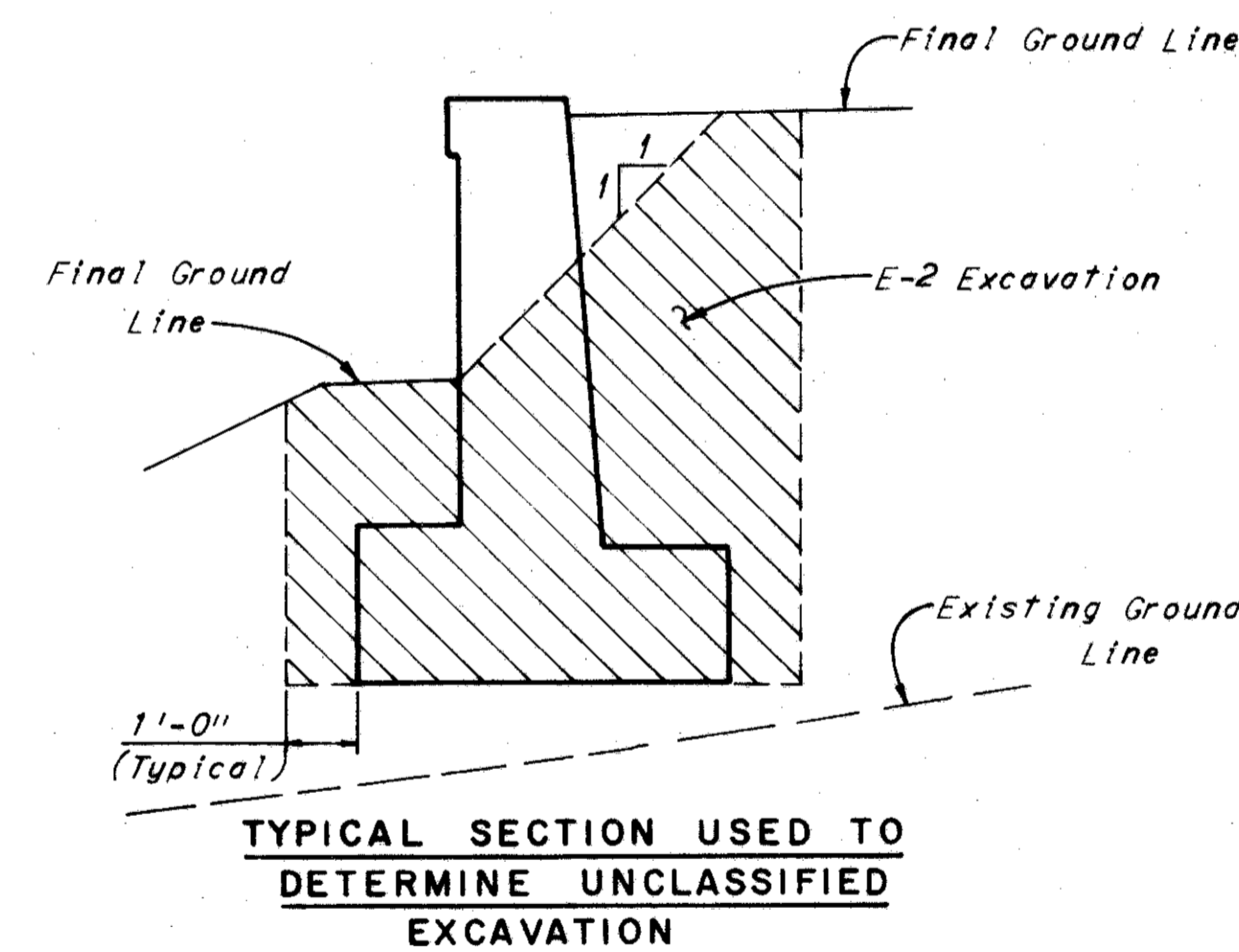
REINFORCEMENT SCHEDULE					
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS)
WM 501	19	27'-6"	Str.		545
WM 502	8	34'-6"	Str.		288
WM 503	9	27'-0"	Str.		253
WM 601	4	26'-3"	Str.		158
WM 602	1 Ser. 3	26'-3" to 27'-6"	Str.	7 1/2"	121
WM 603	4	30'-0"	Str.		180
WM 604	3	31'-3"	Str.		141
WM 605	4	27'-9"	Str.		167
WM 606	3	29'-6"	Str.		133
WM 607	4	33'-0"	Str.		198
WM 608	3	34'-6"	Str.		155
WM 609	81	5'-2"	Str.		629
WM 610	84	4'-3"	Str.		536
WM 611	12	8'-0"	108		144
WM 612	6	5'-8"	157		51
WM 613	3	5'-2"	157		23
WM 614	1 Ser. 15	7'-5" to 7'-10"	104	3/8"	172
WM 615	1 Ser. 19	7'-5" to 7'-10"	148	1/4"	218
WM 616	1 Ser. 15	9'-10" to 10'-2"	104	5/16"	225
WM 617	1 Ser. 19	9'-10" to 10'-2"	148	1/4"	285
WM 618	15	8'-8"	104		196
WM 619	20	8'-8"	148		261
WM 620	1 Ser. 19	7'-0" to 7'-4"	104	1/4"	205
WM 621	1 Ser. 25	7'-0" to 7'-4"	148	3/8"	269
		Total Weight =			5,553



ESTIMATED QUANTITIES-RETAINING WALL 90			
ITEM	DESCRIPTION	UNIT	QUANTITY
E-2	Unclassified Excavation	Cu. Yd.	232
S-1	Class "E" Concrete, Retaining Wall (Above Footing)	Cu. Yd.	46
S-1	Class "E" Concrete, Retaining Wall Footing	Cu. Yd.	54
S-3	Waterproofing, Premolded Sealing Strip	Lin. Ft.	17
S-4	Reinforcing Steel	Pounds	5,553
S-9	1" Preformed Expansion Joint Filler	Sq. Ft.	14
S-29	Porous Backfill	Cu. Yd.	9
I-15	Guard Rail, Standard Type (Deep)	Lin. Ft.	119

Note: Wall Quantities carried to General Summary, sheet 42

For Replacement Bar Schedule See Sheet 308



H.N.T.B. WALL NO. 90			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
WALL LEFT OF NORTHBOUND RELOCATED WEST 14th STREET			
STA. 25 + 30.72 STA. 26 + 32.00			
CLEVELAND		CUYAHOGA COUNTY OHIO	
DRAWN CHB	TRACED	CHECKED [Signature]	REVIEWED [Signature]
DATE 1-25-65	DATE	DATE 2-1-65	DATE 1-28-65
			SHEET 510



SCOPE OF WORK

The work contemplated under this contract comprises the furnishing and installing complete with valves, fire hydrants and other appurtenances, the following water main relocations and performing other incidental work necessary to abandon existing water facilities.

- 8" Cast Iron Pipe and Ductile Iron Pipe - Permanent water main in Relocated Redman Avenue between West 13th Street and West 14th Street and connecting with West 15th Street under Jennings Freeway.
- 8" Cast Iron Pipe in Relocated West 17th Street between Titus Avenue and Cleveland Metropolitan General Hospital with connections at Eglindale Avenue and Aiken Avenue.
- 24" Prestressed Concrete Cylinder Pipe Water Main from Jennings Road near The Jones and Laughlin plant entrance to Clark Avenue along West 14th Street.
- 8" Cast Iron Pipe - Connection between Holmden Avenue and Buhler Avenue at Interstate 71.

The Contractor shall do all the work and furnish all the labor and material necessary for the final completion of this contract in the manner and under the conditions herein specified and provided and in accordance with the contract drawings. In the case of any item not specifically mentioned in the "Waterwork Notes", the State of Ohio Department of Highways "Construction and Material Specifications - Jan. 1, 1963" shall govern.

DEFINITIONS

Whenever in these specifications or in any documents or instructions in construction where these specifications govern, the following terms are used, (or pronouns in place of them). The intent and meaning shall be interpreted as follows:

THE STATE

The State is the State of Ohio acting through its authorized representative.

ENGINEER

The Engineer is Division Deputy Director or Division Engineer, the Division Construction Engineer or The Division Maintenance Engineer, The Project Engineer assigned to administer the contract, or their duly designated deputies, agents, or representatives.

THE CITY, OR THE CITY OF CLEVELAND

The City, or The City of Cleveland, is The Director, Department of Public Utilities, of the City of Cleveland.

STATUS OF CITY INSPECTOR

Inspectors as designated by the Director of Public Utilities shall be authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the waterworks, and to the preparation or manufacture of the materials to be used in the waterworks. The city inspector as designated by the Director of Public Utilities shall make work instructions through the Project Engineer.

ACCESS TO WORK AND PLACE OF MANUFACTURE

The Contractor shall notify the Engineer and Director of Public Utilities, at least seven (7) days previous to the commencement of the manufacture of any materials, of the time and place where the manufacture is to commence, in order that a representative of the Engineer and Director may be present to inspect the manufacture. The Contractor shall provide, without charge or expense to the State and City, all necessary assistance to the Engineer and Director when required for inspection or verification of work done.

DIMENSIONS, DETAILED DRAWINGS AND ELEVATIONS

Figured dimensions on drawings shall take precedence over measurements by scale, and detailed drawings are to take precedence over general drawings and shall be considered as explanatory of them and not as indicating extra work. If, however, any of the detailed drawings show more elaborate or expensive work than is specified and indicated by the contract drawings, notice thereof must be given to the Engineer by the Contractor within ten (10) days after the receipt of such detailed drawings in order that the drawings may be amended or the additional expense on account of such work may be adjusted and authorized. If the Engineer does not receive such notice from the Contractor within ten (10) days after detailed drawings have been received by him, it is hereby agreed that the Contractor accepts the drawings and will execute them without claim for extra compensation.

FLOODS AND FREEZING WEATHER

Proper facilities shall be provided for protecting the work from damage by flood, rain or frost, and work done in freezing weather shall be done in such manner as the Engineer may approve. Valves shall be protected from freezing until backfilled in the completed work.

ADDITIONAL WORK

(A) - Attention is called to the fact that the work of this contract includes certain performances as incidental to the itemized requirements hereof, though not exclusive as follows: To perform all excavation, backfilling, sheeting, shoring, temporary and final repaving and to test the installation. Sand backfill shall be placed under existing and proposed pavement. For the performances herein described and for other incidental performances of like nature, the State will make no specific or separate payment or allowance, but the cost thereof shall be included in the prices stipulated to be paid for the various items of the work to be done under this contract.

MADE E.C.E. DATE 11-6-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE \_\_\_\_\_

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

# WATERWORK NOTES

(B) - Preliminary flushing: Before being placed in service all dirt and foreign matter shall be removed from the new water main or extensions to existing mains by a thorough flushing through the hydrants or by other approved means. Each valved section of newly laid pipe shall be flushed independently. This shall be done after the pressure test and may be done before or after the trench shall have been backfilled.

(C) - Chlorination: Following the preliminary flushing, the newly laid water pipe shall be chlorinated. The process of chlorinating, the method of procedure, the chlorinating agent, and the rate of application shall be determined by the Engineer. The City of Cleveland will furnish the necessary labor and material required for such chlorination and install the necessary taps at the ends of the water main sections to be chlorinated. The Contractor shall pay for chlorination or sampling of the water at the rate of ten cents (10¢) per linear foot for the first thousand feet, and five cents (5¢) per foot thereafter of the water main proper, with a minimum charge of one hundred dollars (\$100.00). The Contractor shall furnish the necessary labor for excavating and backfilling which will be required for the installation of taps for injecting the chlorine solution, operating pumps and flushing mains. In cases where the water main installation does not exceed 350 feet in length, the Contractor shall pay a minimum charge of thirty-five dollars (\$35.00) for flushing and sampling water.

(D) - Final flushing and test: Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremities until the replacement water throughout its length shall, upon test, both chemically and bacteriologically, be proven equal to the water quality served the public from the existing water supply system.

(E) - For the performances described in paragraphs B, C and D, the State will make no specific or separate payment or allowances, but the cost thereof shall be included in the prices stipulated to be paid for each linear foot of pipe furnished and installed.

MAINTENANCE OF SERVICE AND CONNECTING RELOCATED MAINS

The Contractor shall follow strictly the sequence of construction shown on the plans. All existing fire hydrant leads and house services shall be hand tunneled using special care to avoid any damage which might require shutting down the existing main until the new main is ready to be placed in service.

When the new mains have been tested and chlorinated and are ready to be connected to the old main, the Contractor shall make such connections at a time designated by the City. Prior to shutting down the existing mains, the Contractor shall take suitable precautions to assure a minimum interruption to service, including the following:

- Perform all necessary excavation, including bell holes exposing the existing main sufficiently for the operation of the pipe saw by the City.
- Remove the cap or plug from the end of the new main.
- Swab the inside of all pipes, bends and sleeves to be used in connection thoroughly with a chlorine solution of at least 100 p.p.m.
- Make-up as much of the connection as possible outside the ditch to eliminate the need for caulking most of the necessary joints during the shutdown. By careful measurement all pipe cuts can be made by the Contractor prior to shutting down.
- Have sufficient manpower and equipment on the site to perform the operation in a minimum of time.

PAINTING

(A) - It is the intention of these specifications to provide that all metal work subject to corrosion shall be satisfactorily protected by a durable coating of paint or other approved material and that all metal surfaces not buried in earth, or in concrete, shall be left clean and well painted at the completion of the contract. Unless otherwise specified, the protection shall be at least that given by three (3) coats of approved paint. The first coat is to be applied at the shop before the metal has rusted and after all grease, dirt and scale has been removed. Bolts and nuts shall not be shop coated, but shall receive three (3) coats of approved paint after installation.

(B) - All metal work which has not been coated before the arrival on the job shall be given a temporary protective coating of such a nature as to permit the ready adherence of future coatings. The temporary coating shall be a good grade asphaltic paint or other approved material. This temporary protection shall apply particularly to the valve boxes and covers, and elsewhere when in the opinion of the Engineer, such protection is necessary.

(C) - All surfaces of metal which will be in contact after assembling shall be painted, at least one coat, before assembling. The final coat of paint on all exposed work shall be given shortly before the completion of the contract.

(D) - Where painting clauses appear hereinafter, they shall take precedence over this section, except that temporary protection herein described may be required.

TESTS, INSPECTION AND REPORTS

Notwithstanding the requirements of any other provisions of these specifications, the Contractor shall arrange for and pay all costs involved for shop inspection of all materials furnished, manufacture of all pipe, valves, fittings, etc., field and shop welds and welding, and furnish to the State and the City of Cleveland copies of all shop, fabrication, manufacture and other related inspection reports of materials furnished. This inspection shall be done by a recognized inspection laboratory approved by the City of Cleveland.

HANDLING PIPE AND ACCESSORIES

(A) - Unloading: Cast iron pipe, fittings, valves, hydrants, and other accessories shall, unless otherwise directed, be unloaded at the point of delivery, hauled to and distributed at the site of the project by the Contractor. They shall at all times be handled with care to avoid damage. In loading and unloading they shall be lifted by hoists or slid, or rolled on skidways in such manner as to avoid shock. Under no circumstances shall they be dropped. Pipe handled on skidways must not be skidded or rolled against pipe already on the ground.

(B) - At site of work: In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

(C) - Protection of pipe coating: Pipe shall be handled in such manner that a minimum amount of damage to the coating will result. Any cast iron pipe or fitting, the coat of which has been damaged in shipping or handling, shall have the damaged portion well cleaned and covered with an asphalt paint, approved by the Engineer, before being placed in the work. The Contractor shall thoroughly coat all exposed parts of bolts and nuts with an approved asphalt paint, after all pipe has been laid and before backfilling has been placed. All field coating shall be furnished by the Contractor.

(D) - Pipe kept clean: The interior of the pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times.

(E) - Frost protection: Valves and hydrants before installation shall be drained and stored in a manner that will protect them from damage by freezing.

CHANGES IN WATER PIPES

(A) - Wherever it becomes necessary in the opinion of the Engineer to change the location of house connections, such changes will be made as work to be done by the City. The Contractor shall notify the City in ample time to permit the City to make such changes and avoid unnecessary delay in the completion of the work. The Contractor shall also cooperate with the City in making these changes and shall do all excavating, backfilling and repaving as may be required. The City will furnish the piping material for and make all changes required, including tapping, in the location of existing house service connections and meters. The City will charge the Contractor for materials and labor furnished in making these service connections and alterations and costs thereof shall be included in the unit price bid for "Service Connections" or "Water Meters Relocated".

(B) - Wherever it becomes necessary, in the opinion of the Engineer, to change the location or elevation of water mains and hydrants, and where connections are to be made between existing distribution mains and water mains under this contract, the Contractor shall remove and dispose of all existing water line materials required to make the connection, and shall furnish and install complete, all the cast iron or ductile iron pipe, fittings and valves to make the connections indicated. The Contractor shall also furnish all necessary labor, materials, tools and equipment and make the excavation, backfill and repaving for such connections. Payment for this will be included in price bid under appropriate item for size of water main or connection to be installed. All pipes, valves, hydrants and appurtenances removed shall become the property of the Contractor.

WORK TO BE DONE BY THE CITY

(A) The City will furnish the piping material for and make all changes required, including tapping, in the location of existing house service connections and meters, but the Contractor shall do all the necessary excavation, backfilling and repaving required therefore. The City will charge the Contractor for materials and labor furnished in making these service connections and costs thereof shall be included in the unit price bid for "service connections" or "water meters relocated".

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APPROVED  
 DATE FEB. 4, 1965  
*Wm. E. Miller*  
 DIRECTOR OF PUBLIC UTILITIES  
*Arnold Porthal*  
 COMMISSIONER OF WATER AND HEAT  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*R. F. Connor*  
 ENGINEER OF CONSTRUCTION AND SURVEYS  
*William J. Sweeney*  
 ENGINEER OF DESIGN

<b>LOW SERVICE DISTRICT</b>	
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO	
SUBJECT	WATER WORK NOTES FOR MEDINA - JENNINGS INTERCHANGE IN CLEVELAND, OHIO



# WATERWORK NOTES

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(B) The City will install all branch sleeves and valves, but the Contractor shall supply the branch sleeves and valves, lead, and do all the necessary excavation, backfilling and repaving required therefor.

To cover labor and installation costs, the City will charge the following flat rates for the installation of tapping sleeves and valves. In addition to the above requirements, the Contractor shall furnish all air compressors required for the work.

SIZE OF MAIN	LABOR AND INSTALLATION BY CITY
6"	\$130.00
10"	150.00
12"	160.00
16"	260.00
24"	410.00
30"	500.00

(C) In locations shown on the plans the Contractor will be required to sleeve-in to the existing mains. To speed up this operation, it is called to the Contractor's attention that the water department has on hand at Harvard Yards Motor operated pipe cutters which are available for cutting pipe by city forces at the following rates. The prices include cost of labor, use of pipe cutting machine, and truck. The Contractor shall do all necessary excavation, backfilling and repaving and all air compressor equipment shall be furnished by the Contractor.

SIZE OF PIPE	COST PER CUT
6"	\$30.00
10"	30.00
12"	30.00
16"	35.00
24"	60.00
30"	80.00

### EXCAVATION

(A) - The Contractor shall remove all existing structures, roadways, driveways and other similar materials and make to the lines and grades given, all excavation necessary for the proper construction of the water main, pipe connections and appurtenant structures, including tunnel and shaft excavation. The excavation shall include the removal, handling, rehandling and disposal of materials encountered in the work and shall include all pumping, bailing, draining, sheeting and bracing. Moreover, the Contractor must assume all responsibility for any added expense or other liability which may arise by means of quicksand, obstacles or conditions foreseen or unforeseen and encountered in the work of this contract.

(B) - Trenches shall in every case be of sufficient width to permit solid packing of refill under and around pipes, and satisfactory construction of all appurtenances and for such sheeting and shoring, pumping and draining as may be necessary.

(C) - The trench shall be dug to the alignment and depth required and only so far in advance of pipe laying as the Engineer shall permit. The trench shall be so braced and drained that workmen may work therein safely and efficiently. It is essential that the discharge from pumps be led to natural drainage channels, to drains, or to sewers.

(D) - The trench width may vary with and depend upon the depth of trench and the nature of the excavated material encountered, but in any case shall be of ample width to permit the pipe to be laid and jointed properly and of the backfill to be placed and compacted properly. The minimum width of unsheeted trench shall be eighteen (18) inches and for pipe ten (10) inches or larger, at least twelve (12) inches larger than the outside diameter of the pipe for concrete pipe and eighteen (18) inches larger than the outside diameter of the pipe for cast iron and steel pipe, except by consent of the Engineer. The maximum clear width of trench shall be not more than two (2) feet greater than the outside pipe diameter. When sheeting and bracing is used, the trench width shall be increased accordingly.

(E) - The trench, unless otherwise specified, shall have a flat bottom conforming to the grade to which the pipe is to be laid. The pipe shall be laid upon sound soil cut true and even, so that the barrel of the pipe will have a bearing for its full length.

(F) - Any part of the trench excavated below grade shall be corrected with approved material, thoroughly compacted.

(G) - When the uncovered trench bottom at subgrade is soft and in the opinion of the Engineer cannot support the pipe, a further depth and/or width shall be excavated and refilled to pipe foundation grade as required under (F), or other approved means shall be adopted to assure a firm foundation for the pipe.

(H) - Ledge rock, boulders, large stones, and shale shall be removed to provide a clearance of at least six (6) inches below all parts of the pipe, valves, or fittings, and to a clear width of six (6) inches on each side of all concrete pipe and nine (9) inches on each side of all cast iron and steel pipe shall be provided.

(I) - Excavation below subgrade in rock, shale or in boulders shall be refilled to subgrade with approved material, thoroughly compacted.

(J) - Bell holes of ample dimensions shall be dug in earth trenches at each joint to permit the jointing to be made properly. Adequate clearance for properly jointing pipe laid in rock shall be provided at bell holes.

(K) - The use of excavating machinery will be permitted except in places where operation of same will cause damage to trees, buildings, or existing structures above or below ground, in which case hand methods shall be employed.

(L) - Trees, fences, poles and all other property shall be protected unless their removal is authorized. Any property damaged shall be satisfactorily restored by the Contractor.

(M) - Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, fire or police call boxes, or other utility controls shall be left unobstructed and accessible during the construction period.

(N) - The Contractor shall maintain all excavations in good order during the construction, so as not to hinder or injure the pipe laying, masonry or other work. He shall take all reasonable precautions to prevent movement of the sides of such excavation, and shall remove at his own expense any material sliding into the excavation.

### SHEETING AND BRACING

(A) - The Contractor shall furnish and put in place such sheeting and bracing as may be required to support the sides of trenches or other excavation and shall remove such sheetings and bracings, as the trench or excavation is filled up, unless the Engineer shall order it left in place, in which case the Contractor shall cut the plank off at a height as ordered by the Engineer, or as called for on the contract drawings. That portion of the timber ordered to be left in place will be paid for at the rate of eighty dollars (\$80.00) per thousand feet board measure. No payment will be made for wasted ends.

(B) - Whenever the excavations for the work herein to be done are immediately adjacent to other subsurface structures, the Contractor shall furnish and place sheeting and bracing where noted on contract drawings and as may be necessary so as to reduce to a minimum the possibility of injuring or damaging the same.

(C) - If the Engineer is of the opinion that at any point sufficient or proper supports, sheeting, or bracings have not been provided, he may order additional supports, sheeting or bracing, at the expense of the Contractor, and the compliance with such orders by the Contractor shall not relieve or release him from his responsibility for sufficiency of such supports.

### REMOVAL OF EXCAVATED MATERIAL

This item shall be as specified in section E-106 of the State Highway Specifications.

### LAYING PIPE

(A) - Proper implements, tools, and facilities, satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe, fittings, and valves shall be carefully lowered into the trench piece by piece by means of derrick, proper slings, and other suitable tools or equipment, in such manner as to prevent damage to pipe or coating, under no circumstances shall pipe or accessories be dropped or dumped into the trench. If any defective piece be discovered while pipe is suspended or after being laid, a new piece shall be furnished and installed by the Contractor at the site of the work.

(B) - All foreign matter or dirt shall be removed from the inside of the pipe before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying.

(C) - At times when pipe laying is not in progress, the open ends of pipe shall be closed by approved means, and no trench water shall be permitted to enter the pipe. No pipe shall be laid in water, or when the trench conditions or the weather is unsuitable for such work, except by permission of the Engineer.

(D) - Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane to avoid obstructions, to plumb stems, or for other reasons, the degree of deflection shall be approved by the Engineer.

(E) - Before laying cast iron or ductile iron pipe, all lumps, blisters and excess coal tar coating shall be removed from the bell and spigot ends of each pipe, the pipe ends shall then be kept clean until joints are made.

### FLOATING

The Contractor shall take every precaution against the floating of the pipe due to water coming into the trench, or through caving in, flushing or puddling. In case of such floating the Contractor shall replace the pipe at his own expense, and make wholly good any injury or damage which may have resulted.

### TESTING MAINS

(A) - All pipes, valves, fittings, etc., shall be laid in such a manner as to leave all joints watertight. After the pipe is laid, and before backfilling is placed around the joints, such lengths of the water main as the Engineer may determine, shall be tested under a hydrostatic pressure of seventy-five (75) pounds per square inch above the static pressure, but nowhere less than 100 pounds per square inch.

(B) - The test shall be under the direction of the Engineer and Director of Public Utilities or his designate. The Contractor may obtain water for testing by observing the rules and regulations enforced in the municipalities or townships in which the work is being done. The City will furnish a pressure gage for measuring the pressure on the water main, but the Contractor shall furnish a suitable pump, pipes, test heads and all appliances, labor, fuel and other appurtenances necessary to make these tests.

(C) - The test pressure shall be maintained for a sufficient length of time to allow for a thorough examination of joints and elimination of leakage where necessary. The pipe lines shall be made absolutely tight under the test pressure.

(D) - After a section of the water main has been tested, the Contractor shall drain same.

(E) - In cold weather immediately after testing a section of the water main, the Contractor is to open all valves, air cocks, by-passes and drains and properly drain bonnets of all valves in the section of the water main, and take all other precautions necessary to prevent injury to water main and appurtenances due to freezing.

### CLOSING VALVES

The closing of all gate valves on water mains for making connections, tests, or for any other cause, shall be done by the City of Cleveland and sufficient notice shall be given to the City, by the Contractor, so that the work may be done with a minimum of inconvenience to the public and delay to the Contractor.

### PLUGGING DEAD ENDS

Standard plugs with clamps shall be inserted into the bells of all dead ends of pipes, tees, or crosses, and spigot ends capped and clamped by the Contractors, on all mains constructed by him and existing water mains where indicated in the contract drawing. Concrete pipes shall be placed when called for on the contract drawings, or ordered by the Engineer. The cost of furnishing the plugs shall be included in the per linear foot price bid for the various sizes of new water mains and for size plug installed where shown on existing water main. (See pay item)

### BACKFILLING

(A) - This work includes all backfilling, together with ramming, puddling, and rolling, as required. The regrading of grounds, the replacing of surface and subsurface structures, the placing and maintaining of temporary sidewalks, and driveways, the furnishing of suitable material for backfill, reseeding lawns and replacing trees and shrubbery damaged by the Contractor, and all appurtenant work incidental thereto. Pavements, curbs, sidewalk and driveways within the limits of the work shall be temporarily surfaced, maintained and finally replaced or repaved as set forth under roads, surfaces, sidewalks driveways and curbing.

(B) - Backfill, unless otherwise specified, may be made with material excavated from the trenches, providing same is satisfactory to the Engineer. If, in the opinion of the Engineer, the material excavated is unsatisfactory, then the Contractor shall furnish at his own expense other material suitable for backfill. All backfill shall be free from slag, cinders, rubbish and other objectionable material.

(C) - Before laying the pipe, the bottom of the trench shall be brought to the grade of the bottom of the pipe, except of field joints. Wherever the bottom of the trench has been excavated below the bottom of the pipe, the Contractor shall place sand, or other material satisfactory to the Engineer to bring the bottom of the trench to the grade of the bottom of the pipe. This bed shall be thoroughly tamped before the pipe is laid.

APPROVED  
DATE FEB. 4, 1965

*J. J. Smith*  
DIRECTOR OF PUBLIC UTILITIES  
*J. C. Smith*  
COMMISSIONER OF WATER AND HEAT  
*Arnold B. Smith*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*J. P. Smith*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William J. Smith*  
ENGINEER OF DESIGN

### LOW SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT WATER WORK NOTES FOR MEDINA -  
JENNINGS INTERCHANGE IN  
CLEVELAND, OHIO

MADE ECE DATE 11-4-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE \_\_\_\_\_

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY      CLEVELAND      NEW YORK

# WATERWORK NOTES

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(D) - Unless otherwise specified, the backfill under, around and to a depth of one (1) foot above the top of all pipe, shall be made with material satisfactory to the Engineer, which material shall be free from stone and other objectionable material noted above. The Contractor must use special care in placing this portion of the backfill, so as to avoid injuring, distorting or moving the pipe when compacting same. Above this level the backfill shall be made with material satisfactory to the Engineer. However, where specified, sand shall be used for the entire portion of the backfill. See below.

(E) - Backfilling as noted in paragraph (D) shall be tamped in thin layers, simultaneously on each side of the pipe, and thoroughly compacted so as to provide a solid backing against the external surface of the pipe.

(F) - Only after the backfill previously mentioned has been satisfactorily compacted, may work proceed in placing the remaining backfill which must be carefully placed and compacted by tamping, puddling, or rolling. All precautions must be taken to eliminate future settlement. The number of men tamping shall be not less than the number backfilling, and additional men shall be kept in the trench to spread the material.

(G) - Backfilling shall not be done in freezing weather, except by permission of the Engineer, and it shall not be made with frozen material, nor shall any fill be made where the material already in the ditch is frozen.

(H) - The entire backfill shall be made with sand where permanent pavements, curbs, driveways, or sidewalks, have been opened for or undercut by the excavation.

(I) - All sand to be used for backfill shall be a natural bank sand, graded from fine to coarse, not lumpy or frozen, and free from slag, cinders, ashes, rubbish, or other deleterious or objectionable material. It shall not contain a total of more than 10 per cent by weight of loam and clay, and all material must be capable of being passed through a 1/2 inch sieve. Not more than 5 per cent shall remain on a No. 4 sieve.

**ROAD SURFACES, SIDEWALKS, DRIVEWAYS, AND CURBING**

(A) - The Contractor shall remove all pavements and road surfaces within the lanes of excavation. After the pipe has been laid, all appurtenant work constructed and backfill completed, he shall furnish, place and maintain, wherever the pavement or road surface has been removed or damaged by him, a temporary pavement in the paved portion of streets, or a temporary road surface in the unpaved portion of streets, so as to provide a safe and passable roadway until such time as the final pavement or road surface is completed.

(B) - All pavements, road surfaces, sidewalks, driveways, or curbs, which the Contractor is required to replace or to have replaced, shall, at the expiration of this contract, be in at least as good condition as at the time of awarding the contract.

(C) - Tunneling will not be permitted without permission of the Engineer. In backfilling tunnels, sand shall be used as far as possible and balance of backfilling made with Class E concrete, rammed in place.

(D) - No specific or separate payment will be made for all of this work, but the cost thereof shall be included in the prices bid for the various items of the work to be done under this contract. Restoration as noted above will only be required in areas where the plans do not otherwise propose new construction of pavement, sidewalks, and curbs, except that temporary restoration in such areas may be required by the Engineer in order to maintain traffic or local access.

**LIST AND INVOICES**

(A) - The Contractor shall furnish the Engineer with the list in duplicate of pieces in each shipment of pipe and specials, giving the serial number and designation of each pipe and special sent at that time.

(B) - The material shall be shipped in such sections as the Engineer may order.

**WORK INCLUDED**

The Contractor shall furnish, all the materials for and shall properly construct and connect in place, at the locations shown on the drawings or as directed, all cast iron or ductile iron pipe and fittings, including all excavation work, the cutting into and removal of existing pipe, backfilling, sand backfill, and repaving, all as required for the proper completion of the work included under this contract.

**CAST IRON PIPE AND FITTINGS**

(A) - All pit cast pipe shall be manufactured in all respects in accordance with, and shall meet the requirements of the latest "Standard Specifications for Cast Iron Pipe and Special Fittings" as adopted by the American Water Works Association which specifications except as herein modified are made a part of these specifications.

(B) - All pit cast pipe and fittings shall be cement lined and of the size and classes noted on the respective contract drawings.

(C) - In lieu of pit cast pipe above the Contractor will be permitted to furnish either centrifugal or high strength cement lined pipe. The metal shall have a modulus of rupture of not less than 40,000 pounds and a tensile strength of not less than 18,000 pounds and shall be for class noted on the contract drawings. Pipe may be furnished in 12, 16, or 18 foot lengths. The centrifugally cast pipe shall conform to the American Standard Specification A21.6-1952 and all subsequent amendments thereto.

When noted on the contract drawings ductile iron pipe shall be supplied. All ductile iron pipe shall be manufactured in accordance with A.S.A. A21.6 or federal specification WWP-421B. All ductile iron fittings shall be manufactured in accordance with A.S.A. A21.10 or AWWA C 100-08. Ductile iron shall have a minimum of 60,000 psi. Ultimate tensile strength, 40,000 psi yield point and 10% elongation. The chemical analysis shall be as follows: Carbon 3% minimum, Phosphorus .08% maximum and Silicon 2.75% maximum.

(1) - The thickness of the centrifugally cast iron pipe shall conform to the following table:

STANDARD THICKNESS OF CENTRIFUGALLY CAST IRON PIPE AND DUCTILE IRON PIPE

SIZE	WORKING PRESSURE	STANDARD THICKNESS	CLASS
6"	250	.48	25
8"	250	.52	25
10"	250	.56	25
12"	250	.60	25
16"	200	.68	25

(2) - All fittings, such as bends, tees, crosses, offsets, hydrant branches, etc., shall have bell and bell or bell and spigot ends with cast lead joints, pipe between offsets or bends and on hydrant branches, shall also be of bell and spigot type with lead joints.

(D) - All pipe shall have bell and spigot ends for cast lead joints or a slip-on type joint with compressed rubber ring inserts. All pipe and fittings shall be cement lined.

(E) - Gaskets shall be of rubber or other equally effective protection against uneven distortion of the gasket.

(F) - Where fittings are shown which are not covered by the above specifications, they in such particulars as are lacking thereon, shall conform to the dimensions and otherwise meet the specifications for the respective type which are carried in the latest revisions to the current edition of the "Handbook of Cast Iron Pipe" by the Cast Iron Pipe Research Association or which are otherwise shown on the contract drawings.

(G) - Wherever changes in line and grades of the main as shown on the drawings are not standard fitting deflections, the Contractor will be permitted to submit details using combinations of standard fittings and small deflections (not to exceed a maximum of one half (1/2) inch joint opening) in the adjoining lengths of pipe.

(H) - Plugs for bell and spigot pipe and caps for lugged pipe shall be furnished with two (2) plugged two (2") inch taps for drain and air cock connections.

(I) - Closure pieces shall be accurately measured and cut in the field and installed using solid type pattern sleeves as shown or as required.

(J) - Tests, inspection, reports and analyses of tests of samples for all materials shall be furnished as set forth elsewhere in these notes.

(K) - Bitumastic coating shall be applied on the exterior of all cast iron pipe and fittings in accordance with AWWA specifications.

**CEMENT LINING**

All cast iron or ductile iron pipe and fittings shall be given a cement mortar lining at the point of manufacture. The lining shall conform to the American Standard Specification A 21.4-1952 and all subsequent amendments thereto.

**MARKING**

All cast iron or ductile iron pipe and fittings shall be suitably marked to denote the manufacturer, class, date, weight and other elements of identification.

**LAYING**

(A) - Proper and suitable tools and appliances for the safe and convenient handling and laying of the pipes and fittings shall be used. Great care shall be taken to prevent the pipe coating from being damaged, particularly on the inside of pipes and fittings and any such damage shall be remedied as directed. All pipes and fittings shall be carefully examined by the Contractor for defects just before laying and no pipe or fitting shall be laid which is known to be defective.

(B) - If any defective pipe is discovered after having been laid, it shall be removed and replaced with a sound pipe or fitting in a satisfactory manner, by the Contractor at his own expense. All pipes and fittings shall be thoroughly cleaned before they are laid, shall be kept clean until they are used in the completed work, and, when laid, shall conform to the lines and grades given by the Engineer. Open ends of pipes shall be kept plugged with a bulkhead during construction. In no event shall any portion of the damaged pipe be permitted to remain in the line. Any approval stamps found on the pipe shall be removed or the pipe broken up for scrap.

(C) - Pipe laid in trench shall be laid to a firm and even bearing for its full length. Precautions shall be taken against floating.

(D) - It is the intention of these specifications to secure first class workmanship in the placing of pipe and accessories. In such details as are not specifically mentioned herein or called for on the drawings, the Contractor will be required to conform with the applicable sections of the latest "Standard Specifications for Laying Cast Iron Pipe" as adopted by the American Water Works Association.

**CUTTING PIPE**

Whenever the pipes require cutting to fit into the lines, the work shall be done in a satisfactory manner so as to leave a smooth end at right angles to the axis of the pipe. In no event shall flame cutting be used. When a piece of pipe is cut to fit into the line, no payment will be made for the portion cut off and not used in the line.

**JOINTS**

(A) - Lead joints: In jointing all bell and spigot pipe and fittings having lead joints, the spigot of each pipe shall be properly seated in the bell of the next adjacent piece and adjusted so as to give a uniform annular space. The joint shall be made with twisted hard jute and soft pig lead. Before placing the jute, it shall be sterilized either by boiling or by dipping in a concentrated solution of "HTH". The jute shall be twisted and thoroughly driven into the bell, so that the lead, after having been caulked, shall have a depth of 2 1/2 inches.

The furnace and melting pot shall be kept near the joint to be poured and each joint shall be made with one pouring. Dross shall not be allowed to accumulate in the melting pot. The joints shall be thoroughly caulked by competent pipe joiners and in such manner as will secure a tight joint without overstraining the iron of the bell.

**PAINTING**

After erection, all exposed or damaged coatings and all bolts for lugged joints shall be cleaned and painted with three (3) field coats of Inertol 50 or Bitumastic 50 or equivalent.

**DRAWINGS**

(A) - The Contractor shall submit to the Engineer for approval duplicate prints of all shop drawings for pit cast iron pipe and fittings and miscellaneous details which are not standard construction, and are not mentioned in the regular catalogue of the company furnishing the pipe. No work shall be done in the shop until after the drawings have been approved.

(B) - The approval of the drawings by the Engineer shall not relieve the Contractor of any of his obligations in connection with this contract.

**MEASUREMENT**

The number of lineal feet of cast iron pipe and ductile iron pipe line and connections to be paid for shall be the actual number of lineal feet furnished and placed in accordance with these specifications as measured along the axis of the piping including fittings and valves connected up in place. For connections between new and existing mains, measurement shall be the distance from centerline to centerline of mains and the actual length of existing main ordered to be removed to make the connection.

**FURNISHING AND SETTING 6" HYDRANTS**

**WORK INCLUDED**

The Contractor shall furnish all hydrants, caulking material, labor, tools and equipment for and shall properly connect at the location shown on the Contract Drawings, 6" hydrants, complete, as required for the proper completion of the work included under this contract.

**HYDRANTS**

The 6" hydrants shall be City of Cleveland Standard and shall conform to the City's specifications on file in Room 624 Lincoln Building, Cleveland 14, Ohio.

**SETTING**

(A) - General Location: Hydrant shall be located in a manner to provide complete accessibility, and in such manner that the possibility of damage from vehicles or injury to pedestrians will be minimized. Unless otherwise directed, the setting of any hydrant shall conform to the following:

(B) - Location Regarding Curb Lines: When placed behind curb the hydrant barrel shall be set so that center of barrel will be no less than 3 feet from the gutter face of the curb, or deviate from location indicated on contract drawings, except by consent of the Engineer.

(C) - Location Regarding Sidewalk: When set in the lawn space between the curb and the sidewalk, or between the sidewalk and the property line, no portion of the hydrant or nozzle cap shall be within 6 inches of the sidewalk.

(D) - Position of Nozzles: The hydrant shall stand plumb, with the nozzles pointing toward the road and at an angle of forty-five degrees therefrom. Where hydrant branch piping is parallel with, or not at right-angles to the curb, the Contractor shall release swivel head bolts and adjust the hydrant nozzles to face the road at the proper angle. A hydrant without swivel heads will be adjusted by the City where necessary to correct the angle on nozzles. The elevation shall conform to the established grade with tops of frost casing at least four (4) inches above grade.

(E) - Connection to Main: The hydrant shall be connected to the main pipe with a cast iron branch controlled by the independent gate valve of the same size as hydrant, except as otherwise directed.

APPROVED

DATE FEB. 4, 1965

*J. J. O'Donnell*  
DIRECTOR OF PUBLIC UTILITIES

*W. J. ...*  
COMMISSIONER OF WATER AND HEAT

*...*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*...*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*...*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT **WATER WORK NOTES FOR MEDINA-JENNINGS INTERCHANGE IN CLEVELAND, OHIO**

MADE E.C.E. DATE 11-6-64 TRACED DATE  
CHECKED DATE SCALE

**HOWARD, NEEDLES, TAMMEN & BERGENDOFF**  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

# WATERWORK NOTES

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(F) - Drainage at Hydrant: Drainage shall be provided at the base of the hydrant by filling around the elbow with coarse gravel or crushed stone to at least six (6) inches above the waste opening. Wherever a hydrant is set in rock, clay or other impervious soil, the trench shall be widened and deepened on each side of the hydrant base, which space shall be filled compactly with coarse gravel or broken stone mixed with coarse sand of sufficient quantity to absorb all water to be drained from the hydrant when the valve is closed.

(G) - Anchorage for Hydrant: The hydrant shall be set on a stone slab or similar foundation and base of hydrant and hydrant tee well braced against unexcavated earth at the end of the trench with concrete backing, or it shall be tied to the pipe with suitable rods or clamps as directed by the Engineer.

(H) - Cleaning: The hydrant shall be thoroughly cleaned of dirt or foreign matter before setting.

### FIRE HYDRANTS RELOCATED

#### WORK INCLUDED

The Contractor shall remove the hydrants and properly set in place and connect at the locations shown on the drawings or as directed by the Engineer. This shall include all excavating, backfilling, seeding and sodding, and repaving required for the proper completion of the work included under this contract.

#### MATERIALS

All hydrants to be relocated must be in good condition. All other materials and appurtenances necessary for the proper completion of this item shall be of the kind and grade called for in these notes for the particular kind of construction in which the materials are to be used.

#### CONSTRUCTION METHODS

The construction methods shall conform to the requirements of the item "6" Hydrants" as set forth elsewhere in these notes.

### FIRE HYDRANTS ABANDONED

Where fire hydrants are indicated to be abandoned (not indicated for removal), no work is required, the hydrant becomes the property of the Contractor and shall be disposed of as he sees fit.

### 2-INCH GALVANIZED WROUGHT IRON AND BRASS PIPE FOR FLUSHING CONNECTIONS

#### WORK INCLUDED

The Contractor shall furnish all the materials for and shall properly connect in place at the locations shown on the drawings or as ordered, all 2-inch extra strong brass pipe and fittings, and all 2-inch extra heavy galvanized wrought iron pipe and fittings respectively, which are necessary for the proper completion of the work included under this contract.

#### BRASS PIPE AND FITTINGS

All brass pipe and fittings shall be extra strong, 2-inch pipe size and the pipe shall conform to A.S.T.M. Specifications B 43-42. Fittings shall be extra strong weight and shall have sound, well fitting threads.

#### GALVANIZED WROUGHT IRON PIPE AND FITTINGS

All galvanized wrought iron pipe, nipples and fittings shall be extra heavy genuine wrought iron pipe A.S.T.M. Designation A 72-59 T. The fittings shall be beaded, of malleable iron, extra heavy weight. All pipe and fittings shall be hot galvanized inside and outside, and shall have sound, well-fitting threads.

#### ERECTION

All pipe shall be carefully placed to the proper lines and grades, and shall be connected up, unless otherwise shown, with screw fittings. Screw joints shall be made tight with a graphite paste and screwed home. A liberal number of unions shall be used to permit the ready removal of any section.

### VALVES

#### WORK INCLUDED

The Contractor shall furnish all the materials for and shall properly set in place and connect at the locations shown on the drawings or as directed. All air cocks, drain valves, and gate valves of the various sizes and types specified or ordered all as required for the proper completion of the work included under this contract.

#### AIR COCKS

All air cocks or air vent valves shall be 2-inch brass angle type globe valves. 2-inch air cocks shall be equal in all respects to the Farnan "Cleveland Standard" Brass Air Bent Valve No. W-4695 as manufactured by the Farnan Brass Works.

#### GATE VALVES

(A) Type of Valves: The gate valves shall be manufactured in full compliance with the Standard Specifications for Gate Valves for Ordinary Water Works Service of the American Water Works Association AWWA C-500-61 or latest revision thereof and in addition shall comply with the following supplementary requirements. All gate

valves shall be of the non-revolving double disc parallel seat bottom wedge or side wedge type. All gate valves 20 inches and over in size shall include by-pass valves attached thereto. In opening or closing the valve, the gates shall be forced ascend or descend by reason of the thrust exerted upon them by the valve stem nut; this thrust being generated by the rotation of the valve stem. In closing the valve, the discs when opposite the ports, shall be pressed firmly against the body seats by wedges or some other device equally suitable to the Engineer.

(B) Valves with Stationary Stems: All gate valves, unless otherwise ordered, shall be made with single, non-rising stems.

(C) Hub Ends: The dimensions of the bells on valves up to and including 24 in. in diameter shall conform to those for Class D pressure fittings, as required by AWWA C100. On valves 30 in. and larger in size, the bell dimensions shall be for the classes ordered.

(D) Victaulic Ends: Victaulic ends shall conform to the dimensions given on the contract drawings.

(E) Flange Ends: The end flanges of flanged gate valves shall conform in dimensions and drilling to the "American 125 pound Cast Iron Flanges Standard", unless otherwise ordered.

(F) Screw Ends: All 2-inch gate valves and under shall be made with screw ends, unless otherwise specified.

(G) Vertical and Horizontal Valves: All gate valves, 16 inches and under, shall be constructed to work vertically. Valves over 16 inch waterway shall be constructed to work horizontally.

(H) By-Passes: By-passes with gate valves shall be provided on valves 20 inches and larger. The by-passes shall be located on or below the horizontal centerline of the valves. By-pass valves shall be of the same size as the by-pass and shall conform to the requirement of these specifications for the specific valve used. The size requirements of by-passes shall be as follows: 20-inch valves shall be provided with 3-inch by-passes; valves 24 inches to 30 inches, inclusive, shall be provided with 4-inch by-passes; valves 36 inches to 42 inches, inclusive, shall be provided with 6-inch by-passes; 48 inch valves shall be provided with 8-inch by-passes.

(I) Flanges: When flanged valves are required, the flanges shall be faced and drilled. Bolt holes shall be spot faced on the back when necessary to secure an even bearing. All bolt holes shall be of the size shown on the drawings to be submitted and approved, shall be accurately drilled from templates, spaced equal distances apart and shall straddle horizontal and vertical axis, all as shown on the drawings. The dimensions and drilling of all end flanges shall conform to the spacing indicated on the drawings which shall be the American 125 pounds Cast Iron Flange Standard. Flanges shall be plain face with a smooth finish.

(J) Marking: All gate valves 3 inches and over shall have the identity of maker, size and the year when made and also the letters "C.W.D." cast upon its body or dome in raised letters.

(K) Stuffing Boxes: The stuffing box on each gate valve 3 inches or over, must be separate from the dome and fastened to it by bolts. For 2 inch valves and under, the stuffing boxes may be formed in the dome of the valve. When required by the Director, valves 16 inches and smaller, shall be furnished with "O" ring type seal plate. The seal plate shall be fitted with at least two "O" rings, the lower "O" ring serving as the pressure seal and the upper "O" ring as a combined dirt and moisture seal. The "O" rings shall be Precision Rubber Corporation Quality Compound No. 122-70, or approved equal.

(L) Seat and Gate Rings: Dimensions of the bronze seat and gate rings shall be proportioned to fit the test pressure required, and shall meet the approval of the Engineer. The rings shall be firmly secured in place by an approved device, which will prevent them from working loose, particularly when the valve is left partly open. Dimensions of the bronze seat and gate rings for gate valves shall be not less than that specified in the following tables. Body seat rings shall be made of Grade One Bronze. Gate seat rings shall be made of Grade Five Bronze.

#### BODY AND GATE RINGS

##### BOTTOM WEDGE

VALVE SIZE	BODY RINGS			GATE RINGS		
	FACE	DEPTH	THICKNESS AT BASE OF THREADS	FACE THICKNESS	FACE THICKNESS	DEPTH
3"	9/16	9/16	3/16	3/16	5/8	1/4
4"	9/16	9/16	3/16	3/16	5/8	5/16
6"	11/16	9/16	3/16	5/32	11/16	5/16
8"	3/4	5/8	3/16	7/32	13/16	5/16
10"	3/4	5/8	3/16	7/32	13/16	11/32
12"	7/8	5/8	7/32	7/32	1	11/32
16"	1-1/8	3/4	1/4	9/32	1-1/4	1/2
20"	1-3/8	1-1/8	5/16	3/8	1-3/8	5/8
24"	1-3/8	1-1/8	5/16	3/8	1-3/8	5/8
30"	1-1/2	1-1/4	3/8	7/16	1-1/2	3/4

SIZE OF VALVE INCHES		DIAMETER OF STEM AT BASE OF THREAD - INCHES		NO. OF THREADS PER INCH	
3"	13/32	1/2	3/16	4	21/64
4"	7/16	9/16	3/16	4	21/64
6"	1/2	11/16	1/4	3	21/64
8"	17/32	11/16	1/4	3	21/64
10"	5/8	13/16	3/8	3	21/64
12"	5/8	13/16	3/8	3	21/64
16"	3/4	1	15/32	3	13/32
20"	7/8	1-5/16	17/32	2	17/32
24"	1-1/16	1-3/8	21/32	2	19/32
30"	1-5/16	1-1/2	25/32	2	19/32

#### DIMENSIONS IN INCHES

(M) Valve Stem: All gate valves shall be of the single screw type. The stems shall be of Grade Three Bronze. The threads of stems and stem nuts shall be of Acme, modified Acme or one-half V Type. If requested, a manufacturer's certificate of test shall be furnished with all bronze stems. All stem collars shall be cast integral with stems. The diameters of stems at the base of the thread shall be not less than those shown below. The stem opening and thrust-bearing recess shall be Grade One, bronze bushed. The number of threads per inch shall be as given below.

SIZE OF VALVE INCHES	DIAMETER OF STEM AT BASE OF THREAD - INCHES	NO. OF THREADS PER INCH
2	0.469	4
3	0.859	4
4	0.859	3
6	1.000	3
8	1.000	3
10	1.125	3
12	1.188	3
16	1.438	3
20	1.896	3
24	1.980	2
30	2.480	2

(N) Wrench Caps: The wrench caps and retaining nuts on heads of valve stems and pinion shafts shall be of Grade Three Bronze. On valves 24 inches and over, wrench caps shall be 2 inches square and 2 inches deep. On valves 4 inches to 20 inches, inclusive, they shall be 1-3/4 inches square on top, 1-7/8 inches square at base, and 1-3/4 inches deep. On 3 inch valves and under, they shall be 1-1/4 inches square on top, 1-3/8 inches square at base and 1-1/2 inches deep. Machined wrench caps for valves 3 inches to 48 inches inclusive shall be fitted to a machined square stem or pinion shaft and held in place by a retaining nut. Wrench caps shall have a cut-away skirt to permit easy access to gland bolts.

(O) Valves to open clockwise except 2 inches and under. All gate valves 3 inches and over including by-pass valves, shall be made to open by turning in a clockwise direction. All valves to be so made that they can be easily operated.

(P) Facing of Gates: All discs or gates and threads for seat rings in the body shall be machined true and a groove or grooves shall be machined in each disc or gate for the reception of the face ring. The disc and seat rings shall be securely and rigidly attached to the discs or body seats in a manner approved by the Engineer, and the rings are to be finished to a true surface.

(Q) Rollers and Scrapers: In all valves 20 inches in diameter and larger designed to lie horizontally, each gate or disc shall be provided with two bronze rollers travelling on bronze-faced tracks and provided with suitable bronze scrapers or two stainless steel rollers travelling on stainless steel-faced tracks and provided with suitable stainless steel scrapers. The thickness of the facing of the tracks shall be not less than 1/4 inch. The bronze shall be Class 1 and the stainless steel shall be ASTM A 276-55, Type 302.

APPROVED  
DATE FEB. 4, 1965  
*[Signature]*  
DIRECTOR OF PUBLIC UTILITIES  
*[Signature]*  
COMMISSIONER OF WATER AND HEAT  
*[Signature]*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*[Signature]*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*[Signature]*  
ENGINEER OF DESIGN

<b>LOW SERVICE DISTRICT</b>	
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO	
SUBJECT	WATER WORK NOTES FOR MEDINA-JENNINGS INTERCHANGE IN CLEVELAND, OHIO

MADE E.C.E.	DATE 11-6-64	TRACED	DATE
CHECKED	DATE	SCALE	

**HOWARD, NEEDLES, TAMMEN & BERGENDOFF**  
CONSULTING ENGINEERS  
KANSAS CITY      CLEVELAND      NEW YORK

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(R) **Valve Guides:** All valves 20 inches in diameter and larger shall be provided with guides or tracks which shall be made straight and true, and all irregularities must be machined off. The guides or tracks of horizontal valves shall be substantially faced with a minimum of 1/4 inches of Grade One Bronze, or stainless steel ASTM A 276-55, Type 302, satisfactory to the Engineer, securely fastened and planned off smooth and true.

(S) **Gearing.** All valves 20 inches in diameter and larger shall be equipped with enclosed cut tooth steel gears. Gears, shafts and bearings shall be such as to provide easy operation without bending or twisting.

(T) **Dowel Pins.** All gear valves shall have two dowel pins set in the flanges connecting the dome and body. Size of the pins to be shown in plans.

(V) **Grease Cases.** All valves 20 inches in diameter and larger shall have water tight grease cases installed. The grease cases shall be of the extended type and shall be made of cast iron conforming to ASTM specifications, serial designation A 126, Class B or any subsequent amendment thereto. Bearing surfaces for valve stem and pinion shaft shall be bronze bushed with Grade One Bronze. The grease cases shall be securely bolted to the valve bonnet through a heavy cast iron yoke. The yoke shall be of sufficient length to provide space for repacking valve and grease case stuffing boxes. All grease cases shall be provided with a removable cover securely bolted in place to allow easy access to the gears. There shall also be provided convenient filling and draining plugs and sufficient oil to fully submerge the pinion gear. The valves shall be delivered with the grease cases filled with the proper oil as recommended by the manufacturer.

(W) **Indicators:** All valves 20 inches in diameter and over, shall be equipped with indicators denoting the positions of the gate. The moving part and bearings to be of bronze or bronze-lined.

(AA) **Bronze Parts:** The stems, stem nuts, operating nuts, retaining nuts, disc and seat rings, shall be of solid bronze. Other parts such as wedges, glands, thrust bearings, gear spindles, rollers, scrapers and tracks, and all other parts coming together in operation, shall be of bronze, or substantially lined with bronze or stainless steel of a thickness not less than 1/4 of an inch and as shown on drawings submitted and approved. All 2 inch valves and under shall be made entirely of bronze, except handwheels which shall be of malleable iron.

(BB) **Cast Iron Parts:** The bodies, covers, discs, frames, etc., of all gate valves 3 inches and over, shall be of cast iron.

(CC) **Waterway Opening:** With the valve open, an unobstructed waterway shall be afforded, the diameter of which is not to be less than the full nominal diameter of the valve.

**MATERIAL SPECIFICATIONS**

(A) - **Strength of Valves:** The gate valve shall be designed for 150 lb. working pressure and shall withstand an internally applied hydrostatic pressure at all points of at least 300 lbs. per square inch. A factor of safety of not less than 10 shall be used on the design. Should tests develop any weakness, the valves from that design shall be rejected and a new design made.

(B) - **Reinforcement at Flanges:** All valve flanges shall be reinforced by fillets in accordance with the manufacturer's practice proven satisfactory in actual service.

(C) - **Joints:** All joints of the valves shall be faced true in a lathe or planer, and put together with a gasket of some material acceptable to the Engineer.

(D) - **Bolt Holes:** All bolt holes shall be accurately drilled from templates and spaced equal distances apart.

(E) - **Bolts and Nuts:** All bolts and nuts shall be made of silicone bronze (A.S.T.M. B 98-55, Alloy A) or stainless steel (A.S.T.M. A 276-55, Type 302).

(F) - **Parts to be Interchangeable:** All parts of valves of the same size and make must be perfectly interchangeable and all work done in a thorough and workmanlike manner.

(G) - **Castings:** All castings, whether of bronze, iron or steel, shall be sound and smooth without cold shuts, swells, lumps, scabs, blisters, sand holes or other imperfections, and shall be made in accordance with the best modern foundry practice to obtain castings of the best quality and of uniform thickness. No welding, plugging, or filling of holes or other defects will be permitted. For parts whose thickness is less than one (1) inch, casting being thinner than the specified thickness by .06 of an inch or more shall be rejected, and for parts whose thickness is one (1) inch or more, castings being thinner than specified by .08 of an inch or more shall be rejected.

(H) - **Bronze Parts:** (1) Bronze for parts, other than those listed below, shall be Grade One. (2) Valve stems, pinion shafts, stem nuts, wrench caps and retaining nuts shall be made of Grade Three bronze. (3) Disc rings shall be made of Grade Five bronze.

(I) - **Tests of Bronze:** (1) If demanded, a manufacturer's certificate of test shall be furnished with all bronze stems. (2) All stems of 16-inch gate valves and over, shall have a prolongation on one end of each stem, of the same dimensions and cross section as the stem, and of sufficient length to enable the cutting of specimens parallel with the longitudinal axis of the stem. Specimens shall be cut from prolongations one-half way between surface and central axis. Other methods of test will be considered by the Director, but must be submitted in detail with the bid.

(3) For all stems of gate valves smaller than 16 inches, not less than two test pieces shall be cast from the molten metal of each heat, from which valve stems are being made. (4) All stems made from bronze showing less strength, elongation and/or ductility than above required shall be rejected. (5) Tests of valve stems, or the various parts of any valve may be made at any time before or after delivery, and if found to be deficient in strength or unsatisfactory to the Director, the whole lot or shipment may be rejected.

(J) - **Cast Iron:** (1) **Quality:** Cast Iron shall conform to ASTM Specifications A 126, Class B, or latest revision thereof. All iron castings shall be tough and without brittleness, such as may be cut drilled and chipped by hand with due ease. A blow from a hammer shall produce an indentation on the edge of the casting without flaking the metal.

(2) - **Tests:** Bars from the molten metal from which the valves are being made shall be tested at such time and in such manner as the Engineer may require. The requirements of A.S.T.M. Specifications A 126 shall govern testing procedures to determine the physical and chemical characteristics of the iron castings. Should the result obtained from the bar tested fail to show that the cast iron meets the requirements herein specified, the entire melt will be rejected. Test bars, however, whose failure is due to inherent defects shall not be considered. All valves made from iron showing less strength than called for in the A.S.T.M. Specifications shall be rejected.

(K) - **Quality of Wrought Iron:** All wrought iron shall be tough, fibrous, and uniform in character. Specimens cut from bars and broken in a testing machine shall show a tensile strength of not less than 45,000 PSI, with an elongation of 18 per cent in eight diameters.

(L) - **Quality of Materials:** Grade One cast bronze shall conform to the properties of A.S.T.M. B 62.

**Grade Two** cast bronze shall conform to the properties of A.S.T.M. B 132, Alloy A.

**Grade Three** cast bronze shall conform to the properties of A.S.T.M. B 132, Alloy B.

**Grade Four** rolled bronze shall conform to the properties of A.S.T.M. B 21, Alloy A (one-half hard).

**Grade Five** bronze shall be sufficiently malleable to conform to dovetailed grooves when peened or rolled, and shall have a minimum compressive strength, without deformation, of 4,000 PSI., and shall have the following chemical composition:

Copper, per cent	91.0
Tin, per cent	0.0
Zinc, per cent	5.0
Lead, per cent	4.0

**Silicon Bronze** - This bronze shall conform to A.S.T.M. Specification B-98, Alloy A.

**Stainless Steel** - The stainless steel shall conform to A.S.T.M. Specifications A-276, Type 302.

**Cast Iron** - The cast iron shall conform to A.S.T.M. Specification A 126, Class B.

(M) - **Other Materials:** All other materials used in the manufacture of these valves and not specified in the specifications shall be of the best quality of their respective kinds, and subject to inspection, tests, and approval by the Engineer.

(N) - **Chemical Analysis:** Chemical analysis of the material used shall be furnished by the Contractor whenever required by the Engineer.

(O) - **Cleaning of Castings:** All iron castings shall be thoroughly cleaned on the outside and inside surfaces, and protected from rain or moisture until they are painted.

(P) **Hydrostatic Tests at Shop:** All gate valves shall be tested in the shop by hydrostatic pressure, by closing the valve and applying the required test pressure in the body and dome of the valve as specified below.

3" and under	300 P.S.I. - No time requirement
4" through 12"	400 P.S.I. - No time requirement
14" through 20"	300 P.S.I. for 15 minutes, drop pressure to 150 P.S.I., then elevate again to 300 P.S.I. for 15 minutes - a total of 1/2 hour.
24" through 48"	300 P.S.I. for 1/2 hour, drop pressure to 150 P.S.I., then elevate again to 300 P.S.I. for 30 minutes - a total of 1 hour.

This is a modification of section 29 of the "Standard Specifications AWWA Designation C-500-61". All leaks, flaws of other defects developed in making these tests shall be corrected to the satisfaction of the Engineer or the entire piece shall be rejected. After testing, all valves shall be thoroughly drained. All equipment for testing and all tests shall be made at the Contractor's expense.

(Q) **Performance Tests:** Each valve shall be operated in the position that it will assume in service and for the full length of gate travel in both directions, to demonstrate the free and perfect functioning of all parts in the intended manner. Any defects of workmanship shall be corrected and the test repeated until satisfactory performance is demonstrated.

**PLACING AND TESTING**

(A) - All valves shall be set accurately and carefully to the lines and grades given. All connections to pipe shall have the necessary flanged lead or screwed ends as required under the following items: Cast iron pipe and fittings, furnishing and setting 6" (six inch) hydrants, and 2-inch galvanized wrought iron pipe and brass pipe and as shown on the valve schedule.

(B) After the valves are set in place and ready to operate, the Contractor shall test them under working pressure and conditions herein specified under the Specification "Testing Mains" and any valve found to leak shall be made water-tight and, if found to be of faulty design, shall be satisfactorily repaired or replaced by the Contractor.

**PAINTING**

(A) - Iron body valves shall either be dipped in asphalt paint and all bronze parts cleaned, or all iron castings shall be painted inside before assembling with two (2) coats of an approved paint and, after passing the hydraulic test, shall be given at least two (2) coats of approved paint outside.

(B) - After erection, all exposed metal surfaces of valves except brass or bronze shall be painted with (2) field coats of coal tar pitch paint equal to Inertal 66 or Koppers Bitumastic 50.

**INSPECTION**

The Engineer or his authorized designate will inspect the material and work done, as the interests of the City or State may require. Such officer shall have unrestricted access to the Contractor's plant, and to all parts of the work, and other places at which the preparation of the material and the construction of the different parts of the work to be done under these specifications are carried on, and he shall receive all facilities and assistance to carry out his work of inspection and testing in a manner satisfactory to the Engineer. Such inspection shall not relieve the Contractor from any obligation to perform said work strictly in accordance with the specifications, or any modifications thereof as herein provided, and work not so constructed shall be removed and made good by the Contractor at his own expense.

**DRAWINGS**

(A) - Prior to the manufacture of any valves, the Contractor shall submit for the approval of the Engineer and Director of Public Utilities of the City of Cleveland, complete working, detail, and dimension drawings showing thicknesses and kinds of material, and similar information.

(B) - One print of each of the drawings submitted will be returned with the criticisms or approval of the Engineer. In case the drawings are not approved, the Contractor shall again send for approval duplicate revised prints of the drawings to take care of the criticisms noted, and after the drawings have been finally approved, the Contractor shall again furnish to the Engineer fourteen additional prints, six of which shall be furnished to the Director of Public Utilities of the City of Cleveland, of each drawing. No work shall be done in the shop until after the drawings have been finally approved.

**PAYMENT**

The unit price stipulated for valves shall include the furnishing, placing, testing and painting of the air cock, drain valves, check and gate valves, including by-pass valves, operating nuts and other accessories and appurtenances and the furnishing of all labor, tools, and appliances necessary to complete the work as specified or as shown.

APPROVED  
 DATE FEB. 4, 1965

*[Signature]*  
 DIRECTOR OF PUBLIC UTILITIES  
*[Signature]*  
 COMMISSIONER OF WATER AND HEAT  
*[Signature]*  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
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 ENGINEER OF CONSTRUCTION AND SURVEYS  
*[Signature]*  
 ENGINEER OF DESIGN

<b>LOW SERVICE DISTRICT</b>
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO
SUBJECT WATER WORK NOTES FOR MEDINA-JENNINGS INTERCHANGE IN CLEVELAND, OHIO

MADE E.C.E. DATE 11-6-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE \_\_\_\_\_

**HOWARD, NEEDLES, TAMMEN & BERGENDOFF**  
 CONSULTING ENGINEERS  
 KANSAS CITY      CLEVELAND      NEW YORK

# WATERWORK NOTES

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## PRESTRESSED CONCRETE CYLINDER PIPE

### WORK INCLUDED

The Contractor shall furnish all the materials, labor, tools and equipment for and shall properly construct and connect in place the water main at locations shown on the drawings, or as directed, using prestressed concrete cylinder pipe and fittings and including all excavation work, backfilling, sand backfill, repaving, concrete cylinder fittings, cast iron pipe and fittings, victaulic and dresser couplings, etc., all as required for the proper completion of the work included under this contract.

### DEFINITIONS

Whenever the words "concrete pipe" or "prestressed concrete cylinder pipe" are used, they shall refer to and mean "prestressed steel cylinder reinforced concrete pressure pipe".

### PRESTRESSED CONCRETE CYLINDER PIPE

(A) All prestressed concrete pipe to be furnished shall conform to these specifications and shall conform to the latest ANWA C 301-58 "Standard Specifications for Reinforced Concrete Water Pipe-Steel Cylinder Type, Prestressed".

(B) The Prestressed concrete cylinder pipe shall be furnished in uniform length of not less than sixteen feet for the pipe except that shorter lengths may be used to meet special conditions. The nominal thickness of the core and the nominal thickness of the mortar coating shall not be less than that given in the following table:

NOMINAL INSIDE DIAMETER	CORE THICKNESS	MINIMUM MORTAR COATING
24"	1-1/2"	3/4"
30"	1-3/4"	3/4"

The interior diameter of the pipe shall not be less than the nominal diameter by more than one per cent (1%). The thickness of the wall of the pipe shall not be less than the nominal thickness by more than eight (8) per cent. The ends of pipe shall be at right angles to the pipe axis. Pipes may be beveled to form curves. The concrete used to line the steel cylinders shall be made from suitable aggregates composed of hard, durable particles, clean and free from loam or organic material. Cement shall fulfill the requirements of ASTM designation: C 150-52, "Standard Specifications for Portland Cement". It is the intent of this specification to produce a concrete having a 28-day strength of 4500 or a 7-day strength of 3000 pounds per square inch for standard 6" x 12" test cylinders which shall be cured in the same manner as the pipe. Concrete for which 28-day strength tests shall show strengths of less than 4500 pounds per square inch may be used providing that the maximum design compressive stresses in the concrete shall not exceed forty (40) per cent of the strength of the concrete at the time of wrapping.

(C) The concrete lining of the steel cylinder may be placed vertically by the use of interior forms or may be placed by the centrifugal process. When the centrifugal process is used, the cylinder shall be held securely in spinning frames and the frames placed horizontally in a machine which will cause them to rotate rapidly about their longitudinal axis at a rim speed sufficient to insure good compaction of the concrete. The concrete shall be placed in the steel cylinders while they are revolving in such manner that the rotation shall evenly distribute the concrete along the entire length of the pipe. After the concrete has been deposited, the frames shall continue to revolve until the excess water has come to the surface and the concrete has become thoroughly compacted. The interior surface of the pipe may be finished either while it is still in the centrifugal machine or by means of a honing operation after the concrete has set. When the spinning of the concrete is completed, the lined cylinders shall be removed from the machine and placed in a vertical position for curing. After the concrete has taken its final set, the pipes shall be kept in a warm atmosphere for curing.

(D) When the concrete lining is placed by a vertical casting, the steel cylinder shall be placed vertically about an interior mold and the mold and cylinder shall be held in circular and concentric position by top and bottom rings of steel or cast iron. While the concrete is being placed, vibrations shall be employed so as to produce a concrete of maximum density. After completion of the pouring operation and when concrete has taken its final set, the lined cylinders shall be kept in a warm atmosphere until the following day, when the molds may be removed.

(E) After the interior molds have been removed, or in the case of centrifugal casting, after the concrete has hardened sufficiently, the concrete lining shall be kept moist by water or steam until at least 36 hours after the placing of the concrete. The temperature of the atmosphere to which the new concrete is exposed during this curing period shall be maintained above 50° F. but not exceeding 150° F. on the second day after placing the concrete, the pipe may be tipped into horizontal position and placed in storage. Where steam has not been used during this initial curing period, the concrete shall be kept moist for a further period of 5 days by intermittent sprinkling.

(F) In lieu of the moist curing method previously described, the manufacturer may use curing compounds of the emulsified asphalt or synthetic resin type, but such compounds must be applied to the concrete at such time as to assure the retention of adequate moisture for the proper hydration of the cement.

(G) Whatever method is used, however, the curing shall proceed in such manner and for such a period as to assure the concrete lining attaining the required strength.

(H) The cement mortar coating shall be applied to the cores after they have been wrapped under tension with high tensile wire. The mortar used for this coating shall consist of one part of cement to not more than three parts of fine aggregate, measured by volume. The mortar shall be placed on the pipe by a machine in which the mortar, previously mixed, is driven against the exterior surface of the core so as to produce a dense coating around the pipe and covering the steel reinforcing. Upon completion of the coating operation, the pipes shall be placed where they are protected from sun, wind and rain and after the mortar has hardened sufficiently, it shall be kept moist with water or steam until the following day or for a period of not less than twelve hours, at which time the pipes may be placed in the storage yard. If water is used for curing, the pipes shall be kept moist by periodic sprinkling for an additional 3 days after being placed in storage. In lieu of the moist curing method, the manufacturer may use concrete curing compounds of the emulsified asphalt or synthetic resin type, provided that such compounds must be applied to the mortar at such time as to assure the retention of adequate moisture for the proper hydration of the cement.

(I) The pipe shall be reinforced with a continuous welded steel cylinder of hot rolled steel sheets not lighter than 16 U.S. gage and shall conform to the requirements of ASTM designation A 254-52T, Grade B, specifications for "Heavy Gage Structural Quality Flat Hot Rolled Carbon Steel Open Hearth" or any subsequent amendments thereto, and ASTM designation: A242-52T, specifications for "Low-Alloy Structural Steel" or any subsequent amendments thereto, either open hearth or bessemer sheets having physical and chemical qualities equivalent to those mentioned may be used. Where the pipes are designed for special conditions or for high operating pressures, the cylinders may be made from hot-rolled sheets of special alloy steel having higher elastic limit and ultimate strength than those specified. In such case the sheets shall be of good welding quality and shall conform to the steel manufacturer's published specifications for the special grade of steel being supplied. Each completed cylinder with joint rings welded to it shall be subjected to a hydrostatic test by closing the ends at the joint rings, filling with water in contact at all points with welds, and raising the water pressure to stress the cylinder to a fibre stress of 25,000 pounds per square inch. While under pressure test, all welds shall be thoroughly inspected. If any leaks are found, they shall be repaired and the cylinder shall be retested. The finished cylinder with joint rings attached shall be water tight under the required test pressure. Arc welding shall be an approved process and test welds shall be furnished from the work as required.

(J) The high tensile wire used for circumferential reinforcement shall be of high tensile properties either cold drawn of high carbon MB basic, untempered according to the diameter of the pipe and the pressure for which it is designed. The type of wire to be used shall be determined by the manufacturer and shall conform to the appropriate ASTM Specifications as follows:

ASTM DESIGNATION	A 82-34	A 227-47T
Title	Cold-drawn steel wire for concrete reinforcement	Hard-drawn steel spring wire
Min. Ultimate Strength:		
6 GA. U.S.S.	80,000 PSI	192,000 PSI
Min. Elastic Limit:		
6 GA. U.S.S.	64,000 PSI	100,000 PSI

The elastic limit shall be determined by the Johnson Method.

(K) The thickness of sheets for the steel cylinder and the diameter of wire used, as well as the centerline spacing at which it is placed and the tension under which it is wound around the lined cylinder shall be such that the zero compression pressure be at least 50 pounds plus 1-1/4 times the static pressure. The maximum centerline spacing of the wire shall not exceed one inch and the wire shall not be lighter than 6 gauge U.S.S. The lined cylinder shall not be wrapped with wire until at least 6 days after placing of the concrete.

(L) Steel of special section of spigot joint rings shall conform to ASTM designation: A 31-52T, Grade A, specifications for "Boiler Rivet Steel and Rivets".

(M) Steel of flat section for bell rings shall conform to ASTM designation: A 245-44T, Grade B, specification for "Light Gage Structural Quality Flat Hot-Rolled Carbon Steel" or A 283-46T, Grade A, specification for "Structural Quality Low and Intermediate Tensile Strength Carbon Steel Plates", or any subsequent amendments thereto.

(N) Fittings or specials shall be furnished and installed as shown on the drawings for concrete cylinder pipe or as required and all include specials with bell end, spigot end, flanged end, and victaulic end outlets, with access manholes, air cocks, pitometer, and drain connections, anchor rings, bends, test heads, closure pieces, bevel and pipe, joint harness, etc. The Contractor shall submit to the Engineer detailed designs and shall receive his approval before the construction of any such specials. The zinc coated joint rings shall meet the requirements of one of the following ASTM Specifications: 3/4" bell rings A 303-52T, Grade A; 1" and 3/8" bell rings less than 6" in width: A 31-52T, Grade A; all spigot rings A 31-52T, Grade A.

(O) Special pieces, such as tees, wyes, or branch openings, shall also be of cylinder construction. In all cases, the reinforcement shall adequately compensate for the openings in the pipe wall. If the special piece is prestressed, then the area of the steel in the cylinder and cage, in addition to the compensating reinforcement previously mentioned, shall be not less than that for the adjoining prestressed straight pipe. If the special piece is not prestressed, then the additional area of the steel in such cylinder and cage shall be not less than that for the adjoining straight pipe if such straight pipe were designed as concrete cylinder pipe.

(P) The openings in the special may be formed by steel rings or castings of suitable design securely welded to the cylinder and reinforcing cage. All bends and special pieces shall be provided with joint rings corresponding to those in the straight pipe.

(Q) All vertical bends, where the deflections is 15° or greater, flanged pipe between the vertical bends, and all concrete cylinder pipe reducers shall be constructed of steel cylinders of 3/8" thickness plate and shall have the same longitudinal and circumferential steel in the cage as the adjoining straight pipe would have, if such straight pipe were designed as concrete cylinder pipe.

(R) Cast steel saddles and forgings or the equivalent in fabricated steel plates shall be welded to the steel cylinder for manhole and pipe connections and for drain, pitometer, and air cock connections, and shall be drilled and tapped and provided with malleable iron plugs.

(S) Unless otherwise shown or required, the ends of each pipe for typical field joints shall be formed by zinc coated steel joint rings securely welded to the steel cylinders, with the ring forming the bell end covered on the exterior surface with reinforced concrete and the ring forming the spigot end lined on its inner surface with concrete. The spigot ring shall have a substantial groove on its outer surface for the purpose of receiving, holding and protecting the gasket. The joints shall be self-centering and the rings forming the joints shall be of such shape and dimensions that the pipe shall center themselves without the aid of the rubber gasket. The welding of the joint rings to the cylinder pipe shall consist of at least one full continuous weld for pipe sections that are properly tested hydraulically for strength and water tightness. For pipe sections that have to be cut to be fitted up to make bends, such construction shall have double continuous welds. Likewise, any special construction, such as for outlets or for pipes having special ends, shall have double continuous welds.

(T) The gasket sealing the joint shall be of special composition rubber having a texture to secure a permanently watertight seal. The type of gasket shall have been in satisfactory use in comparable installations for not less than five (5) years.

(U) Access construction manholes in addition to those shown on the drawings shall be located as required to provide easy access for field welding and placing of mortar as required for field joints.

(V) Testing bulkheads shall be furnished and installed for testing any completed sections of the prestressed concrete cylinder pipe mains as may be required.

(W) All steel for castings shall conform to the specifications for grade 70-36 steel castings, as given in the "Standard Specifications for Mild-to-Medium Strength Carbon-Steel Castings for General Industrial Use, ASTM designation: A 27-52T".

(X) All steel forgings shall conform to "Standard Specifications for Carbon-Steel Forgings, ASTM designation: A 235-52T".

(Y) All forged or rolled steel pipe flanges shall conform to the "Standard Specifications for Forged or Rolled Steel Pipe Flanges for General Service, ASTM designation: A 181-49, Grade 1".

(Z) All structural steel including angles for anchor rings shall conform to "Tentative Specifications for Steel for Bridges and Buildings, ASTM designation: A 7-52T".

APPROVED  
DATE FEB. 4, 1965

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DIRECTOR OF PUBLIC UTILITIES  
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COMMISSIONER OF WATER AND HEAT  
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**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO  
SUBJECT WATER WORK NOTES FOR MEDINA-JENNINGS INTERCHANGE IN CLEVELAND, OHIO

MADE ECE DATE 11-6-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
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HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY      CLEVELAND      NEW YORK

FED. RD. DIVISION	STATE	PROJECT	
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# WATERWORK NOTES

(AA) All cast iron pipe and fittings shall conform to these specifications.  
(BB) All wrought iron used shall conform to "Standard Specifications for Rolled Wrought Iron Shapes and Bars, ASTM designation: A 207-39," And all subsequent amendments thereto.

(CC) Iron castings must be smooth and free from blowholes and other defects and the material shall conform to "Standard Specifications for Gray Iron Castings, ASTM designation: A 48-48, Class No. 30", and all subsequent amendments thereto.

(DD) Closure pieces with dresser coupling joints with stops removed, shall be provided as are necessary for the proper construction of the water mains. Measurements for length of closure pieces will be made in the field by the Contractor after adjacent pipe sections are in place in the trench.

(EE) Tests, inspection, reports and analyses of tests of samples for all materials shall be furnished in accordance with previous instructions in these notes.

## MARKING

Each pipe and special shall have conspicuously painted in black on the inside, a serial number for the purpose of identification. Serial numbers shall agree with lists to be furnished to the Engineer. The top center line of all special fittings and each pipe that has a beveled end shall have a white ring painted in the shop around the mark both on the inside and outside of the pipe.

## TYPICAL FIELD JOINTS FOR CONCRETE PIPE

The Contractor shall make all typical field joints and welded tied joints marked "X", "Y", and "Z" as shown on the contract drawings or as required and as specified in the section of these notes titled laying pipe and shall properly make all field welds for the above tied joints. The annular recesses at the joint, both inside and outside of the pipe, shall be filled with cement mortar mixed in a proportion of not less than one part of cement and two parts of sand.

## FLANGED JOINTS

(A) Flanged joints shall be installed as shown on the drawings. Flanges shall be either cast steel, forged or rolled steel, or properly welded and machine fabricated steel plates, welded to pipe with two continuous welds. They shall have plain faces and shall be faced true and smooth at right angles to the axis of the pipe and shall be spot faced on the back. Drilling shall conform to "American 1928 Standard".

(B) All bolts used in the finished work for flanges and tied joints for concrete pipe shall be of medium open hearth steel. The ends of all bolts must be finished to standard radius in acceptable manner. All screw threads shall be American Standard Course Thread (N.C.). Stud bolts double end (rod) shall be used to make the flanged joints on pipe. All nuts shall be hexagonal, cold pressed semi-finished and made of medium open hearth steel. All dimensions to be according to American Standard Heavy. Bolts and nuts shall be delivered to the field free from grease, rust and dirt and shall be properly protected from moisture and dirt in the field. Gaskets for flanged pipe shall be 5X manila rope pattern or other approved type.

(C) In place of flanged joints, on concrete pipe between vertical bends on tied distances, and elsewhere as shown on the drawings, the use of butt welded joints will be permitted, unless specifically prohibited on the drawings. The steel cylinder shall be reinforced having a thickness of not less than that called for in detail Z. The ends of the steel cylinders shall be beveled. The weld material and the welding procedure shall conform to the AWWA C-206-50 "Tentative Standard Specifications for Field Welding of Steel Water Pipe Joints" and any subsequent amendments thereto. The annular recesses at the joint, both inside and outside of the pipe shall be protected against corrosion by an approved method. All exposed steel surfaces, both inside and outside of the pipe, shall be coated in accordance with the coating requirements of these specifications.

## VICTAULIC TYPE COUPLINGS

(A) Where shown on the drawings or where required, the Contractor shall furnish and install victaulic type couplings for connection of line valves to prestressed concrete cylinder pipe reducers. The couplings shall be adapted for installation on shouldered end cast iron spacers. Reducers and fittings are designed for not less than the working pressure noted on the contract drawings. Couplings shall be composed of malleable iron housings held together with steel bolts, heat treated and with a continuous hollow, molded rubber sealing ring, of such type that the seal becomes tight as the pressure within the pipe increases. The joints shall be constructed and installed and be equal in all respects to those manufactured by the Victaulic Company of America. Malleable housings shall conform to the "Standard Specifications for Malleable Iron Castings, ASTM designation: A 47-48". Bolts shall be manufactured by the coupling manufacturer and shall be heat treated steel bolts having 100,000 PSI. Tensile strength.

(B) All metal parts of the couplings shall be coated at the shop with one coat of bituminous primer furnished by the same manufacturer who furnished the coatings as specified under "Coating".

## SHOP COATING AND PAINTING

(A) The exposed surface of the steel ends of spigot, bell, victaulic or flanged steel outlet connections and the flanged ends of concrete pipe, etc., shall be cleaned, primed, and enameled inside and outside in accordance with the AWWA Specifications C 203-51 and C 204-51. The enamel shall be Type A. The coating may be applied by brush or spray. All coatings shall be applied in the shop before shipment. The outside coating shall stop against the flanges at ends of pipe sections.

(B) Zinc coated pipe ends for rubber gasket joints are not to be coated.

(C) No primer or coating is required for the grooved steel bands at the ends of the concrete cylinder pipe to receive victaulic type couplings.

(D) All finished surfaces shall be coated with white lead and tallow or equal and not primed.

(E) After erection all exposed or damaged coatings on surfaces buried under ground, all bolts on flanges and victaulic couplings shall be cleaned and painted with three field coats of inertol 50 or bitumastic 50 or equivalent.

## TRANSPORTATION AND DELIVERY

(A) The Contractor shall transport, deliver and distribute along the line of the work, the pipe, specials and appurtenances.

(B) Pipe shall be loaded for shipment upon suitable cars or trucks which shall be provided with wooden skids. In loading and unloading the pipe, more than ordinary care must be taken to prevent any injury to the concrete cylinder pipe, steel and pipe ends and protuberant steel connections. Such work must be done slowly with the pipe at all times under perfect control, and under no condition shall the pipe be dropped.

(C) In distributing the pipe in the field, each pipe must be placed as nearly as possible to the point where it is to be laid, and facing in the proper direction. Suitable skids or blocks must also be left under each pipe, and the pipe securely wedged in place to prevent its being moved until required. A steel cable sling shall be used for rolling or lifting pipe. No iron chains shall be used. Pipe which has been improperly distributed and which must be moved longitudinally along the trench shall be reloaded on a wagon, or lifted and swung by a derrick or moved by such means as may be satisfactory to the Director.

(D) If, in the process of manufacture, transportation, or handling, any concrete pipe or special receives any indentation or deformation to the concrete, steel ends or connections, the removal of which will in any degree injure it, such pipe or special shall be rejected and replaced at the Contractor's expense.

(E) Pipe which is placed in storage, streets or drives must be so arranged as not to cause undue inconvenience to traffic and must be protected sufficiently to prevent injury to the concrete cylinder pipe, and the coating of the steel ends and connections.

## MATERIALS DATA WITH PROPOSAL

Each bidder shall submit with his proposal, and in the form provided, the information called for below:

- Name of pipe manufacturer and location of plant.
- Name of coupling manufacturer and location of plant.
- Pipe coating and lining data.

## DRAWINGS

(A) The Contractor shall submit to the Director for approval, duplicate prints of all shop drawings for concrete pipe, fittings, and specials, and miscellaneous details, such as air cock and drain forgings, castings, etc.

(B) The Contractor shall also furnish an assembly plan for the entire length of the pipe line for which concrete pipe is furnished under the appropriate items. This assembly plan shall also show the correct location of all fittings furnished.

(C) One print of each of the drawings submitted will be returned with the criticisms or approval of the Director. In case the drawings are not approved, the Contractor shall again send for approval duplicate revised prints of the drawings to take care of the criticisms noted, and after the drawings have been finally approved, the Contractor shall again furnish to the Director ten additional prints, eight (8) on paper and two (2) on cloth, of each drawing. No work shall be done in the shop until after the drawings have been finally approved.

(D) The approval of the drawings by the Director shall not relieve the Contractor of any of his obligations in connection with this contract.

## EXPERIENCE QUALIFICATIONS

All bidders will be required to show to the satisfaction of the Director that the type and size of pipe and fittings he proposes to furnish, will be made by a manufacturer whose pipe has been successfully used for like work outside of the builder's works for a period of not less than five (5) years.

## MEASUREMENT

The number of linear feet of water main to be paid for under prestressed concrete cylinder pipe shall be the actual number of linear feet furnished and placed in accordance with these specifications as measured along the axis of the main, including fittings and valves connected up in place.

## PAYMENT

(A) The unit price stipulated to be paid for each linear foot of water main shall include the furnishing, laying, painting and inspection and testing of prestressed concrete pipe, concrete cylinder fittings, cast iron pipe and fittings, victaulic and dresser couplings, the excavation, sheeting and shoring, backfilling, sand backfilling, seeding and sodding, sidewalk replacement, and the temporary and permanent repaving for the above main and for service connection changes by the City Water Department, and the furnishing of all labor, materials, tools, appliances, and equipment to complete the work as specified or shown.

## EXTRA CONCRETE PRESSURE PIPE FITTINGS

### WORK INCLUDED

(A) The Contractor shall furnish all the materials for and shall properly install all the concrete pressure pipe fittings of the various sizes specified which are not shown on the contract drawings or on approved shop drawings and which are ordered installed by the Director in order to change line or grade to avoid obstacles previously unknown, or to meet other field conditions, and any outlet connections for drains, air cocks or other use which may be required due to field conditions, and including all extra excavation, sheeting, shoring, backfilling, sand backfill, seeding, sodding and temporary and permanent repaving required therefor for the proper completion of the work under this contract.

(B) In general, the work of this item shall include bevels, half bevels, adapters, elbows, tangential outlet pieces, and pipes with small outlets (with or without tied joints) which were not shown on approved shop drawings and which are ordered installed by the Director.

(C) The provisions of this item shall not relieve the Contractor of his responsibilities to investigate existing facilities as indicated under notes and specifications, nor to use less than normal diligence in excavating or laying pipe to anticipate possible difficulties.

## CONCRETE PRESSURE PIPE FITTINGS

All fittings to be furnished and installed under this item shall be manufactured and installed in full conformance with the requirements of item "Prestressed Concrete Cylinder Pipe" of these specifications. Joints, marking, shop coating, painting, testing and chlorinating shall conform to the requirements of item "Prestressed Concrete Cylinder Pipe", and drawings shall be submitted and approved as required therein.

## PAYMENT

(A) The unit price stipulated per each for the various sizes of extra concrete pressure pipe fittings shall be in full compensation for the furnishing and installing of such extra fittings as are ordered by the Director and which are not shown on the contract drawings or approved shop drawings, and shall include any extra excavation, sheeting, shoring, backfilling, sand backfill, seeding, sodding, and temporary and permanent repaving required therefor, and the furnishing of all labor, materials, tools, and appliances necessary to complete the work as specified or as shown.

(B) No deduction will be made in the lengths of pipe and fittings to be paid for under item "Prestressed Concrete Cylinder Pipe", where extra fittings are ordered to be installed and, likewise, no payment will be made for extra fittings which are installed for the convenience of the Contractor without specific orders from the Director.

APPROVED

DATE FEB. 4, 1965

*William J. Sweeney*  
DIRECTOR OF PUBLIC UTILITIES  
*J. P. Connor*  
COMMISSIONER OF WATER AND HEAT  
*William J. Sweeney*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*William J. Sweeney*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William J. Sweeney*  
ENGINEER OF DESIGN

## LOW SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT WATER WORK NOTES FOR MEDINA-JENNINGS INTERCHANGE IN CLEVELAND, OHIO

MADE ECE DATE 11-6-64 TRACED DATE  
CHECKED DATE SCALE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

# WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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**CUYAHOGA COUNTY**  
CUY-71-17.83  
CUY-176-12.76

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## BRANCH SLEEVE AND VALVES

### WORK INCLUDED

(A) The Contractor shall furnish the branch sleeve and valves for the locations shown on the drawings or on working drawings furnished by the Engineer or as directed of the sizes shown or required for the proper completion of the work included under this contract.

(B) In general, the work of this item contemplates the furnishing and delivery of the material to the proper location on the job. The City of Cleveland, Division of Water, will install the branch sleeves and valves, but the Contractor shall do all the necessary excavation and backfilling required therefor and repaving if so noted on the contract drawings and pay for the work in accordance with specified schedule. Where branch sleeve and valve is to be installed and tap made in prestressed concrete cylinder pipe, the Contractor shall arrange for the work with the pipe fabricator or valve supplier. The work shall be performed under the supervision of the Division of Water and Heat.

### QUALITY OF VALVES

The branch sleeve and valves shall be A. P. Smith Manufacturing Company or approved equal. All sleeves shall be of the class and size as shown or as directed and shall conform for materials, tests, painting, drawings, etc., to the requirements of the item cast iron pipes and fittings, of these specifications, insofar as they apply. The valves furnished and used under this item shall comply with the requirements of the item valves of this contract, whenever the same may be pertinent. The provisions of the sections (U), (V), and (W) of the item on valves pertaining to grease cases shall apply to the branch sleeves and valves.

### PAYMENT

The unit price stipulated for each branch sleeve and valve furnished under this item shall include the furnishing and delivery to the proper location, and shall include all excavation, sheeting and shoring, backfilling, sand backfilling, seeding and sodding and repaving, if so noted on the contract drawings, and the furnishing of all labor, materials, tools and appliances necessary to complete the work as specified or as shown.

### VALVE BOXES

Materials and specifications shall conform to State of Ohio Specification I-8.

### INSERTING VALVES

The inserting valves to be installed shall be A. P. Smith Manufacturing Company or approved equal. It shall be installed in the line by a machine and operators approved by the City. Complete shop drawings and procedures to be followed shall be approved by the City before proceeding with the work.

## BRICK AND PLAIN CONCRETE MASONRY

Under these items the Contractor shall furnish all necessary labor, materials, tools and equipment for the construction, complete, of all miscellaneous masonry structures and including all water main drain and pitometer vaults, access and anchorage manholes, valve chambers, sewer manholes, catch basins, anchors, piers at pipe bends and under line valves, floors for drain and valve vaults, and other appurtenant work together with the hauling, mixing, placing, forms, scaffolding, sheeting and bracing, grouting, plastering, curing, etc., all as specified, required or shown on the contract drawings.

### BRICK AND MASONRY MATERIAL

(A) The material furnished by the Contractor for the various kinds of masonry construction to be constructed shall conform to the following specifications:

(B) All brick furnished and used shall be No. 2 shale brick and shall comply with the requirements for "Grades A" ASTM designation: C 32-42.

(C) Section M-13 Portland Cement (ASTM C-150, Type I). Portland cement shall conform to the requirements for "Type I" of the specifications for portland cement, ASTM designation C 150.

The compressive strength requirements shall govern.

### (PACKAGING AND MARKING)

When the cement is delivered in packages, the name and brand of the manufacturer shall be plainly indicated thereon. Similar information shall be provided in the shipping advices accompanying the shipment of packaged or bulk cement. A bag shall contain 94 pounds net. A barrel shall consist of 376 pounds net. All packages shall be in good condition at the time of inspection.

### (D) Section M-2.1 - SAND

1. General. The sand shall be natural composed of clean, hard, durable, uncoated particles of stone, well graded from coarse to fine, with the coarse particles predominating, free from lumps of clay and all organic matter.

2. Grading. (U. S. Standard Sieve Series). The sand shall be well graded from coarse to fine and when tested by means of laboratory sieves shall conform to the following grading:

SIEVE NO.	TOTAL PER CENT PASSING
3/8"	100
No. 4	95-100
No. 8	70-95
No. 16	45-80
No. 30	25-60
No. 50	10-30
No. 100	1-10

### (E) Section M-3.5 - CRUSHED ROCK AND SLAG

1. General. The crushed rock and slag shall be clean, sound, and durable, or uniform quality, and free from thin, elongated or brittle pieces. If produced by crushing gravel only that portion which has been retained on a screen with 2-inch or larger square openings shall be used and the largest size limited to No. 4.

The aggregate may include crushed limestone, crushed boulders, composed of limestone, granite trap rock or rock of similar nature, or crushed slag. Aggregate furnished under this section is subject to the maximum percentage limitations of deleterious substances specified under Section M-3.1 in case of limestone; under Section M-3.6 in case of slag; and Section M-3.91 in case of gravel.

### (F) Section M-3.6 - SLAG

1. General. The broken slag shall be composed of air-cooled blast furnace slag and shall be clean, sound, durable, reasonably uniform in density and free from an excess of thin, or elongated pieces.

(G) All water shall be clean and accurately measured for each batch of concrete.

(H) All plain concrete shall be mixed in the proportion of one (1) part of cement. Two (2) parts of sand and four (4) parts of coarse aggregate.

(I) All cement mortar shall be mixed in the proportion of one (1) part of cement to three (3) parts of sand, except the mortar for brick catch basins and sewer manholes which shall be 1:2 mix.

### MANHOLE CONSTRUCTION

(A) All brick manholes, brick necks and extensions shall be built in accordance with the contract drawings.

(B) The walls of manholes shall be built of No. 2 shale brick laid in 1:3 portland cement mortar, with brick arranged radially as headers, forming a wall nine (9) inches thick. In deep manholes, the wall shall be 13 inches thick below a point 12 feet from the surface. All of the brick composing said manholes shall be laid in full mortar beds and joints, with no mortar joints appearing on the inner surface of the manhole exceeding three-eighths (3/8") thick.

(C) The top of the walls of manholes shall be properly leveled off with mortar so as to form a flat surface upon which the cast iron manhole ring is to rest, and said manhole shall be carried to proper height as indicated by the contract drawings.

(D) The entire outer surface of all brick manholes shall be plastered with a smooth coating of 1:3 portland cement mortar, at least one-half (1/2) thick.

### PAYMENT

No separate payment will be made for brick or plain concrete masonry. Payment will be included in the unit price bid for the item in which it is used. Payment for concrete piers is to be included in the unit price bid for the pipe.

## MISCELLANEOUS METAL WORK

### WORK INCLUDED

(A) - The Contractor shall furnish and install all miscellaneous metal work which is required for the proper completion of the work included under this contract and is not specifically included under the other items of these specifications.

(B) In general, the work shall include the furnishing and installing of manhole frames and covers, manhole steps, valve boxes, extension stems and brace, structural members, bronze bolts, and other similar items required for the proper completion of the work.

### MATERIALS

All castings shall conform to the requirements of Section O-7.81 of the "Standard Specifications for Construction of Pavements, Sidewalks, and Sewers" or the City of Cleveland dated January, 1950, except that the cast iron shall be Class No. 30. Wrought iron shall meet the requirements of the A.S.T.M. Specifications A 207-39. All structural steel shall meet the requirements of the A.S.T.M. Specifications A 7-46. All bronze bolts and nuts shall conform to U.S. Standard sizes, and shall be clean cut and have well fitted threads. All bronze bolts and nuts shall be of Tabin or Manganese Bronze, or of similar approved materials.

### CLEANING AND TESTING

All castings shall be thoroughly cleaned and subjected to a careful hammer test. No castings shall be coated unless clean and free from rust, and approved in these respects by the Engineer or his authorized inspector immediately before being dipped.

### COATING

Each casting shall be sprayed or brushed inside and out with one coat of asphaltic compound varnish. The varnish shall be made of high grade asphalt fluxed and blended with properly treated drying oils and thinned to a proper consistency with a volatile solvent. The varnish shall be Black Asphalt Varnish as manufactured by the Excelsior Varnish Works, Inc., Cleveland 2, Ohio, Koppers Asphalt Varnish or approved equal. Other methods of coating and types of coating materials shall be subject to the approval of the Engineer, in addition to the shop coat the castings shall receive two (2) coats of approved paint.

### INSPECTION

The Engineer or his authorized assistant, shall have the right to inspect the material and work done, as the interests of the City or State may require. Such inspection shall not relieve the Contractor from any obligation to perform said work strictly in accordance with the specifications, or any modification thereof, as herein provided, and work not so constructed shall be removed and made good by the Contractor, at his own expense. All manhole rings and covers must be sound and shall conform to these specifications, and any defective castings which may have passed the inspector at the works, or elsewhere, shall be at all times liable to rejection when discovered, until the date of final payment under this contract.

### VALVE BOXES AND COVERS

The Contractor shall furnish and install, over each vertically set valve of the locations shown on the drawings, or as required, valve boxes and covers of the types and sizes indicated on the contract plans. These shall be carefully located over the valve nuts, and shall be set plumb and true to elevation as required.

### DETAILED DRAWINGS

Complete detailed drawings of miscellaneous metal work shall be submitted to the Engineer for approval, prior to the manufacture of any work to be furnished under this item, in accordance with these specifications.

### PAINTING

All miscellaneous metal work not galvanized shall be thoroughly cleaned and given three (3) field coats of coal tar pitch equal to Inertol 50 or Bitumastic 50.

### STEPS AND LADDERS

Galvanized wrought iron steps and ladders of the size and shape shown on the contract drawings shall be built into the brick and concrete masonry of the manholes as indicated on the drawings.

### RIMS AND COVERS

(A) All cast iron manhole rims and covers of the forms, dimensions and details shown on the contract drawings shall be furnished and installed as directed.

(B) The rims shall be properly set in place in a full bed of mortar or poured monolithic in the masonry, at such elevation as to make the top of the rim conform to the finished surfaces of the structures or the finished grade as estimated by the Engineer.

### PAYMENT

Payment for miscellaneous metal work will be included in the price bid for the item in which it is used.

APPROVED

DATE FEB. 4, 1965

*William J. Sweeney*  
DIRECTOR OF PUBLIC UTILITIES  
*Howard*  
COMMISSIONER OF WATER AND HEAT  
*J. R. Connor*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William J. Sweeney*  
ENGINEER OF DESIGN

## LOW SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT WATER WORK NOTES FOR MEDINA-  
JENNINGS INTERCHANGE IN  
CLEVELAND, OHIO

MADE BY ECE DATE 11-6-64 TRACED DATE \_\_\_\_\_  
CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE \_\_\_\_\_

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

520  
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CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

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# WATERWORK NOTES

## PAYMENT

### ITEM SPECIAL - SERVICE CONNECTION RELOCATION

The City will furnish the piping material for and make all changes required in the location of existing house connections and meters from the corporation cock to the curb cock, but the Contractor shall do all the necessary excavation, backfilling and repaving required. The City will charge the Contractor for the materials and labor furnished in making these service connections and alterations. Materials to be furnished by the City include piping, corporation cock, curb cock, water meter and vault. Payment for all the above will be made at the contract unit price bid for each for "Service Connection Relocation". The City of Cleveland will charge the Contractor for the following work:

Size of Connection	Connection Only	By-Pass, Gate & Check Valves	Meter Vault	Total
3/4 inch	\$50.00	None	\$110.00	50.00(a)
1 inch	\$75.00	None	\$110.00	75.00(a)

(A) Add \$110.00 if meter vault is required. Charges for extending connections and resetting meters.

Size of Connection	Extending Connection	Reset Meter	Rebuild Vault
3/4" Meter	\$30.00	\$25.00	\$110.00
1" Meter	\$35.00	\$30.00	\$110.00

### ITEM SPECIAL - WATER MAIN

The footage measured as provided above shall be paid for at the contract price bid per linear foot for "Item Special - Water Main" classified as to size and type, which price and payment shall constitute full compensation for excavating and for furnishing, hauling, and placing the pipe, pipe bends, concrete piers, sheeting and bracing, backfill, water used for compaction, incidental concrete, the removal of all surplus excavation and discarded material, repaving, and for all labor, equipment, tools and incidentals necessary to complete this item, except for the items specifically listed as separate pay items.

### ITEM SPECIAL - VALVES

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Valves", classified as to size and type, which price and payment shall constitute full compensation for all excavation and backfill, and for furnishing, hauling, and placing the valves, roadway boxes, connections and other material, and for all labor, equipment, tools and incidentals necessary to complete this item.

### ITEM SPECIAL - 6" FIRE HYDRANTS

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - 6" Fire Hydrants", which price and payment shall constitute full compensation for excavating and for furnishing, hauling and placing the 6" fire hydrants and appurtenances, sheeting and bracing, backfill, water used for compaction, the removal of all surplus excavation, repaving, and for all labor, equipment, tools and incidentals necessary to complete this item.

### ITEM SPECIAL - FIRE HYDRANTS REMOVED

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Fire Hydrants Removed", which price and payment shall constitute full compensation for excavating, removal of fire hydrant and appurtenances, furnishing, hauling and placing plugs, clamps and blocking, sheeting and bracing, backfill, water used for compaction, incidental concrete, the removal of all surplus excavation and discarded material, repaving, and for all labor, equipment, tools and incidentals necessary to complete this item. All materials shall become the property of the Contractor.

### ITEM SPECIAL - FIRE HYDRANTS SALVAGED

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Fire Hydrants Salvaged", which price and payment shall constitute full compensation for excavating, removal of fire hydrant and appurtenances, furnishing, hauling and placing plugs, clamps and blocking, sheeting and bracing, backfill, water used for compaction, incidental concrete, the removal of all surplus excavation and discarded material, repaving, and for all labor, equipment, tools and incidentals necessary to complete this item. Hydrants will remain the property of the City of Cleveland. They shall be stored on the Right of Way and the City of Cleveland Division of Water and Heat (Harvard Yards) shall be advised that they may be removed from the site.

### ITEM SPECIAL - FIRE HYDRANTS RELOCATED

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Fire Hydrants Relocated", which price and payment shall constitute removing and reconnection according to the provisions of these specifications for the particular type of construction called for on the Plans, and for all excavation, backfilling, seeding and sodding and repaving, and the furnishing of all material, labor, equipment, tools and appliances necessary to complete the work as specified or as shown.

### ITEM SPECIAL - SHEETING AND BRACING LEFT IN PLACE

The number of board feet of sheeting and bracing left in place when ordered by the Engineer, shall be paid for at the unit price of eighty dollars (\$80.00) per thousand board feet of "Item Special - Sheeting and Bracing Left in Place", which price and payment shall include full compensation for all labor, equipment, tools and incidentals necessary to complete this item.

### ITEM SPECIAL - FLUSHING CONNECTIONS

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Flushing Connections", whether temporary or left in place, which price and payment shall constitute full compensation for excavating and for furnishing, hauling and placing plugs, clamps, valves, roadway boxes, pressure backing and appurtenances, and for all labor, equipment, tools and incidentals necessary to complete this item.

### ITEM SPECIAL - PIPE CUTS WITH CONNECTIONS TO EXISTING MAINS AND SERVICE CONNECTION RELOCATIONS

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Pipe Cuts With Connections To Existing Mains and "Item Special - Service Connection Relocations", which price and payment shall constitute full compensation for excavating and for furnishing, hauling and placing all material, and for all labor, equipment, tools and incidentals necessary to complete this item.

### ITEM SPECIAL - FIRE LINE VAULT RELOCATED

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Fire Line Vault Relocated", which price and payment shall constitute full compensation for excavating, backfilling, construction of new vault, relocation of manhole frame and cover, removing and resetting valves in new vault and miscellaneous piping. The City of Cleveland will construct the vault, remove and reset valves including miscellaneous piping. The Contractor will pay the City of Cleveland \$820 for this work.

APPROVED

DATE FEB. 4, 1965

*[Signature]*  
DIRECTOR OF PUBLIC UTILITIES

*[Signature]*  
COMMISSIONER OF WATER AND HEAT

*[Signature]*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*[Signature]*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*[Signature]*  
ENGINEER OF DESIGN

## LOW SERVICE DISTRICT

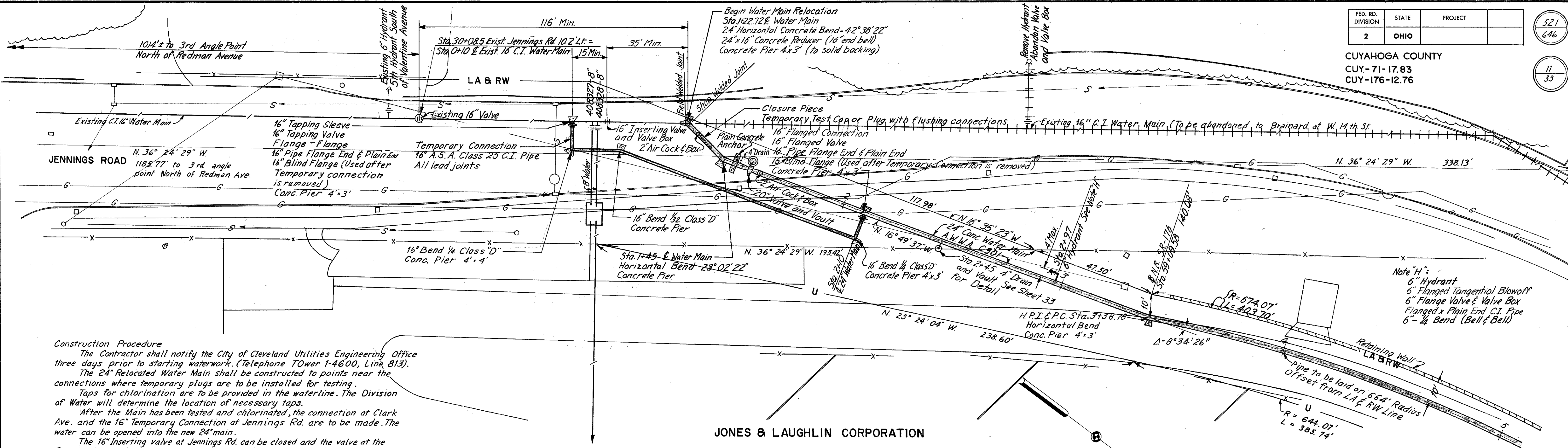
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT WATER WORK NOTES FOR MEDINA - JENNINGS INTERCHANGE IN CLEVELAND, OHIO

MADE ECE DATE 11-6-64 TRACED DATE  
CHECKED DATE SCALE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK





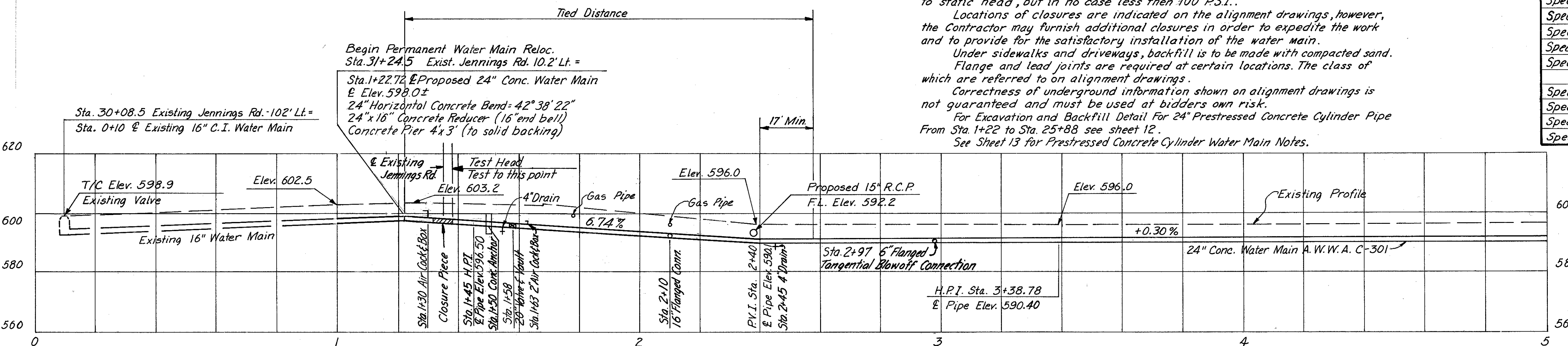
**Construction Procedure**  
 The Contractor shall notify the City of Cleveland Utilities Engineering Office three days prior to starting waterwork. (Telephone Tower 1-4600, Line 813).  
 The 24" Relocated Water Main shall be constructed to points near the connections where temporary plugs are to be installed for testing.  
 Taps for chlorination are to be provided in the waterline. The Division of Water will determine the location of necessary taps.  
 After the Main has been tested and chlorinated, the connection at Clark Ave. and the 16" Temporary Connection at Jennings Rd. are to be made. The water can be opened into the new 24" main.  
 The 16" Inserting valve at Jennings Rd. can be closed and the valve at the Brainard-Jennings W.14th Street intersection can be closed thereby taking the Jennings Rd. 16" C.I. Water main out of Service. Make the permanent connection at Jennings Rd. and remove the Temporary By-pass Connection by closing the 16" Tapping Valve and the 16" Flanged Valve.  
 All paved areas, curb, sidewalk, etc., that fall outside of the limits shown on the pavement detail sheets and have been removed or damaged due to the water relocation work, shall be restored. The cost of such work shall be included in the price bid for the waterwork items.  
 If the proposed 24" water main interferes with existing 6" water mains, or house connections that are to remain in service, the 6" water main and house connections shall be lowered to clear. The cost of such lowering is to be included in the price of the water main relocation items.

To J. & L. Corp.  
 Maintain in Service  
 at all time

JONES & LAUGHLIN CORPORATION

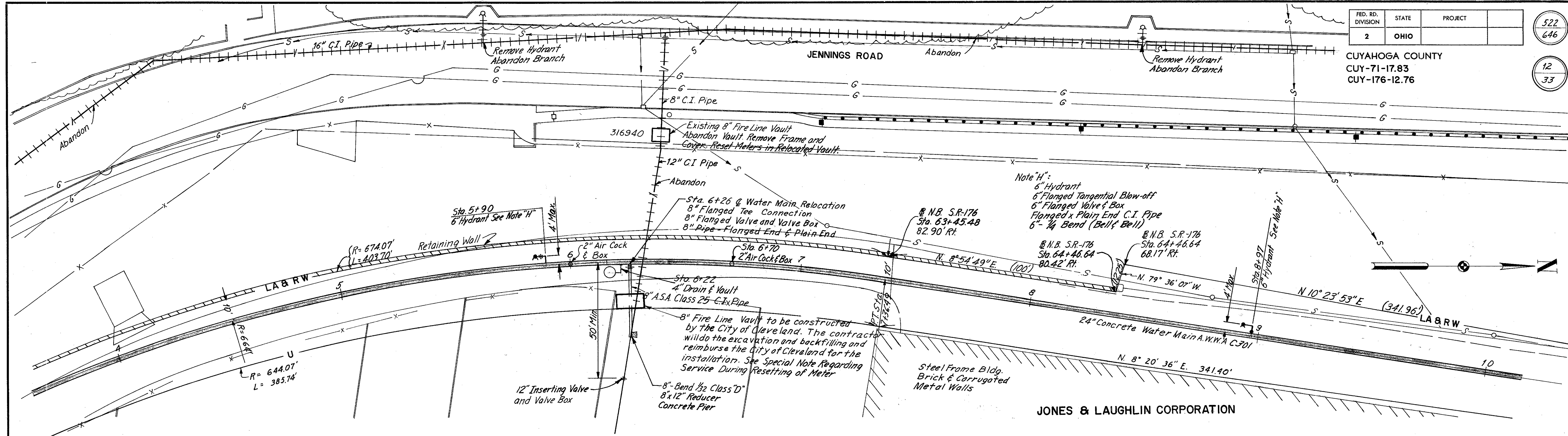
**General Notes**  
 The existing 16" Cast Iron Water Main shall be cut at the location shown. The depth is not known. It shall be the responsibility of the Contractor to locate exactly the depth and supply the Engineer and Pipe Fabricator with the measurements.  
 The pipe line stationing is along horizontal centerlines of pipes and along tangents to P.I. points at horizontal bends.  
 Elevations are based on sea level datum.  
 The pipe fabricator shall follow as closely as possible the points of changes of grade as given on these contract drawings.  
 The static head to be used for both design and testing shall be measured from elevation 803.0. The field testing head shall be 75 P.S.I. plus that due to static head, but in no case less than 100 P.S.I.  
 Locations of closures are indicated on the alignment drawings, however, the Contractor may furnish additional closures in order to expedite the work and to provide for the satisfactory installation of the water main.  
 Under sidewalks and driveways, backfill is to be made with compacted sand.  
 Flange and lead joints are required at certain locations. The class of which are referred to on alignment drawings.  
 Correctness of underground information shown on alignment drawings is not guaranteed and must be used at bidders own risk.  
 For Excavation and Backfill Detail for 24" Prestressed Concrete Cylinder Pipe From Sta. 1+22 to Sta. 25+88 see sheet 12.  
 See Sheet 13 for Prestressed Concrete Cylinder Water Main Notes.

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	24" Prestressed Concrete Cylinder Pipe and Fittings C-301	378 Lin. Ft.
Special	16" Temporary By-Pass Connection complete with Pipe and Fittings	151 Lin. Ft.
Special	20" Valve	1 Each
Special	16" Tapping Sleeve and 16" Tapping Valve	1 Each
Special	16" Inserting Valve and Valve Box	1 Each
Special	Pipe Cuts	2 Each
Special	Test Main	1 Each
Special	Plain Concrete Anchor	1 Each
Special	2" Air Cock and Box Complete	2 Each
Special	Valve Chamber	1 Each
Special	24" Extra Concrete Pressure Pipe Fittings	4 Each
Special	6" Fire Hydrant	1 Each
Special	6" Water Main A.S.A. Class 25 Cast Iron Pipe (Cement Lined, All Lead Joints) and Fittings	6 Lin. Ft.
Special	4" Drain	2 Each
Special	Drain Vault	1 Each
Special	6" Valve and Box	1 Each
Special	16" Flanged Valve	1 Each



APPROVED  
 DATE FEB. 4, 1965  
 J. C. [Signature]  
 DIRECTOR OF PUBLIC UTILITIES  
 COMMISSIONER OF WATER AND HEAT  
 Harold [Signature]  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
 J. P. [Signature]  
 ENGINEER OF CONSTRUCTION AND SURVEYS  
 William J. [Signature]  
 ENGINEER OF DESIGN

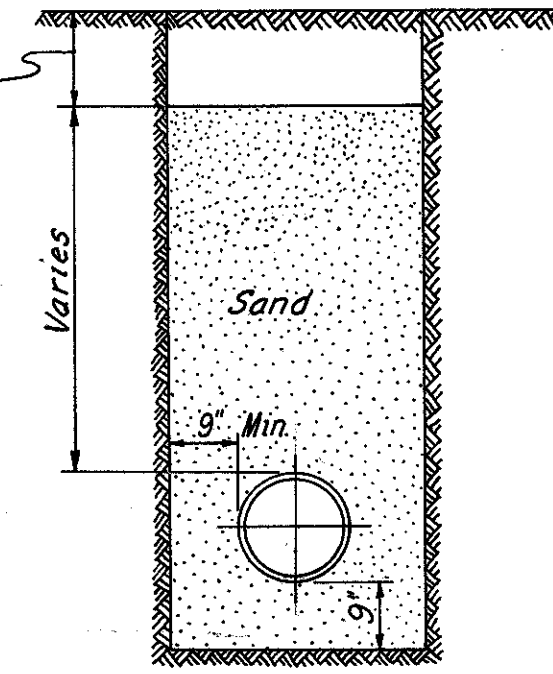
**LOW SERVICE DISTRICT**  
 DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER AND HEAT  
 CLEVELAND, OHIO  
 SUBJECT: 24" Reinforced Concrete Water Main From Jennings Road Near The J.&L. Steel Corp. Entrance To Clark Avenue. **B-1948**



Note: Fire Lines to Jones and Laughlin Corp. The time that the fire line is out of service shall be held to a minimum. No more than one fire line shall be out of service at a time. The existing 12\"/>

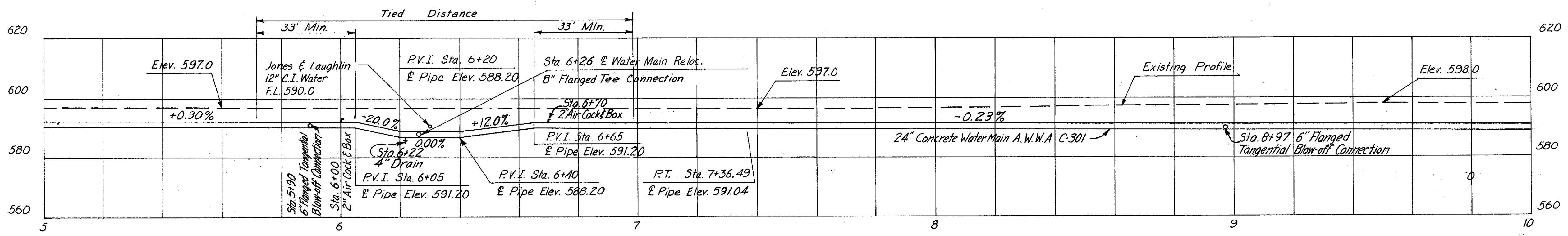
**EXCAVATION AND BACKFILL**  
 From Sta. 1+22 to Sta. 25+88

When the uncovered trench bottom at subgrade is unsuitable or excavated material contains slag, cinders, rubbish and other objectionable material, excavation and backfill shall be as shown. Backfilling with approved material shall be at all locations where water main and appurtenances are installed. Approved material for backfilling as hereon noted shall be sand backfill as specified. Payment for this will be included in price bid under appropriate item for size of water main and appurtenances to be installed.



SAND BACKFILL  
 Scale: 1/2\"/>

Item	Description	Quantity
Special	24\"/>	500 Lin. Ft.
Special	8\"/>	32 Lin. Ft.
Special	8\"/>	1 Each
Special	8\"/>	1 Each
Special	12\"/>	1 Each
Special	2\"/>	2 Each
Special	4\"/>	1 Each
Special	6\"/>	2 Each
Special	6\"/>	12 Lin. Ft.
Special	Drain Vault	1 Each
Special	6\"/>	1 Each



APPROVED  
 DATE FEB. 4, 1965  
 J. J. [Signature]  
 DIRECTOR OF PUBLIC UTILITIES  
 J. S. [Signature]  
 COMMISSIONER OF WATER AND HEAT  
 Arnold [Signature]  
 COMMISSIONER, DIVISION OF UTILITIES ENGINEERING  
 J. P. [Signature]  
 ENGINEER OF CONSTRUCTION AND SURVEYS  
 William J. [Signature]  
 ENGINEER OF DESIGN

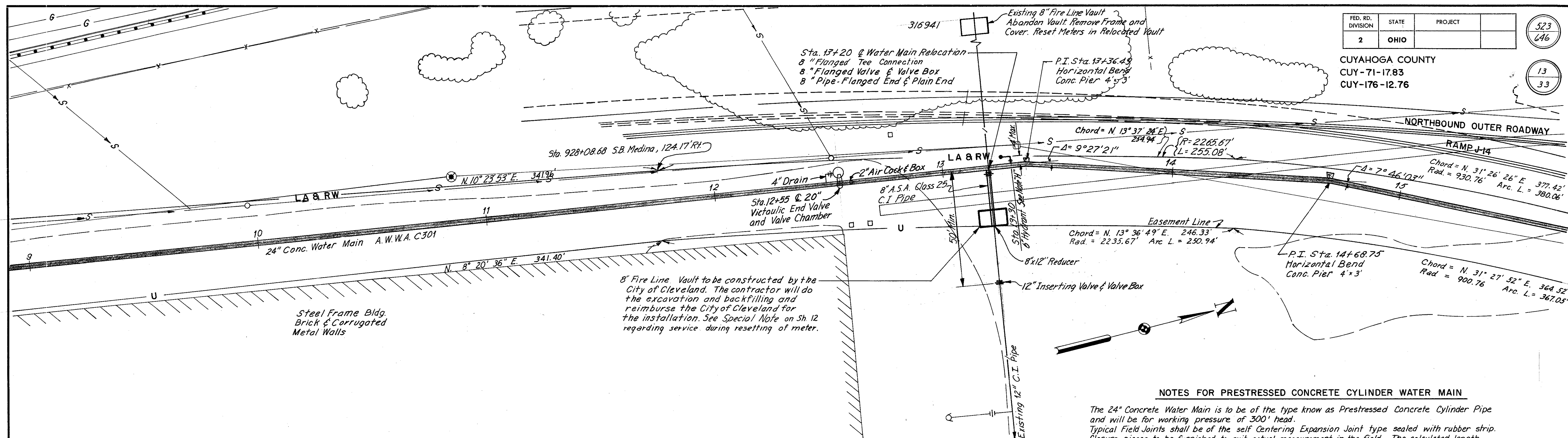
**LOW SERVICE DISTRICT**  
 DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER AND HEAT  
 CLEVELAND, OHIO

SUBJECT: 24\"/>
 Entrance To Clark Avenue. **B-1949**

MADE ECE DATE 11-12-64 TRACED HLD DATE 10-8-64  
 CHECKED DATE SCALE 1\"/>

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

Note: Future Jones and Laughlin Corp. Elev. is 596.00

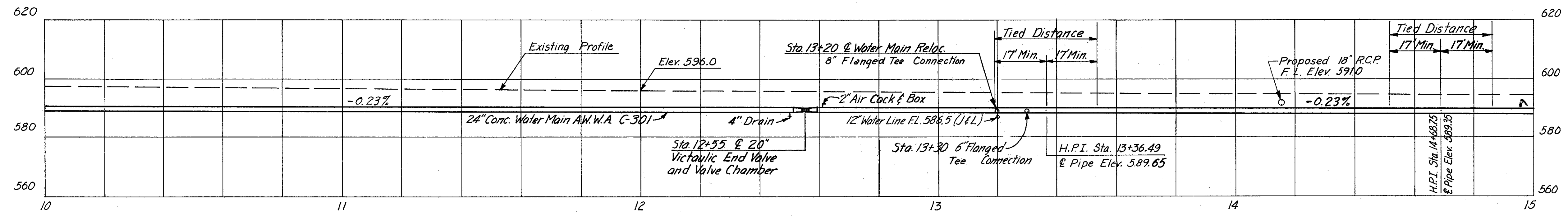


JONES & LAUGHLIN CORPORATION

NOTES FOR PRESTRESSED CONCRETE CYLINDER WATER MAIN

- The 24" Concrete Water Main is to be of the type known as Prestressed Concrete Cylinder Pipe and will be for working pressure of 300' head. Typical Field Joints shall be of the self Centering Expansion Joint type sealed with rubber strip. Closure pieces to be furnished to suit actual measurement in the field. The calculated length shall not be less than 6'-0".
- For concrete details and further description Contract Dwg. No. 30, 31, 33 and 34. Details shall be developed by Fabricator and submitted for approval by Contractor. See Specifications. The detailed specifications for "Prestressed Concrete Cylinder Pipe" shall be modified as follows for the manufacture of pipe only. All other requirements of the detailed specifications shall remain in effect.
- (A) All Prestressed Concrete Pipe to be furnished shall conform to the specifications and shall conform to the latest A.W.W.A. C301-64 "Standard Specifications for Reinforced Concrete Water Pipe - Steel Cylinder Type, Prestressed."
- (B) The thickness of sheets for the steel cylinder and the diameter of wire used as well as the centerline spacing at which it is placed and the tension under which it is wound around the lined cylinder shall be such that the zero compression pressure be at least 50 pounds plus 1/4 times the static pressure. The maximum centerline spacing of the wires shall not exceed one inch and the wire shall not be lighter than #6 gauge U.S.S.
- (C) Identification marks will be required as indicated in the detailed specifications.
- (D) Steel test reports and test specimens will be required as indicated in the details specifications.
- (E) Gaskets shall conform to the detailed specifications requirements. Samples shall be made available for testing as required in the detailed specifications.
- (F) Coating on Joint Rings shall be as specified in the detailed specifications.
- (G) Specials and Fittings shall be conform to the detail specifications.
- (H) Linings and Coatings of structural steel connections shall conform to the detailed specifications.
- (I) Manufacturers design calculations will be required.
- (J) A tabulated schedule will be required.

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	24" Prestressed Concrete Cylinder Pipe & Fittings C-301	500 Lin. Ft.
Special	8" A.S.A. Class 25 C.I. Pipe (Cement Lined) and Fittings	24 Lin. Ft.
Special	8" Flanged Valve and Box, Complete	1 Each
Special	12" Inserting Valve & Valve Box	1 Each
Special	8" Fire Line Vault	1 Each
Special	2" Air Cock & Box	1 Each
Special	4" Drain	1 Each
Special	20" Victaulic End Valve & Valve Chamber	1 Each
Special	6" Fire Hydrant	1 Each
Special	6" Water Main A.S.A. Class 25 (Cement Lined) and Fittings	6 Lin. Ft.
Special	6" Valve and Box	1 Each



APPROVED  
 DATE FEB. 4, 1965  
 J. J. Daniels  
 DIRECTOR OF PUBLIC UTILITIES  
 COMMISSIONER OF WATER AND HEAT  
 Harold W. Miller  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
 J. R. Connor  
 ENGINEER OF CONSTRUCTION AND SURVEYS  
 William J. Sweeney  
 ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**  
 DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER AND HEAT  
 CLEVELAND, OHIO

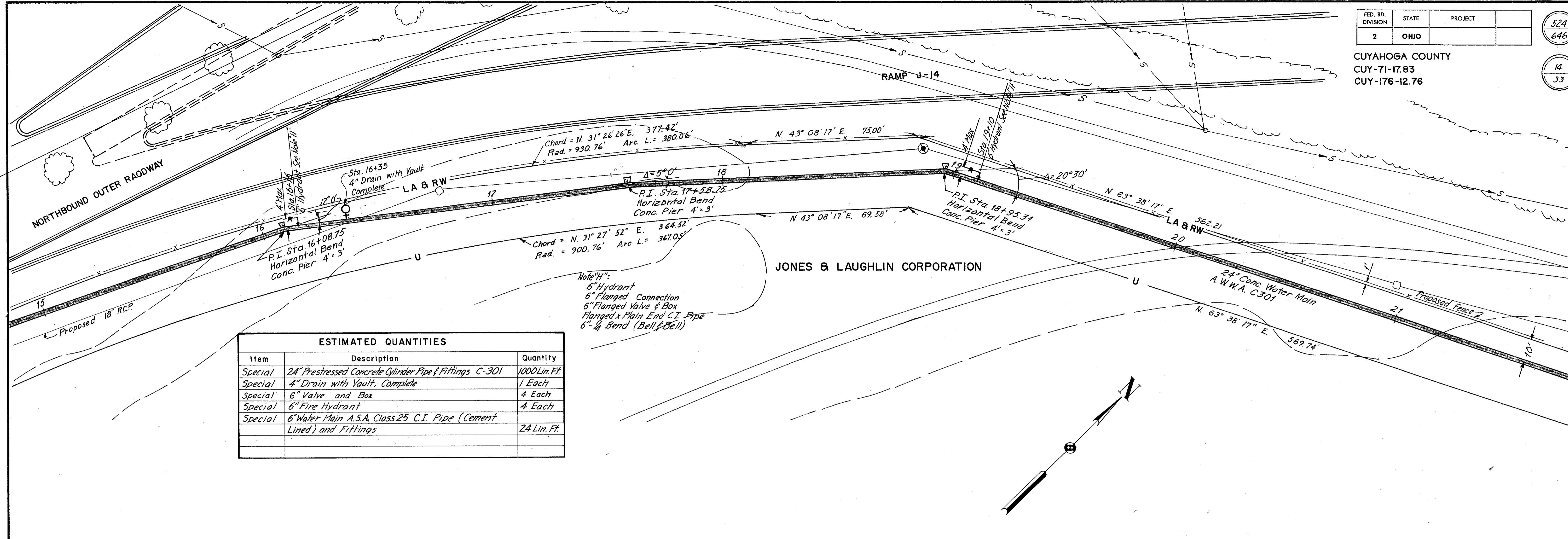
SUBJECT: 24" Reinforced Concrete Water Main From Jennings Road Near The J.&L. Steel Corp. Entrance To Clark Avenue. **B-1950**

MADE E.C.E. DATE 11-12-64 TRACED H.L.D. DATE 10-9-64  
 CHECKED DATE SCALE 1"=20'

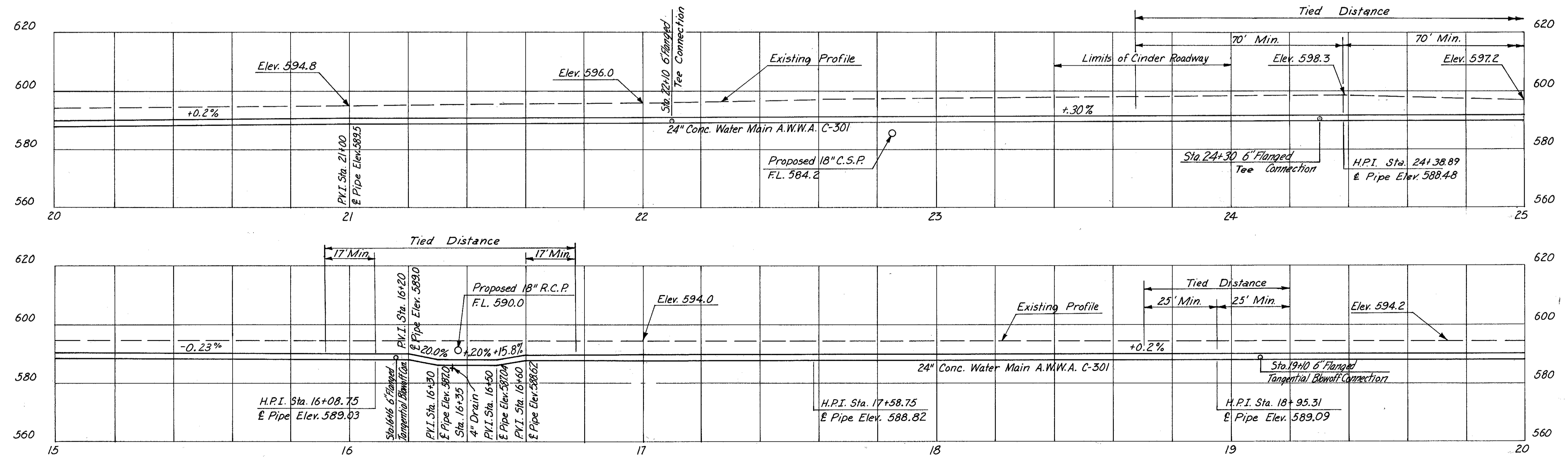
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

Note: 1. Future Jones & Laughlin Corp. Elev. is 596.00.  
 2. For Excavation and Backfill Detail For 24" Prestressed Concrete Cylinder Pipe see sheet 12.

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	24" Prestressed Concrete Cylinder Pipe & Fittings C-301	1000 Lin. Ft.
Special	4" Drain with Vault, Complete	1 Each
Special	6" Valve and Box	4 Each
Special	6" Fire Hydrant	4 Each
Special	6" Water Main A.S.A. Class 25 C.I. Pipe (Cement Lined) and Fittings	24 Lin. Ft.



APPROVED  
DATE FEB. 4, 1965  
DIRECTOR OF PUBLIC UTILITIES  
COMMISSIONER OF WATER AND HEAT  
ENGINEER OF CONSTRUCTION AND SURVEYS  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO  
SUBJECT: 24" Reinforced Concrete Water Main From Jennings Road Near The J.&L. Steel Corp. Entrance To Clark Avenue. **B-1951**

MADE: ECE DATE 11-12-64 TRACED: H1D DATE 10-12-64  
CHECKED: DATE SCALE 1" = 20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

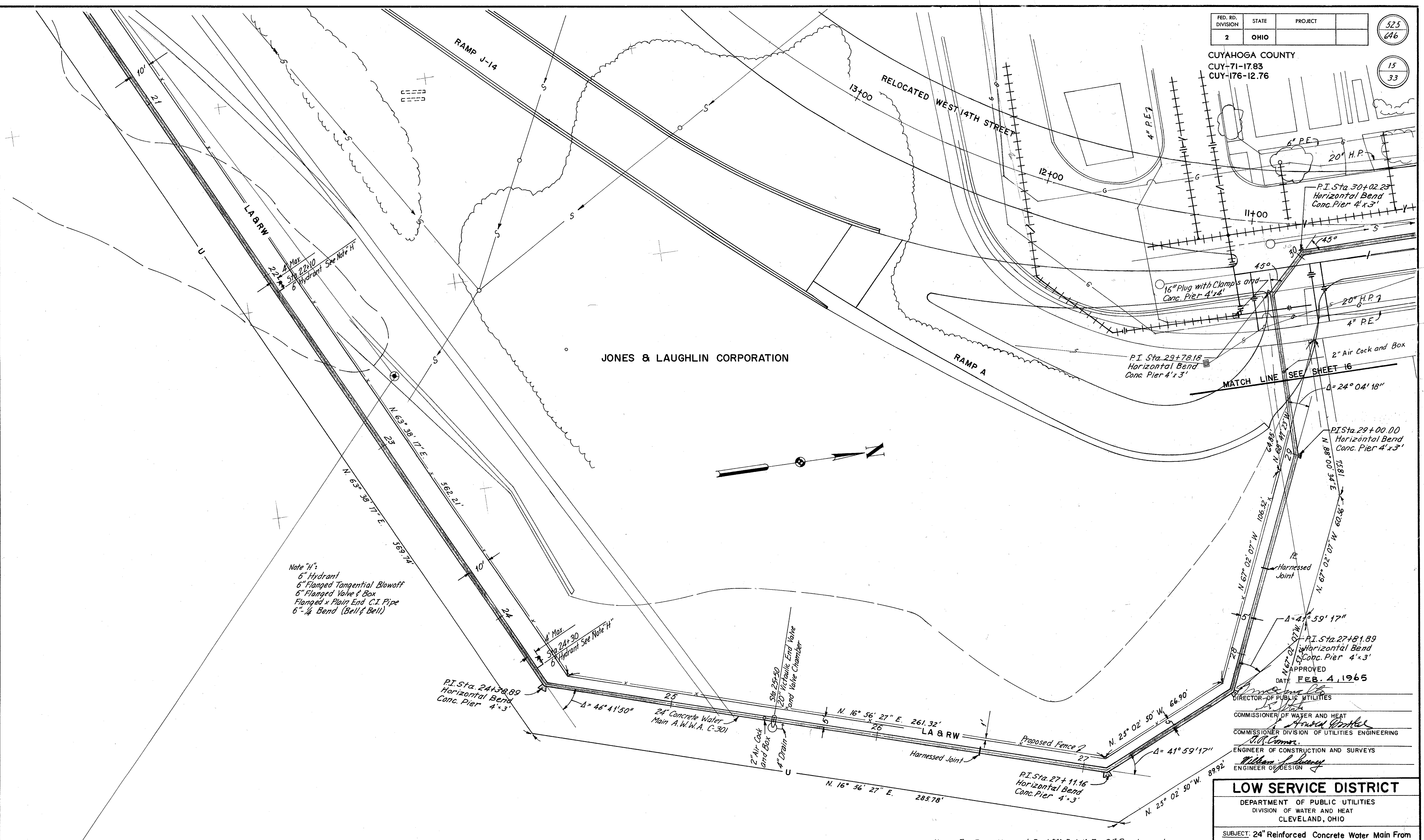
Note: 1. Future Jones & Laughlin Corp. Elev. is 596.00.  
2. For Excavation and Backfill Detail For 24" Prestressed Concrete Cylinder Pipe see sheet 12.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

525  
646

15  
33

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



Note "H":  
6" Hydrant  
6" Flanged Tangential Blowoff  
6" Flanged Valve & Box  
Flanged x Plain End C.I. Pipe  
6" 1/4 Bend (Bell & Bell)

APPROVED  
DATE FEB. 4, 1965  
Director of Public Utilities  
Commissioner of Water and Heat  
Commissioner Division of Utilities Engineering  
Engineer of Construction and Surveys  
Engineer of Design

**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

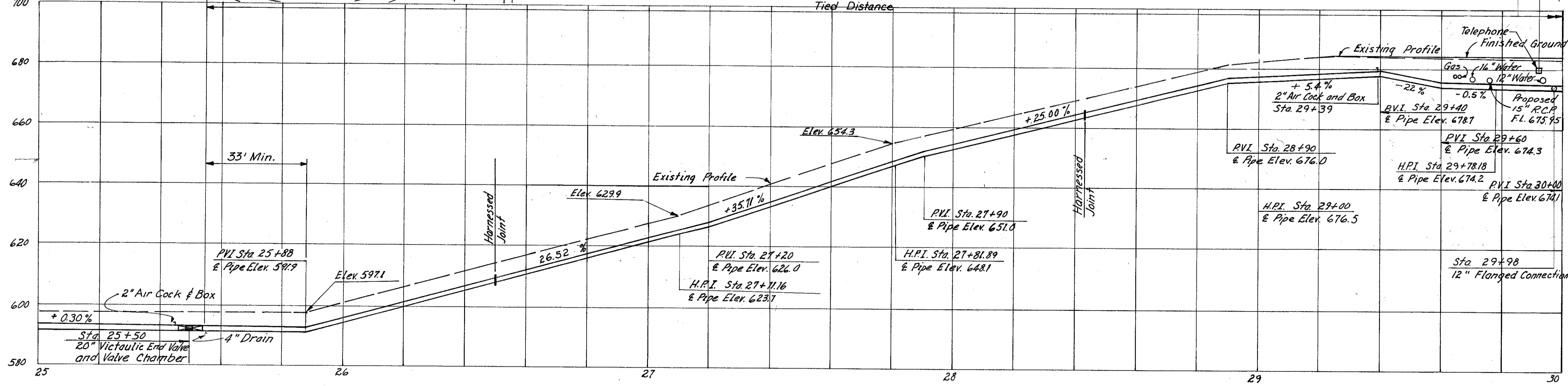
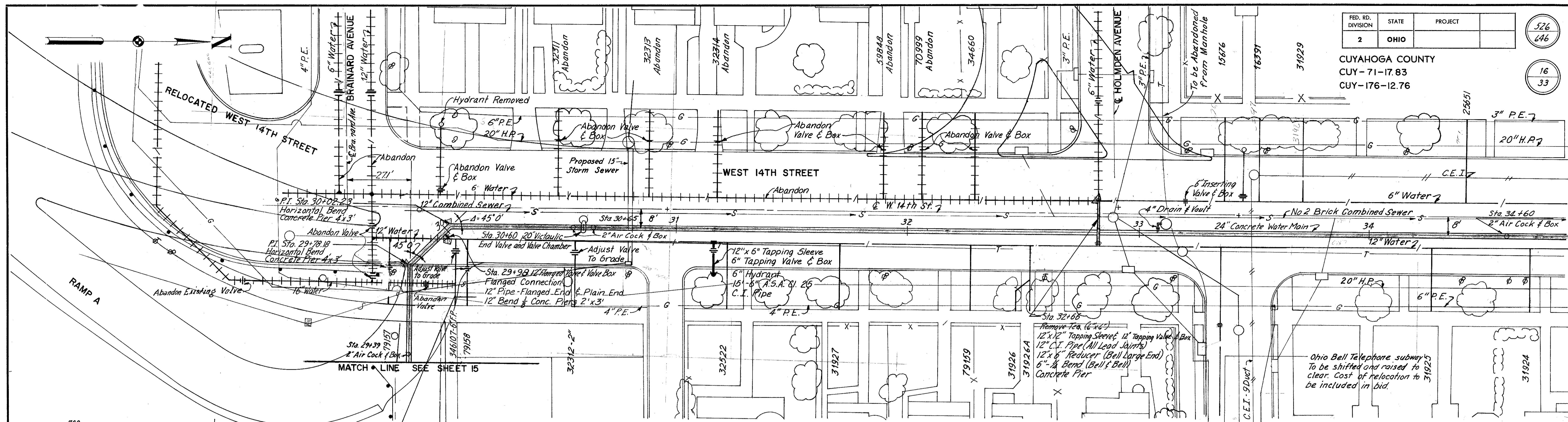
SUBJECT: 24" Reinforced Concrete Water Main From Jennings Road Near The J.&L. Steel Corp. Entrance To Clark Avenue. **B-1952**

MADE ECE DATE 11-13-64 TRACED HLD DATE 10-13-64  
CHECKED DATE SCALE 1"=20'

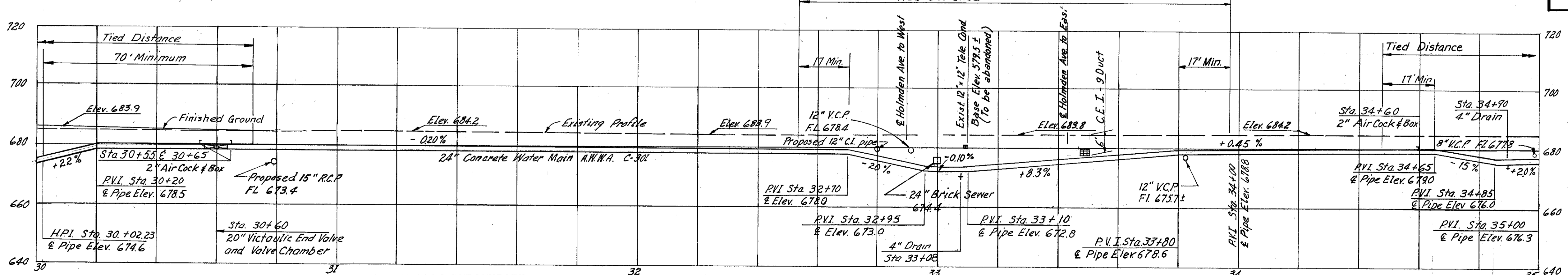
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

Note: For Excavation and Backfill Detail For 24" Prestressed Concrete Cylinder Pipe see sheet 12.

WATER LINE - JENNINGS RD. TO CLARK AVE.



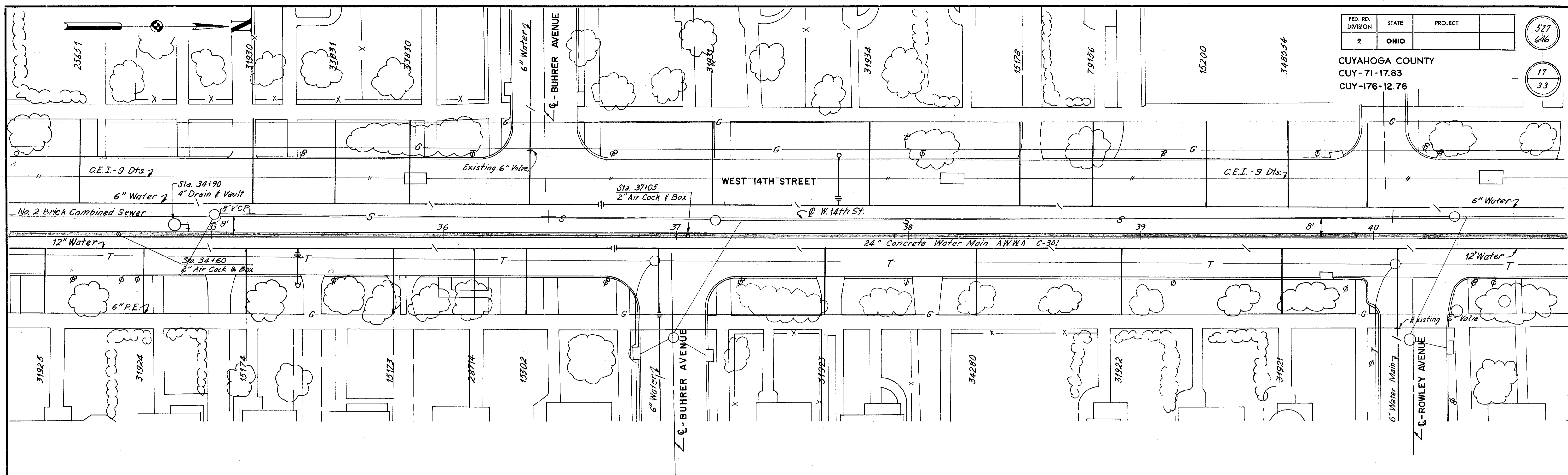
ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	24" Prestressed Conc. Cylinder Pipe and Fitting C-301	1010 L.F.
Special	12" Water Main A.S.A. Class 25 Cast Iron Pipe & Fittings	25 L.F.
Special	12"x12" Tapping Sleeve and 12" Tapping Valve & Box	1 ea.
Special	12" Flanged Valve & Valve Box	1 ea.
Special	12" x 6" Tapping Sleeve and 6" Tapping Valve & Box	1 ea.
Special	6" Water Main A.S.A. Class 25 Cast Iron Pipe & Fittings	15 L.F.
Special	Adjust Valve Box to Grade	3 ea.
Special	Hydrant Removed	1 ea.
Special	Abandon Valve and Box	12 ea.
Special	Pipe Cuts	3 ea.
Special	6" Valve and Box (Inserting)	1 ea.
Special	6" Hydrant	1 ea.
Special	2" Air Cock and Box complete	5 ea.
Special	4" Drain	3 ea.
Special	20" Victaulic End Valve and Valve Chamber	2 ea.
Special	Drain Vault	2 ea.



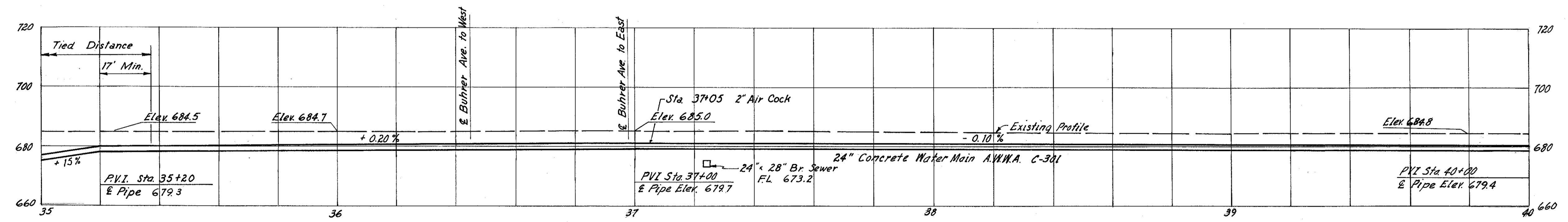
APPROVED  
 DATE FEB. 4, 1965  
 [Signature]  
 DIRECTOR OF PUBLIC UTILITIES  
 COMMISSIONER OF WATER AND HEAT  
 [Signature]  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
 [Signature]  
 ENGINEER OF CONSTRUCTION AND SURVEYS  
 [Signature]  
 ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**  
 DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER AND HEAT  
 CLEVELAND, OHIO

SUBJECT: 24" Reinforced Concrete Water Main From Jennings Road Near The J.L. Steel Corp. Entrance To Clark Avenue. **SM-1786**



ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	24" Prestressed Conc. Cylinder Pipe AWWA. C 301	500 L.F.
Special	2" Air Cock and Box	1 Each



APPROVED  
DATE FEB. 4, 1965

*J. S. Smith*  
DIRECTOR OF PUBLIC UTILITIES

*J. S. Smith*  
COMMISSIONER OF WATER AND HEAT

*Arnold Smith*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*J. P. Smith*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. Sweeney*  
ENGINEER OF DESIGN

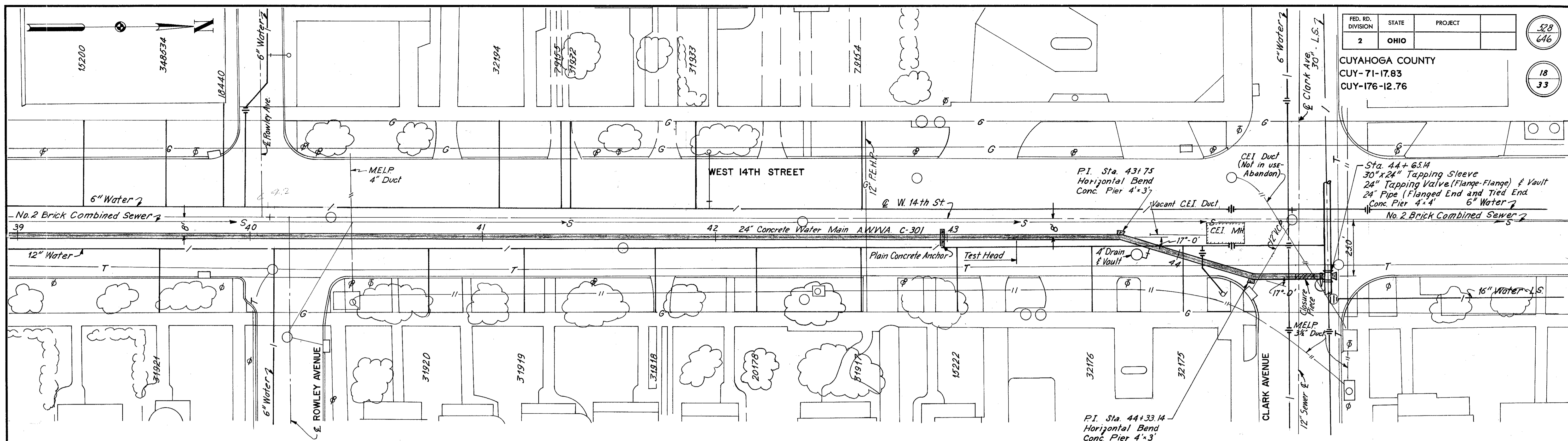
Note: Between Sta. 30+00 ± and Sta. 43+95 ± it may be necessary to remove abandoned street car tracks in W-14th Street in order to excavate for the pipe. It will also be necessary to replace existing pavement in W-14th Street. Cost of removal of street car tracks and replacing pavement in W-14th Street is to be included in the price of 24" Water Main. All salvaged rail becomes the property of the Contractor.

**LOW SERVICE DISTRICT**

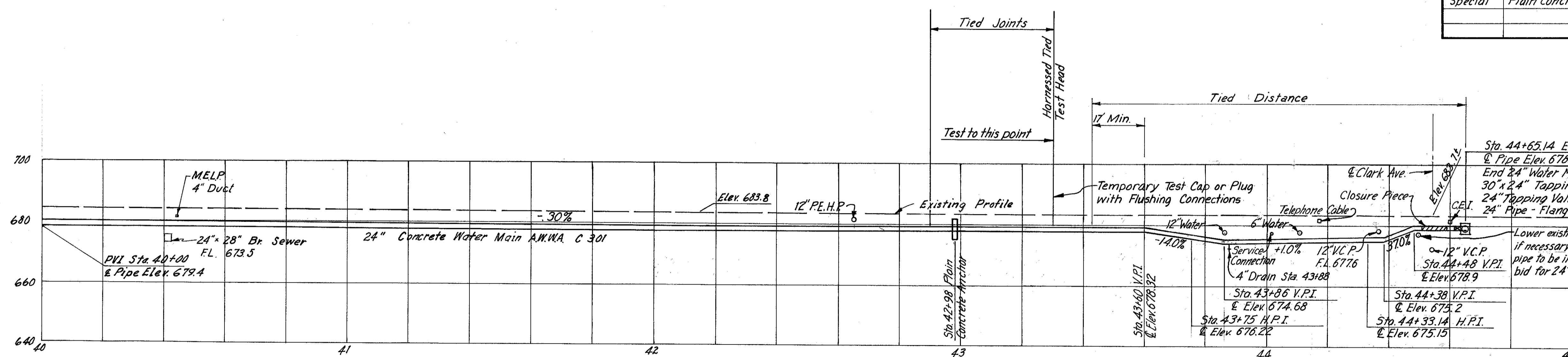
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT: 24" Reinforced Concrete Water Main From Jennings Road Near The J.&L. Steel Corp. Entrance To Clark Avenue.

**SM-1787**



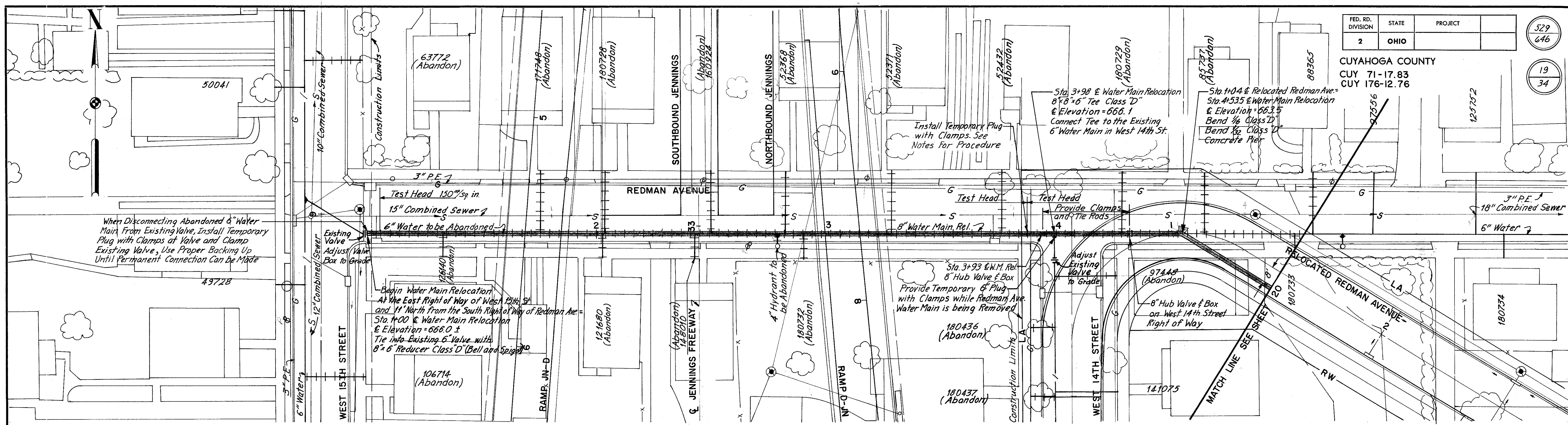
ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	24" Prestressed Concrete Cylinder Pipe & Fittings C 301	466 Lin. Ft.
Special	30"x24" Tapping Sleeve & 24" Tapping Valve (Flange-Flange)	1 Each
Special	Valve Chamber	1 Each
Special	4" Drain & Vault	1 Each
Special	Plain Concrete Anchor	1 Each



APPROVED  
 DATE FEB. 4, 1965  
 DIRECTOR OF PUBLIC UTILITIES  
 COMMISSIONER OF WATER AND HEAT  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
 ENGINEER OF CONSTRUCTION AND SURVEYS  
 ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**  
 DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER AND HEAT  
 CLEVELAND, OHIO  
 SUBJECT: 24" Reinforced Concrete Water Main From  
 Jennings Road Near The J.&L. Steel Corp.  
 Entrance To Clark Avenue. **SM-1788**

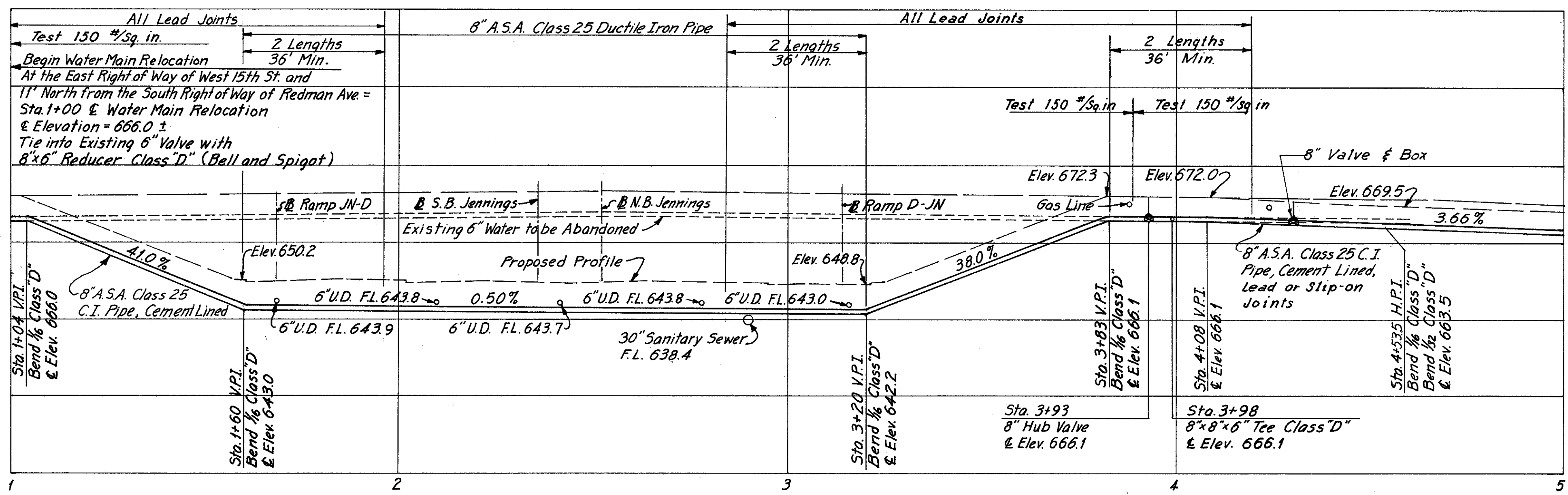




Note: For Removal of Existing Facilities in West 15th St. See Sheet 25

Note: For Removal of Existing Facilities in West 14th St. See Sheet 26

- The Contractor shall notify the Utilities Engineering Office three working days prior to starting water work. Call Tower-1-4600, Line 813.
- Procedure for construction of 8" water main relocation:
1. Install relocated section from 12' West of the existing 6" water main in West 14th Street to a point near the connection with the existing water main in West 13th Street. Install temporary cast iron plugs with clamps and properly backed up for testing.
  2. Taps for chlorination are to be provided after work has begun. The Division of Water will determine the location of necessary taps.
  3. After chlorination and testing, the temporary plug nearest West 13th Street can be removed and the connection made to the new water line. The temporary plug 12' west of 6" water main in West 14th Street will remain in place.
  4. After the grading work is completed for the Jennings Freeway, install relocated section near the west end to a point near where the temporary plug from the first test was left in place. Install temporary cast iron plugs with clamps and properly backed up for testing.
  5. After chlorination and testing, the temporary plugs and also the plug remaining from the first test, can be removed and the connections made.



APPROVED  
 DATE FEB. 4, 1965

*William J. Lawrence*  
 DIRECTOR OF PUBLIC UTILITIES

*John J. Miller*  
 COMMISSIONER OF WATER AND HEAT

*William J. Lawrence*  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*William J. Lawrence*  
 ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. Lawrence*  
 ENGINEER OF DESIGN

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	8" A.S.A. Class 25 Cast Iron Pipe (Cement Lined, Lead or Slip-on Joints) and Fittings	248 Lin. Ft.
Special	8" A.S.A. Class 25 Ductile Iron Pipe	160 Lin. Ft.
Special	Test Main	2 Each
Special	8" Hub Valve and Box	2 Each
Special	Pipe Cuts	2 Each
Special	Valve Adjusted to Grade	2 Each

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER AND HEAT  
 CLEVELAND, OHIO

SUBJECT Water Main Relocation in Redman Ave.  
 from W. 15th St. to W. 13th St.

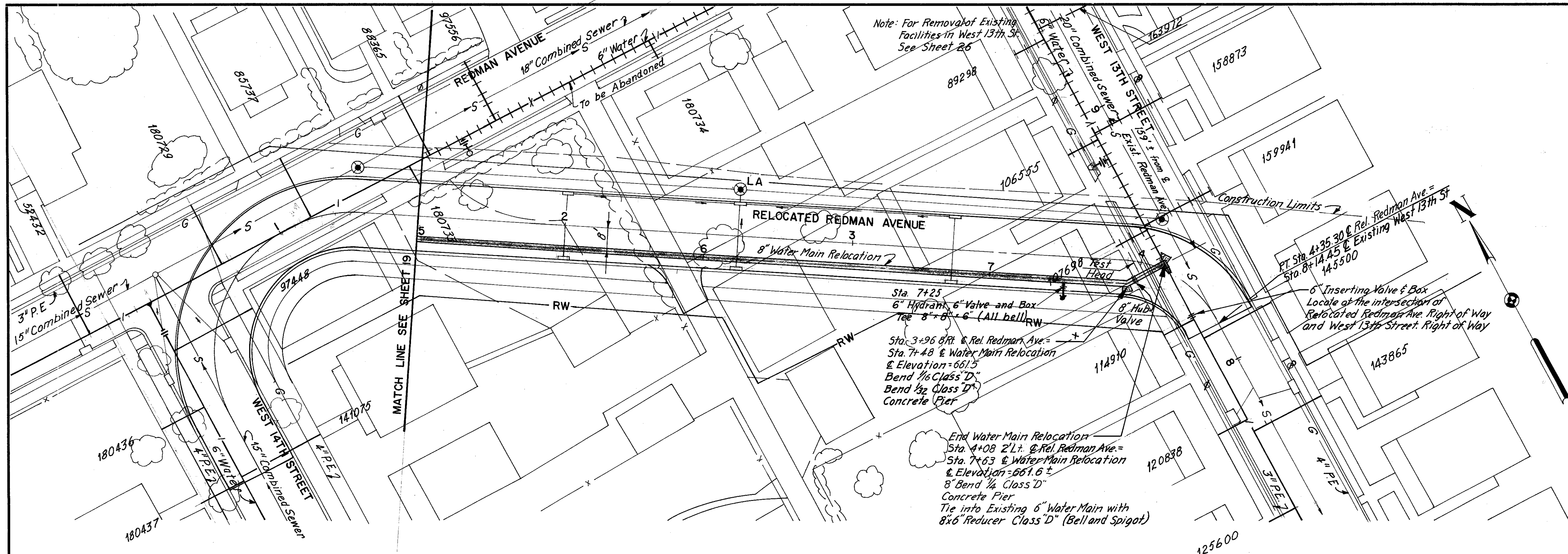
**B-1953**

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

530  
646

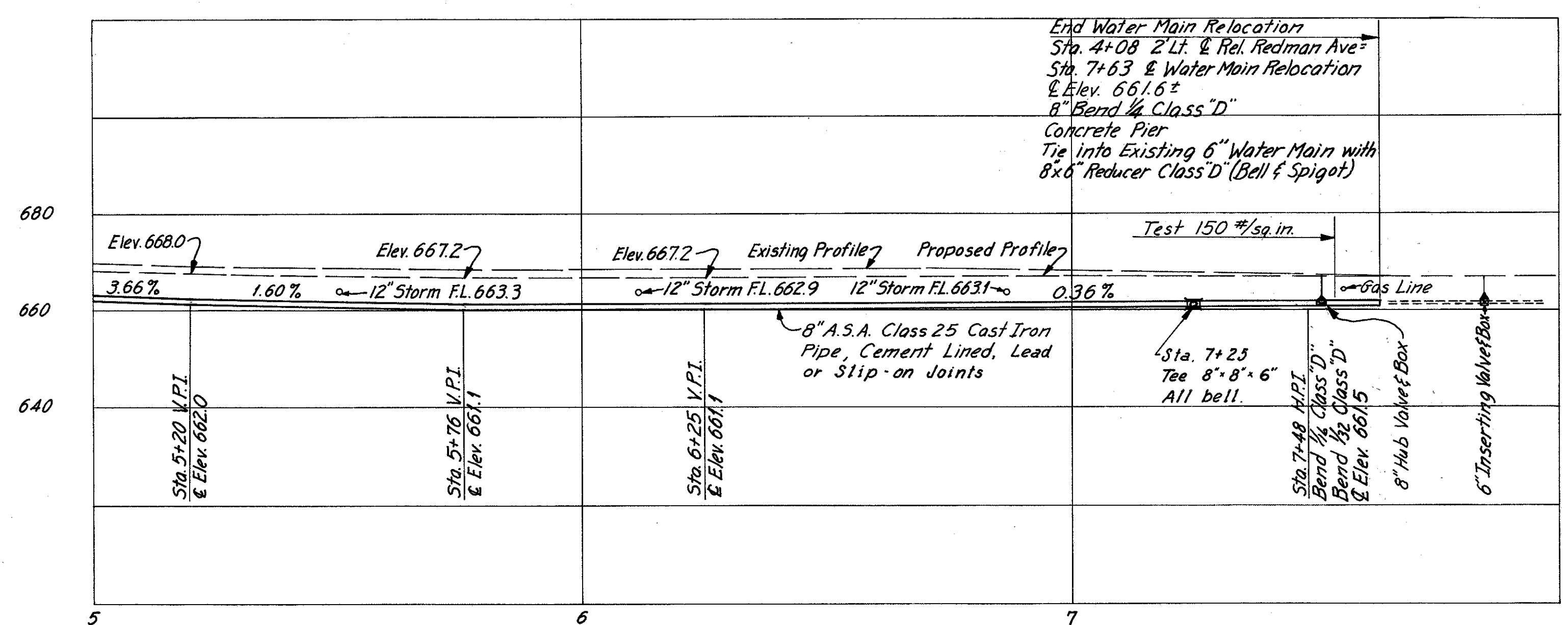
CUYAHOGA COUNTY  
CUY 71-17.83  
CUY 176-12.76

20  
34



**CURVE DATA @ REL. REDMAN**

PI Sta = 4+18.23  
Δ = 58° 33' 48"  
R = 37.00'  
T = 20.75'  
L = 37.82'  
E = 5.42'



APPROVED  
DATE **FEB 4 1965**  
*William J. Sweeney*  
DIRECTOR OF PUBLIC UTILITIES  
*Arnold D. Miller*  
COMMISSIONER OF WATER AND HEAT  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*J.P. Connor*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William J. Sweeney*  
ENGINEER OF DESIGN

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	8" A.S.A. Class 25 Cast Iron Pipe (Cement Lined, Lead or Slip-on Joints) and Fittings	263 Lin. Ft.
Special	8" Hub Valve and Box	1 Each
Special	Pipe Cuts	2 Each
Special	6" Hydrant	1 Each
Special	6" Valve and Box	1 Each
Special	6" A.S.A. CI 25 C.I. Pipe (Cement Lined) and Fittings	6 Lin. Ft.
Special	6" Inserting Valve and Box	1 Each

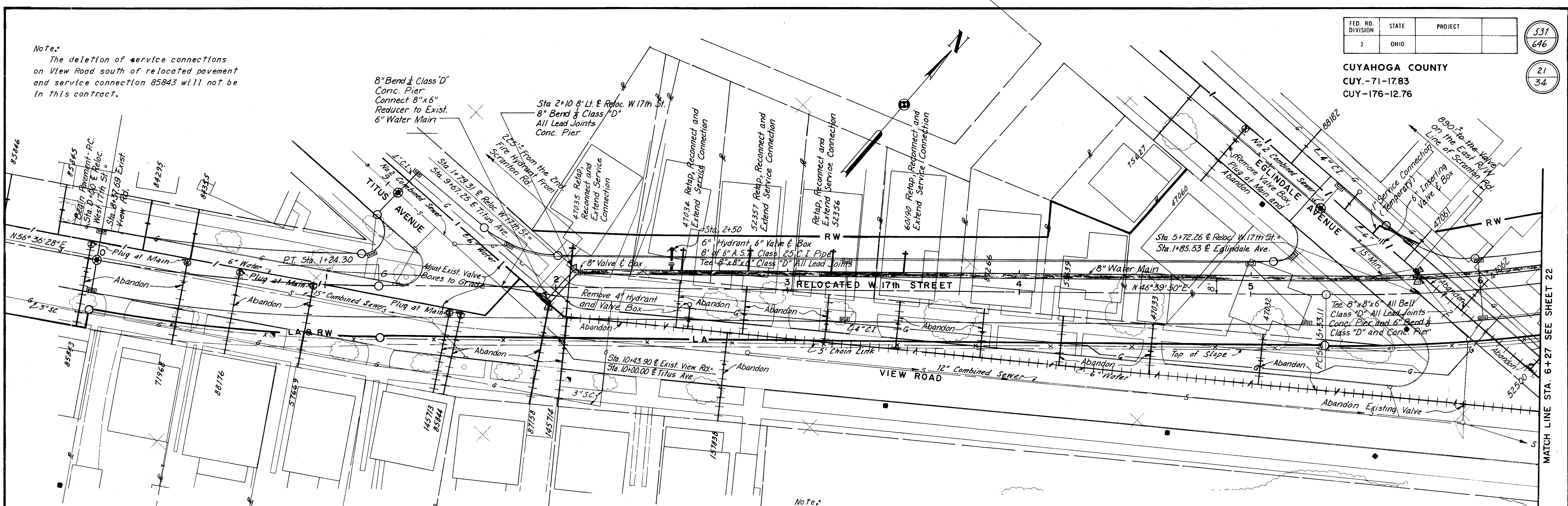
**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO  
SUBJECT Water Main Relocation in Redman Ave.  
from W. 15th St. to W. 13th St.  
**B-1954**

MADE *RHA* DATE *11-9-64* TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED *ECE* DATE *1-6-65* SCALE *1" = 20'*

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY  
 CUY.-71-17.83  
 CUY-176-12.76

Note:  
 The deletion of service connections on View Road south of relocated pavement and service connection 85843 will not be in this contract.

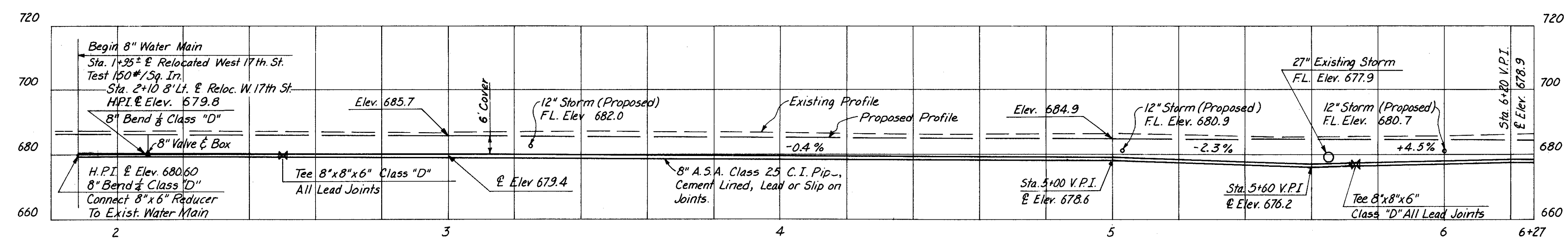


**CURVE DATA @ RELOC. W. 17TH ST.**  
 P.I. = Sta. 0+62.31  
 Δ = 09°56'38"  
 D = 08°00'00"  
 R = 716.20'  
 T = 62.31'  
 L = 124.30'  
 E = 2.71'

Item	Description	Quantity
Special	8" Water Main A.S.A. Class 25 C.I. Pipe (Cement Lined, Lead or Slip-on Joints) and Fittings.	447 Lin. Ft.
Special	6" Water Main A.S.A. Class 25 C.I. Pipe, (Cement Lined all Lead Joints) and Fittings	8 Lin. Ft.
Special	1" Service Connection (Temporary)	1 Each
Special	Fire Hydrants Removed	1 Each
Special	6" Fire Hydrants	1 Each
Special	6" Valve and Box	1 Each
Special	6" Inserting Valve and Box	1 Each
Special	8" Valve and Box	1 Each
Special	Pipe Cuts	4 Each
Special	Test Main	1 Each
Special	Retap, Reconnect and Extend Service Connections	5 Each
Special	Adjust Existing Valve to Grade	2 Each
Special	Service Connection - Plug at Main	7 Each

Note:  
 The Contractor shall notify the Utilities Engineering Office three working days prior to starting water work Call Tower-1-4600, Line 813.  
 Procedure for construction of 8" water main for Relocated West 17th Street:  
 1. Service must be maintained to the Cleveland Metropolitan General Hospital throughout the entire construction except for the length of time it takes to connect up to their existing 8" line. This can be done by maintaining service on West 17th Street, which will feed the hospital, and by disconnecting the service on Aiken Avenue between the existing valve at the west property line of West 17th Street and the proposed 12" inserting valve on Aiken Avenue. Then the proposed 8" water main can be laid between Aiken Avenue and the existing 8" water main of the hospital. When this phase has been completed, the remainder of the proposed 8" water main can be laid, maintaining existing service throughout construction except where existing water mains and service connections will be abandoned.  
 2. Taps for chlorination are to be provided after the work has begun. The Division of Water will determine the location of necessary taps.

**CURVE DATA @ RELOC. W. 17TH ST.**  
 P.I. = Sta. 06+47.40  
 Δ = 18°08'01"  
 D = 08°00'00"  
 R = 716.20'  
 T = 114.29'  
 L = 226.67'  
 E = 9.06'

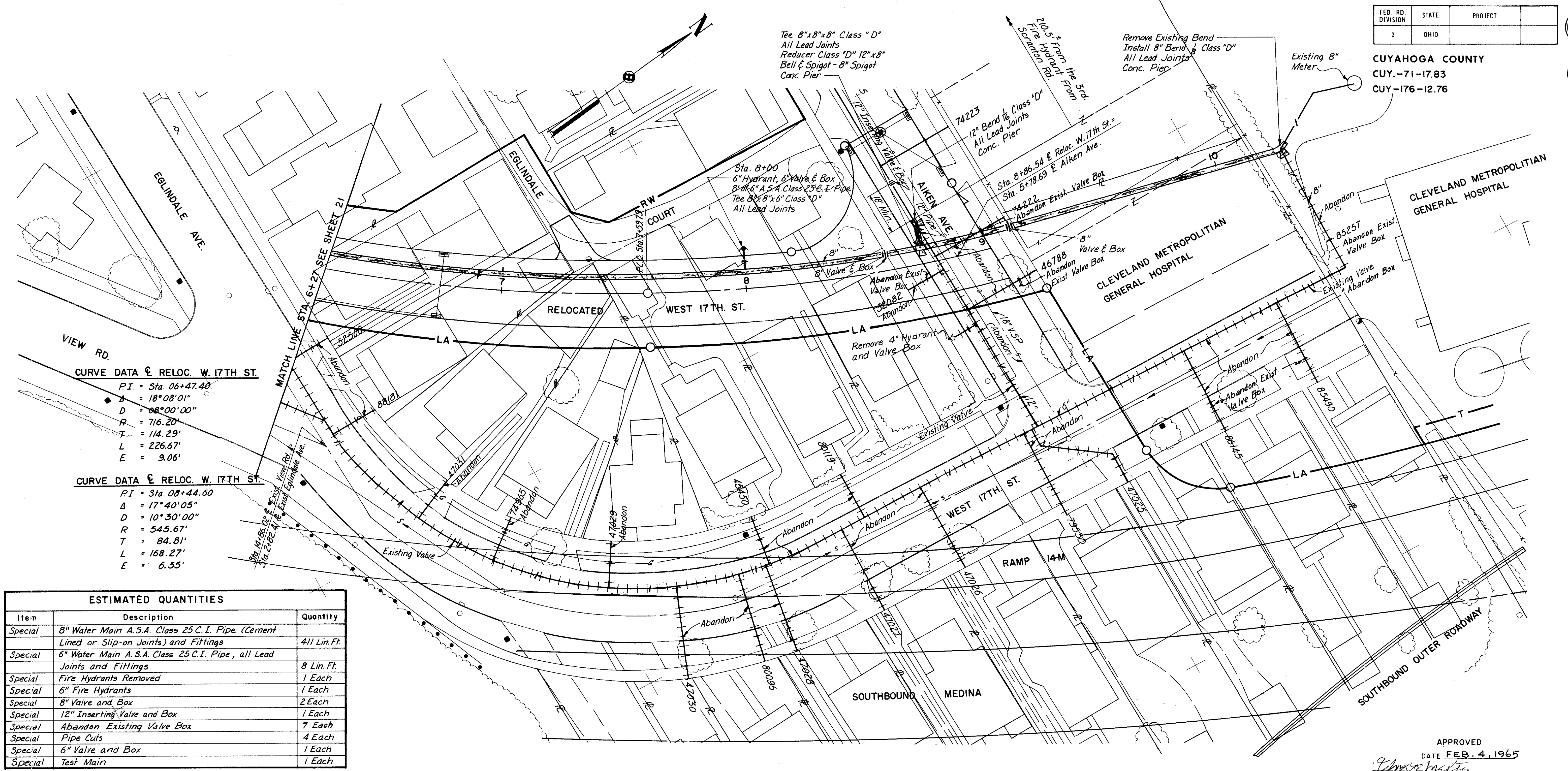


APPROVED  
 DATE FEB. 4, 1965  
 [Signature]  
 DIRECTOR OF PUBLIC UTILITIES  
 [Signature]  
 COMMISSIONER OF WATER AND HEAT  
 [Signature]  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
 [Signature]  
 ENGINEER OF CONSTRUCTION AND SURVEYS  
 [Signature]  
 ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**  
 DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER AND HEAT  
 CLEVELAND, OHIO  
 SUBJECT 8" WATER MAIN RUNNING ALONG RELOCATED WEST 17TH ST. CONNECTING TITUS AVE., VIEW RD., EGLINDALE AVE., AIKEN AVE AND CLEVE. METRO. GEN. HOSP.

SCALE 1" = 20'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE BY DATE 1-3-64  
 TRCD. DATE  
 CKD. F.C.E. DATE 1-7-65  
 KANSAS CITY CLEVELAND NEW YORK

**B-1955**



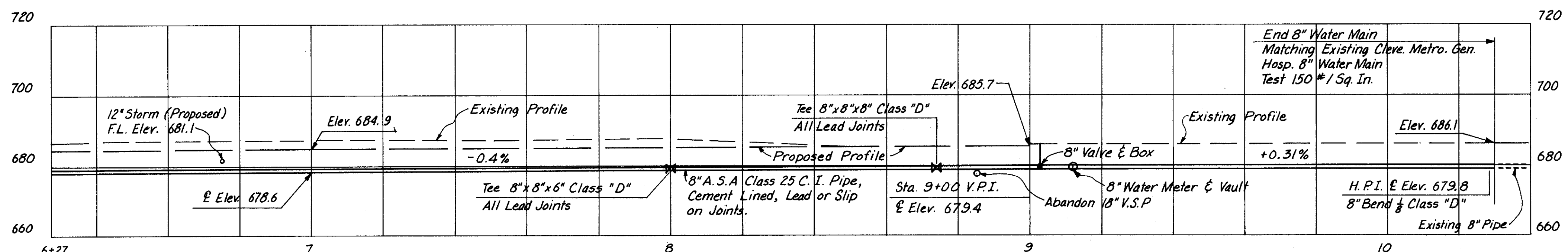
**CURVE DATA @ RELOC. W. 17TH ST.**

P.I. = Sta. 06+47.40  
 $\Delta = 18^{\circ}08'01''$   
 $D = 08^{\circ}00'00''$   
 $R = 716.20'$   
 $T = 114.29'$   
 $L = 226.67'$   
 $E = 9.06'$

**CURVE DATA @ RELOC. W. 17TH ST.**

P.I. = Sta. 08+44.60  
 $\Delta = 17^{\circ}40'05''$   
 $D = 10^{\circ}30'00''$   
 $R = 545.67'$   
 $T = 84.81'$   
 $L = 168.27'$   
 $E = 6.55'$

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	8" Water Main A.S.A. Class 25 C.I. Pipe (Cement Lined or Slip-on Joints) and Fittings	411 Lin. Ft.
Special	6" Water Main A.S.A. Class 25 C.I. Pipe, all Lead Joints and Fittings	8 Lin. Ft.
Special	Fire Hydrants Removed	1 Each
Special	6" Fire Hydrants	1 Each
Special	8" Valve and Box	2 Each
Special	12" Inserting Valve and Box	1 Each
Special	Abandon Existing Valve Box	7 Each
Special	Pipe Cuts	4 Each
Special	6" Valve and Box	1 Each
Special	Test Main	1 Each



APPROVED  
 DATE FEB. 4, 1965

*[Signature]*  
 DIRECTOR OF PUBLIC UTILITIES

*[Signature]*  
 COMMISSIONER OF WATER AND HEAT

*[Signature]*  
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*[Signature]*  
 ENGINEER OF CONSTRUCTION AND SURVEYS

*[Signature]*  
 ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
 DIVISION OF WATER AND HEAT  
 CLEVELAND, OHIO

SUBJECT 8" WATER MAIN RUNNING ALONG  
 RELOCATED WEST 17TH ST. CONNECTING  
 TITUS AVE., VIEW RD., EGLINDALE AVE.,  
 AIKEN AVE. AND CLEVE. METRO. GEN. HOSP.

SCALE 1" = 20'

HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 CONSULTING ENGINEERS  
 MADE BY DATE 11-3-64  
 TRCD DATE  
 KANSAS CITY CLEVELAND NEW YORK

**B-1956**



# WATER LINE PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

534  
646

CUYAHOGA COUNTY  
CUY - 71-17.83  
CUY-176-12.76

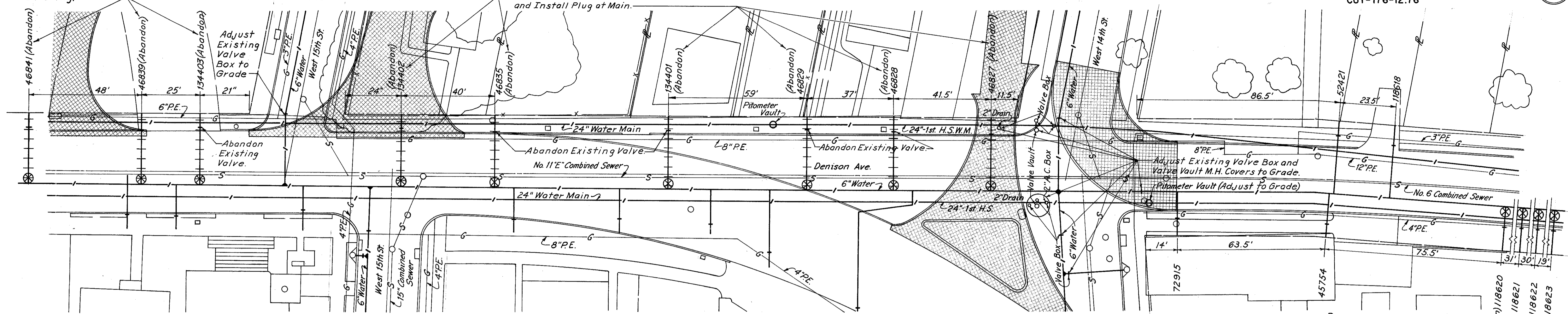
24  
37

Remove Service Connection, Install Plug at the Main & Remove Meter Vault if Existing.

Note: For Alterations to 6" Water Line on W. 15th St. See Sheet 25.

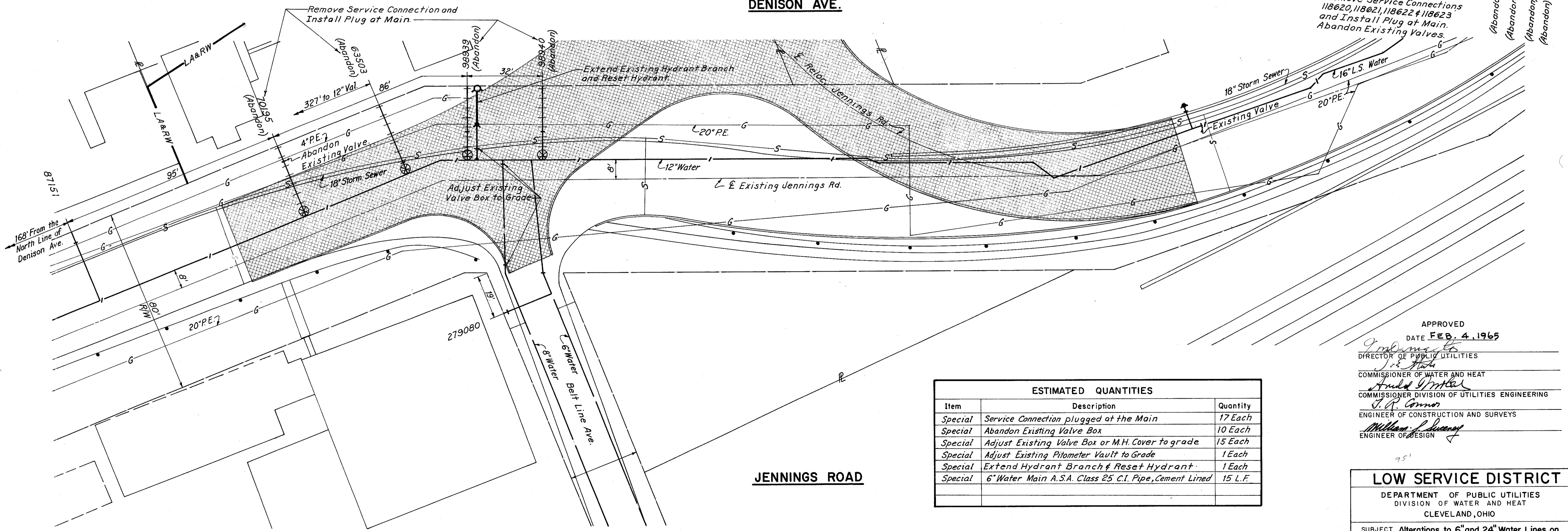
Remove Service Connection and Install Plug at Main.

Note: For Alterations to 6" Water Line on W. 14th St. See Sheet 26



**DENISON AVE.**

Remove Service Connections 118620, 118621, 118622 & 118623 and Install Plug at Main. Abandon Existing Valves.



**JENNINGS ROAD**

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	Service Connection plugged at the Main	17 Each
Special	Abandon Existing Valve Box	10 Each
Special	Adjust Existing Valve Box or M.H. Cover to grade	15 Each
Special	Adjust Existing Pitometer Vault to Grade	1 Each
Special	Extend Hydrant Branch & Reset Hydrant	1 Each
Special	6" Water Main A.S.A. Class 25 C.I. Pipe, Cement Lined	15 L.F.

APPROVED  
DATE FEB. 4, 1965  
*[Signature]*  
DIRECTOR OF PUBLIC UTILITIES  
COMMISSIONER OF WATER AND HEAT  
*[Signature]*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*[Signature]*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*[Signature]*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Alterations to 6" and 24" Water Lines on Denison Ave. From 95' West of W. 15th St. to 233' East of W. 14th St.  
Alterations to 12" Water Line on Jennings Rd. Vicinity Belt Line Ave.  
**8-1958**

MADE T.J.T. DATE 11-12-64 TRACED D.V.S. & R.J.K. DATE 10-30-64  
CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE 1" = 20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

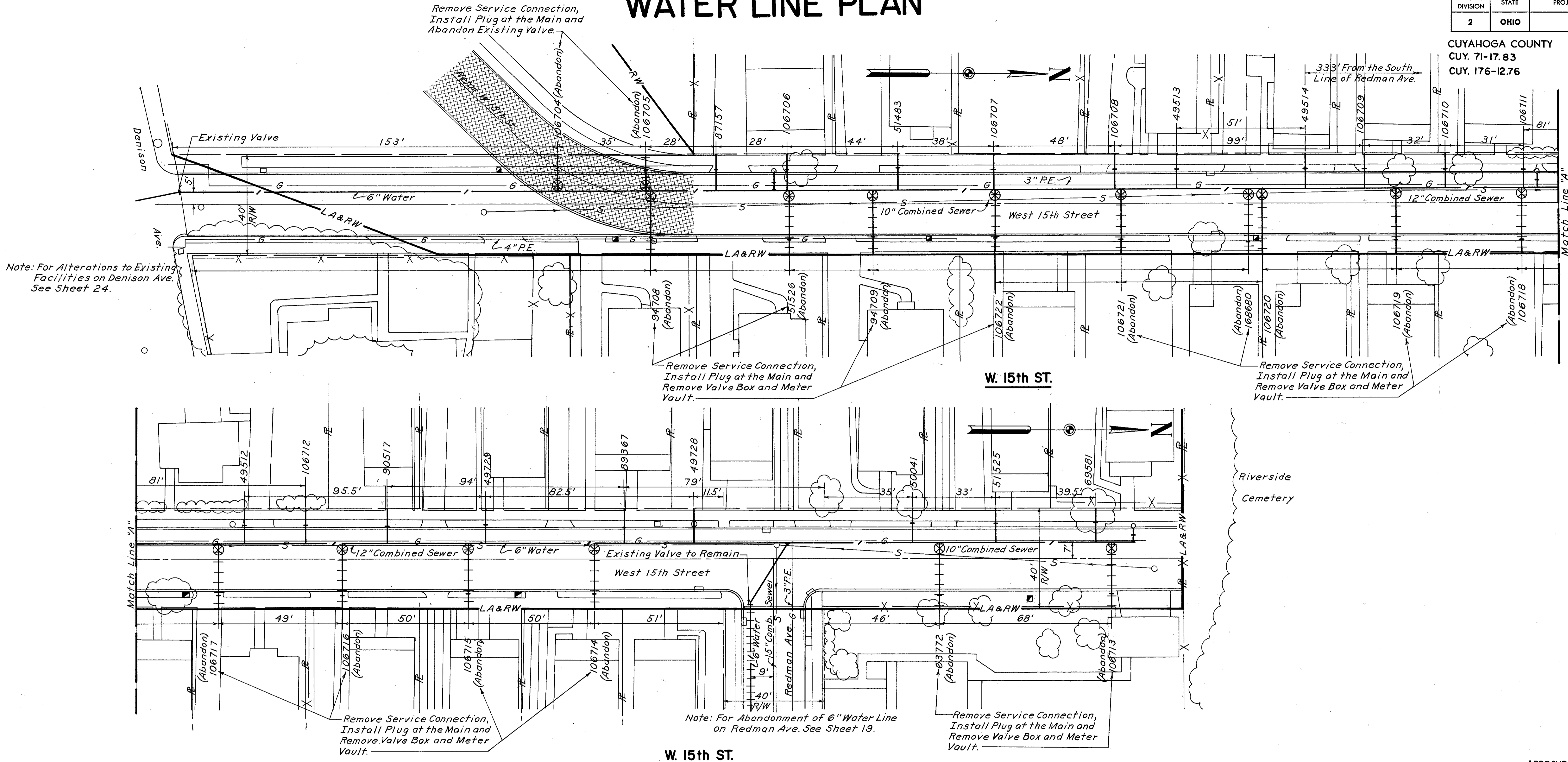
# WATER LINE PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

535  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

25  
34



Note: For Alterations to Existing Facilities on Denison Ave. See Sheet 24.

Note: For Abandonment of 6" Water Line on Redman Ave. See Sheet 19.

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	Service Connection Plugged at the Main	17 Each
Special	Abandon Existing Valve Box and Meter Vault	17 Each

APPROVED  
DATE **FEB. 4, 1965**  
*W. J. Tamm*  
DIRECTOR OF PUBLIC UTILITIES  
*J. S. Smith*  
COMMISSIONER OF WATER AND HEAT  
*Howard D. Smith*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*J. R. Gorman*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William L. Sweeney*  
ENGINEER OF DESIGN

**B-1959**

**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Alteration to 6" Water Line on West 15th Street From Denison Ave. North to the Southerly Line of Riverside Cemetery.

MADE *T.J.T.* DATE *11-12-64* TRACED *R.J.K.* DATE *11-12-64*  
CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE *1" = 20'*

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

# WATER LINE PLAN

Note: For Alterations to Existing Facilities on Denison Ave. See Sheet 24

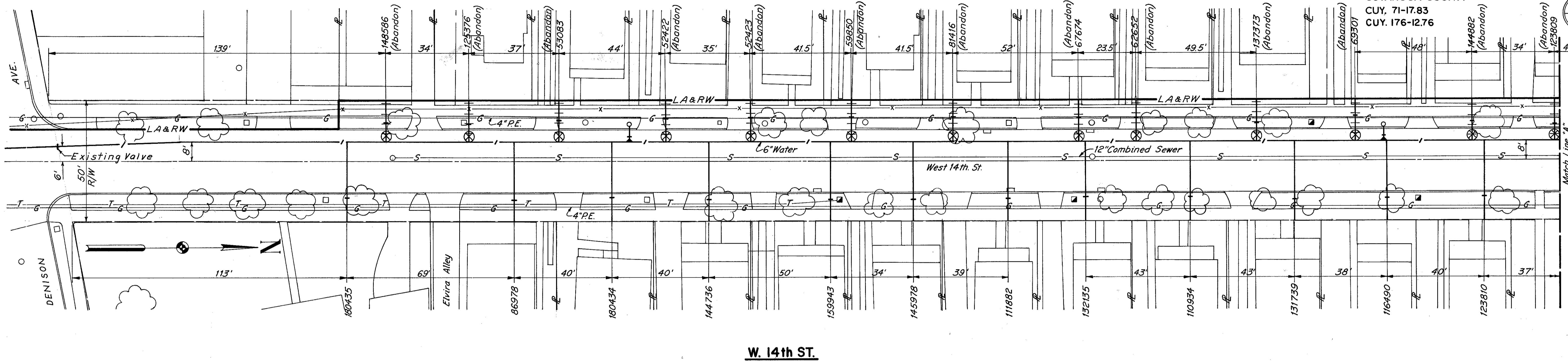
Note: Disconnect All Service Connections on the West Side of W. 14th St. Install Plugs at the Main and Remove Valve Boxes and Meter Vaults.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

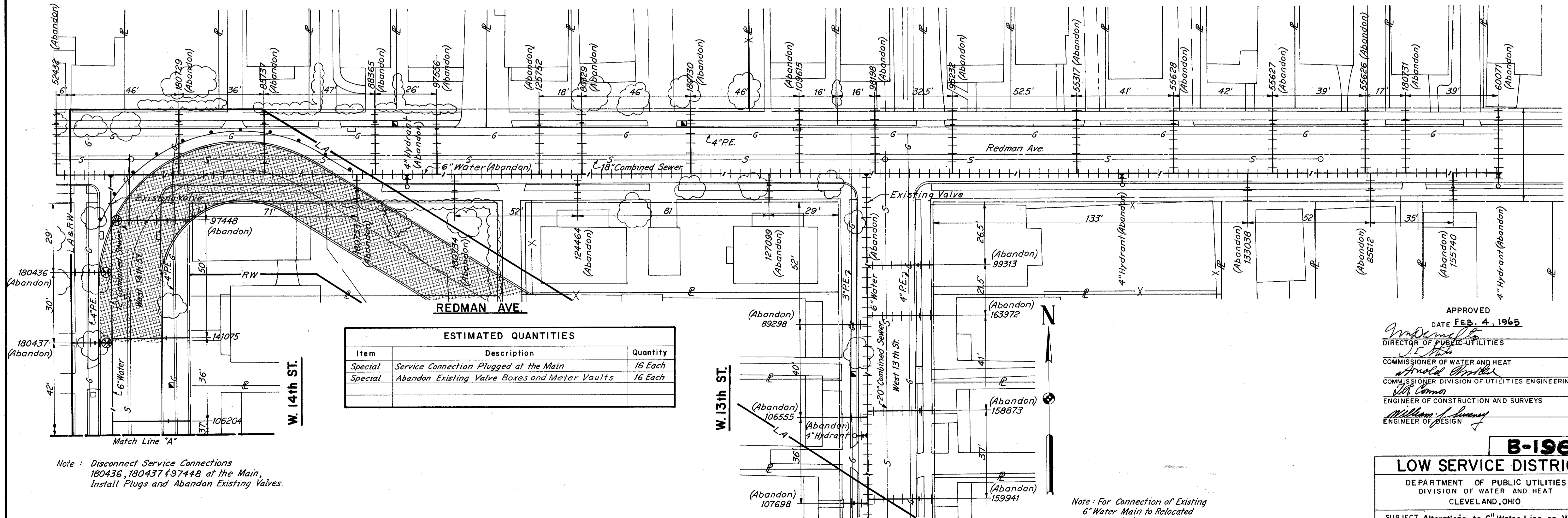
536  
646

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

26  
34



## W. 14th St.



ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	Service Connection Plugged at the Main	16 Each
Special	Abandon Existing Valve Boxes and Meter Vaults	16 Each

APPROVED  
DATE FEB. 4, 1965  
*W. J. ...*  
DIRECTOR OF PUBLIC UTILITIES  
*...*  
COMMISSIONER OF WATER AND HEAT  
*...*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*...*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William J. ...*  
ENGINEER OF DESIGN

**B-1960**  
**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO  
SUBJECT Alterations to 6" Water Line on W. 14th St. From Denison Ave. to Redman Ave. Abandon 6" Water Line on Redman Ave. From W. 14th St. to 240' East of W. 13th St. and 150' on W. 13th St.

Note: For Connection of Existing 6" Water Main to Relocated 8" Water Main at Relocated Redman Ave. See Sheet 20



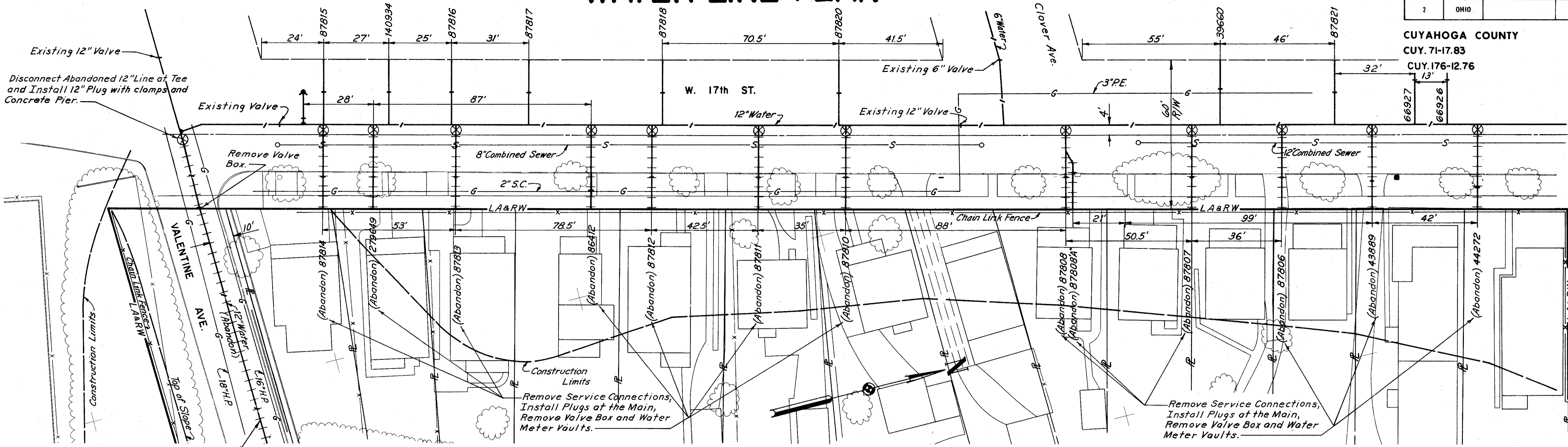
# WATER LINE PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

537  
646

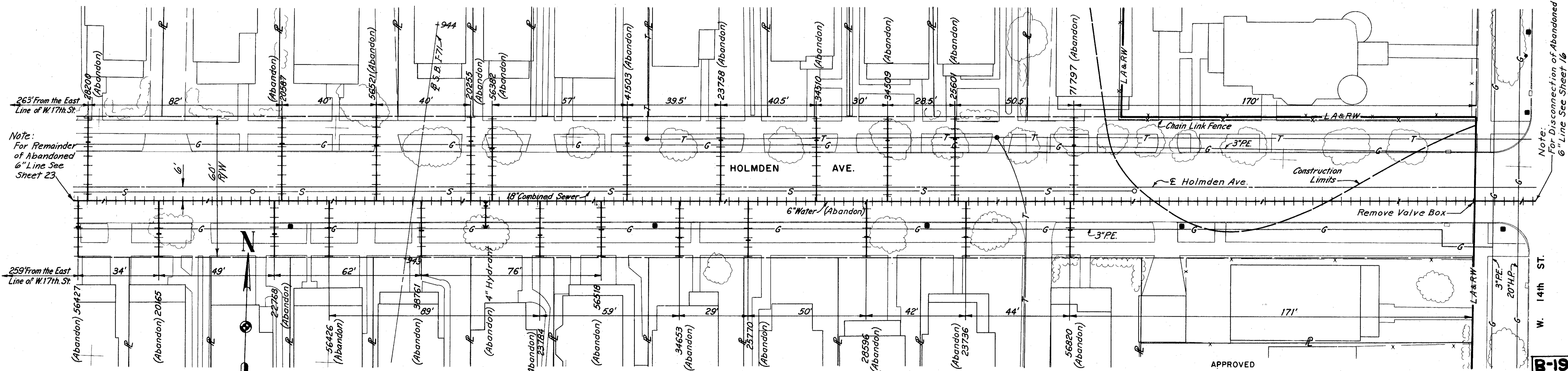
27  
34

CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76



Note: Abandon 297' of 12" Water Main to Water Main in Jennings Rd. including 12" Valve and Connection No. 261149.

## W. 17th ST.



Note: For Remainder of Abandoned 6" Line See Sheet 23.

Note: For Disconnection of Abandoned 6" Line See Sheet 16.

## HOLMDEN AVE.

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	Service Connection Plugged at Main	12 each
Special	Water Main Plugged at Main	1 each
Special	Abandon Existing Valve Box	14 each
Special	Abandon Water Meter Vaults	13 each

APPROVED  
DATE FEB. 4, 1965

*W. J. ...*  
DIRECTOR OF PUBLIC UTILITIES

*J. ...*  
COMMISSIONER OF WATER AND HEAT

*J. ...*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*J. ...*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. ...*  
ENGINEER OF DESIGN

**B-1961**

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT: Alterations to 12" Water Line on West 17th Street from Valentine Avenue to 141' North of Clover Avenue. Abandon 5" Water Line on Holmden Avenue from West 14th Street to 250' East of West 17th Street.

SCALE: 1" = 20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

MADE BY: R.L.K. DATE: 11-12-64  
TRCD BY: R.L.K. DATE: 11-12-64  
CRD. E.C.E. DATE: 1-7-65

# WATER LINE PLAN

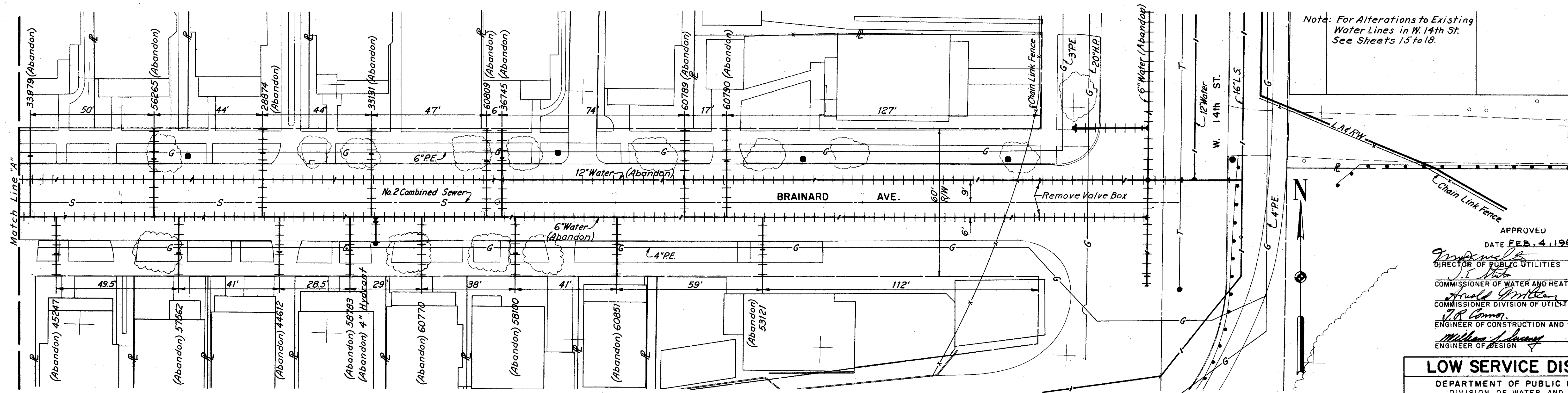
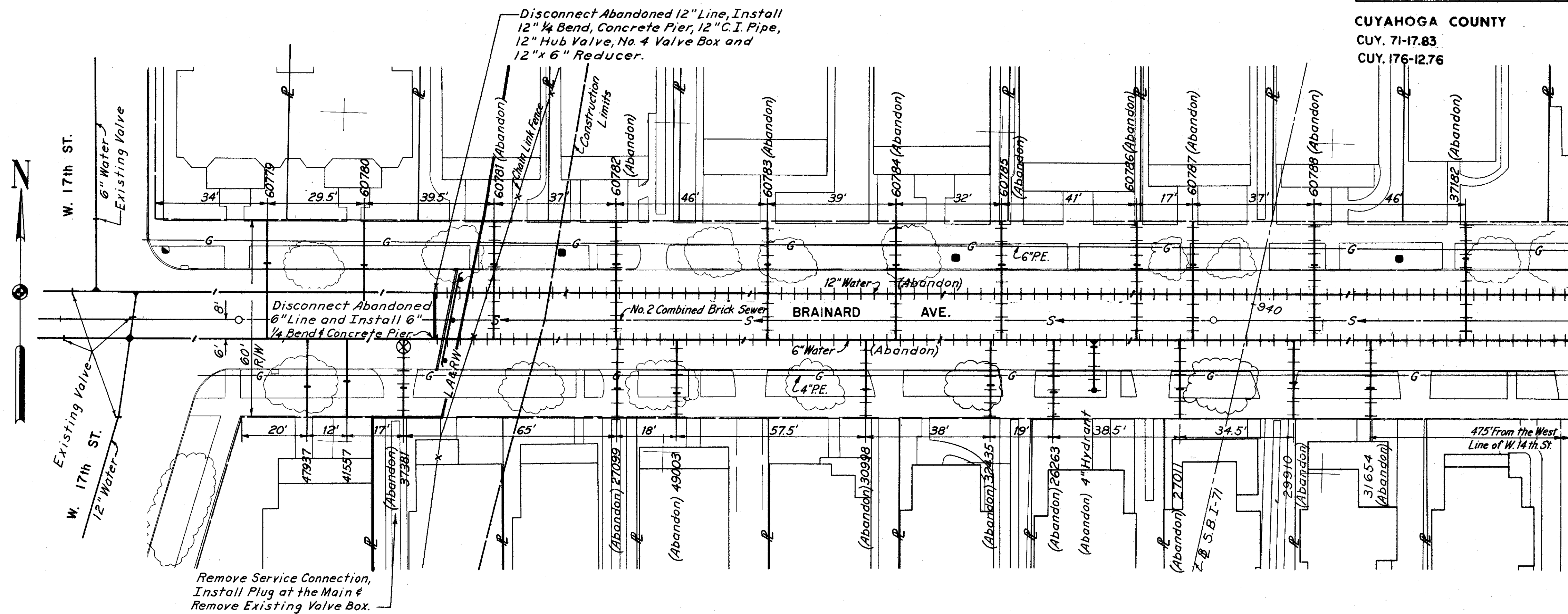
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

538  
646

**CUYAHOGA COUNTY**  
CUY. 71-17.83  
CUY. 176-12.76

28  
34

ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	Abandon Existing Valve Box	3 each
Special	Service Connection Plugged at Main	1 each
Special	Pipe Cuts	2 each
Special	12" Water Main A.S.A. Class 25 C.I. Pipe, Cement Lined and Fittings	14 Lin. Ft.



Note: For Alterations to Existing Water Lines in W. 14th St. See Sheets 15 to 18.

APPROVED  
DATE FEB. 4, 1965

*[Signature]*  
DIRECTOR OF PUBLIC UTILITIES

*[Signature]*  
COMMISSIONER OF WATER AND HEAT

*[Signature]*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*[Signature]*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*[Signature]*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Abandon Existing 6" and 12" Water Lines in Brainard Avenue from West 14th Street to West 17th Street.

**B-1962**

SCALE 1" = 20'  
HOWARD, NEEDLES, TAMMEN & BERGENOFF  
CONSULTING ENGINEERS  
MADE P.J.K. DATE 11-12-64  
TRCD R.J.K. DATE 11-12-64  
CKD. E.C.E. DATE 1-7-65 KANSAS CITY CLEVELAND NEW YORK

# WATER LINE PLAN

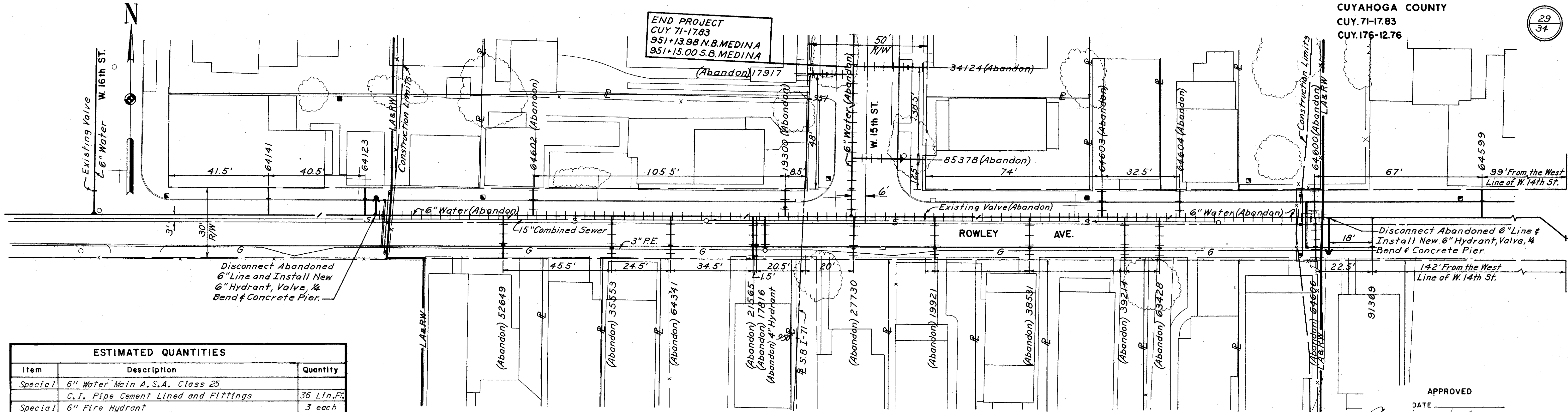
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

539  
646

29  
34

**CUYAHOGA COUNTY**  
CUY. 71-17.83  
CUY. 176-12.76

END PROJECT  
CUY. 71-17.83  
951+13.98 N.B. MEDINA  
951+15.00 S.B. MEDINA



ESTIMATED QUANTITIES		
Item	Description	Quantity
Special	6" Water Main A.S.A. Class 25 C.I. Pipe Cement Lined and Fittings	36 Lin. Ft.
Special	6" Fire Hydrant	3 each
Special	6" Valve	3 each
Special	Pipe Cuts	3 each

APPROVED

DATE \_\_\_\_\_

*[Signature]*  
DIRECTOR OF PUBLIC UTILITIES

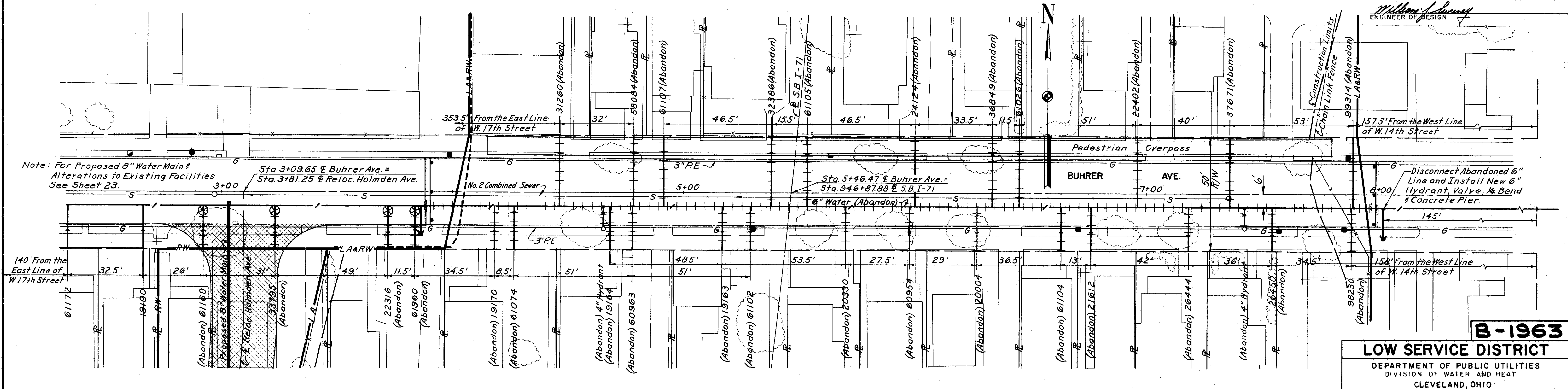
*[Signature]*  
COMMISSIONER OF WATER AND HEAT

*[Signature]*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*[Signature]*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*[Signature]*  
ENGINEER OF DESIGN

## ROWLEY AVE.



## BUHRER AVE.

**B-1963**

**LOW SERVICE DISTRICT**

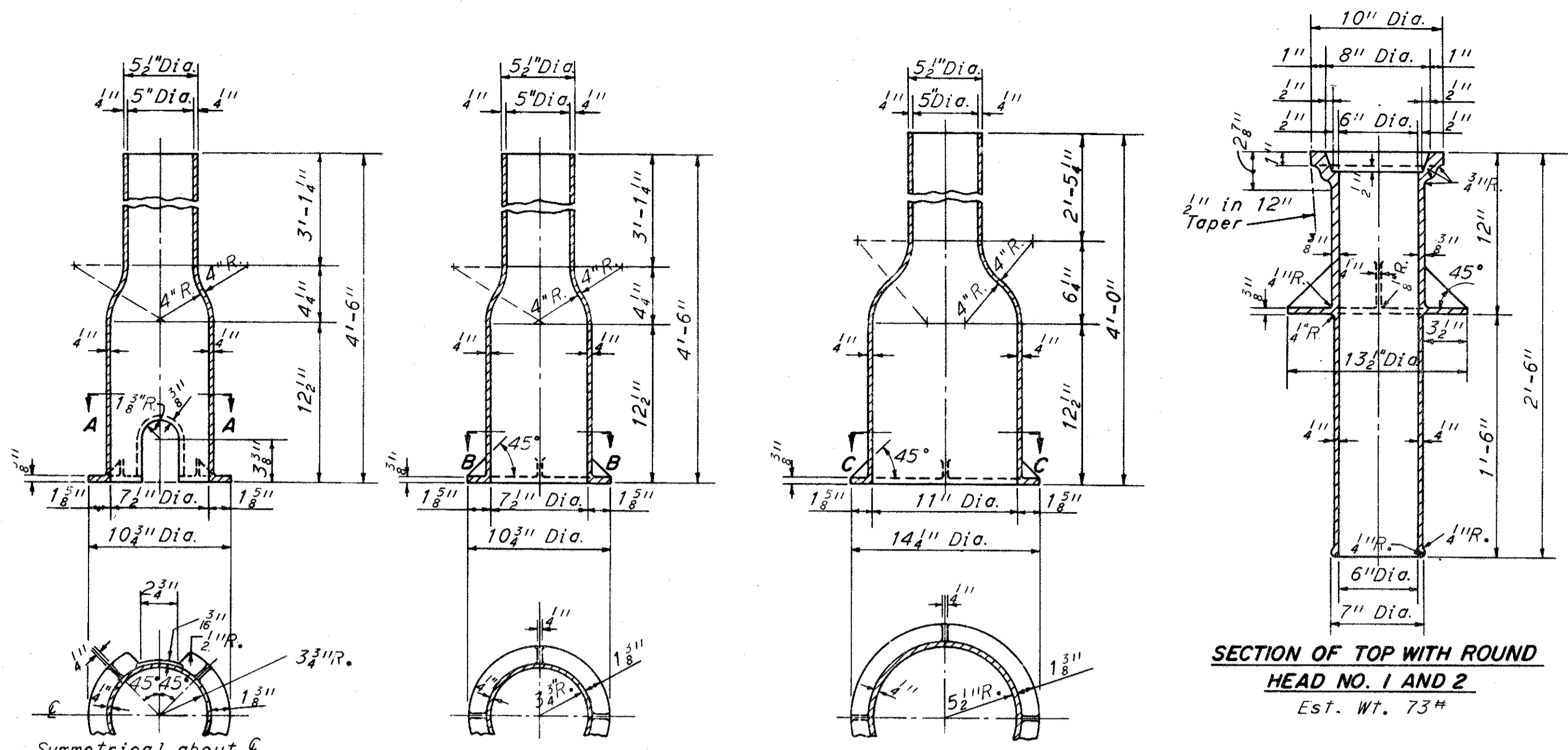
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT Abandon 6" Water Line on Rowley Avenue from 160' west of West 14th Street to 87' east of West 16th Street. Abandon 6" Water Line on Buhrer Avenue from 145' west of West 14th Street to 295' east of West 17th Street.

SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE I.U.I. DATE 11-12-64 CONSULTING ENGINEERS  
TRCD. R.J.K. DATE 11-12-64 KANSAS CITY CLEVELAND NEW YORK  
CKD. E.C.E. DATE 1-7-65

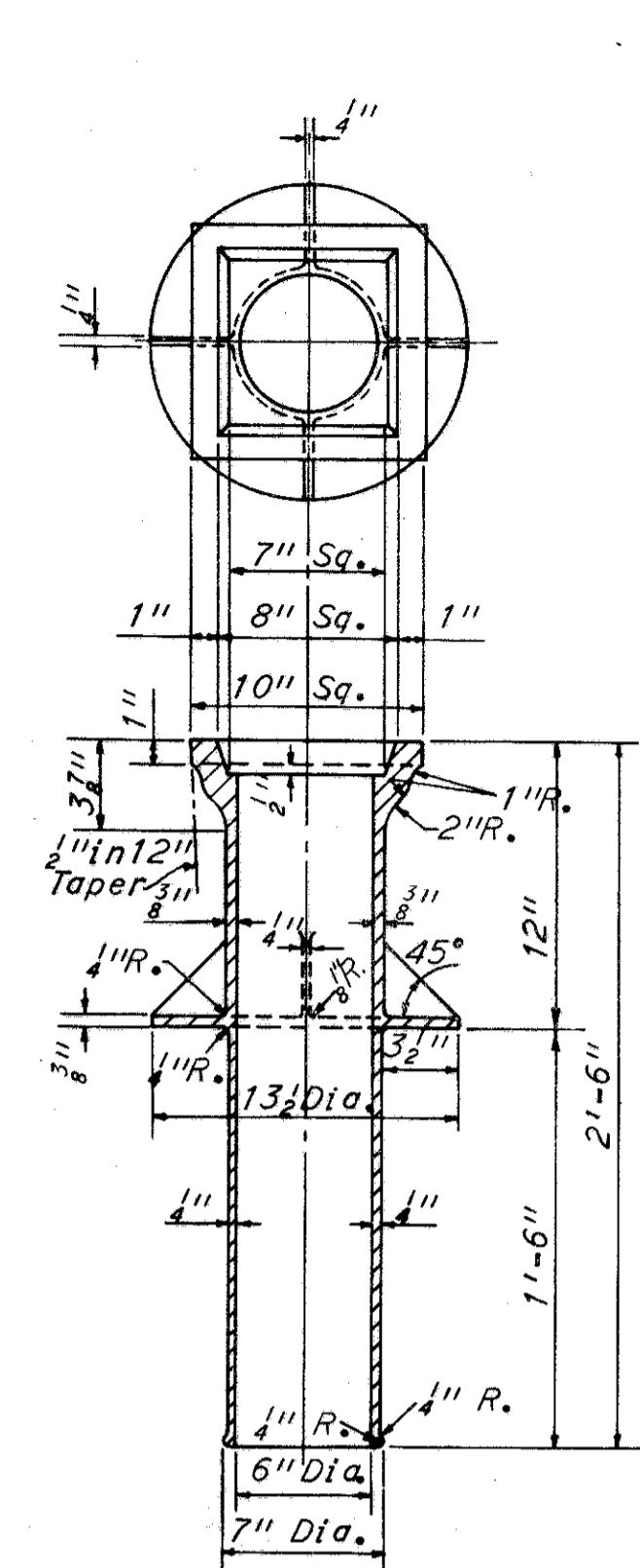
CUYAHOGA COUNTY  
CUY-71-17.83 CUY-176-12.76



**SECTION A-A**  
Base No. 1 for 1 1/2" and 2" Valves  
Est. Wt. 69#

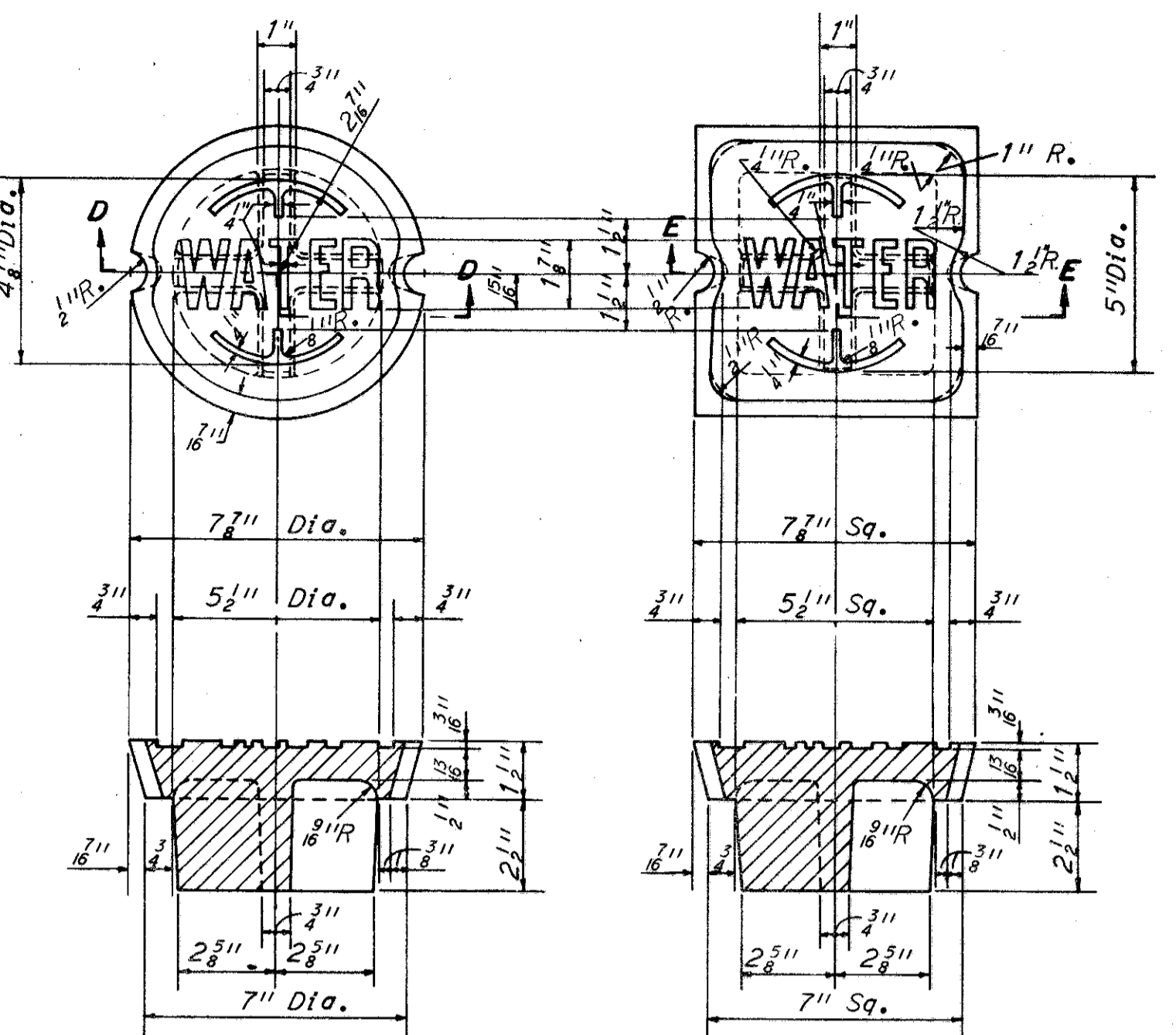
**SECTION B-B**  
Base No. 2 and 3 for 3", 4", 6" and 8" Valves  
Est. Wt. 71#

**SECTION C-C**  
Base No. 4 for 10", 12" and 16" Valves  
Est. Wt. 79#

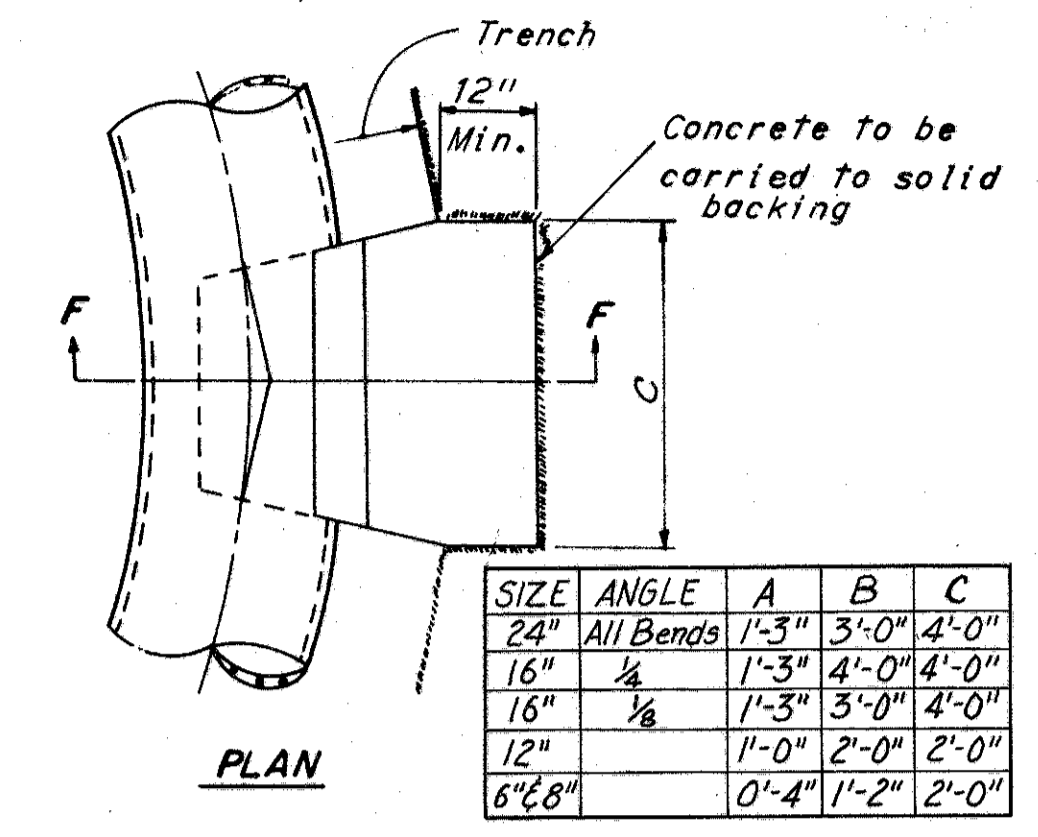


**SECTION D-D**  
Detail of round cover for No. 1 and 2 Top  
Est. Wt. 20#

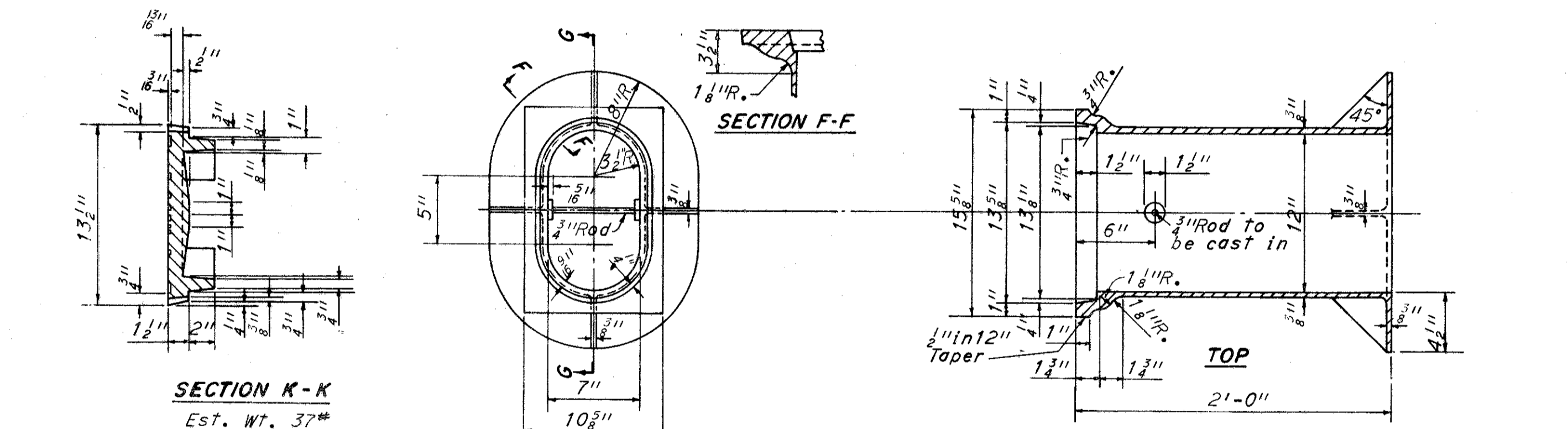
**SECTION E-E**  
Detail of square cover for No. 3 and 4 Top  
Est. Wt. 23#



**SECTION F-F**  
CONCRETE PIER FOR BENDS  
Scale 1/2" = 1'-0"

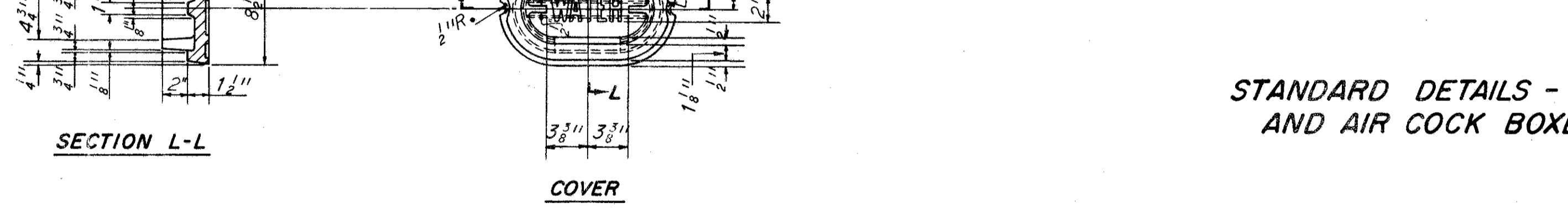


SIZE	ANGLE	A	B	C
24"	All Bends	1'-3"	3'-0"	4'-0"
16"	1/2	1'-3"	4'-0"	4'-0"
12"	1/8	1'-3"	3'-0"	4'-0"
6" x 8"		0'-4"	1'-2"	2'-0"



**SECTION G-G**  
Air Cock Box No. 5 is Top and Cover  
Air Cock Box No. 6 is Top, Base 2'-6" Long and Cover  
Flushing Box No. 7 is Top, Base 5'-0" Long and Cover  
Est. Wt. 128#

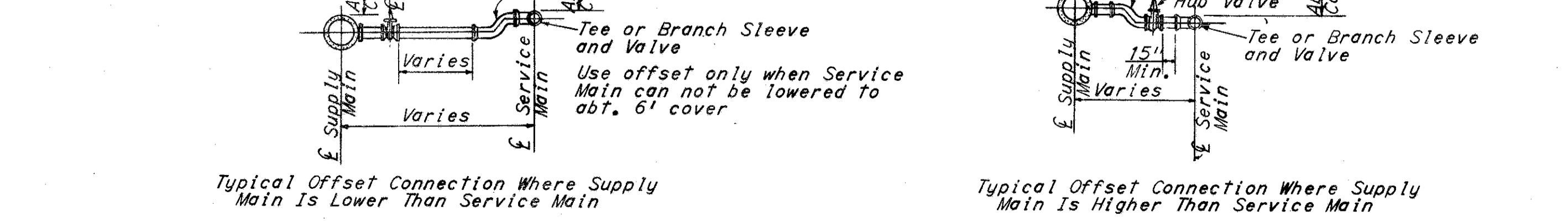
**SECTION H-H**  
Est. Weight 2'-6" Long = 70#  
Est. Weight 5'-0" Long = 126#



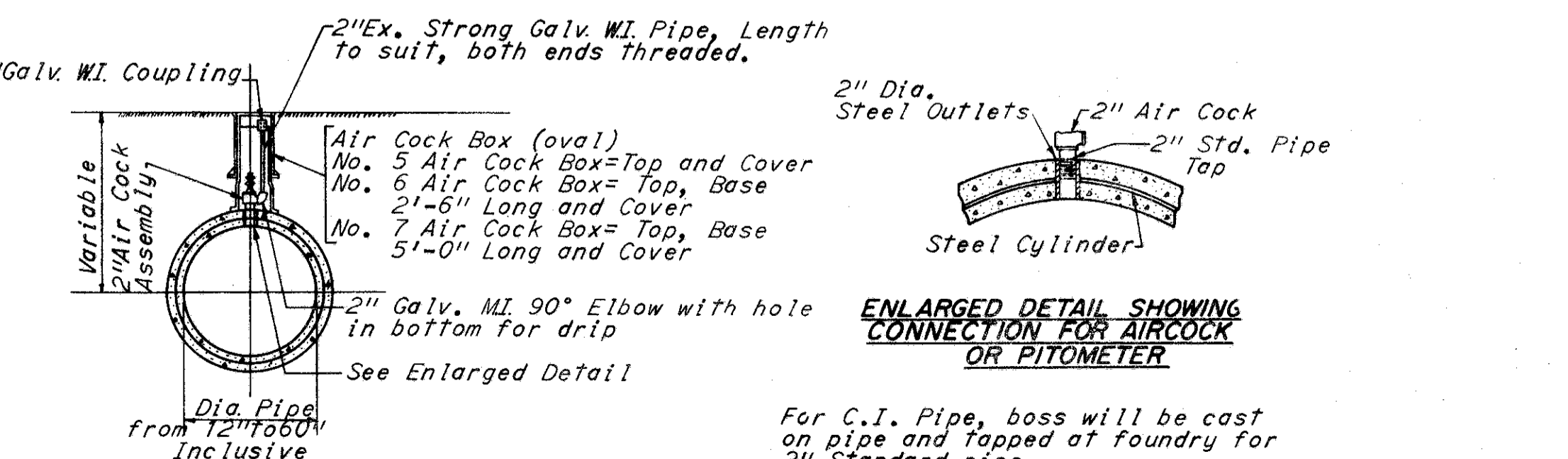
**SECTION K-K**  
Est. Wt. 37#

**SECTION L-L**

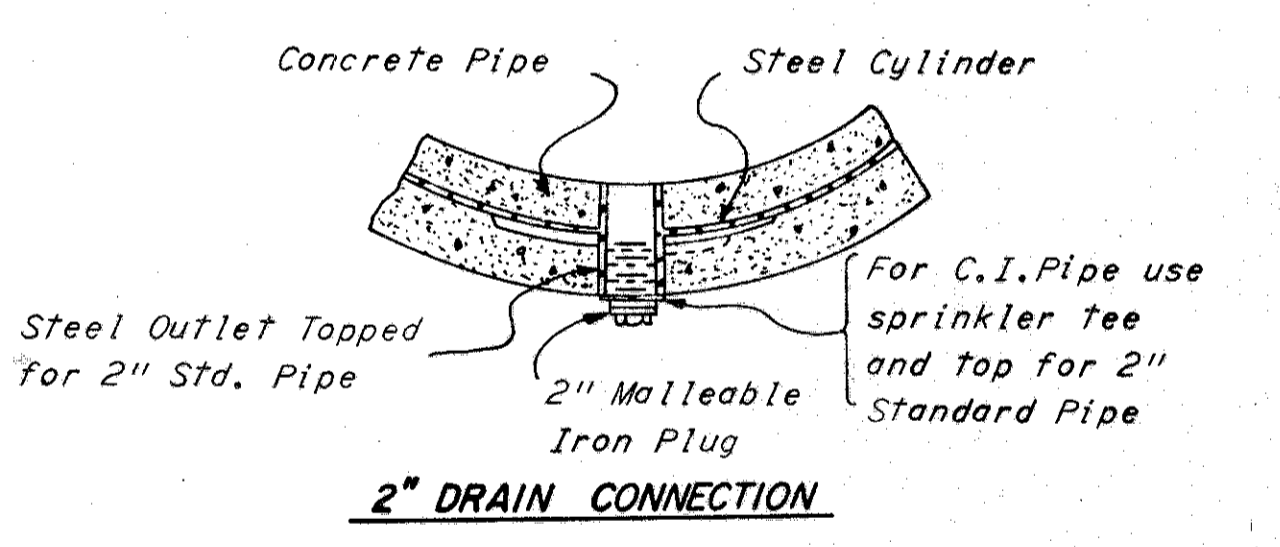
**STANDARD DETAILS - VALVE AND AIR COCK BOXES**



**TYPICAL OFFSET CONNECTIONS**



**ENLARGED DETAIL SHOWING CONNECTION FOR AIRCOCK OR PITOMETER**



**2" DRAIN CONNECTION**

APPROVED  
DATE FEB. 4, 1965

*James M. ...*  
DIRECTOR OF PUBLIC UTILITIES

*J. E. ...*  
COMMISSIONER OF WATER AND HEAT

*Arnold ...*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

*J. P. Connor*  
ENGINEER OF CONSTRUCTION AND SURVEYS

*William J. ...*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT: WATERWORK DETAILS FOR MEDINA-JENNINGS INTERCHANGE IN CLEVELAND, OHIO.



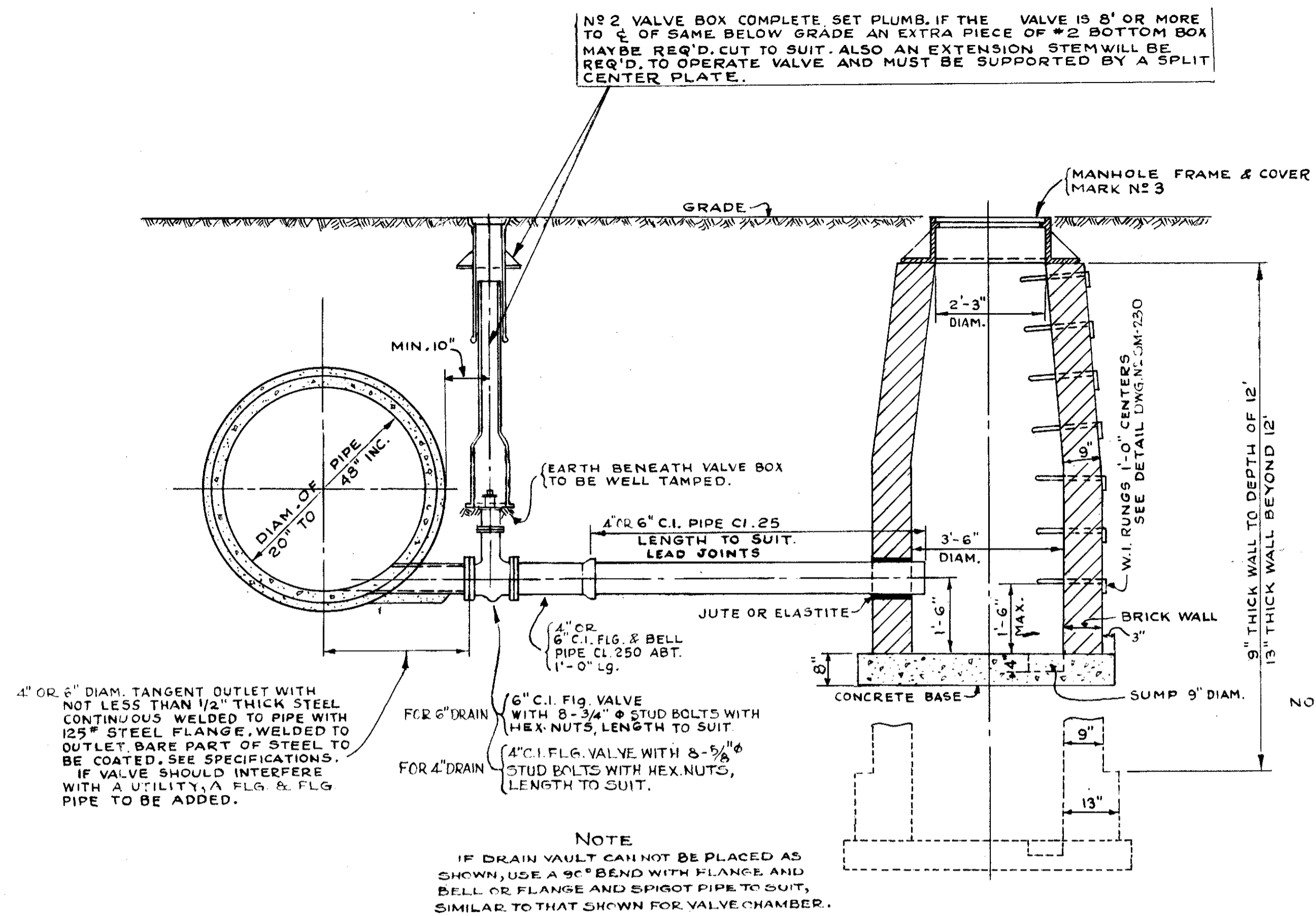


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

543  
646

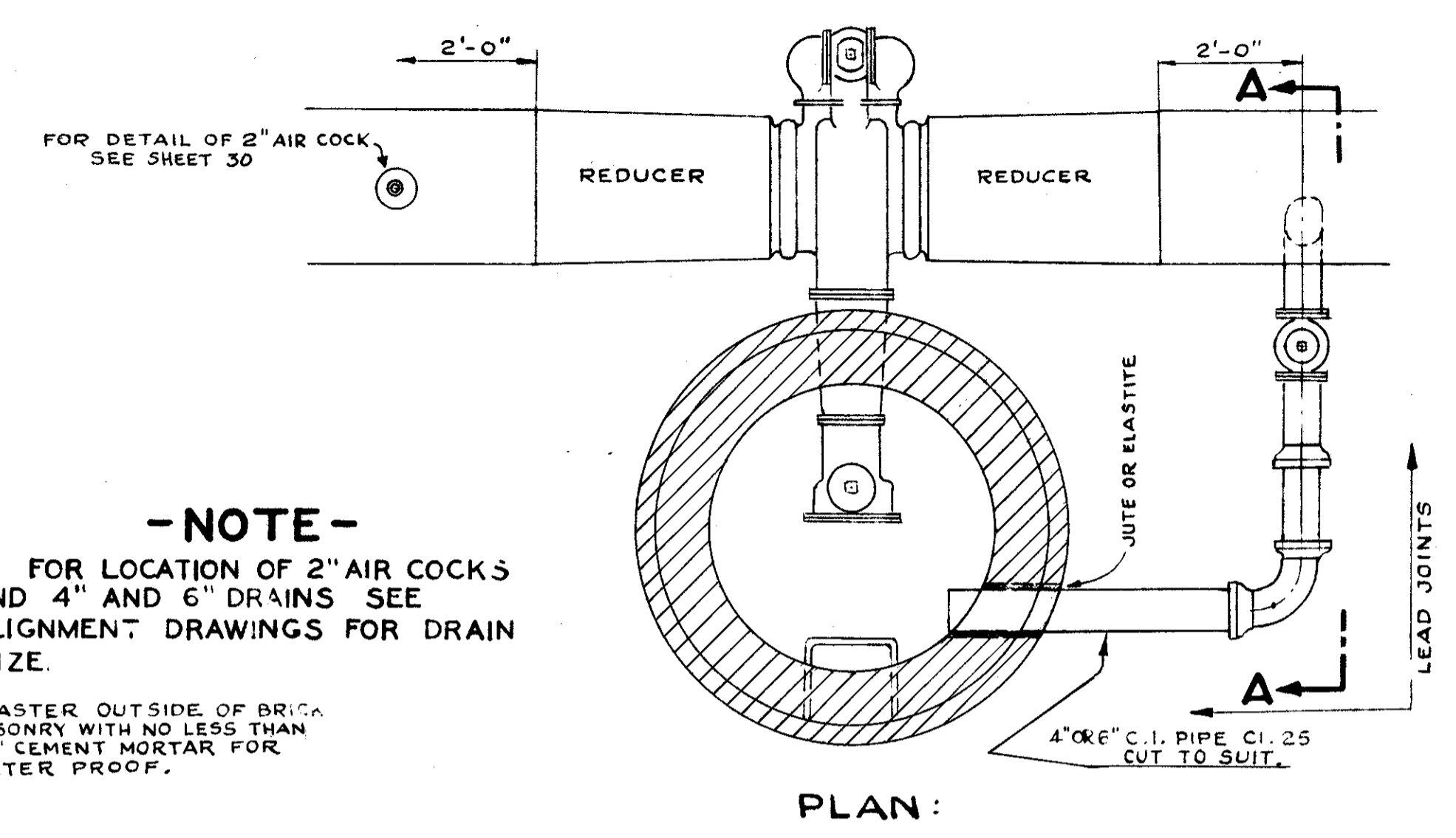
CUYAHOGA COUNTY  
CUY-71-1783  
CUY-176-12.76

33  
34



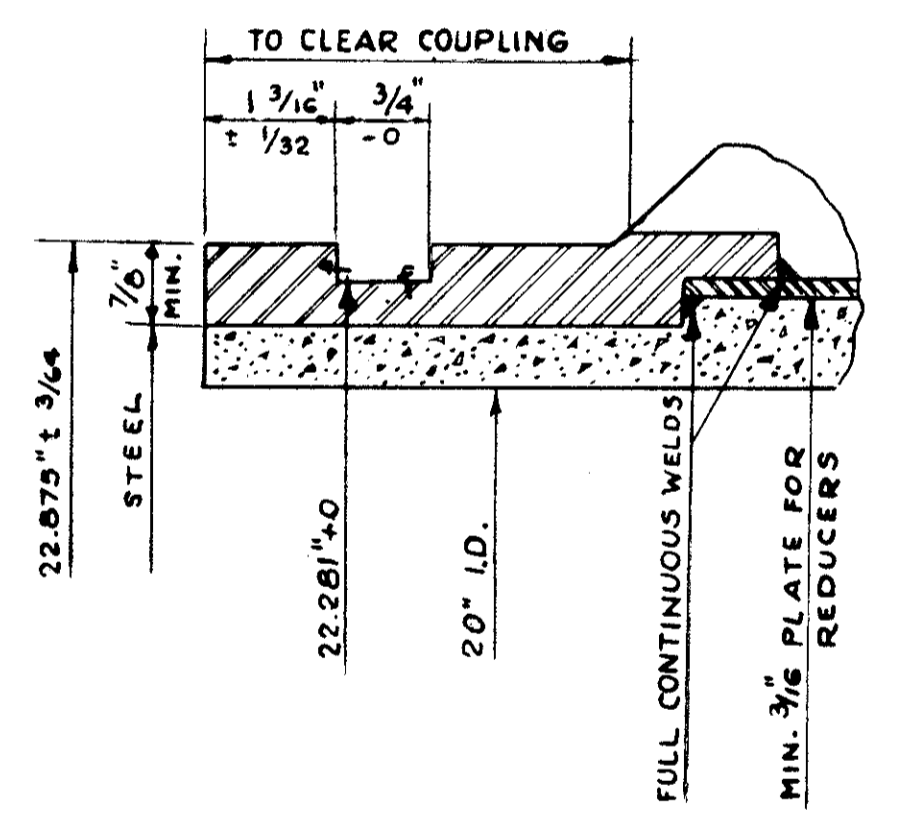
**TYPICAL DETAIL OF 4" OR 6" DRAIN AND VAULT**

DETAIL SHOWN FOR 4 1/2" PIPE  
SCALE: 1/2" = 1 FT.

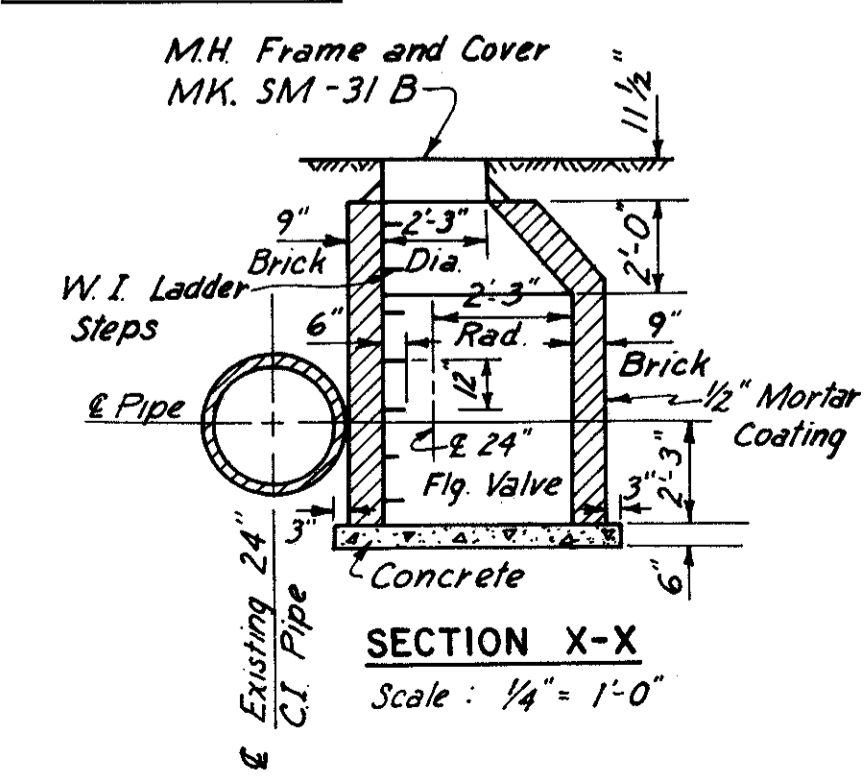


**TYPICAL DETAIL SHOWING 4" OR 6" DRAIN FROM WATER MAIN TO VALVE CHAMBER**

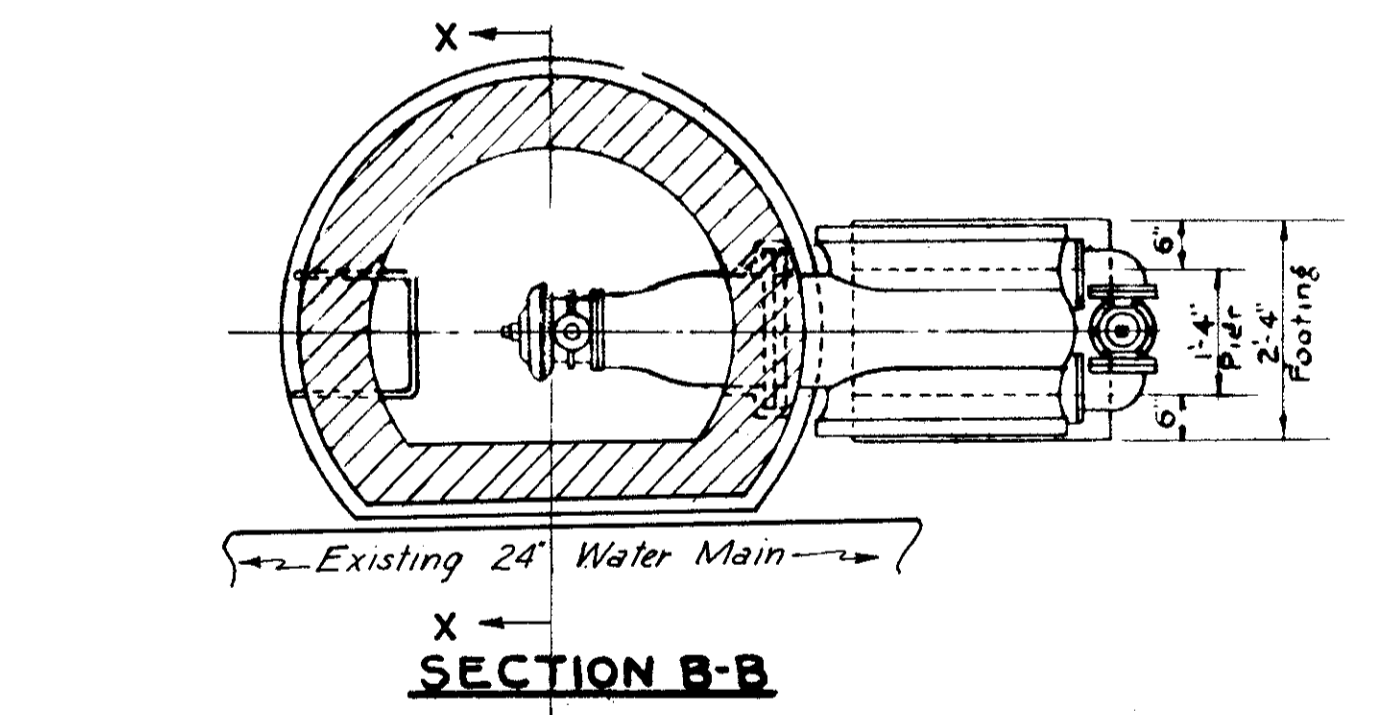
DETAIL SHOWN FOR 24" PIPE & 20" VALVE.  
SCALE: 1/2" = 1 FT.



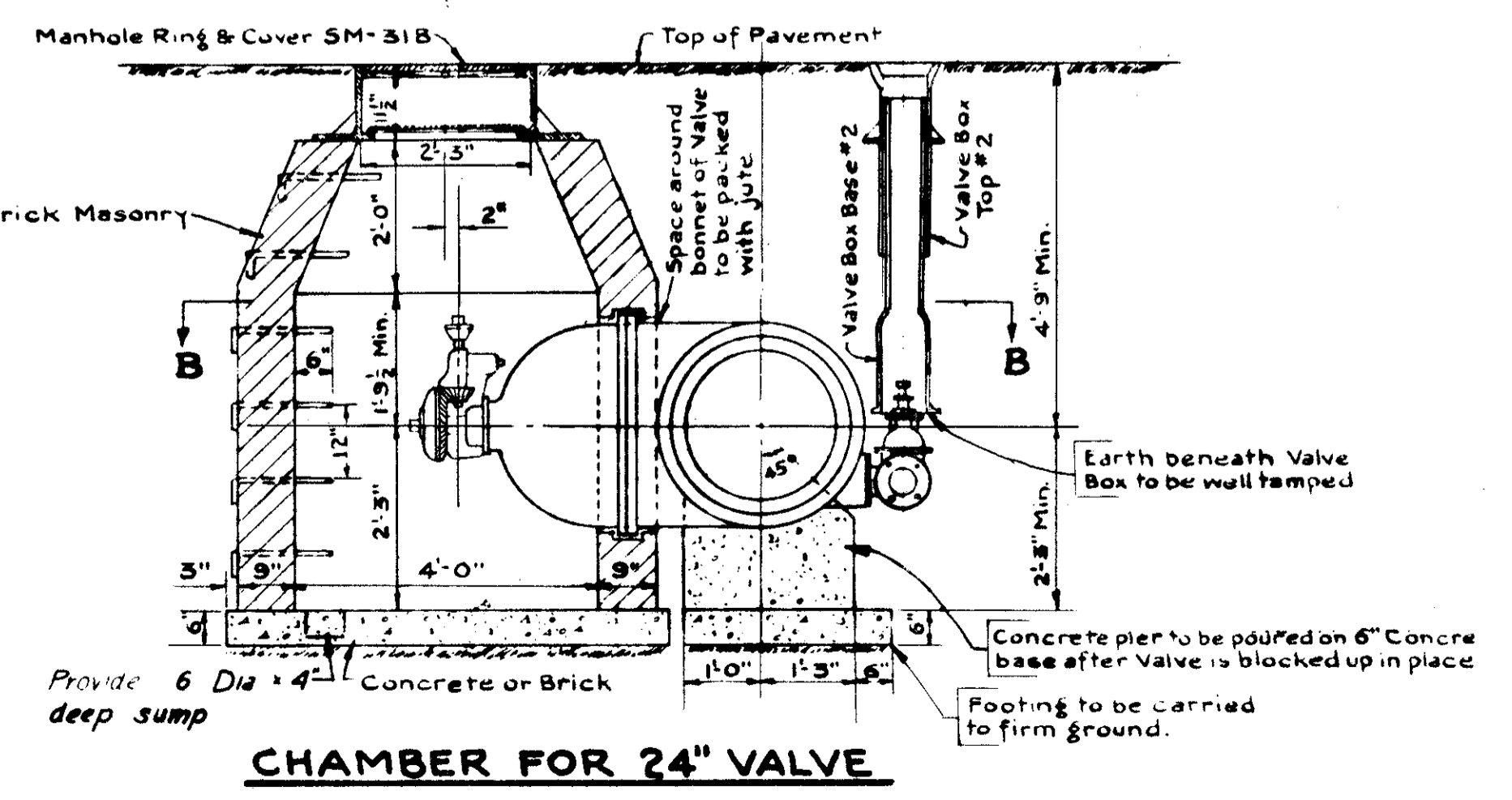
**DETAIL "X" FOR STYLE N°44 victaulic COUPLING.**



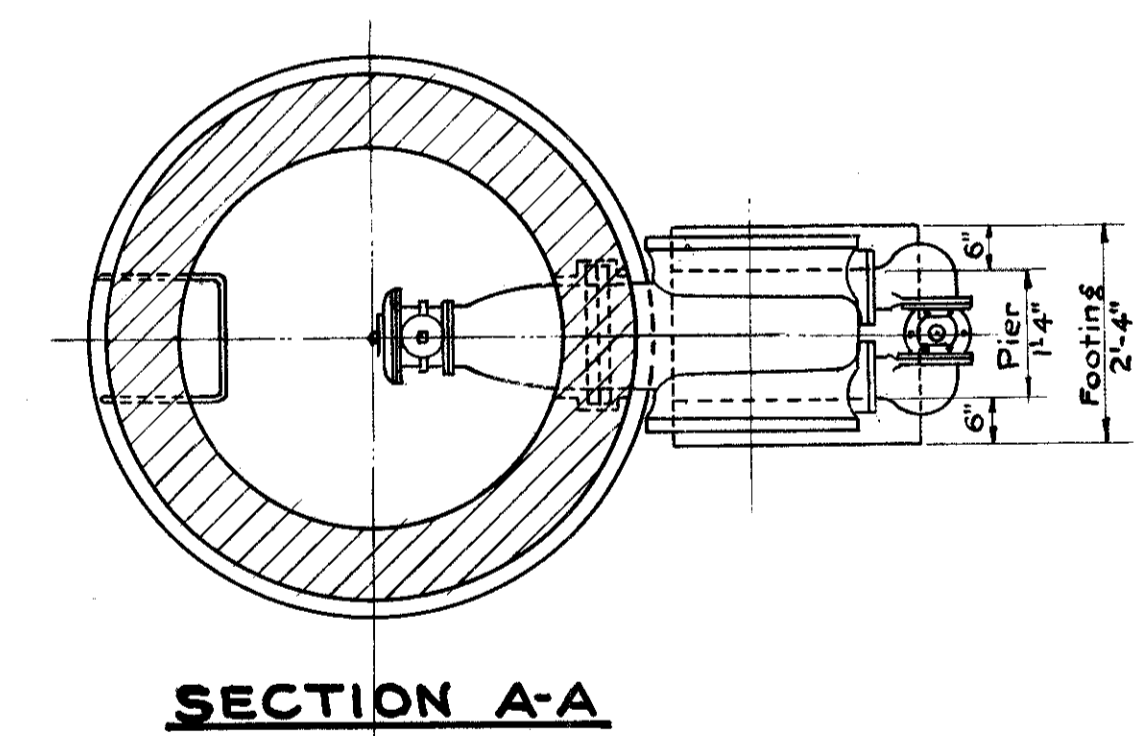
**SECTION X-X**  
Scale: 1/4" = 1'-0"



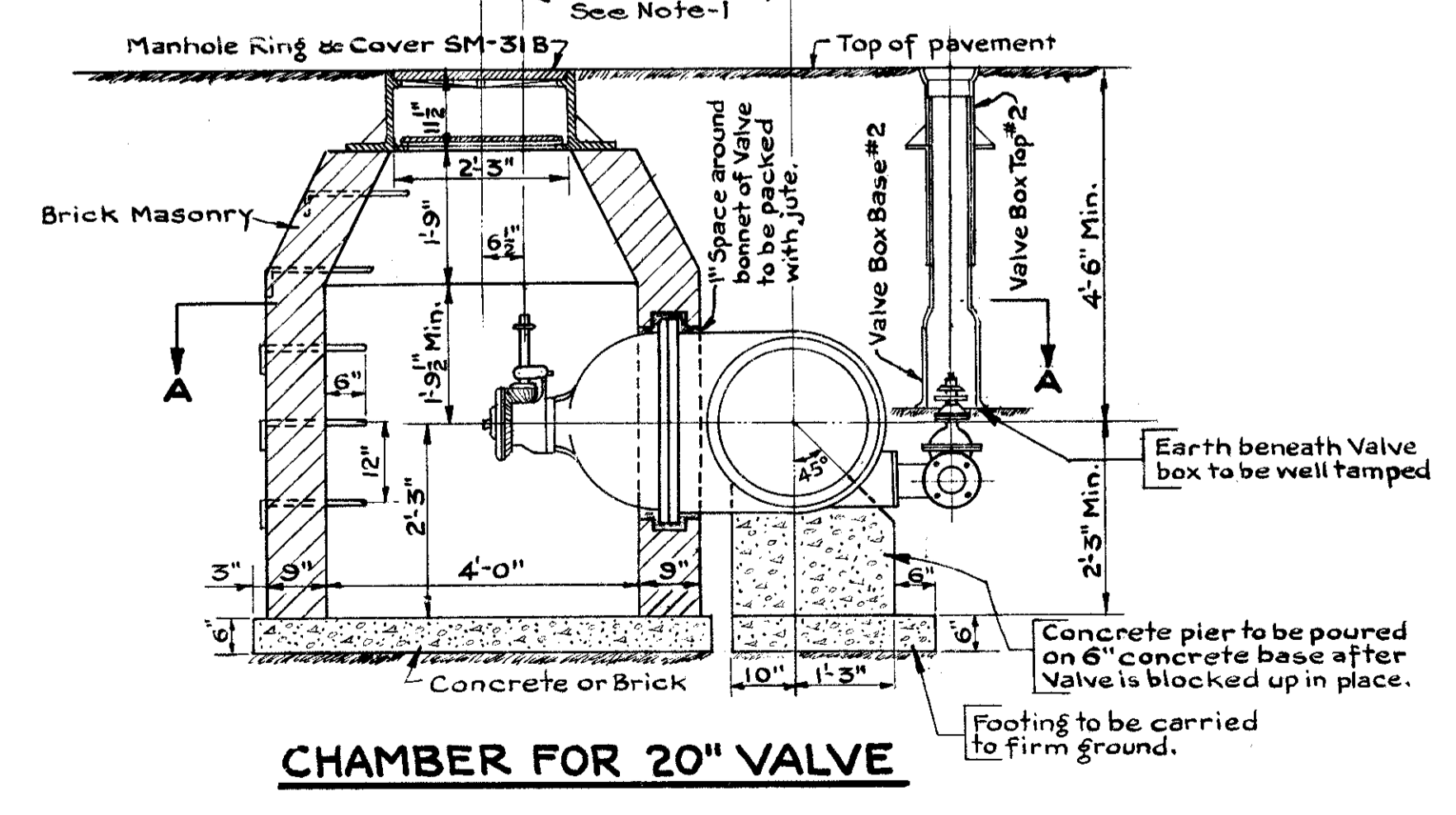
**SECTION B-B**



**CHAMBER FOR 24" VALVE**



**SECTION A-A**



**CHAMBER FOR 20" VALVE**

APPROVED  
DATE FEB. 4, 1965  
*James P. ...*  
DIRECTOR OF PUBLIC UTILITIES  
*...*  
COMMISSIONER OF WATER AND HEAT  
*...*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*...*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William J. ...*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**

DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO

SUBJECT WATERWORK DETAILS FOR MEDINA-JENNINGS INTERCHANGE IN CLEVELAND, OHIO

MADE ECE DATE 1-7-65 TRACED DATE  
CHECKED DATE SCALE As Shown

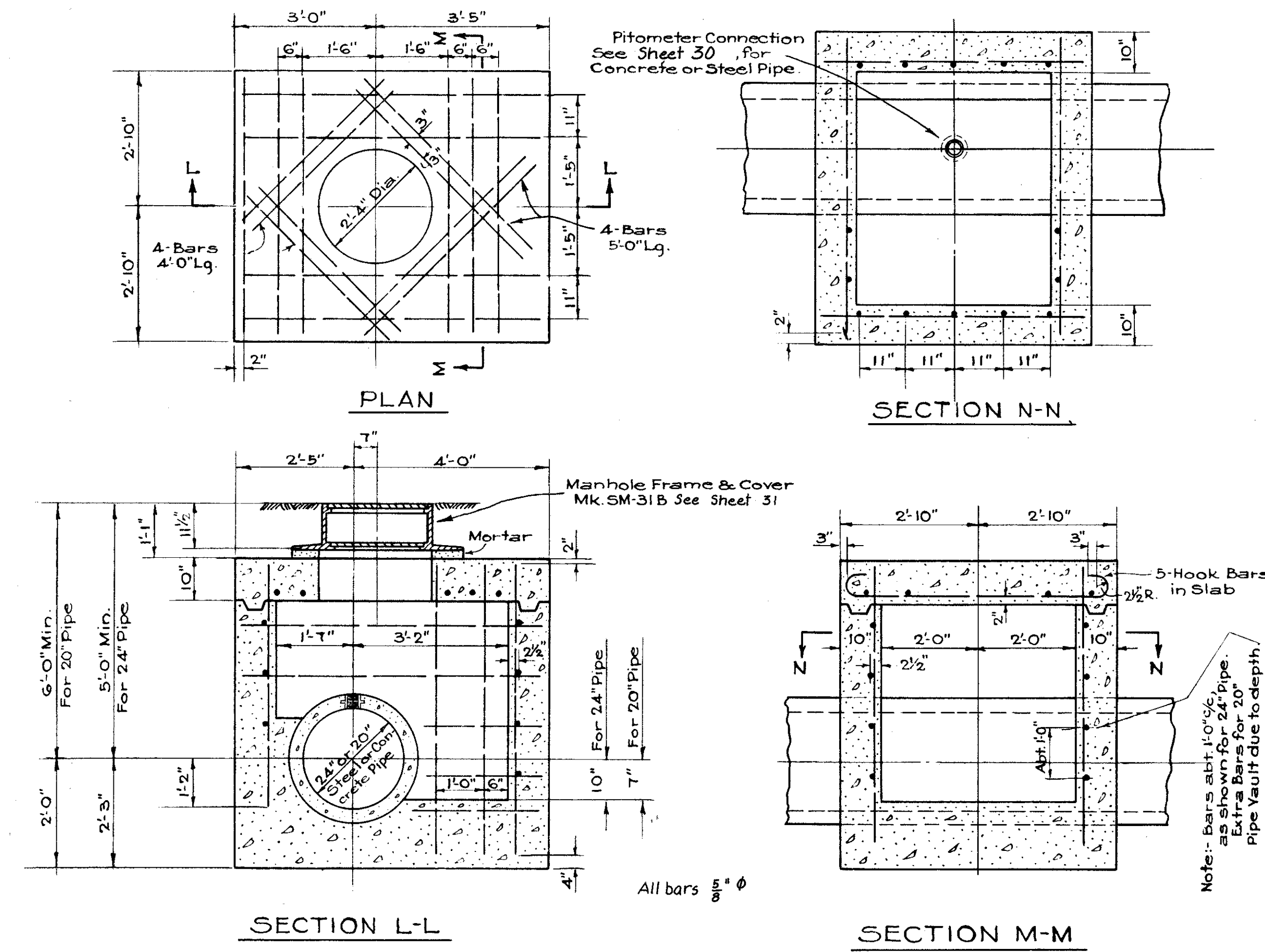
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

544  
646

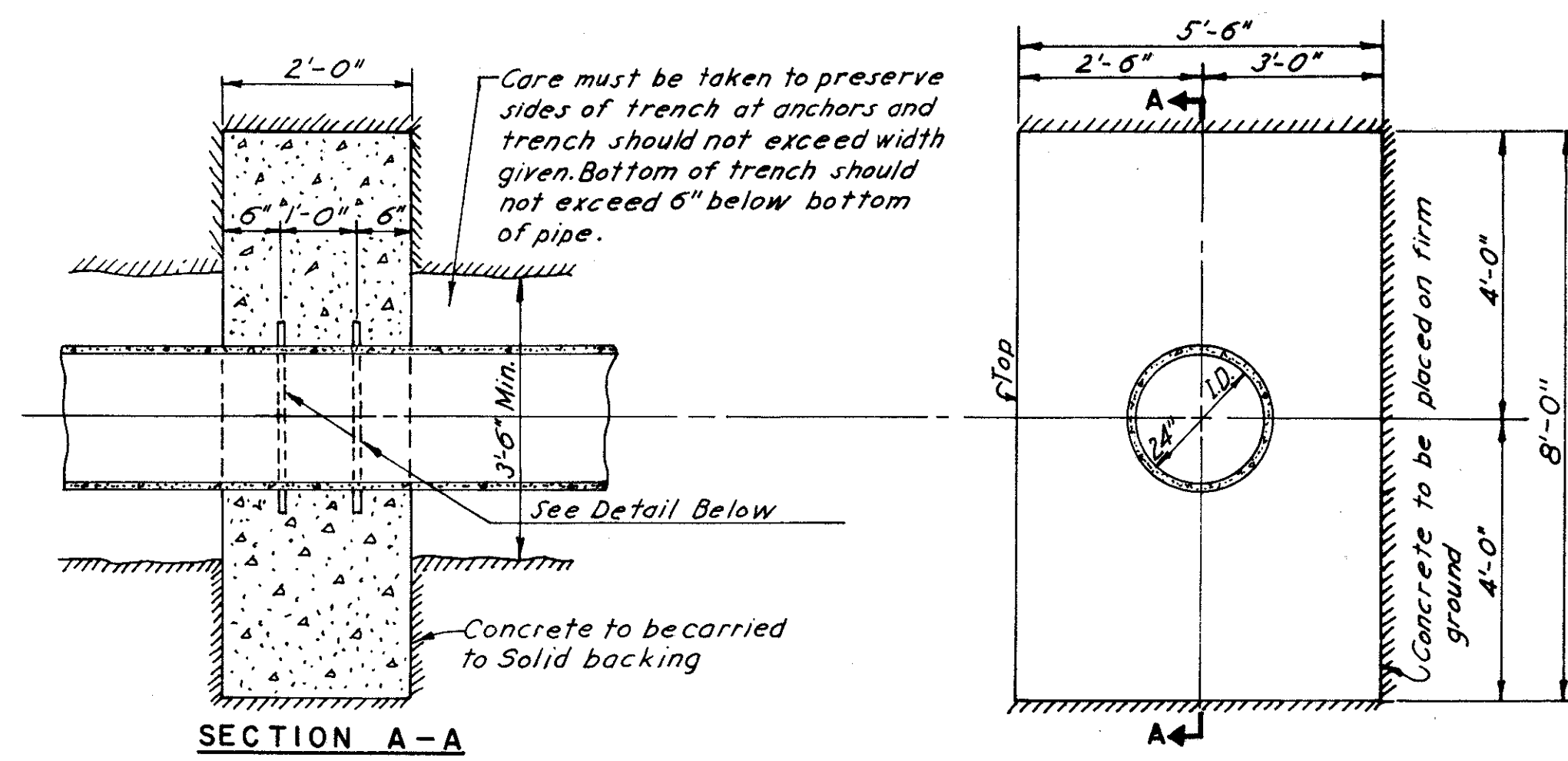
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

34  
34

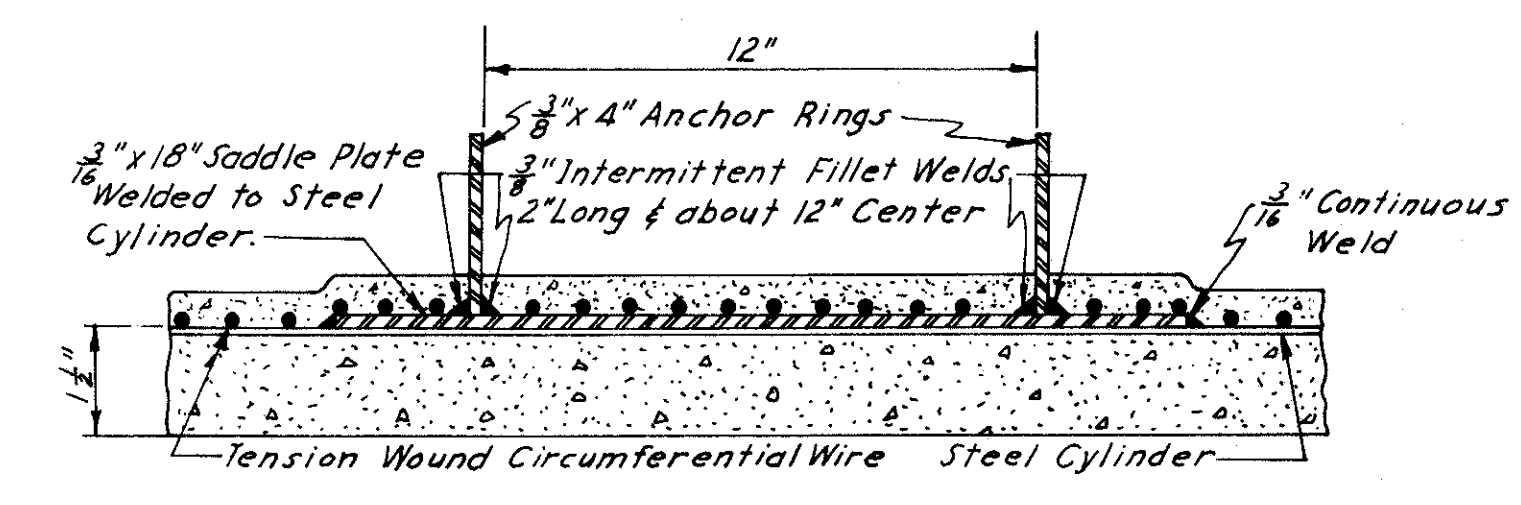


**PITOMETER VAULT FOR 24" AND 20" PIPE  
FOR 24" PIPE SHOWN**

Quantity of 2 Each carried to the  
General Summary to be used where  
directed by the Engineer.



**PLAIN ANCHOR**  
Scale 1/2" = 1'-0"



**ANCHOR DETAIL FOR 24" PIPE**

APPROVED  
DATE FEB. 4, 1965  
*J. M. Malto*  
DIRECTOR OF PUBLIC UTILITIES  
*J. E. Hutto*  
COMMISSIONER OF WATER AND HEAT  
*Arnold Proff*  
COMMISSIONER DIVISION OF UTILITIES ENGINEERING  
*J. R. Corner*  
ENGINEER OF CONSTRUCTION AND SURVEYS  
*William J. Sweeney*  
ENGINEER OF DESIGN

**LOW SERVICE DISTRICT**  
DEPARTMENT OF PUBLIC UTILITIES  
DIVISION OF WATER AND HEAT  
CLEVELAND, OHIO  
SUBJECT: WATERWORK DETAILS FOR MEDINA-  
JENNINGS INTERCHANGE IN  
CLEVELAND, OHIO

MADE E.C.E. DATE 1-6-65 TRACED DATE  
CHECKED DATE SCALE As Noted

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

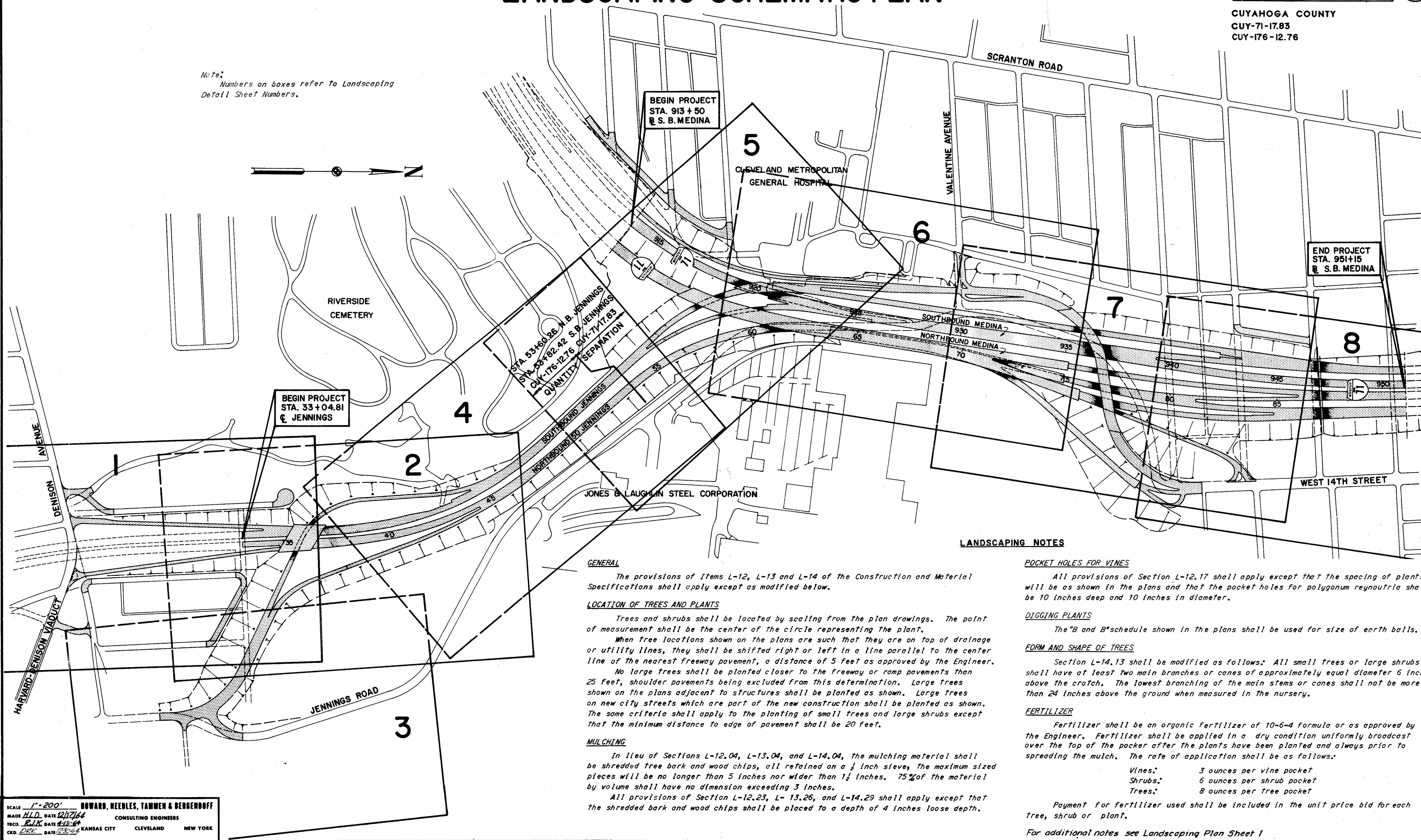


# LANDSCAPING SCHEMATIC PLAN

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		545 646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

Note:  
 Numbers on boxes refer to Landscaping  
 Detail Sheet Numbers.



## LANDSCAPING NOTES

### GENERAL

The provisions of Items L-12, L-13 and L-14 of the Construction and Material Specifications shall apply except as modified below.

### LOCATION OF TREES AND PLANTS

Trees and shrubs shall be located by scaling from the plan drawings. The point of measurement shall be the center of the circle representing the plant.  
 When tree locations shown on the plans are such that they are on top of drainage or utility lines, they shall be shifted right or left in a line parallel to the center line of the nearest freeway pavement, a distance of 5 feet as approved by the Engineer.  
 No large trees shall be planted closer to the freeway or ramp pavements than 25 feet, shoulder pavements being excluded from this determination. Large trees shown on the plans adjacent to structures shall be planted as shown. Large trees on new city streets which are part of the new construction shall be planted as shown. The same criteria shall apply to the planting of small trees and large shrubs except that the minimum distance to edge of pavement shall be 20 feet.

### MULCHING

In lieu of Sections L-12.04, L-13.04, and L-14.04, the mulching material shall be shredded tree bark and wood chips, all retained on a 1/2 inch sieve, the maximum sized pieces will be no longer than 5 inches nor wider than 1 1/2 inches. 75% of the material by volume shall have no dimension exceeding 3 inches.  
 All provisions of Section L-12.23, L-13.26, and L-14.29 shall apply except that the shredded bark and wood chips shall be placed to a depth of 4 inches loose depth.

### POCKET HOLES FOR VINES

All provisions of Section L-12.17 shall apply except that the spacing of plants will be as shown in the plans and that the pocket holes for polygonum Reynoutria shall be 10 inches deep and 10 inches in diameter.

### DIGGING PLANTS

The "B and B" schedule shown in the plans shall be used for size of earth balls.

### FORM AND SHAPE OF TREES

Section L-14.13 shall be modified as follows: All small trees or large shrubs shall have at least two main branches or canes of approximately equal diameter 6 inches above the crotch. The lowest branching of the main stems or canes shall not be more than 24 inches above the ground when measured in the nursery.

### FERTILIZER

Fertilizer shall be an organic fertilizer of 10-6-4 formula or as approved by the Engineer. Fertilizer shall be applied in a dry condition uniformly broadcast over the top of the pocker after the plants have been planted and always prior to spreading the mulch. The rate of application shall be as follows:

Vines:	3 ounces per vine pocket
Shrubs:	6 ounces per shrub pocket
Trees:	8 ounces per tree pocket

Payment for fertilizer used shall be included in the unit price bid for each tree, shrub or plant.

For additional notes see Landscaping Plan Sheet 1

SCALE 1" = 200'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE H.L.D. DATE 12/27/64 CONSULTING ENGINEERS  
 TRCD R.L.K. DATE 4/13/65  
 CRD. DRK. DATE 12/30/64 KANSAS CITY CLEVELAND NEW YORK

**LANDSCAPING NOTES**

SEEDING AND SODDING

The Contractor shall water all seeded areas as directed by the Engineer to the extent necessary to promote growth of a dense, even stand of grass.

A thick uniform stand of growing grasses, satisfactory to the Engineer, will be required before seeded or sodded areas will be accepted. The Contractor shall water, mow and reseed bare areas as required by the Engineer in the period prior to date of acceptance of the project. Cost of necessary watering and reseeding seeded or sodded areas shall be included in the price bid per square yard for seeding or sodding.

**LANDSCAPING NOTES**

DEFINITIONS

Date of acceptance referred to in the note captioned "Seeding and Sodding" is defined as the date of the letter from the Engineer of Construction to the Contractor which notifies him that the final inspection has been made and that he is relieved of the responsibility for further maintenance.

Life of the contract, referred to in Items L-12, L-13 and L-14 is defined as the entire period beginning on the date the contract is signed by the Director of Highways and terminating on the date of the letter from the Engineer of Construction to the Contractor which notifies him that the final inspection has been made and that he is relieved of the responsibility for further maintenance.

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
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CUY. 176-12.76

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**LANDSCAPING NOTES**

SEEDING AND PROTECTING

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

Seed shall be sown at the rate of three (3) pounds per 1,000 square feet, and shall be a uniform mixture in the following proportions in lieu of the mixture listed in Section L-9.11:

- 65% Creeping Red Fescue
- 25% Kentucky Blue Grass
- 10% Red Top

ITEM SPECIAL - MOWING SEEDED AND SODDED AREAS

The Contractor shall mow all seeded and sodded areas placed under this project as often as required by the Engineer so that grass height will not exceed six inches at any time during the life of this contract. Mowing shall be performed with suitable tools and equipment so that grass growth will be cut no shorter than three inches in height.

The number of acres to be paid for will be for each operation performed by the Contractor for the actual area mowed, as directed by the Engineer. An estimated quantity of 14.4 acres has been included in the General Summary.

The acres measured as provided above shall be paid for at the contract unit price bid per acre for "Item Special - Mowing Seeded and Sodded Areas", which price and payment shall constitute full compensation for furnishing all labor, material, tools, equipment and incidentals necessary to complete this item.

AGRICULTURAL LIMING MATERIAL

The location and need for agricultural liming materials will be determined by the Engineer on the basis of laboratory tests after rough grading operations have been performed. The quantity of agricultural liming materials shown on the plans is sufficient for application to the entire exposed soil area of the contract but may be partially or completely omitted, as may be directed by the Engineer if laboratory tests indicate the item is not needed. Agricultural liming material shall be applied at the rate of 100 pounds per 1,000 square feet or surface area, except that on all surfaces of shale it shall be applied at the rate of 10 tons per acre.

The quantity of agricultural liming material is estimated and is included for use only when and in amounts as directed by the Engineer. The amount of this item and its location shall be recorded as used, and payment will be included in the final payment estimate.

COMMERCIAL FERTILIZER

All areas to be seeded under Item L-9 or sodded under Item L-10 shall have commercial fertilizer 12-12-12, applied at the rate of twenty (20) pounds per 1,000 square feet.

PLANTING BEDS

All areas to be seeded shall be free of rock or other foreign material three inches or greater in any dimension and shall be satisfactorily shaped and finished as required by Sections E-1.05(e) and E-1.10 of the specifications. Areas in front of residences, between curb and sidewalk and other specified areas shall be free of all stones one inch or greater in any dimension and shall have smooth surfaces. In such areas hand raking will be required if inaccessible to machines, and may be required if machines do not provide results equivalent to hand raking.

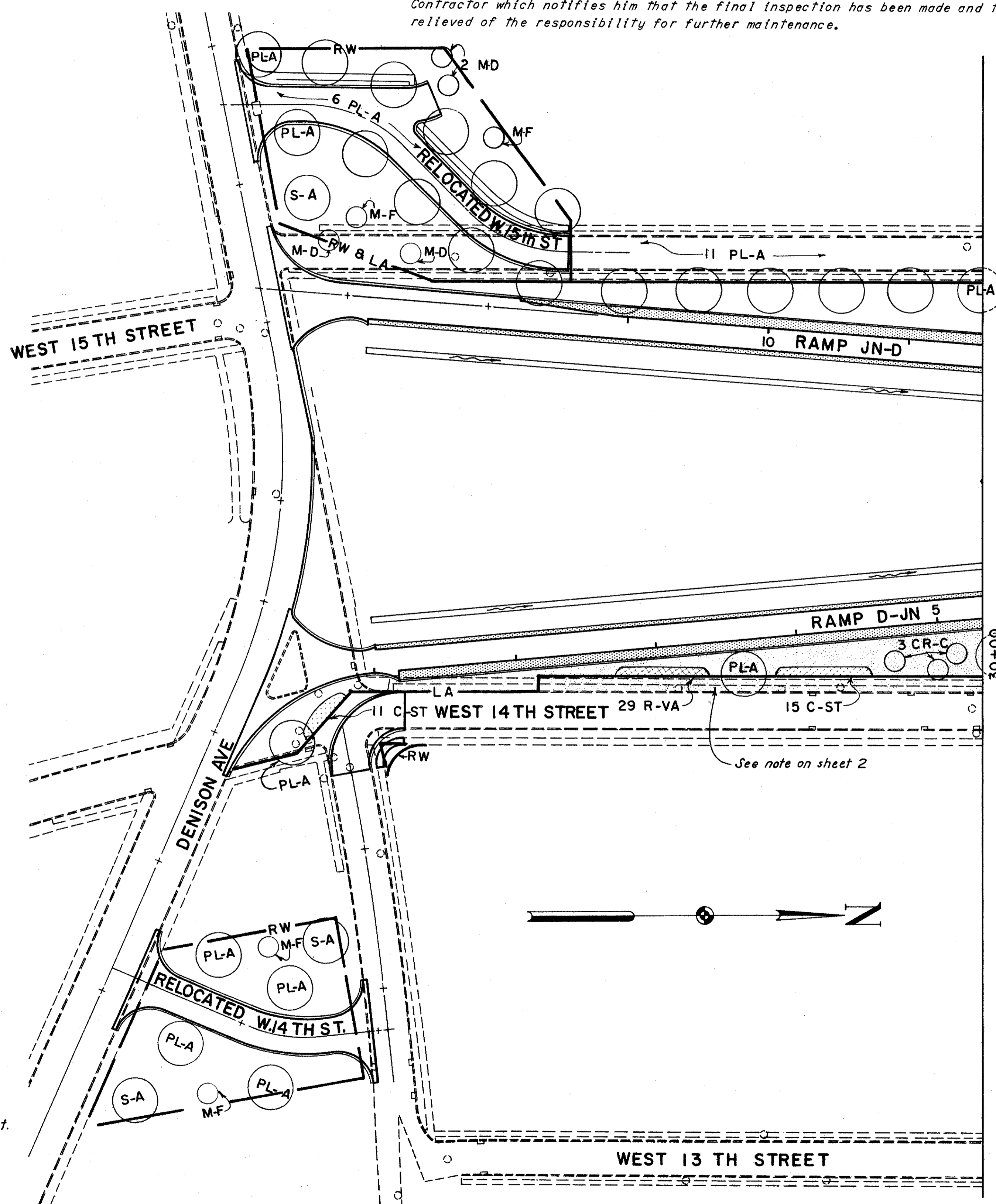
Topsoil removed and stored, under Item E-1, shall be placed and spread to the extent available, over the following areas which are listed in the order of completion, to a depth of four inches over soils or six inches over rock areas with open voids.

- (a) Interchange interiors with slopes of 1 on 3 or flatter.
- (b) Turf medians.
- (c) Shoulders and inslopes 1 on 3 or flatter.
- (d) Backslopes 1 on 3 or flatter.

In areas where the above requirements have not been met and slopes of 1 on 3 or flatter contain visible rocks or foreign material of such quantity that raking is not practicable, the Contractor will be required to remove the upper surface to a depth sufficient to receive a soil cover. Suitable soil shall be stored or furnished, delivered and placed at the Contractor's expense to a depth of four inches over areas where rock or foreign material is intermixed with soil or fine material, or to a depth of six inches where rock or foreign material exists without fines in the voids.

Areas which are to be planted with vines, Item L-12, shall be reasonably free from large rocks in quantity, however, occasional rocks can be tolerated by varying spacing of pocket holes.

Cost of the above work shall be included in the price bid per cubic yard of Roadway Excavation, Item E-1, and no separate payment will be made.



MATCH LINE 30+00 & FUTURE JENNINGS FREEWAY SEE SHEET 2

**LEGEND**

- Large Trees
- Small Trees or Large Shrubs
- Vines
- Crushed Aggregate Slope Protection (Quantities are included with Bridge Plans)

Note:  
Landscape Design by William A. Strong, Landscape Architect.

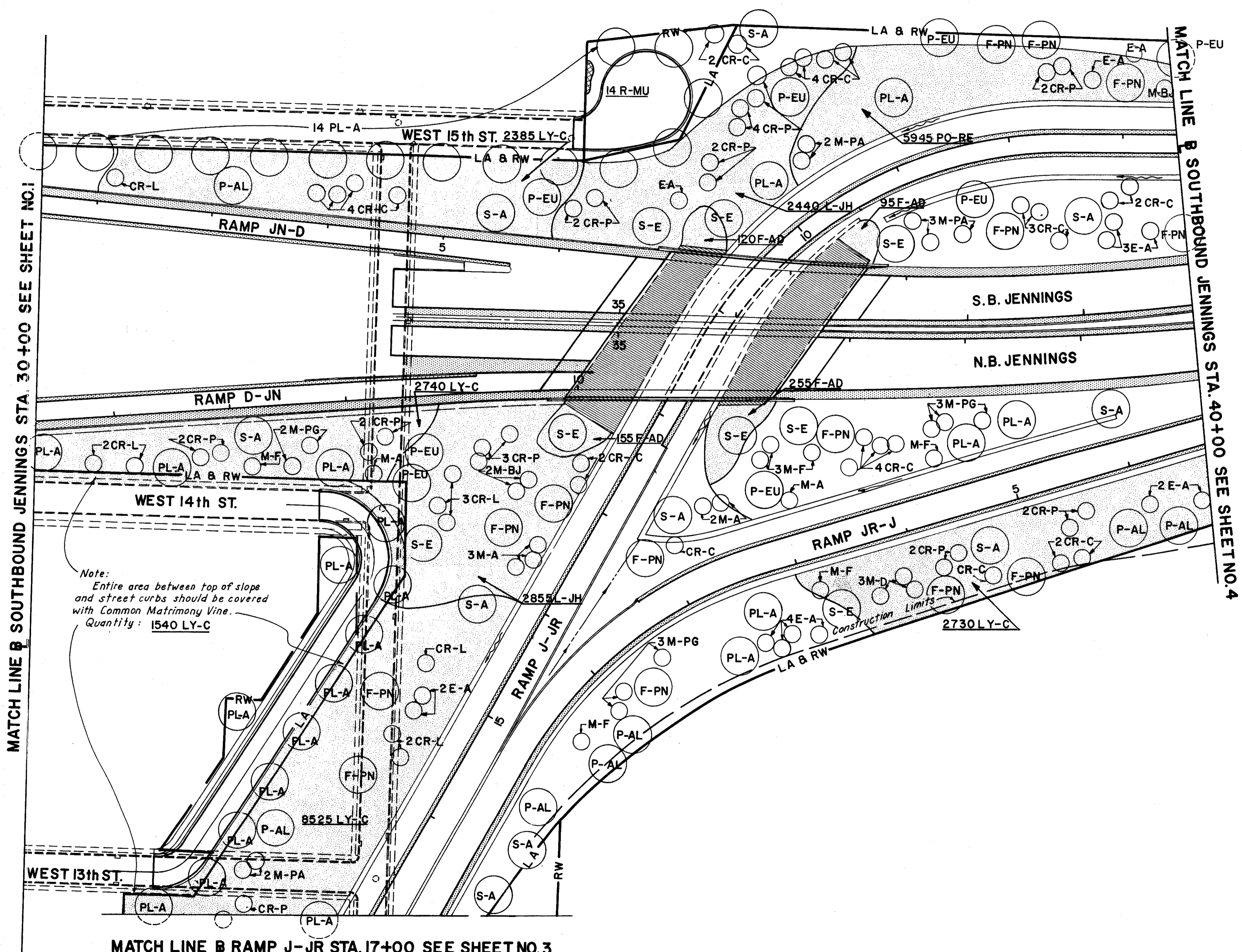
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MADE IM DATE 12-22-64  
TRCD. DATE  
CKD DRK DATE 12-30-64  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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 CUY-71-17.83  
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SCALE 1" = 50'  
 MADE DJS DATE 12-22-64  
 TRCD DATE 12-23-64  
 CKD DRK DATE 12-31-64  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

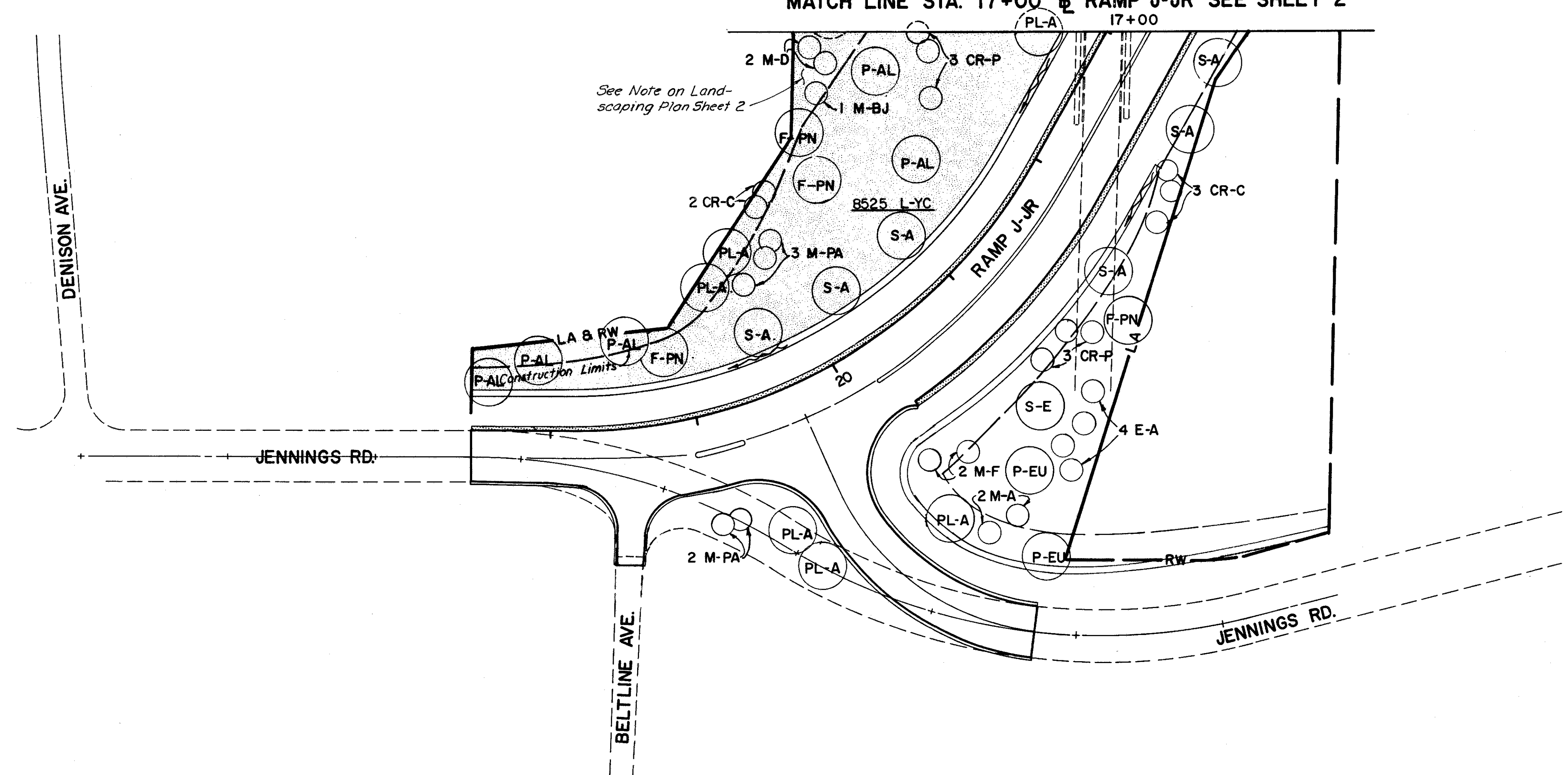
FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
 CUY. 71-17.83  
 CUY 176-12.76

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MATCH LINE STA. 17+00 @ RAMP J-JR SEE SHEET 2



**LEGEND**

-  Large Trees
-  Small Trees or Large Shrubs
-  Vines
-  Crushed Aggregate Slope Protection (Quantities are included with Bridge Plans)



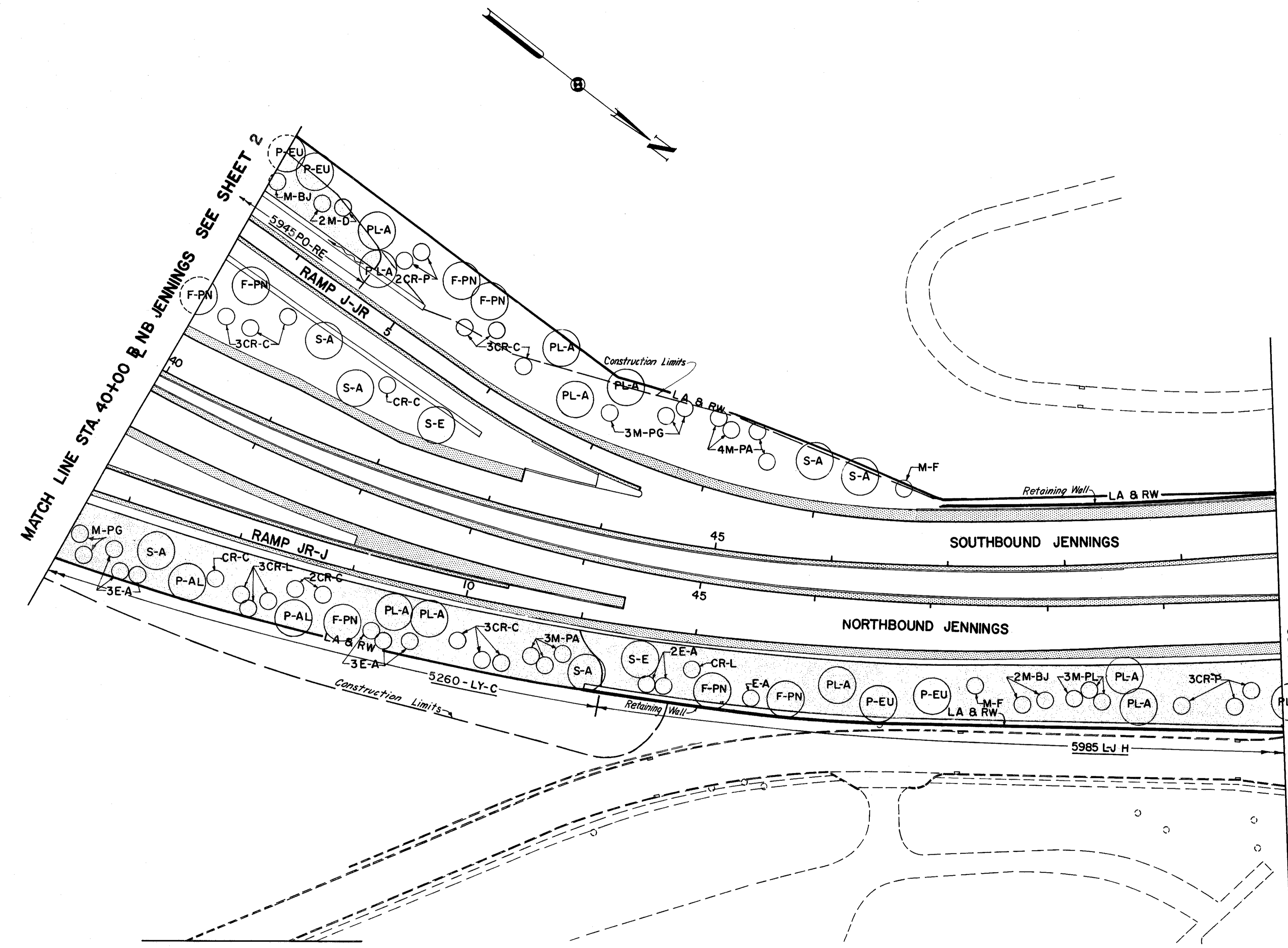
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 TRCD DATE 1-11-65  
 CKD IM DATE 12-30-64  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

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CUYAHOGA COUNTY  
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MATCH LINE STA. 50+00 & NB JENNINGS SEE SHEET 5

- LEGEND**
-  Large Trees
  -  Small Trees or Large Shrubs
  -  Vines
  -  Crushed Aggregate Slope Protection (Quantities are included with Bridge Plans)

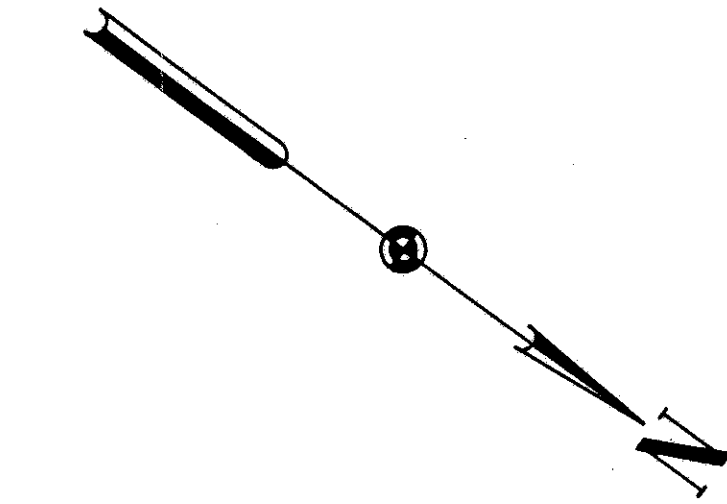
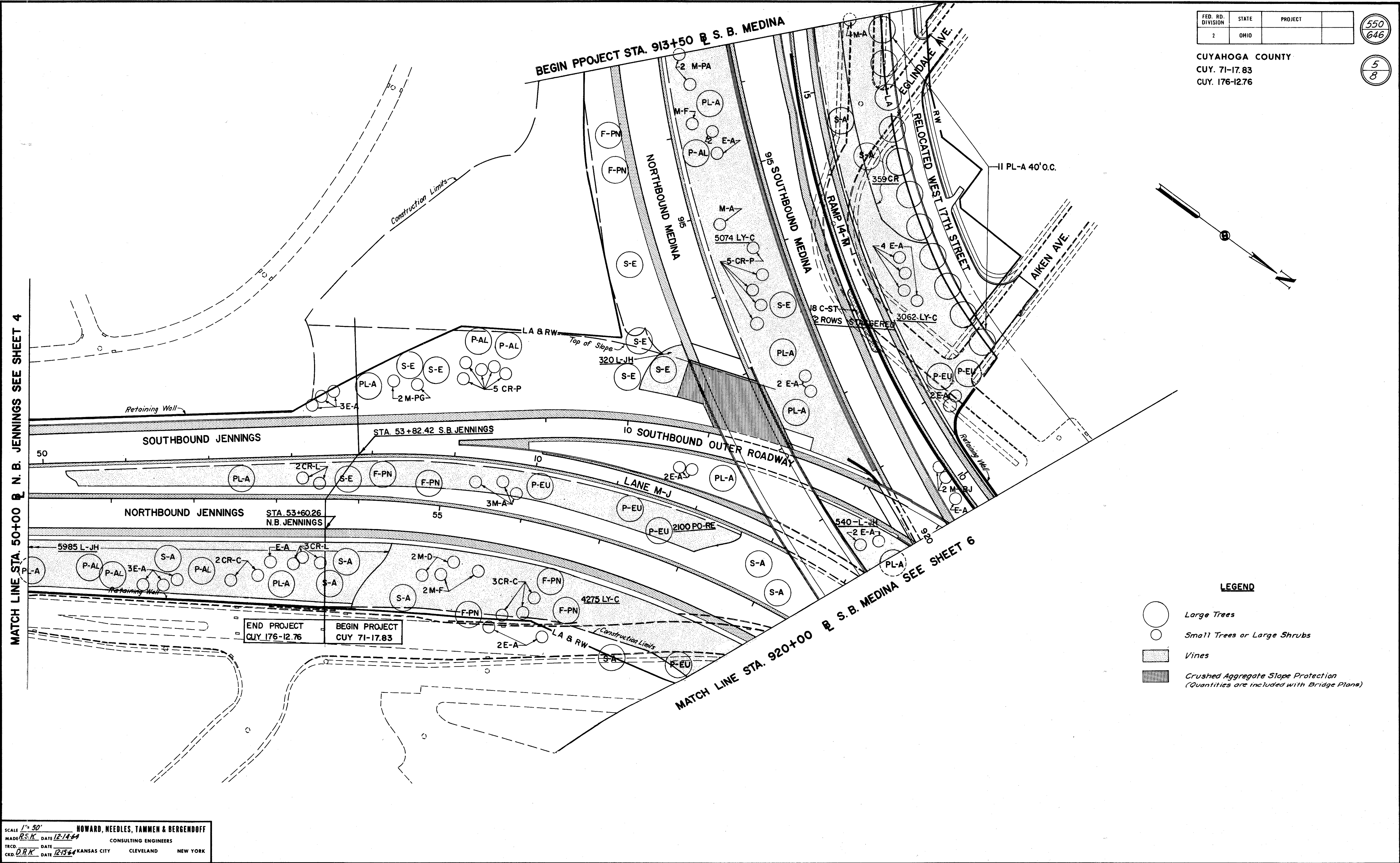
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 MADE R.S.K. DATE 12-14-64  
 TRCD. DATE 12-15-64  
 CKD. DATE 12-15-64  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT	
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CUYAHOGA COUNTY  
CUY. 71-17.83  
CUY. 176-12.76

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**LEGEND**

	Large Trees
	Small Trees or Large Shrubs
	Vines
	Crushed Aggregate Slope Protection (Quantities are included with Bridge Plans)

SCALE 1" = 50'  
 MADE BY R.S.K. DATE 12-14-64  
 TRCD DATE 12-15-64  
 CKD D.R.K. DATE 12-15-64  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

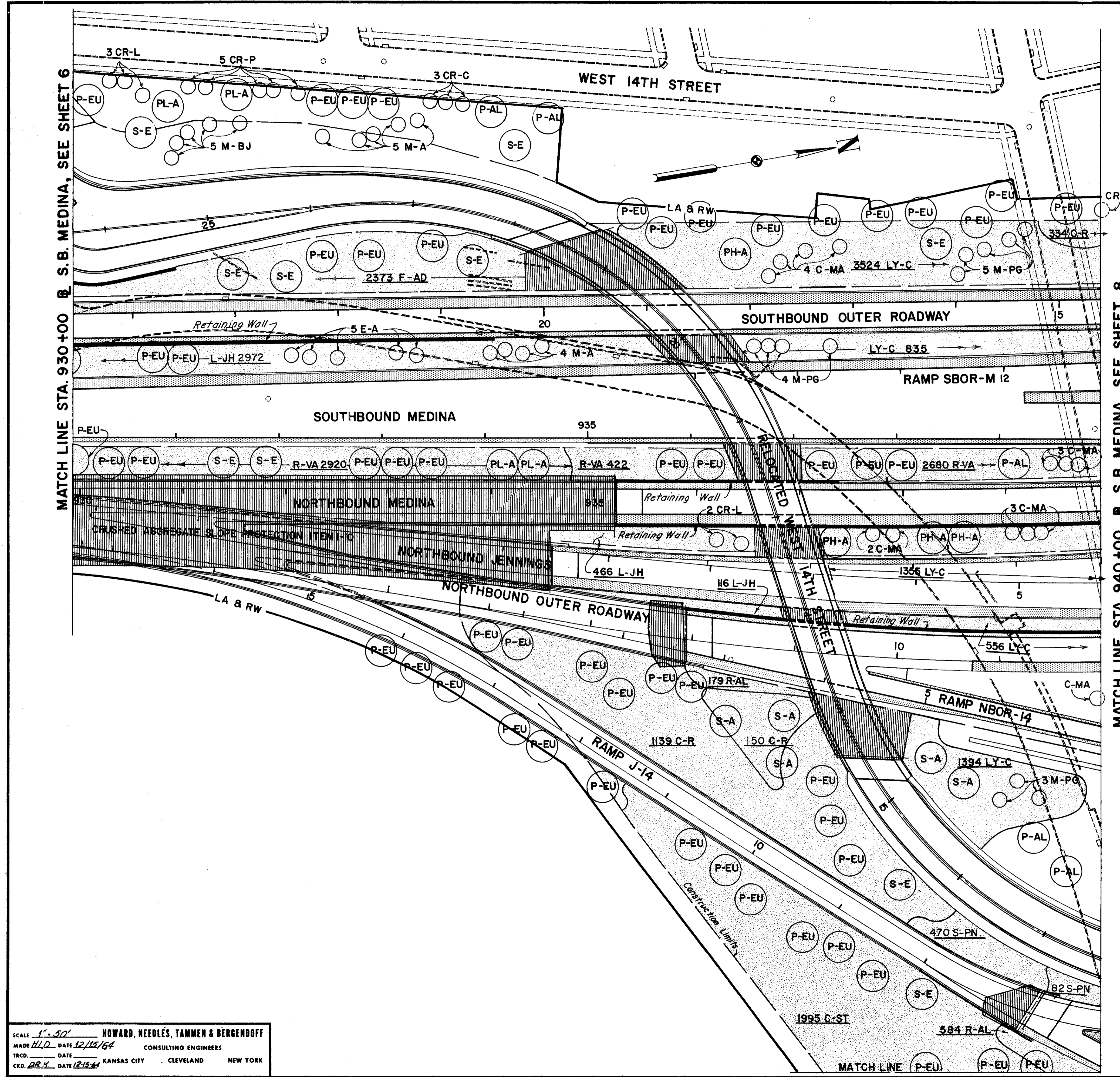


FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY  
CUY-71-1783  
CUY-176-12.76

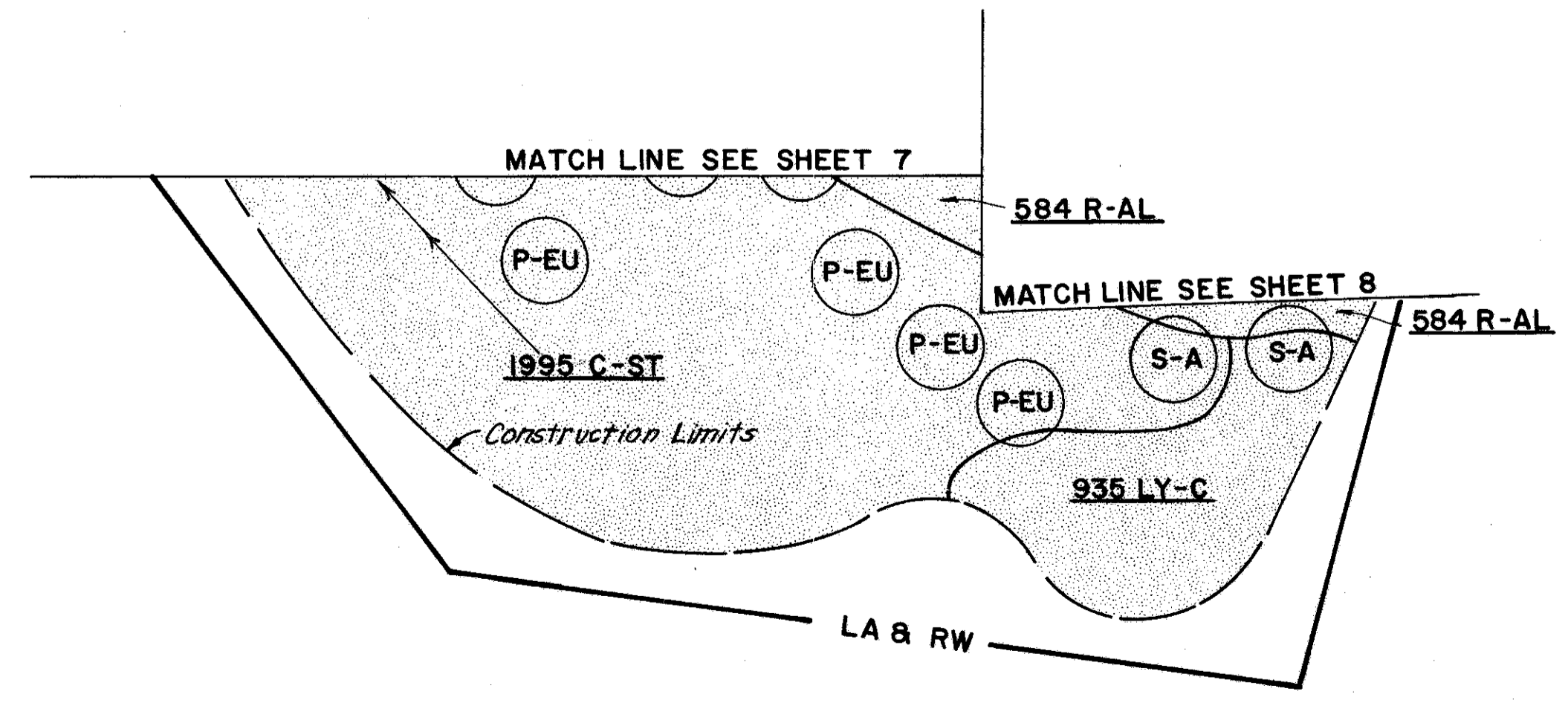
7  
8



MATCH LINE STA. 930+00 @ S.B. MEDINA, SEE SHEET 6

MATCH LINE STA. 940+00 @ S.B. MEDINA, SEE SHEET 8

- LEGEND**
- Large Trees
  - Small Trees or Large Shrubs
  - Vines
  - Crushed Aggregate Slope Protection (Quantities are included with Bridge Plans)



SCALE 1" = 30'  
MADE H.L.D. DATE 12/15/64  
TRCD. DATE  
CND. DR. N. DATE 12-15-64

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

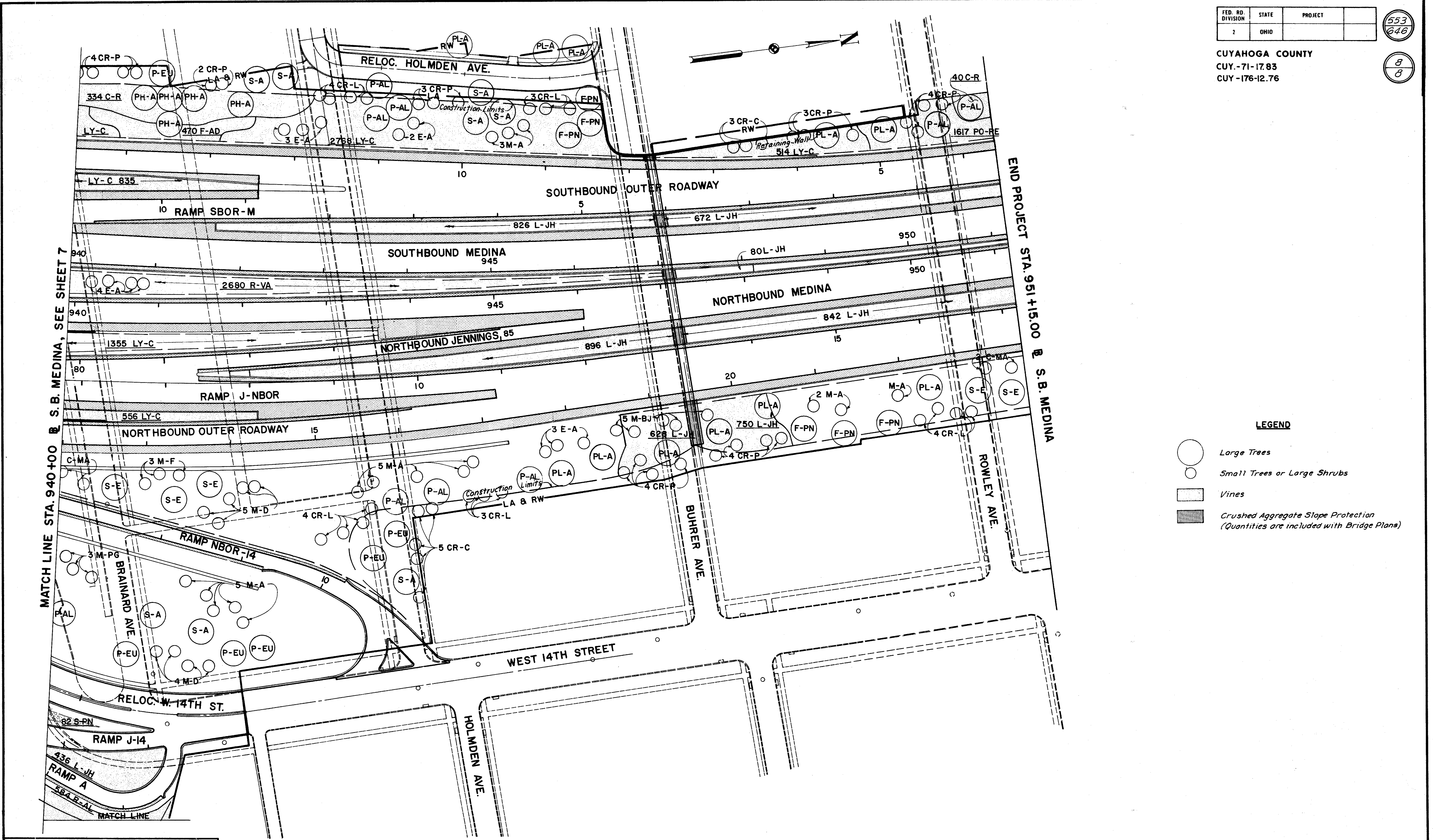


FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY  
CUY.-71-17.83  
CUY.-176-12.76

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**LEGEND**

-  Large Trees
-  Small Trees or Large Shrubs
-  Vines
-  Crushed Aggregate Slope Protection (Quantities are included with Bridge Plans)

SCALE 1" = 50'  
MADE H.L.D. DATE 12/11/64  
TRCD. DATE  
CKD D.R.K. DATE 12-15-64  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

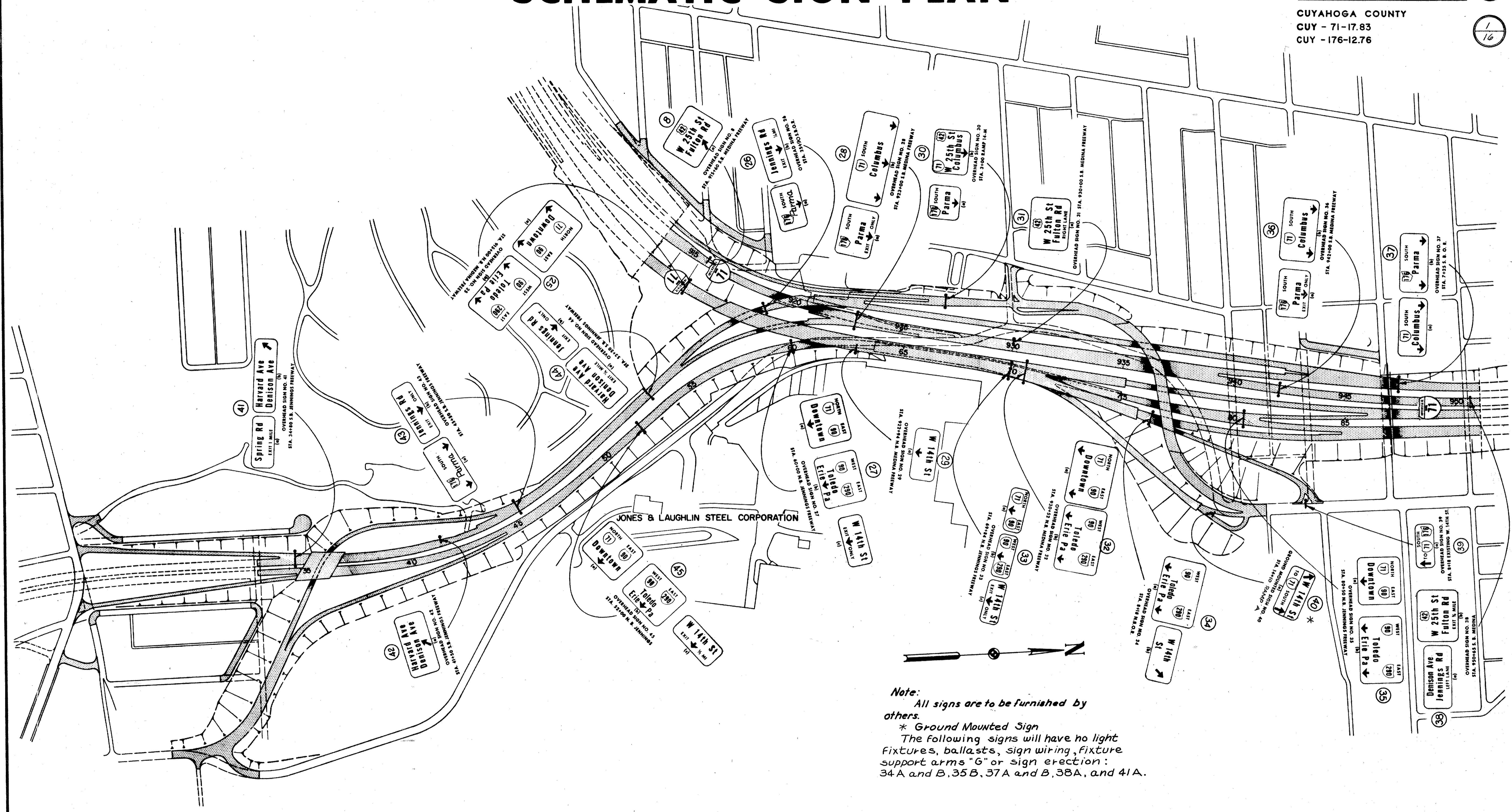
M-17

# SCHEMATIC SIGN PLAN

FED. RD. DIVISION	STATE	PROJECT	554 646
2	OHIO		

CUYAHOGA COUNTY  
 CUY - 71-17.83  
 CUY - 176-12.76

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**Note:**  
 All signs are to be furnished by others.  
 \* Ground Mounted Sign  
 The following signs will have no light fixtures, ballasts, sign wiring, fixture support arms "G" or sign erection:  
 34A and B, 35B, 37A and B, 38A, and 41A.

SCALE 1" = 200'  
 MADE BY HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS  
 DATE 1-22-64  
 TRC. DATE 4-23-64  
 C.B.K. DATE 12-28-64  
 C.D. DATE 12-28-64  
 KANSAS CITY CLEVELAND NEW YORK



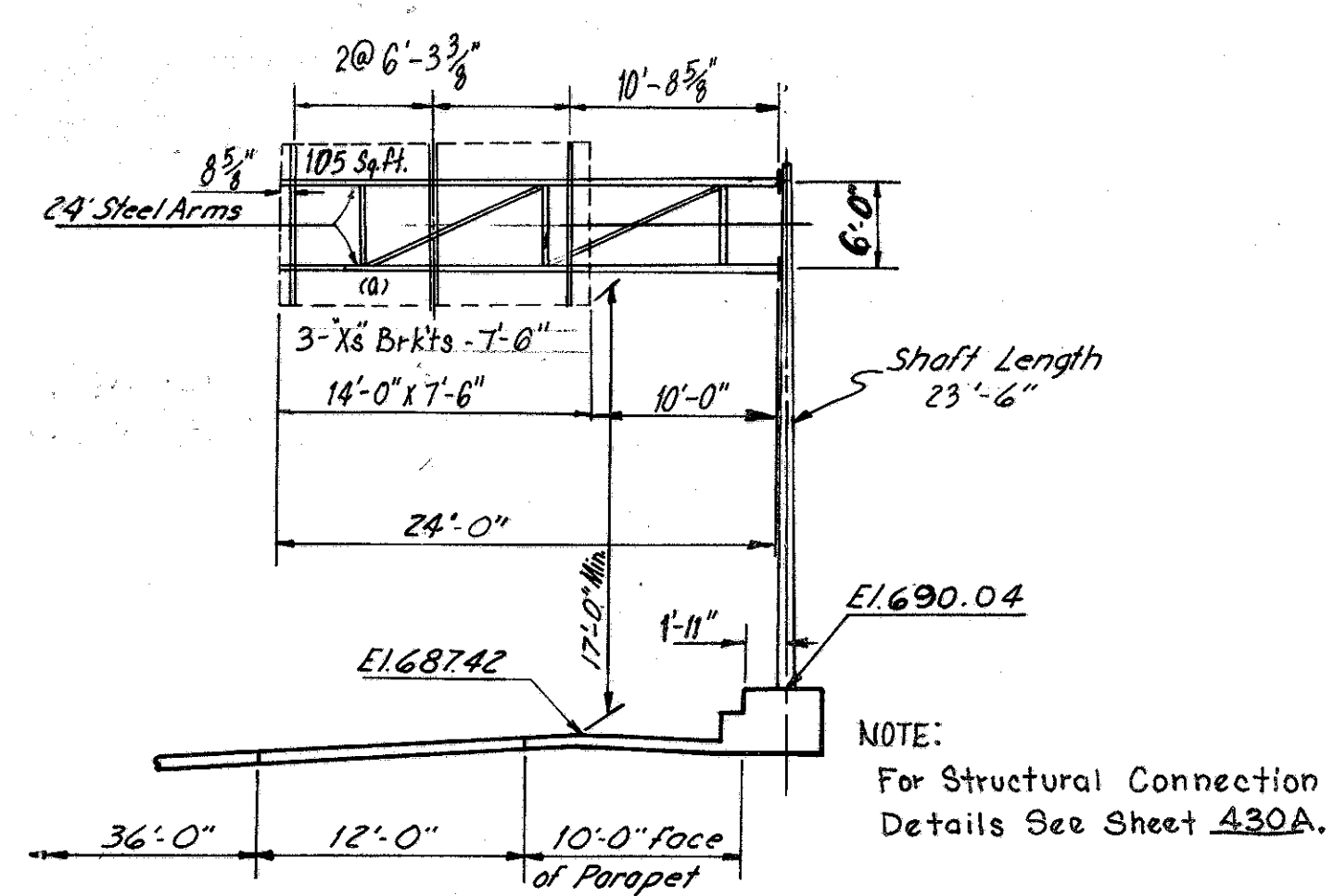
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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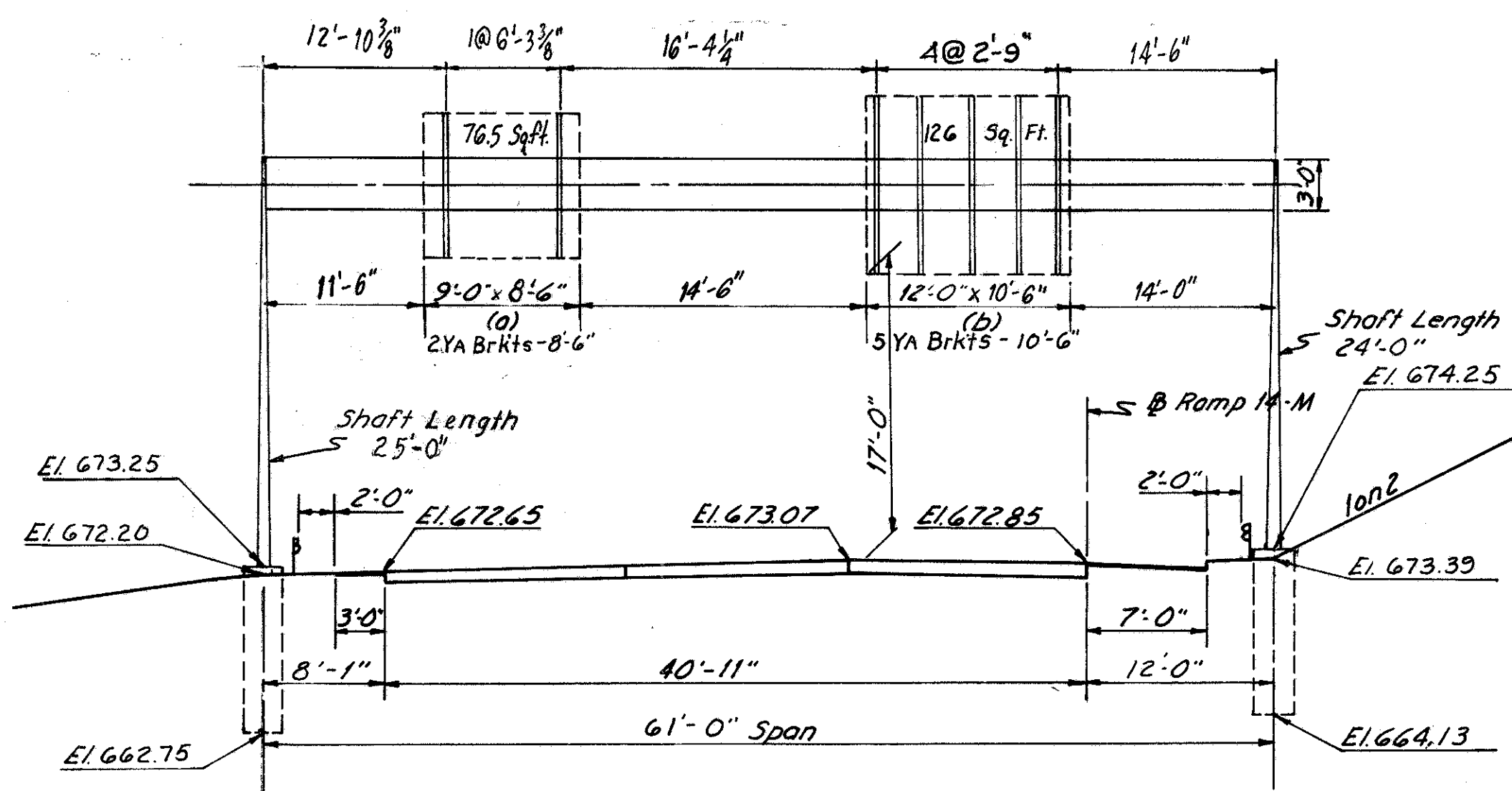
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# SIGN SUPPORT DETAILS

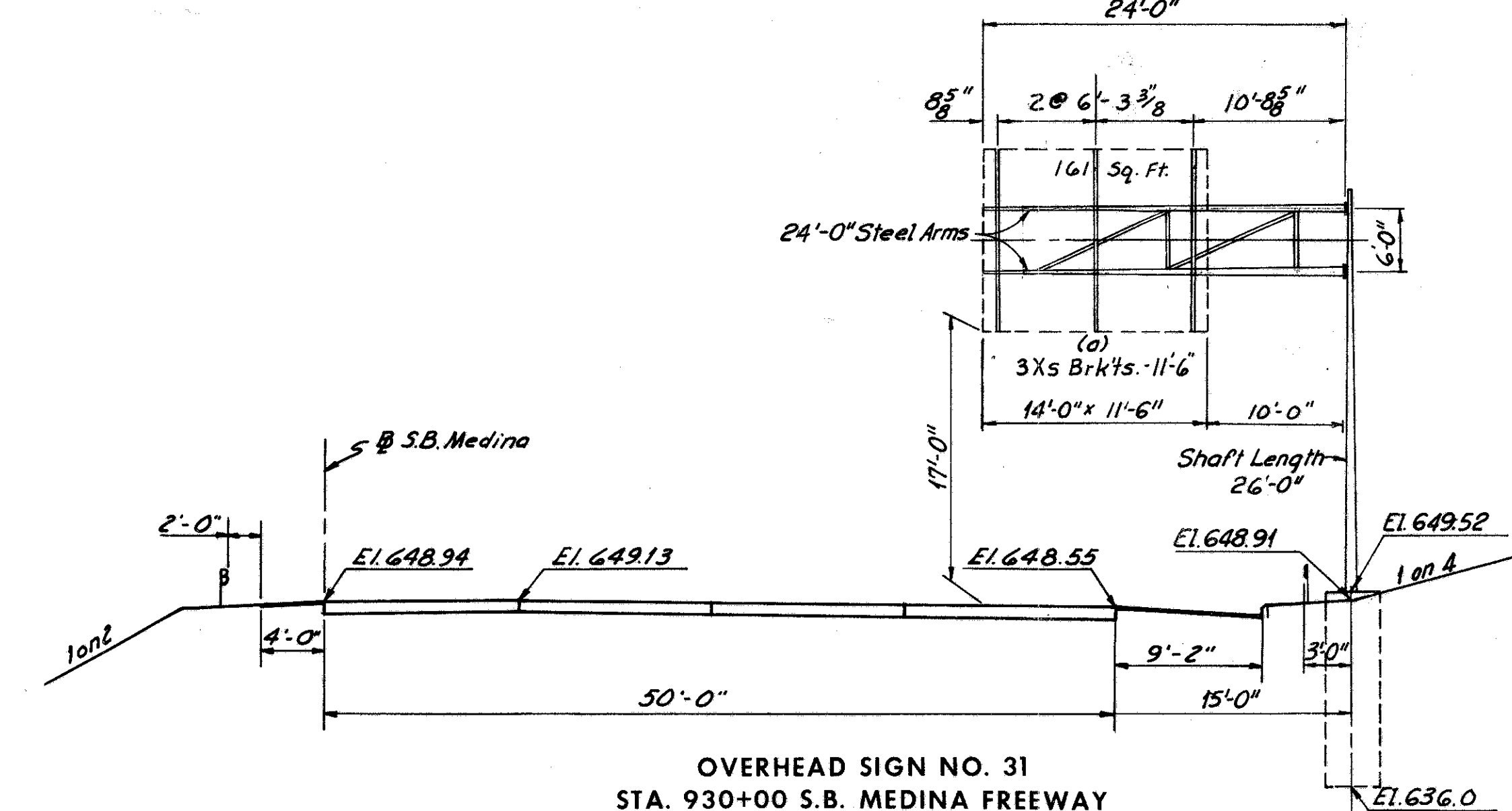
CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



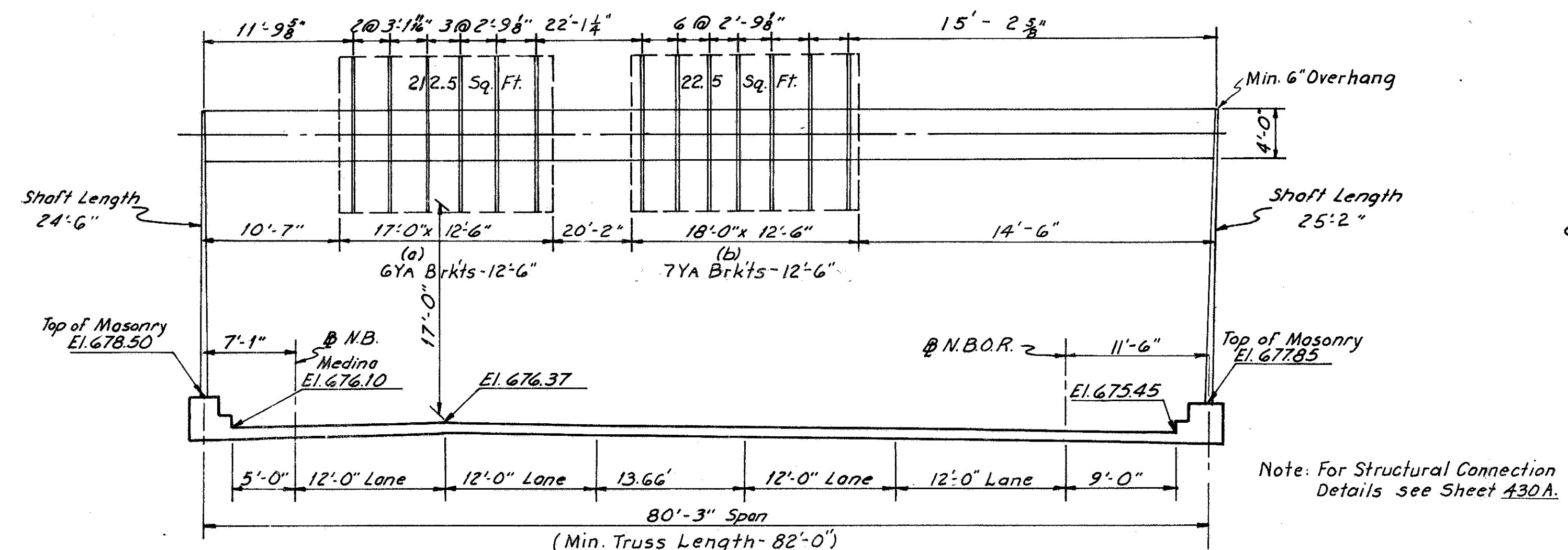
OVERHEAD SIGN NO. 29  
STA. 922+94 N.B. MEDINA FREEWAY  
STD. NO. 12.24-DESIGN NO. 5 MOD.  
24'-0" ARMS



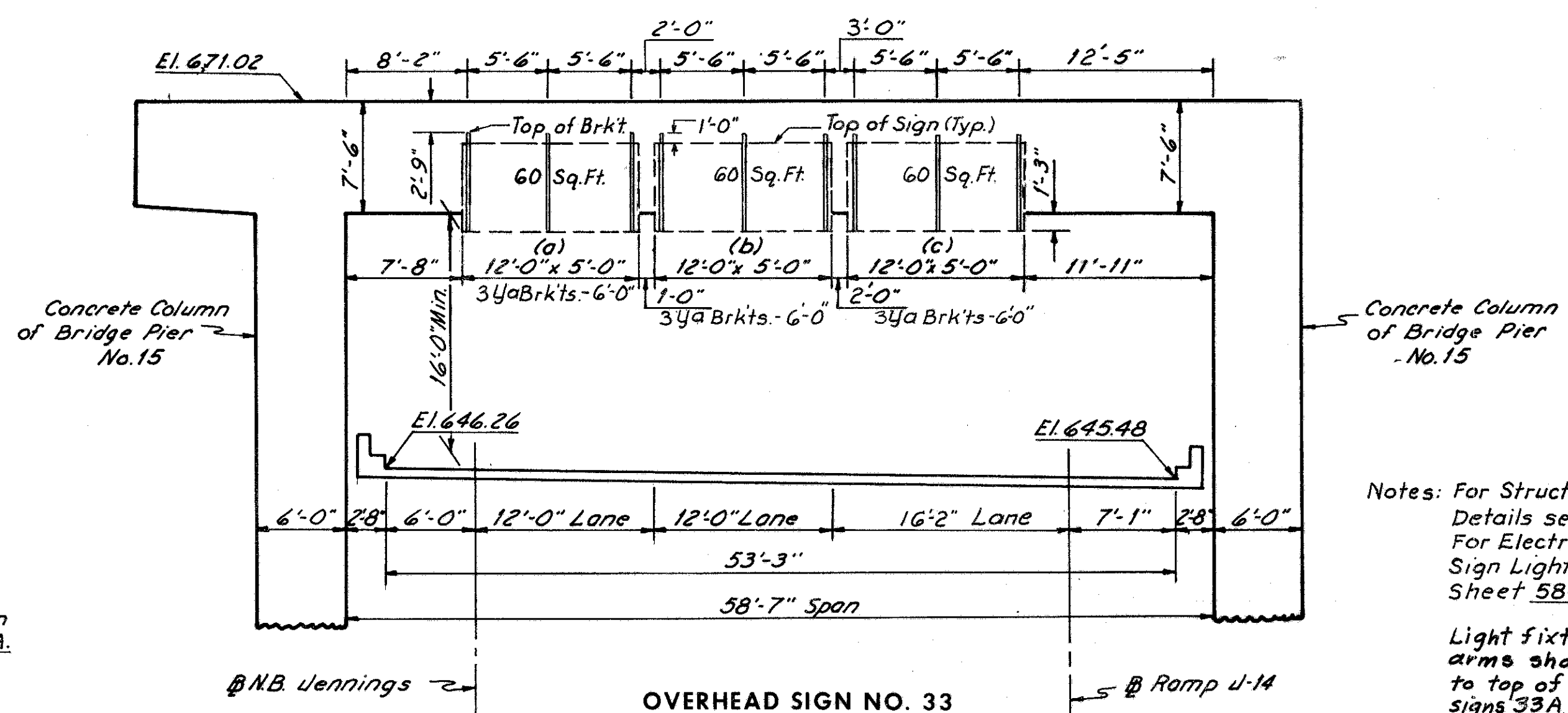
OVERHEAD SIGN NO. 30  
STA. 3+00 RAMP 14-M  
STD. NO. 7.3-DESIGN NO. 2 MOD.  
61'-0" SPAN



OVERHEAD SIGN NO. 31  
STA. 930+00 S.B. MEDINA FREEWAY  
STD. NO. 12.24-DESIGN NO. 6 MOD.  
24'-0" ARM



OVERHEAD SIGN NO. 32  
STA. 930+52 N.B. MEDINA FREEWAY  
STD. NO. 7.6-DESIGN NO. 3 MOD.  
± 80'-3" SPAN



OVERHEAD SIGN NO. 33  
STA. 69+84 N.B. JENNINGS FREEWAY  
SPECIAL ATTACHED TO STRUCTURE

Notes: For Structural Connection Details see Sheet 430A.  
For Electrical Service and Sign Lighting Details see Sheet 584, 566, & 567.

Light fixtures & support arms shall be attached to top of sign brackets of signs 33A, B, & C.

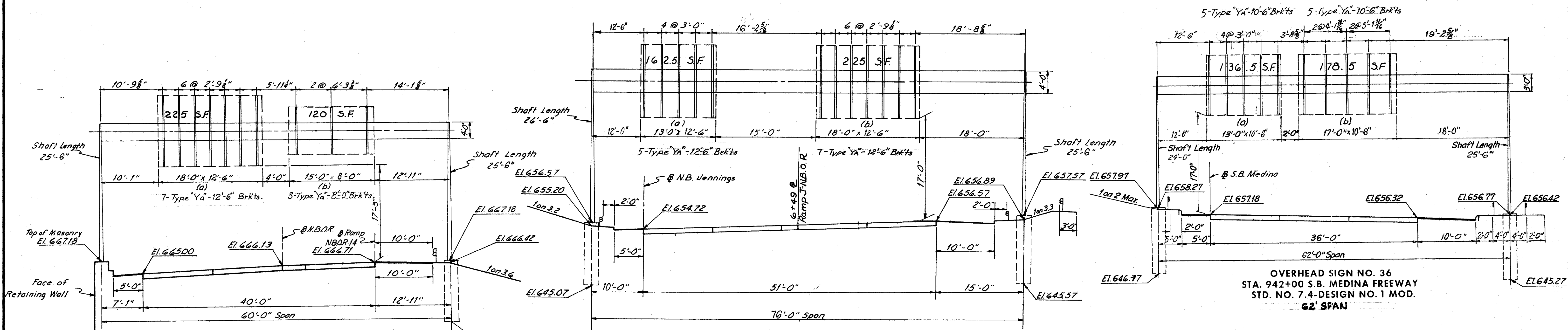
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

557  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

4  
16

# SIGN SUPPORT DETAILS



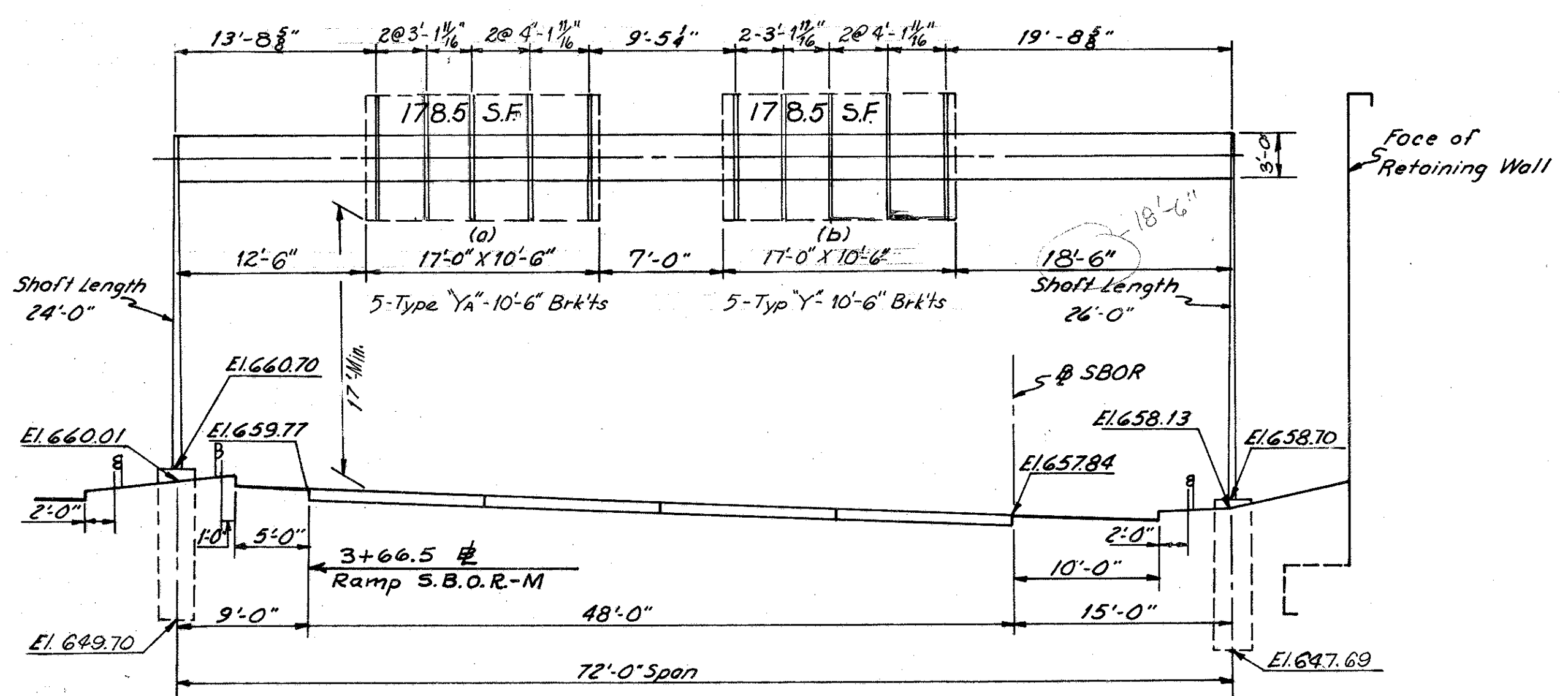
**OVERHEAD SIGN NO. 34**  
STA. 8+18 N.B.O.R.  
STD. NO. 7.4-DESIGN NO. 2 MOD.  
60' SPAN

NOTE: Sign erection, light fixtures, ballasts and sign wiring not required for signs 34A and B.

**OVERHEAD SIGN NO. 35**  
STA. 80+50 N.B. JENNINGS FREEWAY  
STD. NO. 7.5-DESIGN NO. 2 MOD.  
76' SPAN  
(Erect @ 90° to Ramp J-N.B.O.R.)

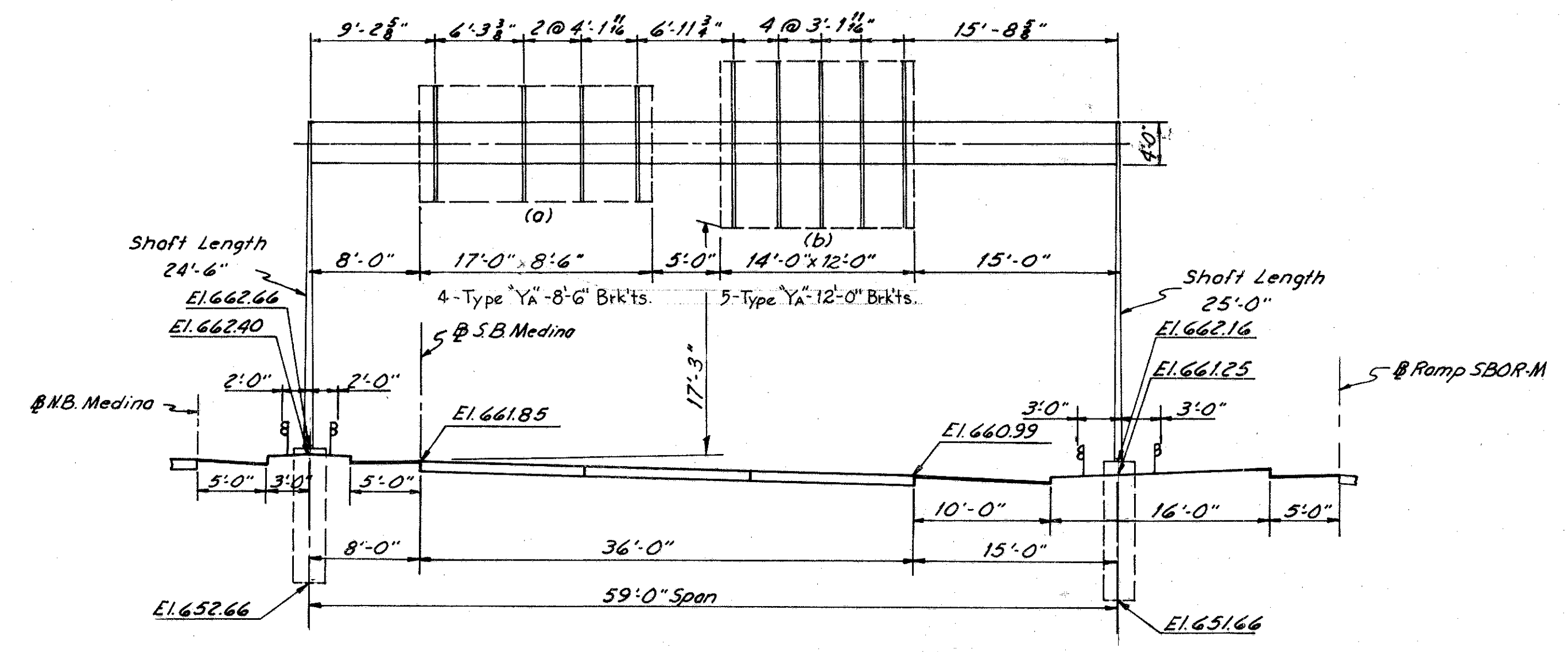
NOTE: Sign erection, ballasts, light fixtures and sign wiring not required for sign 35 B.

**OVERHEAD SIGN NO. 36**  
STA. 942+00 S.B. MEDINA FREEWAY  
STD. NO. 7.4-DESIGN NO. 1 MOD.  
62' SPAN



**OVERHEAD SIGN NO. 37**  
STA. 7+25 S. B. O. R.  
STD. NO. 7.5-DESIGN NO. 1 MOD.  
72' SPAN  
(Erect @ 90° to Ramp S.B.O.R.-M)

NOTE: Sign erection, light fixtures, ballasts, and sign wiring not required for Signs 37A & B.



**OVERHEAD SIGN NO. 38**  
STA. 950+65 S.B. MEDINA FREEWAY  
STD. NO. 7.4-DESIGN NO. 2 MOD.  
59' SPAN

NOTE: Sign erection, ballasts, light fixtures, and sign wiring not required for Sign 38 A

SCALE 1/8"=1'-0"  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE R.D. DATE 12-12-69  
TRCD. R.D. DATE 12-12-69  
CKD. R.B.H. DATE 12-12-69 KANSAS CITY CLEVELAND NEW YORK  
CONSULTING ENGINEERS

FED. RD. DIVISION	STATE	PROJECT
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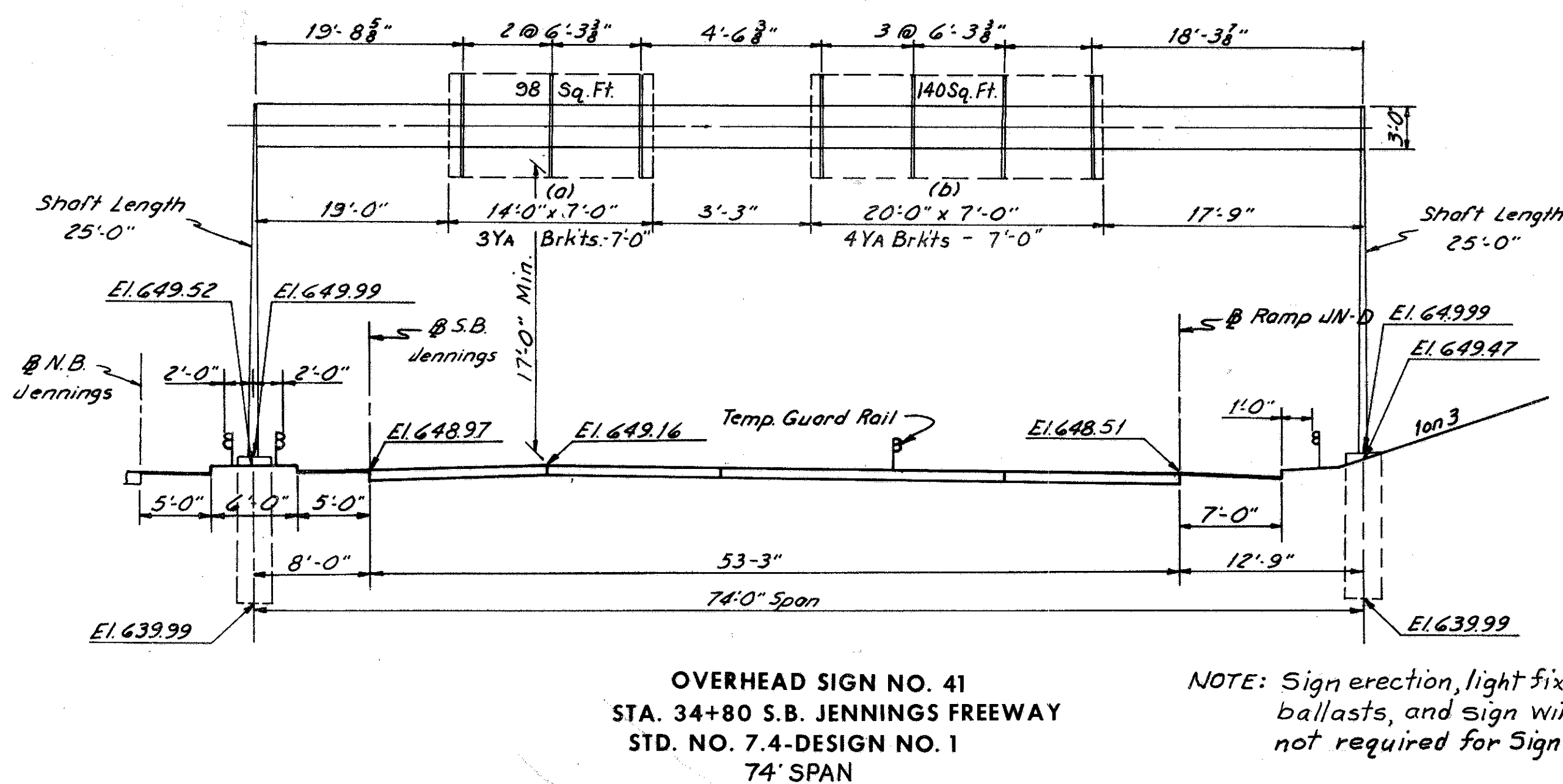
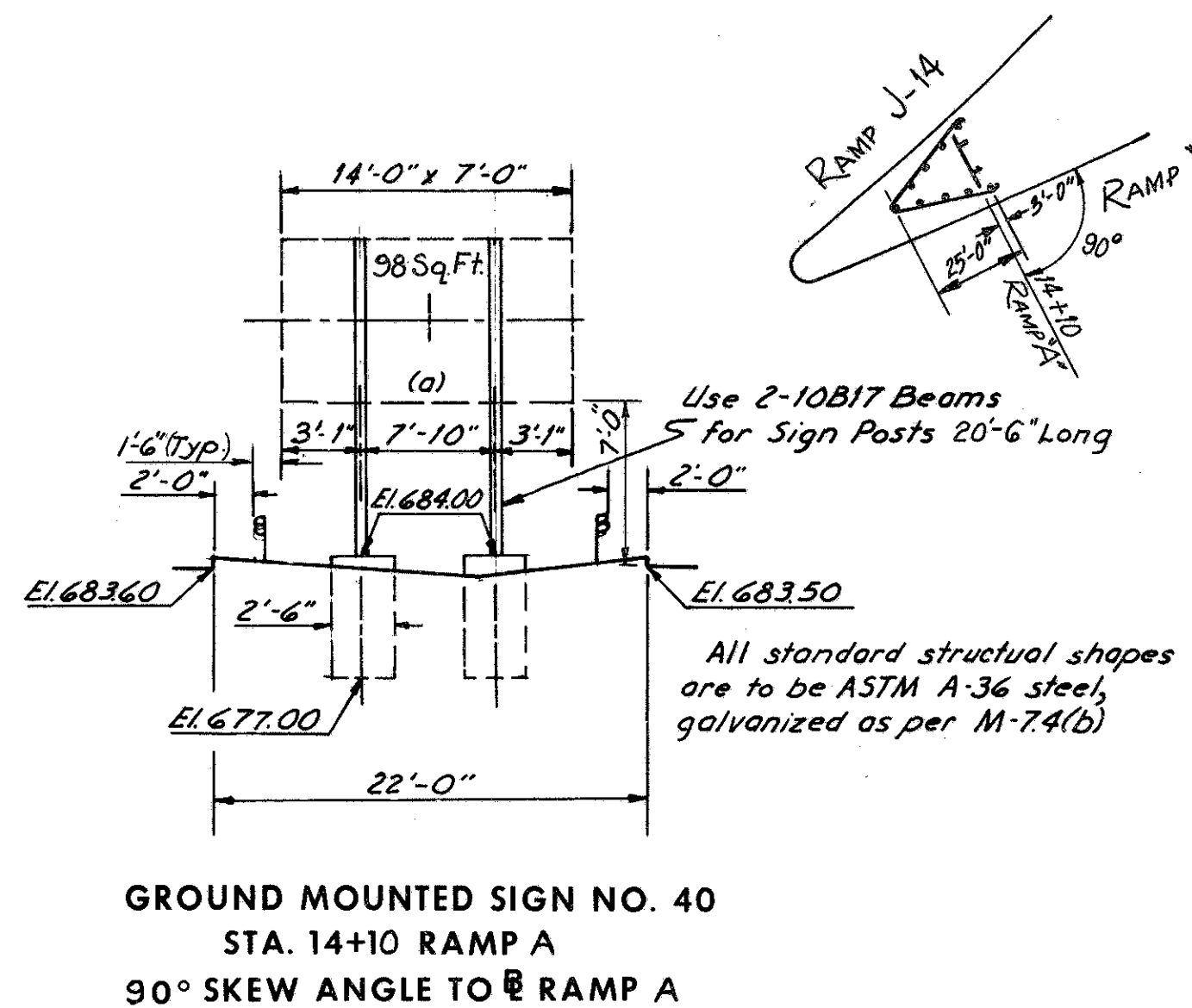
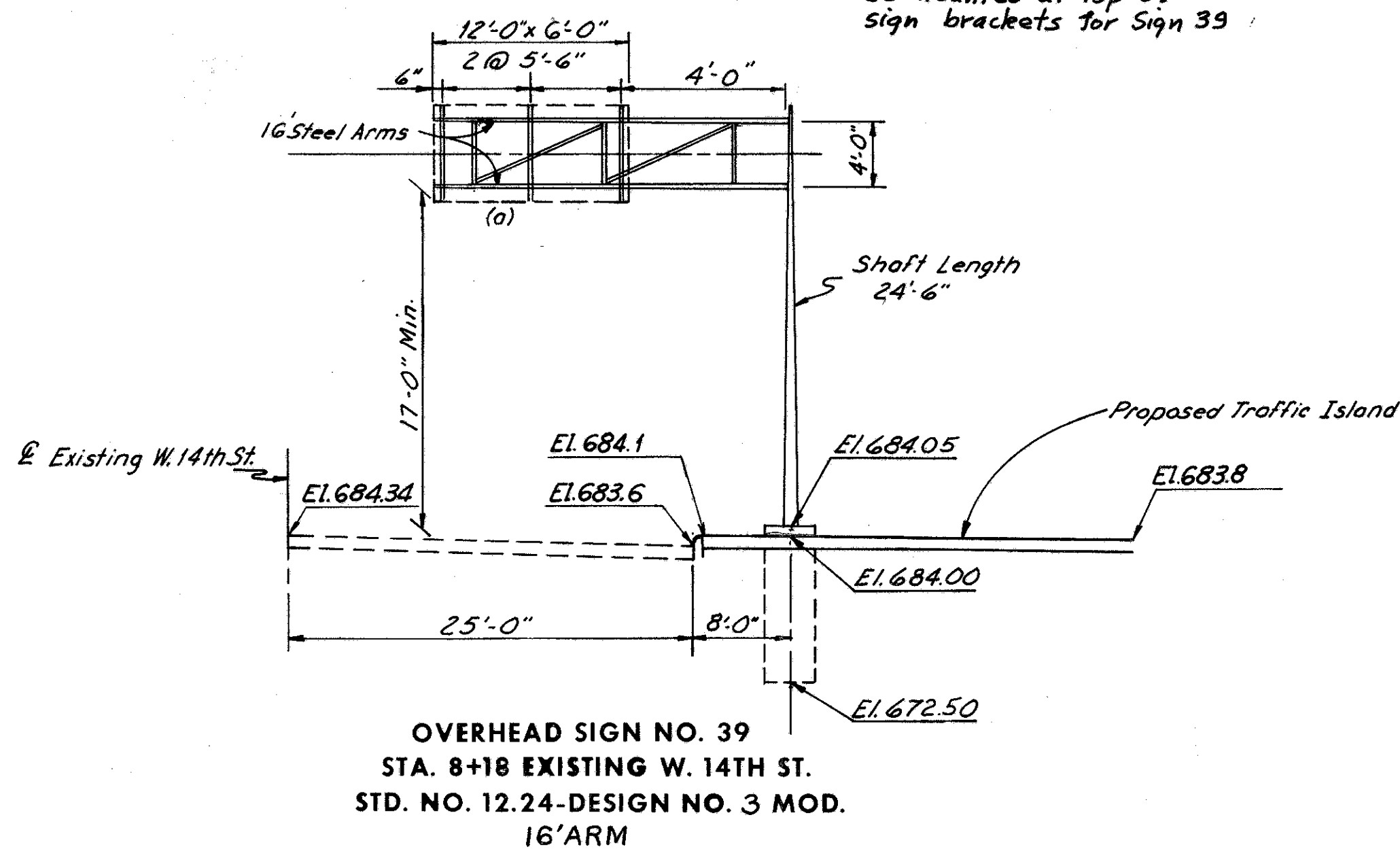
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CUYAHOGA COUNTY  
CUY.-71-17.83  
CUY.-176-12.76

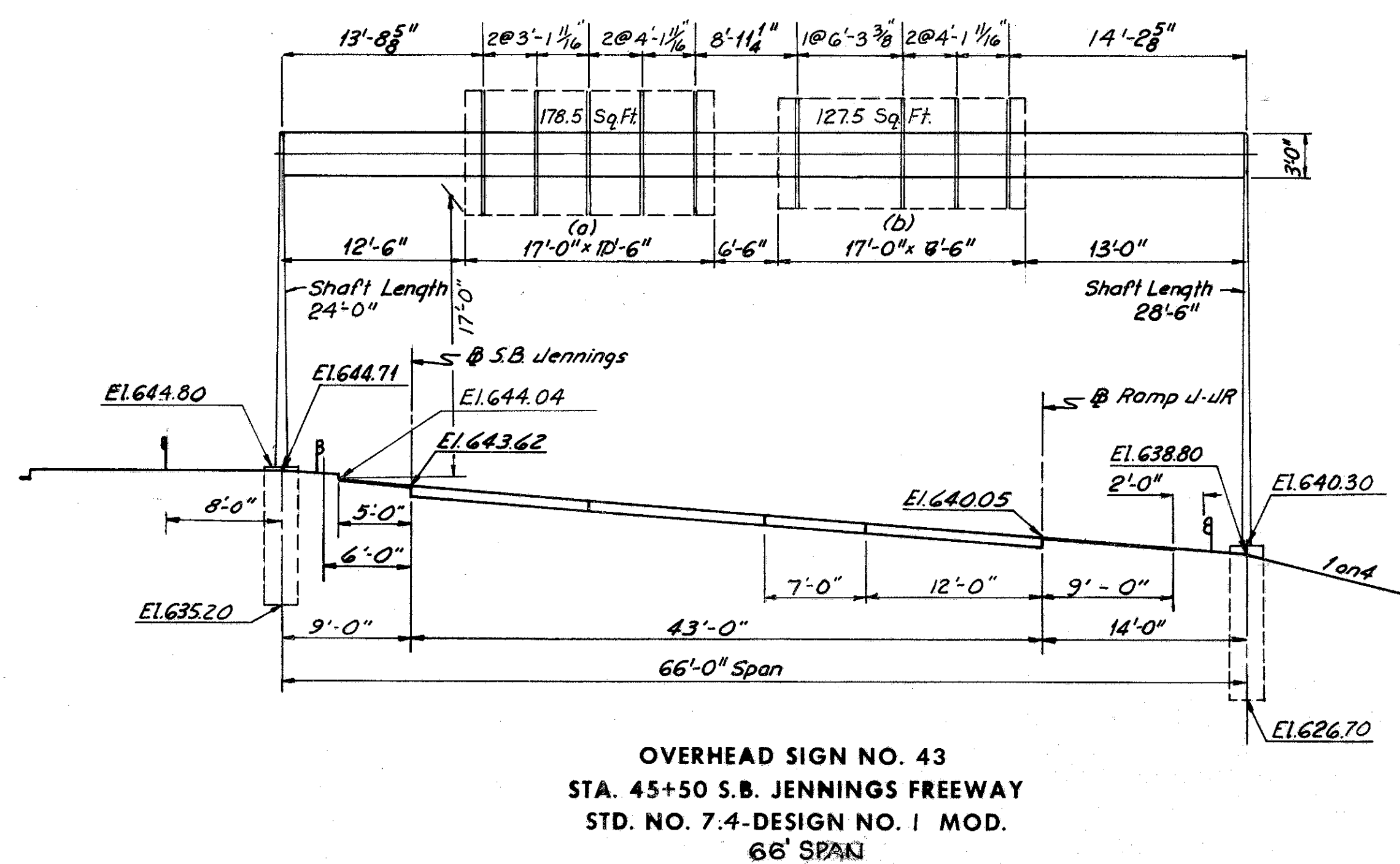
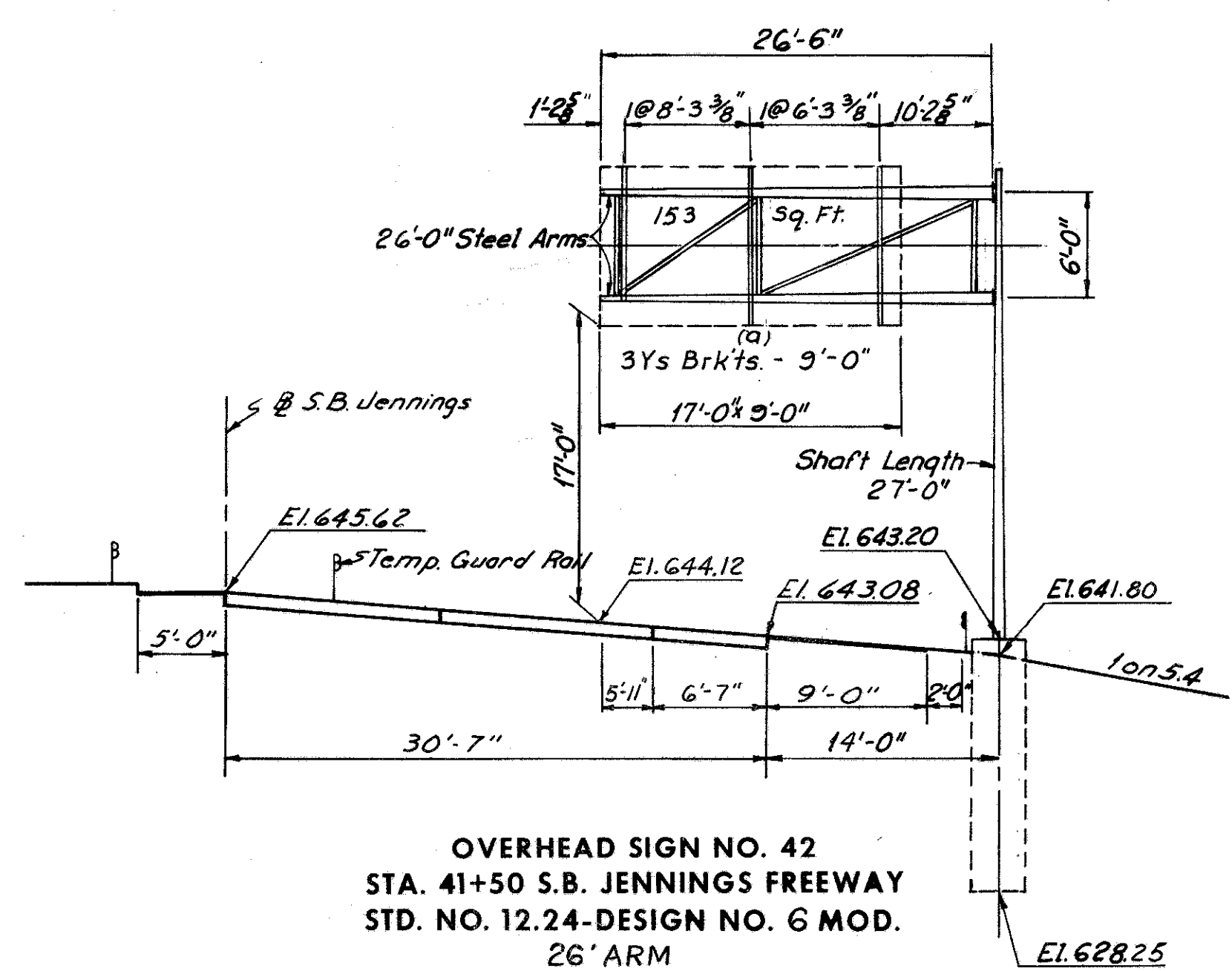
5  
16

# SIGN SUPPORT DETAILS

Note: Light fixtures and support arms "E" shall be mounted at top of sign brackets for Sign 39

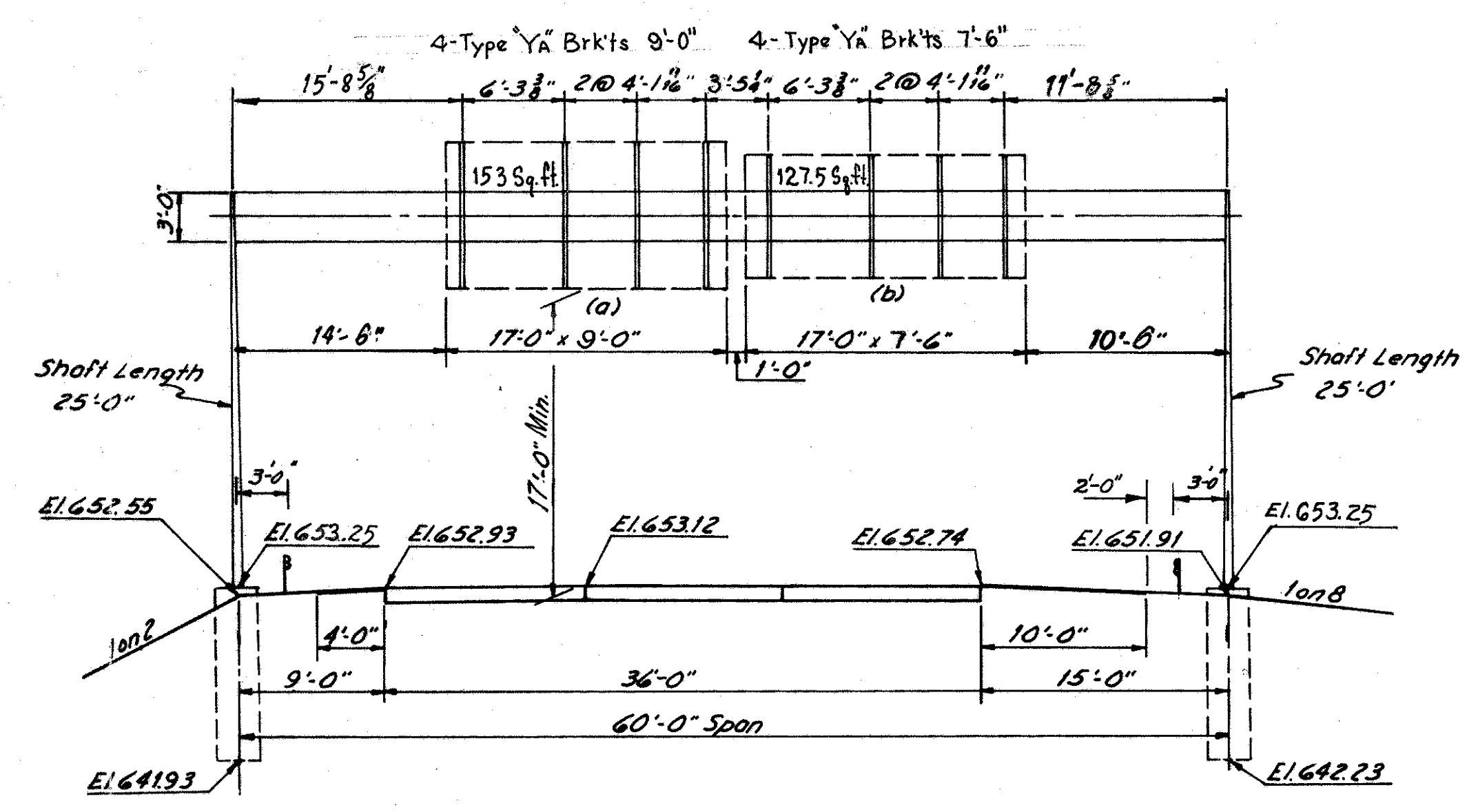


NOTE: Sign erection, light fixtures, ballasts, and sign wiring not required for Sign 41A.

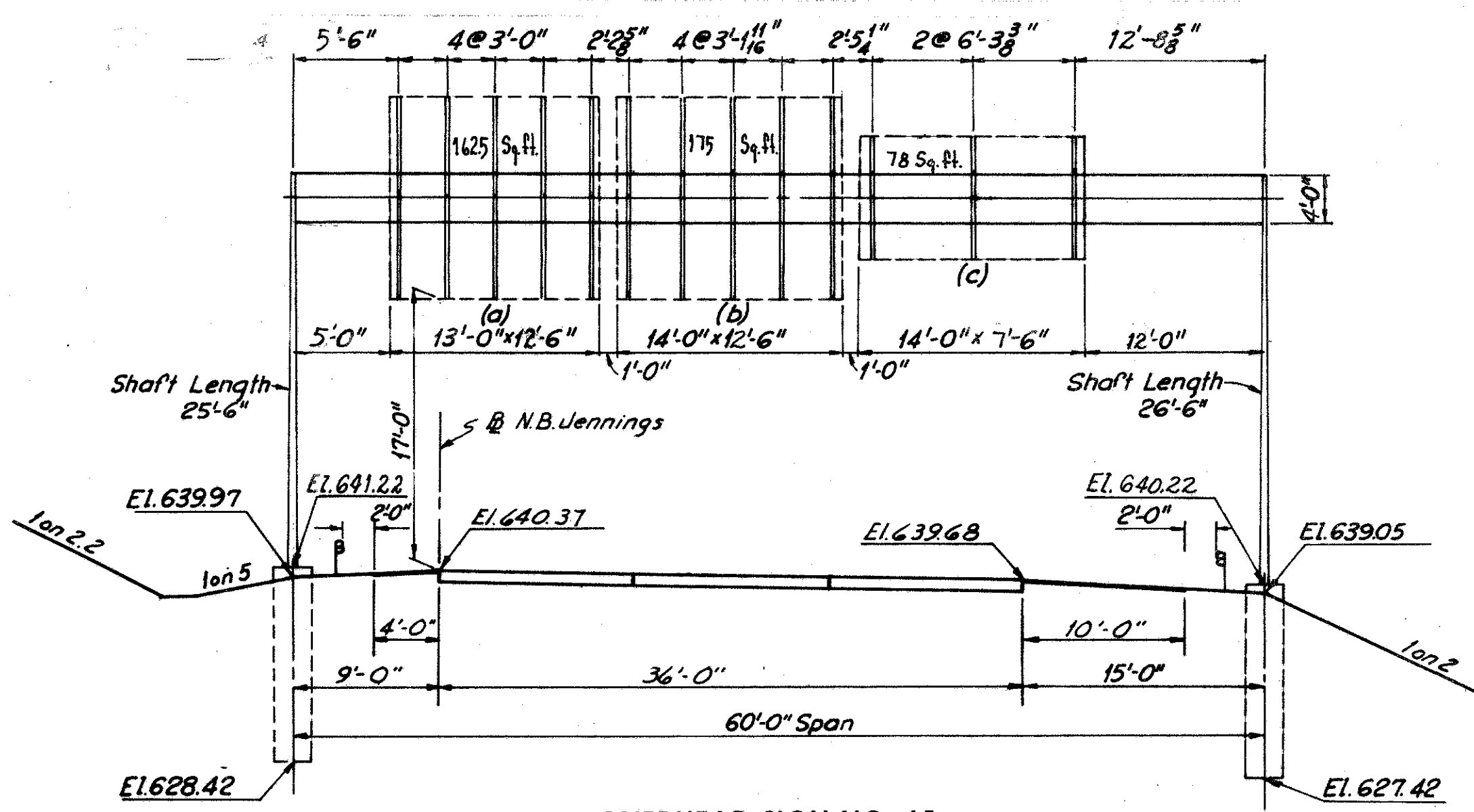


CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

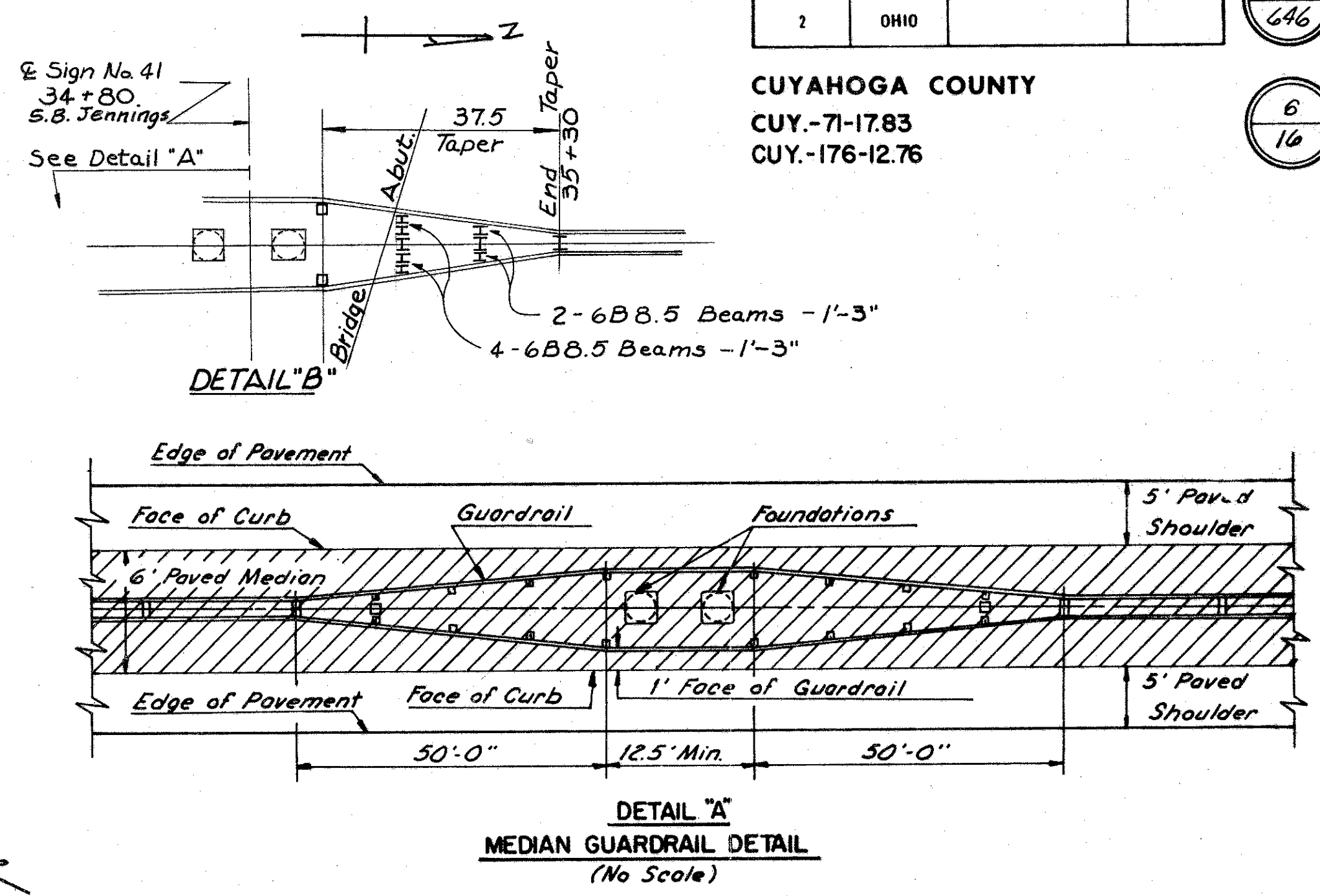
# SIGN SUPPORT DETAILS



OVERHEAD SIGN NO. 44  
STA. 53+50 S.B. JENNINGS FREEWAY  
STD. 7.4-DESIGN NO. 1  
60' SPAN



OVERHEAD SIGN NO. 45  
STA. 52+00 N. B. JENNINGS FREEWAY  
STD. NO. 7.5 DESIGN NO. 2 MOD.  
60' SPAN



DETAIL "A"  
MEDIAN GUARDRAIL DETAIL  
(No Scale)

Note: Payment for brackets shall be included in the unit price bid for Item I-129, "Overhead Sign Supports". Vertical sign brackets shall be furnished for all overhead supports.

Unit Price Bid for Item I-15, Guardrail, Steel Beam Barrier Type (Deep) shall include cost of all material and labor necessary to modify typical Median Barrier Type Guardrail to two single guardrails, by-passing overhead sign support as shown in Detail "A" and "B".

\* 95% State, 5% City

SIGN NUMBERS															Subtotals															
CUY-71-17.83															CUY-176-12.76					CUY-71-17.83										
8	25	26	27	28	29	30	31*	32	33	34	35	36	37	38	39*	40	41	42	43	44	45	Total	Unit	Item No.	Description	Normal Partic.	95% State 5% City			
						1																			I-129	Overhead Sign Support	No. 7.3 Des. 2 Mod. 61'-0" Span	1		
																										I-129	Overhead Sign Support	No. 7.4 Des. 1 Mod. 66'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.4 Des. 1 Mod. 74'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.3 Des. 1 Mod. 50'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.4 Des. 1 Mod. 62'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.5 Des. 1 Mod. 72'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.4 Des. 2 Mod. 59'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.5 Des. 2 Mod. 60'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.4 Des. 1 Mod. 60'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.5 Des. 2 Mod. 76'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.5 Des. 3 Mod. 81'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.5 Des. 2 Mod. 72'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.5 Des. 2 Mod. 60'-0" Span	1	
																										I-129	Overhead Sign Support	No. 7.6 Des. 3 Mod. 80'-3" Span	1	
																										I-129	Overhead Sign Support	No. 12.24 Des. 3 Mod. 16'-0" Arm	1	
																										I-129	Overhead Sign Support	No. 12.24 Des. 6 Mod. 22'-0" Arm	1	
																										I-129	Overhead Sign Support	No. 12.24 Des. 5 Mod. 24'-0" Arm	1	
																										I-129	Overhead Sign Support	No. 12.24 Des. 6 Mod. 24'-0" Arm	1	
																										I-129	Overhead Sign Non-Standard Attached to Structure		1	
																										I-129	Structural Supports, Steel Beam Type 10 B 17		41	
																										I-129	Concrete for Sign Support Foundation, as per plan		99.46	5.77
																										I-15	Guard Rail Steel Beam Standard Type (Deep) as per plan		6.00	50
																										S-25	1" x 10'-0" Solid Wrought Iron Ground Rod & Wire Connection		12	2
																										I-129	Sign Erection, Guide Sign Type, as per plan		3628	233
																										I-129	Overhead Sign Support	No. 12.24 Des. 5 Mod. 26'-0" Arm	1	
																										I-129	Overhead Sign Support	No. 7.5 Des. 2 Mod. 60'-0" Span	1	

**SIGN SUPPORT MODIFICATIONS**

Sign Nos. 29 and 32 Support on structure  
Sign Nos. 8, 39 and 42 Pole length longer than standard  
Sign No. 34 Left shaft on wall  
Sign Nos. 25, 26, 27, 28, 30, 35, 36, 37, 38, 43, 31 & 45 Unequal shaft lengths





FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

361  
 646  
 8  
 16

**NOTES**

**MATERIALS**  
 THE OVERHEAD SPAN TRUSS SHALL BE ALUMINUM AND THE END FRAMES SHALL BE STEEL.  
 SPAN TRUSS AND END FRAMES, INCLUDING HARDWARE, SHALL BE IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION I-129 UNLESS OTHERWISE NOTED.

STEEL POLE BASES AND GUSSETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A-373.

AFTER FABRICATION THE TAPERED POLES SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

**FABRICATION**  
 THE ENTIRE STEEL END FRAME SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH SEC. M-7.4(d). MAXIMUM LENGTH OF SPAN SECTIONS IS 30 FT.

**ERECTION**  
 USE A MINIMUM OF 1" CAMBER IN SPAN TRUSS MEMBER FOR A 50' SPAN; ADD 1/4" OF CAMBER FOR EACH 5' OF INCREASE IN SPAN OVER 50'.

**PAYMENT**  
 PAYMENT FOR THE GALVANIZED CONDUIT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS.

**SOILS**  
 THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

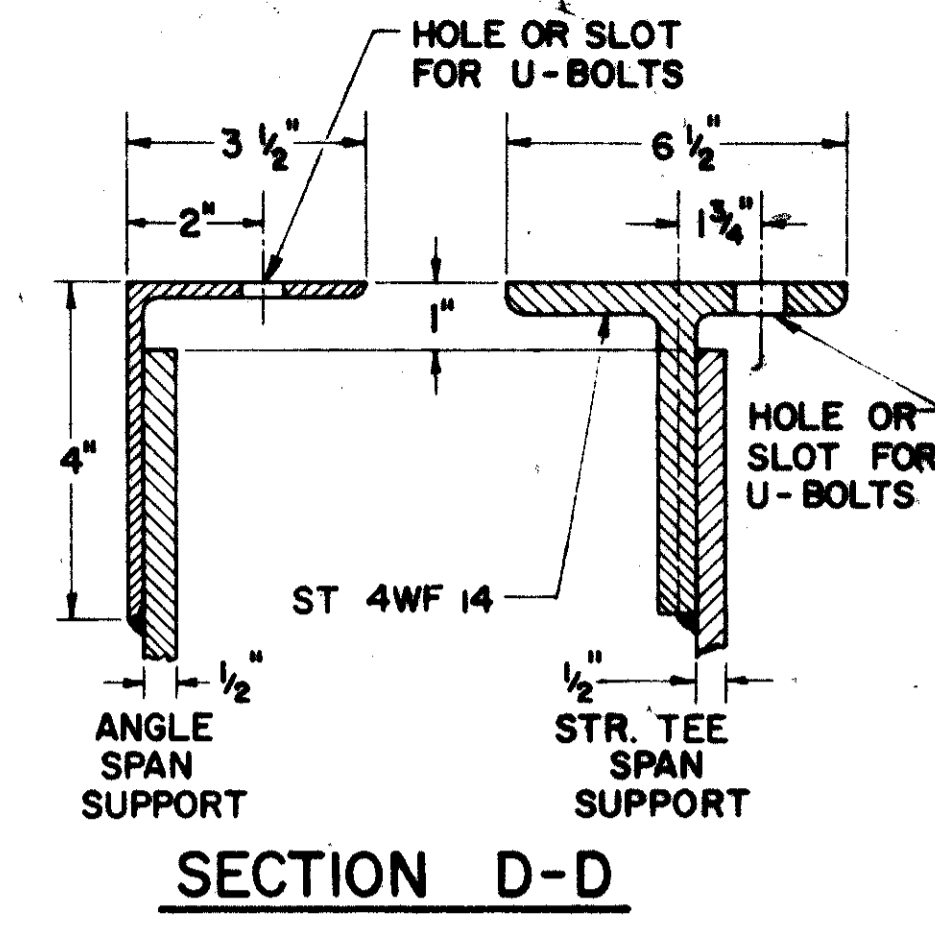
**REINFORCING STEEL**  
 COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER.

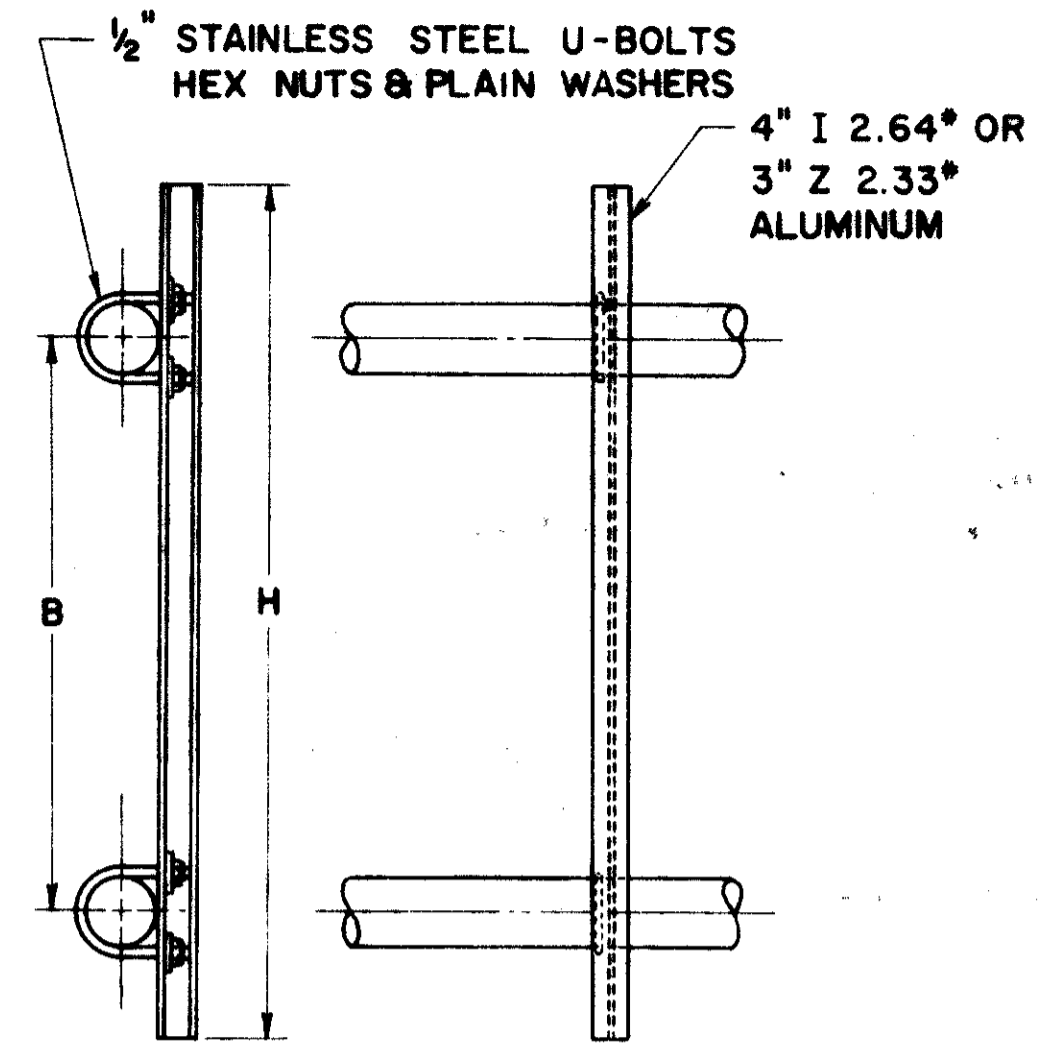
**FOUNDATION ELEVATION**  
 ELEVATION OF TOPS OF FOUNDATIONS SHALL BE BUILT UP SO THAT 17" CLEARANCE IS MAINTAINED OVER THE ENTIRE WIDTH OF THE PAVEMENT AND SHOULDERS.

**CONDUIT IN FOUNDATION**  
 TWO 2" AND ONE 1/2" CONDUITS ARE REQUIRED PER SIGN SUPPORT. COST IS INCLUDED WITH I-129 SUPPORTS. SEE DETAIL SHEET 587.

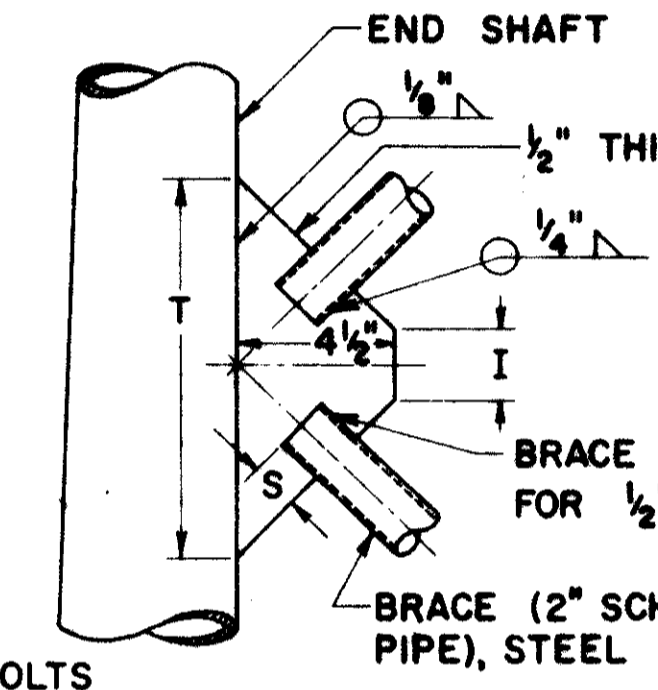
**DESIGN**  
 THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.



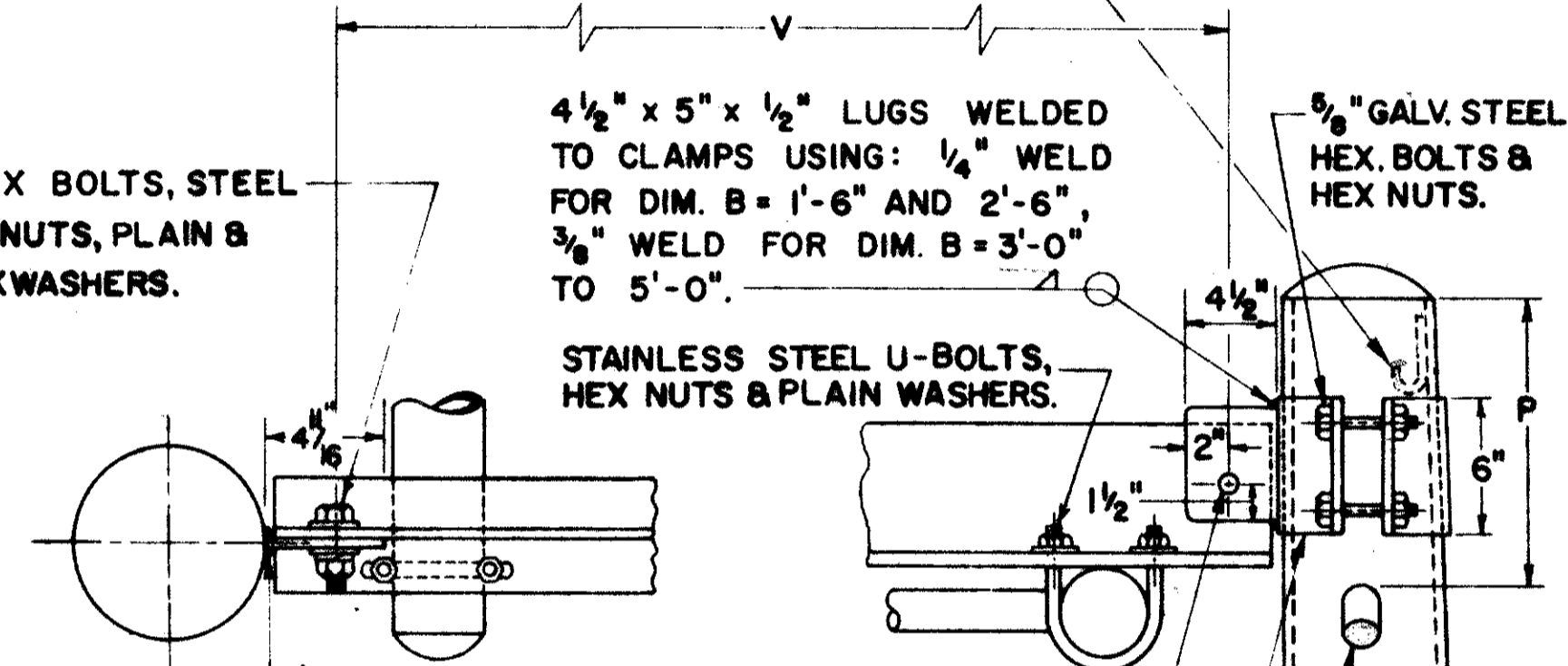
**SECTION D-D**



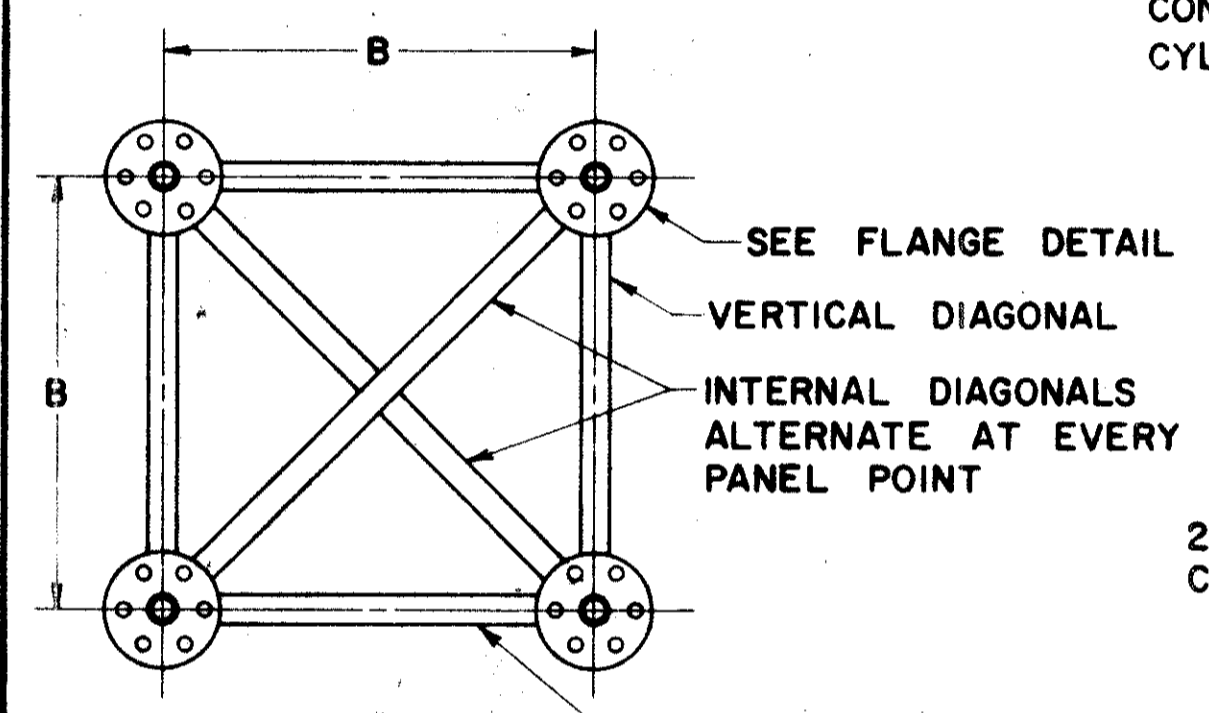
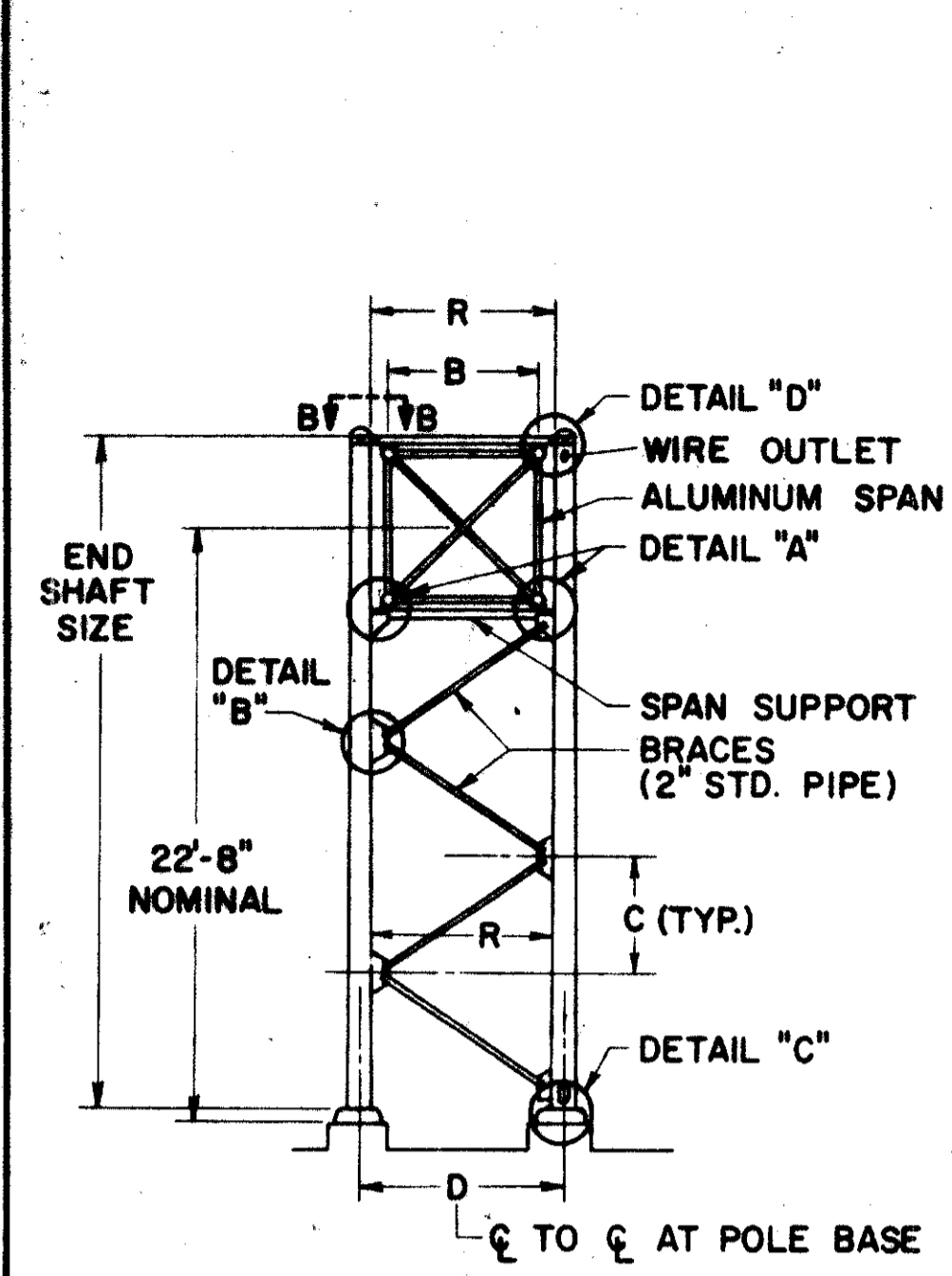
**SIGN BRACKET**



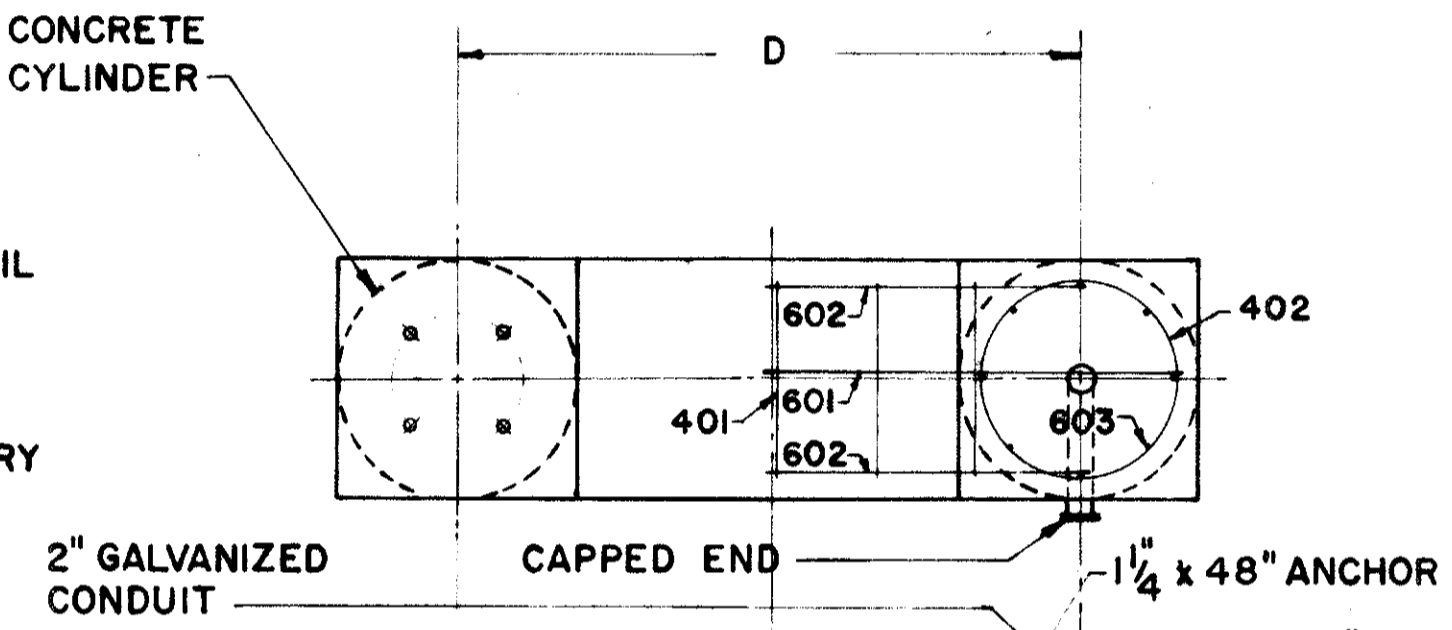
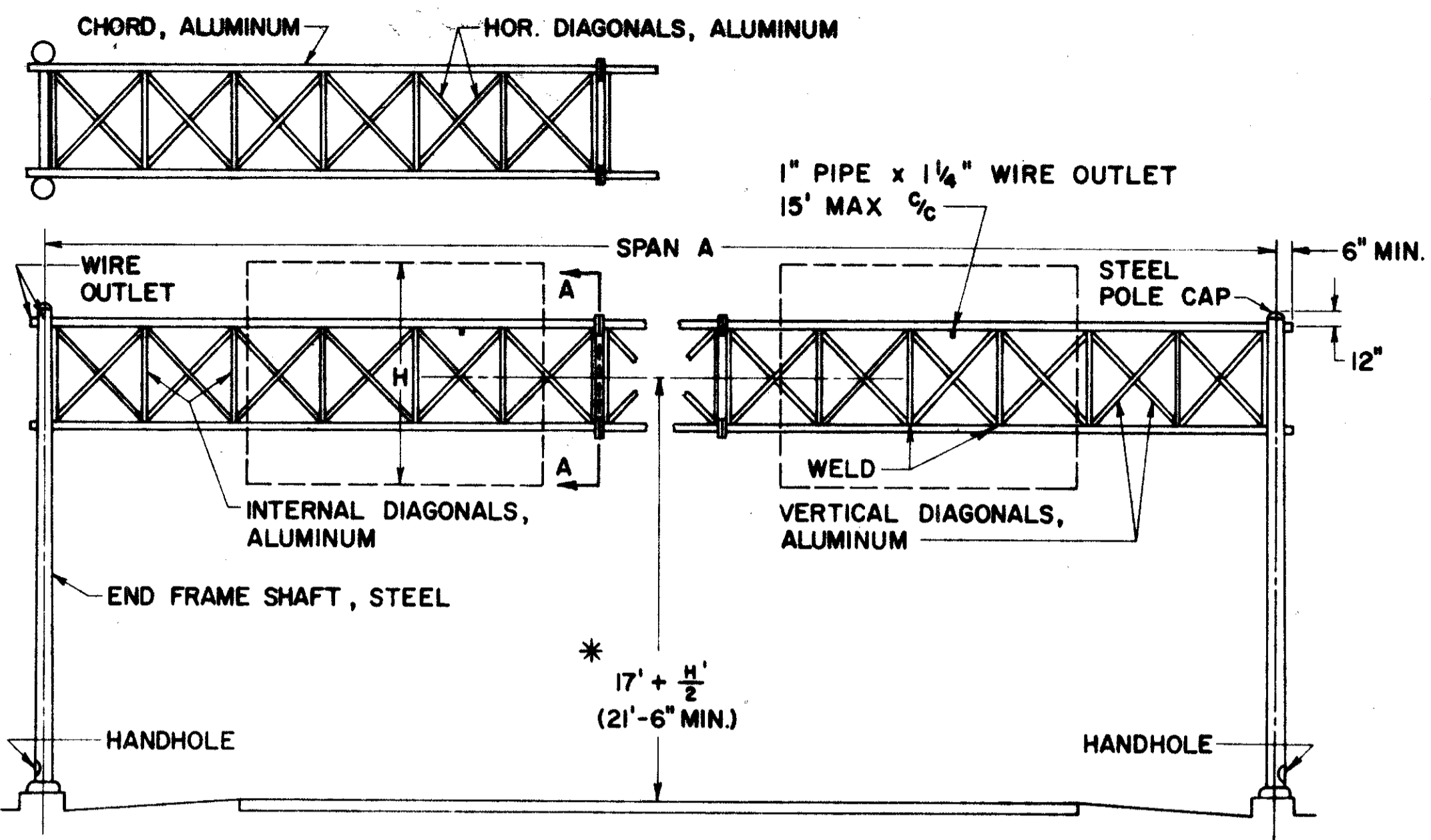
**DETAIL B**



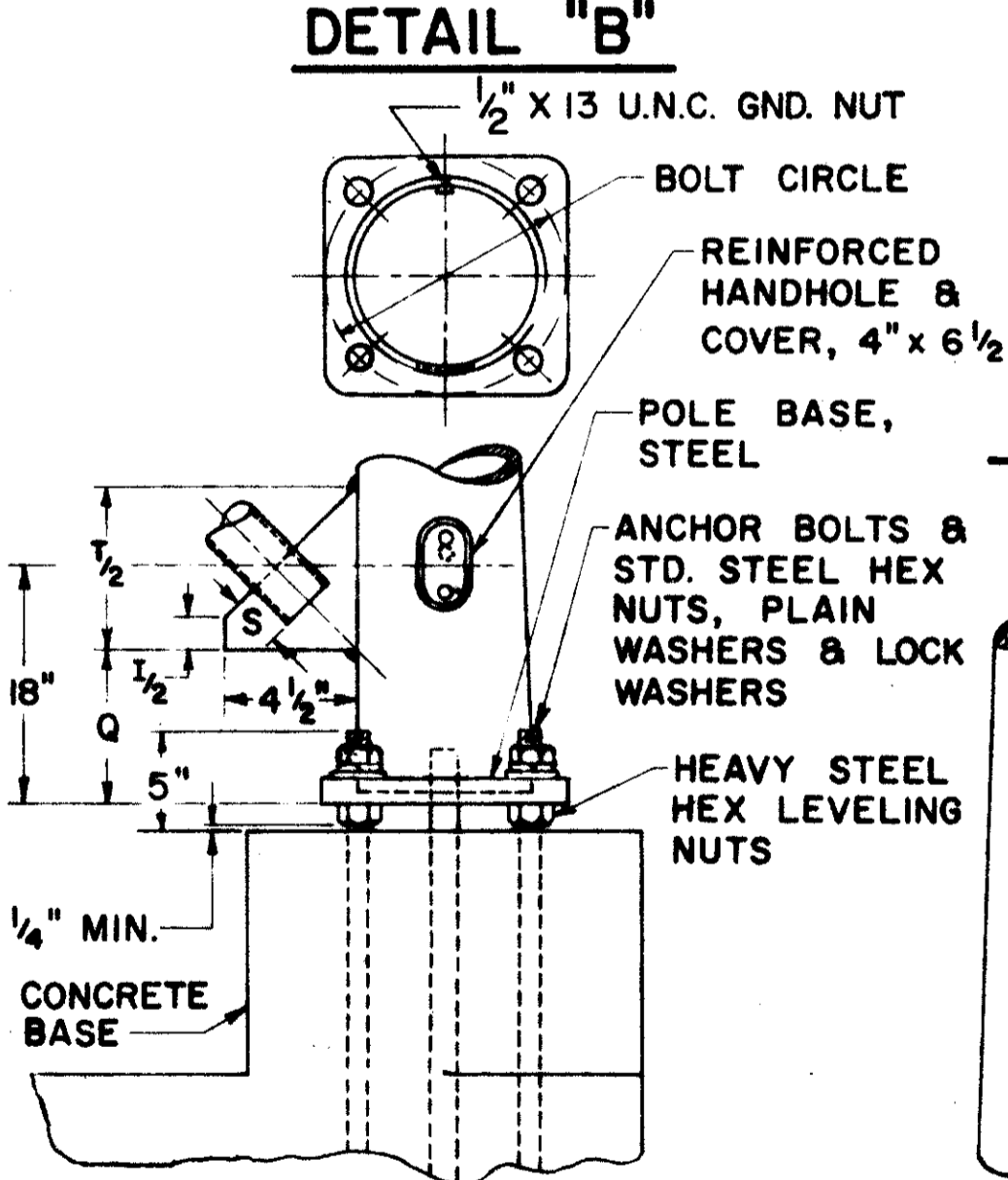
**VIEW B-B UPPER SPAN SUPPORT (ALTERNATE METHODS)**



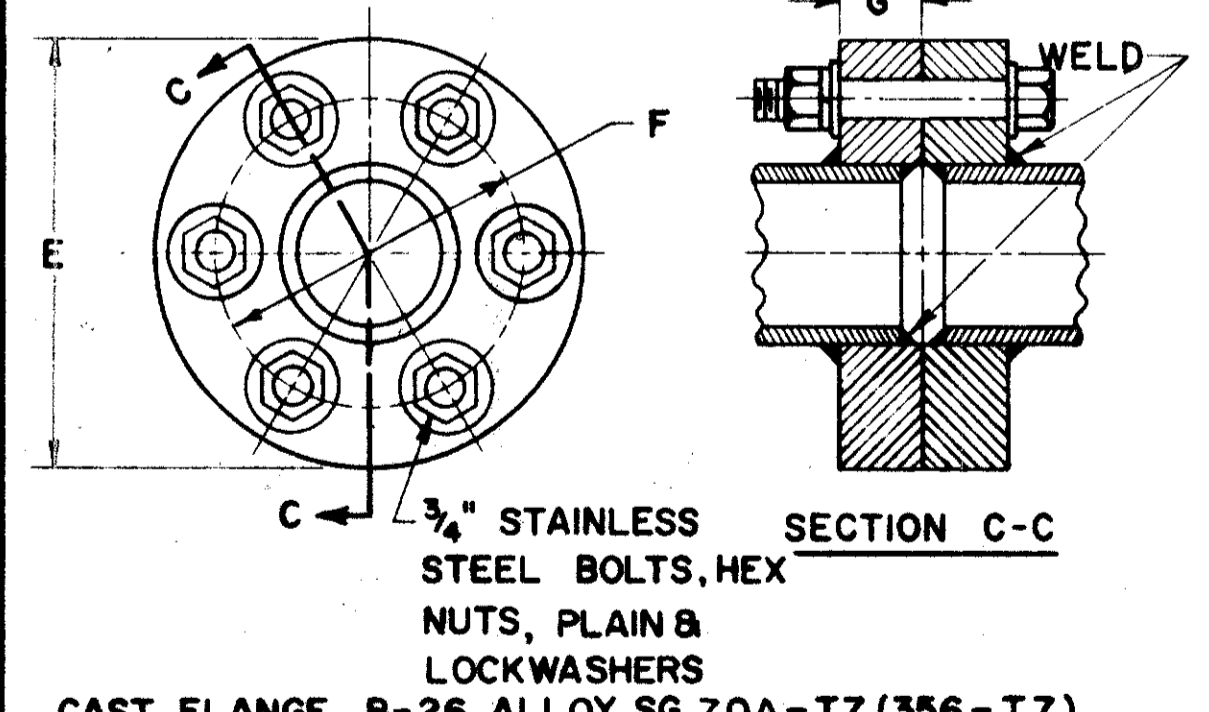
**SECTION A-A**



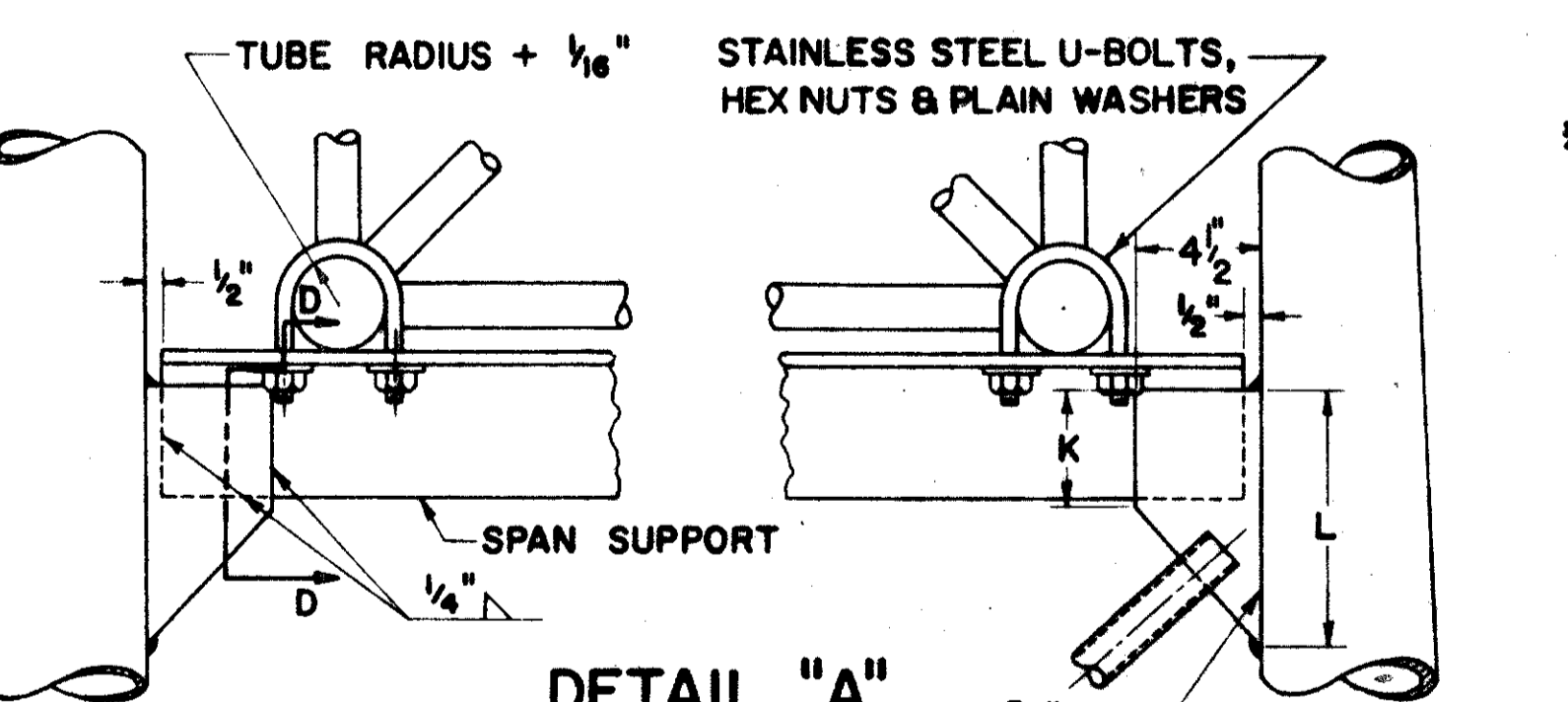
**FOUNDATION DETAIL**



**POLE BASE DETAIL**



**FLANGE DETAIL**



**LOWER SPAN SUPPORT**

DESIGN NO.	SPAN A	B	C	D	E	END SHAFT	BRACE LENGTH	F	G	I	K	L	P	Q	R	S	T	U BOLTS	V	BOLT CIRCLE	SPAN SUPPORT SECTION D-D	CHORDS	HORIZONTAL AND INTERNAL DIAGONAL	VERTICAL DIAGONAL
1	50' Thru 55'	3'-0"	4'-11 3/4"	4'-5"	7"	8" x 4.5" x 25'-0", 3GA	5'-10 13/16"	5 1/2"	1 1/4"	3 1/2"	4 3/4"	8"	12"	6 5/8"	3-9"	1 1/2"	10"	5/8"	3'-3 5/8"	11"	SPLIT TEE 3'-8"	3 1/2" x .188"	1.660" x .140"	1.660" x .140"
2	56' Thru 80'	3'-0"	4'-11 3/4"	4'-5"	9 1/4"	8" x 4.5" x 25'-0", 3GA	5'-10 13/16"	7 7/16"	1 3/8"	3 1/2"	4 3/4"	8"	12"	6 5/8"	3-9"	1 1/2"	10"	5/8"	3'-3 5/8"	11"	SPLIT TEE 3'-8"	4 3/4" x .188"	1.900" x .145"	1.660" x .140"
3	81' Thru 90'	4'-0"	4'-10 1/4"	5'-7"	9 1/4"	8" x 6.22" x 25'-6", 3GA	6'-7 1/8"	7 7/16"	1 3/8"	5/8"	4 3/8"	7 3/4"	12"	6 1/4"	4-11"	1 1/2"	9 1/2"	5/8"	4'-5 5/8"	11"	SPLIT TEE 4'-10"	4 3/4" x .188"	1.900" x .145"	1.900" x .145"
4	91' Thru 105'	4'-0"	4'-10 1/4"	5'-7"	9 1/4"	8" x 6.22" x 25'-6", 3GA	6'-7 1/8"	7 7/16"	1 3/8"	5/8"	4 3/8"	7 3/4"	12"	6 1/4"	4-11"	1 1/2"	9 1/2"	5/8"	4'-5 5/8"	11"	SPLIT TEE 4'-10"	4 3/4" x .188"	2" x .188"	1.900" x .145"

REINFORCEMENT SCHEDULE			
MARK	NO.	LENGTH	TYPE
401	12" C/C	8'-6"	102
402	12" C/C	7'-6"	103
601	4	D+4'-0"	101
602	8	D+2'-0"	101
603	32	D_T-6"	STR.

**BUREAU OF TRAFFIC  
 OHIO DEPARTMENT OF HIGHWAYS**

**OVERHEAD SIGN SUPPORTS No. 7.3**

DATE: 7-25-62  
 5-5-64  
 2-5-65

APPROVED: *Robert P. Jones*  
 ENGINEER OF TRAFFIC

**NOTES**

**MATERIALS**  
THE OVERHEAD SPAN TRUSS SHALL BE ALUMINUM AND THE END FRAMES SHALL BE STEEL.  
SPAN TRUSS AND END FRAMES, INCLUDING HARDWARE, SHALL BE IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION I-129 UNLESS OTHERWISE NOTED.  
STEEL POLE BASES AND GUSSETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A-373.  
AFTER FABRICATION THE TAPERED POLES SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

**FABRICATION**  
THE ENTIRE STEEL END FRAME SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH SEC. M-744. MAXIMUM LENGTH OF SPAN SECTIONS IS 30 FT.

**ERECTION**  
USE A MINIMUM OF 1" CAMBER IN SPAN TRUSS MEMBER FOR A 50' SPAN; ADD 1/4" OF CAMBER FOR EACH 5' OF INCREASE IN SPAN OVER 50'.

**PAYMENT**  
PAYMENT FOR THE GALVANIZED CONDUIT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS.

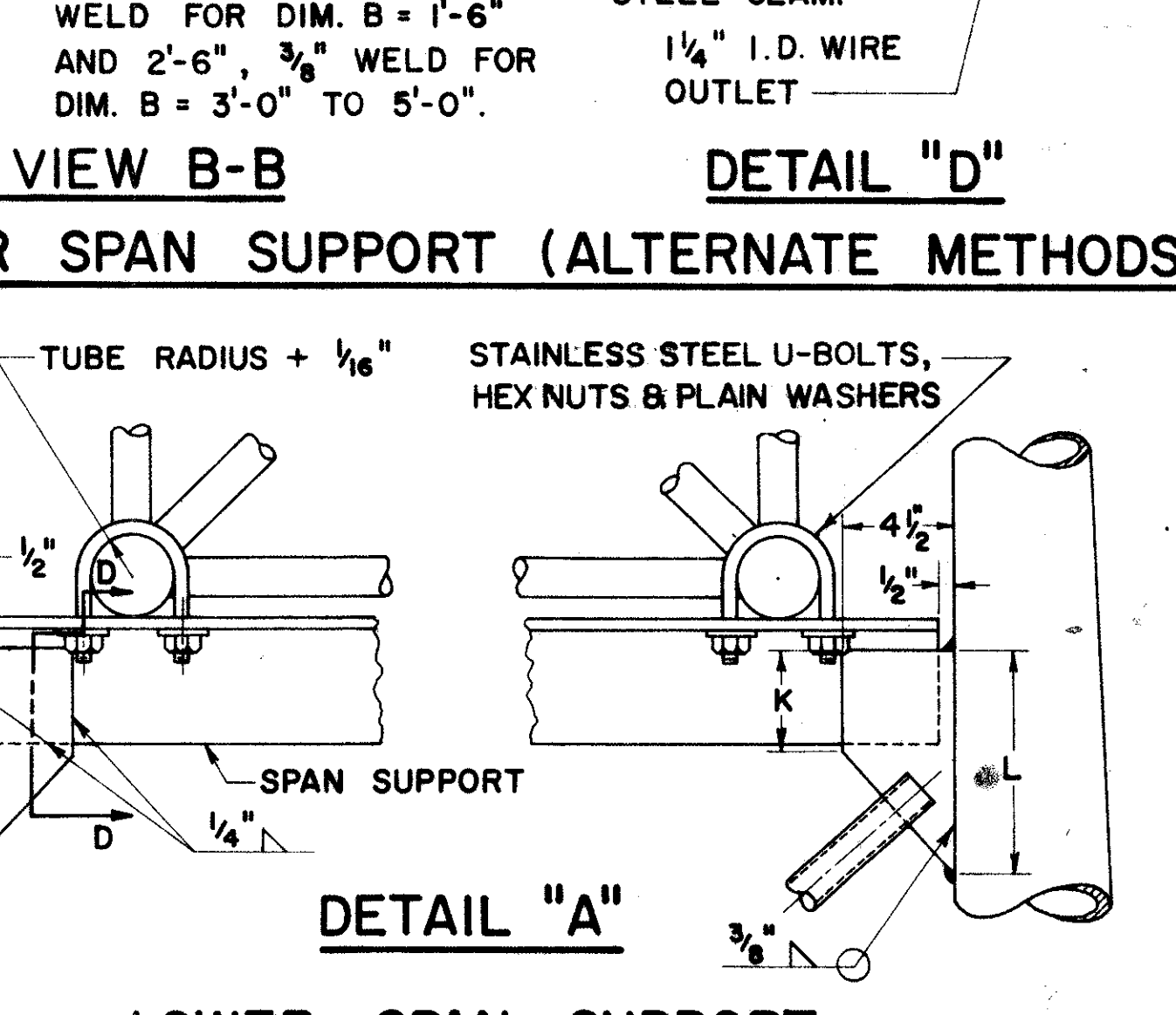
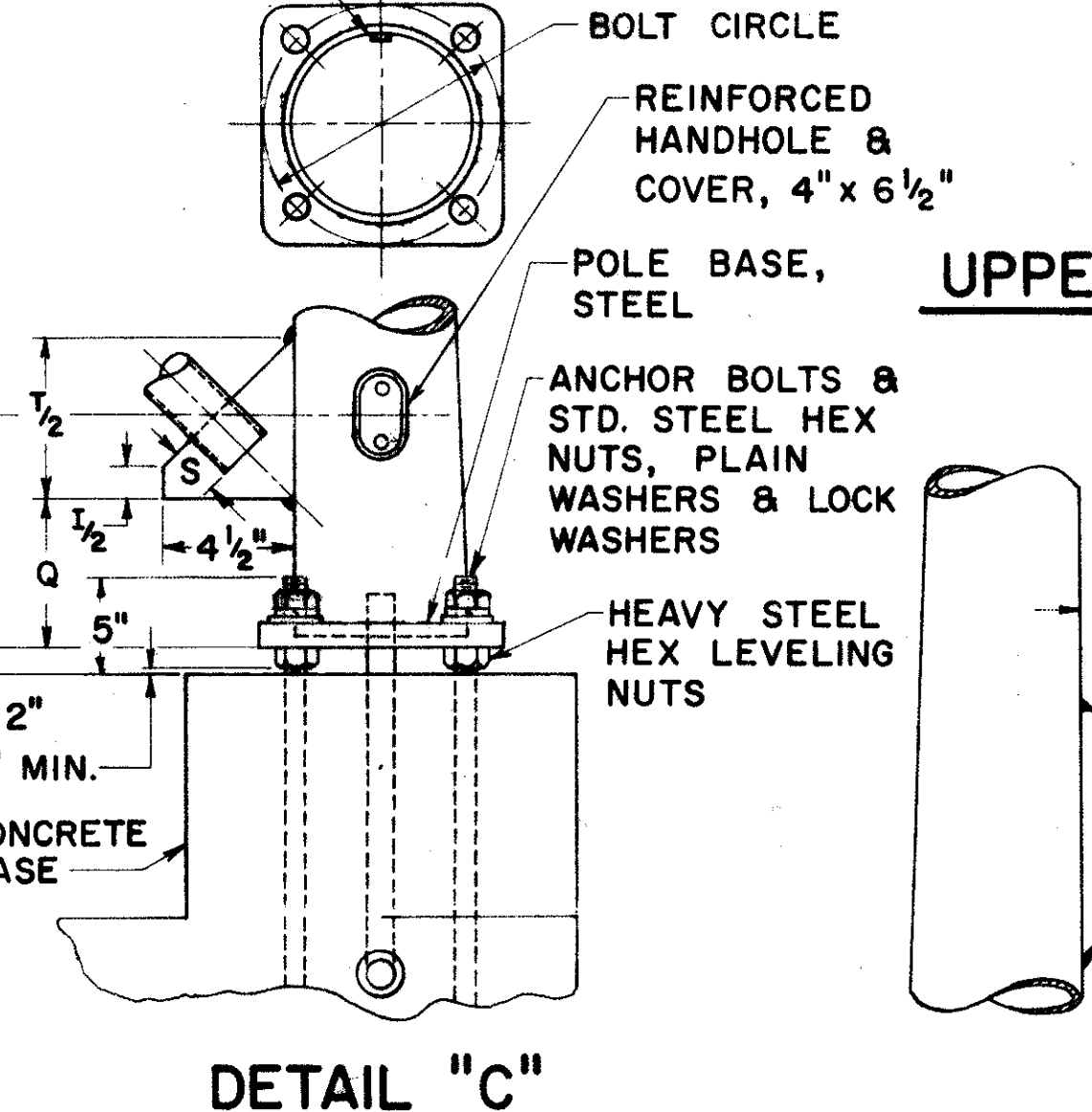
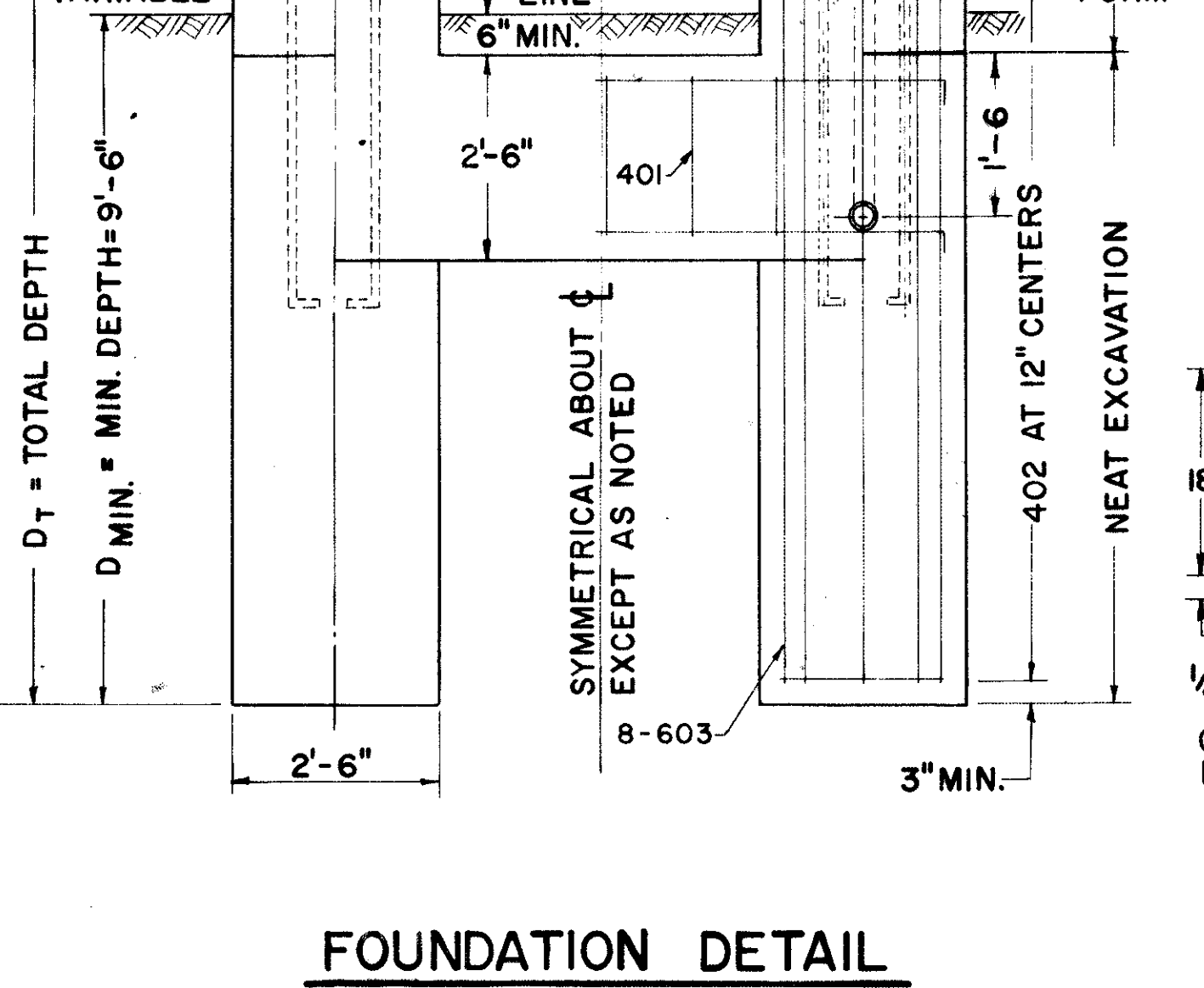
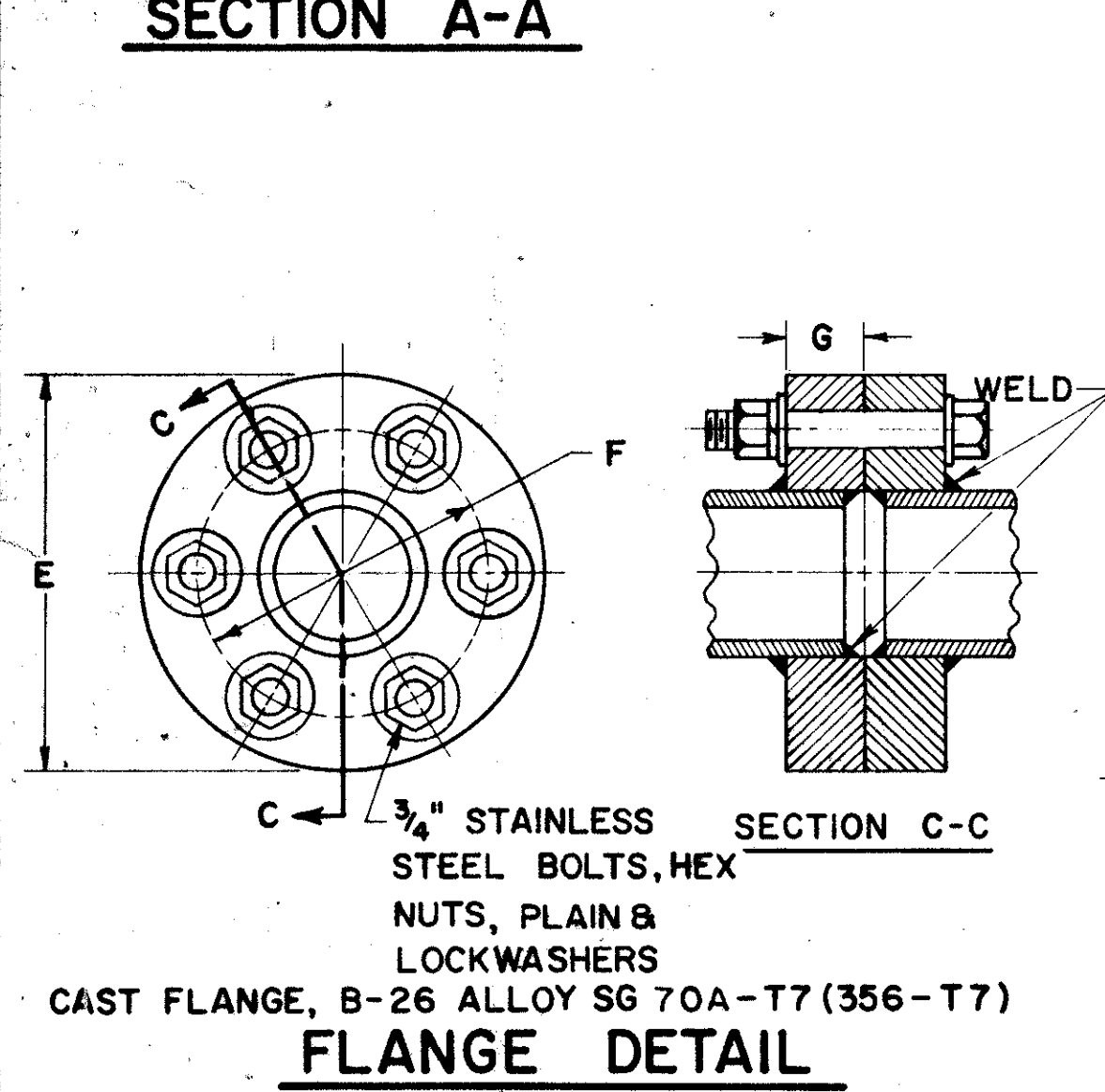
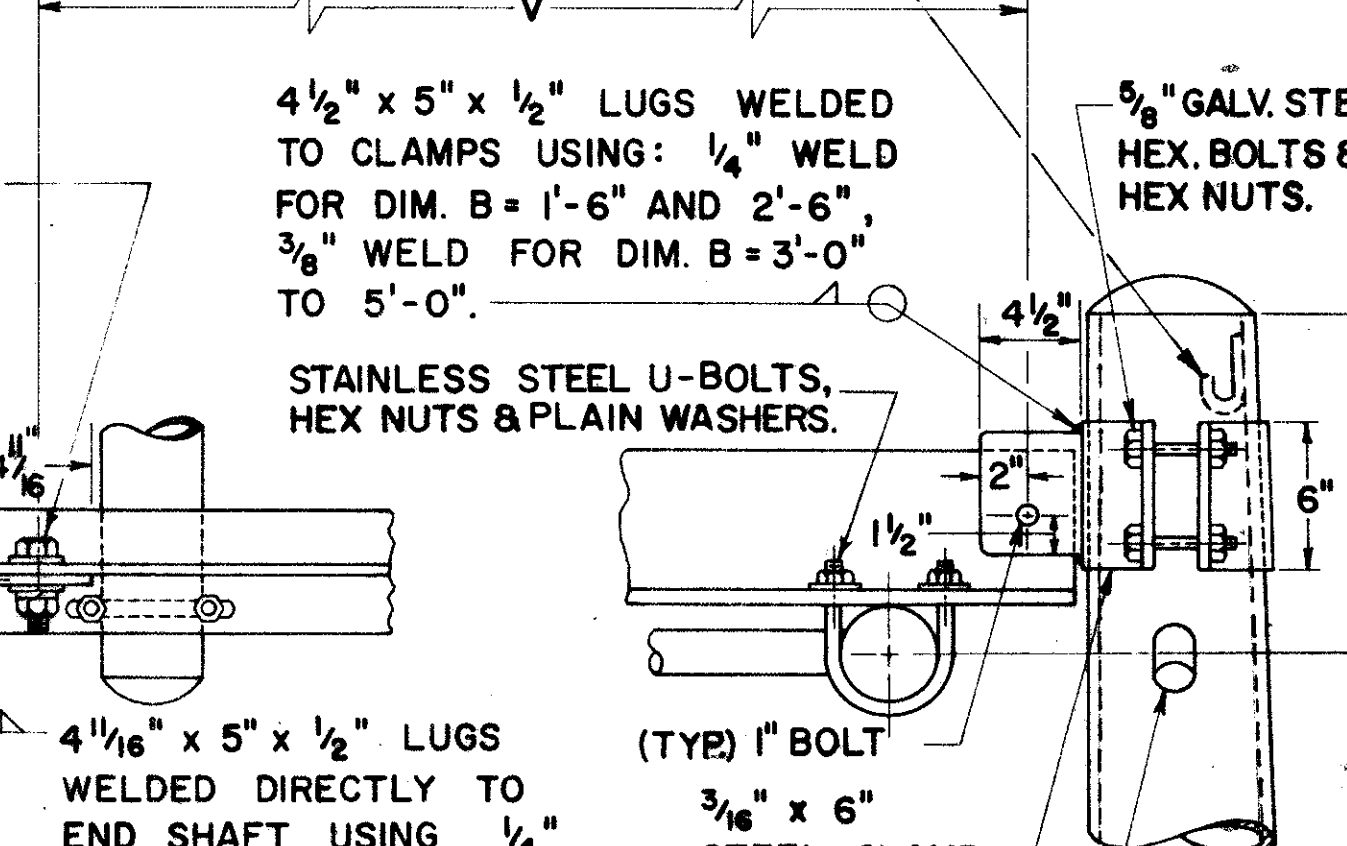
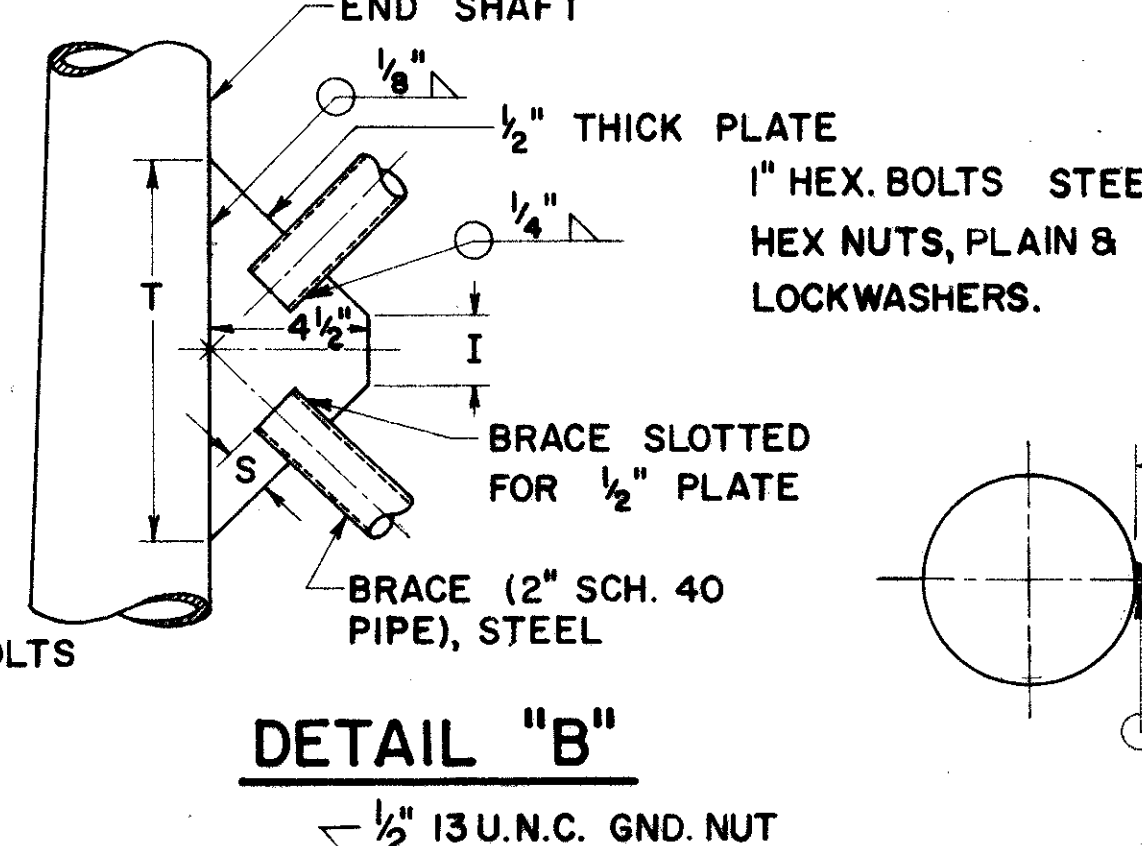
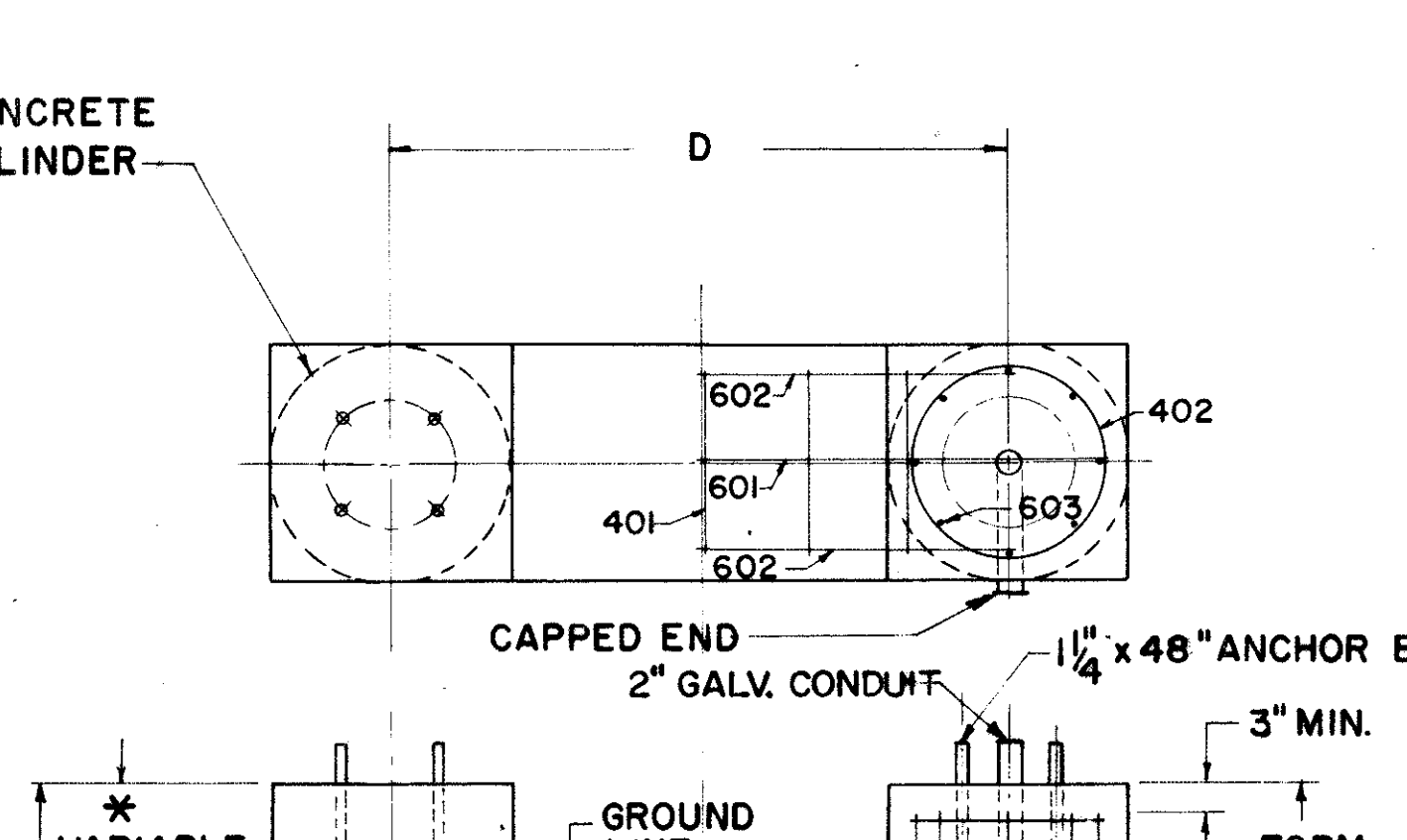
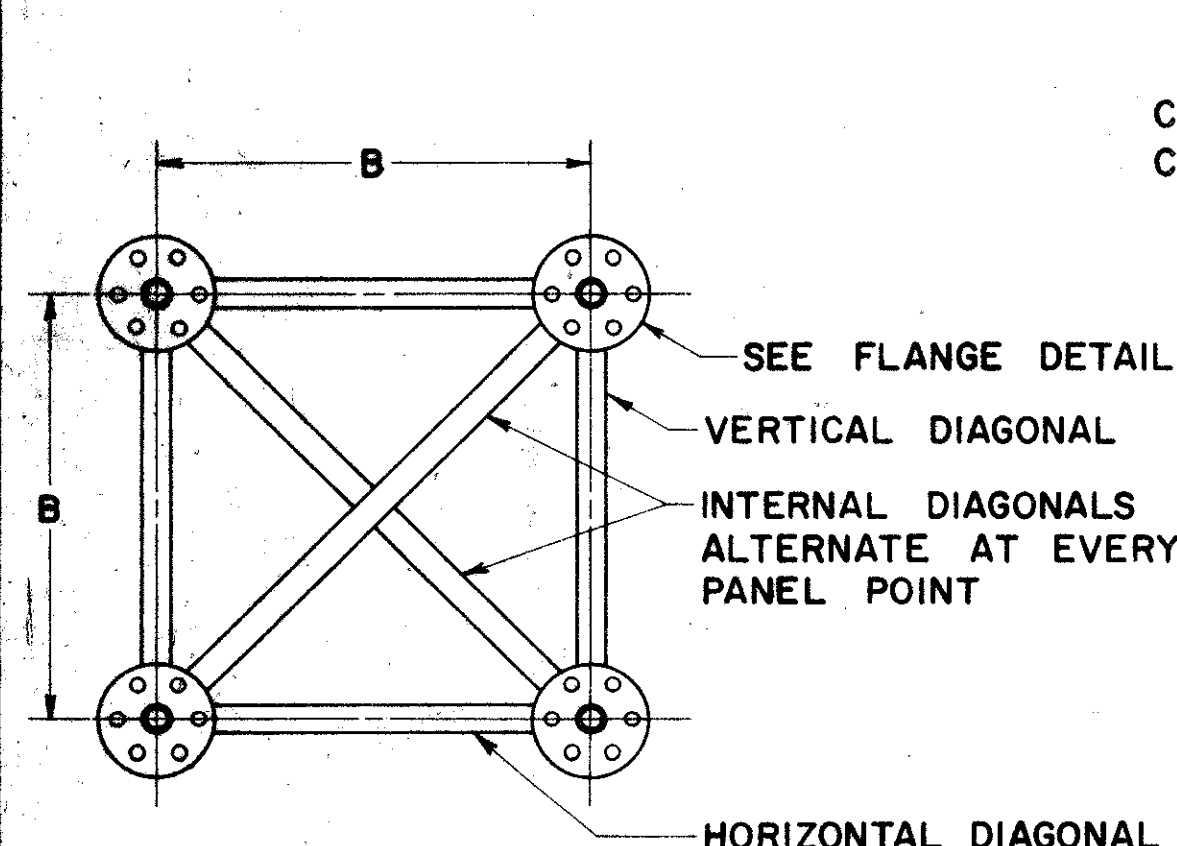
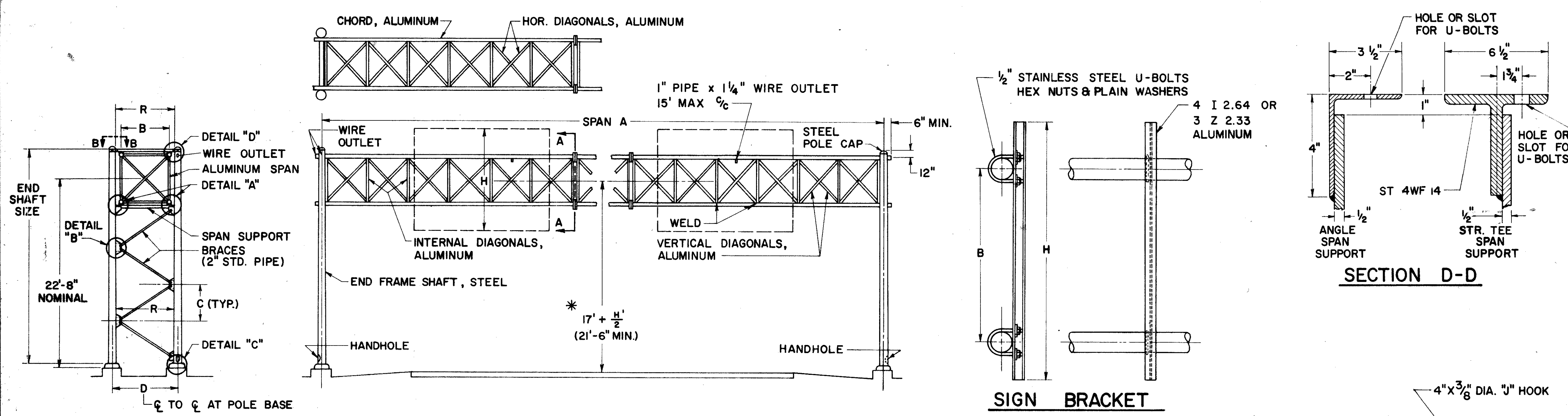
**SOILS**  
THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

**REINFORCING STEEL**  
COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS. BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER.

**\*FOUNDATION ELEVATION**  
ELEVATION OF TOPS OF FOUNDATIONS SHALL BE BUILT UP SO THAT 17" CLEARANCE IS MAINTAINED OVER THE ENTIRE WIDTH OF THE PAVEMENT AND SHOULDERS.

**CONDUIT IN FOUNDATION**  
TWO 2" AND ONE 1/2" CONDUITS ARE REQUIRED PER SIGN SUPPORT. COST IS INCLUDED WITH I-129 SUPPORTS. SEE DETAIL SHEET 587.

**DESIGN**  
THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.



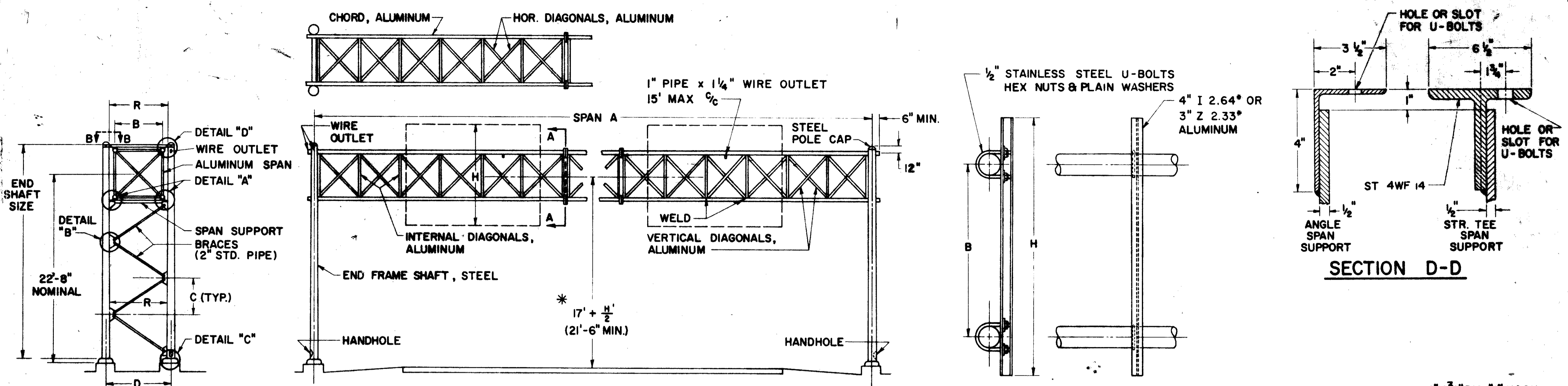
DESIGN NO.	SPAN A	B	C	D	E	END SHAFT	BRACE LENGTH	F	G	I	K	L	P	Q	R	S	T	U BOLTS	V	BOLT CIRCLE	SPAN SUPPORT SECTION D-D	CHORDS	HORIZONTAL AND INTERNAL DIAGONAL	VERTICAL DIAGONAL	REINFORCEMENT SCHEDULE
1	50' thru 75'	3'-0"	4'-11 3/4"	4'-5"	9 1/4"	8" x 4.5" x 25'-0", 3 GA.	5'-10 13/16"	7 7/16"	1 3/8"	3 1/2"	4 3/4"	8"	12"	6 5/8"	3'-9"	1 1/2"	10"	5 7/8"	3'-3 5/8"	11"	SPLIT TEE 3'-8"	4 3/4" x .188"	1.900" x .145"	1.660" x .140"	MARK NO. LENGTH TYPE
2	76' thru 85'	4'-0"	4'-10 1/4"	5'-7"	9 1/4"	8" x 6.22" x 25'-6", 3 GA.	6'-7 1/8"	7 7/16"	1 3/8"	5 5/8"	4 3/8"	7 3/4"	12"	6 1/4"	4'-10"	1 1/2"	9 1/2"	5 5/8"	4'-4 5/8"	11"	SPLIT TEE 4'-10"	4 3/4" x .188"	2" x .188"	1.900" x .145"	401 12"C/C 8'-6" 102
3	86' thru 90'	4'-0"	4'-10 1/4"	5'-7"	11"	8" x 6.22" x 25'-6", 3 GA.	6'-7 1/8"	8 1/2"	1 1/2"	5 5/8"	4 3/8"	7 3/4"	42"	6 1/4"	4'-10"	1 1/2"	9 1/2"	5 5/8"	4'-4 5/8"	11"	SPLIT TEE 4'-10"	5 1/2" x .250"	2" x .188"	1.900" x .145"	402 12"C/C 7'-6" 103
4	91' thru 110'	5'-0"	4'-8 1/2"	6'-7"	11"	8" x 6.18" x 26'-0", 3 GA.	7'-3 1/4"	8 1/2"	1 1/2"	-	3 1/2"	7 3/4"	12"	7 1/4"	5'-10"	1 3/4"	11 1/4"	3 3/4"	5'-4 5/8"	11"	SPLIT TEE 5'-10"	5 1/2" x .250"	2 1/2" x .188"	2 1/2" x .188"	601 4 D+4'-0" 101 602 8 D+2'-0" 101 603 32 D+6" STR. 103

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

**OVERHEAD SIGN SUPPORTS I-129 No. 7.4**

DATE 5-2-66  
7-2-66  
6-8-66  
2-5-66

APPROVED *Robert E. Lomer*  
ENGINEER OF TRAFFIC



**NOTES**

**MATERIALS**  
THE OVERHEAD SPAN TRUSS SHALL BE ALUMINUM AND THE END FRAMES SHALL BE STEEL.  
SPAN TRUSS AND END FRAMES, INCLUDING HARDWARE, SHALL BE IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION I-129 UNLESS OTHERWISE NOTED.  
STEEL POLE BASES AND GUSSETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A-373.  
AFTER FABRICATION THE TAPERED POLES SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

**FABRICATION**  
THE ENTIRE STEEL END FRAME SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH SEC. M-7440. MAXIMUM LENGTH OF SPAN SECTIONS IS 30 FT.

**RECTION**  
USE A MINIMUM OF 1" CAMBER IN SPAN TRUSS MEMBER FOR A 50' SPAN; ADD 1/4" OF CAMBER FOR EACH 5' OF INCREASE IN SPAN OVER 50'.

**PAYMENT**  
PAYMENT FOR THE GALVANIZED CONDUIT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS.

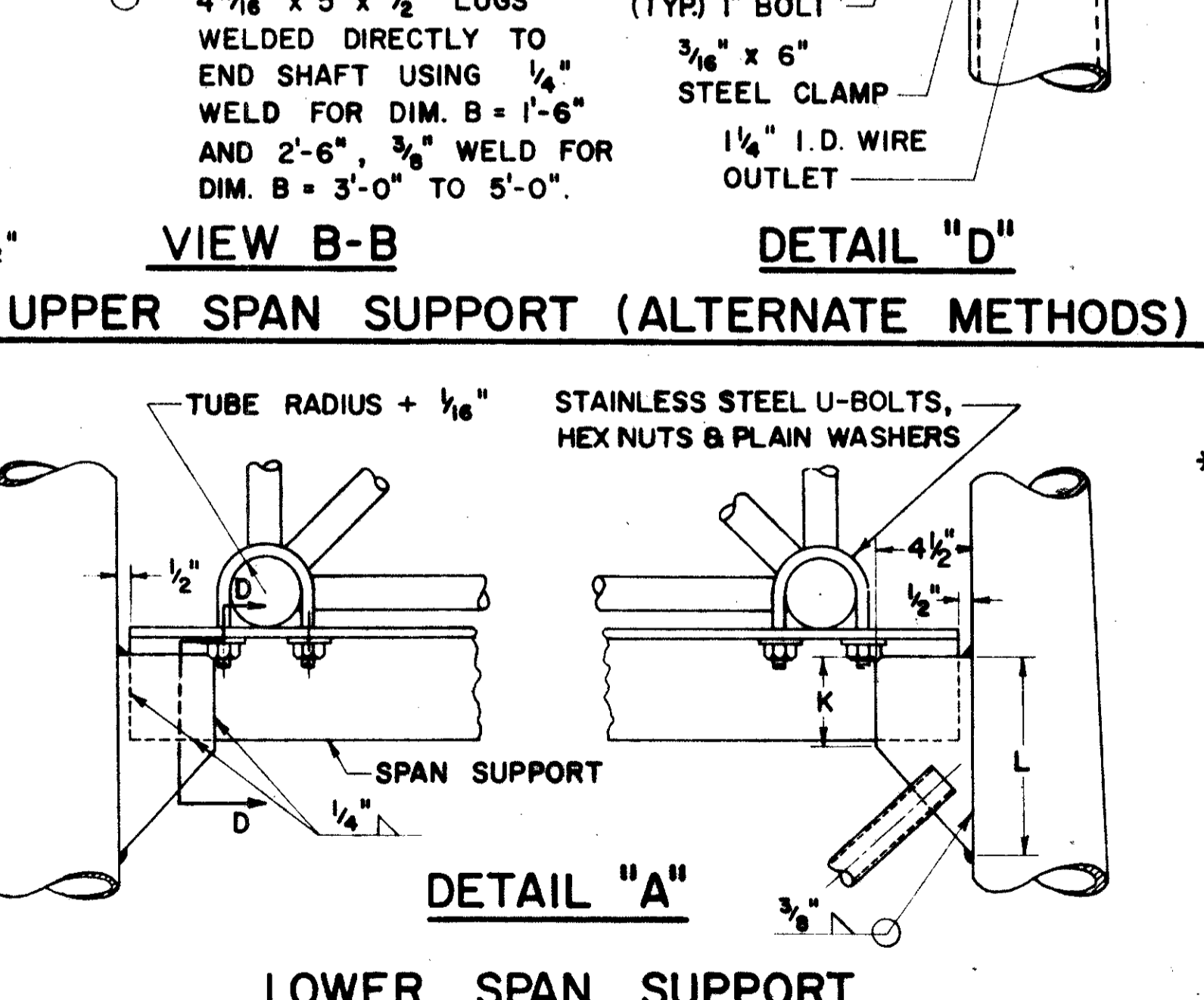
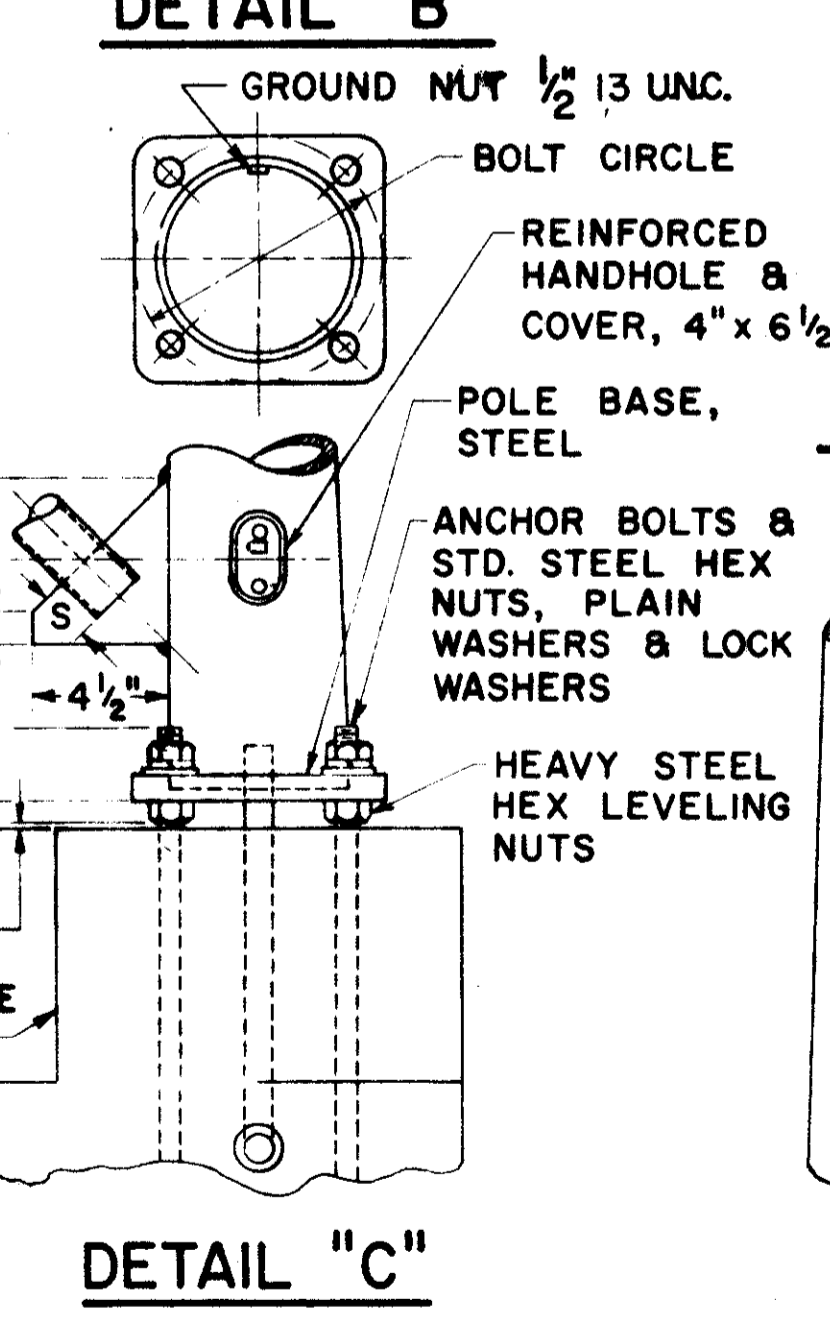
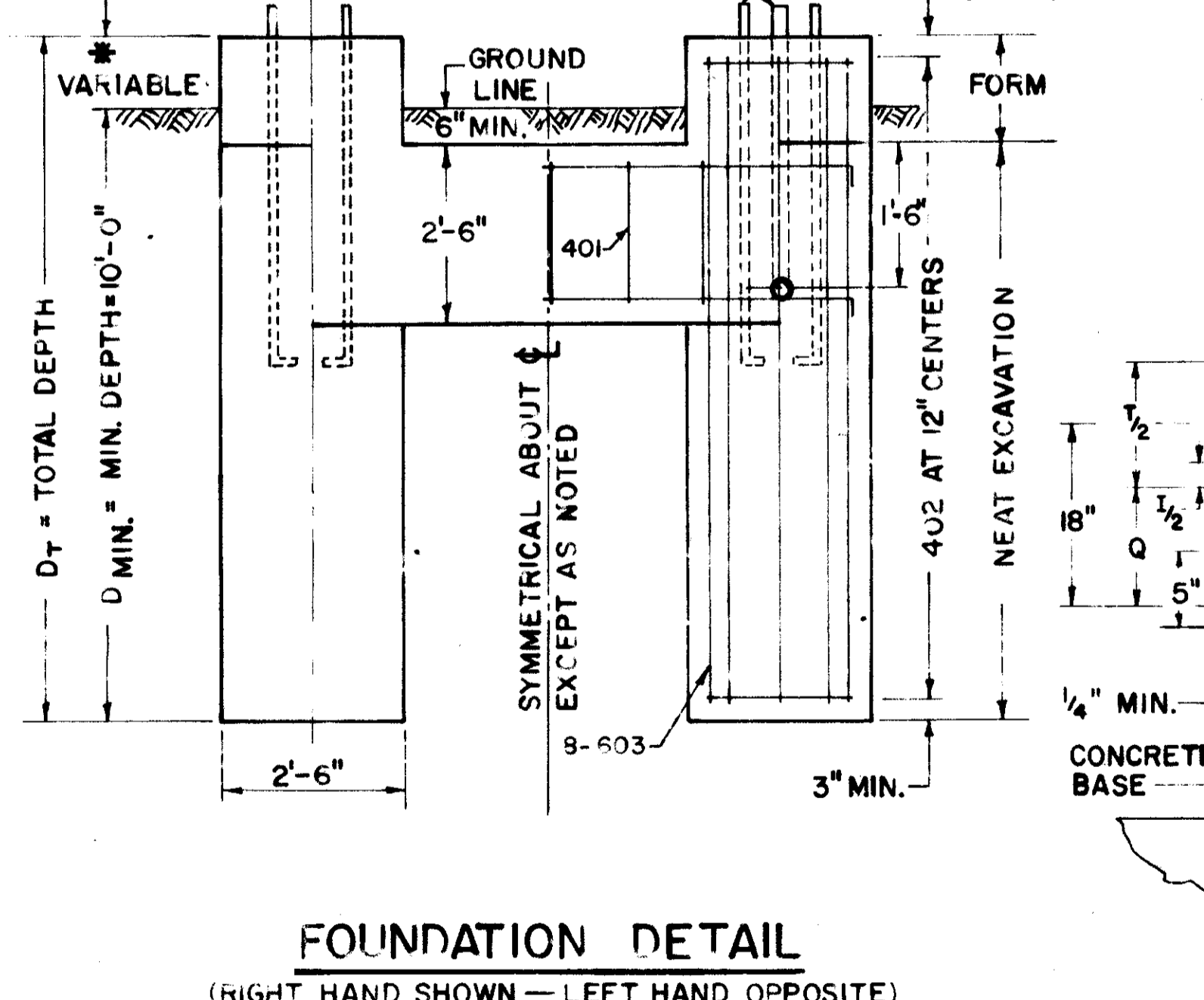
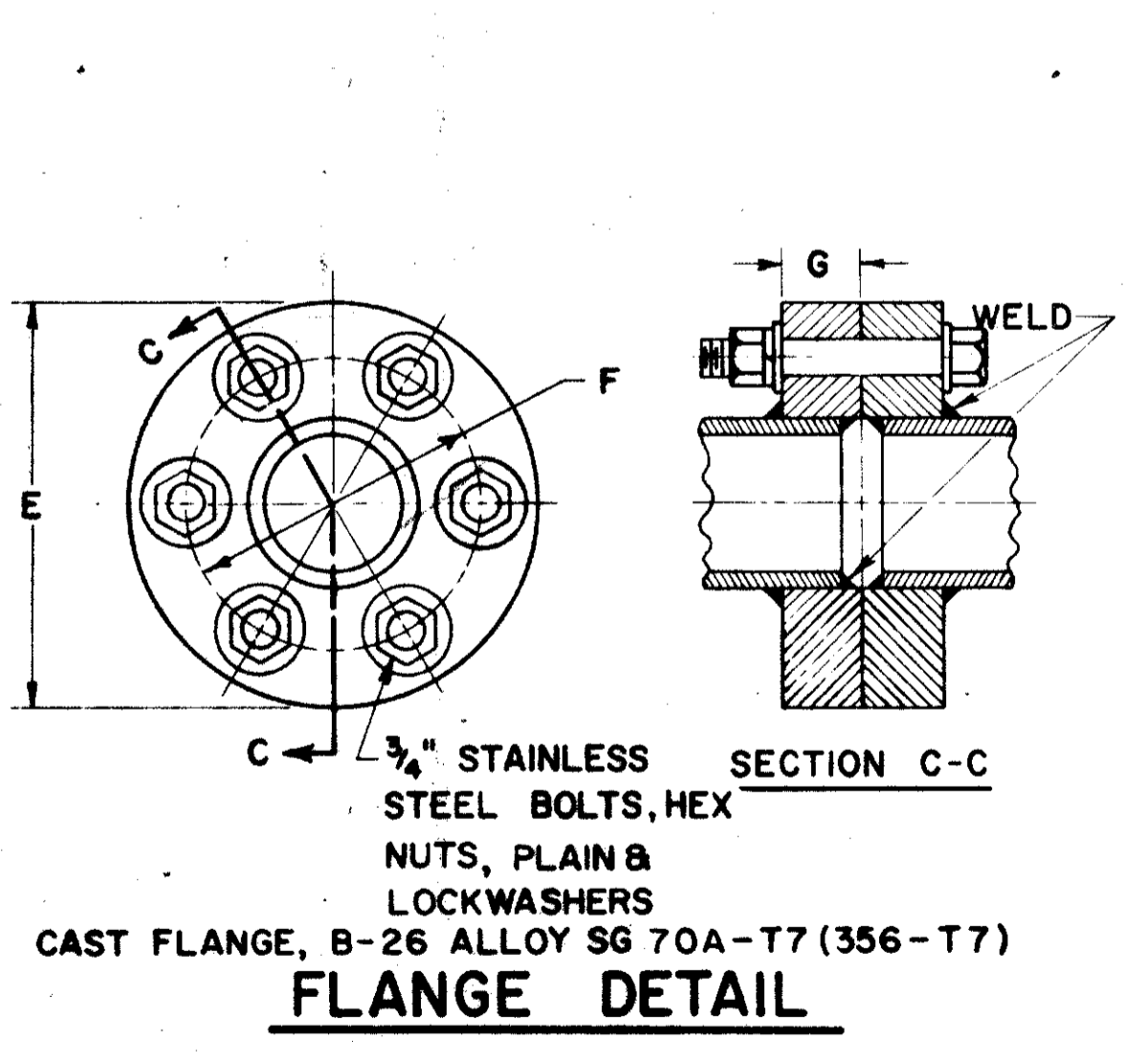
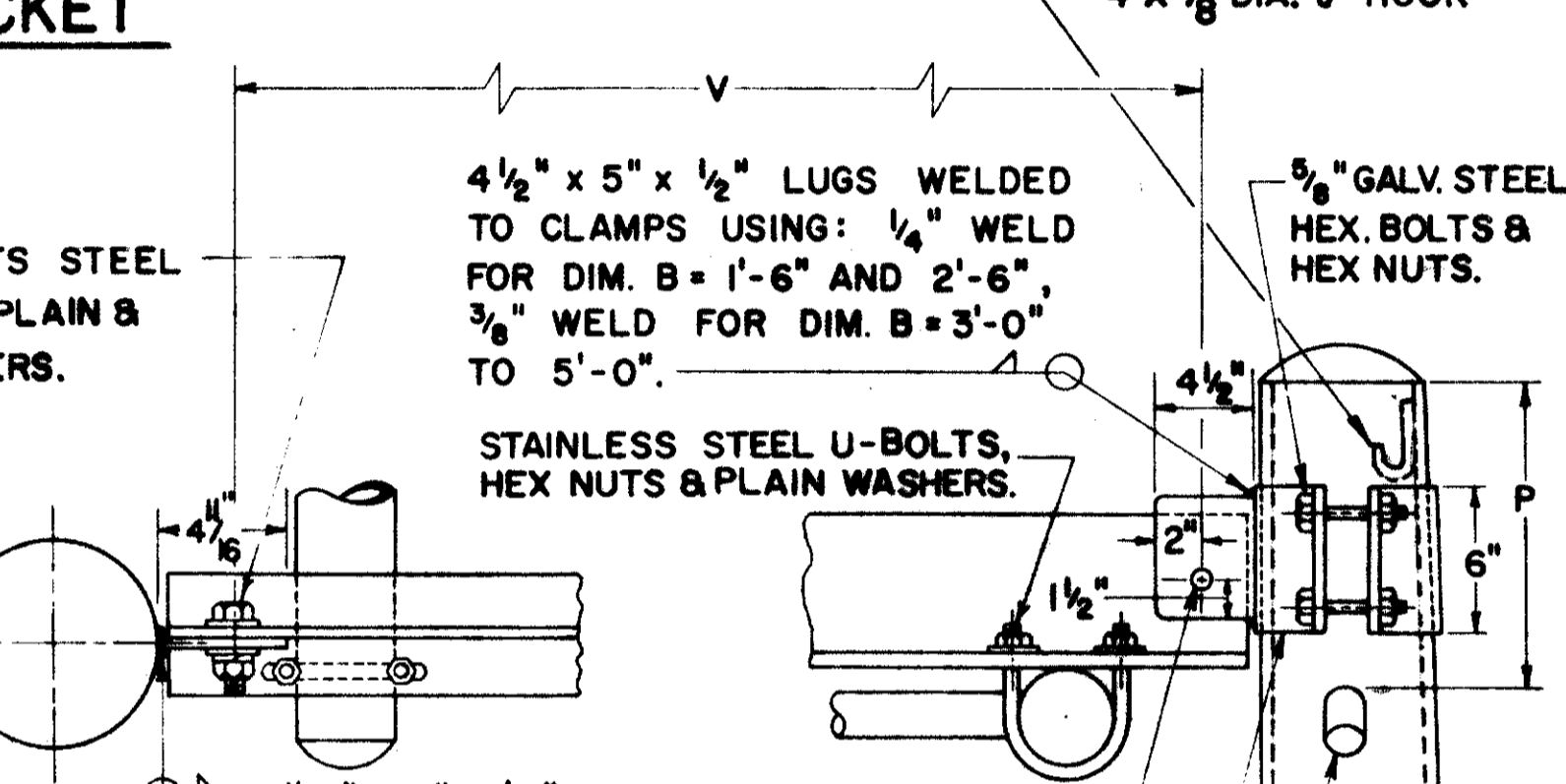
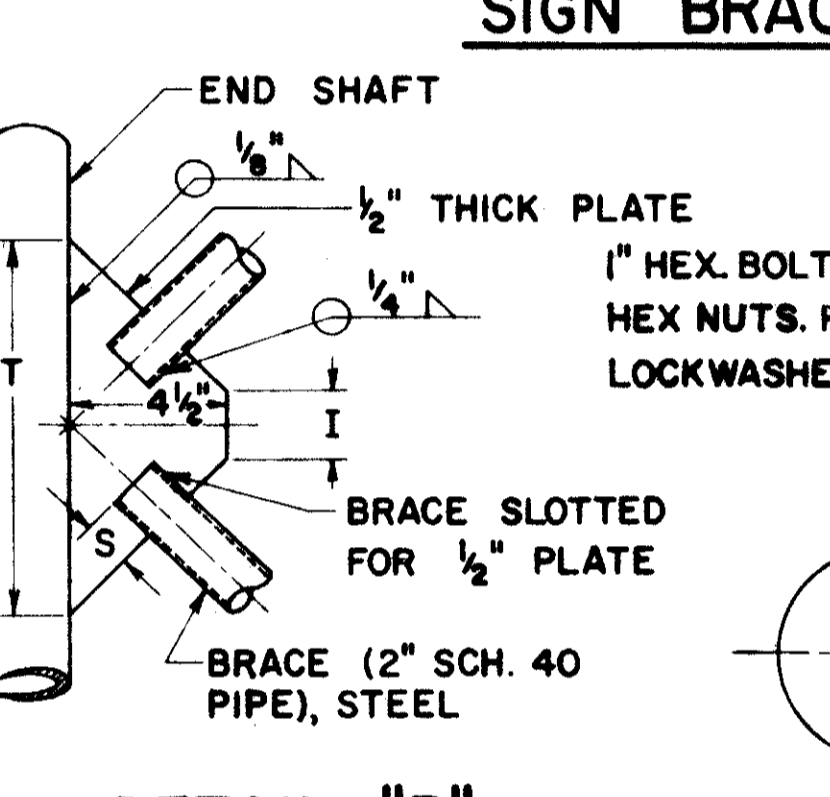
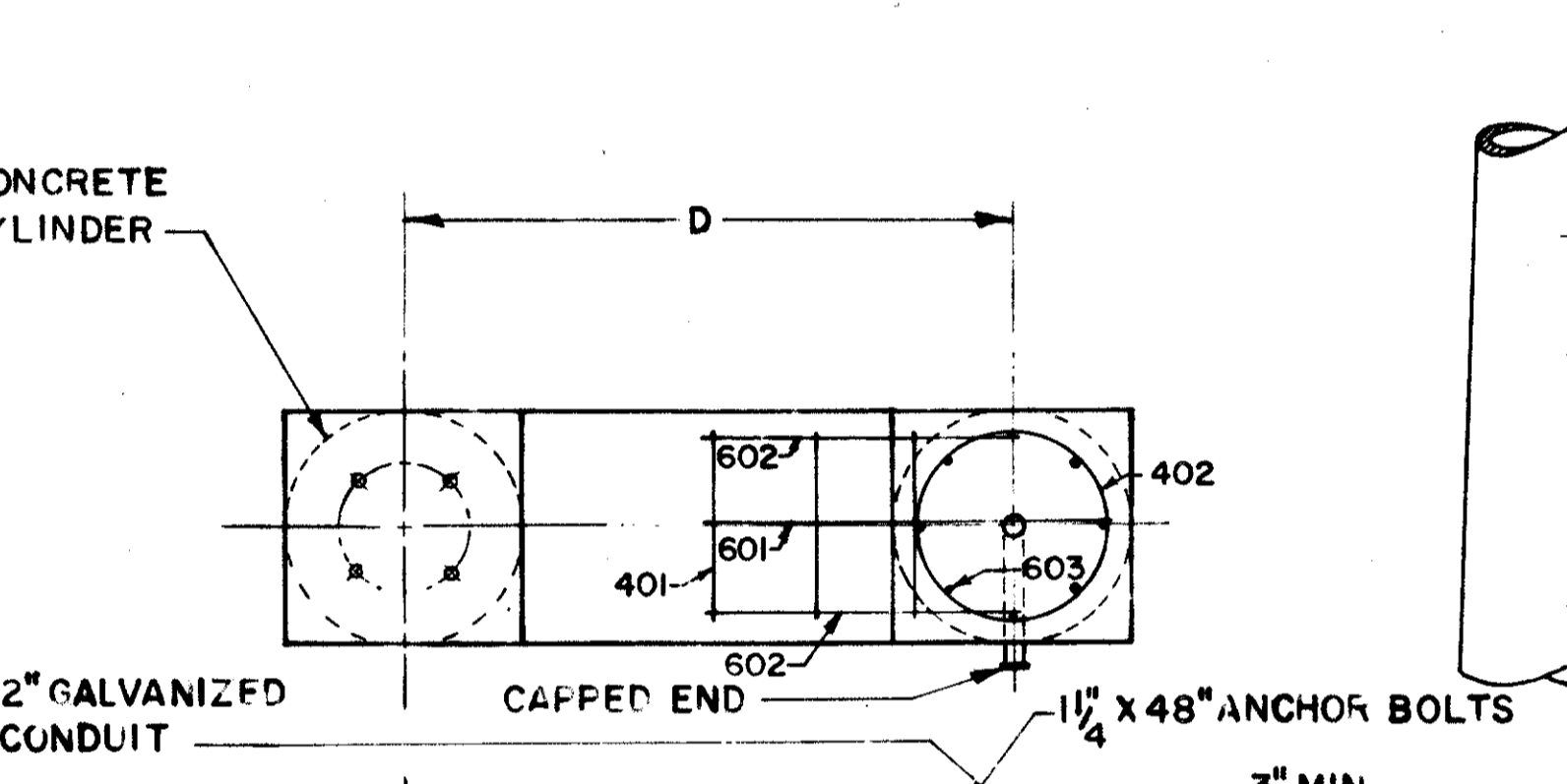
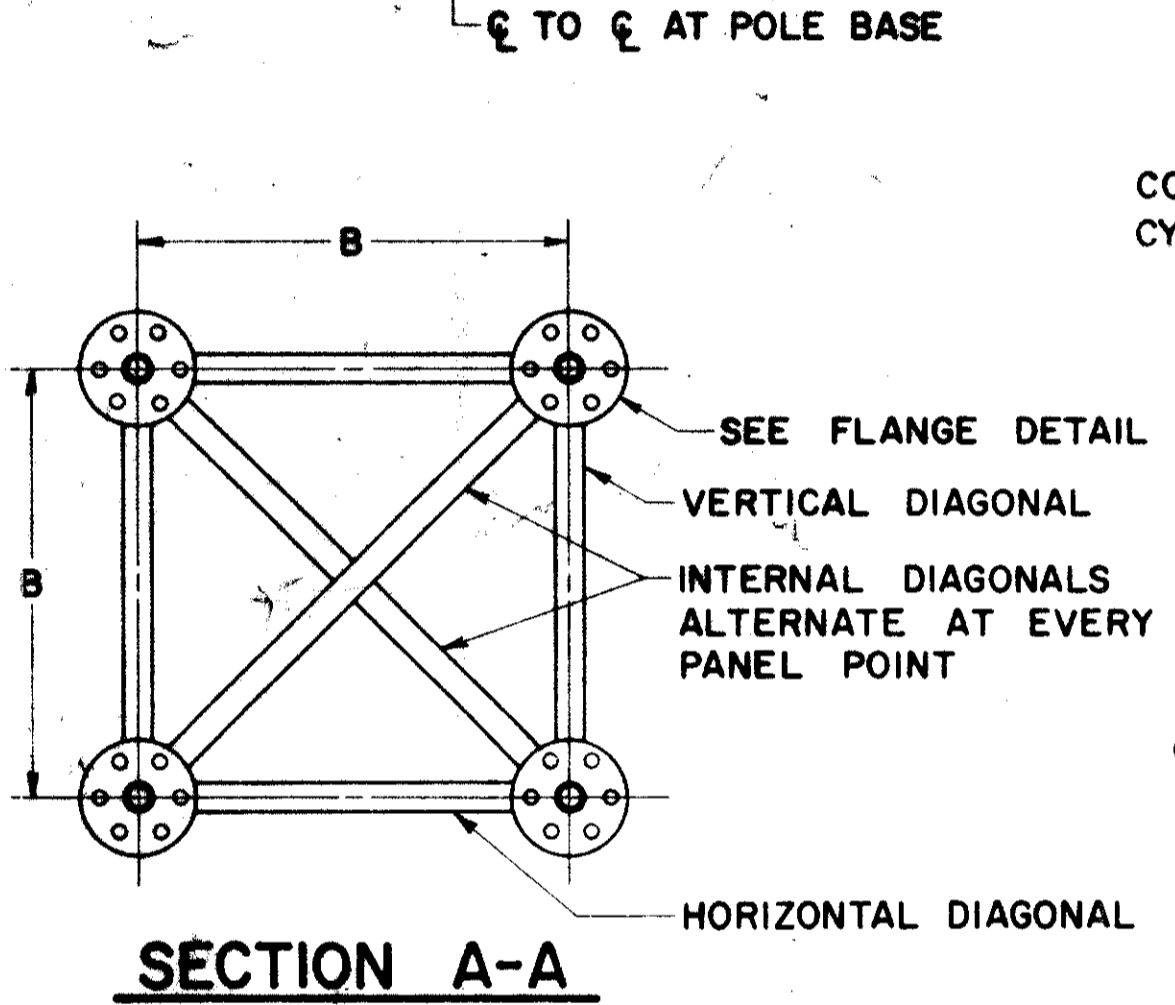
**SOILS**  
THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY); FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

**REINFORCING STEEL**  
COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.  
BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER.

**FOUNDATION ELEVATION**  
ELEVATION OF TOPS OF FOUNDATIONS SHALL BE BUILT UP SO THAT 17" CLEARANCE IS MAINTAINED OVER THE ENTIRE WIDTH OF PAVEMENT AND SHOULDERS.

**CONDUIT IN FOUNDATION**  
TWO 2" AND ONE 1/2" CONDUITS ARE REQUIRED PER SIGN SUPPORT. COST IS INCLUDED WITH I-129 SUPPORTS. SEE DETAIL SHEET 587.

**DESIGN**  
THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.



DESIGN NO.	SPAN A	B	C	D	E	END SHAFT	BRACE LENGTH	F	G	I	K	L	P	Q	R	S	T	U	V	BOLT CIRCLE	SPAN SUPPORT SECTION D-D	CHORDS	HORIZONTAL AND INTERNAL DIAGONAL	VERTICAL DIAGONAL
1	50' THRU 70'	3'-0"	4'-1 1/4"	4'-5"	9 1/4"	8" X 4.5" X 25'-0", 3GA	5'-10 3/16"	7 7/16"	1 3/8"	3 1/2"	4 3/4"	8"	12"	6 5/8"	3'-9"	1 1/2"	10"	5 5/8"	3'-35 5/8"	11"	SPLIT TEE 3'-8"	4 3/4" X .188"	1.900" X .145"	1.660" X .140"
2	71' THRU 80'	4'-0"	4'-10 1/4"	5'-7"	9 1/4"	8" X 6.22" X 25'-6", 3GA	6'-7 7/8"	7 7/16"	1 3/8"	5 5/8"	4 3/8"	7 3/4"	12"	6 1/4"	4'-11"	1 1/2"	9 1/2"	5 5/8"	4'-5 3/8"	11"	SPLIT TEE 4'-10"	4 3/4" X .188"	2" X .188"	1.900" X .145"
3	81' THRU 86'	4'-0"	4'-10 1/4"	5'-7"	11"	8" X 6.22" X 25'-6", 3GA	6'-7 7/8"	8 1/2"	1 1/2"	5 5/8"	4 3/8"	7 3/4"	12"	6 1/4"	4'-11"	1 1/2"	9 1/2"	5 5/8"	4'-5 3/8"	11"	SPLIT TEE 4'-10"	5 1/2" X .250"	2" X .188"	1.900" X .145"
4	86' THRU 110'	5'-0"	4'-8 1/2"	6'-7"	11"	8" X 6.16" X 26'-0", 3GA	7'-3 1/4"	8 1/2"	1 1/2"	-	3 1/2"	7 3/4"	12"	7 1/4"	5'-11"	1 3/4"	11 1/4"	3 3/4"	5'-5 5/8"	11"	SPLIT TEE 5'-10"	5 1/2" X .250"	2 1/2" X .188"	2 1/2" X .188"

REINFORCEMENT SCHEDULE			
MARK	NO.	LENGTH	TYPE
401	12"C/C	8'-6"	102
402	12"C/C	7'-6"	103
601	4	D+4'-0"	101
602	8	D+2'-0"	101
603	32	D+-6"	STR.

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

**OVERHEAD SIGN SUPPORTS I-129 No.7.5**

APPROVED *Robert E. Lamer*  
ENGINEER OF TRAFFIC

DATE  
5-2-62  
7-25-62  
4-23-64  
2-5-65

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

**NOTES**

**MATERIALS**  
THE OVERHEAD SPAN TRUSS SHALL BE ALUMINUM AND THE END FRAMES SHALL BE STEEL.  
SPAN TRUSS AND END FRAMES, INCLUDING HARDWARE, SHALL BE IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION I-129 UNLESS OTHERWISE NOTED.  
STEEL POLE BASES AND GUSSETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A-373.  
AFTER FABRICATION THE TAPERED POLES SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

**FABRICATION**  
THE ENTIRE STEEL END FRAME SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH SEC. M-7.4(d). MAXIMUM LENGTH OF SPAN SECTIONS IS 30 FT.

**ERECTION**  
USE A MINIMUM OF 1" CAMBER IN SPAN TRUSS MEMBER FOR A 50' SPAN; ADD 1/4" OF CAMBER FOR EACH 5' OF INCREASE IN SPAN OVER 50'.

**PAYMENT**  
PAYMENT FOR THE GALVANIZED CONDUIT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS.

**SOILS**  
THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

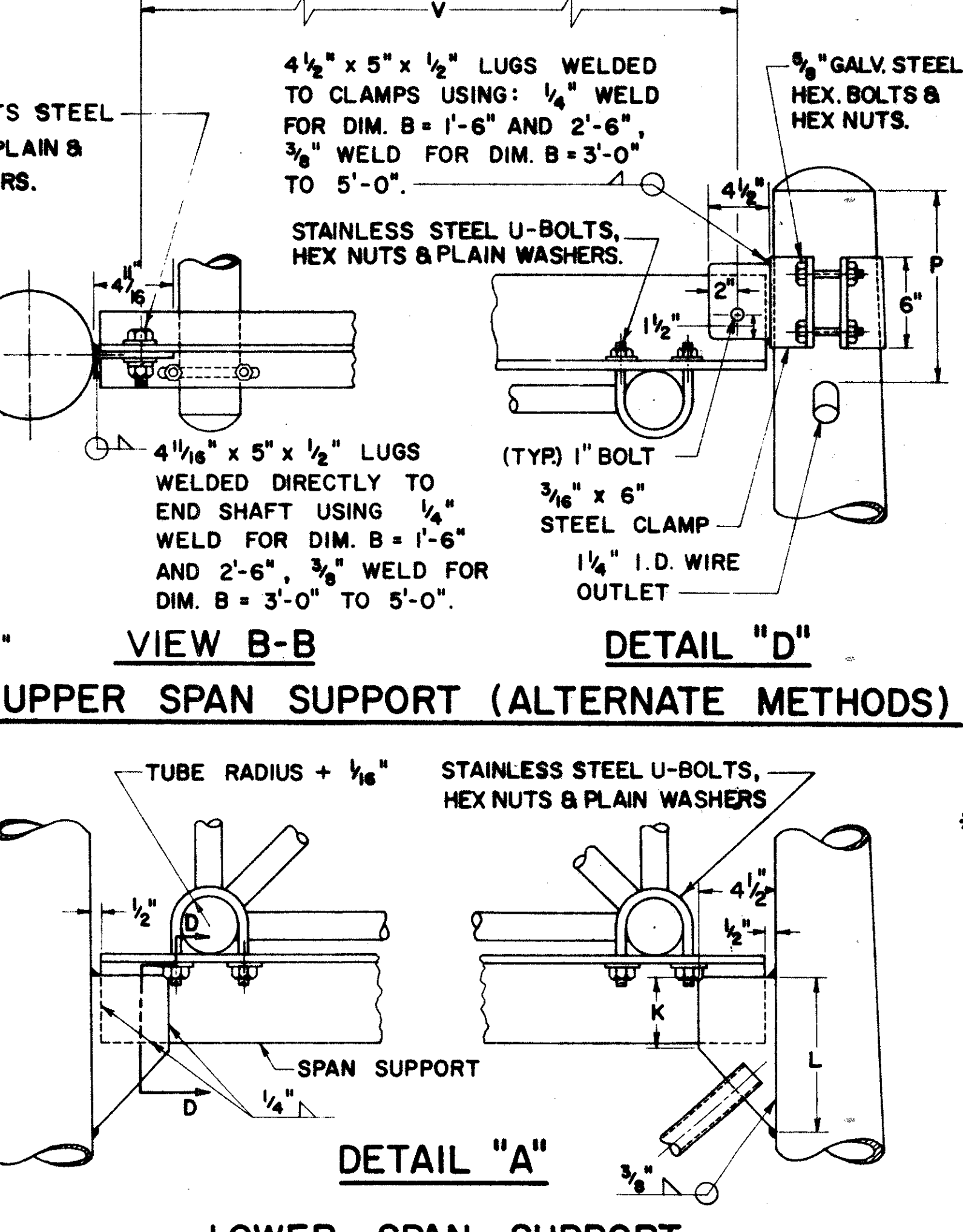
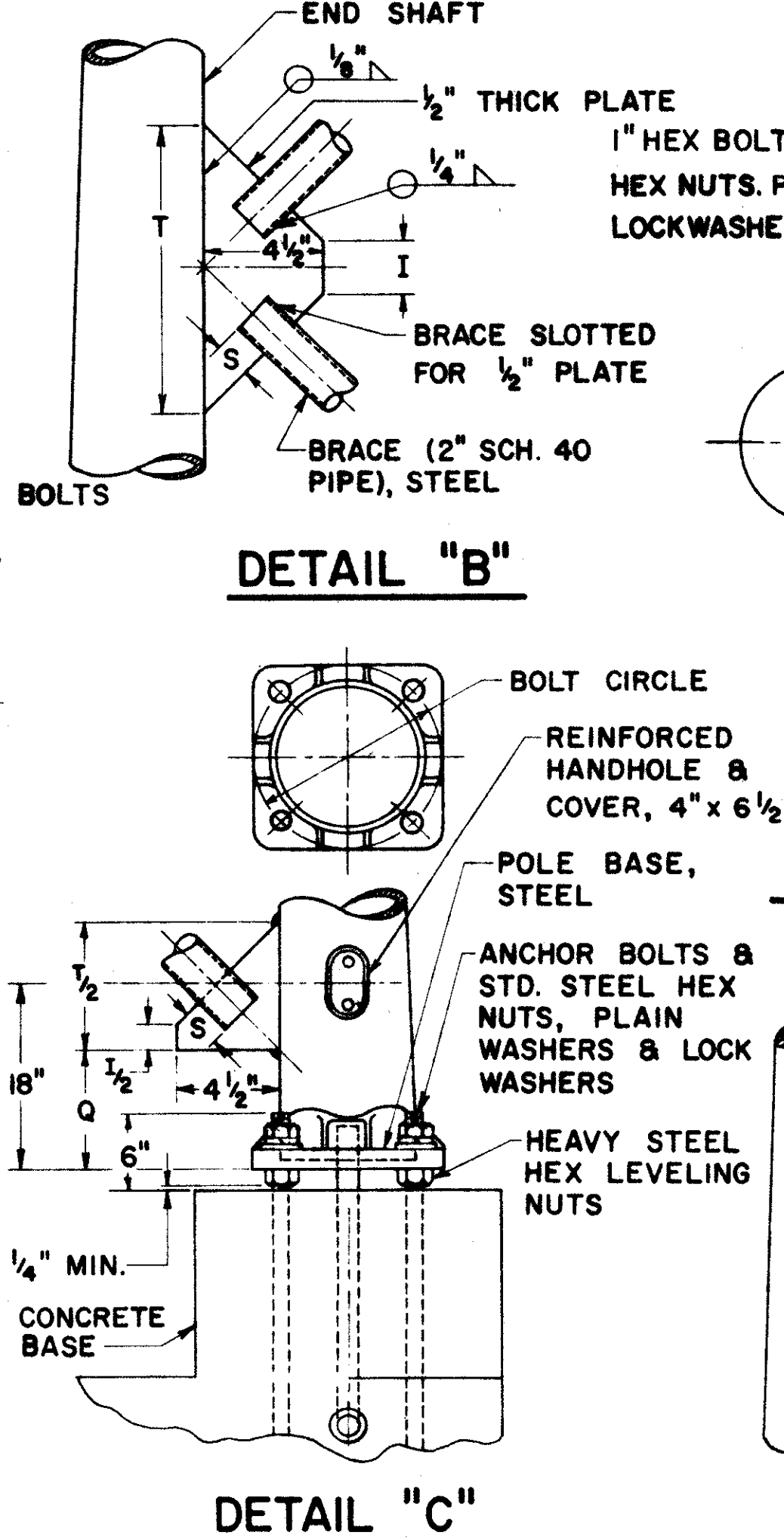
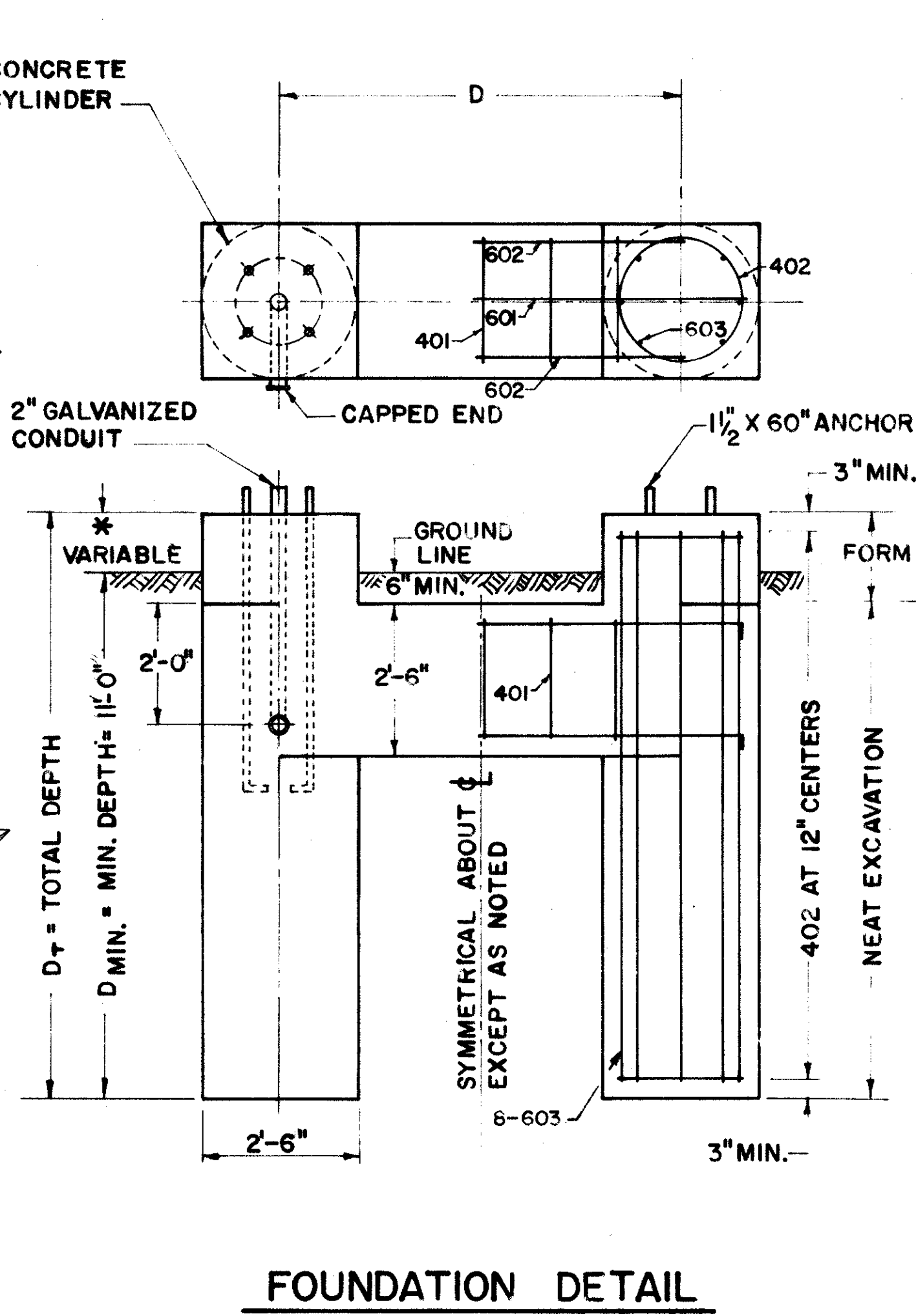
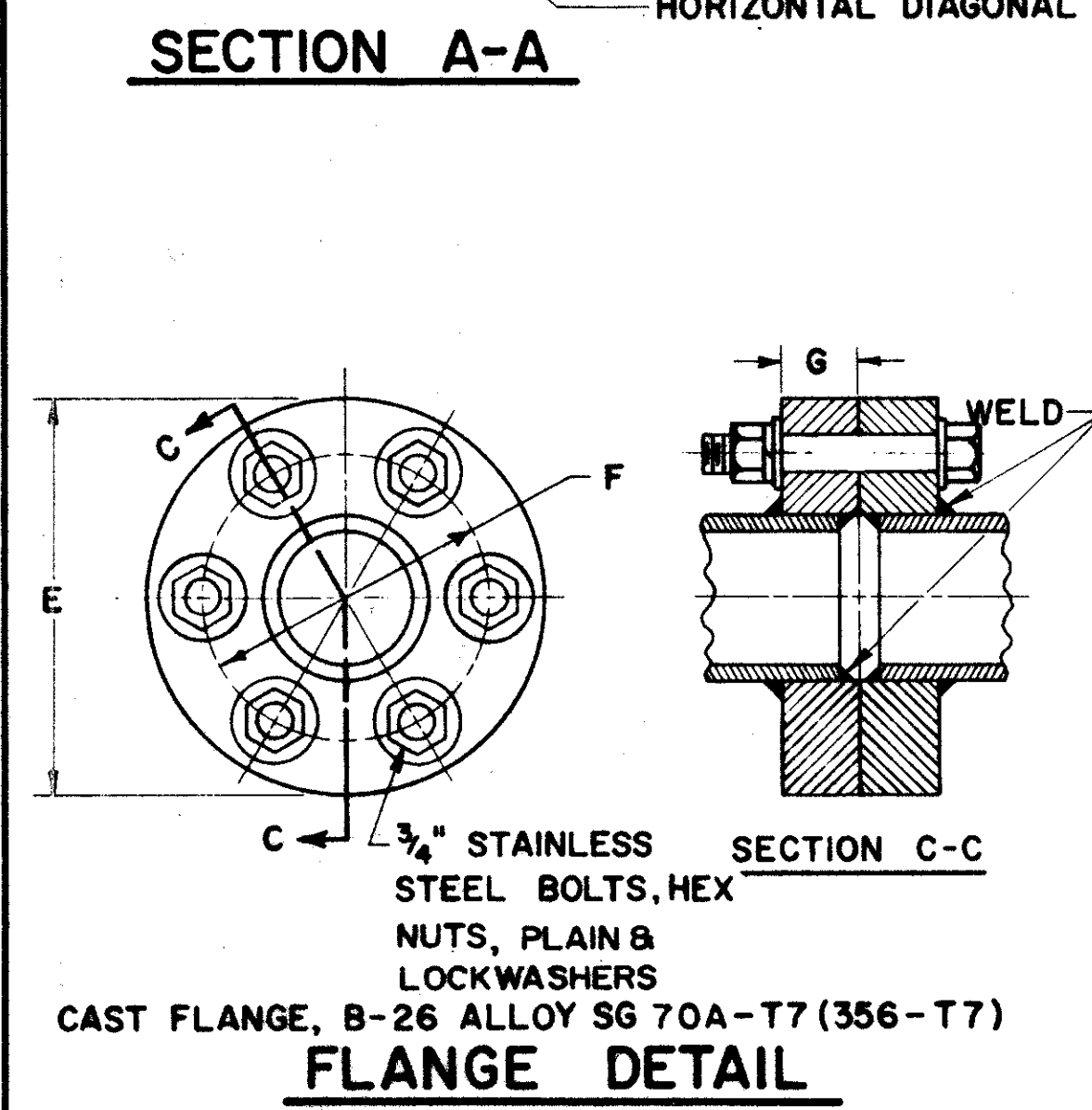
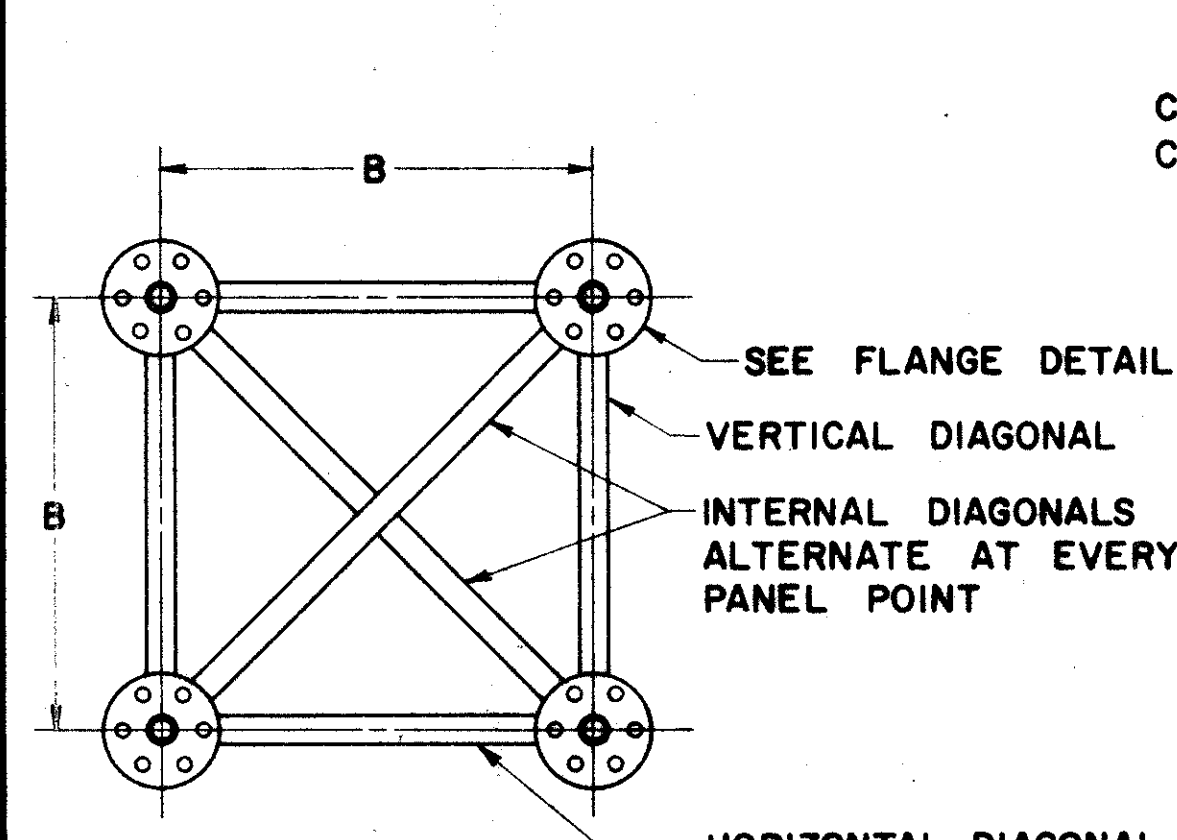
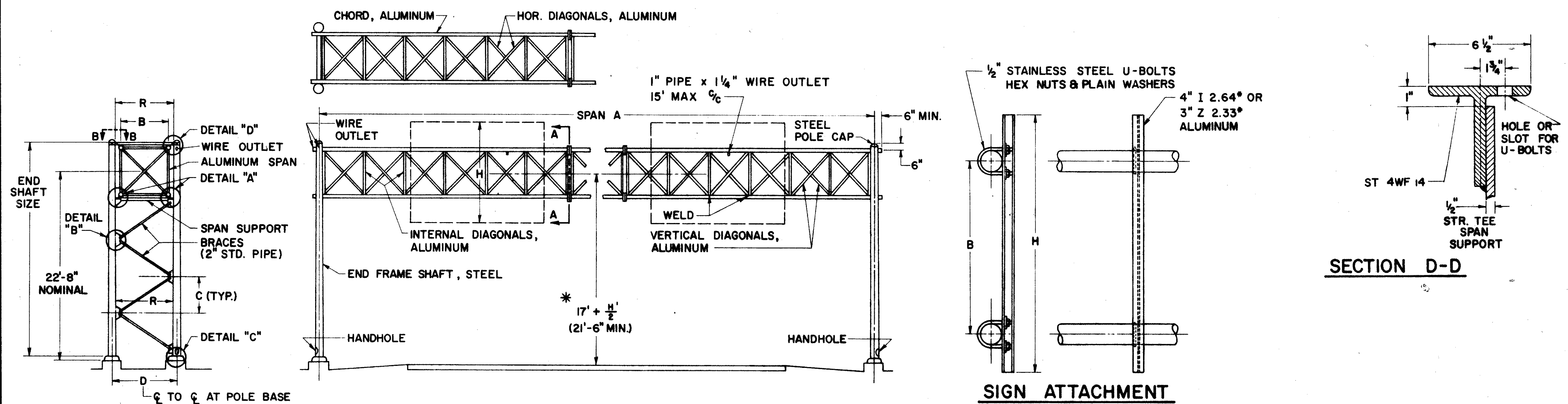
**REINFORCING STEEL**  
COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED AND THE FIRST TWO DIGITS WHERE FOUR DIGITS ARE USED, INDICATE THE BAR SIZE NUMBER.

**\*FOUNDATION ELEVATION**  
ELEVATION OF TOPS OF FOUNDATIONS SHALL BE BUILT UP SO THAT 17' CLEARANCE IS MAINTAINED OVER THE ENTIRE WIDTH OF THE PAVEMENT AND SHOULDERS.

**CONDUIT IN FOUNDATION**  
TWO 2" AND ONE 1/2" CONDUITS ARE REQUIRED PER SIGN SUPPORT. COST IS INCLUDED WITH I-129 SUPPORTS. SEE DETAIL SHEET 587.

**DESIGN**  
THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.



DESIGN NO.	SPAN A	B	C	D	E	END SHAFT	BRACE LENGTH	F	G	I	K	L	P	Q	R	S	T	U BOLTS	V	BOLT CIRCLE	SPAN SUPPORT SECTION D-D	CHORDS	HORIZONTAL AND INTERNAL DIAGONAL	VERTICAL DIAGONAL
1.	50' thru 65'	3'-0"	4'-11 3/4"	4'-5"	9 1/4"	8" X 4.5 X 25'-0", 3GA	5'-10 5/16"	7 7/16"	3 3/8"	3 1/2"	4 3/4"	8"	12"	6 5/8"	3'-9"	1 1/2"	10"	5 5/8"	3'-3 5/8"	11"	Split Tee 3'-8"	4 3/4" X .188"	2" X .188"	1.660" X .140"
2.	70' thru 75'	4'-0"	4'-10 1/4"	5'-7"	9 1/4"	8" X 6.25 X 25'-0", 3GA	6'-7 1/8"	7 7/16"	3 3/8"	3 5/8"	4 3/4"	7 3/4"	12"	6 1/4"	4'-11"	1 1/2"	9 1/2"	5 5/8"	4'-5 5/8"	10"	Split Tee 4'-10"	4 3/4" X .188"	2" X .188"	1.900" X .145"
3.	80'	4'-0"	4'-10 1/4"	5'-7"	11"	8" X 6.25 X 25'-6", 3GA	6'-7 1/8"	8 1/2"	1 1/2"	5 5/8"	4 7/8"	7 3/4"	12"	6 1/4"	4'-11"	1 1/2"	9 1/2"	5 5/8"	4'-5 5/8"	10"	Split Tee 4'-10"	5 1/2" X .250	2 1/2" X .188"	1.900" X .145"
4.	85' thru 110'	5'-0"	4'-8 1/2"	6'-7"	11"	8" X 6.18 X 26'-0", 3GA	7'-3 1/4"	8 1/2"	1 1/2"	-	3 1/2"	7 3/4"	12"	7 1/4"	5'-11"	1 3/4"	11 1/4"	3 3/4"	5'-5 5/8"	10"	Split Tee 5'-10"	5 1/2" X .250	2 1/2" X .188"	2 1/2" X .188"

REINFORCEMENT SCHEDULE			
MARK	NO.	LENGTH	TYPE
401	12"C/C	8'-6"	102
402	12"C/C	7'-6"	103
601	4	D+4'-0"	101
602	8	D+2'-0"	101
603	32	D <sub>T</sub> -6"	STR.

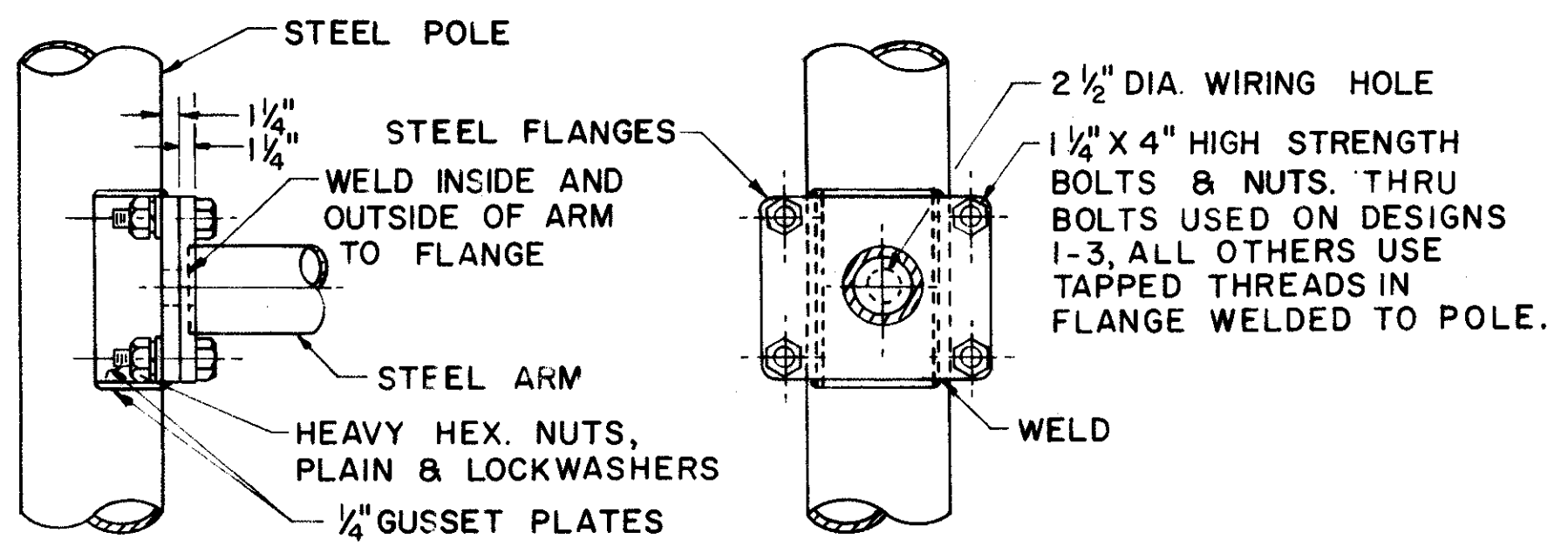
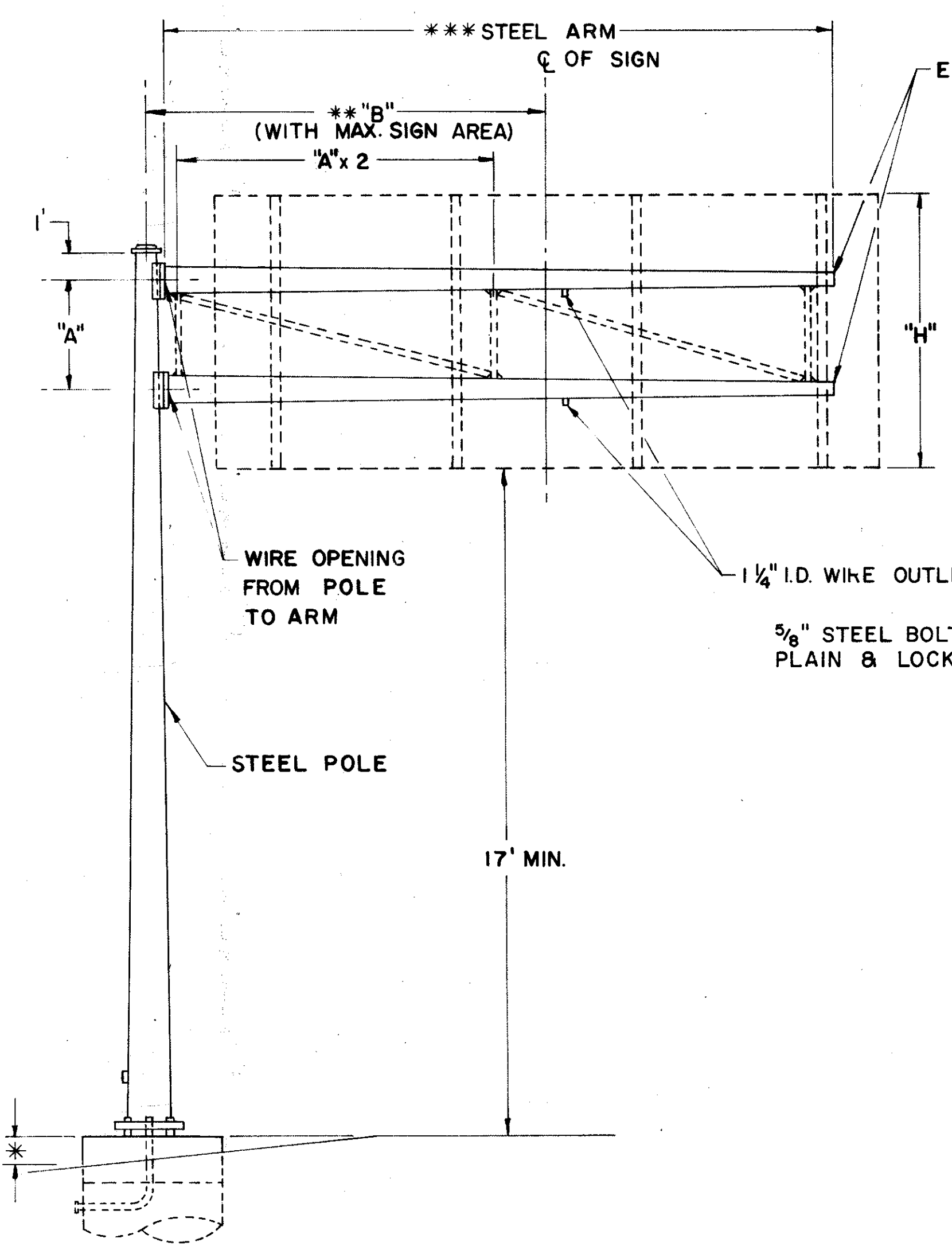
BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

**OVERHEAD SIGN SUPPORTS No.7.6**

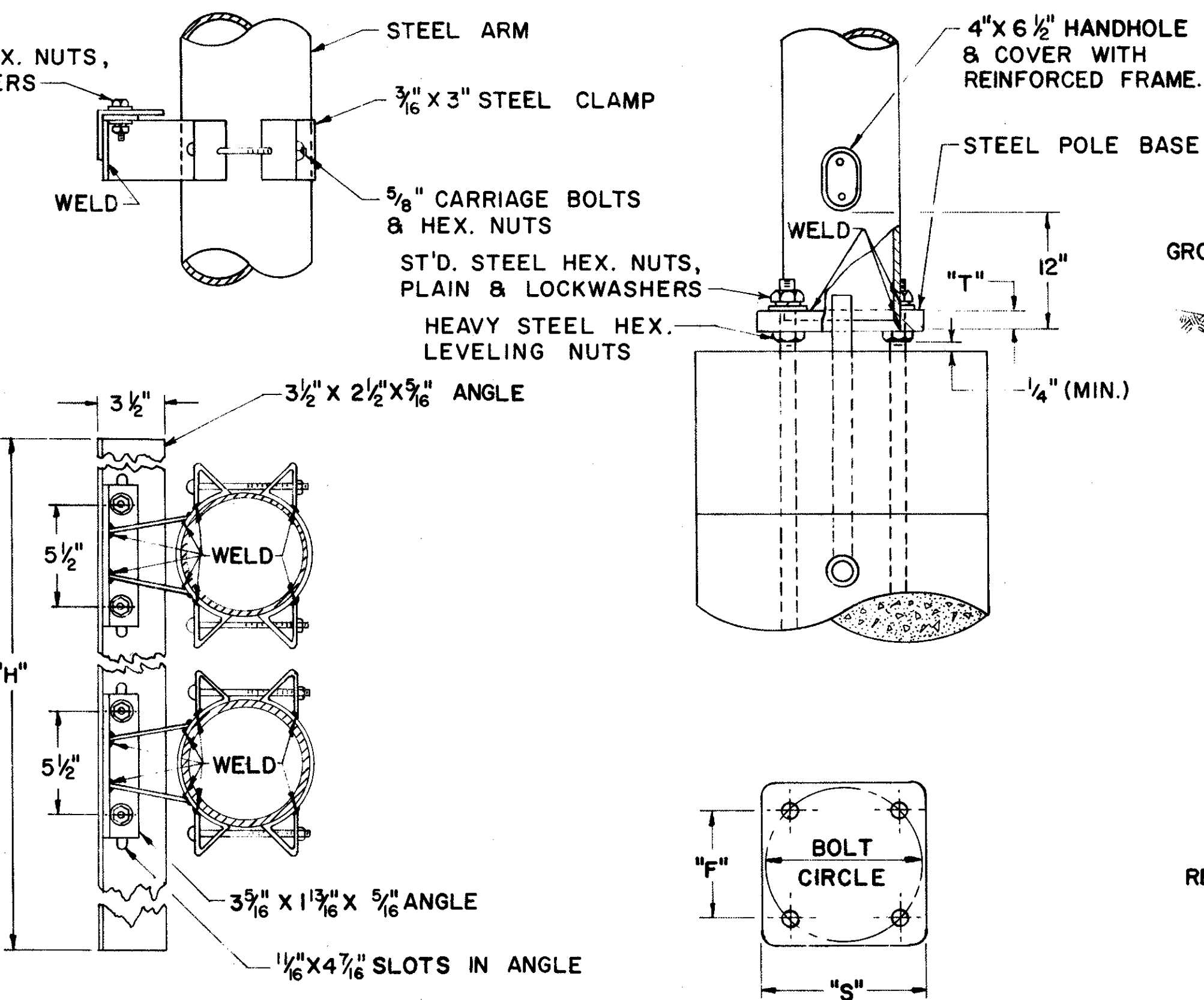
I-129 No.7.6

DATE 2-5-65

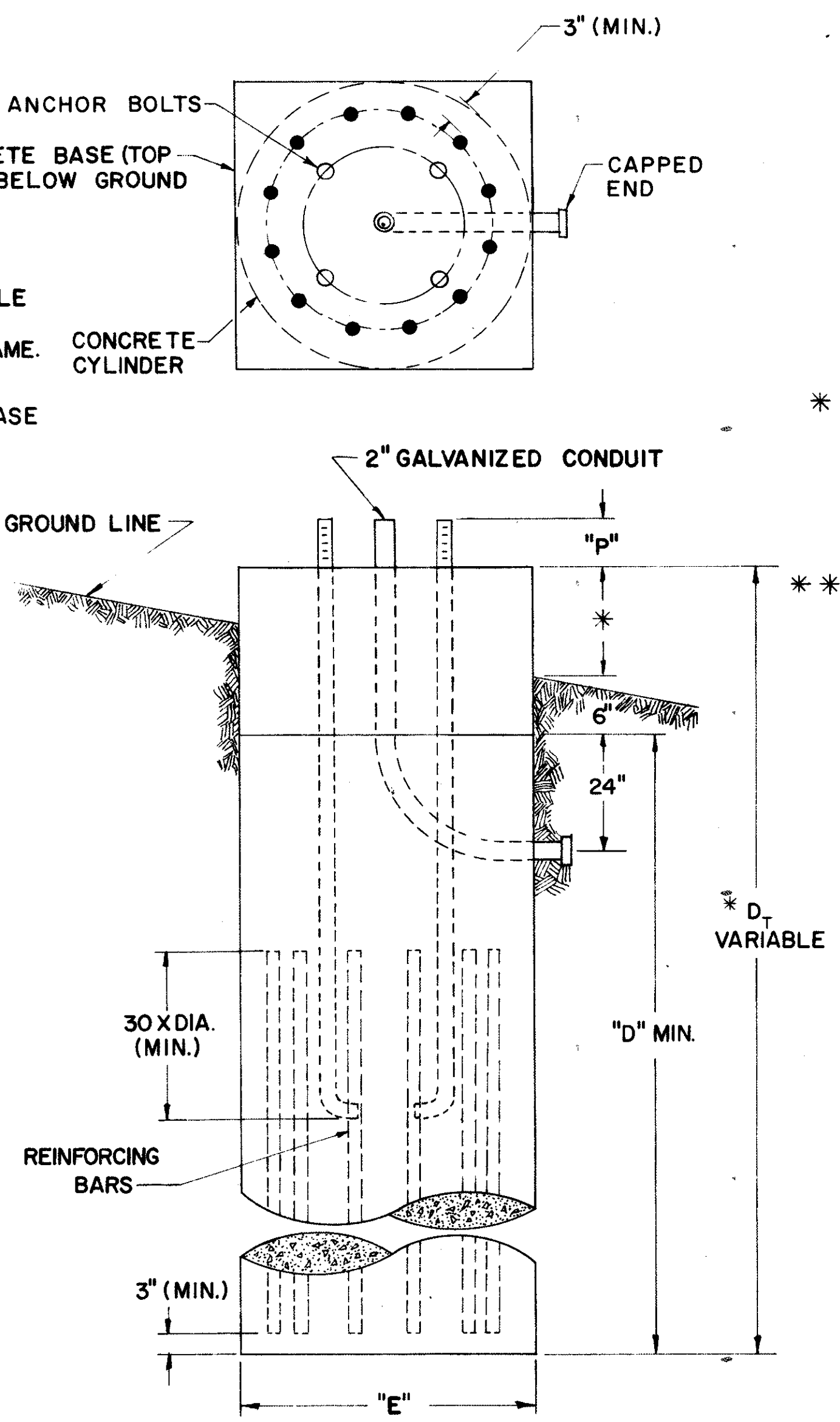
APPROVED \_\_\_\_\_ ENGINEER OF TRAFFIC



**ARM ATTACHMENT**



**POLE DETAIL**



**FOUNDATION DETAIL**

**SIGN ATTACHMENT DETAIL**

DESIGN NO.	POLE SIZE	*** ARM SIZE	DIM A	DIM **B	DIM "D" MIN.	DIM E	DIM F	DIM P	DIM S	DIM T	BOLT CIRCLE	ANCHOR BOLT SIZE	MAX SIGN AREA	REINF. BARS SIZE	NO.
1	3 Ga, 12" X 8.78" X 23'-0"	7 Ga, 6.9" X 4.66" X 16'-0"	4'	12'	9'	3'-0"	11 5/16"	7 3/4"	17"	2"	16"	1 3/4" X 90"	80	3/4"	12
2	3 Ga, 12" X 8.78" X 23'-0"	7 Ga, 8" X 5.2" X 20'-0"	4'	16'	9'	3'-0"	11 5/16"	7 3/4"	17"	2"	16"	1 3/4" X 90"	80	3/4"	12
3	3 Ga, 15" X 11.5" X 25'-0"	7 Ga, 8.3" X 6.06" X 16'-0"	4'	12'	11'	3'-0"	15 1/2"	8 3/8"	23"	2"	22"	2" X 96"	120	1"	12
4	3 Ga, 16" X 12.5" X 25'-0"	3 Ga, 9.2" X 6.40" X 20'-0"	4'	16'	11'	3'-0"	16 5/8"	8 3/8"	24 1/2"	2"	23 1/2"	2" X 96"	120	1"	12
5	0 Ga, 18" X 14.36" X 26'-0"	7 Ga, 11" X 7.92" X 22'-0"	6'	14'	13'	3'-0"	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 120"	180	1 1/8"	12
6	0 Ga, 18" X 14.36" X 26'-0"	7 Ga, 12.5" X 8.86" X 26'-0"	6'	18'	13'	3'-0"	18"	9 3/8"	26 1/2"	2 1/2"	25 1/2"	2 1/4" X 120"	180	1 1/8"	12
7	2 PLY 7 Ga, 18" X 14.36" X 26'-0"	7 Ga, 12.5" X 9.14" X 24'-0"	6'	14'	15'	3'-0"	18"	9 3/4"	26 1/2"	2 1/2"	25 1/2"	2 1/2" X 144"	240	1 1/4"	12
8	2 PLY 1/4", 18" X 14.36" X 26'-0"	3 Ga, 12.5" X 8.58" X 28'-0"	6'	18'	15'	3'-0"	18"	11 1/4"	26 1/2"	3"	25 1/2"	3" X 144"	240	1 1/4"	12

**NOTES**

**FABRICATION**- ALL PORTIONS OF THE SIGN SUPPORT, INCLUDING SIGN ATTACHMENTS, SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M. DESIGNATIONS A-123 AND A-153. THE CONDUIT SHALL BE GALVANIZED IN ACCORDANCE WITH SEC. S-25.08 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS FOR PAYMENT.

\* **FOUNDATION**- THE TOP ELEVATION OF FOUNDATIONS SHALL BE VARIED SO AS TO MAINTAIN A MINIMUM CLEARANCE OF 17' BETWEEN THE BOTTOM OF THE SIGN AND THE HIGHWAY CROWN.

\*\* **ERECTION**- VALUES OF "B" MAY BE EXCEEDED PROVIDED THE PRODUCT OF ACTUAL SIGN AREA TIMES THE DISTANCE FROM C OF POLE TO C OF SIGN DOES NOT EXCEED THE MAX. SIGN AREA TIMES "B".

\*\*\* **ARMS** 20' LONG OR LONGER ARE TO BE TRUSS TYPE WITH 3" X 3" X 3/8" ANGLES WELDED TO GUSSET PLATES.

**MATERIAL**- STEEL POLE BASES, FLANGES, AND END CAPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A 30 GRADE B. HIGH STRENGTH STEEL BOLTS SHALL CONFORM TO ASTM SPECIFICATION A193 GRADE B7 AFTER FABRICATION TAPERED POLES AND ARMS SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

**SOILS**- THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

**REINFORCING STEEL**- REINFORCING STEEL AS SHOWN IN TABLE SHALL BE INSTALLED WHEN "D" EXCEEDS THE ANCHOR BOLT LENGTH BY MORE THAN 3 FT. THE COST AND PLACEMENT OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.

**DESIGN**

THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.

**CONDUIT IN FOUNDATION**

TWO 2" AND ONE 1/2" CONDUITS ARE REQUIRED PER SIGN SUPPORT IN FOUNDATIONS. COST INCLUDED WITH I-129 SUPPORTS. SEE DETAIL SHEET 587.

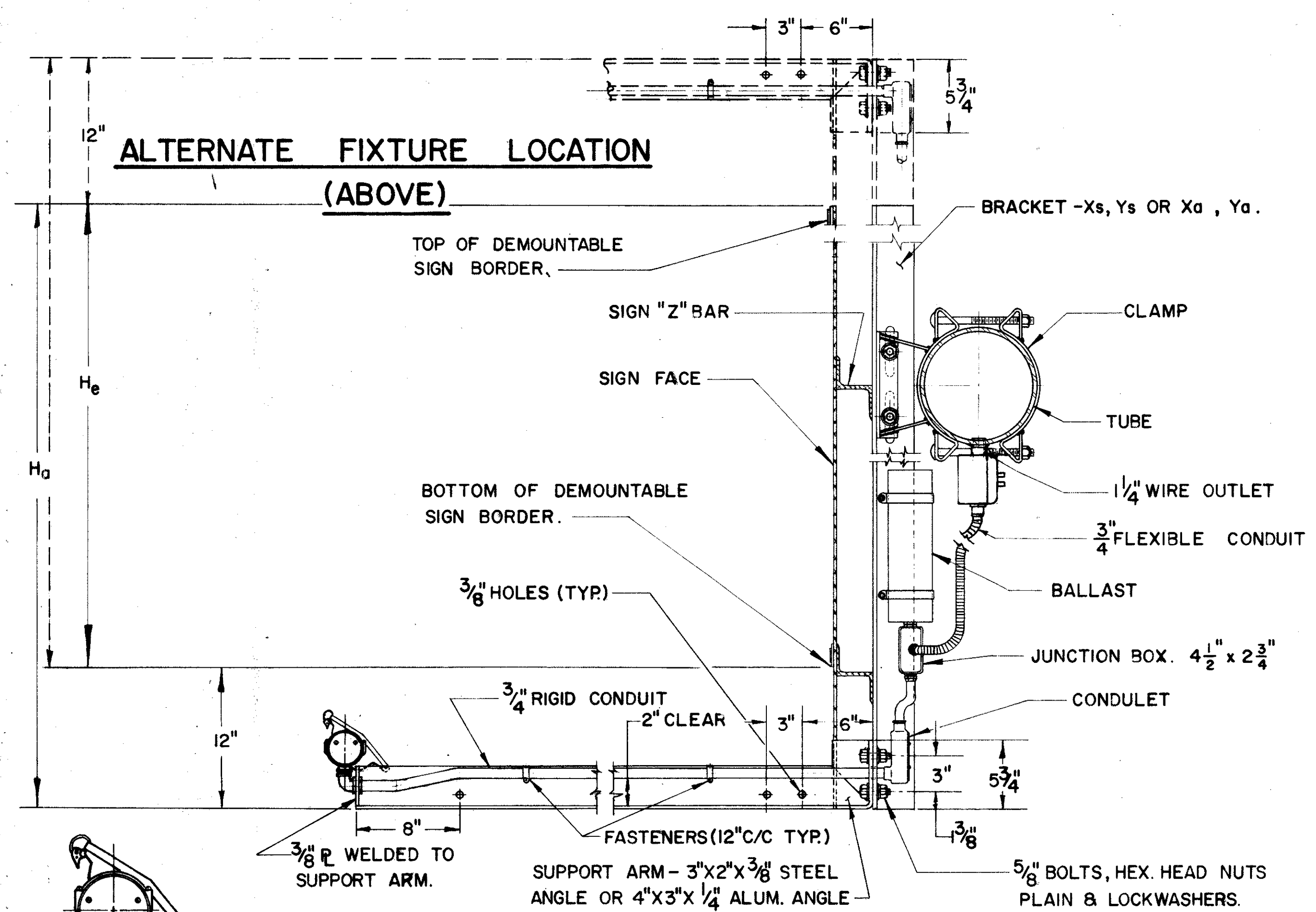
BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

**OVERHEAD SIGN SUPPORT**

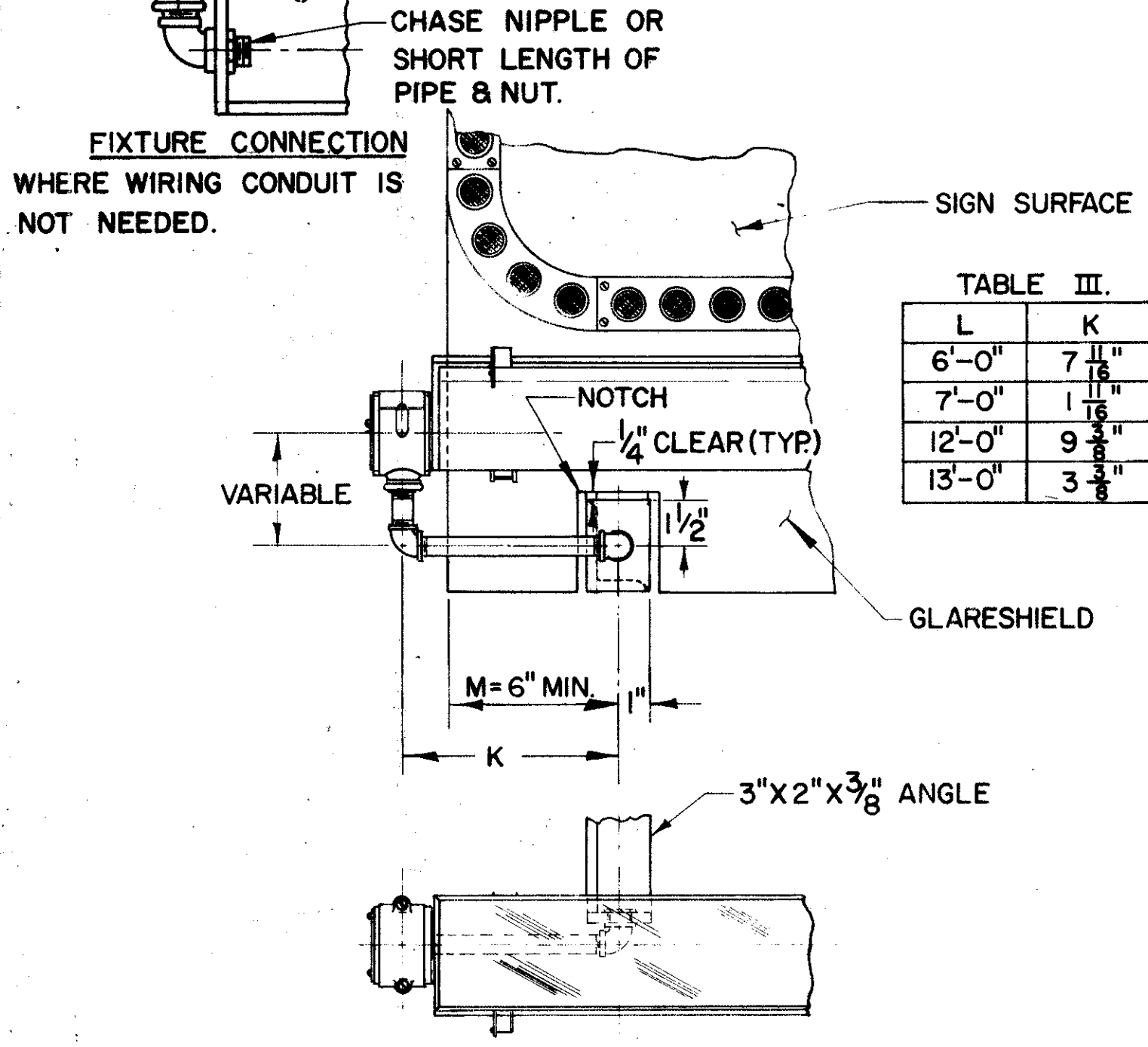
**I-129 No. 12.24**

DATE 8-18-61  
4-11-62  
2-5-65

APPROVED *Robert E. Conner*  
ENGINEER OF TRAFFIC



**STANDARD FIXTURE LOCATION (BELOW)**

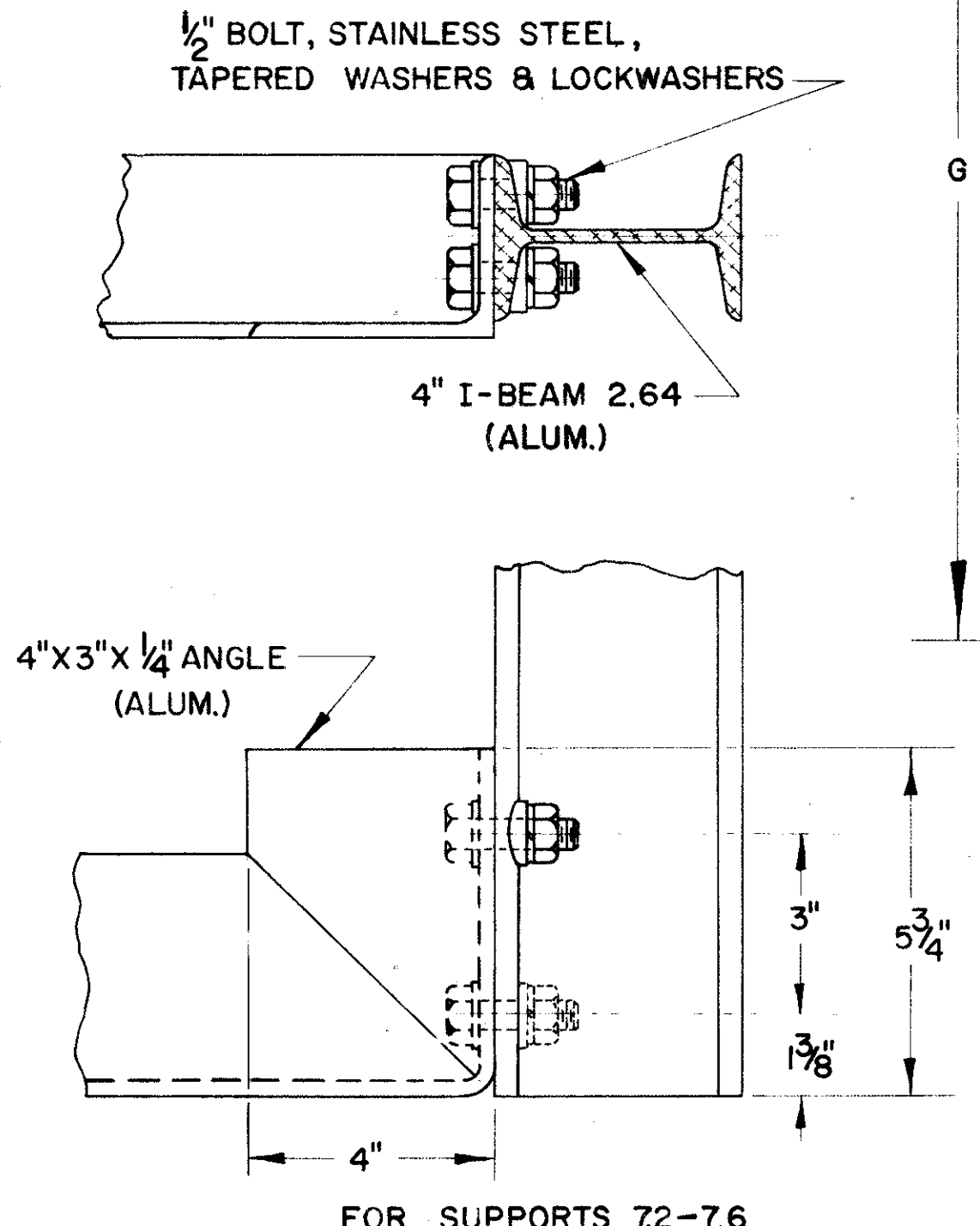


ALTERNATE FIXTURE CONNECTIONS FOR SIGN 6', 7', 12' & 13' IN LENGTH.

**DETAIL A.**

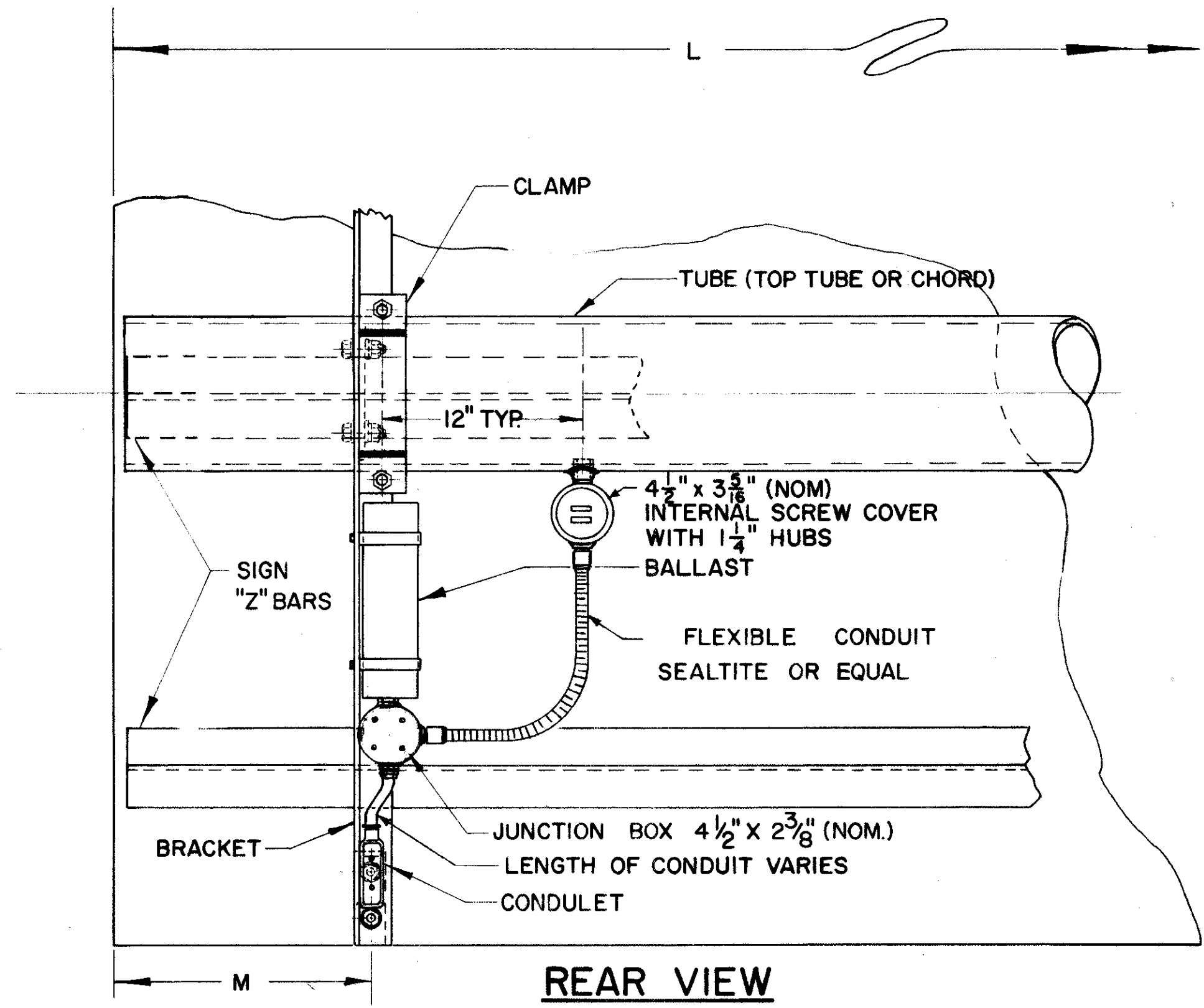
TABLE III.

L	K
6'-0"	7 1/8"
7'-0"	1 1/8"
12'-0"	9 3/8"
13'-0"	3 3/8"

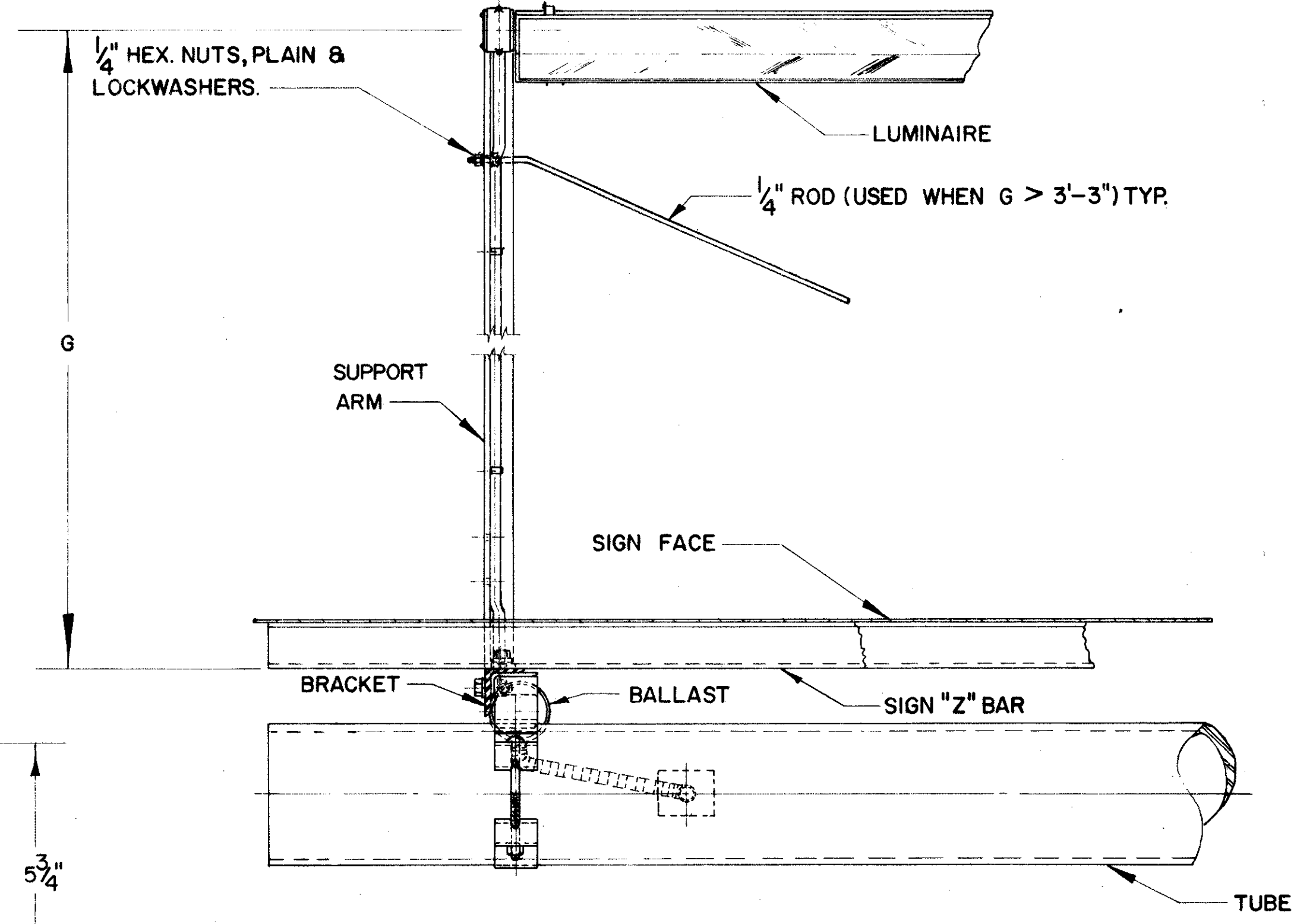


FOR SUPPORTS 7.2-7.6

**DETAIL B.**



**REAR VIEW**



**TOP VIEW**

**FABRICATION** — ALL STRUCTURAL COMPONENTS SHOWN ON THIS SHEET SHALL CONFORM TO SUPPLEMENT SPECIFICATIONS I-129.

**MATERIALS** — THE MATERIALS USED IN THE COMPONENTS SHOWN ON THIS SHEET SHALL BE IN CONFORMANCE WITH THE MATERIALS USED IN THE SIGN SUPPORT.

TABLE I.

"L" SIGN LENGTH	"M" EDGE DISTANCE	NUMBER OF FIXTURES	"M" EDGE DISTANCE				NO. BALLAST
			A	B	LT.	RT.	
6'-0"	7'-0"	1	6"	6"	6"	6"	1
8'-0"	9'-0"	1	10 3/8"	10 1/4"	16 3/8"	16 1/4"	1
10'-0"	11'-0"	1	10 3/8"	10 1/4"	16 3/8"	16 1/4"	1
12'-0"	13'-0"	2	6"	6"	6"	6"	1
14'-0"	15'-0"	2	8 5/8"	8 3/8"	14 5/8"	14 3/8"	1
16'-0"	17'-0"	1	8 5/8"	8 3/8"	14 5/8"	14 3/8"	1
18'-0"	19'-0"	2	8 5/8"	8 3/8"	14 5/8"	14 3/8"	1
20'-0"	21'-0"	3	7"	6 7/8"	13"	12 7/8"	2
22'-0"	23'-0"	2	7"	6 7/8"	13"	12 7/8"	2
24'-0"	25'-0"	1	7"	6 7/8"	13"	12 7/8"	2
26'-0"	27'-0"	3	7"	6 7/8"	13"	12 7/8"	2

Sn = Nominal Fixture Length, 72" & 96" respectively.  
Sa = Actual Fixture Length, 75 3/8" and 99 3/8" respectively. (Slight variation for different manufacturers.)  
M = Distance from edge of sign to center of notch, min. 6". When the length of the sign minus 1'-0" is less than the sum of the actual fixture lengths, an offset "K" is used. For additional details see detail A and table III.

TABLE II.

MAX. BRACKET SPACING FOR EXTERNALLY ILLUMINATED SIGNS

ACTUAL SIGN HEIGHT "Ha"	SUPPORT TYPES			
	9.12, 11.08, 13.2, 7.2	9.24, 10.48, 12.24, 14.5, 15.8, 7.2 to 7.6	DOUBLE TUBE	
	SINGLE TUBE	DOUBLE TUBE		
	LESS 36" C/C	C/C 36"-42"	C/C 48"-54"	C/C 60"-72"
to 5'-0"	6'-4" with X 8'-4" with Y	8'-4" with X	8'-4" with X	8'-4" with X
5'-6" to 8'-0"	6'-4" with Y	4'-2" with X 6'-4" with Y	6'-4" with X 8'-4" with Y	8'-4" with X
8'-6" to 10'-0"	3'-2" with X 4'-2" with Y	6'-4" with Y	6'-4" with Y	8'-4" with Y
10'-6" to 12'-0"		4'-2" with Y	6'-4" with Y	6'-4" with Y
12'-6" to 14'-0"		3'-2" with Y	3'-2" with Y	4'-2" with Y

Ha = ACTUAL SIGN HEIGHT  
He = EFFECTIVE SIGN HEIGHT  
BRACKET SIZE: Xs = 3 1/2" x 2 1/2" x 5/16" - L @ 6.1 LB. STEEL } 9.12, 10.48, 11.08,  
Ys = 4" x 3 1/2" x 1/4" - Z @ 8.2 LB. STEEL } 12.24, 14.5 & 15.8  
Xa = 3" x 2 1/2" x 1/4" - Z @ 2.33 LB. ALUM. } 7.2 Thru 7.6  
Ya = 4" x 2 1/2" x 3/16" - I @ 2.64 LB. ALUM.

WHEN MAX. ALLOWABLE SPACING IS LESS THAN ACTUAL FIXTURE LENGTHS, Sa, ADDITIONAL STANDARD BRACKETS MUST BE FURNISHED, EQUAL IN HEIGHT TO "Ha".

SUPPORTS 7.2 THROUGH 7.6 SHALL HAVE AN ALUMINUM FIXTURE ARM, 4"x3"x1/4" ANGLE. SEE DETAIL B. BOLTS AND ACCESSORIES SHALL BE STAINLESS STEEL.

NOTE: FOR ADDITIONAL CONNECTION DETAILS ON SIGN 33 SEE SHEET 430 A.

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

STRUCTURAL DETAILS FOR EXTERNALLY ILLUMINATED SIGNS

APPROVED *Jack C. Taylor*  
ENGINEER OF TRAFFIC

DATE: 10-15-66  
3-5-67  
2-5-66

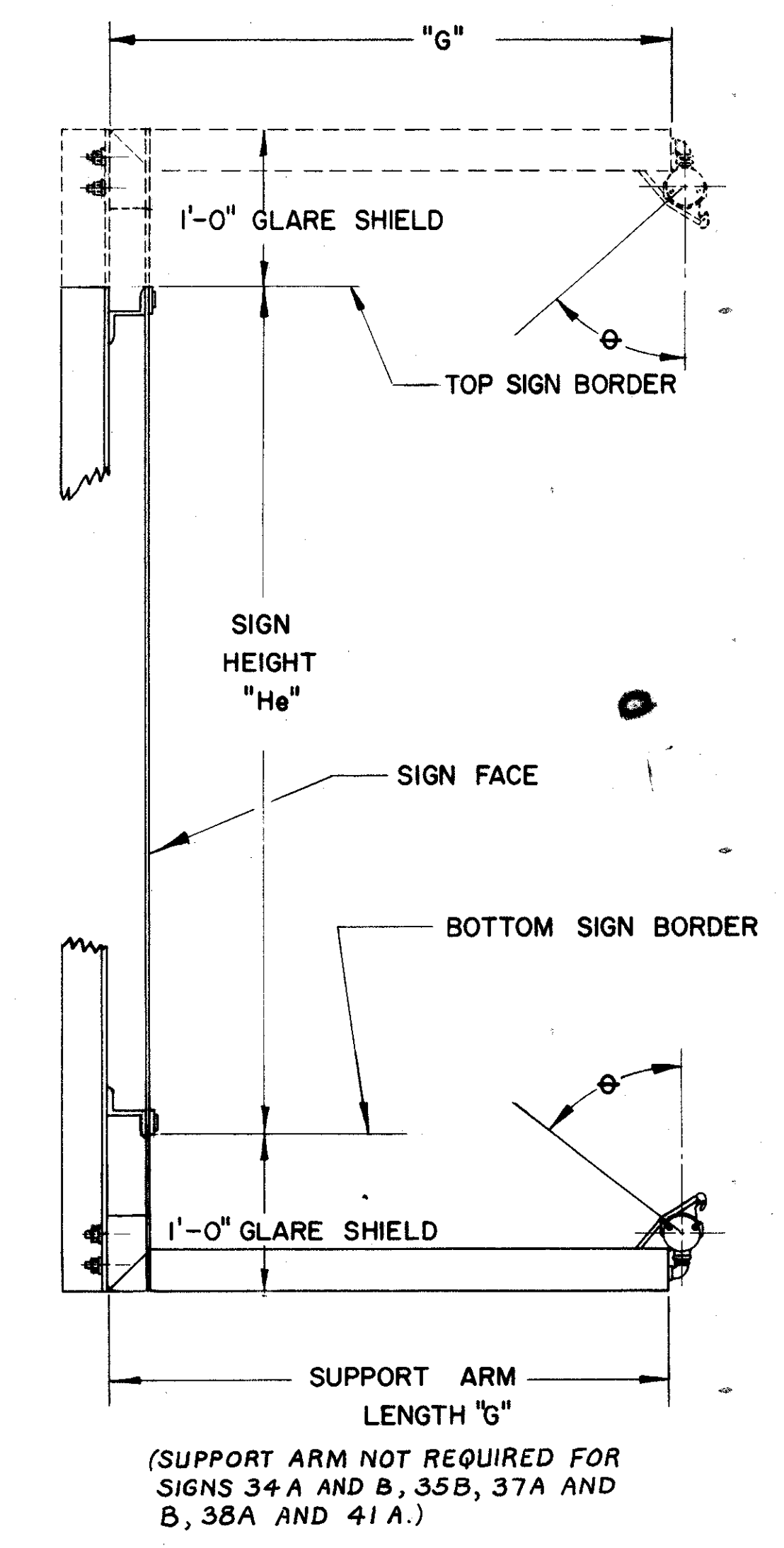
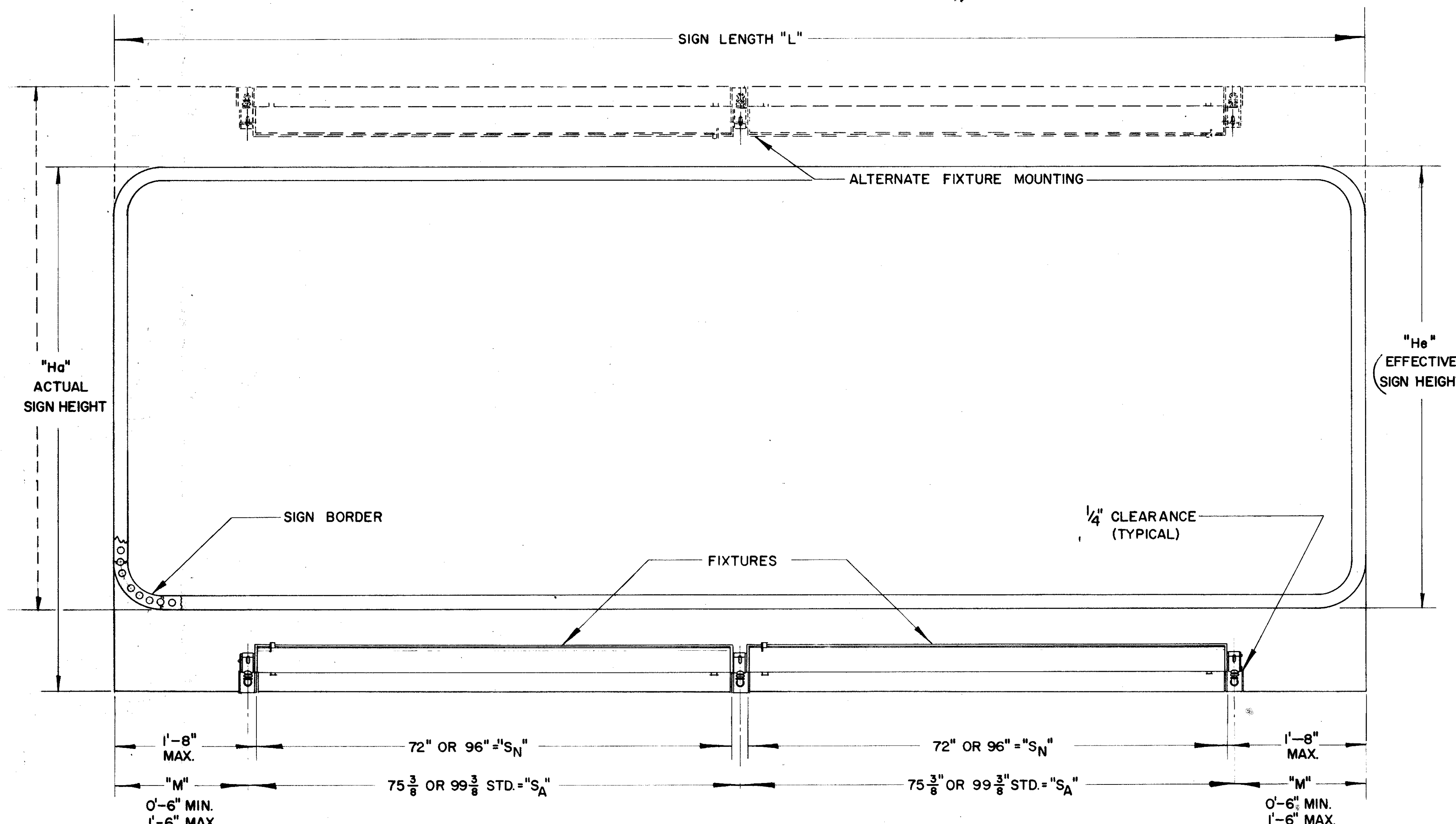
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

567  
646

CUYAHOGA COUNTY  
CUY-71-1783  
CUY-176-12.76

14  
16

SIGN LIGHTING NOTES



SIGN ILLUMINATION

SIGN ILLUMINATION SHALL BE BY ATTACHED FLUORESCENT FIXTURES AS SHOWN ON ILLUMINATED SIGN DETAIL SHEETS.

LAMPS

LAMPS SHALL BE TYPE F72 OR F96-T12/CW/HO AS MANUFACTURED BY WESTINGHOUSE, GENERAL ELECTRIC OR APPROVED EQUAL FOR SIGNS TO A MAXIMUM HEIGHT OF 6'-6\".

LAMP FIXTURES

LIGHTING FIXTURES SHALL BE CONSTRUCTED OF CORROSION RESISTANT MATERIALS OR WITH HIGH QUALITY CORROSION RESISTANT FINISH. ALL FIXTURES SHALL BE SPECIFICALLY DESIGNED FOR OUTDOOR SIGN LIGHTING SERVICE.

THE BODY DESIGN OF THE FIXTURE SHALL PROVIDE AN-ASYMMETRIC SPECULAR ALZAK REFLECTOR TO GIVE A HIGH LEVEL OF UNIFORM ILLUMINATION AND SHALL PROVIDE A WIREWAY FROM END TO END.

EXTERIOR FINISH OF THE FIXTURE BODY SHALL BE INTERSTATE GREEN COLOR, HEAT RESISTANT BAKED ENAMEL AS #8950 UNIVERSAL OR MIDWESTERN COLOR WORKS, PAINT AND VARNISH INC. OR APPROVED EQUAL.

BALLASTS

BALLASTS FOR FIXTURES SHALL BE WEATHER-PROOF OUTDOOR TYPE FOR A 120 VOLT 60 CYCLE SYSTEM AND SHALL PROVIDE LAMP STARTING AT AN AMBIENT TEMPERATURE OF -20°F.

EFFECTIVE SIGN HEIGHT "H"	SUPPORT ARM LENGTH "G"	APPROX. AIMING ANGLE $\phi$
3'-0" to 5'-0"	2'-9"	25°
5'-0" to 6'-6"	3'-3"	25°
7'-0" to 10'-0"	4'-3"	17°
10'-6" to 13'-0"	5'-9"	23°

"L" SIGN LENGTH	NO. OF FIXTURES		He=3'-0" to 6'-6" LAMP= T12/cw/ho			He=7'-0" to 13'-0" LAMP= T12/cw/sho		
	72	96	BALLAST NO.	WATTAGE PER SIGN	BALLAST TYPE	BALLAST NO.	WATTAGE PER SIGN	BALLAST TYPE
6'-0" to 7'-0"	1		1	190	A	1	250	C
8'-0" to 9'-0"	1		1	190	A	1	250	C
10'-0" to 11'-0"		1	1	190	A	1	250	C
12'-0" to 13'-0"	2		1	250	B	1	425	D
14'-0" to 15'-0"	2		1	250	B	1	425	D
16'-0" to 17'-0"	1	1	1	250	B	1	425	D
18'-0" to 19'-0"		2	1	250	B	1	425	D
20'-0" to 21'-0"	3		2	440	A & B	2	675	C & D
22'-0" to 23'-0"	2	1	2	440	A & B	2	675	C & D
24'-0" to 25'-0"	1	2	2	440	A & B	2	675	C & D
26'-0" to 27'-0"		3	2	440	A & B	2	675	C & D

BALLASTS

TYPE	MANUFACTURERS		WATTAGE
	G.E.	JEFFERSON	
A	GG 3583	257-151	190
B	GG 3535	257-171	250
C	GG 3585	257-231	250
D	GG 3588	257-181	425

BALLASTS SHALL BE GENERAL ELECTRIC, JEFFERSON AS SPECIFIED ABOVE OR EQUAL.

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

ELECTRICAL DETAILS  
FOR EXTERNALLY  
ILLUMINATED SIGNS

EI-2

DATE  
10-31-63  
5-6-64  
10-29-64  
2-5-65

APPROVED *Frank J. Taylor*  
ENGINEER OF TRAFFIC

**NOTES**

**GENERAL**

DETAILS OF THIS SHEET SHALL APPLY TO EACH OVERHEAD SIGN STRUCTURE TO SUPPORT EXTERNALLY ILLUMINATED SIGNS.

**SERVICE**

ELECTRIC SERVICE SHALL ENTER THROUGH A 2" GALVANIZED RIGID STEEL CONDUIT INSTALLED IN STRUCTURE FOUNDATION AS PER DETAIL. SIGN SERVICE OR CIRCUITRY SHALL BE CONTROLLED AS REQUIRED BY THE SYSTEM DESIGN AT THE PRIMARY SOURCE.

SERVICE CONDUCTORS SHALL BE THE SIZE AND TYPE AS SPECIFIED.

**COMBINATION SWITCH AND TRANSFORMER**

(TYPE Y OR Z ENCLOSURE REQUIRED AS PER SCHEDULE ON THIS SHEET)

THIS COMBINATION SHALL BE A 30 OR 60 AMPERE 600 VOLT SWITCH WITH A .25 TO 3.0 KVA TRANSFORMER. THE COMBINATION AND ENCLOSURE SHALL BE AS SQUARE D CLASS 9421, COLUMBUS ELECTRIC WORKS CLASS 101, PANALS INCORPORATED-CLASS 9400, OR APPROVED EQUAL.

**TRANSFORMER**

THE TRANSFORMER SHALL BE DRY TYPE SINGLE FACE 240/480 VOLT PRIMARY 120/240 VOLT SECONDARY, THE TYPE AND CAPACITY AS SPECIFIED IN DETAILED SCHEDULE ON THIS SHEET.

**ENCLOSURE**

THE ENCLOSURE SHALL BE NEMA #4 WATER TIGHT .063 GAGE STAINLESS STEEL ASTA 302-303. A DISCONNECT HANDLE SHALL BE FLANGE MOUNTED AND CAPABLE OF BEING LOCKED IN EITHER POSITION. THE ENCLOSURE SHALL BE EQUIPPED WITH A DOOR LOCKING MECHANISM WITH A DEFEATER THAT NECESSITATES TWO HANDS TO OPERATE MECHANISM WITH THE SWITCH IN OFF POSITION. SPACE FOR A 2" INSULATED CHASE NIPPLE SHALL BE PROVIDED APPROXIMATELY 2 1/4" ABOVE THE CENTER LINE OF THE LOWER MOUNTING SLOT. THIS ENCLOSURE AND STRUCTURE SHALL BE FIELD DRILLED AND TAPPED FOR THE REQUIRED NIPPLE AS SHOWN ON THE DETAIL ON THIS SHEET.

THIS ENCLOSURE SHALL BE FLANGE MOUNTED ON BRACKETS WITH 5/16"-18x3/4" HEX HEAD CADMIUM PLATED MACHINE BOLTS. ENCLOSURES SHALL BE TYPE Y OR Z AS SPECIFIED AND DIMENSIONED ON THIS SHEET.

**ENCLOSURE MOUNTING BRACKET**

THE ENCLOSURE MOUNTING BRACKET SHALL BE FABRICATED THEN GALVANIZED BEFORE ASSEMBLY. THE BRACKET SHALL BE FIELD MOUNTED WITH 5/16" HEX HEAD SELF TAPPING CADMIUM PLATED SCREWS. THE SIGN SUPPORT SHALL BE FIELD DRILLED, AS PER DETAIL.

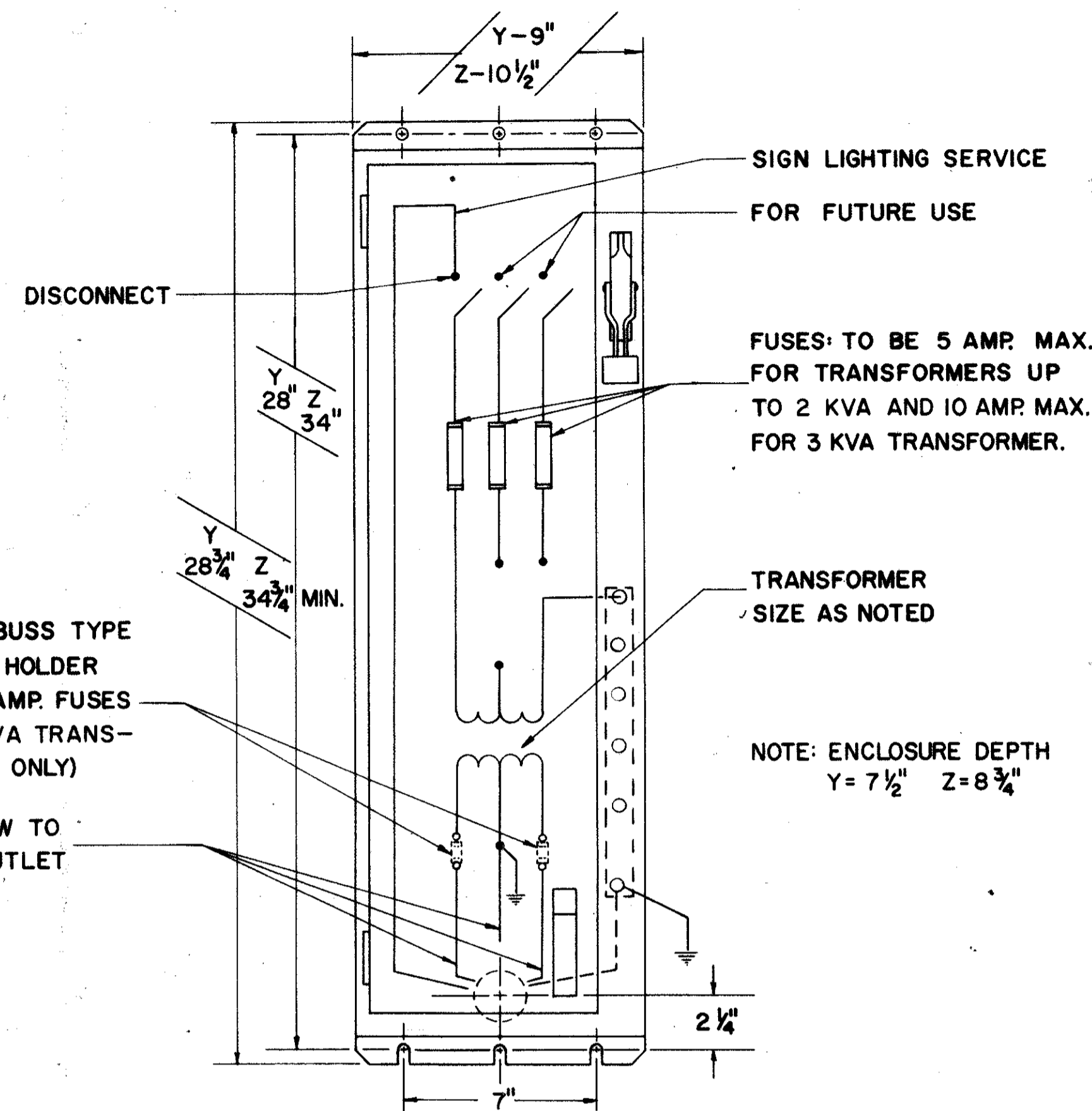
**WIRE AND CABLE**

ALL WIRE AND CABLE UP TO AND INCLUDING #4 SHALL COMPLY WITH FAA TYPE A SPECIFICATIONS. #2 OR LARGER WIRE OR CABLE SHALL BE G.E. 58006 OR ANACONDA AP-10711, OR EQUAL. ALL WIRE AND CABLE SHALL BE 600 VOLT.

**GROUNDING**

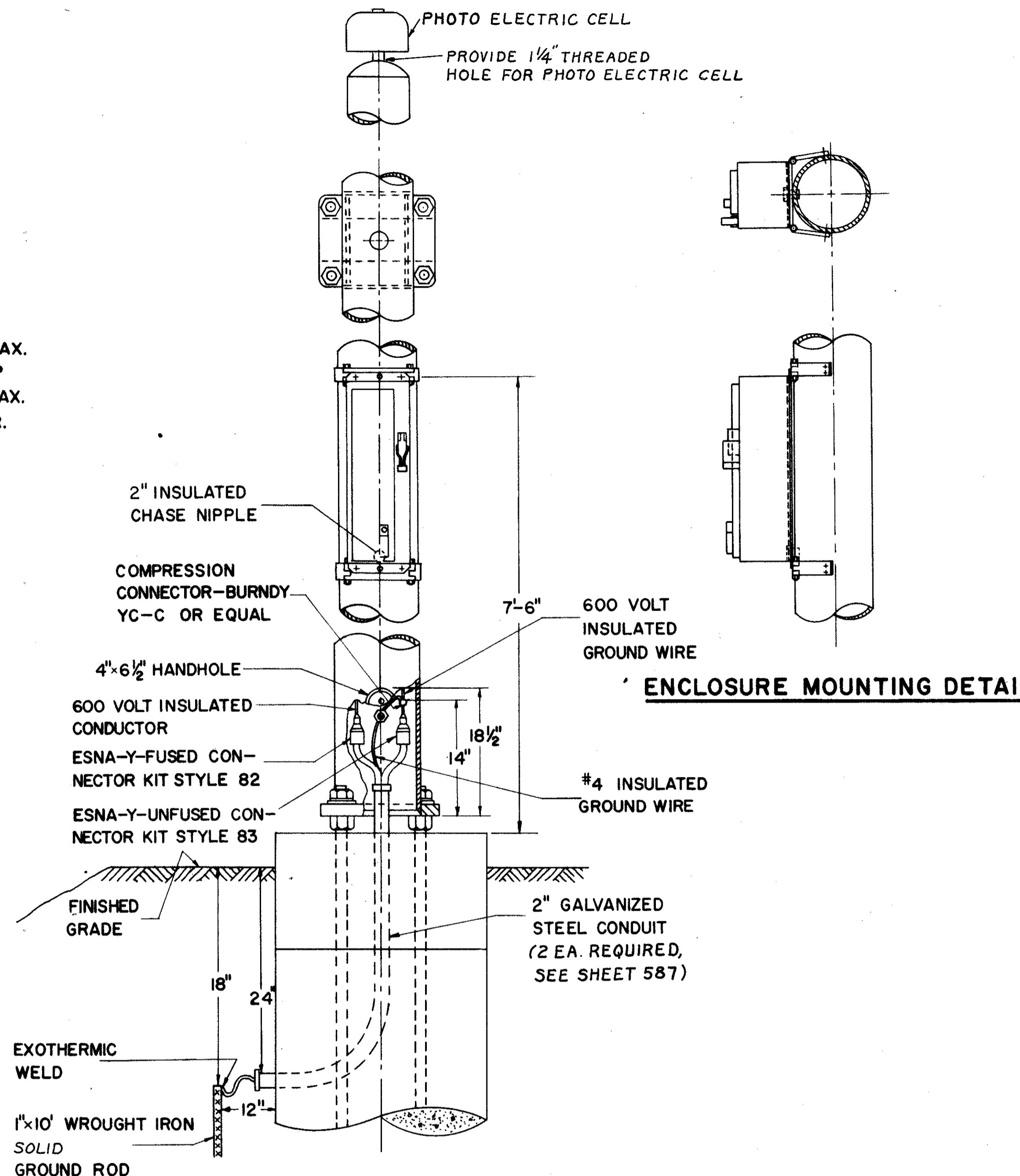
EACH SIGN SUPPORT OR STRUCTURE SHALL BE GROUNDED WITH A #4 RUBBER INSULATION AND NEOPRENE JACKETED CONDUCTOR. THE GROUNDING CONDUCTOR SHALL BE CONNECTED TO THE SWITCH THEN TO THE COMPRESSION CONNECTOR IN THE SIGN SUPPORT THEN TO A 1"x10" SOLID WROUGHT IRON GROUND ROD. GROUND CONDUCTOR SHALL BE EXOTHERMICALLY WELDED TO GROUND ROD AND THEN TAPED WITH PLASTIC ELECTRICAL TAPE AT EACH EXPOSED PORTION OF CONDUCTOR. THE WELDED CONNECTION AND TAPED PORTION SHALL BE PAINTED 2 COATS OF GLYPTAL INSULATING ENAMEL.

A ONE-HALF INCH (1/2") EMT CONDUIT SHALL BE FURNISHED IN EACH SIGN SUPPORT FOUNDATION REQUIRING GROUNDING, TO HOUSE THE GROUND WIRE IN LIEU OF DETAIL SHOWN ON THIS SHEET.

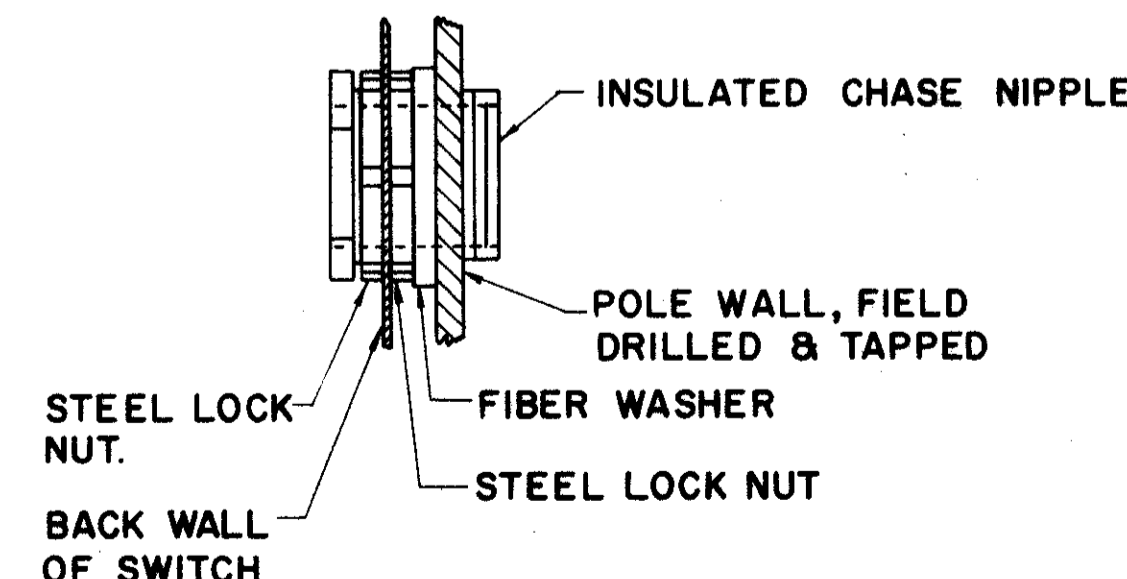


**TYPICAL ENCLOSURE DETAIL**

480 VOLT SIGN LIGHTING SERVICE  
(SEE ADDITIONAL DETAILS ON SHEET 584 FOR ADAPTATION TO PHOTO ELECTRIC CELL AND SPECIAL WIRING FOR SIGN 33)

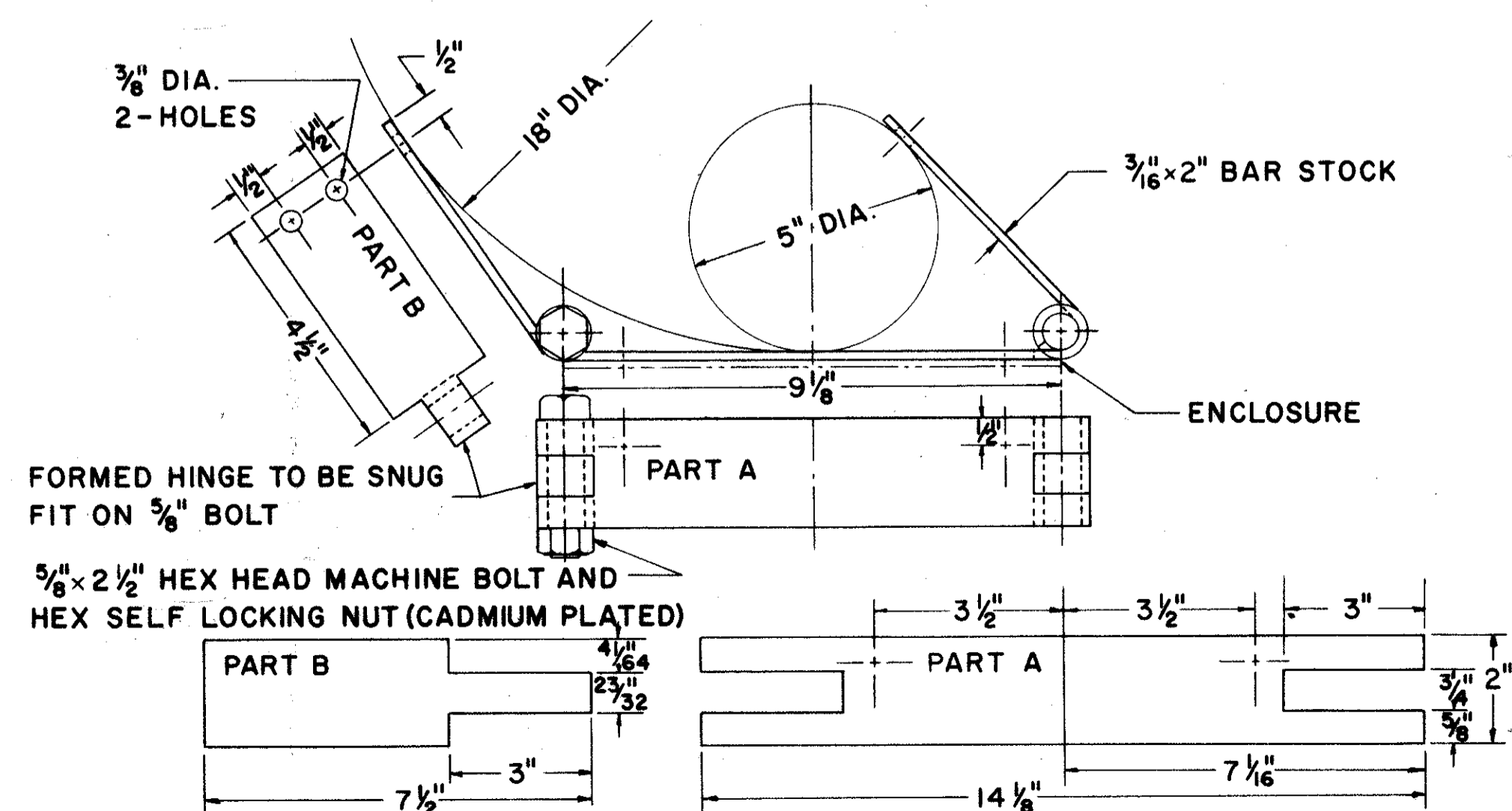


**SIGN SUPPORT DETAIL FOR ILLUMINATED SIGNS**



**TRANSFORMERS**

TYPE	MANUFACTURERS	OUTPUT K.V.A.	SWITCH TRANSFORMER ENCLOSURE
I	G.E. 9T51Y7 244-241	.25	Y
II	JEFFERSON 244-251	.50	Y
III	9T51Y9 244-261	.75	Y
IV	9T51Y10 244-401	1.00	Z
V	9T51Y11 244-411	1.50	Z
VI	9T51Y12 244-421	2.00	Z
VII	9T51Y13 244-431	3.00	Z



**ENCLOSURE MOUNTING BRACKET**

BUREAU OF TRAFFIC  
OHIO DEPARTMENT OF HIGHWAYS

ELECTRICAL SIGN  
SERVICE DETAILS  
480 VOLT SYSTEM

ES-3A

DATE  
6-18-64  
2-5-65

APPROVED \_\_\_\_\_  
ENGINEER OF TRAFFIC



FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

569  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

16  
16

**NOTES**

**GENERAL**

PROTECTIVE GUARD RAIL FOR OVERHEAD SIGN STRUCTURES SHALL CONFORM TO SEC. I-15, FOR STEEL BEAM TYPE (DEEP).

AT LOCATIONS WHERE GUARD RAIL IS IN PLACE, THE SIGN SUPPORT FOUNDATIONS SHALL BE ERRECTED BEHIND EXISTING GUARD RAIL.

A MINIMUM OF SIX GUARD RAIL POSTS IS REQUIRED IN ADVANCE OF THE SIGN SUPPORT.

THE LENGTH OF GUARD RAIL DEPENDS ON THE POST SPACING. (EXAMPLE: FOR A SINGLE LINE OF GUARD RAIL IN ADVANCE OF A SIGN SUPPORT, THE MINIMUM LENGTH IS 50 FT. FOR A POST SPACING OF 6'-3", 75 FT. FOR A POST SPACING OF 12'-6".)

WHERE PROPOSED GUARD RAIL FLARES ARE CONSTRUCTED OF RAIL ELEMENTS WHICH HAVE NOT BEEN FABRICATED EXACTLY TO FIT THE CURVATURE SHOWN ON THE PLANS, THE TWO END POSTS OF EACH FLARED SECTION SHALL BE ENCASED IN A MINIMUM 4" THICKNESS OF CLASS "E" CONCRETE FOR THE FULL DEPTH OF THE POST BELOW THE GROUND LINE. PAYMENT FOR ENCASEMENT, IF REQUIRED, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE GUARD RAIL.

**ADDITIONAL DETAILS**

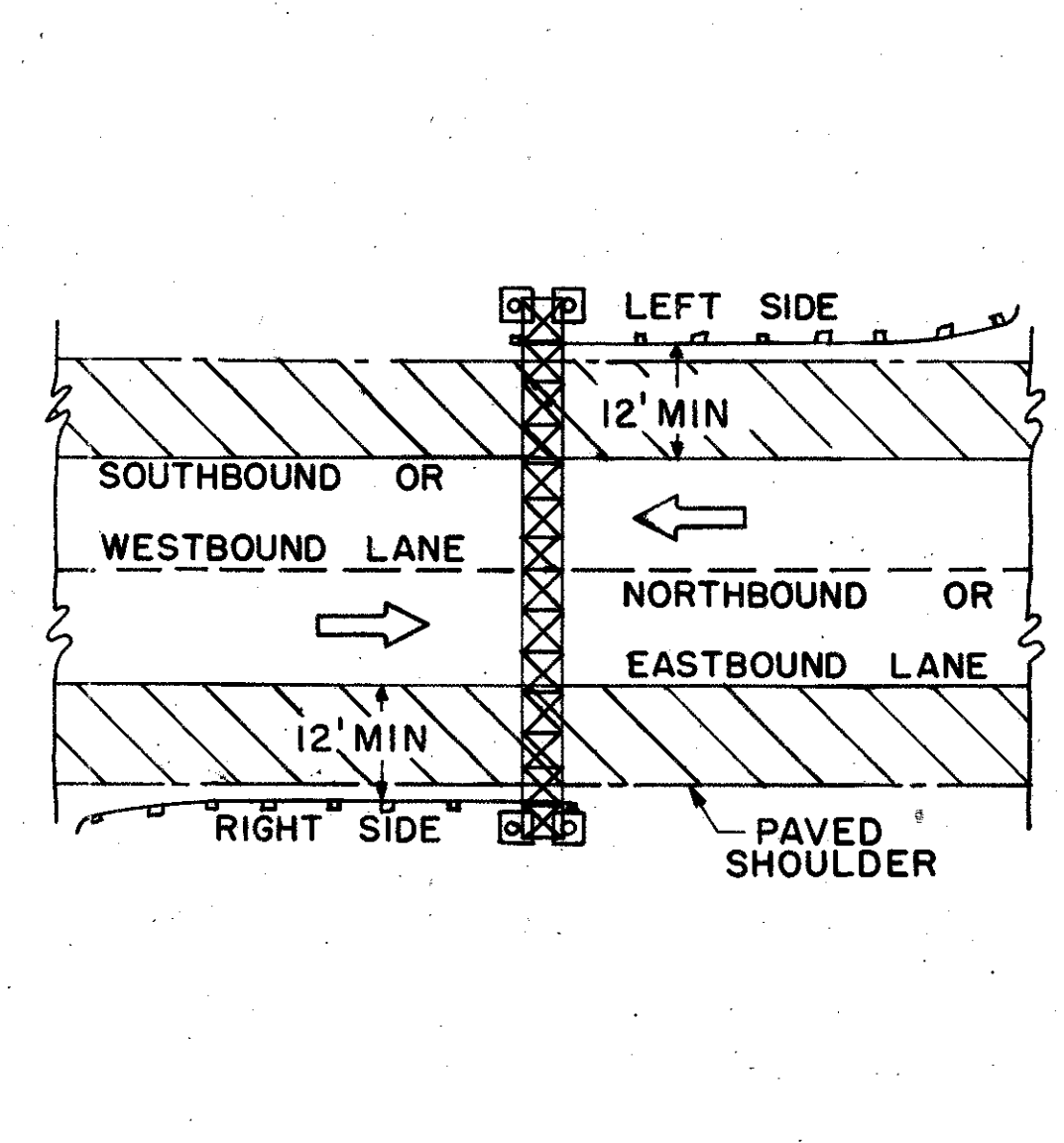
FOR MEDIAN FLARE DETAILS WHEN BARRIER GUARD RAIL IS ENCOUNTERED SEE DETAILS "A" AND "B" ON SHEET 559.

FOR BIFURCATION GUARD RAIL ON SIGN 40, SEE DETAILS, SHEET 558. CONVERGING POINT OF GUARD RAIL SHALL BE ONE-HALF THE LATERAL WIDTH FROM CURB TO CURB.

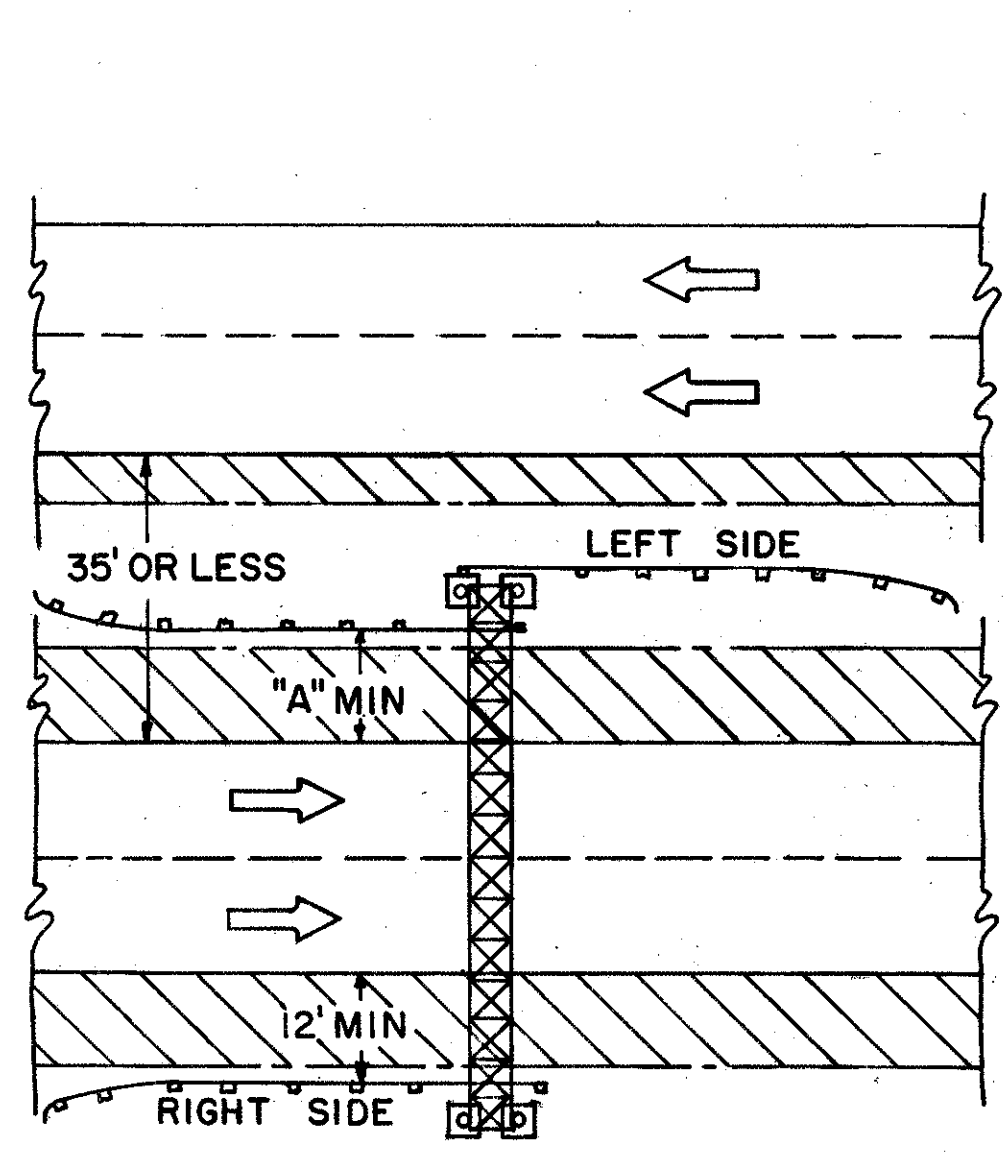
GUARD RAIL SHALL BE PLACED AS SHOWN ON THE PAVEMENT DETAIL SHEETS 51-71, AND SUPPORT DETAIL SHEETS 555-559.

**DESIGN**

THE DESIGN OF GUARD RAIL PROTECTION FOR OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.

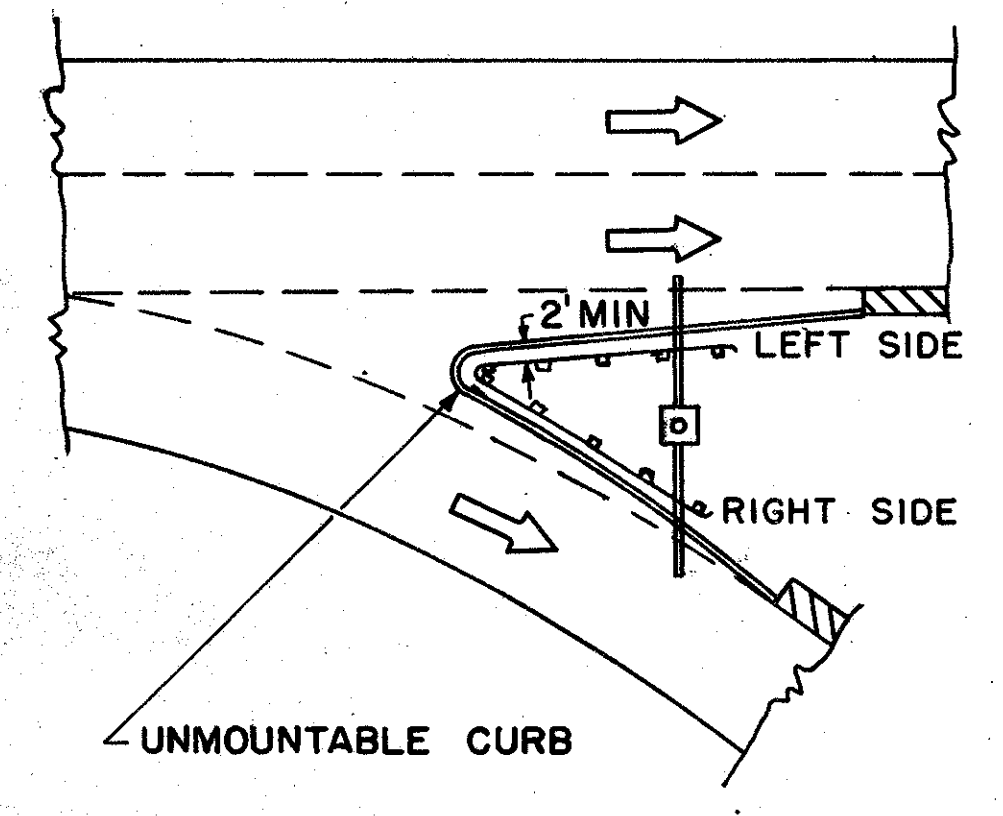
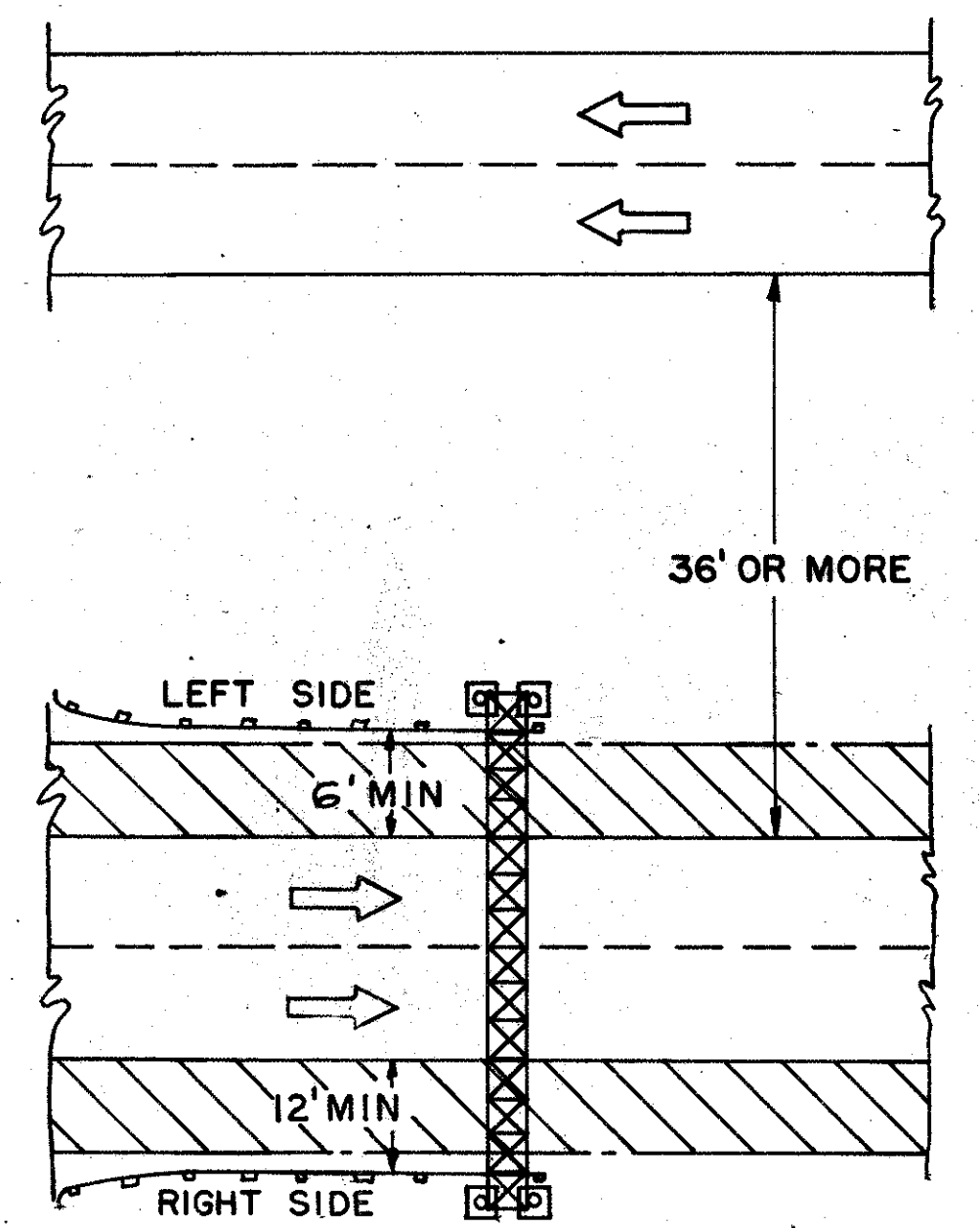


**MULTIPLE LANE UNDIVIDED**

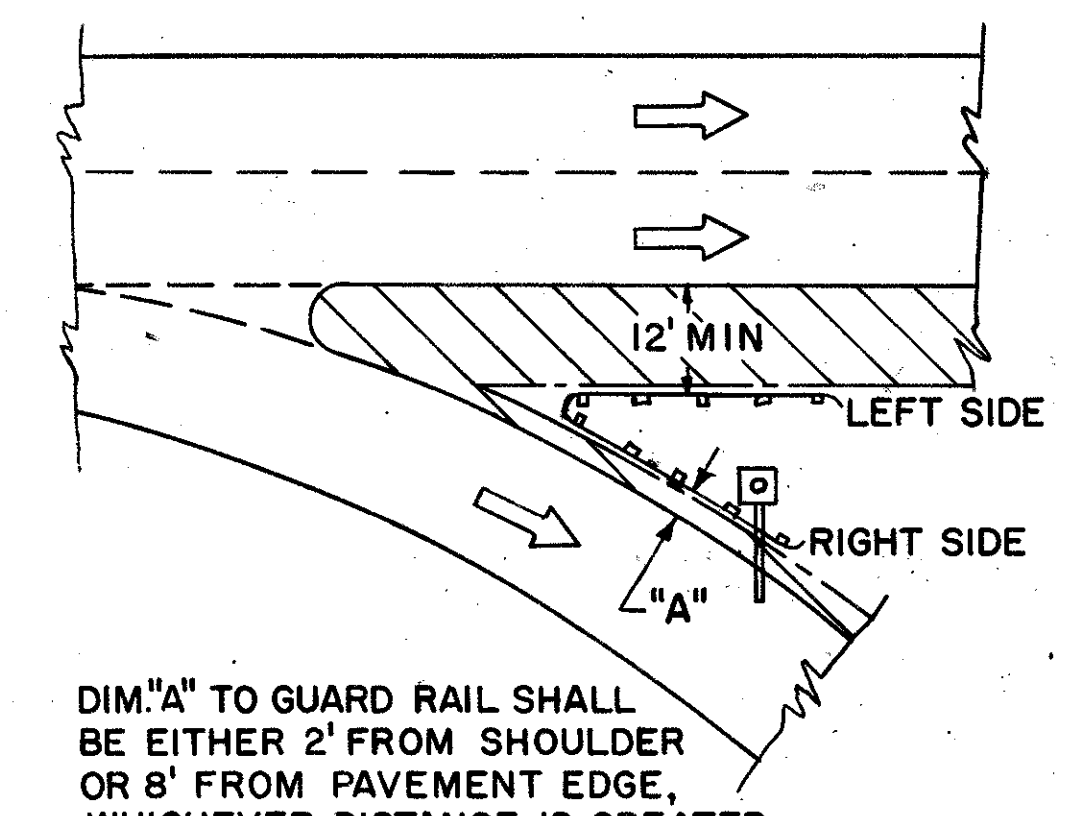


DIM. "A" TO GUARD RAIL SHALL BE EITHER 6' MIN. FROM EDGE OF PAVEMENT OR 2' MIN. FROM THE FACE OF CURB, EXCEPT WHERE OTHERWISE SPECIFIED.

**FOUR LANE DIVIDED**



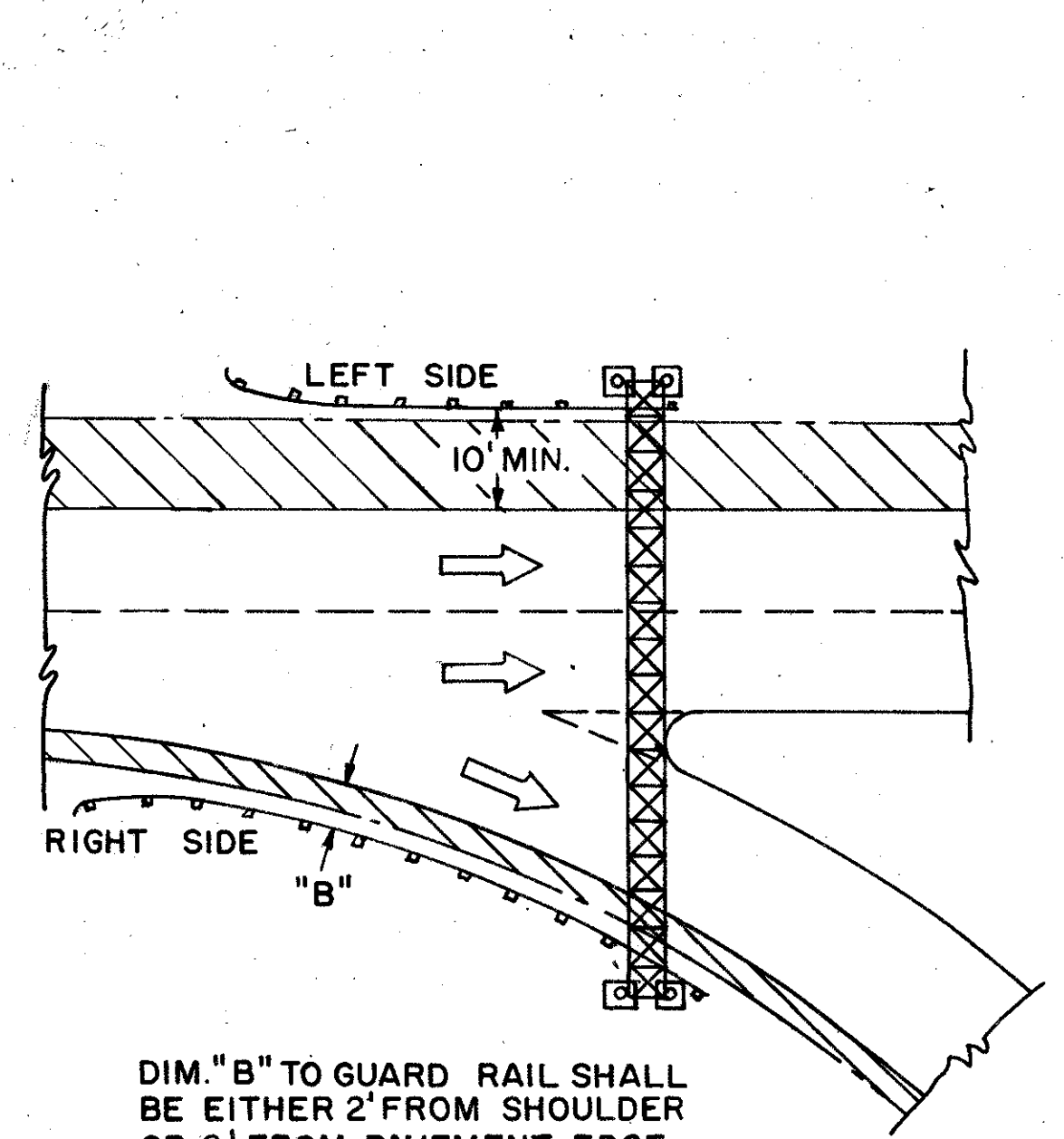
**(CURB SECTION)**



**(SHOULDER SECTION)**

**BIFURCATION**

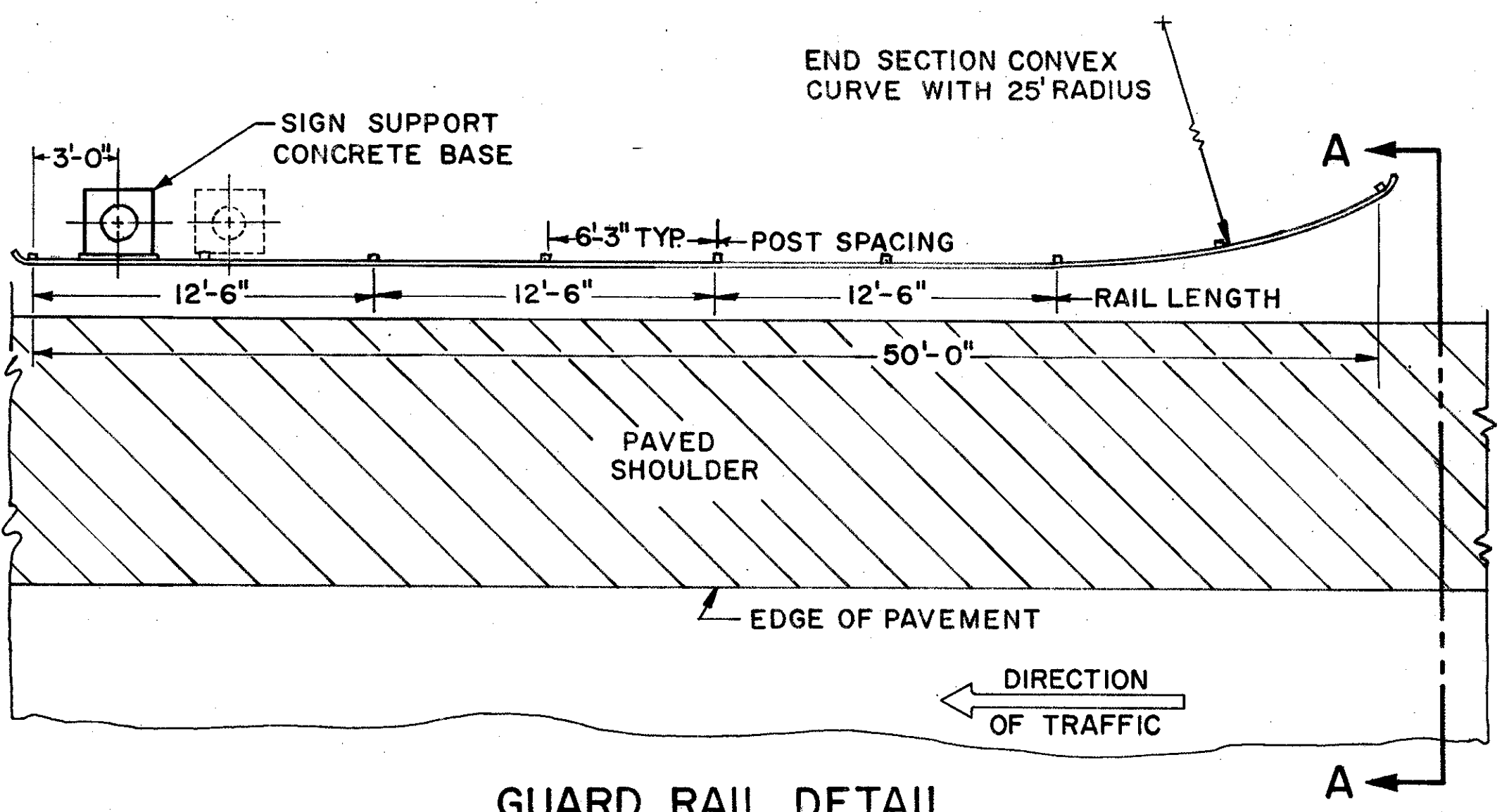
(NOT APPLICABLE)



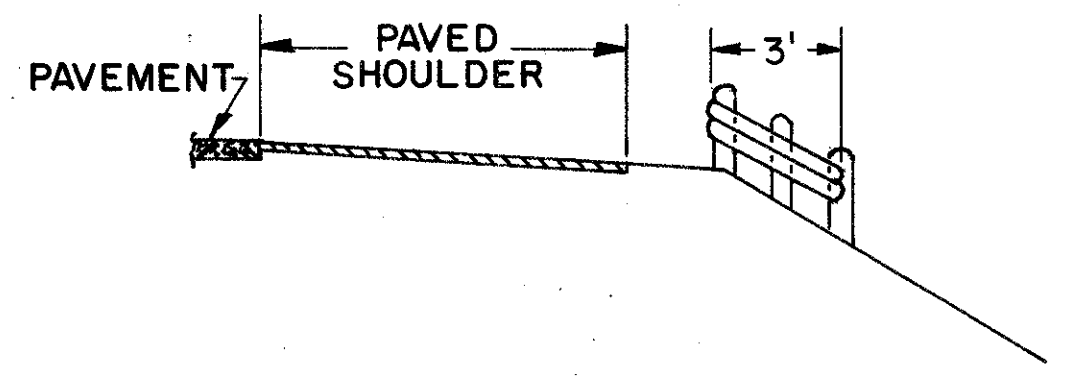
DIM. "B" TO GUARD RAIL SHALL BE EITHER 2' FROM SHOULDER OR 8' FROM PAVEMENT EDGE, WHICHEVER DISTANCE IS GREATER.

**(ROADWAY SPAN)**

**BIFURCATION**



**GUARD RAIL DETAIL**



**SECTION A-A**

BUREAU OF TRAFFIC OHIO DEPARTMENT OF HIGHWAYS		DATE
GUARD RAIL	I-129	4-8-60
	I-15	6-20-60
		1-2-62
		4-18-62
APPROVED	<i>Robert E. Lower</i> ENGINEER OF TRAFFIC	2-5-65

# LIGHTING NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

570  
646

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
MEDINA-JENNINGS INTERCHANGE  
CUY 71-17.83  
CUY-176-12.76

## GENERAL

All references herein to the "Director" refer to the Director of Highways, Ohio Department of Highways, Section 6-1.03.

These notes supplement the State of Ohio's Construction and Material Specifications dated January 1, 1963, for materials used and for the installation of roadway, bridge and underpass lighting, feeders to overhead signs, and underground provisions for police call and traffic surveillance systems for the interchange portion of the Cuyahoga County, City of Cleveland Medina Freeway, I-71 with the Jennings Freeway. The cable installations and provisions for future cables shall be underdeck wired in galvanized or corrosion resisting rigid metal conduits, as required, under pavement wired in corrosion resisting rigid metal conduits, and underground wired either in plastic ducts or corrosion resisting rigid metal conduits as indicated and required. Mercury street-lighting luminaires with 400-watt clear lamps on lanes freeway, ramps, streets and bridge decks, and 250-watt lamps underdeck and in underpasses shall be provided. These notes shall include the complete installation of all underground feeders to illuminated signs, lighting units, and underground provisions for the police call box and traffic surveillance systems on roadways where indicated. The work to be performed consists of furnishing all labor, supplies, equipment, materials, services, plant and transportation, and performing all operations necessary for the installation of all lighting and communications work in strict accordance with these notes, the Standard Specifications, proposal, supplemental specifications, instructions, notices, and drawings, subject to the terms and conditions of the Contract, and including such instructions as may be furnished by the Director during prosecution of the work in interpretation of said drawings and specifications. These notes, schedules and the accompanying drawings are intended to provide for all material and labor required to furnish and install the complete roadway lighting, signing circuits, and provisions for the police call and traffic surveillance systems.

The Contractor shall furnish and install all lighting equipment, including all lamps, ballasts, luminaires, standards, call box foundation bases, base castings, wiring, luminaire brackets, anchor bolts, foundation bases, pull boxes, junction boxes, mountings, conduit, ducts, cable, grounds, tests, connectors, fused disconnects, lighting transformer and panel stations, sign service panels, and all incidentals necessary for the complete systems, installed, adjusted, regulated, inspected, tested, connected for operation, energized, operating and accepted. Materials not specifically covered shall be of the first quality and bear the Underwriters Laboratories' seal of approval. All materials, equipment and devices shall be carefully installed, adjusted and balanced by the Contractor to the complete satisfaction of the Director, the Cleveland Division of Light and Power, and the Cleveland Fire Department.

Insofar as practicable, all major items of electrical equipment, such as luminaires, cables, standards, ducts, conduits, transformers, panels, etc., installed under the Contract, shall be the same type and consist of products of the same manufacturer in order to secure uniformity, single responsibility, and most satisfactory service. Unless specifically noted otherwise, all lighting equipment shall be equal to the latest and best grade of that type of equipment as manufactured by the General Electric Company, Line Material, Westinghouse Electric Corporation, or other approved manufacturers. Throughout the plans the use of trade names for electrical and lighting equipment is meant to be descriptive only. Comparable products of other electrical firms are acceptable if accessories and main members are compatible with one another and serve the intended purpose. Subject to the approval of the Director, equivalent materials and equipment will be allowed.

All materials furnished shall be new, shall be of the best quality and workmanship, shall be the best standard product of a manufacturer regularly engaged in the production of this type of equipment, and shall be of the manufacturer's latest approved design. The responsibility for the correct and satisfactory installation and operation of all materials and equipment required herein shall rest with the Contractor. Before any equipment is ordered or installation of the lighting system is begun, a complete schedule of materials and equipment proposed for installation shall be submitted for the approval of the Director and the Cleveland Division of Light and Power. The schedule shall initially include eight (2 for City) sets of catalog cuts, diagrams, drawings, brochures, or other such descriptive data as may be required by the Director. In the event any items of material or equipment contained in the schedule fail to comply with the specification requirements, such items will be rejected. A layout diagram showing in general the arrangement and location of the cables, conduits, and equipment is shown. This shall be considered only as illustrative, and subject to the approval of the Director, the Contractor shall modify it as necessary for complete and proper construction and operation. The locations of the branches, conduits, grounds, call box bases, pull boxes, junction boxes, cables, ducts, and roadway lighting units shown on the plans are diagrammatic only, and may be subject to slight shifting as the Director may require to conform to local conditions, subject to the maintenance of the lighting intensity indicated on the plans. The contractor will not be required to submit "As-Built" drawings of the lighting layout portion of the work. The design layout drawings will serve as working "As-Built" drawings. However, the Contractor shall submit to the Director and to the City of Cleveland Division of Light and Power complete sets of corrected prints marked up in colored pencil to show all deviations from the plans. The Director's approval shall not relieve the Contractor responsibility of furnishing and installing all items necessary for the proper functioning, as required by Section S-25.05.

All electrical materials, construction, and installation shall be in accordance with the National Electrical Code. The lighting installations, when completed, shall comply with the current applicable provisions of the I.E.E.E. Standards and Practices, American Standards, and National Electric Manufacturer's Association Standards, and shall conform to all local and special laws, codes, or ordinances of the Federal, State and Municipal Departments, commissions, etc., governing such installation, and to the special requirements herein set forth. Should the plans and detailed specifications be in conflict with these requirements, through error or omission, the Contractor shall call such conflict to the attention of the Director, and the Contractor shall make the necessary corrections in the installation as he may be directed.

In order to prevent deterioration due to corrosion, all bolts, nuts, studs, washers, pins, terminals, springs and similar fastenings and fittings shall be where practicable, of an approved corrosion-resisting material such as brass or bronze, or of a material treated in an approved manner to render it adequately resistant to corrosion. Cap screws, set screws, and tap bolts shall be of stainless steel, brass or bronze. Hot dip galvanizing per A.S.T.M. Specification A-153 will be considered such approved treatment for all ferrous hardware.

## STANDARDS

The Contractor shall provide a luminaire standard support for each roadway, deck, and underdeck lighting unit. Each standard shall be installed complete with a tapered, steel pole with cast steel anchor base, welds, steel truss-type bracket arm where indicated, pole and bracket cable, grounding lug, handhole, handhole cover, J-hook, and a final as required. The Contractor shall provide all poles and bracket arms for mounting luminaires at 35'-0" or 17'-0" above roadway. Each roadway and deck lighting unit shall comprise a 32-foot or 29-foot-6-inch steel pole respectively, with a 10-foot, 15-foot or 18-foot steel bracket adequate for 400-watt integral ballast mercury type luminaire. Poles of custom lengths shall be provided as indicated for wall-mounted units. Light standards shall conform as nearly as possible to the Specifications and drawings of the City of Cleveland and to the notes, herein, and shall be similar to the designs referenced as to general design and finish, height, base, mast arm, cross-section dimensions, and to general appearance. Standards shall be fabricated in a continuous round, true taper of approximately 0.14 inch per foot and shall be of the dimension indicated. Standards shall be made of steel. Metal poles shall be formed from one length of sheet steel and welded with only one longitudinal, automatically electrically welded joint and shall have no intermediate transverse joints or welds. The shaft material shall be hot-rolled basic open hearth steel not less than No. 11 or 7 manufacturer's standard gauge as indicated. After forming and welding, the tapered shaft shall be cold-rolled or worked under sufficient pressure to flatten out the weld (eliminating need for finish grinding) to increase the elastic limit of the metal in the completed shaft (providing a minimum yield strength of 48,000 psi), and to produce a true tapered tube without flat spots and a true round cross section throughout the length of the shaft. The poles, brackets and bases shall be galvanized inside and outside after fabrication in conformance with Section M-7.4(d). After erection minor scratches shall be given two coats of zinc rich base paint. Apply second coat after first coat has completely dried. Standards with major damage to galvanizing will be rejected. The poles shall contain all modifications as required and called for on the plans. All hardware shall be bronze, galvanized or stainless steel.

Light poles manufactured by means other than that specified above shall be made of not less than No. 11 or No. 7 manufacturer's standard gauge steel including the weld area with a minimum yield strength of 48,000 psi, meet the permanent set and deflection values tabulated herein and otherwise meet the requirements of these specifications. All such poles shall be shot blasted to remove scale and weld slag preparatory to galvanizing.

Light poles shall be capable of withstanding loading (applied 18" from top) as indicated in the following, without exceeding the permanent set and deflection (measured 18" from top of pole).

Pole Size	Arm	B.C.	Bolt Proj'n	Elastic Defl. Rate In. per 100 lbs.	At 2/3 Yield Load Lbs.	Total Perm. Defl. Lbs.	At Yield Load Lbs.	Perm. Defl. Lbs.
9.5x5.02x 32'-7 Ga.	18' 4" 10'	13"	3 1/2"	1.61	1007	16.70	0.5 1512	27.30 2.94
9.0x4.52x 32'-11 Ga.	10'	12.5"	3"	2.92	605	18.17	0.5 908	29.66 3.15
9.0x4.87x 29.5'-11 Ga.	15'	12.5"	3"	2.16	659	14.73	0.5 989	24.00 2.64
8.0x3.87x 29.5'-11 Ga.	10'	11"	2 5/8"	3.32	517	17.66	0.5 776	28.84 3.08
6x3.76x 16'x11 Ga.	None	9"	1 1/2"	.93	550	5.61	0.5 826	8.93 1.26
6.5x3.94x 18.25'11 Ga.	None	9.5"	2 1/2"	1.16	564	7.04	0.5 845	11.28 1.48

\*Actual pole required is 6.0"x4.01"x14.25" with 6" top tenon extension to accommodate 3.5" to 4.0" underpass luminaire slip fitter.

⊙ Actual pole required is 6.5" x 4.2" x 16.5" with 6" top tenon extension to accommodate 3.5" to 4.0" underpass luminaire slip fitter.

Truss-type bracket arms shall be provided for standards where indicated. Brackets shall be braced, with ends for luminaires formed to accommodate 2-inch slip fitters. The inner end of each bracket arm shall be continuously welded to a fabricated steel shoe, and shall be designed that it will fit over and double bolt to a forged steel plate with wire guide lip, continuously welded to the pole. Bracket arms shall be interchangeable with those now in use on adjacent expressways. Standards shall be complete with 4" by 6" by 4" or 4" by 6" reinforced handholes. Handhole covers shall be fastened to poles by No. 35 bronze or stainless steel captive chains. The openings for lighting units off structures shall be on the field side; openings for units on structures shall be on the roadway side.

Bracket arms and their related pole attachment devices shall sustain a vertical load of 250 pounds applied within 3 inches of the luminaire end of the support without collapse or rupture or any portion of the pole assembly. The bracket arms and their related pole attachment devices shall sustain a vertical load of 100 pounds applied within 3 inches of the luminaire end of the support and with the support attached to a rigid structure. The vertical deflection shall not exceed 5/8 per cent of the support length. This includes a maximum allowance of 1/4 or 1 per cent of the support length for testing methods and permanent set. The bracket arms and their related pole attachment devices shall sustain a transverse, horizontal load of 50 pounds applied within 3 inches of the luminaire end of the support with the support attached to a rigid structure. The horizontal deflection shall not exceed 1 per cent of the support arm length, and the pole attachment devices shall not develop any looseness within the specified loading range. This test shall be conducted with a vertical load of 30 pounds on the support. Deflection shall be defined as the total transverse displacement of longitudinal centerline of the shaft or luminaire support at the point of test load application between its initially unloaded and fully loaded position.

Roadway lighting standards shall have welded on cast steel bases. Each base shall be provided with four holes to receive the anchor bolts, and four holes for ventilation located in the body of the base directly behind the anchor bolt holes. Cast steel bases shall be one piece, and shall comply with the requirements of Section M-7.7. The base shall telescope the shaft and one continuous electric arc weld shall be on the inside of the base at the end of the shaft. The other similar weld on the outside at the top of the base. Welds shall be a minimum of 1/2 inches apart. The standards shall be of such design as to make a complete wiring raceway after the standards have been assembled and erected. The bracket arms shall be normal to the edges of the roadway, and shall not be less than 2" inside diameter standard steel pipe, ASTM-120, Schedule 40. The standards shall be equipped with a "J" hook placed inside and above the bracket mounting height, to attach a cable grip in such a manner to prevent the pole and bracket cables from hanging in the pole and bracket assembly at the point of bracket attachment to pole. The light standards shall be supplied with a corrosion resistant grounding nut inside the base, plus an accompanying corrosion resistant screw (1"-13 UNC) and flat washer. Welders and welding operators shall be prequalified for Class A welding in the state of Ohio.

Payment for ground-mounted standards with 18-foot, 10-foot, duplex, or without brackets, mounted on concrete bases will be made at the Contract unit price each for Item S-25, "Round Duplex Pole (9.5"x5.02"x32'-0")-18' Br's.", "Round Duplex Pole (9.5"x5.02"x32'-0")-10' Br's.", "Round Pole (9.5"x5.02"x32'-0")-18' Br.", "Round Pole (9.04"x4.52"x32'-0")-10' Br.", or "Round Pole (6.5"x4.2"x16'-6")", completely assembled in place, completed and accepted, including steel pole for 35'-0" or 17'-0" mounting, 7 ga. pole for duplex and 18-foot brackets; 18-foot, 10-foot, or without bracket as required; anchor base, pole top tenon where required, grounding, handhole, decal, handhole cover, captive chain, leaf covers, final, galvanizing, J-hook, cable grips, adjustments, ground lug, connections, modifications, and all incidentals required. Payment for steel standards on structures with 15-foot, 10-foot, or without brackets will be made at the Contract unit price each for Item S-25, "Round Pole (9.04"x4.52"x29'-6")-15' Br.", or "Round Pole (9.04"x4.52"x29'-6")-10' Br.", or "Round Pole (6.0"x4.01"x14'-3")", assembled in place, completed and accepted, including 29'-6", 14'-3", or custom length steel pole, 35'-0" or 17'-0" mounting, bracket, anchor base, grounding, handhole, handhole cover, captive chain, leaf covers, final, galvanizing, J-hook, cable grips, adjustments, ground lug, connections, decal, modifications, and all incidentals required. Alternate bids are required for poles of other-than-round cross-sections.

## LUMINAIRES

Luminaires shall be provided for all roadway, deck, and underpass lighting units. Roadway and deck luminaires shall meet the distribution patterns Type II-M-C or III-M-C with medium length classification and cut off brightness control as defined by ASA and IES, and be located as shown on the plans. The luminaires shall be complete lighting devices, and the roadway and deck units shall be supported with light centers of 35 ft. above the pavement as indicated. Each luminaire shall consist of a cast aluminum housing, main reflector slip fitter, seals, refractor, holding ring, automatic latch, socket, lamp, 240/480-volt integral ballast, terminal board, and wiring - all wired and assembled. Luminaires shall have a natural aluminum finish. The refractor for each luminaire shall be high quality, diffusing, pressed clear glass of the borosilicate type as Endural or Pyrex, well annealed and homogeneous and free from imperfections and striation. It shall contain prisms pressed on the inside surface and, where necessary, on the outside surface, that are optically designed to redirect by refracting the light from the lamp and upper reflector to produce the ASA-IES type distribution curve required. The inside surface at the top section of the refractor in the driver angles of view shall contain prisms with substantially flat surfaces to be used optically in cooperation with the reflector and lamp for producing the main beam. The refractor shall be clearly embossed with designations "Street Side" and "House Side". For diffusing of the light and good appearance, a continuous pattern of adjoining diffusing flutes or configurations shall be pressed on the outside surface. The refractors shall be so contoured and of sufficient thickness for high mechanical strength to resist malicious breakage and carefully tempered to withstand sudden changes in temperature. Lamp sockets shall be heavy-duty, and shall incorporate all the latest design features available, such as center spring loaded contacts, plated parts and locking devices. The socket positions shall be adjustable vertically and horizontally, but factory set for true type II-M-C or III-M-C distributions from H33-ICD lamps. Enclosed luminaires shall be 400-watt size, and shall be Westinghouse OV-25, Line Material Unistyle 400, General Electric Form M-400, or approved equal.

The Contractor shall provide ballasts for all roadway and deck lighting units. Ballasts shall be of the type suitable for mounting in the luminaires. Ballasts shall be high power factor, constant wattage or regulated output type for 400-watt lamps as indicated on the plans, shall be radio interference free, and shall be designed for parallel operation from a nominal 240/480-volt circuit, with constant performance characteristics when 480-volt circuit varies between 420 and 540 volts. Power factor shall be not less than 95 per cent. The ballast secondary regulation to the lamps shall be within ± 1/2 per cent.

All roadway and deck luminaires shall be carefully adjusted after pole erection and plumbing operations are complete. On roadway sections without grades, luminaires shall be perfectly horizontal according to the manufacturer's instructions and the design of the luminaires. All luminaires shall be horizontal transversely to the roadway, and in addition, luminaires where on grades shall be rotated on bracket pipes so as to be normal to the surface of the roadway in the longitudinal plane. The leveling of the luminaires for uniform brightness is considered an essential feature of the installation of the roadway lighting, and no perceptible variations will be accepted.

Luminaires will be paid for at the contract unit prices paid for, "Luminaire, Type III-M-C" and "Luminaire, Type II-M-C", per each, in place, and shall include integral ballast, housing, reflector, refractor, lamp receptacle, wiring corrosion resistant fittings, latches, gaskets, terminal board, seals, leveling slip fitter, glass sleeveings, and all incidentals.

## UNDERPASS LIGHTS

Underpass lighting shall be provided on 16.5-foot and 14.25-foot poles both on and off structures and on the pier cap under the bridge where indicated. The outdoor, weatherproof, 250-watt mercury vapor fixtures shall be installed under the decks as indicated, and connected to the branch circuit cables either through light pole pilasters, foundations, or through conduit in pier to the junction box in the bridge curb as indicated. Units shall be complete, consisting of an optical train which includes a single piece prismatic refractor mounted in an aluminum door assembly, type SF-2 fixture wire, an asymmetric polished aluminum reflector, an anodized aluminum visor, an integral cast guard, an integral output ballast, and a cast aluminum housing. Built-in regulated output ballasts shall be designed for 240/480-volt circuit, and operate at 95 per cent or better power factor. Lamp wattage shall not exceed ± 5% with ± 10% voltage variation. The refractors shall be made of molded, thermal shock-resisting borosilicate glass. Each door assembly

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TRCD. G.S. DATE 12-29-64  
CKD. J.R.K. DATE 12-29-64 KANSAS CITY CLEVELAND NEW YORK

# LIGHTING NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

571  
646

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
MEDINA-JENNINGS INTERCHANGE

CUY 71-17.83  
CUY-176-12.76

The cable-duct shall consist of factory preassembled cables in black medium density polyethylene duct. The materials to be furnished and used for duct shall have properties that meet the following requirements when tested by the methods indicated:

Property	Requirement	Test Method
Tensile Strength	2,500 psi	ASTM D 412
Elongation	300% min.	ASTM D 412
Carbon Black Content	Less than 2%	ASTM D 1603
Density	.926 - .940	ASTM D 1505
Melt Index	1.50 max.	ASTM D 1238
Brittle Temperature	-70° C max.	
80% Non-Failure		ASTM D 746
Minimum Wall Thickness	1/4" - .14"	

The minimum bending radius for 1/4 inch conduit shall be 18 inches. The conduit shall withstand impact and bending stresses incidental to transportation, handling and installation at temperature as low as -50° F. It shall not fracture, split or be damaged in any way by normal handling at this temperature. A 10-foot length of test conduit shall be bent into an upright U shape and filled with water. It shall be maintained at -20° C. for 24 hours. Conduit shall not crack or burst during this test. The assembly of cable-duct may be performed by extruding the duct around the specified conductors or by pulling the conductors through the preformed duct at the factory. When assembled by the extrusion method, the Contractor shall demonstrate the freedom of the conductors by pulling one foot of the conductor from the installed cable-duct. The duct shall be manufactured in continuous lengths so that it can be installed without splices between pull boxes and lighting poles. The duct shall be laid parallel to the trench prior to installation. This shall be accomplished by unreeing the duct from the bed of a slowly moving truck or by similar means. The duct needed for a particular run shall be of a length to allow for extension into pull boxes for splicing, and for extension of the conductors through the handhole in the standards for lighting. In no case shall the nominal diameter be less than 1/4" I.D. The number of conductors used in the duct and the "DUCT FILL" shall conform to the requirements of the National Electrical Code. Cable-duct and cables shall be installed in continuous lengths without splices from handhole to handhole. Splicing will be permitted only in pull boxes, junction boxes or handholes of light standards. At the terminals, cables shall be spliced to the leads in conformity with the instructions contained herein. Care shall be taken to insure watertight joints. At all terminals seal between cable and ducts with sealer not injurious to either. All splices shall be made with approved cable connector assemblies.

Item S-25, "Cable-Duct - 2-1/c No. 4", or "Cable-Duct 2-1/c No. 6", will be paid for at the contract unit price per lineal foot, in place, completed and accepted, including all cable-duct with two 600-volt cables in conduits or direct burial, caulking underground in conduit bushings, terminals, connections, testing, and all incidentals necessary. Measurement will be made per foot of cable-duct in place, each foot for payment for multiple cable-duct includes two insulated conductors. Where two cable-ducts are in same trench or conduit, payment will be twice the amount for one circuit, etc. Item S-25, "Circuit Cable, 1/c No. 4", or "Circuit Cable, 1/c No. 6", shall include all 600-volt cables in place on structures and cables in 1-inch long-tail ducts between structure and nearest sign or light base, or to pull boxes off structure, and will be paid for at the contract unit price per lineal foot, in place, completed and accepted, including all cables of the respective sizes and voltages in rigid steel conduits, caulking in conduit bushings, splicing, terminals, connections, testing, and all incidentals necessary. Measurement will be made per foot of single cable in place. Payment for No. 12, single-conductor pole and bracket cable will be made at the contract unit price per lineal foot for Item S-25, "Pole and Bracket Cable, 1/c No. 12", in place, completed and accepted including all cables in poles, brackets, conduit where indicated, wiring, splices, terminals, and all incidentals. Each foot for payment includes one conductor. Payment for No. 10, single-conductor underpass cable in conduits on structure will be made at the contract unit price per lineal foot for Item S-25, "Circuit Cable, 1/c No. 10", in place, completed and accepted, including wiring, splicing, terminals, testing, and all incidentals necessary. Each foot for payment includes one conductor.

### CABLE CONNECTORS

"Y" - cable connector assemblies shall be provided for all 3-way cable connections in pole base handholes for branch taps to luminaires, in pull boxes and curb junction boxes for branch taps to call box transformers and underpass lighting, and for sign and lighting feeder taps from pole bases, junction boxes, and pull boxes. In-line connectors shall be provided for all feeder in-line thru splices in junction structures. Connectors shall be approved, field applied, waterproof, ballasts on type connectors shall be capable of repeated quick disengagements without damage; copper. Bodies and housings shall be of water-resistant synthetic rubber suitable for direct burial or installation in sunlight. Metal and rubber parts shall be lubricated with silicone compound for easy assembly. The loadside housing of fused connectors shall be constructed to retain the fuse when disconnected, and shall be permanently marked "loadside". The "Y" insert body shall retain the second junction boxes for all branch taps shall be similar to ESNM Style 82; unfused "Y" connectors for grounded neutral taps shall be similar to ESNM Style 83. Semi-permanent "Y" connectors in pole bases, junction boxes and pull boxes for feeder taps shall be unfused type similar to ESNM Style 84. Insert plastic plugs in unused openings of the dead-end poles. The in-line fused disconnect in ungrounded lead to underpass fixture ballast of unit on structure shall be similar to ESNM Style 84. The semi-permanent type in-line connectors for splices in feeder cables shall be similar to ESNM Style 51. The quantity for Style 51 connectors is indeterminate, and the number installed shall be as required by field conditions. Variation from estimated quantity shall not be cause for change in bid price. Fuses shall be 4-ampere, 13/32" x 1/4" midjet type, 600-volt high interrupting capacity type. Fuses shall carry 110% continuously and open at 137% in one hour or less. Disconnect-type "Y" connectors for branch circuits will be paid for at the contract unit price each, in place, completed and accepted, including plastic plug and fuse where required by Item S-25, "Fused 'Y' Connector, Style 82", or "Unfused 'Y' Connector, Style 83". The semi-permanent type "Y" connectors for feeder taps will be paid for at the contract unit price paid for Item S-25, "Semi-Permanent 'Y' Connector, Style 84", furnished in place, and shall include one 3-way semi-permanent feeder connection,

shall be equipped with stainless steel pressure latches, stainless steel hinges, and a safety chain. The housings shall be dust, bug, and moisture resisting with captive neoprene and double felt gasketing, and shall have rear access holes in gasketed aluminum cover-plates and three tapped 3/8-inch or 1/2-inch conduit entries, one on each side and one on the top with conduit plugs. The fixtures shall be not less than about 16 inches over-all width, with maximum height and depth about 11 inches and 8 inches respectively. Refractor inner and outer surfaces shall be covered with an array of reflecting and refracting prisms and diffusing flutes which shall be designed to provide an asymmetric light distribution. Units shall have adjustable socket positions for 70 degree beam positions, and shall be installed with sockets in 70 degree low beam positions. The vertical maximum candlepower output shall occur at 70 degree through 0 degree lateral. The vertical distribution with a 250-watt clear mercury vapor lamp shall be as follows:

0°	not less than 1925 candlepower
15°	not less than 1875 candlepower
25°	not less than 1575 candlepower
35°	not less than 1275 candlepower
45°	not less than 1775 candlepower
55°	not less than 2350 candlepower
65°	not less than 4800 candlepower
75°	not less than 4150 candlepower
85°	not less than 1725 candlepower
90°	not less than 1900 candlepower
105°	not less than 1400 candlepower

The installation work for the underpass luminaire on the face of the bridge pier shall include the 4-inch octagonal by 5-inch deep junction box flush in face of pier where indicated, mounting lugs, type SF-2 fixture wire to junction box, and 3 amp. fuse. Install a 600-volt, high interrupting capacity fused disconnect in the junction box in the ungrounded lead to the fixture.

Item S-25, "Underpass Luminaire On Pier", or "Underpass Luminaire On Pole", will be paid for at the contract unit price each, in place, completed and accepted, including integral ballast, reflector, refractor, corrosion resistant fittings, guard, gasket, latches, hinges, safety chains, mounting and flush junction box for unit on pier, mounting for units on poles, fixture wire, fixture wires to junction box, all connections and splices, mounting lugs, fastenings, and all incidentals.

### LAMPS

Good lamps shall be burning in all luminaires for acceptance. Lamps shall be of the mercury vapor, weather resistant type, with quartz arc tubes, having a high mean output and long economic life equal to Westinghouse "Life Guard", Sylvania Banner or General Electric "Bonus" design. The 19,500 initial lumen horizontal mercury vapor lamps for roadway and deck luminaires shall be 400-watt clear, ASA-H33-ICD type, and shall be installed in roadway luminaires where indicated on the plans. The mercury lamps shall be suitable for operating on a 480-volt circuit through constant-wattage or regulator type ballasts. The 10,500 initial lumen horizontal lamps in underpass units shall be 250-watt clear, ASA H37-5KB type, and shall be installed in all underpass and underdeck fixtures. Lamps shall be rated for an average life in excess of 16,000 hours. The lamps shall be guaranteed by replacement until acceptance; and after acceptance, the unexpired manufacturers guarantee against premature lamp failure shall be transferrable to the City of Cleveland. The Contractor shall mark the bases of all lamps with month and year of installation, and advise the City of Cleveland of the name of his lamp supplier in order to obtain lamp life credit.

Item S-25, "400-W. Lamp", or "250-W. Lamp", will be paid for at the unit price each, in place, completed and accepted, including testing, adjustments, guarantee, and all incidentals.

### LIGHT POLE FOUNDATIONS

The Contractor shall provide cast-in-place concrete foundation bases for the ground-mount lighting units and the police call boxes where indicated on the plans. The bases shall be complete with anchor bolts, anchor nuts, reinforcing, ground rods, ground leads, and entrance conduits. The bases shall be level and finished to the details shown. Concrete for cast-in-place pole bases shall be Class C conforming with Section S-1.07. The four steel anchor bolts for each 7-foot deep Type "A" pole base shall be on 13-inch bolt circle with 3/4-inch bolt projection, and be 1/4" x 4-0" threaded 6 inches on straight end and hot-dip galvanized no more than 1 to 4 inches beyond threads, with a 6-inch "L" bend at bottom end; for Type "B", base shall be 6-feet deep and otherwise similar to Type "A" except with 12.5" bolt circle, 3-inch bolt projection and four 1/2"x3/4" with 4" "L" bend; base for Type "C" shall be same size as Type B, except with 24-inch bolt projection and 9.5" bolt circle; foundations for police call boxes shall be 20"x14"x3'-0", with 0.5 inch anchor bolts and 6 inch bolt projection. The Contractor shall provide the shims for leveling and the galvanized hexagonal anchoring nuts as required. The anchor bolts shall be set in the bases, and the bases poured with concrete to the finished grade with the top surfaces level. The steel for bolts shall conform to AISI Designation C-1035 hot-rolled special quality, or ASTM A-101, Grade 1035 Special Quality. The tensile strength of bolts shall be not less than 67,000 per square inch, with a minimum yield strength of 45,000 per square inch. Bolt stock shall conform with ASTM Spec. A-29 and nominal bar size shall equal nominal bolt size. The anchor bolts shall be capable of resisting at yield strength stress the bending moment of the shaft at its yield strength stress. Bolts, hexagonal nuts and shims shall be hot-dipped galvanized after fabrication in conformance with the requirements of ASTM Specification Designation A-153. The Contractor shall obtain a factory certified anchor bolt setting template and shall submit same for approval before setting any bolts. The tops of the bases shall be level, anchor bolts shall be vertical, and the placement of the bolts and the projections shall be as required. A 1-inch by 10-foot, solid, pointed, wrought iron ground rod shall be placed vertically in the trench outside each light pole foundation. The ground rods for police call box foundations shall be through bases as indicated. The grounding shall be not over 25 ohms resistance to absolute. Additional rods shall be driven ten feet apart until 25 ohms or less is secured. The No. 4 A.W.G. 7-strand insulated ground leads to FAA Specification L-824, Type A shall be attached to the rods by Exothermic welding, and run through foundation conduit and connected to a ground nut in the standard, using a bronze bolt and washer.

Payment for concrete foundation bases for ground-mount lighting units will be made at the contract unit price each for "Light Pole Foundation, Type A", "Light Pole Foundation, Type B", "Light Pole Foundation, Type C", or "Call Box Foundation",

completed and accepted, including excavations, forms, reinforcing, concrete, curing, anchor nuts, anchor bolts, setting anchor bolts, conduits in bases for wiring, grounding pole, backfilling, tamping, removing waste, 90-degree bends, bushings, grounding electrode(s), grounding tests, ground leads, clamps, welds, finishing, cleaning, grading, dowel hook bars for anchoring call box foundations to walls and footings where required, and all incidentals.

### ANCHOR U-BOLTS ON STRUCTURES

The Contractor shall provide anchor U-bolts and conduits in the concrete blisters outside the handrails and in walls for mounting lighting units and police call boxes, where indicated on the plans. The concrete bases shall be complete with anchor U-bolts, anchor nuts, entrance conduits, and grounding. The anchor U-bolts shall be furnished with threads, with two galvanized anchor nuts for each bolt, and anchor U-bolts galvanized one to four inches beyond threaded ends. The steel for bolts shall be as specified for bolts in light pole foundations. Extend a No. 10, 7-strand bare copper grounding wire from one anchor bolt of each pole on bridge to girder or beam flange, and on wall to ground rod or pile casing in foundation, and connect each end by Exothermic weld. The Contractor may at his option provide individual anchor bolts to same depth with 4-inch "L" bends of bottom ends.

Payment for light pole anchor U-bolts for standards and call boxes on bridge and wall structures will be made at the Contract unit price per set of two for one light or call box pole for Item S-25, "Pole Anchor Bolts for Structure" in place, completed and accepted, and shall include anchor U-bolts, required bolt circles, required projection, hex nuts, galvanizing, setting anchor U-bolts, leveling base, No. 10 ground lead to outside beam or girder of structure or to ground rod on wall, welds to anchor U-bolt and beam flange, welds to ground rod or pile casing for unit on walls, and all incidentals.

### BOXES IN BRIDGE CURBS

Cast iron curb junction boxes shall be provided flush in the bridge walks and in walls for branches to signs, police call boxes, underpass lighting units, and for conduit crossovers. Boxes shall be complete with bosses, wiring, grounding, conduit connections, and bushings, and shall be as shown. The 12" by 8" by 8" and the 12" by 6" by 6" boxes shall be not less than 1/4 inch thick. The 24" by 12" by 8" and the 24" by 6" by 6" boxes shall be not less than 1/2 inch thick. Boxes shall be galvanized cast iron and shall be complete with cross-ribbed checked sidewalk covers, reinforcing ribs, pry bar slots, mounting flanges, bosses with drilled and tapped holes, Neoprene gasket, flush stainless steel cover screws, and 1-inch screwed copper drain to below or out of concrete. Boxes shall be O.Z. Type "YT", Hope, Spring City, or approved equal.

Items S-25, "Junction Box On Structure - 12"x8"x8\"", "Junction Box On Structure - 12"x6"x6\"", "Junction Box On Structure - 24"x12"x8\"", and "Junction Box On Structure - 24"x6"x6\"", completed and accepted, will be paid for at the contract unit price each, which price shall be full compensation for furnishing and installing box and all appurtenances, conduit connections, checked ribbed covers, gaskets, screws, drain, grounding, splices, and all incidentals.

### PULL BOXES

Concrete pull boxes shall be provided for lighting, signing, call boxes and traffic surveillance where shown on the layouts. The construction of boxes, reinforcing mesh, slots, handles, covers and openings shall be as shown in the details. Boxes may be precast or cast-in-place. The walls shall be composed of monolithic concrete as shown. All entering conduits sleeves shall be cast or grouted in place. Reinforcing steel of No. 4 (or 1/2") rods at 6" centers each way shall conform to requirements of the Standard Specifications. Boxes shall be Class C concrete conforming with Section S-1.07 of the Standard Specifications, and shall be modified as required. Covers shall be seated with less than 0.5 in. total clearance each way. A 1/2" by 10" wrought iron ground rod shall be placed in the bottom of each Type A pull box, extending 6 inches into box.

The work under Item S-25, "Pull Box" - Type A or "Pull Box" - Type B, each, furnished in place, measured as provided in the foregoing, will be paid for at the contract price per box, which price shall be full compensation for furnishing all required materials, including excavation, forms, concrete, reinforcing steel, ground rod in Type A, cover, impressed "light" on Type B pull box or "police" in cover of Type A pull boxes, handle, grouting conduits, removing waste, and all incidentals.

### CALL BOX TRANSFORMER AND CABLE

Indicator lights on tops of police call boxes shall be energized from the sign feeder circuits as indicated. To energize the 120-volt lamp from the 480 volt sign feeders, the contractor shall provide 200-volt, 480-120-volt, 60-cycle, type molded rubber lighting transformers in adjacent curb junction boxes or pull boxes as required. Primary ungrounded connections shall be made to sign feeders through fused ESNM Style 82 "Y" connectors; grounded connections shall be made through ESNM Style 83 "Y" connectors. Each molded transformer shall include two minimum size No. 10 AWG secondary leads to tops of call boxes, and leads shall be attached to transformers through watertight caps and plugs. Caps and plugs shall be sealed with No. 22 electrical tape 1/2-inch wide. Transformers shall be similar to ESNM No. 5150-A1, except 480-120 volt transformers, or approved equal.

The work under Item S-25, "Call Box Transformer and Cable", per each, furnished in place, will be paid for at the contract price per transformer, which price shall include transformer, polychloroprene jacket, watertight lead connections, watertight plugs and caps, No. 10 AWG insulated leads to indicator light connections to "Y" connectors in feeders, fuse for transformer primary, grounding one secondary lead, and all incidentals. The "Y" Connectors will be paid for under other S-25 items.

### CABLES AND CABLE-DUCT

The lighting and signing feeder systems shall be conductors in rigid conduits or cable-duct on or off structures, as indicated, wired and installed as completed multiple 480-volt systems as indicated with ballasts for each roadway and underpass unit. Cables shall be provided where indicated on the drawings, and shall be No. 4 AWG, 6 AWG, 10 AWG, or 12 AWG as indicated. Multiple cables including grounding neutrals shall be rated for 600 volts as indicated. All cable shall have been manufactured less than two years prior to installation. The underground and underdeck insulated cables shall conform to F.A.A. Specification L-824, Type A (dated November 4, 1963) and shall be single conductor, 600-volt size as indicated. In junction boxes, pull boxes, pole bases, and common locations where there is more than one circuit present, identify each conductor by distribution station and circuit number on plastic tags or permanent type wire markers. Identify grounded conductors by "W" following distribution station and circuit number. The pole and bracket cable for circuits between handholes and ballasts in luminaires and where indicated, shall be single conductor type for 600-volt ratings. No. 12 AWG, 7-strand copper, and shall conform to Specification L-824, Type A. The No. 10 AWG conductors for underpass lighting shall be of similar construction.

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# LIGHTING NOTES

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crimp-on ring-tongue terminals, lugs, bolts, elastic stop nut, housing, insert body, water seals, silicone, instructions, and all incidentals. In-line connector assemblies used for feeder splices will be paid for at the contract unit price paid for Item S-25, "Semi-Permanent In-line Connector, Style 51"; in-line fused disconnects for the ungrounded leads to underpass fixtures will be paid for at the contract unit price paid for Item S-25, "In-line Fused Disconnect, Style 64", furnished in place, and shall include all applicable features required for "W" connectors.

### CONDUITS

The Contractor shall provide rigid metal conduits where indicated for the sign, roadway and underpass lighting circuits, and for police call and traffic surveillance systems both on and off structures, for all sign and roadway lighting circuits under pavement, and for communications circuits for call boxes where indicated. Longitudinal conduits in the walls, parapets and abutments for present and future wiring shall be complete as indicated on the plans, and shall include drains, expansion couplings, deflection fittings and extensions to pole bases. Conduits on structures shall be placed as shown on the plans, and expansion couplings shall be of such size as to provide for up to eight inches of movement at all expansion joints. Expansion couplings on structures shall be standard factory steel type to provide for movement and vibrations. Expansion fittings on bridges shall be similar to O.Z. Type EX, Hope, Spring City, or approved equal. Deflection fittings at wall joints shall be similar to O.Z. Type DX, or equivalent by Hope or Spring City.

The materials furnished and used in this work shall meet the requirements as specified herein. Underground conduits, underpavement conduits, and exposed conduits on structures shall be rigid alloy steel or wrought iron, enameled or plastic coated on the inside to provide a smooth wire raceway and shall further meet the requirements of State Supplemental Spec. M-106.11 or the Fed. Gen. Services Spec. WWP-441c for wrought iron. Flexible conduit for connection between pier and superstructure shall be JIC approved, polyvinyl-chloride jacketed, liquid-tight type. Flexible conduit sections shall be complete with approved fittings. Metallic conduits completely embedded in concrete in structures shall conform to the requirements of ASA Specifications for Galvanized Rigid Steel Conduit, Designation C80.1, and further shall be hot-dipped galvanized inside and out after threading and provided with an approved enamel or plastic coating on the inside to provide a smooth wire raceway. Metallic conduits in structures shall be run concealed in direct lines, with long sweep bends and offsets to facilitate installation of cables without excessive pulling tensions. Conduit ends shall be cut square and accurately beveled. Threaded ends of all metallic conduits shall be swabbed with Conduit Joint Sealing Compound before the couplings are made up to make them watertight. No reinforcing bars shall be cut, bent, displaced or otherwise altered from the design plans, except with permission of the Engineer. All conduit runs in bridge curbs shall be installed with moisture traps in lowest areas, and shall be pitched to drain. Traps shall be tee-type with caps and plugs, or reducers, and shall include a 1" copper drain to the bottom side of the parapet. Ground each metallic run by size 1/0, 7-strand, bare copper wire Exothermic welded to conduit and to top flange of adjacent beam.

This work shall consist of furnishing and installing empty 3-inch, Type II plastic conduits direct burial for the police call and traffic surveillance systems. The conduit to be furnished shall be composed of modified high impact styrene, and shall conform to industry standards and Federal Specification No. L-6-00740 (CSA-FSS). The material used in the conduit shall have a minimum deflection temperature of 65°C, minimum impact strength of 0.80 foot pound per inch of notch, minimum tensile strength at rupture of 3000 PSI and 15 per cent, respectively, minimum crush strength of 1000 pounds per linear foot, and minimum wall thickness of .110 for the three inch size conduit used. The conduits shall be installed in 30-foot lengths, and coupled with watertight, solvent weld joints. The conduits shall generally be installed with long-radius sweeps without using fittings for bends. A length of 30 or 40 per cent conductivity, No. 104 telephone line, high strength, copperclad drag wire of not less than .104 inch diameter and 1283 pounds breaking strength shall be left in each run. Conduit and fittings shall be provided by a manufacturer with a minimum of five years experience extruding the foregoing type conduit. The minimum separation to be maintained between power and communication conduits is 12 inches for earth, 6 inches for solid concrete, or one in corrosion resistant steel sleeve.

Payment for flexible conduit, for flexible connections from underdeck to pier top for underpass lighting will be made at the contract unit price per linear foot for Item S-25, "Conduit - 1 1/4\" Flexible", in place, completed and accepted and shall include all fittings, attachments, fastenings, and all incidentals. Payment for rigid conduit embedded in bridges, walls, piers, structures and wingwalls, will be made at the contract unit price per linear foot for Item S-25, "Conduit - 1 1/4\" Rigid Galv. Steel", "Conduit - 1 1/4\" Rigid Galv. Steel", "Conduit - 2\" Rigid Galv. Steel", or "Conduit - 3\" Rigid Galv. Steel", in place, completed and accepted, and shall include all expansion couplings, deflection fittings, bonding jumpers, bushings, bends, reaming, threading, fittings, attachments, clamps, tees, plugs, joint sealer compound, adapters to flexible conduit where required, wire chairs, tamping, encasing, drains, supports, locknuts, fastenings, and all incidentals. Payment for exposed conduits on structures, conduits under pavement, and longitudinal, direct burial, underground conduits off structures will be made at the contract unit price per linear foot for Item S-25, "Conduit - 1 1/4\" Corrosion Resistant", "Conduit - 2\" Corrosion Resistant", or "Conduit - 3\" Corrosion Resistant", in place, completed and accepted including all alloy or wrought iron conduits for wiring from ends of bridge wingwalls to adjacent ground-mount lighting units, police call boxes, or pull boxes where indicated, all conduits off structures for communications, couplings, sealer compound, threading, fittings, fastenings, attachments, locknuts, bushings, conduit connections, grounding, approved coating inside and out after threading, and all incidentals.

Underground styrene conduits, installed in accordance with requirements, will be measured by length in direct horizontal runs between centers of terminations, and will be paid for at the contract price per linear foot for Item S-25, "Conduit - 3\" Plastic", installed. This price shall be full compensation for conduits, draw wire, couplings, bends, conditioning conduits, plugging conduits, and sealing around conduits with concrete where they enter pull boxes.

### TRANSFORMER AND PANEL STATIONS

The Contractor shall provide three new complete transformer and panel stations for the 480-volt lighting branch circuits where indicated on the plans. The design of the stations shall follow the most modern practice. The pole-mounted distribution transformers shall be furnished with all standard accessories in accordance with this specification and to the applicable NEMA and ASA Standards. The transformers shall be 37.5 Kva or 50 Kva, 55 C, 60 cycles, single phase, oil-immersed, self-protected. The primary-voltage windings shall be dual-rated 2400-7200 volts complete with two bushings, four rated kv taps, (2 approx. 2-1/2% above and 2 approx. 2-1/2% below rated voltage), and manual tap-changer. Taps shall be accessible from the top through a removable cover. The secondary voltage windings shall be rated 480 volts with terminals for single-phase, 2-wire operation. Mounts shall be EEI-NEMA Type C. In addition to primary protection indicated, the transformers shall be furnished with internal low voltage circuit breakers, high voltage fuses, and valve-type arresters. All protection equipment shall be of the outdoor, weather-proof type. The primary cutouts to protect the transformers shall be open-type, load-break, single-pole, 100-ampere, 7.8 Kv, 5000 AIR, complete with fuse holders and 40 or 50 amp. fuses. The lightning arresters for the protection of the primary high voltage circuits of the transformers shall be 3000 volts. The cutouts and arresters shall be equal to General Electric, Westinghouse, Line Material, or approved equal.

The lighting circuits shall be switched in the secondary mains by enclosed magnetic contactors, operated by a photoelectric relay. The contactors shall include selector switches for manual on, off, and automatic positions, and 250-volt-amp., 480-120 volt control dry-type transformers. The photoelectric relays shall be socket-mounted, of tubeless circuitry, 115-volt, 3000 W, SPSTDC contacts, normally closed, closed at night with factory set 5 foot candles, built-in fuses, and built-in lightning arresters. The relays shall be fail safe, and have built-in time delay to avoid erroneous operation due to transient lights. The internal pilot relay contacts shall be rhodium-plated silver. The relays shall be General Electric, Hughey and Phillips, Ripley, Tark, Fisher Pierce Model 63303-DA, or approved equal. The photoelectric controllers shall be attached on the poles about 20 feet above ground level, and oriented to the north as indicated. The sockets and mounting brackets shall be galvanized. The on-off-automatic selector switches shall be enclosed in general purpose cases within the general enclosures, and may be similar to General Electric Type CR 2940-NA 101 D oil-tight type. The contactors shall be electrically held and enclosed with service switch in a code-gauge, weatherproof, NEMA Type 3, weather resistant, galvanized, sheet steel general enclosure similar to one required for the distribution panelboard. Contactors shall be rated on the basis of 8 hours enclosed, and shall be 90 or 135 amp., 600-volt, NEMA Size 3 or 4, respectively, as indicated.

The lighting branch distribution panelboards shall be 200-amp., as indicated, and consist of automatic short-circuit and overcurrent protective devices of the circuit-breaker type, assembled into a single interior NEMA Type 1 general purpose enclosure which in turn shall be mounted inside a separate code gauge, waterproof, galvanized sheet steel NEMA Type 3 weather resistant enclosure, consisting of a box, gasket, copper screened drain, and lockable front designed to be mounted on two short crossarms on a pole. Hinges shall be flush. The cylinder tumbler lock shall be combination catch and lock. The panelboard shall be of the dead-front type and shall be in accordance with Underwriters Laboratories, Inc., standards for panelboards and enclosing cabinets, and so labeled. The panelboard shall be designed for connecting to a two-wire single-phase, 480-volt A-C, one side grounded source. The mains of the panelboards shall be provided with solderless lugs only. The service connections to the panelboard shall be through service entrance switches.

The service entrance switches shall be 480-volt, 200 amp., combination devices, consisting of switch mechanisms and high-interrupting-capacity current limiting fuses. The combination devices shall be capable of closing against, remaining closed and safely limit interrupting short-circuit currents up to 200,000 amperes rms symmetrical with no derating. The switch mechanisms shall have load-interrupting capacity of twelve times the continuous-current rating of the combination devices. The switch mechanisms shall be quick-make, quick-break type with the speed of operation in both closing and opening independent of the operator. The allowable temperature rise, for carrying rated load current of the switch and fuse shall be 55°C rise over 40°C ambient at the connecting terminal. The switch door shall be interlocked. There shall be provisions for locking service switches open. The branch overcurrent protective devices shall be molded-case circuit breakers. The panel shall contain single-pole type F molded-case, 600-volt, 50-ampere, 15,000 RMS ampere interrupting ratings, breakers. The branch breakers shall have quick-make and quick-break toggle mechanisms, inverse-time trip characteristics, and shall be trip-free on overload or short circuit. Automatic release is to be secured by a bimetallic thermal element releasing the mechanism latch. In addition, a magnetic armature shall be provided to trip the breakers instantly for short-circuit currents above the overload range. Automatic tripping shall be indicated by a handle position between the manual OFF and ON positions. The individual breakers shall be calibrated and sealed to eliminate tampering or unauthorized changes in calibration. Breakers shall be of the interchangeable type and capable of being operated in any position. The directories shall be typewritten and plasticized, and shall indicate clearly the identification and location of each branch circuit.

Time switches with 10-hour synchronous, mechanical carryover shall be included to prevent daily between 7:45 a.m. and 4:45 p.m. energization of the automatic lighting control circuits. Switches shall be single-pole, single-throw, 35-amp., mounted in contactor enclosures, and connected as indicated. Switches shall be Sangamo Type W, or equivalent by Tark, Paragon or General Electric.

At bases of wood poles, the vertical 1 1/4 in. rigid metal conduits on poles shall be adapted underground at the horizontal to the 1 1/2 in. polyethylene ducts of cable-ducts by liquid-tight type female hub connectors similar to T-4 B Type 5275. Cables of cable-ducts shall be extended without splices in metal conduits up poles to panelboards.

Wiring at the stations shall be installed in corrosion resistant rigid alloy steel or wrought iron conduit. Conduit fittings shall be installed as required for the watertight entrance of wiring into the conduits. Conduits shall be securely held in place on pole structures by pipe straps located at intervals not exceeding 6 feet. The neutral conductors and non-current-carrying metallic parts of all equipment at the transformer stations shall be grounded to a 10 x 10 x 10 solid wrought iron ground rods for not over 25 ohms resistance. The ground conductors shall be protected by a half-round wood molding from below the ground line to a point at least 8 feet above the ground line. The distance between ground rods and poles shall be not less than 3 feet. If additional rods are installed, the distance between ground rods and pole shall not be less than 6 feet. Pole line hardware at the transformer stations shall be hot-dip galvanized and shall be in accordance with the standards of the Cleveland Division of Light and Power. Suitable washers shall be installed under bolt heads and nuts on wood surfaces. Eye bolts, strain plates and clevises shall be used wherever required to adequately support and protect the pole, crossarms, guy wires and insulators. Ogee washers shall be provided wherever the bolt heads bear directly on timber.

The wood poles at the transformer stations shall be 40-foot, Class 2, either Southern Pine, full-treated from bottom to top with creosote or pentachlorophenol, with a minimum retention of 6 pounds per cubic foot, or butt-treated Douglas Fir or Western Red Cedar, and shall conform to the American Standards 05.1 as to shape, condition and fiber stress. Poles shall be machine-shaved, roof-sawed, round, sound, well-proportioned from butt to top without short kinks or crooks. Butt-treated poles shall be treated by an approved process from the bottom to a point not less than one foot above the finished ground line and shall be set not less than 6'-6" deep in normal firm ground. When setting poles, the holes shall be of ample size to allow the easy entrance of the butts, and the size of the holes of the bottom shall be large enough to permit the proper use of tampers. When backfilling holes, minimum of 3 tampers shall be used for each shoveler, in order to insure that the earth is tightly packed. In no case shall be earth be thrown into a greater depth than 4 inches without being tamped hard before the next layer is deposited. The surplus earth shall be placed around the poles in a conical shape and packed tightly in order that water will drain away from the poles. The poles shall be carefully aligned and graded with arms at right angles to the direction of the primary line. The vertical and longitudinal strength of crossarms, the requirements for climbing space and pin spacing shall conform to the requirements of the Cleveland Division of Light and Power. The Contractor shall retreat the poles and arms with preservative after any cutting or boring.

All construction practices and materials shall be in accordance with the usual practices of the Cleveland Division of Light and Power. The Contractor shall prepare shop drawings of the transformer stations he proposes to install, and shall submit same for review by the Director, and the Cleveland Division of Light and Power. Approval of the shop drawing(s) shall be obtained before any materials are procured or the fabrication is begun. Drawing(s) shall include crossarms and other timber work, framing, connections, bracing, anchorage, make and type of equipment and spacing of the equipment to be installed. The Contractor shall make all necessary arrangements for power. The initial services to be supplied to the transformer stations for the roadway lighting will be 2400-volt primary. The primary services will be extended overhead approximately as shown on the plans. The Power Company will provide at their cost the insulators and guy for dead-ending their lines at the stations. All costs to the Contractor, other than those mentioned immediately above, in connection with the introduction of this service shall be included in the unit cost for the transformer and panel stations in the proposal. The Contractor shall consult and cooperate with the Company in locating its distribution lines so that lines will be as short and direct as possible, but he will not be required to furnish, install, or make any provisions for metering.

Payment for Item S-25, "Transformer and Panel Station, 37.5 Kva," or "Transformer and Panel Station, 50 Kva," will be made at the unit price each, in place, completed and accepted, including distribution transformer, primary service and connections, primary cutout, primary fuse, insulators, primary arrester, secondary disconnect, fuse, magnetic switch, conduit on pole for feeders, conduits to underground for branches, adapters, bushings, general enclosures, cable, pothead or sealed conduit terminal fittings, excavation, backfilling, tamping, ground wires, grounding, crossarms, distribution panel, directory, branch breakers, photoelectric relay, time clock (switch) with 10-hour mechanical carryover, controller, on-off-automatic selector switch, control transformer, treated pole, painting, locks, secondary feeder wiring, warning sign, adjustments, joint compound, couplings, saddles, fittings, fastenings, attachments, anchor bolts, ground lugs, welds, ground rods, ground wire moulding on pole, clamps, grounding bushings, and all necessary incidentals. All costs incurred obtaining each service shall be included in each item.

### SIGN COMMERCIAL ELECTRIC SERVICES

The Contractor shall provide services for signs at the transformer and panel stations as indicated. Poles, switch enclosure mountings, conduits, etc. shall be as shown for transformer and panel stations, except Class 6 poles. The fused service switches shall be type approved for service entrance, 480 volts, 60-amps., 3-pole, in NEMA 4 water-tight, ASA 502 or 503 stainless steel enclosures, and with lockable fused-mounted switches handles. Conduit connections to be through water-tight hubs. The class and type of switch and enclosure shall be as manufactured by Square D, General Electric, Columbus Electric Panels, Inc. or approved equal. Wiring shall be as indicated. Payment for Item S-25, "Sign Commercial Electric Service", will be made at the unit price each, in place, completed and accepted, including both secondary racks, No. 4 mains wiring, insulators, pole-mounted secondary arrester, fuses, service entrance switch, enclosure, conduit entrance head, conduits on pole, conduits to underground, adapters to sign underground circuit cable-ducts, bushings, excavation, backfilling, tamping, ground, rod, moulding, crossarms, treated pole, painting, lock, warning sign, identification sign, fittings, fastenings, attachments, and all incidentals.

### INSPECTION AND TESTING

The Contractor shall furnish all equipment and appliances necessary to test the completed cable systems, and burning and performance tests will be required for the roadway and sign light circuits. It shall be the Contractor's responsibility to demonstrate to the satisfaction of the Director of Highways and the Cleveland Division of Light and Power that all lighting circuits are continuous and free from short circuits and unsecured grounds, that all circuits are properly connected in accordance with the applicable wiring diagrams, and that the resistance to ground for each insulated conductor is not less than ten megohms. The Contractor shall furnish a complete report of megohm readings on all circuits installed to the Cleveland Division of Light and Power and to the Highway Department's Lighting Engineer. Record resistance, location, circuit number, and date tests were made. Submit six certified copies, three to the Engineer and three to the Highway Lighting Engineer in Columbus, Ohio. Costs of all inspections, energy and tests shall be considered incidental to and included in the unit prices bid for the various items, S-25, on this project. The installation of all street lighting equipment will also be inspected by a representative of the Cleveland Division of Light and Power while being installed. Before the inspections and tests are to be made, the Contractor shall notify the Cleveland Division of Light and Power and the Highway Department's Lighting Engineer by written order when he is ready. The completed lighting system including automatic controls shall be operated from sunset to sunrise each night for a period of one week without interruption or failure after all faults are corrected and prior to acceptance by the State. During this trial operation, the Contractor shall correct any defects which may develop, and make a record of nature of failure and method and date of correction, at no extra cost to the State.

# LIGHTING NOTES

## TRENCHING

The Contractor shall perform all excavations for installing underground cable-ducts, conduits, grounds, pull boxes and foundation bases in whatever substances encountered to the depths indicated on the drawings or as otherwise specified. The bottom of the trenches shall be accurately graded to provide uniform depth below ground surface. Backfill remainder of trench in accordance with Sec. I-1.07, Type 4 except that the material in the first 4" above cable-duct shall contain no pieces larger than 1".

Item S-25, "Trenching", will be paid at the Contract unit price per lineal foot for required width and depth, which price shall be full compensation for excavation for conduits and cable-ducts for lighting, signing and communication circuits in whatever materials encountered; backfilling, removing waste, compacting, grading and leveling of trench bottom, and all incidentals.

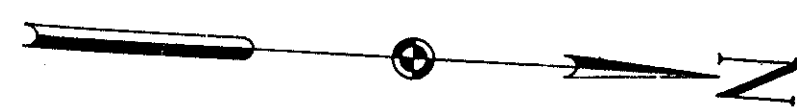
## STRUCTURE GROUNDING

This item shall consist of furnishing and installing for each structure a complete grounding system at one outside end of each fixed pier where indicated. Grounds shall be complete, and each ground for bridge with spread footings shall consist of bare copper coil under the footing concrete, lead to above top of pier, and welded connection to superstructure steelwork. The coil under the concrete footing shall consist of one 25-foot closed loop of No. 0 bare copper. To ground steelwork of bridges to pile footings, a No. 0 bare, soft annealed copper wire shall be connected at the lower end by the Exothermic weld process to a steel pile casing. The No. 0 grounding conductors between welds to piles or loops, to above pier tops shall be as straight and direct as practicable. The connections between piles or grounding loops and superstructure steelwork shall be with continuous No. 0 bare copper. The 25-foot loop of bare wire shall be placed on the base in the bottom of the footing and covered with tar paper before pouring the footings. One end of each loop shall be brought up as directly as feasible, and connected by Exothermic weld to a superstructure girder or beam flange. Grounding shall be accomplished as soon as the steelwork to which the grounding wires are to be attached is in place. Across expansion joints between framing units, the Contractor shall provide one No. 6 solid or stranded copper wire suitably looped to provide for expansion across the joints, Exothermic welded to one pair of the outside, adjacent, abutting girders. All disturbed painting shall be restored.

Ground system components for superstructure grounding will not be measured separately as items, but will be lumped into ground system units. The loops between abutting outside girders across roller expansion joints, in the bridges shall be installed by the Contractor, but will not be measured or paid for directly, but shall be considered as subsidiary work to and included in the unit price for each of the individual ground systems, Item S-25, "Bridge Structure Grounding", in place, completed and accepted, including loops, groundings, leads, welds, cables, loops between girders, tests, and all incidentals.

## QUANTITIES ON STRUCTURES

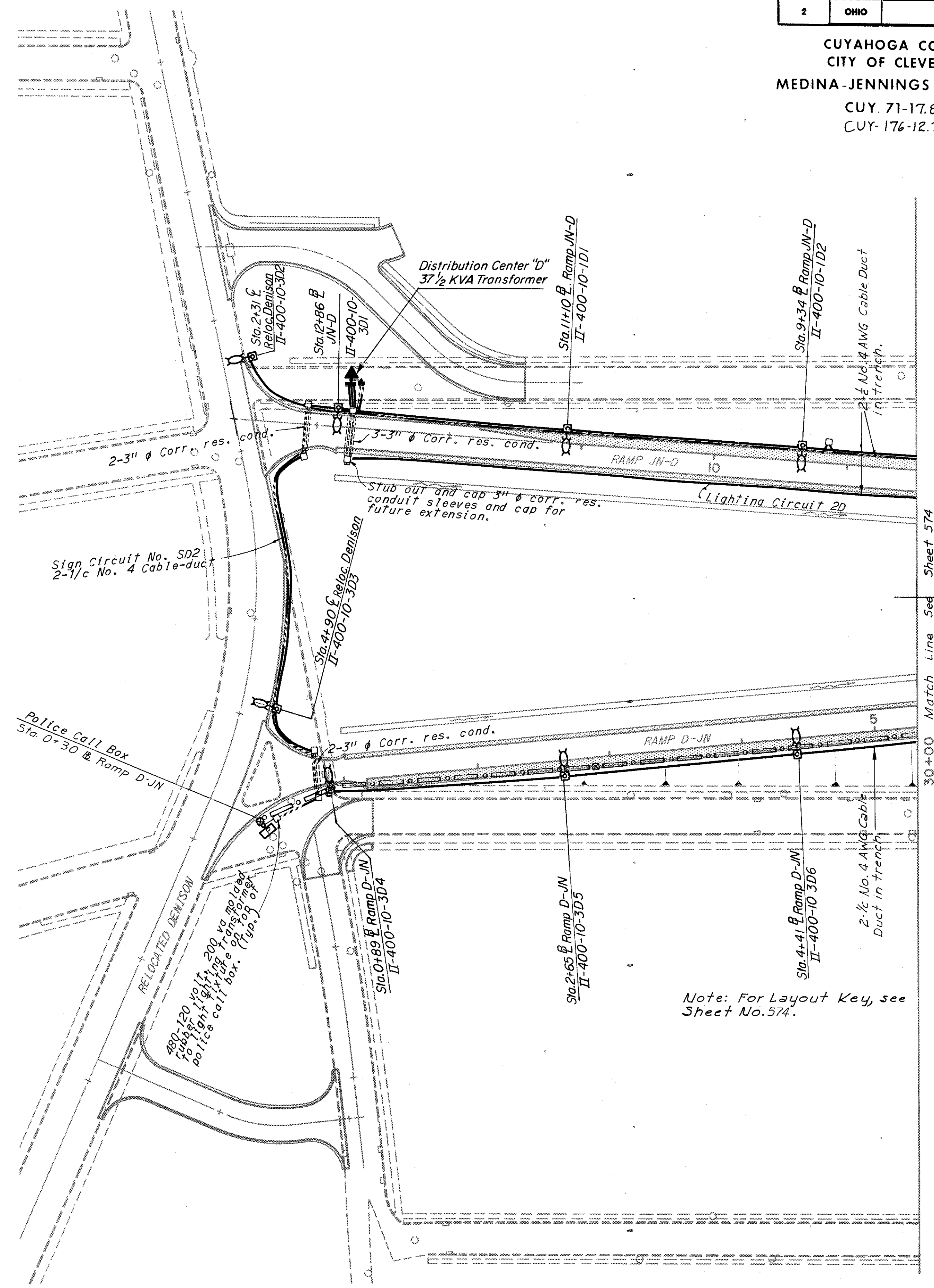
Quantities for all lighting items on structures, including luminaires, poles, cables, anchor bolts, conduits, junction boxes, and bridge electrical grounds are included in and are to be paid for with quantities for the respective structures.



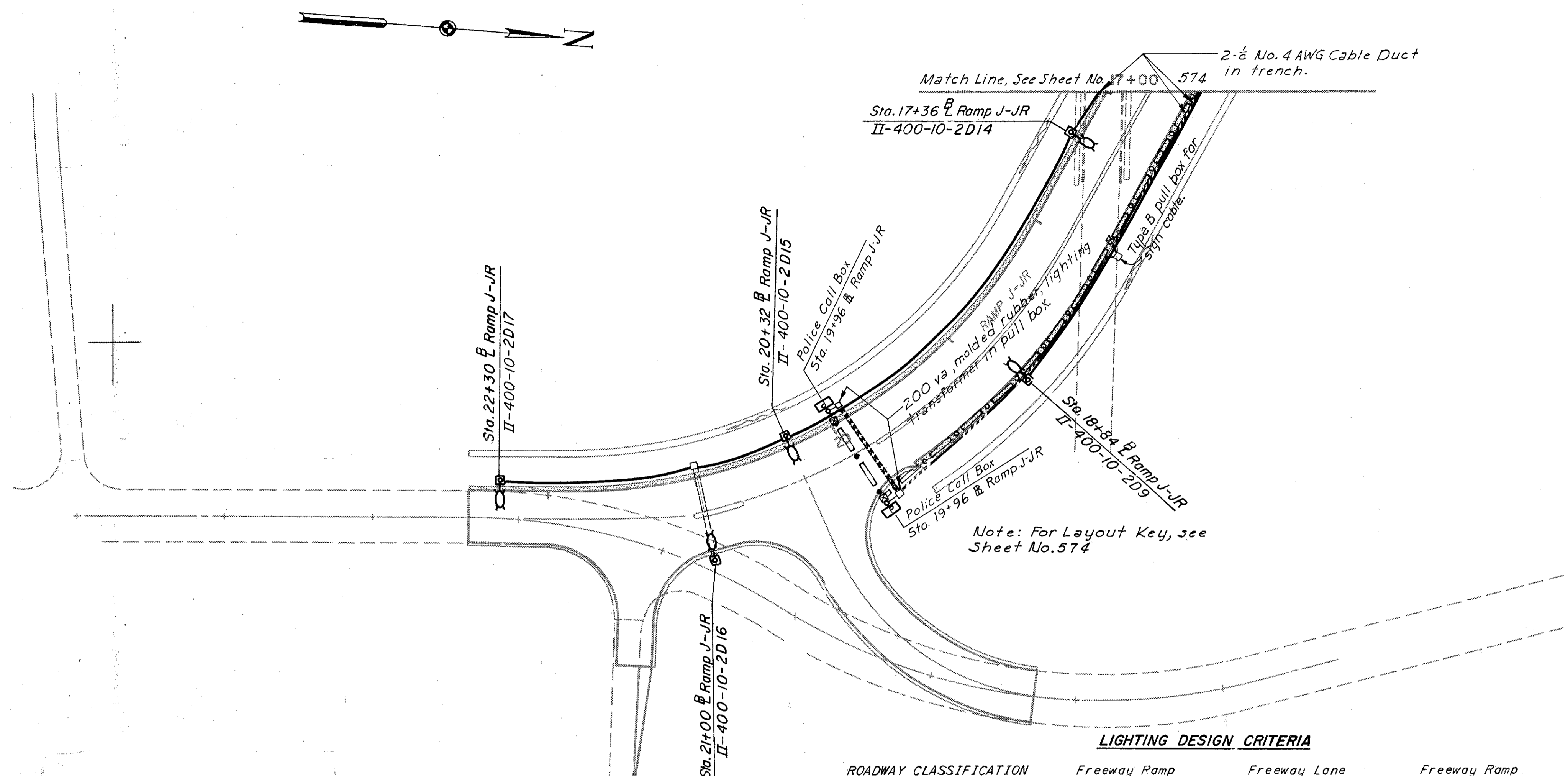
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY  
CITY OF CLEVELAND  
MEDINA-JENNINGS INTERCHANGE  
CUY. 71-17.83  
CUY-176-12.76



SCALE NONE. HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE GJC DATE 12-28-64 CONSULTING ENGINEERS  
TRCD EG DATE 12-29-64  
CKD J.R.K. DATE 12-29-64 KANSAS CITY CLEVELAND NEW YORK



**LIGHTING DESIGN CRITERIA**

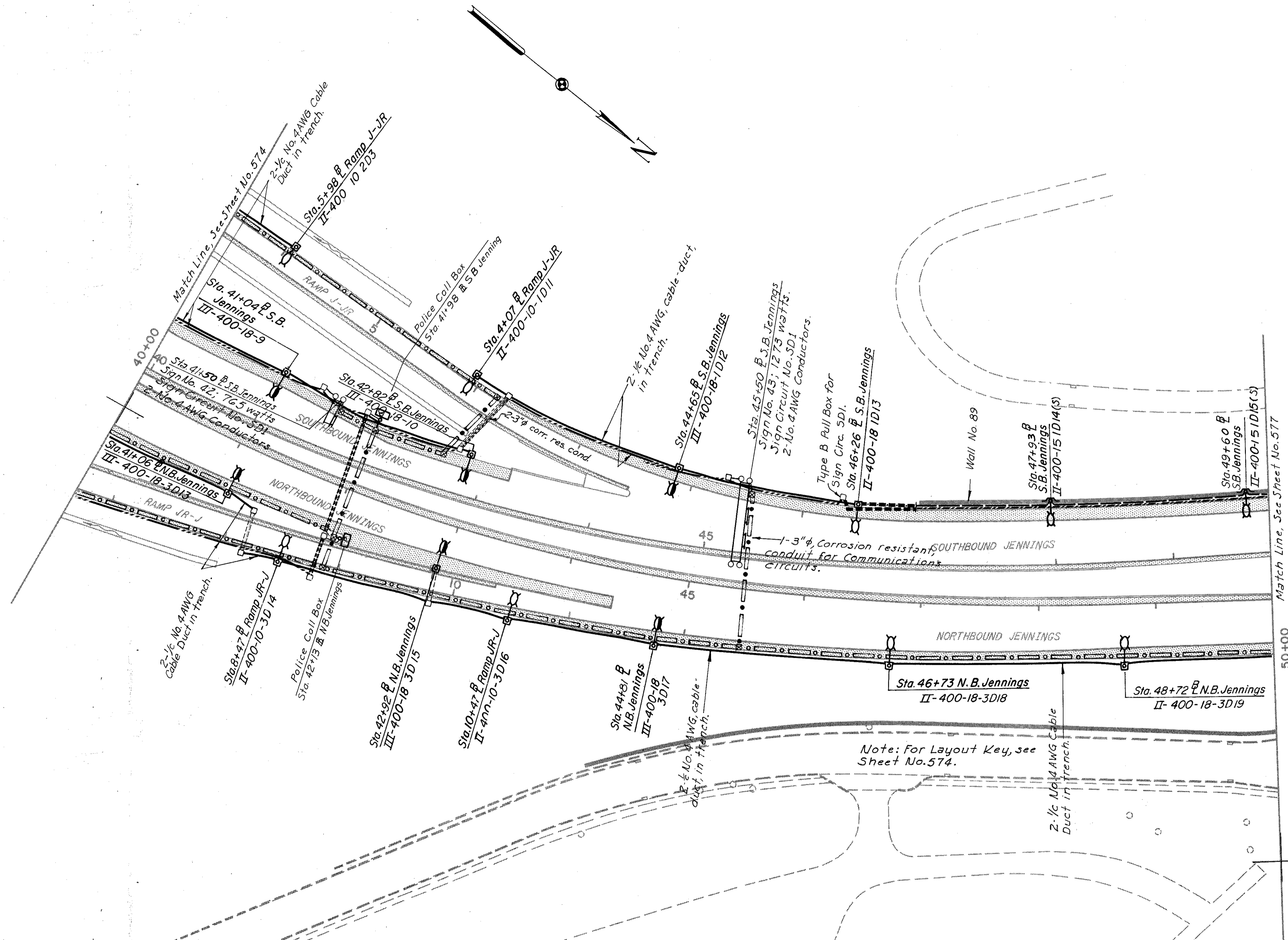
ROADWAY CLASSIFICATION	Freeway Ramp	Freeway Lane	Freeway Ramp	Freeway Lane	Freeway Lane	Underdeck
WIDTH	16 ft.	24 ft.	36 ft.	40 ft.	50 ft.	48'
AREA CLASS	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
INTENSITY	1.2 F.C.Av. Initial	1.2 F.C.Av. Initial	1.2 F.C.Av. Initial	1.2 F.C.Av. Initial	1.2 F.C.Av. Initial	1.44 F.C.Av. Initial
MINIMUM INTENSITY	0.3 F.C. Initial	0.3 F.C. Initial	0.3 F.C. Initial	0.3 F.C. Initial	0.3 F.C. Initial	0.77 F.C. Initial
DISTRIBUTION TYPE	II-M-C	II-M-C	II-M-C	II-M-C	II-M-C	70°
MAINTENANCE FACTOR	100%	100%	100%	100%	100%	100%
LAMP DESIGNATION	ASA H33-1CD	ASA H33-1CD	ASA H33-1CD	ASA H33-1CD	ASA H33-1CD	ASA H 35-5KB
LAMP DESIGN OUTPUT	19,500 lum.init.hor.	19,500 lum.init.hor.	19,500 lum.init.hor.	19,500 lum.init.hor.	19,500 luminit.hor.	10,500
LAMP FACTOR	0.95	0.95	0.95	0.95	0.95	100%
MOUNTING HEIGHT	35.0 ft.	35.0 ft.	35.0 ft.	35.0 ft.	35.0 ft.	17.0 ft.
M.H. CORRECTION FACTOR	0.74	0.74	0.74	0.74	0.74	0.77
LUMINAIRE OVERHANG	4 ft. 8 in.	4 ft. 8 in.	4 ft. 8 in.	4 ft. 8 in. (18' br.)	4 ft. 8 in.	-3 ft.
PHOTOMETRIC DATA	L.M. Test E-359-85	L.M. Test E-359-85	L.M. Test E-359-85	L.M. Test E-359-85	L.M. Test E-359-85	Holophane 20183
COEFFICIENT OF UTILIZATION	22%	33%	44%	47%	50%	.33
DESIGN SPACING	200 ft. one side	200 ft. one side	199 ft. one side	191 Stg'rd.	162 ft. Stg'rd.	50.6 ft. Stg'rd.

ROADWAY CLASSIFICATION	Freeway	Freeway	Freeway	Freeway Lane	Freeway Lane
WIDTH	36 ft. -16 ft. -36 ft.	48 ft. -16 ft. -48 ft.	82 ft. -16 ft. -64 ft.	73 ft.	83 ft.
AREA CLASS	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate
INTENSITY	1.2 F.C.Av. Initial	1.2 F.C.Av. Initial	1.2 F.C.Av. Initial	1.2 F.C.Av. Initial	1.2 F.C.Av. Initial
MINIMUM INTENSITY	0.3 F.C. Initial	0.3 F.C. Initial	0.3 F.C. Initial	0.3 F.C. Initial	0.3 F.C. Initial
DISTRIBUTION TYPE	III-M-C	III-M-C	III-M-C	III-M-C	III-M-C
MAINTENANCE FACTOR	100%	100%	100%	100%	100%
LAMP DESIGNATION	ASA H33-1CD	ASA H33-1CD	ASA H33-1CD	ASA H33-1CD	ASA H33-1CD
LAMP DESIGN OUTPUT	19,500 lum.init.hor.	19,500 lum.init.hor.	19,500 lum.init.hor.	19,500 lum.init.hor.	19,500 lum.init.hor.
LAMP FACTOR	0.95	0.95	0.95	0.95	0.95
MOUNTING HEIGHT	35.0 ft.	35.0 ft.	35.0 ft.	35.0 ft.	35.0 ft.
M.H. CORRECTION FACTOR	0.74	0.74	0.74	0.74	0.74
LUMINAIRE OVERHANG	4 ft. 8 in. (18' br.)	4 ft. 8 in. (18' br.)	4 ft. 8 in. (18' br.)	4 ft. 8 in. (18' br.)	4 ft. 8 in. (18' br.)
PHOTOMETRIC DATA	L.M. Test No. E-359-84	L.M. Test No. E-359-84	L.M. Test No. E-359-84	L.M. Test No. E-359-84	L.M. Test No. E-359-84
COEFFICIENT OF UTILIZATION	48%	52%	57%	56%	57%
DESIGN SPACING	195 ft. opp. spa.	178 ft. opp. spa.	126 ft. opp.	112 ft. Stg'rd.	100 ft. Stg'rd.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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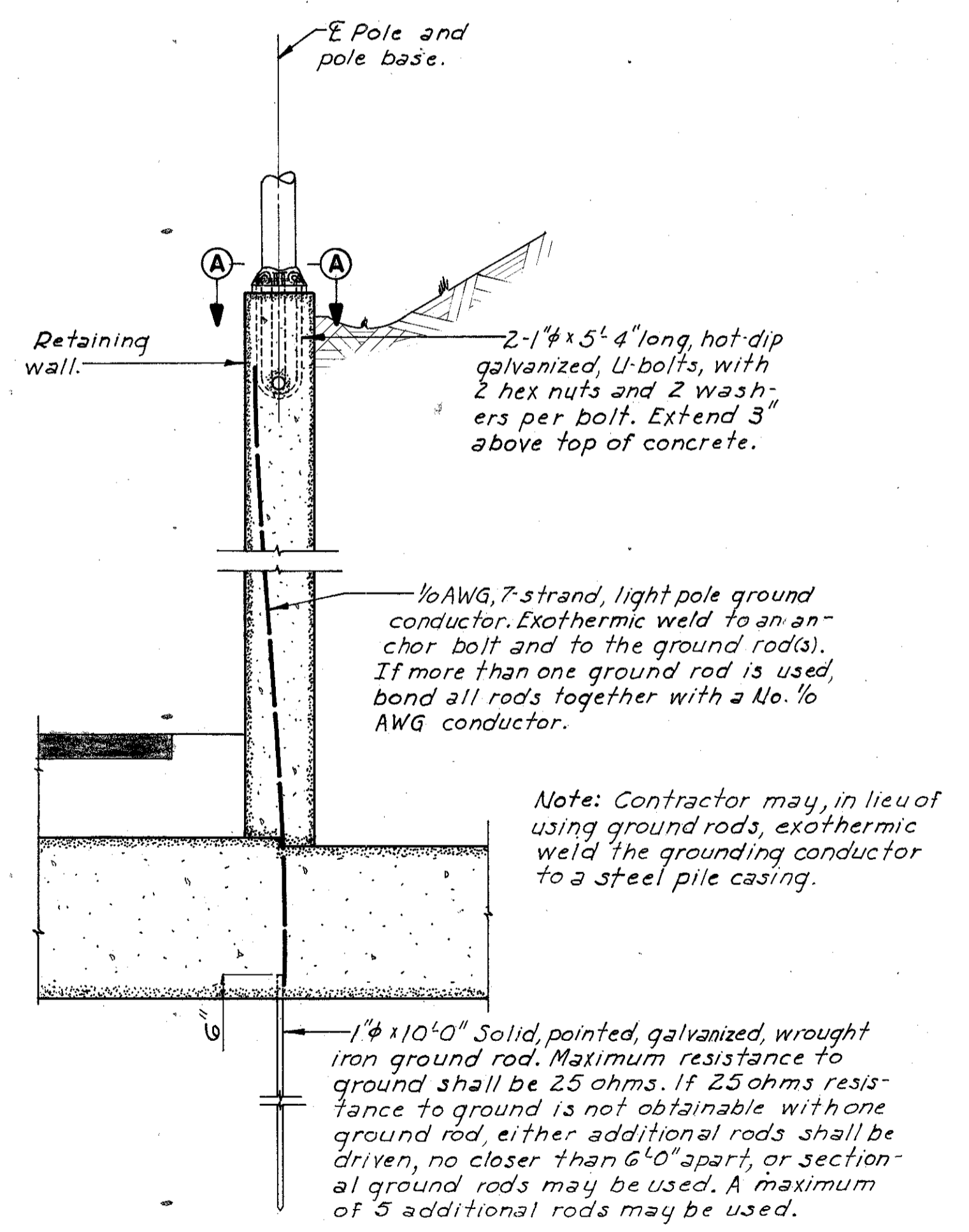
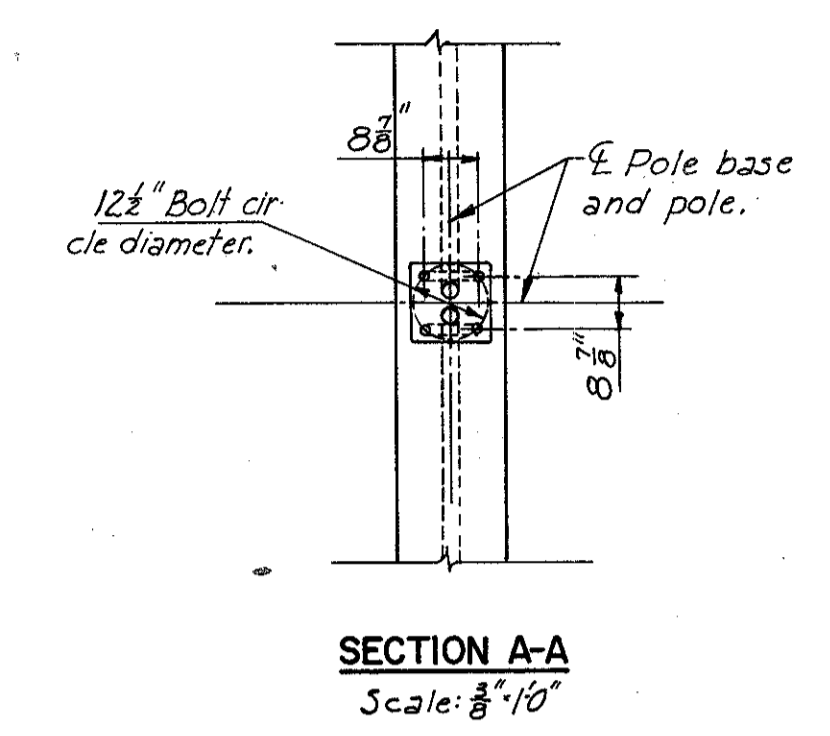
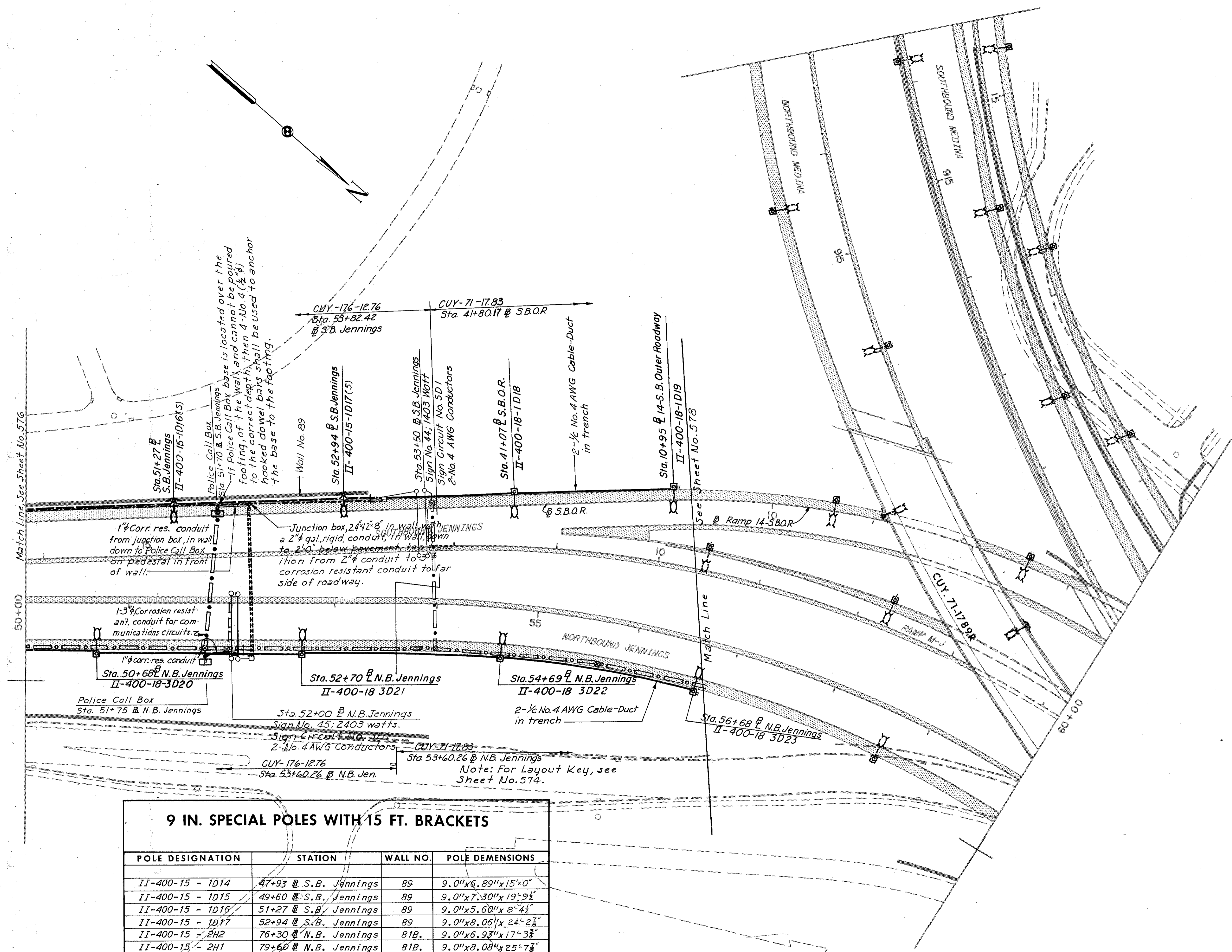
CUYAHOGA COUNTY  
CITY OF CLEVELAND  
MEDINA-JENNINGS INTERCHANGE  
CUY 71-17.83  
CUY-176-12.76



SCALE \_\_\_\_\_ HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE J.R.H. DATE 11-10-69 CONSULTING ENGINEERS  
TRCD \_\_\_\_\_ DATE \_\_\_\_\_ KANSAS CITY CLEVELAND NEW YORK  
CKD G.J.C. DATE 12-22-69

LIGHTING LAYOUT  
2-3-65

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
**MEDINA-JENNINGS INTERCHANGE**  
CUY 71-17.83 CUY 176-12.76



**9 IN. SPECIAL POLES WITH 15 FT. BRACKETS**

POLE DESIGNATION	STATION	WALL NO.	POLE DIMENSIONS
II-400-15 - 1014	47+93 @ S.B. Jennings	89	9.0"x6.89"x15'0"
II-400-15 - 1015	49+60 @ S.B. Jennings	89	9.0"x7.30"x19'9 1/2"
II-400-15 - 1016	51+27 @ S.B. Jennings	89	9.0"x5.60"x8'4 1/2"
II-400-15 - 1017	52+94 @ S.B. Jennings	89	9.0"x8.06"x24'2 1/2"
II-400-15 - 2H2	76+30 @ N.B. Jennings	81B	9.0"x6.92"x17'3 3/8"
II-400-15 - 2H1	79+60 @ N.B. Jennings	81B	9.0"x8.08"x25'7 1/8"



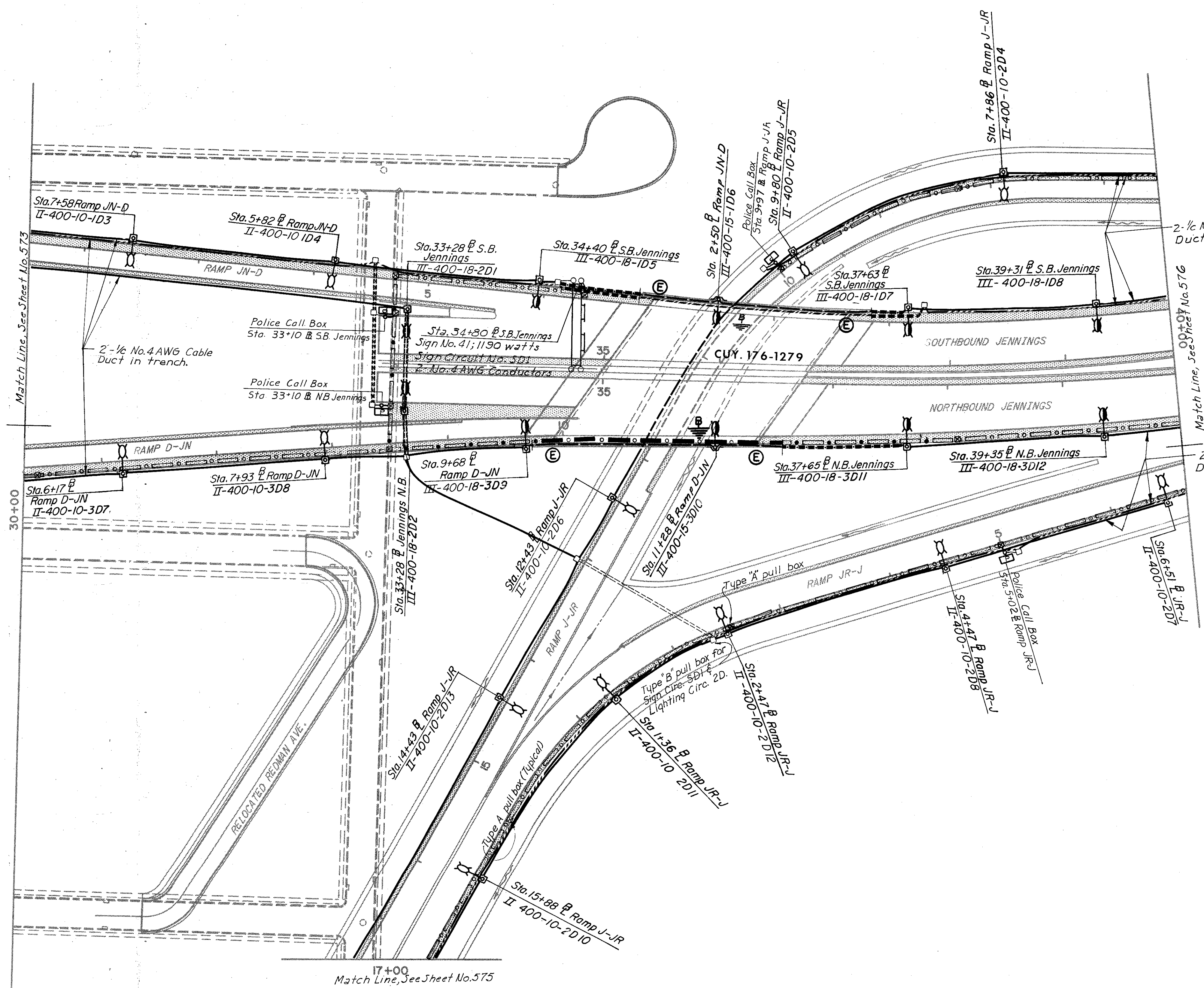
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

574  
646

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
MEDINA-JENNINGS INTERCHANGE  
CUY. 71-17.83  
CUY. 176-12.76

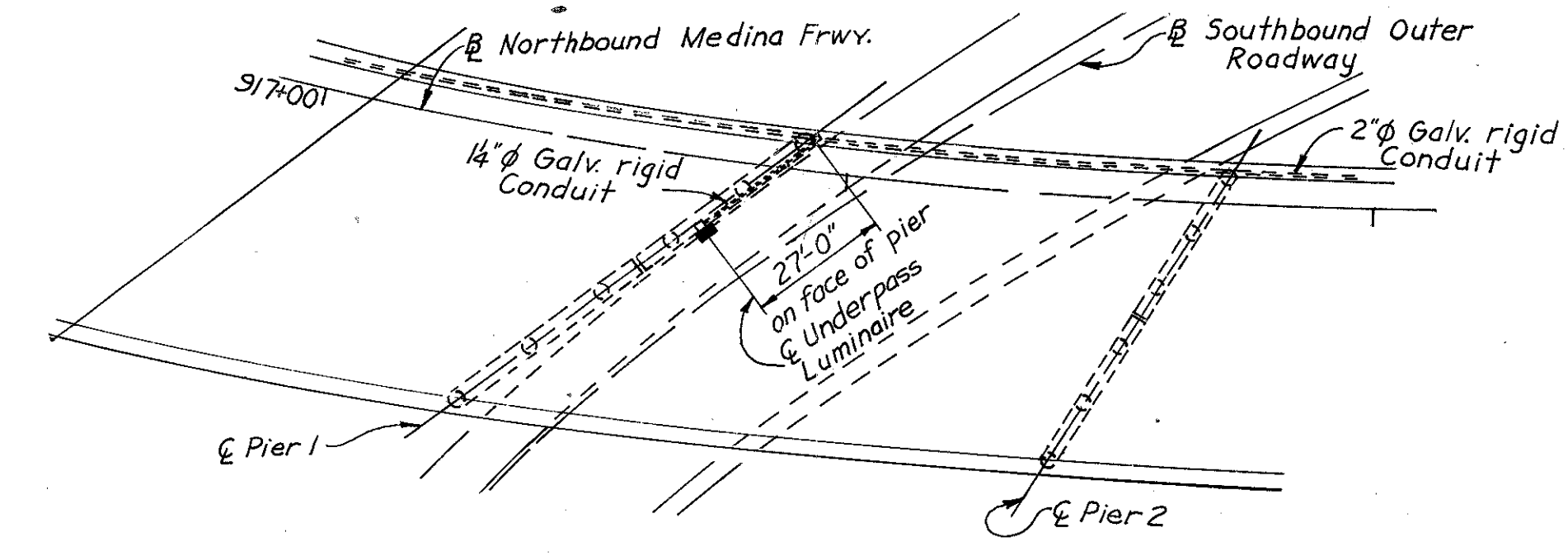
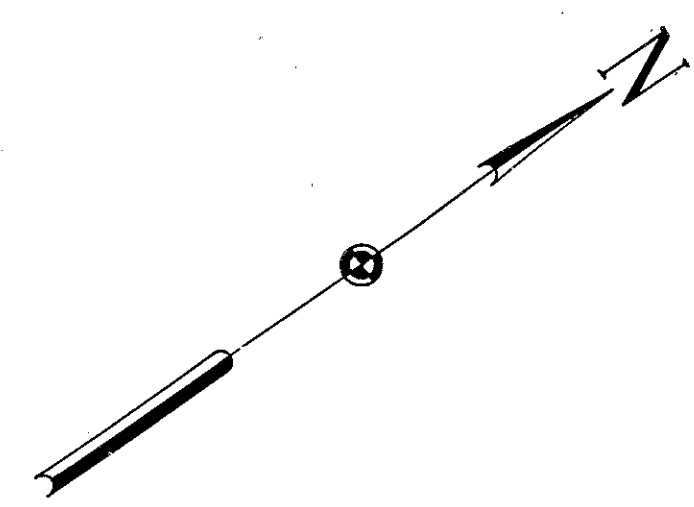
LAYOUT KEY

- Typical Ground Mounted Lighting Unit: Clear Mercury Vapor Lamp; 400 watt size; ASA-IES Type II, on standard.
- Typical Ground Mounted Lighting Unit: Clear Mercury Vapor Lamp; 400 watt size; ASA-IES Type III, on standard.
- Typical Structure Mounted Lighting Unit: ASA-IES Type II, Same as above.
- Typical Structure Mounted Lighting Unit: ASA-IES Type III, Same as above.
- Typical Ground Mounted Underpass Lighting Unit: 250 watt, clear, M.V. Lamp; on standard.
- Typical Structure Mounted Underpass Lighting Unit: 250 watt, clear, M.V. Lamp; on standard.
- Concrete Pull Box, Type "B" for Lighting and/or Signing
- Junction Box, galv. cast-iron, in structures, of sizes as noted.
- Transformer Station and Service Panel for Roadway Lighting.
- Service Panel and Pole, for Sign Lighting.
- Cable Duct, directly buried, for Roadway Lighting.
- Multiple Circuits, in 2" Diam. galv. rigid, conduit in structures, for Roadway Lighting.
- Multiple Circuits in 2" Diam., corrosion resistant, conduit, from end of structures to nearest pull box or lighting unit, directly buried, for Roadway Lighting.
- Multiple Circuits in 3" Diam., corrosion resistant, conduit under paved areas, for Roadway Lighting.
- Multiple Circuits in 2" Diam., corrosion resistant, conduit from end of structures to nearest pull box, directly buried, for Sign Lighting.
- Multiple Circuits in Cable Duct, directly buried, for Sign Lighting.
- Multiple Circuits in 2" Diam., galv. rigid, conduit in structures; for Sign Lighting.
- Multiple Circuits in 3" Diam., corrosion resistant, conduit under paved areas, for Sign Lighting.
- 2" Diam., corrosion resistant conduit, for power circuits to call boxes.
- 2-3" Diam., Plastic conduits for communications circuits, directly buried.
- 2-3" Diam., galv. rigid, conduits in structures, for communications circuits.
- 2-3" Diam., corrosion resistant, conduits, directly buried, for communications circuits.
- Concrete Pull Box for communications circuits, Type "A".
- Junction Box in structures, galv. cast-iron, for communications circuits.
- Call Box, with a 2" Diam. corrosion resistant, conduit to the nearest concrete Pull Box or junction box, as shown.
- Bridge Ground at fixed Piers, on outside bedms, as shown.
- Expansion joint in conduit (s) in structures, as shown or required.
- Drain fitting in conduit (s), in low point in conduit runs in structures, as shown.
- II-400-18-1C3 -Typical Laminaire Designation: II is ASA-IES Type, 400 is lamp wattage, 18 is the bracket length, 1C3 is the circuit designation where 1 is the circuit number, C is for the service panel location, and 3 is for the Pole Number in the circuit. (S) indicates Special Length of 9" pole.
- Typical Mercury Vapor Underpass Lighting Unit: 250-watt clear M.V. Lamp. Mounted on face of Pier as shown and detailed.

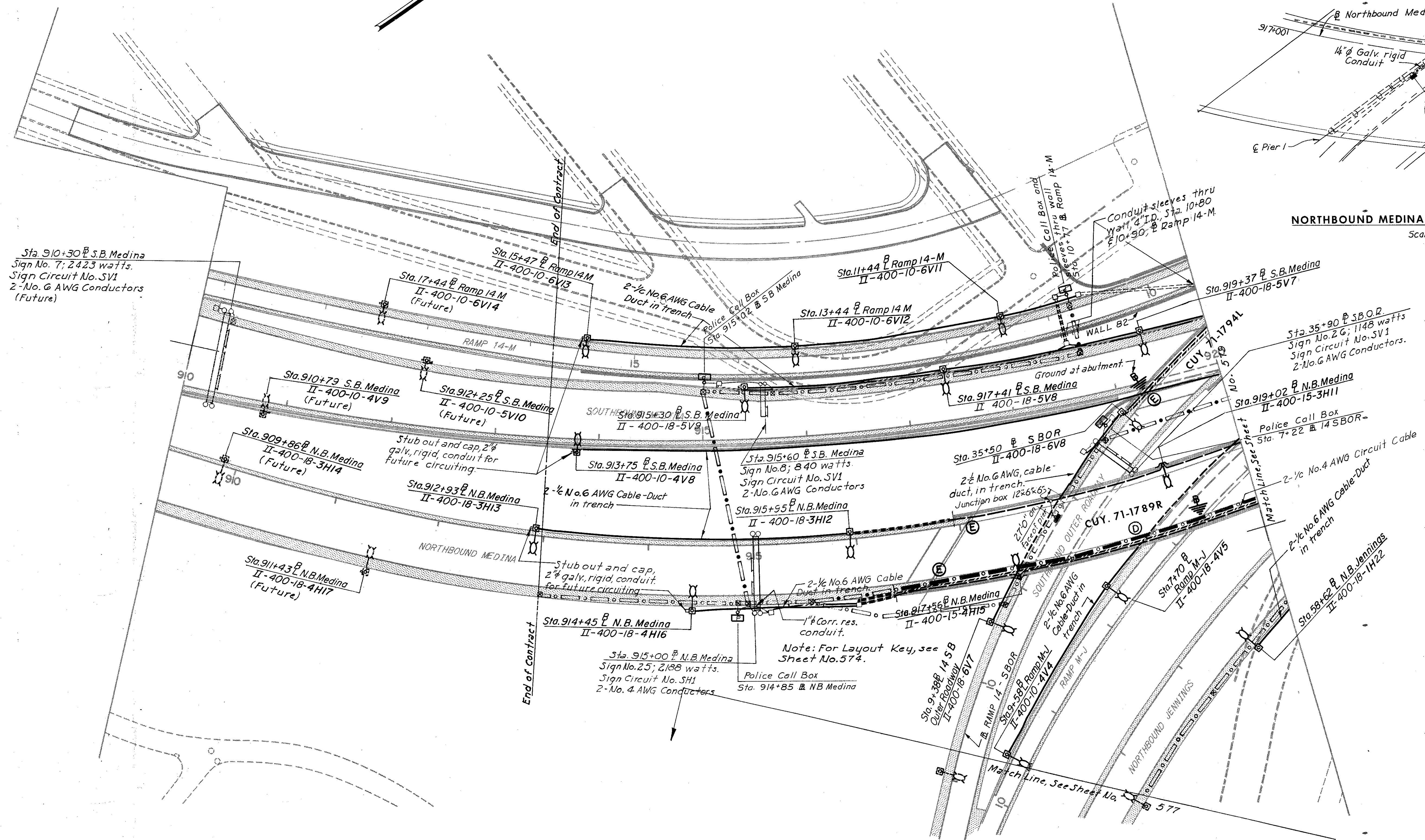


SCALE 1"=50'  
 MADE BY HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 TRCD. DATE 11-4-64 CONSULTING ENGINEERS  
 CKD. DATE 12-27-64 KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
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CUY 71-17.83 CUY 176-12.76

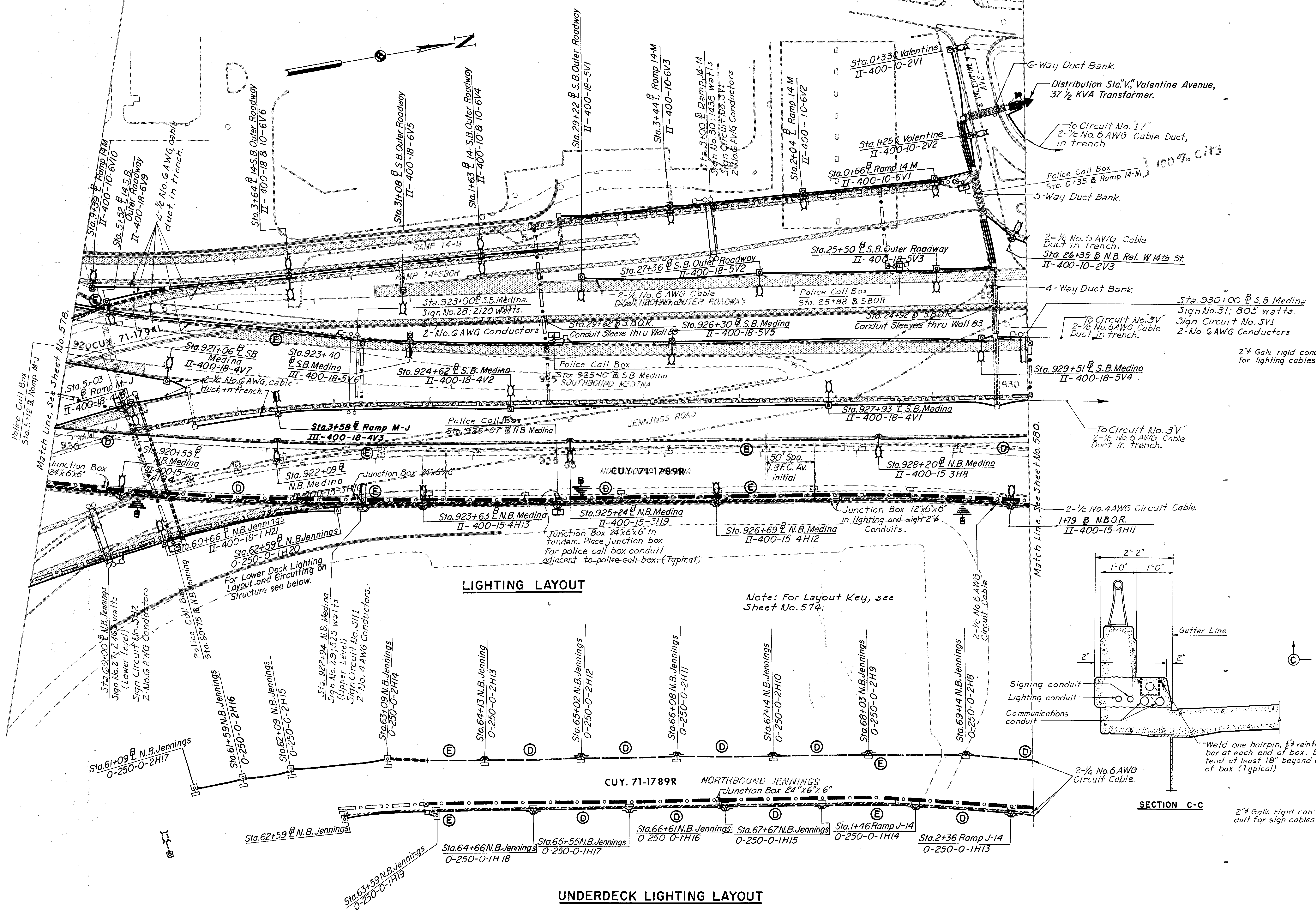


NORTHBOUND MEDINA OVER SOUTHBOUND JENNINGS  
Scale: 1"=30'



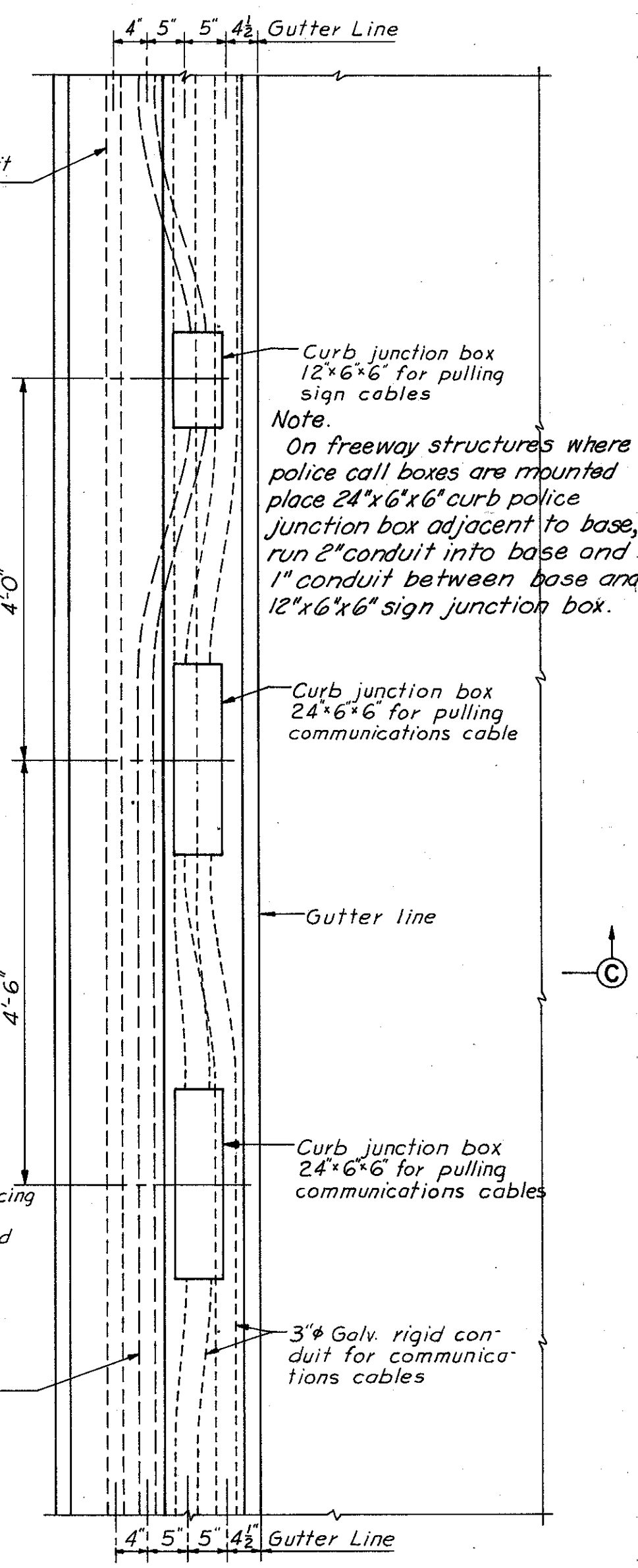
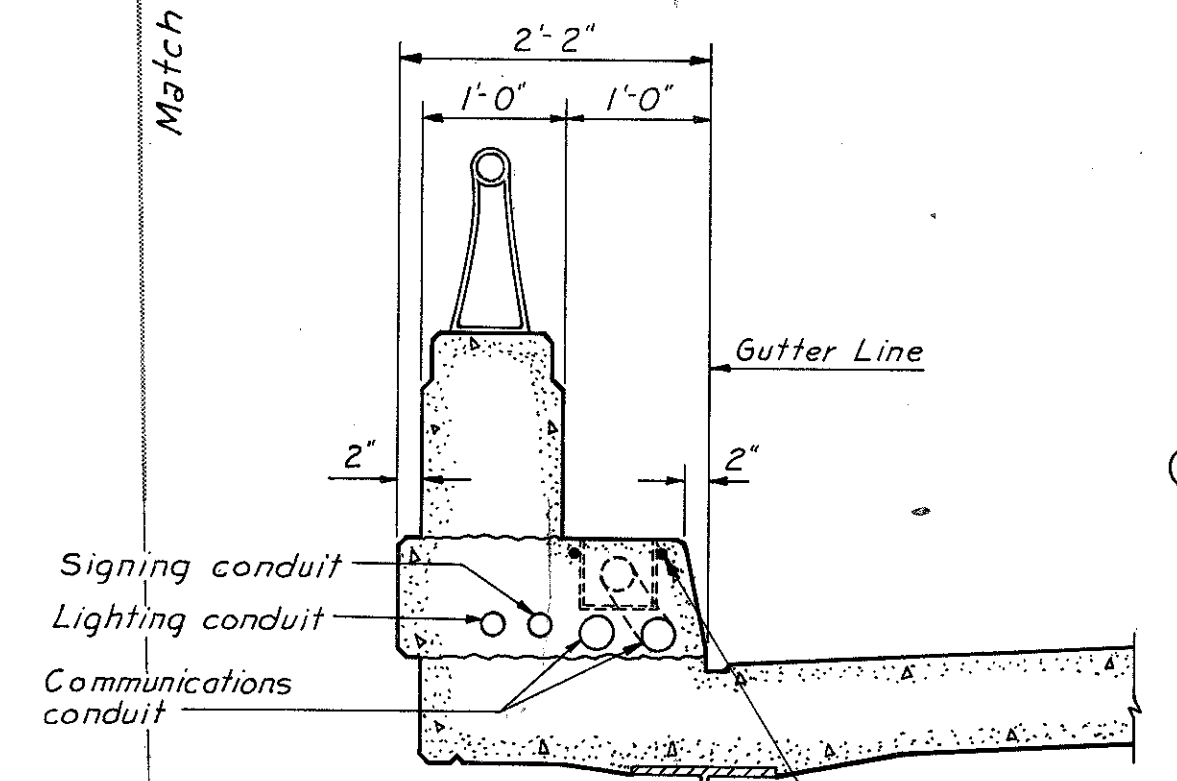
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HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
MADE I.R.K. DATE 11-20-69 CONSULTING ENGINEERS  
TRCD 1 DATE 1-23-70 KANSAS CITY CLEVELAND NEW YORK  
CKD G.J.C. DATE 12-23-69

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
**MEDINA-JENNINGS INTERCHANGE**  
CUY 71-17.83 CUY 176-12.76



**LIGHTING LAYOUT**

**UNDERDECK LIGHTING LAYOUT**



**PULL BOXES ON STRUCTURE DETAILS**  
Scale: 3/4" = 1'-0"

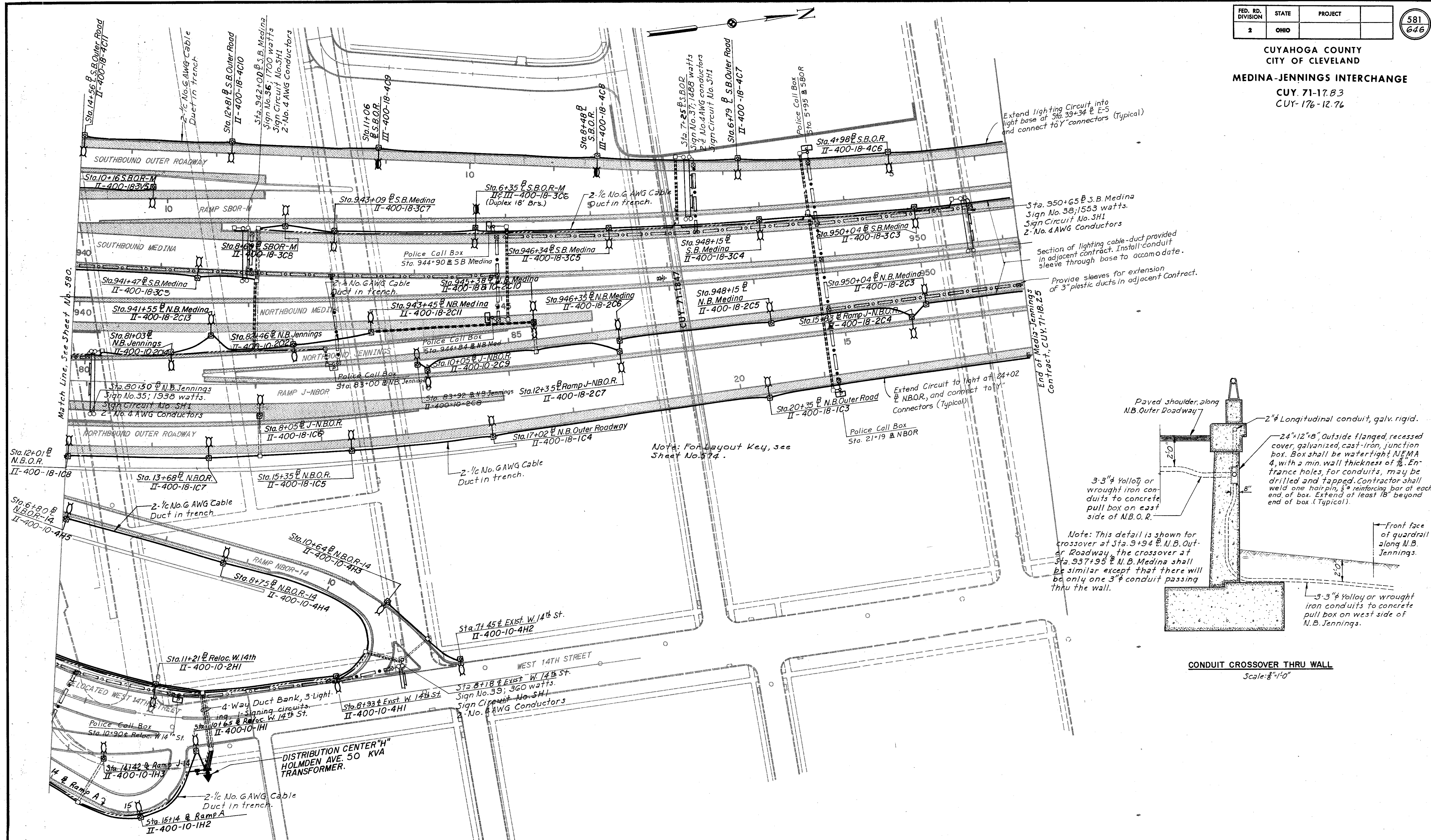
SCALE: 1" = 50'  
HOWARD, NEEDLES, TAMMEN & BERGENOFF  
MADE I.R.K. DATE 1-20-63 CONSULTING ENGINEERS  
TRCD. D.L.R. DATE \_\_\_\_\_  
CKD G.J.C. DATE 12-22-65 KANSAS CITY CLEVELAND NEW YORK



FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

581  
646

CUYAHOGA COUNTY  
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**MEDINA-JENNINGS INTERCHANGE**  
CUY. 71-17.83  
CUY-176-12.76



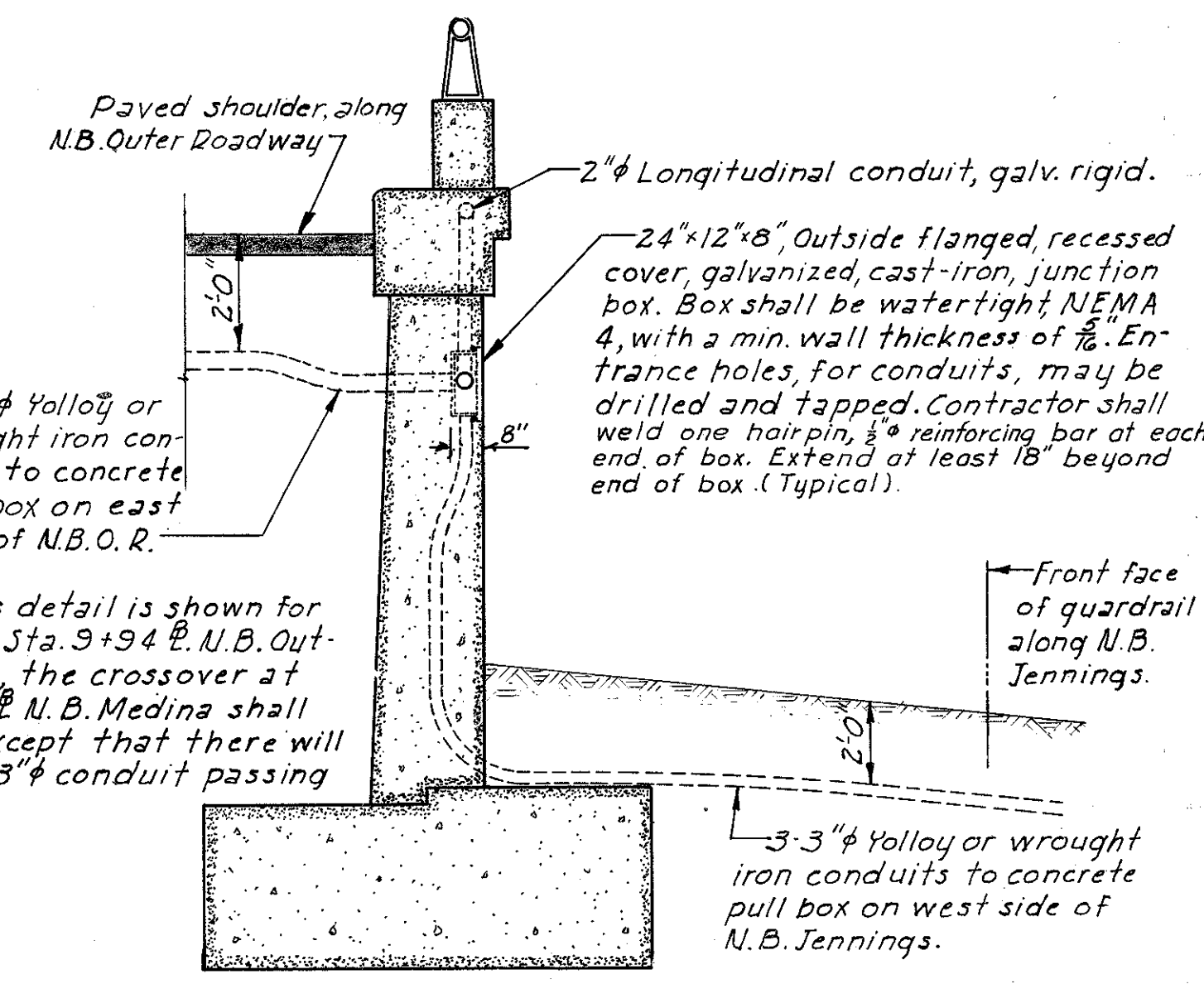
Note: For layout key, see Sheet No. 574.

Extend lighting circuit into light base at Sta. 39+34 E-5 and connect to Y-connectors (Typical)

Section of lighting cable-duct provided in adjacent contract. Install conduit sleeve through base to accommodate.

Provide sleeves for extension of 3" plastic ducts in adjacent contract.

Extend circuit to light at 24+02 E-NBOR, and connect to Y-connectors (Typical)



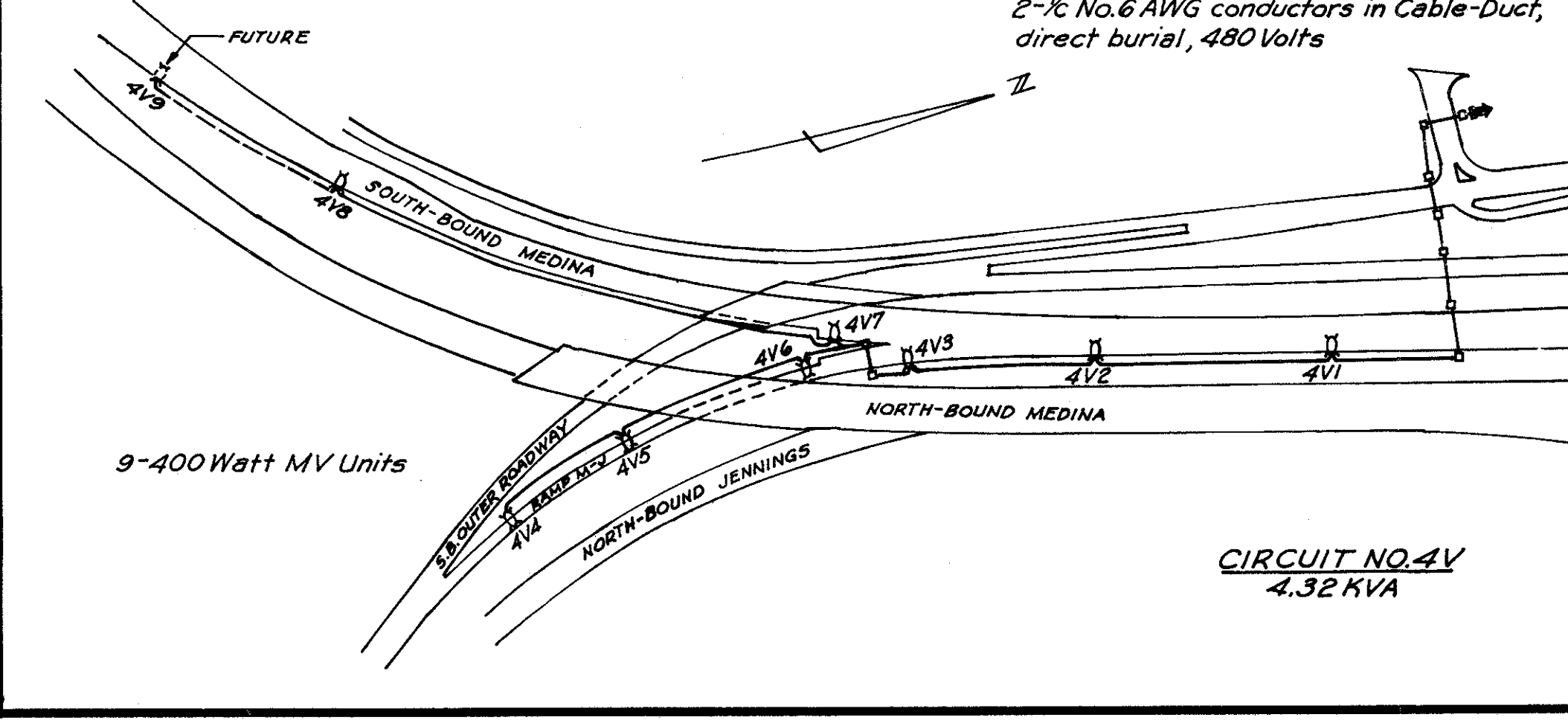
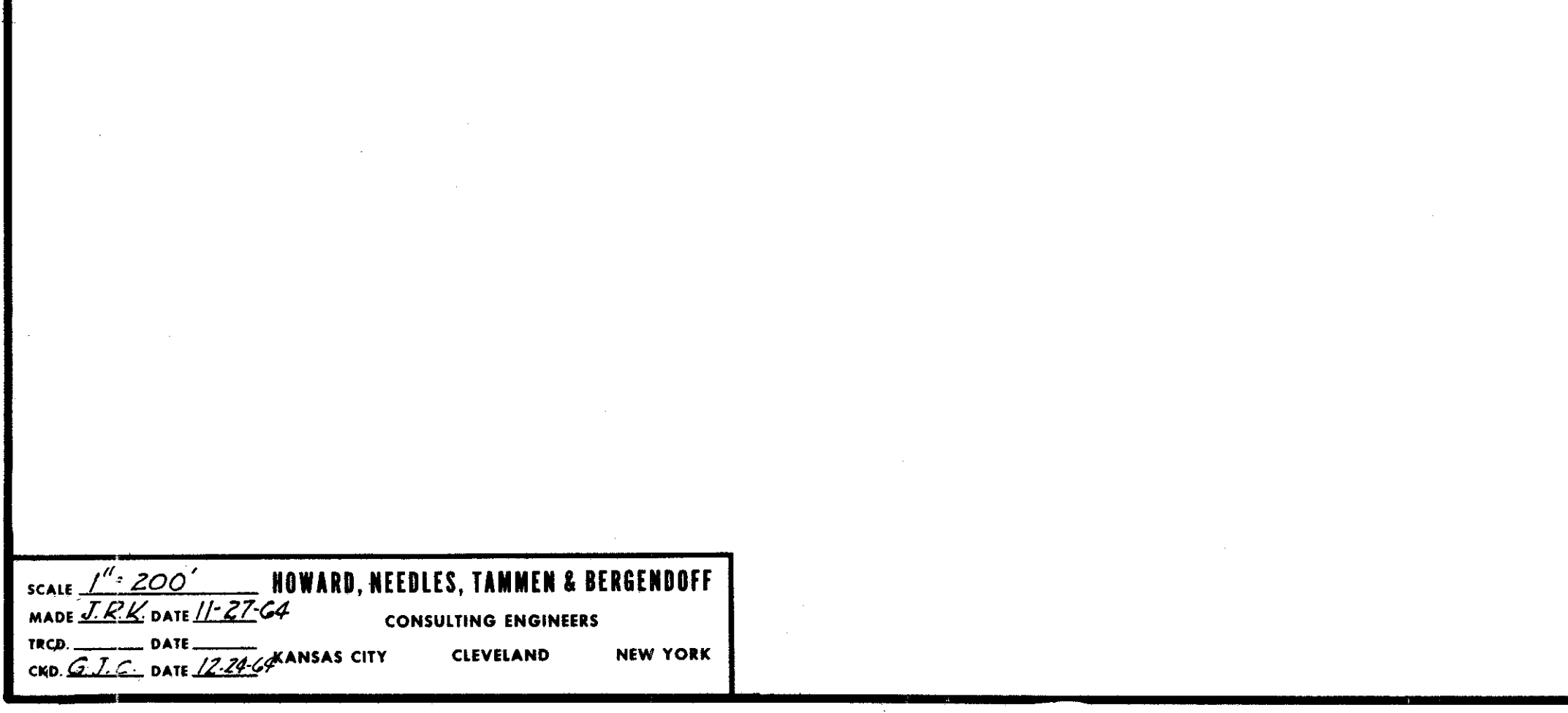
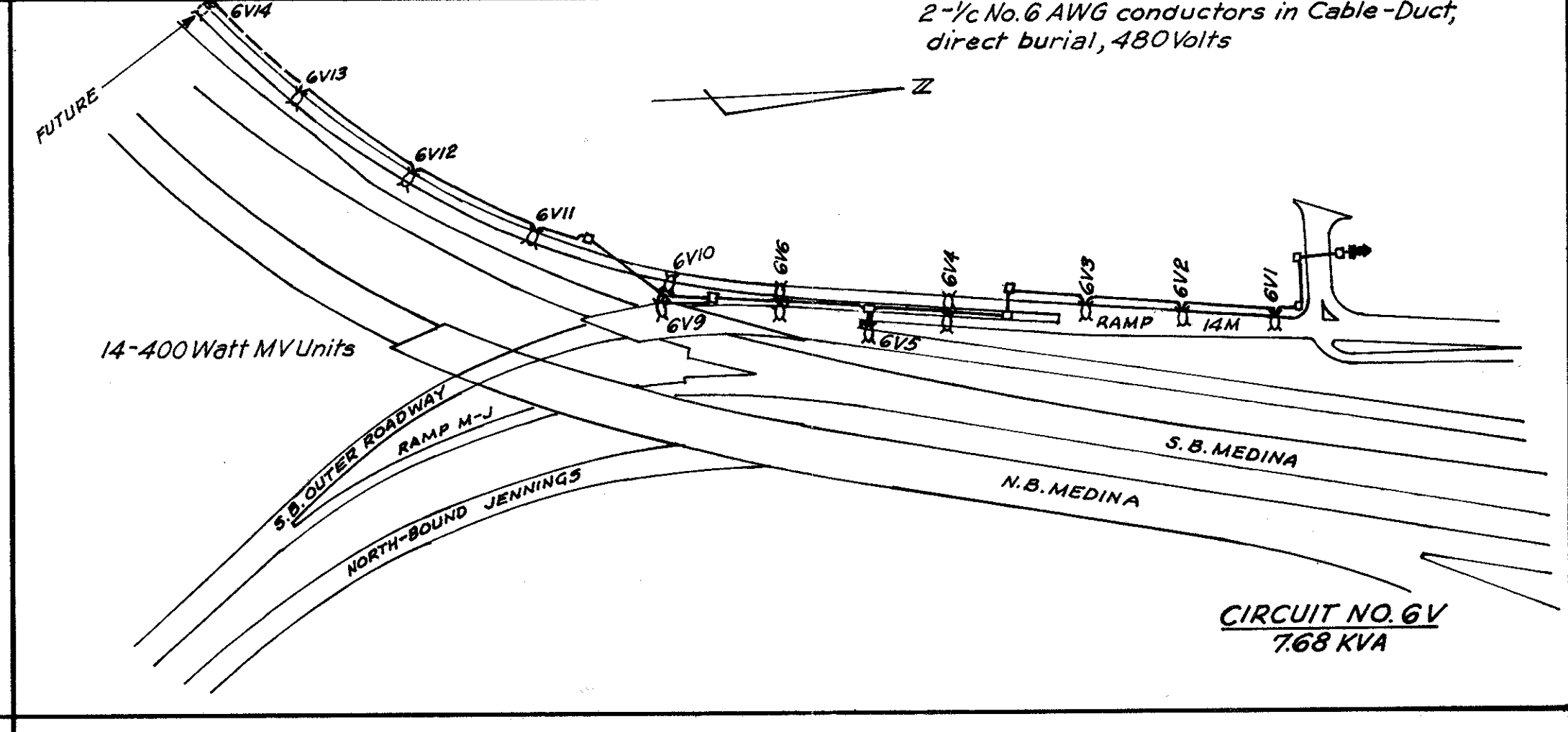
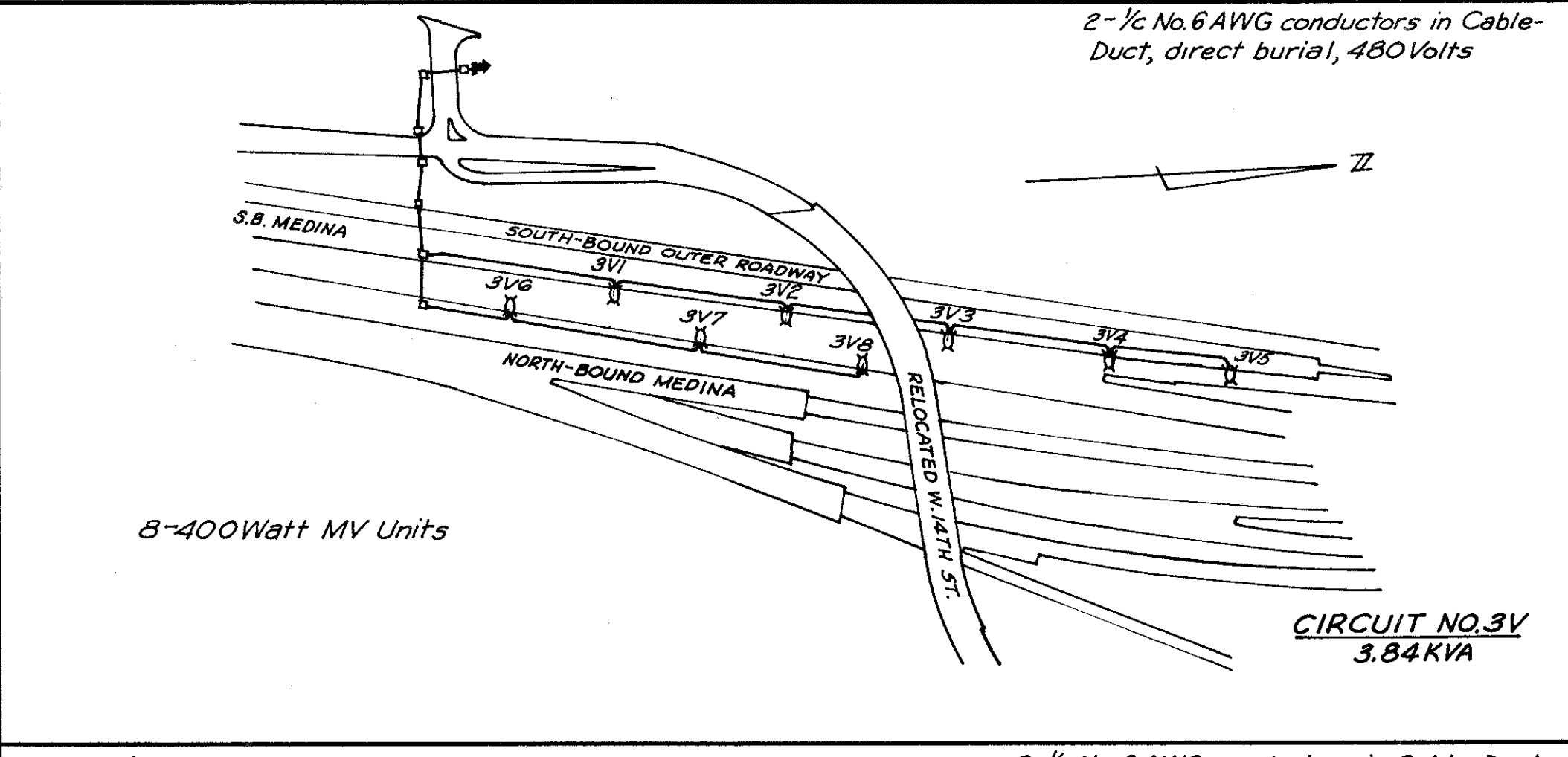
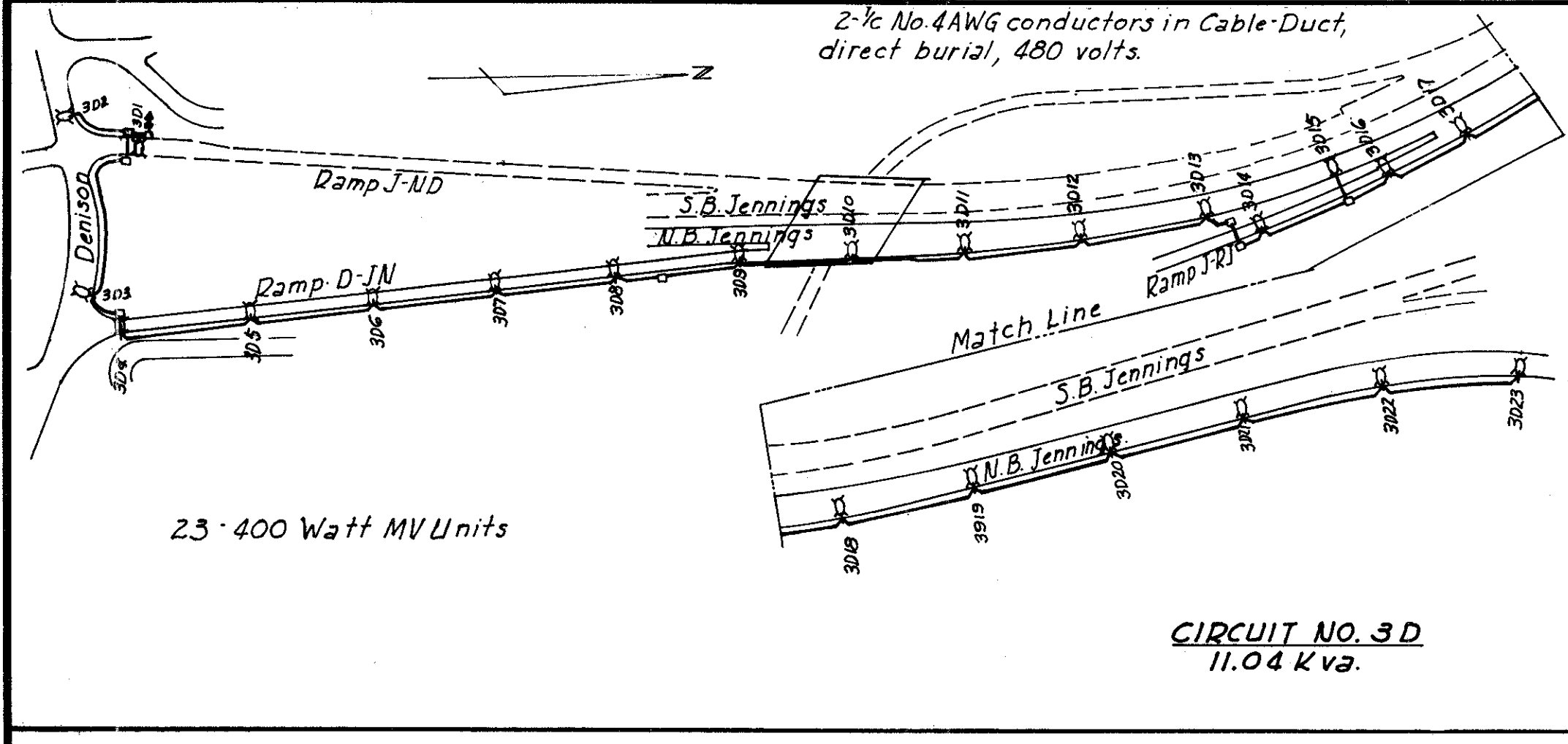
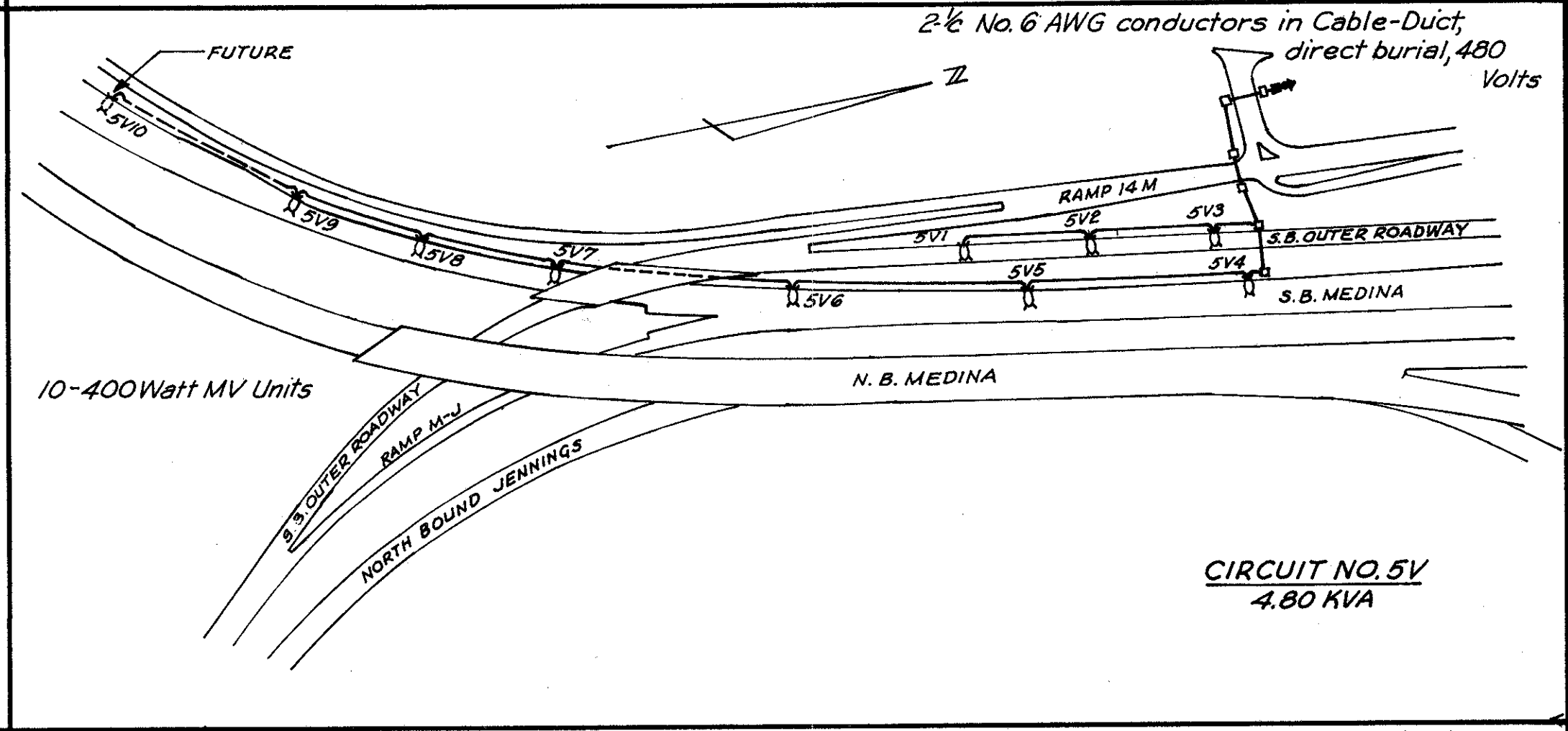
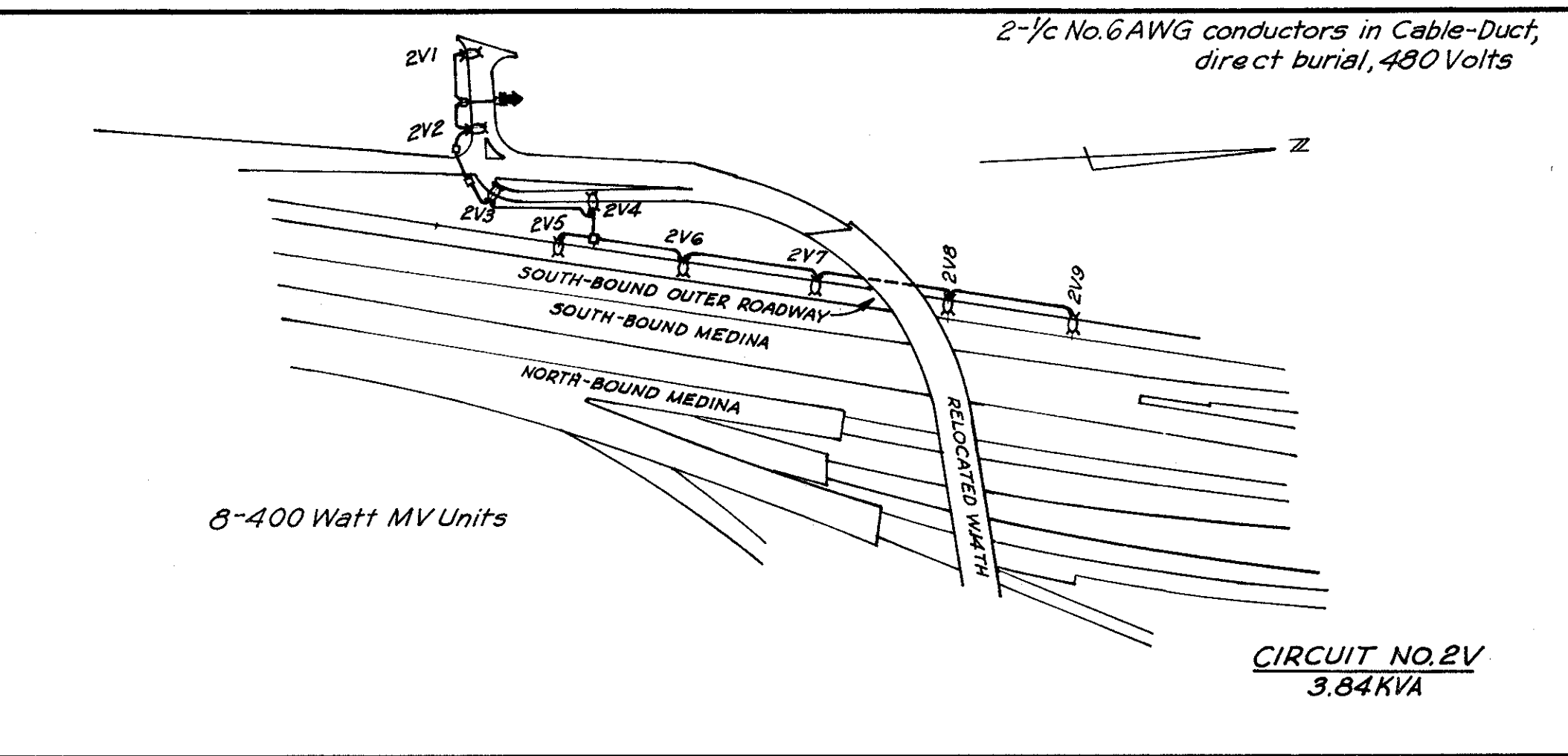
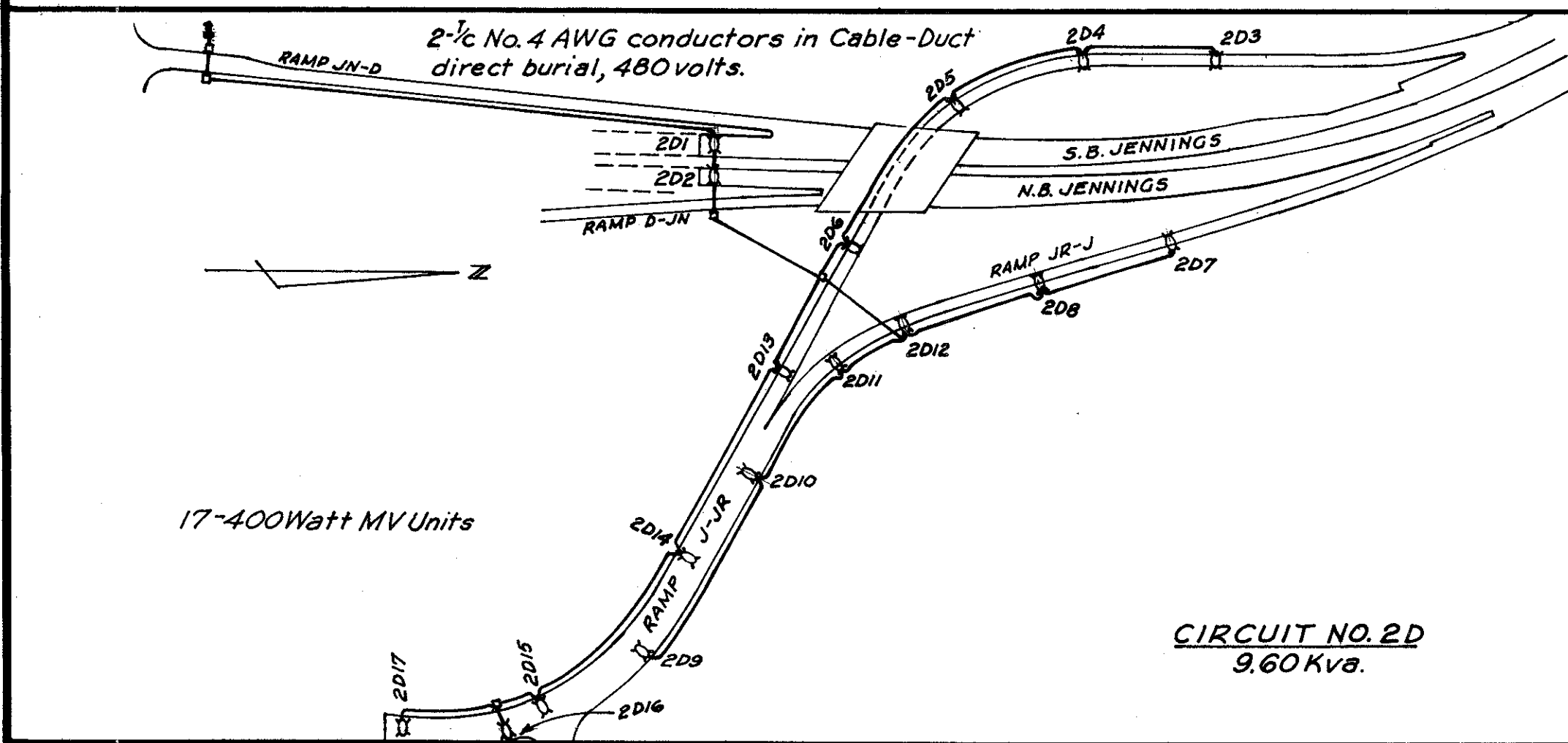
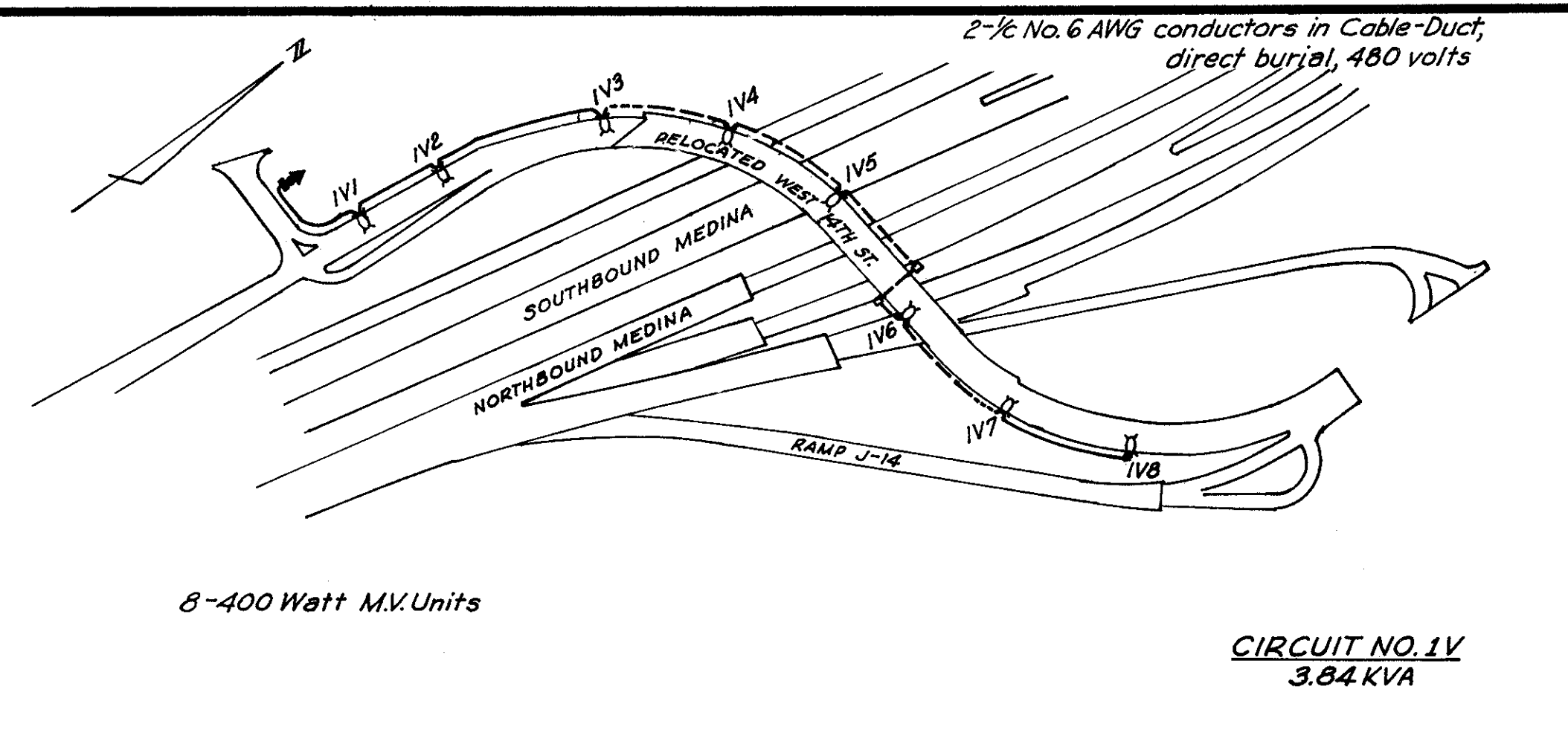
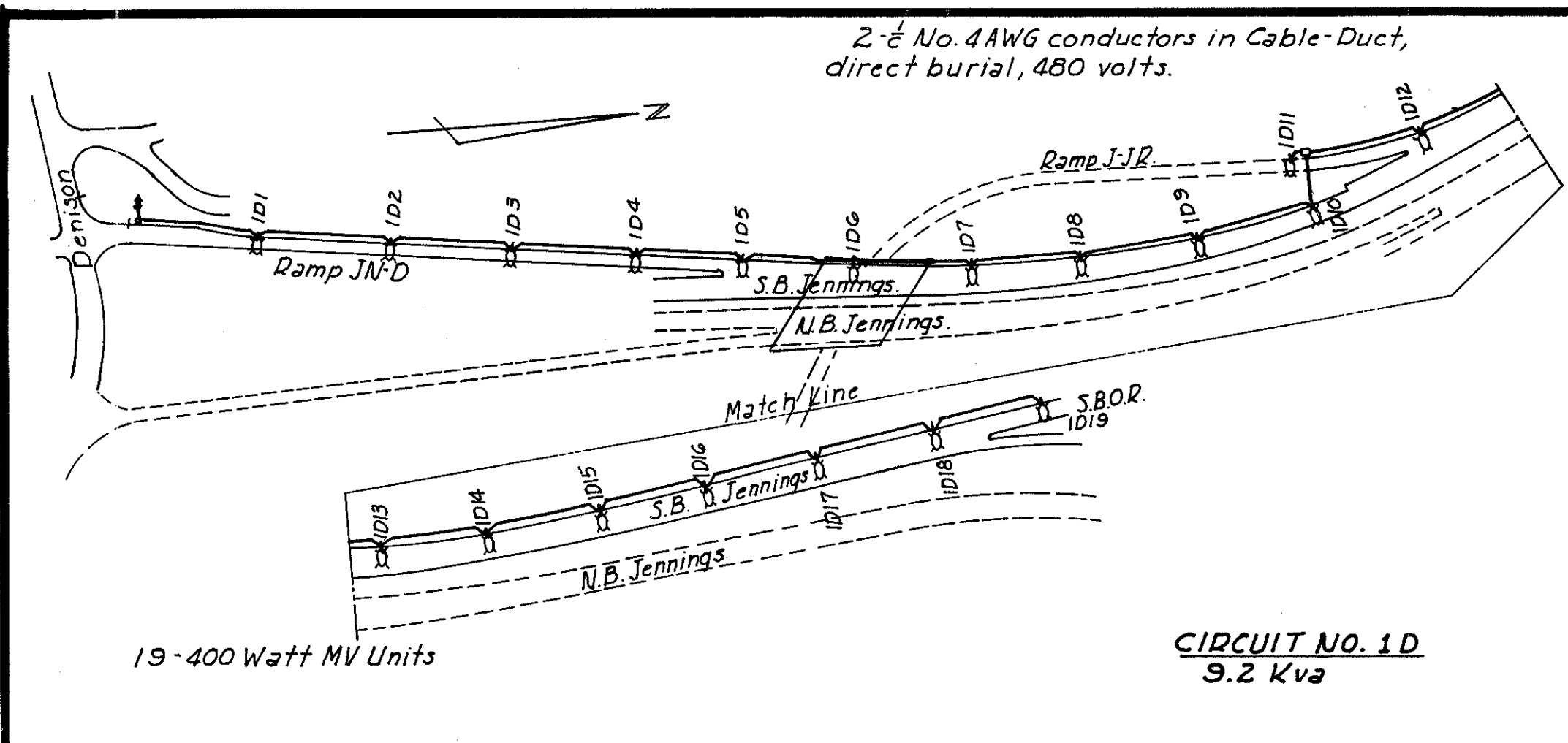
SCALE 1"=50'  
MADE P.R.V. DATE 11-20-69  
TRCD. D.L.R. DATE  
CKD. G.T.C. DATE 12-22-69  
**HOWARD, NEEDLES, TAMMEN & BERGENOFF**  
CONSULTING ENGINEERS  
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CUY-71-17.83  
CUY-176-12.76

CIRCUIT CROSS-REFERENCE NUMBERS	
PLAN CIRCUIT NO.	M.E.L.P. CIRCUIT NO.
1 D	A20
2 D	A21
3 D	A22
1 V	A23
2 V	A24
3 V	A25
4 V	A26
5 V	A27
6 V	A28

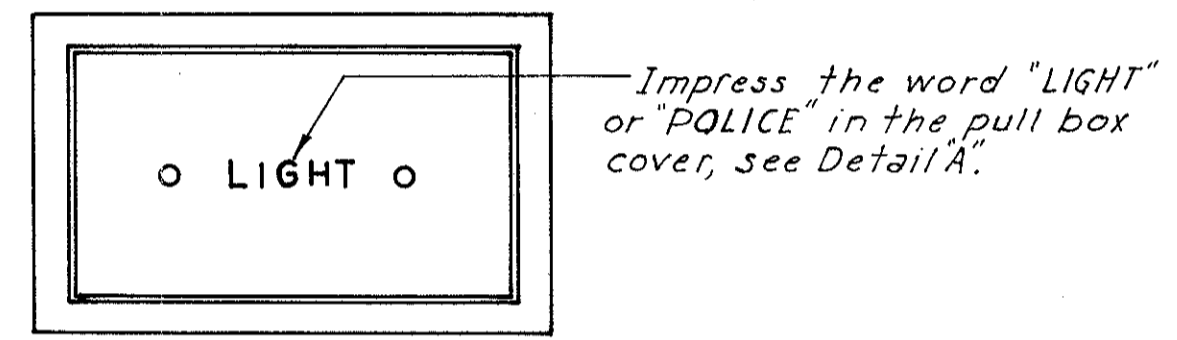
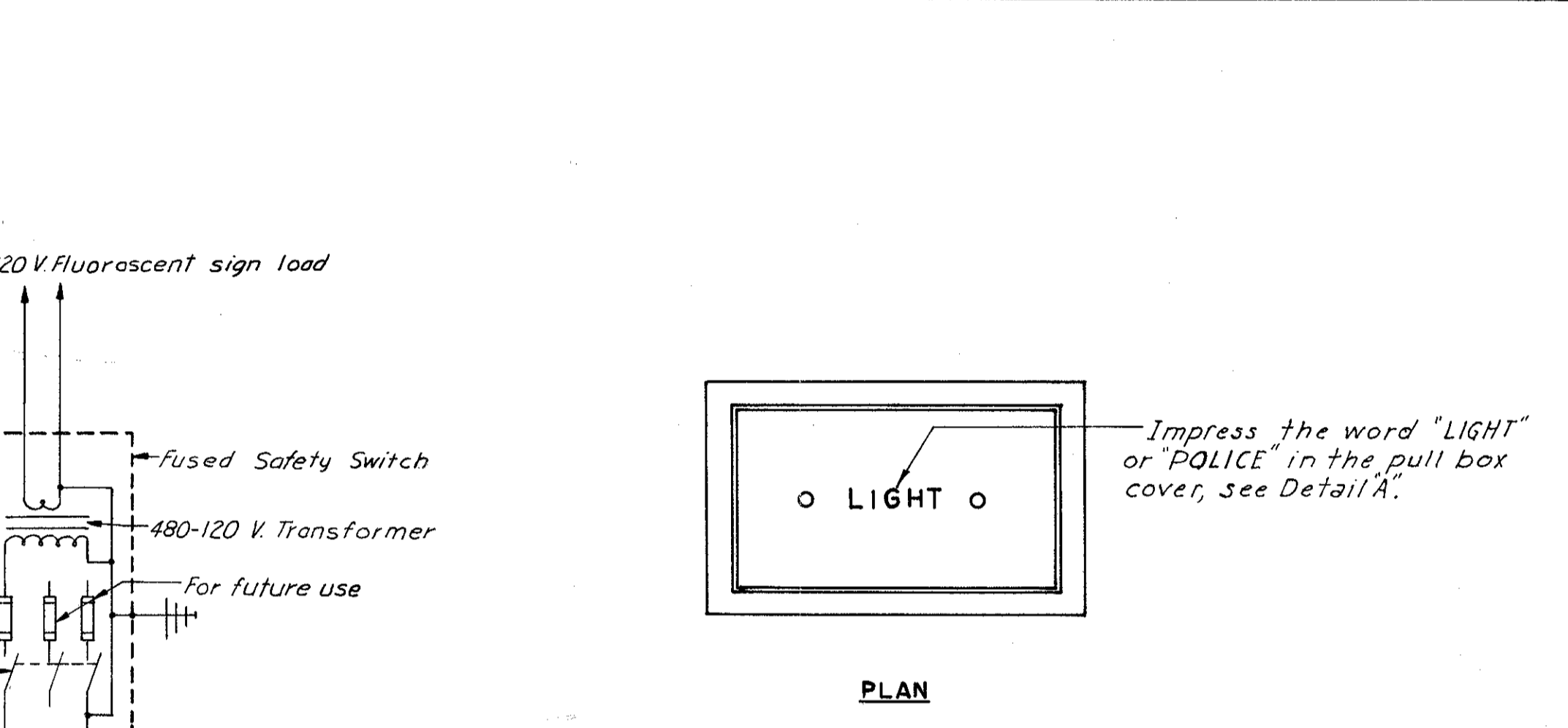
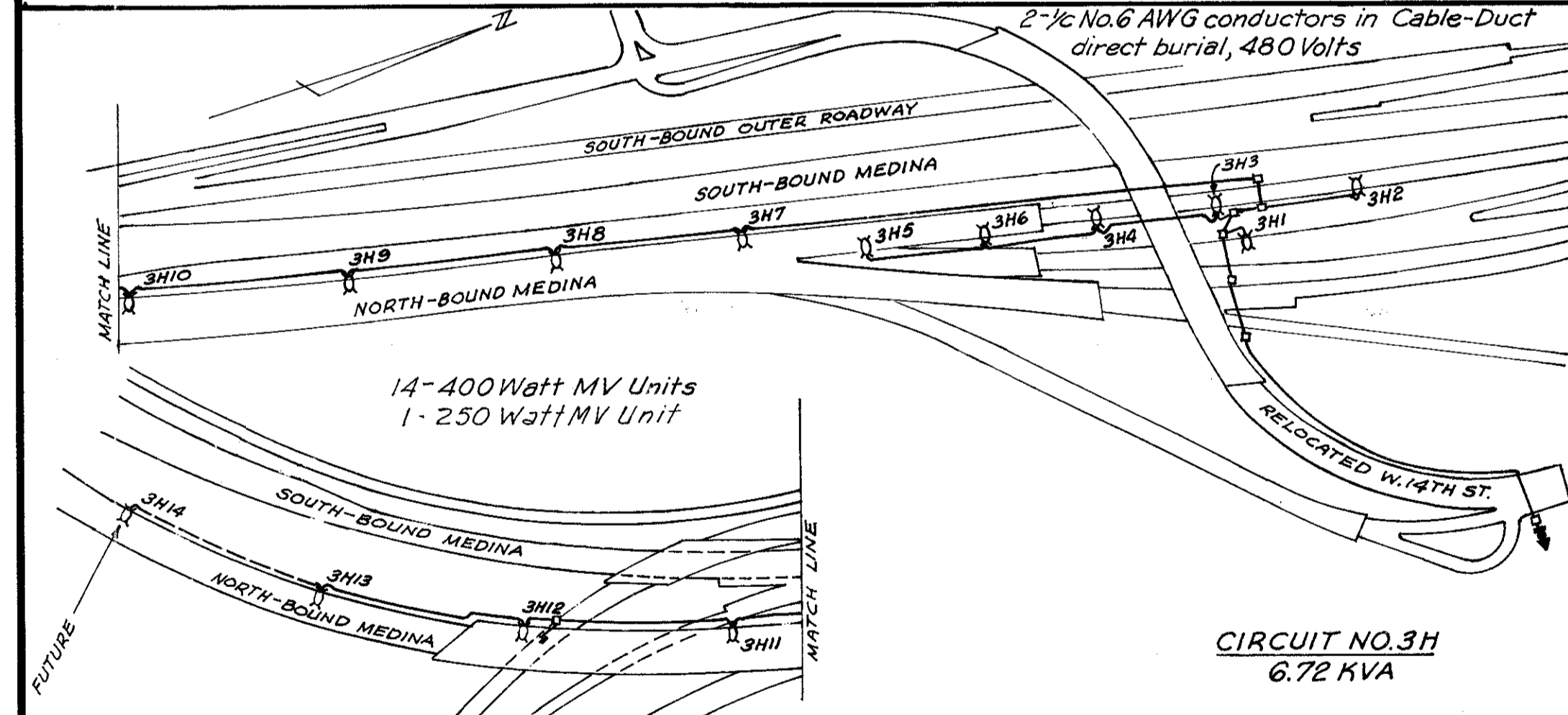
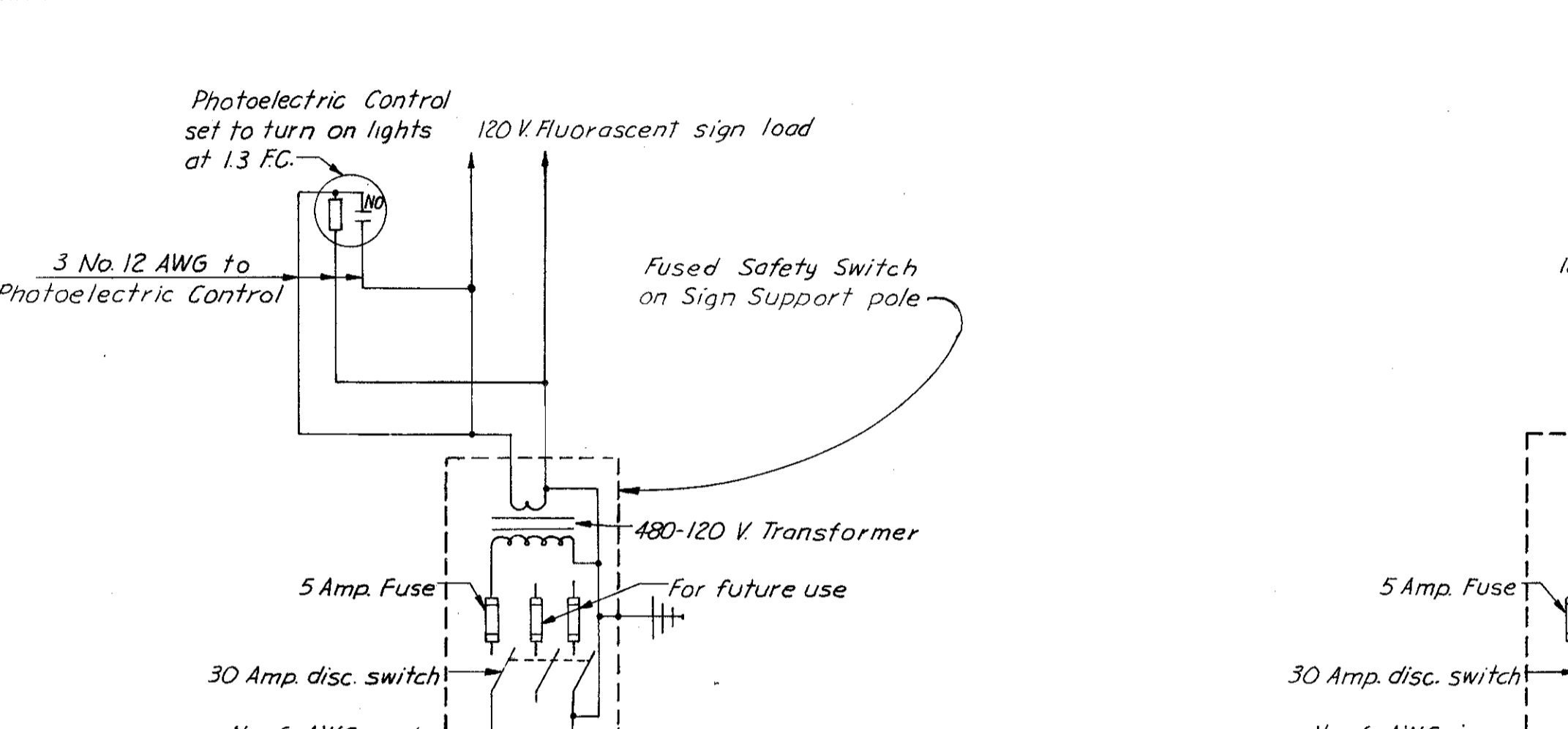
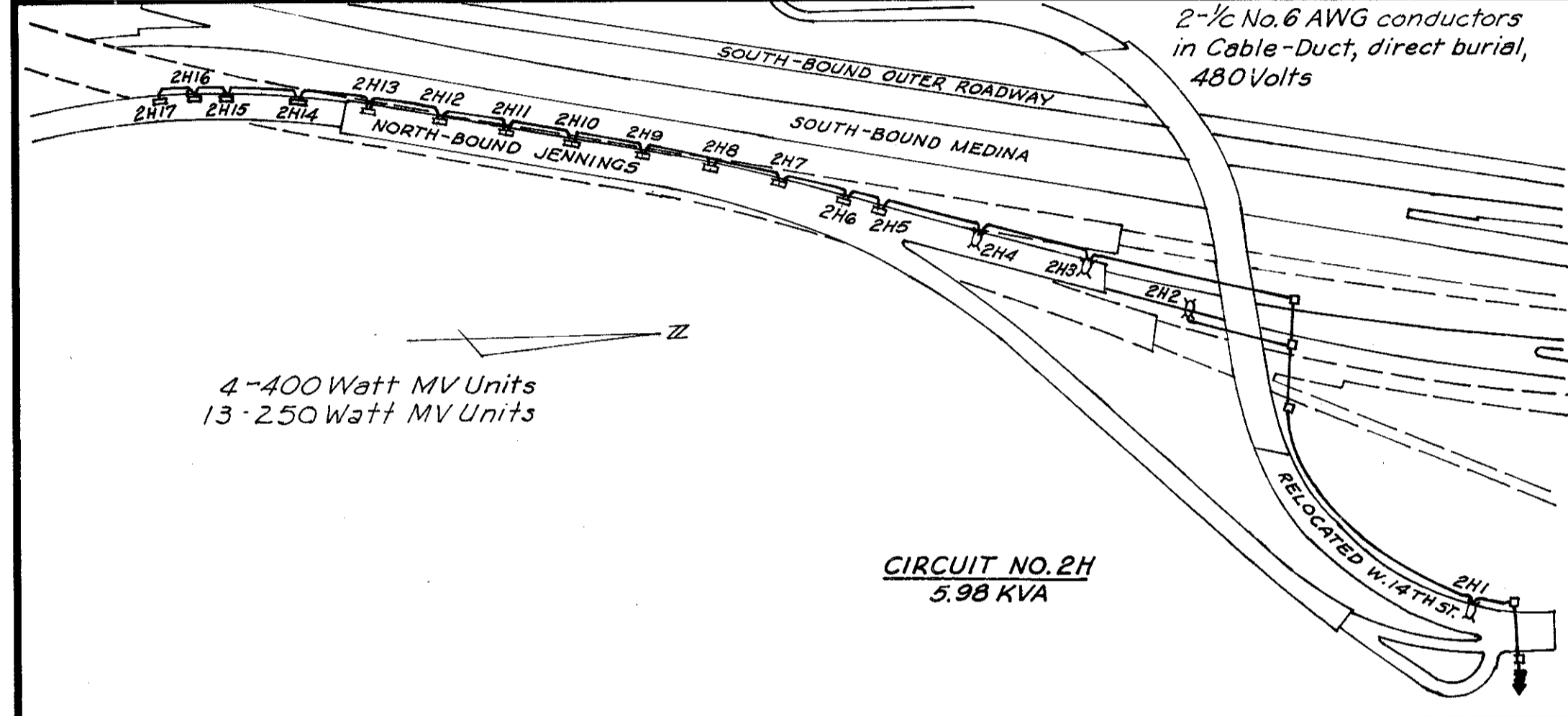
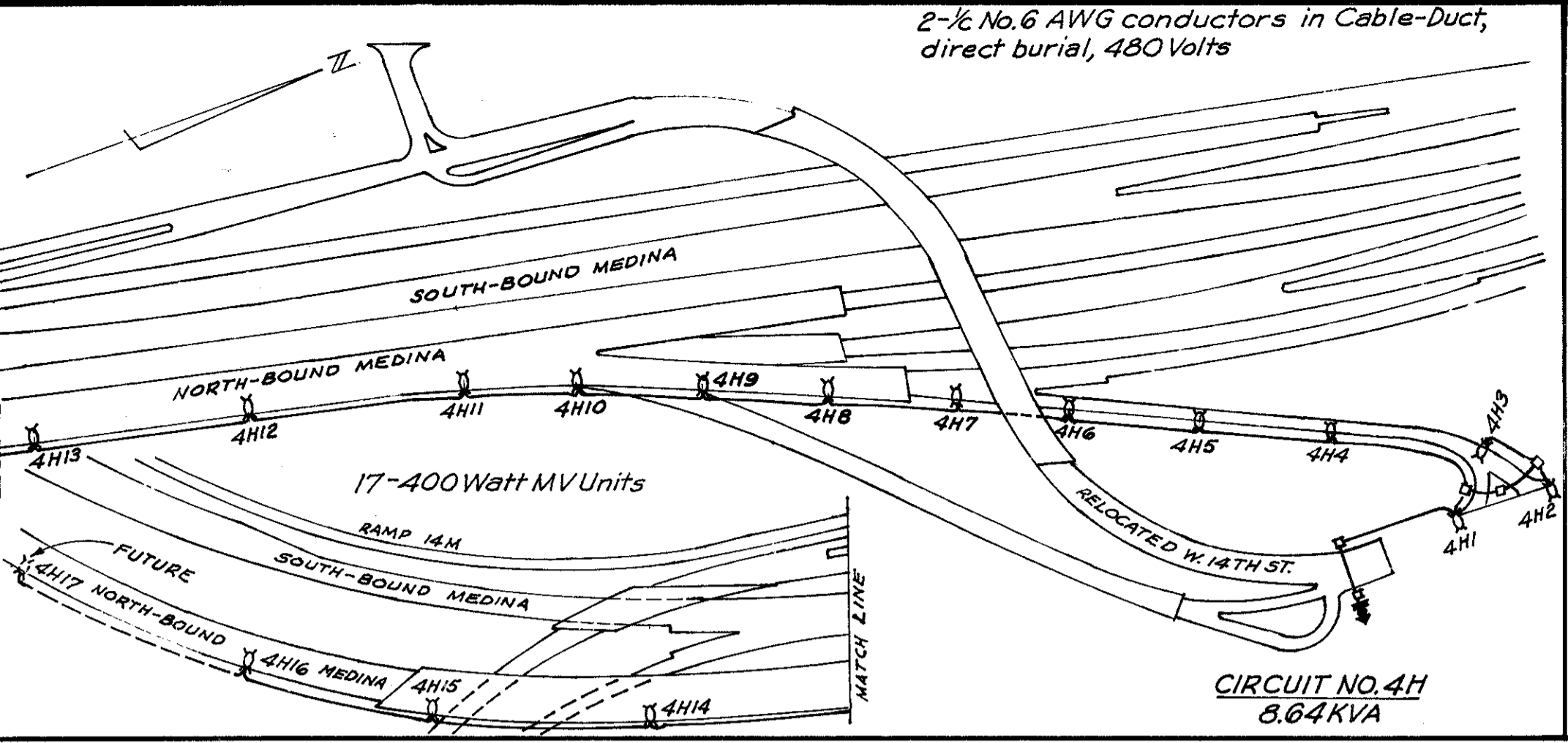
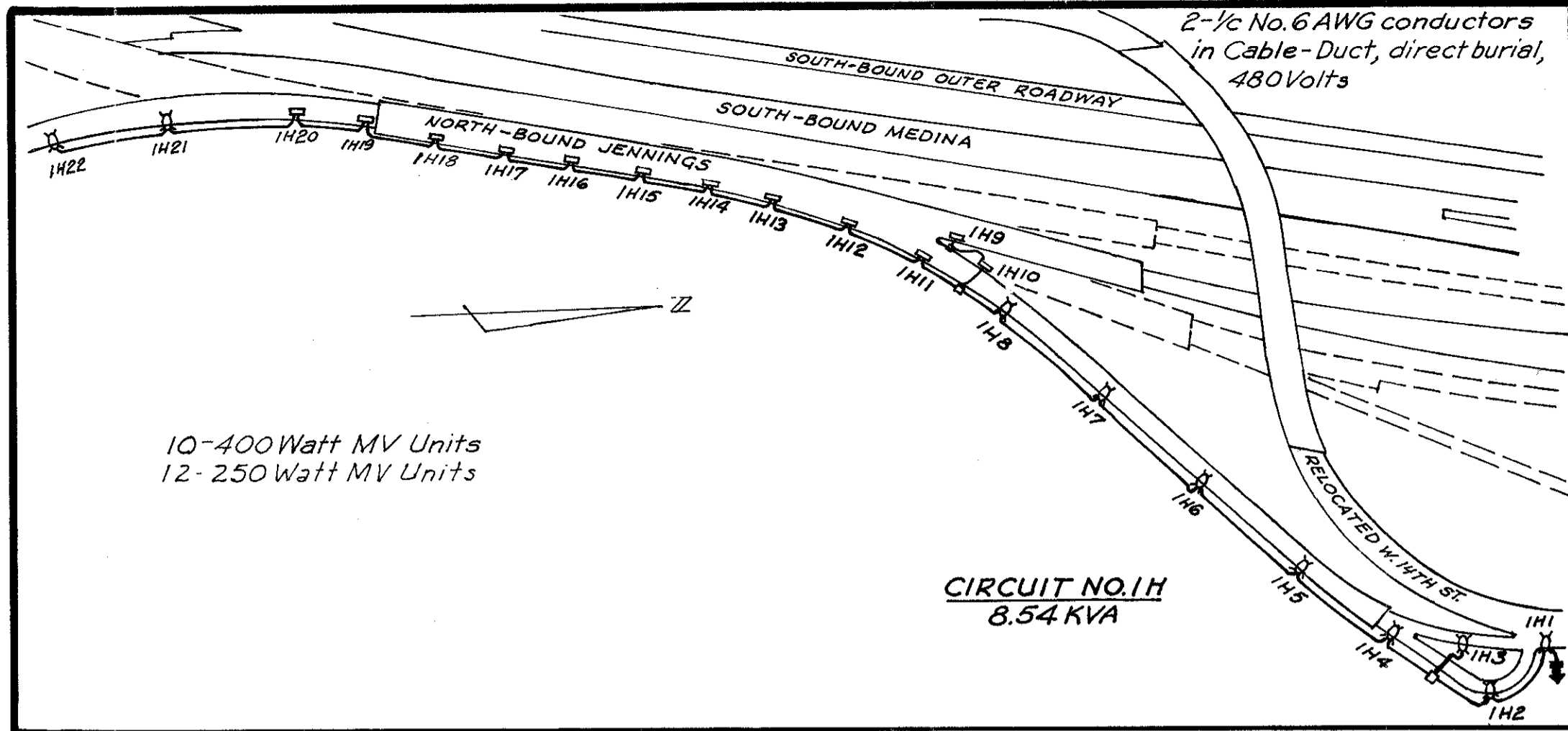
\*M.E.L.P. Number on Pole Identification Decal.



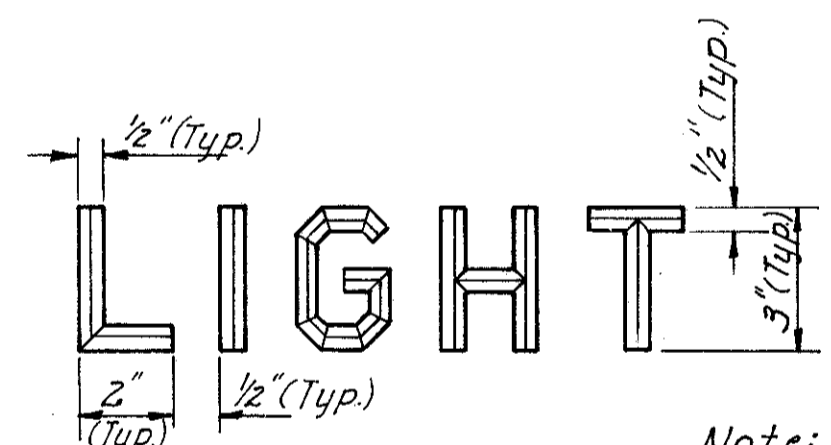
CUYAHOGA COUNTY  
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**MEDINA-JENNINGS INTERCHANGE**  
CUY 71-17.83 CUY 176-12.76

CIRCUIT CROSS-REFERENCE NUMBERS	
PLAN CIRCUIT NO.	M.E.L.P. CIRCUIT NO.*
1 H	A 29
2 H	A 30
3 H	A 31
4 H	A 32

\* M.E.L.P. Number on Pole Identification Decal.

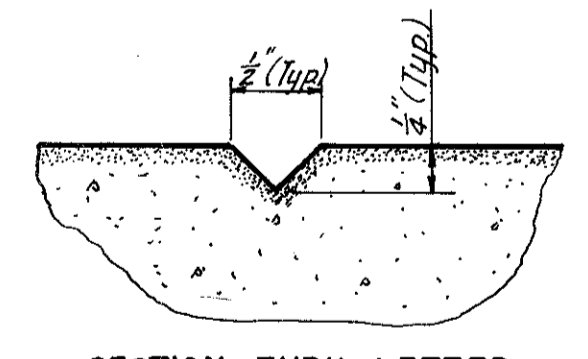


PLAN

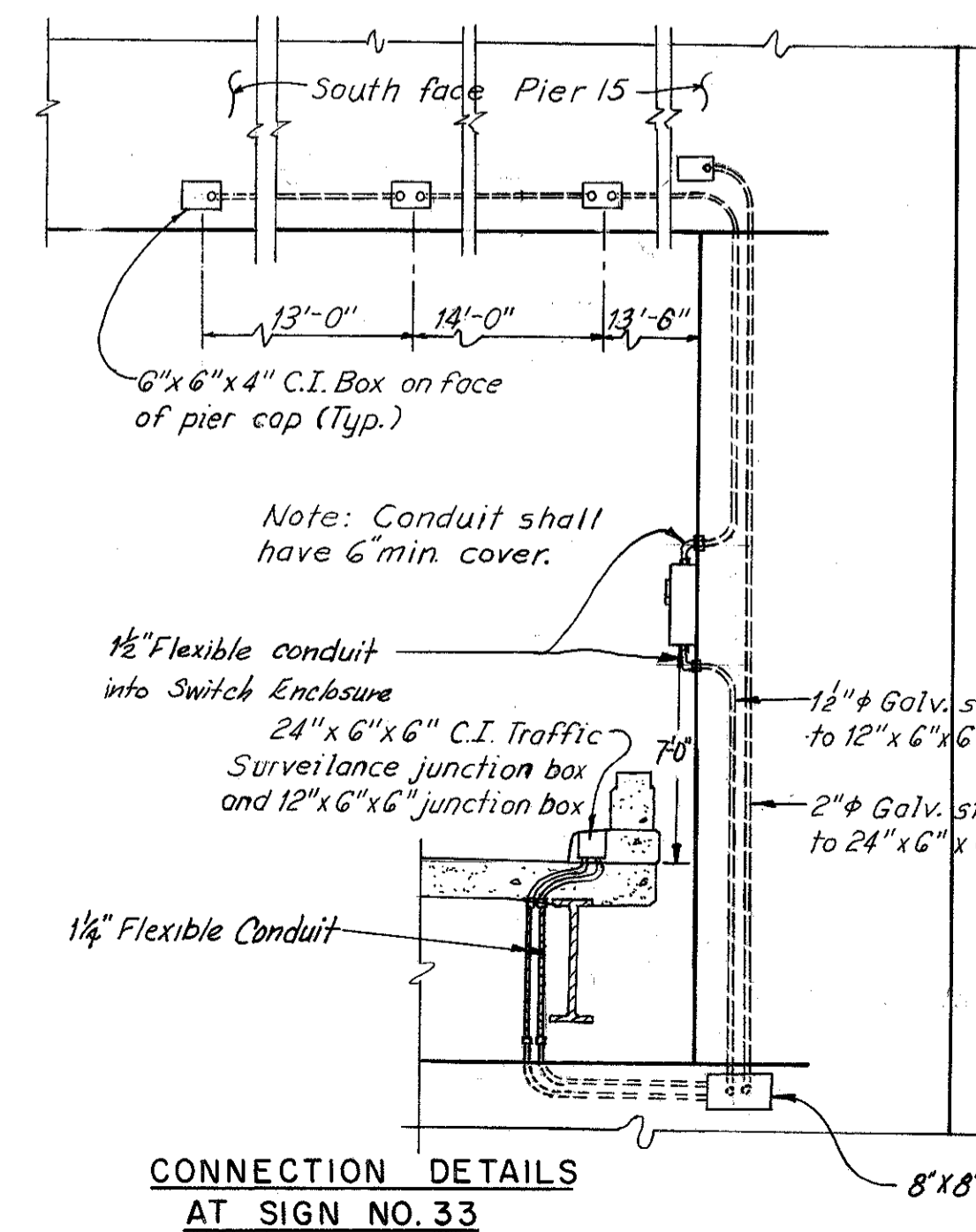


Note: Dimensions may vary slightly according to the Manufacturers' tolerances.

DETAIL "A"

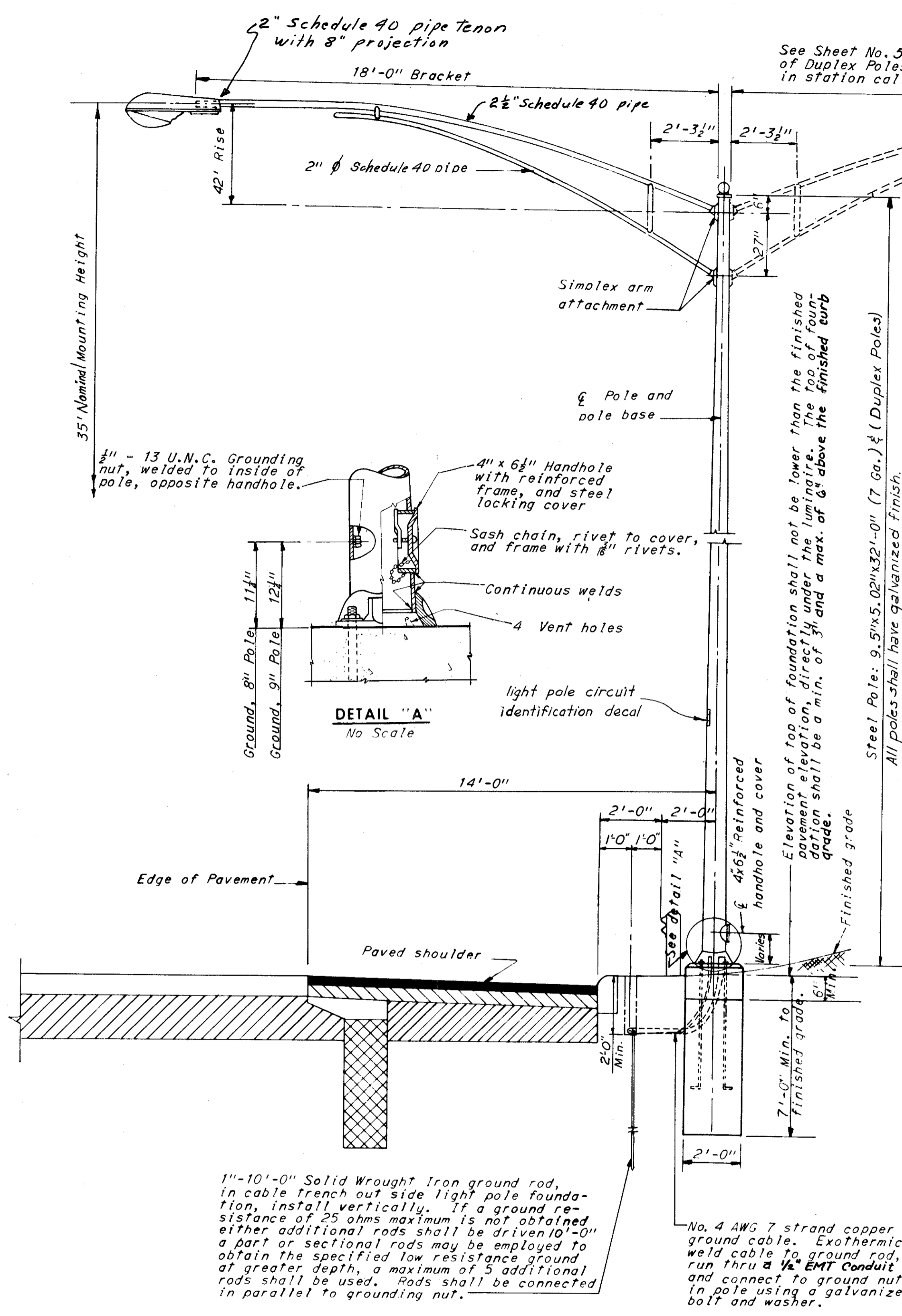


PULL BOX COVER DETAILS  
No Scale



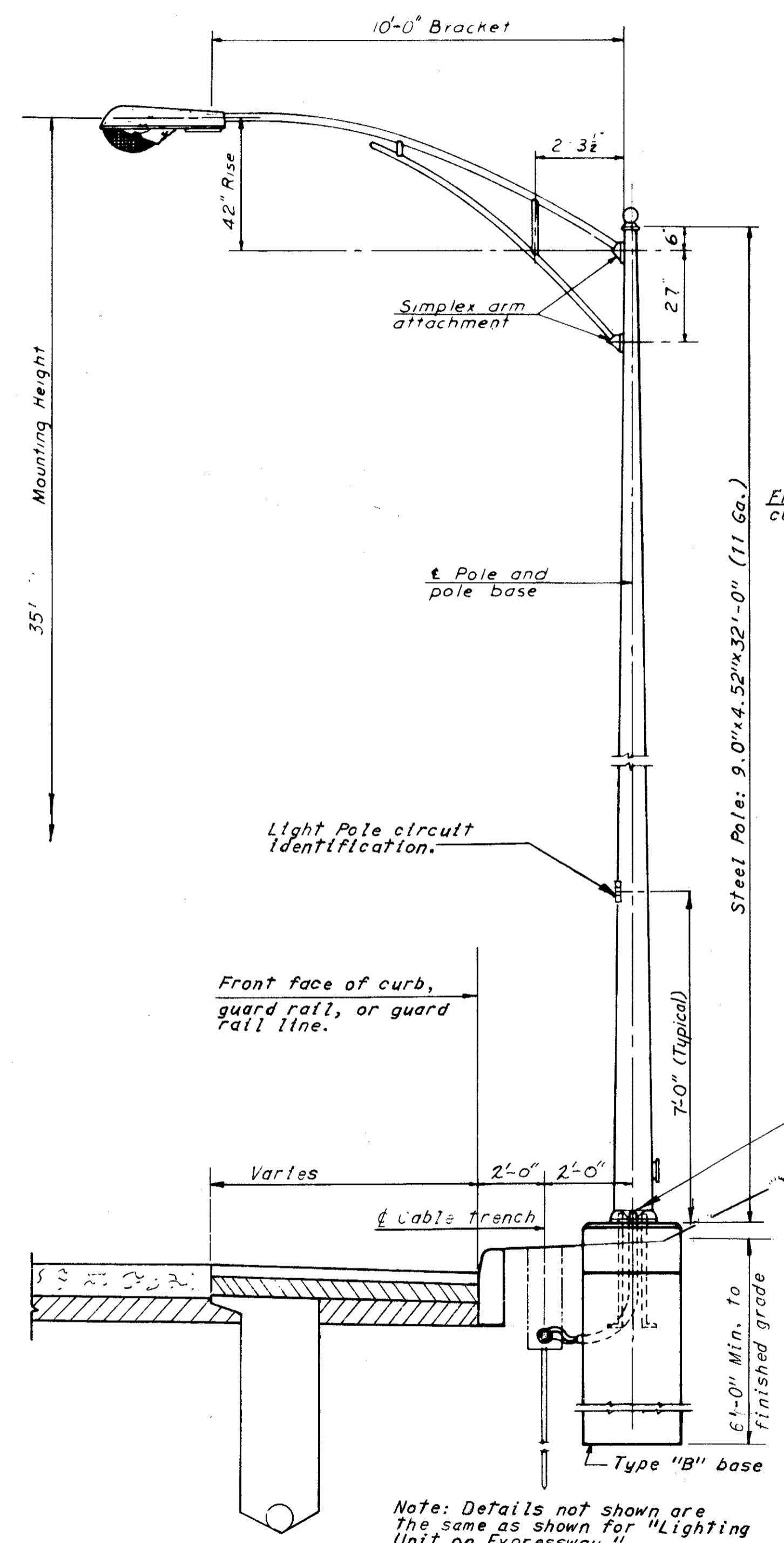


**CUYAHOGA COUNTY  
CITY OF CLEVELAND  
MEDINA-JENNINGS INTERCHANGE**  
CUY-71-17.83  
CUY-176-12.76



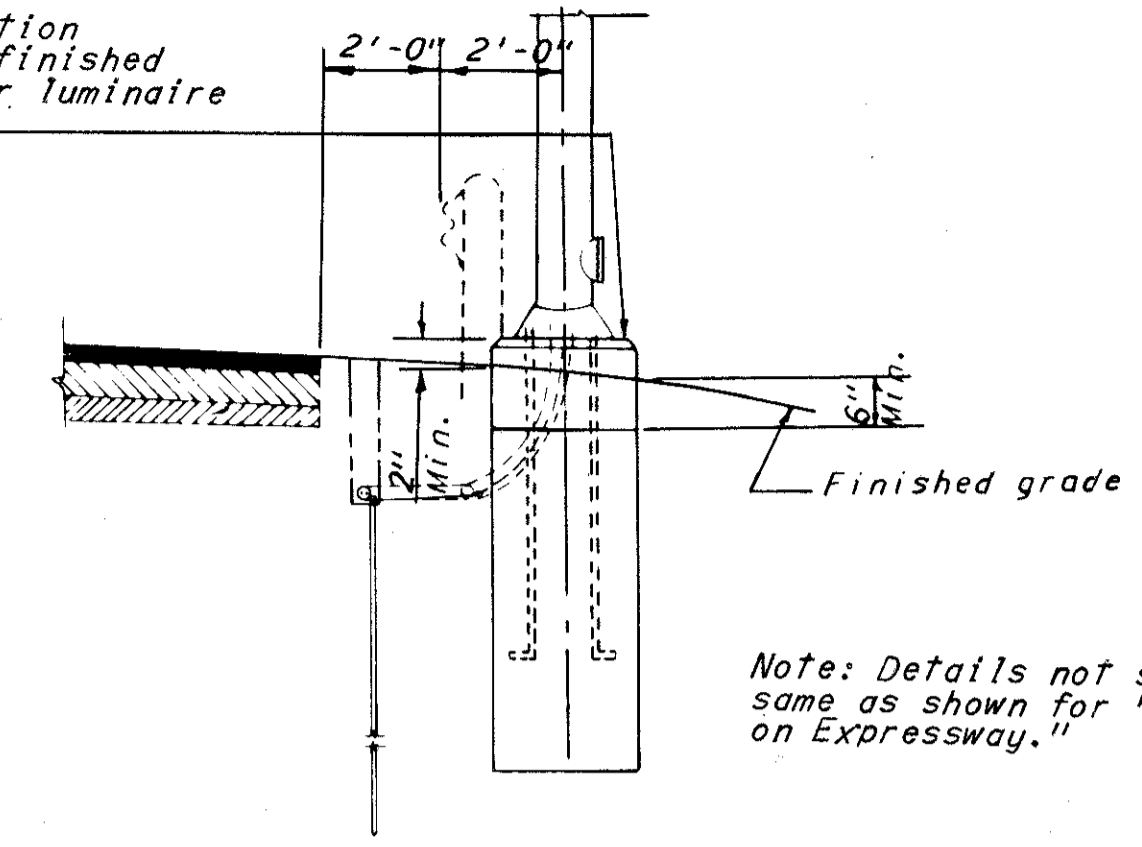
**LIGHTING UNIT ON EXPRESSWAYS**

Scale: 3/8" = 1'-0"



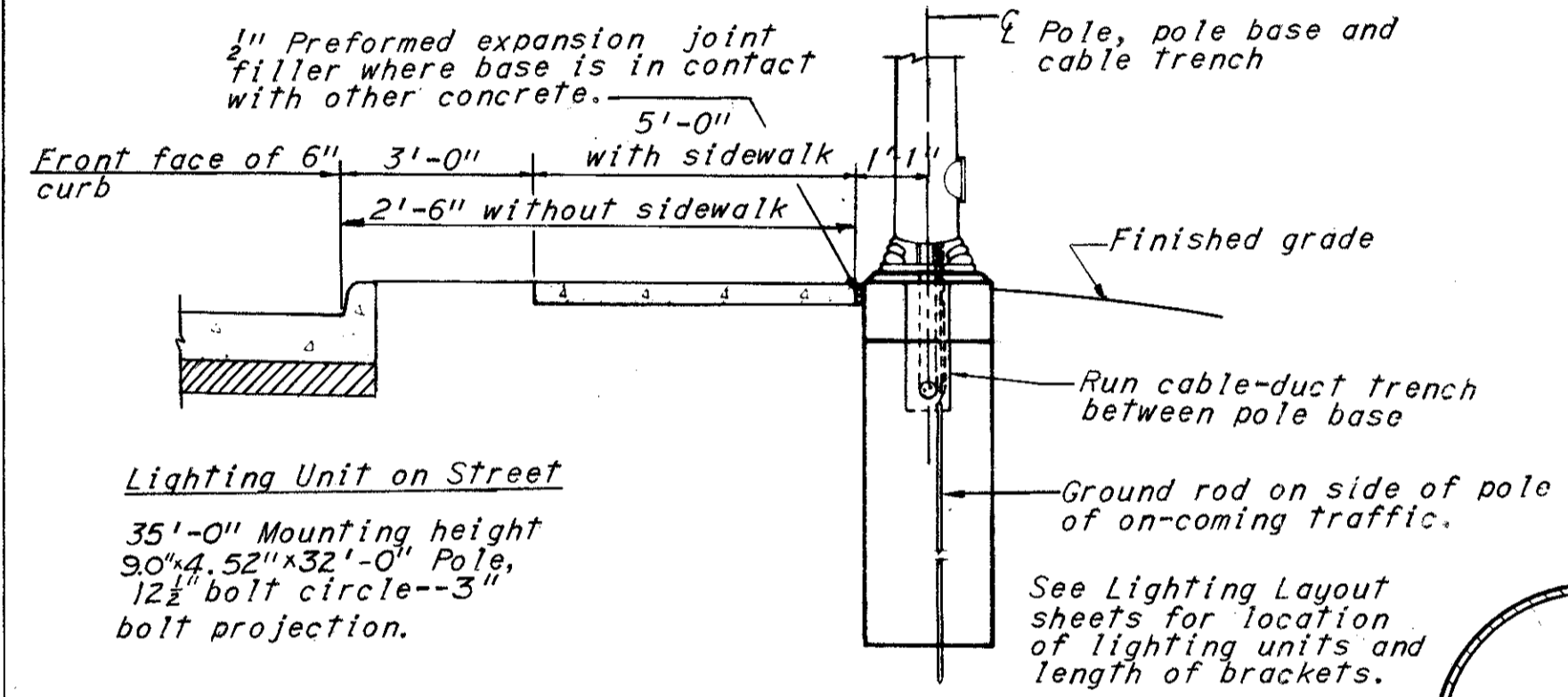
**LIGHTING UNIT ON LANES**

Scale: 3/8" = 1'-0"



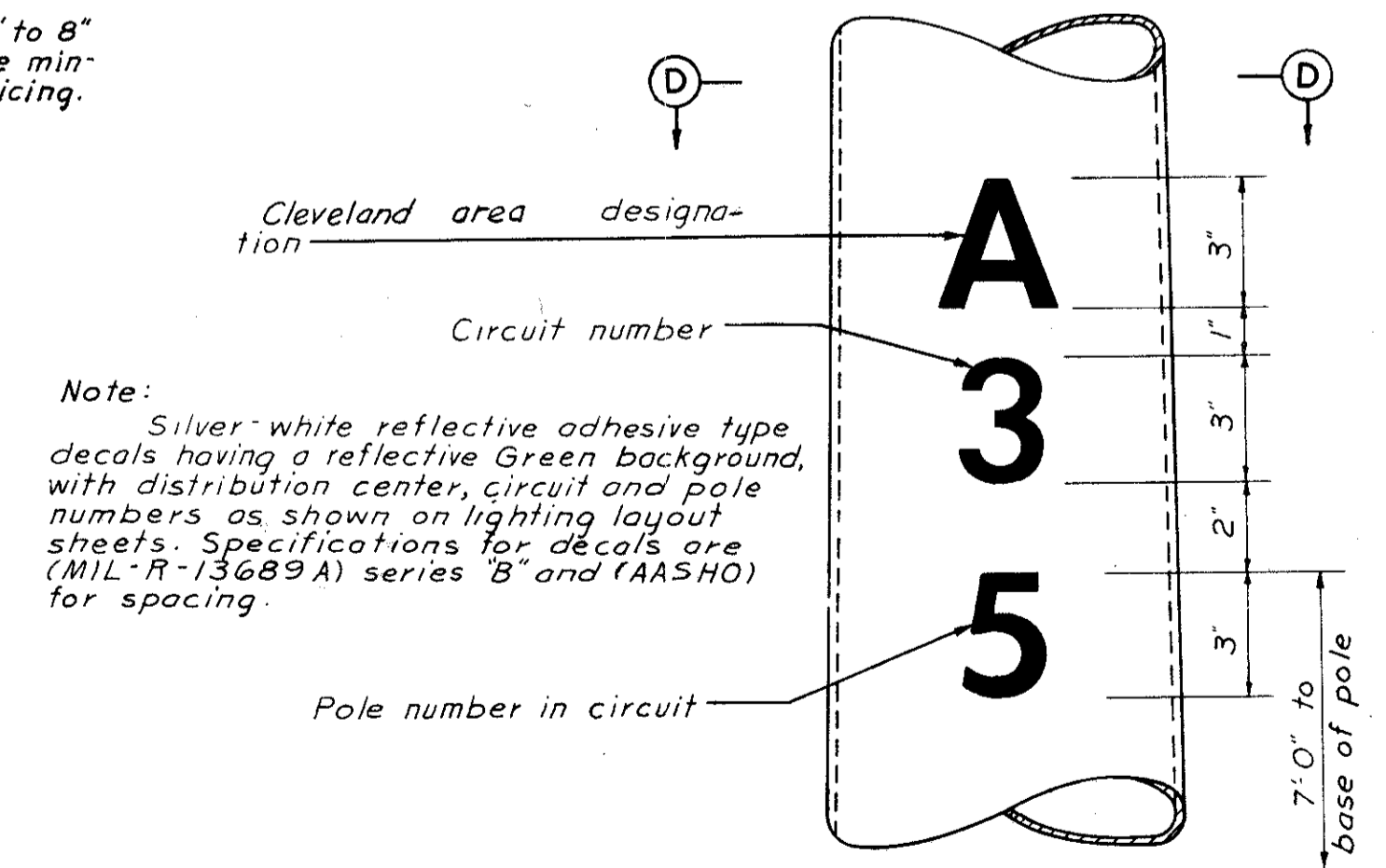
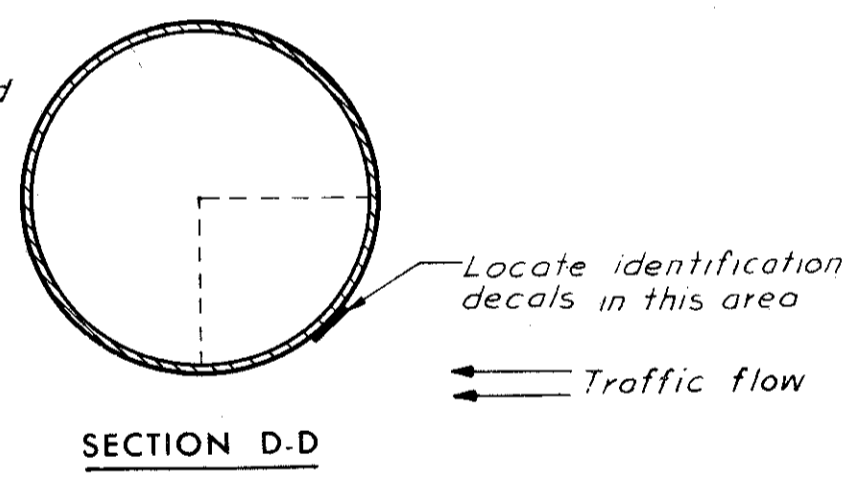
**LIGHTING UNIT ON EXPRESSWAYS WITHOUT CURB**

Scale: 3/8" = 1'-0"



**LIGHTING UNIT WITH SIDEWALK**

Scale: 3/8" = 1'-0"

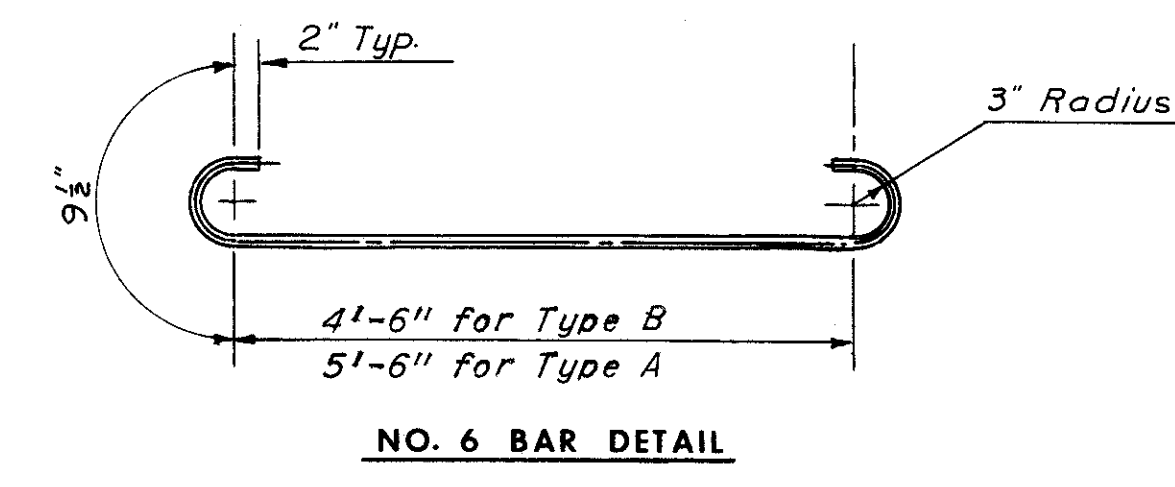


**ELEVATION**

**LIGHT POLE CIRCUIT IDENTIFICATION**  
No Scale

**GROUND MOUNT LIGHTING UNITS**  
3-3-65

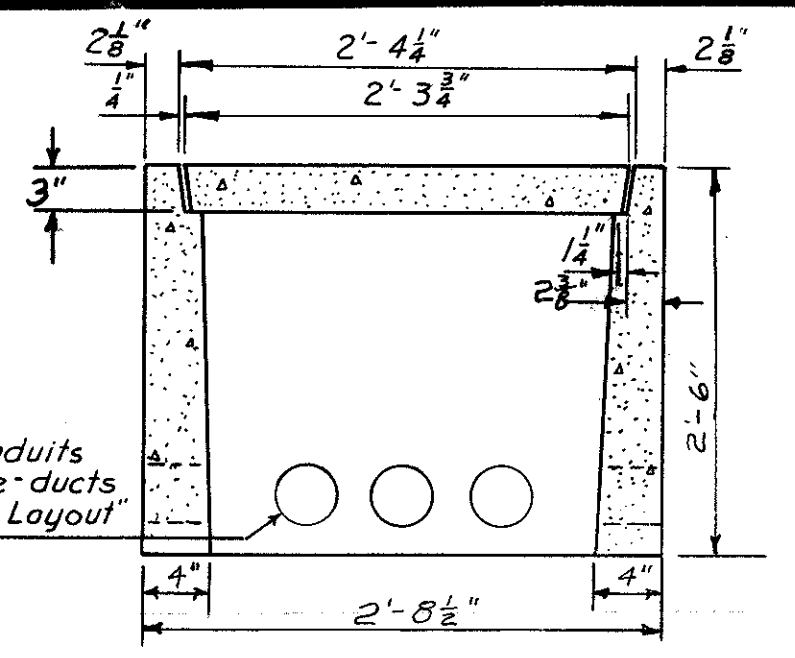
CUYAHOGA COUNTY  
CITY OF CLEVELAND  
**MEDINA-JENNINGS INTERCHANGE**  
CUY. 71-17.03  
CUY-176-12.76



**NO. 6 BAR DETAIL**

3/8"  $\phi$  Openings for conduits or direct burial cable-ducts as shown on "Lighting Layout" sheets, (Typical).

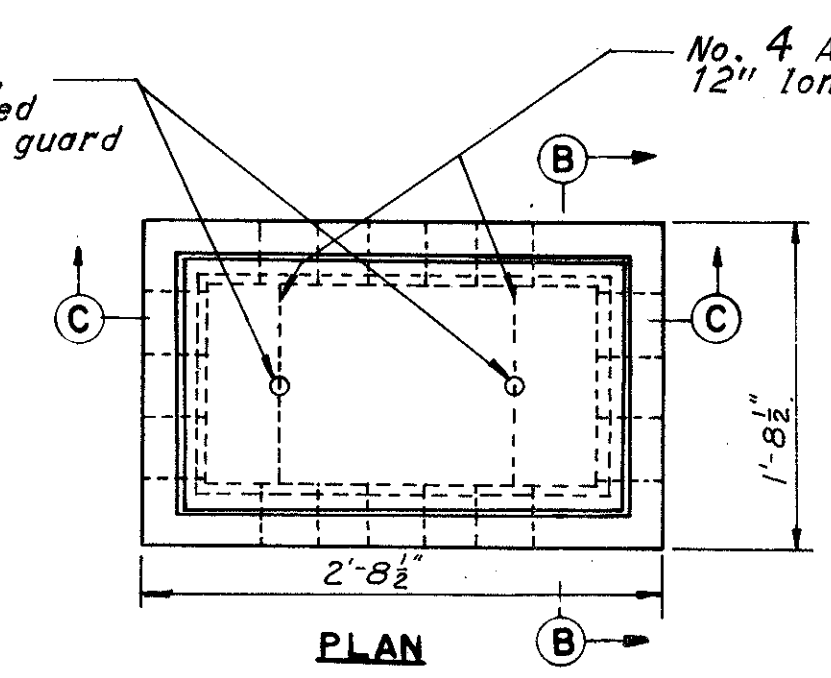
Class "C" concrete, using No. 4 size aggregate, mixed and placed in accordance with standard provisions



**SECTION C-C**

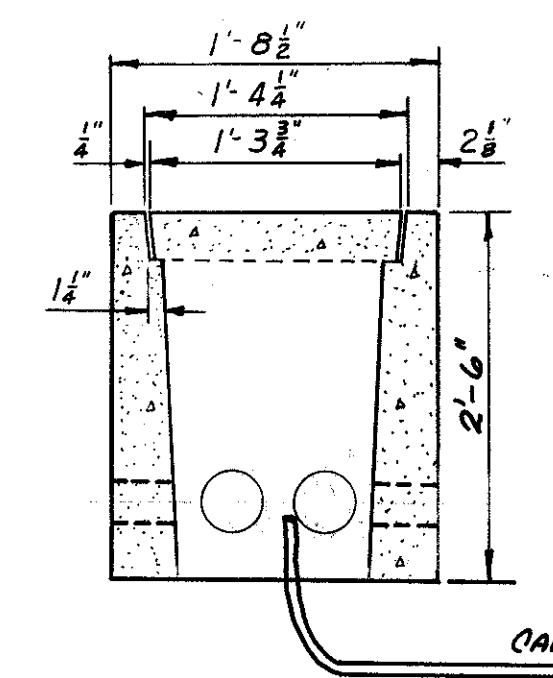
Note: Reinforcement in cover to have an area of 0.12 Sq. In. per Ft. of width. Spacing not to exceed 4" each way.

Holes, 1 1/2"  $\phi$  3/4" deep.  $\phi$  of box to be located 3'-0" behind face of guard rail.



**PLAN**

Note: See "Pull Box Cover Details," Sheet No. 584, for size and dimensions of impressed words, LIGHT or POLICE, in pull box cover.

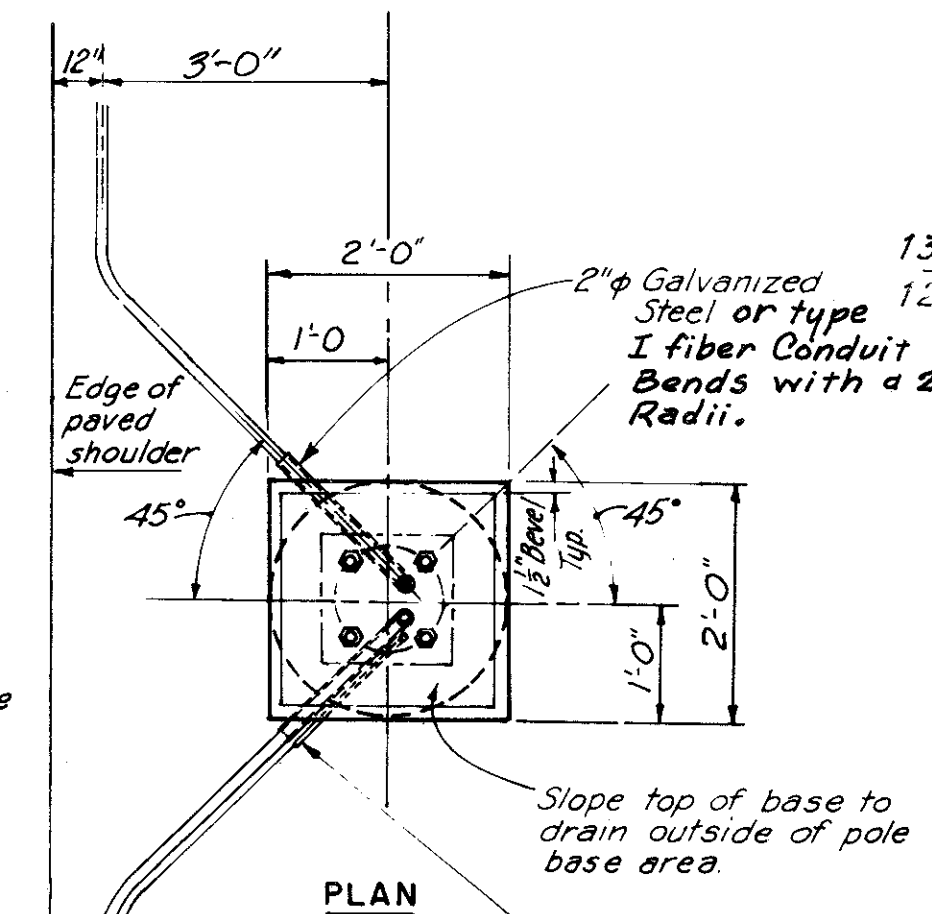


**SECTION B-B**

Note: Contractor to fill with grout any unused holes in sides of boxes. Conduits or ducts shall be pitched to drain, toward boxes, a minimum of one inch per one hundred feet.

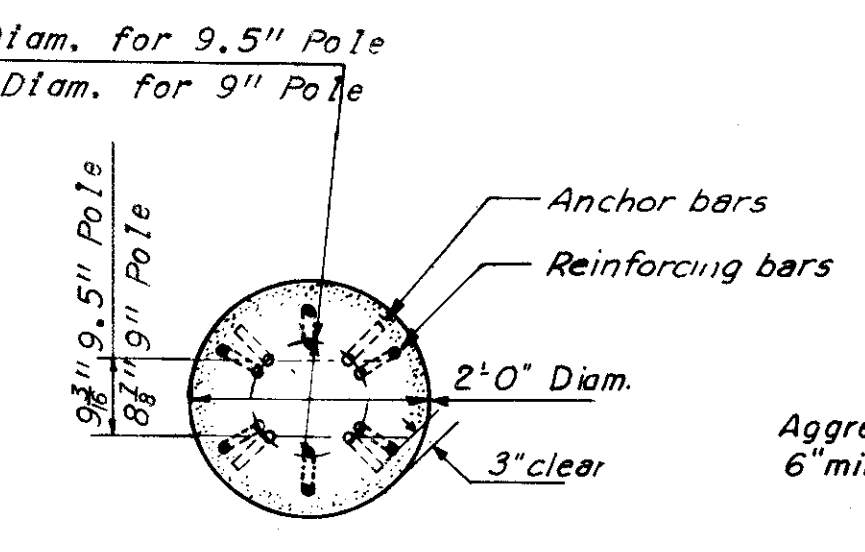
**TYPE "B" PULL BOX DETAILS**

No Scale



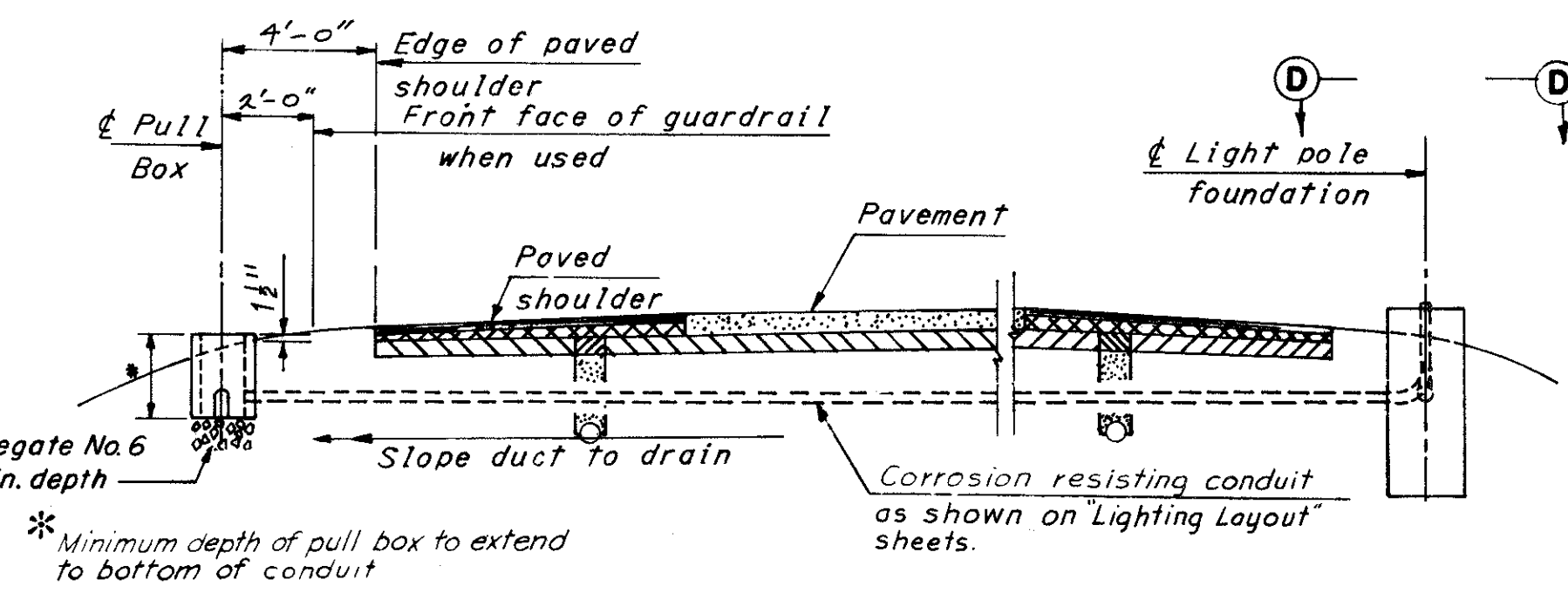
**PLAN**

Note: For placement of conduit in pole base see lighting layout sheets.



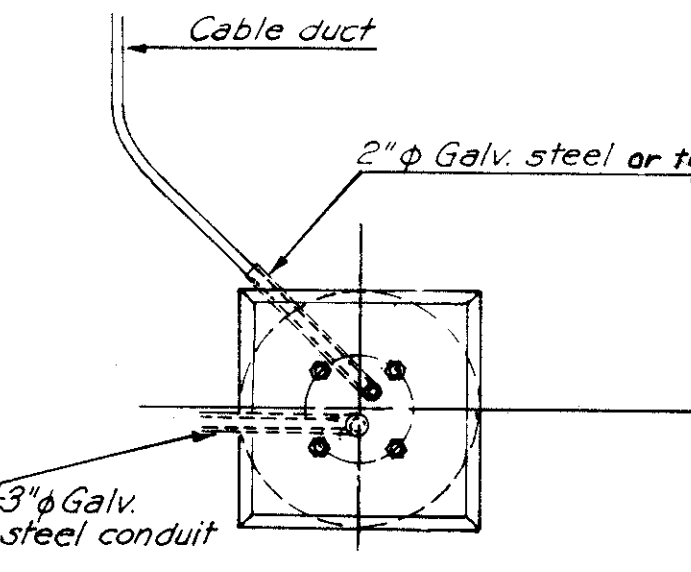
**SECTION A-A**

REINFORCING STEEL FOR LAMP STANDARD FOUNDATIONS SHALL CONFORM TO SECTION S-4 OF THE STANDARD PROVISIONS AND THE COST SHALL BE INCLUDED IN THE PAYMENT FOR STANDARD FOUNDATIONS.



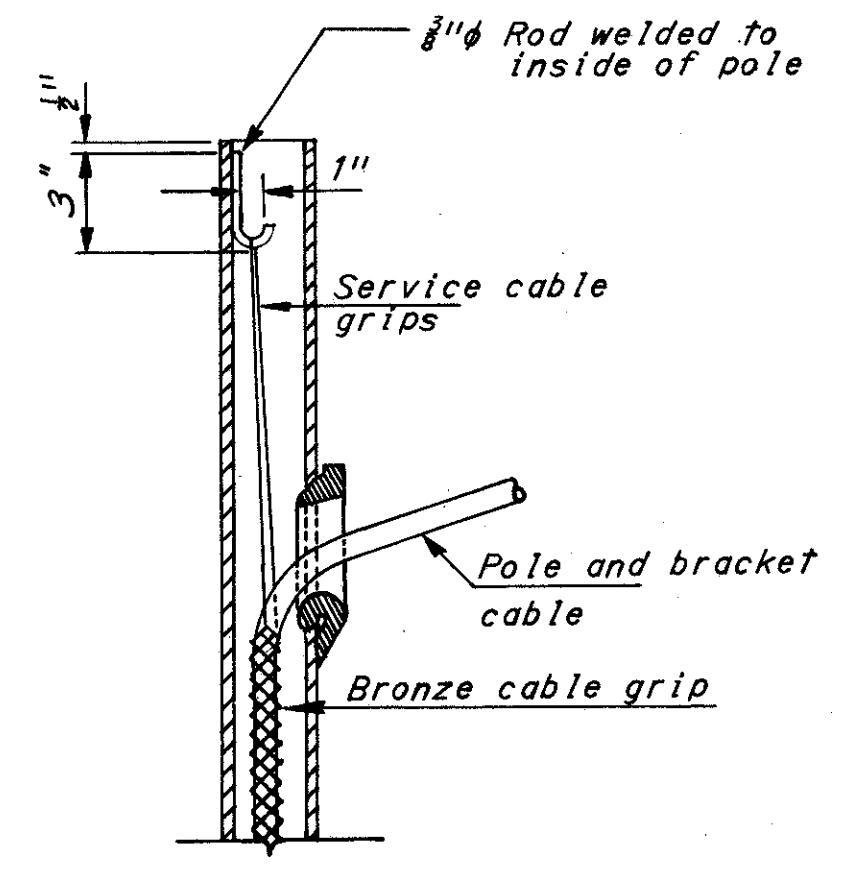
**DUCT CROSSOVER SECTION**

Scale: 1/8" = 1'-0"



**SECTION D-D**

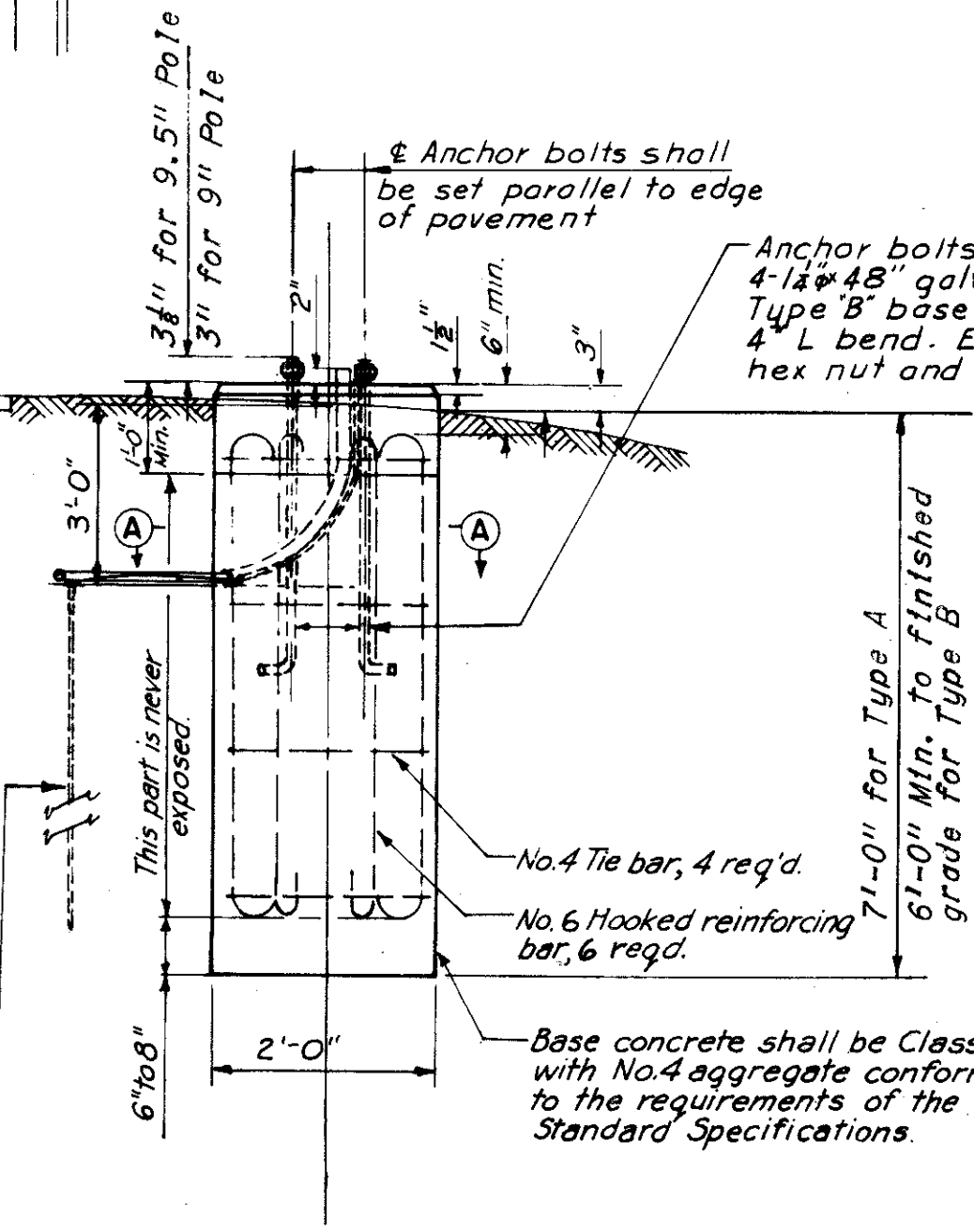
Note: Pull boxes shall be no closer than 10'-0" to the nearest pole base.



**"J-HOOK" DETAIL**

Scale: 1/4" = 1'-0"

Note: All ground rods shall be driven on the right side of pole bases, facing from roadway.

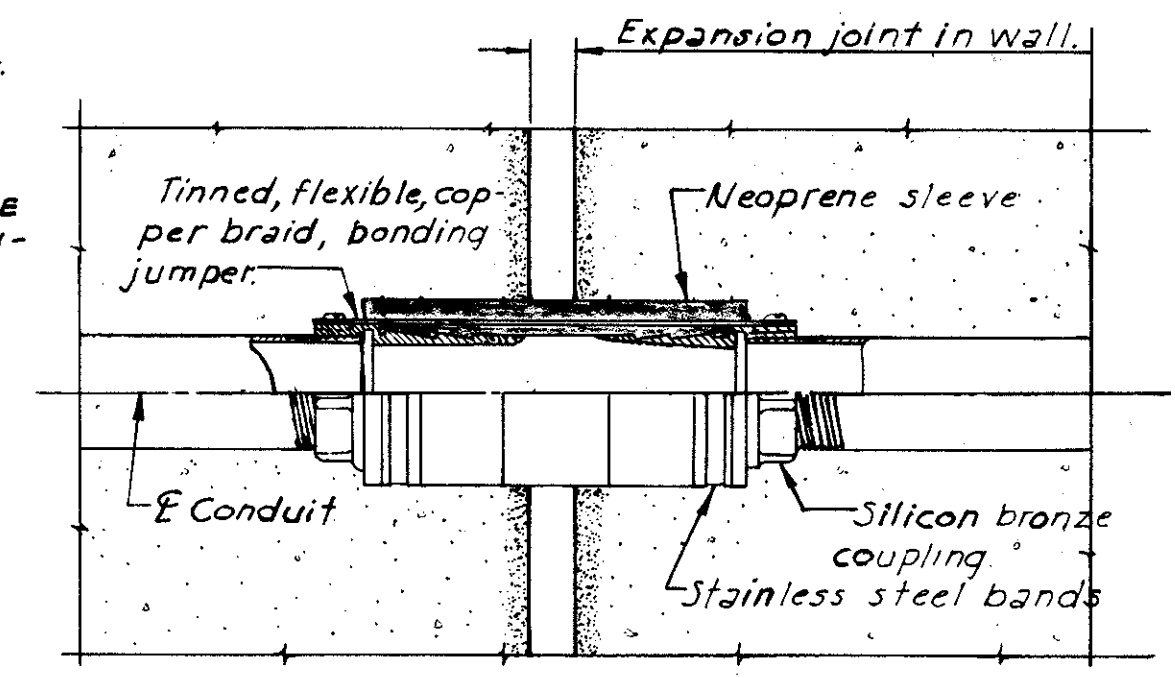


**ELEVATION**

**POLE BASE DETAILS**

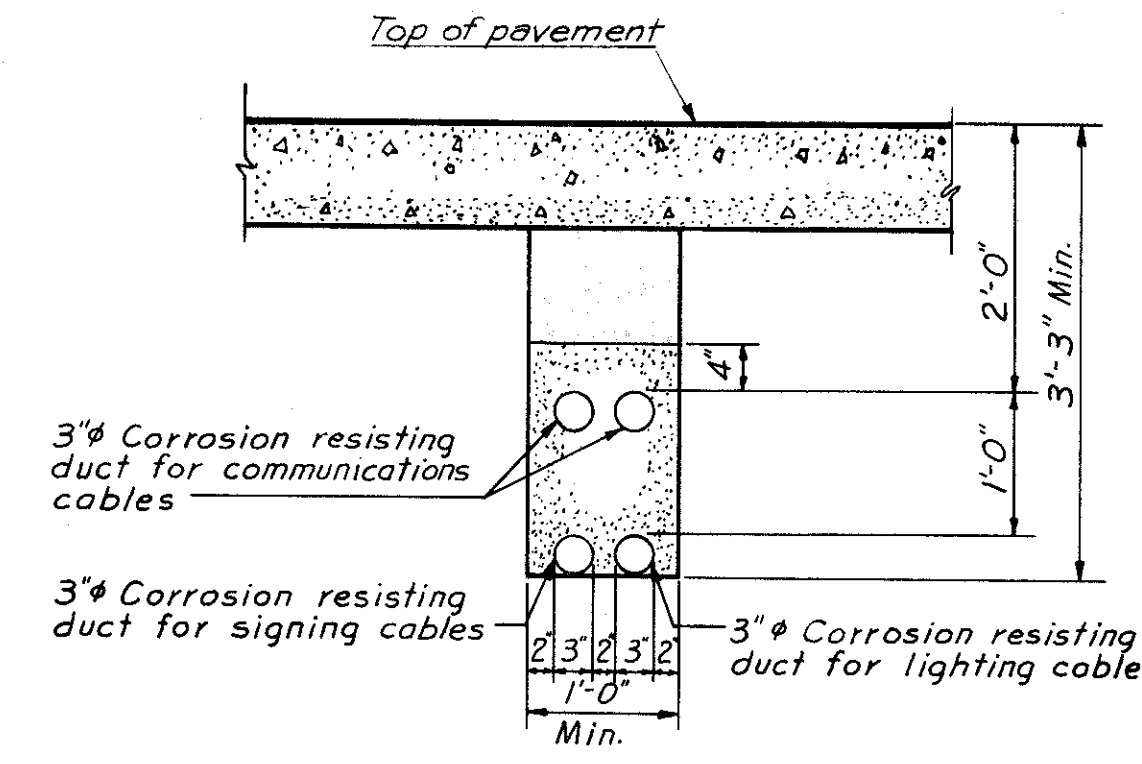
Scale: 1/2" = 1'-0"

FOUNDATION CONDUIT SHALL BE TYPE I FIBRE DUCT OR STANDARD WEIGHT GALVANIZED STEEL CONDUIT



**EXPANSION AND DEFLECTION JOINT FITTING IN WALLS**

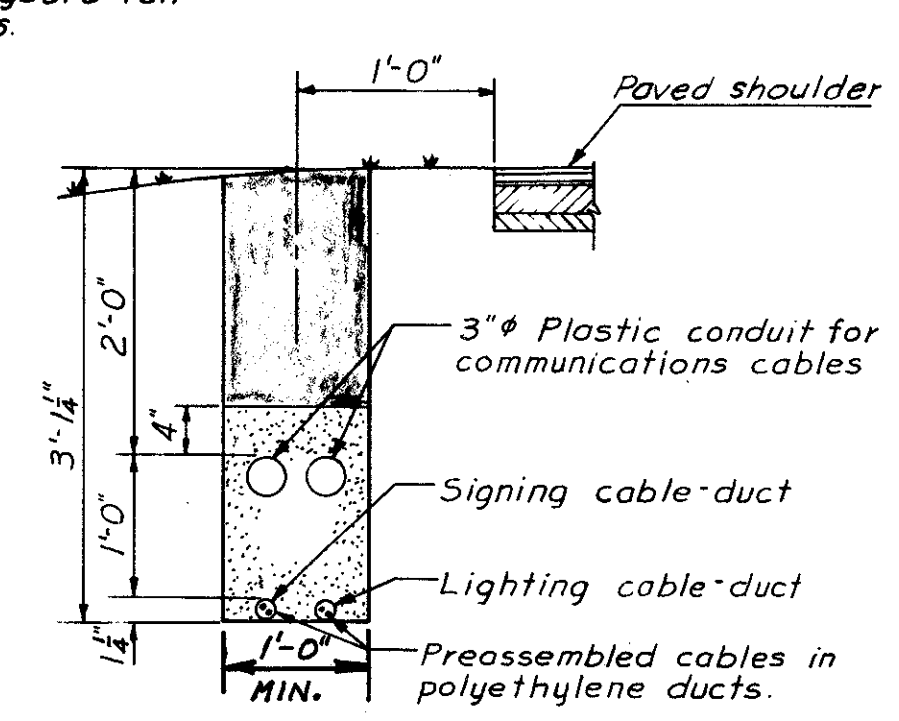
No Scale



**DUCT UNDER ROADWAY DETAILS**

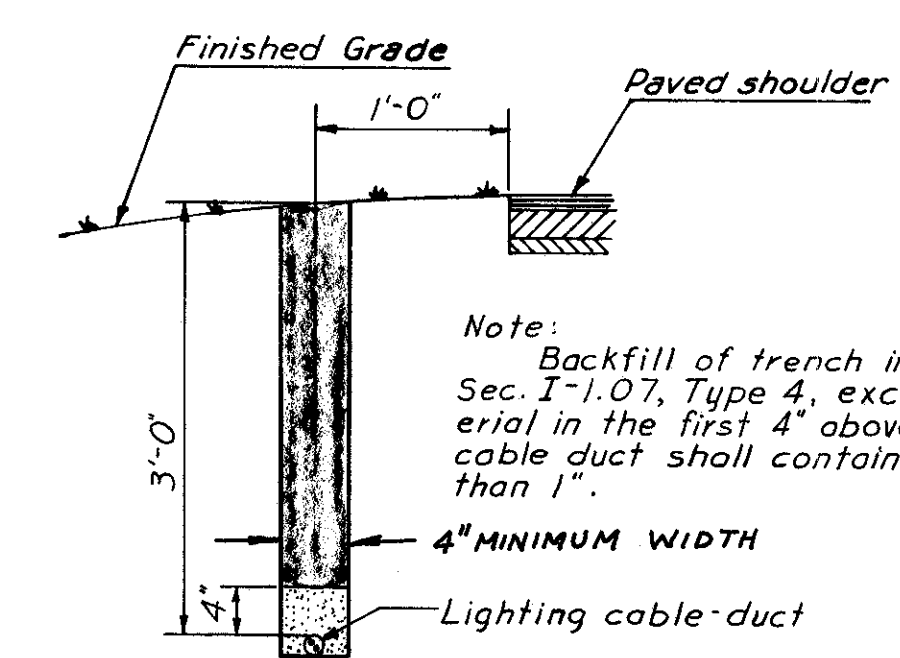
No Scale

Note: Trench shall miss guard rail posts.



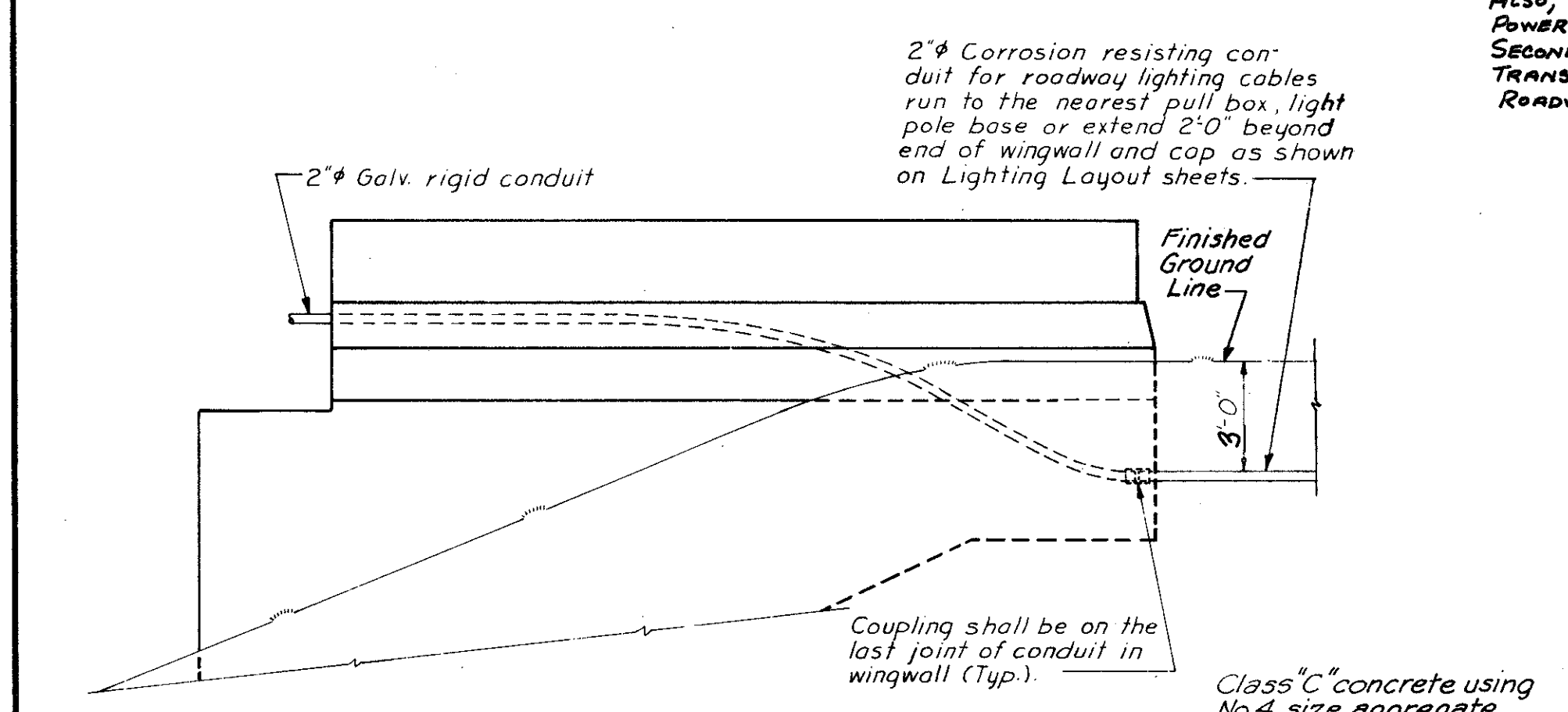
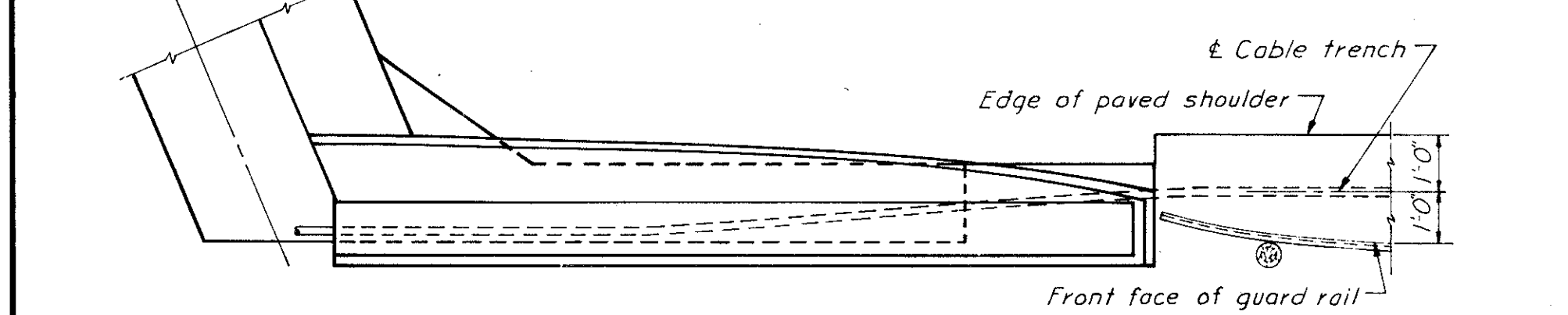
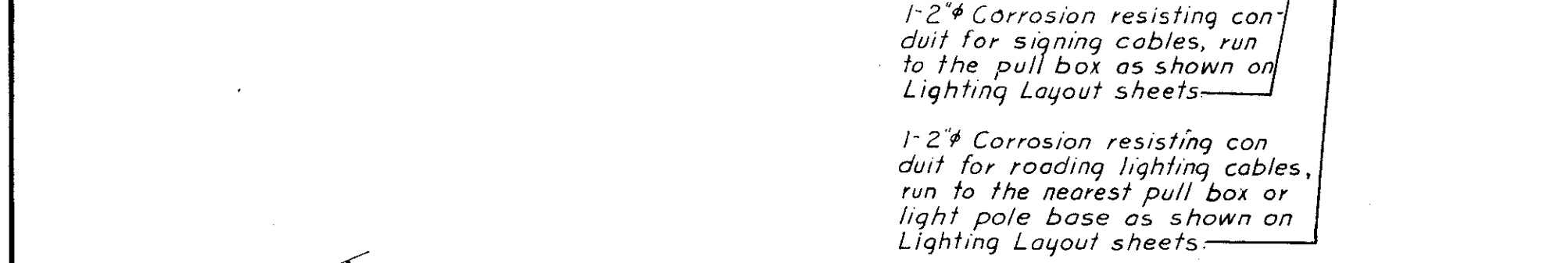
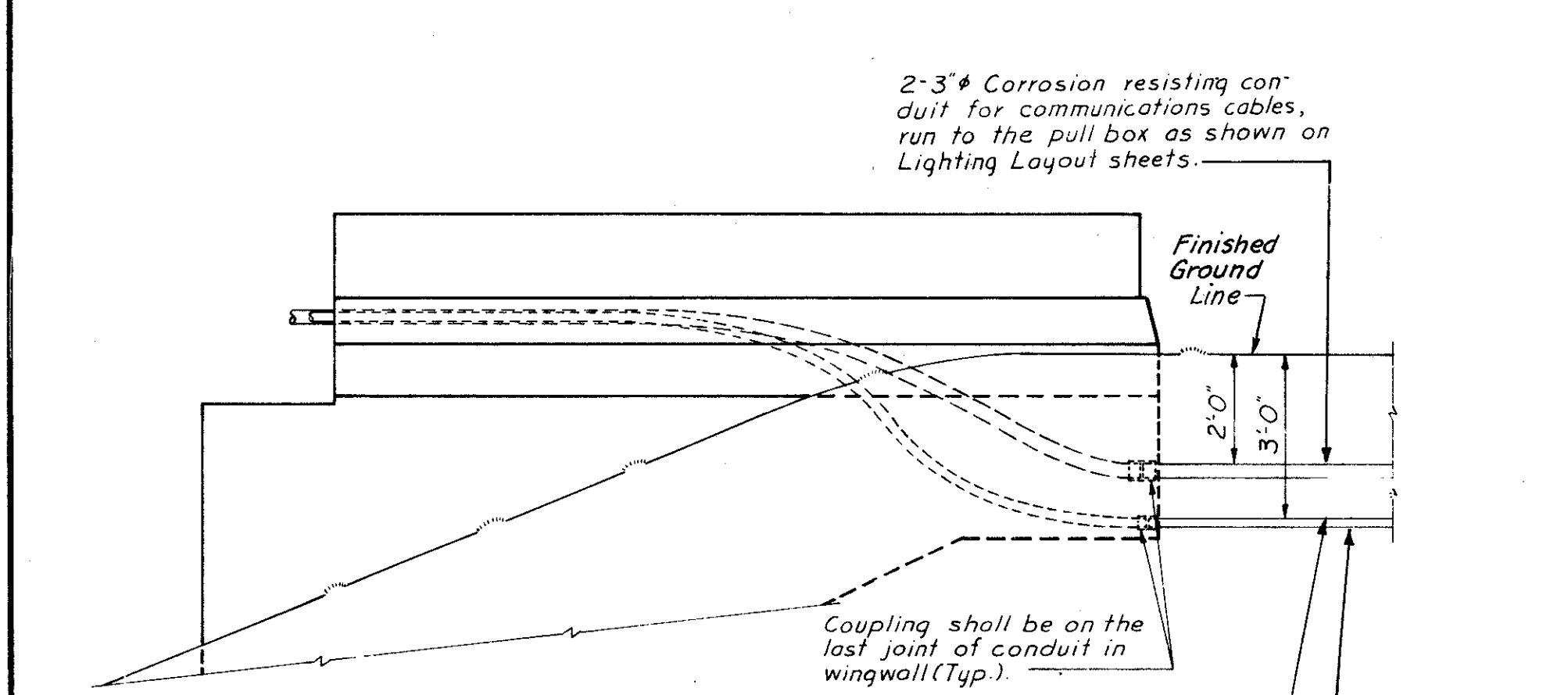
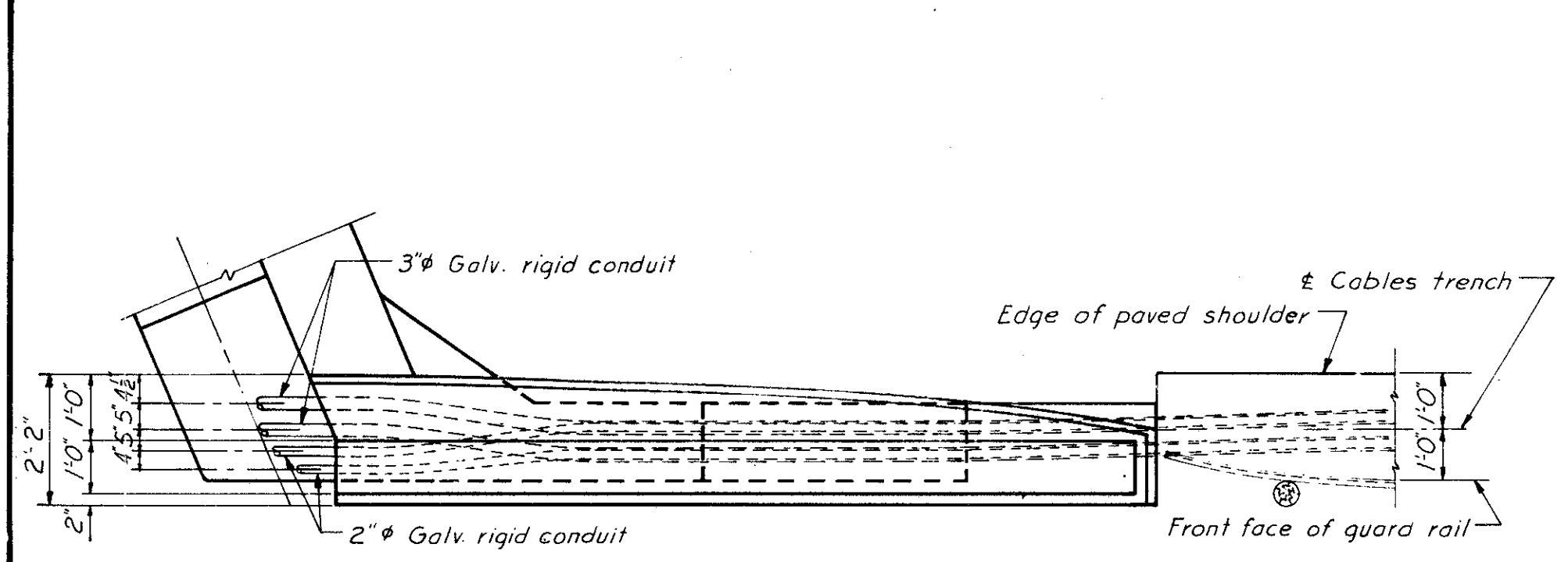
**CABLE DUCT TRENCH DETAILS**

No Scale



NOTE: KEEP CABLE-DUCT ON SIDE OF TRENCH AWAY FROM GUARD RAIL IF ANY.

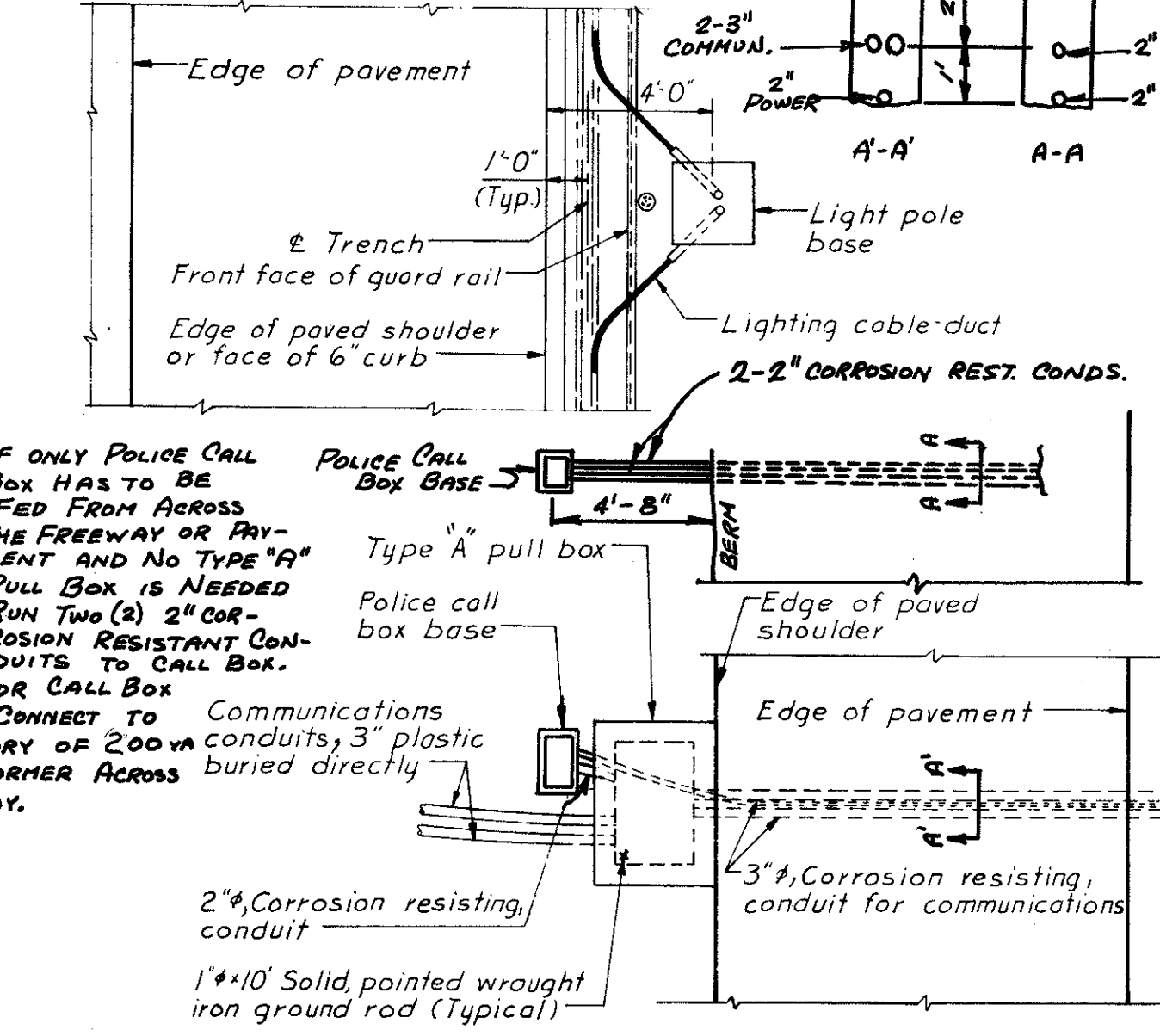
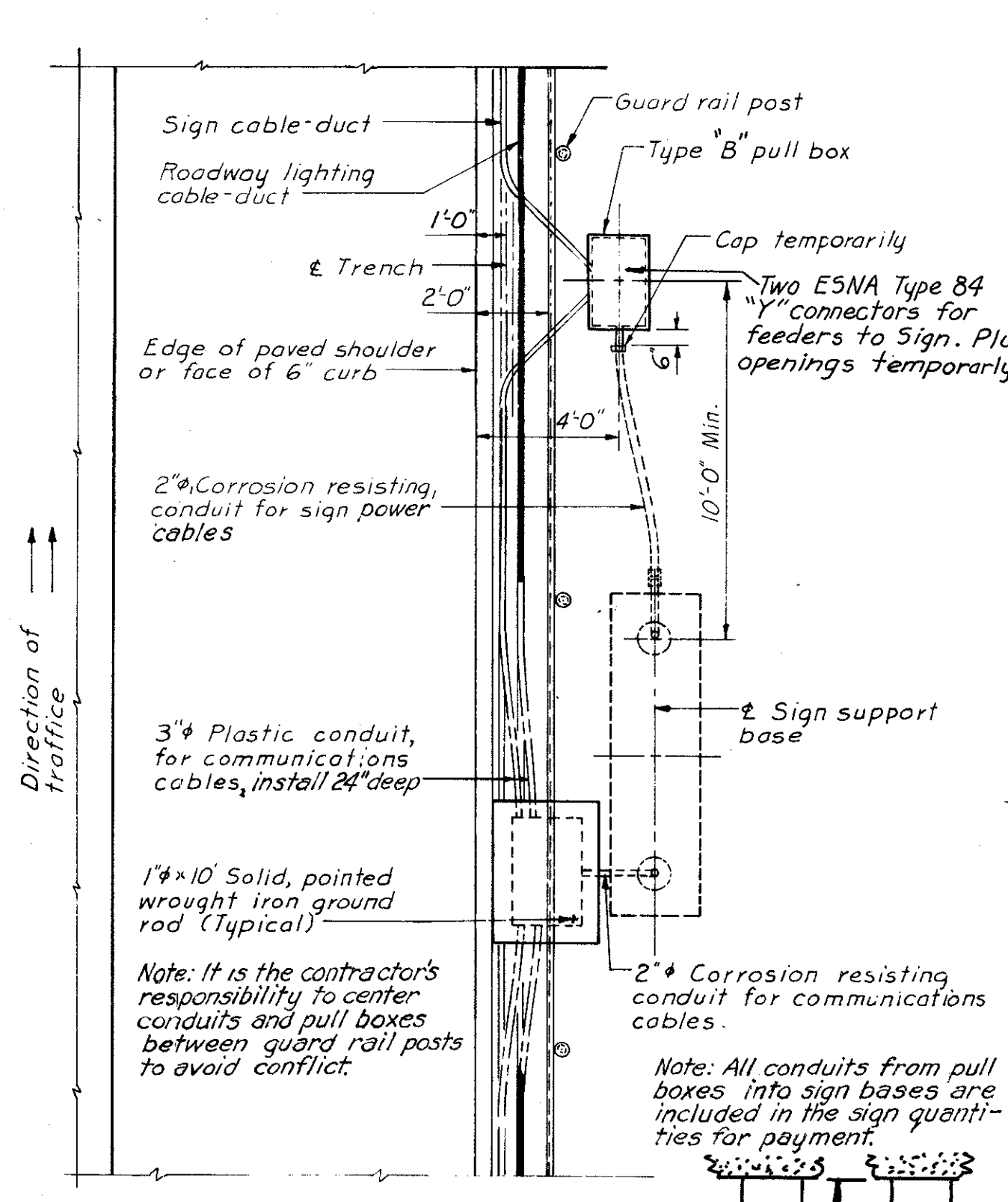
CUYAHOGA COUNTY  
CITY OF CLEVELAND  
MEDINA-JENNINGS INTERCHANGE  
CUY 71-17.83  
CUY-176-12.76



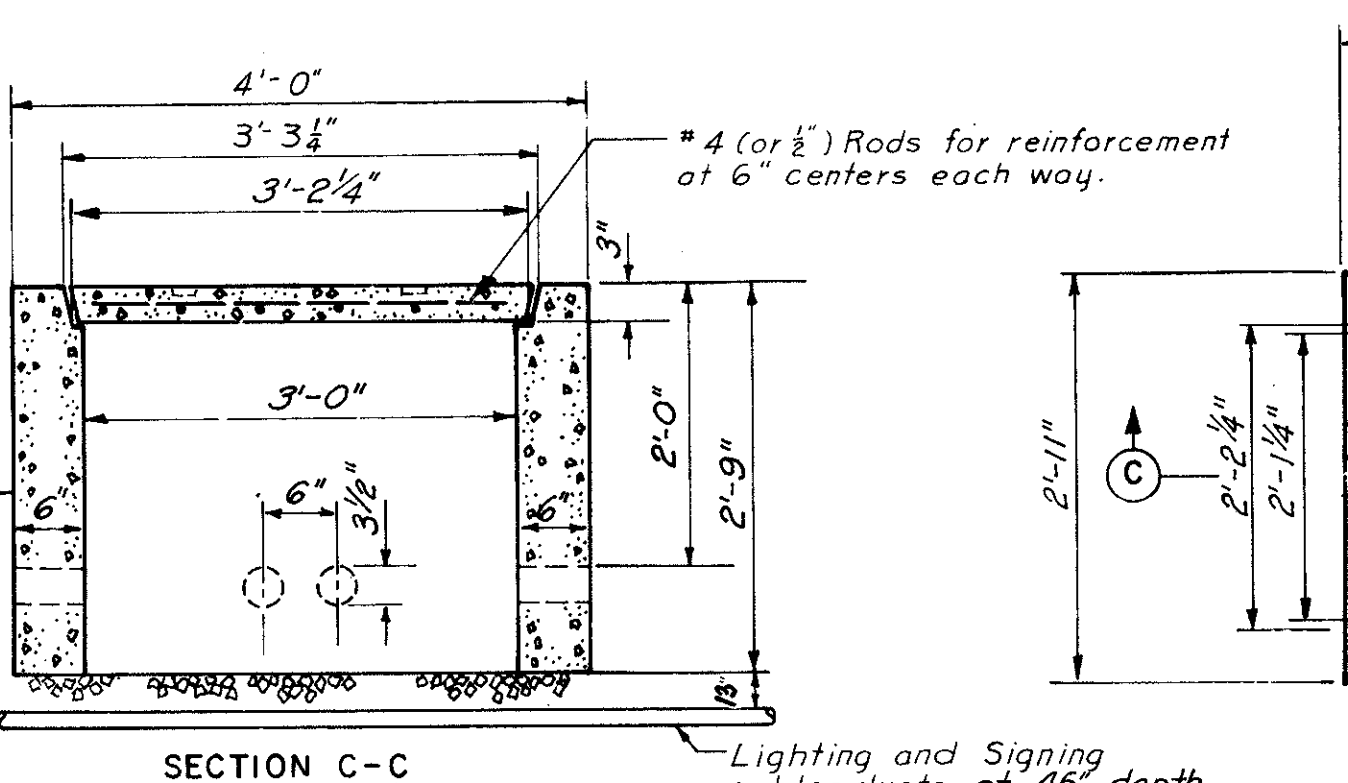
CONDUIT IN WINGWALL DETAILS  
No Scale

Class "C" concrete using No. 4 size aggregate, mixed and placed in accordance with standard provisions.

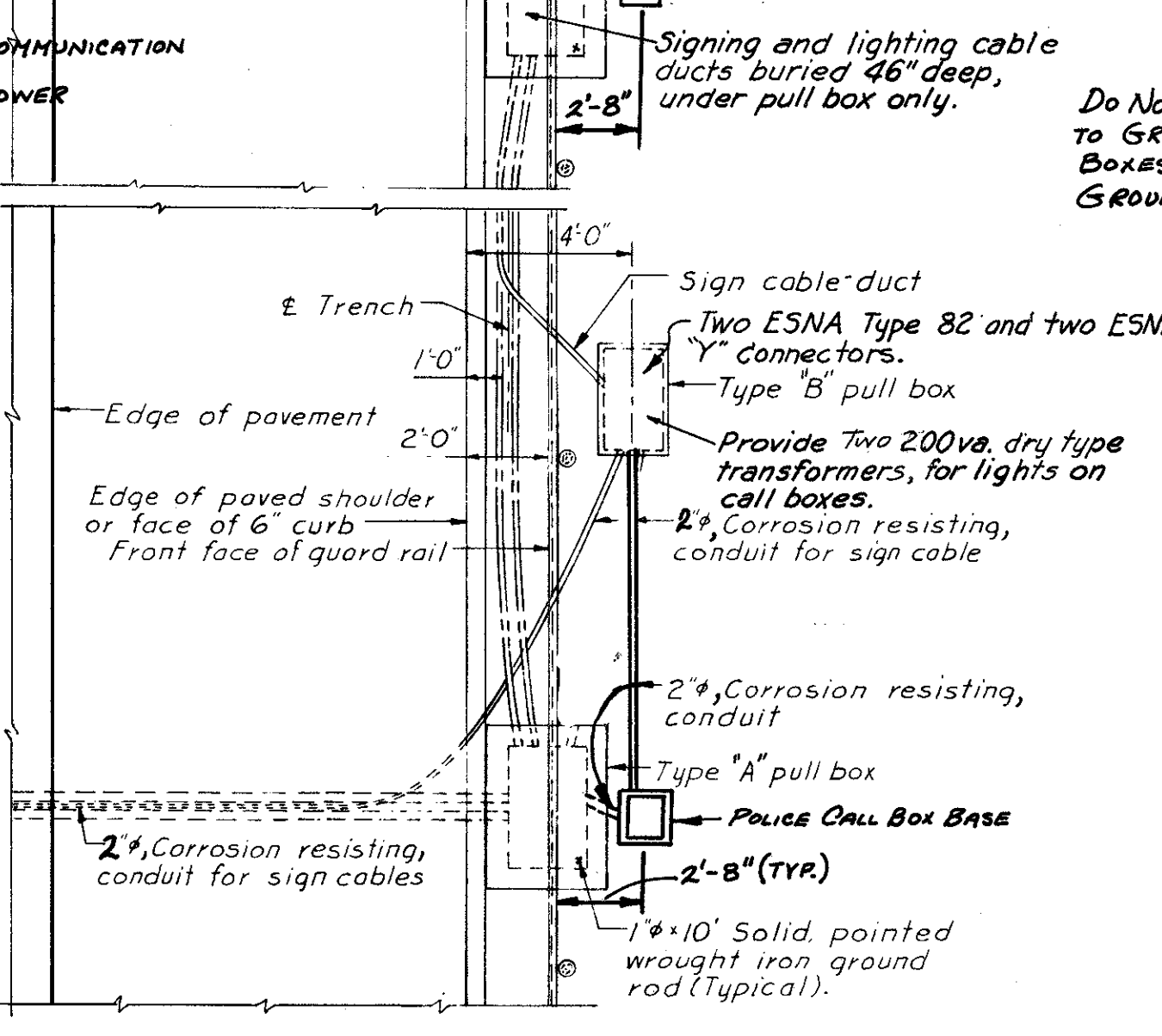
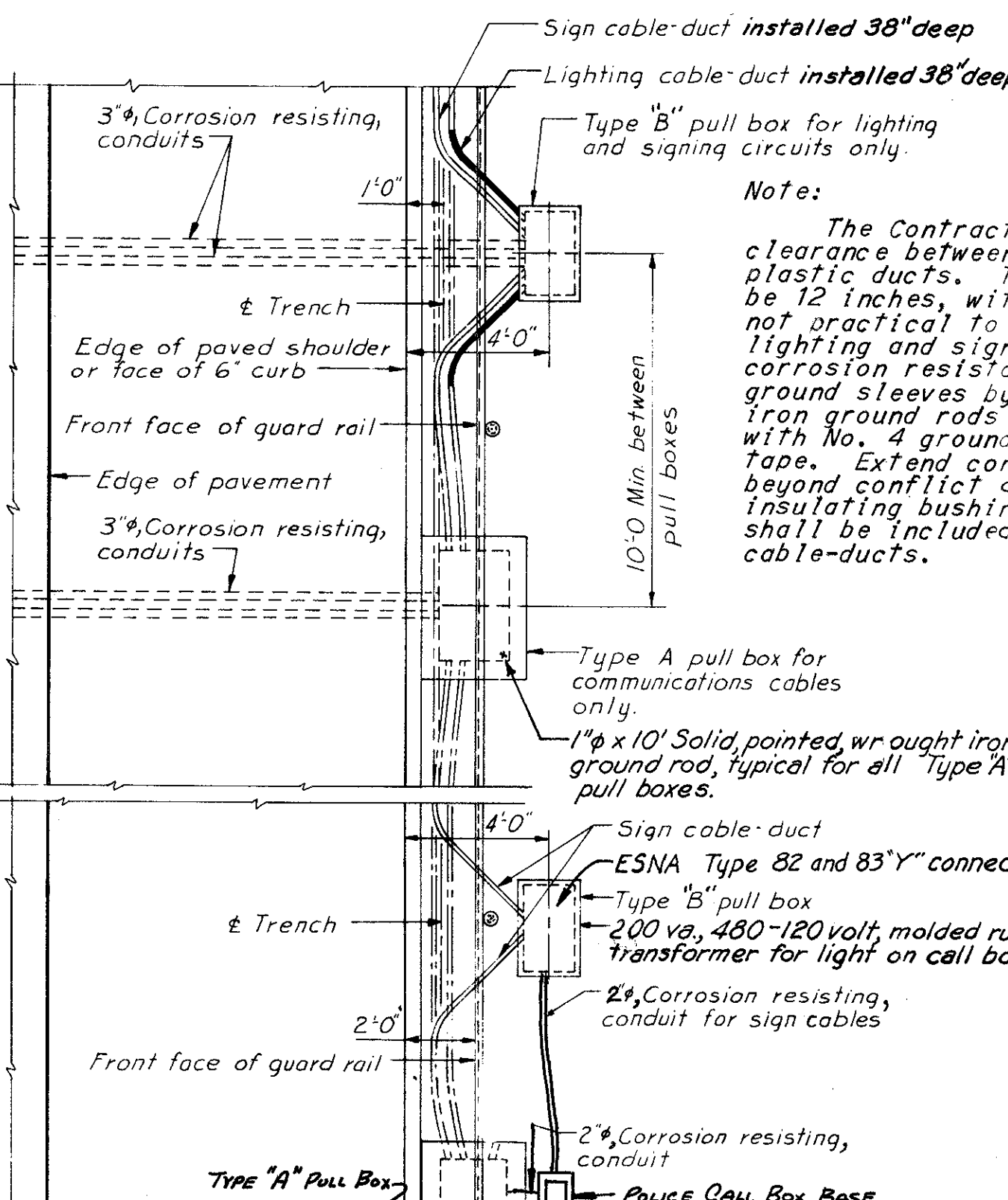
Note: Contractor to fill with grout any unused holes in sides of boxes. Conduits or ducts shall be pitched to drain toward boxes a minimum of one inch per one hundred feet.



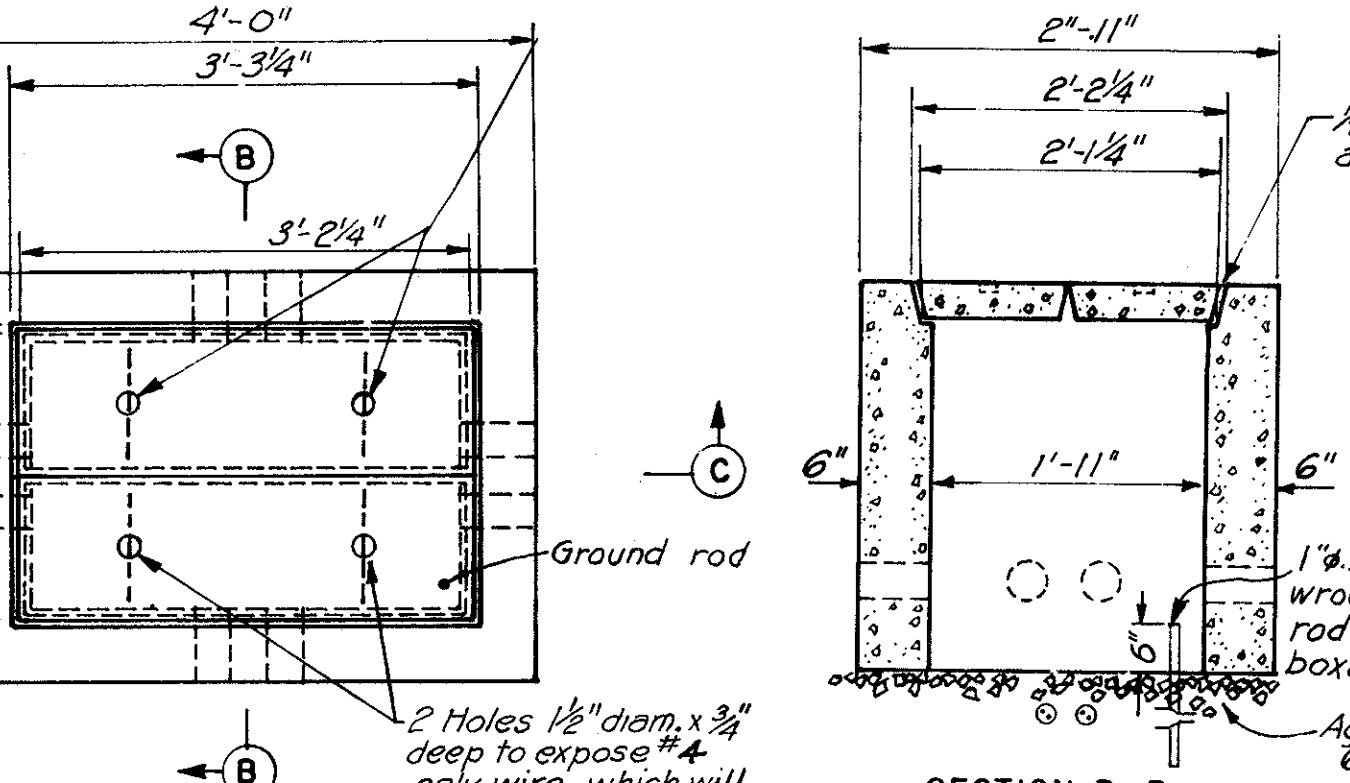
GROUND LOCATION PLAN FOR CONDUITS  
Scale: 1/4" = 1'-0"



SECTION C-C  
Note: Provide 1/2 inch preformed expansion joint filler where pull box is in contact with other concrete.



TYPE "A" PULL BOX DETAILS  
Scale: 3/8" = 1'-0"



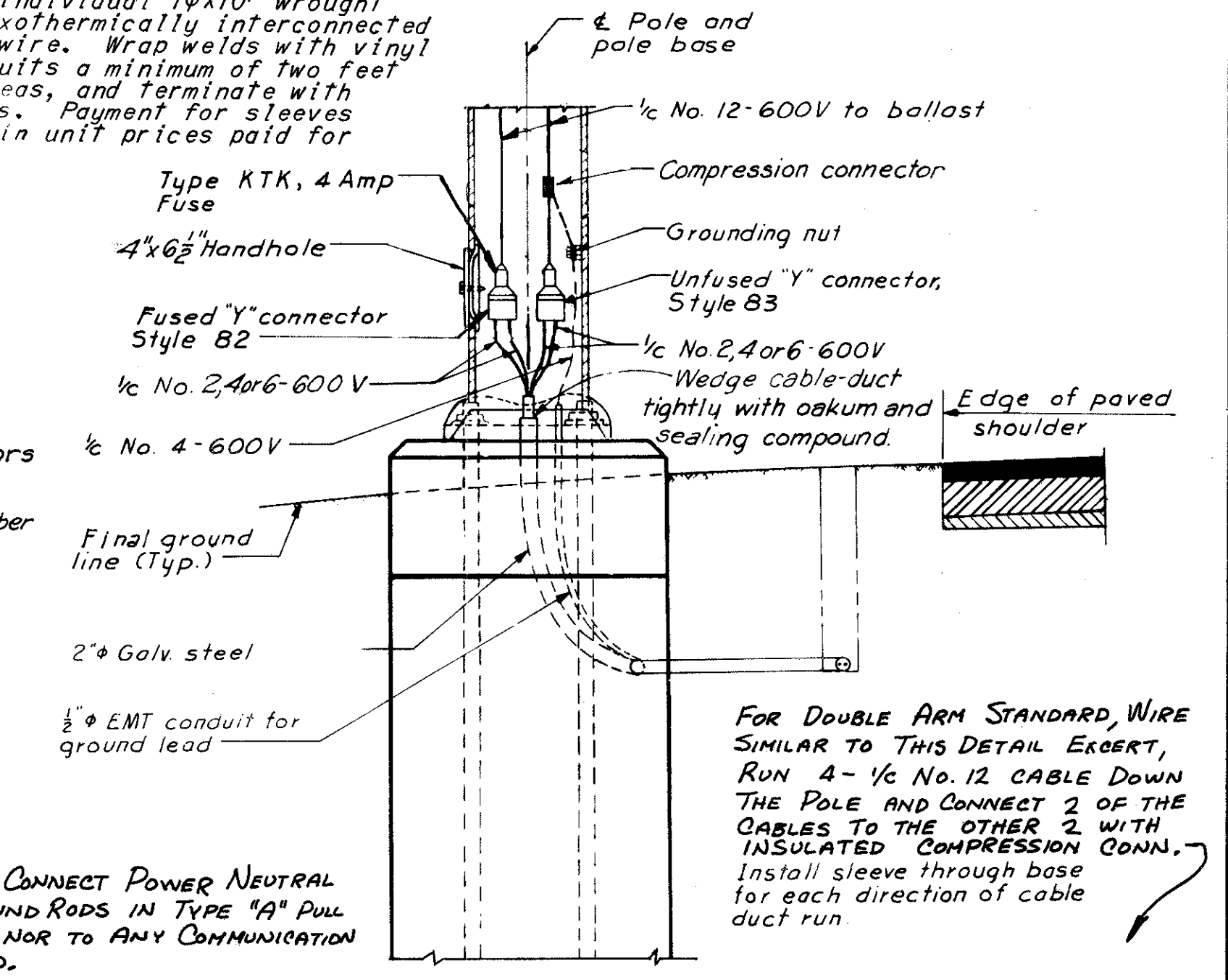
SECTION B-B

PLAN  
Scale: 3/8" = 1'-0"

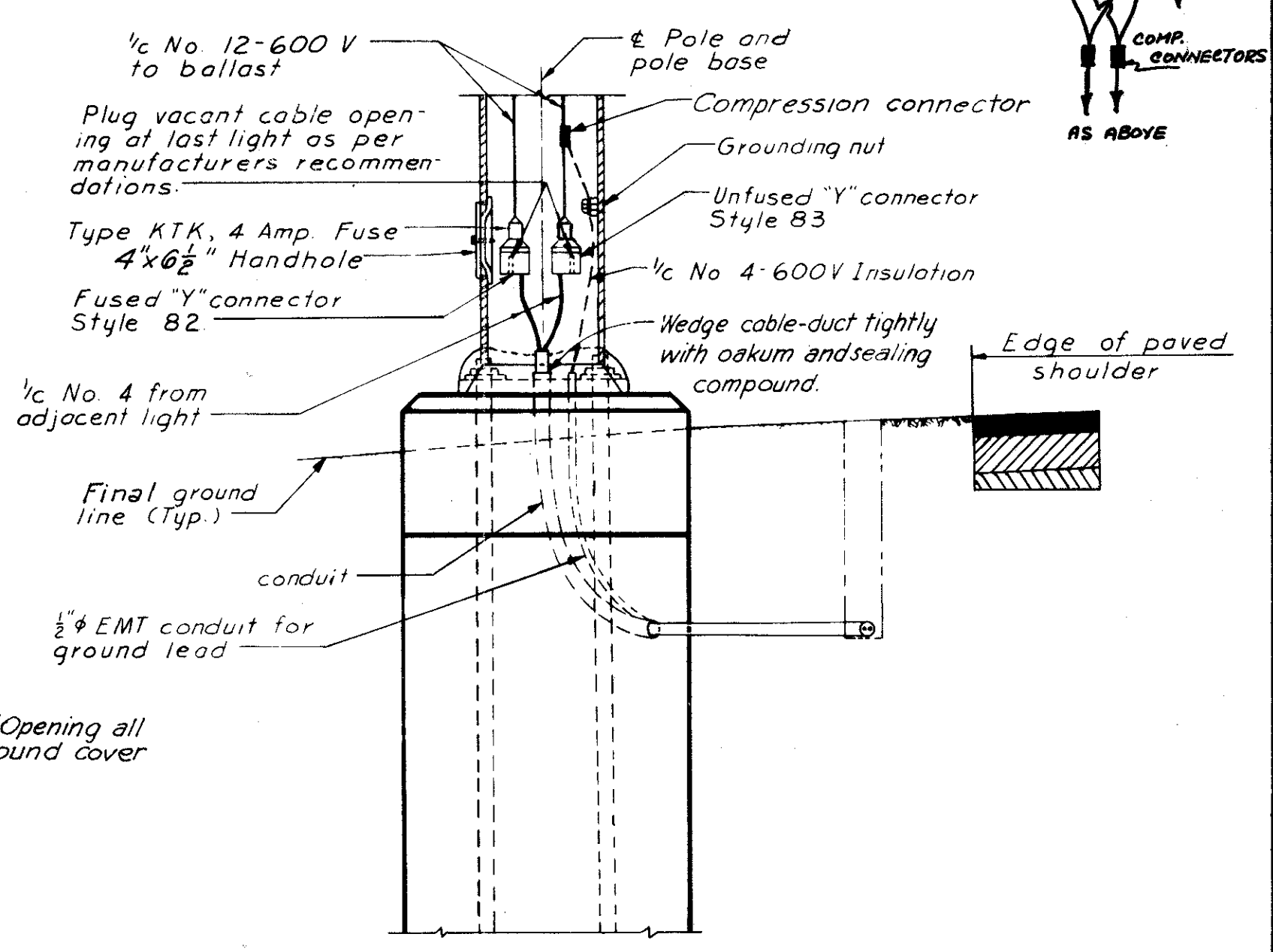
Note:

The Contractor shall maintain a minimum clearance between power and communications plastic ducts. The clearance in earth shall be 12 inches, with 6 inches in concrete. If not practical to maintain clearance, install lighting and sign power cable ducts in 2 inch corrosion resistant rigid conduit sleeves, and ground sleeves by individual 1/2 x 10 wrought iron ground rods exothermically interconnected with No. 4 ground wire. Wrap welds with vinyl tape. Extend conduits a minimum of two feet beyond conflict areas, and terminate with insulating bushings. Payment for sleeves shall be included in unit prices paid for cable-ducts.

Do NOT CONNECT POWER NEUTRAL TO GROUND RODS IN TYPE "A" PULL BOXES NOR TO ANY COMMUNICATION GROUND.



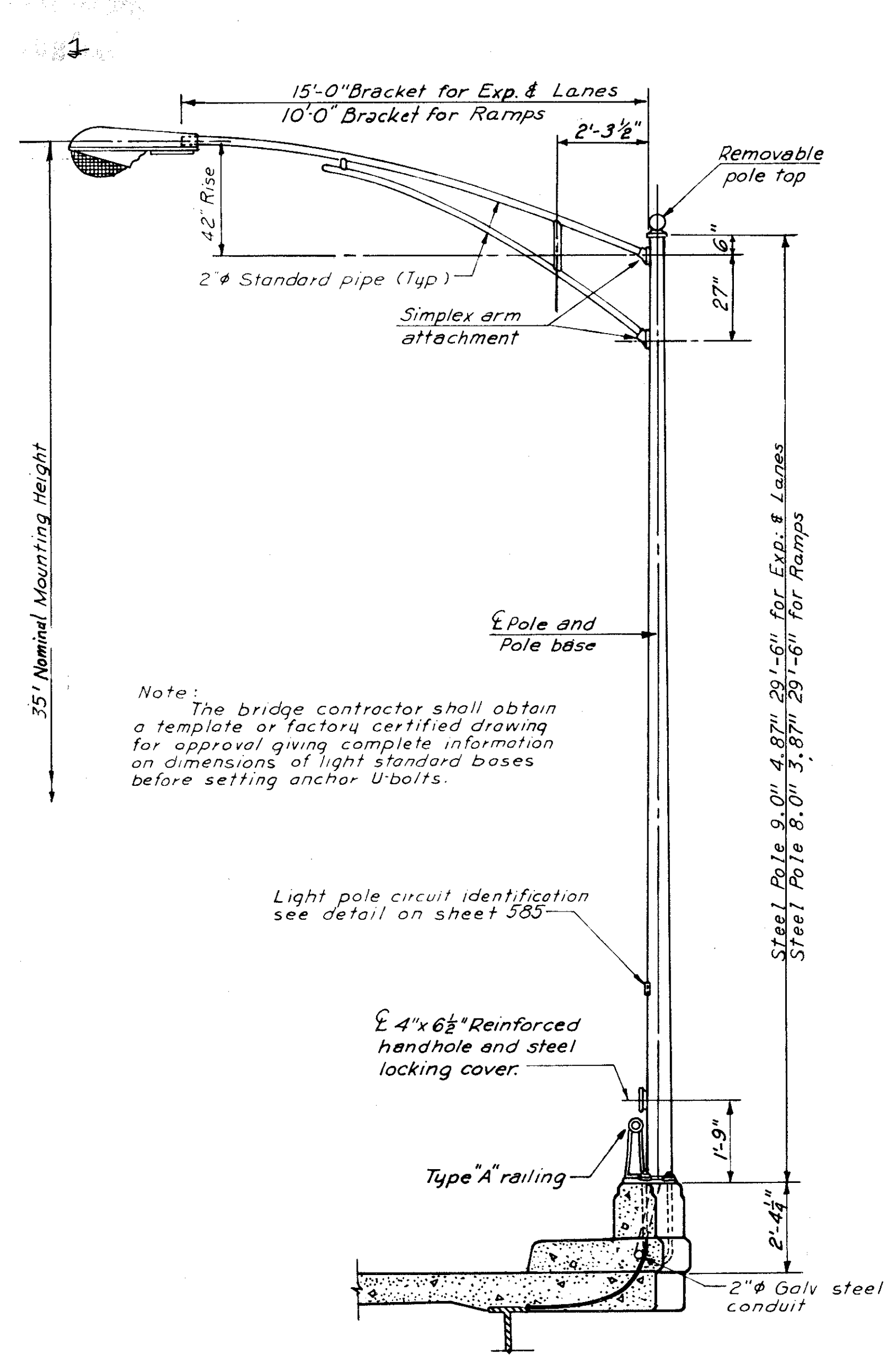
CIRCUIT CABLE CONNECTION AT LIGHT POLE  
No Scale



CIRCUIT CABLE CONNECTION AT LAST LIGHT POLE  
No Scale

GENERAL LIGHTING DETAILS  
3-3-65

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
**MEDINA-JENNINGS INTERCHANGE**  
CUY. 71-17.83  
CUY. 176-12.76



Note:  
The bridge contractor shall obtain a template or factory certified drawing for approval giving complete information on dimensions of light standard bases before setting anchor U-bolts.

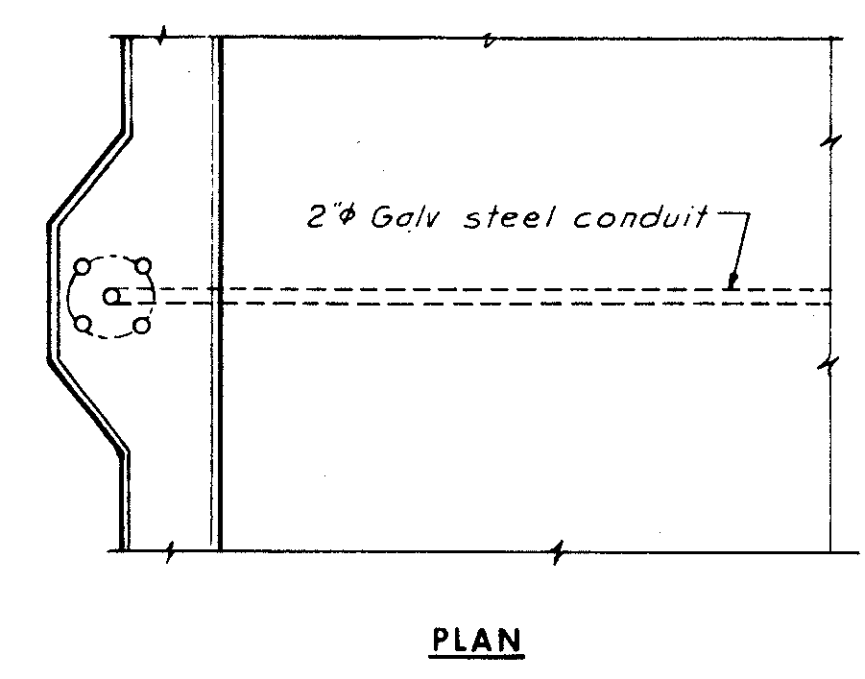
Light pole circuit identification see detail on sheet 585

4" x 6 1/2" Reinforced handhole and steel locking cover.

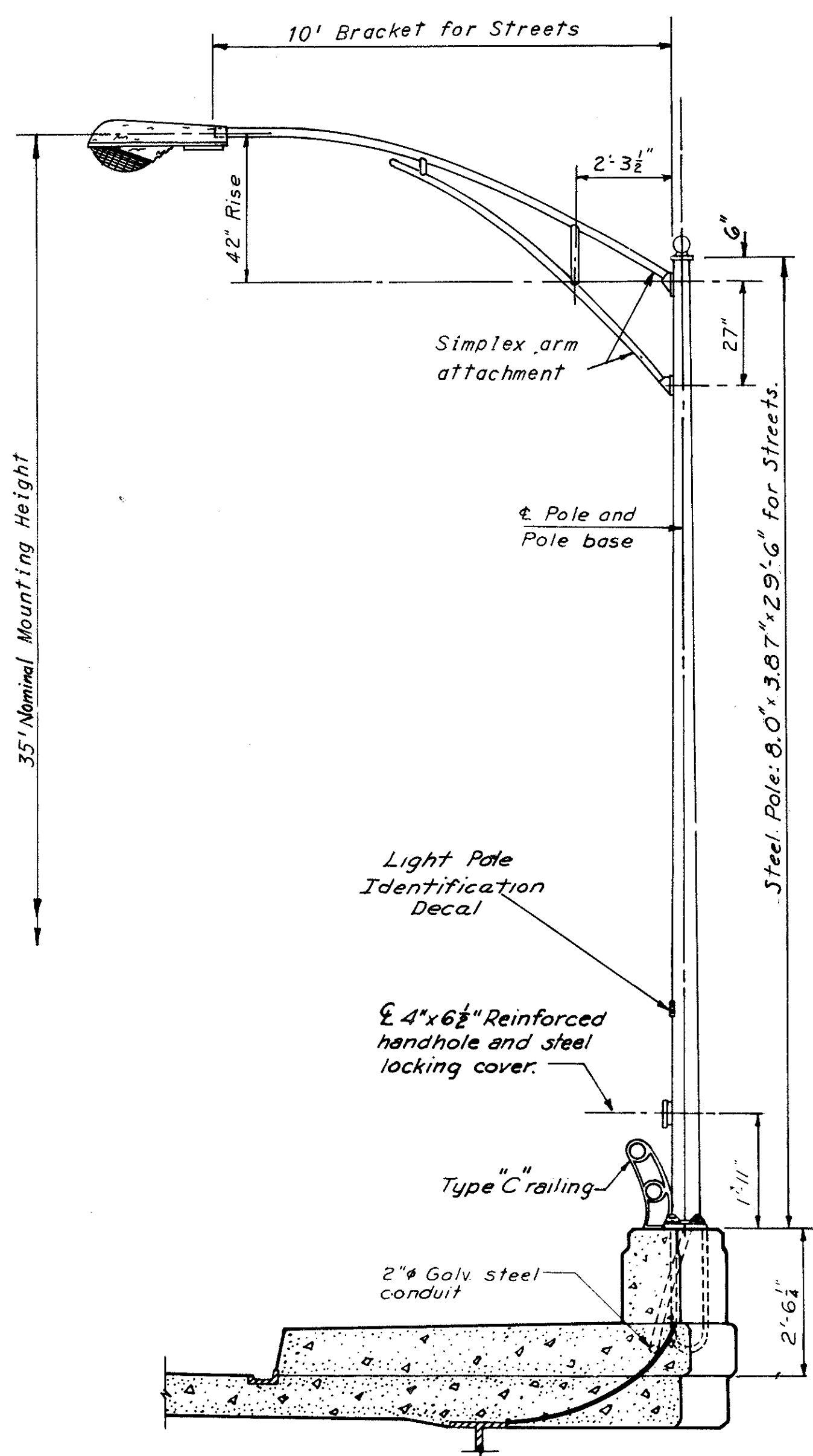
Type "A" railing

**LIGHTING UNIT ON STRUCTURES**  
Scale: 3/8" = 1'-0"

Note: For dimensions and notes not shown see 'Light Standard Support Details' on this sheet.



PLAN

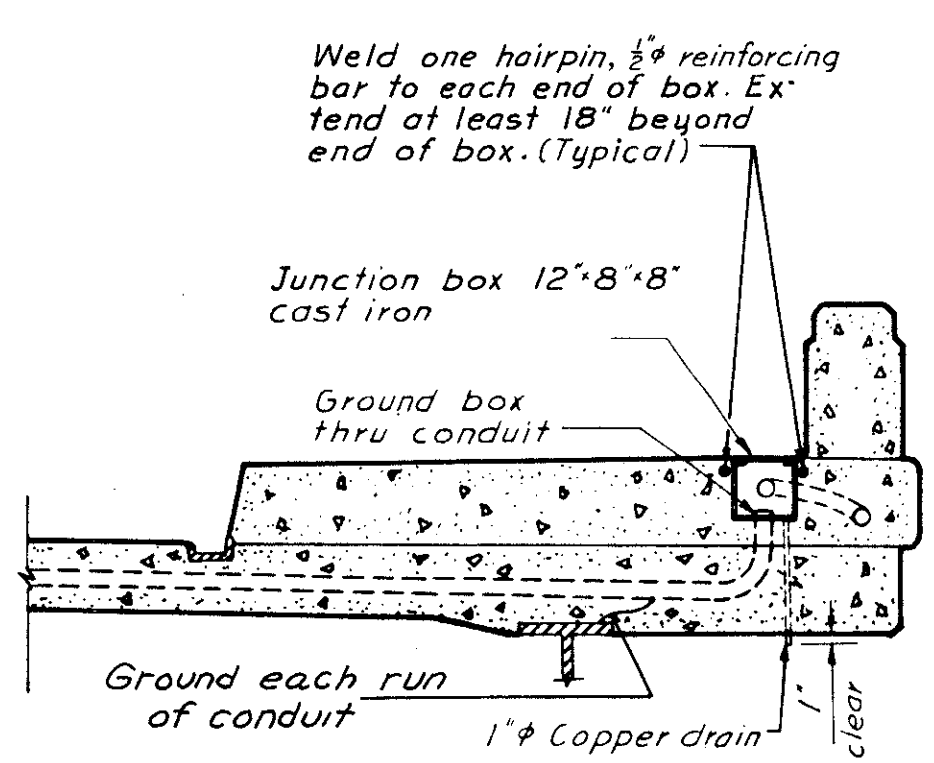


Light Pole Identification Decal

4" x 6 1/2" Reinforced handhole and steel locking cover.

Type "C" railing

**CONDUIT CROSSOVER ON BRIDGE**  
Scale: 1/2" = 1'-0"

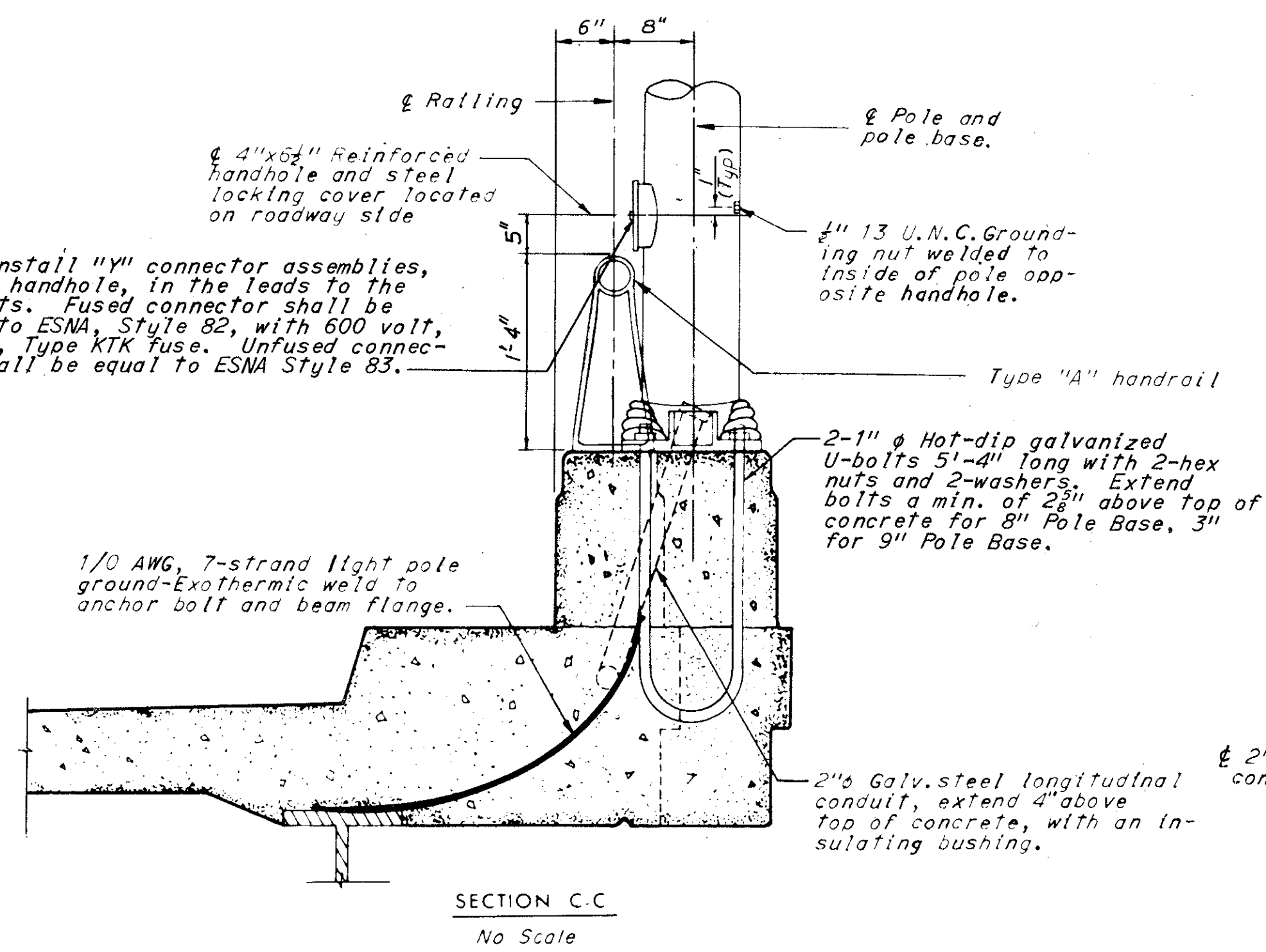


Weld one hairpin, 1/2" reinforcing bar to each end of box. Ex. tend at least 18" beyond end of box. (Typical)

Junction box 12"x8"x8" cast iron

Ground box thru conduit

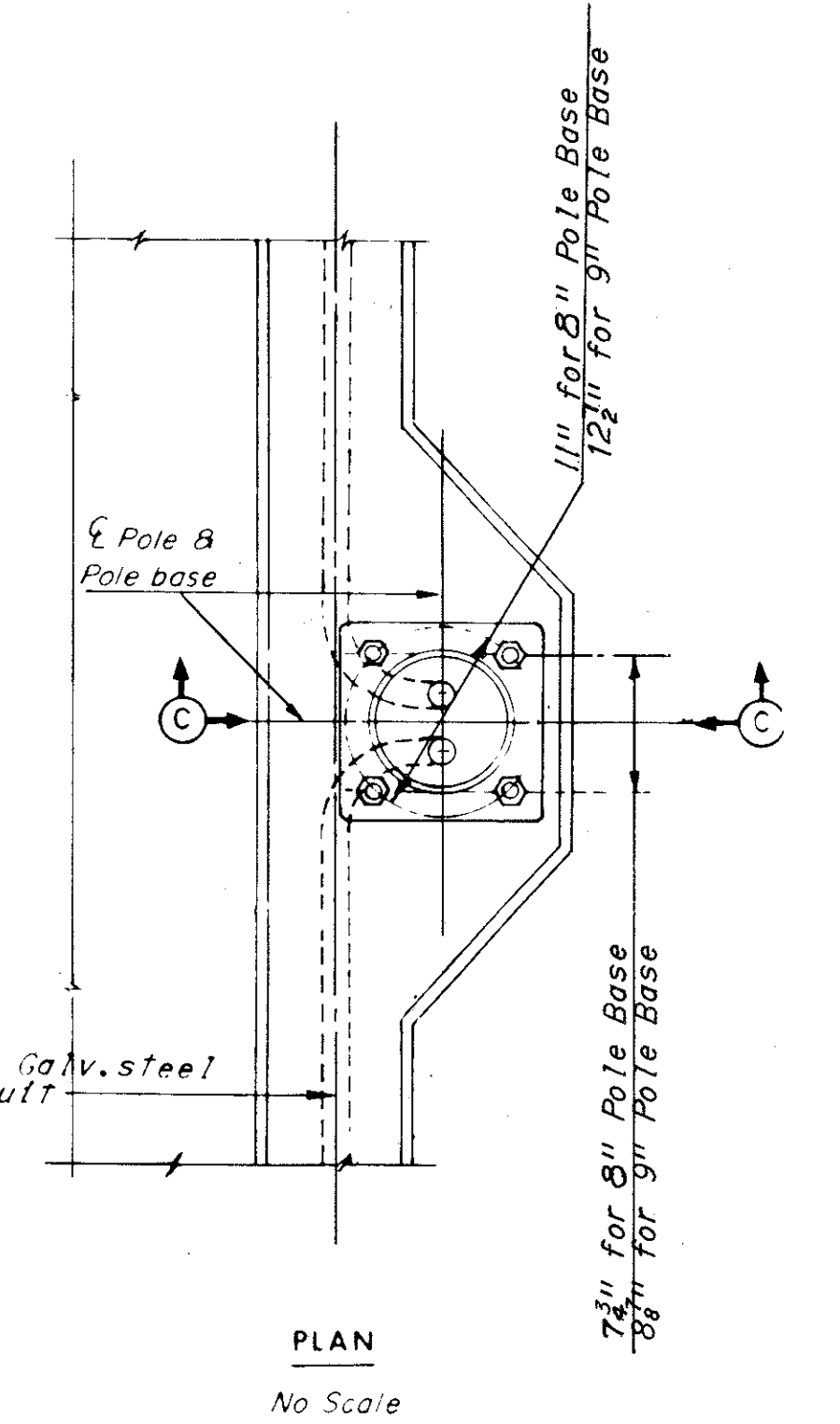
Ground each run of conduit



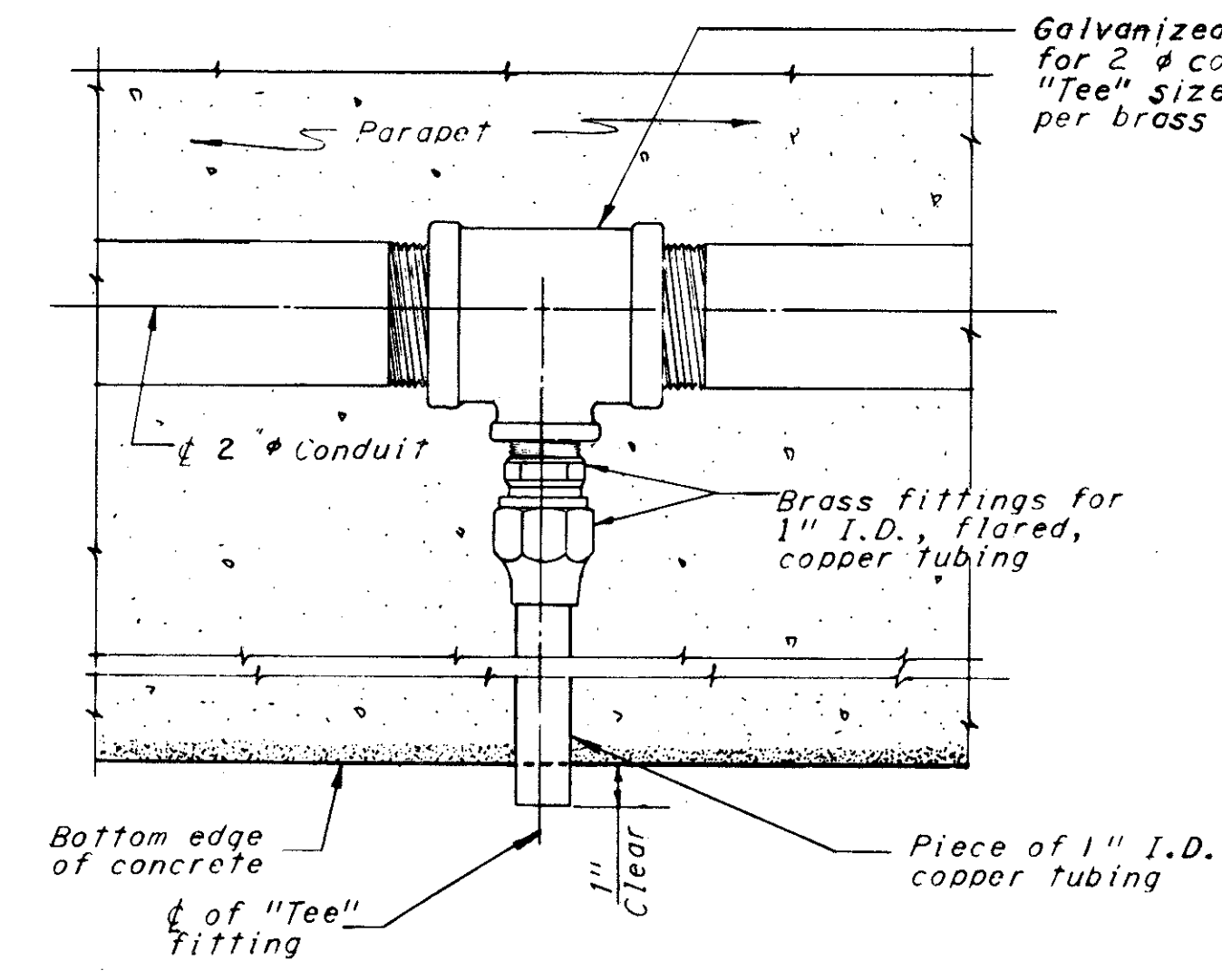
Install "Y" connector assemblies, in the handhole, in the leads to the ballasts. Fused connector shall be equal to ESNA, Style 82, with 600 volt, 4 amp., Type KTK fuse. Unfused connector shall be equal to ESNA Style 83.

SECTION C-C  
No Scale

**LIGHT STANDARD SUPPORT DETAILS**  
No Scale

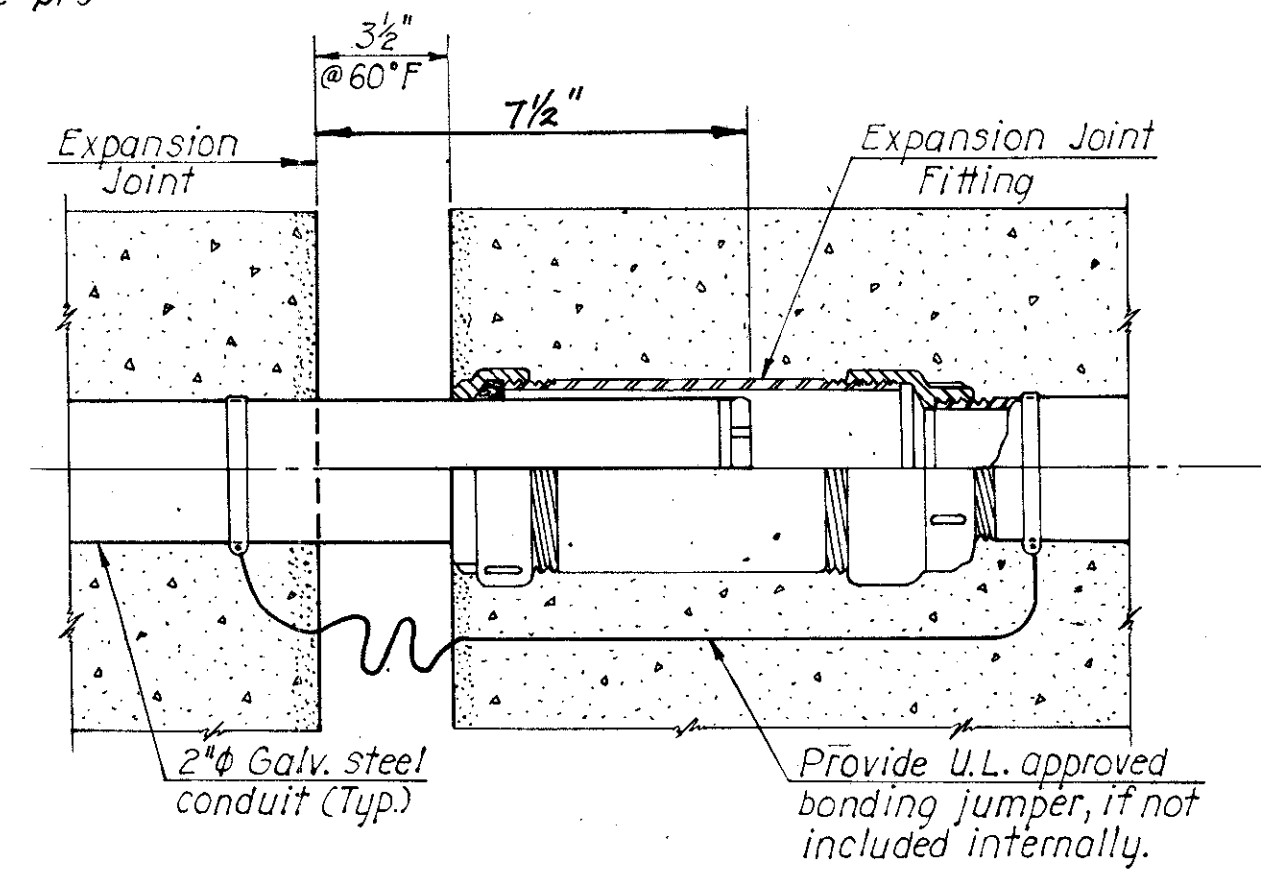


PLAN  
No Scale



**CONDUIT DRAIN FITTING**  
No Scale

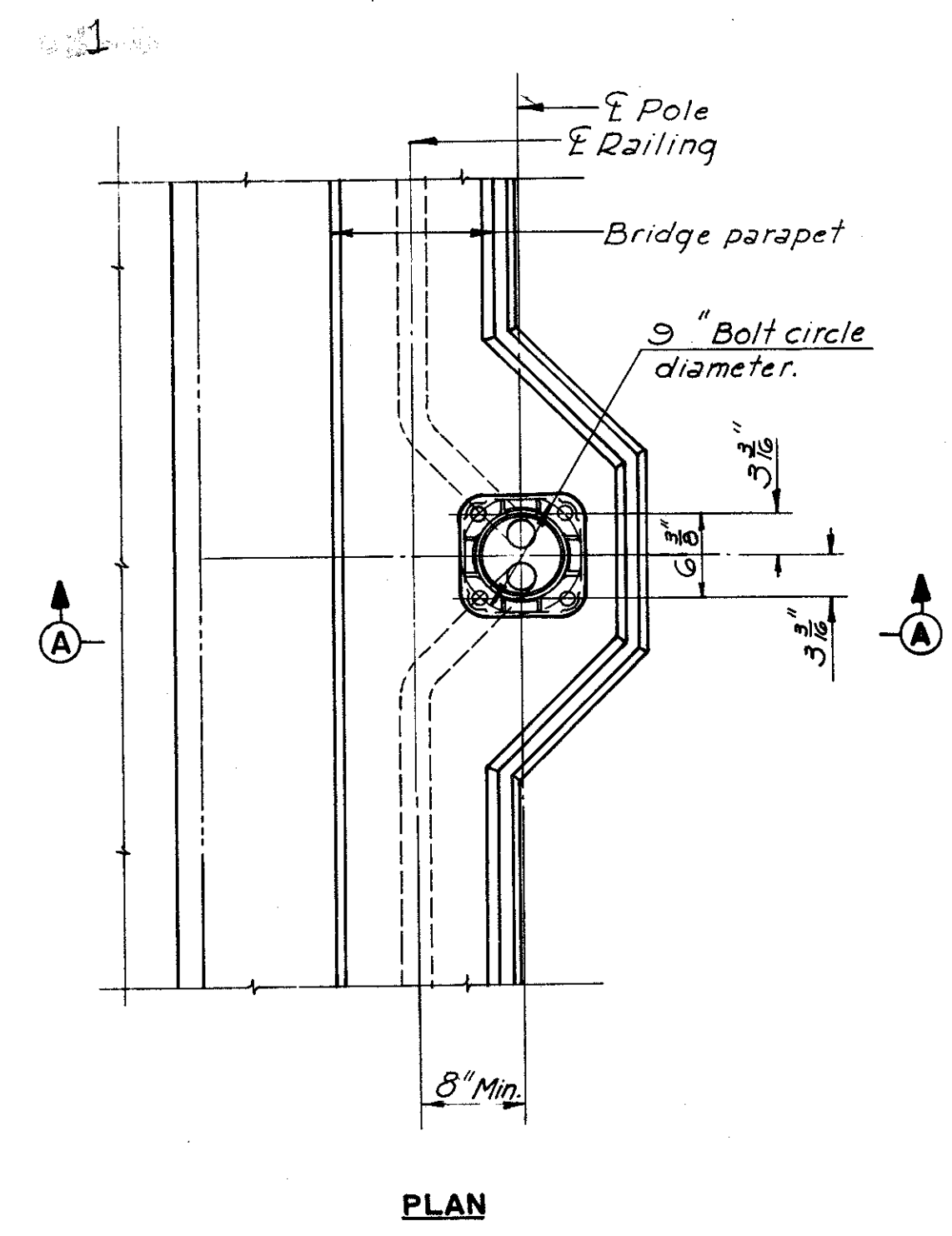
Note: One drain is required between each pair of pole bases on structures, except where an expansion joint is at low point.



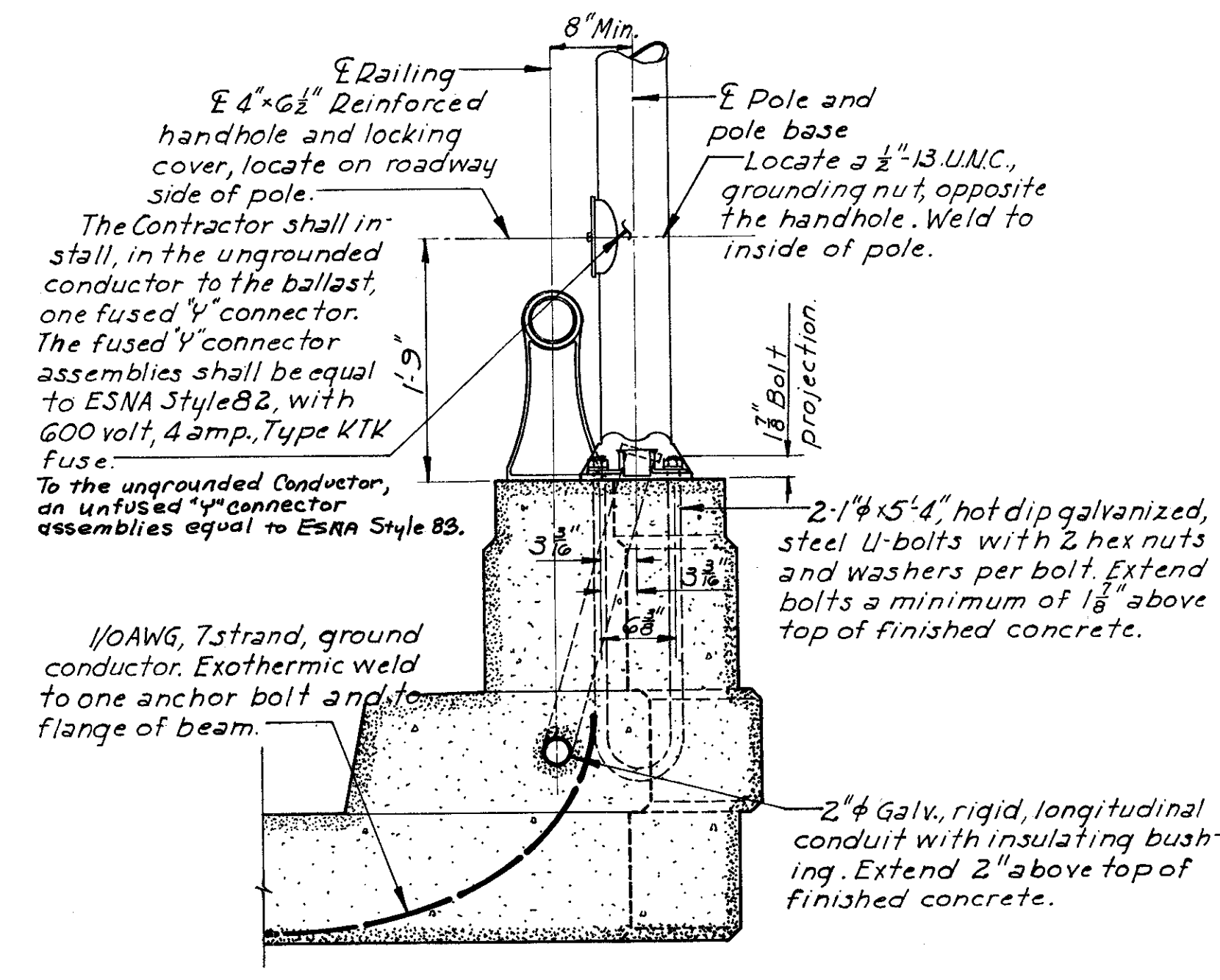
**EXPANSION JOINT FITTING**  
No Scale

**BRIDGE LIGHTING DETAILS**

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
**MEDINA-JENNINGS INTERCHANGE**  
CUY-71-17.83  
CUY-176-12.76

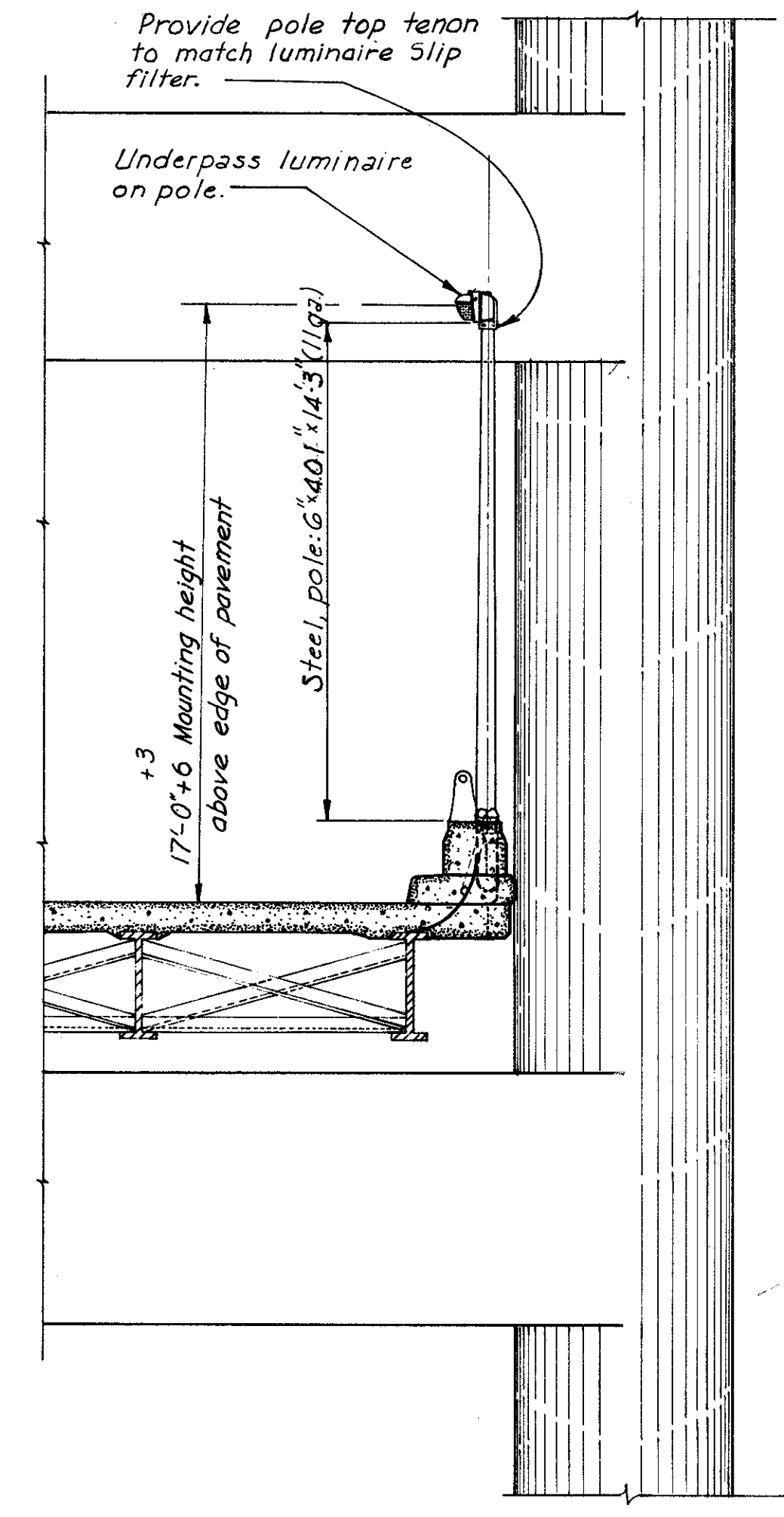


PLAN

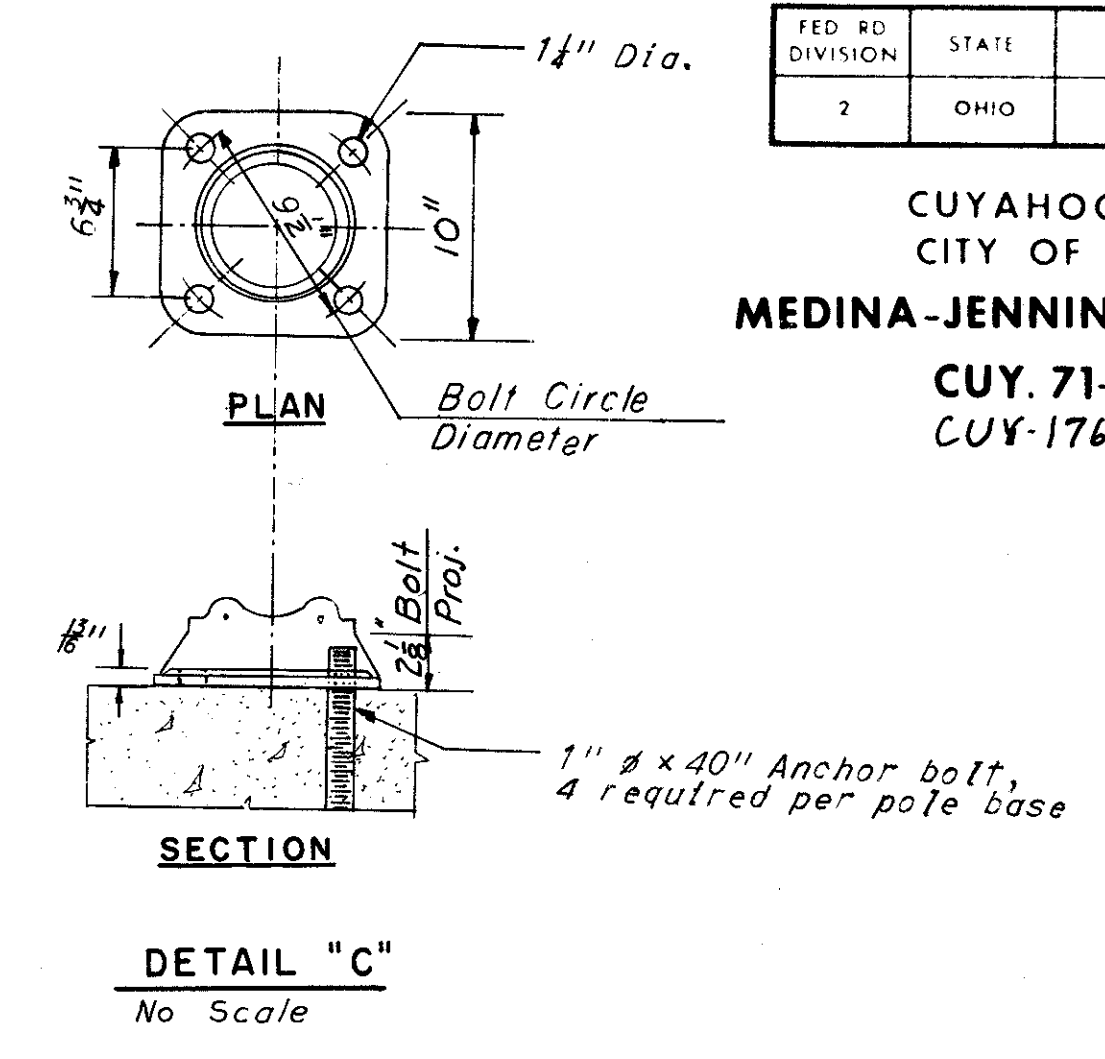


SECTION A-A

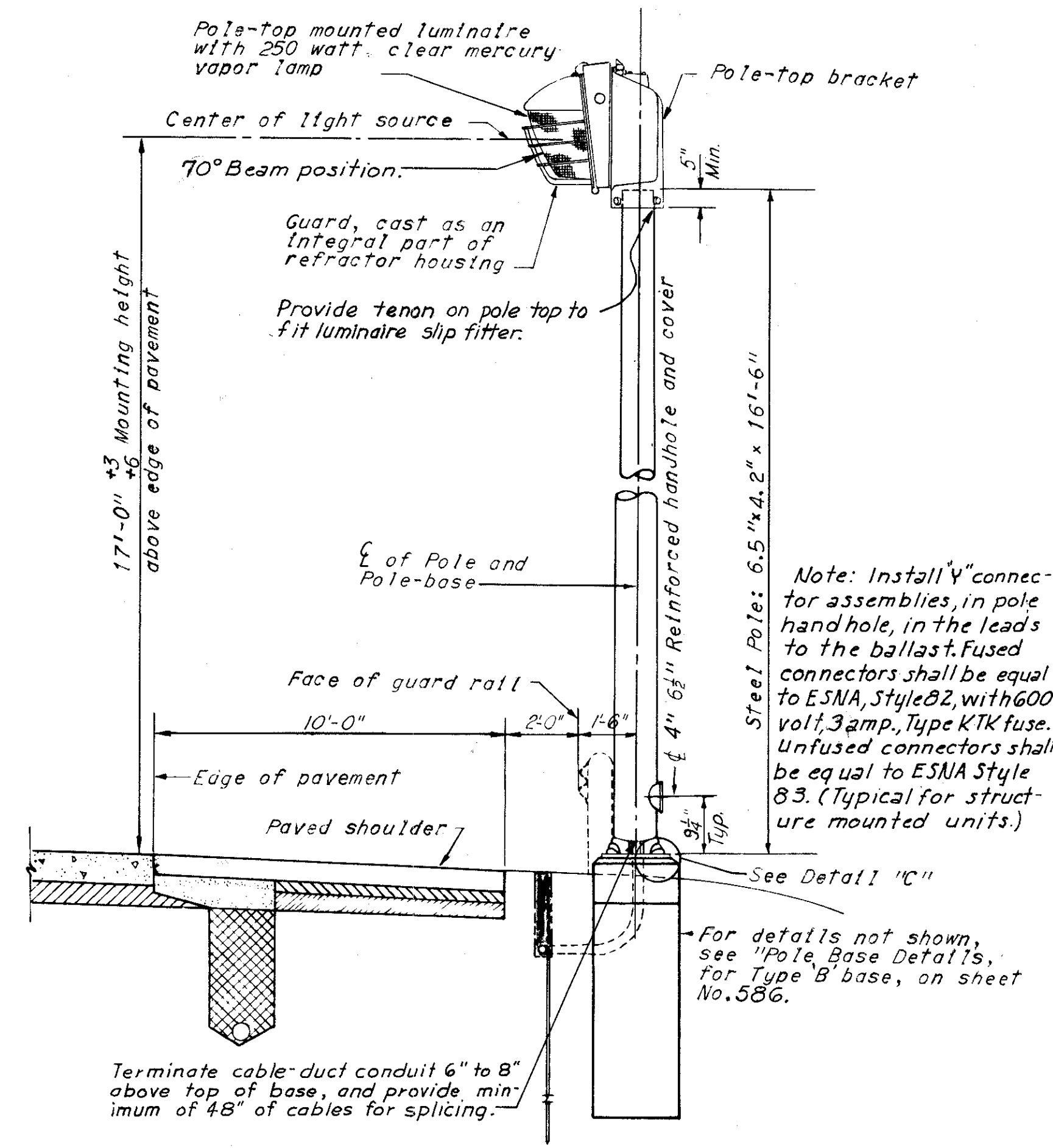
**N.B. JENNINGS UNDER N.B. MEDINA  
LOWER BRIDGE LIGHT STANDARD SUPPORT DETAILS**  
Scale: 1"=1'-0"



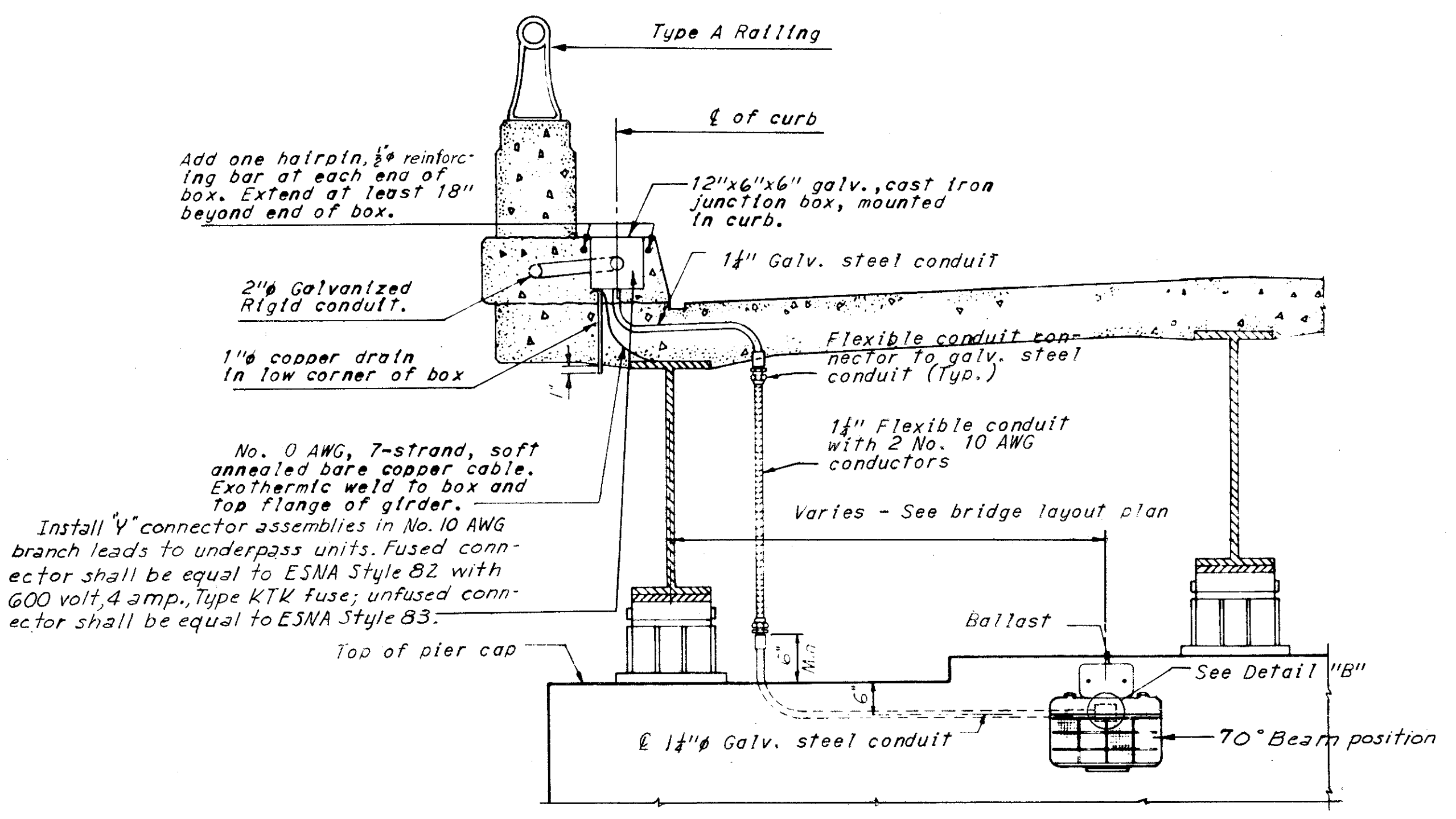
SECTION THRU DOUBLE DECK BRIDGE  
Scale: 1/2"=1'-0"



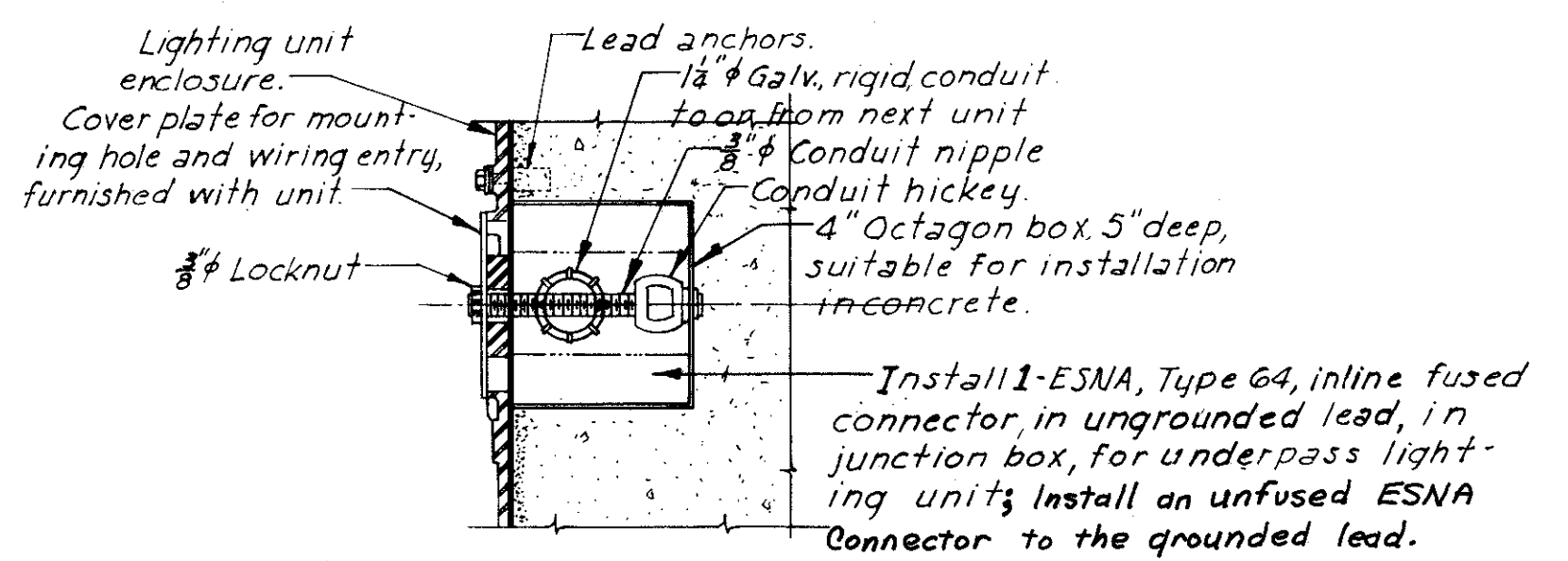
DETAIL "C"  
No Scale



GROUND-MOUNT LIGHTING UNIT FOR JENNINGS UNDER MEDINA  
No Scale

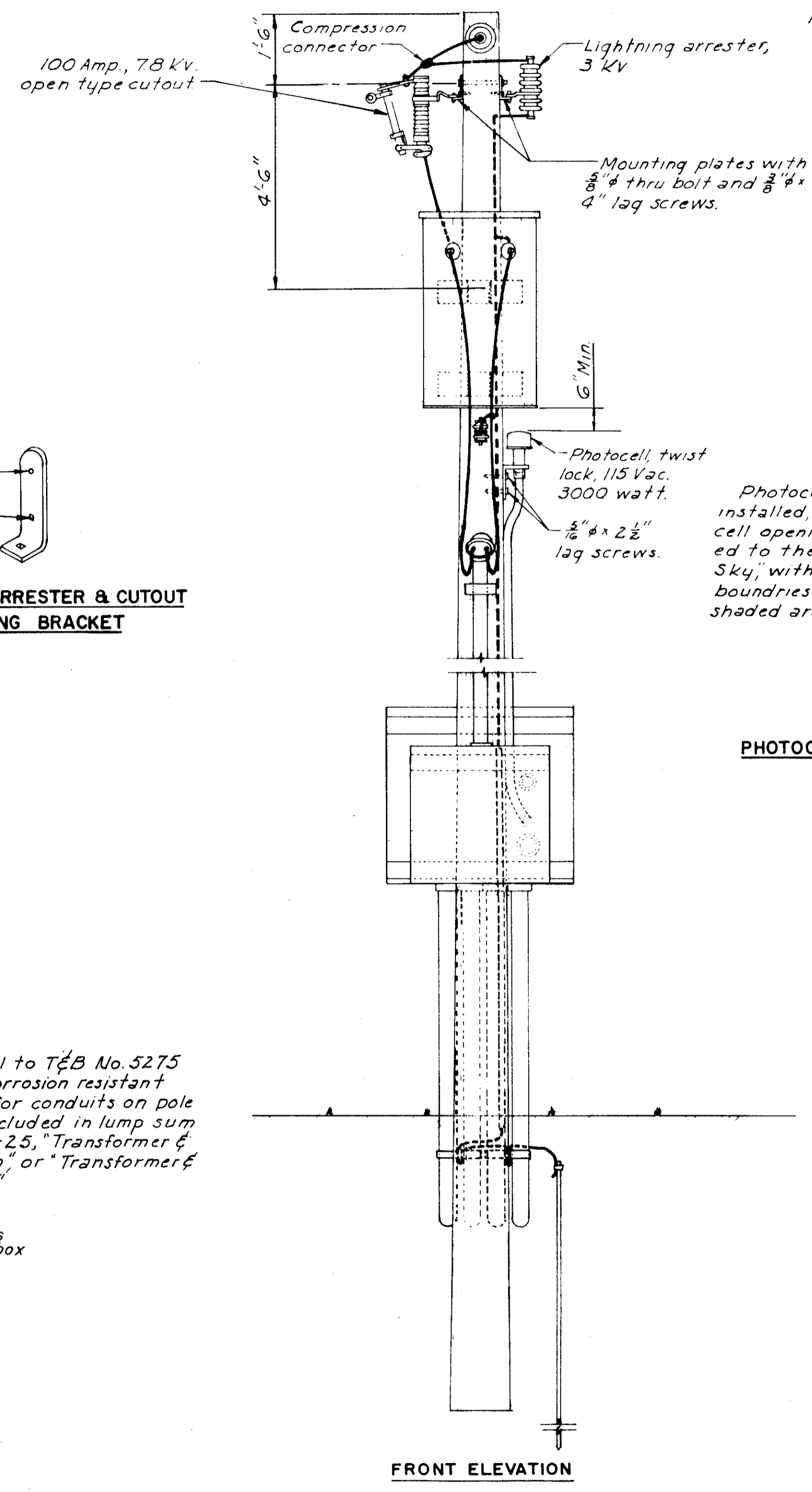
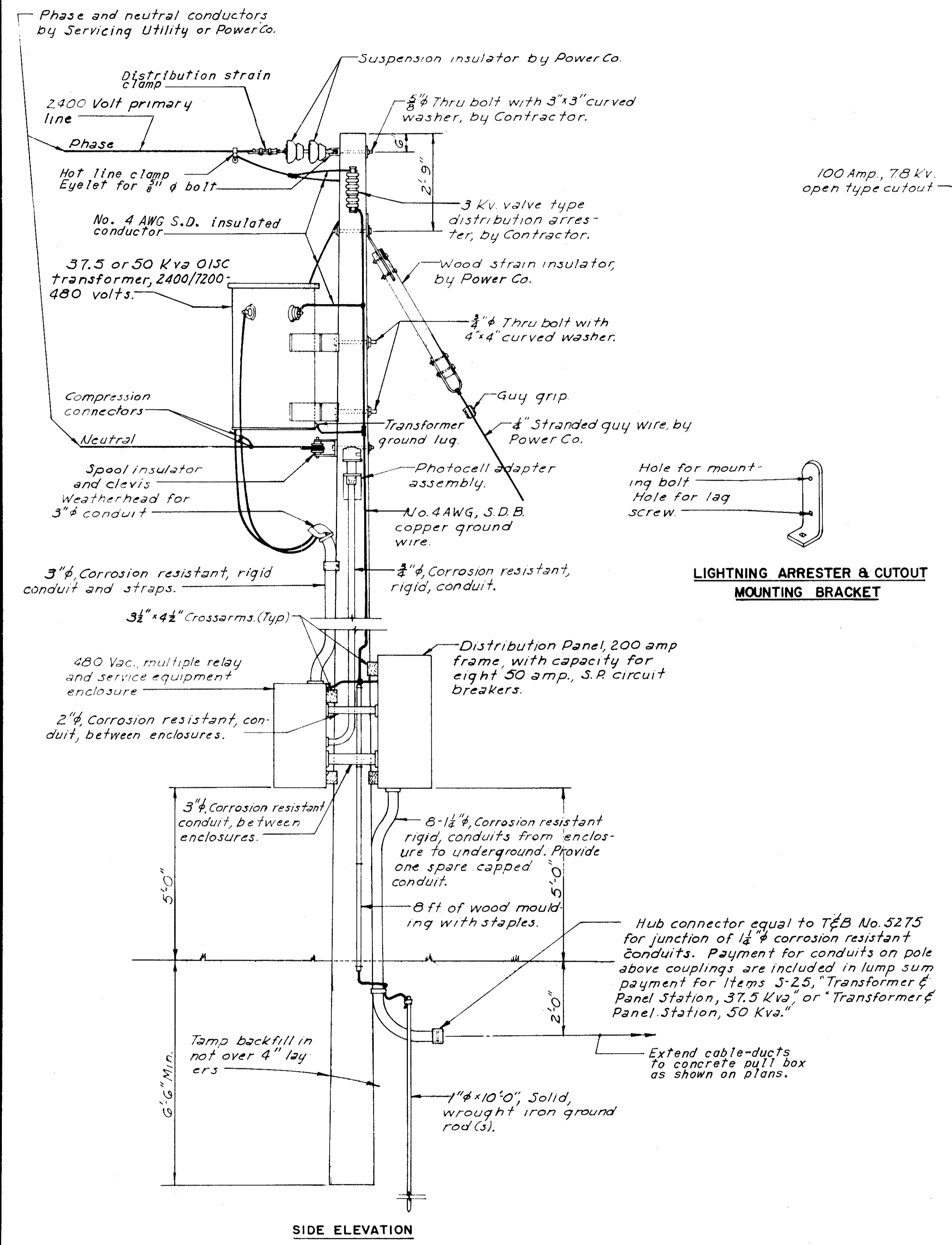


**UNDERPASS LIGHTING UNIT ON PIER CAP**  
Scale: 3/4"=1'-0"  
(ON S.B. JENNINGS UNDER N.B. MEDINA ONLY)  
(BR. NO. CUY. 71-1789R)



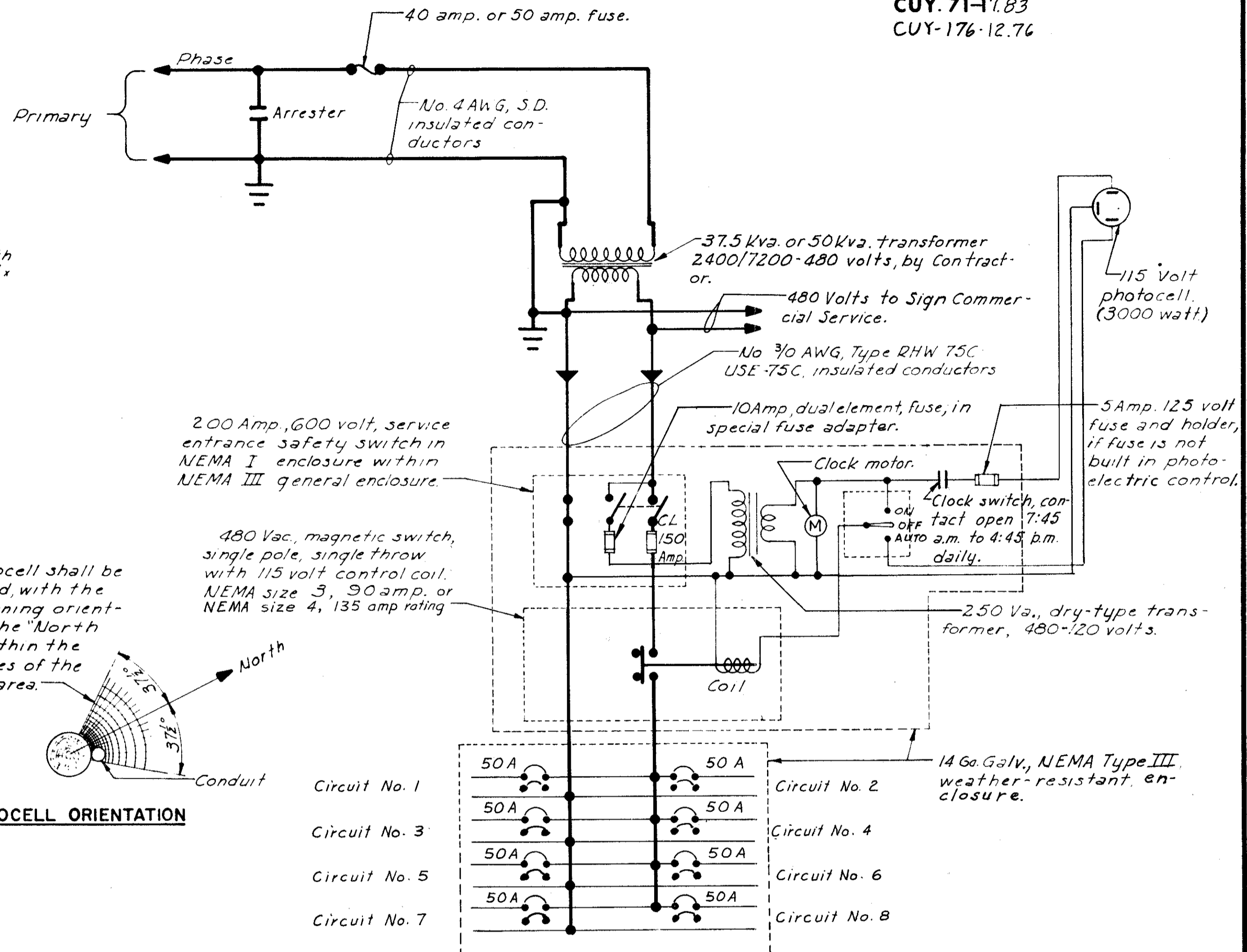
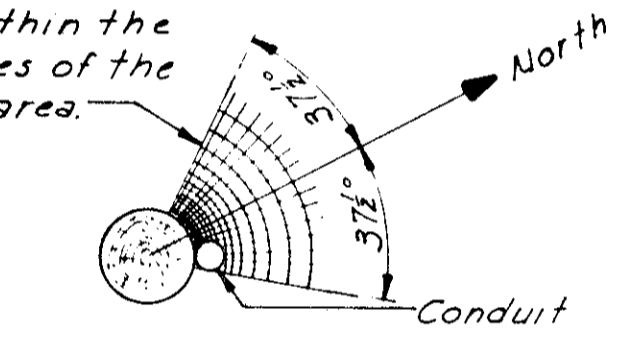
DETAIL "B"  
No Scale

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
**MEDINA-JENNINGS INTERCHANGE**  
CUY. 71-17.83  
CUY-176-12.76



**LIGHTNING ARRESTER & CUTOUT MOUNTING BRACKET**

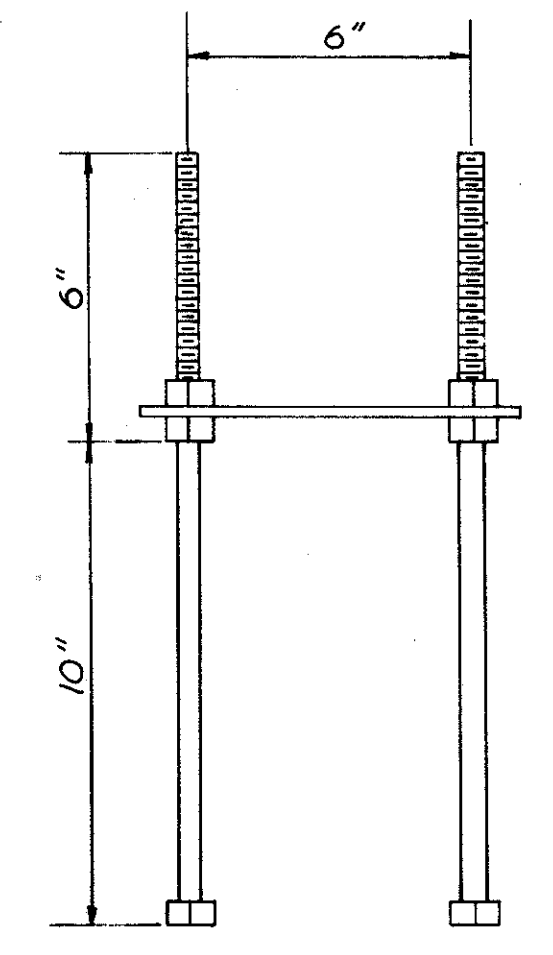
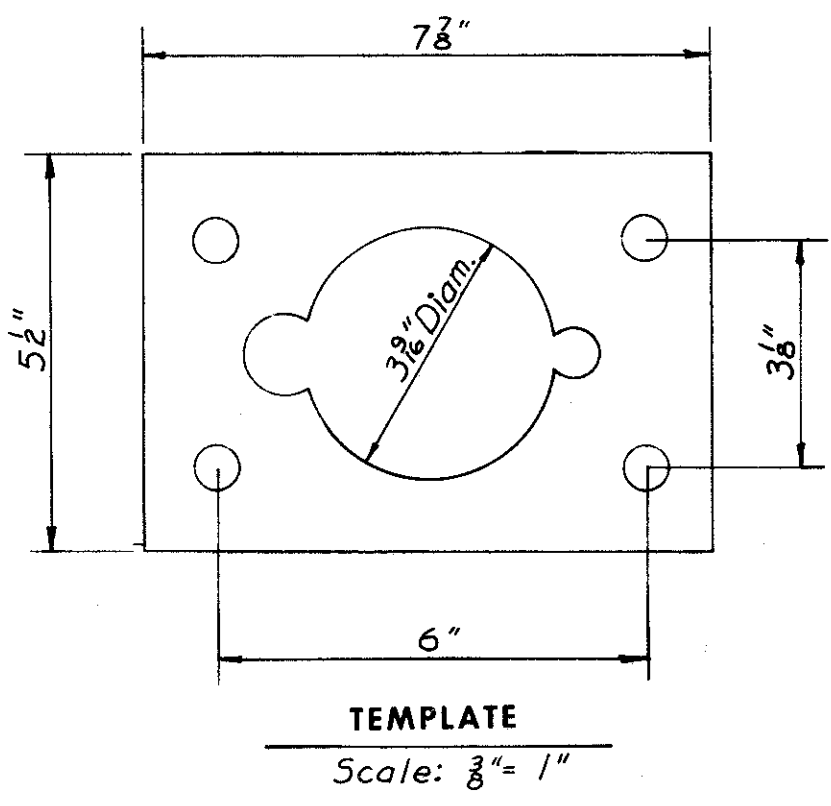
**PHOTOCELL ORIENTATION**



**TRANSFORMER AND PANEL STATION**  
No Scale

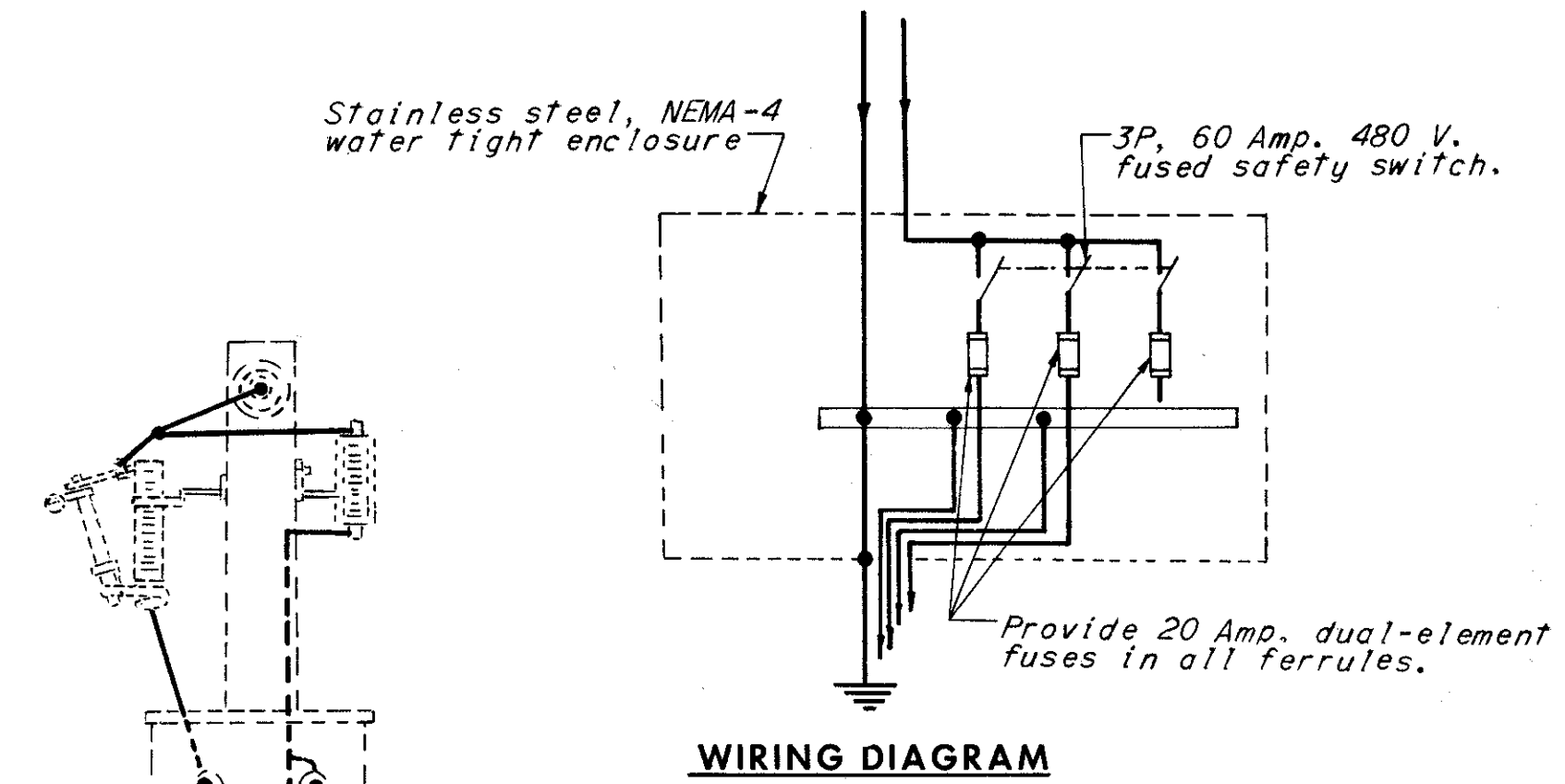
**WIRING DIAGRAM**  
No Scale

CUYAHOGA COUNTY  
CITY OF CLEVELAND  
**MEDINA-JENNINGS INTERCHANGE**  
CUY 71-17.83  
CUY-176-12.76

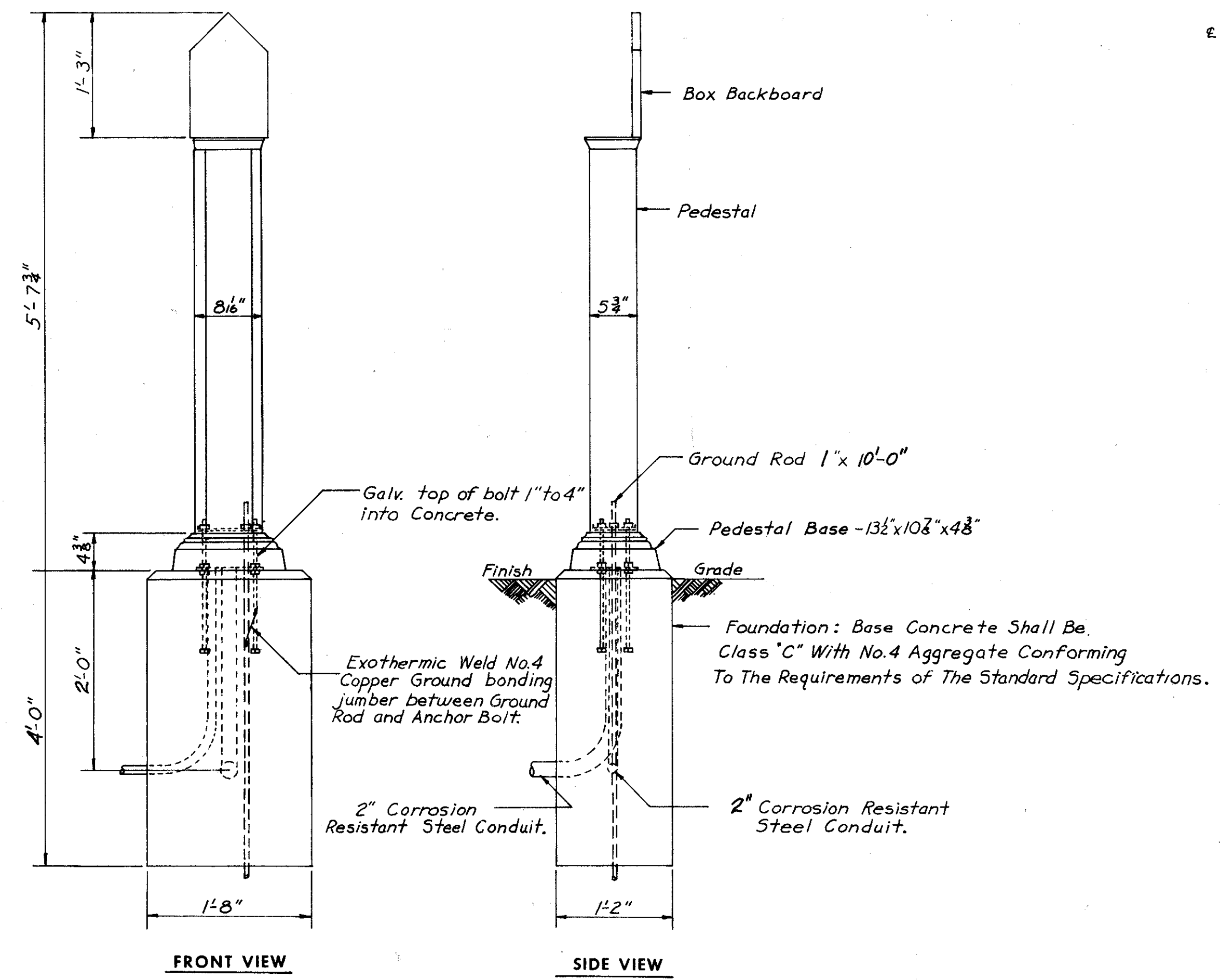


Anchor bolt steel shall have minimum yield of 50,000 psi 70,000 psi ultimate strength.

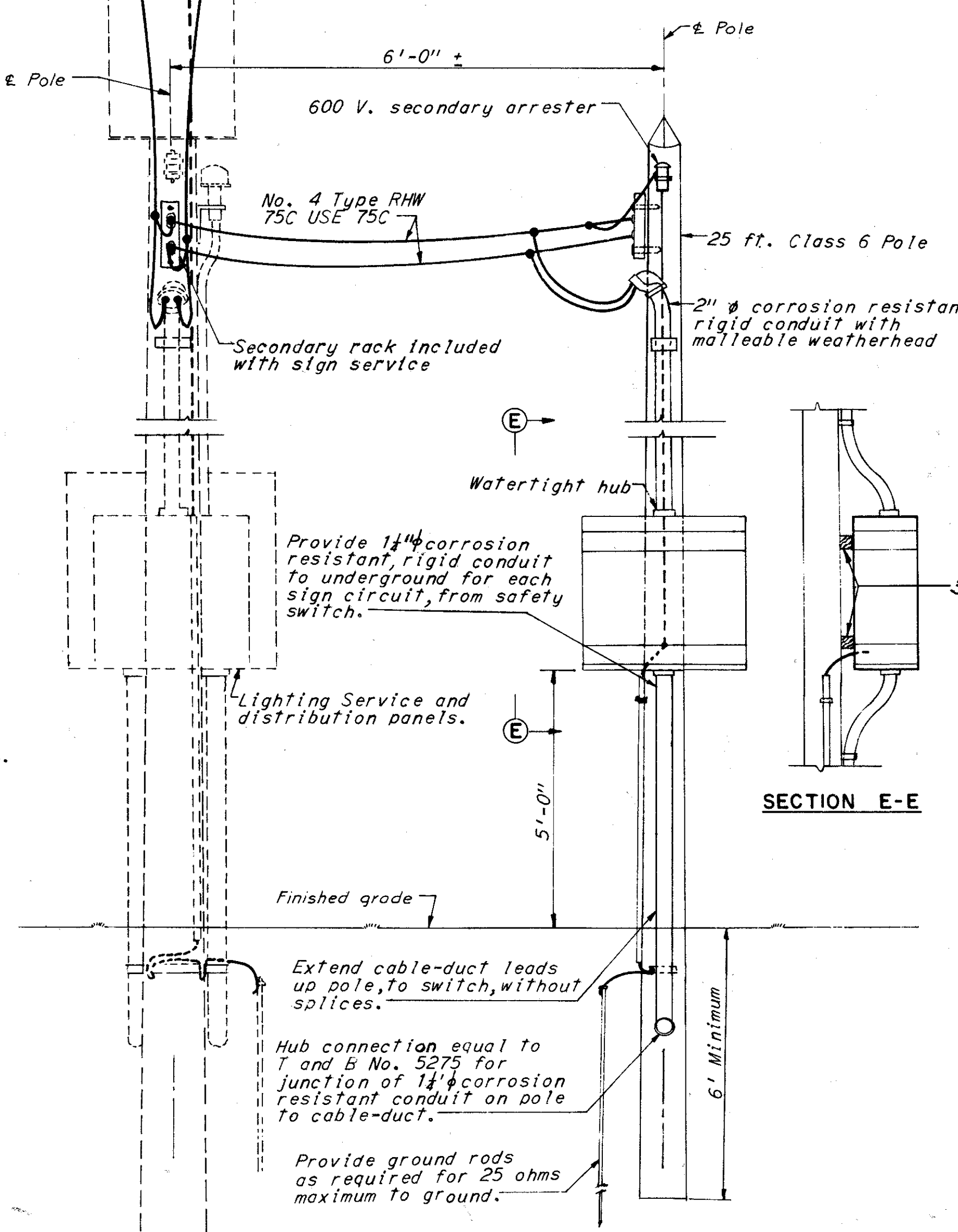
**TEMPLATE AND BOLT ASSEMBLY.**  
Scale: 3"=1'-0"



**WIRING DIAGRAM**

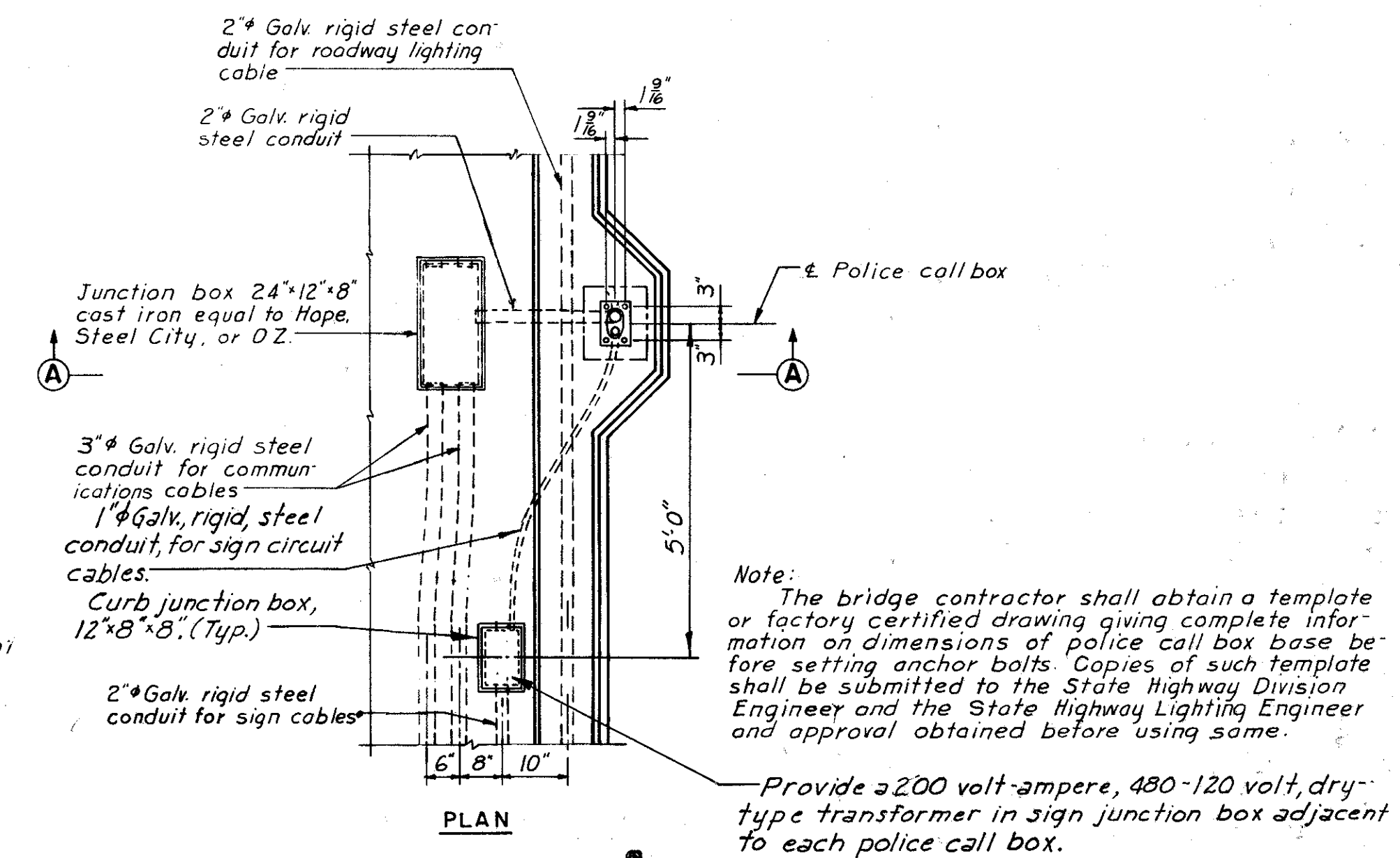


**POLICE CALL BOX FOUNDATION BASE**  
Scale: 1"=1'-0"

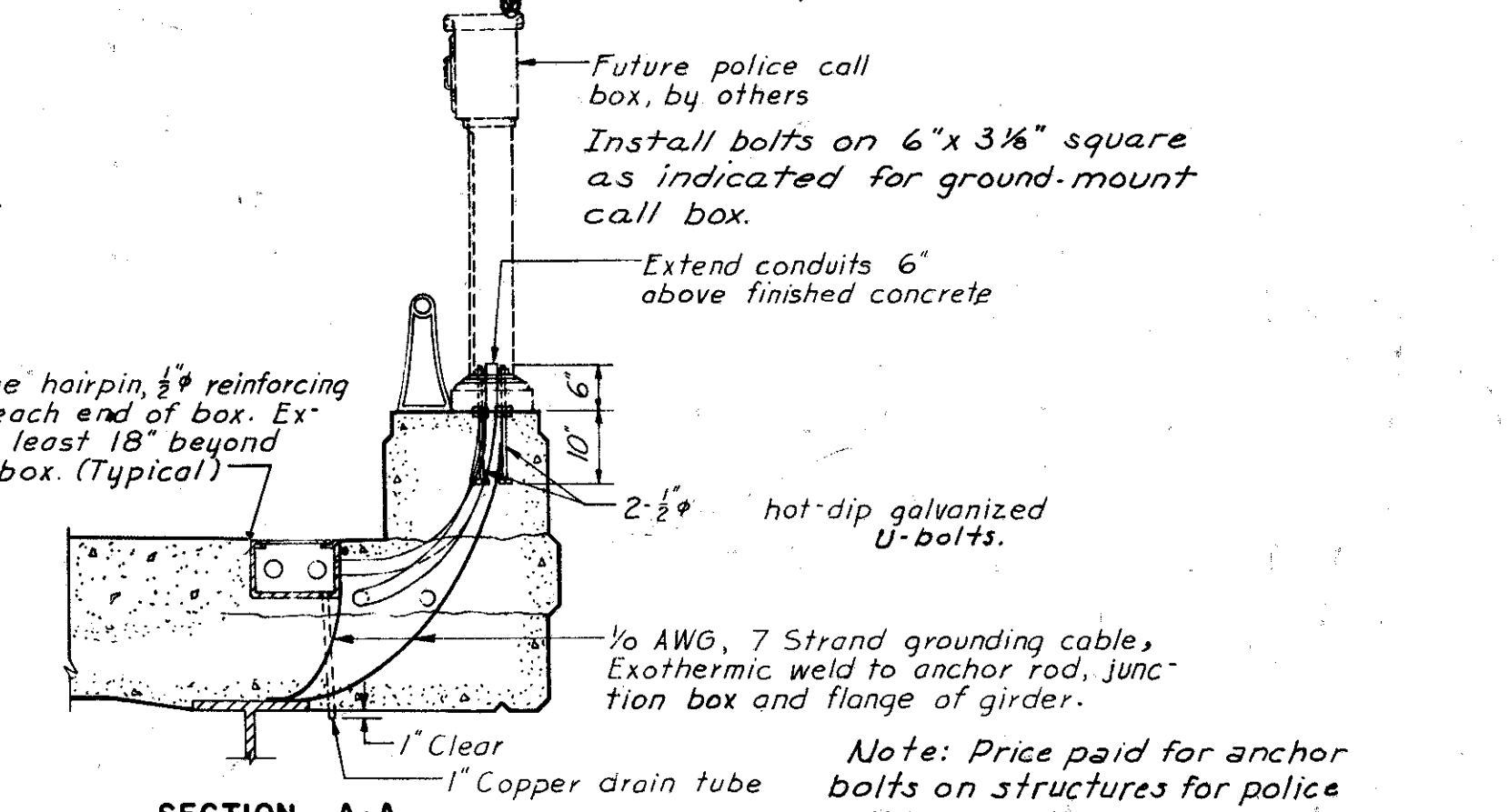


**TRANSFORMER AND PANEL STATION**  
No Scale

**SIGN COMMERCIAL ELECTRIC SERVICE**  
No Scale



**PLAN**



**SECTION A-A**  
**POLICE CALL BOX ON CUY-71-1826**  
Scale: 1/2"=1'-0"

Note: Price paid for anchor bolts on structures for police call boxes will be price paid for set of two Item S-25; Pole Anchor Bolts on Structure of 2" bolts required for one anchor base.

JENNINGS ROAD DETOUR CURVE DATA

P.C. Sta. = 10+00.00 P.C.C. Sta. = 11+69.59 $\Delta = 5^{\circ}05'16''$ $D = 3^{\circ}00'00''$ $R = 1909.86'$ $T = 84.85'$ $L = 169.59'$ $E = 1.88'$	P.C.C. Sta. = 11+69.59 P.T. Sta. = 21+74.79 $\Delta = 20^{\circ}06'14''$ $D = 2^{\circ}00'00''$ $R = 2864.79'$ $T = 507.82'$ $L = 1005.20'$ $E = 44.66'$	P.C. Sta. = 35+08.39 P.T. Sta. = 38+32.14 $\Delta = 8^{\circ}05'38''$ $D = 2^{\circ}30'00''$ $R = 2291.83'$ $T = 162.15'$ $L = 323.76'$ $E = 5.73'$	P.C. Sta. = 41+12.39 P.T. Sta. = 43+75.08 $\Delta = 13^{\circ}08'06''$ $D = 5^{\circ}00'00''$ $R = 1145.92'$ $T = 131.93'$ $L = 262.70'$ $E = 7.57'$
---	---	--	---

CURVE DATA  
CLARK AVE RAMP

P.C. Sta. = 12+16.58 P.T. Sta. = 18+28.03 $\Delta = 122^{\circ}17'27''$ $D = 20^{\circ}00'00''$ $R = 286.48'$ $T = 519.93'$ $L = 611.45'$ $E = 307.15'$	P.C. Sta. = 59+42.91 P.T. Sta. = 61+27.91 $\Delta = 10^{\circ}00'00''$ $D = 10^{\circ}00'00''$ $R = 572.96'$ $T = 93.31'$ $L = 185.00'$ $E = 7.55'$
--	--

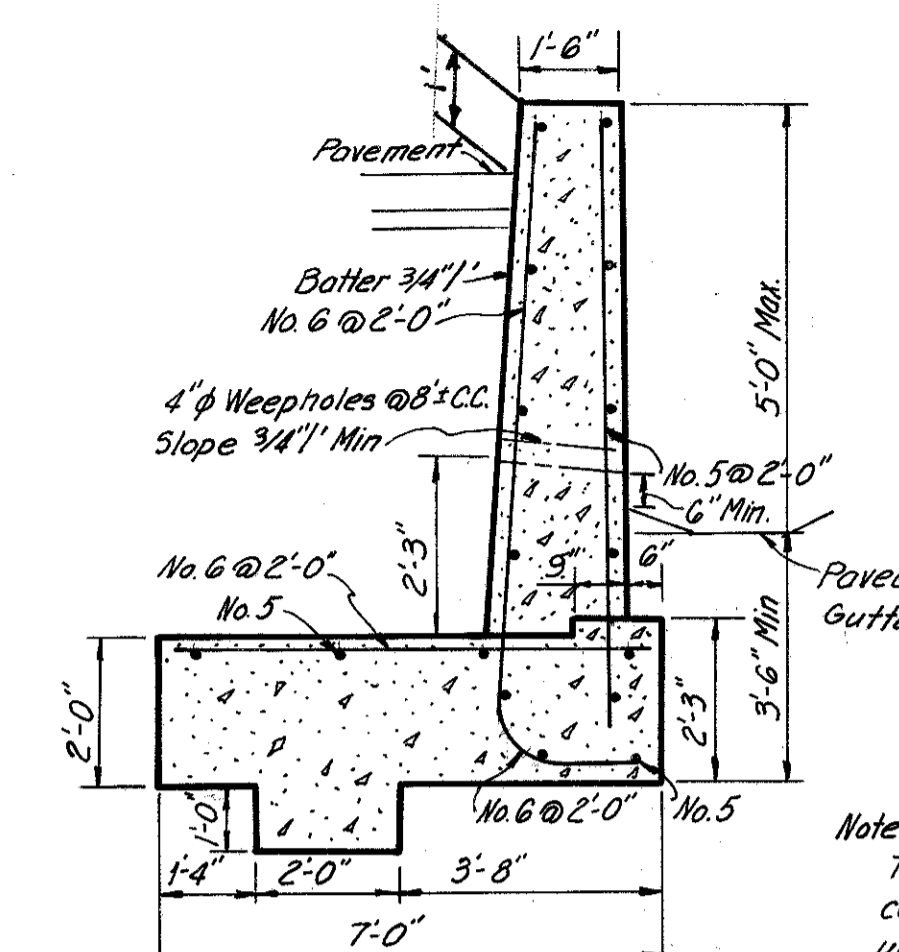
P.C. Sta. = 46+87.27 P.T. Sta. = 52+89.78 $\Delta = 45^{\circ}11'17''$ $D = 7^{\circ}30'00''$ $R = 763.94'$ $T = 317.91'$ $L = 602.51'$ $E = 63.51'$	P.C. Sta. = 59+42.91 P.T. Sta. = 61+27.91 $\Delta = 10^{\circ}00'00''$ $D = 10^{\circ}00'00''$ $R = 572.96'$ $T = 93.31'$ $L = 185.00'$ $E = 7.55'$
---	--

# DETOUR SCHEMATIC PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
CUY - 71-17.83  
CUY - 176-12.76

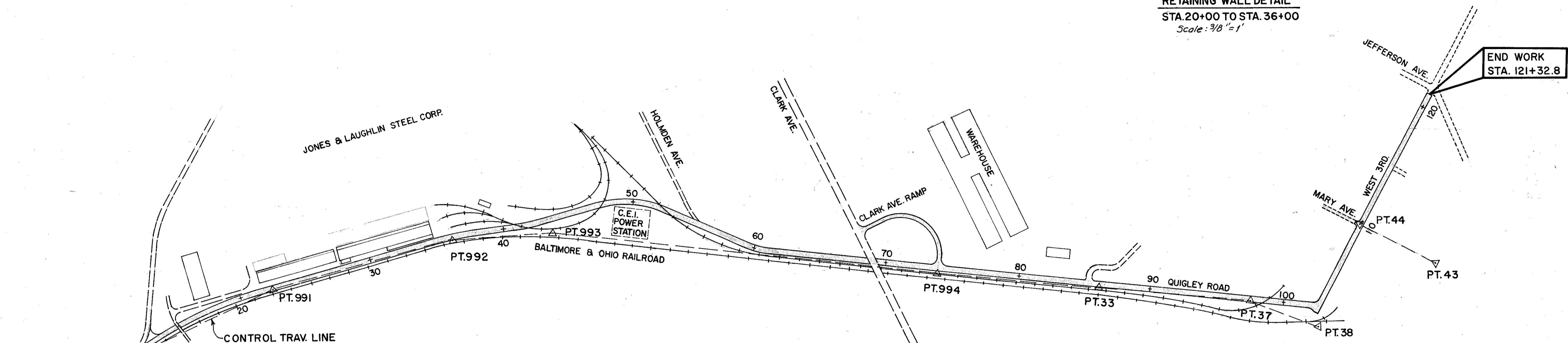
591  
646  
1  
19



Note: Contractor to provide vertical Expansion joints in wall at 84'-0" ctrs. and vertical contraction joints at 1/3 points between expansion joints. Joints are required in footings only at change in bottom of footing elevation. The expansion joints shall be filled with 1" preformed expansion joint filler (Sec. M-10.02) horizontal reinforcing shall stop 2" clear of the joints. Contractor shall provide 12"x12" preformed sealing strip (M-10.01) in 13"x3/4" recess in back face of wall at all wall joints.

Note: The key shall be placed in a carefully made trench against undisturbed earth.

RETAINING WALL DETAIL  
STA. 20+00 TO STA. 36+00  
Scale: 3/8" = 1'



NOTES

Construction of the Jennings Road Detour shall include new pavement, shoulders, guardrail, fencing, drainage and water items from existing Jennings Road through the Jones and Laughlin Steel Corporation property to and along Quigley Road, widening and resurfacing of Quigley Road to West 3rd Street, West 3rd Street to Jefferson Avenue. Construction of the Clark Avenue Ramp from Clark Avenue to Quigley Road is also included. See details on following sheets. The retaining wall from Sta. 20+00 to 36+00 is also included.

The Contractor shall maintain the detour road throughout the life of the contract.

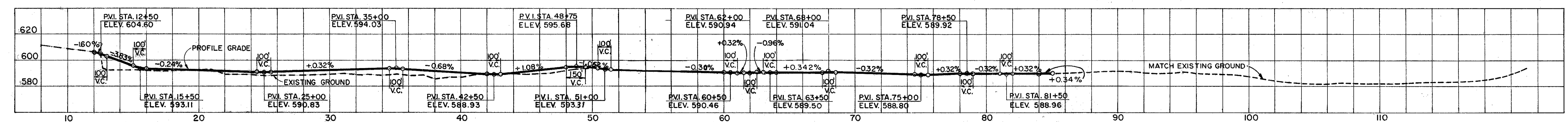
The locations of the underground utilities shown on the plans have been obtained by diligent field checks and searches of available records. It is believed that they are essentially correct, but the State of Ohio makes no guarantee as to their accuracy or completeness.

All work required for adjusting railroads, including grade crossings, will be done by others, except the new grade crossing at Sta. 51+90. It is the intention of the lump sum bid item for the construction of this Detour Road to include any additional items deemed necessary by the Engineer for the completion of this item to be included in the price bid for Item 5-15, Detour Road.

All of the detour road construction shall remain in place, except for the ramp from Quigley Rd. to Clark Ave.

All Waterwork shall be performed in accordance with the specifications as shown on Sheets 512 thru 520.

Payment for all of the above, except removal of Clark Ave. Ramp shall be included in the lump sum bid for Item 5-15 Temporary Run-Around Road As Per Plan. Removal of the Clark Ave. Ramp shall be paid for as Item 5-15 Removal of Temporary Run-Around Road.



MADE LVM DATE 10-13-64 TRACED DATE  
CHECKED RHA DATE 12-22-64 SCALE Hor. 1"=400', Vert. 1"=40'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK



# CONTROL DATA

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

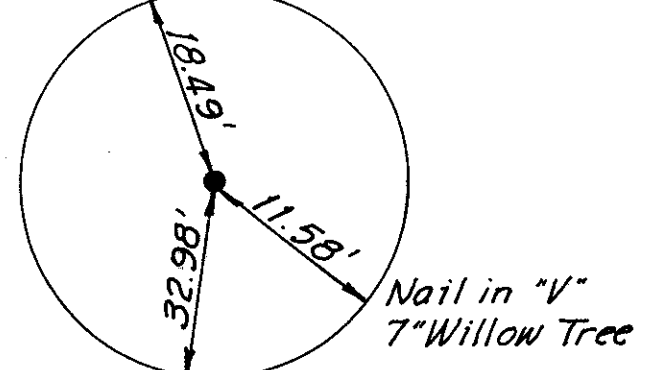
592  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

2  
19



"X" on bolt of Guard Rail post  
(Post opposite Retaining Wall end)

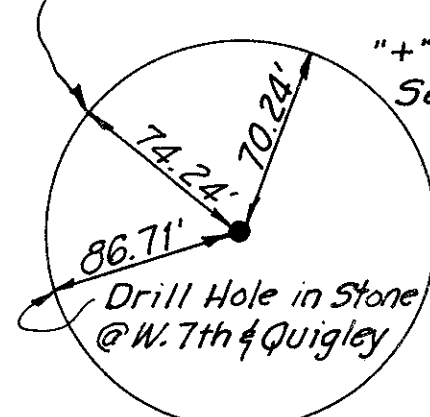


Nail in "V"  
7" Willow Tree  
PK Nail in sidewalk joint

**POINT 75**

East side of Jennings Rd @ Retaining Wall. Stud in sidewalk with screw inserted into it.

"V" Chiseled in S.E. leg  
of Transmission Tower



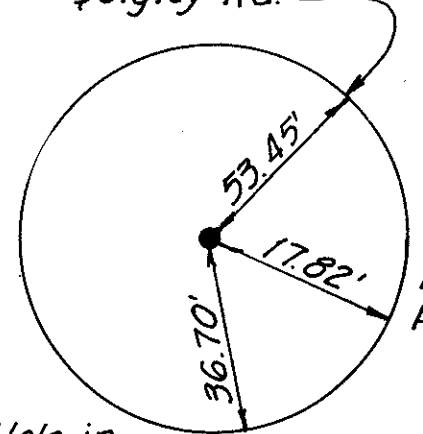
"+" Chiseled in  
Sewer M.H. Frame

Drill Hole in Stone  
@ W. 7th & Quigley

**POINT 33**

Cast Bronze HNTB Survey Marker on end of Iron Rod driven into ground with concrete poured around it. (Near W. 7th & Quigley)

PK Nail in Joint  
Quigley Rd.



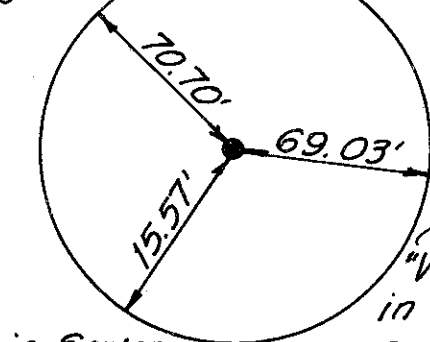
PK Nail set in  
Pavement Crack

Drill Hole in  
Stone in Quigley

**POINT 37**

Stud driven into concrete pavement with screw inserted into it.

S.E. edge of con-  
crete storage box

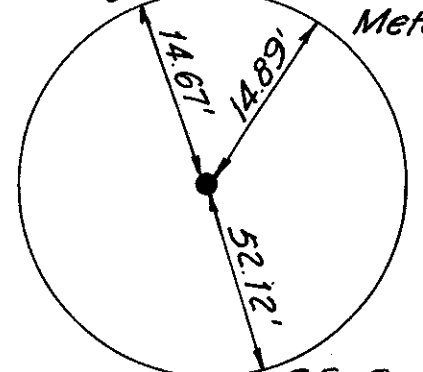


"+" Chiseled in Sewer  
M.H. Frame.

**POINT 38**

Cast Bronze HNTB Survey Marker on Steel Rod set in Concrete. (Near intersection of W. 3rd & Quigley)

"+" on N.E. top Flange  
Bolt of Fire Hyd.

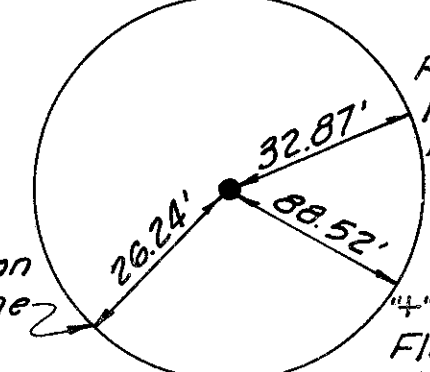


"+" on frame of  
Metal Grille

S.E. Screw at Base  
of Metal Light Pole

**POINT 43**

Cast Bronze HNTB Survey Marker on Steel Rod set in Concrete. (East side of Cuyahoga River in Sahio River Pumping Station.)



PK Nail set  
in Asphalt  
Parking Lot

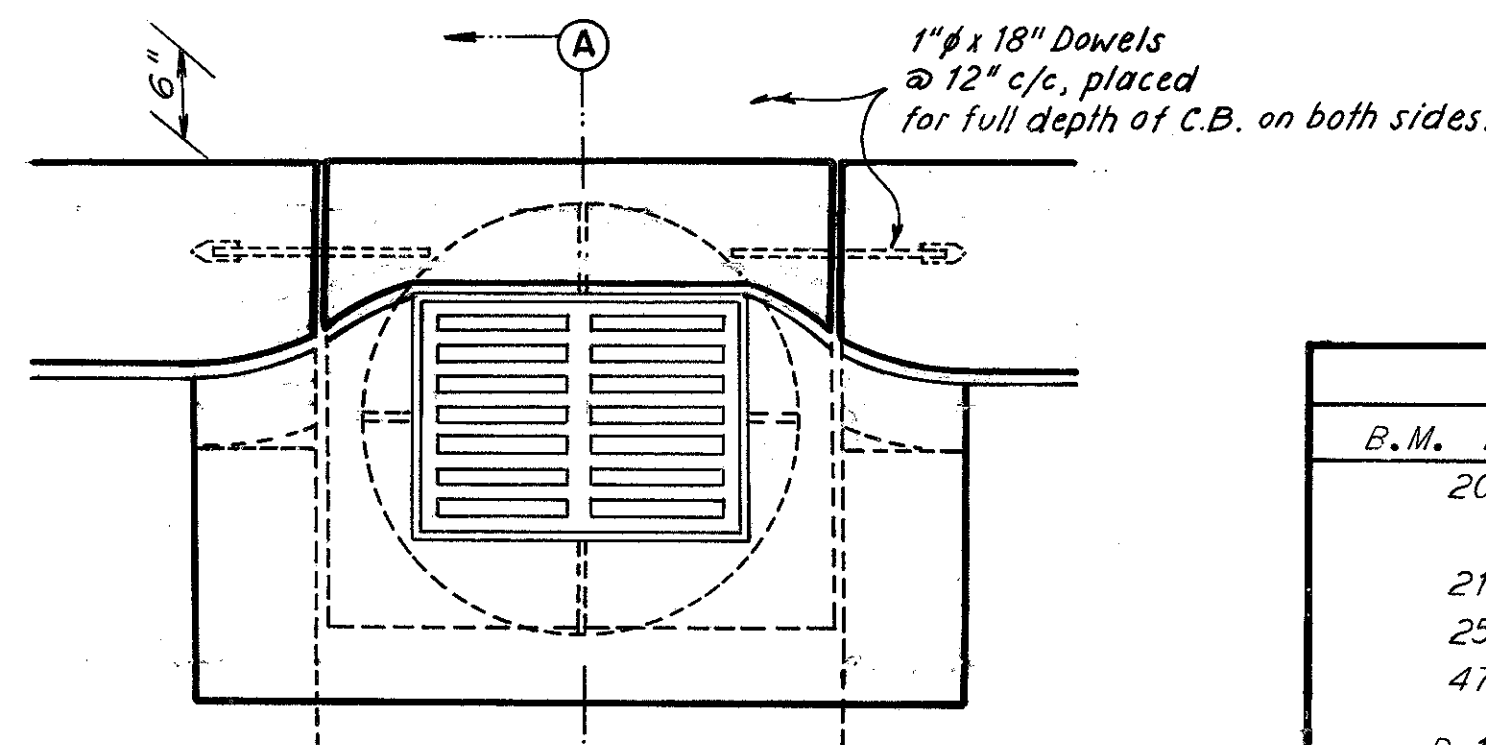
"+" Chiseled on  
Manhole Frame

"+" on N.E. top  
Flange Bolt  
of Fire Hyd.

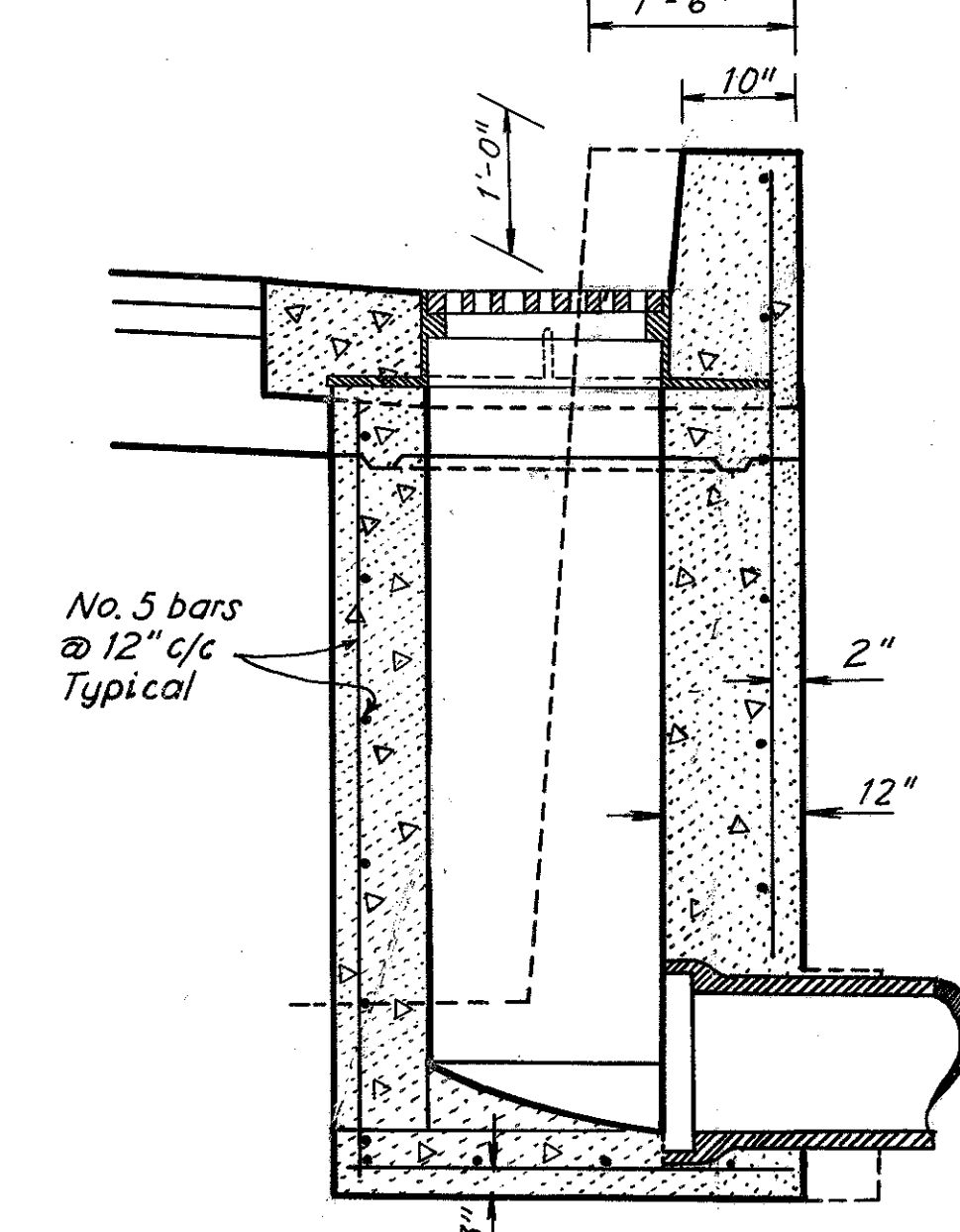
**POINT 44**

Stud drilled into concrete pavement with screw inserted into it. (In intersection of W. 3rd & Mary)

LINE	STATION	P.C.		P.I.		P.T. or P.C.C.		Δ	D	R	T	L	E		
		N. COORD.	E. COORD.	STATION	N. COORD.	E. COORD.	STATION							N. COORD.	E. COORD.
Jennings Road Detour	10+00.00	652,752.16	222,671.26	10+84.85	652,833.59	222,647.38	11+69.59	652,916.81	222,630.84	5°05'16"	3°00'00"	1,909.86'	84.85'	169.59'	1.88'
Jennings Road Detour	11+69.59	652,916.81	222,630.84	16+77.41	653,414.90	222,531.88	21+74.79	653,916.65	222,610.16	20°06'14"	2°00'00"	2,864.79'	507.82'	1,005.20'	44.66'
Jennings Road Detour	35+08.39	655,234.31	222,815.72	36+70.54	655,394.52	222,840.72	38+32.14	655,549.62	222,888.02	8°05'38"	2°30'00"	2,291.83'	162.15'	323.76'	5.73'
Jennings Road Detour	41+12.39	655,817.67	222,969.77	42+44.31	655,943.86	223,008.26	43+75.08	656,075.49	223,017.06	13°08'06"	5°00'00"	1,145.92'	131.93'	262.70'	7.57'
Jennings Road Detour	46+87.27	656,386.98	223,037.89	50+05.18	656,704.18	223,059.10	52+89.78	656,912.68	223,299.08	45°11'17"	7°30'00"	763.94'	317.91'	602.51'	63.51'
Jennings Road Detour	59+42.91	657,341.06	223,792.11	61+27.91	657,402.26	223,862.55	61+27.91	657,482.64	223,909.93	18°30'00"	10°00'00"	572.96'	93.31'	185.00'	7.55'
Clark Avenue Ramp	12+16.58	658,342.87	224,059.76	17+36.51	658,862.55	224,043.64	18+28.03	658,598.56	224,491.56	122°17'27"	20°00'00"	286.48'	519.93'	611.45'	307.15'



**PLAN**



Scale: 3/4" = 1'  
**SECTION A-A**

**MODIFIED STD. NO. 6 CATCH BASIN**  
Note: For details not shown see Std. Drwg.

**BENCHMARK ELEVATION**

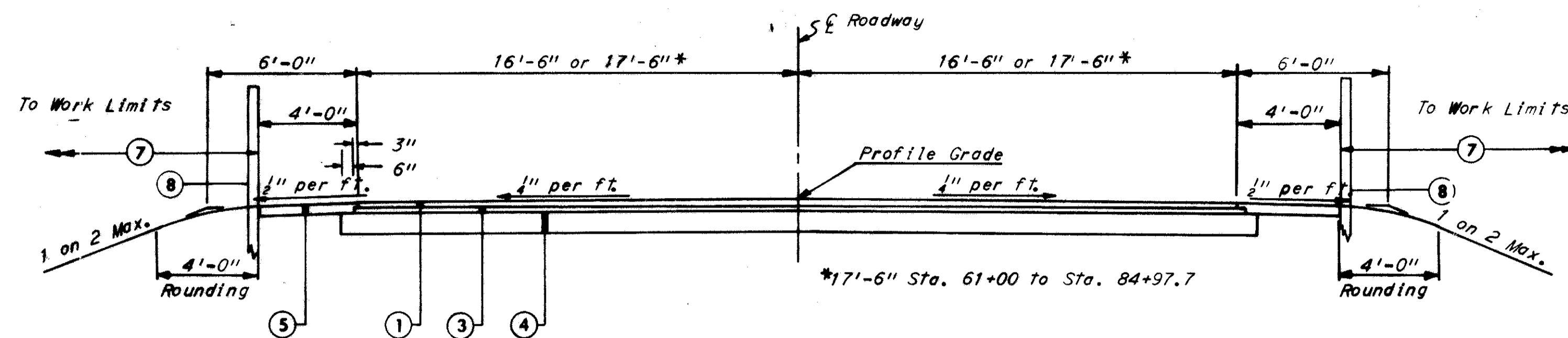
B.M. No.	Elevation	Description
20	594.477	" " Cut S.E. Corner Concrete Base S.E. Corner of Tower N.E. Corner W. 7th and Quigley Road
21	591.319	" " N.W. Corner of Concrete @ N.W. Corner of Air Products and Chemicals Inc. fence
25	584.917	Top N.E. Flange Bolt Top F. Hyd. N. side of 3rd and Quigley
47	613.731	Top N.E. Flange Bolt Top F. Hyd. West side Jennings 225'+ North of Traverse Point 76
D-104	593.772	" " Cut-in S.E. Corner of Concrete Base of S.E. leg of Tower 50'+ N.W. of Quigley Avenue and 225'+ N.E. of Holmden Avenue
D-105	592.288	R.R. Spike S.E. side of Power Pole No. 615106 12'+ South of Clark Avenue Bridge on West side Quigley Avenue
D-106	590.922	Top N.E. Flange Bolt Fire Hydrant West side of Quigley in front of 3020 Quigley Avenue
D-107	583.776	R.R. Spike West side of Power and Telephone Pole No. 64702 Across from 2530 West 3rd Street East side of West 3rd Street 25' Right of Sta. 112+15
D-108	598.677	Top of N.W. Flange Bolt of Hydrant on N.E. Corner at 3rd Street and Jefferson Avenue

**TRAVERSE POINTS**

Traverse Point No.	Distance		Length	Bearing	Coordinates	
	From	To			North	East
75					652,909.36	2,222,647.12
991	75	991	1,084.57	N 01°06'02" W	653,993.72	2,222,626.29
992	991	992	1,378.74	N 09°31'30" E	655,353.46	2,222,854.44
993	992	993	740.58	N 20°57'47" E	656,045.02	2,223,119.40
994	993	994	2,896.06	N 30°31'09" E	658,539.86	2,224,590.09
33	994	33	1,243.38	N 29°03'59" E	659,626.66	2,225,194.15
37	33	37	1,082.28	N 28°23'42" E	660,578.73	2,225,708.88
38	37	38	585.37	N 43°59'59" E	660,999.81	2,226,115.47
44					661,614.05	2,225,570.73
43	44	43	628.64	N 49°18'23" E	662,023.93	2,226,047.38

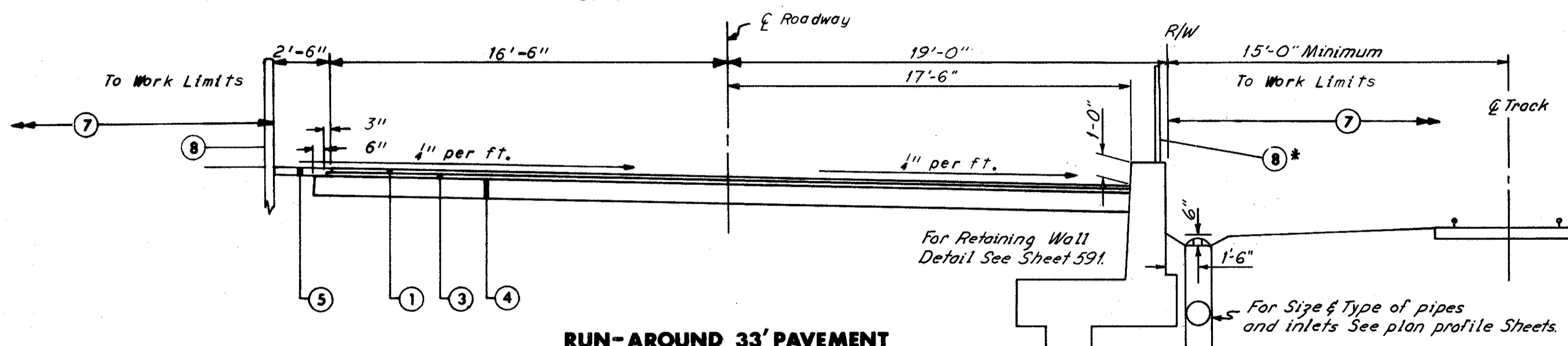
SCALE \_\_\_\_\_ **HOWARD, NEEDLES, TAMMEN & BERGENDOFF**  
MADE DJS DATE 12-20-64 CONSULTING ENGINEERS  
TRCD. \_\_\_\_\_ DATE \_\_\_\_\_  
CKD. LVM DATE 12-24-64 KANSAS CITY CLEVELAND NEW YORK

# TYPICAL SECTIONS



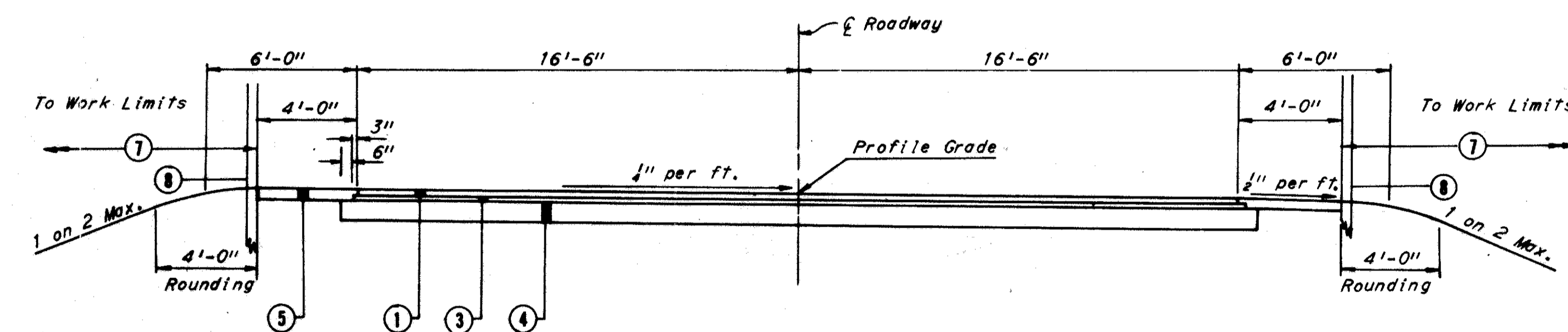
**RUN-AROUND 33' PAVEMENT**  
Sta.13+50 to Sta.15+00  
Sta.37+00 to Sta.60+00  
Sta.61+00 to Sta.84+97.7

\*For Detail of mounting Fence See Sheet 317.

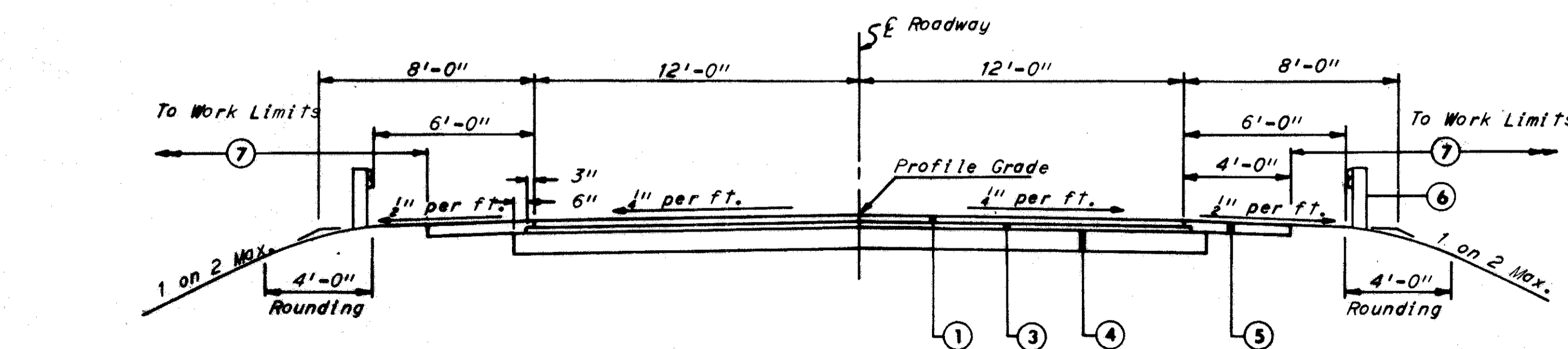


**RUN-AROUND 33' PAVEMENT**  
Sta.20+00 to Sta.36+00

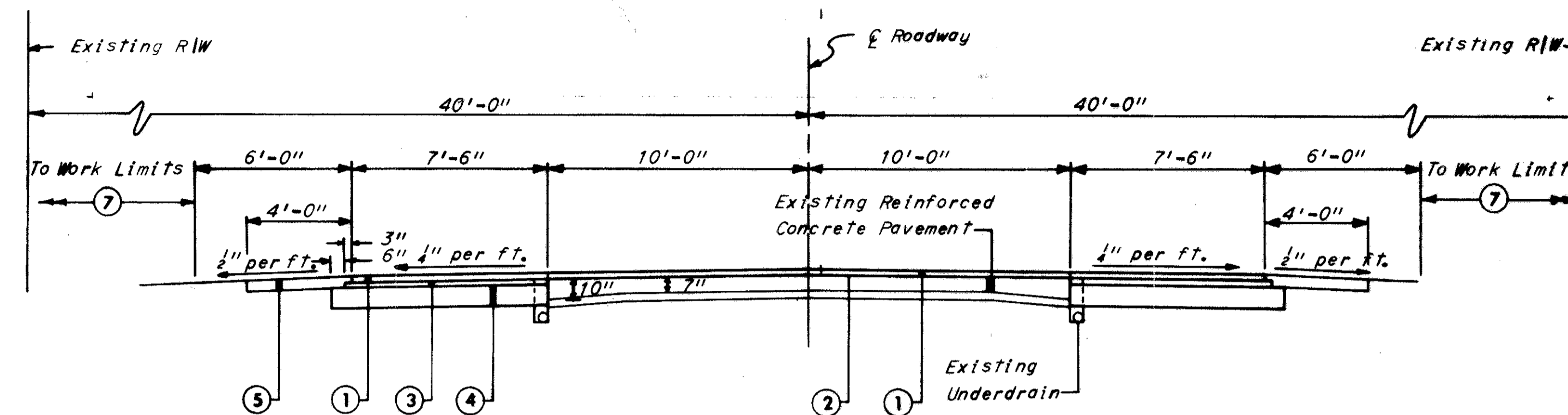
For Retaining Wall Detail See Sheet 591.  
For Size & Type of pipes and inlets See plan profile Sheets.



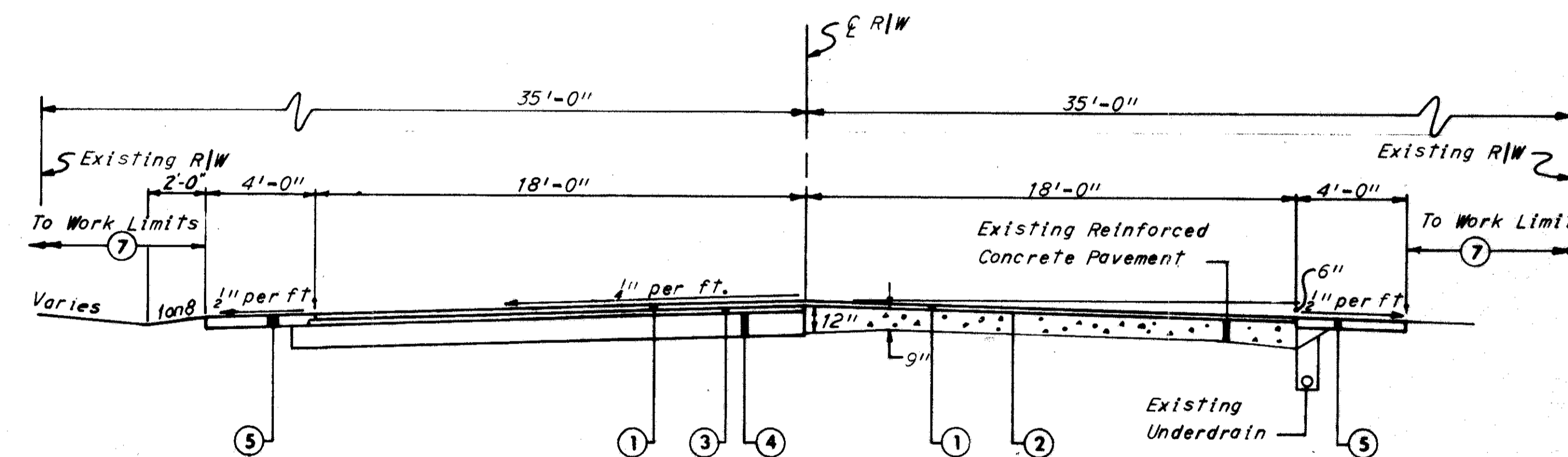
**RUN-AROUND 33' PAVEMENT**  
Sta.16+00 to Sta.19+00



**RAMP**  
**QUIGLEY ROAD TO CLARK AVENUE**



**QUIGLEY ROAD WIDENING**  
Sta.84+97.7 to Sta.102+87.35



**WEST 3RD. STREET WIDENING**  
Sta.102+87.35 to Sta.121+32.8

### LEGEND

- ① Item T-35 2 1/2" Asphaltic Concrete Surface Course, Type A (70-85) Thickness shown is "designed" thickness as described in Sec. T-35.01
- ② Item T-30 Bituminous Tack Coat, Sec. M-5.5, MS-2 or RS-1, or Sec. M-5.2, RC-1 or RC-2, as per Sec. T-30.02, applied at the rate of 0.10 Gal. per Sq. Yd.
- ③ Item B-35 2 1/2" Asphaltic Concrete Leveling Course, (70-85) Thickness shown is "designed" thickness as described in Sec. B-35.01
- ④ Item B-19 10" Aggregate Base Course
- ⑤ Item I-18 5" Stabilized Crushed Aggregate Shoulders and Approaches
- ⑥ Item I-15 Guard Rail Steel Beam Standard Type (Deep)
- ⑦ Item L-9 Seeding and Protecting
- ⑧ Item I-26 Chain Link Fence

### Notes:

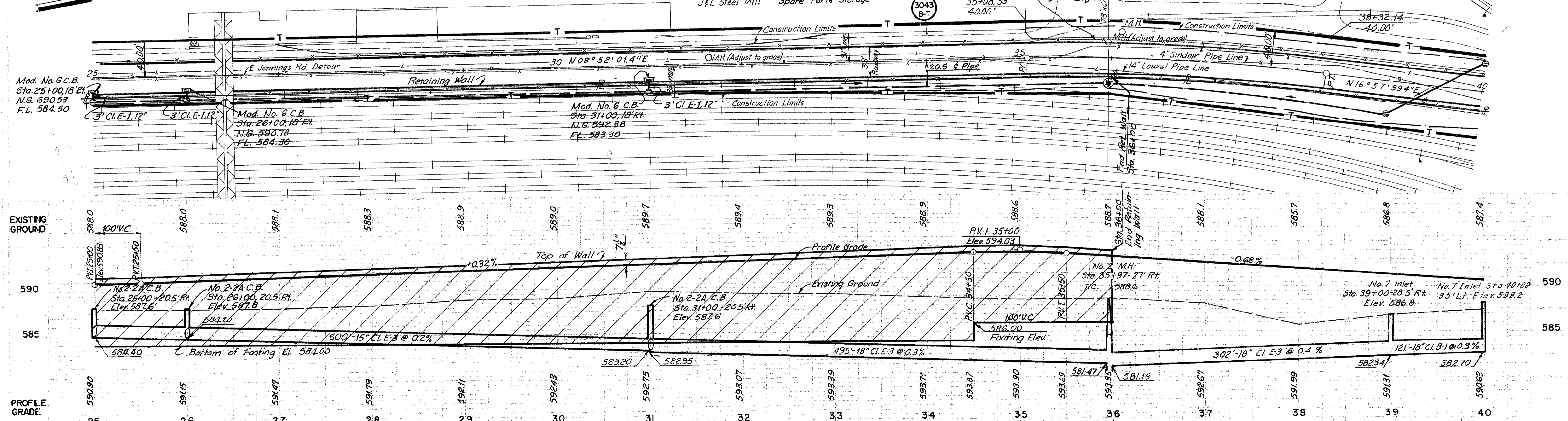
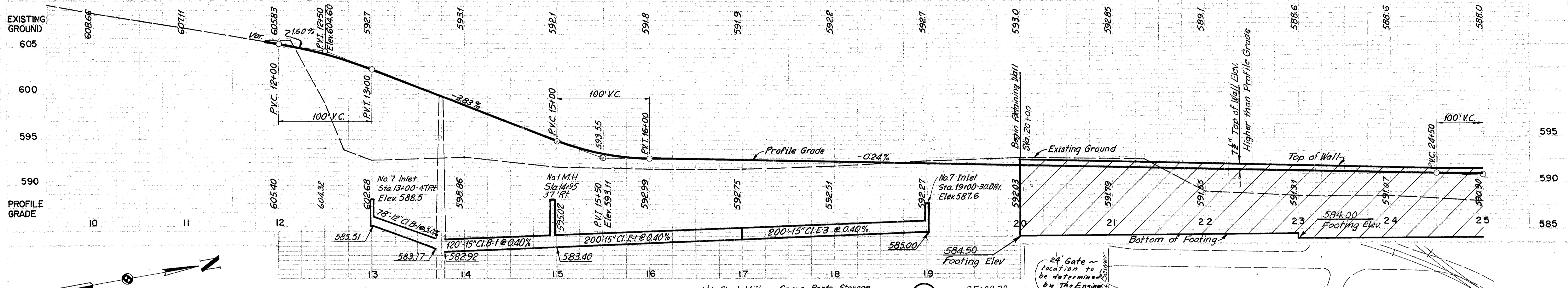
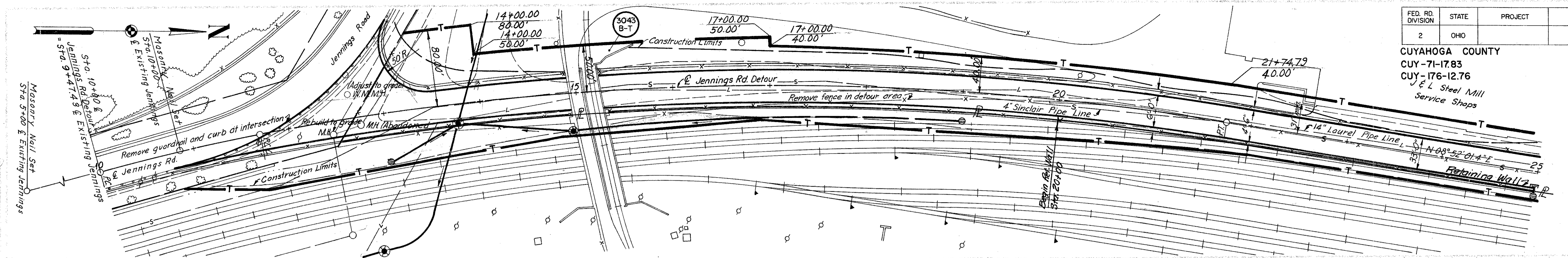
In lieu of Items ① ② ③ and ④ as shown in the Typical Sections, 9" Portland Cement Concrete Pavement, Item T-70 may be used as specified in Section S-15.06, Class A Pavement, of the Construction and Material Specifications.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

594  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76  
 J & L Steel Mill  
 Service Shops

4  
19



HOWARD, NEEDLES TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY, CLIFTON, AND NEW YORK

Rev. 2-23-65

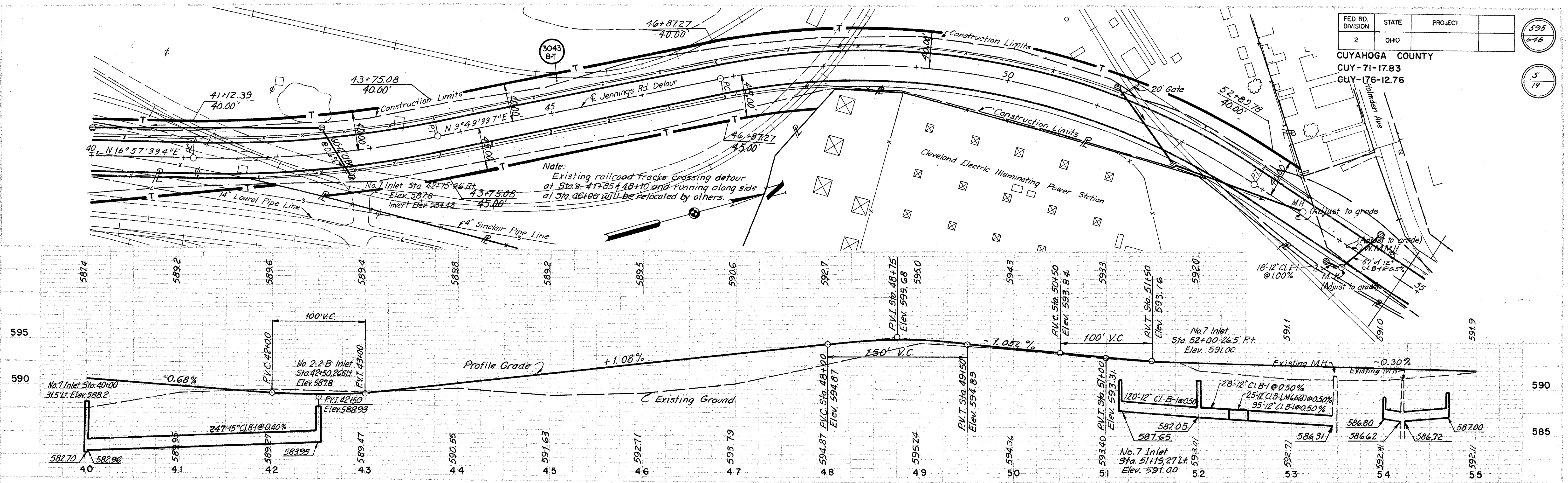
JENNINGS ROAD DETOUR STA. 10+00 TO STA 40+00

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

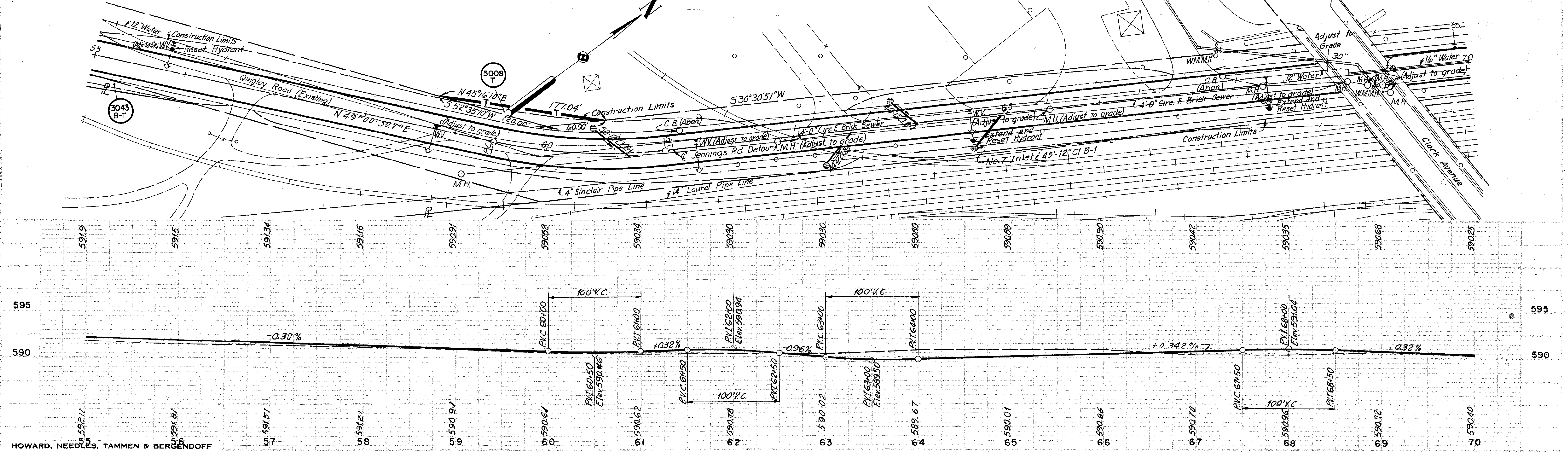
CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

595  
646

5  
19



Notes: All new inlets along Detour Road to be No. 7 unless otherwise specified.  
 Crosses to be filled with concrete below invert.



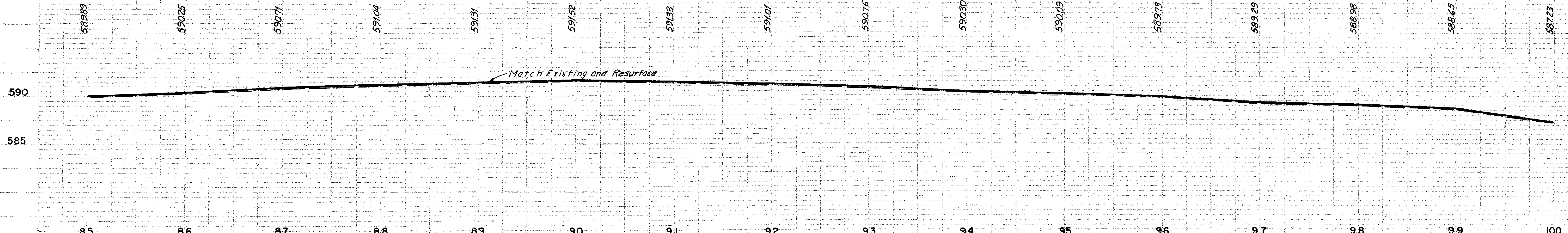
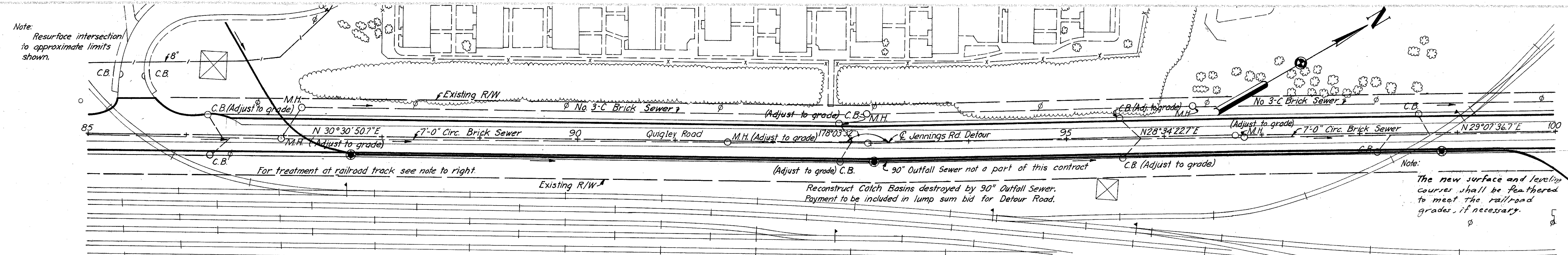
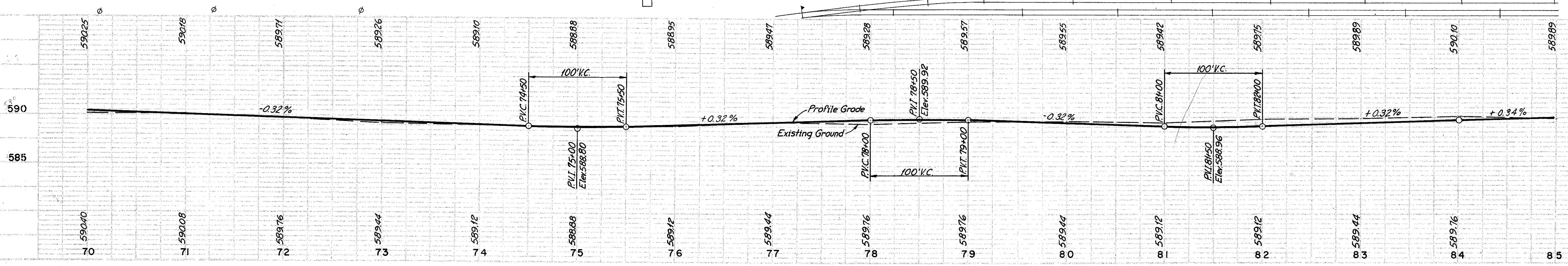
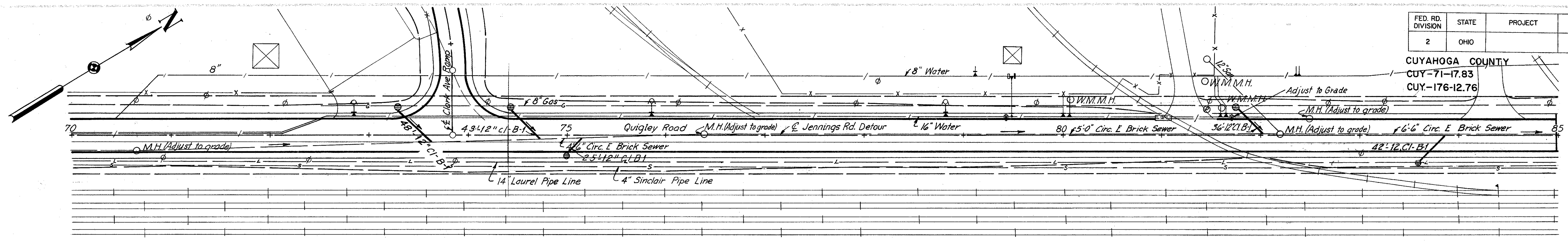
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY, LEVELAND, NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

596  
646

6  
19

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76



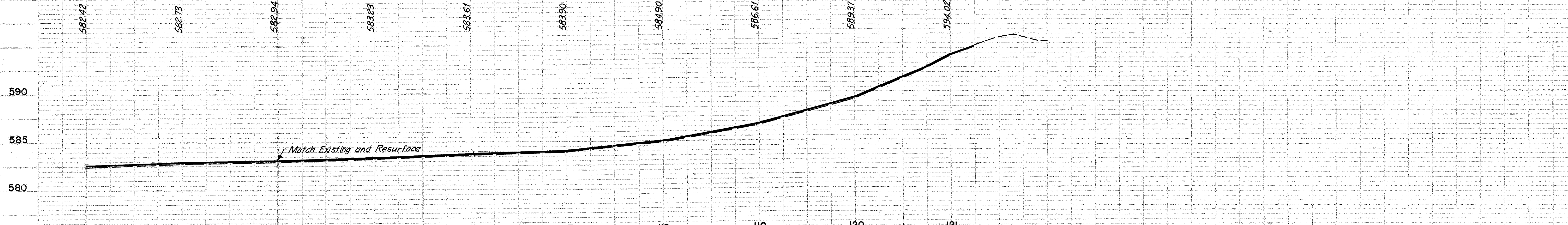
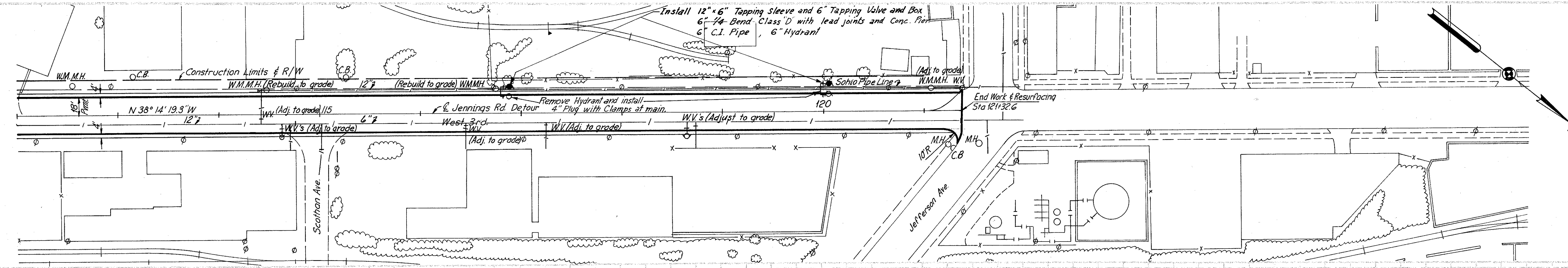
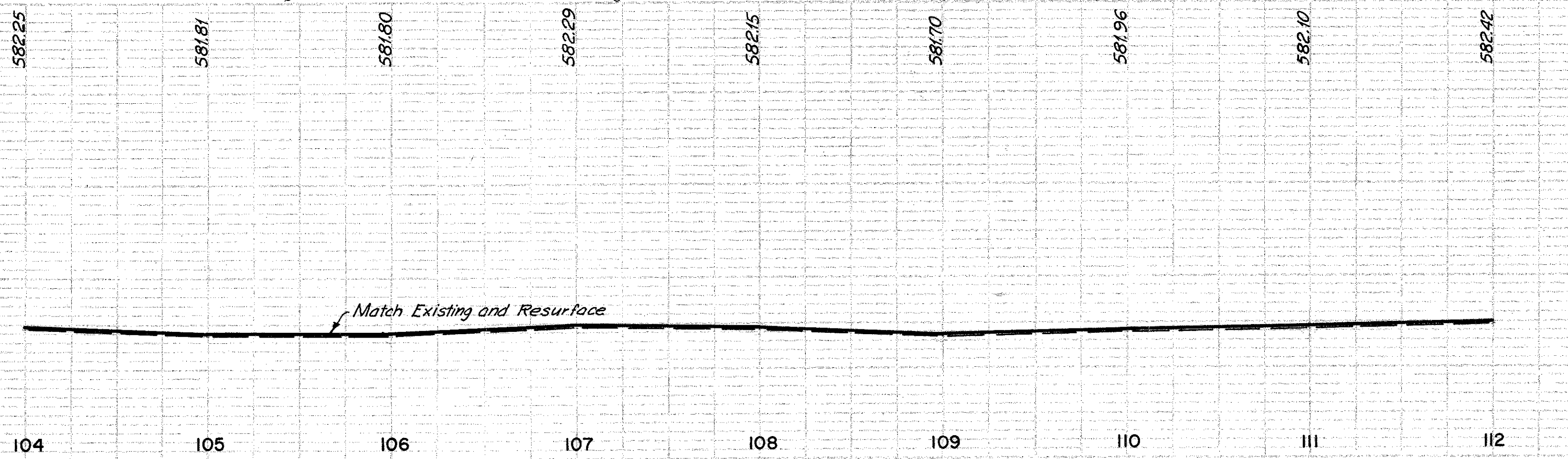
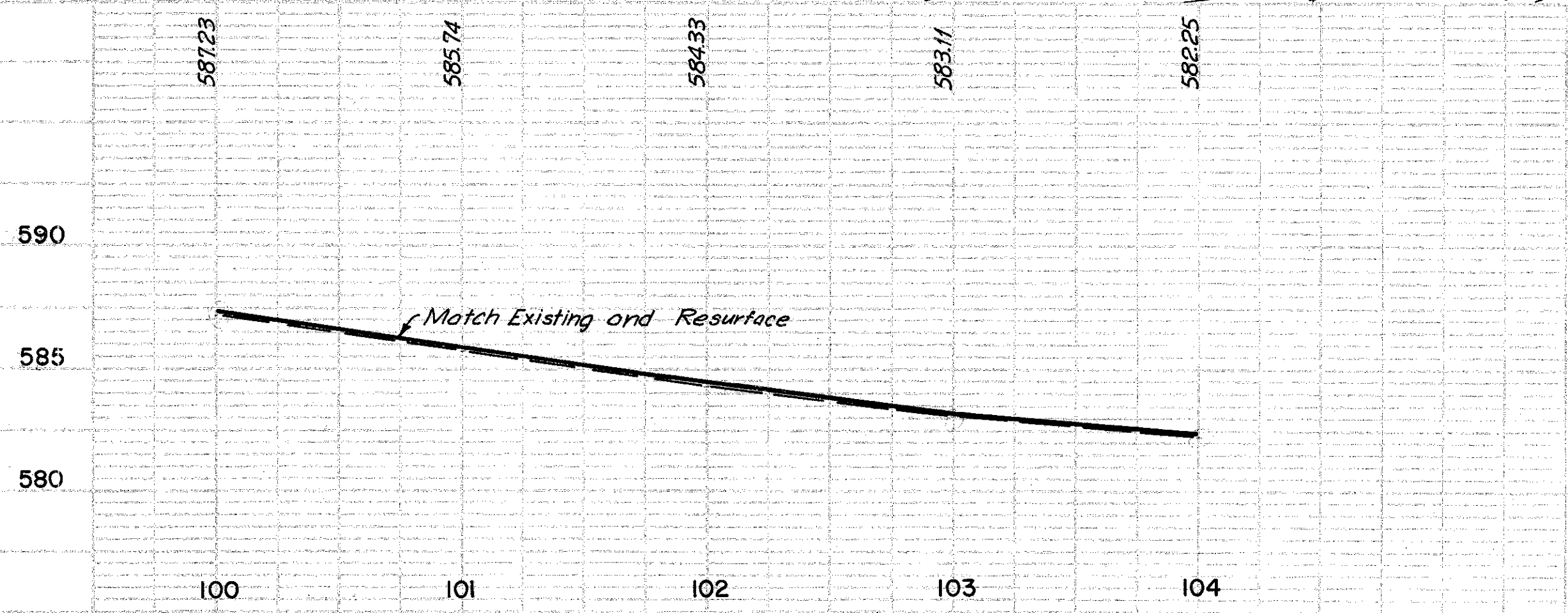
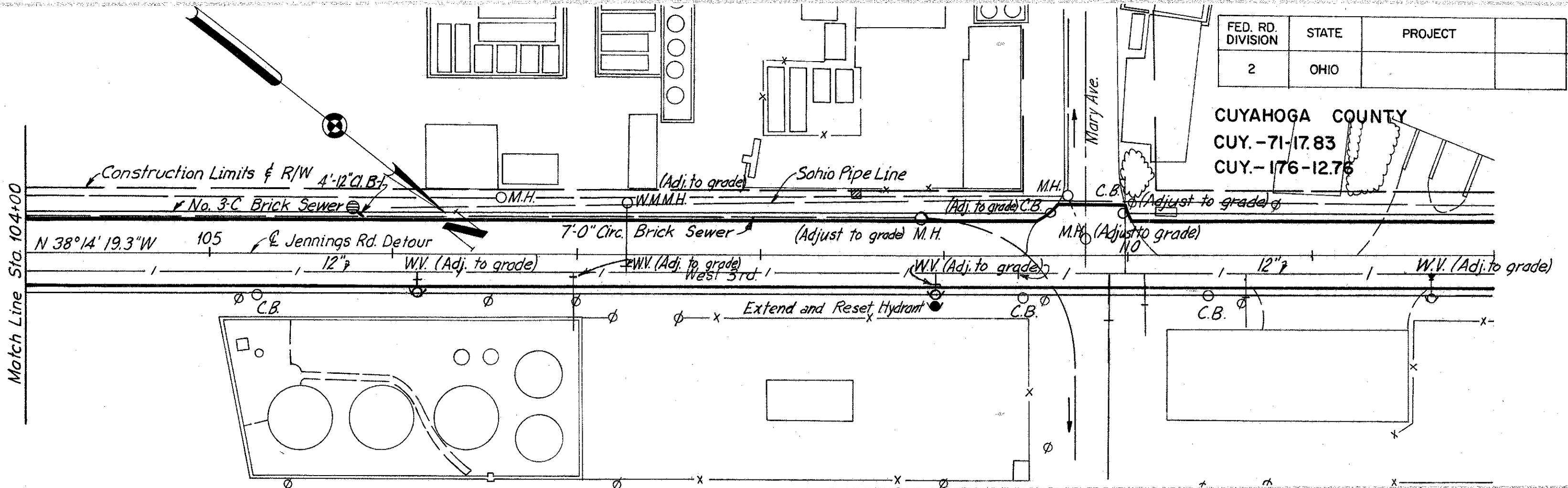
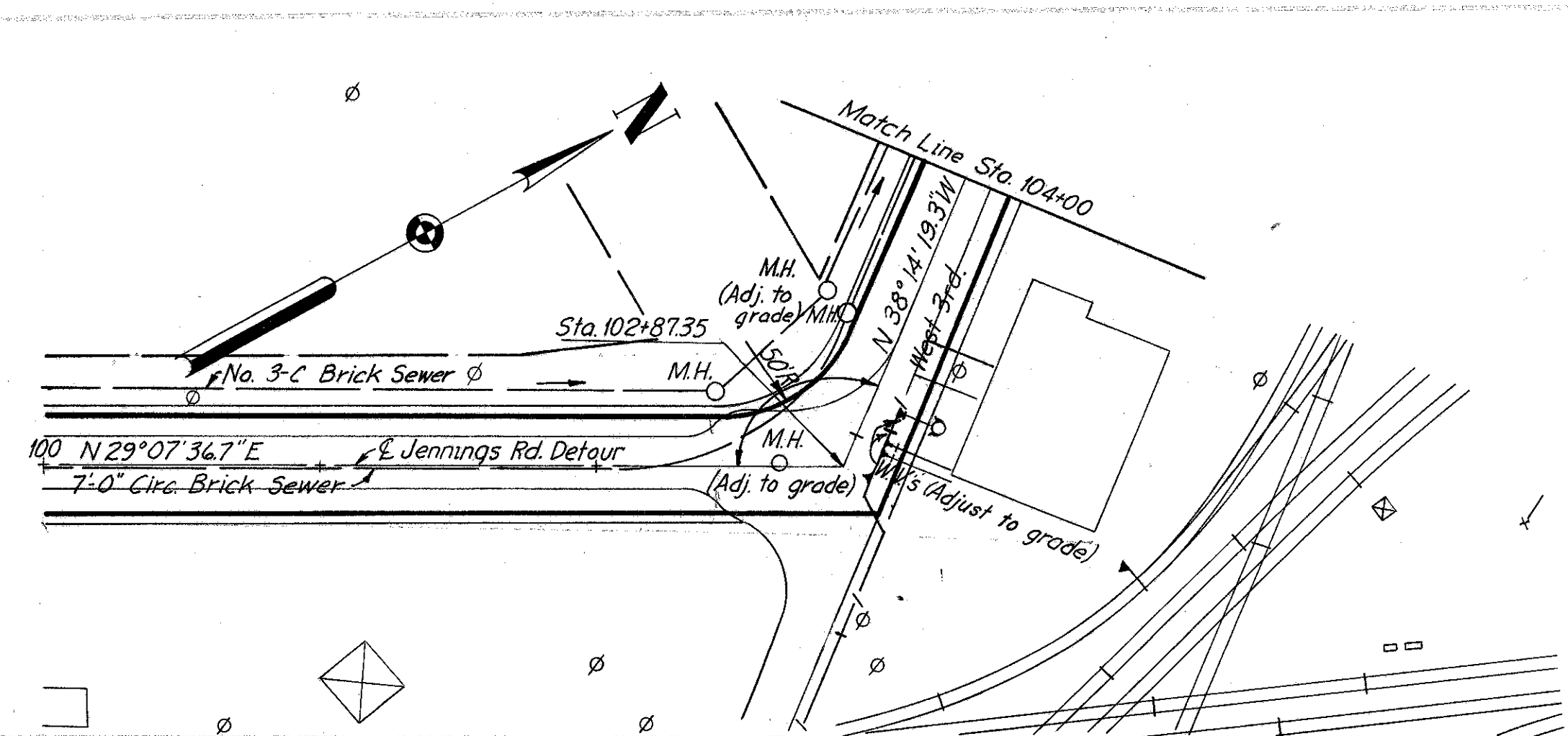
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

597  
646

CUYAHOGA COUNTY  
CUY.-71-17.83  
CUY.-176-12.76

7  
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HOWARD, NEEDLES TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY, CLEVELAND, NEW YORK



FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

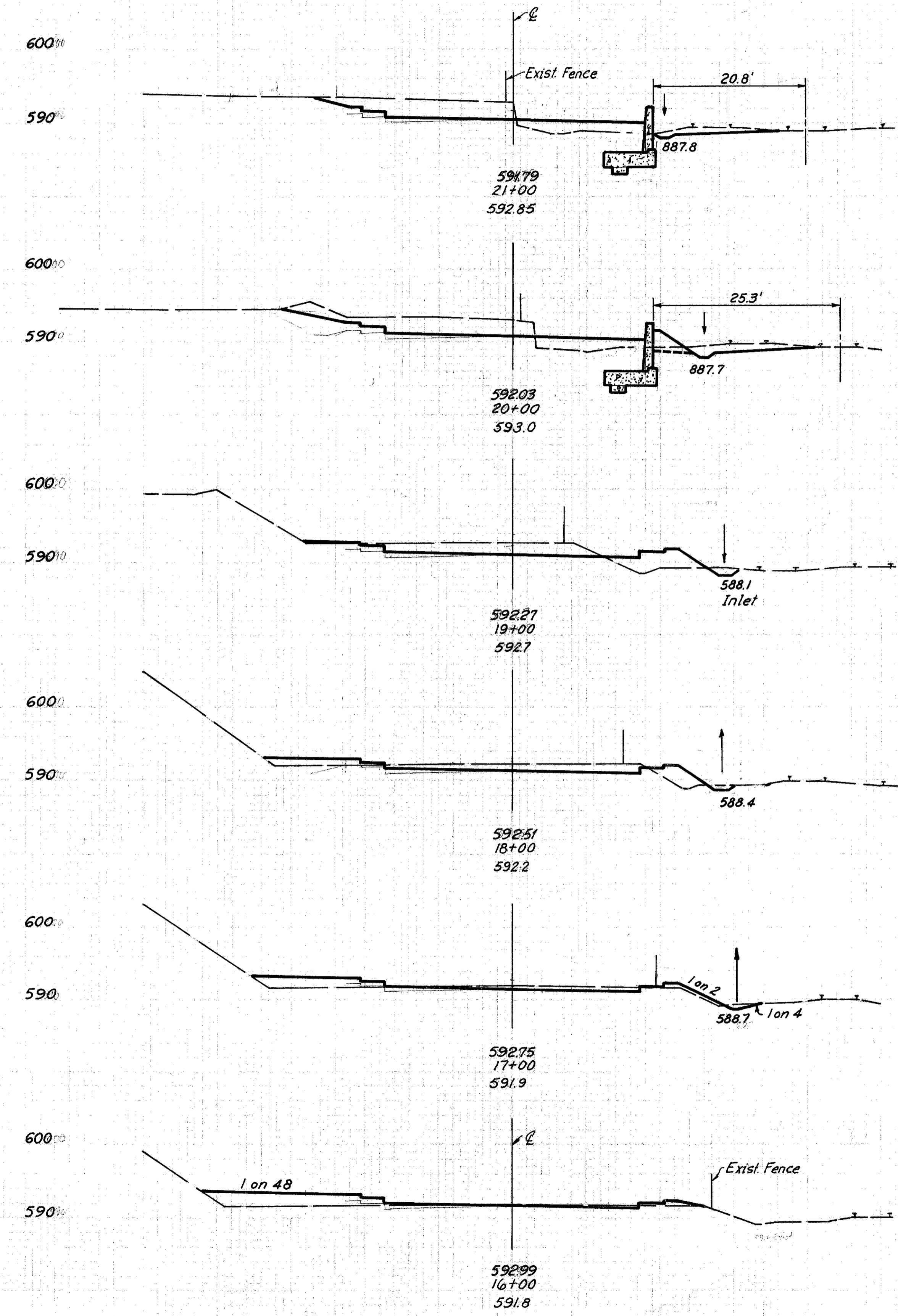
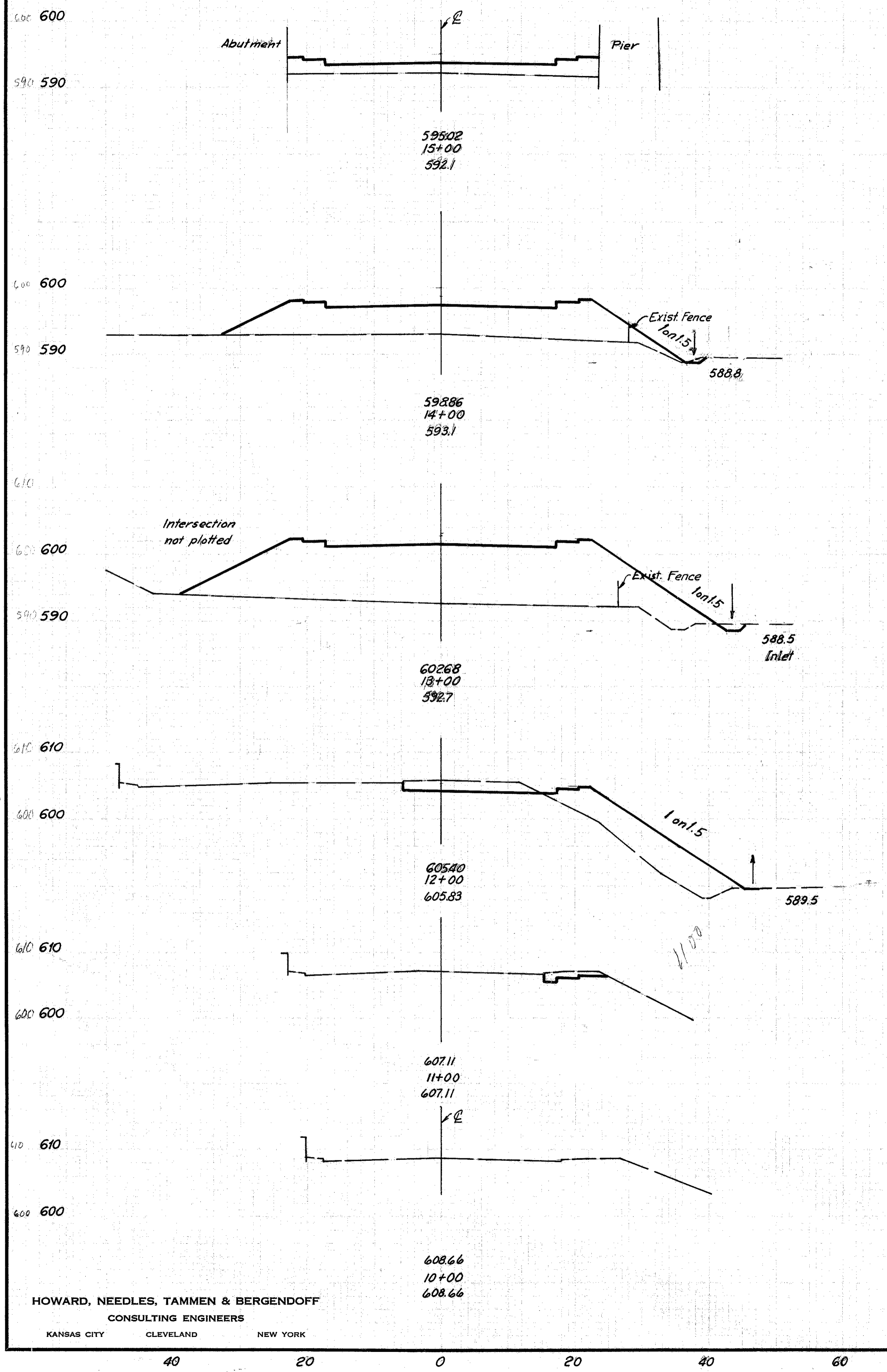
599  
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19

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK









FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

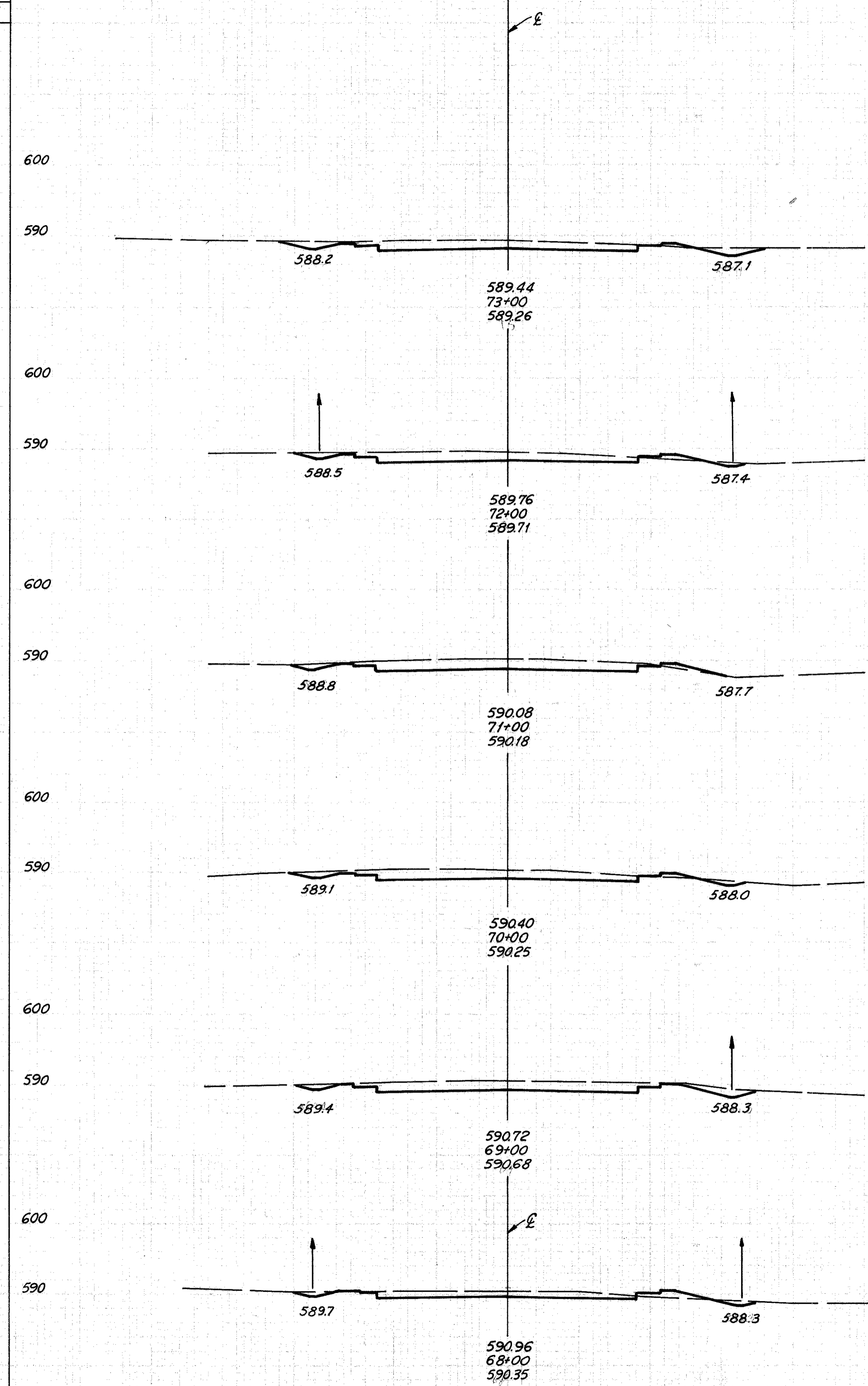
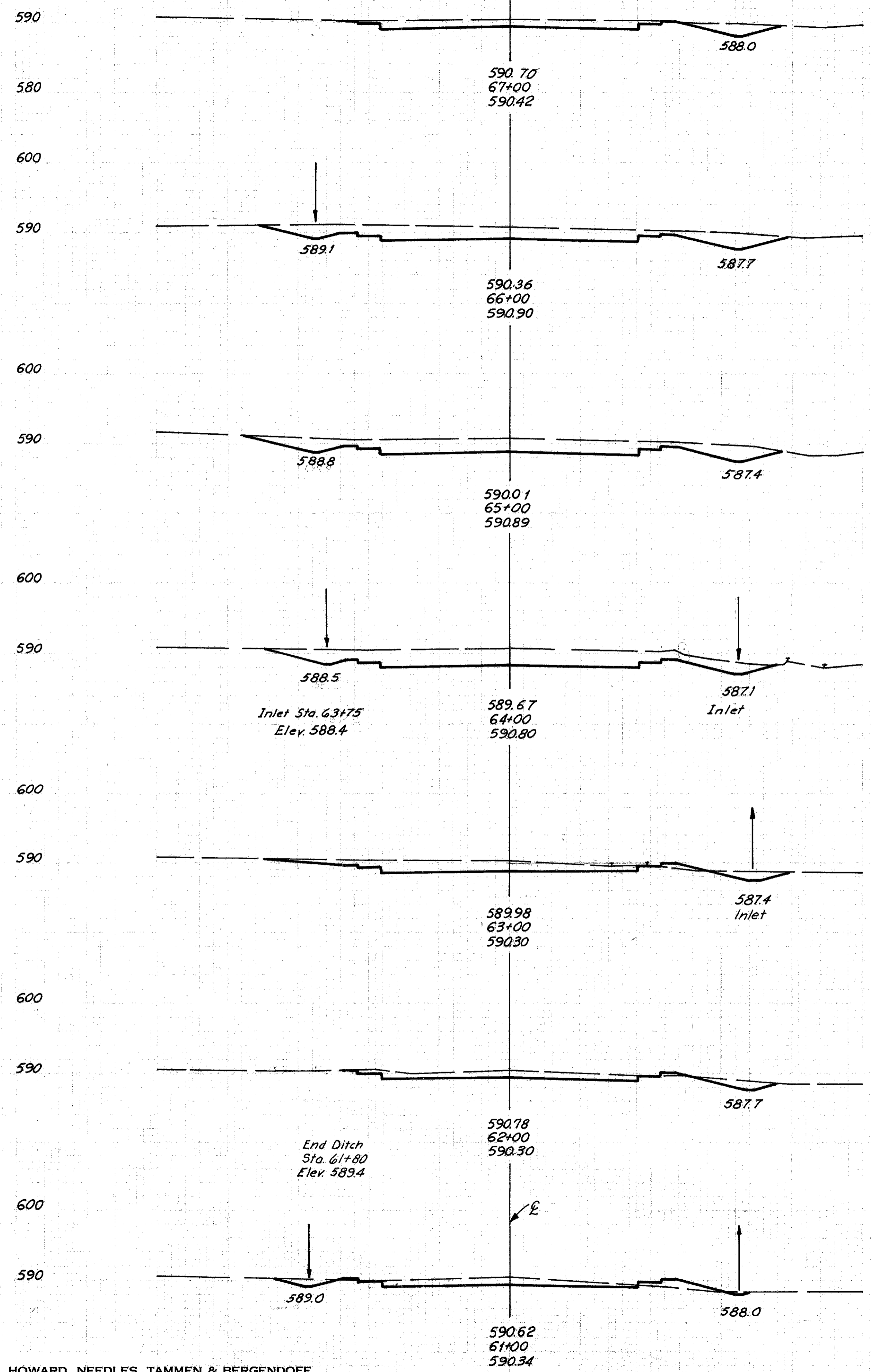
603  
846

13  
19

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

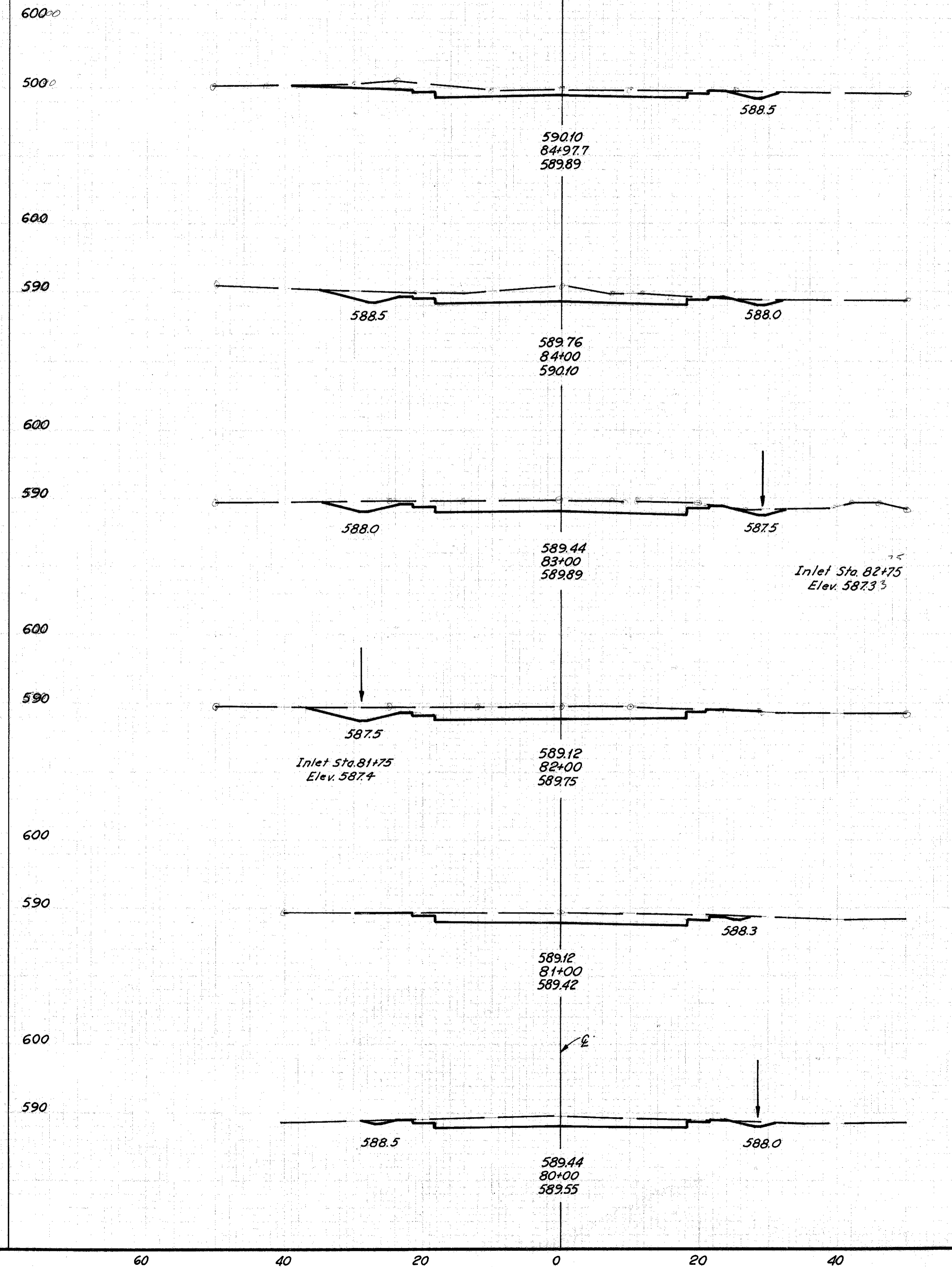
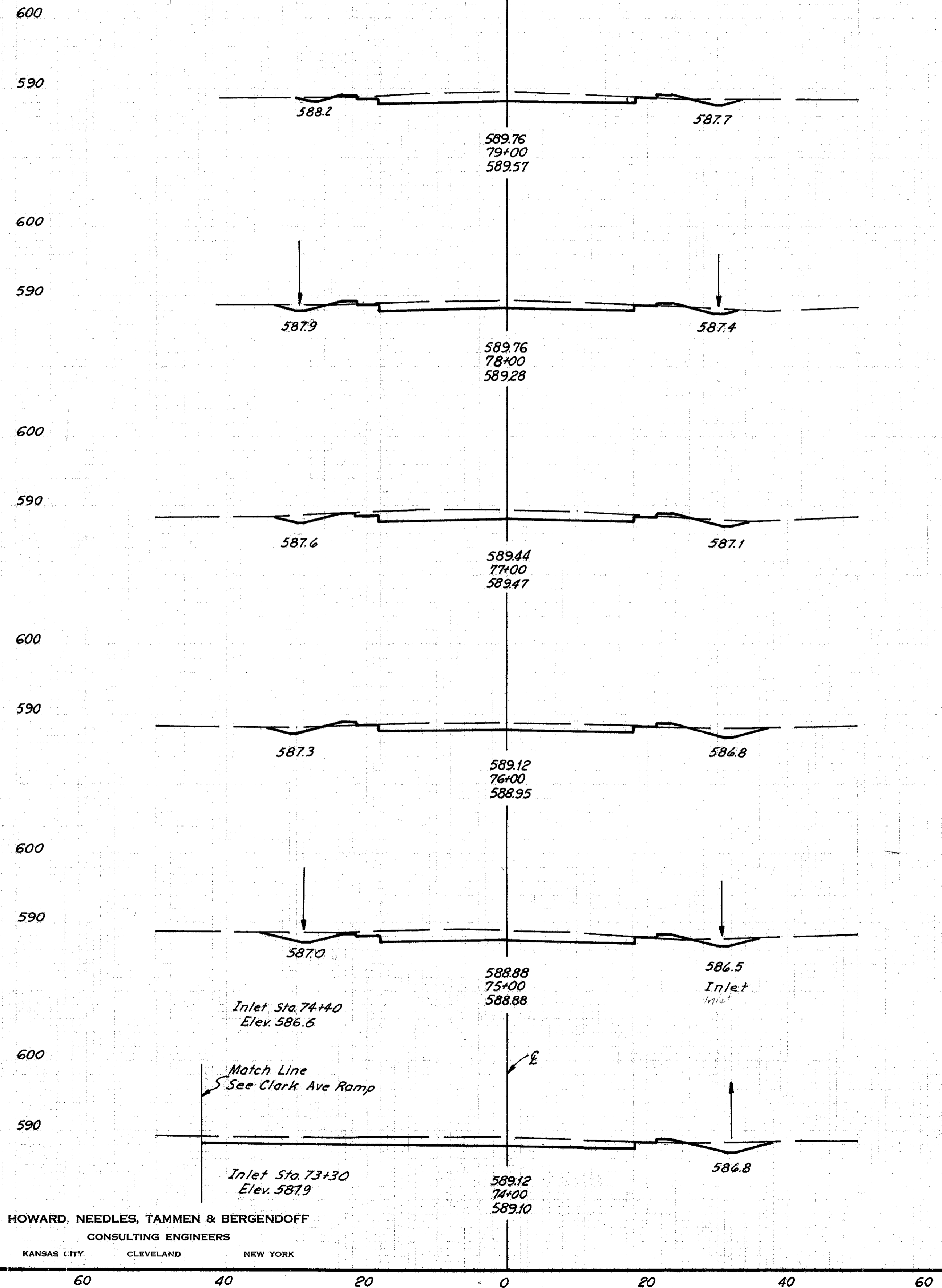
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

604  
646  
14  
19

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

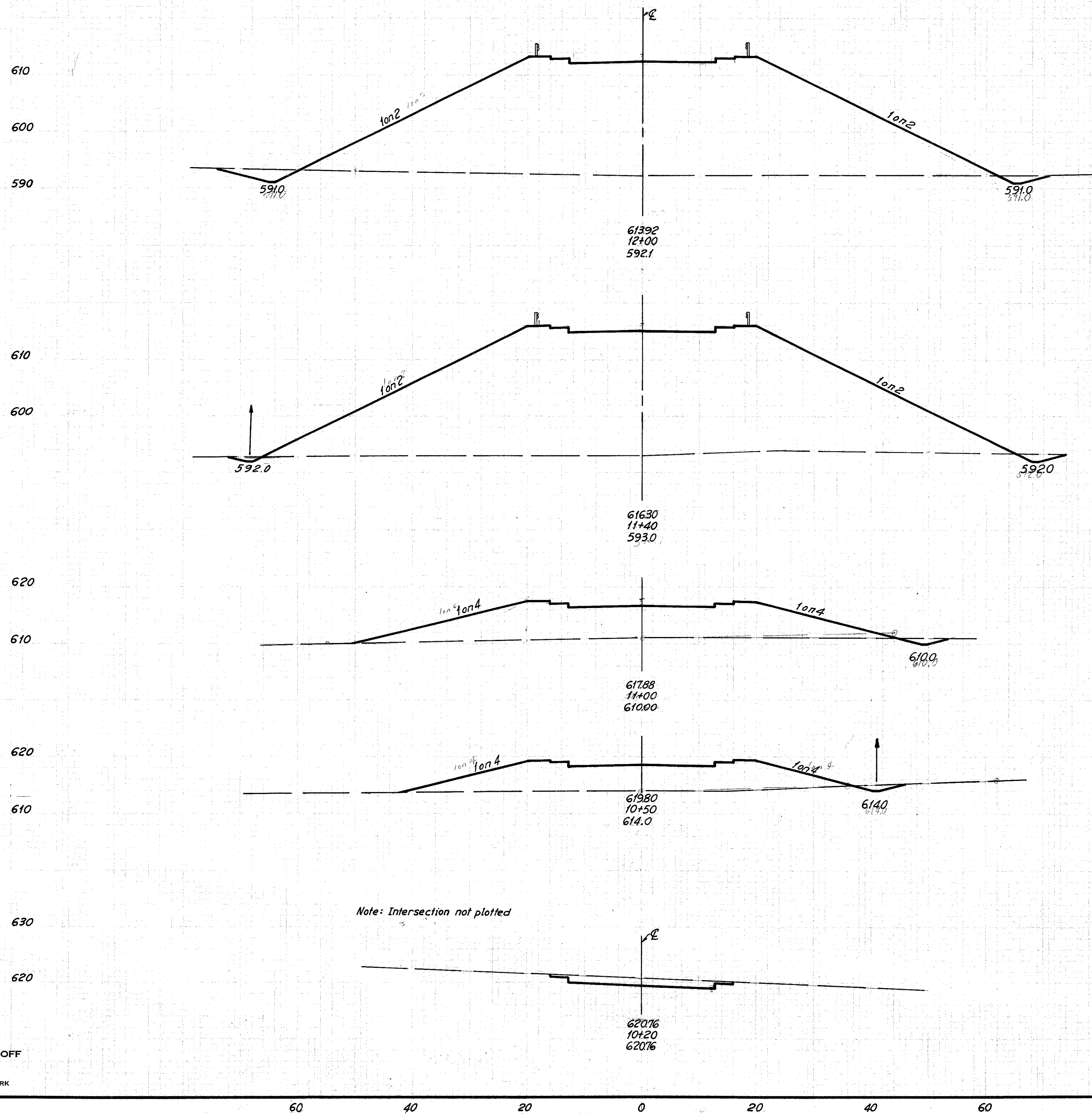
60 STA. 74+00 TO STA. 84+97.7

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

605  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

15  
79

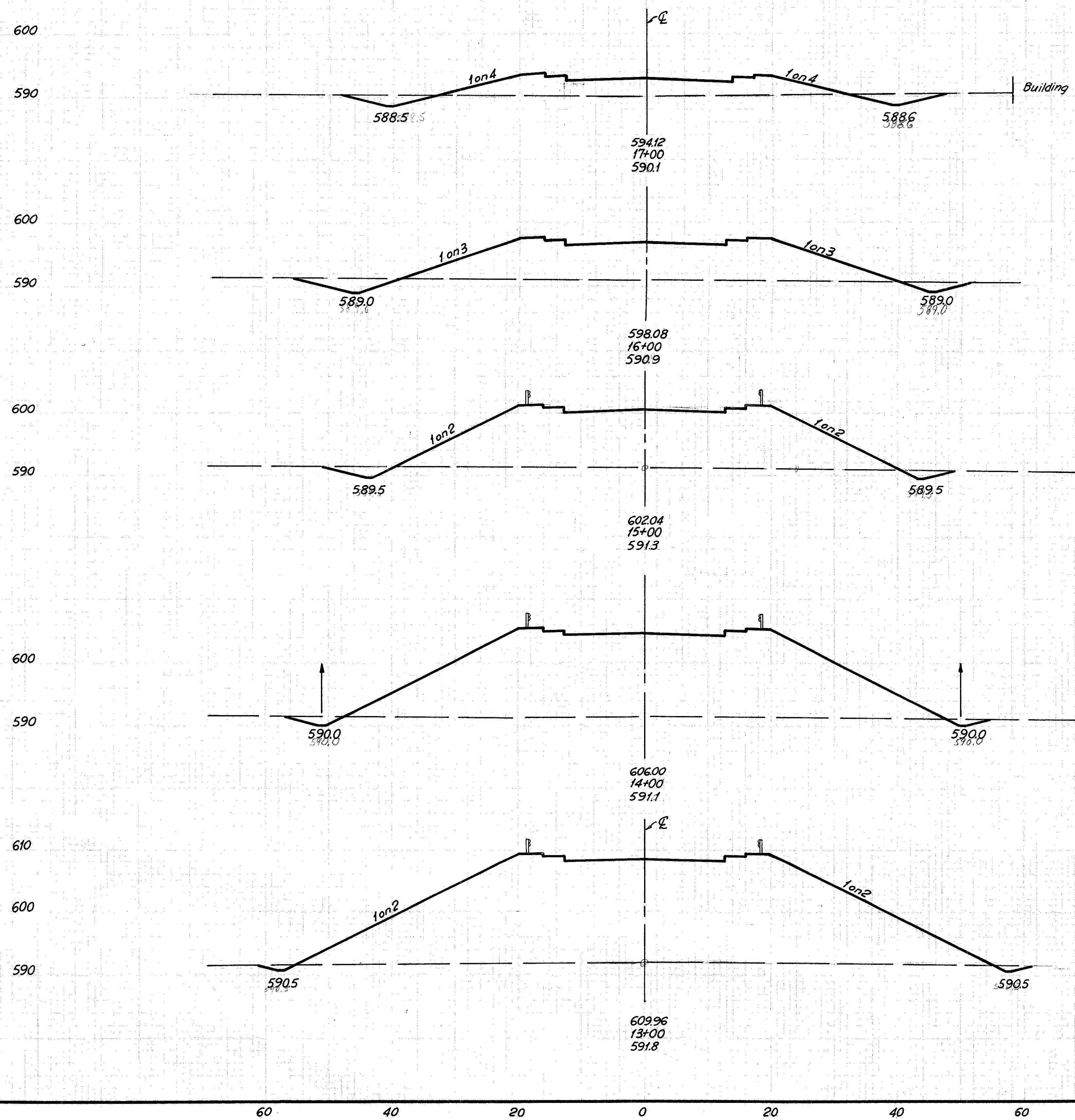


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

606  
546

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

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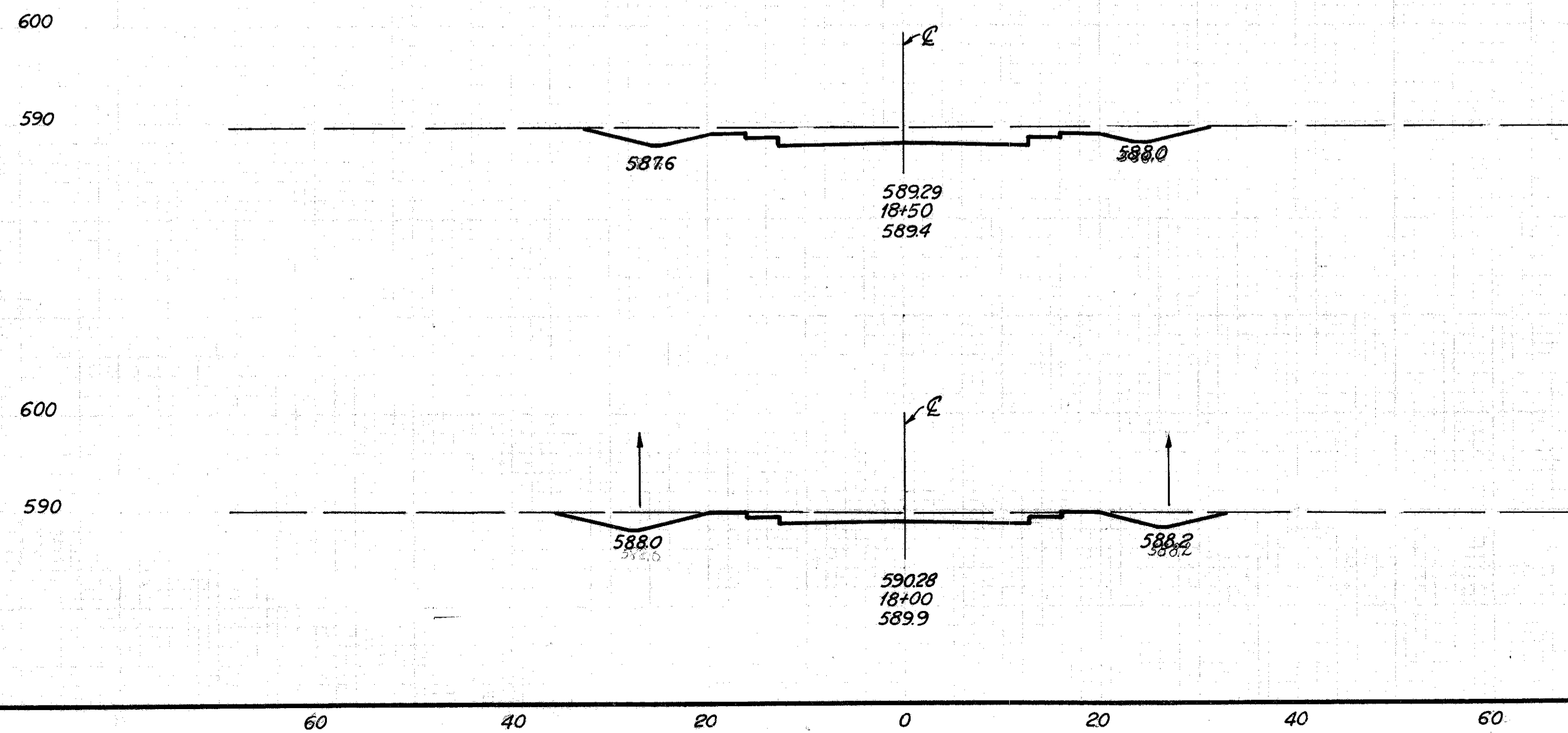


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

607  
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CUYAHOGA COUNTY  
CUY-71-1783  
CUY-176-12.76

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HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

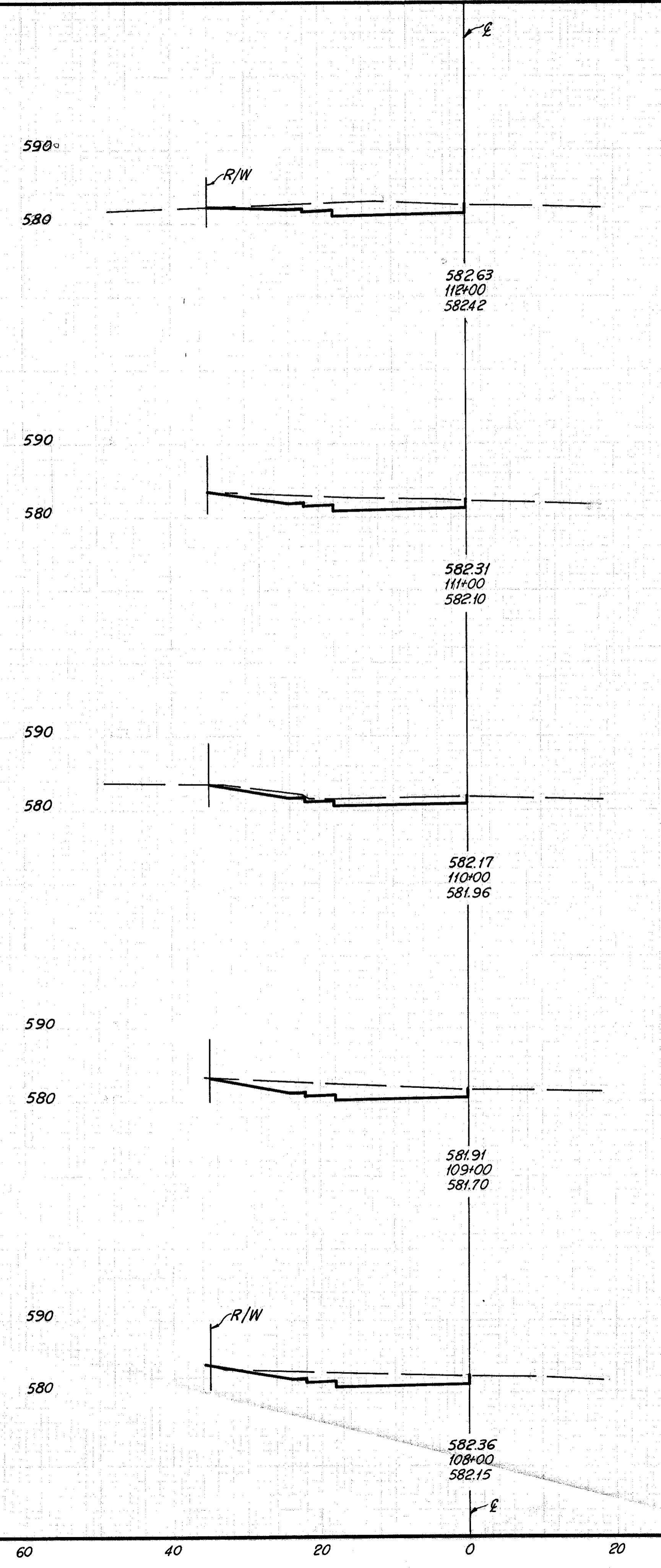
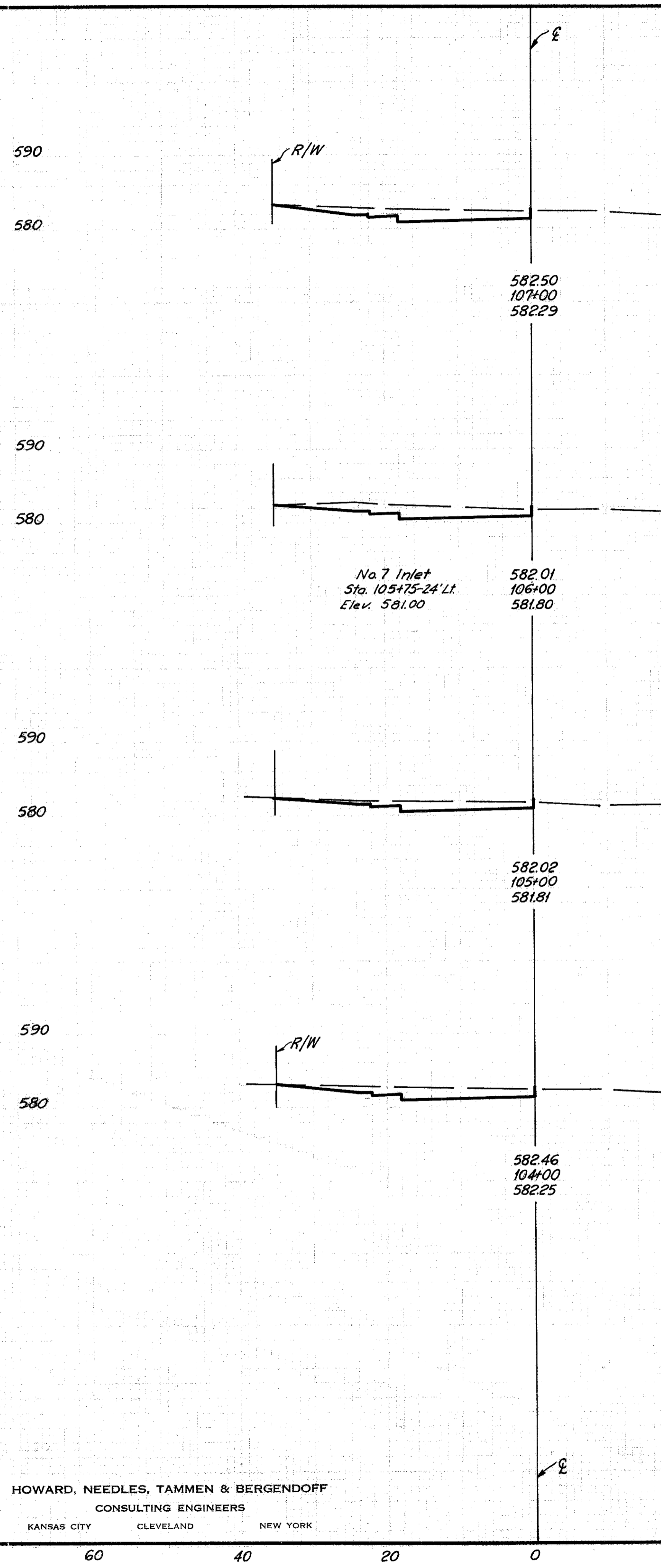


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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646

18  
19

CUYAHOGA COUNTY  
CUY- 71-17.83  
CUY-176-12.76



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

60 40 20 0 20 40 60 40 20 0 20 40

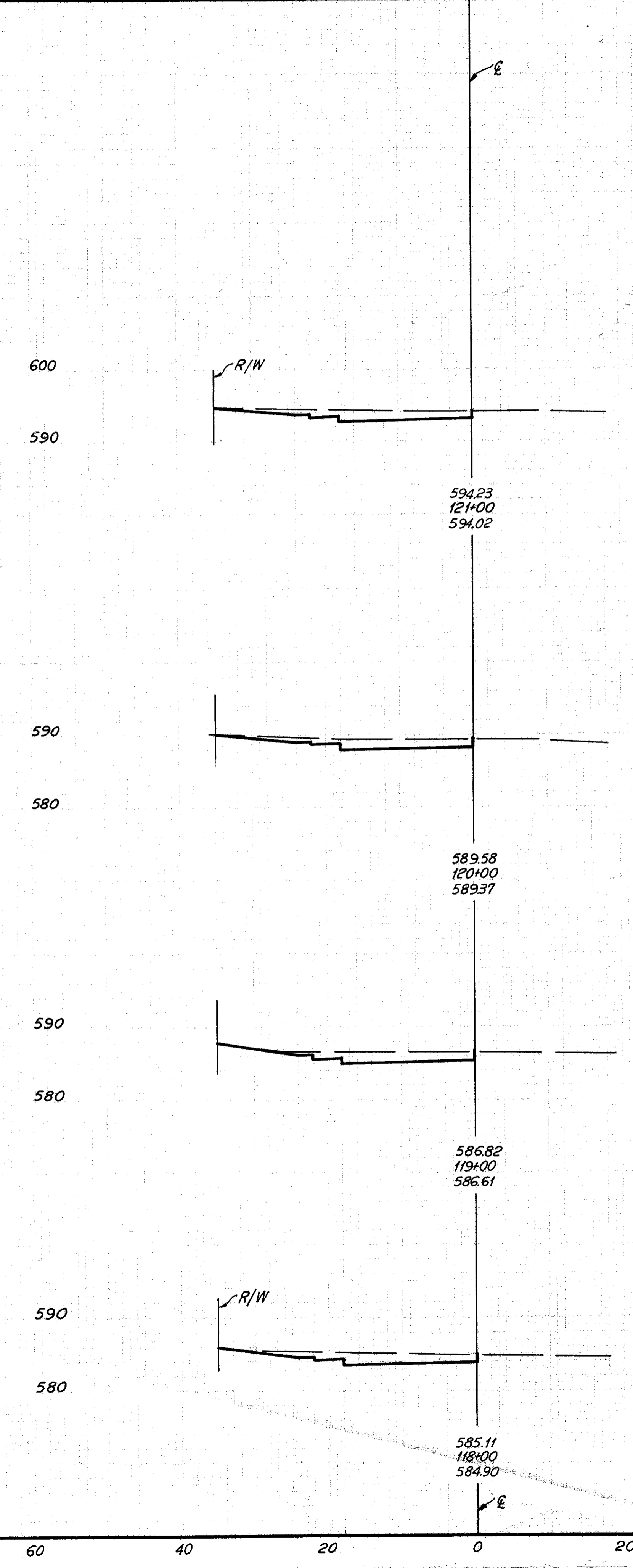
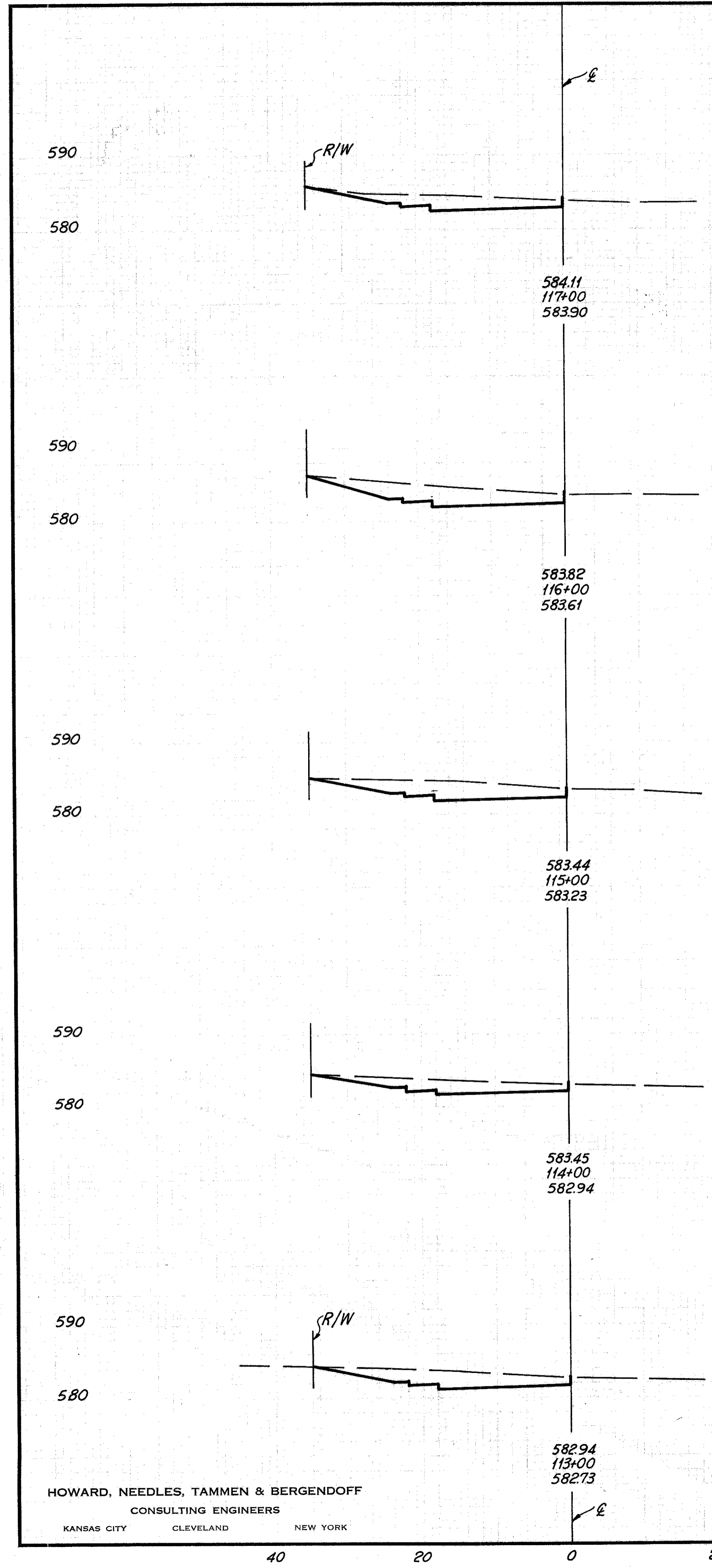
JENNINGS ROAD DETOUR STA. 104 + 00 TO STA. 112 + 00

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

609  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

19  
19



HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

JENNINGS ROAD DETOUR STA. 113+00 TO STA. 121+00

This improvement has been declared a limited access highway from Station 913+50.00 to Station 951+15.00 by the action of the Director of Highways and recorded in Volume Number 45, Page 1190 and Volume Number 48, Page 89 of the Director's Journal pursuant to law.

# CENTER LINE SURVEY PLAT

I.R. 71 SEC. 17.83 & S.R. 176 SEC. 12.76

CUYAHOGA COUNTY, OHIO

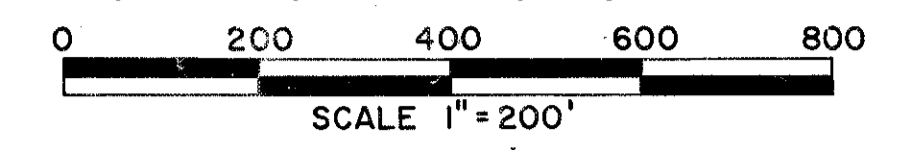
TWP. T.7, R.13, O.L.66,67,72 & 73

834309

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

610  
676  
1  
2



RECEIVED FOR RECORD  
AT 11/19/64  
OCT 16 1964

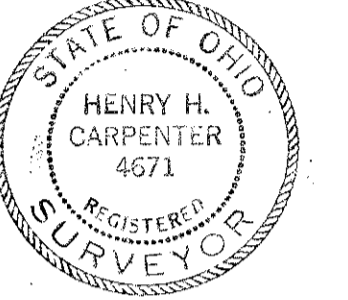
RECORDED IN CUYAHOGA COUNTY RECORDS  
Vol. 191 Page 89  
MARK BRESLER  
County Recorder

Received \_\_\_\_\_ at \_\_\_\_\_  
Recorded \_\_\_\_\_  
Plat Book \_\_\_\_\_ Page \_\_\_\_\_  
Signed \_\_\_\_\_ Recorder Cuyahoga County Ohio  
fee \_\_\_\_\_

I hereby certify that this plat is a true delineation of a survey made for the Ohio Department of Highways in Cuyahoga County  
By Henry A. Carpenter  
Registered Surveyor No. 4671  
Date 9-21-64

Howard, Needles, Tammen & Bergendoff  
Consulting Engineers

Signed Charles M. Lynch  
Date 10-16-64 Division Deputy Director  
Ohio Department of Highways



**S.B. I-71 CURVE DATA**

P.I. Sta. 905+40.84  
 $\Delta = 21^{\circ}14'41''$   
 $D = 2^{\circ}00'00''$   
 $R = 2864.79'$   
 $T = 537.28'$   
 $L = 1062.23'$   
 $E = 49.95'$

**S.B. I-71 CURVE DATA**

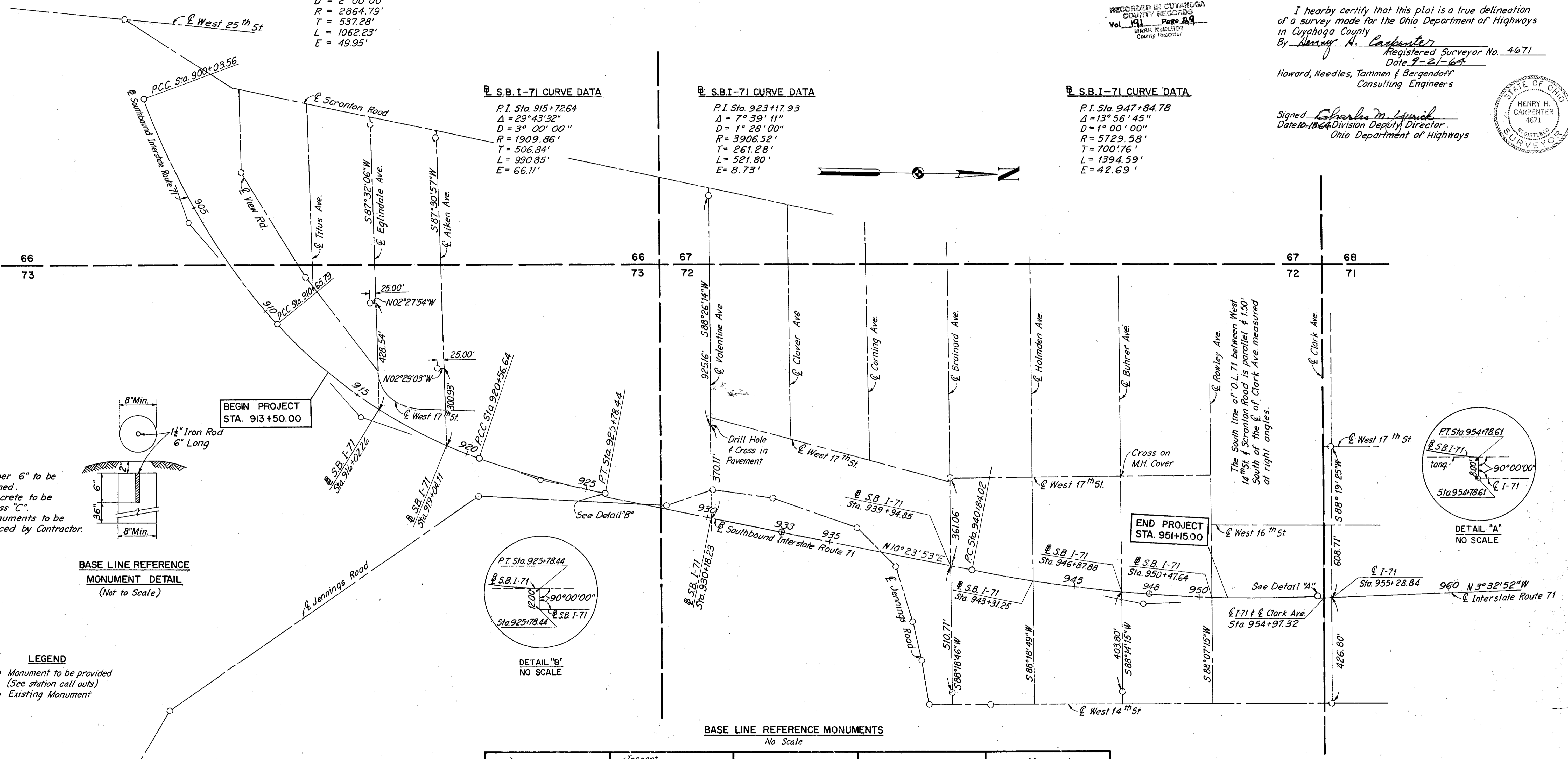
P.I. Sta. 915+72.64  
 $\Delta = 29^{\circ}43'32''$   
 $D = 3^{\circ}00'00''$   
 $R = 1909.86'$   
 $T = 506.84'$   
 $L = 990.85'$   
 $E = 66.11'$

**S.B. I-71 CURVE DATA**

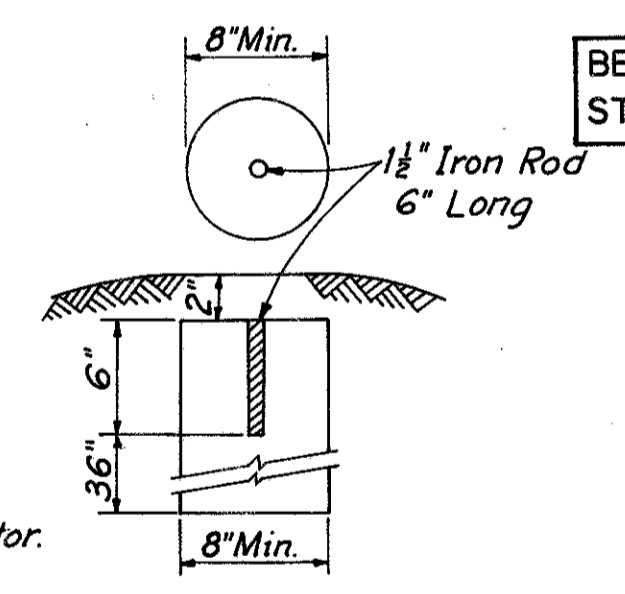
P.I. Sta. 923+17.93  
 $\Delta = 7^{\circ}39'11''$   
 $D = 1^{\circ}28'00''$   
 $R = 3906.52'$   
 $T = 261.28'$   
 $L = 521.80'$   
 $E = 8.73'$

**S.B. I-71 CURVE DATA**

P.I. Sta. 947+84.78  
 $\Delta = 13^{\circ}56'45''$   
 $D = 1^{\circ}00'00''$   
 $R = 5729.58'$   
 $T = 700.76'$   
 $L = 1394.59'$   
 $E = 42.69'$

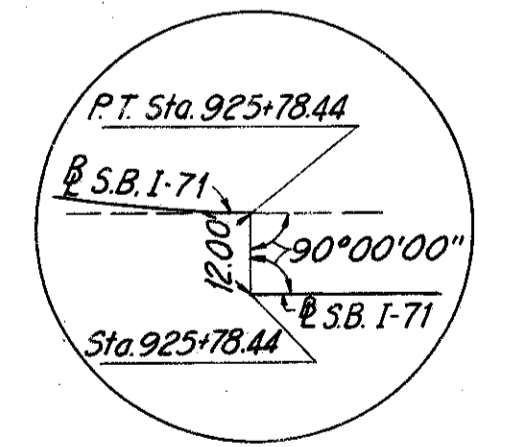


- Notes:
- Upper 6" to be formed.
  - Concrete to be Class "C".
  - Monuments to be placed by Contractor.

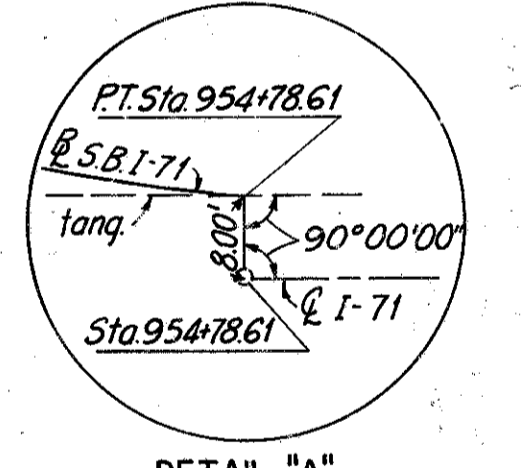


BASE LINE REFERENCE MONUMENT DETAIL  
(Not to Scale)

- LEGEND
- Monument to be provided (See station call outs)
  - Existing Monument

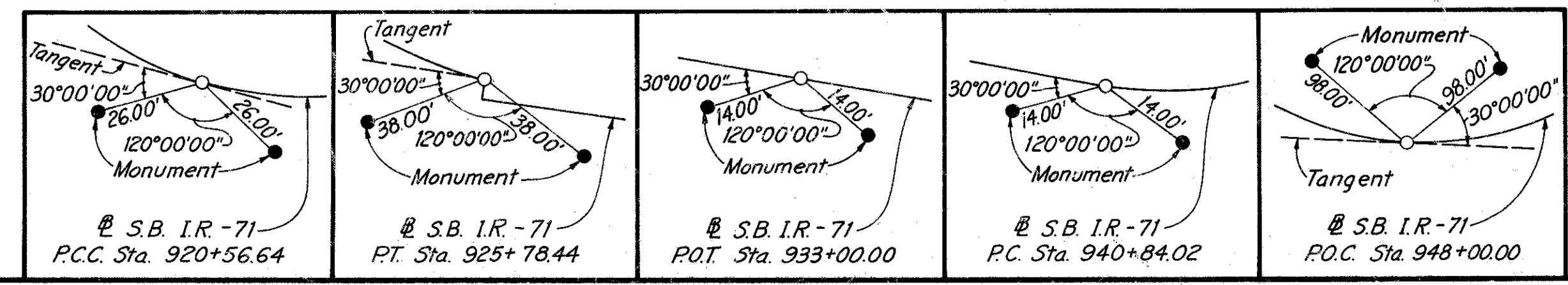


DETAIL "B"  
NO SCALE



DETAIL "A"  
NO SCALE

BASE LINE REFERENCE MONUMENTS  
No Scale



MADE W.J.M. DATE 7-7-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED R.P.R. DATE 7-10-64 SCALE 1" = 200'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE

COMPLETION DATE \_\_\_\_\_

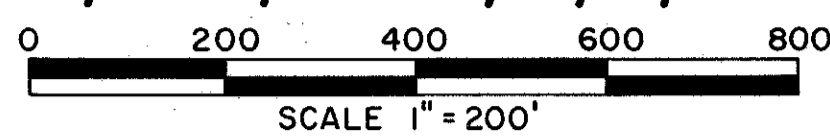
V.233D Oct. 14 / 64

# CENTER LINE SURVEY PLAT

I.R. 71 SEC. 17.83 & S.R. 176 SEC. 12.76

CUYAHOGA COUNTY, OHIO

TWP. T.7, R.13, O.L. 72, 73, 74, 83 & 84



834310

RECEIVED FOR RECORD  
AT 11:04 AM  
OCT 16 1964

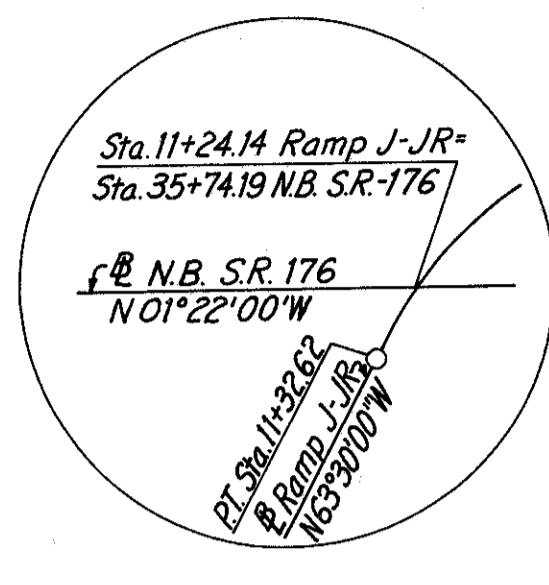
RECORDED IN CUYAHOGA COUNTY RECORDS  
Vol. 191 Page 29  
MARK 11/13/77  
County Recorder

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

611  
646

2  
2



DETAIL "D"  
No Scale

**N.B. S.R. - 176 CURVE DATA**

PI. Sta. 43+19.58  
Δ = 38° 19' 08"  
Δc = 20° 19' 08"  
Θs = 09° 00' 00"  
Dc = 04° 00' 00"  
Rc = 1432.39'  
Ts = 724.54'  
Ls = 450.00'  
Lc = 507.97'  
Es = 90.22'

**RAMP J-JR CURVE DATA**

PI. Sta. 20+15.04  
Δ = 61° 11' 14"  
D = 16° 00' 00"  
R = 358.10'  
T = 211.72'  
L = 382.42'  
E = 57.91'

**N.B. S.R. - 176 CURVE DATA**

PI. Sta. 58+95.63  
Δ = 50° 05' 01"  
D = 05° 00' 00"  
R = 1145.92'  
T = 535.37'  
L = 1001.67'  
E = 118.89'

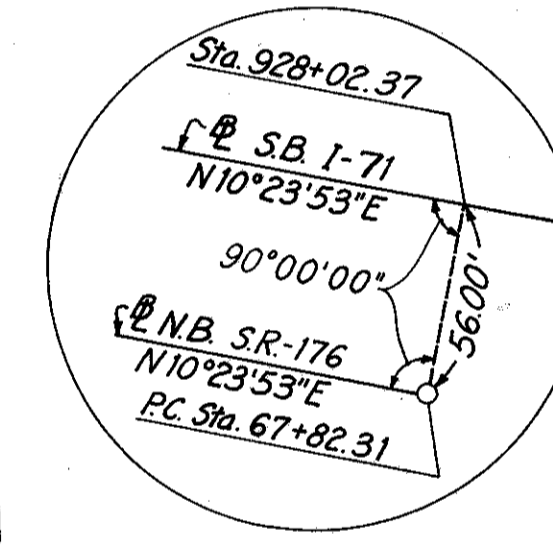
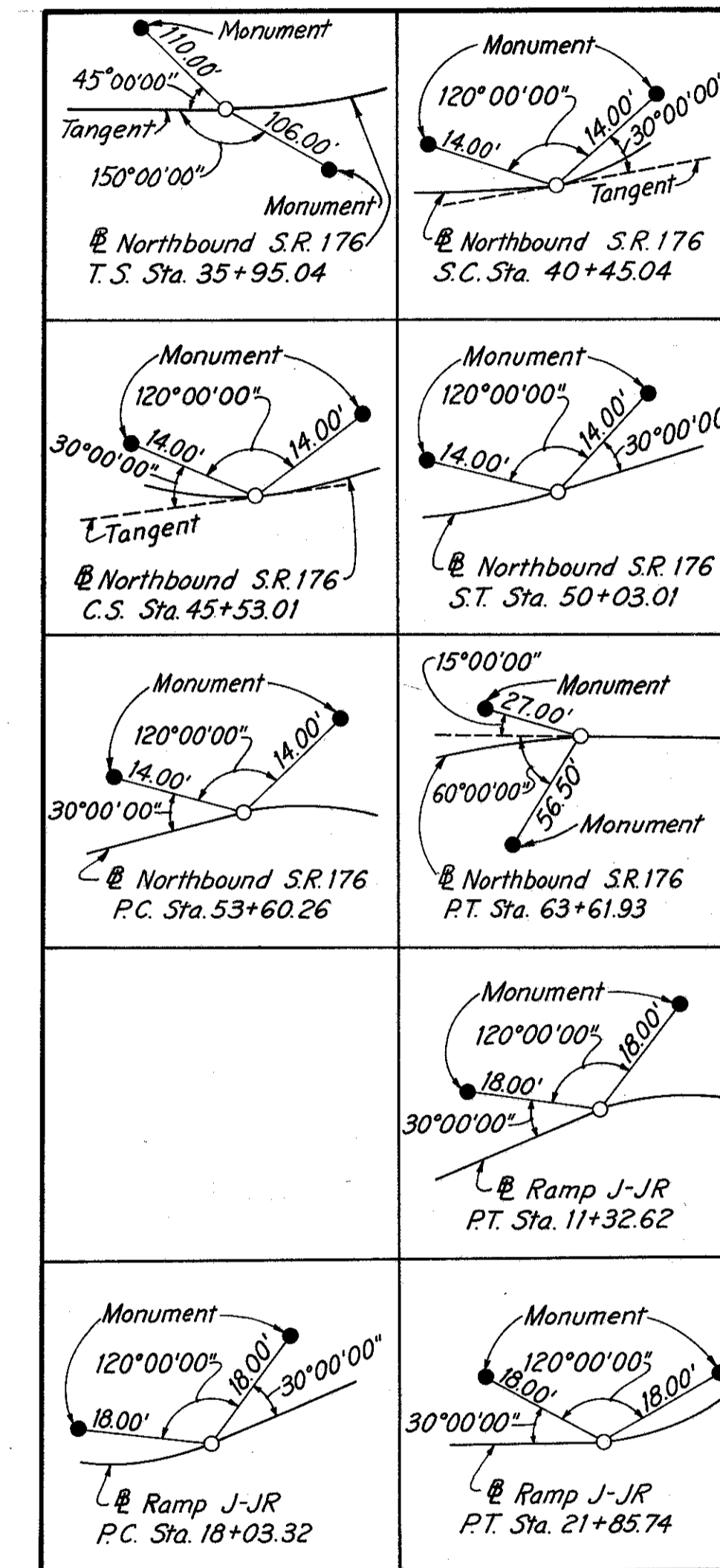
**RAMP J-JR CURVE DATA**

PI. Sta. 09+62.56  
Δ = 60° 52' 31"  
D = 16° 00' 00"  
R = 358.10'  
T = 210.41'  
L = 380.47'  
E = 57.24'

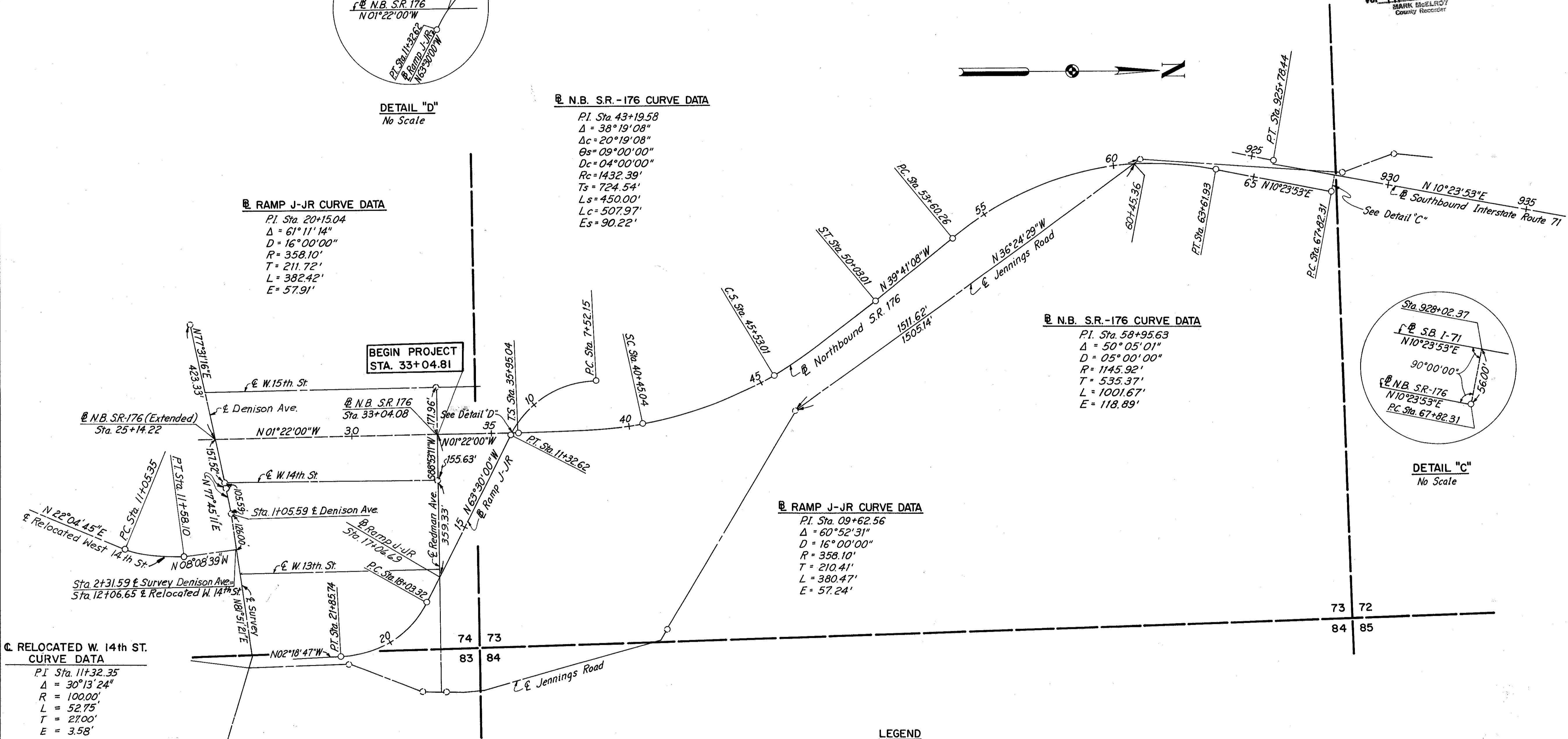
**RELOCATED W. 14th ST. CURVE DATA**

PI. Sta. 11+32.35  
Δ = 30° 13' 24"  
R = 100.00'  
L = 52.75'  
T = 27.00'  
E = 3.58'

**BASE LINE REFERENCE MONUMENTS**  
No Scale



DETAIL "C"  
No Scale



**LEGEND**  
● Monument to be provided (See station call outs).  
○ Existing Monument.

MADE R.P.R. DATE 5-11-64 TRACED R.J.K. DATE 5-12-64  
CHECKED W.J.M. DATE 8-10-64 SCALE 1" = 200'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY, CLEVELAND, NEW YORK

NAME	REVISION	DATE

COMPLETION DATE

✓ 85P Oct. 14 / 64

3  
EF-3

EF-3

STATE OF OHIO  
DEPARTMENT OF HIGHWAYS  
**CUY-71-17.83**  
**CUY-176-12.76**  
CUYAHOGA COUNTY  
CITY OF CLEVELAND

LIMITED ACCESS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	I-71-5(33) 244 US-1463(2)

612  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

1  
35

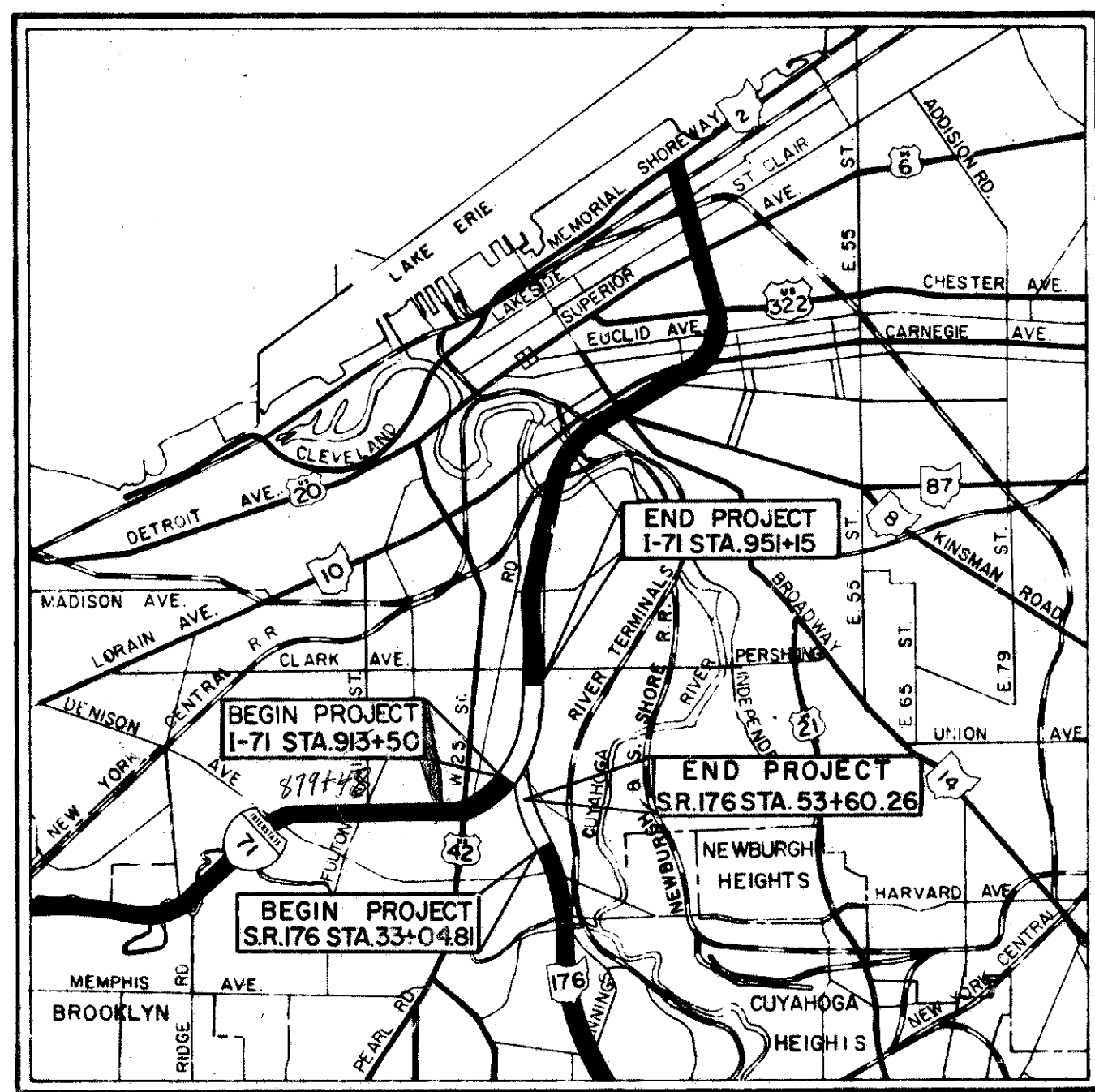
This improvement is especially designed for through traffic, and has been declared a limited access highway by action of the Director of Highways in accordance with the provisions of Section 5511.02, Revised Code of Ohio.

**I-71-5(33)244**  
**US-1463(2)**

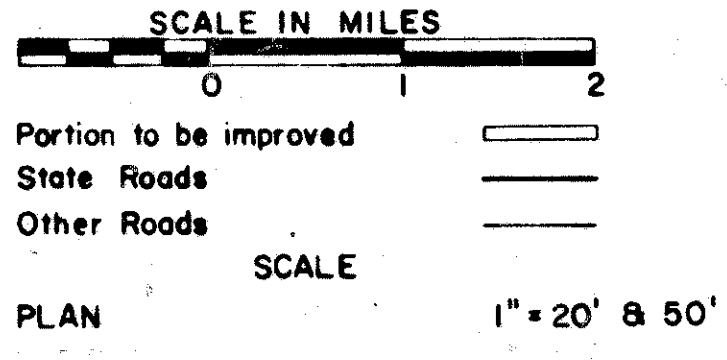
The standard specifications of the State of Ohio, Department of Highways, including changes and supplemental specifications listed in the proposal shall govern this improvement.

CONVENTIONAL SIGNS

Property Line	---	---
Existing Right of Way	---	---
Limited Access Line	---	---
Right of Way Line	---	---
Temporary Right of Way	---	---
Center Line	---	---
Work Agreement Line	---	---
Fence Line	---	---
Guard Rail (Existing)	---	---
Guard Rail (Proposed)	---	---
Railroad	---	---
Power Poles	---	---
Telephone Poles	---	---
Power & Telephone Poles	---	---
Light Poles	---	---
Trees (Existing)	---	---
Water Line	---	---
Gas Line	---	---
Telephone Conduit	---	---
Sewer (Existing)	---	---
Oil Line	---	---
Electrical Tower	---	---
Fire Hydrant	---	---
Manhole (Sewer)	---	---
Manhole (Telephone)	---	---
Catch Basin or Inlet	---	---
Underground Elect. Conduit	---	---
Original Twp. Lot Line	---	---
Subdivision Line	---	---
Sublot Line	---	---



DELIVERY POINT NYC R.R. LOCATION MAP AVERAGE HAUL 1/2 MILE



PREPARED AND RECOMMENDED BY  
**HOWARD NEEDLES TAMMEN & BERGENDOFF**  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

**H. G. SOURS**  
ASSOCIATE  
COLUMBUS

FILE NO. CUYAHOGA COUNTY  
DATE OF LETTING \_\_\_\_\_, 196\_\_  
CONTRACT NO. \_\_\_\_\_

# SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3000WA	City of Cleveland								12	
3001D-T					11.02A.				12	
3001WL	The Riverside Cemetery Association	919	527	0.52A.	14.57A.	No			13-16	Deed area is only that
3001A-WL		299	220	102.46A.	2.60A.	No			19-21,24	portion of land lying
3001B-WL		3775	185	80	1.38A.	Yes			17-19	North of North line of
3001WD					6.982	No			17	O.L. 74.
3001A-T					2.51A.				15,16,19-21,24	
3001B-T					76.95				17,19	
3001-T					0.89A.				17	
3001C-T					5.66A.				11	
3001M-T					930				16	
3002 WL	The A.R. Bahr Lumber Company	9980	235	2.93 A.	2.93 A.	Yes			18-21,24	Total Taking
3003WL	Valdia Barnett and Mildred Barnett	10615	377	3675	3675	Yes			19	Total Taking
3304WL	Rose Slisz	10681	575	2450	2450	Yes			19	Total Taking
3005WL	Gertrude F. Baltz and Ramond Baltz	7820	600	2358	2358	Yes			19	Total Taking
3006WL	Margaret A. Hoban	6207	159	2492	2492	Yes			19	Total Taking
3007WL	William J. Bryer	9751	329	3776	3776	Yes			19	Total Taking
3008WL	Anna Mary Meister	5087	331	3835	3835	Yes			19	Total Taking
3009WL	Eva Eyring	5618	529	3894	3894	Yes			19	Total Taking
3012WL	George Bumm and Antonia Bumm	4385	204	3315	875	Yes	2440(L)		19	Partial Taking
3012WA									19	
3013WL	Caesar Hendke and Adina Hendke	8830	305	3520	3520	Yes			19	Total Taking
3014WL	Gustav Preis and Matilda Preis	3496	304	3703	3703	Yes			19	Total Taking
3015WL	Marko Kalinic and Olga Kalinic	8075	739	6574	6574	Yes			19	Total Taking
3016WL	Wasilij Butenko and Theresia Butenko	8486	45	6764	6764	Yes			19	Total Taking
3017WL	Wasilij Butenko and Theresia Butenko	8486	45	5414	5414	Yes			19	Total Taking
3018WL	Mary Louise Sammon	6436	672	5616	5616	Yes			19	Total Taking
3019WL	John S. Swartz and Mary F. Swartz	5463	490	5818	5818	Yes			19	Total Taking
3020WL	Rudolph Heil and Ann Heil	9040	684	6286	6286	Yes			19,20	Total Taking
3021WL	Ervin Lozdins and Rita S. Lozdins	7420	669	0.53A.	0.53A.	Yes			19,20	Total Taking
3022WL	Frank Stevens and Frances A.	5801	119	14,675	350	Yes	14,325		19	Partial Taking
3022WA	Stevens								19	
3023WL	Carl Mehringer and Leah Mehringer	7295	469	4475	1398	Yes	3077		20	Partial Taking
3024WL	John Chipka	7007	628	4957	2465	Yes	2492		20	Partial Taking

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3025WL	John A. Kolba, et.al.	9762	410	8113	8113	Yes			20	Total Taking
3026WL	Peter Freskakis	10312	57	9781	9781	Yes			20	Total Taking
3027WL	Herman E. Brock and Pearl R. Brock	9431	166	10563	10563	Yes			20	Total Taking
3028WL	Bernadette A. Grosse	4511	164	7786	7786	Yes			20	Total Taking
3029WL	John F. Persanyi and Helen Persanyi	9436	420	7614	7614	Yes			20	Total Taking
3030WL	Mary L. Vincik	8888	265	7441	7441	Yes			20	Total Taking
3031WL	Eugen Kachanovski and Ina Kachanovski	8649	318	5829	5829	Yes			21	Total Taking
3032WL	Albert Mishaga and Christine Mishaga	6656	154	5718	5718	Yes			21	Total Taking
3033WL	Wincenty Spiczzonek and Mike Bielemuk	9922	272	5608	5608	Yes			21	Total Taking
3034WL	Jno Skelly, et.al.	6694	711	5497	5497	Yes			21	Total Taking
3035WL	Fred C. H. Zacharias and Jeannette Zacharias	6873	247	5377	5377	Yes			21	Total Taking
3036WL	Teodor Stereb and Anna Stereb	8466	692	6578	6578	Yes			21	Total Taking
3037WL	James R. Towles and Mary A. Towles	9011	472	6405	6405	Yes			21	Total Taking
3038WL	Mary Marhevka	5805	315	6233	6233	Yes			21	Total Taking
3039WL	Gregory Chernick and Stella Chernick	5226	76	6027	6027	Yes			21	Total Taking
3040WL	Eleanor A. Foose and A.J. Foose	5648	674	7590	7590	Yes			22	Total Taking
3041WL	Elias Maximuk and Kathryn Maximuk	7091	221	6609	6609	Yes			22	Total Taking
3042WL	Oscar Krampitz and Ernestine L. Krampitz	5887	373	6664	6664	Yes			22	Total Taking

**FENCE LEGEND**

- (E) End Post
- (C) Corner Post
- (L) Line Post

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

MADE R.P.P. DATE 9-17-64 TRACED DATE  
CHECKED DATE SCALE

**ESTIMATED QUANTITIES - FENCE**

Project No.	R/W Sheet No.														Total Quantity	Unit	Item	Description				
	13	14	15	16	21	22	23	24	25	26	27	28	29	30					31	32	33	34
CUY - 176 - 12.76	1595	2480	1980	1045															7,100	Lin.Ft.	I-26	5 ft. Chain Link Fence
	1																		1	each	I-26	*Chain Link Fence Gate
CUY - 71 - 17.83				675	130	645	365	540	2590	1535	425	621	330	532	341	680	401	143	9,953	Lin.Ft.	I-26	5 ft. Chain Link Fence
											1				1	1	1		4	each	I-26	*Chain Link Fence Gate

**Note:**

\*All chain link fence gates are 14' swing-type.

For Fence Abutment Connection Detail see Standard Construction Drawing F-3. Areas followed by the letter "A" are in acres; all other areas are in square feet.

Residual areas that are landlocked are followed by the letter (L).

NAME	REVISION	DATE
P.G.S.	Parcel 3001 M-T Added	7-19-66

# SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY- 71 -17.83  
 CUY- 176 -12.76

614  
646  
3  
35

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3043B-T	Jones and Laughlin Steel Corporation				7.6 Ac.	No			4 & 5	Jennings Rd. Defour Plans
3043WL	Jones and Laughlin Steel Corporation	5450	439	8.27A	7.11A.	No	0.46A.	16,22-24		70 A. within Jennings Rd.
3043A-WL				134.82A	10.99A.	No	119.36A.	16,25,26		4.47 A. within Jennings
3043T					4,751	No		16,25		Rd.
3043A-T					1,41A.	No		26		
3043 Aerial					3,392	No		25,26		Construction of Buildings
3043U					190A.	No		16,25,26		within this area is
3043S					0.63A.	No		15		Restricted
3043A-S					0.39	No		35-A		
3044WD	Clarence C. Buchwald	9036	674	1939	1099	Yes	840	22		Partial Taking
3044WA								22		
3045WD	Domingo Rivera and Luz Maria Rivera	1120	363	1546	1546	Yes		22		Total Taking
3046WD	John T. Mihalik and Catherine Mihalik	5853	151	2235	2235	Yes		22		Total Taking
3047WD	Maurice Kronick and Clara Kronick	9739	235	2217	2217	Yes		22		Total Taking
3049WD	Carl Buecheler and Maria Buecheler	4029	110	4000	1000	Yes	3000	22		Partial Taking
3049WA								22		
3050WL	Katherine Kuhfeld	9975	682	4000	3000	Yes	1000	22		Total Taking
3050EL					1000					
3051WL	Genevieve F. Francis P. Rericha	10607	609	2614	2614	Yes		22		Total Taking
3052WL	Irma Rock, et. al.	7605	14	3589	3589	Yes		22		Total Taking
3053WL	Marianne Rock	10374	277	3228	3228	Yes		22		Total Taking
3054WL	Jack E. Wachuta and Barbara J. Wachuta	8481	650	1840	1840	Yes		23		Total Taking
3055WL	Katerina Trneny	7893	494	4780	4731	Yes	49	23		Total Taking
3055EL					49					
3056WL	George Paszkewycz and Anna Paszkewycz	7456	225	4375	3857	Yes	518	23		Total Taking
3056EL					518					
3057WL	Kenneth Brooks and Elizabeth B. Brooks	9910	15	4591	3658	Yes	933	23		Total Taking
3057EL					933					
3058WL	Paul Brooks and Ruth Brooks	8244	723	8008	8008	Yes		23		Total Taking

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3059WL	Marian Nedved	7644	359	4673	4673	Yes		23		Total Taking
3060WL	William Chamryk and Sophie Chamryk	5437	35	5020	5020	Yes		23		Total Taking
3061WL	John Kubiszak and Julia Kubiszak	5822	526	4375	4375	Yes		23		Total Taking
3062WL	Anthony Jucha and Anastasia Jucha	5674	670	5000	5000	Yes		23		Total Taking
3063WL	Susan Avon	8885	150	5000	5000	Yes		23		Total Taking
3064WL	Joseph N. Peshe	6403	610	5000	5000	Yes		23		Area of 3064A-WL included
3064A-WL					245			23		
3065WL	Phillip P. Logan and Katharine Logan	7094	682	5000	5000	Yes		23		Area of 3065A-WL included
3065A-WL					1033			23		
3066WL	Cecelia Polivka	8851	245	4955	4955	Yes		23		Area of 3066A-WL included
3066A-WL					1457			23		
3067WL	Board of Trustees of Cuyahoga County Hospital	9043	392	26 A.	186,228	Yes	21,72A.	25		Partial Taking
3067A-T					3843			25		
3067A-SA					5147			25,27		To repair damages to silos and equipment during construction
3068WL	Carmella Yusi and Charles Yusi	8404	18	3791	3791	Yes		27		Total Taking
3069WL	Kataryna Mazur	8436	679	3483	3483	Yes		27		Total Taking
3070WL	Jeanette Wishinski	6235	313	3483	3483	Yes		27		Total Taking
3070EL		91-6891	22							SOLD BY STATE
3071WL	Adolph E. Tucky	6461	589	6107	6107	Yes		27		Total Taking
3072WL	Anna Wengrin	7452	578	8118	8118	Yes		27		Total Taking
3073WL	Mike J. Gerda and Anna J. Gerda	5048	517	7915	7915	Yes		27		Total Taking
3074WL	Gladys L. Pawl	5144	719	8375	8375	Yes		27		Total Taking
3075WL	A. M. Prociak	9762	388	9230	9230	Yes		27		Total Taking
3076WL	Paul Glatzhofer and Dorothy Glatzhofer	4756	374	6567	6567	Yes		27		Total Taking
3077WL	Charles W. Chupil and Helen E. Chupil	6077	547	2745	2745	Yes		27		Total Taking
3078WL	Charles W. Chupil and Helen E. Chupil	8668	39	2970	2970	Yes		27		Total Taking

Note:  
 Areas followed by the letter "A" are in acres; all others areas are in square feet.  
 Residual areas that are landlocked are followed by the letter (L).

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

MADE R.P.P. DATE 9-17-64 TRACED DATE  
 CHECKED DATE SCALE

W.T.	ADDED PCL. 3070 EL & REMARKS	5-7-92
HRT	Added Parcel 3067A-SA	2-18-75
HRT	ADDED PCLS 3050EL, 3055EL, 3056EL & 3057EL	7-27-72
C.J.V.	REV. AREA PARCEL 3043A-S	2-16-66
NAME	REVISION	DATE

# SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

615  
646

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

4  
35

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3079WL	Adeline Martin, et.al.	10986	311	2970	2970	Yes			27	Total Taking
3080WL	Adeline Martin, et.al.	10986	311	6461	6461	No			27	Total Taking
3081WL	Carl G. Rubino and Mary D. Rubino	8461	275	2970	2970	Yes			27	Total Taking
3082WL	Carl G. Rubino and Mary D. Rubino	8461	275	3137	3137	No			27	Total Taking
3083WL	Ellsworth P. Holler and Martha C. Holler	5885	583	7862	7862	Yes			28	Total Taking
3084WL	Julius Czajka and Michalina Czajka	6433	445	8010	8010	Yes			28	Total Taking
3085WL	James Ropar and Catherine Ropar	4807	528	8158	4693	Yes	3465		28	Partial Taking
3085T					420				28	
3086WL	Ella R. Davis, et.al.	10932	399	8306	4526	Yes	3780		28	Partial Taking
3087WL	Chester P. David and Margaret David	9437	602	8454	4674	Yes	3780		28	Partial Taking
3088WL	Theodore Galaida	10666	5	8603	4823	Yes	3780		28	Partial Taking
3089WL	Zoltan G. Duchon and Julia Duchon	9938	658	6300	2520	Yes	3780		28	Partial Taking
3090WL	Outdoor Investment Company	6602	30	2964	2964	No			28	Total Taking
3091WL	James Lipin and Ann Lipin	7226	639	10324	6544	Yes	3780		28	Partial Taking
3093WL	Michael Merva, et.al. (B.P.R. Participation)	9069	480	2625	2625	Yes			28	Total Taking
3094WL	Eugene B. Fortney and Delores Fortney	10605	491	2252	2252	Yes		830	28	Total Taking
3095WL	Mary J. Culkar	8469	704	3932	3932	Yes			28	Total Taking
3096WL	Roy W. Ecoff and Lillian B. Ecoff	6611	180	4785	4785	Yes			28	Total Taking
3099WL	Anna Kanchuk	7082	320	5259	5259	Yes			28	Total Taking
3100WL	Fedor Seneczko and Maria Seneczko	10617	305	5536	5536	Yes			28	Total Taking
3101WL	Walter Peznar and Stella Peznar	6228	65	5813	5813	Yes			28	Total Taking
3102WL	Henry A. Hessel and Gertrude E. Hessel	5417	412	6091	6091	Yes			28	Total Taking
3103WL	Lemuel Phillips and Mary Phillips	10302	146	6368	6368	Yes			28	Total Taking
3104WL	John Nahrebecki	7479	739	6580	6580	Yes			28	Total Taking
3105WL	P. Hyde and R. Hyde	8248	195	6020	6020	Yes			28	Total Taking

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3106WL	Walter T. Fedrowiz and Wanda P. Fedrowiz	8818	235	5356	5356	Yes			29	Total Taking
3107WL	Anna H. Stempinski	9491	79	5926	5926	Yes			29	Total Taking
3108WL	George Joseph Sessin	10135	102	4125	4125	Yes			29	Total Taking
3109WL	Richard L. Farris	9457	696	2732	2732	Yes			29	Total Taking
3110WL	Genevieve Davalosky	10641	80	2795	2795	Yes			29	Total Taking
3111WL	Anna Dabool	9742	226	2615	2615	Yes			29	Total Taking
3112WL	Michael Struk and Olga Struk	8440	605	2090	2090	Yes			29	Total Taking
3113WL	Mary Koefsky	8894	187	2418	2418	Yes			29	Total Taking
3114WL	Kostantina Stamatias	5245	421	1385	1385	Yes			29	Total Taking
3115WL	Edward Harants, et.al.	9768	627	5766	5766	Yes			29	Total Taking
3116WD	Margaret Hay	9927	200	3146	596	Yes	2550		22	Partial Taking
3116WA									22	
3116A-WD	<del>George W. Haberbosch, et.al.</del>	<del>575</del>	<del>208</del>	<del>294</del>	<del>0</del>	<del>No</del>	<del>286</del>		22	COMBINED WITH PARCEL 3116 WD
3117WD	Alexander Szilvas	11139	357	2702	626	Yes	2076		22	Partial Taking
3117WA									22	
3118WD	Joseph Lesky and Maria Lesky	10901	561	2918	756	Yes	2162		22	Partial Taking
3118WA									22	
3119WD	Delmar R. Wilburn and Joan F. Wilburn	10309	583	2525	868	Yes	1657		22	Partial Taking
3119WA									22	
3120WD	Martin S. Wald	10347	663	2222	1030	Yes	1192		22	Partial Taking
3120WA									22	
3125U	James E. and Inez M. Jackson	7276	253	3236	3236	Yes			22,23	Total Taking
3126U	Maude A. Kallenbrunnen	8874	3	3500	3500	Yes			22	Total Taking
3200WD	Outdoor Investment Company	7025	633	4620	4620	No			14	Total Taking
3200A-WD	Betty D. Weltman	10166	107	4380	4380	No			14	Total Taking
3200B-WD	Anna M. Richards	4108	157	7185	5523	Yes	1662		14	Partial Taking
3200C-LA	Mary Slabe	10306	147	7594	0	No			14	Limited Access Only
3200D-WD	Louise W. Fischer	2133	560	3218	3218	No			14	Total Taking
3200E-WD	The Merryman Club	6269	184	11,766	75	No	11691		14	Partial Taking
3201WD	City of Cleveland B.P.R. Participation	2889	35	27,424	18,410	No	5717		13	Partial Taking
3202WL	Frances S. Konarski	2498	307	7609	7609	Yes			13	Total Taking
3201EL	City of Cleveland				3297				13	

**Note:**

Areas followed by the letter "A" are in acres; all other areas are in square feet.  
Residual areas that are landlocked are followed by the letter (L).

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

MADE RRP DATE 9-17-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE \_\_\_\_\_

H.R.T.	Rev. Area Pcl. 3201WD & added Pcl. 3201EL	4-25-85
A.M.	Pcl. 3201 WD B.P.R. Partic. area added	7-6-66
A.M.	Pcl. 3093WL B.P.R. Partic. area added	3-22-66
K.J.S.	COMBINED PARCEL 3116-A-WD WITH PARCEL 3116-WD	8-24-65
	3085 T	1-18-65
NAME	REVISION	DATE





# SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY- 71 - 17.83  
 CUY- 176 - 12.76

617  
646

6  
35

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3249WD	Julia Rozhon, et.al.	9440	92	5148	1247	Yes		3901	14	Partial Taking
3249WA									14	
3250WL	Eleanor Hronec and Julia M. Rozhon, trustees for Raymond Kapusta	9441	670	5148	4602	Yes		546	14	Partial Taking
3252WD	Jan Tretiak and Zofia Tretiak	10384	63 & 65	4882	82	No		4800	14	Partial Taking
3253WD	Jos. Czarnecki and Mary Czarnecki	6447	277	4884	1729	Yes		3155	14	Partial Taking
3253WA									14	
3254WL	Richard S. Farren, et.al.	9758	154	4886	4886	Yes			14	Total Taking
3255WL	Vukosav Ercevic and Vera Ercevic	7666	532	4889	4889	Yes			14	Total Taking
3256WL	Don Petruzzi and Anna Petruzzi	4825	440	2481	2481	Yes			14	Total Taking
3257WL	Joseph Wojnarowski and Mary Wojnarowski	4936	487	2481	2481	Yes			14	Total Taking
3259WL	John Sidloski, et.al.	10379	449	5460	800	No		4660	14	Partial Taking
3260WL	Frank P. Golaszewski and Anna Golaszewski (B.P.R. Participation)	9421	156	5460	5460	Yes			14	Total Taking
3261WL	Frank Stachura and Stanislaw Stachura	3042	570	5460	5460	Yes			14	Total Taking
3262WL	Tillie Kuczek and S. Stopa	7878	332	4680	4680	Yes			14	Total Taking
3263WL	Curyl Chmura and Julia Chmura	1816	606	4560	4560	Yes			14	Total Taking
3264WL	Tillie Kuczek	4752	574	4560	4560	Yes			14	Total Taking
3266WL	Frank M. Yurich Jr. and Elinore Yurich	6410	337	39,575	26,695	Yes		12,880(L)	14	Partial Taking
3266WA		7246	504						14	
		6410	336							
		6410	339							
		6422	203							
3271WL	Outdoor Investment Company	6807	49	8069	8069	No			14	Total Taking
3272WL	Rudolph A. Verhosek and Rose L. Verhosek	9437	52	4600	4600	Yes			14	Total Taking
		10688	449							
3273WL	Mary Janes Gibbs and Virginia Wengatz	7065	109	5175	5175	Yes			14	Total Taking
3274WL	Andrew Kalembo and Joan Kalembo	10158	143	6325	6325	Yes			14	Total Taking
3275WL	Frank Dindia	6671	383	12,445	12,445	No			14	Total Taking
		6671	394							combined with 3276WL & 3277WL
		6671	392							

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS	
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT			
3278WL	Lewis E. Noble and Joan M. Noble	8870	326	5320	5320	Yes			14	Total Taking	
3279WL	Anna Budzik	6700	137	5180	5180	Yes			14	Total Taking	
3280WL	Bazyli Semenchuk and Efrosina Semenchuk	7686	601	5180	5180	Yes			14	Total Taking	
3281WL	John Zajac and Mary Zajac	8242	272	5180	5180	Yes			14	Total Taking	
3282WL	Edward Mitchell, et.al.	10928	273	10,360	10,360	Yes			14	Total Taking	
3284WL	Charles Allison Jr. and Carolyn M. Allison (B.P.R. Participation on u.s. 1463(d))	9938	516	5180	5180	Yes		(4625)	(555)	Total Taking	
3285WL	Louis J. Andreasik and Helen D. Andreasik (B.P.R. Participation)	6897	310	5180	5180	Yes		(3700)	(1480)	Total Taking	
3286WL	Salvatore Tacchite (B.P.R. Participation)	8431	46	5180	5180	Yes			(2868)	(2312)	
3287WL	Stephen R. Noga and Dorothy A. Noga (B.P.R. Participation)	7624	126	5600	5600	Yes			(2180)	(3420)	
3288WL	Mary Rys (B.P.R. Participation)	7068	410	5600	5600	Yes			(1800)	(3800)	
3289WL	Stanley Cielec and Cecilia Cielec (B.P.R. Participation)	5282	215	5600	5600	Yes			(1820)	(4280)	
3290WL	Richard S. Cielec and Fern M. Cielec (B.P.R. Participation)	8619	552	5600	5600	Yes			(800)	(4800)	
3291WL	John Gerrick Jr. and Phyllis E. Gerrick (B.P.R. Participation)	7626	27	5600	5600	Yes			(240)	(5360)	
3292WL	John Kalembo and Helen Kalembo (B.P.R. Participation)	8844	397	5656	5656	Yes			(5656)	Total Taking	
3293WL	Catherine Truchatta (B.P.R. Participation)	10186	485	4823	4823	No			(4823)	Total Taking	
3294WL	Frank Dindia (B.P.R. Participation)	6671	391	9489	9489	No			(9489)	Total Taking	
		6671	389								
3300WL	Cosmo Plastics Company	6677	308	48,365	766	No			47,599	30	Partial Taking
3300U		7270	478		1877	No				26,30	
3302WL	Victoria Pahana	6217	186	5040	1260	Yes	3780			31	Partial Taking
3302WA										31	
3303WL	Feliks Bizga and Katarzyna Bizga	5888	312	5040	5040	Yes				31	Total Taking
3304WL	Girard O. Davis	6658	737	12,600	12,600	Yes				31	Total Taking
3305WL	Anna Wiedemann	9714	29	5040	5040	Yes				31	Total Taking
3306WL	Frank J. Czajkowski and Stella Czajowski	8618	103	5040	5040	Yes				31	Total Taking
3307WL	Louis Piskorik	8289	518	5040	5040	Yes				31	Total Taking
3308WL	Joseph Knark, et.al.	10674	365	5670	5670	Yes				31	Total Taking

See Note Sheet 14 - I-71 Participation.

Note:  
 Areas followed by the letter "A" are in acres, all other areas are in square feet.  
 Residual areas that are landlocked are followed by the letter (L).

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

MADE R.P.R. DATE 9-17-64 TRACED \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED \_\_\_\_\_ DATE \_\_\_\_\_ SCALE \_\_\_\_\_

A.M.	Pc/ 3260 WD B.P.R. Limits added	7-6-66
A.M.	Pc/s 3284 WL to 3294 WL - B.P.R. Partic. Areas added	3-22-66
R.T.S.	Rev. Deed Area & Residue. Par. 3300	June 1 1965
NAME	REVISION	DATE



# SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

619  
646

CUYAHOGA COUNTY  
CUY- 71 -17.83  
CUY- 176-12.76

8  
35

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3360WL	Anna Niemczyk, et.al.	8872	298	4457	4457	Yes			32	Total Taking
3361WL	Ann H. Walker	9937	113	4825	4825	Yes			32	Total Taking
3362WL	Joseph L. Gajewski and Loretta C. Gajewski	7601	66	3708	3708	Yes			32	Total Taking
3363WL	Paul F.A. Naugle Jr. and Olga Naugle	8277	258	3708	3708	Yes			32	Total Taking
3364WL	Arthur J. Masten	9717	528	5933	5933	Yes			32	Total Taking
3365WL	Myrosław Heynysh and Eugenia Heynysh	9717	741	4450	4450	Yes			32	Total Taking
3366WL	Stefan Hlohowskyj, et.al.	8664	279	4450	4550	Yes			32	Total Taking
3367WL	Nicholas Kapral	9077	300	7417	7417	Yes			32	Total Taking
3368WL	Eli Mike	6453	416	7417	7417	Yes			32	Total Taking
3369WL	Stella Zarichni a.k.a. Stella Zarichny	3332	406	7417	7417	Yes			32	Total Taking
3370WL	William H. Tate and Mary Tate	864	468 & 469	7420	7420	Yes			32	Total Taking
3371WL	Leo J. Mackey	9776	600	7416	7416	Yes			32	Total Taking
3372WD	Robert Henry Parsch and Katherine R. Parsch	10998	175	3610	3610	Yes			32	Total Taking
3373WD	Anna Mitchell	4927	173	3807	375	Yes	3432		32	Partial Taking
3373WA									32	
3374WL	The Board of Education of The City School District of The City of Cleveland.	3569 4931 4934	496 439 483	64,600	11,680	Yes	52,920		33 & 33A 33 & 33A	Buhrer School
3374T					32,193					
3375WL	Charles A. Embriano and Florence R. Embriano, et.al.	8639	616	7500	7500	Yes			33	Total Taking
3376WL	Elizabeth Fenko	3729	5	3750	3750	Yes			33	Total Taking
3377WL	Wilmer E. Richmond and Donna J. Richmond	10700	163	3750	3750	Yes			33	Total Taking
3378WL	Anna Zubal	7002	459	7500	7500	Yes			33	Total Taking
3379WL	Giuseppe Bagnoli and Julia Bagnoli	5822	658	8156	8156	Yes			33	Total Taking
3380WL	John W. Szwagulak and Sophie Szwagulak	6039	696	4125	4125	Yes			33	Total Taking
3381WL	Harold Jenkins and Orgie A. Jenkins	5689	6	4031	4031	Yes			33	Total Taking
3382WL	Nick H. LoConti	8812	268	6378	6378	Yes			33	Total Taking
6000 T	Harry R. Horvitz, et al	8838	55	351530	42250	No			8	Jennings Road Detour Plans
6001 T	A.J. Gregg Realty Co.	9012	589	131222	29207	No			8	" " " "
6002 T	Union Carbide Corp.	9766	27	304692	29787	No			8	" " " "

PARCEL NO.	OWNER	DEED RECORD		DEED AREA	TO BE ACQ'D.		RESIDUE		SHEET NO.	REMARKS
		BOOK	PAGE		LAND	BLDGS.	LEFT	RIGHT		
3383WL	Thomas Fair and Rosalind Fair	9912	570	6380	6380	Yes			33	Total Taking
3384WL	Earl Jacobson and Marjorie Jacobson	10341	179	3150	1800	Yes		1350	33	Partial Taking
3384WA									33	
3386WL	John Zajac and Elizabeth Zajac	10643	63	8324	1680	Yes		6644	33	Partial Taking
3386WA									33	
3387WL	Brookhauser Development Company	10911	547	20,385	4120	Yes		16,265	33	Partial Taking
3392WL	John P. Scensny and Charlotte H. Scensny	10911 9784	551 128	4516	4516	Yes			33	Total Taking
3393WL	Julia Ercegovac	9775	577	6420	6420	Yes			33	Total Taking
3394WL	Herculano P. Andrade and Angelina Andrade	5608	255	6400	6400	Yes			33	Total Taking
3395WL	Katharina Breudigam	7812	275	5070	5070	Yes			33	Total Taking
3396WL	Nicolas Strilbycky and Sofia Strilbycky	3053	51	6253	6253	Yes			33	Total Taking
3397WL	Frank Kovalcek, et.al.	10643	197	7056	7056	Yes			33	Total Taking
3398WL	The Cleveland Tile and Cabinet Company, an Ohio Corporation	9952	339	8425	8425	Yes			33	Total Taking
3399WL	Michael J. Vargo and Helen J. Vargo	9477	618	4200	4200	Yes			33	Total Taking
3400WL	Ann Davis	10167	686	2900	2900	Yes			33	Total Taking
3401WL	Evelyn Casciano and Helen L. Gaydos, et.al.	7679	336	9775	9775	Yes			33	Total Taking
3402WL	Walter C. Priesmeyer	8682	141	5153	1476	Yes	3677		34	Partial Taking
3402WA									34	
3403WL	Anton Krisak and Elizabeth Krisak	6476	461	4620	1330	Yes	3290		34	Partial Taking
3403WA									34	
3413WL	Joe Tytko and Anna Tytko	4562	605	5090	5090	Yes			34	Total Taking
3414WL	Wasilie Mischanko and Marie Mischanko	8664	219	4620	4620	Yes			34	Total Taking
3423WL	Harold J. Benarth and Jean Benarth	8071	676	2634	2634	Yes			34	Total Taking
3424WL	Paul Schindler and Helen Schindler	7059	266	2185	2185	Yes			34	Total Taking
3425WL	Theresa M. Potkey	6481	67	2396	2396	Yes			34	Total Taking
3426WL	Eleanor Pollock	8603	11	2415	2415	Yes			34	Total Taking
5008 T	Cleveland Electric Illuminating Co.	5472	101	4.89 Ac.	1353	No			5	Jennings Rd. Detour Plans
3437WL	Michael J. Kolodty	4872	465	12,628	2401	No		10,227	34	Partial Taking
5000AS	The Baltimore & Ohio Railroad Co.				44,800	No			35	
5000BS					8,345	No			35	
5002AS	The Wheeling & Lake Erie Railway Co.				3,800	No			35-A	
5006S	Elco Lubricant Co.	7907 1124	621 527		1,985	No			35	
5007S	Cuyahoga Lime Co.	9796	725		6,300	No			35-A	

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK  
MADE R.P.P. DATE 9-17-64 TRACED DATE  
CHECKED DATE SCALE

C.V.V.	REV. AREAS PARCELS - 5002A-S, 5007-S	2-16-66
K.J.S.	REV. TAKE PARCELS 5002-A-S & 5007-S	8-11-64
NAME	REVISION	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

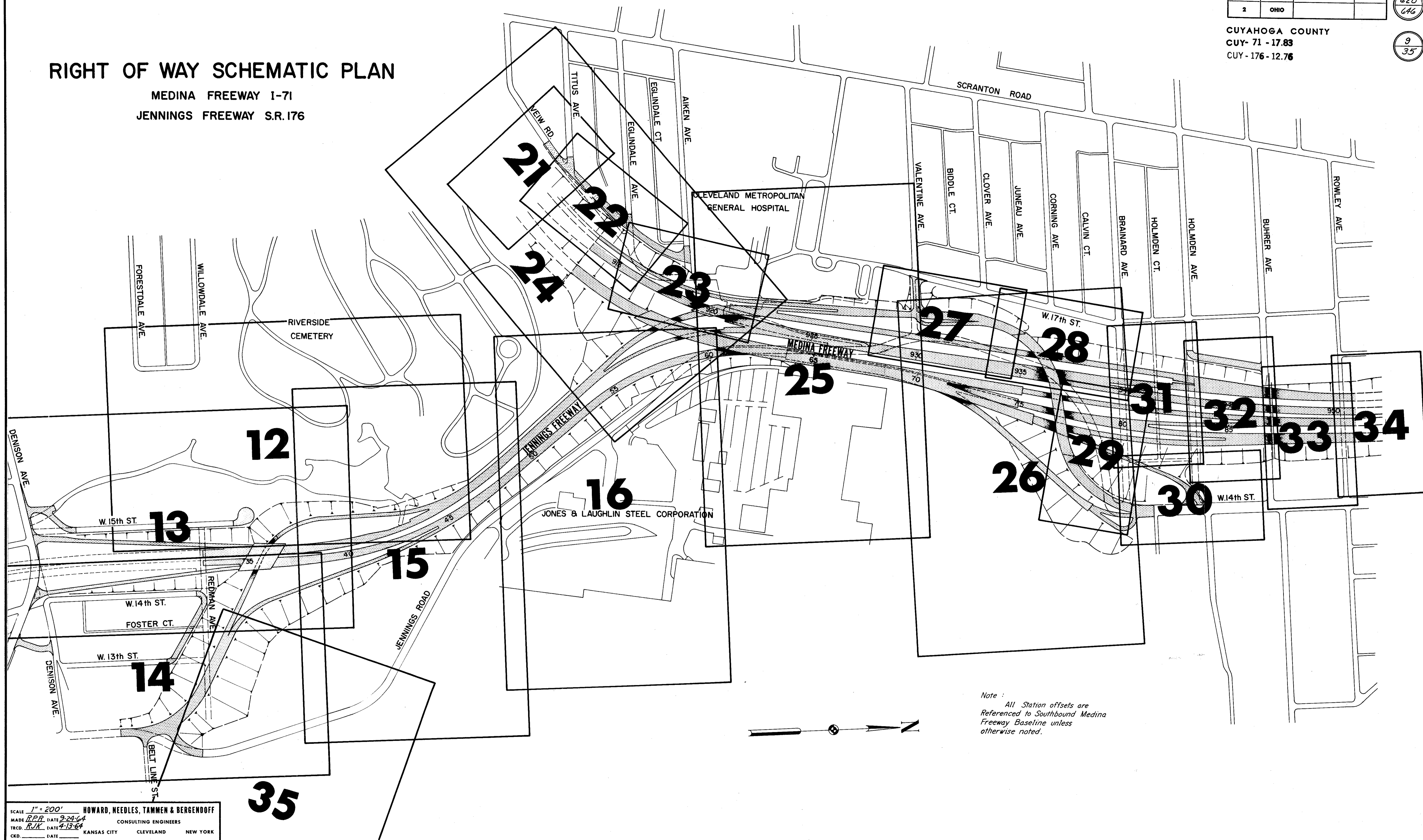
620  
646

9  
35

CUYAHOGA COUNTY  
 CUY- 71 - 17.83  
 CUY - 176 - 12.76

# RIGHT OF WAY SCHEMATIC PLAN

MEDINA FREEWAY I-71  
 JENNINGS FREEWAY S.R. 176



Note: All Station offsets are Referenced to Southbound Medina Freeway Baseline unless otherwise noted.

SCALE 1" = 200'  
 MADE R.P.P. DATE 2-24-64  
 TRCD. R.J.A. DATE 4-13-64  
 HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

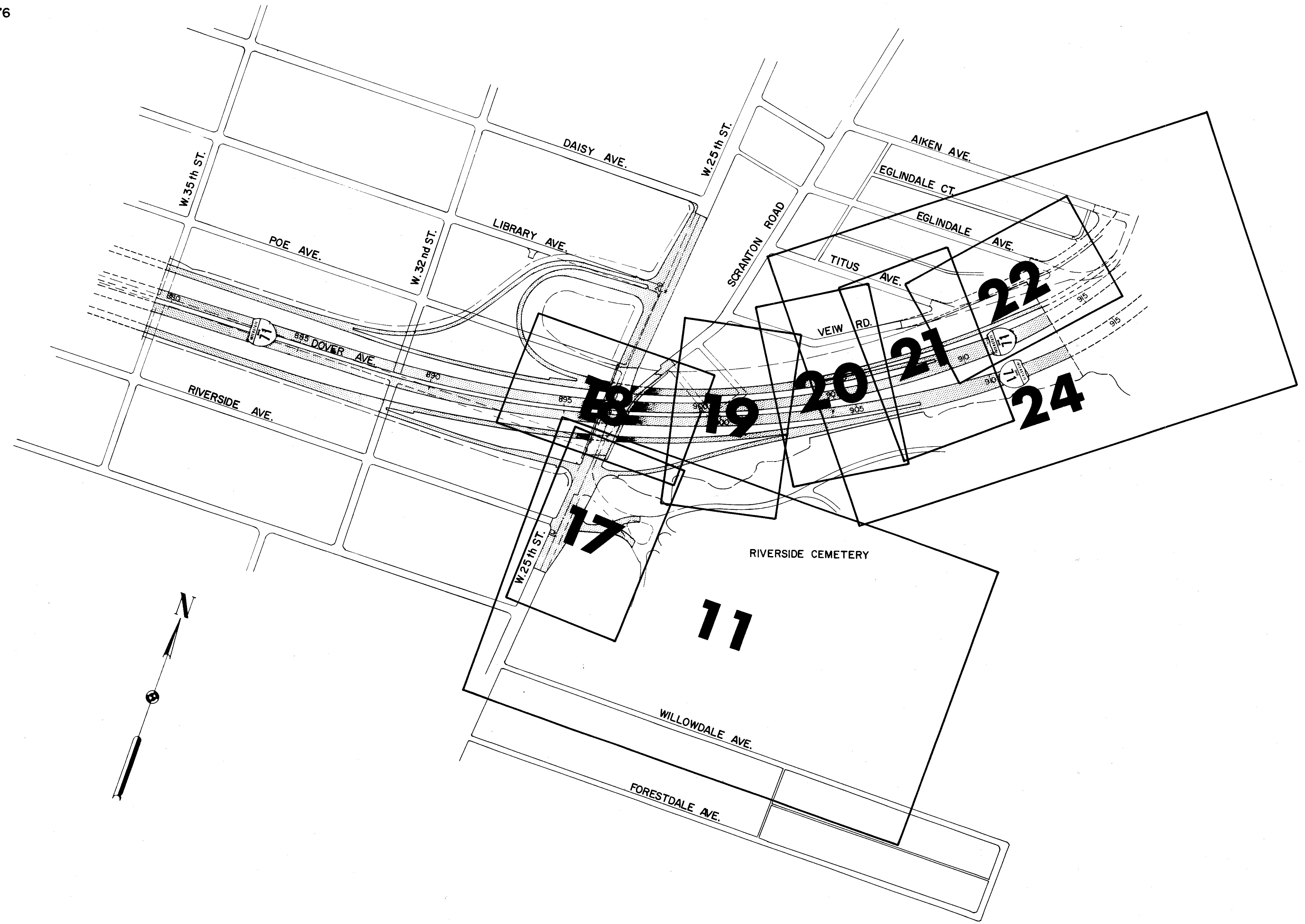
621  
646

CUYAHOGA COUNTY  
 CUY- 71 - 17.83  
 CUY - 176 - 12.76

10  
35

# RIGHT OF WAY SCHEMATIC PLAN

MEDINA FREEWAY I-71  
 JENNINGS FREEWAY S.R. 176



SCALE 1"=200'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 MADE P.P.S. DATE 2-23-69 CONSULTING ENGINEERS  
 TRCD. H.L.D. DATE 2-20-69 KANSAS CITY CLEVELAND NEW YORK  
 CKD. DATE

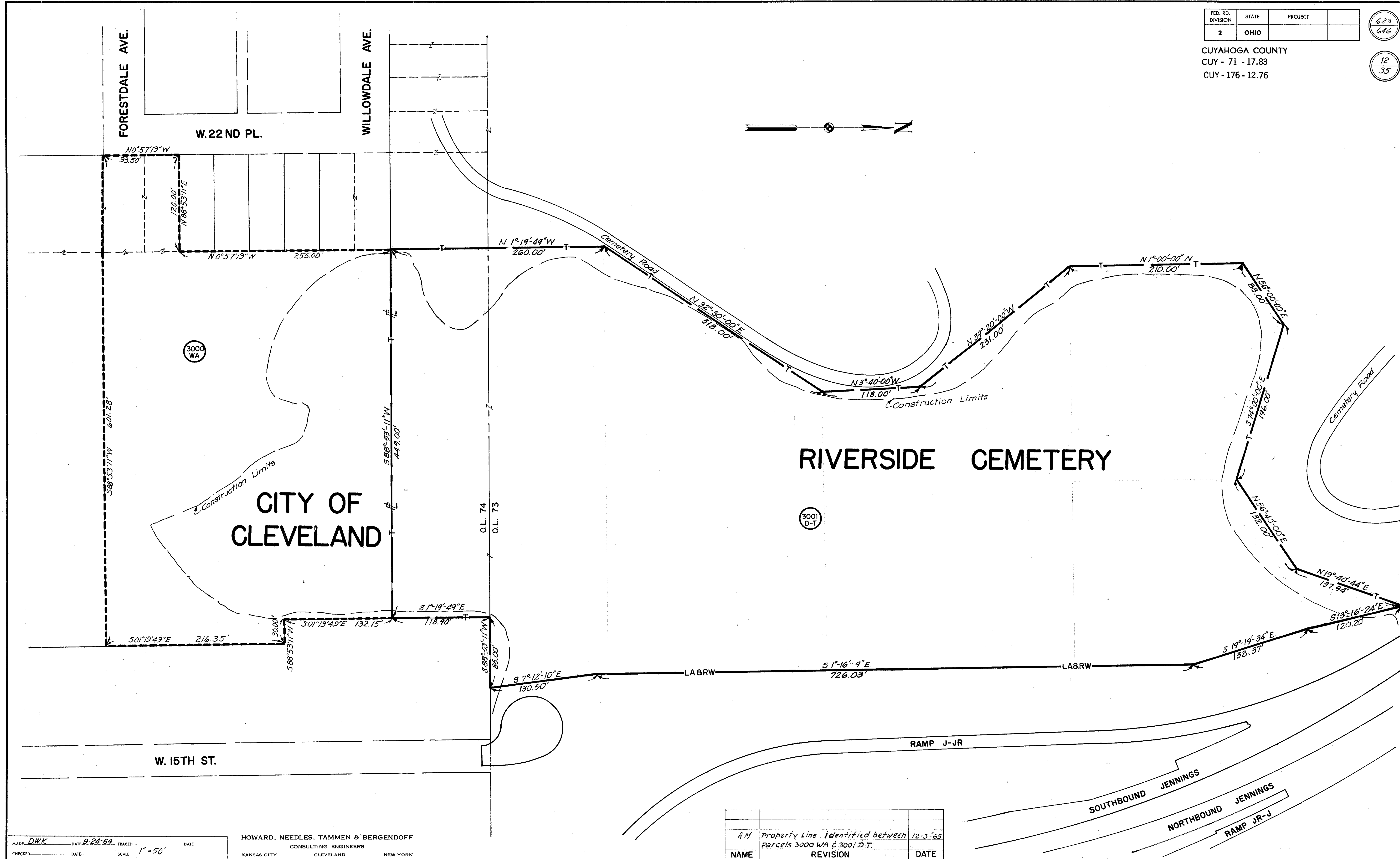


FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

623  
646

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76

12  
35



MADE *D.W.K.* DATE *9-24-64* TRACED DATE  
CHECKED DATE SCALE *1" = 50'*

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE
<i>A.M.</i>	<i>Property Line identified between</i>	<i>12-3-65</i>
	<i>Parcels 3000 WA &amp; 3001 D.T.</i>	



FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

624  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

13  
35



**N.B. S.R.-176 CURVE DATA**

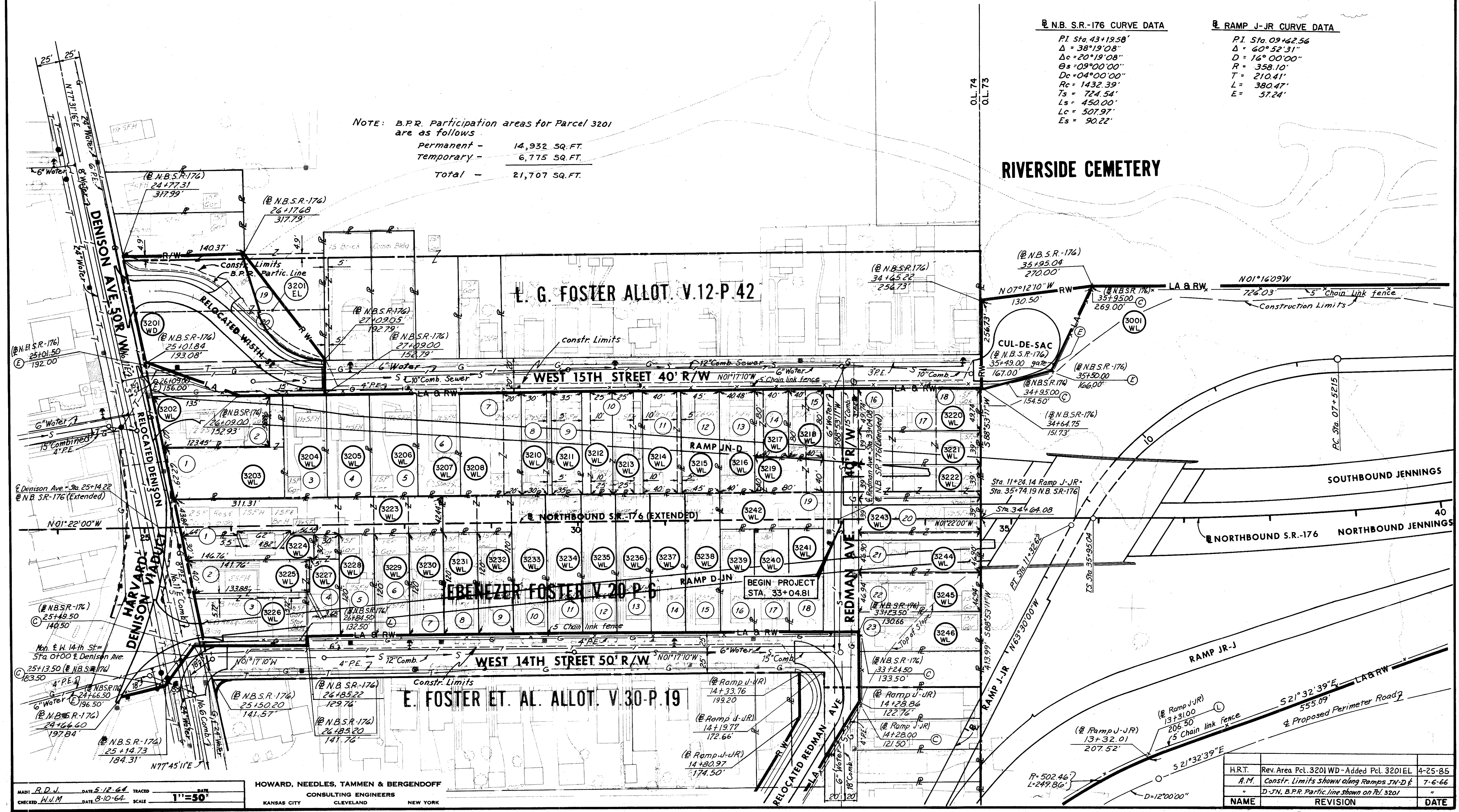
P.I. Sta. 43+19.58'  
 $\Delta = 38^{\circ}19'08''$   
 $\Delta c = 20^{\circ}19'08''$   
 $\Theta = 09^{\circ}00'00''$   
 $Dc = 04^{\circ}00'00''$   
 $Rc = 1432.39'$   
 $Ts = 724.54'$   
 $Ls = 450.00'$   
 $Lc = 507.97'$   
 $Es = 90.22'$

**RAMP J-JR CURVE DATA**

P.I. Sta. 09+62.56  
 $\Delta = 60^{\circ}52'31''$   
 $D = 16^{\circ}00'00''$   
 $R = 358.10'$   
 $T = 210.41'$   
 $L = 380.47'$   
 $E = 57.24'$

NOTE: B.P.R. Participation areas for Parcel 3201  
 are as follows  
 Permanent - 14,932 SQ. FT.  
 Temporary - 6,775 SQ. FT.  
 Total - 21,707 SQ. FT.

**RIVERSIDE CEMETERY**



MADE: R.D.J. DATE: 5-12-64 TRACED: \_\_\_\_\_  
 CHECKED: W.J.M. DATE: 8-10-64 SCALE: 1"=30'  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

H.R.T.	Rev. Area Pct. 3201 WD - Added Pct. 3201 EL	4-25-85
A.M.	Constr. Limits Shown along Ramps JN-D & J-JR	7-6-66
"	D-JN, B.P.R. Partic. Line Shown on Pct. 3201	"
NAME	REVISION	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

625  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

14  
35

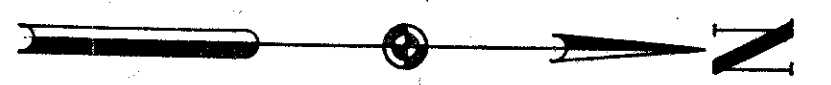


RELOCATED W 14 ST  
CURVE DATA  
PI Sta 11+32.35  
Δ = 30° 13' 24"  
D = 100.00'  
L = 52.75'  
T = 27.00'  
E = 3.58'

RAMP J-JR CURVE DATA  
PI Sta 20+15.04  
Δ = 61° 11' 14"  
D = 16° 00' 00"  
R = 358.10'  
T = 211.72'  
L = 382.42'  
E = 57.91'

**RIVERSIDE CEMETERY**

NO FEDERAL PARTICIPATION IN  
RESIDUES PARCELS 3284 THRU 3294  
ON U.S. 1463 (1).  
RESIDUAL VALUES ASSIGNED TO  
I-71 PROJECT.



OL.73  
OL.84

NAME	REVISION	DATE
A.M.	Pc/s 3276 WL & 3277 WL added (part of 3275 WL)	7-6-66
B.P.R.	Partic. Line shown on Parcel 3260 WL	"
A.M.	Participation note added, Prc/s 3284 to 3294	3-10-66

MADE R.D.U. DATE 6-12-64 TRACED DATE  
CHECKED R.P.R. DATE 9-9-64 SCALE 1"=50'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

626  
646

CUYAHOGA COUNTY  
 CUY- 71 - 17.83  
 CUY- 176 - 12.76

15  
35

# JONES & LAUGHLIN CORPORATION

## RIVERSIDE CEMETERY

## JENNINGS ROAD

### N.B.S.R.-176 CURVE DATA

P.I. = Sta. 43+19.58  
 $\Delta = 38^{\circ}19'08''$   
 $\Delta c = 20^{\circ}19'08''$   
 $\theta s = 09^{\circ}00'00''$   
 $Dc = 04^{\circ}00'00''$   
 $Rc = 1432.39'$   
 $Ts = 724.54'$   
 $Ls = 450.00'$   
 $Lc = 507.97'$   
 $Es = 90.22'$

### SEWER CURVE DATA

P.I. Sta. 0+72.82  
 $\Delta = 88^{\circ}54'00''$   
 $R = 50.00'$   
 $T = 49.05'$   
 $L = 77.58'$

### SEWER CURVE DATA

P.I. Sta. 9+00.17  
 $\Delta = 59^{\circ}26'00''$   
 $R = 50.00'$   
 $T = 28.54'$   
 $L = 51.87'$

MADE: R.D.V. DATE: 5-19-64 TRACED: DATE: \_\_\_\_\_  
 CHECKED: R.P.R. DATE: 9-9-64 SCALE: 1"=50'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE

FEB 11 1965 RIGHT OF WAY



FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

628  
646

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

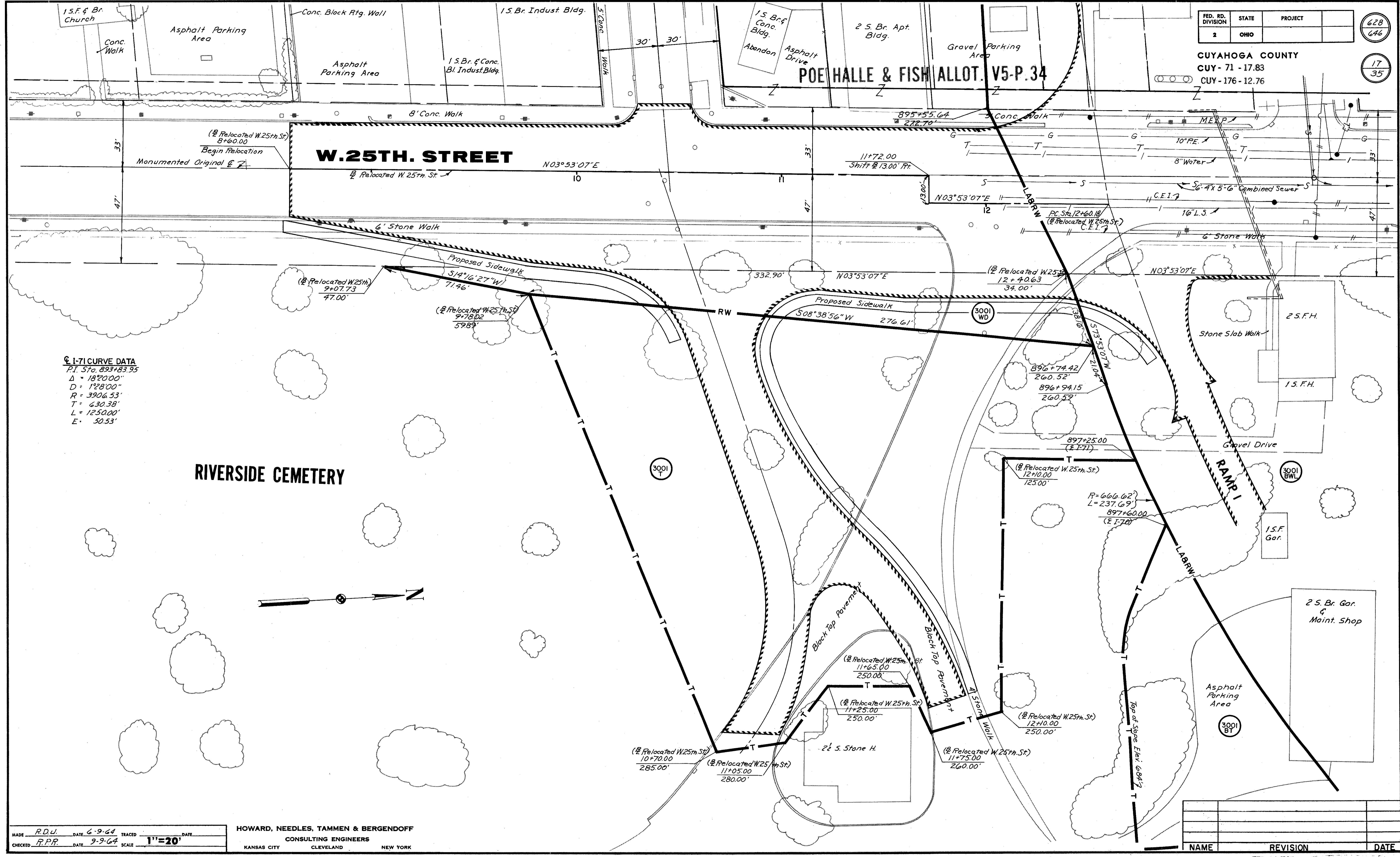
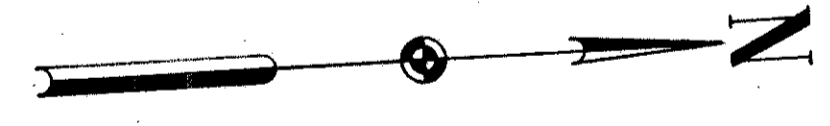
17  
35

**POE HALLE & FISH ALLOT. V5-P.34**

**W. 25TH. STREET**

**RIVERSIDE CEMETERY**

**1-71 CURVE DATA**  
 P.I. Sta. 893+83.95  
 Δ = 182°00'  
 D = 128'00"  
 R = 3906.53'  
 T = 630.38'  
 L = 1250.00'  
 E = 50.53'



MADE R.D.U. DATE 6-9-64 TRACED DATE  
 CHECKED R.P.R. DATE 9-9-64 SCALE 1"=20'

**HOWARD, NEEDLES, TAMMEN & BERGENDOFF**  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE



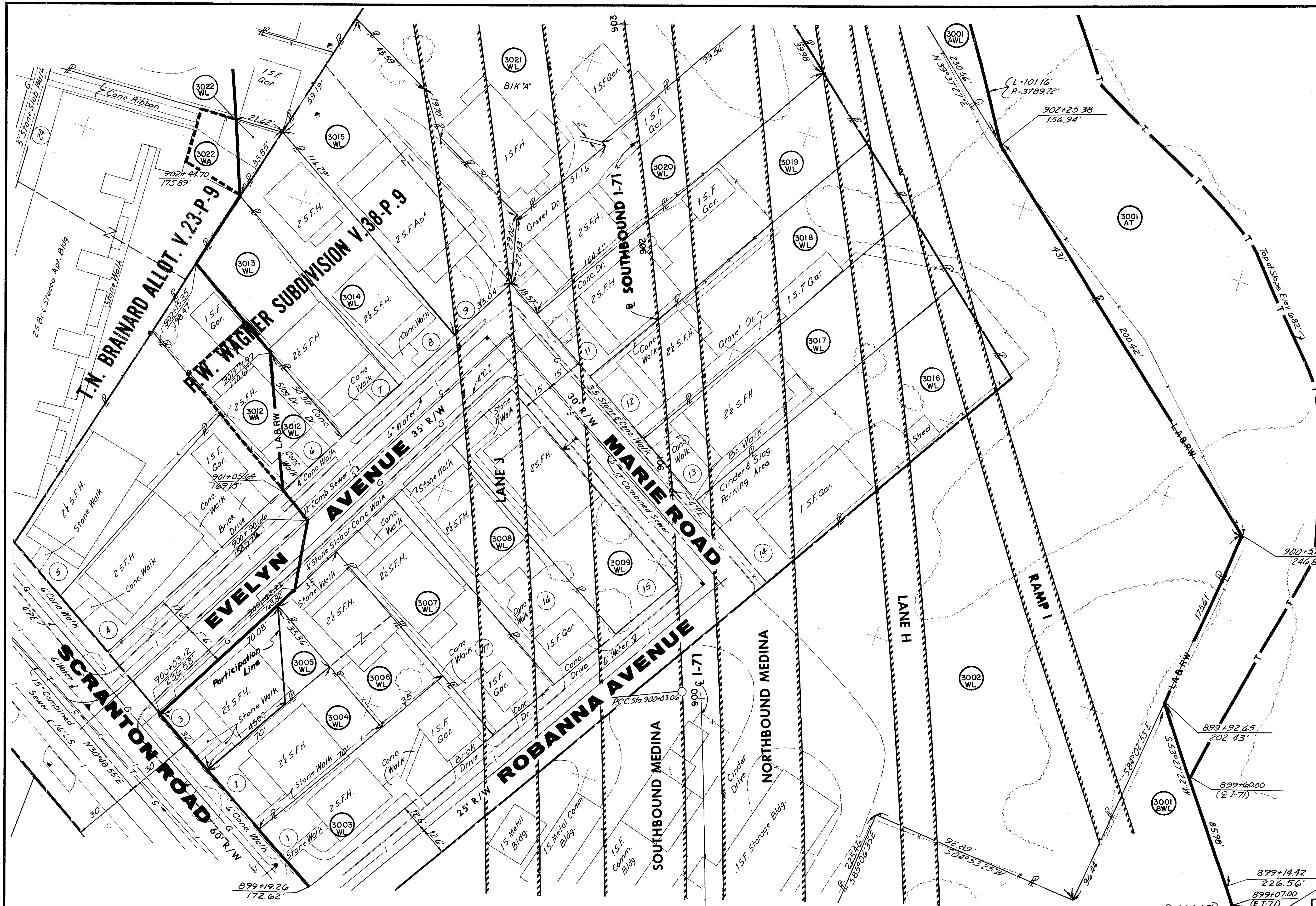
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

630  
646

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

19  
35

# RIVERSIDE CEMETERY



**E I-71 CURVE DATA**  
 P.I. Sta. 893+83.95  
 Δ = 18°20'00"  
 D = 1°28'00"  
 R = 3906.53'  
 T = 630.38'  
 L = 1250.00'  
 E = 50.53'

**S.B. I-71 CURVE DATA**  
 P.I. Sta. 905+40.84  
 Δ = 21°14'41"  
 D = 2°00'00"  
 R = 2844.79'  
 T = 537.28'  
 L = 1062.23'  
 E = 49.95'

3001 BT

NAME	REVISION	DATE

MADE R.D.J. DATE 8-3-64 TRACED DATE  
 CHECKED W.J.M. DATE 9-9-64 SCALE 1"=20'

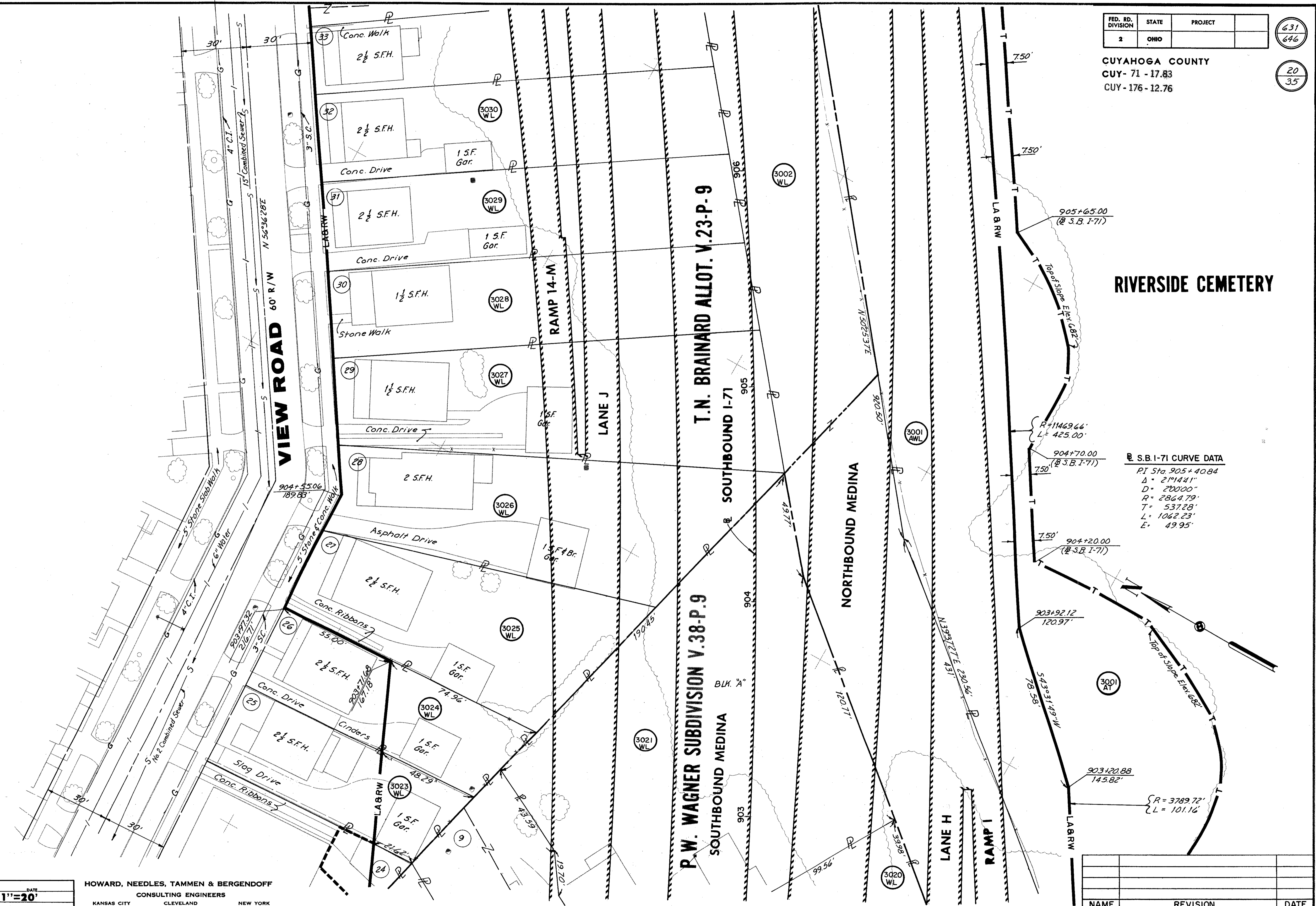
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

631  
646

20  
35

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76



MADE R.D.J. DATE 2-7-64 TRACED DATE  
CHECKED W.J.M. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE

FEB 11 1965 RIGHT OF WAY





**J.M. CURTISS & T.N. BRAINARD**  
**EASTVIEW ADDITION & EXTENSION V.16-P.19**

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

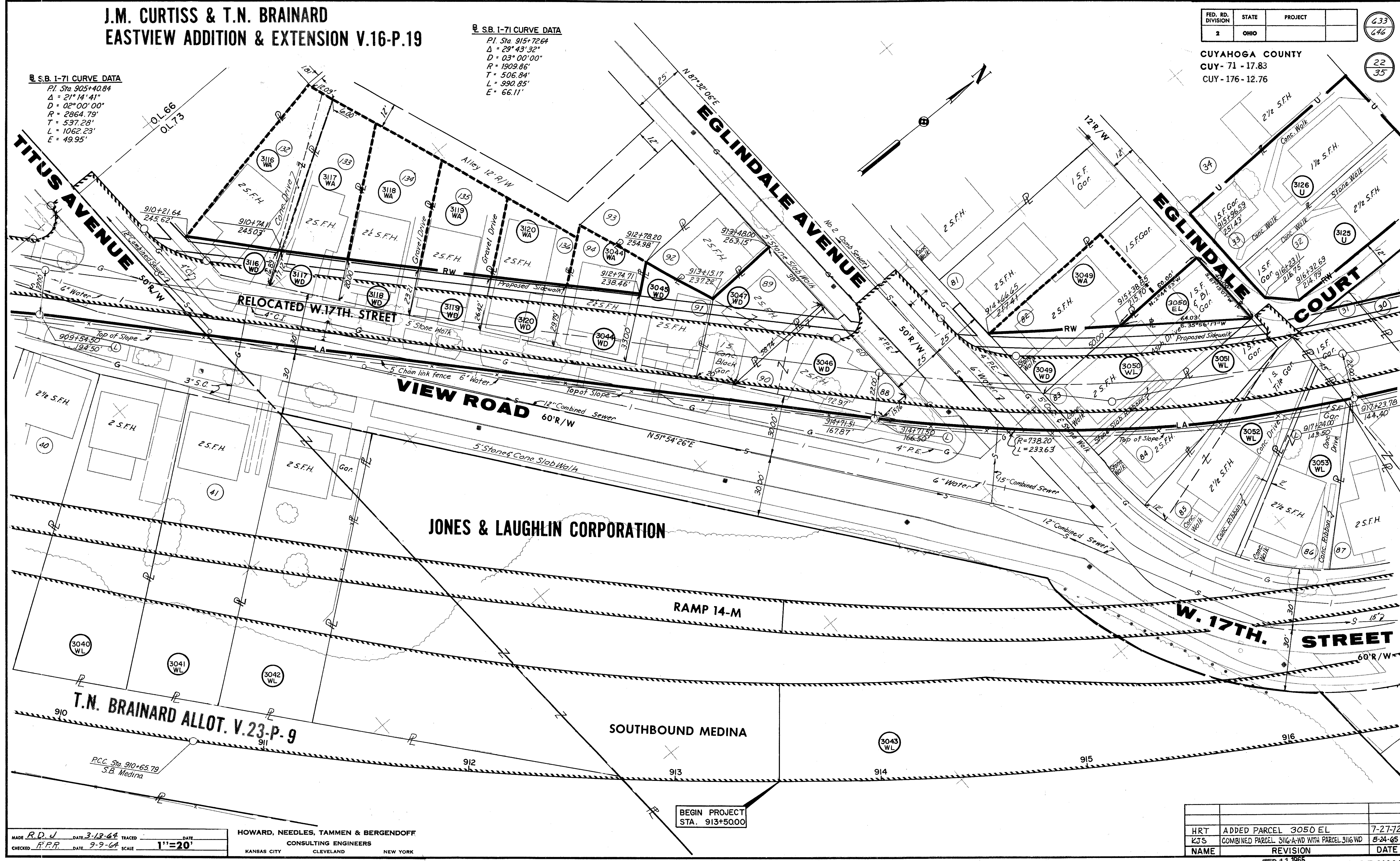
CUYAHOGA COUNTY  
 CUY - 71 - 17.83  
 CUY - 176 - 12.76

633  
646

22  
35

**S.B. I-71 CURVE DATA**  
 P.I. Sta. 905+40.84  
 $\Delta = 21^{\circ}14'41''$   
 $D = 02^{\circ}00'00''$   
 $R = 2864.79'$   
 $T = 537.28'$   
 $L = 1062.23'$   
 $E = 49.95'$

**S.B. I-71 CURVE DATA**  
 P.I. Sta. 915+72.64  
 $\Delta = 29^{\circ}43'32''$   
 $D = 03^{\circ}00'00''$   
 $R = 1909.86'$   
 $T = 506.84'$   
 $L = 990.85'$   
 $E = 66.11'$



**JONES & LAUGHLIN CORPORATION**

**RAMP 14-M**

**W. 17TH STREET**

**T.N. BRAINARD ALLOT. V.23-P.9**

**SOUTHBOUND MEDINA**

BEGIN PROJECT  
 STA. 913+50.00

MADE R.D.V. DATE 3-12-64 TRACED DATE  
 CHECKED R.P.R. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

HRT	ADDED PARCEL 3050 EL	7-27-72
KJS	COMBINED PARCEL 3016-A-WD WITH PARCEL 3016-WD	8-24-65
NAME	REVISION	DATE

FEB 11 1965 RIGHT OF WAY

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

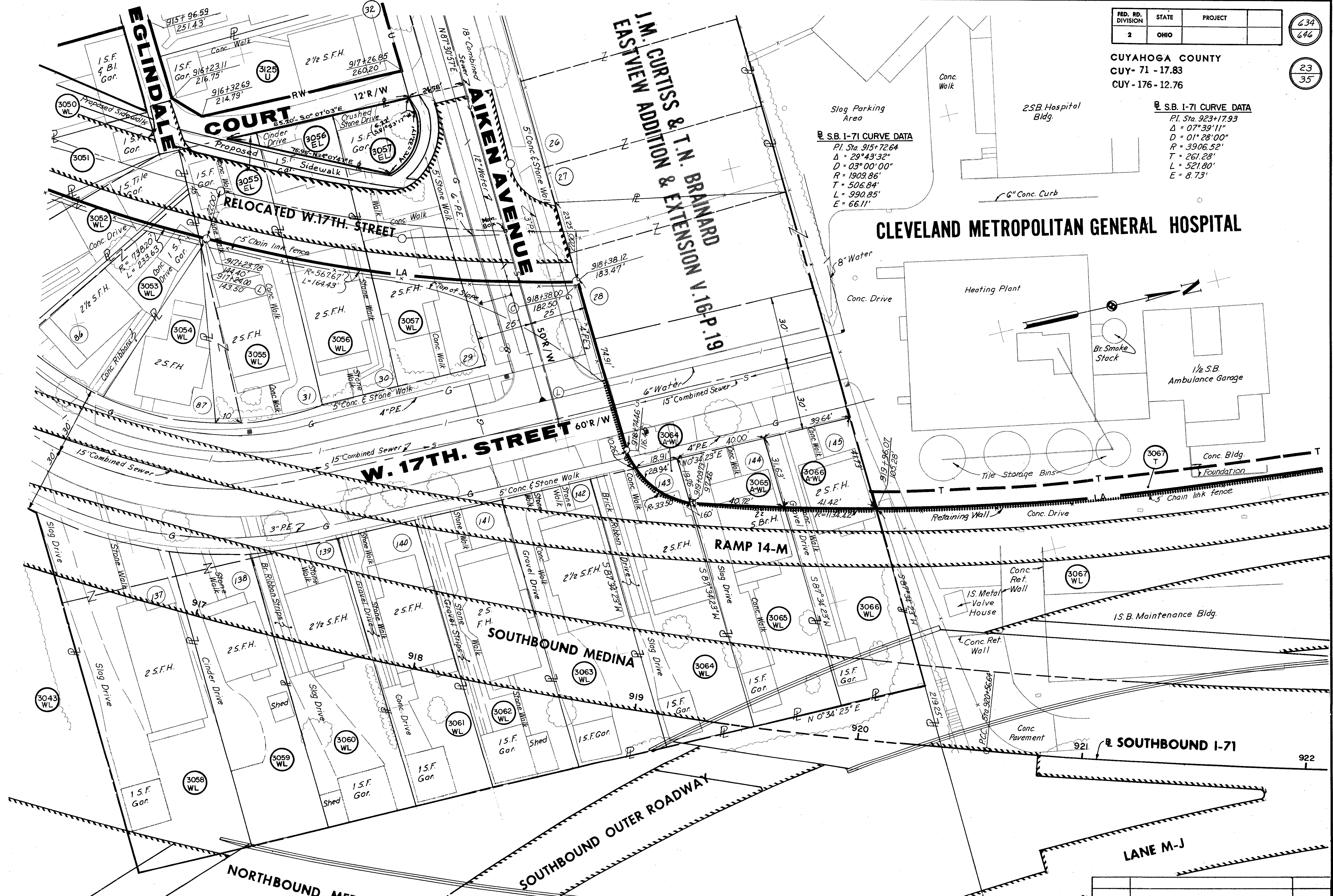
634  
646

23  
35

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

**SB. I-71 CURVE DATA**  
 P.I. Sta. 923+17.93  
 $\Delta = 07^{\circ}39'11''$   
 $D = 01^{\circ}28'00''$   
 $R = 3906.52'$   
 $T = 261.28'$   
 $L = 521.80'$   
 $E = 8.73'$

**SB. I-71 CURVE DATA**  
 P.I. Sta. 915+72.64  
 $\Delta = 29^{\circ}43'32''$   
 $D = 03^{\circ}00'00''$   
 $R = 1909.86'$   
 $T = 506.84'$   
 $L = 990.85'$   
 $E = 66.11'$



MADE R.D.V. DATE 5-5-64 TRACED DATE  
 CHECKED R.P.P. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

HRT	ADDED PCLS. 3055EL, 3056EL & 3057EL	7-27-72
NAME	REVISION	DATE

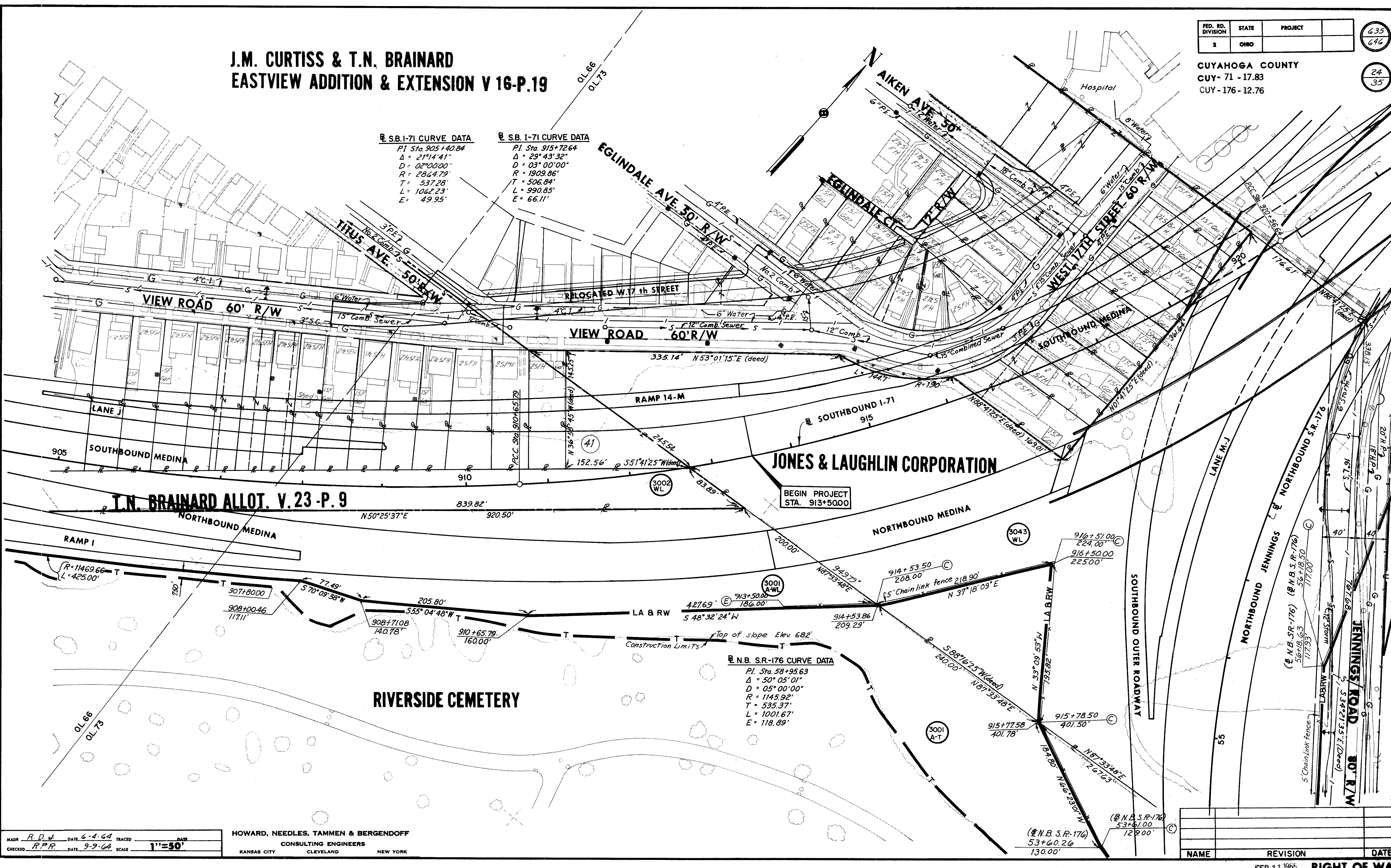
FEB 11 1965 RIGHT OF WAY

**J.M. CURTISS & T.N. BRAINARD  
EASTVIEW ADDITION & EXTENSION V 16-P.19**

FED. RD. DIVISION	STATE	PROJECT	635 646
2	OHIO		24 35

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY - 176 - 12.76

S.B. I-71 CURVE DATA		S.B. I-71 CURVE DATA	
PI Sta. 905+40.84	$\Delta = 21^{\circ}14'41''$	PI Sta. 915+72.64	$\Delta = 29^{\circ}43'32''$
D = 02°00'00"	R = 2864.79'	D = 03°00'00"	R = 1909.86'
T = 537.28'	L = 1062.23'	T = 506.84'	L = 990.85'
E = 49.95'		E = 66.11'	



MADE R.D.W. DATE 6-4-64 TRACED DATE  
CHECKED P.P.R. DATE 9-9-64 SCALE 1"=50'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

636  
646

CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

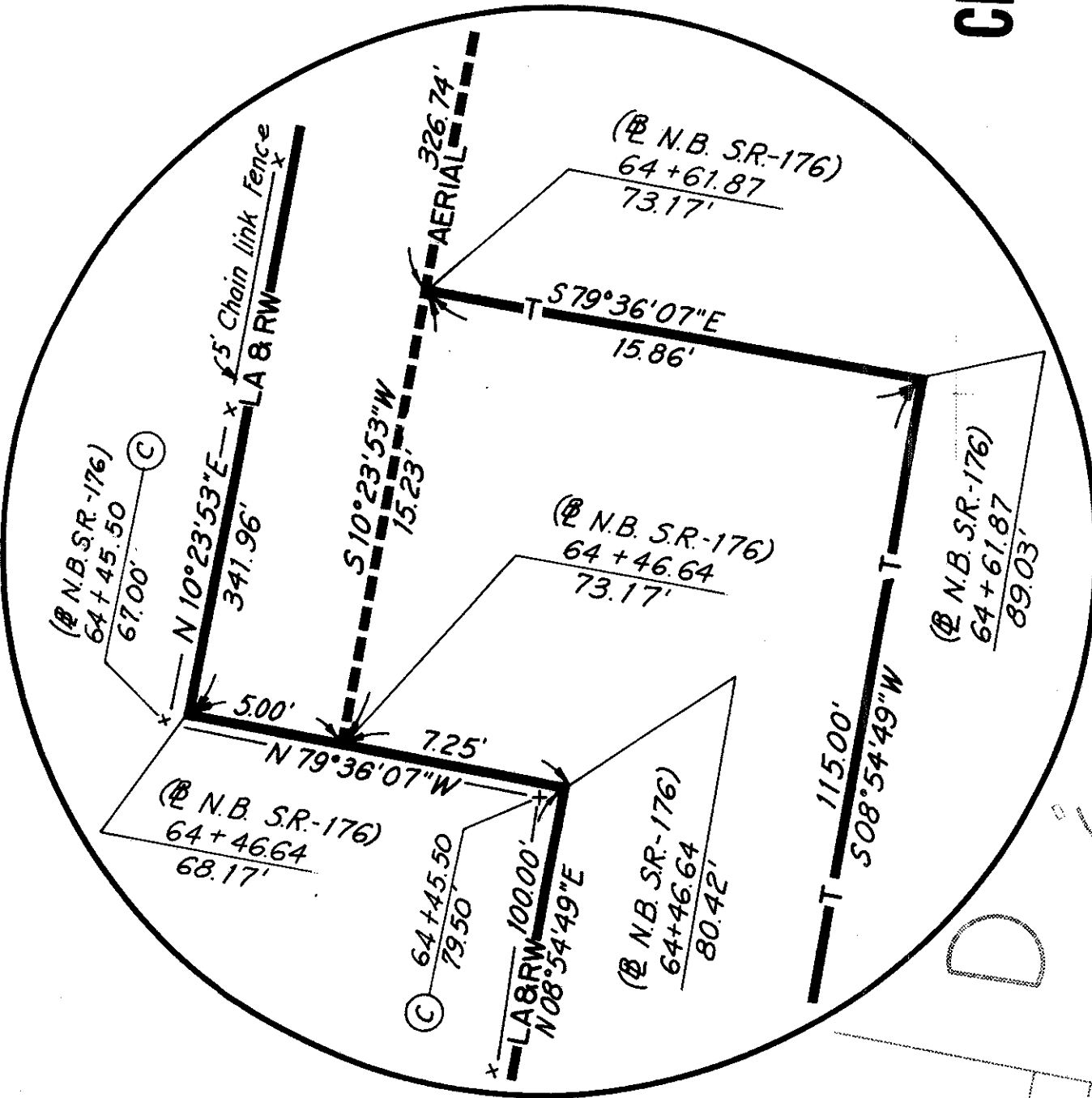
25  
35

VALENTINE AVE. 929+41.54  
12' water 362.07

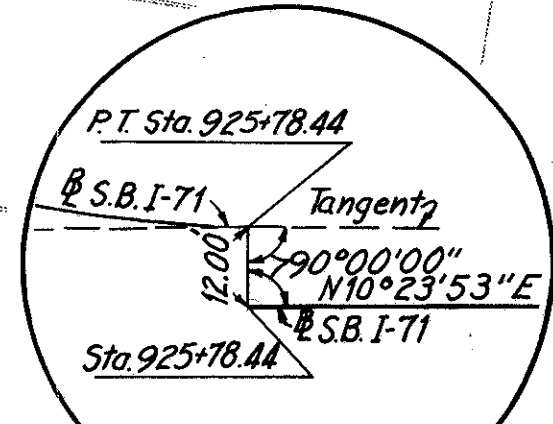
Note: For Dimensions of Parcel 3067A-T See Sheet 27

O.L. 72  
O.L. 73

**S.B. I-71 CURVE DATA**  
 P.I. Sta. 923+17.93  
 $\Delta = 07^{\circ}39'11''$   
 $D = 01^{\circ}28'00''$   
 $R = 3906.52'$   
 $T = 261.28'$   
 $L = 521.80'$   
 $E = 8.73'$

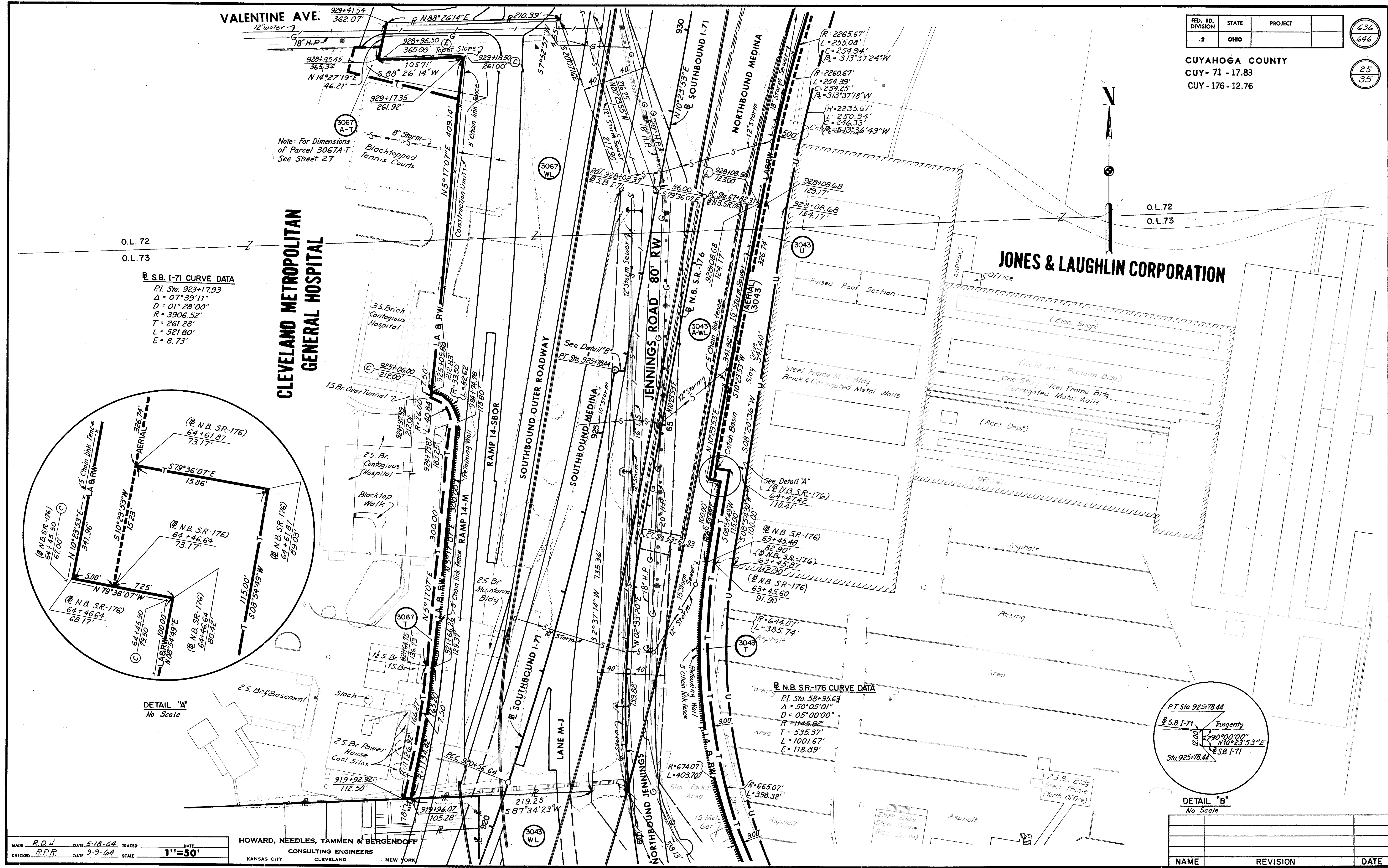


**N.B. SR-176 CURVE DATA**  
 P.I. Sta. 58+95.63  
 $\Delta = 50^{\circ}05'01''$   
 $D = 05^{\circ}00'00''$   
 $R = 1145.92'$   
 $T = 535.37'$   
 $L = 1001.67'$   
 $E = 118.89'$



**CLEVELAND METROPOLITAN GENERAL HOSPITAL**

**JONES & LAUGHLIN CORPORATION**



MADE R.D.J. DATE 5-18-64 TRACED DATE  
 CHECKED R.P.P. DATE 9-9-64 SCALE 1"=50'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

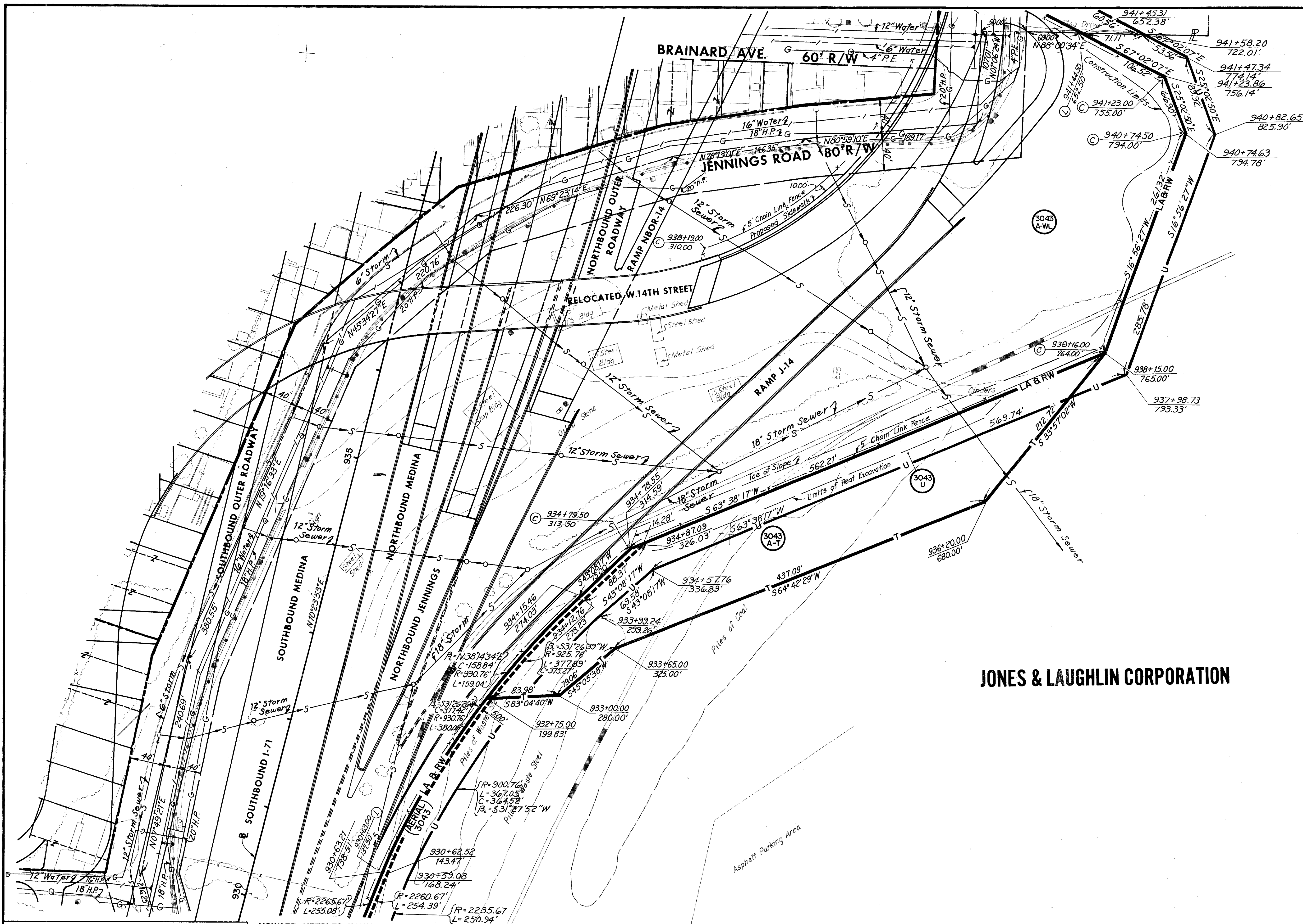
NAME	REVISION	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

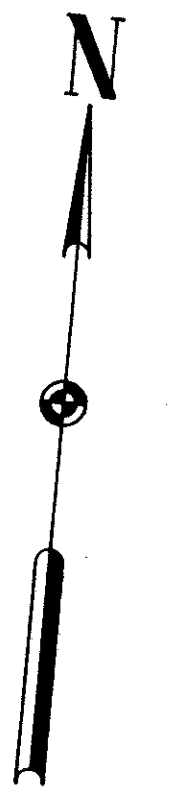
637  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

26  
35



**JONES & LAUGHLIN CORPORATION**

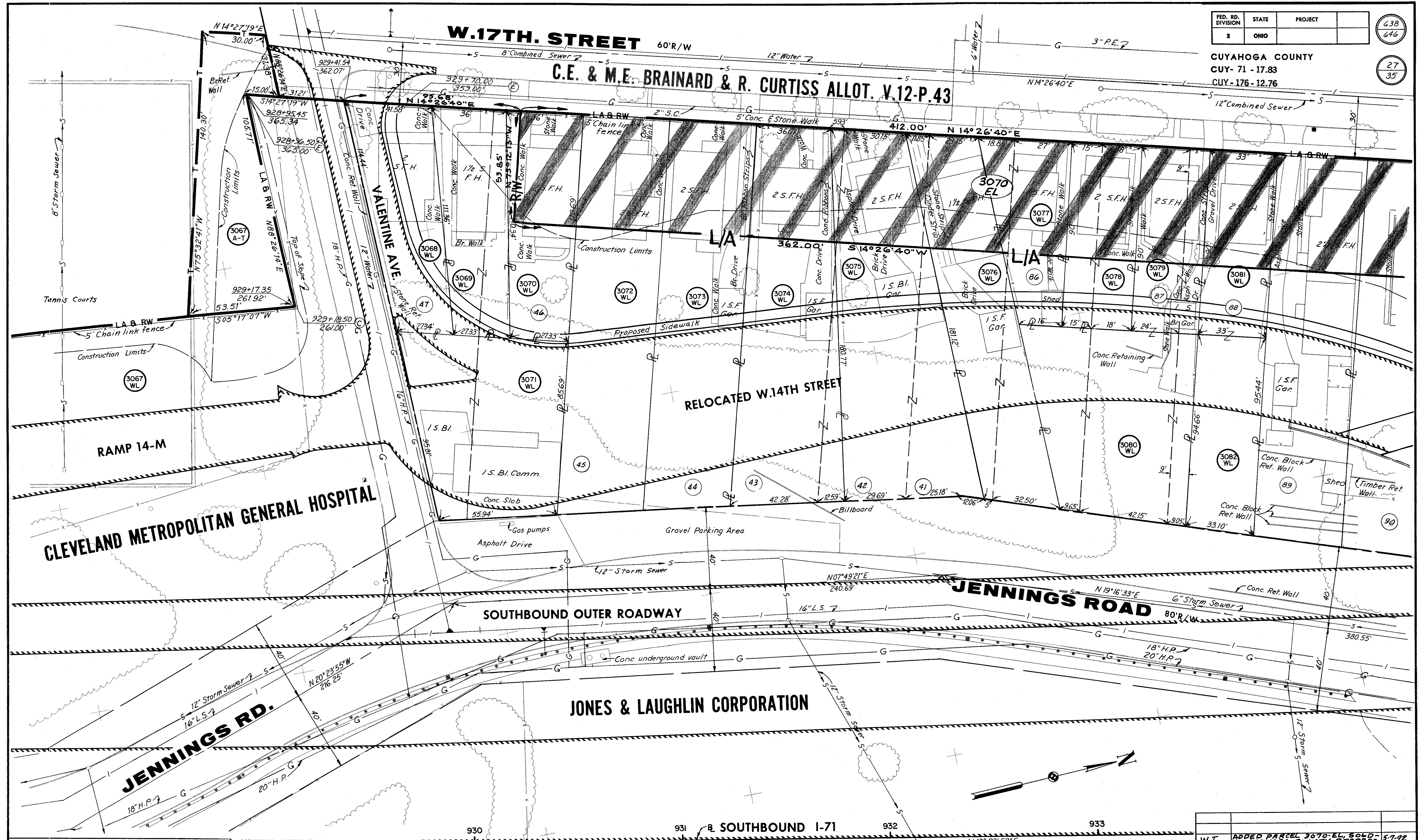


MADE R.D.V. DATE 6-11-64 TRACED DATE  
CHECKED P.P.P. DATE 9-9-64 SCALE 1"=50'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE

**W.17TH. STREET** 60'R/W  
**C.E. & M.E. BRAINARD & R. CURTISS ALLOT. V.12-P.43**



MADE R.D.V. DATE 3-12-64 TRACED DATE  
CHECKED R.P.R. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

PARCEL SOLD BY STATE

W.T.	ADDED PARCEL 3070-EL SOLD - CUYAHOGA COUNTY RECORDS VOL. 91-6891, PG. 22	5-7-92
NAME	REVISION	DATE



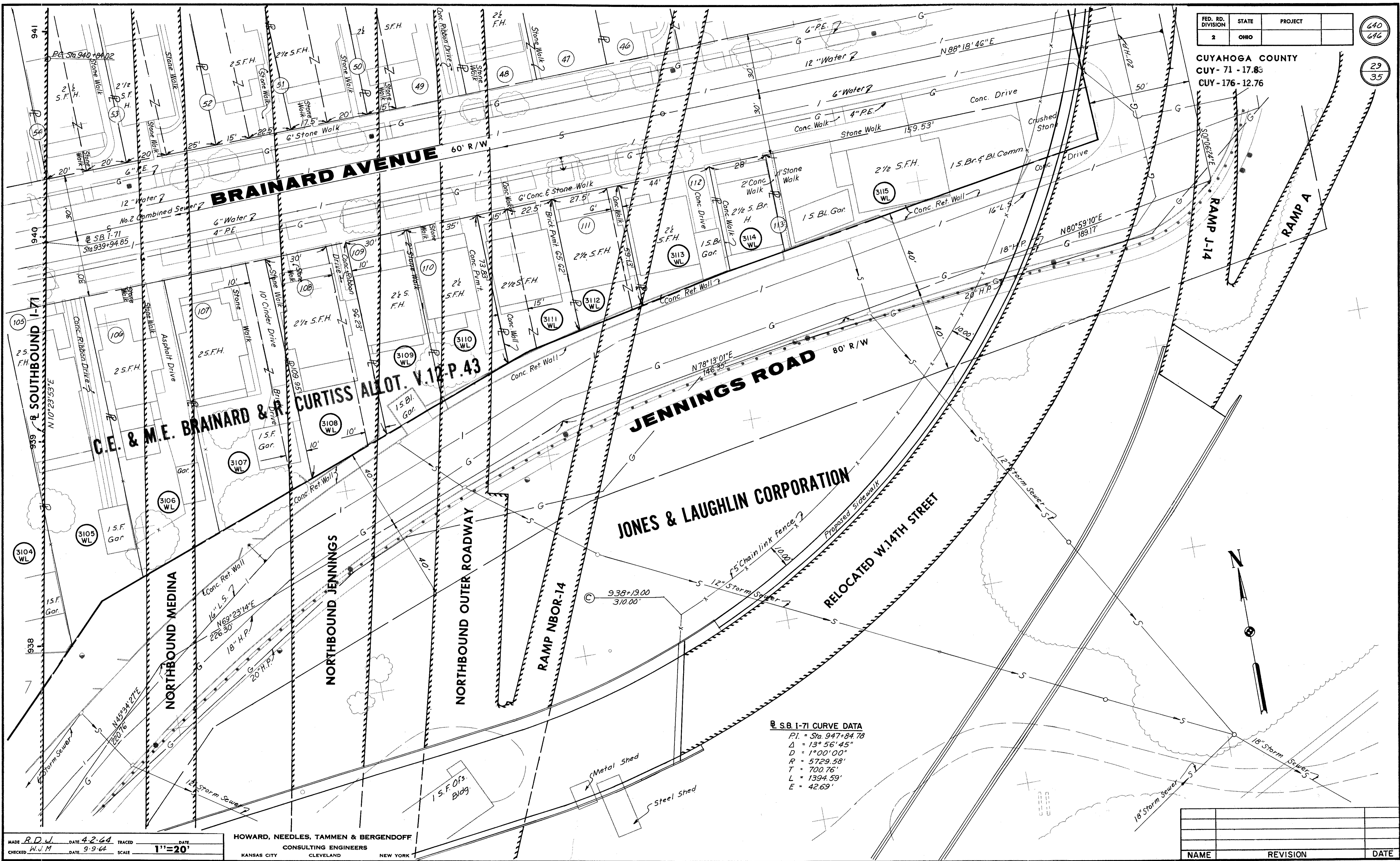


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

640  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

29  
35



**JONES & LAUGHLIN CORPORATION**

**S.B. I-71 CURVE DATA**  
 P.I. = Sta. 947+84.78  
 Δ = 13° 56' 45"  
 D = 1° 00' 00"  
 R = 5729.58'  
 T = 700.76'  
 L = 1394.59'  
 E = 42.69'

MADE R.D.J. DATE 4-2-64 TRACED DATE  
 CHECKED W.J.M. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE

FEB 11 1965 RIGHT OF WAY

C.E. & M.E. BRAINARD & R. CURTISS ALLOT. V.12-P.43

BRAINARD AVENUE 60'R/W

CATHERINE E. BRAINARD ALLOT. V.12-P.12

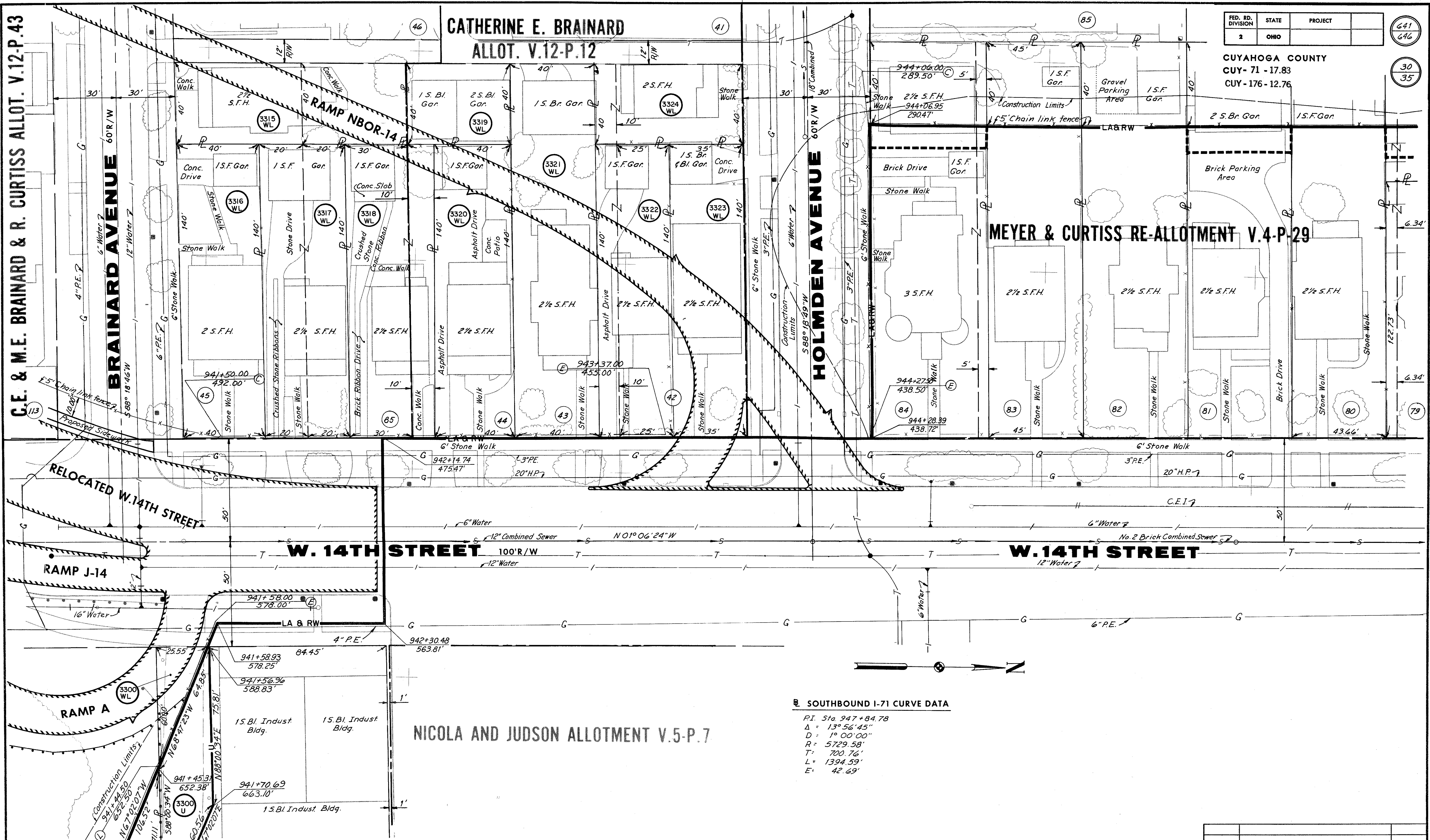
HOLMDEN AVENUE 60'R/W

MEYER & CURTISS RE-ALLOTMENT V.4-P-29

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGO COUNTY  
CUY-71-17.83  
CUY-176-12.76

641  
646  
30  
35



**SOUTHBOUND I-71 CURVE DATA**

P.I. Sta. 947+84.78  
 $\Delta = 13^\circ 56' 45''$   
 $D = 1^\circ 00' 00''$   
 $R = 5729.58'$   
 $T = 700.76'$   
 $L = 1394.59'$   
 $E = 42.69'$

MADE R.D.V. DATE 3-11-62 TRACED DATE  
 CHECKED W.J.M. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

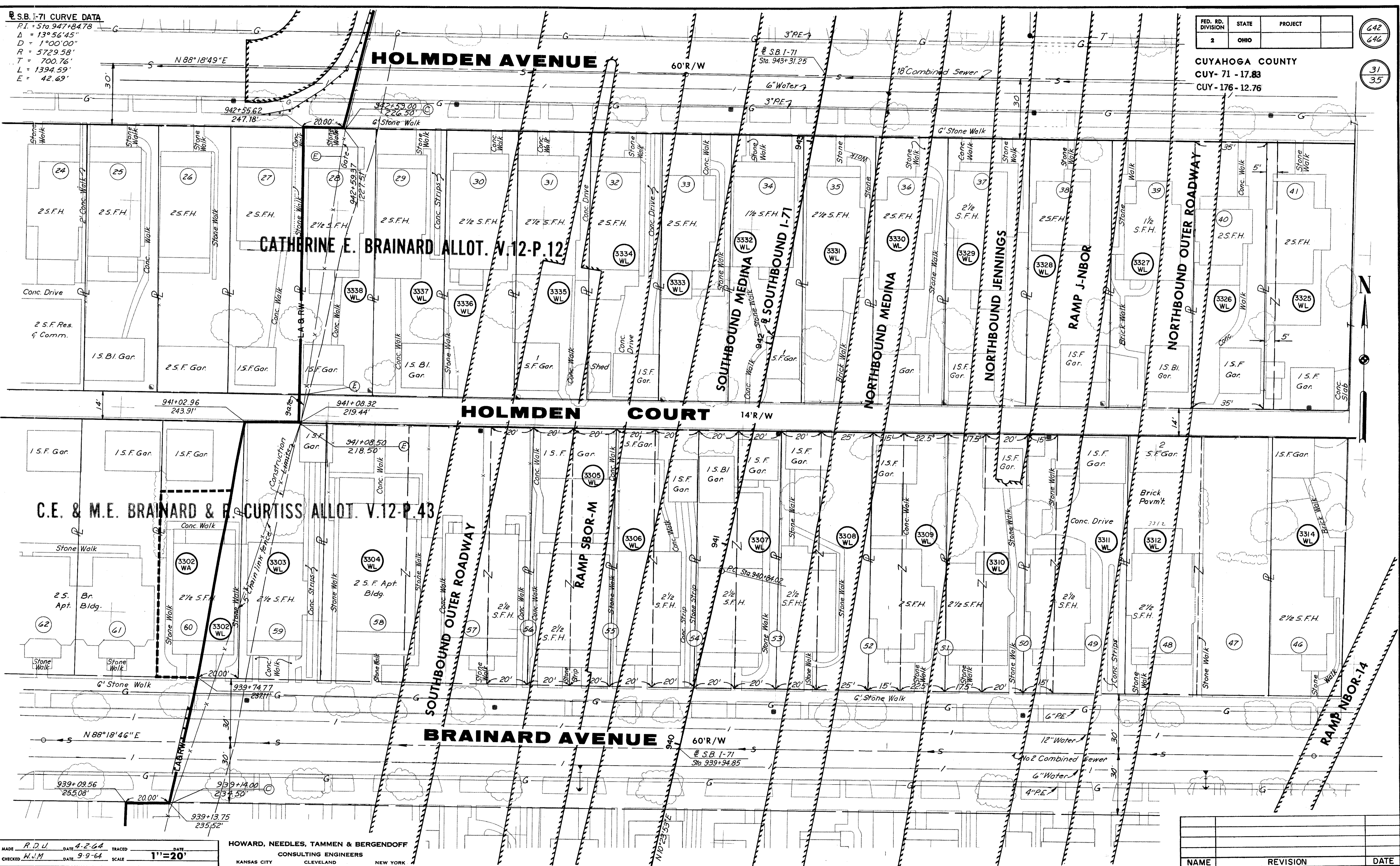
NAME	REVISION	DATE

**S.B. I-71 CURVE DATA**  
 P.I. = Sta. 947+84.78  
 $\Delta = 13^{\circ}56'45''$   
 $D = 1^{\circ}00'00''$   
 $R = 5729.58'$   
 $T = 700.76'$   
 $L = 1394.59'$   
 $E = 42.69'$

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY  
 CUY-71-17.83  
 CUY-176-12.76

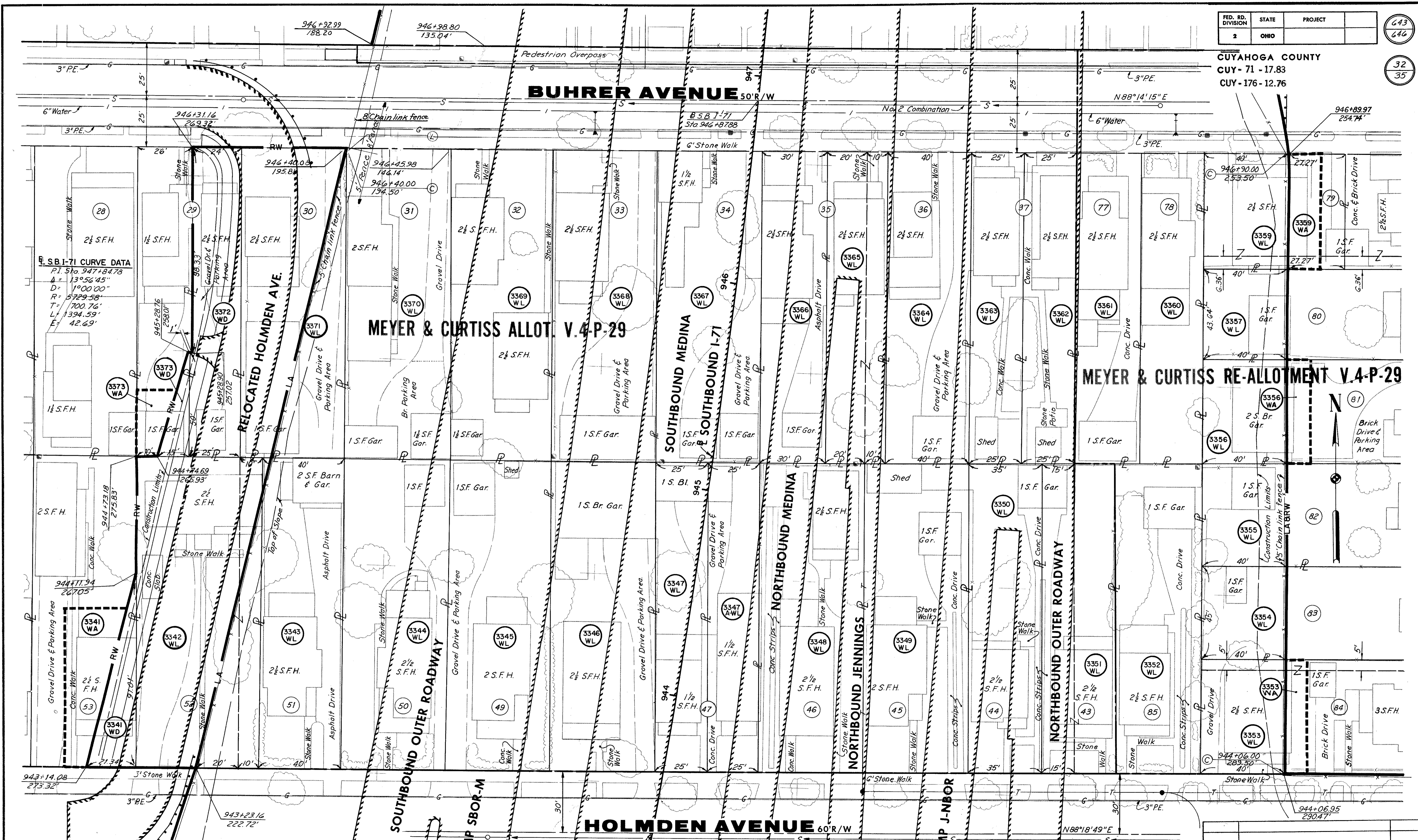
642  
 646  
 31  
 35



MADE R.D.U. DATE 4-2-64 TRACED DATE  
 CHECKED W.J.M. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE



**S.B.I-71 CURVE DATA**  
 P.I. Sta. 947+84.78  
 Δ = 13°56'45"  
 D = 1°00'00"  
 R = 5729.58'  
 T = 700.76'  
 L = 1394.59'  
 E = 42.69'

MADE R.J.K. DATE 4-2-64 TRACED DATE  
 CHECKED W.J.M. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

S.B.I-71  
 Sta 943+31.25

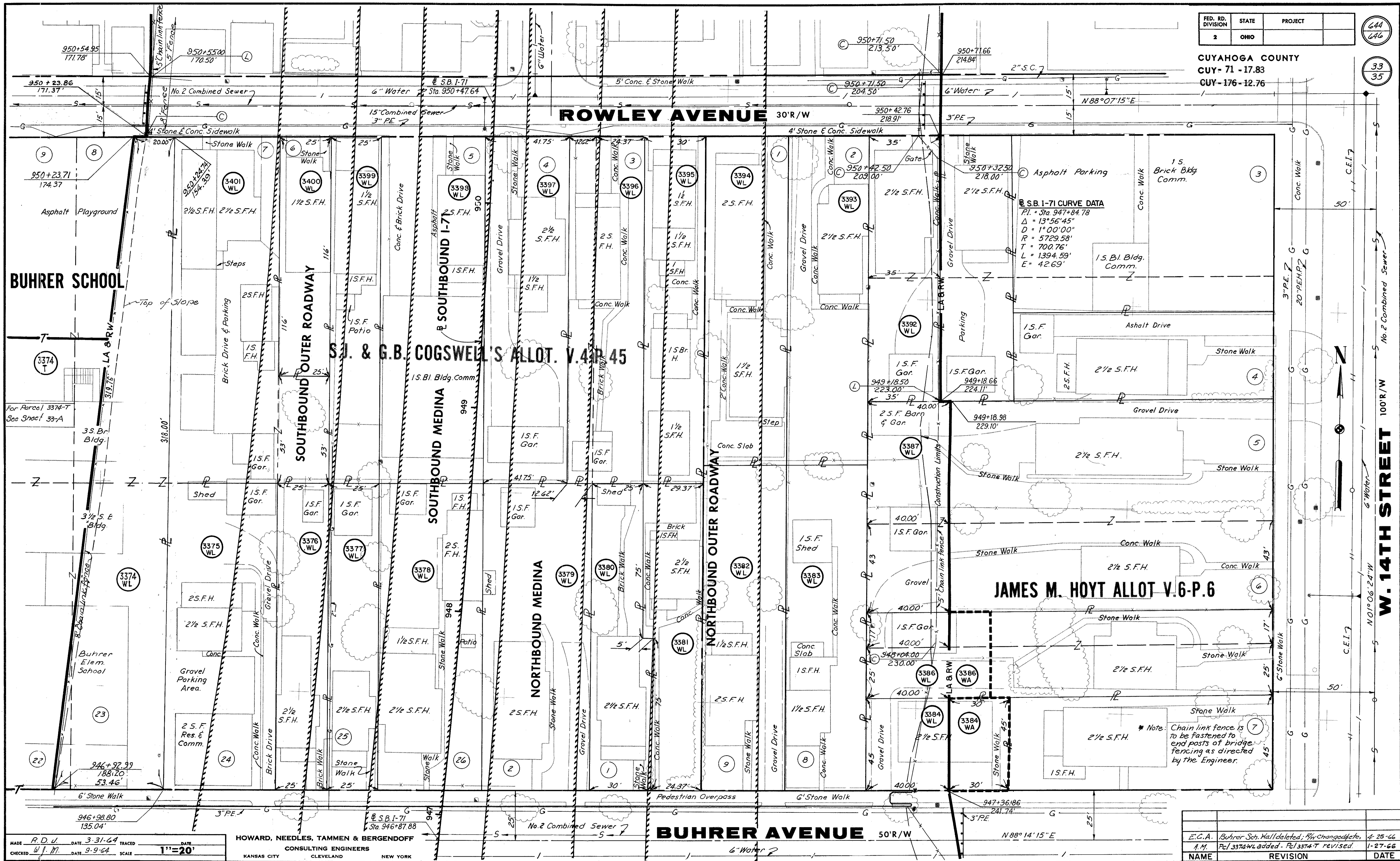
E.C.A.	Buhrer Sch. Wall deleted; Sq. changed date 4-25-66
NAME	REVISION
	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

644  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

33  
35



MADE R.D.U. DATE 3-31-64 TRACED DATE  
CHECKED W.M. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
KANSAS CITY CLEVELAND NEW YORK

BUHRER AVENUE 50'R/W

E.C.A.	Buhrer Sch. Wall deleted; Pkwy changed date.	4-25-66
A.M.	Pcl 3374WL added. Pcl 3374-T revised.	1-27-66
NAME	REVISION	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

645  
646

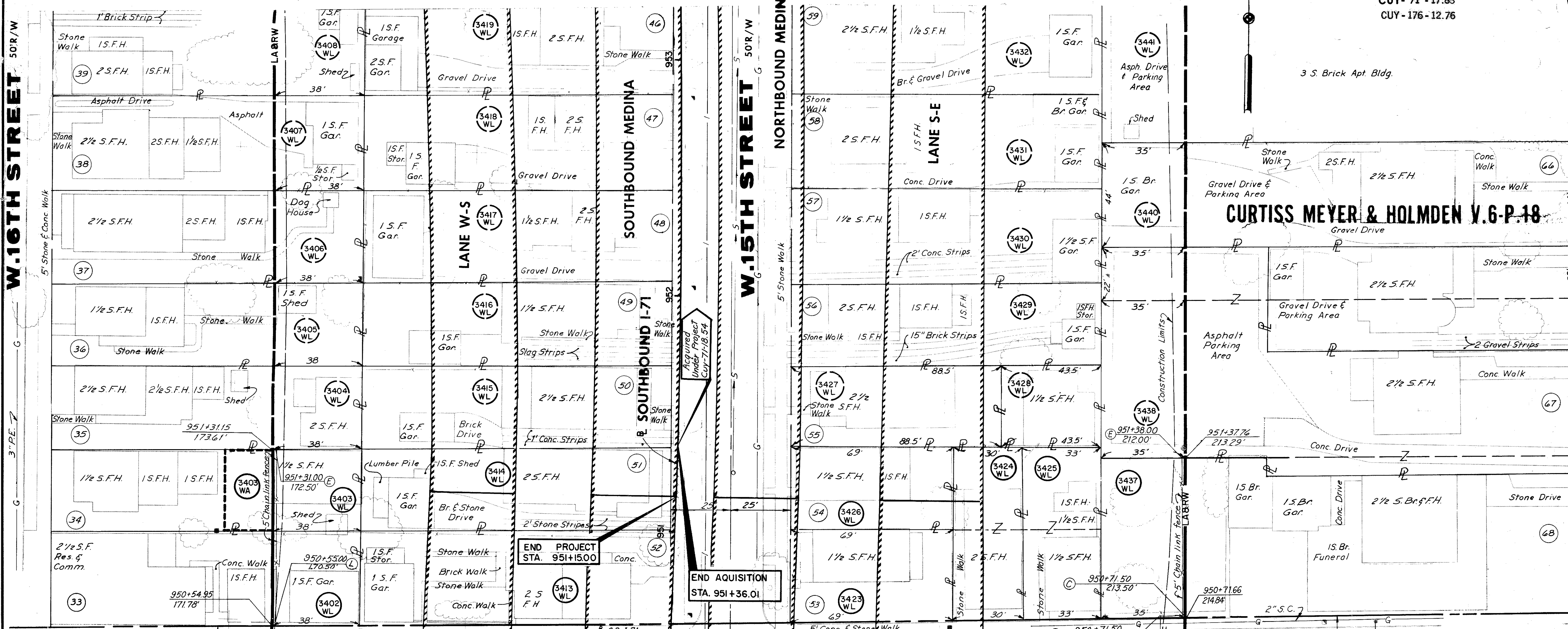
CUYAHOGA COUNTY  
CUY- 71 - 17.83  
CUY- 176 - 12.76

34  
35

W. 16TH STREET 50'R/W

W. 15TH STREET 50'R/W

W. 14TH STREET 100'R/W



**CURTISS MEYER & HOLMDEN V.6-P.18**

**JAMES M. HOYT ALLOT V.6-P.6**

**S.J. & G.B. COGSWELL'S ALLOT. V.4-P.45**

Acquired Under Project Cuy-71-18.5A

END PROJECT STA. 951+15.00

END ACQUISITION STA. 951+36.01

**S.B. 1-71 CURVE DATA**  
 P.I. = Sta 947+84.78  
 $\Delta = 13^{\circ}56'45''$   
 $D = 1^{\circ}00'00''$   
 $R = 5729.58'$   
 $T = 700.76'$   
 $L = 1394.59'$   
 $E = 42.69'$

MADE R.D.J. DATE 3-9-64 TRACED DATE 9-9-64  
 CHECKED W.J.M. DATE 9-9-64 SCALE 1"=20'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

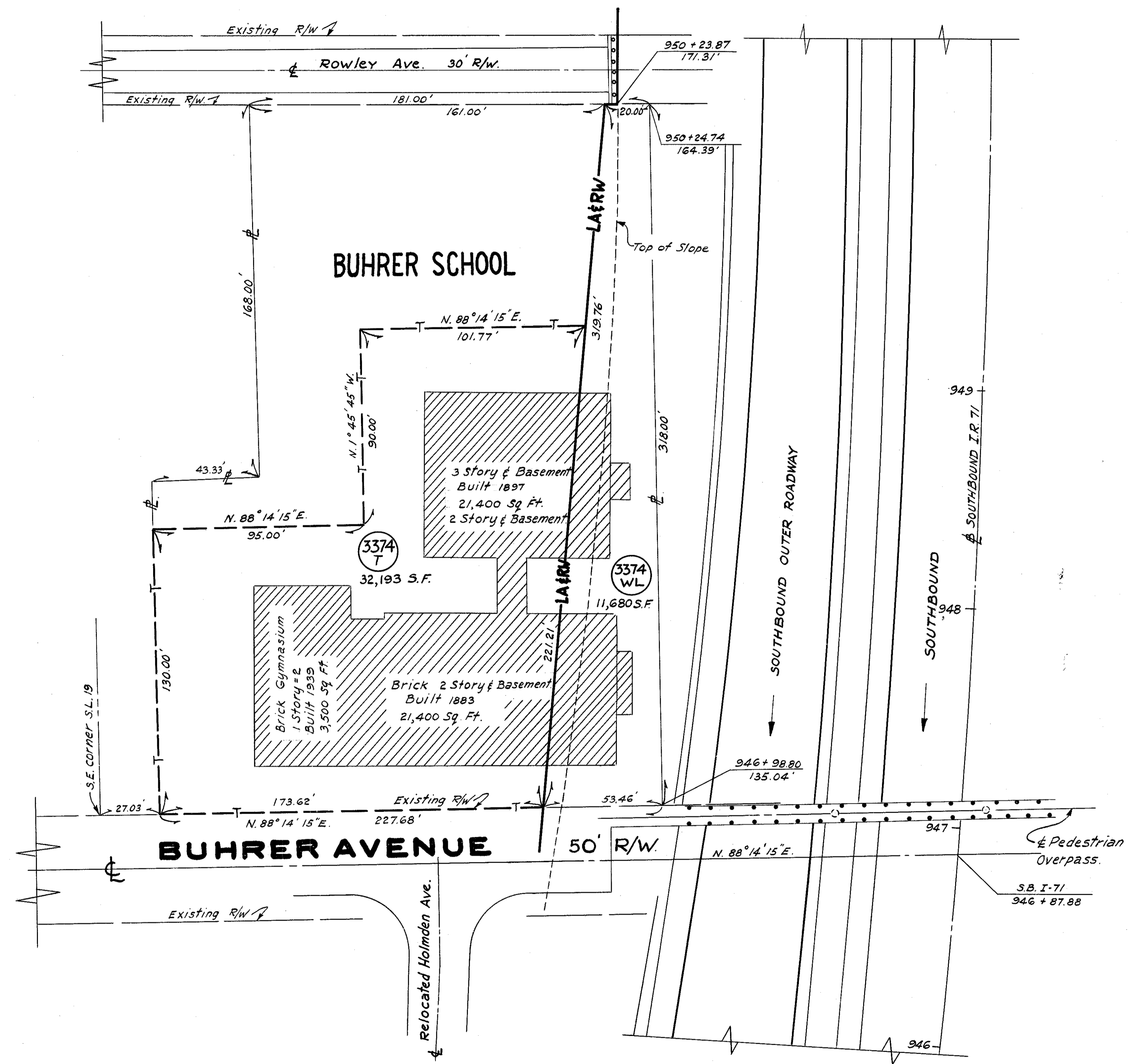
E.C.A.	Buhrer Sch. Wall deleted; Reshored 4-25-66
NAME	REVISION
	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

644-A  
646

CUYAHOGA COUNTY  
CUY-71-17.83  
CUY-176-12.76

33-A  
35



Scale: 1" = 30'

E.C.A. Name	Sheet 33-A added	4-25-66
Revision		Date

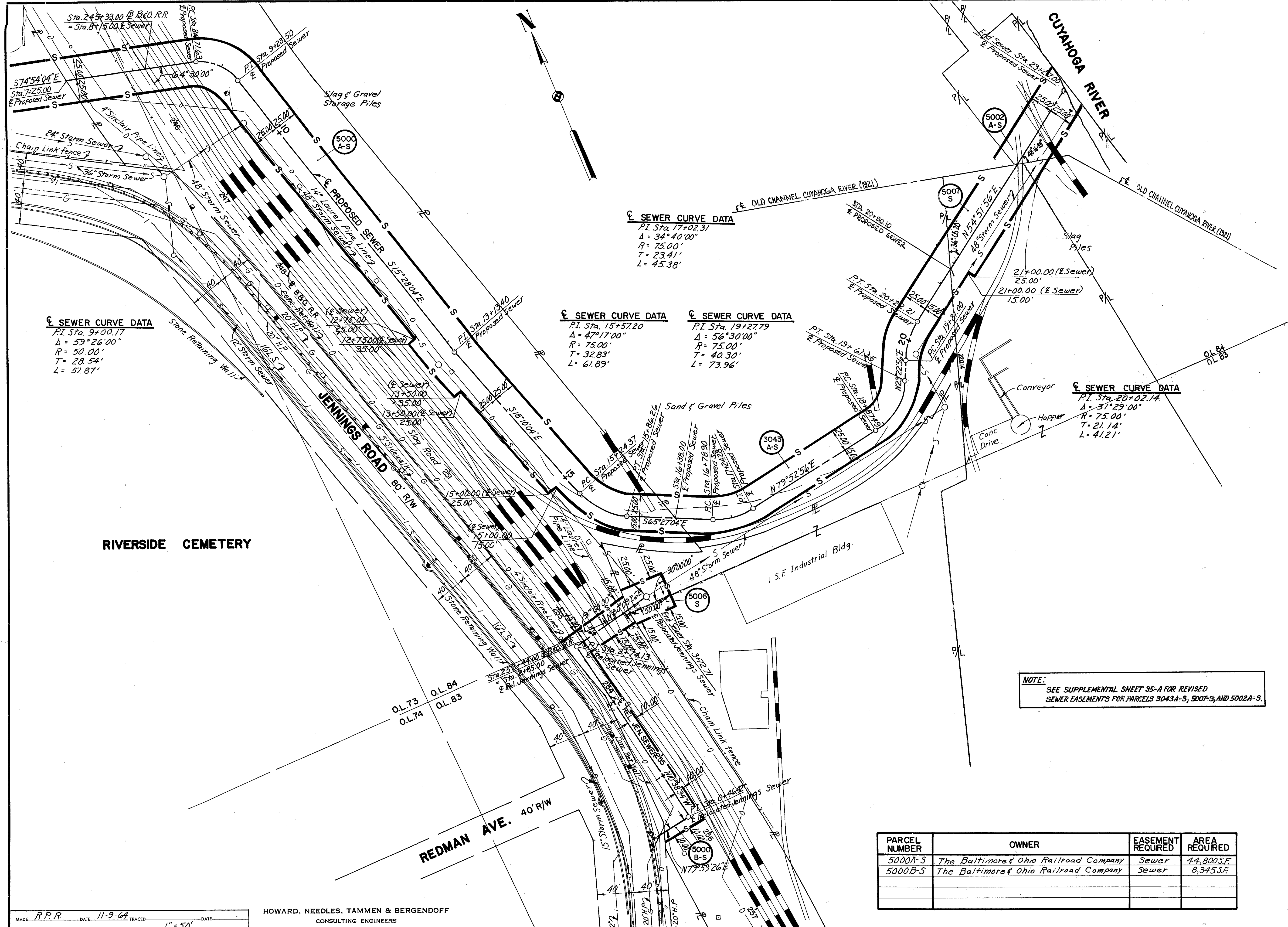
RIGHT OF WAY

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

696  
646

CUYAHOGA COUNTY  
CUY - 71 - 17.83  
CUY - 176 - 12.76

35  
35



**SEWER CURVE DATA**  
 P.I. Sta. 17+02.31  
 $\Delta = 34^{\circ}40'00''$   
 $R = 75.00'$   
 $T = 23.41'$   
 $L = 45.38'$

**SEWER CURVE DATA**  
 P.I. Sta. 9+00.17  
 $\Delta = 59^{\circ}26'00''$   
 $R = 50.00'$   
 $T = 28.54'$   
 $L = 51.87'$

**SEWER CURVE DATA**  
 P.I. Sta. 15+57.20  
 $\Delta = 47^{\circ}17'00''$   
 $R = 75.00'$   
 $T = 32.83'$   
 $L = 61.89'$

**SEWER CURVE DATA**  
 P.I. Sta. 19+27.79  
 $\Delta = 56^{\circ}30'00''$   
 $R = 75.00'$   
 $T = 40.30'$   
 $L = 73.96'$

**SEWER CURVE DATA**  
 P.I. Sta. 20+02.14  
 $\Delta = 31^{\circ}29'00''$   
 $R = 75.00'$   
 $T = 21.14'$   
 $L = 41.21'$

**NOTE:**  
 SEE SUPPLEMENTAL SHEET 35-A FOR REVISED SEWER EASEMENTS FOR PARCELS 3043A-S, 5007-S, AND 5002A-S.

PARCEL NUMBER	OWNER	EASEMENT REQUIRED	AREA REQUIRED
5000A-S	The Baltimore & Ohio Railroad Company	Sewer	44,800 S.F.
5000B-S	The Baltimore & Ohio Railroad Company	Sewer	8,345 S.F.

MADE R.P.R. DATE 11-9-64 TRACED DATE SCALE 1" = 50'

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 KANSAS CITY CLEVELAND NEW YORK

C.J.V.	SUPPLEMENTAL SH. 35-A	2-16-66
K.T.S.	REV. R.S. PARCELS 5002A-S, 5007-S & 3043A-S	8-11-65
NAME	REVISION	DATE

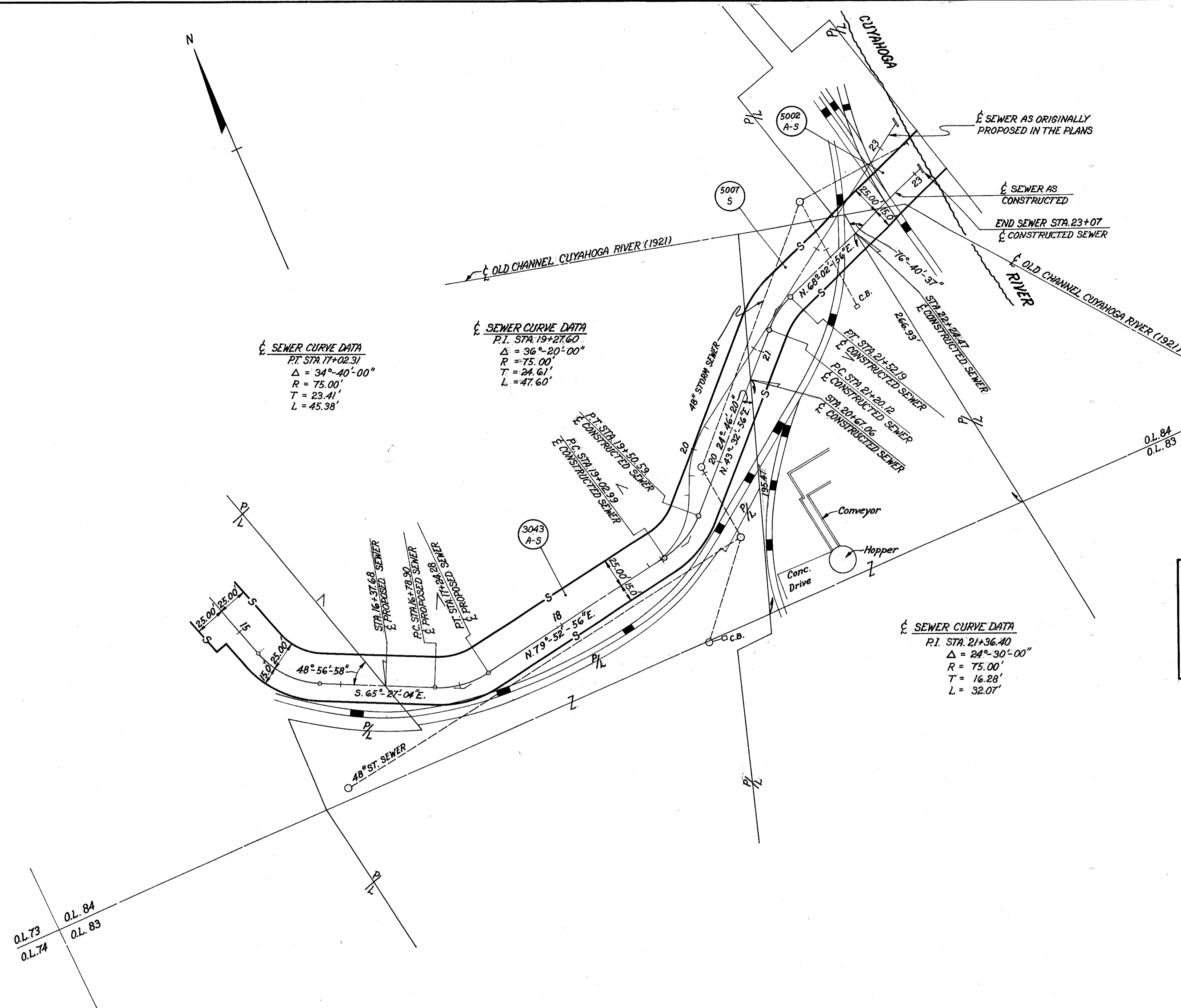


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

646-A  
646

CUYAHOGA COUNTY  
CUY - 71-17.83  
CUY - 176-12.76

35-A  
35



**NOTE:**  
THIS R/W SHEET IS A SUPPLEMENTAL SHEET TO BE USED IN CONJUNCTION WITH R/W SHEET #35. THE REVISED SEWER EASEMENTS WERE NECESSITATED BY REASON OF A REVISION IN SEWER ALIGNMENT DURING CONSTRUCTION BETWEEN STA. 18+87.49 AND THE RIVER.

PARCEL NUMBER	OWNER	EASEMENT REQUIRED	AREA REQUIRED
5002A-S	THE WHEELING & LAKE ERIE RAILROAD CO.	SEWER	3,800 SQ. FT.
5007-S	CUYAHOGA LIME COMPANY	SEWER	6,300 SQ. FT.
3043A-S	JONES & LAUGHLIN STEEL CORPORATION	SEWER	0.39 AC.

C.J.V.	REV AREAS PARCELS-5002A-S, 5007-S, 3043A-S	2-16-66
R.P.R.	ADDED TIES BETWEEN SEWER & R/S.	2-10-66
C.J.V.	SUPPLEMENTAL SHEET 35-A	JAN, 66
NAME	REVISION	DATE

RIGHT OF WAY